

Agenda Item IX-2
August, 1979

MEMORANDUM

DATE: August 21, 1979

TO: Council Members, Scientific & Statistical Committee and
Advisory Panel

FROM: Jim H. Branson, ^{Mark} Executive Director

SUBJECT: Final Report Contract 78-7: "A Coded Wire Tag Recovery
Program on Chinook and Coho Salmon in Southeast Alaska - 1978"

COUNCIL ACTION

Approval for final payment.

BACKGROUND INFORMATION

The final report has been studied to see if it complies with the terms and conditions of the contract. Our only problem was that we were not able to see a clear relationship between the contract objective of "determining the incidence of British Columbia, Washington, Columbia River and Oregon salmon" and the final report. In soliciting advice on the matter we asked Dr. Harville to review the final report to determine if the objective was achievable; and if it were achievable, was it achieved?

In an August 14 PFMC letter from Graham King (coordination, Regional Marketing Processing Center) to Jim Branson, he draws the conclusion that the determination of "incidence of occurrence" was probably a misunderstanding in setting up the contract. He goes on to say that he feels the contractor's understanding of "incidence of occurrence" was "observed numbers of tags" except in the case of the coho analysis where they were able to use escapement figures and come up with actual estimated harvest rates. The letter goes on to discuss the future of Southeast Alaska tagging program and suggests improvements in the area of sampling rates, area of catch, timeliness and analysis. The recommendations in the letter should help the Council and the states in these types of contracts and tag recovery programs in general.

The matter will have been reviewed by the Scientific & Statistical Committee for their report to the Finance Committee.

Attachment:

Letter from King to Branson dated August 14, 1979.



1X-2
Aug. 1979

North Pacific Fishery Management Council

Harold E. Lokken, Chairman
Jim H. Branson, Executive Director

Suite 32, 333 West 4th Avenue
Post Office Mall Building



Mailing Address: P.O. Box 3136DT
Anchorage, Alaska 99510

Telephone: (907) 274-4563
FTS 265-5435

Contract No. 78-7

A CODED WIRE TAG RECOVERY PROGRAM ON CHINOOK AND COHO SALMON IN SOUTHEAST ALASKA - 1978

This Contract, entered into between the North Pacific Fishery Management Council, herein called the Council and represented by the Executive Director, executing this Contract and,

The Alaska Department of Fish and Game
Division of Commercial Fisheries
Subport Building
Juneau, Alaska 99801

hereinafter called "The Contractor", agrees as following:

INTRODUCTION

The North Pacific Fishery Management Council and the Pacific Fishery Management Council are responsible for developing separate fishery management plans for salmon caught in the offshore waters in the North Pacific Ocean. The North Pacific Council has appointed the Contractor lead agency for the preparation of this plan for the waters in the Fishery Conservation Zone (FCZ) off Alaska.

Salmon in the North Pacific Ocean migrate over long distances. Salmon that spawn in the Columbia River and in Oregon and Washington, are caught by salmon fishermen trolling in the FCZ off Alaska. In addition, several major stocks of British Columbia fish are also caught in this fishery.

This research project and Contract will provide the funding to continue an ongoing tag recovery program which is providing data on the origin of salmon caught off Alaska.

ARTICLE I - STATEMENT OF WORK

A. Background

Two important aspects of fisheries research are (a) the definition of stocks and (b) the estimates of contribution these stocks give to fisheries. In this respect, little is known about the origin of Chinook

ARTICLE VI - PAYMENTS

Provisional payments for services under this Contract will be made on the basis of quarterly billing with an accompanying detailed invoice. Total billing may not exceed \$79,300. An explanatory management letter of no more than two pages must accompany each voucher.

ARTICLE VII - GENERAL PROVISIONS (ATTACHED)

ARTICLE VIII - BUDGET

| | | |
|----------|-------------------------------|-----------|
| Line 100 | Personal Services | \$ 62,300 |
| | Six Samplers | |
| | Two decoders | |
| | One Assistant | |
| | Overtime | |
| Line 200 | Travel. | 6,000 |
| Line 300 | Contractual Services. | 8,000 |
| | Aircraft Charters | |
| | for Transporting men and | |
| | supplies | |
| Line 400 | Supplies. | 3,000 |
| | Total | \$ 79,300 |

The parties hereto executed this Contract as of the day and year of the last signature date indicated below:

ALASKA DEPARTMENT OF FISH & GAME

By: *Carl L. Rosier*
Title: *Acting Deputy Commissioner*
Date: *4/13/78*

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

By: *Jim M. Brown*
Title: EXECUTIVE DIRECTOR
Date: 4/13/78

Deliverables

All products shall be delivered to Executive Director, NPFMC. Two copies must be submitted and must be of professional quality and reproducible. The original must be one of the copies submitted and shall be camera ready copy, single spaced, typed on one side of the page on good quality white paper, measuring 8½ x 11 inches. Any printed summaries and plots generated by computer/printer may be reduced photocopies.

The following format will be used in preparing the final report:

Title Page
Preface
Executive Summary
Table of Contents
List of Figures
List of Tables
List of Abbreviations and Symbols
Acknowledgements
Introduction
Methods
Results
Conclusions
Recommendations
Abstract
Key Words
References

The Executive Director, NPFMC, may allow combinations of sections or their omissions or other changes if requested by the Contractor.

ARTICLE III - COSTS AND TERMS OF PAYMENTS

The Council agrees to pay and the Contractor agrees to accept as full payment for all work described in the Contract, \$79,300.

ARTICLE IV - PERIOD OF CONTRACT

Work on this Contract shall commence on May 1, 1978 and shall be completed by April 30, 1979 unless extended by written mutual agreement.

ARTICLE V - CONTRACT MONITOR

Mrs. Judy A. Willoughby is designated Contract Monitor. The Contract Monitor is responsible for the administration of this Contract for the Council. Mrs. Willoughby is located at the Council's headquarters office, 333 W. 4th Avenue, Suite 32, Post Office Mall Building, P. O. Box 3136 DT, Anchorage, Alaska, 99510. Her telephone number is (907) 274-4563.

The Contractor will sample and examine Coho and Chinook salmon at the following selected cold storages and canneries during the dates specified:

- (a) Pelican Cold Storage - May 1 to September 20
- (b) Craig Cold Storage - May 1 to September 20
- (c) Sitka Sound Seafoods - May 15 to September 20
- (d) Petersburg Cold Storage - June 15 to September 20
- (e) Juneau Cold Storage - May 15 to September 20
- (f) Ketchikan Cold Storage - June 1 to September 20

The Contractor will report to the Council on:

- (a) The incidence of occurrence of marked Chinook salmon released from Columbia River hatcheries and caught in the Alaskan salmon fishery.
- (b) The incidence of occurrence of marked Chinook salmon released from coastal streams and hatcheries of Washington, Oregon and British Columbia and caught in the Alaskan salmon fishery.
- (c) The incidence of occurrence of Chinook and Coho salmon released from coastal streams and hatcheries in Southeast Alaska and caught in the salmon fishery in Alaska.
- (d) The catch information by fishing district for the Alaska troll fishery.
- (e) The Southeastern Alaska troll catch data by two week period, fishing district and number of landings.

ARTICLE II - PROJECT SCHEDULES AND DELIVERABLES

Schedule

| <u>Date</u> | <u>Event</u> |
|--------------------|---|
| May 1, 1978 | Contract award and post award briefing. |
| September 25, 1978 | This report will be a preliminary expanded outline of the final report and will include sufficient raw data observations as to serve as a progress report of the summer's collection of data. |
| January 22, 1979 | Interim Progress Report. |
| April 30, 1979 | Final report. This report will include printed reports and statements of completion of all tasks asked for in this Contract. |

and Coho salmon which are taken in the sport and commercial fisheries off Alaska. However, the opportunity exists to advance the state of knowledge of stock composition and relative contribution because segments of the ocean population of Chinook and Coho salmon available to Alaskan fisheries have been marked prior to their migration to the ocean as smolts.

This project is critically important in that it will supply base data required for developing the ocean troll salmon fishery management plan by the North Pacific Fishery Management Council. Further, it will supply information pertinent to the negotiations between Canada and the United States on West Coast salmon management problems, and lastly, it will provide information required for understanding and developing the Pacific Council's troll salmon fishery management plan. This project has interstate as well as international implications and the fishery has previously been identified as a high priority candidate for federal funding by the National Marine Fisheries Service.

B. Objectives

The major objectives of this Contract program are to provide specific information on the definition of stocks and to estimate the contribution these stocks give to the fisheries.

The specific objectives are to:

1. Determine the incidence of occurrence of marked Chinook salmon released from Columbia River hatcheries.
2. Determine the incidence of occurrence of marked Chinook salmon released from coastal streams and hatcheries of Washington, Oregon and British Columbia.
3. Determine the incidence of occurrence of Chinook and Coho salmon released from coastal streams and hatcheries in Southeast Alaska.
4. Compile catch information by fishing district for the Alaska troll fishery.
5. Provide all Southeast Alaska troll catch data by a two week period, fishing district and number of landings.

C. Statement of Work

The Contractor will sample Chinook and Coho salmon landed by the coastal troll fishery and the inshore gillnet fishery at appropriate and below mentioned cold storages and canneries. The Contractor will examine approximately 80 percent of the coastal caught Chinook salmon and approximately 60 percent of the coastal caught Coho salmon at locations and dates specified above.

A CODED WIRE TAG RECOVERY PROGRAM
ON CHINOOK AND COHO SALMON IN
SOUTHEAST ALASKA-1978

CONTRACT NO. 78-7

NORTH PACIFIC FISHERIES MANAGEMENT COUNCIL

By

R. Alan Davis
Demarie Wood
and
Patricia Hunn

Alaska Department of Fish and Game

July 1979

EXECUTIVE SUMMARY

Chinook and coho salmon were sampled at eleven different ports in Southeast Alaska between May and September of 1978 to identify fish with adipose fin clips indicating the presence of coded wire tags. A total of 94,564 chinook salmon and 266,302 coho salmon were sampled. This represented 25 and 21 percent of the total Southeast chinook and coho troll catches, though not all fish sampled were caught by the troll fishery. A total of 1,981 tags were recovered from chinook salmon; 1,078 tags were recovered from coho salmon. The tags were decoded, recorded and returned to the agency which originally tagged the fish.

The results of the tag recoveries were used to establish harvest rates for six coho runs in northern Southeast Alaska.

In addition, data were compiled on the catch by the troll fishery. These data include both the number of fish caught and their weight for each of the five salmon species. It is organized by the week and the statistical area in which the fish were caught. Data on the number of boats making landings and the total number of landings were also recorded.

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ACKNOWLEDGEMENTS

This project was funded by the North Pacific Fishery Management Council, Contract No. 78-7, and the Alaska Department of Fish and Game.

INTRODUCTION

The Alaska Department of Fish and Game initiated the Ocean Troll Fishery Research Program in 1970 to evaluate catch trends and assess stock strengths in the commercial troll fishery for chinook (Oncorhynchus tshawytscha) and coho (O. kisutch) salmon in Southeast Alaska. Funding provided by the North Pacific Fishery Management Council and the Alaska Department of Fish and Game was used to recover coded wire tags from these species caught by the troll and net fisheries in 1978.

Tags recovered from the various fisheries in Southeast Alaska, having been released from hatcheries or wild stock streams in British Columbia, Washington, Oregon, and Alaska are forwarded to the respective agency after decoding. Tags are reread by their respective agency and corrections are returned to the Sitka laboratory. Because of the time delay in receiving corrections there is a possibility that tag totals by code presented in this report will change slightly in succeeding months. Corrections will be entered into the computer file and will be available to agencies requesting the corrected data.

STATUS OF THE FISHERY

CHINOOK SALMON

The 1978 preliminary catch figures for Southeast Alaska power and hand troll fishing show 372,385 chinook, or 7,213,189 pounds, for an average weight of 19.7 pounds (Table 1). The power troll catch was 319,029 chinook, or 6,389,766 pounds, for an average weight of 20.0 pounds (Appendix 4). The hand troll catch was 53,293 chinook, or 823,423 pounds, for an average weight of 15.5 pounds (Appendix 5). These figures show a substantial increase in catch and average weight over the 1977 landings (Table 1). Landings were reported in dressed weights.

COHO SALMON

The 1978 preliminary figures show a combined troll fishery landing of 1,088,898 coho, or 7,818,428 pounds, for an average weight of 7.2 pounds (Table 1). The power troll catch was 706,290 coho, or 4,375,705 pounds for an average weight of 6.2 pounds (Appendix 4). The hand troll catch was 381,608 coho, or 3,442,723 pounds, for an average weight of 8.9 pounds (Appendix 5). The catch was more than twice that of 1977, but the average weights were down from 1977 (Table 1). Landings were reported in dressed weights.

Table 1. Salmon Catch by Troll Gear - 1971-1978

| <u>YEAR</u> | <u>LANDINGS</u> | <u>CHINOOK</u> Number Pounds | <u>SOCKEYE</u> Number Pounds | <u>COHO</u> Number Pounds | <u>PINK</u> Number Pounds | <u>CHUM</u> Number Pounds | <u>TOTAL</u> Numbers Pounds |
|-------------|-----------------|------------------------------------|------------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|
| 1971 | 21,490 | 330,095 4,357,254 | 1,931 12,165 | 458,903 3,487,662 | 125,225 438,287 | 11,888 87,971 | 928,042 8,383,339 |
| 1972 | 21,103 | 241,620 2,843,238 | 977 5,776 | 791,623 4,890,219 | 166,137 534,426 | 11,531 86,011 | 1,034,220 8,359,670 |
| 1973 | 24,913 | 307,598 4,283,929 | 2,118 13,704 | 540,457 3,807,368 | 137,106 456,660 | 11,531 93,729 | 998,810 8,656,400 |
| 1974 | 29,797 | 322,129 4,376,843 | 2,602 17,800 | 846,422 5,721,685 | 263,466 950,197 | 13,805 114,673 | 1,448,424 11,181,180 |
| 1975 | 17,464 | 287,337 3,792,133 | 1,098 8,355 | 214,250 1,294,794 | 76,873 249,459 | 2,784 22,758 | 592,342 5,368,499 |
| 1976 | 11,069 | 223,440 2,904,720 | 1,325 7,950 | 516,849 3,617,943 | 192,376 769,504 | 6,552 58,968 | 940,542 7,359,085 |
| 1977 | 35,955 | 271,759 3,979,496 | 1,273 7,841 | 506,835 4,158,400 | 281,188 1,194,728 | 7,291 65,619 | 1,068,346 9,406,084 |
| 1978* | 48,088 | 372,385 7,213,189 | 2,716 16,864 | 1,088,898 7,818,428 | 545,145 2,209,644 | 31,087 199,586 | 2,040,231 17,457,711 |

*Preliminary Figures

PINK, CHUM AND SOCKEYE SALMON

The 1978 preliminary figures show a combined troll fishery landing for pink salmon of 545,145, or 2,209,644 pounds, for an average weight of 4.1 pounds. Landings for chums were 31,087, or 199,586 pounds, for an average weight of 6.4 pounds. The landings for sockeye were 2,716, or 16,864 pounds, for an average weight of 6.2 pounds (Table 1 and Appendices 4 and 5). The catch of these three species more than doubled the 1977 catch (Table 1). Landings were reported in dressed weights.

METHODS

Recovery of micro-wire tagged salmon from the commercial fisheries is accomplished by placing temporary employees as samplers in delivery ports during the summer fishing season. Samplers are instructed in methods of sampling individual deliveries and combined packer trips, the recording of data by catch area and date, and the recovery of data from tags of salmon bearing the adipose fin clip as an external identifier for the presence of coded wire tags. (See Appendix 1 for an example of the data record form).

Unless prevented by processing operations, sampling is conducted at the time the fish are unloaded from the fishing vessel and sorted as to species, size and grade. All fish observed are counted by species. Those fish not having an adipose fin are removed from the sorting table. A core from the snout of each fin clipped salmon is removed and checked for the presence of a coded wire tag. If a tag is determined to be present, the core and an identifying number are placed in a plastic zip-lock bag. Associated data such as total number of fish by species in the sample, weight of the sample, date of the sample, area of catch, length of the fish and the numerical identifier are recorded on a waterproof form. If the vessel fished in more than one statistical catch area since the previous delivery, all areas in which fishing was conducted are recorded. If a roving buyer or packer is sampled locations of the buying stations or pick-up points are noted.

There were instances when the specific sample area could not be determined. This situation usually occurred when a vessel fished in more than one statistical area between deliveries. Instead of recording the tag as recovered from an "unknown area" the samplers were instructed to record all areas in which fishing took place. These pooled areas vary in the number of specific areas that are combined into one, but they are generally grouped by geographic location of the statistical area (Table 2 and Fig. 1).

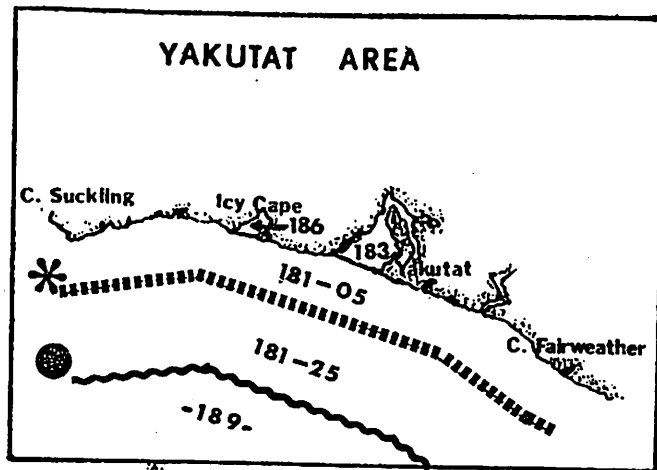
Table 2. KEY FOR POOLED AREAS

- A - Inside waters, south of Pt. Hugh and Pt. Gardner
Areas 101, 2, 3, 5, 6, 7, 8, 9, 10
 - B - Inside water, north of Pt. Hugh and Pt. Gardner
Areas 111, 12, 14, 15
 - C - Inside waters of Southeast Alaska
Areas 101, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15
 - D - Outside waters, south of Cape Ommaney
Areas 104, 150, 152
 - E - Outside waters, north of Cape Ommaney
Areas 113, 154, 116, 157, 181, 189
 - F - Outside waters of Southeast Alaska
Areas 150, 104, 152, 113, 154, 116, 157, 181, 189
 - G - South of Pt. Hugh, Pt. Gardner, Cape Ommaney
Areas 101, 2, 3, 4, 5, 6, 7, 8, 9, 10, 150, 152
 - H - North of Pt. Hugh, Pt. Gardner, Cape Ommaney
Areas 111, 112, 113, 114, 115, 116, 154, 157, 189
 - I - All of Southeast Alaska, and samples marked "no area"
 - J - 103 and 104
- 113 - Area 113 as marked on map
- 213 - 113, 114, 116 combined areas
- 313 - Catch landed at Sitka caught in 113 (generally from
Cape Ommaney to Khaz Bay)
- 413 - Catch landed at Pelican caught in 113 (generally
from Khaz Bay to Cross Sound)
-

Fig. 1

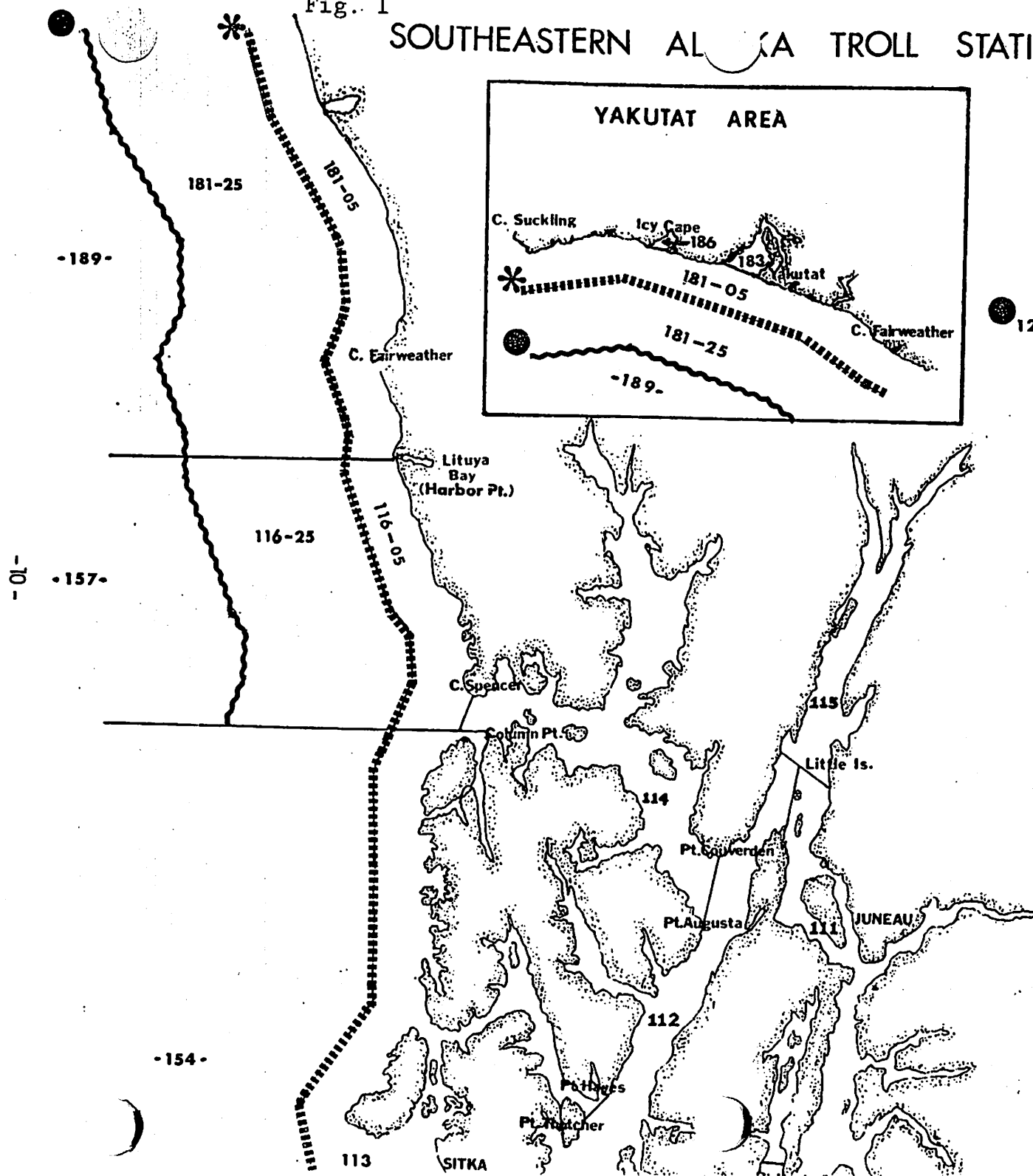
SOUTHEASTERN ALASKA TROLL STATISTICAL CHART

REVISED 1978



* ALASKA "3 MILE LIMIT" -----

● 12 MILE DEMARCATION LINE ~~~~~



Two pooled areas, 313 and 413, are sub-divisions of statistical catch area 113. A large percentage of the total chinook and coho troll catch occurs in this area. Since the area is so large in size, the sub-division allows more discrete recording of the tag recovery location.

The cores and the corresponding sample information are forwarded to Sitka by mail, air freight or chartered aircraft.

Salmon with adipose clips but with out a positive tag indication are marked with a plastic "spaghetti" tag and the head is removed in the plant by cold storage personnel. The head is then shipped to Sitka with the associated data and an attempt is made to remagnetize the tag. If this effort fails to produce a positive tag indication the head is X-rayed. If there is no tag in the head the sample is discarded and recorded as an adipose clip without a tag.

Tags are removed from cores in the dissection lab in Sitka and are decoded using a stereo dissecting microscope. Tag code, identifying number and associated biological sample data are recorded on standard keypunch forms (example Appendix 2). Recovery data are forwarded to a computer file in Fairbanks, via Juneau, through the data terminal in Sitka.

Sampling effort in 1978 was designed to maximize effort in terms of expenditure of time and money. Sampling was initiated in Pelican, Sitka, Ketchikan, Craig, Juneau and Petersburg during the month of May. The cold storages and fish buyers in these locations process approximately 90 percent of the chinook delivered in Southeast Alaska during this period. As the season progressed sampling was initiated at Elfin Cove, Port Alexander, Metlakatla, Tee Harbor and Auke Bay near Juneau, and various buying scows. Later in the season, during September, sampling was initiated at Excursion Inlet and Hoonah. Because of the expense incurred in placing samplers at the various remote locations an attempt was made to sample during the periods of greatest productivity in terms of numbers of fish sampled. Funding for sampling at Ketchikan, Metlakatla and Port Alexander, was provided by the Alaska Department of Fish and Game, Fisheries Rehabilitation and Enhancement Division.

RESULTS

Table 3 shows the incidence of occurrence of marked chinook salmon released from the Columbia River system, coastal areas of Washington, Oregon and British Columbia and of marked chinook and coho salmon released from Southeast Alaska.

The majority, approximately 65%, of all marked chinook salmon were recovered in the outside waters of Southeast Alaska north of Cape Ommany. This includes statistical areas 113, 116, 154, 157, 181, 189 and pooled areas 313, 413 and E. The majority of marked coho salmon released from Southeast Alaska occurred in the northern inside waters, statistical areas 111,

114, 115 and pooled area H. This trend is to be expected since most of these released coho were from northern Southeast streams.

A total of 94,564 chinook and 266,302 coho were sampled. This represents 25 and 21 percent of the catch, respectively (Tables 4 and 5). Sample size is a function of total catch and sampling effort. The original sample size of approximately 80 percent of the chinook harvest and 60 percent for coho harvest could not be achieved as a result of the unusually large catch size and the fixed amount of sampling capability. Preliminary catch figures indicated that 388,455 chinook and 1,570,532 coho salmon were caught by the commercial troll and net fisheries in 1978 (Table 6). Primary emphasis of sampling was on the commercial troll fisheries. Commercial gillnet and purse seine fisheries were sampled as personnel were available. The troll catch was 372,385 chinook and 1,088,898 coho (Appendix 7). Tag recovery by agency is presented in Appendix 8.

| | Columbia River | Washington | Oregon | British Columbia | S.E. Alaska (Chinook) | S.E. Alaska (Coho) | Total (Chinook) |
|-------|-------------------|------------|--------|---------------------|--------------------------|-----------------------|--------------------|
| 101 | 33 | 26 | 11 | 68 | 0 | 0 | 138 |
| 102 | 8 | 11 | 6 | 26 | 0 | 0 | 51 |
| 103 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 104 | 5 | 6 | 6 | 24 | 0 | 0 | 41 |
| 105 | 0 | 0 | 0 | 4 | 0 | 0 | 4 |
| 106 | 6 | 3 | 0 | 1 | 0 | 4 | 10 |
| 107 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 108 | 0 | 0 | 0 | 1 | 1 | 2 | 2 |
| 109 | 5 | 1 | 2 | 7 | 0 | 73 | 15 |
| 110 | 1 | 0 | 0 | 7 | 1 | 6 | 9 |
| 111 | 0 | 1 | 0 | 0 | 0 | 142 | 1 |
| 112 | 2 | 2 | 0 | 7 | 3 | 47 | 14 |
| 113 | 25 | 46 | 45 | 81 | 0 | 35 | 197 |
| 114 | 1 | 2 | 0 | 14 | 0 | 198 | 17 |
| 115 | 0 | 0 | 0 | 0 | 0 | 122 | 0 |
| 116 | 5 | 4 | 6 | 5 | 0 | 16 | 20 |
| 150 | 1 | 0 | 0 | 3 | 0 | 0 | 4 |
| 152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 154 | 9 | 11 | 20 | 3 | 0 | 8 | 43 |
| 157 | 3 | 5 | 23 | 8 | 0 | 10 | 39 |
| 181 | 6 | 18 | 22 | 7 | 0 | 2 | 53 |
| 189 | 0 | 10 | 6 | 7 | 0 | 0 | 23 |
| 213 | 10 | 18 | 23 | 57 | 1 | 18 | 109 |
| 313 | 23 | 46 | 78 | 160 | 0 | 30 | 307 |
| 413 | 2 | 13 | 32 | 49 | 0 | 6 | 96 |
| A | 16 | 5 | 2 | 15 | 0 | 5 | 38 |
| B | 0 | 0 | 0 | 0 | 0 | 16 | 0 |
| C | 10 | 2 | 1 | 16 | 0 | 23 | 29 |
| D | 3 | 0 | 0 | 6 | 0 | 0 | 9 |
| E | 69 | 124 | 156 | 158 | 0 | 100 | 507 |
| F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| G | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| H | 6 | 11 | 15 | 13 | 0 | 151 | 45 |
| I | 3 | 0 | 1 | 7 | 0 | 1 | 11 |
| J | 19 | 26 | 28 | 69 | 0 | 3 | 142 |
| K | 2 | 1 | 0 | 0 | 0 | 17 | 3 |
| Total | 274 | 392 | 483 | 826 | 6 | 1035 | 1981 |

TABLE 3.- Incidence of occurrence of marked Chinook salmon caught in the S.E. Alaska salmon fishery by statistical and pooled areas. 1978

Table 4 . CHINOOK - SAMPLE SIZE AND PERCENT
BY STATISTICAL AREA - 1978

| <u>STATISTICAL AREA</u> | <u>NUMBER SAMPLED</u> | <u>PRELIMINARY CATCH</u> | <u>PERCENT SAMPLED</u> |
|-----------------------------|---------------------------|------------------------------|----------------------------|
| 1 | 200 | 14925 | 1.34% |
| 2 | 143 | 4686 | 3.06% |
| 3 | 109 | 13489 | .81% |
| 4 | 218 | 33230 | .66% |
| 5 | 212 | 1524 | 13.91% |
| 6 | 530 | 5321* | 9.96% |
| 7 | 108 | 3726 | 2.90% |
| 8 | 128 | 916* | 13.98% |
| 9 | 863 | 11035 | 7.82% |
| 10 | 347 | 3483 | 9.97% |
| 11 | 1865 | 3508* | 53.17% |
| 12 | 3891 | 4423 | 87.98% |
| 13 | 53098 | 162098 | 32.76% |
| 14 | 6473 | 19154 | 33.80% |
| 15 | 48 | 254 | 18.90% |
| 16 | 7682 | 10899 | 70.49% |
| 152 | -0- | 147 | -0- |
| 154 | 5099 | 33385 | 15.28% |
| 157 | 4125 | 13506 | 30.55% |
| 181 | 6566 | 20677 | 31.76% |
| 183 | 46 | 1861 | 2.48% |
| 186 | -0- | 96 | -0- |
| 189 | 2813 | 15159 | 18.56% |
| TOTAL | 94,564 | 377,502 | 25.05% |

*Includes Gillnet

Table 5. COHO - SAMPLE SIZE AND PERCENT
BY STATISTICAL AREA - 1978

| <u>STATISTICAL AREA</u> | <u>NUMBER SAMPLED</u> | <u>PRELIMINARY CATCH</u> | <u>PERCENT SAMPLED</u> |
|-----------------------------|---------------------------|------------------------------|----------------------------|
| 1 | 1986 | 137600 | 1.45 |
| 2 | 864 | 25339 | 3.41 |
| 2 | 864 | 53580 | 1.62 |
| 4 | 25 | 51367 | .048 |
| 5 | 1884 | 15865 | 11.88 |
| 6 | 9020 | 68199* | 13.23 |
| 7 | 864 | 5500 | 15.71 |
| 8 | 4085 | 34268* | 11.92 |
| 9 | 5663 | 42184 | 13.43 |
| 10 | 3207 | 8860 | 36.20 |
| 11 | 24006 | 49771* | 48.24 |
| 12 | 20092 | 38325 | 52.43 |
| 13 | 66155 | 271248 | 24.39 |
| 14 | 43535 | 187515 | 23.22 |
| 15 | 24102 | 52783* | 45.67 |
| 16 | 22572 | 54202 | 41.65 |
| 152 | -0- | 704 | -0- |
| 154 | 14420 | 72470 | 19.9 |
| 157 | 10370 | 12685 | 81.75 |
| 181 | 4237 | 42268 | 10.03 |
| 183 | 594 | 5450 | 10.90 |
| 186 | -0- | 765 | -0- |
| 189 | 7757 | 22742 | 34.11 |
| TOTAL | 266,302 | 1,253,690 | 21.25% |

* Includes Gillnet

Table 6 . SOUTHEASTERN ALASKA SALMON CATCH - 1978
(PRELIMINARY)

| GEAR | SPECIES | | | | | TOTAL |
|-------------------|--------------|----------------|----------------|-------------------|----------------|-------------------|
| | CHINOOK | RED | COHO | PINK | CHUM | |
| PURSE SEINE: | | | | | | |
| NORTHERN- | 176 | 36,867 | 4,718 | 2,281,477 | 27,175 | 2,350,413 |
| SOUTHERN- | <u>5,379</u> | <u>147,340</u> | <u>132,335</u> | <u>15,405,456</u> | <u>256,252</u> | <u>15,946,762</u> |
| TOTAL- | 5,555 | 184,207 | 137,053 | 17,686,933 | 283,427 | 18,297,175 |
| DRIFT GILLNET- | 7,542 | 342,750 | 206,798 | 746,993 | 273,997 | 1,578,080 |
| TROLL- | 372,385 | 3,171 | 1,092,998 | 546,315 | 31,413 | 2,047,265 |
| TRAP- | 125 | 5,011 | 3,932 | 683,340 | 1,302 | 693,710 |
| SETNET: | | | | | | |
| YAKUTAT- | <u>2,848</u> | <u>127,629</u> | <u>129,751</u> | <u>30,258</u> | <u>6,080</u> | <u>296,566</u> |
| TOTAL- | 388,455 | 662,768 | 1,570,532 | 19,693,839 | 596,219 | 22,911,813 |

Sampling of the coho troll and gillnet fisheries was keyed to ports where the majority of the deliveries were made. Tags from these northern Southeast Alaska river systems were recovered at Juneau, Auke Bay, Tee Harbor, Excursion Inlet, Hoonah, Elfin Cove, Pelican, Sitka, Port Alexander, Craig, and Petersburg (Fig. 2). Harvest rates could not be determined for some river systems because escapements could not be counted due to ice formation in the rivers. Harvest rates and escapements in rivers that were surveyed were as follows:

| <u>RIVER SYSTEM^a</u> | <u>ESCAPEMENT COUNT</u> | <u>HARVEST RATE (%)^b</u> |
|---------------------------------|-------------------------|-------------------------------------|
| Berners River | 3,119 | 81.3 |
| Auke Bay | 700 | 65.8 |
| Speel River | 1,300 | 82.9 |
| Chilkeet River | 1,159 | 68.7 |
| Chilkat Lake | 436 | 96.6 |
| Mosquito Lake | 17 | 96.6 |

These high harvest rates can also be assumed for other northern Southeast Alaska systems as their returning adults must pass through the same fisheries.

Total exploitation and survival rates will be calculated by project personnel when the final catch figures are available. A report documenting this information will be published by the Alaska Department of Fish and Game in the Department's Informational Leaflet Series.

No harvest rates could be calculated for chinook recovered in the Alaska troll fishery. These rates will be supplied by the tagging agencies in a coast-wide report published after all year classes have returned.

Harvest rates by statistical catch areas or fishing districts demonstrate the exploitation of coho stocks in northern Southeast Alaska. Harvest rates in coastal districts were generally lower than in terminal areas, however, Chilkat Lake and Speel River stocks exhibited higher harvest rates in statistical area 113 than in statistical areas 112, 111 and 115 (Speel River only, Table 7).

^aAll in northern Southeast Alaska

^bSee Appendix 6 for formulae used in calculations of harvest rates

CHINOOK AND COHO TAGGING AND RECOVERY

TAGGING LOCATION 1976
 RECOVERY LOCATION 1978

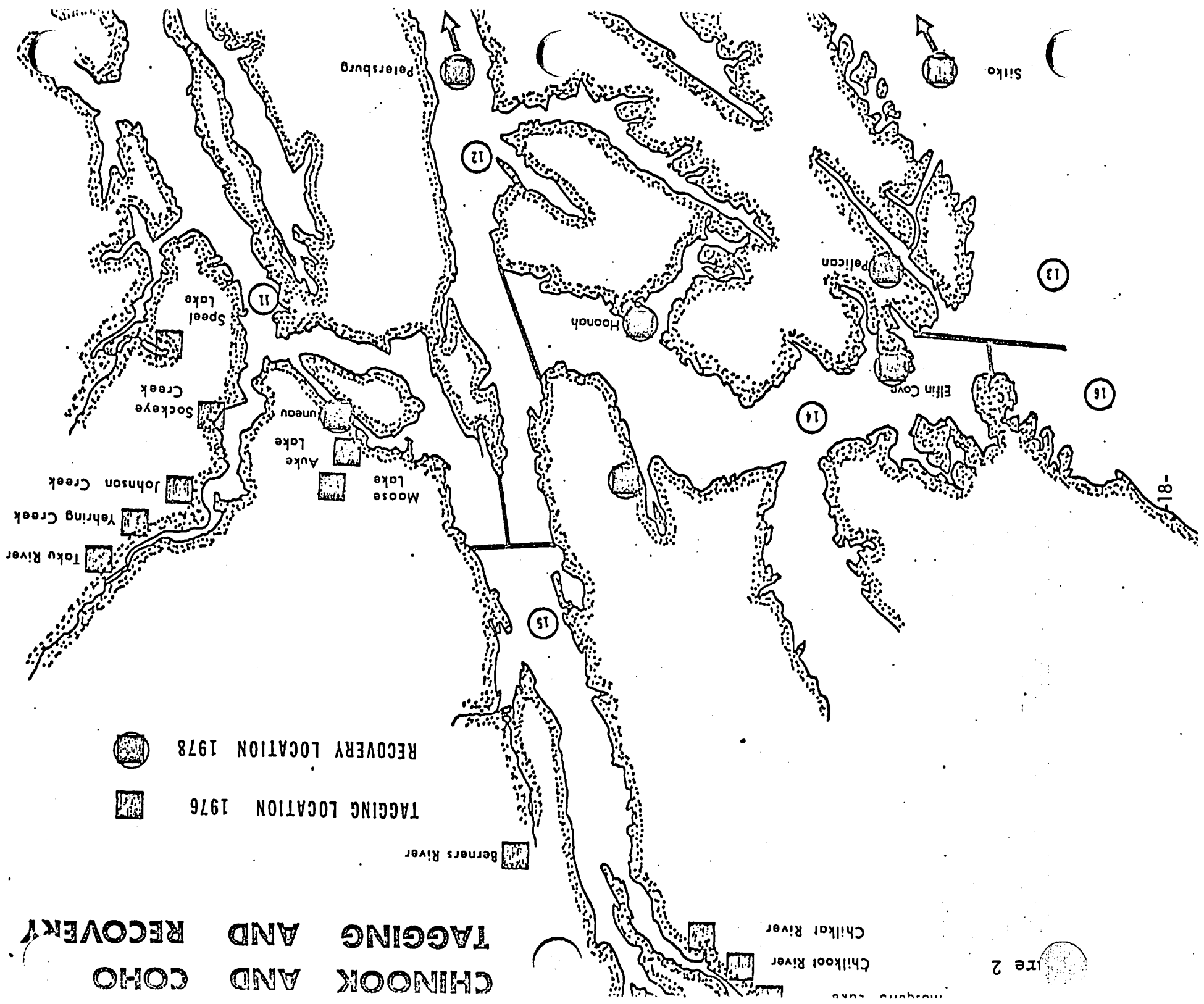


Table 7 . Harvest Rates and Numbers of Fish Harvested by District
for Six Rivers in Northern Southeast Alaska

| Stream | Adults Available | Total Harvest Rate | Districts | | | | | |
|-------------|------------------|--------------------|-----------------------------|------------|------------|------------|------------|------------|
| | | | Harvest Rate/Number of Fish | | | | | |
| | | | <u>116</u> | <u>113</u> | <u>114</u> | <u>112</u> | <u>111</u> | <u>115</u> |
| Speel R. | 7602 | 82.9 | 23.8/1499 | 58.2/2795 | 58.7/1178 | 30.0/199 | 41.0/82 | 20.1/166 |
| Berner's R. | 16679 | 81.3 | 18.2/2467 | 22.3/2473 | 75.6/6516 | 4.7/ 98 | 15.7/314 | 54.8/927 |
| Auke Lake | 2046 | 65.8 | ---- | 23.2/ 312 | 60.1/ 621 | 7.4/ 30 | 26.3/ 90 | 10.4/ 39 |
| Chilkat L. | 12823 | 96.6 | 40.3/4991 | 75.0/5547 | 96.1/1776 | 34.3/ 25 | 50.0/ 24 | 85.9/ 20 |
| Chilkoot R. | 3702 | 68.7 | ---- | 47.9/1218 | 75.0/ 993 | ---- | ---- | ---- |
| Mosquito L. | 500 | 96.6 | 88.8/ 428 | 92.0/ 50 | 99.1/ 1 | 88.2/ 1 | ---- | 96.3/ 1 |

DISCUSSION

The chinook season for troll gear is open in most inside waters of Southeast Alaska from January 1 to December 31 of each year (Fig. 1). Areas adjacent to terminal areas or major chinook rivers are closed to trolling at various times in the early spring to insure unimpeded access for chinook to their natal streams. The outside and coastal waters are open to trolling April 15 to October 31, however, there is little fishing effort prior to May 15 and most boats have ceased fishing by October 1. There is minimal fishing effort in inside waters through the winter months. Chinook taken by net gear are incidental to the conduct of fisheries for other target species. This catch is usually less than 15 percent of the total chinook catch for all gear (Table 6).

The coho season for troll gear in inside and outside waters in Southeast Alaska is June 15 to September 20. The number of fish caught is usually insignificant prior to July 15 (Appendices 3, 4, and 5). Catches begin to increase in outside and coastal waters during July and peak during the second week of August. Catches in inside waters begin to increase in late July and peak during the second week of September. There are net fisheries targeted on coho, but because of limited fishing time for most net gear, the catch is usually less than half of the catch for all gear.

An extensive Coho (O. kisutch) coded wire tagging program was initiated in six river systems in northern Southeast Alaska in 1976 (Fig. 2). Returning adults were intercepted in the troll and gillnet fisheries in 1978. The purpose of this tagging study was to determine, if possible, the harvest rates of the fisheries on each of these river systems (Table 7).

The coastal areas usually receive a significant amount of troll fishing effort in terms of number of boats fishing per week during the time coho stocks are migrating along the coast. Since the closure of the coastal areas to hand troll gear in April, 1978, the effort has been entirely by power troll gear.

When great numbers of vessels are concentrated in the coastal areas along the migration routes of returning coho stocks fish in excess of escapement needs can be harvested before the coho enter other fisheries. The efficiency of power troll gear for harvesting large numbers of coho has been documented by the excessively high harvest rates. This phenomenon compounds the problems of fisheries managers who are managing terminal fisheries for the harvest of pink (O. gorbuscha) and chum (O. keta) salmon as they must allow for an incidental harvest of coho salmon. The incidental harvest of coho salmon by the net fisheries is often directly related to the amount of fishing time allowed for other species. It is feasible during a year of low abundance of coho and an increased abundance of other species that the incidental catch of coho

by terminal net fisheries would not allow adequate escapement.

In recent years, since 1975, an increase in the hand troll coho catch has been documented (Table 8). The catch by hand troll gear primarily occurs in the intermediate corridors between the coastal and the terminal areas. This increase in catch further reduces the potential coho escapement.

There are no data concerning the ideal harvest rate for wild coho stocks. Washington State uses a harvest rate of 3:1 (75% harvest and 25% escapement) for Puget Sound wild coho stocks where no hatchery fish occur. Where both wild and hatchery stocks occur together the Washington harvest: escapement rate is 4:1 (80 % harvest and 20% escapement).

It is difficult to determine a safe harvest:escapement ratio for wild stock coho salmon in Alaska. Southeast Alaska coho spend an average of two years in freshwater before emigrating as smolts compared to only one year in Washington state, hence higher escapement levels may be necessary to offset the higher mortality during the additional year of freshwater rearing. A conservative estimate of a safe catch: escapement ratio required to maintain wild stock coho salmon runs in Southeast Alaska may be in the order of 1:1 (50% harvest and 50% escapement). A catch:escapement ratio greater than 3:2 (60% harvest and 40% escapement) may prove detrimental to Alaska wild coho stocks (Gray, 1978).

It can be assumed that harvest rates greater than 90 percent such as those for the Chilkat and Mosquito Lake systems, are excessively high.

ABSTRACT

Chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon were sampled for adipose fin clips as external identifiers for the presence of micro-wire tags at eleven different ports in Southeast Alaska from May to September 1978. The chinook and coho samples were collected from the troll fishery; gillnet and purse seine fisheries were sampled as time allowed. A total of 94,564 chinook and 266,302 coho were sampled, representing an effort of 25 and 21 percent respectively, for the Southeast Alaska commercial troll fishery.

Coho salmon harvest rates, calculated for six northern Southeast Alaska stream systems ranged from 65.8 to 96.6 percent.

Table 8. NUMBER OF HANDTROLLERS WHO MADE LANDINGS
BY POUND INCREMENTS - 1975-1978

| .YEAR | PERMITS ISSUED | PERMITS FISHED | NUMBER OF PERMITS WITH LANDINGS (POUNDS) | | | | |
|----------|-------------------|-------------------|--|-------------|---------------|---------------|-------|
| | | | 1- 499 | 500- 999 | 1000- 4999 | 5000- 9999 | 10000 |
| 1975 | 2091 | 1086 | 764 | 144 | 169 | 8 | 1 |
| 1976 | 2082 | 1237 | 738 | 189 | 278 | 27 | 5 |
| 1977 | 2952 | 1849 | 1090 | 347 | 343 | 60 | 9 |
| 1978 | 3908 | 2604 | 1282 | 397 | 738 | 151 | 36 |
| INCREASE | 1.86 | 2.39 | 1.67 | 2.75 | 4.36 | 18.87 | 36.00 |

LITERATURE CITED

Gray, Phillip L, Florey, K. R., Koerner, J. F. and Merriott, R. A., 1978. Coho Salmon (Oncorhynchus kisutch) fluorescent pigment mark-recovery program for the Taku, Berners, and Chilkat Rivers in Southeastern Alaska (1972-1974). Alaska Department of Fish and Game, Informational Leaflet Number 176:41.

APPENDICES

Appendix 1. CODED WIRE TAG SAMPLING FORM

Port _____

Species Observed: King
Coho
Chum

Sampler _____

| DATE | BOAT NAME and ADF&G NUMBER | GEAR | NO. DAYS FISHED | AREA(S) FISHED &/OR LOCATION | NO. FISH OBSERVED | WEIGHT SAMPLE | R/S | NO. CORES TAKEN | FORK LENGTH | CORE NUMBER |
|------|----------------------------|------|-----------------|------------------------------|-------------------|---------------|-----|-----------------|-------------|-------------|
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Appendix

STANDARD
KEYPUNCH
FORM
1978

| Tag No. | Agency | Data I | Data II | Species | Port | Gear | Days Fished | Area of Tag | | | | Area of Catch | | | |
|---------|--------|--------|---------|---------|------|------|-------------|-------------|--|--|--|---------------|--|--|--|
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Appendix 3. Statistical Weeks - 1978

| <u>WEEKS</u> | <u>FROM</u> | <u>THRU</u> | <u>WEEKS</u> | <u>FROM</u> | <u>THRU</u> |
|--------------|-------------|-------------|--------------|-------------|-------------|
| 1 | Jan 1 | Jan 7 | 28 | Jul 9 | Jul 15 |
| 2 | Jan 8 | Jan 14 | 29 | Jul 16 | Jul 22 |
| 3 | Jan 15 | Jan 21 | 30 | Jul 23 | Jul 29 |
| 4 | Jan 22 | Jan 28 | 31 | Jul 30 | Aug 5 |
| 5 | Jan 29 | Feb 4 | 32 | Aug 6 | Aug 12 |
| 6 | Feb 5 | Feb 11 | 33 | Aug 13 | Aug 19 |
| 7 | Feb 12 | Feb 18 | 34 | Aug 20 | Aug 26 |
| 8 | Feb 19 | Feb 25 | 35 | Aug 27 | Sept 2 |
| 9 | Feb 26 | Mar 4 | 36 | Sept 3 | Sept 9 |
| 10 | Mar 5 | Mar 11 | 37 | Sept 10 | Sept 16 |
| 11 | Mar 12 | Mar 18 | 38 | Sept 17 | Sept 23 |
| 12 | Mar 19 | Mar 25 | 39 | Sept 24 | Sept 30 |
| 13 | Mar 26 | Apr 1 | 40 | Oct 1 | Oct 7 |
| 14 | Apr 2 | Apr 8 | 41 | Oct 8 | Oct 14 |
| 15 | Apr 9 | Apr 15 | 42 | Oct 15 | Oct 21 |
| 16 | Apr 16 | Apr 22 | 43 | Oct 22 | Oct 28 |
| 17 | Apr 23 | Apr 29 | 44 | Oct 29 | Nov 4 |
| 18 | Apr 30 | May 6 | 45 | Nov 5 | Nov 11 |
| 19 | May 7 | May 13 | 46 | Nov 12 | Nov 18 |
| 20 | May 14 | May 20 | 47 | Nov 19 | Nov 25 |
| 21 | May 21 | May 27 | 48 | Nov 26 | Dec 2 |
| 22 | May 28 | Jun 3 | 49 | Dec 3 | Dec 9 |
| 23 | Jun 4 | Jun 10 | 50 | Dec 10 | Dec 16 |
| 24 | Jun 11 | Jun 17 | 51 | Dec 17 | Dec 23 |
| 25 | Jun 18 | Jun 24 | 52 | Dec 24 | Dec 30 |
| 26 | Jun 25 | Jul 1 | 53 | Dec 31 | Dec 31 |
| 27 | Jul 2 | Jul 8 | | | |

Appendix 4. PRELIMINARY
 ALASKA DEPARTMENT OF FISH AND GAME
 1978 SALMON CATCH BY REGION, GEAR, STAT-AREA, AND WEEK
 REGION - SOUTHEASTERN
 GEAR - POWER GURDY TROLL

| <u>AREA</u> | <u>WEEK</u> | <u>BOATS</u> | <u>LANDINGS</u> | <u>K I N G S</u> <u>NUMBER POUNDS</u> | | <u>R E D S</u> <u>NUMBER POUNDS</u> | | <u>C O H O S</u> <u>NUMBER POUNDS</u> | | <u>P I N K S</u> <u>NUMBER POUNDS</u> | | <u>C H U M S</u> <u>NUMBER POUNDS</u> | |
|-------------|-------------|--------------|-----------------|--|-------|--|--|--|--|--|----|--|----|
| 000 | 17 | 1 | 1 | 12 | | | | | | | | | |
| | 21 | 1 | 1 | 4 | 153 | | | | | | | | |
| | 24 | 1 | 1 | 25 | 86 | | | | | | | | |
| | 30 | 1 | 1 | 106 | 371 | | | 80 | | 10 | | 1 | |
| | 33 | 1 | 1 | 84 | 1,151 | | | | | | 34 | | 5 |
| | | | | | 1,261 | | | 409 | | 380 | | 1 | |
| | | | | | 231 | | | 1,677 | | 1,099 | | | 7 |
| <u>AREA</u> | <u>000</u> | <u>TOTAL</u> | 5 | 5 | 3,022 | | | 489 | | 390 | | 2 | |
| | | | | | | | | 2,156 | | 1,133 | | | 12 |
| 101 | 03 | 2 | 2 | 19 | 258 | | | | | | | | |
| | 05 | 4 | 4 | 69 | 940 | | | | | | | | |
| | 07 | 1 | 1 | 3 | 51 | | | | | | | | |
| | 08 | 1 | 1 | 7 | 92 | | | | | | | | |
| | 12 | 1 | 1 | 1 | 20 | | | | | | | | |
| | 14 | 1 | 2 | 19 | 236 | | | | | | | | |
| | 17 | 1 | 1 | 6 | 72 | | | | | | | | |
| | 18 | 4 | 5 | 95 | 1,253 | | | | | | | | |

Appendix 7. PRELIMINARY
 POWER TROLL AND HAND TROLL
 CATCH BY AREA - 1978

| AREA | LANDINGS | KINGS | REDS | COHO | PINKS | CHUM |
|-------|----------|--------|------|--------|--------|-------|
| 000 | 14 | 244 | 0 | 517 | 405 | 11 |
| 101 | 2735 | 14925 | 307 | 137606 | 88955 | 1107 |
| 102 | 1476 | 4686 | 34 | 25339 | 15113 | 809 |
| 103 | 3535 | 13489 | 83 | 53580 | 20879 | 1459 |
| 104 | 1157 | 33230 | 168 | 51367 | 50193 | 2396 |
| 105 | 1400 | 1524 | 84 | 15865 | 10468 | 606 |
| 106 | 1494 | 2594 | 96 | 18426 | 12238 | 513 |
| 107 | 806 | 3726 | 21 | 5550 | 10764 | 81 |
| 108 | 256 | 414 | 0 | 1954 | 55 | 2 |
| 109 | 2547 | 11035 | 60 | 42184 | 64441 | 1130 |
| 110 | 479 | 3483 | 8 | 8860 | 5304 | 161 |
| 111 | 2469 | 1418 | 236 | 15485 | 3367 | 320 |
| 112 | 4892 | 4423 | 51 | 38325 | 35283 | 1119 |
| 113 | 8637 | 162098 | 404 | 271248 | 73653 | 12243 |
| 114 | 11920 | 19154 | 872 | 187515 | 119340 | 5711 |
| 115 | 356 | 254 | 8 | 4393 | 871 | 146 |
| 116 | 760 | 10899 | 66 | 54202 | 6988 | 659 |
| 152 | 7 | 147 | 0 | 704 | 494 | 9 |
| 154 | 1882 | 33385 | 121 | 72470 | 18450 | 1501 |
| 157 | 133 | 13506 | 44 | 12685 | 1516 | 246 |
| 181 | 658 | 20677 | 34 | 42268 | 3454 | 558 |
| 183 | 344 | 1861 | 4 | 5450 | 185 | 8 |
| 186 | 4 | 54 | 0 | 163 | 5 | 0 |
| 189 | 127 | 15159 | 15 | 22742 | 2724 | 292 |
| TOTAL | 48088 | 372385 | 2716 | 108898 | 545145 | 31087 |

Appendix 8. CODED WIRE TAG RECOVERIES
BY AGENCY-1978

CHINOOK

| <u>AGENCY</u> | <u>NO. OF RECOVERIES</u> |
|--|--------------------------|
| Washington Department of Fisheries | 422 |
| Canadian Department of Environment | 826 |
| Alaska Department of Fish and Game | 5 |
| U.S. Fish and Wildlife Service | 179 |
| Oregon Department of Fish and Wildlife | 543 |
| NMFS-Little Goose Hatchery | 5 |
| NMFS-Little Port Walter | 1 |

COHO

| <u>AGENCY</u> | <u>NO. OF RECOVERIES</u> |
|--|--------------------------|
| Washington Department of Fisheries | 2 |
| Canadian Department of Environment | 38 |
| NMFS-Little Port Walter | 185 |
| Alaska Department of Fish and Game | 850 |
| U.S. Fish and Wildlife Service | 2 |
| Oregon Department of Fish and Wildlife | 1 |

Appendix 9. NUMBER OF CODED WIRE TAG RECOVERIES
 BY AREA BY TAG CODE FROM
 WASHINGTON DEPARTMENT OF FISHERIES
 1978

CHINOOK AND COHO

| <u>AREA</u> | <u>TAG CODE</u> | <u>SUBTOTAL</u> |
|-------------|-----------------|-----------------|
| 106 | 01 14 15 | 1 |
| 112 | 01 06 05 | 1 |
| 113 | 01 06 04 | 5 |
| 113 | 01 06 05 | 8 |
| 113 | 01 06 08 | 1 |
| 113 | 01 06 10 | 3 |
| 113 | 01 11 05 | 1 |
| 113 | 01 11 06 | 1 |
| 113 | 01 11 07 | 1 |
| 113 | 01 11 08 | 1 |
| 113 | 01 14 15 | 1 |
| 114 | 01 06 04 | 1 |
| 116 | 01 06 05 | 1 |
| 116 | 01 14 15 | 1 |
| 154 | 01 06 05 | 2 |
| 154 | 01 06 11 | 1 |
| 154 | 01 10 03 | 1 |
| 154 | 01 11 08 | 1 |
| 154 | 01 11 13 | 1 |
| 157 | 01 06 04 | 2 |

NUMBER OF CODED WIRE TAG RECOVERIES
BY AREA BY TAG CODE FROM
CANADIAN DEPARTMENT OF ENVIRONMENT
1978

CHINOOK AND COHO

| <u>AREA</u> | <u>TAG CODE</u> | <u>SUBTOTAL</u> |
|-------------|-----------------|-----------------|
| 101 | 02 01 12 | 1 |
| 101 | 02 03 09 | 1 |
| 102 | 02 16 29 | 1 |
| 104 | 02 04 08 | 1 |
| 104 | 02 06 06 | 1 |
| 105 | 02 02 06 | 1 |
| 105 | 02 04 03 | 1 |
| 106 | 02 13 05 | 1 |
| 108 | 02 04 03 | 1 |
| 109 | 02 01 12 | 1 |
| 109 | 02 02 08 | 1 |
| 109 | 02 03 02 | 2 |
| 109 | 02 04 08 | 1 |
| 109 | 02 04 09 | 1 |
| 109 | 02 06 06 | 2 |
| 109 | 02 10 02 | 1 |
| 110 | 02 04 03 | 5 |
| 110 | 02 10 02 | 1 |
| 110 | 02 12 06 | 1 |
| 112 | 02 03 08 | 1 |

MEMBER STATES

ALASKA
CALIFORNIA
IDAHO
OREGON
WASHINGTON

PACIFIC MARINE FISHERIES COMMISSION

528 S.W. MILL STREET
PORTLAND, OREGON 97201
PHONE (503) 229-5840

August 14, 1979

IX - 2
August 1979

EXECUTIVE DIRECTOR
JOHN P. HARVILLE

TREASURER
G. L. FISHER

| FILE | ACT | INFO | ROUTE TO | INITIAL |
|-------------|-----|------|---------------|---------|
| | | | Exec. Dir. | J |
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| AUG 17 1979 | | | | |

Mr. Jim H. Branson, Executive Director
North Pacific Fisheries Management Council
P.O.Box 3136 DT
Anchorage, Alaska 99510

Dear Mr. Branson:

Dr. Harville passed on to me your letter of August 2nd and the attached contract and report on the Southeast Alaska tag recovery program for my review.

From my reading of the contract and the report on the work done and from my knowledge of the tag recovery programs all along the coast I formed the opinion that there may have been a misunderstanding in the setting up of the contract. This was confirmed by telephone conversation with Guy Thornberg and Al Davis.

The contract called for determining the "incidence of occurrence" of marked salmon from various sources. The date for delivery of the final report was April 30 of the year following the season. If "incidence of occurrence" was understood by the Council to mean estimated numbers in the catch, as I suspect it was, then there is no way that this information could have been delivered so fast with the funds provided. The State of Washington, which has more years of experience and sophistication in this field, and a far bigger budget, has only just delivered such information for their 1977 fisheries. It is clear to me that Al Davis' team would never have contracted to deliver these estimates in such a short time frame. Apparently they understood "incidence of occurrence" to be observed numbers of tags, except in the case of the coho analysis where they were able to use escapement figures and come up with estimated harvest rates.

"Incidence of occurrence", therefore, was a poor choice of phrase as, strictly speaking, it does mean actual numbers in the catch - and this is how I interpreted it at first sight; however, it is obvious to me that the sampling team could not possibly have interpreted the phrase to mean anything other than the number of observed tags.

Without a major upgrade of the data collection effort, including especially the interface between the two shops in ADF&G collecting the catch statistics and tag recovery data, there is no way that estimates of numbers of tagged salmon in the catch, could have been made in the stated time frame.

My evaluation of the work apart from this confusion is that the sampling program has done the same fine job as it has each year with the limited

Mr. Jim H. Branson
August 14, 1979

Page 2.

funds at its disposal and in face of the special difficulties encountered in the Southeast Alaska troll fishery.

The Future of Southeast Alaska Tagging Program

In reviewing the report I was reminded of technical problems that have plagued the tag recovery programs all along the coast and some of which are especially acute in Southeast Alaska. I want to make comments on these problem areas which relate only obliquely or not at all to the work done under the contract, but relate very much to the calculation of estimates of tagged fish in the catch and contribution rates. I hope any future upgrade of Southeast Alaska's sampling program will address these problems.

Sampling Rates

Looking at tables 4 and 5 one sees a great variation in sampling rates from one statistical area to another (from less than 1% to over 80%). This has serious drawbacks in many applications of the data obtained. If number observed is being used in an analysis it makes it difficult, if not impossible, to make comparisons between areas. On the other hand, if estimates are made of the actual number of tags in the catch by multiplying the observed number by the catch/sample ratio, then the estimate for an area with a sampling rate of 1%, for example, will have very large confidence intervals (one tag observed would give an estimate of 100 while if one more happens to be observed the estimate will be 200!) and unpredictable biases can result.

There has been an agreement among the states for many years to sample at a rate of 20%. Researchers design their tagging experiments on this assumption. Therefore it would be desirable to make the sampling rates as close as possible to a uniform 20% in all areas. The logistics of doing this are particularly difficult in Southeast Alaska. Therefore, the decision to concentrate effort in some areas at the expense of other areas in order to achieve an overall sampling rate of 20% is understandable but difficult to justify from the standpoint of theoretical statistics.

Area of Catch

A problem that occurs with tag recovery sampling in all states but is more acute in regions like Puget Sound and Southeast Alaska, is the problem of obtaining usable information on area of catch. The difficulty comes in making estimates of the numbers of tags in the catch by area, using the catch data from the fish tickets and the tag recovery data from the sampling program. These two independent data collection efforts do not, in general, produce area of catch information that can be reliably combined. A deeper problem from a

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theoretical statistics standpoint is that the sampling program is actually obtaining a random sample by port of landing rather than by area of catch. A solution to the problem of getting good estimates by area of catch would be to first make an estimate of the number of tags caught by port of landing and then to apportion these estimated tags at each port in a given time period into statistical catch areas. Port of landing and area of catch information from the catch statistics compiled from the fish tickets would be used in each of these steps.

Timeliness

Another major difficulty in Southeast Alaska as in other states is in obtaining, on a timely basis, the necessary summarized catch information from the landing tickets to expand the observed numbers of tags into an estimated number in the catch. An emergency meeting of PMFC's Salmon and Steelhead Committee recently addressed this problem and transmitted a very strong recommendation to the Directors of the State fisheries agencies urging them to improve the catch statistics collecting programs to ensure the availability of the necessary catch summaries by April of the year following the salmon season (copy of recommendation attached).

Currently the State of Washington is the most advanced in this respect having just delivered the 1977 recovery estimates about fifteen months behind target!

Conclusion

I recommended once before that the ADFG involve a biometrician in improving the statistical design of the sampling program. I would still recommend this and that the data collection systems be upgraded to meet the requirements of that design. Of course, extra funds would be needed but when one considers the millions of dollars going annually into tagging salmon along the coast and the potential benefits to management, a few hundred thousand spent over one or two years to upgrade the sampling design and the data collection system should be considered as a very worthwhile investment. In order to obtain the necessary, approximately uniform, sampling rate in all areas, the annual operating costs of the sampling program would also increase significantly.

I realize I began by reviewing a report and have ended up with a pitch for more funds. While I'm not directing this pitch to the council, I do believe that you should be aware of the situation and the need. Please don't hesitate to call on me if you have any further problems in this area or have any difficulties with this letter.

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Yours sincerely,



Grahame King, Coordinator
Regional Mark Processing Center

GK/mf

Attach: Salmon-Steelhead Committee Request (7/9/79)

CC: Al Davis
Gary Thornburgh
Clarence Pautzke
Roy Wahle
Ronald Skoog
John Harville

Contract 78-7: The Salmon Tag Recovery Program

The SSC reviewed the Contract and the final report from the contractor. The Committee recommended the Council approve final payment of this contract. We noted that there is still a need, not adequately addressed in the contract language or funding and therefore not in the report, for analysis of tag recovery data in terms of actual exploitation rates of various stocks in the Alaska troll fishery. These questions and analysis of the importance of pertinent logbook, fish ticket and observer data to management of Alaskan troll fisheries need to be the subject of further research.