

**Fishery Management Report No. 97-3**

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**Area Management Report for the Recreational  
Fisheries of Northern Cook Inlet, 1996**

by

**Craig Whitmore**

and

**Dana Sweet**

July 1997

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Alaska Department of Fish and Game

Division of Sport Fish



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used in Division of Sport Fish Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

<b>Weights and measures (metric)</b>		<b>General</b>		<b>Mathematics, statistics, fisheries</b>	
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis	$H_A$
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
gram	g	and	&	catch per unit effort	CPUE
hectare	ha	at	@	coefficient of variation	CV
kilogram	kg	Compass directions:		common test statistics	F, t, $\chi^2$ , etc.
kilometer	km	east	E	confidence interval	C.I.
liter	L	north	N	correlation coefficient	R (multiple)
meter	m	south	S	correlation coefficient	r (simple)
metric ton	mt	west	W	covariance	cov
milliliter	ml	Copyright	©	degree (angular or temperature)	°
millimeter	mm	Corporate suffixes:		degrees of freedom	df
<b>Weights and measures (English)</b>		Company	Co.	divided by	÷ or / (in equations)
cubic feet per second	ft <sup>3</sup> /s	Corporation	Corp.	equals	=
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	fork length	FL
inch	in	et alii (and other people)	et al.	greater than	>
mile	mi	et cetera (and so forth)	etc.	greater than or equal to	≥
ounce	oz	exempli gratia (for example)	e.g.,	harvest per unit effort	HPUE
pound	lb	id est (that is)	i.e.,	less than	<
quart	qt	latitude or longitude	lat. or long.	less than or equal to	≤
yard	yd	monetary symbols (U.S.)	\$, ¢	logarithm (natural)	ln
Spell out acre and ton.		months (tables and figures): first three letters	Jan,...,Dec	logarithm (base 10)	log
<b>Time and temperature</b>		number (before a number)	# (e.g., #10)	logarithm (specify base)	log <sub>2</sub> , etc.
day	d	pounds (after a number)	# (e.g., 10#)	mid-eye-to-fork	MEF
degrees Celsius	°C	registered trademark	®	minute (angular)	'
degrees Fahrenheit	°F	trademark	™	multiplied by	x
hour (spell out for 24-hour clock)	h	United States (adjective)	U.S.	not significant	NS
minute	min	United States of America (noun)	USA	null hypothesis	$H_0$
second	s	U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	percent	%
Spell out year, month, and week.				probability	P
<b>Physics and chemistry</b>				probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
all atomic symbols				probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
alternating current	AC			second (angular)	"
ampere	A			standard deviation	SD
calorie	cal			standard error	SE
direct current	DC			standard length	SL
hertz	Hz			total length	TL
horsepower	hp			variance	Var
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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Craig Whitmore  
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Dana Sweet  
*Division of Sport Fish, Palmer*

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

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*Craig Whitmore and Dana Sweet*  
*Alaska Department of Fish and Game, Division of Sport Fish*  
*1800 Glenn Highway, Suite 4, Palmer, AK 99645-6736*

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# INTRODUCTION

This report is divided into two sections. Section I presents an introductory overview of the Northern Cook Inlet Management Area. Included in this section are a general geographic and organizational description of the management area; an inventory of the available fishery resources of the management area; an overview of the Alaska Board of Fisheries processes; a historical perspective of recreational angler effort, catch and harvest within management area waters; and an approximation of the economic value of the recreational fisheries of the management area. A general description of research and management activities, ongoing access programs, and a summary of the current major biological and social issues in the Northern Cook Inlet Management Area are also presented. Section II provides a more detailed summary of the major fisheries in the Northern Cook Inlet Management Area. Included in this section are a description and historical perspective of each fishery; the objective governing their management; and descriptions of recent fishery performance, recent Board of Fisheries actions, social and biological issues, and ongoing or recommended research and management activities.

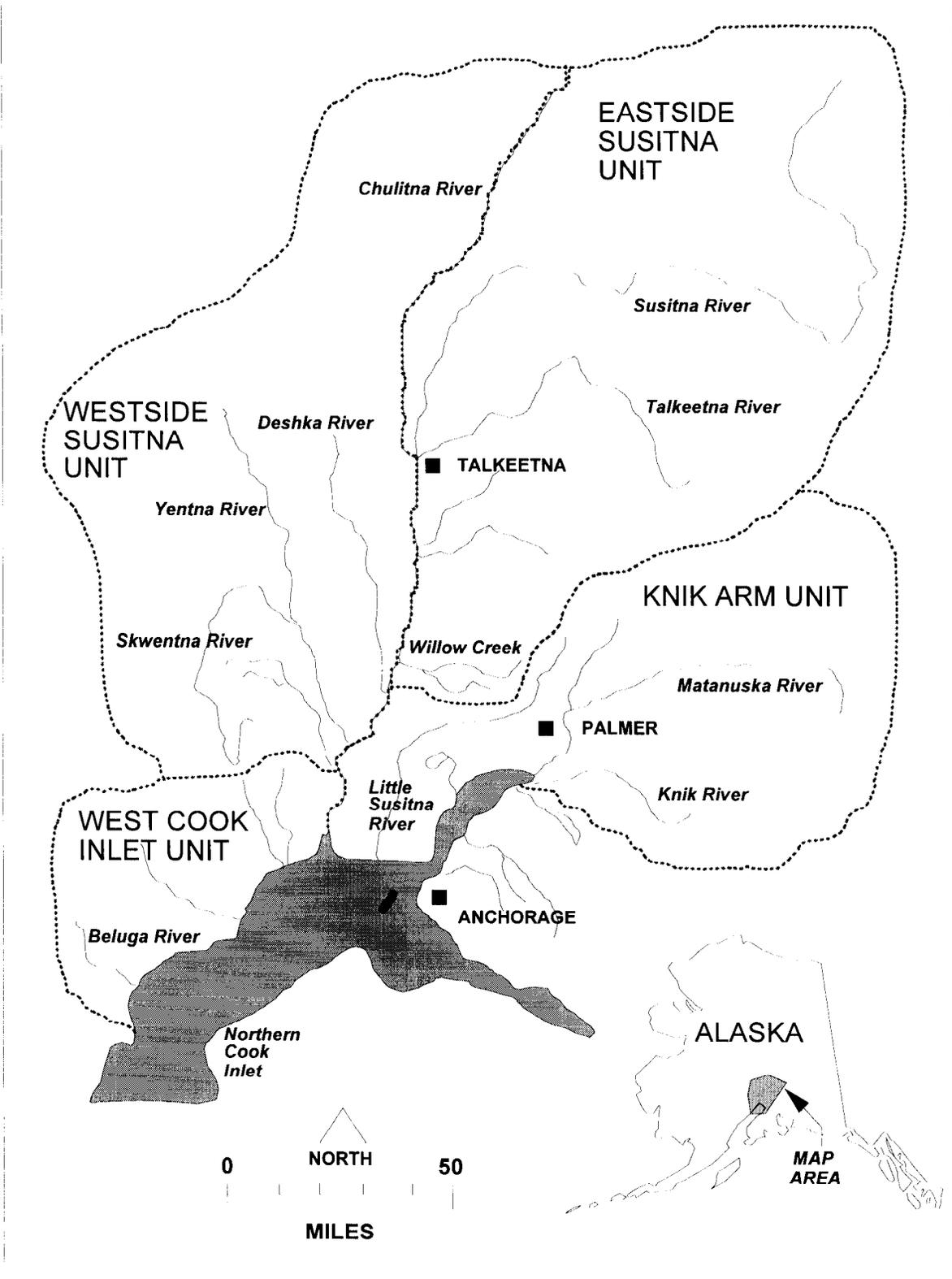
## SECTION I: MANAGEMENT AREA OVERVIEW

### MANAGEMENT AREA DESCRIPTION

The Northern Cook Inlet sport fish management area (NCIMA) includes all freshwater drainages and adjacent marine waters of Upper Cook Inlet between the West Foreland and the Eklutna River, excluding the upper Susitna River drainage above the Oshetna River confluence (Figure 1). The management area encompasses approximately 23,000 square miles and is dominated by the Susitna River drainage which originates in glaciers of the Alaska and Talkeetna mountain ranges and flows about 200 miles in a southerly direction before entering Cook Inlet near Anchorage. Most sport fisheries in the NCIMA are easy to access by road or jet-boat, with the exception of the remote West Cook Inlet Unit waters which are accessible only by boat or aircraft.

For the purposes of management and harvest reporting, the NCIMA is segregated into four major units (Figure 1):

1. Knik Arm Unit: This unit includes all waters of the Matanuska and Knik River drainages, the Little Susitna River drainage, and all waters draining into Knik Arm excluding those entering south and west of the Eklutna River; all adjacent marine waters of Cook Inlet; and the waters of the Nancy Lake Recreation Area.
2. Eastside Susitna Unit: This unit includes all drainages of the upper Susitna River above the Chulitna River to and including the Oshetna River drainage, all eastside drainages of the Chulitna River, and all eastside drainages of the Susitna River below its confluence with the Chulitna River to and including Willow and Deception creeks to the south. This area also includes eastside drainages of the Susitna River within a half mile of the Susitna River downstream of Willow Creek. This management unit has no marine waters.



**Figure 1.-Map of the Northern Cook Inlet sport fish management area.**

3. Westside Susitna Unit: This unit includes all westside drainages of the Chulitna River, and all westside drainages of the Susitna River below its confluence with the Chulitna River. This management unit has no marine waters.
4. West Cook Inlet Unit: This unit includes all freshwater drainages entering Cook Inlet between the Susitna River and the West Foreland, and all adjacent marine waters of Cook Inlet.

The NCIMA is comprised of two complete and a portion of a third Statewide Harvest Survey (SWHS) reporting area (Howe et al. 1996). These areas include: (1) the Knik Arm Drainage Area reporting unit (Area K), the East-Side Susitna Drainage Area reporting unit (Area M), and the West-Side Cook Inlet-West-Side Susitna Drainage Area reporting unit (Area N). The West-Side Cook Inlet-West-Side Susitna Drainage Area (Howe et al. 1996) includes fresh and marine waters between the West Foreland and Cape Douglas, an area outside of the NCIMA; Area N fisheries outside of the NCIMA are not included in this report.

In terms of political geography, the management area is very similar to the boundaries of the Matanuska-Susitna Borough. About 50% of the state's population resides within or immediately adjacent to the management area. Major communities within the management area include Wasilla, Palmer, Talkeetna, Willow, and Houston. Smaller communities in the management area include Tyonek, Chickaloon, and Skwentna. The Municipality of Anchorage, Alaska's largest community, borders the management area. Although much of Alaska's population resides in or near the NCIMA, it is important to note that much of the management area is either sparsely populated or uninhabited because of a limited transportation system. The State of Alaska is the principal land manager in the NCIMA. Other significant land managers in the NCIMA include the Matanuska-Susitna (Mat-Su) Borough, various native corporations and villages, and the federal government.

Management and research functions for the NCIMA are conducted from the Alaska Department of Fish and Game (ADF&G) Palmer area office. The Division of Sport Fish staff stationed in Palmer include a permanent full-time Fisheries Biologist III Area Management Biologist (Craig Whitmore), a permanent full-time Fisheries Biologist III Area Research Biologist (Gene Sandone), a permanent full-time Fisheries Biologist II Assistant Area Management Biologist (Larry Bartlett), three permanent full-time Fisheries Biologist II Research Biologists (David Rutz, Suzanne Hayes and Robert Lafferty), and one permanent full-time Clerk-Typist III (Nancy Deslauriers), who is shared with the Division of Wildlife Conservation staff. These positions are assisted by approximately 20 permanent-seasonal Fisheries Biologists and Fish and Wildlife Technicians who act as crew leaders and staff for area research and management projects. Significant support is also provided to the area staff from the Sport Fish Division's Southcentral region Research and Technical Services (RTS) staff. A regional maintenance worker (James Whitt, Jr.) performs maintenance services for the Southcentral region from a shop located in Palmer.

## **FISHERIES RESOURCE INVENTORY**

Sport anglers fishing NCIMA waters can target all five species of North American Pacific salmon (pink *Oncorhynchus gorbuscha*, coho *O. kisutch*, sockeye *O. nerka*, chum *O. keta*, and chinook *O. tshawytscha*) in both fresh and salt water. In addition, there are major fisheries for rainbow trout *O. mykiss*, Dolly Varden *Salvelinus malma*, Arctic char *Salvelinus alpinus*, and

Arctic grayling *Thymallus arcticus*; as well as for lake trout *Salvelinus namaycush*, northern pike *Esox lucius*, burbot *Lota lota*, whitefish *Coregonus* and *Prosopium*, landlocked salmon *Oncorhynchus*, and smelt *Osmeridae*.

## **ALASKA BOARD OF FISHERIES ACTIVITIES**

The waters of the NCIMA fall within two sport fishing regulatory areas: the Susitna/West Cook Inlet Regulatory Area and the Cook Inlet/Resurrection Bay Salt Water Regulatory Area. Regulations governing the sport fisheries of the Susitna/West Cook Inlet and the Cook Inlet/Resurrection Bay Salt Water Regulatory Areas are established in Chapters 61 and 58, respectively, of Title 5 of the Alaska Administrative Code. Regulations pertaining to other Cook Inlet fisheries including subsistence (Chapter 01), personal use (Chapter 77) and commercial fisheries (Chapter 21) are also contained in Title 5 of the Alaska Administrative Code.

The process of developing fishing regulations appropriate for fisheries in the NCIMA occurs within the established Alaska Board of Fisheries (BOF) process. Public input concerning regulation changes and allocation issues is provided for in this process through various means including submission of proposals, direct testimony to the BOF, and/or participation in local fish and game advisory committees. Advisory committees have been established throughout Alaska to assist the Boards of Fisheries and Game in assessing fisheries and wildlife issues and proposed regulations. Most active committees meet at least once each year, usually in the fall prior to the BOF meetings. Staff from the Division of Sport Fish and other divisions are often invited to attend the committee meetings. In this way, advisory committee meetings allow for direct public interaction with staff involved with resource issues of local concern. Within the NCIMA there are four Fish and Game Advisory Committees: Denali, Matanuska, Tyonek and Mt. Yenlo. Staff also have significant interaction with the Anchorage Advisory Committee which is outside, but bordering, the NCIMA. Under the current operating schedule the BOF meets on a 3-year cycle. Proposals regarding the NCIMA were addressed most recently in February 1996. The next BOF meeting to address Cook Inlet finfish regulations is scheduled for 1998. Appendix F provides a summary of BOF regulatory actions.

## **EXISTING MANAGEMENT PLANS**

Upper Cook Inlet fisheries have been the focus of intensive allocation battles for many years. These conflicts have lead the BOF to establish numerous management plans and policies to guide the area's fisheries. These plans attempt to assure sustained yield of the area's fish resources, as well as establishing allocations, management actions and guidelines.

There are 10 management plans or policies which the BOF has adopted that impact NCIMA fisheries. These are:

1. Upper Cook Inlet Salmon Management Plan (5 AAC 21.363),
2. Northern District Chinook Salmon Management Plan (5 AAC 21.366),
3. Fish Creek Sockeye Salmon Management Plan (5 AAC 21.364),
4. Big River Sockeye Salmon Management Plan (5 AAC 21.368),
5. Little Susitna River Coho Salmon Management Plan (5 AAC 61.060),
6. Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy (ADF&G 1986),

7. Packers Creek Sockeye Salmon Management Plan (5 AAC 21.370),
8. Northern District Coho Salmon Management Plan (5 AAC 21.358),
9. Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540), and
10. Skwentna River Personal Use Salmon Fishery Management Plan (5 AAC 77.526).

The Upper Cook Inlet Salmon Management Plan (UCISMP) establishes allocation criteria and primary direction for fishery management. The other plans relate to the Upper Cook Inlet Salmon Management Plan, providing specific direction to fishery managers regarding user groups, time, area or species. The Upper Cook Inlet Salmon Management Plan can be broken into the following allocative components:

1. Provide for a subsistence priority;
2. Manage the Northern District chinook salmon, early Russian River sockeye salmon, and early Kenai River chinook salmon returns (which normally move through upper Cook Inlet prior to June 30) primarily for recreational use;
3. Manage those stocks moving through upper Cook Inlet between July 1 and August 15 primarily for commercial uses;
4. After August 15 manage stocks moving to Kenai Peninsula drainages primarily for recreational use;
5. Manage stocks other than those spawning in Kenai Peninsula drainages primarily for commercial uses; and
6. Minimize the incidental commercial harvest of Northern District coho salmon, late Kenai River chinook salmon, and early Kenai River coho salmon.

This plan states that chinook salmon bound for the NCIMA will be managed primarily for recreational uses because these fish stocks move through upper Cook Inlet prior to June 30. From July 1 to August 15, NCIMA salmon are managed primarily for commercial uses as they pass through upper Cook Inlet. After August 15, the department is to minimize the incidental commercial harvest of Northern District coho salmon stocks.

Included in the UCISMP are guiding principals to assist the Board of Fisheries when taking actions associated with adoption of regulations regarding upper Cook Inlet salmon stocks. These principles are:

1. The conservation and sustained yield of healthy salmon resources and maintenance of the habitat and ecosystem on which salmon and allied species depend for survival throughout their life-cycle;
2. The maintenance of viable and diverse fish species and stocks;
3. The maintenance of the genetic diversity of fish species and stocks;
4. The best available information should be presented to the Board;
5. The capability of the action being implemented and evaluated, including factors such as flexible and adaptive management, conflict with other law and mixed stock management;

6. The capability of the action providing tangible benefits to user groups or conservation, with the least risk to existing fisheries and to conservation;
7. Stability and viability of sport, commercial and personal use fisheries.

The Tyonek subsistence fishery (5 AAC 01.560) is an important component of the Upper Cook Inlet Salmon Management Plan. This fishery provides subsistence fishing opportunity primarily to residents of the village of Tyonek. Fish harvested in this fishery are bound for NCIMA. Specific fishing periods occur from May 15 through October 15. This fishery has been regulated by a 4,200 chinook salmon harvest quota since 1980.

The Northern District Chinook Salmon Management Plan was adopted in 1985 by the BOF. This plan provides for 6-hour commercial fishing periods, with gillnets 35 fathoms in length with a maximum mesh size of 6 inches.

To fulfill changes to the Northern District Chinook Salmon Management Plan, adopted by the Board of Fisheries during the November 1996 meeting, the Department of Fish and Game shall manage the Northern District commercial chinook salmon fishery as follows:

1. The harvest shall not exceed 12,500 chinook salmon.
2. The season closes on June 24, unless closed earlier by emergency order.
3. The number of regular periods shall be determined by the department based on preseason expectations of chinook salmon run strength.
4. The area from 1 mile south of the Theodore River to the Susitna River is closed to fishing; provisions of this paragraph do not apply after December 31, 1998.
5. If at least 90% of the biological escapement goal (BEG) for the Theodore River (BEG = 750) or Chuitna River (BEG = 1,400) is not met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.
6. In addition to above, if at least 90% of the biological escapement goal for the Chuitna River has not been met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to sport fishing for chinook salmon during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.

The Fish Creek Sockeye Salmon Management Plan (5 AAC 21.364) was adopted by the BOF in 1986 and modified in 1996. This plan governs the harvest of Fish Creek sockeye salmon in excess of the system's 50,000 escapement goal. This plan presently provides for a terminal set gillnet fishery in Knik Arm near the mouth of Fish Creek through July 29. From July 10 through July 31 a personal use dip net fishery is permitted in Fish Creek (5 AAC 77.545).

The Big River Sockeye Salmon Management Plan authorizes a harvest of Big River salmon by set gillnets in the Kustatan Subdistrict of the Central District. Sockeye salmon are the targeted species. This fishery extends from May 25 through June 24, but is subject to emergency closure when the incidental harvest of chinook salmon exceeds 1,000 fish.

The Little Susitna River Coho Salmon Management Plan (5 AAC 61.060) was adopted by the BOF in 1990 and modified in 1992 and 1996. This plan provides the department management

guidelines to ensure that a spawning escapement of 7,500 nonhatchery coho salmon into the Little Susitna River upstream of the George Parks Highway is achieved.

The Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy for Cook Inlet waters was adopted by the BOF in 1986. This policy provides future Fisheries Boards, ADF&G managers, and the sport fishing public with the following:

1. Management policies and implementation directives for Cook Inlet rainbow and steelhead trout, and
2. A systematic approach to developing sport fishing regulations that includes a process for rational selection of waters for such special management as catch-and-release, trophy areas and high yield fisheries.

The Packers Creek Sockeye Salmon Management Plan directs the department not to base commercial fishing time in the Kalgin Island subdistrict on enhanced run strength of Packers Creek sockeye salmon. The plan limits extra fishing time to no more than one additional fishing period per week.

The purpose of the Northern District Coho Salmon Management Plan is to minimize the harvest of Susitna River coho salmon and to limit the commercial harvest of coho salmon bound for freshwater streams and rivers of the Northern District of upper Cook Inlet.

The Upper Cook Inlet Personal Use Salmon Fishery Management Plan establishes time, area, methods and means for taking salmon for personal use. This plan first went into effect during the 1996 season. Salmon harvest opportunity was established to replace the harvest opportunity which previously was provided through the Upper Cook Inlet Subsistence Salmon Management Plan which was repealed by the BOF in 1995. The Upper Cook Inlet Personal Use Salmon Fishery Management Plan provides for personal use dip net fisheries in the Kenai and Kasilof rivers and Fish Creek. Additionally, limited personal use gill net fishing opportunity is provided near the terminus of the Kasilof River.

The Skwentna River Personal Use Salmon Fishery Management Plan establishes a personal use fish wheel fishery in the Yentna River downstream of its confluence with the Skwentna River.

Fisheries for other species not covered by the above management plans or policies are managed to assure sustained yield of the targeted fish stock while assuring for the continued, and where possible, the expanded opportunity to participate in the fishery.

## **RECREATIONAL ANGLER EFFORT**

Beginning in 1977, recreational angler effort in the NCIMA has been estimated using the SWHS, a mail survey (Mills 1979-1994, Howe et al. 1995, 1996). This survey estimates the number of angler-days of sport fishing effort expended by recreational anglers fishing Alaskan waters, as well as the harvest of important sport species. The SWHS is designed to provide estimates of effort and harvest by site and, unfortunately, is not designed to provide estimates of effort directed towards a single species at a site. Beginning in 1990, the SWHS was modified to include estimation of catch (release plus harvest) by site. Additionally, onsite creel surveys have been selectively used in conjunction with the SWHS for fisheries that require more detailed information or inseason management. The following summary of recreational angler effort in the NCIMA is based on the SWHS data.

From 1977 through 1994, an average of 294,651 angler-days have been spent by anglers fishing NCIMA waters (Table 1). Historically, the effort expended by anglers fishing NCIMA waters has represented an average of 15% of the total statewide and 21% of the Southcentral region (Region II) angling effort. Angler-effort generally increased annually from 1977 through 1988 (Figure 2), when 392,875 angler-days were documented. Since 1988, effort has ranged from 295,081 angler-days (1995) to a record high in 1992 of 398,225 angler-days. The Kenai Peninsula sport fish management area is currently the only management area in Alaska which receives greater use by recreational anglers (Howe et al. 1996).

During 1995 anglers spent an estimated 295,081 angler-days fishing NCIMA waters. This was a 21% decrease in effort from 1994 and approximately equal to the historical average. The effort in 1995 represented 11% and 15% of the total statewide and Southcentral region angling effort, respectively (Table 1).

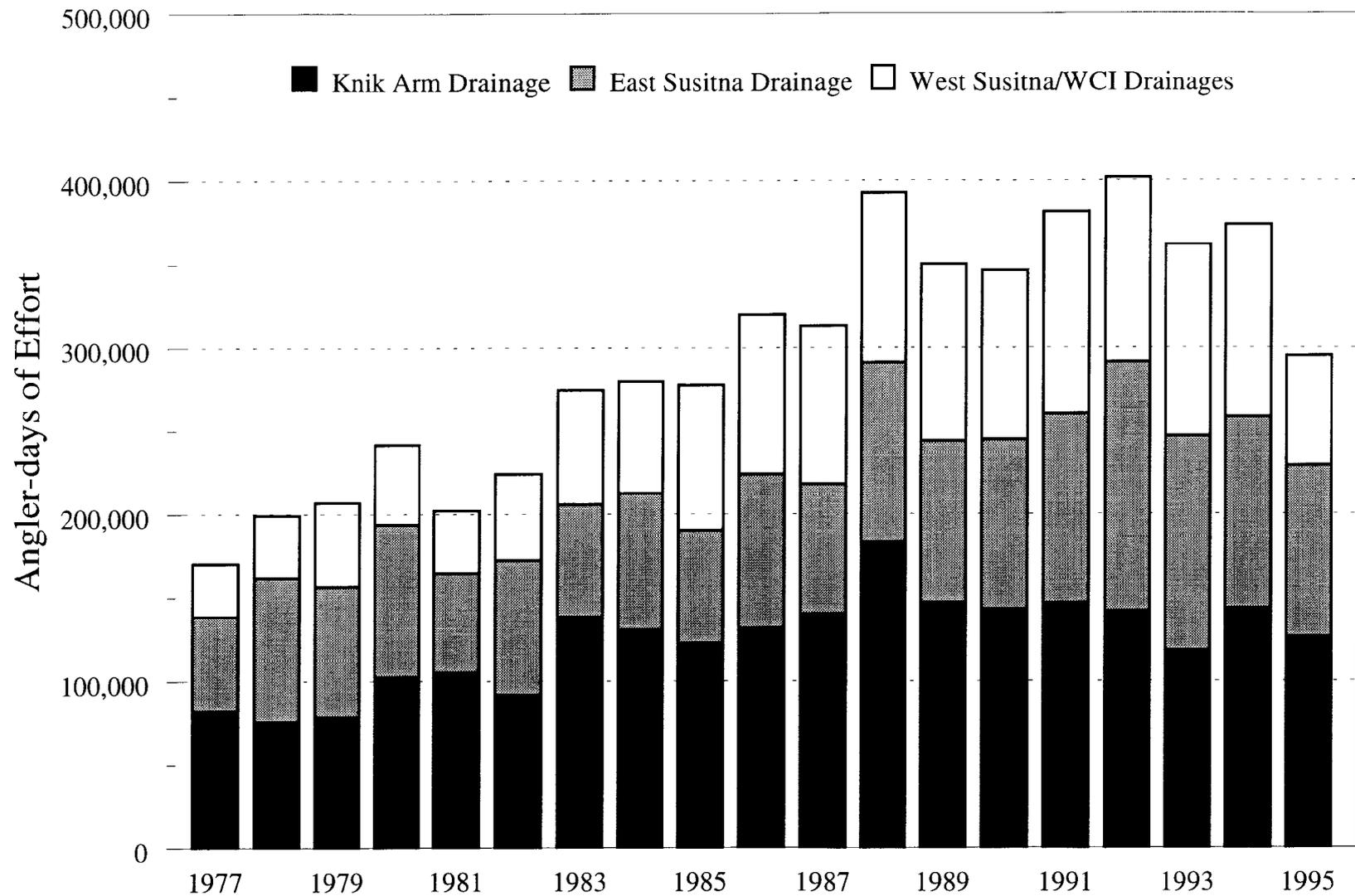
Forty-two percent of the total effort from the NCIMA has historically occurred in the Knik Arm Management Unit (Table 1). From 1977 through 1994, these waters supported an average of 123,420 angler-days of fishing effort. A record number of angler-days (183,029) were expended during 1988. Nearly all of the effort over this period was expended in fresh water (Table 2). The Little Susitna River is the most heavily fished stream in the Knik Arm Management Unit, averaging 36,466 angler-days of effort annually (Table 2, Figure 3). Other major fisheries occur in the many stocked lakes in the basin (notably in Big, Finger and Kepler Complex lakes) and at various road-accessible streams including the Knik River and its tributaries, the Eklutna Power Plant tailrace, Big Lake drainage streams, and Cottonwood and Wasilla creeks (Table 2, Figure 3). A limited saltwater fishery also occurs off the mouth of Fish Creek in Knik Arm (Table 2).

Anglers fishing the Eastside Susitna Management Unit from 1977 through 1994 expended an average of 91,790 angler-days (Table 1). This expenditure of effort has represented an average of 32% of the total sport effort from all NCIMA waters from 1977 through 1994. A total of 102,686 angler days were spent in this area during 1995, a decrease from the historical high recorded in 1992. Major fisheries occur in Willow, Montana, Sheep, and Little Willow creeks, and the Talkeetna River and its various tributaries (Table 3, Figure 4).

Anglers fishing the Westside Susitna Management Unit from 1977 through 1994 expended an average of 73,489 angler-days (Table 4). This expenditure of effort has represented an average of 25% of the total effort from all NCIMA waters from 1977 through 1994. A total of 60,177 angler days occurred during 1995, a considerable decrease from the previous 4 years. Major fisheries occur in the Deshka River, Lake and Alexander creeks and the Yentna River and its tributaries (Table 4, Figure 5). Other fisheries occur in various remote lakes in the area (notably in Judd, Shell, Whiskey, and Hewitt lakes) (Table 4, Figure 5).

**Table 1.-Number of angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1995.**





**Figure 2.-Angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1995.**

**Table 2.-Angler-days of sport fishing effort for the Knik Arm drainage by fishery, 1977-1995.**

Year	Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Finger Lake	Kepler Lk Complex	Big Lake	Nancy Lk Complex	Other Lakes <sup>c</sup>	Other Streams	Total
1977		11,063			2,805			14,864	7,962	11,869		7,259	26,127	81,949
1978		12,127			3,446			11,502	5,730	9,865		7,647	25,223	75,540
1979		21,301			4,024	5,345		4,433	5,439	8,300		7,011	22,558	78,411
1980		22,420			5,726	9,268		6,483	8,597	12,195		9,153	28,688	102,530
1981		26,162	4,904		4,019	8,663		5,267	8,227	14,568		8,488	24,754	105,052
1982		24,020	6,653		6,261	5,186		3,514	6,943	15,371		8,615	15,150	91,713
1983	17,127	35,477	9,183		3,239	5,944		8,512	9,149	15,989		10,907	19,571	3,291 138,389
1984	4,316	48,517	9,369	3,413	3,547	7,144		6,843	9,770	12,916		7,194	15,892	1,806 130,727
1985	692	41,643	8,970	2,995	3,115	4,560	903	4,259	9,226	16,299		5,960	22,243	1,761 122,626
1986	983	45,770	13,015	8,549	3,387	5,653	2,641	5,589	9,544	14,559		6,520	13,147	2,249 131,606
1987	1,974	35,659	6,990	11,663	2,173	2,934	2,898	10,830	14,379	17,693		15,125	16,187	1,662 140,167
1988	1,239	49,731	23,229	13,188	2,228	4,056	3,110	8,240	18,245	10,077		12,099	35,159	2,428 183,029
1989	2,352	54,798	11,141	10,342	2,406	3,069	4,204	4,840	12,821	12,748		8,349	19,024	818 146,912
1990	2,494	40,159	17,878	7,618	2,679	3,056	3,936	6,737	13,644	11,798		9,973	19,949	2,963 142,884
1991	3,147	50,838	13,736	5,892	2,893	1,623	3,693	5,998	11,337	13,759		10,239	20,043	3,407 146,605
1992	1,540	49,304	8,856	4,279	1,110	1,974	4,534	5,506	15,556	11,545		12,299	24,723	599 141,825
1993	2,116	42,249	6,824	4,523	1,774	3,077	2,976	7,843	7,461	8,446		9,393	20,606	926 118,214
1994	1,244	45,149	9,658	8,974	2,226	3,230	3,496	9,434	11,832	9,987		10,197	25,063	2,882 143,372
Mean	3,269	36,466	10,743	7,403	3,170	4,674	3,239	7,261	10,326	12,666		9,246	21,895	2,066 123,420
90-94 Mean	2,108	45,540	11,390	6,257	2,136	2,592	3,727	7,104	11,966	11,107		10,420	22,077	2,155 138,580
1995	940	41,119	10,893	11,453	1,373	2,598	2,256	7,814	10,885	6,979		9,723	18,928	1,193 126,154

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes effort for lakes and streams, 1977-1982.

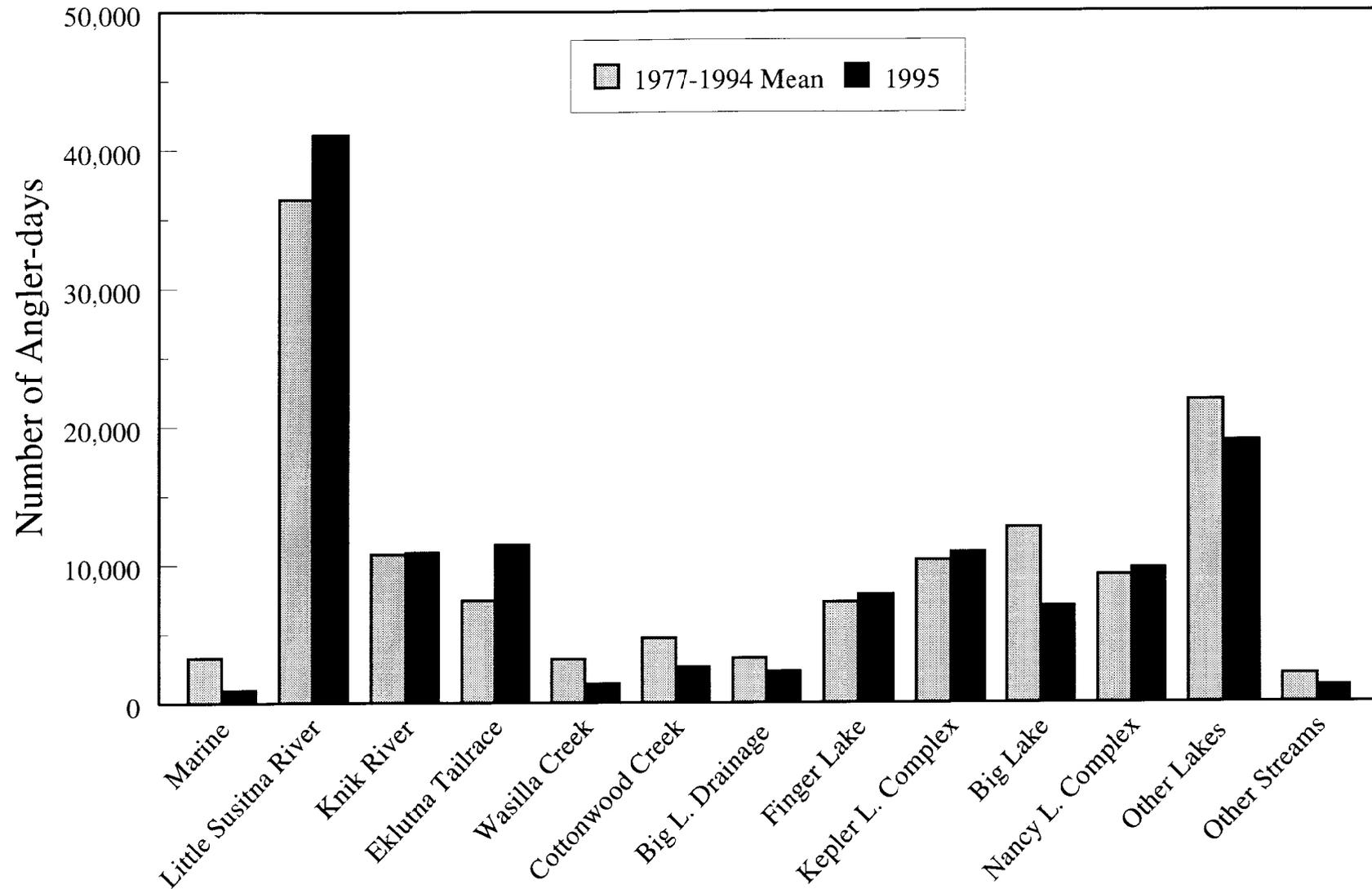


Figure 3.-Mean number of angler-days per year of sport fishing effort expended at sites in the Knik Arm management unit, 1977-1995.

**Table 3.-Angler-days of sport fishing effort for the eastside Susitna River drainage by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams	Lakes <sup>b</sup>	Total
1977	14,024	4,583			8,112		14,268			3,163		12,501	56,651
1978	22,682	5,687			11,869		25,762			5,040		14,970	86,010
1979	18,911	5,171		3,710	6,728		22,621		3,317	5,125		12,639	78,222
1980	29,011	8,190		4,963	8,014		19,287		5,208	4,388		12,216	91,304
1981	14,060	3,845		3,860	6,936		16,657		3,062	3,584		7,850	59,854
1982	19,704	5,579		5,101	9,093		23,645		3,787	3,856		9,980	80,745
1983	13,405	2,791	1,344	5,048	6,237		17,109		3,429	7,564	5,460	5,084	67,471
1984	21,649	5,872	2,995	4,952	6,106	1,305	19,239		3,229	9,252	4,417	2,742	81,758
1985	16,282	5,705		5,289	2,844		20,028		4,144	7,213	4,162	2,097	67,764
1986	10,733	4,490	2,908	4,362	10,091	1,993	20,268	2,010	8,124	8,638	10,566	8,106	92,289
1987	13,583	5,850	2,717	3,332	9,019	1,865	13,745	2,046	3,912	17,096	2,101	2,551	77,817
1988	27,758	10,768	1,454	4,529	18,699	2,947	16,498	2,074	4,129	12,733	3,648	2,740	107,977
1989	23,811	5,285	6,320	4,029	13,010	3,058	16,179	767	4,592	15,218	1,907	2,688	96,864
1990	32,200	6,505	2,313	6,103	11,392	3,714	11,284		4,485	18,299	3,287	2,335	101,917
1991	32,520	7,792	1,981	7,816	14,872	2,811	10,745	1,056	5,788	18,466	6,172	3,159	113,178
1992	50,958	9,240	2,177	6,391	17,509	4,908	18,437	1,366	4,833	21,478	6,347	5,840	149,484
1993	41,218	6,422	1,600	5,033	12,636	3,423	21,615	655	4,094	22,580	5,161	3,945	128,382
1994	34,362	6,744	1,957	5,842	11,526	3,300	16,220	1,092	4,265	18,642	6,134	4,449	114,533
Mean	24,271	6,140	2,524	5,023	12,262	2,932	17,978	1,383	4,400	11,241	4,947	6,438	91,790
90-94 Mean	38,252	7,341	2,006	6,237	13,587	3,631	15,660	1,042	4,693	19,893	5,420	3,946	121,499
1995	29,392	6,386	1,460	3,912	9,758	1,993	16,303	826	2,756	19,358	6,019	4,523	102,686

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes effort for lakes and streams, 1977-1982.

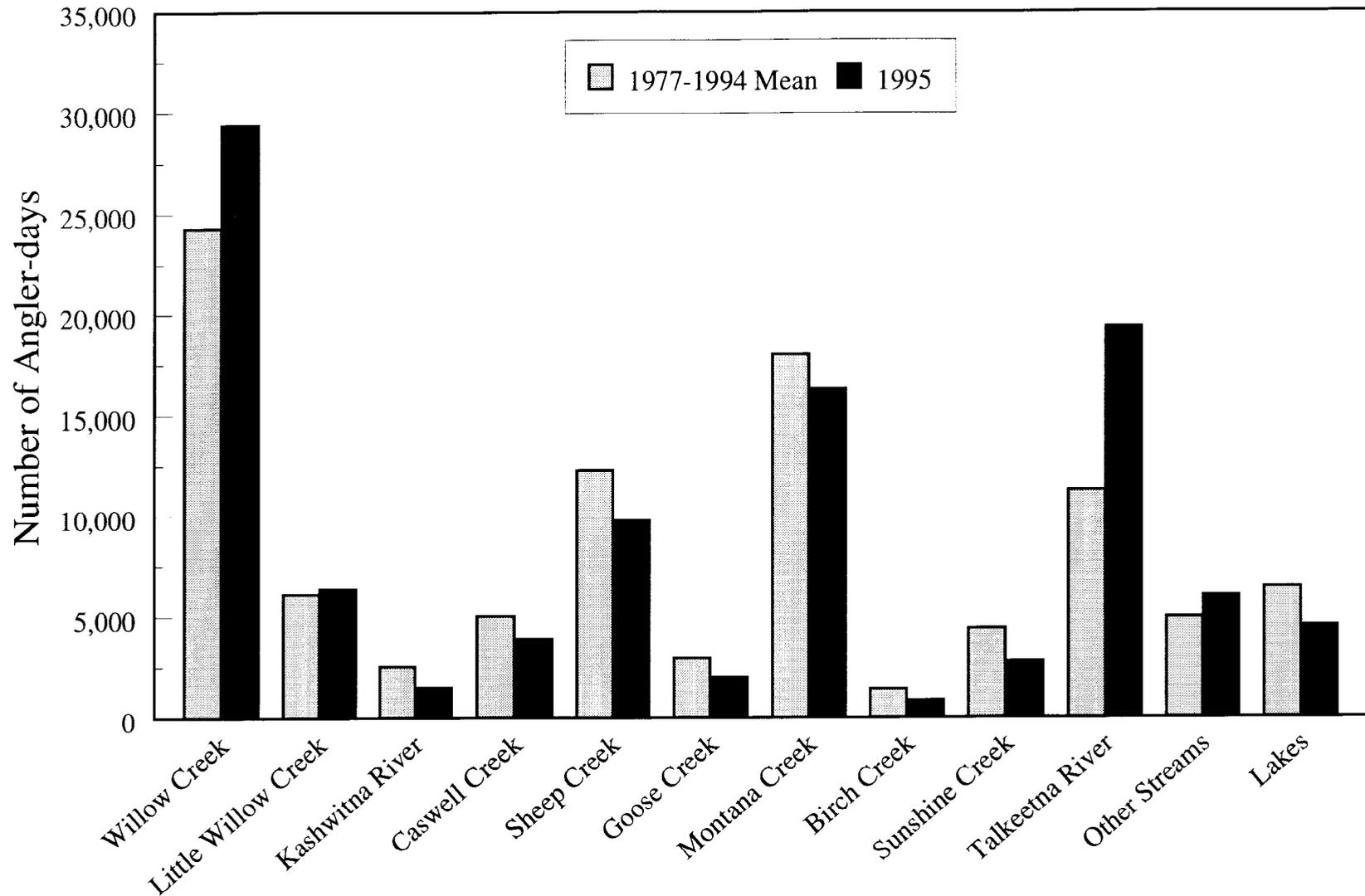


Figure 4.-Mean number of angler-days per year of sport fishing effort expended at sites in the eastside Susitna River management unit, 1977-1995.

**Table 4.-Angler-days of sport fishing effort for the westside Susitna River drainage by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Shell Lake	Whiskey Lake	Hewitt Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	5,991	3,852					6,946		1,342	317	566	287	436	7,269	2,205	29,211
1978	6,914	9,111					8,767		732	151	302	129	172	6,011	3,420	36,509
1979	8,284	13,236					13,881		2,185	519	263	189	613	7,577	1,615	48,362
1980	6,812	19,364					8,325		2,542	814	414	29	471	4,998	2,999	46,768
1981	6,892	13,248					6,471		1,378					4,963	2,120	35,072
1982	10,748	18,391					8,649		1,911		444	171		7,012	3,412	50,738
1983	9,425	23,174					14,749		4,566	155	913			6,284	4,653	63,919
1984	7,261	20,561				786	14,739		3,848	1,255				9,652	3,161	61,263
1985	12,884	29,322					14,323		1,682					13,159	5,722	77,092
1986	19,113	29,739		1,193			15,626	3,838	2,186	963				13,753	1,325	87,736
1987	13,220	30,008					16,842	6,918	3,242	2,698				9,571	1,949	84,448
1988	19,591	32,160				2,001	16,007	5,784	8,040	588				8,047	3,121	95,339
1989	14,651	39,432	550	345	656	914	14,061	8,035	8,698	400				5,565	3,001	96,308
1990	19,863	32,082	1,024		849	1,318	17,914	4,857	5,184					5,430	3,914	92,435
1991	26,235	38,011	459		1,003	2,466	14,726	3,820	6,589	544				6,560	3,659	104,072
1992	18,085	37,056	992		1,985	2,198	16,869	3,873	5,153			800		9,586	4,899	101,496
1993	21,660	30,643			2,110	1,263	26,113	6,454	5,613					10,587	2,281	106,724
1994	25,608	19,267			3,936	1,195	27,958	7,011	7,292					10,113	3,732	106,112
Mean	14,069	24,370	756	769	1,757	1,518	14,609	5,621	4,010	764	484	161	498	8,119	3,177	73,489
90-94 Mean	22,290	31,412	825		1,977	1,688	20,716	5,203	5,966	544			800	8,455	3,697	102,168
1995	10,648	4,808			2,728	1,465	15,808	4,729	6,354					10,790	2,847	60,177

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include effort from West Cook Inlet drainage waters.

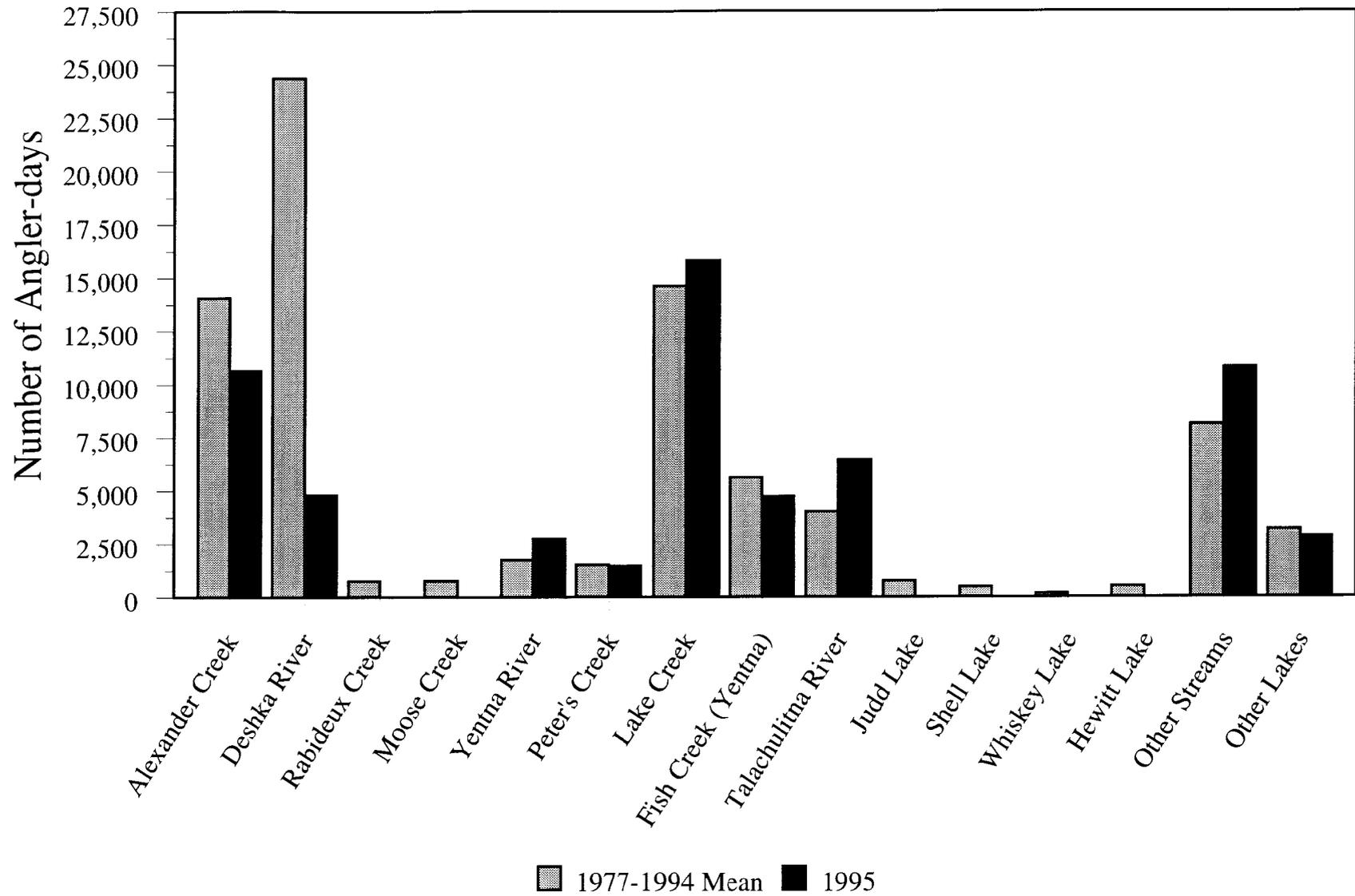


Figure 5.-Mean number of angler-days per year of sport fishing effort expended at sites in the westside Susitna River management unit, 1977-1995.

From 1977 through 1994 anglers fishing West Cook Inlet Management Unit waters expended an average of 5,908 angler-days (Table 5). This expenditure of effort represents an average of 2% of the total effort from all NCIMA waters from 1977 through 1994. A record number of angler-days (10,594) were spent in this area in 1987. All the annual effort has been expended in fresh water. Major fisheries include the Chuitna, Lewis, Theodore, and Beluga river drainages (Figure 6).

### **RECREATIONAL FISH HARVEST**

From 1977 through 1994, an average of 209,638 fish were caught and kept (harvested) by anglers fishing NCIMA waters (Tables 6 and 7, Figures 7 and 8). Coho salmon, rainbow trout and chinook salmon accounted for 55% of this average harvest.

On average, fish from the Knik Management Unit accounted for 45% of fish caught and kept within the NCIMA (Table 6). The harvest was dominated by rainbow trout, coho salmon and landlocked salmon (Table 8). The Eastside Susitna and Westside Susitna units accounted for 28% and 24% of the NCIMA harvest during this time period, respectively, with chinook salmon, coho salmon, rainbow trout and Arctic grayling dominating harvests (Tables 6, 9 and 10). The West Cook Inlet Unit accounted for only 2% of the NCIMA harvest, with chinook and coho salmon accounting for 62% of the WCI harvest (Table 11).

The 1977-1995 harvests by fishery of all species from the NCIMA are listed in Appendix A.

### **RECREATIONAL FISH CATCH AND RELEASE**

Estimates of the number of fish caught and released by anglers fishing NCIMA waters became available for the first time during 1990 (Mills 1991-1994, Howe et al. 1995, 1996). From 1990 through 1995 the average percent released was approximately 60% of the total catch (Table 12).

The proportion and type of fish released by anglers varies within and among management units (Mills 1991-1994, Howe et al. 1995, 1996) (Tables 13 and 14). Arctic grayling, rainbow trout, lake trout, chum salmon and pink salmon were the most frequently released fish species during 1990-1995. In all units during 1992-1995, the number of fish caught and released was greater than the number of fish caught and harvested, except during 1994 in the West Cook Inlet Unit (Figure 9).

### **OTHER USER GROUPS**

Salmon returning to the NCIMA are also harvested by various commercial set and drift gillnet fisheries located throughout Upper Cook Inlet (Appendix B1). In nearly all cases harvests in the commercial fisheries are much larger than in NCIMA sport fisheries (Figure 10). The average commercial harvest from 1977 through 1995 was 5.6 million salmon by the various commercial fisheries of Upper Cook Inlet, whereas during this same period an average of approximately 100,000 anadromous salmon were harvested annually by recreational anglers (Table 7 and Appendix B2). Chinook salmon are the exception: during 1990 through 1994, the yearly harvest of chinook salmon in the recreational harvest greatly exceeded the commercial harvest. The following year, 1995, the Upper Cook Inlet commercial harvest was roughly equal to the NCI recreational harvest (Table 7, Appendix B2).

**Table 5.-Angler-days of sport fishing effort for the West Cook Inlet drainage by fishery, 1977-1995.**

Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other	Total
1977	1,355		1,037	343		2,735
1978	1,185		905	172		2,262
1979	1,069		912	31		2,012
1980	614		700	43		1,357
1981	1,364		899			2,263
1982	751		375			1,126
1983	4,290		448			4,738
1984	2,342		3,497			5,839
1985	3,381		5,601	1,023		10,005
1986	3,532		4,786			8,318
1987	3,169		6,194	1,231		10,594
1988	1,637		4,056	837		6,530
1989	2,666	866	4,113	1,114	1,238	9,997
1990	4,443		3,626	1,285		9,354
1991	2,454		2,841	496		5,791
1992	2,817	512	2,091			5,420
1993	2,966		2,528	400	2,665	8,559
1994	2,236		3,492		3,710	9,438
Mean	2,348	689	2,672	634	2,538	5,908
90-94 Mean	2,983	512	2,916	727	3,188	7,712
1995	2,205		2,425		1,434	6,064

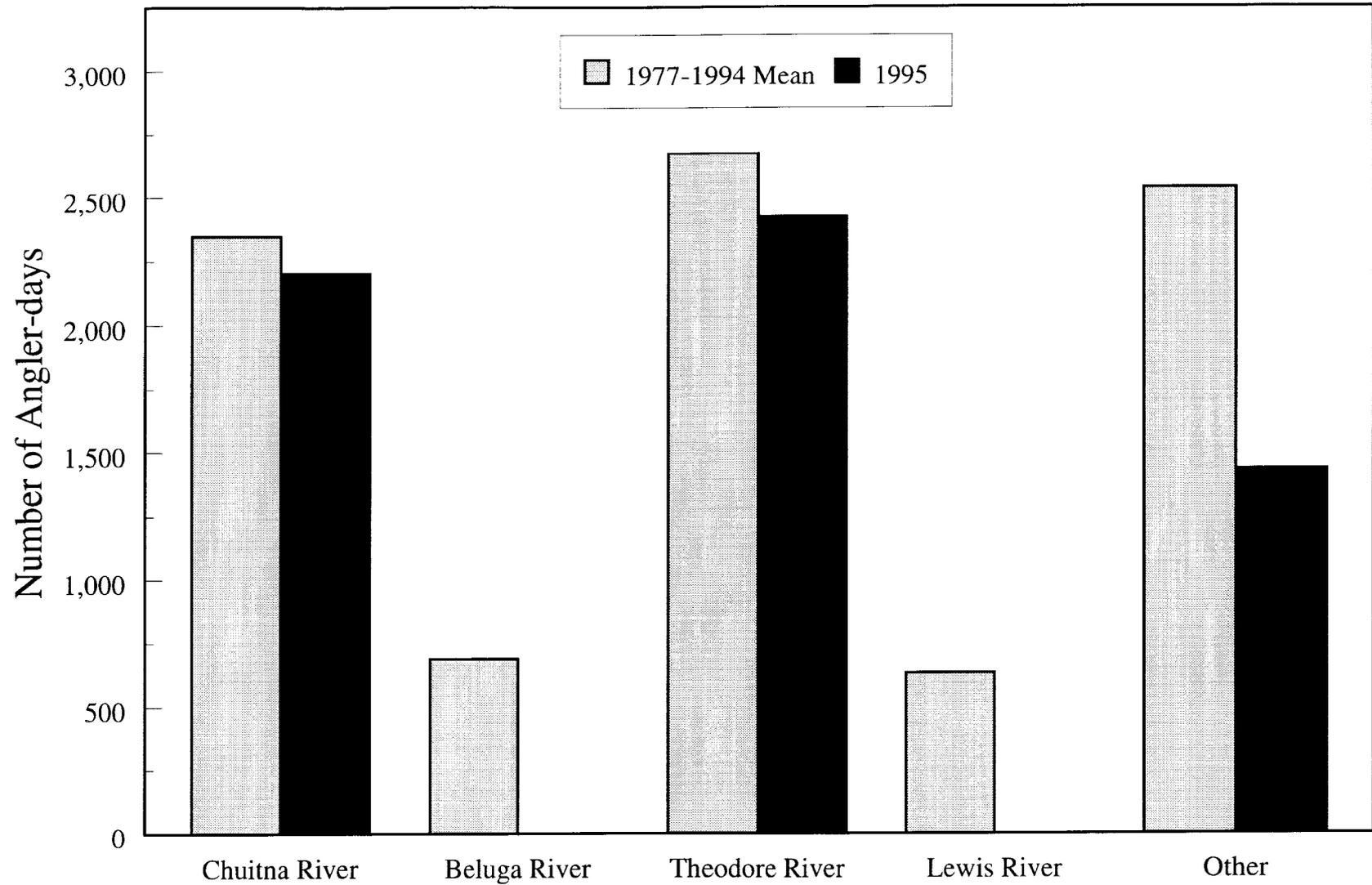


Figure 6.-Mean number of angler-days per year of sport fishing effort expended in the West Cook Inlet drainage, 1977-1995.

**Table 6.-Northern Cook Inlet Management Area recreational harvest by management unit, 1977-1995.**

Year	Knik Arm		East Susitna R.		West UCI & West Susitna R.		NCIMA Total	Alaska Total	% by NCIMA	Region II Total	% by NCIMA
	Harvest	% NCIMA	Harvest	% NCIMA	Harvest	% NCIMA					
1977	67,979	43	49,274	31	39,606	25	156,859	2,300,332	7	1,929,407	8
1978	66,420	32	96,469	46	48,287	23	211,176	2,399,472	9	1,992,212	11
1979	68,658	41	50,476	30	49,392	29	168,526	2,502,213	7	2,044,813	8
1980	102,015	41	93,271	38	52,272	21	247,558	2,627,312	9	2,118,543	12
1981	109,824	57	46,558	24	35,784	19	192,166	2,528,056	8	2,052,719	9
1982	82,976	44	58,998	31	47,592	25	189,566	2,828,706	7	2,222,354	9
1983	92,690	51	45,330	25	45,112	25	183,132	3,086,280	6	2,409,876	8
1984	94,974	45	62,071	30	53,197	25	210,242	3,115,966	7	2,517,185	8
1985	104,136	53	39,684	20	53,514	27	197,334	3,096,044	6	2,469,836	8
1986	90,264	40	73,083	32	64,045	28	227,392	3,163,433	7	2,609,304	9
1987	98,373	47	47,548	23	62,839	30	208,760	3,207,138	7	2,584,420	8
1988	156,784	54	62,693	22	71,845	25	291,322	3,483,306	8	2,841,033	10
1989	115,070	51	51,426	23	61,257	27	227,753	3,213,867	7	2,519,404	9
1990	90,035	47	44,360	23	57,170	30	191,565	3,033,301	6	2,428,172	8
1991	103,384	44	51,068	22	71,092	32	255,544	3,311,513	7	2,633,148	9
1992	88,267	39	76,569	34	66,622	29	231,458	3,234,048	7	2,675,940	9
1993	90,017	41	67,907	31	61,191	28	219,115	2,989,720	7	2,387,224	9
1994	87,547	45	51,984	27	54,498	28	194,029	3,349,821	9	2,689,718	7
Mean	94,967	45	59,376	28	55,295	26	209,638	2,970,636	7	2,395,850	9
90-94 Mean	91,850	43	58,378	28	62,115	29	212,342	3,183,866	7	2,562,840	8
1995	57,182	40	42,845	30	41,344	29	141,371	2,909,979	5	2,396,666	6

**Table 7.-Northern Cook Inlet Management Area sport fish harvest by species, 1977-1995.**

Year	Chinook	Coho	Sockeye	Pink	Chum	Landlocked	Rainbow	Dolly	Arctic	Lake	Northern		White		Total	
	Salmon	Salmon	Salmon	Salmon	Salmon	Salmon	Trout	Varden	Grayling	Trout	Burbot	Pike	Fish	Smelt		Other
1977	4,674	17,206	7,962	30,136	2,062	27,429	32,270	13,365	15,799	3,231	1,024	132	0	0	1,569	156,859
1978	3,543	27,019	3,140	58,808	17,969	21,252	42,087	17,130	15,728	1,980	876	316	0	0	1,318	211,166
1979	7,964	24,076	6,193	13,925	5,599	12,144	47,924	17,718	27,949	1,789	1,172	382	0	0	1,691	168,526
1980	8,198	39,167	7,658	61,985	5,577	21,163	49,428	18,255	29,720	2,833	1,383	232	0	0	1,959	247,558
1981	8,602	23,621	8,369	9,627	4,820	24,533	63,592	20,310	24,506	2,375	518	125	0	0	1,168	192,166
1982	12,448	34,836	9,067	19,045	8,111	11,841	49,948	19,723	29,196	1,560	1,656	607	0	0	1,528	189,566
1983	14,860	15,489	21,423	5,686	6,032	23,854	46,184	20,226	21,227	3,532	2,305	944	0	0	1,369	183,131
1984	20,424	47,891	15,422	14,763	8,115	15,428	42,851	14,428	21,148	2,843	2,778	1,821	1,058	0	1,272	210,242
1985	21,904	34,082	9,678	4,018	3,053	15,345	63,319	18,539	18,485	622	1,855	1,404	2,477	2,240	313	197,334
1986	25,873	42,651	14,203	15,992	9,354	16,405	42,631	20,268	20,109	2,286	2,899	1,977	2,105	10,651	24	227,428
1987	25,906	48,386	13,530	4,634	6,304	15,032	39,909	16,385	16,405	2,046	5,140	2,464	2,861	9,265	493	208,760
1988	29,720	72,020	14,555	8,693	13,408	17,207	74,907	17,627	18,662	2,529	1,835	3,182	3,128	8,849	0	291,322
1989	35,792	61,420	14,238	5,191	9,097	11,577	54,952	12,697	12,238	2,397	978	3,120	1,716	2,324	15	227,752
1990	30,967	45,732	11,392	6,005	2,557	16,101	40,105	13,573	8,170	1,656	3,141	2,842	3,516	5,591	217	191,565
1991	33,958	65,657	11,510	3,495	3,240	15,754	52,420	13,009	10,084	1,527	981	6,640	2,057	6,132	80	226,544
1992	45,226	78,033	11,790	8,225	2,858	11,961	34,121	7,185	6,272	1,698	1,412	5,382	862	15,523	910	231,458
1993	49,287	80,240	13,085	4,792	2,512	14,567	27,864	5,674	5,166	775	1,655	5,721	878	6,596	303	219,115
1994	31,098	67,465	11,067	3,870	2,937	14,198	28,807	5,145	8,044	488	2,276	3,884	1,193	13,135	422	194,029
Mean	22,802	45,833	11,349	15,494	6,311	16,988	46,296	15,070	16,606	2,009	1,882	2,288	1,214	4,461	814	209,696
% of Total Mean	11	22	5	7	3	8	22	7	8	1	<1	1	<1	2	<1	
90-94 Mean	38,107	67,425	11,769	5,277	2,821	14,516	36,663	8,917	7,547	1,229	1,893	4,894	1,701	9,395	386	212,342
1995	16,518	59,633	10,240	3,081	7,967	7,318	19,867	3,831	3,199	456	858	3,546	227	4,549	81	141,371

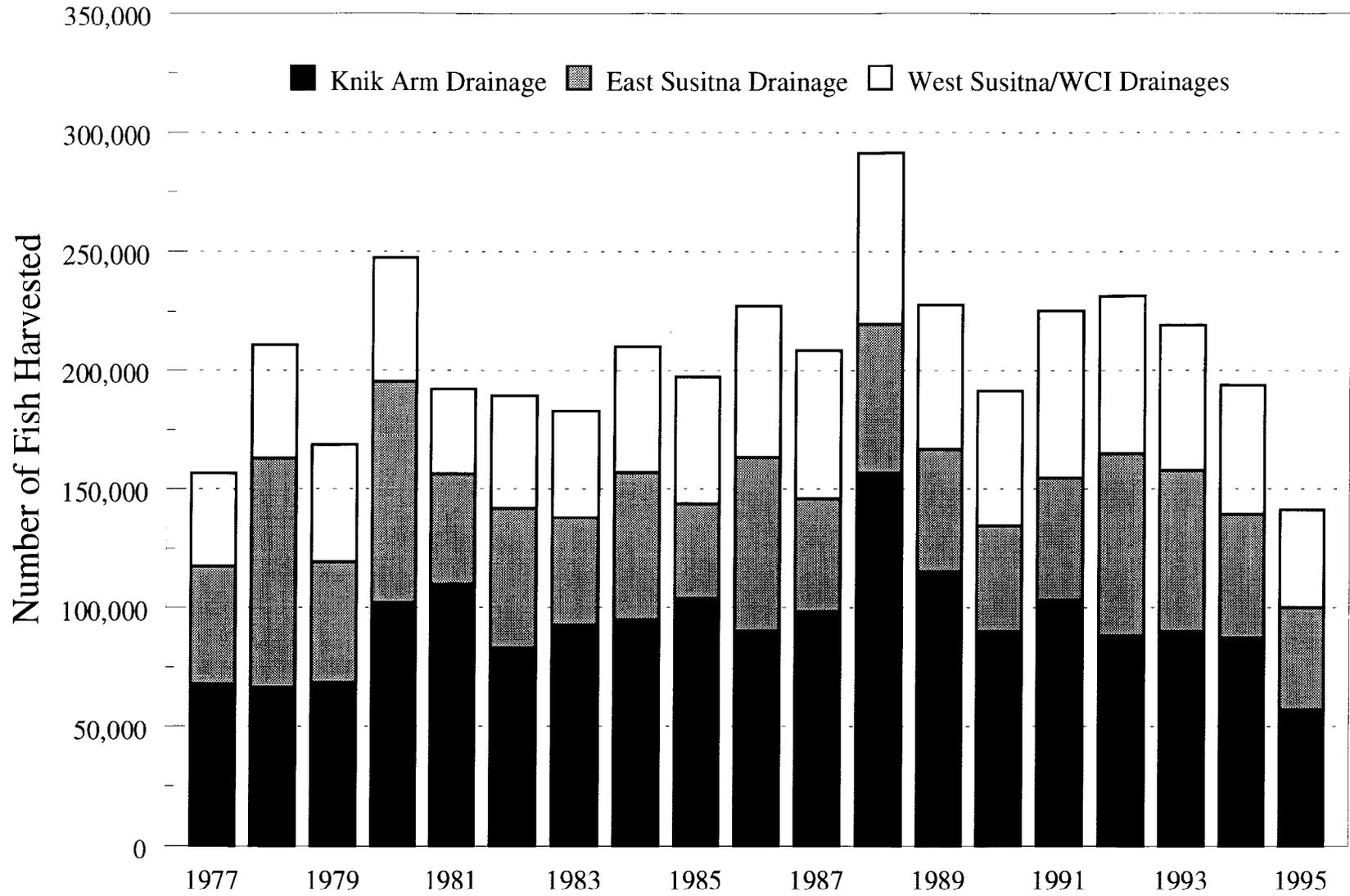


Figure 7.-Northern Cook Inlet Management Area recreational harvest, 1977-1995.

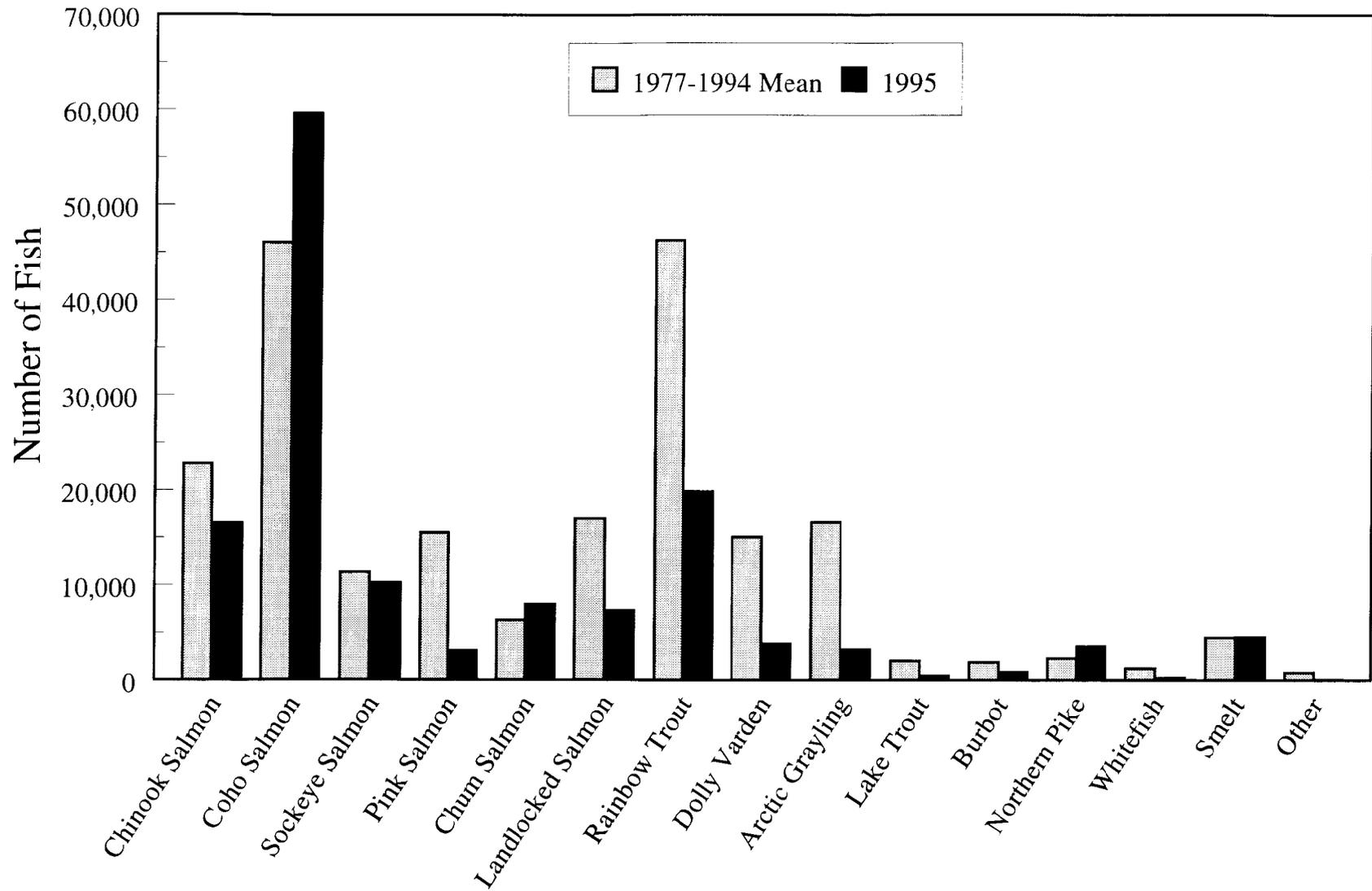


Figure 8.-Northern Cook Inlet Management Area mean recreational harvest by species, 1977-1995.

**Table 8.-Knik Arm drainage sport fish harvest by species, 1977-1995.**

Year	Rainbow Trout	Landlocked Salmon	Coho Salmon	Dolly Varden	Sockeye Salmon	Arctic Grayling	Chum Salmon	Pink Salmon	Chinook Salmon	Lake Trout	Smelt	White Fish	Northern Pike	Other	Burbot	Total
1977	18,615	26,917	4,366	7,541	1,576	3,916	250	1,661	207	2,260				380	290	67,979
1978	23,139	18,884	7,895	7,982	1,239	2,413	1,131	1,842	140	507				795	452	66,419
1979	24,843	11,853	7,139	8,582	3,616	8,371	654	818	800	1,254				437	291	68,658
1980	29,368	19,500	16,030	12,484	5,674	9,514	534	4,701	646	2,118				1,136	310	102,015
1981	41,749	24,255	10,484	14,475	6,080	7,396	431	834	1,466	1,791				776	87	109,824
1982	30,549	10,845	13,676	13,540	4,621	2,924	1,174	1,425	1,666	1,058				817	681	82,976
1983	26,421	22,805	6,139	13,391	14,297	4,425	642	1,009	1,255	1,279				429	597	92,689
1984	26,418	14,768	23,429	9,103	9,240	2,480	2,032	2,743	2,057	1,919				449	336	94,974
1985	46,431	14,461	14,339	13,336	5,612	4,768	514	787	1,889	277	560	587	156	209	210	104,136
1986	27,690	14,299	12,361	13,048	6,009	4,233	3,770	1,800	1,524	313	3,351	580	458	24	804	90,264
1987	24,663	14,887	25,787	11,425	8,785	3,893	2,574	886	2,476	906	0	380	924	462	325	98,373
1988	58,609	16,588	40,037	11,314	8,076	8,367	5,221	1,927	2,916	1,911	0	1,163	364	0	291	156,784
1989	44,518	11,041	23,846	8,143	9,040	5,429	4,477	1,321	4,341	835	0	844	863	0	372	115,070
1990	30,699	15,950	18,762	8,746	6,588	3,068	746	650	2,022	1,067	0	622	754	99	262	90,035
1991	39,636	15,740	22,186	9,138	4,968	2,816	1,099	926	2,277	512	0	900	2,709	0	477	103,384
1992	27,995	11,875	25,814	4,186	5,349	2,511	510	1,044	3,969	840	0	257	2,605	812	500	88,267
1993	21,565	13,829	35,763	3,686	5,926	1,343	885	230	3,602	201	0	227	2,102	176	482	90,017
1994	22,446	14,153	28,539	3,532	5,082	2,898	1,356	635	4,303	66	2,292	242	1,328	163	512	87,547
Mean	31,409	16,258	18,700	9,647	6,210	4,487	1,556	1,402	2,086	1,062	620	580	1,226	698	404	94,967
% of Total Mean	33	17	20	10	7	5	2	2	2	1	<1	<1	1	<1	<1	
90-94 Mean	28,468	14,309	26,213	5,858	5,583	2,527	919	697	3,235	537	458	450	1,900	250	447	91,850
1995	14,878	7,285	20,650	2,109	4,349	818	4,115	409	1,707	118	0	71	522	0	151	57,182

**Table 9.-Eastside Susitna River drainage sport fish harvest by species, 1977-1995.**

Year	Pink Salmon	Coho Salmon	Arctic Grayling	Rainbow Trout	Chum Salmon	Chinook Salmon	Dolly Varden	Sockeye Salmon	Land-					Total
									locked Salmon	White- Fish	Burbot	Lake Trout	Other	
1977	19,663	5,709	7,469	5,225	1,382	1,056	2,726	3,594	512		619	693	626	49,274
1978	50,711	8,573	6,590	5,930	14,203	886	5,640	267	2,368		271	877	153	96,469
1979	11,189	7,564	10,489	9,463	3,791	1,298	3,699	1,020	291		427	472	773	50,476
1980	52,746	10,368	10,959	6,715	4,552	1,370	2,671	873	1,663		367	267	720	93,271
1981	8,143	6,593	11,860	8,813	4,149	2,202	2,874	833	278		220	287	306	46,558
1982	15,345	10,167	9,747	7,536	6,644	2,063	4,066	1,555	996		199	335	345	58,998
1983	3,954	5,176	7,478	9,639	4,982	2,852	4,205	3,221	1,049		901	1,404	469	45,330
1984	9,491	13,916	11,222	7,656	5,211	4,428	4,004	2,705	660	1,058	1,133	362	225	62,071
1985	2,510	7,042	7,822	7,872	2,142	4,342	3,138	1,465	884	1,365	1,085	17	0	39,684
1986	10,527	16,190	10,346	8,061	4,756	8,569	4,213	4,029	2,106	1,090	1,380	1,816	0	73,083
1987	2,209	11,028	7,568	6,647	3,042	8,603	3,946	2,046	145	796	1,175	343	0	47,548
1988	4,129	19,518	6,020	7,622	6,604	9,139	4,748	2,857	619	546	600	291	0	62,693
1989	2,715	17,078	4,562	4,972	4,151	9,783	3,040	2,527	536	442	395	1,210	15	51,426
1990	4,093	11,743	2,910	5,008	1,565	9,423	3,613	2,677	151	1,378	1,345	387	67	44,360
1991	2,001	19,479	3,875	7,854	1,950	9,083	2,140	2,897	14	626	407	726	16	51,068
1992	5,899	33,790	2,189	3,948	2,044	21,307	2,394	3,468	86	265	608	495	76	76,569
1993	3,941	26,063	2,401	3,713	1,480	22,688	1,413	4,137	738	87	909	288	49	67,907
1994	1,968	20,870	3,484	3,658	1,269	14,970	1,033	3,443	45	172	674	232	166	51,984
Mean	11,735	13,937	7,055	6,685	4,107	7,448	3,309	2,423	730	711	706	583	223	59,376
% of Total Mean	20	24	12	11	7	13	6	4	1	1	1	1	<1	
90-94 Mean	3,580	22,389	2,972	4,836	1,662	15,494	2,119	3,324	207	506	789	426	75	58,378
1995	2,311	19,165	1,486	3,138	3,234	7,872	1,012	3,682	33	80	517	254	61	42,845

**Table 10.-Westside Susitna River drainage sport fish harvest by species, 1977-1995.**

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Lake Trout	Dolly Varden	Rainbow Trout	Arctic Grayling	White- Fish	Northern Pike	Burbot	Smelt	Other Fish	Total
1977	2,938	6,599	2,786	8,142	423	278	2,246	7,472	4,414		132	115		551	36,096
1978	2,039	10,173	1,634	5,605	2,635	596	2,667	12,295	6,725		316	153		370	45,208
1979	5,768	9,036	1,557	1,854	1,154	63	4,591	12,555	9,089		382	454		436	46,939
1980	6,148	12,141	1,111	4,237	491	448	2,825	12,785	9,247		232	706		103	50,474
1981	4,742	5,940	1,408	555	240	297	2,003	11,296	5,250		125	211		86	32,153
1982	8,573	10,658	2,881	2,065	293	167	1,813	11,465	6,525		607	776		366	46,189
1983	9,568	3,610	3,549	702	398	849	2,400	9,253	9,314		944	807		461	41,835
1984	12,106	9,511	3,415	2,467	872	562	798	8,079	7,409		1,821	1,309		598	48,947
1985	13,644	11,270	2,302	584	347	328	1,267	8,114	5,895	525	1,248	560	1,680	104	47,868
1986	13,402	13,117	4,076	3,385	615	157	2,470	6,668	5,441	435	1,519	715	7,300	0	59,300
1987	13,350	8,746	2,427	1,467	688	797	688	8,020	4,908	1,685	1,540	3,640	9,265	31	57,252
1988	15,970	16,283	3,167	2,582	1,474	327	1,401	8,058	4,275	1,419	2,818	944	8,849	0	67,567
1989	19,343	18,226	2,307	1,045	415	352	1,486	4,928	2,104	382	2,257	192	2,324	0	55,361
1990	17,425	13,883	1,938	1,238	234	202	1,163	3,960	2,158	1,381	2,088	1,534	5,591	51	52,846
1991	21,836	20,507	3,083	524	191	289	1,436	4,526	3,367	531	3,931	97	6,132	64	66,514
1992	18,737	16,218	2,916	1,264	304	363	400	2,028	1,572	340	2,777	304	15,523	22	62,768
1993	21,142	15,454	2,161	586	147	276	463	2,481	1,422	555	3,619	264	6,596	49	55,215
1994	10,248	15,361	1,919	1,259	312	113	507	2,526	1,654	779	2,556	1,090	9,483	84	47,891
Mean	12,052	12,041	2,480	2,198	624	359	1,701	7,584	5,043	803	1,606	771	7,274	188	51,134
% of Total Mean	21	32	4	3	<1	<1	1	5	4	2	5	2	20	<1	
90-94 Mean	17,878	16,285	2,403	974	238	249	794	3,104	2,035	717	2,994	658	8,665	54	57,047
1995	6,265	17,148	2,106	361	591	84	622	1,757	895	76	3,024	190	4,549	20	37,686

**Table 11.-West Cook Inlet drainage sport fish harvest by species, 1977-1995.**

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Dolly Varden	Rainbow Trout	Arctic Grayling	White- Fish	Burbot	Smelt	Other Fish	Total
1977	473	532	6	670	7	852	958	0		0	0	12	3,510
1978	478	378	0	650	0	841	723	0		0	0	0	3,070
1979	98	337	0	64	0	846	1,063	0		0	0	45	2,453
1980	34	628	0	301	0	275	560	0		0	0	0	1,798
1981	192	604	48	95	0	958	1,734	0		0	0	0	3,631
1982	147	335	10	210	0	304	398	0		0	0	0	1,404
1983	1,185	564	356	21	10	230	871	10		0	0	10	3,257
1984	1,833	1,035	62	62	0	523	698	37		0	0	0	4,250
1985	2,029	1,431	299	137	50	798	902	0	0	0	0	0	5,646
1986	2,378	983	89	280	213	537	212	89	0	0	0	0	4,781
1987	1,477	2,825	272	72	0	326	579	36	0	0	0	0	5,587
1988	1,695	1,182	455	55	109	164	618	0	0	0	0	0	4,278
1989	2,325	2,270	364	110	54	29	534	143	48	19	0	0	5,896
1990	2,097	1,344	189	24	12	51	438	34	135	0	0	0	4,324
1991	762	2,485	562	44	0	295	404	26	0	0	0	0	4,578
1992	1,213	2,211	57	18	0	205	150	0	0	0	0	0	3,854
1993	1,855	2,960	861	35	0	112	105	0	9	0	0	29	5,976
1994	1,577	2,695	623	8	0	73	177	8	0	0	1,360	9	6,607
Mean	1,214	1,378	236	159	25	412	618	21	19	0	136	6	4,161
% of													
Total Mean	30	33	6	4	<1	10	15	<1	<1	0	3	<1	
90-94													
Mean	1,501	2,339	458	26	2	147	255	14	29	0	272	8	5,068
1995	674	2,670	103	0	27	88	94	0	0	0	0	0	3,656

**Table 12.-Percent of fish released by recreational anglers in the Northern Cook Inlet Management Area for 1990-1995.**

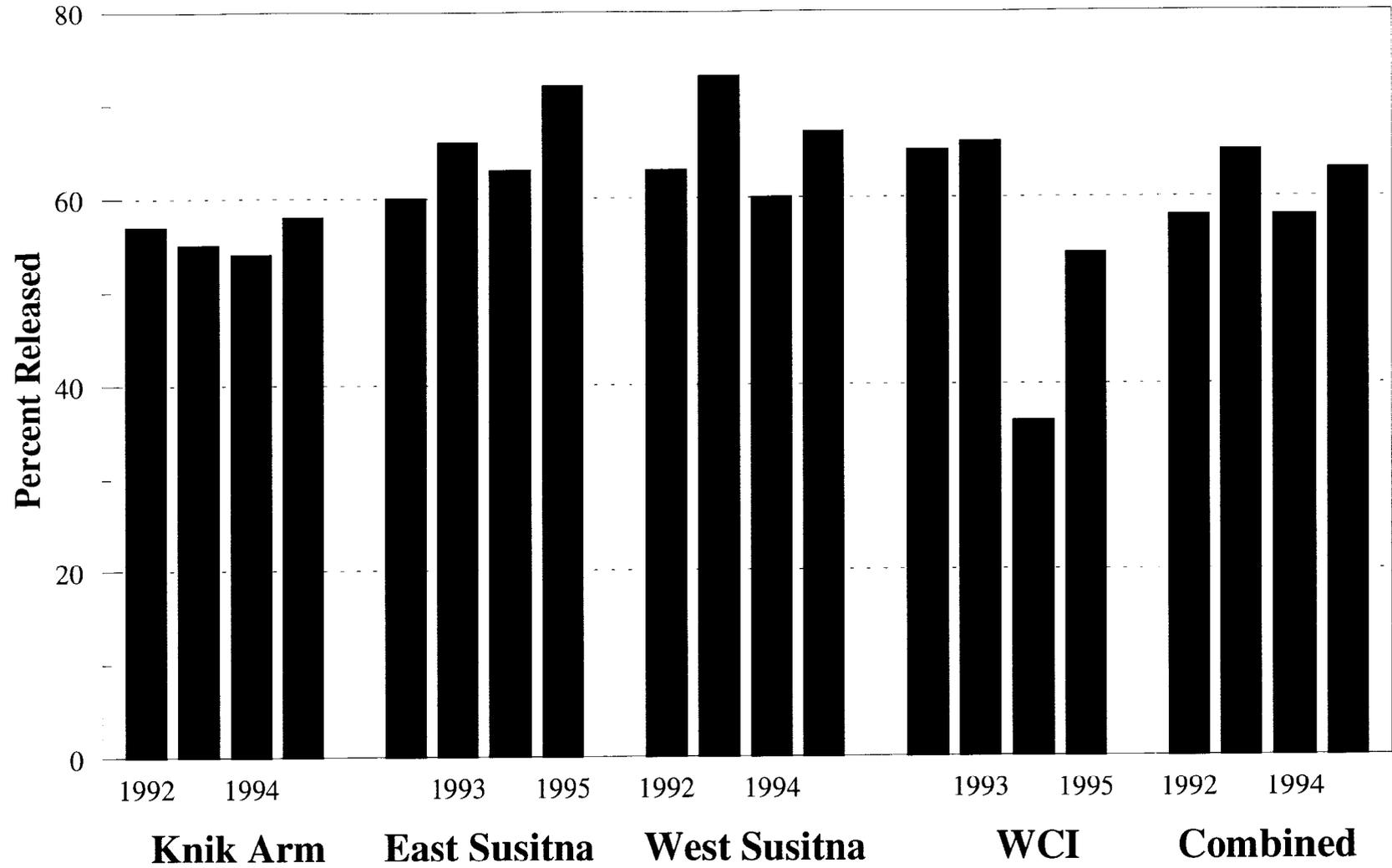
	1990		1991		1992		1993		1994		1995		Average
	Percent		Percent		Percent		Percent		Percent		Percent		Percent
	Catch	Released	Released										
Chinook Salmon	80,485	61.5%	59,961	43.4%	86,500	47.8%	137,446	64.2%	44,875	30.7%	35,072	52.9%	50.1
Coho Salmon	75,568	39.7%	105,424	32.7%	118,972	34.7%	123,660	35.4%	93,919	28.5%	95,961	37.9%	34.8
Sockeye Salmon	23,124	48.8%	18,626	37.1%	19,739	40.3%	24,098	45.4%	21,243	47.9%	17,665	42.0%	43.6
Pink Salmon	40,631	85.2%	17,461	79.9%	51,786	84.1%	47,126	89.7%	29,446	86.9%	38,512	92.0%	86.3
Chum Salmon	15,239	83.2%	12,989	75.1%	20,761	86.2%	16,960	85.2%	20,442	85.6%	54,914	85.5%	83.5
Landlocked Salmon	28,017	42.5%	24,174	34.1%	26,489	54.8%	30,388	52.1%	25,431	44.2%	12,287	40.4%	44.7
Lake Trout	5,052	67.2%	3,932	61.2%	6,373	73.4%	4,835	84.0%	3,972	87.2%	1,823	75.0%	74.7
Dolly Varden	40,620	66.5%	34,670	59.7%	21,285	66.2%	23,467	75.8%	19,003	72.9%	12,700	69.8	68.5
Rainbow Trout	156,460	74.4%	163,694	67.9%	129,627	73.7%	125,179	77.7%	119,624	75.9%	96,375	79.4%	74.8
Arctic Grayling	46,490	82.4%	38,218	73.5%	38,385	83.7%	39,626	87.0%	49,901	83.9%	23,187	86.2%	82.8
Whitefish	5,247	33.0%	4,486	54.1%	3,253	73.5%	3,307	73.5%	3,831	68.9%	955	76.2%	63.2
Northern Pike	17,058	83.3%	18,214	63.5%	20,925	74.3%	34,237	83.3%	8,252	52.9%	16,239	78.2%	72.6
Burbot	4,078	23.0%	2,023	51.5%	2,612	45.9%	3,094	46.5%	3,163	28.0%	1,444	40.6%	39.3
Smelt	5,591	0.0%	6,151	0.3%	15,523	0.0%	6,596	0.0%	13,433	2.2%	4,600	1.1	0.6
Other	837	74.1%	825	90.3%	1,377	33.9%	1,158	73.8%	1,273	66.8%	1,096	92.6%	58.4
All	544,497	57.7%	510,848	49.6%	563,607	58.2%	621,177	64.9%	457,788	57.5%	412,830	63.3%	58.5

**Table 13.-Percent of fish released by recreational anglers in the Knik Arm and Eastside Susitna River areas, 1992-1995.**

Species	Knik Area								East Susitna Area							
	1992		1993		1994		1995		1992		1993		1994		1995	
	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released
Chinook Salmon	6,590	39.8%	6,526	44.8%	6,124	29.9%	2,771	38.4%	30,521	30.2%	54,268	58.2%	23,985	37.6%	16,376	51.9%
Coho Salmon	36,317	28.9%	50,674	29.4%	38,734	26.3%	28,858	28.4%	51,981	35.0%	39,888	34.7%	28,717	27.3%	31,602	39.4%
Sockeye Salmon	8,257	35.2%	8,964	33.9%	8,990	43.5%	6,445	32.5%	6,707	48.3%	8,007	48.3%	7,116	51.6%	6,939	46.9%
Pink Salmon	5,706	81.7%	2,263	89.9%	4,352	85.4%	1,554	73.7%	37,170	84.1%	34,652	88.6%	17,729	88.9%	31,809	92.7%
Chum Salmon	2,393	78.7%	4,098	78.4%	4,225	67.9%	16,567	75.2%	15,891	87.1%	9,192	83.9%	12,379	89.7%	34,757	90.7%
Landlocked Salmon	25,743	53.9%	29,125	52.5%	25,232	43.9%	12,152	40.1%	746	88.5%	1,263	41.6%	199	77.4%	135	75.6%
Lake Trout	2,662	68.4%	1,135	82.3%	309	78.6%	228	48.2%	3,070	83.9%	2,513	88.5%	2,490	90.4%	1,207	79.0%
Dolly Varden	10,364	59.6%	9,910	62.8%	9,767	63.8%	5,440	61.2%	7,194	66.7%	8,498	83.4%	6,356	83.7%	3,666	72.4%
Rainbow Trout	85,331	67.2%	69,635	69.0%	70,255	68.1%	56,108	73.5%	19,915	80.2%	24,240	84.7%	23,619	84.5%	16,363	80.8%
Arctic Grayling	10,206	75.4%	6,349	78.8%	13,544	78.6%	4,529	81.9%	16,018	86.3%	14,367	83.3%	16,154	78.4%	9,126	83.7%
Whitefish	578	55.5%	454	50.0%	724	66.6%	200	64.5%	1,002	73.6%	757	88.5%	1,157	85.1%	568	85.9%
Northern Pike	7,097	63.3%	10,141	79.3%	2,816	52.8%	825	36.7%	0	0.0%	0	0.0%	0	0.0%	0	0%
Burbot	770	35.1%	771	37.5%	708	27.7%	377	59.9%	1,132	46.3%	1,458	37.7%	1,208	44.2%	837	38.2%
Smelt	0	0.0%	0	0.0%	2,303	0.5%	51	100%	0	0.0%	0	0.0%	0	0.0%	0	0%
Other	1,116	27.2%	226	22.1%	329	50.5%	19	100%	152	50.0%	294	83.3%	449	63.0%	122	50.0%
<b>Total</b>	<b>203,130</b>	<b>56.5%</b>	<b>200,27</b>	<b>55.1%</b>	<b>188,430</b>	<b>53.5%</b>	<b>136,124</b>	<b>58.0%</b>	<b>191,499</b>	<b>60.0%</b>	<b>199,397</b>	<b>65.9%</b>	<b>141,558</b>	<b>63.3%</b>	<b>153,504</b>	<b>72.1%</b>

**Table 14.-Percent of fish released by recreational anglers in the Westside Susitna River and West Cook Inlet areas, 1992-1995.**

Species	West Susitna Area								West Cook Inlet Area							
	1992		1993		1994		1995		1992		1993		1994		1995	
	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released
Chinook Salmon	44,389	67.5%	70,049	69.8%	12,582	18.6%	14,137	55.7%	5,000	75.7%	6,603	71.9%	2,166	27.2%	1,788	62.2%
Coho Salmon	26,722	40.8%	26,964	44.1%	22,983	34.5%	28,181	39.2%	3,952	44.1%	6,034	50.9%	3,485	22.7%	4,488	40.5%
Sockeye Salmon	4,660	37.4%	5,482	60.6%	4,366	56.0%	4,178	49.6%	115	50.4%	1,645	47.7%	771	19.2%	103	0%
Pink Salmon	8,846	85.7%	9,149	93.6%	7,144	82.4%	5,007	92.8%	64	71.9%	1,062	96.7%	221	96.4%	109	0%
Chum Salmon	2,462	87.7%	3,579	95.9%	3,597	91.3%	3,482	83.0%	15	100.0%	91	100.0%	221	100.0%	108	75.5%
Landlocked Salmon	0	0.0%	0	0.0%	0	0.0%	0	0%	0	0.0%	0	0%	0	0.0%	0	0%
Lake Trout	641	43.4%	1,177	76.6%	552	79.5%	388	78.4%	0	0.0%	10	0.0%	621	87.6%	0	0%
Dolly Varden	2,973	86.5%	4,477	83.3%	2,097	75.8%	2,577	75.9%	754	72.8%	582	80.8%	783	90.7%	1,017	91.3%
Rainbow Trout	23,621	91.4%	29,911	91.7%	25,157	90.0%	23,432	92.5%	762	80.3%	1,411	92.6%	583	70.2%	472	80.1%
Arctic Grayling	11,875	86.8%	18,910	92.5%	20,144	91.8%	9,359	90.4%	286	100.0%	0	0.0%	59	86.4%	176	0%
Whitefish	1,673	79.7%	2,078	73.3%	1,931	59.7%	487	84.4%	0	0.0%	18	50.0%	19	100.0%	0	0%
Northern Pike	13,828	79.9%	24,077	85.0%	5,436	53.0%	15,414	80.4%	0	0.0%	19	100.0%	0	0.0%	0	0
Burbot	709	57.1%	854	69.1%	1,247	12.6%	230	17.4%	0	0.0%	11	100.0%	0	0.0%	0	0
Smelt	15,523	0.0%	6,596	0.0%	9,770	2.9%	4,549	0%	0	0.0%	0	0.0%	1,360	0.0%	0	0
Other	109	79.8%	599	92.0%	477	82.4%	955	97.9%	0	0.0%	39	25.6%	18	50.0%	0	0
<b>Total</b>	<b>158,031</b>	<b>63.3%</b>	<b>203,902</b>	<b>73.0%</b>	<b>117,483</b>	<b>59.5%</b>	<b>112,376</b>	<b>66.5%</b>	<b>10,948</b>	<b>64.8%</b>	<b>17,525</b>	<b>65.9%</b>	<b>10,317</b>	<b>36.0%</b>	<b>8,261</b>	<b>53.6%</b>



**Figure 9.-Percent of the recreational catch of all species from the Northern Cook Inlet Management Area released, 1991-1995, by management unit.**

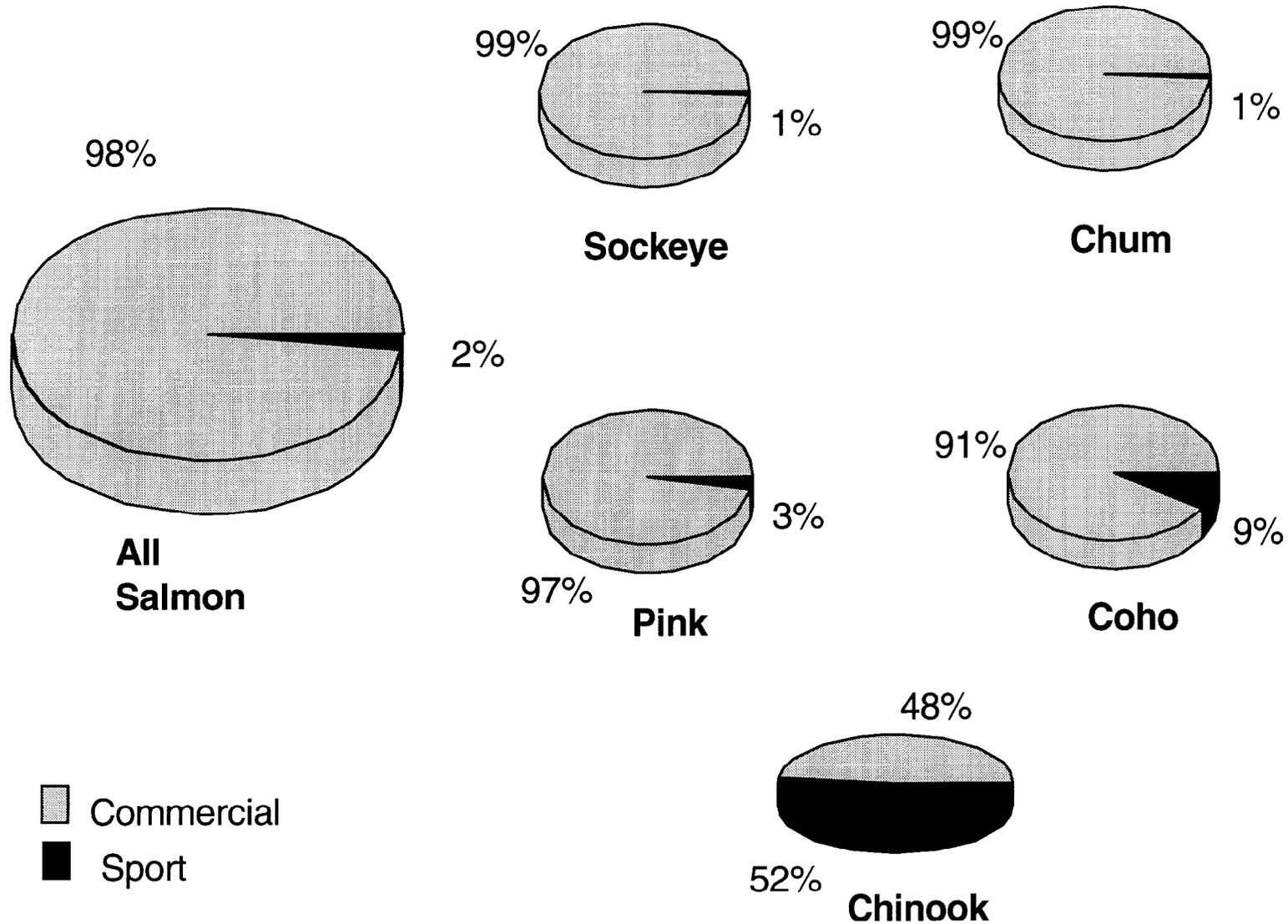


Figure 10.-Composition of the Northern Cook Inlet salmon harvest, 1977-1995.

It is generally believed that not all commercial fisheries in Upper Cook Inlet intercept the same proportion of NCIMA salmon stocks. For purposes of management, it has generally been assumed that NCIMA salmon stocks are intercepted to a larger extent in the drift net and Western District set net fisheries of the Central District (Appendices B3 and B4) and in the set net fishery of the Northern District (Appendices B5-B9) than in other commercial fishing districts. Although quantifiable estimates of contribution to these commercial fisheries by specific stock units are not available for many of the species, a consistently high proportion of the harvests in the Northern District set net fisheries is assumed to be composed of NCIMA stocks, whereas the proportional harvests of NCIMA salmon stocks in the Central District drift and set net fisheries are assumed to be dependent on both time and area fished.

Fish stocks of NCIMA are also harvested in the Tyonek subsistence fishery, Fish Creek personal use dip net fishery, Skwentna personal use fish wheel fishery, and by educational fishery permits in Knik Arm by the Village of Eklutna and the Knik Tribal council. The harvest by these fisheries on wild stocks is relatively low when compared to recreational and commercial harvests. The Fish Creek personal use dip net fishery targets enhanced sockeye salmon and harvests 20,00-30,000 salmon annually.

### ECONOMIC VALUE OF SPORT FISHERIES

Direct estimates are available to assess the economic value of the NCIMA recreational fisheries during 1986 (Jones and Stokes Associates, Inc. 1987). The economic value of the sport fisheries of the NCIMA was estimated to be approximately 29 million dollars (Table 15). This compared to an estimated value of 127 million dollars for Southcentral Alaska sport fisheries during 1986 (Jones and Stokes Associates, Inc. 1987). Resident anglers expended about 18.5 million dollars whereas nonresident anglers expended about 10.6 million dollars.

The Jones and Stokes survey also provided estimates of the direct expenditures for selected NCIMA fisheries (Table 16). These data suggest that considerable variability exists in amount of money expended by anglers, depending upon the species and location fished. Generally, anglers spent more money fishing for chinook and coho salmon than for hatchery-reared fish stocked into lakes. Also, anglers expended more money fishing remote locations than road-accessible locations.

**Table 15.-Estimated economic value of NCIMA sport fisheries during 1986.**

Angler Type	Southcentral Alaska			NCI Management Area		
	Angler-Days	Expenditures	\$/Ang-Day	Angler-Days	\$/Ang-Day	Expenditures
Resident	1,153,660	74,163,000	64.29	288,613	64.29	18,555,000
Non-Resident	201,488	52,892,000	262.51	40,380	262.51	10,600,000
Both	1,355,148	127,055,000	--- <sup>a</sup>	328,993	--- <sup>a</sup>	29,155,000

FROM: Data from Jones and Stokes Associates, Inc. 1987.

<sup>a</sup> Value not computed.

**Table 16.-Economic value for selected NCIMA sport fisheries during 1986.**

Fishery	Resident Anglers (dollars)	Non-Resident Anglers (dollars)	Total (dollars)
Little Susitna River			
Chinook Salmon Fishing	794,000	666,000	1,460,000
Coho Salmon Fishing	312,000	397,000	709,000
Combined	1,106,000	1,063,000	2,169,000
West Susitna River/WCI			
Chinook Salmon Fishing	2,480,000	2,569,000	5,049,000
Coho Salmon Fishing	278,000	363,000	641,000
Combined	2,758,000	2,932,000	5,690,000
East Susitna River			
Chinook Salmon Fishing	435,000	507,000	942,000
Coho Salmon Fishing	161,000	195,000	356,000
Combined	596,000	702,000	1,298,000
Lake Creek (all species)	541,000	322,000	863,000
Kepler Lake Complex			
Rainbow Trout Fishing	162,000	2,000	164,000
Big Lake			
Rainbow Trout Fishing	214,000	40,000	244,000
All Sites	5,377,000	5,061,000	10,438,000

From: Jones and Stokes Associates, Inc. 1987.

## **ONGOING RESEARCH AND MANAGEMENT ACTIVITIES**

There are eight major research programs presently being initiated, ongoing or being curtailed in the NCIMA. These include:

1. Creel and escapement studies to assess returns of chinook and coho salmon in selected Northern Cook Inlet streams;
2. Stocking, creel and escapement studies to assess returns of wild and hatchery chinook salmon to Willow Creek;
3. Assessment of Willow Creek chinook salmon marine interception and inriver return;
4. Assessment of the return of chinook salmon to the Deshka River including estimates of the marine interception, inriver return, and spawning escapement to the Deshka River;
5. Creel and escapement studies to assess returns of nonhatchery and hatchery coho salmon to the Little Susitna River;
6. Evaluation of the differences in survival and growth between stocked mixed sex and triploid coho salmon and between mixed sex and all-female rainbow trout in Mat-Su Valley lakes;
7. Distribution, abundance, and age composition studies of northern pike in the Susitna River drainage; and
8. Distribution, abundance, and age composition studies of rainbow trout in the eastside Susitna River drainage.

We anticipate that emphasis among these programs will change over time, with programs being reduced or curtailed as findings are obtained and as new priorities are established.

Routine management activities that occur in the NCIMA include:

1. Participation in the BOF process,
2. Fishery monitoring and inseason fishery management,
3. Involvement with the public regarding fishery issues,
4. Enforcement of fishing regulations,
5. Habitat monitoring and permit review,
6. Indexing fish abundance in stocked lakes and assisting with annual fish stockings, and
7. Providing input on public access issues.

## **MAJOR BIOLOGICAL AND SOCIAL ISSUES FOR NCIMA**

There are several major biological and social issues associated with the NCIMA that affect area fisheries. Issues of importance that were discussed in the 1993-1995 Area Management Reports (AMR) for Recreational Fisheries of Northern Cook Inlet (Whitmore et al. 1994-1996) for which the status has not changed are:

1. Willow Creek State Recreational Area,
2. Timber Development,
3. Improved or expanded access,

4. Development of coal reserves,
5. Allocation,
6. Regulation enforcement,
7. Susitna River Basin Recreation Rivers Management Plan (ADNR 1991), and
8. Susitna River sockeye salmon.

These issues will not be discussed in this report.

Additional biological or social issues which affect these fisheries include:

1. Northern Cook Inlet Chinook Salmon. During 1990-1994 a trend of decreasing abundance of chinook salmon was observed in NCI. Severe restrictions to the recreational fishery have stabilized returns, however, specific stock returns remain below escapement goals. Factors other than recreational or commercial harvests that may have contributed to reduced production of chinook salmon include poor egg to smolt survival, poor survival during the marine portion of their life cycle, and environmental conditions and predation during these periods. Department programs are being established to: (a) monitor spawning ground escapements; (b) monitor angler participation, catch and harvest; (c) mark NCI juveniles with coded wire tags; (d) evaluate marine fishery harvests of NCI stocks; (e) enhance Willow Creek and Eklutna Tailrace stocks; and (f) determine the cause of low production in the Deshka River.
2. Little Susitna River. Stocking of coho salmon into the Little Susitna River did not result in a significant increase in angler participation, therefore, the stocking program has been terminated. A weir previously operated at river mile (RM) 32 was moved to RM 70 prior to the 1996 season. The Houston City Council supported the idea that the weir significantly delayed fish migration and requested it be moved above their community at RM 68. Elimination of the stocking program made it no longer necessary to evaluate the contribution of hatchery fish to the total return allowing placement of the weir in the upper river (RM 70).
3. Knik Arm Coho Salmon. Coho salmon escapements have been below biological escapement goals in Knik Arm tributaries for several years. Wasilla Creek was stocked with coho salmon in 1996 creating returns in 1997. Because of the concern for wild stock coho salmon in this system this was a one-time stocking event and regardless of the 1997 return size recreational fishing in excess of the scheduled weekend fishery will not be allowed. A weir will be operated on Wasilla Creek during the 1997 season to evaluate the total run size and hatchery fish contribution. Additionally, a survey will be conducted of the fishery to determine the contribution of hatchery fish to the 1997 harvest and catch. Plans are being made to stock coho salmon of Jim Creek origin in the Eklutna Powerplant Tailrace to provide additional coho salmon to the Eklutna Tailrace fishery in 1998.

## **SECTION II: MAJOR FISHERIES OVERVIEW**

### **CHINOOK SALMON FISHERIES**

Chinook salmon runs to the NCIMA collectively comprise the largest stock of this species within the entire Cook Inlet drainage. Within the management area, the Susitna River supports the largest stock of chinook salmon. The Susitna River stock is considered to be the fourth most abundant in Alaska, smaller than only the Yukon, Kuskokwim and Nushagak river stocks (Delaney and Vincent-Lang 1992). Although estimates of total return are unavailable for Northern Cook Inlet chinook salmon (largely due to our inability to accurately estimate spawning escapement) the collective annual return is believed to number from 100,000 to 200,000 fish (Delaney and Vincent-Lang 1992).

Harvests of NCI chinook salmon varied from 11,000 to 70,000 from 1893 through 1940, averaging about 38,500 fish (Table 17). This harvest level of Northern Cook Inlet chinook salmon appears to be sustainable, considering this level was maintained for over a half century. However, after harvest levels increased to an average of 84,500 annually from 1940 to 1952, a steady decline in harvests occurred until fisheries were closed to allow stocks to rebuild (Figure 11). This history suggests that the maximum sustainable harvest range for NCI chinook salmon is between 38,500 and 84,500 fish.

In 1976, the Magnuson Fishery Conservation and Management Act was established. This act, sometimes known as the 200-mile limit law, extended federal fishery management authority into waters from 3 to 200 miles from the United States coast. Its effects on Cook Inlet chinook salmon are not fully understood, however, it seems likely that the act and its associated fishery management plans increased chinook salmon returns to NCI.

The chinook salmon returns to the NCIMA have historically been harvested by a variety of users including recreational, commercial, and subsistence/personal use fishermen (Table 18). However, harvest strategies for NCI chinook salmon have changed substantially since the 1890s. The fishery has slowly evolved from a mixed-stock commercial harvest to a recreationally-dominated harvest that targets a multitude of discrete substocks. A detailed user history is documented in Whitmore et al. 1993.

Beginning in 1975 and continuing through 1990, recreational fisheries targeting the NCI chinook salmon runs were gradually expanded to use increasing returns. These expansions have been guided by the Upper Cook Inlet Salmon Management Plan adopted as policy by the Alaska Board of Fisheries in 1977. This plan (5 AAC 21.363), as it relates to NCI chinook salmon stocks, stipulates that those stocks normally moving in Upper Cook Inlet to spawning grounds prior to July 1 are to be managed primarily for recreational uses. Therefore, recreational fisheries have been expanded and currently constitute the largest harvests. In 1986 the Alaska Board of Fisheries adopted the Northern District King Salmon Management Plan (5 AAC 21.366). This step-down plan allows for a harvest up to 12,500 chinook salmon by a commercial setnet fishery in the Northern District during June. The plan was adopted to allocate a portion of the increasing NCI chinook salmon returns to the commercial fishery.

Under these plans, harvest of NCI chinook salmon increased through 1993 with harvests during 1986 through 1993 ranging from 40,300 to 54,200. Mean and peak harvest of NCIMA chinook

**Table 17.-Estimated harvests, by all user groups, of chinook salmon of Northern Cook Inlet origin, 1893-1995.**

Year	Harvest <sup>a</sup>	Year	Harvest <sup>a</sup>	Year	Harvest <sup>a</sup>
1893	24,000	1935	60,060	1977	5,446
1894	12,400	1936	64,850	1978	4,430
1895	20,159	1937	68,786	1979	9,837
1896	14,461	1938	46,130	1980	11,301
1897	11,266	1939	42,181	1981	11,372
1898	13,111	1940	50,413	1982	17,121
1899	13,682	1941	83,858	1983	18,706
1900	21,346	1942	76,144	1984	23,996
1901	27,455	1943	89,105	1985	25,842
1902	39,210	1944	68,168	1986	43,192
1903	52,818	1945	55,362	1987	40,335
1904	24,058	1946	51,425	1988	44,153
1905	14,134	1947	85,443	1989	50,981
1906	17,936	1948	84,797	1990	42,430
1907	50,355	1949	89,025	1991	43,397
1908	27,019	1950	130,274	1992	52,788
1909	47,699	1951	150,010	1993	54,235
1910	39,222	1952	59,600	1994	36,183
1911	44,676	1953	71,544	1995	22,944
1912	38,293	1954	52,260		
1913	50,922	1955	37,199		
1914	38,043	1956	52,248		
1915	67,034	1957	34,214		
1916	50,316	1958	18,278		
1917	52,399	1959	26,226		
1918	27,909	1960	22,031		
1919	19,041	1961	15,822		
1920	31,650	1962	16,216		
1921	11,157	1963	14,106		
1922	24,824	1964	3,698		
1923	23,929	1965	7,801		
1924	21,610	1966	815		
1925	40,826	1967	623		
1926	60,496	1968	1,163		
1927	69,923	1969	3,927		
1928	55,908	1970	1,853		
1929	54,155	1971	10,494		
1930	57,854	1972	5,748		
1931	41,122	1973	246		
1932	56,745	1974	238		
1933	47,425	1975	301		
1934	57,903	1976	692		

<sup>a</sup> Source of data: 1893-1968 Delaney and Vincent-Lang 1992; 1969-1994 Ruesch and Fox 1995, Mills 1979-1994, and Howe et al. 1995-1996 (see Table 20 of this report).

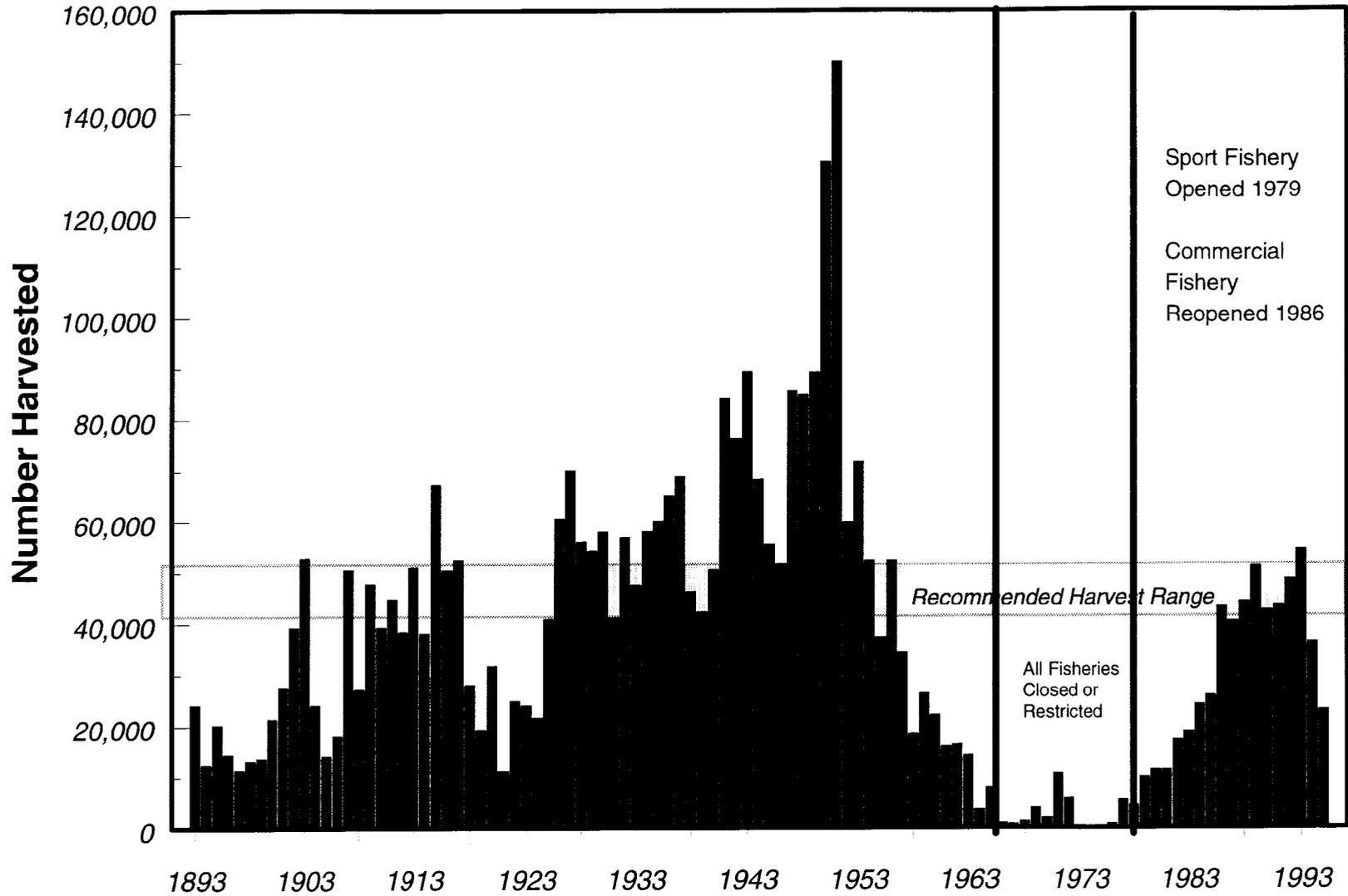


Figure 11.-Estimated harvests by all user groups of chinook salmon of Northern Cook Inlet origin, 1893-1995.

**Table 18.-Northern Cook Inlet Management Area origin chinook salmon estimated harvests, 1977-1996.**

Year	Commercial <sup>a</sup>		Recreational <sup>b</sup>				Subsistence <sup>c</sup>	Grand Total		
	NCI <sup>d</sup>	Kustatan	Total	Knik Arm Drainages	Eastside Susitna	Westside Susitna	West Cook Inlet		Total	
1977	565	207	772	207	1,056	2,938	473	4,674	5,446	
1978	666	221	887	140	886	2,039	478	3,543	4,430	
1979	1,714	159	1,873	800	1,298	5,768	98	7,964	9,837	
1980	993	174	1,167	646	1,370	6,148	34	8,198	11,301	
1981	725	43	768	1,466	2,202	4,742	192	8,602	2,002	11,372
1982	2,716	391	3,107	1,666	2,063	8,573	147	12,449	1,565	17,121
1983	933	163	1,096	1,255	2,852	9,568	1,185	14,860	2,750	18,706
1984	1,004	214	1,218	2,057	4,428	12,106	1,833	20,424	2,354	23,996
1985	1,890	211	2,101	1,889	4,342	13,644	2,029	21,904	1,837	25,842
1986	15,488	308	15,796	1,524	8,569	13,402	2,378	25,873	1,523	43,192
1987	12,701	176	12,877	2,476	8,603	13,350	1,477	25,906	1,552	40,335
1988	12,836	123	12,959	2,916	9,139	15,970	1,695	29,720	1,474	44,153
1989	12,731	1,144	13,875	4,341	9,783	19,343	2,325	35,792	1,314	50,981
1990	9,582	1,084	10,666	2,022	9,423	17,425	2,097	30,967	797	42,430
1991	6,859	925	7,784	2,277	9,083	21,836	762	33,958	1,655	43,397
1992	4,554	964	5,518	3,969	21,307	18,737	1,213	45,226	2,044	52,788
1993	3,277	424	3,701	3,602	22,688	21,142	1,855	49,287	1,247	54,235
1994	3,185	449	3,634	4,303	14,970	10,248	1,577	31,098	1,451	36,183
1995	4,130	198	4,328	1,707	7,872	6,265	674	16,518	2,098	22,944
1996	1,679	145	1,824	No data available for recreational or subsistence harvest						

<sup>a</sup> Source of data, Ruesch and Fox 1996.

<sup>b</sup> Source of data, SWHS, Mills 1979-1994, Howe et al. 1995 and 1996.

<sup>c</sup> Source of data, Ruesch and Fox 1996. Includes Tyonek subsistence fishery 1980-1995 and Northern/Central districts subsistence fisheries 1985 and 1991-1993. 1994-1995 data include Northern districts.

<sup>d</sup> Northern District total.

salmon in recreational fisheries from 1986 through 1993 are 34,590 and 49,287 fish, respectively (Table 7) (Mills 1988-1994). Mean and peak harvest from the Northern District commercial fisheries, which harvest chinook salmon bound for NCIMA streams, during 1986 through 1993 are 9,753 and 15,488 fish, respectively (Appendix B5).

In response to development of a recreationally-dominated harvest that targets a multitude of discrete substocks, biological escapement goals (BEG) have been established for 17 NCIMA chinook salmon spawning streams. These goals were based on average long-term escapement levels and are intended to assure the long-term viability of NCIMA chinook salmon stocks. Spawning escapement is indexed annually using helicopter surveys and weirs. The combined aerial survey escapement goal for NCIMA is 36,700 chinook salmon, however, each of the 17 streams are evaluated according to their individual escapement and corresponding goal. From the late 1970s through 1989 escapement objectives were achieved. However, since 1990, observed spawning escapements in selected streams have decreased and the combined escapement goal for NCIMA was not achieved during 1992-1995.

In response to returns below escapement goals, action was taken through emergency orders and regulations to reduce harvest levels. As a result of this action the combined harvest of NCI chinook salmon has been reduced from a peak level in 1993 of 54,235 fish to less than 23,000 fish in 1995 (Table 18). Emergency orders that have modified regulations for these fisheries since 1991 are outlined in Appendix D. The regulation history of chinook salmon in Northern Cook Inlet waters is outlined in Appendix E.

A marine recreational fishery has developed in recent years along the eastside beaches of the Kenai Peninsula (Deep Creek, Ninilchik and Whiskey Gulch area) which targets mixed stocks of early-run chinook salmon. Contribution of specific stocks to these mixed-stock harvests are unknown, but we assume that a portion of this harvest is made up of fish bound for NCIMA waters. NCI chinook salmon may also be harvested in the Lower Cook Inlet recreational fishery and Kodiak and Chignik commercial fisheries (Appendices B10, B11 and B12). Federally managed groundfish commercial fisheries catch chinook salmon as incidental bycatch, however, numbers and streams of origin of these fish are largely unknown (Lafferty et al. *In prep*).

Regulations providing for subsistence fisheries and personal use fisheries have changed in recent years as a result of BOF and court actions. Currently there is one subsistence fishery, one personal use fishery and two educational fisheries authorized in the NCIMA. In 1980 a subsistence set gillnet fishery was authorized at the village of Tyonek as a component of the Upper Cook Inlet Salmon Management Plan. This fishery is presently regulated by a 4,200 chinook salmon harvest quota, however, the annual harvest has never exceeded 2,800 chinook salmon (Table 19). In addition, the Upper Cook Inlet Subsistence Salmon Management Plan allowed a set gillnet fishery along the west side of northern Cook Inlet extending to Fish Creek during 1985, 1991, 1992 and 1994. In 1995 the BOF, in response to court action closing the fishery, allowed a personal use set gillnet fishery in place of the existing subsistence fishery. The BOF during the March 1996 meeting rescinded this fishery. Presently the Fish Creek Personal Use Fishery is administered under the Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan (5 AAC 77.545). The harvest of chinook salmon is prohibited in this fishery. The native villages of Eklutna and Knik were issued educational permits to fish salmon of all species which have resulted in small harvests.

**Table 19.-Northern Cook Inlet Management Area subsistence gillnet, personal use gillnet and personal use fish wheel salmon harvests, 1980-1996.**

Year	Number of Permits <sup>a</sup>	Chinook	Sockeye	Coho	Pink	Chum
<u>Tyonek Fishery</u>						
1980	67	1,936	262	0	0	0
1981	70	2,002	269	64	32	15
1982	69	1,565	209	0	0	0
1983	75	2,750	185	40	0	2
1984	75	2,354	nd <sup>b</sup>	nd <sup>b</sup>	nd <sup>b</sup>	nd <sup>b</sup>
1985	76	1,720	44	8	0	nd <sup>b</sup>
1986	65	1,523	198	210	45	44
1987	61/64	1,552	161	149	5	24
1988	42/47	1,474	52	185	6	9
1989	47/49	1,314	67	175	0	1
1990	37/42	797	92	366	124	10
1991	54/57	1,105	25	80	0	0
1992	44/57	905	74	234	7	19
1993	53/12	1,247	43	36	11	9
1994	49/58	840	41	111	0	22
1995	55/70	1,271	45	123	14	15
1996 (preliminary)	46/73	967	60	40	19	18
Mean		1,490	107	107	15	11
<u>Northern/Central Districts Subsistence and Personal Use Fisheries</u>						
<u>Subsistence Fisheries</u>						
1985						
North (E./W.)/Cent	638	117	2,218	1,427	90	121
Knik Arm	405	4	1,649	2,055	48	212
Total	1,043	121	3,867	3,482	138	333
1986-1990						
No Fishery						
1991						
Northern (E./W.)		92	1,383	1,009	90	399
Knik Arm		21	2,952	1,698	339	1,139
Central		383	16,520	665	88	58
Total	7,065	550	32,230	3,520	537	1,598
1992						
Northern (E./W.)		348	3,733	2,511	316	576
Knik Arm		132	5,203	2,328	354	965
Central		477	20,013	3,982	547	212
Total	9,200	1,139	46,419	10,320	1,818	1,827
1993						
No Fishery						
1994						
Northern (E./W.)		375	5,830	3,602	365	708
Knik Arm		236	7,419	2,736	353	680
Central		890	40,084	5,843	2,257	341
Total	4,900/10,127 <sup>c</sup>	1,501	53,333	12,181	2,975	1,729
<u>Personal Use Gillnet Fisheries<sup>d</sup></u>						
1995						
Northern (E./W.)	545	558	7,200	3,543	272	775
Knik Arm	816	269	13,440	3,928	431	1,202
Central	73	110	805	558	32	116
Total	1,434	937	21,445	8,029	735	2,093
Annual Mean		850	31,459	7,506	1,214	1,516
<u>Skwentna Personal Use Fish wheel</u>						
1996	14		191	36	88	40

<sup>a</sup> Number of permits returned for early/late season.

<sup>b</sup> No data available.

<sup>c</sup> Number of permits returned/number of permits issued.

<sup>d</sup> In 1995 the subsistence fishery was replaced with a personal use fishery.

## **Recent Board of Fisheries Action**

A summary of BOF actions is included in Appendix F.

The BOF, during its October 1994 work session, delegated authority to the department to modify regulations for the 1995 fishing season. Changes were made to increase the spawning escapement into NCIMA streams primarily by reducing the chinook salmon harvest to half of the 1994 harvest level.

Regulation changes were made as follows:

1. The Deshka River and Prairie Creek were closed to fishing for chinook salmon;
2. Alexander Creek above the confluence of Trail Creek was closed to fishing for chinook salmon;
3. The bag and possession limit in the Susitna River drainage was reduced to one chinook salmon over 16 inches in length;
4. The use of bait throughout the NCIMA was prohibited (excluding the Anchorage Management Unit);
5. Fishing in the NCIMA was allowed only between the hours of 6:00 a.m. and 11:00 p.m. May 15 through July 13. This time restriction did not apply to that portion of the Susitna River drainage currently opened to weekend-only fishing (e.g. between, but not including, the Deshka River and the Talkeetna River) and the Anchorage Management Unit; and
6. The first opening of the Northern District commercial chinook salmon fishery occurred by emergency order. Additional openings of this fishery were dependent upon inseason indications of run strength.

With these restrictions in place, 1995 inseason harvest surveys showed a decrease in harvest to approximately 50% of the 1994 level (Whitmore et al. 1996). The 1995 escapement goals in all eastside Susitna River index streams except Prairie Creek were exceeded. However, the overall escapement goal was still not achieved, as nine of the 10 streams in the Westside Susitna and West Cook Inlet management units did not reach their goals.

During the March 1996 meeting the BOF adopted a regulation closing the Lewis River to chinook salmon fishing. Action on other chinook salmon proposals was rescheduled for a meeting in November 1996. During this November meeting the following regulations concerning chinook salmon in the NCIMA were adopted:

1. Peters Creek was closed to sport fishing for chinook salmon upstream from a department marker approximately 1 mile upstream of its confluence with the Kahiltna River. This closure includes catch and release fishing for chinook salmon.
2. Theodore River was closed to sport fishing for chinook salmon. This includes catch and release fishing for chinook salmon.
3. Alexander Creek is open to the retention of chinook salmon only from its mouth upstream to a department marker at Granite Creek, January 1 through June 30. Only unbaited, single-hook, artificial lures may be used and no chinook salmon over 16 inches may be retained from January 1 through June 30 in all waters of the Alexander Creek drainage between a

department marker at Granite Creek upstream to a department marker 400 yards upstream of Trail Creek.

4. In all waters of the Susitna River drainage between the confluence of the Deshka River and the confluence of the Talkeetna River: after taking a chinook salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to chinook salmon fishing during that same day.
5. In the Little Susitna River from its mouth to the Parks Highway bridge at Houston: after taking a chinook salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to chinook salmon fishing during that same day. The bag and possession limit of chinook salmon 16 inches or more in length taken from the Little Susitna River drainage is one fish per day and in possession.
6. In all waters of the Susitna-West Cook Inlet Management Area, excluding the Susitna River between its confluence with the Deshka River and its confluence with the Talkeetna River: after taking a chinook salmon 16 inches or more in length, a person may not fish for chinook salmon during that same day.

To fulfill changes to the Upper Cook Inlet King Salmon Management Plan, as adopted by the Board of Fisheries, the Department of Fish and Game shall manage the Northern District commercial chinook salmon fishery as follows:

1. The harvest shall not exceed 12,500 chinook salmon.
2. The season closes on June 24, unless closed earlier by emergency order.
3. The number of regular periods shall be determined by the department based on preseason expectations of chinook salmon run strength.
4. The area from 1 mile south of the Theodore River to the Susitna River is closed to fishing; provisions of this paragraph do not apply after December 31, 1998.
5. If at least 90% of the biological escapement goal for the Theodore River (BEG = 750) or Chuitna River (BEG = 1,400) is not met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.
6. In addition to (5) above, if at least 90% of the biological escapement goal for the Chuitna River has not been met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to sport fishing for chinook salmon during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.

### **Management Strategy**

The management strategy for NCI chinook salmon has been established through the Board of Fisheries process. Established management plans that address user allocation and specific regulations have been adopted for each fishery. Action has been taken through the BOF regulatory process since 1994 to reduce the chinook salmon harvest to below 20,000 fish annually, in efforts to achieve aerial survey biological escapement goals. Escapement goal information is not available until after termination of the recreational fishery, therefore, it is not

anticipated that recreational fishery regulations will be modified inseason by emergency order. General area restrictions have been established to reduce harvest potential including reduction of daily and seasonal bag limits, area wide bait prohibition, and reduction in time and area open to fishing. Streams which have consistently fallen short of escapement goals have been closed to chinook salmon fishing.

## **Knik Arm Unit Chinook Salmon Fishery**

### **Background and Historical Perspective**

The Little Susitna River (Figure 12), is the only Knik Arm Management Unit stream open to the harvest of chinook salmon. It supports a major chinook salmon fishery as well as the largest coho salmon fishery in the NCIMA. Chinook salmon bound for the Little Susitna River are also harvested in the Upper Cook Inlet subsistence and personal use fisheries, the Northern District commercial fishery and possibly saltwater sport fisheries adjacent to the Kenai Peninsula.

Access to the Little Susitna River occurs at three primary locations: (1) intertidal waters of the river are accessed by boats crossing the marine waters of Knik Arm from the Port of Anchorage public boat launch, (2) the road-accessible Little Susitna Public Use Facility which includes a launch and campground, and (3) private and public launches near the Parks Highway which provide access to the upper reaches of the river. The Little Susitna Public Use Facility is by far the most heavily used access to the river. Power boats can travel from the mouth of the river to the Parks Highway during periods of moderate to high water levels. However, during low flows travel is restricted to smaller jet boats between river mile 28 and the Parks Highway at river mile 70.

Chinook salmon return to the Little Susitna River from late May through early July with the peak immigration approximately mid-June. Spawning occurs from the Burma Road area upstream to Hatcher Pass with the majority of spawning taking place upstream of the Parks Highway bridge. Few chinook salmon use tributaries for spawning. Peak spawning occurs during the last week of July.

Chinook salmon fishing is permitted from the river's mouth upstream to the Parks Highway, a distance of about 70 miles. The chinook salmon fishing season is from January 1 through July 13.

Inseason harvest and fishing effort for chinook salmon were estimated by onsite creel surveys from 1979 through 1990. Findings from the creel surveys indicated harvest estimates from the SWHS accurately represented the fishery, therefore, the creel survey was discontinued in 1991. The average estimated annual harvest of chinook salmon from the Little Susitna River for the 10-year period 1985-1994 was 2,824 (Figure 13, Appendix A3) (Mills 1986-1994 and Howe et al. 1995).

Due to the semiglacial character of the Little Susitna River, successful aerial survey counts of chinook salmon spawning areas cannot be conducted annually. Chinook salmon aerial escapement surveys were completed during 11 of the years from 1983 through 1996. The average chinook salmon escapement index during these years, based on aerial surveys, was 1,304 fish with a peak escapement count of 3,197 fish in 1988 (Table 20). During 1988, 1989, 1994

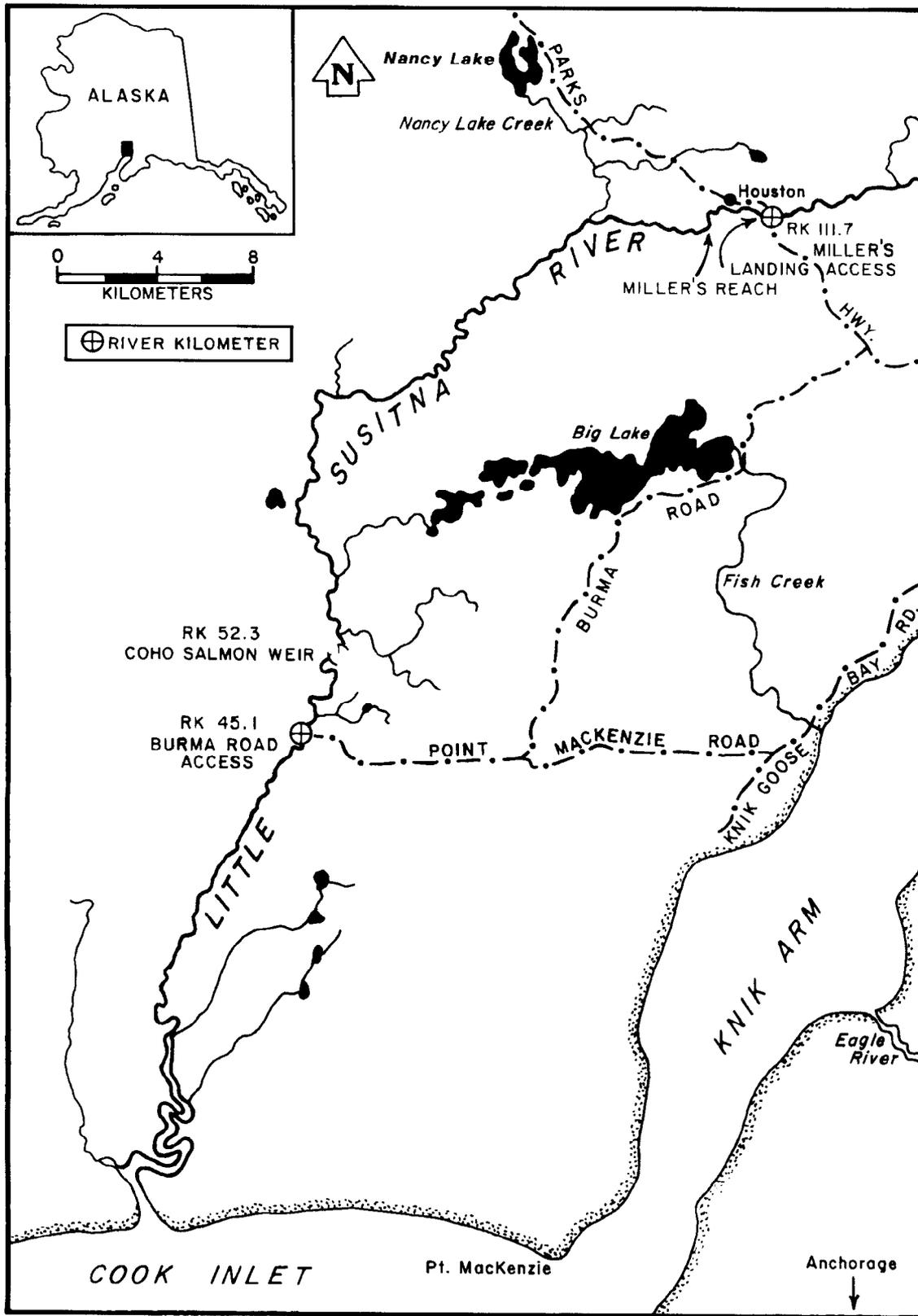


Figure 12.-Map of the Little Susitna River.

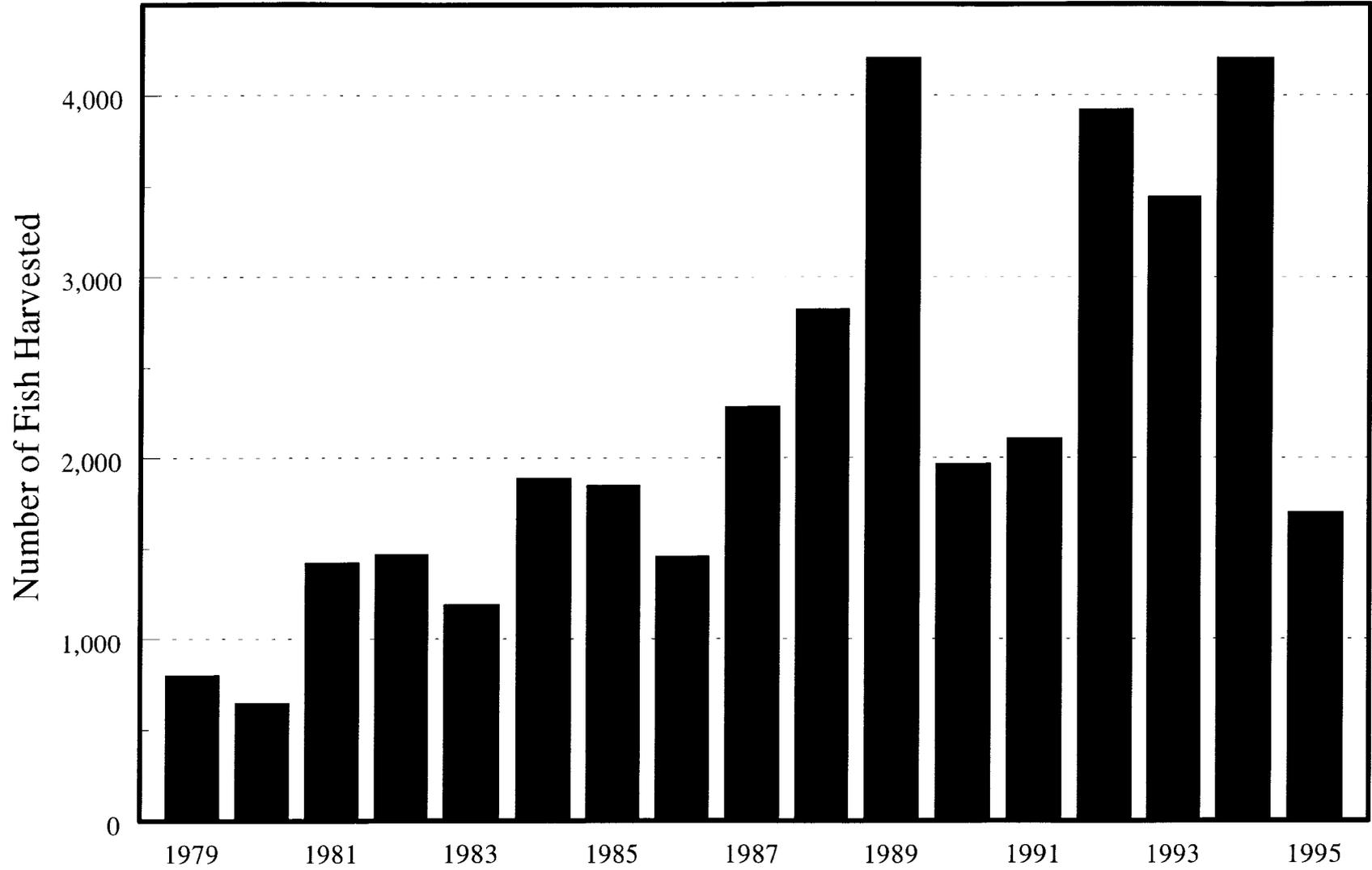


Figure 13.-Little Susitna River chinook salmon harvest, 1979-1995.

**Table 20.-West Cook Inlet and Knik Arm management units chinook salmon escapement index counts, 1979-1996.**

Year	West Cook Inlet <sup>a</sup>					Knik Arm	
	Chuitna	Theodore	Lewis	Other	Total	Little Susitna River	
	River	River	River	Streams <sup>c</sup>	WCI	Weir	Aerial
1979	1,246	512	546	236	2,540		nc <sup>b</sup>
1980 <sup>b</sup>							nc <sup>b</sup>
1981	1,362	535	560	1,144	3,601		nc <sup>b</sup>
1982	3,438	1,368	606	1,972	7,384		nc <sup>b</sup>
1983	4,043	1,519	nc	nc <sup>b</sup>	5,562		929
1984	2,845	1,251	947	nc <sup>b</sup>	5,043		558
1985	1,600	1,458	861	700	4,619		1,005
1986	3,946	1,281	722	165	6,114		nc <sup>b</sup>
1987	nc <sup>b</sup>	1,548	875	nc <sup>b</sup>	2,423		1,386
1988	3,024	1,906	616	nc <sup>b</sup>	5,546	7,400	3,197
1989	990	1,026	452	nc <sup>b</sup>	2,468	4,367	nc <sup>b</sup>
1990	480	642	207	nc <sup>b</sup>	1,329		922
1991	537	508	303	nc <sup>b</sup>	1,348		892
1992	1,337	1,053	445	nc <sup>b</sup>	2,835		1,441
1993	2,085	1,110	531	156	3,882		nc <sup>b</sup>
1994	1,012	577	164	368	2,121	2,981	1,221
1995	1,162	694	146	221 <sup>d</sup>	2,223	2,809	1,714
1996	1,343	368	257	424 <sup>d</sup>	2,392		1,079
BEG <sup>e</sup>	1,400	750	400		2,550		850

<sup>a</sup> Aerial count unless otherwise indicated.

<sup>b</sup> No count conducted, turbid water.

<sup>c</sup> May include Olsen, Nikoli, Coal, Straight, Bishop, Drill, and Scarp creeks.

<sup>d</sup> Coal creek.

<sup>e</sup> Biological escapement goal.

and 1995 a weir was operated and escapement counts were obtained. These counts ranged from 2,809 to 7,400 (Table 20).

### **Recent Fishery Performance**

The 1995 sport harvest of chinook salmon from the Little Susitna River was 1,698 fish (Howe et al. 1996). This is well below the 1990-1994 average of 3,126 fish and the lowest harvest since 1986. Prior to 1986 harvests did not exceed 1,900 fish (Appendix A3). The prohibition of the use of bait in conjunction with the reduction of hours open to fishing probably was the major cause of the 1995 harvest reduction. The Little Susitna River harvest accounted for approximately 10% of the total chinook salmon harvest from NCIMA waters during 1995 (Table 7 and Appendix A3). Harvest rates during 1996, based on reports from anglers and guides, were similar to 1995. The peak of the 1996 fishing season occurred during the Millers Reach wildfire which caused the closure of the road to the Little Susitna Public Use Facility for several days. The majority of anglers access the river at this point and its inaccessibility probably reduced the harvest and effort for the 1996 season considerably.

Aerial survey evaluation of the chinook salmon spawning escapement in 1996 resulted in a count of 1,079 fish (Table 20), which exceeded the established BEG of 850 fish.

### **Management Objectives**

The estimated escapement which produces the greatest yield, the biological escapement goal (BEG), was set at 850 fish as assessed by aerial survey for the Little Susitna River (Table 21). The BEG is based on the average aerial survey index counts of spawning chinook salmon. The management objective is to maximize fishing opportunity while insuring a spawning population of 850 chinook salmon as indexed by aerial survey. During 1988, 1989, 1994 and 1995, years in which a weir program was conducted and harvest estimates are available, inriver exploitation rates were estimated at approximately 28%, 49%, 59% and 38%, respectively. This indicates an increasing rate of exploitation from 1988 to 1994, which, if continued would lead to stock conservation concerns. This trend of increasing exploitation was reversed in 1995 primarily through reduction in fishing hours and implementation of a bait prohibition.

### **Recent Board of Fisheries Actions**

During an October 1994 meeting the BOF delegated authority to restrict chinook salmon harvests in Northern Cook Inlet to the Commissioner of the ADF&G in order to address stock conservation concerns. Additional restrictions implemented by the ADF&G for the 1995 season were: (1) a possession limit of one chinook salmon over 16 inches in length, (2) prohibition of the use of bait during chinook salmon season, and (3) reducing recreational fishing time during chinook salmon season to the hours of 6:00 a.m. through 11:00 p.m.

During a November 1996 meeting the BOF adopted the following regulations: (1) in the Little Susitna River from its mouth to the Parks Highway bridge at Houston, after taking a chinook salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to chinook salmon fishing during that same day, and (2) the bag and possession limit of chinook salmon 16 inches or more in length taken from the Little Susitna River drainage is one fish per day and in possession.

The next BOF meeting concerning the Little Susitna River is scheduled for 1998.

**Table 21.-Chinook salmon biological escapement goals (BEG) for Northern Cook Inlet Management Area waters.**

Drainage	BEG	Method of Survey
<u>Knik Arm Management Unit</u>		
Little Susitna River	850	Aerial
<u>Eastside Susitna River Management Unit</u>		
Chulitna River	2,000	Aerial
Clear Creek	1,300	Aerial
Goose Creek	350	Aerial
Little Willow Creek	650	Aerial
Montana Creek	1,100	Aerial
Prairie Creek	4,700	Aerial
Sheep Creek	650	Aerial
Willow Creek	1,750	Aerial
<u>Westside Susitna River Management Unit</u>		
Alexander Creek	2,700	Aerial
Deshka River	11,200	Aerial
Lake Creek	2,900	Aerial
Peters Creek	1,300	Aerial
Talachulitna River	2,700	Aerial
<u>West Cook Inlet Management Unit</u>		
Chuitna River	1,400	Aerial
Lewis River	400	Aerial
Theodore River	750	Aerial

## **Current Issues**

There are several issues confronting the fishery resources of the Little Susitna River and the users of these resources. These issues include: (1) inclusion of the Little Susitna River as one of six rivers in the Recreation Rivers Act, (2) extension of the South Big Lake Road to the Little Susitna River at river mile 39.5 and (3) use restrictions associated with habitat issues such as streambank erosion within the State Game Refuge.

A discussion of the Recreation Rivers Act and use restrictions within the State Game Refuge is provided in Whitmore et al. 1996. A discussion of the South Big Lake Road extension is provided in Whitmore et al. 1993.

Chinook salmon harvest in the Little Susitna River has increased considerably in recent years. Overexploitation of the chinook stock has been a concern. The years 1992 through 1994 each resulted in a record harvest and increased exploitation rate. The implementation of the previously mentioned regulations reduced the harvest level in 1995 and 1996 and hopefully will stabilize the harvest at an acceptable level.

## **Ongoing Research and Management Activities**

Placement of a weir to count chinook salmon was discontinued following the 1995 season. An aerial survey is conducted annually to determine chinook salmon spawning escapement. Harvest and catch are estimated with the SWHS.

## **Recommended Research and Management Activities**

The implementation of restrictions prior to the 1995 season (mainly the prohibition of bait) reduced the chinook harvest considerably during 1995 and 1996. The addition, in 1997, of a regulation that does not allow fishing for the remainder of the day after the harvest of a chinook salmon over 16 inches should help stabilize harvest levels.

Aerial surveys will be continued to index numbers of spawning chinook salmon. Increased regulation enforcement is recommended as many complaints were received concerning the use of bait by anglers.

Continued maintenance and development of access is necessary for the Little Susitna River chinook salmon fishery. The primary boating access project is operation of the Little Susitna Public Use Facility by Division of Parks and Outdoor Recreation (Table 22). Additional boating access programs proposed for the Little Susitna River include upgrading facilities within the Little Susitna River Public Use Facility, hardening camping areas within the Susitna Flats State Game Refuge and repairing or stabilizing river bank damaged caused by boating activity. Proposed nonboating access projects include improvement of parking and sanitation facilities adjacent to the Parks Highway and upgrading trails adjacent to the Little Susitna Public Use Facility.

## **Eastside Susitna Management Unit Chinook Salmon Fisheries**

### **Background and Historical Perspective**

The Eastside Susitna Management Unit includes all drainages of the Susitna River downstream of the Oshetna River to the confluence of the Chulitna River and drainages which flow into the Chulitna River from the east and those drainages which flow into the Susitna River from the east between the Talkeetna and Deshka rivers (Figure 14). The Eastside Susitna Management Unit is composed of three distinct geographical areas in which different regulations are in effect. These

**Table 22.-Access projects for NCIMA listed in prioritized order.**

No.	Location	Project	Estimated Cost
<b>Non-Boating Projects</b>			
1.	Various ADF&G managed sites <sup>a</sup>	Site maintenance contracts.	\$20,000
2.	Eklutna Tailrace <sup>a</sup>	Expand parking and construct vault toilets.	\$200,000
3.	Sheep Creek	Trail repairs: foot bridge, guardrail, erosion repair.	\$15,000
4.	Caswell Creek	Road, trail and parking upgrade, bank stabilization.	\$35,000
5.	Honeybee and Lynne Lakes	Access road realignment, survey and site enhancement.	\$7,500
6.	Loon Lake	Complete foot trail and vehicle parking.	\$5,000
7.	Tigger Lake	Create vehicle parking and foot trail.	\$7,500
8.	Lorraine Lake	Enhance vehicle parking and foot trail.	\$5,000
9.	Bruce Lake	Create vehicle parking and foot trail.	\$5,000
10.	Bearpaw Lake	Enhance vehicle parking and access road.	\$7,500
11.	Barley Lake	Enhance vehicle parking, access road and construct boardwalk.	\$7,500
12.	Horseshoe Lake	Create vehicle parking and foot trail.	\$5,000
13.	Cope Property	Purchase property.	\$90,000
14.	Wasilla Creek	Low-level upgrade: harden access road and signage (dependent on Cope property acquisition).	\$10,000
15.	Finger Lake	ADA dock construction.	\$125,000
16.	Little Susitna River-Parks Highway	Parking enhancement. Provide sanitation facility.	\$100,000
17.	Little Susitna River Public Use Facility	Trail improvements.	\$100,000
<b>TOTAL</b>			<b>\$745,000</b>
<b>Boating Projects</b>			
1.	Little Susitna River Public Use Facility <sup>a</sup>	Contract operation with DNR Parks	\$55,000
2.	Clear Creek <sup>a</sup>	Construct and install four pit toilets.	\$20,000
3.	Susitna Landing <sup>a</sup>	Construct new housing for concessionaire.	\$60,000
4.	Little Susitna River	Access feasibility study	\$50,000
5.	Bonnie Lake	Repair eroded boat ramp.	\$3,000
6.	Big Lake South SRA <sup>a</sup>	Boat ramp improvements and expanded parking.	\$200,000
7.	Christiansen Lake	Enhance boat launch facility as a cooperative effort with the Mat-Su Borough.	\$50,000
8.	Nancy Lake SRA	Boat ramp upgrade and install new ADA fishing dock.	\$200,000
9.	Susitna Landing	Construct: handicapped access dock, concrete boat ramp and permanent boat tie-ups. Stream bank stabilization.	\$100,000
10.	Little Susitna River Public Use Facility	Install 30 picnic tables, 30 fire rings and permanent boat tie-ups. Stream bank repairs. Fish cleaning table upgrade.	\$50,000
11.	Little Susitna River within the Susitna Flats State Game Refuge	Harden camp sites. Stream bank stabilization and repair damage caused by boating activity.	\$100,000
12.	Knik River-Glenn Highway	Construct boat launch.	\$100,000
13.	Chulitna River	Construct new boat ramp with DNR Parks.	\$300,000
14.	Remote sites	Sanitation improvements.	\$100,000
<b>TOTAL</b>			<b>\$1,438,000</b>

<sup>a</sup> Funded in FY98

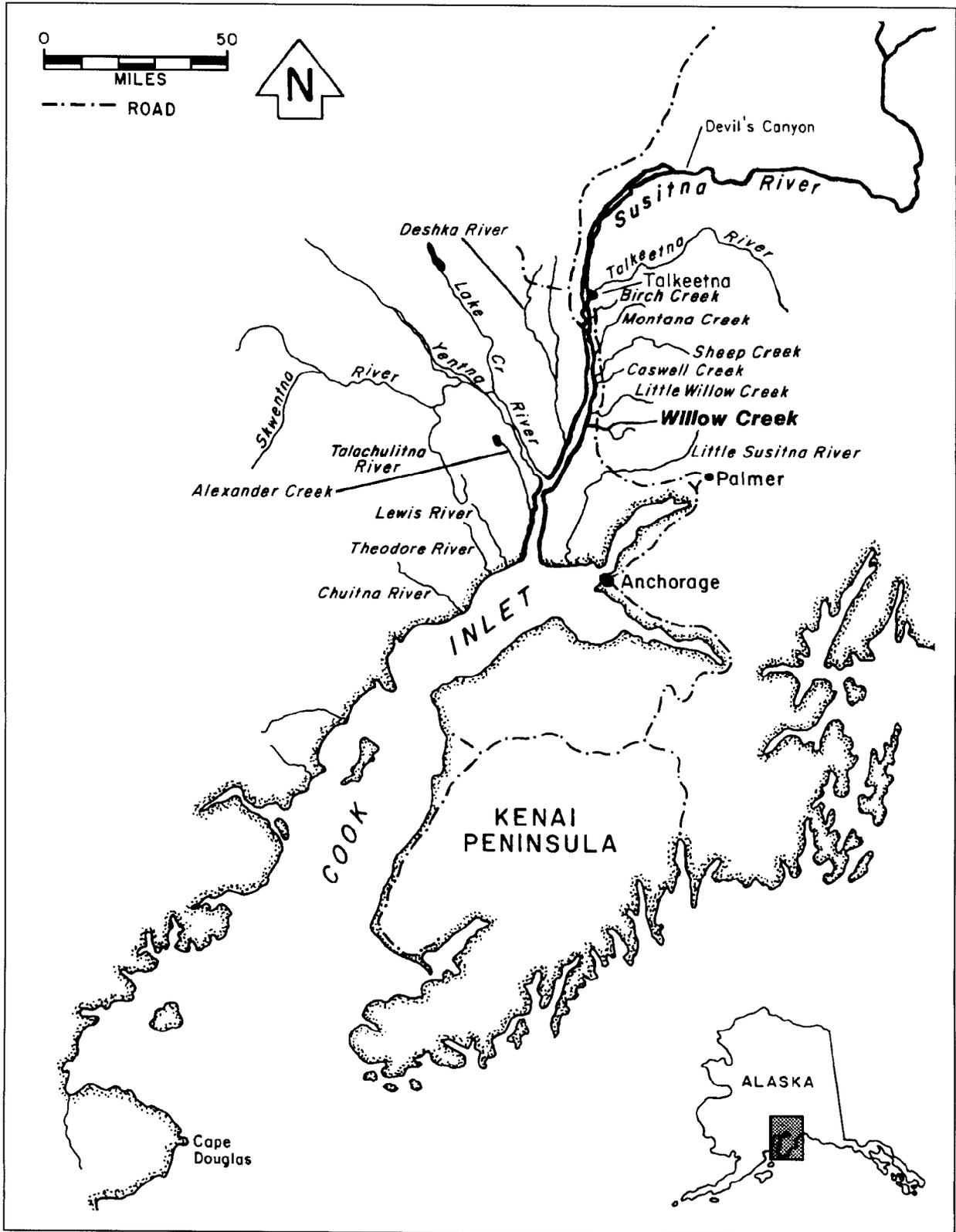


Figure 14.-Map of Northern Cook Inlet area.

areas include: (1) the eastside Susitna River tributaries between the Deshka and Talkeetna rivers, (2) the Talkeetna River, and (3) the upper Susitna area which includes the Susitna River and all tributaries upstream of the confluence with the Chulitna River to the Oshetna River. Regulations governing eastside Susitna River fisheries since chinook salmon fishing reopened in 1979 are described in Appendix E.

Many clearwater tributaries enter the Susitna River from the east between its junction with the Deshka River upstream to the Talkeetna River. This portion of the management unit is accessible by paved road. The George Parks Highway (Alaska Route 1) parallels the Susitna River on the east en route to connecting Anchorage and Fairbanks. The Alaska Railroad also parallels the east side of the Susitna River to a large extent. Both transportation systems provide angler access to numerous tributaries. Waters of this area within one-quarter mile of the Susitna River (except Willow Creek) are open to chinook salmon fishing each Saturday, Sunday and Monday for 4 consecutive weeks beginning the second Saturday in June. Major fisheries occur in Little Willow, Caswell, Sheep, Goose and Montana creeks (Figure 15). Each of these fisheries extend from the Susitna River upstream to the George Parks Highway except Montana Creek which extends 1 mile upstream of the Alaska Railroad bridge. Willow Creek is open to chinook salmon fishing from January 1 through the third Monday in June and then reopens on a Saturday through Monday basis for 2 consecutive weeks beginning the fourth Saturday in June. In addition, waters within a one-quarter mile radius of the Susitna River and the mouths of Sunshine and Birch Creek plus numerous small sloughs and creeks are open to chinook salmon fishing Saturday through Monday for 4 consecutive weeks starting the second Saturday in June.

The Talkeetna River joins the Susitna River about 98 miles upstream from Cook Inlet. This glacial system contains two major and numerous minor clearwater tributaries that support chinook salmon (Figure 16). Clear Creek is the most prominent chinook fishery within the Talkeetna River drainage. The Talkeetna Spur Road provides access to the Talkeetna River, however, a boat is required to reach virtually all chinook salmon fisheries within the drainage. This area is primarily accessed from the Talkeetna boat launch.

The Talkeetna River and upper Susitna River drainages are open to chinook salmon fishing from January 1 through July 13. The upper Susitna River area (Talkeetna to Devil's Canyon) is accessible only by boat or railroad. A public boat launch adjacent to the community of Talkeetna provides access to the area. Boat travel is relatively safe from the Talkeetna River upstream to the entrance of Devil's Canyon, a distance of about 55 miles. Boat travel beyond the entrance to Devil's Canyon is extremely hazardous and few boat operators ever venture past this location. Indian River and Portage Creek are the most prominent chinook salmon fisheries within the Upper Susitna River Area. The entrance to Devil's Canyon, beyond which salmon can not migrate, is about 150 miles upstream from Cook Inlet. The portion of the Susitna River above the Talkeetna River is designated as a trophy fishery for rainbow trout, therefore only unbaited, single-hook artificial lures are permitted as terminal gear.

Through 1994 the bag and possession limits for chinook salmon in all Eastside Susitna Management Unit fisheries were one chinook salmon per day and two in possession, 16 inches or more in length. In 1995 they were reduced to a one per day possession limit. The bag and possession limits for chinook salmon under 16 inches in length are 10 per day and in possession.

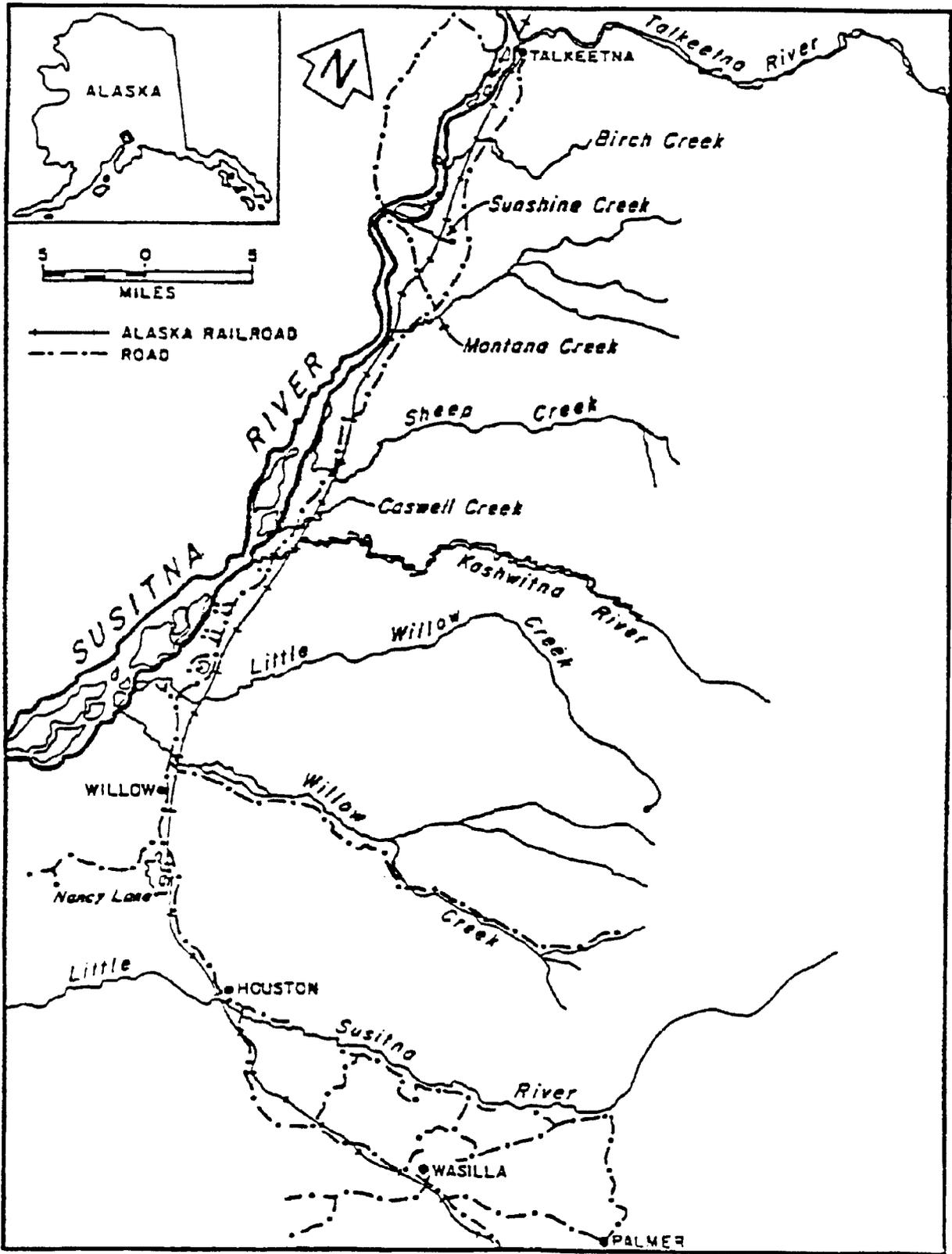


Figure 15.-Map of eastside tributaries of the Susitna River.

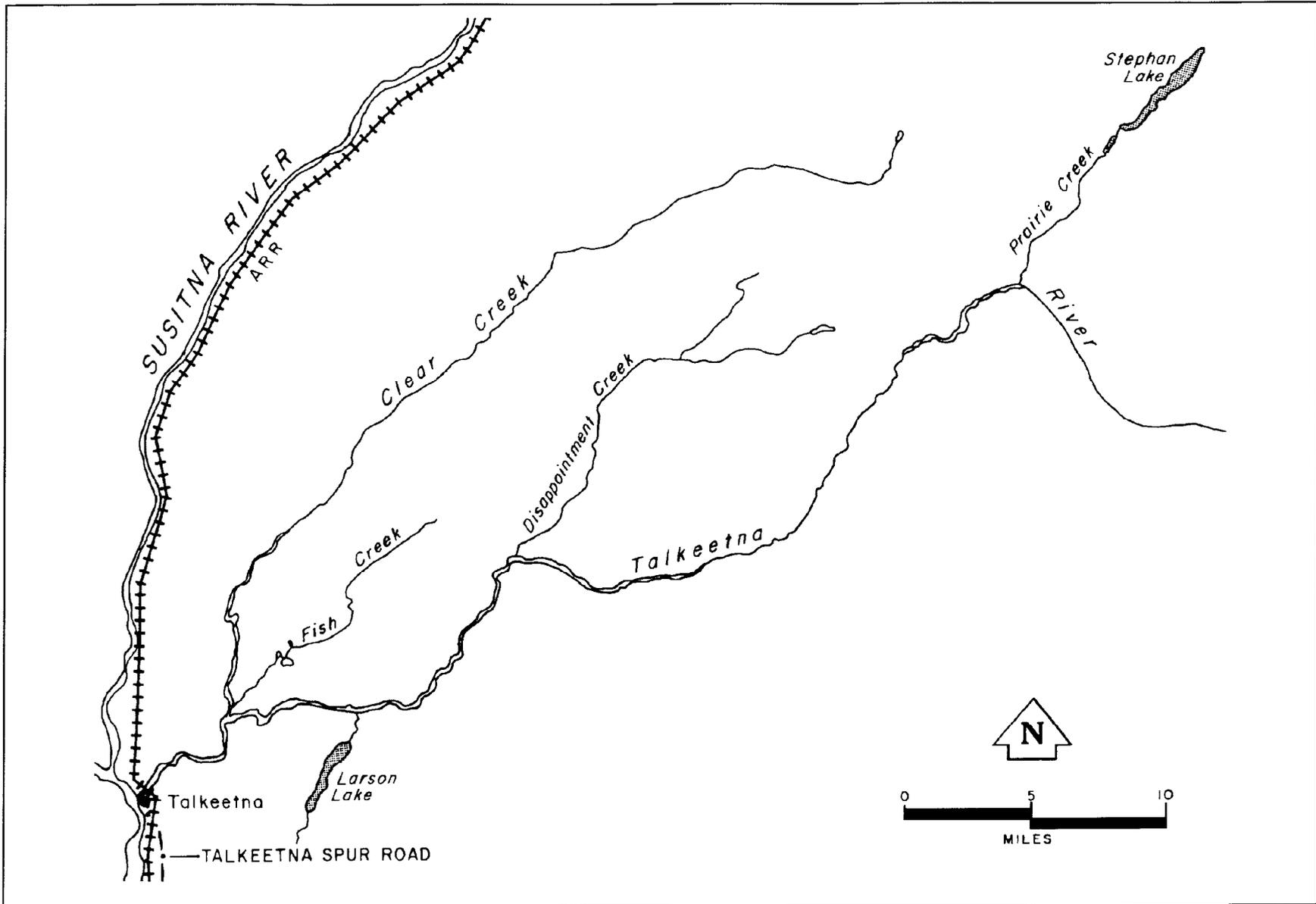


Figure 16.-Map of the Talkeetna River area.

**Table 23.-Harvest of chinook salmon from eastside Susitna River, westside Susitna River, West Cook Inlet and Knik Arm drainages, 1979-1995.**

Year	Eastside Susitna River			Westside Susitna River	West		Total
	Hatchery	Non- hatchery	Total		Cook Inlet	Knik Arm	
1979			1,298	5,768	98	800	7,964
1980			1,370	6,148	34	646	8,198
1981			2,202	4,742	192	1,466	8,602
1982			2,063	8,573	147	1,666	12,449
1983			2,852	9,569	1,185	1,255	14,860
1984			4,428	12,106	1,833	2,057	20,424
1985			4,342	13,644	2,029	1,889	21,904
1986			8,569	13,366	2,378	1,524	25,873
1987			8,603	13,350	1,477	2,476	25,906
1988	355	8,784	9,139	15,970	1,695	2,916	29,720
1989	1,079	8,704	9,783	19,343	2,325	4,341	35,792
1990	1,194	8,229	9,423	17,425	2,097	2,022	30,967
1991	844	8,239	9,083	21,836	762	2,277	33,958
1992	4,566	16,741	21,307	18,737	1,213	3,969	45,226
1993	3,977	18,711	22,688	21,142	1,855	3,602	49,287
1994	2,703	12,267	14,970	10,248	1,577	4,303	31,098
1995	1,111	6,761	7,872	6,265	674	1,707	16,518

During 1987 to 1995, the Eastside Susitna Management Unit fisheries have collectively provided 27%-48% of the chinook salmon harvest from the NCIMA. The harvest has ranged from 7,872 to 22,688 during this period (Table 23) with 1992 and 1993 harvests doubling all previous years (Appendix A5). Included in this harvest are hatchery fish taken in Willow Creek, which totaled approximately 1,000 to 4,000 fish annually.

Aerial survey escapement counts of Eastside Susitna Management Unit chinook salmon stocks suggest that these substocks comprise from 30% to 60% of the Susitna River chinook salmon escapement (Tables 24 and 25). Prairie Creek, a headwater tributary of the Talkeetna River, consistently receives the largest escapement which has ranged between 2,254 and 9,463 from 1987 through 1996 (Table 24).

Willow Creek, Talkeetna River, Sheep Creek and Montana Creek traditionally produce the largest harvest of chinook salmon in the Eastside Susitna Management Unit. Between 1990 and 1994 the average annual harvest for these fisheries ranged from 2,259 to 5,987 (Appendix A5). Tagging studies have shown that these chinook salmon substocks are subject to harvest at stream mouths other than their natal stream (Peltz and Sweet 1992). Therefore, stocks from the upper

**Table 24.-Eastside Susitna River Management Unit chinook salmon escapement index counts (aerial), 1979-1996.**

Year	Willow Creek	Deception Creek	Little Willow	Sheep Creek	Goose Creek	Montana Creek	Clear Creek	Prairie Creek	Chulitna River	Portage Creek	Indian River	Kashwitna River	Other Streams <sup>b</sup>	Total
1979	848	239	327	778	nc <sup>a</sup>	1,094	864	nc <sup>a</sup>	nc <sup>a</sup>	190	285	457	nc <sup>a</sup>	5,082
1980 <sup>a</sup>														
1981	991	366	459	1,013	262	814	nc <sup>a</sup>	1,875	nc <sup>a</sup>	659	422	558	nc <sup>a</sup>	7,419
1982	592	229	316	527	140	887	982	3,844	863	1,111	1,053	156	268	10,986
1983	777	121	1,042	975	477	1,641	938	3,200	4,058	3,140	1,193	297	nc <sup>a</sup>	17,859
1984	2,789	675	nc <sup>a</sup>	1,028	258	2,309	1,520	9,000	4,191	2,341	1,456	111	nc <sup>a</sup>	25,678
1985	1,856	1,044	1,305	1,634	401	1,767	2,430	6,500	783	-- <sup>c</sup>	-- <sup>c</sup>	457	4,066	22,243
1986	2,059	521	2,133	1,285	nc <sup>a</sup>	nc <sup>a</sup>	nc <sup>a</sup>	8,500	nc <sup>a</sup>	nc <sup>a</sup>	nc <sup>a</sup>	700	nc <sup>a</sup>	15,198
1987	2,768	692	1,320	895	416	1,320	nc <sup>a</sup>	9,138	5,252	2,616	1,246	872	nc <sup>a</sup>	26,535
1988	2,496	790	1,515	1,215	1,076	2,016	4,850	9,280	nc <sup>a</sup>	1,402	456	1,159	nc <sup>a</sup>	26,255
1989	5,060	800	1,325	610	835	2,701	nc <sup>a</sup>	9,463	nc <sup>a</sup>	1,309	659	355	nc <sup>a</sup>	23,117
1990	2,365	700	1,115	634	552	1,576	2,380	9,113	2,681	1,886	1,473	872	nc <sup>a</sup>	25,347
1991	2,006	747	498	154 <sup>d</sup>	968	1,605	1,974	6,770	4,410	1,223	1,468	340	nc <sup>a</sup>	22,163
1992	1,660	983	673	nc <sup>a</sup>	369	1,560	1,530	4,453	2,527	1,078	479	470	nc <sup>a</sup>	15,782
1993	2,227	1,221	705	nc <sup>a</sup>	347	1,218	886	3,023	2,070	629	362	525	nc <sup>a</sup>	13,213
1994	1,479	766	712	542	375	1,143	1,204	2,254	1,806	857	336	430	nc <sup>a</sup>	11,904
1995	3,792	834	1,210	1,049	374	2,110	1,928	3,884	3,460	1,505	796	836	nc <sup>a</sup>	21,778
1996	1,776	1,211	1,077	1,028	305	1,841	2,091	5,037	4,172	2,185	579	782	nc <sup>a</sup>	22,084
BEG <sup>e</sup>	1,750 <sup>f</sup>		650	650	350	1,100	1,300	4,700	2,000					

<sup>a</sup> No counts conducted.

<sup>b</sup> May include Honolulu, Byers, Troublesome, Bunco, Birch, Sunshine, Larson creeks.

<sup>c</sup> Included with other streams.

<sup>d</sup> Poor count due to timing, poor visibility or weather conditions.

<sup>e</sup> Biological escapement goal.

<sup>f</sup> Includes both Willow Creek and Deception Creek.

**Table 25.-Westside Susitna River Management Unit chinook salmon escapement index counts, 1979-1996.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Talachulitna River	Cache Creek	Other Streams <sup>b</sup>	Total
1979	6,215	27,385	108	4,196	1,648	nc <sup>a</sup>	nc <sup>a</sup>	39,552
1980 <sup>a</sup>								
1981	nc <sup>a</sup>	nc <sup>a</sup>	nc <sup>a</sup>	nc <sup>a</sup>	2,025	nc <sup>a</sup>	nc <sup>a</sup>	2,025
1982	2,546	16,000	nc <sup>a</sup>	3,577	3,101	nc <sup>a</sup>	nc <sup>a</sup>	25,224
1983	3,755	19,237	2,272	7,075	10,014	497	nc <sup>a</sup>	42,850
1984	4,620	16,892	324	nc <sup>a</sup>	6,138	nc <sup>a</sup>	nc <sup>a</sup>	27,974
1985	6,241	18,151	2,901	5,803	5,145	206	485	38,932
1986	5,225	21,080	1,915	nc <sup>a</sup>	3,686	424	nc <sup>a</sup>	32,330
1987	2,152	15,028	1,302	4,898	nc <sup>a</sup>	556	nc <sup>a</sup>	23,936
1988	6,273	19,200	3,927	6,633	4,112	818	nc <sup>a</sup>	40,963
1989	3,497	nc <sup>a</sup>	959	nc <sup>a</sup>	nc <sup>a</sup>	362	nc <sup>a</sup>	4,818
1990	2,596	18,166	2,027	2,075	2,694	484	nc <sup>a</sup>	28,042
1991	2,727	8,112 <sup>c</sup>	2,458	3,011	2,457	499	161	19,425
1992	3,710	7,736	996	2,322	3,648	487	nc <sup>a</sup>	18,899
1993	2,763	5,769	1,668	2,869	3,269	1,690	nc <sup>a</sup>	18,028
1994	1,514	2,665	573	1,898	1,575	628	570	9,421
1995	2,090	4,156	1,041	3,017	2,521	1,601	408	14,834
1996	2,319	10,048 <sup>d</sup> 6,343 14,354 <sup>d</sup>	749	3,514	2,748	581	548	16,802
BEG <sup>e</sup>	2,700	11,200	1,300	2,900	2,700			

<sup>a</sup> No count conducted.

<sup>b</sup> May include Donkey Creek, Red Creek and other miscellaneous creeks.

<sup>c</sup> Low count due to timing, poor visibility or weather conditions.

<sup>d</sup> Weir count.

<sup>e</sup> Biological escapement goal.

portions of the drainage, such as Prairie Creek, are harvested at stream mouths along their migration corridor. The magnitude of nonnatal stream harvest has not been defined.

Few chinook salmon arrive at the mouths of Eastside Susitna Management Unit tributaries between the Deshka and Talkeetna rivers prior to mid-June. The third and fourth weekends in June generally provide the majority of the harvest. Very few chinook salmon arrive at the Talkeetna River prior to June 20 with the peak occurring the first week in July. The Upper Susitna River fishery has similar run timing to that of the Talkeetna River.

Creel surveys were employed from 1979-1989 to monitor the effort for and harvest of chinook salmon and collect biological samples at Willow Creek, Montana Creek and the Talkeetna River. Creel surveys were continued on Willow Creek through 1993 and again in 1995; and in 1991, 1992 and 1995 for the Talkeetna River. Biological samples were collected from the Talkeetna River during the 1993, 1994 and 1996 seasons and annually at Willow Creek. No harvest estimates were collected during this time. Creel surveys were intermittently conducted at Sheep, Goose, Caswell, Little Willow, Sunshine, and Birch creeks and within the upper Susitna River area. Findings from these surveys have been documented in Department of Fish and Game annual reports (Watsjold 1980, 1981; Bentz 1982, 1983; Hepler and Bentz 1984-1987, Hepler et al. 1988 and 1989, Sweet and Webster 1990, Sweet et al. 1991, Peltz and Sweet 1992 and 1993, Sweet and Peltz 1994, Whitmore et al. 1995 and 1996).

Willow Creek was identified in 1981 as a candidate for chinook salmon stocking in the Cook Inlet Regional Salmon Enhancement Plan. A chinook salmon smolt stocking program was initiated in 1985, and with the exception of 1987, the program has continued annually (Table 26). The goals of this program are to: (1) maintain the present quality and quantity of natural chinook salmon production, (2) produce through supplemental hatchery production an additional 6,000 returning chinook salmon of which 4,000 would be available for harvest at Willow Creek on an annual basis by 1994, and (3) provide a minimum of 15,000 angler-days of chinook salmon fishing opportunity during the period June 10 to July 10 (Sweet and Peltz 1994).

### **Recent Fishery Performance**

The 1995 harvest from the Eastside Susitna Management Unit was 7,872 fish (Table 9 and Appendix A5), approximately half the 1990-1994 mean harvest. This harvest represented approximately 48% of the entire chinook salmon harvest from the NCIMA (Tables 7 and 9). In total, 16,376 chinook salmon were caught in the Eastside Susitna Management Unit during 1995, of which 52% were released (Table 13). The harvest estimate for 1995 includes approximately 1,100 hatchery fish taken in the Willow Creek fishery.

During 1995 the harvest of chinook salmon from Willow Creek, Talkeetna River, and Montana Creek was 2,742 (approximately 1,100 hatchery produced), 2,126 and 1,004 fish, respectively (Appendix A5). The harvest from these three drainages accounted for 75% of the total harvest from the Eastside Susitna Management Unit during 1995.

A creel survey to estimate the relative contribution of hatchery-produced chinook salmon to the sport harvest was conducted at the mouth of Willow Creek in 1996. An escapement survey to estimate hatchery contribution was also conducted. During 1996 hatchery fish accounted for 45% of the harvest, 11% of the escapement in the mainstem of Willow Creek above the confluence of Deception Creek, and 46% of the Deception Creek escapement. The 1989-1995

**Table 26.-Number of chinook salmon smolt stocked into the Willow Creek drainage from 1985-1996.**

Brood Year	Release Location	Total Smolt Release	Number Coded-wire Tagged	Mean Size	Release Date
1983	Deception	101,256	8,152	18.0	6/13/85
1984	Deception	214,384	11,038	13.8	6/11-12/85
	Deception	218,743	10,708	14.0	6/20/85
1985	Deception	49,668	9,933	16.7	5/01/86
	Deception	127,904	18,400	12.2	5/10/86
	Deception	<u>147,877</u>		11.4	5/10/86
		275,781	18,400		
1987	Deception	201,091	20,936	10.9	7/12/88
1988	Deception	240,885	19,851	13.0	5/31/89
1989	Deception	219,362	41,570	14.4	5/24/90
	Deception	219,432	40,575	13.4	5/24/90
	Deception	<u>216,697</u>	<u>40,438</u>	13.9	5/24/90
		655,491	122,583		
1990	Deception	168,777		11.2	5/21/91
	Deception	70,258	31,167	12.3	5/31/91
	Willow	73,756		12.3	5/28/91
	Willow	<u>78,878</u>	<u>31,167</u>	12.3	5/30/91
		391,669	62,334		
1991	Deception	179,724	33,464	13.5	5/29/92
	Deception	<u>35,752</u>		14.5	6/09/92
		215,476	33,464		
1992	Deception	160,194	39,420	14.9	6/01/93
1993	Deception	177,913	45,921	13.3	5/24-25/94
1994	Deception	184,740	46,256	13.5	5/25/95
1995	Deception	186,918	47,145	14.4	6/12-17/96

sport harvest hatchery contributions averaged 41%. In association with this project the age, sex and size composition of the harvest was determined (Table 27). In 1996 males accounted for about 69% of the sport harvest. Approximately 36% of the harvest was composed of 4 year olds (2-ocean jacks), and age-5, -6, and -7 fish composed 30%, 32%, and 1% of the harvest, respectively. Escapement index counts in 1996 indicated a minimum of 2,987 spawners in Willow and Deception creeks combined (Table 24).

A detailed summary of the performance of the chinook salmon enhancement program in Willow Creek will be written in 1997 which will include information from initiation of the program through the 1996 season.

During 1996 catch sampling to determine age, sex and size composition of the harvest was conducted at Clear Creek, the primary chinook salmon sport fishing stream in the Talkeetna River drainage. Males accounted for approximately 51% of the sample. Age-4, -5, -6 and -7 fish accounted for 12%, 32%, 53% and 2% of the harvest, respectively (Table 27).

The 1996 escapement indices for Eastside Susitna Management Unit chinook salmon totaled 22,084 fish (Table 24). Prairie Creek (a Talkeetna River tributary) reached its BEG for the first time since 1991. All other streams except Goose Creek exceeded their BEG in 1996 (Tables 21 and 24). We believe that regulations initiated in 1995 were mainly responsible for this increase in spawning escapement by reducing the harvest in all chinook fisheries.

### **Management Objectives**

Biological escapement goals for eight Eastside Susitna Management Unit systems have been established (Table 21). These escapement goals were based on historic escapement index counts. The management objective for these eight systems is to achieve the escapement goal within each system. In the weekend-only fisheries which cross the George Parks Highway, management strategies provide maximum levels of sustained chinook salmon fishing opportunity while attaining escapement objectives. Management objectives specific to Willow Creek relative to the chinook salmon enhancement program are to provide 15,000 angler-days of participation and opportunity to harvest an additional 4,000 hatchery-produced chinook salmon.

The objective of regulations established for the 1995 season and continued in 1996 was to reduce the harvest to half the 1994 level. Based on SWHS estimates the 1995 harvest appears to have decreased substantially (Appendix A5). A corresponding increase in eastside Susitna River escapement indices has also occurred.

In the upper Susitna River area, management strategies are in place to allow for sustained yield of trophy-size rainbow trout. Full utilization of chinook salmon within this area is not a primary objective.

### **Recent Board of Fisheries Actions**

During an October 1994 meeting the BOF delegated authority to restrict chinook salmon harvests in Northern Cook Inlet to the Commissioner of the ADF&G in order to address stock conservation concerns. Under this authority restrictions implemented by ADF&G for the 1995 season were: (1) a possession limit of one chinook salmon over 16 inches in length, (2) prohibition of the use of bait during chinook salmon season, and (3) limitation of recreational

**Table 27.-Sex and age composition and length-at-age of chinook salmon sampled from Willow, Clear, Alexander and Lake creeks sport harvests, Deshka River weir and Northern Cook Inlet commercial harvest, 1996.**

	Willow Creek <sup>a</sup>				Clear Creek <sup>a</sup>				Lake Creek <sup>a</sup>				Alexander Creek <sup>a</sup>				Deshka River Weir <sup>a</sup>				NCI Commercial <sup>a</sup>			
	1.2	1.3	1.4	1.5	1.2	1.3	1.4	1.5	1.2	1.3	1.4	1.5	1.2	1.3	1.4	1.5	1.2	1.3	1.4	1.5	1.2	1.3	1.4	1.5
<b>Male</b>																								
Percent	36.4	15.3	16.1	0.4	11.8	17.6	19.4	0.6	13.5	14.0	15.2	0.6	39.0	15.6	4.3	1.2	48.3	17.2	5.5	0	36.6	23.2	9.8	0
SE	3.1	2.3	2.4	0.4	2.5	2.9	3.0	0.6	2.6	2.7	2.8	0.6	3.8	2.9	1.6	0.9	2.6	1.9	1.2		5.4	4.7	3.3	
Mean Length (mm)	618	860	1,018	1,000	614	861	1,014	1,045	624	789	973	1,150	594	782	904	1,005	573	813	932		593	801	997	
SE	4.9	12.1	12.4		9.3	10.3	10.5		9.7	17.4	13.5		5.8	12.4	32.3	30.0	3.8	7.7	8.6		10.8	13.1	27.4	
Sample Size	88	37	39	1	20	30	33	1	23	24	26	1	64	26	7	2	185	66	21		30	19	8	
<b>Female</b>																								
Percent	0	14.9	15.7	0.4	0	14.1	33.5	1.8	0	18.1	34.5	1.2	0	26.8	11.6	0	0	20.4	7.8	0	0	13.4	12.2	0
SE		2.3	2.3	0.4		2.7	3.6	1.0		3.0	3.7	0.8		3.5	2.5			2.1	1.4			3.8	3.6	
Mean Length (mm)		833	968	1,015		864	945	1,030		837	941	963		780	896			805	899			815	914	
SE		7.9	9.9			7.1	6.9	8.7		7.3	7.7	47.5		7.4	13.5			6.2	8.1			13.7	13.2	
Sample Size	0	36	38	1	0	24	57	3	0	31	59	2	0	33	47	0	0	78	30	0	0	11	10	0
<b>Combined</b>																								
Percent	36.4	30.2	31.8	0.8	11.8	31.8	52.9	2.4	13.5	32.2	49.7	1.8	39.0	42.7	15.9	1.2	48.3	37.6	13.3	0	36.1	36.6	22.0	0
SE	3.1	3.0	3.0	0.6	2.4	3.6	3.8	1.2	2.6	3.6	3.8	1.0	3.8	3.9	2.9	0.9	2.6	2.5	1.7		5.3	5.3	4.6	
Mean Length (mm)	618	832	933	1,008	614	862	970	1,034	624	816	951	1,025	594	781	898	1,005	573	809	912		592	806	951	
SE	4.9	7.2	8.4	7.5	9.3	6.5	6.8	7.2	9.7	9.1	6.9	68.3	5.8	6.5	12.8	30.0	3.8	4.8	6.3		10.6	9.6	17.0	
Sample Size	88	73	77	2	20	54	90	4	23	55	85	3	64	70	26	2	185	144	51	0	30	30	18	0
Total Percent Male (SE)	69.0 (3.0)				50.6 (3.9)				45.6 (3.8)				61.6 (3.8)				71.8 (2.3)				73.2(4.9)			
Total Percent Female (SE)	31.0 (3.0)				49.4 (3.9)				54.4 (3.8)				38.4 (3.8)				28.2 (2.3)				26.8 (4.9)			
Total Sample Size	242				170				171				164				338				82			

<sup>a</sup> Less than 5% of the population consists of age classes other than those listed.

fishing during chinook salmon season to the hours of 6:00 a.m. through 11:00 p.m. (not including that portion of the eastside Susitna River management unit currently open to weekend-only fishing).

Regulations affecting the Eastside Susitna Management Unit adopted by the BOF during the November 1996 meeting are: (1) in all waters of the Susitna River drainage between the confluence of the Deshka River and the confluence of the Talkeetna River, after taking a chinook salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to chinook salmon fishing during that same day, and (2) in all waters of the Susitna-West Cook Inlet Management Area, excluding the Susitna River between its confluence with the Deshka River and its confluence with the Talkeetna River, after taking a chinook salmon 16 inches or more in length, a person may not fish for chinook salmon during that same day.

The next BOF meeting to include Eastside Susitna Management Unit chinook salmon is scheduled for 1998.

### **Current Issues**

The primary social issues in the Eastside Susitna Management Unit chinook salmon fisheries are associated with crowding, regulation violations, and the Recreation Rivers Act.

The decrease in spawning escapement during the period 1992-1994 is the primary biological issue confronting these fisheries. Increasingly restrictive regulations have been implemented since 1993 with the goal of decreasing harvest and effort levels and increasing spawning escapement. The adoption of regulations for 1997 that do not allow fishing for chinook salmon after harvesting one should help alleviate the overcrowding.

### **Ongoing Research and Management Activities**

Willow Creek has been the site of an ongoing chinook salmon stocking program since 1985. Inseason assessment of the biological characteristics of and hatchery contribution to the harvest and escapement have been and continue to be important components in developing Willow Creek as a responsible stocking program. In addition, catch sampling to document age, length and sex of the Talkeetna River chinook salmon harvest at Clear Creek was conducted in 1996. Annual assessment of escapement has been an ongoing activity associated with the Eastside Susitna Management Unit fisheries. Results from escapement indices in conjunction with harvest data from the SWHS are the primary elements used to manage these fisheries.

With the implementation of the five chinook salmon seasonal bag limit and chinook salmon stamp requirement, managers decided an enforcement program was necessary. During the 1996 season, department personnel inspected anglers' fishing licenses at several Parks Highway accessible fisheries including Montana, Sheep, Goose and Willow creeks.

A juvenile chinook salmon coded wire tag (CWT) program was initiated at Willow Creek in July of 1996. Approximately 42,600 juvenile chinook salmon were marked with coded wire tags. Tag recoveries will occur as these fish return to Cook Inlet waters and are intercepted in commercial, subsistence, personal use, and recreational fisheries. This program will be continued in 1997.

### **Recommended Research and Management Activities**

We recommend continuation of the assessment of the Willow Creek hatchery enhancement program and juvenile CWT program. The feasibility of an expanded CWT program on additional eastside Susitna River streams will be investigated in 1997.

Catch sampling at Clear Creek will be discontinued at its present level. Some onsite contact with the fishery should be maintained to monitor inseason activity.

Aerial escapement surveys will be continued as they are our only indication of run strength in many streams. Enforcement activities should be continued to maintain contact with anglers and insure compliance with regulations.

Continuation of the access maintenance, development and land acquisition upgrades is necessary in the Eastside Susitna Management Unit (Table 22). In 1995 the department signed a lease with the Alaska Railroad for a 10-acre parcel containing a boat launching ramp into the Talkeetna river. This site provides boating access to clearwater tributaries of the Talkeetna and upper Susitna rivers which offer angling opportunities for resident species and all five salmon species. During 1996 the department upgraded the boat launch, repositioning and installing concrete planks and installing river bank rip-rap to prevent erosion. Additionally, a structured parking area for 60 trailered vehicles was developed and a vaulted toilet was installed. The department has contracted a private concessionaire to oversee the operation of the facility and perform routine maintenance.

Maintenance at Sheep Creek is provided annually through contract with private maintenance companies. No boating access is available from this site. The Sheep Creek parking and camping area provides anglers with access to the confluence of Sheep Creek and the Susitna River. This site is accessible by road from Mile 86.3 on the Parks Highway. In addition to the standard maintenance at this site a small wooden bridge will be constructed across an eroded portion of the trail to comply with standards set by the Americans with Disabilities Act (ADA). Other enhancement slated for this site include: extending the guardrail along a portion of the trail to curtail erosion caused by foot traffic, and installation of a foot/ATV ramp to allow access to a lower portion of the river bank.

The Caswell Creek parking and camping area provides anglers with access to the confluence of Caswell Creek and the Susitna River. No boating access is available at this site. This site is accessible by road from Mile 84 on the Parks Highway. The department has been granted management authority over a 30-acre tract, including this site, from Alaska Department of Natural Resources (ADNR). Contracts are established annually with local maintenance companies to provide and maintain portable toilets, empty dumpsters, and provide general facility cleaning. Improvements needed at this site include: (1) smooth and grade the road, adding necessary materials to allow access during rainy periods; (2) upgrade parking within the facility; and (3) upgrade the trail from the parking area to the stream to reduce erosion along the trail.

Susitna Landing is located at the confluence of the Kashwitna and Susitna rivers and can be reached by vehicle from Mile 82.5 on the Parks Highway. Services provided at the boating access landing include parking, boat launching and RV camping. A concessionaire contracted by the department operates the facility and performs routine maintenance. Several major upgrades are needed at this site. The concession stand was replaced during 1996. Current plans provide

for construction of a covered picnic area, construction of a handicap access ramp to concession stand, dredging below boat ramps, new housing for the concessionaire, and installation of a fence for a secure boat storage.

The Chulitna River Bridge at Mile 133 of the Parks Highway is located in Denali State Park. Development of a boat launch at this site will increase angling opportunity by providing access to vast areas currently inaccessible. This project will be a cooperative effort with ADNR, Division of Parks and Outdoor Recreation.

## **Westside Susitna Management Unit Chinook Salmon Fisheries**

### **Background and Historical Perspective**

Tributaries that drain into the Susitna River from the west (Figure 14) supported the largest chinook salmon fisheries within the NCIMA through 1991. Access to the relatively remote fisheries in this area is primarily by boat or aircraft. Susitna Landing, located at the mouth of the Kashwitna River, and Deshka Landing, located about 4 miles upstream from the Deshka River, are the principal boat access sites on the Susitna River. A few anglers also gain access to Westside Susitna Management Unit fisheries by traversing Cook Inlet by boat from the Port of Anchorage. The Petersville Road provides the only vehicular access to this portion of the Susitna River drainage. This road allows access to the upper reaches of the Deshka River and Peters Creek.

The Yentna River, the largest tributary of the Susitna River, is within this management unit. This glacial river joins the Susitna River about 30 miles upstream from Cook Inlet.

The westside Susitna River chinook salmon fisheries supported the largest harvest of chinook salmon within the NCIMA until the 1992 season when the eastside Susitna River harvest surpassed it (Table 23). The Deshka River, Alexander Creek and Lake Creek have supported the largest chinook salmon fisheries in this management unit (Appendix A7). The collective harvest from these three fisheries during 1990-1994 represents 81% of the total chinook salmon harvest from the Westside Susitna Management Unit fisheries. The Deshka River consistently provided the largest chinook salmon harvest within the NCIMA until 1993 when Lake Creek surpassed it. The Deshka River has been closed to chinook salmon fishing since June 17, 1994.

The peak harvest at the mouth of Alexander Creek (Susitna River mile 10) normally occurs during the first week in June. The harvest at the mouth of the Deshka River (Susitna River mile 40) peaks during mid-June whereas at Lake Creek (64 miles from the mouth of the Susitna River at Yentna River mile 34) the peak harvest usually takes place during the third week in June.

Harvest levels at major westside Susitna River fisheries have increased substantially since 1979. Improved access (as described in Whitmore et al. 1993) and population growth has undoubtedly increased both participation and harvest. However, it is important to recognize that liberalized regulations during 1986 through 1992, when the chinook salmon bag limit in this area was increased to two daily over 16 inches in length (only one over 28 inches) and four in possession (only two over 28 inches), also contributed to expanded use of the area's chinook salmon resources. Regulations governing westside Susitna River fisheries since chinook salmon fishing reopened in 1979 are described in Appendix E.

The chinook salmon fishing season at all westside Susitna River fisheries through 1993 extended from January 1 through July 13. With the exception of the Deshka and Chulitna rivers, all

westside Susitna River tributaries were open to chinook salmon fishing in their entirety. The Deshka River drainage was closed to chinook salmon fishing upstream from the Moose/Kroto Creek fork; and the Chulitna River was closed with the exception of the East Fork drainage, which is within the Eastside Susitna Management Unit. Beginning in 1994 additional time and area closures have been implemented to reduce chinook salmon harvest and effort. Unbaited, single-hook artificial lures are mandatory within the Talachulitna River and in a large portion of the Lake Creek drainage.

The Deshka River, Alexander Creek, Lake Creek and the Talachulitna River are included in the Recreation Rivers Act.

Commercial services play an important support role in Westside Susitna Management Unit fisheries. Creel surveys in 1989 revealed that 64% of the chinook salmon fishing effort at Lake Creek was supported by some form of commercial service, e.g. fishing guides, lodges, air charter, etc. (Engel and Vincent-Lang 1992). In contrast, commercial services were used by only 14% and 6% of the participants at Alexander Creek and the Deshka River, respectively.

Aerial surveys during the 1990 chinook fishery revealed very light fishing pressure scattered throughout the vast reaches of the Yentna River drainage (Sweet et al. 1991). The distribution and magnitude of this effort did not suggest that any surveyed water was in danger of overharvest because of heavy fishing pressure.

Beginning in 1991 and continuing through 1994, chinook salmon spawning abundance in westside Susitna River tributaries was below desired levels (Table 25). Chinook salmon escapement counts in the Deshka River indicate an alarming decline during this period, while the average recreational harvest of chinook salmon during 1990 through 1992 was approximately 40% greater than the average harvest during the previous 10 years (Appendix A7). The escapement goal of 11,200 fish counted by aerial survey for the Deshka River has not been achieved since 1990 (Tables 21 and 25).

Concern for Susitna River chinook salmon grew during 1992 when harvest rates of commercial and sport fisheries that intercept these stocks reflected that fish abundance was less than desired. An emergency order effective June 22, 1992, reduced the daily bag and possession limit for chinook salmon 16 inches or more in length to one fish in all waters of the Susitna and Little Susitna River drainages. It also required the release of all chinook salmon 16 inches or more in length, and the use of unbaited, artificial lures in all waters of the Deshka River drainage between the Deshka River's confluence with Trapper Creek and the confluence of Moose and Kroto creeks (the Forks); and in all waters of the Alexander Creek drainage upstream from Alexander Creek's confluence with Trail Creek (Appendix D). Growing concern caused the BOF during their 1992 meeting to adopt new regulations for the 1993 chinook salmon season. These regulations included a bag limit of one daily and two in possession, a seasonal five Cook Inlet chinook salmon limit and a requirement that sport fishing guides cannot participate or engage in fishing during the chinook salmon season while clients are present or within their control.

In response to a low escapement to the Deshka River in 1993, an emergency order was issued prior to the 1994 season which: (1) prohibited the use of bait throughout the Deshka River drainage, and (2) reduced the possession limit for chinook salmon greater than 16 inches in length to one fish in the Deshka River drainage. In combination with current area-wide regulations, managers believed these actions would reduce the recreational harvest by half in the

Deshka River. A low harvest by the Northern District commercial fleet during the early portion of their 1994 season, in combination with poor catch rates in the Alexander and Lake creeks recreational fisheries, indicated that a low return of chinook salmon to the Susitna River drainage was occurring. In response, an emergency order was issued effective June 17, 1994 which closed the Deshka River to fishing for chinook salmon and prohibited the use of bait in the majority of the Susitna River drainage. In addition, the remaining periods of the Northern District commercial set net fishery were closed.

Aerial survey evaluation of streams in the Westside Susitna Management Unit during 1994 resulted in a fourth consecutive year of reduced chinook salmon abundance (Table 25). BEGs were not achieved within any of the index streams during the 1994 season. This prompted the management strategy outlined previously in the Chinook Salmon Fisheries Management Strategy section through regulations outlined in the Recent Board of Fisheries Action described in this section. The objective of regulations adopted during the 1994 BOF meeting was to decrease the 1995 chinook salmon harvest to half the 1994 level. Regulations adopted during the 1996 meeting were established to further conserve the chinook salmon resource in efforts to meet established BEGs.

### **Recent Fishery Performance**

The 1995 chinook salmon fishery resulted in a harvest of 6,265 chinook salmon, approximately 35% of the 1990-1994 mean and the lowest harvest since 1981 (Appendix A7). Escapement surveys conducted in 1995 revealed increased numbers in all index areas, however the BEG was achieved only in Lake Creek, with the Deshka River still considerably below its escapement objective (Table 25). In 1996 escapement surveys again showed improvement with the exception of Peters Creek, which fell below its BEG for the third straight year. The Deshka River increased in 1996 but still reached only 57% of its goal. Alexander Creek, although showing an improvement, failed to reach its goal for the third consecutive year. A weir was constructed in the Deshka River in 1996 for the second consecutive year to count adult chinook salmon. Counts of 10,048 and 14,354 chinook resulted in 1995 and 1996, respectively. Aerial survey counts in 1995 and 1996 resulted in 4,156 (41% of the weir count) and 6,343 (44% of the weir count), respectively (Table 25).

Age, sex and size samples were collected from the chinook salmon harvest at Lake and Alexander creeks and from the Deshka River weir (Table 27). Male chinook salmon accounted for 46% and 62% of the harvest in Lake and Alexander creeks, respectively. Age-5 and -6 chinook salmon dominated the Lake Creek harvest while the Alexander Creek harvest was dominated by chinook salmon ages 4 and 5. The Deshka River weir sample contained 48% age-4, 38% age-5 and 13% age-6 fish. Males comprised 72% of the sample.

### **Management Objectives**

Biological escapement goals for five Westside Susitna Management Unit systems have been established (Table 21). These escapement goals were based on historic escapement index counts. The management objective for these five systems is to achieve the escapement goals while providing maximum levels of sustained chinook salmon fishing opportunity.

The objective of regulations established for the 1995 season was to reduce the harvest to half the 1994 level. Based on results from the SWHS and two inseason creel surveys (Whitmore et al. 1996) the 1995 harvest appears to have decreased substantially with a corresponding increase in

all westside Susitna River escapement indices. Following the 1996 season escapement, counts in all index streams, with the exception of Peters Creek, increased for the second consecutive year.

Despite increased fishing restrictions initiated in 1995, Alexander Creek and Peters Creek continued to fall below their BEG. Restrictions to further reduce the harvest were established during the 1996 BOF meeting. Regulations were adopted to close Alexander Creek to chinook salmon fishing after June 30 and designate a portion of the creek as hook-and-release fishing. Peters Creek has been closed to chinook salmon fishing upstream of a department marker located 1 mile upstream of the mouth.

In the Talachulitna River, only single-hook artificial lures may be used to allow for the sustained yields of trophy-sized rainbow trout. Full utilization of chinook salmon within this drainage is not a primary objective.

### **Recent Board of Fisheries Actions**

During an October 1994 meeting the BOF delegated authority to restrict chinook salmon harvests in Northern Cook Inlet to the Commissioner of the ADF&G in order to address stock conservation concerns. Additional restrictions implemented by the ADF&G for the 1995 season were: (1) a possession limit of one chinook salmon over 16 inches in length, (2) prohibition of the use of bait during chinook salmon season, (3) limitation of recreational fishing during chinook salmon season to the hours of 6:00 a.m. through 11:00 p.m., and (4) closure of the Deshka River and Alexander Creek above the confluence of Trail Creek to fishing for chinook salmon.

Regulations affecting the Westside Susitna Management Unit adopted by the BOF during the November 1996 meeting were:

1. Peters Creek was closed to sport fishing for chinook salmon upstream from a department marker approximately 1 mile upstream of its confluence with the Kahiltna River. This closure includes catch-and-release fishing for chinook salmon.
2. Alexander Creek is open to the retention of chinook salmon only from its mouth upstream to a department marker at Granite Creek, January 1 through June 30. Only unbaited, single-hook, artificial lures may be used and no chinook salmon over 16 inches may be retained from January 1 through June 30 in all waters of the Alexander Creek drainage between a department marker at Granite Creek upstream to a department marker 400 yards upstream of Trail Creek.
3. In all waters of the Susitna River drainage between the confluence of the Deshka River and the confluence of the Talkeetna River: after taking a chinook salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to chinook salmon fishing during that same day.
4. In all waters of the Susitna-West Cook Inlet Management Area, excluding the Susitna River between its confluence with the Deshka River and its confluence with the Talkeetna River: after taking a chinook salmon 16 inches or more in length, a person may not fish for chinook salmon during that same day.

The next BOF meeting concerning westside Susitna River fisheries will take place in 1998.

### **Current Issues**

Managers are concerned with providing fishing opportunity for anglers while maintaining the harvest at a level that will allow escapement goals to be met.

As previously noted, the Deshka River, Alexander Creek, Lake Creek and the Talachulitna River have been classified by the Alaska Legislature as recreation rivers. Motorized/nonmotorized restrictions and commercial-use permits are the most controversial issues associated with this plan. No funds have been allocated for enforcement of regulations.

Improved or expanded access to the western drainages of the Susitna River is yet another issue confronting the fisheries and fishery users of this area. Numerous recreational support industries that service the area as well as residents of the area favor retention of the region's wilderness (roadless) features. Many other interests support an expanded road system within the area which would promote development of mineral, forest, agriculture and recreation resources as well as enhance private settlement of the area. The issue of transportation corridors is addressed in Whitmore et al. 1993.

### **Ongoing Research and Management Activities**

Escapement index counts by aerial survey have been performed annually on major westside Susitna River chinook salmon populations since the mid 1970s. Harvest trends for most Westside Susitna Management Unit stocks have also been assessed by the SWHS since chinook salmon fishing reopened in 1979. Inseason surveys have also documented age, length, and sex compositions of major chinook salmon stocks.

A juvenile chinook salmon coded wire tagging (CWT) program was initiated at the Deshka River in the spring of 1995 and continued in 1996. During the 1996 season approximately 1,500 chinook salmon juveniles were marked with coded wire tags. Tag recoveries will occur as these fish return to Cook Inlet waters and are intercepted in commercial, subsistence and recreational fisheries. In addition a weir was placed in the Deshka River where biological information was collected (Table 27) and 14,354 returning adult chinook salmon were counted. In the long term the CWT program and weir will provide data to determine the sustainable yield of chinook salmon in the Deshka River with the weir also increasing our understanding of the relationship between aerial surveys and total run size. The Deshka River weir will be operational during the 1997 season. An alternate stream that can provide over 40,000 juvenile chinook salmon to be marked may be selected for the tagging program instead of the Deshka River in 1997.

As regulations become more numerous and restrictive department personnel have become more involved in regulation enforcement, specifically, inspecting fishing licenses and ticketing violators.

### **Recommended Research and Management Activities**

To increase spawning escapement in the Susitna River, regulations were adopted in 1995 to reduce the harvest to approximately half of the 1994 level. According to SWHS estimates these regulations did result in a substantial decrease in harvest. The 1996 season proceeded under the same regulations as 1995 and overall escapement counts increased again but continued to fall short in the Deshka River, Alexander and Peters creeks. As a result the majority of Peters Creek will be closed to chinook salmon fishing and only the first 2 miles of Alexander Creek will be open to the harvest of chinook salmon. Alexander Creek will close to chinook salmon fishing entirely on June 30. The Deshka River will continue to be closed to chinook salmon fishing.

Chinook salmon escapement monitoring should be continued. Harvest trends should be evaluated annually through the SWHS. Inseason catch sampling to obtain biological information at Alexander Creek and Lake Creek should continue in some form in 1997. Age, sex and size information collected during creel surveys from these fisheries is necessary for development of brood tables with the goal of refining BEGs and developing forecast techniques for these stocks.

The Deshka River weir project should be continued. However, the weir will be moved downriver to a more stable site so it will better withstand high water conditions and remain in operation throughout the entire season. The weir provides biological data and inriver return information for Deshka River chinook salmon.

To better manage the westside Susitna River chinook it would be helpful to understand the fate of these stocks upon entering the marine environment. The CWT program conducted on the Deshka River has not been successful as only small numbers of juveniles have been captured. An investigation into the feasibility of capturing sufficient numbers of Susitna River juvenile chinook salmon for tagging, in addition to the Willow Creek site, should be conducted. If a stream more suitable than the Deshka River is found a tagging operation should begin.

Enforcement activities by department staff should continue in support of Fish and Wildlife Protection.

A lower Susitna River access feasibility study will be conducted during 1997. The objective of the study is to determine the most appropriate site for access development to the Westside Susitna Management Unit should the Deshka River Landing be closed to the public.

## **West Cook Inlet Management Unit Chinook Salmon Fisheries**

### **Fishery Description and Historical Perspective**

The West Cook Inlet Management Unit extends south from the mouth of the Susitna River to the West Foreland of Cook Inlet (Figure 17). Streams of this area, with the exception of the Chakachatna-McArthur and the Beluga River drainages, are relatively small clearwater coastal drainages that originate in the Alaska Range or from slopes of Mount Susitna. The Chakachatna-McArthur and Beluga River drainages are largely glacial and receive minor use by chinook salmon fishermen. Access to the coastal fisheries within the West Cook Inlet Management Unit is by air or water because there is no road link to the Southcentral Alaskan highway system. A road network, built to facilitate oil and gas exploration and the timber industry, does exist in the Tyonek/Beluga area. Several gravel aircraft landing strips are present and a few roads also serve as runways. The village of Tyonek, with a population of nearly 300 people, is the area's primary population center.

Chinook salmon begin to arrive in the area during late May with the peak of most fisheries occurring during mid to late June. The stock is also harvested in the Northern District set gillnet fishery and the Tyonek and Upper Cook Inlet subsistence fisheries. Commercial fishing is permitted to within 500 yards of the mouths of several streams.

**Figure 17.-Map of West Cook Inlet coastal streams.**

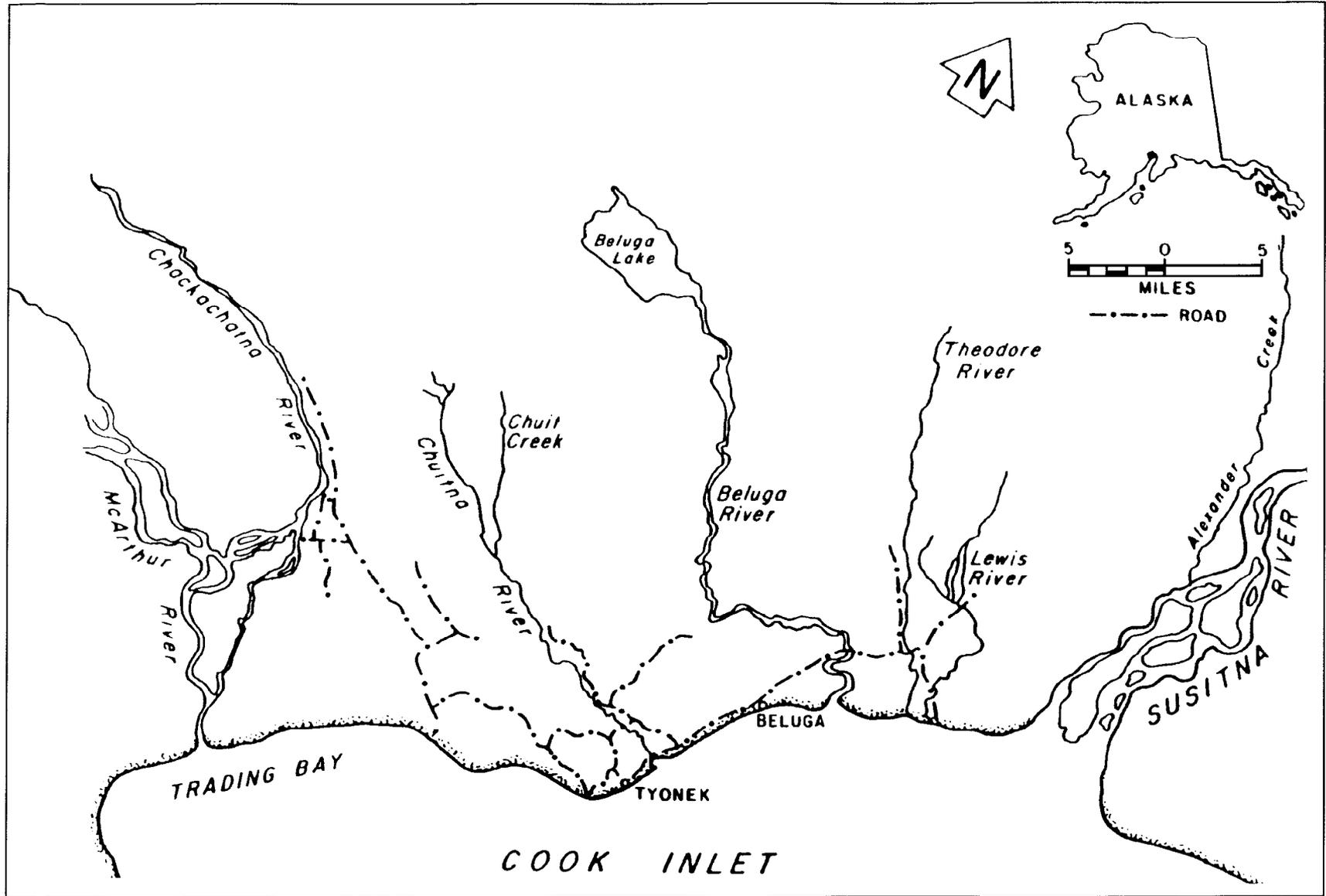


Figure 17.-Map of West Cook Inlet coastal streams.

From 1985 through 1990 participation in these fisheries reached record highs (Table 5). During 1991 and 1992 participation decreased in response to reduced bag and possession limits and reduced season length. The participation level during 1993 again increased over the 1991 and 1992 levels.

The Theodore, Chuitna and Lewis rivers are the area's most prominent chinook salmon fisheries. The collective annual harvest of chinook salmon from these three streams from 1990 through 1994 ranged from 762 to 2,097 fish and averaged 1,501 fish (Appendix A9). Access to this area is by helicopter in the upper reaches of these streams and by airplane and vehicle to the lower reaches.

In recent years, observed spawning escapements in West Cook Inlet Management Unit streams have not always attained their BEG (Table 20). The reduced abundance of spawning chinook salmon in the West Cook Inlet Management Unit can not be attributed solely to elevated instream participation and harvest. Weak returns were also caused by flood-related mortality of eggs and juveniles which occurred in 1986. Inspection of the coastal streams after the October 1986 flood revealed substantial streambed scouring and rechannelization. In association with the flooding there was severe erosion, landslides and subsequent deposition of earth and debris into the streams. The 1993 escapement index count showed an improvement over the previous 4 years but dropped again in 1994 to just over 2,000. The 1994 escapement counts resulted in none of the streams meeting their escapement goals.

The 1993 season ran from January 1 through June 30 with a bag and possession limit for chinook salmon 16 inches and greater of one per day and one in possession. The 1994 season proceeded without any additional regulations. General NCI chinook salmon regulations adopted during October 1994 including the bait prohibition and reduction of fishing hours as described in the recent Board of Fisheries Actions Section were applied to West Cook Inlet Management Unit fisheries.

### **Recent Fishery Performance**

Concern for West Cook Inlet Management Unit chinook salmon stocks escalated during the early 1990s. Low catch rates in the commercial, subsistence, and recreational fisheries coupled with low observed spawning escapements has warranted restriction by regulation and emergency order for recreational fisheries (Appendix D).

The combined harvest for the West Cook Inlet drainage during 1995 was estimated to be 674, the lowest recorded harvest since 1982 and well below the previous 5-year average of 1,501 (Appendix A9). Prior to the 1995 season regulations were initiated to reduce the harvest to half the 1994 level. (These regulations were listed previously in the Chinook Salmon Overview, BOF actions section of this report). The 1996 season operated with the same regulations as the 1995 season (with the exception of the Lewis River closure) and is expected to have produced a comparable harvest.

Spawning escapement counts in 1995 resulted in a slight increase over 1994, but all index areas fell below their established BEGs (Table 20). Escapement counts in the Lewis River have been dangerously low the past 3 years. This, along with low harvest levels, resulted in closure of the Lewis River to chinook salmon fishing in 1996. The 1996 escapement counts overall increased slightly, but again all index streams fell below their BEG with the Theodore River attaining only 50% of its goal.

### **Management Objectives**

Biological escapement goals for three West Cook Inlet Management Unit streams have been established (Table 21). These escapement goals were based on historic escapement index counts. The management objective for these three streams is to achieve the escapement goal while providing maximum levels of sustained chinook salmon fishing opportunity.

### **Recent Board of Fisheries Actions**

During an October 1994 meeting the BOF delegated authority to restrict chinook salmon harvests in Northern Cook Inlet to the Commissioner of the ADF&G in order to address stock conservation concerns. Restrictions implemented by the ADF&G regarding the WCI streams for the 1995 season were: (1) prohibition of the use of bait during chinook salmon season, and (2) limitation of recreational fishing during chinook salmon season to the hours of 6:00 a.m. through 11:00 p.m.

During the March 1996 meeting the BOF adopted a regulation closing the Lewis River to chinook salmon fishing. Action on other chinook salmon proposals was rescheduled for a meeting in November 1996. During this November meeting the following regulations affecting the West Cook Inlet Management Unit were adopted:

1. Theodore River is closed to sport fishing for chinook salmon. This includes catch-and-release fishing for chinook salmon.

The following regulations apply to the Northern District commercial chinook salmon fishery:

1. The area from 1 mile south of the Theodore River to the Susitna River is closed to fishing; provisions of this paragraph do not apply after December 31, 1998.
2. If at least 90% of the biological escapement goal for the Theodore River (BEG = 750) or Chuitna River (BEG = 1,400) is not met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.
3. In addition to above, if at least 90% of the biological escapement goal for the Chuitna River has not been met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to sport fishing for chinook salmon during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.

The next BOF meeting concerning the West Cook Inlet Management Unit fisheries will be in 1998.

### **Current Issues**

The decline in spawning chinook salmon abundance beginning in 1990 has become a major concern facing these fisheries. This reduction may be partially related to flood events during the 1980s and increased use of the area by helicopter fishermen. The West Cook Inlet Management Unit streams have exhibited the same declining trend seen in streams of the Susitna River drainage.

### **Ongoing Research and Management Activities**

Research and management activities directed at these fisheries have consisted of periodic onsite creel observation and regulation enforcement activities, annual assessment of chinook salmon escapement by helicopter, and estimation of annual harvest by the SWHS.

### **Recommended Research and Management Activities**

Chinook salmon fishery monitoring should be continued. Harvest trends should be evaluated annually through the SWHS.

The continued failure of WCI streams to meet established BEGs may lead to increased restrictions on chinook salmon fishing.

Enforcement activities should be continued to insure compliance with existing regulations.

## **COHO SALMON FISHERIES**

Recreational harvests of coho salmon in the NCIMA ranged from 15,489 to 80,240 fish during 1977 through 1994, and averaged 45,833 fish (Mills 1979-1994; Howe et. al. 1995) (Table 28 and Appendix A11). These harvests have accounted for 26% of the coho salmon harvests in the region and 18% of the statewide harvests during these years. Within the NCIMA, the Knik Management Unit, which includes the Little Susitna River, accounts for the largest harvest of coho salmon. The Eastside Susitna Unit is second followed closely by the Westside Susitna Unit. West Cook Inlet Management Unit, with fewer accessible streams, is a distant fourth in average harvest. Harvests of coho salmon in the Knik Management Unit are dominated by harvests from the Little Susitna River while harvests from other management units have been spread across several systems (Appendices A12-A19).

In addition to recreational harvests, NCIMA area coho salmon stocks contribute to Cook Inlet commercial harvests. Commercial harvests of coho salmon in Upper Cook Inlet commercial fishing districts averaged 448,103 fish during 1977 to 1996 (Appendix B2). The Central District drift gillnet fishery accounted for approximately one-half of the average harvest (Appendix B3). Significant numbers of NCIMA bound coho salmon are harvested in the Western subdistrict of the Central District and in the General and Eastern subdistricts of the Northern District (Appendices B4-B7 and B9). The remaining commercial harvests of coho salmon are from several smaller subdistricts within the Central District (Ruesch and Fox 1996).

Management strategies for NCIMA coho salmon begin to develop as the stocks enter Cook Inlet and are intercepted by the commercial fishery. The magnitude, catch per unit effort, and distribution of the commercial harvest often are the first indicators of general run strength. As coho salmon enter fresh water, the department currently has very limited ability to gauge overall run size. Counting weirs at the Little Susitna River and the Deshka River provide the only quantitative measure of coho abundance in the many drainages of Northern Cook Inlet. Fish wheels and sonar at the Yentna River, and foot and aerial index counts for a few select streams also provide an understanding of relative abundance.

A creel survey to estimate coho salmon harvest and fishing effort was conducted at the Little Susitna River from 1982 through 1993. Intermittent or partial creel survey data have also been collected from other coho salmon fisheries.

**Table 28.-Northern Cook Inlet Management Area recreational harvest of coho salmon by management unit, 1977-1995.**

Year	Northern Cook Inlet Management Area					Region II		Statewide	
	Knik Arm	Eastside	Westside	West Cook	Total	Number	% of NCIMA	Number	% of NCIMA
	Unit	Susitna Unit	Susitna Unit	Inlet Unit					
1977	4,366	5,709	6,599	532	17,206	67,866	25.3	105,004	16.4
1978	7,895	8,573	10,173	378	27,019	81,990	33.0	131,945	20.5
1979	7,139	7,564	9,036	337	24,076	93,234	25.9	119,329	20.2
1980	16,030	10,368	12,141	628	39,167	127,958	30.8	164,302	24.0
1981	10,484	6,593	5,940	604	23,621	95,376	25.2	125,666	19.1
1982	13,676	10,167	10,658	335	34,836	136,153	27.2	195,644	18.9
1983	6,139	5,176	3,610	564	15,489	87,935	18.0	149,270	10.6
1984	23,429	13,916	9,511	1,035	47,891	166,688	28.7	238,536	20.1
1985	14,339	7,042	11,270	1,431	34,082	137,671	24.8	200,773	17.0
1986	12,361	16,190	13,117	983	42,651	188,872	22.9	255,887	16.9
1987	25,787	11,028	8,746	2,825	48,386	176,710	27.4	235,435	20.5
1988	40,037	19,518	16,283	1,182	77,020	225,812	34.1	281,450	27.4
1989	23,846	17,078	18,226	2,270	61,420	237,155	26.0	338,195	18.2
1990	18,762	11,743	13,883	1,344	45,732	214,114	21.4	325,936	14.1
1991	22,186	19,479	20,507	2,485	64,657	254,961	25.2	389,569	16.5
1992	25,814	33,790	16,218	2,211	78,033	237,204	32.7	345,513	22.5
1993	35,763	26,063	15,454	2,960	80,240	283,868	31.1	412,487	21.4
1994	28,539	20,870	15,361	2,695	67,465	299,849	22.4	502,948	13.3
90-94 Mean	26,213	22,389	16,285	2,339	67,225	257,999	26.1	395,126	17.0
% of NCIMA	39	33	24	3					
1995	20,650	19,165	17,148	2,670	59,633	263,749	22.6	368,631	16.2

**Knik Arm Management Unit: Little Susitna River Coho Salmon Fishery Background and Historical Perspective**

The harvest of Little Susitna River coho salmon has ranged from 2,835 to 27,610 during 1977 to 1995 (Table 29) (Mills 1979-1994; Howe et al. 1995, 1996). It has been a consistent second to the Kenai River which supports the largest freshwater coho salmon harvest in Alaska.

Coho salmon escapements to the Little Susitna River were measured by weir in 1986 and from 1988 through 1996. In 1986 the weir was damaged for several days by flood waters and the escapement count through the weir was incomplete (Table 30). Prior to 1986, coho salmon escapement abundance was indexed by ground and/or aerial methods when water conditions permitted. Weir counts from 1988 through 1994 averaged approximately 24,700 coho salmon (Table 30).

Access to this fishery is described in the section addressing the river's chinook salmon fishery.

**Table 29.-Harvest and effort for Little Susitna River coho salmon, 1977-1995.**

Year	Harvest	Release	Annual Effort Angler days <sup>a</sup>
1977	3,415		11,063
1978	4,865		12,127
1979	3,382		21,301
1980	6,302		22,420
1981	5,940		26,162
1982	7,116		24,020
1983	2,835		35,477
1984	14,253		48,517
1985	7,764		37,498
1986	6,039		45,776
1987	13,003		35,659
1988	19,009		49,731
1989	14,129		54,708
1990	7,497	4,906	40,159
1991	16,450	4,692	50,838
1992	20,033	7,960	49,304
1993	27,610	10,589	42,249
1994	17,665	4,576	45,149
1995	14,451	5,042	41,119
Mean	11,145		36,488

Source: Mills 1977-1994, Howe et al. 1995, 1996.

<sup>a</sup> Participation directed at coho salmon represents only a portion of the annual effort.

**Table 30.-Knik Arm drainage coho salmon escapement index counts, 1981-1996.**

Drainage <sup>a</sup>	Little Susitna River <sup>b</sup>			Fish Creek <sup>c</sup>	Cotton-wood Ck.	Wasilla Creek Drainage			Matanuska River	Knik River Drainage			Grand Total
	Hatchery	Non-hatchery	Total <sup>f</sup>			Wasilla Creek	Spring Ck. (Wasilla)	Spring Ck. (Flats)		Yellow Creek	McRoberts Creek	Upper Jim Creek	
1981			6,750	2,330	423	238	ns <sup>d</sup>	64	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	9,805
1982			6,800	5,201	737	171	ns <sup>d</sup>	105	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	13,014
1983			2,666	2,342	506	4	ns <sup>d</sup>	28	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	5,546
1984			20,991	4,510	935	876	ns <sup>d</sup>	90	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	27,402
1985			3,540	5,089	334	16	150	81	65	662	ns <sup>d</sup>	266	10,203
1986			7,511 <sup>e</sup>	2,166	121	ns <sup>d</sup>	141	147	20	439	ns <sup>d</sup>	403	10,948
1987			4,865	3,871	360	251	110	42	58	667	ns <sup>d</sup>	1,587	11,811
1988	4,428	16,063	20,491	2,162	293	ns <sup>d</sup>	82	30	110	1,911	ns <sup>d</sup>	1,848	26,927
1989	6,862	8,370	15,232	3,479	147	ns <sup>d</sup>	67	39	226	597	ns <sup>d</sup>	253	20,040
1990	3,370	10,940	14,310	2,673	167	34	38	12	146	599	589	668	19,236
1991	8,322	29,279	38,249	1,297	158	118	16	5	136	484	418	286	41,172
1992	2,690	19,492	21,182	1,705	6	3	11	0	57	11	59	39	23,073
1993	9,189	25,633	34,822	2,078	265	ns <sup>d</sup>	67	69	490	503	535	496	39,325
1994	4,162	24,786	28,948	350	232	282	76	60	172	506	2,119	714	33,459
1995	1,135	11,131	12,266	390	242	46	20	38	220	702	1,288	107	15,475
1996			13,384 <sup>g</sup>	682	189	84	30	29	101	72	439	224	15,234

<sup>a</sup> Aerial or foot surveys unless otherwise noted.

<sup>b</sup> Aerial or foot surveys 1981-1985 and 1987. Weir counts from weir at river mile 34, 1986, 1988-1995.

<sup>c</sup> 1982-1991 weir count plus stream survey; 1992, 1993 weir count; 1994 and 1995 weir was removed on August 15 before the majority of the coho run.

<sup>d</sup> No survey conducted.

<sup>e</sup> Weir washed out in flood from July 21-July 29, 1986.

<sup>f</sup> 1988-1991 includes harvest upstream of the weir, 1992-1995 does not include harvest upstream of the weir. Weir moved above sport fishery in 1996.

<sup>g</sup> 12,932 coho salmon counted through a weir operated at river mile 71, plus 452 counted in a stream survey below the weir.

Coho salmon return to the Little Susitna River primarily from mid-July through early September. Tagging studies indicate that coho salmon migrate slowly up the Little Susitna River and remain available to the fishery for about 4 weeks, after which they pass the George Parks highway bridge into waters closed to fishing for salmon. Spawning takes place from late September through mid-October. Spawning primarily occurs upstream from the George Parks Highway in the mainstem of the river, however some spawning occurs in tributary streams.

Supplemental coho salmon stocking has occurred at the Little Susitna River since 1982 (Table 31). Fingerling plants dominated the initial years of stocking but these releases generally yielded low returns. Beginning in 1987, returns from smolt releases started to make significant contributions to the sport harvest. The 1995 smolt release in Nancy Lake was the last scheduled stocking of hatchery coho salmon for the Little Susitna River.

The contribution of hatchery fish to the sport harvest has ranged from 17% to 75% and averaged 37% of the creel survey harvest estimates during 1987 through 1995 (Bartlett and Conrad 1988, Bartlett and Vincent-Lang 1989, Bartlett and Sonnichsen 1990, Bartlett and Bingham 1991, Bartlett 1992-1994, Bartlett 1996).

Coho salmon smolt were initially released into Nancy Lake, which drains into the Little Susitna River about 6 miles downstream from the George Parks Highway (Figure 12). Nancy Lake did not support a return of adult coho salmon before stocking occurred. Rearing juvenile coho salmon used Nancy Lake by ascending Lake Creek from the Little Susitna River. Adults of

**Table 31.-Coho salmon stocking history for the Little Susitna River, 1982-1995.**

Year Stocked	Fry Release			Smolt Release			Total Number Released
	Size (gm)	Number Released	Number Marked	Size (gm)	Number Released	Number Marked	
1982	0.57	2,950					2,950
1983	0.57	216,508	20,835				216,508
1984	0.91	426,216	10,000				426,216
1985	0.30	1,225,000	10,004	17.1	54,394	12,151	1,279,394
1986	1.00	316,270		17.2	580,065	24,401	580,065
1987				19.2	302,055	23,955	302,055
1988	1.00	3,374,126	3,126	20.1	438,374	24,628	3,812,500
1989				19.8	358,478	25,631	358,478
1990	1.1-2.0	473,327	72,327	20.8	308,356	45,220	781,683
1991				22.2	277,762	46,358	277,762
1992				23.8	158,459	19,222	158,459
1993				19.0	131,591	19,930	131,591
1994				19.7	126,694	43,818	126,694
1995				21.3	151,985	45,245	151,985

hatchery origin now return to Nancy Lake where some spawn in tributaries to the lake. Eggs for the Little Susitna River and 1996 Wasilla Creek stocking programs, as well as for Bird,

Campbell, and Ship creeks in the Anchorage Management Unit, were taken from the return to Nancy Lake.

The Little Susitna River coho salmon sport fishery has been managed in accordance with the Little Susitna River Coho Salmon Management Plan since 1991 and as modified following the 1992 and 1996 seasons. Currently the bag and possession limits are set by the management plan at three coho salmon 16 inches or more in length.

Only unbaited, artificial lures are allowed in the Little Susitna River between July 15 and August 6. This requirement is designed to reduce the catch rate of the early-arriving nonhatchery stock, thereby reducing the hook-and-release mortality. Since the 1993 season this requirement resulted in an increase of nonhatchery fish to the escapement and preservation of the natural run timing. The hook-and-release mortality of bait-caught, ocean-fresh coho salmon has been documented to be approximately 70% (Vincent-Lang et al. 1993). The management plan allows the use of bait after August 6, a period when hatchery fish are more abundant in the fishery.

Prior to the 1996 season the management plan also directed liberalization of the bag and possession limit by emergency order to five coho salmon downstream of river mile 32.5 and within a one-quarter mile radius of the confluence of Lake Creek and the Little Susitna River when the escapement goal of 7,500 nonhatchery coho salmon upstream of the Parks Highway was projected. This direction to liberalize the bag limit was eliminated during the November 1996 Board of Fisheries meeting. Downstream of the Burma Road access site anglers are required to quit fishing when a bag limit of Little Susitna coho salmon is harvested. Coho salmon intended to be released cannot be removed from the water. This requirement reduces hook-and-release mortality.

Creel and escapement observations have shown that coho salmon abundance at the Little Susitna River fluctuates widely. Inriver returns have ranged from 22,000 to approximately 62,000 during 1988 through 1995 (Tables 29 and 30).

### **Recent Fishery Performance**

A program was conducted to estimate the proportion of hatchery fish in the Little Susitna River harvest during 1995 and 1996. The 1995 estimated relative contribution of 20.4% was applied to the 1995 harvest estimate of 14,451 fish (Table 29) to produce an estimate of 2,949 hatchery fish in the sport harvest. The total 1995 return to the Little Susitna River, including approximately 70% hook-and-release mortality of the released fish, was approximately 30,500 coho salmon.

In 1996 a total of 2,507 coho salmon from the Little Susitna Public Use Facility boat angler harvest was inspected. The inspected creels contained 175 coho salmon with a missing adipose fin. One hundred and fifty-seven of these fish had a detectable code (31-23-39) and 18 fish had either no tag or the head was not collected. Based on the marked to unmarked ratio of hatchery fish (Table 31), the 1996 sport harvest was composed of approximately 23% hatchery fish.

In 1996, a total of 12,932 coho salmon were counted through the Little Susitna River weir between August 10 and September 22 (Table 30). Approximately 50% of these fish were censused between August 25 and September 5. The new weir site (river mile 71), used in 1996 for the first time, is 1 mile above the George Parks Highway and approximately 7 miles above Nancy Creek, the outlet stream for the Nancy Lake coho salmon smolt releases. A total of 459 coho salmon were sampled for age and sex composition and mean length estimates. No adipose

finclipped fish were observed. Seventy-three samples (16%) were rejected for scale regeneration. Age 2.1 was the dominant age class and accounted for 71% of the fish (Table 32). The sex ratio of coho salmon passed through the weir in 1996 was 43% females and 57% males (Table 32). The mean length of all sampled fish was 599 mm (Table 32).

Estimating the hatchery contribution to the escapement through the Little Susitna River weir was not possible in 1996 because it was moved upstream of the hatchery fish release site. The proportional contribution of hatchery coho salmon to the total number of coho salmon observed during the 1996 Nancy Lake egg take was estimated to be 94.6%. A mark-recapture experiment to estimate the abundance of spawning coho salmon in Nancy Creek was not successful. An accurate estimate could not be produced due to a number of factors including: fish holding at the confluence of Nancy Creek and the Little Susitna River and not entering Nancy Lake as early as in previous years, the extended length of time between the first and last egg takes allowed marked coho salmon to die off before recapture, difficulties in catching fish, and not marking enough fish for the experiment.

During the 1995 season the Central and Northern District harvests of the Cook Inlet commercial fishery were sampled to estimate the contribution of hatchery fish (Cyr et al. 1997). Approximately 102,000 coho salmon were examined from the commercial harvests for a missing adipose fin (indicating the fish had been marked at a hatchery). The contribution of Little Susitna River hatchery stocks to the 1995 commercial harvests was estimated to be 5,800 fish. The estimated contribution of Little Susitna River-released hatchery coho salmon to the 1996 Cook Inlet commercial fisheries is pending analysis of 1996 tag returns.

### **Management Objectives**

Prior to November 1996 management objectives for the Little Susitna River were: (1) to provide 7,500 naturally spawning coho salmon upstream of the George Parks Highway; (2) to ensure that the historical age and sex composition of naturally spawning fish, and the run timing of the natural stock were not altered by supplemental coho salmon production; (3) to supplement the natural stock of coho salmon with hatchery coho salmon; and (4) to provide coho salmon fishing opportunity from the George Parks Highway downstream to tidewater without emergency restrictions (ADF&G Unpublished). With the elimination of the release of hatchery fish in 1996 objectives number two and three are no longer relevant.

### **Recent Board of Fisheries Actions**

During the November 1996 Board of Fisheries meeting the Little Susitna River Coho Salmon Management Plan was amended. The amendment eliminated increasing the bag and possession limit from three to five fish when the spawning escapement upstream of the Parks Highway bridge was projected to exceed 7,500 nonhatchery fish. With the moving of the weir from RM 32 to RM 71 coho salmon escapement information does not become available until primary participation in the fishery has ended.

### **Current Issues**

There are four primary issues associated with Little Susitna River fisheries: (1) management of the area under the Recreation Rivers Act, (2) South Big Lake Road extension to the Little Susitna

**Table 32.-Sex and age composition and length-at-age of coho salmon sampled from the Little Susitna River weir, 1996.**

<u>Age</u>	1.1	2.1	Total
<u>Male</u>			
Percent	18.1	38.9	57.0
SE	2.0	2.5	2.5
Mean Length (mm)	597	605	603
SE	4.6	2.7	2.4
Sample Size	70	150	220
<u>Female</u>			
Percent	10.9	32.1	43.0
SE	1.6	2.4	2.5
Mean Length (mm)	588	596	594
SE	4.8	2.4	2.2
Sample Size	42	124	166
<u>Combined</u>			
Percent	29.0	71.0	100
SE	2.3	2.3	3.0
Mean Length (mm)	594	601	599
SE	3.4	1.9	1.7
Sample Size	112	274	386
Total Percent Male (SE)		57.0 (2.5)	
Total Percent Female (SE)		43.0 (2.5)	
Total Sample Size	386		

River and the associated campground (Whitmore et al. 1993), (3) damage to riparian vegetation and accelerated stream bank erosion in areas heavily used by the public, and (4) weir location was changed from river mile 32 to 1 mile upstream of the George Parks highway (river mile 71). A description of the Recreation Rivers Act and an explanation of the South Big Lake extension to the Little Susitna are described in Whitmore et al. 1993 and Whitmore et al. 1996.

During 1996, a survey was conducted regarding angler impacts to riparian habitat on the Little Susitna River from the mouth upstream to the Parks Highway (Bartlett 1996). Findings from this survey indicated that 3% of the total 139 miles of river bank within the study area showed signs of impact. There are no plans to conduct evaluations of angler impact during the 1997 season.

In August of 1995 a decision was made to move the weir upstream of the George Parks Highway starting in 1996 to census adult coho salmon. This decision was in response to the termination of the coho salmon stocking program in the Little Susitna River. Without the stocking program the need for the weir at the lower site was reduced. The Houston City Council advocated moving the weir, as many residents of Houston felt the weir has significantly delayed salmon run timing. Elimination of the hatchery program was in recognition that stocking has not resulted in a significant increase in angler participation. Stocking coho salmon at another site would result in better use of the stocking effort. At other sites in Northern Cook Inlet where similar levels of stocking have been implemented angler participation has increased over 15,000 angler days annually.

### **Ongoing and Recommended Research and Management Activities**

In 1996 the Little Susitna River coho salmon program consisted of creel inspections and coded wire tag recoveries from the sport harvest of boat anglers exiting the fishery through the Little Susitna River Public Use Facility boat launch. Coded wire tag recoveries were also conducted during the Nancy Lake egg take. Coho salmon were enumerated and subsampled for age, length and sex compositions at the Little Susitna River counting weir. The 1996 harvest of coho salmon from the Little Susitna River will be available from the SWHS in 1997.

In 1997 inspection of the sport harvest for hatchery fish will cease as hatchery coho salmon will no longer be stocked in Nancy Lake. The counting weir was moved upstream of the George Parks Highway to census the daily passage of coho salmon. Collection of information to estimate run timing and the age, size and sex composition of the escapement will be included in the 1997 program.

With the end of enhancement, additional protection of natural-spawning stock may be warranted. Current regulation requires a prohibition of bait between July 15 and August 6 to reduce the hook-and-release mortality and preserve the run timing of early-arriving nonhatchery stock. Bait is allowed after August 5, but in the absence of hatchery coho salmon, additional management action may be required to effectively reduce the magnitude of hook-and-release mortality to help provide more fish for spawning and harvest.

Although this fishery has been relatively stable for the past several years, future management planning must recognize that increased angling participation may occur. Inriver returns and the escapement goal of spawning stock should be maximized, in part, through the enforcement of fishery regulations designed to reduce harvest efficiency during critical periods, and through habitat actions focusing on river bank restoration and protection.

The contribution of hatchery released Little Susitna River coho salmon to the commercial fishery has been evaluated. Currently we assume that the commercial harvest rate of wild Little Susitna coho salmon is similar. A study should be conducted to verify this assumption.

Providing angler access to the fishery resources is an important component of the Little Susitna River fisheries management program. Several programs related to site maintenance, acquisition and development are discussed in the Knik Arm Management Unit chinook salmon section of this report. The location, type, and number of public recreational facilities, such as campgrounds, launches, and trails, that are ultimately constructed along the river should become a component in the long-term planning to provide diverse fishing opportunities

## **Knik Arm Management Unit: Other Coho Salmon Fisheries**

### **Background and Historical Perspective**

In addition to the Little Susitna River, the Knik Arm Management Unit (Figure 18) supports five significant recreational coho salmon fisheries, the area's only personal use dip net fishery, and two educational permit fisheries. Fish Creek, Cottonwood Creek, and Wasilla Creek are restricted primarily to intertidal fisheries that provide weekend-only salmon fishing. Weekend-only fishing has been mandatory on these streams since 1971 because harvestable stock surpluses cannot normally accommodate continuous daily exploitation. Motor boats are not permitted on Wasilla Creek during weekends from July 15 through August 15.

The Eklutna Hydroelectric Power Plant Tailrace (Figure 19) is a recreational fishery that is largely supported by coho salmon returning to the Cook Inlet Aquaculture Association's (CIAA) hatchery located at the head of the tailrace. The nonprofit Eklutna hatchery began operation in 1982. Current production goals are 9 million sockeye salmon eggs of Big Lake brood and 100,000 coho salmon eggs taken from returning Eklutna stock (CIAA 1996). Coho salmon are released into the tailrace as smolt. A fish ladder links the hatchery with the tailrace which in turn drains into the Knik River.

The Eklutna sport fishery is confined to the one-half-mile long tailrace. Coho, chum, and a few sockeye salmon are harvested by sport anglers within the tailrace. All but the terminal 100 yards of the tailrace are subject to preferential harvest rights by the Aquaculture Association. Salmon of Knik River, and recently of Matanuska River, drainage origin are also harvested at the confluence of the tailrace and the Knik River.

Jim Creek, excluding the Little Susitna River, is traditionally the largest Knik Arm recreational fishery in terms of both participation and coho salmon harvest. This stream enters the glacial Knik River about 10 river miles from salt water. The entire Jim Creek drainage is open to coho salmon fishing throughout the year. The greatest fishing effort occurs at the confluence in an area locally known as the Jim Creek Flats. Fishing effort and harvest rates at the confluence are sharply influenced by the Knik River discharge. Jim Creek Flats is very difficult to fish during periods of high Knik River discharge because the entire area becomes inundated by glacial waters. Upstream reaches of Jim Creek can be accessed by power and nonpower boats.

Coho salmon return to the Knik Arm fisheries from late-July through August. Spawning occurs from late September through mid-October. The average weight of Knik Arm coho salmon, excluding those of Little Susitna River origin, is less than 6 pounds. Bag and possession limits for all Knik Arm fisheries are three coho salmon 16 inches or more in length. The collective

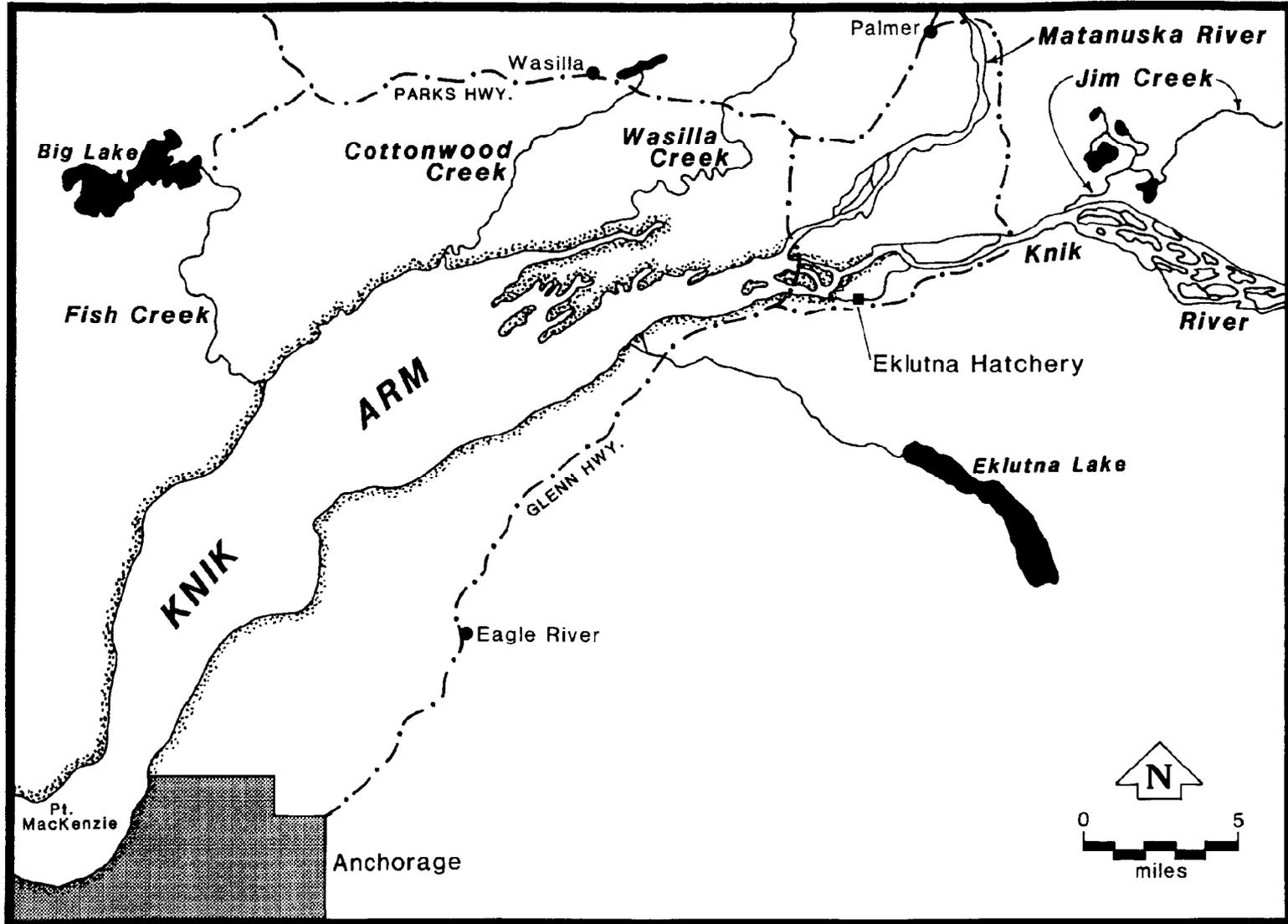


Figure 18.-Map of the Knik Arm drainage.

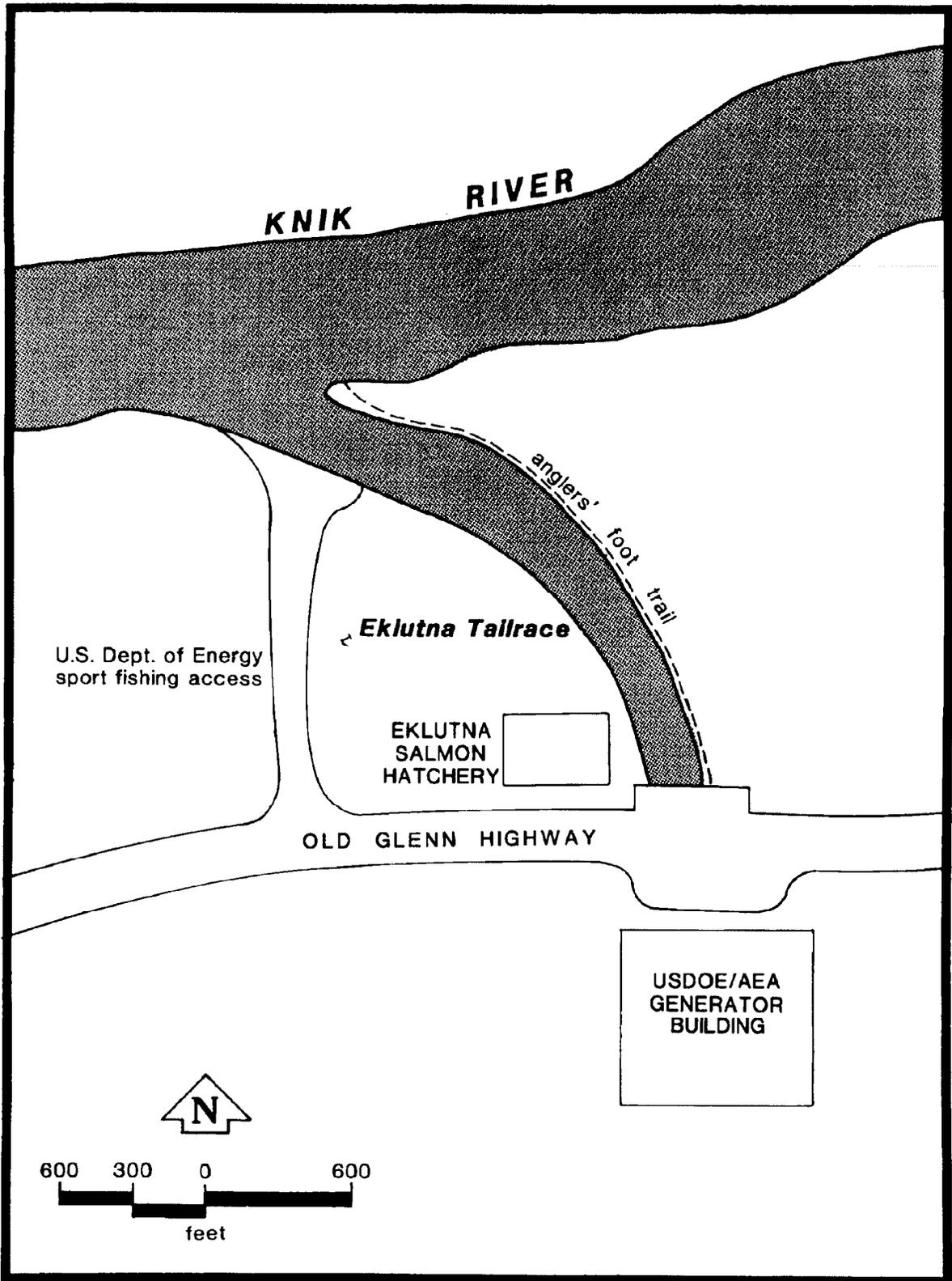


Figure 19.-Map of the Eklutna hatchery and Eklutna powerplant tailrace.

annual harvest for these five fisheries averaged 7,329 coho salmon during the period 1990 through 1994 (Mills 1991-1994, Howe et al. 1995) (Table 33, Appendix A12). Jim Creek averaged 3,867 coho salmon during this period whereas the three weekend-only fisheries each averaged from 529 to 1,439 fish annually.

Coho salmon have been stocked into the majority of the Knik Management Unit systems (Table 34). Stocking of Fish and Cottonwood creeks was initiated during the late 1970s, Eklutna Tailrace in 1983 and Jim and Wasilla creeks in the late 1980s. This stocking effort was made up of a combination of fingerling and smolt releases. All releases from the Big Lake Hatchery to these systems were terminated after the 1991 release as a result of the Big Lake Hatchery closure. Cook Inlet Aquaculture Association has operated the Eklutna Hatchery since 1981 and has released coho salmon to the Eklutna Tailrace. Contribution of hatchery fish to the catch and harvest in these recreational fisheries was not evaluated. In 1996 coho salmon smolt of Little Susitna River origin from Elmendorf Hatchery were released in Wasilla Creek.

Knik Arm coho salmon are harvested commercially in the Central and Northern Districts of Cook Inlet (Appendices B1-B7 and B9). The stocks are also harvested within Knik Arm by a special set gillnet fishery that operates near the mouth of Fish Creek. The Knik Arm commercial gillnet fishery has been conducted annually since 1987. Coho salmon harvests from this fishery have ranged from 809 to 11,604 and averaged 3,434 coho salmon annually during the period 1987 through 1996 (Table 35). The Knik Arm commercial set net fishery is discussed further in the Fish Creek Sockeye Salmon Fishery section of this report.

### **Recent Fishery Performance**

The 1995 recreational harvest for Knik Arm streams was 5,759, down 45% from the 1994 harvest and 21% below the 1990 through 1994 average (Table 33). The angler days of participation from these fisheries during 1995 was up slightly from 1994 and 27% above the 22,569 average for the 1990-1994 period.

The total indexed spawning escapement to Knik Arm streams in 1996 was 1,850 fish, considerably below the 1990-1994 average of 4,393 (Table 30).

The Knik Arm commercial set net fishery was executed under the Fish Creek Sockeye Salmon Management Plan during the 1996 season. The coho salmon harvest was 1,820 fish; which was slightly below the 1995 harvest and only 53% of the 1987 to 1995 average of 3,434 fish (Table 35).

### **Management Objectives**

Biological escapement goals have been established for Fish, Wasilla, Cottonwood, and Jim creeks (Table 36). These escapement goals are based on historic escapement index counts. The management objective for these three systems is to achieve the escapement goal while providing a maximum level of sustained coho salmon fishing opportunity.

### **Recent Board of Fisheries Actions**

The BOF discussed the Knik Arm coho salmon fisheries extensively during the November 1996 meeting. No regulations were changed regarding these fisheries. However, the BOF expressed concern regarding the low returns to those systems with established escapement goals. The next BOF meeting is scheduled for 1998.

**Table 33.-Fishing effort and coho salmon harvest from Knik Arm fisheries, 1977-1995.**

Year	<u>Wasilla Creek</u>		<u>Cottonwood Creek</u>		<u>Fish Creek</u>		<u>Eklutna Tailrace</u>		<u>Jim Creek<sup>b</sup></u>		<u>Total</u>	
	Harvest	Angler-days <sup>a</sup>	Harvest	Angler-days <sup>a</sup>	Harvest	Angler-days <sup>a</sup>	Harvest	Angler-days <sup>a</sup>	Harvest	Angler-days <sup>a</sup>	Harvest	Angler-days <sup>a</sup>
1977	472	2,805									472	2,805
1978	2,112	3,446									2,112	3,446
1979	1,211	4,024	1,198	5,345							2,409	3,446
1980	3,555	5,726	3,375	9,268							6,930	14,994
1981	814	4,019	1,373	8,663					1,801	4,904	3,988	17,586
1982	1,624	6,261	1,886	5,186					2,306	6,653	5,816	18,100
1983	345	3,239	518	5,944					774	9,183	1,637	18,366
1984	1,920	3,547	1,895	7,144			561	3,413	3,429	9,369	7,805	23,473
1985	1,900	3,115	1,005	4,560	284	903	557	2,995	2,523	8,970	6,269	20,545
1986	944	3,387	690	5,653	364	2,641	502	8,549	2,948	13,015	5,448	33,245
1987	1,195	2,173	1,159	2,934	833	2,898	2,318	11,663	3,676	6,990	9,181	26,658
1988	1,273	2,228	746	4,056	1,637	3,110	3,329	13,188	11,078	23,229	18,063	45,811
1989	975	2,406	876	3,069	784	3,314	1,666	10,342	4,220	11,141	8,521	30,272
1990	1,012	2,679	286	3,056	398	3,936	1,012	7,618	6,184	17,878	8,892	35,167
1991	844	2,893	176	1,623	486	3,693	631	5,892	2,920	13,736	5,087	27,837
1992	413	1,110	348	1,974	526	3,638	664	4,279	3,409	8,856	5,360	19,857
1993	1,133	1,774	736	3,077	741	2,341	1,337	4,523	2,878	6,824	6,825	18,539
1994	1,390	2,226	1,100	3,230	492	2,358	3,553	8,974	3,946	9,658	10,481	26,446
1995	445	1,373	340	2,598	435	2,256	990	11,453	3,549	10,893	5,759	28,573

<sup>a</sup> In some cases, participation includes effort directed at species other than coho salmon.

<sup>b</sup> Knik River and tributaries including Jim Creek.

**Table 34.-Summary of coho salmon stocked in Cottonwood, Wasilla, Jim, and Fish creeks and the Eklutna tailrace, 1977-1996.**

Brood Year	Brood Stock	Release		Average Size (g)	Number Released	Number Marked
		Year	Drainage			
<b>Big Lake Hatchery</b>						
1977	Big Lake	1978	Cottonwood Creek	0.80	317,694	32,064
1978	Big Lake	1979	Cottonwood Creek	0.54	246,762	19,992
1979	Big Lake	1980	Cottonwood Creek	0.63	154,991	15,000
1979	Big Lake	1980	Cottonwood Creek	0.49	155,004	15,000
1980	Big Lake	1981	Cottonwood Creek	0.59	299,742	30,528
1981	Big Lake	1982	Cottonwood Creek	0.45	364,911	89,389
1982	Cottonwood Lk & Big Lake	1983	Cottonwood Creek	0.45	368,022	23,465
1983	Cottonwood Lk Big Lake	1984	Cottonwood Creek	0.91	372,318	10,373
1984	Cottonwood Lk & Big Lake	1985	Cottonwood Creek	0.30	317,000	10,000
1985	Big Lake	1986	Cottonwood Creek	0.85	315,881	13,092
1986	Big Lake	1987	Cottonwood Creek	1.4	315,916	15,600
1987	Big Lake	1988	Cottonwood Creek	1.1	597,000	0
1987	Big Lake	1989	Cottonwood Creek	16.4	16,900	0
1989	Big Lake	1990	Cottonwood Creek	1.1	202,000	0
1989	Big Lake	1991	Cottonwood Creek	25.3	72,000	0
1990	Big Lake	1992	Cottonwood Creek	11.0	53,900	35,341
1991	Big Lake	1993	Cottonwood Creek	12.1	74,198	40,875
1986	Big Lake	1988	Wasilla Creek	17.0	12,850	0
1987	Big Lake	1989	Wasilla Creek	15.7	21,600	0
1989	Big Lake	1990	Wasilla Creek	1.1	152,000	0
1989	Big Lake	1991	Wasilla Creek	25.0	69,500	0
1990	Big Lake	1992	Wasilla Creek	10.9	76,315	44,148
1991	Big Lake	1993	Wasilla Creek	11.4	77,174	41,711
1986	Big Lake	1988	Jim Creek	17.0	7,550	0
1987	Big Lake	1989	Jim Creek	16.4	20,100	0
1989	Big Lake	1990	Jim Creek	1.1	163,000	0
1976	Big Lake	1977	Fish Creek	0.28	40,673	0
1977	Big Lake	1978	Fish Creek	0.70	101,081	40,959
1978	Big Lake	1979	Fish Creek	0.49	383,295	30,218
1979	Big Lake	1980	Fish Creek	0.58	450,827	22,337
1980	Big Lake	1981	Fish Creek	0.64	118,071	13,072
1981	Big Lake	1982	Fish Creek	0.45	596,975	23,735
1982	Big Lake	1983	Fish Creek	0.45	1,379,179	24,329
1983	Big Lake	1984	Fish Creek	0.76	987,166	11,166
1984	Big Lake	1985	Fish Creek	0.30	1,641,600	10,000
1985	Big Lake	1986	Fish Creek	1.0	2,354,725	13,497
1986	Big Lake	1987	Fish Creek	1.2	1,906,945	15,632
1986	Big Lake	1987	Fish Creek	7.8	445,310	20,010
1986	Big Lake	1988	Fish Creek	17.0	20,400	20,400
1987	Big Lake	1988	Fish Creek	1.2	1,562,850	14,050
1987	Big Lake	1988	Fish Creek	7.6	366,226	21,384
1987	Big Lake	1989	Fish Creek	15.7	10,644	9,644

-continued-

**Table 34.-Page 2 of 2.**

Brood Year	Brood Stock	Release		Average Size (g)	Number Released	Number Marked
		Year	Drainage			
1988	Big Lake	1990	Fish Creek	19.0	21,671	5,671
1989	Big Lake	1990	Fish Creek	1.2	504,077	20,077
1989	Big Lake	1991	Fish Creek	25.3	82,988	9,488
1990	Big Lake	1992	Fish Creek	10.9	74,953	45,538
1991	Big Lake	1993	Fish Creek	10.8	67,934	43,257
<u>Eklutna Hatchery</u>						
1981	Cottonwood Lk & Big Lake	1983	Tailrace	15.4	633 <sup>a</sup>	452
1982	Cottonwood Lk & Big Lake	1984	Cottonwood Creek	18.7	16,244	15,757
1982	Cottonwood Lk & Big Lake	1984	Tailrace	18.7	28,150 <sup>a</sup>	27,306
1984	Cottonwood Lk & Big Lake	1986	Tailrace	22.0	101,326	101,326
1985	Eklutna	1987	Tailrace	25.0	147,715	14,772
1986	Eklutna	1988	Tailrace	16.0	72,881	7,300
1987	Eklutna	1988	Jim Creek	1.4	68,000	0
1987	Eklutna	1989	Tailrace	19.0	50,787	2,052
1988	Eklutna	1990	Tailrace	21.6	54,278	2,916
1989	Eklutna	1991	Tailrace	22.0	21,285	1,381
1990	Eklutna	1992	Tailrace	16.7	131,829	0
1991	Eklutna	1993	Tailrace	15.9	108,000	0
1992	Eklutna	1994	Tailrace	11.5	62,400	0
1993	Eklutna	1995	Tailrace	16.9	69,867	0
1994	Eklutna	1996	Tailrace	14.5	69,176	0
<u>Elmendorf Hatchery</u>						
1994	Little Susitna R.	1996	Wasilla Creek	20.9	145,923	46,839

<sup>a</sup> Some fingerlings escaped into tailrace due to vandalism.

**Table 35.-Harvest of coho salmon in the Knik Arm commercial set net fishery, 1987 through 1996.**

Year	Coho Salmon	Dates
1987	2,043	Jul 27 - Jul 29
1988	11,604	Jul 23 - Jul 29
1989	6,075	Jul 24 - Jul 29
1990	5,708	Jul 27 - Jul 29
1991	1,630	Jul 21 - Jul 23
1992	1,817	Jul 19 - Jul 26
1993	831	Jul 18 - Jul 25
1994	809	Jul 19 - Jul 24
1995	1,999	Jul 16 - Jul 25
1996	1,820	Jul 16 - Jul 23
Mean	3,434	Range Jul 16 - Jul 29

**Table 36.-Coho salmon biological escapement goals (BEG) for Knik Arm Management Unit streams.**

Stream	BEG <sup>a</sup>
Cottonwood Creek	300
Wasilla Creek	300
Fish Creek	2,700
Jim Creek drainage	1,000

<sup>a</sup> Biological escapement goal.

### **Current Issues**

Of major concern to fishery managers is the failure of Cottonwood, Wasilla and Jim creeks to meet their biological escapement goals again in 1996 (Tables 30 and 36). This, coupled with the recent decrease in harvest and increase in effort on Knik Arm streams, indicates a stock conservation problem.

Urbanization is also a concern with Knik Arm stocks. Spawning streams which support fisheries in the Knik Arm Management Unit, excluding the Little Susitna River, are small in size and have easy public access. Several of the streams flow through residential areas. Habitat degradation to these streams and spawning areas due to urbanization is evident. Additionally, available information and enforcement action suggests that a substantial amount of salmon poaching occurs in these drainages. Considering long-term declining trends in abundance of stocks, the need to address these fishing infractions and habitat violations continues.

In consideration of the history of poor returns to Wasilla Creek it has been determined that further stocking may be detrimental to wild stock Wasilla Creek coho salmon. If fishing harvest and effort levels increase to maximize harvest of hatchery fish, wild stock coho salmon may be overharvested.

### **Ongoing Research and Management**

Annual harvest and effort information pertaining to these fisheries is obtained from the SWHS. Spawning escapement has been assessed by means of a weir on Fish Creek through August 15, primarily for management of commercial and personal use sockeye salmon fisheries. Plans are being made to operate the Fish Creek weir through September 1997 to evaluate the coho salmon return. Ground surveys have been conducted annually within established index areas in Wasilla, Cottonwood and Jim creeks. In addition to conducting spawning ground surveys during 1997, a weir will be operated on Wasilla Creek to evaluate the total return of coho salmon to this system. We will determine if enhanced fish, released in 1996, travel upstream to spawning areas above

the release site. The recreational harvest of Wasilla Creek coho salmon will also be evaluated to determine the contribution of hatchery fish to the harvest. Regardless of the number of fish returning to Wasilla Creek during the 1997 season, the fishery will not be liberalized as there is concern that the wild stock biological escapement goal may not be achieved.

### **Recommended Research and Management Activities**

The indexing of coho salmon in Knik Arm streams should continue. Weirs should be maintained on Wasilla Creek and Fish Creek to evaluate total returns of coho salmon. The contribution of hatchery fish to the Wasilla Creek escapement and recreational fishery should be evaluated.

Stocking of coho salmon to Wasilla Creek will be terminated. An alternate site such as the Eklutna Tailrace should be selected for future stocking to provide anglers additional coho salmon fishing opportunity.

Several fishery access projects should be implemented in the Knik Management Unit (Table 22). The Eklutna tailrace fishery site should be enhanced in consideration of increasing the number of coho salmon stocked at this site. Vehicle parking should be expanded, a vault toilet should be constructed, and stream bank stabilization should be designed. Land (Cope Property) should be acquired adjacent to Rabbit Slough on Wasilla Creek to provide better access to the Wasilla Creek coho salmon fishery. Additionally a Knik River boat launch should be constructed to provide boating access to Knik River tributary streams. Purchase of the Cope Property and development of the Knik River boat launch should be conducted in conjunction with the Wildlife Conservation Division of the Department of Fish and Game. In addition to providing better fishery access, development of these two sites will greatly enhance hunting and wildlife viewing opportunity.

### **Eastside Susitna, Westside Susitna, and West Cook Inlet Management Units Coho Salmon Fisheries**

#### **Fishery Description and Historical Perspective**

Coho salmon harvests in these three management units averaged 41,012 fish during 1990 through 1994 (Mills 1991-1994; Howe et al. 1995) (Table 28). The Susitna River drainage supports the largest coho salmon stock within the NCIMA and the contribution of the harvest from the Eastside Susitna and Westside Susitna Management Units has been approximately 57% of the total NCIMA coho salmon harvest during this time period. The West Cook Inlet Management Unit contribution to the total NCIMA has been approximately 3% during this time period.

A description of these management units, including access to these areas, is presented in the chinook salmon section of this report. Coho salmon returning to these units are early-run stocks which begin to enter these drainages about mid-July. The migration into the Yentna River drainage (Susitna River mile 28, Westside Susitna Management Unit) normally peaks the last week in July, whereas the peak passage into the Talkeetna River (Susitna River mile 99, Eastside Susitna Management Unit) takes place 7 to 10 days later. Few coho salmon enter the Susitna River after early September. Most spawning occurs between mid-September and mid-October. Little information is available regarding West Cook Inlet Management Unit coho salmon run timing, however it is assumed to be similar to that of the Susitna River.

Total coho salmon abundance in the Susitna River drainage has not been estimated. Abundance in portions of this vast drainage has been measured by sonar, fish wheels, weir, and mark-and-recapture methods. During the period 1981 through 1983, coho salmon abundance was estimated

to average 47,000 fish in the Susitna River excluding all systems below river mile 80 (Table 37). It is important to recognize that significant coho salmon returns occur in tributaries that enter the Susitna River downstream from river mile 80. Coho salmon abundance in such systems as the Deshka River, Alexander Creek, and Willow Creek, as well as many other important coho salmon sport fisheries, was not measured during the 1981-1983 studies.

Coho salmon abundance in the Yentna River has been estimated by side-scan sonar and fish wheels since 1981. Estimates made during 1981-1984 encompassed the entire coho salmon migration. Yentna River sonar enumeration of coho salmon entering the Yentna River drainage ranged from 6,279 to 74,346 fish during 1981 to 1996 (Table 37). From 1985 to 1996 the sonar program was terminated prior to the end of the coho salmon return. The number of coho salmon passing river mile 80 on the Susitna River exceeded the number of coho salmon entering the Yentna River each year during the period 1981 to 1983. Side-scan sonar to enumerate salmon, and fish wheels to apportion sonar counts by species, may not be adequate tools to estimate abundance of coho salmon. Coho salmon only make up a small portion of the fish wheel catch. Any error in species apportionment of the sonar count using the fish wheel catch may result in a large error in the coho salmon estimate. Additionally, coho salmon may be distributed across the entire river while the sonar only counts fish swimming along river banks.

Very little information is available regarding coho salmon spawning abundance in the West Cook Inlet Management Unit. No coho salmon escapement information has been collected by the department during recent years in this management unit.

The Deshka River, Alexander Creek and Lake Creek are the major Westside Susitna Management Unit coho salmon fisheries. Coho salmon harvest from these three streams averaged 11,379 fish during the period of 1990 to 1994. This harvest accounted for 70% of the Westside Susitna Management Unit coho salmon harvest (Appendix A16).

Coho salmon were counted through a weir at approximately river mile 17 on the Deshka River during 1995. The entire run was not counted because an unknown number of fish spawn in the Deshka River and several tributaries downstream of river mile 17. Water conditions did not permit indexing fish below the weir when the weir was removed on September 4, 1995. A total of 12,824 coho salmon were counted. During 1996 the weir was operational only through July 30 after which high water made counting fish impossible. At that time only 2,544 coho had passed through the weir.

All the Eastside Susitna Management Unit tributaries provide fishing opportunities for coho salmon. During recent years Willow, Montana, and Caswell creeks and the Talkeetna River have produced the largest coho salmon harvests in this management unit, averaging 15,275 fish during 1990 through 1994 and accounting for 68% of the Eastside Susitna harvest (Appendix A14).

**Table 37.-Eastside and westside Susitna River drainage coho salmon escapement index counts, 1981-1996.**

Year	Westside Susitna River Drainage			Eastside Susitna River Drainage <sup>a</sup>				Susitna River <sup>b</sup>	Grand Total
	Yentna River <sup>c</sup>	Rabideux Ck.	Total	Birch Ck.	Question Ck.	Answer Ck.	Total		
1981	17,017	ns <sup>d</sup>	17,017	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	37,000	54,017
1982	34,089	ns <sup>d</sup>	34,089	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	80,000	114,089
1983	8,867	ns <sup>d</sup>	8,867	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	ns <sup>d</sup>	24,000	32,867
1984	16,007	480	16,487	236	60	57	353	ns <sup>d</sup>	16,840
1985	9,181	82	9,263	30	89	9	128	ns <sup>d</sup>	9,391
1986	23,457	ns <sup>d</sup>	23,457	25	ns <sup>d</sup>	ns <sup>d</sup>	25	ns <sup>d</sup>	23,482
1987	6,279	50 <sup>e</sup>	6,329	46	149	10	205	ns <sup>d</sup>	6,534
1988	12,173	230	12,403	63	337	160	560	ns <sup>d</sup>	12,963
1989	25,695	20	25,715	180	31	66	277	ns <sup>d</sup>	25,992
1990	21,346	20	21,366	36	41	6	83	ns <sup>d</sup>	21,449
1991	57,275	185	57,460	300	492	51	843	ns <sup>d</sup>	58,303
1992	29,073	ns <sup>d</sup>	29,073	167	227	181	575	ns <sup>d</sup>	29,648
1993	37,752	ns <sup>d</sup>	37,752	178	370	34	582	ns <sup>d</sup>	38,344
1994	25,173	105	25,278	224	339	0 <sup>f</sup>	563	ns <sup>d</sup>	25,841
1995	74,346	39	74,385	127	155	35	317	ns <sup>d</sup>	74,702
1996	34,464	ns <sup>d</sup>	34,464	458	238	43	739	ns <sup>d</sup>	35,203

<sup>a</sup> Survey conducted by walking portions of the creek.

<sup>b</sup> Sonar counts upstream of river mile 80.

<sup>c</sup> Sonar counts, dates of assessment vary, estimates for 1981-1984 encompass the entire coho salmon migration.

<sup>d</sup> No survey conducted.

<sup>e</sup> Poor survey conditions.

<sup>f</sup> Beaver dam downstream of index area blocking passage of fish.

In the West Cook Inlet Management Unit the Chuitna River is the primary producer of coho salmon. The average harvest in this stream between 1990 and 1994 was estimated at 1,265 fish which accounts for approximately 54% of the harvest within this management unit (Appendix A18).

Coho salmon sport fishing is permitted throughout the year at most sites. However, portions of several Eastside Susitna Management Unit fisheries are closed to salmon fishing to protect spawning fish. Closures usually include upper reaches of tributaries that are road accessible.

Major tributaries or portions of tributaries within the Susitna River drainage are restricted to unbaited, single-hook artificial lures throughout the year. These regulations are implemented as part of special management regulations for rainbow trout under the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy. Under this policy, only unbaited artificial lures may be used from September 1 through May 15 in all flowing waters of the Susitna River drainage. Additionally, bait is prohibited from May 15 through July 13 in waters open to chinook salmon fishing. Exceptions have been made for fishing for burbot when legal burbot fishing gear is utilized.

In the Eastside Susitna Management Unit, the bag and possession limits for coho salmon are three salmon 16 inches or more in length. In the Westside Susitna and West Cook Inlet Management units the bag and possession limits are three coho salmon daily and six in possession.

Susitna River coho salmon are harvested in commercial fisheries located in the Northern and Central Districts of Cook Inlet. In the Northern District, commercial fishing is not permitted within 500 yards of the terminus of the Susitna River and several of the West Cook Inlet Management Unit streams. Commercial fishing is not permitted within 1 statute mile of the terminus of several other West Cook Inlet Management Unit streams including Threemile Creek, Chuitna River, Nikolai Creek and the McArthur River. Significant numbers of Susitna River and West Cook Inlet drainage coho salmon are harvested in the mixed-stock drift net fisheries which occur in the Central District during July and early August.

### **Recent Fishery Performance**

The 1995 recreational coho salmon harvest from the Eastside Susitna, Westside Susitna and West Cook Inlet units was estimated at 38,983 fish (Table 28). The 1995 harvest was slightly below the 1990-1994 mean of 41,013. The largest harvest on record was 52,219 fish in 1992. This harvest represented about 65% of the total coho salmon harvested from the NCIMA. Of these three units, the Eastside Unit had the largest harvest of coho salmon in 1995.

Sonar enumeration of coho salmon at river mile 4 of the Yentna River estimated a return of 34,464 coho salmon to the Yentna River drainage in 1996 (Table 37). The operation of the sonar counters ceased on August 10. This date coincides with the closing dates of the past 10 years of operation and does not represent the entire run.

### **Recent Board of Fisheries Actions**

The Board of Fisheries has taken no specific actions with respect to Susitna River coho salmon sport fisheries during recent years. The next BOF meeting is scheduled for 1998.

### **Current Issues**

Allocation of coho salmon between commercial and recreational fisheries remains an issue of controversy.

The popularity of these fisheries has increased in previous years and managers lack of information regarding stock status makes management decisions difficult.

Issues relating to large scale timber development, recreational river management, and road and boat launch construction are of importance in developing future use and management strategies for coho salmon in these management units.

### **Ongoing Research and Management**

Sonar and fish wheel enumeration of Yentna River coho salmon is performed by the Division of Commercial Fisheries. This enumeration project is directed primarily toward sockeye salmon and is generally ended prior to the end of the coho salmon run.

Coho salmon were counted through a weir at river mile 17 on the Deshka River in 1996. However, due to water conditions during the 1996 season it was not possible to achieve a total season count.

In the Eastside and Westside Susitna Management Units four small Susitna River tributaries continue to be included in the annual coho salmon escapement indices (Table 37). These are Question Creek, Answer Creek, Birch Creek and Rabideux Creek. These coho salmon spawning streams enter the Susitna River drainage between river mile 80 and 85. They are indexed because of their accessibility from the road system. The escapement to these small streams is small and fish are often blocked from reaching the index area by beaver dams. It is often unknown if an absence, or very low numbers, of spawning fish in these streams is due to a downstream blockage or is a reflection of abundance trends in the Susitna River drainage.

The Susitna River coho salmon sport harvest and catch is estimated annually by the SWHS. Effort is not estimated specific to a species but across all species for a specific drainage or group of drainages.

### **Recommended Research and Management Activities**

Methods should be established to estimate returns of spawning coho salmon to the Susitna River and West Cook Inlet. Coho salmon stocks of concern are road-accessible Eastside Susitna Management Unit streams including Willow, Sheep, Montana, and Birch creeks and the Kashwitna River. Harvests since 1988 have been considerably higher than previous years (Appendix A14).

The weir which was operated on the Deshka River during 1995 and 1996 will be operated in 1997 at RM 7 instead of RM 17. This area offers a more stable site for the weir and should allow successful operation during high water conditions. Sport harvest estimates of coho salmon on the Deshka River will be subsequently taken from the 1996 SWHS.

Currently we believe that wild coho salmon are exploited at the same rate as NCI hatchery released coho salmon. This assumption should be tested by implementing a wild coho salmon smolt marking program. Tag recoveries would be made in the Cook Inlet commercial and recreational fisheries.

We don't know if an absence, or low numbers, of spawning coho salmon indexed in small road-accessible Susitna River tributaries reflects instream problems such as blockage by beaver dams or overall low numbers returning to the Susitna River drainage. Because of this uncertainty, it is important that projects which give a more complete picture of coho salmon abundance in the Susitna River drainage, such as the Deshka River weir, be maintained to assist management of this important recreational species. Additionally, it should be determined if projects such as the Yentna River sonar operated by the Commercial Fisheries Management and Development (CFMD) Division, should be tuned to reliably estimate the escapement of coho salmon.

Access development, acquisition, and maintenance programs for these areas are discussed under the chinook salmon section of this report.

## **SUBSISTENCE AND EDUCATIONAL SALMON FISHERIES AND FISH CREEK PERSONAL USE FISHERY**

### **Background and Historical Perspective**

In 1978, the State of Alaska passed its first subsistence statute (AAC 16.05.258) which gave priority to subsistence uses of fish and game resources over other uses. Brannian and Fox (1996) provide a detailed history of subsistence and personal use salmon fishing in Upper Cook Inlet. Currently, the only area open to subsistence fishing in Upper Cook Inlet is the Tyonek Subdistrict on the west side of Cook Inlet in the Northern District. In addition, there is a personal use dip net fishery in Fish Creek and a personal use fish wheel fishery near the community of Skwentna in the Yentna River.

Fish Creek sockeye salmon have long been used in commercial and subsistence fisheries (Engel and Vincent-Lang 1992). A subsistence fishery was operational through 1970. In 1971 the Knik Arm subsistence fishery was closed because of declining sockeye salmon escapements into Fish Creek. It was reopened in 1984 and 1985 then closed again in 1986. The Fish Creek commercial set gillnet and personal use dip net fisheries along the northwest shore of Knik Arm were initiated by the Board of Fisheries in 1986 to use sockeye salmon surplus to spawning and egg take needs. These fisheries continue annually, contingent upon a projected escapement of 50,000 Fish Creek sockeye salmon. Closure of the commercial fishery after July 26 was mandatory to prevent an excessive interception of coho salmon. In 1989 the period these fisheries were open to harvest of sockeye salmon was modified to reduce conflict between the two user groups. On projection of a 50,000 sockeye salmon escapement to Fish Creek, the commercial fishery is allowed from July 15 through July 26. Fishing periods are Tuesdays and Sundays from 7:00 a.m. to 7:00 p.m. The dip net fishery was initially established to open July 30, but several changes have occurred in subsequent BOF meetings. Most recently the Fish Creek dip net fishery was modified under the Upper Cook Inlet Salmon Fisheries Management Plan and the current fishery is open from July 10-July 31.

The Upper Cook Inlet Subsistence Management Plan provided for a subsistence set gillnet fishery in Northern Cook Inlet waters in 1991, 1992 and 1994 (Table 19). Subsistence set gillnet fishing was allowed for a total of 17 days between May 21 and September 28. A subsistence set gillnet fishing day in Northern Cook Inlet was from 8:00 a.m. until 8:00 p.m. The threat of a court-ordered closure of this subsistence fishery for the 1995 season caused the BOF to take action to allow the fishery to proceed as a personal use fishery, with the exception of the Tyonek

subsistence fishery which has been allowed to continue. The gill net personal use fishery in marine waters in the Northern District of Upper Cook Inlet was eliminated in 1996 by BOF action (Table 19).

The escapement of sockeye salmon into the Fish Creek drainage has been documented since 1936 (Chlupach and Kyle 1990). Recorded escapement of these late-run sockeye salmon ranged from 2,700 fish in 1973 to 307,000 fish in 1940. Since 1968 the escapement of sockeye salmon has ranged from the 1973 low of 2,700 fish to a 1984 high of 192,400 fish (Table 38, Figure 20). Due to declining abundance during the early 1970s, enhancement of Fish Creek sockeye salmon was initiated in 1975. Hatchery fish are estimated to comprise more than 90% of most returns. The Big Lake state fish hatchery, which ceased operations in June 1993, supported the sockeye salmon enhancement program through 1992 using Fish Creek stock as brood (Table 39). Enhancement continued, using Fish Creek stock as brood and utilizing the Eklutna fish hatchery, a private hatchery operated by Cook Inlet Aquaculture Association located on the Knik River in the Eklutna powerplant tailrace.

The Board of Fisheries established the Skwentna Fish Wheel Personal Use fishery in March of 1996. The fishery occurs in the mainstem Yentna River from its confluence with Martin Creek upstream to its confluence with the Skwentna River. The season is from July 15 through July 31 and salmon, excluding chinook salmon, may be taken from 4:00 a.m. until 8:00 p.m. on Mondays, Wednesdays and Fridays.

The villages of Eklutna and Knik were granted educational permits annually, beginning in 1994, to fish set gillnet sites for salmon at one site near each village. A total of 1,000 salmon by each village is allowed. The fisheries run from June 1 to September 30.

### **Recent Fishery Performance**

In 1995 the Fish Creek personal use dip net fishery was restricted to the waters of Fish Creek. In 1995 fishing commenced at 5:00 a.m. July 26 and ended at 12 midnight on August 8. During this period the fishery was closed on July 28, August 1 and August 4 to allow for escapement into the creek upstream of the area open to dip netting. This action allowed for spawning escapement from all segments of the return. An estimated 9,102 sockeye salmon and 2,640 coho salmon (retention of coho salmon was allowed for the first time in this fishery in 1993) were harvested during the 1995 dip net season (Table 40).

The 1996 dip net fishery operated under a revised regulation scheme. In order to allow an opportunity for the fish to travel through the fishery, fishing was limited to the hours of 11:00 a.m. to 11:00 p.m. daily. A permit is now required and the season runs July 10-31 with a limit of 25 fish for the head of household plus 10 fish for each member of the household. These permits must be returned with the total catch recorded. The earlier closing date is to limit the number of coho harvested. Preliminary harvest estimates for the 1996 season indicate a harvest of 16,500 sockeye salmon (Table 40).

During the 1996 season, 63,164 sockeye salmon entered Fish Creek to spawn (Table 38). The weir on Fish Creek was operated from July 7 through August 14. The sockeye salmon escapement goal of 50,000 fish was attained on July 30. Run timing for Fish Creek sockeye salmon is such that the peak of the return occurs as coho salmon are starting to move into the drainage. Only 682 coho salmon had passed the weir before it was removed (Table 38).

**Table 38.-Fish Creek weir sockeye and coho salmon escapements, 1968-1996.**

Year	Coho <sup>a</sup>	Sockeye <sup>b</sup>	Dates of Operation
1968	2,088	19,616 <sup>c</sup>	1 Jul-31 Jul
1969	4,253	12,456	4 Jul-2 Sep
1970	1,048	25,000	19 Jul-8 Aug
1971	583	31,470	8 Jul-7 Aug
1972	716	6,981	24 Jul-10 Sep
1973	210	2,705	18 Jul-6 Sep
1974	1,154	16,225	8 Jul-6 Sep
1975	1,601	29,882	3 Jul-8 Sep
1976	765	14,032	5 Jul-10 Sep
1977	970	5,183	7 Jul-15 Aug
1978	3,184	3,555	7 Jul-30 Sep
1979	2,511	68,739 <sup>d</sup>	9 Jul-29 Aug
1980	8,924	62,828 <sup>d</sup>	4 Jul-1 Sep
1981	2,330	50,479 <sup>d</sup>	9 Jul-7 Sep
1982	5,201	28,164	12 Jul-8 Sep
1983	2,342	118,797 <sup>d</sup>	12 Jul-30 Aug
1984	4,510	192,352 <sup>d</sup>	1 Jul-19 Sep
1985	5,089	68,577 <sup>d</sup>	8 Jul-29 Aug
1986	2,166	29,800 <sup>d</sup>	14 Jul-26 Aug
1987	3,871	91,215 <sup>d</sup>	8 Jul-27 Aug
1988	2,162	71,603 <sup>d</sup>	7 Jul-9 Sep
1989	3,478	67,224 <sup>d</sup>	6 Jul-8 Sep
1990	2,673	48,717 <sup>d</sup>	5 Jul-14 Sep
1991	1,297	50,500 <sup>d</sup>	9 Jul-12 Sep
1992	1,705	72,108 <sup>d</sup>	10 Jul-10 Sep
1993	2,378	117,619 <sup>d</sup>	7 Jul-20 Aug
1994	350	100,638 <sup>d</sup>	8 Jul-15 Aug
1995	390	115,101 <sup>d</sup>	7 Jul-15 Aug
1996	682	63,164 <sup>d</sup>	9 Jul-15 Aug
Mean <sup>e</sup>		54,646	

<sup>a</sup> Measured by weir (1968 excepted). Years 1980-1993 include downstream foot surveys upon removing weir.

<sup>b</sup> Weir count.

<sup>c</sup> A counting screen was used instead of a weir.

<sup>d</sup> Hatchery sockeye salmon contributed to the escapement.

<sup>e</sup> The mean coho salmon escapement is not estimated because in many years of record the weir was removed before the run was complete.

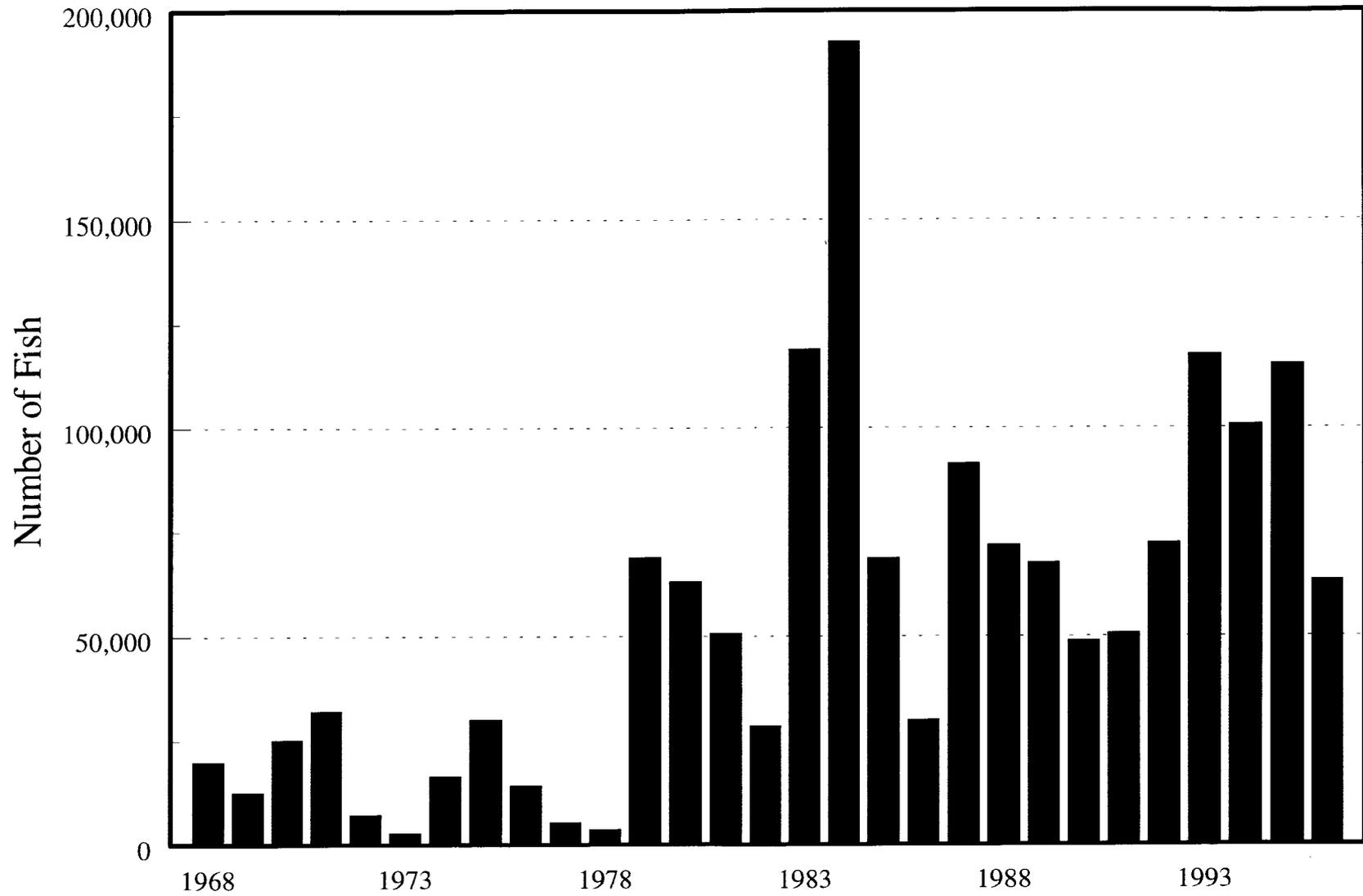


Figure 20.-Fish Creek sockeye salmon escapement, 1968-1996.

**Table 39.-Big Lake Hatchery (1975-1992) and Eklutna Hatchery (1993-1995) sockeye salmon fry releases into the Big Lake drainage by brood year, 1975-1996.**

Brood Year	Eggs Incubated	Fry Released	Egg/Fry Survival	Number Marked	Size (gm) At Release
1975	180,300	71,168	39.5%	0	0.15
1976	10,034,013	7,686,382	76.6%	72,673	0.15
1977	8,748,867	5,739,010	65.6%	66,153	0.13
1978	9,832,726	0	0.0%		
1979	5,053,808	806,047	15.9%	0	0.15
1980	4,699,733	3,967,941	84.4%	0	0.14
1981	5,662,004	4,263,356	75.3%	0	0.17
1982	8,624,662	6,601,409	76.5%	0	0.16
1983	9,294,426	7,362,000	79.2%	0	0.15
1984	16,210,000	12,430,000	76.7%	18,835	0.15
1985	21,550,000	15,000,000	69.6%	18,120	0.20
1986	17,500,000	11,866,000	67.8%	19,613	0.20
1987	20,300,000	14,492,000	71.4%	20,085	0.15
1988	19,700,000	13,205,848	67.0%	24,848	0.15
1989	14,835,000	10,815,319	72.9%	24,319	0.20
1990	14,734,000	10,037,290	68.1%	22,290	0.24
1991	7,357,000	3,111,000	56.4%	0	0.25
1992	10,330,000	4,586,000	59.2% <sup>a</sup>	0	0.22
1993	9,000,000	5,000,000	90% <sup>b</sup>	0	0.43
1994	7,700,000	5,000,000	81% <sup>b</sup>	0	0.40
1995	8,000,000	5,000,000	81% <sup>b</sup>	0	0.39

<sup>a</sup> Includes 1,534,000 fry transferred to Eklutna hatchery.

<sup>b</sup> Additional fry retained for smolt program.

**Table 40.-Fish Creek salmon harvests, by commercial set gillnet and personal use dip net, 1987-1996.**

Year	Commercial Gillnet						Personal Use Dip Net					
	Sockeye	Coho	Chum	Pink	Chinook	Total	Sockeye	Coho	Chum	Pink	Chinook	Total
1987	24,090	2,043	403	264	0	26,800	2,200					2,200
1989	47,925	6,075	4,979	545	4	59,528	5,000					5,000
1990	23,450	5,708	5,308	696	4	35,166	6,500					6,500
1991	10,459	1,630	961	21	0	13,071	14,369		549	567		15,485
1992	10,748	1,817	1,289	573	0	14,427	19,002		607	678		20,287
1993	47,751	831	990	29	0	49,601	37,224	973	503	2,068		40,768
1994	7,528	809	357	141	0	8,835	16,012	1,336	248	632		18,228
1995	19,477	1,999	1,018	72	5	22,571	9,102	2,640	99	290		12,131
1996	35,790	1,820	161	25	0	37,796	16,500	2,345	147	316	33	19,341
Mean	26,547	3,434	1,579	296	2	31,858	12,891	1,824	359	759	33	14,294

The commercial fishery in the Fish Creek special harvest area harvested 35,790 sockeye salmon and 1,820 coho salmon during the 1996 openings (Table 40). The majority of these salmon are bound for Fish Creek, but a portion is bound for other Knik Arm drainages such as Cottonwood and Jim creeks.

The Tyonek subsistence harvest during 1996 totaled 1,104 salmon of which 967 were chinook salmon (Table 19).

The 1996 season marked the first year of the Skwentna Personal Use Fish Wheel fishery. One fish wheel was operated during the 1996 season by 14 households. A total of 459 salmon were harvested. Sockeye salmon dominated the harvest (Table 19).

The Knik Village 1996 harvest totaled 278 salmon of which 5 were chinook, 163 sockeye, 45 coho, 3 pink and 62 chum. The 1996 Eklutna Village educational permit harvest is not yet available (Table 41).

### **Management Objectives**

The management objective of the Fish Creek personal use fishery is to allow escapement of sockeye salmon along the entire course of the return while harvesting fish in excess of the 50,000 escapement goal. The fishery is designed to target primarily sockeye salmon, terminating prior to the peak of the coho salmon return.

There are no established management objectives for the Tyonek subsistence fishery or the Skwentna fish wheel fishery. All fisheries are managed to achieve maximum sustained yield.

**Table 41.-Educational fishery permit harvests in NCIMA, 1994-1996.**

Permit Holder	Chinook	Coho	Sockeye	Pink	Chum	Total	Dates of Operation
<b>Knik Tribal Council</b>							
1994						29	
1995	5	1	21	0	1	55	
1996	5	45	163	3	62	278	6/17, 7/10,12, 20
<b>Eklutna Village</b>							
1994		7				172	
1995	14	37	55	6	42	155	
1996 <sup>a</sup>							

<sup>a</sup> No data available

### Recent Board of Fisheries Actions

The Upper Cook Inlet Subsistence Fishery Management Plan was repealed by the BOF in June of 1995. The Tyonek subsistence fishery is promulgated under the Upper Cook Inlet Salmon Management Plan. No changes have been made to the Tyonek Subsistence fishery as provided under the Upper Cook Inlet Salmon Management Plan by 5 AAC 01.560. Fishing Seasons and Daily Fishing Periods.

During the March 1996 BOF meeting the Upper Cook Inlet Personal Use Salmon Fishery Management Plan was established. This plan modified the Fish Creek Dip Net Fishery to provide:

1. The fishery will open July 10 through July 31 from 11:00 a.m. to 11:00 p.m. daily, provided the spawning escapement of sockeye salmon into Big Lake drainage is projected to exceed 50,000 fish;
2. A seasonal bag limit of 25 salmon per head of household plus 10 additional fish for each member of the household (except chinook salmon) ;
3. A permit is required which shall be returned to ADF&G with the harvest recorded; and
4. Upon harvesting a fish both lobes of the tail fin must be removed.

During the March 1996 BOF meeting the Skwentna River Personal Use Management Plan was established. Salmon, other than chinook salmon, may be taken as follows:

1. A permit is required which shall be returned to ADF&G with the harvest recorded;,
2. In the mainstem of the Yentna River from its confluence with Martin Creek upstream to its confluence with the Skwentna River from July 15 through July 31 from 4:00 a.m. through 8:00 p.m. Monday, from 4:00 a.m. through 8:00 p.m. Wednesday, from 4:00 a.m. through 8:00 p.m. Friday;
3. Only with a fish wheel as follows: ((a) each fish wheel must be equipped with a livebox; the live box must be constructed so that it contains no less than 45 cubic feet of water volume while it is in operation; (b) the permit holder shall attach a wood or metal plate

that is at least 12 inches high by 12 inches wide, bearing the permit holder's name and address in letters and numerals at least one inch high, so that the name and address are plainly visible; (c) the permit holder shall be present to attend the fish wheel at all times while the fish wheel is in operation, and chinook salmon and rainbow trout must be returned alive to the water; (d) a live box is a submerged container that is attached to the fish wheel that will keep fish caught by the fish wheel alive;

4. Only one permit may be issued to each household per year and the annual limit for the fishery is 25 salmon for the head of household and 10 salmon for each dependent of the permit holder;
5. The commissioner shall close the personal use fishery, by emergency order, as necessary to ensure that no more than 2,500 salmon are taken during the entire season under this section;
6. The provisions of this plan do not apply after December 31, 1999.

The next BOF meeting addressing Cook Inlet finfish is scheduled to occur in 1998.

### **Current Issues**

Much of the land adjacent to the Fish Creek Dip Net fishery is under private ownership causing annual conflict between fishery participants and land owners. During the 1996 season one of the primary land owners in the area charged dip net fishers a fee to access the fishery. Posting of land owned by private land owners could effectively curtail the personal use fishery as it now exists, and require managers to restructure public participation in the fishery.

There is conflict between dip net fishermen operating from shore and dip net fishermen operating from boats. Dip net fishermen have been disappointed since the 1995 season when the marine waters adjacent to the mouth of Fish Creek were closed to dip net fishing.

Litter accumulation and substantial short-term damage to the marsh area near the mouth of Fish Creek occurs due to the large number of people participating in the personal use fishery. These problems are the source of increasing public and land owner comment. The department presently provides toilets and a dumpster to alleviate the litter problem.

Currently there are no major concerns associated with the Skwentna Fish Wheel Fishery and the Tyonek Subsistence Fishery.

Many members of the public have expressed displeasure that personal use gill net fishing opportunity is not available in Upper Cook Inlet, specifically Knik Arm.

### **Ongoing Research and Management Activities**

Salmon escapement is monitored by a weir located approximately 3 miles from the outlet of Fish Creek into Knik Arm. This sockeye escapement evaluation program is paid for by the Commercial Fisheries Management and Development Division and operated by the Division of Sport Fish. The personal use Fish Creek fishery harvest is estimated by the SWHS and with the return of personal use permits with harvest recorded. The Fish Creek drainage is scheduled to be stocked annually with sockeye salmon fry from the Eklutna Hatchery.

The Skwentna Personal Use and Tyonek Subsistence fishery harvest information is gained from returned permits with harvest information included as part of the permitting requirement.

## **Recommended Research and Management**

Department markers at the mouth of Fish Creek placed during the 1995 season reduced the confusion with fishery participants concerning the legal fishing area. Placement of signs to inform participants of fishery regulations and fish identification techniques will continue. As with most fisheries in this management area, increased enforcement would provide for a more orderly fishery.

Department markers are placed at the boundaries of the Skwentna Personal Use Fishery area.

## **STOCKED LAKE FISHERIES**

### **Background and Historical Perspective**

Currently 64 lakes in the NCIMA are stocked on an annual, biennial, or triennial basis, including one research lake that is closed to fishing. The 63 stocked lakes range in size from 2 to 362 surface acres (Table 42 and Appendix C1).

The stocking program began in 1952 when two lakes received 22,000 rainbow trout fry. Although eight species of salmonids have been planted since 1952, rainbow trout, coho salmon and Arctic grayling have become the primary species used in the stocking program. Steelhead/rainbow trout from the Karluk River (Kodiak) and four strains of Alaska rainbow trout (Naknek River, Talarik Creek, Swanson River and Big Lake) as well as rainbow trout from federal and private hatcheries located in the states of Idaho, Montana, Oregon and Washington have been stocked. Landlocked salmon fisheries have been supported by coho salmon from Washington State, at least nine Alaskan egg take sources, and chinook salmon from three Alaskan sources. Since 1979 only native Alaskan fish have been stocked in the NCIMA. Arctic grayling egg take sources have been Junction Lake, Tolsona Lake and Moose Creek. Arctic char, originating from egg takes at Aleknagik Lake, and lake trout from Paxson Lake were first stocked in 1988.

The final egg take from Big Lake strain rainbow trout brood stock at Ft. Richardson Hatchery took place in 1993. All resulting fingerling were stocked in Big Lake drainage lakes and all remaining brood stock were stocked in Anchorage area landlocked lakes and in Big Lake. Swanson River strain rainbow trout are the sole rainbow trout brood stock source remaining at Ft. Richardson Hatchery. Beginning in 1994, Big Lake drainage system lakes having intermittent outlets have been stocked with triploid all-female Swanson River strain rainbow trout.

In most cases stocked landlocked lakes represent new fisheries because game fish were not present before stocking occurred. Stocked lakes benefit anglers and recreational support industries by providing diverse, year-round fishing opportunities and by diverting angling pressure from natural stocks. The majority of the stocking is directed toward road-accessible lakes that tend to draw entire family groups for some combination of fishing, camping, picnicking, boating, and ice skating.

Rainbow trout appear to be the species preferred by most anglers. A survey of anglers fishing stocked lakes in the NCIMA in 1977 (Watsjold 1978) revealed that 70% preferred to fish for rainbow trout, 19% desired landlocked coho salmon and 11% listed Arctic grayling as their

**Table 42.-Northern Cook Inlet Management Area lake stocking summary for nonanadromous fish, 1996.**

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN <sup>a</sup> MARK	BROODSTOCK <sup>b</sup> (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING <sup>c</sup> METHOD
<u>RAINBOW TROUT (1996)</u>								
Beverly	42	07/16/96	4,352		96 Swanson R(TAF)	Ft. Richardson	1.10g	T/BU
Big No Luck	68	08/13/96	6,809		96 Swanson R(TAF)	Ft. Richardson	2.50g	A
Carpenter	176	07/22/96	17,244		96 Swanson R	Ft. Richardson	1.50g	T
Coyote	2	06/06/96	198		95 Swanson R(TAF)	Ft. Richardson	105.8g	T
Crystal	132	07/17/96	13,170		96 Swanson R(TAF)	Ft. Richardson	1.10g	T
Dawn	12	07/22/96	2,360		96 Swanson R(TAF)	Ft. Richardson	1.50g	T/BU
Diamond	139	07/22/96	13,900		96 Swanson R	Ft. Richardson	1.30g	T
Echo	23	06/10/96	2,411		95 Swanson R	Ft. Richardson	78.40g	T
Farmer	21	07/22/96	1,100		96 Swanson R	Ft. Richardson	1.30g	T/BU
Finger	362	07/16/96	38,186		96 Swanson R	Ft. Richardson	0.87g	T
Florence	55	07/17/96	5,460		96 Swanson R	Ft. Richardson	1.50g	T/BU
Homestead	17	07/22/96	1,700		96 Swanson R(TAF)	Ft. Richardson	1.50g	T/BU
Honeybee	58	07/17/96	5,800		96 Swanson R	Ft. Richardson	1.50g	T/BU
Ida	46	07/16/96	4,589		96 Swanson R	Ft. Richardson	1.50g	T/BU
Irene	18	07/01/96	1,990		95 Swanson R (TAF)	Ft. Richardson	104.00g	T/BU
Kalmbach	125	07/16/96	12,644		96 Swanson R	Ft. Richardson	0.87g	T
Kashwitna	160	07/23/96	16,000		96 Swanson R(TAF)	Ft. Richardson	1.60g	T
Kepler-Bradley	58	05/21/96	1,576		95 Swanson R	Ft. Richardson	86.80g	T
		06/10/96	2,983		95 Swanson R	Ft. Richardson	78.40g	T
		06/26/96	1,346		95 Swanson R	Ft. Richardson	96.00g	T
		07/12/96	126		94 Swanson R	Ft. Richardson	800.00g	T
		07/18/96	3,134		96 Swanson R	Ft. Richardson	1.10g	T
Knik	50	07/18/96	2,965		96 Swanson R	Ft. Richardson	1.10g	T
		06/25/96	2,463		95 Swanson R	Ft. Richardson	92.00g	T
		07/25/96	9,207		96 Swanson R(TAF)	Ft. Richardson	1.60g	T
Little Lonely	56	07/17/96	5,600		96 Swanson R	Ft. Richardson	1.50g	T
Loberg	11	06/12/96	1,140		95 Swanson R	Ft. Richardson	83.00g	T
Long [K/B]	74	07/16/96	7,485		96 Swanson R	Ft. Richardson	1.50g	T
Long (Mi. 86)	106	06/10/96	2,983		95 Swanson R	Ft. Richardson	78.40g	T
		06/26/96	806		95 Swanson R	Ft. Richardson	96.00g	T
Loon	108	07/25/96	6,137		96 Swanson R(TAF)	Ft. Richardson	1.60g	T
Lorraine	132	07/22/96	13,218		96 Swanson R	Ft. Richardson	1.30g	T/BU
Lucille	362	07/18/96	36,654		96 Swanson R(TAF)	Ft. Richardson	1.50g	T
Lynne	70	07/17/96	7,067		96 Swanson R	Ft. Richardson	1.50g	T

-continued-

**Table 42.-Page 2 of 5.**

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN <sup>a</sup> MARK	BROODSTOCK <sup>b</sup> (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING <sup>c</sup> METHOD
<u>RAINBOW TROUT (1996) Continued</u>								
Marion	113	07/22/96	11,300		96 Swanson R	Ft. Richardson	1.30g	T/BU
Matanuska	62	05/21/96	1,078		95 Swanson R	Ft. Richardson	86.80g	T
		06/10/96	2,937		95 Swanson R	Ft. Richardson	78.40g	T
		06/26/96	4,894		95 Swanson R	Ft. Richardson	96.00g	T
		07/01/96	2,492		95 Swanson R	Ft. Richardson	104.00g	T
Morvro	87	07/25/96	8,660		96 Swanson R(TAF)	Ft. Richardson	1.60g	T/BU
North Friend	81	07/23/96	8,150		96 Swanson R(TAF)	Ft. Richardson	1.60g	T
Ravine	12	07/16/96	2,534		96 Swanson R	Ft. Richardson	1.50g	T/BU
Reed	20	07/16/96	1,954		96 Swanson R	Ft. Richardson	0.87g	T/BU
Rocky	59	07/01/96	3,946		95 Swanson R	Ft. Richardson	104.00g	
Ruby			4,810					
Seventeenmile	100	07/16/96	10,000		96 Swanson R	Ft. Richardson	1.50g	T
Seymour	229	07/16/96	22,676		96 Swanson R(TAF)	Ft. Richardson	1.10g	T
Slipper (Eska)	9	06/16/96	456		95 Swanson R(TAF)	Ft. Richardson	105.80g	T
South Friend	56	07/23/96	5,570		96 Swanson R(TAF)	Ft. Richardson	1.60g	T/BU
South Rolly	108	08/16/96	10,615		96 Swanson R(TAF)	Ft. Richardson	2.90g	T
Tanaina	109	08/16/96	10,163		96 Swanson R(TAF)	Ft. Richardson	2.90g	
Tigger	19	07/23/96	2,017		96 Swanson R	Ft. Richardson	1.30g	T/BU
Twin Island	151	07/30/96	15,119		96 Swanson R(TAF)	Ft. Richardson	2.10g	A
Vera	111	07/17/96	11,050		96 Swanson R(TAF)	Ft. Richardson	1.10g	T/BU
Visnaw	131	07/25/96	12,271		96 Swanson R(TAF)	Ft. Richardson	1.70g	T
Walby	54	06/06/96	1,995		95 Swanson R(TAF)	Ft. Richardson	105.80g	T
		7/16/96	5,417		96 Swanson R(TAF)	Ft. Richardson	1.10g	T
Weiner	21	06/06/96	1,204		95 Swanson R(TAF)	Ft. Richardson	105.80g	T
		07/16/96	2,148		96 Swanson R(TAF)	Ft. Richardson	1.10g	T
Willow	143	07/23/96	14,490		96 Swanson R(TAF)	Ft. Richardson	1.60g	T
Wishbone	53	07/16/96	2,639		96 Swanson R(TAF)	Ft. Richardson	1.10g	A
Wolf	62	07/17/96	12,400		96 Swanson R(TAF)	Ft. Richardson	1.10g	T/BU
"X"	101	07/23/96	5,055		96 Swanson R	Ft. Richardson	1.30g	T/BU
"Y"	40	07/23/96	<u>3,970</u>		96 Swanson R	Ft. Richardson	1.30g	T/BU
			450,003					

RAINBOW TROUT (1996 Totals Stocked)

Number of lakes: 53

Number of surface acres: 4,646.9

	Diploid Mixed-Sex	Triploid All-Female	TOTAL STOCKED
# Broodstock	126	0	126
# Catchables	31,055	5,843	36,898
# Fingerling	175,222	237,757	412,979
Total Rainbow Stocked:	206,403	243,600	450,003

-continued-

**Table 42.-Page 3 of 5.**

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN <sup>a</sup> MARK	BROODSTOCK <sup>b</sup> (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING <sup>c</sup> METHOD
<u>COHO SALMON (non-anadromous) [1996]</u>								
Barley	19	05/14/96	1,860		95 Bear Lake	Elmendorf	6.80g	T/BU
Bear Paw	45	05/16/96	4,500		95 Bear Lake	Elmendorf	5.30g	T/BU
Carpenter	176	05/14/96	17,640		95 Bear Lake	Elmendorf	6.80g	T
Christiansen	179	05/29/96	17,900		95 Bear Lake	Elmendorf	9.20g	T
Diamond	139	05/16/96	13,900		95 Bear Lake	Elmendorf	5.30g	T/BU
Echo	23	05/15/96	2,300		95 Bear Lake	Elmendorf	6.20g	T
Kalmbach	125	05/15/96	12,500		95 Bear Lake	Elmendorf	6.20g	T
Klaire	7	05/15/96	900		95 Bear Lake	Elmendorf	6.20g	T/BU
Knik	50	05/14/96	5,000		95 Bear Lake	Elmendorf	6.80g	T
Loberg	11	05/15/96	1,100		95 Bear Lake	Elmendorf	6.20g	T
Memory	83	05/15/96	8,300		95 Bear Lake	Elmendorf	6.20g	T
Prator	98	05/16/96	9,800		95 Bear Lake	Elmendorf	5.30g	T
Rocky	59	05/16/96	2,900		95 Bear Lake	Elmendorf	5.30g	T
Victor	14	05/15/96	<u>2,700</u>		95 Bear Lake	Elmendorf	6.20g	T/BU
			101,300					

COHO SALMON (non-anadromous) [1996 Totals Stocked]

Number of lakes: 14

Number of surface acres: 1,027.5

	Bear Lake
	Diploid
	Mixed-Sex
# Fingerling:	<u>101,300</u>
Total Coho Stocked:	101,300

-continued-

**Table 42.-Page 4 of 5.**

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN <sup>a</sup> MARK	BROODSTOCK <sup>b</sup>	HATCHERY	STOCKING SIZE	STOCKING <sup>c</sup> METHOD
<u>ARCTIC GRAYLING (1996)</u>								
Bruce			2,700					
Canoe	21	10/03/96	4,200		96 Moose L.	Clear	3.42g	T/BU
Finger	362	10/03/96	20,000		96 Moose L.	Clear	3.42g	T
Florence	55	10/03/96	5,460		96 Moose L.	Clear	3.42g	T/BU
Kepler-Bradley	58	10/01/96	5,800		96 Moose L.	Clear	3.48g	T
Knik	50	10/08/96	2,500		96 Moose L.	Clear	3.92g	T
Long [Mi. 86]	106	10/01/96	10,600		96 Moose L.	Clear	3.48g	T
Lorraine	132	10/08/96	13,200		96 Moose L.	Clear	3.92g	T/BU
Meirs	17	10/03/96	3,400		96 Moose L.	Clear	3.42g	T/BU
Reed	20	10/03/96	1,950		96 Moose L.	Clear	3.42g	T/BU
Seventeenmile	100	10/01/96	10,000		96 Moose L.	Clear	3.48g	T
"Y"	40	10/03/96	<u>3,900</u>		96 Moose L.	Clear	3.42g	T/BU
			83,710					

ARCTIC GRAYLING (1996 Totals Stocked)

Number of lakes: 12

Number of surface acres: 960

Moose Lake

Fingerling 83,710

Total Grayling Stocked: 83,710

ARCTIC CHAR (1996)

Benka	123	08/29/96	12,300		1995 hatchery brood	Clear	9.22g	T
Finger	362	08/28/96	36,200		1995 hatchery brood	Clear	9.22g	T
Irene	18	09/10/96	1,800		1995 hatchery brood	Clear	10.53g	T/BU
Lynne	70	09/10/96	7,000		1995 hatchery brood	Clear	10.53g	T/BU
Marion			11,300					
Matanuska	62	09/10/96	<u>3,100</u>		1995 hatchery brood	Clear	10.53T	T
			71,700					

ARCTIC CHAR (1996 Totals Stocked)

Number of lakes: 6

Number of surface acres: 635

1995 hatchery brood

Fingerling 71,700

Total Arctic Char Stocked: 71,700

-continued-

**Table 42.-Page 5 of 5.**

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN <sup>a</sup> MARK	BROODSTOCK <sup>b</sup>	HATCHERY	STOCKING SIZE	STOCKING <sup>c</sup> METHOD
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CHINOOK SALMON (1996)

Finger	362	10/25/96	19,854		1995 Willow Ck.	Ft. Richardson	93.20g	T
		10/26/96	2,857		1995 Willow Ck.	Ft. Richardson	94.50g	T
		10/26/96	7,011		1995 Willow Ck.	Ft. Richardson	93.20g	T
		11/01/96	4,987		1995 Willow Ck.	Ft. Richardson	94.20g	T
		11/02/96	1,495		1995 Willow Ck.	Ft. Richardson	93.10g	T

CHINOOK SALMON (1996 Totals Stocked)

Number of lakes: 1

Number of surface acres: 362

1995 Willow Ck.

Catchables 36,204

Total Chinook Stocked: 36,204

ALL SPECIES

Number of lakes: 64

Number of surface acres: 5,110.1

# Rainbow Trout	454,813
# Coho Salmon (non-anadromous)	101,300
# Chinook Salmon (non-anadromous)	36,204
# Arctic Grayling	83,710
# Arctic Char	71,700
Total Fish Stocked (1996)	747,727

<sup>a</sup> FIN MARK: LV = diploid mixed-sex; RV = diploid all-female.

<sup>b</sup> TREATMENT: (AF) = diploid all-female; (TAF) = triploid all-female.

<sup>c</sup> Stocking Method: A = airdrop; T = tank truck; T/BU = carried in buckets to lake

choice. Rainbow trout comprised 58% of all fish stocked in landlocked lakes within the NCIMA during the period 1992 through 1996. Annual releases of all species during 1994-1996 ranged from 1,129,049 to 1,370,346 (Appendix C1).

Ninety-four percent of the rainbow trout released into NCIMA waters during the period 1994-1996 were fingerlings. Most fingerlings weighed between 1 and 2 grams and were released during July. By June of the year following introduction, fingerlings at age 1 will typically range from 3 to 6 inches in length, at age 2 from 6 to 11 inches, at age 3 from 11 to 16 inches, and at age 4 from 16 to 20 inches in length. Approximately 70% to 80% of the rainbow trout harvested from stocked lakes are age 2 and about 15% to 20% are age 3. Few stocked rainbow trout exceed age 4 and relatively few rainbow trout achieve harvestable size prior to age 2.

Catchable rainbow trout, weighing about 100 grams, are stocked to supplement rainbow trout production resulting from fingerling plants. These larger fish provide angling opportunities in nonproductive lakes and help maintain good catch rates in heavily fished lakes. Usually less than 6% of the rainbow trout stocked in the NCIMA are catchable size at introduction.

Coho salmon are normally stocked in May at about 3 to 5 grams each. These fish achieve a harvestable size (6 to 11 inches) at age 1, the year following introduction. Most coho salmon are either harvested or die after becoming sexually mature by age 3. Stocked salmon support important winter fishing opportunities within the NCIMA.

Arctic grayling are stocked in September as fingerlings weighing 3 to 5 grams. Arctic grayling normally recruit into the harvest by age 2.

Although the contributions from the landlocked lake stocking program have been significant to date, it is important to recognize that poor survival of stocked fish has also been documented. Research investigations have accompanied development of the area's stocking program since the early 1970s. The primary objective of this research has been to develop cost-effective stocking practices that provide both expanded and diverse fishing opportunities. Lake stocking research has been directed toward but not limited to the following: evaluation and selection of rainbow trout brood stock, development of effective stocking densities and size of stocked fish for various lake environments, establishment of optimal time and frequency of stockings in various landlocked lake environments, evaluation of sterile rainbow trout for stocking lakes that have open or intermittent linkage with drainages that support wild rainbow trout, evaluation of all-female diploid rainbow trout to eliminate high mortality associated with spawning males, and evaluation of sterile coho salmon for stocking lakes that have open or intermittent drainages that support wild coho salmon.

### **Recent Fishery Performance**

A total of 64 lakes was stocked with 747,727 game fish in 1996 (Appendix C1). Forty-four of these lakes were located in the Knik Arm Management Unit and the remainder in the Eastside Susitna Management Unit. Releases in 1996 included 454,813 rainbow trout, 101,300 coho salmon, 36,204 chinook salmon, 83,710 Arctic grayling, and 71,700 Arctic char. Eighteen lakes were stocked with more than one species of fish in 1996. Stocking locations, species, numbers of fish and fish size are listed in Table 42.

The SWHS (Howe et al. 1996) estimated that 31,209 angler-days of participation resulted from the area's landlocked stocking program in 1995. Fishing effort at lakes having both stocked and

indigenous game fish is not included in estimates of participation associated with lake stocking. The 1995 catch from stocked landlocked lakes included an estimated 37,290 rainbow trout of which 26% were harvested, 11,038 landlocked salmon (61% were harvested), and 3,771 Arctic grayling (17% were harvested). Rainbow trout from stocked lakes represented 28% of all rainbow trout caught and 25% of the entire harvest of this species from the NCIMA.

The Kepler Lake Complex, consisting of nine stocked lakes, supported 10,885 angler-days of effort, and Finger Lake supported 7,814 angler-days of effort in 1995. Collectively, these two stocking sites yielded 60% of the effort associated with stocked landlocked lakes within the NCIMA (Howe et al. 1996).

### **Management Objectives**

The primary objective of this program is to provide additional fishing opportunities in a cost-effective manner on a sustainable basis by stocking lakes with game fish that are indigenous to Alaska. An additional objective of the program is to insure that stocking does not negatively impact wild stocks or other fisheries. All stocking is conducted in accordance to guidelines set forth in the Statewide Stocking Plan for Recreational Fisheries.

### **Recent Board of Fisheries Actions**

During the fall of 1992 the Board of Fisheries restricted three catch and release lakes ("X", Long, and Wishbone) to allow fishing only during the open-water season, May 1 through October 30. The new regulations took effect in 1993. Board of Fisheries action in 1992 also resulted in a reduction of the rainbow trout bag limit in Big Lake to two fish per day, only one of which may be 20 inches or more in length.

There was no BOF action taken during 1996 specific to stocked lakes, however, rainbow trout bag and possession limits in all waters of NCI, excluding stocked lakes, were reduced from five per day and in possession to two per day and in possession.

### **Current Issues**

The cost associated with providing an angler-day of stocked-lake fishing averaged \$3.28 over the last 5 years. During the period of 1993 through 1995 an average 64,376 stocked fish have been caught annually and 35% of that catch has been harvested. Increased stocking levels have not produced parallel increases in participation. Lake stocking research indicates the area's stocking program is making more harvestable fish available than ever before, but anglers are not taking full advantage of these fish.

Why has increased stocking not produced proportionate increases in participation? Has the current level of stocking exceeded demand for stocked lake fishing? Are anglers unaware of stocked lake fishing opportunities? Is participation hindered because of poor access, or lack of support facilities at many stocked lakes? Does the SWHS adequately reflect year-round participation of anglers fishing Matanuska-Susitna Valley stocked lakes? Finding answers and solutions to these issues will be essential if stocking in the NCIMA is to function in a cost-effective manner.

### **Ongoing Research and Management Activities**

Landlocked lake research in 1996 continued evaluation of current stocked lakes for abundance and size and age composition of stocked fish. Data collected from sampling are used to evaluate

stocking plans and update the Matanuska-Susitna Valley Lakes fishing forecast. Eleven lakes in the Matanuska-Susitna Valley were evaluated in 1996.

Johnson Lake was sampled in 1996 to continue comparing survival and growth of diploid (normal) mixed-sex and all-female diploid rainbow trout fingerling. Preliminary data indicate that 3 years after introduction into a lake all-female rainbow trout survival was approximately half of the average survival of diploid mixed-sex rainbow trout, while the mean length of all-female fish was approximately equal to the mean length of diploid fish.

Johnson Lake was stocked in June of 1994, with equal numbers of diploid (normal) mixed-sex and triploid (sterile) Little Susitna River strain coho salmon fingerling. Data collected in September of 1996 to estimate the proportion of the population comprised of each type of fish and compare mean length indicated a combination of 25% triploid fish and 75% diploid fish with the mean length of triploid fish 10% less than diploid fish. If triploid coho can be developed in a cost-effective manner, the fish could be stocked in lakes that have open or intermittent linkage with drainages that support wild salmon. Also, if triploid coho do not mature and die at 3 years as do most diploid coho, they would be available to the fishery longer and provide larger fish.

Stocked lake Fish Transport Forms (FTP) were updated, combining lakes stocked with the same species on one FTP form and classifying lakes on the basis of totally landlocked, barriered, or weired.

Additionally, responses are made to public inquiries relating to stocked lakes, including extreme water levels, algae blooms, public access, northern pike infestation and shoreline erosion.

### **Recommended Research and Management Activities**

Current levels of stocking within the NCIMA should not increase during the next several years. Substantial effort should be directed toward increasing angler participation at stocked lakes by improving the public's awareness of available fishing opportunities. Annual updating of the area's stocked lakes brochure and expanded distribution of this popular pamphlet may help. Providing the brochure to visitor centers, sporting good outlets and license vendors should become an annual objective of the stocked lakes program. An additional objective of the program should be to improve and maintain public access, parking, and signing at stocked lakes.

All stocked lakes should continue to be evaluated on a rotational basis. When coupled with public input, these data provide the basis for modifying stocking strategies and providing fishing information to the public.

Evaluation of the stocked lakes program and assessment of the cost effectiveness of various stocking strategies through use of harvest and effort estimates made available in the SWHS should be continued.

A survey of stocked lakes was conducted during the spring of 1994 by a volunteer, Mr. Gene Horning. Mr. Horning made notes regarding problems in locating access sites and in following the access to the lakes. He additionally photographed parking areas, trail heads and lake access junctions. Mr. Horning put together a series of three-ring notebooks with notes and photographs identifying the current status of access sites and recommendations on access site improvements. A summary of his findings is presented in Table 43.

**Table 43.-Northern Cook Inlet Management Area stocked lakes access summary, 1996.**

LAKE	ACCESS ROUTE	EASEMENT <sup>a</sup> CLASSIFICATION	PARKING AREA	TRAIL CONDITION	% PUBLIC SHORELINE	COMMENTS
Barley	needs sign	P.U.E.	5 vehicle gravel	cleared section line	1%	100 yd. walk in
Bearpaw	good	P.U.A.	limited to road R.O.W.	ruttled 4WD track	50%	designated public park in plat maps
Benka	good	P.U.A.	2 vehicle gravel	access rd. ends at lake	0.5%	not legal; no camping
Beverly	good	S/L (33')	5 vehicle gravel	needs sign, swampy	15%	needs sign at "Y" in trail; State land
Big	good	S.R.A.	20 vehicle gravel	concrete boat launches	2%	2 State Rec. Sites; camping
Big No Luck	canoe trail	S.R.A.	15 vehicle gravel	canoe trail: 1.5 miles	100%	Nancy Lake S.R.A.; camping
Bruce	good	P.U.E. (60')	limited to road R.O.W.	cleared easement	1%	shoreline muskeg; improve parking
Canoe	good	S.R.A.	6 vehicle gravel	packed gravel	21%	dock, picnic tables, outhouse; K/B Rec.
Carpenter	last mile is 4WD	P.U.E. (150')	3 vehicle, dirt	access rd. ends at lake	0.7%	needs upgrade
Christiansen	needs sign	MSB park	6 vehicle gravel	access rd. ends at lake	0.4%	gravel boat launch; no camping
Coyote	good	P.U.A.	2 vehicle gravel	good	100%	borough blocked rd. access to park
Crystal	needs sign	P.U.E. (60')	10 vehicle gravel	access rd. ends at lake	0.4%	vehicle access blocked; no camping
Dawn	good	P.U.A.	8 vehicle gravel	needs boardwalk	5%	designated public park: Tract C
Diamond	good	S/L (50')	6 vehicle gravel	needs improvement	36%	100 yd. walk in
Echo	good	Rd. R.O.W.	4 vehicle paved pull-out	signed, gravel	15%	shoreline trees, brush; pvt campground
Farmer	good	S/L	limited to road ROW	needs better signing	1%	shoreline muskeg; improve parking
Finger	good	S.R.A.	30 vehicle gravel	access rd. ends at lake	5%	State Rec. Site, camping
Florence	good	S/L (66')	limited to road R.O.W.	good	0.8%	improve parking; no camping
Homestead	need signs	R.O.W. Ease. (50')	limited to access rd.	access rd. ends at lake	1%	shoreline swampy; no camping
Honeybee	need signs	P.U.A.	limited to access rd.	needs work, swampy	6%	access road is not public; adj. State land
Ida	need signs	P.U.E. (20')	4 vehicle gravel	steep, gravel	0.1%	no camping
Irene	good	S.R.A.	4 vehicle gravel	gravel	15%	K/B Rec. Area
Kalmbach	good	S/L	5 vehicle gravel	need signs, swampy	20%	need sign at "Y" in trail; adj. State land
Kashwitna	good	Rd. R.O.W.	30 vehicle paved	access is by lake	10%	shoreline muskeg along R.O.W.
Kepler/Bradley	good	S.R.A.	30 vehicle gravel	marked, gravel	89.5%	private camping
Klaire	good	S.R.A.	30 vehicle gravel	.4 mile; needs sign	100%	brushy shoreline; K/B Rec. Area
Knik	good	P.U.A.	2 vehicle gravel	access rd. ends at lake	0.6%	no camping
Lalen	good	P.U.E. (20')	2 vehicle gravel	access rd. ends at lake	0.2%	gravel boat launch; no camping
Loberg	good	Rd. R.O.W.	3 vehicle gravel	access rd. ends at lake	6%	brushy shoreline along R.O.W.
Long (Mile 86)	good	S.R.A.	15 vehicle gravel	access rd. ends at lake	90%	State Rec. Site; camping
Long (K/B)	good	S.R.A.	7 vehicle gravel	packed dirt, steep	100%	hook & release only; K/B Rec. Area
Little Lonely	need signs	S/L	limited to road R.O.W.	short, dirt	0.5%	access rd. can be 4WD; no camping
Loon	good	S/L (50')	5 vehicle gravel	access rd. ends at lake	0.4%	no camping
Lorraine	need signs	MSB property	6 vehicle gravel	muddy, ruttled by 4WD	95%	surrounded by borough land
Lucille	good	P.U.E.	3 vehicle gravel	access rd. ends at lake	4%	2 access sites; camping at Lucille Park
Lynne	need signs	P.U.A.	2 vehicle dirt	access rd. ends at lake	2%	access rd. is not public; 2% is State land
Marion	good	P.U.A.	4 vehicle gravel	steep dirt, some erosion	12%	adj. to MSB land
Matanuska	good	S.R.A.	30 vehicle gravel	short gravel	35%	docks, picnicking, outhouse; K/B Rec. Area
Meirs	good	P.U.E.	8 vehicle, can be muddy	steep, dirt	1%	no camping
Memory	good	S/L (33')	4 vehicle, gravel	access rd. ends at lake	0.3%	no camping
Mile 180	need sign	Rd. R.O.W.	10 vehicle, paved pullouts	pullouts beside lake	40%	lakeshore muskeg
Morvro	need signs	S/L (33')	limited to rd. R/W	swampy, rough	0.3%	needs work with trail & parking
North Friend (Montana)	good	Rd. R.O.W.	10 vehicle gravel cross Parks	short trail to outlet	0.5%	access Parks R.O.W.
Prator	good	P.U.A.	4 vehicle gravel	access rd. ends at lake	2%	Castle Public Park; no camping
Ravine	needs sign	P.U.A.	4 vehicle gravel	steep, worn	50%	adj. State land
Reed	good	P.U.E. (10')	limited to rd. R/W	ends in drop-off	0.2%	improve parking; no camping

-continued-

**Table 43.-Page 2 of 2.**

LAKE	ACCESS ROUTE	EASEMENT <sup>a</sup> CLASSIFICATION	PARKING AREA	TRAIL CONDITION	% PUBLIC SHORELINE	COMMENTS
Rocky	good	S.R.A.	30 vehicle gravel	access rd. ends at lake	5%	State Rec. Site; camping
Ruby	ATV, no signs	Trail Easement (50')	15 vehicle gravel	5 mile ATV trail	40%	new surveyed trail, adj. state land
Seventeenmile	need signs	P.U.A.	8 vehicle gravel	access rd. ends at lake	0.6%	need no camping signs
Seymour	good	S/L (83')	4 vehicle gravel	access rd. ends at lake	0.5%	MSB land adjacent
Slipper (Eska)	good	Rd. R.O.W.	20 vehicle gravel	access rd. ends at lake	75%	last 1/4 mile rough
South Friend (Montana)	good	Rd. R.O.W.	10 vehicle gravel	short, dirt	10%	shoreline swampy along R.O.W.
South Rolly	good	S.R.A.	20 vehicle gravel	access rd. ends at lake	100%	State Rec. Site; camping
Tigger	needs sign	State prop.	2 vehicle gravel	needs marked	100%	new access being acquired from MSB
Twin Island	needs signs	MSB prop.	4 vehicle gravel	needs marked	0.6%	MSB prop conflict/ mental health land
Vera	good	S/L (50')	6 vehicle dirt	soft tundra	0.3%	no camping
Victor	good	S.R.A.	30 vehicle gravel	dirt, some mud	100%	brushy shoreline; K/B Rec. Area
Visnaw	needs sign	S/L	3 vehicle gravel	access rd. ends at lake	0.4%	no camping
Walby	good	P.U.A.	6 vehicle gravel	access rd. ends at lake	1%	no camping
Wiener	good	Rd. R.O.W.	(2) 4 vehicle pullouts	pullouts beside lake	25%	access along Glenn Hwy.
West Sunshine	good	P.U.E. (20')	4 vehicle gravel	steep, dirt	0.4%	no camping
Willow	good	S/L (50')	30 vehicle gravel	access rd. ends at lake	0.4%	access by Willow Comm. Center
Wishbone	needs signs	State prop.	4 vehicle dirt	rough 4WD only	100%	hook & release only, State land
Wolf	good	S.R.A.	10 vehicle gravel	short dirt	33%	S.R.A.; camping
"X"	good	State prop.	2 vehicle dirt	need boat	100%	hook & release only; State land
"Y"	good	Rd. R.O.W.	2 vehicle dirt	short, steep	100%	brushy, State land

<sup>a</sup> R.O.W. = right of way

S/L = section line easement (feet wide)

P.U.A. = dedicated (or reserved) public use area (parcel platted for public recreation)

P.U.E = dedicated public use easement (feet wide)

S.R.A. = state recreation area (parcel managed by State Parks)

MSB = Matanuska Susitna Borough

In support of the lake fishing program, handouts have been made for each stocked lake. They include a bathymetric map of the lake, directions to the public access, stocking history and description of available facilities. These maps need to be updated with the land status of lake front property identified as public or private lands. Prior to updating these maps, public use easements need to be verified. Additionally, public handouts need to be constructed for other lakes that have public access and support recreational fishing opportunities. This work is ongoing.

To provide better angler access and increase fishing opportunities, access improvements should be made on an annual basis (Table 43). Efforts should be directed to a few lakes annually. Current projects include:

1. **Signage** identifying public access on an as-needed basis.
2. **Loon Lake** access trail was relocated last fall to contain it within a nearby section line easement. A parking area was also developed at the trailhead with help from the Mat-Su Trails Council. We plan to conclude this project next spring by further hardening surfaces of the trail and parking area with more gravel and providing signage.
3. **Honeybee and Lynne Lakes** access road easement was applied for and surveyed last summer. Some realignment will be necessary next spring for approval and recording.
4. **Lorraine Lake** easement acquisition and development. An application for public easement has been submitted to the Mat-Su Borough. The proposed easement is overlying a traditional route crossing Borough land. Improvements will include gravel hardening of an existing parking area and foot trail. Signage will be provided for public identification.
5. **Tigger Lake** easement acquisition and development. An application for public easement has been submitted to the Mat-Su Borough for a short walk-in trail. Subsequent clearing and signage, to define the trail, will be performed upon easement classification. The Borough has also requested us to develop a small vehicle parking area at the trailhead, with a vehicle barricade to restrict access to walk-in only.
6. **Bruce Lake** public use easement will be developed into a foot access trail. This will require some brushing and signage. Future plans also include development of a small vehicle parking area located at the trailhead.
7. **Bearpaw Lake** existing access road will be gravel hardened and a parking area developed.
8. **Barley Lake** public use easement was relocated in 1996 to alleviate conflicts occurring with the caretaking of an abandoned dairy farm. The new site will be upgraded with gravel fill as needed along with the construction of a boardwalk crossing marshy ground to the water's edge. Signage will be provided for access identification and to define a parking area. Improvements to this site were begun by DOC this summer and should be completed in 1997.
9. **Horseshoe Lake (Pt. MacKenzie)** section line easement will be developed into a foot trail with a stairwell leading down an embankment to the water's edge. This project is slated for the 1997 construction season.

There are several State Recreation Sites along the road system of the NCIMA. State Recreation Sites are on state lands that are managed by the Department of Natural Resources, Division of

Parks and Outdoor Recreation. These sites all allow day use with the majority providing camping opportunities. Most of these sites require payment of a fee for facility use. In general, camping opportunities adjacent to lakes and streams along the road system are limited. At the majority of recreation sites adjacent to lakes and streams Sport Fish Restoration moneys were used in development of at least parking areas and boat ramps. It is appropriate to use access monies in maintaining and improving these facilities as they often provide outstanding opportunities to people in the pursuit of power boating and recreational fishing activities.

1. **Finger Lake.** The Finger Lake State Recreational Site is within the core area of the Matanuska-Susitna Borough. The site provides camping, day use, fishing, swimming and other recreational opportunities. The facility is adjacent to urban and residential areas of the borough and is generally full during the open-water period. It also supports significant day use during the winter months, primarily for ice fishing. An ADA accessible fishing dock is needed to allow full access to the site.
2. **Nancy Lake.** The Nancy Lake State Recreation Site, on the northeast shore of Nancy Lake, has 30 camping sites and is reached from Mile 66.5 on the Parks Highway. The Nancy Lake recreation site is a popular area, especially during the open water season. Nancy Lake is within the Nancy Lake State Recreation Area which is one of Alaska's few flat, lake-studded landscapes preserved in its natural state for recreation. Nancy Lake is also one of the larger lakes in the NCIMA and supports a significant amount of power boat activity. A boat ramp is presently in use at the Nancy Lake Recreation Site. However, this ramp is old and needs to be upgraded. A double lane boat ramp needs to be installed. Additionally, the dock associated with this ramp needs to be upgraded and a new fishing dock needs to be installed. Upgrading this facility is not expected to significantly increase power boating and angling, however, it is expected to curtail a significant drop in participation.
3. **Bonnie Lake.** The Bonnie Lake parking area and boat launch was graded during 1995. Continued site maintenance will be provided by Alaska Department of Natural Resources Division of Parks and Outdoor Recreation (ADNR, DPOR). The ADF&G will provide pumping of vaulted toilets and finance ADNR, DPOR for facility maintenance. Design and construction of a fishing dock was completed during the summer of 1996 as a joint effort between ADNR, DPOR, ADF&G, and the Bonnie Lake Homeowners Association.
4. **Big Lake South** boat launch and parking facility receives a tremendous amount of recreational boating activity throughout the summer. The substantial increase in use of this facility since its construction has not only left it in a state of disrepair but shown it to be of inadequate dimension. ADNR, DPOR has not been financially capable of performing the maintenance required to keep this a safe public access to Big Lake. The ADF&G is considering funding the upgrade of this facility as a cooperative agreement with ADNR, DPOR. Improvements will include expanding the parking area and replacing the concrete boat launching ramp. The anticipated cost for this venture is \$200,000.

## **RAINBOW TROUT FISHERIES**

### **Background and Historical Perspective**

NCIMA rainbow trout harvests have ranged from 28,000 to 52,000 fish and averaged 36,663 fish during the years 1990 through 1994 (Mills 1991-1994, Howe et al. 1995) (Table 44). This harvest accounts for 36% and 23% of the average harvest within Region II and the state,

respectively. Rainbow trout harvested from the Knik Arm Management Unit account for approximately 78% of the total NCIMA harvest. A large percentage is a result of the stocked lake program. The Westside Susitna and the Eastside Susitna Management units have accounted for 8% and 13% of this harvest, respectively, with the West Cook Inlet Management Unit accounting for less than 1%. Since 1990 the SWHS has estimated the catch of rainbow trout. From 1990-1994 the average catch was approximately 139,100 (Mills 1991-1994, Howe et al. 1995) (Table 44). The Knik Management Unit continues to dominate the catch (59%), with Westside Susitna and Eastside Susitna Management units accounting for 23% and 17%, respectively.

The Board of Fisheries attempted for several years to accommodate a wide array of individual requests for regulatory reform to provide for conservative rainbow trout management. In 1984 they determined that a comprehensive trout policy was needed. During 1985 through 1986 a 13-member citizen planning team working with the department and the angling community developed a draft management policy.

During the fall of 1986 the Board of Fisheries officially adopted this plan as a management policy for Cook Inlet and Copper River rainbow trout. The policy provides a systematic approach for selecting fishery regulations as well as a process for rational identification of waters for special management (ADF&G 1986). The Board of Fisheries has used the policy since 1986 to implement regulations for rainbow trout within the NCIMA (Engel and Vincent-Lang 1992).

Even before the policy was developed, the management of Susitna River trout was becoming conservative. Bag and possession limits, for example, were 10 rainbow trout prior to 1982. Beginning in 1982 the bag and possession limits dropped to five rainbow trout of which only two could be 20 inches or more in length. In 1983 the limit was further reduced to allow just one fish 20 inches or more in length. Starting in 1987 and continuing to the present, all streams within the Susitna River drainage have been regulated according to the conservative yield concept of the rainbow trout plan. This management concept strives to maintain historical size and age compositions and abundance levels for wild trout. Bag and possession limits under this concept are two trout, of which only one may be 20 inches or more in length. This management strategy also requires the use of unbaited artificial lures in all flowing waters from September 1 through May 15 to enhance survival of released fish at the time when trout are often a targeted species. During 1997 all eastside Susitna River tributaries will be restricted to a single-hook artificial lure, upstream of the Parks Highway. This regulatory scheme attempts to allow a modest portion of the annual trout production to be removed from most populations while the rest are recycled.

The majority of Cook Inlet rainbow trout fisheries in flowing waters are additionally managed under a seasonal limit of two rainbow trout over 20 inches. To assure compliance with this regulation, anglers must, immediately upon harvesting a trout over 20 inches, record that harvest on the back of their license or on a harvest record.

**Table 44.-Northern Cook Inlet Management Area recreational catch and harvest of rainbow trout by management unit, 1977-1995.**

**Table 44.-Northern Cook Inlet Management Area recreational catch and harvest of rainbow trout by management unit, 1977-1995.**

Year	Northern Cook Inlet Management Area										Region II		Statewide	
	Knik Arm Unit		Eastside Susitna Unit		Westside Susitna Unit		West Cook Inlet Unit		Total		Harvest Number	% NCIMA	Harvest Number	% NCIMA
	Catch <sup>a</sup>	Harvest	Catch <sup>a</sup>	Harvest	Catch <sup>a</sup>	Harvest	Catch <sup>a</sup>	Harvest	Catch <sup>a</sup>	Harvest				
1977		18,615		5,225		7,472		958		32,270	80,345	39.8	94,307	33.9
1978		23,139		5,930		12,295		723		42,087	107,243	39.1	120,231	34.9
1979		24,843		9,463		12,555		1,063		47,924	129,815	36.7	139,390	34.2
1980		29,368		6,715		12,785		560		49,428	126,686	38.9	153,476	32.1
1981		41,749		8,813		11,296		1,734		63,592	149,460	41.2	178,613	34.5
1982		30,549		7,536		11,465		398		49,948	142,579	34.8	173,242	28.6
1983		26,421		9,639		9,253		871		46,184	141,705	32.5	168,677	27.3
1984		26,418		7,656		8,079		698		42,851	128,649	33.3	170,117	25.2
1985		46,431		7,872		8,114		902		63,319	142,316	44.5	181,991	34.8
1986		27,690		8,061		6,668		212		42,631	114,873	37.1	152,855	27.9
1987		24,663		6,647		8,020		579		39,909	101,397	39.4	138,698	28.8
1988		58,609		7,622		8,058		618		74,907	155,960	48.0	241,831	40.0
1989		44,518		4,972		4,928		534		54,952	127,444	43.1	209,961	26.2
1990	98,720	30,699	21,806	5,008	33,093	3,960	2,338	438	155,957	40,105	122,987	32.6	191,809	20.9
1991	88,645	39,636	26,329	7,854	46,870	4,526	1,290	404	163,134	52,420	127,492	40.7	205,642	25.2
1992	85,331	27,995	19,915	3,948	23,621	2,028	760	150	129,627	34,121	97,730	34.9	139,973	24.4
1993	69,635	21,565	24,240	3,713	29,911	2,481	1,411	105	125,197	27,864	82,312	33.9	136,681	20.4
1994	70,255	22,446	23,619	3,658	25,157	2,526	529	177	119,624	28,807	76,384	37.7	112,261	25.6
90-94 Mean	82,527	28,468	23,182	4,836	32,130	3,104	1,266	255	139,105	36,663	101,381	36.2	157,273	23.3
1995	56,108	14,876	15,363	3,138	23,432	1,757	472	94	96,375	19,867	74,972	26.5	112,681	17.6

<sup>a</sup> Catch estimates available beginning in 1990.

A major portion of the Eastside Susitna Management Unit has been managed for trophy-size trout (trout over 20 inches) since 1987. This fishery encompasses all drainages of the Susitna River from the junction of the Susitna and Talkeetna rivers upstream to Devil's Canyon. Under this strategy, only one trout 20 inches or more in length is allowed daily with a two trout over 20 inch seasonal limit. Small trout must be released immediately. An unbaited, single-hook lure requirement complements this strategy.

Major portions of three of the Susitna River drainage's best trout streams joined the Talachulitna River as catch-and-release waters starting in 1987. No-kill strategies now govern most of the Lake Creek drainage, much of the Deshka River, and the Fish Creek drainage located within the Talkeetna River drainage. The Talachulitna River had previously become Alaska's first catch-and-release trout fishery in 1977. In 1993 catch-and-release regulations were also established for the North Fork of the Kashwitna River. Unbaited, single-hook lures are mandatory in all catch-and-release waters. Catch-and-release strategies were adopted to perpetuate quality fishing rather than protect or rebuild depressed stocks (Engel and Vincent-Lang 1992).

Stocked landlocked lakes make up the majority of waters that fall under the maximum sustained yield management concept. Bag and possession limits under this management concept are five trout. Although stocked lakes are primarily managed for put-and-take fisheries, three stocked lakes have been established for catch-and-release fishing using unbaited artificial lures, and closed November 1 to April 30 to prohibit ice fishing.

Wild trout are not supplemented with hatchery trout in the Susitna River drainage. Public testimony during the development of the rainbow trout plan suggested little interest in the use of hatchery fish to augment wild stocks. In fact, many participants in the planning process expressed strong opposition to any hatchery assistance for wild Susitna River trout.

A description of the Susitna River drainage as well as a discussion of access routes within the area have previously been presented in overviews pertaining to Susitna River chinook salmon fisheries.

According to the SWHS, the harvest of Susitna River (Eastside and Westside Susitna Management Units) rainbow trout has ranged from 5,976 to 12,380 fish and averaged 7,940 fish annually during the period 1990 through 1994. Approximately 39% of the trout harvest from the Susitna River drainage has been from Westside Susitna Management Unit tributaries during this period (Table 44).

The Deshka River, Lake Creek and Alexander Creek generally provide the largest harvests among Westside Susitna Management Unit fisheries (Appendix A49). Willow Creek, Sheep Creek, Montana Creek and the Talkeetna River drainage maintain the largest harvests of rainbow trout from the Eastside Susitna Management Unit (Appendix A47).

Studies have been conducted on rainbow trout stocks of the Deshka River, Lake Creek and Talachulitna River since 1989 (Bradley 1990 and 1991), the Kashwitna River since 1991, Peters Creek since 1992 (Rutz 1992 and 1993) and the North Fork Kashwitna in 1996. Assessment of migration and the age and length characteristics of these stocks has been the primary focus of these investigations. Onsite creel surveys were also conducted at Lake Creek during 1988 and 1989 (Vincent-Lang and Hepler 1989). Significant differences in age composition and mean length-at-age statistics occurred among Susitna River tributaries sampled during 1989-1992

(Rutz 1992 and 1993). Rainbow trout tagged during 1991 and 1992 indicated low numbers of trout over 510 mm in length, the size limit defined in the Cook Inlet and Copper River Rainbow/Steelhead Trout Management Policy for trophy trout. This lack of adequately sized fish, combined with the relatively slow growth rate of Susitna River basin trout in comparison to other Alaskan waters containing trophy trout, suggests that these Susitna River rainbow trout stocks may not be viable candidates for management as trophy fisheries under the established 20-inch rule stated in the Cook Inlet rainbow trout management policy (Rutz 1992).

### **Recent Fishery Performance**

A harvest of 4,895 rainbow trout in 1995 was the lowest on record for the Eastside and Westside Susitna management units and represents less than half of the historical mean harvest for this stock. Since 1989 there has been a trend of reduced harvests for Susitna River rainbow trout. This trend is not totally understood but the increasingly conservative regulations that govern major rainbow trout populations within the drainage, as well as a growing desire among anglers to release the majority of their trout catch, may be partly responsible.

The catch during the period 1990 through 1994 for the Eastside Susitna Management Unit ranged from 19,915 to 26,329 and averaged 23,200 fish (Table 44). The Westside Susitna Management Unit catch ranged from 23,621 to 46,870 and averaged 32,100. The percentage of the total catch harvested in Eastside and Westside management units ranged from 15%-30% (average 21%) and 8%-12% (average 10%), respectively (Table 44).

During 1995, Willow Creek in the Eastside Susitna Management Unit produced the largest rainbow trout harvest from the Susitna River drainage. An estimated 351 fish were harvested from Willow Creek's catch of 2,340 rainbow trout. The second largest harvest occurred from the Talkeetna River where 287 fish were kept from a catch of 3,510 (Appendix A47 and A48). (Howe et al. 1996).

During 1995 an estimated 565 rainbow trout were harvested in Lake Creek, a Westside Susitna Management Unit fishery, from a catch of 5,546. The Dëshka River, also a Westside Susitna tributary, yielded a rainbow trout harvest and catch of 183 and 2,288 fish, respectively. The Talachulitna River drainage, which is a catch-and-release fishery, produced a catch of 6,286 rainbow trout. In 1995 the rainbow trout catches in all major Susitna River fisheries were well below their 1990-1994 average with the exception of the Yentna River. The 1990-1994 average catch for that system is only 189 (Appendix A49 and A50) (Howe et al. 1996). Three households that responded to the 1995 survey reported catches of 20-80 rainbow trout, pulling the 1995 Yentna catch estimate to 1,638. The catches from those three households alone nearly equal the previous 5-year average. This may be a chance of sampling, or may represent a real change in participation.

The vast majority of the rainbow trout harvest in the Knik Arm Unit resulted from stocked lake fisheries (Appendices A45 and A46). These fisheries have been discussed previously in the Stocked Lake Fisheries section of this report.

### **Management Objectives**

Past and current management of Susitna basin rainbow trout followed the guidelines set forth in the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy.

## **Recent Board of Fisheries Actions**

During the 1996 BOF meeting the Board took a more conservative approach to wild rainbow trout management for NCIMA lakes and streams. The following regulations were adopted:

1. Rainbow trout may not be possessed or retained in all waters of the Prairie Creek drainage and within one-quarter mile of its confluence with the Talkeetna River. In Prairie Creek the bag and possession limits for Arctic grayling are two fish.
2. Only unbaited, single-hook, artificial lures may be used in the Prairie Creek drainage and within one-quarter mile of its confluence with the Talkeetna River.
3. Rainbow trout, Dolly Varden, whitefish, and Arctic grayling may not be possessed or retained in all waters of the Alexander Creek drainage and within one-quarter mile of its confluence with the Susitna River. Northern pike may be possessed and retained.
4. Only unbaited, single-hook, artificial lures may be used in all flowing waters of the Alexander Creek drainage upstream of an ADF&G regulatory marker located 400 yards upstream of the confluence of Trail Creek.
5. Fish Lake Creek (Yentna River) drainage upstream of the first lake is closed to salmon fishing from July 14 through December 31.
6. Unbaited, single-hook, artificial lures are required year-round upstream of the Parks Highway in Rabideux Creek, Montana Creek, Goose Creek, Caswell Creek, Kashwitna River, Gray's Creek, Little Willow Creek, Sheep Creek, Willow Creek and Little Susitna River, and upstream of a department regulatory marker in Birch Creek drainage and Sunshine Creek drainage, and upstream of the Petersville Road in Trapper Creek.
7. Only unbaited, single-hook, artificial lures may be used from September 1 through May 31 in all waters of the above described drainages and in all waters within a one-half mile radius of their confluence with the Susitna River or the mouth of the Little Susitna River.
8. All waters of Rabideux Creek, Trapper Creek, Gray's Creek, and the Kashwitna River within a one-quarter mile radius of their confluence with the Susitna River are closed to sport fishing from June 1 through July 13, except during chinook salmon season as authorized by 5 AAC 61.010(f)(2). Chinook salmon season commences with the second Saturday through Monday in June and continues for three additional consecutive 3-day weekends thereafter.
9. The retention of rainbow trout in the Willow Creek drainage and in all waters within one-half mile radius of its confluence with the Susitna River is prohibited. All rainbow trout caught in the Willow Creek drainage and within a one-half mile radius of its confluence with the Susitna River must be immediately released.
10. Unbaited, single-hook, artificial lures are required year-round in the Willow Creek drainage upstream of a department marker located one-quarter mile upstream from its confluence with the Susitna River and in all waters of the Willow Creek drainage and within a one-half mile radius of its confluence with the Susitna River from September 1 through May 31.
11. The retention of rainbow trout is prohibited in Montana Creek drainage and all waters within a one-half mile radius of its confluence with the Susitna River.

12. Only unbaited, single-hook, artificial lures may be used year-round in Montana Creek upstream of the Parks Highway. Only unbaited, single hook, artificial lures may be used in Montana Creek downstream of the Parks Highway and in all waters within a 1/2 mile radius of its confluence with the Susitna River from September 1 through May 31.
13. The bag and possession limit for rainbow trout in all flowing waters and nonstocked lakes of the Susitna West-Cook Inlet Area open to the retention of rainbow trout is two rainbow trout of which one may be over 20 inches in length and the bag and possession limit in stocked lakes is five rainbow trout of which one may be over 20 inches in length. Stocked lakes are: Barley, Bear Paw, Bench, Benka, Beverly, Big No Luck, Upper and Lower Bonnie, Bruce, B-J, Canoe, Carpenter, Christiansen, Coyote, Crystal, Dawn, Diamond, Echo, Farmer, Finger, Florence, Homestead, Honeybee, Ida, Irene, Klaire, Kalmbach, Kashwitna, Kepler/Bradley, Knik, Lalen, Little Lonely, Little No Luck, Loberg (Junction), Long (Glenn Highway MP 86), Loon, Lorraine, Lucille, Lynne, Marion, Matanuska, Meirs, Memory, Morvro, North Friend, Prator, Ravine, Reed, Rocky, Ruby, Seventeenmile, Seymour, Slipper, South Friend, South Rolly, Tigger, Twin Island, Vera, Victor, Visnaw, Walby, Weiner, West Sunshine, Willow, Wolf, and Y.

### **Current Issues**

Issues concerning NCIMA wild rainbow trout include the need for evaluation of clearwater streams and tributaries in the greater Mat-Su urban area. Rainbow trout harvests continue to decline while pressure from a growing urban population continues to increase. It is imperative to understand the population dynamics of these systems to effectively manage the resource, however, little information is available regarding the resident fish populations in most of these systems.

### **Ongoing Research and Management Activities**

Catch and harvest trends for rainbow trout are measured by the SWHS.

A stock assessment program was initiated on the north fork of the Kashwitna River and Willow Creek during 1996. Fish were captured, measured, tagged with a Floy anchor tag and a scale was removed for age determination. All age classes were found in both populations of rainbow trout, but fish were more abundant in the North Fork Kashwitna. Eight percent of the fish captured in the North Fork Kashwitna exceeded 20 inches in length compared with 2% of the Willow Creek sample. The data collected will provide an index for future management of these fisheries.

### **Recommended Research and Management Activities**

Age and length assessment of primary rainbow trout fisheries including, but not limited to the Talachulitna River, Willow Creek and the north fork of the Kashwitna should be conducted over a period of years to determine if a trend in age and size composition exists. Methods need to be developed to measure the abundance of rainbow trout in key fisheries to identify conservation problems.

A population estimate and age composition description of rainbow trout should be conducted in the Willow Creek drainage. This study should be conducted for a series of years or on a 3-year cycle to determine if establishing the stream as a special management area for rainbow trout has an effect on the abundance and age composition of rainbow trout in this drainage. A method should be adopted to determine where Willow Creek rainbow trout are harvested.

A list of proposed studies to be conducted on resident fish populations should be developed. Available information for most resident fish species is limited to findings of the SWHS.

An evaluation of burbot in Nancy Lake and Big Lake should be conducted. Nancy Lake was closed to burbot fishing beginning in 1993 and the Big Lake bag limit was reduced due to stock conservation concerns.

SWHS catch and harvest information for Arctic grayling suggest this species is being overharvested. Bag and possession limits for Arctic grayling should be reduced areawide. Information regarding Arctic grayling stock status should be collected during all resident fish projects.

The department should continue to participate in land and water use planning.

## **NORTHERN PIKE FISHERIES**

### **Background and Historical Perspective**

Northern pike are not indigenous to the NCIMA. They were illegally introduced into this area during the early 1950s. Since then, northern pike have been reported in nearly 70 lakes and more than a dozen tributaries of the Susitna River (Appendix G) (D. Rutz, Alaska Department of Fish and Game, Palmer, personal communication). Prior to 1992 several of these lakes consistently produced fish in the trophy class range (greater than 42.5 inches or 1,080 mm). Northern pike weighing up to 20 lb were commonly caught with fish occasionally weighing over 30 lb (D. Rutz, Alaska Department of Fish and Game, Palmer, personal communication).

The harvest of northern pike in the NCIMA numbered less than 200 fish, which barely accounted for 1% of the statewide harvest of northern pike when the SWHS was initiated in 1977 (Mills 1979) (Table 45). Northern pike harvests slowly increased through 1983 when the harvest remained less than 1,000 fish. Since 1984 the harvest of northern pike has greatly increased. The average harvest during 1984-1987 was 1,916 while 1988-1991 averaged 3,946 fish (Figure 21) (Mills 1985-1992). The harvest of northern pike increased at an annual rate of about 23% from 1977 through 1991. The highest reported harvest of 6,640 fish occurred in 1991. Though northern pike harvests have decreased since 1991, the catch nearly doubled from 1990 to 1993. This may indicate that the size of harvested pike may be decreasing. This became evident in 1994 when the overall catch dropped to a 5-year low of 8,252 fish, a decrease of 76% from the previous year's 34,218 catch (Howe et al. 1995). The decrease in both catch and harvest is probably the result of reduced availability of large pike. Anglers prefer to fish for large pike and once the large (old) fish have been removed anglers quickly lose interest in pursuing the remaining fish.

### **Recent Fishery Performance**

The NCIMA harvest of northern pike during the 1995 season was 3,546 fish. The Westside Susitna Management Unit accounted for about 85% of this harvest and the Knik Management Unit the remainder (Table 45, Appendices A54-A56). The SWHS has not documented harvests of northern pike from the Eastside Susitna Management Unit or the West Cook Inlet Management Unit, so other than public testimony no information is available regarding northern pike harvest from these areas.

**Table 45.-Northern Cook Inlet Management Area recreational catch and harvest of northern pike by management unit, 1977-1995.**

Year	Northern Cook Inlet Management Area <sup>a</sup>						Region II		Statewide	
	Knik Arm Unit <sup>b</sup>		Westside Susitna Unit		Total		Harvest Number	Harvest % NCIMA	Harvest Number	Harvest % NCIMA
	Catch <sup>c</sup>	Harvest	Catch <sup>c</sup>	Harvest	Catch <sup>c</sup>	Harvest				
1977		0		132		132	321	41.1	11,982	1.1
1978		0		316		316	767	41.2	12,520	2.5
1979		0		382		382	762	50.1	12,741	3.0
1980		0		232		232	1,358	17.1	17,000	1.4
1981		0		125		125	1,411	8.8	16,536	0.7
1982		0		607		607	1,707	35.5	18,964	3.2
1983		0		944		944	2,642	35.7	21,476	4.4
1984		0		1,821		1,821	4,424	41.2	18,641	9.8
1985		156		1,248		1,404	2,240	62.7	17,943	7.8
1986		458		1,519		1,977	2,894	68.3	21,890	9.0
1987		924		1,540		2,464	4,839	50.9	19,079	12.9
1988		364		2,818		3,182	3,598	88.4	23,440	13.6
1989		863		2,257		3,120	4,434	70.4	21,659	14.4
1990	2,593	754	14,465	2,088	17,058	2,842	3,655	77.7	15,985	17.3
1991	7,021	2,709	11,193	3,931	18,214	6,640	8,704	76.3	29,611	22.4
1992	7,097	2,605	13,828	2,777	20,925	5,382	7,314	73.6	18,616	28.9
1993	10,141	2,102	24,077	3,619	34,218	5,717	7,131	80.2	19,366	29.5
1994	2,816	1,328	5,436	2,556	8,252	3,884	5,800	67.0	25,785	15.1
90-94 Mean	5,934	1,900	13,800	2,994	19,733	4,893	6,521	75.0	21,873	22.4
1995	825	522	15,414	3,024	16,239	3,546	5,323	66.6	19,006	18.7

<sup>a</sup> No reported catch or harvest from Eastside Susitna or West Cook Inlet management units.

<sup>b</sup> Harvest of northern pike prior to 1985 may have been included in other fish species category.

<sup>c</sup> Catch estimates available beginning in 1990.

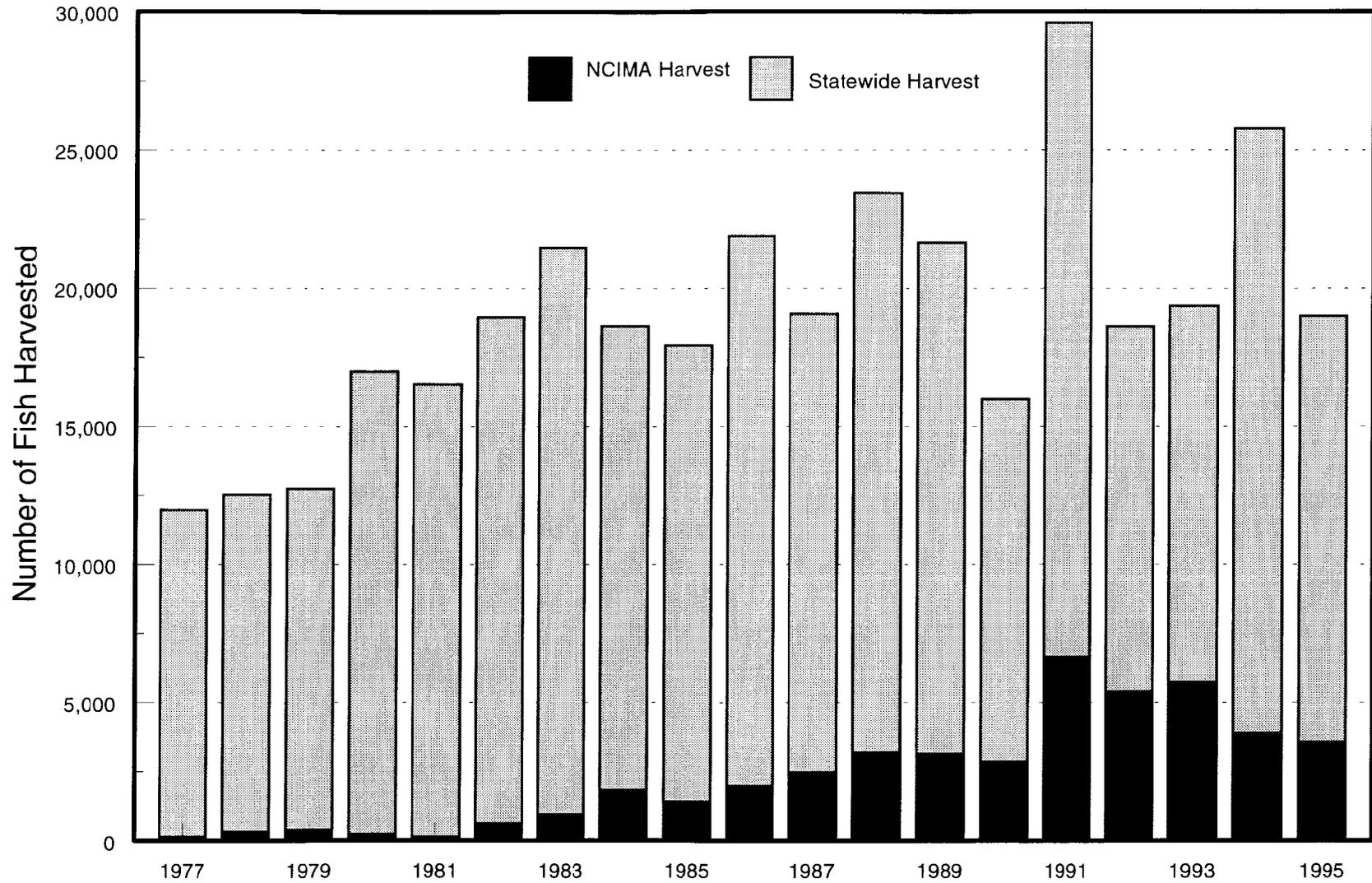


Figure 21.-Estimated northern pike harvest from Northern Cook Inlet Management Area and statewide, 1977-1995

The NCIMA catch of northern pike during 1995 was 16,239 fish with 95% of this catch being reported from the Westside Susitna Management Unit. The percentage of fish kept increased dramatically from 17% in 1993 to 47% during 1994. During 1995 the catch nearly doubled the 1994 level while the harvest remained approximately equal (Table 45).

### **Management Objectives**

There are no objectives established governing the management of this fishery. During the 1996 BOF meetings the department supported various proposals to liberalize sport fishing gear and bag limits for northern pike.

### **Recent Board of Fisheries Actions**

During the 1996 BOF meeting the following regulations were adopted:

1. Sport fishing for northern pike using five (5) lines is allowed in specified lakes of the Susitna West-Cook Inlet Area provided hooks are single hooks with a gap between the point and shank no smaller than 3/4 inch, the lines are closely attended, and all species of fish other than northern pike are immediately released. Specified lakes include: Alexander Lake, Sucker Lake, Trapper Lake, Flathorn Lake, Whiskey Lake, Hewitt Lake, Donkey Lake, Three Mile Lake (Beluga area), Neil Lake, Kroto Lake, and lakes of the Nancy Lake Recreation Area excluding Nancy and Big No Luck Lake.
2. The 10 fish bag and possession limit on northern pike in the Susitna-West Cook Inlet Area was repealed. There is no bag, possession or size limit on northern pike in the Susitna-West Cook Inlet Area.

The next BOF meeting will be in 1998.

### **Current Issues**

Northern pike are well known for their voracious appetites. Several states including Wyoming, Idaho, Maine, and Michigan have addressed northern pike predation on salmonids as a major management concern (D. Rutz, Alaska Department of Fish and Game, Palmer, personal communication). Other state agencies rely on stocking northern pike to control populations of undesirable species. In Alaska there is a growing concern by commercial fishermen, recreational anglers and fishery managers that northern pike predation on chinook, coho and sockeye salmon as well as rainbow trout may adversely impact these stocks during a period in which they are subject to increasing harvest. Many people favor eradicating northern pike to reduce their impact on other resident fish species. Studies have shown that in several Susitna Basin streams there is an overlap between salmonid and northern pike habitat. Juvenile salmon stocks (mostly coho salmon) can be quickly eliminated by northern pike predation (Rutz 1996). In addition, the decimation of rainbow trout and grayling stocks within some of these systems has also been attributed to northern pike predation. Northern pike prefer soft rayed fish as a food source. This was evident with northern pike sampled in Hewitt, Moose, Indian and Witso creeks where sockeye salmon, rainbow trout and coho salmon juveniles were preferred over stickleback (Rutz 1996). Once preferred food items have been depleted, northern pike quickly adapt to alternative sources (Chapman et al. 1979, Rutz 1996) such as insects.

Although there are concerns regarding the impact on salmon and rainbow trout stocks as a result of northern pike predation, many recreational anglers welcome a healthy pike population as they provide increased recreational opportunities during the entire year. Throughout literature there is

a history of overexploitation of northern pike due to increasing recreational harvests. Even though the northern pike sport fishery in Upper Cook Inlet is fairly new, the performance of this fishery already suggests overexploitation as evidenced by the lack of large (old) fish. However, a management scheme to produce large pike would be detrimental to indigenous resident species and salmonid populations.

### **Ongoing Research and Management Activities**

Age, size, weight and sex samples were collected from a limited number of northern pike during the winter of 1993 and spring of 1994 and 1995. In addition an investigation of juvenile coho salmon in pike infested waters and a northern pike dietary study was conducted during 1995. Radio transmitters were implanted in 38 northern pike during 1994 and monitored through the spring of 1995.

During 1996, 18 northern pike were captured and surgically implanted with radio-transmitters in four selected Susitna River tributaries. The objectives were: (1) to estimate the age and length composition of northern pike in select Susitna River tributaries, (2) to determine monthly movements and distribution of radio-tagged northern pike in select Susitna River tributaries, (3) to estimate the number of northern pike stomachs containing salmonids, and (4) to estimate the species composition of prey items contained in nonempty stomachs. Radioed northern pike were monitored monthly to determine movement. All northern pike captured in the vicinity of confirmed locations of radioed northern pike were dispatched and dissected. The stomach contents were analyzed to determine prey species and composition. Minnow traps were also set near areas with signals from radioed northern pike to determine the availability of prey items. This study was primarily conducted to determine food preferences of northern pike in relation to availability of prey items, and for an indication of the effect that northern pike predation is having on Susitna River juvenile salmon.

### **Recommended Research and Management Activities**

We recommend that the current northern pike research program be discontinued as of July 1, 1997.

We recommend that the northern pike abundance be estimated in the Doshka River to determine if northern pike could be an influencing factor on reduced production of chinook salmon in this drainage.

## **ACKNOWLEDGMENTS**

Much of the content of this report was taken from Larry Engel and Doug Vincent-Lang's 1992 NCIMA report to the Board of Fisheries. Craig Baer and Dave Rutz made significant contributions to the stocked lakes, rainbow trout and northern pike sections; Larry Erie contributed access information and Terry Bradley contributed to the coho section. Margaret Leonard and Sandy Sonnichsen are responsible for the editing and finalizing of the document.

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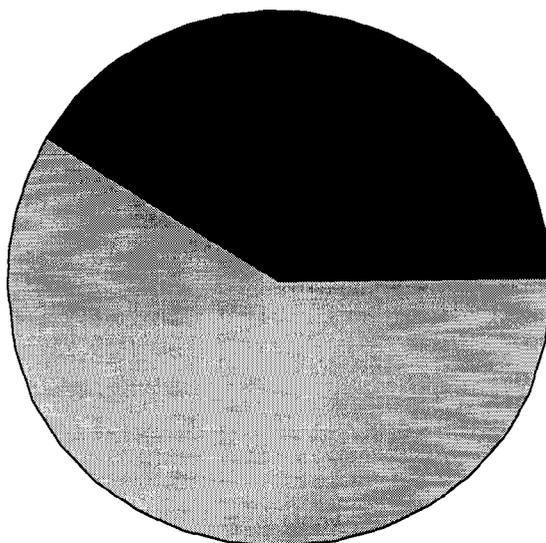
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## **APPENDIX A**

Other Species 41.0%

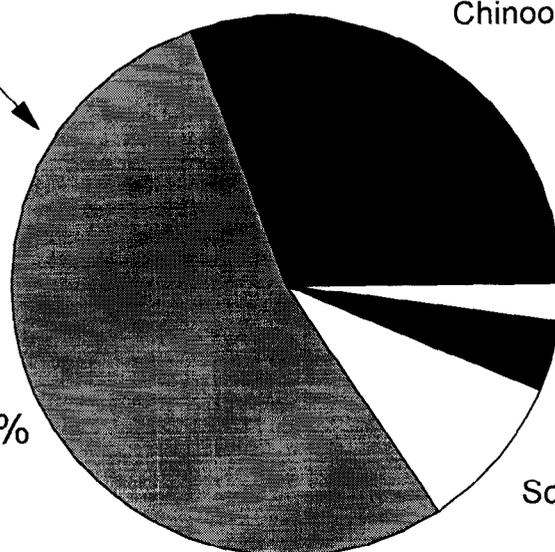


Anadromous Salmon 59.0%



Chinook 30.4%

Coho 53.7%



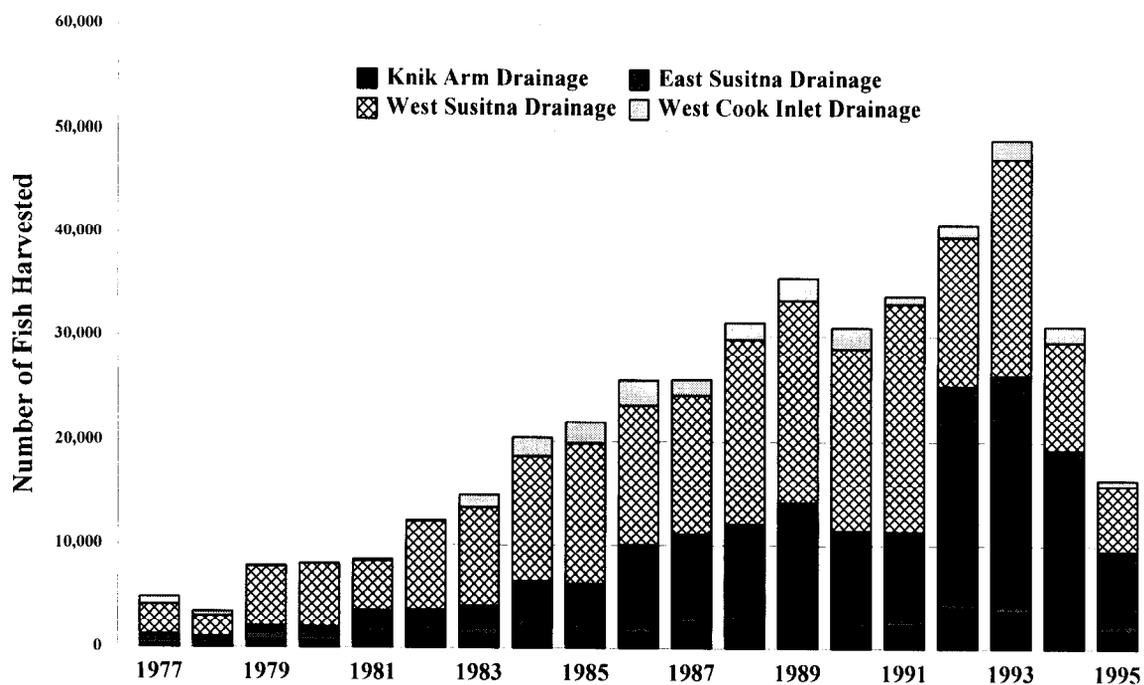
Chum 2.3%

Pink 4.2%

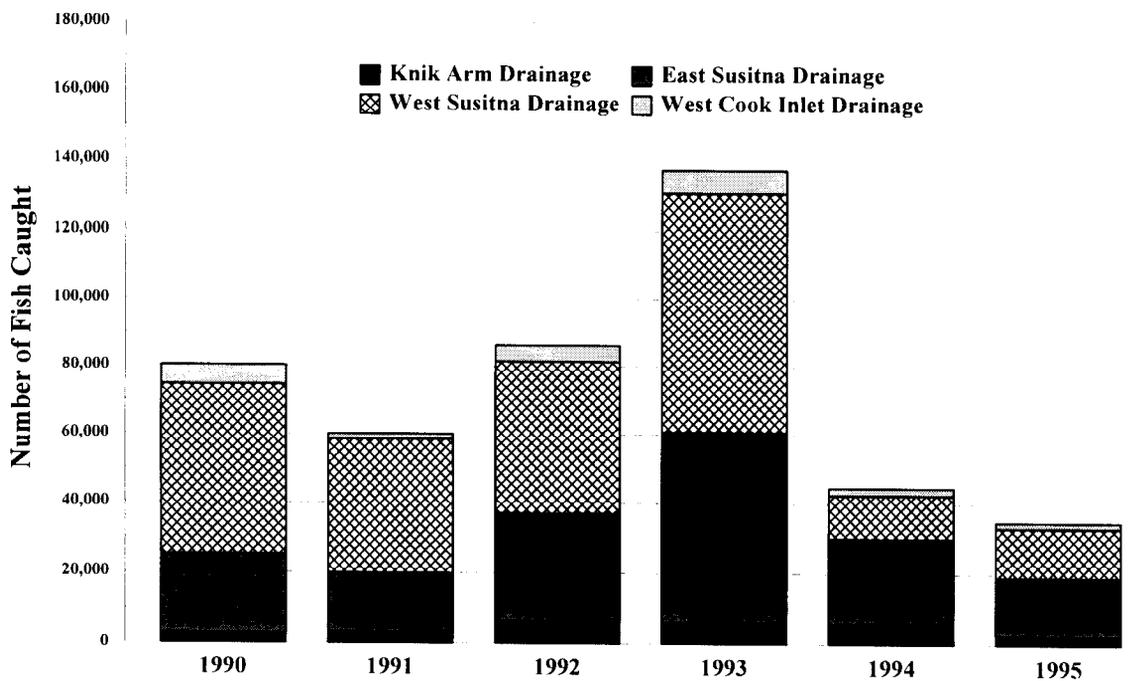
Sockeye 9.4%

**Appendix A1.-Northern Cook Inlet Management Area sport fish harvest anadromous salmon composition, 1977-1995.**

## Harvest



## Catch



Appendix A2.-Northern Cook Inlet Management Area recreational chinook salmon harvest and catch, 1977-1995.

**Appendix A3.-Knik Arm drainage chinook salmon harvest by fishery, 1977-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1977			191			0			16	207
1978			93			47			0	140
1979			800			0	0		0	800
1980			646			0	0		0	646
1981			1,418	0		0	0		48	1,466
1982			1,467	0		0	0		199	1,666
1983	16	47	1,187	5		0	0		0	1,255
1984	125	24	1,883	0	0	0	0		25	2,057
1985			1,845	0	0	0	0	44	0	1,889
1986		50	1,457	0	0	0	0	0	17	1,524
1987	117	58	2,282	0	0	0	0	19	0	2,476
1988	0	0	2,822	0	0	66	0	0	28	2,916
1989	77	44	4,204	0	0	16	0	0	0	4,341
1990	28	23	1,965	0	0	6	0	0	0	2,022
1991	129	23	2,102	0	0	17	0	6	0	2,277
1992	16	8	3,920	0	0	9	0	0	16	3,969
1993	104	48	3,441	0	0	9	0	0	0	3,602
1994	0	20	4,204	0	0	0	0	0	79	4,303
90-94 Mean	55	24	3,126	0	0	0	0	1	19	3,235
1995		9	1,698	0	0	0	0	0	0	1,707

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A4.-Knik Arm drainage chinook salmon catch by fishery, 1990-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1990	40	29	3,069	0	0	12	0	0	90	3,240
1991	129	102	3,012	0	0	17	0	45	6	3,311
1992	16	17	6,484	0	0	48	0	9	16	6,590
1993	218	58	6,223	0	0	189	0	0	9	6,526
1994	0	20	5,993	0	0	0	0	0	129	6,142
90-94 Mean	101	45	4,956	0	0	19	0	11	50	5,162
1995		66	2,705	0	0	0	0	0	0	2,771

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A5.-Eastside Susitna River drainage chinook salmon harvest by fishery, 1977-1995.**

Year	Willow Creek	Lt.Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna <sup>a</sup> River	Other <sup>b</sup>	Total
1977	137	16			259		415			25	204	1,056
1978	47	0			256		408			12	163	886
1979	459	0		156	10		312		10	312	39	1,298
1980	289	32		215	45		559		13	172	45	1,370
1981	585	0		249	0		661		57	373	277	2,202
1982	629	0		471	0		241		52	450	220	2,063
1983	534	0	231	272	0		504		105	934	272	2,852
1984	774	37	0	586	0	0	1,522		125	1,272	112	4,428
1985	1,063	25		527	0		979		771	871	106	4,342
1986	1,017	872	73	327	1,778	145	2,796	290	327	908	36	8,569
1987	1,987	711	116	88	1,610	334	1,726	44	319	1,639	29	8,603
1988	2,349	937	0	578	1,847	218	1,070	28	303	1,762	47	9,139
1989	2,846	507	11	357	1,116	385	1,708	28	368	2,372	85	9,783
1990	3,237	387	6	330	1,537	504	478		465	2,358	121	9,423
1991	3,208	684	41	305	1,519	288	575	47	230	2,025	161	9,083
1992	8,884	1,023	16	592	2,663	1,033	3,078	101	365	3,338	214	21,307
1993	8,626	1,200	38	531	2,300	633	4,054	9	280	4,729	288	22,688
1994	5,980	745	78	562	1,349	361	3,111	108	297	2,144	235	14,970
90-94 Mean	5,987	808	36	464	1,874	564	2,259	66	327	2,919	204	15,494
1995	2,742	436	18	397	746	226	1,004	0	132	2,126	45	7,872

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A6.-Eastside Susitna River drainage chinook salmon catch by fishery, 1990-1995.**

Year	Willow Creek	Lt.Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna <sup>a</sup> River	Other <sup>b</sup>	Total
1990	7,551	762	51	1,408	3,333	1,008	1,098		749	5,633	484	22,077
1991	5,267	886	75	420	2,421	725	1,766	80	351	4,215	368	16,574
1992	12,609	1,472	127	948	3,134	1,136	4,650	86	518	5,273	568	30,521
1993	21,555	2,710	88	830	4,412	1,482	9,305	37	461	12,205	1,183	54,268
1994	8,978	1,494	107	767	1,974	609	4,931	162	420	4,088	455	23,985
90-94 Mean	11,192	4,465	90	875	3,055	992	4,350	91	500	6,283	612	29,485
1995	4,897	905	91	519	1,323	422	2,226	0	245	5,464	284	16,376

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A7.-Westside Susitna River drainage chinook salmon harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	820	1,017					464		224	413	0	2,938
1978	769	850					326		12	82	0	2,039
1979	712	2,811					1,796		293	156	0	5,768
1980	1,438	3,685					775		121	129	0	6,148
1981	1,121	2,769					795		57	0	0	4,742
1982	2,506	4,307					1,645		0	115	0	8,573
1983	1,711	4,889					2,423		336	209	0	9,568
1984	2,107	5,699				112	2,881		424	709	174	12,106
1985	2,761	6,407					2,575		224	1,677	0	13,644
1986	2,937	6,490		44			2,134	647	201	904	45	13,402
1987	2,224	5,632					3,282	834	116	1,252	10	13,350
1988	4,687	5,474				549	2,784	729	909	829	9	15,970
1989	4,882	8,062	12	81	215	339	3,554	1,202	403	575	18	19,343
1990	5,119	6,161	55		178	385	3,423	740	709	631	24	17,425
1991	6,548	9,306			301	495	2,712	660	848	942	24	21,836
1992	4,124	7,256	23		652	655	3,668	879	445	867	168	18,737
1993	5,154	5,682			653	283	6,425	1,148	875	922	0	21,142
1994	3,070	624			402	202	3,548	930	927	545	0	10,248
90-94 Mean	4,803	5,806	39		437	404	3,955	871	761	781	43	17,878
1995	1,217	0			425	252	2,838	545	509	479	0	6,265

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A8.-Westside Susitna River drainage chinook salmon catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	13,939	16,438	108		346	910	9,544	1,897	3,485	2,594	109	49,370
1991	11,319	14,006	0		441	2,076	5,321	1,242	2,885	1,417	87	38,794
1992	9,777	13,911	70		1,395	1,361	9,444	1,940	3,839	2,175	477	44,389
1993	15,897	14,032			1,462	1,712	25,150	2,725	6,492	2,579	0	70,049
1994	4,749	730			482	259	4,240	1,133	1,329	660	0	12,582
90-94 Mean	10,936	11,823			825	1,264	10,740	1,787	3,606	1,885	135	46,037
1995	2,225	232			1,123	725	5,627	1,193	2,207	805	0	14,137

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

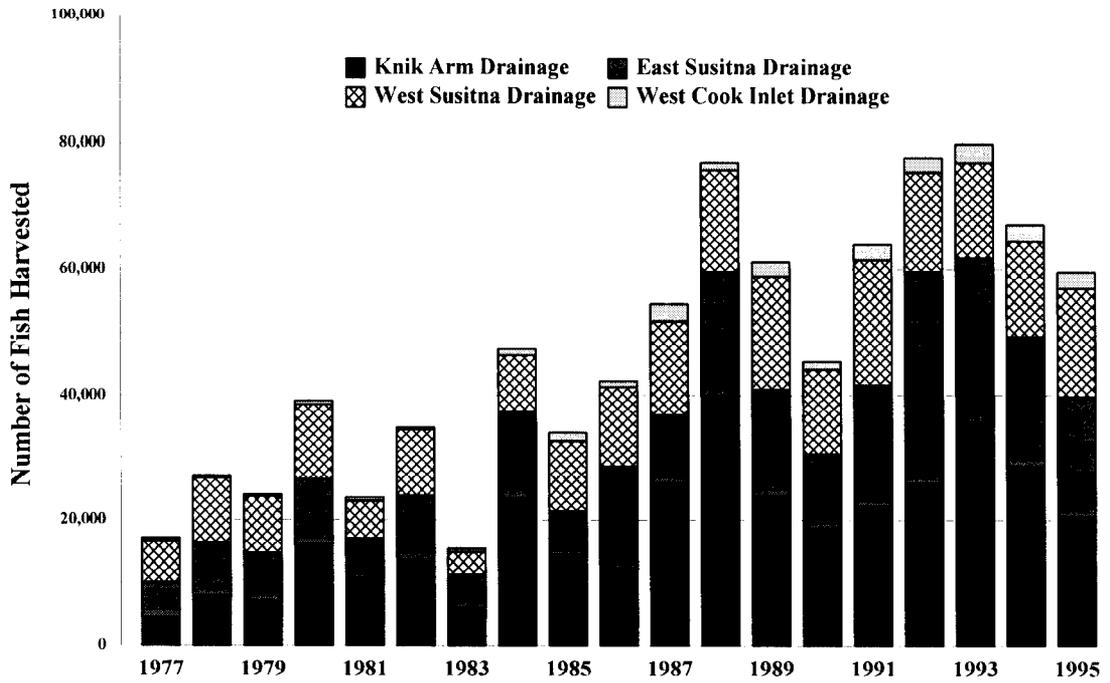
**Appendix A9.-West Cook Inlet drainage chinook salmon harvest by fishery, 1977-1995.**

Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other Sites	Total
1977	227		237	9		473
1978	408		58	12		478
1979	78		20	0		98
1980	17		17	0		34
1981	115		77			192
1982	105		42			147
1983	1,185		0			1,185
1984	723		1,110			1,833
1985	734		1,195	100		2,029
1986	960		1,418			2,378
1987	146		1,146	185		1,477
1988	312		1,137	246		1,695
1989	581	237	1,317	190		2,325
1990	1,064		748	285		2,097
1991	377		369	16		762
1992	516	175	522			1,213
1993	893		527	27	408	1,855
1994	530		581		466	1,577
90-94 Mean	676	175	549	109	437	1,501
1995	201		360	0	113	674

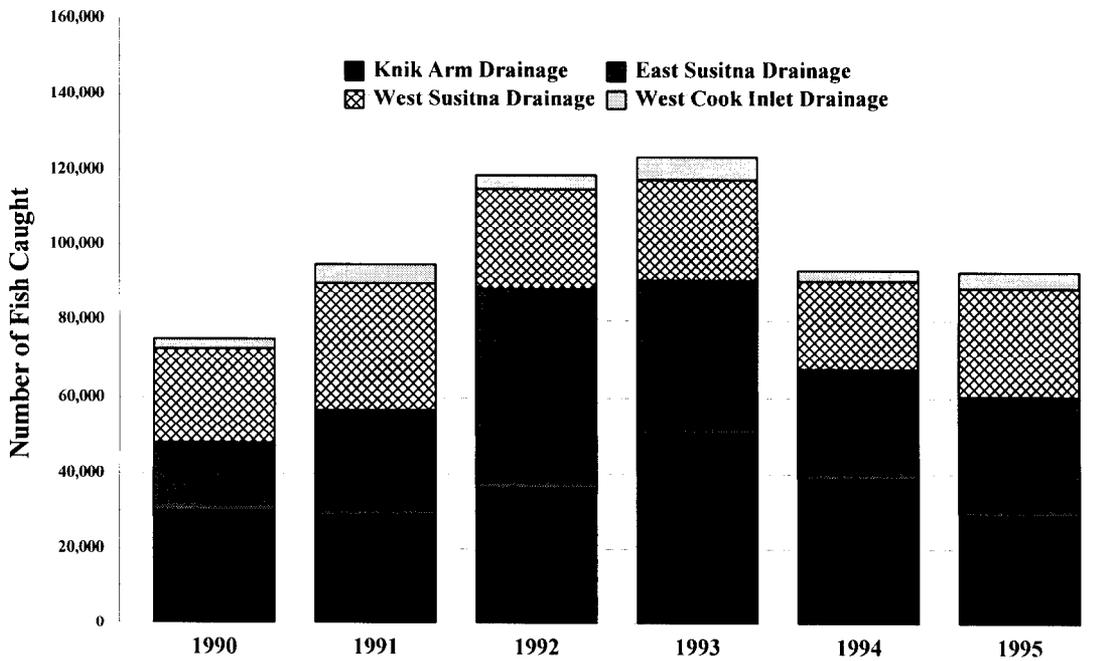
**Appendix A10.-West Cook Inlet drainage chinook salmon catch by fishery, 1990-1995.**

Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other Sites	Total
1990	2,659		2,252	887		5,798
1991	834		692	16		1,542
1992	2,848		1,945		207	5,000
1993	3,929		1,390	409	875	6,603
1994	699		877		565	2,141
90-94 Mean	2,568		1,570	437	541	4,217
1995	602		748		438	1,788

## Harvest



## Catch



**Appendix A11.-Northern Cook Inlet Management Area recreational coho salmon harvest and catch, 1977-1995.**

**Appendix A12.-Knik Arm drainage coho salmon harvest by fishery, 1977-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Jim Creek <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1977			3,415			472			479	4,366
1978			4,865			2,112			918	7,895
1979			3,382			1,211	1,198		1,348	7,139
1980			6,302			3,555	3,375		2,798	16,030
1981			5,940	1,801		814	1,373		556	10,484
1982			7,116	2,306		1,624	1,886		744	13,676
1983	983	513	2,835	774		345	518		171	6,139
1984	1,060	12	14,253	3,429	561	1,920	1,895		299	23,429
1985		120	7,764	2,523	557	1,900	1,005	284	186	14,339
1986		106	6,039	2,948	502	944	690	364	768	12,361
1987	181	453	13,003	3,676	2,318	1,195	1,159	833	2,969	25,787
1988	200	73	19,009	11,078	3,329	1,273	746	1,637	2,692	40,037
1989	142	204	14,129	4,220	1,666	975	876	784	850	23,846
1990	251	35	7,497	6,184	1,012	1,012	286	398	2,087	18,762
1991	255	182	16,450	2,920	631	844	176	486	242	22,186
1992	130	0	20,033	3,409	664	413	348	526	291	25,814
1993	181	984	27,610	2,878	1,337	1,133	736	741	163	35,763
1994	100	99	17,665	3,946	3,553	1,390	1,100	492	194	28,539
90-94 Mean	183	260	17,851	3,867	1,439	958	529	529	595	26,213
1995		132	14,451	3,549	990	445	340	435	308	20,650

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A13.-Knik Arm drainage coho salmon catch by fishery, 1990-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1990	342	63	12,403	8,774	1,675	1,361	433	677	4,230	29,958
1991	364	249	21,142	3,715	917	1,068	310	637	406	28,808
1992	308	0	27,993	4,672	1,069	688	494	681	412	36,317
1993	267	1,042	38,199	4,365	1,615	2,132	1,032	1,133	889	50,674
1994	100	139	22,241	5,168	6,792	1,727	1,347	627	593	38,734
90-94 Mean	276	299	24,396	5,339	2,414	1,395	723	751	1,306	36,898
1995		273	19,853	4,435	1,441	771	359	577	1,149	28,858

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A14.-Eastside Susitna River drainage coho salmon harvest by fishery, 1977-1995.**

Year	Willow Creek	Lt. Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna <sup>a</sup> River	Other <sup>b</sup>	Total
1977	679	225			438		1,415			1,070	1,882	5,709
1978	905	151			478		2,451			2,200	2,388	8,573
1979	462	262		624	462		1,735		774	1,248	1,997	7,564
1980	1,207	494		1,124	430		2,684		1,534	661	2,234	10,368
1981	747	29		901	326		2,261		968	422	939	6,593
1982	1,069	398		776	367		3,060		1,719	996	1,782	10,167
1983	576	52	52	408	596		1,402		722	836	532	5,176
1984	1,846	1,147	162	1,247	661	449	4,502		1,733	1,509	660	13,916
1985	1,026	528		608	478		1,972		1,205	747	478	7,042
1986	944	363	871	472	1,343	363	1,488	980	4,029	3,376	1,961	16,190
1987	2,898	561	36	453	1,068	145	1,394	163	1,612	2,608	90	11,028
1988	4,875	1,237	327	1,455	3,165	291	2,219	691	2,146	2,929	183	19,518
1989	4,218	1,388	336	834	2,231	190	2,295	281	2,159	2,775	371	17,078
1990	2,711	639	197	2,596	991	180	778		704	2,539	408	11,743
1991	4,154	1,308	167	3,819	1,544	657	1,612	322	1,761	3,435	700	19,479
1992	8,591	1,830	713	5,393	4,049	502	3,595	858	2,259	5,531	469	33,790
1993	5,743	1,213	554	2,385	2,413	428	3,496	535	2,922	5,830	544	26,063
1994	4,504	1,452	328	1,569	1,586	478	2,619	281	1,906	5,476	671	20,870
90-94 Mean	5,141	1,288	392	3,152	2,117	449	2,420	499	1,910	4,562	558	22,389
1995	3,498	992	472	1,687	1,092	152	2,385	198	1,385	6,672	632	19,165

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A15.-Eastside Susitna River drainage coho salmon catch by fishery, 1990-1995.**

Year	Willow Creek	Lt. Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna <sup>a</sup> River	Other <sup>b</sup>	Total
1990	4,111	1,007	344	3,276	1,581	254	1,491		950	4,488	672	18,174
1991	5,189	1,792	260	4,768	2,579	676	2,393	322	2,846	5,134	1,983	27,942
1992	12,300	3,037	972	7,171	5,531	664	6,397	1,126	3,182	9,717	1,864	51,981
1993	7,964	1,481	606	3,308	4,475	771	5,134	764	3,787	10,661	937	39,888
1994	5,845	1,806	328	1,796	1,959	615	3,296	525	2,116	8,485	1,946	28,717
90-94 Mean	7,082	1,825	502	4,068	3,225	596	3,742	684	2,576	7,697	1,480	33,340
1995	4,752	1,466	604	1,838	1,593	239	3,545	415	1,705	14,011	1,434	31,062

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A16.-Westside Susitna River drainage coho salmon harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Peters Creek	Yentna River	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other <sup>b</sup>	Total
1977	1,562	559				1,203		346	2,929	6,599
1978	2,401	1,789				2,212		88	3,683	10,173
1979	1,560	973				2,671		125	3,707	9,036
1980	999	2,290				2,351		491	6,010	12,141
1981	891	632				1,035		240	3,142	5,940
1982	1,907	2,463				1,603		524	4,161	10,658
1983	408	1,036				1,392		84	690	3,610
1984	1,509	1,646		12		2,432		486	3,426	9,511
1985	1,455	2,637				4,105		224	2,849	11,270
1986	1,352	4,256				1,575	324	402	5,208	13,177
1987	1,539	2,789				1,358	362	235	2,463	8,746
1988	1,965	7,458		18		2,110	400	418	3,914	16,283
1989	2,207	8,947	409	47	103	1,907	549	688	3,369	18,226
1990	1,973	4,959	540	33	353	2,986	793	276	1,970	13,883
1991	2,296	8,111	32	221	718	4,221	1,081	828	2,999	20,507
1992	834	7,110	543	300	275	2,632	575	405	3,544	16,218
1993	1,719	6,530		67	227	3,101	920	152	2,738	15,454
1994	2,188	5,511		72	556	2,723	714	427	3,170	15,361
90-94 Mean	1,802	6,444	372	139	426	3,133	817	418	2,884	16,285
1995	2,692	2,275		183	569	4,736	1,058	1,031	4,604	17,148

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet Management Unit lakes and streams.

**Appendix A17.-Westside Susitna River drainage coho salmon catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Peters Creek	Yentna River	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other <sup>b</sup>	Total
1990	2,931	8,629	672	110	617	4,573	1,212	849	4,901	24,494
1991	3,465	10,849	32	1,112	211	7,424	1,491	3,716	4,484	32,974
1992	1,725	10,211	794	308	640	4,251	1,142	1,215	6,436	26,722
1993	2,698	10,698		181	370	5,401	1,342	408	5,966	27,064
1994	2,723	8,579		136	556	3,872	1,194	1,492	4,431	22,983
90-94 Mean	2,744	9,793	499	191	659	5,104	1,276	1,536	5,244	26,847
1995	3,098	3,746		874	634	6,135	1,921	5,271	6,502	28,181

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet Management Unit lakes and streams.

**Appendix A18.-West Cook Inlet drainage coho salmon harvest by fishery, 1977-1995.**

Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	316		113	103		532
1978	277		101	0		378
1979	287		50	0		337
1980	258		370	0		628
1981	594		10			604
1982	220		115			335
1983	554		10			564
1984	898		137			1,035
1985	1,095		261	75		1,431
1986	815		168			983
1987	1,684		996	145		2,825
1988	782		400	0		1,182
1989	1,228	419	502	112	9	2,270
1990	1,113		198	33		1,344
1991	1,791		513	181		2,485
1992	1,547	243	421			2,211
1993	1,313		236	194	1,217	2,960
1994	559		521		1,615	2,695
90-94 Mean	1,265	243	378	136	1,416	2,339
1995	1,407		372		891	2,670

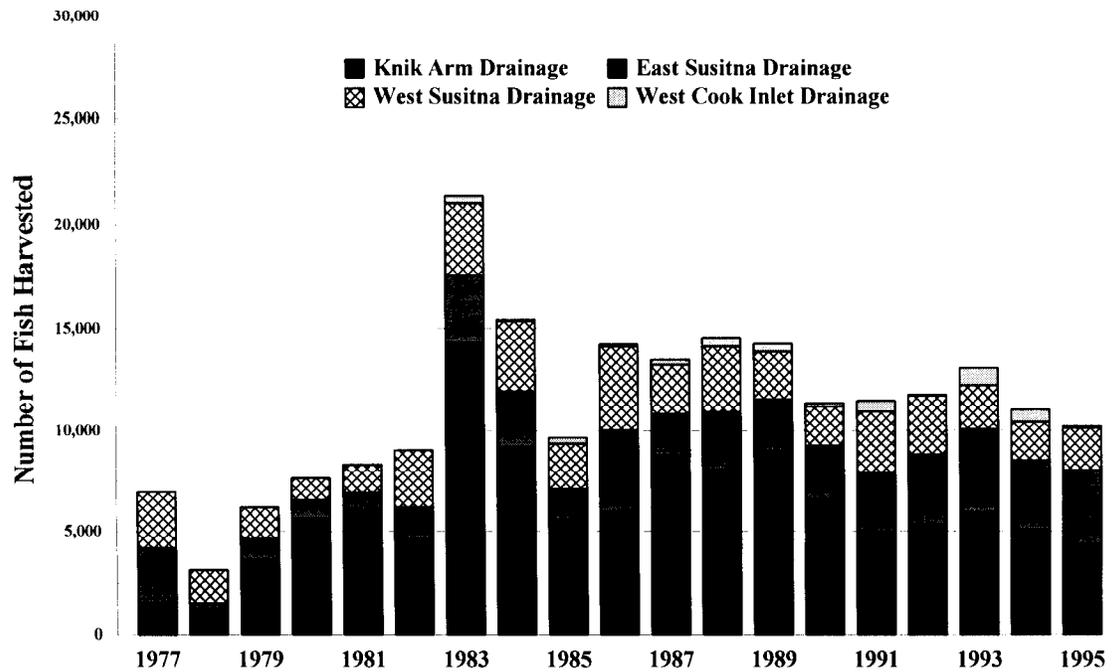
<sup>a</sup> Includes lakes and streams.

**Appendix A19.-West Cook Inlet drainage coho salmon catch by fishery, 1990-1995.**

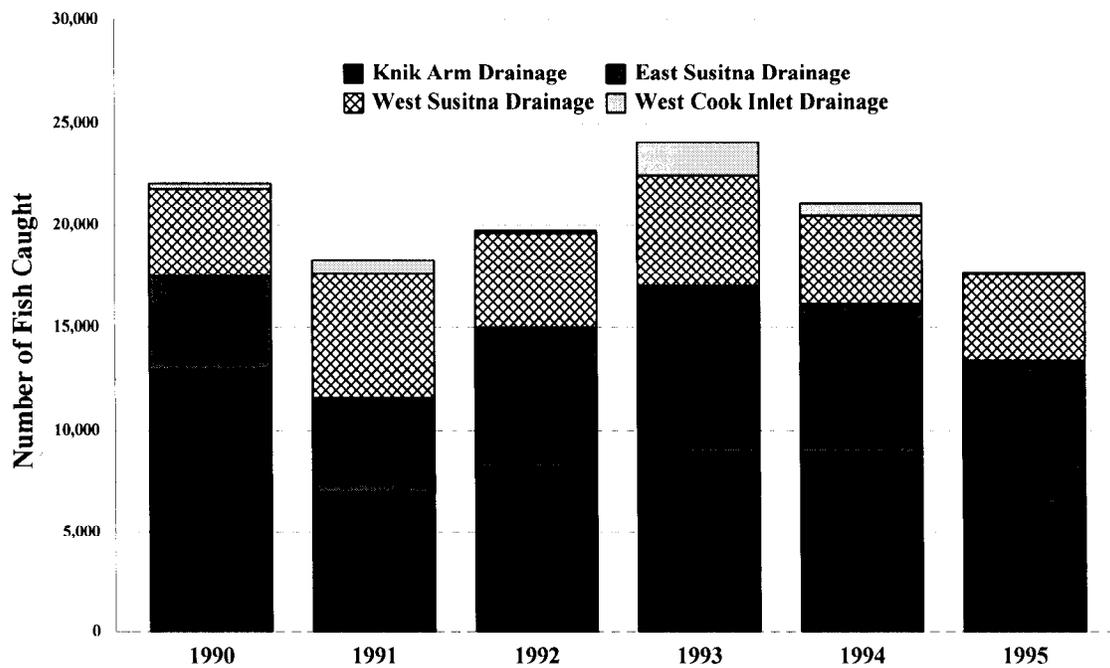
Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1990	2,336		231	44		2,611
1991	4,292		757	205		5,254
1992	2,486		1,207		259	3,952
1993	2,878		686	270	2,200	6,034
1994	691		693		1,713	3,097
90-94 Mean	2,537		715	173	1,391	4,190
1995	2,626		815		1,047	4,488

<sup>a</sup> Includes lakes and streams.

## Harvest



## Catch



Appendix A20.-Northern Cook Inlet Management Area recreational sockeye salmon harvest and catch, 1977-1995.

**Appendix A21.-Knik Arm drainage sockeye salmon harvest by fishery, 1977-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Big Lake	Nancy Lake <sup>c</sup>	Other <sup>d</sup>	Total
1977			888			274			37	56	321	1,576
1978			859			0			0	14	366	1,239
1979			1,478			0	1,525		157	0	456	3,616
1980			2,127			0	2,660		43	69	775	5,674
1981			1,619	450		0	3,245		134	316	316	6,080
1982			1,865	880		0	608		126	618	524	4,621
1983	6,013	1,748	2,787	1,277		0	1,632		89	587	164	14,297
1984	499	237	6,385	823	187	200	661		175	12	61	9,240
1985		76	2,894	1,037	142	120	1,179	109	22	33	0	5,612
1986		50	3,616	905	28	61	789	39	0	99	422	6,009
1987	417	435	3,513	1,105	254	18	869	1,087	0	670	417	8,785
1988	437	36	2,310	1,928	200	36	346	2,037	0	109	637	8,076
1989	789	364	2,315	1,322	204	98	683	2,900	0	169	196	9,040
1990	174	87	891	2,219	29	19	271	2,238	0	107	553	6,588
1991	395	320	1,722	1,459	19	56	47	565	0	207	178	4,968
1992	8	148	1,274	1,471	173	8	633	1,241	0	263	130	5,349
1993	588	106	2,487	1,041	211	134	453	598	0	0	308	5,926
1994	123	6	1,809	1,258	133	76	807	476	0	66	328	5,082
90-94 Mean	258	133	1,637	1,490	113	59	442	1,024	0	129	299	5,583
1995		218	1,116	990	190	31	895	651	0	31	227	4,349

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Nancy Lake complex lakes.

<sup>d</sup> Includes lakes and streams.

**Appendix A22.-Knik Arm drainage sockeye salmon catch by fishery, 1990-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Big Lake	Nancy Lake <sup>c</sup>	Other <sup>d</sup>	Total
1990	417	145	2,267	3,537	78	97	417	4,109		223	1,676	12,966
1991	405	320	2,908	1,713	19	56	47	678		320	526	6,992
1992	90	148	2,572	2,055	205	8	953	1,430		625	171	8,257
1993	708	106	3,755	1,185	284	151	1,099	1,330		38	308	8,964
1994	123	25	3,581	1,996	209	218	1,215	561		642	420	8,990
90-94 Mean	349	149	3,017	2,097	159	106	746	1,622		370	620	9,234
1995		416	2,116	1,357	221	114	1,228	725		227	41	6,445

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Nancy Lake complex lakes.

<sup>d</sup> Includes lakes and streams.

**Appendix A23.-Eastside Susitna River drainage sockeye salmon harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Other Lakes	Total
1977	831	305			450		978			334	696		3,594
1978	56	28			14		85			28	56		267
1979	94	141		0	31		346		157	31	220		1,020
1980	83	77		77	0		257		116	6	257		873
1981	77	67		38	105		182		220	29	115		833
1982	94	105		52	88		514		189	115	398		1,555
1983	425	110	0	151	370		534		685	534	343	69	3,221
1984	249	337	0	87	62	0	561		100	636	636	37	2,705
1985	139	80		110	30		279		249	508	70	0	1,465
1986	290	0	109	0	0	0	363	182	290	1,597	1,198	0	4,029
1987	254	72	54	0	163	0	163	72	181	580	507	0	2,046
1988	564	55	18	164	273	36	364	255	18	1,110	0	0	2,857
1989	414	51	59	110	169	17	296	76	363	617	25	330	2,527
1990	208	149	99	69	149	50	149	0	119	1,506	179	0	2,677
1991	397	71	62	230	168	0	44	97	88	1,280	460	0	2,897
1992	526	164	33	123	189	58	370	140	394	1,356	115	0	3,468
1993	528	120	0	106	39	0	237	241	183	2,560	113	10	4,137
1994	383	28	0	82	102	0	85	66	133	2,278	286	0	3,443
90-94 Mean	408	106	39	122	129	22	177	109	183	1,796	231	2	3,324
1995	430	73	0	0	98	52	481	0	220	2,082	145	101	3,682

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Other includes lakes and streams for 1977-1982.

**Appendix A24.-Eastside Susitna River drainage sockeye salmon catch by fishery, 1990-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams	Other Lakes	Total
1990	862	208	99	119	208	79	406		159	2,121	238	0	4,499
1991	574	71	62	291	194	0	194	124	124	1,943	653	379	4,609
1992	929	205	33	140	296	173	600	140	731	3,173	246	41	6,707
1993	942	381	0	154	149	17	570	337	202	5,009	191	55	8,007
1994	616	161	0	130	210	0	399	66	199	4,331	995	9	7,116
90-94													
Mean	785	205	39	167	211	54	434	167	283	3,315	465	97	6,188
1995	838	250	0	0	214	52	991	0	251	3,830	312	201	6,939

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

**Appendix A25.-Westside Susitna River drainage sockeye salmon harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	349	0			658		457	24	842	456	2,786
1978	183	0			254		141	70	662	324	1,634
1979	79	0			440		47	220	362	410	1,557
1980	52	0			267		112	267	34	379	1,111
1981	67	0			211		172		594	364	1,408
1982	335	0			252		63		1,320	911	2,881
1983	69	0			726		41	0	1,370	1,314	3,549
1984	87	125			374		262	312	1,395	860	3,415
1985	261	50			137		50		772	1,032	2,302
1986	0	11			547	1,273	424	514	1,173	134	4,076
1987	72	272			435	398	290	580	163	217	2,427
1988	55	146			291	146	800	182	1,038	509	3,167
1989	260	217	9	139	121	165	251	130	547	468	2,307
1990	30	189	0	20	358	89	189		646	417	1,938
1991	136	262	155	0	262	475	78	233	968	514	3,083
1992	123	82	0	107	115	189	205		1,331	764	2,916
1993	45	87		103	489	412	171		724	130	2,161
1994	38	0		237	430	142	237		653	182	1,919
90-94 Mean	74	124	52	93	331	261	176	233	864	401	2,403
1995	94	42		239	392	178	191		879	91	2,106

<sup>a</sup> Yentna River drainage.

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A26.-Westside Susitna River drainage sockeye salmon catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	80	626	0	20	626	239	656		1,353	746	4,346
1991	136	281	155	19	911	523	475	853	1,676	959	5,988
1992	148	205	0	107	271	288	247		2,515	879	4,660
1993	194	207		463	1,517	480	322		1,579	720	5,482
1994	90	169		332	822	161	681		1,326	785	4,366
90-94 Mean	130	298	52	188	829	338	476	853	1,690	818	4,968
1995	116	64		239	615	295	1,003		1,498	348	4,178

<sup>a</sup> Yentna River drainage.

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A27.-West Cook Inlet drainage sockeye salmon harvest by fishery, 1977-1995.**

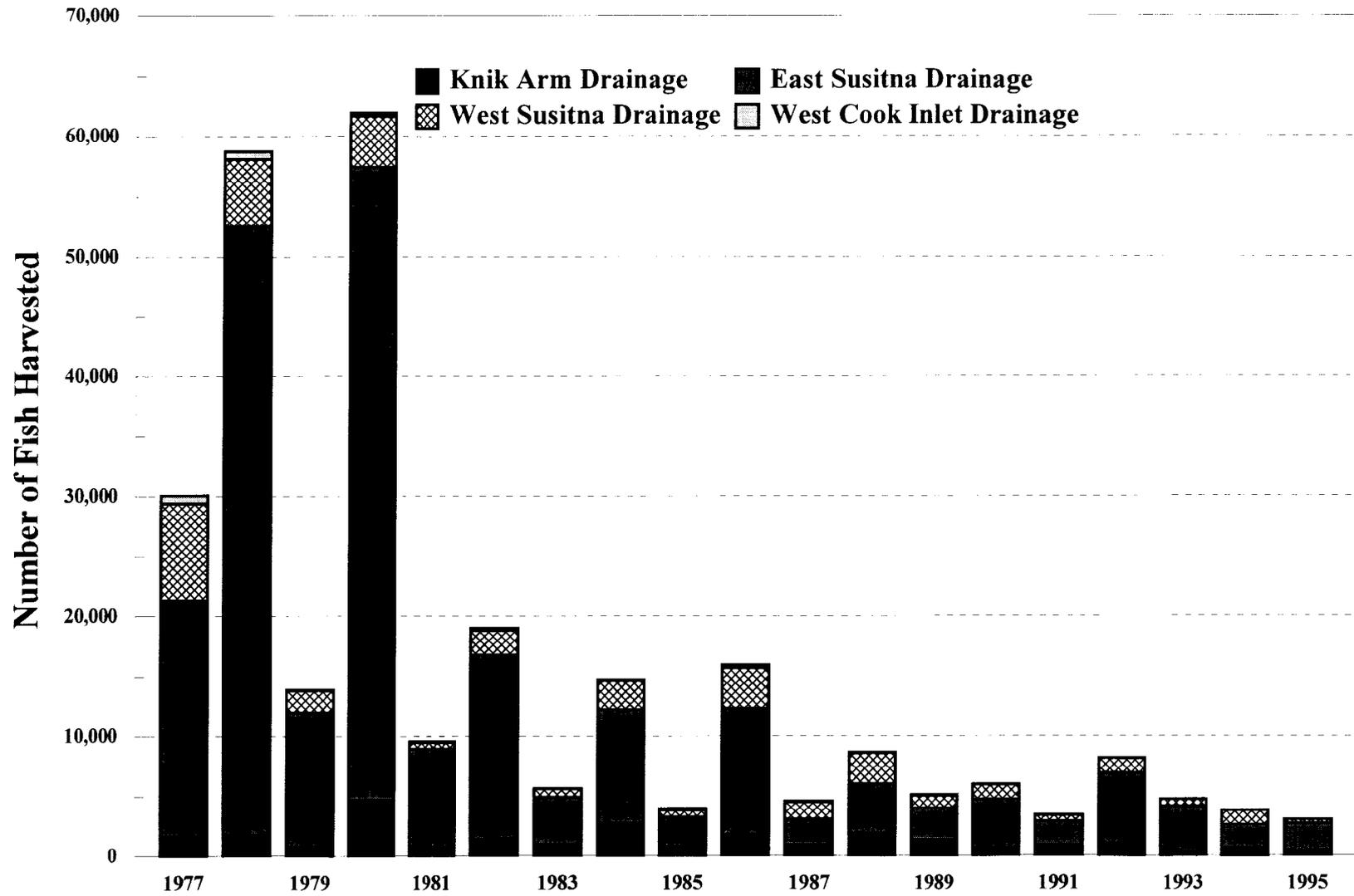
Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	6	0	0		6
1978	0	0	0		0
1979	0	0	0		0
1980	0	0	0		0
1981	48	0			48
1982	10	0			10
1983	356	0			356
1984	62	0			62
1985	274	25	0		299
1986	22	67			89
1987	272	0	0		272
1988	437	18	0		455
1989	43	52	0	269	364
1990	139	50	0		189
1991	552	10	0		562
1992	8	49			57
1993	46	35	0	780	861
1994	0	9		614	623
90-94 Mean	149	31	0	697	458
1995	62	0		41	103

<sup>a</sup> Includes lakes and streams.

**Appendix A28.-West Cook Inlet drainage sockeye salmon catch by fishery, 1990-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1990	219	50	0		269
1991	698	10	0		708
1992	66	49			115
1993	181	35	0	1,429	1,645
1994	0	95		562	657
90-94 Mean	233	48	0	996	679
1995	62	0		41	103

<sup>a</sup> Includes lakes and streams.



Appendix A29.-Northern Cook Inlet Management Area recreational pink salmon harvest, 1977-1995.

**Appendix A30.-Knik Arm drainage pink salmon harvest by fishery, 1977-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1977			1,208			217			236	1,661
1978			1,517			279			46	1,842
1979			618			136	0		64	818
1980			3,918			310	0		473	4,701
1981			709	0		96	0		29	834
1982			1,163	31		147	0		84	1,425
1983	361	209	251	47		10	0		131	1,009
1984	312	0	2,045	287	0	62	0		37	2,743
1985		0	590	175	0	0	0	22	0	787
1986		39	696	138	160	66	0	646	55	1,800
1987	0	18	217	18	217	199	0	217	0	886
1988	36	36	1,146	127	327	0	0	255	0	1,927
1989	60	69	518	164	225	69	17	199	0	1,321
1990	81	0	325	35	35	23	0	127	24	650
1991	210	149	419	9	17	0	0	122	0	926
1992	9	46	870	0	9	0	0	55	55	1,044
1993	0	0	124	0	0	0	58	38	10	230
1994	17	0	455	9	77	0	0	68	9	635
90-94 Mean	63	39	439	11	28	5	12	82	20	697
1995		0	264	58	58	10	19	0	0	409

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A31.-Eastside Susitna River drainage pink salmon harvest by fishery, 1977-1995.**

Year	Willow Creek	Lt. Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna <sup>a</sup> River	Other <sup>b</sup>	Total
1977	7,140	1,261			4,291		3,568			1,314	2,089	19,663
1978	18,901	3,142			6,981		15,619			2,074	3,994	50,711
1979	3,445	745		100	2,418		2,472		700	645	664	11,189
1980	23,638	6,420		1,663	6,362		8,230		2,408	622	3,403	52,746
1981	2,797	604		335	1,236		1,782		958	19	412	8,143
1982	4,789	1,520		1,092	2,599		3,595		1,132	220	398	15,345
1983	1,647	157	0	126	682		902		241	73	126	3,954
1984	3,155	524	0	337	948	50	3,030		611	636	200	9,491
1985	697	169		10	10		807		468	120	229	2,510
1986	1,561	799	36	254	3,049	145	2,033	290	944	399	1,017	10,527
1987	815	109	54	36	344	18	507	0	54	272	0	2,209
1988	1,510	491	36	55	891	164	709	18	73	182	0	4,129
1989	1,045	115	0	41	288	107	288	16	436	379	0	2,715
1990	1,554	463	0	142	486	154	712		273	130	179	4,093
1991	890	203	0	19	309	58	251	0	97	135	39	2,001
1992	1,951	467	9	128	1,466	339	586	46	385	394	128	5,899
1993	1,427	243	10	36	520	36	1,147	0	19	486	17	3,941
1994	712	277	85	9	243	33	221	0	66	102	220	1,968
90-94 Mean	1,307	331	21	67	605	124	583	12	168	249	117	3,580
1995	772	136	19	39	362	38	700	0	10	177	58	2,311

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A32.-Westside Susitna River drainage pink salmon harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other Steams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	1,263	391			4,927		539	1,022	0	8,142
1978	1,146	697			2,833		31	898	0	5,605
1979	236	109			882		100	527	0	1,854
1980	809	689			2,101		276	362	0	4,237
1981	57	19			412		29	38	0	555
1982	482	377			389		220	597	0	2,065
1983	126	21			430		0	125	0	702
1984	62	748		0	636		87	922	12	2,467
1985	112	87			137		0	248	0	584
1986	413	882			670	313	235	872	0	3,385
1987	91	652			670	18	0	0	36	1,467
1988	400	800		0	491	255	18	582	36	2,582
1989	8	152	0	0	177	177	8	523	0	1,045
1990	273	297	0	0	262	48	250	108	0	1,238
1991	55	98	11	0	131	22	0	207	0	524
1992	458	513	0	0	220	37	0	36	0	1,264
1993	144	84	19	0	210	65	10	54	0	586
1994	283	564	50	17	228	102	0	15	0	1,259
90-94 Mean	243	311	16	3	210	55	52	84	0	974
1995	57	77	0	0	55	86	48	38	0	361

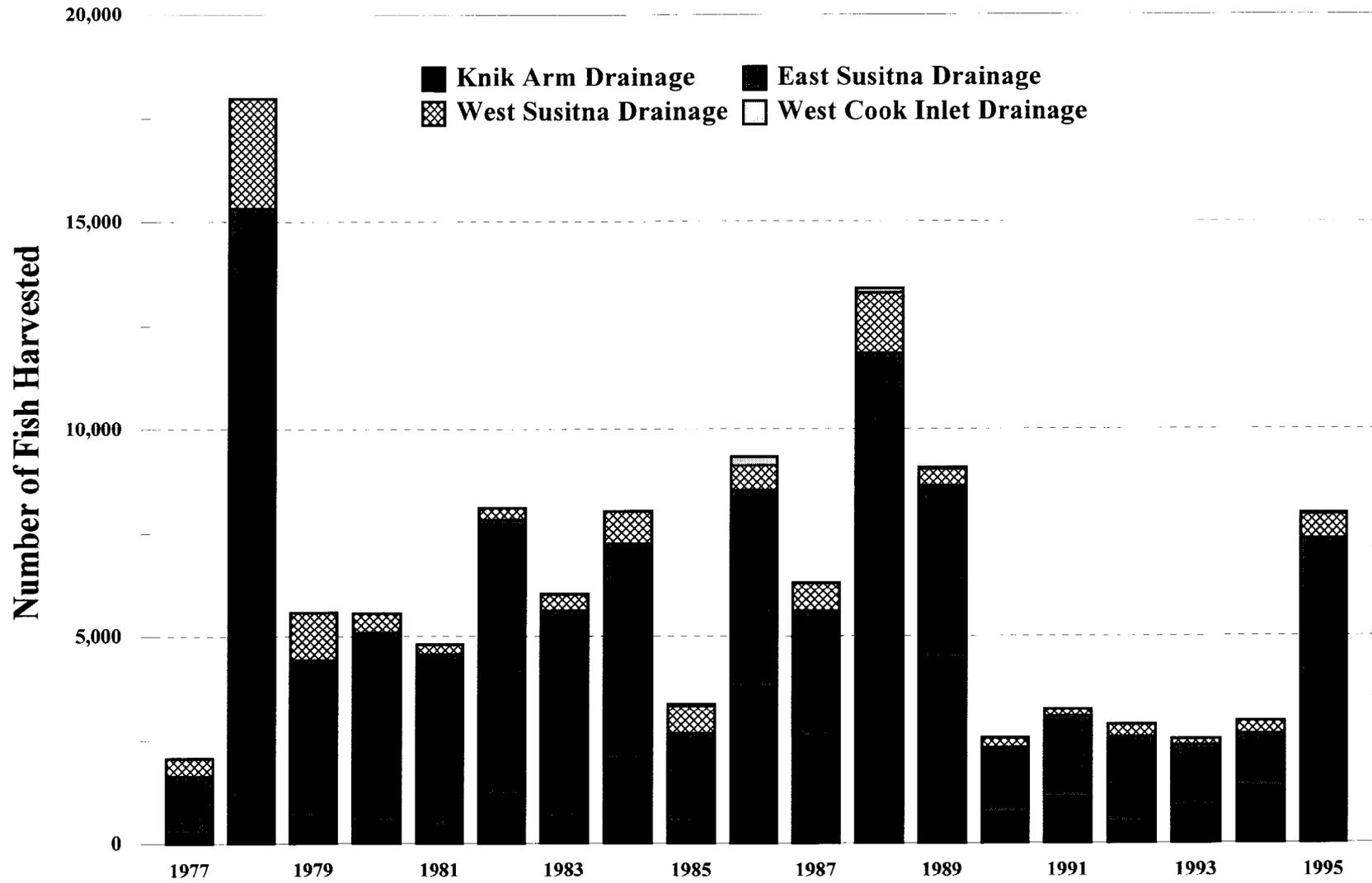
<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A33.-West Cook Inlet drainage pink salmon harvest by fishery, 1977-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	245	363	62		670
1978	155	449	46		650
1979	55	9	0		64
1980	69	232	0		301
1981	38	57			95
1982	147	63			210
1983	21	0			21
1984	0	62			62
1985	62	75	0		137
1986	235	45			280
1987	0	72	0		72
1988	0	55	0		55
1989	34	0	8	68	110
1990	12	12	0		24
1991	44	0	0		44
1992	18	0		0	18
1993	0	0	9	26	35
1994	0	0		8	8
90-94 Mean	15	2	3	11	26
1995	0	0		0	0

<sup>a</sup> Includes lakes and streams.



Appendix A34.-Northern Cook Inlet Management Area recreational chum salmon harvest, 1977-1995.

**Appendix A35.-Knik Arm drainage chum salmon harvest by fishery, 1977-1995.**

Year	Fish Ck. Marine	Other Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Other <sup>c</sup>	Total
1977			131			17			102	250
1978			956			58			117	1,131
1979			364			45	0		245	654
1980			465			9	0		60	534
1981			278	0		58	0		96	432
1982			943	168		0	0		63	1,174
1983	84	26	450	10		0	0		73	642
1984	62	0	1,708	125	25	0	0		112	2,032
1985		66	382	11	55	0	0	0	0	514
1986		72	822	1,021	1,750	0	0	66	39	3,770
1987	0	0	534	233	1,641	146	10	10	0	2,574
1988	18	55	673	291	3,438	0	0	564	182	5,221
1989	93	92	712	435	3,043	0	0	19	83	4,477
1990	11	11	170	45	464	11	0	34	0	746
1991	8	31	425	31	379	0	155	70	0	1,099
1992	23	0	319	8	152	0	0	0	8	510
1993	0	9	500	46	293	0	37	0	0	885
1994	0	22	690	169	365	0	0	0	110	1,356
90-94 Mean	8	15	432	60	311	2	38	21	24	919
1995		9	620	433	3,035	9	0	9	0	4,115

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams.

**Appendix A36.-Eastside Susitna River drainage chum salmon harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other <sup>b</sup>	Total
1977	343	175			202		326			146	190	1,382
1978	2,458	1,015			1,697		4,429			1,912	2,692	14,203
1979	582	118		9	682		745		55	355	1,245	3,791
1980	989	270		19	648		571		225	385	1,445	4,552
1981	1,533	192		0	987		805		125	57	450	4,149
1982	2,086	199		0	1,750		1,708		231	31	639	6,644
1983	1,490	147	0	0	902		1,311		42	650	440	4,982
1984	2,095	224	0	112	586	125	1,447		37	337	248	5,211
1985	926	10		0	159		508		50	329	160	2,142
1986	508	109	36	218	1,307	36	871	254	545	799	73	4,756
1987	851	217	0	0	616	91	217	18	0	1,032	0	3,042
1988	1,419	546	18	18	1,892	255	928	146	36	1,255	91	6,604
1989	1,454	115	62	44	890	273	379	26	176	626	106	4,151
1990	336	197	0	35	382	278	69		12	197	59	1,565
1991	712	77	0	15	364	124	116		70	356	116	1,950
1992	471	137	0	23	342	152	182	129	23	562	23	2,044
1993	401	146	42	95	229	63	287	0	28	181	8	1,480
1994	177	90	10	0	291	29	171	0	37	450	14	1,269
90-94 Mean	416	118	12	35	316	98	333	36	34	292	96	1,725
1995	608	169	9	81	459	65	4,331	0	0	339	173	3,234

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams.

**Appendix A37.-Westside Susitna River drainage chum salmon harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	30	0		162		37	194	0	423
1978	215	0		1,015		234	1,171	0	2,635
1979	45	0		136		55	918	0	1,154
1980	121	0		69		17	284	0	491
1981	10	0		48		0	182	0	240
1982	0	0		199		0	94	0	293
1983	0	0		52		0	346	0	398
1984	37	87		249		75	424	0	872
1985	12	25		124		0	186	0	347
1986	22	34		212	0	45	302	0	615
1987	127	54		36	0	0	471	0	688
1988	18	164		346	0	91	855	0	1,474
1989	45	0	18	163	0	72	90	27	415
1990	12	12	0	70	0	12	128	0	234
1991	61	17	0	44	17	52	0	0	191
1992	23	46	0	121	38	0	76	0	304
1993	88	0	0	25	0	0	34	0	147
1994	52	29	7	67	19	15	123	0	312
90-94 Mean	47	21	1	65	15	16	72	0	238
1995	272	0	0	181	113	11	14	0	591

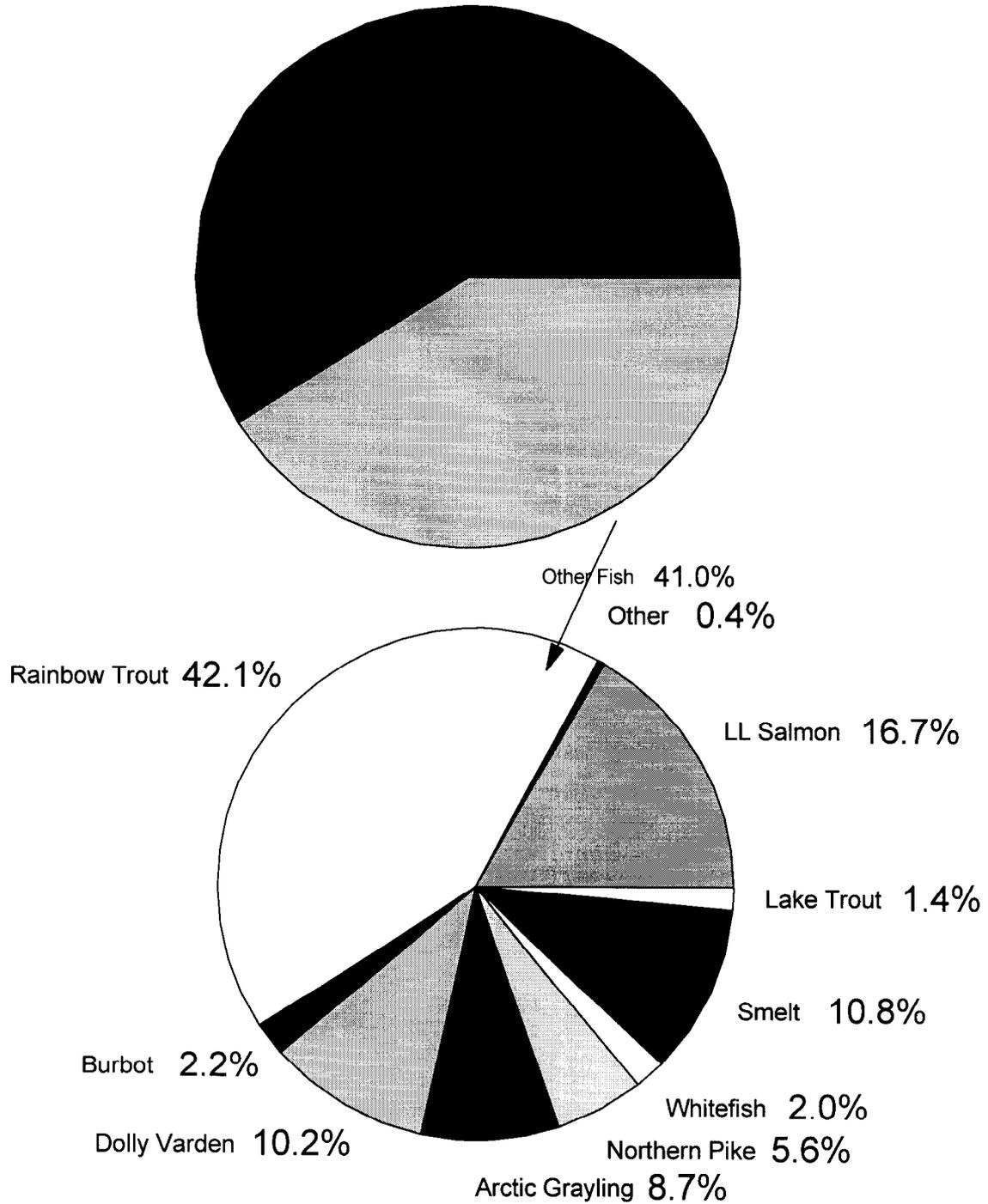
<sup>a</sup> Fish Lake drainage (Yentna drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A38.-West Cook Inlet drainage chum salmon harvest by fishery, 1977-1995.**

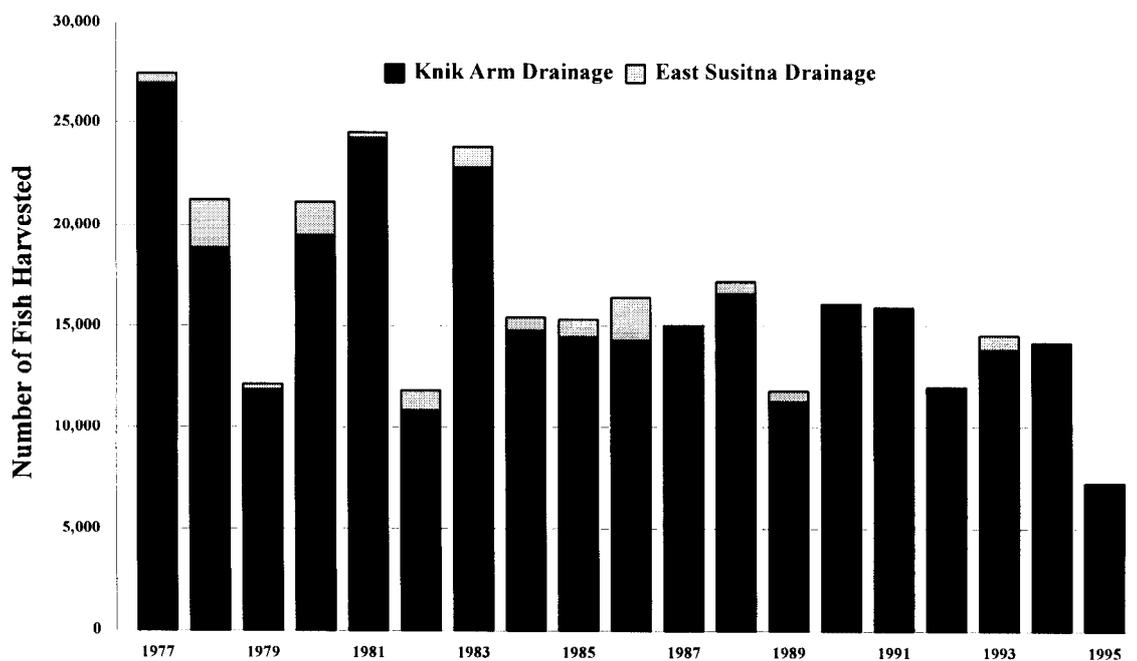
Year	Chuitna River	Theodore River	Lewis River	Other	Total
1977	7	0	0		7
1978	0	0	0		0
1979	0	0	0		0
1980	0	0	0		0
1981	0	0			0
1982	0	0			0
1983	10	0			10
1984	0	0			0
1985	50	0	0		50
1986	179	34			213
1987	0	0	0	54	54
1988	109	0	0		109
1989	0	0	0		0
1990	0	12	0		12
1991	0	0	0		0
1992	0	0			0
1993	0	0	0		0
1994	0	0	0		0
90-94 Mean	0	2	0		2
1995	9	0		18	27

Anadromous Salmon 59.0%

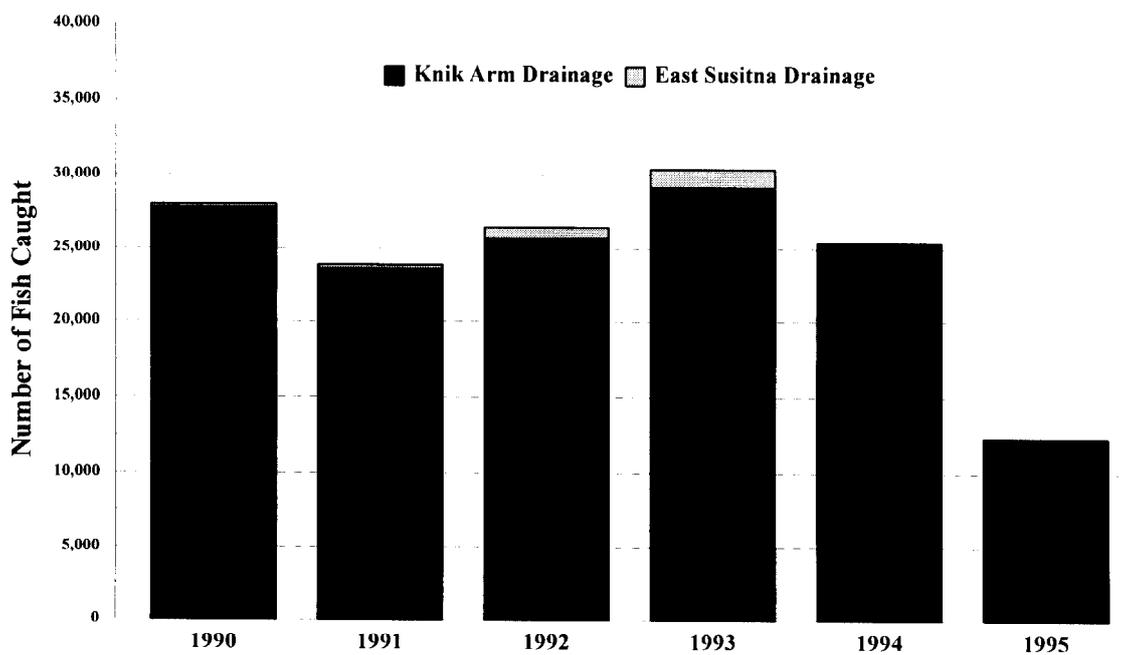


**Appendix A39.-Northern Cook Inlet Management Area sport fish harvest resident fish composition, 1977-1995.**

## Harvest



## Catch



Appendix A40.-Northern Cook Inlet Management Area recreational landlocked salmon harvest and catch, 1977-1995.

**Appendix A41.-Knik Arm waters landlocked salmon harvest by fishery, 1977-1995.**

Year	Memory Lake	Lucille Lake	Kepler L. Complex	Finger Lake	Wasilla Lake	Big Lake	Nancy L. Complex	Other Lakes	Total
1977		8,952	528	14,739		721	76	1,901	26,917
1978		4,963	298	8,588		226	262	4,547	18,884
1979		4,272	64	5,209	1,054	145	227	882	11,853
1980		3,633	2,807	10,685	43	189	146	1,997	19,500
1981		7,549	2,577	9,321	182	651	354	3,621	24,255
1982		3,312	681	4,506	42	324	126	1,854	10,845
1983		2,245	2,224	12,714	31	462	231	4,898	22,805
1984	1,663	2,681	773	7,282	100	1,384	50	835	14,768
1985		1,491	4,803	5,618	69	659	0	1,821	14,461
1986		246	2,580	6,244	168	0	34	5,027	14,299
1987		1,521	3,550	8,439	0	0	199	1,178	14,887
1988		618	2,183	11,896	0	0	18	1,873	16,588
1989	1,734	663	1,462	3,805	0	0	1,108	2,269	11,041
1990		279	2,314	10,453	0	0	295	2,609	15,950
1991	1,628	899	2,188	6,818	0	2,493	119	1,595	15,740
1992	1,525	173	1,222	4,965	0	1,979	162	1,849	11,875
1993	877	45	1,140	7,898	0	2,566	11	1,292	13,829
1994	1,902	0	1,821	7,480	0	2,004	129	817	14,153
90-94 Mean	1,483	279	1,737	7,523	0	1,808	143	1,632	14,309
1995	234	25	210	5,842	0	219	0	755	7,285

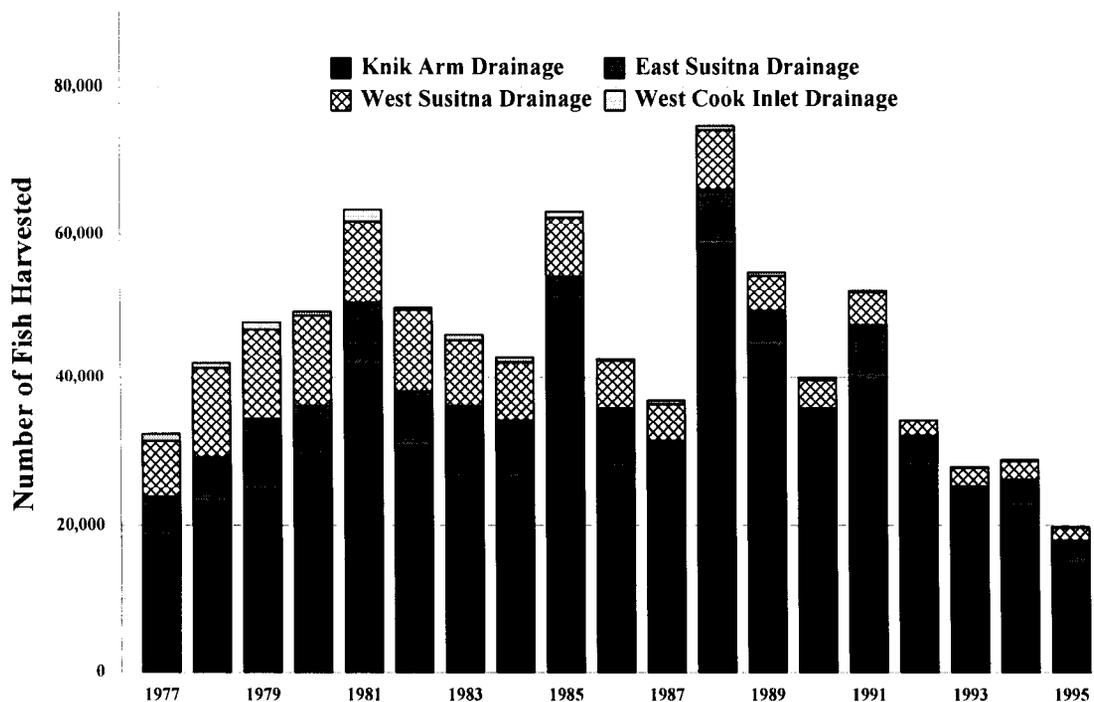
**Appendix A42.-Knik Arm waters landlocked salmon catch by fishery, 1990-1995.**

Year	Memory Lake	Lucille Lake	Kepler L. Complex	Finger Lake	Wasilla Lake	Big Lake	Nancy L. Complex	Other Lakes	Total
1990		410	4,414	17,066	0	0	525	5,350	27,765
1991	3,358	899	3,596	9,243	0	3,816	119	2,613	23,644
1992	4,056	400	4,673	10,190	0	3,483	162	2,779	25,743
1993	2,046	45	2,516	18,247	0	3,935	78	2,258	29,125
1994	2,739	9	3,624	13,749	0	2,768	165	2,178	25,232
90-94 Mean	3,050	353	3,765	13,699	0	2,800	210	3,036	26,302
1995	415	184	336	8,446	0	1,053	0	1,718	12,152

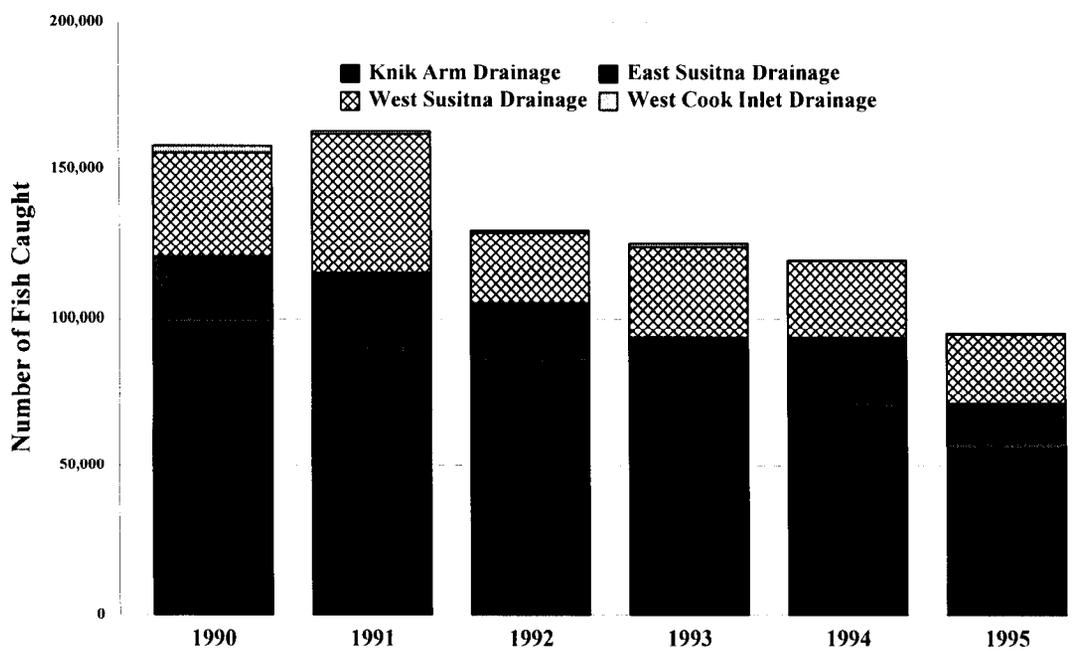
**Appendix A43.-Eastside Susitna River drainage  
landlocked salmon harvest and catch, 1977-1995.**

Year	Lakes Harvest	Lakes Catch
1977	512	
1978	2,368	
1979	291	
1980	1,663	
1981	278	
1982	996	
1983	1,049	
1984	660	
1985	884	
1986	2,106	
1987	145	
1988	619	
1989	536	
1990	151	252
1991	14	259
1992	86	746
1993	738	1,263
1994	45	199
90-94 Mean	207	544
1995	33	135

## Harvest



## Catch



Appendix A44.-Northern Cook Inlet Management Area recreational rainbow trout harvest and catch, 1977-1995.

### Appendix A45.-Knik Arm drainage rainbow trout harvest by fishery, 1977-1995.

Year	Little Susitna	Knik River <sup>a</sup>	Wasilla Creek	Cotton-wood Ck	Big Lake <sup>b</sup>	Wasilla Lake	Finger Lake	Kepler L. Complex	Big Lake	Lucille Lake	Kalmbach Lake	Carpenter Lake	Knik Lake	Memory Lake	Seymour Lake	Bonnie Lakes	Nancy L. Complex	Other Streams <sup>c</sup>	Other Lakes	Total	
1977	843		252				0	1,822	3,906	0							2,642	9,150		18,615	
1978	886		45				0	5,180	4,845	0							1,853	10,330		23,139	
1979	1,391		500	1,736		2,782	0	3,372	2,882	0							2,909	9,271		24,843	
1980	852		121	1,085		2,084	0	5,906	5,398	0							2,540	11,382		29,368	
1981	2,692	0	38	824		2,261	0	8,200	9,810	0							4,723	13,201		41,749	
1982	1,551	0	63	786		2,243	0	7,325	9,369	0							2,840	6,372		30,549	
1983	1,290	0	84	556		1,804	0	3,986	4,102	0							4,846	1,490	8,263	26,421	
1984	860	549	312	748		848	0	9,128	4,938	0			382				1,771	1,247	5,635	26,418	
1985	1,294	780	260	590	347	1,231	3,381	14,011	6,953	35							2,514	1,197	13,838	46,431	
1986	1,407	235	11	145	391	1,653	3,172	7,249	5,105	168				726		736	2,200	815	3,677	27,690	
1987	447	58	126	301	204	680	2,476	7,758	2,476	3,379							2,728	427	3,603	24,663	
1988	1,273	382	582	782	309	891	5,421	16,462	4,220	8,495							910	5,439	964	12,479	58,609
1989	599	0	91	163	1,063	972	2,788	18,233	5,402	972	1,625		872	590	445		945	3,696	117	5,945	44,518
1990	673	0	131	410	361	443	2,544	10,223	3,282	246							738	2,182	1,131	8,335	30,699
1991	781	0	28	628	209	1,953	2,539	8,496	4,883	600			600	1,046			363	2,818	545	14,147	39,636
1992	720	0	24	404	791	483	1,860	6,839	2,090	309	610	1,116	887	364	459	1,045	2,945	8	7,041	27,995	
1993	186	0	30	475	228	630	2,037	2,930	2,073	424				890	734		399	2,116	248	8,165	21,565
1994	300	0	135	425	393	735	2,666	3,551	2,260	156				323	570	1,184	1,300	56	8,392	22,446	
90-94																					
Mean	532	0	70	468	396	849	2,329	6,408	2,918	347	610	1,116	744	656	588	746	2,272	398	9,216	28,468	
1995	326	0	37	413	150	390	1,887	2,648	1,371	249	543	393		395		365	785	119	4,797	14,878	

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Includes lakes and streams, 1977-1982.

### Appendix A46.-Knik Arm drainage rainbow trout catch by fishery, 1990-1995.

Year	Little Susitna	Knik River <sup>a</sup>	Wasilla Creek	Cotton-wood Ck	Big Lake <sup>b</sup>	Wasilla Lake	Finger Lake	Kepler L. Complex	Big Lake	Lucille Lake	Kalmbach Lake	Carpenter Lake	Knik Lake	Memory Lake	Seymour Lake	Bonnie Lakes	Nancy L. Complex	Other Streams	Other Lakes	Total
1990	1,953	0	607	2,183	2,100	1,707	5,645	35,085	8,123	1,034						2,133	7,466	5,448	25,236	98,720
1991	1,507	0	28	795	614	2,916	4,576	18,986	10,588	670			2,246	1,576		893	6,348	2,371	34,531	88,645
1992	2,319	0	40	1,987	2,375	1,544	6,087	24,887	5,296	602	3,103	1,868	1,504	1,314	712	3,309	7,765	64	20,555	85,331
1993	1,308	0	195	3,987	1,445	1,497	7,272	16,151	4,845	651				1,523	1,224	2,356	5,130	367	21,684	69,635
1994	1,198	0	312	911	2,295	2,142	6,168	16,534	5,502	302				1,230	1,413	2,657	4,372	282	24,932	70,255
90-94																				
Mean	1,657	0	236	1,973	1,766	1,961	5,950	22,329	6,871	653	3,103	1,868	1,875	1,411	1,116	2,270	6,216	1,706	25,388	82,517
1995	1,783	0	92	1,015	412	1,001	5,792	16,634	3,565	514	1,067	824		863		1,331	2,344	209	18,662	56,108

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

**Appendix A47.-Eastside Susitna River drainage rainbow trout harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Other Lakes	Total
1977	1,055	224			368		727			450	2,401		5,225
1978	913	334			470		1,193			1,501	1,519		5,930
1979	1,500	345		282	573		1,536		382	1,373	3,472		9,463
1980	1,168	353		154	385		854		193	950	2,658		6,715
1981	1,475	374		326	201		1,111		249	1,226	3,851		8,813
1982	891	335		189	325		2,243		545	608	2,400		7,536
1983	1,689	514	357	231	409		1,332		178	1,836	1,656	1,437	9,639
1984	1,359	1,047	449	175	349	125	1,197		374	910	598	1,073	7,656
1985	2,046	746		139	191		1,248		416	832	1,266	988	7,872
1986	545	218	436	0	218	145	399	73	581	1,234	1,126	3,086	8,061
1987	1,141	1,213	471	308	507	272	417	36	72	869	471	870	6,647
1988	1,128	400	255	73	236	291	1,492	73	55	1,110	636	1,873	7,622
1989	906	277	675	37	240	240	407	37	259	822	443	629	4,972
1990	1,008	286	352	101	286	353	487		168	1,109	320	538	5,008
1991	2,044	430	261	384	569	354	615	231	0	1,076	999	891	7,854
1992	712	293	87	47	55	79	467	16	79	665	404	1,044	3,948
1993	934	264	49	148	338	127	271	0	59	242	670	611	3,713
1994	1,161	337	114	53	254	173	241	0	8	262	467	588	3,658
90-94													
Mean	1,172	322	173	147	300	217	416	62	63	671	572	734	4,836
1995	351	250	0	56	79	28	285	0	0	287	442	1,360	3,138

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams, 1977-1982.

**Appendix A48.-Eastside Susitna River drainage rainbow trout catch by fishery, 1990-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams	Other Lakes	Total
1990	3,914	689	1,630	689	840	1,378	1,277		622	4,788	3,913	2,066	21,806
1991	3,965	1,230	692	446	1,076	2,183	2,136	307	154	5,072	6,347	2,721	26,329
1992	3,206	1,124	293	142	633	617	2,501	40	103	5,581	2,754	2,921	19,915
1993	3,934	829	995	217	967	2,054	2,034	49	407	5,685	4,441	2,628	24,240
1994	4,673	2,024	319	172	757	1,566	1,807	56	56	4,687	2,838	4,664	23,619
90-94													
Mean	3,938	1,179	786	333	855	1,560	1,951	113	268	5,163	4,059	3,000	23,182
1995	2,340	730	178	127	506	280	1,245	47	150	3,510	3,078	3,172	15,363

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

**Appendix A49.-Westside Susitna River drainage rainbow trout harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	1,251	1,556				1,853		68	1,677	1,067	7,472
1978	2,640	3,634				2,721		0	1,528	1,772	12,295
1979	1,182	3,182				4,527		100	2,709	855	12,555
1980	1,945	4,305				2,144		86	2,101	2,204	12,785
1981	2,290	3,631				2,874			872	1,629	11,296
1982	2,505	3,804				3,134			597	1,425	11,465
1983	608	2,434				2,287		0	2,917	1,007	9,253
1984	785	2,120			611	3,080		0	1,084	399	8,079
1985	1,318	3,104				1,439			1,387	866	8,114
1986	1,553	3,038				961	45	0	614	457	6,668
1987	978	3,006				1,902	398	0	1,357	379	8,020
1988	1,419	4,075			73	1,146	109	18	672	546	8,058
1989	486	1,676	0	38	162	676	428	105	576	781	4,928
1990	640	707	17	0	303	808	135		810	540	3,960
1991	917	1,275	0	140	295	498	358	0	810	233	4,526
1992	198	459	24	127	214	214	79		349	364	2,028
1993	128	452		36	49	184	172		1,163	297	2,481
1994	207	415		123	146	714	93		613	215	2,526
90-94 Mean	418	662	14	85	201	484	167	0	749	330	3,104
1995	86	183		140	46	565	360		588	89	1,757

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A50.-Westside Susitna River drainage rainbow trout catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Lake Creek <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	3,065	6,197	34	135	1,532	8,757	707	10,761	2,474	1,431	35,093
1991	2,301	5,303	16	295	1,182	12,969	1,415	18,489	2,863	2,037	46,870
1992	1,124	3,396	142	214	633	5,399	768	7,892	2,123	1,930	23,621
1993	992	5,772		101	331	9,232	647	8,824	3,329	683	29,911
1994	1,075	3,345		201	646	10,387	740	6,646	1,536	763	25,157
90-94 Mean	1,711	4,803	64	189	828	9,349	855	10,522	2,465	1,494	32,130
1995	472	2,288		1,638	644	5,546	596	6,286	3,499	2,463	23,432

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A51.-West Cook Inlet drainage rainbow trout harvest by fishery, 1977-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	509	415	34		958
1978	443	226	54		723
1979	336	609	118		1,063
1980	301	250	9		560
1981	642	1,092			1,734
1982	199	199			398
1983	441	430			871
1984	424	274			698
1985	590	225	87		902
1986	67	145			212
1987	344	199	36		579
1988	218	382	18		618
1989	162	305	19	48	534
1990	286	135	17		438
1991	171	109	124		404
1992	79	63		8	150
1993	29	27	0	49	105
1994	70	0		107	177
90-94 Mean	127	67	47	55	255
1995	9	40		45	94

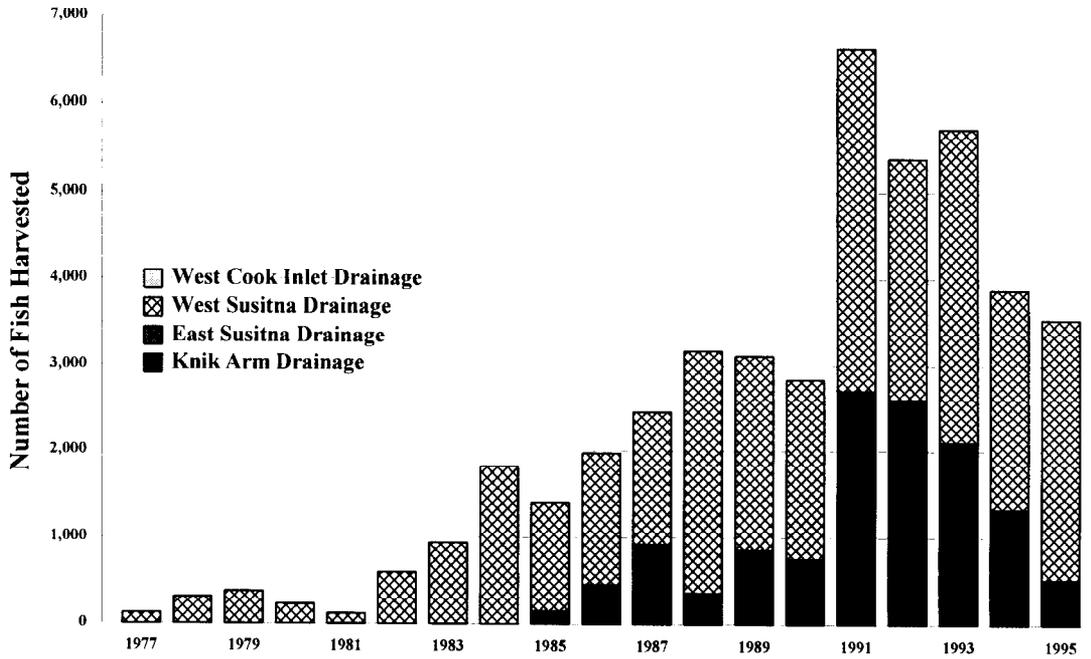
<sup>a</sup> Includes lakes and streams.

**Appendix A52.-West Cook Inlet drainage rainbow trout catch by fishery, 1990-1995.**

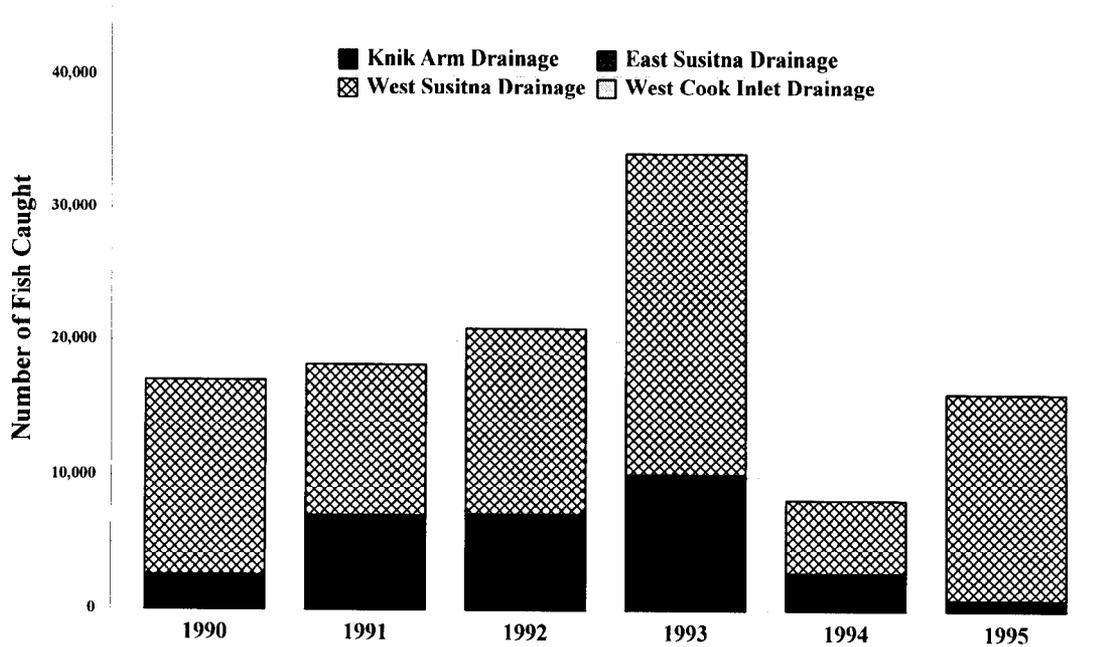
Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1990	1,126	842	370		2,338
1991	575	482	233		1,290
1992	309	435		16	760
1993	733	353	69	256	1,411
1994	161	229		139	529
90-94 Mean	581	468	224	137	1,266
1995	127	260		85	472

<sup>a</sup> Includes lakes and streams.

## Harvest



## Catch



Appendix A53.-Northern Cook Inlet Management Area recreational northern pike harvest and catch, 1977-1995.

**Appendix A54.-Knik Arm drainage northern pike harvest by fishery and total catch, 1985-1995 (grouped with other fish prior to 1985).**

Year	Little Susitna	Knik River <sup>a</sup>	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Eklutna Tailrace	Nancy Lake <sup>c</sup>	Other <sup>d</sup>	Harvest Total	Catch Total
1985	0	0	0	0	0	0	156	0	156	
1986	0	0	0	0	0	0	458	0	458	
1987	0	0	0	0	0	0	924	0	924	
1988	0	0	0	0	0	0	364	0	364	
1989	0	0	0	0	0	0	863	0	863	
1990	0	0	0	0	0	0	754	0	754	2,593
1991	0	0	0	0	0	0	2,406	303	2,709	7,021
1992	0	0	0	0	0	0	2,101	504	2,605	7,097
1993	0	0	0	0	0	0	1,438	664	2,102	10,141
1994	0	0	0	0	0	0	789	539	1,328	2,816
<hr/>										
90-94										
Mean	0	0	0	0	0	0	1,498	398	1,900	5,934
<hr/>										
1995	29	0	0	0	0	0	10	483	522	825

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

<sup>c</sup> Nancy Lake complex lakes.

<sup>d</sup> Includes lakes and streams.

**Appendix A55.-Westside Susitna River drainage northern pike harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Trapper Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	0	0		42			0	90	132
1978	0	0		9			0	307	316
1979	0	0		209			0	173	382
1980	0	0		103			0	129	232
1981	0	0		0			0	125	125
1982	0	0		52			0	555	607
1983	0	0		52			105	787	944
1984	0	0	0	50			1,136	635	1,821
1985	17	0		52			156	1,023	1,248
1986	514	0		0	491		45	469	1,519
1987	254	0		0	326		0	960	1,540
1988	800	0	0	36	1,455		346	181	2,818
1989	819	0	0	0	676		381	381	2,257
1990	404	0	0	320	370		152	842	2,088
1991	700	0	0	104	921	506	13	1,687	3,931
1992	641	0	0	85	359	410	146	1,136	2,777
1993	1,202	0	0	0	1,080	694	634	9	3,619
1994	1,093	78	0	82	411	558	298	36	2,556
90-94 Mean	808	16	0	118	628	542	249	742	2,994
1995	1,067	0	0	125	257	862	422	291	3,024

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

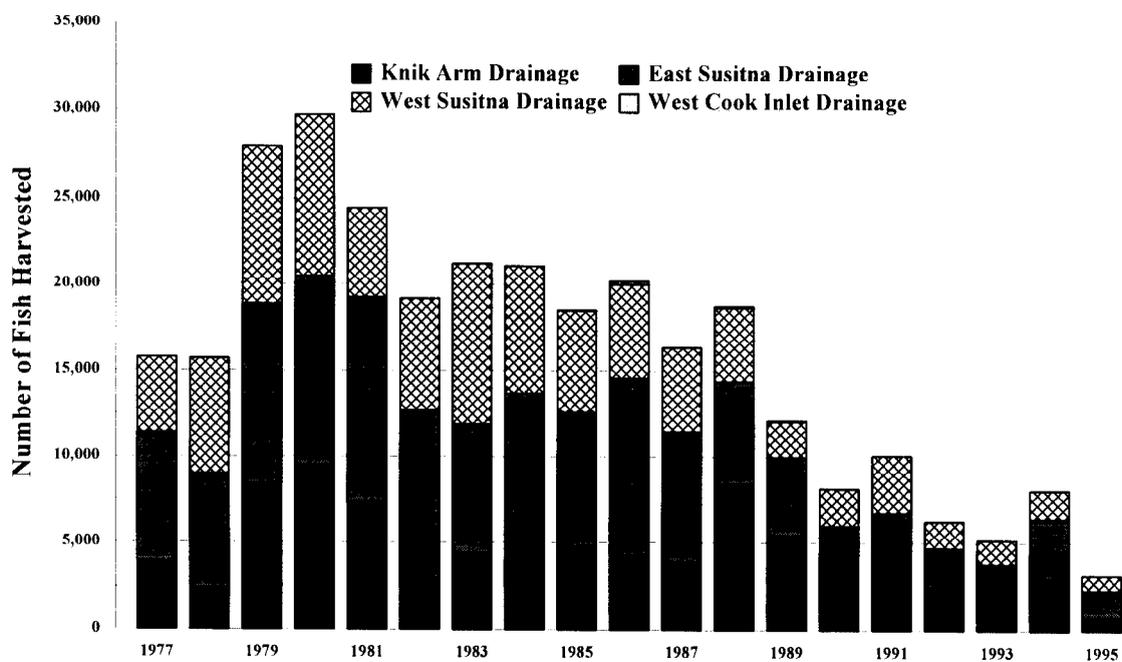
**Appendix A56.-Westside Susitna River drainage northern pike catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Trapper Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	3,149	0	0	589	3,065		691	6,971	14,465
1991	2,866	0	0	376	2,490	1,997	13	3,451	11,193
1992	3,912	0	0	196	1,170	1,349	693	6,508	13,828
1993	12,172	0	0	596	3,885	4,128	3,098	198	24,077
1994	2,306	96	0	318	839	881	832	164	5,436
90-94 Mean	4,881	19	0	415	2,290	2,089	1,065	3,458	13,800
1995	7,651	0	0	334	1,288	2,359	2,862	920	15,414

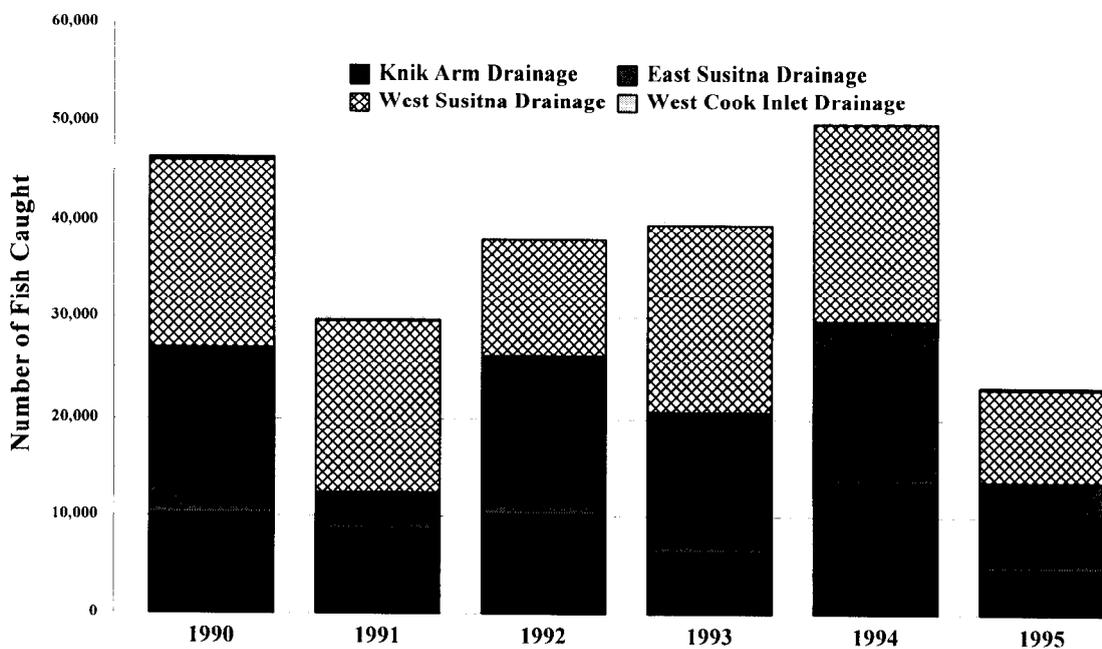
<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

## Harvest



## Catch



Appendix A57.-Northern Cook Inlet Management Area recreational Arctic grayling harvest and catch, 1977-1995.

**Appendix A58.-Knik Arm drainage Arctic grayling  
harvest by fishery, 1977-1995.**

Year	Little Susitna R.	Finger Lake	Kepler L. Complex	Bonnie Lakes	Nancy L. Complex	Other Streams <sup>a</sup>	Other Lakes	Total
1977	190	0	72		0	3,654		3,916
1978	54	0	985		0	1,374		2,413
1979	36	0	2,372		0	5,963		8,371
1980	181	0	1,016		0	8,317		9,514
1981	153	0	671		0	6,572		7,396
1982	388	0	1,027		0	1,509		2,924
1983	199	0	514		0	398	3,314	4,425
1984	100	0	486		12	125	1,757	2,480
1985	191	0	277		0	260	4,040	4,768
1986	223	0	860	1,396	67	89	1,598	4,233
1987	217	54	942		307	0	2,373	3,893
1988	0	0	5,366	473	273	273	1,982	8,367
1989	73	0	3,351	436	90	182	1,297	5,429
1990	115	82	837	263	131	705	935	3,068
1991	60	111	1,338	433	40	80	754	2,816
1992	15	23	1,187	451	68	15	752	2,511
1993	519	73	513	56	0	42	140	1,343
1994	67	292	1,261	97	90	286	805	2,898
90-94 Mean	155	116	1,027	260	66	226	677	2,527
1995	40	99	511	123	0	0	45	818

<sup>a</sup> Includes lakes, 1977-1982.

**Appendix A59.-Knik Arm drainage Arctic grayling catch by fishery, 1990-1995.**

Year	Little Susitna R.	Finger Lake	Kepler L. Complex	Bonnie Lakes	Nancy L. Complex	Other Streams	Other Lakes	Total
1990	738	164	3,216	985	197	1,673	3,215	10,188
1991	80	121	3,591	523	40	110	4,155	8,620
1992	406	23	6,800	797	120	31	2,029	10,206
1993	831	446	4,248	233	119	42	430	6,349
1994	160	1,020	8,763	806	128	600	2,067	13,544
90-94 Mean	443	355	5,324	669	121	491	2,379	9,781
1995	49	716	2,597	567	18	18	564	4,529

**Appendix A60.-Eastside Susitna River drainage Arctic grayling harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Other Lakes	Total
1977	1,483	934			317		379			486	3,870		7,469
1978	208	334			461		958			859	3,770		6,590
1979	2,654	1,091		345	645		791		0	1,045	4,918		10,489
1980	1,868	1,156		353	725		655		0	1,348	4,854		10,959
1981	1,188	623		144	872		891		58	996	7,089		11,860
1982	1,520	377		252	723		849		42	943	5,041		9,747
1983	1,794	84	514	315	839		336		31	1,553	1,625	387	7,478
1984	2,157	1,259	1,397	162	761	125	786		287	1,784	2,042	462	11,222
1985	1,630	1,231		104	815		503		0	1,665	1,527	347	7,822
1986	218	581	436	0	218	73	472		363	3,049	4,355	581	10,346
1987	743	761	851	72	924	163	254	0	18	2,481	868	433	7,568
1988	1,692	455	418	109	400	127	418	0	36	1,000	1,092	273	6,020
1989	721	286	517	148	286	74	92	0	9	1,063	831	535	4,562
1990	1,378	50	202	17	118	34	17		0	605	304	185	2,910
1991	720	503	149	46	274	206	423	0	0	617	743	171	3,875
1992	406	240	53	23	143	75	60	0	0	383	587	219	2,189
1993	520	101	28	75	450	26	90	65	19	471	255	301	2,401
1994	467	113	142	0	159	28	80	0	0	431	1,662	402	3,484
<b>90-94</b>													
Mean	698	201	115	32	229	74	134	16	4	501	710	256	2,972
1995	99	150	106	54	70	0	70	0	0	390	244	203	1,486

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams, 1977-1982.

**Appendix A61.-Eastside Susitna River drainage Arctic grayling catch by fishery, 1990-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams	Other Lakes	Total
1990	3,814	185	756	50	739	454	470		0	5,443	3,159	1,764	16,834
1991	983	823	263	69	1,223	1,074	572	0	0	4,446	2,056	812	3,875
1992	2,337	631	270	789	421	503	195	0	8	2,660	5,777	2,427	16,018
1993	1,531	333	411	261	952	380	313	467	271	5,521	3,032	895	14,367
1994	1,382	753	186	96	512	273	192	0	336	3,303	4,804	4,317	16,154
90-94													
Mean	2,009	545	377	253	769	537	348	117	123	4,275	3,766	2,043	13,450
1995	592	353	220	54	561	114	202	53	0	3,039	2,677	1,258	9,123

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

**Appendix A62.-Westside Susitna River drainage Arctic grayling harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	280	631					1,599		832	45	619	408	4,414
1978	1,871	579					2,115		99	0	1,953	108	6,725
1979	745	1,463					1,963		664	45	3,691	518	9,089
1980	1,145	1,817					1,972		1,713	232	1,808	560	9,247
1981	1,130	1,255					1,600		479		546	240	5,250
1982	1,582	1,457					1,955		587		734	210	6,525
1983	483	1,280					2,224		3,178	21	1,782	346	9,314
1984	362	1,110				150	2,257		898	75	2,395	162	7,409
1985	988	1,335					1,266		434		1,664	208	5,895
1986	1,273	938		771			983	112	290	0	1,040	34	5,441
1987	1,050	942					1,322	91	272	36	1,141	54	4,908
1988	891	1,164				164	637	0	1,128	0	291	0	4,275
1989	267	457	0	67	76	114	314	38	466	19	76	210	2,104
1990	118	152	0		0	303	825	0	337		389	34	2,158
1991	346	333	0		0	213	705	466	1,051	0	253	0	3,367
1992	60	105	45		0	293	301	8	225		497	38	1,572
1993	0	89			0	166	207	28	132		744	56	1,422
1994	107	61			0	254	553	31	204		314	130	1,654
90-94 Mean	126	148	15		0	246	518	107	390	0	439	52	2,035
1995	50	0			106	17	102	53	128		439	0	895

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A63.-Westside Susitna River drainage Arctic grayling catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	893	909	0		0	505	8,656	0	6,467		1,650	51	19,131
1991	705	1,557	0		0	346	6,336	466	6,935	240	559	40	17,184
1992	248	594	218		0	541	4,884	8	3,509		1,835	38	11,875
1993	361	1,053			0	408	7,902	64	5,024		3,930	168	18,910
1994	187	594			0	599	9,435	366	6,275		2,313	375	20,144
90-94 Mean	476	941	73		0	480	7,443	181	5,642	240	2,057	134	17,449
1995	489	319			528	318	2,272	79	3,446		1,855	53	9,359

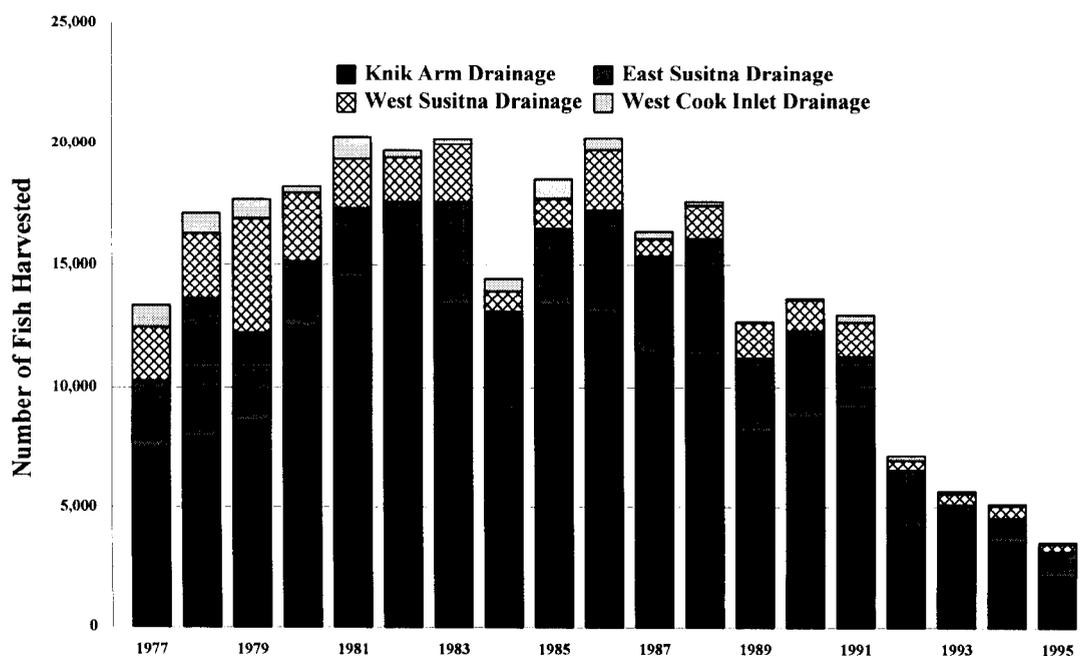
<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

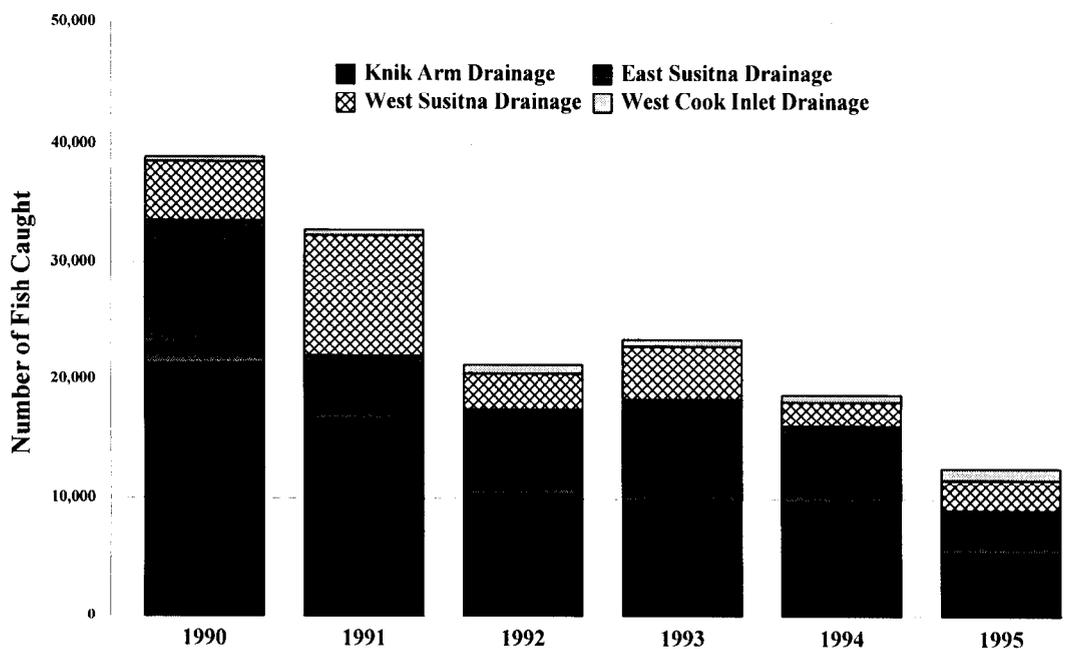
**Appendix A64.-West Cook Inlet drainage Arctic grayling harvest by fishery and total catch, 1977-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other	Harvest Total	Catch Total
1977	0	0	0		0	0
1978	0	0	0		0	0
1979	0	0	0		0	0
1980	0	0	0		0	0
1981	0	0			0	0
1982	0	0			0	0
1983	0	10			10	
1984	0	37			37	
1985	0	0	0		0	
1986	89	0			89	
1987	36	0	0		36	
1988	0	0	0		0	
1989	57	86	0		143	
1990	17	17	0		34	337
1991	13	13	0		26	93
1992	0	0			0	0
1993	0	0	0		0	0
1994	0	0	0	8	8	8
90-94 Mean	6	6	0	8	14	88
1995	0	0	0	0	0	176

## Harvest



## Catch



**Appendix A65.-Northern Cook Inlet Management Area recreational Dolly Varden/Arctic char harvest and catch, 1977-1995.**

**Appendix A66.-Knik Arm drainage Dolly Varden/Arctic char harvest by fishery, 1977-1995.**

Year	Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek <sup>b</sup>	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams <sup>c</sup>	Other Lakes	Total
1977		645			328				4,953	277	1,338		7,541
1978		570			325				5,433	18	1,636		7,982
1979		1,191			364	191		264	4,227	118	2,227		8,582
1980		1,748			189	439		181	7,585	327	2,015		12,484
1981		2,529	1,130		690	67		38	7,741	345	1,935		14,475
1982		1,331	1,279		1,289	10		63	8,793	272	503		13,540
1983	21	1,227	1,310		1,290	157		167	6,126	1,154	1,531	408	13,391
1984	112	1,272	1,509	50	25	0		50	3,866	150	1,696	373	9,103
1985	17	1,791	2,011	104	0	0	104	225	8,096	17	711	260	13,336
1986	0	838	3,094	56	246	45	168	11	7,406	168	625	391	13,048
1987	126	380	127	869	869	0	36	36	8,638	163	145	36	11,425
1988	401	564	2,237	309	0	36	36	273	5,930	1,055	146	327	11,314
1989	63	763	1,507	118	18	191	517	0	4,467	155	181	163	8,143
1990	147	821	1,822	98	0	164	16	0	4,907	66	147	558	8,746
1991	427	747	934	187	1,841	213	0	0	4,162	80	361	186	9,138
1992	8	524	541	25	16	0	16	57	2,597	33	57	312	4,186
1993	0	292	536	195	203	0	185	0	1,812	165	230	68	3,686
1994	9	162	566	36	556	134	124	0	1,489	66	135	255	3,532
90-94 Mean	118	509	880	108	523	102	68	11	2,993	82	186	276	5,858
1995	95	119	456	33	22	0	0	26	1,228	65	10	55	2,109

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage.

<sup>c</sup> Includes lakes and streams, 1977-1982.

**Appendix A67.-Knik Arm drainage Dolly Varden/Arctic char catch by fishery, 1990-1995.**

Year	Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek <sup>b</sup>	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams	Other Lakes	Total
1990	344	2,544	4,808	427	0	279	115	66	10,896	148	606	1,083	21,316
1991	427	1,054	1,467	480	1,967	213	0	0	9,978	93	801	252	16,699
1992	8	1,802	1,032	360	107	0	33	107	6,202	123	156	434	10,364
1993	10	774	1,614	284	515	292	331	0	4,686	327	916	161	9,910
1994	28	624	1,431	191	565	466	133	0	5,086	159	171	913	9,767
90-94 Mean	163	1,360	2,070	348	624	250	122	35	7,370	170	530	569	13,611
1995	134	419	1,304	215	109	44	22	55	2,964	87	10	77	5,440

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage.

**Appendix A68.-Eastside Susitna River drainage Dolly Varden/Arctic char harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Lakes	Total
1977	863	139			94		300			379	951		2,726
1978	280	63			108		633			1,817	2,739		5,640
1979	618	336		91	127		527		264	827	909		3,699
1980	636	122		83	83		167		39	751	790		2,671
1981	249	48		38	57		240		10	1,418	814		2,874
1982	262	189		73	409		356		42	1,069	1,666		4,066
1983	336	73	304	157	52		325		84	1,962	789	126	4,208
1984	424	100	212	25	125	0	661		125	2,020	187	125	4,004
1985	538	520		35	104		17		0	1,352	572	0	3,138
1986	71	0	327	0	182	0	327	0	508	2,396	182	218	4,211
1987	308	54	380	109	72	36	235	18	0	2,680	18	36	3,946
1988	728	200	218	73	182	0	291	0	0	2,146	910	0	4,748
1989	370	28	268	0	120	18	185	0	0	1,719	64	268	3,040
1990	538	67	386	17	50	34	84		0	2,369	68	0	3,613
1991	227	60	72	0	263	60	167	24	0	1,171	36	60	2,140
1992	320	107	25	8	25	90	41	41	0	1,647	0	90	2,394
1993	170	49	39	0	117	10	10	18	0	971	19	10	1,413
1994	118	27	18	18	63	18	46	0	0	520	205	0	1,033
90-94 Mean	275	62	108	9	104	42	70	17	0	1,336	66	32	2,119
1995	139	66	131	0	33	0	11	0	0	545	87	0	1,012

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams, 1977-1982.

**Appendix A69.-Eastside Susitna River drainage Dolly Varden/Arctic char catch by fishery, 1990-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Lakes	Total
1990	1,462	168	1,260	50	185	218	370		67	7,627	924	0	12,331
1991	347	587	120	0	347	131	191	24	12	3,657	180	60	5,356
1992	901	451	295	8	229	90	213	377	0	4,014	484	132	7,194
1993	558	88	400	0	203	58	135	18	19	6,671	338	10	8,498
1994	631	359	83	18	215	108	173	0	0	4,284	358	227	6,356
90-94 Mean	760	271	432	15	236	121	216	105	20	5,251	457	86	7,947
1995	172	174	164	0	197	0	85	0	0	2,765	109	0	3,666

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

**Appendix A70.-Westside Susitna River drainage Dolly Varden/  
Arctic char harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	53	0		122		252	195	1,279	345	2,246
1978	136	0		154		235	371	1,220	551	2,667
1979	182	0		164		155	573	2,872	645	4,591
1980	353	0		121		982	723	603	43	2,825
1981	287	10		67		10		1,130	499	2,003
1982	42	0		482		31		440	818	1,813
1983	136	0		262		105	252	596	1049	2,400
1984	75	25	12	125		50	262	212	37	798
1985	0	139		87		87		642	312	1,267
1986	34	134		0	78	101	514	1,609	0	2,470
1987	0	72		36	36	0	254	163	127	688
1988	236	273	0	91	0	382	0	401	18	1,401
1989	171	86	0	124	38	10	19	257	780	1,485
1990	0	84	269	101	0	84		372	270	1,163
1991	0	0	0	65	327	261	33	440	310	1,436
1992	0	8	0	8	41	66		40	237	400
1993	47	29	0	9	10	9		359	0	463
1994	0	0	18	44	0	103		342	0	507
90-94 Mean	9	24	57	45	76	105	17	311	160	794
1995	0	0	51	43	27	225		276	0	622

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A71.-Westside Susitna River drainage Dolly Varden/  
Arctic char catch by fishery, 1990-1995.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1990	34	185	370	707	0			1,989	1,600	4,885
1991	131	16	82	212	327	1,258	65	5,343	2,794	10,228
1992	0	492	0	156	74	426		1,244	573	2,973
1993	108	49	38	221	48	604		3,409	0	4,477
1994	0	37	36	376	95	867		629	57	2,097
90-94 Mean	56	156	105	334	109	789	65	2,523	1,005	4,932
1995	10	0	70	114	37	1,550		796	0	2,577

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A72.-West Cook Inlet drainage Dolly Varden/Arctic char harvest by fishery, 1977-1995.**

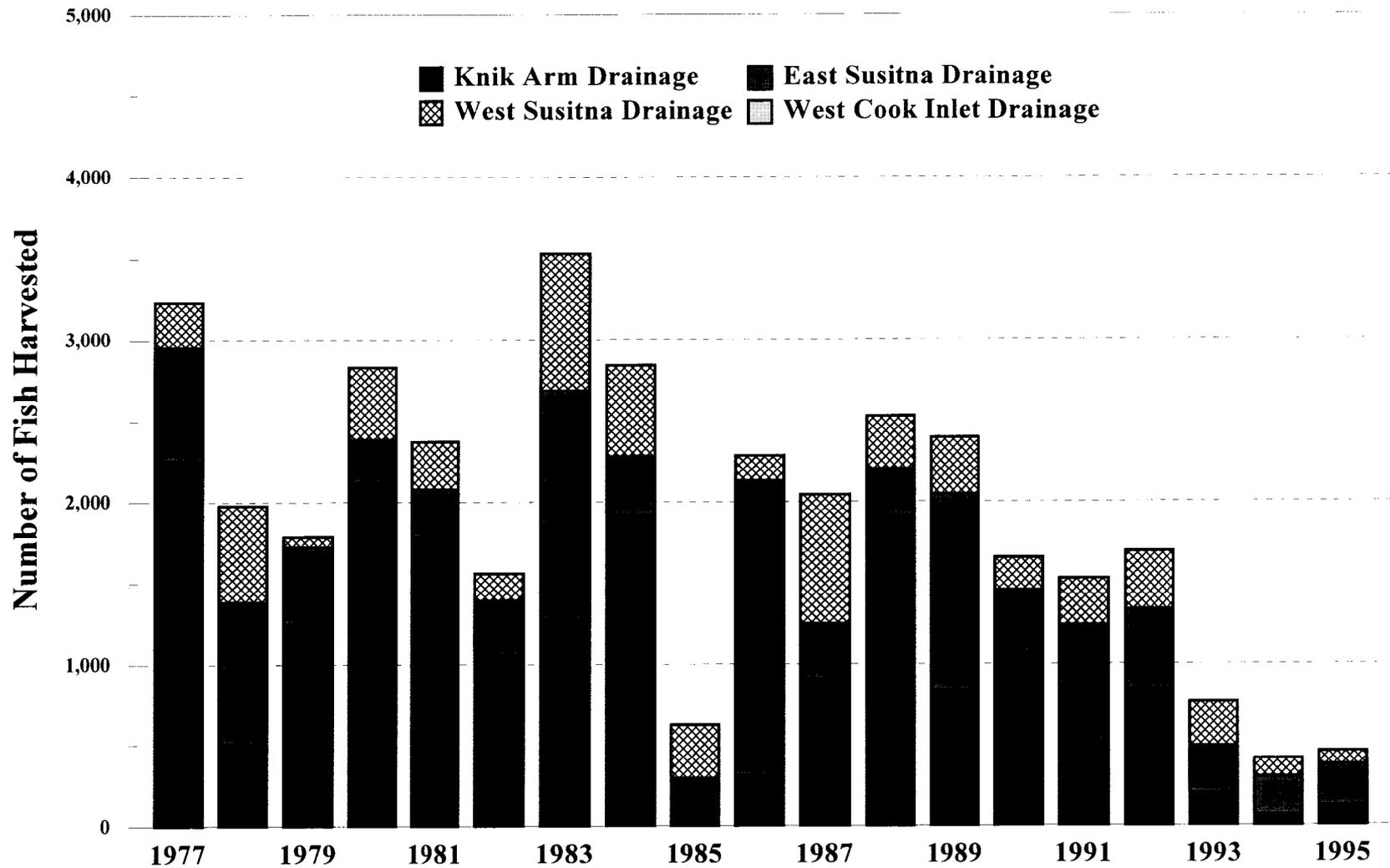
Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	671	181	0		852
1978	461	353	27		841
1979	664	173	9		846
1980	146	129	0		275
1981	843	115			958
1982	304	0			304
1983	209	21			230
1984	511	12			523
1985	260	538	0		798
1986	235	302			537
1987	18	199	109		326
1988	164	0	0		164
1989	10	0	19		29
1990	34	17	0		51
1991	229	33	33		295
1992	131	74			205
1993	73	10	0	29	112
1994	45	0		28	73
90-94 Mean	102	27	11	29	14
1995	50	19		19	88

<sup>a</sup> Includes lakes and streams.

**Appendix A73.-West Cook Inlet drainage Dolly Varden/Arctic char catch by fishery, 1990-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1990	303	168	0		471
1991	474	33	33		540
1992	426	164		164	754
1993	329	166	0	87	582
1994	346	199		77	622
90-94 Mean	376	146	11	109	594
1995	891	69		57	1,017

<sup>a</sup> Includes lakes and streams.



Appendix A74.-Northern Cook Inlet Management Area recreational lake trout harvest, 1977-1995.

**Appendix A75.-Knik Arm drainage lake trout harvest by fishery, 1977-1995.**

Year	Little Susitna R.	Big Lake Drainage <sup>a</sup>	Big Lake <sup>b</sup>	Nancy L. Complex	Other Lakes <sup>c</sup>	Other Streams	Total
1977	0		665	336	1,259		2,260
1978	0		0	127	380		507
1979	0		455	145	654		1,254
1980	0		594	749	775		2,118
1981	0		623	354	814		1,791
1982	0		440	356	262		1,058
1983	31		441	304	503	0	1,279
1984	0		798	549	572	0	1,919
1985	0	0	156	104	0	17	277
1986	0	34	0	201	78	0	313
1987	91	0	0	562	253	0	906
1988	91	0	0	691	1,129	0	1,911
1989	0	0	0	472	363	0	835
1990	0	0	0	558	509	0	1,067
1991	0	0	0	211	271	30	512
1992	0	0	0	377	401	62	840
1993	0	0	0	102	81	18	201
1994	0	0	0	0	66	0	66
90-94 Mean	0	0	0	250	266	22	537
1995	0	0	0	0	118	0	118

<sup>a</sup> Big Lake drainage streams.

<sup>b</sup> Big Lake proper, not including drainage streams.

<sup>c</sup> Includes lakes and streams, 1977-1982.

**Appendix A76.-Eastside Susitna River lake trout harvest, 1977-1995.**

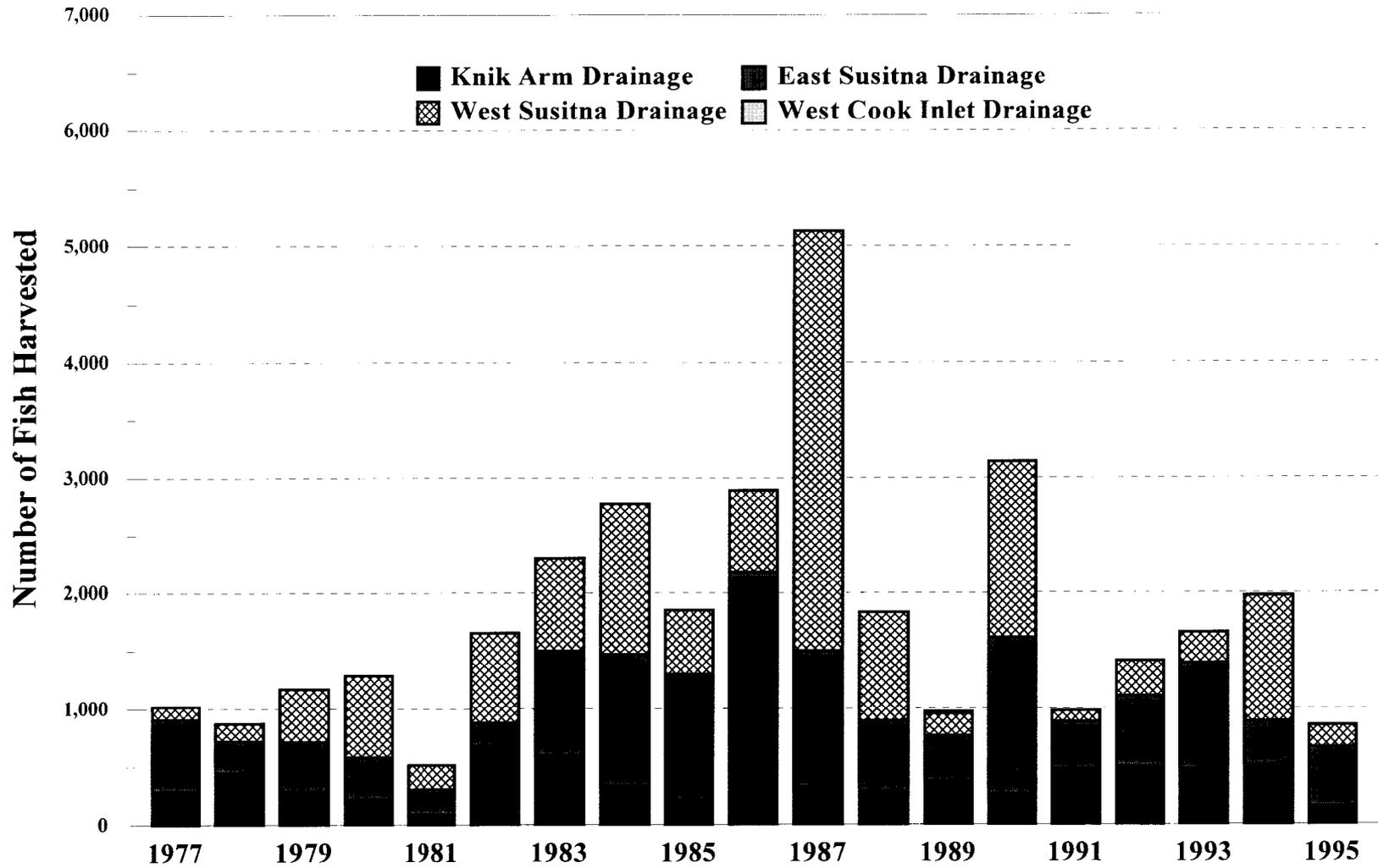
Year	Streams	Lakes	Total
1977		693	693
1978		877	877
1979		472	472
1980		267	267
1981		287	287
1982		335	335
1983	63	1,341	1,404
1984	25	337	362
1985	0	17	17
1986	218	1,598	1,816
1987	0	343	343
1988	0	291	291
1989	83	1,127	1,210
1990	17	370	387
1991	81	645	726
1992	39	456	495
1993	41	247	288
1994	4	228	232
90-94 Mean	36	389	426
1995	0	254	254

**Appendix A77.-Westside Susitna River drainage lake trout harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes <sup>a</sup>	Shell Lake	Judd Lake	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	0	0		116		23	8	23	108	278
1978	0	0		36		45	0	0	515	596
1979	0	0		9		18	0	36	0	63
1980	0	0		0		69	0	181	198	448
1981	0	0		19				0	278	297
1982	0	0		0		52		0	115	167
1983	0	0		0		409	0	10	430	849
1984	0	0		0			0	125	437	562
1985	0	0		121				0	207	328
1986	0	56		0	0		0	0	101	157
1987	0	36		0	18		0	109	634	797
1988	0	0		36	0		18	0	273	327
1989	0	0	38	0	0		0	0	314	352
1990	0	17	0	84	0			0	101	202
1991	0	0	0	61	0		0	46	182	289
1992	0	39	0	0	0			77	247	363
1993	0	0	0	0	0			189	87	276
1994	0	0	0	77	36			0	0	113
90-94 Mean	0	11	0	44	7		0	62	123	249
1995	0	0	0	0	0			74	10	84

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.



Appendix A78.-Northern Cook Inlet Management Area recreational burbot harvest, 1977-1995.

**Appendix A79.-Knik Arm drainage burbot harvest by fishery, 1977-1995.**

Year	Little Susitna	Knik River <sup>a</sup>	Fish Creek <sup>b</sup>	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams <sup>c</sup>	Other Lakes	Total
1977	6				73	148	63		290
1978	9				18	145	280		452
1979	55			0	0	9	227		291
1980	9			0	43	34	224		310
1981	29	0		0	0	29	29		87
1982	10	0		0	461	210	0		681
1983	52	0		0	94	357	31	63	597
1984	25	0		0	75	62	37	137	336
1985	35	0	0	0	70	105	0	0	210
1986	22	0	0	0	335	34	0	413	804
1987	54	0	18	0	36	217	0	0	325
1988	36	0	0	0	55	127	0	73	291
1989	27	0	0	0	163	82	0	100	372
1990	82	0	0	0	82	98	0	0	262
1991	40	13	0	0	66	358	0	0	477
1992	102	0	0	0	110	118	0	170	500
1993	43	0	107	0	278	54	0	0	482
1994	10	0	140	0	279	83	0	0	512
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90-94									
Mean	55	3	49	0	163	142	0	34	447
<hr/>									
1995	0	0	0	0	110	7	0	34	151

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage.

<sup>c</sup> Includes lakes and streams, 1977-1982.

**Appendix A80.-Eastside Susitna River drainage burbot harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Lakes	Total
1977	26	0			45		110			0	438		619
1978	9	0			18		9			27	208		271
1979	18	0		0	64		9		45	9	282		427
1980	0	0		26	45		13		39	32	212		367
1981	48	0		0	0		0		115	0	57		220
1982	63	0		0	0		0		73	0	63		199
1983	21	0	0	31	10		0		367	84	126	262	901
1984	0	0	12	87	648	37	75		100	62	112	0	1,133
1985	105	175		70	0		0		0	420	315	0	1,085
1986	0	0	109	0	0	0	0	73	835	0	290	73	1,380
1987	0	54	18	127	18	72	72	72	344	145	253	0	1,175
1988	18	0	18	309	18	0	0	0	73	55	0	109	600
1989	9	18	46	18	0	9	0	65	185	9	18	18	395
1990	84	0	34	185	34	269	0		638	67	34	0	1,345
1991	0	55	22	66	11	44	22	77	0	88	22	0	407
1992	0	0	0	110	0	51	0	144	68	211	16	8	608
1993	21	85	0	32	75	0	0	118	133	310	135	0	909
1994	0	17	13	228	0	0	0	31	228	74	31	52	674
90-94 Mean	21	31	14	124	24	73	4	74	213	150	48	12	789
1995	0	0	0	115	0	0	63	11	69	122	34	103	517

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams, 1977-1982.

**Appendix A81.-Westside Susitna River drainage burbot harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes <sup>a</sup>	Rabideux Creek	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1977	0	3		42			51	19	115
1978	0	0		0			117	36	153
1979	36	309		64			45	0	454
1980	0	224		0			448	34	706
1981	29	96		29			57	0	211
1982	84	252		0			10	430	776
1983	0	126		283			125	273	807
1984	12	237		100			199	761	1,309
1985	0	140		140			105	175	560
1986	0	257		67	89		302	0	715
1987	18	1,123		507	145		1,738	109	3,640
1988	36	36		327	218		127	200	944
1989	0	96	19	0	19		58	0	192
1990	51	118	34	556	438		84	253	1,534
1991	9	35	0	0	9	35	9	0	97
1992	0	42	0	0	76	76	76	34	304
1993	11	42	0	0	21		190	0	264
1994	0	115	166	45	135		598	31	1,090
90-94 Mean	14	70	40	120	136	56	191	64	658
1995	0	0	21	0	23		146	0	190

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A82.-Knik Arm drainage smelt harvest by fishery, 1985-1995  
(grouped with other fish prior to 1985).**

Year	Marine Fish Creek	Other Marine	Freshwater	Total
1985	0	560	0	560
1986	0	3,351	0	3,351
1987	0	0	0	0
1988	0	0	0	0
1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	0	0	0	0
1994	0	2,292	0	2,292
90-94 Mean	0	458	0	458
1995	0	0	0	0

**Appendix A83.-Westside Susitna River drainage smelt harvest by fishery, 1985-1995 (grouped with other fish prior to 1985).**

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Other Streams <sup>a</sup>	Total
1985	0	0		0	1,680	1,680
1986	0	7,300		0	0	7,300
1987	0	0		0	9,265	9,265
1988	1,547	0		1,083	6,219	8,849
1989	0	0	0	785	1,539	2,324
1990	707	842	3,368	674	0	5,591
1991	3,774	245	0	0	2,113	6,132
1992	379	0	1,082	0	14,062	15,523
1993	0	2,236	0	0	4,360	6,596
1994	0	458	3,438	235	5,352	9,483
90-94 Mean	972	756	1,578	182	5,177	8,665
1995	0	0	1,382	0	3,167	4,549

<sup>a</sup> May include harvest from West Cook Inlet waters.

**Appendix A84.-Knik Arm drainage whitefish harvest by fishery, 1985-1995 (grouped with other fish prior to 1985).**

Year	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake <sup>b</sup>	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams	Other Lakes	Total
1985	587	0	0	0	0	0	0	0	0	0	0	587
1986	134	424	0	0	0	0	11	0	11	0	0	580
1987	199	18	0	0		0	36	0	127	0	0	380
1988	673	327	18	0	0	18	0	18	91	18	0	1,163
1989	599	118	9	0	0	100	0	9	9	0	0	844
1990	443	98	0	0	0	0	0	16	65	0	0	622
1991	732	42	0	0	0	0	84	0	42	0	0	900
1992	138	18	0	0	0	0	0	0	101	0	0	257
1993	157	9	0	0	0	0	35	0	0	0	26	227
1994	170	0	0	0	0	7	0	48	17	0	0	242
90-94 Mean	328	33	0	0	0	1	24	13	45	0	5	450
1995	44	18	0	0	0	0	0	9	0	0	0	71

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage streams.

**Appendix A85.-Eastside Susitna River drainage whitefish harvest by fishery, 1984-1995 (grouped with other fish prior to 1984).**

Year	Lt. Willow	Willow	Kashwitna	Caswell	Sheep	Goose	Montana	Sunshine	Birch	Talkeetna	Other		Total
	Creek	Creek	River	Creek	Creek	Creek	Creek	Creek	Creek	River <sup>a</sup>	Streams	Lakes	
1984	62	349	150	12	37	0	175	175		49	49	0	1,058
1985	350	245		0	105		0	560		105	0	0	1,365
1986	0	73	0	0	0	0	0	581	73	363	0	0	1,090
1987	0	72	36	109	18	0	72	109	36	272	72	0	796
1988	18	218	0	18	55	0	91	0	0	146	0	0	546
1989	0	111	83	0	102	18	18	0	0	46	64	0	442
1990	0	403	101	34	101	0	0	50		319	34	336	1,378
1991	235	188	0	31	94	0	0	0	0	78	0	0	626
1992	28	64	9	18	9	28	18	9	9	55	0	18	265
1993	0	35	0	0	26	9	0	0	0	17	0	0	87
1994	39	58	10	10	19	19	0	0	0	0	17	0	172
90-94 Mean	60	150	22	19	50	11	4	2	2	94	10	71	506
1995	34	9	0	0	9	0	0	0	0	28	0	0	80

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

**Appendix A86.-Westside Susitna River drainage whitefish harvest by fishery, 1985-1995 (grouped with other fish prior to 1985).**

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Other Lakes <sup>b</sup>	Total
1985	0	175		315	0	0	0	35	525
1986	112	156		145	11	0	11	0	435
1987	127	163		851	272	0	163	109	1,685
1988	637	564		91	91	0	36	0	1,419
1989	95	86	0	10	10	38	143	0	382
1990	152	488	0	623	67	0	51	0	1,381
1991	120	199	27	106	0	0	79	0	531
1992	0	193	18	0	28	0	45	56	340
1993	82	351	105	0	8	0	9	0	555
1994	23	110	0	240	116	0	290	0	779
90-94 Mean	75	268	30	194	44	0	95	11	717
1995	8	0	0	42	17	0	9	0	76

<sup>a</sup> Fish Lake drainage (Yentna drainage).

<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A87.-West Cook Inlet drainage whitefish harvest by fishery, 1985-1995 (grouped with other fish prior to 1985).**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1985	0	0	0		0
1986	0	0			0
1987	0	0	0		0
1988	0	0	0		0
1989	0	48	0		48
1990	0	135	0		135
1991	0	0	0		0
1992	0	0	0		0
1993	0	0	0	9	9
1994	0	0		0	0
90-94 Mean	0	27	0	5	29
1995	0	0	0	0	0

<sup>a</sup> Includes lakes and streams.

**Appendix A88.-Knik Arm drainage other fish (includes smelt, whitefish and northern pike prior to 1985) harvest by fishery, 1977-1995.**

Year	Marine	Little Susitna	Knik River <sup>a</sup>	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek <sup>b</sup>	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams <sup>c</sup>	Other Lakes	Total
1977		77			0				17	57	229		380
1978		759			0				0	0	36		795
1979		291			0	55		27	55	9	0		437
1980		1,059			0	0		0	0	43	34		1,136
1981		690	0		0	0		38	10	19	19		776
1982		713	0		0	0		0	0	73	31		817
1983	52	136	0		0	0		0	0	241	0	0	429
1984	0	87	0	0	0	0		75	12	125	0	150	449
1985	0	0	0	0	0	0	35	87	0	0	0	87	209
1986	0	0	0	0	0	0	0	0	24	0	0	0	24
1987	0	0	0	0	0	0	0	0	0	462	0	0	462
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	99	0	99
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	389	141	0	0	260	0	0	0	0	0	22	812
1993	157	19	0	0	0	0	0	0	0	0	0	0	176
1994	0	0	0	33	0	0	0	0	74	0	0	56	163
90-94 Mean	31	82	28	7	0	52	0	0	15	0	20	16	250
1995	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>a</sup> Knik River and tributaries including Jim Creek.

<sup>b</sup> Big Lake drainage.

<sup>c</sup> Includes lakes and streams, 1977-1982.

**Appendix A89.-Eastside Susitna River drainage other fish (includes smelt, whitefish, and northern pike prior to 1984) harvest by fishery, 1977-1995.**

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River <sup>a</sup>	Other Streams <sup>b</sup>	Lakes	Total
1977	218	57			0		133			23	195		626
1978	27	0			9		27			0	90		153
1979	45	0		36	191		91		273	64	73		773
1980	116	13		26	0		13		0	32	520		720
1981	38	0		96	86		19		0	38	29		306
1982	63	0		0	21		10		42	10	199		345
1983	52	0	157	10	0		52		0	126	51	21	469
1984	125	0	0	0	0	0	25		0	0	0	75	225
1985	0	0		0	0		0		0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	15	0	0	0	0	0	0	0	0	0	0	0	15
1990	0	0	0	0	0	0	0		0	0	0	67	67
1991	16	0	0	0	0	0	0	0	0	0	0	0	16
1992	54	0	0	0	0	0	0	0	0	0	0	22	76
1993	29	0	0	0	0	20	0	0	0	0	0	0	49
1994	0	9	0	0	92	0	0	0	0	56	0	9	166
90-94 Mean	20	2	0	0	18	4	0	0	0	11	0	20	75
1995	0	0	0	0	0	0	10	0	0	51	0	0	61

<sup>a</sup> Talkeetna River and tributaries including Clear Creek.

<sup>b</sup> Includes lakes and streams, 1977-1982.

**Appendix A90.-Westside Susitna River drainage other fish (includes smelt, whitefish and northern pike prior to 1985) harvest by fishery, 1977-1995.**

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek <sup>a</sup>	Talachulitna River	Other Streams <sup>b</sup>	Lakes <sup>b</sup>	Total
1977	59	68		14			342	68	551
1978	181	72		18			63	36	370
1979	145	82		109		45	55	0	436
1980	0	69		0			0	34	103
1981	0	19		19			48	0	86
1982	178	115		63			10	0	366
1983	21	430		10			0	0	461
1984	187	212	0	137			50	12	598
1985	35	0		69			0	0	104
1986	0	0		0	0		0	0	0
1987	31	0		0	0		0	0	31
1988	0	0	0	0	0		0	0	0
1989	0	0	0	0	0		0	0	0
1990	17	0	0	34	0		0	0	51
1991	21	0	0	0	0	0	43	0	64
1992	0	22	0	0	0	0	0	0	22
1993	0	0	0	0	0	0	49	0	49
1994	0	0	0	28	0	0	18	38	84
90-94 Mean	8	4	0	12	0	0	22	8	54
1995	20	0	0	0	0	0	0	0	20

<sup>a</sup> Fish Lake drainage (Yentna River drainage).

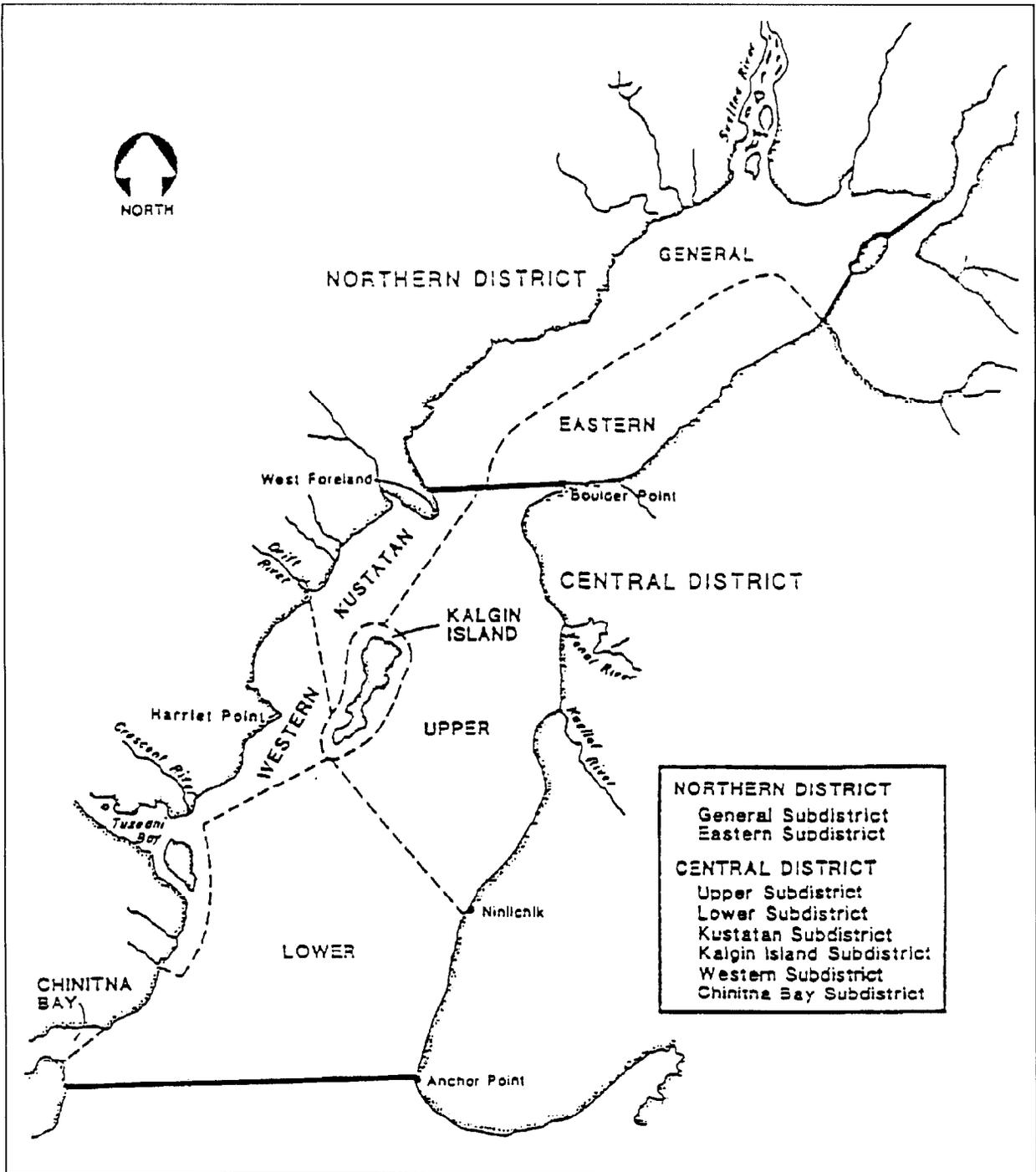
<sup>b</sup> May include harvest from West Cook Inlet waters.

**Appendix A91.-West Cook Inlet drainage other fish (includes smelt, whitefish and northern pike prior to 1985) harvest by fishery, 1977-1995.**

Year	Chuitna River	Theodore River	Lewis River	Other <sup>a</sup>	Total
1977	12	0	0		12
1978	0	0	0		0
1979	45	0	0		45
1980	0	0	0		0
1981	0	0			0
1982	0	0			0
1983	10	0			10
1984	0	0			0
1985	0	0	0		0
1986	0	0			0
1987	0	0	0		0
1988	0	0	0		0
1989	0	0	0		0
1990	0	0	0		0
1991	0	0	0		0
1992	0	0	0		0
1993	0	0	0	29	29
1994	0	0		9	9
90-94	0	0	0	19	8
Mean					
1995	0	0	0	0	0

<sup>a</sup> Includes lakes and streams.

## **APPENDIX B**



**Appendix B1.-Map of Upper Cook Inlet commercial salmon fishing districts.**

**Appendix B2.-Commercial salmon catch from all Upper Cook Inlet districts, 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	14,792	2,052,511	192,599	553,855	1,233,722	4,047,479
1978	17,302	2,621,667	219,360	1,689,098	571,959	5,119,386
1979	13,738	924,415	265,166	72,982	650,357	1,926,658
1980	13,795	1,573,637	271,378	1,786,430	390,810	4,036,050
1981	12,240	1,439,235	485,148	127,169	833,549	2,897,341
1982	20,870	3,259,864	793,937	790,648	1,433,866	6,299,185
1983	20,634	5,049,733	516,322	70,327	1,114,858	6,771,874
1984	8,819	2,102,767	442,619	622,510	684,124	3,860,839
1985	23,297	3,852,141	619,924	83,538	714,140	5,293,040
1986	39,240	4,787,982	756,830	1,299,360	1,134,173	8,017,585
1987	39,661	9,500,186	451,404	109,801	349,132	10,450,184
1988	29,060	6,834,342	560,022	469,972	708,573	8,601,969
1989	26,742	5,010,698	339,201	67,430	122,027	5,566,098
1990	16,105	3,604,064	500,026	603,630	351,197	5,075,022
1991	13,535	2,177,576	425,724	14,663	280,223	2,911,721
1992	16,722	8,901,566	462,565	677,346	350,914	10,409,113
1993	18,841	4,754,846	306,845	100,934	122,767	5,304,233
1994	20,260	3,567,392	580,567	520,481	299,300	4,988,000
1995	17,857	2,951,827	446,954	133,575	529,422	4,079,635
1996 <sup>a</sup>	14,168	3,882,992	325,459	242,867	158,160	4,623,646
Mean	19,884	3,942,472	448,103	501,831	601,664	5,513,953
1977-1995 Mean						5,560,811

<sup>a</sup> Preliminary data.

**Appendix B3.-Upper Cook Inlet commercial salmon catch from the Central District drift net fishery, 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	3,381	1,072,066	106,284	285,943	1,118,861	2,586,535
1978	2,009	1,801,600	67,775	933,049	474,633	3,279,066
1979	1,032	453,692	106,696	19,379	601,404	1,182,203
1980	837	769,078	88,792	963,133	327,506	2,149,346
1981	2,317	632,756	221,923	53,795	752,764	1,663,555
1982	1,232	2,102,307	398,958	270,122	1,340,789	4,113,408
1983	1,115	3,221,783	318,208	26,603	1,040,170	4,607,879
1984	505	1,228,252	195,230	279,608	563,187	2,266,782
1985	1,912	1,890,388	314,795	33,986	643,425	2,884,506
1986	1,826	2,834,170	501,059	614,384	1,009,591	4,961,030
1987	4,551	5,631,691	195,937	38,587	208,014	6,078,780
1988	2,216	4,129,686	263,701	226,456	575,441	5,197,500
1990	620	2,305,707	245,223	323,936	289,302	3,164,788
1991	241	1,117,514	175,504	5,791	215,469	1,514,519
1992	662	5,942,970	263,888	413,588	310,963	6,932,071
1993	769	2,561,451	122,155	46,510	88,994	2,819,879
1994	460	1,878,463	306,217	251,602	245,854	2,682,596
1995	594	1,773,873	241,473	64,632	468,224	2,548,796
1996 <sup>a</sup>	390	2,229,372	176,006	125,736	145,553	2,675,057
Mean	1,404	2,293,517	226,833	261,939	548,429	3,332,016

<sup>a</sup> Preliminary data.

**Appendix B4.-Upper Cook Inlet commercial salmon catch from the Central District western set net fishery, 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	727	200,175	18,721	22,076	96,460	338,159
1978	1,368	164,975	33,881	20,619	50,758	271,601
1979	1,799	111,124	36,329	1,665	72,877	223,794
1980	1,463	143,118	27,600	33,750	34,349	240,280
1981	748	93,036	46,478	4,636	89,676	234,574
1982	1,852	235,208	102,716	8,255	98,459	446,490
1983	1,938	215,566	50,797	1,050	56,161	325,512
1984	1,108	556,300	93,962	55,293	145,645	852,308
1985	2,040	595,122	134,770	9,122	130,096	871,150
1986	1,417	396,175	87,755	51,323	115,800	652,470
1987	424	651,037	51,017	7,640	42,146	752,264
1988	664	298,252	39,626	14,086	45,656	398,284
1989	1,272	55,856	23,342	1,899	17,797	100,166
1990	620	137,425	37,368	16,549	26,596	218,558
1991	552	17,195	19,361	168	4,455	40,731
1992	217	23,143	15,767	612	5,209	44,948
1993	223	23,930	9,195	941	3,433	37,722
1994	203	13,124	20,153	362	2,930	36,772
1995	859	19,444	22,821	949	2,662	30,899
1996 <sup>a</sup>	222	23,646	11,999	254	1,307	37,425
Mean	986	198,693	44,183	12,562	52,124	307,705

<sup>a</sup> Preliminary data.

**Appendix B5.-Upper Cook Inlet commercial salmon catch from all northern districts (East and General [west] subdistricts), 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	565	123,780	20,623	116,518	23,861	285,347
1978	666	51,624	47,256	327,270	37,331	464,150
1979	1,714	112,449	52,635	26,332	9,270	202,400
1980	993	105,647	90,098	474,488	16,728	687,951
1981	725	249,662	134,362	53,325	46,208	484,282
1982	2,716	118,060	85,352	73,307	43,006	322,441
1983	933	184,219	53,867	21,604	29,321	289,944
1984	1,004	210,947	110,218	103,941	75,846	501,837
1985	1,890	163,012	79,245	26,511	31,213	301,844
1986	15,488	141,830	88,108	139,002	76,040	460,468
1987	12,701	164,602	98,920	18,205	67,180	361,608
1988	12,836	129,713	149,742	54,210	75,728	422,229
1989	12,731	280,801	175,710	23,878	81,948	575,068
1990	9,582	96,398	139,401	43,944	35,710	325,035
1991	6,859	116,201	132,270	5,153	39,393	299,876
1992	4,554	69,257	85,486	23,712	24,329	207,361
1993	3,277	146,319	106,258	10,468	25,401	291,723
1994	3,185	120,142	144,064	29,181	40,059	336,631
1995	4,130	109,096	89,300	11,713	43,667	257,908
1996 <sup>a</sup>	1,943	99,230	76,142	20,320	10,930	208,565
Mean	4,925	139,649	97,953	80,154	41,658	364,333

<sup>a</sup> Preliminary data.

**Appendix B6.-Upper Cook Inlet commercial salmon catch from the Northern District General (west) Subdistrict, 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	511	88,729	15,892	102,679	22,252	230,063
1978	388	33,326	35,313	302,529	35,835	407,391
1979	1,418	51,537	34,943	22,627	8,717	119,242
1980	741	60,799	78,345	446,388	14,183	600,456
1981	634	148,806	118,792	45,951	41,789	355,972
1982	2,003	66,940	63,712	66,112	31,850	230,617
1983	841	117,015	42,089	20,749	26,556	207,250
1984	784	136,596	86,813	83,112	67,054	374,359
1985	1,461	95,412	56,751	23,847	27,221	204,692
1986	13,462	94,849	68,994	118,537	67,426	363,268
1987	10,775	97,089	64,082	13,215	53,159	238,320
1988	11,592	98,289	123,356	46,441	70,136	349,814
1989	10,333	201,268	133,952	20,731	64,042	430,326
1990	7,094	69,386	107,300	35,491	31,833	251,104
1991	5,750	81,909	104,896	4,223	34,862	231,640
1992	3,792	54,625	65,434	17,005	23,423	164,279
1993	2,774	119,718	87,191	9,164	23,873	242,720
1994	2,779	90,808	114,759	25,672	36,636	270,654
1995	3,282	85,865	77,312	8,764	41,282	216,525
1996 <sup>a</sup>	1,828	77,637	58,766	18,365	10,625	167,221
Mean	4,112	93,530	76,935	71,580	36,638	282,796

<sup>a</sup> Preliminary data.

**Appendix B7.-Upper Cook Inlet commercial salmon catch from Northern District, Eastern Subdistrict, 1977-1996.**

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	54	35,051	4,731	13,839	1,609	55,284
1978	278	18,293	11,943	24,741	1,493	56,748
1979	296	60,912	17,692	3,705	553	83,158
1980	245	44,077	11,110	26,609	2,397	84,438
1981	91	100,856	15,570	7,374	4,419	128,310
1982	713	51,120	21,640	7,195	11,156	91,824
1983	92	67,204	11,778	855	2,765	82,694
1984	101	74,351	23,405	20,829	8,792	127,478
1985	402	67,600	22,494	2,664	3,992	97,152
1986	2,026	46,981	19,114	20,465	8,614	97,200
1987	1,926	67,513	34,838	4,990	14,021	123,288
1988	1,244	31,424	26,386	7,769	5,592	72,415
1989	2,398	79,533	41,758	3,147	17,906	144,742
1990	2,488	27,012	32,101	8,453	3,877	73,931
1991	1,109	34,292	27,374	930	4,531	68,236
1992	785	14,632	20,052	6,707	906	43,082
1993	503	26,601	19,067	1,304	1,528	49,003
1994	406	29,334	29,305	3,509	3,423	65,977
1995	848	23,233	11,988	2,929	2,385	41,383
1996 <sup>a</sup>	115	21,593	17,376	1,955	305	41,344
Mean	806	46,081	20,986	8,498	5,013	83,384

<sup>a</sup> Preliminary data.

**Appendix B8.-Northern District commercial chinook salmon harvest by period, Cook Inlet, 1986-1996.**

Year	Period <sup>a</sup>				Directed	NCI	Upper Cook
	1	2	3	4	Chinook Salmon Total	Season Total	Inlet Season Total
1986	3,842	5,218	4,711	---	13,771	15,488	39,240
1987	3,365	3,397	3,754	1,025	11,541	12,701	39,661
1988	3,511	3,676	3,935	---	11,122	12,836	29,060
1989	4,148	4,935	1,985	---	11,068	12,731	26,742
1990	2,928	3,041	2,103	---	8,072	9,585	16,105
1991	2,854	1,688	1,431	322	6,305	6,859	13,535
1992	911	2,191	816	---	3,918	4,554	16,722
1993	1,191	1,735	116	---	3,042	3,277	18,841
1994	1,680	1,326	---	---	3,058	3,185	20,260
1995	3,837	---	---	---	3,837	4,130	17,857
1996 <sup>b</sup>	1,679				1,679	1,943	14,168
Mean	2,722	3,023	2,095	678	7,038	7,935	22,926

<sup>a</sup> Fishing periods established by Northern District King Salmon Management Plan (5 AAC 21.366). The season occurs on Mondays, June 1-24, 7:00 a.m. to 1:00 p.m. and is closed when the 12,500 chinook salmon quota is achieved or to address conservation concerns.

<sup>b</sup> Preliminary data.

**Appendix B9.-Knik Arm commercial set gillnet harvest, 1987-1996.**

Year	Chinook Salmon	Sockeye Salmon	Coho Salmon	Pink Salmon	Chum Salmon	Total
1987	<sup>a</sup>	24,090	2,043	264	403	26,800
1988	9	38,251	11,604	591	2,733	53,188
1989	4	47,925	6,075	545	4,979	59,528
1990	4	23,450	5,708	696	5,308	35,166
1991	<sup>a</sup>	10,459	1,630	21	961	13,071
1992	<sup>a</sup>	10,748	1,817	573	1,289	14,427
1993	<sup>a</sup>	47,751	831	29	990	49,601
1994	0	7,528	809	141	357	8,835
1995	5	19,477	1,999	72	1,018	22,571
1996 <sup>b</sup>	0	35,790	1,820	25	161	37,796
Mean	6	25,520	3,613	326	2,004	31,465

<sup>a</sup> Not reported.

<sup>b</sup> Preliminary data.

**Appendix B10.-Sport harvest of chinook salmon from Lower Cook Inlet, 1980-1995.**

Year	Homer Area <sup>a</sup>		Seward Area <sup>a</sup>		Total Lower Cook Inlet <sup>a</sup>		Total Upper Cook Inlet <sup>a</sup>	
	Harvest	% Small <sup>b</sup>	Harvest	% Small <sup>b</sup>	Total	% Small <sup>b</sup>	Harvest	% Small <sup>b</sup>
1980 <sup>c</sup>	431		198		629		1,636	
1981	1,145	16	162	15	1,307	16	2,825	1
1982	1,963	8	335	13	2,298	9	4,025	0
1983	2,664	9	199	5	2,863	9	3,030	4
1984	2,729	5	24	50	2,753	5	4,252	4
1985	1,142	16	187	60	1,329	22	6,146	3
1986	1,440	35	207	62	1,647	38	3,980	4
1987	2,479	15	633	14	3,112	15	5,124	4
1988	9,766	15	2,056	9	11,822	14	6,183	5
1989	4,399	19	976	22	5,375	19	6,334	3
1990	4,965	8	1,004	17	5,969	10	6,514	2
1991	3,665	12	1,547	11	5,212	12	7,158	7
1992	5,741	19	2,925	25	8,666	21	8,938	8
1993 <sup>c</sup>	10,334		5,121		16,182		12,478	
1994 <sup>c</sup>	10,139		2,078		12,217		9,873	
1995 <sup>c</sup>	9,168		3,868		13,036		11,778	

<sup>a</sup> Mills 1981-1994 and Howe et al. 1995 and 1996.

<sup>b</sup> Chinook salmon less than 16 inches.

<sup>c</sup> Harvest not estimated by size in 1980 and 1993-1995.

**Appendix B11.-Estimated harvest of chinook salmon (numbers of fish and mean weight in pounds), by gear type, taken in commercial salmon fisheries in all districts of the Kodiak area, 1980-1995.**

Year	Set Gill Nets		Beach Seines		Purse Seines		All Gear	
	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.
1980	257	14.6	6	19.5	266	20.7	529	17.7
1981	245	18.5	23	10.1	1,150	18.8	1,418	18.6
1982	312	12.4	7	8.0	895	13.1	1,214	12.9
1983	721	11.6	22	18.2	3,096	13.2	3,839	12.9
1984	699	20.2	32	14.8	3,930	21.6	4,661	21.3
1985	377	20.4	23	23.3	4,570	19.2	4,970	19.3
1986	318	16.6	21	23.6	4,042	15.1	4,381	15.3
1987	229	14.3	4	13.5	4,380	12.7	4,613	12.8
1988	1,133	17.4	75	17.5	21,186	13.0	22,394	13.2
1989	106	19.2	0	-	0	-	106	19.2
1990	1,218	12.1	38	16.9	17,550	12.2	18,806	12.2
1991	1,225	12.2	29	13.0	20,980	12.1	22,234	12.1
1992	3,444	12.2	201	19.3	20,654	14.6	24,299	14.3
1993	4,315	11.5	82	21.1	37,802	11.9	42,199	11.9
1994	2,067	16.0	49	21.7	20,460	13.7	22,574	14.0
1995	1,926	13.8	3	24.7	16,775	13.8	18,704	13.8

Source: Data taken from a State of Alaska, Department of Fish and Game, Commercial Fisheries Management and Development Division, Fish Ticket Database Reporting System Report dated 4/20/94 (File T03903.PRN) and Fish Ticket Database Reporting System Report dated 11/15/96 (Request No. T10336, T10330, T10331).

**Appendix B12.-Estimated harvest of chinook salmon (numbers of fish and mean weight in pounds) taken in all commercial fisheries (all purse seine) in the Chignik Area, 1980-1995.**

Year	Chignik Bay District		Central/Eastern Districts		Western District		Perryville District		Total	
	District 271		District 272		District 273		District 275		Total	
	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.
1980	929	21.5	317	13.7	739	6.5	359	8.8	2,344	13.8
1981	2,006	19.4	490	17.5	99	18.0	99	16.7	2,694	18.9
1982	3,269	13.9	79	18.4	1,354	6.6	534	7.4	5,236	11.4
1983	3,560	22.5	421	13.0	1,390	6.8	117	9.4	5,488	17.5
1984	3,696	25.2	135	21.1	487	7.4	0	-	4,318	23.0
1985	1,802	23.9	57	19.8	21	18.0	0	-	1,880	23.7
1986	2,592	23.4	72	21.1	350	11.9	23	16.3	3,037	22.0
1987	1,931	22.2	66	21.2	512	7.3	142	10.7	2,651	18.7
1988	4,331	22.2	1,284	14.0	1,216	8.8	465	8.4	7,296	17.7
1989	3,532	21.6	10	20.7	0	-	0	-	3,542	21.6
1990	3,719	21.7	2,350	11.9	3,190	6.4	642	7.6	9,901	13.6
1991 <sup>a</sup>	2,127	23.6	940	17.6	197	13.0	24	15.9	3,288	21.2
1992 <sup>b</sup>	3,181	21.3	2,191	14.3	4,300	6.6	1,160	9.1	10,832	12.7
1993 <sup>c</sup>	5,240	16.4	9,433	10.6	3,113 <sup>c</sup>	9.3	1,729	11.5	19,515	12.0
1994	1,804	20.4	1,345	17.5	439	14.7	313	15.8	3,901	18.4
1995	3,219	23.8	953	18.3	897	12.1	424	15.0	5,493	20.2

Source: Data taken from a State of Alaska, Department of Fish and Game, Commercial Fisheries Management and Development Division, Fish Ticket Database Reporting System Report dated 4/20/94 (File T03929.PRN & T03930.PRN) and Fish Ticket Database Reporting System Report dated 11/15/96 (Request No. T10337).

<sup>a</sup> In 1991, three chinook salmon were taken in District 271 without gear being recorded (mean weight = 12.3 lb); these fish were included with purse seine harvests.

<sup>b</sup> In 1992, two chinook salmon were taken in District 271 without gear being recorded (mean weight = 4.0 lb); these fish were included with purse seine harvests.

<sup>c</sup> In 1993, 14 chinook salmon were taken in District 273 without gear being recorded (mean weight = 4.6 lb); these fish were included with purse seine harvests.



## **APPENDIX C**

**Appendix C1.-Number of fish (actual and planned) stocked into Northern Cook Inlet Management Area waters, 1994-1997.**

<u>Species/Life Stage/Site</u>	<u>1994 (Actual)</u>	<u>1995 (Actual)</u>	<u>1996 (Actual)</u>	<u>1997 (Planned)</u>
<u>Chinook Salmon Anadromous Smolt</u>				
<u>Willow Creek</u>	177,913	184,740	169,444	200,000
Total	177,913	184,740	169,444	200,000
<u>Coho Salmon Anadromous Smolt</u>				
Wasilla Creek Drainage	0	0	141,923	150,000
Cottonwood Creek Drainage	0	0	0	0
Little Susitna River Drainage	126,694	151,985	0	0
Big Lake Drainage	0	0	0	0
<u>Eklutna Tailrace (Knik River)</u>	<u>62,400</u>	<u>69,867</u>	<u>69,176</u>	<u>0</u>
Total	189,094	221,852	211,099	150,000
<u>Coho Salmon Landlocked Fingerlings</u>				
Barley Lake	1,860	1,860	1,860	1,860
Bear Paw Lake	9,000	4,500	4,500	4,500
Benka	12,3000	0	0	0
Carpenter Lake	17,560	17,640	17,640	17,640
Christiansen Lake	35,804	17,900	17,900	17,900
Diamond Lake	13,900	13,900	13,900	13,900
Echo Lake	4,600	2,300	2,300	2,300
Johnson Lake	7,431	0	0	0
Kalmbach Lake	12,492	12,500	12,500	12,500
Klaire Lake	0	900	900	900
Knik Lake	5,000	5,000	5,000	5,000
Loberg (Junction) Lake	1,100	1,100	1,100	1,100
Matanuska Lake	6,200	0	0	0
Memory Lake	16,600	8,300	8,300	8,300
Prator Lake	19,600	9,800	9,800	9,800
Rocky Lake	5,900	2,900	2,900	2,900
<u>Victor Lake</u>	<u>2,700</u>	<u>2,700</u>	<u>2,700</u>	<u>2,700</u>
Total	172,595	101,300	101,300	101,300
<u>Chinook Salmon Landlocked Subcatchables</u>				
<u>Finger Lake</u>	<u>35,980</u>	<u>35,954</u>	<u>36,204</u>	<u>36,000</u>
Total	35,980	35,954	36,204	36,000

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Species/Life Stage/Site	1994 (Actual)	1995 (Actual)	1996 (Actual)	1997 (Planned)
<u>Rainbow Trout Landlocked Catchables</u>				
Coyote Lake	304	300	198	300
Echo Lake	2,375	2,405	2,411	2,300
Irene Lake	1,799	1,914	1,990	1,800
Kepler/Bradley Lake	7,291	8,495	6,031	5,800
Knik Lake	1,998	2,467	2,463	2,500
Loberg (Junction) Lake	880	1,134	1,140	1,100
Long (Mile 86) Lake	0	3,731	3,789	3,720
Lucille Lake	0	0	0	9,050
Matanuska Lake	7,349	9,538	11,401	9,200
Rocky Lake	0	0	3,946	2,900
Slipper (Eska) Lake	726	900	456	900
South Rolly	0	0	0	5,400
Tanaina Lake	0	0	0	5,450
Walby	2,688	2,572	1,995	5,400
Weiner	0	0	1,204	1,050
<b>Total</b>	<b>28,529</b>	<b>35,706</b>	<b>37,024</b>	<b>56,870</b>
<u>Rainbow Trout Landlocked Fingerlings</u>				
Barley Lake	1,860	1,482	0	1,860
Bear Paw Lake	0	4,500	0	2,250
Bench Lake	0	3,439	0	1,700
Beverly Lake	4,200	0	4,352	4,200
Big No Luck Lake	6,925	5,519	6,809	6,800
Carpenter Lake	17,640	17,991	17,244	17,640
Christiansen Lake	0	17,900	0	8,950
Crystal Lake	13,178	13,170	13,170	13,170
Dawn Lake	2,360	2,360	2,360	2,360
Diamond Lake	10,900	13,964	13,900	13,900
Farmer Lake	1,100	1,100	1,100	1,100
Finger Lake	46,232	36,119	38,186	36,200
Florence Lake	10,910	5,460	5,460	5,460
Homestead Lake	3,588	0	1,700	1,700
Honeybee Lake	5,800	5,950	5,800	5,800
Ida Lake	5,800	4,842	4,589	4,640
Johnson Lake	0	0	0	0
Kalmbach Lake	12,631	12,527	12,644	12,500

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**Appendix C1.-Page 3 of 5.**

Species/Life Stage/Site	1994 (Actual)	1995 (Actual)	1996 (Actual)	1997 (Planned)
<u>Rainbow Trout Landlocked Fingerlings, cont.</u>				
Kashwitna Lake	16,000	16,000	16,000	16,000
Kepler/Bradley Lake	5,812	5,700	6,099	5,800
Knik Lake	2,500	0	0	0
Lalen Lake	9,191	9,387	9,207	9,191
Little Lonely Lake	5,844	0	5,600	5,600
Long Lake (K/B)	7,439	8,340	7,485	7,440
Long Lake (Mi. 86 Glenn)	10,600	11,295	0	0
Loon Lake	10,800	10,800	6,137	10,800
Lorraine Lake	13,200	13,235	13,218	13,200
Lucille Lake	72,386	72,627	36,654	0
Lynne Lake	7,000	7,000	7,067	7,000
Marion Lake	11,300	11,274	11,300	11,300
Matanuska Lake	3,218	0	0	0
Memory Lake	0	8,123	0	4,150
Morvro Lake	8,636	0	8,660	0
North Friend Lake	8,140	8,140	8,150	8,140
Prator Lake	0	9,800	0	4,400
Ravine Lake	2,500	2,632	2,534	2,500
Reed Lake	2,012	2,700	1,954	1,950
Rocky Lake	6,875	0	0	0
Ruby Lake	0	0	4,810	2,400
Seventeenmile Lake	10,000	10,526	10,000	10,000
Seymour Lake	22,897	27,571	22,676	22,900
South Friend Lake	5,570	5,570	5,570	5,570
South Rolly Lake	21,540	21,540	10,615	0
Tanaina Lake	0	0	10,163	0
Tigger Lake	1,890	1,946	2,017	1,890
Twin Lake	6,250	0	0	0
Twin Island Lake	15,074	15,089	15,119	15,100
Vera Lake	11,121	11,050	11,050	11,050
Visnaw Lake	13,090	13,196	12,271	13,070
Walby Lake	10,780	5,390	5,417	0
Weiner Lake	4,142	4,258	2,148	2,120

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Species/Life Stage/Site	1994 (Actual)	1995 (Actual)	1996 (Actual)	1997 (Planned)
<u>Rainbow Trout Landlocked Fingerlings, cont.</u>				
West Sunshine Lake	0	2,230	0	4,460
Willow Lake	14,803	14,300	14,490	14,300
Wishbone Lake	5,307	5,738	2,639	2,635
Wolf Lake	12,407	12,400	12,400	12,400
"X" Lake	10,220	5,055	5,055	5,055
"Y" Lake	3,985	3,970	3,970	3,970
<b>Total</b>	<b>505,825</b>	<b>503,633</b>	<b>417,789</b>	<b>377,121</b>
<u>Arctic Grayling Landlocked Fingerlings</u>				
Bruce Lake	2,700	0	2,700	2,700
Canoe Lake	4,200	4,200	4,200	4,200
Farmer Lake	1,100	0	0	0
Finger Lake	1,800	18,100	20,000	18,100
Florence Lake	5,460	5,460	5,460	0
Kepler/Bradley Lake	5,800	5,800	5,800	5,800
Knik Lake	5,000	2,500	2,500	0
Loberg (Junction) Lake	1,100	0	0	0
Long [Mile 86] Lake	10,600	10,600	10,600	0
Lorraine Lake	13,200	13,200	13,200	0
Matanuska Lake	3,200	0	0	0
Meirs Lake	10,000	3,400	3,400	3,400
Reed Lake	1,950	1,950	1,950	0
Seventeenmile Lake	10,000	10,000	10,000	0
"Y" Lake	3,900	3,900	3,900	3,900
<b>Total</b>	<b>77,510</b>	<b>79,110</b>	<b>83,710</b>	<b>38,100</b>
<u>Arctic Grayling Landlocked Fry</u>				
Long Lake (Mile 86)	64,000	0	0	0
Meirs Lake	16,700	0	0	0
Canoe Lake	21,200	0	0	0
<b>Total</b>	<b>101,900</b>	<b>0</b>	<b>0</b>	<b>0</b>

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**Appendix C1.-Page 5 of 5.**

Species/Life Stage/Site	1994 (Actual)	1995 (Actual)	1996 (Actual)	1997 (Planned)
<u>Arctic Char Landlocked Fingerlings</u>				
Benka Lake	12,300	12,300	12,300	12,300
Finger Lake	36,200	3,200	36,200	36,200
Irene Lake	3,600	1,800	1,800	1,800
Lynne Lake	7,000	7,000	7,000	7,000
Marion Lake	11,300	11,300	11,300	11,300
Matanuska	0	0	3,100	3,100
<b>Total</b>	<b>70,400</b>	<b>35,600</b>	<b>71,700</b>	<b>71,700</b>
<u>Lake Trout Landlocked Fingerlings</u>				
Long Lake (Mile 86)	0	10,600	0	10,600
<b>Total</b>	<b>10,600</b>	<b>0</b>	<b>0</b>	<b>10,600</b>
<b>Total Anadromous Stockings</b>	<b>367,007</b>	<b>406,592</b>	<b>380,543</b>	<b>350,000</b>
<b>Total Landlocked Stockings</b>	<b>1,003,339</b>	<b>791,263</b>	<b>747,727</b>	<b>691,651</b>
<b>Total Stockings</b>	<b>1,370,346</b>	<b>1,197,855</b>	<b>1,128,270</b>	<b>1,041,651</b>

## **APPENDIX D**

## **Appendix D1.-Emergency orders issued for NCIMA waters during 1991-1996.**

### **Emergency Orders issued in 1991:**

1. E. O. No. 2-KS-2-03-91 reduced bag and possession limits within the Chuitna (Chuit), Theodore, Lewis, and Beluga River drainages to 1 king salmon 16 inches or more in length. Effective from May 25 through July 13, 1991.
2. E. O. No. 2-KS-2-16-91 closed the Lewis and Theodore drainages to king salmon fishing, and additionally closed the Chuit River drainage upstream from the Tyonek Road crossing to king salmon fishing. Effective June 25 through July 13, 1991.
3. E. O. No. 2-KS-2-21-91 superseded E. O. 2-KS-2-16-91 and closed Lewis, Theodore and Chuit rivers in their entirety to king salmon fishing. Effective July 4 through July 13, 1991.
4. E. O. No. 2-KS-2-22-91 opened all waters within one-fourth mile radius of Willow Creek's confluence with the Susitna River to fishing for king salmon. Effective July 6 and July 7, 1991.
5. E. O. No. 2-SS-2-27-91 closed to fishing that portion of the Little Susitna River from the fish counting weir located at river mile 32.5 downstream for a distance of 1,500 feet. Effective July 27 through September 14, 1991.
6. E. O. No. 2-RS-1-29-91 closed sockeye salmon fishing in all waters north of the latitude of Anchor Point. Effective 7:00 a.m. July 26 through December 31, 1991.
7. E. O. No. 2-RS-2-33-91 opened the Fish Creek personal use dip net fishery. Effective July 30 through August 9, 1991.
8. E. O. No. 2-RS-2-34-91 reopened the Little Susitna River drainage and all freshwater drainages of Knik Arm to fishing for sockeye salmon. Effective noon, July 29 through December 31, 1991.
9. E. O. No. 2-RS-2-36-91 rescinded E. O. No. 2-RS-1-29-91, thereby reopening recreational sockeye salmon fisheries within waters of the Kenai Peninsula and Susitna-West Cook Inlet regulatory areas and marine waters of Cook Inlet north of Anchor Point. Effective 7:00 a.m. August 2 through December 31, 1991.
10. E. O. No. 2-CS-2-38-91 closed the Eklutna Power Plant tailrace to sport fishing from the Old Glenn Highway downstream to department markers placed approximately 100 yards upstream of the confluence of the tailrace and the Knik River. Effective noon, August 6 through December 31, 1991.
11. E. O. No. 2-SS-2-42-91 increased bag and possession limits to 5 coho salmon at the Little Susitna River downstream from the department's salmon counting weir at river mile 32.5. Effective noon, August 14 through December 31, 1991.
12. E. O. No. 2-BB-2-52-91 reduced the bag and possession limits for burbot from 15 per day and in possession to 5 per day and in possession and reduced gear to two closely attended lines while fishing through ice in the Big Lake drainage (Houston area). Effective December 1, 1991 until superseded by regulation or subsequent emergency order.

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13. E. O. No. 2-BB-2-53-91 closed Nancy Lake (Mile 64 Parks Highway) to burbot fishing. Effective December 1, 1991 until superseded by regulation or subsequent emergency order.

**Emergency Orders issued in 1992:**

1. E. O. No. 2-KS-2-08-92 reduced the length of the king salmon season and reduced the daily bag and possession limit for king salmon to 1 fish greater than 16 inches in length in all waters draining into Cook Inlet between Cape Douglas and the Susitna River, excluding the Susitna River. Additionally this E. O. required the release of all king salmon 16 inches or more in length and the use of unbaited, artificial lures in all waters of the Chuitna River drainage upstream of a department marker located at the old cable crossing, and all waters of the Theodore River drainage upstream of a department marker located approximately 1 river mile upstream of the main Beluga haul road bridge. Effective May 26 through July 13, 1992.
2. E. O. No. 2-KS-2-12-92 clarified that Willow Creek is open to king salmon fishing on Saturday, Sunday and Monday for 3 consecutive weeks. Effective June 20 through June 22, 1992.
3. E. O. No. 20-KS-2-14-92 opened Willow Creek from its mouth upstream to the Parks Highway bridge and all waters within a one-quarter mile radius of Willow Creek's confluence with the Susitna River to king salmon fishing. Effective June 23 through June 26, 1992.
4. E. O. No. 2-KS-2-15-92 reduced the daily bag limit for king salmon, 16 inches or more in length, to 1 fish in all waters of the Susitna and Little Susitna River drainages. It further required the release of all king salmon, 16 inches or more in length, and the use of unbaited artificial lures in all waters of the Deshka River drainage between the Deshka River's confluence with Trapper Creek and the confluence of Moose and Kroto creeks (The Forks); and in all waters of the Alexander Creek drainage upstream from Alexander Creek's confluence with Trail Creek. Effective June 22 through July 13, 1992.
5. E. O. No. 2-RS-2-21-92 opened the Fish Creek personal use dip net fishery. Dip net fishing was allowed for 3 consecutive days followed by a 1 day closure on a continuing basis. Effective 6:00 a.m. July 23 through August 6, 1992.
6. E. O. No. 2-SS-2-22-92 closed to fishing that portion of the Little Susitna River from the fish counting weir located at river mile 33 downstream for a distance of 1,500 feet. Effective July 25 through September 14, 1992.
7. E. O. No. 2-RS-2-28-92 closed the Susitna River drainage to sockeye salmon fishing. Effective July 31 through December 31, 1992.
8. E. O. No. 2-SS-2-29-92 increased bag and possession limits to 5 coho salmon 16 inches or more in length downstream from the department's counting weir at river mile 32.5. Effective August 15 through December 31, 1992.

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**Emergency Orders issued in 1993:**

1. E. O. No. 2-RS-2-23-93 opened the Fish Creek personal use fishery. The dip net fishery opened 9:00 a.m. July 24 and closed midnight August 6, with the fishery being closed July 26, July 30, and August 3, 1993.
2. E. O. No. 2-SS-2-25-93 closed to fishing that portion of the Little Susitna River from the fish counting weir located at river mile 33 downstream for a distance of 1,500 feet. Effective July 23 through September 15, 1993.
3. E. O. No. 2-SS-2-32-93 increased the bag and possession limits to 5 coho salmon at the Little Susitna River downstream from the department's counting weir at river mile 32.5. Effective August 11 through December 31, 1993.
4. E. O. No. 2-SS-2-33-93 closed to fishing that portion of Jim Creek from the fish counting weir located at river mile 1 downstream for a distance of 500 feet. Effective August 12 through November 1, 1993.

**Emergency Orders issued in 1994:**

1. E. O. No. 2-RS-2-28-94 opened the Fish Creek personal use fishery. The dip net fishery opened 9:00 a.m. July 27 and closed midnight August 5, with the fishery being closed July 29 and August 2, 1994.
2. E. O. No 2-RS-2-33-94 supersedes E. O. 2-RS-2-28-94 extending the Fish Creek Personal Use Dip Net Fishery through midnight August 9. Effective August 7, 1994 through August 9, 1994.
3. E. O. No. 2-KS-2-05-94 closed to fishing that portion of the Little Susitna River from the fish counting weir located at river mile 33 downstream for a distance of 1,500 feet. Effective May 25 through September 15, 1994.
4. E. O. No. 2-SS-2-32-94 increased the bag and possession limits to 5 coho salmon at the Little Susitna River downstream from the department's counting weir at river mile 32.5. Effective August 6 through December 31, 1994.
5. E. O. No. 2-SS-2-29-94 closed that portion of Jim Creek to fishing from the fish counting weir located at river mile 1 downstream for a distance of 1,000 feet. Effective July 26, 1994 through November 1, 1994.
6. E. O. No. 2-KS-2-02-94 reduced the chinook salmon possession limit to 1 fish and eliminated the use of bait in the Deshka River. Effective May 1, 1994 through July 13, 1994.
7. E. O. No. 2-KS-2-13-94 closed all waters of the Deshka River drainage to sport fishing for chinook salmon and prohibited the use of bait in the following waters of the Susitna River drainage: (1) all waters of the Susitna River drainage downstream of the Deshka River which flow into the Susitna River from the east and the Alexander Creek drainage, (2) all waters of the Yentna River drainage, (3) all waters of the Talkeetna River drainage, and (4) all waters of the Chulitna River drainage. Effective June 17, 1994 through July 13, 1994.

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**Emergency Orders issued in 1995:**

1. E. O. No. 2-KS-2-07-95 closed to fishing that portion of the Little Susitna River from the fish counting weir located at river mile 33 downstream for a distance of 1,900 feet. Effective May 25 through September 15, 1995.
2. E. O. No. 2-KS-2-08-95 established a possession limit of 1 king salmon 16 inches or more in length in the Little Susitna River. Effective May 24 through September 15, 1995.
3. E. O. No. 2-KS-2-21-95 opened Willow Creek from its mouth upstream to the Parks Highway bridge and all waters within a one-quarter mile radius of Willow Creek's confluence with the Susitna River to king salmon fishing effective 12:01 a.m., Tuesday, July 4 through midnight Tuesday, July 4.
4. E. O. No. 2-RS-02-32-95 opened the Fish Creek personal use fishery. The dip net fishery opened 5:00 a.m. July 26 and closed midnight August 8, with the fishery being closed July 28 and August 1 and August 4, 1995. .
5. E. O. No. 2-SS-02-40-95 increased the bag and possession limits to 5 coho salmon at the Little Susitna River downstream from the department's counting weir at river mile 32.5. Effective August 9 through December 31, 1995.

**Emergency Orders issued in 1996:**

1. E. O. No. 2S-01-96 closed commercial salmon fishing in the Northern District of Upper Cook Inlet for fishing periods June 10, 17 and 24 1996.
2. E. O. No. 2-KS-2-27-96 opened Willow, Little Willow, Sheep and Montana creeks from their mouth upstream to the Parks Highway bridge and all waters within a one-quarter mile radius of their confluence with the Susitna River to king salmon fishing effective 12:01 a.m., Thursday, July 4 through midnight Sunday, July 7, 1996.



## **APPENDIX E**

## **Appendix E1.-Chinook salmon regulatory history for NCIMA waters.**

Chinook salmon fishing in NCIMA waters was open from statehood through 1963. During 1964 through 1966 chinook salmon fishing in fresh water was closed. During 1967 through 1970 Alexander Creek, Clear Creek, Deshka River and Lake Creek were open in their entirety. This fishery operated over a 15-day season during the middle of June on a 250 fish, over 20 inches in length, harvest quota system. Achievement of the quota may have resulted in early season closure. A 1 fish per day 2 per season bag limit for fish over 20 inches in length was in place and a punch card was a requirement of participation in the fishery. In 1971 the harvest quota was eliminated. During 1971 and 1972, in addition to the 15-day season in Alexander Creek, Deshka River, and Lake Creek, a more restrictive fishery was allowed (few days) in Clear Creek and portions of the Little Susitna River, Ship Creek (Anchorage) and Willow Creek, however a punch card was still required. In 1973, the area chinook salmon fishery was closed to the harvest of chinook salmon 20 inches or larger in length and remained so through 1978.

Selected Susitna River streams were reopened to chinook salmon fishing in 1979 after being closed for several years because of low stock abundance. Cautious incremental expansion has characterized the area's chinook salmon fisheries since they reopened. From 1979 through 1982 chinook salmon fishing was permitted at Alexander Creek, Lake Creek and at the Deshka River from the fourth Saturday in May through July 6. These streams drain into the Susitna River from the west. Clear Creek, a tributary of the Talkeetna River, also had a similar chinook salmon season. In addition, three eastside tributaries of the Susitna River, Willow, Caswell and Montana creeks, were open on Saturdays and Sundays only for 4 consecutive weekends commencing on the second Saturday in June. Harvest quotas, ranging from 200 to 7,000 chinook salmon, governed these fisheries from 1979 through 1982. The Chuitna River, a coastal stream near Beluga, and the entire Yentna and Talkeetna River drainages were opened to chinook salmon fishing in 1983. The opening date for chinook salmon fisheries that provided continuous daily fishing was also changed to January 1.

In 1984 the remaining coastal streams near Beluga and all waters draining into the westside of the Susitna River downstream from the Deshka River were opened to chinook salmon fishing. In 1986, portions of five road accessible streams on the east side of the Susitna River opened to weekend-only fishing. These streams were Little Willow, Goose, Sunshine, Sheep and Birch creeks.

Expanded chinook salmon fishing opportunity continued in 1987 when Monday fishing was added to all former weekend-only fisheries that drain into the Susitna River from the east. Saturday through Monday fishing was also allowed on the Susitna River and all flowing waters within one-quarter mile of the Susitna River (excluding the Kashwitna River) between the Deshka and Talkeetna rivers. These "corridor" fisheries were open for 4 continuous "weekends" similar to the previously mentioned Saturday through Monday fisheries. Chinook salmon fishing was permitted for the first time on the Susitna River drainage upstream from the Susitna River's confluence with the Talkeetna River to Devil's Canyon but excluding the Chulitna River drainage. Unbaited, single-hook, artificial lures were mandatory in this area. The season extended from January 1 through July 13. The season for all Susitna River and coastal fisheries that formerly closed on July 6 was extended to July 13 in 1987.

### **Appendix E1.-Page 2 of 3.**

In 1989, chinook salmon fishing was allowed within a one-quarter mile radius of the mouth of the Kashwitna River. That same year fishing was permitted daily at Willow Creek between January 1 and the third Monday in June and on Saturday through Monday for 2 consecutive weeks starting the fourth Saturday in June.

Bag and possession limits were 1 chinook salmon 20 inches or over in length in 1979. The following year bag and possession limits changed to 2 chinook salmon 20 inches or over in length but only 1 chinook salmon could be over 28 inches in length. In 1981 the bag limit was reduced to 1 chinook salmon 20 inches or more in length and in possession. This limit remained in effect through 1985. A 5 fish (20 inches or more in length) per year limit governed all Cook Inlet chinook salmon fisheries from 1979 through 1985. This limit applied collectively to Northern Cook Inlet fresh water, Cook Inlet salt water and the Kenai Peninsula.

In 1986, bag and possession limits for the western drainages of the Susitna River were changed to 2 chinook salmon, 16 inches or more in length daily and 4 in possession and remained so through 1992. Only 1 fish daily and 2 in possession could be over 28 inches. Similar limits also applied to the West Cook Inlet coastal fisheries. Bag and possession limits for eastern drainages of the Susitna River in 1986 were 1 chinook salmon, 16 inches or more in length, and 2 in possession. The seasonal limit was 5 chinook salmon 16 inches or more in length. Anglers were required to list their chinook salmon harvest on nontransferable harvest records from 1979 through 1988. The date and location of harvested chinook salmon were recorded. A \$5 permit stamp was mandatory for chinook salmon fishing from 1980 through 1982. The harvest record and yearly limit was eliminated for all NCI chinook salmon fisheries in 1989.

During the November 1992 BOF meeting several regulations were changed in the Susitna West-Cook Inlet Management Area to be in effect for the 1993 season. A seasonal limit of 5 chinook salmon was established for all waters of Cook Inlet. Individuals or companies engaged in freshwater sport fish guiding were prohibited from participating or engaging in sport fishing while clients were present or within his or her control or responsibility during the chinook salmon season except when guiding a client subject to the Americans with Disabilities Act.

In effect for the 1993 season in the West Cook Inlet area the chinook salmon fishing season was reduced in length to end on June 30. The bag and possession limit was reduced in areas open to the retention of chinook salmon 16 inches or more in length to 1 daily and 1 in possession.

Additionally, in the following areas of West Cook Inlet only unbaited, artificial lures could be used and chinook salmon 16 inches or more in length could not be possessed or retained; all chinook salmon caught had to be released immediately: (1) Chuitna River Drainage: upstream of a department marker located adjacent to the old cable crossing; (2) Theodore River Drainage: upstream of a department marker located approximately 1 mile upstream of the Beluga/Anchorage high voltage power lines; and (3) Lewis River Drainage: upstream of a department marker located approximately 1 river mile upstream of the main Beluga haul road bridge.

### **Appendix E1.-Page 3 of 3.**

Action during the November 1992 meeting also reduced the chinook salmon bag and possession limit in the Susitna River drainage including all flowing waters draining into the west side of the Susitna River downstream of and including the Deshka River. The bag and possession limit for chinook salmon over 16 inches was reduced to 1 daily and 2 in possession.

In addition to BOF action, legislative action during June of 1992 established provisions that prohibited resident or nonresident anglers from fishing in Alaska without a king salmon stamp beginning in 1993.

In anticipation of an inadequate return to the Deshka River, prior to the 1994 chinook season an emergency order was issued reducing the chinook salmon possession limit to one fish and eliminated the use of bait in the Deshka River May 1 through July 14. As the 1994 chinook season progressed it became apparent a weak return was occurring in the entire Susitna River drainage and particularly in the Deshka River. In response to this an emergency order was issued closing all waters of the Deshka River to sport fishing for chinook salmon and prohibiting the use of bait in all waters of the Susitna River drainage downstream of the Deshka River which flow into the Susitna River from the east and the Alexander Creek drainage, all water of the Yentna River drainage, all waters of the Talkeetna River drainage, and all waters of the Chulitna River drainage, June 17 through July 13, 1994.

The BOF during its October 1994 work session choose to delegate to the department the authority to change regulations for the 1995 fishing season. These regulation changes were as follows:

1. the Deshka River and Prairie Creek are closed to fishing for chinook salmon;
2. Alexander Creek above the confluence of Trail Creek is closed to fishing for chinook salmon;
3. the bag and possession limit in the Susitna River and Little Susitna River drainages has been reduced to 1 chinook salmon over 16 inches in length;
4. the use of bait throughout the NCIMA is prohibited (excluding the Anchorage Management Unit),
5. fishing in the NCIMA is allowed only between the hours of 6:00 a.m. and 11:00 p.m. May 15 through July 13. This time restriction will not apply to that portion of the Susitna River drainage currently opened to weekend-only fishing (e.g. between, but not including, the Deshka River and the Talkeetna River) and the Anchorage Management Unit, and
6. the first opening of the Northern District commercial chinook salmon fishery will occur by emergency order. Additional opening of this fishery will be dependent upon inseason indications of run strength.

The only new regulation for the 1996 season was the closure of the Lewis River to king salmon fishing, including catch and release for king salmon.

## **APPENDIX F**

**Appendix F1.-Board of Fisheries regulatory changes made during the November 1992, October 1994, March 1996 and November 1996 meetings.**

PARTIAL SUMMARY OF NEW SPORT, PERSONAL USE, AND SUBSISTENCE FISHING REGULATIONS ADOPTED BY THE BOARD OF FISHERIES FOR NCIMA

King Salmon - Beginning in 1993  
Entire Area

A seasonal limit of 5 king salmon was established for all waters of Cook Inlet. Anglers harvesting a king salmon must immediately enter in ink on the back of their sport fishing license in the appropriate location, the waters fished, species harvested, and date the fish was harvested. Anglers without an annual sport fishing license (anglers younger than 16 years of age and Alaska residents at least 60 years of age) must obtain a king salmon harvest record card prior to king salmon fishing. On harvesting a king salmon they must mark the harvest card accordingly.

The Board also adopted as regulation a proposal which stated that an individual or company engaged in freshwater sport fish guiding may not participate or engage in sport fishing while clients are present or within his or her control or responsibility during the king salmon season, except when guiding a client subject to the Americans with Disabilities Act.

In addition to BOF action, during the first legislative session in June of 1992, legislators passed House Bill 596. This bill included provisions that prohibited resident or nonresident anglers from fishing for king salmon in Alaskan waters unless they have purchased the current year's king salmon tag and have it in possession. King salmon tags are valid from January 1 through December 31. Anglers must stick the tag on the back of their sport fishing license and validate it by signing their name across the tag. Anglers can purchase king salmon tags at the same time they buy their 1993 sport fishing license from their local vendor. There are five groups of resident anglers who are not required to purchase a king salmon tag: (1) blind anglers who qualify for a 25-cent license; (2) anglers under the age of 16; (3) anglers 60 years of age or older who have been a resident of the state for at least 1 year; (4) disabled veterans who are eligible for a free sport fishing license; and (5) anglers who qualify for a \$5 sport fishing license. All nonresident anglers are required to purchase a tag if they are fishing for king salmon in Alaska.

King Salmon - West Cook Inlet Area

The king salmon fishing season was reduced in length to end on June 30. The bag and possession limit was reduced in areas open to the retention of king salmon 16 inches or more in length to 1 daily and 1 in possession.

In the following areas only unbaited, artificial lures may be used, and king salmon 16 inches or more in length may not be possessed or retained; all king salmon caught must be released immediately:

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1. Chuitna River Drainage: upstream of a department marker located adjacent to the old cable crossing;
2. Theodore River Drainage: upstream of a department marker located approximately 1 mile upstream of the Beluga/Anchorage high voltage power lines; and
3. Lewis River Drainage: upstream of a department marker located approximately 1 river mile upstream of the main Beluga haul road bridge.

King Salmon - Susitna River Drainage  
(including all flowing waters draining into the west side of  
the Susitna River downstream of and including the Deshka River)

The bag and possession limit for king salmon over 16 inches was reduced to 1 daily and 2 in possession.

Coho Salmon - Little Susitna River

The management plan for the Little Susitna River was modified. Only unbaited artificial lures may be used in the Little Susitna River from July 15 through August 5. The bag and possession limit for coho salmon 16 inches or more in length during this time period was increased to 3 daily and in possession.

Rainbow Trout

In Big Lake the rainbow trout bag limit was reduced to 2 daily and in possession. In the upper Cook Inlet area only 1 rainbow trout per day and 2 per season may be over 20 inches in length.

Long, X, and Wishbone lakes are closed to sport fishing from November 1 through April 30.

The North Fork of the Kashwitna River was established as a special management area for rainbow trout. Only single-hook, unbaited, artificial lures may be used in the North Fork of the Kashwitna River and rainbow trout may not be possessed or retained; all rainbow trout caught must be released immediately.

Only unbaited artificial lures may be used in all flowing waters of the Susitna-West Cook Inlet area (except when fishing for burbot when using legal gear for burbot as described under burbot in the section) from September 1 through May 15, except in areas in which special regulations are in effect. Areas with special regulations in effect generally require the use of unbaited artificial lures year round and further stipulate that rainbow trout may not be possessed or retained.

### **Appendix F1.-Page 3 of 9.**

In the Lake Creek drainage, rainbow trout may not be possessed or retained in all flowing waters from August 15 through May 15, upstream from a department marker located approximately 100 yards upstream from its confluence with the Yentna River to a department marker located approximately one-quarter mile upstream from Bulchitna Lake. Only single-hook unbaited artificial lures may be used in this area during this time period. The Lake Creek drainage upstream from the Bulchitna Lake marker continues to be managed as a catch-and-release area for rainbow trout.

#### **Burbot**

In the Susitna-West Cook Inlet area set lines are prohibited. Burbot may be taken with more than one line and hook if: (1) the total number of aggregate hooks does not exceed the daily bag limit for waters being fished; (2) the hooks are single hooks with a gap between point and shank larger than three-quarters of an inch; (3) each hook is set to sit on the bottom of the lake or stream; and (4) the burbot gear is closely attended.

The daily bag and possession limit for burbot is 5 daily and in possession in all waters of Susitna-West Cook Inlet Area.

Nancy Lake is closed to the harvest of burbot.

#### **Lake Trout**

The bag and possession limit for lake trout is 2 daily and in possession in all waters of Susitna-West Cook Inlet.

#### **Three Mile Creek**

Three Mile Creek in the West Cook Inlet area-that portion of Three Mile Creek from the road crossing upstream to Three Mile Lake and including that portion of Three Mile lake within a 300 foot radius of the outlet is closed to all fishing.

#### **Fish Creek Personal Use**

Changes in the Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan pertaining to the Fish Creek dip net fishery are as follows:

1. the fishery will be opened by E. O. after July 23 on Saturdays, Sundays, and Wednesdays to the taking of sockeye and coho salmon provided the spawning escapement of sockeye salmon into Big Lake drainage is projected to exceed 50,000 fish;
2. additional fishing time can be established by E. O. provided that no more than 3 consecutive days of fishing is allowed without a minimum of 1 day of closure if escapement into Fish Creek warrants such action;

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3. the area to be open to harvesting salmon by dip net includes waters upstream from a department marker located at the mouth of Fish Creek to a department marker located approximately one-quarter mile upstream of the Knik-Goose Bay Road;
4. the daily bag and possession limit is 6 salmon not in addition to the daily sport fish bag and possession limit;
5. the fishery shall close the second Friday in August, or earlier by E. O. if the harvest of coho becomes excessive in department opinion.

**Subsistence**

In December of 1992 the BOF found that most of Cook Inlet was a nonsubsistence zone and repealed the Upper Cook Inlet Subsistence Management Plan thus eliminating the subsistence fishery in Upper Cook Inlet. The only area that remained open to subsistence fishing in the Upper Cook Inlet area was the Tyonek subdistrict of the Northern District on the west side of Cook Inlet. A court ruling in November of 1993 which found this action by the BOF to be unconstitutional again allowed a subsistence fishery in Upper Cook Inlet for the 1994 season.

During their October 1994 meeting in Fairbanks the BOF delegated authority to restrict chinook salmon harvests in Northern Cook Inlet to the Commissioner of the ADF&G to address stock conservation concerns. The following regulations will be in effect for the 1995 chinook salmon season:

**King Salmon-Entire Area**

1. the Deshka River and Prairie Creek are closed to fishing for chinook salmon;
2. Alexander Creek above the confluence of Trail Creek is closed to fishing for chinook salmon;
3. the bag and possession limit in the Susitna River and Little Susitna River drainages has been reduced to 1 chinook salmon over 16 inches in length;
4. the use of bait throughout the NCIMA is prohibited,
5. fishing in the NCIMA is allowed only between the hours of 6:00 a.m. and 11:00 p.m. May 15 through July 13. This time restriction will not apply to that portion of the Susitna River drainage currently opened to weekend-only fishing (e.g. between, but not including, the Deshka River and the Talkeetna River), and
6. by emergency order only the first opening of the Northern District commercial chinook salmon fishery will occur. Additional opening of this fishery will be dependent upon inseason indications of run strength.

**Appendix F1.-Page 5 of 9.**

The Alaska Board of Fisheries convened in Anchorage, Alaska during March, 1996. A brief summary of regulatory changes affecting the Susitna-West Cook Inlet Area as adopted by the Board of Fisheries follows.

1. The Lewis River is closed to king salmon fishing, including catch and release for king salmon.
2. Changes were made to the Fish Creek Sockeye Management Plan concerning the Fish Creek Personal Use Dipnet fishery. The dip net fishery will now run July 10 through July 30 with a bag limit of 25 salmon per head of household plus 10 salmon per each household member. A permit is required.

The Alaska Board of Fisheries convened in Anchorage, Alaska during November, 1996. A brief summary of regulatory changes affecting the Susitna-West Cook Inlet Area as adopted by the Board of Fisheries follows.

**King Salmon**

5 AAC 21.366. Northern District King Salmon Management Plan

To fulfill changes to the Upper Cook Inlet king salmon management plan, as adopted by the Board of Fisheries, the Department of Fish and Game shall manage the Northern District commercial king salmon fishery as follows:

1. The harvest shall not exceed 12,500 king salmon.
2. The season closes on June 24, unless closed earlier by emergency order.
3. The number of regular periods shall be determined by the department based on preseason expectations of king salmon run strength.
4. The area from one mile south of the Theodore River to the Susitna River is closed to fishing; provisions of this paragraph do not apply after December 31, 1998;
5. If at least 90% of the biological escapement goal for the Theodore River (BEG = 750) or Chuitna River (BEG = 1,400) is not met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.
6. In addition to above, if at least 90% of the biological escapement goal for the Chuitna River has not been met during the 1997 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to sport fishing for king salmon during the 1998 fishing season; the provisions of this paragraph do not apply after December 31, 1998.

5 AAC 61.010. Fishing Seasons:

1. The Alexander Creek drainage is open to the retention (harvest) of king salmon from January 1 through June 30 downstream from a ADF&G regulatory marker at Granite Creek.

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5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

1. In all waters of Alexander Creek drainage between an ADF&G regulatory marker located at Granite Creek, upstream to an ADF&G regulatory marker located 400 yards upstream of Trail Creek, king salmon 16 inches or more in length may not be possessed or retained. All king salmon caught must be released immediately.
2. In all waters of the Susitna River drainage between the confluence of the Deshka River and the confluence of the Talkeetna River: after taking a king salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to king salmon fishing during that same day.
3. In the Little Susitna River from its mouth to the Parks Highway bridge at Houston: after taking a king salmon 16 inches or more in length, a person may not fish for any species of fish in any water open to king salmon fishing during that same day.
4. In all waters of the Susitna-West Cook Inlet Management Area, excluding the Susitna River between its confluence with the Deshka River and its confluence with the Talkeetna River: after taking a king salmon 16 inches or more in length, a person may not fish for king salmon during that same day.
5. The bag and possession limit of king salmon 16 inches or more in length taken from the Little Susitna River drainage is one fish per day and in possession.

5 AAC 61.035. Methods and Means:

1. Only unbaited, single-hook, artificial lures may be used from January 1 through June 30 in all waters of the Alexander Creek drainage between an ADF&G regulatory marker located at Granite Creek and to an ADF&G regulatory marker located 400 yards upstream of Trail Creek.

5 AAC 61.050. Waters Closed to Sport Fishing:

1. Peters Creek (Susitna River drainage) is closed to sport fishing for king salmon upstream from an ADF&G regulatory marker, located approximately 1 mile upstream from its confluence with the Kahiltna River.
2. The Theodore River is closed to sport fishing for king salmon. The provisions of this paragraph do not apply after December 31, 1998.

**Rainbow Trout (Resident Species)**

5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

1. Rainbow trout may not be possessed or retained in all waters of the Prairie Creek drainage and within one-quarter mile of its confluence with the Talkeetna River.
2. In Prairie Creek the bag and possession limits for Arctic grayling are two fish.
3. Rainbow trout, Dolly Varden, whitefish, and Arctic grayling may not be possessed or retained in all waters of the Alexander Creek drainage and within one-quarter mile of its confluence with the Susitna River. Northern pike may be possessed and retained.

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5 AAC 61.035: Methods and Means:

1. Only unbaited, single-hook, artificial lures may be used in the Prairie Creek drainage and within one-quarter mile of its confluence with the Talkeetna River.
2. Only unbaited, single-hook, artificial lures may be used in all flowing waters of the Alexander Creek drainage upstream of an ADF&G regulatory marker located 400 yards upstream of the confluence of Trail Creek.
3. Unbaited, single-hook, artificial lures are required year-round upstream of the Parks Highway in Rabideux Creek, Montana Creek, Goose Creek, Caswell Creek, Kashwitna River, Gray's Creek, Little Willow Creek, Sheep Creek, Willow Creek, and Little Susitna River, and upstream of a department regulatory marker in Birch Creek drainage, Sunshine Creek drainage, and upstream of the Petersville Road in Trapper Creek.
4. Only unbaited, single-hook, artificial lures may be used from September 1 through May 31 in all waters of the above described drainages and in all waters within a one-half mile radius of their confluence with the Susitna River or the mouth of the Little Susitna River.
5. Unbaited, single-hook, artificial lures are required year-round in the Willow Creek drainage upstream of a department marker located one-quarter mile upstream from its confluence with the Susitna River and in all waters of the Willow Creek drainage and within a one-half mile radius of its confluence with the Susitna River from September 1 through May 31.
6. Only unbaited, single-hook, artificial lures may be used year-round in Montana Creek upstream of the Parks Highway. Only unbaited, single-hook, artificial lures may be used in Montana Creek downstream of the Parks Highway and in all waters within a one-half mile radius of its confluence with the Susitna River from September 1 through May 31.

5 AAC 61.050. Waters Closed to Sport Fishing:

1. Fish Lake Creek drainage upstream of the first lake is closed to salmon fishing from July 14 through December 31.
2. All waters of Rabideux Creek, Trapper Creek, Gray's Creek, and the Kashwitna River within a one-quarter mile radius of their confluence with the Susitna River are closed to sport fishing from June 1 through July 13, except during king salmon season as authorized by 5 AAC 61.010(f)(2). King salmon season commences with the second Saturday through Monday in June and continues for three additional consecutive 3-day weekends thereafter.

5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

1. The retention of rainbow trout in the Willow Creek drainage and in all waters within one-half mile radius of its confluence with the Susitna River is prohibited. All rainbow trout caught in the Willow Creek drainage and within a one-half mile radius of its confluence with the Susitna River must be immediately released.
2. The retention of rainbow trout is prohibited in Montana Creek drainage and all waters within a one-half mile radius of its confluence with the Susitna River.

**Appendix F1.-Page 8 of 9.**

1. The bag and possession limit for rainbow trout in all flowing waters and nonstocked lakes of the Susitna West-Cook Inlet Area open to the retention of rainbow trout is two rainbow trout of which one may be over 20 inches in length and the bag and possession limit in stocked lakes is five rainbow trout of which one may be over 20 inches in length. Stocked lakes are: Barley, Bear Paw, Bench, Benka, Beverly, Big No Luck, Upper and Lower Bonnie, Bruce, B-J, Canoe, Carpenter, Christiansen, Coyote, Crystal, Dawn, Diamond, Echo, Farmer, Finger, Lalen, Little Lonely, Little No Luck, Loberg (Junction), Long (Glenn Highway MP 86), Loon, Lorraine, Lucille, Lynne, Marion, Matanuska, Meirs, Memory, Morvro, North Friend, Prator, Ravine, Reed, Rocky, Ruby, Seventeenmile, Seymour, Slipper, South Friend, South Rolly, Tigger, Twin Island, Vera, Victor, Visnaw, Walby, Weiner, West Sunshine, Willow, Wolf, and Y.

**Northern Pike**

5 AAC 61.035: Methods and Means:

1. Sport fishing for northern pike using five (5) lines is allowed in specified lakes of the Susitna West-Cook Inlet Area provided: hooks are single hooks with a gap between the point and shank no smaller than three-quarters inch, the lines are closely attended, and all species of fish other than northern pike are immediately released. Specified lakes include: Alexander Lake, Sucker Lake, Trapper Lake, Flathorn Lake, Whiskey Lake, Hewitt Lake, Donkey Lake, Three Mile Lake (Beluga area), Neil Lake, Kroto Lake, and lakes of the Nancy Lake Recreation Area excluding Nancy and Big No Luck Lake.

5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

1. The 10 fish bag and possession limit on northern pike in the Susitna-West Cook Inlet Area was repealed. There are no bag, possession or size limits on northern pike in the Susitna-West Cook Inlet Area.

**Burbot**

5 AAC 61.035: Methods and Means:

1. In flowing waters of the Susitna River and Yentna River the requirement that burbot lines specified in 5 AAC 61.035 (h)(1),(2), and (3) be closely attended is repealed. The 24-hour requirement (each line must be physically inspected at least once during each 24-hour period) notwithstanding, burbot lines in the specified waters are not required to be closely attended.

**Coho salmon**

5 AAC 61.060: Little Susitna River Management Plan.

1. The option to increase the bag and possession limits of coho salmon in specified areas of the Little Susitna River when the escapement goal of 7,500 nonhatchery fish upstream of the Parks Highway is projected, was repealed. The bag and possession limits of salmon other than king salmon in the Little Susitna River are three fish per day and in possession.

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**Miscellaneous**

5 AAC 61: Reformat the Susitna West-Cook Inlet Area Codified Regulations.

1. The format of the Susitna West-Cook Inlet codified regulation summary will be changed to agree with the format of other management areas.

## **APPENDIX G**

**Appendix G1.-Confirmed and reported northern pike waters in the Northern Cook Inlet Management Area.**

**Susitna Basin Lakes**

Alexander Creek

Alexander Lake  
Sucker Lake  
Trail Lake  
Rabbit Lake

Lower Susitna

Flathorn Lake  
Figure 8 Lake

Mid Susitna

Witsoe Lake  
Witsol Lake  
Lockwood Lake  
Lady Slipper  
Unnamed  
Unnamed  
Unnamed  
Vern Lake  
Ding Dong

Yentna River

Whiskey Lake  
Bulchitna Lake  
Fish Creek Lake 1  
Fish Creek Lake 2  
Fish Creek Lake 3  
Fish Creek Lake 4  
Donkey Lake  
Hewitt Lake  
No Name (Big Bend)

Chelatna Lake

Skwentna River

Eight Mile Lake  
Seven Mile Lake  
No Name (Herk Strip)  
One Stone Lake

Deshka River

Parker Lake  
Trapper Lake  
No Name Lake  
Ambler Lake  
Rocky Lake  
Neil Lake

Kroto Lake

Upper Susitna

Kashwitna Lake<sup>a</sup>

Caswell Lake<sup>a</sup>

Fish Lake<sup>a</sup>

Sawmill Lake<sup>a</sup>

Swan Lake

Nancy Lake Area

Redshirt Lake

Lynx Lake

Cow Lake

Little Chicken

South Rolly Lake

North Rolly Lake

Tanaina Lake

Milo Lake

Frazer Lake

Little Frazer Lake

James Lake

Owl Lake

Char Lake

Ardaw Lake

Phoebe Lake

Chicken Lake

Echo Pond #1

Echo Pond #2

Echo Pond #3

Candle Stick Lake

Bains Pond #1

Bains Pond #2

Bains Pond #3

Willow Creek

Long Lake

Crystal Lake

Rainbow Lake<sup>a</sup>

Shirley Lake<sup>a</sup>

**Susitna Tributaries**

Deshka River

Fish Creek (Flathorn)

Fish Creek (Kroto)

Lake Creek

Fish Lake Creek

Alexander Creek

Trappers Creek

Sucker Creek

Montana Creek

Rolly Creek

Moose Creek

Bottle Creek

Hewitt Creek

Donkey Creek

Indian Creek (Yentna)

Indian (Chulitna)<sup>a</sup>

Rabideux Creek

Fish Lake Creek

Kutna Creek (Yentna)

Shell Creek

Eightmile Creel

Caswell Creek

Witsoe Creek

Trapper (Talkeetna)<sup>a</sup>

Talachulitna Creek<sup>a</sup>

Johnson Creek

Otter Creek

Unnamed (Low Su)

Sunshine Creek<sup>a</sup>

Anderson Creek<sup>a</sup>

Wiggel Creek<sup>a</sup>

Birch Creek<sup>a</sup>

Yentna River

Skwentna River

Chulitna River<sup>a</sup>

**Little Susitna River**<sup>a</sup>

Horseshoe Lake

**Knik River Basin**

Swan Lake<sup>a</sup>

Jim Lake<sup>a</sup>

**West Cook Inlet**

Chuit River

Threemile Creek

Chuit Lake

Threemile Lake

**Landlocked Lakes**

Memory Lake

Finger Lake

<sup>a</sup> Reported but not confirmed northern pike populations (D. Rutz, Alaska Department of Fish and Game, personal communication).