

STATE OF ALASKA

Bill Sheffield, Governor

Annual Performance Report for

INVENTORY AND CATALOGING OF SPORT FISH AND
SPORT FISH WATERS OF THE LOWER SUSITNA RIVER
AND CENTRAL COOK INLET DRAINAGES

by

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RESEARCH PROJECT SEGMENT

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of Sport Fish and Sport
Fish Waters of Western
Prince William Sound,
Lower Susitna River,
Northern Cook Inlet
Drainages.

Cooperators: Kevin Delaney and Kelly Hepler

Period Covered: July 1, 1982 to June 30, 1983

ABSTRACT

In 1982, for the fourth consecutive year, three west side Susitna River streams were opened for a special chinook salmon, Oncorhynchus tshawytscha (Walbaum), season. As in the past, the 1982 fisheries were monitored closely for enforcement purposes and the collection of angling effort and harvest information and biological data including sex ratios and age compositions. The total estimated 1982 harvest for the three streams was 7,726 chinook salmon, while the effort was estimated to be 16,235 angler days. These figures represent the largest harvest and highest level of participation ever recorded for the westside Susitna River chinook salmon sport fishery.

Aerial escapement counts were conducted on all major Susitna River tributaries and western upper Cook Inlet and Anchorage area chinook salmon spawning streams for the first time since 1979. A total of 33,341 chinook salmon were enumerated in the 14 streams surveyed.

In 1982, a coho salmon, Oncorhynchus kisutch (Walbaum), creel census was conducted at Whittier to obtain sport effort and salmon harvest data and evaluate the success of the 1982 and 1981 coho salmon smolt releases. A total number of 5,611 angler-hours were expended to harvest 1,540 coho salmon.

In conjunction with our program in the Division of Sport Fish, the Division of Fishery Rehabilitation and Enhancement Development (FRED) stocked twenty lakes in the Anchorage area with a total of 81,163 rainbow trout, Salmo gairdneri (Walbaum), and 310,860 coho salmon.

Campbell Creek was sampled by minnow traps during August 9-13, 1982, to determine resident and juvenile anadromous fishes distribution. Wire mesh traps baited with salmon eggs were fished overnight. Results indicated juvenile coho salmon were most abundant in the middle and lower reaches of Campbell Creek, whereas juvenile chinook salmon were most abundant in the upper reaches. Resident Dolly Varden, Salvelinus malma (Walbaum), were captured throughout Campbell Creek. No rainbow trout were captured.

KEY WORDS

Western Susitna River, western Prince William Sound, Anchorage, chinook salmon, coho salmon, rainbow trout, creel census, escapement counts, enhancement.

BACKGROUND

The Anchorage community is the largest single metropolitan area within the State. The upper Cook Inlet area is currently a rapidly developing region in terms of urban growth, mineral and hydro development and new transportation corridors. Approximately 50% of the State's anglers now inhabit this geographical area and the number is expected to increase. The upper Cook Inlet resident and anadromous fish stocks are being subjected to dramatic increases in angling pressure, both in the roadside fisheries and, more recently in the remote area fisheries.

A substantial amount of the angling effort within the Anchorage-Susitna/western Prince William Sound management area occurs on the west side Susitna River tributaries. In 1982, for the fourth consecutive year, three streams on the west side were opened for a special chinook salmon season. A seasonal quota of 11,000 chinook salmon has been established for the three streams by the Board of Fisheries. Other pertinent historical data are presented in Reports of Progress by Kubik (Division of Sport Fish, Alaska Department of Fish and Game).

Western Prince William Sound (WPWS) is developing into a popular recreational and sport fishing area, although there is limited diversity of natural fish stocks, and most streams support only runs of pink and possibly chum salmon. There is also concern that the many small stream systems may not have the production capacity to accommodate an increase in fishing effort. In 1978, the Alaska Department of Fish and Game Division of Fisheries Rehabilitation and Enhancement Development (F.R.E.D.) initiated a coho salmon smolt stocking program at Whittier, located on Passage Canal, to supplement the wild fish stocks. The coho salmon returning from their seaward migrations, are expected to gather at their release sites and "mill" for some time making them available to the sport angler. Since 1979, Whittier has been the site of a creel census program to determine the recreational effort and harvest levels of returning hatchery released cohos.

The program of stocking Anchorage area lakes was continued in 1982. In recent years, the stocking program has relied heavily on plants of catchable size rainbow trout, but was expanded in 1982 to include plants of

Table 1. List of Common Names, Scientific Names and Abbreviations.

Common Name	Scientific Name	Abbreviation
Coho salmon	<u>Oncorhynchus kisutch</u> (Walbaum)	SS
Chinook salmon	<u>Oncorhynchus tshawytscha</u> (Walbaum)	KS
Rainbow trout	<u>Salmo gairdnari</u> Richardson	RT
Dolly Varden	<u>Salvelinus malma</u> (Walbaum)	DV
Slimy sculpin	<u>Lottus cognatus</u> Richardson	SSC

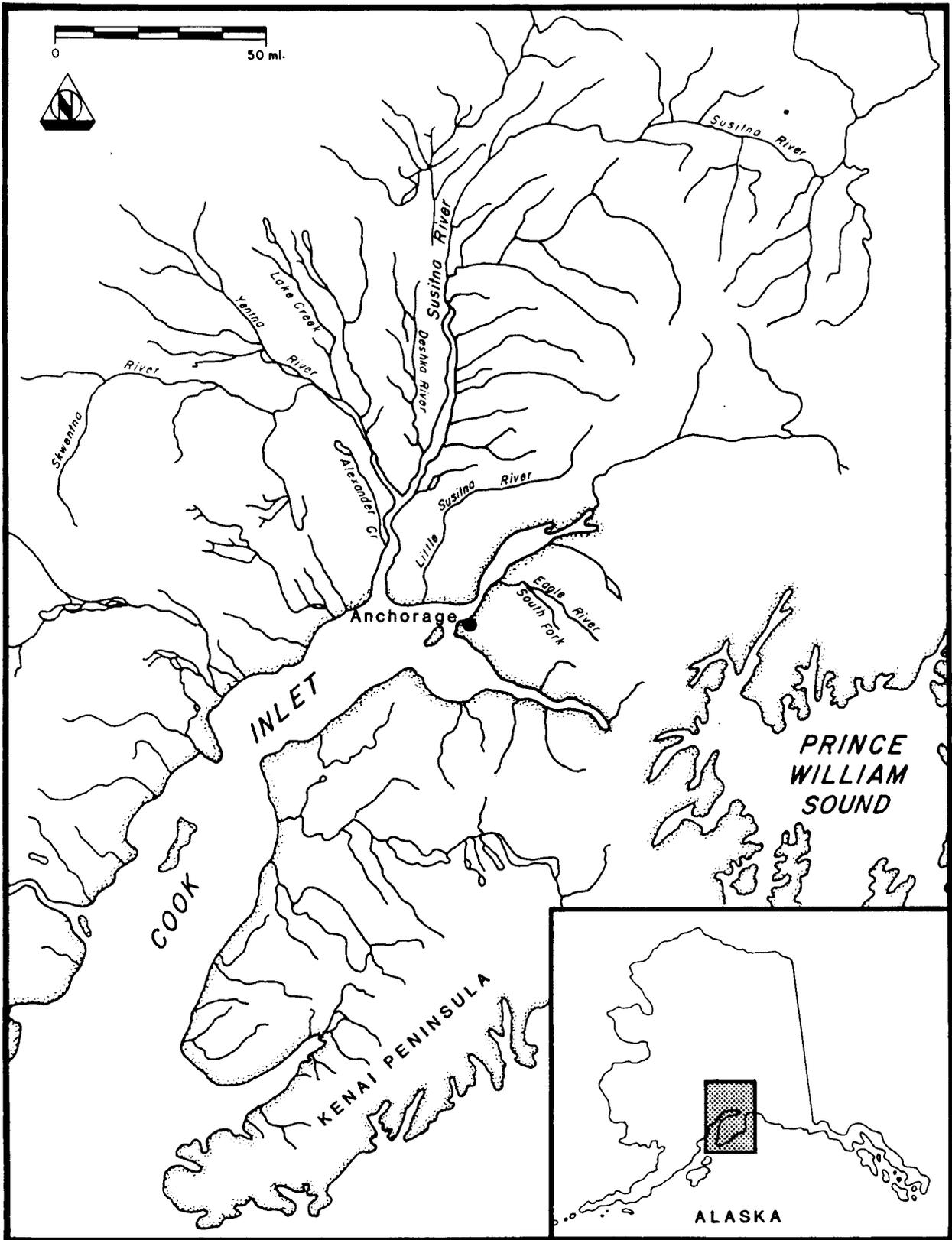


Figure 1. Upper Cook Inlet and western Prince William Sound study area.

subcatchable size rainbow trout and coho salmon. According to the estimates provided by the Statewide Harvest Study (Mills 1979-1981) Anchorage area lakes annually provide 50,000 to 75,000 man-days of angler effort and return approximately 50,000 stocked fish to the anglers' creel.

RECOMMENDATIONS

Creel census programs should be continued on west side Susitna River streams to monitor sport angling effort, obtain harvest estimates and collect biological data from the chinook salmon fisheries.

Chinook salmon enumerations should be continued on west side upper Cook Inlet streams to ascertain the abundance, timing and distribution of chinook salmon escapement in the spawning streams.

Chinook salmon carcass surveys should be continued to provide an independent source of biological data including age, length, and sex composition.

Discontinue the Whittier coho salmon creel census programs on our annual basis.

Assess the sport fishing potential of both the marine and freshwaters of western Prince William Sound.

Evaluation of experimental stocking of Anchorage area lakes should be continued to assess the success of the stocking programs and to aid in determining the future stocking levels.

OBJECTIVES

1. To determine the environmental characteristics of the existing and potential recreational fishing waters of the job area and, where practical, obtain estimates of the sport fish harvest and angler participation rates.
2. To evaluate the impact of water use and urban development projects on fisheries, aquatic life and water quality of lakes and streams in the area.
3. To determine stocking measures, formulate management practices and direct the course of future studies on area waters.
4. To investigate, evaluate and develop plans for the enhancement of salmon stocks.

TECHNIQUES USED

In 1982, a creel census program was utilized to evaluate recreational effort and harvest data from the chinook salmon sport fishery of three west side Susitna River streams. The period from May 22 through July 6 was

stratified by week, weekday and weekend/holiday. Interviews of anglers who had completed fishing were conducted during the period 4:00 a.m. to 10:00 p.m. on both weekends and holidays. Two randomly chosen 3-hour interview periods were utilized for sampling on weekdays and six 3-hour interview periods were utilized for weekends and holidays. Interview procedures consisted of contacting anglers having completed their fishing and recording the number of hours fished and chinook salmon kept by each angler. Total length (tip of snout to tip of tail), fork length (mid-eye to fork of tail), weight and scale samples were obtained from the anglers' catches whenever possible. Angler counts were conducted throughout the creel census program. Angler counting times were randomly chosen and were conducted from fixed-wing aircraft and riverboat. Angler counts utilizing riverboats were conducted four times a day throughout the weekends/holidays, and twice a day during the weekdays. An aerial angler count was conducted for each weekend/holiday period and each weekday (5-day) period.

Chinook salmon scales, collected from the sport fish harvest, were mounted on gum paper and pressed onto acetate. Scales were later examined using a microfische reader to determine the age class frequencies of chinook salmon taken in the sport fish harvest.

The Whittier coho salmon creel census was designed to obtain recreational effort and harvest data and evaluate the success of the 1981 coho salmon smolt release. The period from August through September was stratified by weekday and weekend/holiday. The schedule called for interviewing anglers during a randomly chosen 8-hour period on all weekends, holidays and 3 randomly chosen weekdays each week. Interviews of all anglers who had completed the day's fishing were attempted. The statistical design is similar to that used in the 1978-1979 Deshka River coho salmon creel census (Kubik, 1979). Length and weight data and scale samples were collected in addition to recording harvest and effort data. Each year a varying percentage of the coho smolts have been implanted with coded wire tags and had the adipose fin clipped. Tag return data are used to determine the contribution of different year smolt releases to the sport fishery.

The European method was used to denote salmon age class groups. A decimal mark is used to separate the number of years spent in freshwater from the number of years spent in saltwater.

The chinook salmon escapement surveys on the west side Susitna River tributaries were accomplished by 2-passenger helicopter from July through August.

FINDINGS

West Side Susitna Chinook Salmon Fishery

For the fourth consecutive year, three west side Susitna River streams were open to the taking of chinook salmon 20 inches (508) mm) and over in length. No additional areas within the three streams were opened during 1982, and the west side's collective harvest quota of 11,000 chinook salmon remained unchanged from previous years. The seasonal harvest quota is

allocated to the respective streams as follows: Deshka River, 7,000; Lake Creek, 2,000; and Alexander Creek, 2,000. Scheduled seasons also remained identical to previous years, beginning the fourth Saturday in May and extending through July 6. The 1982 daily bag limit was one chinook salmon 20 inches or more in length with a possession limit of two chinook salmon of this size.

As in the past, the 1982 fisheries were monitored closely for enforcement purposes, and the collection of angling effort and harvest information and biological data including sex ratios and age compositions. Data from the previous 3 years were relied heavily upon to design more effective and efficient creel census programs.

Stable water conditions prevailed at each of the three west side Susitna tributaries during the 1982 chinook season, whereas high, turbid water characterized portions of each of the past seasons. This factor combined with a comparatively strong run of chinook, resulted in favorable harvest rates at all three streams. The total estimated harvest for the three streams was 7,726 chinook salmon 20 inches or more in length, and effort was estimated to be 16,235 angler-days (Table 2). These figures mark the largest harvest and the highest level of participation ever recorded for the west side Susitna River chinook salmon sport fishery.

Deshka River:

The Deshka River, open to chinook salmon fishing from its mouth upstream 31 river miles to the confluence of Moose and Kroto creeks, has historically been the most important producer of chinook salmon in upper Cook Inlet. This remained true in 1982 as the Deshka River accounted for 41% of the total observed upper Cook Inlet escapement.

Chinook salmon were taken beginning the first day of the season, however, the harvest rates remained very low through the first 2 weeks of fishing as the run appeared to build slowly (Table 3). The harvest rate increased significantly during the third week, June 5-11, as large numbers of chinook salmon began entering the mouth of the Deshka River. Word circulated quickly that fishing was excellent and angler effort increased dramatically. Fishing success was excellent throughout the fourth week of the season, June 12-18, during which an estimated 2,080 chinook salmon were harvested, representing the highest weekly catch ever recorded. The harvest rate and catch declined after the fourth week as chinook salmon migrated upstream onto the spawning grounds.

The 1982 Deshka River chinook salmon fishery differed somewhat from previous years in that a comparatively large amount of effort appeared to occur in upstream reaches particularly during the second half of the season. This shifting of effort was caused in part by increased angler knowledge of Deshka River chinook salmon distribution and, in part, by the improvement of an additional access point on Moose Creek, an important Deshka River tributary. The Moose Creek access point is rapidly becoming popular as a starting point for 3-to-5 day canoe or raft trip which terminates at either the Deshka River mouth or 23 miles upstream of the mouth at Neil Lake. Moose Creek is currently closed to the taking of chinook salmon.

Table 2. Chinook Salmon Angler Effort and Harvest Estimates for West Side Susitna River Stream Sport Fishery, 1979-1982.

Stream	Quota	Harvest				Angler-Days				Harvest per Angler-Day			
		1979	1980	1981	1982	1979	1980	1981	1982	1979	1980	1981	1982
Alexander Creek	2,000	1,277	2,281	630	2,252	2,778	4,411	1,714	4,735	0.46	0.52	0.37	0.48
Deshka River	7,000	2,954	4,023	1,895	4,000	6,451	8,397	5,086	7,843	0.46	0.48	0.37	0.51
Lake Creek	<u>2,000</u>	<u>2,045</u>	<u>1,044</u>	<u>641</u>	<u>1,474</u>	<u>3,954</u>	<u>2,237</u>	<u>1,180</u>	<u>3,657</u>	<u>0.52</u>	<u>0.47</u>	<u>0.35</u>	<u>0.40</u>
TOTAL	11,000	6,276	7,348	3,166	7,726	13,183	15,045	7,980	16,235	0.48	0.49	0.37	0.47

Table 3. Chinook Salmon Angler Effort and Harvest Trends From Sport Fish Seasons For Deshka River By Weekly Periods, 1979-1982.

Weekly* Periods	1979			1980			1981			1982		
	%Harvest	%Effort**	Harvest*** Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate
1	*	*	*	13	13	0.40	11	7	0.50	2	2	0.33
2	8	13	0.27	17	22	0.36	23	21	0.49	5	8	0.32
3	29	20	0.66	15	18	0.50	34	27	0.44	14	11	0.67
4	37	30	0.57	32	23	0.63	17	22	0.32	52	41	0.65
5	15	17	0.41	12	14	0.48	9	12	0.25	17	21	0.41
6	7	12	0.24	8	7	0.30	5	10	0.17	8	14	0.32
7	<u>4</u>	<u>8</u>	0.25	<u>3</u>	<u>3</u>	0.44	<u>1</u>	<u>1</u>	0.13	<u>2</u>	<u>3</u>	0.37
Total	100	100		100	100		100	100		100	100	

* The number of weekly periods varies from year to year, since the creel census commences on the fourth Saturday in May.

** Effort measured in angler-days.

*** Harvest per angler day.

Alexander Creek:

Alexander Creek was opened to chinook salmon fishing from its mouth upstream to Alexander Lake. An estimated 2,252 chinook salmon were harvested during the 1982 season in 4,735 recreational angler-days of recreational fishing effort.

No chinook salmon were taken before May 29, however, after that date the run built quickly and sport fishing was excellent throughout the second and third weeks of the season, May 29 to June 11 (Table 4). A majority of the angler effort expended during the first 3 weeks of the season occurs in the lowest 5 miles of Alexander Creek, principally at the mouth. As the harvest rate declines for anglers fishing the mouth, which in 1982 took place during the fourth and fifth weeks (June 12 to 25) the effort gradually shifts to upstream reaches. This effort upstream is split between power boat anglers gaining access from the mouth and fishing as far upstream as the Sucker Creek confluence (approximately 25 stream miles), and fly-in "float trip" anglers originating at Alexander Lake and floating the entire stream. In 1982 the harvest rates estimated for the 6th and 7th weeks of the season excellent, 0.58 and 0.68 fish per day, respectively.

Lake Creek:

Lake Creek was open to chinook salmon fishing from a 1/4 mile radius of its mouth on the Yentna River to a marker located upstream approximately 2 miles. An estimated 1,474 chinook salmon were harvested during the 1982 season in 3,657 angler-days of fishing effort.

Lake Creek is located further from Cook Inlet than either Doshka River or Alexander Creek and, consequently, chinook salmon arrive there somewhat later. In 1982, the first chinook salmon was taken during the third week of the season, June 5-11, but few fish were present at Lake Creek until the beginning of the fourth week, June 12-18, when the harvest rate increased substantially (Table 5). Sport fishing remained consistently good through both the 5th and 6th weeks, June 19 to July 2, before falling off during the last few days of the season.

Age Length Sex Frequency:

Susitna River chinook salmon have three dominant age classes--Age 1.2, 1.3 and 1.4. Insignificant numbers of other age classes with either 0 or 2 years in freshwater and/or 5 years in salt water also exist. Historically, Age 1.3 and 1.4, the 5 and 6-year-old fish, have predominated the sport harvest (Table 6). Age 1.3 and 1.4 fish were dominant again in 1982, except at Alexander Creek where approximately 1/3 of the harvest was comprised of Age 1.2.

The age class structure of the 1982 sport harvest was comprised of a comparatively large percentage of Age 1.4 fish. There are two reasons for this observation. Progeny of the 1976 brood year have made a very strong showing as both Age 1.2 and 1.3 during the previous 2 years indicating excellent juvenile and marine survival. This strong showing continued as 1976 brood year fish reached Age 1.4. Secondly, with the degree of success

Table 4. Chinook Salmon Angler Effort and Harvest Trends from Sport Fish Seasons for Alexander Creek by Weekly Periods, 1979-1982.

Weekly* Periods	1979			1980			1981			1982		
	%Harvest	%Effort**	Harvest*** Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate
1	*	*	*	16	11	0.75	6	10	0.24	0	2	0
2	3	11	0.13	15	21	0.36	32	18	0.63	23	23	0.46
3	16	16	0.44	33	28	0.61	26	19	0.49	12	9	0.66
4	21	22	0.44	16	20	0.41	14	24	0.21	9	12	0.39
5	24	16	0.69	13	11	0.62	11	22	0.18	18	27	0.31
6	28	20	0.66	5	7	0.38	7	4	0.70	27	19	0.68
7	8	15	0.26	2	2	0.56	4	3	0.63	11	8	0.58
Total	100	100		100	100		100	100		100	100	

* The number of weekly periods varies from year to year, since the creel census commences on the fourth Saturday in May.

** Effort measured in angler-days.

*** Harvest per angler day.

Table 5. Chinook Salmon Angler Effort and Harvest Trends from Sport Fish Seasons for Lake Creek by Weekly Periods, 1979-1982.

Weekly* Periods	1979			1980			1981			1982		
	%Harvest	%Effort**	Harvest*** Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate	%Harvest	%Effort	Harvest Rate
1	*	*	*	0	0	0.0	0	0	0.0	0	0	0.0
2	0	0	0.0	0	7	0.0	2	5	0.13	0	3	0.0
3	4	4	0.55	1	10	0.03	18	18	0.35	2	8	0.9
4	40	40	0.52	40	35	0.54	38	29	0.47	26	28	0.39
5	31	30	0.53	35	25	0.65	28	25	0.40	44	31	0.56
6	17	18	0.49	14	15	0.42	9	16	0.20	23	23	0.40
7	<u>8</u>	<u>8</u>	0.49	<u>10</u>	<u>8</u>	0.65	<u>5</u>	<u>7</u>	0.24	<u>5</u>	<u>7</u>	0.27
Total	100	100		100	100		100	100		100	100	

* The number of weekly periods varies from year to year, since the creel census commences on the fourth Saturday in May.

** Effort measured in angler-days.

*** Harvest per angler day.

Table 6. Chinook Salmon Age Class Frequency from Sport Fish Harvest for Deshka River, Alexander Creek and Lake Creek, 1979-1982.

	Year	Sample Size	Age Group By Percent		
			1.2	1.3	1.4
Deshka River	1979	297	7	60	33
	1980	181	10	51	39
	1981	159	10	57	33
	1982	298	13	45	42
Alexander Creek	1979	97	20	63	17
	1980	43	16	77	7
	1981	68	16	54	30
	1982	117	33	29	38
Lake Creek	1979	123	7	40	53
	1980	69	19	50	31
	1981	73	16	59	25
	1982	307	15	39	46

experienced in the 1982 sport fishery, anglers were more likely to release smaller fish and continue fishing for a larger and therefore older chinook salmon.

The average length of chinook salmon by age class varied in the three west side Susitna streams' sport harvest. Lake Creek chinook salmon were slightly larger at each age than Deshka River or Alexander Creek fish. The mean fork length and ranges of lengths by age class are listed in Table 7.

The sex ratio of the west side Susitna River sport harvest ranged from 1.07 male to 1.0 female chinook salmon at Lake Creek to 1.84 male to 1.0 female at Alexander Creek (Table 8).

This variation can be explained by examining the age composition of each stream's sport harvest. Lake Creek, with a relatively high percentage of Age 1.4 fish, has proportionally more females while Alexander Creek with 33% Age 1.2 produced a high percentage of males. The Deshka River with a fairly even split between the three predominant age classes had a sex ratio of 1.45 male to 1.0 female.

Escapement Surveys:

Aerial escapement counts were conducted during July and August 1982 on all major Susitna River and western upper Cook Inlet including chinook salmon spawning streams for the first time since 1979. High turbid water precluded counts on most streams in 1980 and 1981. A total of 33,341 chinook salmon were enumerated in the 14 streams surveyed (Table 9). Overall counting conditions ranged from moderate to good. Counts of 2,546, 16,000 and 3,577 were recorded for Alexander Creek, Deshka River and Lake Creek, respectively.

These are the lowest escapement counts observed for each of these streams since 1975, but when the sport fish harvest is taken into account the total run size is only slightly below the 5-year average of 1975 to 1979.

Record runs of chinook salmon were observed spawning in both the Talachulitna and Chuitna Rivers. All other western upper Cook Inlet streams were also average or above average in escapement.

The 1982 chinook salmon escapements into west side Susitna River and western upper Cook Inlet streams were the first where all three predominate age classes were prodigy of the large spawning escapements observed since 1976. The 1976 run has made a strong showing as Ages 1.2, 1.3 and 1.4.

It was also thought, or at least hoped, that the 1977 escapement of 118,620 chinook, the highest in recent years, would likewise contribute a substantial return in the 1982 chinook salmon escapement. This has not been the case as determined from sport harvest estimates. In 1981, Age 1.2 chinook from the 1977 brood year comprised 13% of the harvest. Analysis of the 1982 harvest data indicates the proportion of Age 1.3 fish from 1977 brood decreased in comparison with the 1976 brood returns a year earlier. This could indicate that large escapements are not necessarily going to propagate even larger returns in an increasing stair step manner. Another explanation could be that there was some abnormal factor exerted on the 1977 brood offspring which caused significant mortality at some point in

Table 7. Chinook Salmon Age and Length Data From Sport Fish Harvest for Deshka River, Alexander Creek and Lake Creek, 1982.

	Age Class	% of Total Sample	Fork Length Range mm*	Mean Fork Length*
Deshka River	1.2	13.0	520-675	597
	1.3	45.0	580-955	788
	1.4	42.0	800-1120	940
		<u>100.0</u>		
Alexander Creek	1.2	33.0	470-671	591
	1.3	29.0	602-910	775
	1.4	38.0	700-1136	938
		<u>100.0</u>		
Lake Creek	1.2	15.0	520-665	602
	1.3	39.0	675-1025	816
	1.4	46.0	815-1130	959
		<u>100.0</u>		

*Fork length measured from mideye to fork-of-tail in millimeters.

Table 8. Chinook Salmon Mean Fork Lengths and Sex Ratios by Age Class from the Sport Fish Harvest for Deshka River, Alexander Creek, and Lake Creek, 1982.

Stream	Age Class	Mean Fork Length*		Sex Ratio
		Male	Female	Male : Female
Deshka River	1.2	596	0	All Male
	1.3	785	791	1.25 : 1.0
	1.4	970	911	1.01 : 1.0
				<u>1.45 : 1.0**</u>
Alexander Creek	1.2	589	0	All Male
	1.3	751	812	1.54 : 1.0
	1.4	979	914	1.0 : 1.63
				<u>1.84 : 1.0**</u>
Lake Creek	1.2	600	0	All Male
	1.3	805	823	1.16 : 1.0
	1.4	991	940	1.0 : 1.0
				<u>1.07 : 1.0**</u>

* Fork lengths measured from mideye to fork-of-tail in millimeters.

** Mean sex ratio.

Table 9. Chinook Salmon Escapement Counts for Westside Susitna River, Western Upper Cook Inlet and Anchorage Area Streams, 1976-1982.

Stream	1976*	1977*	1978*	1979	1980	1981	1982
<u>Westside Susitna</u>							
Alexander Creek	5,412	9,246	5,854	6,215	NC**	NC	2,546
Deshka River	21,693	39,642	24,639	27,385	NC	NC	16,000
Lake Creek	3,735	7,391	8,931	4,196	NC	NC	3,577
Talachulitna	1,319	1,856	1,375	1,648	NC	2,025	3,101
<u>Western Upper Cook Inlet</u>							
Chuitna River	1,984	1,981	1,130	1,246	NC	1,362	3,438
Lewis River	380	454	561	546	NC	560	606
Theodore River	1,032	2,263	547	512	NC	535	1,368
Olson Creek	247	1,229	94	17	NC	116	188
Nikolai Creek	11	143	NC	NC	NC	26	520
Drill Creek	11	NC	77	11	NC	NC	697
Scarp Creek	NC	NC	NC	NC	NC	NC	184
Straight (Clear Fork Creek)	59	24	108	NC	NC	126	383
<u>Anchorage Area</u>							
Campbell Creek	210	349	NC	NC	NC	NC	68
Ship Creek	806	1,011	867	124	NC	1,000	665

* No sport fishery 1976 to 1978

** NC = No count

their life cycle. It will require several more years to determine whether the chinook escapements are going to continually increase or remain at some stable level as the chinook salmon reach an optimum carrying capacity in the upper Cook Inlet area.

Whittier Coho Salmon Creel Census

In 1982, a coho salmon creel census was conducted at Whittier to obtain effort and harvest data and evaluate the success of the 1980 and 1981 coho salmon smolt releases. A total number of 5,611 angler-hours were expended to harvest 1,540 coho salmon between August 16 and September 17.

The coho salmon creel census was designed to delineate between shore and boat anglers' effort and harvest levels. Table 10 indicates the two angler groups harvested comparable numbers of coho but the boat anglers' had a significantly higher harvest rate. The boat anglers higher harvest rate was due to two reasons: (1) the mobility of the boats allowed the angler to follow the tide fluctuations and, therefore, increase the fishing time; and (2) the boat anglers had a better chance at getting closer to the schooling cohos than did the shore anglers.

In 1982, the harvest estimate combined with personal observations by ADF&G personnel produced a total run estimation of approximately 2,000 coho salmon, or a return rate of less than 1% from the original release of 220,000 Age 0+ smolts.

Western Prince William Sound Enhancement Project

The Divisions of Sport Fish and F.R.E.D. are working jointly with U.S. Department of Agriculture-Forest Service (USDA-FS) and Prince William Sound Aquaculture Cooperation (PWSAC) to develop and carry out a feasible salmon enhancement program for Western Prince William Sound (WPWS).

The main objective of the enhancement program is to provide new sport fishing opportunities in WPWS within small boat access of Whittier.

Three techniques will be employed in this program: (1) establishment of spawning populations in barren systems; (2) maintenance stocking of isolated lakes with fry or fingerlings, and (3) put and take smolt stocking programs similar to the existing project at Whittier. One to three systems will be started each year for 5 years.

Spawning populations may be established in several barren lakes which currently have velocity or physical barriers in the outlet streams. Before stocking barren lakes it will be necessary to determine if suitable spawning and rearing habitat is available and if fishways construction is feasible.

Fry or fingerling plants will be used in lakes which contain both suitable rearing habitat and barriers in the outlet streams. These lakes will be utilized as natural fish hatcheries and spawning will not be established. Terminal fisheries will subsequently be created since returning adults will not be able to negotiate the outlet barriers.

Table 10. Coho Salmon Sport Fish Harvest and Effort Data, Whittier, 1982.

	Shore Anglers	Boat Anglers	Totals
Coho salmon	784	756	1,540
Angler-hours	3,313	2,296	5,611
Angler days	2,288	1,002	3,290
Angler-hours per day	1.45	2.29	1.71
Coho salmon per hour	0.24	0.33	0.27
Coho salmon per day	0.34	0.75	0.47

The third component of the sport fish enhancement program will be smolt stocking projects modeled after the existing program at Whittier. To maintain these terminal fisheries, smolts will be transported by barge or aircraft to the release sites. As with the Whittier program, release sites will be near the mouth of streams that do not contain suitable spawning or rearing habitat.

Anchorage Area Lake Stocking Program

In 1982, the Division of F.R.E.D. stocked 20 locations in the Anchorage area with a total of 81,163 rainbow trout and 310,860 coho salmon (Table 11). The Anchorage area received approximately 30,000 more catchable-sized rainbow trout in 1982 than 1981 due to increased survival and production at Elmendorf Hatchery.

The present stocking program mainly relies upon planting catchable size rainbow trout but, in 1982, an experimental plant utilizing rainbow trout fingerlings was initiated in Six-Mile Lake. Six-Mile Lake will be test-netted in the spring of 1983 to evaluate overwinter survival and growth of the rainbow trout fingerlings. Additional plants will be made in lakes that contain good overwinter potential. The goal of the fingerling stocking program will be to reduce the amount of catchable-sized rainbows that are needed every year and to establish multi-year-class populations in the lakes.

Westchester Lagoon was planted with 301,110 coho fry, approximately 250 to the pound, in August. The coho fry will overwinter in the lagoon and emigrate to salt water in the spring of 1982. The Division of F.R.E.D. plans to monitor the chemical and physical conditions in the lagoon throughout the winter and then evaluate overwinter survival and the physical condition of the smolts in the spring of 1983. The coho salmon will in theory, return as Age 1.1 adults in the summer of 1984.

Campbell Creek Enhancement

Campbell Creek, draining the from western slopes of the Chugach Mountains and running through the Municipality of Anchorage, was sampled by minnow traps during August 9-13, 1982 to determine resident and juvenile anadromous fishes distribution. Wire mesh traps baited with salmon eggs were fished overnight. Results indicated that juvenile coho salmon were most abundant in the middle and lower reaches of Campbell Creek, from Lake Otis Parkway to Campbell Lake (Table 12). Juvenile chinook salmon were most abundant in Campbell Creek above Lake Otis Parkway. Resident Dolly Varden and sculpin were captured throughout Campbell Creek. No rainbow trout were captured.

The present enhancement plan involves release of 4,000 catchable size rainbow trout. Tentatively, one release is scheduled for late May and one for early July, in the North Fork Campbell Creek.

Specific release sites would be located in the Campbell Tract area off Tudor Road. Access to portions of Campbell Creek in this area is directly available by road. However, fish may have to be transported a short distance (100-200 yards) from the tank truck to preferred release sites.

Table 11. Fishes Stocked In Anchorage Area Vicinity, 1982.

Date	Lake	Species	Size-Grams	Number
<u>Anchorage Area Lakes</u>				
5/24	Cheny	RT*	54.1	2,528
5/24	DeLong	RT	54.1	4,985
5/24	Campbell Point	RT	54.1	4,116
5/24	Sand	RT	54.1	4,006
5/25	Jewell	RT	59.0	10,000
5/28	Jewell	RT	2043.0	83
5/25	"C" Street Gravel	RT	59.0	2,500
8/06	Westchester Lagoon	SS**	2.8	102,100
8/09	Westchester Lagoon	SS	2.8	62,800
8/10	Westchester Lagoon	SS	2.6	136,210
Total number stocked: 28,218 RT catchables 301,110 SS subcatchables				
<u>Chugiak Area Lakes</u>				
5/25	Beach	RT	54.1	2,500
5/26	Lower Fire	RT	59.0	1,788
5/28	Lower Fire	RT	2043.0	50
6/01	Lower Fire	RT	681.0	205
Total number stocked: 4,543 RT catchables				
<u>Ft. Richardson Area Lakes</u>				
5/24	Otter	RT	54.1	9,039
5/28	Otter	RT	2043.0	49
5/25	Thompson	RT	54.7	1,500
5/25	Gwen	RT	54.7	5,000
5/25	Clunie	RT	59.0	9,999
6/23	Derby	RT	56.7	1,000
6/23	Derby	RT	100.8	9
Total number stocked: 26,596 RT catchables				

Table 11. Fishes Stocked In Anchorage Area Vicinity, 1982 (Continued).

Date	Lake	Species	Size-Grams	Number
<u>Elmendorf Area Lakes</u>				
5/20	Hillberg	RT	64.0	2,773
5/20	Green	RT	54.0	5,851
5/28	Green	RT	2043.0	24
5/25	Triangle	RT	54.7	2,141
5/25	Fish	RT	54.7	1,037
9/02	Six Mile	RT	1.44	9,980

Total number stocked: 11,826 RT catchables
 9,980 RT subcatchables

Whittier

5/27	Cove Creek	SS	18.9	9,750
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Summary

Combined stocking totals for Anchorage, Base Lakes and Whittier:

71,183 RT catchables
 9,980 RT subcatchables
 310,860 SS subcatchables

* RT = Rainbow trout

** SS = Coho salmon

Table 12. Campbell Creek Minnow Trapping Results August 9-13, 1982.

Location	No. Traps	Coho No.	Coho No./Trap	Chinook No.	Chinook No./Trap	Dolly Varden No.	Dolly Varden No./Trap
Campbell L. to Minnesota Dr.	12	175	14.6	9	0.8	49	4.1
Minnesota Dr. to "C" Street	12	173	14.4	9	0.8	81	6.8
"C" Street to New Seward Hwy.	18	425	23.6	25	1.4	198	11.0
New Seward Hwy. to Lake Otis Pky.	5	58	11.6	7	1.4	50	10.0
Above Lake Otis Pky.	<u>11</u>	<u>50</u>	<u>4.5</u>	<u>320</u>	<u>29.1</u>	<u>31</u>	<u>2.8</u>
TOTALS	58	881	15.9	370	6.4	409	7.1

Stream velocities would determine specific release locations. Cursory observations indicate velocities in candidate sites are acceptable but monitoring will be required prior to stocking to ensure fish are not rapidly flushed out of the area. Stocking is not recommended in the South Fork Campbell Creek due to predominantly high velocity flows in that section of stream.

Our enhancement efforts should allow for a slow movement of fish through the system providing ample opportunity for angler harvest especially along the Campbell Creek Green Belt. This strategy should also keep many of the rainbow trout from entering Campbell Lake where harvest opportunities would be very limited and would create conflicts between boats, aircraft and landowners.

Natural Resource Development Impact Evaluation

Three major resource developments, presently under evaluation, could have significant effects upon Anchorage/Susitna fisheries and fishery habitat. These developments are the Susitna Hydroelectric Project, the Chackachamna Hydroelectric Project and the Beluga Coal Development Project. Anchorage/Susitna/western Prince William Sound sport fish staff does not conduct the impact evaluation studies in any of these projects, however, the staff has worked with the various contractors in developing fisheries study plans, has conducted on site investigations with the respective study teams to ensure the quality of their fisheries research and has assisted in reviewing the respective projects results.

In addition to the time committed to major project impact evaluations the staff reviews and comments on numerous Title 16 permit applications. In many cases sport fish staff provide the only on site evaluation of the permitted projects. Sport fish area staff also provides assistance to the Habitat Division in classifying and evaluating state land disposals.

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