

**SOUTHEAST ALASKA EXPERIMENTAL TROLL FISHERIES
FOR ALASKA HATCHERY CHINOOK SALMON, 1987**

By

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ABSTRACT

In 1987 experimental troll fisheries authorized by the Alaska Board of Fisheries were conducted in Southeast Alaska to determine the feasibility of increasing the harvest of chinook salmon returning to local hatcheries. These fisheries were conducted several days per week during the first three weeks of June in areas adjacent to the Crystal Lake, Little Port Walter, Neets Bay, and Medvejie hatcheries. About 70 commercial troll vessels participated, harvesting 4,488 chinook salmon of which 1,573 chinook or 35 percent originated from Alaskan hatcheries. By comparison, approximately 12 percent of the chinook salmon harvested during the winter troll fishery (Oct. 1, 1986 - April 14, 1987) were of Alaska hatchery origin, while only 6 percent of the chinook harvested during the general summer troll fishery (June 20 - July 12) originated from Alaska hatcheries. Alaska hatchery chinook may be harvested in addition to chinook catch ceilings established for Southeast Alaska fisheries under the Pacific Salmon Treaty. Other chinook harvested during the experimental troll fisheries were included in the base catch ceilings.

INTRODUCTION

In 1987 experimental troll fisheries were conducted several days per week during the first three weeks of June in areas adjacent to selected Southeast Alaska chinook salmon hatcheries. The purpose of these fisheries was to determine the feasibility of increasing harvest of chinook returning to local hatcheries while limiting the harvest of other chinook stocks. Troll chinook seasons have been drastically curtailed in recent years due to chinook catch ceilings imposed under the Pacific Salmon Treaty, and to increased chinook abundance. As a result, troll harvest rates on Southeast Alaska hatchery stocks have declined. At the same time, local hatchery chinook production is increasing, partially in response to programs designed to mitigate chinook harvest reductions due to Treaty implementation. Experimental troll fisheries are therefore being conducted to develop ways of increasing troll access to hatchery chinook salmon.

GENERAL GUIDELINES FOR EXPERIMENTAL TROLL FISHERIES

In authorizing the experimental troll fisheries, the Alaska Board of Fisheries established guidelines concerning conduct of these fisheries as follows:

1. The fisheries were opened to all Alaska troll permit holders, but pre-registration was required.
2. Non-hatchery catch limits were imposed for all areas. The fishery in each area was limited to 1000 chinook, excluding Alaska hatchery fish; however, if more than 50 percent of the harvest consisted of Alaska hatchery fish, the limit would be increased to 2000.
3. Weekly fishing periods were initially set at two days to limit chinook catches and extend the experimental fisheries throughout the first three weeks of June.
4. Areas opened to fishing were restricted to near-terminal hatchery areas to further limit harvest of non-hatchery chinook stocks.
5. Each participant was required to keep a log book of effort and catch.

LOCATIONS OF HATCHERIES

Locations of the hatcheries near which the 1987 experimental fisheries were conducted are as follows (Figure 1):

Neets Bay

Neets Bay Hatchery is located in Neets Bay on the east side of west Behm Canal near Ketchikan. The hatchery is operated by the Southern Southeast Regional Aquaculture Association.

Crystal Lake

Crystal Lake Hatchery is located on Blind Slough on Mitkof Island approximately 19 miles south of Petersburg. The hatchery is operated by the Division of Fisheries Rehabilitation and Enhancement of the Alaska Department of Fish and Game.

Little Port Walter

Little Port Walter Hatchery is located on the southeast side of Baranof Island approximately 15 miles north of Port Alexander. The hatchery is operated by the Auke Bay Laboratory of the National Marine Fisheries Service.

Medvejie Lake

Medvejie Central Incubation Facility is located in Bear Cove on the east side of Silver Bay near Sitka. The hatchery is operated by the Northern Southeast Regional Aquaculture Association.

FISHING AREAS AND PERIODS

In addition to time and catch limits placed on the experimental fishery in each area, the areas opened to fishing were limited to relatively small, near-terminal areas.

The four areas opened to experimental trolling were:

1. For harvesting Little Port Walter hatchery returns, the waters of Section 9-A were open between the latitude of Patterson Point and Point Armstrong Light, including Patterson Bay, Deep Cove, Port Herbert, Port Walter and Port Lucy (Figure 2). This area was initially opened for 2 days from 12:01 a.m. Monday June 1 through 11:59 p.m. Tuesday June 2, 1987. The next fishing period began on Monday, June 8. The duration of this period was extended through the rest of the week and until June 17 based on the relative availability of Little Port Walter hatchery chinook returns.
2. For harvesting Crystal Lake hatchery returns, the waters of Wrangell Narrows were opened south of 56°46' north latitude and north of a line from North Point to Spruce Point (Figure 3). This fishery was initially opened for two days per week from 12:01 a.m. Monday through 11:59 p.m. Tuesday during June 1-2 and June 8-9; however, the following week the period was extended to four days, June 15-18, due to a relatively high abundance of Crystal Lake hatchery chinook.
3. For harvesting Medvejie Creek hatchery returns, the waters of Silver Bay east of a line from Entry Point to a point at 57°1'43" north latitude, 135°14'17" west longitude were opened for two days each week from 12:01 a.m. Monday through 11:59 p.m. Tuesday between June 1 - 18. The waters of Bear Cove east of 135°09'42" west longitude were closed (Figure 4).
4. For harvesting Neets Bay hatchery returns, the waters of Clarence Strait were opened for two days each week, from 12:01 a.m. Monday through 11:59 p.m. Tuesday, between June 1 - 18 in the following areas (Figure 5):
 - a. The waters of Section 1-F within two nautical miles of the western shore of Gravina Island north of the latitude of the northernmost entrance to Nehenta Bay and south of the latitude of the northernmost entrance to Grant Cove.
 - b. The waters of District 2 north of a line from the northernmost tip of Street Island to the northernmost tip of Niblack Point and south of the latitude of the northernmost tip of Tolstoi Point.

MONITORING THE FISHERIES

Catches of chinook salmon in the experimental troll fisheries were sampled for coded wire tags; scales were taken from non-tagged fish; and vessel landings were monitored for accuracy of reported catches. Over-flights of each fishing area were made during each open period to monitor the number of vessels trolling.

Fishermen registering for the experimental fisheries were asked to keep a daily logbook of catch and effort (Figure 6). The primary purpose of the log book was to provide the Department with catch rates of legal (28" or larger overall length) and sub-legal (less than 28") sized chinook. Incidentally hooked sublegal chinook salmon must be released under general troll fishery regulations.

RESULTS

Catches in the 1987 experimental troll fisheries totaled 4,488 chinook salmon (Table 1). Of the chinook harvested in these fisheries, 1,573 or 35 percent originated from Alaska hatcheries.

Alaska Hatchery Contributions

Approximately 90 percent of the chinook harvested during the 1987 experimental troll fisheries were sampled for coded wire tags. To estimate total contributions, recovered tags were expanded for sampling fractions and tagging rates. Relative percentages of Alaska hatchery chinook varied substantially between the experimental fishing areas. This was due primarily to (1) the general location and size of the experimental fishing areas, (2) the magnitude of chinook returns to the local hatchery, and (3) contributions of other, more distant Southeast Alaska hatcheries, and (4) presence of chinook other than Alaska hatchery chinook in the experimental areas.

The highest percentage of Alaska hatchery chinook occurred in the Wrangell Narrows fishery where 52.0 percent (92 fish) of the 177 chinook harvested were from Alaska hatcheries; 50.3 percent (89 fish) were from the local Crystal Lake hatchery while 1.7 percent (3 fish) were from the Little Port Walter hatchery in lower Chatham Strait (Table 2). The second highest percentage of Alaska hatchery chinook occurred in the lower Chatham Strait area where 36.1

percent (1,228 fish) of the 3,398 chinook harvested originated from Alaska hatcheries. However, only 16.2 percent (551 fish) were from the local Little Port Walter hatchery while 15.8 percent (537 fish) originated from Crystal Lake hatchery. Five other Southeast Alaska hatcheries in aggregate contributed the remaining 140 chinook or 4.2 percent of the total harvest in the lower Chatham Strait experimental area.

In the lower Clarence Strait experimental area, Alaska hatcheries contributed 28.3 percent (253 fish) of the 895 chinook harvested with local hatcheries (Neets Bay, Whitman Lake, Tamgas and Deer Mountain) contributing 22.4 percent (200 fish) of the total. The remaining 53 Alaska hatchery chinook harvested in this area, or 5.9 percent of the total, were from the Little Port Walter and Crystal Lake hatcheries. No Alaska hatchery fish were recovered in the Silver Bay / Medvejie hatchery area, however only 18 chinook were harvested in this area.

Percentages of Alaska hatchery chinook were generally higher during the second and third weeks than during the first week in each of the areas. In the Wrangell Narrows area, the highest percentage (71.6%) occurred during the second week, while the highest percentages occurred during the third week in lower Chatham Strait (37.6%) and lower Clarence Strait (43.4%).

Catch Rates

Data from log books completed by participating fishermen indicated the highest catch rates of legal sized chinook occurred at Little Port Walter where an average of 17.4 chinook per gear day (1 gear day = 13.7 hours) were reported during the three weekly periods. The next highest catch rates were 10.5 and 7.1 legal chinook per gear day in the Ship Island and West Gravina sections of the lower Clarence Strait area (Table 3). In the Wrangell Narrows fishery an average catch rate of 3.8 legal size chinook were reported, while only 1.8 legal size chinook were taken per gear day on average in the Silver Bay area. In most cases the highest catch rate of legal size chinook occurred during the third week.

Sublegal Chinook Hook and Release Rates

Logbooks also provided information on incidental hook and release rates for sublegal size chinook during the experimental troll fisheries. The highest average rate of 27.6 sublegal chinook hooked and released per gear day occurred in the Ship Island section of the lower Clarence Strait area, while the next highest rate was 22.0 sublegal chinook per gear day in the lower Chatham Strait area. Rates in the Silver Bay and West Gravina section of the

lower Clarence Strait area ranged between 15 and 16 sublegal chinook per gear day. The lowest rate occurred in the Wrangell Narrows area where an average of only 1.3 sublegal chinook were hooked and released per gear day.

Ratios of sublegal chinook hooked and released to legal chinook caught ranged from a low of 0.3:1 in the Wrangell Narrows area to a high of 8.6:1 in the Silver Bay area. Average ratios during the three periods in the lower Chatham Strait and lower Clarence Strait areas ranged from 1.3 to 2.6. With the exception of the Silver Bay area, ratios of sublegal to legal chinook during the experimental fisheries were generally in the range observed during winter and summer troll fisheries.

DISCUSSION

Results of the 1987 experimental troll fisheries indicate that substantially higher percentages of Alaska hatchery chinook did occur in these fisheries than in the winter or the general summer troll seasons. During the 1986/87 winter season (Oct. 1, 1986 - April 14, 1987), which is conducted in waters inside the surf line, approximately 3,500 chinook or about 12 percent of the 28,400 winter harvest originated from Southeast Alaska hatcheries compared to 35 percent during the June experimental fisheries (Figure 7). In the summer fishery (June 20 - July 12), during which most of the harvest occurred in outer coastal areas, only about 6 percent or 11,700 of the total 209,500 chinook harvested were from Southeast Alaska hatcheries.

Maturity information was not available for chinook harvested in the 1987 experimental fisheries. Therefore, it was not possible to determine quantitatively what proportion of the chinook harvested were mature fish, and what proportion were immature fish which would potentially be available for harvest during a subsequent summer or winter troll season. However, the higher percentage of hatchery chinook in the June experimental fisheries, plus general on ground observations, indicate that in most areas mature hatchery chinook contributed significantly to the catches.

Results of the 1987 experimental troll fisheries do indicate that appropriate selection of time/area openings in near-terminal hatchery areas can increase the relative contribution of Alaska hatchery chinook to the troll fishery.

Table 1. Summary of chinook salmon catches and estimated contributions from Alaska hatcheries to Southeast Alaska experimental troll fisheries conducted during June 1987.

Area / Hatchery / (Stat. Area)	Statistical Week 1/ ^{1/}			Totals	Alaska Hatchery Contributions	
	23 (5/31-6/6)	24 (6/7-13)	25 (6/14-20)		Numbers	Percent
Wrangell Narrows / Crystal Lake / (106-44)	23	67	87	177	92	52.0%
Lower Chatham Strait / Little Port Walter / (109-10)	255	854	2289	3398	1228	36.1%
Silver Bay / Medvejie / (113-37)	9	3	6	18	0	0.0%
Lower Clarence Strait / Neets, Whitman, Tangas / (101-29, 102-80)	187	304	404	895	253	28.3%
All Areas Combined	474	1228	2786	4488	1573	35.0%

^{1/} Number of days fished per week variable; generally 2-3 days.

Table 2. Chinook salmon harvested and Alaska hatchery contributions to
1987 Southeast Alaska experimental troll fisheries by area.
(Cont.)

Area: Wrangell Narrows (Statistical Area 106-44)
Primary Target Hatchery: Crystal Lake

Stocks Harvested	Fishing Periods						All Weeks Total	
	June 1-2		June 8-9		June 15-18			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alaska hatchery stocks 1/								
Crystal Lake	0	0.0%	46	68.7%	43	49.4%	89	50.3%
Little Port Walter	0	0.0%	2	3.0%	1	1.1%	3	1.7%
Subtotal	0	0.0%	48	71.6%	44	50.6%	92	52.0%
All other stocks 2/	23	100.0%	19	28.4%	43	49.4%	85	48.0%
Totals	23	100.0%	67	100.0%	87	100.0%	177	100.0%
No. of Vessels								
	5		13		13			

Area: Lower Chatham Straits (Statistical Area 109-10)
Primary Target Hatchery: Little Port Walter

Stocks Harvested	Fishing Periods						All Weeks Total	
	June 1-2		June 8-13		June 14-17			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alaska hatchery stocks 1/								
Crystal Lake	20	7.8%	111	13.0%	406	17.7%	537	15.8%
Little Port Walter	45	17.6%	153	17.9%	353	15.4%	551	16.2%
Hidden Falls	0	0.0%	4	0.5%	9	0.4%	13	0.4%
Neets Bay	0	0.0%	9	1.1%	4	0.2%	13	0.4%
Snettisham	0	0.0%	11	1.3%	52	2.3%	63	1.9%
Tangas	9	3.5%	0	0.0%	9	0.4%	18	0.5%
Whitman Lake	0	0.0%	6	0.7%	27	1.2%	33	1.0%
Subtotal	74	29.0%	294	34.4%	860	37.6%	1228	36.1%
All other stocks 2/	181	71.0%	560	65.6%	1429	62.4%	2170	63.9%
Totals	255	100.0%	854	100.0%	2289	100.0%	3398	100.0%
No. of Vessels								
	7		20		25			

Table 2. Chinook salmon harvested and Alaska hatchery contributions to 1987 Southeast Alaska experimental troll fisheries by area.

Area: Silver Bay (Statistical Area 113-37)
 Primary Target Hatchery: Medvejie

Stocks Harvested	Fishing Periods						All Weeks Total	
	June 1-2		June 8-9		June 15-16			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alaska hatchery stocks 1/								
Medvejie	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Subtotal	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All other stocks 2/	9	100.0%	3	100.0%	6	100.0%	18	100.0%
Totals	9	100.0%	3	100.0%	6	100.0%	18	100.0%
No. of Vessels								
	4		1		3			

Area: Lower Clarence Straits (Statistical Areas 101-29, 102-80)
 Primary Target Hatcheries: Neets Bay, Whitman Lake, Tamgas

Stocks Harvested	Fishing Periods						All Weeks Total	
	June 1-2		June 8-9		June 15-16			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alaska hatchery stocks 1/								
Crystal Lake	0	0.0%	4	1.3%	4	1.0%	8	0.9%
Little Port Walter	0	0.0%	0	0.0%	45	11.1%	45	5.0%
Deer Mountain	0	0.0%	0	0.0%	6	1.5%	6	0.7%
Neets Bay	5	2.7%	5	1.6%	15	3.7%	25	2.8%
Snettisham	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tamgas	13	7.0%	11	3.6%	37	9.2%	61	6.8%
Whitman Lake	23	12.3%	17	5.6%	68	16.8%	108	12.1%
Subtotal	41	21.9%	37	12.2%	175	43.3%	253	28.3%
All other stocks 2/	146	78.1%	267	87.8%	229	56.7%	642	71.7%
Totals	187	100.0%	304	100.0%	404	100.0%	895	100.0%
No. of Vessels								
	15		25		19			

1/ Estimated contributions of Alaska hatchery stocks based on coded wire tag recoveries.

2/ Estimated contributions of all other stocks, including Alaska natural and non-Alaska hatchery and natural, obtained by subtracting estimated Alaska hatchery stocks from total.

Table 3. Summary of logbook data for the 1987 Southeast Alaska experimental troll fisheries.

Note: Data on numbers of boats and chinook harvested will differ to some extent from those reported in Tables 1 and 2 due to the fact that logbooks were not completed by all participating vessels.

Fishing Period	No. of Boats	No. of Boat Days	Average Hours Per Day	Legal Size Chinook 1/		Sublegal Size Chinook 1/		Ratio Sublegal: Legal
				Total	Day 2/	Total	Day 2/	

Area: Lower Chatham Strait (109-10)								
June 1-2	3	5	15.1	92	16.7	103	18.7	1.1
June 8-13	14	64	12.6	766	13.0	954	16.2	1.2
June 14-17	14	37	12.4	840	25.1	1092	32.6	1.3

Periods Combined		106		1698	17.4	2148	22.0	1.3
=====								
Area: Silver Bay (113-37)								
June 1-2	3	3	6.5	4	2.8	35	24.6	8.8
June 8-9	7	9	7.6	4	0.8	82	16.5	20.6
June 15-16	8	10	5.6	11	2.7	47	11.4	4.2

Periods Combined		22		19	1.8	164	15.6	8.6
=====								
Area: Wrangell Narrows (106-44)								
June 1-2	8	14	9.7	28	2.8	10	1.0	0.4
June 8-9	15	29	9.0	60	3.1	25	1.3	0.4
June 15-18	16	29	8.2	89	5.1	24	1.4	0.3

Periods Combined		72		177	3.8	59	1.3	0.3
=====								
Area: Lower Clarence Strait / Ship Island (102-80)								
June 1-2	4	6	8.8	48	12.5	145	37.7	3.0
June 8-9	9	17	10.7	105	7.9	373	28.1	3.6
June 15-16	4	7	8.7	74	16.6	78	17.5	1.1

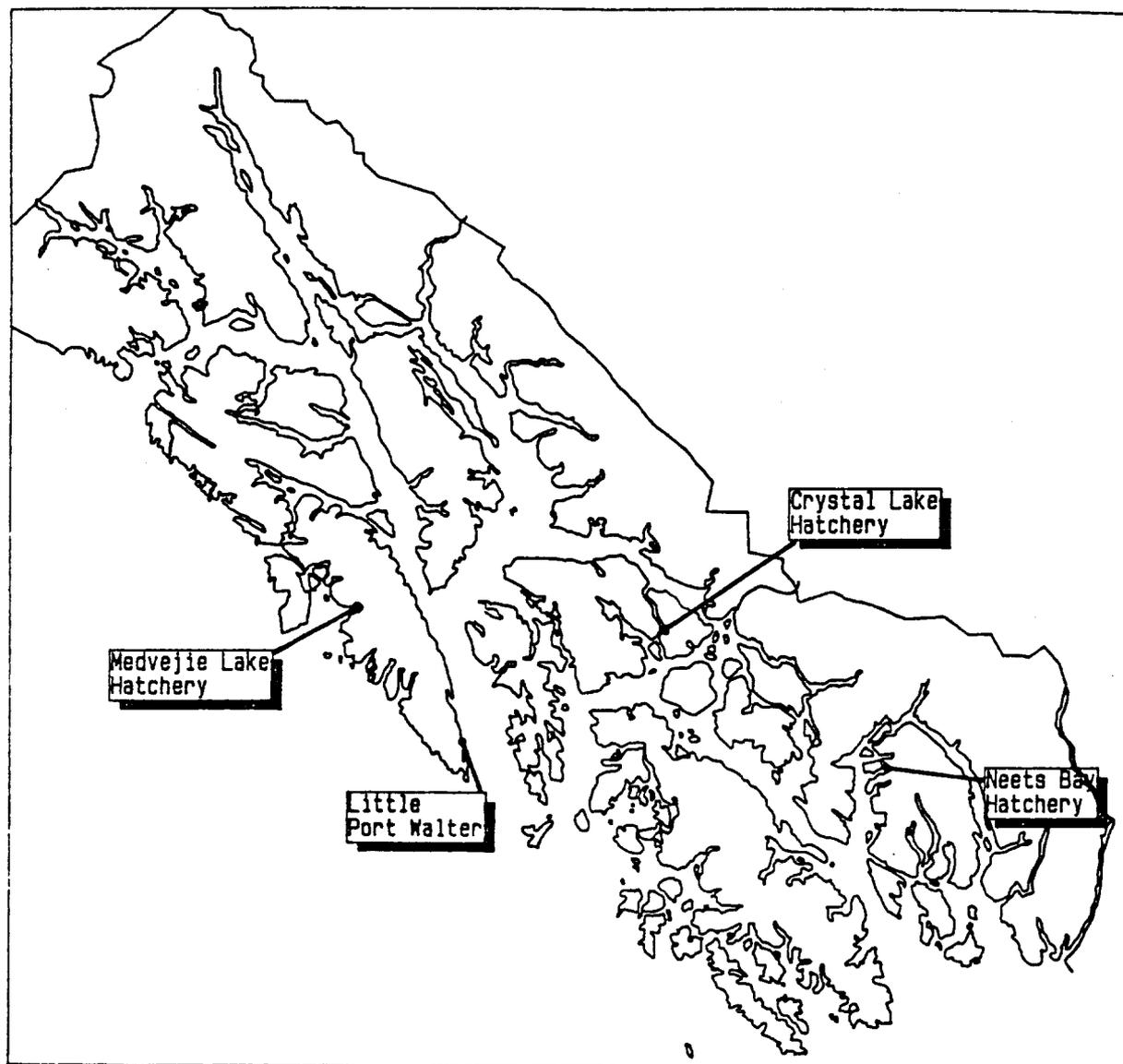
Periods Combined		30		227	10.5	596	27.6	2.6
=====								
Area: Lower Clarence Strait / West Gravina (101-29)								
June 1-2	7	11	12.0	62	6.4	228	23.7	3.7
June 8-13	11	20	10.9	103	6.5	210	13.2	2.0
June 14-17	9	17	10.9	114	8.4	174	12.9	1.5

Periods Combined		48		279	7.1	613	15.7	2.2
=====								

1/ Legal size for troll caught chinook is 28" overall length; chinook less than 28" were released.

2/ A standard gear day of 13.7 hours is used for comparison purposes.

1987 June
Experimental Troll Fishery Areas



S O U T H E A S T A L A S K A

Figure 1. 1987 June experimental troll fishery areas.

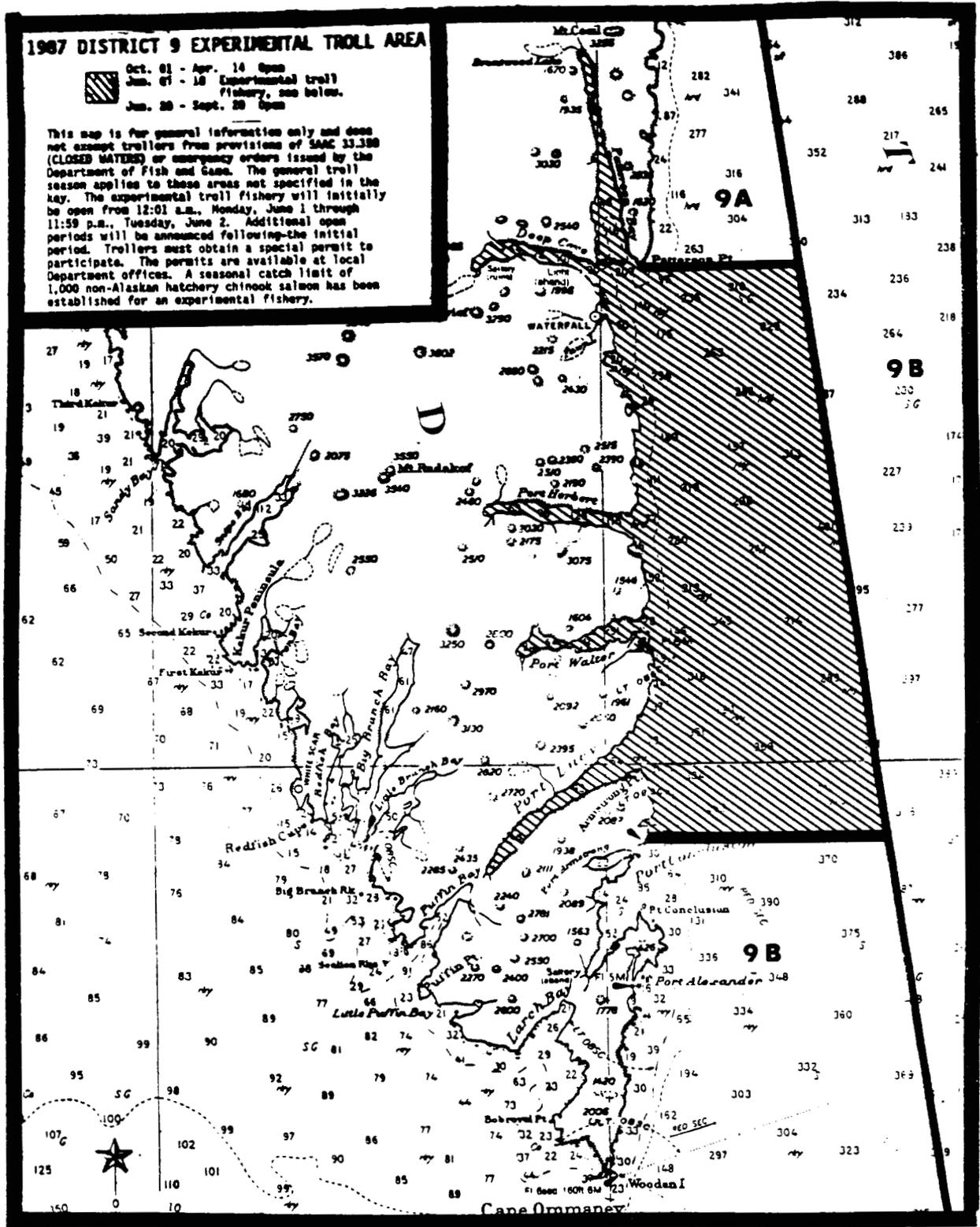


Figure 2. Lower Chatham Strait 1987 experimental troll area.

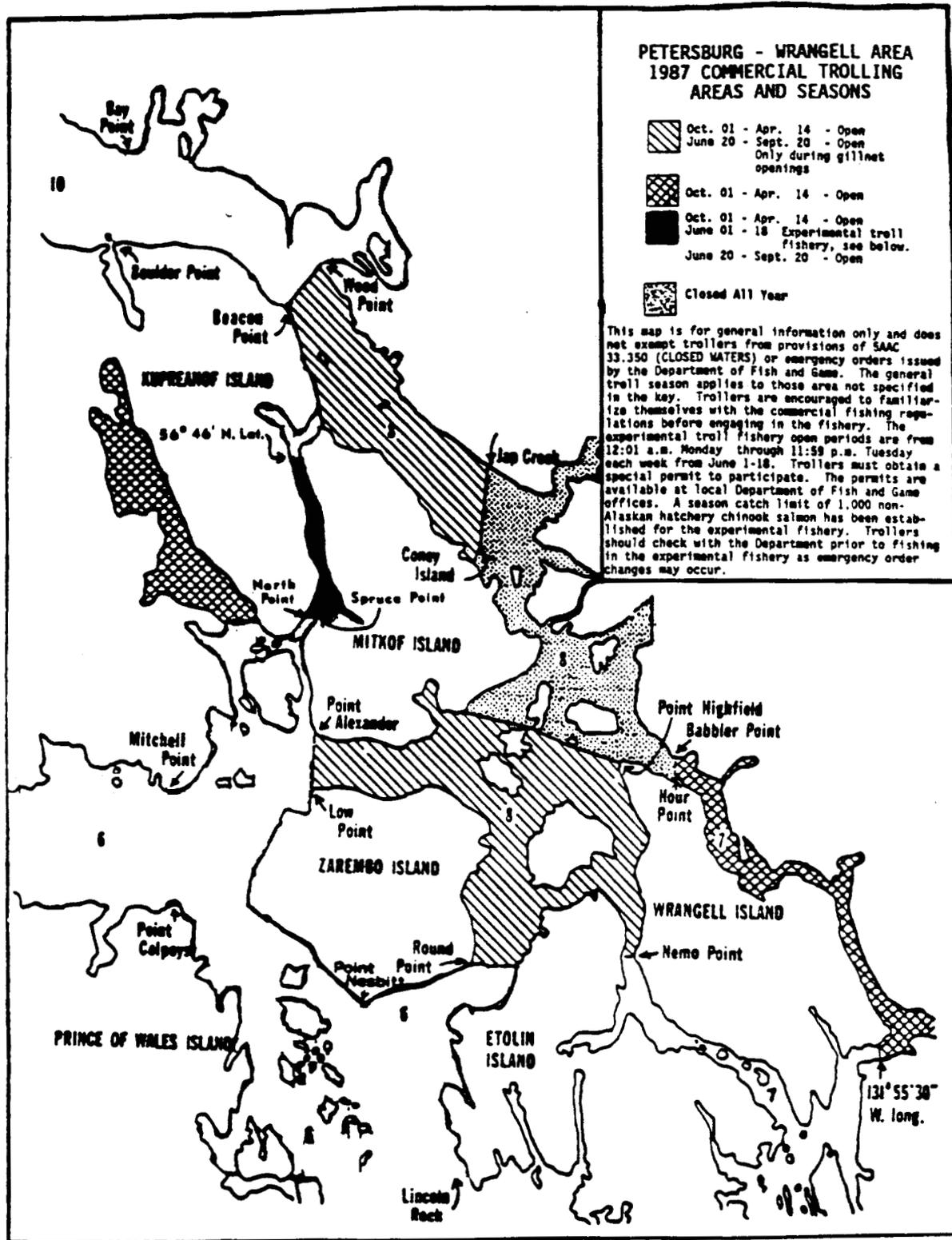


Figure 3. Petersburg/Wrangell area 1987 commercial trolling areas and seasons including the experimental troll fisheries.

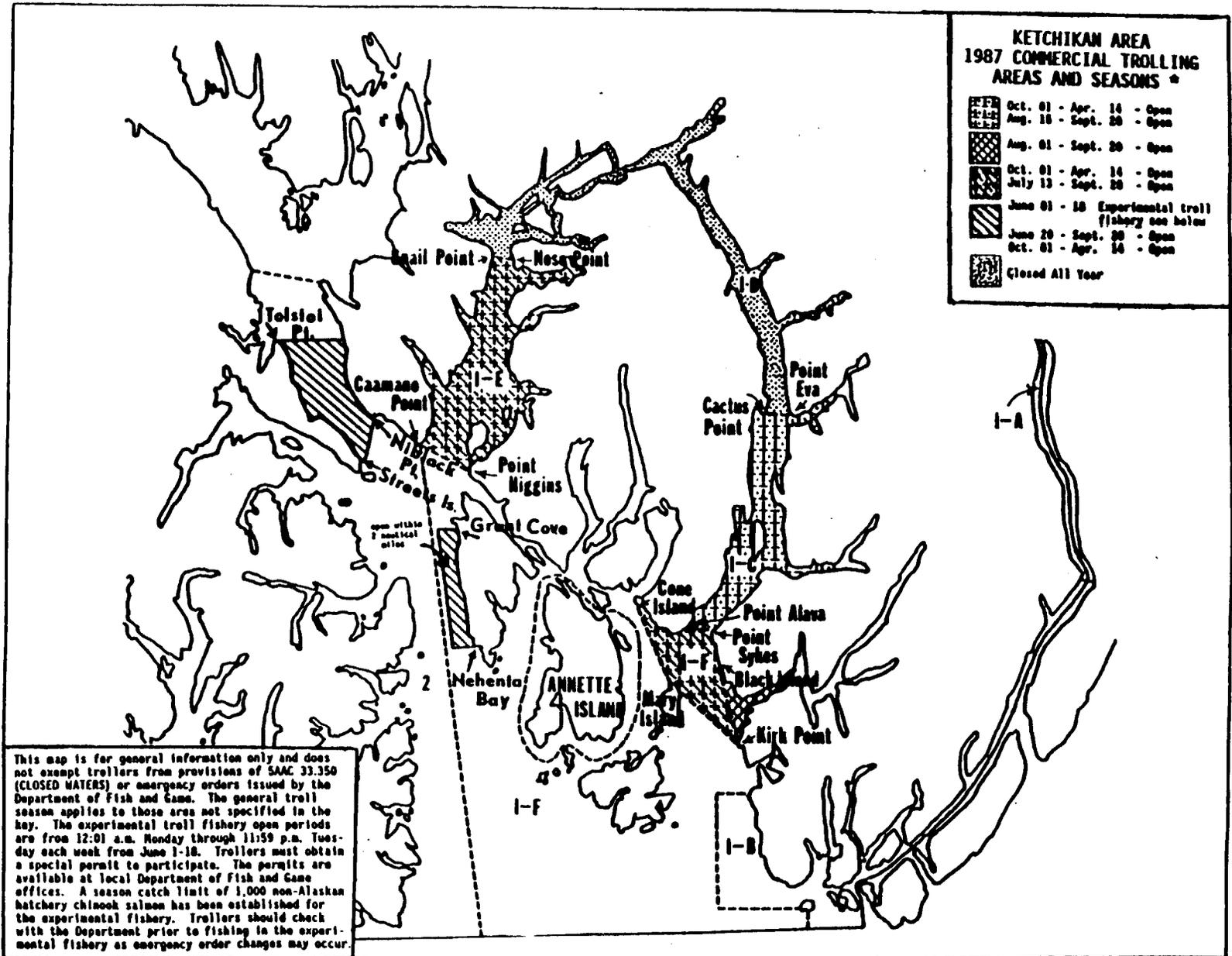


Figure 5. Ketchikan area 1987 commercial trolling areas and season including the experimental troll fisheries.

1987 SOUTHEAST ALASKA EXPERIMENTAL TROLL FISHERY LOGBOOK

Fisherman's
Name:

Vessel
Name:

Date (Mo/Day)	Name of Place Fished	Number of Hours Fished	Legal Chinook Caught	Sub-Legal Chinook Released	# Legal Chinook with Adipose Clip	# Sub-Legal Chinook with Adipose Clip	Comments

Note: All chinook less than 28 inches, including adipose clipped fish, must be released.

Figure 6. Logbook data form for 1987 Southeast Alaska experimental troll fisheries.

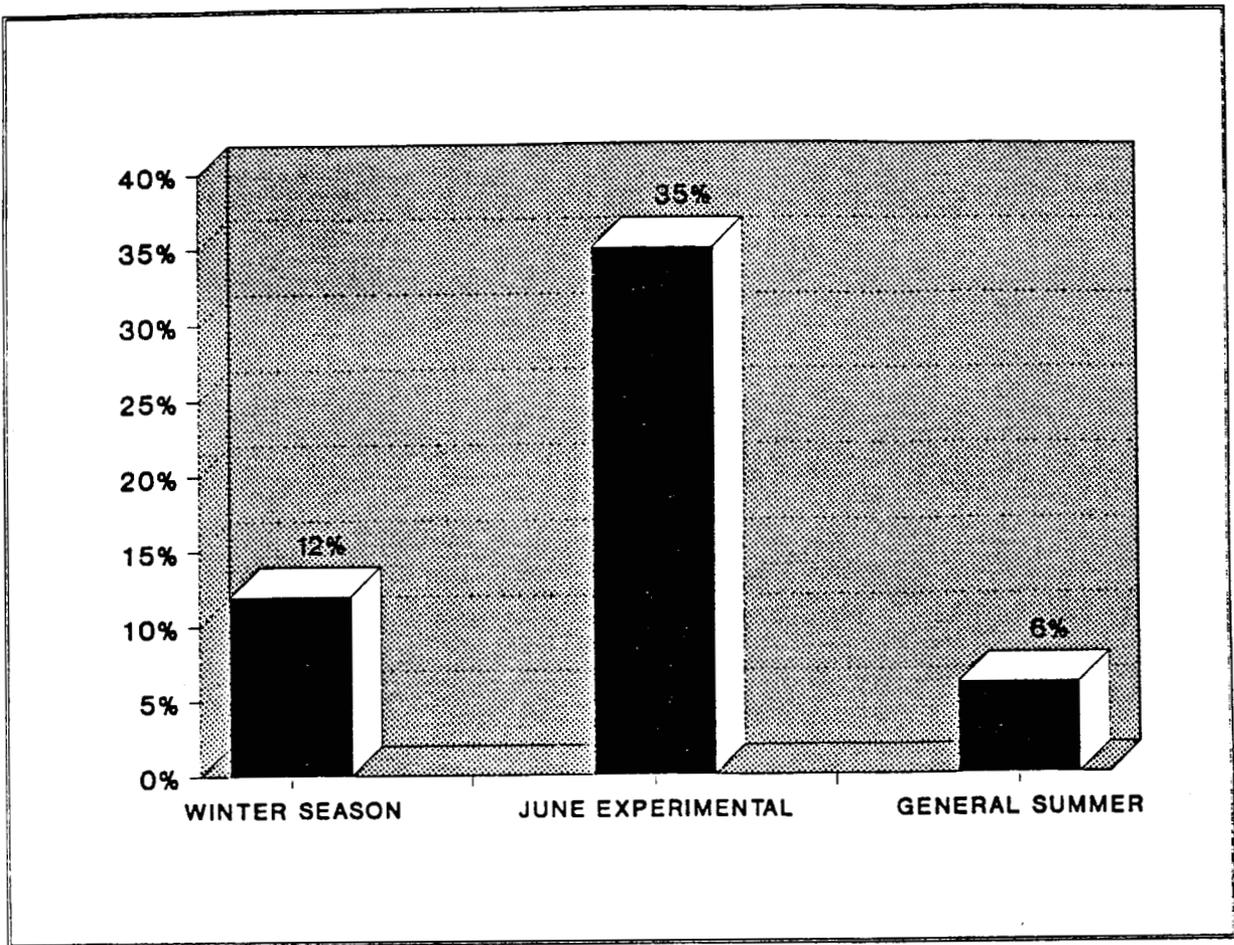


Figure 7. Alaska hatchery contributions as a percent of total chinook salmon catches in the 1987 Southeast Alaska winter, June experimental and summer troll seasons.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

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March 31, 1989

Dr. James Olsen, Program Manager
U.S./Canada Investigations
National Marine Fisheries Service
P.O. Box 210155
Auke Bay, AK 99821

Dear Dr. Olsen:

Re our previous correspondence (January 30, 1989) I herewith submit the two outstanding U.S./Canada reports for Cooperative Agreement No-87-ABH-00025. The reports are entitled:

1. Observations On Chinook Salmon Hook And Release In The 1987 Southeast Alaska Purse Seine Fishery.
2. Southeast Alaska Experimental Troll Fisheries For Alaska Hatchery Chinook Salmon, 1987.

Thank you for your consideration and understanding in regard to these reports.

Sincerely,



Gary Gunstrom
Region I Research Supervisor

cc: Scott Marshall
Michele Joubert