Fishery Management Report No. 99-1

Area Management Report for the Recreational Fisheries of Northern Cook Inlet, 1998

by

Craig Whitmore

and

Dana Sweet

June 1999

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.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
metric ton	mt
milliliter	ml
millimeter	mm

Weights and measures (English)

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

Spell out acre and ton.

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
hour (spell out for 24-hour clock)	h
minute	min
second	s

Spell out year, month, and week.

Physics and chemistry

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

General

All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.
All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.
and	&
at	@
Compass directions:	
east	E
north	N
south	S
west	W
Copyright	©
Corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
et alii (and other people)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.,
id est (that is)	i.e.,
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
number (before a number)	# (e.g., #10)
pounds (after a number)	# (e.g., 10#)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)

Mathematics, statistics, fisheries

alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	F, t, χ^2, etc.
confidence interval	C.I.
correlation coefficient	R (multiple)
correlation coefficient	r (simple)
covariance	cov
degree (angular or temperature)	°
degrees of freedom	df
divided by	÷ or / (in equations)
equals	=
expected value	E
fork length	FL
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
mideye-to-fork	MEF
minute (angular)	'
multiplied by	x
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
standard length	SL
total length	TL
variance	Var

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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; existing management plans; 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, management and educational 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 (WCI) 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 creek to the south and waters of the Nancy Lake Recreation Area. This management unit has no marine waters.
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 and, primarily for management purposes, eastside drainages of the Susitna River within a half

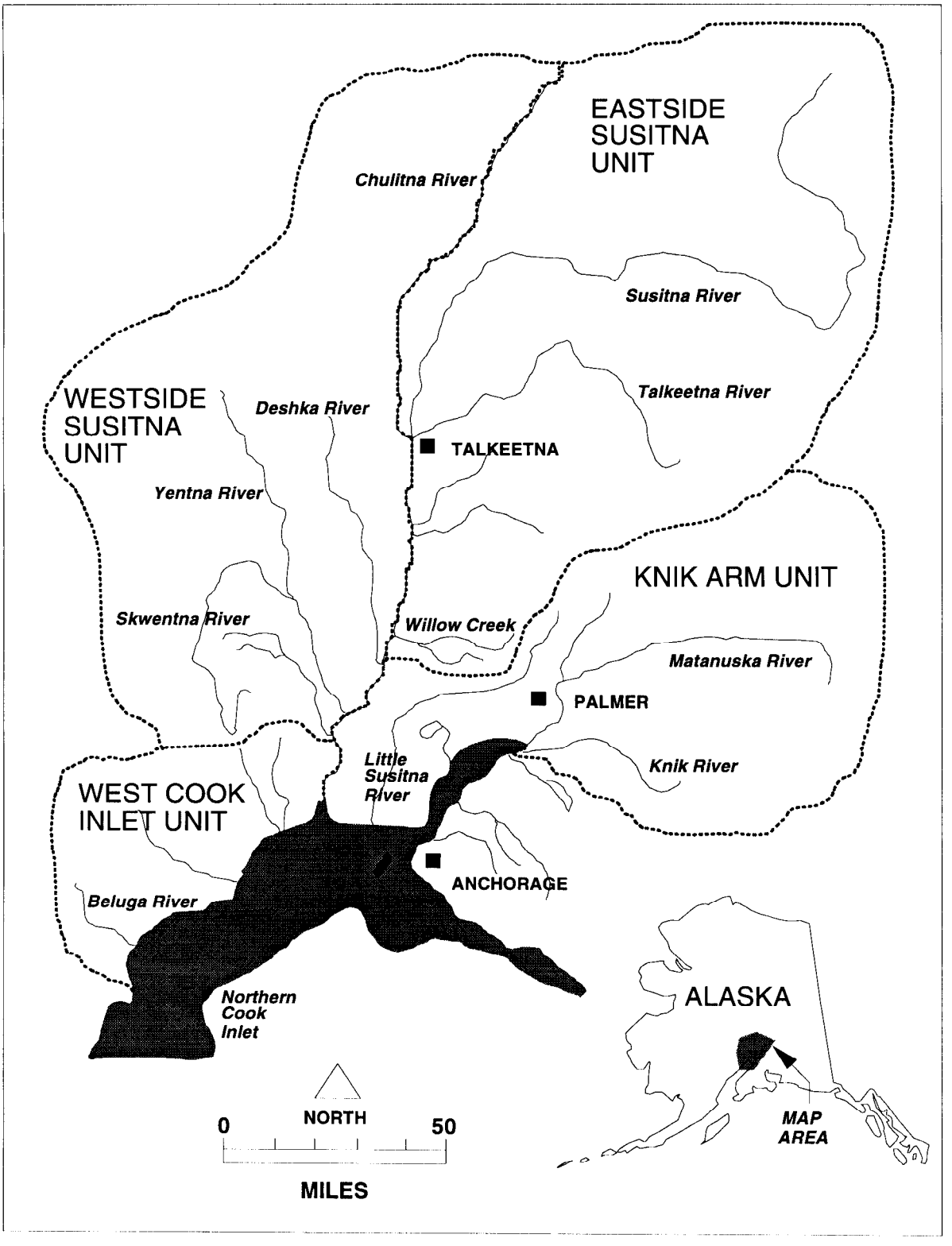

Figure 1.-Map of the Northern Cook Inlet sport fish management area.

mile of the Susitna River downstream of Willow Creek. 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. 1998). 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 (David Rutz), three permanent full-time Fisheries Biologist II Research Biologists (Larry Bartlett, 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 30 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. Active committees meet several times each year. 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 resident finfish species were addressed most recently in October 1998. The remaining finfish regulations are scheduled to be addressed in February 1999. 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. Criteria for Establishing Special Management for Trout (5 AAC 75.013)
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. Upper Yentna River Subsistence Salmon Fishery (5 AAC 01.593)

The Upper Cook Inlet Salmon Management Plan (UCISMP) establishes allocation criteria and primary direction for fishery management. Other plans dealing with salmon 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. 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. Maintenance of viable and diverse fish species and stocks;
3. Maintenance of the genetic diversity of fish species and stocks;
4. Presentation to the Board of the best available information;
5. Proposed actions should be capable of being implemented and evaluated. This consideration includes factors such as flexible and adaptive management, conflict with other law and mixed stock management;

6. Proposed actions should provide tangible benefits to user groups or conservation, with the least risk to existing fisheries and to conservation;

7. Maintenance of the 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. It presently provides for a terminal set gillnet commercial fishery in Knik Arm near the mouth of Fish Creek July 15 through July 26. 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 (5 AAC 21.368) authorizes a harvest of Big River salmon by set gillnets in the Kustatan Subdistrict of the Central District. Sockeye salmon is 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 Criteria For Establishing Special Management For Trout was adopted by the BOF in November 1996 from the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy. This criteria 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 Northern District Coho Salmon Management Plan minimizes the harvest of Susitna River coho salmon and limits 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 gillnet fishing opportunity is provided near the terminus of the Kasilof River.

The Upper Yentna River Subsistence Salmon Fishery establishes a subsistence fish wheel fishery in the Yentna River downstream of its confluence with the Skwentna River. This fishery was implemented as a personal use fishery during the 1996 season and 1997 seasons. State Supreme Court and BOF action changed it to a subsistence fishery beginning in 1998.

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 Statewide Harvest Survey (SWHS), a mail survey (Mills 1979-1994, Howe et al. 1995-1998). This survey estimates the number of angler-days of sport fishing effort expended by recreational anglers fishing Alaskan waters, as well as the harvest and beginning in 1990, catch (number harvested plus number released) of important sport species. The SWHS is designed to provide estimates of effort, harvest and catch by site and, unfortunately, is not designed to provide estimates of effort directed towards a single species at a site. Additionally, onsite creel surveys

have been selectively used 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 1996, an average of 294,783 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 14% of the total statewide and 20% 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. 1998).

During 1997 anglers spent an estimated 300,350 angler-days fishing NCIMA waters falling slightly below the previous 5-year average. The effort in 1997 represented 11% and 17% 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 1996, these waters supported an average of 123,258 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 36,513 angler-days of effort for the period 1977-1997 (Table 2, Figure 3). Other major fisheries occur in the many stocked lakes in the basin (notably in Finger Lake and the Kepler Lake Complex) and at various road-accessible streams including Knik River tributaries, the Eklutna Power Plant tailrace, Big Lake drainage, 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 1996 expended an average of 93,450 angler-days (Table 1). This expenditure of effort has represented an average of 32% of the total sport effort from all NCIMA waters during this time period. A total of 112,267 angler days were spent in this area during 1997, falling below the previous 5-year average (1992-1996). 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 1996 expended an average of 72,090 angler-days (Table 1). This expenditure of effort has represented an average of 24% of the total effort from all NCIMA waters during this time period. A total of 61,155 angler days occurred during 1997, a considerable decrease from the previous 5-year average. Major fisheries occur in the Deshka River, Alexander Creek, and the Yentna River including Lake Creek (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).

From 1977 through 1996 anglers fishing West Cook Inlet Management Unit waters expended an average of 5,986 angler-days (Table 1). This expenditure of effort represents an average of 2% of the total effort from all NCIMA waters during this time period. A record number of angler-days (10,594) were spent in this area in 1987. A total of 5,814 angler days occurred during 1997,

Table 1.-Number of angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1997.

	Knik Arm		Eastside Susitna		Westside Susitna		West Cook Inlet[a]		NCIMA	Alaska	% by	Region II	% by
Year	Effort	% NCIMA	Effort	% NCIMA	Effort	% NCIMA	Effort	% NCIMA	Total	Total	NCIMA	Total	NCIMA
1977	81,949	48	56,651	33	29,211	17	2,735	2	170,546	1,198,486	14	828,351	21
1978	75,540	38	86,010	43	35,709	18	2,262	1	199,521	1,285,063	16	913,417	22
1979	78,411	38	78,222	38	48,362	23	2,012	1	207,007	1,364,739	15	1,014,018	20
1980	102,530	42	91,277	38	46,768	19	1,357	1	241,932	1,488,962	16	1,072,384	23
1981	105,052	52	59,854	30	35,072	17	2,263	1	202,241	1,420,172	14	1,016,731	20
1982	91,713	41	80,745	36	50,738	23	1,126	1	224,322	1,623,090	14	1,131,358	20
1983	138,389	50	67,471	25	63,919	23	4,738	2	274,517	1,732,528	16	1,212,680	23
1984	130,727	47	81,758	29	61,263	22	5,839	2	279,587	1,866,837	15	1,341,658	21
1985	122,626	44	67,764	24	77,092	28	10,005	4	277,487	1,943,069	14	1,406,419	20
1986	131,606	41	92,289	29	87,736	27	8,318	3	319,949	2,071,412	15	1,518,712	21
1987	140,167	45	77,817	25	84,448	27	10,594	3	313,026	2,152,886	15	1,556,050	20
1988	183,029	47	107,977	27	95,339	24	6,530	2	392,875	2,311,291	17	1,679,939	23
1989	146,912	42	96,864	28	96,308	28	9,997	3	350,081	2,264,079	15	1,583,381	22
1990	142,884	41	101,917	29	92,435	27	9,354	3	346,590	2,453,284	14	1,745,110	20
1991	146,605	40	113,178	31	104,072	28	5,791	2	369,646	2,456,328	15	1,782,055	21
1992	141,825	36	149,484	38	101,496	25	5,420	1	398,225	2,540,374	16	1,889,930	21
1993	118,214	33	128,382	35	106,724	29	8,559	2	361,879	2,559,408	14	1,867,233	19
1994	143,372	38	114,533	31	106,112	28	9,438	3	373,455	2,719,911	14	1,966,985	19
1995	126,154	43	102,686	35	60,177	20	6,064	2	295,081	2,787,670	11	1,985,539	15
1996	117,454	39	114,115	38	58,819	20	7,314	2	297,702	2,733,008	11	1,948,892	15
Mean	123,258	42	93,450	32	72,090	24	5,986	2	294,783	2,048,630	14	1,473,042	20
92-96 Mean	129,404	37	121,840	35	86,666	25	7,359	2	345,268	2,668,074	13	1,931,716	18
1997	121,114	40	112,267	37	61,155	20	5,814	2	300,350	2,654,454	11	1,803,564	17

[a] Data include saltwater effort from outside the NCIMA as reported in the SWHS.

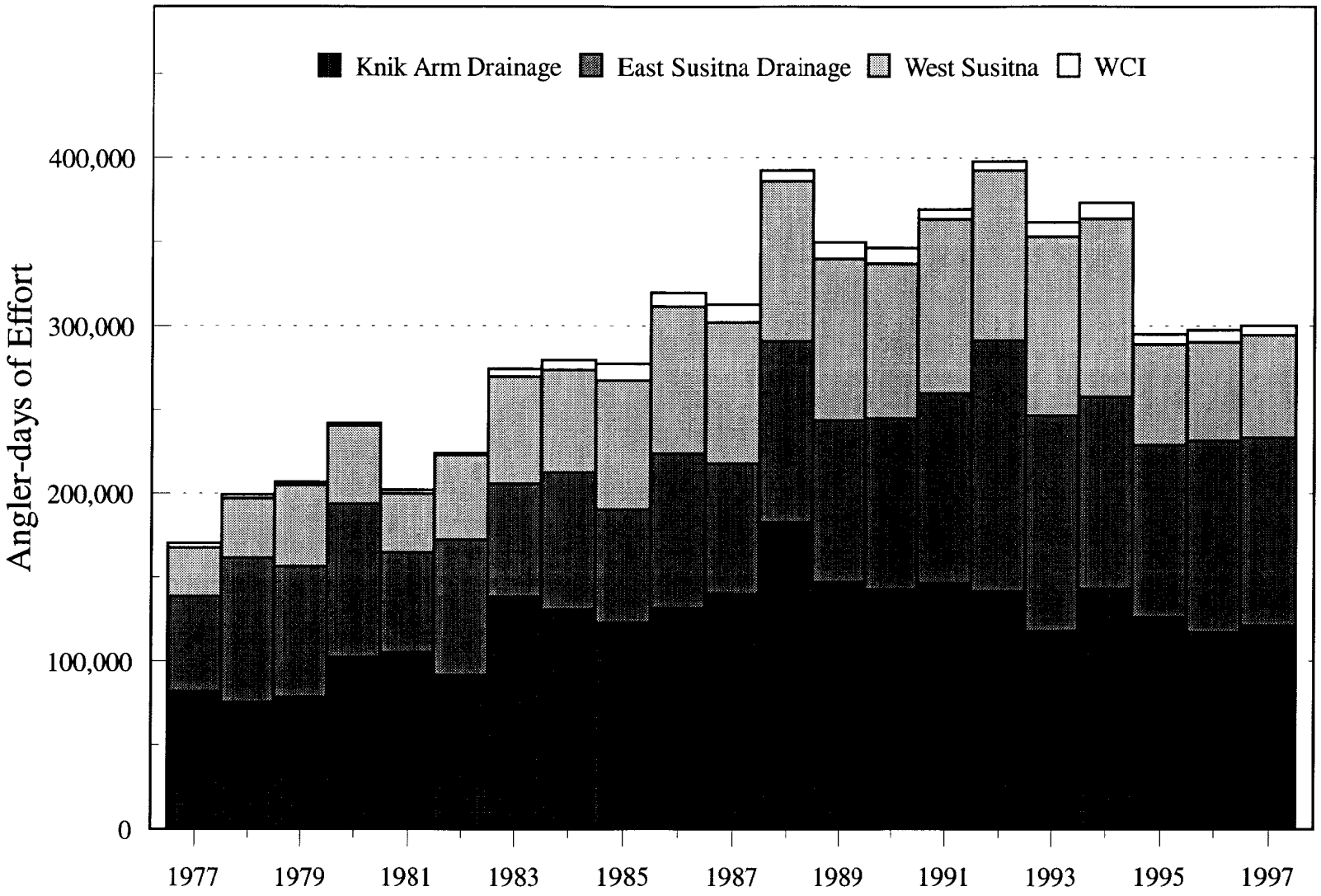

Figure 2.-Angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1997.

Table 2.-Angler-days of sport fishing effort for the Knik Arm drainage by fishery, 1977-1997.

Year	Marine	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cotton-wood Creek	Big Lake drainage streams	Finger Lake	Kepler Lk Complex	Big Lake	Nancy Lk Complex	Other Lakes[b]	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
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
1996	1,213	32,748	10,082	9,392	1,872	2,410	1,217	7,073	9,844	9,649	7,058	23,500	1,396	117,454
Mean	2,956	36,513	10,711	7,868	3,015	4,433	2,989	7,279	10,330	12,231	9,160	21,827	1,956	123,258
92-96 Mean	1,411	42,114	9,263	7,724	1,671	2,658	2,896	7,534	11,116	9,321	9,734	22,564	1,399	129,404
1997	866	35,594	7,177	5,213	1,570	2,759	1,452	9,629	10,908	9,702	9,500	24,938	1,806	121,114

[a] Knik River and tributaries including Jim Creek.

[b] Includes effort for lakes and streams, 1977-1982.

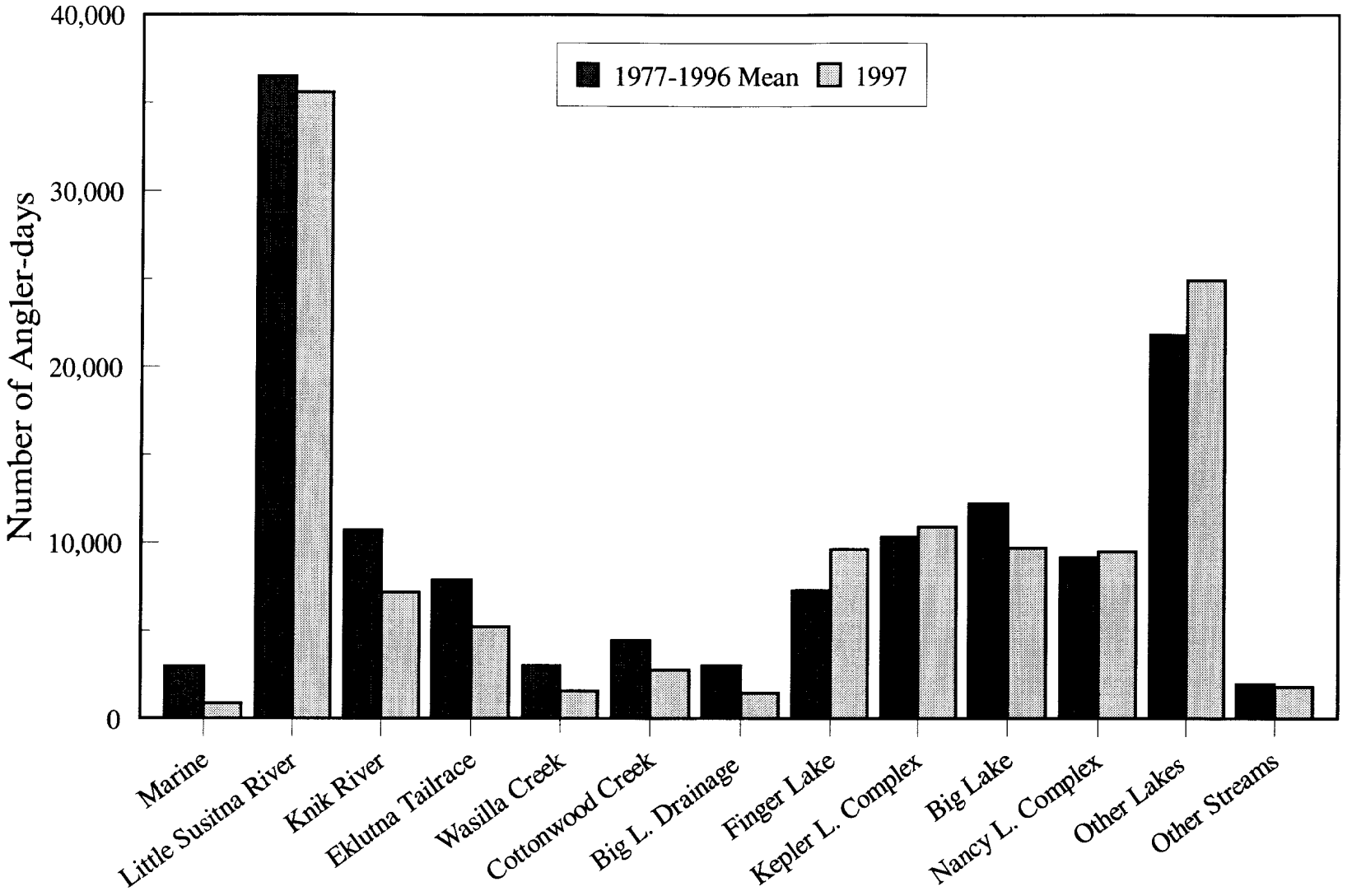

Figure 3.-Mean number of angler-days per year of sport fishing effort expended at sites in the Knik Arm management unit, 1977-1997.

Table 3.-Angler-days of sport fishing effort for the eastside Susitna River drainage by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams	Lakes[b]	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	91,277
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
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
1996	31,709	8,260	1,429	2,082	10,912	2,493	18,623	686	4,137	24,928	4,893	3,963	114,115
Mean	24,899	6,258	2,358	4,797	10,268	2,818	17,927	1,258	4,294	12,331	5,020	6,219	93,450
92-96 Mean	37,528	7,410	1,725	4,652	12,468	3,223	18,240	925	4,017	21,397	5,711	4,544	121,840
1997	28,384	7,700	2,511	1,751	12,152	4,186	18,725	801	2,088	23,630	4,853	5,486	112,267

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes effort for lakes and streams, 1977-1982.

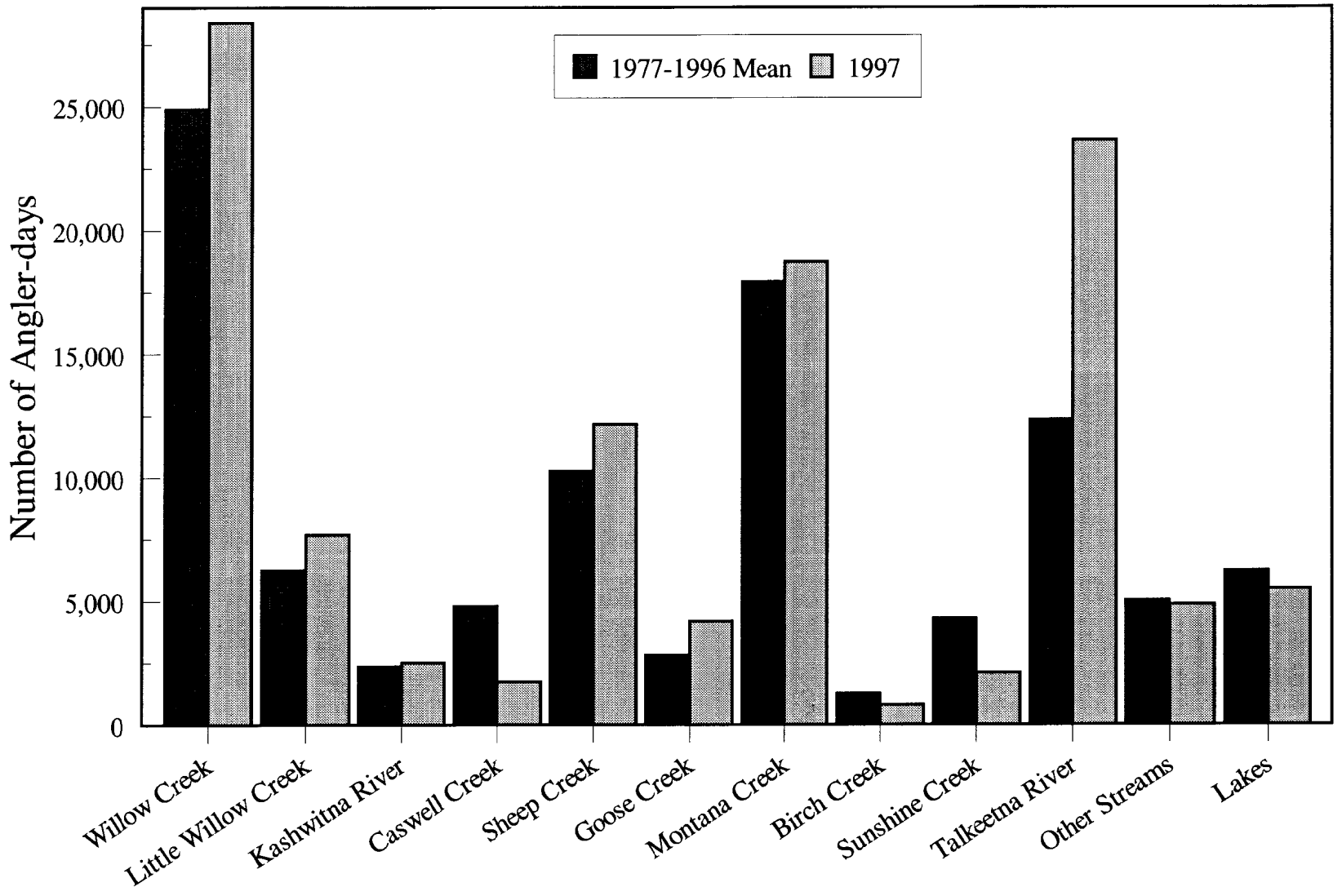

Figure 4.-Mean number of angler-days per year of sport fishing effort expended at sites in the eastside Susitna River management unit, 1977-1997.

Table 4.-Angler-days of sport fishing effort for the westside Susitna River drainage by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Shell Lake	Whiskey Lake	Hewitt Lake	Other Streams[b]	Other Lakes[b]	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	35,709
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
1995	10,648	4,808			2,728	1,465	15,808	4,729	6,354					10,790	2,847	60,177
1996	7,360	6,854			1,719	1,455	16,891	3,055	7,193					12,125	2,167	58,819
Mean	13,562	22,516	756	769	1,873	1,506	14,783	5,307	4,287	764	484	161	498	8,453	3,110	72,090
92-96 Mean	16,672	19,726	992		2,496	1,515	20,728	5,024	6,321				800	10,640	3,185	86,666
1997	9,762	6,780			2,208	817	19,013	3,874	7,262					8,734	2,705	61,155

[a] Fish Lake drainage (Yentna River drainage).

[b] May include effort from West Cook Inlet drainage waters.

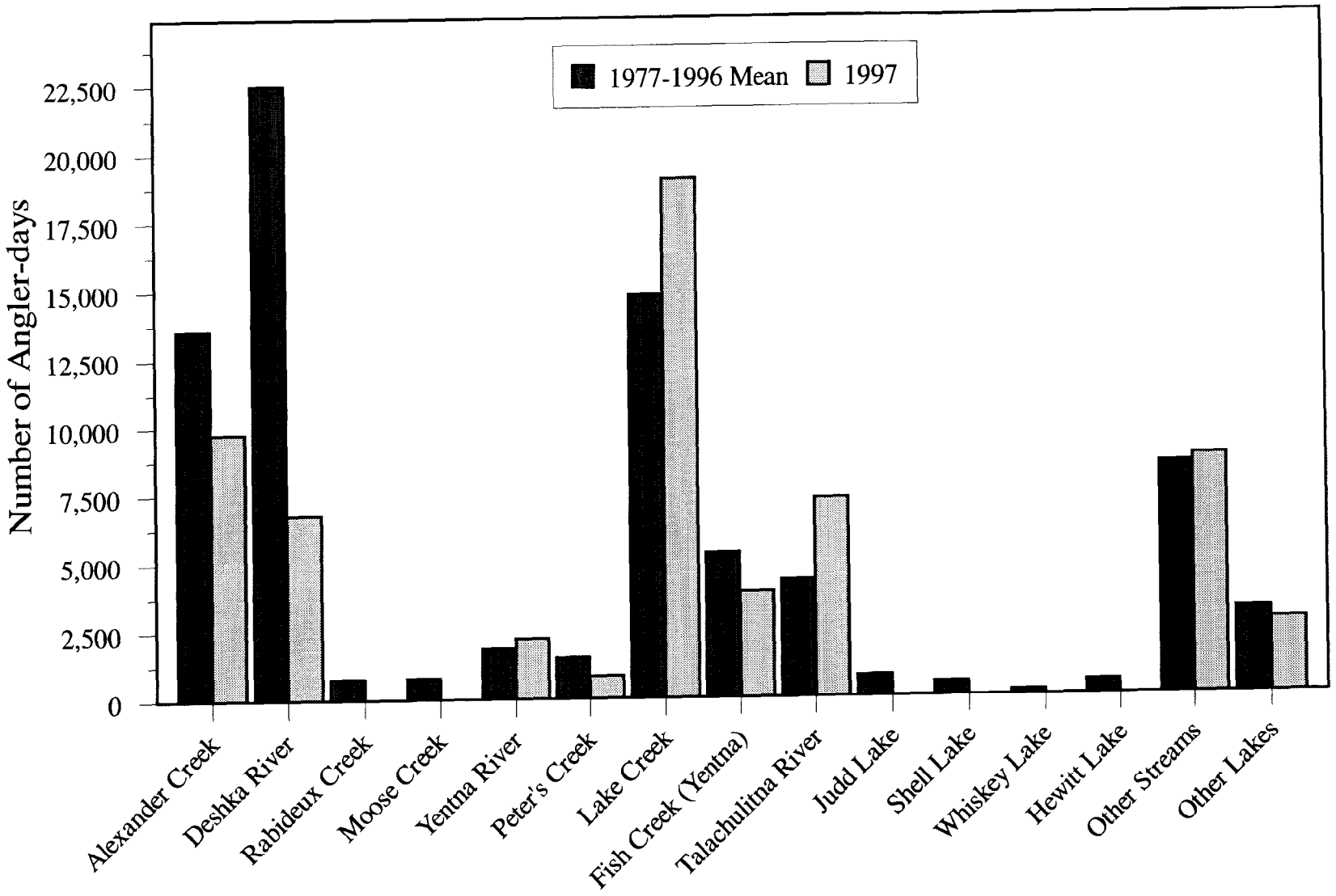

Figure 5.-Mean number of angler-days per year of sport fishing effort expended at sites in the westside Susitna River management unit, 1977-1997.

a decrease from the previous 5-year average. All the annual effort has been expended in fresh water. Major fisheries include the Chuitna and Theodore river drainages (Table 5, Figure 6).

RECREATIONAL FISH HARVEST

From 1977 through 1996, an average of 203,960 fish were caught and kept (harvested) by anglers fishing NCIMA waters (Tables 6 and 7, Figure 7). Coho salmon, rainbow trout and chinook salmon accounted for approximately half of this average harvest (Figure 8).

On average, fish from the Knik Management Unit accounted for 45% of fish caught and kept within the NCIMA during 1977-1996 (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, pink 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 64% of the WCI harvest (Table 11).

The 1977-1997 NCIMA harvests by fishery of all species 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. 1995-1998). From 1992 through 1997 the average percent released was approximately 64% 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. 1995-1998) (Tables 13 and 14). Pink salmon, chum salmon, Arctic grayling, rainbow trout, and whitefish were the most frequently released fish species during 1992-1997. In all units during 1994-1997, 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 1997 was 5.5 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: beginning in 1989 the yearly harvest of chinook salmon in the recreational harvest exceeded the commercial harvest in all but one year (Table 7, Appendix B2).

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 driftnet and Western Subdistrict setnet fisheries of the Central District (Appendices B3 and B4) and in the setnet 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 setnet fisheries is assumed to be composed of NCIMA stocks. Catch

Table 5.-Angler-days of sport fishing effort for the West Cook Inlet drainage by fishery, 1977-1997.

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
1995	2,205		2,425		1,434	6,064
1996	3,541		2,402		1,371	7,314
Mean	2,401	689	2,646	634	2,084	5,986
92-96 Mean	2,753	512	2,588	400	2,295	7,359
1997	2,851		690		2,273	5,814

Figure 6.-Mean number of angler-days per year of sport fishing effort expended in the West Cook Inlet drainage, 1977-1997.

Table 6.-Northern Cook Inlet Management Area recreational harvest by management unit, 1977-1997.

	Knik Arm		Eastside Susitna		Westside Susitna		West Cook Inlet		NCIMA	Alaska	% by	Region II	% by
Year	Harvest	% NCIMA	Harvest	% NCIMA	Harvest	% NCIMA	Harvest	% NCIMA	Total	Total	NCIMA	Total	NCIMA
1977	67,979	43	49,274	31	36,096	23	3,510	2	156,859	2,300,332	7	1,929,407	8
1978	66,419	31	96,469	46	45,208	21	3,070	1	211,166	2,399,472	9	1,992,212	11
1979	68,658	41	50,476	30	46,939	28	2,453	1	168,526	2,502,213	7	2,044,813	8
1980	102,015	41	93,271	38	50,474	20	1,798	1	247,558	2,627,312	9	2,118,543	12
1981	109,824	57	46,558	24	32,153	17	3,631	2	192,166	2,528,056	8	2,052,719	9
1982	82,976	44	58,998	31	46,189	24	1,404	1	189,567	2,828,706	7	2,222,354	9
1983	92,689	51	45,330	25	41,855	23	3,257	2	183,131	3,086,280	6	2,409,876	8
1984	94,974	45	62,071	30	48,947	23	4,250	2	210,242	3,115,966	7	2,517,185	8
1985	104,136	53	39,684	20	47,868	24	5,646	3	197,334	3,096,044	6	2,469,836	8
1986	90,264	40	73,083	32	59,300	26	4,781	2	227,428	3,163,433	7	2,609,304	9
1987	98,373	47	47,548	23	57,252	27	5,587	3	208,760	3,207,138	7	2,584,420	8
1988	156,784	54	62,693	22	67,567	23	4,278	1	291,322	3,483,306	8	2,841,033	10
1989	115,070	51	51,426	23	55,361	24	5,896	3	227,753	3,213,867	7	2,519,404	9
1990	90,035	47	44,360	23	52,846	28	4,324	2	191,565	3,033,301	6	2,428,172	8
1991	103,384	46	51,068	23	66,514	29	4,578	2	225,544	3,311,513	7	2,633,148	9
1992	88,267	38	76,569	33	62,768	27	3,854	2	231,458	3,234,048	7	2,675,940	9
1993	90,017	41	67,907	31	55,215	25	5,966	3	219,105	2,989,720	7	2,387,224	9
1994	87,547	45	51,984	27	47,891	25	6,530	3	193,952	3,349,821	6	2,689,718	7
1995	57,182	40	42,845	30	37,688	27	3,656	3	141,371	2,909,979	5	2,396,666	
1996	77,435	47	48,716	30	34,025	21	4,219	3	164,395	3,336,773	5	2,733,663	6
Mean	92,201	45	58,017	28	49,608	24	4,134	2	203,960	2,985,864	7	2,412,782	8
92-96 Mean	80,090	42	57,604	30	47,517	25	4,845	3	190,056	3,164,068	6	2,576,642	7
1997	57,127	43	38,798	29	29,789	22	7,225	5	132,939	3,294,273	4	2,643,988	5

Table 7.-Northern Cook Inlet Management Area sport fish harvest by species, 1977-1997.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Land-locked Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Lake Trout	Burbot	Northern Pike	White-fish	Smelt	Other	Total
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	12,449	34,836	9,067	19,045	8,111	11,841	49,948	19,723	19,196	1,560	1,656	607	0	0	1,528	189,567
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	77,020	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	12,698	12,238	2,397	978	3,120	1,716	2,324	15	227,753
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	64,657	11,510	3,495	3,240	15,754	52,420	13,009	10,084	1,527	981	6,640	2,057	6,132	80	225,544
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	765	1,655	5,721	878	6,596	303	219,105
1994	31,098	67,465	11,067	3,870	2,937	14,198	28,807	5,145	8,044	411	2,276	3,884	1,193	13,135	422	193,952
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
1996	15,549	67,902	11,154	4,337	4,574	14,623	27,889	6,240	4,218	95	610	5,606	213	1,324	61	164,395
Mean	22,126	47,826	11,284	14,315	6,307	16,387	44,054	14,066	15,316	1,832	1,768	2,516	1,115	4,309	740	203,960
% of Total Mean	11	23	6	7	3	8	22	7	8	1	1	1	1	2	<1	100
92-96 mean	31,536	70,655	11,467	4,861	4,170	12,533	27,710	5,615	5,380	685	1,362	4,828	675	8,225	355	190,056
1997	23,490	32,650	14,808	3,446	3,178	10,056	23,070	4,638	3,893	285	1,302	7,627	256	3,926	314	132,939

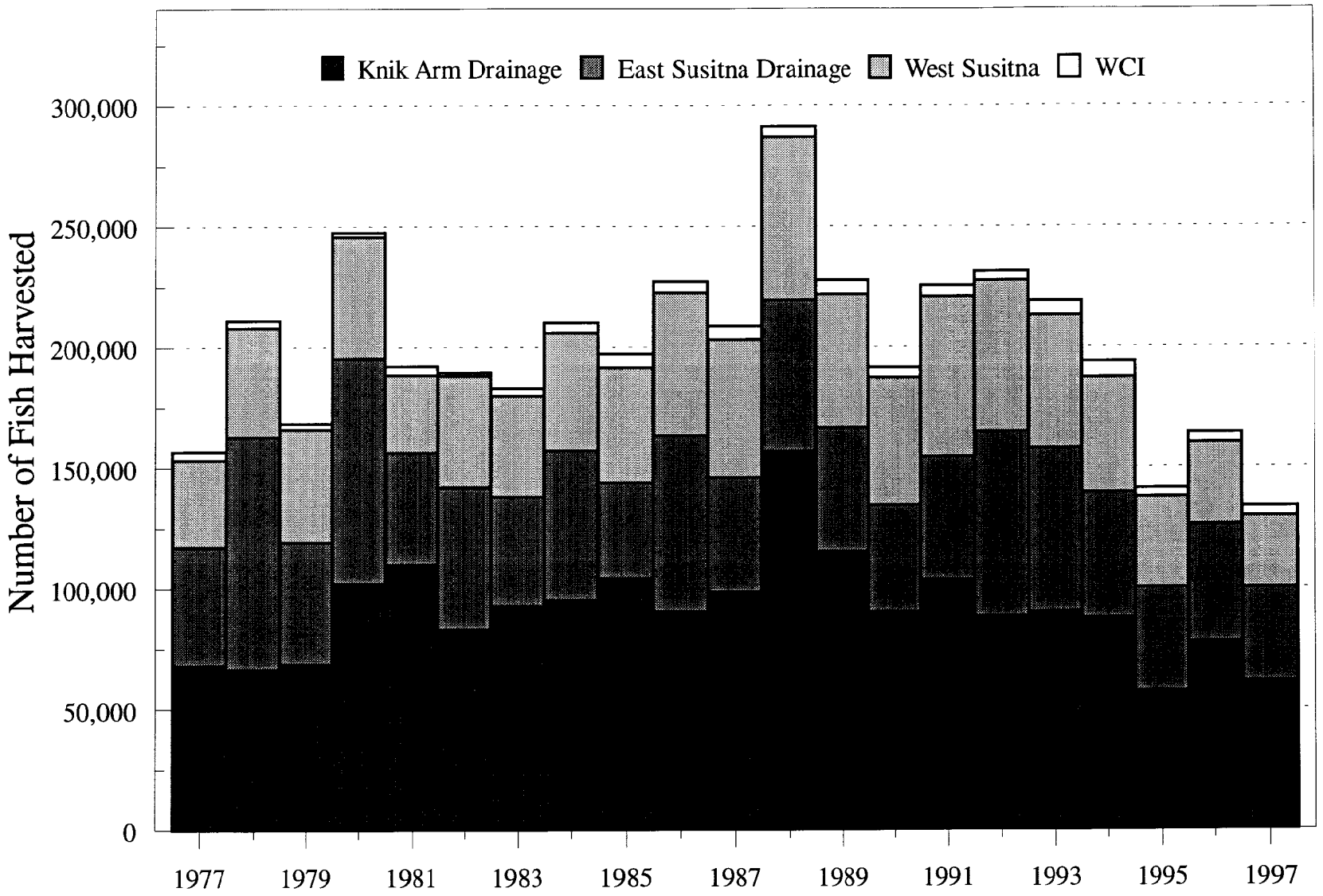

Figure 7.-Northern Cook Inlet Management Area recreational harvest, 1977-1997.

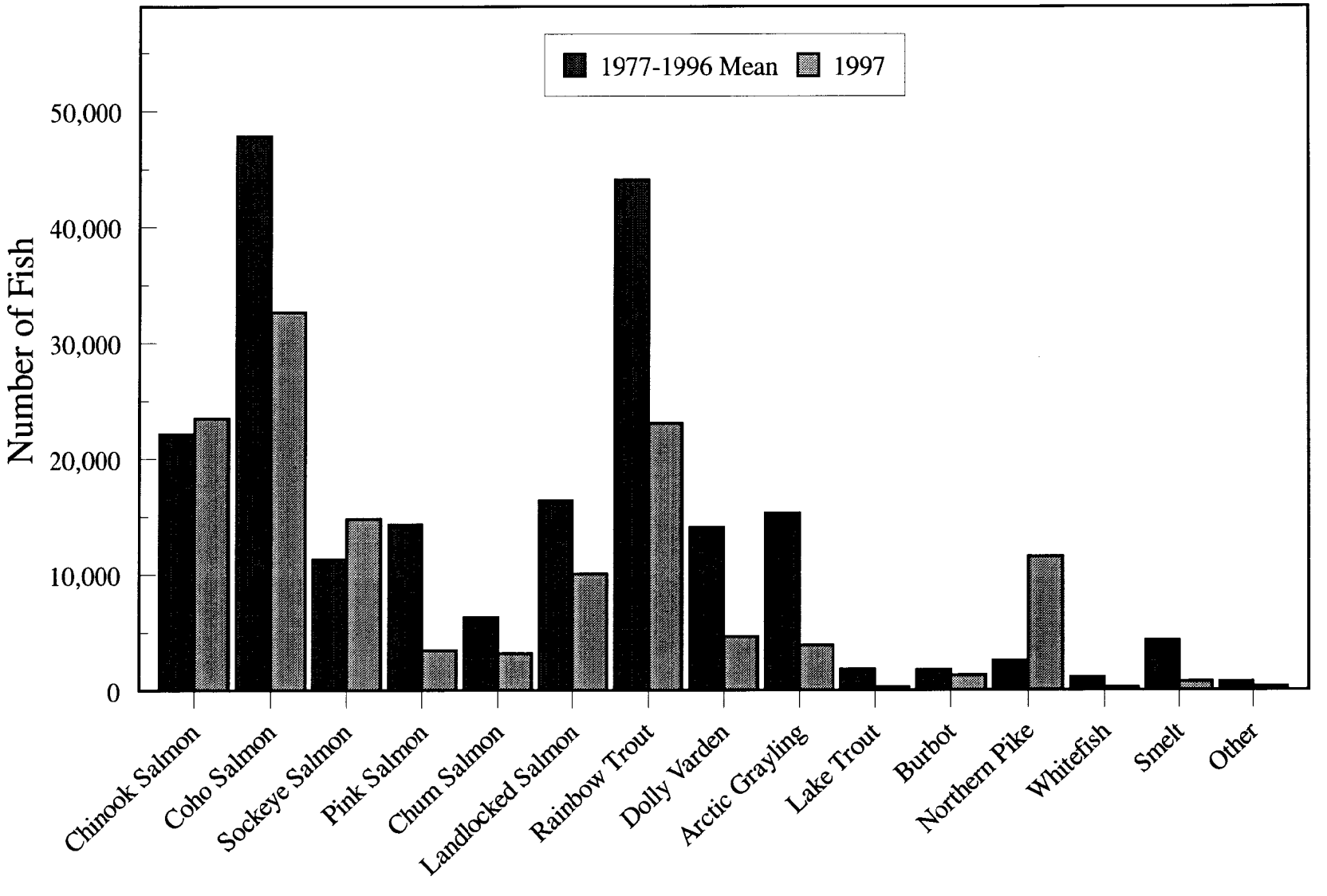

Figure 8.-Northern Cook Inlet Management Area mean recreational harvest by species, 1977-1997.

Table 8.-Knik Arm drainage sport fish harvest by species, 1977-1997.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Land-locked Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Lake Trout	Burbot	Northern Pike	White-fish	Smelt	Other	Total
1977	207	4,366	1,576	1,661	250	26,917	18,615	7,541	3,916	2,260	290				380	67,979
1978	140	7,895	1,239	1,842	1,131	18,884	23,139	7,982	2,413	507	452				795	66,419
1979	800	7,139	3,616	818	654	11,853	24,843	8,582	8,371	1,254	291				437	68,658
1980	646	16,030	5,674	4,701	534	19,500	29,368	12,484	9,514	2,118	310				1,136	102,015
1981	1,466	10,484	6,080	834	431	24,255	41,749	14,475	7,396	1,791	87				776	109,824
1982	1,666	13,676	4,621	1,425	1,174	10,845	30,549	13,540	2,924	1,058	681				817	82,976
1983	1,255	6,139	14,297	1,009	642	22,805	26,421	13,391	4,425	1,279	597				429	92,689
1984	2,057	23,429	9,240	2,743	2,032	14,768	26,418	9,103	2,480	1,919	336				449	94,974
1985	1,889	14,339	5,612	787	514	14,461	46,431	13,336	4,768	277	210	156	587	560	209	104,136
1986	1,524	12,361	6,009	1,800	3,770	14,299	27,690	13,048	4,233	313	804	458	580	3,351	24	90,264
1987	2,476	25,787	8,785	886	2,574	14,887	24,663	11,425	3,893	906	325	924	380	0	462	98,373
1988	2,916	40,037	8,076	1,927	5,221	16,588	58,609	11,314	8,367	1,911	291	364	1,163	0	0	156,784
1989	4,341	23,846	9,040	1,321	4,477	11,041	44,518	8,143	5,429	835	372	863	844	0	0	115,070
1990	2,022	18,762	6,588	650	746	15,950	30,699	8,746	3,068	1,067	262	754	622	0	99	90,035
1991	2,277	22,186	4,968	926	1,099	15,740	39,636	9,138	2,816	512	477	2,709	900	0	0	103,384
1992	3,969	25,814	5,349	1,044	510	11,875	27,995	4,186	2,511	840	500	2,605	257	0	812	88,267
1993	3,602	35,763	5,926	230	885	13,829	21,565	3,686	1,343	201	482	2,102	227	0	176	90,017
1994	4,303	28,539	5,082	635	1,356	14,153	22,446	3,532	2,898	66	512	1,328	242	2,292	163	87,547
1995	1,707	20,650	4,349	409	4,115	7,285	14,878	2,109	818	118	151	522	71	0	0	57,182
1996	1,192	22,819	5,496	927	1,636	14,612	22,554	3,810	1,438	0	63	2,741	137	10	0	77,435
Mean	2,023	19,003	6,081	1,329	1,688	15,727	30,139	8,979	4,151	962	375	1,294	501	518	358	92,201
% of Total Mean	2	21	7	1	2	17	33	10	5	1	<1	1	1	1	<1	100
92-96 mean	2,955	26,717	5,240	649	1,700	12,351	21,888	3,465	1,802	245	342	1,860	187	460	230	80,090
1997	2,740	12,144	4,031	393	395	9,903	19,146	3,537	1,625	9	262	2,749	92	0	101	57,127

Table 9.-Eastside Susitna River drainage sport fish harvest by species, 1977-1997.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Land-locked Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Lake Trout	Burbot	White-fish	Other	Total
1977	1,056	5,709	3,594	19,663	1,382	512	5,225	2,726	7,469	693	619		626	49,274
1978	886	8,573	267	50,711	14,203	2,368	5,930	5,640	6,590	877	271		153	96,469
1979	1,298	7,564	1,020	11,189	3,791	291	9,463	3,699	10,489	472	427		773	50,476
1980	1,370	10,368	873	52,746	4,552	1,663	6,715	2,671	10,959	267	367		720	93,271
1981	2,202	6,593	833	8,143	4,149	278	8,813	2,874	11,860	287	220		306	46,558
1982	2,063	10,167	1,555	15,345	6,644	996	7,536	4,066	9,747	335	199		345	58,998
1983	2,852	5,176	3,221	3,954	4,982	1,049	9,639	4,205	7,478	1,404	901		469	45,330
1984	4,428	13,916	2,705	9,491	5,211	660	7,656	4,004	11,222	362	1,133	1,058	225	62,071
1985	4,342	7,042	1,465	2,510	2,142	884	7,872	3,138	7,822	17	1,085	1,365	0	39,684
1986	8,569	16,190	4,029	10,527	4,756	2,106	8,061	4,213	10,346	1,816	1,380	1,090	0	73,083
1987	8,603	11,028	2,046	2,209	3,042	145	6,647	3,946	7,568	343	1,175	796	0	47,548
1988	9,139	19,518	2,857	4,129	6,604	619	7,622	4,748	6,020	291	600	546	0	62,693
1989	9,783	17,078	2,527	2,715	4,151	536	4,972	3,040	4,562	1,210	395	442	15	51,426
1990	9,423	11,743	2,677	4,093	1,565	151	5,008	3,613	2,910	387	1,345	1,378	67	44,360
1991	9,083	19,479	2,897	2,001	1,950	14	7,854	2,140	3,875	726	407	626	16	51,068
1992	21,307	33,790	3,468	5,899	2,044	86	3,948	2,394	2,189	495	608	265	76	76,569
1993	22,688	26,063	4,137	3,941	1,480	738	3,713	1,413	2,401	288	909	87	49	67,907
1994	14,970	20,870	3,443	1,968	1,269	45	3,658	1,033	3,484	232	674	172	166	51,984
1995	7,872	19,165	3,682	2,311	3,234	33	3,138	1,012	1,486	254	517	80	61	42,845
1996	8,645	25,173	3,475	2,855	2,638	11	2,768	1,687	1,091	95	217	0	61	48,716
Mean	7,529	14,760	2,539	10,820	3,989	659	6,312	3,113	6,478	543	672	608	206	58,017
% of Total Mean	13	25	4	19	7	1	11	5	11	1	1	1	<1	100
92-96 mean	15,096	25,012	3,641	3,395	2,133	183	3,445	1,508	2,130	273	585	121	83	57,604
1997	11,645	11,243	6,742	2,261	2,273	153	1,878	787	1,138	138	252	100	188	38,798

Table 10.-Westside Susitna River drainage sport fish harvest by species, 1977-1997.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Lake Trout	Burbot	Northern Pike	White-fish	Smelt	Other	Total
1977	2,938	6,599	2,786	8,142	423	7,472	2,246	4,414	278	115	132			551	36,096
1978	2,039	10,173	1,634	5,605	2,635	12,295	2,667	6,725	596	153	316			370	45,208
1979	5,768	9,036	1,557	1,854	1,154	12,555	4,591	9,089	63	454	382			436	46,939
1980	6,148	12,141	1,111	4,237	491	12,785	2,825	9,247	448	706	232			103	50,474
1981	4,742	5,940	1,408	555	240	11,296	2,003	5,250	297	211	125			86	32,153
1982	8,573	10,658	2,881	2,065	293	11,465	1,813	6,525	167	776	607			366	46,189
1983	9,568	3,610	3,549	702	398	9,253	2,400	9,314	849	807	944			461	41,855
1984	12,106	9,511	3,415	2,467	872	8,079	798	7,409	562	1,309	1,821			598	48,947
1985	13,644	11,270	2,302	584	347	8,114	1,267	5,895	328	560	1,248	525	1,680	104	47,868
1986	13,402	13,117	4,076	3,385	615	6,668	2,470	5,441	157	715	1,519	435	7,300	0	59,300
1987	13,350	8,746	2,427	1,467	688	8,020	688	4,908	797	3,640	1,540	1,685	9,265	31	57,252
1988	15,970	16,283	3,167	2,582	1,474	8,058	1,401	4,275	327	944	2,818	1,419	8,849	0	67,567
1989	19,343	18,226	2,307	1,045	415	4,928	1,486	2,104	352	192	2,257	382	2,324	0	55,361
1990	17,425	13,883	1,938	1,238	234	3,960	1,163	2,158	202	1,534	2,088	1,381	5,591	51	52,846
1991	21,836	20,507	3,083	524	191	4,526	1,436	3,367	289	97	3,931	531	6,132	64	66,514
1992	18,737	16,218	2,916	1,264	304	2,028	400	1,572	363	304	2,777	340	15,523	22	62,768
1993	21,142	15,454	2,161	586	147	2,481	463	1,422	276	264	3,619	555	6,596	49	55,215
1994	10,248	15,361	1,919	1,259	312	2,526	507	1,654	113	1,090	2,556	779	9,483	84	47,891
1995	6,265	17,148	2,106	361	591	1,757	622	895	84	190	3,024	76	4,549	20	37,688
1996	4,696	17,475	2,053	535	300	2,250	573	1,558	0	330	2,865	76	1,314	0	34,025
Mean	11,397	12,568	2,440	2,023	606	7,026	1,591	4,661	327	720	1,740	682	6,551	170	49,608
% of Total Mean	23	25	5	4	1	14	3	9	1	1	4	1	13	<1	100
92-96 mean	12,218	16,331	2,231	801	331	2,208	513	1,420	167	436	2,968	365	7,493	35	47,517
1997	8,190	7,148	3,662	750	491	1,704	188	992	138	788	4,878	64	771	25	29,789

Table 11.-West Cook Inlet drainage sport fish harvest by species, 1977-1997.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Burbot	White-fish	Smelt	Other	Total
1977	473	532	6	670	7	958	852	0	0		0	12	3,510
1978	478	378	0	650	0	723	841	0	0		0	0	3,070
1979	98	337	0	64	0	1,063	846	0	0		0	45	2,453
1980	34	628	0	301	0	560	275	0	0		0	0	1,798
1981	192	604	48	95	0	1,734	958	0	0		0	0	3,631
1982	147	335	10	210	0	398	304	0	0		0	0	1,404
1983	1,185	564	356	21	10	871	230	10	0		0	10	3,257
1984	1,833	1,035	62	62	0	698	523	37	0		0	0	4,250
1985	2,029	1,431	299	137	50	902	798	0	0	0	0	0	5,646
1986	2,378	983	89	280	213	212	537	89	0	0	0	0	4,781
1987	1,477	2,825	272	72	0	579	326	36	0	0	0	0	5,587
1988	1,695	1,182	455	55	109	618	164	0	0	0	0	0	4,278
1989	2,325	2,270	364	110	54	534	29	143	19	48	0	0	5,896
1990	2,097	1,344	189	24	12	438	51	34	0	135	0	0	4,324
1991	762	2,485	562	44	0	404	295	26	0	0	0	0	4,578
1992	1,213	2,211	57	18	0	150	205	0	0	0	0	0	3,854
1993	1,855	2,960	861	35	0	105	112	0	0	9	0	29	5,966
1994	1,577	2,695	623	8	0	177	73	8	0	0	1,360	9	6,530
1995	674	2,670	103	0	27	94	88	0	0	0	0	0	3,656
1996	1,016	2,435	130	20	0	317	170	131	0	0	0	0	4,219
Mean	1,177	1,495	224	144	24	577	384	26	1	16	68	5	4,134
% of Total Mean	28	36	5	3	1	14	9	1	<1	<1	2	<1	100
92-96 mean	1,267	2,594	355	16	5	169	130	28	0	2	272	8	4,845
1997	915	2,115	373	42	19	342	126	138	0	0	3,155	0	7,225

Table 12.-Percent of fish released by recreational anglers in the Northern Cook Inlet Management Area for 1992-1997.

	1992		1993		1994		1995		1996		1997		Average
	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Catch	Percent Released	Percent Released
Chinook Salmon	86,500	47.7	137,446	64.1	44,857	30.7	35,072	52.9	35,775	56.5	75,136	68.7	53.5
Coho Salmon	118,972	34.4	123,560	35.1	93,919	28.2	93,129	36.0	101,845	33.3	59,945	45.5	35.4
Sockeye Salmon	19,739	40.3	24,098	45.7	21,243	47.9	17,665	42.0	23,889	53.3	30,148	50.9	46.7
Pink Salmon	51,786	84.1	47,126	89.8	29,446	86.9	38,479	92.0	53,103	91.8	33,000	89.6	89.0
Chum Salmon	20,761	86.2	16,960	85.2	20,422	85.6	54,914	85.5	40,021	88.6	34,540	90.8	87.0
Landlocked Salmon	26,489	54.8	30,388	52.1	25,431	44.2	12,287	40.4	20,463	28.5	22,094	54.5	45.8
Lake Trout	6,373	73.4	4,835	84.2	3,351	87.7	1,823	75.0	250	62.0	1,326	78.5	76.8
Dolly Varden	21,285	66.2	23,467	75.8	19,003	72.9	12,700	69.8	20,705	69.9	15,605	70.3	70.8
Rainbow Trout	129,627	73.7	125,197	77.7	119,560	75.9	95,375	79.2	124,370	77.6	110,963	79.2	77.2
Arctic Grayling	38,385	83.7	39,626	87.0	49,901	83.9	23,190	86.2	28,274	85.1	31,054	87.5	85.5
Whitefish	3,253	73.5	3,307	73.5	3,831	68.9	1,255	81.9	999	78.7	1,324	80.7	76.2
Northern Pike	20,925	74.3	34,237	83.3	8,252	52.9	16,239	78.2	23,166	75.8	26,449	71.2	72.6
Burbot	2,611	45.9	3,094	46.5	3,163	28.0	1,444	40.6	1,508	59.5	1,892	31.2	42.0
Smelt	15,523	0.0	6,596	0.0	13,433	2.2	4,600	1.1	2,283	42.0	3,926	0.0	7.6
Other	1,377	33.9	1,158	73.8	1,273	66.8	1,096	92.6	158	61.4	970	67.6	66.0
Total	563,606	58.9	621,095	64.7	457,085	57.6	409,268	65.5	476,809	65.5	448,372	70.4	63.8

Table 13.-Percent of fish released by recreational anglers in the Knik Arm and eastside Susitna River areas, 1994-1997.

	Knik Arm								Eastside Susitna Area							
	1994		1995		1996		1997		1994		1995		1996		1997	
	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	6,124	29.7	2,771	38.4	2,346	49.2	5,180	47.1	23,985	37.6	16,376	51.9	18,896	54.2	35,762	67.4
Coho Salmon	38,734	26.3	28,858	28.4	30,991	26.4	16,641	27.0	28,717	27.3	31,602	39.4	36,368	30.8	20,209	44.4
Sockeye Salmon	8,990	43.5	6,445	32.5	10,463	47.5	5,565	27.6	7,116	51.6	6,939	46.9	7,948	56.3	13,890	51.5
Pink Salmon	4,352	85.4	1,554	73.7	5,564	83.3	1,008	61.0	17,729	88.9	31,809	92.7	35,771	92.0	25,363	91.1
Chum Salmon	4,225	67.9	16,567	75.2	9,045	81.9	3,100	87.3	12,379	89.7	34,757	90.7	25,161	89.5	24,351	90.7
Landlocked Salmon	25,232	43.9	12,152	40.1	20,398	28.4	21,513	54.0	199	77.4	135	75.6	65	83.1	581	73.7
Lake Trout	309	78.6	228	48.2	0		9	0.0	2,490	90.7	1,207	79.0	170	44.1	927	85.1
Dolly Varden	9,767	63.8	5,440	61.2	10,173	62.5	7,521	53.0	6,356	83.7	3,666	72.4	6,689	74.8	5,898	86.7
Rainbow Trout	70,255	68.1	56,108	73.5	69,271	67.4	60,823	68.5	23,619	84.5	15,363	79.6	23,734	88.3	25,734	92.7
Arctic Grayling	13,544	78.6	4,529	81.9	4,652	69.1	5,501	70.5	16,154	78.4	9,126	83.7	9,536	88.6	12,449	90.9
Whitefish	724	66.6	200	64.5	229	40.2	219	58.0	1,157	85.1	568	85.9	279	100.0	915	89.1
Northern Pike	2,816	52.8	825	36.7	9,169	70.1	6,673	58.8	0		0		0		175	42.9
Burbot	708	27.7	377	59.9	197	68.0	444	41.0	1,208	44.2	837	38.2	536	59.5	530	52.5
Smelt	2,303	0.5	51	100.0	0		0		0		0		0		0	
Other	329	50.5	19	100.0	62	100.0	510	80.2	449	63.0	122	50.0	69	11.6	460	59.1
Total	188,412	53.5	136,124	58.0	172,560	55.1	134,707	57.6	141,558	63.3	152,507	71.9	165,222	70.5	167,244	76.8

Table 14.-Percent of fish released by recreational anglers in the westside Susitna River and West Cook Inlet areas, 1994-1997.

	Westside Susitna River								West Cook Inlet							
	1994		1995		1996		1997		1994		1995		1996		1997	
	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	12,582	18.6	14,137	55.7	11,922	60.6	31332	73.9	2,166	27.2	1,788	62.3	2,611	61.1	2862	68.0
Coho Salmon	22,983	33.2	28,181	39.2	30,675	43.0	18931	62.2	3,485	22.7	4,488	40.5	3,811	36.1	4164	49.2
Sockeye Salmon	4,366	56.0	4,178	49.6	4,952	58.5	10125	63.8	771	19.2	103	0.0	526	75.3	568	34.3
Pink Salmon	7,144	82.4	5,007	92.8	11,231	95.2	6058	87.6	221	96.4	109	100.0	537	96.3	571	92.6
Chum Salmon	3,597	91.3	3,482	83.0	5,732	94.8	6822	92.8	221	100.0	108	75.0	83	100.0	267	92.9
Landlocked Salmon	0		0		0		0		0		0		0		0	
Lake Trout	552	79.5	388	78.4	80	100.0	390	64.6	0		0		0		0	
Dolly Varden	2,097	75.8	2,577	75.9	2,964	80.7	1528	87.7	783	90.7	1,017	91.3	879	80.7	658	80.9
Rainbow Trout	25,157	90.0	23,432	92.5	30,072	92.5	22829	92.5	529	66.5	472	80.1	1,293	75.5	1577	78.3
Arctic Grayling	20,144	91.8	9,359	90.4	13,815	88.7	12780	92.2	59	86.4	176	100.0	271	51.7	324	57.4
Whitefish	1,931	59.7	487	84.4	491	84.5	190	66.3	19	100.0	0		0		0	
Northern Pike	5,436	53.0	15,414	80.4	13,997	79.5	19500	75.0	0		0		0		101	31.6
Burbot	1,247	12.6	230	17.4	775	57.4	918	14.2	0		0		0		0	
Smelt	9,770	2.9	4,549	0.0	1,708	23.1	771	0.0	1,360	0.0	0		575	100.0	3155	0.0
Other	477	82.4	955	97.9	27	100.0	0		18	50.0	0		0		0	
Total	117,483	59.2	112,376	66.5	128,441	73.5	132,174	77.5	9,632	32.2	8,261	55.7	10,586	60.1	14,247	49.3

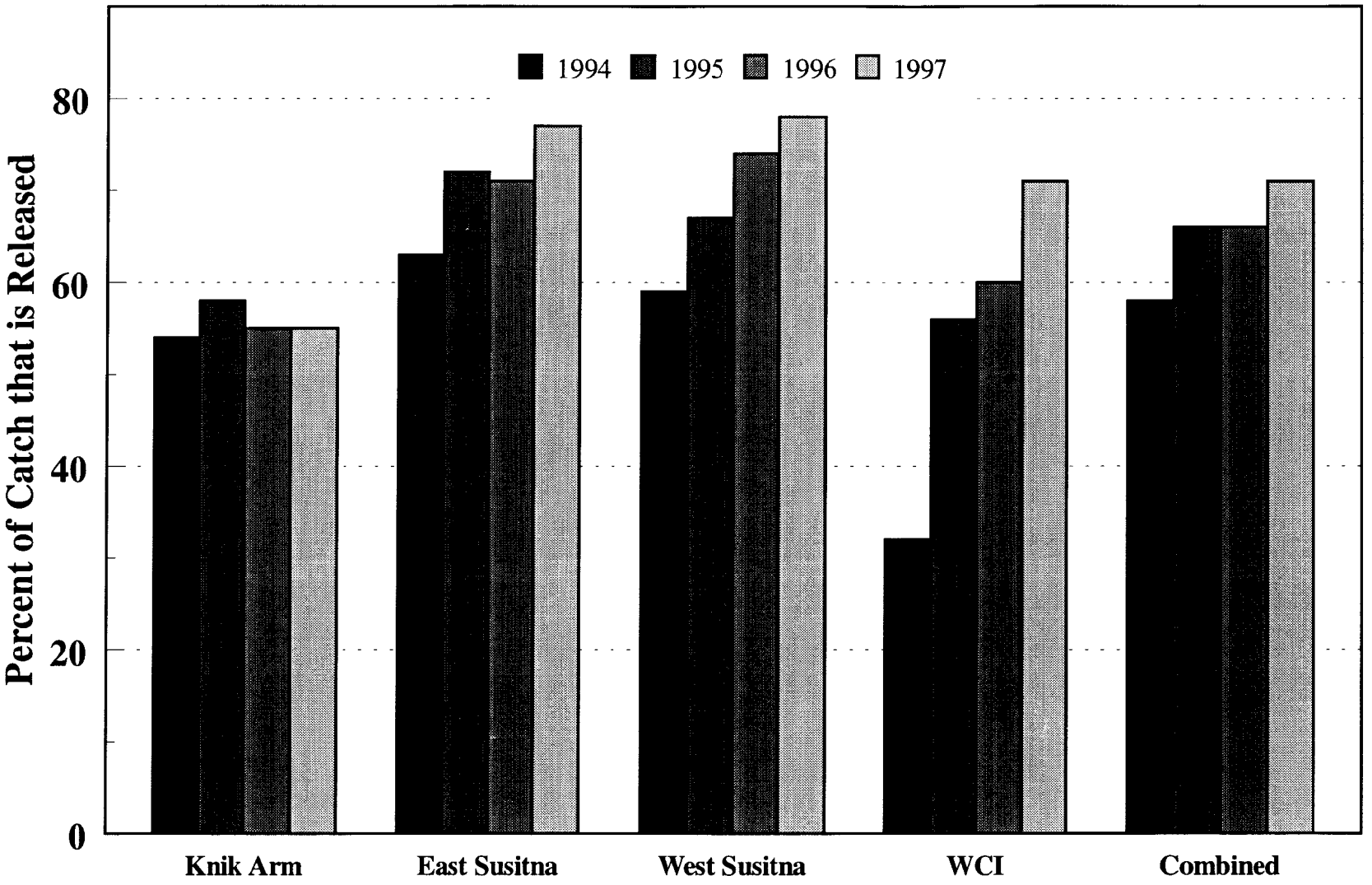

Figure 9.-Percent of the recreational catch of all species from the Northern Cook Inlet Management Area released, 1994-1997, by management unit.

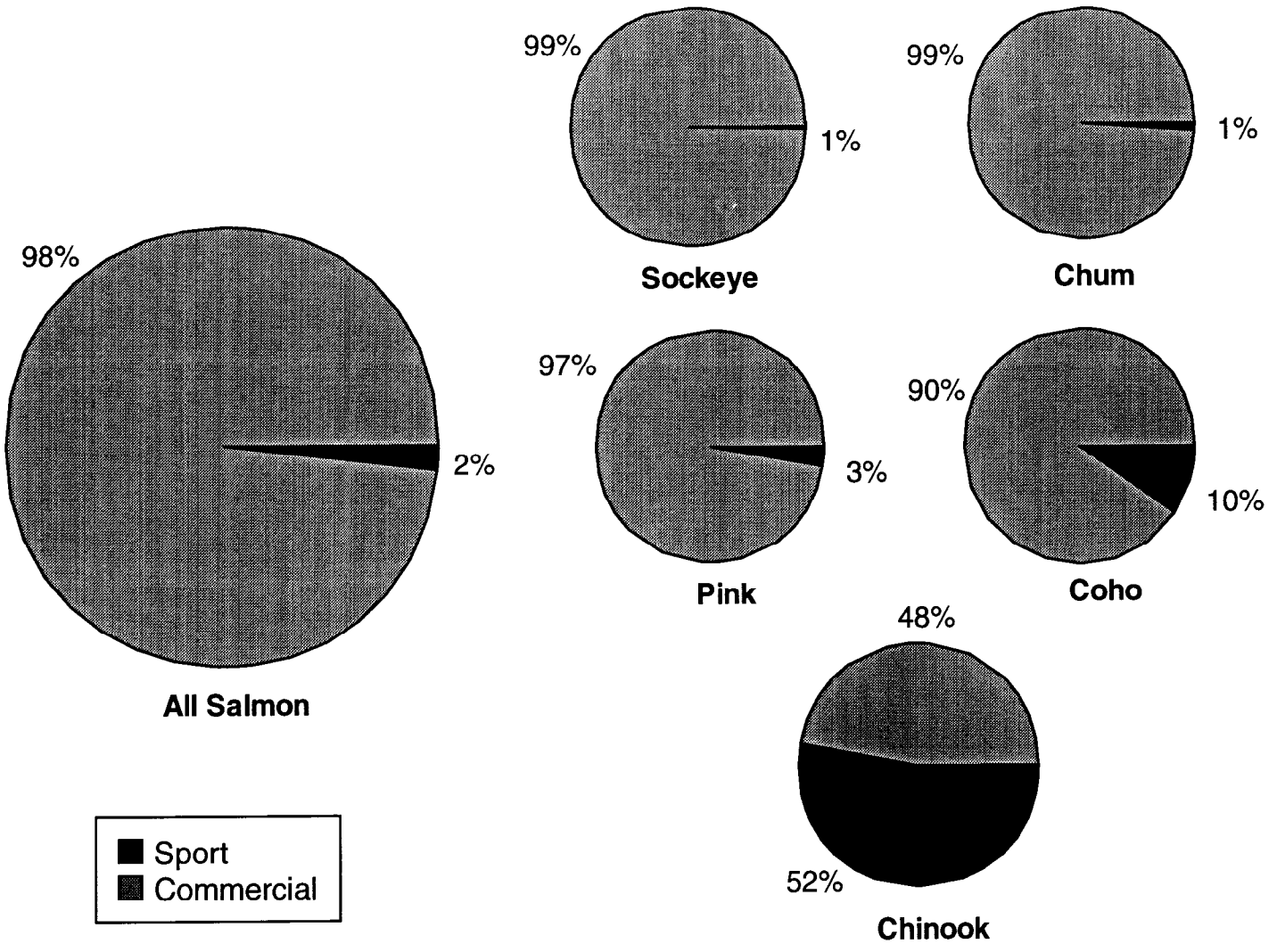

Figure 10.-Composition of the Northern Cook Inlet salmon harvest, 1977-1997.

sampling of the Northern District setnet fishery in 1998 resulted in an estimated 5% contribution of Upper Cook Inlet released hatchery fish (Appendix B13), however, it is presently unknown how this contribution relates to the overall contribution of specific NCIMA wild stocks to the Northern District setnet fishery. The proportional harvests of NCIMA salmon stocks in the Central District drift and setnet 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, Upper Yentna River subsistence fish wheel fishery, and by educational fishery permits issued to the Villages of Eklutna and Tyonek and the Knik Tribal council. The harvest by these fisheries on wild stocks is relatively low when compared to recreational and commercial harvests.

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 indicate 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. Anglers also 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	[a]	328,993	[a]	29,155,000

From: Jones and Stokes Associates, Inc. 1987.

[a] Value not computed.

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

Fishery	Resident Angler Dollars	Non-Resident Angler Dollars	Total
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: Estimated in Jones and Stokes Associates, Inc. 1987.

ONGOING RESEARCH AND MANAGEMENT ACTIVITIES

The following are the major research programs being initiated, ongoing, or being curtailed in the NCIMA:

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 wild and hatchery 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. Evaluation of marine interception of NCI chinook salmon based on coded wire tagged recoveries of hatchery Ship Creek stocks and wild Kenai River stocks;
6. Escapement studies to assess returns of coho salmon to the Little Susitna River, Cottonwood, Wasilla and Fish creeks;
7. Distribution, abundance and age composition studies of northern pike in the Susitna River drainage;
8. Distribution, abundance and age composition studies of rainbow trout in the eastside Susitna River drainage,
9. Distribution, abundance and age composition study of Big Lake Arctic char, and
10. A multi-agency project to evaluate the aquatic resources of the Cottonwood Creek drainage. Work includes documentation of the fish habitat, riparian vegetation and manmade alteration within the 75-foot Matanuska-Susitna Borough's building set back, salmon escapement evaluation by weir, evaluation of fish spawning distribution and coded wire tagging of coho salmon smolt. In addition, the United States Geological Survey (USGS) is monitoring water flow and stage and will analyze water nutrients.

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,
7. Aquatic education, and
8. 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 1993-1996 area management reports (AMR) for recreational fisheries of Northern Cook Inlet (Whitmore et al. 1994-1996, Whitmore and Sweet 1997) 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. Little Susitna River coho salmon stocking and weir operation.

Issues which affect these NCIMA fisheries are included within Section II: Major Fisheries Overview.

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 thoroughly 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 within 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 through 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, total harvest of NCI chinook salmon increased through 1993 with harvests during 1986 through 1993 ranging from 40,300 to 54,200 (Table 17). Mean and peak harvest of NCIMA chinook salmon in recreational fisheries from 1986 through 1993 are 34,591 and 49,287

Table 17.-Estimated harvests, by all user groups, of chinook salmon of Northern Cook Inlet origin, 1893-1997.

Year	Harvest[a]	Year	Harvest[a]	Year	Harvest[a]
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	1996	18,405
1913	50,922	1955	37,199	1997	25,857
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		

[a] Source of data: 1893-1968 Delaney and Vincent-Lang 1992; 1969-1994 Ruesch and Fox 1995, Mills 1979-1994, and Howe et al. 1995-1998 (see Table 18 of this report).

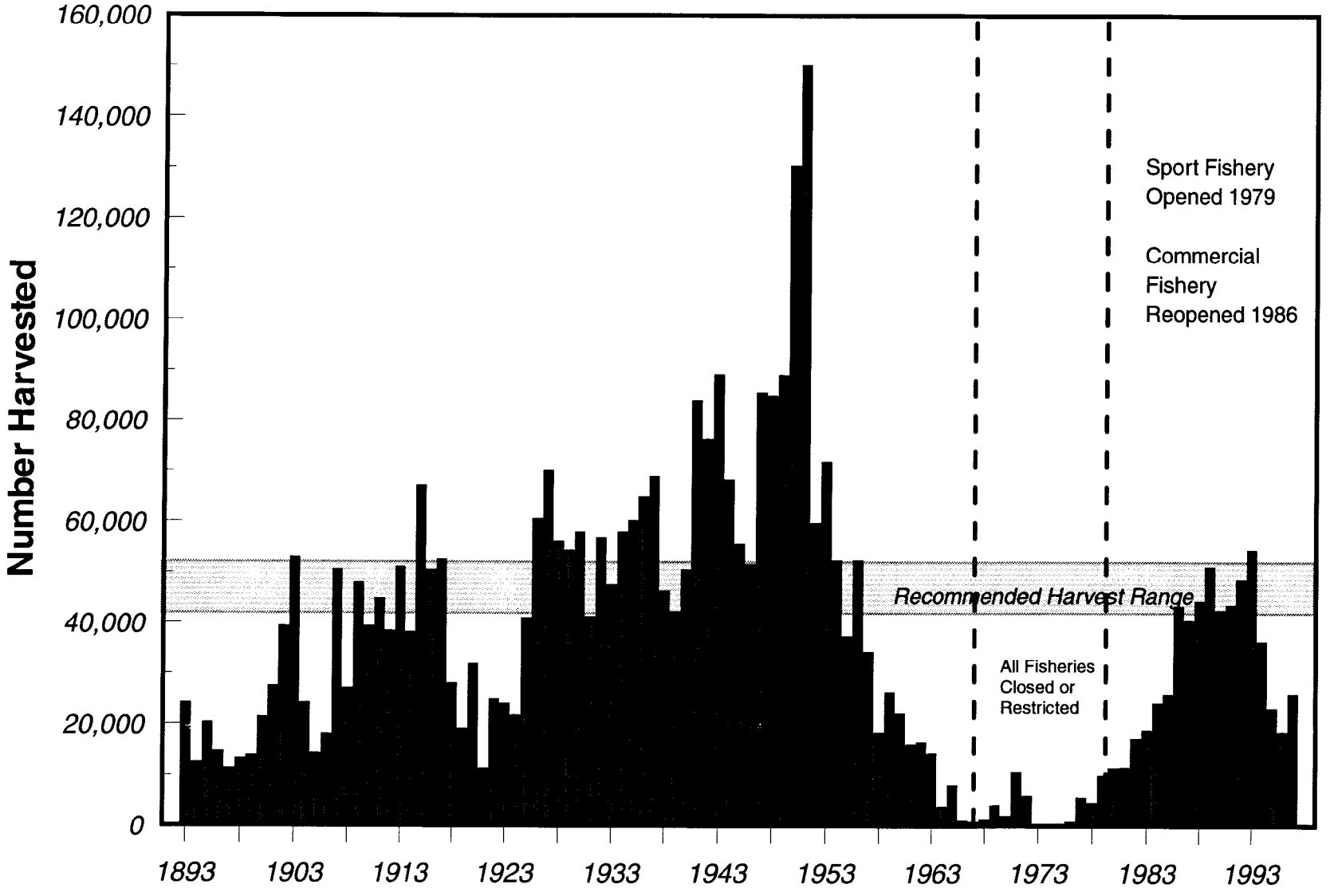

Figure 11.-Estimated harvests by all user groups of chinook salmon of Northern Cook Inlet origin, 1893-1997.

Table 18.-Northern Cook Inlet Management Area-origin chinook salmon estimated harvests, 1977-1998.

	Commercial[a]			Recreational[b]						
Year	NCI[d]	Kustatan	Total	Knik Arm Drainages	Eastside Susitna	Westside Susitna	West Cook Inlet	Total	Subsistence[c]	Grand 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	1,936	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	1,192	8,645	4,696	1,016	15,549	1,032	18,405
1997	1,222	113	1,335	2,740	11,645	8,190	915	23,490	642	25,467
1998	2,471	83	2,554	no data available					810	5,918

[a] Source of data, Ruesch and Fox 1996.

[b] Source of data is SWHS, Mills 1979-1994, Howe et al. 1995-1998.

[c] Source of data is 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.

[d] Northern District total.

fish, respectively (Table 7) (Mills 1988-1994). Sport harvests since 1993, however, have decreased substantially. 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). Catch sampling of the Northern District setnet fishery in 1998 resulted in an estimated 5% contribution of Upper Cook Inlet released hatchery fish (Appendix B13). It is presently unknown how this contribution relates to overall contribution of specific NCIMA wild stocks to the Northern District setnet fishery.

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 (Table 19). 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, beginning in 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 to approximately half of the peak harvest in 1993 (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.

Regulations providing for subsistence fisheries and personal use fisheries have changed in recent years as a result of BOF and court actions. Currently there are two subsistence fisheries, one personal use fishery and three educational fisheries authorized in the NCIMA. Since 1980 a subsistence set gillnet fishery has been 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 20). 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 (Table 21). 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. The Yentna River Subsistence Salmon Fishery allows the taking of salmon with a fish wheel in the Yentna River downstream of the Skwentna River. This fishery was implemented as a personal use fishery during the 1996 season. Prior to the 1998 season Supreme Court and BOF action changed this fishery to a subsistence fishery. The Fish Creek Personal Use Fishery currently provide the area's personal use fishery opportunity. The harvest of chinook salmon is prohibited in these fisheries. Educational permits have been issued to the native villages of Eklutna and Knik since 1994 and Tyonek in 1998 to fish salmon of all species. Annual harvests of 0-32 chinook have been reported.

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

Table 19.-Chinook salmon biological escapement goals (BEG) for Northern Cook Inlet Management Area waters.

Drainage	Biological Escapement Goal (BEG)	Method of Survey
Knik Arm Management Unit		
Little Susitna River	850	Aerial
Eastside Susitna River Management Unit		
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
Westside Susitna River Management Unit		
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
West Cook Inlet Management Unit		
Chuitna River	1,400	Aerial
Lewis River	400	Aerial
Theodore River	750	Aerial

Table 20.-Tyonek subsistence gillnet and Upper Yentna River subsistence and personal use fish wheel salmon harvests, 1980-1998.

	Number of Permits[a]	Chinook	Sockeye	Coho	Pink	Chum
Tyonek Gillnet						
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[b]	nd[b]	nd[b]	nd[b]
1985	76	1,720	44	8	0	nd[b]
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	49/73	1,032	65	110	21	18
1997	42/70	642	94	127	0	8
1998 (preliminary)	43/74	810	128	41	1	2
Mean		1,413	114	114	15	12

Upper Yentna River Fish Wheel (In 1996 some permit holders did not identify species.)

	Number of Permits[a]	Total	Sockeye	Coho	Pink	Chum
1996-Personal Use	14	459	191	36	88	40
1997-Personal Use	21	582	492	61	21	8
1998-Subsistence	21/28[c]	673	473	147	33	20

[a] Number of permits returned for early/late season.

[b] No data available.

[c] Number of permits returned/number of permits issued.

Table 21.-Northern Cook Inlet Management Area subsistence and personal use gillnet salmon harvests, 1985-1995.

	Number of Permits[a]	Chinook	Sockeye	Coho	Pink	Chum
Northern and Central District Subsistence Gillnet						
1985						
North	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[b]	1,501	53,333	12,181	2,975	1,729
Northern and Central District Personal Use gillnet[c]						
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

[a] Number of permits returned for early/late season.

[b] Number of permits returned/number of permits issued.

[c] In 1995 the subsistence fishery was replaced with a personal use fishery.

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 a multitude of commercial fisheries (Appendices B10, B11 and B12). Federally managed groundfish commercial fisheries catch chinook salmon as incidental bycatch, but numbers and streams of origin of these fish are largely unknown (Lafferty et al. 1998).

Recent Board of Fisheries Actions

A summary of BOF actions beginning with 1992 is included in Appendix F.

During the October 1997 meeting the BOF responded in support of a petition to open the Deshka River to king salmon fishing for the 1998 season. The BOF stipulated a seasonal limit of two Deshka River king salmon and delegated authority to the Commissioner of the Department of Fish and Game to establish a fishery under the Administrative Procedure Act. The 1998 fishery ran January 1 through July 13 and was restricted to the lower 5 miles of the river. In addition to the two king salmon seasonal limit other general area king salmon regulations applied.

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. Time and area for the Alexander Creek chinook salmon fishery was reduced. Alexander Creek is open to the retention of chinook salmon 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. Upstream of the department marker catch and release fishing for king salmon is prohibited.
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.

The Board of Fisheries made the following modifications to the Upper Cook Inlet King Salmon Management Plan, that affect the Northern District commercial fishery:

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 coastline from 1 mile south of the Chuitna River outlet, north to the Susitna River outlet will be closed to commercial setnets 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 outlet, north to the Susitna River outlet 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 in efforts to achieve aerial survey biological escapement goals. Following the 1994 season the goal of reducing the harvest potential succeeded in reducing the recreational harvest by half, providing for a harvest of less than 20,000 fish. This goal has been modified with elimination of a minimum harvest objective. The primary goal remains to achieve the BEGs. General area restrictions that have been established to reduce harvest potential are reduction of daily and seasonal bag limits, areawide bait prohibition, and reduction in time and area open to fishing. Streams which consistently fall short of escapement goals have are 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

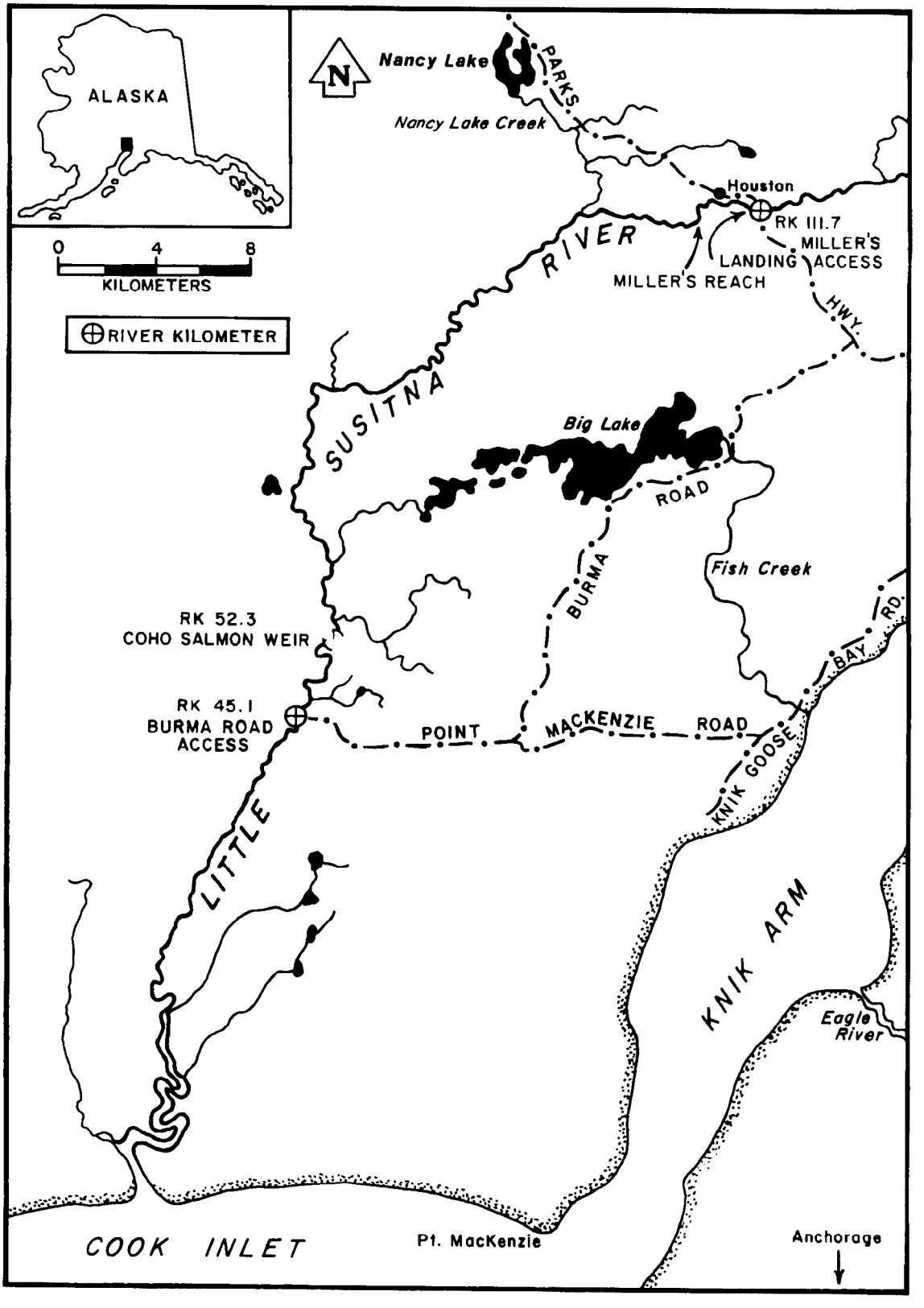

Figure 12.-Map of the Little Susitna River.

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 into Hatcher Pass with the majority of spawning taking place upstream of the Parks Highway bridge. Few chinook salmon use tributaries for spawning. Peak spawning typically 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. Creel survey and SWHS estimates were found to produce comparable results; therefore, the creel survey was discontinued in 1991. The average estimated annual harvest of chinook salmon from the Little Susitna River for the period 1979-1996 was 2,228 fish (Figure 13, Appendix A3) (Mills 1979-1994 and Howe et al. 1995-1997).

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 1998. 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 22). During 1988, 1989, 1994 and 1995 a weir was operated and escapement counts ranging from 2,809 to 7,400 fish were obtained (Table 22).

Recent Fishery Performance

The 1997 sport harvest of chinook salmon from the Little Susitna River was 2,740 fish (Howe et al. 1998), approximately equal to the 1992-1996 average of 2,955 fish and 500 fish above the 20-year average (Appendix A3). The Little Susitna River harvest accounted for approximately 12% of the total chinook salmon harvest from NCIMA waters during 1997 (Table 7 and Appendix A3). Harvest rates during 1998, based on reports from anglers and guides, were similar to 1997.

Aerial survey evaluation of the chinook salmon spawning escapement in 1998 resulted in 1,091 fish. Escapement index counts in recent years have been above the BEG (Table 22).

Management Objectives

The Little Susitna River biological escapement goal (BEG), was set at 850 fish (Table 22). It is based on the average of aerial survey index counts of spawning chinook salmon. The management objective is to maximize fishing opportunity while insuring the attainment of the BEG. 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 indicated an increased rate of exploitation from 1988 to

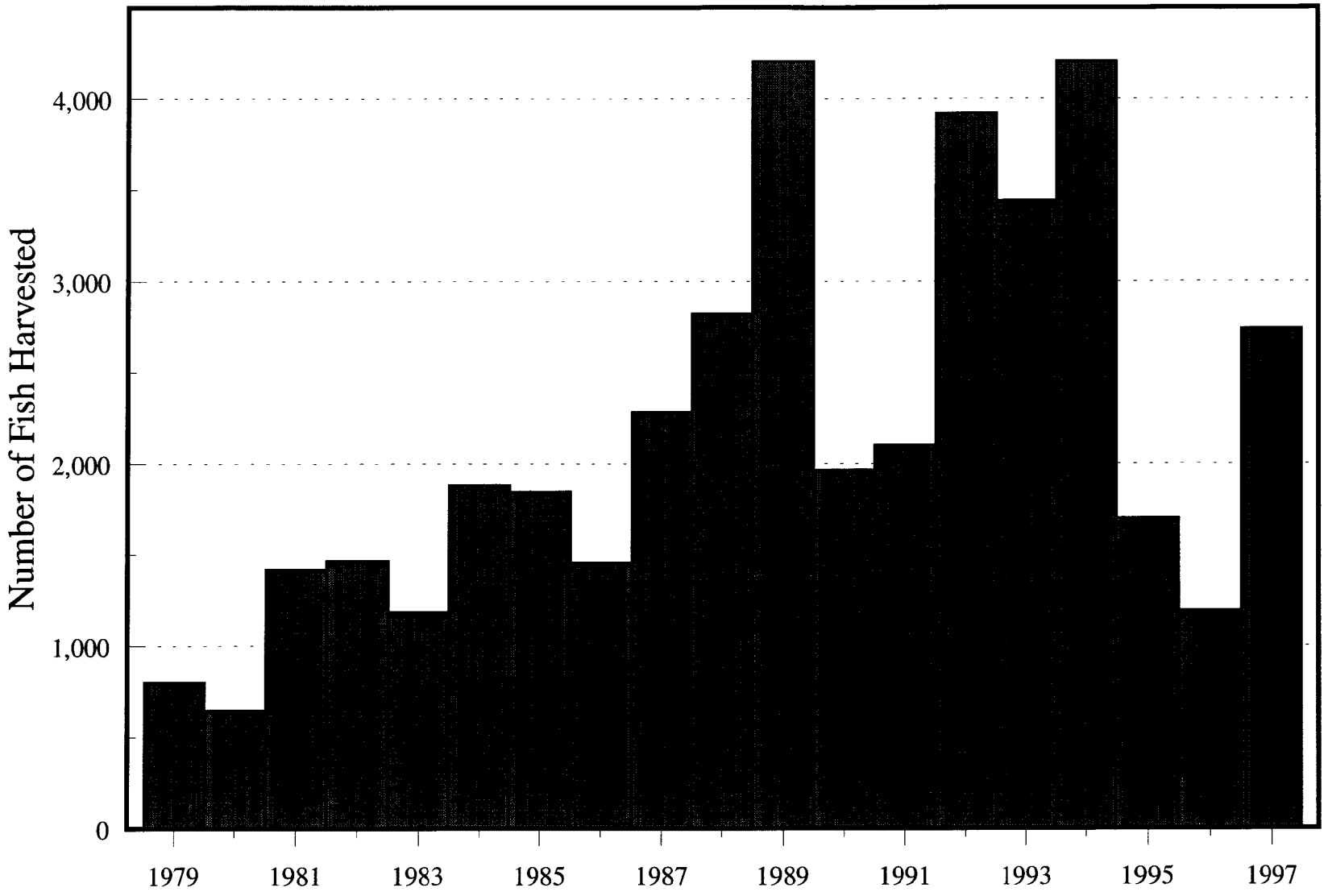

Figure 13.-Little Susitna River chinook salmon harvest, 1979-1997.

Table 22.-West Cook Inlet and Knik Arm management units chinook salmon escapement index counts, 1979-1998.

	West Cook Inlet[a]					Knik Arm	
						Little Susitna River	
Year	Chuitna River	Theodore River	Lewis River	Other Streams[c]	Total WCI	Weir	Aerial
1979	1,246	512	546	236	2,540		[b]
1980	[b]						[b]
1981	1,362	535	560	1,144	3,601		[b]
1982	3,438	1,368	606	1,972	7,384		[b]
1983	4,043	1,519	[b]	[b]	5,562		929
1984	2,845	1,251	947	[b]	5,043		558
1985	1,600	1,458	861	700	4,619		1,005
1986	3,946	1,281	722	165	6,114		[b]
1987	[b]	1,548	875	[b]	2,423		1,386
1988	3,024	1,906	616	[b]	5,546	7,400	3,197
1989	990	1,026	452	[b]	2,468	4,367	[b]
1990	480	642	207	[b]	1,329		922
1991	537	508	303	[b]	1,348		892
1992	1,337	1,053	445	[b]	2,835		1,441
1993	2,085	1,110	531	156	3,882		[b]
1994	1,012	577	164	368	2,121	2,981	1,221
1995	1,162	694	146	221 [d]	2,223	2,809	1,714
1996	1,343	368	257	424 [d]	2,392		1,079
1997	2,232	1,607	777	471 [d]	5,087		[b]
1998	1,869	1,807	626	503 [d]	4,805		1,091
BEG [e]	1,400	750	400		2,550		850

[a] Aerial count unless otherwise indicated.

[b] No count conducted, turbid water.

[c] May include Olsen, Nikoli, Coal, Straight, Bishop, Drill, and Scarp creeks.

[d] Coal creek.

[e] Biological escapement goal.

1994, which, if allowed to continue could lead to stock conservation concerns. This trend was reversed in 1995 primarily through reduction in fishing hours and implementation of a bait prohibition.

Recent Board of Fisheries Actions

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 February 1999.

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) proposed extension of the South Big Lake Road to the Little Susitna River at River Mile 39.5, (3) use restrictions associated with habitat issues such as streambank erosion within the State Game Refuge, (4) safety issues associated with shore anglers and boat traffic, and (5) fee rates for use of the Little Susitna River Public Use Facility.

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 increased considerably from 1979 to 1989 (Appendix A3) creating a concern of overexploitation. During 1992 through 1994 large harvests and increased exploitation rates occurred. Increased restrictions beginning in 1995 resulted in reduced harvest levels in 1995 and 1996 which we hope will stabilize the harvest at an acceptable level.

Ongoing Research and Management Activities

An aerial index survey is conducted annually to determine chinook salmon spawning escapement. Harvest and catch are estimated with the SWHS.

The Little Susitna River Public Use Facility (LSPUF) lies within the Susitna Flats State Game Refuge and is owned by the ADF&G. The Department of Natural Resources, Division of Parks and Outdoor Recreation (DPOR) operates the LSPUF under a cooperative agreement with the ADF&G. This cooperative agreement is included in Appendix J.

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 has helped stabilize harvest levels.

Aerial surveys will be conducted annually to index numbers of spawning chinook salmon. Increased regulation enforcement is recommended to address complaints received from anglers concerning the observed use of bait during the king salmon fishery.

Continued access maintenance and development is necessary for the Little Susitna River chinook salmon fishery. An important boating access project is the operation of the Little Susitna Public Use Facility by Division of Parks and Outdoor Recreation (Table 23). Additional access programs proposed for the Little Susitna River include: upgrading trails adjacent to the Little Susitna Public Use Facility to reduce habitat degradation, conducting bank stabilization projects, and hardening camp sites along the river. The concrete boat ramp was replaced in May of 1998.

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 with different regulations. These 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, including the Oshetna River drainage. Regulations governing eastside Susitna River fisheries since chinook salmon fishing reopened in 1979 are summarized 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), which connects Anchorage and Fairbanks, parallels the Susitna River on the east. 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 Parks Highway, except Montana Creek which extends one half mile upstream of the Parks Highway bridge. 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 on the same schedule. Willow Creek provides the most liberal fishing time in this area. It 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.

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

Table 23.-Proposed access projects for NCIMA in 1998, listed in prioritized order.

	Location	Project	Estimated Cost	Funding Year
	Non-Boating Projects[a]			
1	Region II Small Access Maintenance	Site maintenance contracts, signage.	$189,000	00
2	Eklutna Tailrace	Expand parking and construct vault toilets.	$100,000	NF
3	Little Susitna River Public Use Facility	Trail improvements & bank stabilization.	$100,000	99
4	Caswell Creek	Construct access trail & bank stabilization.	$15,000	99
5	Honeybee and Lynne lakes	Purchase Easement.	$5,000	99
6	Twin Island Lake Easement Acquisition	Purchase Easement linking Pt. MacKenzie Rd. to lake.	$25,000	99
7	Willow Creek SRA Sanitation and Parking	Move vault toilet from eroding river, develop day-use parking.	$250,000	00
8	Finger Lake	ADA dock construction.	$55,000	00
9	Cope Property	Purchase property & upgrade access.	$50,000	NF[b]
D	Non-Boating Lake Improvements	Install boardwalks, docks and develop trails and parking at various lakes.	$200,000	NF[b]
		TOTAL	$989,000	
	Boating Projects[a]			
1	Big Lake South SRA...(Active)	Boat ramp improvements and expanded parking.	$250,000	99
2	Christiansen Lake	Enhance boat launch facility as a cooperative effort with the Mat-Su Borough.	$75,000	99
3	Little Susitna River within the Susitna Flats State Game Refuge	Harden camp sites. Stream bank stabilization and repair damage caused by boating activity, construct permanent boat tie ups.	$100,000	99
4	Susitna Landing	Construct: handicapped access dock, and permanent boat tie-ups. Stream bank stabilization.	$200,000	99
5	Little Susitna River Public Use Facility	Funds RSA to State Parks to operate LSPUF	$53,000	00
6	Finger Lake Boat Ramp	Boat ramp upgrade.	$175,000	00
7	Remote Site Sanitation	Pit toilets at Alexander and Lake creeks.	$100,000	01
8	Knik River-Glenn Highway	Construct boat launch.	$100,000	01
9	Nancy Lake SRA	Boat ramp upgrade and install new ADA fishing dock.	$200,000	NF[b]
D	Chulitna River	Construct new boat ramp with DNR Parks.	$300,000	NF[b]
		TOTAL	$1,553,000	

[a] Completed access projects are listed in Appendix I.

[b] Not Funded.

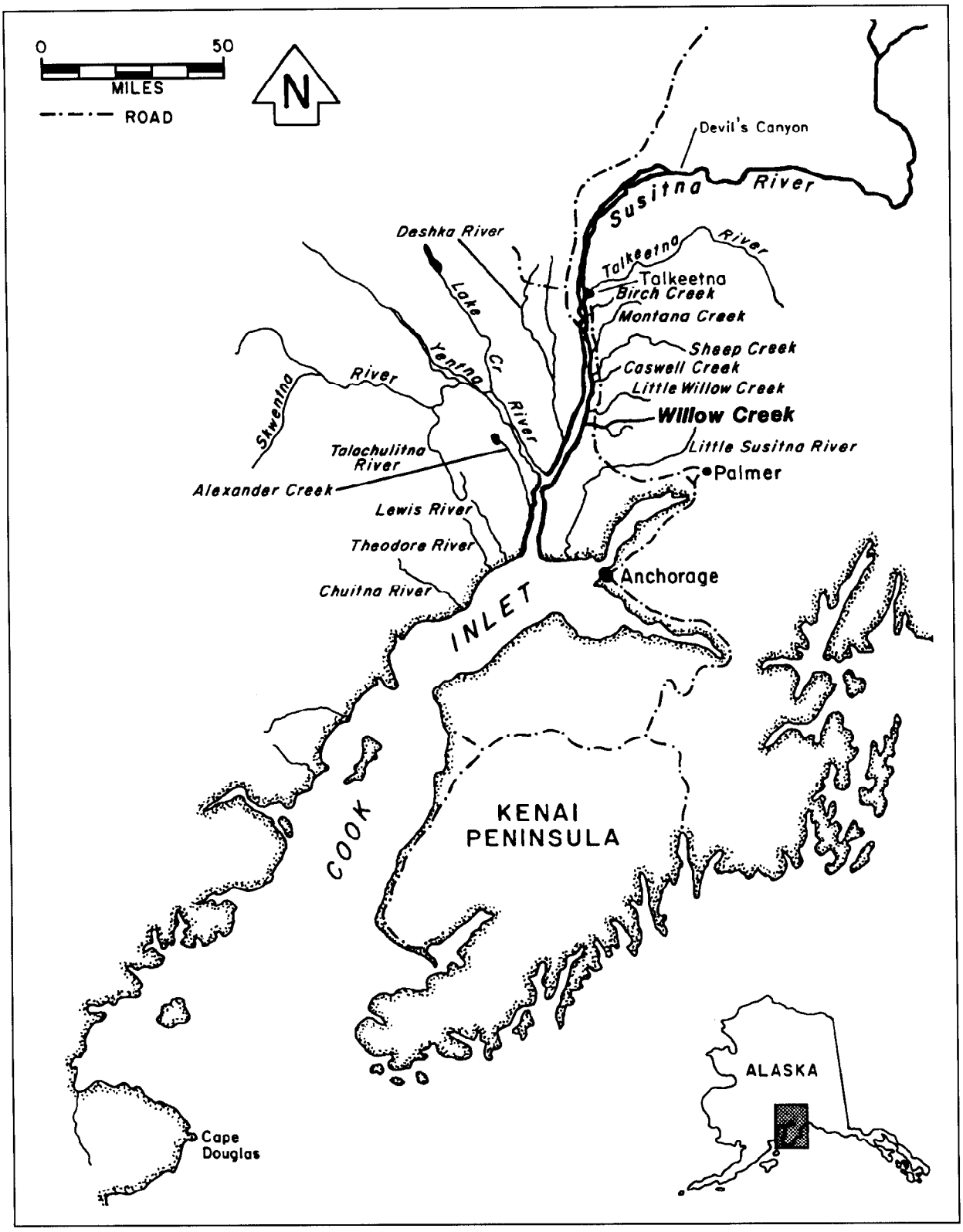

Figure 14.-Map of Northern Cook Inlet area.

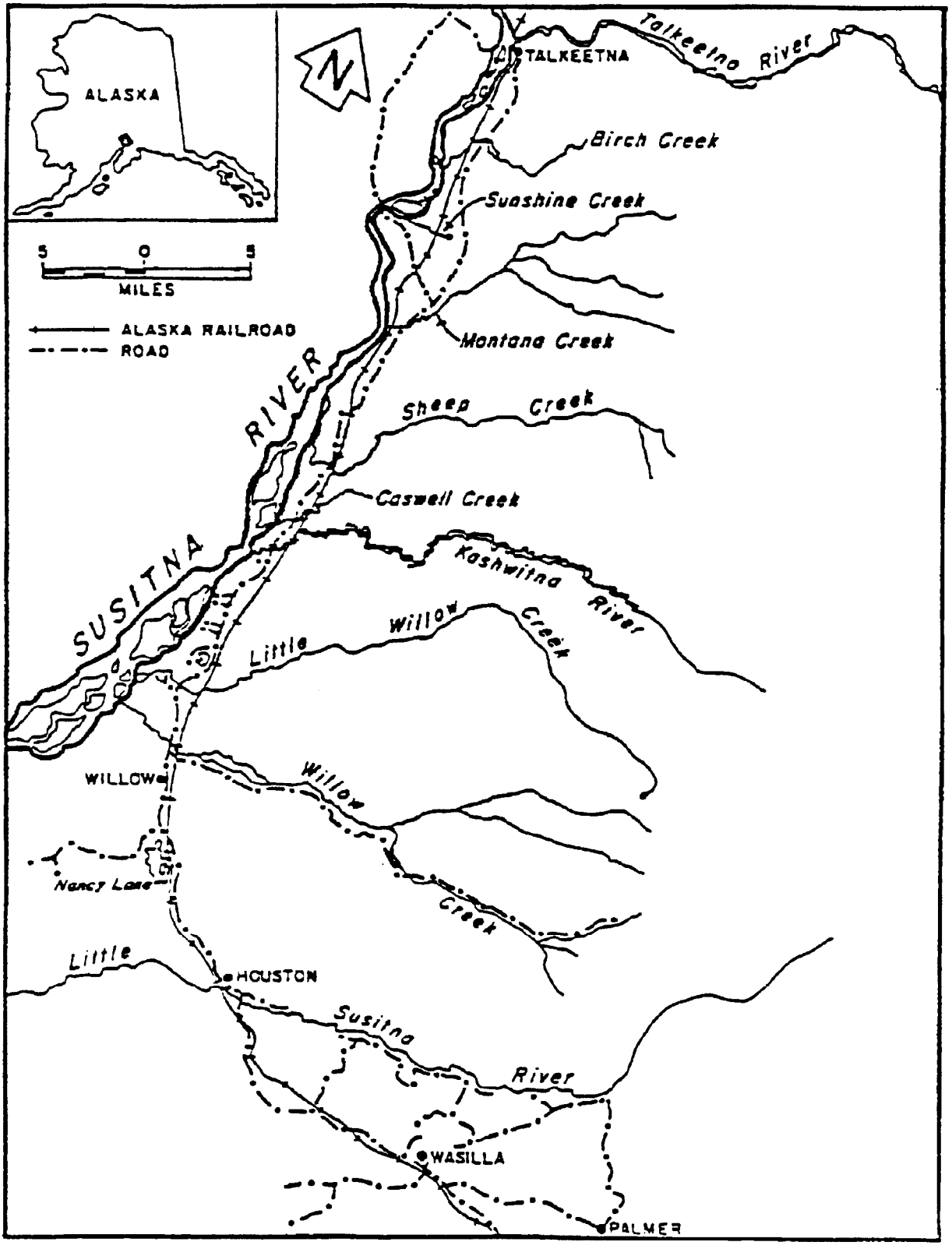

Figure 15.-Map of eastside tributaries of the Susitna River.

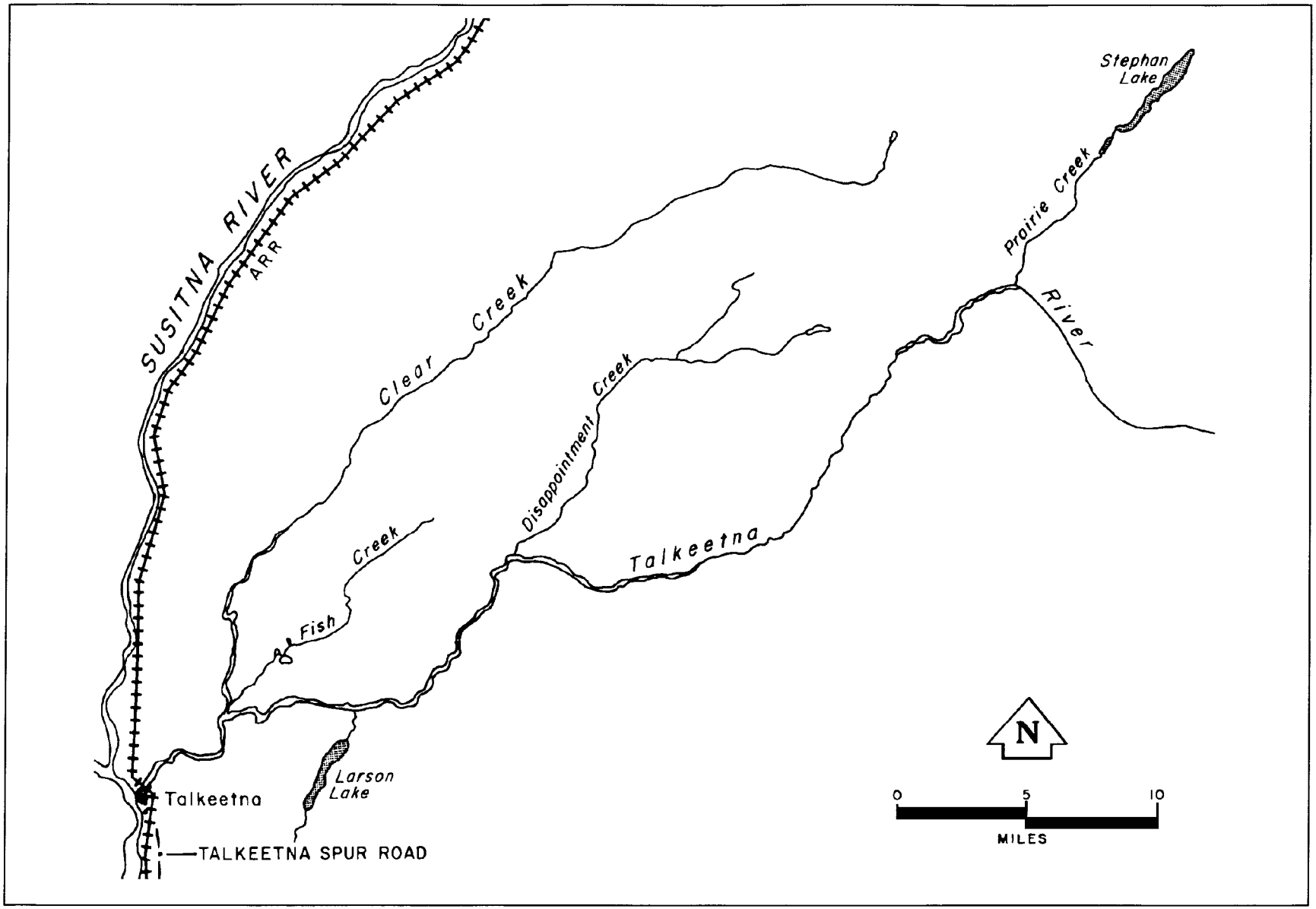

Figure 16.-Map of the Talkeetna River area.

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 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 limit for chinook salmon in all Eastside Susitna Management Unit fisheries was one chinook salmon per day and two in possession, 16 inches or more in length. In 1995 the bag and possession limits were reduced to one per day.

During 1987 to 1996, the Eastside Susitna Management Unit fisheries have collectively provided 27%-56% of the chinook salmon harvest from the NCIMA. The harvest has ranged from 7,872 to 22,688 during this period (Table 24) 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 40% 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 1997 (Table 25).

Willow Creek, Talkeetna River, Sheep Creek and Montana Creek traditionally produce the largest harvest of chinook salmon in the Eastside Susitna Management Unit. The 1992-1996 average annual harvest for these fisheries ranged from 1,662 fish in Sheep Creek to 5,709 fish in Willow Creek (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). For example, stocks from the upper 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 fishery 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 to 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. Additionally, in 1991, 1992 and 1995 creel surveys were conducted for the Talkeetna River. Biological samples were collected from the Talkeetna River during the 1993, 1994 and 1996 seasons and are annually collected 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;

Table 24.-Harvest of chinook salmon from eastside Susitna River, westside Susitna River, West Cook Inlet and Knik Arm drainages, 1979-1997.

	Eastside Susitna River						
Year	Hatchery	Non-hatchery	Total	Westside Susitna River	West Cook Inlet	Knik Arm	Total
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	9,568	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	13,402	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
1996	1,037	7,608	8,645	4,696	1,016	1,192	15,549
1992-1996 Mean	2,679	12,418	15,096	12,218	1,267	2,955	31,536
1997	1,189	10,456	11,645	8,190	915	2,740	23,490

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. 1995-1996, Whitmore and Sweet 1997 and 1998.).

Willow Creek was identified in 1981 as a candidate for chinook salmon stocking in the Cook Inlet Regional Salmon Enhancement Plan (CIRPT 1981). 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, and (3) provide 10,000-15,000 angler-days of chinook salmon fishing opportunity during king salmon season (Sweet *In prep*).

Recent Fishery Performance

The 1997 chinook salmon harvest from the Eastside Susitna Management Unit was 11,645 fish (Table 9 and Appendix A5), approximately 75% of the 1992-1996 mean harvest of 15,096. This

Table 25.-Eastside Susitna River Management Unit chinook salmon escapement index counts (aerial), 1979-1998.

Year	Willow Creek	Deception Creek	Little Willow Creek	Sheep Creek	Goose Creek	Montana Creek	Clear Creek	Prairie Creek	Chulitna River	Portage Creek	Indian River	Kashwitna River	Other Streams[b]	Total
1979	848	239	327	778	[a]	1,094	864	[a]		190	285	457	[a]	5,082
1980														
1981	991	366	459	1,013	262	814	[a]	1,875		659	422	558	[a]	7,419
1982	592	229	316	527	140	887	982	3,844	863	1,111	1,053	156	268	10,968
1983	777	121	1,042	975	477	1,641	938	3,200	4,058	3,140	1,193	297	[a]	17,859
1984	2,789	675		1,028	258	2,309	1,520	9,000	4,191	2,341	1,456	111	[a]	25,678
1985	1,856	1,044	1,305	1,634	401	1,767	2,430	6,500	783	[c]	[c]	457	4,066	22,243
1986	2,059	521	2,133	1,285	[a]	[a]	[a]	8,500		[a]	[a]	700	[a]	15,198
1987	2,768	692	1,320	895	416	1,320	[a]	9,138	5,252	2,616	1,246	872	[a]	26,535
1988	2,496	790	1,515	1,215	1,076	2,016	4,850	9,280		1,402	456	1,159	[a]	26,255
1989	5,060	800	1,325	610	835	2,701	[a]	9,463		1,309	659	355	[a]	23,117
1990	2,365	700	1,115	634	552	1,576	2,380	9,113	2,681	1,886	1,473	872	[a]	25,347
1991	2,006	747	498	154[d]	968	1,605	1,974	6,770	4,410	1,223	1,468	340	[a]	22,163
1992	1,660	983	673	[a]	369	1,560	1,530	4,453	2,527	1,078	479	470	[a]	15,782
1993	2,227	1,221	705	[a]	347	1,218	886	3,023	2,070	629	362	525	[a]	13,213
1994	1,479	766	712	542	375	1,143	1,204	2,254	1,806	857	336	430	[a]	11,904
1995	3,792	834	1,210	1,049	374	2,110	1,928	3,884	3,460	1,505	796	836	[a]	21,778
1996	1,776	1,211	1,077	1,028	305	1,841	2,091	5,037	4,172	2,185	579	782	[a]	22,084
1997	4,841	1,340	2,390	[a]	308	3,073	5,100	7,710	5,618	3,086	1,700	761	[a]	35,927
1998	3,500	1,273	1,782	1,160	415	2,936	3,894	4,465	2,586	1,261	502	619		24,393
BEG[e]	1,750[f]		650	650	350	1,100	1,300	4,700	2,000					

[a] No counts conducted.

[b] May include Honolulu, Byers, Troublesome, Bunco, Birch, Sunshine, Larson creeks.

[c] Included with other streams.

[d] Poor count due to timing, poor visibility or weather conditions.

[e] Biological escapement goal.

[f] Includes both Willow Creek and Deception Creek.

Table 26.-Number of chinook salmon smolt stocked into the Willow Creek drainage from 1985-1998.

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	147,877		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	216,697	40,438	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	78,878	31,167	12.3	5/30/91
		391,669	62,334		
1991	Deception	179,724	33,464	13.5	5/29/92
	Deception	35,752		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
1996	Deception	209,944	207,973	12.2	6/11-20/97
1997	Deception	197,392	197,392	11.5	6/17-26/98

harvest represented approximately 50% of the entire chinook salmon harvest from the NCIMA (Table 24). In total, 35,762 chinook salmon were caught in the Eastside Susitna Management Unit during 1997, of which 67% were released (Table 13). The harvest estimate for 1997 includes approximately 1,000 hatchery fish taken in the Willow Creek fishery.

During 1997 the harvest of chinook salmon from Willow Creek, Talkeetna River, and Montana Creek was 3,417 (approximately 1,000 hatchery produced), 3,939 and 2,243 fish, respectively, which accounted for 82% of the total harvest from the Eastside Susitna Management Unit (Appendix A5).

A catch sampling program to estimate the relative contribution of hatchery-produced chinook salmon to the sport harvest is conducted at the mouth of Willow Creek annually. An escapement survey to estimate hatchery contribution is also conducted. During 1998 hatchery fish accounted for 32% of the harvest, 13% of the escapement in the mainstem of Willow Creek above the confluence of Deception Creek, 64% of the Deception Creek escapement collected during the egg take and 45% of the Deception Creek escapement below the egg-take weir (Table 27). During 1989-1998 the hatchery contribution to the sport harvest averaged 40%. The annual chinook salmon egg take at Deception Creek resulted in 644,900 eggs collected during 1998 (Table 28).

In association with this project the age, sex and size composition of the harvest was determined (Table 29). In 1998 males accounted for about 51% of the Willow Creek sport harvest. Approximately 18% of the harvest was composed of age-1.2 fish, and age-1.3 and –1.4 fish composed 40% and 41% of the harvest, respectively. Escapement index counts in 1998 indicated a minimum of 4,773 spawners in Willow and Deception creeks combined (Table 25).

A detailed summary of the performance of the chinook salmon enhancement program in Willow Creek (Sweet *In prep*), will be completed in 1998 and will include information from initiation of the program through the 1996 season.

The 1998 escapement indices for Eastside Susitna Management Unit chinook salmon totaled 24,393 fish with all streams except Prairie Creek exceeding their BEG (Table 25). Managers believe that regulations initiated in 1995 reducing the harvest in all chinook fisheries contributed significantly to the increase seen in spawning escapements beginning in 1995.

Management Objectives

Biological escapement goals for eight Eastside Susitna Management Unit systems have been established (Table 19). 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. Objectives specific to Willow Creek relative to the chinook salmon enhancement program are to provide 10,000-15,000 angler-days of participation and opportunity to harvest an additional 4,000 hatchery-produced chinook salmon.

The objective of regulations initiated prior to the 1995 season was to reduce the harvest to half the 1994 level. Based on SWHS estimates for 1995-1997 this was accomplished (Appendix A5). A corresponding increase in eastside Susitna River escapement indices also occurred.

Table 27.-Contribution of hatchery-reared chinook salmon to the sport harvest and escapement at Willow Creek, 1998.

Willow Ck Sport Harvest								
	# inspt	# clips obs	# heads col	# tags decoded	# no tag	# heads lost	Contribution	SE
Total	886	86	76	75	1	10	32.25%	3.45%
Tag code	Tag ratio							
312317	0.25811			15			7.42%	1.68%
312434	0.25038			30			15.30%	2.47%
312514	0.25222			15			7.60%	1.73%
312603	0.99499			1			0.13%	0.04%
312604	0.98901			7			0.90%	0.12%
312605	0.99499			2			0.26%	0.06%
312606	0.99100			5			0.64%	0.10%
no tag					1			

Willow Ck Escapement								
	# inspt	# clips obs	# heads col	# tags decoded	# no tag	# heads lost		
Total	199	10	9	9	0	1	13.34%	4.36%
Tag code	Tag ratio							
312317	0.25811			1			2.16%	1.90%
312434	0.25038			4			8.92%	3.93%
312603	0.99499			1			0.56%	0.18%
312604	0.98901			1			0.56%	0.19%
312606	0.991			2			1.13%	0.26%

Deception Ck Escapement								
	# inspt	# clips obs	# heads col	# tags decoded	# no tag	# heads lost		
Total	53	6	3	3	0	3	45.10%	24.35%
Tag code	Tag ratio							
312434	0.25038			2			30.14%	19.94%
312514	0.25222			1			14.96%	13.99%

Deception Ck Eggtake								
	# inspt	# clips obs	# heads col	# tags decoded	# no tag	# heads lost		
Total	199	33	33	32	1	0	63.70%	7.88%
Tag code	Tag ratio							
312317	0.25811			6			11.68%	4.11%
312434	0.25038			15			30.10%	6.73%
312514	0.25222			11			21.92%	5.71%
no tag					1			

Table 28.-Number of eggs collected during NCIMA salmon egg takes, 1989-1998.

	Chinook	Coho			Chum		Sockeye	
Stock	Deception Ck	Jim Ck	Nancy Lk	Eklutna Tailrace	Eklutna (Matanuska)	Eklutna Tailrace	Meadow Ck	Tustemena Lake
1989	913,900		530,300	52,000		3,890,000		
1990	495,100		590,000	150,000		3,050,000		
1991	430,000		878,400	149,000	3,970,000			
1992	391,500		833,600	72,630				
1993	391,100		870,900	100,000			9,000,000	
1994	440,300		903,000	105,000			7,700,000	
1995	629,200		992,700	98,000			8,000,000	
1996	353,000	117,500	853,500				8,000,000	4,321,000
1997	591,300	165,600					8,000,000	4,041,000
1998	644,900	154,900						

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

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; (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; and (3) only unbaited single hook artificial lures may be used in Willow Creek upstream of a department marker approximately one half mile upstream of the confluence of Willow Creek with the Susitna River.

The next BOF meeting to include Eastside Susitna Management Unit chinook salmon is scheduled for February 1999.

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.

Regulations adopted by the BOF effective in 1997 that do not allow fishing for chinook salmon after harvesting one should help alleviate the crowding problem.

Table 29.-Sex and age composition and length-at-age of chinook salmon sampled from the Willow Creek and Deshka River sport harvests, Deshka River weir escapement and Northern Cook Inlet commercial harvest, 1998.

	Willow Creek Harvest				Deshka River Harvest				Deshka River Weir				NCI Commercial			
	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
Male																
Percent	18.2	18.6	14.2	0.4	9.9	18.5	18.3	0.8	28.8	13.8	6.9	0	43.5	16.4	5.3	0.4
SE	2.46	2.48	2.22	0.40	1.53	1.99	1.98	0.45	2.54	1.93	1.42		3.07	2.29	1.39	0.38
Mean Length (mm)	627	811	994	1025	616	771	936	983	570	792	928		597	753	936	1075
SE	7.1	9.5	13.2		6.63	6.80	8.48	49.1	6.09	10.8	9.61		9.0	11.3	49.2	
Sample Size	45	46	35	1	38	71	70	3	92	44	22		114	43	14	1
Female																
Percent	0	21.5	27.1	0	0	21.9	29.5	0.3	0	28.2	21.0	0	0	16.4	16.8	0
SE		2.62	2.83			2.12	2.33	0.26		2.52	2.28			2.29	2.31	
Mean Length (mm)		832	920			791	884	960		792	873			809	901	
SE		6.12	7.73			5.98	5.20			5.15	6.0			8.97	9.47	
Sample Size	0	53	67	0	0	84	113	1	0	90	67		0	43	44	
Combined																
Percent	18.2	40.1	41.3	0.4	9.9	40.5	47.8	1.0	28.8	42.0	27.9	0	43.5	32.8	22.1	0.4
SE	2.46	3.12	3.14	0.40	1.53	2.51	2.56	0.52	2.54	2.77	2.52		3.07	2.91	2.57	0.38
Mean Length (mm)	627	822	945	1025	616	782	904	978	570	792	887		598	781	909	1075
SE	70.8	5.57	7.61		6.63	4.55	4.93	35.2	6.09	4.94	5.66		4.91	8.63	8.60	
Sample Size	45	99	102	1	27	100	56	4	92	134	89		114	86	58	1
Total Percent Male (SE)		51.4 (3.19)				47.8 (2.56)				50.5 (2.80)				66.8 (2.92)		
Total Percent Female (SE)		48.6 (3.19)				52.2 (2.56)				49.5 (2.80)				33.2 (2.92)		
Total Sample Size		247				383				319				262		

Note: Less than 5% of the population consists of age classes other than those listed.

The decrease in spawning escapement during the period 1992-1994 is the primary biological issue confronting these fisheries. The increasingly restrictive regulations that have been implemented since 1993 have been successful in decreasing harvest and effort levels and increasing spawning escapement.

Conflict between power and nonpower boaters has become an issue at Willow Creek. Historically, few power boaters used Willow Creek as it is a narrow, winding, shallow creek that doesn't safely accommodate many boaters at the same time. Float trips and drop-off services have become popular with chinook salmon anglers increasing the amount of interaction between power and nonpower boaters.

Ongoing Research and Management Activities

Willow Creek has been the site of an ongoing chinook salmon stocking program since 1983. Inseason assessment of the biological characteristics of and hatchery contribution to the harvest and escapement continue to be important components in developing Willow Creek as a responsible stocking program.

Annual assessment of escapement is 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.

Department personnel inspect anglers' fishing licenses and harvest records at several Parks Highway-accessible fisheries including Montana, Sheep, Goose and Willow creeks.

A juvenile chinook salmon coded wire tagging (CWT) program was operated at Willow Creek during 1996-1998. A total of approximately 300,000 wild juvenile chinook salmon have been tagged and released. Tagged fish are expected to enter marine waters in 1997-1999 and be available to harvest as immature fish beginning in 1998. The majority are expected to return to Willow Creek in the years 2000-2002 as 5- and 6-year-olds. Tag recoveries will occur as these fish are intercepted in commercial, subsistence, personal use, and recreational fisheries. Catch sampling programs are conducted by the department in the Copper River, Kodiak, and Northern District commercial and Deep Creek marine fisheries. A report detailing the CWT project will be available in late 1999.

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, both of 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 vehicles with trailers 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. In addition, the concessionaire is responsible for maintenance of pit privies installed near the confluence of the Talkeetna River and Clear Creek.

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 was constructed across an eroded portion of the trail during 1997 to comply with standards set by the Americans with Disabilities Act (ADA). Other enhancements 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 maintain toilets, empty dumpsters, and provide general facility cleaning.

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 site include parking, boat launching and RV camping. A concessionaire contracted by the department operates the facility and performs routine maintenance with the department providing upgrades as needed. In 1998 a trailer was installed to replace the existing house and a handicap access ramp to the concession stand was constructed. Current plans provide for dredging below the boat ramps, and installation of a fence for secure boat storage.

Recommended Research and Management Activities

We recommend continuation of the assessment of the Willow Creek hatchery enhancement program and construction of a floating weir in Willow Creek in 2000 to assess the return of CWT chinook salmon.

A program should be initiated to assess the age composition of the return to the Susitna River. A database is available for past years and should be continued to increase our understanding of these stocks.

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 23).

Access projects that are underway or planned to be implemented during next season include: (1) continuation of site maintenance contracts for Sheep Creek and Caswell Creek, (2) participation of concessionaires at the Talkeetna boat launch and Susitna Landing, (3) upgrading the trail at Caswell Creek from parking area to the stream to reduce erosion and (4) enhance the Christensen Lake boat launch facility as a cooperative effort with the Matanuska-Susitna Borough. Plans for future development include construction of a boat launch on the Chulitna River at Mile 133 of the Parks Highway and construction of a new boat launch at Nancy Lake.

The Division of Sport Fish access program directed a study to find cost effective options for providing public access to the lower Susitna River. This investigation was performed primarily because the owner of the Deshka Landing boat launch approached the Division about acquiring and operating it as a public facility. A private engineering firm was hired to evaluate three sites for development as a lower river launch site. These sites included Deshka Landing, a previously

proposed launch site at the Susitna River/Willow Creek confluence, and a new site suitable for launch development between Bell Island and Willow Creek. In consultation with Sport Fish, the firm selected a new site six river miles below Deshka Landing on the east bank of the Susitna River just upstream of its confluence with Rolly Creek.

Because of its susceptibility to ongoing erosion and deposition, along with the presence of wetlands and high potential for cultural remains, the Willow Creek site was judged to be a poor location for a boat launch. Acquisition, renovation, construction, and operational costs were estimated for Deshka Landing and the Rolly Creek site. Considering all the variables involved, the difference in the cost of owning and operating the two sites was not significant. The Division has decided that presently there is no compelling economic reason to purchase Deshka Landing and adequate launch facilities currently exist for boaters accessing the lower Susitna River, consequently, no further action is planned in the near future for any additional boat launch development.

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 1992 when the eastside Susitna River harvest surpassed it (Table 24). 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 1992-1996 represents 76% 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. In 1994 harvests declined dramatically resulting in its closure to chinook salmon fishing 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 increased substantially from 1979-1993. Improved access (as described in Whitmore et al. 1993) and population growth 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. 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 large portions of Lake and Alexander creeks and the Deshka River.

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 over-harvest because of heavy fishing pressure.

Beginning in 1991 and continuing through 1996, chinook salmon spawning abundance in westside Susitna River tributaries fell below desired levels (Table 30). Chinook salmon escapement counts in the Deshka River indicated 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 was not achieved from 1991-1996 (Tables 19 and 30).

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.

Table 30.-Westside Susitna River Management Unit chinook salmon escapement index counts, 1979-1998.

Year	Alexander Creek	Deshka River		Peters Creek	Lake Creek	Talachulitna River	Cache Creek	Other Streams[b]	Total
		Aerial	Weir						
1979	6,215	27,385		108	4,196	1,648	[a]	[a]	39,552
1980 [a]									
1981	[a]	[a]		[a]	[a]	2,025	[a]	[a]	2,025
1982	2,546	16,000		[a]	3,577	3,101	[a]	[a]	25,224
1983	3,755	19,237		2,272	7,075	10,014	497	[a]	42,850
1984	4,620	16,892		324	[a]	6,138	[a]	[a]	27,974
1985	6,241	18,151		2,901	5,803	5,145	206	485	38,932
1986	5,225	21,080		1,915	[a]	3,686	424	[a]	32,330
1987	2,152	15,028		1,302	4,898	[a]	556	[a]	23,936
1988	6,273	19,200		3,927	6,633	4,112	818	[a]	40,963
1989	3,497	[a]		959	[a]	[a]	362	[a]	4,818
1990	2,596	18,166		2,027	2,075	2,694	484	[a]	28,042
1991	2,727	8,112 [c]		2,458	3,011	2,457	499	161	19,425
1992	3,710	7,736		996	2,322	3,648	487	[a]	18,899
1993	2,763	5,769		1,668	2,869	3,269	1,690	[a]	18,028
1994	1,514	2,665		573	1,898	1,575	628	570	9,423
1995	2,090	5,150	10,048	1,041	3,017	2,521	1,601	408	15,828
1996	2,319	6,343	14,354	749	3,514	2,748	581	548	16,802
1997	5,598	19,047	35,587	2,637	3,841	4,494	1,774	1,046	38,437
1998	2,807	15,556	15,409	4,367	5,056	2,759	1,771	642	32,958
BEG [d]	2,700	11,200		1,300	2,900	2,700			

[a] No count conducted.

[b] May include Donkey Creek, Red Creek and other miscellaneous creeks.

[c] Low count due to timing, poor visibility or weather conditions.

[d] Biological escapement goal.

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 areawide 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 setnet 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 26). BEGs were not achieved within any of the index streams during the 1994 season. This prompted the regulations adopted during the 1994 BOF meeting which were intended 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 (Appendix F).

Recent Fishery Performance

The 1997 chinook salmon fishery resulted in a harvest of 8,190 chinook salmon, approximately two-thirds of the 1992-1996 mean and double the 1996 harvest (Appendix A7). The 1997 escapement survey counts increased dramatically over previous years with all index streams greatly exceeding their BEGs. The Deshka River aerial survey count in 1998 resulted in 15,556 fish, well above the BEG for the second consecutive year (Table 30).

During 1998, due to high water, the Deshka River weir was not operable until half way through the chinook salmon migration (based on previous years' data). The weir count of 15,408 fish, therefore, represents approximately half the total escapement. Age, sex and length samples were collected from the chinook salmon passing through the weir (Table 29). Male chinook salmon accounted for 51% of the sample, with age 1.2, 1.3 and 1.4 fish representing 29%, 42% and 28% of the sample, respectively.

The Deshka River was reopened to chinook salmon fishing by emergency order June 21 through July 13, 1997, as weir counts indicated the BEG would be achieved. A limited fishery was allowed in the lower 2 miles of the river. The SWHS estimated a harvest of 45 fish and a catch of 1,996 during this time period. During 1998, in response to a petition addressed by the BOF, the lower 5 miles of the Deshka River were opened with a two fish seasonal limit. A creel survey to estimate harvest, catch and effort was conducted by interviewing anglers exiting the fishery at the Deshka Landing. Harvest and catch were estimated to be 2,200 (SE = 466) and 2,996 (SE = 617) fish, respectively. The estimated effort was 30,014 (SE = 3,457) angler-days. Age, sex and length samples were collected from the harvest at the fishery. Age 1.2, 1.3 and 1.4 represented 10%, 41% and 48% of the harvest, respectively. Forty-eight percent of the harvest was male (Table 29).

Management Objectives
Biological escapement goals for five Westside Susitna Management Unit systems have been established (Table 19). 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 chinook salmon fishing opportunity.

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 the October 1997 meeting the BOF responded in support of a petition to open the Deshka River to chinook salmon fishing for the 1998 season. The BOF stipulated a seasonal limit of two Deshka River chinook salmon and delegated authority to the commissioner of the Department of Fish and Game to establish a fishery under the Administrative Procedure Act.

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 chinook salmon fisheries will take place in February 1999.

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 recreational rivers 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. During 1998 a creel survey to estimate harvest, catch and effort for the Deshka River chinook fishery was conducted for inseason assessment and as a means for providing information for the 1999 Board of Fish meetings.

A juvenile chinook salmon coded wire tagging (CWT) program was operated at the Deshka River in 1995-1997. Tag recoveries will occur as these fish are intercepted in commercial, subsistence and recreational fisheries in which catch sampling programs are being conducted by the department. In addition, a weir is placed in the Deshka River where biological information is collected (Table 29) and returning adult chinook salmon are 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. The weir will also increase our understanding of the relationship between aerial surveys and total run size. The Deshka River weir will be operational during the 1999 season.

An investigation to study the effects of water temperature on spawning success in the Deshka River was conducted in 1996-1998. The program required subjecting Deshka River chinook salmon eggs held in the hatchery to the Deshka River water temperature profile. Preliminary results suggest high egg mortality when water temperatures approach and exceed 20 degrees centigrade.

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

Recommended Research and Management Activities

The Deshka River weir project should be continued to provide biological data and inseason return information. The Deshka River creel survey will be terminated unless conservation concerns again arise.

Chinook salmon escapement monitoring should be continued. Harvest trends should be evaluated annually through the SWHS. We recommend that catch, escapement and carcass sampling be conducted at the Deshka River and catch sampling be conducted at Alexander and Lake creeks. Age, sex and size information collected from these fisheries is necessary for development of brood tables, with the goal of refining BEGs and developing forecast techniques for these stocks.

Biological escapement goals should be reevaluated.

Enforcement activities by department staff should continue to supplement Fish and Wildlife Protection.

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 subsistence fishery. Commercial fishing is permitted to within 500 yards of the mouths of several streams.

From 1985 through 1990 participation in these recreational fisheries reached record highs (Table 5). During 1991 and 1992 participation decreased in response to reduced bag and possession limits and reduced season length. Participation levels since 1992 have fluctuated between 5,800 and 9,400 angler-days annually.

The Theodore, Chuitna and Lewis rivers are the area's most prominent chinook salmon fisheries. The collective annual harvest of chinook salmon from all streams from 1992 through 1996 ranged from 674 to 1,855 fish and averaged 1,267 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 reached the stream's BEG (Table 22). 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. The 1994-1996 escapement counts for all streams were below their escapement goals.

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 have warranted restriction by regulation and emergency order for recreational fisheries (Appendix D).

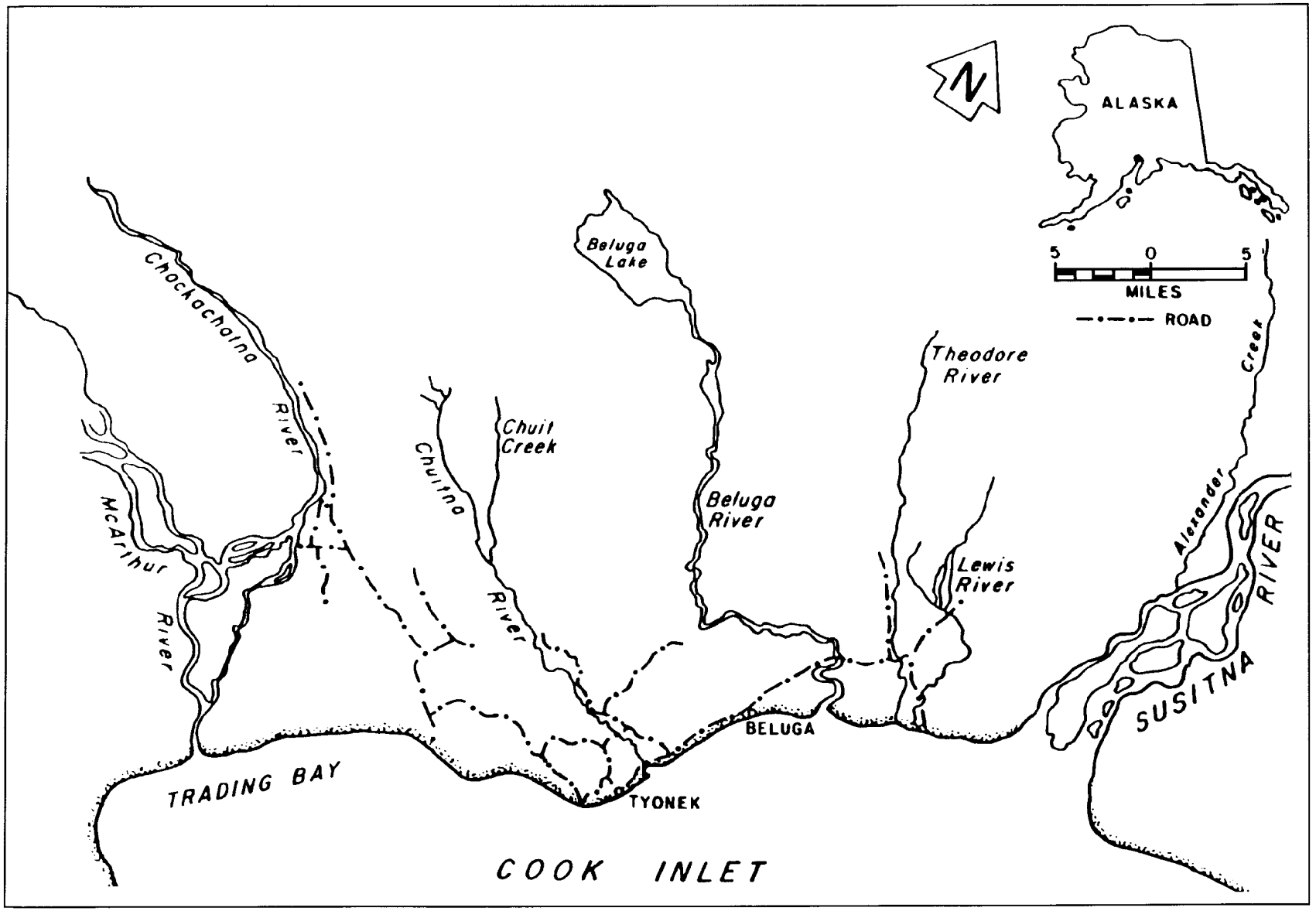

Figure 17.-Map of West Cook Inlet coastal streams.

The Theodore and Lewis Rivers were closed to chinook salmon fishing for the 1997 season. The combined sport harvest for the West Cook Inlet drainage during 1997 was estimated to be 915 fish, well below the previous 5-year average of 1,267 (Appendix A9). Both rivers remained closed in 1998 which combined with unfavorable water conditions in the Chuit River during chinook season should result in a minimal harvest estimate in 1998.

The 1997 and 1998 Tyonek subsistence gillnet fishery harvested 642 and 810 chinook salmon, respectively, well below the average for all years (Table 20).

Spawning escapement counts surpassed BEGs in all three WCI index streams during 1997 and 1998 (Table 22).

Management Objectives

Biological escapement goals for three West Cook Inlet Management Unit streams have been established (Table 19). 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 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.
2. In all waters of the West Cook Inlet Management Unit, after taking a chinook salmon 16 inches or more in length, a person may not fish for chinook salmon during that same day.

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 Chuitna 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 chinook salmon fisheries will be in February 1999.

Current Issues

The decline in spawning chinook salmon abundance beginning in 1990 became a major concern facing these fisheries. This reduction may be partially related to flood events during the 1980s.

The West Cook Inlet Management Unit streams experienced the same declining trend seen in streams of the Susitna River drainage.

With the 1997 and 1998 escapement counts resulting in numbers surpassing BEGs in all streams it is hoped the stocks have reached a level that will allow relaxation of some of the closures imposed in recent years.

The Beluga River drainage has supported an increased number of anglers during the 1996 and 1997 seasons. Several air taxi operators and area lodges drop anglers and guides at the confluence of Coal Creek and Beluga Lake. A survey of this area needs to be conducted to determine impacts of increased use. Additionally, a BEG should be considered for Coal Creek chinook salmon.

Angler trespass on Tyonek Native Corporation (TNC) lands along the Chuitna River has become an issue. Representatives of the State of Alaska have had several meetings with TNC members in efforts to resolve this issue. Although the State believes that under state law the public may stand or walk on any part of the river bed below the ordinary high water mark, TNC has informed the state that it views such activity on the south half of the river bed as trespass. There are two ways for the public to access the Chuitna River without trespassing on private lands. There is public access from the north across Kenai Peninsula Borough property and from the Pan Am Road at Mile 7.

Proposals to prohibit the use of helicopters in WCI fisheries, specifically the Chuitna River drainage, have been addressed by the BOF during the last several meetings. The BOF has not supported prohibiting helicopters.

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.

Continued success of WCI streams in meeting established BEGs may lead to relaxed 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 1996, and averaged 47,826 fish (Mills 1979-1994; Howe et. al. 1995-1997) (Table 7 and Appendix A11). During 1992 through 1996 NCIMA harvests accounted for 25% of the coho salmon harvests in the region and 17% of the statewide harvests (Table 31). 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 a close second followed 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

Table 31.-Northern Cook Inlet Management Area recreational harvest of coho salmon by management unit, 1977-1997.

	Northern Cook Inlet Management Area								
Year	Knik Arm	Eastside Susitna	Westside Susitna	West Cook Inlet	Total Harvest	Region II Total	% by NCIMA	Alaska Total	% by NCIMA
1977	4,366	5,709	6,599	532	17,206	67,866	25	105,004	16
1978	7,895	8,573	10,173	378	27,019	81,990	33	131,945	20
1979	7,139	7,564	9,036	337	24,076	93,234	26	119,329	20
1980	16,030	10,368	12,141	628	39,167	127,958	31	164,302	24
1981	10,484	6,593	5,940	604	23,621	95,376	25	125,666	19
1982	13,676	10,167	10,658	335	34,836	136,153	26	195,644	18
1983	6,139	5,176	3,610	564	15,489	87,935	18	149,270	10
1984	23,429	13,916	9,511	1,035	47,891	166,688	29	238,536	20
1985	14,339	7,042	11,270	1,431	34,082	137,671	25	200,773	17
1986	12,361	16,190	13,117	983	42,651	188,872	23	255,887	17
1987	25,787	11,028	8,746	2,825	48,386	176,710	27	235,435	21
1988	40,037	19,518	16,283	1,182	77,020	225,812	34	281,450	27
1989	23,846	17,078	18,226	2,270	61,420	237,155	26	338,195	18
1990	18,762	11,743	13,883	1,344	45,732	214,114	21	325,936	14
1991	22,186	19,479	20,507	2,485	64,657	254,961	25	389,569	17
1992	25,814	33,790	16,218	2,211	78,033	237,204	33	345,513	23
1993	35,763	26,063	15,454	2,960	80,240	283,868	28	412,487	19
1994	28,539	20,870	15,361	2,695	67,465	299,849	22	502,948	13
1995	20,650	19,165	17,148	2,670	59,633	263,749	23	368,631	16
1996	22,819	25,173	17,475	2,435	67,902	328,178	21	503,413	13
92-96 Mean	26,717	25,012	16,331	2,594	70,655	282,570	25	426,598	17
% of NCIMA	38	35	23	4					
1997	12,144	11,243	7,148	2,115	32,650	283,311	12	462,931	7

dominated by harvests from the Little Susitna River while harvests from other management units are 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 436,721 fish during 1977-1997 (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 are the first indicators of general run strength. As coho salmon enter fresh water, the department has had very limited ability to gauge overall run size. Until 1997, counting weirs at the Little Susitna River and the Deshka River provided the only quantitative measure of coho abundance in the many drainages of Northern Cook Inlet. Beginning in 1997 weirs were also operated in Wasilla, Cottonwood and Fish creeks. Fish wheels and sonar at the Yentna River, and foot and aerial index counts for a few streams also contribute to our understanding of relative abundance.

In response to a poor return of coho salmon to Cook Inlet in 1997 unprecedented action was taken. Emergency orders were issued to close the commercial fishery and to institute an areawide bag limit reduction and bait prohibition for wild stock recreational fisheries.

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.

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 1997 (Table 32) (Mills 1979-1994; Howe et al. 1995-1998). 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 1998. In 1986 the weir was damaged for several days by flood waters and the escapement count through the weir was incomplete (Table 33). Prior to 1986, coho salmon escapement abundance was indexed by ground and/or aerial methods when water conditions permitted. Weir counts from 1988 through 1995, when the weir was installed at River Mile (RM) 32.5, averaged 21,428 coho salmon. Beginning in 1996 the weir was moved upstream to RM 71 making direct comparison of counts impossible.

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

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

Table 32.-Harvest and effort for Little Susitna River coho salmon, 1977-1997.

Year	Harvest	Release	Annual Effort Angler days[a]
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
1996	14,862	5,445	32,748
1997	7,750	2,242	35,594
Mean	11,160	5,682	36,268

Source: Mills 1977-1994, Howe et al. 1995-1998.

[a] Participation directed at coho salmon represents only a portion of the annual effort.

Table 33.-Knik Arm drainage coho salmon escapement index counts, 1981-1998.

	Little Susitna River[b]			Wasilla Creek Drainage[a]						Matanuska River[a]	Knik River Drainage[a]			
Year	Hatchery	Non-hatchery	Total[f]	Fish Creek[c]	Cotton-wood weir	Cotton-wood Ck[a]	Wasilla\ Spring Ck weir	Wasilla Creek	Spring Creek. (Upper)	Spring Creek (Flats)	Yellow Creek	McRoberts Creek	Upper Jim Creek	Eklutna Tailrace	Grand Total
1981			6,750	2,330		423		238	[d]	64	[d]	[d]	[d]	[d]	9,805
1982			6,800	5,201		737		171	[d]	105	[d]	[d]	[d]	[d]	13,014
1983			2,666	2,342		506		4	[d]	28	[d]	[d]	[d]	[d]	5,546
1984			20,991	4,510		935		876		90	[d]	[d]	[d]	[d]	27,402
1985			3,540	5,089		334		16	150	81	65	662	[d]	266	10,203
1986			6,999[e]	2,166		121		[d]	141	147	20	439	[d]	403	10,436
1987			4,865	3,871		360		251	110	42	58	667	[d]	1,587	11,811
1988	4,428	16,063	20,491	2,162		293		[d]	82	30	110	1,911	[d]	1,848	26,927
1989	6,862	8,370	15,232	3,479		147		[d]	67	39	226	597	[d]	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	37,601	1,297		158		118	16	5	136	484	418	286	40,519
1992	2,690	19,492	22,182	1,705		6		3	11	0	57	11	59	39	24,073
1993	9,189	25,633	34,822	2,078		265		[d]	67	69	490	503	535	496	39,325
1994	5,442	23,506	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	15,319
1996	444	16,255	16,699[g]	682		189		84	30	29	101	72	439	224	18,549
1997			9,894	2,549		386		156	38	35	367	701	563	350	15,039
1998			15,158	5,552	2,114	537	3,622\163	120[h]	31[h]	25	302	922	560	no count	29,106
BEG			7,500	2,700		300			300				850		

[a] Foot surveys unless otherwise noted.

[b] Foot and aerial surveys 1981-1985 and 1987. Weir counts from weir at River Mile 34, 1986, 1988-1995.

[c] 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.

[d] No survey conducted.

[e] Weir washed out in flood from July 21-July 29, 1986.

[f] Weir operated at RM 71 beginning in 1996.

[g] 12,932 coho salmon counted through a weir operated at River Mile 71, plus 452 counted in a stream survey below the weir.

[h] Count conducted late due to high water.

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 occurred at the Little Susitna River from 1982-1995 (Table 34). 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 stocking of hatchery coho salmon for the Little Susitna River.

The contribution of hatchery fish to the sport harvest 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, 1996).

Coho salmon smolt were 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.

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 per day and in possession.

Table 34.-Coho salmon stocking history for the Little Susitna River, 1982-1995.

	Fingerling Release			Smolt Release			Total
Year Stocked	Size (gm)	Number Released	Number Marked	Size (gm)	Number Released	Number Marked	Number Released
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

Only unbaited, artificial lures are allowed in the Little Susitna River between July 15 and August 6. This requirement was originally designed to reduce the catch rate of the early arriving nonhatchery stock and remains in effect to reduce hook-and-release mortality. 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.

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 old weir site at River Mile 32.5 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 also helps reduce 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 approximately 20,000 to 62,000 during 1988 through 1997 (Tables 32 and 33).

Recent Fishery Performance

During 1997 the SWHS estimated 7,750 coho were harvested for the Little Susitna River, less than half the 1992-1996 mean of 18,924 and the lowest since 1990 (Appendix A12). As the 1997 season progressed a weak return was indicated. This lead managers to issue an inseason emergency order to insure adequate escapement by reducing the bag and possession limit to one coho salmon. The 1998 season occurred without any inseason emergency orders and appears to have provided an average fishery.

In 1998, a total of 15,158 coho salmon were counted through the Little Susitna River weir at River Mile 71 (Table 33, Appendix H6). A total of 822 coho salmon were sampled for age and sex composition and mean length estimates. Age 2.1 was the dominant age class and accounted for 72% of the fish (Table 35). Coho salmon passed through the weir in 1998 were 50% male. The mean length of all sampled fish was 624 mm (Table 35).

A survey of Nancy Lake Creek drainage in October 1998 resulted in observation of very few adult coho salmon. This suggests that the return of hatchery fish to this site during previous years did not establish a spawning population of coho salmon in this portion of the drainage.

Management Objectives

Management objectives for the Little Susitna River as stated in the Little Susitna River Coho Salmon Management Plan are to provide 7,500 naturally spawning coho salmon upstream of the George Parks Highway and to provide coho salmon fishing opportunity from the George Parks Highway downstream to tidewater without emergency restrictions (ADF&G *Unpublished*).

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

Table 35.-Sex and age composition and length-at-age of coho salmon sampled from the Little Susitna River, Deshka River, Cottonwood Creek, Fish Creek and Wasilla Creek weirs, 1998.

	Little Susitna River			Cottonwood Creek			Fish Creek			Wasilla Creek			Deshka River		
Age	1.1	2.1	Total	1.1	2.1	Total	1.1	2.1	Total	1.1	2.1	Total	1.1	2.1	Total
Male															
Percent	14.7	34.8	49.5	11.3	55.6	66.9	9.2	39.7	48.9	16.5	36.9	53.4	14.1	33.0	47.1
SE	1.2	1.7	1.7	1.8	2.8	2.7	1.3	2.2	2.2	1.4	1.9	1.9	1.8	2.5	2.6
Mean Length (mm)	632	632	632	565	562	563	556	571	568	557	567	564	595	587	589
SE	3.3	2.0	1.7	7.1	3.5	3.2	7.1	3.8	3.4	5.1	3.1	2.6	6.4	4.6	3.8
Sample Size	121	286	407	35	173	208	46	199	245	108	242	350	51	119	170
Female															
Percent	13.0	37.5	50.5	7.4	25.7	33.1	7.2	43.9	51.1	14.3	32.3	46.6	16.3	36.6	52.9
SE	1.2	1.7	1.7	1.5	2.5	2.7	1.1	2.2	2.2	1.4	1.8	1.9	1.9	2.5	2.6
Mean Length (mm)	608	619	616	550	575	570	561	578	576	562	571	568	584	583	583
SE	3.1	1.5	1.4	8.9	5.8	5.0	5.1	2.6	2.4	2.9	1.8	1.5	4.4	3.1	2.5
Sample Size	107	308	415	23	80	103	36	220	256	94	212	306	59	132	191
Combined															
Percent	27.7	72.3	100	18.6	81.4	100	16.4	83.6	100	30.8	69.2	100	30.5	69.5	100
SE	1.6	1.6		2.2	2.2		1.6	1.6		1.8	1.8		2.4	2.4	
Mean Length (mm)	621	625	624	559	566	565	558	575	572	560	569	566	589	585	586
SE	2.4	1.3	1.1	5.6	3.0	2.7	4.5	2.3	2.0	3.0	1.8	1.6	3.8	2.7	2.2
Sample Size	228	594	822	58	253	311	82	419	501	202	454	656	110	251	361
Total Male (SE)			50%			67%			49%			53%			47%
Total Female (SE)			50%			33%			51%			47%			53%
Total Sample Size			822			311			501			656			361

bridge was projected to exceed 7,500 nonhatchery fish. With the placement of the weir at RM 71 instead of RM 32, coho salmon escapement information does not become available until the fishery has ended.

Current Issues

There are three 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 River and the associated campground (Whitmore et al. 1993), and (3) damage to riparian vegetation and accelerated stream bank erosion in areas heavily used by the public. 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 *Unpublished* a). Findings from this survey indicated that 3% of the total 139 miles of river bank within the study area showed signs of impact.

Ongoing and Recommended Research and Management Activities

The Little Susitna River weir will continue to be operated in 1999 to document run timing, subsample coho salmon for age, length and sex compositions and enumerate the return. If coho salmon return information is needed from the Little Susitna River for commercial fishery management decisions the weir should be moved downstream to River Mile 32.5.

Assessment of the sport harvest will be available through the SWHS.

Current regulation requires a prohibition of bait between July 15 and August 6 to reduce the hook-and-release mortality and preserve the early-arriving stock. Additional management action may be required after August 6 since there are no longer hatchery fish to supplement the late portion of the return.

Lilly Creek and other Nancy Lake drainage streams should be surveyed annually to determine if a spawning population has become established as a result of the stocking program.

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.

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. Funding has been secured for the 1999 season to: (1) improve trails and stabilize river banks within the LSPUF, and (2) harden campsites, stabilize

river banks, repair damage caused by boating activity and construct permanent boat tie ups along the Little Susitna River within the Susitna Flats State Game Refuge (Table 23).

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 was originally supported by coho salmon returning to the Cook Inlet Aquaculture Association's (CIAA) hatchery located at the head of the tailrace. A fish ladder links the hatchery with the tailrace which in turn drains into the Knik River. The nonprofit Eklutna hatchery operated from 1981 through 1998.

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 annual harvest for these five fisheries averaged 7,125 coho salmon during the period 1992 through 1996 (Mills 1993-1994, Howe et al. 1995-1997) (Table 36). Jim Creek averaged 3,472 coho salmon during this period whereas the three weekend-only fisheries; Fish, Cottonwood, and Wasilla creeks averaged 556, 664 and 854 fish, respectively.

Coho salmon have been periodically stocked into the majority of the Knik Management Unit systems (Table 37). 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 produced by the ADFG's Big Lake Hatchery, Elmendorf Hatchery and Fort Richardson Hatchery (Table 37). CIAA also collected eggs and reared coho salmon at its Eklutna Hatchery until it suspended operation in 1998.

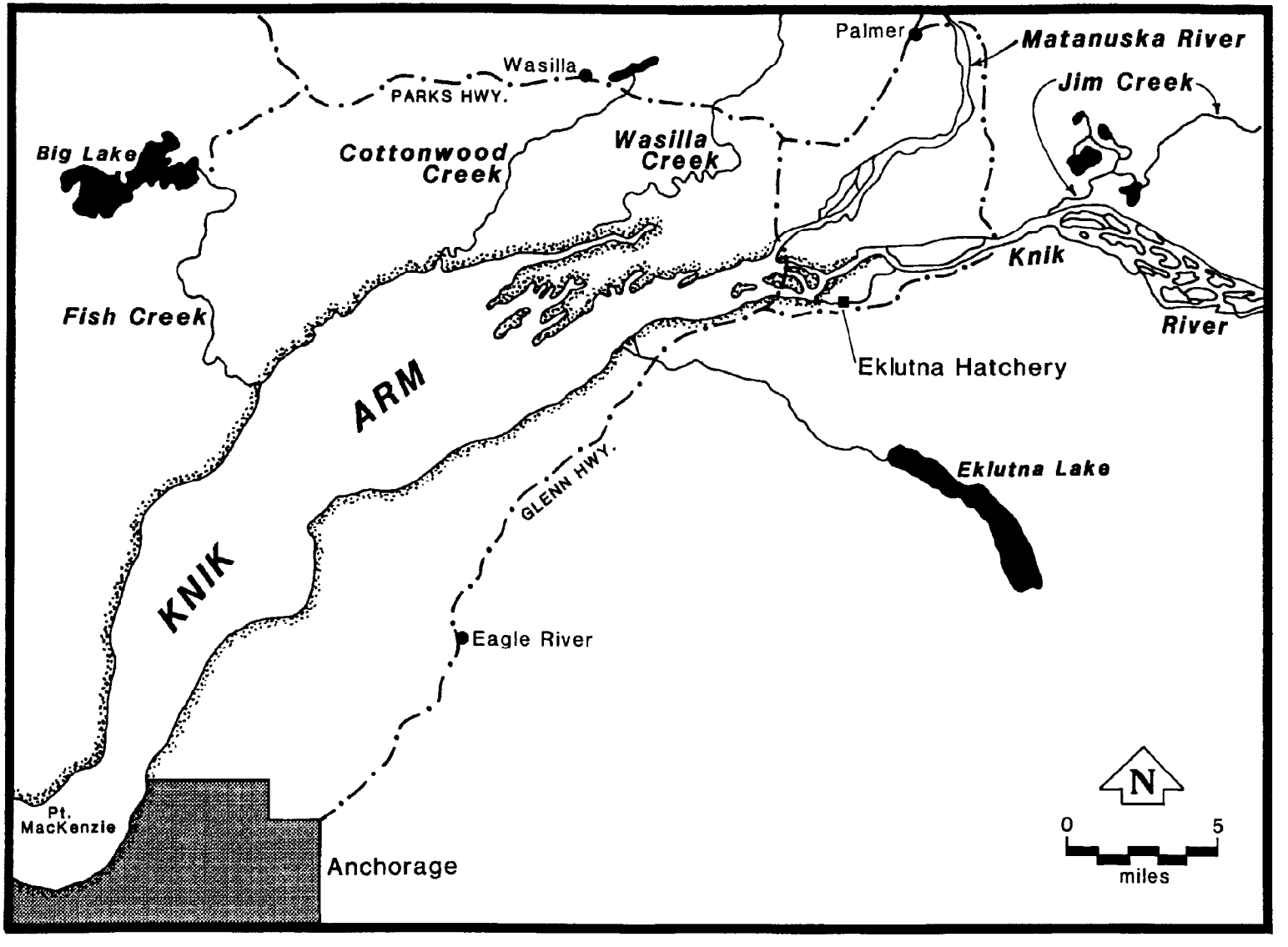

Figure 18.-Map of the Knik Arm drainage.

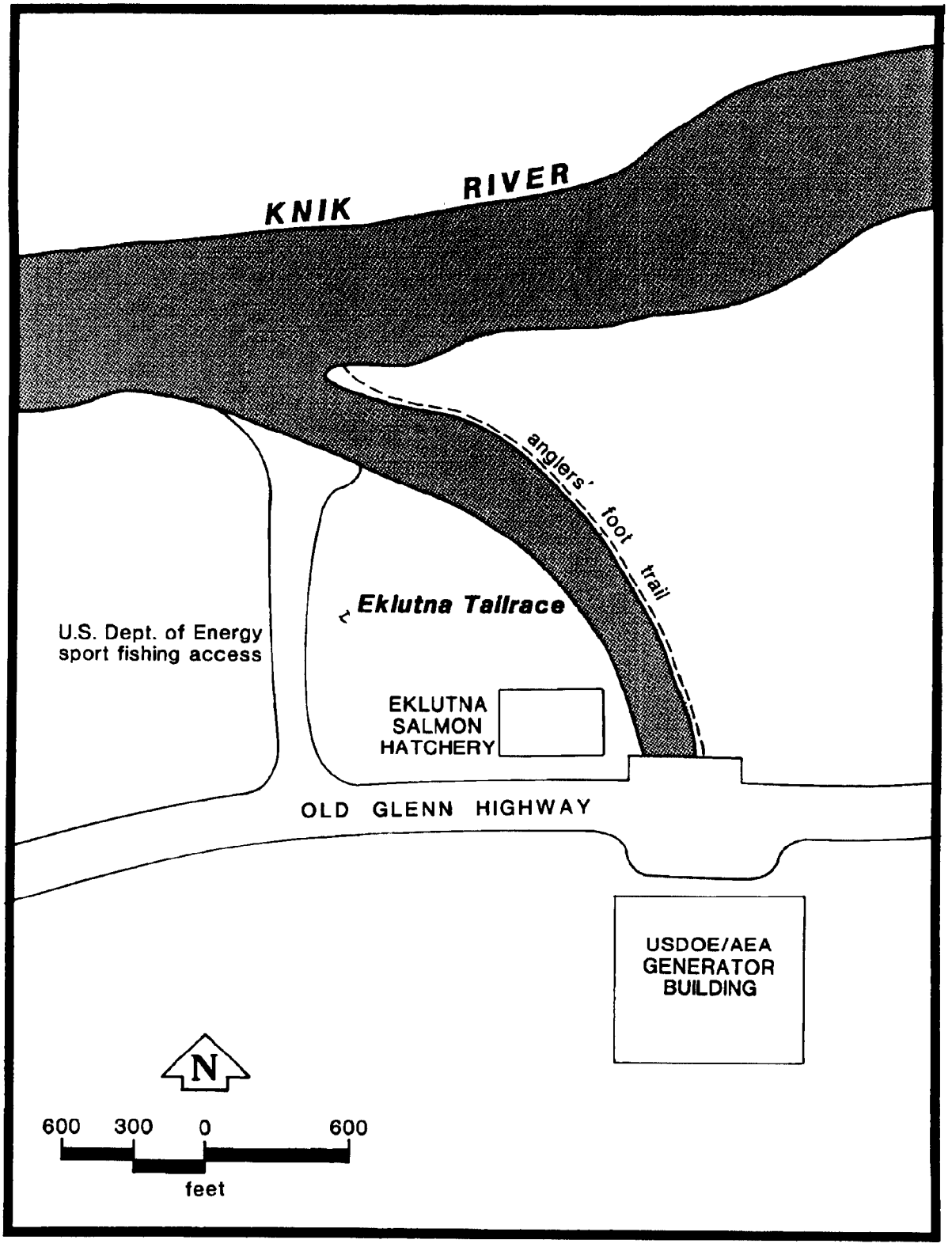

Figure 19.-Map of the Eklutna hatchery and Eklutna powerplant tailrace.

Table 36.-Fishing effort and coho salmon harvest from Knik Arm fisheries, 1977-1997.

	Wasilla Creek		Cottonwood Creek		Fish Creek		Eklutna Tailrace		Jim Creek[b]		Total	
Year	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]
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	9,369
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	20,543
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	5,057	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
1996	890	1,872	794	2,410	586	1,217	1,353	9,392	3,579	10,082	7,202	24,973
1997	775	1,570	406	2,759	162	1,452	795	5,213	1,953	7,177	4,091	18,171
Mean	1,202	2,946	995	4,345	594	2,597	1,376	7,678	3,598	10,503	6,301	22,106

[a] In some cases, participation includes effort directed at species other than coho salmon.

[b] Knik River and tributaries including Jim Creek.

Table 37.-Summary of coho salmon stocked in Cottonwood, Wasilla, Jim, and Fish creeks and the Eklutna tailrace, 1977-1998.

Brood Year	Brood Stock	Release Year	Release Drainage	Average Size (g)	Number Released	Number Marked
Big Lake Hatchery						
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

-continued-

Table 37.-Page 2 of 2.

Brood Year	Brood Stock	Release Year	Release Drainage	Average Size (g)	Number Released	Number Marked
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
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
Eklutna Hatchery						
1981	Cottonwood Lk & Big Lake	1983	Tailrace	15.4	633[a]	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[a]	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
1995	Eklutna	1997	Tailrace	14.5	69,475	0
1996	Eklutna	1998	Tailrace	no data	105,000	0
Elmendorf Hatchery						
1994	Little Susitna R.	1996	Wasilla Creek	20.9	145,923	46,839
Fort Richardson Hatchery						
1996	Jim Creek	1998	Eklutna Tailrace	17.9	112,219	111,882

[a] Some fingerlings escaped into tailrace due to vandalism.

Contribution of hatchery fish to the catch and harvest in these recreational fisheries was not evaluated.

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 set gillnet fishery that operates near the mouth of Fish Creek. The Knik Arm commercial set gillnet fishery has been conducted annually since 1987. Coho salmon harvests from this fishery have ranged from 85 to 11,604 and averaged 2,913 coho salmon annually during the period 1987 through 1997 (Table 38). The Knik Arm commercial set gillnet fishery harvest has averaged 3,128 coho salmon from 1987 through 1997 (Appendix B9) and is discussed further in the Sockeye Salmon Fishery section of this report.

Recent Fishery Performance

The 1997 recreational harvest for Knik Arm streams was 4,091 fish, a decrease from 1996 and well below the 1992-1996 average of 7,125 (Table 36). The 18,171 angler days of participation from these fisheries during 1997 was below the 1996 level and the 1992-1996 average of 23,678. As the 1997 season progressed it became evident that returns were below desired levels. Emergency orders were issued closing Wasilla Creek in its entirety, and prohibiting bait and reducing the bag and possession limit to one coho in all area waters except the Eklutna Tailrace.

The 1997 Fish Creek personal use dip net harvest totaled 336 coho salmon. In response to a lack of returning sockeye salmon this fishery was also closed early resulting in a minimal harvest of coho salmon (Table 38).

Escapement counts in 1998 revealed one of the four index streams with established BEGs, Wasilla Creek, fell below its desired goal (Table 33 and 39).

Weirs were operated on Fish, Cottonwood, Wasilla, and Spring (a tributary to Wasilla Creek) creeks in 1998. Resulting counts were 5,552, 2,114, 3,622 and 163, respectively (Appendices H2-H5). Length and age data were collected at all weirs (Table 35).

In response to coho salmon escapements lagging far behind desired levels and low commercial catch rates indicating a weak return the entire Upper Cook Inlet commercial fishery was closed on August 4, 1998. The resulting coho salmon commercial harvest for 1998 was 548 fish, approximately 20% of the 1987-1998 mean (Table 38).

Management Objectives

Biological escapement goals have been established for Fish, Wasilla, Cottonwood, and Jim creeks (Table 39). Escapement goals for Wasilla, Cottonwood and Jim creeks are based on historic escapement index counts while the Fish Creek goal is based on average coho salmon weir counts from 1968-1992. The management objective for these four 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 February 1999. Consideration will be given to closing Wasilla and Cottonwood creeks to recreational coho salmon fishing and prohibiting the retention of coho salmon in the Fish Creek personal use fishery.

Table 38.-Fish Creek salmon harvests, by commercial set gillnet and personal use dip net, 1987-1998.

	Commercial Gillnet						Personal Use Dip Net (SWHS)[a]					
Year	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
1988	38,251	11,604	325	591	9	50,780	3,000					3,000
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	35,245	1,802	448	25	0	37,520	16,682	3,358	0	96	0	20,136
1997	13,791	85	31	1	1	13,909	1,883	336	9	0	0	2,228
1998	2,597	548	105	0	0	3,250	3,676	614	28	60	1	4,379
Mean	23,443	2,913	1,351	247	2	27,955	11,221	1,543	255	549	0	13,467

[a] Mills 1988-1994, Howe et al. 1995-1998. 1998 data are from permit returns as of November 1998, with 82% of permits returned.

Table 39.-Coho salmon biological escapement goals (BEG) for Knik Arm Management Unit streams.

Stream	BEG[a]
Cottonwood Creek	300
Wasilla Creek	300
Fish Creek	2,700
Jim Creek drainage	1,000

[a] Biological escapement goal.

Current Issues

Of major concern to fishery managers is the failure of Cottonwood, Wasilla, Fish and Jim creeks to consistently meet their biological escapement goals (Tables 33 and 39). Review of the escapement goals has brought into question the relationship of index counts to total return in Wasilla Creek and to a lesser extent Cottonwood and Jim creeks.

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 and habitat degradation to these streams and spawning areas is evident. Additionally, available information and enforcement action suggests that a substantial amount of salmon poaching occurs in these drainages. The need to address these fishing infractions and habitat violations continues.

Ongoing Research and Management

Annual harvest and effort information pertaining to these fisheries is obtained from the SWHS. Prior to 1997 spawning escapement was assessed by means of a weir on Fish Creek through at least August 15, primarily for management of commercial and personal use sockeye salmon fisheries. During 1998 the Fish Creek weir was operated through September 27 to more thoroughly evaluate the coho salmon return. Ground surveys have been conducted annually within established index areas in Wasilla, Cottonwood and Jim creeks.

In 1996 hatchery-reared coho salmon were released into Wasilla Creek (Table 37). Evaluation of the Wasilla Creek escapement through a weir during 1997 identified three hatchery fish of 437 inspected at the weir. This evaluation was considered to be inconclusive as a much higher proportion of these hatchery fish were recovered in a commercial catch sampling program for the Upper Cook Inlet. This indicated that an unknown portion of the coho salmon escapement in Wasilla Creek was not being observed at this weir site. To rectify this situation the weir was moved downstream in 1998.

In addition, during 1997 and 1998, a weir was operated on Cottonwood Creek to evaluate the total return of coho salmon.

A multi-agency watershed study to catalogue the aquatic resources in the Cottonwood Creek drainage was initiated in 1997. The Habitat Division of the ADF&G documented fish habitat, riparian vegetation and man made alterations within the 75-foot creek setback. USGS began monitoring water stage and flow, ADF&G limnologists conducted water analysis and the University of Alaska Anchorage is inventorying aquatic insects. In addition ADF&G is documenting spawning distributions of rainbow trout, sockeye and coho salmon.

A total of 60 females and 60 males was collected from Jim Creek during the 1998 egg take resulting in a total of 154,900 coho salmon eggs (Table 29)**.** This was the final year for Jim Creek egg take; in the future, coho returning to the Eklutna Tailrace will be used as brood stock.

Recommended Research and Management Activities

The indexing of coho salmon in Knik Arm streams should continue. Weirs should be maintained on Wasilla, Cottonwood and Fish creeks to evaluate total returns of coho salmon to determine the relationship of index counts to total return.

The Cottonwood Creek drainage aquatic resource study should be continued with the addition of a smolt CWT tagging study to determine the contribution of Cottonwood Creek coho salmon to the fisheries of Upper Cook Inlet.

The Eklutna Tailrace should be stocked at increased levels to provide anglers additional coho salmon fishing opportunity. Stocking should be limited to sites such as the Eklutna Tailrace; e.g. sites without wild coho salmon stocks present. Eggs will be collected from the coho returning to the tailrace and reared at Fort Richardson Hatchery.

A creel survey should be conducted of the Fish Creek personal use fishery to determine if fishers are properly identifying salmon species harvested. It is necessary to determine how widespread the practice is of identifying bright sockeye salmon as coho salmon to determine the accuracy of catch reports.

Several fishery access projects should be implemented in the Knik Management Unit (Table 23). 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 assure maintenance of Wasilla Creek coho salmon rearing habitat. 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 fishery access and coho salmon rearing habitat, development of these two sites will greatly enhance hunting and wildlife viewing opportunities.

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

Fishery Description and Historical Perspective

Coho salmon harvests in the Eastside and Westside Susitna and West Cook Inlet management units averaged 25,012, 16,331 and 2,594 fish, respectively, during 1992 through 1996 (Mills 1993 and 1994; Howe et al. 1995-1997) (Table 31). The Susitna River drainage supports the largest coho salmon stock within the NCIMA. The contribution of the harvest from the Eastside Susitna and Westside Susitna Management Units has been 58% of the total NCIMA coho salmon harvest during 1992-1996. The West Cook Inlet Management Unit contribution to the total NCIMA has been 4% 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 40). 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 40). 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 5,244, 1,650 and 3,435 fish. respectively, during the period of 1992 to 1996. This harvest accounted for 63% of the Westside Susitna Management Unit coho salmon harvest (Appendix A16). Beginning in 1996 a fish wheel fishery has operated on the Yentna River below the Skwentna River resulting in harvests of less than 150 coho salmon each year. This fishery originated as a personal use fishery and became a subsistence fishery in 1998.

Coho salmon were counted through a weir at approximately River Mile 17 on the Deshka River during 1995 and 1996. During 1996 the weir was operational only through July 30 after which high water made counting fish impossible. In 1997 the weir was moved downstream to RM 7 allowing weir crews easier access and to enumerate a larger portion of the escapement.

All the Eastside Susitna Management Unit tributaries provide fishing opportunities for coho salmon. During recent years Willow Creek and the Talkeetna River have produced the largest coho salmon harvests in this management unit, averaging 5,538 and 6,220 fish, respectively, during 1992 through 1996 and accounting for 47% of the Eastside Susitna harvest (Appendix A14).

In the West Cook Inlet Management Unit the Chuitna River is the primary producer of coho salmon. The average harvest in this stream between 1992 and 1996 was estimated at 1,223 fish which accounts for approximately 47% of the harvest within this management unit (Appendix A18).

Table 40.-Eastside and westside Susitna River drainage coho salmon escapement index counts, 1981-1998.

	Westside Susitna River Drainage				Eastside Susitna River Drainage[a]					
Year	Yentna River[c]	Deshka River[g]	Rabideux Creek	Total	Birch Creek	Question Creek	Answer Creek	Total	Susitna River[b]	Grand Total
1981	17,017		[d]	17,017	[d]	[d]	[d]		37,000	54,017
1982	34,089		[d]	34,089	[d]	[d]	[d]		80,000	114,089
1983	8,867		[d]	8,867	[d]	[d]	[d]		24,000	32,867
1984	16,007		480	16,487	236	60	57	353	[d]	16,840
1985	9,181		82	9,263	30	89	9	128	[d]	9,391
1986	23,457		[d]	23,457	25	[d]	[d]	25	[d]	23,482
1987	6,279		50 [e]	6,329	46	149	10	205	[d]	6,534
1988	12,173		230	12,403	63	337	160	560	[d]	12,963
1989	25,695		20	25,715	180	31	66	277	[d]	25,992
1990	21,346		20	21,366	36	41	6	83	[d]	21,449
1991	57,275		185	57,460	300	492	51	843	[d]	58,303
1992	29,073		[d]	29,073	167	227	181	575	[d]	29,648
1993	37,752		[d]	37,752	178	370	34	582	[d]	38,334
1994	25,173		105	25,278	224	339	0 [f]	563	[d]	25,841
1995	74,346	12,824	39	87,209	127	155	35	317	[d]	87,526
1996	34,464		[d]	34,464	458	238	43	739	[d]	35,203
1997	13,681	8,063	114	21,858	217	186	57	460	[d]	22,318
1998	24,408	6,773	56	31,237	356	519	45	920	[d]	32,157

[a] Survey conducted by walking portions of the creek.

[b] Sonar counts upstream of River Mile 80.

[c] Sonar counts, dates of assessment vary; estimates for 1981-1984 encompass the entire coho salmon migration.

[d] No survey conducted.

[e] Poor survey conditions.

[f] Beaver dam downstream of index area blocking passage of fish.

[g] Weir count. 1995 RM 17, 1997-1998 RM 7: 1998 weir was underwater for an extended time during coho season resulting in an incomplete count.

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.

Flowing waters of 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 used.

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 driftnet fisheries which occur in the Central District during July and early August (Appendix B3).

Recent Fishery Performance

The 1997 recreational coho salmon harvest from the Eastside Susitna, Westside Susitna and West Cook Inlet units was estimated at 11,243, 7,148 and 2,115 fish, respectively (Table 31). The 1997 harvest was less than 50% of the 1992-1995 mean for the Susitna River units. As the 1997 season progressed it became apparent that adequate numbers of coho salmon were not returning to Cook Inlet streams. An emergency order was issued prohibiting the use of bait and reducing the bag and possession limit to one coho salmon for area streams beginning August 9.

Based on reports from anglers and guides and weir counts the 1998 season resulted in an average return.

Sonar enumeration of coho salmon at River Mile 4 of the Yentna River estimated a return of 24,408 coho salmon to the Yentna River drainage in 1998 (Table 40). However, it is unknown if this is an accurate representation of the coho escapement as there are questions about the migration pattern of coho within the river. The Skwentna Personal Use Fish Wheel fishery operated as a subsistence fishery in 1998. Twenty-eight permits were issued and two fish wheels were operated during the 1998 season. A total of 673 salmon were harvested of which 147 were coho salmon (Table 20).

The Deshka River weir (RM 7) passed 6,773 coho in 1998 (Table 40 and Appendix H1). However, this is not a complete escapement count as there were several days during peak migration when fish could not be counted because of flood conditions.

Recent Board of Fisheries Actions
The Board of Fisheries has taken no specific actions with respect to Susitna River and West Cook Inlet coho salmon sport fisheries during recent years. The next BOF meeting is scheduled for February 1999.

Current Issues
Allocation of coho salmon between commercial and recreational fisheries remains a controversial issue.

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

Returns of coho salmon to Alexander Creek during the 1996 and 1997 seasons were at historic lows based on catch rates and angler comments. Speculation suggests that high northern pike concentrations may have had a negative impact on juvenile coho salmon production.

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; however, this enumeration project is directed primarily toward sockeye salmon. Investigations were conducted during the 1998 season to determine the accuracy of enumerating Yentna River coho salmon by sonar. Findings from this study will be presented by the Commercial Fisheries Division. Commercial Fisheries Division also operates weirs at Chelatna, Judd and Packers lakes that indicate small numbers of coho salmon return to these systems.

Coho salmon were counted through a weir at River Mile 7 on the Deshka River in 1998.

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 40). 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 has been operated annually on the Deshka River since 1995 will be operated in 1999 at RM 7. Sport harvest estimates of coho salmon will be taken from the 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.

An investigation of Alexander Creek in the Westside Susitna Management Unit should be conducted to determine the reason for low coho salmon production in recent years. We recommend that a foot survey of Sucker Creek be conducted in 1999 to determine the feasibility of this enumeration technique.

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 Division (CFD), could be used to accurately 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.

SOCKEYE SALMON FISHERIES

Background and Historical Perspective

Recreational harvests of sockeye salmon in the NCIMA ranged from 3,140 to 21,423 fish during 1977-1996 and averaged 11,284 fish (Mills 1979-1994; Howe et al. 1995-1997) (Table 7). Within the NCIMA, the Knik Management Unit accounts for the largest harvest of sockeye salmon. The Eastside Susitna Management Unit is second followed by the Westside Susitna Management Unit. The West Cook Inlet Management Unit, with fewer accessible streams, is a distant fourth in average harvest. Knik Management Unit harvests have been dominated by the Little Susitna River, while Eastside Susitna River Unit harvests have been dominated by the Talkeetna River. Westside Susitna River and WCI units harvests have been spread across several systems (Appendices A21-A28).

In 1978, the State of Alaska passed its first subsistence statute (5 AAC 16.05.258) which gave priority to subsistence uses of fish and game resources over other uses. Sockeye salmon is the predominant harvest in these fisheries. Brannian and Fox (1996) provide a detailed history of subsistence and personal use salmon fishing in Upper Cook Inlet. Currently, the only areas open to subsistence fishing in Upper Cook Inlet are the Tyonek Subdistrict on the west side of Cook Inlet in the Northern District and a fish wheel fishery in the Yentna River near the community of Skwentna. Additionally, there is a personal use dip net fishery in Fish Creek.

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 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 21). 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 (Table 21). The gillnet personal use fishery in marine waters in the Northern District of Upper Cook Inlet was eliminated prior to the 1996 season by BOF action).

Various Knik Arm unit streams have been surveyed for sockeye salmon sporadically throughout past years. Bodenburg Creek, a Knik River tributary, has been surveyed annually since 1968 (except for 1984) (Table 41) and a weir at Jim Creek was operated in 1993 and 1994 resulting in counts of 3,548 and 5,197, respectively (Bartlett *Unpublished* b and c).

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 2,705 fish in 1973 to 307,000 fish in 1940. Since 1968 the escapement of sockeye salmon has ranged from the 1973 low of 2,705 fish to a 1984 high of 192,352 fish (Table 42, Figure 20). Due to declining abundance during the early 1970s, enhancement of Fish Creek sockeye salmon was initiated in 1975. The Big Lake state fish hatchery supported the sockeye salmon enhancement program through 1992 using Fish Creek stock as brood (Table 43). After the Big Lake hatchery closed in 1993 enhancement continued using Fish Creek stock as brood reared at the Eklutna fish hatchery, a private hatchery operated by Cook Inlet Aquaculture Association (CIAA) located on the Knik River in the Eklutna powerplant tailrace. The CIAA discontinued operation of the Eklutna Hatchery in 1998 at which time the program was switched to the Trail Lakes Hatchery, another CIAA facility. Current production goals are 9 million sockeye salmon eggs of Fish Creek brood, from which sockeye salmon fry are released annually into the Big Lake drainage. An additional 1.5 million fry were retained in 1997 for further rearing and release as smolt into the Eklutna tailrace.

Escapement of sockeye salmon to the Susitna River drainage has been documented annually since 1978 at the Yentna River sonar site operated by the Commercial Fisheries Management and Development Division, and by CIAA weirs at Chelatna Lake (Lake Creek drainage) since 1993, and Larson Lake (Talkeetna River drainage) in 1984-1987 and 1997 (Table 42). Within the NCIMA the department also operates a weir at Packers Creek on Kalgin Island.

Table 41.-Bodenburg Creek escapement index surveys, 1968-1998.

Date	Sockeye	Chum	Date	Sockeye	Chum
8/68	350		9/4/86	119	120
9/69	125		9/3/87	77	1
8/25/70	83		8/8/88	86	7
9/5/71	110		8/31/89	190	6
8/31/72	464		9/7/90	195	3
8/27/73	208		8/27/91		1
9/6/74	169		9/6/91	160	
9/3/75	148		8/29/92[a]	54	
9/19/75		3	9/2/92	66	4
9/8/76	111		8/24/93	212	14
8/29/77	178		8/25/94	220	
8/29/78	541		9/6/94		93
8/29/79	321		8/28/95	156	219
8/25/80	483		9/4/96	111	
8/19/81	260		8/28/97	142	4
9/17/82	722		8/21/98	156	13
8/31/83	359				
1984	No count				
9/5/85	232				
			Mean	225	38

[a] Not included in the mean

The Board of Fisheries established the Skwentna Fish Wheel Personal Use fishery in March of 1996. As a result of State of Alaska Supreme Court and Board of Fisheries action it was changed to a subsistence fishery beginning in 1998. 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. Sockeye salmon dominate the harvest.

The villages of Eklutna and Knik were granted educational permits annually, beginning in 1994, to fish set gillnets for salmon at one site near each village. A total of 1,000 salmon by each village is allowed. The fisheries run from May 1 to September 30, with harvests dominated by sockeye salmon. In 1998 a permit was additionally granted to the Village of Tyonek.

Table 42.-Fish Creek weir sockeye and coho salmon, Yentna River sonar, Chelatna Lake weir, Larson Lake weir, Judd Lake weir and Packers Creek weir sockeye salmon counts, 1968-1998.

	Fish Ck Weir			Yentna R Sonar	Chelatna Lk Weir[g]	Larson Lk Weir[f]	Packers Ck Weir	Judd Lk. Weir
Year	Coho[a]	Sockeye[bd]	Dates of Operation	Sockeye	Sockeye	Sockeye	Sockeye	Sockeye
1968	2,088	19,616[c]	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	94,000				
1979	2,511	68,739	9 Jul-29 Aug	157,000				
1980	8,924	62,828	4 Jul-1 Sep	191,000			16,477	
1981	2,330	50,479	9 Jul-7 Sep	340,000			13,024	
1982	5,201	28,164	12 Jul-8 Sep	216,000			15,687	
1983	2,342	118,797	12 Jul-30 Aug	112,000			18,403	
1984	4,510	192,352	1 Jul-19 Sep	194,000		35,254	30,684	
1985	5,089	68,577	8 Jul-29 Aug	228,000		37,874	36,850	
1986	2,166	29,800	14 Jul-26 Aug	92,000		32,322	29,604	
1987	3,871	91,215	8 Jul-27 Aug	66,000		16,753	35,401	
1988	2,162	71,603	7 Jul-9 Sep	52,347			18,607	
1989	3,478	67,224	6 Jul-8 Sep	96,269			22,304	
1990	2,673	48,717	5 Jul-14 Sep	14,0379			31,868	
1991	1,297	50,500	9 Jul-12 Sep	105,000			41,275	
1992	1,705	72,108	10 Jul-10 Sep	66,057			28,361	
1993	2,378	117,619	7 Jul-20 Aug	141,694	20,235		40,869	
1994	350	100,638	8 Jul-15 Aug	128,032	28,303		30,788	
1995	390	115,101	7 Jul-15 Aug	121,479	20,104		29,473	
1996	682	63,164	9 Jul-15 Aug	90,781	28,684		17,767	
1997	2,549	55,035	7 Jul-1 Sep	157,797	84,899	40,112	19,364	
1998	5,552	22,865	7 Jul-27 Sep	119,623	27,284	63,514	17,732	34,416
Mean[e]		53,633		138,546	34,918	37,638	26,028	
Goal	2,700	50,000		100,000-150,000			15,000-25,000	

[a] Measured by weir (1968 excepted). Years 1980-1993 include downstream foot surveys upon removing weir.

[b] Weir count.

[c] A counting screen was used instead of a weir.

[d] Years hatchery sockeye salmon contributed to the escapement were 1979-1981, 1983-1998.

[e] The mean coho salmon escapement is not estimated because in many years of record the weir was removed before the run was complete.

[f] Source of data; Technical Report, Larson Lake Project, Progress Report 1984-1987. Cook Inlet Aquaculture Association. CIAA 1998a.

[g] Source of data; Chelatna Lake Sockeye Salmon Enhancement Progress Report, 1995. Cook Inlet Aquaculture Association. CIAA 1998b.

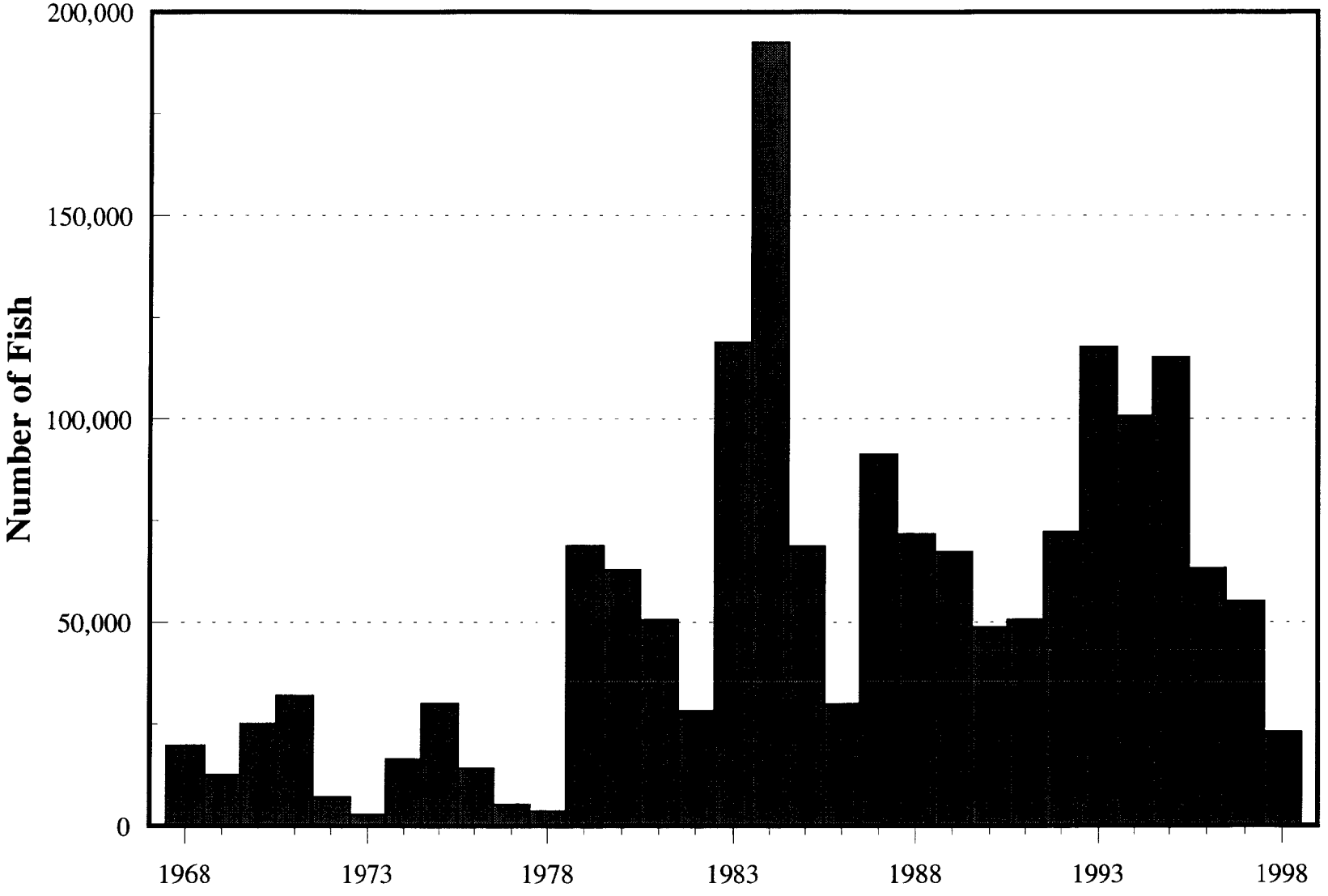

Figure 20.-Fish Creek sockeye salmon escapement, 1968-1998.

Table 43.-Big Lake Hatchery (1975-1992) and Eklutna Hatchery (1993-1996) sockeye salmon fry releases into the Big Lake drainage by brood year, 1975-1997.

Brood Year	Eggs Incubated	Fry Released	Egg/Fry Survival	Number Marked	Release Size-gm	Smolt Released	Release Size-gm
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%[a]	0	0.22		
1993	9,000,000	5,000,000	90%[b]	0	0.43		
1994	7,700,000	5,000,000	81%[b]	0	0.40		
1995	8,000,000	5,000,000	81%[b]	0	0.39	1,390,128	10.4
1996	8,000,000	4,080,000	66%	0	0.40		
1997	8,000,000	5,000,000	76%	0	no data		

[a] Includes 1,534,000 fry transferred to Eklutna hatchery.

[b] Additional fry retained for smolt program.

As more data have become available concerning the northern pike invasion of the Susitna River drainage, their effect on sockeye salmon populations has become evident. A detailed listing of sockeye salmon populations affected in streams and lakes of the NCI is included in the Northern Pike section of this report.

Recent Fishery Performance

The 1997 sport harvest of sockeye salmon in the Knik Management Unit totaled 4,031 fish, 77% of the 1992-1996 mean. The majority of the harvest occurred in the Little Susitna River and Cottonwood Creek (Appendix A21). Harvests from Eastside and Westside Susitna River units totaled 6,742 and 3,662 fish, respectively (Appendices A23 and A25). The 1997 Eastside Susitna Management Unit was approximately double the 1992-1996 mean while the Westside Susitna Unit exceeded its 1992-1996 mean. WCI Unit streams produced a harvest of only 373 fish, approximately equal to their 1992-1996 mean (Appendix A27).

The Fish Creek personal use dip net fishery is restricted to the waters of Fish Creek. The 1997 fishery was limited to the hours of 11:00 a.m. to 11:00 p.m. daily. A permit is required and the season runs July 10-31 with a limit of 25 fish for the head of household plus 10 fish for each additional member of the household. These permits must be returned with the total catch recorded. The closing date is set to limit the number of coho harvested.

As the 1997 season progressed it became evident insufficient numbers of sockeye salmon were returning to Fish Creek to allow a personal use dip net fishery and be assured the 50,000 fish escapement goal would be met. Emergency orders were issued closing the fishery beginning July 23, allowing 55,035 sockeye salmon to passed through the Fish Creek weir (Table 42). An estimated 1,883 sockeye salmon and 336 coho salmon were harvested during the 1997 dip net season (Table 38). 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 (Appendix H2).

The 1998 Fish Creek personal use fishery again had to be closed early by emergency order in hopes of attaining the escapement goal (Appendix D1). However, only 22,865 sockeye salmon were counted through the Fish Creek weir, less than half the desired escapement (Appendix H2). A preliminary harvest estimate of the personal use fishery totals only 3,676 sockeye salmon.

The Yentna River sonar and Packers Creek weir counts both exceeded minimum escapement levels for 1998 (Table 42).

The commercial fishery harvest in the Fish Creek special harvest area was 2,597 sockeye salmon and 548 coho salmon during the 1998 openings (Table 38). 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 1998 totaled 128 sockeye salmon (Table 20).

The Skwentna Personal Use Fish Wheel fishery operated as the Yentna River Subsistence Salmon Fishery in 1998. Twenty-eight permits were issued and two fish wheels were operated during the 1998 season. A total of 673 salmon were harvested of which 473 were sockeye salmon (Table 20).

The Tyonek, Knik and Eklutna villages' educational fisheries 1998 harvest totaled 820 salmon of which 301 were sockeye salmon (Table 44).

Table 44.-Educational fishery permit harvests in NCIMA, 1994-1998.

Permit Holder	Chinook	Coho	Sockeye	Pink	Chum	Total	Dates of Operation
Knik Tribal Council							
1994						29	
1995	5	1	21	0	1	55	
1996	5	45	163	3	62	278	6/17-7/20
1997	19	34	153	0	15	221	5/29-8/10
1998	31	153	186	0	85	455	5/14-8/15
Eklutna Village							
1994		7				172	
1995	14	37	55	6	42	155	
1996[a]							
1997	7	14	39	16	7	83	5/1-9/30
1998	32	116	104	6	51	309	5/1-9/30
Tyonek Village							
1998	0	41	11	3	1	56	8/12-8/14

[a] No data available

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 specific management objectives for the Tyonek subsistence fishery or the Skwentna fish wheel fishery. However, all fisheries are managed to provide sustained yield.

Recent Board of Fisheries Actions

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 fish for each additional 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, Wednesday and Friday;
3. Only with a fish wheel as follows: (a) each fish wheel must be equipped with a livebox; the livebox 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.

Prior to the 1998 season State Supreme Court and BOF action replaced the Skwentna River Personal Use Fishery with the Upper Yentna River Subsistence Salmon Fishery.

The next BOF meeting addressing Cook Inlet finfish is scheduled to occur in February 1999.

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. Posting of private property could effectively curtail the personal use fishery as it now exists, and require managers to restructure public participation in the fishery. There also is conflict between dip net fishermen operating from shore and dip net fishermen operating from boats.

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 comment by the public and local land owners. The department presently provides toilets and a dumpster to alleviate the litter problem.

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

Currently the recreational fishery for sockeye salmon is incidental to the harvest of other salmon. However, directed sockeye salmon fisheries occur at Larson Creek in the Talkeetna River drainage, Nancy Lake Creek in the Little Susitna River drainage, Lake Creek, and the Talachulitna River.

Ongoing Research and Management Activities

Fish Creek escapement is monitored by a weir located approximately 3 miles from the outlet of Fish Creek into Knik Arm. The Fish Creek personal use 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 a CIAA hatchery. Susitna River escapement is monitored at a sonar site on the Yentna River operated by the Commercial Fisheries Management and Development Division. Additionally, weirs are operated at Chelatna and Larson lakes by CIAA and Packers Creek and Judd Lake by the Commercial Fisheries Division.

Harvest information for the Skwentna and Tyonek Subsistence fisheries is gained from harvest totals on returned permits 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 among fishery participants about 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 Subsistence Fishery area.

Expansion of existing sockeye salmon escapement monitoring programs is recommended. Specifically, continued refinement and evaluation of the Yentna River sonar and evaluation of the distribution of spawning sockeye salmon upstream of the sonar site.

STOCKED LAKE FISHERIES

Background and Historical Perspective

Currently 76 lakes in the NCIMA are stocked on an annual, biennial, or triennial basis, including one research lake that is closed to fishing (Appendix C1). The 76 stocked lakes range in size from 2 to 362 surface acres.

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 Fort 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

the 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, snowmachining 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 choice. Rainbow trout comprised 58% of all fish stocked in landlocked lakes within the NCIMA during the period 1993 through 1997. Annual releases of all species during 1996-1998 ranged from 489,532 to 747,727 (Appendix C1).

The majority of rainbow trout released into NCIMA waters during the period 1996-1998 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 (Havens et al. 1995).

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 12% 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 or as subcatchables weighing 40-70 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 coho salmon and rainbow trout for stocking lakes that have open or intermittent linkage with drainages that support wild fish and evaluation

of female diploid rainbow trout to eliminate high mortality associated with spawning males (Bentz et al. 1991).

Recent Fishery Performance

In 1998, 64 lakes were stocked with 530,964 game fish (Appendix C1). The majority of these lakes are located in the Knik Arm Management Unit and the remainder in the Eastside Susitna Management Unit. Releases in 1998 included 393,819 rainbow trout, 97,776 coho salmon, 5,011 Arctic char, 3,488 Arctic grayling, 3,092 lake trout and 27,573 chinook salmon. Twenty one lakes were stocked with more than one species of fish in 1998. Stocking locations, species, numbers of fish and fish size are listed in Table 45

The SWHS (Howe et al. 1998) estimated that 34,181 angler-days of participation resulted from the area's landlocked stocking program in 1997 (Table 46). Fishing effort at lakes having both stocked and indigenous game fish is not included in estimates of participation associated with lake stocking. The 1997 catch from stocked landlocked lakes included an estimated 36,721 rainbow trout of which 33% were harvested, 19,942 landlocked salmon (47% were harvested), and 3,349 Arctic grayling (26% were harvested). Rainbow trout from stocked lakes represented 33% of all rainbow trout caught and 53% of the entire harvest of this species from the NCIMA during 1997 (Table 46).

The Kepler Lake Complex, consisting of nine stocked lakes, supported 10,908 angler-days of effort and Finger Lake supported 9,629 angler-days of effort in 1997 (Table 46). Collectively, these two sites yielded 56% of the effort associated with stocked landlocked lakes within the NCIMA (Howe et al. 1998).

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

BOF action taken in 1998 specific to stocked lakes allows the use of bait in Willow and Crystal Lakes with a bag and possession limit of five per day and five in possession including only one over 20 inches in length. The seasonal limit of two rainbow trout greater than 20 inches applies to these waters.

Current Issues

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. Angler-days of participation at area stocked lakes during 1989 through 1992 are approximately equal to 1997 (Havens et al. 1995).

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

Table 45.-Northern Cook Inlet Management Area lake stocking summary for nonanadromous fish, 1998.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROODSTOCK[a] (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING[b] METHOD
Rainbow Trout				Swanson R. Mixed			
Barley	19	08/12/98	1,785	98 Swanson R	Ft. Richardson	1.50g	T/BU
Bearpaw	45	08/10/98	2,151	98 Swanson R	Ft. Richardson	1.50g	T/BU
Beverly	42	08/21/98	4,003	98 Swanson R(TAF)	Ft. Richardson	1.95g	T/BU
Bruce	27	06/09/98	500	97 Swanson R	Elmendorf	57.4g	T/BU
Carpenter	176	08/12/98	15,876	98 Swanson R	Ft. Richardson	1.50g	T
Christiansen	179	08/10/98	8,466	98 Swanson R	Ft. Richardson	1.50g	T
Coyote	2	06/09/98	500	97 Swanson R(TAF)	Elmendorf	53.70g	T
Crystal	132	08/21/98	12,500	98 Swanson R(TAF)	Ft. Richardson	1.80g	T
Dawn	12	08/21/98	2,297	98 Swanson R(TAF)	Ft. Richardson	1.95g	T/BU
Diamond	139	08/12/98	13,205	98 Swanson R	Ft. Richardson	1.50g	T
Echo	23	06/09/98	2,225	97 Swanson R	Elmendorf	57.40g	T
		07/01/98	700	97 Swanson R	Ft. Richardson	54.60g	T
Farmer	21	08/12/98	1,047	98 Swanson R	Ft. Richardson	1.50g	T/BU
Finger	362	08/10/98	34,254	98 Swanson R	Ft. Richardson	1.50g	T
Florence	55	08/10/98	5,187	98 Swanson R	Ft. Richardson	1.49g	T/BU
Homestead	17	08/12/98	1,677	98 Swanson R(TAF)	Ft. Richardson	1.30g	T/BU
Honeybee	58	08/10/98	5,510	98 Swanson R	Ft. Richardson	1.50g	T/BU
Ida	46	08/11/98	4,408	98 Swanson R	Ft. Richardson	1.50g	T/BU
Irene	18	06/09/98	1,800	97 Swanson R	Elmendorf	57.40g	T/BU
Kalmbach	125	08/10/98	11,875	98 Swanson R	Ft. Richardson	1.50g	T
Kashwitna	160	08/13/98	14,675	98 Swanson R(TAF)	Ft. Richardson	1.20g	T
Kepler-Bradley	58	05/21/98	3,000	97 Swanson R	Elmendorf	56.90g	T
		07/01/98	1,425	97 Swanson R	Elmendorf	54.60g	T
		08/11/98	5,510	98 Swanson R	Ft. Richardson	1.50g	T
Knik	50	06/10/98	2,539	97 Swanson R	Elmendorf	55.10g	T
Knob	52	06/09/98	1,000	97 Swanson R(TAF)	Elmendorf	53.70g	T
Lalen	92	08/04/98	8,694	98 Swanson R(TAF)	Ft. Richardson	1.04g	T
Little Beaver	44	08/21/98	4,300	98 Swanson R(TAF)	Ft. Richardson	1.95g	T
Little Lonely	56	08/10/98	5,320	98 Swanson R	Ft. Richardson	1.50g	
Loberg	11	05/14/98	980	97 Swanson R	Elmendorf	54.60g	T
Long [K/B]	74	08/11/98	7068	98 Swanson R	Ft. Richardson	1.50g	T
Long (Mi. 86)	106	05/21/98	3,000	97 Swanson R	Elmendorf	56.90g	T
Lorraine	132	08/12/98	13,882	98 Swanson R	Ft. Richardson	1.50g	T/BU
Lucille	362	07/01/98	5,143	97 Swanson R(TAF)	Ft. Richardson	54.60g	T
Lynne	70	08/10/98	6,749	98 Swanson R	Ft. Richardson	1.50g	T
Marion	113	08/12/98	9,392	98 Swanson R	Ft. Richardson	1.50g	T/BU
Matanuska	62	05/12/98	3,903	97 Swanson R	Elmendorf	53.10g	T
		07/01/98	3,264	97 Swanson R	Ft. Richardson	54.60g	T
Meirs	17	05/14/98	490	97 Swanson R	Elmendorf	54.60g	T/BU
Memory	84	08/10/98	3,942	98 Swanson R	Ft. Richardson	1.50g	T
Morvro	87	08/21/98	4,300	98 Swanson R(TAF)	Ft. Richardson	1.95g	T/BU
North Friend	81	08/13/98	7,733	98 Swanson R(TAF)	Ft. Richardson	1.20g	T
North Knob	36	06/09/98	926	97 Swanson R(TAF)	Elmendorf	53.70g	
Prator	98	08/10/98	4,180	98 Swanson R	Ft. Richardson	1.50g	T
Ravine	12	08/11/98	2,375	98 Swanson R	Ft. Richardson	1.50g	T/BU

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Table 45.-Page 2 of 3.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROODSTOCK[b] (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING[c] METHOD
Rainbow Trout (cont)							
Reed	20	08/10/98	1,813	98 Swanson R	Ft. Richardson	1.50g	T/BU
Rocky	59	05/14/98	1,986	97 Swanson R	Elmendorf	54.60g	T
Seventeenmile	100	08/11/98	9,500	98 Swanson R	Ft. Richardson	1.50g	T
Seymour	229	08/04/98	20,670	98 Swanson R(TAF)	Ft. Richardson	1.04g	T
Slipper (Eska)	9	06/09/98	952	97 Swanson R(TAF)	Elmendorf	53.70g	T
South Friend	56	08/13/98	5,290	98 Swanson R(TAF)	Ft. Richardson	1.20g	T/BU
South Rolly	108	07/01/98	2,967	97 Swanson R(TAF)	Ft. Richardson	54.60g	T
Tanaina	109	07/01/98	1,265	97 Swanson R(TAF)	Ft. Richardson	54.60g	T/BU
Threemile	119	09/09/98	6,013	97 Swanson R(TAF)	Ft. Richardson	2.23g	T/BU
Tigger	19	08/13/98	1,800	98 Swanson R	Ft. Richardson	1.20g	T/BU
Twin Island	151	08/12/98	15,101	98 Swanson R	Ft. Richardson	1.27g	T/BU
Vera	111	08/21/98	10,500	98 Swanson R(TAF)	Ft. Richardson	1.80g	T/BU
Visnaw	131	08/04/98	11,772	98 Swanson R(TAF)	Ft. Richardson	1.04g	T
Walby	54	06/09/98	4,515	97 Swanson R(TAF)	Elmendorf	53.70g	T
		08/19/98	5,011	98 Swanson R(TAF)	Ft. Richardson	1.20g	T
Weiner	21	06/09/98	3,062	97 Swanson R(TAF)	Elmendorf	53.70g	T
West Sunshine	22	08/13/98	4,237	98 Swanson R(TAF)	Ft. Richardson	1.20g	T/BU
Willow	143	08/21/98	12,900	98 Swanson R(TAF)	Ft. Richardson	1.80g	T
Wolf	62	08/19/98	12,013	98 Swanson R(TAF)	Ft. Richardson	1.95g	T/BU
"X"	101	08/13/98	4,925	98 Swanson R	Ft. Richardson	1.20g	T/BU
"Y"	40	08/13/98	3,771	98 Swanson R	Ft. Richardson	1.20g	T/BU
Total 61 Lakes	5019		393,819				

	Diploid	Triploid	Total
Catchables	25,812	20,330	46,142
Fingerling	199,092	148,585	347,677
Total:	224,904	168,915	393,819

Coho Salmon (non-anadromous)				Bear Lake Diploid			
Barley	19	09/16/98	1,875	97 Bear Lake	Elmendorf	2.40g	T/BU
Bear Paw	45	09/17/98	4,614	97 Bear Lake	Ft. Richardson	6.00g	T/BU
Carpenter	176	10/05/98	17,035	97 Bear Lake	Ft. Richardson	6.90g	T
Christiansen	179	09/16/98	17,900	97 Bear Lake	Ft. Richardson	6.20g	T
Diamond	139	10/05/98	13,968	97 Bear Lake	Ft. Richardson	6.90g	T/BU
Echo	23	09/16/98	2,348	97 Bear Lake	Elmendorf	2.40g	T
Kalmbach	125	09/11/98	12,500	97 Bear Lake	Elmendorf	2.60g	T
Knik	50	09/16/98	5,357	97 Bear Lake	Elmendorf	2.40g	T
Loberg	11	09/16/98	1,119	97 Bear Lake	Elmendorf	2.40g	T
Memory	83	09/11/98	8,300	97 Bear Lake	Elmendorf	2.60g	T
Prator	98	09/11/98	10,115	97 Bear Lake	Elmendorf	2.60g	T
Victor	14	09/16/98	2,713	97 Bear Lake	Elmendorf	2.40g	T/BU
Total 12 Lakes	962		97,776				

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Table 45.-Page 3 of 3.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROODSTOCK[a] (TREATMENT)	HATCHERY	STOCKING SIZE	STOCKING[b] METHOD
Arctic Char							
Benka	123	5/11/98	752	1997 hatchery brood	Ft. Richardson	13.52g	T
Finger	362	5/22/98	1,144	1997 hatchery brood	Ft. Richardson	10.52g	T
Irene	18	4/29/98	750	1997 hatchery brood	Ft. Richardson	13.00g	T/BU
Lynne	70	5/20/98	513	1997 hatchery brood	Ft. Richardson	9.50g	T
Marion	113	6/24/98	510	1997 hatchery brood	Ft. Richardson	13.00g	T
Matanuska	62	5/22/98	1,047	1997 hatchery brood	Ft. Richardson	10.52g	T
Seventeenmile	100	4/28/98	500	1997 hatchery brood	Ft. Richardson	13.04g	T
Total 7 Lakes	848		5,011				
Chinook Salmon							
Finger	362	11/18/98	11,708	1997 Willow Ck.	Ft. Richardson	74.00g	T
		11/19/98	9,137	1997 Willow Ck.	Ft. Richardson	95.00g	T
		11/20/98	1,915	1997 Willow Ck.	Ft. Richardson	72.00g	T
		11/20/98	4,813	1997 Willow Ck.	Ft. Richardson	60.50g	T
Total	362		27,573				
Arctic Grayling							
Bruce	27	08/04/98	475	1997 Moose Lk.	Ft. Richardson	3.64g	T/BU
Canoe	21	10/06/98	783	1997 Moose Lk.	Ft. Richardson	5.95g	T/BU
Finger	362	08/19/98	700	1997 Moose Lk.	Ft. Richardson	7.00g	T
Kepler/Bradley	58	08/14/98	750	1997 Moose Lk.	Ft. Richardson	3.80g	T
Meirs	17	10/06/98	430	1997 Moose Lk.	Ft. Richardson	5.95g	T/BU
Reed	20	08/19/98	350	1997 Moose Lk.	Ft. Richardson	7.00g	T/BU
Total 6 Lakes	505		3,488				
Lake Trout							
Long (Mi. 86)	106	07/29/98	3,092	1997 hatch. brood	Ft. Richardson	11.00g	T
Total All 65 Lakes	5,177		530,964				

[a] Treatment: AF = diploid all-female; TAF = triploid all-female.

[b] Stocking Method: T = tank truck; T/BU = carried in buckets to lake

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 1998 continued the evaluation of current stocked lakes for abundance and size and age composition of stocked fish, plus the evaluation of new lakes for possible stocking. Data collected from sampling are used to evaluate stocking plans and update the Matanuska-Susitna Valley Lakes fishing forecast. Four lakes in the Willow Creek Drainage–Crystal, Long, Shirley and Willow–were sampled in 1998 for Willow Creek tagged rainbow trout. Bathymetric maps were completed on Echo Lake and Cranberry Lake and were added to the 1998 stocking plan, along with Twelvemile Lake.

Table 46.-Statewide Harvest Survey estimated harvest and catch for NCIMA stocked lakes, 1997.

			Landlocked Salmon			Arctic Char			Rainbow Trout			Arctic Grayling			Northern Pike					
Lake	Angler-days	% of Total Effort	Catch	Harvest	% Harvest	Catch	Harvest	% Harvest	Catch	Harvest	% Harvest	Catch	Harvest	% Harvest	Catch	Harvest	% Harvest	Total Catch	Total Harvest	% Harvest
Barley	141	0.4							70	50	71							70	50	71
Benka	1,410	4.1	201	201	100													201	201	100
Bench	111	0.3							141	106	75							141	106	75
Beverly	517	1.5							442	141	32							442	141	32
Big No Luck	264	0.8							172	51	30							172	51	30
Bradley	723	2.1							1,326	757	57	47	0	0				1,326	757	57
Canoe	752	2.2										1,282	148	12				1,282	148	12
Carpenter	533	1.6	183	143	78				2,231	271	12							2,414	414	17
Christiansen	486	1.4	489	61	12				985	211	21							1,474	272	18
Coyote	16	0.0							20	0	0							20	0	0
Crystal	297	0.9							211	50	24							211	50	24
Diamond	439	1.3							221	100	45							221	100	45
Echo	721	2.1	1,243	978	79				687	526	77							1,930	1,504	78
Eska (Slipper)	417	1.2							443	282	64							443	282	64
Farmer	96	0.3							147	13	9							147	13	9
Finger	9,629	28.2	13,989	6,481	46	297	46	15	7,144	2,813	39	645	221	34	315	52	17	22,390	9,613	43
Florence	266	0.8							362	121	33	20	0	0				382	121	32
Homestead	78	0.2							151	40	26							151	40	26
Honeybee	31	0.1							40	40	100							40	40	100
Ida	403	1.2							333	166	50							333	166	50
Irene	326	1.0				11	11	100	486	255	52							497	266	54
Kalmbach	455	1.3	662	265	40				1,259	603	48							1,921	868	45
Kashwitna	47	0.1																0	0	
Kepler	2,543	7.4							3,102	1,520	49	554	218	39				3,656	1,738	48
Knik	423	1.2	82	41	50				512	161	31	20	10	50				614	212	35
Lalen	313	0.9							201	0	0							201	0	0
Loberg	110	0.3							1,206	141	12							1,206	141	12
Long (K/B)	964	2.8							2,905	0	0							2,905	0	0
Long (Mile 86) a	1,500	4.4				18	18	100	1,022	322	32	526	222	42				1,566	562	36
Loon	94	0.3																0	0	
Lucille	1,041	3.0							502	271	54							502	271	54
Marion	141	0.4				80	57	71	181	80	44							261	137	52
Matanuska	2,038	6.0	715	323	45				2,106	895	42	171	0	0				2,991	1,218	41
Memory	1,305	3.8	1,893	746	39				814	342	42				63	42	67	2,770	1,130	41
Prator	379	1.1	122	41	34				256	51	20							378	92	24
Ravine	768	2.2							1,025	472	46							1,025	472	46
Rocky	111	0.3							268	40	15							268	40	15
Ruby	486	1.4							1,560	211	14							1,560	211	14
Seventeenmile	282	0.8							261	50	19							261	50	19
Seymour	564	1.7							402	100	25							402	100	25
South Rolly	752	2.2							311	151	49							311	151	49
Tigger	806	2.4							962	0	0							962	0	0
Twin Island	125	0.4							80	50	63							80	50	63
Vera	110	0.3							141	20	14							141	20	14
Victor	91	0.3	363	7	2													363	7	2
Walby	481	1.4							442	372	84							442	372	84
Weiner	283	0.8							967	224	23	84	37	44				967	224	23
Wishbone	172	0.5							512	0	0							512	0	0
Wolf	141	0.4							112	82	73							112	82	73
TOTAL	34,181	100.0	19,942	9,287	47	147	59	40	36,721	12,151	33%	3,349	856	26%	32	10	31%	60,664	22,483	37%

[a] Lake trout were also stocked in Long Lake in 1996. Nine lake trout were caught and harvested in 1997.

Stocked lake Fish Transport Permits (FTP) have been 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 low water levels, reported fish kills, public access, northern pike infestation and shoreline erosion.

Recommended Research and Management Activities

Current levels of stocking within the NCIMA should not increase significantly during the next several years. With increased development in the Matanuska Susitna Valley, additional barren landlocked lakes should be stocked as legal access becomes available. 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. 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.

Updating stocking history and harvest numbers is an ongoing process. Additionally, public handouts need to be constructed for more lakes that have public access and support recreational fishing opportunities. This work is ongoing.

Recommended Fisheries Access Improvements

To provide better angler access and increase fishing opportunities, access improvements should be made on an annual basis (Table 23 and Table 47). 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 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. Further hardening of the trail and parking area with more gravel and providing signage are ongoing projects.
3. Honeybee and Lynne lakes access road easement was applied for and surveyed. Some realignment will be necessary for approval and recording. Negotiations to purchase portions of the easement from private property owners is ongoing.
4. Christensen Lake boat launch facility enhancement is a cooperative effort with the Mat-Su Borough.
5. Caswell Creek access facility currently consist of a rutted and steep foot trail linking the parking area to the fishery. Plans to incorporate a timbered stairway to enhance access are underway.

Table 47.-Northern Cook Inlet Management Area stocked lakes access summary, 1998.

LAKE	ACCESS ROUTE	EASEMENT[a] CLASSIFICATION	PARKING AREA	TRAIL CONDITION	% PUBLIC SHORELINE	COMMENTS
Barley	needs sign	PUE	5 vehicle gravel	cleared section line	1%	100 yd. walk in
Bearpaw	good	PUA	5 vehicle gravel	Gravel road to lake	50%	designated public park in plat maps
Benka	good	PUA	2 vehicle gravel	access rd. ends at lake	0.5%	not legal; no camping
Beverly	good	S/L (33')	5 vehicle gravel	swampy, ATV or foot access	15%	needs sign at "Y" in trail; State land
Big	good	SRA	20 vehicle gravel	concrete boat launches	2%	2 State Rec. Sites; camping
Big No Luck	canoe trail	SRA	15 vehicle gravel	canoe trail: 1.5 miles	100%	Nancy Lake SRA; camping
Bruce	good	PUE (60')	5 vehicle gravel	cleared easement	1%	shoreline muskeg; improve parking
Canoe	good	SRA	6 vehicle gravel	packed gravel	21%	dock, picnic tables, outhouse; K/B Rec.
Carpenter	last mile is 4WD	PUE (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	PUA	2 vehicle gravel	good	100%	borough blocked rd. access to park
Crystal	needs sign	PUE (60')	10 vehicle gravel	access rd. ends at lake	0.4%	vehicle access blocked; no camping
Dawn	good	PUA	8 vehicle gravel	needs boardwalk	5%	designated public park: Tract C
Diamond	good	S/L (50')	6 vehicle gravel	foot trail	36%	100 yd. walk in
Echo	good	Rd. ROW	4 vehicle paved pull-out	signed, gravel	15%	shoreline trees, brush; pvt campground
Farmer	good	S/L	5 vehicle gravel	needs better signing	1%	shoreline muskeg; improve parking
Finger	good	SRA	30 vehicle gravel	access rd. ends at lake	5%	State Rec. Site, camping
Florence	good	S/L (66')	limited to road ROW	good	0.8%	improve parking; no camping
Homestead	need signs	ROW Ease. (50')	limited to access rd.	access rd. ends at lake	1%	shoreline swampy; no camping
Honeybee	need signs	PUA	limited to access rd.	needs work, swampy	6%	access road is not public; adj. State land
Ida	need signs	PUE (20')	4 vehicle gravel	steep, gravel	0.1%	no camping
Irene	good	SRA	4 vehicle gravel	gravel	15%	K/B Rec. Area
Kalmbach	good	S/L	5 vehicle gravel	swampy, ATV or foot access	20%	need sign at "Y" in trail; adj. State land
Kashwitna	good	Rd. ROW	30 vehicle paved	access is by lake	10%	shoreline muskeg along ROW
Kepler/Bradley	good	SRA	30 vehicle gravel	marked, gravel	89.5%	private camping
Klaire	good	SRA	30 vehicle gravel	.4 mile; needs sign	100%	brushy shoreline; K/B Rec. Area
Knik	good	PUA	2 vehicle gravel	access rd. ends at lake	0.6%	no camping

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Table 47.-Page 2 of 3.

LAKE	ACCESS ROUTE	EASEMENT[a] CLASSIFICATION	PARKING AREA	TRAIL CONDITION	% PUBLIC SHORELINE	COMMENTS
Lalen	good	PUE (20')	2 vehicle gravel	access rd. ends at lake	0.2%	gravel boat launch; no camping
Long (Mile 86)	good	SRA	15 vehicle gravel	access rd. ends at lake	90%	State Rec. Site; camping
Long (K/B)	good	SRA	7 vehicle gravel	packed dirt, steep	100%	hook & release only; K/B Rec. Area
Little Lonely	need signs	S/L	limited to road ROW	short, dirt road	0.5%	access rd. can be 4WD; no camping
Lorraine	need signs	MSB property	6 vehicle gravel	muddy, rutted by 4WD	95%	surrounded by borough land
Loon	good	S/L (50')	5 vehicle gravel	access rd. ends at lake	0.4%	no camping
Lucille	good	PUE	3 vehicle gravel	access rd. ends at lake	4%	2 access sites; camping at Lucille Park
Lynne	need signs	PUA	2 vehicle dirt	access rd. ends at lake	2%	access rd. is not public; 2% is State land
Marion	good	PUA	4 vehicle gravel	steep dirt, some erosion	12%	adj. to MSB land
Matanuska	good	SRA	30 vehicle gravel	short gravel	35%	docks, picnicking, outhouse; K/B Rec. Area
Meirs	good	PUE	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. ROW	10 vehicle, paved pullouts	pullouts beside lake	40%	lakeshore muskeg
Morvro	need signs	S/L (33')	limited to rd. R/W	swampy, foot trail	0.3%	needs work with trail & parking
North Friend (Montana)	good	Rd. ROW	10 vehicle gravel cross Parks	short trail to outlet	0.5%	access Parks ROW
Prator	good	PUA	4 vehicle gravel	access rd. ends at lake	2%	Castle Public Park; no camping
Ravine	needs sign	PUA	4 vehicle gravel	steep, worn	50%	adj. State land
Reed	good	PUE (10')	limited to rd. R/W	ends in drop-off	0.2%	improve parking; no camping
Rocky	good	SRA	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	PUA	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. ROW	20 vehicle gravel	access rd. ends at lake	75%	last 1/4 mile rough
South Friend (Montana)	good	Rd. ROW	10 vehicle gravel	short, dirt	10%	shoreline swampy along ROW
South Rolly	good	SRA	20 vehicle gravel	access rd. ends at lake	100%	State Rec. Site; camping
Tigger	needs sign	PUE	5 vehicle gravel	foot trail, needs sign	100%	new access being acquired from MSB

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Table 47.-Page 3 of 3.

LAKE	ACCESS ROUTE	EASEMENT[a] CLASSIFICATION	PARKING AREA	TRAIL CONDITION	% PUBLIC SHORELINE	COMMENTS
Vera	good	S/L (50')	6 vehicle dirt	soft tundra	0.3%	no camping
Twin Island	needs signs	State prop.	4 vehicle gravel	swampy	0.6%	MSB prop conflict/ mental health land
Victor	good	SRA	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	PUA	6 vehicle gravel	access rd. ends at lake	1%	no camping
Wiener	good	Rd. ROW	(2) 4 vehicle pullouts	pullouts beside lake	25%	access along Glenn Hwy.
West Sunshine	good	PUE (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	SRA	10 vehicle gravel	short dirt	33%	SRA.; camping
"X"	good	State prop.	2 vehicle dirt	need boat	100%	hook & release only; State land
"Y"	good	Rd. ROW	2 vehicle dirt	short, steep	100%	brushy, State land

[a] ROW = right of way
S/L = section line easement (feet wide)
PUA = dedicated (or reserved) public use area (parcel platted for public recreation)
PUE = dedicated public use easement (feet wide)
SRA = state recreation area (parcel managed by State Parks)
MSB = Matanuska-Susitna Borough

6. Twin Island Lake access can only be (legally) achieved over swampy state owned land. All the higher ground between Pt. Mackenzie Road and the lake is privately owned. The Mat-Su Borough, owner of one of these lots, is being solicited for the sale of an easement crossing its property.
7. Little Susitna Public Use Facility incorporates a system of trails providing access to bank anglers. In an effort to reach prime fishing water, anglers have pushed beyond the structured trail system causing upland and stream bank erosion. Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation has provided a plan to harden or elevate these trails. This project will provide handicapped access to prime fishing holes while protecting the environment.
8. Little Susitna River, within the Susitna Flats State Game Refuge, receives a high volume of camping activity during the summer which has thus far gone unchecked and resulted in upland and stream bank degradation. An effort is underway to repair these damaged sites through revegetation and to protect them from further damage by hardening existing camp areas and providing sanitation facilities.

9. Susitna Landing Boat Launch provides limited handicapped access to a major river drainage. Constructing amenities that conform with ADA standards will provide equal access to this vast watershed. Plans to construct a handicapped access dock and trail system along with stream bank stabilization and permanent boat tie-ups are underway.

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 funds 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 being considered for this 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 (SRA) 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. Design and construction of a fishing dock was completed during the summer of 1996 as a joint effort between Alaska Department of Natural Resources Division of Parks and Outdoor Recreation (ADNR, DPOR), ADF&G, and the Bonnie Lake Property Association. Modifications and repairs were completed to the boat ramp in July 1997. Continued site maintenance will be provided by ADNR, DPOR. The ADF&G will provide pumping of vaulted toilets and finance ADNR, DPOR for facility maintenance.

4. Big Lake South boat launch and parking facility receives a tremendous amount of recreational boating activity throughout the summer. The substantial increase in the 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 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 $250,000.

5. Willow Creek SRA is a non-boating facility where use levels are expected to exceed capacity. ADNR, DPOR has developed a draft plan to expand an underdeveloped day-use parking area and enhance an interconnected trail system. This action will effectively accommodate overflow parking and expand the bank fishing area while controlling habitat degradation.

RAINBOW TROUT FISHERIES

Background and Historical Perspective

NCIMA rainbow trout harvests have ranged from 20,000 to 75,000 fish and averaged 44,054 fish during the years 1977 through 1996 (Mills 1979-1994, Howe et al. 1995-1997) (Table 48). This harvest accounts for 38% and 28% of the average harvest within Region II and the state, respectively. Rainbow trout harvested from the Knik Arm Management Unit during this time period accounted for 68% of the total NCIMA harvest. A large percentage of this is a result of the stocked lake program. The Westside Susitna and the Eastside Susitna Management units have accounted for 15% and 14% of the NCIMA harvest, respectively, with the West Cook Inlet Management Unit accounting for the remainder. Since 1990 the SWHS has estimated the catch of rainbow trout. From 1992-1996 the average catch in the NCIMA was 118,826 (Mills 1991-1994, Howe et al. 1995-1997) (Table 48). The Knik Management Unit dominates the catch (59%).

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 used the policy from 1986-1996 to implement regulations for rainbow trout within the NCIMA (Engel and Vincent-Lang 1992). In November 1996 the BOF adopted the Criteria for Establishing Special Management for Trout to replace the Cook Inlet and Copper River Rainbow/Steelhead Trout Management Policy for use in instituting regulations.

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

Table 48.-Northern Cook Inlet Management Area recreational catch and harvest of rainbow trout by management unit, 1977-1997.

	Northern Cook Inlet Management Area												
	Knik Arm		Eastside Susitna		Westside Susitna		West Cook Inlet		Total		Region II		Statewide	
Year	Catch[a]	Harvest	Catch[a]	Harvest	Catch[a]	Harvest	Catch[a]	Harvest	Catch[a]	Harvest	Harvest	% NCIMA	Number	% NCIMA
1977		18,615		5,225		7,472		958		32,270	80,345	40.2	94,307	34.2
1978		23,139		5,930		12,295		723		42,087	107,243	39.2	120,231	35.0
1979		24,843		9,463		12,555		1,063		47,924	129,815	36.9	139,390	34.4
1980		29,368		6,715		12,785		560		49,428	126,686	39.0	153,476	32.2
1981		41,749		8,813		11,296		1,734		63,592	149,460	42.5	178,613	35.6
1982		30,549		7,536		11,465		398		49,948	142,579	35.0	173,242	28.8
1983		26,421		9,639		9,253		871		46,184	141,705	32.6	168,677	27.4
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	31.0
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	33,510	3,960	2,338	438	156,374	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	41.1	205,642	25.5
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	119,560	28,807	76,384	37.7	112,261	25.7
1995	56,108	14,878	15,363	3,138	23,432	1,757	472	94	95,375	19,867	74,972	26.5	112,681	17.6
1996	69,271	22,554	23,734	2,768	30,072	2,250	1,293	317	124,370	27,889	84,573	33.0	136,482	20.4
77-96 mean	76,852	30,139	22,144	6,312	30,368	7,026	1,156	577	130,520	44,054	115,746	38.1	157,946	27.9
92-96 mean	70,120	21,888	21,374	3,445	26,439	2,208	893	169	118,826	27,710	83,194	33.2	127,616	21.7
1997	60,823	19,146	25,734	1,878	22,829	1,704	1,293	342	110,679	23,070	67,261	34.3	100,372	23.0

From: Mills 1979-1994, Howe et al. 1995-1998

[a] Catch estimates available beginning in 1990.

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 were 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 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.

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 inches seasonal limit. Small trout must be released immediately. An unbaited, single-hook lure requirement complements this strategy.

The Talachulitna River became Alaska's first catch-and-release trout fishery in 1977. Beginning in 1987 catch-and-release strategies were initiated in most of the Lake Creek drainage, much of the Deshka River, and the Fish Creek drainage located within the Talkeetna River drainage. In 1993 catch-and-release regulations were established for the North Fork of the Kashwitna River and in 1996 Willow and Montana creeks joined the growing list of catch-and-release streams. 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 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. These three lakes require using unbaited artificial lures and are closed November 1 to April 30.

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 averaged 5,653 fish during the period 1992 through 1996. Approximately 61% of the trout harvest from the Susitna River drainage has been from Eastside Susitna Management Unit tributaries during this time (Appendices A47 and A49).

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

and Montana Creeks produced the largest harvests until 1997, when they became catch-and-release streams.

Studies were conducted on rainbow trout stocks of the Deshka River, Lake Creek and Talachulitna River in 1989 (Bradley 1990 and 1991), the Kashwitna River in 1991, Peters Creek in 1992 (Rutz 1992 and 1993) and the North Fork Kashwitna in 1996. Assessment of migration and the age and length characteristics of these stocks were the primary focus of these investigations. Onsite creel surveys were also conducted at Lake Creek during 1988 and 1989 (Vincent-Lang and Hepler 1989). There were significant differences in age composition and mean length-at-age 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 1,878 rainbow trout in 1997 was the lowest on record for the Eastside Susitna management unit and represents approximately 55% of the 1992-1996 mean harvest for this stock. The Westside Susitna management unit harvest of 1,704 fish represents 77% of the 1992-1996 mean (Table 48). Beginning in 1989 a trend of reduced harvests for Susitna River rainbow trout is evident. 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 largely responsible.

The 1997 catch for the Eastside Susitna Management Unit was 4,360 fish above the 1992 through 1996 average of 21,374 fish (Appendix A48). The 1997 Westside Susitna Management Unit catch was 4,316 below the 1992-1996 average of 26,439 fish (Appendix A50). The percentage of the total catch harvested during this time period in Eastside and Westside management units averaged 7% (Tables 13 and 14).

During 1997, Willow and Montana creeks, previously the largest producers of rainbow trout harvest from the eastside Susitna River drainages, became no retention fisheries; which accounted for a large portion of the drop-off in harvest from previous years. (Appendices A47 and A48) (Howe et al. 1998). The catches for these two fisheries during 1997, however, were well above their 1992-1996 means.

During 1997 an estimated 397 rainbow trout were harvested in Lake Creek, a Westside Susitna Management Unit fishery, from a catch of 8,330 fish (Appendices A49 and A50). The Deshka River, also a Westside Susitna tributary, yielded a rainbow trout harvest and catch of 328 and 2,410 fish, respectively. The Talachulitna River drainage, which is a catch-and-release fishery, produced a catch of 6,013 rainbow trout. In 1997 the total rainbow trout catch in Susitna River fisheries was approximately equal to the 1992-1996 average.

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

Management of Susitna basin rainbow trout through 1996 followed the guidelines set forth in the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy. Current management follows criteria stated in the Criteria For Establishing Special Management For Trout as adopted by the BOF in 1996.

Recent Board of Fisheries Actions

During the October 1998 BOF meeting the following regulations were adopted:

1. On Big Lake, Arctic char bag and possession limits were lowered and a minimum size limit was established. The bag and possession limit changed in Big Lake from two per day, two in possession to one per day, one in possession with a minimum length requirement of 20 inches. Also, a special provision was established that requires the use of unbaited, single-hook, artificial lures from November 1 through April 30.
2. Willow Creek went from no retention of rainbow trout to allowing the retention of one rainbow trout under 16 inches in length per day and in possession upstream of the Parks Highway bridge. The single-hook, unbaited, artificial lure provision for this area remains in effect. Downstream of the Parks Highway bridge rainbow trout may still not be possessed or retained.
3. Anglers will be allowed to retain rainbow trout and use bait when fishing on the Willow Creek drainage lakes. The bag and possession limit in Shirley, Long, and Rainbow lakes is two per day and two in possession with only one over 20 inches in length. The bag and possession limit in Willow and Crystal lakes, which are stocked annually, is five per day and five in possession with only one over 20 inches in length. The seasonal limit of two rainbow trout greater than 20 inches applies to these and all other Cook Inlet waters.
4. Anglers will not be allowed to harvest rainbow trout from Canyon Creek (Skwentna River drainage). Additionally, only single hook, unbaited, artificial lures may be used in Canyon Creek year round.
5. Anglers will not be allowed to retain rainbow trout in flowing waters of West Cook Inlet and the Susitna River drainage from April 15 to June 14. This regulation applies to all flowing waters in these areas, including Willow Creek. This regulation provides for catch-and-release fishing for rainbow trout during this time period.
6. A Dolly Varden size restriction was adopted by the BOF for the NCI and Anchorage areas. The regulation now allows for the retention of only one Dolly Varden greater than 12 inches in length to be retained per day. The bag limit remains five fish per day, with five in possession for all NCI and Anchorage area waters. This regulation does not apply to lakes that are stocked by the Department with Dolly Varden char.

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 have declined in recent years while pressure from a growing urban population continues to increase. It is essential to understand the population dynamics and migratory movements of rainbow trout within these systems to effectively manage this resource. 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.

In 1996, a 2-year study was initiated on Willow Creek, during which approximately 1,000 rainbow trout were sampled and tagged to estimate population size and structure. Population estimates indicated that during July and August of 1997 and 1998 about 2,800 and 4,000 rainbow trout, respectively, resided in Willow Creek between the Parks Highway and Shirleytowne Road. Information gained from this study indicates that there is not a conservation problem associated with Willow Creek rainbow trout.

Additionally, a weir was place in Shirley Creek (the outlet stream from Shirley Lake) approximately 1 mile upstream of its confluence with Willow Creek. The weir operated during the spring and the fall of 1998 to monitor the migration of rainbow trout. Additionally, hoop traps were deployed in the majority of the Willow Creek drainage lakes to determine if rainbow trout tagged in Willow Creek in 1997 migrated into the lakes. Findings from these studies indicate that the migration of rainbow trout between the drainage lakes and Willow Creek is insignificant.

Recommended Research and Management Activities

Abundance, age and length assessment of primary rainbow trout fisheries including, but not limited to the Talachulitna River, Montana Creek, Clear Creek, and the North Fork Kashwitna River, should be conducted.

Abundance estimation and age composition research of rainbow trout in the Willow Creek drainage should continue on a 3- to 5-year cycle to determine the effect current regulations have. The tag recovery program should remain active to determine rainbow trout dispersal patterns within the eastside Susitna River drainages. Spawning populations of eastside Susitna River drainage rainbow trout should be considered for additional research and protection.

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 Arctic char in Big Lake should be conducted. Harvest trends for Arctic char in Big Lake suggest a decline in abundance and little information on the species in Big Lake is available to area managers.

The SWHS catch and harvest estimate for Arctic grayling and Dolly Varden suggests harvest in excess of sustainable yield. Bag and possession limits for both species should be reduced area wide. Information regarding Arctic grayling and Dolly Varden 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). Prior to 1992 several of these lakes consistently produced fish in the trophy class range (greater than 42.5 inches or 1,080 mm) and northern pike weighing up to 20 lb were common, with fish occasionally weighing over 30 lb.

The harvest of northern pike in the NCIMA (when the SWHS was initiated in 1977) numbered less than 200 fish, which accounted for only 1% of the statewide harvest of northern pike (Mills 1979) (Table 49). Northern pike harvests slowly increased through 1983 when the harvest totaled 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 and 1992-1996 averaged 4,828 fish (Figure 21). As northern pike spread throughout the NCIMA anglers have become more interested in them as a recreational fish as indicated by increasing harvest and catch estimates since 1991 (Table 49). With the exception of 1994 and 1995 all years since 1990 recorded harvests over 5,000 fish.

Recent Fishery Performance

The NCIMA harvest of northern pike during the 1997 season was 7,796 fish, the largest recorded harvest since the SWHS began in 1977. The Westside Susitna Management Unit accounted for about 63% of this harvest, the Knik Management Unit 35% with the remainder from the Eastside Susitna and WCI units. (Table 49, Appendices A54-A56). The SWHS's first documented northern pike harvest from the Eastside Susitna and WCI management units came in 1997; previously, other than public testimony no information was available regarding northern pike harvest from these areas.

The NCIMA catch of northern pike during 1997 was 26,449 fish with 74% of this catch being reported from the Westside Susitna Management Unit. During 1997 both harvest and catch exceeded the 1992-1996 mean in all management units (Appendices A54-A56).

Management Objectives

The management objective for this fishery is to maximize harvest opportunity.

Recent Board of Fisheries Actions

During the 1996 BOF meeting the bag limit for northern pike was eliminated.

During the 1998 BOF meeting the following regulations concerning northern pike were adopted:

1. Anglers will be allowed to use bow and arrow for the taking of northern pike in NCI waters. It is required that the arrow be attached to the bow with a line and that the arrow contains a barbed tip.
2. Anglers will no longer be restricted to using ¾ inch single hooks when fishing through the ice on select Northern Cook Inlet lakes where five lines are allowed. Standard ice-fishing gear under the methods and means section of the regulations book will apply to all lakes.
3. A slot limit was established for northern pike in Alexander and Trapper lakes. Anglers will still be able to retain an unlimited number of pike less than 22 inches in length (a 22-inch pike weighs between 3 and 4 pounds). Northern pike between 22 inches and 30 inches in length may not be retained. The bag and possession limit for pike 30 inches or greater in length will be one per day and one in possession. Additionally, the action taken for Alexander and Trapper lakes reduced the number of lines allowed when fishing through the ice for northern pike from 5 lines to 2 lines, and prohibits the use of spears and bow and arrows for taking northern pike.

The next BOF meeting addressing resident species will be in 2001.

Table 49.-Northern Cook Inlet Management Area recreational catch and harvest of northern pike by management unit, 1977-1997.

	Northern Cook Inlet Management Area[a]													
	Knik Arm[b]		Westside Susitna		Eastside Susitna		West Cook Inlet		Total		Region II		Statewide	
Year	Catch[c]	Harvest	Catch[c]	Harvest	Catch[c]	Harvest	Catch[c]	Harvest	Catch[c]	Harvest	Harvest	% NCIMA	Number	% NCIMA
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	8.9	16,536	0.8
1982		0		607						607	1,707	35.6	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	77.8	15,985	17.8
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			19		34,237	5,721	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
1995	825	522	15,414	3,024					16,239	3,546	5,323	66.6	19,006	18.7
1996	9,169	2,741	13,997	2,865					23,166	5,606	7,260	77.2	16,404	34.2
77-96 mean	5,666	1,294	14,059	1,740					19,573	5,035	6,854	73	22,477	23
92-96 mean	6,010	1,860	14,550	2,968					20,564	4,828	6,566	72.9	19,835	25.3
1997	6,673	2,749	19,500	4,878	175	100	101	69	26,449	7,796	9,452	82.5	18,327	42.5

[a] No reported catch or harvest from Eastside Susitna or West Cook Inlet management units until 1993.

[b] Harvest of northern pike prior to 1985 may have been included in other fish species category.

[c] Catch estimates available beginning in 1990.

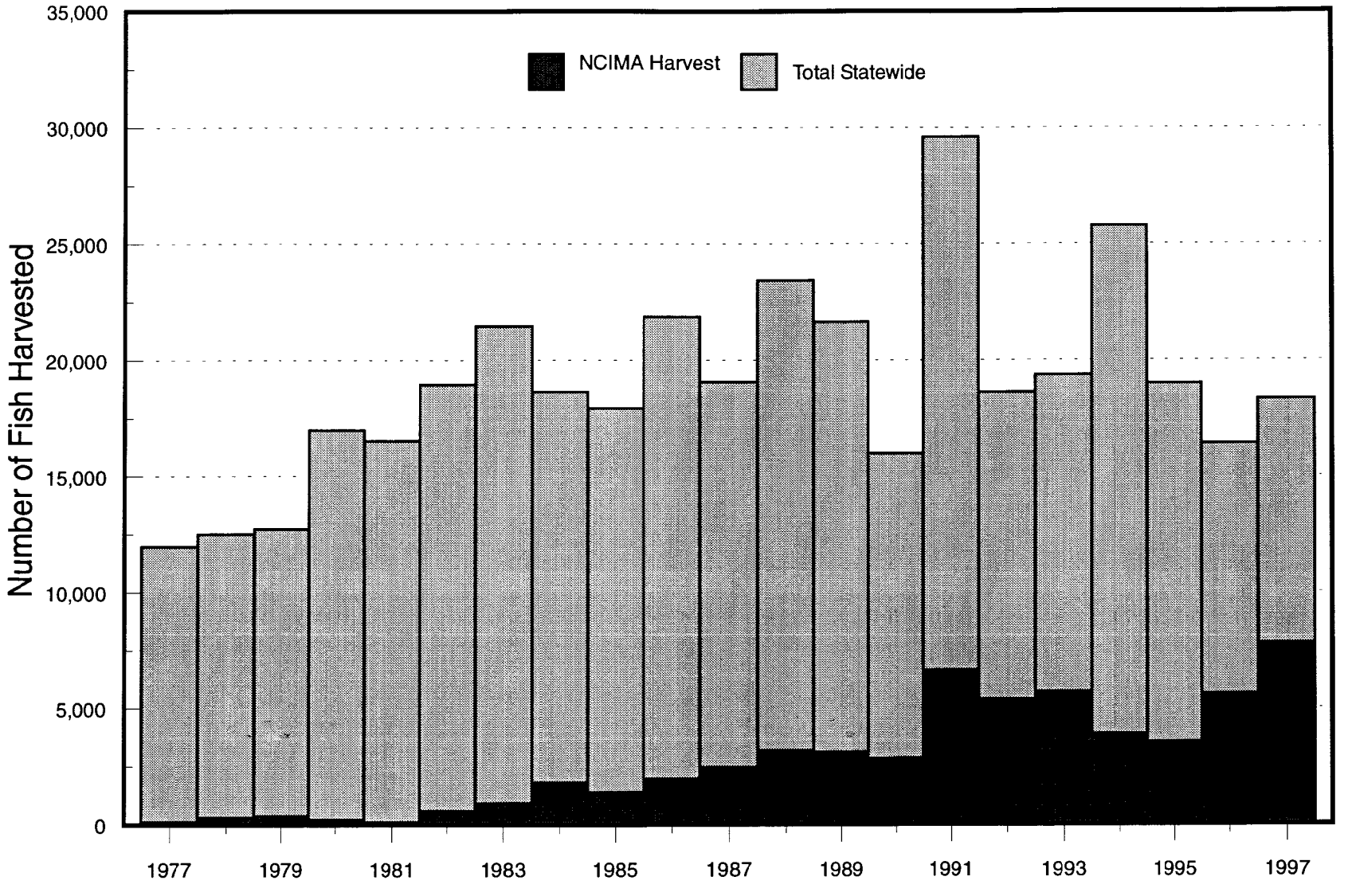

Figure 21.-Estimated northern pike harvest from Northern Cook Inlet Management Area and statewide, 1977-1997.

Current Issues

Northern pike are well known for their voracious appetites. 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 (primarily coho salmon) can be quickly eliminated by northern pike predation (Rutz 1996). In addition, we attribute the decimation of rainbow trout and grayling stocks within some of these systems to northern pike predation. Northern pike prefer soft rayed fish as a food source (Eklov and Garrin 1989). 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 such as insects (Chapman et al. 1979, Rutz 1996).

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.

In an effort to provide anglers the opportunity to catch large fish the BOF adopted a slot limit regulation for Alexander and Trapper lakes. The objective is to remove small fish (less than 22 inches) from the population while allowing some fish to reach a large size (greater than 30 inches). Providing this opportunity will lead to an increase in angler effort resulting in an increase in harvest of unprotected pike less than 22 inches. It is thought that pike in the 22-30 inch protected range will eat a large quantity of small pike thus reducing the population overall and providing large fish for harvest. These fisheries will be closely monitored to evaluate the effectiveness of the slot limit regulation.

The following is a list of systems and lakes where native fish populations (estimated) are thought to have been decimated by northern pike predation. Also included is a list of potential future problem areas.

<u>Susitna Drainage</u>

Severely Depressed Systems

1. Fish Creek (Nancy Lake Canoe System). Probable reduction of sockeye and coho salmon along with more than 30 lake populations and one stream population of rainbow trout. Burbot and whitefish populations were probably also severely impacted.
2. Fish Creek (Kroto Slough). Probable reduction of sockeye and coho salmon, along with seven or eight lake populations and one stream population of rainbow trout and Arctic grayling. Burbot and whitefish populations were probably also severely impacted.

3. Fish Lake Creek (Yentna River). Probable reduction of sockeye and coho salmon, along with five lake populations and one stream population of rainbow trout and Arctic grayling. Burbot and whitefish populations were probably also severely impacted.
4. Donkey Lake (Yentna River). Probable reduction of sockeye and coho salmon, along with lake and stream populations of rainbow trout. Burbot and whitefish populations were also probably severely impacted.
5. Unnamed Creek Kutna Slough (Yentna River). Probable reduction of sockeye salmon and coho salmon, along with a lake population of rainbow trout. Burbot and whitefish populations were probably also severely impacted.
6. Alexander Lake and all inlet streams. Probable reduction of sockeye salmon, coho salmon and chinook salmon, along with lake and stream populations of rainbow trout and Arctic grayling. Burbot and whitefish populations were probably also severely impacted.

Moderately Depressed

1. Indian Creek (Yentna River drainage). Probable reduction of the coho salmon and chinook salmon population due to pike predation. Very few sockeye salmon are present in this system. Rainbow trout population may be less than half its pre-pike abundance.
2. Moose Creek (Yentna River drainage). Probable reduction of the coho salmon and chinook salmon population due to pike predation. Very few sockeye salmon are present in this system. Rainbow trout population may be less than half its pre-pike abundance.
3. Bottle Creek (Yentna River drainage). Probable reduction of the coho salmon population due to pike predation. Very few sockeye or chinook salmon are present in this system. Rainbow trout population may be less than half its pre-pike abundance.
4. Whitso Creek (Susitna River). Probable reduction of the coho salmon population due to pike predation. Very few sockeye or chinook salmon are present in this system. Rainbow trout population may be less than half its pre-pike abundance.
5. Hewitt Creek. This system has two well established lake populations and a well established creek population of northern pike. Much of this system provides excellent pike rearing and spawning habitat. Coho salmon populations are probably heavily impacted by northern pike predation. Sockeye salmon are pelagic feeders in the two lakes, so they seldom come in contact with northern pike during their juvenile rearing period. However, as sockeye smolt migrate out of the lake they are vulnerable to pike predation in a 10-mile stretch of Hewitt Creek for a short period. Because of the large numbers of outmigrating smolt, and given they are only vulnerable to predation for a very short period, we estimate that losses are low. The rainbow trout have nearly disappeared from this system since pike arrived. Little is known about the status of the burbot or whitefish in this system.
6. Deshka River. Losses of sockeye salmon production to pike predation are probably very high for the Deshka River, as most of the production for this species is associated with the shallow water connecting lakes which now contain well established pike populations. Northern pike predation is probably responsible for loss of coho salmon production in this system, with most of this loss attributed to juvenile coho salmon that rear in side sloughs. Pike predation probably has very little effect on the chinook salmon population in the mainstem Deshka

River, but tributaries such as Trappers, Noname and Chijuk creeks may have much higher losses due to stream morphology. Rainbow trout and Arctic grayling populations in some of the connecting lakes have been severely reduced since the arrival of the northern pike, while stream populations are probably only moderately affected. We do not know what effect pike predation has had on the burbot population; however, we know that some lake populations of burbot have been decimated in shallow lake systems with well established pike populations

7. Alexander Creek. Losses are probably heavy for sockeye salmon as most of the production for this species is associated with the shallow water connecting lakes (Alexander, Trail, and Sucker lakes) which contain well established pike populations. Coho populations are not affected to this degree. Much of this loss is to juvenile coho salmon that rear in the hundreds of side channels and sloughs. Again, pike predation probably has very little effect on the chinook salmon population in the mainstem Alexander Creek, but tributaries such as Upper Sucker Creek and all streams above Alexander Lake probably suffered much higher losses as most of the system's pike population is found in these waters. Rainbow trout and Arctic grayling populations in the connecting lakes have also been severely impacted, while stream populations are probably only moderately affected. We do not know what effect pike predation has had on the burbot population in this system.

Lightly Depressed Systems

1. Shell Lake. Very little pike habitat is present in this system and loss of salmonids due to pike predation is expected to be very small.
2. Lake Creek (Chelatna Lake). Chelatna Lake, along with one additional small lake system, contain the majority of Lake Creek's pike population. Very little pike habitat is present in this system and loss of salmonids due to pike predation is expected to be very small.

Potential Problems

1. Mama Bear and Papa Bear lakes (Talkeetna). Should northern pike become established in this system, it is probable that salmonid populations will be severely impacted as much of this system is comprised of ideal spawning and rearing habitat for pike.
2. Caswell Creek. This system supports a fair amount of pike habitat, including several shallow water lakes. Should pike become well established in this system chinook and coho salmon numbers could be significantly reduced.
3. Rabideux Creek. This system supports a fair amount of pike habitat. Should pike become well established they may reduce chinook and coho salmon numbers.
4. Fifteen to twenty small shallow lake systems (Susitna River drainage). Slow moving tributaries which may be comprised of one or more shallow lakes or ponds and support unknown populations of salmonids may have already been or will be seriously impacted by northern pike predation.

West Cook Inlet

Potential Problems

1. Three Mile River (Beluga). Given this system's ideal pike habitat it is probable that salmonid populations, specifically sockeye salmon, will be severely impacted by a growing pike population.

Knik Arm Drainages

Potential Problems

1. Jim Creek. This is a fairly large system that supports ideal pike habitat for both spawning and rearing. It is probable that the large coho and sockeye salmon and Dolly Varden populations will be severely impacted or completely decimated by pike predation should the pike ever become established. In recent years there have been a few unconfirmed northern pike sightings.
2. Cottonwood Creek. Given this system's ideal pike habitat it is probable that coho and sockeye salmon populations along with rainbow trout populations will be severely impacted by pike predation should they become established. There have been several documented northern pike sightings in one of the connecting lakes to this system.
3. Big Lake System (Fish Creek/Meadow Lakes). Only small portions of Big Lake support ideal pike habitat; therefore, existing salmonid populations from Big Lake are not expected to be severely impacted by pike habitation. However, the Meadow Creek drainage which flows into Big Lake does support a great deal of pike habitat and salmonid populations from this system may be severely impacted should pike ever become well established. Northern pike have been documented in one lake of this system and unconfirmed sightings were reported on two others.
4. Little Susitna River. This system supports little northern pike habitat indicating minimal impact to salmonid populations resulting from northern pike predation. Some of the smaller lake systems draining into the Little Susitna River may be severely impacted, but these small lake systems collectively account for a small portion of the overall salmon production for this system.

Overall, northern pike have been destructive to the salmonid resource of the Susitna River drainage. To date there are more than 90 lakes and nearly 50 river systems in the Mat-Su Valley and Anchorage areas that are thought to be inhabited by pike. Though pike have taken their toll on these waters, it is believed that the pike populations throughout the Susitna River drainage may be reaching a point of stability. If pike begin to colonize other systems such as Jim Creek, Big Lake and Cottonwood Creek, we can expect to see large losses in salmonid production.

In shallow lake systems pike have wiped out existing native fish species. Recolonization of native species is highly unlikely. With no species of fish left in these lakes other than pike it may be wise to manage these populations more conservatively, whereby allowing fishermen the opportunity to harvest larger sized pike. However, in flowing waters, pike continue to prey on salmonid populations and current liberal management strategies should remain in effect.

Ongoing Research and Management Activities

During 1996 eighteen northern pike were captured in four Susitna River drainage tributaries and surgically implanted with radio transmitters (Rutz *In prep*). The majority of observed northern pike movement was within tributaries and between sloughs within tributaries. In systems with lakes, movement to and from lakes was common. However, little movement occurred between tributaries. A total of 437 northern pike were captured and examined for stomach content, of which 155 (35%) were determined to have empty stomachs. Of the 282 non-empty stomachs examined, 208 or 74% contained salmonids (Rutz *In prep*). Minnow traps were set in areas of confirmed pike locations (which were slow water side sloughs), and in mainstem creek locations adjacent to those side sloughs. CPUE for the traps set in the vicinity of confirmed northern pike radio signals (side sloughs) was 0.36/trap for salmonids and 36.7/trap for sticklebacks, while CPUE for salmonids was higher (10.06/set) than for stickleback (8.07/set) in the mainstem creek. However, contents of pike stomachs examined from areas where radio signals were confirmed revealed a much higher incidence of salmonids (78%) than stickleback (67%) (Rutz *In prep*).

During 1997 an investigation was conducted to determine the presence or absence and food habits of spawning northern pike in three sloughs of the Deshka River. One hundred twenty-six pike were captured using gill nets. Salmonids were documented within their stomach contents. This project should be conducted on an annual basis.

Recommended Research and Management Activities

1. Susitna drainage radio-tagged pike should continue to be monitored until radio batteries expire (1999).
2. Northern pike distribution and dietary preference should continue to be monitored in selected Susitna drainage waters with major emphasis on the Deshka River.
3. Northern pike in the Deshka River drainage should be radio tagged and monitored until the batteries expire.
4. Age, sex and size information should be collected from Alexander and Trapper lakes' northern pike to determine the effect of the slot limit regulation adopted prior to the 1999 season.

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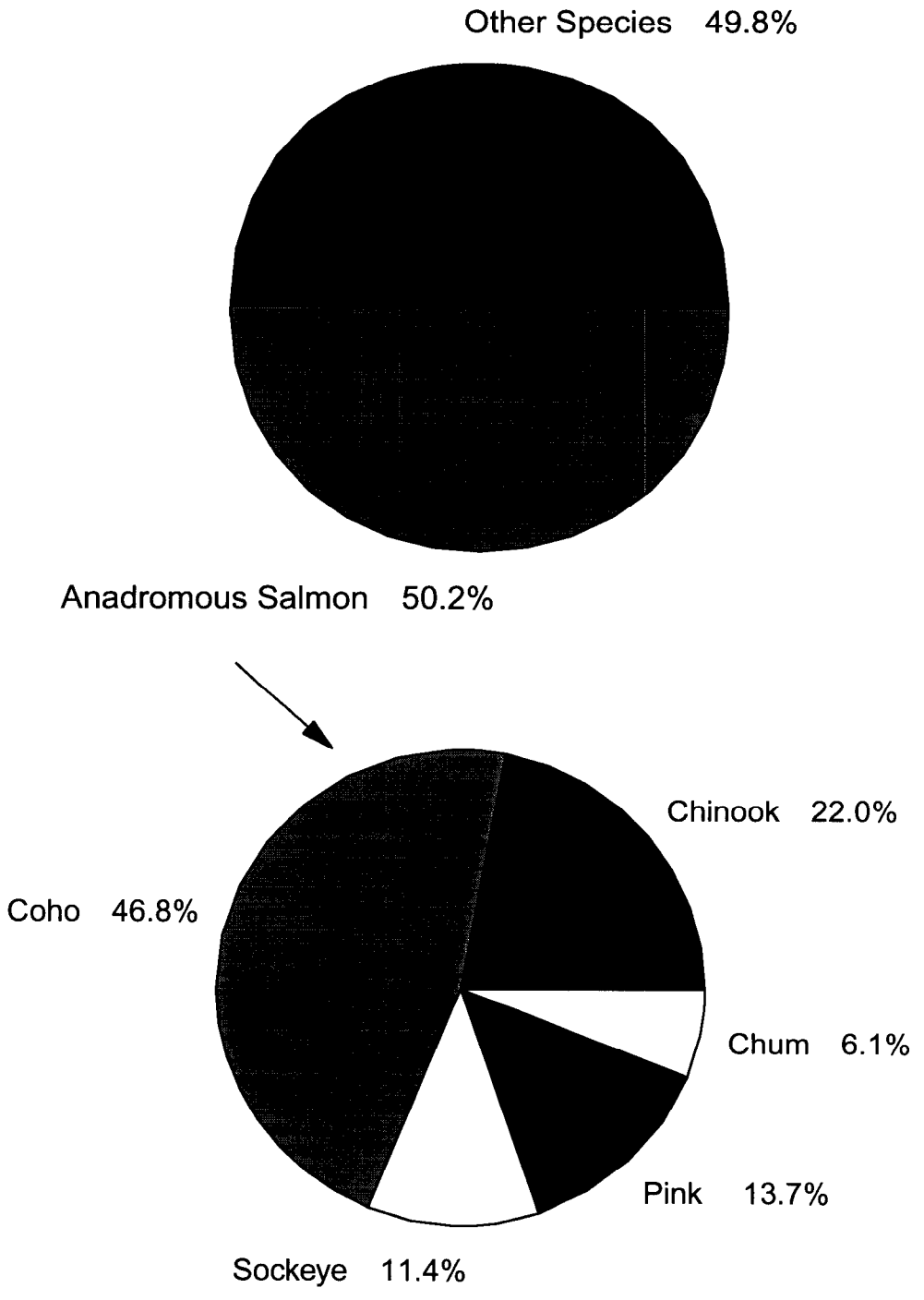
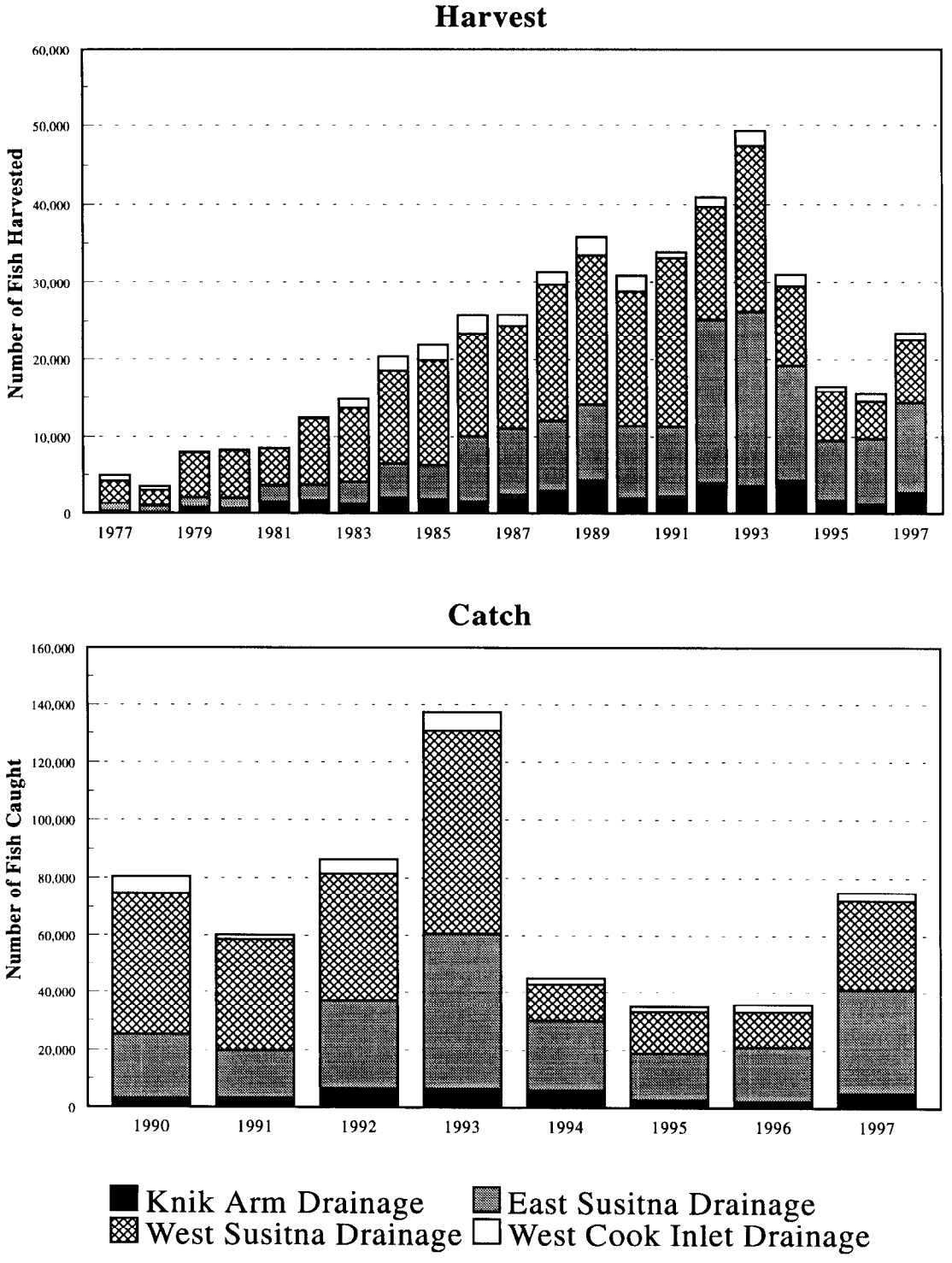
APPENDIX A



Appendix A1.-Northern Cook Inlet Management Area sport fish harvest anadromous salmon composition, 1977-1997.



Appendix A2.-Northern Cook Inlet Management Area recreational chinook salmon harvest and catch, 1977-1997.

Appendix A3.-Knik Arm drainage chinook salmon harvest by fishery, 1977-1997.

Year	Fish Ck. Marine	Other Marine [d]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Other[c]	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
1995		9	1,698	0	0	0	0	0	0	1,707
1996		0	1,192	0	0	0	0	0	0	1,192
92-96 Mean	40	17	2,891	0	0	4	0	0	19	2,955
1997		0	2,740	0	0	0	0	0	0	2,740

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams.

[d] Beginning in 1995 includes all marine.

Appendix A4.-Knik Arm drainage chinook salmon catch by fishery, 1990-1997.

Year	Fish Ck. Marine	Other Marine[d]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Other[c]	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
1995		66	2,705	0	0	0	0	0	0	2,771
1996		0	2,346	0	0	0	0	0	0	2,346
92-96 Mean	78	32	4,750	0	0	47	0	2	31	4,875
1997		0	5,114	0	0	0	0	0	66	5,180

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams.

[d] Beginning in 1995 includes all marine.

Appendix A5.-Eastside Susitna River drainage chinook salmon harvest by fishery, 1977-1997.

Year	Willow Creek	Lt.Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna[a] River	Other[b]	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
1995	2,742	436	18	397	746	226	1,004	0	132	2,126	45	7,872
1996	2,314	568	20	118	1,253	401	1,441	20	49	2,366	95	8,645
92-96 Mean	5,709	794	34	440	1,662	531	2,538	48	225	2,941	175	15,096
1997	3,417	771	11	33	600	331	2,243	33	56	3,939	211	11,645

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A6.-Eastside Susitna River drainage chinook salmon catch by fishery, 1990-1997.

Year	Willow Creek	Lt.Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna[a] River	Other[b]	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
1995	4,897	905	91	519	1,323	422	2,226	0	245	5,464	284	16,376
1996	5,225	1,156	49	282	2,134	979	2,957	59	117	5,714	194	18,896
92-96 Mean	10,659	1,547	92	669	2,595	926	4,814	69	352	6,549	537	28,809
1997	9,144	1,784	66	136	2,097	990	6,227	88	278	13,949	1,003	35,762

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A7.-Westside Susitna River drainage chinook salmon harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	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				2,134	647	201	948	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	215	339	3,554	1,202	403	656	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
1995	1,217	0		425	252	2,838	545	509	479	0	6,265
1996	863	0		236	69	2,144	338	371	675	0	4,696
92-96 Mean	2,886	2,712	23	474	292	3,725	768	625	698	34	12,218
1997	1,621	45	66	335	35	4,099	451	824	714	0	8,190

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A8.-Westside Susitna River drainage chinook salmon catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	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
1995	2,225	232		1,123	725	5,627	1,193	2,207	805	0	14,137
1996	1,395	0		473	264	4,906	768	2,451	1,665	0	11,992
92-96 Mean	6,809	5,781	70	987	864	9,873	1,552	3,264	1,577	95	30,616
1997	4,465	1,996	66	1,190	179	13,174	1,225	6,423	2,614	0	31,332

[a] Fish Lake drainage (Yentna River drainage).

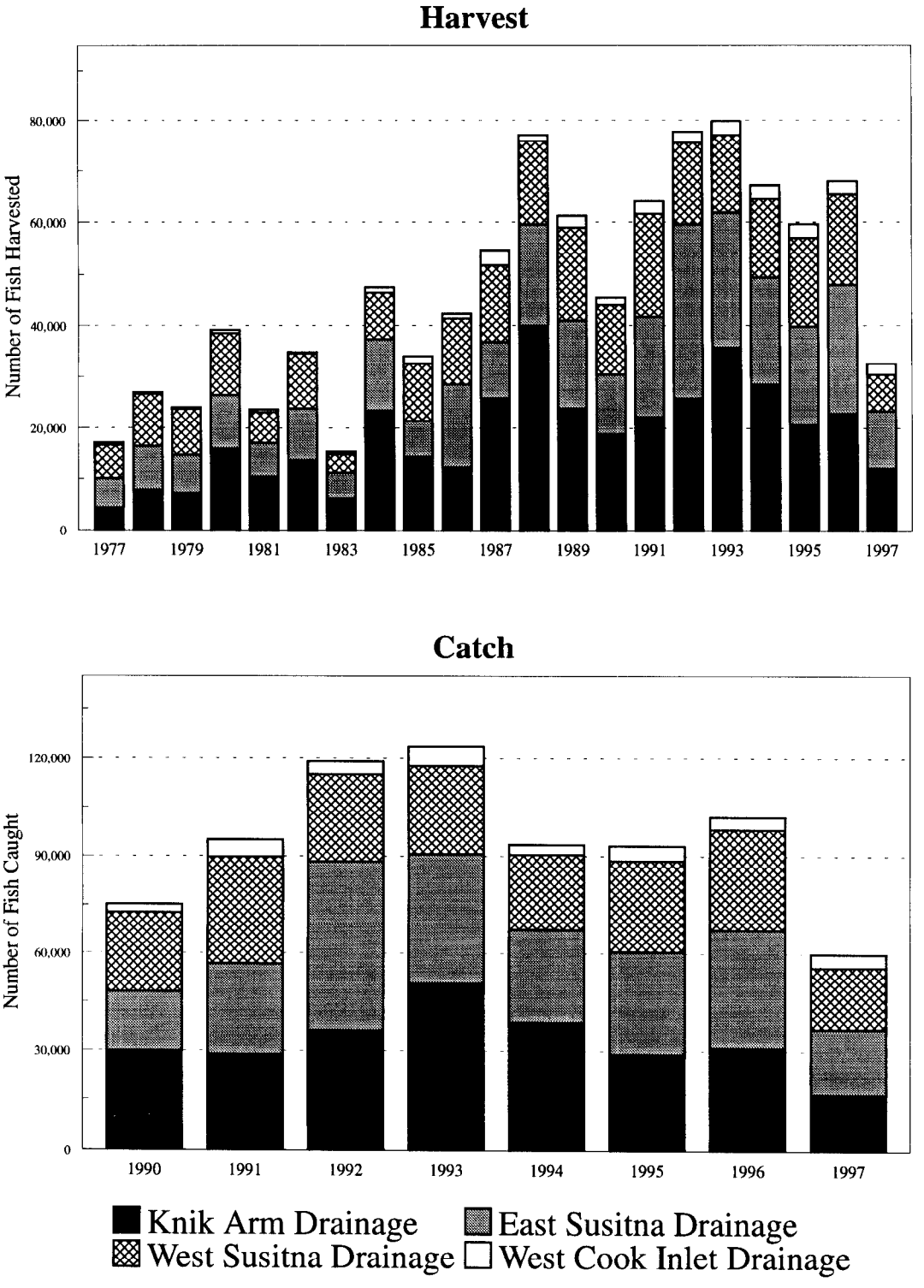
[b] May include harvest from West Cook Inlet waters.

Appendix A9.-West Cook Inlet drainage chinook salmon harvest by fishery, 1977-1997.

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
1995	201		360	0	113	674
1996	594		176	0	246	1,016
92-96 Mean	547	175	433	9	308	1,267
1997	784	56	0	0	75	915

Appendix A10.-West Cook Inlet drainage chinook salmon catch by fishery, 1990-1997.

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	207	1,945		207	5,207
1993	3,929		1,390	409	875	6,603
1994	699		877		565	2,141
1995	602		748		438	1,788
1996	1,594		585		432	2,611
92-96 Mean	1,934	207	1,109	409	503	3,670
1997	2,339	288	115	0	120	2,862



Appendix A11.-Northern Cook Inlet Management Area recreational coho salmon harvest and catch, 1977-1997.

Appendix A12.-Knik Arm drainage coho salmon harvest by fishery, 1977-1997.

Year	Fish Ck. Marine	Other Marine[c]	Little Susitna	Jim Creek[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Fish Creek	Other[b]	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
1995		132	14,451	3,549	990	445	340	435	308	20,650
1996		685	14,862	3,579	1,353	890	794	586	70	22,819
92-96 Mean	137	380	18,924	3,472	1,579	854	664	556	205	26,717
1997		207	7,750	1,953	795	775	406	162	96	12,144

[a] Knik River and tributaries including Jim Creek.

[b] Includes lakes and streams.

[c] Beginning in 1995 includes all marine.

Appendix A13.-Knik Arm drainage coho salmon catch by fishery, 1990-1997.

Year	Fish Ck. Marine	Other Marine[d]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Other[c]	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
1995		273	19,853	4,435	1,441	771	359	577	1,149	28,858
1996		782	20,307	4,314	1,761	1,284	924	765	854	30,991
92-96 Mean	225	447	25,719	4,591	2,536	1,320	831	757	779	37,115
1997		414	9,992	2,865	1,053	1,217	472	319	309	16,641

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams.

[d] Beginning in 1995 includes all marine.

Appendix A14.-Eastside Susitna River drainage coho salmon harvest by fishery, 1977-1997.

Year	Willow Creek	Lt. Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna[a] River	Other[b]	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
1995	3,498	992	472	1,687	1,092	152	2,385	198	1,385	6,672	632	19,165
1996	5,356	2,009	358	694	1,990	446	3,291	269	2,720	7,590	450	25,173
92-96 Mean	5,538	1,499	485	2,346	2,226	401	3,077	428	2,238	6,220	553	25,012
1997	2,634	722	224	321	1,306	181	1,861	195	488	3,105	206	11,243

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A15.-Eastside Susitna River drainage coho salmon catch by fishery, 1990-1997.

Year	Willow Creek	Lt. Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna[a] River	Other[b]	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
1995	4,752	1,466	604	1,838	1,593	239	3,545	415	1,705	14,011	1,434	31,062
1996	8,009	2,346	378	1,029	2,567	735	4,339	437	3,604	12,196	728	36,368
92-96 Mean	7,774	2,027	578	3,028	3,225	605	4,542	653	2,879	11,014	1,382	37,603
1997	4,683	979	299	439	1,872	434	2,850	507	847	6,654	645	20,209

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A16.-Westside Susitna River drainage coho salmon harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Peters Creek	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Other[b]	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
1995	2,692	2,275		183	569	4,736	1,058	1,031	4,604	17,148
1996	817	4,794		61	1,256	3,893	651	1,031	4,882	17,475
92-96 Mean	1,650	5,244	543	137	577	3,435	784	609	3,788	16,331
1997	506	1,280	21	99	656	1,620	371	900	1,695	7,148

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet Management Unit lakes and streams.

Appendix A17.-Westside Susitna River drainage coho salmon catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Peters Creek	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Other[b]	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
1995	3,098	3,746		874	634	6,135	1,921	5,271	6,502	28,181
1996	1,634	7,0.36		61	1,782	6,740	1,306	4,399	7,717	30,675
92-96 Mean	2,376	8,054	794	312	796	5,280	1,381	2,557	6,210	27,125
1997	1,500	3,454	21	398	1,399	2,843	685	3,013	5,618	18,931

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet Management Unit lakes and streams.

Appendix A18.-West Cook Inlet drainage coho salmon harvest by fishery, 1977-1997.

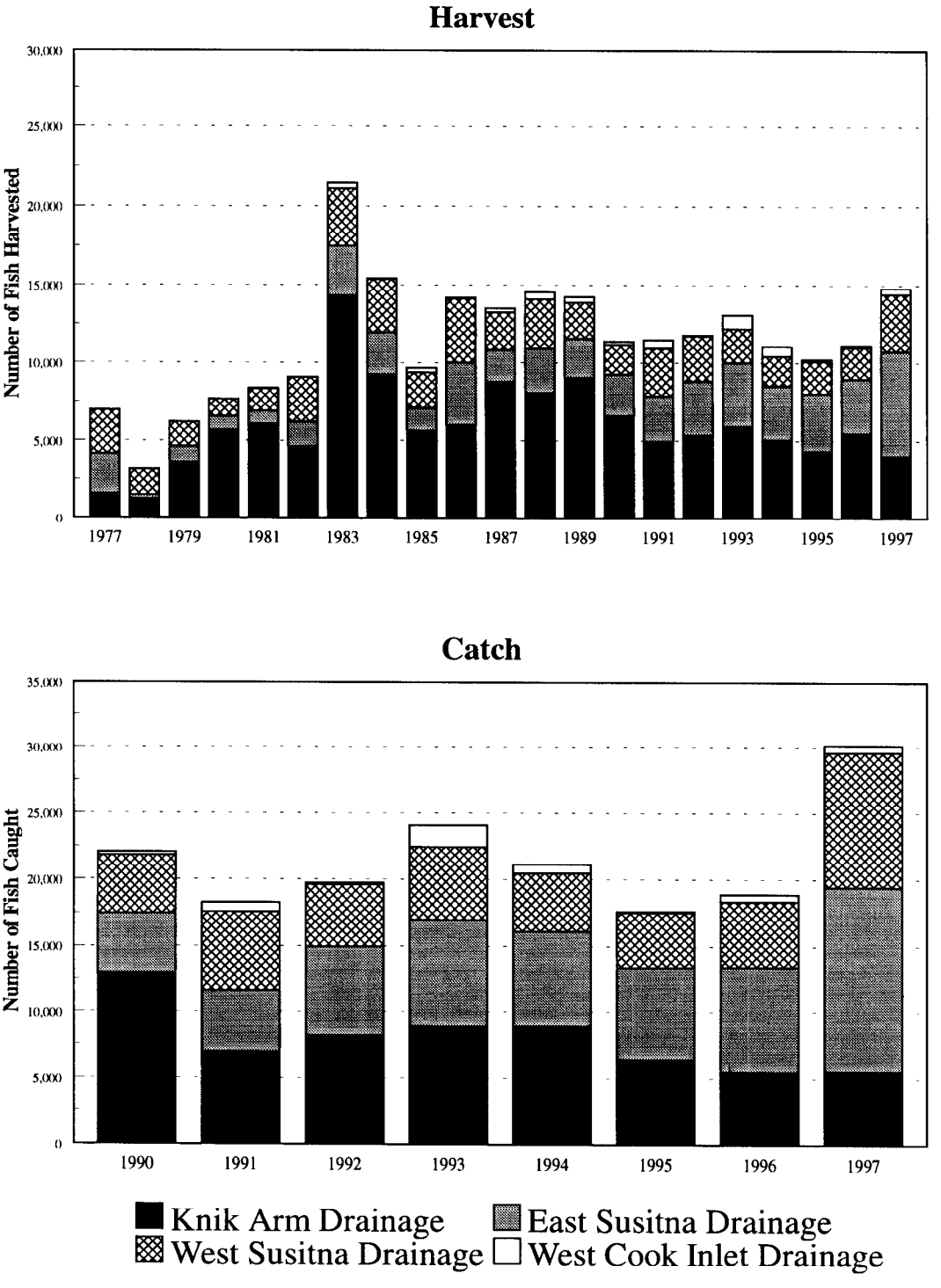
Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other[a]	Total
1977	316		113	103		532
1978	277		101	0		378
1979	287		50	0		337
1980	258		370	0		628
1981	594		10			604
1982	220		115			335
1983	554		10			564
1984	898		137			1,035
1985	1,095		261	75		1,431
1986	815		168			983
1987	1,684		996	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
1995	1,407		372		891	2,670
1996	1,289		366		780	2,435
92-96 Mean	1,223	243	383	194	1,126	2,594
1997	1,275		205		635	2,115

[a] Includes lakes and streams.

Appendix A19.-West Cook Inlet drainage coho salmon catch by fishery, 1990-1997.

Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other[a]	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
1995	2,626		815		1,047	4,488
1996	2,131		465		1,215	3,811
92-96 Mean	2,162		773	270	1,287	4,276
1997	2,641		279		1,244	4,164

[a] Includes lakes and streams.



Appendix A20.-Northern Cook Inlet Management Area recreational sockeye salmon harvest and catch, 1977-1997.

Appendix A21.-Knik Arm drainage sockeye salmon harvest by fishery, 1977-1997.

Year	Fish Ck. Marine	Other Marine[e]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Big Lake	Nancy Lake[c]	Other[d]	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
1995		218	1,116	990	190	31	895	651	0	31	227	4,349
1996		181	2,962	1,392	108	54	573	89	0	114	23	5,496
92-96 Mean	240	132	1,930	1,230	163	61	672	611	0	95	203	5,240
1997		112	1,656	768	116	23	1,168	141	0	35	12	4,031

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Nancy Lake complex lakes.

[d] Includes lakes and streams.

[e] Beginning in 1995 includes all marine.

Appendix A22.-Knik Arm drainage sockeye salmon catch by fishery, 1990-1997.

Year	Fish Ck Marine	Other Marine[e]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Big Lake	Nancy Lake[c]	Other[d]	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
1995		416	2,116	1,357	221	114	1,228	725		227	41	6,445
1996		193	5,604	2,562	240	86	744	304	0	114	23	5,496
92-96 Mean	307	178	3,526	1,831	232	115	1,048	870	0	378	262	8,624
1997		112	2,255	1,332	127	23	1,318	187	0	127	84	5,565

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Nancy Lake complex lakes.

[d] Includes lakes and streams.

[e] Beginning in 1995 includes all marine.

Appendix A23.-Eastside Susitna River drainage sockeye salmon harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	430	73	0	0	98	52	481	0	220	2,982	145	101	3,682
1996	146	260	0	124	11	86	115	0	56	2,055	22	0	3,475
92-96 Mean	403	129	7	87	88	39	258	89	197	2,186	136	22	3,641
1997	137	96	48	35	221	81	167	12	69	5,679	197	0	6,742

[a] Talkeetna River and tributaries including Clear Creek.

[b] Other includes lakes and streams for 1977-1982.

Appendix A24.-Eastside Susitna River drainage sockeye salmon catch by fishery, 1990-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	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
1995	838	250	0	0	214	52	991	0	251	3,830	312	201	6,939
1996	513	692	43	188	11	119	352	0	67	5,854	109	0	7,948
92-96 Mean	768	338	15	122	176	72	582	109	290	4,439	371	61	7,343
1997	418	298	85	35	313	139	474	12	81	11,602	433	0	13,890

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A25.-Westside Susitna River drainage sockeye salmon harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	94	42		239	392	178	191		879	91	2,106
1996	0	11		0	181	84	193		1,194	390	2,053
92-96 Mean	60	44	0	137	321	201	199		956	311	2,231
1997	71	12		491	1,966	246	367		509	0	3,662

[a] Yentna River drainage.

[b] May include harvest from West Cook Inlet waters.

Appendix A26.-Westside Susitna River drainage sockeye salmon catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	116	64		239	615	295	1,003		1,498	348	4,178
1996	0	43		55	750	357	1,496		1,620	631	4,952
92-96 Mean	110	138	0	239	795	316	750		1,708	673	4,728
1997	146	390		491	5,922	450	1,454		1,235	37	10,125

[a] Yentna River drainage.

[b] May include harvest from West Cook Inlet waters.

Appendix A27.-West Cook Inlet drainage sockeye salmon harvest by fishery, 1977-1997.

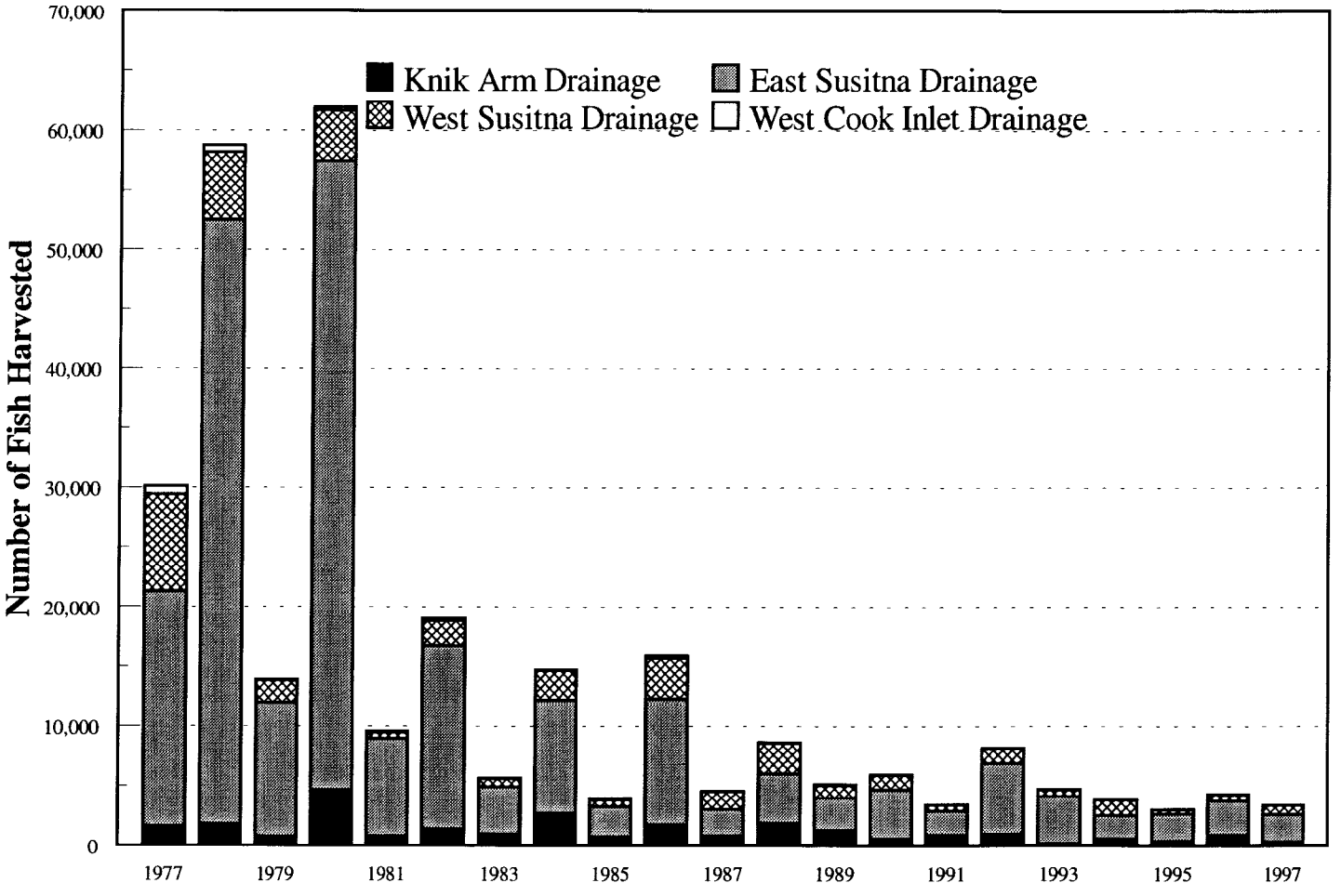
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	6	0	0		6
1978	0	0	0		0
1979	0	0	0		0
1980	0	0	0		0
1981	48	0			48
1982	10	0			10
1983	356	0			356
1984	62	0			62
1985	274	25	0		299
1986	22	67			89
1987	272	0	0		272
1988	437	18	0		455
1989	43	52	0	269	364
1990	139	50	0		189
1991	552	10	0		562
1992	8	49			57
1993	46	35	0	780	861
1994	0	9		614	623
1995	62	0		41	103
1996	36	0		94	130
92-96 Mean	30	19	0	382	355
1997	199	0		174	373

[a] Includes lakes and streams.

Appendix A28.-West Cook Inlet drainage sockeye salmon catch by fishery, 1990-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	62	0		41	103
1996	155	24		347	526
92-96 Mean	93	41	0	595	609
1997	324	0		244	568

[a] Includes lakes and streams.



Appendix A29.-Northern Cook Inlet Management Area recreational pink salmon harvest, 1977-1997.

Appendix A30.-Knik Arm drainage pink salmon harvest by fishery, 1977-1997.

Year	Fish Ck. Marine	Other Marine[d]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Other[c]	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
1995		0	264	58	58	10	19	0	0	409
1996		39	744	10	86	0	0	48	0	927
92-96 Mean	9	17	491	15	46	2	15	42	15	649
1997		0	328	11	11	0	21	0	22	393

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams.

[d] Beginning in 1995 includes all marine.

Appendix A32.-Westside Susitna River drainage pink salmon harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Other Steams[b]	Other Lakes[b]	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
1995	57	77	0	0	55	86	48	38	0	361
1996	20	228	0	0	188	10	69	20	0	535
92-96 Mean	192	293	14	3	180	60	25	33	0	801
1997	261	11	0	0	303	32	66	77	0	750

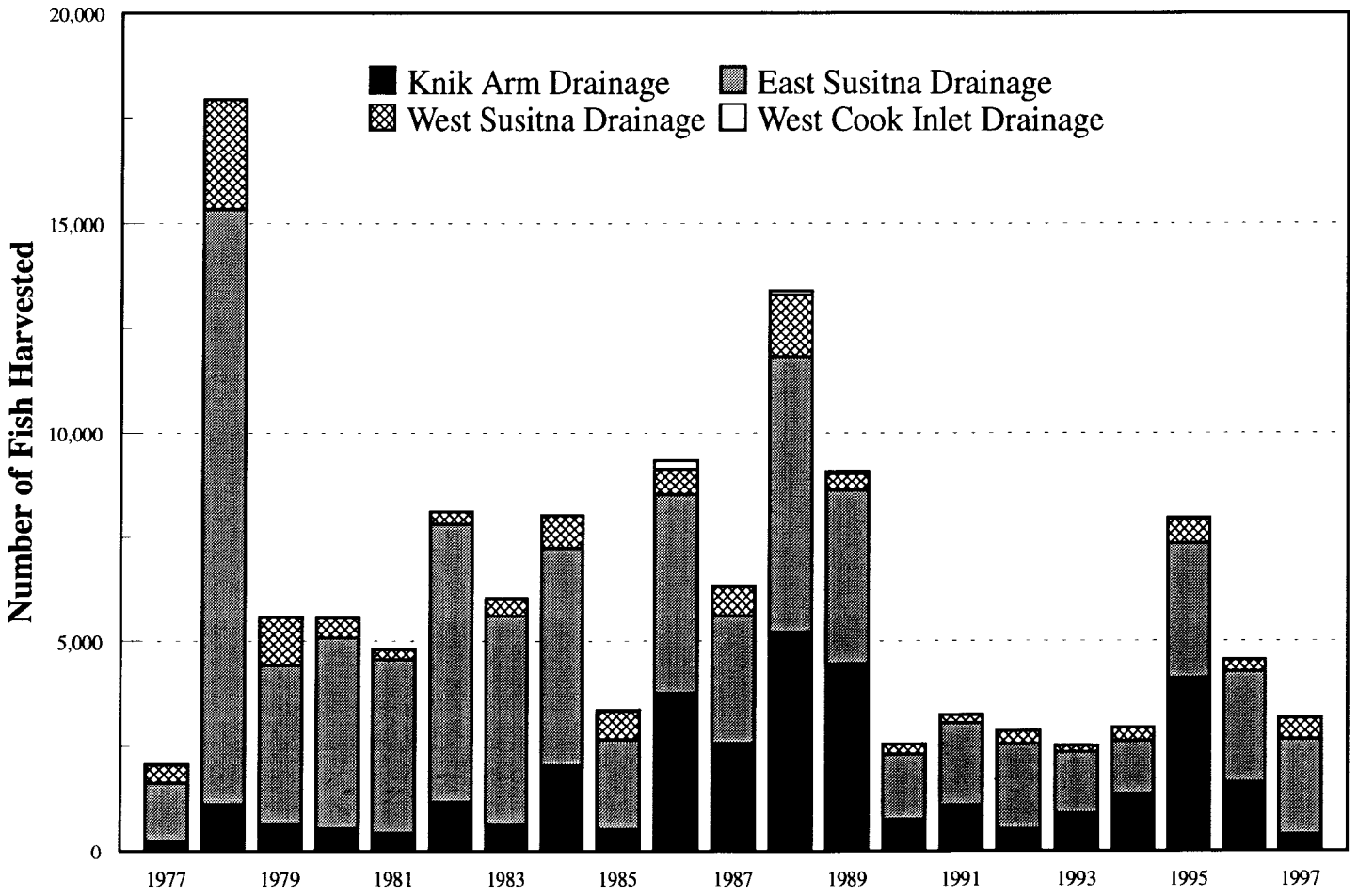
[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A33.-West Cook Inlet drainage pink salmon harvest by fishery, 1977-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	0	0		0	0
1996	0	0		20	20
92-96 Mean	4	0	9	11	16
1997	42	0		0	42

[a] Includes lakes and streams.



Appendix A34.-Northern Cook Inlet Management Area recreational chum salmon harvest, 1977-1997.

Appendix A35.-Knik Arm drainage chum salmon harvest by fishery, 1977-1997.

Year	Fish Ck. Marine	Other Marine[d]	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Other[c]	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
1995		9	620	433	3,035	9	0	9	0	4,115
1996		11	295	315	956	48	0	11	0	1,636
92-96 Mean	8	10	485	194	960	11	7	4	24	1,700
1997		0	235	0	151	0	0	0	9	395

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams.

[d] Beginning in 1995 includes all marine.

Appendix A36.-Eastside Susitna River drainage chum salmon harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other[b]	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
1995	608	169	9	81	459	65	4,331	0	0	339	173	3,234
1996	553	169	0	11	232	134	597	0	0	908	34	2,638
92-96 Mean	442	142	12	42	311	89	1,114	26	18	488	50	2,133
1997	360	130	189	0	411	152	552	13	0	363	103	2,273

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A37.-Westside Susitna River drainage chum salmon harvest by fishery, 1977-1997.

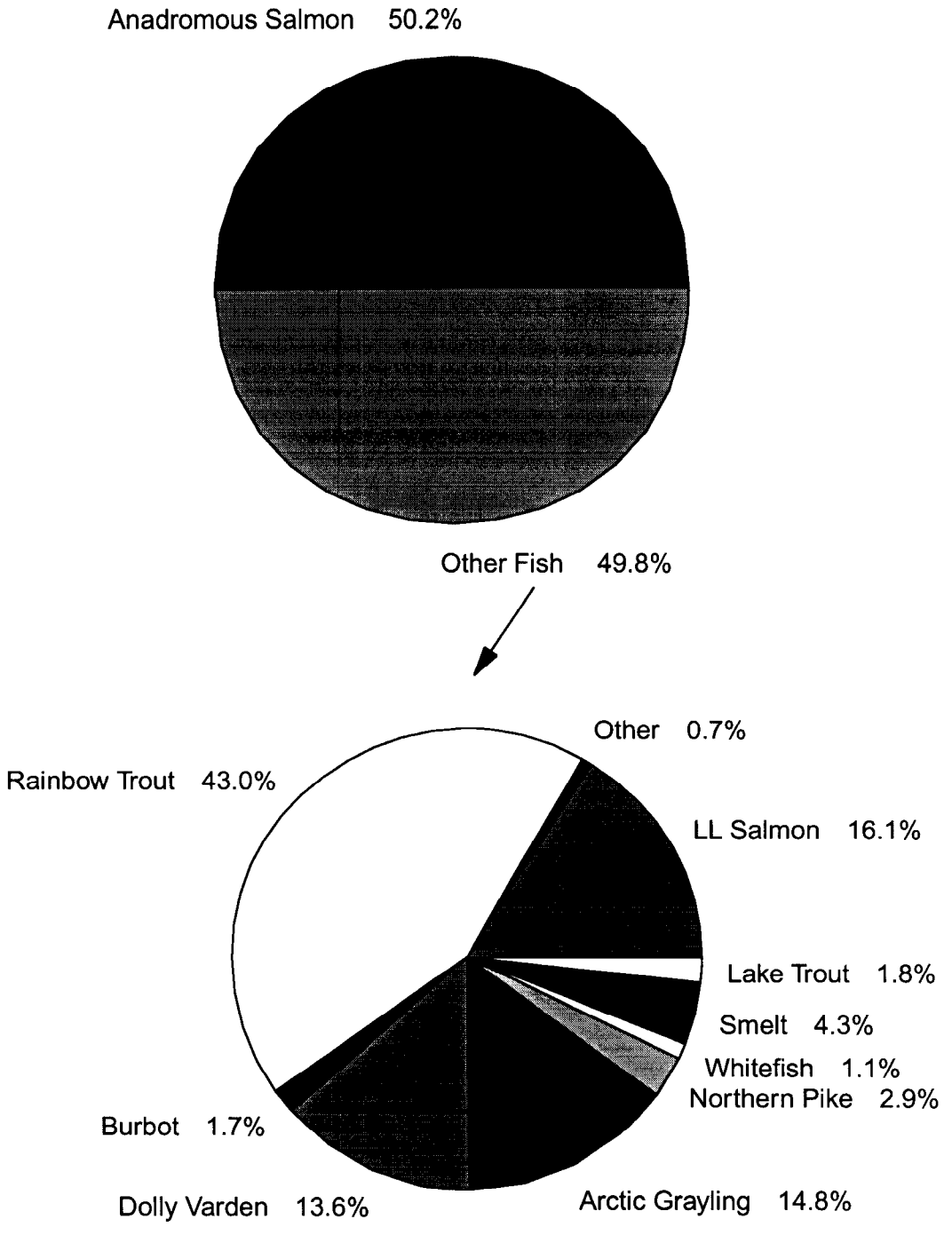
Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	Total
1977	30	0		162		37	194	0	423
1978	215	0		1,015		234	1,171	0	2,635
1979	45	0		136		55	918	0	1,154
1980	121	0		69		17	284	0	491
1981	10	0		48		0	182	0	240
1982	0	0		199		0	94	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
1995	272	0	0	181	113	11	14	0	591
1996	18	45	28	112	0	37	23	37	300
92-96 Mean	91	24	7	101	34	13	54	7	331
1997	48	39	52	178	51	58	65	0	491

[a] Fish Lake drainage (Yentna drainage).

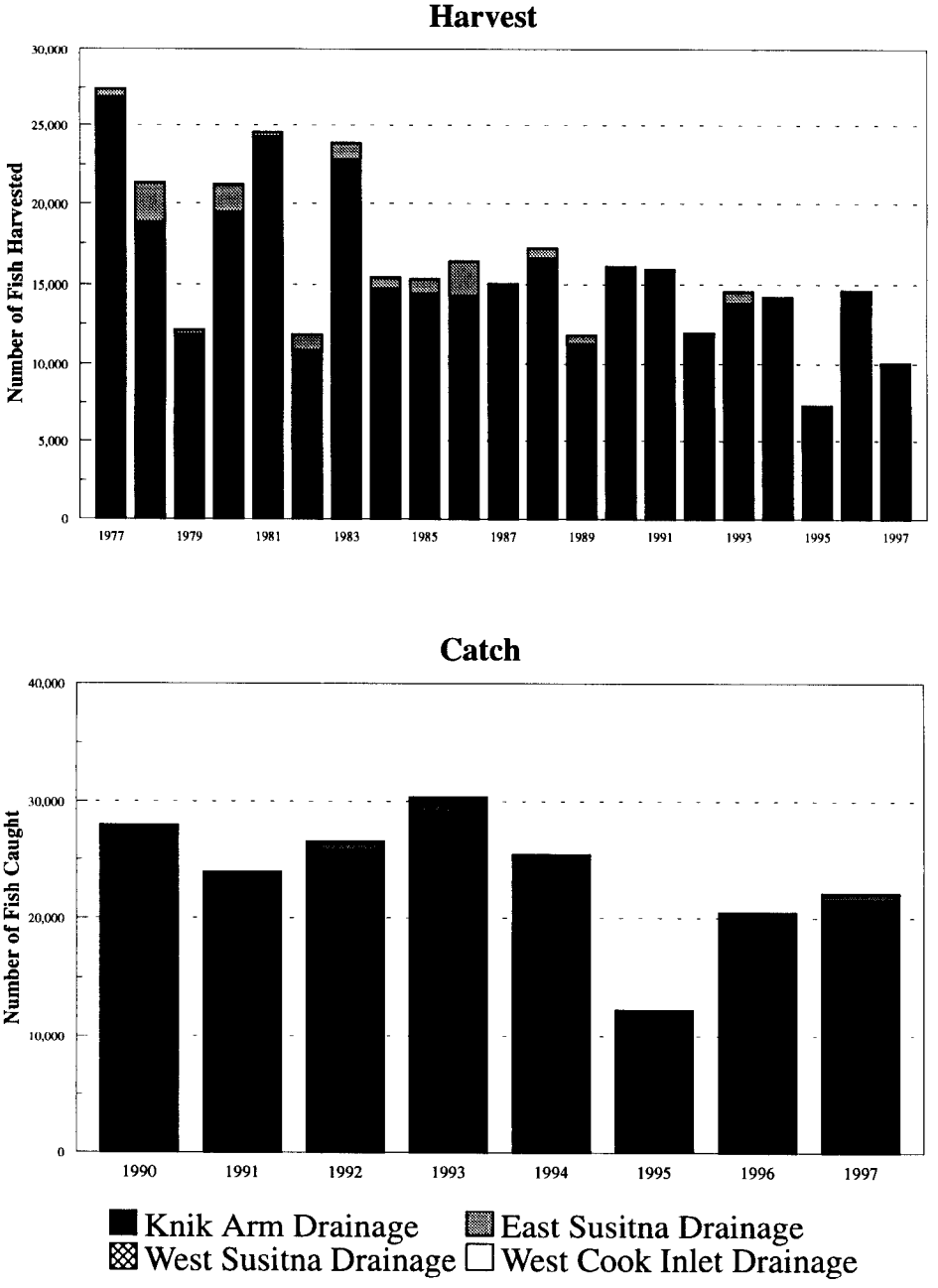
[b] May include harvest from West Cook Inlet waters.

Appendix A38.-West Cook Inlet drainage chum salmon harvest by fishery, 1977-1997.

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
1995	9	0		18	27
1996	0	0		0	0
92-96 Mean	2	0	0	9	5
1997	19	0		0	19



Appendix A39.-Northern Cook Inlet Management Area sport fish harvest resident fish composition, 1977-1997.



Appendix A40.-Northern Cook Inlet Management Area recreational landlocked salmon harvest and catch, 1977-1997.

Appendix A41.-Knik Arm waters landlocked salmon harvest by fishery, 1977-1997.

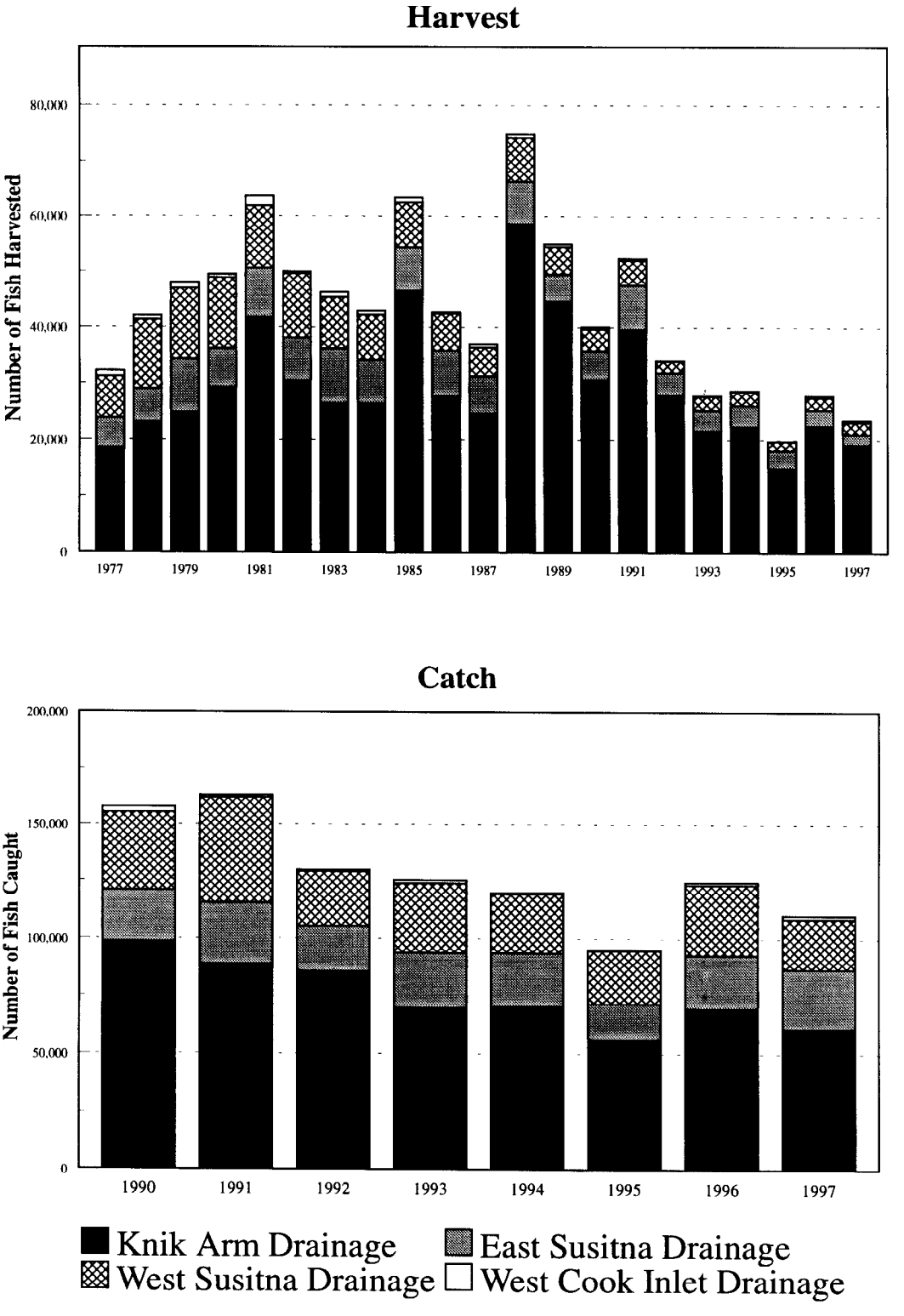
Year	Memory Lake	Lucille Lake	Kepler L. Complex	Finger Lake	Wasilla Lake	Big Lake	Nancy L. Complex	Other Lakes	Total
1977		8,952	528	14,739		721	76	1,901	26,917
1978		4,963	298	8,588		226	262	4,547	18,884
1979		4,272	64	5,209	1,054	145	227	882	11,853
1980		3,633	2,807	10,685	43	189	146	1,997	19,500
1981		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
1995	234	25	210	5,842	0	219	0	755	7,285
1996	1,038		750	10,137	0	578	0	2,109	14,612
92-96 Mean	1,115	61	1,029	5,770	0	1,469	60	1,364	12,351
1997	746	0	1,379	6,481	0	389	152	756	9,903

Appendix A42.-Knik Arm waters landlocked salmon catch by fishery, 1990-1997.

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
1995	415	184	336	8,446	0	1,053	0	1,718	12,152
1996	1,145		1,831	12,877	0	1,494	43	3,008	20,392
92-96 Mean	2,080	160	2,596	12,702	0	2,547	90	2,388	22,530
1997	1,893	0	2,443	13,989	0	1,396	152	1,640	21,513

Appendix A43.-Eastside Susitna River drainage landlocked salmon harvest and catch, 1977-1997.

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
1995	33	135
1996	11	65
92-96 Mean	183	482
1997	153	581



Appendix A44.-Northern Cook Inlet Management Area recreational rainbow trout harvest and catch, 1977-1997.

Appendix A45.-Knik Arm drainage rainbow trout harvest by fishery, 1977-1997.

Year	Little Susitna	Knik River[a]	Wasilla Creek	Cotton-wood Ck	Big Lake[b]	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[c]	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
1995	326	0	37	413	150	390	1,887	2,648	1,371	249	543	393		395		365	785	119	4,797	14,878
1996	130	0	36	250	82	926	2,553	5,706	1,884		241			59			806	210	9,671	22,554
92-96																				
Mean	332	0	52	393	329	633	2,201	4,335	1,936	285	465	755	887	406	588	748	1,590	128	7,613	21,888
1997	302	0	27	181	339	396	2,813	5,283	1,675	271	603	271	161	342	100	445	701	30	5,206	19,146

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

[c] Includes lakes and streams, 1977-1982.

Appendix A46.-Knik Arm drainage rainbow trout catch by fishery, 1990-1997.

Year	Little Susitna	Knik River[a]	Wasilla Creek	Cotton-wood Ck	Big Lake[b]	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
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
1996	344	0	36	1,208	188	2,086	5,465	22,431	6,232		276			759			2,302	453	27,491	69,271
92-96 Mean	1,390	0	135	1,822	1,343	1,654	6,157	19,327	5,088	517	1,482	1,346	1,504	1,138	1,116	2,413	4,383	275	22,665	70,120
1997	884	0	47	834	751	792	7,144	15,616	5,001	502	1,259	2,231	512	814	402	1,067	2,473	100	20,394	60,823

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

Appendix A47.-Eastside Susitna River drainage rainbow trout harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	351	250	0	56	79	28	285	0	0	287	442	1,360	3,138
1996	570	117	65	24	78	71	473	0	106	304	484	476	2,768
92-96 Mean	746	252	63	66	161	96	347	3	50	352	493	816	3,445
1997	0	154	114	20	178	151	0	0	20	181	464	596	1,878

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams, 1977-1982.

Appendix A48.-Eastside Susitna River drainage rainbow trout catch by fishery, 1990-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	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
1995	2,340	730	178	127	506	280	1,245	47	150	3,510	3,078	3,172	15,363
1996	5,014	1,116	723	24	538	424	2,941	0	200	6,219	3,329	3,206	23,734
92-96 Mean	3,833	1,165	502	136	680	988	2,106	38	183	5,136	3,288	3,318	21,374
1997	4,408	1,209	1,827	50	1,704	1,799	2,967	151	50	[illegible]073	2,701	3,795	25,734

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A49.-Westside Susitna River drainage rainbow trout harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	86	183		140	46	565	360		588	89	2,057
1996	95	505		138	227	613	48		539	85	2,250
92-96 Mean	143	403	24	113	136	458	150	0	650	210	2,267
1997	0	328		214	70	397	26		502	167	1,704

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A50.-Westside Susitna River drainage rainbow trout catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	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	25,339
1995	472	2,288		1,638	644	5,546	596	6,286	3,499	2,463	23,432
1996	173	4,493		485	714	7,665	468	12,213	3,682	179	30,072
92-96 Mean	767	3,859	142	528	594	7,646	644	8,372	2,834	1,204	26,589
1997	894	2,410		214	489	8,330	1,213	6,013	2,553	720	22,123

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A51.-West Cook Inlet drainage rainbow trout harvest by fishery, 1977-1997.

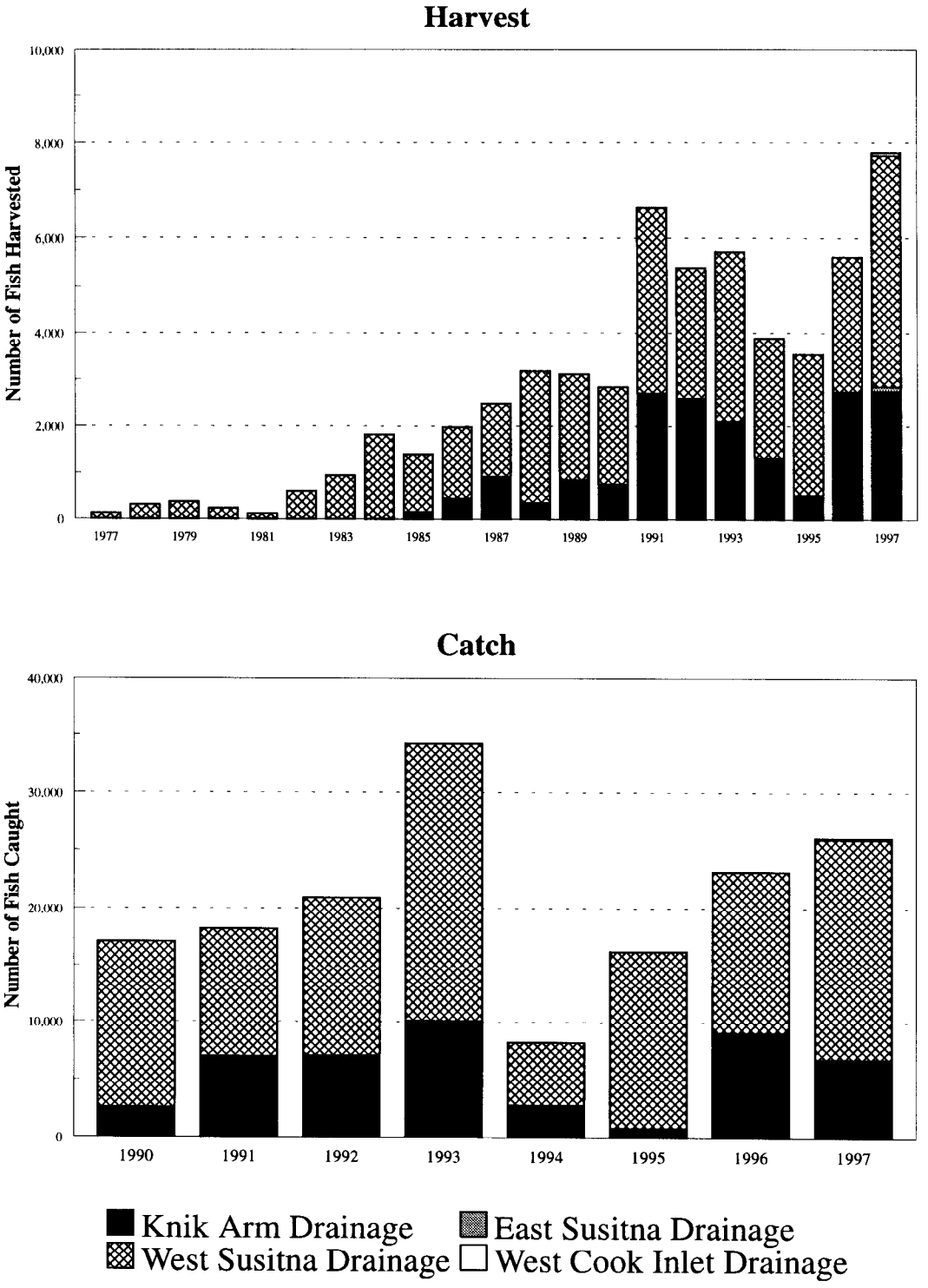
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	509	415	34		958
1978	443	226	54		723
1979	336	609	118		1,063
1980	301	250	9		560
1981	642	1,092			1,734
1982	199	199			398
1983	441	430			871
1984	424	274			698
1985	590	225	87		902
1986	67	145			212
1987	344	199	36		579
1988	218	382	18		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
1995	9	40		45	94
1996	244	61		12	317
92-96 Mean	86	38	0	44	169
1997	131	171	0	40	342

[a] Includes lakes and streams.

Appendix A52.-West Cook Inlet drainage rainbow trout catch by fishery, 1990-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	127	260		85	472
1996	852	264		177	1,293
92-96 Mean	436	308	69	135	893
1997	712	673	0	80	1,465

[a] Includes lakes and streams.



Appendix A53.-Northern Cook Inlet Management Area recreational northern pike harvest and catch, 1977-1997.

Appendix A54.-Knik Arm drainage northern pike harvest by fishery and total catch, 1985-1997.

Year	Little Susitna	Knik River[a]	Wasilla Creek	Cottonwood Creek	Big Lake[b]	Flathorn Lake	Nancy Lake[c]	Other[d]	Harvest Total	Catch Total
1985	0	0	0	0	0		156	0	156	
1986	0	0	0	0	0		458	0	458	
1987	0	0	0	0	0		924	0	924	
1988	0	0	0	0	0		364	0	364	
1989	0	0	0	0	0		863	0	863	
1990	0	0	0	0	0		754	0	754	2,593
1991	0	0	0	0	0		2,406	303	2,709	7,021
1992	0	0	0	0	0		2,101	504	2,605	7,097
1993	0	0	0	0	0		1,438	664	2,102	10,141
1994	0	0	0	0	0		789	539	1,328	2,816
1995	29	0	0	0	0		10	483	522	825
1996	0	0	0	0	0	1,035	1,396	310	2,741	9,169
92-96 Mean	6	0	0	0	0	1,035	1,147	500	1,860	6,010
1997	0	0	0	0	0	283	1,188	1,278	2,749	6,673

Note: Northern pike grouped with other fish prior to 1985.

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake and drainage streams.

[c] Nancy Lake complex lakes.

[d] Includes lakes and streams.

Appendix A55.-Westside Susitna River drainage northern pike harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek[a]	Trapper Lake	Other Streams[b]	Other Lakes[b]	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
1995	1,067	0	0	125	257	862	422	291	3,024
1996	627	0	0	140	262	1,130	635	71	2,865
92-96 Mean	926	16	0	86	474	731	427	309	2,968
1997	1,648	0	0	49	354	1,204	1,429	194	4,878

[a] Fish Lake drainage (Yentna River drainage).

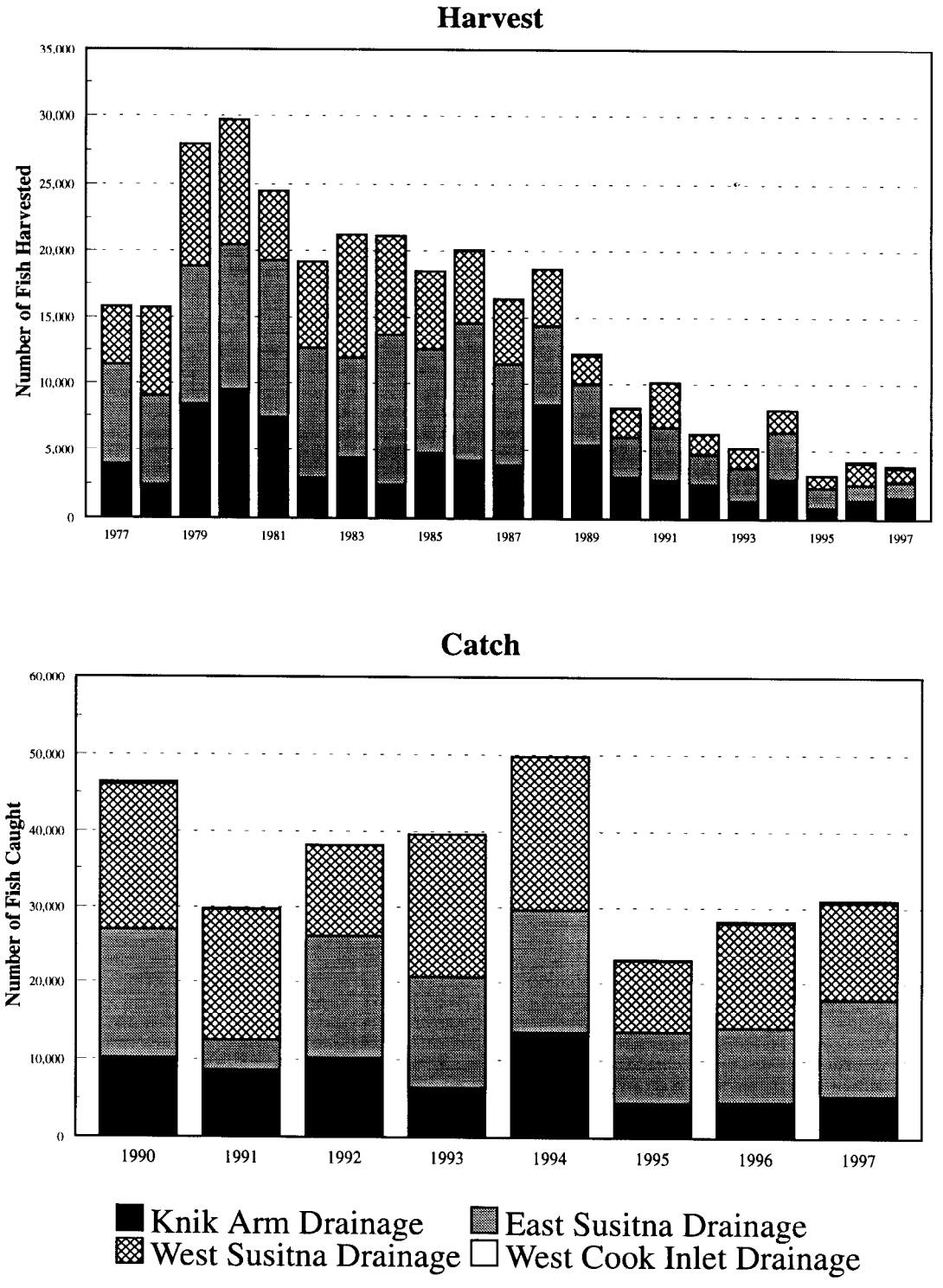
[b] May include harvest from West Cook Inlet waters.

Appendix A56.-Westside Susitna River drainage northern pike catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek[a]	Trapper Lake	Other Streams[b]	Other Lakes[b]	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
1995	7,651	0	0	334	1,288	2,359	2,862	920	15,414
1996	6,072	0	0	315	1,075	3,987	1,495	1,053	13,997
92-96 Mean	6,423	19	0	352	1,651	2,541	1,796	1,769	14,550
1997	10,654	0		133	1,129	2,674	3,926	593	19,109

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.



Appendix A57.-Northern Cook Inlet Management Area recreational Arctic grayling harvest and catch, 1977-1997.

Appendix A58.-Knik Arm drainage Arctic grayling harvest by fishery, 1977-1997.

Year	Little Susitna R.	Finger Lake	Kepler L. Complex	Bonnie Lakes	Nancy L. Complex	Other Streams[a]	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
1995	40	99	511	123	0	0	45	818
1996	28	180	738		0	296	196	1,438
92-96 Mean	134	133	842	182	32	128	388	1,802
1997	57	221	580	490	0	43	234	1,625

[a] Includes lakes, 1977-1982.

Appendix A59.-Knik Arm drainage Arctic grayling catch by fishery, 1990-1997.

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
1995	49	716	2,597	567	18	18	564	4,529
1996	28	616	3,048		0	502	458	4,652
92-96 Mean	295	564	5,091	601	77	239	1,110	7,856
1997	162	645	2,310	1,204	30	404	746	5,501

Appendix A60.-Eastside Susitna River drainage Arctic grayling harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	99	150	106	54	70	0	70	0	0	390	244	203	1,486
1996	205	121	0	0	0	56	93	0	0	206	261	149	1,091
92-96 Mean	339	145	66	30	164	37	79	13	4	376	602	255	2,130
1997	0	79	66	0	195	89	63	0	39	112	372	123	1,138

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams, 1977-1982.

Appendix A61.-Eastside Susitna River drainage Arctic grayling catch by fishery, 1990-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	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
1995	592	353	220	54	561	114	202	53	0	3,039	2,677	1,258	9,123
1996	896	683	341	0	281	429	234	0	0	2,751	1,612	2,309	9,536
92-96 Mean	1,348	551	286	240	545	340	227	104	123	3,455	3,580	2,241	13,040
1997	396	359	895	0	1,851	720	531	0	99	1,783	3,630	2,185	12,449

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A62.-Westside Susitna River drainage Arctic grayling harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	50	0			106	17	102	53	128		439	0	895
1996	19	75			28	234	332	0	317		553	0	1,558
92-96 Mean	47	66	45		27	193	299	24	201		509	45	1,420
1997	0	49	0	0	0	54	105	163	476	0	145	0	992

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A63.-Westside Susitna River drainage Arctic grayling catch by fishery, 1990-1997.

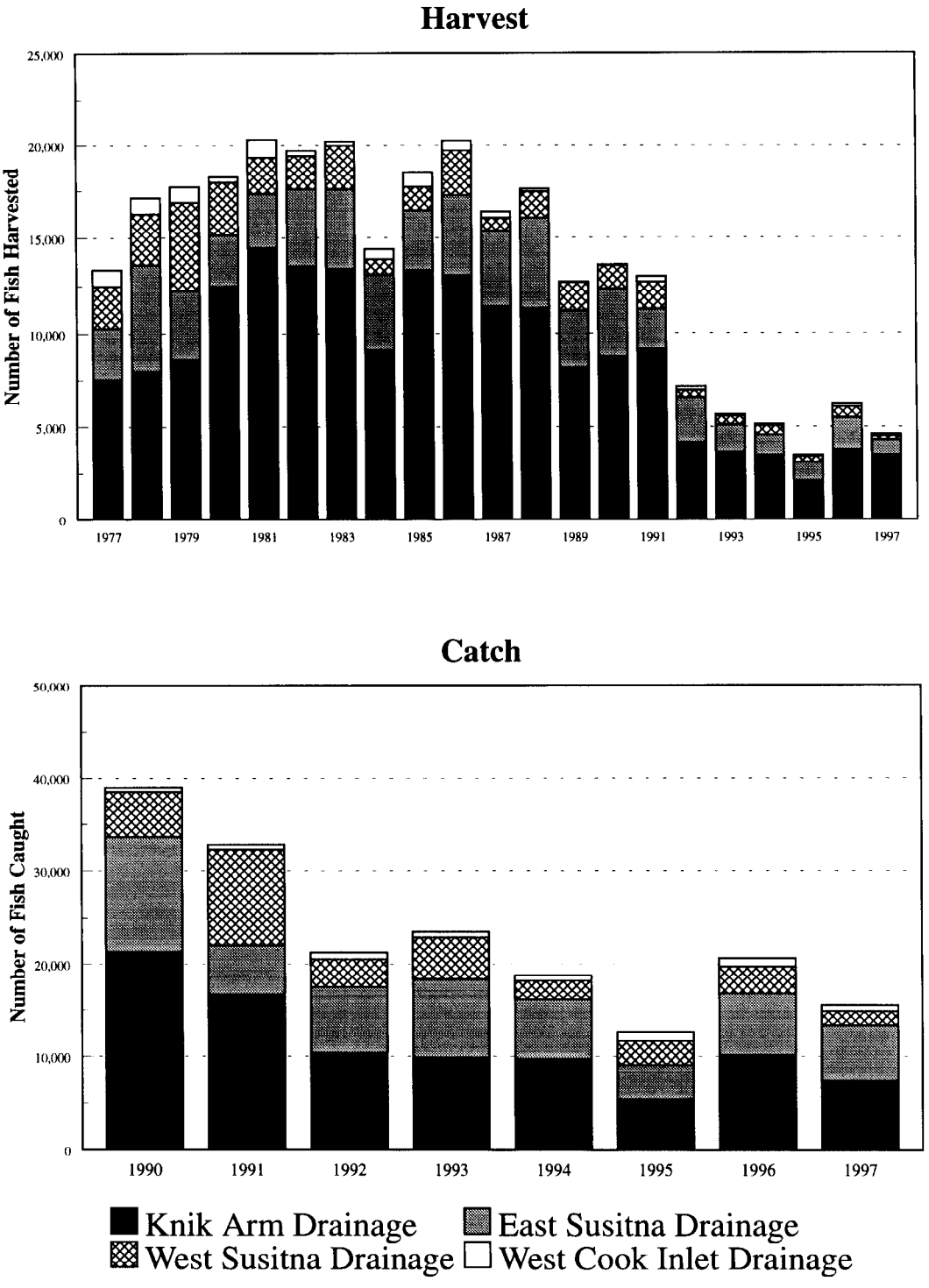
Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	Total
1990	893	909	0		0	505	8,656	0	6,467		1,650	51	19,131
1991	705	1,557	0		0	346	6,336	466	6,935	240	559	40	17,184
1992	248	594	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
1995	489	319			528	318	2,272	79	3,446		1,855	53	9,359
1996	49	561			28	692	1,869	131	7,426		2,732	327	13,815
92-96 Mean	267	624	218		111	512	5,272	130	5,136		2,533	192	14,821
1997	14	300	0	39	0	709	3,349	612	5,841	0	1,916	0	12,780

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A64.-West Cook Inlet drainage Arctic grayling harvest by fishery and total catch, 1977-1997.

Year	Chuitna River	Theodore River	Lewis River	Other	Harvest Total	Catch Total
1977	0	0	0		0	
1978	0	0	0		0	
1979	0	0	0		0	
1980	0	0	0		0	
1981	0	0			0	
1982	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
1995	0	0	0	0	0	176
1996	131	0		0	131	271
92-96 Mean	26	0	0	3	28	91
1997	138	0	0	0	138	304



Appendix A65.-Northern Cook Inlet Management Area recreational Dolly Varden/Arctic char harvest and catch, 1977-1997.

Appendix A66.-Knik Arm drainage Dolly Varden/Arctic char harvest by fishery, 1977-1997.

Year	Marine	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek[b]	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams[c]	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
1995	95	119	456	33	22	0	0	26	1,228	65	10	55	2,109
1996	20	122	1,082	476	0	0	20	39	1,340	83	111	517	3,810
92-96 Mean	26	244	636	153	159	27	69	24	1,693	82	109	241	3,465
1997	0	103	633	503	0	0	80	0	1,809	80	272	57	3,537

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage.

[c] Includes lakes and streams, 1977-1982.

Appendix A67.-Knik Arm drainage Dolly Varden/Arctic char catch by fishery, 1990-1997.

Year	Marine	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek[b]	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
1995	134	419	1,304	215	109	44	22	55	2,964	87	10	77	5,440
1996	61	233	3,665	618	101	203	41	78	3,819	304	444	606	10,173
92-96 Mean	48	770	1,809	334	279	201	112	48	4,551	200	339	438	9,131
1997	46	320	1,456	1,189	0	80	92	0	3,226	173	551	377	7,510

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage.

Appendix A68.-Eastside Susitna River drainage Dolly Varden/Arctic char harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	139	66	131	0	33	0	11	0	0	545	87	0	1,012
1996	182	51	80	0	10	10	61	0	0	1,091	101	101	1,687
92-96 Mean	186	60	59	5	50	26	34	12	0	955	82	40	1,508
1997	12	23	47	0	23	16	105	0	0	390	171	0	787

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams, 1977-1982.

Appendix A69.-Eastside Susitna River drainage Dolly Varden/Arctic char catch by fishery, 1990-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams	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
1995	172	174	164	0	197	0	85	0	0	2,765	109	0	3,666
1996	362	445	282	0	20	49	157	0	20	5,012	241	101	6,689
92-96 Mean	525	303	245	5	173	61	153	79	8	4,549	306	94	6,481
1997	184	69	699	0	436	105	366	0	0	3,627	412	0	5,898

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A70.-Westside Susitna River drainage Dolly Varden/ Arctic char harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	0	0	51	43	27	225		276	0	622
1996	0	30	20	59	20	213		231	0	573
92-96 Mean	9	13	18	33	20	123		250	47	513
1997	0	0	0	0	92	96	0	0	0	188

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A71.-Westside Susitna River drainage Dolly Varden/ Arctic char catch by fishery, 1990-1997.

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	10	0	70	114	37	1,550		796	0	2,577
1996	900	79	30	519	59	806		571	0	2,964
92-96 Mean	204	131	35	277	63	851		1,330	126	3,018
1997	36	70	0	288	138	379	0	617	0	1,528

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A72.-West Cook Inlet drainage Dolly Varden/Arctic char harvest by fishery, 1977-1997.

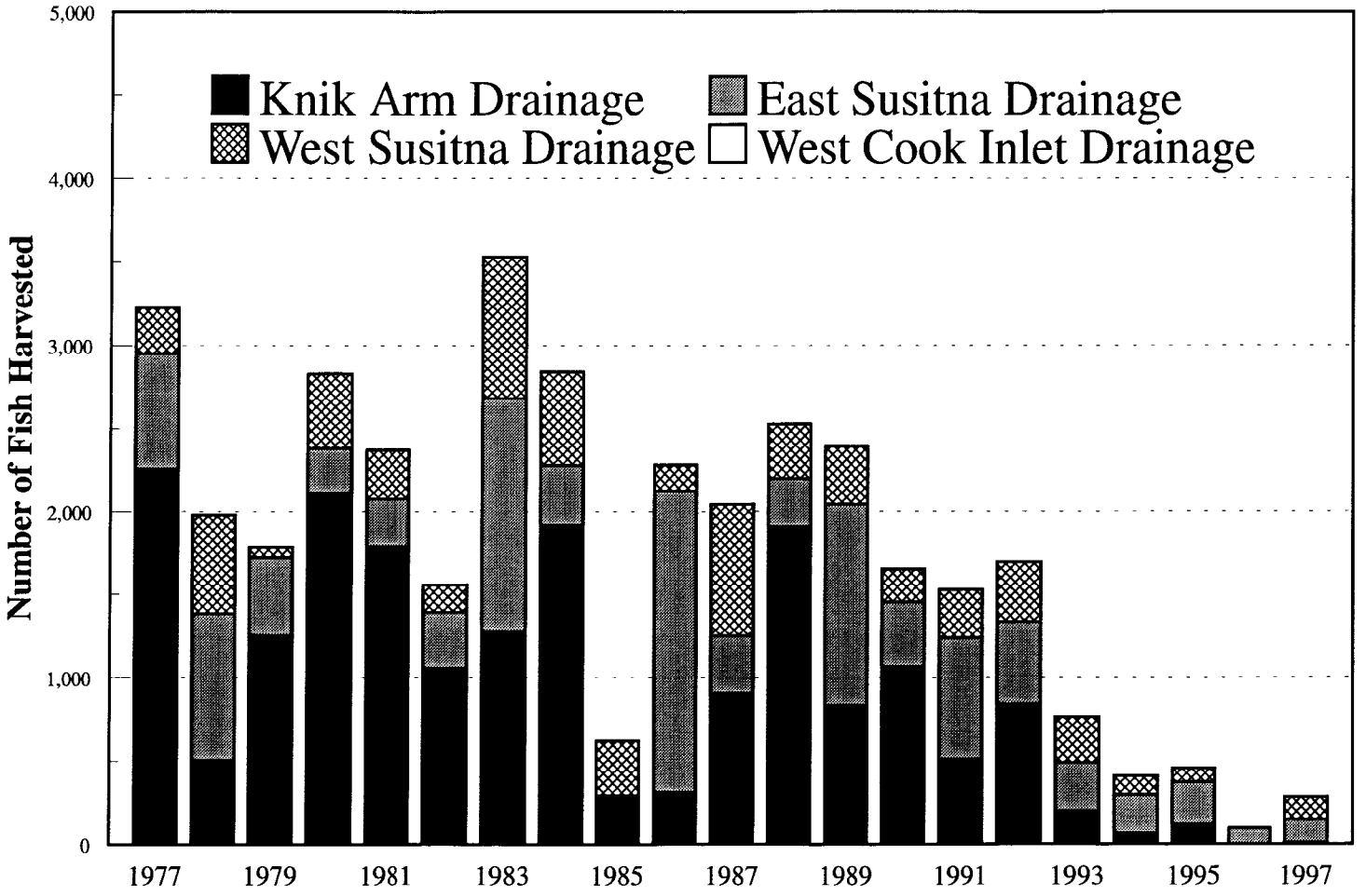
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	671	181	0		852
1978	461	353	27		841
1979	664	173	9		846
1980	146	129	0		275
1981	843	115			958
1982	304	0			304
1983	209	21			230
1984	511	12			523
1985	260	538	0		798
1986	235	302			537
1987	18	199	109		326
1988	164	0	0		164
1989	10	0	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
1995	50	19		19	88
1996	59	91		20	170
92-96 Mean	72	39	0	24	130
1997	114	0	0	12	126

[a] Includes lakes and streams.

Appendix A73.-West Cook Inlet drainage Dolly Varden/Arctic char catch by fishery, 1990-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	891	69		57	1,017
1996	685	164		30	879
92-96 Mean	535	152	0	83	771
1997	405	0	0	253	658

[a] Includes lakes and streams.



Appendix A74.-Northern Cook Inlet Management Area recreational lake trout harvest, 1977-1997.

Appendix A75.-Knik Arm drainage lake trout harvest by fishery, 1977-1997.

Year	Little Susitna R.	Big Lake Drainage[a]	Big Lake[b]	Nancy L. Complex	Other Lakes[c]	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
1995	0	0	0	0	118	0	118
1996	0	0	0	0	0	0	0
92-96 Mean	0	0	0	96	133	16	245
1997	0	0	0	0	0	9	9

[a] Big Lake drainage streams.

[b] Big Lake proper, not including drainage streams.

[c] Includes lakes and streams, 1977-1982.

Appendix A76.-Eastside Susitna River lake trout harvest, 1977-1997.

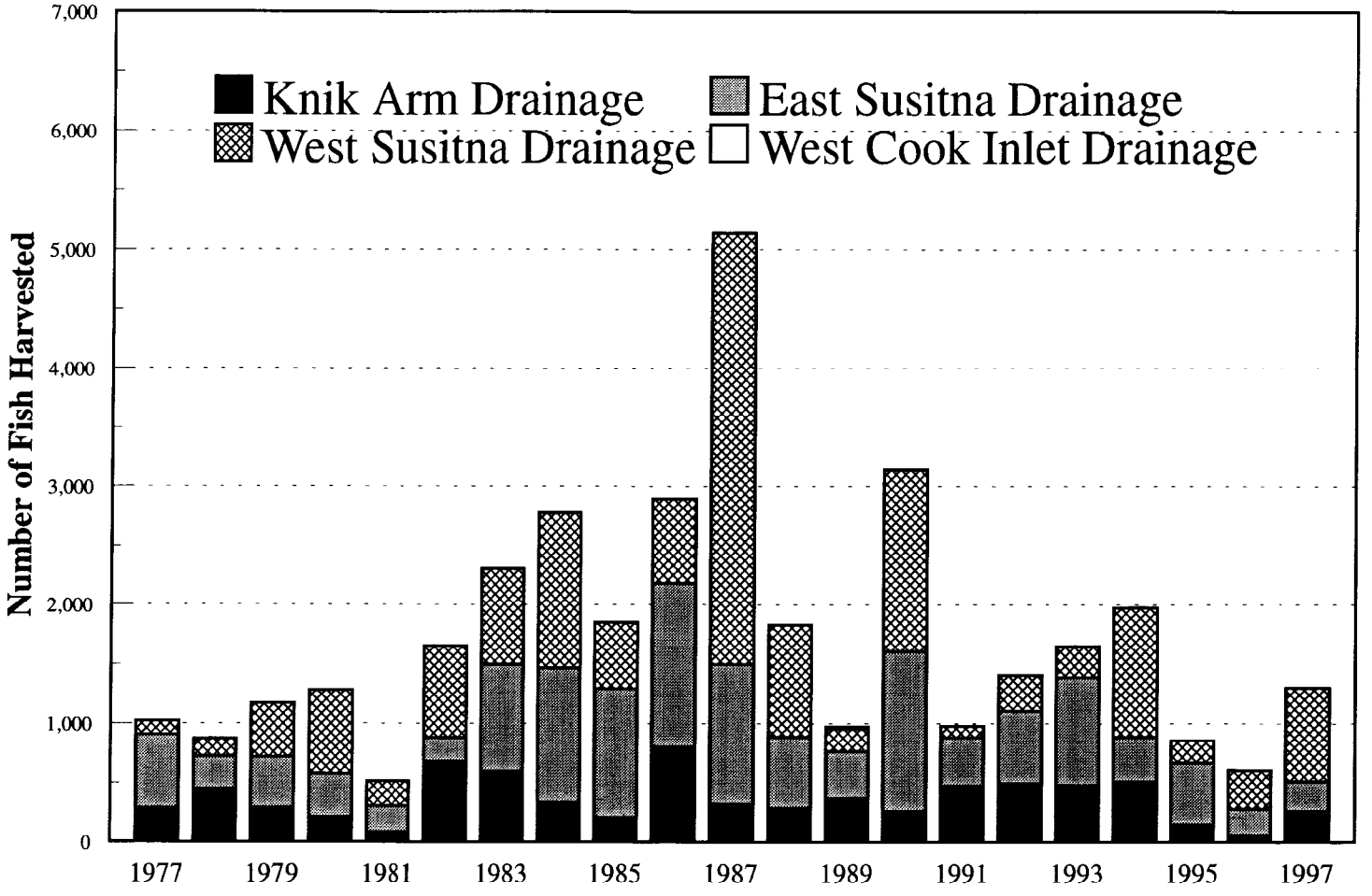
Year	Streams	Lakes	Total
1977		693	693
1978		877	877
1979		472	472
1980		267	267
1981		287	287
1982		335	335
1983	63	1,341	1,404
1984	25	337	362
1985	0	17	17
1986	218	1,598	1,816
1987	0	343	343
1988	0	291	291
1989	83	1,127	1,210
1990	17	370	387
1991	81	645	726
1992	39	456	495
1993	41	247	288
1994	4	228	232
1995	0	254	254
1996	0	95	95
92-96 Mean	17	256	273
1997	0	138	138

Appendix A77.-Westside Susitna River drainage lake trout harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes[a]	Shell Lake	Judd Lake	Other Streams[b]	Other Lakes[b]	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
1995	0	0	0	0	0			74	10	84
1996	0	0	0	0	0			0	0	0
92-96 Mean	0	8	0	15	7			68	69	167
1997	0	0	0	0	0	0	0	111	27	138

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.



Appendix A78.-Northern Cook Inlet Management Area recreational burbot harvest, 1977-1997.

Appendix A79.-Knik Arm drainage burbot harvest by fishery, 1977-1997.

Year	Little Susitna	Knik River[a]	Fish Creek[b]	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams[c]	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
1995	0	0	0	0	110	7	0	34	151
1996	0	0	0	0	44	19	0	0	63
92-96 Mean	31	0	49	0	164	56	0	41	342
1997	10	0	0	0	252	0	0	0	262

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage.

[c] Includes lakes and streams, 1977-1982.

Appendix A80.-Eastside Susitna River drainage burbot harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	0	0	0	115	0	0	63	11	69	122	34	103	517
1996	18	0	0	35	0	0	0	0	18	111	0	35	217
92-95 Mean	8	20	3	104	15	10	13	61	103	166	43	40	585
1997	0	0	0	21	33	0	31	42	31	31	0	63	252

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams, 1977-1982.

Appendix A81.-Westside Susitna River drainage burbot harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes[a]	Rabideux Creek	Other Streams[b]	Other Lakes[b]	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
1995	0	0	21	0	23		146	0	190
1996	0	0	0	64	18		248	0	330
92-96 Mean	2	40	37	22	55	76	252	13	436
1997	10	0	62	0	0	93	581	42	788

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A82.-Knik Arm drainage smelt harvest by fishery 1985-1997.

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
1995	0	0	0	0
1996	0	0	0	0
92-96 Mean	0	458	0	458
1997	0	0	0	0

Note: Smelt grouped with other fish prior to 1985.

Appendix A83.-Westside Susitna River drainage smelt harvest by fishery, 1985-1997.

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Other Streams[a]	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
1995	0	0	1,382	0	3,167	4,549
1996	0	0	657	0	657	1,314
92-96 Mean	76	539	1,312	47	5,520	7,493
1997	0	0	0	0	771	771

Note: Smelt grouped with other fish prior to 1985.

[a] May include harvest from West Cook Inlet waters.

Appendix A84.-Knik Arm drainage whitefish harvest by fishery, 1985-1997.

Year	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[b]	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
1995	44	18	0	0	0	0	0	9	0	0	0	71
1996	88	0	0	0	0	0	49	0	0	0	0	137
92-96 Mean	119	9	0	0	0	1	17	11	24	0	5	187
1997	21	50	0	0	0	21	0	0	0	0	0	92

Note: Whitefish grouped with other fish prior to 1985.

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

Appendix A85.-Eastside Susitna River drainage whitefish harvest by fishery, 1984-1997.

Year	Lt. Willow Creek	Willow Creek	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Sunshine Creek	Birch Creek	Talkeetna River[a]	Other Streams	Lakes	Total
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
1995	34	9	0	0	9	0	0	0	0	28	0	0	80
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
92-96 Mean	20	33	4	6	13	11	4	2	2	20	3	4	121
1997	0	0	0	0	100	0	0	0	0	0	0	0	100

Note: Whitefish grouped with other fish prior to 1984.

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A86.-Westside Susitna River drainage whitefish harvest by fishery, 1985-1997.

Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Lakes[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	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
1995	8	0	0	42	17	0	9	0	76
1996	0	35	0	9	31	0	0	0	75
92-96 Mean	23	138	25	58	40	0	71	11	365
1997	0	0	0	0	0	0	64	0	64

Note: Whitefish grouped with other fish prior to 1985.

[a] Fish Lake drainage (Yentna drainage).

[b] May include harvest from West Cook Inlet waters.

Appendix A87.-West Cook Inlet drainage whitefish harvest by fishery, 1985-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	0	0	0	0	0
1996	0	0	0	0	0
92-96 Mean	0	0	0	2	2
1997	0	0	0	0	0

Note: Whitefish grouped with other fish prior to 1985.

[a] Includes lakes and streams.

Appendix A88.-Knik Arm drainage other fish harvest by fishery, 1977-1997.

Year	Marine	Little Susitna	Knik River[a]	Eklutna Tailrace	Wasilla Creek	Cotton-wood Ck	Fish Creek[b]	Wasilla Lake	Big Lake	Nancy L. Complex	Other Streams[c]	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
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	44	44
92-96 Mean	31	82	28	7	0	52	0	0	15	0	0	24	239
1997	0	0	0	0	0	0	0	41	0	40	0	20	101

Note: includes smelt, whitefish and northern pike prior to 1985.

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage.

[c] Includes lakes and streams, 1977-1982.

Appendix A89.-Eastside Susitna River drainage other fish harvest by fishery, 1977-1997.

Year	Willow Creek	Little Willow	Kashwitna River	Caswell Creek	Sheep Creek	Goose Creek	Montana Creek	Birch Creek	Sunshine Creek	Talkeetna River[a]	Other Streams[b]	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
1995	0	0	0	0	0	0	10	0	0	51	0	0	61
1996	7	0	0	0	0	0	7	0	0	25	22	0	61
92-96 Mean	18	2	0	0	18	4	2	0	0	21	0	6	74
1997	46	0	0	0	0	0	39	0	0	39	64	0	188

Note: includes smelt, whitefish, and northern pike prior to 1984.

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams, 1977-1982.

Appendix A90.-Westside Susitna River drainage other fish harvest by fishery, 1977-1997.

Year	Alexander Creek	Deshka River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Lakes[b]	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
1995	20	0	0	0	0	0	0	0	20
1996	0	0	0	0	0	0	0	0	0
92-96 Mean	4	4	0	6	0	0	13	8	35
1997	0	0	0	0	0	0	0	25	25

Note: includes smelt, whitefish and northern pike prior to 1985.

[a] Fish Lake drainage (Yentna River drainage).

[b] May include harvest from West Cook Inlet waters.

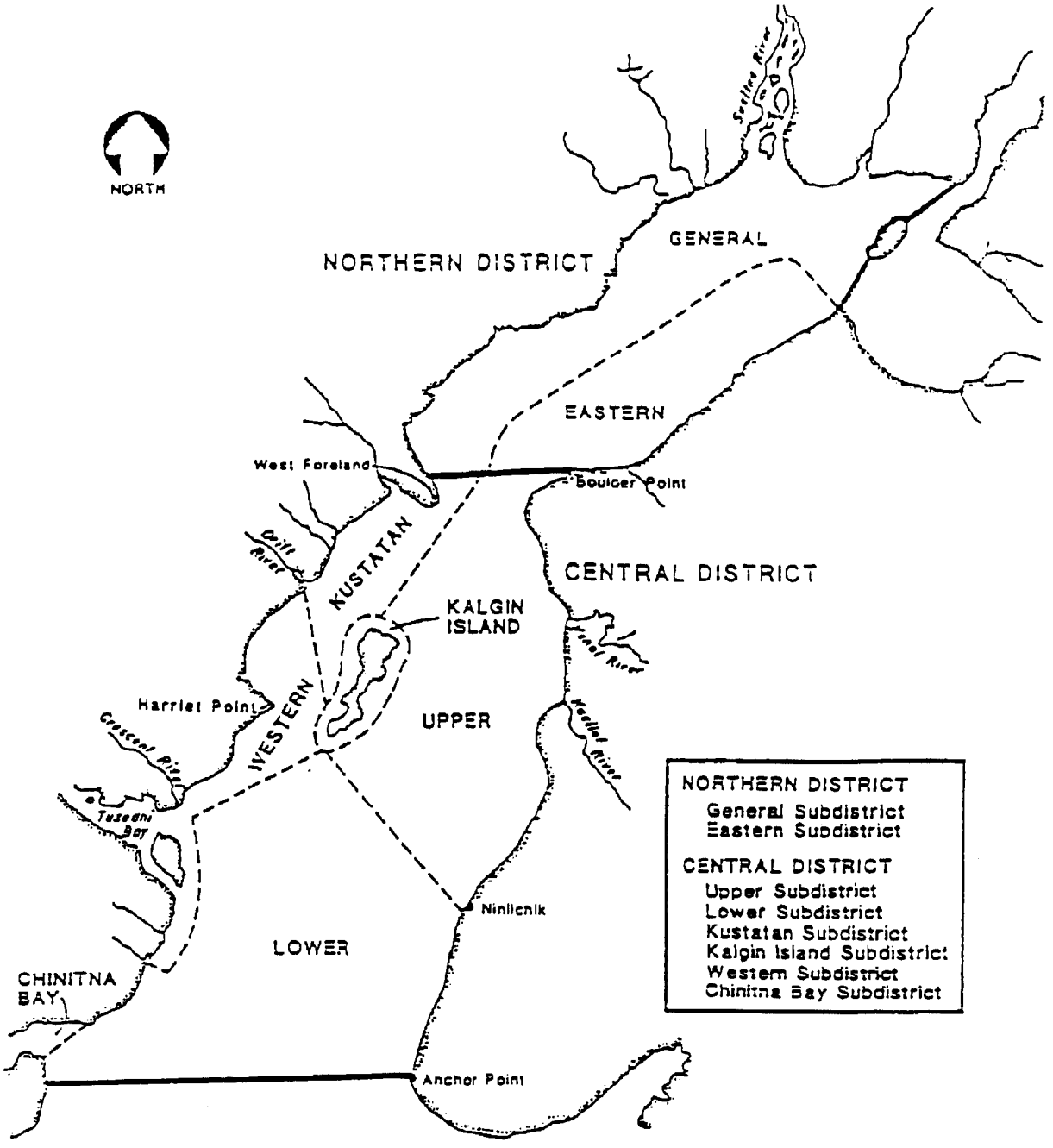
Appendix A91.-West Cook Inlet drainage other fish harvest by fishery, 1977-1997.

Year	Chuitna River	Theodore River	Lewis River	Other[a]	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
1995	0	0	0	0	0
1996	0	0	0	0	0
92-96 Mean	0	0	0	10	8
1997	0	0	0	0	0

Note: includes smelt, whitefish and northern pike prior to 1985.

[a] 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, 1977-1998.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	14,790	2,052,291	192,599	553,855	1,233,722	4,047,257
1978	17,299	2,621,421	219,193	1,688,442	571,779	5,118,134
1979	13,738	924,415	265,166	72,982	650,357	1,926,658
1980	13,798	1,573,597	271,418	1,786,430	390,675	4,035,918
1981	12,240	1,439,277	484,411	127,164	833,542	2,896,634
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	10,062	2,106,714	449,993	617,452	680,726	3,864,947
1985	24,088	4,060,429	667,213	87,828	772,849	5,612,407
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	349,139	10,450,191
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	500,634	603,630	351,197	5,075,630
1991	13,535	2,177,576	425,724	14,663	280,223	2,911,721
1992	17,171	9,108,340	468,911	695,859	274,303	10,564,584
1993	18,719	4,754,698	306,822	100,918	122,767	5,303,924
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	14,248	3,888,778	321,411	242,911	156,457	4,623,805
1997	13,235	4,176,696	152,404	70,928	103,036	4,516,299
Mean	19,683	3,973,825	436,721	482,126	576,809	5,489,165
1998	7,997	1,218,956	160,644	551,260	95,654	2,034,511

Appendix B3.-Upper Cook Inlet commercial salmon catch from the Central District driftnet fishery, 1977-1998.

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
1989	No fishery due to *Exxon Valdez* oil spill					
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	387	2,204,933	171,361	122,728	140,924	2,640,333
1997	636	2,115,883	71,517	29,655	79,444	2,297,135
Mean	1,365	2,283,413	218,835	250,174	524,748	3,278,535
1998	332	599,202	83,337	200,382	88,036	971,289

Appendix B4.-Upper Cook Inlet commercial salmon catch from the Central District western setnet fishery, 1977-1998.

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	208	24,137	12,082	293	1,285	38,005
1997	74	11,979	6,076	1,972	1,346	21,447
Mean	942	189,825	42,372	12,060	49,705	294,102
1998	25	19,874	10,328	456	2,019	32,702

Appendix B5.-Upper Cook Inlet commercial salmon catch from all northern districts (East and General [west] subdistricts), 1977-1998.

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	1,945	104,128	78,097	20,674	11,771	216,615
1997	1,122	95,432	35,657	4,291	7,622	144,124
Mean	4,744	137,777	95,079	76,558	40,078	354,231
1998	2,471	60,646	34,359	11,555	3,977	113,008

Appendix B6.-Upper Cook Inlet commercial salmon catch from the Northern District General (west) Subdistrict, 1977-1998.

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	1,842	80,984	61,653	18,427	11,455	174,361
1997	1,029	84,074	33,384	3,926	7,209	129,622
Mean	3,966	93,239	74,998	68,361	35,276	275,842
1998	1,741	42,314	23,159	6,812	3,662	77,688

Appendix B7.-Upper Cook Inlet commercial salmon catch from Northern District, Eastern Subdistrict, 1977-1998.

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	103	23,144	16,444	2,247	316	42,254
1997	193	11,358	2,276	365	413	14,605
Mean	776	44501	20051	8125	4795	78248
1998	730	18,332	11,200	4,743	315	35,320

Appendix B8.-Northern District commercial chinook salmon harvest by period, Cook Inlet, 1986-1998.

	Period[a]				Directed	NCI Season	UCI Season
Year	1	2	3	4	Total	Total	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	17,171
1993	1,191	1,735	116		3,042	3,277	18,719
1994	1,680	1,326			3,058	3,185	20,260
1995	3,837				3,837	4,130	17,857
1996	1,679				1,679	1,945	14,248
1997	994			51	1,045	1,222	13,235
Mean	2,578	3,023	2,356	466	6,538	7,376	22,153
1998[b]	1,283	881			2,164	2,471	7,997

[a] 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.

[b] Preliminary data.

Appendix B9.-Knik Arm commercial set gillnet harvest, 1987-1998.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1987	[a]	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	[a]	10,459	1,630	21	961	13,071
1992	[a]	10,748	1,817	573	1,289	14,427
1993	[a]	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	0	35,245	1,802	25	448	37,520
1997	1	13791	85	1	31	13,909
Mean	3	25,338	3,128	269	1,683	30,420
1998	0	2,597	548	0	105	3,250

[a] Not reported.

Appendix B10.-Marine sport harvest of chinook salmon from Lower Cook Inlet, 1980-1997.

	Lower Cook Inlet							
	Homer Area [a]		Seward Area [a]		Total [a]		Upper Cook Inlet [a]	
Year	Harvest	% Small [b]	Harvest	% Small [b]	Total	% Small [b]	Total	% Small [b]
1980 [c]	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 [c]	10,334		5,121		16,182		12,478	
1994	10,139		2,078		12,217		9,873	
1995	9,168		3,868		13,036		11,778	
1996	4,585		3,433		8,018		3,330	
1997	7,568		5,761		13,329		4,426	

[a] Mills 1981-1994 and Howe et al. 1995-1998.

[b] Chinook salmon less than 16 inches.

[c] Harvest not estimated by size in 1980 and after 1992.

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.

	Set Gill Nets		Beach Seines		Purse Seines		All Gear	
Year	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	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	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	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	49	21.7	20,460	13.7	22,574	14
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.

	Chignik Bay District 271		Central/Eastern District 272		Western District 273		Perryville District 275		Total	
Year	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	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	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
1985	1,802	23.9	57	19.8	21	18	0		1,880	23.7
1986	2,592	23.4	72	21.1	350	11.9	23	16.3	3,037	22
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	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 [a]	2,127	23.6	940	17.6	197	13	24	15.9	3,288	21.2
1992 [b]	3,181	21.3	2,191	14.3	4,300	6.6	1,160	9.1	10,832	12.7
1993 [c]	5,240	16.4	9,433	10.6	3,113	9.3	1,729	11.5	19,515	12
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	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).

[a] 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.

[b] 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.

[c] 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 B13.-Commercial harvest and hatchery contribution by release site for Northern District commercial chinook salmon, 1998.

	June 1, 1998			June 8, 1998			Total		
	Subdistricts			Subdistricts			Subdistricts		
	General (West)	Eastern	Total	General (West)	Eastern	Total	General (West)	Eastern	Total
Commercial Harvest	935	348	1,283	562	319	881	1,497	667	2,164
Number Sampled	804	278	1,082	469	218	687	1,273	496	1,769
proportion sampled	0.860	0.799	0.843	0.835	0.683	0.780	0.850	0.744	0.817
Estimated # Hatchery Fish in Harvest	41	43	84	6	14	20	47	57	104
Estimated Hatchery Contribution	0.044	0.124	0.066	0.010	0.044	0.015	0.031	0.086	0.048
by Release Site:									
Crooked Creek	0	7	7	0	0	0	0	7	7
proportion	0.000	0.019	0.005	0.000	0.000	0.000	0.000	0.010	0.003
Deception Creek	23	5	28	0	0	0	23	5	28
proportion	0.025	0.014	0.022	0.000	0.000	0.000	0.015	0.007	0.013
Eagle River	6	3	9	0	0	0	6	3	9
proportion	0.006	0.009	0.007	0.000	0.000	0.000	0.004	0.005	0.004
Ship Creek	12	28	40	6	14	20	18	42	60
proportion	0.013	0.081	0.031	0.010	0.044	0.015	0.012	0.064	0.028

APPENDIX C

Appendix C1.-Number of fish (actual and planned) stocked into Northern Cook Inlet Management Area waters, 1996-1999.

Species/Life Stage/Site	1996 (Actual)	1997 (Actual)	1998 (Actual)	1999 (Planned)
Chinook Salmon Anadromous Smolt				
Willow Creek	169,444	209,944	197,392	200,000
Total	169,444	209,944		200,000
Coho Salmon Anadromous Smolt				
Wasilla Creek Drainage	141,923	0	0	0
Cottonwood Creek Drainage	0	0	0	0
Little Susitna River Drainage	0	0	0	0
Big Lake Drainage	0	0	0	0
Eklutna Tailrace (Knik River)	69,176	69,475	111,070	110,000
Total	211,099	69,475	111,070	110,000
Coho Salmon Landlocked Fingerlings				
Barley Lake	1,860	1,860	1,875	1,860
Bear Paw Lake	4,500	4,277	4,614	4,500
Carpenter Lake	17,640	14,473	17,035	17,640
Christiansen Lake	17,900	18,562	17,900	17,900
Diamond Lake	13,900	11,087	13,900	13,900
Echo Lake	2,300	2,300	2,348	2,300
Johnson Lake	0	1,000	0	1,000
Kalmbach Lake	12,500	11,091	12,500	12,500
Klaire Lake	900	0	0	900
Knik Lake	5,000	3,846	5,357	5,000
Loberg (Junction) Lake	1,100	1,100	1,119	1,100
Memory Lake	8,300	6,751	8,300	8,300
Prator Lake	9,800	9,022	10,115	9,800
Rocky Lake	2,900	0	0	0
Victor Lake	2,700	2,700	2,713	2,700
Total	101,300	88,069	97,776	99,440
Chinook Salmon Landlocked subcatchables				
Finger Lake	36,204	36,027	27,573	36,000
Total	36,204	36,027	27,573	36,000
Rainbow Trout Landlocked Catchables				
Bruce Lake	0	0	500	1,700
Coyote Lake	198	500	500	500
Echo Lake	2,411	2,306	2,925	2,300
Irene Lake	1,990	1,800	1,800	1,800
Kepler/Bradley Lake	6,301	5,905	4,425	5,800
Knik Lake	2,463	2,599	2,539	2,500
Knob Lake	0	0	1,000	2,500
Loberg (Junction) Lake	1,140	1,092	980	1,100
Long Lake (Mile 86 Glenn Hwy.)	3,789	4,951	3,000	5,000
Lucille Lake	0	6,157[a]	5,143	7,050
Matanuska Lake	11,401	9,209	7,167	9,200
Meirs Lake	0	0	490	1,700
North Knob Lake	0	0	926	1,500

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Species/Life Stage/Site	1996 (Actual)	1997 (Actual)	1998 (Actual)	1999 (Planned)
Rainbow Trout Landlocked Catchables (continued)				
Ravine Lake	0	0	0	1,000
Rocky Lake	3,946	2,870	1,986	2,900
Slipper (Eska) Lake	456	900	952	900
South Rolly Lake	0	1,860	2,967	5,400
Tanaina Lake	0	1,880	1,265	5,450
Walby Lake	1,995	1,660	4,515	5,400
Weiner Lake	1,204	1,976	3,062	2,000
Willow Lake	0	0	0	4,000
Total	37,024	45,665	46,142	69,700
Rainbow Trout Landlocked Fingerlings				
Barley Lake	0	1,863	1,785	1,860
Bear Paw Lake	0	2,250	2,151	2,250
Bench Lake	0	1,200	0	1,700
Beverly Lake	4,352	4,200	4,003	4,200
Big No Luck Lake	6,809	5,000	0	6,800
Butterfly Lake	0	0	0	4,990
Carpenter Lake	17,244	17,620	15,876	17,640
Christiansen Lake	0	8,267	8,466	8,950
Cranberry Lake	0	0	0	6,350
Crystal Lake	13,170	11,000	12,500	13,170
Dawn Lake	2,360	2,360	2,297	2,360
Diamond Lake	13,900	13,909	13,205	13,900
Echo Lake (Big Lake Area)	0	0	0	8,850
Farmer Lake	1,100	1,113	1,047	1,100
Finger Lake	36,186	38,200	34,254	36,200
Florence Lake	5,460	5,454	5,187	5,460
Homestead Lake	1,700	1,700	1,677	1,700
Honeybee Lake	5,800	6,136	5,510	5,800
Ida Lake	4,589	4,640	4,408	4,640
Kalmbach Lake	12,644	12,530	11,875	12,500
Kashwitna Lake	16,000	12,000	14,675	16,000
Kepler/Bradley Lake	6,099	5,800	5,510	5,800
Lalen Lake	9,207	9,720	8,694	9,191
Little Beaver Lake	0	0	4,300	4,440
Little Lonely Lake	5,600	6,136	5,320	5,600
Long Lake (Kepler/Bradley)	7,485	7,440	7,068	7,440
Loon Lake	6,137	10,800	0	10,800
Lorraine Lake	13,218	13,204	13,882	13,200
Lucille Lake	36,654	0	0	0
Lynne Lake	7,067	5,812	6,749	7,000
Marion Lake	11,300	11,291	9,392	11,300
Memory Lake	0	4,150	3,942	4,150
Morvro Lake	8,660	0	4,300	4,500
North Friend Lake	8,150	8,140	7,733	8,140
Prator Lake	0	4,400	4,180	4,400

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Species/Life Stage/Site	1996 (Actual)	1997 (Actual)	1998 (Actual)	1999 (Planned)
Rainbow Trout Landlocked Fingerlings				
Ravine Lake	2,534	2,516	2,375	2,500
Reed Lake	1,954	1,950	1,813	1,950
Ruby Lake	4,810	0	0	2,400
Seventeenmile Lake	10,000	10,000	9,500	10,000
Seymour Lake	22,676	21,000	20,670	22,900
South Friend Lake	5,570	5,575	5,290	5,570
South Rolly Lake	10,615	0	0	0
Tanaina Lake	10,163	0	0	0
Threemile Lake	0	0	6,013	0
Tigger Lake	2,017	1,731	1,800	1,890
Twin Island Lake	15,119	0	15,101	15,100
Twelvemile Lake	0	0	0	5,600
Vera Lake	11,050	8,000	10,500	11,050
Visnaw Lake	12,271	12,722	11,772	13,070
Walby Lake	5,417	0	5,011	5,390
Weiner Lake	2,148	2,121	0	2,120
West Sunshine Lake	0	4,456	4,237	4,460
Willow Lake	14,490	0	12,900	7,150
Wishbone Lake	2,639	2,000	0	2,635
Wolf Lake	12,400	0	12,013	12,400
"X" Lake	5,055	4,675	4,925	5,055
"Y" Lake	3,970	3,679	3,771	3,970
Total	417,789	314,760	347,677	407,591
Arctic Grayling Landlocked Catchables				
Bruce Lake	0	0	475	500
Canoe Lake	0	0	783	800
Finger Lake	0	0	700	1,000
Kepler/Bradley Lake	0	0	750	800
Meirs Lake	0	0	430	500
Reed Lake	0	0	350	500
Total	0	0	3,488	4,100
Arctic Grayling Landlocked Fingerlings				
Bruce Lake	2,700	0	0	2,700
Canoe Lake	4,200	0	0	4,200
Finger Lake	20,000	0	0	18,100
Florence Lake	5,460	0	0	0
Kepler/Bradley Lake	5,800	0	0	5,800
Knik Lake	2,500		0	0
Lorraine Lake	13,200	0	0	0
Meirs Lake	3,400	0	0	3,400
Reed Lake	1,950	0	0	0
Seventeenmile Lake	10,000	0	0	0
"Y" Lake	3,900	0	0	0
Total	83,710	0	0	34,200

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Species/Life Stage/Site	1996 (Actual)	1997 (Actual)	1998 (Actual)	1999 (Planned)
Arctic Char Landlocked Catchables				
Benka Lake	0	0	752	0
Finger Lake	0	0	1,144	0
Irene Lake	0	0	750	0
Lynne Lake	0	0	513	0
Marion Lake	0	0	510	0
Matanuska Lake	0	0	1,047	0
Seventeenmile Lake	0	0	500	0
Total	0	0	5,216	0
Arctic Char Landlocked Fingerlings				
Benka Lake	12,300	0	0	12,300
Finger Lake	36,200	5,011	0	36,200
Irene Lake	1,800	0	0	1,800
Lynne Lake	7,000	0	0	7,000
Marion Lake	11,300	0	0	11,300
Matanuska Lake	3,100	0	0	3,100
Seventeenmile Lake	0	0	0	10,000
Total	71,700	5,011	0	81,700
Lake Trout Landlocked Fingerlings				
Long Lake (Mile 86 Glenn Hwy.)	10,600	0	3,092	0
Total	10,600	0	3,092	0
Total Anadromous Stockings	380,543	279,419	308,462	310,000
Total Landlocked Stockings	747,727	489,532	530,964	732,731
Total Stockings	1,128,270	768,951	839,426	1,042,731

APPENDIX D

Appendix D1.-Emergency orders issued for NCIMA waters during 1991-1998.

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.

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 emergency order 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.

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.

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. 2-S-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.

Emergency Orders issued in 1997:

1. E. O. No. 2-KS-2-15-97 opened the Deshka River, from the mouth to approximately 2 miles upstream and within a one-quarter mile radius of the Susitna River confluence, to fishing for king salmon over 16 inches in length from 6:00 a.m. through 11:00 p.m. daily through July 13, 1997.
2. E. O. No. 2-KS-2-18-97 opened eastside Susitna River streams to king salmon fishing on July 4, 1997.
3. E. O. No. 2-RS-2-25-97 closed Fish Creek dipnetting from 11:00 a.m. July 23 through 11:00 p.m. July 25, 1997.
4. E. O. No. 2-RS-2-28-97 closed Fish Creek dipnetting for the remainder of the 1997 season on July 26, 1997.
5. E. O. No. 2-SS-02-31-97 prohibited use of bait and reduced daily bag and possession limit of coho to one in all waters of Cook Inlet on August 9, 1997. Areas not included were Eklutna Tailrace, Ship, Bird, and Campbell creeks.

6. E. O. No. 2-SS-2-34-97 closed Wasilla Creek downstream from the railroad bridge, including Rabbit Slough and Spring Creek, to sport fishing August 23 through October 31, 1997.

Emergency Orders issued in 1998:

1. E.O. No. 2-KS-2-08-98 establishes that in the Deshka River when an angler harvests a king salmon 16 inches or more in length they must quit fishing for king salmon for the remainder of the day clarifying a regulation that went into effect when the Deshka River was opened to king salmon fishing for the 1998 season.
2. E.O. No. 2-KS-2-09-98 opens Willow Creek for king salmon fishing June 20-22, 1998.
3. E.O. No. 2-KS-2-12-98 adds Friday July 3 as a day open to king salmon fishing in that portion of the Susitna River drainage upstream from its confluence with the Deshka River to its confluence with the Talkeetna River including Susitna River tributaries from Willow Creek to Trapper Creek.
4. E.O. No. 2-KS-2-14-98 closes the Deshka River to all fishing 1,200 feet downstream and 300 feet upstream of the fish counting weir.
5. E.O. No. 2-RS-2-15-98 closes Fish Creek to dipnetting effective July 25, 1998 through July 31, 1998.

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.

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 limits were 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.

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 waters 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 limits in the Susitna River and Little Susitna River drainages have 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.

The Alaska Board of Fisheries convened in Anchorage, Alaska during November 11-17, 1996. A brief summary of regulatory changes affecting the Susitna-West Cook Inlet Area chinook salmon fisheries as adopted by the Board of Fisheries follows.

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. (3) The harvest shall not exceed 12,500 king salmon.
2. (8) The season closes on June 24, unless closed earlier by emergency order.
3. (9) The number of regular periods shall be determined by the department based on preseason expectations of king salmon run strength.
4. (10) 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. (11) 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. (12) In addition to (11) 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:

- The Alexander Creek drainage is open to the retention (harvest) of king salmon from January 1 through June 30 downstream from an ADF&G regulatory marker at Granite Creek.

5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

- 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.

5 AAC 61.035. Methods and Means:

- 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 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.

5 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

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 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.
2. 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.
3. 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 AAC 61.020. Bag Limits, Possession Limits, and Size Limits:

- The bag and possession limit of king salmon 16 inches or more in length taken from the Little Susitna River drainage is 1 fish per day and in possession.

During 1997 the Deshka River was open to king salmon fishing on June 21 though July 13. Fishing was limited to the lower 2 miles of river and all chinook salmon regulations applying to the Susitna River from its mouth to its confluence with the Deshka River were in effect for the Deshka River.

In 1998 the Deshka River was open to king salmon fishing from its confluence with the Susitna River upstream 5 miles to a Department marker. The seasonal bag limit for king salmon over 16 inches from the Deshka River was set at 2. In addition, all chinook salmon regulations applying to the Susitna River from its mouth to its confluence with the Deshka River were in effect for the Deshka River.

APPENDIX F

Appendix F1.-Board of Fisheries NCIMA regulatory changes made during the November 1992, October 1994, March 1996, November 1996, October 1997 and October 1998 meetings.

1993 Season

King Salmon 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:

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.

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 emergency order 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 emergency order 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;
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 emergency order 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.

1995 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 drainage 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.

1996 Season

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.
3. The Skwentna River Personal Use Management Plan was established. Salmon, other than chinook salmon, may be taken as follows:

    a. A permit is required which shall be returned to ADF&G with the harvest recorded;

    b. 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, Wednesday and Friday;

    c. Only with a fish wheel as follows: (a) each fish wheel must be equipped with a livebox; the livebox 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;

d. 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;

e. 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;

f. The provisions of this plan do not apply after December 31, 1999.

1997 Season

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 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 above, if at least 90% of the biological escapement goal for the Chuitna River has not been met during the 1997 season; the Chuitna 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 an ADF&G regulatory marker at Granite Creek.

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 limits of king salmon 16 inches or more in length taken from the Little Susitna River drainage are 1 fish per day and 1 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 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.

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 2 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.

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, Grays 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, Grays 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 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.

3. The bag and possession limits for rainbow trout in all flowing waters and nonstocked lakes of the Susitna West-Cook Inlet Area open to the retention of rainbow trout are 2 rainbow trout of which 1 may be over 20 inches in length and the bag and possession limits in stocked lakes are 5 rainbow trout of which 1 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 3 fish per day and in possession.

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.

October 1997 BOF meeting

A petition to open the Deshka River to king salmon fishing was presented to the Board by the public. The Board delegated authority to the Commissioner of the Department of Fish and Game to open the Deshka River to king salmon fishing in 1998 with regulation guidelines. The first 5 miles of river were opened and a seasonal bag limit was set at 2 fish. Additionally, those regulations applying to the Susitna River from its mouth to its confluence with the Deshka River were applied to the Deshka River.

October 1998 BOF meeting

The Alaska BOF convened in Wasilla, Alaska during October 1998. A brief summary of regulatory changes affecting the Susitna-West Cook Inlet Area as adopted by the BOF follows.

Resident Finfish

1. Action resulted in a change to the Big Lake Arctic char bag and possession limits and established minimum size limit. The bag and possession limits changed in Big Lake from 2 per day 2 in possession to 1 per day 1 in possession with a minimum length requirement of 20 inches. Also, a special provision was established that requires the use of unbaited, single-hook, artificial lures from November 1 through April 30.
2. Action resulted in allowing the retention of 1 rainbow trout under 16 inches in length per day and in possession upstream of the Parks Highway bridge on Willow Creek. Downstream of the Parks Highway bridge rainbow trout may not be possessed or retained.
3. Action resulted in allowing the use of bait and provides for the retention of rainbow trout in the Willow Creek drainage lakes. The bag and possession limits in Shirley, Long, and Rainbow lakes are 2 per day and 2 in possession with only 1 over 20 inches in length. The bag and possession limits in Willow and Crystal lakes is 5 per day and 5 in possession with only 1 over 20 inches in length.
4. Action resulted in prohibiting the retention of rainbow trout in Canyon Creek and established special provisions allowing only the use of single-hook, unbaited, artificial lures in Canyon Creek.
5. Action resulted in prohibiting the retention of rainbow trout in flowing waters of West Cook Inlet and the Susitna River drainage from April 15th to June 14th. This regulation applies to all flowing waters in these areas including Willow Creek.
6. Established a slot limit for northern pike in Alexander and Trappers lakes. No bag and possession limits are in effect for pike less than 22 inches in length. Northern pike between 22 inches and 30 inches in length may not be retained. The bag and possession limits for pike 30 inches or greater in length are 1 per day and 1 in possession. Additionally, the action

taken for Alexander and Trappers lakes reduced the number of lines allowed when fishing through the ice for northern pike from 5 lines to 2 lines, and prohibited the use of spears and bow and arrows for taking of northern pike.

7. Action resulted in allowing the use of bow and arrow for taking northern pike in NCI waters.
8. Action resulted in eliminating the ¾ inch single-hook size restriction when fishing through the ice on select northern Cook Inlet lakes where 5 lines are allowed.
9. Action resulted in establishing a Dolly Varden size restriction. The regulation now allows for the retention of only 1 Dolly Varden greater than 12 inches in length to be retained per day. The bag limit remains 5 fish per day, with 5 in possession for all NCI and Anchorage area flowing water.

APPENDIX G

Appendix G1.-Northern Cook Inlet Management Area northern pike waters.

Susitna Basin Lakes

Alexander Creek

1. Alexander Lake
2. Sucker Lake
3. Trail Lake
4. Rabbit Lake

Lower Susitna

1. Flathorn Lake
2. Figure 8 Lake

Mid Susitna

1. Witsoe Lake
2. Witsol Lake
3. Lockwood Lake
4. Lady Slipper
5. Unnamed
6. Unnamed
7. Unnamed
8. Vern Lake
9. Ding Dong

Yentna River

1. Whiskey Lake
2. Bulchitna Lake
3. Fish Creek Lake 1
4. Fish Creek Lake 2
5. Fish Creek Lake 3
6. Fish Creek Lake 4
7. Donkey Lake
8. Hewitt Lake
9. No Name (Big Bend)
10. Chelatna Lake
11. Cabin Lake (Big Bend)
12. Pear Lake (Up. Skwentna)
13. Stickleback Lake

Skwentna River

1. Eight Mile Lake
2. Seven Mile Lake
3. No Name (Herk Strip)
4. One Stone Lake

Deshka River

1. Parker Lake
2. Trapper Lake
3. No Name Lake
4. Ambler Lake
5. Rocky Lake
6. Neil Lake
7. Kroto Lake
8. No Name 1mi SW Parker
9. No Name 2 mi SW Parker

Upper Susitna

1. Kashwitna Lake*
2. Caswell Lake*
3. Fish Lake*
4. Sawmill Lake*
5. Swan Lake

Nancy Lake Area

1. Redshirt Lake
2. Lynx Lake
3. Cow Lake
4. Little Chicken
5. South Rolly Lake
6. North Rolly Lake
7. Tanaina Lake
8. Milo Lake
9. Frazer Lake
10. Little Frazer Lake
11. James Lake
12. Owl Lake
13. Char Lake
14. Ardaw Lake
15. Phoebe Lake
16. Chicken Lake
17. Echo Pond #1
18. Echo Pond #2
19. Echo Pond #3
20. Candle Stick Lake
21. Bains Pond #1
22. Bains Pond #2
23. Bains Pond #3

Susitna Tributaries

1. Fish Creek (Flathorn)
2. Fish Creek (Kroto)
3. Lake Creek
4. Fish Lake Creek
5. Alexander Creek
6. Trappers Creek
7. Sucker Creek
8. Montana Creek
9. Rolly Creek
10. Moose Creek
11. Bottle Creek
12. Hewitt Creek
13. Donkey Creek
14. Indian Creek (Yentna)
15. Indian (Chulitna)*
16. Rabideux Creek
17. Fish Lake Creek
18. Kutna Creek (Yentna)
19. Shell Creek
20. Eightmile Creek
21. Caswell Creek
22. Witsoe Creek
23. Trapper (Talkeetna)*
24. Talachulitna Creek*
25. Johnson Creek
26. Otter Creek
27. Unnamed (Lower Su)
28. Sunshine Creek*
29. Anderson Creek*
30. Wiggel Creek*
31. Birch Creek*
32. Yentna River
33. Skwentna River
34. Chulitna River*
35. Tokositna
36. Deshka River

Knik Arm Drainages

1. Little Susitna
2. Swan Lake*
3. Jim Lake
4. Knik Lake
5. Fish Creek (Big Lake)
6. Meadow Creek (Big Lake)
7. Mink Creek
8. Fire Creek

West Cook Inlet

1. Chuit River
2. Chuitbunga Lake
3. Threemile Creek
4. Tukallah Lake
5. Nikolai River

Anchorage Lakes

1. Sand Lake
2. Delong Lake
3. Lower Fire Lake
4. Upper Fire Lake

Mat-Valley Lakes

1. Crystal Lake
2. Long Lake
3. Rainbow Lake*
4. Memory Lake
5. Finger Lake
6. Horseshoe Lake (Little-Su)

* Reported but not confirmed northern pike populations

APPENDIX H

Appendix H1.-Deshka River weir daily counts, 1998.

	Chinook				Coho				Sockeye		Chum		Pink	
Date	Daily	Total	% F[a]	N[b]	Daily	Total	Inspt	Clips	Daily	Total	Daily	Total	Daily	Total
16-Jun	157	157	0	0										
17-Jun	343	500	60	20										
18-Jun	1,009	1,509	65	20										
19-Jun	1,082	2,591	45	20										
20-Jun	3,518	6,109	57	30										
21-Jun	692	6,801	60	20										
22-Jun	537	7,338	50	20										
23-Jun	188	7,526	55	20										
24-Jun	1,609	9,135	48	25										
25-Jun	264	9,399	75	20										
26-Jun	179	9,578	60	30										
27-Jun	1,321	10,899	50	20										
28-Jun	1,035	11,934	50	20										
29-Jun	183	12,117	47	30										
30-Jun	861	12,978	55	20										
1-Jul	343	13,321	50	10										
2-Jul	43	13,364	0	0										
3-Jul	88	13,452	33	3										
4-Jul	71	13,523	50	2										
5-Jul	466	13,989	33	9										
6-Jul	179	14,168	33	3									6	6
7-Jul	6	14,174	50	2										
8-Jul	33	14,207	50	2	1	1	1	0						
9-Jul	25	14,232	57	7	3	4	1	0						
10-Jul	76	14,308	63	8	6	10	3	0					1	7
11-Jul	19	14,327	60	10	0	10	0	0					1	8
12-Jul	163	14,490	67	3	3	13	2	0					3	11
13-Jul	12	14,502		0	7	20	3	0					8	19
14-Jul	2	14,504		0	4	24	4	0					4	23
15-Jul	247	14,751		0	22	46	22	0					173	196
16-Jul	4	14,755		0	4	50	4	0					100	296
17-Jul	10	14,765		0	32	82	32	0			250	250	273	569
18-Jul	23	14,788		0	18	100	18	0	2	2	0	250	1,347	1,916
19-Jul	84	14,872		0	112	212	112	0	0	2	0	250	7,411	9,327
20-Jul	22	14,894		0	158	370	158	0	0	2	0	250	24,744	34,071
21-Jul	23	14,917		0	170	540	170	0	0	2	0	250	38,643	72,714
22-Jul	55	14,972		0	184	724	184	0	3	5	0	250	35,117	107,831

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	Chinook				Coho				Sockeye		Chum		Pink	
Date	Daily	Total	% F	N	Daily	Total	Inspt	Clips	Daily	Total	Daily	Total	Daily	Total
23-Jul	38	15,010		0	119	843	119	0	5	10	0	250	19,800	127,631
24-Jul	30	15,040		0	229	1,072	229	0	4	14	0	250	15,436	143,067
25-Jul	18	15,058		0	411	1,483	411	0	3	17	0	250	46,081	189,148
26-Jul	2	15,060		0	698	2,181	698	0	22	39	0	250	31,400	220,548
27-Jul	68	15,128		0	2,099	4,280	2,099	0	15	54	0	250	18,855	239,403
28-Jul	6	15,134		0	224	4,504	224	0	10	64	0	250	10,704	250,107
29-Jul	12	15,146		0	187	4,691	187	0	5	69	0	250	15,320	265,427
30-Jul	2	15,148		0	90	4,781	90	0	0	69	0	250	23,254	288,681
31-Jul	2	15,150		0	105	4,886	105		1	70	0	250	47,282	335,963
1-Aug	3	15,153		0	150	5,036	150	0	6	76	0	250	58,767	394,730
2-Aug	33	15,186		0	137	5,173	137	0	4	80	0	250	52,364	447,094
3-Aug	28	15,214		0	163	5,336	163	0	2	82	0	250	44,910	492,004
4-Aug	20	15,234		0	167	5,503	167	0	10	92	0	250	26,157	518,161
5-Aug	43	15,277		0	193	5,696	193	0	8	100	1	251	14,431	532,592
6-Aug	19	15,296		0	166	5,862	166	0	2	102	0	251	8,463	541,055
7-Aug	0	15,296		0	224	6,086			0	102	0	251	386	541,441
8-Aug	weir under water													
9-Aug	weir under water													
10-Aug	weir under water													
11-Aug	weir under water													
12-Aug	weir under water													
13-Aug	11	15,307		0	133	6,219			1	103	0	251	113	541,554
14-Aug	30	15,337		0	110	6,329			0	103	0	251	0	541,554
15-Aug	33	15,370			106	6,435			0	103	0	251	175	541,729
16-Aug	18	15,388		0	42	6,477			0	103	0	251	93	541,822
17-Aug	2	15,390		0	20	6,497			0	103	0	251	30	541,852
18-Aug	4	15,394		0	11	6,508			0	103	0	251	23	541,875
19-Aug	13	15,407		0	21	6,529			0	103	0	251	31	541,906
20-Aug	1	15,408		0	0	6,529			0	103	1	252	2	541,908
21-Aug	0	15,408		0	8	6,537			0	103	0	252	2	541,910
22-Aug	0	15,408		0	0	6,537			0	103	0	252	0	541,910
23-Aug	weir under water													
24-Aug	weir under water													
25-Aug	weir under water													
26-Aug	0	15,408		0	9	6,546			0	103	1	253	11	541,921

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	Chinook				Coho				Sockeye		Chum		Pink	
Date	Daily	Total	% F	N	Daily	Total	Inspt	Clips	Daily	Total	Daily	Total	Daily	Total
27-Aug	0	15,408		0	9	6,555			0	103	0	253	5	541,926
28-Aug	0	15,408		0	3	6,558			0	103	1	254	4	541,930
29-Aug	0	15,408		0	10	6,568			0	103	0	254	5	541,935
30-Aug	0	15,408		0	14	6,582			1	104	0	254	4	541,939
31-Aug	0	15,408		0	112	6,694			0	104	0	254	3	541,942
1-Sep	0	15,408		0	16	6,710			1	105	0	254	1	541,943
2-Sep	1	15,409		0	17	6,727			0	105	3	257	3	541,946
3-Sep	0	15,409		0	13	6,740			0	105	3	260	0	541,946
4-Sep	0	15,409		0	16	6,756			1	106	2	262	0	541,946
5-Sep	0	15,409		0	0	6,756			0	106	2	264	0	541,946
6-Sep	0	15,409		0	17	6,773			1	107	0	264	0	541,946

[a] Percent female

[b] Sample size

Appendix H2.-Fish Creek weir counts, 1998.

	Sockeye			Coho					Water	
	Adult	Jack[a]	Total			Pink	Chum	Other	Stage	Temp
Date	Daily	Daily		Daily	Total	Daily	Daily	Fish	(ft)	(C)
7-Jul	0	0	0	0	0					
8-Jul	0	0	0	0	0					
9-Jul	0	0	0	0	0					
10-Jul	0	0	0	0	0					59.0
11-Jul	0	0	0	0	0					
12-Jul	0	0	0	0	0				1.50	59.0
13-Jul	241	15	256	0	0				1.50	59.0
14-Jul	311	10	577	0	0				1.50	59.0
15-Jul	71	2	650	0	0				1.58	61.0
16-Jul	0	0	650	0	0				1.76	64.0
17-Jul	11	0	661	0	0				1.57	62.0
18-Jul	37	3	701	2	2				1.51	62.0
19-Jul	2	0	703	0	2				1.50	60.0
20-Jul	27	8	738	1	3				1.50	60.0
21-Jul	58	6	802	1	4				1.48	60.0
22-Jul	31	3	836	8	12				1.45	60.0
23-Jul	102	14	952	11	23		15		1.44	62.0
24-Jul	361	57	1,370	10	33				1.40	60.0
25-Jul	1,080	66	2,516	19	52				1.37	64.0
26-Jul	1,182	92	3,790	8	60	6			1.35	61.0
27-Jul	740	35	4,565	9	69	5			1.38	61.0
28-Jul	1,430	111	6,106	47	116	0			1.34	61.0
29-Jul	1,333	50	7,489	22	138	0			1.35	61.0
30-Jul	647	73	8,209	31	169	8			1.35	61.0
31-Jul	850	77	9,136	59	228	0			1.38	62.0
1-Aug	4,396	155	13,687	101	329	8			1.34	64.0
2-Aug	1,771	58	15,516	71	400	0			1.32	66.0
3-Aug	418	22	15,956	15	415	3			1.30	16.0
4-Aug	1,260	72	17,288	78	493	3			1.26	15.0
5-Aug	1,735	76	19,099	54	547	7			1.29	16.0
6-Aug	1,050	72	20,221	180	727	13	2		1.47	14.0
7-Aug	1,428	46	21,695	189	916	31	1		1.74	13.0
8-Aug	253	15	21,963	33	949	21	0		1.79	13.0
9-Aug	74	5	22,042	3	952	4	0	0	1.76	13.0

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	Sockeye			Coho					Water	
Date	Adult Daily	Jack Daily	Total	Daily	Total	Pink Daily	Chum Daily	Other Fish	Stage (ft)	Temp (C)
10-Aug	75	8	22,125	4	956	2	0	0	1.72	14.0
11-Aug	66	9	22,200	5	961	0	0	0	1.68	14.0
12-Aug	48	0	22,248	1	962	12	7	0	1.65	14.0
13-Aug	92	18	22,358	3	965	5	6	0	1.62	14.0
14-Aug	119	5	22,482	14	979	2	1	0	1.59	14.0
15-Aug	25	6	22,513	5	984	7	0	0	1.56	14.0
16-Aug	69	6	22,588	133	1,117	23	0	0	1.60	15.0
17-Aug	4	0	22,592	53	1,170	0	0	0	1.62	15.0
18-Aug	0	0	22,592	0	1,170	0	0	0	1.60	12.0
19-Aug	18	0	22,610	0	1,170	2	1		1.56	13.0
20-Aug	35	0	22,645	0	1,170	0	2	0	1.58	12.0
21-Aug	0	2	22,647	1	1,171	2	12	0	1.58	12.0
22-Aug	38	0	22,685	37	1,208	1	2	0	1.64	12.0
23-Aug	39	0	22,724	18	1,226	0	0	0	1.61	13.0
24-Aug	9	0	22,733	62	1,288	0	1	0	1.64	14.0
25-Aug	13	0	22,746	18	1,306	0	0	0	1.68	13.0
26-Aug	1	0	22,747	0	1,306	0	1	0	1.67	12.0
27-Aug	64	0	22,811	1,033	2,339	0	3	0	1.70	12.0
28-Aug	19	0	22,830	3	2,342	0	0	0	1.74	9.0
29-Aug	12	0	22,842	0	2,342	0	0	0	1.70	11.0
30-Aug	6	0	22,848	47	2,389	0	0	0	1.68	12.0
31-Aug	0	0	22,848	0	2,389	0	0	0	1.64	14.0
1-Sep	0	1	22,849	29	2,418	0	0	0	1.56	12.0
2-Sep	0	0	22,849	4	2,422	0	0	0	1.54	10.0
3-Sep	1	0	22,850	22	2,444	0	0	0	1.53	10.0
4-Sep	2	0	22,852	50	2,494	0	0	0	1.52	12.0
5-Sep	0	0	22,852	4	2,498	0	0	0	1.48	10.0
6-Sep	0	0	22,852	10	2,508	0	0	0	1.46	14.0
7-Sep	2	0	22,854	80	2,588	0	0	0	1.46	10.0
8-Sep	0	0	22,854	25	2,613	0	0	0	1.45	10.0
9-Sep	1	0	22,855	280	2,893	0	0	0	1.45	11.0
10-Sep	0	0	22,855	39	2,932	0	0	0	1.44	10.0
11-Sep	0	0	22,855	379	3,311	0	0	0	1.42	10.0

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	Sockeye			Coho					Water	
	Adult	Jack	Total			Pink	Chum	Other	Stage	Temp
Date	Daily	Daily		Daily	Total	Daily	Daily	Fish	(ft)	(C)
12-Sep	1	0	22,856	592	3,903	0	0	0	1.40	10.0
13-Sep	1	0	22,857	265	4,168	0	0	0	1.40	10.0
14-Sep	0	0	22,857	258	4,426	0	0	0	1.38	10.0
15-Sep	0	0	22,857	11	4,437	0	0	0	1.38	10.0
16-Sep	0	0	22,857	115	4,552	0	0	0	1.40	10.0
17-Sep	0	0	22,857	168	4,720	0	0	0	1.38	10.0
18-Sep	2	0	22,859	408	5,128	0	0	0	1.42	12.0
19-Sep	0	0	22,859	23	5,151	0	0	0	1.44	12.0
20-Sep	0	0	22,859	33	5,184	0	0	0	1.44	13.0
21-Sep	0	0	22,859	3	5,187	0	1	0	1.44	11.0
22-Sep	0	0	22,859	18	5,205	0	0	0	1.44	10.0
23-Sep	0	0	22,859	134	5,339	0	0	0	1.68	12.0
24-Sep	6	0	22,865	211	5,550	0	1	0	1.80	9.0
25-Sep	0	0	22,865	2	5,552	0	0	0		
26-Sep	0	0	22,865	0	5,552	0	0	0		
27-Sep	0	0	22,865	0	5,552	0	0	0		
Total						165	56	0		

[a] Small sockeye that have returned after spending only 1 year in the ocean.

Appendix H3.-Cottonwood Creek weir counts, 1998.

	Sockeye			Coho					Water	
	Adults	Jacks[a]	Total			Pink	Chum	Other	Stage	Temp.
Date	Daily	Daily		Daily	Total	Daily	Daily	Fish	(ft)	(C)
7-Jul										
8-Jul										
9-Jul										
10-Jul										
11-Jul										
12-Jul										
13-Jul										
14-Jul										
15-Jul	0	0	0	0	0				0.91	15.0
16-Jul	0	0	0	0	0				0.92	15.0
17-Jul	105	0	105	0	0				0.88	15.0
18-Jul	20	0	125	1	1				0.86	15.0
19-Jul	795	0	920	0	1				0.83	15.0
20-Jul	538	1	1,459	1	2				0.86	16.0
21-Jul	268	1	1,728	0	2				0.86	16.0
22-Jul	1,174	2	2,904	0	2				0.86	15.0
23-Jul	1,440	2	4,346	1	3				0.86	16.0
24-Jul	1,515	18	5,879	0	3				0.84	17.0
25-Jul	318	0	6,197	0	3				0.84	15.0
26-Jul	1,955	13	8,165	1	4				0.84	15.0
27-Jul	3,607	67	11,839	24	28			1	0.87	15.0
28-Jul	2,451	165	14,455	11	39			1	0.87	15.0
29-Jul	1,269	48	15,772	45	84			1	0.90	14.0
30-Jul	1,075	150	16,997	27	111			0	0.84	15.0
31-Jul	500	39	17,536	2	113			0	0.82	14.0
1-Aug	530	135	18,201	3	116			0	0.80	14.0
2-Aug	463	37	18,701	7	123			0	0.81	15.0
3-Aug	714	104	19,519	6	129			0	0.78	14.0
4-Aug	4,167	575	24,261	101	230			3	0.78	15.0
5-Aug	1,249	164	25,674	472	702			1	0.83	15.0
6-Aug	288	72	26,034	60	762			0	1.00	13.0
7-Aug	203	53	26,290	96	858	0	0	0	1.30	14.0
8-Aug	103	53	26,446	131	989	0	0	0	1.03	12.0
9-Aug	44	9	26,499	10	999	6	0	0	1.00	13.0
10-Aug	553	125	27,177	68	1,067	0	0	0	0.98	14.0

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	Sockeye			Coho					Water	
	Adults	Jacks	Total			Pink	Chum	Other	Stage	Temp.
Date	Daily	Daily		Daily	Total	Daily	Daily	Fish	(ft)	(C)
11-Aug	28	21	27,226	2	1,069	0	0	0	0.94	14.0
12-Aug	56	31	27,313	2	1,071	2	0	0	0.94	15.0
13-Aug	116	58	27,487	3	1,074	2	0	0	0.93	14.0
14-Aug	46	52	27,585	3	1,077	1	2	1	0.93	13.0
15-Aug	27	28	27,640	3	1,080	2	0	0	0.93	13.0
16-Aug	6	3	27,649	8	1,088	0	1	0	0.94	14.0
17-Aug	15	7	27,671	4	1,092	1	2	0	0.95	14.0
18-Aug	2	0	27,673	1	1,093	0	0	0	0.96	14.0
19-Aug	14	7	27,694	0	1,093	3	2		0.90	15.0
20-Aug	47	14	27,755	0	1,093	0	4	0	0.90	11.0
21-Aug	0	4	27,759	0	1,093	0	0	0	0.91	11.0
22-Aug	10	7	27,776	7	1,100	0	3	0	0.95	11.0
23-Aug	19	5	27,800	0	1,100	0	4	0	0.96	11.0
24-Aug	64	29	27,893	2	1,102	1	0	0	0.97	11.0
25-Aug	0	3	27,896	0	1,102	0	0	0	0.99	11.0
26-Aug	3	0	27,899	0	1,102	0	0	0	0.99	11.0
27-Aug	2	0	27,901	1	1,103	1	1	0	0.97	10.0
28-Aug	0	0	27,901	0	1,103	0	0	0	0.97	10.0
29-Aug	4	3	27,908	0	1,103	1	0	0	0.97	12.0
30-Aug	6	0	27,914	30	1,133	0	0	0	0.97	12.0
31-Aug	1	1	27,916	0	1,133	0	0	0	1.64	14.0
1-Sep	0	2	27,918	0	1,133	0	0	0	0.96	12.0
2-Sep	0	0	27,918	0	1,133	0	0	0	0.97	11.0
3-Sep	6	2	27,926	1	1,134	0	0	0	0.99	11.0
4-Sep	1	0	27,927	0	1,134	0	0	0	0.96	11.0
5-Sep	0	0	27,927	0	1,134	0	0	0	0.80	11.0
6-Sep	0	0	27,927	0	1,134	0	0	0	0.80	11.0
7-Sep	1	0	27,928	0	1,134	0	0	0	0.80	11.0
8-Sep	0	1	27,929	0	1,134	0	0	0	0.80	11.0
9-Sep	0	0	27,929	0	1,134	0	0	0	0.81	10.0
10-Sep	0	0	27,929	0	1,134	0	0	0	0.79	11.0
11-Sep	0	0	27,929	0	1,134	0	0	0	0.89	11.0
12-Sep	1	0	27,930	874	2,008	0	0	0	0.78	12.0
13-Sep	0	0	27,930	4	2,012	0	0	2	0.78	12.0
14-Sep	0	0	27,930	27	2,039	0	0	0	0.79	12.0

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	Sockeye			Coho					Water	
	Adults	Jacks	Total			Pink	Chum	Other	Stage	Temp.
Date	Daily	Daily		Daily	Total	Daily	Daily	Fish	(ft)	(C)
15-Sep	0	0	27,930	22	2,061	0	0	0	0.78	10.0
16-Sep	0	0	27,930	24	2,085	0	0	0	0.80	11.0
17-Sep	0	0	27,930	7	2,092	0	0	0	0.81	10.0
18-Sep	0	0	27,930	21	2,113	0	0	0	0.88	10.0
19-Sep	0	0	27,930	0	2,113	0	0	0	0.87	12.0
20-Sep	0	0	27,930	0	2,113	0	0	0	0.88	12.0
21-Sep	0	0	27,930	0	2,113	0	0	0	0.83	11.0
22-Sep	0	0	27,930	1	2,114	0	0	0	0.83	10.0
23-Sep	0	0	27,930	0	2,114	0	0	0	0.85	10.0
24-Sep	0	0	27,930	0	2,114	0	0	0	0.99	9.0
25-Sep	0	0	27,930	0	2,114	0	0	0	0.98	9.0
26-Sep	0	0	27,930	0	2,114	0	0	0	0.97	9.0
27-Sep	0	0	27,930	0	2,114	0	0	0		
28-Sep										
29-Sep										
Total	25,819	2,111				20	19	0		

[a] Small sockeye that have returned after spending only 1 year in the ocean.

Appendix H4.-Wasilla Creek weir counts, 1998.

	Sockeye			Coho		Pink		Chum	Water	
	Adults	Jacks[a]							Stage	Temp.
Date	Daily	Daily	Total	Daily	Total	Daily	Total	Daily	(ft)	(C)
25-Jul	0		0							15.0
26-Jul	0		0						1.06	15.0
27-Jul	0		0						1.13	13.0
28-Jul	2		2						1.12	13.0
29-Jul	1		3							
30-Jul	24		27	1	1				1.38	16.0
31-Jul	31	1	59	1	2				1.32	16.0
1-Aug	41	1	101	74	76				1.24	16.0
2-Aug	74	0	175	0	76				1.27	15.5
3-Aug	18	0	193	0	76				1.26	15.0
4-Aug	26	0	219	2	78			2	1.19	15.0
5-Aug	15	1	235	4	82			2	1.37	14.5
6-Aug	16	0	251	16	98	1	1	3	1.88	13.0
7-Aug	47	4	302	145	243	0	1	10	2.23	14.0
8-Aug	50	1	353	12	255	4	5	2	2.28	12.5
9-Aug	46	3	402	22	277	4	9	1	2.29	13.5
10-Aug	-15	0	387	25	302	2	11	1	2.25	14.0
11-Aug	44	0	431	62	364	11	22	4	2.23	15.0
12-Aug	28	2	461	2	366	5	27	1	1.89	15.0
13-Aug	47	1	509	25	391	7	34	6	1.74	15.0
14-Aug	17	2	528	14	405	6	40	4	1.65	15.0
15-Aug	0	0	528	1	406	9	49	1	1.65	15.0
16-Aug	16	0	544	15	421	5	54	4	1.60	14.0
17-Aug	22	1	567	53	474	3	57	6	1.85	14.0
18-Aug	5	0	572	10	484	5	62	4	1.86	14.0
19-Aug	3	0	575	56	540	2	64	4	1.95	12.0
20-Aug	1	0	576	3	543	4	68	1	1.93	12.0
21-Aug	12	0	588	81	624	0	68	0		
22-Aug	58	6	652	554	1,178	6	74	7	2.14	12.0
23-Aug	5	0	657	102	1,280	2	76	0	2.30	10.0
24-Aug	10	0	667	350	1,630	3	79	1	2.30	11.0
25-Aug	0	0	667	3	1,633	1	80	0	2.25	10.0
26-Aug	1	0	668	15	1,648	0	80	1	2.20	10.0
27-Aug	1	0	669	15	1,663	3	83	1	2.28	10.0
28-Aug	0	0	669	4	1,667	0	83	0	2.26	9.0

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	Sockeye			Coho		Pink		Chum	Water	
	Adults	Jacks							Stage	Temp.
Date	Daily	Daily	Total	Daily	Total	Daily	Total	Daily	(ft)	(C)
29-Aug	0	0	669	17	1,684	2	85	0	2.18	10.0
30-Aug	2	0	671	3	1,687	1	86	1	2.10	10.0
31-Aug	4	1	676	75	1,762	1	87	2	2.00	10.0
1-Sep	1	0	677	155	1,917	1	88	1	1.90	10.0
2-Sep	0	0	677	35	1,952	0	88	0	1.90	8.0
3-Sep	1	0	678	55	2,007	0	88	0	1.88	9.0
4-Sep	1	0	679	123	2,130	0	88	0	1.81	10.0
5-Sep	1	0	680	35	2,165	1	89	2	1.75	10.0
6-Sep	0	0	680	3	2,168	0	89	0	1.90	8.0
7-Sep	0	0	680	105	2,273	0	89	0	2.10	9.0
8-Sep	0	0	680	46	2,319	0	89	0	3.40	9.0
9-Sep	2	0	682	39	2,358	0	89	1	3.35	9.0
10-Sep	2	0	684	10	2,368	0	89	0	3.30	9.0
11-Sep	0	1	685	14	2,382	0	89	0	3.30	9.0
12-Sep	2	3	690	87	2,469	0	89	0	3.14	10.0
13-Sep	0	1	691	179	2,648	0	89	0	3.20	10.0
14-Sep	0	0	691	120	2,768	0	89	0	3.34	10.0
15-Sep	0	0	691	13	2,781	0	89	0	3.40	10.0
16-Sep	0	0	691	51	2,832	0	89	0	3.4+	9.0
17-Sep	0	1	692	167	2,999	0	89	0	3.6+	9.0
18-Sep	0	1	693	71	3,070	0	89	0	3.5+	9.0
19-Sep	0	0	693	16	3,086	0	89	0	3.4+	9.0
20-Sep	0	0	693	3	3,089	0	89	0	3.4+	9.0
21-Sep	0	0	693	49	3,138	0	89	0	3.4+	9.0
22-Sep	0	0	693	75	3,213	0	89	0	3.6+	9.0
23-Sep	0	0	693	13	3,226	0	89	0	3.65+	9.0
24-Sep	0	0	693	111	3,337	0	89	0	3.75+	9.0
25-Sep	0	0	693	139	3,476	0	89	0	3.8+	6.0
26-Sep	0	0	693	41	3,517	0	89	0	3.8+	7.0
27-Sep	0	0	693	11	3,528	0	89	0	3.80	7.0
28-Sep	0	0	693	59	3,587	0	89	0	4.0+	6.0
29-Sep	0	0	693	1	3,588	0	89	0	4.0+	5.0
30-Sep	0	0	693	12	3,600	0	89	0	4.0+	5.0
1-Oct	0	0	693	0	3,600	0	89	0	4.4+	5.0
2-Oct	0	0	693	0	3,600	0	89	0	4.00	4.0
3-Oct	0	0	693	0	3,600	0	89	0	3.80	3.5

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	Sockeye			Coho		Pink		Chum	Water	
	Adults	Jacks							Stage	Temp.
Date	Daily	Daily	Total	Daily	Total	Daily	Total	Daily	(ft)	(C)
4-Oct	0	0	693	0	3,600	0	89	0	3.70	3.0
5-Oct	0	0	693	0	3,600	0	89	0	3.60	4.0
6-Oct	0	0	693	13	3,613	0	89	0	4.0+	5.0
7-Oct	0	0	693	0	3,613	0	89	0	4.20	4.0
8-Oct	0	0	693	5	3,618	0	89	0	4.10	4.0
9-Oct	0	0	693	0	3,618	0	89	0	3.80	3.0
10-Oct	0	0	693	2	3,620	0	89	0	3.40	3.0
11-Oct	0	0	693	2	3,622	0	89	0	3.40	1.0
Total	662	31		3,622		89		73		

[a] Small sockeye that have returned after spending only 1 year in the ocean.

Appendix H5.-Spring Creek and Rabbit Slough weir counts, 1998.

	Spring Creek					Rabbit Slough		
	Sockeye			Coho		Sockeye		Coho
	Adults	Jacks[a]	Total					
Date	Daily	Daily		Daily	Total	Daily	Total	Daily
25-Jul	0	0	0	0	0	0	0	0
26-Jul	0	0	0	0	0	0	0	0
27-Jul	0	0	0	0	0	0	0	0
28-Jul	0	0	0	0	0	0	0	0
29-Jul	0	0	0	0	0	0	0	0
30-Jul	0	0	0	0	0	0	0	0
31-Jul	0	0	0	0	0	0	0	0
1-Aug	0	0	0	0	0	4	4	0
2-Aug	0	0	0	0	0	0	4	0
3-Aug	0	0	0	0	0	0	4	0
4-Aug	0	0	0	0	0	0	4	0
5-Aug	0	0	0	0	0	0	4	0
6-Aug	0	0	0	0	0	1	5	0
7-Aug	0	0	0	0	0	0	5	0
8-Aug	0	0	0	0	0	0	5	0
9-Aug	0	0	0	0	0	0	5	0
10-Aug	0	0	0	0	0	2	7	0
11-Aug	0	0	0	0	0	0	7	0
12-Aug	0	0	0	0	0	0	7	0
13-Aug	0	0	0	0	0	0	7	0
14-Aug	0	0	0	0	0	0	7	0
15-Aug	0	0	0	0	0	0	7	0
16-Aug	0	0	0	0	0	0	7	0
17-Aug	2	0	2	0	0	0	7	0
18-Aug	3	0	5	0	0	0	7	0
19-Aug	2	0	7	0	0	1	8	0
20-Aug	3	0	10	0	0	0	8	0
21-Aug	4	0	14	0	0	2	10	0
22-Aug	22	0	36	0	0	14	24	0
23-Aug	10	0	46	0	0	0	24	0
24-Aug	15	3	64	0	0	2	26	0
25-Aug	0	0	64	0	0	2	28	0
26-Aug	11	3	78	0	0	1	29	0
27-Aug	9	0	87	0	0	3	32	0

-continued-

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	Spring Creek					Rabbit Slough		
	Sockeye			Coho		Sockeye		Coho
Date	Adults Daily	Jacks Daily	Total	Daily	Total	Daily	Total	Daily
28-Aug	2	3	92	0	0	0	32	0
29-Aug	5	2	99	0	0	0	32	0
30-Aug	0	0	99	0	0	0	32	0
31-Aug	5	0	104	0	0	0	32	0
1-Sep	0	0	104	0	0	0	32	0
2-Sep	3	0	107	0	0	0	32	0
3-Sep	0	0	107	0	0	0	32	0
4-Sep	0	0	107	0	0	0	32	0
5-Sep	0	0	107	0	0	0	32	0
6-Sep	0	0	107	0	0	0	32	0
7-Sep	0	0	107	0	0	0	32	0
8-Sep	0	0	107	0	0	0	32	0
9-Sep	0	0	107	0	0	0	32	0
10-Sep	1	0	108	2	2	0	32	0
11-Sep	0	1	109	0	2	0	32	7
12-Sep	1	2	112	0	2	0	32	0
13-Sep	0	4	116	2	4	0	32	1
14-Sep	0	0	116	3	7	0	32	1
15-Sep	0	0	116	2	9	0	32	0
16-Sep	0	0	116	16	25	0	32	0
17-Sep	0	0	116	26	51	0	32	1
18-Sep	0	0	116	6	57	0	32	0
19-Sep	0	0	116	5	62	0	32	2
20-Sep	0	0	116	3	65	0	32	2
21-Sep	0	0	116	3	68	0	32	0
22-Sep	0	0	116	3	71	0	32	0
23-Sep	0	0	116	1	72	0	32	0
24-Sep	0	0	116	33	105	0	32	0
25-Sep	0	0	116	30	135	0	32	0
26-Sep	0	0	116	8	143	0	32	0
27-Sep	0	0	116	2	145	0	32	0
28-Sep	0	0	116	1	146	0	32	0
29-Sep	0	0	116	7	153	0	32	0
30-Sep	0	0	116	2	155	0	32	2
1-Oct	0	0	116	0	155	0	32	0

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	Spring Creek					Rabbit Slough		
	Sockeye			Coho		Sockeye		Coho
	Adults	Jacks	Total					
Date	Daily	Daily		Daily	Total	Daily	Total	Daily
2-Oct	0	0	116	0	155	0	32	0
3-Oct	0	0	116	0	155	0	32	0
4-Oct	0	0	116	0	155	0	32	0
5-Oct	0	0	116	0	155	0	32	0
6-Oct	0	0	116	1	156	0	32	0
7-Oct	0	0	116	3	159	0	32	0
8-Oct	0	0	116	1	160	0	32	0
9-Oct	0	0	116	3	163	0	32	0
10-Oct	0	0	116	0	163	0	32	0
11-Oct	0	0	116	0	163	0	32	0
Totals	98	18		163		32		16

[a] Small sockeye that have returned after spending only 1 year in the ocean.

Appendix H6.-Little Susitna River weir counts, 1998.

Date	Coho Daily	Coho Total	Chinook Salmon Daily	Sockeye Salmon Daily	Pink Salmon Daily	Chum Salmon Daily	Other Fish Daily	Water Stage (ft)	Water Temp (C)
31-Jul	1	1			224	7		0.8	11.0
1-Aug	33	34	3		1,679	103		0.8	11.0
2-Aug	97	131			2,453	74		0.8	12.0
3-Aug	13	144	4	1	944	74		0.8	10.0
4-Aug	7	151	0	0	467	24		0.7	10.0
5-Aug	5	156	1	0	559	43		0.8	11.0
6-Aug	35	191	1	1	1,250	28		2.4	10.0
7-Aug	45	236	1	2	612	32		2.4	10.0
8-Aug	52	288	0	1	912	52		1.8	10.0
9-Aug	3	291	0	0	670	47		1.9	11.0
10-Aug	7	298	0	0	281	78		1.5	10.0
11-Aug	51	349	0	0	110	29		1.4	11.0
12-Aug	11	360	0	0	201	23		1.3	11.0
13-Aug	19	379	0	1	265	10		1.2	11.0
14-Aug	4	383	0	1	231	2		1.2	11.0
15-Aug	12	395	0	0	297	4		1.0	10.0
16-Aug	132	527	1	0	537	3		1.3	10.0
17-Aug	439	966	0	0	364	6		3.2	10.0
18-Aug	68	1,034	0	0	404	4		2.3	9.0
19-Aug	122	1,156			338			2.1	9.0
20-Aug	58	1,214	0	0	301	0		2.3	9.0
21-Aug	15	1,229	0	0	148	0		1.7	9.0
22-Aug	640	1,869	1	0	138	0		3.1	9.0
23-Aug	722	2,591	1	1	133	0		2.6	8.0
24-Aug	438	3,029	0	0	169	0		2.4	8.0
25-Aug	322	3,351	0	0	142	0		2.3	8.0
26-Aug	139	3,490	0	0	37	0		2.2	8.0
27-Aug	679	4,169	0	0	76	0		2.1	8.0
28-Aug	714	4,883	0	0	61	0		2.4	8.0
29-Aug	809	5,692	0	0	48	0		1.8	8.0
30-Aug	1,355	7,047	0	0	31	0		1.5	7.0
31-Aug	1,721	8,768	0	0	51	0		1.4	8.0
1-Sep	1,821	10,589	0	0	17	0		1.3	10.0
2-Sep	74	10,663	0	0	9	0		1.2	8.0
3-Sep	23	10,686	0	0	7	0		1.8	9.0
4-Sep	25	10,711	0	0	11	0		1.0	8.0

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Date	Coho		Chinook Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Other Fish	Water	
	Daily	Total	Daily	Daily	Daily	Daily	Daily	Stage (ft)	Temp (C)
5-Sep	7	10,718	0	0	8	0		1.0	7.0
6-Sep	41	10,759	0	0	10	0		1.0	8.0
7-Sep	214	10,973	0	0	5	0		1.0	8.0
8-Sep	1,000	11,973	0	0	11	0		0.9	8.0
9-Sep	488	12,461	0	0	2	0		0.8	8.0
10-Sep	343	12,804	0	0	2	0		0.8	8.0
11-Sep	121	12,925	0	0	0	0		0.7	8.0
12-Sep	213	13,137	0	0	0	1	0	0.7	7.0
13-Sep	190	13,327	0	0	0	0	0	0.7	7.0
14-Sep	502	13,829	0	0	3	0	0	1.0	7.0
15-Sep	164	13,993	0	0	0	0	0	1.0	7.0
16-Sep	292	14,285	0	1	1	0	0	1.2	7.0
17-Sep	303	14,588	0	0	0	0	0	1.3	7.0
18-Sep	109	14,697	0	0	3	0	0	1.4	8.0
19-Sep	57	14,754	0	0	2	0	0	1.4	8.0
20-Sep	127	14,881	0	0	0	0	0	1.4	8.0
21-Sep	92	14,973	0	0	0	0	0	1.9	8.0
22-Sep	37	15,010	0	0	0	0	0	1.8	8.0
23-Sep	21	15,031	0	0	0	0	0	2.0	7.0
24-Sep	52	15,083	0	0	0	0	0	2.7	7.0
25-Sep	6	15,089	0	0	0	0	0	2.4	7.0
26-Sep	22	15,111	0	0	0	0	0	2.6	7.0
27-Sep	17	15,128	0	0	0	0	0	2.4	7.0
28-Sep	19	15,147	0	0	0	0	0	2.5	7.0
29-Sep	11	15,158	0	0	0	0	0	2.2	5.0
30-Sep									
Total	15,158		13	9	14,224	637	0		

Appendix H7.-Deshka River weir daily water temperature and stage, 1998.

Date	(ft)	(C)	Date	(ft)	(C)	Date	(ft)	(C)
16-Jun	1.30	21.0	24-Jul	0.38	19.0	31-Aug	1.50	14.0
17-Jun	1.10	16.0	25-Jul	0.88	18.0	1-Sep	1.30	14.0
18-Jun	1.02	18.0	26-Jul	0.96	17.0	2-Sep	1.10	14.0
19-Jun	0.98	18.0	27-Jul	1.18	17.0	3-Sep	1.00	14.0
20-Jun	0.90	18.0	28-Jul	0.98	17.0	4-Sep	0.94	13.0
21-Jun	0.94	16.0	29-Jul	0.88	17.0	5-Sep	0.88	13.0
22-Jun	1.30	16.0	30-Jul	0.66	20.0	6-Sep	0.80	13.0
23-Jun	1.50	17.0	31-Jul	0.50	21.5			
24-Jun	1.20	17.0	1-Aug	0.38	21.5			
25-Jun	1.10	18.0	2-Aug	0.28	20.0			
26-Jun	0.94	18.0	3-Aug	0.24	18.0			
27-Jun	0.86	18.0	4-Aug	0.20	17.0			
28-Jun	0.78	19.0	5-Aug	0.32	16.5			
29-Jun	0.66	21.0	6-Aug	1.24	16.0			
30-Jun	0.66	23.0	7-Aug	2.58	16.0			
1-Jul	0.58	20.0	8-Aug	2.78	15.0			
2-Jul	0.58	20.0	9-Aug	2.50	15.0			
3-Jul	0.45	19.0	10-Aug	2.78	15.0			
4-Jul	0.41	21.0	11-Aug	2.50	15.0			
5-Jul	0.40	19.5	12-Aug	1.78	15.0			
6-Jul	0.47	18.0	13-Aug	1.25	16.0			
7-Jul	0.58	17.0	14-Aug	1.04	17.5			
8-Jul	0.75	16.5	15-Aug		16.0			
9-Jul	0.86	19.0	16-Aug	0.85	16.5			
10-Jul	0.74	17.0	17-Aug	1.80	14.5			
11-Jul	0.60	17.0	18-Aug	2.45	14.5			
12-Jul	0.58	17.0	19-Aug	1.70	14.5			
13-Jul	0.58	18.0	20-Aug	1.20	14.5			
14-Jul	0.56	18.0	21-Aug	2.00	14.0			
15-Jul	0.50	17.0	22-Aug	2.78	14.0			
16-Jul	0.49	19.5	23-Aug	3.20	14.0			
17-Jul	0.59	20.0	24-Aug	2.50	14.0			
18-Jul	0.58	20.0	25-Aug	2.20	14.0			
19-Jul	0.45	20.0	26-Aug	2.20	14.0			
20-Jul	0.35	20.0	27-Aug	2.60	14.0			
21-Jul	0.30	20.5	28-Aug	2.27	14.0			
22-Jul	0.27	20.0	29-Aug	2.00	14.5			
23-Jul	0.28	19.0	30-Aug	1.80	14.5			

APPENDIX I

Appendix I1.-Completed access projects for NCIMA.

	Location	Project-Manager	Cost Fed-State	Date Complete
	Non-Boating Projects			
1	Willow Creek access	Parking (150), latrines (4), trails, wells (2)-DPOR	$523,946-174,649	Sep 91
2	Access and trails	Parking and trail work at eight small lakes-DSF	$48,000-16,000	Jun 93
3	Wasilla Creek access	Undeveloped area in Palmer Hay Flats SGR-DWC	$24,997-8,332	May 92
4	Sheep Creek access	Latrine, parking, trail-DSF	$111,187-43,338	Jun 91
5	Little Willow Creek access	Undeveloped -DSF	$79,200-26,995	Oct 91
6	Caswell Creek access	Access road, parking-DSF	$8,873-2,958	Jul 91
7	Talachulitna Creek access	Undeveloped remote site at Judd Lake-DSF	$31,518-10,506	Mar 93
8	Echo Lake (Palmer)	Parking (5) and trail - DSF	$25,438-8,479	Jul 94
9	Little Susitna River Public Use Facility	Install 30 picnic tables and 30 fire rings.	$18,750-6,250	Aug 97
10	Mat-Su Access and Trails	Parking and trail work at eight small lakes-DSF	$48,000-16,000	Jun 93
	Boating Projects			
1	Susitna Landing	Gravel ramp, parking (100), latrine, well, store-DSF	$514,047-186,652	Oct 86
2	Little Susitna River Public Use Facility	Launch ramp, parking (234), latrine (3), well (3), sewage dump station-DSF, DPOR	$738,793-279,684	Jun 90
3	Lake Creek access	Undeveloped-DSF	$96,900-39,093	Sept 91
4	Neil Lake access site	Land purchase for trail from lake to Deshka River	$20,775-11,215	Jun 95
5	Talkeetna River boat launch	Boat launch ramp, parking (52), latrine, well-DSF	$300,000-100,000	Oct 96
6	Little Su PUF Boat Ramp Repair	Widened and extended existing boat ramp-DSF	$37,500-12,500	Jun 98
7	Susitna Landing Improvements	Replaced concession building, added handicapped access ramps	$116,250-38,750	Sep 97

DPOR = Division of Parks and Outdoor Recreation

DSF = Division of Sport Fish

SGR-SWC = State Game Refuge, Division of Wildlife Conservation

APPENDIX J

Appendix J1.-Cooperative agreement for management and maintenance of the Little Susitna River Public Use Facility.

ADF&G COOP 89-024

Cooperative Agreement Between

Alaska Department of Natural Resources and

Alaska Department of Fish and Game for

Management and Maintenance of

Little Susitna River Public Use Facility

This agreement is made and entered into between the Department of Natural Resources, P.O. Box 10-7001, Anchorage, Alaska 99510, hereinafter called ADNR, and the Department of Fish and Game, P.O. Box 3-2000, Juneau, Alaska 99802, hereinafter referred to as ADF&G.

I. Purpose of Agreement

To cooperatively manage and maintain the Little Susitna Public Use Facility (LSPUF) for recreational boating, sport fishing, access to the state game refuge and other recreational uses.

II. Authority

ADF&G, pursuant to AS 16.05, has the authority to design and construct projects beneficial for the fish and game resources of the state; to provide public facilities to facilitate the taking of fish and game; to enter into cooperative agreements; to exercise administrative, budgeting, and fiscal powers; and to manage uses and activities on the Susitna Flats State Game Refuge (SFSGR).

ADNR, pursuant to AS 41.21, has the authority to provide for the supervision, development, and maintenance of public recreational land; and to provide clearinghouse services for other state agencies concerned with park and recreational matters.

III. Covenants of the Department of Fish and Game

ADF&G does hereby agree:

1. To construct a boat launch, parking area, and other facilities necessary to improve public recreational boating and sport fishing access to the lower Little Susitna River under the Federal Aid in Sport Fish Restoration program.
2. To contribute access program funds to defer the cost of site management and maintenance in the event that such costs exceed revenues from user fees. The annual amount of the funds shall not exceed the total cost shown in Attachment B.

IV. Covenants of the Department of Natural Resources

ADNR does hereby agree:

1. To operate and manage the site described in Attachment A for the primary purpose of providing public access to the Little Susitna River and the Susitna Flats State Game

Refuge (SFSGR) for recreational boating, sport fishing, and other recreational activities. No change in this use shall be made nor shall the site be closed to the public without the approval of ADF&G.

2. To perform all maintenance and management necessary to keep the access site shown in Attachment A open to the public on a seasonal basis. Services shall include public contact, law enforcement, trash collection, parking lot grading, cleaning of comfort stations, posting of signs, and other minor maintenance needed to keep the site clean and in a good state of repair.

3. To prepare an annual management plan detailing the services to be provided, staffing and equipment requirements, estimated costs, estimated revenue and proposed improvements. This management plan shall become a part of this agreement as Attachment B.

4. To account for and dispose of all user fees collected from the sites in accordance with OMB circular A-102. All fees shall be reviewed and approved by ADF&G prior to implementation. Current approved fees shall be shown in Attachment B.

V. It is mutually agreed that

1. This agreement shall remain in effect indefinitely and shall be renewed annually by revision of Attachment B. This agreement and all subsequent annual renewals shall be effective February 1 of the year shown on Attachment B and shall remain in effect through January 31 of the following year. Either department may terminate this agreement by providing written notice to the other at least 90 days in advance of the date on which termination is to become effective.

2. The LSPUF shall be managed in accordance with regulations contained in 5 AAC 95.515. These regulations apply only to that portion of the SFSGR designated as a management zone for the LSPUF.

3. Each department shall not assign, let, or sublet, either by grant or implication, the whole or any part of any site without the written consent of the other department. The rights and responsibilities vested in each department by this agreement shall not be assigned without the written consent of the other department.

4. ADF&G shall retain administrative control of the LSPUF. ADNR may make improvements on the site provided such improvements are compatible with the primary purpose of providing recreational boating and sport fishing access to the Little Susitna River. All proposed improvements shall be approved by ADF&G through the special area permit process prior to construction. ADNR shall obtain all applicable permits prior to the start of construction.

5. Amendments to this agreement may be proposed by either department, and shall become effective upon approval of both departments. Each department may modify this agreement to meet revised requirements for state or federal law, provided that such modifications shall not cause either department financial loss or commit unavailable staff and resources.

6. Agents and employees of each department shall act in an independent capacity and not as officers, employees, or agents of the other department in performance of this agreement.

7. To not discriminate or permit discrimination on the grounds of race, color, religion, national origin, ancestry, age or sex against any person or group of persons in any manner prohibited by federal or state law or regulations promulgated thereunder. Each department recognizes the right of the other to take such action to enforce such covenant as it deems necessary or as it is directed pursuant to any federal or state law or regulation.
8. Nothing in this agreement shall be construed as obligating either department to expenditure of funds in excess of those herein agreed upon. In the event sufficient funds are not available to operate and maintain the site, ADNR may terminate this agreement with a seven day notice.
9. Nothing in this agreement transfers title or land jurisdiction other than set forth herein.
10. The failure of either department to insist in any one or more instances upon a strict performance by the other of any of the provisions, terms, covenants, reservations, conditions, or stipulations contained herein may not be considered as a waiver or relinquishment thereof for the future, but the same shall continue and remain in full force and effect, and no waiver by either department of any provision, term, covenant, reservation, condition, or stipulation herein may be deemed to have been made in any instance unless expressed in writing by the department.
11. Each department agrees that it will be responsible for its own acts and the results thereof, and each department shall not be responsible for the acts of the other department; and each department agrees it will assume to itself risk and liability resulting in any manner under this agreement.
12. No elected or appointed official shall be admitted to any share or part of the agreement or to any benefit that may arise therefrom.
13. Each party will comply with all applicable laws, regulations, and executive orders relative to Equal Employment Opportunity.
14. Nothing herein is intended to conflict with federal, state, or local laws or regulations. If there are conflicts, this agreement will be amended at the first opportunity to bring it into conformance with conflicting laws or regulations.
15. Policy and position announcements relating specifically to this cooperative program may be made only by mutual consent of the agencies.
16. This agreement is complete and has no other encumbrances, addenda, attachments, or amendments with the following exceptions:

    Attachment A: Little Susitna Public Use Area Site Plan

    Attachment B: Little Susitna Public Use Area Management Plan

Attachment A is not included in this report. Attachment B follows.

Attachment B

ACCESS SITE MAINTENANCE

LITTLE SUSITNA PUBLIC USE FACILITY

PROJECT F-13-M-20

SOUTHCENTRAL ALASKA

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

1997

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Appendix B: Division of Parks & Outdoor Recreation Seasonal Report, 1996

Introduction

Construction of the Little Susitna Public Use Facility (PUF), under project F-13-D-6, provides access to the Little Susitna River. Initial clearing work and construction of one outhouse was completed in the fall of 1988. Construction on the remainder of the facilities was completed in June, 1990.

The facility needs regular maintenance to prevent vandalism and protect the access program's investment. This project will provide the funding that is needed to maintain and manage the facility.

Need

The need for the Little Susitna PUF is documented in the narrative for Project F-13-D-6, Little Susitna Boat Launch Development. This site provides the primary sport fishing access to the Little Susitna River. Although the facility was constructed to accommodate 70,000 angler-days of use annually, the full potential of the site has never been realized. Angler use of the Little Susitna River is summarized in Table 1. Reliable records showing use of LSPUF are not available prior to the 1994 season.

Table 1. Angler-day use of the Little Susitna River.

Year	Angler-days
1989	54,798
1990	40,159
1991	50,838
1992	49,304
1993	42,249
1994	45,149
1995	41,119

The number of angler-days on the Little Susitna River during this seven year period fluctuates by almost 15,000. This variation in use reflects the relative run strengths of both king and silver salmon during this period and the timing of certain management techniques such as increasing bag limits and lifting bait restrictions. For instance, if lifting the bait restriction and increasing the bag limit for silver salmon happened to fall on a weekend during the peak of the run, significantly increased fishing pressure would occur compared to the same scenario happening on a weekday.

In considering the need for maintenance and management of the PUF, two factors must be taken into account. The first is the annual-use level and the second is how that use is distributed throughout this year. The annual-use level at the PUF is relatively high, but more importantly, use is concentrated on summer weekends particularly when the salmon runs are "in." Figure 1 shows use patterns for the 1996 season, which was interrupted by the Miller's Reach Fire. Table 2 summarizes all user groups at the facility during the 1994, 1995 and 1996 seasons.

A user data collection program was begun during the 1994 season. Adjustments were made in-season to ease data collection. Improvements to the system were incorporated into the 1995 data collection program based on problems encountered in analyzing the 1994 data.

Given a constant use rate, a site such as Little Susitna could be maintained and managed with little more than routine trash collection and cleanup. But with the concentrated use and resultant crowding that occurs, a much higher level of effort is necessary. In addition to keeping the site clean, an authoritative presence is needed to keep order and prevent vandalism.

The "Burma Road" site has been open to the public for many years and certain undesirable use patterns have developed. The area had been totally uncontrolled and rowdy behavior was common. A portion of the current user group still seems to resent improvement of the site and some continuing re-education of these individuals is necessary to make this site a quality experience for everyone.

The access program has made an investment of over $1,000,000 in the Little Susitna PUF. A decision to simply leave this investment in the hands of the users without some means of control would not be prudent.

Objectives

1. To ensure that the Little Susitna PUF is a clean, safe, well-maintained public access site.
2. To protect the access program's investment in the Little Susitna PUF.
3. To establish a revenue program that will defray maintenance, management, and future improvement costs.

Expected Results and Benefits

This project will ensure that the results and benefits of the site improvements constructed under Project F-13-D-6, are obtained on a long-term basis.

Project Development

Agreement has been reached with the Department of Natural Resources (DNR), Division of Parks and Outdoor Recreation (DPOR) to maintain and manage the Little Susitna PUF. A management plan for July 1, 1997 through June 30, 1998, is included in Appendix A. A report for the 1996 season is also included with this document.

DPOR will treat the site in the same manner as units of the State Park System. The services they will provide are described in Appendix A. In addition to janitorial-type services, DPOR will also provide a deputized ranger for the site. In light of the past history of the site, an authoritative presence is necessary to maintain order.

Prior to freezeup in the fall, the site is winterized to reduce over-winter damage from weather and vandals. Equipment such as the well and sanitary dump station is secured. The outhouses are pumped out but left open for use. During the winter months, DPOR will provide twice-weekly patrols of the site that include outhouse maintenance. There are a significant number of people who use the area during the winter for snowmachine riding, dog mushing, hunting, and other outdoor activities. DPOR has learned from experience that vandalism increases if an attempt is made to deny public use of outhouses during the winter. In this respect, winter patrols of the PUF and servicing of the outhouses are a measure designed to protect the facility rather than provide a service to the public.

The collection of fees through the 1993 season was accomplished primarily through the honor system and an "iron ranger." Problems with this approach developed and a citizens' work group was established in 1993 to recommend a new fee structure. This new fee system went into effect for the 1994 season. Part of this fee restructuring involved the construction and installation of a fee station at the entrance gate. This station was manned to collect the various fees beginning with the

1994 season. The fee station will continue in operation during the 1997 season. The current fee structure is shown in Appendix A.

The need for additional staff to man the fee station and improved service to the public on site by the Division of Parks and Outdoor Recreation are responsible for the overall increases in the cost to operate and maintain LSPUF. This increased cost has been offset somewhat through restructuring of fees and markedly improved public compliance with the fee structure because of the presence of fee station attendants. The unpredictable nature of fishermen, as shown in Table 1, further complicates the ability to predict the revenues which can be generated by the facility during any given year.

In addition to routine maintenance, one or two small projects are accomplished each year to correct or control situations that were not foreseen in the original design. This includes work such as additional barrier rocks, additional signage for parking and short-term repair of a hole at the end of the boat launch ramp.

NEPA Documentation

This project involves only maintenance and management activities that are categorically excluded from NEPA documentation requirements.