Fishery Management Report No. 03-04

Area Management Report for the Recreational Fisheries in Resurrection Bay, 1998-2000

by

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and

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Alaska Department of Fish and Game **Division of Sport Fish**

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Spell out acre and ton.

Time and temperature

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

Spell out year, month, and week.

Physics and chemistry

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

General

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

Mathematics, statistics, fisheries

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

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by

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SECTION I: OVERVIEW

MANAGEMENT AREA

The Resurrection Bay sport fish management area consists of all fresh and salt waters between Gore Point and Cape Puget. This management area is further divided into two pieces: Resurrection Bay proper (all waters north of a line between Cape Resurrection and Aialik Cape) and all waters outside Resurrection Bay from Gore Point to Cape Puget (Figure 1). The city of Seward is the only community in the management area. Tourism, including a growing sport fish charter industry, is vital to the economy of Seward. Access to area sport fisheries is by road, rail, air, and boat. Except for road-accessible streams, lakes, and Seward beaches, most sport fisheries in the Resurrection Bay Management Area are relatively remote and require a boat or plane to access. Principal land managers include private individuals, the City of Seward, U.S. National Park Service, U.S. Forest Service, native corporations, and the State of Alaska.

Groundfish (halibut, rockfish, lingcod, shark) research and management is directed by a Fishery Biologist III, Scott Meyer, stationed in Homer. Groundfish are managed on a regional scale covering the Gulf of Alaska west of Cape Suckling to the Aleutian Islands. Groundfish issues will not be covered in detail in this report and the reader is referred to the Management Report for Southcentral Alaska Recreational Halibut and Groundfish Fisheries, 2001 (Meyer and Stock 2002).

In September 1995, the Central Gulf Management Area was split into two separate areas: Prince William Sound and Resurrection Bay. Resurrection Bay salmon and Dolly Varden management and research functions are now directed by a Fishery Biologist II, Daniel Bosch, stationed in Anchorage. This report will address saltwater catch and harvest data from the Resurrection Bay proper portion of the management area through 2000.

Codified regulations for Resurrection Bay area saltwater sport fisheries are found in the Cook Inlet-Resurrection Bay Saltwater Area section under Chapter 58, Title 5 of the Alaska Administrative Code (AAC). Codified regulations for Resurrection Bay area freshwater sport fisheries are found in the Kenai Peninsula Area section under Chapter 56 of the AAC. For the purposes of effort, catch, and harvest reporting, the Statewide Harvest Survey (SWHS) by Mills (1979-1994) and Howe et al. (1995, 1996, 2001a-d, Walker et al. *In prep*) is used. Resurrection Bay area fisheries are summarized under Area P in these reports.

FISHERIES RESOURCES

Most area sport fisheries occur in salt water and target five species of Pacific salmon (coho or silver *Oncorhynchus kisutch*, chinook or king *O. tshawytscha*, pink or humpy *O. gorbuscha*, chum or dog *O. keta*, and sockeye or red *O. nerka*), and Dolly Varden *Salvelinus malma*. The Resurrection Bay area is home to one of the largest marine coho salmon fisheries in the Pacific Northwest. This popular fishery is highlighted during the August Seward Silver Salmon Derby sponsored by the Seward Chamber of Commerce. Coho salmon are a mix of hatchery and naturally produced fish, chinook and sockeye salmon are a result of hatchery production, pink and chum salmon and Dolly Varden are wild fish. Resurrection Bay is a popular jumping off point for sport fishing boats targeting groundfish species such as halibut *Hippoglossus stenolepis*, rockfish *Sebastes* and *Sebastolobus*, and lingcod *Ophiodon elongatus*. There is also

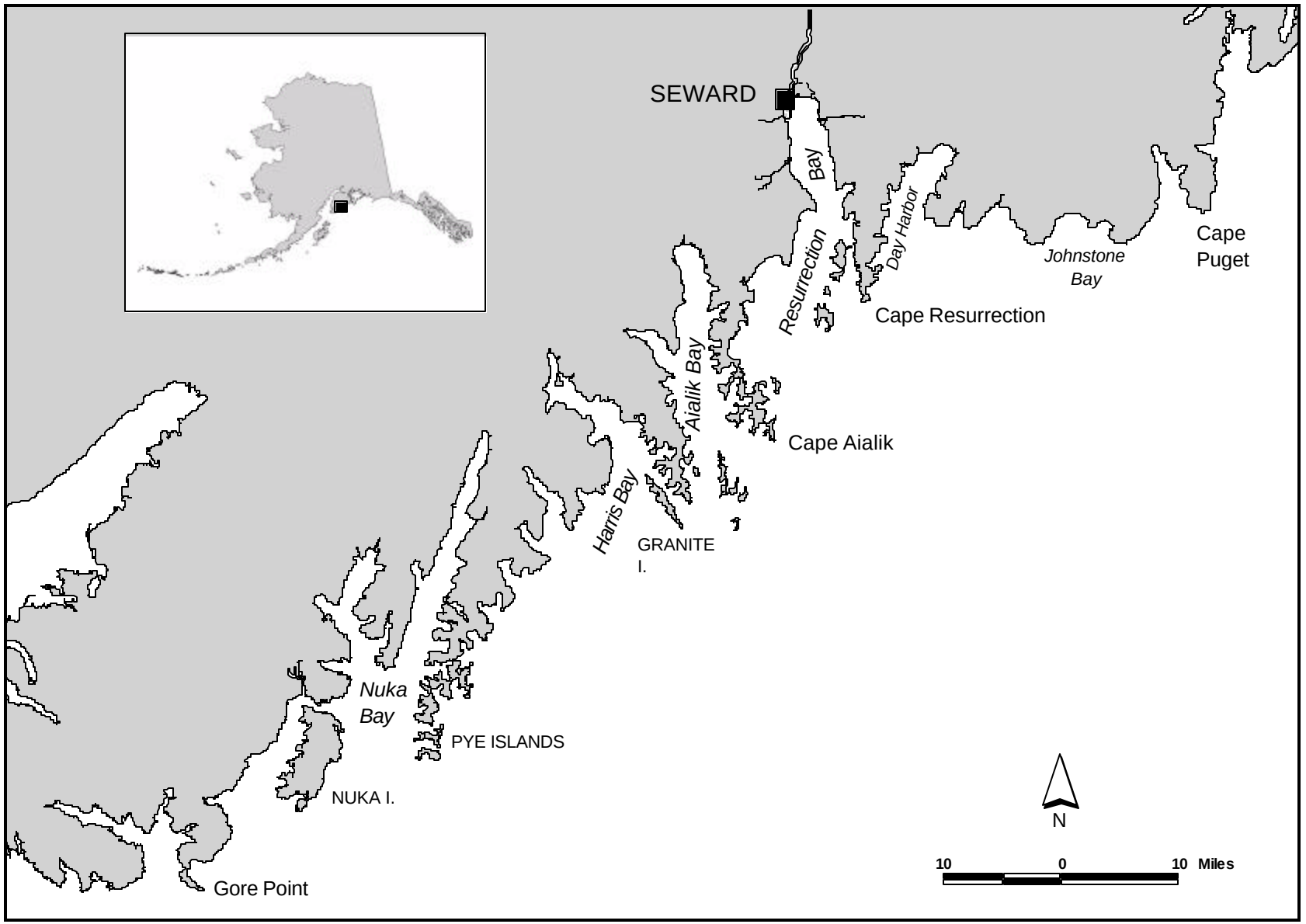

Figure 1.-Resurrection Bay Sport Fish management area.

a salmon shark *Lamna ditropis* fishery developing. All freshwater drainages in Resurrection Bay are closed to salmon fishing but open to Dolly Varden, rainbow trout, and Arctic grayling sport fishing.

ALASKA BOARD OF FISHERIES ACTIVITIES

The Alaska Board of Fisheries (BOF) is responsible for promulgating regulations in state waters. Public input concerning regulation changes and allocation issues is provided through various means including direct testimony to the BOF and participation in local fish and game advisory committees. These advisory committees have been established throughout Alaska to assist the Boards of Fisheries and Game in assessing fisheries and wildlife issues and proposed regulation changes. Proposals must be submitted between the time the board issues a call for proposals, usually in December or January, and a set deadline, usually in early April. Most advisory committees meet at least once each year, usually in the fall prior to BOF meetings. Staff from the Division of Sport Fish and other divisions of the Alaska Department of Fish and Game (ADF&G) often attend committee meetings. Advisory committee meetings allow for direct public interaction with department staff involved with local resource issues. The Seward Advisory Committee represents Seward and Moose Pass.

Under its current schedule, the BOF reviews regulations for each area on a 3-year cycle. Proposals for the Resurrection Bay-Cook Inlet Regulatory Area will next be considered in 2004/2005.

ACTIONS TAKEN AT THE 2001 BOARD OF FISHERIES MEETING

There were seven proposals before the BOF for consideration at the November 2001 meeting that had the potential to affect Resurrection Bay fisheries:

Two proposals were aimed to target coho salmon harvest by anglers in Resurrection Bay toward hatchery stocks. Proposal 32, submitted by Alaska Sportfishing Association, recommended restricting the bag and possession limit of coho salmon to three fish prior to August 1, and six fish August 1 and later. The BOF took "no action" on Proposal 32, based on their action on Proposal 33. Proposal 33, submitted by the Seward Advisory Committee, created a Terminal Harvest Area within Resurrection Bay. In the marine waters north of a line between Cape Resurrection and Cape Aialik, bag and possession limits for salmon other than king salmon in the Terminal Harvest Area would be six per day and in possession. Limits for salmon other than kings outside the Terminal Harvest area would be six per day and in possession, but only three per day and in possession may be coho salmon. The BOF favored Proposal 33. It provides regulatory consistency between Cook Inlet and Prince William Sound, decreases the harvest rate on mixed stocks, and provides protection to local North Gulf Coast coho salmon stocks. Proposal 33 was passed without change.

Proposal 17 proposed a bag limit of two chinook salmon for the Cook Inlet winter fishery between November 1 and March 31. This proposal was submitted in the 1998/99 BOF cycle, but was deferred to the North Gulf of Alaska King Salmon Task Force. However, that task force was eliminated in the fall of 2000 due to lack of funding, so the proposal was considered during the 2001/2002 BOF cycle. The proposal was amended by the BOF to include all marine waters of Cook Inlet, including the North Gulf Coast (Cape Puget to Gore Point) and Resurrection Bay. The proposal was further amended to include chinook salmon harvested in the winter in the annual limit of five that had previously applied only to the Cook Inlet summer fishery. Proposal 17 was carried as amended by the BOF, and for the first time sets an annual limit of five chinook

salmon in North Gulf Coast and Resurrection Bay waters, and requires all anglers to record the harvest of all chinook salmon 20 in length or greater. The daily bag limit for chinook salmon in this area remains at two.

Proposal 27 was submitted by ADF&G to standardize boundaries for sport, personal use, subsistence, and commercial fishing in the Outer Gulf Coast. This proposal would have moved the sport fishing regulatory boundary between the North Gulf Coast Area and Prince William Sound Area from Cape Puget to Cape Fairfield. Bag limits for rockfish and lingcod are more liberal in the Prince William Sound Area than they are in the North Gulf Coast Area. Moving the regulatory boundary east to Cape Fairfield would have included the Cape Puget to Cape Fairfield area, which receives extensive effort from the Seward-based charter boat fleet, in the more liberal Prince William Sound regulations. Liberalizations to rockfish regulations would have only occurred during the winter months when very few boats are fishing. There would have been no real impact to rockfish stocks with this boundary change. However, liberalization of the lingcod regulations would have real impacts to lingcod stocks as the Prince William Sound regulations allow for two lingcod per day compared to the current one per day. With this in mind, ADF&G withdrew the proposal. The BOF took no action on Proposal 27. ADF&G will not resubmit this proposal and North Gulf Coast/Prince William Sound Sport Fish regulatory boundaries will remain as they are.

Cook Inlet Aquaculture Association (CIAA, a private nonprofit corporation) submitted Proposal 31 to amend the Bear Lake Hatchery Plan (Appendix A1). The amendment would have required the Resurrection Bay commercial purse seine fishery to be managed for a sockeye harvest of 66,000 fish, and would have established a Special Harvest Area in the northeast corner of Resurrection Bay. CIAA further proposed to discontinue the Grouse Lake late-run sockeye stocking and enhance the Bear Lake system with early-run fall pre-smolt and spring smolt releases for cost recovery. This proposal failed. It met fairly stiff broad-based opposition, mainly against the proposed harvest strategy. The last portion of this proposal, enhancing Bear Lake with a different life stage of sockeye salmon, has been put forth by CIAA as a change to the Trail Lakes Hatchery Plan for 2002, and is still under consideration by ADF&G.

Two proposals would have affected the Resurrection Bay shark fisheries. The first was in response to the regulation that states a fish becomes a part of the bag and possession limit of the person originally hooking the fish. Proposal 40 would have allowed guides to hook sharks for their clients. However, the BOF expressed concern in setting a precedent of regulation allowing someone else to hook fish, and turned down this proposal. The second proposal, Proposal 41, would have allowed for directed commercial hook-and-line shark fisheries, with sale of sharks as bycatch allowable in other commercial fisheries as well as liberalized bag limits in recreational fisheries. The BOF deferred this proposal to their March 2002 statewide meeting, where it was not accepted.

RECREATIONAL ANGLER EFFORT

Recreational angler effort[1] in Resurrection Bay in 2000 (estimated 83,830 angler-days) was close to the 1990-1999 average of 83,480 angler-days (Table 1). Angler effort trends in Resurrection Bay indicate an overall increase in effort from 72,181 angler-days in 1990 to 83,830 angler-days

[1] The Statewide Harvest Survey (SWHS) by Mills (1979-1994), Howe et al. (1995, 1996, 2001a-d) and Walker et al. (*In prep*) serves as the basic reference for effort, catch, and harvest for Resurrection Bay salmon and Dolly Varden fisheries. It is not possible, because of the nature of the harvest survey, to determine the amount of effort expended on a species-specific basis.

in 2000. The 2000 level of sport fishing effort represents 3% of the statewide and 5% of the Southcentral sport angling effort, respectively (Table 1, Figure 2).

Beginning in 1986, the SWHS began estimating angler activity in Resurrection Bay by charter boat, private boat, and shore anglers (Table 2, Figure 3). In 2000, fishing from charter boats averaged 33% of total effort, private boats accounted for 50%, and shore fishing represented 18%.

Table 1.-Number of angler-days expended in Resurrection Bay compared to Southcentral and Statewide, 1977-2000.

	Statewide	Southcentral	Resurrection Bay		
Year	Effort	Effort	Effort	% of Statewide	% of S.Central
1977			41,797		
1978			53,355		
1979			43,576		
1980			49,623		
1981			56,410		
1982			49,167		
1983	1,732,528	1,212,916	42,150	2%	3%
1984	1,866,837	1,341,658	46,678	3%	3%
1985	1,943,069	1,406,419	55,759	3%	4%
1986	2,071,412	1,518,712	55,372	3%	4%
1987	2,152,886	1,556,050	44,299	2%	3%
1988	2,311,291	1,679,939	53,029	2%	3%
1989	2,264,079	1,583,547	50,546	2%	3%
1990	2,453,284	1,745,110	72,181	3%	4%
1991	2,456,328	1,782,055	73,683	3%	4%
1992	2,540,374	1,889,730	83,568	3%	4%
1993	2,559,408	1,867,233	90,274	4%	5%
1994	2,719,911	1,966,985	86,861	3%	4%
1995	2,787,670	1,985,539	100,194	4%	5%
1996	2,006,528	1,434,943	81,699	4%	6%
1997	2,079,514	1,400,983	90,031	4%	6%
1998	1,856,976	1,258,482	71,564	4%	6%
1999	2,499,152	1,659,966	84,742	3%	5%
2000	2,627,805	1,844,824	83,830	3%	5%

Source: Mills 1979-1994; Howe et al. 1995-1996, 2001a-d; Walker et al. *In prep*.

STOCKING PROGRAM INVENTORY

Stocking of hatchery-raised coho, chinook, and sockeye salmon has increased and diversified opportunities for Resurrection Bay saltwater anglers. These stocking activities consist of two types of programs: those directed specifically toward enhancing the sport fisheries, and those that are intended to increase the harvest potential of the commercial fisheries but incidentally enhance the availability of fish for the sport angler. All of the salmon releases contribute to the common property fisheries and are thus available to any fishery regardless of the target group.

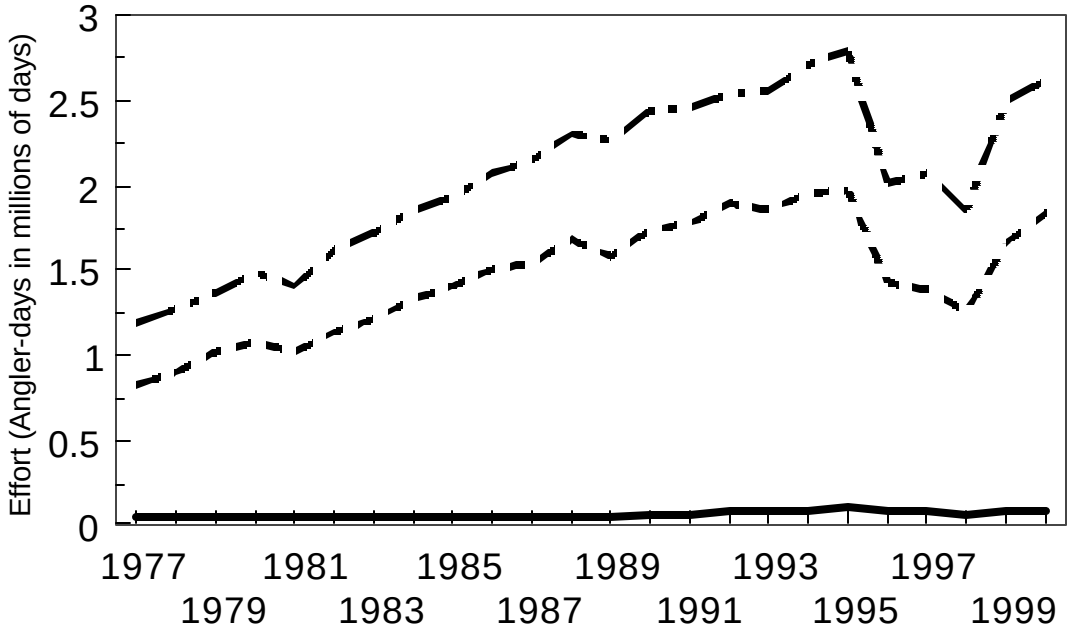

Figure 2.-Number of angler-days expended in Resurrection Bay compared to Southcentral and Statewide, 1977-2000.

Table 2.-Components of Resurrection Bay saltwater sport fish effort, 1977-2000.

	Saltwater	Charter Boat		Private Boat		Shore	
Year	Effort	Effort	Percent	Effort	Percent	Effort	Percent
1977	41,797						
1978	53,355						
1979	43,576						
1980	49,623						
1981	56,410						
1982	49,167						
1983	40,144						
1984	44,669						
1985	47,472						
1986	51,375	13,180	26%	24,923	49%	13,272	26%
1987	42,143	12,423	29%	18,364	44%	11,356	27%
1988	50,251	10,587	21%	23,520	47%	16,144	32%
1989	47,386	10,628	22%	21,207	45%	15,551	33%
1990	69,485	17,810	26%	36,556	53%	15,119	22%
1991	71,332	20,872	29%	32,291	45%	18,169	25%
1992	80,814	21,342	26%	41,206	51%	18,266	23%
1993	85,559	22,251	26%	41,442	48%	21,866	26%
1994	85,742	26,664	31%	38,807	45%	20,271	24%
1995	99,689	32,057	32%	42,132	42%	25,500	26%
1996	81,499	23,214	28%	36,156	44%	22,129	27%
1997	89,686	24,052	27%	41,446	46%	24,188	27%
1998	71,034	22,409	32%	32,129	45%	16,496	23%
1999	84,637	22,962	27%	45,143	53%	16,532	20%
2000	83,551	27,184	33%	41,560	50%	14,807	18%
1986-2000 Average	72,946	20,509	28%	34,459	47%	17,978	25%

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

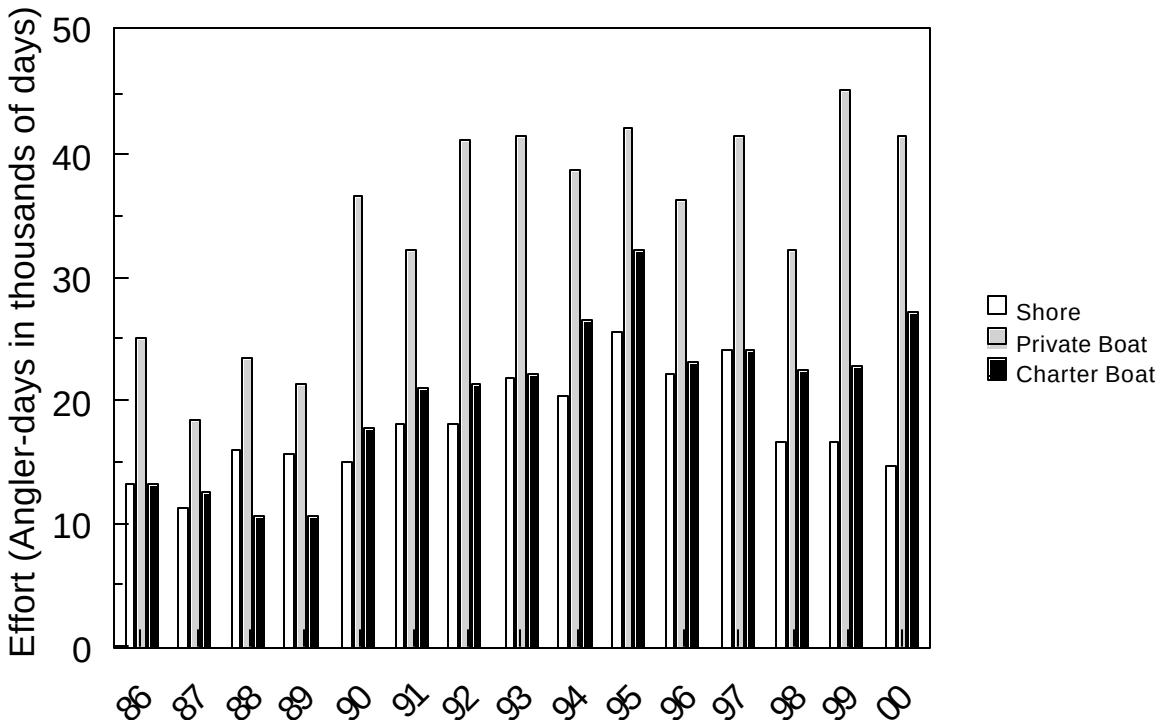

Figure 3.-Components of Resurrection Bay saltwater sport fishing effort, 1986-2000.

Those programs directed toward enhancing sport fisheries include the stocking of coho and chinook salmon smolts by state-operated hatcheries (Fort Richardson and Elmendorf) and the release of coho salmon raised by CIAA. CIAA releases sockeye salmon into Resurrection Bay fresh waters primarily for commercial activities. In 2000, 1.8 million sockeye salmon fry were released at Bear Lake to support commercial fishing activities. To benefit sport anglers, 316,000 coho salmon fry were released into Bear Lake. In addition, over 301,800 coho smolt and over 322,300 chinook salmon smolt were stocked in Seward-area waters in 2000 (Table 3). A complete stocking history of Resurrection Bay can be found in Appendix B.

RESURRECTION BAY MANAGEMENT PLANS

The Board of Fisheries has established two management plans for Resurrection Bay salmon. These plans provide for the sustained yield of area fisheries, as well as establishing allocations and management guidelines for department managers. Management plans and policies established for Resurrection Bay include:

1. Bear Lake Management Plan 5 AAC 21.375. This management plan establishes guidelines for the enhancement of coho and sockeye salmon in Bear Lake near Seward. In essence, the plan provides for the enhancement of sockeye salmon in Bear Lake intended for commercial use in Resurrection Bay, provided the enhancement does not negatively impact coho salmon smolt production from Bear Lake.
2. Resurrection Bay Salmon Management Plan 5 AAC 21.376. This management plan provides allocation and management guidelines for Resurrection Bay salmon fisheries. The plan stipulates that coho and chinook salmon fisheries of Resurrection Bay be managed exclusively for recreational uses, and provides for a commercial fishery for other salmon

species only if the prosecution of these fisheries does not interfere with the recreational fishery in Resurrection Bay.

These management plans are presented in Appendix A.

Table 3.-Hatchery releases in Resurrection Bay from 1994-2001, and planned releases for 2002.

Stocking location	1994	1995	1996	1997	1998	1999	2000	2001	2002[a]
Coho fry									
Bear Lake	320,000	509,000	350,000	448,700	409,000	306,000	316,000	310,000	
Bear Creek									
Coho fingerling									
Bear Creek									
Bear Lake									
Box Canyon Creek									
First Lake									
Sink Hole									
Seward Lagoon									
Coho smolt									
Bear Creek				153,000	177,000	51,000	102,000	120,500	120,000
Bear Lake		7,400	75,000						
Box Canyon Creek									
Grouse Lake									
Lowell Creek	38,000	50,698	69,000	61,687	65,687	62,580	54,184	125,618	120,000
Seward Lagoon	201,577	133,700	182,000	144,112	74,365	109,142	145,693	124,703	120,000
Chinook smolt									
Box Canyon Creek									
Lowell Creek	104,477	95,256	115,000	117,208	101,992	85,502	109,461	114,748	105,000
Seward Lagoon	165,596	220,146	300,000	203,932	205,133	88,066	212,873	113,147	105,000
Spring Creek									
Thumb Cove									
Chum fingerling									
Jap Creek									
Spring Creek									
Sockeye fry									
Bear Lake	170,000	330,000	780,638	788,000	360,000	1,380,000	1,800,000		2,400,000
Sockeye fingerling									
Bear Lake									
Sockeye smolt									
Bear Lake					506,703				
Grouse Lake	570,000	993,000	217,605	2,428,000	1,573,458				
Rainbow trout									
First Lake							1,000	1,000	1,000

Source: Marianne McNair, ADF&G, CFMD, Juneau; Jeff Hetrick and Robert Blankenship, CIAA, Trail Lakes Hatchery; ADF&G, Division of Sport Fish stocking records.

[a] Proposed stocking levels.

SECTION II: FISHERIES OVERVIEW

Major Resurrection Bay sport fisheries occur in salt water. These include an extremely popular coho salmon fishery, as well as chinook, pink, sockeye, and chum salmon, and Dolly Varden fisheries. Groundfish fisheries targeting halibut, rockfish, and lingcod are also popular. In 2000, 83,551 angler-days were expended in Resurrection Bay marine sport fisheries (Table 4). Coho salmon (70,771) and groundfish (64,829) supported the bulk of the harvest.

The following discussion of each fishery includes a brief historical overview, discussions about recent fishery performance, management objectives, recent BOF actions, current issues, and current or recommended management and research activities.

RESURRECTION BAY FISHERIES

Resurrection Bay Coho Salmon Fishery

Resurrection Bay supports one of the largest marine coho salmon sport fisheries in the Pacific Northwest. While most coho salmon harvested from 1990-1999 were by anglers in private boats (58%; Table 5, Figure 4), a shorebased fishery on beaches in and near Seward accounts for about 18% of the total coho salmon harvest in those years. A growing charter boat fleet transports anglers who harvest the remaining 25%. Since the inception of the SWHS in 1977, the marine harvest of coho salmon has ranged from 9,727 in 1984 to a peak of 87,213 in 1997 (Table 5, Figure 5). The 9-day Seward Silver Salmon Derby, which has been held each August since 1956, highlights this fishery. The Board of Fisheries recognized the importance of the Resurrection Bay coho salmon sport fishery, and in 1966 developed the Resurrection Bay Salmon Management Plan (5 AAC 21.376), which gave the sport fishery exclusive use of the bay's coho salmon. In 1976, the BOF modified the plan to stipulate that the commercial fishery for pink and chum salmon be managed so that it does not interfere with the recreational coho and chinook salmon fishery. During their November 2001 meeting the BOF created the Resurrection Bay Terminal Harvest Area for Silver Salmon. This area includes all the marine waters in Resurrection Bay north of a line extending from Cape Resurrection to Cape Aialik. Bag and possession limits of six silver salmon inside the terminal harvest remain in effect. In North Gulf Coast marine waters (Cape Puget to Gore Point) outside this terminal harvest area, new bag and possession limits of three silver salmon are in effect starting in 2002.

An ongoing enhancement program was initiated in 1964 in Bear Lake, which flows into Resurrection Bay, to supplement wild-stock production of coho salmon. The enhancement program included stocking hatchery-reared coho fingerlings and eradicating major competitors such as threespine stickleback *Gasterosteus aculeatus*. Initial results of the program resulted in increased smolt production (Vincent-Lang 1987). However, the lake gradually became re-infested with stickleback and the lake was again rehabilitated in 1971. Subsequently, survival of stocked fingerlings to smolt in some years has exceeded 50%. This, coupled with correspondingly high adult survival rates, has increased harvests in the recreational fishery. The Board of Fisheries recognized the importance of this enhancement program's contribution to the sport fishery and, in 1971, adopted the Bear Lake Management Plan (5 AAC 21.375). This plan stated that Bear Lake be managed primarily for the production of coho salmon and, in accordance with this objective, placed restrictions on the number of sockeye salmon that could be passed into Bear Lake.

Table 4.-Effort expended sport fishing and harvest by species in Resurrection Bay, 1977-2000.

Year	Saltwater Effort	All Effort	Salmon					Dolly Varden	Groundfish [a]	Other [b]
			Chinook	Coho	Pink	Sockeye	Chum			
1977	41,797		515	14,528	1,595	6	63	1,720	14,457	26,034
1978	53,355		501	16,731	6,610	0	39	1,248	20,080	47,173
1979	43,576		156	14,315	2,100	0	100	973	24,690	15,562
1980	49,623		198	19,665	12,614	0	276	878	30,884	32,496
1981	56,410		162	14,721	7,776	0	194	5,335	22,853	20,736
1982	49,167		345	18,518	9,328	0	458	1,562	25,687	21,830
1983	40,144	42,150	199	11,277	4,909	0	923	5,811	20,215	15,421
1984	44,669	46,678	24	9,727	11,510	1,305	2,569	1,771	26,087	12,773
1985	47,472	55,759	187	11,227	5,262	1,335	634	191	22,554	4,382
1986	51,375	55,372	207	14,418	11,008	337	1,958	1,071	47,222	11,637
1987	42,143	44,299	633	24,220	3,368	815	1,974	815	18,853	1,694
1988	50,251	53,029	2,056	17,626	2,001	418	3,947	728	46,327	2,754
1989	47,386	50,546	976	19,184	4,856	624	1,696	993	41,186	17,806
1990	69,485	72,181	1,004	29,761	6,193	418	427	228	27,910	9,480
1991	71,332	73,683	1,547	30,964	4,714	983	757	524	38,352	2,299
1992	80,814	83,568	2,925	27,904	4,277	1,135	1,321	376	53,453	6,728
1993	85,559	90,274	5,121	47,572	4,172	1,865	680	774	50,537	1,644
1994	85,742	86,861	2,078	38,465	5,573	1,415	688	283	56,910	1,744
1995	99,689	100,194	3,886	40,098	4,799	1,294	396	675	43,743	2,356
1996	78,262	81,699	6,247	75,808	4,910	767	1,676	705	48,303	1,646
1997	89,686	90,031	6,436	87,213	1,571	1,786	745	494	50,967	4,042
1998	71,034	71,564	3,267	69,146	2,837	1,269	209	861	47,803	9,975
1999	84,637	84,742	2,640	75,620	4,560	1,031	663	221	53,122	2,060
2000	83,551	83,830	2,655	70,771	3,883	1,485	1,179	514	64,829	3,269
80-89 average	47,864	49,690	499	16,058	7,263	483	1,463	1,916	30,187	14,153
90-99 average	81,624	83,480	3,515	52,255	4,361	1,196	756	514	24,159	4,197

Source: Mills 1979-1994; Howe et al. 1995-1996, 2001a-d; Walker et al. *In prep*.

[a] Includes halibut, rockfish, and lingcod (1991-2000).

[b] Other may include smelt, herring, sablefish, cod, greenling, sculpin, shark, and lingcod (1987-1990).

Table 5.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of coho salmon.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										14,528
1978										16,731
1979										14,315
1980										19,665
1981										14,721
1982										18,518
1983										11,277
1984										9,727
1985										11,227
1986		2,125		8,364		10,489		3,929		14,418
1987		2,209		16,652		18,861		5,359		24,220
1988		1,473		9,932		11,405		6,221		17,626
1989		2,889		13,444		16,333		2,851		19,184
1990	10,039	7,487	21,392	16,631	31,431	24,118	8,403	5,643	39,834	29,761
1991	8,265	7,335	20,484	18,452	28,749	25,787	5,827	5,177	34,576	30,964
1992	5,830	5,263	19,199	15,976	25,029	21,239	7,823	6,665	32,852	27,904
1993	13,957	12,907	31,728	27,018	45,685	39,925	8,512	7,647	54,197	47,572
1994	6,872	6,377	23,510	21,248	30,382	27,625	11,337	10,840	41,719	38,465
1995	9,150	8,172	25,737	21,713	34,887	29,885	12,717	10,213	47,604	40,098
1996	24,093	18,696	51,346	41,898	75,439	60,594	19,217	15,214	94,656	75,808
1997	30,300	24,010	75,463	50,188	105,763	74,198	16,771	13,015	122,534	87,213
1998	19,501	16,288	63,145	42,552	82,646	58,840	11,537	10,306	94,183	69,146
1999	29,891	24,053	54,169	44,500	84,060	68,553	8,628	7,067	92,688	75,620
2000	25,706	22,708	47,222	42,079	72,928	64,787	7,186	5,984	80,114	70,771

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

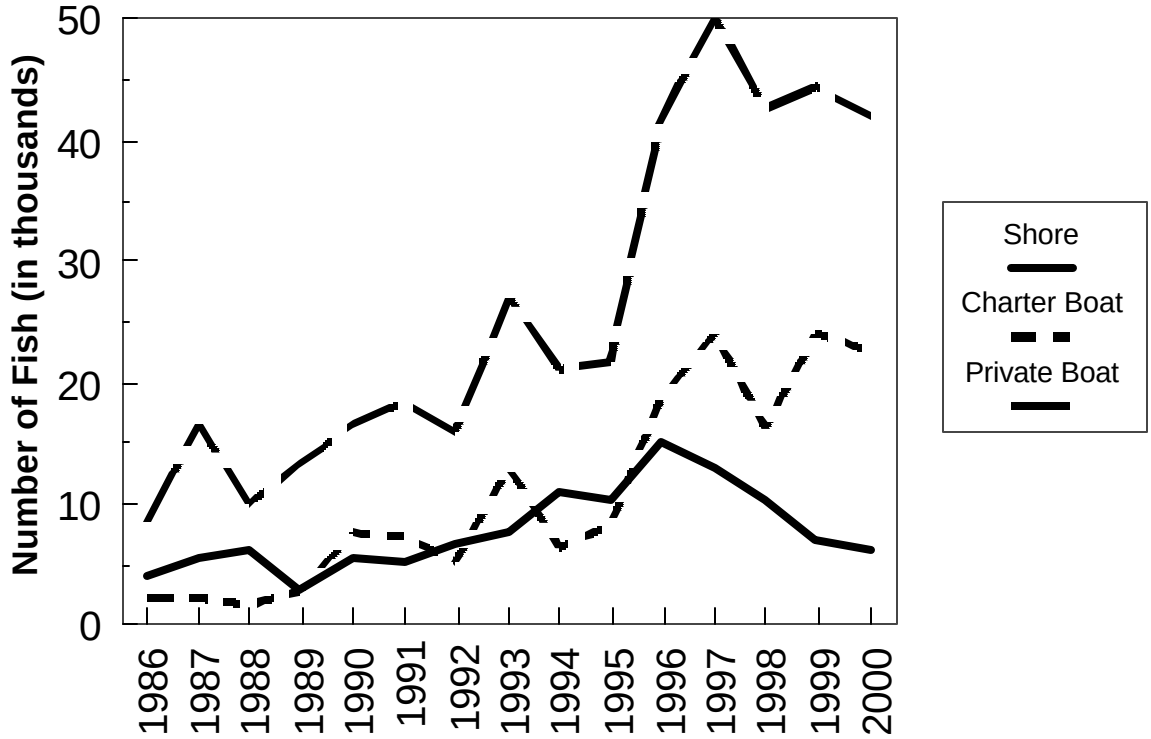

Figure 4.-Resurrection Bay saltwater coho salmon harvest by fishery, 1986-2000.

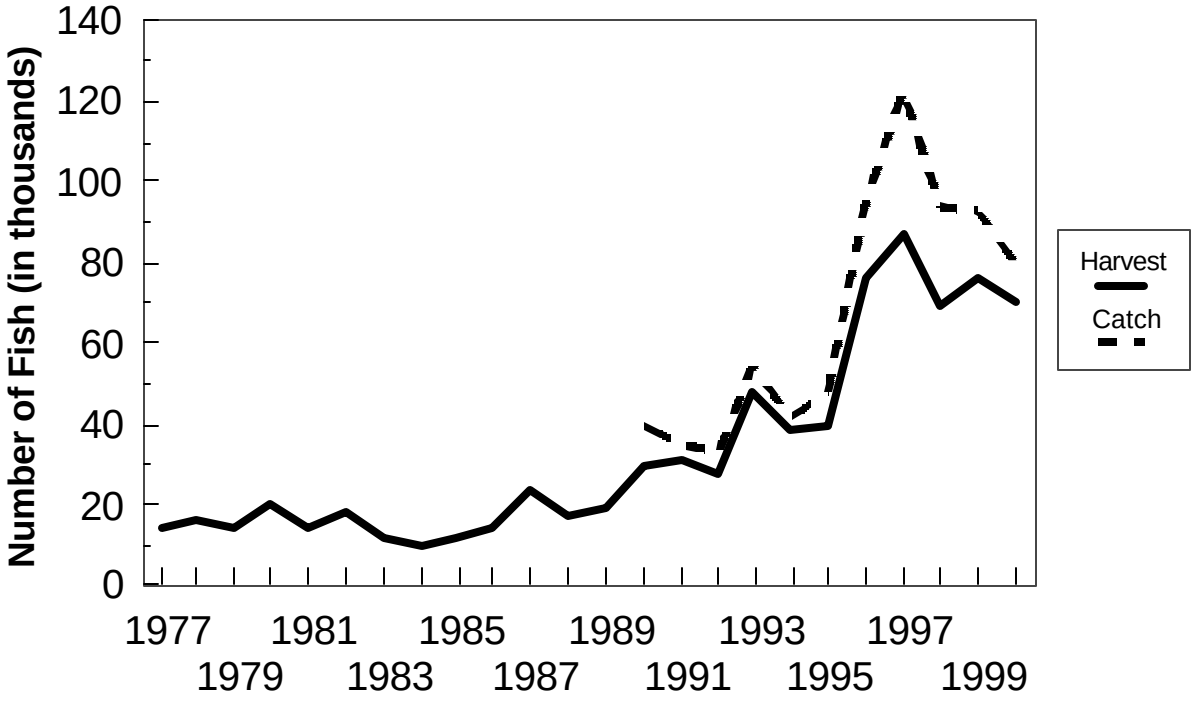

Figure 5.-Total Resurrection Bay saltwater coho salmon harvest, 1977-2000.

In 1988, the BOF revised the Bear Lake Management Plan. The revised plan allowed for lifting the restrictions placed on the number of sockeye salmon that could be passed into the lake and allowed for the enhancement of sockeye salmon in Bear Lake. The purpose of this change was to allow for the development of a commercial sockeye salmon fishery in Resurrection Bay. Bear Lake was considered to be the only viable location for such enhancement in the Resurrection Bay area. In making this change, however, the BOF recognized the importance of Bear Lake in producing coho salmon for the recreational fishery and stipulated that: (1) any enhancement of sockeye salmon must not cause a net loss of coho salmon smolt production from Bear Lake, and (2) that any commercial fishery developed as a result of this enhancement effort must be prosecuted with minimal conflict to the recreational fishery. With this change, in 1989 the Cook Inlet Aquaculture Association took over control of the Bear Lake weir and its operations, which had been operated by the Division of Sport Fish since the early 1960s.

Another component of the coho salmon enhancement in Resurrection Bay began in 1969 with annual plants of hatchery-reared smolt at a variety of local release sites. Although survival rates have varied between sites and years, smolt-to-adult survivals have been as high as 15%. The contribution of these fish to the sport fishery has also been significant, up to 51% (Vincent-Lang 1987; Vincent-Lang et al. 1988; Carlon and Vincent-Lang 1989, 1990). Hatchery release sites and number of fish stocked can be found in Table 3 and Appendix B.

The Department currently stocks about 240,000 coho smolt at two Resurrection Bay locations; Lowell Creek (120,000) and Seward Lagoon (120,000). The Seward Chamber of Commerce also buys 120,000 coho smolt each year from CIAA that are released into Bear Creek. As part of their contractual agreement to operate the Trail Lakes Hatchery, CIAA also releases about 400,000 coho fry annually into Bear Lake.

The current bag and possession limits for salmon other than chinook salmon in Resurrection Bay salt water are six fish per day and in possession. Snagging is legal in salt water. All freshwater drainages of Resurrection Bay have been closed to salmon sport fishing since before statehood.

Recent Fishery Performance

Estimates for Resurrection Bay angler effort (83,830) and coho salmon harvest (70,771; Table 4) in 2000 have increased over the previous 10-year average (Figure 5), especially harvest. Angler harvest by type in 2000 varied from the 1990-1999 averages mentioned earlier. Anglers fishing from private boats still accounted for most of the coho salmon harvest (42,079, 59%); but shore-based anglers fishing along Seward beaches from the boat harbor to Lowell Point and across the bay at the mouth of Spring Creek only accounted for 5,984 coho, or just 9% of the harvest. Charter boat clients harvested the remaining 22,708 fish (32%; Table 5, Figure 4).

The 2001 recreational coho salmon fishery offered excellent opportunities for anglers out of Seward. Strong returns of early coho in July were reported from anglers targeting coho in the marine waters near Pony Cove and the mouth of Resurrection Bay. Many charter boat operators were able to limit out (six coho to each angler) two charters a day. Starting in August, angler success was highest east of Resurrection Bay in Whidbey, Johnstone, and Puget bays. Charter operators, following the schools of coho as they moved east, reported catches from as far as Montague Island. Anglers fishing from private boats reported similar success, but catches were limited later in the season due to the limited range of the smaller boats.

The average yearly coho harvest in Resurrection Bay has increased from 15,858 fish from 1977-1989, to the current 5-year average (1996-2000) of 73,284 coho. Stocking levels alone do not

appear to account for this increased level of harvest. Both charter and private anglers continue to venture farther out of Resurrection Bay and target coho salmon earlier in the season. Anecdotal evidence suggests that coho salmon caught in the Resurrection Bay fisheries are from adjacent coho salmon stocks, most likely Prince William Sound. A study addressing this issue was initiated in 2001. Starting in 2002, 100% of all coho salmon released into Resurrection Bay with have thermal marked otoliths. All hatcheries involved in coho release programs in Prince William Sound and in Cook Inlet thermally mark the otoliths of all coho salmon released. With all hatchery-released coho salmon marked, the department will implement a study to estimate the hatchery contribution of the coho salmon harvest from the Port of Seward. This study will be designed to estimate the contribution of each hatchery by time and area of harvest. The origin of the wild contribution of the harvest will not be determined, but the total wild contribution will be estimated.

Coho bag and possession limits in the marine waters of the Resurrection Bay Management Area (Resurrection Bay and adjacent waters of the Outer Gulf Coast from Gore Point to Cape Puget) are currently six per day and six in possession. Coho limits in Cook Inlet to the west, and Prince William Sound to the east are both regulated at three per day and three in possession. In designated Terminal Harvest Areas, in Prince William Sound and Lower Cook Inlet, where returning hatchery fish are targeted, coho bag limits are six per day. The BOF considered two proposals during the winter of 2001/2002 to help limit the harvest of coho salmon in the Resurrection Bay fisheries that are bound for other areas.

Since 1998, 5 AAC 75.076 has required that all saltwater charter boat operators report their number of clients, their catch, and their harvest by species. The saltwater charter logbooks (from 1998 to 2000) report fishing for, or harvesting coho salmon from 35 statistical areas out of Seward (Figure 6). Of these 35 areas, 90% or more of the coho salmon harvested from charter boats comes from only five areas. These five areas are 496002, 495938, and 495932 which all include portions of Resurrection Bay; 485933 (Whidbey Bay); and 485935 (Johnstone Bay) to the east of Resurrection Bay. During 1998–2000 only 6,160 (38%) to 7,336 (29%) of total coho harvested by charter boat were harvested before the beginning of August, while 10,236–17,608 (62% to 71%) were harvested after the beginning of August. In almost all of these five statistical areas a majority of the coho are harvested after the beginning of August. The one exception is area 495932, which includes Pony Cove and Cape Aialik. Generally by the time the Seward Silver Salmon Derby begins in early August, 50% or more of the coho harvest has occurred. To the east of Resurrection Bay, Whidbey Bay (485933), and Johnstone Bay (485935) are targeted more heavily after the beginning of August.

Management Objective

For coho salmon smolt releases, the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 18,000 coho salmon; and (2) generate 25,000 angler-days of fishing opportunity directed at stocked coho salmon for both boat and shorebased anglers.

While no formal escapement goals have been established for coho salmon returns in Resurrection Bay, CIAA allows a minimum of 300 coho salmon into Bear Lake. A weir on Bear Creek is used to collect coho salmon eggs for ADF&G and CIAA stocking activities.

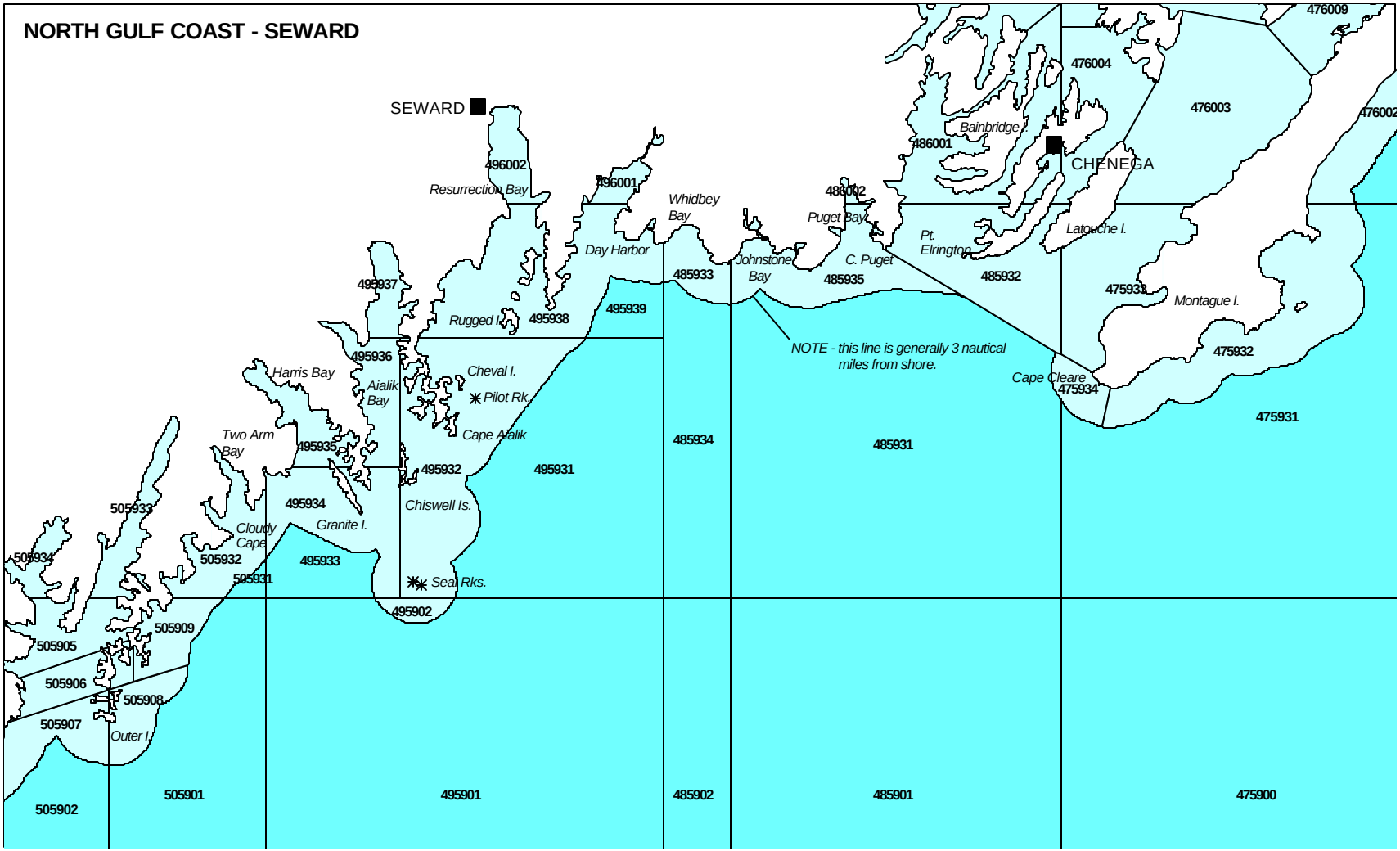

Figure 6.-Seward-area and North Gulf Coast statistical reporting areas for charter boat logbook data.

No other specific fishery objectives have been formally established for Resurrection Bay coho salmon fisheries to date other than management objectives outlined in the Bear Lake and Resurrection Bay Management Plans.

Recent Board of Fisheries Actions

In 1998/1999, the BOF passed a proposal submitted by the Alaska Sealife Center (ASLC). This proposal asked for a small saltwater closed area centered around their newly constructed fish pass to protect returning experimental pink salmon in 2000 through 2002. While the department has the authority to invoke 5 AAC 75.050. Waters Closed to Sport Fishing. (a) the waters within 300 feet of a fish weir or fish ladder are closed to sport fishing, unless a lesser distance is indicated by department markers, ASLC was urged to submit this proposal for BOF deliberation. The area in question is popular with shore and boat anglers, especially during the Seward Silver Salmon Derby. The department recognized the need for a seasonal closure around the fish pass to ensure adequate returns of research fish, but did not agree that a year-round closure is necessary. The BOF passed an amended version of the original proposal, closing the saltwater area within a 300-ft radius of the ASLC fish pass (or as marked by the department) to sport fishing from August 1 through October 31. This regulation expires after the 2002 season.

In November 2001 the BOF enacted regulations that make all marine waters in Resurrection Bay, north of a line between Cape Aialik and Cape Resurrection, a Terminal Harvest Area for coho salmon. The bag and possession limit for coho salmon in this Terminal Harvest Area is six per day and six in possession. In all other North Gulf Coast Marine waters, from Cape Puget to Gore Point, the bag and possession limit for coho is now three per day and three in possession, and is consistent with coho salmon bag and possession limits in Cook Inlet and Prince William Sound. This is designed to focus effort on enhanced stocks of coho in Resurrection Bay and to reduce fishing effort on wild coho stocks in the North Gulf coast.

Current Issues

The impact on Resurrection Bay sport fisheries by developing a commercial sockeye salmon fishery targeting stocks returning to Bear Lake appears to be minimal. This fishery occurs in late-May through June, well before coho salmon are present in Resurrection Bay. The commercial fishery is further restricted to weekdays to avoid any conflict with weekend anglers and the area near Seward is closed to commercial fishing. The Division of Commercial Fisheries staff based in Homer is responsible for management of this fishery and work closely with Division of Sport Fish staff to minimize conflicts. The increasing sport harvest of coho salmon reported from Seward is another issue being addressed as previously described.

Ongoing Research and Management Activities

A research project to estimate hatchery and natural contribution to the sport fishery has been discussed due to increases in harvest. Hatchery coho releases, both in and outside of Resurrection Bay, have been thermally marked with patterns unique to each hatchery. A feasibility study began in 2001 to establish sampling methods and insure adequate sample sizes of sport-caught coho could be obtained. Funding is being secured to continue this study as a full project in 2002.

Recommended Research and Management Activities

Determine the hatchery contribution of coho salmon harvested in Seward, by time and area, using thermal-marked otoliths on all hatchery released coho salmon.

Resurrection Bay Chinook Salmon Fishery

Resurrection Bay does not support any wild returns of chinook salmon. The sport fishery for chinook salmon in and near Resurrection Bay is supported primarily by hatchery-produced fish, with a limited harvest of wild feeder chinook salmon. Chinook salmon smolt were stocked in Box Canyon Creek, a tributary of Resurrection River, from 1976-1979 and 1983, in an attempt to create a new sport fishery (Appendix B). These attempts failed to produce significant adult returns. Beginning in 1984, chinook salmon smolt have been released in marine waters adjacent to Lowell Creek. In 1985, Seward Lagoon was also stocked with early-run chinook smolt. These releases of "early-run" (May-June) fish have averaged approximately 225,000 smolt annually since 1988 (Table 3, Appendix B). Starting in 1991, chinook salmon smolt with late run timing (August) have been stocked in Seward Lagoon. This program to release late-run chinook, intended to diversify and extend fishing opportunities in Resurrection Bay, was cut in 1998 due to the unavailability of brood stock. Consequently, a reduction in chinook salmon sport harvest of about 1/3 is expected.

The marine waters of Resurrection Bay are open to the taking of chinook salmon throughout the year. The bag and possession limits for chinook salmon in Resurrection Bay salt water are two fish per day and in possession with no size restrictions. Snagging is legal in salt water. All freshwater drainages of Resurrection Bay have been closed to salmon sport fishing since before statehood.

From 1990-1999, the average harvest of chinook salmon from marine waters of Resurrection Bay has been about 3,515 fish (Table 4). Harvests ranged from 1,004 in 1990 to a peak of 6,469 in 1997. Most chinook (60%) during this period were harvested by shorebased anglers (Table 6, Figure 7).

Recent Fishery Performance

The sport harvest of chinook salmon in Resurrection Bay during 2000 (2,665; Figure 8) fell within the range for 1990-1999 (Table 4). In 2000, shore anglers, concentrated near release sites at Lowell Creek and the Seward Lagoon outfall, accounted for 46% of the total harvest (Table 6, Figure 7) with snagging being the preferred method. Anglers trolling in private boats accounted for 27% of the total harvest, while anglers employing charter boats saw an increase in 2000 and accounted for 27% of the total chinook harvest. A small but growing number of boat anglers are targeting these hatchery-produced fish in May. Observations of the chinook salmon fishery indicate that most of the early-run harvest is taken by shore anglers while most of the late run is harvested by boat anglers targeting silver salmon. Anglers with private boats and a few charter operators have also started targeting winter kings. These chinook, also called "feeder kings," are generally from "non-local" stocks (a few as far away as Washington and British Columbia) and spend winters feeding in Alaskan waters. This fishery is highly weather dependant and has reported low harvest so far.

Management Objective

The Resurrection Bay Salmon Management Plan allocates chinook salmon to the sport fishery.

Table 6.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of chinook salmon.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										515
1978										501
1979										156
1980										198
1981										162
1982										345
1983										199
1984										24
1985										187
1986		13		97		110		97		207
1987		217		127		344		289		633
1988		236		655		891		1,165		2,056
1989		147		371		518		458		976
1990	84	62	890	532	974	594	1,290	410	2,264	1,004
1991	437	358	452	420	889	778	888	769	1,777	1,547
1992	388	329	1,584	1,219	1,972	1,548	1,669	1,377	3,641	2,925
1993	976	674	1,655	1,292	2,631	1,966	3,834	3,155	6,465	5,121
1994	632	348	691	434	1,323	782	2,092	1,296	3,415	2,078
1995	913	608	1,225	899	2,138	1,507	3,139	2,379	5,277	3,886
1996	1,330	807	1,354	1,172	2,684	1,979	4,972	4,268	7,656	6,247
1997	1,175	573	3,220	2,156	4,395	2,729	4,924	3,740	9,319	6,469
1998	729	263	1,421	880	2,150	1,143	2,447	2,124	4,597	3,267
1999	594	303	1,185	779	1,779	1,082	2,432	1,558	4,211	2,640
2000	854	717	1,478	717	2,332	1,434	1,565	1,221	3,897	2,655

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

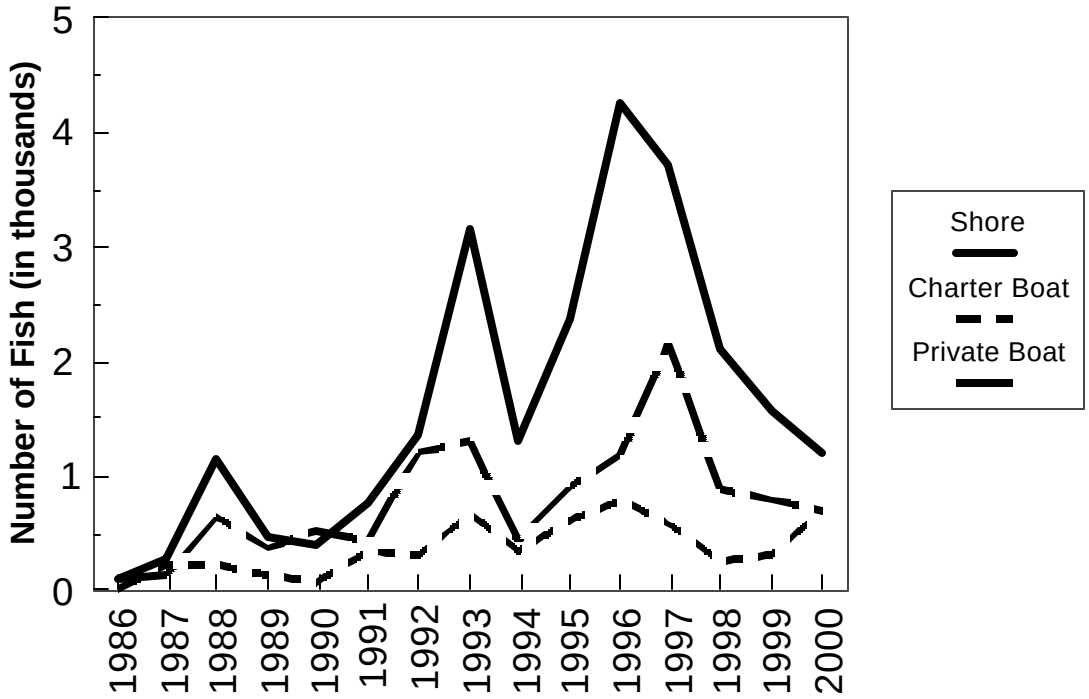

Figure 7.-Resurrection Bay saltwater chinook salmon harvest by fishery, 1986-2000.

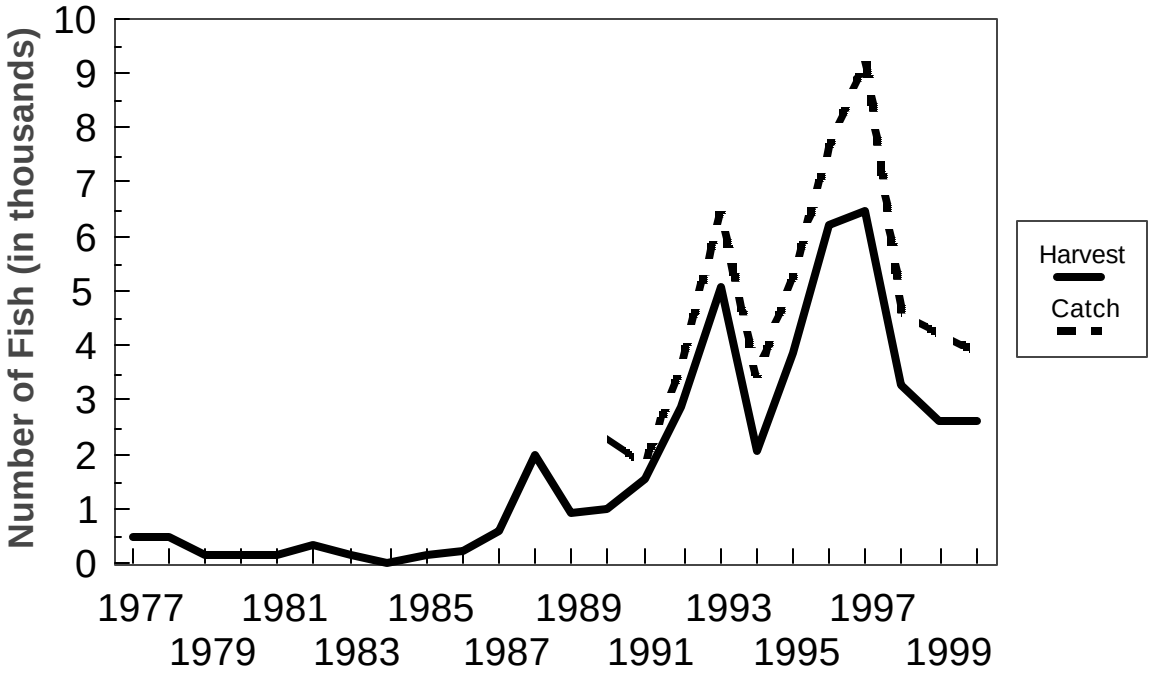

Figure 8.-Total Resurrection Bay saltwater chinook salmon harvest, 1977-2000.

For hatchery-produced chinook salmon, the management objectives are to: (1) produce, through hatchery production, an annual return of 6,000 early-run chinook salmon; and (2) generate 10,000 angler-days of chinook salmon fishing opportunity annually for both boat and shorebased anglers.

Recent Board of Fisheries Actions

There were no BOF actions specific to this fishery in 1998/1999. In November 2001 the BOF enacted regulations to include North Gulf Coast marine waters, including Resurrection Bay, in the annual limit of five chinook salmon 20 inches in length or greater that had previously applied only to Cook Inlet waters. This regulation will go into effect in the 2002 fishing season.

Current Issues

There has been some public discussion in Seward in regard to the "snag" fishery that has developed targeting these hatchery fish. A small but growing portion of the public would like to see regulations similar to those in effect for the Homer Spit Lagoon enacted for Seward area beaches, i.e. only allow snagging by emergency order after fish "go off the bite." To date, no BOF proposal has been generated.

Ongoing Research and Management Activities

There are no ongoing research projects. Management activities consist of attending public meetings, working with the local Fish and Game Advisory Committee, and observing the fishery in mid-June and again during the Seward Silver Salmon Derby.

Recommended Research and Management Activities

No new research or management activities are recommended.

Resurrection Bay Pink Salmon Fishery

Wild stocks that spawn in most Resurrection Bay streams support the pink salmon fishery. Pink salmon return to Resurrection Bay from late-July through mid-September with the peak of the return occurring in mid-late August. Pink salmon returns are largest during even years.

The sport fishing season is open all year and the bag and possession limit is six salmon per day other than chinook, and six in possession. Snagging is legal in salt water. All freshwater drainages of Resurrection Bay have been closed to salmon sport fishing since before statehood.

The 1990-1999 average pink salmon harvest in Resurrection Bay was 4,361 fish (Table 4). Since 1990 most of the harvest has been from shore anglers (41%) and private boat anglers (40%) (Table 7, Figure 9).

Recent Fishery Performance

The sport harvest of pink salmon from Resurrection Bay in 2000 was an estimated 3,883 fish and falls within the lower end of the range of estimated harvest for the past 10 years (Table 7, Figure 10). Private boat anglers harvested the largest proportion of the total harvest (43%) in 2000 followed by shoreline anglers (36%) and charter boat anglers (20%; Table 7, Figure 9). Most pink salmon observed caught by sport anglers are released. It is not known whether the decrease in angler harvest is due to declining pink salmon runs or increased abundance of more desirable coho salmon runs.

Table 7.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of pink salmon.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										1,595
1978										6,610
1979										2,100
1980										12,614
1981										7,776
1982										9,328
1983										4,909
1984										11,510
1985										5,262
1986		2,538		1,911		4,449		6,559		11,008
1987		1,503		471		1,974		1,394		3,368
1988		346		1,255		1,601		400		2,001
1989		557		990		1,547		3,309		4,856
1990	2,346	1,027	7,224	3,086	9,570	4,113	5,326	2,080	14,896	6,193
1991	1,873	1,157	3,833	1,569	5,706	2,726	2,996	1,988	8,702	4,714
1992	1,328	897	4,067	1,548	5,395	2,445	4,616	1,832	10,011	4,277
1993	1,284	866	5,946	1,822	7,230	2,688	3,978	1,484	11,208	4,172
1994	1,435	657	4,320	1,500	5,755	2,157	5,782	3,416	11,537	5,573
1995	1,549	883	6,119	2,186	7,668	3,069	5,081	1,730	12,749	4,799
1996	1798	645	4,152	1,351	5,950	1,996	6,572	2,914	12,522	4,910
1997	911	298	3,376	676	4,287	974	2,647	597	6,934	1,571
1998	1131	406	5,928	1,409	7,059	1,815	2,575	1,022	9,634	2,837
1999	3,961	1,285	9,471	2,386	13,432	3,671	2,314	889	15,746	4,560
2000	2,355	791	8,189	1,681	10,544	2,472	6,848	1,411	17,392	3,883

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

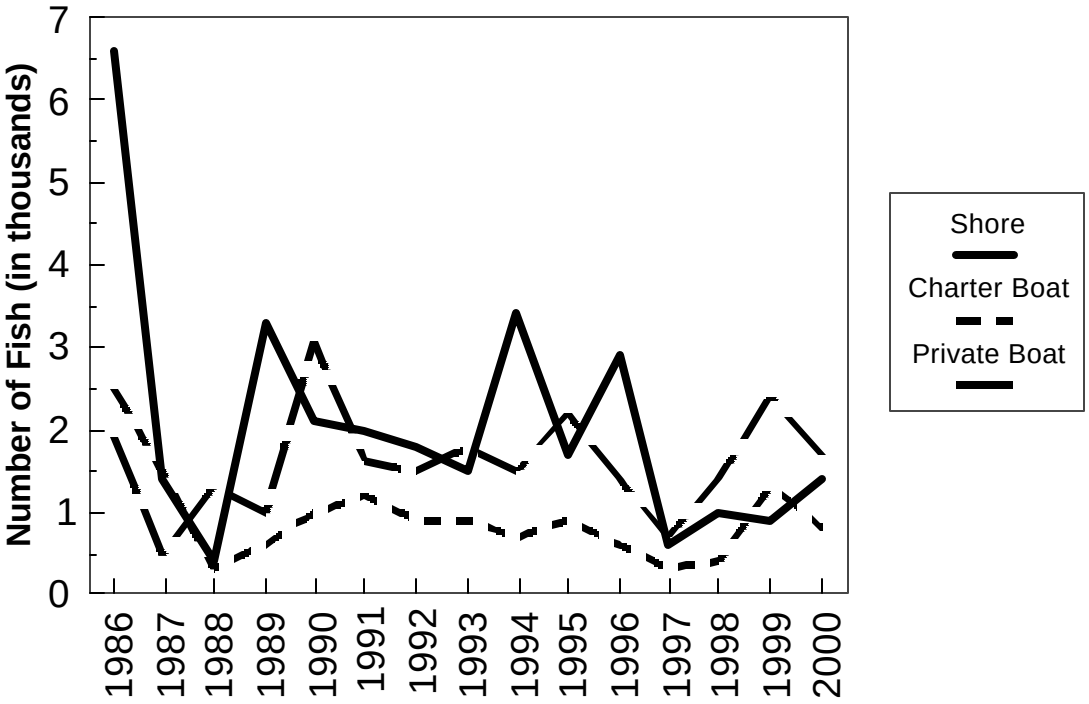

Figure 9.-Resurrection Bay saltwater pink salmon harvest by fishery, 1986-2000.

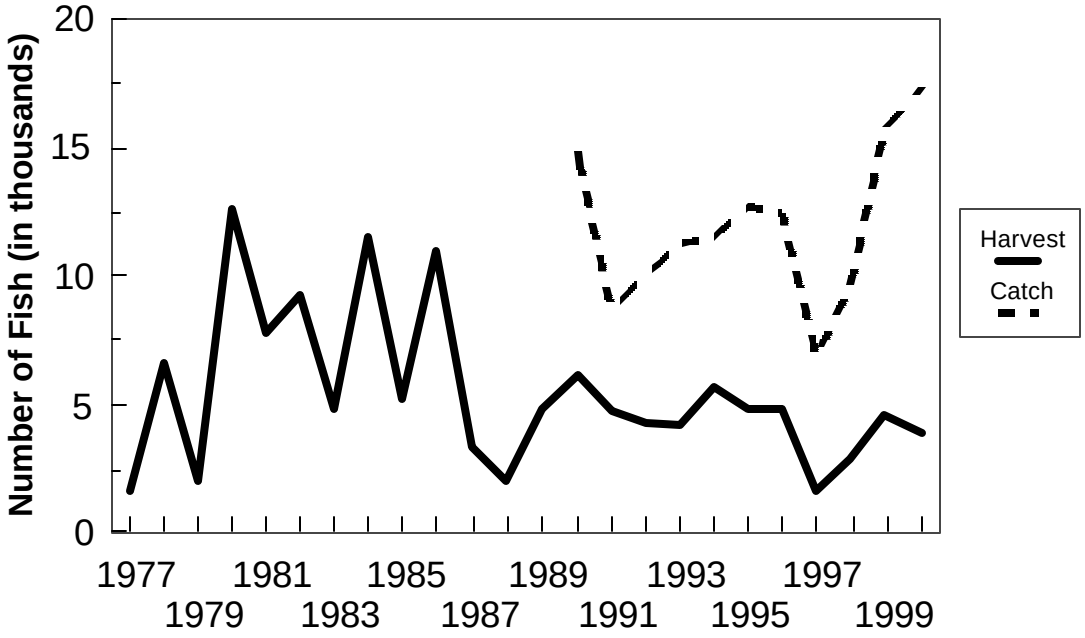

Figure 10.-Total Resurrection Bay saltwater pink salmon harvest, 1977-2000.

Management Objective
No specific fishery objectives have been formally established for Resurrection Bay pink salmon sport fisheries. However, the Resurrection Bay Salmon Management Plan allocates surplus pink salmon to the commercial fleet.

Recent Board of Fisheries Actions
At the 1998/1999 BOF meeting a proposal was submitted by the ASLC. This proposal asked for a small saltwater closed area centered around their newly constructed fish pass to protect returning experimental pink salmon in 2000 through 2002. While the department has the authority to invoke 5 AAC 75.050. Waters Closed to Sport Fishing. (a) the waters within 300 feet of a fish weir or fish ladder are closed to sport fishing, unless a lesser distance is indicated by department markers, the ASLC was urged to submit this proposal for BOF deliberation. The area in question is popular with shore and boat anglers, especially during the Seward Silver Salmon Derby. The department recognized the need for a seasonal closure around the fish pass to ensure adequate returns of research fish, but did not agree that a year-round closure is necessary. BOF passed an amended version of the original proposal, closing the saltwater area within a 300-ft radius of the ASLC fish pass (or as marked by the department) to sport fishing from August 1 through October 31. This regulation expires after the 2002 season.

Current Issues
There are no major issues surrounding the Resurrection Bay pink salmon sport fishery.

ASLC initiated a genetic research project releasing fish from the facility in 1999 and 2000. The newly constructed fish pass allowing fish to return to the facility does not work. Research permits were issued to allow ASLC staff to recover stray experimental fish in freshwater streams in the Resurrection Bay area.

Ongoing Research and Management Activities
The Division of Sport Fish does not conduct any research on pink salmon stocks in Resurrection Bay. Management activities consist of attending public meetings, and working with the local Fish and Game Advisory Committee. The Division of Commercial Fisheries conducts aerial escapement surveys of pink salmon in the lower Cook Inlet area including Resurrection Bay.

Recommended Research and Management Activities
No new research or management activities are recommended.

Resurrection Bay Sockeye Salmon Fishery

Sockeye salmon return to Resurrection Bay streams, primarily Bear Lake and its tributaries, from late-May through July. Spawning occurs in mid-July through September.

Resurrection Bay has historically been managed primarily for the recreational coho salmon fishery. The sport harvest of sockeye salmon has been incidental. In 1966, the BOF developed the Resurrection Bay Salmon Management Plan (5 AAC 21.376), which allocated the bay's coho salmon to the sport fishery. In 1976 the BOF modified the plan to stipulate that commercial fisheries for pink and chum salmon be managed so that they did not interfere with the recreational coho and chinook salmon sport fishery. After a successful coho salmon enhancement program was established in Bear Lake, the BOF adopted the Bear Lake Management Plan (5 AAC 21.375) in 1971. This plan stated that Bear Lake be managed primarily for the production of coho salmon and, in accordance with this objective, placed restrictions on the number of sockeye salmon entering Bear Lake.

Bear Lake is considered the only viable candidate for sockeye salmon enhancement in Resurrection Bay. In 1988, the BOF substantially modified the Bear Lake Management Plan. This plan rescinded restrictions on the Bear Lake sockeye salmon escapement. The sockeye salmon dip net fisheries in Bear Creek were no longer permitted. The plan directed the department to establish a sockeye salmon escapement goal for Bear Lake and stipulated that if enhancement of sockeye salmon occurs, the early run timing of the native stock is to be maintained. The Board specified that sockeye salmon enhancement should not cause a net loss of coho smolt production from Bear Lake. Should enhancement of sockeye salmon create a viable commercial fishery, it was the Board's intent that this fishery be conducted "with minimal conflict with the sport fishery." This plan was a major departure from previous policy in that Bear Lake is now managed for both coho and sockeye salmon production.

In the spring of 1990, 20,000 sockeye salmon fry and 2.4 million early-run sockeye salmon smolt were released into Bear Lake. These smolt contributed to the first sockeye salmon returns in 1992, and are targeted by a commercial seine fishery conducted from late-May through June in Resurrection Bay. The first significant return from the 1990 fry release occurred in 1994 when fish returned as 2-ocean adults. In 1994, about 540,000 “late-run” sockeye salmon smolt were released into Grouse Lake. Returning adults to Grouse Lake are not available to commercial fishers in Resurrection Bay. CIAA harvests the returning adults in Grouse Creek for cost recovery. CIAA has stopped stocking sockeye into Grouse Lake due to the poor commercial value of fish harvested here. They are attempting to change the Trail Lakes Hatchery Management Plan to stock Bear Lake with more sockeye pre-smolt in an attempt to increase their cost recovery profits in Resurrection Bay.

The saltwater sport fishing season is open all year and the bag and possession limit is six salmon other than chinook per day and in possession. Snagging is legal in salt water. All freshwater drainages of Resurrection Bay have been closed to salmon sport fishing since before statehood.

From 1990-1999, the average harvest of sockeye salmon from Resurrection Bay was 1,200 fish (Table 4). In most years estimates are available, shore anglers account for the largest proportion of harvest (Table 8, Figure 11).

Recent Fishery Performance

The sport harvest of sockeye salmon from Resurrection Bay in 2000 (1,485) was just slightly above the 10-year average (1990-1999) (Tables 4 and 8, Figure 12). In 2000 shore anglers took most (46%) of the harvested fish followed by private boat anglers (32%). Observations of the chinook salmon fishery indicate most sockeye salmon caught by sport anglers were incidental. Sockeye salmon, unlike pink salmon, were not released if caught incidental to targeted species.

Management Objective

The department has established a biological escapement goal of 1,000 sockeye salmon for Bear Lake. CIAA’s annual management plan, approved by the department, specifies that a minimum of 5,000 and maximum of 8,000 sockeye salmon are passed into Bear Lake. No other specific fishery objectives have been formally established for Resurrection Bay sockeye salmon fisheries to date other than management objectives outlined in the Bear Lake and Resurrection Bay Management Plans.

Recent Board of Fisheries Actions

CIAA submitted a proposal for the 1998/1999 BOF meeting requesting the closure of a small area of salt water centered around the mouth of Spring Creek to all sport fishing from July 1

Table 8.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of sockeye salmon.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										6
1978										0
1979										0
1980										0
1981										0
1982										0
1983										0
1984										1,305
1985										1,335
1986		31		92		123		214		337
1987		91		217		308		507		815
1988		18		236		254		164		418
1989		128		99		227		397		624
1990	273	68	408	272	681	340	185	78	866	418
1991	320	256	216	208	536	464	692	519	1,228	983
1992	99	58	666	551	765	609	699	526	1,464	1,135
1993	318	206	1,375	1,147	1,693	1,353	666	512	2,359	1,865
1994	408	408	574	306	982	714	748	701	1,730	1,415
1995	209	198	407	284	616	482	833	812	1,449	1,294
1996	409	161	507	325	916	486	491	281	1,407	767
1997	458	76	636	493	1,094	569	1,447	1,217	2,541	1,786
1998	516	431	591	439	1,107	870	716	399	1,823	1,269
1999	151	108	719	697	870	805	280	259	1,150	1,064
2000	460	331	1,609	477	2,069	808	712	677	2,781	1,485

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

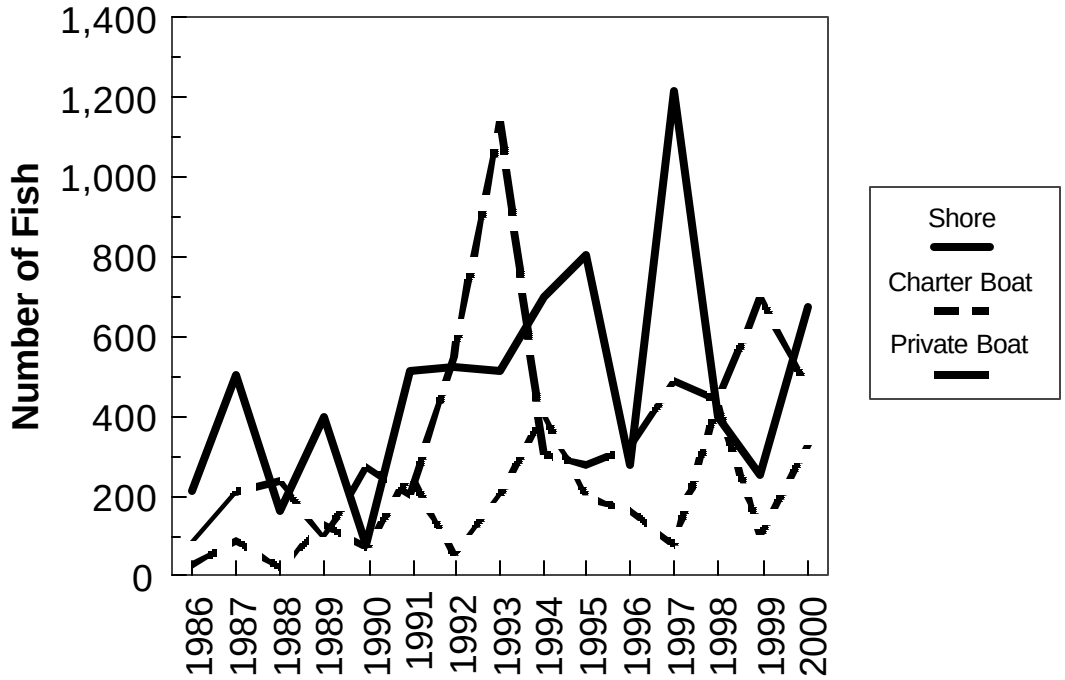

Figure 11.-Resurrection Bay saltwater sockeye salmon harvest by fishery, 1986-2000.

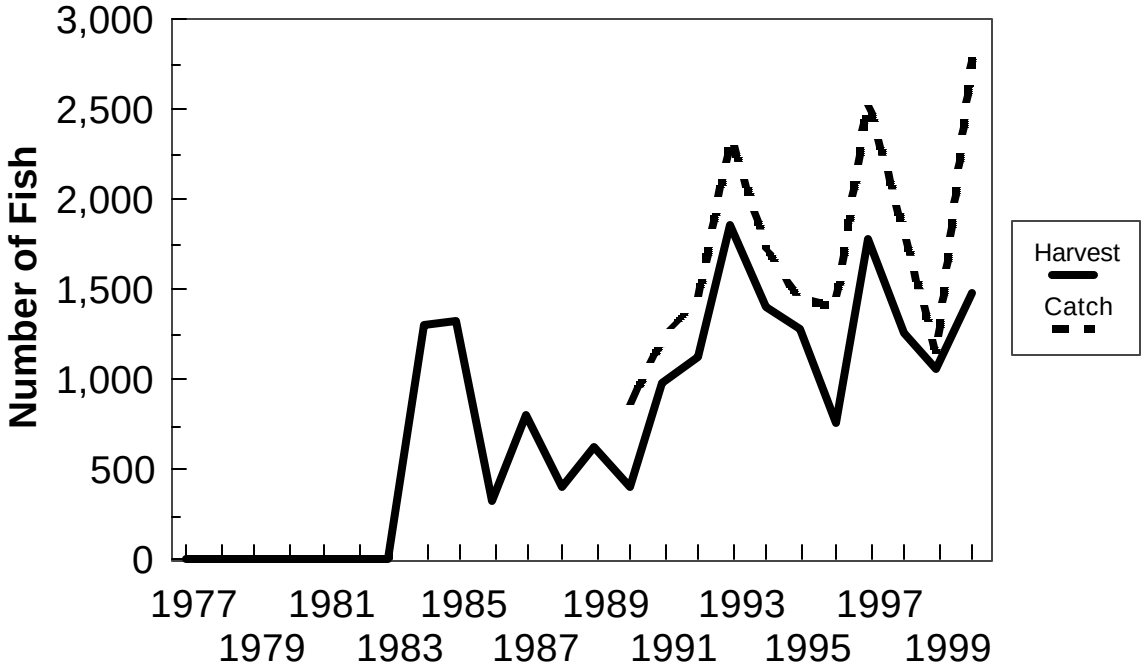

Figure 12.-Total Resurrection Bay saltwater sockeye salmon harvest, 1977-2000.

through August 7. CIAA had submitted to ADF&G project plans to stock sockeye salmon smolt into Spring Creek and use returning adults for cost recovery. CIAA also proposed to release approximately 250,000 coho salmon smolt into Spring Creek primarily for sport anglers, although fish that escape the sport fishery would be harvested for cost recovery. The ADF&G Commissioner denied the project permits citing pathological concerns; therefore, CIAA withdrew their proposal.

Current Issues

The impact on Resurrection Bay sport fisheries by developing a commercial sockeye salmon fishery targeting stocks returning to Bear Lake appears to be minimal. This commercial fishery occurs in late-May through June, well before coho salmon are present in Resurrection Bay. The commercial fishery is further restricted to weekdays to avoid any conflict with weekend anglers and restricted away from Seward beaches to avoid conflicts with chinook salmon anglers. The Division of Commercial Fisheries staff responsible for management of this fishery have worked closely with Division of Sport Fish staff to minimize conflicts.

CIAA had a proposal before the BOF at the 2001/2002 meeting to amend the Bear Lake Hatchery Plan (Appendix A1). The amendment required the Resurrection Bay commercial purse seine fishery to be managed for a sockeye harvest of 66,000 fish; and would have established a Special Harvest Area in the northeast corner of Resurrection Bay. CIAA further proposed to discontinue the Grouse Lake late-run sockeye stocking and enhance the Bear Lake system with early-run fall pre-smolt and spring smolt releases for cost recovery. This proposal failed at the BOF meeting, but CIAA is still attempting to gain permission to enhance the Bear Lake system with early-run fall pre-smolt and spring smolt releases for cost recovery.

There has been some public discussion about having a dip net fishery for sockeye salmon and/or a freshwater sport fishery targeting these hatchery sockeye salmon. To date, no BOF proposal has been submitted.

Ongoing Research and Management Activities

There are no ongoing research projects. Management activities consist of attending public meetings, Cook Inlet Regional Planning Team meetings, and working with the local Fish and Game Advisory Committee.

Recommended Research and Management Activities

There are no recommended management or research projects at this time.

Resurrection Bay Chum Salmon Fishery

Wild stocks that spawn in most Resurrection Bay streams support the chum salmon fishery. Chum salmon return to Resurrection Bay from mid-July through late August with the peak of the return occurring in early August. Chum salmon fingerlings were stocked into two Resurrection Bay streams, Jap and Spring creeks, in 1985 (Appendix B).

The sport fishing season is open all year and the bag and possession limit is six salmon other than chinook per day and six in possession. Snagging is legal in salt water. All freshwater drainages of Resurrection Bay have been closed to salmon sport fishing since before statehood.

The 1990-1999 average chum salmon harvest in Resurrection Bay was 756 fish. That is nearly half the average chum harvest from 1980-1989 (1,463; Table 4). Shore anglers (Table 9, Figure 13) harvested 59% of the chum salmon from 1990-1999.

Table 9.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of chum salmon.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										63
1978										39
1979										100
1980										276
1981										194
1982										458
1983										923
1984										2,569
1985										634
1986		275		199		474		1,484		1,958
1987		163		362		525		1,449		1,974
1988		819		1,091		1,910		2,037		3,947
1989		222		207		429		1,267		1,696
1990	296	148	268	56	564	204	480	223	1,044	427
1991	415	294	106	106	521	400	471	357	992	757
1992	501	243	2,338	463	2,839	706	1,374	615	4,213	1,321
1993	267	79	294	117	561	196	1,913	484	2,474	680
1994	87	58	251	131	338	189	926	499	1,264	688
1995	287	92	257	120	544	212	1,294	184	1,838	396
1996	517	363	961	176	1,478	539	3,123	1,137	4,601	1,676
1997	263	248	866	241	1,129	489	1,886	256	3,015	745
1998	128	49	99	8	227	57	575	152	802	209
1999	242	79	430	61	672	140	2,621	523	3,293	663
2000	844	179	1,103	541	1,947	720	2,488	459	4,435	1,179

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

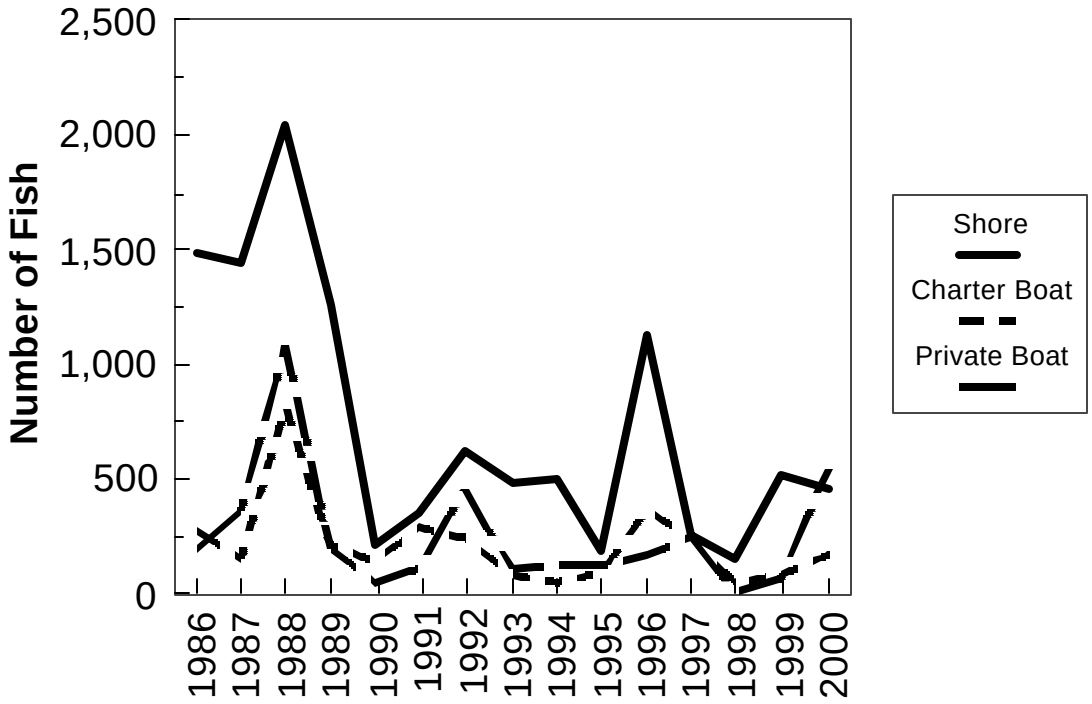

Figure 13.-Resurrection Bay saltwater chum salmon harvest by fishery, 1986-2000.

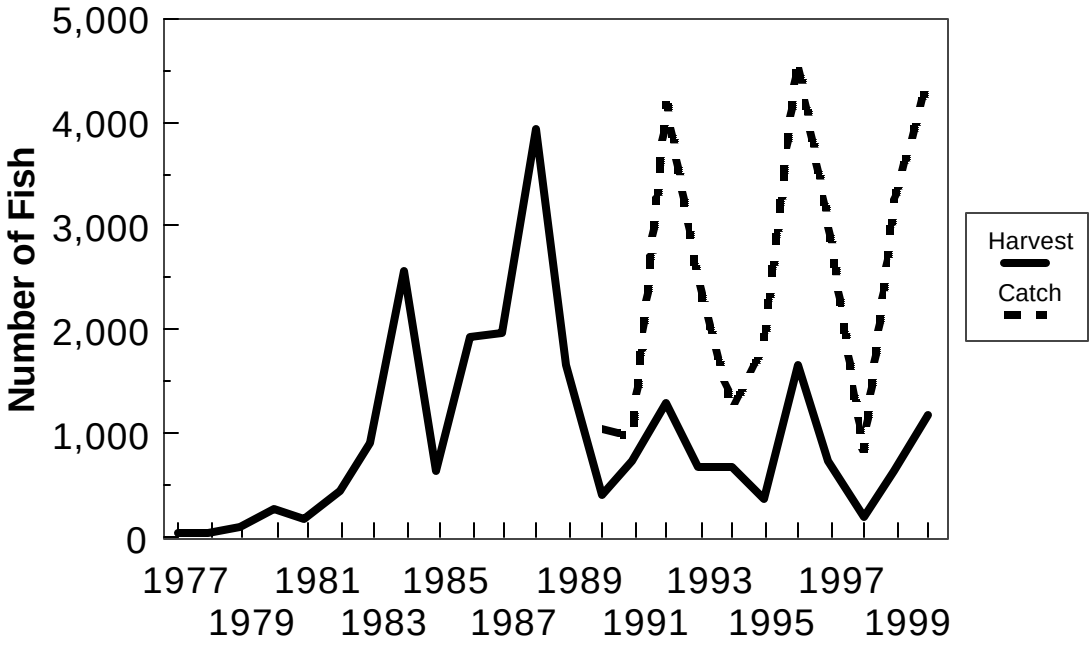

Figure 14.-Total Resurrection Bay saltwater chum salmon harvest, 1977-2000.

Recent Fishery Performance
The sport harvest of chum salmon from Resurrection Bay in 2000 is an estimated 1,179 (Table 9, Figure 14). Shore anglers and private boat anglers harvested most of the chum salmon (39% and 46% respectively (Table 9, Figure 13). Most chum salmon harvested by boat anglers are taken incidental to other species, while shore anglers target chum salmon at the mouths of Spring and Tonsina creeks.

Management Objective
No specific fishery objectives have been formally established for Resurrection Bay chum salmon sport fisheries. However, the Resurrection Bay Salmon Management Plan allocates surplus chum salmon to the commercial fleet.

Recent Board of Fisheries Actions
There were no BOF actions specific to this fishery in 2001/2002.

Current Issues
There are no major issues surrounding the Resurrection Bay chum salmon sport fishery.

Ongoing Research and Management Activities
The Division of Sport Fish does not conduct any research on chum salmon stocks in Resurrection Bay. Management activities consist of attending public meetings, and working with the local Fish and Game Advisory Committee. The Division of Commercial Fisheries conducts aerial and/or foot escapement surveys of chum salmon in the lower Cook Inlet area including Resurrection Bay.

Recommended Research and Management Activities
No new research or management activities are recommended.

Resurrection Bay Dolly Varden Fishery

Dolly Varden are available to Resurrection Bay saltwater anglers in May as fish migrate out to sea and again in late August through September as fish return to freshwater overwintering areas.

All Resurrection Bay waters (fresh and salt) are open year-round to fishing for Dolly Varden, except Seward Lagoon, which is closed to all sport fishing. Daily bag and possession limits are five in salt water, two in flowing fresh waters, and five in lakes and ponds. There are no size restrictions for Dolly Varden in Resurrection Bay. Snagging is legal in salt water but illegal in fresh water.

The average saltwater harvest from 1990-1999 was 514 fish (Table 4). Harvest from 1999-2000 is mostly split between shorebased (37%) and private boat anglers (41%), with anglers fishing from charter boats accounting for only 21% of the harvest in marine waters (Table 10, Figure 15).

Recent Fishery Performance
The Dolly Varden harvest in 2000 was estimated to be 242 fish (Table 10, Figure 16), most of which (72%) were taken from shore. Few anglers are observed targeting Dolly Varden in marine waters during the time period that they are present. Anglers fishing in May now target hatchery chinook salmon and anglers fishing in August through September are targeting coho salmon.

Management Objective
No specific fishery objectives have been formally established for Resurrection Bay marine Dolly Varden fisheries.

Table 10.-Resurrection Bay saltwater sport catch (1990-2000) and harvest (1977-2000) of Dolly Varden.

	Boat									
	Charter		Private		Total		Shore		Total	
Year	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest
1977										1,720
1978										1,248
1979										973
1980										878
1981										5,335
1982										1,562
1983										5,811
1984										1,771
1985										191
1986		260		245		505		566		1,071
1987		109		344		453		362		815
1988		36		437		473		255		728
1989		75		618		693		300		993
1990	115	94	246	21	361	115	226	113	587	228
1991	97	97	311	220	408	317	336	207	744	524
1992	24	24	262	164	286	188	344	188	630	376
1993	370	321	770	328	1,140	649	238	125	1,378	774
1994	66	47	271	27	337	74	718	209	1,055	283
1995	43	33	237	204	280	237	699	438	979	675
1996	752	254	182	146	934	400	744	305	1,678	705
1997	396	141	645	170	1,041	311	337	183	1,378	494
1998	149	72	1,931	670	2,080	742	296	119	2,376	861
1999	125	34	242	154	367	188	55	33	422	221
2000	138	34	105	34	243	68	498	174	741	242

Source: Mills 1979-1994; Howe et al. 1995 and 1996, 2001a-d; Walker et al. *In prep*.

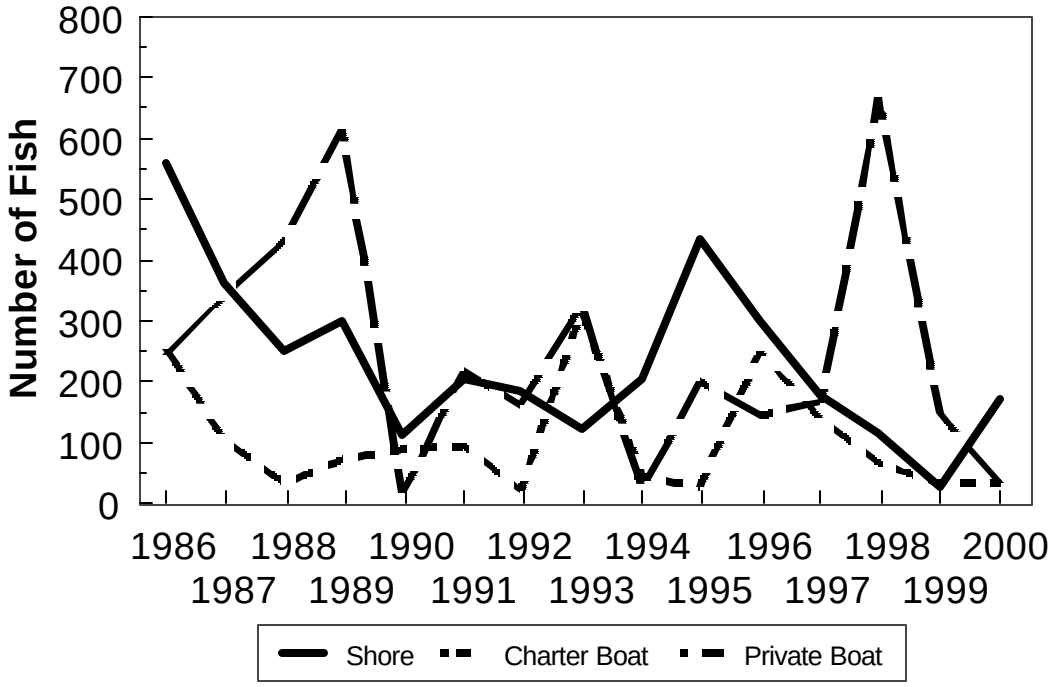

Figure 15.-Resurrection Bay saltwater Dolly Varden harvest by fishery, 1986-2000.

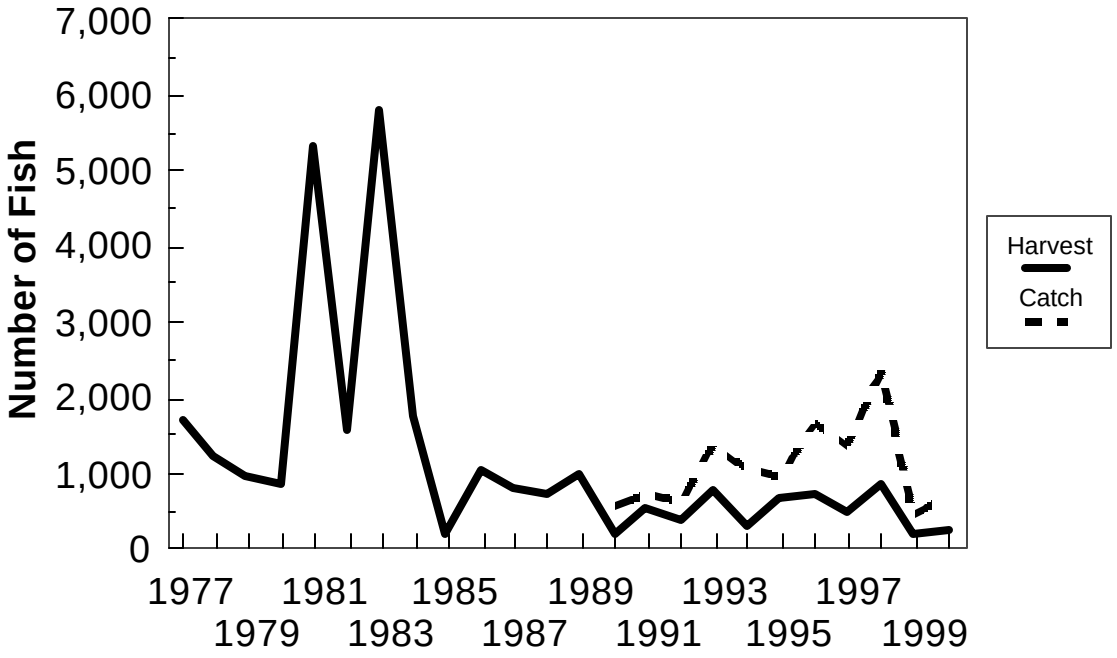

Figure 16.-Total Resurrection Bay saltwater Dolly Varden harvest, 1977-2000.

Recent Board of Fisheries Actions

During the 1995/96 meeting cycle, the BOF passed a Kenai Peninsula freshwater proposal, which reduced Dolly Varden bag, and possession limits in fresh water streams from five to two. No proposals specific to Resurrection Bay Dolly Varden were submitted for BOF deliberation during the 2001/2002 meeting.

Current Issues

It is not known whether the decline in Resurrection Bay saltwater Dolly Varden harvests is a result of declining stock size or a function of anglers targeting more desirable and abundant salmon species.

Ongoing Research and Management Activities

The Division of Sport Fish does not conduct any research on Dolly Varden stocks in Resurrection Bay. Management activities consist of attending public meetings and working with the local Fish and Game Advisory Committee.

Recommended Research and Management Activities

No new research or management activities are recommended.

LITERATURE CITED

Carlon, J. A., and D. S. Vincent-Lang. 1989. Stockings, migrations, and age, sex, and length compositions of coho, sockeye, and chinook salmon in Resurrection Bay, Alaska, during 1988. Alaska Department of Fish and Game, Fishery Data Series No. 82, Juneau.

Carlon, J. A., and D. S. Vincent-Lang. 1990. Stockings, migrations, and age, sex, and length compositions of coho, sockeye, and chinook salmon in Resurrection Bay, Alaska, during 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-14, Anchorage.

Howe, A. L., G. Fidler, A. Bingham, and M. 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, A. L., G. Fidler, and M. 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, A. L., G. Fidler, C. Olnes, A. Bingham, and M. J. Mills. 2001a. Harvest, catch, and participation in Alaska sport fisheries during 1996. Alaska Department of Fish and Game, Fishery Data Series No. 97-29 (Revised), Anchorage.

Howe, A. L., G. Fidler, C. Olnes, A. Bingham, and M. J. Mills. 2001b. Harvest, catch, and participation in Alaska sport fisheries during 1997. Alaska Department of Fish and Game, Fishery Data Series 98-25 (Revised), Anchorage.

Howe, A. L., G. Fidler, C. Olnes, A. Bingham, and M. J. Mills. 2001c. Participation, catch and harvest in Alaska sport fisheries during 1998. Alaska Department of Fish and Game, Fishery Data Series 99-41 (Revised), Anchorage.

Howe, A. L., R. J. Walker, C. Olnes, K. Sundet, and A. E. Bingham. 2001d. Participation, catch and harvest in Alaska sport fisheries during 1999. Alaska Department of Fish and Game, Fishery Data Series 01-8, Anchorage.

Meyer, S. C., and C. E. Stock. 2002. Management report for Southcentral Alaska recreational halibut and groundfish fisheries, 2001. Alaska Department of Fish and Game, Fishery Management Report No. 02-05, Anchorage.

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-A), 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-A), Juneau.

LITERATURE CITED (Continued)

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-1-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-1-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-1-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-1-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 1986. Alaska Department of Fish and Game, Fishery Data Series No. 2, Juneau.

Mills, M. J. 1988. Alaska statewide sport fisheries harvest report 1987. Alaska Department of Fish and Game, Fishery Data Series No. 52, Juneau.

Mills, M. J. 1989. Alaska statewide sport fisheries harvest report 1988. 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 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 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 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 and participation in Alaska sport fisheries during 1993. Alaska Department of Fish and Game, Fishery Data Series No. 94-28, Anchorage.

Vincent-Lang, D. S. 1987. Biological statistics for coho (Oncorhynchus kisutch) and sockeye (O. nerka) salmon in Resurrection Bay, Alaska, 1962-1986. Alaska Department of Fish and Game, Fishery Manuscript No. 1, Juneau.

Vincent-Lang, D. S., R. H. Conrad, and E. T. McHenry. 1988. Migrations and age, sex, and length compositions of coho and sockeye salmon in Resurrection Bay, Alaska, during 1987. Alaska Department of Fish and Game, Fishery Data Series No. 40, Juneau.

Walker, R. J, C Olnes, K. Sundet, and A. E. Bingham. In prep. Participation, catch and harvest in Alaska sport fisheries during 2000. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

APPENDIX A. RESURRECTION BAY MANAGEMENT PLANS

Appendix A1.-Resurrection Bay Management Plans.

5 AAC 21.375. BEAR LAKE MANAGEMENT PLAN.

(a) Any restrictions, in board policies dated before the effective date of this section, on the maximum number of indigenous Bear Lake sockeye salmon spawners are rescinded. The department shall establish an escapement goal for Bear Lake sockeye salmon stocks and shall manage all contributing fisheries to meet this goal.

(b) Enhancement activities related to either indigenous Bear Lake sockeye salmon stocks or transplanted sockeye salmon stocks must consider the impact on continuing enhancement of Bear Lake coho salmon. It is the intent of the Board of Fisheries that

(1) any enhancement of sockeye salmon must not cause a net loss of coho salmon smolt production from Bear Lake;

(2) any enhancement of sockeye salmon in Bear Lake must maintain the early run timing of the indigenous stocks;

(3) the prime objective of any Bear Lake sockeye salmon enhancement must be to provide the opportunity for a commercially viable sockeye salmon fishery prosecuted with minimal conflict with the recreational fishery.

History - Eff. 6/10/89, Register 110 Authority - AS 16.05.060, AS 16.05.251

5 AAC 21.376. RESURRECTION BAY SALMON MANAGEMENT PLAN.

(a) Since the beginning of significant commercial harvests of pink and chum salmon in Resurrection Bay, there have been some conflicts between recreational and commercial fishermen. The issues are the protection of coho and chinook salmon for the recreational fishery, and the management of surplus pink and chum salmon stocks in a manner that provides for a commercial fishery while minimizing the incidental catch of coho and chinook salmon.

(b) The department shall, by emergency order,

(1) manage Resurrection Bay coho and chinook salmon stocks exclusively for recreational use;

(2) manage the indigenous pink and chum salmon stocks primarily for commercial use, insofar as that harvest does not interfere in time or area with the recreational fishery;

(3) manage the commercial fishery in Resurrection Bay in a manner that does not interfere with the recreational fishery.

History - Eff. 6/10/89, Register 110 Authority - AS 16.05.060, AS 16.05.251

APPENDIX B. STOCKING RECORDS

Appendix B1.-Hatchery releases in Resurrection Bay, 1966-2001; and planned releases for 2002.

Stocking location	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Coho fry													
Bear Lake													
Bear Creek													
Coho fingerling													
Bear Creek													
Bear Lake	360,100	246,400					450,800	453,300	450,800	449,900	224,600	10,800	225,820
Box Canyon Creek													
First Lake										1,000			
Sink Hole												11,500	
Seward Lagoon													
Coho smolt													
Bear Creek				47,900	6,400	50,983	155,500				35,600	35,102	28,574
Bear Lake													
Box Canyon Creek					3,200								
Grouse Lake											35,200	35,003	53,455
Lowell Creek													
Seward Lagoon			42,400	27,100	38,600	10,900	66,500	30,200	100,000	100,700	100,600	100,456	148,999
Chinook smolt													
Box Canyon Creek											25,100	50,036	150,488
Lowell Creek													
Seward Lagoon													
Spring Creek													
Thumb Cove													
Chum fingerling													
Jap Creek													
Spring Creek													
Sockeye fry													
Bear Lake													
Sockeye fingerling													
Bear Lake													
Sockeye smolt													
Bear Lake													
Grouse Lake													

-continued-

Appendix B1.-Page 2 of 3.

Stocking location	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Coho fry													
Bear Lake												333,211	
Bear Creek													
Coho fingerling													
Bear Creek													390,060
Bear Lake	225,460	150,011	246,545	227,800	198,801	220,000	300,446	445,693	223,300	347,155			
Box Canyon Creek									257,461				
First Lake													
Sink Hole													
Seward Lagoon								122,908					
Coho smolt													
Bear Creek	40,503												
Bear Lake												583,700	
Box Canyon Creek								53,607					
Grouse Lake	44,010	50,286	54,593	13,238		53,100	56,134						
Lowell Creek									57,232	63,806	66,606	63,733	89,892
Seward Lagoon	98,566	100,757	109,958	53,970	82,506	67,772	50,256	88,704	65,514	118,741	272,346	145,619	119,057
Chinook smolt													
Box Canyon Creek	257,540				54,521								
Lowell Creek						39,206	132,708	100,900	95,963	95,673	122,800	216,140	93,200
Seward Lagoon							53,587			109,020	109,464	112,831	373,165
Spring Creek											75,063		
Thumb Cove						71,427							
Chum fingerling													
Jap Creek							282,620						
Spring Creek							173,187						
Sockeye fry													
Bear Lake												20,000	1,530,000
Sockeye fingerling													
Bear Lake													
Sockeye smolt													
Bear Lake												2,399,000	74,900
Grouse Lake													

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Stocking location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002-proposed
Coho fry											
Bear Lake		450,000	320,000	509,000	350,000	448,700	409,000	306,000	316,000	310,000	
Bear Creek		170,000									
Coho fingerling											
Bear Creek											
Bear Lake											
Box Canyon Creek											
First Lake											
Sink Hole											
Seward Lagoon											
Coho smolt											
Bear Creek						153,000	177,000	51,000	102,000	120,500	120,000
Bear Lake	51,733			7,400	75,000						
Box Canyon Creek											
Grouse Lake											
Lowell Creek	59,492	64,361	38,000	50,698	69,000	61,687	65,687	62,580	54,184	125,618	120,000
Seward Lagoon	154,219	159,091	201,577	133,700	182,000	144,112	74,365	109,142	145,693	124,703	120,000
Chinook smolt											
Box Canyon Creek											
Lowell Creek	108,390	104,870	104,477	95,256	115,000	117,208	101,992	85,502	109,461	114,748	105,000
Seward Lagoon	261,803	184,742	165,596	220,146	300,000	203,932	205,133	88,066	212,873	113,147	105,000
Spring Creek											
Thumb Cove											
Chum fingerling											
Jap Creek											
Spring Creek											
Sockeye fry											
Bear Lake	1,795,529	44,400	170,000	330,000	780,638	788,000	360,000	1,380,000	1,800,000		2,400,000
Sockeye fingerling											
Bear Lake		1,765,861									
Sockeye smolt											
Bear Lake	565,489						506,703				
Grouse Lake			570,000	993,000	217,605	2,428,000	1,573,458				
Rainbow trout											
First Lake									1,000	1,000	1,000

Source: Marianne McNair, ADF&G, CFMD, Juneau; Jeff Hetrick and Robert Blankenship, CIAA, Trail Lakes Hatchery; ADF&G, Division of Sport Fish stocking records.