

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations
of Alaska.

Project No.: F-9-11

Study No.: G-1 Study Title: INVENTORY AND CATALOGING

Job No.: G-1-H Job Title: Inventory and Cataloging
of Sport Fish and Sport Fish
Waters of the Lower Susitna
River and Central Cook Inlet
Drainages.

Period Covered: July 1, 1978 to June 30, 1979.

ABSTRACT

Rainbow trout, *Salmo gairdneri* Richardson, were experimentally stocked in 13 Anchorage area lakes and coho salmon, *Oncorhynchus kisutch* (Walbaum), were planted in three lakes.

The 1978 escapement of chinook salmon, *O. tshawytscha* (Walbaum), in west side Susitna streams was studied. Escapement in the majority of surveyed streams appeared to be considerably less than 1977 levels; a total of 47,875 were observed compared to 77,303 enumerated during 1977.

A creel census conducted at Eshamy Creek in Prince William Sound revealed a total recreational harvest of 419 sockeye salmon, *O. nerka* (Walbaum), in 248 man-days of fishing effort.

Creel census data obtained from the Deshka River disclosed that anglers fished an estimated 7,858 man-hours to harvest 1,513 coho salmon, a seasonal rate of success of 0.19 fish per hour.

Chinook and coho salmon juveniles were sampled in the Deshka River. Data were collected on their size, population density, habitat preference, and timing of outmigration. The work was accomplished in the lower 5 miles of the river.

BACKGROUND

Concern over the decline of recreational harvest levels of coho salmon in upper Cook Inlet streams necessitated a continuation of a creel census program on the Deshka River, a popular sport fishing area, to obtain angling

effort and harvest data. Periodic creel checks have been conducted in the past but have provided a less than accurate estimate of total catch. During 1977 and 1978 the fishery was more closely monitored.

The magnitude of the chinook salmon run into upper Cook Inlet cannot be evaluated because of the many turbid, glacial streams in which the salmon cannot be detected visually. Enumeration of salmon in the Susitna River drainage is confined to the clear water tributaries. Since 1964, chinook salmon escapement surveys have been made annually on selected streams in the Susitna basin.

During 1978 a creel census program was conducted at Eshamy Creek in western Prince William Sound to establish sport fish effort and harvest levels. Recreational access to Eshamy Lake and Lagoon is primarily by small boats, originating from Whittier, and by float planes. Present recreational use is light but is expected to increase significantly as facilities at Whittier and Valdez develop.

As in previous years, the program for restocking Anchorage area lakes was continued in 1978. Test netting to determine population trends within managed lakes was also conducted.

Past studies on the Deshka River have been concerned with the recreational harvest and escapement of adult salmon. Virtually no information was available on the early life history of rearing salmonids in this system. In that the Deshka presently provides recreational angling for coho salmon and may be opened to chinook salmon fishing in the near future, it was felt necessary to collect basic information on the juveniles of these species. Data were collected on growth, population densities, habitat preference and timing of outmigration on these two important species in the lower five miles of the river.

The study area is shown in Figure 1, and a list of common and scientific names of all species mentioned in this report is presented in Table 1.

RECOMMENDATIONS

1. Creel censuses should be conducted on the Deshka River and Alexander and Lake creeks to obtain angling effort and estimates of the total chinook harvest.
2. Investigation of waters between the Chakachatna River on Cook Inlet and the headwaters of the Talachulitna River should be conducted on a continuing basis due to anticipated effects of proposed coal and gas field development in the area,
3. Studies on the early life history of chinook and coho salmon should be continued to obtain data to determine if a relationship exists between juvenile populations and subsequent spawning populations.
- . Coho sport fish effort and harvest data should continue to be collected in selected west side Cook Inlet drainages.

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

Common Name	Scientific Name & Author	Abbreviation
Coho salmon	<i>Oncorhynchus kisutch</i> (Walbaum)	SS
Chinook salmon	<i>Oncorhynchus tshawytscha</i> (Walbaum)	KS
Sockeye salmon	<i>Oncorhynchus nerka</i> (Walbaum)	RS
Pink salmon	<i>Oncorhynchus gorbuscha</i> (Walbaum)	PS
Dolly Varden	<i>Salvelinus malma</i> (Walbaum)	DV
Rainbow trout	<i>Salmo gairdneri</i> Richardson	RT
Cutthroat trout	<i>Salmo clarki</i> Richardson	CT
Arctic grayling	<i>Thymallus arcticus</i> (Pallas)	GR
Threespine stickleback	<i>Gasterosteus aculeatus</i> (Linnaeus)	TST
Burbot	<i>Lota lota</i> (Linnaeus)	BB
Slimy sculpin	<i>Cottus cognatus</i> Richardson	CD

5. Chinook salmon escapement counts **should** be continued on west side upper Cook Inlet streams.
6. Experimental stocking evaluations on Anchorage area lakes should be continued.

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

Fish population sampling throughout the Anchorage area was accomplished with 125 ft. variable mesh gill nets, a Smith-Root Type V backpack **electro-**fishing unit, minnow traps, hook and line, and dip nets. Measurements on fish collected included total lengths to the nearest millimeter (mm) and weight to the nearest gram (g). Scale samples from fish were pressed on cellulose acetate sheets and projected on the screen of a Micro-Design C.O.M. 200 scale reader to determine age.

Escapement surveys were conducted from July 18 through August 7. Streams were low and clear, thus affording excellent viewing conditions. Generally, most of the major stream systems are surveyed at least twice to determine the peak period of abundance. Two basic methods, aerial and ground surveys, are utilized to obtain distribution, **numbers** and time of arrival of chinook salmon in upper Cook Inlet streams. All surveys on the west side Susitna River were done by helicopter. Other counting methods have included counting towers, weirs, and sonar salmon counters. However, since it is not economically feasible to have a weir or tower on each stream, aerial and ground methods will continue as the only source of information on most streams of the area.

The Deshka River coho salmon creel census program was designed to obtain effort and harvest data. The period July 8 through August 31 was stratified by week, weekday, and weekend-holiday. Interviews of anglers who had finished fishing for the day were conducted throughout the period 8 a.m. to 10 p.m.

on weekends and holidays and during three randomly selected weekdays from 8 a.m. to 3 p.m., or 3 p.m. to 10 p.m.

Total angler hours, angler days, and harvest were estimated each week as follows:

$$H = \sum_{h=1}^2 N_h \bar{C}_h \quad \text{where} \quad \bar{C}_h = \frac{N_h \sum_{i=1}^{N_h} C_{hi}}{N_h}$$

$$D = \sum_{h=1}^2 N_h \bar{I}_h \quad \text{where} \quad \bar{I}_h = \frac{M_h \sum_{j=1}^{M_h} I_{hj}}{M_h}$$

$$K = \sum_{h=1}^2 N_h \bar{C}_h \bar{k}_h \quad \text{where} \quad \bar{k}_h = \frac{M_h \sum_{j=1}^{M_h} k_{hj}}{M_h}$$

H = Total angler hours

D = Total angler days

K = Total coho harvest

C_{hi} = Number of anglers, count i, stratum h

I_{hj} = Number of hours fished, angler j, stratum h

k_{hj} = Number of coho salmon kept, angler j, stratum h

M_h = Number of anglers interviewed, stratum h

n_h = Number of anglers counted, stratum h

N_h = Number of hours in the fishing week, stratum h

h = 1 for the weekday stratum

h = 2 for the weekday 1 holiday stratum

Total angler hours, angler days, and harvest for the season were estimated by summing the weekly estimates.

A creel census was also conducted at Eshamy Creek to determine angler utilization. This census was designed to contact 100% of the anglers for total sport harvest and effort information.

Data were collected on juvenile coho and chinook salmon populations in the lower five miles of the Deshka River through the use of baited minnow traps. Numbers caught were recorded by date, species, age and habitat preference. Measurements, on a representative sample of the fish collected, included total lengths to nearest millimeter (mm). Attempts were made to reset traps in their previous location.

FINDINGS

Results

Juvenile chinook and coho trapping was initiated as soon after breakup as possible in the Deshka River. The first traps were set on May 16 and recovered the following day. This basic overnight trapping schedule was continued three days per week until August 25 when the field season was terminated.

Chinook and Coho Smolts:

The catch of chinook and coho smolts is presented in bi-monthly periods in Table 2.

Data in Table 2 indicate chinook salmon migration had commenced prior to the first trapping period. The table also shows that chinook smolt catch per trap was high during the first two bi-monthly periods, then dropping for the next two. On the fifth bi-monthly period the catch suddenly climbed again. No explanation can be provided for this late July spurt. After this, the catch declined throughout August, which was expected.

The coho smolt catch indicates no trends except that the stock is very low.

Chinook and Coho Yearlings:

No chinook salmon yearlings were caught in the Deshka River during the 1978 field season. This leads to two possible assumptions: (1) all chinook salmon migrate to sea as Age 1+ smolts, or (2) this area does not provide the habitat desired by yearling chinook salmon.

Chinook and Coho Fry:

Throughout the field season, a total of 794 traps were fished for 18,940 hours. This effort resulted in a catch of 9,172 chinook salmon fry and 11 coho salmon fry. The low coho catch again indicates that the study area may not provide suitable habitat for this species. The catch rate for both species has been divided into bi-monthly periods and is presented in Table 3.

Table 3 illustrates that the catch rate of chinook fry is very low in May and June. This is attributed to their small size, which permits them to escape from the 1/8 inch traps utilized in this study. It is also known that the study area is not a chinook salmon spawning area.

The high chinook fry catch experienced during July indicates a large movement of these fish through the study area. At this time, it is not known if these fish are migrating to or from the system. Further studies will be required to determine the direction of this movement.

Table 2. Deshka River Salmon Smolt Catch, 1978.

Date	No. of Hours	No. of Traps	No. of Chinook Smolts	Chinook Smolts Per Trap	Chinook Smolts Per Trap	No. of Coho Smolts	Coho Smolts Per Hour	Coho Smolts Per Trap
May 5-31	3,153.0	141	168	.05	1.19	...	...	...
June 1-15	3,206.4	140	273	.09	1.95	17	.01	.12
June 16-30	2,747.8	137	37	.01	.27	25	.01	.18
July 1-15	1,409.0	60	54	.04	.90	...	...	...
July 16-31	2,771.0	116	178	.06	1.53	1	Tr.	.01
August 1-15	3,311.1	120	21	.01	.18	2	Tr.	.02
August 16-31	2,441.9	100	3	Tr.	.03	...	...	...

Table 3. Deshka River Salmon Fry Catch, 1978.

Date	Number Hours	Number Traps	Chinook Fry	Chinook Fry Per Hour	Chinook Fry Per Trap	Coho Fry	Coho Fry Per Hour	Coho Fry Per Trap
May 16-31	3,153.0	141	...	...	...	...	...	...
June 1-15	3,206.4	140	397	.12	2.8	2	Tr.	Tr.
June 16-3	2,747.8	117	1,242	.45	10.6	2	Tr.	Tr.
July 1-15	1,409.0	60	2,045	1.45	34.1	...	...	...
July 16-31	2,671.0	116	4,596	1.72	39.6	2	Tr.	Tr.
August 1-15	3,311.1	120	814	.25	6.8	3	Tr.	Tr.
August 16-25	<u>2,441.9</u>	<u>100</u>	<u>78</u>	<u>.03</u>	<u>.8</u>	<u>2</u>	<u>Tr.</u>	<u>Tr.</u>
	18,940.2	794	9,172	.48	11.6	11	Tr.	Tr.

Catch by Habitat:

Minnow trap locations were divided into five different habitat types: (1) riffle; (2) pool: slow, shallow, 1-2 ft deep; (3) pool: slow, deep, 2+ ft; (4) pool: fast, shallow, 1-2 ft deep; and (5) pool: fast, deep, 2+ ft. Again, the catch is presented in bi-monthly periods and is presented in Table 4.

As shown in Table 4, the highest catch rates for juvenile chinook salmon occurred in habitat type 4 (pool, shallow, fast). Overall, 58% of the kings were caught in fast moving waters with the remaining 42% caught in slow waters.

Although the coho catch was too small to reach any definite conclusions, it appears they may prefer slower moving waters. This assumption is made in that their highest catch occurred in habitat type 3 (pool, deep, slow).

Juvenile Salmon Size:

Records of size in millimeters (mm) of juvenile salmon were kept throughout the season. However, the low number of coho captured prevented any meaningful utilization of their growth data.

The chinook salmon smolts exhibited no particular growth pattern from mid-May to mid-June when the last measurement was taken. Smoltification was determined primarily by pigmentation and secondarily by size. They ranged in size from 76 mm to 93 mm. The seasonal average size of chinook salmon smolts was found to be 80.2 mm, total length.

Chinook salmon fry exhibited steady growth throughout the season after mid-June. Bimonthly averages were: June 1 through 15, 53.5 mm; June 16 through 30, 66.3 mm; July 1 through 15, 68.1 mm; July 16 through 31, 68.8 mm; August 1 through 15, 75.2 mm; and August 15 through 31, 85.1 mm. It is interesting to note that the fry captured in late August averaged 5 mm larger than outmigrant smolts caught in the late spring. This provides some evidence that the larger smolts are first to migrate in the spring prior to the start of this study.

Other Species:

Other species encountered were rainbow trout, Arctic grayling, pink salmon, burbot, slimy sculpin, and threespine stickleback.

Of the above species, stickleback were by far the most abundant. Their total catch in numbers exceeded the combined catch of all other species. Table 5 illustrates the stickleback catch by time periods.

The high early catch followed by the steady decline gives evidence that the majority of these sticklebacks are not permanent residents of the study area but are migratory spawning fish that utilize this portion of the system.

Table 4. Catch of Chinook and Coho Salmon by Habitat Type, Deshka River, 1978.

Habitat Type	Number	Traps	Number	Chinook	Per Hour	Chinook	Per Trap	Coho	Number	Coho	Per Hour	Per Trap
1. Riffle	15	77	77	5.13	.22	5.13	.22	4	.01	.22	.01	.22
2. Pool, shallow slow - 2 feet	12	22	22	1.83	.08	1.83	.08	1	Tr.	.08	Tr.	.08
3. Pool, deep slow - 2+ feet	18	186	186	4.89	.21	4.89	.21	15	.02	.39	.02	.39
4. Pool, shallow fast - 2 feet	15	179	179	11.93	.81	11.93	.81	6	.02	.40	.02	.40
5. Pool, deep fast - 2+ feet	20	119	119	5.95	.26	5.95	.26	14	.03	.70	.03	.70
June 1 - June 15												
1	15	77	220	16.92	.72	16.92	.72	5	.01	.23	.01	.23
3	15	429	429	8.76	.56	8.76	.56	23	.07	.47	.07	.47
4	17	115	115	19.32	.80	19.32	.80	4	.01	.18	.01	.18
5	16	105	105	6.56	.28	6.56	.28	2	.01	.13	.01	.13
June 16 - June 30												
1	13	220	220	16.92	.72	16.92	.72	5	.01	.23	.01	.23
3	15	116	116	7.73	.33	7.73	.33	3	.01	.20	.01	.20
4	19	429	429	8.76	.56	8.76	.56	23	.07	.47	.07	.47
5	16	105	105	6.56	.28	6.56	.28	2	.01	.13	.01	.13
July 1 - July 15												
1	6	281	281	46.83	7.81	46.83	7.81	...	...	...	...	...
2	15	680	680	45.33	3.02	45.33	3.02	...	...	...	...	...
3	15	497	497	33.13	2.21	33.13	2.21	1	Tr.	.01	Tr.	.01
4	12	440	440	36.67	3.06	36.67	3.06	1	Tr.	.08	Tr.	.08
5	12	252	252	21.00	1.75	21.00	1.75	...	...	...	...	...
July 16 - July 31												
1	15	708	708	2.06	.14	2.06	.14	4	.01	.27	.01	.27
3	17	828	828	1.33	.09	1.33	.09	3	Tr.	.11	Tr.	.11
4	33	1,757	1,757	2.32	.17	2.32	.17	6	.01	.18	.01	.18
5	21	712	712	1.48	.11	1.48	.11	3	.01	.14	.01	.14
August 1 - August 15												
1	14	89	89	6.36	.23	6.36	.23	3	.01	.21	.01	.21
2	20	195	195	9.75	.36	9.75	.36	2	Tr.	.10	Tr.	.10
3	50	284	284	5.68	.20	5.68	.20	9	.01	.18	.01	.18
4	20	92	92	4.60	.16	4.60	.16	1	Tr.	.05	Tr.	.05
5	16	145	145	9.06	.34	9.06	.34	2	Tr.	.13	Tr.	.13
August 16 - August 31												
1	14	9	9	.64	.04	.64	.04	...	...	...	...	...
23	23	28	28	1.22	.08	1.22	.08	5	.01	.22	.01	.22
26	40	26	26	.65	.04	.65	.04	12	.01	.30	.01	.30
12	12	12	12	.75	.05	.75	.05	4	.01	.25	.01	.25
4	4	4	4	.57	.02	.57	.02	...	...	...	...	...
Total Season												
1	77	1,834.7	1,834.7	17.97	.75	17.97	.75	14	.01	.18	.01	.18
105	105	1,810	1,810	17.24	.70	17.24	.70	15	.01	.14	.01	.14
219	219	2,250	2,250	10.27	.41	10.27	.41	4	.01	.29	.01	.29
118	118	2,905	2,905	24.62	1.01	24.62	1.01	22	.01	.30	.01	.30
92	92	1,537	1,537	13.16	.55	13.16	.55	21	.01	.23	.01	.23

Table 5. Stickleback Catch by Time Periods, Deshka River, 1978.

Date	Number Traps	Number Stickleback	Catch Per Trap
May 16 - 31	148	4,699	31.8
June 1 - 15	140	3,681	26.3
June 16 - 30	117	1,917	16.4
July 1 - 15	60	868	14.5
July 16 - 31	116	1,351	11.6
August 1 - 15	120	421	3.5
August 16 - 31	100	17	.2

Sport Fish Stocking:

Seventeen lakes and one stream in the Anchorage management area were experimentally stocked with game fish in 1978. The location of each lake, species, and number of fish released, is shown in Table 6.

Test Netting:

The nine lakes in the Anchorage area test netted in 1978 are shown in Table 7, with fish species present and size composition of fish caught. All of the lakes shown are included in the Sport Fish Division's experimental stocking program.

Some of the lakes were test netted twice, the first time in October to determine survival of planted fish prior to freeze-up and again during the month of May after the ice had gone off to determine winter survival. In general, survival of stocked fish in these managed lakes appeared to be normal after a summer's fishing season; however, test netting results during May produced no fish in Triangle or Gwen lakes. These lakes are small in size and are relatively shallow, thus contributing to low oxygen levels. Overwintering of fish in these lakes has been poor in the past and it appears stocking fish of less than catchable size is impractical.

Upper Cook Inlet-West Side Susitna River Chinook Salmon Escapement:

For the sixth consecutive year, chinook salmon surveys of sufficient magnitude to estimate total spawning escapements were conducted on major clear-water tributaries of the western Susitna River. A minimum estimate of the total spawning population was 65,811 chinook salmon.

In 1978 the majority of surveyed streams showed less chinook salmon than were counted the previous year. A total of 47,875 salmon (Table 8) were observed compared to 77,303 enumerated during 1977. Although the 1978 count was approximately 65% of the total estimate of 101,592 made in 1977, the run appeared to be the second highest recorded escapement since surveys began in the early 1960's.

Since 1973 when reliable comparisons could be made on the spawning populations, total stock estimates have ranged from 6,100 to 101,592 chinook salmon (Table 9).

The Deshka River continues to be the most productive chinook stream in the entire upper Cook Inlet-Susitna River drainage. Since 1973 the Deshka has accounted for 40.3% of total chinook salmon observed (Table 10).

A sample of 358 chinook salmon carcasses from the Deshka River were examined for sex and length composition. The salmon ranged in length from 270 mm to 1,070 mm, with a mean of 780 mm. Males averaged 744 mm and females 827 mm. Sex ratio of males to females was 1.3:1. The 1978 carcass sample was composed predominately of five-year-old fish. Age composition determined by length frequencies indicated 56.0% were five years old; 32.1% were six years old; 11.1% were four years old; and 0.8% were three-year-old fish.

Table 6. Experimental Fish Stocking in Anchorage Area Lakes, 1978.

Lake	Location	Species Stocked	Number Stocked
Sand	Anchorage	RT catchables*	5,000
Lower Fire	Anchorage	RT catchables	5,000
Jewell	Anchorage	RT catchables	8,814
Campbell Point	Anchorage	RT catchables	5,083
Beach	Birchwood	RT catchables	612
Otter	Ft. Richardson	RT catchables	12,116
Clunie	Ft. Richardson	RT catchables	9,354
Thompson	Ft. Richardson	RT catchables	5,009
Gwen	Ft. Richardson	RT catchables	4,015
Hillberg	Elmendorf	RT catchables	4,010
Green	Elmendorf	RT catchables	4,025
Triangle	Elmendorf	RT catchables	2,013
Fish	Elmendorf	RT catchables	2,002
C St. Gravel Pit	Anchorage	SS fingerlings	20,000
Cheny Pond	Anchorage	SS fingerlings	20,000
Six-Mile	Elmendorf	SS fingerlings	20,000
Mirror	Chugiak	GR fry	75,000
Willawaw Creek	Portage	GR fry	75,000
Total Stocked:	RT - 67,053		
	SS - 60,000		
	GR - 150,000		

*Catchables - 8- to 10-inch range

Table 7. Test Netting Results, Anchorage Area Lakes, 1978.

Lake	Date	Species	Number of Fish	Length (mm) Range	Mean
Mirror	September 12	GR	1	290	
Cheny	September 11	SS	22	92-126	110
Triangle	May 17		0		
Fish	May 18	RT	1	300	
Six Mile	May 17	SS	46	70-190	
Gwen	May 8		0		
	October 2	RT	29	320-461	344
Clunie	May 10	RT	21	250-400	325
	October 2	RT	11	288-448	348
Thompson	May 8	RT	1	380	
	October 3	RT	3	248-347	295
Otter	May 8	RT	2	355-560	457
		DV	3	210-230	217
		SS	10	110-175	144
	October 4	RT	4	346-435	388
		DV	1		245
		SS	10	157-187	165

Table 8. Chinook Salmon Counts, Upper Cook Inlet*, 1977-1978.

Stream	1977	1978
Deshka River	39,642	24,639
Alexander Creek	13,385	5,854
Chuit River	1,891	1,130
Theodore River	2,263	547
Lewis River	454	561
Talachulitna River	1,856	1,375
Lake Creek	7,391	8,931
Martin Creek	1,060	205
Cache Creek	100	
Bear Creek	298	...
Olson Creek	1,229	94
Pretty Creek	36	10
Bishop Creek	468	
Nikolai Creek	143	...
Straight Creek	24	108
Red Creek	1,511	385
Peters Creek	3,042	1,130
Donkey Creek	159	163
Fish Creek (Quigs)	131	66
Fish Creek (Kroto S.)	132	...
Unnamed-Kichatna River	120	...
Clearwater Creek	47	
quartz Creek	8	...
Canyon Creek	135	...
Dickason Creek	4	...
Unnamed-Hays River	2	...
Coal Creek	...	1,551
Kabideaux Creek	99	...
Drill Creek	...	77
Ship Creek (Anchorage)	1,011	867
S.F. Eagle (Anchorage)	313	182
Campbell (Anchorage)	349	...
Total	77,303	47,875

* Includes Anchorage area streams, Eagle River, Skwentna and Tyover.

Table 9. Upper Cook Inlet-West Side Chinook Salmon Escapement Counts and Population Estimates, 1973-1978.

Year	Observed Counts*	Estimated Counts
1978	47,875	65,811
1977	77,303	101,592
1976	39,435	51,300
1975	7,962	10,000
1974	9,208	11,700
1973	5,454	6,100

* Includes Anchorage area streams.

Table 10. Chinook Salmon Escapement Counts, Upper Cook Inlet and Deshka River, 1973-1978.

Year	Upper Cook Inlet Susitna River Drainage	Deshka River	Percent from Deshka River
1978	60,728	24,639	40.6
1977	91,502	39,642	43.3
1976	56,288	21,693	38.5
1975	9,209	4,737	51.4
1974	12,548	5,279	42.1
1973	<u>13,615</u>	<u>2,381</u>	<u>17.5</u>
Total	243,890	98,371	40.3

A total of 111 chinook salmon carcasses were sampled on Alexander Creek. The fish ranged in size from 330 mm to 1,020 mm, with an average of 793 mm. Males averaged 684 mm and females 859 mm. Sex ratio of males to females was 1:1.6. Age composition indicated 50.5% were five years old; 36.0% were six years old; 11.7% were four years old; and 1.8% were three-year-old fish.

In addition to Alexander and the Deshka River, a total of 175 chinook carcasses were sampled from Lake Creek. These fish were considerably larger than those checked in Alexander and Deshka rivers and ranged in size from 500 mm to 1,200 mm with a mean average of 959 mm. Males averaged 963 mm and females 941 mm. Sex ratio of males to females was 1.5:1. Age composition showed 82.9% were six years old; 13.1% were five years old; and 4.0% were four-year-old fish.

In conjunction with west side Susitna River escapement surveys, Ship Creek and the South Fork of Eagle River, located in the Anchorage area, were surveyed for spawning populations of chinook salmon (Table 8).

Since there was no open chinook season on the Susitna River except for jacks under 508 mm (20 in.) creel census activities were not initiated.

Deshka River Coho Creel Census:

A creel census program to evaluate current fishing levels, angler hours, and the total coho harvest for the Deshka River was conducted for the second consecutive year.

The Deshka River is known to have provided excellent coho fishing in past years. In 1977 fishing was very poor, with a catch rate of 0.05 fish per hour. The total harvest for the entire 1977 season was estimated at only 527 cohos. By contrast, in 1978 the catch rate was 0.19 cohos per hour and the total harvest was 1,513 cohos. In general the harvest rate for coho in the Deshka River was three times better than 1977.

Harvest and effort estimates for 1978 by weekly sampling periods from July 8 through August 31 are presented in Table 11.

Mean length and weight of male coho as collected from 103 fish samples was 531 mm and 2.6 kg. Ninety-five female cohos sampled averaged 520 mm and weighed 2.3 kg.

Age composition of 173 cohos sampled indicated 91.3% were four-year-old fish and 8.7% were three-year-old fish.

Eshamy-Western Prince William Sound:

Creel census activities conducted at Eshamy Creek (Lagoon) in 1978 revealed a total recreational harvest of 419 sockeye salmon (Table 12) in 248 man-days of fishing effort. Catch per angler-day increased from 0.49 in 1977 to 1.69 sockeye in 1978.

Table 11. Deshka River Coho Salmon Harvest and Effort Estimates, 1978.

Week	Angler Hours	Angler Days	Coho Harvest	Hours Angler-Hours	Catch Hour
July 8 - 14	439	95	3	4.62	0.01
July 15 - 21	1,113	166	23	6.70	0.02
July 22 - 28	1,906	470	301	4.05	0.16
July 29 - August 4	1,831	387	307	4.73	0.17
August 5 - 11	862	254	309	3.39	0.36
August 12 - 18	1,281	280	449	4.57	0.35
August 19 - 25	222	77	86	2.88	0.39
August 26 - 31	<u>204</u>	<u>17</u>	<u>35</u>	<u>12.00</u>	<u>0.17</u>
Total	7,858	1,746	1,513	4.50	0.19

Table 12. Eshamy Lagoon Salmon Catch, 1967-1978.

Year	Census Period	Sport Harvest				Total Salmon	Sockeye Escapement	Sockeye Commercial Catch**
		Sockeye	Pink	Coho	Chum			
1967	July 1 - September 5	151	42	6		199	26,593	20,876
1968	June 30 - August 27	316	5	8		329	68,048	Closed
1969	June 26 - September 11	452	40	9	1	502	60,196	61,728
1970	June 25 - September 1	448	49	1		498	11,460	17,292
1971	July 12 - September 5	297	29	23		349	3,000	Closed
1972	July 1 - September 10	1,413	141	60		1,614	28,750	52,888
1974	June 23 - August 27	1,472	364	0		1,836	637*	19,037
1975	June 21 - September 19	53	139	14		206	1,754	Closed
1976	June 25 - September 11	759	140	24		923	19,360	Closed
1977	June 12 - September 12	114	110	17		241	11,746	26,546
1978	June 20 - September 26	419	25	1		445	12,580	Closed

* Escapement count incomplete, weir panels pulled early.

** Eshamy District.

Cutthroat trout and Dolly Varden, are also present in the Eshamy system, but generally receive little fishing effort; most catches are made incidentally to salmon fishing. During 1978 a total of 109 Dolly Varden and 51 cutthroat trout were creel checked.

DISCUSSION

Chinook salmon counts in Upper Cook Inlet revealed a large escapement. A total of 47,875 chinook salmon were observed in 19 local (Anchorage) and west side Susitna streams during 1978, providing a total escapement estimate of 65,811.

The 1978 sport fish harvest of cohos on the Deshka River was generally improved over 1977 levels. This year an estimated 1,513 coho salmon were harvested, providing approximately 1,746 angler days of fishing.

The Deshka River was sampled from mid-May through the end of August to study the early life history of king and coho salmon utilizing the system. The catch rates of coho smolts and fry were so low (45 smolts, 116 yearlings and 11 fry) that no conclusions, other than that they do not dwell in the study area, could be drawn.

The king salmon smolt outmigration was thought to be underway at the start of the study. Peak outmigration of this species occurred in late May-early June, after which it tapered off until late July, when a second peak was recorded. During August the outmigration tapered off to only a trace.

A total of 15 lakes and one stream in the immediate Anchorage, Fort Richardson and Elmendorf AFB vicinity were stocked with game fish in 1978. In recent years stocking programs in this area have relied heavily on plants of catchable size rainbow trout.

Prepared by:

Approved by:

Stanley W. Kubik
Fishery Biologist

Rupert E. Andrews, Director
Sport Fish Division

Roger Wadman
Fishery Biologist

Mark C. Warner, Ph.D.
Sport Fish Research Chief