

SOUTHEAST ALASKA TROLL FISHERY PERFORMANCE MONITORING
1986 THROUGH 1990

By

David Gaudet

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AUTHOR

Dave Gaudet is the Regional Troll Fishery Management Biologist for the Southeast Region of the Alaska Department of Fish and Game, Division of Commercial Fisheries, Box 240020 Douglas, Alaska, 99824-0020.

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ABSTRACT

The Southeast Alaska commercial troll fishery landings were sampled to recover coded-wire-tags and to estimate catch-per-unit-effort of chinook and coho salmon. In addition, aerial overflights were flown in some weeks and this data was combined with the CPUE data to estimate the total landings for the week. The data is needed to ensure that the fishery complies with Pacific Salmon Treaty chinook salmon annex and that Alaska Board of Fisheries directives for conservation and allocation are met.

During the five year period, the program allowed these goals to be met. The overall absolute error in estimation of the chinook salmon catch was 5.5% while for coho salmon it was 13.8%.

INTRODUCTION

This report describes the sampling of chinook and coho salmon caught in the general summer Alaska troll fishery. Results of the sampling are used in the management of the troll fishery.

DESCRIPTION OF THE TROLL FISHERY

The commercial troll fishery in Southeast Alaska and Yakutat (Region 1) occurs in State of Alaska waters and in the Federal Exclusive Economic Zone (EEZ) east of the longitude of Cape Suckling. The EEZ waters are those more than three miles west of the surf line. All other waters of Alaska are closed to commercial trolling.

The commercial troll fishery harvests primarily chinook and coho salmon. Other species of salmon harvested by trollers are normally considered incidental. The troll fishery harvests the majority of the chinook salmon; however, the percentage has declined since quota management was introduced in 1985. The troll fishery is also the major harvester of coho salmon.

Commercial trolling for chinook salmon occurs in two seasons; winter (October 1 through April 14), and summer (April 15 through September 30). The summer season is divided into four fisheries: 1) June experimental fishery; 2) June hatchery access fishery; 3) terminal fishery; and 4) general summer fishery. The first three are designed to maximize the catch of Alaska origin hatchery chinook. Time and area opening or guidelines for time and area are set by the Alaska Board of Fisheries (Board). The season for coho salmon is from June 15 through September 20.

The commercial troll fleet is comprised of two types of gear, hand troll and power troll. Vessels using hand troll gear are limited to two lines on hand-operated gurdies, or four sport fishing poles. Although more permits are available when compared with power troll gear, hand trollers take a smaller portion of the overall catch. Vessels using power troll gear are generally larger than those using hand troll gear and are limited to four lines on power-operated gurdies except with the EEZ north of the latitude of Cape Spencer, where six lines may be used.

STOCK DESCRIPTION, STATUS AND MANAGEMENT

Only the status of the primary troll species, chinook and coho salmon are discussed in this report.

Chinook Salmon Stocks

Native chinook salmon stocks occur throughout Southeast Alaska and Yakutat. Chinook salmon stocks occur primarily in the large mainland rivers and tributaries. The most important are the Alsek, Taku, and Stikine, and the Behm Canal rivers including the Unuk, Chickamin, Blossom and Keta. In total, 34 rivers in the region are known to produce runs of chinook salmon. The three major systems: the Alsek, Taku and Stikine Rivers are also "transboundary" rivers, originating in Canada and flowing to the sea through Alaska. Shared ownership and coordinated management of the transboundary stocks are addressed by the Pacific Salmon Commission (PSC) under terms of the Pacific Salmon Treaty (PST).

Southeast Alaska chinook salmon stocks are all "spring" type, entering spawning streams during the spring and early summer months. After emergence the following spring, the majority of fry remain in freshwater rearing areas for at least one year, migrating seaward the next spring. For most of Southeast Alaska origin chinook, ocean residency may last two, three or four years. Several age classes of mature spawners and immature chinook salmon are harvested by trollers during the fishing season.

Current information indicates that the majority of chinook salmon harvested in the Region 1 troll fishery are produced from spawning grounds and hatcheries in the Pacific Northwest and Canada. This information is based on age structure analysis, coded-wire tagging studies, and general productivity considerations. Management of intermingling chinook stocks is coordinated through the PSC.

Historical Catches of Chinook Salmon

Chinook salmon catches in Southeast Alaska are currently lower than historical levels. Annual commercial, all-gear catches during the past ten years have averaged about 271,400 chinook salmon. This has been primarily due to harvest quotas imposed by the North Pacific Fishery Management Council (NPFMC) during 1981 through 1985, and the Board and the PST since then. This quota is considerably lower than the harvest levels between 1920 and 1950 when catches averaged 540,000 fish. The harvest quota was implemented both as part of a 15-year rebuilding program for Southeast Alaska chinook salmon stocks, and as one of the coastwide conservation actions taken for depressed non-Alaskan chinook stocks which

contribute to the Southeast Alaska fisheries. The decline in abundance was primarily the result of (1) depressed natural chinook salmon stocks both in Southeast Alaska and coastwide due to over-fishing, and (2) loss of freshwater spawning and rearing habitat, particularly in the Pacific Northwest where construction of dams on the Columbia River has drastically reduced salmon production.

Chinook Salmon Fishery Management

Since 1985, a quota is established each year for the total all gear chinook salmon harvest by the PST. This quota was 263,000 in 1985 through 1989 but was raised to 302,000 during 1990. Chinook salmon originating in Alaskan hatcheries do not count against the quota. Troll effort for chinook salmon has generally been increasing along with abundance and/or availability of chinook salmon in Alaskan waters.

As a result, the quota has taken fewer days to harvest each year. A system of in-season catch estimation described in this report is used to estimate the chinook salmon catch by area and predict the date the guideline harvest level will be reached. This system provides more timely catch data than fish tickets because of the delay in processing tickets from all the remote buying stations in Southeast Alaska. In addition, the fishery performance data program also provides CPUE data (effort data from fish tickets is not reliable).

Coho Salmon Stocks

Coho salmon occur in more than 2,000 streams in Southeast Alaska. The majority of coho salmon streams are small, with the number of spawners typically ranging from several individuals up to 1,000 or more. Because of the number of these systems, they collectively make up a substantial portion of the production. Lake systems are also important and typically produce returns of between 1,000 and 8,000 fish. Large populations occur in the Taku, Chilkat, Berners, Stikine, Unuk, Chickamin, and most Yakutat systems. Spawning takes place during the fall and early winter months. Most coho salmon rear in freshwater for two years, and virtually all spend no more than one winter in the ocean before returning. The majority are 4-year-old fish, and are caught in the year of spawning. Coho salmon harvested by trollers are primarily of Alaska origin.

Historical Catches of Coho Salmon

The highest average decade all-gear catch of coho salmon occurred during the 1940's. A decline in average catch occurred during the next three decades with a low average of 1,000,000 coho in the 1970's. During the 1980's the average annual all gear commercial coho salmon catch was 1,900,000 coho salmon. The harvest nearly equaled the 2,000,000 yearly average of the 1940's. It was also an increase of 83% over the 1970's decade average of 1,000,000 coho salmon. This increase is thought to be primarily the result of the unusually mild winters experienced in recent years, and a result of better spawning escapement levels realized since more conservative management was implemented beginning in 1980. Other probable contributing factors included more intensive fishing in highly mixed stock areas, increased targeting during chinook non-retention periods, and contributions from hatchery production.

Coho Salmon Fishery Management

The majority of troll coho salmon are caught between mid-July and early September with a peak in mid-August. Gill net coho salmon catches peak approximately one month later, in mid-September, while stream entrance peaks between late-September and mid-October. Management of coho salmon is based upon in-season assessment of run strength determined from troll fishery performance data, gill net fish tickets, and sport fish catch-per-unit-effort creel census data. Coho salmon are not managed to achieve specific escapement goals, rather, CPUE is compared to previous years' returns, and run strengths returns to the inside fisheries. In addition, they are managed for allocation guidelines established by the Board (61% troll, 19% purse seine, 13% drift gill net, and 7% set gill net). As with chinook salmon management, the fishery performance data provides more timely catch data than fish tickets and also provides CPUE data (fish tickets do not have reliable effort recorded on them).

METHODS

Estimation of the in-season troll catch of chinook and coho salmon is accomplished by multiplying the number of boats observed fishing, times the catch rate derived from dockside sampling. In order to account for the variability in catch rates throughout Southeast Alaska, the region is divided into six areas that closely correspond to fleet fishing patterns (Figure 1):

Area 1 - Waters north and west of Cape Suckling.

- Area 2 - Waters west of Baranof Island and Chichagof Island between Cape Spencer and Cape Ommaney.
- Area 3 - Waters west of Prince of Wales Island between Cape Muzon and Cape Ommaney.
- Area 4 - Waters of Icy Strait, North Chatham Strait, Lynn Canal and Stephens Passage.
- Area 5 - Waters of Frederick Sound, South Chatham Strait and Sumner Strait.
- Area 6 - Waters of Clarence Strait and Dixon Entrance.

Catch rates for each of these areas are calculated weekly using information gathered from dockside interviews at the time trollers deliver. The number of interviews each week is determined by practicality. Sample goals are set for each port based on a percentage of historical landings, but the goals may not be achieved if landings do not meet expectations.

A minimum goal of 2,280 valid data points for a 12 week season is apportioned through the region by port in order to obtain a goal of 10% of expected total landings. The total number of samples by port varies each year due to the variability in fishing effort.

Interviews are normally conducted while cold storage personnel sort and grade the catch. Chinook and coho salmon are either counted by the department sampler or obtained from the fish ticket. Completed sample forms are either mailed or faxed each week to the Sitka area office where they are entered into a computer database.

The number of boats fishing in each area is determined by aerial surveys using light, fixed-wing aircraft. Surveys of the entire region are attempted each week. When a complete survey is not possible, the previous week's data is used until the next time a complete survey is flown, and incomplete points are filled in by averaging.

The following information is produced from the completed samples:

1. Average catch-per-boat-day, by area
2. Estimated catch-per-day, by area
3. Estimated region catch-per-day and week (only for weeks with aerial overflights)

Actual catches of chinook and coho salmon are tallied from fish tickets. Weekly and cumulative estimates are tallied against the fish tickets.

RESULTS

Troll fisheries were sampled weekly beginning on June 20 (statistical week 25) in 1986 and 1987, and July 1 in 1988 through 1990 (statistical week 28 in 1988, and 27 in 1989 and 1990), and continuing through the closure of the summer troll season on September 20 each year (Tables 1 - 5). The number of interviews ranged from 1,378 in 1986 to 2,091 in 1989. The number of days of effort sampled ranged from 5,076.5 in 1986 to 6,562.9 in 1987. A minimum of 16% of the chinook landed were sampled in 1990, while 25% of the landed chinook were examined in 1988 (Table 6). A minimum of 11% of the landed coho were examined in 1986, while 22% were examined in 1989.

Weekly and cumulative weekly reported landings of chinook salmon were compared with weekly and cumulative weekly estimates (Table 7). Comparisons could only be made for weeks during which aerial overflights were made. In general, weekly estimates do reasonably well, however, it is the cumulative total that is needed and the cumulative weekly estimates do estimate the total catch fairly well. In two of the five years (1987 and 1989), the estimate was greater than the final reported landed catch for that period by 2.7% to 4.6%. In the other three years, the estimate was under by 14.7%, 4.7% and 0.8%. The overall absolute estimate error was 5.5%.

Weekly and cumulative weekly reported landings of coho salmon were also compared with weekly and cumulative weekly estimates (Table 8). Similar to chinook salmon, the weekly estimates compare fairly well, however, again the cumulative estimates are much better. In three of the five years, the estimate is lower (from 6.8% to 23.6%) than the reported catch during the period. During the other two years, the estimate was greater by 2.8% to 22.3% than the reported landings. The overall absolute error was 13.8%.

In all five years, the program allowed management to comply with the chinook salmon quota. In addition, the program also allowed harvest sharing and adequate escapement for coho salmon to be achieved.

DISCUSSION

Monitoring of the chinook and coho salmon catch in the troll fishery in order to estimate total harvests has occurred since 1979. It now forms the basis of the in-season management program and is instrumental in ensuring that the PSC chinook salmon quota, and Board guidelines for sharing of coho salmon are achieved as closely as possible.

The basic procedure used to determine catch rates has remained the same since 1979. However, implementation of the program has required continuous changes and updating of methods as effort levels and run sizes have fluctuated.

The aerial boat survey is suspect as the main source of error in the program. Incomplete counts for the region have been a continuing problem since the inception of the program. Weather, particularly poor visibility and high wind velocities, often contribute to incomplete surveys. Approximately 20 hours of small, fixed-wing aircraft flight time are required for a complete survey. Surveys are attempted once each week, and it is possible that with the short chinook openings, this may not be sufficient.

Although the overall sampling goals are being met for the program (greater than 10%), it is not clear that sampling effort is adequate in some of the smaller areas. In addition, the ability to sample in proportion to effort has never been documented.

Table 1. Troll fishery data summary for 1986.

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
26	7	1	20	1	7.0	306	43.7	6,120	0	0	0
	7	2	379	41	194.5	1,825	9.4	24,893	2,186	11.2	29,817
	7	3	70	10	37.0	331	8.9	4,384	497	13.4	6,582
	7	4	27	6	9.0	20	2.2	420	2	0.2	42
	7	5	18	46	162.5	1,559	9.6	1,209	84	0.5	65
	7	6	22	12	35.5	553	15.6	2,399	213	6.0	924
			536	116	445.5	4,594	10.3	39,425	2,982	6.7	37,430
27	7	1	15	21	118	3,178	26.9	2,828	321	2.7	286
	7	2	376	23	88	878	10	26,260	3,721	42.3	111,292
	7	3	51	17	54	628	11.6	4,152	879	16.3	5,811
	7	4	32	10	19	143	7.5	1,686	13	0.7	153
	7	5	22	19	91.5	1,382	15.1	2,326	150	1.6	252
	7	6	29	8	29.5	434	14.7	2,987	197	6.7	1,356
			525	98	400	6,643	16.6	40,239	5,281	13.2	119,150
28	7	1	9	11	61	1,037	17	1,071	1,155	18.9	1,193
	7	2	373	57	273	3,209	11.8	30,691	23,882	87.5	228,410
	7	3	33	30	68.5	323	4.7	1,089	2,077	30.3	7,004
	7	4	38	16	35.5	131	3.7	982	62	1.7	465
	7	5	27	19	84.5	1,512	17.9	3,382	109	1.3	244
	7	6	36	18	61	445	7.3	1,838	3,100	50.8	12,807
			516	151	583.5	6,657	11.4	39,053	30,385	52.1	250,123
29	7	1	9	10	75	1,533	20.4	552	3,686	49.1	3,096
	7	2	385	74	294	3,640	12.4	14,300	24,528	83.4	224,840
	7	3	40	31	67	277	4.1	496	2,570	38.4	10,740
	7	4	35	4	14	109	7.8	818	7	0.5	123
	7	5	27	13	39	247	6.3	513	1,479	37.9	7,167
	7	6	35	25	77.5	644	8.3	873	4,359	56.2	13,780
			531	157	566.5	6,450	11.4	17,552 ¹	36,629	64.7	259,746
30	7	1	9	13	47.5	0	0	0	6,680	140.6	8,860
	7	2	396	62	284.5	0	0	0	24,361	85.6	237,359
	7	3	47	29	70	0	0	0	6,631	94.7	31,166
	7	4	31	12	13.5	0	0	0	85	6.3	1,366
	7	5	27	14	48.5	0	0	0	5,712	117.8	22,259
	7	6	35	12	48	0	0	0	1,804	37.6	9,208
			545	142	512	0	0	0	45,273	88.4	310,218

--Continued--

¹ Week 25 was open 2 days for chinook salmon, the estimated total was 11,269 Week 29 was open 3 days for chinook salmon.

Table 1. (Page 2 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
31	7	1	9	7	27.5	0	0	0	2,259	82.1	5,175
	7	2	408	34	163	0	0	0	11,473	70.4	201,024
	7	3	54	20	43.5	0	0	0	2,123	48.8	18,448
	7	4	27	28	47.5	0	0	0	1,593	33.5	6,338
	7	5	27	8	50.5	0	0	0	2,612	51.7	9,776
	7	6	35	12	48.5	0	0	0	3,091	63.7	15,614
			560	109	380.5	0	0	0	23,151	60.8	256,375
32	7	1	9	2	28	0	0	0	1,634	58.4	3,677
	7	2	419	28	114.5	0	0	0	7,055	61.6	180,719
	7	3	61	16	47	0	0	0	1,873	39.9	17,016
	7	4	40	31	39.5	0	0	0	502	12.7	3,558
	7	5	27	6	23.5	0	0	0	1,445	61.5	11,621
	7	6	34	21	84	0	0	0	4,667	55.6	13,223
			590	104	336.5	0	0	0	17,176	51.0	229,814
33	1	1	9	11	63.5	0	0	0	6,281	98.9	890
	1	2	419	42	267	0	0	0	13,686	51.3	21,477
	1	3	61	27	96	0	0	0	6,340	66	4,029
	1	4	40	7	9	0	0	0	274	30.4	1,218
	1	5	27	15	60.5	0	0	0	3,044	50.3	1,358
	1	6	34	17	79	0	0	0	4,167	52.7	1,793
			590	119	575	0	0	0	33,792	58.8	30,765
34	3	3	61	39	41	127	3.1	567	2,565	62.6	11,449
	3	6	34	3	5	36	7.2	734	117	23.4	2,387
				95	42	46	163	3.5	1,302	2,682	58.3
35	7	1		4	12	60	5.0		710	59.2	
	7	2		86	393	3,451	8.8		18,029	45.9	
	7	3		3	10	30	3.0		791	79.1	
	7	4		22	33.5	32	1.0		492	14.7	
	7	5		5	21.5	189	8.8		773	36.0	
	7	6		22	103.5	542	5.2		4,185	40.4	
				142	573.5	4,304	7.5		24,980	43.6	
36	7	1		7	25	150	6.0		1,532	61.3	
	7	2		27	115	829	7.2		4,146	36.1	
	7	3		3	7	38	5.4		422	60.3	
	7	4		25	39.5	135	3.4		313	7.9	
	7	5		16	37.5	129	3.4		1,022	27.3	
	7	6		29	90	274	3.0		3,510	39.0	
				107	314	1,555	5.0		10,945	34.9	

--Continued--

Table 1. (Page 3 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----		-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE
37	7	1		1	5.5	18	3.3		530	96.4
	7	2		7	37.5	675	18.0		561	15.0
	7	3		2	6	9	1.5		150	25.0
	7	4		21	66	613	9.3		344	5.2
	7	5		7	37.5	371	9.9		660	17.6
	7	6		27	97.5	315	3.2		3,107	31.9
				65	250	2,001	8.0		5,352	21.4
38	7	1		2	10	0	0.0		148	14.8
	7	2		1	1	0	0.0		5	5.0
	7	4		9	20	0	0.0		142	7.1
	7	6		14	62.5	0	0.0		1,493	23.9
				26	93.5	0	0.0		1,788	19.1
			Total Area Efforts Sampled	Total Days Fished	Total Number Sampled	Total Estimate Catch	Total Number Sampled	Total Estimated Catch		
			1,378	5,076.5	32,367	137,571	240,416	1,507,457		

Table 2. Troll fishery data summary for 1987.

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	Chinook			Coho		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
26	7	1	61	2	3.5	57	16.3	6,954	69	19.7	8,418
	7	2	321	28	132.5	1,848	13.9	31,339	662	5.0	11,227
	7	3	81	11	42.0	696	16.6	9,396	0	0.0	0
	7	4									
	7	5	79	28	102.2	1,684	16.5	9,112	93	0.9	503
	7	6	16	10	34.0	441	13.0	1,453	103	3.0	339
			558	79	314.2	4,726	15.0	58,253	927	3.0	20,487
27	7	1	35	13	79	2,286	28.9	7,089	374	4.7	1,160
	7	2	219	56	269	4,622	17.2	26,340	2,417	9.0	13,774
	7	3	74	31	85.5	1,308	15.3	7,924	1,073	12.5	6,501
	7	4	42	17	20	79	4.0	1,161	61	3.0	897
	7	5	117	16	59	2,045	34.7	28,387	10	0.2	139
	7	6	20	7	25.7	263	10.2	1,433	201	7.8	1,095
			507	140	538.2	10,603	19.7	72,334	4,136	7.7	23,566
28	7	1	8	13	66	1,532	23.2	1,300	683	10.3	580
	7	2	359	81	418	7,237	17.3	43,509	4,316	10.3	25,948
	7	3	79	53	141	1,809	12.8	7,095	2,612	18.5	10,244
	7	4	42	45	77.5	306	3.9	1,161	518	6.7	1,965
	7	5	155	33	150	2,665	17.8	19,277	612	4.1	4,427
	7	6	25	15	49.5	335	6.8	1,184	1,948	39.4	6,887
			668	240	902	13,884	15.4	73,526	10,689	11.9	50,051
29	7	1	40	24	183.5	5,575	30.4	1,215	1,929	10.5	2,943
	7	2	114	81	435	7,083	16.3	1,856	6,416	14.7	11,770
	7	3	62	17	42.5	329	7.7	480	1,896	44.6	19,362
	7	4	44	27	40.5	16	0.4	17	514	12.7	3,909
	7	5	105	15	66	1,128	17.1	1,795	1,019	15.4	11,348
	7	6	60	16	59.5	279	4.7	281	2,507	42.1	17,696
			425	180	827	14,410	17.4	5,644 ¹	14,281	17.3	67,028
30	7	1	63	12	31	0	0	0	886	28.6	12,604
	7	2	128	39	155	0	0	0	5,018	32.4	29,007
	7	3	101	53	165	0	0	0	7,015	42.5	30,058
	7	4	82	37	50.5	0	0	0	676	13.4	7,684
	7	5	90	7	36	0	0	0	710	19.7	12,425
	7	6	51	17	71	0	0	0	4,408	62.1	22,164
			515	165	508.5	0	0	0	18,713	36.8	113,942

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¹ Week 21 was open 1 day for chinook salmon, the estimated total was 8,322. Week 29 was open only 1 day for chinook salmon.

Table 2. (Page 2 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
31	7	1	63	15	147	0	0	0	6,107	41.5	18,321
	7	2	130	26	102.5	0	0	0	2,890	28.2	25,658
	7	3	200	19	59	0	0	0	3,065	51.9	72,729
	7	4	82	38	78	0	0	0	1,380	17.7	10,155
	7	5	75	4	12	0	0	0	217	18.1	9,494
	7	6	51	19	87.5	0	0	0	3,347	38.3	13,656
			601	121	486	0	0	0	17,006	35.0	150,013
32	1	1	111	35	178.5	0	0	0	8,957	50.2	5,570
	1	2	132	50	212.5	0	0	0	8,388	39.5	5,210
	1	3	162	63	243	0	0	0	13,477	55.5	8,985
	1	4	87	38	90	0	0	0	2,141	23.8	2,070
	1	5	55	25	103.5	0	0	0	4,767	46.1	2,533
	1	6	39	27	119	0	0	0	4,269	35.9	1,399
			586	238	946.5	0	0	0	41,999	44.4	25,767
33	3	1	160	1	1	0	0	0	11	11.0	5,280
	3	2	134	2	2	0	0	0	10	5.0	2,010
	3	4	91	16	20	0	0	0	243	12.1	3,316
	3	5	35	19	22	0	0	0	284	12.2	1,357
			420	38	45	0	0	0	548	12.2	11,962
34	7	1	208	21	79.5	0	0	0	4,515	56.8	82,690
	7	2	136	69	280	0	0	0	13,754	49.1	46,764
	7	3	87	48	144	0	0	0	5,325	37.0	22,520
	7	4	96	79	147	0	0	0	3,068	20.9	14,025
	7	5	15	50	107	0	0	0	2,604	24.3	2,555
	7	6	14	16	74	0	0	0	1,359	18.4	1,800
			556	283	831.5	0	0	0	30,625	36.8	170,354
35	7	1		25	126	0	0		6,096	48.4	
	7	2		48	144	0	0		3,775	26.2	
	7	3		51	113.5	0	0		2,932	25.8	
	7	4		38	76.5	0	0		1,317	17.2	
	7	5		10	26	0	0		573	22.0	
	7	6		11	46	0	0		357	7.8	
				183	532	0	0		15,050	28.3	

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Table 2. (Page 3 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----		-----Coho-----	
						Number Sampled	CPUE	Catch For Week	Number Sampled
36	7	1		20	101	0	0	4,639	45.9
	7	2		26	71	0	0	2,375	33.5
	7	3		35	63	0	0	963	15.3
	7	4		49	110	0	0	1,871	17.0
	7	5		8	19	0	0	240	12.6
	7	6		5	14	0	0	175	12.5
				143	378	0	0	10,263	27.2
37	7	1		6	17.5	0	0	415	23.7
	7	3		11	44	0	0	635	14.4
	7	4		26	57.5	0	0	639	11.1
	7	5		1	3	0	0	5	1.7
	7	6		5	18.5	0	0	329	17.8
				49	140.5	0	0	2,023	14.4
38	7	2		2	3.5	0	0	83	23.7
	7	4		24	67	0	0	1,137	17.0
	7	5		1	2	0	0	36	18.0
	7	6		10	41	0	0	661	16.1
				37	113.5	0	0	1,917	16.9
			Total Area Efforts Sampled	Total Days Fished	Total Number Sampled	Total Estimate Catch	Total Number Sampled	Total Estimated Catch	
			1,896	6,562.9	43,623	209,757	168,177	633,170	

Table 3. Troll fishery data summary for 1988.

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
28	7	1	56	15	77.5	2,950	38.1	14,921	17	0.2	86
	7	2	384	107	443	8,266	18.7	50,156	776	1.8	4,709
	7	3	103	72	169	3,054	18.1	13,029	1,318	7.8	5,623
	7	4	40	63	87	517	5.9	1,664	107	1.2	344
	7	5	62	84	176.5	2,996	17	7,367	411	2.3	1,011
	7	6	13	11	35.5	272	7.7	697	990	27.9	2,537
			658	352	988.5	18,055	18.3	87,834	3,619	3.7	14,311
29	7	1	73	48	287	10,745	37.4	8,199	426	1.5	758
	7	2	247	104	483.5	7,940	16.4	12,169	1,331	2.8	4,760
	7	3	136	58	138.5	1,206	8.7	3,553	2,409	17.4	16,559
	7	4	59	40	79.5	423	5.3	942	313	3.9	1,626
	7	5	42	66	192.5	2,791	14.5	1,827	1,281	6.7	1,956
	7	6	26	14	41	463	11.3	881	649	15.8	2,881
			583	330	1,222	23,568	19.3	27,571 ¹	6,409	5.2	28,540
30	7	1	80	36	145.5	0	0	0	4,880	33.5	18,782
	7	2	110	29	86	0	0	0	1,565	18.2	14,012
	7	3	168	83	227	0	0	0	5,740	25.3	29,737
	7	4	69	52	86	0	0	0	410	4.8	2,303
	7	5	21	92	236	0	0	0	5,274	22.3	3,285
	7	6	65	44	130.5	0	0	0	4,207	32.2	14,668
			513	336	911	0	0	0	22,076	24.2	82,787
33	7	1	102	43	145.5	0	0	0	5,456	37.5	26,773
	7	2	204	82	295	0	0	0	9,372	31.8	45,367
	7	3	172	103	217	0	0	0	5,727	26.4	31,776
	7	4	114	167	282	0	0	0	3,837	13.6	10,858
	7	5	39	78	203	0	0	0	7,348	36.2	9,882
	7	6	65	28	113.5	0	0	0	2,109	18.6	8,455
			696	501	1,256	0	0	0	33,849	26.9	133,110
36	4	1		18	97	0	0		4,028	41.5	
	4	2		64	241.5	0	0		4,917	20.4	
	4	3		32	105.5	0	0		1,422	13.5	
	4	4		157	340				6,367	18.7	
	4	5		27	96.5	0	0		935	9.7	
	4	6		36	134	0	0		1,833	13.7	
			334	1,014.5		0	0		19,502	19.2	

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¹ Week 27 was open 2 days for chinook salmon, the estimated total was 25,095. Week 29 was open 3 days for chinook salmon.

Table 3. (Page 2 of 2.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
37	7	1		14	62.5	0	0		4,144	66.3	
	7	4		36	92.5	0	0		1,492	16.1	
				50	155	0	0		5,636	36.4	
38	7	1		14	53.5	0	0		1,466	27.4	
	7	4		66	183	0	0		2,680	14.6	
				80	236.5	0	0		4,146	17.5	
		Total Area Efforts Sampled		Total Days Fished	Total Number Sampled	Total Estimate Catch			Total Number Sampled	Total Estimated Catch	
		1,983		5,783.5	41,623	115,405			95,237	258,748	

Table 4. Troll fishery data summary for 1989.

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
27	7	1	90	49	203	8,782	43.3	27,254	585	2.9	1,816
	7	2	421	87	270.2	6,116	22.6	66,706	1,613	6	17,593
	7	3	97	48	82	501	6.1	4,149	1,756	21.4	14,541
	7	4	58	41	60.5	193	3.2	1,295	220	3.6	1,476
	7	5	71	36	108.5	1,357	12.5	6,216	1,351	12.5	6,188
	7	6	34	11	35.9	625	17.4	4,143	1,558	43.4	10,329
			771	272	760.1	17,574	23.1	109,763	7,083	9.3	51,942
28	7	1	71	52	267.5	6,878	25.7	9,128	2,021	7.6	3,755
	7	2	441	62	263.5	3,903	14.8	32,661	2,902	11	33,998
	7	3	59	45	111	1,075	9.7	2,857	1,872	16.9	6,965
	7	4	42	46	63.7	215	3.4	709	255	4	1,177
	7	5	43	37	115	1,167	10.1	2,182	2,127	18.5	5,567
	7	6	48	21	91	895	9.8	2,360	2,445	26.9	9,028
			704	263	911.7	14,133	15.5	49,897 ¹	11,622	12.7	60,490
29	7	1	32	11	18.5	0	0	0	1,407	76.1	17,036
	7	2	460	24	91	0	0	0	6,111	67.2	216,235
	7	3	72	23	82	0	0	0	3,796	46.3	23,332
	7	4	91	31	35.5	0	0	0	435	12.3	7,805
	7	5	47	4	10	0	0	0	368	36.8	12,107
	7	6	33	10	41.5	0	0	0	2,496	60.1	13,893
			735	103	278.5	0	0	0	14,613	52.5	290,408
30	7	1	62	37	132.5	0	0	0	12,356	93.3	40,472
	7	2	357	58	238.2	0	0	0	19,771	83	207,421
	7	3	60	34	105	0	0	0	7,544	71.8	30,176
	7	4	99	50	84.5	0	0	0	1,300	15.4	10,662
	7	5	50	30	88.5	0	0	0	4,811	54.4	19,027
	7	6	31	23	109.5	0	0	0	6,336	57.9	12,556
			659	232	758.2	0	0	0	52,118	68.7	320,314
31	7	1	91	28	76.5	0	0	0	5,542	72.4	46,147
	7	2	253	59	287.5	0	0	0	18,873	65.6	116,258
	7	3	47	28	91.5	0	0	0	5,176	56.6	18,611
	7	4	107	29	43	0	0	0	953	22.2	16,600
	7	5	54	33	80	0	0	0	2,748	34.3	12,984
	7	6	29	21	100.3	0	0	0	5,572	55.6	11,277
			581	198	678.8	0	0	0	38,864	57.3	221,877

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¹ Week 26 was open 1 day for chinook fishing, the estimated total was 15,680. Week 28 was open 5 days for chinook salmon.

Table 4. (Page 2 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----			-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
32	7	1	121	55	217.5	0	0	0	20,299	93.3	79,049
	7	2	150	51	242.5	0	0	0	17,755	73.2	76,877
	7	3	35	40	83	0	0	0	4,355	52.5	12,855
	7	4	116	49	83	0	0	0	3,016	36.3	29,506
	7	5	58	36	57	0	0	0	1,206	21.2	8,590
	7	6	26	19	84.8	0	0	0	6,036	71.2	12,955
				506	250	767.8	0	0	0	52,667	68.6
33	1	1	121	44	230.2	0	0	0	17,638	76.6	9,271
	1	2	150	48	173.5	0	0	0	11,008	63.4	9,517
	1	3	35	22	68	0	0	0	3,101	45.6	1,596
	1	4	116	26	51	0	0	0	1,986	38.9	4,517
	1	5	58	27	79.5	0	0	0	1,491	18.8	1,087
	1	6	26	13	43	0	0	0	1,999	46.5	1,208
				506	180	645.2	0	0	0	37,223	57.7
34	3	1	121	15	16.5	0	0	0	524	31.8	11,528
	3	2	150	7	17	0	0	0	1,382	81.3	36,582
	3	4	116	34	45	0	0	0	1,566	34.8	12,110
	3	5	58	6	9	0	0	0	76	8.4	1,469
				445	62	87.5	0	0	0	3,548	40.5
35	7	1		61	231	0	0		19,408	84	
	7	2		58	239.5	0	0		20,897	87.3	
	7	3		15	70.5	0	0		2,811	39.9	
	7	4		88	207	0	0		8,429	40.7	
	7	5		19	64.3	0	0		2,245	34.9	
	7	6		25	114.5	0	0		3,630	31.7	
					266	926.8	0	0		57,420	62.0
36	7	1		31	86.2	0	0		8,557	99.3	
	7	2		8	20.5	0	0		1,068	52.1	
	7	3		1	7	0	0		184	26.3	
	7	4		36	70	0	0		4,191	59.9	
	7	5		4	15	0	0		507	33.8	
	7	6		7	22	0	0		663	30.1	
					87	220.7	0	0		15,170	68.7
37	7	1		37	118	0	0		11,492	97.4	
	7	2		12	43	0	0		2,021	47	
	7	4		67	171.5	0	0		6,427	37.5	
	7	5		2	3.5	0	0		62	17.7	
					118	336	0	0		20,002	59.5

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Table 4. (Page 3 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----		-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE
38	4	1		30	50.7	0	0	2,530	49.9	
	4	2		6	17	0	0	663	39	
	4	4		23	55.9	0	0	1,846	33	
	4	5		1	3	0	0	22	7.3	
				60	126.6	0	0	0	5,061	40.0
			Total Area Efforts Sampled	Total Days Fished	Total Number Sampled	Total Estimate Catch	Total Number Sampled	Total Estimated Catch		
			2,091	6,497.9	31,707	159,660	315,391	1,253,752		

Table 5. Troll fishery data summary for 1990.

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	Chinook			Coho		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
27	7	1	100	18	63.0	1,609	25.5	17,878	214	3.4	2,378
	7	2	412	89	255.0	5,061	19.8	57,239	3,342	13.1	37,797
	7	3	57	39	94.0	1,083	11.5	4,597	3,079	32.8	13,069
	7	4	57	27	40.0	174	4.3	1,736	85	2.1	848
	7	5	84	29	64.5	843	13.1	7,685	499	7.7	4,549
	7	6	64	29	72.5	1,803	24.9	11,141	3,981	54.9	24,600
				774	231	589.0	10,573	18.0	100,276	11,200	19.0
28	5	1	95	23	98.5	3,270	33.2	15,769	2,262	23	10,908
	5	2	364	80	284.5	3,545	12.5	22,678	5,297	18.6	33,886
	5	3	91	23	57.5	339	5.9	2,683	3,775	65.7	29,872
	5	4	52	39	52.0	324	6.2	1,620	105	2	525
	5	5	105	40	72.5	686	9.5	4,968	1,807	24.9	13,085
	5	6	66	26	110.0	2,566	23.3	7,698	6,340	57.6	19,020
				773	231	675.0	10,730	15.9	55,415	19,586	29.0
29	6	1	90	10	79.5	1,402	17.6	9,523	3,315	41.7	22,517
	6	2	290	65	226.5	1,710	7.5	13,136	8,581	37.9	65,920
	6	3	97	44	119.5	498	4.2	2,425	9,232	77.3	44,963
	6	4	52	37	45.0	344	7.6	2,385	177	3.9	1,227
	6	5	92	39	90.5	811	9.0	4,947	3,119	34.5	19,024
	6	6	37	27	110.5	1,852	16.8	3,721	4,180	37.8	8,398
				658	222	671.5	6,617	9.9	36,137	28,604	42.6
30	6	1	70	36	210.5	5,440	25.8	1,809	11,868	56.4	23,680
	6	2	269	60	224.0	2,490	11.1	2,990	8,924	39.8	64,301
	6	3	104	20	52.0	75	1.4	150	4,183	80.4	50,196
	6	4	61	26	31.5	128	4.1	248	455	14.4	5,287
	6	5	130	27	54.5	480	8.8	1,145	1,536	28.2	21,983
	6	6	38	18	58.0	549	9.5	360	2,366	40.8	9,301
				672	187	630.5	9,162	14.5	6,702 ¹	29,332	46.5
31	7	1	70	11	56.0	0	0.0		5,153	92	34,783
	7	2	330	68	294.5	0	0.0		23,184	78.7	181,851
	7	3	104	19	47.0	0	0.0		2,753	58.6	45,992
	7	4	86	52	57.5	0	0.0		1,099	19.1	11,506
	7	5	130	34	96.5	0	0.0		6,959	72.1	92,883
	7	6	38	7	32.0	0	0.0		1,413	44.2	11,746
				758	191	583.5	0	0.0		40,561	69.5

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¹ Week 30 was open 1 day for chinook salmon.

Table 5. (Page 2 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----		-----Coho-----			
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE	Catch For Week
32	7	1	80	2	8.0	0	0.0		843	105.4	51,010
	7	2	320	31	130.0	0	0.0		8,906	68.5	153,457
	7	3	104	9	31.0	0	0.0		1,964	63.4	46,122
	7	4	96	74	92.5	0	0.0		2,937	31.8	21,337
	7	5	120	12	32.0	0	0.0		1,804	56.4	47,355
	7	6	38	4	16.0	0	0.0		357	22.3	5,935
			758	132	309.5	0	0.0		16,811	54.3	333,216
33	1	1	80	15	74.0	0	0.0		7,627	103.1	8,245
	1	2	320	60	302.5	0	0.0		21,894	72.4	23,161
	1	3	104	18	63.0	0	0.0		4,768	75.7	7,871
	1	4	90	35	74.5	0	0.0		2,934	39.4	3,544
	1	5	120	25	102.5	0	0.0		7,075	69.0	8,283
	1	6	38	16	64.0	0	0.0		2,267	35.4	1,346
			758	169	680.5	0	0.0		46,565	68.4	52,450
34	3	1		6	10.0	82	8.2		543	54.3	
	3	2		44	80.5	931	11.6		5,086	63.2	
	3	4		60	75.0	253	3.4		2,488	33.2	
	3	5		12	19.0	161	8.5		846	44.5	
	3	6		8	14.0	191	13.6		525	37.5	
				130	198.5	1,618	8.2		9,488	47.8	
35	7	1		29	89.0	0	0.0		8,858	99.5	
	7	2		23	72.5	32	0.4		4,886	67.4	
	7	4		68	133.0	0	0.0		4,311	32.4	
	7	5		19	47.5	0	0.0		2,328	49.0	
	7	6		27	98.0	0	0.0		4,031	41.1	
				166	440.0	32	0.1		24,414	55.5	
36	7	1		13	38.0	0	0.0		3,010	79.2	
	7	2		5	8.0	0	0.0		313	39.1	
	7	3		1	3.0	0	0.0		159	53.0	
	7	4		54	122.5	0	0.0		2,688	21.9	
	7	5		6	15.0	0	0.0		539	35.9	
	7	6		23	80.0	0	0.0		3,692	46.2	
				102	266.5	0	0.0		10,401	39.0	

--Continued--

Table 5. (Page 3 of 3.)

Stat Week	Days of Fishing	Area	Aerial Survey Boats	Area Efforts Sampled	Total Days Fished	-----Chinook-----		-----Coho-----		
						Number Sampled	CPUE	Catch For Week	Number Sampled	CPUE
37	7	1		15	54.5	0	0.0		2,415	44.3
	7	2		13	35.5	0	0.0		1,459	41.1
	7	3		1	1.0	0	0.0		14	14.0
	7	4		63	188.0	0	0.0		4,434	23.6
	7	5		9	31.5	0	0.0		1,249	39.7
	7	6		13	51.9	0	0.0		2,320	44.7
				114	362.4	0	0.0		11,891	32.8
38	5	1		6	8.0	0	0.0		251	31.4
	5	2		2	3.5	0	0.0		110	31.4
	5	4		17	48.0	0	0.0		1,069	22.3
	5	5		2	3.0	0	0.0		168	56.0
	5	6		20	89.0	0	0.0		4,152	46.7
				47	151.5	0	0.0		5,750	38.0
			Total Area Efforts Sampled	Total Days Fished	Total Number Sampled	Total Estimate Catch	Total Number Sampled	Total Estimated Catch		
			1,922	5,558.4	38,732	198,530	254,603	1,291,690		

Table 6. The number and percent of chinook and coho salmon sampled and landed, 1986 to 1990.

Year	Number of Chinook Landed	Number of Chinook Sampled	Percent	Number of Coho Landed	Number of Coho Sampled	Percent
1986	199,401	32,367	16%	2,113,865	238,416	11%
1987	204,372	43,623	21%	1,037,516	168,177	16%
1988	166,180	41,623	25%	500,461	95,237	19%
1989	157,885	31,707	20%	1,408,044	315,391	22%
1990	211,945	38,732	18%	1,819,285	254,603	14%

Table 7. Weekly and cumulative weekly estimates and fish ticket actuals for the chinook troll fishery, 1986 to 1990.

Year	Stat Week	Estimate	Fish Ticket	CUMULATIVE		Percent Estimate/ Actual
				Estimate	Fish Ticket	
1986	25	11,269	14,785	11,269	14,785	76.2%
	26	39,425	38,995	50,694	53,780	94.3%
	27	40,239	35,203	90,933	88,983	102.2%
	28	39,053	38,546	129,986	127,529	101.9%
	29	17,552	27,370	147,538	154,899	95.3%
1987	25	8,322	7,948	8,322	7,948	104.7%
	26	58,253	48,795	66,575	56,743	117.3%
	27	72,334	59,309	138,909	116,052	119.7%
	28	73,526	53,803	212,435	169,855	125.1%
	29	5,644	42,457	218,079	212,312	102.7%
1988	27	25,095	16,916	25,095	16,916	148.4%
	28	87,834	82,028	112,929	98,944	114.1%
	29	27,571	65,747	140,500	164,691	85.3%
1989	26	15,680	9,692	15,680	9,692	161.8%
	27	109,763	87,063	125,443	96,755	129.7%
	28	49,897	70,822	175,340	167,577	104.6%
1990	27	100,276	72,122	100,276	72,122	139.0%
	28	55,415	51,923	155,691	124,045	125.5%
	29	36,137	50,392	191,828	174,437	110.0%
	30	6,702	25,653	198,530	200,090	99.2%

Table 8. Weekly and cumulative weekly estimates and fish ticket actuals for the coho troll fishery, 1986-1990.

Year	Stat Week	Estimate	Fish Ticket	CUMULATIVE		Percent Estimate/ Actual
				Estimate	Fish Ticket	
1986	25	7,229	14,056	7,229	14,056	51.4%
	26	37,430	41,279	44,659	55,335	80.7%
	27	119,150	142,158	163,809	197,493	82.9%
	28	250,123	282,574	413,932	480,067	86.2%
	29	259,746	339,949	673,678	820,016	82.2%
	30	310,218	271,195	983,896	1,091,211	90.2%
	31	256,375	264,880	1,240,271	1,356,091	91.5%
	32	229,814	195,615	1,470,085	1,551,706	94.7%
	33	30,765	91,242	1,500,850	1,642,948	91.3%
	34	13,836	110,576	1,514,684	1,753,524	86.4%
1987	25	1,646	3,308	1,646	3,308	49.8%
	26	20,487	27,818	22,133	31,126	71.1%
	27	23,566	41,672	45,699	72,798	62.8%
	28	50,051	72,899	95,750	145,697	65.7%
	29	67,028	125,927	162,778	271,624	59.9%
	30	113,942	128,059	276,720	399,683	69.2%
	31	150,013	150,749	426,733	550,432	77.5%
	32	25,767	101,537	452,500	651,969	69.4%
	33	11,962	29,676	464,462	681,645	68.1%
	34	170,354	148,783	634,816	830,428	76.4%
1988	28	14,311	21,397	14,311	21,397	66.9%
	29	28,540	40,927	42,851	62,324	68.7%
	30	82,787	59,896	125,638	122,220	102.8%
	31					
	32					
	33	133,110	98,955	258,748	277,528	93.2%
1989	26	7,185	4,304	7,185	4,304	166.9%
	27	51,942	54,572	59,127	58,876	100.4%
	28	60,490	78,606	119,617	137,482	87.0%
	29	290,408	136,272	410,025	273,754	149.8%
	30	320,314	231,428	730,339	505,182	144.6%
	31	221,877	183,925	952,213	689,107	138.2%
	32	219,832	187,109	1,172,045	876,216	133.8%
	33	27,198	103,496	1,199,243	979,712	122.4%
	34	61,689	50,908	1,260,932	1,030,620	122.3%
	1990	27	83,241	81,507	83,241	81,507
28		107,296	149,556	190,537	231,063	82.5%
29		162,049	223,469	352,586	454,532	77.6%
30		174,747	181,769	527,333	636,301	100.7%
31		378,691	263,418	906,024	899,719	112.1%
32		333,216	206,062	1,239,241	1,105,781	102.8%
33		52,450	150,596	1,291,691	1,256,377	102.8%

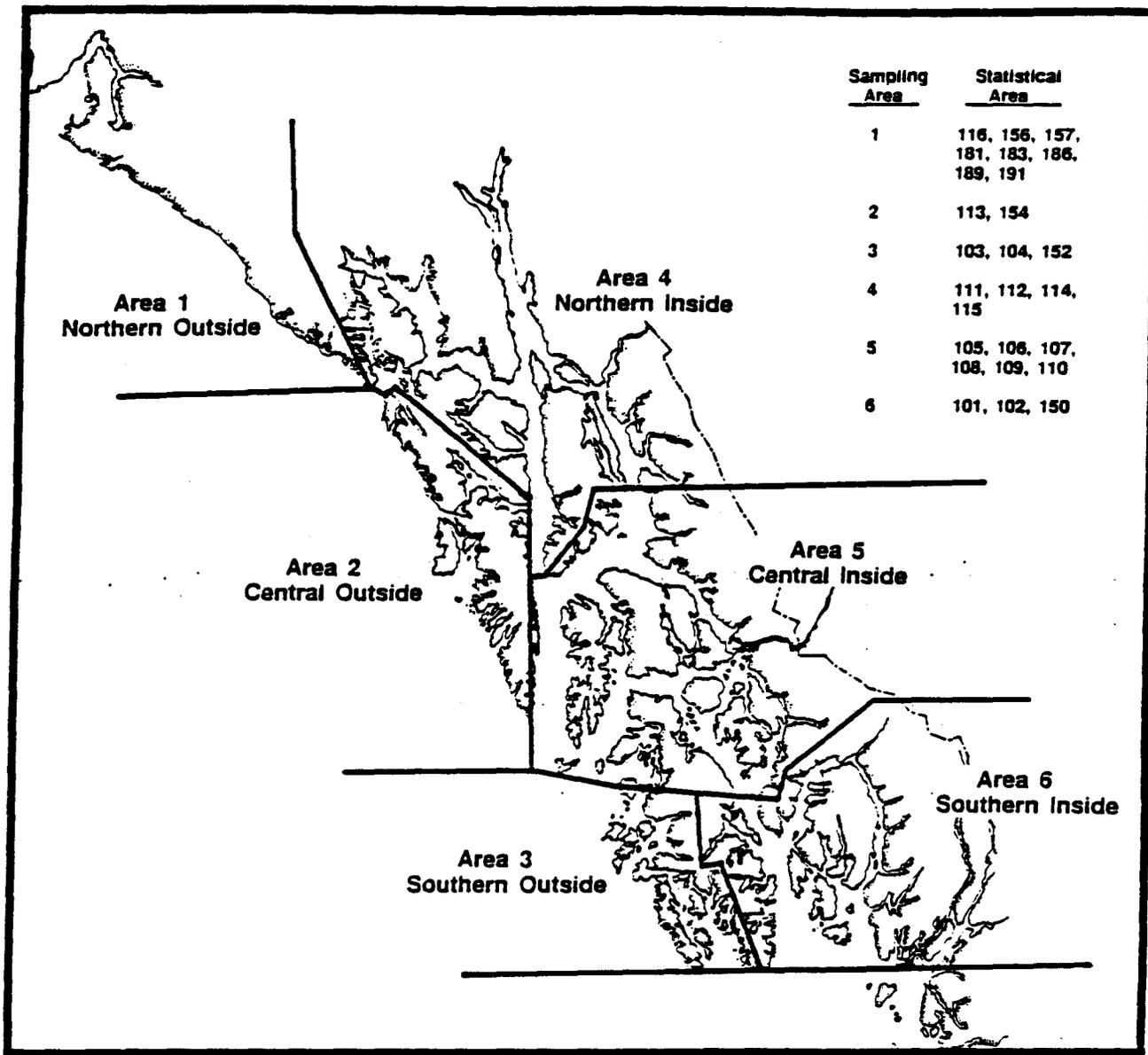


Figure 1. Southeast Alaska showing Fisheries Performance Data Program data collection areas.

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