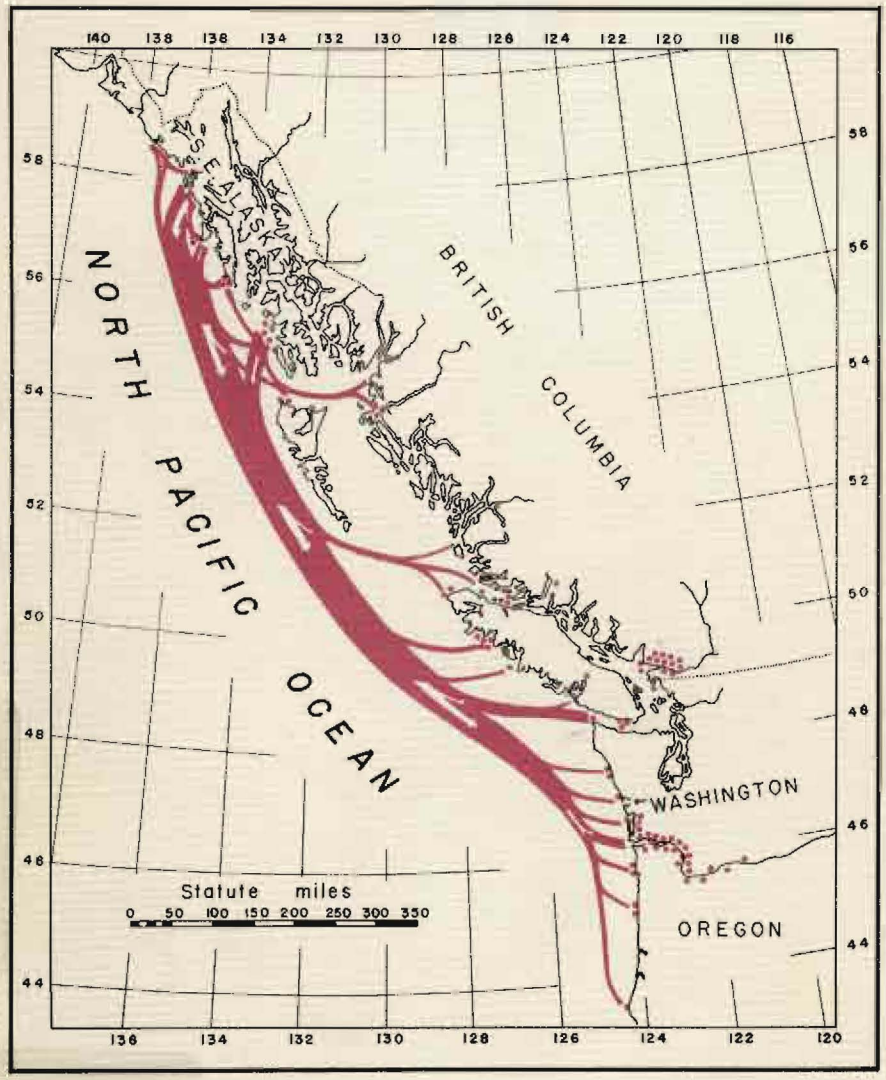
Annual Report No. 2, 1950



ska Department of Fisheries

Juneau, Alaska

DATE DUE

1950
ANNUAL REPORT

Alaska Fisheries Board

and

Alaska Department of Fisheries

Ernest Gruening
Governor

J. Howard Wakefield
Chairman

C. L. Anderson
Director

REPORT NO. 2

JUNEAU, ALASKA

GILL NETTERS IN BRISTOL BAY, BEFORE THE ADVENT OF POWER.

To:

THE GOVERNOR OF ALASKA
MEMBERS OF THE TERRITORIAL LEGISLATURE
AND CITIZENS OF ALASKA

Herewith is submitted the Second Annual Report of the Alaska Fisheries Board, created by the 19th Territorial Legislature and approved March 21, 1949.

This report covers the activities of the Board and the Alaska Department of Fisheries based on the calendar year January 1 to December 31, 1950.

C. L. ANDERSON, Director

J. HOWARD WAKEFIELD, Chairman

IRA H. ROTHWELL, Member

WILLIAM WALTON, Member

J. P. VALENTINE, Member

KARL BRUNSTAD, Member

FOREWORD

In presenting this second annual report of the Alaska Department of Fisheries, a summary is given of the activities of the several divisions, together with a financial statement, pertinent statistics, and a chronological history of the salmon canneries in Western Alaska.

A progress report on the troll salmon investigation is presented in some detail in the Biology section. Although this research program is in the preliminary stages, it is believed that the fishermen, and others, are interested in—and entitled to receive new information as rapidly as it is accumulated. These progress reviews will be made a regular feature of succeeding annual reports. More complete biological bulletins will be issued from time to time as the need arises.

In addition to these publications, the department will continue its past policy of meeting with various fishermen's groups for an exchange of information and ideas. Without the full cooperation of the fishermen no fishery research problem can be successfully solved.

Intelligent research is a necessary adjunct to good fishery management, but good research cannot be accomplished by attempting to cover too much ground. In the long run it is felt that the department will receive more value from its expenditures by concentrating on relatively few problems than by spreading its efforts in an attempt to do a little in each and every fishing district. It was therefore deemed expedient, in view of the limited funds available, to confine the initial work of the biology division to an investigation of the troll fishery of Southeastern Alaska. As additional money becomes available the program can be expanded to cover other fisheries in other districts.

In adding personnel, the department has adopted a policy of recruiting new employees from residents of the Territory. In so far as possible this policy has been followed in the past and will continue to be a guide for the future. However, many of the new openings arising in the department are of a highly technical nature requiring specialized schooling and training. Resident applications for such positions are virtually nonexistent and it has become necessary to hire men from the states. In each case, an effort is made to select capable men who are willing and desirous of making Alaska their future home.

Encouragement is being given to young Alaskans to prepare themselves for future positions in the department. During the summer of 1950, three young residents were employed as temporary aides in the biological division. Two of these were high school seniors who are planning on entering colleges giving specialized fishery courses. The other returned in the fall to the School of Fisheries at the University of Washington for post-graduate work and will enter on permanent duty with the department in the spring of 1951.

As time goes on it is expected that more of the required technical help can be obtained from resident applicants who have properly prepared themselves for fisheries research and management. Employment in the fisheries field, whether it be with private or governmental agencies, should be an attractive future for young Alaskans. These young people reared in the North should be vitally interested in maintaining and improving Alaska's most productive industry.

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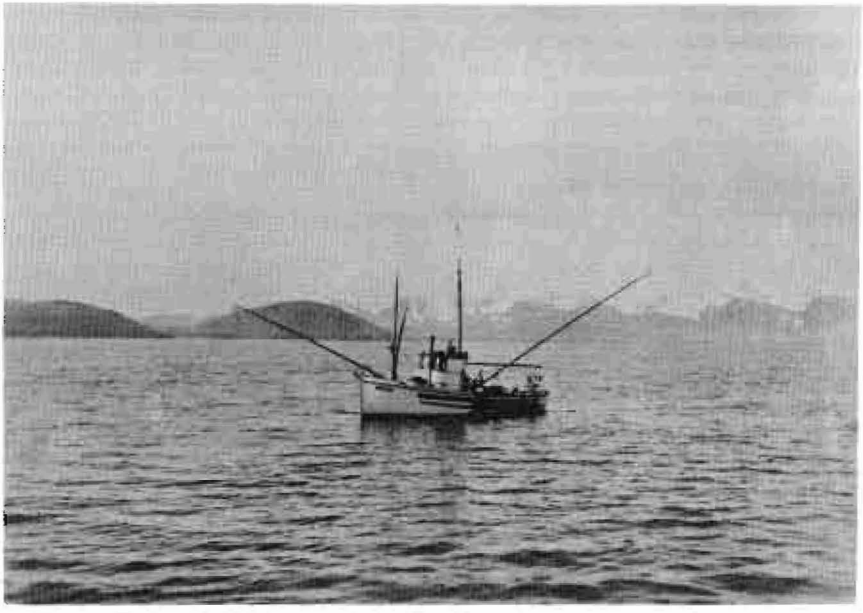


ALASKA SALMON TROLLER, NEAR TAKU INLET, 1951

FISHERIES BOARD

In compliance with the by-laws, as adopted at the organization meeting of April 27, 1949, two regular meetings of the Alaska Fisheries Board were called during the calendar year 1950. Both were held at the office of the Alaska Department of Fisheries in Juneau.

REGULAR SPRING MEETING, APRIL 17-20, 1950

J. Howard Wakefield was elected chairman of the Board to serve until the spring meeting of 1951. This was followed by the Director's report on the activities of the Department since the last meeting. A budget for the period April 1, 1950 to March 31, 1951 was adopted and a work program outlined for the same period.

A cooperative inspection and enforcement operation with the U.S. Fish and Wildlife Service was voted to be continued on approximately the same scale as in 1949. Further participation with that agency in the Falls Creek Fishway project near Petersburg was also agreed to by the Board.

The biological research program, as outlined, was accepted, with the understanding that the major effort should be placed on the troll fishery for king and silver (coho) salmon, and if time and finances permitted, a start was also to be made on the blackcod fishery. The Biological division was authorized to hire a steno-librarian, whose primary duty should be the cataloging and maintaining of the departmental library.

Limited finances of the Department would not permit the expenditure of any large amounts on exploratory fishing and aid to industry. In fact, it was felt that, for the present at least, large scale efforts along these lines could best be conducted by the Ketchikan Laboratory of the Fisheries Experimental Commission and the Exploratory Fishing Section of the U.S. Fish and Wildlife Service. However, the director was authorized to expend limited sums for exploratory fishing to aid small local enterprises. If this would result in the establishment of a single new plant, it would be money well spent.

The financial report for the first fiscal year, April 1, 1949 to March 31, 1950 was presented by the chief clerk and accepted by the Board. The meeting concluded with the adoption of a salary schedule for the ensuing year, at rates of pay in line with those of other Territorial offices and the Fish and Wildlife Service.

REGULAR FALL MEETING, NOVEMBER 15-19, 1950

Following the customary reports to the Board on the activities of the Department since the last meeting, a public hearing was held for discussion of proposed changes in fishing regulations for the 1951 season. A number of local fishermen presented their ideas and several letters on the subject from residents of other areas were read. Officials of the local office of the Fish and Wildlife Service were also in attendance to give their viewpoints. Many suggestions were accepted by the Board for incorporation in the brief submitted to the Fish and Wildlife Service.

The Board's recommendations for the 1951 fishing regulations follow, addressed to Mr. Albert M. Day, Director, Fish and Wildlife Service at Washington, D. C.

In continuance of the procedure that was established in 1949, the Alaska Fisheries Board is herewith offering for your consideration its recommendations relative to the 1951 regulations for the protection of the commercial fisheries of Alaska.

In order that the Board might obtain the viewpoints of as broad a section of the industry as possible, members of the Board or representatives attended most of the hearings in Alaska as well as in Seattle. Numerous letters and briefs were received and several persons appeared before the Board at its recent meeting in Juneau. At this same meeting the proposals of your service were presented and explained by Mr. Richard Shuman, fishery management supervisor. It is felt that this joint session did accomplish a great deal. The Board therefore wishes at this time to extend to you their appreciation of the splendid cooperation given them by Mr. Shuman.

The members of the Alaska Fisheries Board reaffirm their stand for the elimination of salmon traps. No evidence has been produced during the past year to lead them to change their opinions, and they are also convinced that people of Alaska, likewise, have not changed their minds since the plebiscite of 1948. In addition to the suggestions, relative to traps, that were offered last year, two more specific recommendations are offered at this time:

1. In order to permit the free passage of salmon and other fish during closed periods, a minimum of 10 fathoms of the lead, from a point at mean low water outward into deeper water, be lifted to the surface. This should be in addition to the present regulation pertaining to trap enclosures. Such a provision would eliminate the possibility of any fish being delayed in its migrations during closure periods and would therefore aid in securing proper escapement.

2. As a partial aid in preventing the destruction of small salmon and other fish it is recommended that the mesh of the webbing of trap spillers be set at a minimum of 3 1/2 inches, inside the knots when wet. Preliminary investigations indicate that many of the immature salmon and other small fish, especially herring, that find their way into the spillers are unable to escape unharmed because of the small sized mesh now being used in most traps. If such a suggestion is accepted one year should be allowed for conversion and the regulation made effective as of 1952.

In the matter of "personal use" fishing the Board will support any regulation or legislation that will curb the present abuses and at the same time allow for legitimate home use. Some kind of a permit system might be the answer.

The institution of a fish-ticket system is long overdue in Alaska. Without a modern system with proper equipment to keep all records up to date, statistics are of negligible value from either a biological or statistical viewpoint. To be of maximum value for either purpose, prices should be required on all tickets in addition to the other information requested.

GENERAL REGULATIONS

Sec. 102.8a - In full accord with deleting this section requiring boat names on top side.

Sec. 102.14a - With the present emphasis on stream improvement projects and weir counting this would seem to be a "must" regulation.

Sec. 102.18c - (Prohibition of Nylon) Because of the misunderstanding and confusion shown at all meetings as to the exact meaning and purpose of this regulation, it is suggested that action on this proposed change be deferred until more information is available.

Sec. 102.19a - This regulation as presently written, is difficult to understand and should be rewritten and clarified. The following seasons are recommended:

KING SALMON - Outside waters -- March 15 - October 31, inclusive
Inside waters -- Open year around

COHO SALMON - All waters -- July 1 - September 20, inclusive

Preliminary results of this year's investigations indicate that a sizeable part of the king salmon populations occurring in the outside waters are of migratory stock with some recoveries being received from as far south as the coastal streams of the state of Oregon. A season on outside king salmon fishing as listed would be in line with the recommendations of the Pacific Marine Fisheries Commission.

Recoveries of king salmon tagged in inside waters have been meager to date with no indications of a coastwise migration. Until more definite results are available the inside waters should remain open on a year around basis, so as to permit winter fishing by the few local residents who depend upon this fishery for a part of their livelihood.

The July 1 opening for coho salmon will give protection to the immature, undersize fish caught early in the season. On the other end the September 20 closure will protect the mature spawners as they approach their respective streams.

Representatives of the Department have been in touch with the United Trollers of Alaska and also many independent fishermen. It is believed that the suggestions as outlined above will meet the approval of the majority of the Alaska trollers.

Sec. 102.20 - The Board is opposed to a return to the 1949 regulation as to the release of undersized king salmon. Except for one area, namely Cook Inlet, no complaints have been received. In the case of Cook Inlet evidence seems to indicate a minor run of undersized mature jack kings, which quite logically should be retained. It is therefore suggested that exception be made to cover the Cook Inlet area. It is further suggested that the minimum size be determined by length only and the weight provision of 6 pounds dropped. The use of a minimum weight does not seem practical for the fishermen, nor is it suitable for enforcement purposes.

Part 103 - Kotzebue - Yukon - Kuskokwim Area

No proposals for changes in this area were submitted by the Service and the Board has none to offer.

Part 104 - Bristol Bay Area

Sec. 104.3

Sec. 104.4

Sec. 104.5 - The Board is in accord with seasons and weekly closures as proposed by the Service for 1951.

Sec. 104.13 - For reasons outlined last year the Board will support the Service in its regulation to permit the use of power in Bristol Bay in 1951. From information received from bona fide resident fishermen, of that area, there is no reason to change the position of the Board as announced in 1949.

Sec. 104.15 - Since stake or set-nets are in use exclusively by residents of the Bristol Bay area no restrictions should be made at this time that will reduce their numbers. If for conservation reasons it is necessary to eliminate certain locations, then compensatory locations should be arranged. Should it be the desire of the Service to prevent the increase of this type of gear it could be handled in exactly the same manner it has handled another type of fixed gear. By closely defining the areas open to set nets and by regulating the distance between nets, a very close control on the overall number can be obtained exactly as is now being done with traps in other areas. With the advent of power it may become possible for the local residents to participate freely in the drift net fishery. Such is not possible under existing conditions. When that time arrives consideration might then be given to a gradual reduction in fixed gear.

Part 105 - Alaska Peninsula Area

The Board has only one suggestion, which is similar to that made in 1949. In view of the fact that extra protection is deemed necessary for the Bristol Bay runs of 1951, it would seem in order to give these same runs some extra protection as they pass thru the Peninsula area and are subjected to the fishery of that area. All those benefiting from Bristol Bay fish should contribute their share toward conservation of these runs.

Part 107 - Chignik Area

Sec. 107.2 - For uniformity's sake and as an aid to enforcement it is recommended that the season open on June 6 the same date as in the Karluk and Red River districts of Kodiak.

Sec. 107.6 - The prohibition of the use of purse seines should be eliminated, at least in all waters outside the lagoon. So long as traps are permitted, and furthermore since catch control is to be based on weir count, there seems no logical use for denying the use of purse seines, especially of the smaller type as used in the Kodiak area.

Part 108 - Kodiak Area

In general the Board is in accord with the seasons and weekly closures as proposed for 1951 by the Service. However, suggestion is made that a close watch be maintained of the pink salmon runs in the Karluk district and provision be made for an open season by field announcement should sizeable runs appear. There is some evidence to indicate that the runs of early reds at Litnik and perhaps Perenosa Bay have increased so that some additional cropping can be made. An earlier opening in these two particular areas would seem in order.

Sec. 108.25 - Herring seasons. It is recommended that this section be rewritten so that its meaning will be clearer. The following seasons are suggested:

June 15 - October 31 — General season for entire Kodiak area with provision for bait and gill net fishing at other times.

July 1 - October 31 — Season for quota area.

Sec. 108.26 - Quota restrictions to apply only to the period July 1 to September 30. No quota restrictions after that date, since the adverse weather conditions in itself will regulate the catch to a considerable extent.

Part 109 - Cook Inlet

Sec. 109.2 - The Board agrees with the seasons as proposed by the Service, but believes a provision should be made in all three districts that prior to July 5 no gear be allowed with mesh less than 8 1/2 inches stretched measure.

Sec. 109.2a - Under the conditions now existing and with the present lack of biological information, the only real measure that could be promulgated to decrease the intensity of the fishery, is to increase the weekly closed period as proposed. This closure should be uniform in all districts and apply to all types of gear. Dividing the closure time in two periods would probably be more satisfactory from the conservation standpoint as well as to the fisherman.

Sec. 109.4 - This section should be amended so as to allow the use of purse seines in the southern part of the area especially during the pink and chum salmon runs.

Sec. 109.13 - The minimum distance between traps should be increased from 2500 feet to 1 mile so the regulation will be more in conformity with those in other areas.

Herring fishery - The Board is aware that requests have been made from time to time for the setting of a small quota for the Cook Inlet area. For all practical purposes there has been no commercial fishery for years. For the purpose of determining the present status of the herring population the Board will concur in the establishment of a small quota for this area.

The Board is aware that the regulation of the Cook Inlet salmon runs, especially reds, is one of the most difficult problems facing the Service today. It also realizes that the regulations now being proposed may not in themselves solve the problem. The possibility of a repetition of last year's excessive catch and lack of general escapement still remains. The Board therefore requests that the Service explore the feasibility of setting an overall quota on the red salmon pack to act as a buffer in preventing a repetition of what happened last year. Such quota should be in addition to your seasonal and weekly closure proposals and would ensure some escapement that was not realized last year. It is, of course, difficult to say what this quota should be, but a suggestion is made that it be about 10% over the average pack of red salmon during the last 2 cycles of the 1951 run, which is approximately 115,000 cases.

Part 110 - Resurrection Bay Area

The Board concurs in the proposals of the Service as an aid to better enforcement in this and the adjacent Prince William Sound areas.

Part 111 - Prince William Sound Area

The salmon seasons and weekly closures as proposed by the Service are satisfactory to the Board and there is no objection to the suggested restrictions in Valdez Arm. However, the Board is not in favor of any further restrictions on the use of gill nets in Prince William Sound, as has been suggested by certain parties. Drift gill net fishing should be permissible in any area open to traps and purse seines.

Crab fishing - The restrictions on the number of crab pots per boat to 100 is, strictly speaking, not a conservation measure, but is based entirely on economic reasons to give employment to more men and more boats. On this basis the Board is willing to go along with this

restriction, but only in inside waters. The outside waters along the entire coast have tremendous possibilities for crab fishing. Because of adverse weather conditions it is impossible to explore and develop these areas except with large boats carrying more than 100 pots. No restrictions should be made at present that would jeopardize the development of such a potential industry.

Part 112 & 113 - Copper River & Bering River Areas

The seasons and weekly closures as proposed are acceptable except for the fall season. The change in the opening date from August 10 to August 20 is satisfactory, but this 10 day deduction at the start should be added to the season making the closure date September 30.

The Service is asked to give consideration to the request for a trial fishing season on the Copper River only from July 10 to August 7. This would relieve some of the pressure on Prince William Sound and at the same time check on the rehabilitation of the runs during this period, which has been closed for a long time.

Sec. 112.8 - The Board favors retention of this section as is. However if the Service feels some restrictions are in order a suggestion is made that not more than 300 fathoms of gear be permitted on any one boat, or combination of boats fishing from a powered mother-ship.

Part 114 - Yakutat Area

This seems to be somewhat of a forgotten area with the present available information insufficient for the establishment of any real constructive regulations. The Board will therefore support the Service in securing more personnel to obtain more knowledge of this area. Some complaints have been received about the improper placing, or entire lack of markers on several streams. It is requested that the location of the Situk weir be checked to see if it is an obstruction to the upstream passage of salmon as contended by certain residents of Yakutat.

Part 115 - Southeastern Alaska Area

Sec. 115.2 - The recommendation made in 1949 is repeated, that the maximum length of salmon purse seines be decreased from 300 fathoms and at the same time make the maximum length of lead for the entire area 75 fathoms. With this should come strict enforcement of the 7 inch minimum size mesh in the leads. It is believed such a change would be a deterrent to "creek robbing" and also be an incentive for the seiners to move their operations farther away from the streams and closer to the ocean, where a better quality of fish will be caught.

Sec. 115.4a - The concentration of gill nets, in the few small areas now open to them, has been on the increase in recent years and at the same time certain elements are pressing for the removal of gill nets from all river mouths. This type of fishing might be called a "poor man's" fishery, but the fact remains, that the gill netters are, for the most part, local residents, and should be entitled to every consideration. Therefore as an aid in preventing this concentration, more areas should be open to them and the Board repeats its request of 1949, that all areas open to traps or purse seines be open to drift gill nets. Clear water drift netting for salmon is already an established method of fishing in British Columbia and Puget Sound. If in the future it should become necessary to promulgate regulations prohibiting gill netting in river mouths of S. E. Alaska, there must be other places these fishermen can

move with their accustomed type of gear.

Herring - The proposals of the Service are accepted with a suggestion that some satisfactory quota be worked out with the industry, preferably on a 3 year basis as in the other areas.

Shrimp - The proposals concerning shrimp fishing are satisfactory.

Crabs - The Board accepts the proposals on crab fishing with these provisos:

1. The limit of 100 pots per boat apply only to inside waters. Reasons for this explained under heading of Prince William Sound.

2. The overall closure from May 1 to September 1 should only be tentative and subject to change. It is felt that present knowledge is insufficient to justify setting a uniform season over so large an area.

Sec. 117.3 etc. Seasons.

The Board offers for your consideration the following dates for the 1951 season for the entire Southeastern area:

July 23 - 6:00 A.M. to July 25 - 6:00 P.M.	2 1/2 days
July 30 - 6:00 A.M. to August 1 - 6:00 P.M.	2 1/2 days
August 6 - 6:00 A.M. to August 8 - 6:00 P.M.	2 1/2 days
August 13 - 6:00 A.M. to August 17 - 6:00 P.M.	4 1/2 days
August 20 - 6:00 A.M. to August 24 - 6:00 P.M.	4 1/2 days
August 27 - 6:00 A.M. to August 31 - 6:00 P.M.	4 1/2 days
September 3 - 6:00 A.M. to September 5 - 6:00 P.M.	2 1/2 days
	23 1/2 days

It is felt that such a season would be more practical from both a biological and economic standpoint than the shorter more concentrated one proposed by the Service. The number of days per week for fishing should be flexible and subject to decrease or increase as conditions warrant.

For the fall season the following dates for 1951 are suggested:

September 24 - 6:00 A.M. to September 26 - 6:00 P.M.	3 days
October 1 - 6:00 A.M. to October 5 - 6:00 P.M.	5 days

All purse seine areas of S. E. Alaska should be opened for the fall season, also gill netters should be allowed to participate if they so desire. Provision should be made to tap the runs in upper Lynn Canal at this same time. These have been untouched for years.

Sec. 119.7 - If it were true that a good escapement always meant a good return of pinks two years later, an early announcement of the opening of the Stephens Passage mainland might be in order. However disappointments have occurred in the past, which were traceable to this faulty assumption. Furthermore this section has only been closed one cycle. The Board therefore recommends that this area be kept closed in 1951 with a provision for an opening by field announcement if and when a run develops.

Sec. 121.11 - If an early season, as suggested by the Board, is adopted these Bradfield Canal (Anan Creek) markers should remain as at present. In event of a late opening on August 9 the proposed change in markers might be justified.

Sec. 124.9(j) - The Board is in accord with this closure in Portland Canal.

Sec. 116.14 - Since there seemed to be some objection to this section as proposed, a compromise might be worked out by requiring a minimum mesh of 7 inches in all seines used for fishing flounders between June 1 and October 15.

Sec. 119.10 - The suggestion offered by some of the Taku fishermen to move the present markers 500 yards west of the present line should be acceptable. This will move the fishery at that point into deeper water and away from the bar where the nets were apt to ground. In the event that Stephens Passage mainland shore is opened early to unrestricted fishing, then in fairness to the gill netters no further restrictions should be placed on them and the line should be left in its present location.

Sec. 115.5 - The Board is in accord with a "freeze" regulation on set nets in S. E. Alaska and suggests that it be done in a manner similar to that outlined for Bristol Bay.

Sec. 120.4

Sec. 121.11 - The trollers have suggested that the closed area near Wrangell and the one in Bradfield Canal be open to winter trolling from October 5 to June 1. Since the fish in these areas at that time of year are "feeders" and not "spawners" the Board wishes to concur in the trollers' recommendation.

The Board has one final suggestion of a general nature; one that was expressed by others at hearings held in Alaska. A request is made that the proposals of the Service be given some publicity before the hearings are held, so that interested parties will have an opportunity to study them in advance and properly prepare themselves for these meetings. Under the present system with the final hearings being held in Seattle, resident fishermen feel they are not given an equal chance with the industry. In fact it might be in order for the Service to consider holding the final hearings at some point in Alaska.

In offering the above recommendations to you, the Board feels assured that your service will give them careful consideration and is hopeful that many will be accepted. However, regardless of whether or not the two agencies are in final agreement on all points, the Board pledges its assistance and cooperation as in the past.

Respectfully submitted by:

C. L. ANDERSON, Director
for the Alaska Fisheries Board

J. H. Wakefield, Chairman, Port Wakefield, Alaska

Ira H. Rothwell, Cordova, Alaska

Karl Brunstad, Kodiak, Alaska

Wm. R. Walton, Sitka, Alaska

J. P. Valentine, Ketchikan, Alaska

ADMINISTRATION

In addition to the general administration of the Department, including the planning of the work programs of the several divisions, the director was able to spend considerable time in the field. During 1950 he participated in 16 field trips by plane, car and boat. Visits were made to Bristol Bay, Kodiak, Cook Inlet, Yakutat and Southeastern Alaska areas. Aerial reconnaissance trips were made to Atlin and the upper Taku district in connection with the planning of the grayling and Taku River salmon projects.

Preliminary to starting the research investigation of the troll salmon and blackcod fishery, the director, accompanied by the biologists, conducted a series of eight meetings with fishermen in the various ports of Southeastern Alaska.

At the request of Albert Day, Chief of the Fish and Wildlife Service, C. L. Anderson, director of the Alaska Department of Fisheries, was invited to Washington, D. C. in January for a consulation on the proposed changes in the Alaska fisheries regulations for 1950, especially with reference to the recommendations of the Alaska Fisheries Board. Some of these suggestions were adopted.

During the fall of 1950 the director or a representative of the department attended all hearings of the Fish and Wildlife Service, including those at Seattle. Subsequently Juneau officials of the Service met with the Alaska Fisheries Board to review the proposed changes for 1951, after which the Board adopted a series of recommendations, which were incorporated in a brief by the director for presentation to the Washington office of the Fish and Wildlife Service.

Definite progress is being made and the viewpoints of resident fishermen are being given more consideration. The fact that the regional office of the Fish and Wildlife Service is being given more recognition in the formulation of new regulations is, in itself, a most helpful sign.

In November, 1950, Mr. Anderson attended the first Alaska Science Conference in Washington, D. C., where he presented a paper on "Territorial Fishery Administration." This reviewed in a general way the past accomplishments of the department and its plans for the future. Special emphasis was placed on the biological investigations and the hopes of the department for the gradual development of a comprehensive fisheries library and research headquarters in Alaska. It is firmly believed that better and quicker results can be accomplished if the research personnel are year-around residents of Alaska.

While in Washington the director was able to use in a practical, and perhaps somewhat startling way, some of the information obtained from the first season's investigations of the troll salmon fishery. At the same time the Alaska Science Conference was in session, the Federal Power Commission was conducting a hearing on the application from the City of Tacoma for two power dam sites on the Cowlitz River in Washington State. The Cowlitz River is a large tributary of the lower Columbia River and has extremely valuable spawning runs of salmon, trout and other anadromous fish. For the most part these spawning grounds are in excellent shape, having suffered a minimum of damage from the advances of civilization.

During the time Mr. Anderson was acting director of the Washington

State Department of Fisheries, he was active in the successful campaign to set up a fish sanctuary in southwest Washington by legislative act of the 1949 session. This sanctuary area contains all the important salmon spawning tributaries of the lower Columbia River in the State of Washington. Under the terms of the bill the construction of dams and other obstructions or diversions, which would adversely affect fish runs in these streams, would be prohibited.

The construction of the two proposed dams on the Cowlitz River by the City of Tacoma would be in direct violation of the state law and would destroy a very large percentage of migratory fish runs in that stream. In the case of the king salmon stocks, which are of paramount importance to the Alaska trollers, it would mean almost complete destruction. The City of Tacoma sought to circumvent the will of the people of Washington by appealing to the Federal Power Commission. At the formal hearing before this commission to hear expert testimony, Mr. Anderson outlined the king salmon tagging experiments of the Department's biologists and presented evidence to show the value of the Columbia River to Alaska fishermen. It is estimated that the Columbia River contributed around $1,400,000 to the earnings of the Alaska trollers and that a sizeable part of this would be eliminated if the City of Tacoma was permitted to construct the two dams.

On his return from Washington, D. C. Mr. Anderson made arrangements in Seattle for obtaining a shipment of eyed king salmon eggs for planting in Alaskan streams. Further details are discussed in the biological section of this report. Special appreciation is due Mr. Robert Schoettler, Director of the Washington State Department of Fisheries, for furnishing the eggs and to members of his staff for expediting the shipment.

As chairman of the Advisory Committee to the Pollution Control Board, the director attended one hearing in Ketchikan June 29 and another in Juneau on October 14. The Ketchikan meeting was devoted largely to a discussion of the proposed pulp mill at Ward Cove, near Ketchikan. Representatives of the pulp company issued a public statement to the effect that "the proposed mill will never use the calcium base sulphite process that is now commonly used in existing sulphite mills for cooking pulp." This is the process that is doing serious damage to the fisheries of Puget Sound and other areas of the country.

At the Juneau hearing there was a discussion of the proposed "Minimum Requirements for the Prevention of Industrial Waste Pollution" as recommended by the Pollution Control Council, Pacific Northwest area. Copies of this report have been forwarded to all members of the Advisory Committee for comment as to the adviseability of adopting similar regulations for Alaska.

In the line of routine duties may be mentioned preparation of the 1949 annual report of the department and the budget for the 1951-53 biennium for presentation to the 1951 legislature.

As extra official duties Mr. Anderson collaborated in the writing of a revised edition of "Marine Products of Commerce." This book is an extensive compilation of information dealing with the acquisition, handling, biological aspects and the science and technology of the preparation and preservation of marine products.

Two minor projects of the department in 1959, worthy of note were shrimp explorations near Juneau and the grayling transplanting from the Atlin District.

SHRIMP EXPLORATIONS

Early in 1950 the department sponsored shrimp prospecting in the Juneau area by giving a small grant to Harry Christman who used his own 42-foot trawler, Lawco, and gear. Using a 15-foot beam trawl, definite finds were made of the small pinks and coon stripe varieties within a few hours running time of Juneau. Detailed logs were kept of all operations and these are available to interested fishermen at the office of the department.

By June results were successful enough to attract the Anchor Fish Company's floating cannery from Pelican to process the hauls which averaged 250 pounds daily. After the local market was supplied, the overflow was quick-frozen and shipped to Seattle. Other boats are interested and it is expected this will be the forerunner of a permanent plant in the Juneau district.

GRAYLING PLANTING

The Territorial Sportsmen, Inc. requested the assistance of the department in the transplanting of grayling from the Atlin district in British Columbia to lakes and streams adjacent to Juneau to see if that fine game fish would thrive on the coastal side of the range.

The Alaska Department of Fisheries assumed the general supervision of the project, located the sources of supply and made all arrangements with the various governmental agencies involved. Cooperation was excellect and appreciation is hereby expressed to the Canadian Customs, the Canadian Department of Fisheries and especially the British Columbia Game Commission which granted permission to take up to 5,000 grayling fingerlings from Lake MacDonald near Atlin.

On the American side, thanks are due to the U. S. Customs, the Forest Service and the Fish and Wildlife Service, especially the latter which furnished planes for transporting the fish. The Territorial Sportsmen, Inc. provided the funds for purchase of gear and hiring of men.

Due to the late start and many details involved the fishing expedition did not get underway until October. By that time, cold and unfavorable weather was encountered at the high altitude of Lake MacDonald. Fishing was extremely difficult and only 275 grayling were taken. These were transported without loss and released in Auke and Young Lakes near Juneau.

Although the initial attempt was not too successful, it is planned to make another trial in 1951, which will get under way earlier in the season when conditions are more favorable.

BIOLOGY DIVISION

INTRODUCTION

by

C. L. Anderson

In planning for the future development of the department, it was recognized that the ultimate aim of any fisheries conservation or management agency should be to permit the harvesting of a maximum crop each year that is consistent with the ability of the particular species involved to reproduce itself.

However, before such an agency can even approximate such a goal, it must have a staff of trained fishery biologists to furnish it with certain definite fundamental data. This should include information on the life history, especially factors of growth, age composition, and reproductive capacity; on habits such as migration and feeding; and on existing mortalities due to environmental, physical, chemical and predator conditions, and the effects of the existing fisheries. In the case of an anadromous fish, such as salmon, the problem of proper escapement must be investigated. To date, regulation of the salmon runs of Alaska has been more or less by trial and error method. This has often resulted in either over or under population of the spawning grounds. One may be as harmful as another.

Therefore the Fisheries Board felt it imperative that the department inaugurate a Division of Biological Research at the earliest possible date. This became a reality in early 1950 when two biologists were hired on a permanent basis. Both of these men had worked for me in the State of Washington on problems similar to those contemplated in Alaska. During the active fishing season it became possible to augment the field work by the addition of three temporary men.

With such a small staff it was obvious that the department could not consider undertaking such major problems as those connected with the extensive red and pink salmon fisheries. Furthermore, these are now being investigated in a comprehensive way by two other agencies: the Fish and Wildlife Service and the Fisheries Research Institute, the latter with funds furnished by the Alaska Salmon Industry.

It became a case of narrowing the field sufficiently so that the efforts would not be so widely scattered as to be of little value. It also seemed proper that the research should center on fisheries that were now receiving little or no attention. Furthermore, since this department is an agency of the Territory, it was fitting that fisheries should be selected that are of paramount interest to fishermen who are residents of Alaska.

Although a number of fisheries came to mind that would fulfill these conditions, it was decided to concentrate for the initial project on the troll fishery for king (chinook) and coho (silver) salmon. As time and funds allowed, a start was to be made on the blackcod (sablefish) fishery. This decision was based also on the fact that these two are of coastwise interest and are now the subject of extensive investigations by the states of California, Oregon and Washington, as well as by the Province of British Columbia through the Fisheries Research Board of Canada. The overall coordination of the broad research program is being handled by the Pacific Marine Fisheries Commission, of which Cal-

ifornia, Oregon and Washington are official members. Representatives of British Columbia and Alaska are invited to attend and to participate in the discussions.

In a typical fisheries problem the conservation agency should present to its biological staff an assignment that outlines the main objectives, i.e., what it needs to know in order to manage properly a resource for the welfare of all concerned.

The first approach in investigation is through a thorough study of the published literature, selecting the papers of past accomplishments that present problems of a similar nature. Techniques used, methods of analysis and findings are studied; consequently much effort is saved through a knowledge of pitfalls, blind alleys, shortcuts and results discovered from experience of past researchers.

Statistics and past records are collected, organized and analyzed. Changes in fishing effort and gear efficiency are studied and a history of the fishery then compiled step by step. With this background of knowledge and data the problem is broken down into its logical specific component parts such as migration, growth, mortality, fecundity, etc.

The fishermen and members of the industry are met with and are asked to contribute their knowledge and experience. From data gathered in this manner a hypothesis is constructed. This theory is then subjected to rigid investigation through experimental methods, letting the answers fall where they may without regard to personal or pre-established opinions. After adequate investigation the findings are assembled and analyzed. A summary is then prepared for presentation to the administrators.

The broad objectives of the troll salmon investigations are: (1) to discover the present condition of the Alaska troll fishery resources in relation to past production; (2) to establish the component parts being supplied by Alaska streams and from streams from other geographical areas; (3) to establish the degree that Alaska streams contribute to catches of British Columbia, Washington, Oregon, and California fisheries; and (4) to investigate the possibilities of increasing the production of Alaska waters.

The main objective of the blackcod investigation is to determine whether the blackcod found in Alaskan waters are of local isolated stocks or are a part of a coast-wise migratory stock. The statistics of total catch, catch per unit of effort, growth, size at maturity, life span, average size and mortality rates are all necessary components of a sustained yield program.

However, these will have different meanings depending upon the amount of migration or intermingling there may be of the various stocks. The preliminary phase of this investigation has been assisted immeasurably by the International Fisheries Commission and the Fish and Wildlife Service. Both have made available the data and information they have collected.

BIOGRAPHICAL SKETCHES OF BIOLOGISTS

ROBERT R. PARKER was born July 21, 1921, in Seattle, Washington, graduated from high school there and in 1946 was graduated from the University of Washington with a B. S. degree in zoology, specializing in fisheries work. He spent one year as a special technician with the

department of zoology at the University of Washington.

Previous to graduation he had worked three seasons in Alaska for the Fish and Wildlife Service. During one of these he was stationed at the pink salmon experimental station at Little Port Walter in Southeastern Alaska. The other two were spent working on the red salmon investigations in the Bristol Bay area.

Before joining the staff of the Alaska Department of Fisheries in February, 1950, Mr. Parker had worked for the Washington State Department of Fisheries and was assistant to the chief biologist at the time of his resignation from that agency. His studies in Washington State include bottom fish and several species of salmon, more especially troll-caught varieties—kings and silvers.

While earning his way through school, he built his own fishing boat and had actively engaged in salmon trolling and gillnetting. This practical knowledge gained from actual fishing experience is of great value in pursuing his scientific investigations.

WALTER KIRKNESS was also born in Seattle, August 9, 1920, was graduated from high school and went on to get his fisheries biology B.S. degree from the University of Washington in 1943.

While attending school he worked one season with the International Pacific Sockeye Salmon Commission at New Westminster, B. C., on problems connected with rehabilitation of the sockeye salmon runs of the Fraser River, which were largely destroyed by a slide on the river at Hells Gate. He spent one season with the State of Washington Department of Fisheries on salmon and other fishery problems.

Upon graduation he entered the U. S. Marine Corps and served until May, 1946. He had been commissioned a First Lieutenant and participated in a number of major engagements in the Pacific during the war. After release from the Service, he went with the Washington State Department of Fisheries as a biologist until he joined the Alaska Department of Fisheries, April 1, 1950.

Some of his work included studies on miscellaneous commercial species but principally king and silver (coho) salmon of the Puget Sound area, tagging of larger fish caught in commercial and sport fishery, marking (fin-clipping) of fry and fingerling salmon released at the hatcheries, stream surveys to check escapement and search for tagged adults. He made studies of stomach samples of feeding fish to determine diet, as well as overall study of migration patterns and other life history factors of Puget Sound kings and silvers.

BIOLOGICAL INVESTIGATIONS

BY
ROBERT R. PARKER and WALTER KIRKNESS

Realizing that the fishermen and other members of the industry could contribute much of the fundamental knowledge desired for completion of the assignment, a series of open meetings were held in the towns and cities of Southeastern Alaska. Here the problems were discussed at length and persons attending were asked to contribute to the background of knowledge we were endeavoring to assemble. Valuable and pertinent information was gathered on the history and development of the fisheries and in some cases on their decline. Methods of tagging, reimbursement of the fishermen, areas for concentration of effort and many other problems were covered, and from this foundation of information the research program emerged. Thus to the interested fishermen and industry members, a list much too long to enumerate, goes a large measure of credit for work accomplished during the 1950 season. The main efforts were directed toward gathering biological data on the king and silver salmon during their ocean existence.

PLANNING THE PROGRAM

TROLL SALMON FISHERY

The most direct manner of approaching the question of what streams are supplying the king and silver salmon for the Alaska troll fishery is through tagging fish in the fishery itself. With limited funds and personnel, two main areas were established for concentration of effort; one at the northern extremity of the fishery centered at Pelican City and the other at the southern extremity centered at Ketchikan. Any countermigration and differences of the fisheries in the two areas would become apparent by comparison. Tagging to a minor degree was carried out in other areas within the extremities established to check on any predominant pattern of movement that might appear.

TAGGING AREAS

Salmon for tagging were bought directly from the fishermen while fishing and reimbursement was made on the basis of calculated dressed weight and prevailing prices at the nearest cold storage port. The tagger would make arrangements with the fisherman to accompany him for a trip of 10 to 14 days and every effort was made to have the choice of area, gear, and methods used by the fisherman remain the same as in normal commercial fishing. It is felt that our samples are as representative as it was possible to obtain for the areas from which they were drawn. Only fish in reasonably unharmed condition were purchased and these were graded arbitrarily into "A", "B", and "C" according to the extent of their injury and apparent condition. The grading was admittedly far from perfect but it is interesting to compare the rate of returns within the three grades used. This information is presented in Table 1. Fish were graded "C" primarily because of injury to an eye, the gills, or the roof of the mouth in the region of the eyes, or the fish exhibited excessive bleeding, but in every case were quite lively. These data seem to indicate a total mortality for king salmon so injured but some survival for silver salmon.

SECURING THE FISH

TABLE 1. — Recovery rates of king and silver salmon by grade, tagged in outside waters of Southeastern Alaska in 1950.

Species	Grade "A"		Grade "B"		Grade "C"	
	Number Tagged	Percent Recovered	Number Tagged	Percent Recovered	Number Tagged	Percent Recovered
King	546	13.9	114	10.5	40	0
Silver	642	10.1	157	5.1	48	2.1

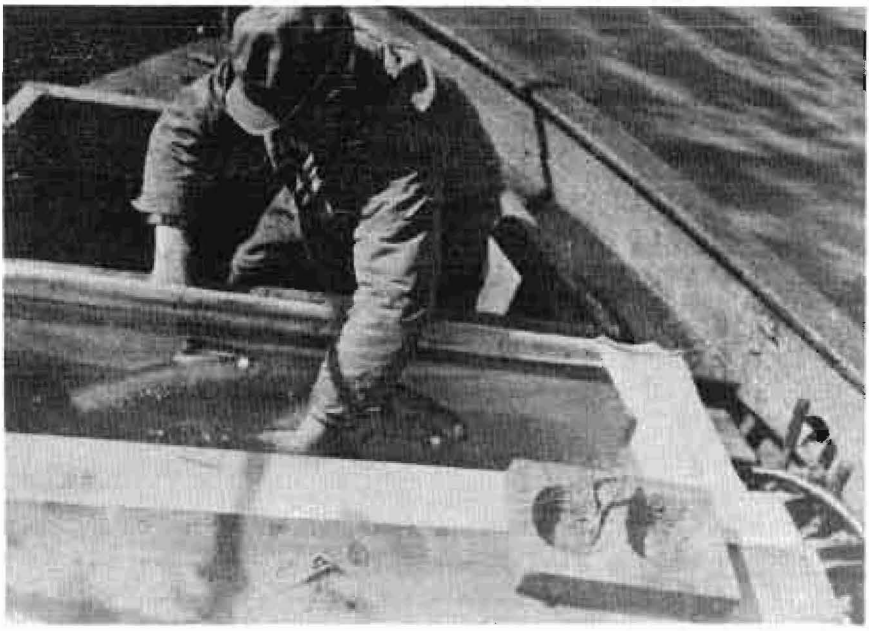


FIGURE 1. — Demonstrating the methods used for tagging king salmon aboard a commercial troller.

TAGS USED

Tags used consisted of two celluloid discs five-eighths of an inch in diameter with a centered hole and a pure nickle pin. One disc is colored red, the other white, and both were printed "Alaska Dept. Fisheries, Juneau," with identical serial numbers. The colors were chosen as being the most striking against the dark background of the fish and duplicate numbers were used in case one disc became lost. In many cases only one disc was recovered, especially from the gill net fishery. In tagging, one of the discs is placed next to the head of the pin and the fish is pierced in the region immediately below the insertion of the dorsal or back fin. The second disc is then threaded on the pin and a knot tied in the exposed end of the pin to prevent the completed tag from separating.

A canvas lined fish box holding approximately 80 gallons of water was used as a live box and the fish were placed therein immediately when caught. The box was supplied with fresh sea water by means of a mechanical pump providing a means of holding fish for observation before tagging. Figure 1 shows a king salmon being tagged in a live box aboard a troller. Figure 2 shows a king salmon with the tag in place before being returned to the water.

TAGGING METHODS

The general areas of tagging, dates of tagging, and numbers of fish involved are presented in Table 2. The major portion of the tagging in Stephens Passage and Behm Canal took place after the main commercial operation, therefore no tag returns are expected until the 1951 season. Tables 3 to 7 present the recovery data for the outside areas.

TAGGING STATISTICS

Figure 3 presents graphically the predominantly southward movement of kings tagged in outside waters. Figure 4 portrays the random dispersal of silver salmon from areas of tagging to points of recapture. It is suggested that reference be made to U. S. Coast and Geodetic Survey Charts 7002 and 8002 for accurate location of geographical areas. Apparently, from examination of Tables 2 to 7 and Figures 3 and 4, the two species in question behave quite differently. Further comparisons are made in Table 8 which presents the average distance traveled, average time free, percentages of stream recoveries, and Alaskan recoveries. Table 9 presents the recoveries by gear.

RECOVERY STATISTICS

FIGURE 2—Showing a tag in place on a king salmon.

TABLE 2. — Numbers of king and silver salmon tagged during 1950

AREA	KINGS		SILVERS	
	Number Tagged	Dates Tagged	Number Tagged	Dates Tagged
Outside Waters				
Cape Spencer to Cape Fairweather	149	June and July	81	July
Cape Bingham to Lisianski Strait	276	May thru July and September	264	June and July
Lisianski Strait to Cape Edgecumbe	99	June thru September	0	
Coronation Island to Cape Felix	176	May thru July	473	May thru July
Duke Island	10	July	30	July
Inside Waters				
Northern Stephens Passage	497	May, August thru October	7	August
Northern Chatham Strait	27	May and July	1	August
Behm Canal	274	September thru December	1	October
TOTAL TAGGED	1508		857	

The kings showed no countermigration except in one instance, viz. Noyes Island to Snipe Bay, a northward movement of 65 nautical miles in 48 days, and very few were recovered in the same or close to the same locality. The silver salmon, conversely, moved in a random manner from the outside waters to fisheries or spawning streams in inside waters. Much counter movement is evident and no definite migration paths or routes are indicated. The significance of the king salmon experiment may be altered by 1951 tag returns but it is apparent from these preliminary results that the king salmon fishery is largely dependent upon supplies from outside territorial waters while for the silver salmon the opposite is true. Likewise the percentage of Alaskan recoveries has significance for Alaskans when discussions of closed seasons and size limits are entered.

DIFFERENCES IN BEHAVIOR OF KING AND SILVER SALMON

Each fish landed was measured in a straight line from the tip of the nose to the end of the middle rays of the caudal fin or tail, and this measurement is referred to as fork-length. A patch of scales was taken from the area below the dorsal fin and immediately above the lateral line. These were used in age analysis. Fish badly injured were dressed and the sex products and stomachs were preserved in a four percent solution of formalin for future study.

DATA COLLECTED ON THE FISH

TABLE 3. — Recoveries of king and silver salmon tagged from Cape Spencer to Cape Fairweather, thru December, 1950.

Area Recovered	Number Recovered
Kings	
North Inian Pass	1
Willapa River, Washington	1
Columbia River	4
Total	6
Silvers	
South Inian Pass	1
Point Gustavus, Icy Strait	1
Point Adolphus, Icy Strait	1
Pleasant Island, Icy Strait	1
Near Excursion Inlet, Icy Strait	1
Funter Bay, West Coast Admiralty Island	1
Glacier Point, Chilkat Inlet	1
Taku River	1
Salisbury Sound, South End Chichagof Island	1
Snow Pass, near Zarembo Island	1
Total	10

TABLE 4 — Recoveries of king and silver salmon tagged from Cape Bingham to Lisianski Strait.

Area Recovered	Number Recovered
Kings	
Yacobi Rock, Yacobi Island	1
Cape Edgecumbe	2
Whale Bay, Baranof Island	1
Snipe Bay, Baranof Island	2
Saint Joseph Island, North of Noyes Island	2
Langara Island, North of Graham Island	1
Nass River, Canada	1
Skeena River, Canada	3
Nahwitta Bar, North Coast Vancouver Island	1
Blinkhorn Light, Vancouver Island	1
Knights Inlet, Canada	1
Kyuquot Sound, West Vancouver Island	1
Esperanza Reef, West Vancouver Island	1
Rafael Point, West Vancouver Island	1
Swiftsure Bank, South Vancouver Island	1
Sooke Trap, South Vancouver Island	2
Point Roberts, Washington	1
Fraser River, Canada	7
Queets River, Washington	2

TABLE 4. (cont'd) — Recoveries of king and silver salmon tagged from Cape Bingham to Lisianski Strait.

Area Recovered	Number Recovered
Kings	
Palix River, Willapa Harbor, Washington	1
Columbia River	10
Nehamlem River, Oregon	1
Cape Lookout, Oregon	1
Siletz River, Oregon	1
Total	46
Silvers	
Astrolabe Bay, N.W. of Cape Spencer	1
Icy Point, N.W. of Cape Spencer	1
Pleasant Island, Icy Strait	1
Funter Bay, West Coast Admiralty Island	3
Tee Harbor, N.W. of Juneau	1
Taku River	3
White Sisters, off Chichagof Island	1
Kalinin Bay, North Coast Kruzof Island	1
Basket Bay, East Coast Chichagof Island	1
Point Gardner, S.W. end Admiralty Island	1
Cape Fanshaw, North Frederick Sound	1
Whale Bay, Baranof Island	1
Warren Island, North Iphigenia Bay	1
Warren Cove, East Coast Warren Island	1
Stikine River	2
Grindall Island, off Kasaan Bay	1
Wales Island, Portland Inlet	1
Skeena River, Canada	1
Total	23

TABLE 5. — Recoveries of king salmon tagged from Lisianski Strait to Cape Edgecumbe, thru December, 1950.

Area Recovered	Number Recovered
Shag Rock, North Graham Island	1
Cape Scott, North End Vancouver Island	1
Barkley Sound, S.W. Vancouver Island	1
Fraser River, Canada	2
Chehalis River, Grays Harbor, Washington	1
Willapa Harbor, Washington	1
Columbia River	4
Yaquina River, Oregon	1
Floras Creek, Oregon	1
Total	13

TABLE 6—Recoveries of king and silver salmon tagged from Coronation Island to Cape Felix, Sumez Island, thru December, 1950.

Area Recovered	Number Recovered
Kings	
Snipe Bay, Southwest Baranof Island	1
St. Joseph Island, North of Noyes Island	1
Veta Bay, Baker Island	1
Skeena River, Canada	1
Langara Island, North of Graham Island	1
Bella Coola River, Canada	1
Cracroft Island, Johnstone Strait	1
Cape Scott, North End Vancouver Island	1
Kyuquot Sound, West Vancouver Island	1
Esperanza Inlet, West Vancouver Island	2
Alberni Canal, S.W. Vancouver Island	1
Sooke Trap, South End Vancouver Island	1
Fraser River, Canada	4
Off of Grays Harbor, Washington	1
Willapa River, Washington	1
Columbia River	4
Total	23
Silvers	
Gull Cove, North Chichagof Island	1
Point Kingsmill, North End Kuiu Island	1
Warren Channel, Warren Island	1
Sea Otter Sound	5
Point Baker, N.W. Prince of Wales Island	1
Blind Slough, South Mitkof Island	1
Stikine River	3
Bucareli Bay, West Sumez Island	1
Sumez Island, Southwest End	1
Cape Muzon, Southeast Dall Island	1
Shipwreck Point, Cordova Bay	2
Cape Chacon, S.E. Prince of Wales Island	1
Smeaton Bay, in small stream	2
Ship Island, West Cleveland Peninsula	1
Loring, Behm Canal	1
Meyers Chuck, N.W. Cleveland Peninsula	1
Lincoln Rock, North Clarence Strait	2
Dundas Island, East Dixon Entrance	2
Skeena River, Canada	3
Langara Island, North Graham Island	1
Masset Harbor, North Graham Island	1
Rose Spit, N.E. End Graham Island	1
Klemtu, Milbanke Sound	1
Johnstone Strait	1
Area Unknown	4
Total	40

TABLE 7. — Recoveries of king and silver salmon tagged off Duke Island, thru December, 1950.

Area Recovered	Number Recovered
Kings	
Copalis Beach, Washington	1
Total	1
Silvers	
Sitklan Island, Portland Inlet	1
Wales Island, Portland Inlet	1
Skeena River, Canada	1
Total	3

Earlier researchers have established that the growth of the scale in size is directly proportional to the growth in length of the fish and this concept has been used in the calculations presented in this paper. When the king salmon are approximately one and one-half inches in length the scales are first formed as "platelets" which are the central plates or rings in the scales presented in Figures 5 and 6. As the salmon grows, proportional amounts of material are deposited on the surface of the scales. These appear as concentric rings or "circuli" and a number are formed during each years growth. During periods of fast growth the circuli are widely spaced; during periods of slow growth the distances between circuli are narrow. The zones of slow growth occur normally during the late fall and winter seasons and are referred to as the "annuli" or winter checks. The scales were soaked in a solution of water and detergent to clean them of slime and debris and four scales from each fish were selected and mounted between glass slides. The mounted scales were then placed on a microscope and an enlarged image of the best one was projected on a flat surface. The ages of salmon are determined by counting the number of annuli or winters the fish has survived.

USE OF THE SCALES

King salmon may be divided into two distinct groups according to their early life history as portrayed by their scales. Some leave the spawning stream as soon as the yolk sac is absorbed and the centers of their scales show rapid growth, characterized by relatively wide spaces between circuli shortly after the scales are formed. This type is demonstrated by Figure 5 and is referred to as an "ocean type." Others spend the first year of their life in the stream and the centers of their scales show very slow growth to the first annulus. These are referred to as "stream type" and an example is offered by Figure 6. There is not always such a clear distinction as in the examples used and many complicating combinations of stream

OCEAN AND STREAM TYPE KING SALMON

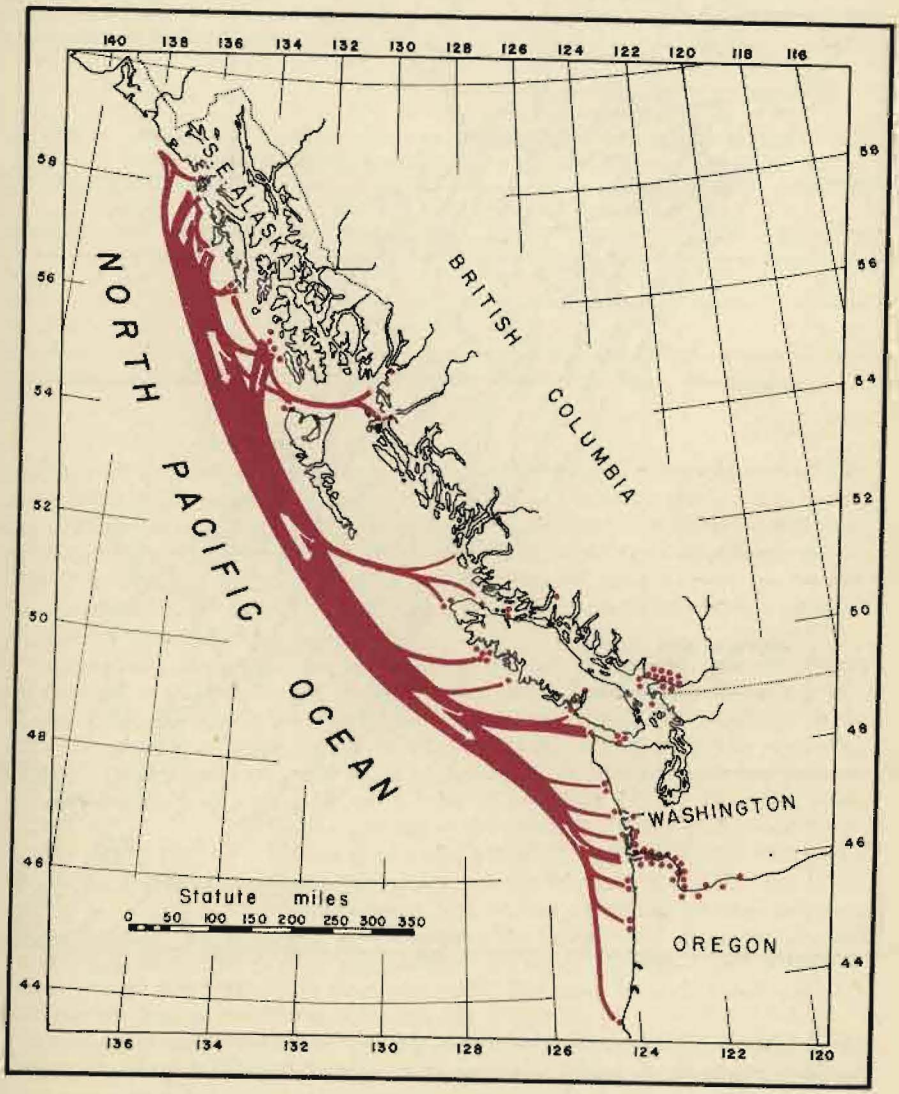


FIGURE 3—Diagrammatic presentation of the predominantly southward movement of king salmon from Southeastern Alaska. Each dot represents one recovery. Thickness of lines is proportional to number of fish in the sample.

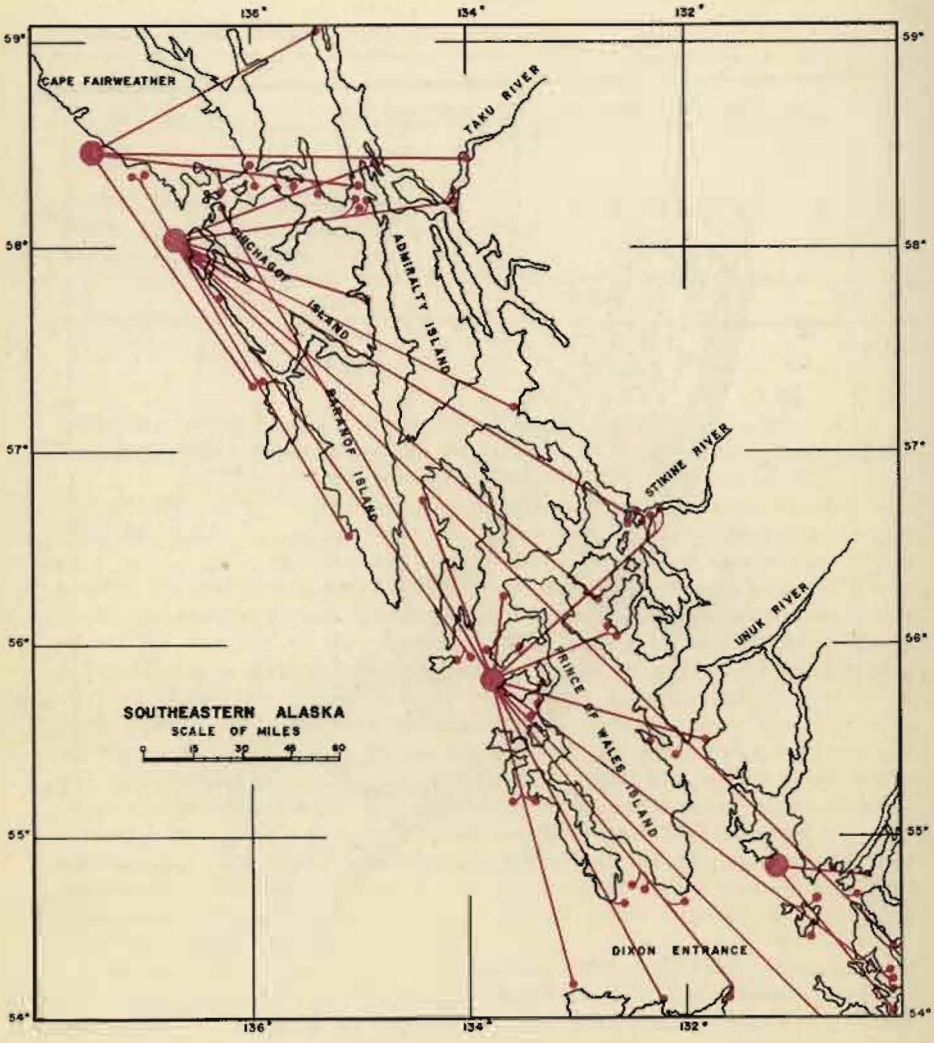


FIGURE 4—Diagrammatic presentation of the random dispersal of silver salmon from the points of tagging to points of recapture. Large dots are areas of tagging. Each small dot represents one recovery.

TABLE 8. — Comparing statistics of movements of king and silver salmon tagged in outside waters of Southeast Alaska in 1950 (data through Dec. 31).

Species	Average Distance Traveled *	Average Time Free in Days	Percentage of Stream Recoveries	Percentage of Alaskan Recoveries
Kings	615	64	65.2	13.5
Silvers	116	36	25.0	80.3

* Distance in nautical miles

TABLE 9 — Percentage recovery by gear of king and silver salmon tagged in outside waters of Southeastern Alaska in 1950. *

Species	Gill Net	Troll	Trap	Purse Seine	Dip Net	Beach Seine	Spawning Ground	Sport	Unknown
King	55	26	3	1	4	1	1	1	6
Silvers	24	33	20	9	0	0	4	1	9

* One king salmon was recovered dead on the beach at Copalis, Washington.

and ocean growth are encountered in actual populations. However for the purposes of expedition, some standards of classification were needed. The criteria of classification which have been used are as follows: Stream type—where the first annulus (winter zone) occurs in fresh water and is preceeded only by typical stream growth, and ocean type where the first annulus occurs in the ocean and is preceeded by some amount of typical fast ocean growth.

The amount of overlapping between age groups in respect to fork length increases with age. As an example, the fish taken from the area between Cape Bingham and Lisianski Strait have been used and the material is graphically presented in Figure 7. By measuring the anterior radius of the scale, (Figure 5), it is possible to approximate the size of the fish at the completion of each annulus and this device has been used to compensate for growth taking place while the sample was being drawn from the area. The polygram presented at the bottom of the figure shows the frequency of sizes occuring in the sample; those labeled 1st, 2nd, etc. demonstrate the frequency of sizes attained at the completion of the corresponding years of growth. This examination shows that only the one year old fish may be separated out of a sample by length measurements alone.

AGE-LENGTH RELATIONSHIP

Average growth rates or yearly increments have been calculated for ocean type kings for all the northern areas combined. The approximate average size at the end of the first year is ten inches. During their second year the kings grow approximately nine inches; during their third, eight inches; during their fourth, seven and one half inches; and during their fifth, six and one half inches. The com-

GROWTH RATES OF KING SALMON

TABLE 10. — Number and percentage of age classes encountered by the fishery in the northern tagging area of Southeastern Alaska.

Area	Number in Sample	2's		3's		4's		5's		6's	
		No.	%	No.	%	No.	%	No.	%	No.	%
Cape Spencer to Cape Fairweather	177	14	8	52	29	104	59	7	4		
Cape Bingham to Cape Edgecumbe	333	4	1	23	7	205	62	94	28	7	2
North Stephens Passage*	561	124	22	289	52	114	20	28	5	5	1

* One 1 year old was present in the northern Stephens Passage Sample.

bined average yearly increment for all age groups is approximately eight inches each year. Average growth rates during the year have also been computed. The annulus was, on the average, completed about the first of May when growth accelerated to about one inch a month for five months or through September when growth processes slowed and the formation of the winter zone or annulus began.

In addition to the tagging and sampling at sea, shore sampling stations were established at Ketchikan, Sitka and Juneau to enlarge the samples for studies of length-weight-age relationship, growth, and for statistics of amounts of fish caught by area and the number of boats concerned.

SHORE SAMPLING

The personnel also collected information on the catch for past years through the media of cold storage's and buyer's records, and from fishermen's log books. The analysis of the bulk of these data is incomplete and will be reported on in future publications. The analysis has progressed sufficiently, however, to enlighten certain differences within the king salmon stocks as encountered by the Southeastern Alaska troller.

TABLE 11. — Calculated average fork lengths of king salmon at the completion of the 1949-50 annulus for areas shown. Ocean type only used.

Area	Annulus			
	First	Second	Third	Fourth
Cape Spencer to Cape Fairweather	11.0	18.9	24.9	
Cape Bingham to Cape Edgecumbe		21.9	27.8	32.8
Northern Stephens Passage	11.4	18.4	27.4	34.2

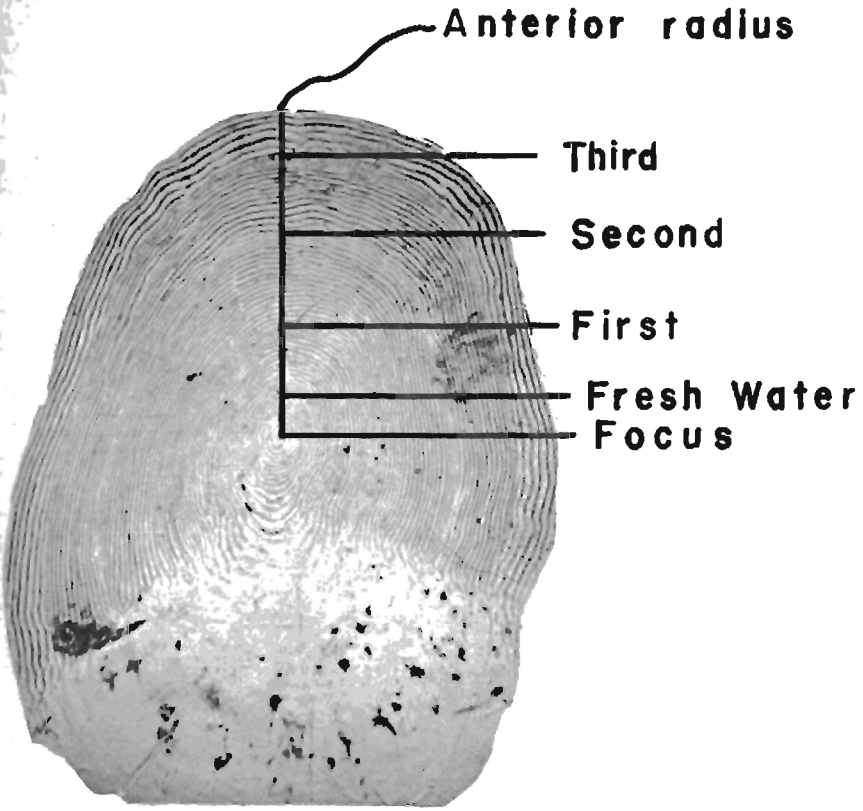


FIGURE 5—Photomicrograph of an ocean type king salmon scale in its 4th year and 25.0 inches fork length. Taken in Stephens Passage on July 12, 1950.

AREAS SEPARATED BY DOMINANT AGE GROUPS

Data concerning the ages of king salmon in the samples from between Cape Edgecumbe and Cape Fairweather and from northern Stephens Passage are presented in Table 10. By examination of the table, it is evident that the three samples differ in respect to dominant age groups available. The stocks available between Cape Bingham and Cape Edgecumbe were characterized by the dominance of fish in their fourth year with the second dominant age group being fish in their fifth year. In the fishery from Cape Spencer to Cape Fairweather, the dominant age group was composed of fish in their fourth year and the second dominant group of fish were in their third year. In northern Stephens Passage fish in their third year were dominant and the second and fourth year groups were equally subdominant. A further difference was discovered

AREAS SEPARATED BY ABUNDANCE OF OCEAN TYPE KINGS

in the relative abundance of ocean type fish occuring in each area. The kings encountered in the fishery from Cape Spencer to Cape Fairweather were approximately 80 percent ocean

FIGURE 6—Photomicrograph of a stream type king salmon scale in its 3rd year and 24.0 inches fork length. Taken outside Chichagof Island on August 31, 1950.

type; the kings from Cape Bingham to Cape Edgecumbe were approximately 90 percent ocean type, and the fish taken in northern Stephens Passage were, for all practical purposes, 100 percent ocean type.

When the average sizes of king salmon, as calculated at the time of completion of the 1949-50 annulus, are compared for each of the three northern areas another difference appears. These data are presented in Table 11. Only the third group (calculated from fish in their fourth year) are comparable for all areas as fish in their third year (group 2) were poorly represented in the sample from Cape Bingham to Cape Edgecumbe (refer to Table 10). In the third group the average sizes from northern Stephens Passage and the area between Cape Bingham and Cape Edgecumbe show no real differences, but in comparing these two with the sample from Cape Spencer to Cape Fairweather a difference in average size of two and one half inches is apparent.

AREAS SEPARATED BY AVERAGE GROWTH RATES

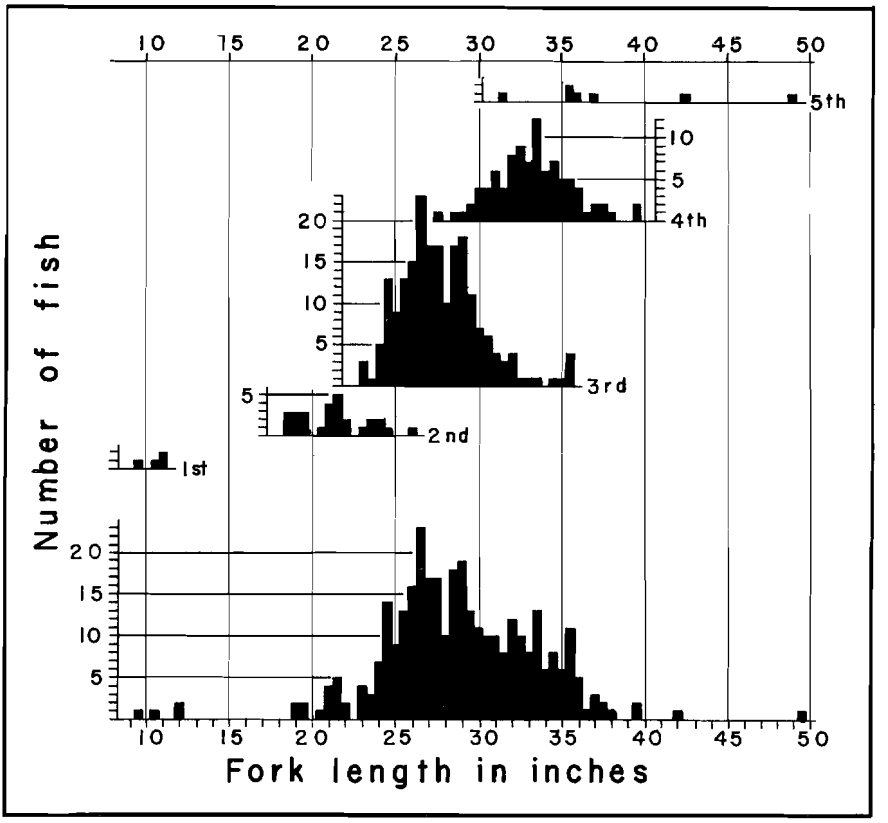


FIGURE 7—Polygrams showing the age-length frequency relationship of king salmon from the area between Cape Bingham and Lisianski Strait.

ESTIMATES OF MATURITY

The majority of the king salmon encountered by the fishery between Cape Bingham and Cape Edgecumbe are probably mature. By using the rate of river recovery for each age group and the percentage composition of ages in the catch, the best estimate is that 70 percent of all the king salmon captured in that area were mature. Scale analysis for the southern areas has not been completed but the fish may be compared by means of size frequencies as tagging took place during the same time of the year. Figure 8 presents this comparison graphically and shows the southern fish to be somewhat larger than the northern stock. The assumption may be that the southern fish were also older and therefor at least as mature as the king salmon taken in the Cape Bingham to Cape Edgecumbe area. It is believed the fish from the Southern area were of the same stock as those from Cape Bingham to Cape Edgecumbe, as the migration patterns were nearly identical as to areas recovered.

It is pertinent at this point to make a few remarks based on the conclusions arrived at through the 1950 research. Southeastern Alaska may conveniently be divided, according to types of kings encountered, into inside and outside waters, and the outside waters divided into two components at Cross Sound. In the outside area south of Cross Sound the

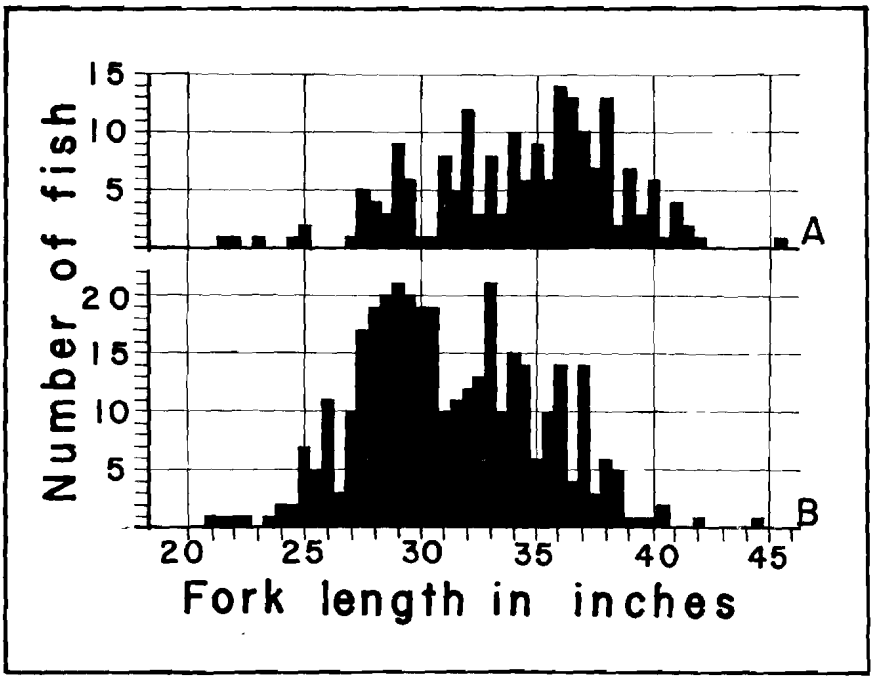


FIGURE 8—Length frequency of king salmon captured in the area Cape Bingham to Lisianski Strait compared with length frequency of king salmon captured in the area Coronation Island to Cape Felix. Figure a represents fish taken from Coronation Island to Cape Felix during May through July. Figure B represents fish taken from Cape Bingham to Lisianski Strait during May through July and September.

king stocks are supplied primarily by non-Alaskan streams and this area in turn supplies the main portion of Southeastern Alaska king salmon production. In the area north of Cross Sound the kings are in some measure produced from non-Alaskan river systems but a conclusive report cannot be made until further research is completed. In the inside waters the king salmon differ from those of outside waters in respect to size and age composition and it is suggested that they are primarily of local origin. Substantiation or disproof of this hypothesis will be forthcoming in 1951.

Since the major portion of the catch is dependent upon production in areas which are developing industrially at an accelerating rate, it seems unwise to be optimistic about the future of the king salmon troll fishery in Southeastern Alaska. The question becomes, what can we do to either replace losses or increase production in the face of an expanding fishery? The answers lie in the potential of the Alaskan streams as king producers and research efforts are now being shifted in this direction.

An initial step of investigating the potential king salmon production of Southeastern Alaska streams was taken in 1950 by securing a shipment of 35,000 eyed king salmon eggs from the State of Washington Depart-

FIGURE 9—Method of planting eyed eggs.

ment of Fisheries. At present, the local stocks of king salmon are almost entirely spring runs and are associated with the larger rivers—such as the Taku and the Stikine. The eggs secured were from a fall spawning stock adapted to relatively short and small streams such as the vast majority of streams in Southeastern Alaska. This initial shipment was planted on December 22, 1950 in two streams in the vicinity of Juneau, chosen to facilitate an accurate check on the developing eggs. Figure 9 shows the methods used in planting. A cylindrical metal tube, 18 inches in diameter, was used by working it into a suitable gravel riffle and removing the gravel from the inside as the tube was forced into the stream bed. A few eggs were placed in a layer at a depth of eighteen inches and covered with a layer of gravel, then successive layers of eggs and gravel were placed until the top layer of eggs was approximately eight inches below the surface of the stream bed. An estimated three thousand eggs were used for each artificial nest.

Plantings will be made on successive years and in other streams with the objective of forming a successful nucleus of fall spawning king salmon to use as a source of future plantings for the area in general. It is along such lines as planting barren waters, opening new areas, and increasing production of presently producing areas that the future of the troll fishery looks the brightest. A great potential production certainly exists for both king and silver salmon in Alaska.

BLACKCOD FISHERY

Work on blackcod (Anoplopoma fimbria) during 1950 was necessarily confined to the accumulation of statistics. Valuable records have been contributed by the International Fisheries Commission and the Fish and Wildlife Service which present a reliable history of the fishery from its inception to date.

The fishery for 1950 failed to materialize to its normal size, as a result of large holdings of frozen fish from previous years and a low prevailing price. However, several hundred blackcod were measured for dressed-to-round conversion factors and otoliths and scales collected for possible age analysis. These data are not yet completed and no presentation is being made.

LIBRARY

The most useful tool of any research organization is an adequate library of literature pertaining to its primary and associated fields of study. In beginning an investigation, a thorough study of past accomplishments lays the foundations for future success. Knowledge of techniques, methods, short cuts, and false approaches are valuable to planning a specific problem and much effort, time and material is saved by avoiding unnecessary duplication. With these thoughts in mind, the personnel of the Alaska Department of Fisheries pooled their personal collections to form a nucleus of a fisheries library. A librarian was employed and has progressed rapidly in the cross indexing and arrangement of the material on hand. The library is steadily growing and at present contains approximately 100 bound volumes and 2700 separates dealing with scientific and general fisheries literature. This material is available for the use of anyone interested in fish or fisheries.

INSPECTION AND STREAM IMPROVEMENT

Lewis MacDonald, Supervisor

In continuance of its cooperative program with the Fish and Wildlife Service, the Alaska Department of Fisheries furnished the federal agency with fourteen men during 1950 to assist in the enforcement of fishery regulations and for stream inspection. This additional personnel was of material help in improving the efficiency of their enforcement division during the active fishing seasons.

Ten stream inspectors, equipped with outboard motor boats, were employed; three in Southeastern Alaska, three in Kodiak, one in Cook Inlet and three in the Copper River-Prince William Sound areas. Wherever available, men were secured who could furnish their own boats, motors and camping equipment. This was not possible in the Kodiak and Cook Inlet areas so the department purchased three complete outfits for use in those two districts. While primarily delegated to watch one river—one with red salmon runs—some of these men were moved to pink salmon streams after the red species had completed its migrations in the original location.

Four fishery inspectors with larger boats were hired. These were located in strategic spots in Southeastern Alaska, where mobile units of this type can be used most effectively for both curtailment of violations as well as for inspection of stream escapement.

Approximately 10,000 miles were flown in an Alaska charter service plane, plus several thousand miles in Fish and Wildlife Service aircraft, during the 1950 fishing season for enforcement and inspection purposes.

FALLS CREEK FISHWAY

In an effort to speed up construction of the important Falls Creek fishway near Petersburg, the department purchased the necessary steel, cement, sand, gravel and other supplies early in 1950. In addition, it carried the payroll for eight men until July 1, when the new appropriation of the Fish and Wildlife Service became available.

This joint venture of the two agencies was planned for completion by the fall of 1950. However, due to severe weather conditions in the spring and several flash floods during the summer, progress was greatly hindered.

There was no pink salmon run in 1950 which might have tested the ladder. By the time the coho salmon appeared the lower ladder was sufficiently along to allow its use by this species. Based on periodic counts, it is estimated that 1,500 to 2,000 coho salmon surmounted the falls. The ladder appeared unusually efficient, with the salmon entering and passing through the structure without difficulty.

A reinforced concrete control dam or weir was constructed across the stream bed at the upper, or inlet end, of the lower ladder. By means of stop logs, the elevation of the pool behind this weir was raised sufficiently so the coho salmon were able to jump the upper falls with a minimum of loss. Completion of the upper ladder in 1951 will allow the salmon to pass this falls without difficulty.

STATISTICS

In presenting a statistical section in this 1950 annual report, the same three tables appearing in the 1949 report are being repeated in an abbreviated form. In each case the figures for the last available year have been added to the preceding nine years, thus making a workable table covering the latest ten-year period. Readers interested in previous years are referred to the 1949 annual report of the department.

An additional series of tables, Numbers IV to XII, have been incorporated to show, by districts, the numbers of each species taken by each kind of gear. Starting with 1945 these statistics are on a yearly basis, while those previous are given in averages for ten-year periods. Numbers of apparatus were not available in the decade 1905-1914. Since numerous requests have been received for this information, it is hoped that this compilation will meet with approval.

In this report, Southeastern Alaska takes in the area from the southern boundary of Alaska north to Yakutat; Central comprises the area west of Yakutat including all south of the Alaska Peninsula; Western includes the northern shore of the Peninsula, Bristol Bay, Kuskokwim and Yukon Rivers.

The following statistics were compiled from records of the Treasury Department, Department of Commerce and Labor, Bureau of Fisheries, Fish and Wildlife Service, Pacific Fisherman and other sources. Use of this material is hereby gratefully acknowledged.

TABLE I — Number of Operating Salmon Canneries and Total Pack in cases (48 one-pound cans) by Districts for All Alaska — 1941-1950 Inclusive.

Year	Pack Southeast	No. Can.	Pack Central	No. Can.	Pack Western	No. Can.	Pack Total	No.Can Total
1941	4,294,333	47	1,958,959	42	678,748	20	6,932,040	109
1942	2,648,707	48	1,954,154	44	473,005	8	5,075,866	100
1943	1,892,868	34	2,167,306	35	1,368,095	14	5,428,269	83
1944	1,972,552	36	1,877,381	43	1,043,126	15	4,893,059	93
1945	1,549,543	41	2,091,739	44	713,287	11	4,354,569	96
1946	1,476,326	45	1,772,318	51	711,966	20	3,960,610	116
1947	1,056,878	32	1,786,629	43	1,414,895	15	4,260,394	90
1948	1,277,773	34	1,316,494	53	1,374,254	17	3,968,521	104
1949	2,493,709	37	1,281,212	51	588,550	29	4,363,471	107
1950	1,190,174	39	1,439,029	54	643,889	15	3,273,092	108

TABLE II

Comparative Value by Species, 1941-1950 Inclusive

In this table the initial average price per case is given by year, according to species. During each season, prices fluctuated according to supply and demand, therefore values quoted must be regarded as approximate.

TABLE II — Comparative Values of Canned Salmon Giving Initial Price Per Case and Approximate Total Value Per Species; and Total Calue for All Species. 1949-1950

Year	Coho	Chum	Pink	King	Red	Total Value
1941	8.92	6.36	6.76	12.00	12.48	
	3,446,378	4,727,670	32,100,536	511,375	15,431,642	56,217,601
1942	11.48	7.56	7.94	15.18	15.33	
	4,162,571	7,123,196	22,358,651	682.432	13,972,063	48,298,913
1943	11.94	7.54	7.90	15.44	15.04	
	2,006,841	6,878,028	18,225,882	844,440	29,868,438	57,823,629
1944	12.05	7.37	8.00	15.75	15.23	
	2,258,738	7,525,672	16,749,448	583,009	24,079,273	51,196,140
1945	12.12	7.68	8.04	16.70	15.51	
	2,457,242	5,312,270	18,007,700	720,196	18,260,272	44,757,680
1946	17.30	10.53	10.67	21.25	19.55	
	3,250,249	6,421,647	21,895,235	805,199	20,784,864	53,157,194
1947	18.24	17.95	18.72	21.08	24.19	
	2,689,888	8,229,464	32,210,755	1,112,539	35,739,285	79,981,931
1948	25.96	21.10	24.24	26.70	27.51	
	5,732,253	15,082,926	31,445,485	1,435,578	44,964,049	98,660,291
1949	22.00	15.00	16.00	24.00	26.05	
	3,781,482	7,498,382	44,147,496	1,402,934	25,581,995	82,412,289
1950	22.00	21.10	24.00	23.00	29.00	
	5,556,430	15,539,056	26,753,868	1,590,996	34,811,975	84,252,325
			Total Value All Species, 1905-1950			$1,658,017,714

TABLE III

Table III, covering the years 1939 to 1948 inclusive, shows the poundage and values of 25 fishery products taken in Alaskan waters. Salmon has been the backbone of the Alaska fishing industry but other products, such as fish livers and viscera, reflect changing demand and values.

FISHERY PRODUCT —		1939	1940	1941	1942
Salmon	Lbs.	452,166,000	439,182,000	560,000,000	430,867,000
	Val.	$36,291,929	$33,017,823	$58,738,363	$50,793,594
Trout	Lbs.	55,337	36,531	2,822	44,175
	Val.	$ 4,604	$ 3,517	$ 311	$ 6,676
Herring	Lbs.	185,462,000	94,158,000	154,316,250	43,833,350
	Val.	$ 2,090,473	$ 1,258,071	$ 2,476,998	$ 901,454
Halibut*	Lbs.	6,994,639	9,516,622	8,998,580	8,444,189
	Val.	$ 412,963	$ 758,882	$ 788,688	$ 1,044,971
Livers	Lbs.	109,800	145,000	124,715	101,053
	Val.	$ 54,900	$ 72,500	$ 44,159	$ 81,506
Viscera	Lbs.	1,116	48,048	134,463	160,019
	Val.	$ 78	$ 4,928	$ 14,694	$ 31,337
Cod	Lbs.	401,711	187,375	99,666	24,075
	Val.	$ 17,291	$ 8,459	$ 7,846	$ 3,371
Ling Cod	Lbs.	337	6,900	165,845	4,147
	Val.	$	$ 139	$ 8,634	$ 104
Livers	Lbs.	753	627	383	268
	Val.	$ 301	$ 251	$ 212	$ 268
Sablefish (Black Cod)	Lbs.	1,675,838	1,969,939	2,967,245	3,969,316
	Val.	$ 63,476	$ 54,414	$ 132,810	$ 330,249
Livers	Lbs.	73,033	45,842	69,149	91,123
	Val.	$ 31,142	$ 16,598	$ 23,840	$ 96,604
Viscera	Lbs.	13,870	57,723	51,220	169,386
	Val.	$ 971	$ 3,198	$ 5,607	$ 30,468
Rockfish	Lbs.	69,813	90,294	295,719	154,770
	Val.	$ 7,520	$ 6,269	$ 12,740	$ 8,962
Livers	Lbs.			1,096	583
	Val.			$ 311	$ 431
Flounder	Lbs.	30,323	51,396	44,200	40,892
	Val.	$ 4,440	$ 2,556	$ 7,628	$ 3,992
Shark Livers	Lbs.		1,742		590
Liver Oil Below)	Val.		$ 87		48
Skate Livers	Lbs.				
	Val.				
Misc. Fish Livers	Lbs.			72,346	218,018
	Val.			$ 17,172	$ 42,433
Misc. Fish Viscera	Lbs.				19,425
	Val.				$ 3,456
Misc. Liver Oil	Lbs.				
	Val.				
Whale	Lbs.	6,012,000			
	Val.	$ 136,941			
Shellfish —					
Crab	Lbs.	305,498	316,905	288,800	195,748
	Val.	$ 94,579	$ 88,533	$ 103,924	$ 149,582
Shrimp	Lbs.	438,193	507,333	443,278	303,356
	Val.	$ 165,482	$ 186,441	$ 164,097	$ 153,789
Clams	Lbs.	425,205	498,798	272,829	590,121
	Val.	$ 240,511	$ 273,436	$ 132,599	$ 426,273
Oysters	Lbs.	455	893	714	
	Val.	$ 166	$ 328	$ 289	
TOTAL	Lbs.	654,235,951	546,821,768	755,292,709	589,231,604
TOTAL	Val.	$39,617,770	$35,756,430	$62,680,922	$54,109,568

* Includes fish landed in Canadian ports by Alaska halibut fleet.

† Halibut liver oil, 1942 — 1,245 lbs., value $6,640.

‡ All sablefish viscera oil.

The largest take in pounds of all fish during this 10-year span was in 1941—but the total value was greatest in 1948, mirroring inflation trends.

TABLE III

Summary of Alaska Fishery Products by Approximate Poundage and Values, 1939-1948 Inclusive

1943	1944	1945	1946	1947	1948
457,306,800	393,318,474	402,633,233	391,689,076	381,807,676	210,608,877
$60,363,015	$53,875,717	$48,917,341	$59,090,973	$93,143,961	$101,193,919
21,089	38,588	45,382	41,504	12,587	49,351
$ 2,859	$ 5,919	$ 7,385	$ 8,558	$ 2,435	$ 15,892
32,404,362	39,628,462	47,444,544	63,883,821	63,249,923	58,388,893
$ 1,829,491	$ 2,458,170	$ 2,973,500	$ 6,573,416	$ 6,533,778	$ 5,694,889
13,666,500	22,208,230	20,544,885	21,985,095	21,293,309	27,566,134
$ 2,277,975	$ 3,122,568	$ 2,869,808	$ 3,598,808	$ 4,316,087	$ 6,615,876
290,933	427,485	329,278	362,850	416,893*	408,479
$ 343,437	$ 271,984	$ 390,960	$ 509,481	$ 587,484	$ 892,537
160,290	846,640	1,122,016	743,640	796,439*	818,141
$ 28,020	$ 117,423	$ 265,007	$ 188,739	$ 244,918	$ 791,853
12,003	510,000	543,680	921,114	819,822	786,931
$ 1,443	$ 56,000	$ 80,255	$ 152,660	$ 163,498	$ 85,389
31,434	172,199	243,440	311,617	40,056	65,837
$ 1,921	$ 12,998	$ 17,415	$ 20,659	$ 17,568	$ 9,823
468	2,931	5,573	4,814	8,190	3,319
$ 1,303	$ 6,444	$ 11,163	$ 9,823	$ 16,621	$ 7,736
4,084,545	5,164,254	5,839,950	6,306,172	934,435*	4,943,507
$ 485,378	$ 572,694	$ 636,613	$ 744,510	$ 143,250*	$ 968,100
142,323	147,557	155,070	190,916	32,358	149,055
$ 168,266	$ 242,719	$ 263,941	$ 324,688	$ 55,463	$ 324,719
153,121	289,671	256,184	344,895	43,443*	240,119
$ 27,370	$ 73,386	$ 63,798	$ 83,827	$ 13,771	$ 106,994
188,663	666,879	997,743	779,600	27,937	50,389
$ 16,669	$ 54,549	$ 77,590	$ 59,678	$ 1,759	$ 3,122
518	4,314	6,182	1,452	817	658
$ 515	$ 3,130	$ 4,475	$ 1,080	$ 449	$ 658
33,636	32,317	85	60	180	124,237
$ 4,105	$ 2,217	$ 17	$ 24	$ 72	$ 11,170
342,174	542,245	124,260	136,500	153,695	167,232
$ 26,757	$ 150,481	$ 26,133	$ 31,834	$ 58,412	$ 80,930
	4,561	7,607	11,816	10,581	10,615
	$ 411	$ 839	$ 1,266	$ 1,160	$ 1,086
19,091	19,841		28,857	138,819	1,237
$ 9,546	$ 2,335		$ 5,287	$ 36,283	$ 124
361,839	8,903		13,981	60,373	17,704
$ 43,695	$ 2,145		$ 3,996	$ 21,130	$ 133,906
	19,807	28,553‡	31,867	992	1,172
	$ 96,778	$ 275,577	$ 63,734	$ 9,363	$ 131,808
194,078	316,416	480,749	590,701	541,016	875,079
$ 156,392	$ 252,206	$ 352,222	$ 649,080	$ 495,465	$ 977,810
114,120	140,620	214,806	346,811	350,375	493,271
$ 57,256	$ 118,439	$ 177,400	$ 323,372	$ 326,467	$ 523,750
795,900	947,210	926,899	945,857	622,412	442,003
$ 503,756	$ 576,607	$ 543,865	$ 928,424	$ 250,939	$ 502,053
4,617	4,248	3,780	3,159	2,691	$ 1,026
$ 2,054	$ 1,888	$ 1,680	$ 2,106	$ 1,796	$ 684
510,378,504	465,451,852	481,965,899	389,676,175	471,365,019	306,213,266
$66,421,221	$62,077,208	$57,956,784	$73,376,023	$106,441,769	$119,074,818

Above Totals Do Not Include These—

Shark liver oil — 1945 .....118,447 lbs., value $53,150
1946 .....128,722 lbs., value 45,056
1947 ..... 59,723 lbs., value 35,384

Abalone — 1940 ..... 40 lbs., value 11

Smelt — 1937 ..... 275 lbs. $ 8
1940 ..... 300 lbs. 30
1945 ...17,851 lbs. 2,162

TABLE IV — Number of salmon taken from 1905 to 1914 by 10-year average by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: % of catch	56%	47%	3%	
Coho or silver	283,399	45,664		329,063
Chum or Keta	1,777,484	29,530	483	1,807,497
Pink or humpback	7,850,442	706,923	246	8,557,611
King or spring	1,499	3,063	981	5,543
Red or sockeye	1,290,111	2,513,599	191,541	3,995,251
Total	11,202,935	3,298,779	193,251	14,694,965
GILLNETS: % of catch	3%	8%	74%	
Coho or silver	111,623	18,943	122,921	253,487
Chum or Keta	56,077	662	504,680	561,419
Pink or Humpback	50,026	7,489	225,626	283,141
King or spring	71,252	20,308	108,811	200,371
Red or sockeye	399,040	484,106	2,681,512	3,564,658
Total	688,018	531,508	3,643,550	4,863,076
TRAPS: % of catch	40%	45%	23%	
Coho or silver	243,640	121,809	13,285	378,734
Chum or Keta	728,904	61,150	146,486	936,540
Pink or humpback	5,877,069	523,282	274,111	6,674,462
King or spring	15,748	30,646	4,951	51,345
Red or sockeye	924,554	2,347,287	661,023	3,932,864
Total	7,789,915	3,084,174	1,099,856	11,973,945
LINES: % of catch	1%			
Coho or silver	15,462			15,462
Chum or Keta				
Pink or humpback				
King or spring	160,447			160,447
Red or sockeye				
Total	175,909			175,909
WHEELS: % of catch				
TOTALS				
Coho or silver	654,124	186,416	136,206	976,746
Chum or Keta	2,562,465	91,342	651,649	3,305,456
Pink or humpback	13,777,537	1,237,694	499,983	15,515,214
King or spring	248,946	54,017	114,743	417,706
Red or sockeye	2,613,705	5,344,992	3,534,076	11,492,773
Grand Total	19,856,777	6,914,461	4,936,657	31,707,895

TABLE V — Number of salmon taken from 1915 to 1924 by 10-year average by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	358	112	19	
% of catch	38%	35.9%	5%	
Coho or silver	309,596	78,414	1,584	389,594
Chum or Keta	3,507,281	477,371	48,098	4,032,750
Pink or humpback	9,955,911	3,219,060	102,668	13,277,639
King or spring	9,542	1,671	7,304	18,517
Red or sockeye	853,125	1,964,687	777,783	3,595,595
Total	14,635,455	5,741,203	937,437	21,314,095
GILLNETS: No. of	279	859	2,247	
% of catch	2.5%	11%	89.1%	
Coho or silver	21,431	135,480	114,938	271,849
Chum or Keta	107,576	65,876	576,544	749,996
Pink or humpback	117,453	141,119	174,326	432,898
King or spring	48,306	32,853	132,426	213,585
Red or sockeye	420,035	1,134,414	10,614,050	12,168,499
Total	714,801	1,509,742	11,612,284	13,836,827
TRAPS: Number of	282	112	12	
% of catch	57.5%	53.1%	4.3%	
Coho or silver	643,235	268,425	6,437	918,097
Chum or keta	2,063,347	193,084	110,244	2,966,675
Pink or humpback	20,743,324	3,031,254	130,431	23,905,009
King or spring	30,408	34,644	14,145	79,197
Red or sockeye	1,256,847	3,870,540	573,141	5,700,528
Total	24,737,161	7,397,947	834,398	33,569,506
LINES: % of catch	2%			
Coho or silver	183,323			183,323
Chum or keta	9,422			9,422
Pink or humpback	11,970			11,970
King or spring	419,856			419,856
Red or sockeye	8,346			8,346
Total	632,917			632,917
WHEELS: % of catch			1.6%	
Coho or silver			203,082	203,082
Chum or Keta				
Pink or humpback				
King or spring			8,671	8,671
Red or sockeye				
Total			211,753	211,753
TOTAL:				
Coho or silver	1,157,585	482,319	326,041	1,965,945
Chum or Keta	5,687,626	1,336,331	734,886	7,758,843
Pink or humpback	30,828,658	6,391,433	407,425	37,621,516
King or spring	508,112	69,168	162,546	739,826
Red or sockeye	2,538,353	6,969,641	11,964,974	21,472,968
Grand Total	40,720,334	15,248,892	13,595,872	69,559,098

TABLE VI — Number of salmon taken from 1925 to 1934 by 10-year average, by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	366	207	10	
% of catch	24.9%	30.4%	4.4%	
Coho or silver	147,000	91,383	54	239,037
Chum or Keta	2,103,735	1,052,945	49,042	3,205,722
Pink or humpback	7,144,650	5,584,465	104,314	12,833,429
King or spring	1,080	2,305	6,427	9,812
Red or sockeye	349,075	886,220	573,752	1,809,047
Total	9,746,140	7,617,318	733,589	18,097,047
GILLNETS: No. of	254	1,364	1,985	
% of catch	2.1%	7.3%	91.6%	
Coho or silver	203,937	328,782	14,325	547,044
Chum or Keta	46,136	55,957	880,255	982,348
Pink or humpback	126,417	255,004	80,115	461,536
King or spring	25,807	59,289	98,384	183,480
Red or sockeye	301,907	1,126,034	10,510,829	11,938,770
Total	704,204	1,825,066	11,583,908	14,113,178
TRAPS: Number of	388	189	2	
% of catch	69.9%	62.3%	.7%	
Coho or silver	639,468	592,465		1,231,933
Chum or Keta	2,063,343	1,756,096	14,469	3,833,908
Pink or humpback	20,221,612	9,262,664		29,484,276
King or spring	11,114	56,091	2,327	69,532
Red or sockeye	1,035,095	4,001,059	86,078	5,122,232
Total	23,970,632	15,668,375	102,874	39,741,881
LINES: % of catch	3.1%			
Coho or silver	504,554			504,554
Chum or Keta	2,031			2,031
Pink or humpback	2,460			2,460
King or spring	454,289			454,289
Red or sockeye	422			422
Total	963,756			963,756
WHEELS: % of catch			3.3%	
Coho or silver			15,720	15,720
Chum or Keta			444,065	444,065
Pink or humpback				
King or spring			24,986	24,986
Red or sockeye			4,436	4,436
Total			489,207	489,207
TOTAL:				
Coho or silver	1,495,559	1,012,630	30,099	2,538,288
Chum or Keta	4,215,245	2,864,998	1,387,831	8,468,074
Pink or humpback	27,495,139	15,102,133	184,429	42,781,701
King or spring	492,290	117,685	132,124	742,099
Red or sockeye	1,686,499	6,013,313	11,175,095	18,874,907
Grand Total	35,384,732	25,110,759	12,909,578	73,405,069

TABLE VII — Number of salmon taken for 10-year average from 1935 to 1944 by apparatus and species in each geographic section of Alaska.

Apparatus and species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	488	380	4	
% of catch	32.6%	38.8%	4.1%	
Coho or silver	203,777	90,625	44	294,446
Chum or Keta	2,886,036	1,414,741	50,463	4,351,240
Pink or humpback	10,278,699	10,936,490	1,210	21,216,399
King or spring	7,750	1,472	1,306	10,528
Red or sockeye	481,447	1,103,241	465,982	2,050,670
Total	13,857,709	13,546,569	519,005	27,923,283
GILLNETS: No. of	335	1,582	1,913	
% of catch	2.3%	9.4%	92.1%	
Coho or silver	223,888	393,222	35,610	652,720
Chum or Keta	56,497	200,750	603,856	861,103
Pink or humpback	225,641	619,782	113,482	958,905
King or spring	12,065	71,097	89,021	172,183
Red or sockeye	388,808	1,970,187	10,337,384	12,696,379
Total	906,899	3,255,038	11,179,353	15,341,290
TRAPS: Number of	275	156	0	
% of catch	61.8%	51.8%		
Coho or silver	636,274	457,279		1,093,553
Chum or Keta	2,340,704	1,497,631		3,838,335
Pink or humpback	19,115,655	2,927,990		22,043,645
King or spring	4,774	37,541		42,315
Red or sockeye	1,063,718	3,546,472		4,610,190
Total	23,161,125	8,466,913		31,628,038
LINES: % of catch	3.3%			
Coho or silver	718,441	250		718,691
Chum or keta	9,867			9,867
Pink or humpback	16,545			16,545
King or spring	569,202			569,202
Red or sockeye	2,558			2,558
Total	1,316,613	250		1,316,863
WHEELS: % of catch			3.8%	
Coho or silver			9,715	9,715
Chum or Keta			368,942	368,942
Pink or humpback			2,310	2,310
King or spring			12,909	12,909
Red or sockeye			1,821	1,821
Total			395,697	395,697
TOTAL:				
Coho or silver	1,782,380	941,376	45,369	2,769,125
Chum or Keta	5,293,104	3,113,122	1,023,261	9,429,487
Pink or humpback	29,636,540	14,484,262	117,002	44,237,804
King or spring	593,791	110,110	103,236	807,137
Red or sockeye	1,936,531	6,619,900	10,805,187	19,361,618
Grand Total	39,242,346	25,268,770	12,094,055	76,605,171

TABLE VIII — Number of salmon taken in 1945 by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	349	306	2	
% of catch	36%	43%	8%	
Coho or silver	223,182	77,839	1,125	302,146
Chum or Keta	1,826,813	2,117,546	332,331	4,276,690
Pink or humpback	8,262,205	13,682,799	3,120	21,948,124
King or spring	24,028	1,260	86	25,374
Red or sockeye	466,045	1,220,086	362,709	2,048,840
Total	10,802,273	17,099,530	699,371	28,601,174
GILLNETS: No. of	356	1,277	589	
% of catch	3%	8%	92%	
Coho or silver	259,841	545,765	28,837	834,443
Chum or Keta	39,280	142,518	664,188	845,986
Pink or humpback	49,250	303,987	83	353,320
King or spring	27,542	66,802	49,602	143,946
Red or sockeye	422,239	2,135,146	7,276,296	9,833,681
Total	798,152	3,194,218	8,019,006	12,011,376
TRAPS: Number of	265	145	0	
% of catch	55%	49%		
Coho or silver	666,656	341,868		1,008,524
Chum or Keta	1,446,599	1,646,054		3,092,653
Pink or humpback	13,271,928	14,813,585		28,085,513
King or spring	3,252	52,342		55,574
Red or sockeye	794,741	2,418,408		3,213,149
Total	16,183,156	19,272,257		35,455,413
LINES: % of catch	6%			
Coho or silver	1,437,936	5,196		1,443,132
Chum or Keta	5,789			5,789
Pink or humpback	71,133			71,133
King or spring	383,312			383,312
Red or sockeye	264			264
Total	1,898,434	5,196		1,903,630
TOTAL:				
Coho or silver	2,587,615	970,668	29,962	3,588,245
Chum or Keta	3,318,481	3,906,118	996,519	8,221,118
Pink or humpback	21,654,516	28,800,371	3,203	50,458,090
King or spring	438,114	120,404	49,688	608,206
Red or sockeye	1,683,289	5,773,640	7,639,005	15,095,934
Grand total	29,682,015	39,571,201	8,718,377	77,971,593

TABLE IX — Number of salmon taken in 1946 by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	432	447	10	
% of catch	31%	50%	7%	
Coho or silver	195,979	73,623	275	269,877
Chum or Keta	2,506,001	1,914,475	73,307	4,493,783
Pink or humpback	7,150,285	13,678,137	28	20,828,450
King or spring	22,192	1,857	2,330	26,379
Red or sockeye	330,359	929,766	603,796	1,863,921
Total	10,204,816	16,597,858	679,736	27,482,410
GILLNETS: No. of	336	1,375	1,227	
% of catch	1%	9%	93%	
Coho or silver	192,983	660,541	75,585	929,109
Chum or Keta	46,128	82,345	379,708	508,181
Pink or humpback	37,171	632,279	72,218	741,668
King or spring	18,125	64,523	71,326	153,974
Red or sockeye	143,800	1,514,573	8,378,192	10,036,565
Total	438,207	2,954,261	8,977,029	12,369,497
TRAPS: Number of	273	147	0	
% of catch	62%	41%		
Coho or silver	720,373	600,495		1,320,868
Chum or Keta	1,446,297	1,084,289		2,530,586
Pink or humpback	17,594,999	9,708,378		27,303,377
King or spring	1,733	31,379		33,112
Red or sockeye	414,082	2,159,906		2,573,988
Total	20,177,484	13,584,447		33,761,931
LINES: % of catch	6%			
Coho or silver	1,257,513	4,629		1,262,142
Chum or Keta	11,811			11,811
Pink or humpback	39,355			39,355
King or spring	526,438			526,438
Red or sockeye				
Total	1,835,117	4,629		1,839,746
TOTAL:				
Coho or silver	2,366,848	1,339,288	75,860	3,781,996
Chum or Keta	4,010,237	3,081,109	453,015	7,544,361
Pink or humpback	24,821,810	24,018,794	72,246	48,912,850
King or spring	568,488	97,759	73,656	739,903
Red or sockeye	888,241	4,604,245	8,981,988	14,474,474
Grand Total	32,655,624	33,141,195	9,656,765	75,453,584

TABLE X — Number of salmon taken in 1947 by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	476	338	8	
% of catch	31%	52%	2%	
Coho or silver	139,725	88,707	95	228,527
Chum or Keta	1,623,036	1,774,060	79,592	3,476,688
Pink or humpback	4,346,379	12,019,726		16,366,105
King or spring	5,264	1,226	144	6,634
Red or sockeye	229,658	1,975,530	334,162	2,539,250
Total	6,344,062	15,859,249	413,993	22,617,304
GILLNETS: No. of	417	1,362	1,349	
% of catch	3%	8%	98%	
Coho or silver	147,934	403,441	42,723	594,098
Chum or Keta	56,460	105,191	298,304	459,955
Pink or humpback	79,398	268,212	36	347,646
King or spring	14,744	92,807	92,873	200,424
Red or sockeye	217,943	1,559,899	18,680,251	20,458,093
Total	516,479	2,429,550	19,114,187	22,060,216
TRAPS: Number of	267	155	0	
% of catch	59%	40%		
Coho or silver	416,645	350,814		767,459
Chum or Keta	1,639,476	727,897		2,367,373
Pink or humpback	9,534,317	8,570,382		18,104,699
King or spring	1,136	34,664		35,800
Red or sockeye	298,237	2,554,266		2,852,503
Total	11,889,811	12,238,023		24,127,834
LINES: % of catch	7%			
Coho or silver	841,775	10,065		851,840
Chum or Keta	41,331			41,331
Pink or humpback	81,469			81,469
King or spring	474,954			474,954
Red or sockeye	332			332
Total	1,439,861	10,065		1,449,926
TOTAL:				
Coho or silver	1,546,079	853,027	42,818	2,441,924
Chum or Keta	3,360,303	2,607,148	377,896	6,345,347
Pink or humpback	14,041,563	20,858,320	36	34,899,919
King or spring	496,098	128,697	93,017	717,812
Red or sockeye	746,170	6,089,695	19,014,413	25,850,278
Grand Total	20,190,213	30,536,887	19,528,180	70,255,280

TABLE XI — Number of salmon taken in 1948 by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	486	372	14	
% of catch	30%	53%	4%	
Coho or silver	122,947	60,187	5,320	188,454
Chum or Keta	1,905,270	2,321,224	214,812	4,441,306
Pink or humpback	4,335,522	8,574,109	1,514	12,911,145
King or spring	227	2,064	2,057	4,348
Red or sockeye	112,855	1,040,991	468,747	1,622,593
Total	6,476,821	11,998,575	692,450	19,167,846
GILLNETS: No. of	663	2,815	1,602	
% of catch	3%	13%	96%	
Coho or silver	218,669	472,992	53,131	744,792
Chum or Keta	52,270	227,888	663,556	943,714
Pink or humpback	140,903	536,747	54,477	732,127
King or spring	20,514	77,977	78,496	176,987
Red or sockeye	207,110	1,679,637	14,346,864	16,233,611
Total	639,466	2,995,241	15,196,524	18,831,231
TRAPS: Number of	242	157	0	
% of catch	58%	34%		
Coho or silver	530,689	245,863		776,552
Chum or Keta	1,984,663	896,234		2,880,897
Pink or humpback	9,721,418	4,832,518		14,553,936
King or spring	271	37,250		37,521
Red or sockeye	203,809	1,593,282		1,797,091
Total	12,440,850	7,605,147		20,045,997
LINES: % of catch	9%			
Coho or silver	1,273,548	364		1,273,912
Chum or Keta	62,296			62,296
Pink or humpback	154,605	62		154,667
King or spring	459,084			459,084
Red or sockeye	751			751
Total	1,950,284	426		1,950,710
TOTAL:				
Coho or silver	2,145,853	779,406	58,451	2,983,710
Chum or Keta	4,004,499	3,445,346	878,368	8,328,213
Pink or humpback	14,352,448	13,943,436	55,991	28,351,875
King or spring	480,096	117,291	80,553	677,940
Red or sockeye	524,525	4,313,910	14,815,611	19,654,046
Grand Total	21,507,421	22,599,389	15,888,974	59,995,784

TABLE XII — Number of salmon taken in 1949 by apparatus and species in each geographic section of Alaska.

Apparatus and Species	Southeast Alaska	Central Alaska	Western Alaska	Totals
SEINES: Number of	244	445	9	
% of catch	34%	51%	2%	
Coho or silver	140,711	93,004	1,443	235,158
Chum or Keta	1,205,736	1,685,863	61,690	2,953,289
Pink or humpback	15,493,830	8,057,160	17	23,551,007
King or spring	492	3,382	198	4,072
Red or sockeye	74,277	1,058,010	87,114	1,219,401
Total	16,915,046	10,897,419	150,462	27,962,927
GILLNETS: No. of	399	3,106	1,419	
% of catch	1%	14%	98%	
Coho or silver	90,942	397,942	51,781	540,665
Chum or Keta	35,745	238,961	353,631	628,337
Pink or humpback	82,725	334,875	33	417,633
King or spring	7,399	93,225	94,426	195,050
Red or sockeye	266,925	2,023,280	6,429,886	8,720,091
Total	483,736	3,088,283	6,929,757	10,501,776
TRAPS: Number of	262	154	0	
% of catch	61%	35%		
Coho or silver	569,543	248,936		818,479
Chum or Keta	1,572,045	607,261		2,179,306
Pink or humpback	28,207,473	4,924,640		33,132,113
King or spring	13	32,491		32,504
Red or sockeye	146,705	1,733,393		1,880,098
Total	30,495,779	7,546,721		38,042,500
LINES: % of catch	4%			
Coho or silver	1,478,694			1,478,694
Chum or Keta	80,818			80,818
Pink or humpback	136,648			136,648
King or spring	472,159			472,159
Red or sockeye	1,892			1,892
Total	2,170,211			2,170,211
TOTAL:				
Coho or silver	2,279,890	739,882	53,224	3,072,996
Chum or Keta	2,894,344	2,532,085	415,321	5,841,750
Pink or humpback	43,920,676	13,316,675	50	57,237,401
King or spring	480,063	129,098	94,624	703,785
Red or sockeye	489,799	4,814,683	6,517,000	11,821,482
Grand Total	50,064,772	21,532,423	7,080,219	78,677,414

CHRONOLOGICAL HISTORY OF SALMON CANNERIES IN WESTERN ALASKA

Compiled by Lewis MacDonald from records of the Bureau of Fisheries, Fish & Wildlife Service and other sources.

Since readers of our 1949 Annual Report showed much interest in the history of salmon canneries in Southeastern Alaska, it seemed advisable to continue the series in this report.

The history of Western Alaska also shows a high mortality among the canneries built since 1884 when the Arctic Packing Company located the first plant on the Nushagak River. During the period covered by this history 51 canneries were built; 36 were burned, abandoned or moved to other sites; and from time to time numerous operations have been consolidated. 15 plants operated in Western Alaska in 1950.

1884

The Arctic Packing Co. erected a cannery near the Moravian Mission, Nushagak River, which was the start of the salmon canning industry in the Bering Sea. This company became a member of the Alaska Packers in 1901 and consolidated with the Nushagak Canning Co. at Clark Point. A double cannery was erected in 1901 at Clark Point and packs were no longer made at the old cannery.

1885

The Alaska Packing Co. erected a cannery on the Western side of Nushagak Bay, 1 1/2 miles below the junction of the Wood and Nushagak Rivers. Became a member of the Alaska Packers Association in 1893 and operated to 1930. In 1945, the Bristol Bay Packing Co. purchased the cannery, did extensive work and installed new machinery; presently operating.

1886

The Bristol Bay Canning Co. built on the Western shore of Nushagak Bay at a place called Dillingham, about two miles below the cannery of the Alaska Packing Co. This cannery became a member of the Alaska Packers Association in 1893 and packed until the plant closed in 1907; did not reopen and was dismantled several years later.

1888

The Nushagak Canning Co. built a cannery on the Eastern shore of Nushagak Bay at Clark Point. This cannery was not operated from 1891 until 1901 but became a member of the Alaska Packers in 1893. In 1901 a double cannery was erected here and put into operation; still operating.

1889

The Western Alaska Packing Co. built a cannery at Ozernoy on the western side of Stepovak Bay. Packs were made in 1889 and 1890 but fish were so scarce that the cannery was dismantled in 1891 and the site abandoned.

The Thin Point Packing Co. was organized by Louis Sloss & Co. of

San Francisco and operated at Thin Point, near the extreme western end of the Alaska Peninsula, until 1891. In 1893 the plant became a member of the Alaska Packers Association and was moved during 1894 to Naknek River to become part of the Arctic Packing Co.

In 1890 the cannery ship "Oneida" struck on the Sanaks while enroute for the cannery and lost nearly all of the 77 Chinese on board.

1890

The Central Alaska Co. moved its cannery from Kayak Island, near Katalla in Central Alaska, to Thin Point on the Alaska Peninsula. Operated in 1890, 1891 and 1892, then became a member of the Alaska Packers Association but was no longer operated. In 1895 the available machinery was moved to Koggiung on the Kvichak River.

The Bering Sea Packing Co. built the first cannery on the Ugashik River, about 23 miles above Smoky Point. A pack was made in 1891, then closed as the site proved unsuitable. Plant was moved in 1893 to about 15 miles above Smoky Point and operated through 1896. Cannery then sold to Alaska Packers Association; equipment moved to one of their own canneries and site abandoned.

1894

The Naknek Packing Co. purchased the saltery station of L. A. Peterson and erected a cannery, about three miles from the mouth of the Naknek River (Naknek Village). In 1928 this cannery merged with the Red Salmon Canning Co., under which name they operated until 1930 when the cannery was closed and not reopened.

The Alaska Packers built a cannery at the saltery station of the Arctic Packing Co. on the Naknek River; moved the machinery from the Thin Point Packing Co., and are still operating under the name Diamond NN.

1895

The Alaska Packers Association built a cannery known as the Ugashik Fishing Station above Pilot Station, twelve miles from the bar on the Ugashik River. Packed from 1896 through 1907. In 1906 the equipment for Ugashik was lost in the San Francisco fire and their Coffee Creek cannery building at Kvichak was also destroyed by fire. The salvaged equipment of the Coffee Creek cannery was sent to Ugashik and the plant then operated as a cannery for its last pack. Was later used as a saltery station.

The Point Roberts Packing Co. built a cannery at Koggiung, Kvichak Bay, is a member of the Alaska Packers Association and still operating as Koggiung Cannery.

1899

The Pacific Steam Whaling Co. built a cannery on the eastern shore of Nushagak Bay, at Nushagak Village. In 1901 the cannery was sold to the Pacific Packing & Navigation Co.; then sold in 1904 to Northwestern Fisheries and operated until 1932, then leased to the Pacific American Fisheries. PAF purchased the cannery in 1933 but it was not reopened.

The Egegik Packing Co., a member of the Alaska Packers Assn., built a cannery on the left bank of the Egegik River above the saltery station of the Alaska Packers. Was completed in 1900 and has operated each year since, except for 1905 and 1906.

1900

The North Alaska Salmon Co. built two canneries above Koggiung on Kvichak Bay about 1,000 feet apart; however, only one cannery operated after 1905. Libby, McNeill & Libby purchased both plants in 1916 and operated until 1936 when a mud flat which had formed in front forced abandonment of the sites.

The Kvichak Packing Co., member of the Alaska Packers Assn., built a cannery at Bear Slough, Kvichak River, called Coffee Creek or Diamond X; last operated in 1941.

The Bristol Packing Co. built a cannery on the left bank of the Ugashik River, about 25 miles from Smoky Point; operated until 1906. Part of plant used for a few years thereafter as a saltery station.

1901

The Alaska Salmon Co. built a cannery on Wood River in Nushagak Bay and operated until 1942. Then the cannery changed its name to Bristol Bay Packing Co., purchased the old Alaska Packers cannery at Dillingham, and operated at that location.

The Alaska Portland Packers built a cannery at Nushagak River. The plant was destroyed by fire August 10, 1910, but was rebuilt for operation the following year. This property was then transferred to Pacific American Fisheries in 1934 and is still in operation.

The Columbia River Packers built a cannery on Nushagak River and are still operating. Stockholders have changed but packing name remains the same.

The Red Salmon Canning Co. built a cannery still farther up the Ugashik River from Alaska Packers. This cannery was idle from 1939 until 1942, then leased to L. G. Wingard Packing Co.; still in operation.

The Alaska Packers Assn. built another cannery nearer the mouth of the Naknek River, the Diamond O, but ceased operation in 1929. Salmon then packed at either Diamond M or Diamond NN, farther up the river.

The Alaska Packers Assn. built a cannery 15 miles above their cannery on Ugashik River; operated until 1906. Was later dismantled.

1903

The North Alaska Salmon Co. started a new cannery at Nushagak Bay at Ekuk Spit. Libby, McNeill & Libby purchased this cannery in 1916 and are still operating it.

The North Alaska Salmon Co. built and operated a new cannery across from the Alaska Packers on Egegik River. Was operated after 1913 by Libby, McNeill & Libby except from 1941 until 1946; rebuilt in 1947 and still operating.

The Alaska Fishermans Packing Co. built a cannery below that of the Pacific Steam Whaling Co. in Nushagak Bay; operated until 1913 when control passed to Libby, McNeill & Libby. Cannery burned in 1915; rebuilt for operation following year; closed in 1936 because of mud flat formation at dock.

1904

The Union Packing Co. established a cannery above the North Alaska Salmon Co. in Kvichak Bay, having moved the plant from Kell Bay, Southeastern Alaska. Packs were made until 1907 and then abandoned.

The North Alaska Salmon Co. built a cannery at Hallersville on Lock-

anok River, Kvichak Bay; abandoned in 1913 when a mud flat formed in front of the cannery prohibiting tenders and scows from landing at dock. Sold to Libby, McNeill & Libby in 1916 but not operated.

1910

The Alaska Fisherman Packing Co. purchased the saltery of Olsen & Co. at Kvichak Bay and converted it to a cannery; packed through 1913 when Libby, McNeill & Libby purchased this and the Nushagak plant, continuing to operate under the same name. Burned out in 1915 but rebuilt and operated in 1916. Has operated since 1917 under name Libby, McNeill & Libby, Koggiung.

The Bristol Bay Packing Co. started a cannery at Kvichak Bay. This plant burned in 1936 with a considerable part of a season's pack. Rebuilt in 1937 (see 1937).

1911

The Alaska Packers built a third cannery close to the mouth of the Naknek River, calling the cannery Diamond M; made its last pack in 1941. Packs for this cannery were then made at NN, or at Koggiung, which was rebuilt in 1946.

The Pacific American Fisheries built a cannery at King Cove, a few miles east of Thin Point, on the south side of the Alaska Peninsula. Still operating.

1912

The Pacific American Fisheries built a cannery at Port Moller but did not operate that year. Operated in 1913 and still operating.

1913

The North Alaska Salmon Co. built a cannery at Peterson Point, Kvichak Bay. In 1916 Libby, McNeill & Libby purchased all the plants of this company. Using the machinery from the Hallersville cannery, Libbyville has operated continuously except for the years 1941 through 1946.

1915

The Nelson Lagoon Packing Co. started a cannery at Nelson Lagoon, Alaska Peninsula. This cannery was dropped from the active list of canneries in 1927 as it had not operated for several years.

1916

The Pacific American Fisheries built a cannery at Ikatan, Unalaska Island. This cannery made its last pack in 1933; the machinery was removed and the fish packed at their King Cove plant.

The Red Salmon Canning Co. built a cannery two miles above the Naknek Packing Co. on the Naknek River. Still operating.

The Bering Sea Packing Co. built a cannery at Herendeen Bay. In 1918 they sold this cannery to the Everett Packing Co., which sold in 1919 to the Herendeen Bay Consolidated Canneries. In 1933 this operation ceased and canning has been carried on by a floater.

1917

The Sockeye Salmon Co. built a cannery at Morzhovia Bay, a few miles from Isanotski Strait. In 1920 they moved to the Unimak side of the

strait and leased the cannery to P. E. Harris & Co. which purchased it in 1921. This cannery was listed as False Pass after 1930 instead of Isanotski Strait and is still operating.

The Phenix Packing Co. started a new cannery at Herendeen Bay; sold to the Pacific American Fisheries in 1923. This cannery was dropped from the active list in 1927 as they had not operated for several years.

The Pacific American Fisheries built a cannery at Ikatan on Isanotski Strait; operated through 1934 when the machinery was removed and the cannery not reopened.

The Fidalgo Island Packing Co. started a new cannery at Herendeen Bay; was dropped in 1927 from the active list of canneries.

1918

The Carlisle Packing Co. started a floating cannery at Andreafsky, Yukon River; moved to Kwiguk Slough in 1919; moved in 1922 to Kvichak Bay, Koggiung River; and in 1927 the Alaska Packers purchased the cannery to consolidate with their two canneries, no longer using the Carlisle plant which was then abandoned.

The Northwestern Fisheries Co. built a new cannery two miles below the Naknek Packing Co. on Naknek River. All canneries of the Northwestern Fisheries were leased to Pacific American Fisheries in 1933 with option to purchase; none were operated. This plant, known as Nornek cannery, was purchased by PAF in 1935 and operated in 1937, 1939, 1940 and 1941. Sold in 1944 to Intercoastal Packing Co. but not operated until 1947. Still operating under name of Columbia River Packers Assn.

1919

The Alaska Portland Packers built a new cannery above the Alaska Packers Diamond N on the right hand side of Naknek River. Sold to Pacific American Fisheries in 1934 and still operating.

1920

The Shumagin Packing Co. installed machinery in their saltery station at Squaw Harbor, Shumagin Islands. This plant was sold in 1934 to Pacific American Fisheries and still operates at this location.

The Alaska Packers Assn. started a new cannery on the Ugashik River and operated until 1939 when the plant was closed. Has not operated since but has been maintained by the Alaska Packers.

1923

The Alaska Salmon Co. opened a new cannery on the Kvichak River at a location formerly operated as a saltery. Operated as a cannery in 1923; thereafter used as a saltery station.

1925

The Nakat Packing Corp. purchased the salmon saltery of Peter M. Nelson on Kvichak Bay, Bristol Bay; converted into a cannery and still operating under the name Nakeen.

1937

The Bristol Bay Packing Co. had completed one of two new canneries, to replace the buildings lost by fire in 1936. Plant was operated during the season with six lines of machinery. In 1938 the Bristol Bay Packing

Co. was merged into the Alaska Salmon Co. but did not operate. Reverted to Bristol Bay Packing Co. in 1945; still operating. (Refer to 1910).

1938

A new four line cannery was built at Naknek by the Thompson Salmon Co., a subsidiary of the Columbia River Packers. Still operating.

1947

The Egegik Packing Co., a new concern, packed salmon that fall season at Egegik and are still operating.

There have been no new installations of shore plants since 1947.

GILLNET FLEET IN TAKU INLET, 1951

FINANCIAL STATEMENT

The 1949 legislative act creating the Alaska Department of Fisheries also provided for an appropriation of $250,000.00. Being set up as a continuing fund, the unused balance did not revert to the Territorial general fund at the end of the biennium.

During the fiscal year 1949, the Territorial Administrative Board allotted $70,000.00 for operations of the department and froze the balance of the original appropriation. In the 1950 fiscal year two releases, totaling $97,500.00, were made by the board. A balance of $82,500.00 still remains frozen.

While all other activities of the department are reported on a calendar year basis, it should be noted that the financial statement is set up to correspond to the Territorial fiscal year, which runs from April 1, of one year to March 31, of the following year.

The following report shows the amounts allocated to each division of the department, together with a detail of expenditures and the balances on hand as of March 31, 1951.

A summary concludes the financial statement.

ALLOTMENTS AND EXPENDITURES

ALLOTMENTS
ALLOTMENTS AND EXPENDITURES

ALLOTMENTS AND EXPENDITURES
April 1, 1950 — March 31, 1951

Balance from first year's operations	$ 19,897.33
Released April 1, 1950	75,000.00
Released January 15, 1951	22,500.00
Total	$117,397.33

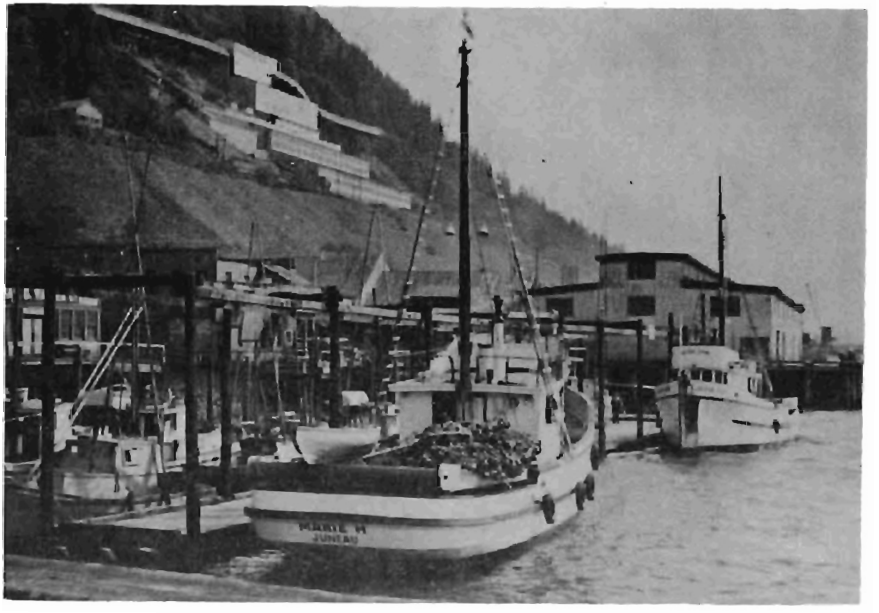
	Expenditures	Allotments
ADMINISTRATION		$23,800.00
Salaries & Wages	$14,964.92	
Transportation	2,075.64	
Subsistence & Lodging	660.30	
Office Expense	583.76	
Telephone & Telegraph	156.41	
Postage, Freight & Express	139.24	
Printing	374.50	
Rent	2,387.73	
Retirement & Industrial Insurance	766.64	
Other General Expenses	270.09	
Operating Expenses	28.74	
Capital Outlay, Office	721.02	
Capital Outlay, Utility Equipment	510.57	
	$23,639.56	
Credit	13.25	
	$23,626.31	$23,626.31
Balance		173.69

	Expenditures	Allotments
FISHERIES BOARD		$ 2,750.00
Salaries & Wages	$ 435.00	
Transportation	1,070.00	
Subsistence & Lodging	1,127.50	
Postage, Freight & Express	1.20	
	$ 2,633.70	$ 2,633.70
Balance		$ 116.30
STREAM IMPROVEMENT		$21,550.00
Salaries & Wages	$ 9,644.13	
Transportation	293.08	
Subsistence & Lodging	485.00	
Office Expense	5.95	
Retirement & Industrial Insurance	130.00	
Other General Expenses	200.31	
Operating Expenses	6,505.50	
	$17,263.97	$17,263.97
Balance		$ 4,286.03
BIOLOGY		$38,000.00
Salaries & Wages	$21,375.04	
Transportation	1,306.16	
Subsistence & Lodging	3,553.41	
Office Expenses	453.77	
Telephone & Telegraph	1.68	
Postage, Freight & Express	43.29	
Printing	20.80	
Retirement & Industrial Insurance	506.25	
Other General Expenses	181.99	
Operating Expenses	6,990.38	
Office Equipment	1,665.40	
Utility Equipment	644.73	
	$36,742.90	$36,742.90
Balance		$ 1,257.10
INSPECTION		$31,297.33
Salaries & Wages	$21,654.58	
Transportation	3,629.90	
Subsistence & Lodging	573.47	
Office Expenses	63.60	
Telephone & Telegraph	10.59	
Postage, Freight & Express	49.86	
Retirement & Industrial Insurance	430.40	
Other General Expense	30.63	
Operating Expenses	1,662.10	
Office Equipment	294.15	
Floating Equipment	1,619.25	
	$30,018.53	$30,018.53
Balance		$ 1,278.80

SUMMARY

March 31, 1951

DIVISION	Allotments	Expenditures	Balance
Administration	$ 23,800.00	$ 23,626.31	$ 173.69
Fisheries Board	2,750.00	2,633.70	116.30
Stream Improvement	21,550.00	17,263.97	4,286.03
Biology	38,000.00	36,742.90	1,257.10
Inspection	31,297.33	30,018.53	1,278.80
TOTALS	$117,397.33	$110,285.41	$7,111.92



ALASKA SALMON SEINER AT JUNEAU

DISCHARGING THE CATCH, BRISTOL BAY, ALASKA

LOOKING AHEAD

WATERSHED MANAGEMENT

In studying the history of the decline of the salmon runs of the Pacific Coast, it is striking to notice how invariably these declines are blamed on over-fishing. These statements come most often from those least acquainted with the subject and are frequently made to cover up other causes, which may be of their own making. For an illustration, the builders of the great hydro-electric and irrigation projects in the Columbia River basin are prone to blame the declining salmon stocks of this river to over-fishing. The actual fact is that the fall runs, which have been as heavily fished as the others, are still in reasonably good shape. The fall salmon runs spawn in the tributaries and main stem of the river which, so far, have been least affected by man's encroachments.

On the contrary, the spring populations are in deplorable shape. Some are completely and permanently annihilated. Most of the up-river spawning areas, formerly used by these early runs, are absolutely blocked by high dams. Grand Coulee and a number of lesser ones could be mentioned. No attempt whatsoever was made to elevate the mature salmon over these edifices. The spawning areas above were simply, and finally, written off by the dam builders. It would seem that if just a part of the creative genius required to plan and build these structures, had been applied to the problem, spawning salmon would still be going above Grand Coulee to complete their life's mission and their offspring would be coming down safely to the sea.

While it is true that over-fishing is responsible for many declines, there is evidence to show that in numerous cases it is of minor or no consequence. The actual reasons are often found to be changes in the environment of the salmon due to natural and unnatural (man-made) conditions. This is especially true of the fresh water stages of its existence. Many examples could be cited. Some of the natural ones are cyclic climatic changes, floods, droughts, freezes, earthquakes, earthslides, beaver dams and increase in predators. On the other hand there are such man-made, or unnatural, causes as deforestation due to logging; hydro-electric, irrigation, flood control, and navigation projects; pollution, especially from pulp mills; soil conservation and reclamation schemes; gravel washing and mining operations; road construction such as stream culverts; insect control using poisonous sprays; and many others. The listing of these does not necessarily mean that all are inimical to the continuation of our salmon fisheries. It does mean, however, that if such projects are improperly and unwisely planned, the results will be disastrous to our fisheries. Alaska needs new industries, but not at the expense of her most important resource, which if properly cared for, will produce year after year.

Luckily the advance of civilization has, as yet, had but very minor adverse effects on our fisheries. These have been mostly of a localized character. However, a new era of progress and industrialization for Alaska is at hand. With it will come the attendant evils to our fish and game resources, just as it came to every other frontier territory. It behooves us to profit by the mistakes of others before it is too late. At

least two federal agencies are already quietly planning for our future and we may wake up some morning with a series of dams planned for our major streams without regard to the damage they might inflict on our major industry.

It therefore seemed appropriate that the Alaska Department of Fisheries institute, as soon as possible, a section devoted exclusively to the above related subjects. This new division, to be known as "watershed management," will be started as soon as competent personnel can be acquired. The duties usually ascribed to "stream improvement" will be handled, but it will be somewhat broader in scope, so as to include all fresh water phases of the salmon's life. Utilization of barren lakes and streams will be stressed.

While this new division will become a "watchdog" to ward off the evil effects of advancing civilization, it is not intended to block progress. By profiting from the mistakes of the past and by cooperation of all parties, it should be possible to have new industries and still maintain our fisheries.

SPORT FISH PROGRAM

In comparison with the states, Alaska is still a sport fishermen's paradise. There are countless lakes and streams that are barely touched and where the novice may take a limit of trout or grayling with little effort. However, conditions are changing due to the increased population and greater accessibility through roads and by small planes. The sport fishing pressure is rapidly accelerating. Evidence of decline in our game fish populations is already manifesting itself close to the major cities, such as the increasing scarcity of trout in the Anchorage area and fewer grayling in the Fairbanks district.

Here again it would seem fitting that Alaska profit from the mistakes of others. The inauguration of a sound sport fish program at this early date might avoid many of the pitfalls experienced by the states. Because of our early start it may be possible to maintain good angling with a minimum of expense.

In line with this thinking, the Alaska Fisheries Board has authorized the establishment of a sport or game fish division within the Department of Fisheries. The headquarters for this program will be at the University of Alaska. This location is more convenient than the main office of the department at Juneau, since it is planned to start the first work in the more critical areas around Fairbanks and Anchorage. Furthermore the University authorities have kindly offered to furnish office space for the staff and full use of its library and laboratory equipment.

Other districts of Alaska are having, or will have, their sport fish problems. As the need arises and funds become available all sections will be covered. In Southeastern Alaska king and silver salmon are highly important game fish as well as commercial. These two species are already being given intensive attention by the department.

Efforts to introduce grayling to lakes near Juneau will be continued in cooperation with the Territorial Sportsmen, Inc. If this experiment proves successful, this fine sport fish could then be introduced to suitable waters convenient to other cities.

HAIR SEAL CONTROL

For many years the Territory of Alaska has expended large sums of money in payment of hair seal bounties. Almost $300,000 will be required to pay for all bounties turned in during the biennium 1949-51. It should be noted that in this period the bounty was set at $6 and applied throughout the Territory from Dixon Entrance to Demarcation Point. The records will show that the greater part of this money was paid for seal scalps turned in from the northern and western coastal sections where there are no important salmon fisheries and where this animal is an article of food and commerce.

There is ample evidence to show that hair seals are predatory on salmon at the mouths of many streams, especially in certain rivers having important gill net fisheries. The Copper and Stikine Rivers are notable examples. Gill netters in both these areas can produce abundant testimony from their own experiences relating to damage by the hair seals.

However, when one deals with areas removed from these and other similar locations, damage to the salmon runs by hair seals is problematical. All the available information seems to point to the contrary. While an occasional salmon may be taken, the bulk of the hair seal's food consists of other species of fish and shellfish, largely bottom types and mostly non-commercial.

It is known that hair seal herds are of a local nature and do not make long migrations like the fur seal. It would therefore seem logical that efforts to reduce and control their numbers should be limited and concentrated in the areas of greatest damage to the salmon runs. With this in view the Fisheries Board has selected the Stikine and Copper River districts for the initial experiments on hair seal control. If this plan can be successfully accomplished, it will not only minimize the damage from these predators, but save the Territory money as well.

BIOLOGICAL RESEARCH

The troll salmon investigations of the biology division will be continued, with emphasis on tagging of king salmon in the offshore waters north of Cross Sound and in the inside waters of Southeastern Alaska. There is some reason to believe that the king salmon, being caught in the Cape Fairweather area may exhibit a different migration pattern than those to the south. Movements of the inside king salmon still remain a mystery and the solution must rest on recoveries from an intensive inside tagging operation.

The investigation of this species will be further expanded by a concentrated program on the Taku River, which will include both the troll and gill net fisheries at the mouth, as well as up-stream studies of the spawning grounds. It is also planned to devote more effort to the black-cod fishery during the coming biennium.

COOPERATION WITH THE FISH AND WILDLIFE SERVICE

In carrying out the wishes of the Alaska Legislature, the Alaska Department of Fisheries will carefully correlate its various activities with those of the Federal agency to avoid duplication of effort and working at cross purposes. Specifically, the department will again cooperate with their enforcement division by furnishing 15 to 20 seasonal fishery and stream inspectors. Also sufficient Territorial funds will be allotted

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to carry through the Falls Creek fishway construction until July 1, 1951 when further Federal funds will again become available to complete the project.

EXPLORATORY FISHING AND AID TO INDUSTRY

By mutual agreement major exploratory fishing efforts in Alaska will be conducted by the Fish and Wildlife Service with their new modern exploratory vessel, the "John N. Cobb." Aid to industry and market development will be carried forward by the Ketchikan Laboratory of the Fisheries Experimental Commission and the Alaska Development Board. This department will cooperate with and assist these organizations in their respective programs. However the field is large, so where duplication of effort is not involved, the Department of Fisheries will continue to offer its facilities for the direct aid and promotion of local industries.