Fishery Management Report No. 00-8

Area Management Report for the Recreational Fisheries of Northern Cook Inlet, 1999

by

Dave Rutz

and

Dana Sweet

June 2000

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

FISHERY MANAGEMENT REPORT NO. 00-8

AREA MANAGEMENT REPORT FOR THE RECREATIONAL FISHERIES OF NORTHERN COOK INLET, 1999

by
Dave Rutz
and
Dana Sweet
Division of Sport Fish, Palmer

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

June 2000

Development of this manuscript was partially financed by the Federal Aid in Sport fish Restoration Act (16 U.S.C. 777-777K) under Project F-10-15, Job Nos. S-2-17, S-2-19, S-2-26, S-2-29, and S-2-33.

The Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm This publication has undergone regional peer review.

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

This document should be cited as:
Rutz, D. and D. Sweet. 2000. Area management report for the recreational fisheries of Northern Cook Inlet, 1999. Alaska Department of Fish and Game, Fishery Management Report No. 00-8, Anchorage.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

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

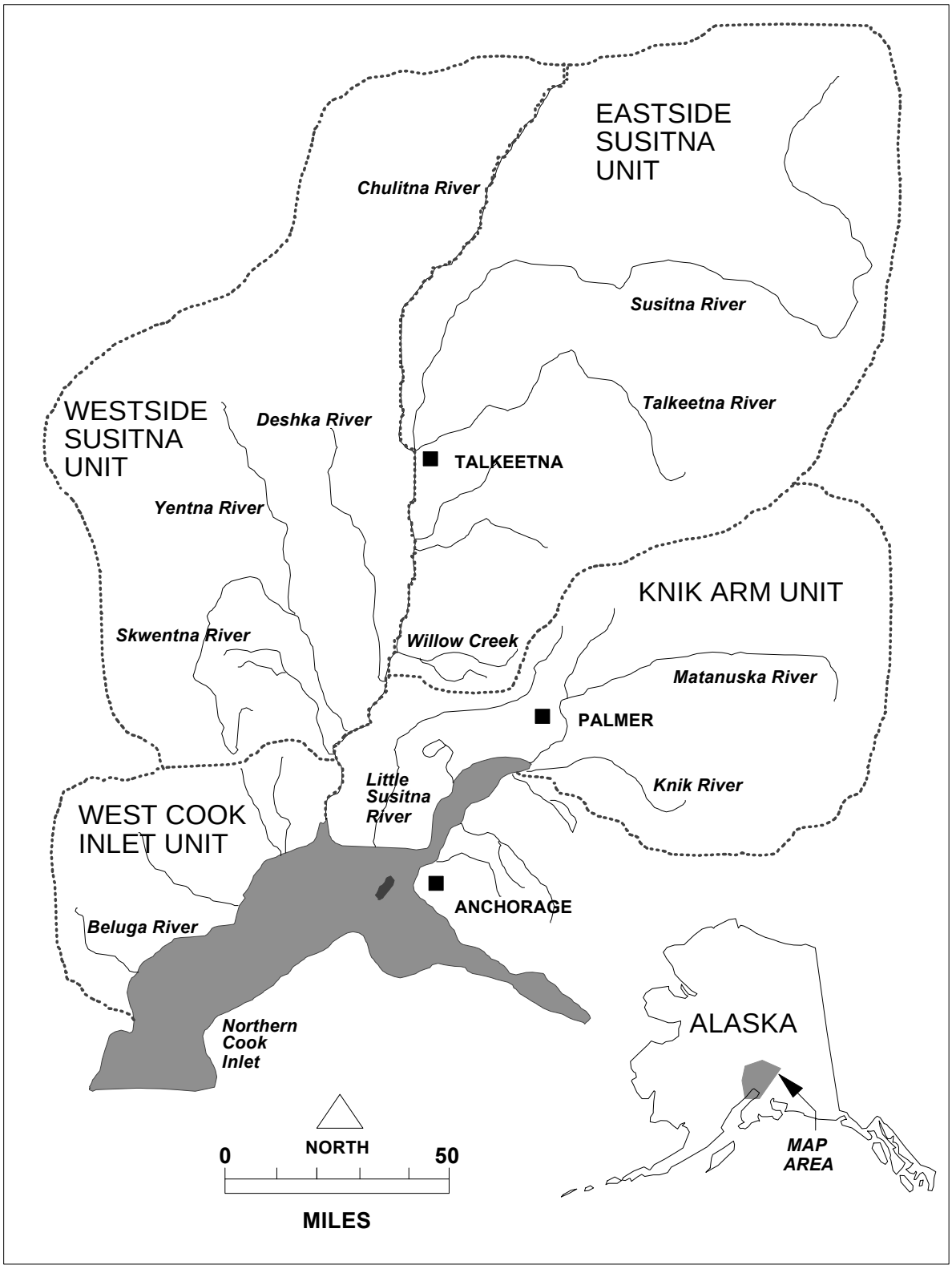


Figure 1.-Map of the Northern Cook Inlet sport fish management area.

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), (2) the East Susitna River Drainage Area reporting unit (Area M), and (3) the West Cook Inlet-West Susitna River Drainages Area reporting unit (Area N). The West Cook Inlet-West Susitna River Drainages Area 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 60% 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, Sutton, 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. 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 (David Rutz), a permanent full-time Fisheries Biologist III Area Research Biologist, Assistant to the Manager (Dana Sweet), Lakes Specialist (Craig Bear), Maintenance Access Coordinator (Larry Erie), and two permanent full-time Fisheries Biologist II Research Biologists (Suzanne Hayes and Robert Lafferty). One permanent full-time Administrative Assistant III (Nancy Deslauriers) and an Administrative Assistant II (Leslie Adams) are 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 Policy and Technical Services (PTS) 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), educational permits (Chapter 93), statewide provisions (Chapter 75) 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 were addressed in February 1999. An out-of-cycle BOF meeting was called in 2000 to address the Cook Inlet coho conservation issue. The next regularly scheduled BOF meetings are scheduled for 2001 and 2002. 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 King 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 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 (5 AAC 21.363) (UCISMP) provides long-term direction to the Board for allocation and conservation of fisheries involving UCI salmon stocks. The plan defines UCI salmon stocks as those that move through the Northern and Central Districts and spawn in waters draining into those districts. Various "step down" management plans relate to the Upper Cook Inlet Salmon Management Plan and provide specific direction to fishery managers regarding user groups, time, area or species.

The Upper Cook Inlet Salmon Management Plan established the following provisions for the management and conservation of UCI salmon stocks:

1. Provide for a subsistence priority.
2. Harvest of UCI salmon will be governed by specific and comprehensive management plans.
3. In adopting these plans the following will be considered: need for subsistence, protection of fisheries habitat, and the needs and demands of user groups.
4. The management plans may address: the need to allocate harvestable surplus among commercial, sport, guided sport and personal use fisheries and the need to allocate the harvestable surplus within user groups.
5. In the absence of a specific management plan salmon shall be harvested in the fisheries that have historically harvested them.
6. In the absence of a specific management plan the burden of conservation shall be shared among all user groups in close proportion to their respective harvest.

Included in the UCISMP are eight 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.
8. Use a precautionary approach in a manner consistent with the degree of uncertainty regarding the status and biology of the resource.

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 King Salmon Management Plan (5 AAC 21.366) was adopted in 1985 by the BOF. This plan provides for the management of the commercial harvest of chinook salmon in the Northern District as follows.

1. The season runs from June 1 through June 24, unless closed by emergency order.
2. Fishing periods are 7:00 a.m. to 1:00 p.m. on Mondays, with the number of periods determined by the department based on expectations of run strength.
3. Harvest shall not exceed 12,500.
4. Set gillnets may not exceed 35 fathoms in length and six inches in mesh size.
5. No CFEC permit holder may operate more than one set gillnet at a time.
6. No net shall be set within 1,200 feet of another.
7. No net shall be placed seaward of another.
8. June 1 though June 24 the area from 1 mile south of the Theodore River to the Susitna River is open the first Monday in June only. Provisions of this paragraph do not apply after December 31, 2001.
9. 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 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the following fishing season; the provisions of this paragraph do not apply after December 31, 2001.
10. If at least 90% of the biological escapement goal (BEG) for the Chuitna River is not met during the fishing season, the Chuitna River shall be closed to sport fishing for king salmon during the following fishing season. Provisions of this paragraph do not apply after December 31, 2001.

The Fish Creek Sockeye Salmon Management Plan (5 AAC 21.364) was adopted by the BOF in 1985 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. This fishery was closed by the BOF in 1999 and will remain closed until new information is available at the next scheduled BOF meeting.

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. The purpose of this plan is to ensure an adequate spawning escapement of coho salmon into the Little Susitna River and provide management guidelines to the department. The escapement goal is set at 9,600-19,200 coho salmon above the Parks Highway bridge. The management plan also sets the daily bag and possession limits at 3 and limits tackle to artificial lures from July 16 through August 5.

The Criteria For Establishing Special Management For Trout (5 AAC 75.013) was adopted by the BOF in November 1996 from the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy. These criteria provide 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 (5 AAC 21.370) 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 Salmon Management Plan (5 AAC 21.358) provides for the following management guidelines:

1. Minimizes the harvest of coho salmon bound for the Northern District of UCI and provides the department direction for management of salmon stocks.
2. Manage the Northern district commercial salmon fisheries based on abundance of Yentna River sockeye salmon, or other salmon indices as it deems appropriate.
3. Manage the Northern district commercial salmon fisheries to minimize the incidental take of coho salmon stocks bound for the Northern District.
4. Restricts Central District drift gillnet fishery weekly fishing periods unless late-run sockeye salmon to the Kenai River will be more than 4 million.
5. Personal use fishing with a set gillnet is prohibited in the Northern District.
6. Employ a precautionary approach to chum salmon management.
7. To minimize the harvest of coho salmon, no targeted pink salmon fishing will be allowed in the Central and Northern districts until a pink salmon management plan is brought to the Board in 2002.
8. Directs the department to conduct habitat assessments to determine loss of riparian habitat by noncommercial fishermen.

The Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540) 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 (5 AAC 01.593) establishes a subsistence fish wheel fishery for salmon other than king salmon in the Yentna River downstream of its confluence with the Skwentna River to the confluence of Martin Creek. A seasonal limit of 2,500 salmon was set. This fishery was implemented as a personal use fishery during the 1996 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. 1995-1999). 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 1997, an average of 295,049 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. During 1988-1997, 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. 1999).

Table 1.-Number of angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters as estimated by SWHS, 1977-1998.

	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
1997	121,114	40	112,267	37	61,155	20	5,814	2	300,350	2,654,454	11	1,803,564	17
Mean	123,156	42	94,346	32	71,569	24	5,978	2	295,049	2,077,479	14	1,488,781	20
93-97 Mean	125,262	38	114,397	35	78,597	24	7,438	2	325,693	2,690,890	12	1,914,443	17
1998	95,904	37	108,134	41	52,803	20	4,943	2	261,784	2,153,992	12	1,465,738	18

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

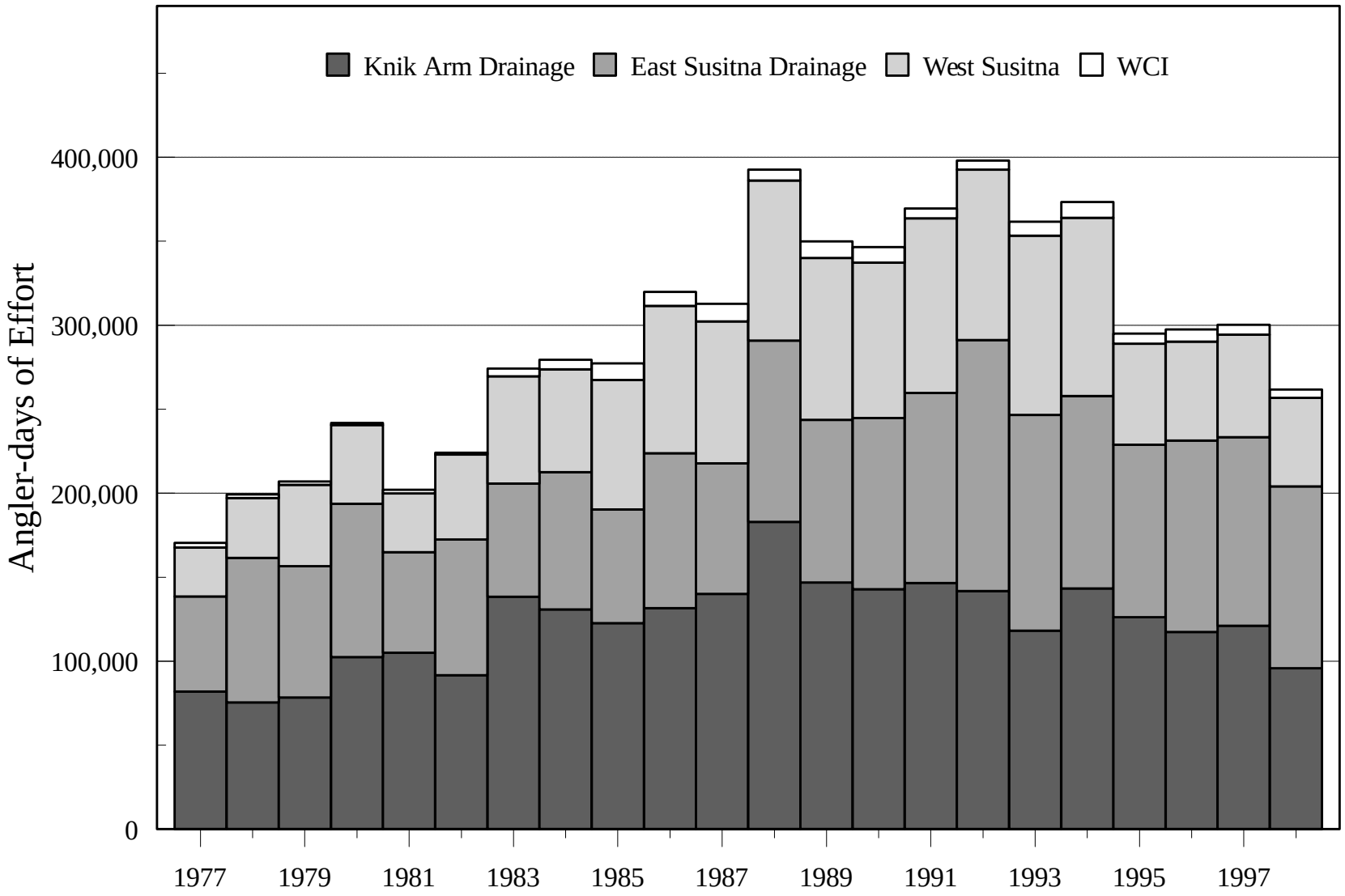


Figure 2.-Angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1998.

During 1998 anglers spent an estimated 261,784 angler-days fishing NCIMA waters. This falls below the previous 5-year average and is the lowest annual effort recorded since 1982. The effort in 1998 represented 12% and 18% 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 1997, these waters supported an average of 123,156 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 36,469 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 1997 expended an average of 94,346 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 108,134 angler-days were spent in this area during 1998, falling slightly below the previous 5-year average (1993-1997). 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 1997 expended an average of 71,569 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 52,803 angler-days occurred during 1998, a considerable decrease from the previous 5-year average and the lowest on record since 1982. Major fisheries occur in the Deshka River, Alexander Creek, and the Yentna River including Lake Creek (Table 4, Figure 5). Other fisheries occur in numerous remote lakes in the area (Table 4, Figure 5).

From 1977 through 1997 anglers fishing West Cook Inlet Management Unit waters expended an average of 5,978 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 4,943 angler-days occurred during 1998, a considerable decrease from the previous 5-year average and the lowest on record since 1983. 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 1997, an average of 200,578 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 1977-1997 (Table 6). The harvest was dominated by rainbow trout, coho salmon and landlocked salmon (Table 8). The Eastside Susitna and Westside Susitna units

Table 2.-Angler-days of sport fishing effort for the Knik Arm drainage by fishery as estimated by SWHS, 1977-1998.

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
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
Mean	2,816	36,469	10,503	7,678	2,946	4,345	2,870	7,391	10,357	12,110	9,177	21,975	1,946	123,156
93-97 Mean	1,276	39,372	8,927	7,911	1,763	2,815	2,279	8,359	10,186	8,953	9,174	22,607	1,641	125,262
1998	1,106	27,250	6,403	6,555	1,473	4,480	2,709	5,329	7,732	7,581	5,719	19,171	396	95,904

[a] Knik River and tributaries including Jim Creek.

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

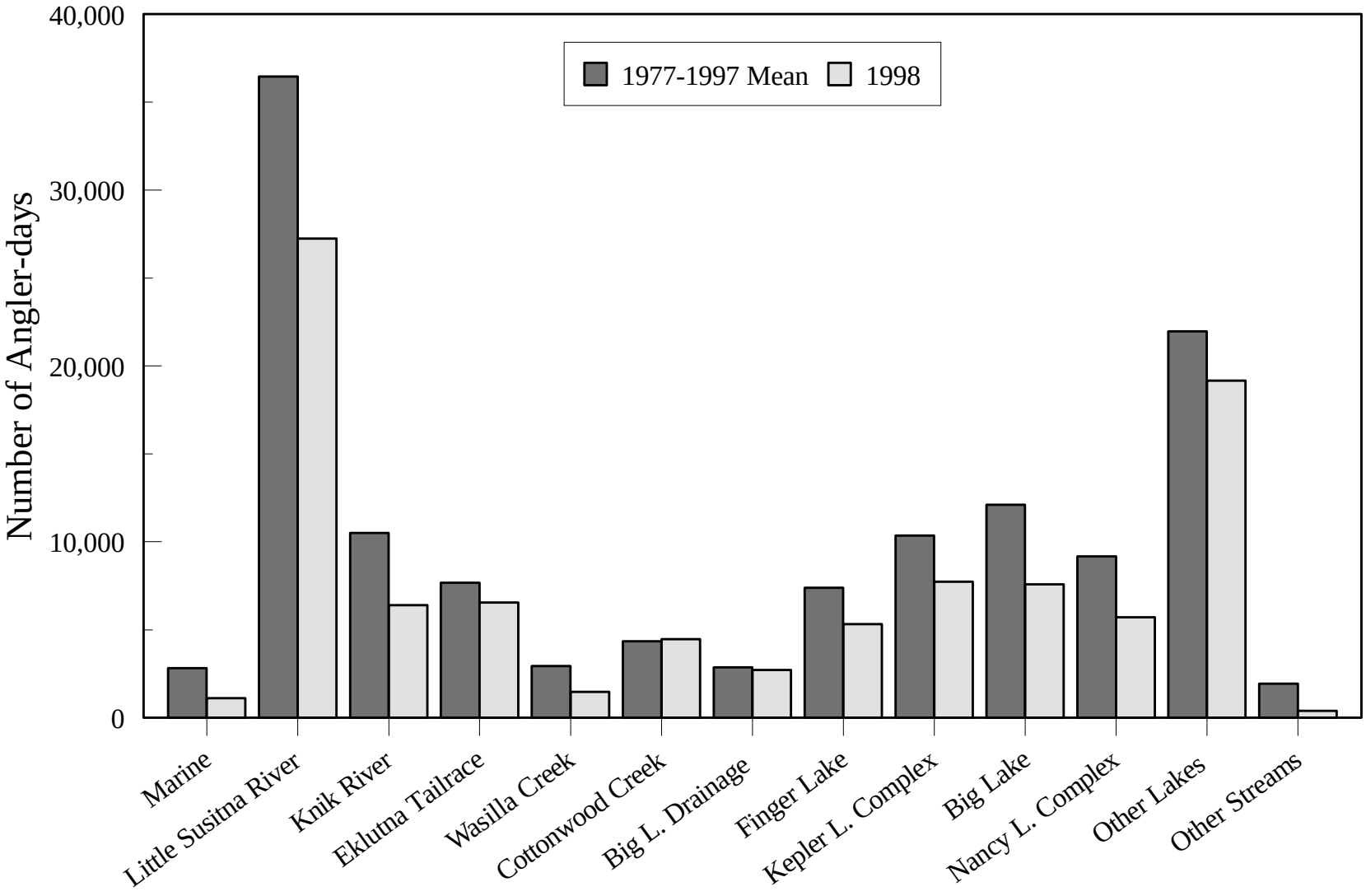


Figure 3.-Mean number of angler-days per year of sport fishing effort expended at sites in the Knik Arm management unit, 1977-1998.

Table 3.-Angler-days of sport fishing effort for the eastside Susitna River drainage by fishery as estimated by SWHS, 1977-1998.

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
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
Mean	25,065	6,327	2,369	4,637	10,358	2,923	17,965	1,216	4,178	12,869	5,008	6,184	94,346
93-97 Mean	33,013	7,102	1,791	3,724	11,397	3,079	18,297	812	3,468	21,828	5,412	4,473	114,397
1998	28,820	6,032	2,108	3,457	12,341	2,986	18,342	1,323	2,928	19,913	6,152	3,732	108,134

[a] Talkeetna River and tributaries including Clear Creek.

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

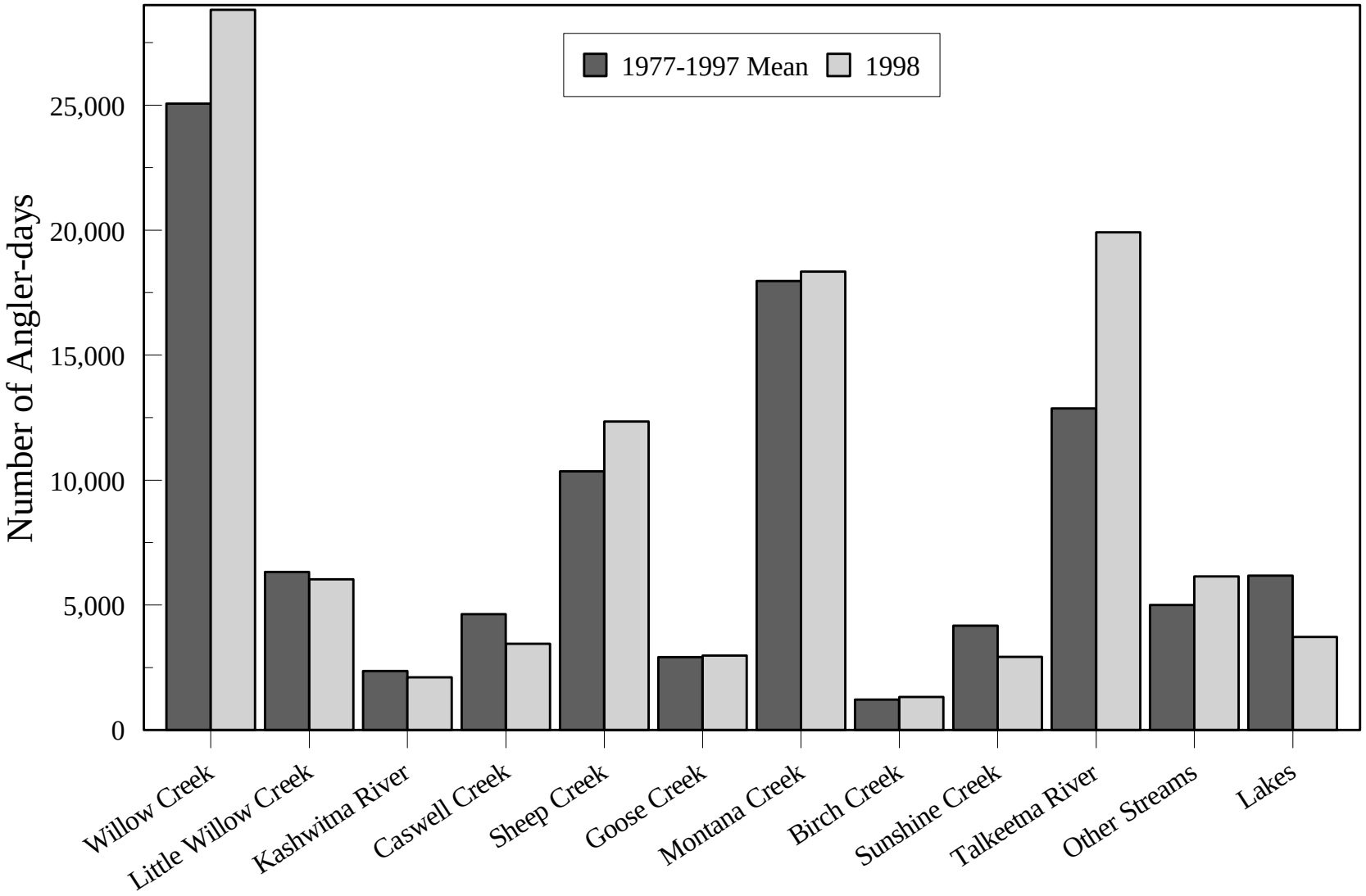


Figure 4.-Mean number of angler-days per year of sport fishing effort expended at sites in the eastside Susitna River management unit, 1977-1998.

Table 4.-Angler-days of sport fishing effort for the westside Susitna River drainage by fishery as estimated by SWHS, 1977-1998.

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
1997	9,762	6,780			2,208	817	19,013	3,874	7,262					8,734	2,705	61,155
Mean	13,381	21,767	756	769	1,910	1,443	14,985	5,187	4,428	764	484	161	498	8,466	3,091	71,569
93-97 Mean	15,008	13,670			2,540	1,239	21,157	5,025	6,743					10,470	2,746	78,597
1998	7,457	14,241	621		841	548	12,442	2,731	3,325					9,519	1,078	52,803

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

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

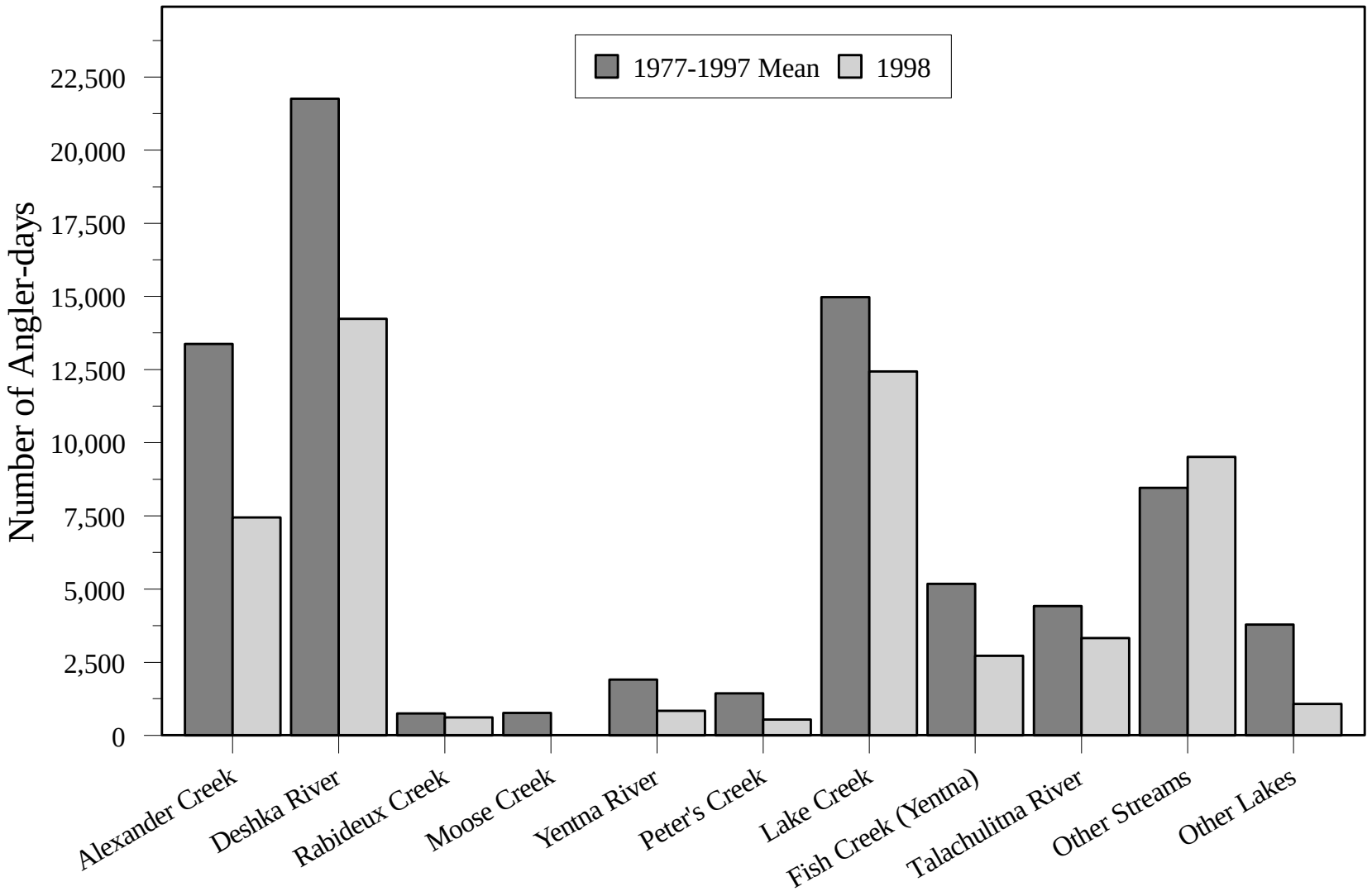


Figure 5.-Mean number of angler-days per year of sport fishing effort expended at sites in the westside Susitna River management unit, 1977-1998.

Table 5.-Angler-days of sport fishing effort for the West Cook Inlet drainage by fishery as estimated by SWHS, 1977-1998.

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
1997	2,851		690		2,273	5,814
Mean	2,422	689	2,553	634	2,115	5,978
93-97 Mean	2,760		2,307	400	2,291	7,438
1998	3,445		284		1,214	4,943

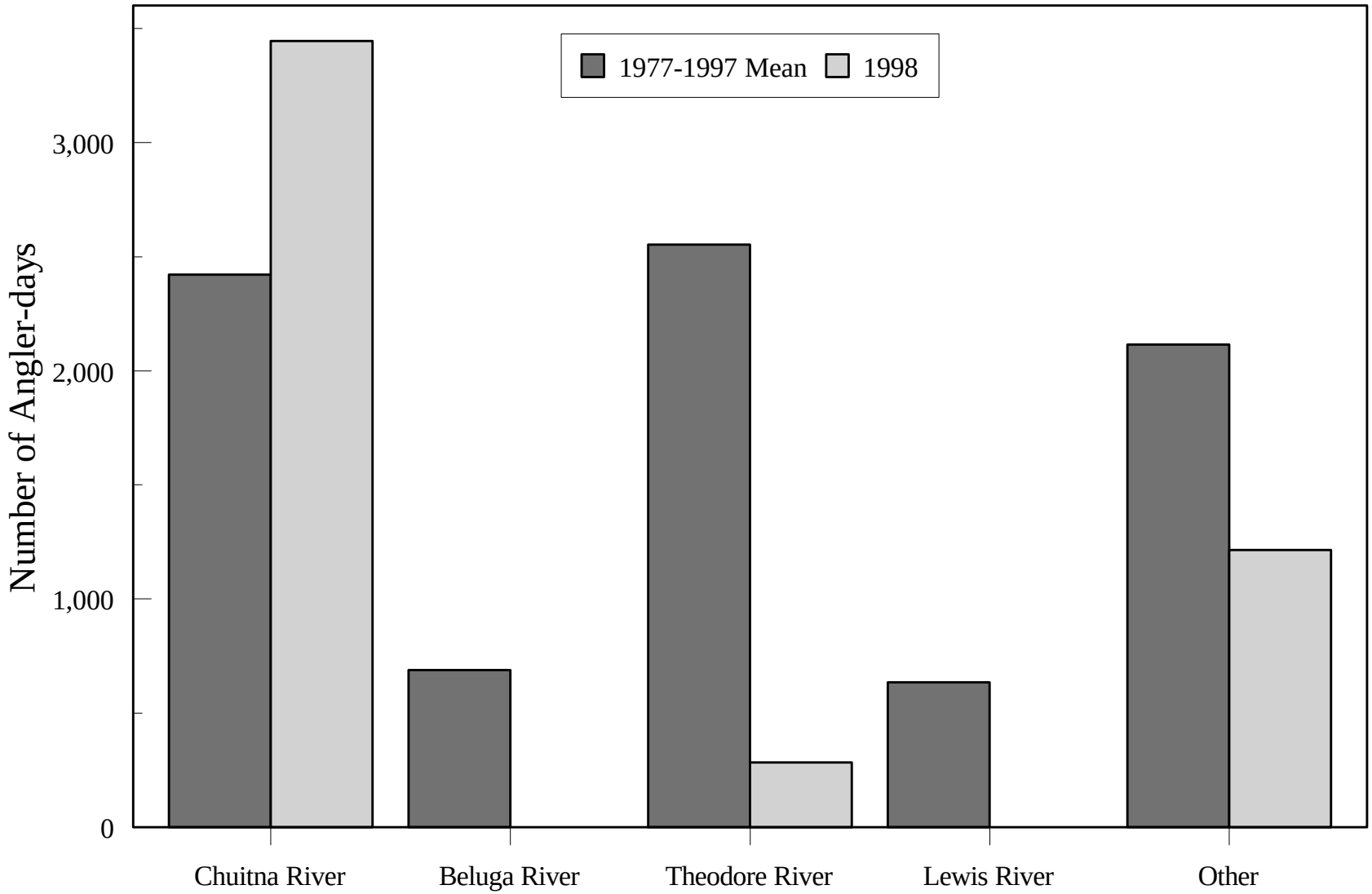


Figure 6.-Mean number of angler-days per year of sport fishing effort expended in the West Cook Inlet drainage, 1977-1998.

Table 6.-Northern Cook Inlet Management Area recreational harvest by management unit as estimated by SWHS, 1977-1998.

	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	6
1996	77,435	47	48,716	30	34,025	21	4,219	3	164,395	3,336,773	5	2,733,663	6
1997	57,127	43	38,798	29	29,789	22	7,225	5	132,939	3,294,273	4	2,643,988	5
Mean	90,531	45	57,101	28	48,664	24	4,282	2	200,578	3,000,550	7	2,423,792	8
93-97 Mean	73,862	43	50,050	29	40,922	24	5,519	3	170,352	3,176,113	5	2,570,252	7
1998	71,369	39	55,078	30	46,933	26	7,820	4	181,200	3,163,194	6	2,365,536	8

Table 7.-Northern Cook Inlet Management Area sport fish harvest by species as estimated by SWHS, 1977-1998.

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
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
Mean	22,191	47,104	11,452	13,798	6,158	16,085	43,055	13,617	14,772	1,758	1,745	2,760	1,074	4,291	719	200,578
% of Total Mean	11	23	6	7	3	8	21	7	7	1	1	1	1	2	<1	100
93-97 mean	27,188	61,578	12,071	3,905	4,234	12,152	25,499	5,106	4,904	402	1,340	5,277	553	5,906	236	170,352
1998	26,240	74,780	15,815	4,941	3,789	5,818	20,155	3,577	3,789	262	1,376	12,078	566	7,865	149	181,200

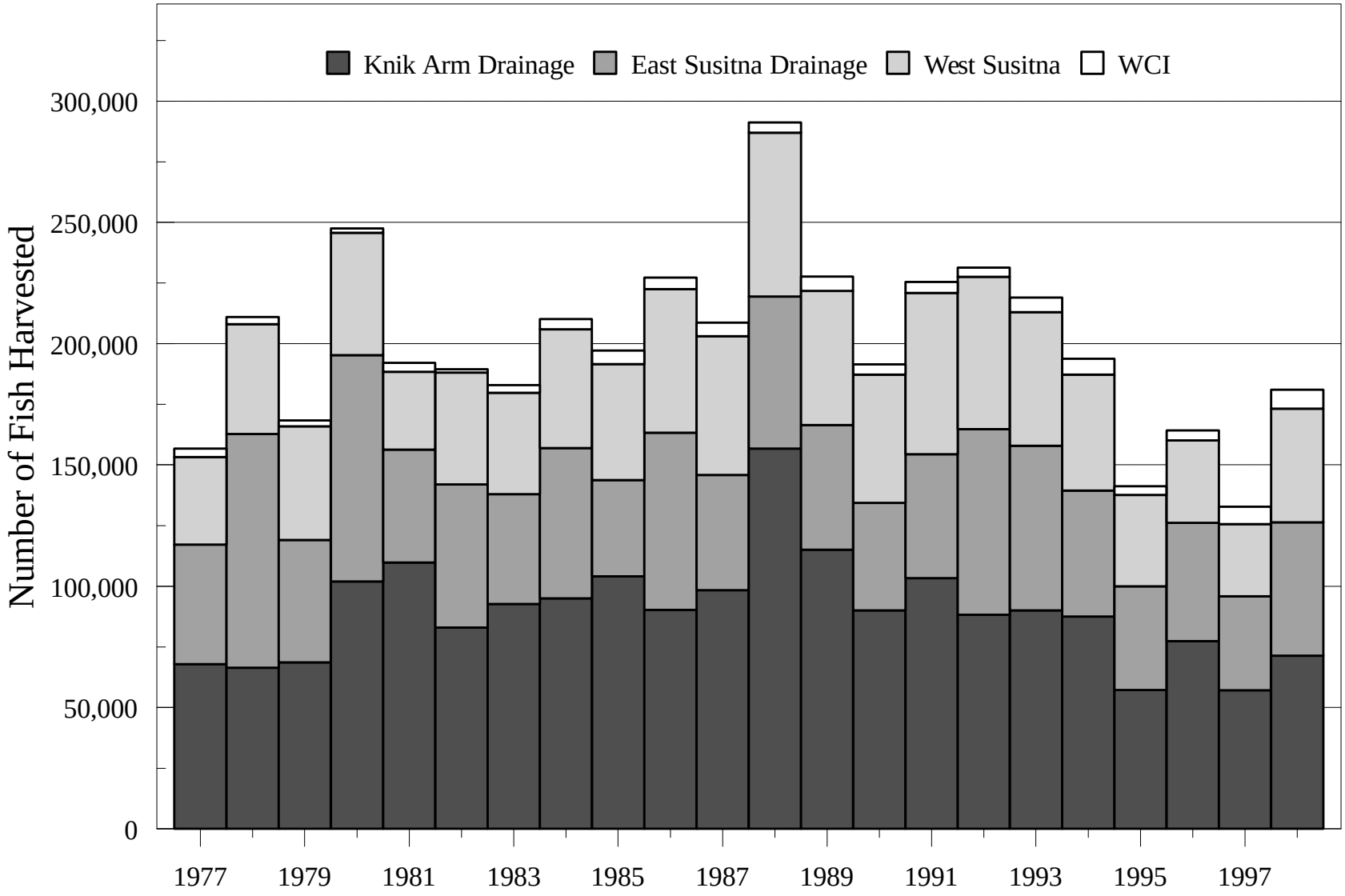


Figure 7.-Northern Cook Inlet Management Area recreational harvest, 1977-1998.

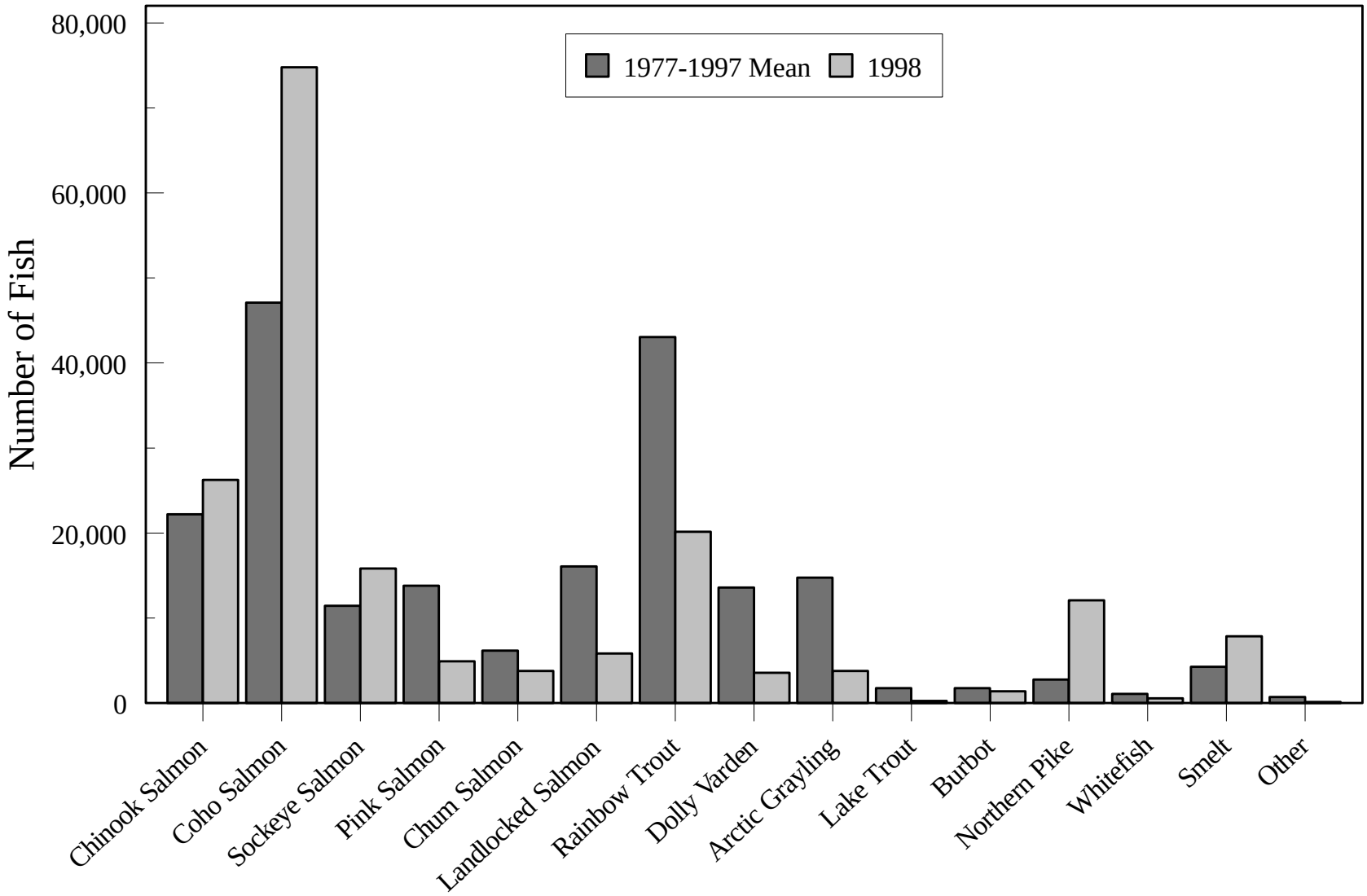


Figure 8.-Northern Cook Inlet Management Area mean recreational harvest by species, 1977-1998.

Table 8.-Knik Arm drainage sport fish harvest by species as estimated by SWHS, 1977-1998.

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
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
Mean	2,057	18,676	5,984	1,284	1,626	15,450	29,616	8,719	4,031	916	369	1,406	469	478	346	90,531
% of Total Mean	2	21	7	1	2	17	33	10	4	1	<1	2	1	1	<1	100
93-97 mean	2,709	23,983	4,977	519	1,677	11,956	20,118	3,335	1,624	79	294	1,888	154	460	88	73,862
1998	2,344	27,672	5,812	795	845	5,498	17,815	2,425	1,304	74	121	6,223	356	0	85	71,369

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 1977-1998 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. 1995-1999). From 1992 through 1998 the average percent released was approximately 65% of the total catch (Table 12).

The proportion and type of fish released by anglers varies within and among management units (Howe et al. 1995-1999) (Tables 13 and 14). Pink salmon, chum salmon, Arctic grayling, and rainbow trout were the most frequently released fish species during 1992-1998. In all units during 1994-1998, the number of fish caught and released was greater than the number of fish caught and harvested, except 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 1998 was 5.3 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 sampling of the Northern District setnet fishery in 1998 resulted in an estimated 5% contribution of Upper Cook Inlet-released hatchery fish. Upper Cook Inlet hatchery-released fish contributed 4% of the commercial harvest in 1999 (Appendix B11). 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.

Table 9.-Eastside Susitna River drainage sport fish harvest by species as estimated by SWHS, 1977-1998.

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
1997	11,645	11,243	6,742	2,261	2,273	153	1,878	787	1,138	138	252	100	188	38,798
Mean	7,725	14,593	2,739	10,412	3,908	635	6,101	3,002	6,224	523	652	572	206	57,101
% of Total Mean	14	26	5	18	7	1	11	5	11	1	1	1	<1	100
93-97 mean	13,164	20,503	4,296	2,667	2,179	196	3,031	1,186	1,920	201	514	88	105	50,050
1998	12,232	27,635	6,481	2,030	2,548	320	991	889	1,435	138	219	96	64	55,078

Table 10.-Westside Susitna River drainage sport fish harvest by species as estimated by SWHS, 1977-1998.

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
1997	8,190	7,148	3,662	750	491	1,704	188	992	138	788	4,878	64	771	25	29,789
Mean	11,244	12,310	2,498	1,962	601	6,772	1,524	4,486	318	723	1,889	634	6,106	163	48,664
% of Total Mean	23	25	5	4	1	14	3	9	1	1	4	1	13	<1	100
93-97 mean	10,108	14,517	2,380	698	368	2,144	471	1,304	122	532	3,388	310	4,543	36	40,922
1998	10,958	15,444	2,940	2,030	396	1,149	147	1,019	50	1,036	5,855	114	5,795	0	46,933

Table 11.-West Cook Inlet drainage sport fish harvest by species as estimated by SWHS, 1977-1998.

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
1997	915	2,115	373	42	19	342	126	138	0	0	3,155	0	7,225
Mean	1,164	1,525	231	139	24	566	372	31	1	15	215	5	4,282
% of Total Mean	27	36	5	3	1	13	9	1	<1	<1	5	<1	100
93-97 mean	1,207	2,575	418	21	9	207	114	55	0	2	903	8	5,519
1998	706	4,029	582	86	0	200	116	31	0	0	2,070	0	7,820

Table 12.-Percent of fish released by recreational anglers in the Northern Cook Inlet Management Area for 1992-1998.

	1992		1993		1994		1995		1996		1997		1998		Average
	Catch	Percent Released	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	73,612	64.4	55.0
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	113,612	34.2	35.2
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	27,067	41.6	46.0
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	122,702	96.0	90.0
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	53,055	92.9	87.8
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	15,290	61.9	48.1
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	813	67.8	75.5
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	21,195	83.1	72.6
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	116,091	82.6	78.0
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	31,666	88.0	85.9
Whitefish	3,253	73.5	3,307	73.5	3,831	68.9	1,255	81.9	999	78.7	1,324	80.7	1,596	64.5	74.5
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	47,297	74.5	72.9
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	2,195	37.3	41.3
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	11,610	32.3	11.1
Other	1,377	33.9	1,158	73.8	1,273	66.8	1,096	92.6	158	61.4	970	67.6	286	47.9	63.4
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	638,087	71.6	64.9

Table 13.-Percent of fish released by recreational anglers in the Knik Arm and Eastside Susitna River areas, 1994-1998.

	1994		1995		1996		1997		1998	
Knik Arm	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	4,237	44.7
Coho Salmon	38,734	26.3	28,858	28.4	30,991	26.4	16,641	27.0	34,905	20.7
Sockeye Salmon	8,990	43.5	6,445	32.5	10,463	47.5	5,565	27.6	8,631	32.7
Pink Salmon	4,352	85.4	1,554	73.7	5,564	83.3	1,008	61.0	10,000	92.1
Chum Salmon	4,225	67.9	16,567	75.2	9,045	81.9	3,100	87.3	5,006	83.1
Landlocked Salmon	25,232	43.9	12,152	40.1	20,398	28.4	21,513	54.0	14,852	63.0
Lake Trout	309	78.6	228	48.2	0		9	0.0	91	18.7
Dolly Varden	9,767	63.8	5,440	61.2	10,173	62.5	7,521	53.0	10,699	77.3
Rainbow Trout	70,255	68.1	56,108	73.5	69,271	67.4	60,823	68.5	67,245	73.5
Arctic Grayling	13,544	78.6	4,529	81.9	4,652	69.1	5,501	70.5	6,929	81.2
Whitefish	724	66.6	200	64.5	229	40.2	219	58.0	480	25.8
Northern Pike	2,816	52.8	825	36.7	9,169	70.1	6,673	58.8	17,091	63.6
Burbot	708	27.7	377	59.9	197	68.0	444	41.0	489	75.3
Smelt	2,303	0.5	51	100.0	0		0		3,745	100.0
Other	329	50.5	19	100.0	62	100.0	510	80.2	246	65.4
Total	188,412	53.5	136,124	58.0	172,560	55.1	134,707	57.6	184,646	61.3
Eastside Susitna River										
Chinook Salmon	23,985	37.6	16,376	51.9	18,896	54.2	35,762	67.4	35,857	65.9
Coho Salmon	28,717	27.3	31,602	39.4	36,368	30.8	20,209	44.4	44,444	37.8
Sockeye Salmon	7,116	51.6	6,939	46.9	7,948	56.3	13,890	51.5	11,803	45.1
Pink Salmon	17,729	88.9	31,809	92.7	35,771	92.0	25,363	91.1	93,001	92.3
Chum Salmon	12,379	89.7	34,757	90.7	25,161	89.5	24,351	90.7	41,384	94.1
Landlocked Salmon	199	77.4	135	75.6	65	83.1	581	73.7	438	26.9
Lake Trout	2,490	90.7	1,207	79.0	170	44.1	927	85.1	575	57.6
Dolly Varden	6,356	83.7	3,666	72.4	6,689	74.8	5,898	86.7	8,119	89.1
Rainbow Trout	23,619	84.5	15,363	79.6	23,734	88.3	25,734	92.7	26,649	96.3
Arctic Grayling	16,154	78.4	9,126	83.7	9,536	88.6	12,449	90.9	15,737	90.9
Whitefish	1,157	85.1	568	85.9	279	100.0	915	89.1	660	85.5
Northern Pike	0		0		0		175	42.9	260	0.0
Burbot	1,208	44.2	837	38.2	536	59.5	530	52.5	481	54.5
Smelt	0		0		0		0		0	0.0
Other	449	63.0	122	50.0	69	11.6	460	59.1	32	0.0
Total	141,558	63.3	152,507	71.9	165,222	70.5	167,244	76.8	279,440	65.9

Table 14.-Percent of fish released by recreational anglers in the Westside Susitna River and West Cook Inlet areas, 1994-1998.

	1994		1995		1996		1997		1998	
Westside Susitna R.	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	31,332	73.9	30,938	64.6
Coho Salmon	22,983	33.2	28,181	39.2	30,675	43.0	18,931	62.2	28,585	46.0
Sockeye Salmon	4,366	56.0	4,178	49.6	4,952	58.5	10,125	63.8	5,867	49.9
Pink Salmon	7,144	82.4	5,007	92.8	11,231	95.2	6,058	87.6	19,346	89.5
Chum Salmon	3,597	91.3	3,482	83.0	5,732	94.8	6,822	92.8	6,657	94.1
Landlocked Salmon	0		0		0		0		0	
Lake Trout	552	79.5	388	78.4	80	100.0	390	64.6	139	64.0
Dolly Varden	2,097	75.8	2,577	75.9	2,964	80.7	1,528	87.7	2,091	93.0
Rainbow Trout	25,157	90.0	23,432	92.5	30,072	92.5	22,829	92.5	20,684	94.4
Arctic Grayling	20,144	91.8	9,359	90.4	13,815	88.7	12,780	92.2	8,969	88.6
Whitefish	1,931	59.7	487	84.4	491	84.5	190	66.3	456	75.0
Northern Pike	5,436	53.0	15,414	80.4	13,997	79.5	19,500	75.0	29,786	80.3
Burbot	1,247	12.6	230	17.4	775	57.4	918	14.2	1,225	15.4
Smelt	9,770	2.9	4,549	0.0	1,708	23.1	771	0.0	5,795	0.0
Other	477	82.4	955	97.9	27	100.0	0		8	100.0
Total	117,483	59.2	112,376	66.5	128,441	73.5	132,174	77.5	160,546	70.8
West Cook Inlet										
Chinook Salmon	2,166	27.2	1,788	62.3	2,611	61.1	2,862	68.0	2,580	72.6
Coho Salmon	3,485	22.7	4,488	40.5	3,811	36.1	4,164	49.2	5,678	29.0
Sockeye Salmon	771	19.2	103	0.0	526	75.3	568	34.3	766	24.0
Pink Salmon	221	96.4	109	100.0	537	96.3	571	92.6	355	75.8
Chum Salmon	221	100.0	108	75.0	83	100.0	267	92.9	8	100.0
Landlocked Salmon	0		0		0		0		0	
Lake Trout	0		0		0		0		8	0.0
Dolly Varden	783	90.7	1,017	91.3	879	80.7	658	80.9	286	59.4
Rainbow Trout	529	66.5	472	80.1	1,293	75.5	1,577	78.3	1,513	86.8
Arctic Grayling	59	86.4	176	100.0	271	51.7	324	57.4	31	100.0
Whitefish	19	100.0	0		0		0		0	
Northern Pike	0		0		0		101	31.6	160	73.8
Burbot	0		0		0		0		0	
Smelt	1,360	0.0	0		575	100.0	3,155	0.0	2,070	0.0
Other	18	50.0	0		0		0		0	
Total	9,632	32.2	8,261	55.7	10,586	60.1	14,247	49.3	13,455	41.7

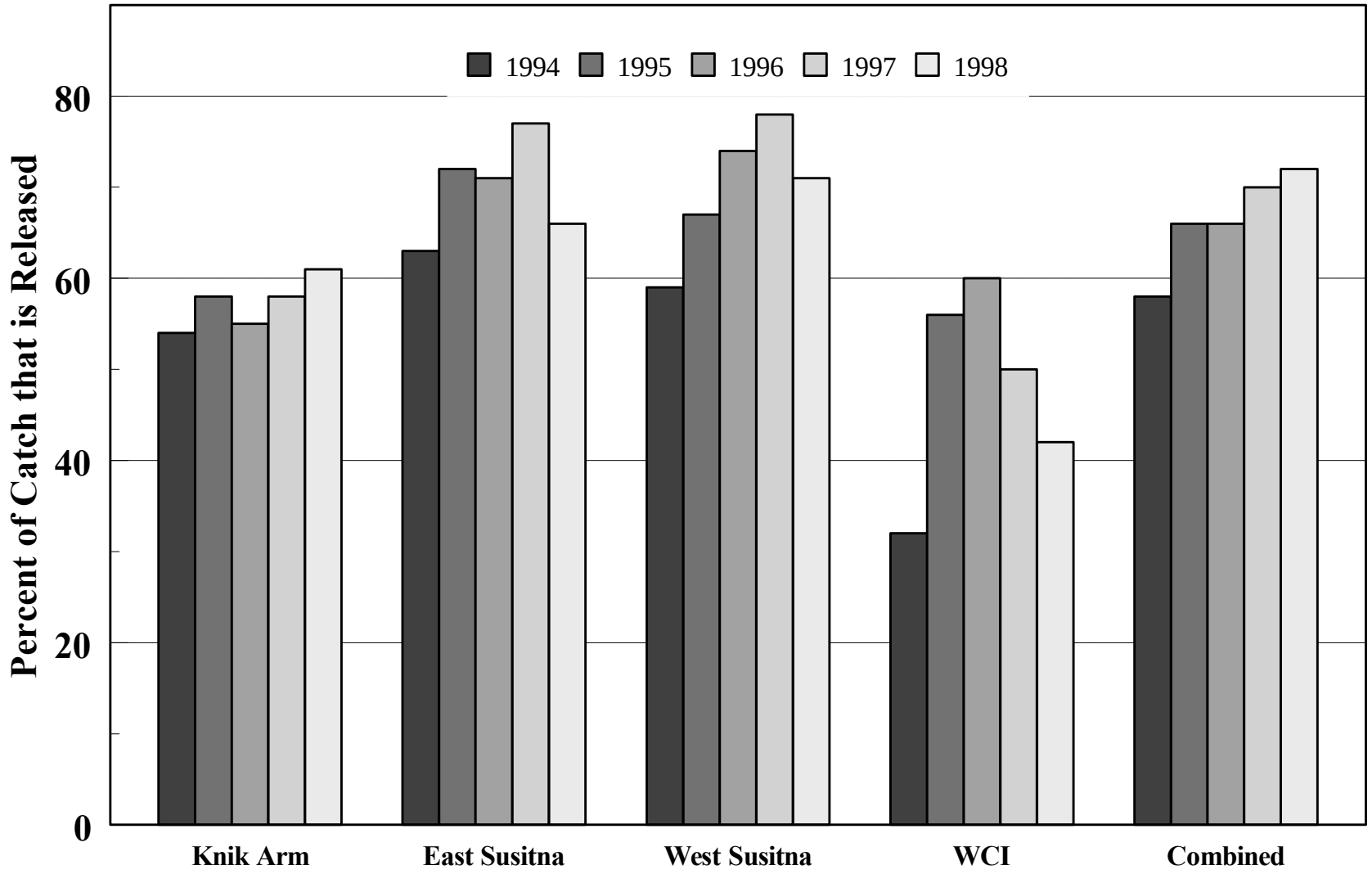


Figure 9.-Percent of the recreational catch of all species from the Northern Cook Inlet Management Area released, 1994-1998, by management unit.

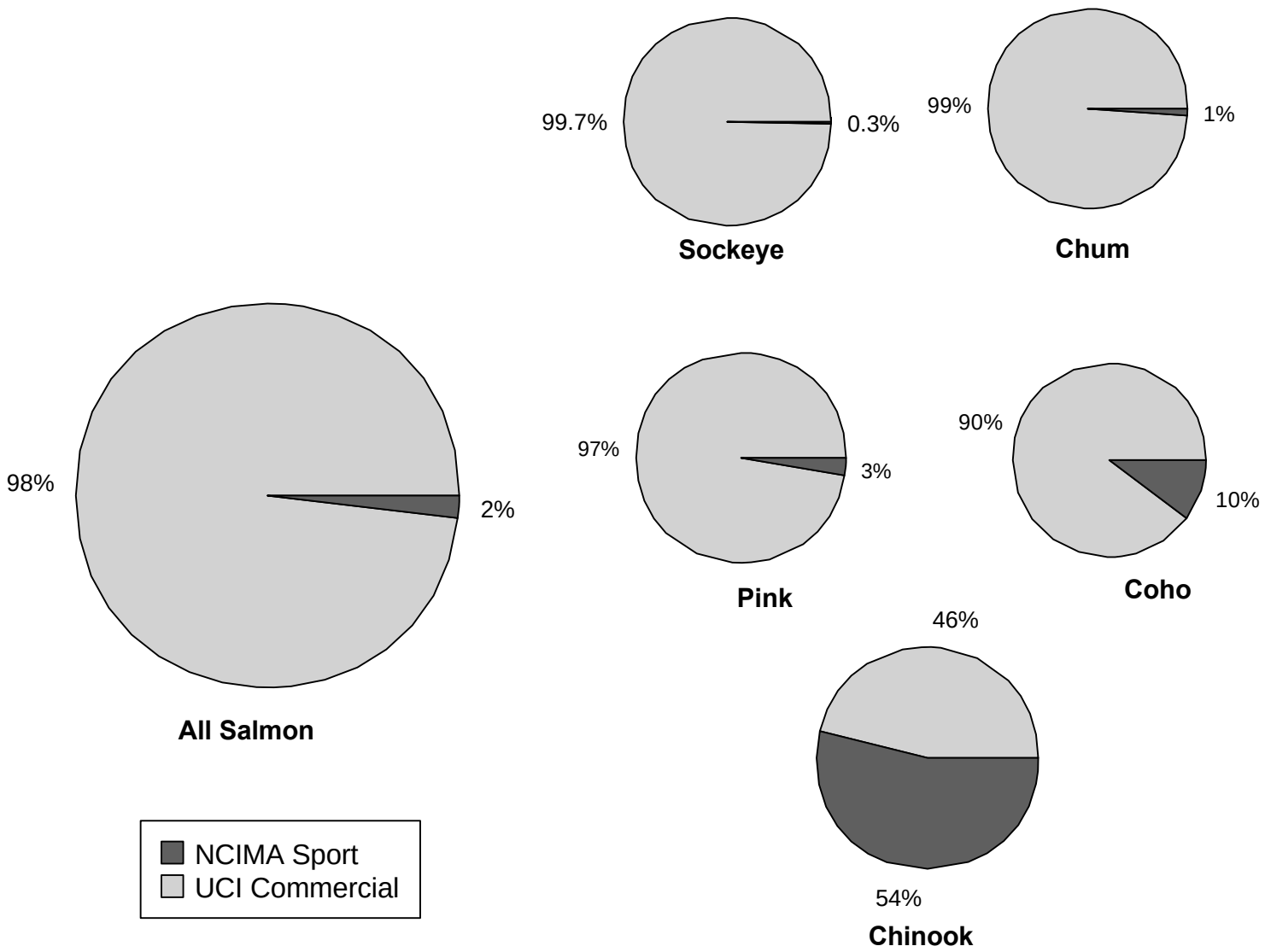


Figure 10.-Composition of the Northern Cook Inlet salmon harvest, 1977-1998.

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

The most recent estimate available to assess the economic value of the NCIMA recreational fisheries was conducted in 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. Beginning in 1990 the annual number of nonresident sport fishing licenses sold has surpassed the number of resident licenses (Howe et al. 1999). Nonresident licenses accounted for 58% of all sport fishing licenses in 1997 and probably presently represent more than 50% of the value of the sport fisheries.

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. It is likely that cost per angler-day has increased substantially (15%-25%) during the decade and a half since this report was completed.

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. Escapement studies to assess returns of chinook and coho salmon in selected Northern Cook Inlet streams;
2. Creel and escapement studies to assess Willow Creek chinook salmon hatchery enhancement;
3. Assessment of Willow Creek wild and hatchery chinook salmon marine interception and inriver return;
4. Assessment of the return of chinook and coho salmon 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. Evaluation of the effects of regulations requiring slot limits for northern pike harvest in Alexander and Trapper lakes;
8. Willow Creek rainbow trout evaluation studies;
9. Distribution, abundance, movement, food preference and length composition studies of northern pike in the Susitna River drainage; and
10. A multiagency 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, and 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 and providing regulatory signs,
5. Habitat monitoring and permit review,
6. Evaluating 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) 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),
8. Little Susitna River coho salmon stocking and weir operation, and
9. The effects of an increasing population on a finite resource.

Current issues which affect 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 it was maintained for over a half century. After harvest levels increased from 1940 to 1952 to an average of 84,500 annually, 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 70,000 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 allow use of 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, originally stipulated 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 were 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, 1893-1998.

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	25,467
1914	38,043	1956	52,248	1998	32,158
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.

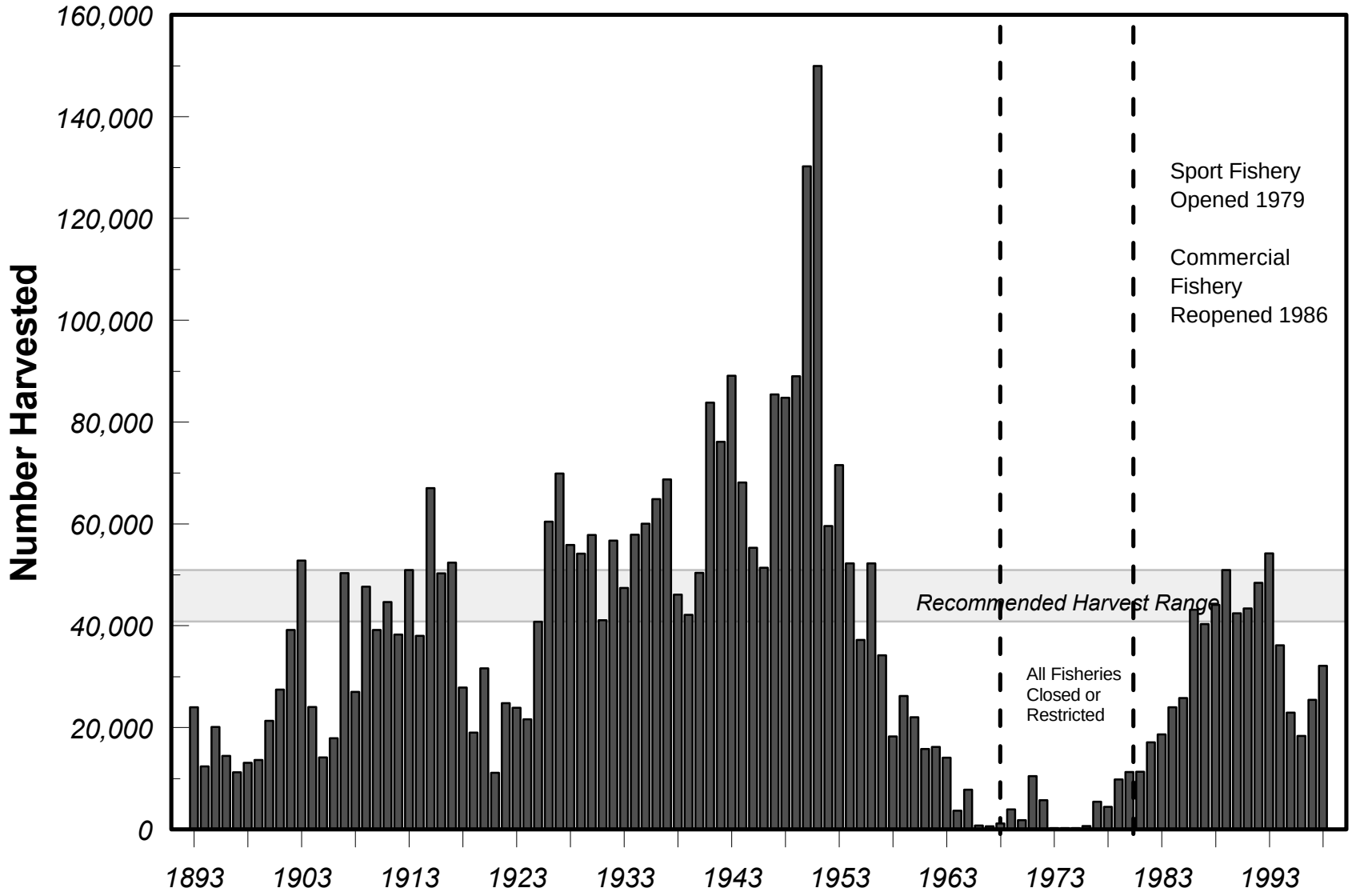


Figure 11.-Estimated harvests by all user groups of chinook salmon of Northern Cook Inlet origin, 1893-1998.

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	2,344	12,232	10,958	706	26,240	810	32,158

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

[b] Source of data is SWHS, Mills 1979-1994, Howe et al. 1995-1999.

[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 1987-1994). Sport harvests since 1993 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 1999 resulted in an estimated 4% contribution of Upper Cook Inlet released hatchery fish (Appendix B11). 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 18 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 34,250 chinook salmon; however, each of the 18 streams is 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 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 was reduced to approximately half of the 1993 peak harvest (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, two personal use fisheries 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 to Martin Creek. 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 provides the area's only personal use salmon fishery opportunity. The harvest of chinook salmon is prohibited in both of 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 0-42 chinook have been reported.

Table 19.-Chinook salmon biological escapement goals (BEG) for Northern Cook Inlet Management Area waters in 1999.

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	1,350	Aerial
Deception Creek	400	Aerial
Westside Susitna River Management Unit		
Alexander Creek	2,700	Aerial
Deshka River	8,750	Aerial
	17,500	Weir
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, 1980-1999.

	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	49/74	886	127	49	1	1
1999	76/91	1,314	145	91	26	9
Mean		1,569	122	120	16	11

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
1999-Subsistence	21	524	455	43	15	11

[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 District						
East & West Subdistricts		92	1,383	1,009	90	399
Knik Arm Subdistrict		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 District						
East & West Subdistricts		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 District						
East & West Subdistricts		375	5,830	3,602	365	708
Knik Arm Subdistrict		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.

A marine recreational fishery has developed in recent years along the eastside beaches of the Kenai Peninsula (Deep Creek, Ninilchik and Whiskey Gulch area) which targets mixed stocks of early-run chinook salmon. Contribution of specific stocks to these mixed-stock harvests is unknown, but recent tagging studies have shown 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 (Appendix B10). 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 February 1999 BOF meeting the following regulations were adopted:

1. The Deshka River will be open to king salmon fishing from its mouth upstream to Chijuk Creek a distance of approximately 19 river miles from January 1 to July 13. Other area regulations apply such as a one fish per day bag and possession limit, a five fish seasonal limit, and once an angler harvests his or her king they must quit fishing for king salmon the remainder of the day. Additionally, fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., no bait is allowed, and guides cannot fish while guiding clients.
2. The area open for retention of king salmon on Alexander Creek was extended from its mouth upstream to Trail Creek. This provides anglers with an additional 11 miles of stream from the 1997 and 1998 seasons in which they may harvest king salmon on Alexander Creek.
3. The Theodore River was opened to catch-and-release fishing for king salmon from January 1st through June 30th, only single hook artificial lures will be allowed. Other West Cook Inlet Area Regulations apply as follows: fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., bait is prohibited, and guides cannot fish while guiding.
4. There will be increased fishing opportunities for the road accessible Parks Highway streams (Eastside Susitna River tributaries) during the early part of June. The Parks Highway streams (Eastside Susitna River tributaries) will open to king salmon fishing from January 1st through the third Monday in June and for the next two consecutive 3-day weekends. This regulation identifying the fishing season is consistent with that on Willow Creek.
5. On the Little Susitna River, anglers will be allowed to use treble hooks year-round downstream of the Parks Highway Bridge. Existing bait restrictions were modified to allow the use of bait during the month of September.
6. The area open to king salmon fishing on the Kashwitna River was extended from its mouth upstream to the Parks Highway Bridge, a distance of 2 miles. The Kashwitna River, a Parks Highway stream, will be regulated under the new season regulation implemented for the Parks Highway streams.
7. In all waters of the Westside-Susitna River and West Cook Inlet Management Areas (excluding waters between the Deshka River and the Talkeetna River mouths), anglers will be allowed to continue to fish for king salmon (catch-and-release) once they have harvested their limit excluding Alexander Creek, Lake Creek, Deshka River, Fish Lake Creek and Clear

Creek. In these streams you will be required to quit fishing for king salmon for the day once you have harvested your limit.

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 an effort to achieve 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 are closed to chinook salmon fishing. On streams with weirs or programs in place that provide inseason sport harvest information, regulations may be liberalized if harvestable surpluses are projected.

Knik Arm Unit Chinook Salmon Fishery

Background and Historical Perspective

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

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

Chinook salmon return to the Little Susitna River from late May through early July with the peak immigration approximately mid-June. Spawning occurs from the Burma Road area upstream 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.

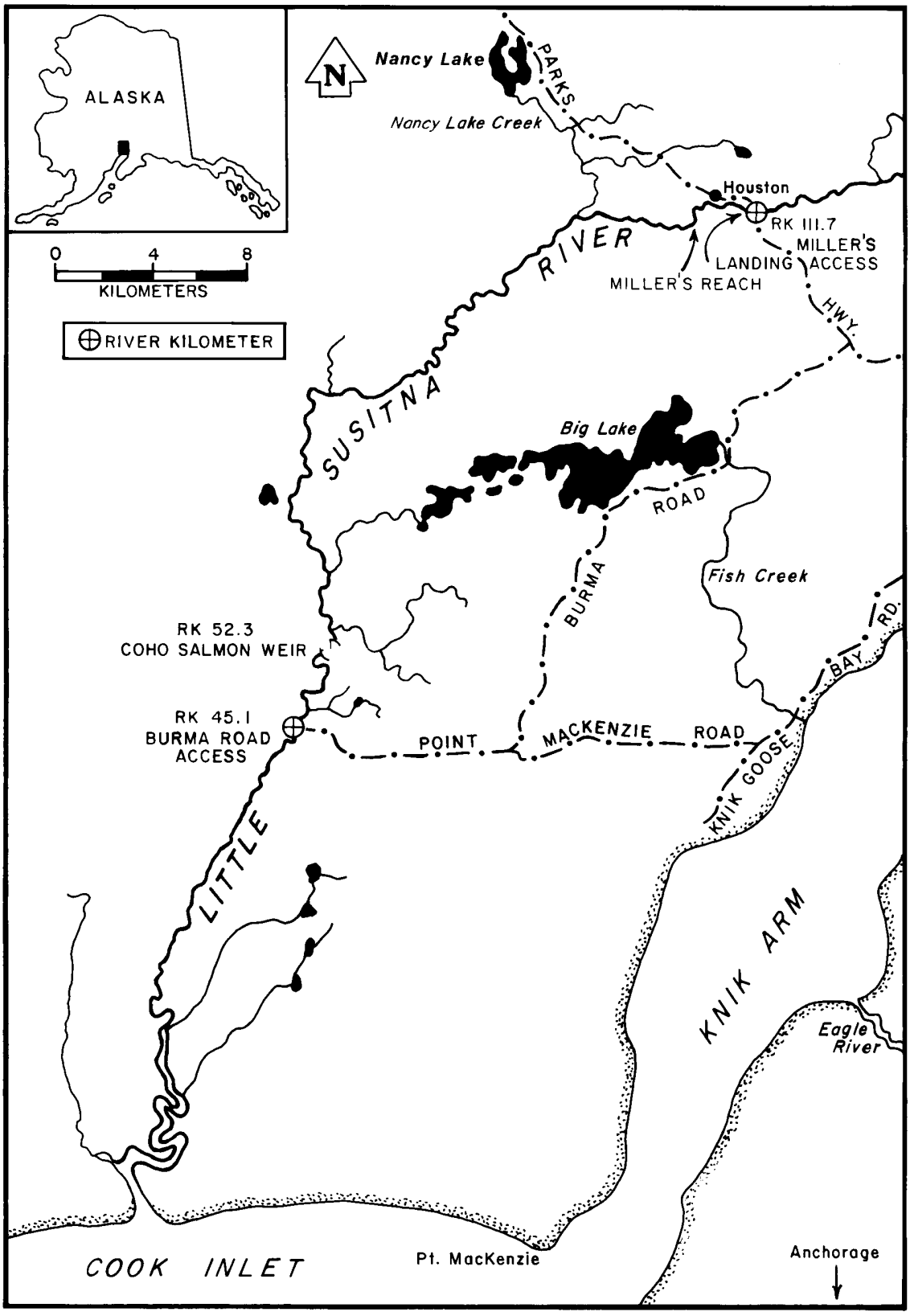


Figure 12.-Map of the Little Susitna River.

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 program was discontinued in 1991. The average estimated annual harvest of chinook salmon from the Little Susitna River for the period 1979-1997 was approximately 2,200 fish (Figure 13, Appendix A3) (Mills 1979-1994 and Howe et al. 1995-1998).

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).

In order to increase road accessible harvest opportunities and reduce angler impacts on the area's wild chinook salmon populations, the Eklutna Powerplant Tailrace was chosen as a chinook salmon stocking site in 1999. There is no wild chinook salmon return to these waters. The Eklutna Hydroelectric Power Plant Tailrace (Figure 14) 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. This nonprofit hatchery operated from 1981 through 1998. A fish ladder links the hatchery with the tailrace that in turn drains into the Knik River. Presently the coho fishery is supported by hatchery fish reared at the Fort Richardson Hatchery, an ADF&G facility, and released in the tailrace. The 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 drainage origin are also harvested at the confluence of the tailrace and the Knik River. The annual objective is to release 105,000 chinook smolt resulting in a return of 2,000 adults, generating 10,000 angler-days of effort directed at these fish. Moose Creek wild chinook salmon will be used as brood stock annually (ADF&G *Unpublished*).

Recent Fishery Performance

The 1998 sport harvest of chinook salmon from the Little Susitna River was 2,344 fish (Howe et al. 1999), approximately equal to the 1993-1997 average of 2,655 fish (Appendix A3). The Little Susitna River harvest accounted for approximately 9% of the total chinook salmon harvest from NCIMA waters during 1998 (Table 7 and Appendix A3).

High waters on the Little Susitna River created poor fishing conditions during most of the 1999 season. Some guides and anglers complained of the difficulty in catching fish in the high turbid water without the use of bait and requested that the department open the river to bait fishing. Bait remained prohibited and when water clarity improved a dramatic increase in sport catch and harvest was observed, indicating at least an average chinook salmon return was present. Unfortunately, during the time the department conducts its aerial escapement survey, the stream again became turbid making it impossible to conduct a survey. An aerial survey conducted on Moose Creek, a Knik Management Unit steam that is closed to chinook salmon fishing, counted 744 fish, indicating an above average (mean of 592 fish) return (Table 22).

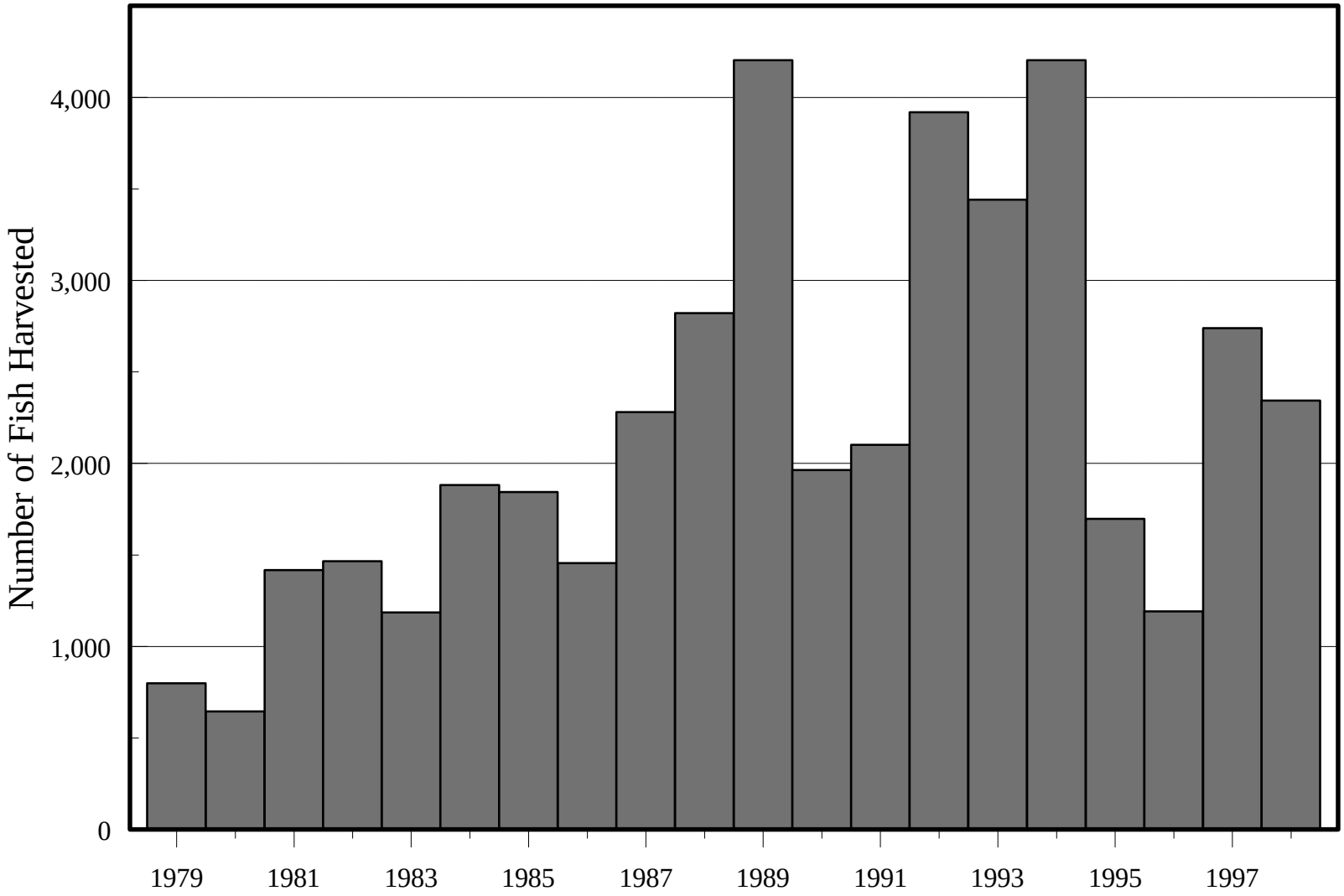


Figure 13.-Little Susitna River chinook salmon harvest, 1979-1998.

Table 22.-Knik Arm Management Unit chinook salmon escapement index counts, 1979-1999.

	Little Susitna River			Matanuska River	
Year	Weir	Aerial	Comments	Moose Creek[a]	Comments
1979		[b]		253	
1980		[b]		[b]	
1981		[b]		238	
1982		[b]		406	
1983		929		452	
1984		558		541	
1985		1,005		475	
1986		[b]		419	
1987		1,386		957	
1988	7,400	3,197		1,072	
1989	4,367	[b]		999	
1990		922		545	
1991		892		704	
1992		1,441		959	
1993		[b]		175	Late count
1994	2,981	1,221		894	
1995	2,809	1,714		488	
1996		1,079		652	
1997		[b]		652	
1998		1,091		214	
1999		[b]		744	
Mean	4,389	1,286		592	
BEG [c]		850		No BEG	

[a] Foot survey through 1994, helicopter beginning in 1995

[b] No count conducted, turbid water.

[c] Biological escapement goal.

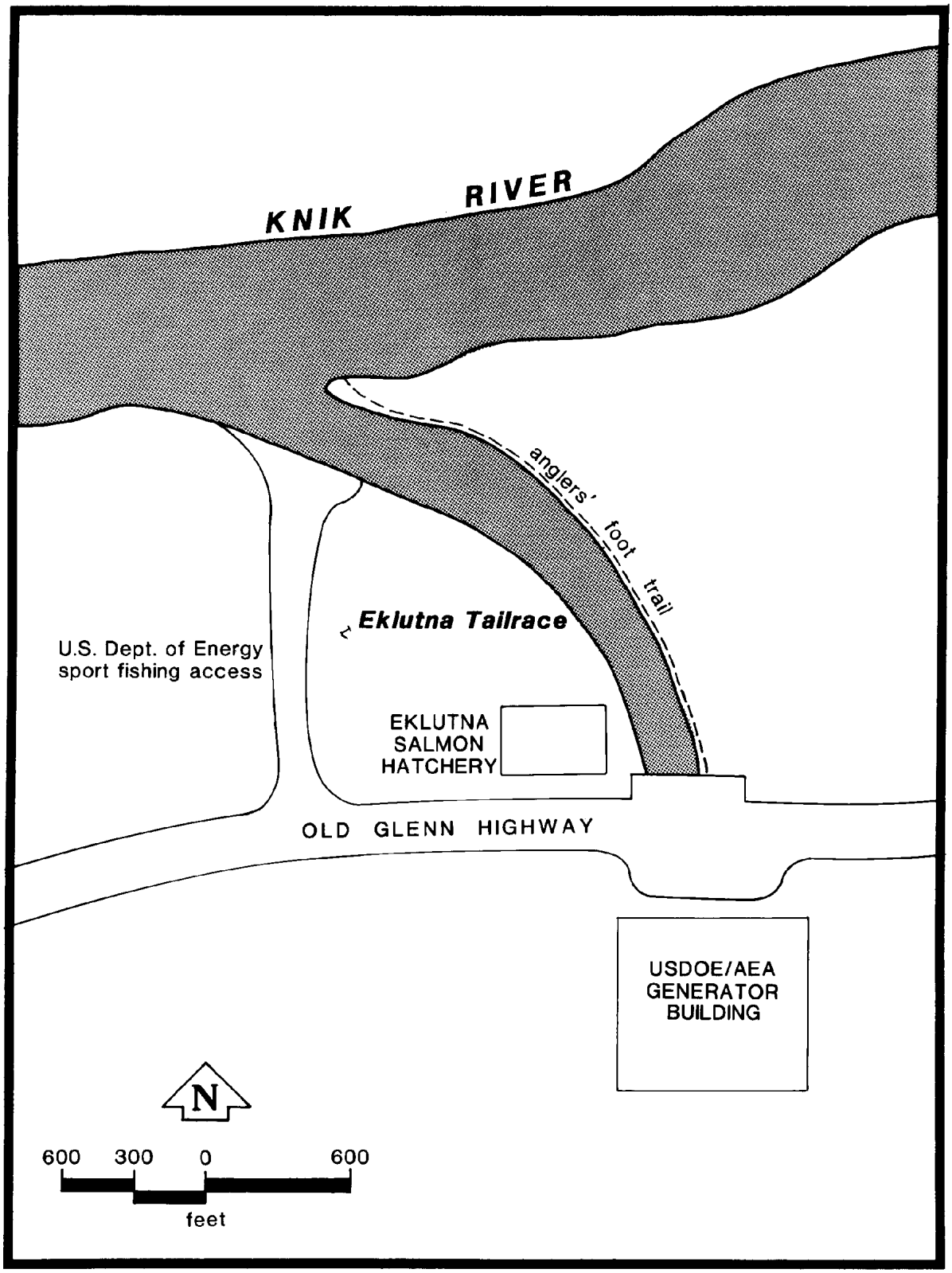


Figure 14.-Map of the Eklutna hatchery and Eklutna powerplant tailrace.

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 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 the February 1999 BOF meeting the only regulation adopted concerning the Little Susitna River allowed anglers to use treble hooks year-round downstream of the Parks Highway Bridge. Previously they were not allowed September 1 through May 31.

The next BOF meeting concerning the Little Susitna River chinook salmon is scheduled for 2002.

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) proposed extension of the South Big Lake Road to the Little Susitna River at River Mile 39.5, (2) use restrictions associated with habitat issues such as streambank erosion within the State Game Refuge, (3) safety issues associated with shore anglers and boat traffic, (4) horsepower restrictions, and (5) concerns including user fee rates and overnight boat mooring facilities for guide boats and the lack of Park Ranger presence at Little Susitna River Public Use Facility.

Following a series of public meetings, the daily boat launch and parking fee will be increased from $5 to $10 per day. The seasonal boat launch and parking fee will be increased from $75 to $150 per year for private users and from $150 to $300 per year for commercial users. In response to numerous complaints concerning the lack of Park Ranger presence, $25,000 of boating access monies will be used to fund a position.

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. 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 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 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.

In order to increase road-accessible harvest opportunities and reduce angler impacts on the area's wild chinook salmon populations, the Eklutna Tailrace was chosen as a chinook salmon stocking site. The annual objective is to release 105,000 smolt resulting in a return of 2,000 adult chinook salmon, generating 10,000 angler-days of effort directed at these fish. Moose Creek wild chinook salmon will be used as brood stock annually. The first smolt release is scheduled to occur in May 2001.

Recommended Research and Management Activities

Aerial surveys should 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. Additional access programs that are either being implemented or 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.

Continuation of the development of the Eklutna Tailrace chinook salmon stocking program is recommended.

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 1). 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. The majority of the fisheries in this portion of the management unit are accessible by paved road. There are, however, exceptions, including Little Willow and Greys creeks and various Susitna River side sloughs that require use of a boat to access their most productive portions. 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 Parks Highway streams) 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 Willow, 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. They are open to chinook salmon fishing from January 1 through the third Monday in June and then reopen 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 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 1993 to 1997, the Eastside Susitna Management Unit fisheries have collectively provided approximately 50% of the chinook salmon harvest from the NCIMA. The harvest has ranged from 7,872 to 22,688 during this period (Table 23) with 1992 and 1993 harvests doubling all previous years (Appendix A5). Included in this harvest are hatchery fish taken in Willow Creek, which totaled approximately 1,000 to 4,000 fish annually.

Aerial survey escapement counts of Eastside Susitna Management Unit chinook salmon stocks suggest that these substocks comprise from 40% to 60% of the Susitna River chinook salmon escapement (Tables 23 and 24). 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 1998 (Table 24).

Willow Creek, Talkeetna River, Sheep Creek and Montana Creek traditionally produce the largest harvest of chinook salmon in the Eastside Susitna Management Unit. The 1993-1997 average annual harvest for these fisheries ranged from 1,250 fish in Sheep Creek to 4,616 fish in Willow Creek (Appendix A5). Tagging studies have shown that these chinook salmon substocks

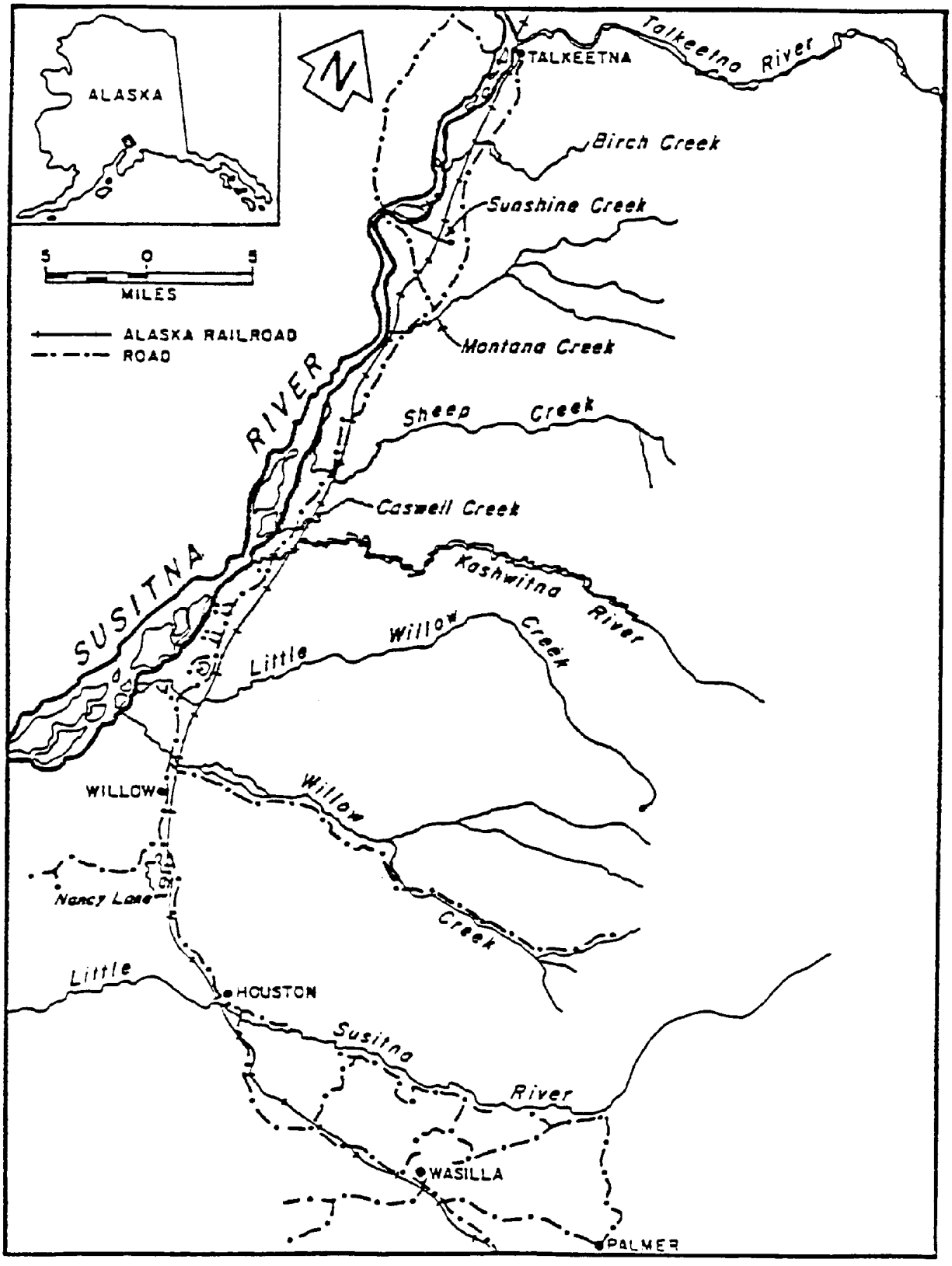


Figure 15.-Map of eastside tributaries of the Susitna River.

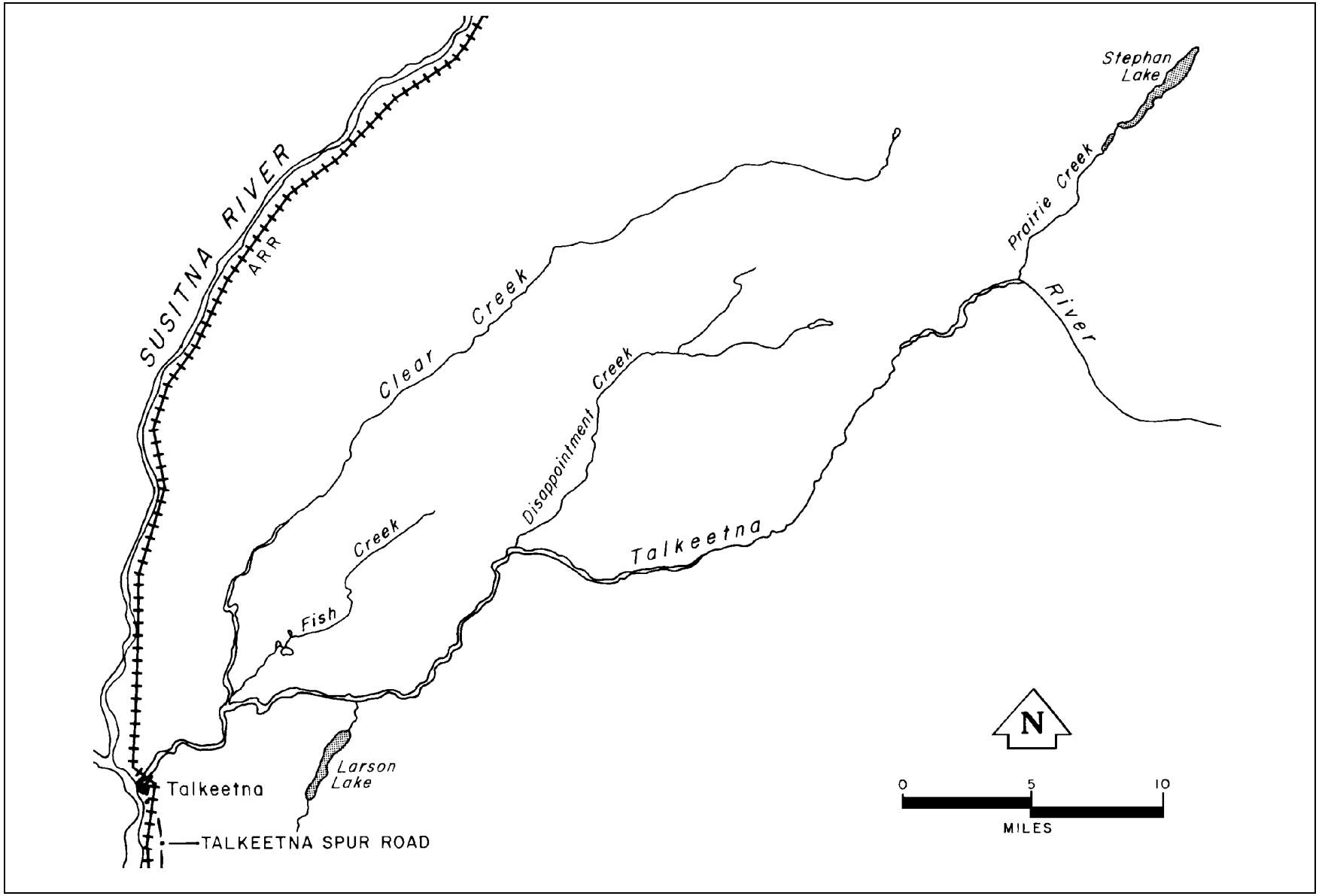


Figure 16.-Map of the Talkeetna River area.

Table 23.-Harvest of chinook salmon from eastside Susitna River, westside Susitna River, West Cook Inlet and Knik Arm drainages as estimated by SWHS, 1979-1998.

	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
1997	1,189	10,456	11,645	8,190	915	2,740	23,490
1993-1997 Mean	2,679	12,418	15,096	12,218	1,267	2,955	31,536
1998	1,049	11,183	12,232	10,958	706	2,344	26,240

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 run timing similar to 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 are collected during this time. Creel surveys were intermittently conducted at Sheep, Goose, Caswell, Little Willow, Sunshine, and Birch creeks and within the upper Susitna River area. Findings from these surveys have been documented in Department of Fish and Game annual reports (Watsjold 1980, 1981; Bentz 1982, 1983; Hepler and Bentz 1984-1987, Hepler et al. 1988 and 1989, Sweet and Webster 1990, Sweet et al. 1991, Peltz and Sweet 1992 and 1993, Sweet and Peltz 1994, Whitmore et al. 1995-1996, Whitmore and Sweet 1997-1999).

Table 1.-Eastside Susitna River Management Unit chinook salmon escapement index counts (aerial), 1979-1999.

Year	Willow Creek	Deception Creek	Little Willow Creek	Sheep Creek	Goose Creek	Montana Creek	Clear Ck	Prairie Creek	Chulitna River	Portage Creek	Indian River	Kashwitna River	Other [b]	Total
1979	848	239	327	778	[a]	1,094	864	[a]	[a]	190	285	457	[a]	5,082
1980														
1981	991	366	459	1,013	262	814	[a]	1,875	[a]	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]	[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	[a]	1,402	456	1,159	[a]	26,255
1989	5,060	800	1,325	610	835	2,701	[a]	9,463	[a]	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	[a]	24,393
1999	2,081	1,000	1,837	[a]	268	2,088	2,216	5,871	5,455	1,797	1,049	644	[a]	24,306
BEG[e]	1,350	400	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.

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 25). 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 1999).

Recent Fishery Performance

The 1998 chinook salmon harvest from the Eastside Susitna Management Unit was 12,232 fish (Table 9 and Appendix A5), approximately 90% of the 1993-1997 mean harvest of 13,164. This harvest represented approximately 50% of the entire chinook salmon harvest from the NCIMA (Table 23). In total, 35,857 chinook salmon were caught in the Eastside Susitna Management Unit during 1998, of which 66% were released (Table 13). The harvest estimate for 1998 includes approximately 1,000 hatchery fish taken in the Willow Creek fishery.

During 1998 the harvest of chinook salmon from Willow Creek, Talkeetna River, and Montana Creek was 3,254 (approximately 1,000 hatchery produced), 4,422 and 1,792 fish, respectively, which accounted for the majority 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 1999 hatchery fish accounted for 49% of the harvest, 6% of the escapement in the mainstem of Willow Creek above the confluence of Deception Creek, 73% of the Deception Creek escapement collected during the egg take and 20% of the Deception Creek escapement below the egg-take weir (Table 26). During 1989-1999 the hatchery contribution to the sport harvest averaged 41%. The annual chinook salmon egg take at Deception Creek resulted in 792,214 eggs collected during 1999 (Table 27).

In order to reduce the chance of hatchery fish mixing with nonhatchery mainstem Willow Creek fish, a new stocking location was established in Deception Creek approximately 6 miles upstream at the egg take weir site. The original release site was in Deception Creek approximately 100 yards upstream of its confluence with Willow Creek. The first release at the new site occurred in 1996 and the 2001 return will be the first return year consisting of releases entirely from the upstream Deception Creek release site. Beginning in 1996, 100% of hatchery-released fish were adipose finclipped and implanted with a CWT. This allowed the identification of all hatchery-reared fish during egg take so they would not be used as brood stock for future Deception Creek release. The first year in which all returning hatchery-reared fish are marked will be 2001. A detailed summary of the performance of the chinook salmon enhancement program in Willow Creek is available which includes information from initiation of the program through the 1996 season (Sweet 1999).

Table 25.-Number of chinook salmon smolt stocked into the Willow Creek drainage from 1985-1999.

Brood Year	Release Location[a]	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
1998	Deception	201,586	199,772	11.5	6/14,16,17/99

[a] Prior to 1996 the Deception Creek release site was at the mouth of Deception Creek. Beginning in 1996 the release site was at the Fourmile Road crossing.

Table 26.-Contribution of hatchery-reared chinook salmon to the sport harvest and escapement at Willow Creek, 1999.

Recovery Site	Willow Creek				Deception Creek						
	Harvest		Escapement		Escapement		Egg take		Combined		Brood Yr-
	# recov	% Contrib	# recov	% Contrib	# recov	% Contrib	# recov	% Contrib	# recov	% Contrib	Age
Tag Code											
312317	2	0.80	0	0.00	0	0.00	0	0.00	0	0.00	93 - 7
312434	17	6.97	1	2.19	5	7.13	1	1.78	6	4.81	94 - 6
312514	44	17.90	0	0.00	6	8.50	24	42.51	30	23.87	95 - 5
312532	7	5.78	0	0.00	0	0.00	0	0.00	0	0.00	97 - 3
312603	56	3.74	2	1.10	6	2.15	18	8.08	24	4.84	96 - 4
312604	36	6.50	1	0.55	0	0.00	12	5.42	12	2.43	96 - 4
312605	63	5.07	1	0.55	3	1.08	9	4.04	12	2.42	96 - 4
312606	49	1.97	1	0.55	3	1.08	20	9.02	23	4.66	96 - 4
312607	19	0.72	2	1.11	0	0.00	6	2.71	6	1.22	96 - 4
Total	293	49.44	8	6.06	23	19.94	90	73.56	113	44.25	
											Total
Total Tags Decoded	293		8		23		90		113		527
No Tag Found	7		0		1		4		5		17
Head Lost	51		1		0		3		3		58
Total Clips Observed	351		9		24		97		121		602
Total Fish Inspected	1,140		205		280		231		511		2,367

Table 27.-Number of eggs collected during NCIMA salmon egg takes, 1989-1999.

	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						
1999	792,214			193,660				

In association with this project the age, sex and size composition of the harvest was determined (Table 28). In 1999 males accounted for about 50% of the Willow Creek sport harvest. Approximately 20% of the harvest was composed of age-1.2 fish, 37% age-1.3 and 42% age-1.4 fish. Escapement index counts in 1999 indicated a minimum of 3,081 spawners in Willow and Deception creeks combined (Table 24).

The 1999 season was extended for eastside Susitna River streams along the Parks Highway, allowing fishing daily through the third weekend in June. This regulatory strategy was implemented to provide additional angling opportunity early in the season when fewer fish are present, whereby increasing angler opportunity while only minimally increasing the number of chinook salmon harvested. Information provided to the department from recreational anglers and guides in concert with information obtained from the Willow Creek chinook salmon catch sampling program indicated that we were seeing an above average return of chinook salmon to eastside Susitna systems. In response, the department, by emergency order authority, extended the fishing season for the eastside Susitna River tributaries for an additional 3-day weekend.

The 1999 escapement indices for Eastside Susitna Management Unit chinook salmon totaled 24,306 fish with all streams except Goose Creek exceeding their BEG (Table 24). Surveys were completed in all index streams except Sheep Creek where turbid water made counting impossible.

Management Objectives

Biological escapement goals for nine Eastside Susitna Management Unit streams have been established (Table 19). These escapement goals were based on historic escapement index counts.

Table 28.-Sex and age composition and length-at-age of chinook salmon sampled from the Willow Creek sport harvest, Deshka River weir escapement and Northern Cook Inlet commercial harvest, 1999.

	Deshka River Weir				Willow Creek Harvest				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
Male												
Percent	30.5	14.6	9.0	0.2	19.6	16.1	13.9	0.3	40.0	11.0	7.0	0
SE	2.2	1.7	1.4	0.2	2.2	2.1	1.9	0.3	3.5	2.2	1.8	
Mean Length- mm	598	811	918	1,010	646	816	978	1,070	600	843	957	
SE	4.4	8.1	10.2		5.1	8.2	8.7		5.3	9.5	19.3	
Sample Size	136	65	40	1	62	51	44	1	79	22	14	
Female												
Percent	0	28.9	16.6	0	0	21.5	28.4	0.3	0	35.5	5.0	0.5
SE		2.2	1.8			2.3	2.5	0.3		3.4	1.5	0.5
Mean Length- mm		792	888			832	919	1,080		797	920	895
SE		4.2	5.5			4.7	6.7			7.1	15.8	
Sample Size		129	74			68	90	1		71	10	1
Combined												
Percent	30.5	43.5	25.6	0.2	19.6	37.5	42.3	0.6	40.0	46.5	12.0	0.5
SE	2.2	2.4	2.1	0.2	2.2	2.7	2.8	0.4	3.5	3.5	2.3	0.5
Mean Length- mm	598	799	898	1,010	646	825	938	1,075	600	808	941	895
SE	4.4	3.9	5.2		5.1	4.4	5.8	5.0	5.4	6.2	13.3	
Sample Size	136	194	114	1	62	119	134	2	80	93	24	1

Total Percent Male (SE)	54.5 (2.4)	49.8 (2.8)	58.5 (3.5)
Total Percent Female (SE)	45.5 (2.4)	50.2 (2.8)	41.5(3.5)
Total Sample Size	446	317	200

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

The management objective for these nine streams is to achieve the escapement goal within each system. In the streams 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.

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

Recent Board of Fisheries Actions
During the February 1999 meeting the BOF adopted the following regulations:

1. The Parks Highway streams (East Side Susitna River tributaries) will open to chinook salmon fishing from January 1 through the third Monday in June and for the next two consecutive 3-day weekends. This regulation identifying the fishing season is consistent with that on Willow Creek.
2. The area open to chinook salmon fishing on the Kashwitna River was extended from its mouth upstream to the Parks Highway Bridge, a distance of 2 miles. The Kashwitna River, a Parks Highway stream, will be regulated under the new season regulation implemented for the Parks Highway Streams.

The next BOF meeting to include Eastside Susitna Management Unit chinook salmon is scheduled for 2002.

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 1999 allowing a longer chinook salmon season on the Parks Highway streams should help alleviate the crowding problem.

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 a chinook salmon stocking program since 1985. Inseason assessment of the biological characteristics of and hatchery contribution to the harvest and escapement continue to be important components in continuing 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 recreational fisheries. A report detailing the CWT project will be available in 2000. Beginning in June 2000 a weir will be operated on Willow Creek for CWT recovery.

The department is responsible for the following public access facilities within this management unit:

1. A private concessionaire is contracted to oversee the operation of the Talkeetna River boat launching facility and perform routine maintenance. Fees are charged. In addition, the concessionaire is responsible for maintenance of pit privies installed near the confluence of the Talkeetna River and Clear Creek.
2. Maintenance at Sheep Creek is provided annually through contract with private maintenance companies. No boating access is available from this site. The parking and camping area provides anglers with access to the confluence of Sheep Creek and the Susitna River. 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. This is a no fee area.
3. 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. 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. During 1999 the access road was graded and hardened with gravel. This is a no fee area.
4. Susitna Landing is located at the confluence of the Kashwitna and Susitna rivers and can be reached by vehicle. Services provided at site include parking, boat launch and RV camping. Fees are charged. A contracted concessionaire operates the facility and performs routine maintenance with the department providing upgrades as needed. 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. The Fisheries Access Improvement section gives a detailed summary of these projects.

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) upgrading Susitna Landing boat launch, dock and walkway. Plans for future development include construction of a boat launch on the Chulitna River at Mile 133 of the Parks Highway.

The department is currently looking into the possibility of constructing a boat launch facility at the mouth of Willow Creek. This project is still in the planning stages and would require a feasibility study before being implemented.

Westside Susitna Management Unit Chinook Salmon Fisheries

Background and Historical Perspective

Tributaries that drain into the Susitna River from the west (Figure 17) 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 glacially turbid river flows into 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 23). The Deshka River, Alexander Creek and Lake Creek have supported the largest chinook salmon fisheries in this management unit (Appendix A7). The collective harvest from these three fisheries during 1993-1997 represents 74% 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 closing the Deshka River to chinook salmon fishing June 17, 1994 through June 21, 1997.

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

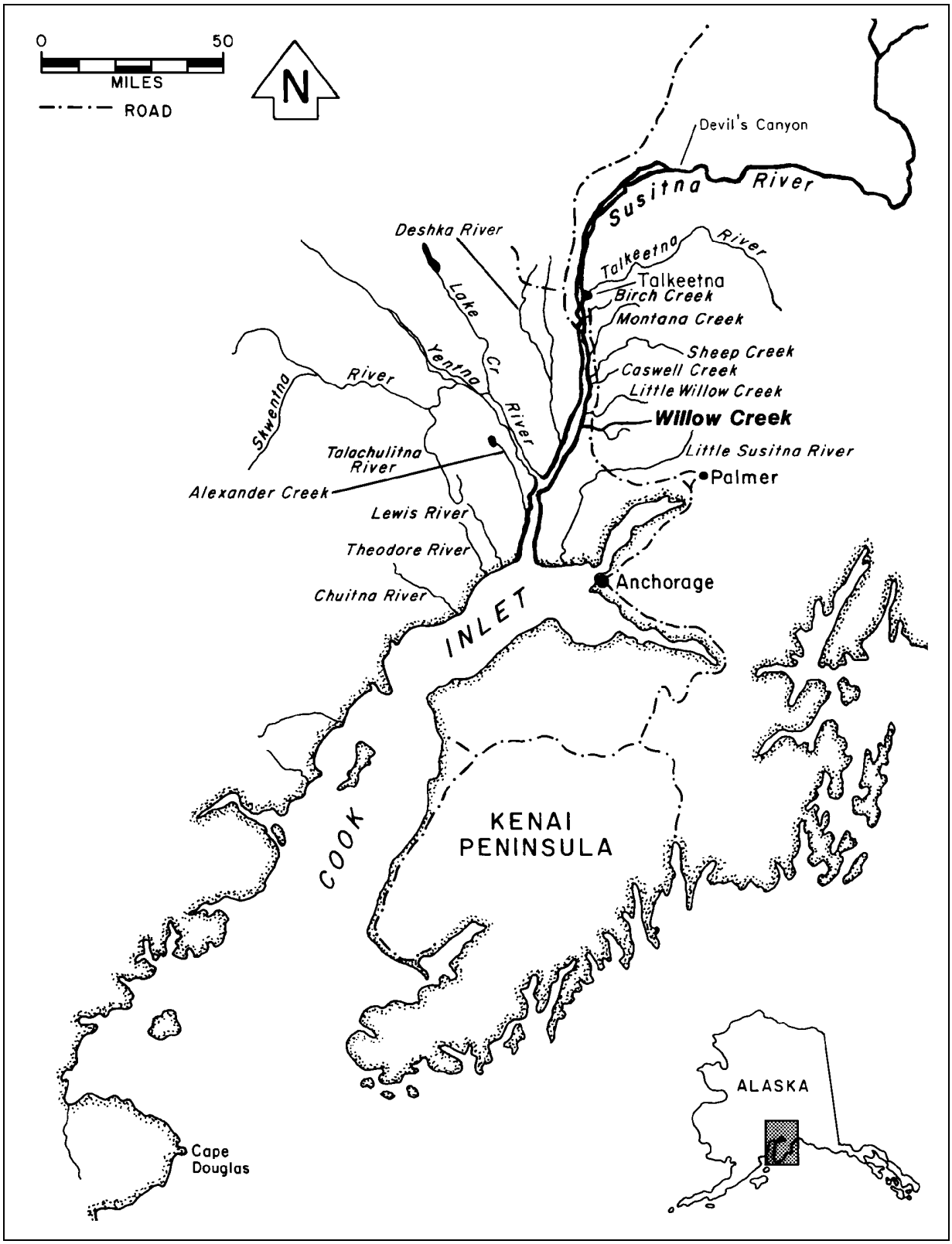


Figure 17.-Map of Northern Cook Inlet area.

increased to two daily over 16 inches in length (only one over 28 inches) and four in possession (only two over 28 inches), also contributed to an increased harvest. 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. It is thought that commercial services have increased their role in the Alexander and Deshka river fisheries since the 1989 survey.

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 29). 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 for the Deshka River from 1994 through 1998 was 1,200 chinook salmon, counted by aerial survey. This goal was not achieved from 1991-1996 (Table 29).

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 (E.O.) 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

Table 29.-Westside Susitna River Management Unit chinook salmon escapement index counts, 1979-1999.

Year	Alexander Creek	Deshka River Aerial	Deshka River Weir	Peters Creek	Lake Creek	Talachulitna River	Cache Creek	Other Streams[b]	Total
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[f]	4,367	5,056	2,759	1,771	642	32,958
1999	3,974	12,904	29,307	3,298	2,877	4,890	1,720	597	30,260
BEG [d]	2,700	8,750[e]	17,500	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.

[e] Aerial escapement goal 1994-1998 was 11,200; revised for 1999 to 8,750.

[f] During 1998 weir count represents only half the return. High water delayed construction until June 16.

its 1992 meeting to adopt new regulations for the 1993 chinook salmon season. These regulations included a bag limit of one daily and two in possession, a seasonal five Cook Inlet chinook salmon limit and a requirement that sport fishing guides cannot participate or engage in fishing during the chinook salmon season while clients are present or within their control.

In response to a low escapement to the Deshka River in 1993, an emergency order was issued prior to the 1994 season which: (1) prohibited the use of bait throughout the Deshka River drainage, and (2) reduced the possession limit for chinook salmon greater than 16 inches in length to one fish in the Deshka River drainage. In combination with current 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 29). 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 1998 chinook salmon fishery resulted in a harvest of 10,958 chinook salmon, slightly above the 1993-1997 mean (Appendix A7). The 1998 escapement surveys resulted in all streams exceeding their BEGs (Table 29).

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. The resulting SWHS harvest and catch estimates were 4,143 and 7,219, respectively. This harvest estimate combined with the escapement survey results indicate that the Deshka River return is no longer an immediate concern.

Early in the 1999 season catch information from the sport harvest at Alexander Creek along with harvest information from the commercial fishery indicated the beginning of an above average return. In response to the excess escapement during the prior 2 years, the BOF expanded the area opened for chinook salmon fishing in the Deshka River to the lower 17 miles and raised the seasonal limit to five fish over 16 inches for the 1999 season. By June 9 Deshka River weir count again indicated an above average return was in progress. This prompted the department to issue an E.O. to liberalize sport fishing regulations on the Deshka River. The use of bait was allowed whereby increasing the harvest of surplus fish. The Deshka River aerial survey in 1999 resulted in 12,904 fish, well above the BEG for the third consecutive year (Table 29). The Deshka River weir count was 29,307, well above the 17,500 fish BEG set for weir passage.

Age, sex and length samples were collected from the chinook salmon passing through the Deshka River weir (Table 28). Male chinook salmon accounted for 55% of the sample, with age-1.2, -1.3 and -1.4 fish representing 30%, 44% and 26% of the sample, respectively.

Inseason reports from lodge owners, guides and anglers further up the Susitna drainage at Lake Creek, Talachulitna River and Clear Creek also indicated that the chinook salmon return was above average. The 1999 escapement surveys resulted in all streams exceeding their BEGs.

Management Objectives

Biological escapement goals for five Westside Susitna Management Unit systems (Lake, Alexander, Peters creeks and the Deshka and Talachulitna rivers) have been established (Table 19). These escapement goals were based on historic aerial counts of escapement index areas. In addition, during 1999 the BOF established a weir-based escapement goal for the Deshka River. The BOF also lowered the Deshka River aerial survey goal from 11,200 to 8,700 based on data indicating approximately 50% of the weir count was observed during an aerial survey. 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 February 1999 meeting were:

1. The Deshka River will be open to chinook salmon fishing from its mouth upstream to Chijuk Creek a distance of approximately 19 River miles from January 1 to July 13. Other area regulations apply such as a one fish per day bag and possession limit, a five fish seasonal limit, and once an angler harvests his or her chinook they must quit fishing for chinook salmon the remainder of the day. Additionally fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., no bait is allowed and guides cannot fish while guiding clients.
2. The area open for retention of chinook salmon on Alexander Creek was extended from its mouth upstream to Trail Creek. This provides anglers with an additional 11 miles of stream from the 1997 and 1998 seasons in which they may harvest chinook salmon on Alexander Creek.
3. In all waters of the Westside-Susitna River and West Cook Inlet Management Areas (excluding waters between the Deshka River and the Talkeetna River mouths), anglers will be allowed to continue to fish for chinook salmon (catch-and-release) once they have harvested their limit excluding Alexander Creek, Lake Creek, Deshka River, Fish Lake Creek and Clear Creek. In these streams you will be required to quit fishing for chinook salmon for the day once you have harvested your limit.

In addition, during 1999 the BOF established a weir-based escapement goal of 15,500 fish for the Deshka River and lowered the Deshka River aerial survey goal from 11,200 to 8,700.

The next BOF meeting concerning westside Susitna River chinook salmon fisheries will take place in 2002.

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.

Timber sales along upper Deshka River tributaries may have an impact on juvenile chinook salmon rearing habitat in affected portions of the creek. Increased access due to the accompanying logging activity may also lead to additional poaching.

Ongoing Research and Management Activities

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

A juvenile chinook salmon coded wire tagging (CWT) program was 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 28), returning adult chinook salmon are counted and harvest upstream of the weir is recorded. 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 2000 season.

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.

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.

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 18). 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 a targeted 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 1993 through 1997 ranged from 674 to 1,855 fish and averaged 1,207 fish (Appendix A9). Access to this area is by helicopter in the upper reaches of these streams and by airplane combined with vehicle to the lower reaches.

In the 1990s, observed spawning escapements in West Cook Inlet Management Unit streams did not always reach some streams' BEG (Table 30). 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

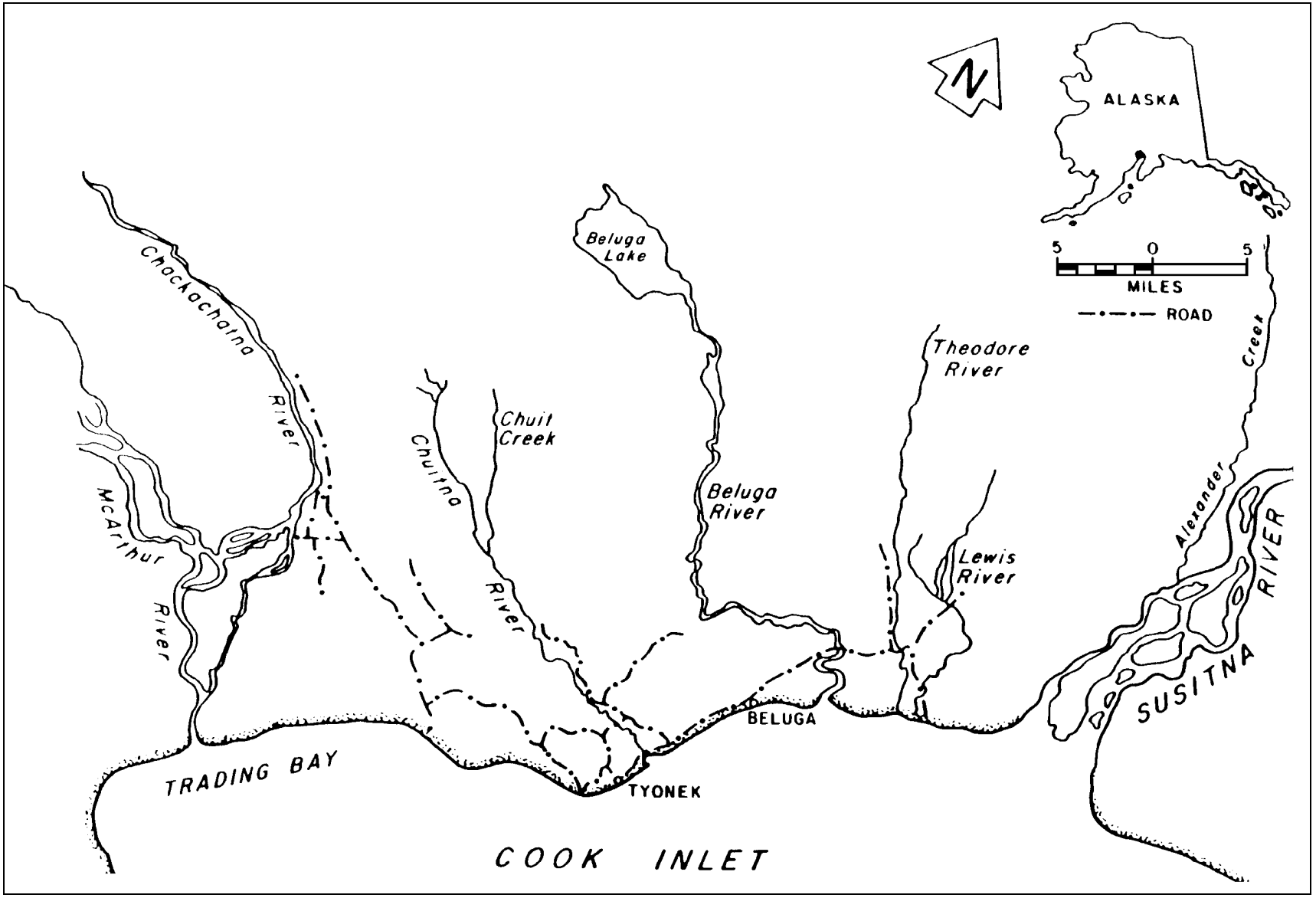


Figure 18.-Map of West Cook Inlet coastal streams.

Table 30.-West Cook Inlet Management Unit chinook salmon escapement index counts (aerial), 1979-1999.

Year[a]	Chuitna River	Theodore River	Lewis River	Coal Creek	Other Streams[c]	Total WCI
1979	1,246	512	546		236	2,540
1980	[b]					
1981	1,362	535	560		1,144	3,601
1982	3,438	1,368	606		1,972	7,384
1983	4,043	1,519	[b]		[b]	5,562
1984	2,845	1,251	947		[b]	5,043
1985	1,600	1,458	861		700	4,619
1986	3,946	1,281	722		165	6,114
1987	[b]	1,548	875		[b]	2,423
1988	3,024	1,906	616		[b]	5,546
1989	990	1,026	452		[b]	2,468
1990	480	642	207		[b]	1,329
1991	537	508	303		[b]	1,348
1992	1,337	1,053	445		[b]	2,835
1993	2,085	1,110	531		156	3,882
1994	1,012	577	164		368	2,121
1995	1,162	694	146	221		2,223
1996	1,343	368	257	424		2,392
1997	2,232	1,607	777	471		5,087
1998	1,869	1,807	626	503		4,805
1999	3,721	2,221	675	1,195		7,812
Mean	2,014	1,150	543	563	677	3,957
BEG[d]	1,400	750	400	No BEG		2,550

[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] Biological escapement goal.

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. This trend reversed in 1997 when all West Cook Inlet BEGs were exceeded.

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).

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 (Appendix A9). Both rivers remained closed in 1998 which, combined with unfavorable water conditions in the Chuit River during chinook season, resulted in a 1998 harvest estimate of 706. The Chuitna, Lewis and Theodore rivers all surpassed their spawning escapement goals (BEG) for 1998 (Table 30).

The Chuitna River is the main indicator stream for gauging the strength of chinook salmon returns to the West Cook Inlet drainage. However, during 1999 poor fishing conditions due to high water precluded gathering early-season harvest information on this system. Guides and anglers frustrated with poor water conditions on the Chuitna River decided to shift their effort to the Theodore River (open to catch-and-release fishing in 1999) as water conditions on this system were low and clear. Catch information from anglers fishing the Theodore River indicated a stronger than average return. About mid-June, when the water conditions in the Chuitna improved, catch rates began to increase. In addition, aerial observations from some of the helicopter charter services reported lots of chinook salmon in the Chuitna and Lewis rivers.

Aerial surveys to index chinook salmon spawning escapement indicated all streams surpassed their BEGs in 1999 (Table 30). If this trend continues the department may submit a proposal at the next BOF meeting to liberalize chinook salmon fishing regulations.

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 February 1999 BOF meeting the following regulation were adopted:

1. In all waters of the Westside-Susitna River and West Cook Inlet Management Areas (excluding waters between the Deshka River and the Talkeetna River mouths), anglers will be allowed to continue to fish for chinook salmon (catch-and-release) once they have harvested their limit excluding Alexander Creek, Lake Creek, Deshka River, Fish Lake Creek and Clear Creek. In these streams you will be required to quit fishing for chinook salmon for the day once you have harvested your limit.
2. The Theodore River was opened to catch-and-release fishing for chinook salmon from January 1 through June 30, only single hook artificial lures will be allowed. Other West

Cook Inlet Area regulations apply as follows: fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., bait is prohibited, and guides cannot fish while guiding.

3. If at least 90% of the biological escapement goal (BEG) for the Chuitna River is not met during the fishing season the Chuitna River shall be closed to sport fishing for chinook salmon during the following fishing season. Provisions of this paragraph do not apply after December 31, 2001.

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

1. June 1 though June 24 the area from 1 mile south of the Theodore River to the Susitna River is open the first Monday in June only. Provisions of this paragraph do not apply after December 31, 2001.

2. 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 fishing season, the area from 1 mile south of the Chuitna River to the Susitna River will be closed to commercial fishing during the following fishing season; the provisions of this paragraph do not apply after December 31, 2001.

The next BOF meeting concerning the West Cook Inlet Management Unit chinook salmon fisheries will be in 2002.

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 1997-1999 escapement 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 1996-1999 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 been an issue for many years. Representatives of the State of Alaska have had several meetings with TNC members in efforts to resolve this problem. 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.

Timber sales adjacent to WCI streams may have an adverse impact on juvenile salmon rearing habitat. Additionally, increased access due to logging activity may lead to additional poaching.

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 relaxing more restrictions on chinook salmon fishing.

Enforcement activities should be continued to ensure 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 1997, and averaged 47,104 fish (Mills 1979-1994; Howe et al. 1995-1998) (Table 7 and Appendix A11). During 1993 through 1997 NCIMA harvests accounted for 21% of the coho salmon harvests in the region and 14% 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 dominated by harvests from the Little Susitna River while harvests from other management units are distributed across several systems (Appendices A12-A19).

In addition to recreational harvests, NCIMA area coho salmon stocks contribute to Cook Inlet commercial harvests. Commercial harvests of coho salmon in Upper Cook Inlet commercial fishing districts averaged 448,103 fish during 1977-1996, followed by an average of 146,130 during 1997-1999 (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. Comparison between years can be difficult as fishery restrictions may vary from year to year. 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 on the Yentna River, and foot and aerial index counts for a few streams also contribute to our understanding of relative abundance.

Table 31.-Northern Cook Inlet Management Area recreational harvest of coho salmon by management unit as estimated by SWHS, 1977-1998.

	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
1997	12,144	11,243	7,148	2,115	32,650	283,311	12	462,931	7
77-97 Mean	18,676	14,593	12,310	1,525	47,104	189,936	25	278,708	18
93-97 Mean	23,983	20,503	14,517	2,575	61,578	291,791	21	450,082	14
% of NCIMA 93-97	39	33	24	4					
1998	27,672	27,635	15,444	4,029	74,780	375,742	20	600,862	12

In response to a poor return of coho salmon to Cook Inlet in 1997, 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. Restrictive action was again taken in the commercial fishery in 1998 because of a poor sockeye return. Because of the nature of the mixed-stock fishery, this action undoubtedly put more coho salmon on the spawning grounds. No additional action was required in the sport fishery during 1998 as instream coho abundance seemed to be above average. In 1999, poor returns again forced managers to take action in the sport and commercial fisheries. Unfortunately these actions were instituted too late to increase coho salmon inriver abundance. Low abundance of coho salmon to UCI streams prompted the governor and users to submit a request to the BOF to meet out of cycle and address this conservation problem. The BOF met in February 2000 and significant actions to both the sport and commercial fisheries were taken to reduce the overall harvest of Cook Inlet coho salmon.

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 1998 (Table 32) (Mills 1979-1994; Howe et al. 1995-1999). 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 1999. 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 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.

Table 32.-Harvest and effort for Little Susitna River coho salmon as estimated by SWHS, 1977-1998.

	Harvest				Annual Effort
Year	Hatchery[b]	Nonhatchery	Total[c]	Released	Angler days[a]
1977		3,415	3,415		11,063
1978		4,865	4,865		12,127
1979		3,382	3,382		21,301
1980		6,302	6,302		22,420
1981		5,940	5,940		26,162
1982		7,116	7,116		24,020
1983		2,835	2,835		35,477
1984		14,253	14,253		48,517
1985		7,764	7,764		37,498
1986	109	5,930	6,039		45,776
1987	3,407	9,596	13,003		35,659
1988	9,638	9,371	19,009		49,731
1989	10,597	3,550	14,129		54,708
1990	2,242	5,255	7,497	4,906	40,159
1991	7,699	8,751	16,450	4,692	50,838
1992	3,406	16,627	20,033	7,960	49,304
1993	7,703	19,907	27,610	10,589	42,249
1994	6,165	11,500	17,665	4,576	45,149
1995	2,991	11,460	14,451	5,042	41,119
1996	3,418	11,444	14,862	5,445	32,748
1997	0	7,750	7,750	2,242	35,594
Mean	5,215	8,046	10,653	5,682	34,619
93-97 Mean		12,412	16,468	5,579	39,372
1998	0	17,164	17,164	4,558	27,429

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

[b] Bartlett and Conrad 1988, Bartlett and Vincent-Lang 1989, Bartlett and Sonnichsen 1990, Bartlett and Bingham 1991, Bartlett 1992-1994, 1996.

[c] Mills 1977-1994, Howe et al. 1995-1999.

Table 33.-Knik Arm drainage coho salmon escapement index counts, 1981-1999.

Year	Little Susitna River[b]			Fish Creek Weir[c]	Cotton-wood Ck Weir	Cotton-wood Ck[a] Survey	Wasilla Creek Drainage[a]					Matanuska River[a]	Knik River Drainage[a]					Grand Total[g]
	Hatchery	Non-hatchery	Total [f]				Wasilla/ Spring Ck Weir	Wasilla Creek Survey	Spring Creek (Upper)	Spring Creek (Flats)	Total	Yellow Creek	McRoberts Creek	Upper Jim Creek	Total	Jim Ck Weir	Eklutna Tailrace	
1981			6,750	2,382	2,436[h]	423		238	[d]	64	302	[d]			[d]			9,857
1982			6,800	5,201	2,064[h]	737		171	[d]	105	276	[d]			[d]			13,014
1983			2,666	2,342		506		4	[d]	28	32	[d]			[d]			5,546
1984			22,206	4,510		935		876		90	966	[d]			[d]			28,617
1985			3,889	5,089		334		16	150	81	247	65	662		662		266	10,552
1986			6,999[e]	2,166		121		[d]	141	147	288	20	439		439		403	10,436
1987			4,865	3,871		360		251	110	42	403	58	667		667		1,587	11,811
1988	4,428	16,063	20,491	2,162		293		[d]	82	30	112	110	1,911		1,911		1,848	26,927
1989	6,862	8,370	15,232	3,479		147		[d]	67	39	106	226	597		597		253	20,040
1990	3,370	10,940	14,310	2,719		167		34	38	12	84	146	599	589	1,188		668	19,282
1991	8,322	29,279	37,601	1,297		158		118	16	5	139	136	484	418	902		286	40,519
1992	2,324	19,069	20,393	1,705		6		3	11	0	14	57	11	59	70		39	22,284
1993	9,615	23,763	33,378	2,328		265		[d]	67	69	136	490	503	535	1,038	5,532	496	38,131
1994	5,124	22,696	27,820	350		232		282	76	60	418	172	506	2,119	2,625	6,451	714	32,331
1995	1,069	10,748	11,817	390		242		46	20	38	104	220	702	1,288	1,990		107	14,870
1996	444	16,255	16,699	682		168		84	30	29	143	101	72	439	511		224	18,528
1997			9,894	2,578	936	386		156	38	35	229	367	701	563	1,264		350	15,068
1998			15,159	5,483	2,114	537	3,622\163	120[f]	31[f]	25	176	302	922	560	1,482			23,139
1999			3,017	1,766	478	71	1,579\11	211	40	16	267	88	12	320	332			5,541
BEG			9,600-19,200	2,700		300					300				830			

[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; RM 71, 1996-1999.

[c] 1982-1991 weir count plus stream survey; 1992, 1993 weir count; 1994-1996 weir was removed on August 15 before the majority of the coho run. In 1997 the weir was out on September 1; in 1998 it was out September 27; in 1999 it was out September 26.

[d] No survey conducted.

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

[f] Count conducted late due to high water.

[g] Grand total includes Little Susitna total, Fish Creek weir, Cottonwood Creek survey, Wasilla Creek total, Yellow Creek, McRoberts Creek/Jim Creek total and Eklutna Tailrace.

[h] Combination weir and foot survey. Weir was removed prior to completion of coho run.

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

	Fingerling Release			Smolt Release			Total		Number	
Year Stocked	Size (gm)	Number Released	Number Marked	Size (gm)	Number Released	Number Marked	Number Released	Recovery Year	Recovered in Harvest	% of Harvest[a]
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	1986	109	18
1987				19.2	301,167	24,650	301,167	1987	3,407	26
1988	1.00	3,374,126	3,126	20.1	446,016	24,628	3,820,142	1988	9,638	51
1989				19.8	354,897	25,631	354,897	1989	10,597	75
1990	1.1-2.0	473,327	72,327	20.8	308,356	45,220	781,683	1990	2,242	30
1991				22.2	277,762	46,358	277,762	1991	7,699	47
1992				23.8	312,925	38,786	312,925	1992	3,406	17
1993				19.0	279,873	40,242	279,873	1993	7,703	28
1994				19.7	126,694	43,818	126,694	1994	6,165	35
1995				21.3	151,985	45,245	151,985	1995	2,991	21
1996							0	1996	3,418	23
Mean									5,215	34

[a] Bartlett and Conrad 1988, Bartlett and Vincent-Lang 1989, Bartlett and Sonnichsen 1990, Bartlett and Bingham 1991, Bartlett 1992-1994, 1996.

During 1986 through 1996 the contribution of hatchery fish to the sport harvest ranged from 17% to 75% and averaged 34%, varying with the number of fish released and the strength of the wild fish return (Tables 32 and 34) (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, however, rearing juvenile coho salmon occupied 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.

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 beginning 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 1998 the SWHS estimated 17,164 coho were harvested for the Little Susitna River, approximately equal to the 1993-1997 mean of 16,468 (Appendix A12). The weir count totaled 15,159 (Table 33), within the middle of the BEG range. The 1998 season occurred without any inseason emergency orders and appears to have provided an average fishery.

In 1999, a total of 3,017 coho salmon were counted through the Little Susitna River weir at River Mile 71 (Table 33, Appendix H6), less than a third of the lower end of the 9,200-19,600 fish BEG. A few guides were reporting poor catches of coho salmon early in the season. However, with the no-bait rule in effect until August 5 and high turbid water, it was assumed that low catch rates were more a factor of poor fishing conditions than low coho salmon returns. As the season progressed and water conditions improved it became evident a lower than normal return would result. This prompted the department to take E.O. action to restrict these fisheries to a one fish bag limit and prohibit the use of bait beginning August 19.

A total of 660 coho salmon were sampled for age and sex composition and mean length estimates at the Little Susitna weir in 1999. Age 2.1 was the dominant age class and accounted for 72% of the fish (Table 35). Coho salmon passed through the weir in 1999 were 58% male. The mean length of all sampled fish was 577 mm (Table 35).

Management Objectives

Management objectives for the Little Susitna River as stated in the Little Susitna River Coho Salmon Management Plan are to provide 9,600-19,200 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.

Recent Board of Fisheries Actions

During the February 1999 meeting the BOF adopted the following regulation change: on the Little Susitna River, anglers will be allowed to use treble hooks year-round downstream of the

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, 1999.

	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	2.2	Total
Male																
Percent	15.5	42.4	58.0	23.0	29.9	52.9	14.5	30.9	45.5	22.2	39.0	61.2	11.9	42.8	3.0	58.4
SE	1.4	1.9	1.9	2.7	3.2	3.5	1.6	2.1	2.3	1.7	2.0	2.0	2.0	3.0	1.0	3.1
Mean Length (mm)	570	589	584	461	470	466	448	504	486	487	497	494	541	544	517	542
SE	4.3	2.1	2.0	6.1	5.4	4.0	9.2	4.4	4.5	4.8	3.4	2.8	9.1	4.5	16	3.9
Sample Size	102	280	383	47	61	108	71	151	222	132	232	364	32	115	8	157
Female																
Percent	12.1	29.8	42.0	14.2	32.4	47.1	14.8	39.8	54.5	12.3	26.4	38.8	6.3	33.8	1.5	41.6
SE	1.3	1.8	1.9	2.5	3.3	3.5	1.6	2.2	2.3	1.4	1.8	2.0	1.5	2.9	0.7	3.0
Mean Length (mm)	553	573	567	484	488	486	507	523	519	502	516	512	550	550	556	550
SE	3.4	2.2	1.9	6.3	6.1	4.6	4.4	2.8	2.4	4.6	3.1	2.6	5.8	3.4	34	3.1
Sample Size	80	197	277	29	66	96	72	194	266	73	156	230	17	91	4	112
Combined																
Percent	27.6	72.3	100	37.3	62.3	100	29.3	70.7	100	34.5	65.4	100	18.2	76.6	4.5	100
SE	1.7	1.7		3.4	3.4		2.1	2.1		2.0	2.0		2.4	2.6	1.3	
Mean Length (mm)	562	582	577	470	479	475	478	515	504	493	505	501	544	547	530	545
SE	2.9	1.6	1.4	4.6	4.1	3.1	5.6	2.5	2.5	3.5	2.4	2.0	6.3	2.9	16	2.6
Sample Size	182	477	660	76	127	204	143	345	488	205	388	594	49	206	12	269
Total Male			58%			53%			46%			61%				58%
Total Female			42%			47%			54%			39%				42%
Total Sample Size			660			204			488			594				269

Parks Highway Bridge. Existing bait restrictions were modified to allow the use of bait during the month of September.

During an "out of cycle" BOF meeting in February 2000 the Board adopted regulations to reduce the recreational daily coho salmon bag and possession from three coho to two and reduce the amount of allowable gear in the Northern District commercial fishery from three 35 fathom gill nets to two.

Current Issues

In 2 of the last 3 years (1997 and 1999) the Little Susitna River coho return has been weak. Emergency orders were issued during the 1997 and 1999 seasons prohibiting bait and reducing the bag limit to one coho to insure reaching the biological escapement goal (BEG). Even with these additional restrictions the 1999 escapement reached only one-third the BEG and the 1997 return barely surpassed the lower level of the range (Table 33). Sport fishing guides have complained these conditions cause them a level of uncertainty that makes it difficult for them to plan for their clients. They would like a management plan that will spell out steps that will be taken to limit harvests when a conservation concern becomes evident during the fishing season. This plan would insure that the burden of conservation is shared by both commercial and sport fisheries.

Other issues associated with Little Susitna River fisheries are:

1. Management of the area under the Recreation Rivers Act,
2. The South Big Lake Road extension to the Little Susitna River and the associated campground (Whitmore et al. 1993),
3. The damage to riparian vegetation and accelerated stream bank erosion in areas heavily used by the public. 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, and
4. The management of the Little Susitna River Public Use Facility (LSPUF) including issues in regard to the increased user fees for both the public and guides, and use of the boat mooring facility and horsepower restrictions.

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.

Ongoing and Recommended Research and Management Activities

If funding is available the Little Susitna River weir will be moved from its present location at RM 71 downstream to RM 32. This move would provide inseason management information presently unavailable. The weir also provides run timing, age, length and sex composition and total return data.

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

Current regulation requires a prohibition of bait from July 15 through August 5 to reduce the hook-and-release mortality and preserve the early-arriving stock. Additionally, for 2000, the bag and possession limit was reduced from three to two coho salmon.

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 was secured prior to 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. Much of this work was completed in 1999 with the remainder scheduled for completion by 2001.

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 1) 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 (Figure 19) 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 14) 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. Presently the fishery is supported by hatchery fish reared at the Fort Richardson Hatchery (an ADF&G facility) and released in the tailrace. This 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. In light of recent coho restrictions it is likely the coho salmon stocking program will be significantly increased at this site in the future.

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

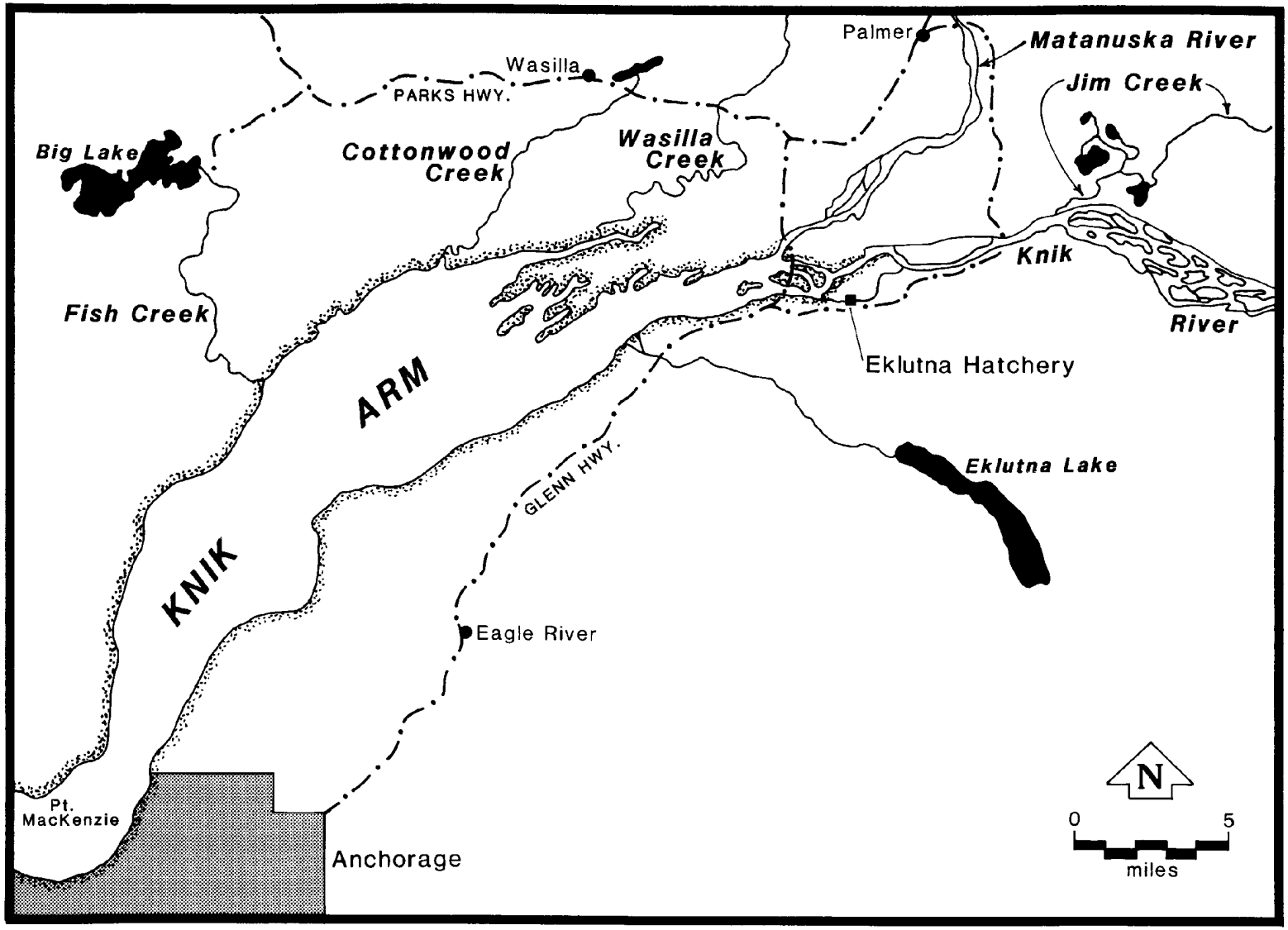


Figure 19.-Map of the Knik Arm drainage.

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. In 2000 the bag and possession limits for all Knik Arm fisheries were reduced from three to two coho salmon 16 inches or more in length. The collective annual harvest for these five fisheries averaged 6,872 coho salmon during the period 1993 through 1997 (Mills 1994, Howe et al. 1995-1998) (Table 36). Jim Creek averaged 3,181 coho salmon during this period, whereas the three weekend-only fisheries of Fish, Cottonwood, and Wasilla creeks averaged 483, 675 and 927 fish, respectively.

Coho salmon have been periodically stocked into 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 ADF&G'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. 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 from 1987-1998 and coho salmon harvests have ranged from 85 to 11,604, averaging 2,913 annually during this period (Table 38). BOF action closed the Knik Arm commercial set gillnet fishery during 1999-2001 to allow more coho and sockeye salmon escapement into Knik Arm streams.

Recent Fishery Performance

In response to coho salmon escapements lagging 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).

The 1998 recreational harvest for Knik Arm streams was 10,539 fish, a substantial increase from 1997 and well above the 1993-1997 average of 6,301 (Table 36). The 21,620 angler-days of participation from these fisheries during 1998 fell slightly below the 1993-1997 average of 23,340. The 1998 Fish Creek personal use dip net harvest totaled 649 coho salmon. In 1998, for the second year in a row, a lack of returning sockeye salmon forced an early closure resulting in a minimal harvest of coho salmon (Table 38).

Because of weak returns in previous years, the BOF reduced recreational fishing time on Fish, Wasilla and Cottonwood creeks beginning in 1999. Fishing hours were restricted from 24-hour fishing days to 12-hour fishing days (6:00 a.m. to 6:00 p.m.) in these Saturday and Sunday only fisheries. Also in 1999, regulations were enacted to prevent anglers from continuing to fish for any species in these streams after harvesting a bag limit of coho salmon.

Table 36.-Fishing effort and coho salmon harvest from Knik Arm fisheries as estimated by SWHS, 1977-1998.

	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
93-97 Mean	927	1,763	675	2,815	483	1,925	1,606	7,911	3,181	8,927	6,872	23,340
1998	1,408	1,473	1,267	4,480	1,508	2,709	1,667	6,555	4,689	6,403	10,539	21,620

[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, 1977-1999.

		Release		Average	Number	Number
Brood Year	Brood Stock	Year	Drainage	Size (g)	Released	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
1983	Big Lake	1984	Fish Creek	0.76	987,166	11,166

-continued-

Table 37.-Page 2 of 2.

Brood Year	Brood Stock	Release Year	Release Drainage	Average Size (g)	Number Released	Number Marked
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
1997	Jim Creek	1999	Eklutna Tailrace	16.6	126,602	42,663

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

Table 38.-Fish Creek salmon harvests, by commercial set gillnet and personal use dip net, 1987-1999.

	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	4,036	649	29	80	1	4,796
1999	No fishery						902	13	0	6	0	921
Mean	23,443	2,913	1,351	247	2	27,955	10,455	1,329	227	490	0	11,668

[a] Mills 1988-1994, Howe et al. 1995-1998. 1998 (final) and 1999 (preliminary) data are estimated from returned permits.

Fish, Cottonwood and Wasilla creeks, having a very limited open season, generate little angler effort; consequently, little inseason catch information is available. Jim Creek, the second most popular sport fishery, had high turbid waters through much of the 1999 season; however, the department received no complaints from anglers concerning this particular stream. Poor returns to the Knik Arm streams prompted the department to take E.O. action to restrict these fisheries to a one fish bag limit and prohibit the use of bait on August 19, 1999. Of the four Knik arm streams that have established coho salmon BEGs, not one met its escapement goal (Table 33).

Weirs were operated on Fish, Cottonwood, Wasilla, and Spring (a tributary to Wasilla Creek) creeks in 1999. Resulting counts were 1,754, 462, 1,564 and 11, respectively, all substantially below previous years (Appendices H2-H5). Length and age data were collected at all weirs (Table 35).

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, concern was expressed regarding the low returns to those systems with established escapement goals. During

February 1999, the BOF reduced recreational fishing time on Fish, Wasilla and Cottonwood creeks. Fishing hours were restricted from 24-hour fishing days to 12-hour fishing days (6:00 a.m. to 6:00 p.m.) in these Saturday and Sunday only fisheries. Also in 1999, regulations were enacted to prevent anglers from continuing to fish for any species in these streams after harvesting a bag limit of coho salmon.

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

Stream	Biological Escapement Goal (BEG)	
Cottonwood Creek		300
Wasilla Creek		300
Fish Creek		2,700
Jim Creek Drainage		830
Little Susitna River	from 1991 thru 1998	7,500
	from 1999	9,600-19,200

An "out of cycle" BOF meeting occurred in February 2000 to address Cook Inlet coho conservation concerns. Several restrictions were imposed on the commercial and sport fisheries to reduce coho salmon harvests beginning in 2000. The following sport fishing regulations were adopted: (1) the bag and possession limits for coho salmon were reduced from three to two (excluding the stocked Eklutna Tailrace fishery); (2) Wasilla Creek was closed year-round to salmon fishing; (3) once an angler has retained a bag limit of coho salmon from Fish and Cottonwood creeks, they may not fish in either creek in waters open to salmon fishing on the same day; (4) Jim Lake, Upper Jim Creek and McRoberts Creek were closed to salmon fishing year-round.

Current Issues

Of major concern is the failure of Cottonwood, Wasilla, Fish and Jim creeks to consistently meet their biological escapement goals (Tables 33 and 39). The overall well-being of these stocks has perplexed managers. Review of these 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 is ongoing.

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. Beginning in 1998 the Fish Creek weir was operated through the end of September 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 addition, during 1997-1999, weirs were operated on Cottonwood Creek and Wasilla Creek to evaluate the total return of coho salmon.

A project to coded wire tag wild coho salmon smolts in Cottonwood Creek was initiated in 1999. These tagged coho will identify the Cottonwood Creek coho stock in the mixed-stock fisheries of Cook Inlet during their return in 2000. Currently the Cottonwood Creek coho salmon stock is one of two tagged wild coho stocks in Cook Inlet, along with tagged hatchery releases. Returning coho salmon will be inspected for finclips in the commercial and sport fisheries of Cook Inlet and the escapement in Cottonwood Creek. This multi-year project should provide information for determining appropriate escapement levels in order to provide sustainable coho salmon yields in the future.

During the period of May 17 through June 15, 1999, a total of 33,986 coho smolts were tagged and released in Cottonwood Creek. Additionally, standard measurements of age, length and weight were recorded. The mean length of all coho smolts was 121 mm fork length. During the week of May 17-May 23 the coho smolt mean length of 126.7 mm was significantly ($\alpha = 0.05$) longer than the remaining three weekly coho smolt mean lengths of 119.5, 118.3 and 120 mm. Age-2 smolts dominated the age composition, ranging from 56% to 80% during the four weekly samplings. Age-1 and -3 components averaged 18% and 14%, respectively. Weights of coho smolts ranged from 42 to 613 grams. Median weights of age-1, -2 and -3 coho smolts were 94, 170 and 213 grams, respectively. Further information concerning this project will be published in a Fisheries Data Series report in FY 2001.

A multi-agency watershed study to catalogue the aquatic resources in the Cottonwood Creek drainage was initiated in 1997. The Habitat Division of 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.

Coho returning to the Eklutna Tailrace were used as brood stock in 1999 (Table 27). Fish were collected by seine and transported to the Fort Richardson hatchery for egg take and development. They will be released as smolt into the Eklutna Tailrace.

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 CWT project and drainage aquatic resource study should be continued at least through 2001.

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.

Several fishery access projects should be implemented in the Knik Management Unit. These are discussed in detail in the Fisheries Access Improvements section of this report. 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 20,503, 14,517 and 2,575 fish, respectively, during 1993 through 1997 (Mills 1994; Howe et al. 1995-1998) (Table 31). The Susitna River drainage supports the largest coho salmon stock within the NCIMA and the entire Upper Cook Inlet area. The contribution of the harvest from the Eastside Susitna and Westside Susitna Management Units was 57% of the total NCIMA coho salmon harvest during 1993-1997. The West Cook Inlet Management Unit contribution to the total NCIMA was 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 and 1997-1999 encompassed the entire coho salmon migration. From 1985 to 1996 the sonar program was terminated prior to the end of the coho salmon return. Yentna River sonar enumeration of coho salmon entering the Yentna River drainage ranged from 6,279 to 74,346 fish during 1981 to 1999 (Table 40). 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 and 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 riverbanks.

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 4,078, 1,584 and 3,233 fish, respectively, during the period of 1993 to 1997. This harvest accounted for 61% of the Westside Susitna Management Unit coho salmon harvest during this time period (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, then was reinstituted as 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 to enumerate a larger portion of the escapement and allow weir crews easier access.

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 4,347 and 5,735 fish, respectively, during 1993 through 1997 and accounting for 49% of the Eastside Susitna harvest (Appendix A14).

Table 40.-Eastside and westside Susitna River drainage coho salmon escapement index counts, 1981-1999.

	Westside Susitna River Drainage				Eastside Susitna River Drainage[a]					
Year	Yentna River[b]	Deshka River[c]	Rabideux Creek	Total	Birch Creek	Question Creek	Answer Creek	Total	Susitna River[d]	Grand Total
1981	17,017		[e]	17,017	[e]	[e]	[e]	[e]	37,000	54,017
1982	34,089		[e]	34,089	[e]	[e]	[e]	[e]	80,000	114,089
1983	8,867		[e]	8,867	[e]	[e]	[e]	[e]	24,000	32,867
1984	16,007		480	16,487	236	60	57	353	[e]	16,840
1985	9,181		82	9,263	30	89	9	128	[e]	9,391
1986	23,457		[e]	23,457	25	[e]	[e]	25	[e]	23,482
1987	6,279		50 [f]	6,329	46	149	10	205	[e]	6,534
1988	12,173		230	12,403	63	337	160	560	[e]	12,963
1989	25,695		20	25,715	180	31	66	277	[e]	25,992
1990	21,346		20	21,366	36	41	6	83	[e]	21,449
1991	57,275		185	57,460	300	492	51	843	[e]	58,303
1992	29,073		[e]	29,073	167	227	181	575	[e]	29,648
1993	37,752		[e]	37,752	178	370	34	582	[e]	38,334
1994	25,173		105	25,278	224	339	0 [g]	563	[e]	25,841
1995	74,346	12,824	39	87,209	127	155	35	317	[e]	87,526
1996	34,464		[e]	34,464	458	238	43	739	[e]	35,203
1997	13,681	8,063	114	21,858	217	186	57	460	[e]	22,318
1998	24,408	6,773	56	31,237	356	519	45	920	[e]	32,157
1999	37,933	4,563	169	42,665	153	128	470	751	[e]	43,416

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

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

[c] Weir count. 1995 RM 17, 1997-1999 RM 7: 1998 and 1999 weirs were underwater for an extended time during coho season resulting in an incomplete count.

[d] Sonar counts upstream of River Mile 80.

[e] No survey conducted.

[f] Poor survey conditions.

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

In the West Cook Inlet Management Unit the Chuitna River is the primary producer of coho salmon. The average harvest in this stream between 1993 and 1997 was estimated at 1,169 fish which accounts for approximately 45% of the harvest within this management unit (Appendix A18).

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

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 were three fish 16 inches or more in length until 2000 when they were reduced to two. In the Westside Susitna and West Cook Inlet Management units the bag and possession limits were three coho salmon daily and six in possession until 2000 when they were reduced to two per day and four in possession. These reductions were instituted to address conservation concerns.

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 1998 recreational coho salmon harvest from the Eastside Susitna, Westside Susitna and West Cook Inlet units was estimated at 27,635, 15,444 and 4,029 fish, respectively (Table 31). The 1998 harvest was well above the 1993-1997 mean for the Susitna River units and approximately double the 1997 harvest.

In 1999 initial catches from the Central District commercial drift fleet for coho salmon were low; however, it was thought that this was partly due to poor fishing conditions caused by high winds. As the season progressed commercial catches remained poor. Total commercial catch for the Northern Cook Inlet was 120,083 fish, the lowest on record in over two and a half decades. Actions were taken by the department through its E.O. authority to increase the number of Susitna River-bound sockeye salmon to the spawning grounds. This action undoubtedly increased the number of coho bound for Northern District waters; however, the increased savings of coho was much smaller than anticipated. An additional E.O. was issued to increase coho salmon inriver returns to the Northern District.

During the 1999 season catch information received from recreational anglers and guides for the Westside Susitna Unit indicated a fair to average return of coho salmon. Fair to good catches were reported for most of the major tributaries including Alexander and Lake creeks and the Deshka and Talachulitna rivers. Weir counts for the Deshka River appeared low at 4,563; however, it is thought that an additional 1,000-2,000 coho salmon may have passed the weir without being counted due to high water (Table 40). Sonar enumeration of coho salmon at River Mile 4 of the Yentna River estimated a return of 37,933 coho salmon to the Yentna River drainage in 1999, the third highest count recorded since 1981 (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. During the Skwentna River Subsistence Fish Wheel fishery in 1999, twenty-one permits were issued and two fish wheels were operated. A total of 43 coho salmon was harvested (Table 20).

Catch information from fishermen and guides combined with periodic spot checks of the sport fishery by area staff indicated an average to above average return of coho to Eastside Susitna Unit. Although a few anglers reported poor catches of coho salmon for some of the Parks Highway streams, most reports indicated average to good catches. This was true for the Talkeetna area streams as well. There are currently no departmental programs available to monitor inseason returns of coho salmon to Eastside Susitna streams. The department does, however, conduct escapement surveys to index spawning numbers of coho salmon on three area streams (Table 40).

Currently there are no departmental programs available to monitor inseason runs of coho salmon to West Cook Inlet streams. However, inseason catch information received in 1999 from recreational anglers and guides indicated an average to above average return. Good numbers of coho salmon were observed in the Chuitna, Theodore and Lewis rivers by staff when conducting aerial surveys to index chinook salmon abundance. In addition, information provided from a helicopter charter service catering to anglers also indicated good numbers of coho salmon were present.

Recent Board of Fisheries Actions

During the February 1999 BOF meeting the following proposal was adopted: In all waters of West Cook Inlet South of the Susitna River (i.e. Chuitna, Lewis, Theodore & McArthur rivers) once an angler has harvested their bag limit of three coho salmon, they may no longer fish on these streams for the remainder of the day. These same streams are closed to coho salmon fishing commencing October 1-December 31.

The BOF met out of cycle in February of 2000 to address a coho salmon conservation concern. During this meeting several restrictions were imposed on commercial and sport fisheries to reduce coho salmon harvests beginning in 2000. In the Eastside Susitna Unit the daily bag and possession limits were reduced from three coho salmon to two. In the Westside Susitna Unit and West Cook Inlet Unit the bag and possession limits were reduced from three per day and six in possession to two per day and four in possession.

The next BOF meeting regarding coho salmon issues is scheduled for February 2002.

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.

In the Eastside and Westside Susitna Management Units, four small Susitna River tributaries continue to be included in the annual coho salmon escapement indices. These are Question Creek, Answer Creek, Birch Creek and Rabideux Creek (Table 40). 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.

Returns of coho salmon to Alexander Creek and the Deshka River 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 are counted through a weir at River Mile 7 on the Deshka River and by foot survey in four Susitna River tributaries between River Mile 80 and 85.

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. Fisheries in these streams have become considerably more popular than in previous years (Appendix A14).

The weir which has been operated annually on the Deshka River since 1995 will be operated in 2000 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 the feasibility of constructing a weir in Sucker Creek (a tributary of Alexander Creek) be addressed in 2000.

A method for annually indexing abundance of coho salmon in the Susitna River drainage is badly needed. 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 drainage. Because of this uncertainty, it is important that projects that 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. New projects would be costly and at this point in time funding for programs of this magnitude is not likely to be appropriated.

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 1977-1997 and averaged 11,452 fish (Mills 1979-1994; Howe et al. 1995-1998) (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, specifically Larson Creek. Westside Susitna River and WCI units harvests have been spread across several systems (Appendices A25-A28).

Fish Creek (Knik Arm) sockeye salmon have long been used in commercial and subsistence fisheries (Engel and Vincent-Lang 1992). The Knik Arm subsistence fishery was operational through 1970. In 1971 it was closed because of declining sockeye salmon escapements into Fish Creek. It reopened in 1984 and 1985 then closed again in 1986. The Board of Fisheries established the Skwentna Fish Wheel Personal Use fishery in March of 1996, then reestablished it as a subsistence fishery in 1998 (Table 20). Sockeye salmon dominate these harvests.

The Fish Creek commercial set gillnet and personal use dip net (Table 38) 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. 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 which targeted sockeye salmon (Table 21). 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.

Sockeye salmon populations are present in numerous streams throughout the Knik Arm Unit, some of which have been surveyed sporadically during past years (Tables 41 and 42). Bodenburg Creek, a Knik River tributary, has been surveyed annually since 1968 (except for 1984) (Table 41).

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 Division, and by CIAA weirs at Chelatna Lake (Lake Creek drainage) since 1993, Larson Lake (Talkeetna River drainage) in 1984-1987 and since 1997, and Hewitt Lake in 1990 (Table 42). Within the NCIMA the department also operates a weir at Packers Creek on Kalgin Island.

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 1998 sport harvest of sockeye salmon in the Knik Management Unit totaled 5,812 fish, well above the 1993-1997 mean of 4,977. The majority of the harvest occurred in the Knik River and Cottonwood Creek (Appendix A21). Harvests from Eastside and Westside Susitna River units totaled 6,481 and 2,940 fish, respectively (Appendices A23 and A25). The 1998 Eastside Susitna Management Unit was approximately 50% above the 1993-1997 mean while the

Westside Susitna Unit exceeded its 1993-1997 mean by approximately 25%. WCI Unit streams produced a harvest of 582 fish, approximately 40% above their 1993-1997 mean (Appendix A27).

Sockeye salmon were sampled for age, sex and length at weirs operated on Cottonwood, Wasilla and Fish creeks during 1999. Data pertaining to age and sex composition and length-at-age are contained in Appendix L.

Table 41.-Bodenburg Creek escapement index surveys, 1968-1999.

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		8/30/99	257	21
1984	No count				
9/5/85	232				
			Mean	221	36

[a] Not included in the mean.

Table 42.-Sockeye salmon counts from Yentna River sonar, Chelatna, Hewitt, Judd and Larson lakes, Fish, Cottonwood, Jim and Packers creeks weirs, and Little Susitna River weir, 1968-1999.

	Jim Ck Weir [a]	Fish Ck Weir [b,c]	Little Susitna R Weir [d]	Yentna R Sonar	Hewitt Lk Weir [e]	Chelatna Lk Weir [f]	Larson Lk Weir [g]	Packers Ck Weir	Judd Lk. Weir	Cottonwood Ck Weir
Year										
1968		19,616[h]								
1969		12,456								
1970		25,000								
1971		31,470								
1972		6,981								
1973		2,705								
1974		16,225								
1975		29,882								
1976		14,032								
1977		5,183								
1978		3,555		94,000						
1979		68,739		157,000						
1980		62,828		191,000				16,477		
1981		50,479		340,000				13,024		
1982		28,164		216,000				15,687		
1983		118,797		112,000				18,403		
1984		192,352		194,000			35,254	30,684		
1985		68,577		228,000			37,874	36,850		
1986		29,800		92,000			32,322	29,604		
1987		91,215		66,000			16,753	35,401		
1988		71,603	2,642	52,347				18,607		
1989		67,224	6,203	96,269				22,304		
1990		48,717		14,0379	12,943			31,868		
1991		50,500		105,000				41,275		
1992		72,108		66,057				28,361		
1993	3,548	117,619		141,694		20,235		40,869		
1994	5,197	100,638	16,918	128,032		28,303		30,788		
1995		115,101	7,129	121,479		20,104		29,473		
1996		63,164		90,781		28,684		17,767		
1997		55,035		157,797		84,899	40,112	19,364		8,224
1998		22,865		119,623		27,284	63,514	17,732	34,416	27,930
1999		26,725		99,029		no weir	18,943	16,860		39,272
Mean[i]	4,364	52,792	8,223	136,749		34,918	34,967	25,570		18,857
Goal		50,000		100,000-150,000				15,000-25,000		

[a] Bartlett *Unpublished* b and c.

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

[c] Years hatchery sockeye salmon contributed to the escapement were 1979-1981, 1983-1999.

[d] Bartlett and Vincent-Lang 1989; Bartlett and Sonnichsen 1990; Bartlett 1996a and 1996b.

[e] CIAA 1998a.

[f] CIAA 1998b.

[g] CIAA 1991.

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

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

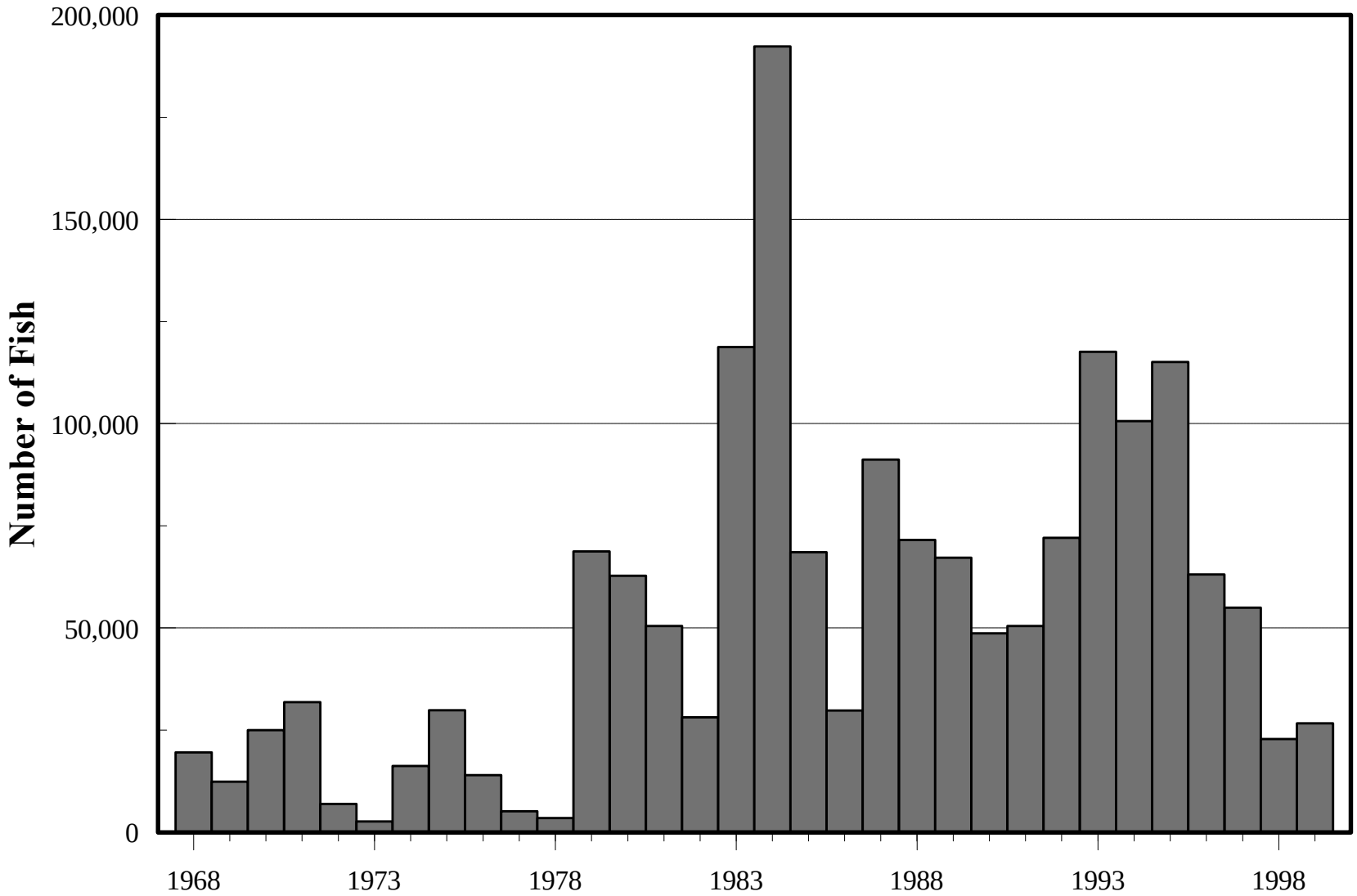


Figure 20.-Fish Creek sockeye salmon escapement, 1968-1999.

Table 43.-Big Lake Hatchery (1975-1992), Eklutna Hatchery (1993-1996) and Trail Lakes Hatchery (1997 and 1998) sockeye salmon fry releases into the Big Lake drainage by brood year, 1975-1998.

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[b]	90%	0	0.43		
1994	7,700,000	5,000,000[b]	81%	0	0.40		
1995	8,000,000	5,000,000[b]	81%	0	0.39	1,390,128	10.4
1996	8,000,000	4,080,000[b]	66%	0	0.40		
1997	8,000,000	5,000,000[b]	76%	0	no data		
1998	5,132,000	196,960[b]	75%	100%[c]	0.73		
1999	1,490,000						

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

[b] Additional fry retained for smolt program.

[c] 100% otolith marked.

The Fish Creek personal use dip net fishery harvested only 4,036 sockeye in 1998. Emergency orders were issued closing the fishery early. The 1999 Fish Creek personal use fishery again had to be closed early by emergency order in hopes of attaining the escapement goal (Appendix D1). A preliminary harvest estimate totals only 902 sockeye salmon in 1999.

The Tyonek subsistence harvest during 1998 and 1999 totaled 127 and 145 sockeye salmon (Table 20). The Yentna River Subsistence Salmon Fishery harvested 473 and 455 sockeye salmon in 1998 and 1999, respectively (Table 20). Educational permit holders harvested approximately 300 and 350 sockeye in 1998 and 1999, respectively.

Management Objectives

The management objective for sockeye salmon in the NCIMA is to attain established escapement goals as measured at various weirs and sonar sites while harvesting fish in excess of these escapement goals.

Recent Board of Fisheries Actions

The next BOF meeting addressing sockeye salmon is scheduled in 2002.

Current Issues

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. With the area-wide reduction of the coho bag and possession limits, managers anticipate the harvest of NCIMA sockeye salmon will increase as anglers begin targeting them to supplement their harvests.

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 drainage is scheduled to be stocked annually with sockeye salmon fry from a CIAA hatchery. Weirs on Cottonwood and Wasilla creeks have been in operation the past 3 years primarily for coho salmon enumeration, but have allowed the opportunity to monitor the sockeye salmon return also.

Susitna River escapement is monitored at a sonar site on the Yentna River operated by the Commercial Fisheries Division. Additionally, weirs are operated at Chelatna and Larson lakes by CIAA, and Packers Creek and Judd Lake by the Commercial Fisheries Division.

Recommended Research and Management

Expansion of existing sockeye salmon escapement monitoring programs is recommended. Specifically, we need to refine and evaluate the Yentna River sonar and to evaluate the distribution of spawning sockeye salmon upstream of the sonar site.

PERSONAL USE AND SUBSISTENCE FISHERIES

Background and Historical Perspective

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 and a personal use smelt fishery, the majority of which takes place in the Susitna River.

Fish Creek sockeye salmon have long been used in commercial and subsistence fisheries (Engel and Vincent-Lang 1992). The Knik Arm subsistence fishery was operational through 1970. In 1971 the 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 continued 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. Due to low returns in 1997 and 1998, the BOF closed this fishery for the 1999 through 2001 fishing seasons.

The dip net fishery was initially established to open July 30, but several changes have occurred since 1986. 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. A permit is required, 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 salmon harvested.

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.

The overwhelming majority of the personal use smelt harvest comes from the Susitna River drainage. Most of this harvest occurs in and around the mouth of the Susitna River and in the mainstem Susitna River downstream of the Yentna/Susitna confluence (Appendices A82 and A83). The average harvest from 1993–1997 was 6,058. The inriver return of smelt to the Susitna River drainage ranges in the millions with personal use harvest accounting for less than 1% of this return. In terms of harvest, this fishery is likely one of the most underutilized in the state. It is managed inseason with spot checks conducted by Palmer Area staff and postseason through the SWHS. It is likely that unless increased access is provided to the Susitna River, the personal use harvest for smelt will remain fairly stable.

The Board of Fisheries established the Skwentna River Personal Use Salmon Fishery in March of 1996. As a result of State of Alaska Supreme Court and Board of Fisheries action, it was reinstituted as the Upper Yentna River Subsistence Salmon 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 and is prosecuted strictly by fish wheel. Most of the participants are local residents from the Skwentna area. The season is from July 15 through July 31, from 4:00 a.m. until 8:00 p.m. on Mondays, Wednesdays and Fridays. Sockeye salmon dominate the harvest and chinook salmon harvest is not allowed. The number of permits returned per season ranged from 14 in 1996 to 21 in 1998, and averaged 18. Average annual harvest is 571 fish (Table 20).

The Tyonek subsistence fishery was established in 1980. Participants are allowed to harvest all species of salmon. Tyonek natives are the primary users. The season commences on May 15 and continues through October 15. Chinook salmon dominate the harvest while coho and sockeye salmon are harvested in similar numbers. Few pink and chum salmon are harvested. The average harvest from 1980–1999 was 1,569 chinook, 122 sockeye, 120 coho, 16 pink and 11 chum with an average overall harvest of 1,569 salmon (Table 20).

Recent Fishery Performance

The Fish Creek personal use dip net fishery presently is restricted to the waters of Fish Creek and limited to the hours of 11:00 a.m. to 11:00 p.m. daily. As in 1997, the 1998 fishery had to be closed early by emergency order in hopes of attaining the escapement goal (Appendix D1). However, even with this action in 1998, only 22,865 sockeye salmon were counted at the weir, less than half the desired escapement (Table 42). The 1998 harvest estimate of the personal use fishery totaled only 4,036 sockeye salmon.

The 1999 season commenced on July 10 and periodic onsite inspection by staff indicated that dipnetting was poor. No fish showed up at the Fish Creek weir until July 26, indicating that most of the fish harvested in the dip net fishery were not of Fish Creek origin. In response to low weir counts and poor catch rates the department, though E.O. authority, closed the fishery on July 26. The preliminary harvest estimate generated from returned permits was 902 sockeye. Additionally, low returns in 1997 and 1998 prompted the BOF to close the Fish Creek commercial setnet fishery through the year 2001. The cause of poor sockeye salmon returns to the Fish Creek system is currently unknown. Increased urbanization within the system may be a contributing factor.

The 1998 personal use smelt harvest was 7,865 fish, 33% above the 1993-1997 mean. The 1999 harvest is thought to have been average.

Twenty-one permits were issued for the 1999 Upper Yentna River Subsistence fishery, down slightly from 1998 (Table 20). In 1999 the average salmon harvest per permit was 32, approximately equal to the 1996-1998 average of 31 fish. Total harvest for 1999 was 524 fish of which 455 were sockeye salmon, 43 coho salmon, 15 pink salmon and 11 chum salmon.

The 1999 Tyonek subsistence fishery harvest estimate totaled 1,585. Harvest by species was 1,314 chinook; 145 sockeye; 91 coho; 26 pink and 9 chum salmon (Table 20).

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. Regulation and management of this fishery are governed by the Upper Cook Inlet Personal Use Salmon Fishery Management Plan.

There are no specific management objectives for the personal use smelt fishery, Tyonek subsistence fishery or the Upper Yentna River subsistence fish wheel fishery. However, all fisheries are managed to provide sustained yield.

Recent Board of Fisheries Actions

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 in 2002.

Current Issues

The Fish Creek Dipnet Fishery has closed early because of poor returns of sockeye salmon for 3 years in a row. The cause of the poor returns is presently unknown.

Much of the land adjacent to the Fish Creek Dip Net fishery is under private ownership causing annual conflict between fishery participants and landowners. Due to the large number of people participating in the fishery there is conflict between shore and boat fishermen, litter accumulation and substantial short-term damage to the marsh area near the mouth of Fish Creek. These problems are the source of increasing comment by the public and local landowners. The department presently provides toilets and a dumpster to alleviate the litter problem.

Ongoing Research and Management Activities

Department markers and regulatory signs are placed at the mouth of Fish Creek to delimit the legal fishing area and list the present regulations.

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 Division. Harvest information for the Upper Yentna and Tyonek subsistence fisheries is collected from returned permits as required by the permitting process. Harvest information for the personal use smelt fishery is collected through the SWHS.

Recommended Research and Management

Department markers will continue to be placed at the mouth of Fish Creek. 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.

The department will continue to operate the weir on Fish Creek as long as the personal use fishery exists. It is likely that more restrictive measures will be necessary in the Fish Creek

personal use fishery in 2000 as escapement goals have not been met the past 2 years and inseason E.O. closures were necessary.

Department markers will continue to be placed at the boundaries of the Upper Yentna River subsistence fishery area.

EDUCATIONAL FISHERIES

Background and Historical Perspective

The first educational fishery, the 1989 Kenaitze Tribal fishery (on the Kenai Peninsula), originated as a Federal Court-ordered subsistence fishery resulting from extensive legislation and litigation related to both state and federal interpretation of subsistence. Prior to the 1993 fishing season the Alaska Superior Court, in negotiations with the department and the Kenaitze Tribe, ordered the department to issue educational fishing permits. The Knik Tribal Council and the Native Village of Eklutna were first issued permits for the 1994 season. In 1998 the Tyonek Subsistence Camp was issued its first permit. These educational fisheries, originally ordered as an interim fishery until the court cases were decided, have been applied for and renewed by the department annually.

The guidelines for educational fisheries were established by the BOF and are administered under chapter 93 of the Alaska Administrative Code. Only 1,000 fish per permit are allowed. The season is from May 1 to September 30. These permits are issued on an annual basis and must be renewed each year. Permit holders must submit to the department a postseason summary as indicated in the specifications. A failure to meet specifications will result in nonrenewal of a permit. The average number of fish harvested each year per permit is approximately 200.

Recent Fishery Performance

The Knik Tribal Council educational permit harvest has averaged 207 fish per year. During the 1999 season approximately 394 salmon were harvested. Sockeye salmon dominated the harvest with 177 fish; 120 coho salmon, 55 chum salmon and 42 chinook salmon were also harvested (Table 44).

The Eklutna Native Village educational permit harvest has averaged 179 fish annually. The 1999 season was slightly below average with 139 fish being harvested. Sockeye salmon dominated the harvest with 80 fish, followed by chinook salmon with 11, 25 coho, 20 chum, and 3 pink salmon (Table 44).

The Tyonek Village educational permit harvest was 56 in 1998, the first permitted year. During 1999 the harvest nearly doubled to 100 fish. All fish harvested in 1999 were reported as sockeye salmon (Table 44).

Management Objectives

The objective of this fishery is to implement the provisions of the permit. Standards, general conditions, and requirements of an educational fishery program are outlined in 5 AAC 93.200-235. Council and Tribal objectives for the educational fisheries include teaching and preserving the cultural and traditional subsistence way of life as well as providing food for the elders and others in need.

Recent Board of Fisheries Actions

The Board has not recently addressed this fishery.

Table 44.-Educational fishery permit harvests in NCIMA, 1991-1999.

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
1999	42	120	177	0	55	394	5/27-8/14
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
1999	11	25	80	3	20	139	5/1-9/30
Tyonek Village							
1998	0	41	11	3	1	56	8/12-8/14
1999	0	0	100	0	0	100	7/7-7/10

[a] No data available

Current Issues

The educational fishery harvests of all species of salmon are minimal and have an insignificant effect on the inriver sport fisheries.

Ongoing Research and Management Activities

Reports on the educational program, as required by each permit, have been submitted annually to the Area Biologist and compiled in the Area Management Report.

Recommended Research & Management

No research activity specific to this fishery is recommended. The annual permit data should continue to be compiled.

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). These lakes range in size from 2 to 362 surface acres and are stocked with a variety of sizes and species of game fish including: rainbow trout, coho salmon, chinook salmon, Arctic grayling, Arctic char, lake trout and recently a chinook salmon and pink salmon hybrid (pinook).

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, Arctic char 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 and 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 1999. Annual releases of all species during 1997-1999 ranged from 489,532 to 732,731 (Appendix C1).

The majority of rainbow trout released into NCIMA waters during the period 1997-1999 were fingerlings. Most fingerlings weighed between 1 and 2 grams and were released during July and August. 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. Fifteen percent 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.

King salmon are stocked as catchables, weighing about 100 grams, in early November providing winter ice fishing opportunities in three heavily fished lakes.

Arctic char are stocked as catchables weighing about 100 grams in May in seven lakes (Appendix C1), providing more diversity for sport fishing.

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 1999, 68 lakes were stocked with 612,776 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 1999 included 473,284 rainbow trout; 91,199 coho salmon; 17,465 Arctic char; 322 Arctic grayling; and 30,456 chinook salmon. Eighteen lakes were stocked with more than one species of fish in 1999. Stocking locations, species, numbers of fish and fish size are listed in Table 45.

The SWHS (Howe et al. 1999) estimated that 22,196 angler-days of participation resulted from the area's landlocked stocking program in 1998 (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 1998 catch from stocked landlocked lakes included an estimated 40,447 rainbow trout of which 11,184 were harvested, 9,955 landlocked salmon (4,332 were harvested); and 4,350 Arctic grayling (723 were harvested). Rainbow trout from stocked lakes represented 35% of all rainbow trout caught and 55% of the entire harvest of this species from the NCIMA during 1998 (Tables 46 and 47).

Table 45.-Northern Cook Inlet Management Area lake stocking summary for nonanadromous fish, 1999.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROODSTOCK (TREATMENT) [a]	HATCHERY	STOCKING SIZE	STOCKING METHOD[b]
Rainbow Trout				Swanson R. Mixed			
Barley	19	08/02/99	1,917	99 Swanson R	Ft. Richardson	3.0g	T/BU
Bearpaw	45	08/04/99	2,300	99 Swanson R	Ft. Richardson	2.3g	T/BU
Bench	34	09/14/99	1,723	99 Swanson R(TAF)	Ft. Richardson	2.3g	A
Benka	123	08/10/99	6,001	99 Swanson R	Ft. Richardson	2.2g	T
Beverly	42	08/04/99	4,200	99 Swanson R(TAF)	Ft. Richardson	2.0g	T/BU
Big No Luck	68	09/14/99	7,023	99 Swanson R(TAF)	Ft. Richardson	2.3g	A
Bruce	27	05/18/99	1,733	98 Swanson R	Elmendorf	117.0g	T/BU
Butterfly	50	10/30/99	5,074	99 Swanson R(TAF)	Ft. Richardson	5.4g	T/BU
Carpenter	176	08/02/99	18,029	99 Swanson R	Ft. Richardson	2.3g	T
Christiansen	179	08/10/99	9,006	99 Swanson R	Ft. Richardson	2.0g	T
Coyote	2	05/15/99	505	98 Swanson R(TAF)	Elmendorf	91.6g	T
Cranberry	63	08/02/99	6,484	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Crystal	132	08/18/99	10,251	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Dawn	12	08/02/99	2,418	99 Swanson R(TAF)	Ft. Richardson	2.0g	T/BU
Diamond	139	08/02/99	13,914	99 Swanson R	Ft. Richardson	2.7g	T
Echo	23	05/11/99	2,312	98 Swanson R	Elmendorf	124.0g	T
Farmer	21	08/02/99	1,125	99 Swanson R	Ft. Richardson	2.3g	T/BU
Finger	362	07/20/99	32,533	99 Swanson R	Ft. Richardson	2.0g	T
Florence	55	08/18/99	5,500	99 Swanson R	Ft. Richardson	2.0g	T/BU
Homestead	17	08/02/99	1,676	99 Swanson R(TAF)	Ft. Richardson	2.0g	T/BU
Honeybee	58	07/20/99	6,133	99 Swanson R	Ft. Richardson	2.0g	T/BU
Ida	46	08/20/99	4,600	99 Swanson R	Ft. Richardson	2.3g	T/BU
Irene	18	05/17/99	1,725	98 Swanson R	Elmendorf	117.0g	T/BU
Kalmbach	125	08/04/99	12,500	99 Swanson R	Ft. Richardson	2.2g	T
Kashwitna	160	08/10/99	16,000	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Kepler-Bradley	58	04/22/99	1,669	98 Swanson R	Elmendorf	138.5g	T
		04/23/99	2,414	98 Swanson R	Elmendorf	117.0g	T
		04/23/99	1,635	98 Swanson R	Elmendorf	160.5g	T
		08/02/99	5,880	99 Swanson R	Ft. Richardson	2.3g	T
Knik	50	05/07/99	2,464	98 Swanson R	Elmendorf	137.5g	T
Knob	52	06/22/99	1,588	98 Swanson R(TAF)	Elmendorf	109.0g	T
		07/13/99	1,500	98 Swanson R(TAF)	Elmendorf	106.0g	T
Lalen	92	07/21/99	9,553	99 Swanson R(TAF)	Ft. Richardson	1.8g	T
Little Beaver	44	08/02/99	4,414	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Little Lonely	56	10/13/99	6,074	99 Swanson R	Ft. Richardson	6.1g	T/BU
Loberg	11	05/05/99	994	98 Swanson R	Elmendorf	157.0g	T
Long [K/B]	74	08/02/99	7,412	99 Swanson R	Ft. Richardson	2.90g	T
Long (Mi. 86)	106	06/11/99	2,729	98 Swanson R	Elmendorf	106.0g	T
		07/07/99	2,007	98 Swanson R	Elmendorf	102.0g	T
Loon	108	8/04/99	10,800	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Lorraine	132	08/02/99	13,180	99 Swanson R	Ft. Richardson	2.9g	T/BU
Lucille	362	05/25/99	3,173	98 Swanson R(TAF)	Ft. Richardson	98.5g	T
		06/13/99	1,576	98 Swanson R(TAF)	Ft. Richardson	98.5	T
		07/30/99	2,507	98 Swanson R(TAF)	Ft. Richardson	69.8g	T
		09/28/99	3,365	98 Swanson R(TAF)	Ft. Richardson	73.5g	T
Lynne	70	07/20/99	7,333	99 Swanson R	Ft. Richardson	2.0g	T
Marion	113	08/02/99	11,291	99 Swanson R	Ft. Richardson	2.4g	T/BU
Matanuska	62	04/27/99	7,359	98 Swanson R	Elmendorf	98.5g	T
		04/29/99	1,946	98 Swanson R	Elmendorf	139.0g	T

-continued-

Table 45.-Page 2 of 3.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROODSTOCK (TREATMENT) [a]	HATCHERY	STOCKING SIZE	STOCKING METHOD[b]
Rainbow Trout (continued)							
Meirs	17	05/17/99	1,725	98 Swanson R	Elmendorf	117.0g	T/BU
Memory	84	08/04/99	4,200	99 Swanson R	Ft. Richardson	2.2g	T
Morvro	87	08/04/99	4,658	99 Swanson R(TAF)	Ft. Richardson	2.0g	T/BU
North Friend	81	08/10/99	8,100	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
North Knob	36	07/13/99	900	98 Swanson R(TAF)	Elmendorf	106.0g	T
Prator	98	08/04/99	4,400	99 Swanson R	Ft. Richardson	2.3g	T
Ravine	12	09/13/99	1,023	98 Swanson R	Ft. Richardson	66.5g	T/BU
		10/11/99	2,500	99 Swanson R	Ft. Richardson	5.5g	T/BU
Reed	20	08/04/99	2,000	99 Swanson R	Ft. Richardson	2.2g	T/BU
Rocky	59	05/13/99	1,659	98 Swanson R	Elmendorf	106.0g	T
		05/14/99	1,244	98 Swanson R	Elmendorf	106.0g	T
Seventeenmile	100	07/23/99	10,230	99 Swanson R	Ft. Richardson	2.0g	T
Seymour	229	07/21/99	22,904	99 Swanson R(TAF)	Ft. Richardson	1.8g	T
Slipper (Eska)	9	05/14/99	905	98 Swanson R(TAF)	Elmendorf	87.5g	T
South Friend	56	08/10/99	5,600	99 Swanson R(TAF)	Ft. Richardson	2.3g	T/BU
South Rolly	108	05/25/99	3,217	98 Swanson R(TAF)	Ft. Richardson	98.5g	T
		07/20/99	2,197	98 Swanson R(TAF)	Ft. Richardson	66.5g	T
		07/30/99	2,570	98 Swanson R(TAF)	Ft. Richardson	69.0g	T
		09/27/99	3,044	98 Swanson R(TAF)	Ft. Richardson	87.5g	T
Tanaina	109	07/20/99	5,280	98 Swanson R(TAF)	Ft. Richardson	66.5g	T/BU
Tigger	19	08/10/99	1,900	99 Swanson R	Ft. Richardson	2.0g	T/BU
Twelvemile	56	08/18/99	5,600	99 Swanson R(TAF)	Ft. Richardson	2.0g	T
Twin Island	151	09/14/99	15,121	99 Swanson R(TAF)	Ft. Richardson	2.5g	T/BU
Vera	111	10/04/99	13,736	99 Swanson R(TAF)	Ft. Richardson	3.5g	T/BU
Visnaw	131	07/21/99	13,182	99 Swanson R(TAF)	Ft. Richardson	1.8g	T
Walby	54	07/24/99	5,400	99 Swanson R(TAF)	Ft. Richardson	1.9g	T/BU
Weiner	21	05/26/99	800	98 Swanson R(TAF)	Elmendorf	98.5g	T
		07/24/99	2,200	99 Swanson R(TAF)	Ft. Richardson	1.9g	T
West Sunshine	22	08/10/99	4,500	99 Swanson R(TAF)	Ft. Richardson	2.2g	T/BU
Willow	143	05/28/99	1,000	98 Swanson R(TAF)	Elmendorf	98.5g	T
		07/20/99	2,980	98 Swanson R(TAF)	Elmendorf	66.5g	T
		10/04/99	9,514	99 Swanson R(TAF)	Ft. Richardson	3.5g	T
Wolf	62	07/24/99	12,400	99 Swanson R(TAF)	Ft. Richardson	1.9g	T/BU
"X"	101	08/10/99	5,100	99 Swanson R	Ft. Richardson	2.0g	T/BU
"Y"	40	08/11/99	4,000	99 Swanson R	Ft. Richardson	2.0g	T/BU
Total 67 Lakes	5,402		473,334				

	Diploid	Triploid	Total
Catchables	34,638	37,107	71,745
Fingerling	199,058	202,531	401,589
Total:	233,696	239,638	473,334

Coho Salmon (non-anadromous)				Bear Lake Diploid			
Barley	19	06/09/99	1,900	98 Bear Lake	Ft. Richardson	3.1g	T/BU
Bear Paw	45	06/03/99	4,321	98 Bear Lake	Ft. Richardson	5.2g	T/BU
Carpenter	176	06/03/99	13,724	98 Bear Lake	Ft. Richardson	5.2g	T
Christiansen	179	06/06/99	17,906	98 Bear Lake	Ft. Richardson	3.2g	T
Diamond	139	06/09/99	13,900	98 Bear Lake	Ft. Richardson	2.9g	T/BU

-continued-

Table 45.-Page 3 of 3.

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	BROOD STOCK (TREATMENT) [a]	HATCHERY	STOCKING SIZE	STOCKING METHOD[b]
Coho Salmon (continued)							
Echo	23	05/29/99	2,302	98 Bear Lake	Ft. Richardson	5.2g	T
Kalmbach	125	06/03/99	12,841	98 Bear Lake	Ft. Richardson	5.2g	T
Knik	50	06/09/99	5,000	98 Bear Lake	Ft. Richardson	3.2g	T
Loberg	11	05/29/99	1,100	98 Bear Lake	Ft. Richardson	5.2g	T
Memory	83	06/03/99	8,396	98 Bear Lake	Ft. Richardson	5.2g	T
Prator	98	06/03/99	9,809	98 Bear Lake	Ft. Richardson	5.2g	T
Total 11 Lakes	948		91,199				
Arctic Char							
Benka	123	10/12/99	3,098	1998 hatchery brood	Ft. Richardson	9.4g	T
Finger	362	10/06/99	5,318	1998 hatchery brood	Ft. Richardson	9.4g	T
Irene	18	10/12/99	570	1998 hatchery brood	Ft. Richardson	9.4g	T/BU
Lynne	70	10/12/99	2,020	1998 hatchery brood	Ft. Richardson	9.4g	T
Marion	113	10/12/99	3,082	1998 hatchery brood	Ft. Richardson	9.4g	T
Matanuska	62	10/12/99	850	1998 hatchery brood	Ft. Richardson	9.4g	T
Seventeenmile	100	10/07/99	2,527	1998 hatchery brood	Ft. Richardson	7.6g	T
Total 7 Lakes	848		17,465				
Chinook Salmon							
Finger	362	11/04/99	13,334	1998 Willow Ck.	Ft. Richardson	63.0g	T
		11/05/99	8,159	1998 Willow Ck.	Ft. Richardson	63.0g	T
Matanuska	62	11/08/99	4,035	1998 Willow Ck.	Ft. Richardson	77.0g	T
Memory	83	11/09/99	4,928	1998 Willow Ck.	Ft. Richardson	77.0g	T
Total 3 Lakes	507		30,456				
Arctic Grayling							
Canoe	21	05/23/99	150	1998 Moose Lk.	Ft. Richardson	117.0g	T/BU
Finger	362	05/23/99	172	1998 Moose Lk.	Ft. Richardson	117.0g	T
Total 2 Lakes	383		223				
Total 68 All Lakes	5,423		612,776				

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

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

The Kepler Lake Complex, consisting of nine stocked lakes, supported 7,732 angler-days of effort, and Finger Lake supported 5,329 angler-days of effort in 1998 (Table 46). Collectively, these two sites yielded 59% of the effort associated with stocked landlocked lakes within the NCIMA (Howe et al. 1999).

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 reduce effort on the area's wild stocks and insure that stocking does not negatively impact wild stock genetics or other fisheries. All stocking is conducted in accordance with guidelines set forth in the Statewide Stocking Plan for Recreational Fisheries (ADF&G *Unpublished*).

Table 46.-Statewide Harvest Survey estimated harvest and catch for NCIMA stocked lakes, 1998.

			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	93	0.4							202	185	92							202	185	92
Benka	991	4.5				110	110	100										110	110	100
Bench	26	0.1							140	48	34							140	48	34
Beverly	35	0.2							182	81	45							182	81	45
Big No Luck	167	0.8													278	84	30	278	84	30
Bradley	574	2.6							380	144	38	42	0	0				422	144	34
Canoe	702	3.2										3,213	405	13				3,213	405	13
Carpenter	651	2.9	1,108	240	22				1,460	329	23							2,568	569	22
Christiansen	351	1.6	438	320	73				118	0	0							556	320	58
Coyote	74	0.3							513	294	57							513	294	57
Crystal	140	0.6							168	0	0							168	0	0
Dawn	561	2.5							337	101	30							337	101	30
Diamond	242	1.1	391	349	89				446	311	70							837	660	79
Echo	531	2.4	481	142	30				358	196	55							839	338	40
Eska (Slipper)	343	1.5							165	137	83	153	51	33				318	188	59
Farmer	45	0.2							82	62	76							82	62	76
Finger	5,329	24.0	5,531	2,276	41	472	176	37	6,828	1,801	26	427	82	19	8	0	0	13,266	4,335	33
Florence	37	0.2							135	8	6							135	8	6
Homestead	26	0.1							136	88	65							136	88	65
Honeybee	254	1.1							385	151	39							385	151	39
Ida	109	0.5							406	347	85							406	347	85
Irene	494	2.2				67	0	0	2,518	529	21							2,585	529	20
Kalmbach	358	1.6	1,182	702	59				188	95	51							3,955	797	20
Kashwitna	9	0.0							16	16	100							16	16	100
Kepler	1,135	5.1							3,616	1,038	29		218					3,616	1,038	29
Knik	757	3.4	320	185	58				3,324	984	30							3,644	1,169	32
Lalen	159	0.7							353	25	7							353	25	7
Little Beaver	29	0.1							35	0	0							35	0	0
Loberg	187	0.8							421	84	20							421	84	20
Long (K/B)	1,165	5.2							4,995	0	0							4,995	0	0
Long (Mile 86) a	206	0.9				91	76	84	909	202	22	110	42	38				1,110	320	29
Loon	103	0.5							84	42	50							84	42	50
Lucille	590	2.7							1,396	224	16							1,396	224	16
Marion	143	0.6							259	128	49							259	128	49
Matanuska	1,165	5.2	362	42	12	67	17	25	2,684	1,038	39							3,113	1,097	35
Meirs	36	0.2										101	67	66				101	67	66
Memory	443	2.0	118	76	64				453	373	82				9	8	89	580	457	79
Morvro	9	0.0							84	0	0							84	0	0
Ravine	233	1.0							982	247	25							982	247	25
Reed	37	0.2							17	17	100	109	25	23				126	42	33
Rocky	688	3.1							1,134	352	31							1,134	352	31
Ruby	198	0.9							464	263	57							464	263	57
Seventeenmile	317	1.4							708	101	14	153	51	33				861	152	18
Seymour	19	0.1							25	0	0							25	0	0
South Rolly	673	3.0							433	42	10				118	50	42	551	92	17
Threemile	19	0.1																0	0	0
Twelvemile	18	0.1	24	0	0													24	0	0
Vera	183	0.8							763	199	26							763	199	26
Victor	18	0.1																0	0	0
Visnaw	467	2.1							480	328	68							480	328	68
Walby	597	2.7							792	464	59							792	464	59
Willow	57	0.3							157	0	0							157	0	0
Wolf	139	0.6							112	110	98							112	110	98
X & Y	264	1.2							604	0	0	42	0	0				646	0	0
TOTAL	22,196	100.0	9,955	4,332	44	807	379	47	40,447	11,184	28%	4,350	723	17%	413	142	34%	58,557	16,760	29%

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

Table 47.-Northern Cook Inlet Management Area recreational catch and harvest of rainbow trout by management unit as estimated by SWHS, 1977-1998.

	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
1997	60,823	19,146	23,734	1,878	22,829	1,704	1,465	342	108,851	23,070	67,261	34.3	100,372	23.0
77-97 mean	74,849	29,616	22,343	6,101	29,425	6,772	1,195	566	127,811	43,055	113,437	38.0	155,204	27.7
93-97 mean	65,218	20,118	22,138	3,031	26,280	2,144	1,034	207	114,671	25,499	77,100	33.1	119,695	21.4
1998	67,245	17,815	26,649	991	20,684	1,149	1,513	200	116,091	20,155	56,728	35.5	103,744	19.4

From: Mills 1979-1994, Howe et al. 1995-1999

[a] Catch estimates available beginning in 1990.

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, Howe et al. 1998). However, given that bag limits were recently reduced on lakes containing wild stocks, it is likely that we will see a substantial increase in use at the area's stocked lakes.

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

Ongoing Research and Management Activities

Landlocked lake research in 1999 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.

A hybrid salmon, a combination of pink and chinook, is being developed for stocked lakes. Hybrid salmon are sterile, allowing fish to be stocked in barriered lakes and remain in the harvestable population longer by not becoming sexually mature and dying at age 3. Hybrid salmon are scheduled to be stocked and evaluated in three lakes during 2000.

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.

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.

RAINBOW TROUT FISHERIES

Background and Historical Perspective

NCIMA rainbow trout harvests have ranged from 20,000 to 75,000 fish and averaged 43,055 fish during the years 1977 through 1997 (Mills 1979-1994, Howe et al. 1995-1998) (Table 46). 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 69% 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 16% and 14% of the NCIMA harvest, respectively, with the West Cook Inlet Management Unit accounting for the remainder. Several lake and riverine populations of rainbow trout in the Westside Susitna Management Unit have been severely impacted by northern pike predation (Rutz 1998). Since 1990 the SWHS has estimated the catch of rainbow trout. From 1993-1997 the average catch in the NCIMA was 114,671 (Mills 1994, Howe et al. 1995-1998) (Table 46). The Knik Management Unit dominates the catch (57%).

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 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 5,235 fish during the period 1993 through 1997. Approximately 60% 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 while the Talachulitna River generally produces the largest catches (Appendix A49 and A50). 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 for trophy trout defined in the Criteria for Establishing Special Management for 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 (Rutz 1992).

Recent Fishery Performance

A harvest of 991 rainbow trout in 1998 was the lowest on record for the Eastside Susitna management unit and represents approximately 33% of the 1993-1997 mean harvest for this stock. The Westside Susitna management unit harvest of 1,149 fish represents 54% of the 1993-1997 mean (Table 47). 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, are thought to be largely responsible.

The 1998 catch for the Eastside Susitna Management Unit was 26,649 fish, above the 1993 through 1997 average of 22,538 fish (Appendix A48). The 1998 Westside Susitna Management Unit catch was 20,684, below the 1993-1997 average of 26,238 fish (Appendix A50). In all years, less than 10% of the total rainbow trout catch in Eastside and Westside management units is harvested (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. This accounted for a large portion of the drop in harvest for the Eastside Susitna Management Unit from previous years (Appendices A47 and A48) (Howe et al. 1998). The catches for these two fisheries during 1997 and 1998 were above all previous years (except 1996 for Willow Creek) indicating that the no-retention restrictions may be increasing the number of rainbow trout available to anglers.

During 1998 an estimated 326 rainbow trout were harvested in Lake Creek, a Westside Susitna Management Unit fishery, from a catch of 7,376 fish (Appendices A49 and A50). The Deshka River, also a Westside Susitna tributary, yielded a rainbow trout harvest and catch of 218 and 1,647 fish, respectively. The Talachulitna River drainage, which is a catch-and-release fishery, produced a catch of 4,651 rainbow trout. In 1998 the total rainbow trout catch in Susitna River fisheries was approximately equal to the 1993-1997 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 (Including Other Resident Species)

During the October 1998 BOF meeting the following regulations pertaining to resident fish were adopted:

Board Actions Concerning Rainbow Trout

1. 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.
2. 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.
3. 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.
4. 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.

Board Actions Concerning Miscellaneous Resident Species

1. 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.
2. 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.

The next BOF meeting addressing resident finfish is scheduled for 2001.

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.

Presently there are no structured research projects involving rainbow trout underway; however, rainbow trout tagged in 1996-1998 are being recovered by anglers throughout the drainage. This information will help us understand dispersal patterns in the Susitna River drainage.

Recommended Research and Management Activities (Including Other Resident Species)

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 effects of current regulations. The findings of the 1997 and 1998 studies (Bartlett and Hansen *In prep*) will be compared with findings from the next research cycle to evaluate the effect of the current regulations.

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 estimates for Arctic grayling and Dolly Varden/Arctic char suggest harvest in excess of sustainable yield. Bag and possession limits for both species should be reduced areawide. Information regarding Arctic grayling and Dolly Varden/Arctic char 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 more than 100 lakes and more than a dozen tributaries of the Susitna River (Appendix G). Prior to 1992 several of these lakes consistently produced northern pike in the trophy class range (greater than 42.5 inches or

1,080 mm) and it was common to find fish weighing up to 20 lb and fish occasionally weighing over 30 lb.

In 1977 when the SWHS was initiated the harvest of northern pike in the NCIMA numbered less than 200 fish. At that time NCIMA accounted for only 1% of the statewide harvest of northern pike (Mills 1979) (Table 48). 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, indicated by increasing harvest and catch estimates since 1991 (Table 48). With the exception of 1994 and 1995, all years since 1990 recorded harvests over 5,000 fish.

Recent Fishery Performance

The NCIMA estimated harvest of northern pike during the 1998 season was 12,410 fish, over twice the 1993-1997 mean and the largest harvest on record. The Westside Susitna Management Unit accounted for about 47% of this harvest, the Knik Management Unit 50%, with the remainder from the Eastside Susitna and WCI units (Table 48, 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 majority of the increase during the 1998 season is represented by the harvest in the Knik Management Unit. In 1998 this management unit more than doubled its 1996 and 1997 harvests. During 1997, for the first time, the NCIMA pike harvest surpassed the Arctic-Yukon-Kuskokwim (AYK) area which was previously the major producer of pike. This trend continued in 1998.

The NCIMA estimated catch of northern pike during 1998 was 47,297 fish. The Westside Susitna Management Unit reported 62% of this catch with the Knik Management Unit reporting 36%. During 1998 harvest and catch doubled the 1993-1997 mean in both these management units (Appendices A54-A56). The NCIMA catch of northern pike has yet to surpass the AYK catch; however, the gap is narrowing.

Management Objectives

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

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

Table 48.-Northern Cook Inlet Management Area recreational catch and harvest of northern pike by management unit as estimated by SWHS, 1977-1998.

	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
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
77-97 mean	5,792	1,406	14,739	1,889					20,568	4,828	6,566	73	19,835	25
93-97 mean	5,925	1,888	15,685	3,388					21,669	5,311	6,993	74.7	19,778	28.0
1998	17,091	6,223	29,786	5,885	260	260	160	42	47,297	12,410	14,466	85.8	24,512	50.6

[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.

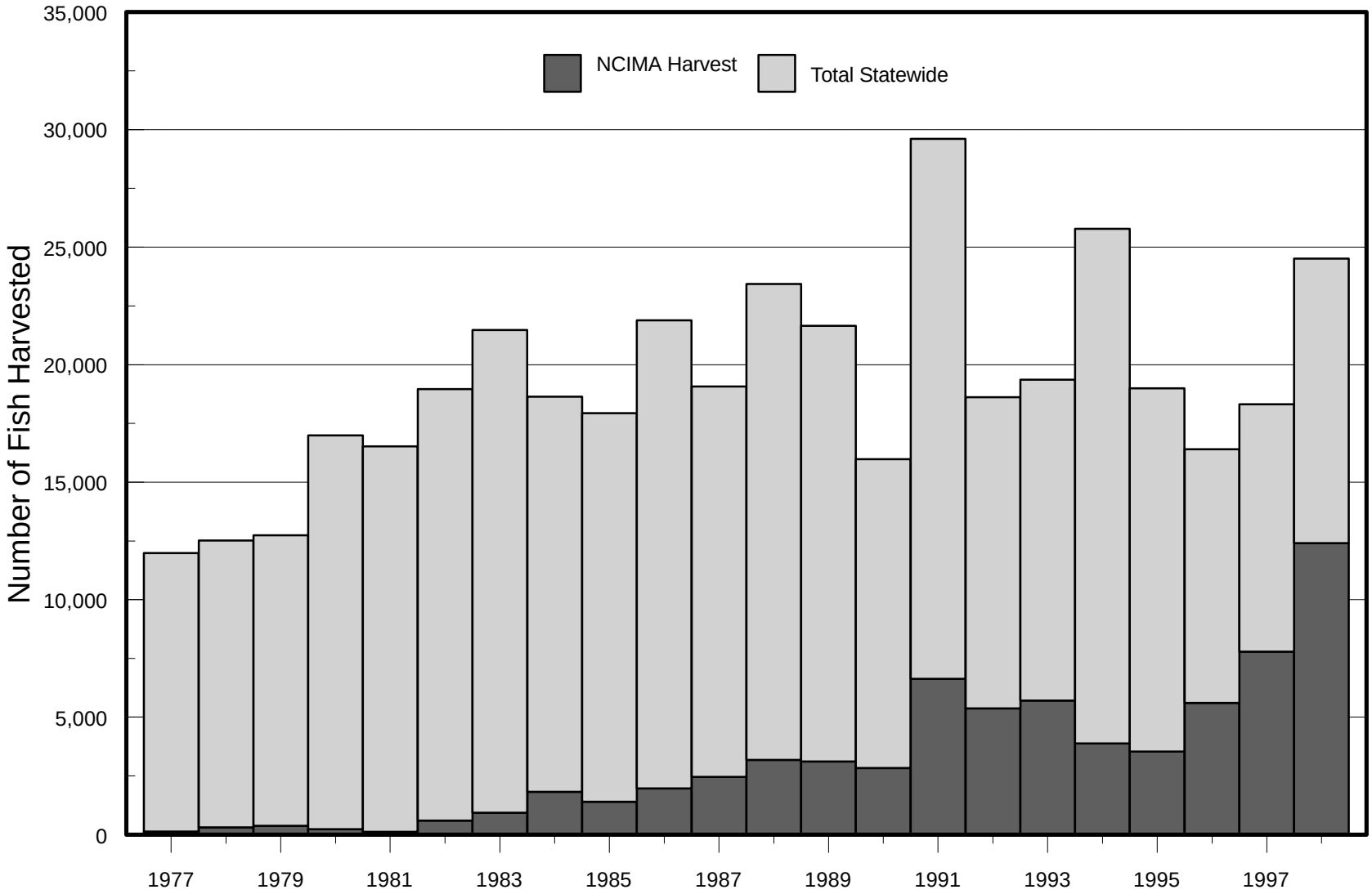


Figure 21.-Estimated northern pike harvest from Northern Cook Inlet Management Area and statewide, 1977-1998.

and providing large fish for harvest. These fisheries will be closely monitored to evaluate the effectiveness of the slot limit regulation.

Recent Board of Fisheries Actions

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.

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 the Deshka River, 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 and 1998).

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 fish.

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

Susitna Drainage

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 populations 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 the 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 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, contains 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, 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 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 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. Salmonids were documented within their stomach contents. This project should be conducted on an annual basis.

Age, sex and size information were collected from Alexander Lake northern pike during May to measure the effect of the slot limit regulation adopted prior to the 1999 season. Unfortunately the pike population had already spawned by the time the netting was done so the information was not comparable to other years. Upon completion of spawning the larger pike disperse throughout the lake causing the size composition of the population to be biased toward smaller fish.

Recommended Research and Management Activities

1. Northern pike distribution and dietary preference should continue to be monitored in selected Susitna drainage waters with major emphasis on the Deshka River.
2. Northern pike in the Deshka River drainage should be radio tagged and monitored until the batteries expire.
3. Age, sex and size information should be collected from Alexander lake northern pike in the spring of 2000 to determine the effect of the slot limit regulation adopted prior to the 1999 season.

FISHERIES ACCESS IMPROVEMENTS

To provide better angler access and increase fishing opportunities, access improvements should be made annually. Proposed projects are listed in Table 49. Efforts should be directed to a few stocked lakes each year (Table 50). 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.

Table 49.-Proposed access projects for NCIMA in 1999.

	Location	Project	Estimated Cost	Funding Year
	Non-Boating Projects[a]			
1.	Region II Small Access Maintenance (non-boating)	Site maintenance contracts, signage	$162,600	00
2.	Eklutna Tailrace	Expand parking and construct vault toilets.	$100,000	NF[c]
3.	Little Susitna River Public Use Facility	Trail improvements & bank stabilization.	$100,000	00
4.	Caswell Creek	Construct access trail & bank stabilization.	$0	SAM[d]
5.	Honeybee and Lynne lakes	Purchase easement.	$0	SAM
6.	Willow Creek SRA Sanitation	Move vault toilet from eroding river.	$40,000	01
7.	Finger Lake	ADA dock construction.	$20,000	01
8.	Cope Property	Purchase property & upgrade access.	$50,000	NF
		TOTAL	$472,600	
	Boating Projects[a]			
1.	Region II Small Access Maintenance (Boating)		$179,600	00
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 (Active)	Harden camp sites. Stream bank stabilization and repair damage caused by boating activity, construct permanent boat tie ups.	$60,000	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.	$90,300[b]	00
6.	Finger Lake Boat Ramp	Boat ramp upgrade.	$120,000	00
7.	Remote Site Sanitation	Pit toilets at Alexander and Lake Creeks.	$100,000	NF
8.	Knik River-Glenn Highway	Construct boat launch.	$100,000	NF
9.	Nancy Lake SRA	Boat ramp upgrade and install new ADA fishing dock.	$200,000	01
10.	Chulitna River	Construct new boat ramp with DNR Parks.	$300,000	NF
		TOTAL	$1,424,900	

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

[b] Increased RSA includes a 6 month Parks tech position and a one-time boat purchase.

[c] NF = Not Funded.

[d] SAM = Small Access Maintenance Project.

Table 50.-Northern Cook Inlet Management Area stocked lakes access summary, 1999.

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

-continued-

Table 50.-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

-continued-

Table 50.-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	need 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

5. Caswell Creek access currently consists 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.
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 (ADNR, DPOR) 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 ADNR Division of Parks and Outdoor Recreation, 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.

ACKNOWLEDGMENTS

A portion of the content of this report was taken from Larry Engel and Doug Vincent-Lang's 1992 NCIMA report to the Board of Fisheries. Craig Baer made significant contributions to the stocked lakes section and Larry Erie contributed access information. Margaret Leonard prepared this document for publication.

LITERATURE CITED

ADF&G (Alaska Department of Fish and Game). 1986. Cook Inlet and Copper River rainbow/steelhead trout management policy. Division of Sport Fish, Anchorage.

ADF&G (Alaska Department of Fish and Game). Unpublished. Statewide stocking plan for recreational fisheries 2000-2004. February 2000. Division of Sport Fish, Anchorage.

ADNR (Alaska Department of Natural Resources). 1991. Susitna basin recreation rivers management plan. Division of Land, Land and Resources Section, Anchorage.

Bartlett, L. 1992. Creel, escapement, and stock statistics for coho salmon on the Little Susitna River, Alaska, during 1991. Alaska Department of Fish and Game, Fishery Data Series No. 92-24, Anchorage.

Bartlett, L. 1993. Creel, escapement, and stock statistics for coho salmon on the Little Susitna River, Alaska, during 1992. Alaska Department of Fish and Game, Fishery Data Series No. 93-32, Anchorage.

Bartlett, L. 1994. Creel, escapement, and stock statistics for coho salmon on the Little Susitna River, Alaska, during 1993. Alaska Department of Fish and Game, Fishery Data Series No. 94-29**,** Anchorage.

Bartlett, L. D. 1996a. Escapement and stock statistics for coho salmon on the Little Susitna River and selected Matanuska-Susitna Valley, Alaska streams during 1994. Alaska Department of Fish and Game, Fishery Data Series No. 96-16, Anchorage.

Bartlett, L. 1996b. Escapement and stock statistics for coho salmon of the Little Susitna River and selected streams of the Matanuska-Susitna Valley, Alaska, 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-39, Anchorage.

Bartlett, L. Unpublished a. Northern Cook Inlet management area anadromous salmon waters. Located at: Alaska Department of Fish and Game, Palmer.

Bartlett, L. D. Unpublished b. Biological and escapement studies of coho and sockeye salmon in the Jim Creek drainage, Knik arm, Alaska, during 1993. Located at: Alaska Department of Fish and Game, Palmer.

Bartlett, L. D. Unpublished c. Coho and sockeye stock assessment studies in the Jim Creek drainage, Knik Arm, Alaska, during 1994. Located at: Alaska Department of Fish and Game, Palmer.

LITERATURE CITED (Continued)

Bartlett, L. and A. Bingham. 1991. Creel and escapement statistics for coho salmon on the Little Susitna River, Alaska, during 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-46, Anchorage.

Bartlett, L. and R. H. Conrad. 1988. Effort and catch statistics for the sport fishery for coho salmon in the Little Susitna River with estimates of escapement, 1987. Alaska Department of Fish and Game, Fishery Data Series No. 51, Juneau.

Bartlett, L. D. and P. A. Hansen. *In prep*. Stock assessment of rainbow trout in Willow Creek, 1997 and 1998. Alaska Department of Fish and Game, Fishery Data Series report, Anchorage.

Bartlett, L. and S. Sonnichsen. 1990. Creel and escapement statistics for coho salmon and chinook salmon on the Little Susitna River, Alaska, during 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-59, Anchorage.

Bartlett, L. and D. Vincent-Lang. 1989. Creel and escapement statistics for coho and chinook salmon stocks of the Little Susitna River, Alaska, during 1988. Alaska Department of Fish and Game, Fishery Data Series No. 86, Juneau.

Bentz, R. W. 1982. Inventory and cataloging of the sport fish and sport fish waters in upper Cook Inlet. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1981-1982, Project F-9-14, 23 (G-I-D):76-112, Juneau.

Bentz, R. W. 1983. Inventory and cataloging of sport fish and sport fish waters in upper Cook Inlet. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1982-1983, Project F-9-15, 24 (G-I-D):59-104, Juneau.

Bentz, R. W., A. C. Havens, G. H. Sanders, and C. L. Skaugstad. 1991. A summary of fish stocking evaluations in Alaska, 1985-1989. Alaska Department of Fish and Game, Fishery Manuscript No. 91-7, Anchorage.

Bradley, T. J. 1990. Cook Inlet rainbow trout studies, 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-60, Anchorage.

Bradley, T. J. 1991. Cook Inlet rainbow trout studies, 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-54, Anchorage.

Brannian, L. and J. Fox. 1996. Upper Cook Inlet subsistence and personal use fisheries, report to the Alaska Board of Fisheries, 1996. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Information Report No. 2A96-03, Anchorage.

Chapman, L. J., W. C. Mackay, and C. W. Wilkison. 1979. Feeding flexibility in northern pike (Esox lucius): fish verses invertebrate prey. Canadian Journal of Fisheries and Aquatic Science 46:666-669.

Chlupach, R. S. and G. B. Kyle. 1990. Enhancement of Big Lake sockeye salmon (Oncorhynchus nerka): summary of fisheries production (1976-1989). Alaska Department of Fish and Game, Division of Fisheries Rehabilitation, Enhancement and Development Report No. 106, Juneau.

CIAA (Cook Inlet Aquaculture Association). 1991. Technical report, Larson Lake project. Progress Report 1984-1987. Cook Inlet Aquaculture Association.

CIAA (Cook Inlet Aquaculture Association). 1998a. Hewitt Lake sockeye salmon enhancement report for 1990. Cook Inlet Aquaculture Association.

CIAA (Cook Inlet Aquaculture Association). 1998b. Chelatna Lake Sockeye Salmon Enhancement Progress Report, 1995. Cook Inlet Aquaculture Association.

CIRPT (Cook Inlet Regional Planning Team). 1981. Cook Inlet regional salmon enhancement plan 1981-2000. Located at: Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Delaney, K. and D. Vincent-Lang. 1992. Current status and recommendations for the future management of the chinook salmon stocks of Northern Cook Inlet. A report to the Alaska Board of Fisheries, Anchorage, Alaska, November 1992. Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

LITERATURE CITED (Continued)

Eklov, P. and S. G. Garrin. 1989. Predatory efficiency and prey selection: interactions between pike Esox lucius, perch Fluviatalis and rudd Scardinius erythrophthalmus. Oikos 56:149-156.

Engel, L. and D. Vincent-Lang. 1992. Area management report for the recreational fisheries of Northern Cook Inlet. Report to the Alaska Board of Fisheries, November 1992. Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

Havens, A. C., T. Bradley, C. Baer. 1995. Lake Stocking manual for nonanadromous fisheries in Southcentral Alaska. Alaska Department of Fish and Game, Special Publication No 95-2, Anchorage.

Hepler, K. R. and R. W. Bentz. 1984. Chinook salmon population and angler use studies of upper Cook Inlet waters. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1983-1984, Project F-9-16, 25 (G-II-M):40-58, Juneau.

Hepler, K. R. and R. W. Bentz. 1985. Chinook salmon population and angler use studies of Northern Cook Inlet waters. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1984-1985, Project F-9-17, 26 (G-II-M):150-172, Juneau.

Hepler, K. R. and R. W. Bentz. 1986. Cook Inlet chinook salmon studies. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1985-1986, Project F-10-1, 27 (S-32-7 and 8):174-195, Juneau.

Hepler, K. R. and R. W. Bentz. 1987. Harvest, effort, and escapement statistics for selected chinook salmon (Oncorhynchus tshawytscha) sport fisheries in Northern Cook Inlet, Alaska, 1986. Alaska Department of Fish and Game, Fishery Data Series No. 8, Juneau.

Hepler, K. R., R. Conrad, and D. Vincent-Lang. 1988. Estimates of effort and harvest for selected sport fisheries for chinook salmon in Northern Cook Inlet, Alaska, 1987. Alaska Department of Fish and Game, Fishery Data Series No. 59, Juneau.

Hepler, K. R., A. G. Hoffmann, and D. Vincent-Lang. 1989. Estimates of effort and harvest of selected sport fisheries for chinook salmon in Northern Cook Inlet, Alaska, 1988. Alaska Department of Fish and Game, Fishery Data Series No. 85, Juneau.

Howe, Allen L., Gary Fidler, Allen E. Bingham, and Michael J. Mills. 1996. Harvest, catch, and participation in Alaska sport fisheries during 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-32, Anchorage.

Howe, Allen L., Gary Fidler, and Michael J. Mills. 1995. Harvest, catch, and participation in Alaska sport fisheries during 1994. Alaska Department of Fish and Game, Fishery Data Series No. 95-24, Anchorage.

Howe, Allen L., Gary Fidler, Cynthia Olnes, Allen E. Bingham, and Michael J. Mills. 1997. Harvest, catch, and participation in Alaska sport fisheries during 1996. Alaska Department of Fish and Game, Fishery Data Series No. 97-29, Anchorage.

Howe, Allen L., Gary Fidler, Cynthia Olnes, Allen E. Bingham, and Michael J. Mills. 1998. Harvest, catch, and participation in Alaska sport fisheries during 1997. Alaska Department of Fish and Game, Fishery Data Series No. 98-25, Anchorage.

Howe, A. L., R. J. Walker, C. Olnes, G. Heineman, and A. E. Bingham. 1999. Harvest and catch in Alaska sport fisheries during 1998. Alaska Department of Fish and Game, Fishery Data Series No. 99-41, Anchorage.

Jones & Stokes Associates, Inc. 1987. Southcentral Alaska sport fishing economic study. Final research report. November 1987. (JSA86-0413.) Sacramento, CA. Prepared for Alaska Department of Fish and Game, Sport Fish Division, Research and Technical Services Section, Anchorage, AK.

Lafferty, R., S. Hayes, T. R. McKinley, and R. A. Clark. 1998. Recent history of chinook salmon harvests in marine waters of Southcentral Alaska: A compilation of harvest, size, and coded wire tag data by fishery, 1980-1995 and recommendations for future assessment. Alaska Department of Fish and Game, Fishery Management Report No. 98-1, Anchorage.

LITERATURE CITED (Continued)

Mills, M. J. 1979. Alaska statewide sport fish harvest studies. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1978-1979, Project F-9-11, 20 (SW-1), Juneau.

Mills, M. J. 1980. Alaska statewide sport fish harvest studies. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1979-1980, Project F-9-12, 21 (SW-1), Juneau.

Mills, M. J. 1981a. Alaska statewide sport fish harvest studies (1979). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1980-1981, Project F-9-13, 22 (SW-I-A), Juneau.

Mills, M. J. 1981b. Alaska statewide sport fish harvest studies (1980). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1980-1981, Project F-9-13, 22 (SW-I-A), Juneau.

Mills, M. J. 1982. Alaska statewide sport fish harvest studies (1981). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1981-1982, Project F-9-14, 23 (SW-I-A), Juneau.

Mills, M. J. 1983. Alaska statewide sport fish harvest studies (1982). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1982-1983, Project F-9-15, 24 (SW-I-A), Juneau.

Mills, M. J. 1984. Alaska statewide sport fish harvest studies (1983). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1983-1984, Project F-9-16, 25 (SW-I-A), Juneau.

Mills, M. J. 1985. Alaska statewide sport fish harvest studies (1984). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1984-1985, Project F-9-17, 26 (SW-I-A), Juneau.

Mills, M. J. 1986. Alaska statewide sport fish harvest studies (1985). Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1985-1986, Project F-10-1, 27 (RT-2), Juneau.

Mills, M. J. 1987. Alaska statewide sport fisheries harvest report. Alaska Department of Fish and Game, Fishery Data Series No. 2, Juneau.

Mills, M. J. 1988. Alaska statewide sport fisheries harvest report. Alaska Department of Fish and Game, Fishery Data Series No. 52, Juneau.

Mills, M. J. 1989. Alaska statewide sport fisheries harvest report. Alaska Department of Fish and Game, Fishery Data Series No. 122, Juneau.

Mills, M. J. 1990. Harvest and participation in Alaska sport fisheries during 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-44, Anchorage.

Mills, M. J. 1991. Harvest, catch, and participation in Alaska sport fisheries during 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-58, Anchorage.

Mills, M. J. 1992. Harvest, catch, and participation in Alaska sport fisheries during 1991. Alaska Department of Fish and Game, Fishery Data Series No. 92-40, Anchorage.

Mills, M. J. 1993. Harvest, catch, and participation in Alaska sport fisheries during 1992. Alaska Department of Fish and Game, Fishery Data Series No. 93-42, Anchorage.

Mills, M. J. 1994. Harvest, catch, and participation in Alaska sport fisheries during 1993. Alaska Department of Fish and Game, Fishery Data Series No. 94-28, Anchorage.

Peltz, L. and D. E. Sweet. 1992. Performance of the chinook salmon enhancement program in Willow Creek, Alaska, 1985-1991. Alaska Department of Fish and Game, Fishery Data Series No. 92-33, Anchorage.

Peltz, L. and D. E. Sweet. 1993. Performance of the chinook salmon enhancement program in Willow Creek, Alaska, 1985-1992. Alaska Department of Fish and Game, Fishery Data Series No. 93-22, Anchorage.

Ruesch, P. H. and J. Fox. 1995. Upper Cook Inlet commercial fisheries annual management report, 1994. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A95-26, Anchorage.

LITERATURE CITED (Continued)

Ruesch, P. H. and J. Fox. 1996. Upper Cook Inlet commercial fisheries annual management report, 1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A-96-27, Anchorage.

Rutz, D. S. 1992. Age and size statistics for rainbow trout collected in the Susitna River drainage during 1991. Alaska Department of Fish and Game, Fishery Data Series No. 92-26, Anchorage.

Rutz, D. S. 1993. Age and size statistics for rainbow trout collected in the Susitna River drainage during 1992. Alaska Department of Fish and Game, Fishery Data Series No. 93-55, Anchorage.

Rutz, D. S. 1996. Seasonal movements, age and size statistics, and food habits of upper Cook Inlet northern pike during 1994 and 1995. Alaska Department of Fish and Game, Fishery Data Series No. 96-29, Anchorage.

Rutz, D. S. 1998. Seasonal movements, food availability and prey preferences of northern pike in selected Susitna River drainages, 1996 and 1997. Alaska Department of Fish and Game, Fishery Data Series report, Anchorage.

Sweet, D. E. 1999. Performance of the chinook salmon enhancement program in Willow Creek, Alaska, 1985-1996. Alaska Department of Fish and Game, Fishery Manuscript No. 99-2, Anchorage.

Sweet, D. E., A. E. Bingham, and K. A. Webster. 1991. Estimates of effort and harvest for selected sport fisheries for chinook salmon in Northern Cook Inlet, Alaska, 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-6, Anchorage.

Sweet, D. E. and L. Peltz. 1994. Performance of the chinook salmon enhancement program in Willow Creek, Alaska, 1985-1993. Alaska Department of Fish and Game, Fishery Manuscript No. 94-3, Anchorage.

Sweet, D. E. and K. A. Webster. 1990. Estimates of effort and harvest for selected sport fisheries for chinook salmon in Northern Cook Inlet, Alaska, 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-32, Anchorage.

Vincent-Lang, D., M. Alexandersdottir, D. McBride. 1993. Mortality of coho salmon caught and released using sport tackle in the Little Susitna River, Alaska. Fisheries Research 15 (1993):339-356. Elsevier Science Publishers B.V., Amsterdam.

Vincent-Lang, D. and K. R. Hepler. 1989. Estimates of sport effort and catch and harvest of rainbow trout and coho salmon in Lake Creek, Alaska during 1988. Alaska Department of Fish and Game, Fishery Data Series No. 81, Juneau.

Watsjold, D. A. 1978. Inventory, cataloging and population sampling of the sport fish and sport fish waters in upper Cook Inlet. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1977-1978, Project F-9-10, 19 (G-I-D):57-88, Juneau.

Watsjold, D. A. 1980. Inventory and cataloging of the sport fish and sport fish waters in upper Cook Inlet. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1979-1980, Project F-9-12, 21 (G-I-D):91-120, Juneau.

Watsjold, D. A. 1981. Inventory and cataloging of the sport fish and sport fish waters in upper Cook Inlet. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Performance Report, 1980-1981, Project F-9-13, 22 (G-I-D):62-85, Juneau.

Whitmore C. and D. Sweet. 1997. Area management report for the recreational fisheries of Northern Cook Inlet, 1996. Alaska Department of Fish and Game, Fishery Management Report No. 97-3, Anchorage.

Whitmore C. and D. Sweet. 1998. Area management report for the recreational fisheries of Northern Cook Inlet, 1997. Alaska Department of Fish and Game, Fishery Management Report No. 98-4, Anchorage.

Whitmore C. and D. Sweet. 1999. Area management report for the recreational fisheries of Northern Cook Inlet, 1998. Alaska Department of Fish and Game, Fishery Management Report No. 99-1, Anchorage.

Whitmore, C., D. Sweet and L. Bartlett. 1993. Area management report for the recreational fisheries of Northern Cook Inlet. Alaska Department of Fish and Game, Division of Sport Fish, Anchorage.

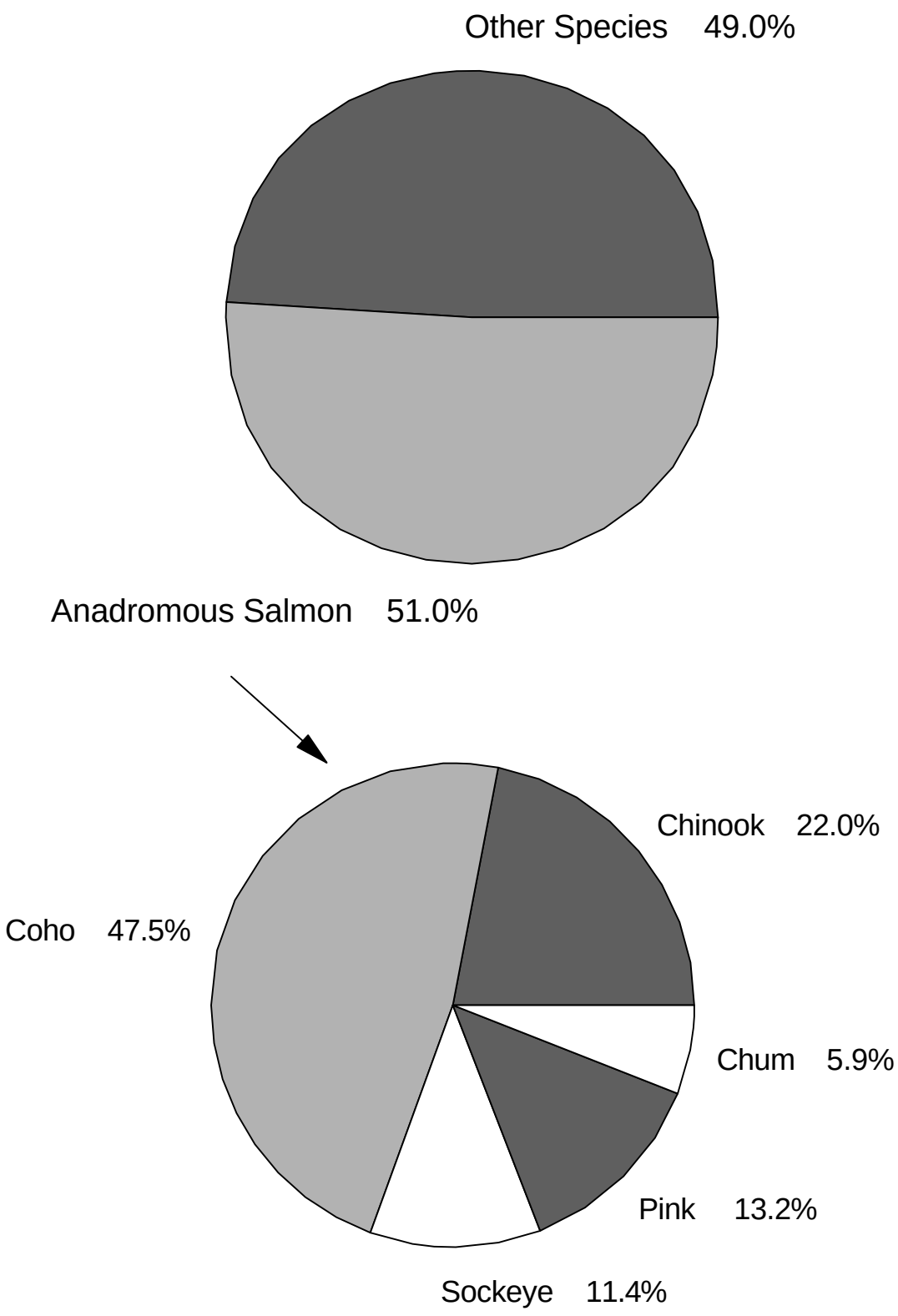
LITERATURE CITED (Continued)

Whitmore, C., D. Sweet and L. Bartlett. 1995. Area management report for the recreational fisheries of Northern Cook Inlet, 1994. Alaska Department of Fish and Game, Fishery Management Report No. 95-6, Anchorage.

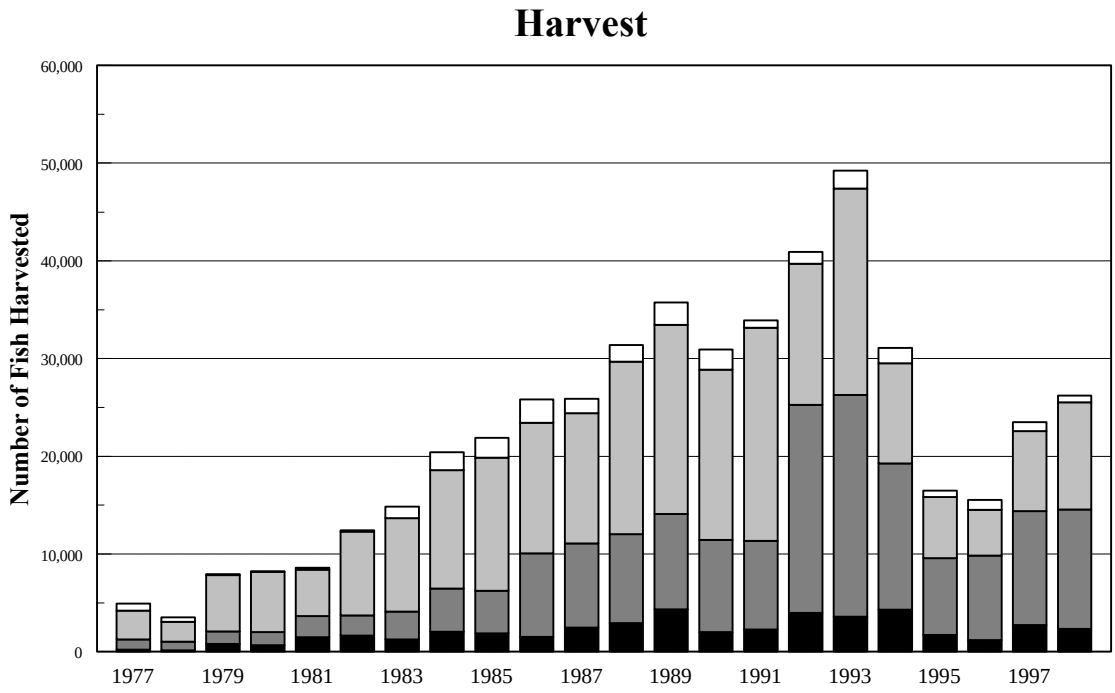
Whitmore, C., D. Sweet and L. Bartlett. 1996. Area management report for the recreational fisheries of Northern Cook Inlet, 1995. Alaska Department of Fish and Game, Fishery Management Report No. 96-2, Anchorage.

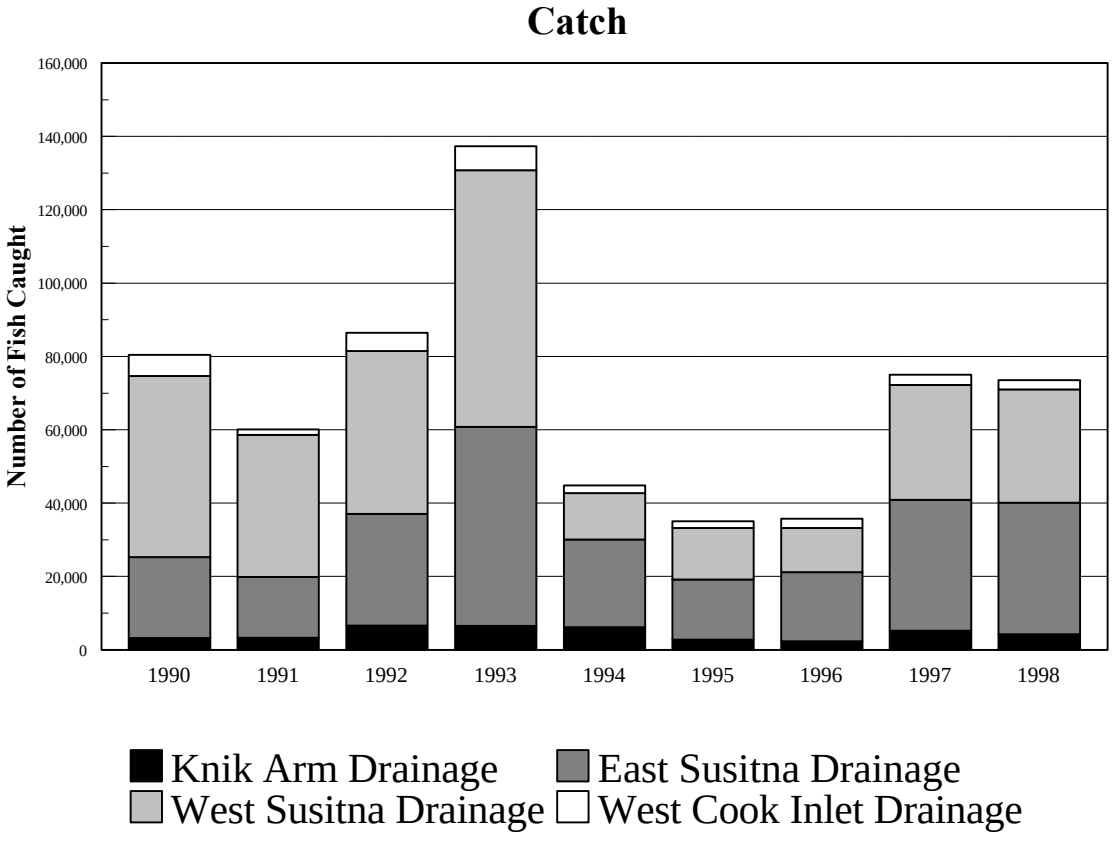
Whitmore, C., D. Sweet, L. Bartlett, A. Havens, and L. Restad. 1994. 1993 Area management report for the recreational fisheries of Northern Cook Inlet. Alaska Department of Fish and Game, Fishery Management Report No. 94-6, Anchorage.

APPENDIX A



Appendix A1.-Northern Cook Inlet Management Area sport fish harvest anadromous salmon composition, 1977-1998.





Appendix A2.-Northern Cook Inlet Management Area recreational chinook salmon harvest and catch, 1977-1998.

Appendix A3.-Knik Arm drainage chinook salmon harvest by fishery, 1977-1998.

Year	Fish Ck. Marine	Other Marine [a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Other[d]	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
1997		0	2,740	0	0	0	0	0	0	2,740
93-97 Mean	35	15	2,655	0	0	4	0	0	19	2,709
1998	0	0	2,344	0	0	0	0	0	0	2,344

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Includes lakes and streams.

Appendix A4.-Knik Arm drainage chinook salmon catch by fishery, 1990-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Other[d]	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
1997		0	5,114	0	0	0	0	0	66	5,180
93-97 Mean	44	29	4,476	0	0	0	0	0	0	4,593
1998	0	0	4,237	0	0	0	0	0	0	4,237

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Includes lakes and streams.

Appendix A5.-Eastside Susitna River drainage chinook salmon harvest by fishery, 1977-1998

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
1997	3,417	771	11	33	600	331	2,243	33	56	3,939	211	11,645
93-97 Mean	4,616	744	33	328	1,250	390	2,371	34	163	3,061	175	13,164
1998	3,254	620	15	275	815	422	1,792	83	132	4,422	402	12,232

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A6.-Eastside Susitna River drainage chinook salmon catch by fishery, 1990-1998.

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
1997	9,144	1,784	66	136	2,097	990	6,227	88	278	13,949	1,003	35,762
93-97 Mean	9,966	1,610	80	507	2,388	896	5,129	69	304	8,284	624	29,857
1998	10,860	1,851	36	485	2,325	831	4,507	154	165	13,682	961	35,857

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A7.-Westside Susitna River drainage chinook salmon harvest by fishery, 1977-1998.

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
1997	1,621	45	66	335	35	4,099	451	824	714	0	8,190
93-97 Mean	2,385	1,270	66	410	168	3,811	682	701	667	0	10,108
1998	1,399	4,143	97	366	74	2,708	931	563	686	0	10,958

[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, 1990-1998.

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
1997	4,465	1,996	66	1,190	179	13,174	1,225	6,423	2,614	0	31,332
93-97 Mean	5,746	3,398	66	946	628	10,619	1,409	3,780	1,665	0	28,004
1998	3,044	7,219	122	762	309	10,076	1,760	4,719	2,957	0	30,938

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

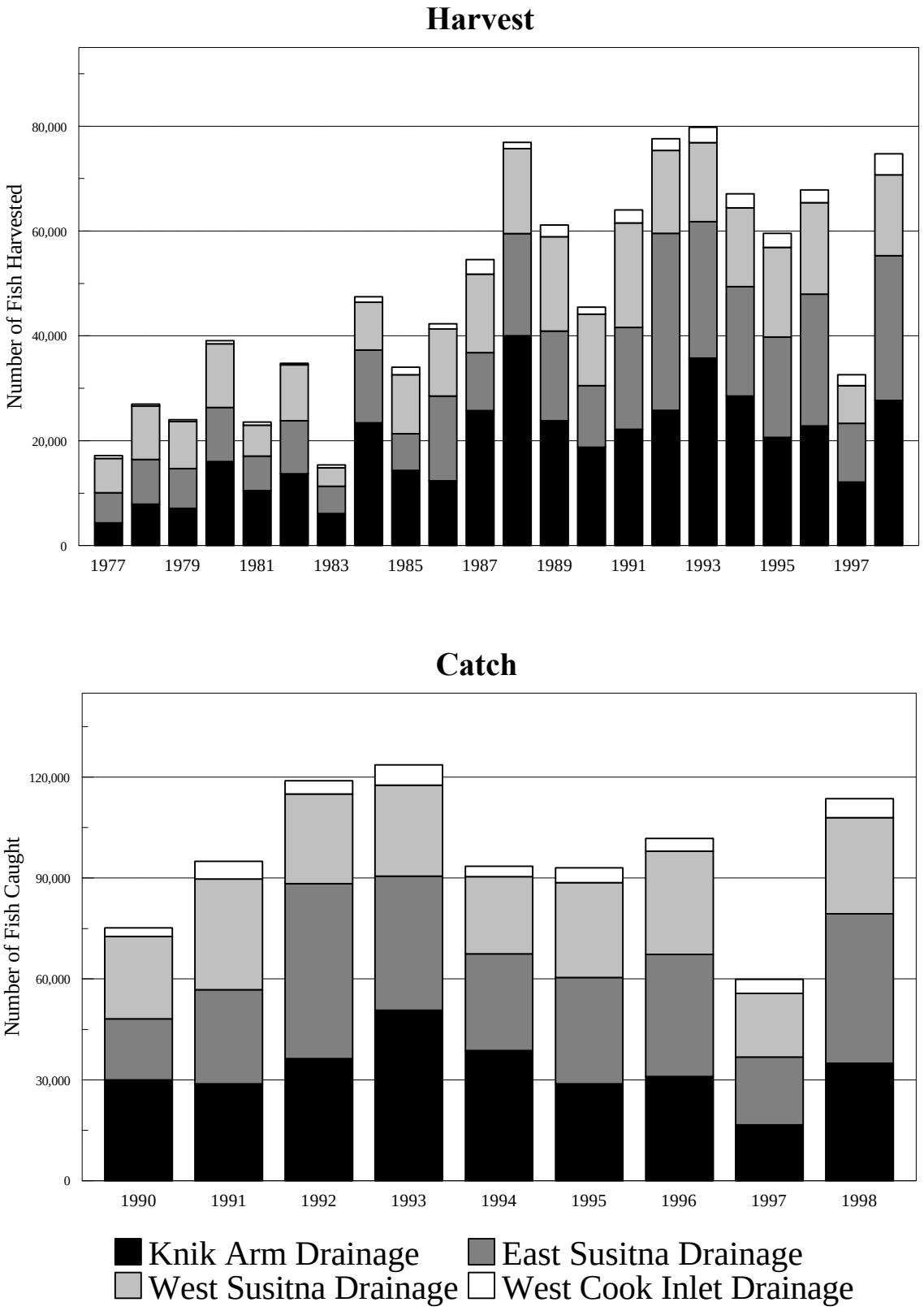
[b] May include harvest from West Cook Inlet waters.

Appendix A9.-West Cook Inlet drainage chinook salmon harvest by fishery, 1977-1998.

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
1997	784	56	0	0	75	915
93-97 Mean	600	56	329	7	262	1,207
1998	633	36	0	0	37	706

Appendix A10.-West Cook Inlet drainage chinook salmon catch by fishery, 1990-1998.

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
1997	2,339	288	115	0	120	2,862
93-97 Mean	1,833	288	743	205	486	3,201
1998	2,176	354	13	0	37	2,580



Appendix A11.-Northern Cook Inlet Management Area recreational coho salmon harvest and catch, 1977-1998.

Appendix A12.-Knik Arm drainage coho salmon harvest by fishery, 1977-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Jim Creek[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Fish Creek	Other[c]	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
1997		207	7,750	1,953	795	775	406	162	96	12,144
93-97 Mean	141	421	16,468	3,181	1,606	927	675	483	159	23,983
1998		134	17,164	4,689	1,667	1,048	1,267	1,508	159	27,672

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Includes lakes and streams.

Appendix A13.-Knik Arm drainage coho salmon catch by fishery, 1990-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Other[d]	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
1997		414	9,992	2,865	1,053	1,217	472	319	309	16,641
93-97 Mean	184	530	22,118	4,229	2,532	1,426	827	684	759	33,180
1998		218	21,722	5,750	1,954	1,675	1,379	1,834	373	34,905

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Includes lakes and streams.

Appendix A14.-Eastside Susitna River drainage coho salmon harvest by fishery, 1977-1998.

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
1997	2,634	722	224	321	1,306	181	1,861	195	488	3,105	206	11,243
93-97 Mean	4,347	1,278	387	1,331	1,677	337	2,730	296	1,884	5,735	501	20,503
1998	7,148	1,399	801	609	4,071	427	3,172	1,146	1,902	6,517	443	27,635

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A15.-Eastside Susitna River drainage coho salmon catch by fishery, 1990-1998.

Appendix A16.-Westside Susitna River drainage coho salmon harvest by fishery, 1977-1998.

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
1997	506	1,280	21	99	656	1,620	371	900	1,695	7,148
93-97 Mean	1,584	4,078	21	96	653	3,233	743	708	3,418	14,517
1998	1,309	4,216	172	261	317	5,235	1,007	1,162	1,765	15,444

[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, 1990-1998.

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
1997	1,500	3,454	21	398	1,399	2,843	685	3,013	5,618	18,931
93-97 Mean	2,331	6,703	21	330	948	4,998	1,290	2,917	6,047	25,567
1998	2,598	5,400	235	538	701	10,165	2,185	3,078	3,685	28,585

[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, 1977-1998.

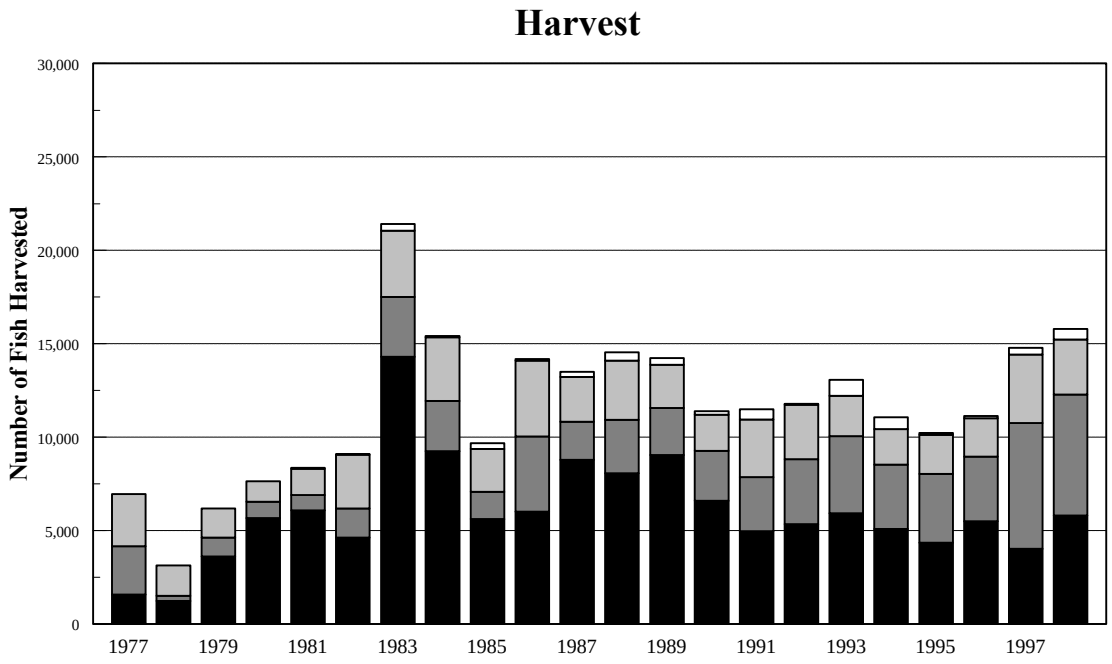
Year	Chuitna River	Beluga River	Theodore River	Lewis River	Other[a]	Total
1977	316		113	103		532
1978	277		101	0		378
1979	287		50	0		337
1980	258		370	0		628
1981	594		10			604
1982	220		115			335
1983	554		10			564
1984	898		137			1,035
1985	1,095		261	75		1,431
1986	815		168			983
1987	1,684		996	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
1997	1,275		205		635	2,115
93-97 Mean	1,169		340	194	1,028	2,575
1998	2,877	337	457	45	313	4,029

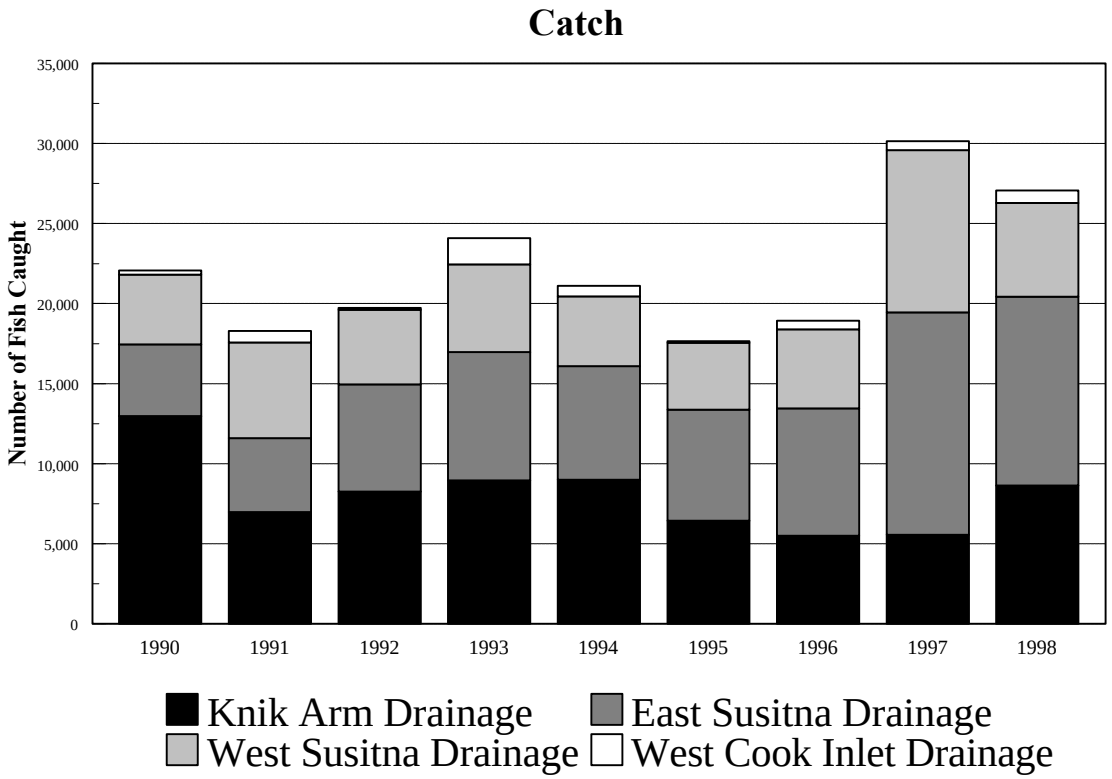
[a] Includes lakes and streams.

Appendix A19.-West Cook Inlet drainage coho salmon catch by fishery, 1990-1998.

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
1997	2,641		279		1,244	4,164
93-97 Mean	2,193		588	270	1,484	4,319
1998	4,329	354	488		507	5,678

[a] Includes lakes and streams.





Appendix A20.-Northern Cook Inlet Management Area recreational sockeye salmon harvest and catch, 1977-1998.

Appendix A21.-Knik Arm drainage sockeye salmon harvest by fishery, 1977-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Big Lake	Nancy Lake[d]	Other[e]	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
1997		112	1,656	768	116	23	1,168	141	0	35	12	4,031
93-97 Mean	356	125	2,006	1,090	152	64	779	391	0	49	180	4,977
1998		22	913	1,342	61	235	2,989	179	0	0	71	5,812

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Nancy Lake complex lakes.

[e] Includes lakes and streams.

Appendix A22.-Knik Arm drainage sockeye salmon catch by fishery, 1990-1998.

Year	Fish Ck Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Big Lake	Nancy Lake[d]	Other[e]	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
1997		112	2,255	1,332	127	23	1,318	187	0	127	84	5,565
93-97 Mean	416	170	3,462	1,686	216	118	1,121	621	0	279	245	8,085
1998		39	1,633	2,034	152	353	3,806	229	0	257	128	8,631

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Nancy Lake complex lakes.

[e] Includes lakes and streams.

Appendix A23.-Eastside Susitna River drainage sockeye salmon harvest by fishery, 1977-1998.

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	2,082	145	101	3,682
1996	146	260	0	124	11	86	115	0	56	2,655	22	0	3,475
1997	137	96	48	35	221	81	167	12	69	5,679	197	0	6,742
93-97 Mean	325	115	10	69	94	44	217	64	132	3,051	153	22	4,296
1998	97	48	0	0	107	0	203	34	72	5,033	887	0	6,481

[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, 1990-1998.

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
1997	418	298	85	35	313	139	474	12	81	11,602	433	0	13,890
93-97 Mean	665	356	26	101	179	65	557	83	160	6,125	408	53	8,780
1998	790	48	17	17	463	84	298	201	91	7,911	1,883	0	11,803

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A25.-Westside Susitna River drainage sockeye salmon harvest by fishery, 1977-1998.

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
1997	71	12		491	1,966	246	367		509	0	3,662
93-97 Mean	50	30		214	692	212	232		792	159	2,380
1998	102	61	0	273	990	205	197		950	162	2,940

[a] Yentna River drainage.

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

Appendix A26.-Westside Susitna River drainage sockeye salmon catch by fishery, 1990-1998.

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
1997	146	390		491	5,922	450	1,454		1,235	37	10,125
93-97 Mean	109	175		316	1,925	349	991		1,452	504	5,821
1998	208	94		338	2,612	387	605		1,421	202	5,867

[a] Yentna River drainage.

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

Appendix A27.-West Cook Inlet drainage sockeye salmon harvest by fishery, 1977-1998.

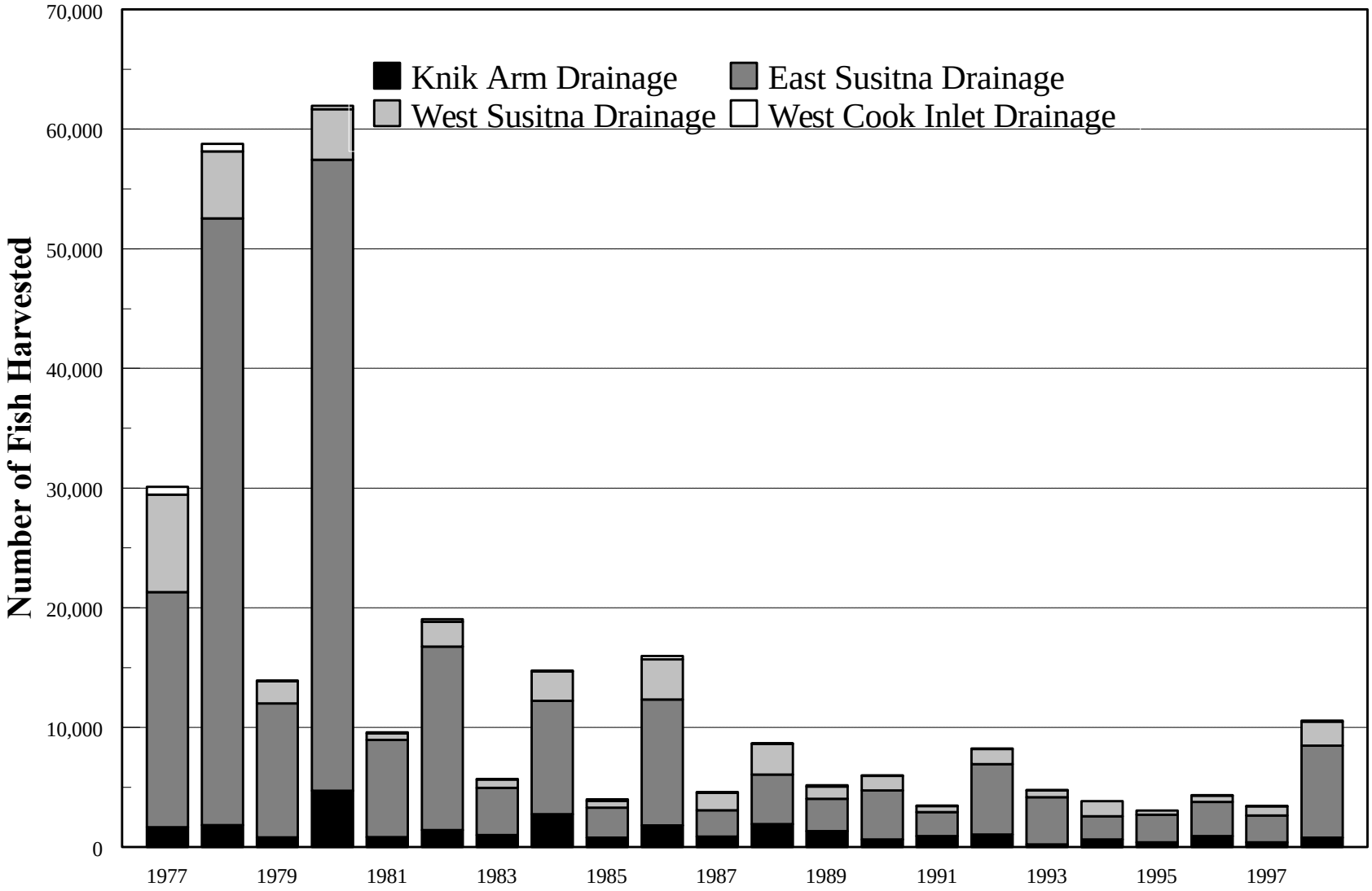
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	6	0	0		6
1978	0	0	0		0
1979	0	0	0		0
1980	0	0	0		0
1981	48	0			48
1982	10	0			10
1983	356	0			356
1984	62	0			62
1985	274	25	0		299
1986	22	67			89
1987	272	0	0		272
1988	437	18	0		455
1989	43	52	0	269	364
1990	139	50	0		189
1991	552	10	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
1997	199	0		174	373
93-97 Mean	69	9	0	341	418
1998	291	8		283	582

[a] Includes lakes and streams.

Appendix A28.-West Cook Inlet drainage sockeye salmon catch by fishery, 1990-1998.

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
1997	324	0		244	568
93-97 Mean	144	31	0	525	700
1998	433	34		299	766

[a] Includes lakes and streams.



Appendix A29.-Northern Cook Inlet Management Area recreational pink salmon harvest, 1977-1998.

Appendix A30.-Knik Arm drainage pink salmon harvest by fishery, 1977-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Other[d]	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
1997		0	328	11	11	0	21	0	22	393
93-97 Mean	9	8	383	18	46	2	20	31	8	519
1998		0	358	34	0	0	0	64	39	795

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Includes lakes and streams.

Appendix A31.-Eastside Susitna River drainage pink salmon harvest by fishery, 1977-1998.

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	7,140	1,261			4,291		3,568			1,314	2,089	19,663
1978	18,901	3,142			6,981		15,619			2,074	3,994	50,711
1979	3,445	745		100	2,418		2,472		700	645	664	11,189
1980	23,638	6,420		1,663	6,362		8,230		2,408	622	3,403	52,746
1981	2,797	604		335	1,236		1,782		958	19	412	8,143
1982	4,789	1,520		1,092	2,599		3,595		1,132	220	398	15,345
1983	1,647	157	0	126	682		902		241	73	126	3,954
1984	3,155	524	0	337	948	50	3,030		611	636	200	9,491
1985	697	169		10	10		807		468	120	229	2,510
1986	1,561	799	36	254	3,049	145	2,033	290	944	399	1,017	10,527
1987	815	109	54	36	344	18	507	0	54	272	0	2,209
1988	1,510	491	36	55	891	164	709	18	73	182	0	4,129
1989	1,045	115	0	41	288	107	288	16	436	379	0	2,715
1990	1,554	463	0	142	486	154	712		273	130	179	4,093
1991	890	203	0	19	309	58	251	0	97	135	39	2,001
1992	1,951	467	9	128	1,466	339	586	46	385	394	128	5,899
1993	1,427	243	10	36	520	36	1,147	0	19	486	17	3,941
1994	712	277	85	9	243	33	221	0	66	102	220	1,968
1995	772	136	19	39	362	38	700	0	10	177	58	2,311
1996	1,606	529	0	38	356	98	867	0	19	217	125	2,855
1997	789	54	0	0	250	148	665	0	32	259	64	2,261
93-97 Mean	970	249	26	22	303	79	613	0	32	189	117	2,599
1998	3,700	313	58	25	319	106	1,688	0	59	533	887	7,688

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A32.-Westside Susitna River drainage pink salmon harvest by fishery, 1977-1998.

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
1997	261	11	0	0	303	32	66	77	0	750
93-97 Mean	153	193	14	3	197	59	39	41	0	698
1998	495	1,068	0	0	321	44	33	69	0	2,030

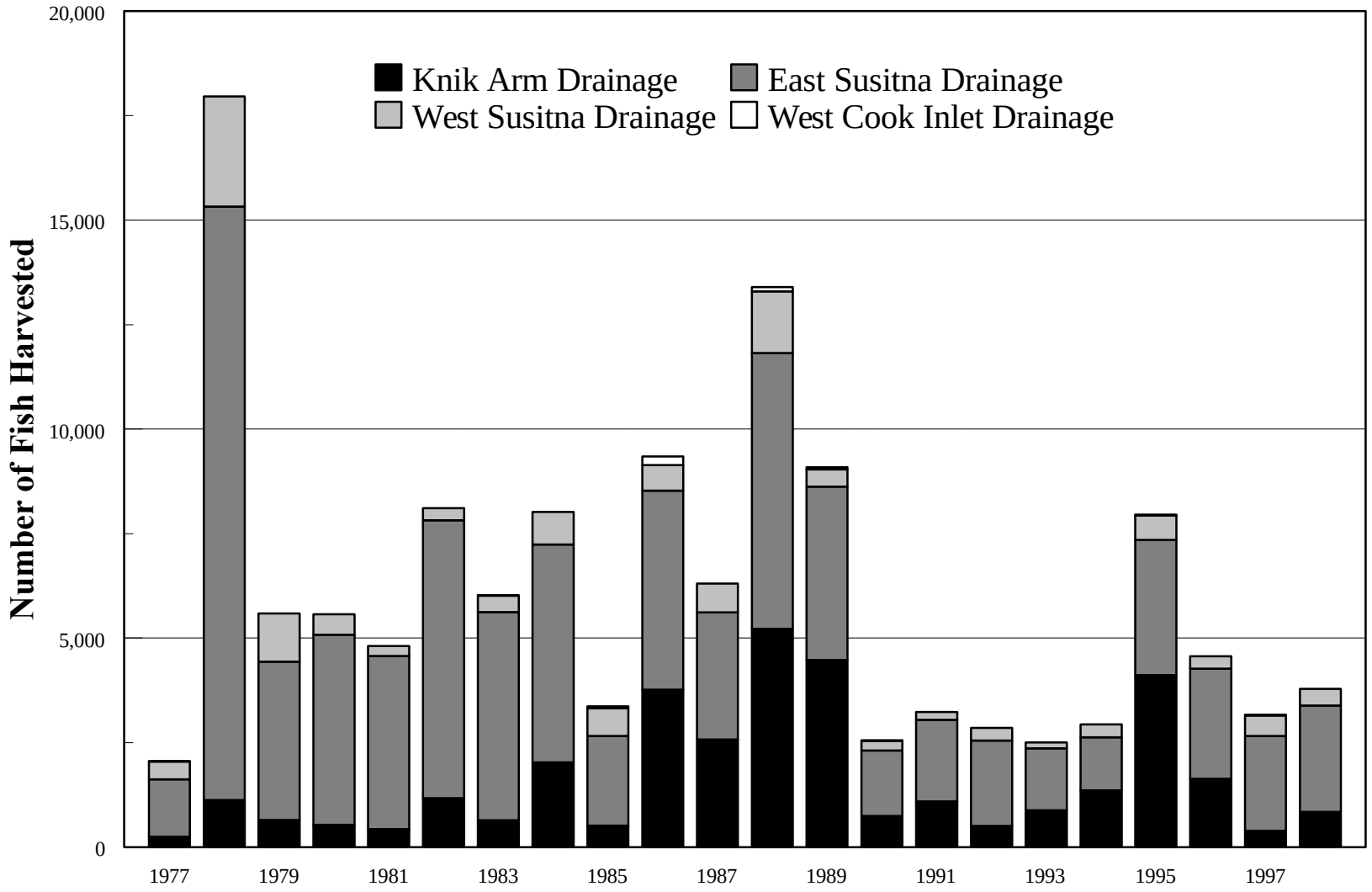
[a] Fish Lake drainage (Yentna River drainage).

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

Appendix A33.-West Cook Inlet drainage pink salmon harvest by fishery, 1977-1998.

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
1997	42	0		0	42
93-97 Mean	8	0	9	11	21
1998	0	17		69	86

[a] Includes lakes and streams.



Appendix A34.-Northern Cook Inlet Management Area recreational chum salmon harvest, 1977-1998.

Appendix A35.-Knik Arm drainage chum salmon harvest by fishery, 1977-1998.

Year	Fish Ck. Marine	Other Marine[a]	Little Susitna	Knik River[b]	Eklutna Tailrace	Wasilla Creek	Cottonwood Creek	Big Lake[c]	Other[d]	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
1997		0	235	0	151	0	0	0	9	395
93-97 Mean	0	10	468	193	960	11	7	4	24	1,677
1998		17	487	85	241	0	0	15	0	845

[a] Beginning in 1995 includes all marine.

[b] Knik River and tributaries including Jim Creek.

[c] Big Lake drainage streams.

[d] Includes lakes and streams.

Appendix A36.-Eastside Susitna River drainage chum salmon harvest by fishery, 1977-1998.

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
1997	360	130	189	0	411	152	552	13	0	363	103	2,273
93-97 Mean	420	141	50	37	324	89	1,188	3	13	448	66	2,179
1998	506	83	51	34	806	102	558	85	8	315	0	2,548

[a] Talkeetna River and tributaries including Clear Creek.

[b] Includes lakes and streams.

Appendix A37.-Westside Susitna River drainage chum salmon harvest by fishery, 1977-1998.

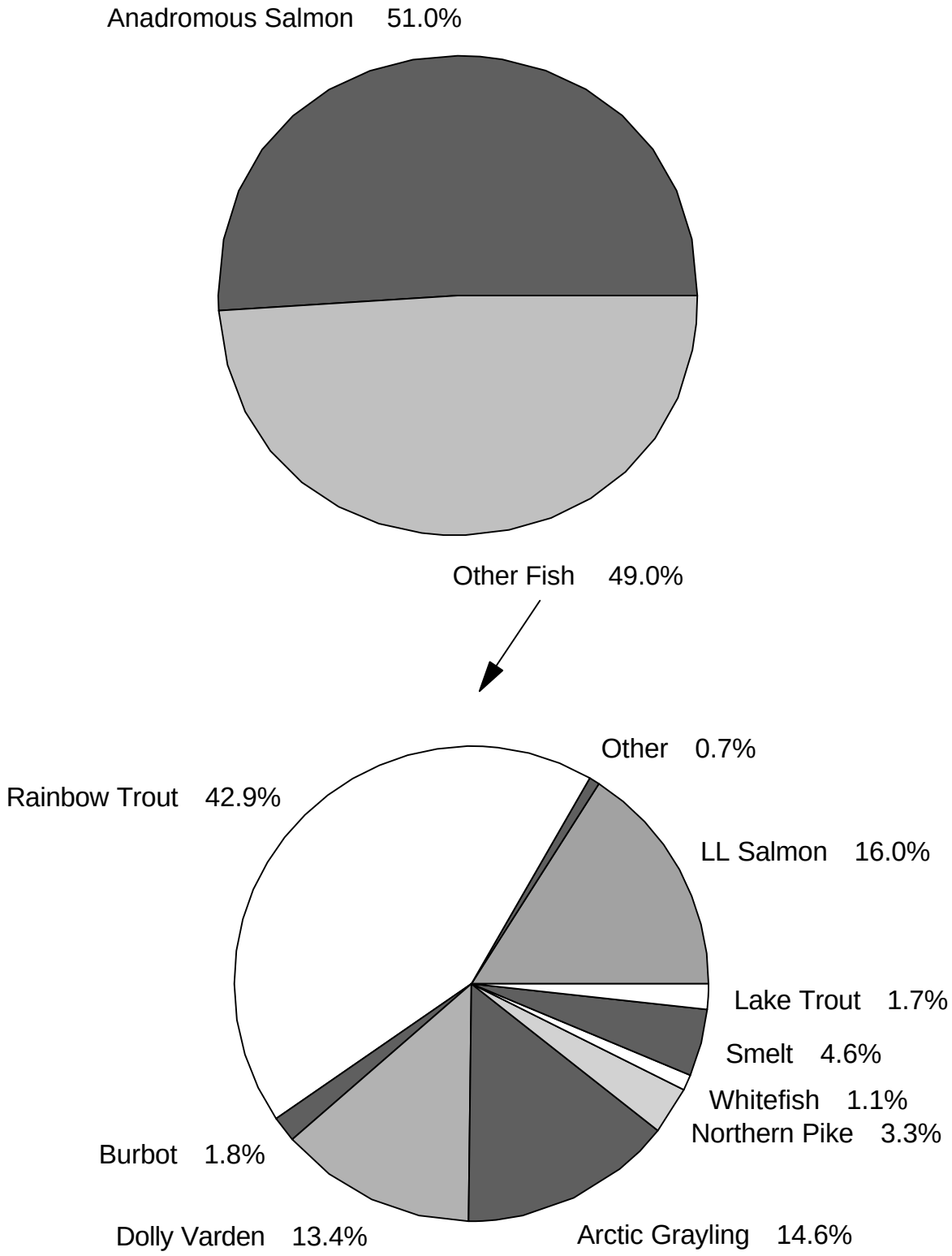
Year	Alexander Creek	Deshka River	Yentna River	Lake Creek	Fish Creek[a]	Talachulitna River	Other Streams[b]	Other Lakes[b]	Total
1977	30	0		162		37	194	0	423
1978	215	0		1,015		234	1,171	0	2,635
1979	45	0		136		55	918	0	1,154
1980	121	0		69		17	284	0	491
1981	10	0		48		0	182	0	240
1982	0	0		199		0	94	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
1997	48	39	52	178	51	58	65	0	491
93-97 Mean	96	23	17	113	37	24	52	7	368
1998	269	0	0	86	0	0	41	0	396

[a] Fish Lake drainage (Yentna drainage).

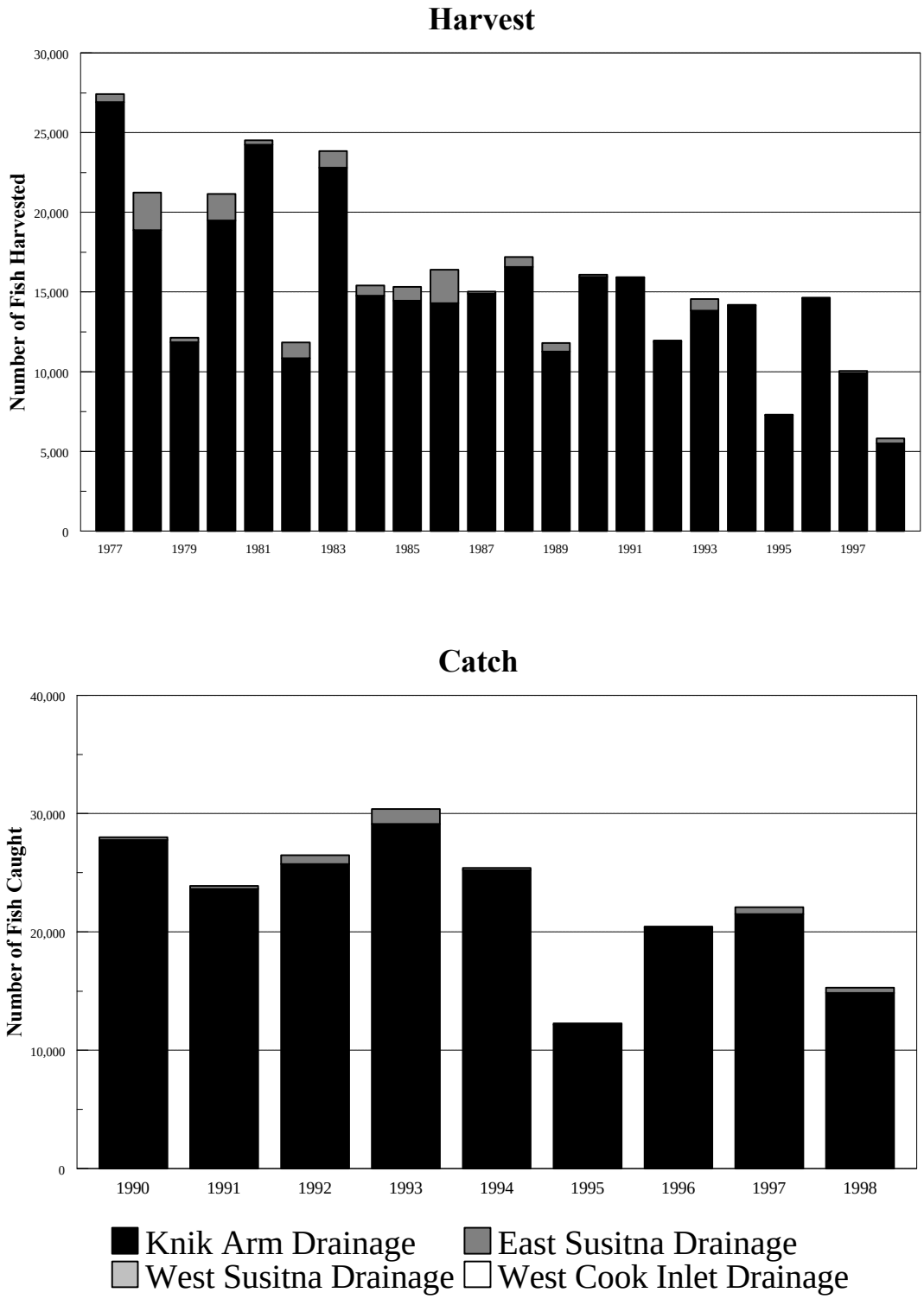
[b] May include harvest from West Cook Inlet waters.

Appendix A38.-West Cook Inlet drainage chum salmon harvest by fishery, 1977-1998.

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
1997	19	0		0	19
93-97 Mean	6	0	0	6	12
1998	0	0		0	0



Appendix A39.-Northern Cook Inlet Management Area sport fish harvest resident fish composition, 1977-1998.



Appendix A40.-Northern Cook Inlet Management Area recreational landlocked salmon harvest and catch, 1977-1998.

Appendix A41.-Knik Arm waters landlocked salmon harvest by fishery, 1977-1998.

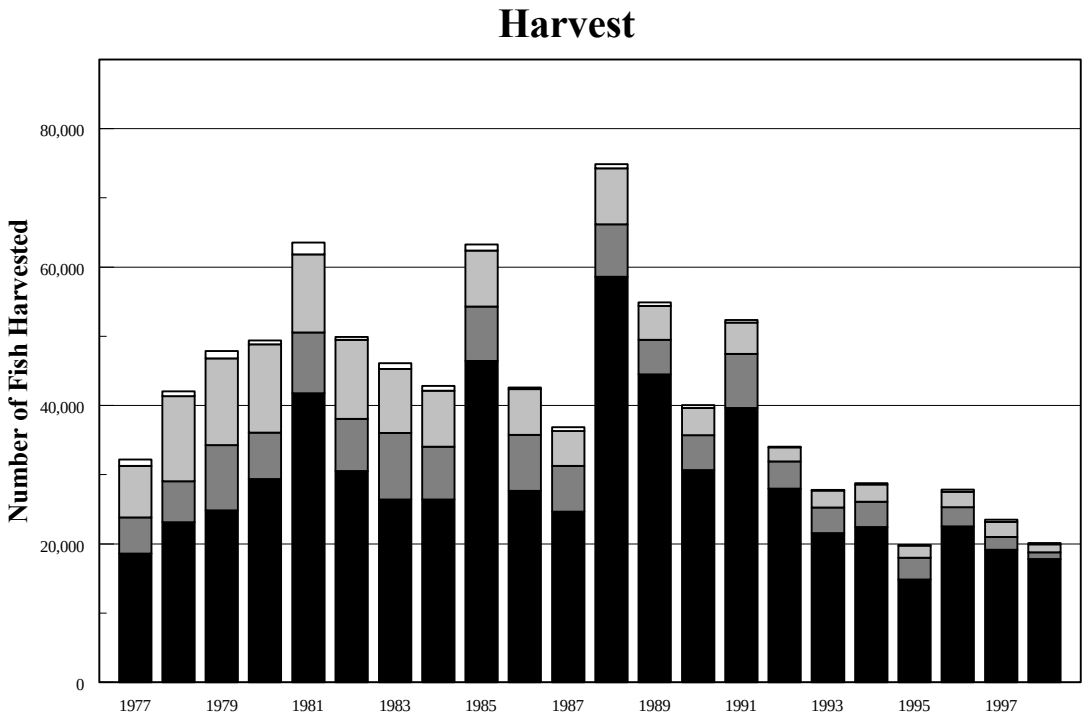
Year	Memory Lake	Lucille Lake	Kepler L. Complex	Finger Lake	Wasilla Lake	Big Lake	Nancy L. Complex	Other Lakes	Total
1977		8,952	528	14,739		721	76	1,901	26,917
1978		4,963	298	8,588		226	262	4,547	18,884
1979		4,272	64	5,209	1,054	145	227	882	11,853
1980		3,633	2,807	10,685	43	189	146	1,997	19,500
1981		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
1997	746	0	1,379	6,481	0	389	152	756	9,903
93-97 Mean	959	18	1,060	6,073	0	1,151	58	1,146	11,956
1998	76	0	294	2,285	0	367	42	2,434	5,498

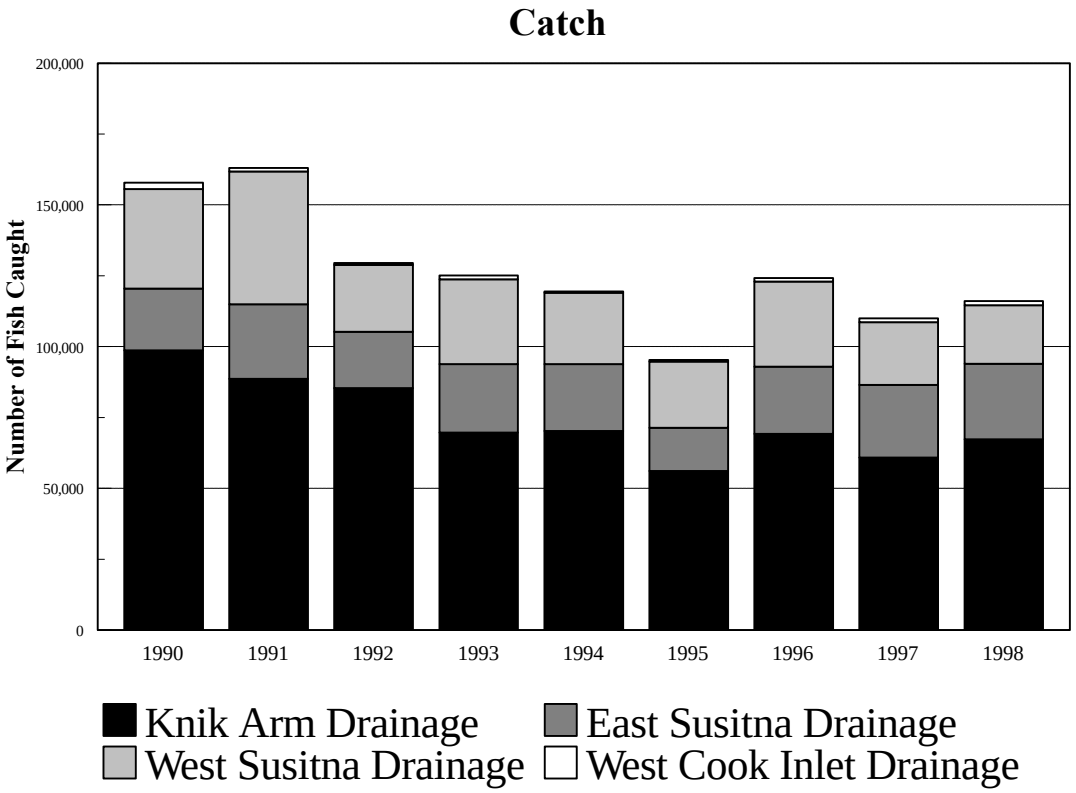
Appendix A42.-Knik Arm waters landlocked salmon catch by fishery, 1990-1998.

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
1997	1,893	0	2,443	13,989	0	1,396	152	1,640	21,513
93-97 Mean	1,648	60	2,150	13,462	0	2,129	88	2,160	21,684
1998	118	0	967	5,531	0	1,543	42	6,651	14,852

Appendix A43.-Eastside Susitna River drainage landlocked salmon harvest and catch, 1977-1998.

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
1997	153	581
93-97 Mean	196	449
1998	320	438





Appendix A44.-Northern Cook Inlet Management Area recreational rainbow trout harvest and catch, 1977-1998.

Appendix A45.-Knik Arm drainage rainbow trout harvest by fishery, 1977-1998.

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
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
93-97 Mean	249	0	53	349	238	615	2,391	4,024	1,853	275	462	332	161	402	468	598	1,142	133	7,249	20,118
1998	59	0	0	390	412	487	1,820	3,169	1,370	225	95	329	984	373	0	264	326	42	7,470	17,815

[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, 1990-1998.

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
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
93-97 Mean	1,103	0	136	1,591	1,018	1,504	6,368	17,473	5,029	492	867	1,528	512	1,038	1,013	1,853	3,324	282	22,633	65,218
1998	321	0	103	1,878	1,276	1,410	6,828	16,201	5,311	1,396	188	1,460	3,324	453	17	1,241	1,184	151	24,503	67,245

[a] Knik River and tributaries including Jim Creek.

[b] Big Lake drainage streams.

Appendix A47.-Eastside Susitna River drainage rainbow trout harvest by fishery, 1977-1998.

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
1997	0	154	114	20	178	151	0	0	20	181	464	596	1,878
93-97 Mean	603	224	68	60	185	110	254	0	39	255	505	726	3,031
1998	0	113	42	0	157	42	0	20	144	191	181	101	991

[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, 1990-1998.

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
1997	4,408	1,209	1,827	50	1,704	1,799	2,967	151	50	5,073	2,701	3,795	25,734
93-97 Mean	4,074	1,182	808	118	894	1,255	2,199	61	173	5,035	3,277	3,493	22,538
1998	4,670	1,264	1,593	93	4,896	342	4,181	138	186	4,678	2,528	2,080	26,649

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A49.-Westside Susitna River drainage rainbow trout harvest by fishery, 1977-1998.

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
1997	0	328		214	70	397	26		502	167	1,704
93-97 Mean	103	377		130	108	495	140		681	171	2,204
1998	0	218	25	0	17	326	144	0	419	0	1,149

[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, 1990-1998.

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
1997	894	2,410		214	489	8,330	1,213	6,013	2,553	720	22,123
93-97 Mean	721	3,662		528	565	8,232	733	7,996	2,920	962	26,318
1998	563	1,647		25	848	7,376	730	4,651	2,787	2,023	20,684

[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, 1977-1998.

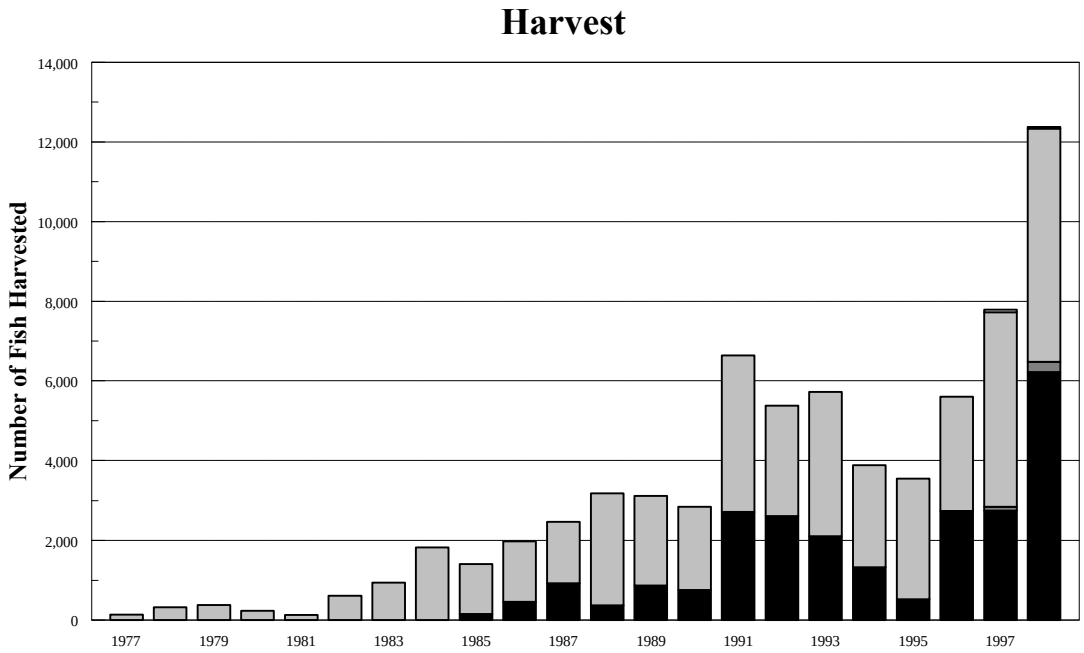
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	509	415	34		958
1978	443	226	54		723
1979	336	609	118		1,063
1980	301	250	9		560
1981	642	1,092			1,734
1982	199	199			398
1983	441	430			871
1984	424	274			698
1985	590	225	87		902
1986	67	145			212
1987	344	199	36		579
1988	218	382	18		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
1997	131	171	0	40	342
93-97 Mean	97	60	0	51	207
1998	34	25		141	200

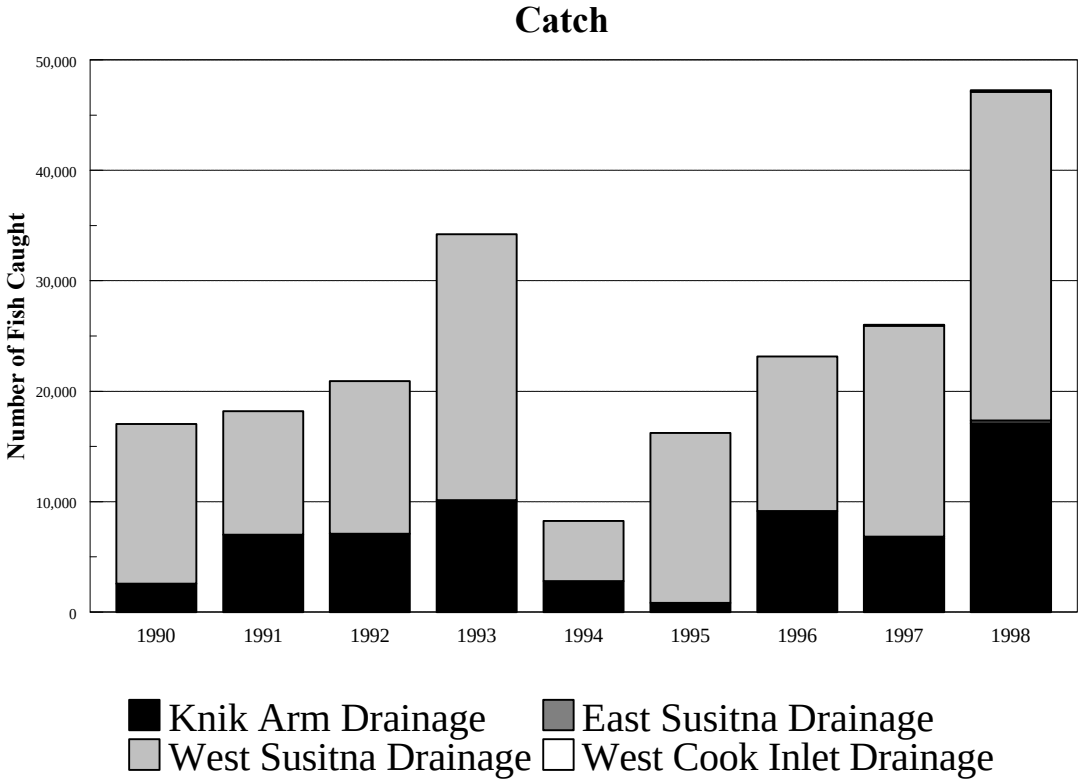
[a] Includes lakes and streams.

Appendix A52.-West Cook Inlet drainage rainbow trout catch by fishery, 1990-1998.

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
1997	712	673	0	80	1,465
93-97 Mean	517	356	35	147	1,034
1998	396	834		283	1,513

[a] Includes lakes and streams.





Appendix A53.-Northern Cook Inlet Management Area recreational northern pike harvest and catch, 1977-1998.

Appendix A54.-Knik Arm drainage northern pike harvest by fishery and total catch, 1985-1998.

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
1997	0	0	0	0	0	283	1,188	1,278	2,749	6,673
93-97 Mean	6	0	0	0	0	659	964	655	1,888	5,925
1998	102	0	0	0	320	1,764	2,734	1,303	6,223	17,091

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, 1977-1998.

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
1997	1,648	0	0	49	354	1,204	1,429	194	4,878
93-97 Mean	1,127	16	0	79	473	890	684	120	3,388
1998	2,996	34	0	121	381	1,365	59	899	5,855

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

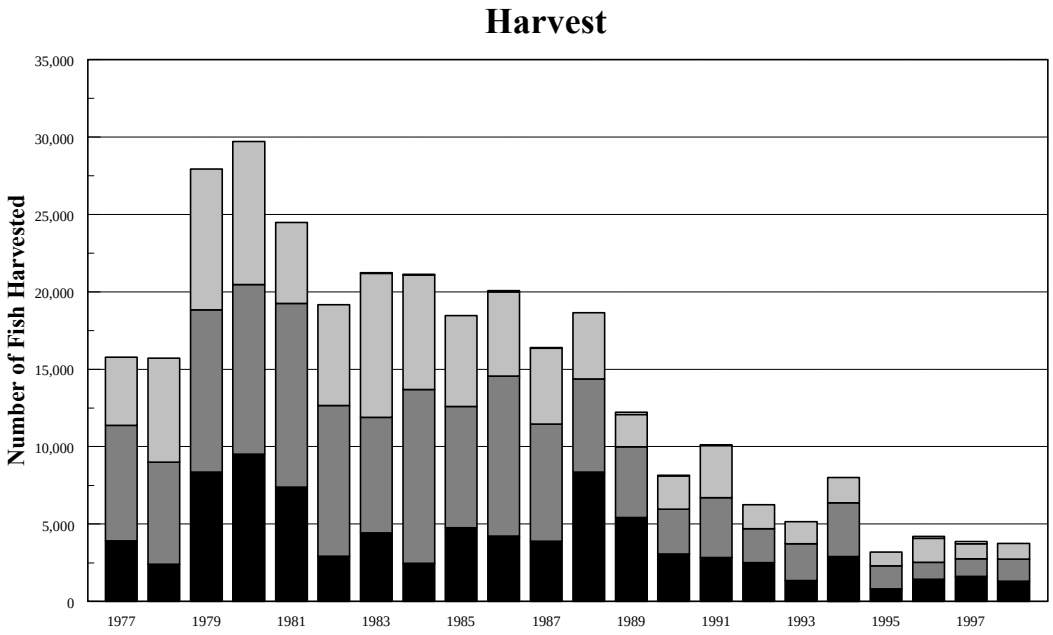
[b] May include harvest from West Cook Inlet waters.

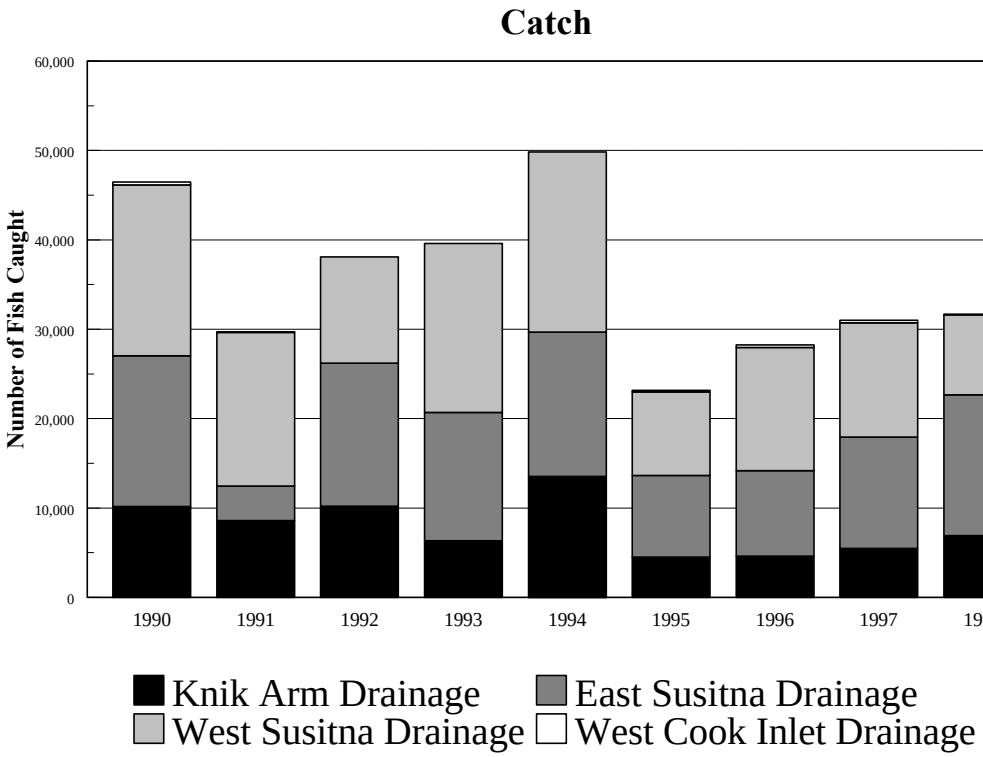
Appendix A56.-Westside Susitna River drainage northern pike catch by fishery, 1990-1998.

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
1997	10,654	0		133	1,129	2,674	3,926	593	19,109
93-97 Mean	7,771	19	0	339	1,643	2,806	2,443	586	15,607
1998	18,486	162	0	1,194	664	2,401	1,214	5,665	29,786

[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, 1977-1998.

Appendix A58.-Knik Arm drainage Arctic grayling harvest by fishery, 1977-1998.

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
1997	57	221	580	490	0	43	234	1,625
93-97 Mean	142	173	721	192	18	133	284	1,624
1998	0	82	557	185	0	0	480	1,304

[a] Includes lakes, 1977-1982.

Appendix A59.-Knik Arm drainage Arctic grayling catch by fishery, 1990-1998.

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
1997	162	645	2,310	1,204	30	404	746	5,501
93-97 Mean	246	689	4,193	703	59	313	853	6,915
1998	0	427	3,255	719	80	0	2,448	6,929

Appendix A60.-Eastside Susitna River drainage Arctic grayling harvest by fishery, 1977-1998.

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
1997	0	79	66	0	195	89	63	0	39	112	372	123	1,138
93-97 Mean	258	113	68	26	175	40	79	13	12	322	559	236	1,920
1998	0	8	220	0	93	42	0	0	63	39	727	243	1,435

[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, 1990-1998.

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
1997	396	359	895	0	1,851	720	531	0	99	1,783	3,630	2,185	12,449
93-97 Mean	959	496	441	82	831	383	294	104	141	3,279	3,151	2,193	12,326
1998	1,089	517	641	59	2,844	328	488	0	71	3,556	4,208	1,936	15,737

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A62.-Westside Susitna River drainage Arctic grayling harvest by fishery, 1977-1998.

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
1997	0	49	0	0	0	54	105	163	476	0	145	0	992
93-97 Mean	35	55	0	0	27	145	260	55	251	0	439	37	1,304
1998	0	8	0		0	170	497	0	132		202	10	1,019

[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, 1990-1998.

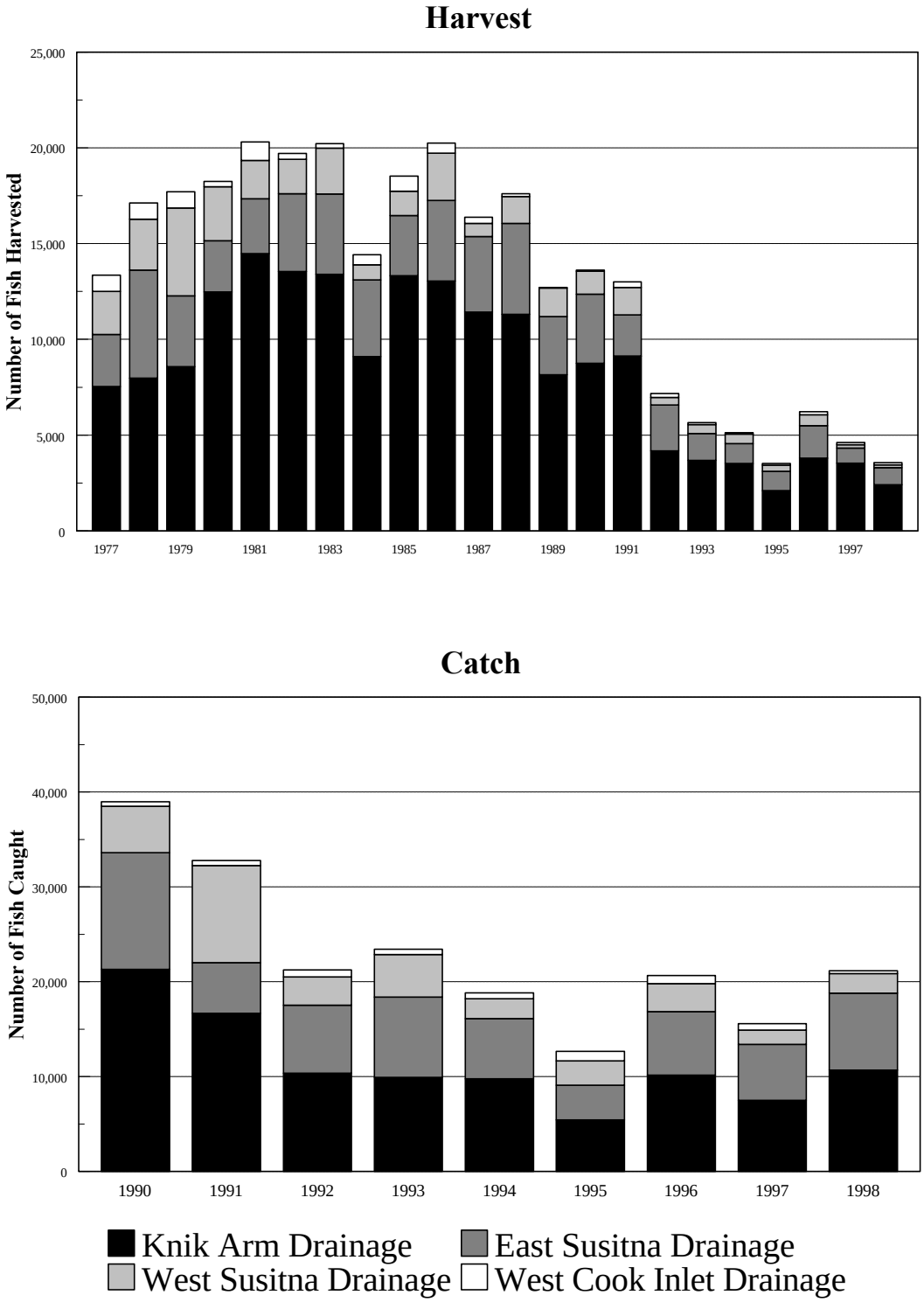
Year	Alexander Creek	Deshka River	Rabideux Creek	Moose Creek	Yentna River	Peters Creek	Lake Creek	Fish Creek[a]	Talachulitna River	Judd Lake	Other Streams[b]	Other Lakes[b]	Total
1990	893	909	0		0	505	8,656	0	6,467		1,650	51	19,131
1991	705	1,557	0		0	346	6,336	466	6,935	240	559	40	17,184
1992	248	594	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
1997	14	300	0	39	0	709	3,349	612	5,841	0	1,916	0	12,780
93-97 Mean	220	565	0	39	111	545	4,965	250	5,602	0	2,549	485	15,002
1998	31	920	0		120	662	3,283	34	1,253		2,456	210	8,969

[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, 1977-1998.

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
1997	138	0	0	0	138	304
93-97 Mean	54	0	0	2	55	152
1998	0	0	0	0	0	31



Appendix A65.-Northern Cook Inlet Management Area recreational Dolly Varden/Arctic char harvest and catch, 1977-1998.

Appendix A66.-Knik Arm drainage Dolly Varden/Arctic char harvest by fishery, 1977-1998.

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
1997	0	103	633	503	0	0	80	0	1,809	80	272	57	3,537
93-97 Mean	25	160	655	249	156	27	82	13	1,536	92	152	190	3,335
1998	8	111	576	130	17	17	0	0	1,139	76	34	317	2,425

[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, 1990-1998.

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
1997	46	320	1,456	1,189	0	80	92	0	3,226	173	551	377	7,510
93-97 Mean	56	474	1,894	499	258	217	124	27	3,956	210	418	427	8,560
1998	8	560	1,291	372	305	17	68	0	5,905	126	202	1,845	10,699

[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, 1977-1998.

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
1997	12	23	47	0	23	16	105	0	0	390	171	0	787
93-97 Mean	124	43	63	4	49	11	47	4	0	703	117	22	1,186
1998	8	0	76	0	119	0	59	0	0	449	68	110	889

[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, 1990-1998.

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
1997	184	69	699	0	436	105	366	0	0	3,627	412	0	5,898
93-97 Mean	381	227	326	4	214	64	183	4	8	4,472	292	68	6,221
1998	383	51	770	66	1,049	51	76	0	0	5,428	135	110	8,119

[a] Talkeetna River and tributaries including Clear Creek.

Appendix A70.-Westside Susitna River drainage Dolly Varden/ Arctic char harvest by fishery, 1977-1998.

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
1997	0	0	0	0	92	96	0	0	0	188
93-97 Mean	9	12	18	31	30	129	0	242	0	471
1998	0	0	0	31	14	8	0	69	25	147

[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, 1990-1998.

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
1997	36	70	0	288	138	379	0	617	0	1,528
93-97 Mean	211	47	35	304	75	841	0	1,204	11	2,729
1998	0	17	0	217	117	327		1,287	126	2,091

[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, 1977-1998.

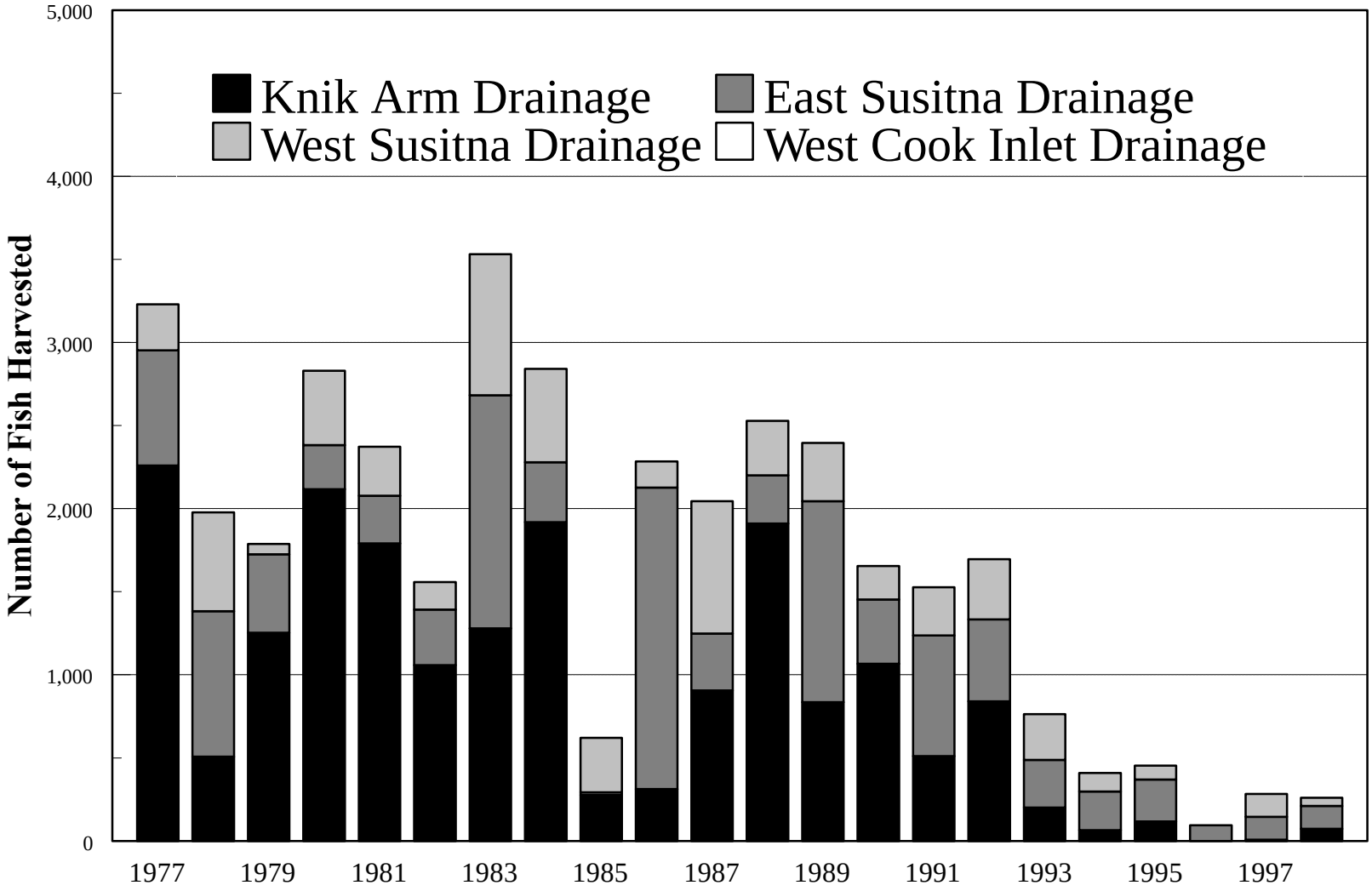
Year	Chuitna River	Theodore River	Lewis River	Other[a]	Total
1977	671	181	0		852
1978	461	353	27		841
1979	664	173	9		846
1980	146	129	0		275
1981	843	115			958
1982	304	0			304
1983	209	21			230
1984	511	12			523
1985	260	538	0		798
1986	235	302			537
1987	18	199	109		326
1988	164	0	0		164
1989	10	0	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
1997	114	0	0	12	126
93-97 Mean	68	24	0	22	114
1998	60	0		56	116

[a] Includes lakes and streams.

Appendix A73.-West Cook Inlet drainage Dolly Varden/Arctic char catch by fishery, 1990-1998.

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
1997	405	0	0	253	658
93-97 Mean	531	120	0	101	752
1998	230	0		56	286

[a] Includes lakes and streams.



Appendix A74.-Northern Cook Inlet Management Area recreational lake trout harvest, 1977-1998.

Appendix A75.-Knik Arm drainage lake trout harvest by fishery, 1977-1998.

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
1997	0	0	0	0	0	9	9
93-97 Mean	0	0	0	20	53	5	79
1998	0	0	0	0	74	0	74

[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, 1977-1998.

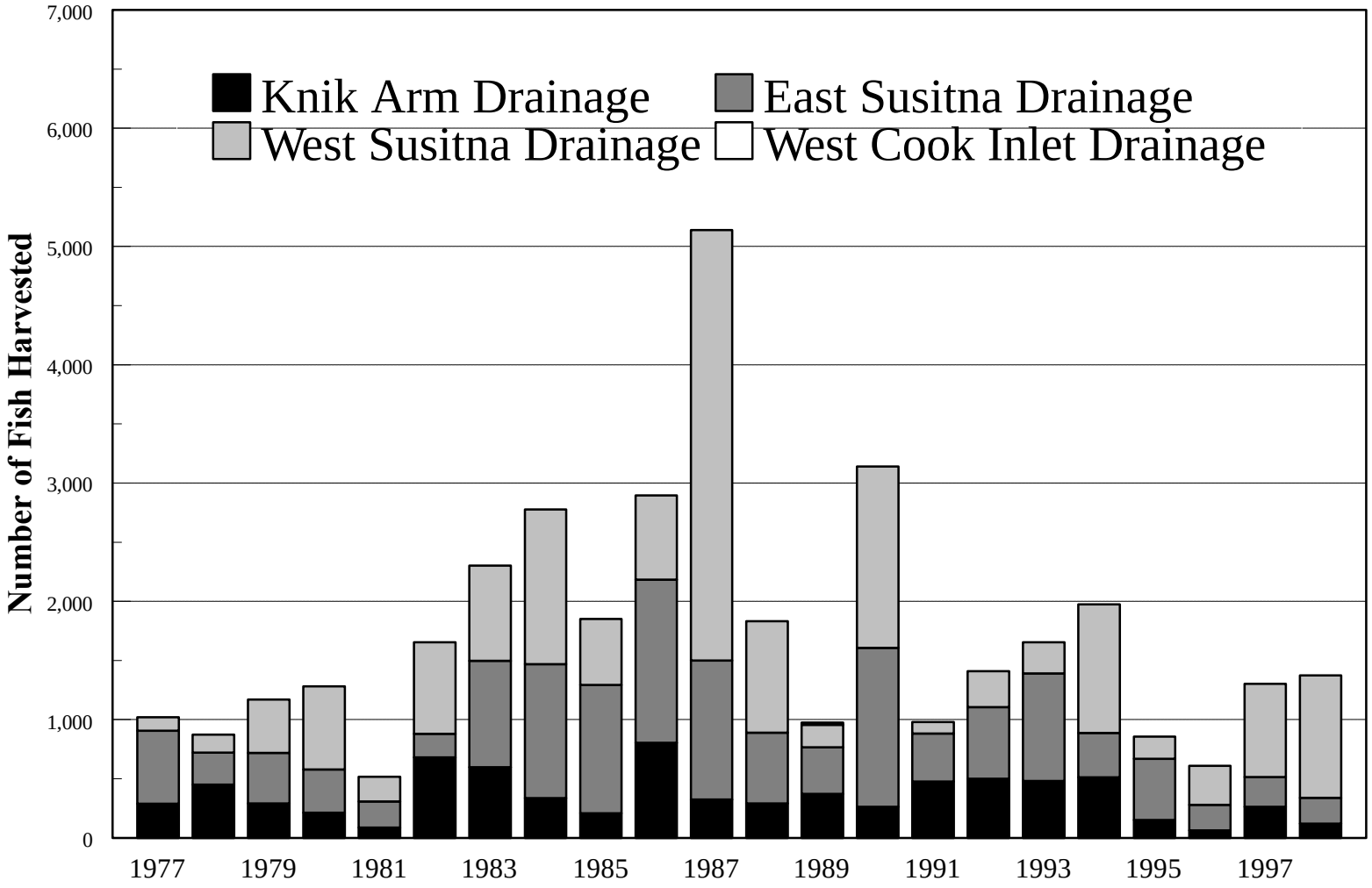
Year	Streams	Lakes	Total
1977		693	693
1978		877	877
1979		472	472
1980		267	267
1981		287	287
1982		335	335
1983	63	1,341	1,404
1984	25	337	362
1985	0	17	17
1986	218	1,598	1,816
1987	0	343	343
1988	0	291	291
1989	83	1,127	1,210
1990	17	370	387
1991	81	645	726
1992	39	456	495
1993	41	247	288
1994	4	228	232
1995	0	254	254
1996	0	95	95
1997	0	138	138
93-97 Mean	9	192	201
1998	0	244	138

Appendix A77.-Westside Susitna River drainage lake trout harvest by fishery, 1977-1998.

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
1997	0	0	0	0	0	0	0	111	27	138
93-97 Mean	0	0	0	15	7	0	0	75	25	122
1998	0	0	0	0	0	0	0	50	0	50

[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, 1977-1998.

Appendix A79.-Knik Arm drainage burbot harvest by fishery, 1977-1998.

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
1997	10	0	0	0	252	0	0	0	262
93-97 Mean	13	0	49	0	193	33	0	7	294
1998	0	0	0	0	121	0	0	0	121

[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, 1977-1998.

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
1997	0	0	0	21	33	0	31	42	31	31	0	63	252
93-97 Mean	8	20	3	86	22	0	19	40	96	130	40	51	514
1998	12	0	8	0	12	0	20	12	71	34	0	50	219

[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, 1977-1998.

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
1997	10	0	62	0	0	93	581	42	788
93-97 Mean	4	31	50	22	39	93	353	15	532
1998	0	23	0	6	8	150	849	0	1,036

[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, 1985-1998.

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
1997	0	0	0	0
93-97 Mean	0	458	0	458
1998	0	0	0	0

Note: Smelt grouped with other fish prior to 1985.

Appendix A83.-Westside Susitna River drainage smelt harvest by fishery, 1985-1998.

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
1997	0	0	0	0	771	771
93-97 Mean	0	539	1,095	47	2,861	4,543
1998	0	0	2,050	0	3,745	5,795

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, 1985-1998.

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
1997	21	50	0	0	0	21	0	0	0	0	0	92
93-97 Mean	96	15	0	0	0	6	17	11	3	0	5	154
1998	310	15	15	0	0	0	4	0	12	0	0	356

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, 1984-1998.

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
1997	0	0	0	0	100	0	0	0	0	0	0	0	100
93-97 Mean	15	20	2	2	31	6	0	0	0	9	3	0	88
1998	4	46	4	0	4	0	0	26	0	4	0	8	96

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, 1985-1998.

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
1997	0	0	0	0	0	0	64	0	64
93-97 Mean	23	99	21	58	34	0	74	0	310
1998	0	36	8	0	63	3	4	0	114

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, 1985-1998.

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
1997	0	0	0	0	0
93-97 Mean	0	0	0	2	2
1998	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, 1977-1998.

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
1997	0	0	0	0	0	0	0	41	0	40	0	20	101
93-97 Mean	31	4	0	7	0	0	0	8	15	8	0	24	97
1998	0	0	0	0	0	0	0	0	0	0	51	34	85

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, 1977-1998.

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
1997	46	0	0	0	0	0	39	0	0	39	64	0	188
93-97 Mean	16	2	0	0	18	4	11	0	0	34	17	2	105
1998	32	0	0	0	0	0	0	0	0	0	32	0	64

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, 1977-1998.

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
1997	0	0	0	0	0	0	0	25	25
93-97 Mean	4	0	0	6	0	0	13	13	36
1998	0	0	0	0	0	0	0	0	0

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.

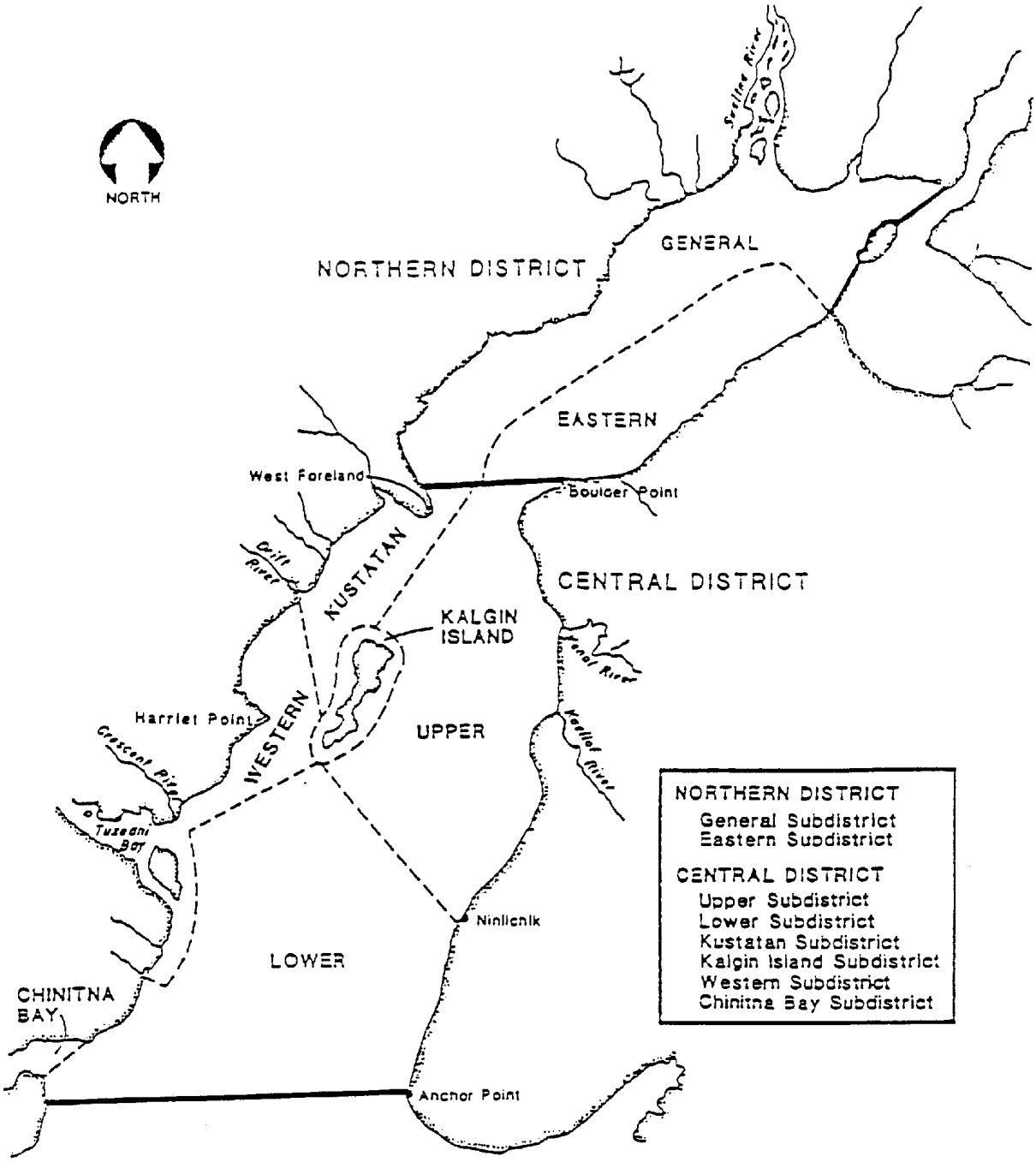
Appendix A91.-West Cook Inlet drainage other fish harvest by fishery, 1977-1998.

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
1997	0	0	0	0	0
93-97 Mean	0	0	0	10	8
1998	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, 1977-1999.

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
1998	7,997	1,218,956	160,644	551,260	95,654	2,034,511
Mean	19,152	3,848,603	424,172	485,269	554,938	5,332,135
1999	14,128	2,680,707	125,343	16,129	174,243	3,010,550

Appendix B3.-Upper Cook Inlet commercial salmon catch from the Central District driftnet fishery, 1977-1999.

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
1998	332	599,202	83,337	200,382	88,036	971,289
Mean	1,365	2,283,413	218,835	250,174	524,748	3,278,535
1999	561	1,414,267	64,529	3,552	166,329	1,649,238

Appendix B4.-Upper Cook Inlet commercial salmon catch from the Central District western setnet fishery, 1977-1999.

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
1998	25	19,874	10,328	456	2,019	32,702
Mean	900	182,100	40,916	11,533	47,537	282,220
1999	697	49,441	6,062	1,963	3,280	61,443

Appendix B5.-Upper Cook Inlet commercial salmon catch from all northern districts (East and General [west] subdistricts), 1977-1999.

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	1,222	95,432	35,657	4,291	7,622	144,224
1998	2,471	60,646	34,359	11,555	3,977	113,008
Mean	4,645	134,271	92,319	73,604	38,437	343,270
1999	2,657	59,080	31,436	592	3,985	97,750

Appendix B6.-Upper Cook Inlet commercial salmon catch from the Northern District General (west) Subdistrict, 1977-1999.

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
1998	1,741	42,314	23,159	6,812	3,662	77,688
Mean	3,865	90,924	72,642	65,564	33,839	266,835
1999	2,261	37,117	23,700	485	3,629	67,192

Appendix B7.-Upper Cook Inlet commercial salmon catch from Northern District, Eastern Subdistrict, 1977-1999.

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
1998	730	18,332	11,200	4,743	315	35,320
Mean	774	43,312	19,648	7,971	4,591	76,296
1999	396	21,963	7,736	107	356	30,558

Appendix B8.-Northern District commercial chinook salmon harvest by period, Cook Inlet, 1986-1999.

	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
1998	1,283	881			2,164	2,471	7,997
Mean	2,479	2,809	2,356	466	6,202	6,999	21,064
1999 [b]	1,827	407			2,234	2,657	14,128

[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, 1987-1999.

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
1998	0	2,597	548	0	105	3,250
Mean	3	23,443	2,913	247	1,552	28,156
1999	No fishery in 1999					

[a] Not reported.

Appendix B10.-Marine sport harvest of chinook salmon from the Homer and Seward areas of the Lower Cook Inlet and the Upper Cook Inlet, 1980-1998.

	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		6,495	
1997	7,568		5,761		13,329		9,476	
1998	5,638		3,739		9,377		8,363	

[a] Mills 1981-1994 and Howe et al. 1995-1999.

[b] Chinook salmon less than 16 inches.

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

Appendix B11.-Commercial harvest and hatchery contribution by release site for Northern District commercial chinook salmon, 1999.

	June 7, 1999			June 14, 1999			June 7 & 14, 1999		
	Subdistricts			Subdistricts			Subdistricts		
	General (West)	East	Total	General (West)	East	Total	General (West)	East	Total
Harvest	1,539	288	1,827	348	59	407	1,887	347	2,234
Number Sampled	1,352	229	1,581	81	79	160	1,433	308	1,741
Proportion sampled	0.878	0.795	0.865	0.233	1.339	0.393	0.759	0.888	0.779
Estimated # Hatchery in Harvest	43	16	59	24	2	26	67	18	85
Estimated Hatchery Contribution	0.028	0.056	0.032	0.070	0.026	0.063	0.036	0.051	0.038
by Release Site:									
1994 Ship Creek	0	0	0	24	0	24	24	0	24
proportion	0.000	0.000	0.000	0.070	0.000	0.060	0.013	0.000	0.011
1995 Ship Creek	14	7	21	0	0	0	14	7	21
proportion	0.009	0.025	0.012	0.000	0.000	0.000	0.007	0.021	0.009
1995 Deception Creek	15	5	20	0	0	0	15	5	20
proportion	0.009	0.017	0.011	0.000	0.000	0.000	0.008	0.014	0.009
1996 Deception Creek	14	4	18	0	2	2	14	5	20
proportion	0.009	0.013	0.010	0.070	0.026	0.004	0.008	0.015	0.009

Note: One wild chinook salmon, originally tagged as a coho salmon in the Deshka River, was commercially harvested on June 7 in the Western portion of the Northern District.

Appendix B12.-Upper Cook Inlet commercial fisheries season summary for 1999.

All harvest numbers in this summary are preliminary harvest figures based on inseason catch reports.

Regulatory Changes

There were many regulation changes as a result of the Board of Fisheries meeting in February 1999, with significant changes to management plans used to conduct the UCI commercial fishery. Probably the most dramatic and most difficult change to implement was with the abundance-based escapement goal in the Kenai River. Under this management plan the escapement goal and management actions change according to the level of total return to the Kenai River.

Kenai River Total Sockeye Return	Escapement Goal
Less than 2 Million	600,000-850,000
2 Million to 4 Million	750,000-950,000
Over 4 Million	850,000-1,100,000

In addition to changes in the escapement goal there are required 24-hour no-fishing periods on Fridays beginning at 12 noon ("windows") in the Kenai and East Forelands Sections in returns of over 2 million and additional 24-hour closures if the chinook recreational fishery is restricted. The only other sockeye salmon escapement goal change as a result of the BOF meeting was in the Crescent River where the goal was reduced from a range of 50,000-100,000 to a range of 25,000-50,000 sockeye salmon due to productivity changes within Crescent Lake. There were many other regulation changes including changing the regular fishing period schedule from Monday and Friday periods to Monday and Thursday periods. The only exceptions to this fishing schedule are the set gillnet fisheries conducted under the Big River Sockeye Salmon Management Plan, 5 AAC 21.368 and Northern District King Salmon Management Plan, 5 AAC 21.366. All species of salmon retained from a commercial catch for personal use must now be reported on an ADF&G fish ticket. The use of aircraft "spotter pilots" is not allowed for 1 hour prior to, during, or 1 hour after a fishing period. The early July drift fishery restriction that has occurred by emergency order the last several years is now in regulation to occur between July 9 and July 15. A second late July restriction of the drift fishery was added to occur on or immediately before July 25, making a total of three drift restrictions in regulation. Set gillnet fisheries in Knik Arm conducted under the Fish Creek Sockeye Salmon Management Plan, 5 AAC 21.364, will not take place during the 1999-2001 fishing seasons. In 5 AAC 21.360 Kenai River Sockeye Salmon Management Plan, a change was made to allow the drift gillnet fishery to be managed independent of the set gillnet fishery in the Upper Subdistrict. This change might have an impact during the 24-hour closed periods mentioned above for the set gillnet fishery where the drift gillnet fishery may be open in a portion of the Kenai and Kasilof sections offshore of the set gillnet areas.

Sockeye Salmon

The preseason forecast for a return to the Kenai River of 1.7 million sockeye salmon initially resulted in an escapement goal target of 600,000 to 850,000. The Upper Cook Inlet harvest of 2.7 million sockeye salmon was 700,000 fish over the preseason forecast (Table 1). Much of this additional harvest is likely attributable to Kasilof River stocks which were much stronger than forecast; however, no return estimate by river system is available at this time. Kenai stocks

are also likely stronger than forecast. Sockeye salmon prices at the beginning of the season were $.90 to $1.10 per pound but by the end of the season most processors were paying $1.30 to $1.40 per pound, paid retroactively to the beginning of the season. This resulted in an exvessel value for sockeye salmon of $22.8 million, which was 96% of the total UCI exvessel value for salmon.

The commercial salmon season for most areas of Upper Cook Inlet opens for Monday and Thursday regular periods beginning June 25. The exceptions to this June 25 general opening are set gillnetting in the Kenai, Kasilof and East Forelands sections.

The Kasilof Section, targeting Kasilof River sockeye salmon stocks, opened for regular Monday and Thursday fishing periods on Thursday July 1. One additional fishing period of 15 hours on July 3 was needed in the Kasilof Section prior to the Kenai and East Forelands sections opening for regular periods. The Kenai and East Forelands sections opened as scheduled on Thursday July 8. With a strong Kasilof return, 20 hours of additional fishing time was necessary in the Kasilof Section beginning on July 8, and 13 hours on July 11 to control Kasilof escapements prior to Kenai stocks arriving in any significant numbers. Because the Kenai River return was forecast to be fairly weak, a conservative fishing pattern was established that restricted additional fishing time in the Kasilof Section to within 0.5 mile of the mean high tide mark until July 27. This restriction excludes set gillnets from 0.5 to 1.5 miles from shore. It also eliminates drift gillnets, which lowered the exploitation rate of Kenai sockeye salmon stocks until Kenai run strength could be evaluated. In addition the regular period scheduled for July 26 was closed in the entire Upper Subdistrict to ensure adequate Kenai escapement. Escapements to both the Kenai and Kasilof rivers increased substantially over the July 23-27 period with the Kasilof River escapement rapidly approaching the upper end of the escapement range, while the escapement into the Kenai was projected to be within the 600,000 to 850,000 range. A fairly aggressive fishing pattern was necessary in the Kasilof Section to try to control escapement to the Kasilof River. However, several days of high wind and tides, combined with a great deal of debris in the water, greatly reduced the efficiency of the fishing gear, which contributed to exceeding the Kasilof River escapement goal by over 60,000 sockeye salmon (Table 2). In the Kenai and East Forelands sections additional fishing time was allowed to harvest surplus Kenai sockeye salmon until July 30 when the Kenai total return estimate was approaching 2 million. At that time we were unsure which Kenai total return range was appropriate for management, over or under 2 million. We elected to try and manage for the overlap in the escapement goal ranges and managed for an escapement range of 750,000 to 850,000 sockeye salmon. An escapement within this range would be within the BEG range for over or under 2 million total return levels to the Kenai River. In addition the 24-hour closed periods on Fridays in the Kenai and East Forelands sections were implemented as required. This change late in the season in escapement objectives resulted in fishing only in the Kasilof Section until August 1, when we could project the 750,000 Kenai River sockeye salmon escapement goal. From August 1 to August 5 the Kenai, Kasilof and East Forelands sections were open to maintain the escapement into the Kenai River within the targeted range, with a final escapement of 803,410 sockeye salmon.

Since 1990 the Crescent River on the west side of Cook Inlet has been producing at a lower level than is required to meet escapement goals without severe restrictions to the commercial fishery. In 1999 the BEG for this system was lowered in response to decreased productivity in Crescent Lake. Early season harvests and escapement to this system were good enough that no early season restrictions were implemented to either the drift or set gillnet fisheries in this area. On

July 12 it became apparent that the lower end of the escapement goal was assured and continuous fishing was allowed in the set gillnet fishery in the Western Subdistrict south of Redoubt Point until July 31. This is a very small fishery with few participants and, even with this extended fishing time, the upper end of the escapement goal was exceeded by 20,000 sockeye salmon with a final escapement of 69,590 sockeye salmon.

The commercial fishery targeting Fish Creek stocks in Knik Arm was closed by BOF action for the 1999-2001 seasons. This system has been enhanced since 1976. Even with the commercial fishery in Knik Arm and the personal use dip net fishery in Fish Creek being closed, the final escapement of 26,691 sockeye salmon was well below the 50,000 sockeye salmon BEG. Packers Creek on Kalgin Island has been enhanced since 1973, with both stocking and lake fertilization implemented during some portion of this project. Both stocking and fertilization were terminated in 1998. The 1999 escapement of sockeye salmon into Packers Creek was 25,648, slightly above the upper end of the escapement goal range of 15,000 to 25,000. The 1999 return to Packers Creek was fairly weak, but has allowed a modest harvest in the Kalgin Island Subdistrict and a modest amount for cost recovery by Cook Inlet Aquaculture Association.

Chum Salmon

The 1999 harvest of 178,955 chum salmon was a modest improvement from returns we have seen the last 3 years. The 1999 chum harvest would likely have been higher except for management actions restricting the drift fleet and Northern District fisheries for Yentna sockeye and Northern District coho salmon. Since the flood of 1986 chum salmon production in much of southcentral Alaska has been poor, with recent harvests well below the long-term average harvest of 563,000. The chum salmon return to Chinitna Bay was essentially unexploited as the local set gillnet fishery was inactive due to poor prices and no tendering service from any processor. Fishermen were paid $.15 to $.40 per pound for chum salmon, producing an exvessel value of $250,000 or just 1.1% of the overall fishery value.

Pink Salmon

The 1999 harvest of 16,163 pink salmon is one of the lowest harvests for an odd year in Upper Cook Inlet. As with chum salmon, management actions restricting the drift fleet and Northern District fisheries for Yentna sockeye salmon and Northern District coho salmon are a contributing factor to this poor pink salmon harvest. Pink salmon escapements are not monitored in Upper Cook Inlet; however, it appears that escapements to most river systems were normal for odd year run strengths. Prices paid for pink salmon were $.03 to $.10 per pound resulting in an exvessel value for this species of $6,800.

Coho Salmon

The 1999 coho salmon harvest of 123,587 was about half of the average long-term harvest in Upper Cook Inlet and the lowest harvest since 1973. Average commercial coho salmon harvests by decade since 1950 are 194,000, 262,000, 187,000, 529,000 and 348,000, with an overall average harvest of 313,000. Commercial coho salmon harvests in UCI during the 1980s and early 1990s were much higher than the long-term average due to good coho salmon production and also due to strong sockeye salmon returns to Upper Cook Inlet, resulting in more fishing time in the Central District. Coho salmon harvests since 1997, and especially in 1999, have been reduced due to a number of factors. Most notably wild stock coho salmon harvests statewide have declined by an average of approximately 40% during the last 3 years compared to the average of 1990-1998. In addition, regulations from the BOF since 1996 reducing the fishing

time of the drift fleet in the Central District, and elimination of additional fishing time directed at coho and sockeye salmon surpluses in the Northern District and Kalgin Island subdistricts has lowered the commercial exploitation rate dramatically.

Chinook Salmon

The 1999 harvest of 14,155 chinook salmon was about equal to the recent 10-year average harvest and much improved over the 1998 harvest of 7,997. The 1999 chinook salmon harvest was valued at $400,000, approximately 1.5% of the total exvessel value. The directed chinook salmon fishery in the Northern District was limited to the first two periods of three scheduled, to aid in rebuilding a number of stocks where escapement levels had been below desired levels in recent years. The resulting catch was 1,827 chinook salmon from the first period and 407 from the second period. Harvest and effort for the second period was much reduced due to strong winds out of Turnagain Arm. Even with this harvest reduction during the second period the harvest is the highest since 1995, and much improved over 1997 when only one period was allowed. The set gillnet fishery harvest in the Kenai, Kasilof and East Forelands sections in 1999 was 9,339 chinook salmon. The sonar count into the Kenai River was 48,000 with an estimated 12,000 fish harvested in the recreational fishery, leaving an escapement of 36,000; slightly above the BEG of 17,800 to 35,700.

Table 1.-Upper Cook Inlet commercial salmon harvest by species, 1954-1999.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1954	63,780	1,207,046	321,525	2,189,207	510,068	4,291,626
1955	45,926	1,027,528	170,777	101,680	248,343	1,594,254
1956	64,977	1,258,789	198,189	1,595,375	782,051	3,899,381
1957	42,158	643,712	125,434	21,228	1,001,470	1,834,002
1958	22,727	477,392	239,765	1,648,548	471,697	2,860,129
1959	32,651	612,676	106,312	12,527	300,319	1,064,485
1960	27,512	923,314	311,461	1,411,605	659,997	3,333,889
1961	19,737	1,162,303	117,778	34,017	349,628	1,683,463
1962	20,210	1,147,573	350,324	2,711,689	970,582	5,200,378
1963	17,536	942,980	197,140	30,436	387,027	1,575,119
1964	4,531	970,055	452,654	3,231,961	1,079,084	5,738,285
1965	9,741	1,412,350	153,619	23,963	316,444	1,916,117
1966	8,544	1,852,114	289,837	2,005,745	532,756	4,688,996
1967	7,859	1,380,062	177,729	32,229	296,837	1,894,716
1968	4,536	1,104,904	469,850	2,278,197	1,119,114	4,976,601
1969	12,397	692,175	100,777	33,383	269,847	1,108,579
1970	8,336	732,605	275,399	814,895	776,229	2,607,464
1971	19,765	636,303	100,636	35,624	327,029	1,119,357
1972	16,086	879,824	80,933	628,574	630,103	2,235,520
1973	5,194	670,098	104,420	326,184	667,573	1,773,469
1974	6,596	497,185	200,125	483,730	396,840	1,584,476
1975	4,787	684,752	227,379	336,333	951,796	2,205,047
1976	10,865	1,664,150	208,695	1,256,728	469,802	3,610,240
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
1998	7,997	1,218,956	160,644	551,260	95,654	2,034,511
1999	14,155	2,668,933	123,587	16,163	178,955	3,001,793
Average						
46 Year	19,825	2,389,524	313,829	694,260	563,092	3,980,529
10 Year	15,328	3,811,726	348,766	295,039	239,131	4,709,990

Table 2.-Enumeration goals and counts of sockeye salmon in selected streams of Upper Cook Inlet, 1968-1999.

	Kenai River		Kasilof River		Fish Creek	
Year	Goal	Estimate[a]	Goal	Estimate[a]	Goal	Estimate[b]
1968	0	88,000	0	93,000	0	19,616
1969	150,000	53,000	75,000	46,000	0	12,456
1970	150,000	73,000	75,000	37,000	0	25,000
1971	150,000	No Count	75,000	No Count	0	31,900
1972	150,000-250,000	318,000	75,000-150,000	112,000	0	6,981
1973	150,000-250,000	367,000	75,000-150,000	40,000	0	2,705
1974	150,000-250,000	161,000	75,000-150,000	64,000	0	16,225
1975	150,000-250,000	142,000	75,000-150,000	48,000	0	29,882
1976	150,000-250,000	380,000	75,000-150,000	140,000	0	14,032
1977	150,000-250,000	708,000	75,000-150,000	155,000	0	5,183
1978	350,000-500,000	399,000	75,000-150,000	117,000	0	3,555
1979	350,000-500,000	285,000	75,000-150,000	152,000	0	68,739
1980	350,000-500,000	464,000	75,000-150,000	187,000	0	62,828
1981	350,000-500,000	408,000	75,000-150,000	257,000	0	50,479
1982	350,000-500,000	620,000	75,000-150,000	180,000	50,000	28,164
1983	350,000-500,000	630,000	75,000-150,000	210,000	50,000	118,797
1984	350,000-500,000	345,000	75,000-150,000	232,000	50,000	192,352
1985	350,000-500,000	501,000	75,000-150,000	503,000	50,000	68,577
1986	350,000-500,000	501,000	75,000-150,000	276,000	50,000	29,800
1987	400,000-700,000	1,597,000	150,000-250,000	249,000	50,000	91,215
1988	400,000-700,000	1,021,500	150,000-250,000	202,000	50,000	71,603
1989	400,000-700,000	1,599,959	150,000-250,000	158,206	50,000	67,224
1990	400,000-700,000	658,908	150,000-250,000	144,289	50,000	50,000
1991	400,000-700,000	645,000	150,000-250,000	238,000	50,000	50,500
1992	400,000-700,000	994,760	150,000-250,000	183,178	50,000	71,385
1993	400,000-700,000	813,617	150,000-250,000	149,939	50,000	117,619
1994	400,000-700,000	1,003,446	150,000-250,000	205,117	50,000	95,107
1995	450,000-700,000	628,760	150,000-250,000	205,902	50,000	115,000
1996	550,000-800,000	797,847	150,000-250,000	249,944	50,000	63,160
1997	550,000-825,000	1,064,818	150,000-250,000	266,025	50,000	54,656
1998	550,000-850,000	767,558	150,000-250,000	273,213	50,000	22,853
1999	750,000-950,000	803,410	150,000-250,000	313,512	50,000	26,691

-continued-

Table 2.-Page 2 of 2.

	Susitna River		Crescent River		Packers Creek	
Year	Goal	Estimate[a]	Goal	Estimate[a]	Goal	Estimate[b]
1978	200,000	94,000	0	No Count	0	No Count
1979	200,000	157,000	50,000	87,000	0	No Count
1980	200,000	191,000	50,000	91,000	0	16,477
1981	200,000	340,000	50,000	41,000	0	13,024
1982	200,000	216,000	50,000	59,000	0	15,687
1983	200,000	112,000	50,000	92,000	0	18,403
1984	200,000	279,000	50,000	118,000	0	30,684
1985	200,000	228,000	50,000	129,000	0	36,850
1986	100,000-150,000[c]	92,000	50,000	No Count	0	29,604
1987	100,000-150,000[c]	66,000	50,000-100,000	119,000	0	35,401
1988	100,000-150,000[c]	52,347	50,000-100,000	57,716	15,000-25,000	18,607
1989	100,000-150,000[c]	96,269	50,000-100,000	71,064	15,000-25,000	22,304
1990	100,000-150,000[c]	140,379	50,000-100,000	52,180	15,000-25,000	31,868
1991	100,000-150,000[c]	105,000	50,000-100,000	44,500	15,000-25,000	41,275
1992	100,000-150,000[c]	66,057	50,000-100,000	58,227	15,000-25,000	28,361
1993	100,000-150,000[c]	141,694	50,000-100,000	37,556	15,000-25,000	40,869
1994	100,000-150,000[c]	128,032	50,000-100,000	30,355	15,000-25,000	30,788
1995	100,000-150,000[c]	121,479	50,000-100,000	52,250	15,000-25,000	29,473
1996	100,000-150,000[c]	90,781	50,000-100,000	28,729	15,000-25,000	19,095
1997	100,000-150,000[c]	157,822	50,000-100,000	70,768	15,000-25,000	33,846
1998	100,000-150,000[c]	119,623	50,000-100,000	62,257	15,000-25,000	17,732
1999	100,000-150,000[c]	99,029	50,000-100,000	69,590	15,000-25,000	25,648

[a] Derived from sonar counters unless otherwise noted.

[b] Weir Counts.

[c] Yentna River only.

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	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

-continued-

Appendix C1.-Page 2 of 4.

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

-continued-

Appendix C1.-Page 3 of 4.

Species/Life Stage/Site	1996 (Actual)	1997 (Actual)	1998 (Actual)	1999 (Planned)
Rainbow Trout Landlocked Fingerlings (continued)				
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

-continued-

Appendix C1.-Page 4 of 4.

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 1991-1999.

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 salmon 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.

Emergency Orders issued in 1999:

1. E.O. No. 2-KS-2-05-99 closed the Deshka River to fishing from 1,000 yards downstream to 200 yards upstream of the fish counting weir.
2. E.O. No. 2-KS-2-07-99 allowed the use of bait in the first 17 miles of the Deshka River and within a ¼ mile radius of the mouth of the Deshka River with the Susitna River, June 22 through July 13, 1999.
3. E.O. No. 2-KS-2-11-99 opened Willow, Little Willow, Sheep and Montana creeks to king salmon fishing for an additional weekend, July 10 through July 12, 1999.
4. E.O. No. 2-RS-2-15-99 closed Fish Creek to dipnetting on July 26, 1999.
5. E.O. No. 2-SS-2-20-99 reduced the bag limit to one coho salmon and no bait for Cottonwood, Wasilla and Fish creeks and the Little Susitna River, on August 19, 1999.

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 limits for chinook salmon over 16 inches were 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 1 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 limits of king salmon 16 inches or more in length taken from the Little Susitna River drainage are 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. Inseason E.O.s affecting chinook salmon fishing opened Willow Creek June 20-22 to correct an oversight in the regulations and added one Friday to chinook fishing in the Susitna River between the Deshka River and the Talkeetna River (excluding both).

The BOF made the following changes for the 1999 season. The Deshka River will be open to king salmon fishing from its mouth upstream to Chijuk Creek a distance of approximately 19 river miles from January 1 to July 13. Other area regulations apply such as 1 fish per day bag and possession limits, a 5 fish seasonal limit, and once an angler harvests his or her king salmon they must quit fishing for king salmon the remainder of the day. Additionally fishing is allowed

only between the hours of 6:00 a.m. to 11:00 p.m., no bait is allowed and guides cannot fish while guiding clients.

The area open for retention of king salmon on Alexander Creek was extended from its mouth upstream to Trail Creek. This provides anglers with an additional 11 miles of stream from the 1997 and 1998 seasons in which they may harvest king salmon on Alexander Creek.

The Theodore River was opened to catch-and-release fishing for king salmon from January 1 through June 30, only single hook artificial lures will be allowed. Other West Cook Inlet Area Regulations apply as follows: fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., bait is prohibited, and guides cannot fish while guiding.

There will be increased fishing opportunities for the road-accessible Parks Highway streams (Eastside Susitna River tributaries) during the early part of June. The Parks Highway streams (Eastside Susitna River tributaries) will open to king salmon fishing from January 1 through the third Monday in June and for the next two consecutive 3-day weekends. This regulation identifying the fishing season is consistent with that on Willow Creek.

On the Little Susitna River, anglers will be allowed to use treble hooks year-round downstream of the Parks Highway Bridge. Existing bait restrictions were modified to allow the use of bait during the month of September.

The area open to king salmon fishing on the Kashwitna River was extended from its mouth upstream to the Parks Highway Bridge, a distance of 2 miles. The Kashwitna River, a Parks Highway stream, will be regulated under the new season regulation implemented for the Parks Highway streams.

In all waters of the Westside-Susitna River and West Cook Inlet Management Areas (excluding waters between the Deshka River and the Talkeetna River mouths), anglers will be allowed to continue to fish for king salmon (catch-and-release) once they have harvested their limit excluding Alexander Creek, Lake Creek, Deshka River, Fish Lake Creek and Clear Creek. In these streams you will be required to quit fishing for king salmon for the day once you have harvested your limit.

By E.O. Willow, Little Willow, Sheep and Montana creeks were open to king salmon fishing for an additional weekend, July 10 through July 12, 1999.

Appendix E2.-Coho salmon regulatory history for NCIMA waters, 1991-1999.

1991

1. Little Susitna River Coho Salmon Management Plan (5 AAC 61.060). Initiated in 1991 season. One coho salmon January 1 through August 5, 3 coho salmon August 6 through December 31, increase to 5 coho salmon below weir and at Nancy Lake Creek when 7,500 projected above Parks Highway, quit fishing when bag limit harvested below Burma Landing. Previously there was a 3 salmon daily bag limit, all 3 of which could be coho salmon.

Emergency Orders:

1. 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.
2. 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.
3. E.O. No. 2-RS-2-33-91 opened the Fish Creek personal use dip net fishery. Effective July 30 through August 9, 1991.
4. 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.
5. 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.
6. 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.
7. 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.

1992

1. Little Susitna River Coho Salmon Management Plan modified. In effect for 1993 season. Only unbaited artificial lures may be used in the Little Susitna River from July 15 through August 5. The bag and possession limits for coho salmon 16 inches or more in length during this time period were increased to 3 daily and in possession.
2. Aimed at rainbow trout. Only unbaited artificial lures may be used in all flowing waters of the Susitna-West Cook Inlet area September 1 though May 15. Initiated in 1993 season.

3. Changes in the Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan (5 AAC 77.540) pertaining to the Fish Creek dip net fishery. 1993 was the first year coho salmon were allowed in the harvest. Daily bag and possession limit 6 salmon.

4. BOF found that most of Cook Inlet was a nonsubsistence zone and repealed the Upper Cook Inlet Subsistence Salmon Management Plan (5 AAC 01.592) thus eliminating the subsistence fishery in Upper Cook Inlet for the 1993 season (eliminated the Knik set gillnet fishery). This plan was reinstated by court action for the 1994 season. The only area that remained open to subsistence fishing in the Upper Cook Inlet area during 1993 was the Tyonek subdistrict of the Northern District on the west side of Cook Inlet.

Emergency Orders:

1. 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.

2. 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.

3. E.O. No. 2-RS-2-28-92 closed the Susitna River drainage to sockeye salmon fishing. Effective July 31 through December 31, 1992.

4. 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.

1993

Emergency Orders:

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.

1994

Emergency Orders:

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.

1995

1. Upper Cook Inlet Subsistence Salmon Management Plan was repealed by the BOF in 1995. BOF took action to allow subsistence fishery as a personnel use fishery. The Knik set gillnet fishery was executed as a personal use fishery in 1995.

Emergency Orders:

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-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.
3. 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.

1996

1. The Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540) establishes time, area, methods and means for taking salmon for personal use. This plan first went into effect during the 1996 season. It 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. No Knik set gillnet fishery was provided.

2. Changes were made to the Fish Creek Sockeye Management Plan (5 AAC 21.364) concerning the Fish Creek Personal Use Dipnet fishery. The dip net fishery will now run July 10 through July 31 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 Salmon Fishery Management Plan (5 AAC 77.526) 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 and 1997 seasons.
4. Little Susitna River Coho Salmon Management Plan was modified. 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.
5. Aimed at rainbow trout but could affect late-season coho salmon fishing. 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.

1997

Emergency Orders:

1. 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.
2. E.O. No. 2-RS-2-28-97 closed Fish Creek dipnetting for the remainder of the 1997 season on July 26, 1997.
3. E.O. No. 2-SS-02-31-97 prohibited use of bait and reduced daily bag and possession limit of coho salmon to one in all waters of Cook Inlet on August 9, 1997. Areas not included were Eklutna Tailrace, Ship, Bird, and Campbell creeks.
4. 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.

1998

1. The Upper Yentna River Subsistence Salmon Fishery (5 AAC 01.593) 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 and 1997 seasons. State Supreme Court and BOF action changed it to a subsistence fishery beginning in 1998. This change did not affect coho salmon harvest.

Emergency Orders:

1. 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.
2. E.O. No. 2-RS-2-15-98 closes Fish Creek to dipnetting effective July 25, 1998 through July 31, 1998.

1999

1. Recreational fishing time on Fish, Wasilla and Cottonwood creeks has been reduced. Fishing hours were restricted from 24-hour fishing days to 12-hour fishing days (6:00 a.m. to 6:00 p.m.) in these Saturday and Sunday only fisheries. Once you have harvested your bag limit of three salmon you may no longer fish on this stream for the remainder of the day.
2. In all waters of West Cook Inlet South of the Susitna River (i.e. Chuitna, Lewis, Theodore & McArthur River) once you have harvested your bag limit of 3 coho salmon you may no longer fish on this stream for the remainder of the day. These same streams are closed to coho salmon fishing from October 1-December 31
3. For the Little Susitna River existing bait restrictions were modified to allow the use of bait during the month of September.
4. Little Susitna River Coho Salmon Management Plan was modified. The escapement goal of 7,500 coho salmon was changed to an escapement range of 9,600-19,200 nonhatchery fish.

Emergency Orders:

1. E.O. No. 2-KS-2-05-99 closed the Deshka River to fishing from 1,000 yards downstream to 200 yards upstream of the fish counting weir.
2. E.O. No. 2-RS-2-15-99 closed Fish Creek to dipnetting on July 26, 1999.
3. E.O. No. 2-SS-2-20-99 reduced the bag limit to 1 coho salmon and no bait for Cottonwood, Wasilla and Fish creeks and the Little Susitna River, on August 19, 1999.

APPENDIX F

Appendix F1.-Board of Fisheries NCIMA regulatory changes made from November 1992 through December 1999.

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 limits were 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 limits for coho salmon 16 inches or more in length during this time period were 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 limits for burbot are 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 limits for lake trout are 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 salmon 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 limits in the Susitna River drainage have 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.

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 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 limits on northern pike in the Susitna-West Cook Inlet Area were 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 15 to June 14. 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 waters.

February 1999 BOF Meeting

1. Proposal 261. The Deshka River will be open to king salmon fishing from its mouth upstream to Chijuk Creek a distance of approximately 19 river miles from January 1 to July 13. Other area regulations apply such as 1 fish per day bag and possession limits, a 5 fish seasonal limit, and once an angler harvests his or her king salmon they must quit fishing for king salmon the remainder of the day. Additionally fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., no bait is allowed and guides cannot fish while guiding clients.
2. Proposal 273. The area open for retention of king salmon on Alexander Creek was extended from its mouth upstream to Trail Creek. This provides anglers with an additional 11 miles of stream from the 1997 and 1998 seasons in which they may harvest king salmon on Alexander Creek.

3. Proposal 263. The Theodore River was opened to catch-and-release fishing for king salmon from January 1 through June 30, only single-hook artificial lures will be allowed. Other West Cook Inlet Area Regulations apply as follows: fishing is allowed only between the hours of 6:00 a.m. to 11:00 p.m., bait is prohibited, and guides cannot fish while guiding.
4. Proposal 265. There will be increased fishing opportunities for the road-accessible Parks Highway streams (Eastside Susitna River tributaries) during the early part of June. The Parks Highway streams (Eastside Susitna River tributaries) will open to king salmon fishing from January 1 through the third Monday in June and for the next two consecutive 3-day weekends. This regulation identifying the fishing season is consistent with that on Willow Creek.
5. Proposal 274. On the Little Susitna River, anglers will be allowed to use treble hooks year-round downstream of the Parks Highway Bridge. Existing bait restrictions were modified to allow the use of bait during the month of September.
6. Proposal 268. The area open to king salmon fishing on the Kashwitna River was extended from its mouth upstream to the Parks Highway Bridge, a distance of 2 miles. The Kashwitna River, a Parks Highway stream, will be regulated under the new season regulation implemented for the Parks Highway streams.
7. Proposal 269. In all waters of the Westside-Susitna River and West Cook Inlet Management Areas (excluding waters between the Deshka River and the Talkeetna River mouths), anglers will be allowed to continue to fish for king salmon (catch-and-release) once they have harvested their limit excluding Alexander Creek, Lake Creek, Deshka River, Fish Lake Creek and Clear Creek. In these streams you will be required to quit fishing for king salmon for the day once you have harvested your limit.
8. Proposal 193. Recreational fishing time on Fish, Wasilla and Cottonwood creeks has been reduced. Fishing hours were restricted from 24-hour fishing days to 12-hour fishing days (6:00 a.m. to 6:00 p.m.) in these Saturday and Sunday only fisheries. Once you have harvested your bag limit of 3 coho salmon you may no longer fish on these streams for the remainder of the day.
9. Proposal 260. In all waters of West Cook Inlet south of the Susitna River (i.e. Chuitna, Lewis, Theodore & McArthur rivers) once you have harvested your bag limit of 3 coho salmon you may no longer fish on these streams for the remainder of the day. These same streams are closed to coho salmon fishing commencing October 1-December 31.

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 Lake
5. Big No Luck Lake
6. South Rolly Lake
7. North Rolly Lake
8. Tanaina Lake
9. Milo Lake
10. Frazer Lake
11. Little Frazer Lake
12. James Lake
13. Owl Lake
14. Char Lake
15. Ardaw Lake
16. Phoebe Lake
17. Chicken Lake
18. Echo Pond #1
19. Echo Pond #2
20. Echo Pond #3
21. Candle Stick Lake
22. Bains Pond #1
23. Bains Pond #2
24. 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. Prator Lake
4. Rainbow Lake*
5. Memory Lake
6. Finger Lake
7. Cottonwood Lake*
8. Horseshoe Lake (Little-Su)
9. Andersen Lake
10. Mud Lake*
11. Wasilla Lake*

* Reported but not confirmed northern pike populations

APPENDIX H

Appendix H1.-Deshka River weir daily counts, 1999.

	Chinook Salmon							Coho		Sockeye		Chum		Pink		River		Boats thru
	Daily	Harv		Sampled		Ad Clips										Stage	Temp.	the Weir
Date	Passage	above	Cum.	n	% F	Inspt	Clips	Daily	Total	Daily	Total	Daily	Total	Daily	Total	(ft)	(C)	(numbers)
1995			10,048						12,824		1,388		5		44,595			
1996			14,354															
1997			35,587						8,063		614		12		1,101			
1998			30,000	(Count X 2)					6,773		107		264		541,946			
95-98 Mean			22,497						9,220		703		94		195,881			
1999 Total			**29,307**						**4,563**		**63**		**26**		**777**			
29-May	12	2	10	0	0	0	0	0	0	0	0	0	0	0	0	1.80	10	24
30-May	9	2	17	2	0	2	0	0	0	0	0	0	0	0	0	1.80	10	17
31-May	51	1	67	10	40	10	0	0	0	0	0	0	0	0	0	1.60	10	7
01-Jun	288	1	354	18	50	18	0	0	0	0	0	0	0	0	0	1.67	10	5
02-Jun	33	1	386	13	54	13	0	0	0	0	0	0	0	0	0	1.92	10	3
03-Jun	0	0	386	40	38	40	0	0	0	0	0	0	0	0	0	2.95	10	2
04-Jun	15	0	401	15	53	15	0	0	0	0	0	0	0	0	0	2.98	10	15
05-Jun	21	4	418	16	63	16	0	0	0	0	0	0	0	0	0	2.48	10	22
06-Jun	822	0	1,240	17	44	17	0	0	0	0	0	0	0	0	0	2.05	13	24
07-Jun	1,796	2	3,034	16	56	16	0	0	0	0	0	0	0	0	0	1.75	14	10
08-Jun	2,191	0	5,225	10	50	10	0	0	0	0	0	0	0	0	0	1.60	14	8
09-Jun	781	6	6,000	0	0	0	0	0	0	0	0	0	0	0	0	1.40	15	11
10-Jun	362	2	6,360	16	0	16	0	0	0	0	0	0	0	0	0	1.36	15	7
11-Jun	339	5	6,694	10	50	10	1	0	0	0	0	0	0	0	0	1.20	15	22
12-Jun	1,028	7	7,715	49	49	49	0	0	0	0	0	0	0	0	0	0.80	15	24
13-Jun	576	25	8,266	34	35	34	0	0	0	0	0	0	0	0	0	0.78	15	22
14-Jun	1,252	3	9,515	30	47	30	0	0	0	0	0	0	0	0	0	0.76	16	6
15-Jun	2,380	3	11,892	37	54	37	0	0	0	0	0	0	0	0	0	0.68		11
16-Jun	171	3	12,060	16	16	16	0	0	0	0	0	0	0	0	0	0.60	17	9
17-Jun	873	1	12,932	27	52	27	0	0	0	0	0	0	0	0	0	0.60	17	9
18-Jun	1,547	8	14,471	16	66	16	0	0	0	0	0	0	0	0	0	0.70	15	16
19-Jun	4,372	16	18,827	14	36	14	0	0	0	0	0	0	0	0	0	0.80	15	15
20-Jun	2,360	10	21,177	0	0	0	0	0	0	0	0	0	0	0	0	0.80	15	12
21-Jun	524	7	21,694	24	54	24	0	0	0	0	0	0	0	0	0	1.00	15	6
22-Jun	832	9	22,517	30	37	30	0	0	0	0	0	0	0	0	0	1.85	14	9
23-Jun	362	10	22,869	0	0	0	0	0	0	0	0	0	0	0	0	1.50	14	18
24-Jun	956	5	23,820	0	0	0	0	0	0	0	0	0	0	0	0	1.30	14	19
25-Jun	409	11	24,218	10	50	10	0	0	0	0	0	0	0	0	0			
26-Jun	750	42	24,926	0	0	0	0	0	0	0	0	0	0	0	0	0.94	14	24
27-Jun	309	52	25,183	14	43	14	0	0	0	0	0	0	0	0	0	0.90	15	18
28-Jun	485	7	25,661	4	50	4	0	0	0	0	0	0	0	0	0	0.86	15	3
29-Jun	255	5	25,911	7	29	7	0	0	0	0	0	0	0	0	0	0.75	16	10
30-Jun	170	7	26,074	10	40	10	0	0	0	0	0	0	0	0	0	0.70	10	
01-Jul	494	6	26,562	0	0	0	0	0	0	0	0	0	0	0	0	0.66	16	8
02-Jul	144	5	26,701	0	0	0	0	0	0	0	0	0	0	0	0	0.59	18	14
03-Jul	467	11	27,157	10	40	10	0	0	0	0	0	0	0	0	0	0.52	20	15
04-Jul	66	3	27,220	0	0	0	0	0	0	0	0	0	0	0	0	0.46	20	6
05-Jul	27	14	27,233	0	0	0	0	0	0	0	0	0	0	0	0	0.41	21	12
06-Jul	19	0	27,252	0	0	0	0	0	0	0	0	0	0	0	0	0.36	20	3
07-Jul	9	0	27,261	0	0	0	0	0	0	0	0	0	0	0	0	0.30	19	3
08-Jul	181	0	27,442	0	0	0	0	0	0	0	0	0	0	0	0	0.28	18	1
09-Jul	207	0	27,649	0	0	0	0	0	0	0	0	0	0	0	0	0.27	17	12
10-Jul	387	0	28,036	7	57	7	0	0	0	0	0	0	0	2	2	0.24	18	7

-continued-

Appendix H1.-Page 2 of 2.

	Chinook Salmon							Coho		Sockeye		Chum		Pink		River		Boats thru
	Daily	Harv		Sampled		Ad Clips										Stage	Temp.	the Weir
Date	Passage	above	Cum.	n	% F	Inspt	Clips	Daily	Total	Daily	Total	Daily	Total	Daily	Total	(ft)	(C)	(numbers)
11-Jul	278	5	28,309	0	0	0	0	0	0	0	0	0	0	0	2	0.24	18	7
12-Jul	64	0	28,373	5	20	5	0	0	0	2	2	0	0	0	2	0.26		0
13-Jul	211	0	28,584	0	0	0	0	6	6	0	2	0	0	0	2	0.24		0
14-Jul	260	0	28,844	0	0	0	0	11	17	2	4	1	1	0	2	0.22		0
15-Jul	131	0	28,975	0	0	0	0	18	35	0	4	0	1	0	2	0.19	19	
16-Jul	84	0	29,059	0	0	0	0	23	58	0	4	0	1	2	4	0.22	18	
17-Jul	0	0	29,059	0	0	0	0	2	60	0	4	0	1	0	4	0.35	17	6
18-Jul	26	0	29,085	0	0	0	0	15	75	0	4	1	2	0	4	0.41	17	7
19-Jul	21	0	29,106	0	0	0	0	25	100	0	4	0	2	0	4	0.40	16	0
20-Jul	16	0	29,122	0	0	0	0	11	111	0	4	0	2	0	4	0.39	16	0
21-Jul	26	0	29,148	0	0	0	0	54	165	5	9	0	2	0	4	0.45	16	2
22-Jul	31	0	29,179	0	0	0	0	51	216	2	11	0	2	2	6	0.55	16	2
23-Jul	6	0	29,185	0	0	0	0	67	283	0	11	0	2	0	6	0.45	16	7
24-Jul	4	0	29,189	0	0	0	0	17	300	0	11	0	2	2	8		16	9
25-Jul	3	0	29,192	0	0	0	0	32	332	0	11	1	3	2	10	0.38	16	5
26-Jul	21	0	29,213	0	0	0	0	551	883	24	35	0	3	19	29	0.48	16	2
27-Jul	6	0	29,219	0	0	0	0	21	904	9	44	0	3	6	35	1.98	15	4
28-Jul	6	0	29,225	0	0	0	0	192	1,096	12	56	0	3	2	37	1.46	15	6
29-Jul	14	0	29,239	0	0	0	0	134	1,230	1	57	2	5	13	50	1.30	15	9
30-Jul	8	0	29,247	0	0	0	0	179	1,409	1	58	0	5	17	67	1.15	15	17
31-Jul	Weir underwater															2.85	15	18
01-Aug	Weir underwater															3.40	16	30
02-Aug	Weir underwater															3.60	15	7
03-Aug	8	0	29,255	0	0	0	0	148	1,557	0	58	10	15	35	102	2.10	15	12
04-Aug	6	0	29,261	0	0	0	0	128	1,685	0	58	10	25	96	198	1.60	16	10
05-Aug	6	0	29,267	0	0	0	0	135	1,820	0	58	0	25	93	291	1.33	16	17
06-Aug	10	0	29,277	0	0	0	0	127	1,947	0	58	0	25	20	311	1.14	17	6
07-Aug	7	0	29,284	0	0	0	0	380	2,327	1	59	0	25	64	375	1.06	16	15
08-Aug	5	0	29,289	0	0	0	0	364	2,691	0	59	0	25	66	441	1.03	16	4
09-Aug	7	0	29,296	0	0	0	0	447	3,138	0	59	0	25	27	468	1.13	16	3
10-Aug	4	0	29,300	0	0	0	0	407	3,545	0	59	0	25	28	496	1.03	16	5
11-Aug	2	0	29,302	0	0	0	0	354	3,899	0	59	0	25	108	604	0.95	16	4
12-Aug	4	0	29,306	0	0	0	0	543	4,442	0	59	0	25	157	761	0.87	16	5
13-Aug	0	0	29,306	0	0	0	0	30	4,472	0	59	0	25	5	766	2.24	16	
14-Aug	Weir underwater															3.10	16	10
15-Aug	Weir underwater															3.50	16	13
16-Aug	Weir underwater															3.00	16	8
17-Aug	Weir underwater																	
18-Aug	0	0	29,306					3	4,475	1	60	0	25	0	766	1.80	17	8
19-Aug	0	0	29,306					15	4,490	1	61	0	25	0	766	1.70	17	0
20-Aug	No data																	
21-Aug	0	0	29,306					45	4,535	0	61	0	25	8	774	1.35	15	
22-Aug	0	0	29,306					6	4,541	0	61	0	25	0	774	1.25	15	
23-Aug	1	0	29,307					1	4,542	1	62	1	26	0	774	1.16	13	4
24-Aug	0	0	29,307					3	4,545	1	63	0	26	0	774	0.96	14	
25-Aug	0	0	29,307					3	4,548	0	63	0	26	0	774	0.95	14	0
26-Aug	0	0	29,307					15	4,563	0	63	0	26	3	777	1.44	13	1

Appendix H2.-Fish Creek weir counts, 1999.

	Sockeye				Coho					River Water	
Date	Adults Daily	Jacks Daily	Total Cumulative	Number Sampled	Daily	Total Cumulative	Pink Daily	Chum Daily	Other Fish	Stage (ft)	Temp. (C)
Mean			53,633 (1968-98)			4,050 (1997-98)					
1999 Total	23,704	3,021	26,725	891		1,754	32	8	1		
09-Jul	0	0	0		0	0	0	0	0		
10-Jul	0	0	0		0	0	0	0	0		
11-Jul	0	0	0		0	0	0	0	0		
12-Jul	0	0	0		0	0	0	0	0	1.10	17.0
13-Jul	0	0	0		0	0	0	0	0	1.10	15.0
14-Jul	0	0	0		0	0	0	0	0	1.13	16.0
15-Jul	0	0	0		0	0	0	0	0	1.15	15.0
16-Jul	0	0	0		0	0	0	0	0	1.10	15.0
17-Jul	0	0	0		0	0	0	0	0	1.00	15.0
18-Jul	0	0	0		0	0	0	0	0	1.40	15.0
19-Jul	0	0	0		0	0	0	0	0	1.14	14.0
20-Jul	0	0	0		0	0	0	0	0	1.16	14.0
21-Jul	0	0	0		0	0	0	0	0	1.00	15.0
22-Jul	0	0	0		0	0	0	0	0	1.00	14.0
23-Jul	0	0	0		0	0	0	0	0	1.15	15.0
24-Jul	0	0	0		0	0	0	0	0	1.00	16.0
25-Jul	0	0	0		0	0	0	0	0	1.00	14.0
26-Jul	0	0	0		0	0	0	0	0	1.00	15.0
27-Jul	1,623	86	1,709	40	9	9	1	0	0	1.20	14.0
28-Jul	3,788	451	5,948	200	6	15	0	0	0	1.00	15.0
29-Jul	4,337	423	10,708	40	0	15	0	0	0	1.20	14.0
30-Jul	3,466	260	14,434	40	0	15	0	0	0	1.22	18.0
31-Jul	1,596	226	16,256	80	0	15	0	0	0	1.24	15.0
01-Aug	2,351	200	18,807	40	0	15	0	0	0	1.20	20.0
02-Aug	1,952	310	21,069	40	14	29	0	0	1	1.20	17.0
03-Aug	1,013	239	22,321	40	17	46	0	0	0	1.19	16.0
04-Aug	906	241	23,468	40	18	64	0	0	0	1.18	17.0
05-Aug	716	205	24,389	40	5	69	1	0	0	1.80	17.0
06-Aug	215	59	24,663	34	36	105	0	0	0	1.20	20.0
07-Aug	591	74	25,328	40	21	126	1	0	0	1.30	18.0
08-Aug	115	16	25,459	0	0	126	0	0	0	1.36	18.0
09-Aug	109	19	25,587	30	4	130	0	0	0	1.40	20.0
10-Aug	383	53	26,023	40	24	154	2	0	0	1.38	15.0
11-Aug	84	12	26,119	40	32	186	3	0	0	1.36	15.0
12-Aug	144	34	26,297	22	115	301	5	2	0	1.36	16.0
13-Aug	133	32	26,462	0	223	524	1	1	0	1.80	15.0
14-Aug	9	4	26,475	0	13	537	0	0	0	2.00	17.0
15-Aug	25	7	26,507	0	5	542	0	1	0	2.00	17.0
16-Aug	24	10	26,541	24	8	550	0	1	0	2	16.0
17-Aug	20	9	26,570	20	25	575	2	1	0	2	15.0
18-Aug	30	17	26,617	11	65	640	7	0	0	2	15.0
19-Aug	9	7	26,633	11	34	674	6	0	0	2	17.0

-continued-

Appendix H2.-Page 2 of 2.

	Sockeye				Coho					River Water	
Date	Adults Daily	Jacks Daily	Total Cumulative	Number Sampled	Daily	Total Cumulative	Pink Daily	Chum Daily	Other Fish	Stage (ft)	Temp. (C)
20-Aug	2	1	26,636	0	0	674	0	0	0	2	17.0
21-Aug	2	0	26,638	0	0	674	1	0	0	2	17.0
22-Aug	1	0	26,639	0	6	680	0	0	0	2	16.0
23-Aug	9	6	26,654	0	9	689	1	0	0	2	14.0
24-Aug	5	5	26,664	8	20	709	0	0	0	2	12.0
25-Aug	19	8	26,691	10	144	853	1	1	0	2	14.0
26-Aug	3	0	26,694	0	7	860	0	0	0	2	17.0
27-Aug	2	0	26,696	0	20	880	0	0	0	2	14.0
28-Aug	1	0	26,697	0	0	880	0	0	0	2	15.0
29-Aug	0	0	26,697	0	0	880	0	0	0	2	14.0
30-Aug	2	0	26,699	0	5	885	0	0	0	2	14.0
31-Aug	3	1	26,703	0	50	935	0	0	0	2	13.0
01-Sep	4	1	26,708	0	23	958	0	0	0	2	15.0
02-Sep	3	4	26,715	0	214	1,172	0	1	0	2	12.0
03-Sep	2	0	26,717	0	45	1,217	0	0	0	2	14.0
04-Sep	3	0	26,720	0	107	1,324	0	0	0	2	13.0
05-Sep	0	0	26,720	0	0	1,324	0	0	0	2	12.0
06-Sep	0	0	26,720	0	13	1,337	0	0	0	2	12.0
07-Sep	0	0	26,720	0	4	1,341	0	0	0	2	12.0
08-Sep	0	0	26,720	0	13	1,354	0	0	0	2	11.0
09-Sep	0	0	26,720	0	3	1,357	0	0	0	2	12.0
10-Sep	1	0	26,721	0	0	1,357	0	0	0	2	15.0
11-Sep	0	0	26,721	0	0	1,357	0	0	0	2	15.0
12-Sep	0	0	26,721	0	0	1,357	0	0	0	2	12.0
13-Sep	0	0	26,721	0	0	1,357	0	0	0	2	12.0
14-Sep	0	0	26,721	0	6	1,363	0	0	0	2	10.0
15-Sep	0	0	26,721	0	141	1,504	0	0	0	2	10.0
16-Sep	0	0	26,721	0	15	1,519	0	0	0	2	11.0
17-Sep	1	0	26,722	1	13	1,532	0	0	0	2	12.0
18-Sep	0	0	26,722	0	11	1,543	0	0	0	2	14.0
19-Sep	0	0	26,722	0	115	1,658	0	0	0	2	10.0
20-Sep	1	0	26,723	0	32	1,690	0	0	0	2	12.0
21-Sep	1	1	26,725	0	32	1,722	0	0	0	2	12.0
22-Sep	0	0	26,725	0	27	1,749	0	0	0	2	12.0
23-Sep	0	0	26,725	0	0	1,749	0	0	0	2	12.0
24-Sep	0	0	26,725	0	1	1,750	0	0	0	2	10.0
25-Sep	0	0	26,725	0	2	1,752	0	0	0	2	10.0
26-Sep	0	0	26,725	0	2	1,754	0	0	0	2	9.0
Total	23,704	3,021	26,725	891	1,754		32	8	1		

Appendix H3.-Cottonwood Creek weir counts, 1999.

	Sockeye Salmon				Coho Salmon						River Water	
Date	Adults Daily	Jacks Daily	Total	Number Sampled	Daily	Total	Number Sampled	Chinook Daily	Chum Daily	Other Fish	Stage (ft)	Temp. (C)
97-98 Mean			17,897			1,525		0	35	0		
99 Total			39,272			462		4	4	30		
12-Jul	0	0	0	0	0	0	0	0	0	0	0.90	18.0
13-Jul	0	0	0	0	0	0	0	0	0	0	0.90	17.5
14-Jul	12	0	12	0	0	0	0	0	0	1	0.90	18.0
15-Jul	2	0	14	2	0	0	0	0	0	0	0.90	17.5
16-Jul	4	0	18	4	0	0	0	0	0	0	0.92	15.0
17-Jul	1	0	19	1	0	0	0	0	0	0	0.90	15.0
18-Jul	6	0	25	3	0	0	0	0	0	0	0.90	15.0
19-Jul	5	0	30	1	0	0	0	0	0	0	0.92	15.0
20-Jul	53	2	85	15	0	0	0	0	0	1	0.92	15.0
21-Jul	25	2	112	5	1	1	0	0	0	0	0.92	15.0
22-Jul	505	10	627	40	0	1	0	0	0	0	0.92	14.0
23-Jul	740	8	1,375	57	0	1	0	0	0	0	0.92	18.0
24-Jul	1,000	6	2,381	80	0	1	0	0	0	0	0.92	16.0
25-Jul	181	12	2,574	40	0	1	0	0	0	0	0.92	15.0
26-Jul	1,532	21	4,127	120	0	1	0	0	0	0	0.92	16.0
27-Jul	1,439	22	5,588	80	3	4	2	0	0	0	0.90	14.0
28-Jul	2,118	34	7,740	80	7	11	4	0	0	0	0.90	15.0
29-Jul	2,414	93	10,247	120	2	13	0	0	0	0	0.90	15.0
30-Jul	6,016	105	16,368	120	0	13	0	0	0	0	0.90	14.0
31-Jul	4,710	41	21,119	200	3	16	0	0	0	0	0.90	19.0
01-Aug	2,775	48	23,942	50	3	19	2	0	0	0	0.90	17.0
02-Aug	2,353	105	26,400	55	5	24	1	1	0	0	0.90	16.0
03-Aug	3,007	96	29,503	60	14	38	6	0	0	0	0.90	16.0
04-Aug	1,790	82	31,375	40	10	48	3	0	0	0	0.90	16.0
05-Aug	2,082	75	33,532	40	7	55	5	0	0	0	0.92	16.0
06-Aug	1,548	28	35,108	40	14	69	7	0	0	0	0.92	16.0
07-Aug	873	18	35,999	30	7	76	6	0	0	0	0.92	16.0
08-Aug	584	16	36,599	10	4	80	3	1	0	0	0.94	15.0
09-Aug	557	37	37,193	11	18	98	14	0	0	0	0.94	15.0
10-Aug	444	39	37,676	0	11	109	10	0	0	0	0.94	15.0
11-Aug	35	4	37,715	0	6	115	4	0	0	0	0.94	16.0
12-Aug	262	15	37,992	5	13	128	10	0	1	0	0.98	15.0
13-Aug	378	10	38,380	6	130	258	60	1	1	0	1.02	17.0
14-Aug	30	0	38,410	10	5	263	0	0	0	0	1.02	14.0
15-Aug	6	0	38,416	0	4	267	3	0	0	0	1.04	15.0
16-Aug	170	12	38,598	5	6	273	5	0	0	0	1.02	14.0
17-Aug	113	10	38,721	0	19	292	13	0	0	0	1.02	15.0
18-Aug	107	14	38,842	0	23	315	16	1	0	0	1.02	15.0
19-Aug	61	10	38,913	0	9	324	6	0	0	0	1.02	15.0
20-Aug	29	1	38,943	0	4	328	3	0	0	0	1.02	14.0
21-Aug	4	0	38,947	0	4	332	0	0	0	0	1.02	14.0
22-Aug	0		38,947	0	0	332	0	0	0	0	1.02	15.0

-continued-

Appendix H3.-Page 2 of 2.

	Sockeye Salmon				Coho Salmon						River Water	
	Adults	Jacks		Number			Number	Chinook	Chum	Other	Stage	Temp.
Date	Daily	Daily	Total	Sampled	Daily	Total	Sampled	Daily	Daily	Fish	(ft)	(C)
23-Aug	41	4	38,992	0	0	332	0	0	1	0	1.00	14.0
24-Aug	46	7	39,045	0	0	332	0	0	0	0	1.00	13.0
25-Aug	10	1	39,056	0	0	332	0	0	0	0	1.02	14.0
26-Aug	62	3	39,121	0	2	334	0	0	0	0	1.02	13.0
27-Aug	34	1	39,156	0	1	335	0	0	0	0	1.08	14.0
28-Aug	38	2	39,196	0	2	337	0	0	1	0	1.06	15.0
29-Aug	4	0	39,200	0	1	338	0	0	0	0	1.06	13.0
30-Aug	12	1	39,213	0	9	347	7	0	0	5	1.02	14.0
31-Aug	4	1	39,218	0	4	351	4	0	0	0	1.02	12.0
01-Sep	5	1	39,224	0	5	356	2	0	0	0	1.02	13.0
02-Sep	1	1	39,226	0	2	358	0	0	0	1	1.02	13.0
03-Sep	2	0	39,228	0	1	359	1	0	0	0	1.06	13.0
04-Sep	5	0	39,233	0	15	374	10	0	0	0	1.08	12.0
05-Sep	19	2	39,254	0	1	375	0	0	0	0	1.04	11.0
06-Sep	2	0	39,256	0	3	378	3	0	0	0	1.02	10.0
07-Sep	2	0	39,258	0	0	378	0	0	0	5	1.04	13.0
08-Sep	1	0	39,259	0	0	378	0	0	0	0	1.04	13.0
09-Sep	6	0	39,265	0	2	380	2	0	0	0	1.02	13.0
10-Sep	1	0	39,266	0	2	382	2	0	0	0	1.02	11.0
11-Sep	1	0	39,267	0	1	383	1	0	0	0	1.02	11.0
12-Sep	0	0	39,267	0	0	383	0	0	0	0	1.02	11.0
13-Sep	0	0	39,267	0	0	383	0	0	0	0	1.04	11.0
14-Sep	2	0	39,269	0	16	399	14	0	0	1	1.02	10.0
15-Sep	0	0	39,269	0	11	410	10	0	0	0	1.02	10.0
16-Sep	0	0	39,269	0	16	426	10	0	0	1	1.02	10.0
17-Sep	2	0	39,271	0	0	426	0	0	0	3	1.02	10.0
18-Sep	1	0	39,272	0	1	427	0	0	0	2	1.00	10.0
19-Sep	0	0	39,272	0	32	459	0	0	0	4	1.00	10.0
20-Sep	0	0	39,272	0	2	461	2	0	0	0	1.00	9.0
21-Sep	0	0	39,272	0	1	462	0	0	0	6	1.10	9.0
Total	38,272	1,000	39,272	1,330	462		251	4	4	30		

Appendix H4.-Wasilla Creek weir counts, 1999.

	Sockeye				Coho Salmon			Pink		Chum		River Water	
Date	Adults Daily	Jacks Daily	Total Cum	Number Sampled	Daily	Total	Number Sampled	Daily	Total	Daily	Total	Stage (ft)	Temp. (C)
Total 98			693			3,622			89		73		
Total 99	775	60	835	475		1,564	679	3	0	82	0		
22-Jul	0	0	0	0	0	0	0	0	0	0	0		12.0
23-Jul	0	0	0	0	0	0	0	0	0	0	0	3.70	15.0
24-Jul	0	0	0	0	0	0	0	0	0	0	0	3.68	14.5
25-Jul	0	0	0	0	0	0	0	0	0	0	0	3.72	14.0
26-Jul	0	0	0	0	0	0	0	0	0	0	0	3.80	14.0
27-Jul	0	0	0	0	2	2	1	0	0	0	0	4.00	14.0
28-Jul	3	0	3	3	10	12	4	0	0	1	1	3.98	14.0
29-Jul	1	0	4	1	0	12	0	0	0	0	1	4.05	13.0
30-Jul	1	0	5	1	1	13	1	0	0	0	1	4.12	13.0
31-Jul	3	0	8	2	14	27	9	0	0	0	1	4.18	15.0
01-Aug	7	2	17	8	3	30	2	0	0	0	1	4.20	15.0
02-Aug	8	1	26	6	26	56	24	0	0	0	1	4.20	14.0
03-Aug	8	2	36	8	5	61	5	0	0	0	1	4.21	15.0
04-Aug	12	4	52	10	15	76	12	0	0	2	3	4.16	15.0
05-Aug	23	1	76	18	9	85	3	0	0	0	3	4.12	15.0
06-Aug	21	2	99	12	16	101	7	0	0	2	5	4.09	14.0
07-Aug	67	4	170	36	31	132	11	0	0	3	8	4.10	15.0
08-Aug	38	2	210	22	48	180	23	0	0	5	13	4.18	14.0
09-Aug	45	0	255	24	65	245	25	0	0	5	18	4.23	15.0
10-Aug	39	1	295	28	40	285	18	1	1	8	26	4.26	15.0
11-Aug	48	4	347	30	42	327	23	0	1	2	28	4.25	15.0
12-Aug	28	2	377	5	139	466	40	0	1	5	33	4.46	15.0
13-Aug	15	3	395	9	254	720	90	0	1	9	42	4.83	14.5
14-Aug	20	1	416	9	15	735	10	0	1	2	44	5.06	13.0
15-Aug	20	3	439	9	7	742	7	0	1	5	49	5.16	11.5
16-Aug	25	2	466	14	9	751	4	1	5	4	135	5.19	14.0
17-Aug	39	2	507	21	48	799	17	0	5	6	141	5.17	14.0
18-Aug	35	1	543	29	140	939	50	0	5	5	146	5.11	15.0
19-Aug	28	0	571	18	77	1,016	30	0	5	2	148	5.05	14.0
20-Aug	18	1	590	11	13	1,029	6	0	5	0	148	4.99	13.5
21-Aug	20	2	612	13	2	1,031	2	0	5	0	148	4.92	13.0
22-Aug	10	2	624	8	0	1,031	0	0	5	0	148	4.87	12.0
23-Aug	26	1	651	15	4	1,035	2	1	6	0	148	4.83	13.0
24-Aug	23	0	674	16	18	1,053	11	0	6	2	150	4.78	13.0
25-Aug	13	0	687	7	10	1,063	7	0	6	3	153	4.80	12.0
26-Aug	19	3	709	13	9	1,072	6	0	6	0	153	4.86	13.0
27-Aug	11	1	721	6	32	1,104	12	0	6	1	154	4.89	14.0
28-Aug	22	0	743	10	40	1,144	9	0	6	1	155	4.84	14.0
29-Aug	21	3	767	14	32	1,176	13	0	6	1	156	4.77	13.0
30-Aug	8	1	776	5	68	1,244	28	0	6	2	158	4.72	14.0
31-Aug	8	1	785	6	58	1,302	20	0	6	3	161	4.67	14.0

-continued-

Appendix H4.-Page 2 of 2.

	Sockeye				Coho Salmon			Pink		Chum		River Water	
Date	Adults Daily	Jacks Daily	Total Cum	Number Sampled	Daily	Total	Number Sampled	Daily	Total	Daily	Total	Stage (ft)	Temp. (C)
01-Sep	4	1	790	3	29	1,331	10	0	6	2	163	4.60	14.0
02-Sep	3	0	793	2	14	1,345	13	0	6	0	163	4.55	11.0
03-Sep	0	0	793	0	7	1,352	6	0	6	0	163	4.56	10.0
04-Sep	2	0	795	1	1	1,353	1	0	6	0	163	4.63	11.0
05-Sep	8	0	803	8	3	1,356	2	0	6	0	163	4.65	10.5
06-Sep	4	1	808	2	18	1,374	11	0	6	0	163	4.62	11.0
07-Sep	5	2	815	4	10	1,384	9	0	6	1	164	4.55	12.0
08-Sep	2	0	817	0	12	1,396	9	0	6	0	164	4.50	11.0
09-Sep	2	0	819	2	4	1,400	4	0	6	0	164	4.43	10.0
10-Sep	3	0	822	0	27	1,427	10	0	6	0	164	4.36	11.0
11-Sep	4	0	826	2	14	1,441	6	0	6	0	164	4.31	11.0
12-Sep	1	0	827	0	2	1,443	2	0	6	0	164	4.22	10.0
13-Sep	0	2	829	1	28	1,471	13	0	6	0	164	4.20	10.0
14-Sep	1	0	830	1	9	1,480	6	0	6	0	164	4.15	10.0
15-Sep	0	0	830	0	13	1,493	6	0	6	0	164	4.16	10.0
16-Sep	0	1	831	0	30	1,523	20	0	6	0	164	4.17	10.0
17-Sep	2	0	833	1	1	1,524	0	0	6	0	164	4.13	10.0
18-Sep	0	0	833	0	1	1,525	1	0	6	0	164	4.05	10.0
19-Sep	1	0	834	1	10	1,535	2	0	6	0	164	3.99	9.5
20-Sep	0	0	834	0	8	1,543	6	0	6	0	164	3.96	12.0
21-Sep	0	1	835	0	12	1,555	5	0	6	0	164	3.97	9.0
22-Sep	0	0	835	0	8	1,563	5	0	6	0	164	3.98	9.0
23-Sep	0	0	835	0	0	1,563	0	0	6	0	164	3.95	9.0
24-Sep	0	0	835	0	1	1,564	0	0	6	0	164	3.88	8.0
25-Sep	0	0	835	0	0	1,564	0	0	6	0	164	3.86	8.0
26-Sep	0	0	835	0	0	1,564	0	0	6	0	164	3.85	5.5
27-Sep	0	0	835	0	0	1,564	0	0	6	0	164	3.86	7.0

Appendix H5.-Spring Creek and Rabbit Slough weir counts, 1999.

	Spring Creek					Rabbit Slough		
	Sockeye Salmon			Coho Salmon		Sockeye		Coho
Date	Adults Daily	Jacks Daily	Total Cum	Daily	Total	Daily	Total	Daily
98 Total			116		163		32	16
99 Total	6	1	7		11		48	1
28-Jul	0	0	0	2	2	0	0	0
29-Jul	1	0	1	0	2	0	0	0
30-Jul	0	0	1	0	2	0	0	0
31-Jul	0	0	1	0	2	0	0	0
01-Aug	0	0	1	0	2	0	0	0
02-Aug	0	0	1	0	2	0	0	0
03-Aug	0	0	7	0	5	0	12	0
04-Aug	1	0	2	0	2	0	0	0
05-Aug	0	0	2	0	2	0	0	0
06-Aug	1	0	3	3	5	0	0	0
07-Aug	0	0	3	0	5	0	0	0
08-Aug	0	0	3	0	5	0	0	0
09-Aug	0	0	3	0	5	0	0	0
10-Aug	1	1	5	0	5	0	0	0
11-Aug	2	0	7	0	5	0	0	0
12-Aug	0	0	7	0	5	under water		0
13-Aug	0	0	7	0	5	under water		
14-Aug	weir under water					under water		
15-Aug	weir under water					under water		
16-Aug	weir under water					under water		
17-Aug	weir under water					under water		
18-Aug	weir under water					under water		
19-Aug	weir under water					under water		
20-Aug	0	0	7	0	5	0	0	0
21-Aug	0	0	7	0	5	0	0	0
22-Aug	0	0	7	0	5	0	0	0
23-Aug	0	0	7	0	5	4	4	0
24-Aug	0	0	7	0	5	2	6	0
25-Aug	0	0	7	0	5	2	8	0
26-Aug	0	0	7	0	5	4	12	0
27-Aug	0	0	7	0	5	0	12	0
28-Aug	0	0	7	0	5	2		0
29-Aug	0	0	7	0	5	0		0
30-Aug	0	0	7	0	5	5		0
31-Aug	0	0	7	0	5	4		0
01-Sep	0	0	7	0	5	8		0
02-Sep	0	0	7	0	5	6		0
03-Sep	0	0	7	0	5	5		1
04-Sep	0	0	7	0	5	1	43	0
05-Sep	0	0	7	0	5	0	43	0

-continued-

Appendix H5.-Page 2 of 2.

	Spring Creek					Rabbit Slough		
	Sockeye Salmon			Coho Salmon		Sockeye		Coho
Date	Adults Daily	Jacks Daily	Total Cum	Daily	Total	Daily	Total	Daily
06-Sep	0	0	7	0	5	4	47	0
07-Sep	0	0	7	0	5	1	48	0
08-Sep	0	0	7	0	5	0	48	0
09-Sep	0	0	7	0	5	0	48	0
10-Sep	0	0	7	0	5	0	48	0
11-Sep	0	0	7	0	5	0	48	0
12-Sep	0	0	7	0	5	0	48	0
13-Sep	0	0	7	0	5	0	48	0
14-Sep	0	0	7	0	5	0	48	0
15-Sep	0	0	7	0	5	0	48	0
16-Sep	0	0	7	0	5	0	48	0
17-Sep	0	0	7	0	5	0	48	0
18-Sep	0	0	7	1	6	0	48	0
19-Sep	0	0	7	0	6	0	48	0
20-Sep	0	0	7	0	6	0	48	0
21-Sep	0	0	7	0	6	0	48	0
22-Sep	0	0	7	4	10	0	48	0
23-Sep	0	0	7	1	11	0	48	0
24-Sep	0	0	7	0	11	0	48	0
25-Sep	0	0	7	0	11	0	48	0
26-Sep	0	0	7	0	11	0	48	0
27-Sep	0	0	7	0	11	0	48	0

Appendix H6.-Little Susitna River weir counts, 1999.

	Coho Salmon			Chinook		Sockeye		Chum			Pink		River Water	
Date	Daily	Total	Number Sampled	Daily	Total	Daily	Total	Daily	Total	Number Sampled	Daily	Total	Stage (ft)	Temp. (C)
Mean 1996-98		13,917			15		45		1,890			4,835		
Total 1999		3,017			696		70		14,177			14		
10-Jul	0	0	0	4	4	0	0	0	0	0	0	0	0.98	15.0
11-Jul	0	0	0	5	9	0	0	0	0	0	0	0	0.96	13.0
12-Jul	0	0	0	0	9	1	1	1	1	0	0	0	1.00	11.0
13-Jul	0	0	0	143	152	12	13	4	5	0	1	1	0.98	13.0
14-Jul	0	0	0	138	290	8	21	1	6	0	0	1	0.92	12.0
15-Jul	0	0	0	63	353	8	29	10	16	0	0	1	0.99	12.0
16-Jul	0	0	0	57	353	9	29	17	33	0	0	1	1.00	11.5
17-Jul	0	0	0	19	410	3	38	22	55	0	0	1	1.10	111.0
18-Jul	0	0	0	35	429	1	41	22	77	0	0	1	1.40	11.0
19-Jul	0	0	0	43	464	2	42	11	88	0	0	1	1.20	10.0
20-Jul	0	0	0	38	507	1	44	34	122	10	0	1	1.20	11.0
21-Jul	0	0	0	59	545	5	45	56	178	10	0	1	1.50	11.0
22-Jul	0	0	0	22	604	4	50	33	211	20	0	1	1.70	10.0
23-Jul	0	0	0	8	626	2	54	29	240	10	0	1	1.30	
24-Jul	0	0	0	2	634	1	56	75	315	10	0	1	1.20	
25-Jul	0	0	0	3	636	2	57	126	441	16	0	1	1.30	
26-Jul	0	0	0	25	639	2	59	333	774	30	0	1	1.70	12.0
27-Jul	0	0	0	5	664	2	61	218	992	30	0	1	1.90	12.0
28-Jul	0	0	0	5	669	2	63	534	1,526	30	0	1	2.00	11.0
29-Jul	0	0	0	1	675	1	66	579	2,105	30	0	1	1.70	11.0
30-Jul	0	0	0	0	675	0	66	471	2,576	30	0	1	1.90	9.0
31-Jul	0	0	0	9	684	0	66	2,315	4,891	30	0	1	2.50	9.0
01-Aug	0	0	0	4	688	2	68	758	5,649	30	1	2	2.00	10.0
02-Aug	1	1	0	2	690	0	68	444	6,093	20	0	2	2.00	10.0
03-Aug	0	1	0	0	690	0	68	1,098	7,191	20	4	6	1.80	12.0
04-Aug	0	1	0	1	691	0	68	813	8,004	20	3	9	1.60	11.0
05-Aug	0	1	0	1	692	0	68	484	8,488	10	2	11	1.40	10.0
06-Aug	0	1	0	0	692	1	69	355	8,843	24	0	11	1.40	10.0
07-Aug	1	2	0	1	693	0	69	1,534	10,377	0	0	11	1.40	10.0
08-Aug	0	2	0	0	693	0	69	485	10,862	0	0	11	1.40	11.0
09-Aug	7	9	1	1	694	0	69	1,225	12,087	0	0	11	1.40	11.0
10-Aug	4	13	2	0	694	0	69	611	12,698	0	1	12	1.40	11.0
11-Aug	3	16	0	1	695	0	69	677	13,375	0	1	13	1.20	11.0
12-Aug	0	16	0	0	695	0	69	174	13,549	0	0	13	1.80	10.0
13-Aug	High water - no count													10.0
14-Aug	High water - no count													10.0
15-Aug	High water - no count													10.0
16-Aug	High water - no count													10.0
17-Aug	High water - no count												3.40	10.0
18-Aug	16	32	10	0	695	0	69	85	13,634	0	0	13	2.70	11.0

-continued-

Appendix H6.-Page 2 of 2.

	Coho Salmon			Chinook		Sockeye		Chum			Pink		River Water	
Date	Daily	Total	Number Sampled	Daily	Total	Daily	Total	Daily	Total	Number Sampled	Daily	Total	Stage (ft)	Temp. (C)
19-Aug	36	68	20	0	695	0	69	67	13,701	0	0	13	2.40	11.0
20-Aug	9	77	9	1	696	0	69	34	13,735	0	0	13	2.00	11.0
21-Aug	19	96	19	0	696	0	69	57	13,792	0	0	13	1.80	11.0
22-Aug	23	119	23	0	696	1	70	46	13,838	0	0	13	1.70	11.0
23-Aug	18	137	18	0	696	0	70	61	13,899	0	0	13	1.50	11.0
24-Aug	24	161	10	0	696	0	70	54	13,953	0	1	14	1.50	11.0
25-Aug	41	202	30	0	696	0	70	22	13,975	0	0	14	1.50	11.0
26-Aug	172	374	25	0	696	0	70	63	14,038	0	0	14	2.00	10.0
27-Aug	103	477	25	0	696	0	70	36	14,074	0	0	14	1.70	11.0
28-Aug	115	592	20	0	696	0	70	14	14,088	0	0	14	1.60	11.0
29-Aug	69	661	20	0	696	0	70	23	14,111	0	0	14	1.50	11.0
30-Aug	131	792	30	0	696	0	70	5	14,116	0	0	14	1.40	11.0
31-Aug	93	885	30	0	696	0	70	11	14,127	0	0	14	1.30	10.0
01-Sep	40	925	40	0	696	0	70	2	14,129	0	0	14	1.30	10.0
02-Sep	94	1,019	50	0	696	0	70	2	14,131	0	0	14	1.30	10.0
03-Sep	276	1,295	68	0	696	0	70	10	14,141	0	0	14	2.30	7.5
04-Sep	116	1,411	40	0	696	0	70	2	14,143	0	0	14	2.80	
05-Sep	54	1,465	50	0	696	0	70	4	14,147	0	0	14	2.20	7.0
06-Sep	303	1,768	50	0	696	0	70	8	14,155	0	0	14	2.17	7.0
07-Sep	186	1,954	30	0	696	0	70	2	14,157	0	0	14	1.80	7.0
08-Sep	189	2,143	30	0	696	0	70	7	14,164	0	0	14	1.70	7.0
09-Sep	145	2,288	30	0	696	0	70	6	14,170	0	0	14	1.60	7.0
10-Sep	205	2,493	0	0	696	0	70	1	14,171	0	0	14	1.57	7.0
11-Sep	160	2,653	30	0	696	0	70	4	14,175	0	0	14	1.35	8.0
12-Sep	82	2,735	30	0	696	0	70	1	14,176	0	0	14	1.30	7.0
13-Sep	58	2,793	10	0	696	0	70	0	14,176	0	0	14	1.20	7.0
14-Sep	6	2,799	0	0	696	0	70	0	14,176	0	0	14	1.15	7.0
15-Sep	28	2,827	10	0	696	0	70	0	14,176	0	0	14	1.20	7.0
16-Sep	36	2,863	10	0	696	0	70	0	14,176	0	0	14	1.20	7.0
17-Sep	12	2,875	7	0	696	0	70	0	14,176	0	0	14	1.00	7.0
18-Sep	21	2,896	10	0	696	0	70	0	14,176	0	0	14	1.08	7.0
19-Sep	17	2,913	13	0	696	0	70	0	14,176	0	0	14	1.18	7.0
20-Sep	23	2,936	0	0	696	0	70	0	14,176	0	0	14	1.20	7.0
21-Sep	17	2,953	0	0	696	0	70	0	14,176	0	0	14	1.10	7.0
22-Sep	12	2,965	0	0	696	0	70	0	14,176	0	0	14	1.20	7.0
23-Sep	6	2,971	0	0	696	0	70	0	14,176	0	0	14	1.20	7.0
24-Sep	0	2,971	0	0	696	0	70	1	14,177	0	0	14	1.10	7.0
25-Sep	6	2,977	0	0	696	0	70	0	14,177	0	0	14	1.10	7.0
26-Sep	1	2,978	0	0	696	0	70	0	14,177	0	0	14	1.10	7.0
27-Sep	4	2,982	0	0	696	0	70	0	14,177	0	0	14	1.00	7.0
28-Sep	7	2,989	0	0	696	0	70	0	14,177	0	0	14	1.30	7.0
29-Sep	28	3,017	0	0	696	0	70	0	14,177	0	0	14	1.50	7.0

APPENDIX I

Appendix I1.-Completed access projects for NCIMA, 1999.

	Location	Project-Manager[a]	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

[a] DPOR = Division of Parks and Outdoor Recreation
DSF = Division of Sport Fish
SGR-DWC = 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

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

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.

APPENDIX K

Appendix K1.-Habitat permit applications for the NCIMA during 1999.

Location	Issued to	Subject	Issued	Permit #	Date Expires
Parks/4th July Ck & 3 unnamed waterbodies	Mazzitello/DOT	Beaver Dam Removal	09/29/1999	FG-II-0591	10/16/1999
Lake Creek	AKRR	Retain 2,000 cy of fill after train derailment	01/07/1999		permit not neccesary
Fish Creek	Gathercole, Steve	Vehicle removal	01/06/1999	FG99-11-0009	01/08/1999
Susitna Flats State Game /Lewis River	Sullivan/Unocal	Bridge repair	01/06/1999	FG98-II-0674	05/01/1999
White Lake Outlet Stream	Bailey, Bonnie/MTA	Telecomm. Cable	01/06/1999	FG98-II-0693	permit not neccesary
Peters Ck, Moose Ck, Kroto, 2 mile, etc	Tatlow, Carl	Placer Mining / stream crossings	01/06/1999	FG97II0133 amendment2	12/31/1999
Larson Creek	Carlson, Stan / CF	Weir Auth.	01/13/1998	FG98-II-0004	12/31/1999
Caribou, Billy & Chitina Creeks	Henrickson, Mike	Rec. Placer Mining	01/15/1999	FG-II-0001	permit not neccesary
Cache Creek	Weathers, Douglas	Placer Mining	01/15/1999	FG98-II-0708	12/31/1999
Peters Creek	Wolff, Gordon	Placer Mining	01/14/1999	FG98-II-0706	12/31/1999
Frozen lakes of Mat-Su Borough	McGhan Construction	Operate over weight vehicles on frozen lakes	01/14/1999	FG98-II-0700	12/31/1999
Cottonwood Lake	Amberger, Joe	Dock Construction	01/21/1999	FG98-II-0705	03/31/2000
Big Lake	Miller, David	Dock Construction	01/21/1999	FG99-II-0008	12/31/1999
Little Susitna River	McMillan	Recreational Mining	01/22/1999	FG99-II-0033	07/15/1999
Big Lake-North Shore	Zeddies, William	Dock Reconstruction	01/22/1999	FG99-II-0018	12/31/1999
Spring Creek Tributary	Leykom, Mary/ DOT	Culvert Extension	01/22/1999	FG98-II-0701	07/15/2000
Little Susitna River	McAlister, Robert	Recreational Placer Mining	01/25/1999	FG99-II-0025	07/15/1999
Wasilla Lake – Lakeshore Subd.	Cominsky, Al	Dock Construction	01/22/1999	FG99-II-0013	12/31/1999
Big Lake – Erickson Subd.	Baldwin, Keith	Dock Replacement	01/27/1999	FG99-II-0023	12/31/1999
Big Lake	Nolfi, Jay	Dock Replacement	01/27/1999	FG99-II-0021	12/31/1999
Willow Creek	Kataiva, Kenneth	Recreational Placer Mining	01/25/1999	FG99-II-0026	permit not neccesary
Fish Creek	DeLay, Rae /DOT	Bank Stabilization and Bridge Construction	02/27/1998	FG98-II-0078	12/31/1999
Indian River	Thomas, Roy/AKRR	Culvert Installation and Bulkhead	02/05/1999	FG98-II-0214	12/31/1999
Big Lake	Winneck, Walt	Dock Construction	02/05/1999	FG99-II-0020	03/31/1999
Answer, Possum & Middle Fork Montana Cks	Gissel, Chris	Frozen Stream Crossings/Heavy Equipment	02/05/1999	FG99-II-0063	permit not neccesary
Kashwitna River	Showers, Don	Winter Vehicle stream	02/10/1999	FG99-II-0027	03/31/1999
Crooked Lake Weir	Wilson, Wade	Non Authorization of Weir	02/10/1999	FG99-II-0022	permit not neccesary
Near Bodenburg Creek and Knik River	Butte Farm	Not Auth. Aerial pesticide/fungicide.	02/10/1999		permit not neccesary
Willow Creek	King, Roger	Recreational Placer Mining	02/09/1999	FG99-II-0039	07/15/1999
Moose, Kroto, and unnamed creeks	Reynolds, James/PII	Ice Bridges and Culverts	02/09/1999	FG99-II-0058	12/31/1999
White Creek	Guidotti/Gold Hill Mine	Placer Mining/Stream Diversion	02/17/1999	FG99-II-0041	12/31/1999
Visnaw Lake	Brown, Rick/MSB	Shoreline Restoration/Buffer	02/16/1999		permit not neccesary
Wasilla Lake	Ferris, Kevin	Dock Construction	02/16/1999	FG99-II-0072	03/31/1999
Kahiltna River	Thiele, Rudiger	Recreational Placer Mining	02/16/1999	FG99-II-0049	07/15/1999
Cottonwood Lake	Kennedy, Daniel	Dock Construction	02/18/1999	FG99-II-0044	12/31/1999
Nancy Lake	Cray, Mike	Floating Dock Installation	02/23/1999	FG99-II-0052	12/31/1999
Wasilla Lake	Bess, Rick	Dock Construction	03/11/1999	FG99-II-0079	03/31/2000
Talachulitna Creek	Shields, Pat/Com fish	Weir Installation and Operation	03/10/1998	FG98-II-0141	12/31/1999
Statewide Memorandum	Distribution	Oil Spill Notification List	03/01/1999	Memorandum	permit not neccesary
Near Trapper Creek	Strube, Steve Forestry	Timber Harvesting/Access Winter Roads		Memorandum	permit not neccesary
Windy Creek & Cache Creek	Soule, Harold	Placer Mining / stream crossings	03/02/1999	FG99-II-0054	12/31/1999
Caribou Creek	Sanner,Carol/DOT	Geotechnical Drilling	03/03/1999	FG99-II-0057	12/31/1999
Big Lake	Brown, Gregory	Dock Construction	03/12/1999	FG99-II-0107	03/31/1999
Wasilla Lake	Dodd, Henry	Dock Construction	03/12/1999	FG99-II-0116	03/31/2000
Big Lake	Harris, Dottie	Dock Construction	03/12/1999	FG99-II-0110	03/31/2000

-continued-

Appendix K1.-Page 2 of 6.

Location	Issued to	Subject	Issued	Permit #	Date Expires
Klutina River	Klutina River	Vehicle Crossing, Bridge Removal,Restoration	03/09/1999	FG99-II-0112	08/01/1999
5 Lewis River Sites in Su Flats SG Refuge	Peterson, Judd/DEC	Reserve pit Closure Plans	03/08/1999	Memorandum	permit not neccesary
Resurrection,Glacier,Deep,Ninil,Kasilof,Chulitna,Knik,Little Nelchina,Scott,Red,					
Cloud,Felton,Deadman,Olds,Kalsin,Myrtle,Roslyn,E.Fo	Sanner,Carol/DOT	Water withdrawal Seismic Retrofitting on existing Bridges	03/08/1999	FG99-II-0070	12/31/2000
L-Su,Flathorn Lk,B-Su & Yentna Rivers	Grey, Doug	Vehicle Stream Crossings	03/02/1999	FG99-II-0099	03/31/1999
Big Lake	Richison,Nancy	Dock & Boat House Reconstruction	03/12/1999	FG99-II-0124	12/31/1999
Knik Arm	Sheridan,Diane DOG/OMB	ARRC Geotechnical Investigation	03/16/1999	Memorandum	permit not neccesary
Ivan River Unit & Pretty Creek#2 / Su Flats SGR	Peterson, Judd/DEC	Unocal Reserve Pit Closure	03/16/1999	Memorandum	permit not neccesary
Wasilla Creek Access Road	Sheridan,Diane DOG/OMB	Wetland Fill	03/16/1999	Memorandum	permit not neccesary
Kroto Creek	Swing, Jim /MSB	Bridge Installation	03/17/1999	FG98-II-0323	06/30/1999
Anchor River/Fritz Creek Critical Habitat Area	Bear, David/HEA	Hazard Tree Removal/ Utility Line Rightofway	03/17/1999	FG99-II-0128	05/15/1999
Possum Creek/Montana Creek	Gissel, Chris	Culvert Installation	03/18/1999	FG99-II-0135	12/31/1999
Kashwitna River	Delo, Howard	Maintenance Dredging	03/23/1999	FG99-II-0144	09/30/2001
Big Lake	Strutz, Shirley	Dock Construction	03/25/1999	FG99-II-0155	04/15/1999
Wasilla Lake	Manual, Steve	Dock Construction	03/26/1999	FG99-II-0159	04/15/1999
Oil Well Road	Holzman/DNR	Realign right of way/preventHabitat loss for New Bridge	03/26/1999	Memorandum	permit not neccesary
Big Lake	Hellman, Owen	Dock Construction	03/26/1999	FG99-II-0142	03/31/2000
Roosevelt Creek	Thompson,Kevin	Placer Mining	03/22/1999	FG99-II-0136	permit not neccesary
Flat Lake	Kruse, Dan	Dock Construction	03/30/1999	FG99-II-0169	04/15/2000
Knik River/Glacier	Mt.View Knik Glacier Boat Tours	Temporary Commercial Recreation Camp	03/26/1999	Memorandum	permit not neccesary
Little Lonely Lake	Quintavell,Keith/MEA	Electric Utility Line on the bed of L-Lonely	03/26/1999	FG99-II-0112	permit not neccesary
West Papoose Lake	Webster, Dawn	Requested Variance for Cabin on island	03/19/1999		permit not neccesary
Unnamed Stream Section T.18N,R2W,S.M.	Kalmbach, G.F.	Culvert Installation	03/31/1999	FG99-II-0109	12/31/1999
Big Lake	Wiederbolt, John	Dock Construction	03/31/1999	FG99-II-0166	04/15/1999
Big Lake	Burnett, Jack	Dock Construction	03/31/1999	FG99-II-0165	04/15/1999
Honeybee Lake	Quintavell,Keith/MEA	Submerged Utility Line	04/02/1999	FG99-II-0111	permit not neccesary
Cache Creek	Herzog, Martin	Placer Mining	04/01/1999	FG99-II-0108	12/31/1999
Deshka,Moose,Camp,Cottonwood,Rabbit, Ninilchik,Kenai,	Campbell,				
Chester,Costello,Tlikakila,Johnson,Ship,Chester	Frenzel,Steve/USGS	Scientific Educational Fish Resource Permit	03/24/1999	SF-99-027	11/01/1999
Cornelius Lake	Donofrio, Dave	Dock Construction	04/05/1999	FG99-II-0175	03/31/2000
Wasilla Lake / Tranquility Shores Subdivision	Kay, Jean	Dock Construction	04/01/1999	FG99-II-0173	03/31/2000
Matanuska River	Sanner,Carol/DOT	Bank Protection	04/06/1999	FG99-II-0171	12/31/2001
Big Lake	Wilkes, Bill	Dock Construction	04/09/1999	FG99-II-0196	04/15/1999
Kings Lake	Kranich, Robert	Beach Development & Dock Construction	04/08/1999	FG99-II-0106	permit not neccesary
Spring Creek Tributary	Glenn, Becky/MTA	Aerial Telecommunications Cable Crossing	04/14/1999	FG99-II-0133	permit not neccesary
Big Lake	Hill, David	Dock Construction	04/13/1999	FG99-II-0200	04/15/2000
Lucky Gulch Creek	Morris, Claude	Placer Mining	04/19/1999	FG99-II-0191	permit not neccesary
Lucille Creek	Bailey, Bonnie/MTA	Underground Telecomm. Facilities	04/23/1999	FG99-II-0204	permit not neccesary
Canyon, Divide & Long Creeks	Friend, Jerry L	Recreational Placer Mining	04/23/1999	FG99-II-0126	permit not neccesary
Soapstone powerline area and Willer-Kash	Strube, Steve Forestry	5 year schedule Timber Sales	04/22/1999	Memorandum	permit not neccesary
Mud Lake	Wallin, Dennis	Floating Dock Installation	04/20/1999	FG99-II-0209	12/31/1999
Rogers Creek	Price, Al / ARC	Trestle/Bridge Replacement	05/07/1999	FG99-II-0160	12/31/2000
Honeybee Lake	Holzman/DNR	MEA Right of way	05/14/1999	Memorandum	permit not neccesary
Little Lonely Lake	Holzman/DNR	MEA Right of way	05/14/1999	Memorandum	permit not neccesary
Windy Creek	Holbek, Peter	Placer Mining	05/27/1999	FG99-II-0271	permit not neccesary
Unnamed Lakes (Sec.12&13T.17N,R3W,S.M.	Kuby, Buz/DNR	Temporary Water Use Permit	05/28/1999	Memorandum	10/31/1999

-continued-

Appendix K1.-Page 3 of 6.

Location	Issued to	Subject	Issued	Permit #	Date Expires
South Fork &/or Windy Creek	Kuby, Buz/DNR	Temporary Water Use Permit	05/28/1999	Memorandum	10/31/1999
Rainbow Lake	Quintavell,Keith	Submerged Utility Line	05/24/1999	FG99-II-0318	permit not neccesary
Memory Lake Area/Unnamed Stream	Moma, Paul	Culvert Extensions	05/24/1999	FG98-II-0035	07/01/1999
Walby Lake Area/Unnamed Ponds/Streams	Wildon, Wade	Culvert Reinstallation	05/25/1999	FG99-II-0250	07/15/1999
Unnamed Cottonwood Creek Tributary	Barry, Paul	Bottomless Culvert Installation	05/20/1999	FG99-II-0172	12/31/1999
Wasilla Lake	Kornchuck, Kurt	Dock Construction	05/20/1999	FG99-II-0188	03/31/2000
196 Mile Creek	Price, Al / ARC	Trestle/Bridge Replacement	05/20/1999	FG99-II-0162	12/31/2000
Cottonwood Creek	Lafferty, Bob/ADFG	Fishery Enhancement/weir/smolt trap	05/20/1999	FG99-II-0326	12/31/2001
Cottonwood Creek	Lafferty, Bob/ADFG	Fishery Enhancement/weir/smolt trap	05/20/1999	FG99-II-0327	12/31/2001
Little Susitna River	Lafferty, Bob/ADFG	Fishery Enhancement/weir	05/20/1999	FG99-II-0328	12/31/2001
197.5 Mile Creek (ARRC MP 197.5)	Price, Al / ARC	Trestle/Bridge Replacement	05/21/1999	FG99-II-0163	12/31/2000
Eldorado Creek	Bauer, Todd	Placer Mining (Stream Diversion)	05/21/1999	FG99-II-0248	12/31/1999
Susitna River	O'Neill, Robert/ARC	Bank Protection	05/21/1999	FG99-II-0251	07/15/1999
Mat-Valley Lakes	Bell, Michael A/SUNY	Stickleback collection/Fish Resource Permit	05/19/1999	SF-99-066-A-1	08/15/1999
Poorman Creek	Conway, James	Placer Mining	05/17/1999	FG99-II-0249	12/31/1999
Moose & Eska Creek	Kuby, Buz/DNR	Temporary Water Use Permit	05/12/1999	Memorandum	07/01/2000
Willow Creek	Delcupp, Daniel	Bank Revegetation	05/11/1999	FG99-II-0184	12/31/1999
7 Mile Lake Lagoon	Brown, Rick/MSB	Preliminary Plat Review/waterfront	05/12/1999	Comment only	no permit
Buffalo Mine Road	Holzman/DNR	MEA Right of way	05/12/1999	Memorandum	no permit
Big Lake Vicinity	Compton, Carol/DNR	Land Use /backhoe/EPA Restoration	05/03/1999	Memorandum	permit not neccesary
Rainbow Lake	Holzman/DNR	MEA Right of way	06/14/1999	Memorandum	permit not neccesary
Nugget & Cache Creeks	Kragness, Leonard	Placer Mining	06/10/1999	FG99-II-0157	12/31/1999
Gopher Gulch	Garrett, Dennis	Placer Mining	06/11/1999	FG99-II-0272	permit not neccesary
Wasilla Lake	McLane, Sam	Outfall Structure, Dock Removal, Bank Restoration	06/11/1999	FG98-II-0665	12/31/1999
MSB Fish Bearing Waters	Gathercole, Steven/Happy Hooker Towing	Vehicle Removal from Lakes,Creeks & Streams	06/09/1999	FG99-II-0143	12/31/1999
MSB/PHF	Mylius, Dick	Exchange of Lands/Colleen Matt	06/09/1999	Correspondence only	no permit
Thunder Creek	Amidon, Steven	Placer Mining	06/08/1999	FG99-II-0270	12/31/1999
Big Lake	Sheridan,Diane DOG/OMB	Wetland Fill	06/08/1999	Memorandum	no permit
Busch Creek	Titchenal, Robert	Placer Mining	06/15/1999	FG99-II-0312	permit not neccesary
East Fork Fishhook Creek	Kuby, Buz/DNR	Temporary Water Use Permit	06/16/1999	Memorandum	08/15/1999
Trading Bay State Game Refuge	Krueger, Thomas	Hovercraft Operation	06/11/1999	FG99-II-0090	09/01/1999
Matanuska River	Sanner,Carol/DOT	Bank Protection	06/26/1998	FG98-II-0463	12/31/1999
PHFSGR/Wasilla Creek	Lafferty, Bob/ADFG	Fish Weir	06/25/1999	FG98-II-0344	12/31/1999
Horseshoe Lake Creek (Little-Su Tributary)	Foran, Tom/ MTA	Aerial Telecommunications Cable Crossing	06/25/1998	FG98-II-0366	12/31/1998
Matanuska River	Sanner,Carol/DOT	Material Removal (Gravel from riverbed)	06/02/1998	FG95-II-0085	12/31/1999
Anna Lake	Lee, Susan/MSB	Variance Request for recreational Cabin	06/01/1999	Correspondence only	FG wish this permit not be granted
Big Lake	Archibald, Gary	Variance Request	06/01/1999	Correspondence only	ADFG does not support
Barry's Meadows	Brown, Rick/MSB	Preliminary Plat Review/waterfront	06/03/1999	Proposal Review	ADFG recommends mitigation
Nancy Lake	Brown, Rick/MSB	Vacation of Patent Reservation	06/03/1999	Petition Review	recommend replacement easement
Little Susitna River	Kuby, Buz/DNR	Temporary Water Use Permit (hydroseeding)	06/03/2009	Proposal Review	5/30/99 5 year extension requested
Montana Creek	Lewis, Becky	Vehicle Stream Crossings	06/30/1999	FG99-II-0429	07/15/1999
Mud Lake	Svendsen, Jon	Bank Restoration	06/30/1999	FG99-II-0428	12/31/1999
Long Lake	Daly, Mark	Floating Dock Installation	06/24/1999	FG99-II-0363	12/31/1999
Ryan Creek & Stepan Lake Outlet Stream & Trib	Wilson, Wade/MSB	Three Culvert Extensions, Rehabilitation	06/25/1999	FG99-II-0350	Permit Denied
Meadow Creek	Gryte, Haaken	Boat Basin Expansion	06/28/1999	Proposal to Excavate	Denied
Ivan River	Sullivan, Faye/Unocal	Debris Removal under Bridge	06/25/1999	FG99-II-0445	07/10/1999

-continued-

Appendix K1.-Page 4 of 6.

Location	Issued to	Subject	Issued	Permit #	Date Expires
Dinkel, Weinie & Dinkel Lakes	Jones, Gregory	Discharge Treated Sewage into the refuge	06/17/1999	Proposal	ADFG does not support this
Moose Creek	Valentine, Jerry	Vehicle Stream Crossings	06/22/1999	FG99-II-0426	07/15/1999
Moose Creek	Koch, Rick/Construction	Vehicle Stream Crossings	06/22/1999	FG99-II-0431	07/15/1999
Bodenburg Creek	Smith, Doug/RCDI	Bridge Replacement (Elk Road)	06/17/1999	FG98-II-0511	07/15/1999
Bodenburg Creek	Smith, Doug/RCDI	Bridge Replacement (North Bridge Road)	06/17/1999	FG98-II-0510	7/15/99-amended 10/4/99
Deception Creek	Luper, Charles	Vehicle Stream Crossings	06/18/1999	FG99-II-0390	07/15/1999
Butte Creek	Town, Bob	Recreational Placer Mining	06/18/1999	FG-II-0406	permit not neccesary
Peters Creek	Reem, Richard	Recreational Placer Mining	06/18/1999	FG99-II-0364	07/15/1999
Bodenburg Creek	Smith, Doug/RCDI	Bridge Replacement (Back Acres Road)	06/17/1999	FG98-II-0512	7/15/99-amended 10/4/99
Stephan Lake	McRoberts, Pat/MEA	Submerged Utility Line	02/29/1999	FG99-II-0496	12/31/1999
SFSGR, GBSGR & PHSGR	Frair, Jacqueline/Ducks Unlimited	Helicopter Surveys (vegetation)	07/28/1999	FG99-II-0481	08/15/1999
RBCHA & TBSGR	Carothers, Gar	Helicopter Landings (collect soil and water samples)	07/20/1999	FG99-II-0424	09/30/1999
Wasilla Creek	De Ley, Rae	Culvert Modification	09/29/1998	FG98-II-0023	08/30/1999
East Papoose Lake	Brown, Rick/MSB	Creating 3 Lots	07/27/1999	Proposal Review	ADFG recommends mitigation
Rabideux Agricultural Area	Trickett, Steve/DNT	Temporary Access Trail 9 (3 mile 20ft wide)	07/27/1999	Proposal Review	no permit
Big Lake	Walker, Thomas/CIAA	Variance Request	07/27/1999	Proposal Review	ough info. Or mitigation proposed
Willow Creek	Mason, Arnold	Placer Mining	07/27/1999	Proposal Review	permit not neccesary
Susitna Flats State Game Refuge	General Public Permit	Camping & Protection of Restoration Sites	07/26/1999	FG99-II-GP15	12/31/1999
Moose Creek (Tolovankorga Subdivision)	Brown, Rick/MSB	Preliminary Plat Review/waterfront	07/20/1999	Proposal Review	ADFG recommends mitigation
Peters Creek	Earl, Robert	Vehicle Stream Crossings	07/20/1999	FG99-II-0465	12/31/1999
Nancy Lake Tributary	Strube, Steve Forestry	Forest Land Use Plan/Timber Sale	07/23/1999	Memorandum	Plan Review
Little Susitna River	McCracken, Betsy	Campsite Construction & Bank Restoration	07/21/1999	FG99-II-0335	08/15/1999
Big Lake	Bailey, Bonnie/MTA	Submerged Utility Line	07/19/1999	FG99-II-0413	12/31/1999
Big Lake	Harmon, Jerry	Dock Replacement	07/15/1999	FG99-II-0404	12/31/1999
Caribou Creek	Sanner,Carol/DOT	Geo-technical Drilling	07/12/1999	FG99-II-0057	12/31/1999
Cottonwood Lake	Amberger, Joe	Shoreline Restoration, Enhancement & Mitigation	07/13/1999	FG99-II-0468	07/15/1999
Unnamed Stream, Samovar Way Rd.Section 21,T,19N,R2E,	Wilson, Wade/MSB	Culvert Installation	07/02/1999	FG99-II-0391	12/31/1999
Vera Lake	Holzman/DNR	MEA Right of way	07/02/1999	Memorandum	
Vera Lake	Quintavell, Keith/MEA	Submerged Utility Line	07/02/1999	FG99-II-0410	
Near Willow Creek (Burrow's River Aire Subd)	Brown, Rick/MSB	Subdividing lots adjacent to Willow Creek	07/01/1999	Proposal Review	
Bodenburg Creek	Kaucic, Charles/MSB	New 40 ft Railroad Bridge	07/01/1999	FG99-II-0384	07/15/1999
My Creek (SFSGR)	Erie, Larry/ADF&G	Vehicle use, stream crossing for bank restoration/campsite p	07/01/1999	FG99-II-0453	07/15/1999
Little Susitna River	McCracken, Betsy	Campsite Construction & Bank Restoration	07/07/1999	FG99-II-0335	08/15/1999
Peters Creek	Hansen, Jeff	Recreational Placer Mining	07/08/1999	FG99-II-0421	12/31/1999
Beverly Lake Outlet Stream	Kalmbach, G.F.	Culvert Reinstallation	08/04/1999	Compliance inspt rpt	08/31/1999
Unnamed Stream, S34,T.19N,R1E,S.M.	Bailey, Bonnie/MTA	Buried Telecommunications Facilities	08/30/1999	FG99-II-0534	permit not neccesary
Knik River in Three Locations	Kuby, Buz/DNR	Temporary Water Use Permit	08/10/1999	Memorandum	10/31/1999
Wolf Lake	Brown, Rick/MSB	Prelim plat,vacation of section line easement(ROW), utility	08/17/1999	Proposal Review	
Cache Creek	Lee, Kenneth & Winona	Placer Mining	08/12/1999	FG99-II-0458	12/31/1999
Long Lake	Brown, Rick/MSB	Variance Request in Long Lake Subd.	08/26/1999	Request Review	No Objection
Susitna Flats State Game Refuge	Peterson, Judd/DEC	Unocal Reserve Pit Closure	08/26/1999	Memorandum l	File-Additional info not received
Nancy Lake	Cray, Mike	Floating Dock Installation	08/27/1999	FG99-II-0052	12/31/2000
Wasilla Lake	Atkinson, Tom/OMB	Commercial Float Plane Docks	08/27/1999	Memorandum	Additional info required
Fish Creek Heights	Brown, Rick/MSB	Preliminary Plat Review	08/19/1999	Request Review	
Peters Creek	Tait, Robert	Vehicle Stream Crossings	08/18/1999	FG99-II-0518	09/20/1999

-continued-

Appendix K1.-Page 5 of 6.

Location	Issued to	Subject	Issued	Permit #	Date Expires
Big Lake	Wright, Tex	Pile Replacement (Dock)	08/27/1999	FG99-II-0501	04/15/2000
Flat Lake	Bailey, Bonnie/MTA	Submerged Utility Line	08/27/1999	FG99-II-0533	12/31/1999
Kroto Creek Tributary	Lord, Ronald H.	Vehicle Stream Crossings	08/10/1999	FG99-II-0470	12/31/1999
Wishbone Hill & Jonesville Area	Buzby, Bruce/DNR	Revision for Coal Exploration Permit	08/23/1999		
Matanuska River	Sanner,Carol/DOT	Bank Protection	08/24/1999	FG98-II-0463	12/31/1999
Wasilla Creek	Lafferty, Bob/ADFG	Fish Weir	08/21/1998	FG98-II-0524	12/31/2000
Meadow Creek	Walker, Thomas/CIAA	Weir Installation and Operation	08/21/1998	FG98-II-0526	02/28/2003
Two-Mile Creek	Swing, Jim/MSB	Bottomless Culvert Installation	08/27/1998	FG98-II-0594	12/31/1999
Eska Creek	Mulcahy, Laurie/DOT	Bridge Construction	08/26/1998	FG97-II-0740	12/31/1999
Cottonwood Creek	Swing, Jim/MSB	Bridge Installation	08/27/1998	FG98-II-0595	12/31/1999
Unnamed Stream (Twin #1)	Swing, Jim/MSB	Culvert Installation	08/27/1998	FG98-II-0596	12/31/1999
Unnamed Stream (Twin #2)	Swing, Jim/MSB	Bridge Installation	08/27/1998	FG98-II-0597	12/31/1999
Unnamed Stream S 11,T.24N,R.7W.,S.M.	Swing, Jim/MSB	Culvert Installation	08/27/1998	FG98-II-0598	12/31/1999
Kroto Creek	Davis, Jeffrey/OMB	Bridge Installation	08/28/1998	Memorandum	03/31/1999
Fourth of July Creek and 3 Unnamed Waterbodies	Mazzitello, John/DOT	Beaver Dam Removal-Parks Hwy	09/29/1999	FG99-II-0591	10/16/1999
Archangel Creek	Oliver, Jim	Placer Mining	09/10/1999	FG99-II-0540	
Loberg Lake	Kuby, Buz/DNR	Temporary water use permit (Summit Paving Cons)	09/22/1999	Memorandum	08/15/2000
Little Susitna River	Erie, Larry/ADF&G	Campsite Construction & Bank Restoration	09/20/1999	FG99-II-0578	08/15/2000
Blodgett Lake	Webstre, Dawn/MSB	Variance Request	09/16/1999	Request Review	
Caswell Lake and Kashwitna Lake	Kuby, Buz/DNR	Temporary Water Use Permit Parks Hwy	09/15/1999	Memorandum	10/31/1999
Cottonwood Creek	Atkinson, Tom/OMB	Wetland Fill to construct large storage facility	09/13/1999	Memorandum	Permit Not Granted
Nancy Lake	Beattie, Pat	Dock Construction	09/03/1999	FG99-II-0545	03/31/2000
Wasilla Creek	Leykom, Mary/DOT	Water Withdrawal	09/02/1999	FG99-II-0530	12/31/2000
Wasilla Creek	Leykom, Mary/DOT	Water Withdrawal	09/02/1999	FG99-II-0543	12/31/2000
Unnamed Stream Section 10,T.17N,R3W,S.M.	Bailey, Bonnie/MTA	Buried Telecommunications Facilities	09/02/1999	FG99-II-0535	
Big Creek and Peters Creek	Oliver, Jim	Big Ck placer mining/Peters Ck vehicle stream crossings	09/03/1999	FG99-II-0539	12/31/1999
Rolly Creek	Anderson, John	Stream Ford	09/03/1999	FG99-II-0558	12/31/1999
Kroto Creek	Nash, Charles	Equipment Ford	09/03/1999	FG99-II-0514	Permit Not Required
Big Lake	Hamrick, Wes	Tag one Rainbow trout for Derby Sept. 11-12,1999	09/10/1999	SF-99-100	09/12/1999
Mat-Su Borough	Strube, Steve Forestry	Forest Practices Notification Timber Harvesting	09/08/1999	Memorandum	
Unspecified Lake	Spurgeon, Kevin	Construct a Boat Ramp	09/08/1999	Correspondence only	No App. Yet
Big Lake	Lee, Susan/MSB	Variance Request	09/09/1999	Proposal Review	
Knik R, Friday, Jim & Bodenburg Creeks	Cox, Ted/Butte Community Council	Removal of Abandoned Vehicles	09/08/1999	FG99-II-0574	12/31/2000
Moose Creek	Helling, James/Usibelli Coal Mine	Equipment Ford	10/07/1999	FG99-II-0596	12/31/2000
Lynne Lake	Compton, Carol/DNR	Dam Removal	10/13/1999	Memorandum	
Moose Creek	Helling, James/Usibelli Coal Mine	Equipment Ford	10/07/1999	FG99-II-0	12/31/2000
Bodenburg Creek	Borup, Bruce/MRCDC	Bridge Replacement	10/08/1999	FG99-II-0563 (Permit Denial)	Permit Not Granted
Niklason Lake	Pakan, John	Floatplane Dock Construction	10/07/1999	FG99-II-0577	12/31/2000
Nancy Lake	Kleewein, Kenny	Floating Dock Construction	10/08/1998	FG98-II-0636	12/31/1999
Kroto Ck locations, Lake Ck, Two Mile, Moose, Unnamed (	Ellis, Edward	Ice Bridges & Culverts	11/05/1998	FG98-II-0639	12/31/2000
Kroto, Moose & Unnamed Creeks	Tatlow, Carl D	Bridges, Ice Bridges and Culvert Onlys	11/06/1998	FG93-II-0700	12/31/1999
Lake & Yenlo Creeks	Ellis, Edward	Vehicle Stream Crossings	11/04/1998	FG98-II-0638	03/31/2000
Lake Creek	Ellis, Edward	Equipment Ford	11/05/1998	FG98-II-0640	12/31/2000
Wasilla Creek	Besse, Richard L.	Bridge Construction	11/19/1998	FG98-II-0659	
Big Lake	Coppola, Fred	Bank Restoration	11/20/1998	FG98-II-0647	12/31/1999
Little Susitna River	Love, Bobby	Vehicle Stream Crossings	10/14/1999	FG99-II-0581	Permit Denied

-continued-

Appendix K1.-Page 6 of 6.

Location	Issued to	Subject	Issued	Permit #	Date Expires
Goose Bay State Game Refuge	General Public Permit	Off-road Vehicle Use	10/22/1999	FG99-II-GP11	12/31/1999
Skookum Creek	Bradley, Joe	Placer Mining	10/25/1999	FG99-II-0552	Permit Not Required
Rainbow Lake	Bailey, Bonnie/MTA	Buried Telecommunications Facilities	10/25/1999	FG99-II-0566	Permit Not Required
Little Su River Milepost 57 to 67	Sworts, Brad/DOT	Drainage Structures Meeting Summary	11/05/1999	Memorandum	
Stephan Lake	McRoberts, Pat/MEA	Submerged Utility Line	11/09/1999	FG99-II-0496	12/31/2000
Caribou Creek	Sanner,Carol/DOT	Geo-technical Drilling	11/10/1999	FG99-II-0057	12/31/2000
Trading Bay State Game Refuge	Krueger, Thomas	Hovercraft usage on Refuge	11/09/1999	Reminder FG-II-0090	09/01/1999
Wasilla Lake	Brown, Rick/MSB	Preliminary Plat	10/27/1999	Correspondence only	Permit Not Required
Fourth of July Creek	Mazzitello, John/DOT	Beaver Dam Removal	10/27/1999	FG99-II-0589	12/31/1999
Knik River (MP 0 - 10)	Kuby, Buz/DNR	Temporary Water Use Permit-Wilder Const.	10/29/1999	Comment Only	10/31/1999
Gold Creek	Garrett, Dennis R.	Placer Mining	10/29/1999	FG99-II-0576	
Lynx Lake Inlet Stream	Kelly, Robert J.	Culvert Installation	10/29/1999	FG99-II-0583	07/15/2000
Trading Bay State Game Refuge	General Public Permit	Off-road Vehicle Use	11/10/1999	FG99-II-GP38	03/31/2000
Nancy Lake	McRoberts, Pat/MEA	Submerged Utility Line	11/26/1999	FG99-II-0606	12/31/2000

APPENDIX L

Appendix L1.-Age, sex and length composition of sockeye salmon sampled at the Fish Creek weir July 27-August 24, 1999.

	Age Group								
	1.1	1.2	2.1	1.3	2.2	1.4	2.3	3.2	Total
Males	3,056	6,520	255	255	509		102		10,697
Percent	1.45	24.43	0 .96	0.96	1.91		0.38		40.08
Mean Length	331	485	318	558	472		515	438	
SE	2	3	6	17	8		5		2
Sample Size	60	128	5	5	10		2		210
Females	51	13,498		407	1,783	51	153	51	15,994
Percent	0.19	5,0.57		1.52	6.68	0.19	0.57	0.19	59.92
Mean Length	295	472		516	483	510	528	480	475
SE		2		10	5		14		1
Sample Size	1	265		8	35	1	3	1	314
Both Sexes	3,107	20,018	255	662	2,292	51	255	51	6,691
Percent	1.64	75.00	0.96	2.48	8.59	0.19	0.96	0.19	100
Mean Length	330	476	318	532	480	510	523	480	460
SE	2	1	6	9	4		8		1
Sample Size	61	393	5	13	45	1	5	1	524

Appendix L2.-Age, sex and length composition of sockeye salmon sampled at the Cottonwood Creek weir July 15-September 19, 1999.

	Age Group					
	1.2	2.1	1.3	2.2	2.3	Total
Males	8,826	308	1,387	3,700	347	14,568
Percent	22.47	0.78	3.53	9.42	0.88	37.10
Mean Length	457	340	511	465	517	463
SE	2	5	4	3	10	1
Sample Size	229	8	36	96	9	378
Females	15,762		1,542	6,783	617	24,704
Percent	40.14		3.93	17.27	1.57	62.90
Mean Length	467		504	466	505	470
SE	1		4	2	5	1
Sample Size	409		40	176	16	641
Both Sexes	24,588	308	2,929	10,483	964	39,272
Percent	62.61	0.78	7.46	26.69	2.45	100
Mean Length	463	340	507	465	509	467
SE	1	5	3	1	5	1
Sample Size	638	8	76	272	25	1,019

Appendix L3.-Age, sex and length composition of sockeye salmon sampled at Wasilla Creek weir July 28-September 19, 1999.

	Age Group								
	0.2	1.1	1.2	2.1	1.3	2.2	2.3	3.2	Total
Males	4	2	247	2	28	123	13	2	421
Percent	0.48	0.24	29.58	0.24	3.35	14.73	1.56	0.24	50.42
Mean Length	423	310	449	350	507	444	505	425	452
SE	3		2		9	4	9		2
Sample Size	2	1	112	1	13	56	6	1	192
Females			237		26	136	15		414
Percent			28.38		3.11	16.29	1.80		49.6
Mean Length			452		500	454	509		458
SE			2		9	3	10		1
Sample Size			108		12	62	7		189
Both Sexes	4	2	484	2	54	259	28	2	835
Percent	0.48	0.24	5,7.96	0.24	6.47	31.02	3.35	0.24	100
Mean Length	423	310	450	350	504	449	507	425	455
SE	3		1		6	2	7		1
Sample Size	2	1	220	1	25	118	13	1	381