BACKGROUND INFORMATION
REGARDING THE MOVEMENTS OF SALMON
BETWEEN NORTHERN BRITISH COLUMBIA AND SOUTHEAST ALASKA

Prepared by

Fisheries Research Board of Canada
Biological Station
Nanaimo, B. C.

October, 1965

CONFIDENTIAL

BACKGROUND INFORMATION REGARDING THE MOVEMENTS OF SALMON BETWEEN NORTHERN BRITISH COLUMBIA AND SOUTHEAST ALASKA

Prepared by

Fisheries Research Board of Canada
Biological Station, Nanaimo, B. C.

FOREWORD

Joint consideration by the United States and Canada of management problems caused by the movements of salmon between Northern British Columbia and Southeast Alaska began with the formation in 1959 of an international "Committee on problems of mutual concern related to the conservation and management of salmon stocks in Southeast Alaska and Northern British Columbia". Background information on events leading up to the formation of this Committee and a brief outline of the Committee's activities from 1959 to the present are included in Appendix A of this report. Details of the Committee's findings are included in the Committee's most recent report (April 1965), copies of which have already been distributed.

Since studies reported by the Committee were completed, a considerable amount of tagging has been done by Canadian and United States vessels, both on the high seas and coastal waters, as part of the INPFC research program. A brief account of the results of these tagging programs bearing on the problem of movements of salmon in the Northern British Columbia—Southeast Alaska area is given in Appendix B.

In the Committee's report, information on the extent of interception was not available for all areas of concern. For this reason some of the estimates were characterized as being "minimum". Clarification of the use of the term minimum, and an attempt to estimate the total interception of Alaska-bound pink and sockeye in British Columbia waters in 1957 and 1958 are provided in Appendix C.

The Committee's report provides detailed information only for the years 1957 and 1958. In Appendix D information is given on the likely contribution of various British Columbia stocks to the Alaskan fishery off the west coast of Prince of Wales Island in 1957 and 1958 and provides some comparisons of the possible extent of interception by this fishery in other recent years with catches in Canadian areas to which the fish were likely destined.

The Committee's report showed that Canadian fisheries near the International Boundary (particularly in the Dundas Island area) intercepted some

salmon bound for Alaska. At present the westward extension of the Canadian fishery in this area is limited by the position of the "surf line". However, if fishing were permitted westward along the Boundary to Cape Muzon it is likely that Canadian fisheries could prosecute fisheries on most of the Alaskan runs which approach their spawning grounds through Dixon Entrance. The likely constitution and timing of the Alaskan runs approaching through Dixon Entrance is outlined in Appendix E.

Estimates of the extent of interception of salmon bound for one country that were caught by fishermen of the other presented in the Committee's report were based mainly on data on tag recoveries made in commercial fisheries. Supplementary information on recoveries of tagged salmon on the spawning grounds presented in Appendix F emphasizes the importance of Canadian stocks in fisheries in the area of concern.

As further background, summaries of available data on the distribution of spawners of all species of salmon in the outer west coast of Prince of Wales Island are summarized in Appendix G. Data on escapements of sockeye throughout Southeast Alaska are given in Appendix H.

In a limited number of copies of this report, maps showing the statistical areas of Southeast Alaska in recent years are given in Appendix I and a list of available statistics for many of these areas are presented in Appendix J.

For the most part, the various Appendices contained in the present report represent preliminary arrays of data and are subject to later correction. In several instances more detailed analyses may be required to provide more complete and balanced assessments of the subject matter.

TABLE OF CONTENTS

Background information on the formation of the Committee on Problems of Mutual Concern Related to the Conservation and Management of Salmon Stocks in Southeast Alaska and Northern British Columbia; the Committee's work, report, and present status

A. Formation of the Committee

In 1957, Canada and the United States began discussions regarding co-ordination of salmon fishing regulations. At the 1957 Conference on this subject "the representatives of both Canada and the United States agreed that development of major offshore salmon net fisheries posed a serious management problem and that regulation of such fishing in the eastern Pacific was essential to the conservation of salmon stocks of North American origin".

Offshore salmon net fishing lines were established by both countries. In regard to the Alaska line the following agreement was reached (page 7, item 4, Summary of Proceedings):

"The line described in the Alaska Fishery Regulations was appropriate.

"In this connection it was understood that the closing lines connecting headlands in Alaska, which were discussed and which serve as a base-line in some areas for the measurement of the seaward limits of the 'waters of Alaska' as this expression is used in the Alaska Fishery Regulations, are not definitive. On the request of the Canadian Delegation for a chart showing the definitive line the United States Delegation agreed to submit such a chart as soon as possible".

Upon receipt of the chart some months later it was noted that the Alaska line was generally 3 miles further offshore than lines established by Canada and the States of Washington, Oregon, and California.

At this same time, information was becoming available from taggings carried out in 1957 and 1958 on the west coast of Southeast Alaska. These taggings revealed the mixing of stocks of Alaska and British Columbia origin in the Noyes Island area and a substantial interception of British Columbia-bound pink and sockeye by the Alaskan fishery.

At the Second Conference on Co-ordination of Fishing Regulations in 1959 Canada expressed concern regarding the position of Alaska's net fishing line. Agreement between Canada and the United States could not be reached regarding this line. The position of both countries in this regard as given in the Summary of Proceedings of the 1959 Conference is as follows -

(Quote):

Review of Offshore Salmon Net Fishing Lines

The discussion on this item was opened by the Canadian Delegation recalling that when consideration was being given to the location of offshore salmon net fishing lines in the eastern Pacific Ocean at the Seattle Conference in 1957, a chart showing the location of the proposed line in Alaska was not available; that Canada had requested a copy of such a chart showing a definitive line; and that this was made available some months later for study. The Canadian Delegation stated that it was apparent that the offshore salmon net fishing line in Alaska was located using a different basis for its location than was used in defining the lines agreed to along the coasts of California, Oregon, Washington and British Columbia.

The Canadian Delegation requested that consideration be given to adjusting the line in Alaska in order to have it conform more closely to the offshore salmon net fishing lines agreed to for all other areas. It was stated that particular attention should be given to relocating the line in southern Alaska where net fisheries were known to affect seriously in some years the management of certain salmon stocks originating in streams of northern British Columbia.

The United States Delegation stated that there were administrative problems involved in this connection in the Alaska area. Most of the fisheries were operating close to land in localities where fishing had been carried out in a traditional manner for the past 50 years or more. Some of the stocks could not be harvested efficiently by any other means. It was the understanding of the United States that the objective of the offshore fishing lines was to prevent the development of major new offshore net fisheries or the expansion of existing fisheries. In the United States view this objective had been achieved. New net fisheries have not developed nor were the existing net fisheries in the waters of Alaska expanding.

The United States Delegation stated that if there were conservation problems caused by location of the line it would be happy to consider them. In this connection, the United States Delegation pointed out that its records indicated that the Canadian fishery in northern British Columbia near the International Boundary intercepted considerable quantities of salmon bound for Alaskan streams.

After an exchange of observations on the management problems associated with the salmon fisheries of southeast Alaska and northern British Columbia it was decided that the matter should be referred to an Ad Hoc Committee for further review. This committee subsequently submitted the following report:

Report of Ad Hoc Committee on the Review of Offshore Salmon Net Fishing Lines

"The Ad Hoc Committee on the Review of Offshore Salmon Net Fishing Lines held several meetings during the current week. The Committee discussed the location of the salmon net fishing lines which are set out in the Summary Proceedings of the Conference on Co-ordination of Fisheries Regulations held in

Seattle, Washington, in February 1957. The Committee reached no agreement with respect to adjustment of the offshore salmon net fishing limits of Alaska and of Bristish Columbia".

The Canadian Delegation made the following statement in commenting on this report:

"With reference to the discussions which have taken place at this Conference, at both the general sessions and at the meetings of the Ad Hoc Committee on Review of Offshore Salmon Net Fishing Lines, it seems to the Canadian representatives that, with respect to the offshore salmon net fishing lines, there is an obvious difference between the Canadian and United States lines in the northern areas. From the Canadian point of view this difference arises from the lack of a uniform basis for determining the location of the offshore salmon net fishing limits in Alaska as compared with that in Canada.

"It is stated in the Summary Proceedings of the Conference on Co-ordination of Fisheries Regulations held in Seattle, Washington, in February 1957, under Major Agreements Reached (4) and (5) -

'(4) The line described in the Alaska Fishery Regulations was appropriate.

In this connection it was understood that the closing lines connecting headlands in Alaska, which were discussed and which serve as a baseline in some areas for the measurement of the seaward limits of the 'waters of Alaska' as this expression is used in the Alaska Fishery Regulations, are not definitive. On the request of the Canadian Delegation for a chart showing the definitive line the United States Delegation agreed to submit such a chart as soon as possible.

'(5) All the lines delimiting offshore waters agreed to during the Conference would be made effective for the coming season and consideration would be given to adjusting the lines whenever experience indicated that an adjustment was required.'

"It was Canada's understanding at the Seattle Conference that when the chart showing the definitive line for Alaska had been received and reviewed we would have an opportunity, as outlined in Major Agreement No. 5 of the Seattle Conference, to meet again and propose necessary adjustments of the lines as was the procedure followed at the Seattle Conference in considering the location of the lines in all other areas.

"The chart requested by Canada at the Seattle Conference was received from the United States some eight months after the Conference. The chart was examined and Canada is still of the view that the Alaska line is not definitive. Because of this Canada made a formal request to the United States for the opportunity to review and consider adjustments in the Alaska line in order to achieve uniformity in the basis for locating offshore salmon net fishing limits in the eastern Pacific Ocean insofar as it could be done within practical and

geographical limitations.

"Canada regrets that it has not been possible, at the present Conference, to reach agreement on matters relating to the offshore salmon net fishing limits in Alaska.

"Canada understands and appreciates the practical considerations and difficulties involved in attempting to adjust the Alaskan offshore salmon net fishing limits, but we consider that there should be uniformity, within practical limitations, of the basis on which the lines are established in all areas. Such basis of uniformity was established by Canada and by the States of Washington, Oregon and California.

"Because of the obvious difference in the bases used in establishing the offshore salmon net fishing limits in Alaska and in British Columbia, Canada has no alternative but to reserve the right to adjust the offshore salmon net fishing limits for British Columbia to conform with the basis used by the United States for Alaska".

The United States Delegation made the following statement with reference to this matter:

"The report of the Seattle Conference states with respect to offshore salmon net fishing lines that '... development of major offshore salmon net fisheries posed a serious management problem and that regulation of such fishing in the eastern Pacific Ocean was essential to the conservation of salmon stocks of North American origin'. No other objective for offshore salmon net fishing lines is given in the report.

"The report of the Seattle Conference also includes the following statement: 'The US Delegation stated that: The Secretary of the Interior now prohibits the taking of salmon by US Nationals in the Pacific Ocean outside the waters of Alaska north of Dixon Entrance and east of 175 degrees west longitude, except by means of trolling'.

"After consideration of various proposals by the United States and Canada, the following agreement was reached regarding the Alaska line:

> 'The line described in the Alaska Fishery Regulations was appropriate.
>
> 'In this connection, it was understood that the closing lines connecting headlands in Alaska which were discussed and which serve as a baseline in some areas for the measurement of the seaward limits of the 'waters of Alaska' as this expression is used in Alaska Fishery Regulations, are not definitive.
>
> 'All the lines delimiting offshore waters agreed to during the Conference would be made effective for the coming season and consideration would be given to adjusting the lines wherever experience indicated that an adjustment was required'.

"From these statements it seems clear to us that the method or basis for constructing the salmon net fishing lines in Alaska was understood and was 'appropriate'. If this was not the case, there has been a most unfortunate misunderstanding.

"The current Conference has given consideration to adjusting the Alaska lines following the proposal of Canada that adjustment is required. It appears that conservation problems are involved where the fisheries of both countries operate on the same stocks of fish. The United States Delegation has proposed that the conservation problems created by the taking by the United States of quantities of salmon enroute to Canadian streams and by the taking by Canada of quantities of salmon enroute to Alaskan streams be studied by an Ad Hoc Committee to be set up by this Conference, and that all of the evidence on these problems in the possession of the Parties be supplied to this Committee, in order that a determination may be made as to whether an adjustment is required to resolve the conservation problem.

"If Canada considers that the solution of its conservation problems is so urgent that the delay thus entailed would be very damaging, the United States is prepared immediately to undertake the study of all pertinent data on the problem in order to resolve the problems of the Conference".

The report of the Ad Hoc Committee on Review of Offshore Salmon Net Fishing Lines was accepted". (Unquote)

Subsequently the Conference adopted the following joint resolution:

> "This Conference, recognizing the desirability of reaching an early solution of problems of mutual concern related to the conservation and management of salmon stocks in southeast Alaska and northern British Columbia which became apparent during the Second Conference on Co-ordination of Fisheries Regulations, recommends to the Governments of the United States and Canada, that a committee be established as soon as possible to consider these problems and subsequently recommend appropriate action to insure continued effective conservation of these stocks".

Further, "It was agreed that such a committee would be established at an early date with instructions to submit a report as quickly as possible".

B. Summary of work done by the Committee

At the outset, the Committee decided that "problems of mutual concern" be considered to occur when fish destined for rivers of one country are caught by the fisheries of the other country. Each country then listed the statistical fishing areas of the other country where interception was indicated or considered possible. Both the United States and Canada reserved the right to add to their areas of concern in the future. It was agreed that the first step

of the Committee should be a full interchange of data and statistics for full study and to familiarize the respective sections with the fisheries in question. Three items were selected for interchange:

(1) Information on the salmon fisheries of mutual concern, including descriptions of the gear used and amount, catch statistics, and statistical area charts.

(2) Full information on salmon tagging.

(3) Salmon fishing regulations and escapement data.

Subsequently, the Committee agreed that exchange of interpretations of data would be carried out. Each country would include in its reports anything thought to be pertinent to the areas of concern. It was further agreed that a joint report would result, made up of separate interpretive reports which might or might not be endorsed in toto by both countries.

The Committee's report was submitted to the two governments in April, 1965. Essentially the report deals with the analysis and interpretation of the United States and Canadian taggings carried out in 1957 and 1958.

The following conclusions were made by the Committee:

(1) The mixing of salmon stocks of British Columbia and Alaska origin within the study area has been demonstrated.

(2) Interception of fish destined for the rivers of one country by the fisheries of the other has occurred.

(3) Mixing of British Columbia and Alaska sockeye and pink stocks has occurred within the fishing areas of British Columbia and Southeast Alaska from as far south of the International Boundary as British Columbia Statistical Area 5, to as far north of the International Boundary as Southeast Alaska Statistical Area 173.

(4) Areas in which substantial interception has been demonstrated are those on both sides of, and closely adjacent to, the International Boundary, and in the vicinity of Noyes Island off the west coast of Prince of Wales Island. Substantial agreement on the degree of interception of sockeye and pinks in 1957 and 1958 in these areas was shown in the United States and Canadian interpretations of the exchanged data.

(5) The 1957 pink runs in the areas under study were characterized by a strong southward movement past Noyes Island into British Columbia waters and a minor northward movement from Northern British Columbia into Alaska waters. The Canadian and United States sections estimated that 1,992,000 and 1,704,000 respectively, or 71 percent and 61 percent, of the Alaska Area 121 catch of 2,818,000 pinks were bound for British Columbia rivers. The degree of interception of Alaska-bound pinks in British Columbia was minor and relatively insignificant.

(6) The 1958 pink runs approached the study area from a more southerly direction than in 1957. Interception of British Columbia-bound pinks in Alaska was relatively much less - the Canadian and United States sections estimated that 50,000 and 47,000 respectively, or 5 percent, of the catch of 964,017 pinks in Alaska Areas 121 and 122 was bound for British Columbia. Substantial numbers of Alaska-bound pinks were taken in British Columbia waters in 1958, particularly in British Columbia Areas 3 and 4. The Canadian and United States sections estimated that a minimum of 152,000 and 212,000 respectively, or 7 percent and 10 percent, of the catch of 2,063,000 pinks in Areas 3, 4 and 5 were bound for Alaska rivers.

(7) In both 1957 and 1958, sockeye runs approached the areas under study from a northerly direction. Substantial proportions of the 1957 and 1958 catch in Alaska Area 121 were bound for British Columbia rivers. For 1957 the Canadian and United States sections estimated that 160,000 and 138,000 respectively, or 68 percent and 59 percent, of the Area 121 catch of 234,000 sockeye were British Columbia-bound. For 1958 the Canadian and United States sections estimated that 20,000 and 16,000 respectively, or 36 percent and 30 percent, of the Area 121 catch of 56,000 were bound for British Columbia rivers.

In both 1957 and 1958 only minor proportions of the British Columbia sockeye catch within the study area were estimated to be Alaska-bound. For 1957 and 1958, the United States section estimated that a minimum of 600 and 8,500 sockeye respectively, or 0.1 percent and 0.8 percent, of the combined catches made in British Columbia Areas 3, 4 and 5 were Alaska-bound. For 1957 and 1958, the Canadian section estimated that 600 and a minimum of 18,400 sockeye respectively, or 0.1 percent and 1.7 percent, of the combined catches made in British Columbia Areas 3, 4 and 5 were Alaska-bound.

(8) None of the tagging programs carried out by either country has been designed specifically to answer questions on problems of mutual concern, and existing tagging data from programs designed for other purposes do not provide necessary data to indicate with precision either all of the locations or degrees of mixing of Alaska and British Columbia stocks. It should be emphasized that the calculations of Alaska-bound fish taken by Canadian fishermen and of Canada-bound fish taken by United States fishermen applied to 1957 and 1958 only. The results cannot necessarily be applied to other years because of possible year-to-year variations in migration routes, weather conditions affecting efficiency of fishing gear, and in the character of the fisheries. Further study of such factors is recommended.

C. Present status of the Committee

At the last meeting of the Committee (June 4, 1963) the following was recorded in the minutes regarding future meetings and exchange of data:

Future meetings - "The Committee was of the opinion that no date should be set for a future meeting. It was acknowledged that following the

submission of the Committee's report to the two governments a further meeting might be required. It was agreed also that a future meeting would be called at the request of either the United States or Canadian sections of the Committee or their respective governments".

Data exchange - "After some discussion it was agreed by the Committee that regulatory information exchange should continue but having regard to the considerable time and effort necessary to compile spawning ground data and the fact it had not been used to any large degree in the Committee's deliberations, this information would be exchanged only upon the request of either section", and further, "Consideration of need for further exchange. It was noted that both sections had previously agreed to carry on the exchange of information on tagging, regulations and catch statistics on a continuing basis".

Generally, the exchange of data is not going well. The Canadian section experienced difficulty in obtaining Alaska catch statistics for 1963 and 1964. Some 1963 data was provided only after five written requests and a telegram from the Area Director to Alaska Department of Fish and Game. Letters requesting 1964 data were not acknowledged. The data was finally received September 1965.

On the other hand, the exchange of copies of field announcements regarding changes in fishing regulations in areas of concern has continued. Informal communication between the Skeena Salmon Management Committee's Director of Investigations and the Alaska Department's field biologist at Ketchikan has been excellent.

Further information on the presence of salmon stocks of mixed origin off the west coasts of Southeast Alaska and British Columbia

Tagging programs carried out over the years in Southeast Alaska and Northern British Columbia have been used to reveal areas of mixing of Alaska- and British Columbia-bound salmon and, in some areas and years, to demonstrate the interception of fish bound for one country by the fishery of the other. Information available up to 1958, for pink and sockeye salmon, has been summarized in the Report of the Committee on Problems of Mutual Concern Related to the Conservation and Management of Salmon Stocks in Southeast Alaska and Northern British Columbia. In this report it was shown that, in 1957 and 1958, extensive mixing of Alaska and British Columbia pinks and sockeye occurred in the International Boundary Area and also in the vicinity of Noyes Island on the west coast of Southeast Alaska.

More recently (1961-1964), both Canada and the United States have tagged salmon closely adjacent to the west coasts of Southeast Alaska and British Columbia. Results from these taggings, together with those carried out in 1957 and 1958, provide information regarding the migration routes of salmon bound for each country, the presence of British Columbia-bound salmon closely adjacent to the west coast of Southeast Alaska, and the presence of Alaska-bound salmon closely adjacent to the west coast of British Columbia.

A. The 1957 and 1958 west coast taggings

In 1957 and 1958, the United States tagged pinks and sockeye at 5 locations in the vicinity of Noyes Island, Southeast Alaska. The tagging locations are shown in Figure 1. The fish were captured largely in shore-based salmon traps. The remainder were taken by seines operating alongshore.

Table I provides pertinent tag recovery data. Recoveries of pinks in British Columbia were made from 1957 taggings at Cape Addington, Cape Ulitka, Point Desconocida and from 1958 taggings at Cape Addington, Roller Bay, Granite Point, Cape Ulitka and Point Desconocida. Tagged sockeye were recovered in British Columbia from 1957 taggings at Cape Addington and from 1958 taggings at Cape Addington, Roller Bay, Granite Point, and Cape Ulitka.

These results reveal the presence of substantial numbers of British Columbia-bound sockeye and pinks in the vicinity of Noyes Island in 1957 and 1958.

The reader is referred to the Report of the Committee on Problems of Mutual Concern Related to the Conservation and Management of Salmon Stocks in Southeast Alaska and Northern British Columbia for further details of these taggings and further analysis of the results.

B. The 1961-1964 west coast taggings

Tagging was carried out annually from 1961 through to 1964 as part of each country's contribution to studies of the International North Pacific Commission. Most tagging was done well offshore but each year small numbers of salmon were tagged close to the coast. For the purpose of this report, only the "inshore" taggings, i.e. those carried out within approximately 25 nautical miles of headland to headland lines along the west coasts of Southeast Alaska and British Columbia, will be considered. In most cases the fish were captured and tagged well within 25 miles of the coast and some were tagged only a few miles offshore.

Salmon were tagged each year from May through to August but most tags were affixed in June and July. The fish were captured by purse seines in the case of the United States taggings and by seines and long-lines in the case of the Canadian taggings. Most tag recoveries were made in the commercial fisheries but a few were recovered on the streams.

Results of the 1961-1964 "inshore" taggings

Figures 2 and 3 show the locations of taggings made within 25 nautical miles of lines joining headlands along the west coast. Figure 2 shows tagging locations off the west coast of Southeast Alaska. The solid symbols represent taggings resulting in some recoveries in British Columbia. Figure 3 shows tagging locations off British Columbia and in this figure the solid symbols represent taggings resulting in some recoveries in Alaska. The data from which these figures were drawn is given in Tables II and III.

The "inshore" taggings were carried out from as far south as 48°30' North Latitude (off Juan de Fuca Strait) to as far north as Latitude 59°02' (off Dry Bay, Alaska). For the period 1961-1964, taggings off the west coast of Southeast Alaska (Figure 2) revealed the presence of British Columbia-bound salmon within 25 nautical miles of the coast from Latitude 55°00' (off Dall Island) to as far north as Latitude 58°35' (off Lituya Bay) - a distance of approximately 286 nautical miles. In the same period, taggings off British Columbia revealed the presence of Alaska-bound salmon within 25 miles of the west coast of the Queen Charlotte Islands and in Hecate Strait. The most southerly tagging resulting in recoveries in Alaska was at Latitude 52°00' - approximately 165 nautical miles from the Alaska-British Columbia boundary. No recoveries were made in Alaska from two taggings carried out off the west coast of Vancouver Island.

The presence of British Columbia-bound salmon adjacent to the west coast of Southeast Alaska

1. Sockeye salmon

In the 4-year period, 1961-1964, a total of 35 tagged sockeye were recovered from 18 tagging locations extending along the west coast of Southeast Alaska from Latitude 55°00' (off Dall Island) to Latitude 58°20' (off Icy Point).

See Figure 4. Recoveries in British Columbia totalled 17 and these were from 10 of the 18 tagging locations. These 10 locations extended from Latitude 55°00' (off Dall Island) north to Latitude 58°03' (off Cross Sound).

When individual years are considered, tagging locations and the number of recoveries are more limited. The 1961 taggings revealed the presence of British Columbia-bound sockeye off the west coasts of Baranof and Dall Islands. In 1962, British Columbia-bound sockeye were present off Cross Sound and off Kruzof and Dall Islands. Recoveries in British Columbia were made from 2 out of 3 taggings carried out off the west coast of Kruzof Island in 1963. In 1964, British Columbia-bound sockeye were shown to be present off Coronation Island.

2. Pink salmon

Figure 5 shows pink salmon tagging locations for the years 1961-1964. These locations were distributed along the west coast of Southeast Alaska in much the same way as for sockeye. The most southerly point of tagging was Latitude 55°00' (off Dall Island), while the most northerly tagging was at 58°35' (off Lituya Bay). A total of 210 tag recoveries were made, 54 of these in British Columbia. British Columbia-bound pinks were shown to be present along the west coast from Latitude 55°00' (off Dall Island) to as far north as Latitude 58°20' (off Icy Point).

In 1961 and 1962, tag recoveries showed British Columbia-bound pinks were present off Icy Point and off the west coasts of Kruzof, Baranof, and Dall Islands. No recoveries in British Columbia were made from 2 taggings carried out off Chicagof Island in 1963. In 1964, British Columbia-bound pinks were present off Coronation Island.

3. Chum salmon

Recoveries were made from 1961, 1962, and 1964 tagging locations extending north from Latitude 55°00' (off Dall Island) to Latitude 58°35' (off Lituya Bay). See Figure 6. A total of 33 recoveries were made and of these 11 were made in British Columbia. In the 1961-1964 period British Columbia-bound chums were present off Lituya Bay and off the west coasts of Chicagof, Kruzof, Baranof, and Dall Islands. The presence of British Columbia-bound chum salmon off the west coast of Southeast Alaska was shown in each of the 3 years of tagging.

4. Coho salmon

Figure 7 shows the 1961-1964 tagging locations which were dispersed along most of the Southeast Alaska coast. A total of 25 tagged coho were recovered and 15 of these were recovered in British Columbia. British Columbia-bound coho were present in 1961 and 1962 off the west coasts of Chicagof, Kruzof, Baranof, and Dall Islands. A single tagging off Chicagof Island in 1963 resulted in no recoveries in British Columbia.

5. Chinook salmon

Taggings which resulted in recoveries were few and restricted to the years 1961 and 1964 (see Figure 8). In all, only 5 tagged chinooks were recovered and 2 of these were recovered in British Columbia. These 2 recoveries were from a 1961 tagging off Dall Island and a 1964 tagging off Baranof Island.

The presence of Alaska-bound salmon adjacent to the west coast of British Columbia

Taggings off British Columbia's west coast were more limited in number and area tagged than those made off Southeast Alaska. Figure 3 shows tagging locations off British Columbia's west coast for the years 1961, 1962, and 1964. No tagging was done within 25 miles of the west coast in 1963.

Also included in the figure is the location of a 1962 tagging in Hecate Strait.

With the exception of 1 coho, recoveries in Alaska were limited to pink salmon. A total of 129 pinks were recovered from all taggings and of these 50 were recovered in Alaska. Alaska-bound pink salmon were shown to be present in 1961, 1962, and 1964 off the northwest end of Graham Island and in 1961 and 1964 off Cape St. James.

In 1962, 1 pink salmon tagged in Hecate Strait was recovered in Alaska.

One coho tagged off Graham Island in 1962 was recovered in Alaska.

C. Summary

1. Salmon were tagged within 25 nautical miles of the west coast of Southeast Alaska in 1957, 1958, and in the years 1961 to 1964. Taggings within 25 nautical miles of British Columbia's west coast were carried out in 1961, 1962, and 1964. In all years of tagging, some salmon tagged off the coast of one country were recovered in the waters of the other.

2. British Columbia-bound salmon were shown to be present off the west coast of Southeast Alaska from Latitude 55°00' (off Dall Island) to as far north as Latitude 58°35' (off Lituya Bay). Alaska-bound salmon were shown to be present off the west coast of the Queen Charlotte Islands, B. C. between Latitudes 52°03' and 54°10'. In addition, a single recovery in Alaska of salmon tagged in Hecate Strait, B. C. in 1962 indicates the presence of Alaska-bound fish in that area in that year.

3. British Columbia-bound sockeye and chinook were shown to be present off the west coast of Southeast Alaska in all years for which information for these species is available: 1957, 1958, and 1961 to 1964 in the case of sockeye;

and 1961 and 1962 in the case of chinook. British Columbia-bound pinks were shown to be present off the west coast of Southeast Alaska in 1957, 1958, 1961, 1962, and 1964; chums in 1961, 1962, and 1964; and coho in 1961 and 1962.

4. Alaska-bound pink salmon were shown to be present off the west coast of the Queen Charlotte Islands in each of the 3 years that tagging was carried out (1961, 1962 and 1964). Recoveries in Alaska of other species was limited to a single coho which was tagged off Graham Island in 1962.

5. The presence of British Columbia-bound salmon off the Southeast Alaska west coast (in 6 out of 6 years of tagging) demonstrates that some British Columbia-bound salmon commonly approach British Columbia waters from a northerly direction and in doing so migrate closely along the Southeast Alaska west coast. The frequency of recoveries in Alaska from taggings off British Columbia (in 3 out of 3 years) suggests that some Alaska-bound salmon approach the west coast of the Queen Charlotte Islands while on their way to Alaska waters.

Table I. Distribution of recoveries of pink and sockeye tagged off the west coast of Southeast Alaska in 1957 and 1958.

Species	Year	Place Tagged	Number Tagged	Recovered in tagging area	Recovered outside tagging area				
					Inside B.C.	Border* B.C.	Border* Alaska	Inside Alaska	Total
Pink	1957	Cape Addington	7,524	951	1,139	147	179	558	2,023
		Cape Ulitka	3,961	1,000	448	38	100	373	959
		Pt. Desconocida	3,162	55	1	0	90	307	398
	1958	Cape Addington, Roller Bay, Granite Point	3,205	180	125	17	181	702	1,025
		Cape Ulitka	1,738	132	25	4	52	361	442
		Pt. Desconsocida	2,482	239	3	0	119	464	586
Sockeye	1957	Cape Addington	500	64	73	13	17	20	123
	1958	Cape Addington	1,119	49	101	2	55	168	326
		Roller Bay	19	1	6	1	1	4	12
		Granite Point	77	2	12	1	2	8	23
		Cape Ulitka	291	27	12	0	16	55	83

*Recoveries in border areas include fish recovered in British Columbia and Alaska where specific areas of recapture are not known.

Table II. Recoveries from 1961-1964 taggings carried out within 25 nautical miles of the west coast of Southeast Alaska.

Year	Tagging Location		Number and location of recoveries by species																
			Sockeye			Pink			Chum			Coho			Chinook			All Species		
	Lat.	Long.	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total
1961	56°31'	135°20'	2	1	3	..	..	..	1	1	2	..	..	..	..	..	..	3	2	5
	56°22'	135°20'	1	0	1	1	7	8	..	..	..	..	..	..	..	..	..	2	7	9
	56°54'	135°58'	3	0	3	18	17	35	0	1	1	0	1	1	..	..	..	21	19	40
	56°30'	135°15'	..	..	..	..	..	..	0	1	1	..	..	..	..	..	..	0	1	1
	57°09'	136°00'	..	..	..	..	..	..	1	0	1	..	..	..	..	..	..	1	0	1
	56°54'	135°57'	..	..	..	..	..	..	..	..	..	2	0	2	..	..	..	2	0	2
	56°40'	135°17'	..	..	..	..	..	..	..	..	..	1	0	1	..	..	..	1	0	1
	58°19'	137°17'	0	1	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	1
	58°18'	137°10'	0	2	2	0	2	2	0	4	4	..	..	..	..	..	..	0	8	8
	58°17'	137°09'	0	1	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	1
	58°20'	137°13'	0	7	7	0	14	14	0	4	4	..	..	..	..	..	..	0	25	25
	58°20'	137°14'	0	1	1	0	6	6	..	..	..	..	..	..	..	..	..	0	7	7
	58°19'	137°09'	..	..	..	1	22	23	0	1	1	..	..	..	..	..	..	1	23	24
	58°23'	137°20'	..	..	..	0	2	2	..	..	..	0	1	1	..	..	..	0	3	3
	59°02'	138°34'	..	..	..	0	1	1	..	..	..	..	..	..	..	..	..	0	1	1
	58°22'	137°17'	..	..	..	..	..	..	0	1	1	..	..	..	..	..	..	0	1	1
	58°21'	137°20'	..	..	..	..	..	..	0	2	2	..	..	..	..	..	..	0	2	2
	55°00'	133°55'*	1	0	1	1	0	1	1	1	2	1	0	1	1	0	1	5	1	6
	Totals		7	13	20	21	71	92	3	16	19	4	2	6	1	0	1	36	102	138
1962	57°23'	136°02'	2	0	2	0	1	1	2	0	2	2	0	2	..	..	..	6	1	7
	57°50'	137°00'	0	1	1	6	5	11	0	1	1	..	..	..	..	..	..	6	7	13
	57°19'	136°17'	..	..	..	0	2	2	2	1	3	4	1	5	..	..	..	6	4	10
	57°24'	136°00'	..	..	..	0	2	2	1	0	1	1	1	2	..	..	..	2	3	5
	56°49'	136°05'	..	..	..	..	..	..	0	1	1	..	..	..	..	..	..	0	1	1
	56°57'	135°45'	..	..	..	..	..	..	..	..	..	0	2	2	..	..	..	0	2	2
	58°03'	137°02'	1	2	3	4	10	14	0	2	2	..	..	..	..	..	..	5	14	19
	55°56'	135°15'*	..	..	..	2	11	13	..	..	..	2	0	2	..	..	..	4	11	15
	55°00'	134°05'	3	0	3	4	2	6	2	1	3	1	1	2	..	..	..	10	4	14
	55°00'	133°30'	..	..	..	14	9	23	..	..	..	1	0	1	..	..	..	15	9	24
	Totals		6	3	9	30	42	72	7	6	13	11	5	16	..	..	..	54	56	110
1963	57°23'	136°24'	1	0	1	0	2	2	..	..	..	0	1	1	..	..	..	1	3	4
	57°18'	136°02'	..	..	..	0	2	2	..	..	..	..	..	..	..	..	..	0	2	2
	57°10'	136°23'	1	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1
	Totals		2	0	2	0	4	4	..	..	..	0	1	1	..	..	..	2	5	7
1964	58°35'	137°44'	..	..	..	0	2	2	1	0	1	0	1	1	..	..	..	1	3	4
	58°27'	138°02'	..	..	..	0	1	1	..	..	..	..	..	..	..	..	..	0	1	1
	56°50'	136°00'	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	1	0	1
	56°17'	135°03'	..	..	..	0	2	2	..	..	..	..	..	..	..	..	..	0	2	2
	56°30'	135°27'	..	..	..	0	12	12	..	..	..	..	..	..	..	..	..	0	12	12
	55°26'	134°00'	0	1	1	0	1	1	..	..	..	..	..	..	0	1	1	0	3	3
	55°51'	134°28'	2	0	2	3	17	20	..	..	..	0	1	1	..	..	..	5	18	23
	55°51'	134°38'	0	1	1	0	3	3	..	..	..	..	..	..	0	2	2	0	6	6
	56°35'	136°08'	..	..	..	0	1	1	..	..	..	..	..	..	..	..	..	0	1	1
	Totals		2	2	4	3	39	42	1	0	1	0	2	2	1	3	4	7	46	53

*Canadian taggings: All others carried out by the United States.

Table III. Recoveries from 1961-1964 taggings carried out within 25 nautical miles of the west coast of British Columbia.

Year	Tagging Location		Number and location of recoveries by species																	
			Sockeye			Pink			Chum			Coho			Chinook			All Species		
	Lat.	Long.	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total	B.C.	Alaska	Total
1961	54°10'	133°14'	..	..	..	4	0	4	..	..	..	..	..	..	..	..	..	4	0	4
	54°00'	133°20'	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1
	52°00'	131°10'	14	0	14	9	2	11	1	0	1	..	..	..	3	0	3	28	2	30
	Totals		14	0	14	13	2	15	1	0	1	..	..	..	3	0	3	33	2	35
1962	54°10'	133°30'	2	0	2	4	4	8	..	..	..	1	1	2	..	..	..	7	5	12
	54°07'	133°37'	..	..	..	20	31	51	..	..	..	1	0	1	..	..	..	21	31	52
	54°05'	133°46'																		
	54°00'	133°46'	..	..	..	1	0	1	..	..	..	..	..	..	..	..	..	1	0	1
	52°33'	130°50'	..	..	..	3	1	4	..	..	..	..	..	..	..	..	..	3	1	4
	52°20'	132°10'	3	0	3	8	0	8	..	..	..	..	..	..	..	..	..	11	0	11
	51°50'	136°06'	..	..	..	..	..	..	1	0	1	1	0	1	..	..	..	2	0	2
	48°30'	125°40'	..	..	..	6	0	6	..	..	..	1	0	1	..	..	..	7	0	7
	Totals		5	0	5	42	36	78	1	0	1	4	1	5	..	..	..	52	37	89
1963	Nil																			
1964	52°03'	131°36'	..	..	..	0	1	1	..	..	..	..	..	..	..	..	..	0	1	1
	48°56'	126°08'	2	0	2	2	0	2	2	0	2	..	..	..	..	..	..	6	0	6
	54°10'	133°12'*	..	..	..	11	7	18	..	..	..	..	..	..	..	..	..	11	7	18
	52°04'	131°18'*	..	..	..	11	4	15	..	..	..	..	..	..	..	..	..	11	4	15
	Totals		2	0	2	24	12	36	2	0	2	..	..	..	..	..	..	28	12	40

*United States taggings: All others carried out by Canada.

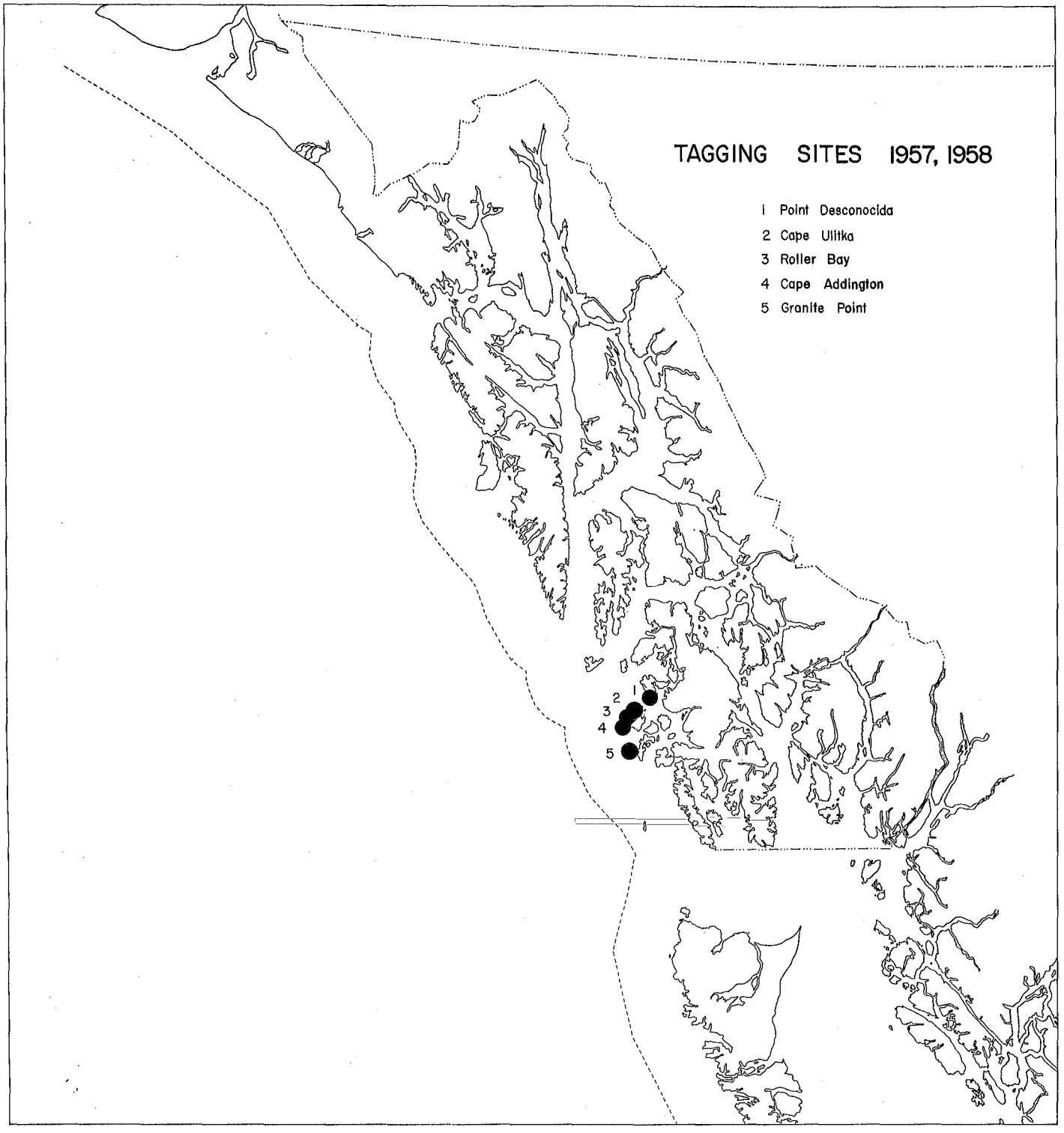


Figure 1. West coast tagging sites for pink and sockeye salmon in Southeast Alaska in 1957 and 1958. The offshore line is located approximately 25 nautical miles from lines joining headlands.

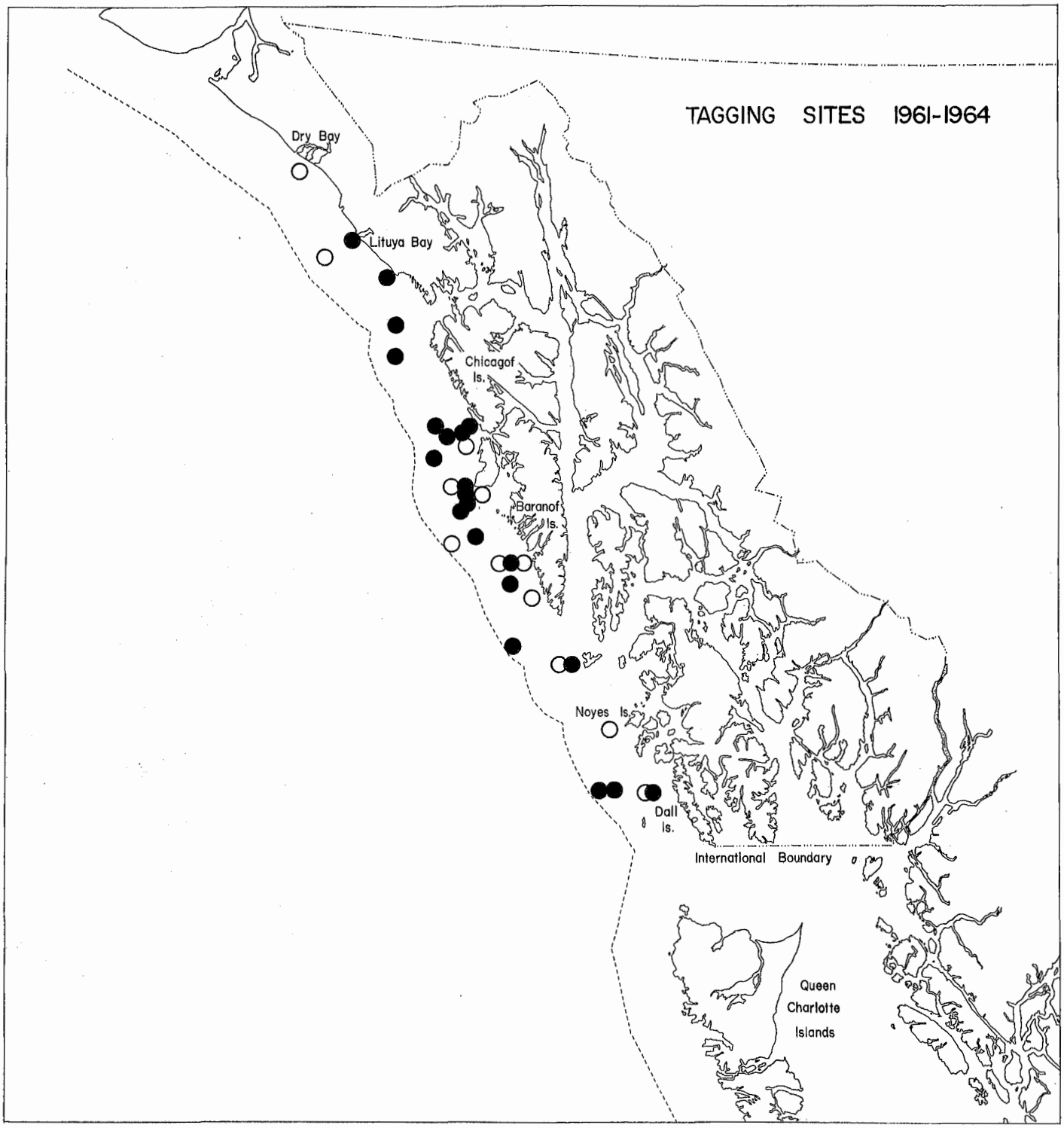


Figure 2. Tagging sites off the west coast of Southeast Alaska, 1961 to 1964. The solid symbols represent locations from which some recoveries were made in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

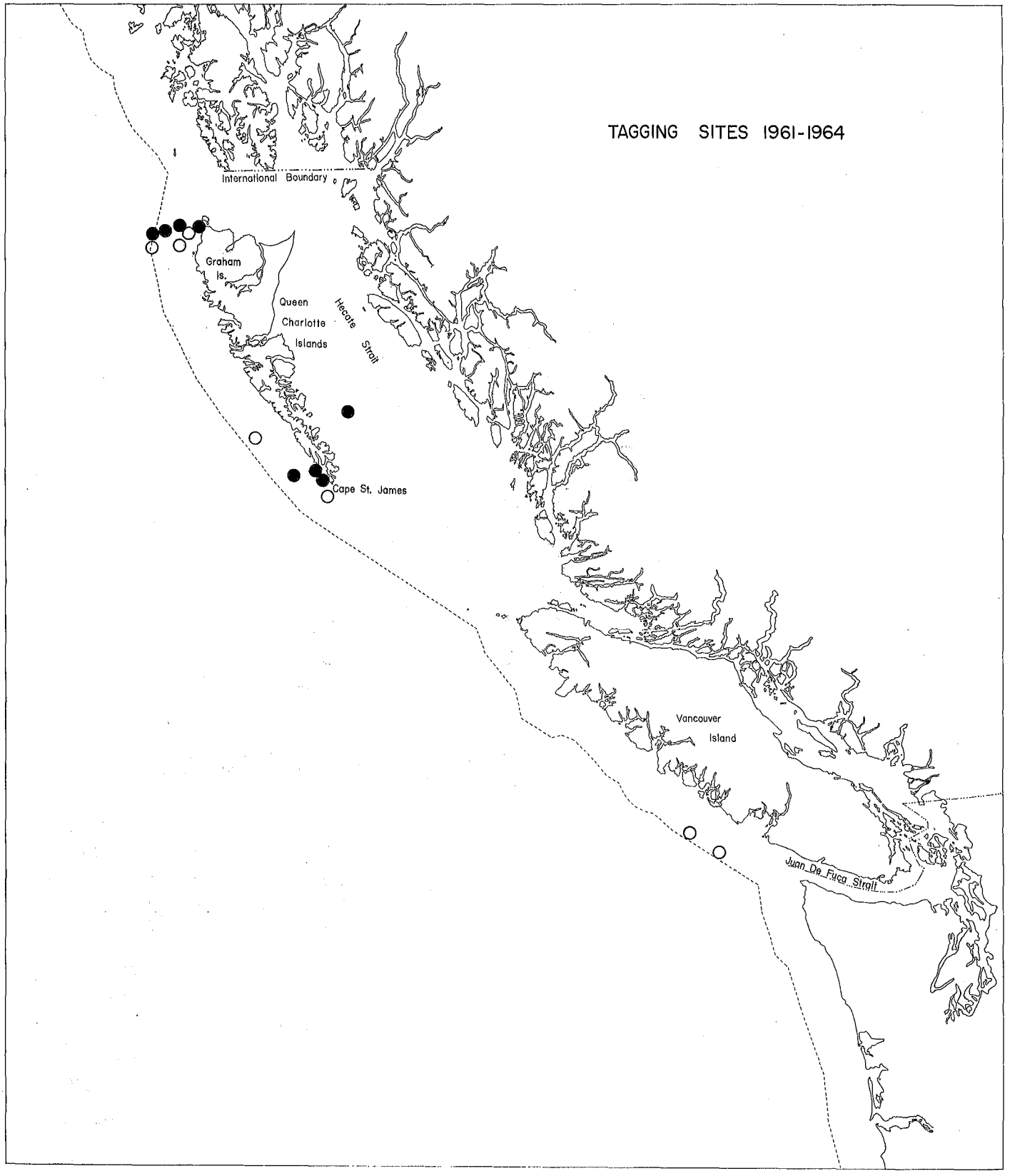


Figure 3. Tagging sites off the west coast of British Columbia, 1961 to 1964. The solid symbols show locations from which some recoveries were made in Alaska. The offshore line is located approximately 25 nautical miles from lines joining headlands.

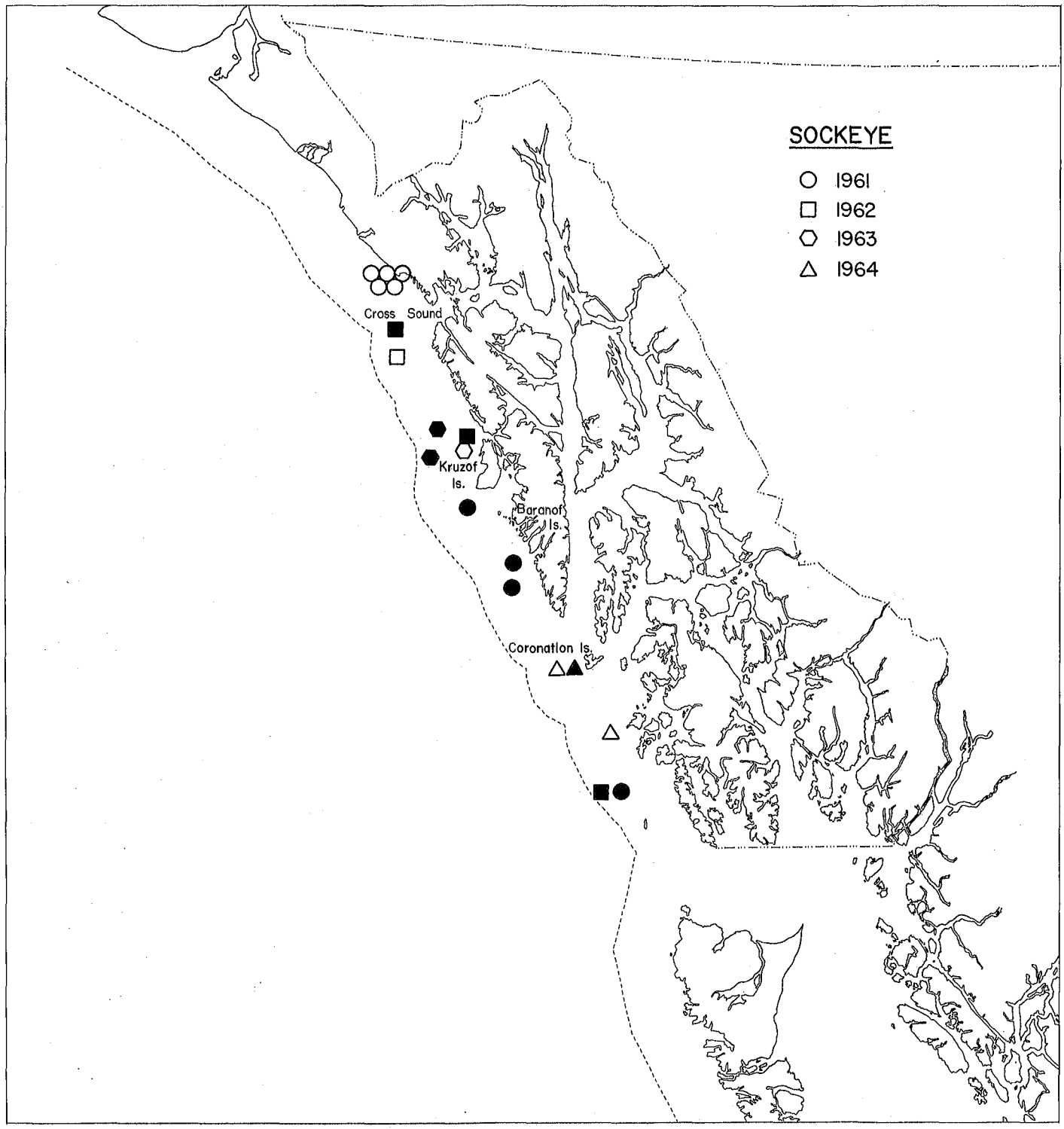


Figure 4. Sockeye tagging sites off the west coast of Southeast Alaska for the years 1961-1964. Solid symbols represent taggings resulting in some recoveries in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

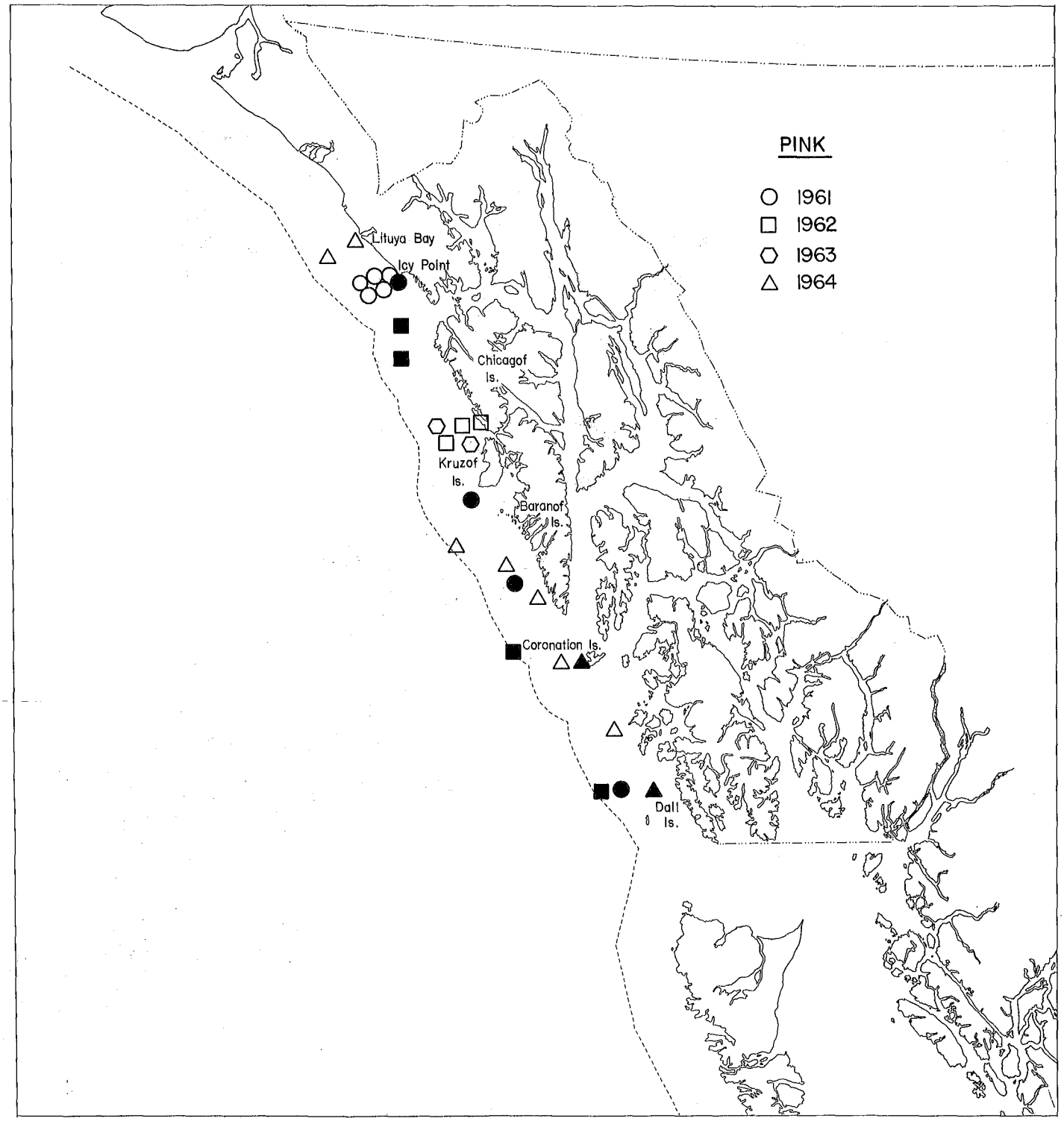


Figure 5. Pink tagging sites off the west coast of Southeast Alaska for the years 1961-1964. Solid symbols represent taggings resulting in some recoveries in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

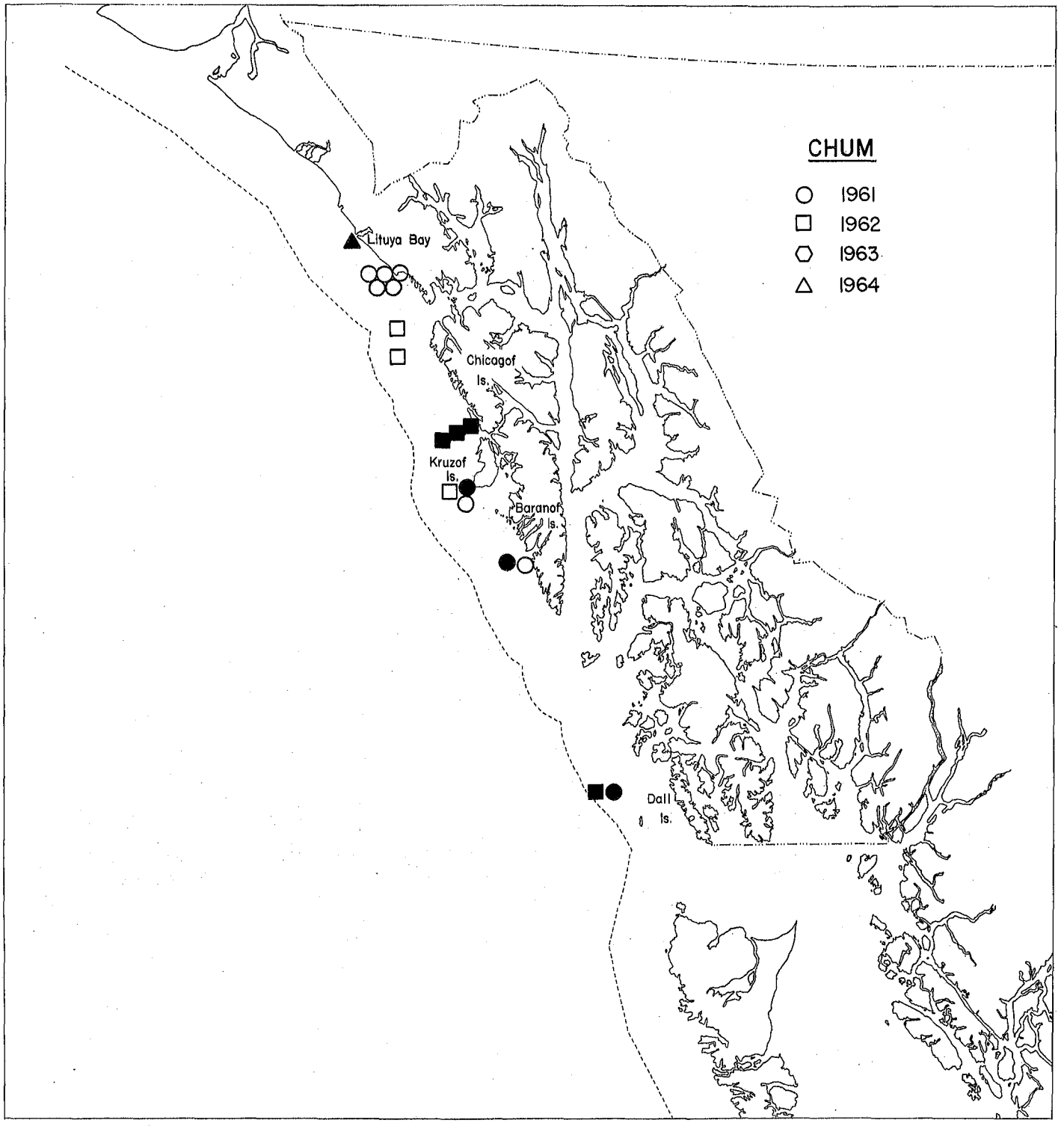


Figure 6. Chum tagging sites off the west coast of Southeast Alaska for the years 1961-1964. Solid symbols represent taggings resulting in some recoveries in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

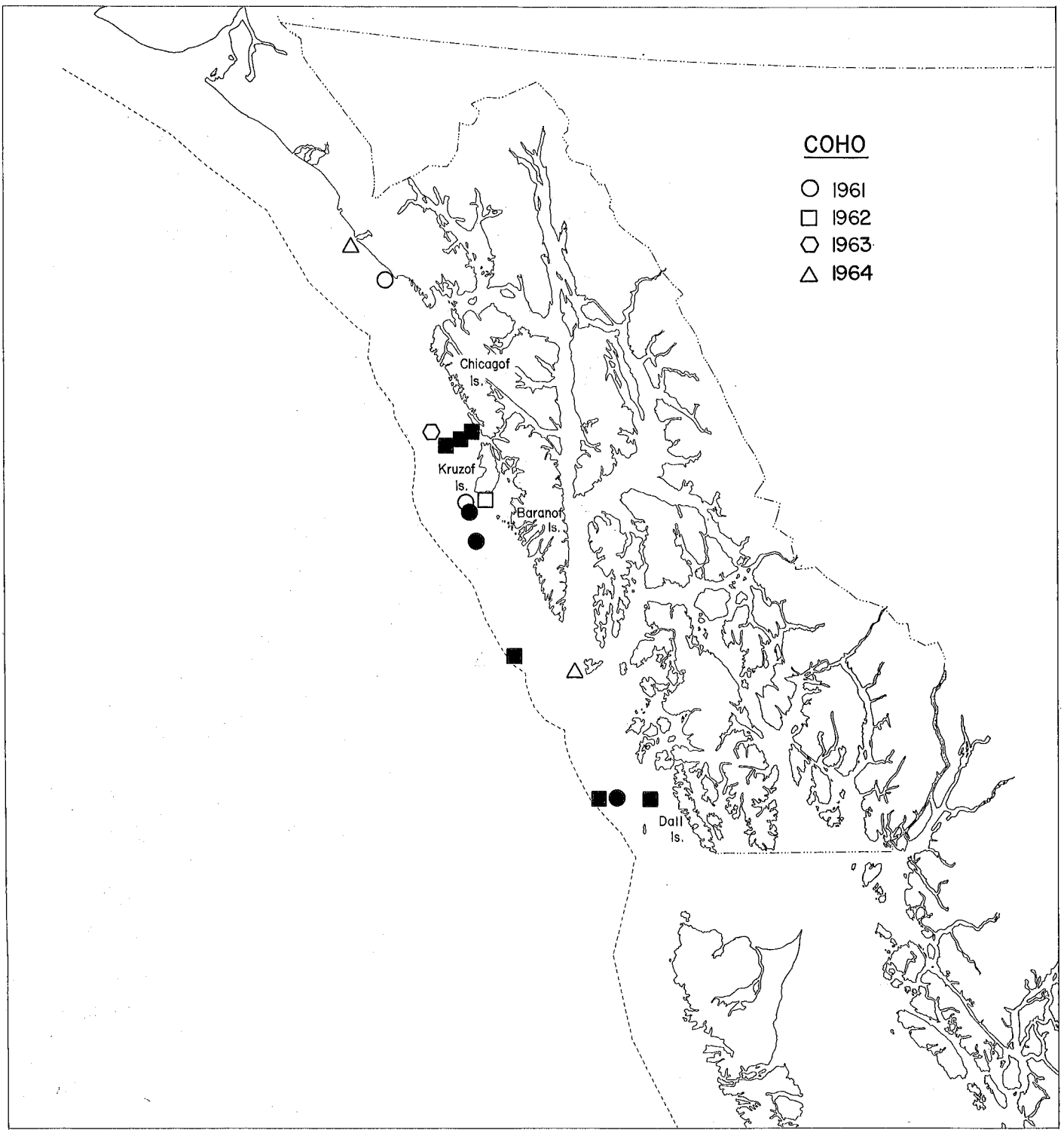


Figure 7. Coho tagging sites off the west coast of Southeast Alaska for the years 1961-1964. Solid symbols represent taggings resulting in some recoveries in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

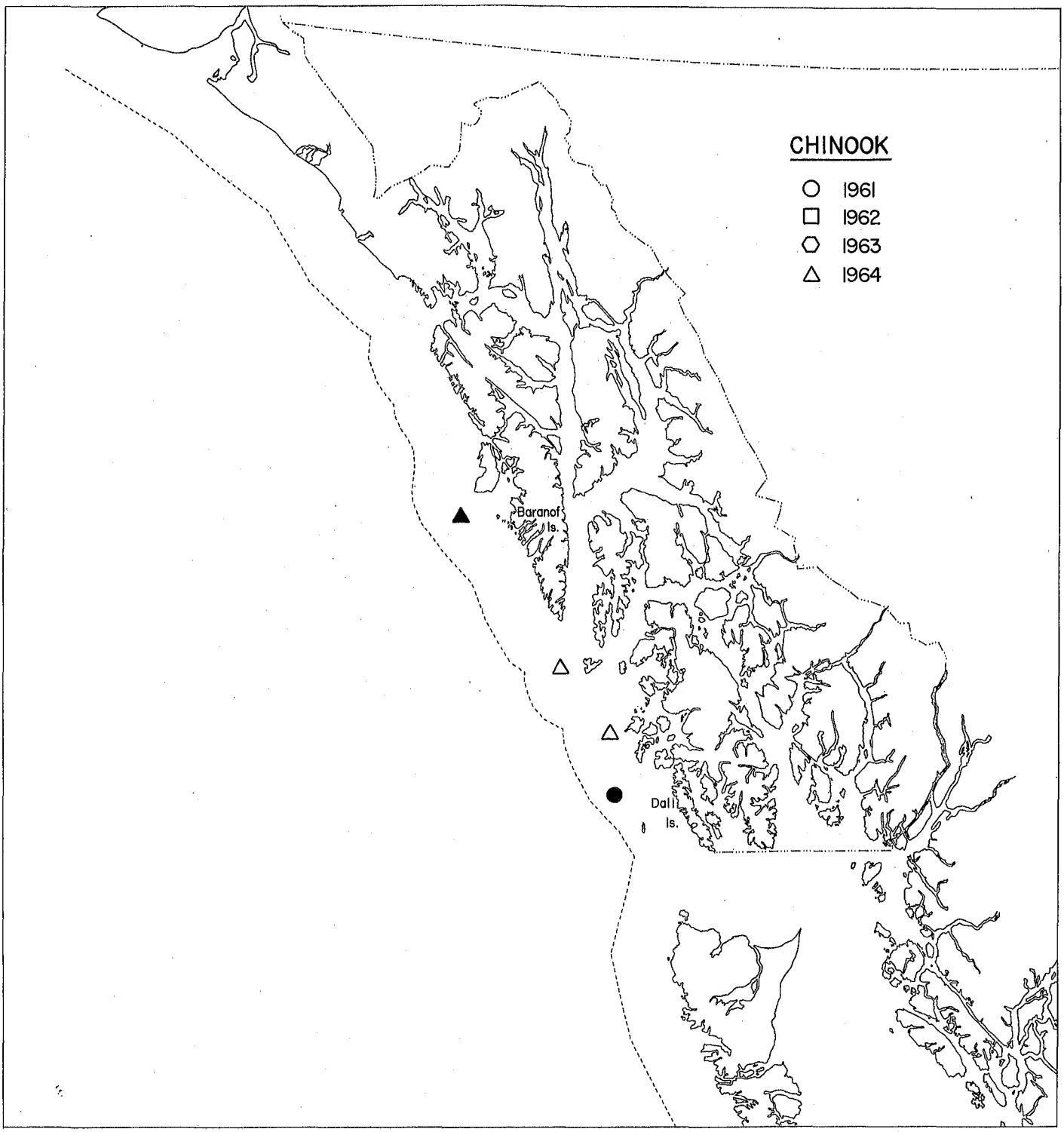


Figure 8. Chinook tagging sites off the west coast of Southeast Alaska for the years 1961-1964. The solid symbols represent taggings resulting in some recoveries in British Columbia. The offshore line is located approximately 25 nautical miles from lines joining headlands.

A note on the use of the word "minimum" with estimates of interception contained in the Report of the Committee on Problems of Mutual Concern Related to the Conservation and Management of Salmon Stocks in Southeast Alaska and Northern British Columbia.

When estimates of interception were summarized in the Committee's Report, estimates for certain areas were lacking due to insufficient data from these areas and could not be included in the totals or percentages given. This was indicated by plus signs following estimates given in Tables I and II of the report and by describing estimates as minimal in conclusions Numbers 6 and 7.

Estimates of the interception of Alaska-bound pinks in 1957 and 1958 and of sockeye in 1958 in British Columbia Areas 3, 4, and 5 were described as minimum because of the lack of estimates for some Nass River (Area 3) subareas. In 1957 and 1958, no estimates were made by the United States for subareas 3X and 3Z, and by Canada for subarea 3Z and the eastern one-half of subarea 3Y. In 1958 the United States did not estimate sockeye interception in subareas 3X and 3Z and Canadian figures were lacking for the eastern one-half of subarea 3Y. The catches in these subareas were described as "mixed", i.e., unknown proportions of Alaska and British Columbia-bound fish.

Approximations of interception in these subareas can be made by assuming that the proportion of Alaska-bound fish present is the same as shown in the nearest adjoining area. This has been done below using figures from the Canadian Report only. It must be pointed out that the figures given are considered to be overestimates because in each case the proportion of Alaska fish in an "outside" subarea (3Y or its western one-half) has been applied to the catch in an "inside" area (3Z or the eastern one-half of 3Y) where the proportion of Alaska-bound fish would probably be considerably smaller.

1. Pinks, 1957 and 1958.

(A) Subarea 3Z - assuming the same proportion of Alaska-bound fish as in adjoining subarea 3Y, then the catches of Alaska-bound pinks in 1957 and 1958 would be 1,010 and 199,456, respectively.

(B) The eastern one-half of subarea 3Y - if it is assumed that the proportion of Alaska-bound fish is the same as in the western one-half of this subarea, then the catch of Alaska-bound pinks in the whole of subarea 3Y in 1958 would be 106,265.

2. Sockeye, 1958

(A) The eastern one-half of subarea 3Y - assuming that the proportion of Alaska-bound sockeye is the same as in the western one-half, then the catch of Alaska-bound sockeye in the whole of subarea 3Y would be 25,175.

When the above values for subareas 3Y and 3Z are combined with those available for other areas, estimates of the total numbers of Alaska-bound pinks and sockeye taken in British Columbia Areas 3, 4, and 5 are provided. In the following table, these estimates are compared to the "minimum estimates" given in the Committee's Report.

	Catch in Areas 3, 4, and 5	Number and percent bound for Alaska			
		"Minimum estimates" from Committee's Report using Canadian data		Revised estimates	
		Number	Percent	Number	Percent
Sockeye 1958	1,075,554	18,427+	1.7+	31,008	2.9
Pink 1957	3,168,878	5,058+	0.2+	6,068	0.2
1958	2,062,795	151,529+	7.3+	404,149	19.6

Even though the revised estimate include what are considered to be overestimates of interception in subareas 3Y and 3Z, they do not greatly exceed the "minimum estimates" except in the case of pinks in 1958 (an increase of 252,620). The true number of Alaska-bound fish intercepted probably lies between the two values given.

Notes on the effect of interception at Noyes Island, Southeast Alaska, on British Columbia salmon stocks.

Extensive tagging programs in 1957 and 1958 indicated clearly that United States fisheries off the west coast of Prince of Wales Island, particularly in the Noyes Island area, intercepted salmon bound for British Columbia. In these years tagging data were sufficient to permit estimation of the actual numbers of Canada-bound sockeye and pinks intercepted.

Tagging in years subsequent to 1957 and 1958, indicated that Canada-bound salmon commonly approach from the north. Although tagging was not conducted within areas where Alaskan commercial fleets were operating, results suggest that interception could have occurred in most years. In the present report detailed information on the destination of sockeye and pinks intercepted at Noyes Island in 1957 and 1958 is presented. In addition, to gain some idea of the effects of interception on Canadian pink and sockeye stocks, estimates of the numbers of Canada-bound salmon taken in Alaska's Noyes Island fishery from 1951 to 1964 (based on 1957 and 1958 data) are compared with the catches in British Columbia Statistical Areas 3 and 4 (where most of the fish intercepted in 1957 and 1958, were bound).

A. The estimated number of sockeye and pinks intercepted at Noyes Island and bound for specific British Columbia areas.

Canadian estimates of the numbers of British Columbia-bound sockeye and pinks taken by the United States fishery in the Noyes Island area (Southeast Alaska Statistical Areas 121 and 122) are given below:

		Total catch at Noyes Island	Estimated percent and number bound for British Columbia	
			Percent	Number
Sockeye	1957	233,650 (Area 121)	68.3	159,500
	1958	55,553 (Area 121)	36.0	19,991
		4,727 (Area 122-11)	7.2	342
Pink	1957	2,818,143 (Area 121)	70.7	1,992,100
	1958	496,326 (Area 121)	8.7	43,192
		467,691 (Area 122)	1.5	7,000

Estimates of the number of sockeye and pinks which were bound for specific areas of British Columbia can be made from the number of recoveries from the 1957 and 1958 taggings at Noyes Island which were made in each British Columbia area (see Table I, and Tables II to V). For example, in 1957, 1,741 pinks tagged at Noyes Island were recovered at known locations in British Columbia. Of these, 75 were recovered in Area 5. The estimated number of Area 5 bound pinks intercepted at Noyes Island is therefore -

$\frac{75}{1,741} \times 1,992,100$ (the total for British Columbia) or 85,817 pinks.

A certain amount of error arises from this method of estimating. It is assumed that tag recovery effort was constant throughout British Columbia. This was undoubtedly not the case. However, as most tag recoveries were made in commercial fisheries, and as fishing rates do not usually vary markedly from area to area, the error is probably not large. Further error may result from the recovery in one area of fish destined for another. The areas in which this is known to occur to a large extent are subareas 3X and 3Y. To correct for this, recoveries from the 1957 and 1958 Canadian taggings in subareas 3X and 3Y were used to determine the numbers and final destination of 3X and 3Y bound pinks intercepted at Noyes Island. Despite the above limitations the method used is considered to provide a reasonable breakdown as to area of origin of the intercepted salmon.

From estimates provided in Tables II to IV the following observations can be made:

1. Pinks, 1957, (Table II).

Of the total of 1,992,100 British Columbia-bound pinks taken at Noyes Island, 1,495,421 or 75.1% were destined for the Skeena River and 128,568 or 6.5% for the Nass River. Relatively small numbers proceeded to areas as far south as Area 29.

2. Pinks, 1958, (Table III).

A total of 50,192 pinks caught in Alaska Areas 121 and 122 were destined for British Columbia. Of these, 20,718 or 41.3% were bound for the Skeena River, 10,394 or 20.7% for the Nass River, and 8,055 or 16.0% for Queen Charlotte Island areas. Relatively smaller numbers proceeded to British Columbia Areas 5 to 12.

3. Sockeye, 1957, (Table IV).

A total of 159,500 British Columbia-bound sockeye was taken in Alaska Area 121. Of this total, 126,403 or 79.2% were going to the Skeena River and 12,702 or 8.0% for the Nass River. The remainder were bound for areas as far south as Area 29.

4. Sockeye, 1958, (Table V).

Of the 20,333 British Columbia-bound sockeye taken in Alaska Areas 121 and 122, 14,510 or 71.4% were destined for the Skeena River and 3,000 or 14.8% for the Nass River. Small numbers were bound for areas as far south as Area 29.

B. The effect of 1957 and 1958 interception at Noyes Island on the Skeena River sockeye and pink runs.

1. Sockeye, 1957 and 1958.

The catch of Skeena River-bound sockeye in 1957 in Alaska Area 121 was estimated to be 126,403. This amounts to 14% of the total run of 891,403 (this total includes the Alaska catch) and 45% of the Area 4 catch (282,209). In 1958, the catch of 14,510 Skeena River-bound sockeye in Alaska Areas 121 and 122-11 amounts to 1% of the total Skeena run of 1,441,110 and 2% of the Area 4 catch (602,070).

2. Pinks, 1957 and 1958.

The interception in 1957 of 1,495,421 Skeena-bound pinks in Alaska Area 121 amounts to 29% of the total Skeena run of 5,234,737 and 53% of the total catch of Skeena-bound pinks in Areas 3 and 4. In 1958, 20,718 of the pinks caught in Alaska Areas 121 and 122 were Skeena River-bound. This amounts to 1% of the total Skeena run of 1,592,555 and 2% of the Area 4 catch.

C. The interception of British Columbia-bound sockeye and pinks in recent years

Data on which to base estimates of interception are available only for 1957 and 1958; the two years of large-scale taggings. In these years, 68.3% and 36.0% of the Noyes Island sockeye catch and 70.7% and 8.7% of the pink catch was estimated to consist of British Columbia-bound fish.

The substantial differences in the proportions of British Columbia-bound fish in these two years probably reflects differences in the migration routes of the salmon as they approach British Columbia streams. The 1957 tagging revealed that the approach was largely from the north. In 1958, tagging indicated a more southerly approach. These two years appear to represent two quite different, if not extreme, situations with respect to the interception of British Columbia-bound salmon at Noyes Island. Estimates of interception for other years based on 1957 and 1958 results may, therefore, provide some idea of the possible long-term effect on British Columbia stocks and catch.

In Tables VI and VII estimates of the number of sockeye and pinks intercepted at Noyes Island (Southeast Alaska Area 121) are given for the years 1951 to 1964. Two estimates are provided for each year; one based on the proportions of British Columbia-bound fish in the Noyes Island catch in 1957, the other on 1958 proportions. These estimates are compared to the Canadian

catch in British Columbia Areas 3 and 4 (the bulk of the fish intercepted in 1957 and 1958 were bound for the Nass and Skeena Rivers).

From the figures provided in Tables VI and VII the following observations can be made:

1. If British Columbia-bound sockeye and pinks approached from the north each year and the proportions in the Noyes Island catch were as shown in 1957, then 1,082,000 sockeye and 9,399,000 pinks were intercepted in the 14-year period 1951 to 1964. This amounts to 10.9% of the sockeye catch and 50.9% of the pink catch in Areas 3 and 4 during the same period. For individual years (strike years not considered) the number of sockeye intercepted has been as low as 3.8% and as high as 37.5% of the combined Areas 3 and 4 catch. The number of pinks intercepted in any one year has been from 3.7% to 149.2% of the Areas 3 and 4 catch.

2. Assuming a more southerly approach and the 1958 proportions of British Columbia-bound fish in the Noyes Island catch, then from 1951 to 1964, 570,000 sockeye and 1,156,000 pinks were intercepted. These figures amount to 5.7% and 6.3% of the combined catch in Areas 3 and 4 for the same period of years. For individual years (strike years not considered) sockeye interception was as little as 1.7% and as much as 19.8% of the Areas 3 and 4 catch. Pink interception was from 1.9% to 18.5% of the Areas 3 and 4 catch.

With present information, it is not possible to assess to what extent the 1957 and 1958 data are representative of the general situation at Noyes Island. However, tagging in other years indicates that British Columbia-bound pinks and sockeye commonly approach from the north and it is likely that interception along the west coast would be a common occurrence. Further tagging experiments would be required to give a more accurate picture of the extent of variation in degree of interception.

Table I. British Columbia recoveries of pink and sockeye salmon tagged in Alaska's west coast district in 1957 and 1958.

Year		Areas of recovery																		
		Unknown	1	2	3	4	5	6	7	8	9	10	12	13	14	19	20	28	29	Total
									Pink											
1957	Fishery	33	2	39*	318	1,116	75	51	59	32	6	2	29	6	1	1	1	..	3	1,774
	Stream	..	..	4	..	81	6	2	..	1	..	..	2	..	..	..	..	1	1	98
1958	Fishery	2	11	18**	67	67	8	7	1	2	..	..	2	..	..	..	..	..	..	185
	Stream	..	..	2	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	5
									Sockeye											
1957	Fishery	1	1	..	15	60	4	1	..	..	..	..	2	2	..	..	..	..	..	86
	Stream	..	..	..	..	11	..	..	..	..	..	..	..	..	..	..	..	..	..	11
1958	Fishery	1	1	1	25	92	7	2	4	..	..	..	2	..	..	..	..	..	..	135
	Stream	..	..	..	..	101	1	..	..	..	..	..	..	..	..	..	..	..	..	102

*Mainly 2 AE

**Mainly 2 BE

Table II. Destination of British Columbia-bound pink salmon caught in Area 121 in 1957.

Area	No. destined for B. C. areas	No. of 3X bound pinks destined for other areas	No. of 3Y bound pinks destined for other areas	Total	Percent
British Columbia					
1	2,288	..	..	2,288	0.1
2	44,625	..	..	44,625	2.2
3X	12,706	..	..	..	..
3Y	266,833	..	..	..	..
3Z	84,323	829	43,416	128,568	6.5
4	1,276,950	10,843	207,628	1,495,421	75.1
5	85,817	248	4,578	90,643	4.5
6	58,355	183	2,510	61,048	3.1
7	67,509	172	2,510	70,191	3.5
8	36,615	97	1,329	38,041	1.9
9	6,865	43	591	7,499	0.4
10	2,288	22	295	2,605	0.1
12-29	46,926	118	1,920	48,964	2.5
B. C. Totals	1,992,100	12,555	264,777	1,989,893	99.9
Alaska		151	2,056	2,207	0.1

Table III. Destination of British Columbia-bound pink salmon caught in Areas 121 and 122 in 1958.

Area	No. destined for B. C. areas	No. of 3Y bound pinks destined for other areas	Total	Percent
1	3,017	..	3,017	6.0
2	4,937	101	5,038	10.0
3X	0	..	..	..
3Y	9,325	..	..	..
3Z	9,051	1,343	10,394	20.7
4	18,376	2,342	20,718	41.3
5	2,194	424	2,618	5.2
6	1,920	202	2,122	4.2
7	274	40	314	0.6
8	549	50	599	1.2
12	549	11	560	1.1
B. C. Totals	50,192	4,513	45,380	90.4
Alaska		4,812	4,812	9.6

Table IV. Destination of British Columbia-bound sockeye salmon caught in Area 121 in 1957.

Area	No. destined for B.C. areas	No. of 3X bound sockeye destined for other areas	No. of 3Y bound sockeye destined for other areas	Total	Percent
British Columbia					
1	1,876	..	..	1,876	1.2
2	0	..	..	..	..
3X	2,165	..	..	..	..
3Y	17,321	..	..	..	..
3Z	8,661	211	3,830	12,702	8.0
4	112,588	1,703	12,112	126,403	79.2
5	7,506	140	766	8,412	5.3
6	1,877	18	96	1,991	1.2
7	..	17	95	112	0.1
12,13,29	7,506	44	335	7,885	4.9
B. C. Totals	159,500	2,133	17,234	159,381	99.9
Alaska		32	87	119	0.1

Table V. Destination of British Columbia-bound sockeye salmon caught in Areas 121 and 122 in 1958.

Area	No. destined for B. C. areas	No. of 3X and 3Y bound sockeye destined for other areas	Total	Percent
1	152	..	152	0.7
2	152	7	159	0.7
3X	316	..	..	..
3Y	632	..	..	..
3Z	2,846	154	3,000	14.8
4	13,960	550	14,510	71.4
5	1,062	47	1,109	5.5
6	303	13	316	1.6
7	607	0	607	3.0
8	0	7	7	..
12,13,29	303	0	303	1.5
B. C. Totals	20,333	778	20,163	99.2
Alaska		170	170	0.8

Table VI. Estimates of sockeye interception at Noyes Island, 1951-1964, assuming 1957 or 1958 proportions of British Columbia-bound fish in the catch.

Year	Catch in Alaska Area 121	No. of B. C.-bound fish caught		Catch in B. C. Areas			No. of B. C.-bound fish caught in Alaska Area 121 as proportion of the catch in B. C. Areas 3 and 4	
		Using 1957 data	Using 1958 data	3	4	Total	Percent using 1957 data	Percent using 1958 data
	1000's	1000's		1000's				
1951	18	12	6	226	692	918	13.4	7.1
1952	27	18	10	304	1,295	1,599	11.5	6.1
1953	146	99	52	198	659	857	11.6	6.1
1954	92	62	33	102	572	674	9.3	4.9
1955	56	38	20	158	157	315	12.1	6.4
1956	77	53	28	255	149	404	13.0	6.9
1957	234	160[1]	84	143	282	425	37.5[1]	19.8
1958	56	38	20[1]	399	602	1,001	3.8	2.0[1]
1959	190	129	68	227	196	423[2]	30.6	16.1
1960	129	88	46	133	186	319	27.6	14.5
1961	52	36	19	281	895	1,176	3.0	1.7
1962	139	95	50	218	484	702	13.6	7.1
1963	138	95	50	29	142	171[2]	55.3	29.1
1964	231	158	83	170	766	936	16.9	8.9
Totals	1,584	1,082	570	2,843	7,077	9,920	10.9	5.7

[1]Firm figures calculated from 1957 and 1958 tagging data.

[2]Strike reduced catch.

Table VII. Estimates of pink interception at Noyes Island, 1951-1964, assuming 1957 or 1958 proportions of British Columbia-bound fish in the catch.

Year	Catch in Alaska Area 121	No. of B. C.-bound fish caught		Catch in B. C. Areas			No. of B. C.-bound fish caught in Alaska Area 121 as proportion of the catch in B. C. Areas 3 and 4	
		Using 1957 data	Using 1958 data	3	4	Total	Percent using 1957 data	Percent using 1958 data
	1000's	1000's		1000's				
1951	620	438	54	1,204	452	1,656	26.4	3.3
1952	478	338	42	291	1,451	1,742	19.4	2.4
1953	765	541	67	246	426	672	80.5	10.0
1954	287	203	25	563	739	1,302	15.6	1.9
1955	95	67	8	461	1,330	1,791	3.7	0.4
1956	1,763	1,247	153	1,005	416	1,421	87.8	10.8
1957	2,818	1,992[1]	245	701	2,342	3,043	65.5[1]	8.1
1958	496	351	43[1]	682	901	1,583	22.2	2.7[1]
1959	615	434	53	229	577	806[2]	53.8	6.6
1960	502	355	44	68	170	238	149.2	18.5
1961	438	309	38	348	1,054	1,402	22.0	2.7
1962	1,095	774	95	294	580	874	88.6	10.9
1963	2,067	1,462	180	134	491	625[2]	233.9	28.8
1964	1,255	887	109	357	965	1,322	67.1	8.2
Totals	13,294	9,399	1,156	6,583	11,894	18,477	50.9	6.3

[1]Firm figures calculated from 1957 and 1958 tagging data.

[2]Strike reduced catch.

ABUNDANCE AND TIMING OF SALMON RUNS TO ALASKA PASSING THROUGH DIXON ENTRANCE

Considerable numbers of Alaska-bound salmon approach their spawning grounds through Dixon Entrance. In some years Canadian net fisheries intercept parts of these runs, primarily at Dundas Island in Statistical Area 3. There is little doubt that, if fishing were not limited by the position of the present surf-line (Fig. 1), Canadian fisheries could extend seaward along the International Boundary and the degree of interception would undoubtedly be greater. The purpose of the present report is to summarize information on the destination of Alaskan salmon which could be intercepted by Canadian fishermen in the Dixon Entrance area and to provide data on the abundance of these stocks.

(a) Destination of Alaskan salmon passing through Dixon Entrance.

In recent years pink salmon have formed the bulk of the salmon caught in Southeast Alaska (pinks provided two-thirds of the total Southeastern Alaska salmon pack from 1955 to 1965). For pinks there have been a number of tagging experiments conducted in waters adjacent to the International Boundary from Cape Muzon inshore to Boston and Tracy Islands at the entrance to Portland Inlet (Fig. 2 and 3). From these taggings (both in British Columbia and in Alaska), 16,904 recoveries were made in Alaska (Table I). For 15,602 of these, data on the areas of recovery were sufficiently well documented to permit inclusion in the analysis. Of these, at least[1] 13,619 (87.3%) were recovered in Alaskan statistical areas adjacent to the International Boundary (Areas 101, 111, 112, 113, 123 -- see Appendix I for location of statistical areas). An additional 773 (5.0%) were recovered in the so-called west coast area (now covered by Areas 121 and 122)[1]. Only 1210 (7.7%) were recovered in Alaskan areas to the north.

These data indicate that most Alaskan pinks present along the International Boundary in Dixon Entrance would be bound for the Alaskan border areas mentioned above. Taggings further north in Southeastern Alaska (primarily in the Sumner Strait region) provided some recoveries in Alaskan areas adjacent to the International Boundary (118 or 10.1% of the 1167 well-

---

[1]Most (531 out of 773) of the recoveries in the so-called "west coast district" resulted from taggings in 1947. In this year recovery data are available only for large statistical areas, most of which overlap with modern statistical areas. Many, perhaps most, of the recoveries listed as being made in the west coast district in 1947 were actually made in Area 123, but precise information to permit estimation of the number that would fall into this category is lacking. Thus the 13,619 recoveries (87.3% of the Alaskan returns) listed as recoveries made in areas adjacent to the International Boundary is minimal and the true figure is perhaps close to 90% of all recoveries made in Alaska.

documented recoveries made in Alaska), but the majority, 985 or 84.4%, were made in the central part of Southeastern Alaska (Sumner Strait, Northern and Central Clarence Strait and the Stikine area). Considering that the runs in these northern areas have been generally smaller than those to the south, these data suggest that a relatively small part of the pink runs to Alaskan areas adjacent to the International Boundary had approached through the inside passage to the north. Taggings off the west coast of Prince of Wales Island provided over three-and-a-half times as many recoveries in areas adjacent to the border than in Alaskan statistical areas to the north (1402 compared to 391 -- see Table I), suggesting that in the area off the Alaskan coast northwestward from Dixon Entrance, among Alaska-bound pinks most would pass through Dixon Entrance.

The foregoing suggests that the great majority of pink salmon bound for Alaskan areas adjacent to the International Boundary (Alaskan Statistical Areas 101, 111, 112, 113 and 123) approach through Dixon Entrance and that relatively few pinks bound for other Alaskan areas would be found in Dixon Entrance.

Tagging data for chums and sockeye are not as complete, but a preliminary inspection of the data suggests that the migration routes of these species in Southeastern Alaska is similar to that of the pinks. Information on the movements of coho and chinook are virtually lacking.

(b) Catches of pink, chum and sockeye salmon in Alaskan statistical areas adjacent to the International Boundary (Areas 101, 111, 112, 113 and 123).

As shown in Table II, pinks form the bulk of the salmon catch in the Alaskan border statistical areas (1951 to 1963 average 3.3 million pinks, or 74% of the average total catch of 4.6 million salmon). Most pinks were caught in Areas 101 and 112, the "inside" areas. In some years tagging indicates catches in the latter two areas could contain substantial numbers of pinks bound for British Columbia. Recently, annual pink catches in the border areas have varied from just under a million (0.72 million in 1960) to over 6 million (6.46 million in 1962).

Chums are the next most abundant species in the catches of the Alaska border areas providing an annual catch of from a quarter of a million to over one million, and an average for the 1951 to 1963 period of 0.75 million.

Sockeye catches in this area are relatively small (recently varying from just under 0.1 million to over 0.3 million, with a 1951-1963 average of 0.15 million). Again tagging indicates that some of these sockeye would have been bound for British Columbia streams.

Incomplete statistics indicate that coho catches in these areas average about a quarter of a million annually and the chinook catch about 68,000 annually.

It is known that runs to these Alaska border areas intermingle extensively with salmon bound for British Columbia as they migrate inshore.

This extensive mixing has been noted as far north as the Noyes Island fishery off the west coast of Prince of Wales Island where it occurs throughout most of the fishing season (Fig. 4 and 5). It is likely that this mixing extends into Dixon Entrance (indeed in 1958, Alaskan- and British Columbia-bound pinks were mixed to a considerable extent at Dundas Island) and that any Canadian fishery operating in Dixon Entrance would catch Canadian-bound salmon as well as those bound for Alaska. Such fishing of Canadian stocks seaward from present fishing areas might create serious domestic management problems. Tagging in various parts of Dixon Entrance would be required to determine the extent of mixing and to assess the consequences in management of Canadian salmon stocks of development of a Canadian fishery in the outer waters of the Entrance.

Examination of catch data (Fig. 6 and 7) suggests that there is some segregation in timing between pinks bound for Cordova Bay and southern Clarence Strait (Areas 123, 113 and, to some extent, Area 112) as opposed to those bound for other southern Southeastern Alaskan areas (Areas 101 and 111) and for British Columbia. In both even- and odd-numbered years from 1957 to 1960, catches in Area 123 (Cordova Bay) and Area 113 (southeastern Clarence Strait) were made mainly in the latter half of August, whereas those in Area 101 and British Columbia Areas 3 and 4 were made mainly before mid-August. Pink catches in Area 112 (southwestern Clarence Strait) spanned both periods. The same type of segregation occurs for sockeye (Fig. 8), but because the location of fishing is determined largely by the availability of the more abundant pink salmon (sockeye are taken mainly incidentally with pinks), the observed differences in timing of catches may not reflect real differences in the timing of the sockeye runs themselves.

The foregoing suggests that, at least for pink salmon, some segregation exists in the timing of runs and that pinks bound for Alaska (particularly for Cordova Bay and southern Clarence Strait) would form a high proportion of the run available for exploitation in the outer part of Dixon Entrance late in the season. Pink stocks bound for these areas provided an average of at least 33% of the pink catch in Alaskan statistical areas adjacent to the International Boundary.

(c) Summary.

Salmon runs approaching Alaska through Dixon Entrance provide annual catches in Alaska averaging 4.6 million fish (range 1.3 to just under 9 million in the 1951 to 1963 period). Most of these are pinks. These fish all pass through Canadian waters (on the basis of the position of the present International Boundary) en route to Alaska and might be available to a Canadian fishery if one extended seaward beyond the present surf-line. Preliminary data indicate that to a considerable extent these runs are mixed with runs to Canadian streams as both groups migrate through Dixon Entrance. However, an average of about one-third of the Alaska-bound pinks would approach late in the season after Canada-bound fish had left the Dixon Entrance area. Further tagging would be required to determine the true extent of mixing of the runs earlier in the season.

Table I. Recoveries from pink salmon taggings in southern Southeastern Alaska and Northern British Columbia, 1924 to 1958.

Tagging area	Recoveries													
	Alaska												British Columbia	Total
	Sumner Strait District (Areas 141, 142, 143 and 144), Stikine District (Area 130), Northern and Central Sections (Areas 115 and 114), Clarence Strait District.		North Behm, Southeast and Southwest Sections (Areas 111, 112 and 113), Clarence Strait District, Southern District (Area 101) and Cordova Bay (Area 123).		West Coast District (Areas 121 and 122 only).		Other Southeastern Alaska areas (Area 15A and northward).		Unknown Alaskan areas	Total Alaskan recoveries			
	No.	%*	No.	%*	No.	%*	No.	%*	No.	No.	No.	No.	No.	
Southern District (Area 101) North Behm and Southeast Sections Clarence Strait District (Areas 111 and 112)	458	5.1	8,283	93.0	164**	1.8	2	<0.1	1,032	9,939	349	10,288		
Southwest Section Clarence Strait District (Area 113)	654	16.1	2,999	73.9	399**	9.8	7	0.2	223	4,282	1	4,283		
Cordova Bay (Area 123)	64	3.2	1,741	86.2	209	10.3	6	0.3	7	2,027	6	2,033		
British Columbia Areas 3, 4 and 5	18	2.9	596	96.8	1	0.2	1	0.1	40	656	4,874	5,530		
Total "border areas"	1,194	7.6	13,619	87.3	773	5.0	16	0.1	1,302	16,904	5,230	22,134		
West Coast District (Areas 121 and 122 only)	391	6.1	1,402	21.9	4,603	71.8	17	0.3	106	6,519	1,957	8,476		
Sumner Strait District (Areas 142, 143, 144 only)	985	84.4	118	10.1	24	2.1	40	3.4	23	1,190	3	1,193		

*Percentages are calculated from the total number of well-documented Alaskan recoveries, i.e., they are based on the total Alaskan recoveries less the recoveries from "unknown Alaskan areas".

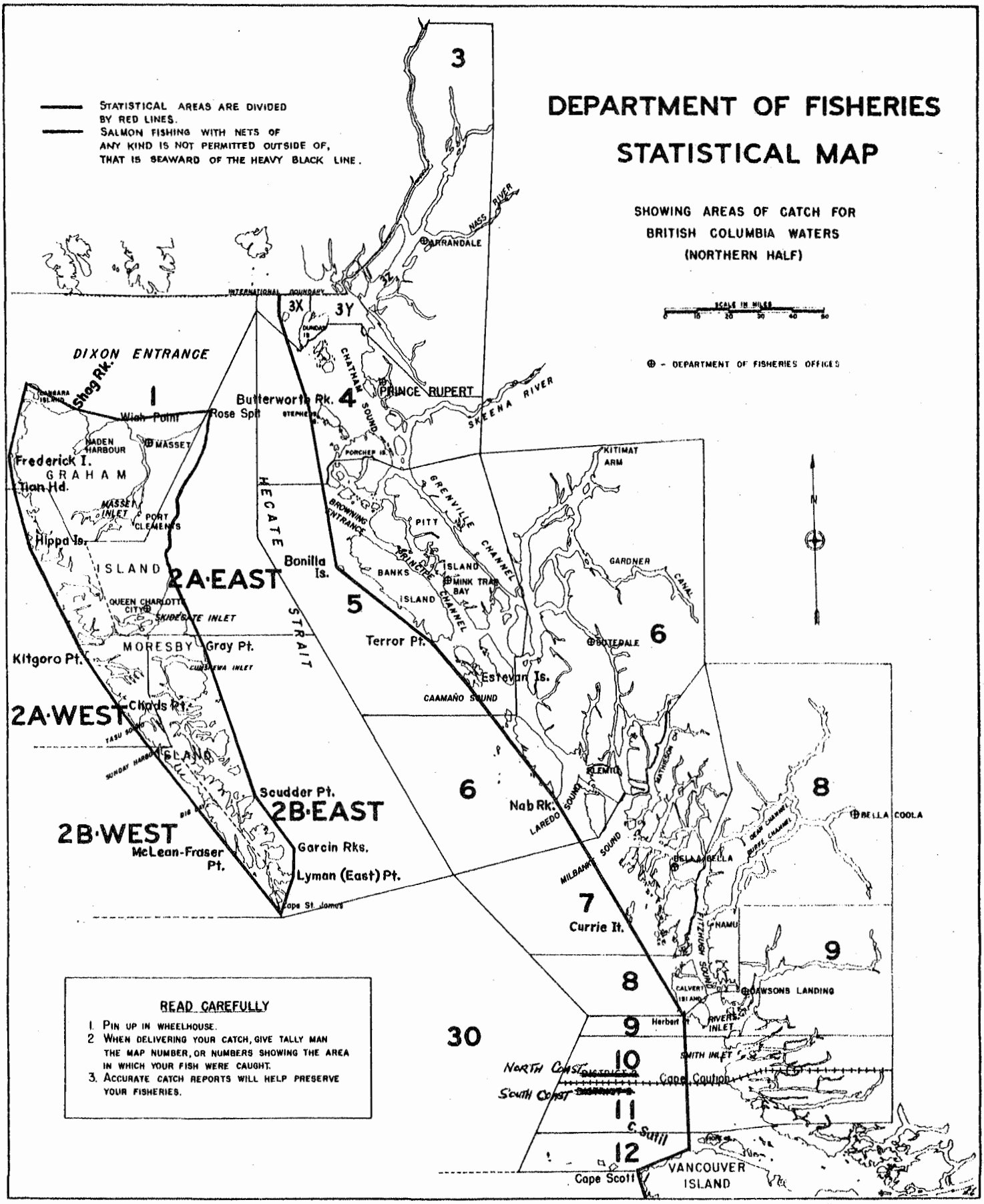
**The recoveries in the West Coast District from the 1947 taggings in the Southern District, and in the North Behm, Southeast and Southwest sections of the Clarence Strait District were grouped together. The majority of the recoveries indicated above in areas 121 and 122 were probably recovered in Cordova Bay (Area 123).

Table II. Catches of pink, chum and sockeye salmon in Southeastern Alaska areas adjacent to the International Boundary, 1951 to 1963.

Areas	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	Average	Areas	1963	Average
Pink																
101	3,137,233	3,544,000	928,000	1,764,000	602,000	1,851,300	383,510	2,092,503	681,800	430,428	426,574	2,445,012	1,523,863			
111*							41,451	203,228	125,100	27,228	119,012	208,086	120,684	101	661,703	2,280,255
112	1,045,000	740,000	367,000	1,051,000	389,700	1,149,000	236,653	1,137,173	309,410	151,873	430,509	2,239,740	770,588			
113	2,333,000	913,000	362,000	738,000	136,000	1,238,300	248,021	683,509	56,023	60,429	191,852	944,820	658,746	102	747,413	665,567
123	496,000	185,000	231,000	171,600	900,000	1,030,000	138,580	428,069	155,177	51,542	766,024	622,539	431,294	103**	501,540	436,698
Total							1,048,215	4,544,482	1,327,510	721,500	1,933,971	6,460,197	3,505,175		1,910,656	3,382,520
Chum																
101	400,855	441,000	413,000	286,000	27,000	110,000	172,721	276,092	145,732	166,756	60,208	98,118	216,457			
111*							8,180	32,097	5,656	4,208	20,926	13,189	14,043	101	70,101	285,529
112	94,000	175,000	58,000	61,000	31,500	92,000	64,303	106,683	20,648	26,835	59,925	85,892	72,982			
113	361,000	960,000	522,000	231,000	109,000	765,117	664,989	343,913	152,652	106,974	210,377	173,048	383,339	102	91,638	360,900
123	85,000	31,000	61,000	108,800	80,000	119,000	107,392	178,705	59,845	39,379	230,463	176,066	106,388	103**	89,842	105,114
Total							1,017,585	937,490	384,533	344,152	581,899	546,313	793,209		251,581	751,543
Sockeye																
101	46,538	51,000	156,000	51,500	36,100	87,200	66,464	165,478	38,379	28,180	58,564	72,551	71,496			
111*							4,226	21,138	4,213	827	1,010	3,286	5,783	101	36,005	108,140
112	36,000	33,234	45,000	43,550	27,058	48,000	44,789	88,528	22,156	6,018	20,275	27,862	36,873			
113	31,000	40,000	33,700	23,000	18,500	19,000	21,628	38,282	5,668	2,657	3,774	3,953	20,097	102	15,978	19,780
123	24,000	16,000	48,000	88,230	22,000	9,000	10,296	28,867	21,260	10,255	14,614	1,659	24,515	103**	9,380	23,350
Total							147,403	342,293	91,676	47,937	98,237	109,311	158,764		61,363	151,270

*Catch statistics not available for Area 111 for the years 1951 to 1956.

**The catch figures shown for Area 103 include catches only in those subareas which make up the former Area 123.


STATISTICAL AREAS ARE DIVIDED BY RED LINES.
SALMON FISHING WITH NETS OF ANY KIND IS NOT PERMITTED OUTSIDE OF, THAT IS SEAWARD OF THE HEAVY BLACK LINE.
DEPARTMENT OF FISHERIES
STATISTICAL MAP
SHOWING AREAS OF CATCH FOR BRITISH COLUMBIA WATERS (NORTHERN HALF)
SCALE IN MILES
0 10 20 30 40 50
⊕ - DEPARTMENT OF FISHERIES OFFICES
3
3X
3Y
1
2A·EAST
2A·WEST
2B·EAST
2B·WEST
4
5
6
7
8
9
10
11
12
30
DIXON ENTRANCE
Shag Rk.
Wisk Point
Rose Spit
Butterworth Rk.
PRINCE RUPERT
SKEENA RIVER
NASS RIVER
INTERNATIONAL BOUNDARY
CHATHAM SOUND
HECATE STRAIT
Frederick I.
GRAHAM
Tian Hd.
MASSET
MADEN HARBOUR
MASSET INLET
PORT CLEMENTS
Hippa Is.
ISLAND
QUEEN CHARLOTTE CITY
SKIDEGATE INLET
MORESBY
Gray Pt.
Kitgoro Pt.
Clinds Pt.
Scudder Pt.
McLean-Fraser Pt.
Garcin Rks.
Lyman (East) Pt.
Cape St. James
Bonilla Is.
Terror Pt.
BROWNING ENTRANCE
GRENVILLE CHANNEL
PITT ISLAND
BANKS ISLAND
PRINCESS CHANNEL
MINK TRAP BAY
KITIMAT ARM
GARDNER CANAL
BOTEDALE
Estevan Is.
CAAMAÑO SOUND
Nab Rk.
LAREDO SOUND
KLEMTU
MATHIESON CHANNEL
MILBANKE SOUND
BELLA BELLA
BELLA COOLA
DEAN CHANNEL
FITZHUGH SOUND
NAMU
Currie It.
CALVERT ISLAND
GOWSONS LANDING
RIVERS INLET
SMITH INLET
Herbert
NORTH COAST DISTRICT
SOUTH COAST DISTRICT
Cape Caution
C. Sutil
Cape Scott
VANCOUVER ISLAND
READ CAREFULLY
1. PIN UP IN WHEELHOUSE.
2. WHEN DELIVERING YOUR CATCH, GIVE TALLY MAN THE MAP NUMBER, OR NUMBERS SHOWING THE AREA IN WHICH YOUR FISH WERE CAUGHT.
3. ACCURATE CATCH REPORTS WILL HELP PRESERVE YOUR FISHERIES.
THIRD EDITION JUNE 1957

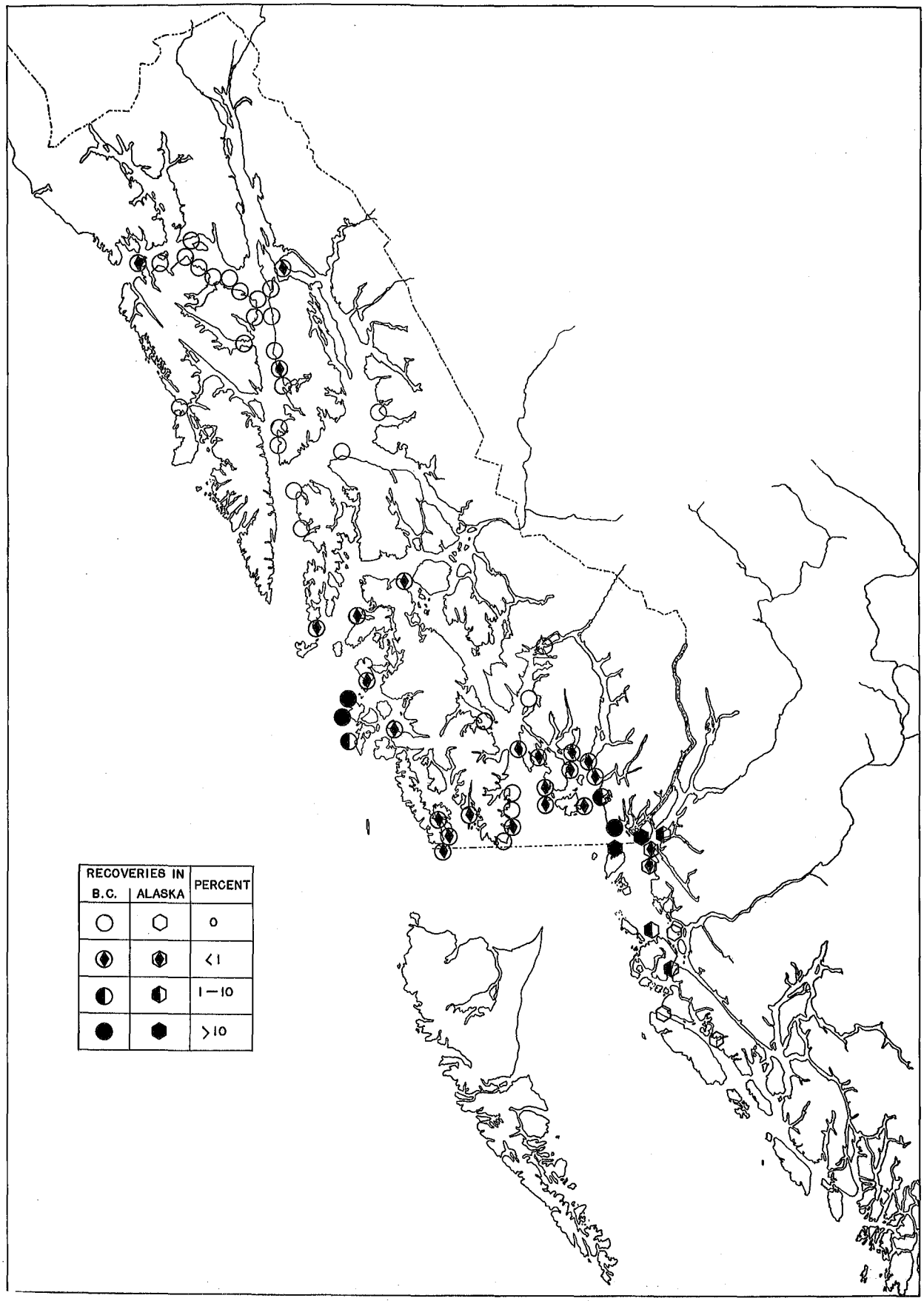


Figure 2 Pink salmon tagging sites in Southeastern Alaska and northern British Columbia, 1924-1958, indicating approximate proportions of recoveries from British Columbia taggings made in Alaska and of recoveries from Alaskan taggings made in British Columbia.

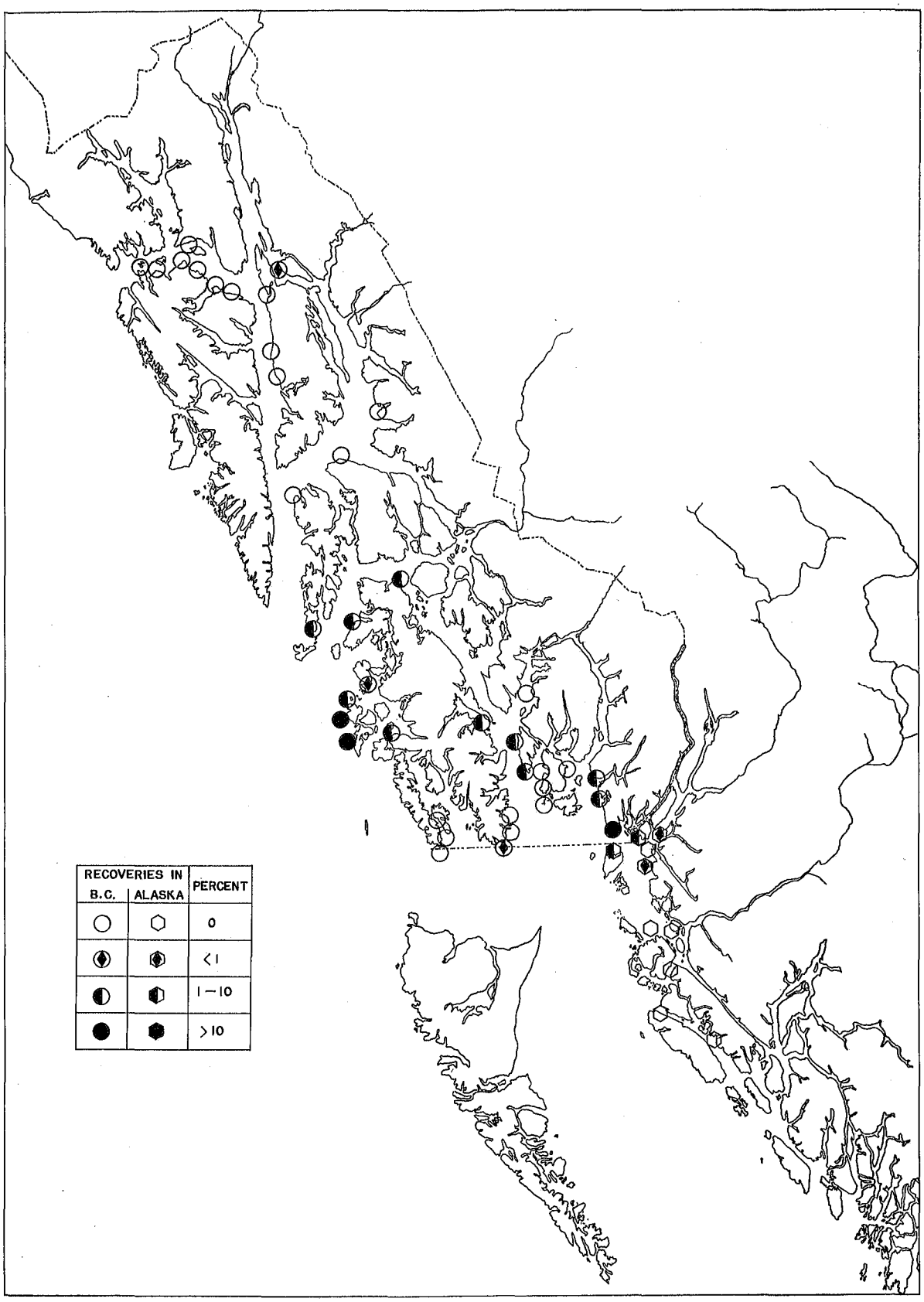


Figure 3. Sockeye salmon tagging sites in Southeastern Alaska and northern British Columbia, 1924-1958, indicating approximate proportions of recoveries from British Columbia taggings made in Alaska and of recoveries from Alaskan taggings made in British Columbia.

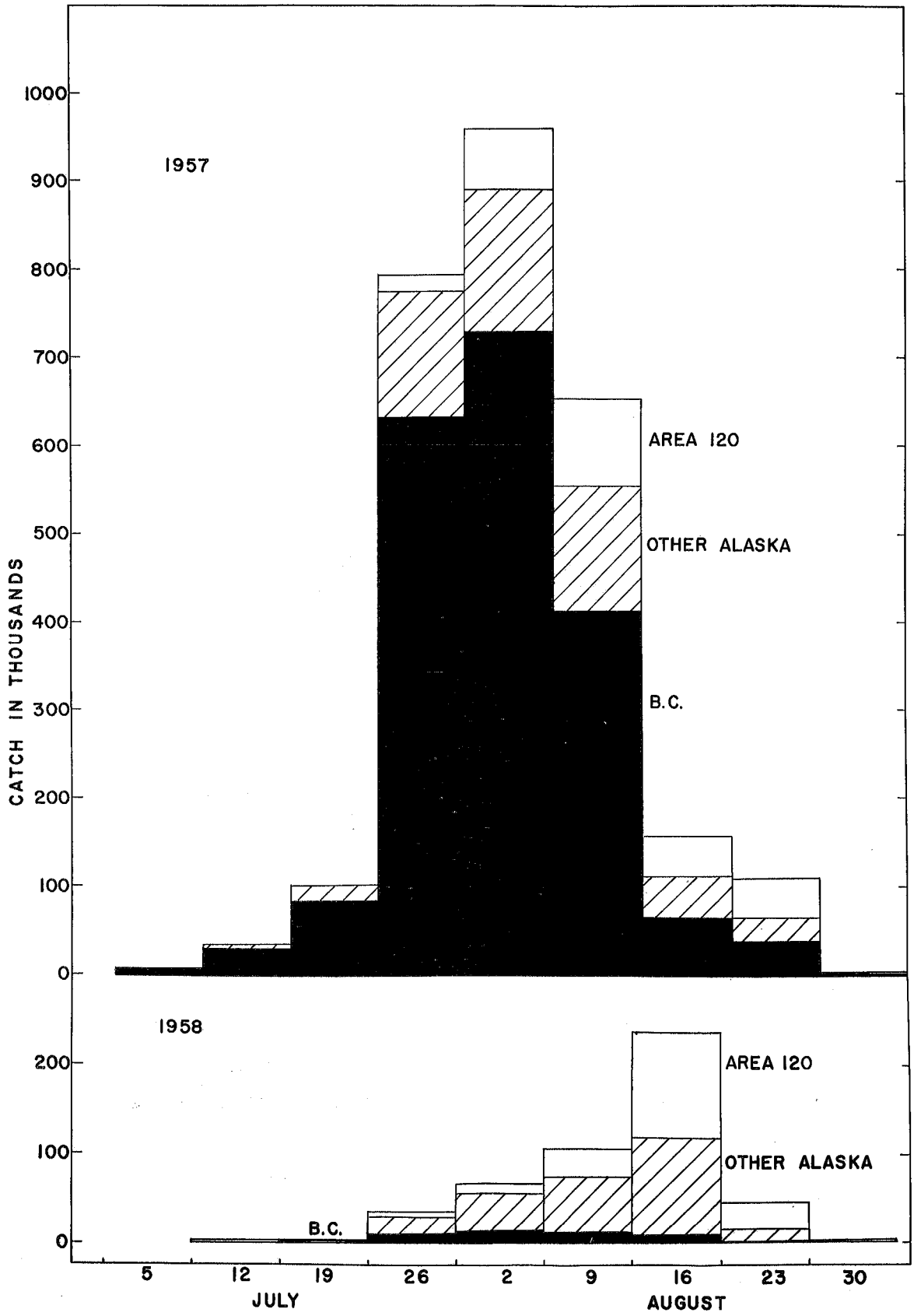


Fig. 4. Estimated numbers of pink salmon caught at Noyes Island bound for British Columbia, Alaska area 120, and other Alaskan areas in 1957 and 1958. "Other Alaska" recoveries were made mainly in Alaska border areas 101, 111, 112 and 113.

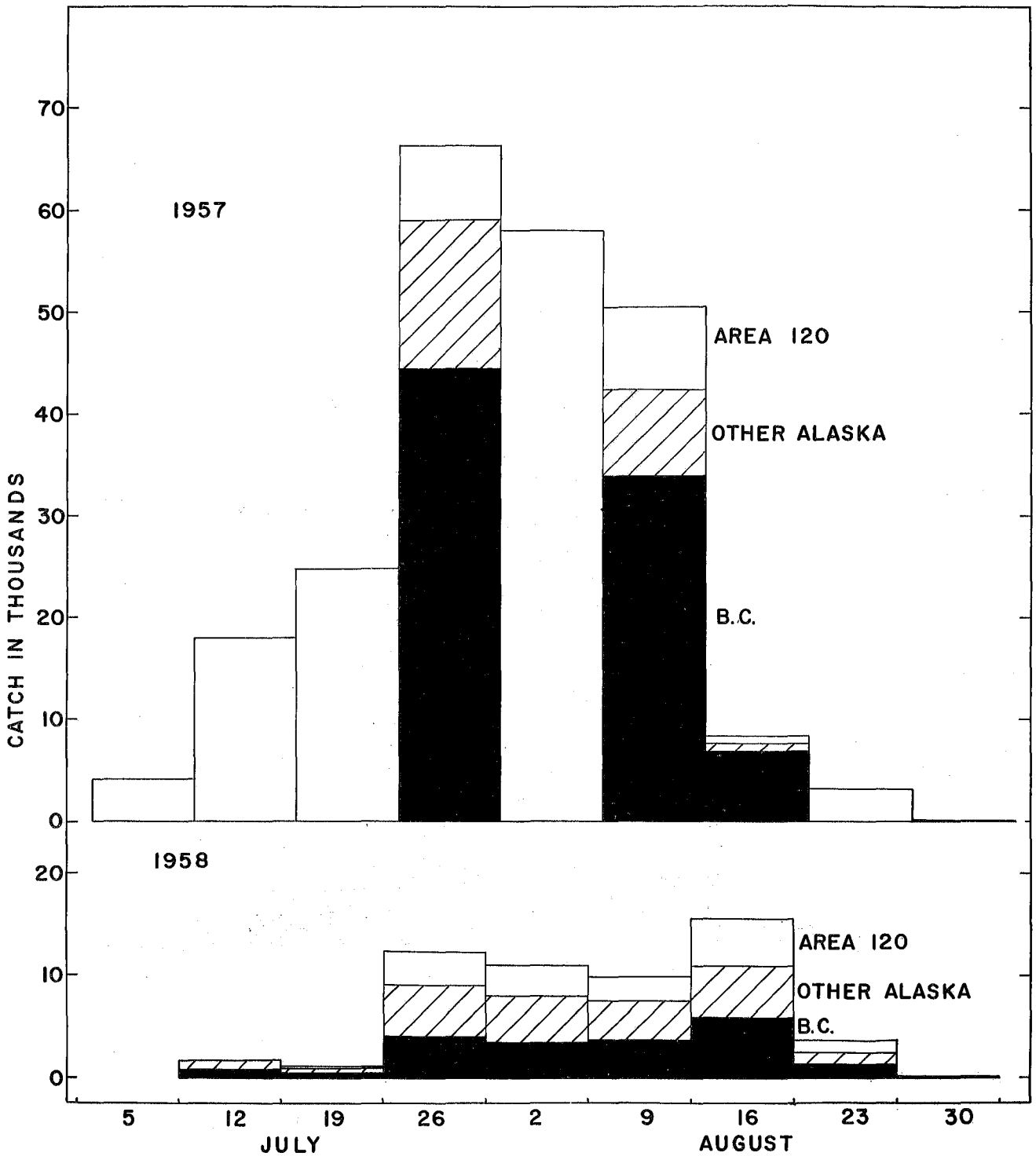


Fig. 5. Estimated numbers of sockeye salmon caught at Noyes Island bound for British Columbia, Alaska area 120 and other Alaskan areas in 1957 and 1958. "Other Alaska" recoveries were made mainly in Alaska border areas 101, 111, 112 and 113.

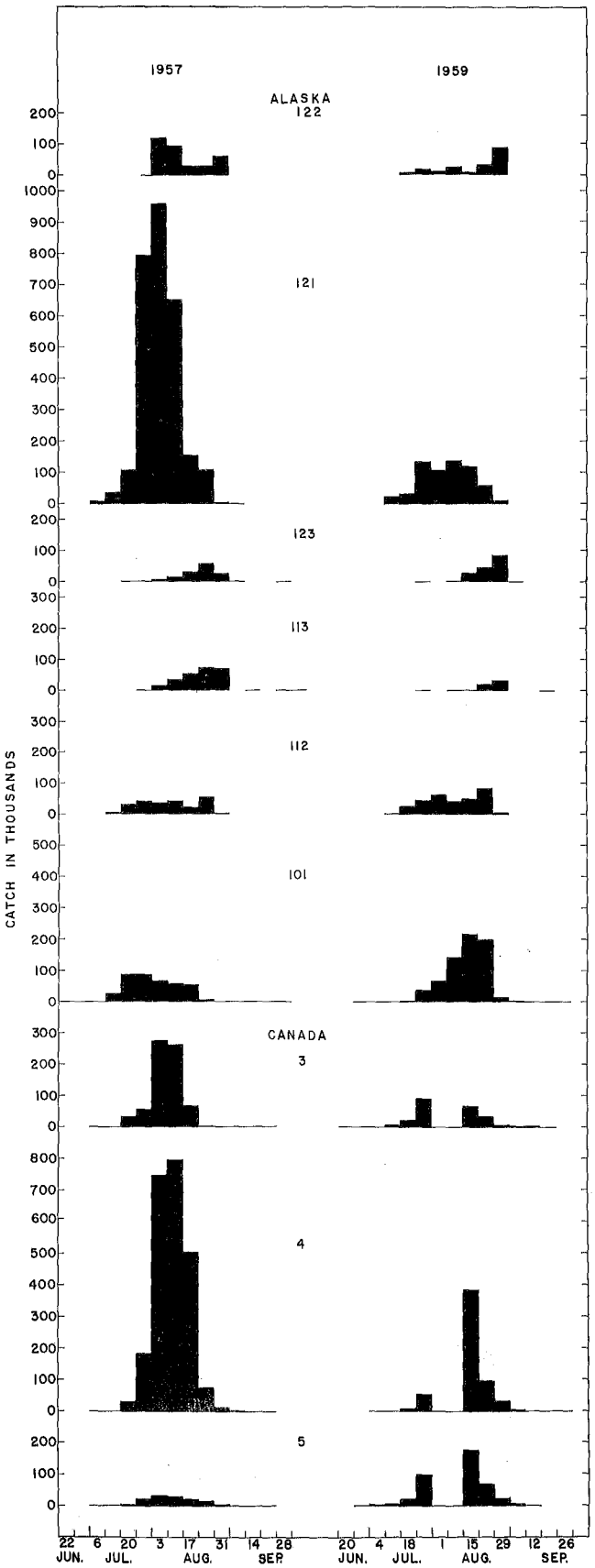


Fig. 6. Weekly catches of pink salmon in various statistical areas in Southeastern Alaska and northern British Columbia in 1957 and 1959.

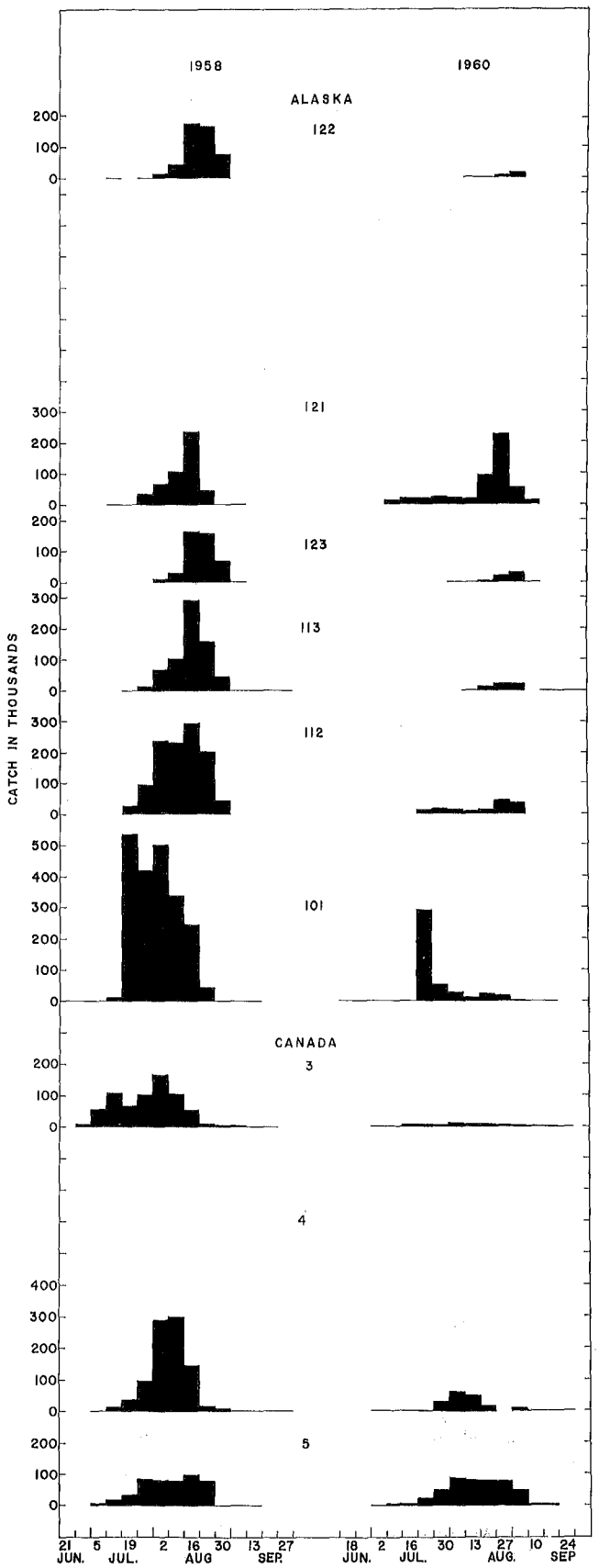


Fig. 7. eekly catches of pink salmon in various statistical areas in Southeastern Alaska and northern British Columbia in 1958 and 1960.

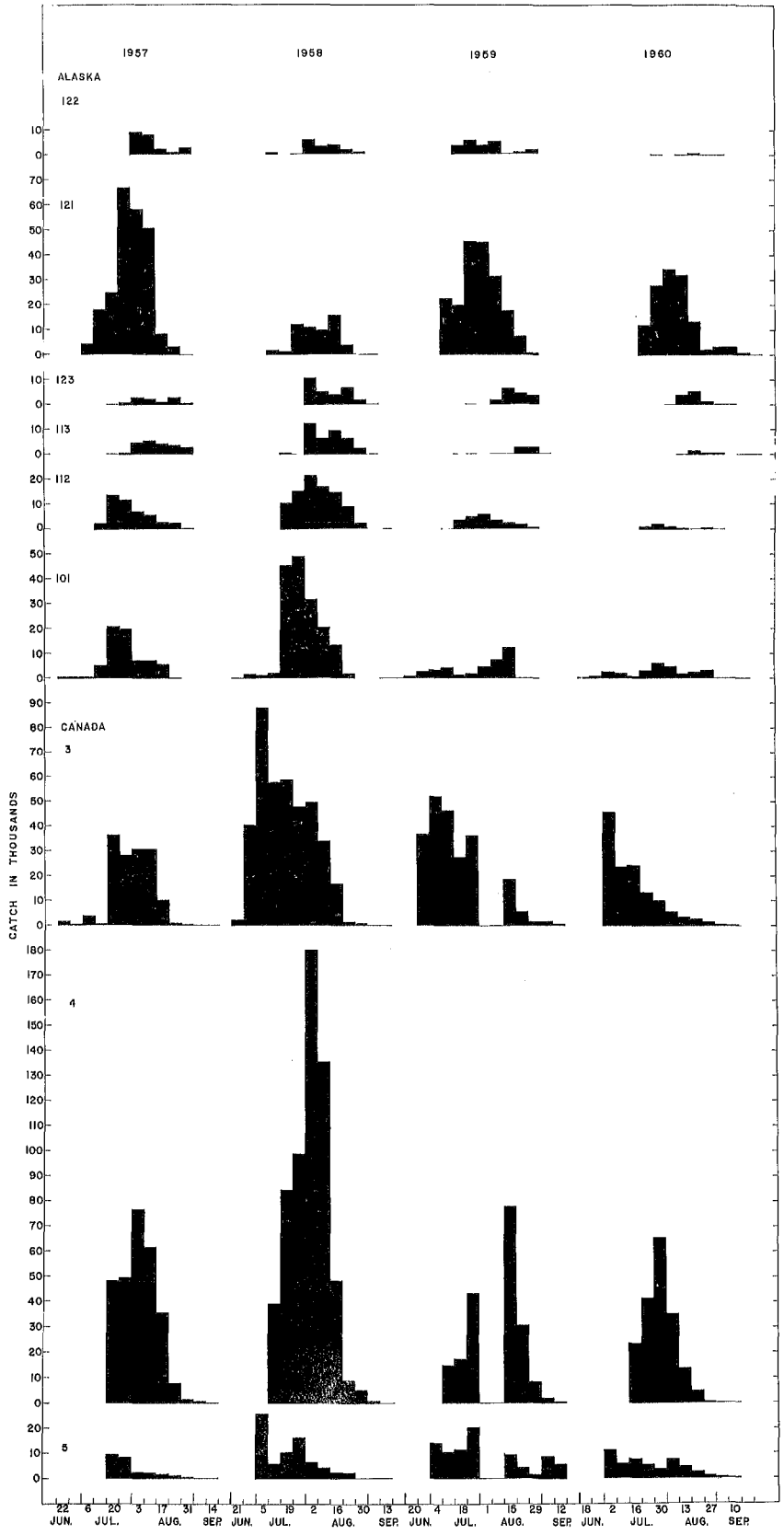


Fig. 8. Weekly catches of sockeye salmon in various statistical areas in Southeastern Alaska and northern British Columbia from 1957 to 1960.

Stream recoveries of sockeye tagged in southern Southeastern Alaska and Northern British Columbia in 1956, 1957 and 1958.

In Table I are tabulated the sockeye tags recovered in streams in Alaska and in British Columbia from the taggings carried out in Northern British Columbia in 1956, 1957, and 1958. In these years all the stream recoveries were made in British Columbia with the exception of one which was recovered in Alaska in 1958. This latter tag was recovered from a sockeye in Hugh Smith Lake which drains through Sockeye Creek into Boca-de-Quadra. The sockeye in the Hugh Smith system spawn in two inlet streams, Buschmann and Cobb Creeks. The escapement to Buschmann Creek in 1958 was reported to have been 550 sockeye. No escapement estimate is available for Cobb Creek in 1958.

In Table II are listed the sockeye tags recovered in streams in Alaska and in British Columbia from the taggings carried out in the west coast district of Southeastern Alaska in 1957 and 1958. In 1957 from the tagging at Cape Addington one tag was recovered in an Alaskan stream, the Klawak River, and 11 were recovered in a British Columbia stream, the Skeena River. No estimate is available of the number of sockeye spawners in the Klawak system in 1957.

In 1958 sockeye were tagged at several locations in the west coast district. From the taggings at Cape Addington 4 tags were recovered in Alaskan streams, two each in the Klawak River and in a stream draining into Shinaku Inlet, and 86 tags were recovered in British Columbia streams, 85 in the Skeena River and 1 in Keecha Lake on Banks Island. No stream recoveries were made from the tagging at Roller Bay and from the Granite Point tagging only 7 were recovered in fresh water, all of them at the Babine Fence. One tag was recovered in the Shinaku Inlet stream and 7 at the Babine Fence from the Cape Ulitka tagging. From the "inside" tagging at Point Desconocida 1 tag was recovered in the Skeena River at 4 Mile Canyon and 13 were recovered in Alaskan streams, 10 of them in the Klawak River and one each in Sarkar Creek, in a Warmchuck stream, and in a Port St. Nicholas stream. From the other "inside" taggings at Tranquil Point and McLeod Bay a single tag from Tranquil Point was recovered at the Babine Fence.

For 1958 the total escapement of sockeye to the Klawak River, Sarkar Creek, and the Warmchuck stream were estimated to have been 25,000, 30,000 and 5,000 respectively. Sockeye are not reported by the United States spawning report or the stream catalogue to occur in the Shinaku Inlet or Port St. Nicholas streams. Nevertheless, recoveries in these latter two streams probably are authentic since they were made by field staff of the Fisheries Research Institute.

Summary

1. A total of 2,418 sockeye were tagged in Northern British Columbia in 1956, 1957, and 1958. Of these 591 were recovered in spawning streams, 590 of them in British Columbia and 1 in Alaska.

2. In 1957 and 1958 a total of 2,006 sockeye were tagged at Cape Addington, Roller Bay, Granite Point, and Cape Ulitka along the outer coast of the west coast district of Southeastern Alaska. From these taggings 117 tags were recovered in spawning streams, 111 of them in British Columbia streams and 6 in Alaskan streams.

3. Out of a total of 732 sockeye tagged in 1958 at Point Desconocida, Tranquil Point, and McLeod Bay in the "inside" portions of the west coast district of Southeastern Alaska 15 tags were recovered in spawning streams, 2 in British Columbia streams and 13 in Alaskan streams.

4. The proportions of stream recoveries in British Columbia and Alaska do not necessarily indicate the proportions of British Columbia and Alaska fish tagged because the recovery effort in the two areas may not have been comparable.

Table I. Stream recoveries of sockeye tagged in Northern British Columbia in 1956, 1957, and 1958.

Tagging area	Number tagged	Recoveries			
		Alaska	British Columbia		
			Area 3	Area 4	Area 5
		1956			
Dundas Island	79	..	..	30	..
Pointer Rocks	1	..	..	..	..
Parkin Island	9	..	1	..	..
Tracy Island	1	..	..	..	..
Somerville Island	2	..	..	..	..
Rachael Islands	25	..	..	11	..
Avery Island	2	..	..	1	..
Ogden Channel	8	..	..	2	..
Total	127	..	1	44	..
		1957			
Dundas Island	960	..	12	236	3
Boston-Tracy Islands	94	..	10	3	..
Birnie-Maskelyne Islands	43	..	..	7	..
Finlayson Island	105	..	..	29	..
Somerville Island	277	..	32	4	..
Southern Chatham Sound	16	..	..	2	..
Ogden Channel	35	..	..	9	..
Total	1,530	..	54	290	3
		1958			
Dundas Island	395	1	..	104	..
Southern Chatham Sound	246	..	..	75	..
Ogden Channel	120	..	..	19	..
Total	761	1	..	198	..
Grand Total	2,418	1	55	532	3

Table II. Stream recoveries of sockeye tagged in the west coast district of Southeastern Alaska in 1957 and 1958.

	Tagging locations						
	Cape Addington	Roller Bay	Granite Point	Cape Ulitka	Point Desconocida	Tranquil Point	McLeod Bay
	1957						
Number tagged	500						
Number recovered							
Alaska							
12220-60 (WC39) (178) Klawak River	1						
British Columbia							
Kitsumkalum River	1						
Skeena River at Skeena Crossing	1						
Skeena River at Glen Vowell	1						
Kispiox River	1						
Babine Fence	7						
Total British Columbia	11						
Total	12						
	1958						
Number tagged	1,119	19	77	291	601	42	89
Number recovered							
Alaska							
12220-49 (WC37) (180) Port St. Nicholas	..	..	..	..	1	..	..
12220-60 (WC39) (178) Klawak River	2	..	..	..	10	..	..
12220-61 (WC46) (172) Shinaku	2	..	..	1	..	..	..
12231-22 (WC56) (160) Sarkar Creek	..	..	..	..	1	..	..
12232-31 (WC77) (166) Warmchuck	..	..	..	..	1	..	..
Total Alaska	4	0	0	1	13	0	0
British Columbia							
Skeena River below Terrace	1	..	..	..	..	..	..
Skeena River at Hazelton Creek	1	..	..	..	..	..	..
Skeena River at 4 Mile Canyon	2	..	..	..	1	..	..
Alastair Lake	1	..	..	..	..	..	..
Babine Fence	80	..	7	7	..	1	..
Keecha (Gale) Lake, Area 5	1	..	..	..	..	..	..
Total British Columbia	86	0	7	7	1	1	0
Total	90	0	7	8	14	1	0

Salmon spawning escapements in the "outside" portion of the west coast district of Southeastern Alaska, 1951 to 1960.

The location of all salmon spawning streams in southern Southeastern Alaska and Northern British Columbia and the general abundance and timing of the runs of each species of salmon to these streams were given in reports submitted in 1962 by the United States and Canadian sections of the "Committee on Problems of Mutual Concern etc.". Tabulations in the reports indicated for each stream whether each species of salmon was present, absent, or information on its presence was unknown. Where appropriate indices of abundance were available, the runs were divided into two arbitrary divisions: "Major" and "Minor". These categories, involving different numbers of spawners for each species (see below), were established so that, in general, the total number of spawners supported by the "major" streams accounted for approximately three-quarters or more of the spawners in the areas of concern. A stream was considered to be a "major" producer when, during the period 1951-60

(i) for sockeye salmon, the escapement was in excess of 5,000 in more than one year,

(ii) for pink salmon, the escapement was in excess of 20,000 in more than one year,

(iii) for chum salmon, the escapement was in excess of 10,000 in more than one year,

(iv) for coho salmon, the escapement was in excess of 2,000 in more than one year, and

(v) for chinook salmon, the escapement was in excess of 500 in more than one year.

For the so-called "major" stocks the reports provided annual escapement indices and notes on timing for the period 1951 to 1960.

The location of each salmon stream in the former Area 121 and sub-area 122-11, which make up the outside portion of the west coast district of Southeastern Alaska, is shown in the attached figure and the general abundance of each species of salmon in these streams are shown in Table I. The stream numbers are those used in the report of the United States section. In the area under consideration sockeye are reported "not present" in all streams with the exception of the Manhattan Arm stream, Essowah Lake, and stream 169 for which sockeye are listed as "unknown". "Minor" stocks of pink salmon in both the odd and even numbered years and of chum salmon are reported to spawn in all streams with the exception of the Essowah Lakes system and stream 169 in which the status of these stocks is not known. Coho salmon are reported in minor numbers in the Manhattan Arm stream, "not present" in streams 168, 168A, and 169A, and "unknown" in the remaining streams. Chinook salmon are not present

in any of the streams under consideration.

The United States Fish and Wildlife Service's Special Scientific Report - Fisheries No. 465, "Stream Catalog of Southeastern Alaska Regulatory District No. 3 and 4" does not list any spawning streams in the former Area 121 and lists only two streams (streams 168A and 169) in the former subarea 122-11. The escapement record to the latter two streams is shown in Table II. Streams 168, 195, 197, 199, and 200A are not shown on Alaska Topographic maps in the scale of 1:250,000.

Summary

1. The data provided by the United States shows that in the outside portion of the west coast district of Southeastern Alaska there are 10 salmon spawning streams in the former Area 121 and the former subarea 122-11. None of these streams was reported to have "major" stocks of salmon.

2. Sockeye were not present in 13 of the 16 streams while in the remaining 3 streams sockeye were listed as unknown.

3. "Minor" pink and chum escapements were reported in 14 streams. In the other two streams pink and chum were listed as unknown.

4. Coho salmon were absent from 3 streams, unknown in 12 streams and present in minor amounts in the remaining stream.

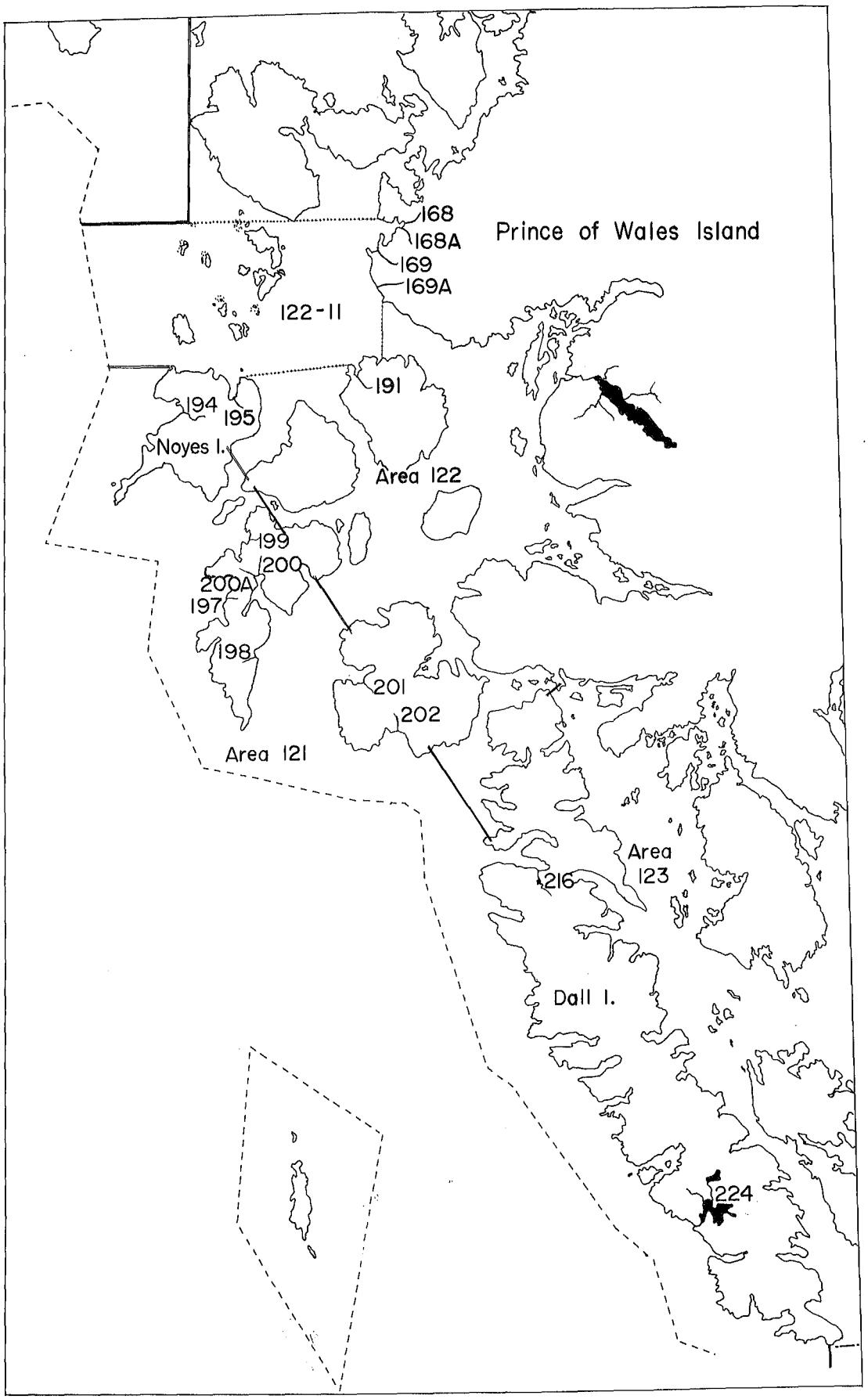
5. No chinooks were reported present in any stream.

Table I. Location and general abundance of each species of salmon in all streams in Area 121 and subarea 122-11. (Major stock - M; Minor stock - +; Unknown - U; Not present - 0)

Stream name	Map Index No.	Sockeye	Pink		Chum	Coho	Chinook
			Odd	Even			
Area 121							
Unnamed	194	0	+	+	+	U	0
"	197	0	+	+	+	U	0
"	198	0	+	+	+	U	0
"	199	0	+	+	+	U	0
"	200	0	+	+	+	U	0
"	200A	0	+	+	+	U	0
"	201	0	+	+	+	U	0
"	202	0	+	+	+	U	0
Manhattan Arm	216	U	+	+	+	+	0
Essowah Lake	224	U	U	U	U	U	0
Subarea 122-11							
Unnamed	168	0	+	+	+	0	0
"	168A	0	+	+	+	0	0
"	169	U	U	U	U	U	0
"	169A	0	+	+	+	0	0
"	191	0	+	+	+	U	0
"	195	0	+	+	+	U	0

Table II. Escapement record of streams 168A and 169. From Special Scientific Report - Fisheries No. 465.

	Date	Pink		Chum		Coho	Remarks
		Live	Dead	Live	Dead	Live	
				Stream 168A			
1942	Sept. 21	55,000	..	14,000	..	..	Excellent
1943	Oct. 4	60,000	..	15,000	..	..	Excellent
1944	Oct. 17	6,500	..	12,000	..	..	Fair
1945	Sept. 22	60,000	7,500	1,000	2,500	..	Excellent
1957	Sept. 10	140	..	70	..	..	None off or at mouth
				Stream 169			
1941	Sept. 10	45,000	..	2,400	..	..	Good
1942	Sept. 29	40,000	..	16,000	..	800	Good
1943	Sept. 30	90,000	..	10,000	..	1,000	Excellent
1944	Oct. 8	23,500	..	3,500	..	..	Fair
1945	Sept. 20	112,000	..	1,600	..	..	Excellent
1947	Oct. 6	..	..	..	..	..	Good
1953	Sept. 14	55	..	25	..	..	
1957	Sept. 10	25	..	..	..	..	A few at mouth
1961	Aug. 18	..	..	..	..	..	800 salmon at mouth, stream low
	Aug. 20	21	..	..	..	..	
1962	Sept. 3	..	..	..	..	..	5,000 pink and chum at mouth, stream low



Location of salmon spawning streams in the "outside" portion of the West Coast District of Southeastern Alaska.

Sockeye escapements in Southeastern Alaska

Sockeye escapement data from Southeastern Alaska are available to us from four different sources:

(a) The report by the United States section "Spawning Ground Information and Fishing Seasons for Areas of Mutual Concern".

(b) The stream catalogues issued by the United States Fish and Wildlife Service for Regulatory Districts No. 1, 2, 3, and 4.

(c) Annual reports of the Alaska Department of Fish and Game.

(d) Spawning escapement figures for Regulatory Districts No. 12, 13, 14, and 15 obtained from personnel of the United States Fish and Wildlife Service's Auke Bay Laboratory.

The United States report gives the location of each sockeye spawning stream in southern Southeastern Alaska and the general abundance and timing of the sockeye run to each of these streams. Tabulations in the report indicate for each stream whether sockeye were present, absent, or information on their presence was unknown. Where approximate indices of abundance were available, the runs were divided into two arbitrary divisions: "Major" and "Minor". These categories were established so that, in general, the total number of spawners supported by the "major" streams accounted for approximately three-quarters or more of all the spawners in the areas of concern. A "major" stock of sockeye was considered to be one where during the period 1951 to 1960 the escapement was in excess of 5,000 in more than one year. For the "minor" stocks no further information was provided whereas for some of the "major" stocks escapement indices for part of the period 1951 to 1960 and notes on timing were provided.

All available sockeye spawning escapement data for streams in various parts of southern Southeastern Alaska are arrayed in Table I. The streams listed are those provided in the United States report. Some of these streams are not listed in the stream catalogues. Some streams not listed in the United States report as sockeye spawning streams are reported in the stream catalogues to have sockeye. These latter streams have not been included in Table I as escapement figures for these streams either are not available or are insignificant. The locations of the various sockeye streams mentioned in this present report are indicated in Figure 1. The boundaries of the Regulatory Districts of Southeastern Alaska are shown in Figure 2. The escapement figures tabulated in Table I were obtained from the United States report supplemented by escapement figures from the stream catalogues.

In Table I the average escapements have been calculated for each stream and have been summed for each Regulatory District and for all of southern Southeastern Alaska. In Table II are summarized the average escapements of sockeye in the years 1951 to 1962 to British Columbia statistical Areas 1, 2, 3, 4, 5, and 6. Comparison of the average escapements to southern Southeastern

Alaska and to Northern British Columbia indicates that the average escapement of sockeye to streams in the Regulatory Districts in southern Southeastern Alaska are of the same order as escapements to the streams in British Columbia statistical Areas 1, 2, 5, and 6, but much smaller than those in the Nass (Area 3) and Skeena (Area 4) areas.

Available information on the sockeye escapements to the remainder of Southeastern Alaska follows.

Regulatory District No. 7

A stream catalogue for this district is not available. The report to the Committee indicates that none of the streams in the district support spawning populations of sockeye.

Regulatory District No. 8

A stream catalogue is not available for this district, the Stikine gillnet area. The gillnet catch in this district has averaged 31,000 sockeye in the years 1933 to 1958 with a maximum catch of 81,000 in 1941 and a minimum catch of 8,800 in 1949 and 1955. The Alaska Department of Fish and Game estimates that 90% of the escapement spawn in Tahltan Lake (33), a tributary of the Stikine. No escapement figures are available.

Regulatory Districts No. 9, 10, and 11

Stream catalogues are not available for these districts. The gillnet catch of Taku River sockeye averaged 33,000 in the years 1904 to 1927 and 35,500 in the years 1945 to 1956. In the Taku River system sockeye are reported to spawn in the Silver Salmon system (34), in Tatsamenie Lake (35) and in the Kowatua Creek system (36). River races of sockeye have been observed on the Nakina (37), Nahlin (38), and Dudidontu Rivers (39). A small population is reported to spawn in a lake tributary to the Taku River a few miles upstream from the International Boundary.

Sockeye are also reported to spawn in the Whiting (40) and Speel Rivers (41) both of which drain into Port Snettisham, the former originating in Canada.

No escapement figures are available for the Taku, Whiting and Speel Rivers.

Regulatory District No. 12

A stream catalogue for this district is not available. The information which follows was obtained from the United States Fish and Wildlife Service at Auke Bay, Alaska.

Baranof Island

(42) Lake Eva. The escapement in the period 1953 to 1962 averaged 2,600 sockeye with a maximum of 13,845.

Admiralty Island

(43) Kanalku Lake. 2,500 sockeye reported in 1960.

Chichagof Island

(44) Sockeye Creek. 125 sockeye in 1956, 31 in 1957.

(45) Kook Lake. Average escapement in period 1953 to 1960 was 6,100 sockeye with a maximum escapement of 30,000 in 1960.

(46) Pavlof Lake. Average escapement in the period 1953 to 1962 was 700 sockeye. The largest escapement was in 1959 with 3,500 sockeye.

Regulatory District No. 13

A stream catalogue is not available for this district. The following data were obtained from the United States Fish and Wildlife Service at Auke Bay, Alaska.

Baranof Island

(47) Tamako Lake (Redfish). The escapement has varied from as low as 400 to as high as 50,000 sockeye in the years 1953 to 1962.

(48) Still Harbour. 50 sockeye in 1961.

(49) Port Banks. 6,000 sockeye reported in 1960, 2,000 in 1962.

(50) Great Arm. 4,500 sockeye reported in 1960.

(51) Politofski Lake. 200 sockeye in 1960, 400 in 1961.

(52) Necker Bay. 3,000 sockeye in 1953, 6,000 in 1962.

(53) Redoubt Lake. Escapements have varied from a low of 75 to a high of 22,900 in the years 1953 to 1960.

(54) Silver Bay. 2,000 sockeye in 1960, 4,500 in 1961.

Chichagof Island

(55) Lake Anna. A minor run.

(56) Klag Bay. Escapement has varied from a low of 600 to a high of 20,000 in the years 1954 to 1962.

Yakobi Island

(57) Takanis Lake. 1,000 sockeye reported in 1960.

(58) Surge Bay. 5,000 sockeye reported in 1962.

(59) Hoktaheen Creek. 3,000 sockeye reported in 1953.

Regulatory District No. 14

A stream catalogue is not available for this district. The data, which follow, were obtained from the United States Fish and Wildlife Service at Auke Bay, Alaska.

Cross Sound

(60) Murk Bay. 200 sockeye reported in 1961.

(61) Point Villaluenga. No information available.

(62) Dicks Arm. No information available.

(63) Unnamed Lake. Escapement averaged 2,800 in the years 1959 to 1962.

Glacier Bay

(64) Berg Bay. The escapement averaged 100 in the years 1953, 1954, and 1957.

(65) Bartlett Cove. 200 sockeye reported in 1962.

(66) Neva Creek. 1,000 sockeye reported in 1953. 40 in 1957. The location of this stream is not known.

Regulatory District No. 15

A stream catalogue is not available for this district. The figures below were obtained from the United States Fish and Wildlife Service at Auke Bay, Alaska.

(67) Chilkoot Lake

1941 - 25,000
1947 - 20,000
1948 - 15,000
1949 - 10,560
1954 - Good run

(68) Chilkat Lake and River

1945 - 36,000
1946 - 39,000
1947 - 40,000
1948 - 120,000
1953 - Poor
1954 - Good run
1959 - Several hundred
1960 - Several hundred
1961 - 105.

According to the Alaskans "the Chilkoot and Chilkat runs are large and composed of many races. The above figures do not reflect the magnitude of the runs".

Summary

1. Sockeye escapement data have been obtained from United States sources for parts of Southeastern Alaska for years after 1951.

2. Escapement figures are not available for all streams and where available are not complete for all years. Escapement estimates were made in a variety of ways and vary considerably in reliability from year to year and from stream to stream.

3. Southeastern Alaska has many small sockeye runs similar to those on the islands along the northern coast of British Columbia. A few moderately large runs occur in mainland rivers, including the Chilkoot, Chilkat, Taku, Stikine, and Whiting Rivers, but none approaches the importance of the Skeena or the Nass Rivers.

4. In the southern part of Southeastern Alaska there are about 15 "major" and 16 "minor" stocks of sockeye. Average escapements in these streams have been calculated on the basis of available figures. During the period 1951 to 1960 the average escapements in this part of Southeastern Alaska was about 137,000 sockeye. This compares with an average annual escapement of about 153,000 sockeye to streams in British Columbia statistical Areas 1, 2, 5, and 6 during the years 1951 to 1962. The average escapement during the same period to Areas 3 and 4, the Nass and Skeena Rivers was about 387,000 and 558,000 sockeye, respectively.

Table I. Escapements of sockeye to streams in southern Southeastern Alaska, 1951 to 1960. Unbracketed figures were obtained from the United States report(s), the bracketed from stream catalogues.

Stream name	No.	Annual escapements										Total Escapement	Average Escapement
		1951	1952	1953	1954	1955	1956	1957	1958	1959	1960		
Regulatory District No. 1													
Major streams													
Buschmann Creek	1	..	..	..	7,000	4,000	10,000	2,000	550	1,200	150	24,900	3,557
Naha River	2	..	..	(few)	(1,850)	(8,000)	(18,000)	(2,500)	5,000	2,000	..	37,350	5,335
Minor streams													
Fillmore River	3	..	..	..	..	..	(9,000)	..	400	..	..	9,400	4,700
Sockeye Creek	4	..	..	..	..	(2)	(6,000)	(400)	..	..	..	6,402	2,134
Bakewell Creek	5	(3)	..	(70)	..	..	..	..	..	..	..	73	37
Tamgass Creek	6	..	..	..	..	(3,500)	(22,000)	(3,000)	..	..	..	28,500	9,500
Total average escapement													25,263
Regulatory District No. 2													
Major streams													
Dolomi Creek	7	..	..	(1,000)	..	(8,000)	(8,000)	(800)	..	(1,000)	..	18,800	3,760
Karta River	8	(few)	..	2,000	..	..	10,000	7,000	8,000	10,000	..	37,000	6,167
Thorne River	9	..	..	(poor)	..	..	(10,000)	(5,000)	..	(500)	..	15,500	3,875
Minor streams													
Nichols Creek	10	..	..	..	..	(100)	(1,500)	(3,000)	..	..	..	4,600	1,533
Kegan Creek	11	..	..	(300)	..	..	(7,000)	(1,200)	..	..	..	8,500	2,833
Total average escapement													18,168
Regulatory District No. 3													
Major streams													
Klakas Lake Creek	12	..	..	..	..	..	..	..	..	(7,000)	..	7,000	7,000
Hetta Lake Creek	13	..	(2)	(1,800)	..	..	..	(present)	..	(19,600)	..	21,402	5,350
Eek Lake Creek	14	..	..	(200)	(4,000)	..	..	..	..	(23,500)	..	27,700	9,233
Klawak River	15	..	(200)	..	..	(3,000)	..	..	25,000	7,000	23,000	58,200	11,640
Sarkar Creek	16	..	..	(5,000)	..	..	17,000	50,300	30,000	20,000	22,000	144,300	24,050
Warmchuck	17	..	..	..	..	..	8,000	2,000	5,000	..	4,000	19,000	4,750
Minor streams													
Hunter Creek	18	----------				No data available except sockeye do occur					----------		
Unnamed stream	19	----------				No data available. Not listed in stream catalogue					----------		
Unnamed stream	20	----------				No data available except sockeye do occur					----------		
Unnamed stream	21	--------- No data available. Sockeye not present according to stream catalogue ---------											
2 Unnamed streams	22	----------				No data available. Not listed in stream catalogue					----------		
Karheen Creek	23	----------				No data available. Not listed in stream catalogue					----------		
Total average escapement													62,023+
Regulatory District No. 4													
No sockeye streams are listed for this district either in the United States report or in the stream catalogue. Sockeye are said to spawn in a Manhattan Arm stream (24) and in the Essowah Lake system (25).													
Regulatory District No. 5													
The United States report indicates there are no sockeye streams in those portions of the district known formerly as subareas 144-70 and 144-61. A stream catalogue for this district is not available.													
Regulatory District No. 6													
A stream catalogue is not available for this district. The following information is from the United States report and applies only to those portions of the district known formerly as Areas 115 and 143.													
Major streams													
Log Jam Creek	26	..	..	..	..	..	2,500	35,000	35,000	5,000	..	77,500	19,375
Hatchery Creek	27	----------				No data available		----------					
Eagle Creek	28	..	..	..	few	4,000	..	..	..	6,000	..	10,000	3,333
Red Bay Lake	29	few	..	..	2,000	..	18,000	17,000	17,000	6,159	4,000	64,159	9,165
Minor streams													
Navy Creek	30	----------				No data available		----------					
Unnamed stream	31	----------				No data available		----------					
Ratz Harbour Stream	32	----------				No data available		----------					
Total average escapement													31,873+
Total average escapement for southern Southeastern Alaska													137,327

Table II. Average escapements of sockeye to streams in Northern British Columbia areas, 1951 to 1962.

Area	Average escapement
1	19,100
2	24,600
3	387,300
4	557,900*
5	51,900
6	57,900
Total	1,098,700

*Using count of large sockeye at Babine Fence.

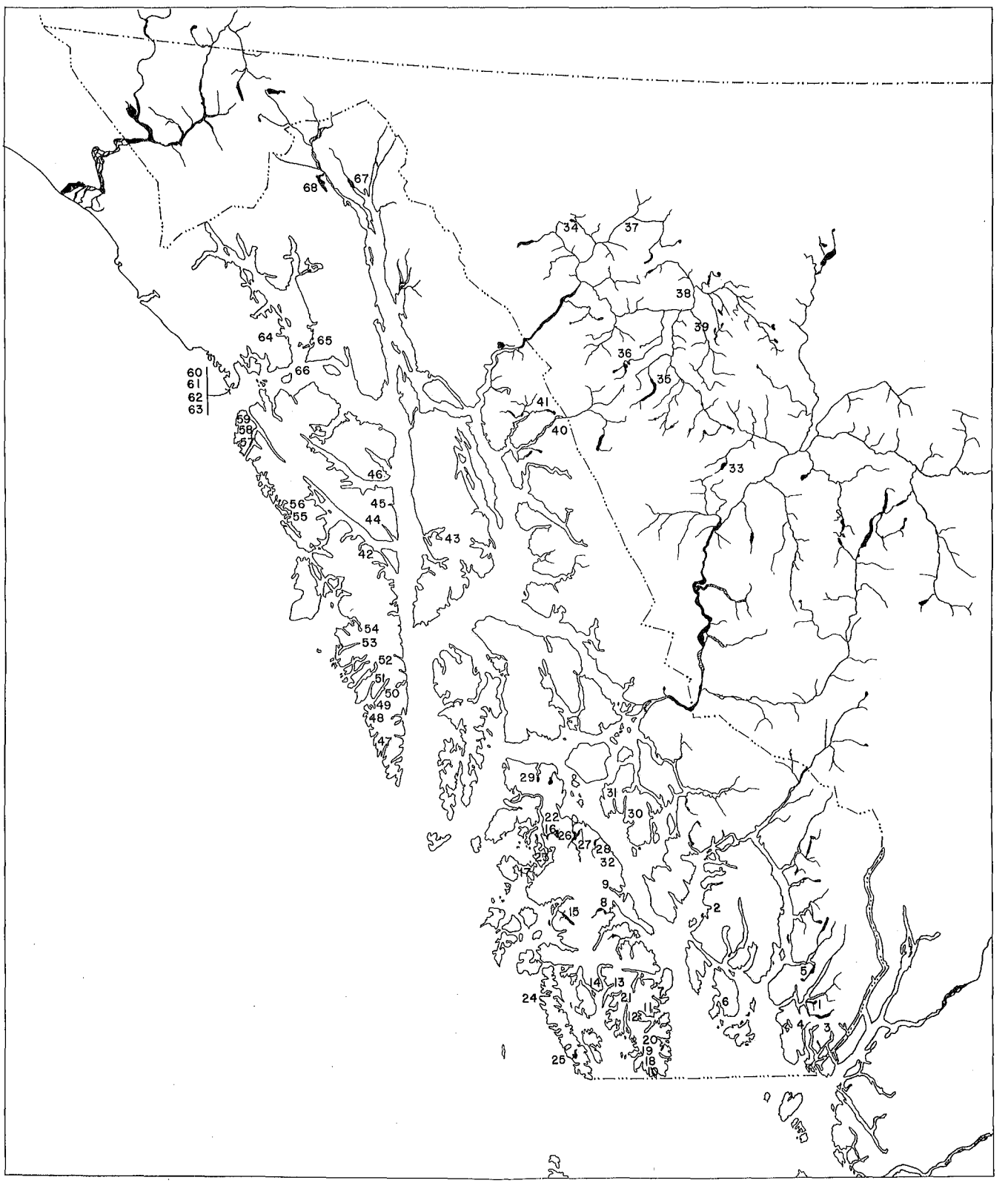


Figure 1. Location of sockeye spawning streams tributary to the coast of Southeastern Alaska.

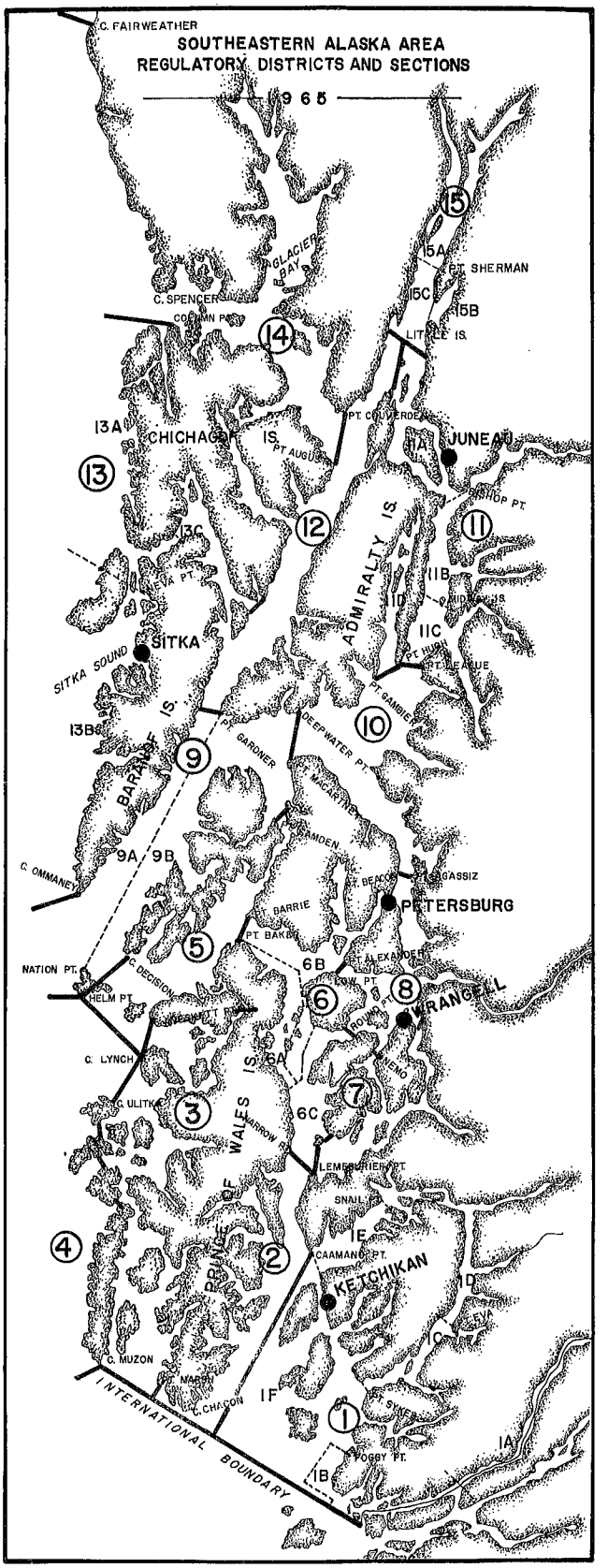


Figure 2. Regulatory Districts and Sections in Southeastern Alaska, 1965.

SOUTHEASTERN ALASKA

STATISTICAL AREA MAPS

(a) 1957 to 1960

(b) 1961 and 1962

(c) 1963 onward.

(a) 1957 to 1960

SOUTHEASTERN ALASKA

STATISTICAL AREA MAPS

(a) 1957 to 1960

(b) 1961 and 1962

(c) 1963 onward.

(a) 1957 to 1960

GPO 993228

HECATE STRAIT TO ETOLIN ISLAND

INCLUDING

BEHM AND PORTLAND CANALS

PRINCE WALES ISLAND

REVILLAGIGEDO ISLAND

ETOLIN I.

BELL I.

ANNETTE I.

GRAVINA I.

DUKE I.

CLEVELAND PENINSULA

BEHM CANAL

PORTLAND INLET

HECATE STRAIT

NARROW PT.

PT. FITZGIBBON

CHICKAMIN RIVER

WALKER COVE

BUSHY PT.

RUDYERD BAY

PT. HIGGINS

SMEATON BAY

DOKE PT.

PT. STYKES

QUADRA PT.

BOCA DE QUADRA

ADAMS PT.

MARSH

CAPE FOX

NAHAS INLET

WILLARD INLET

FILLMORE INLET

HIDDEN INLET

KENDALL PENINGSULA

115-10, 115-20, 115-30, 115-40

141-20, 141-30

111-10, 111-20, 111-30

102

101-22, 101-23, 101-24, 101-31, 101-32, 101-52

101-11, 101-12, 101-13, 101-14, 101-41, 101-42, 101-43, 101-44, 101-45, 101-51

112-10, 112-20, 112-30

113-11, 113-12, 113-13, 113-21, 113-22, 113-23, 113-30

114-10, 114-20

123-12, 123-21, 123-22, 123-23

STATISTICAL AREA CHART

PREPARED BY; CHARLES J. DICOSTANZO MAY, 1957

MODIFICATIONS:

GPO 993228

DIXON ENTRANCE TO CHATHAM STRAIT

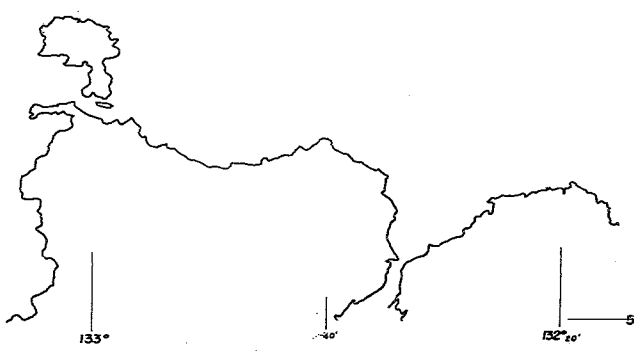
SCALE 1:229,376
AT LAT. 55°

STATISTICAL AREA CHART

PREPARED BY ; CHARLES J. DI COSTANZO MAY, 1957

MODIFICATIONS :

DIXON ENTRANCE



GPO 993228

ETOLIN ISLAND TO MIDWAY ISLANDS
INCLUDING
SUMNER STRAIT

STATISTICAL AREA CHART

PREPARED BY ; CHARLES J. DI COSTANZO MAY, 1957

MODIFICATIONS :

ADMIRALTY ISLAND
153-60
GLASS PENINSULA
STEPHENS PASSAGE
153-40
153-50
T. ASTLEY
153-82
153-72
153-71
153-81
153-83
HOBART
153-84
153-73
BAY
CAPE FANSHAW
154-40
FREDERICK SOUND
154-91
154-92
154-93
GRAND PT.
154-51
CAPE BENDEL
KUPREANOF ISLAND
154-95
154-94
154-52
154-53
ADE PT.
154-55
154-56
KUIU I.
142-70
130-10
130-30
154-62
154-61
T ELLIS
142-10
MITKOF I.
130-40
154-72
144-10
ARRIE
TSCHELL PT.
ALEXAND
130-20
STRAIT
142-20
130-50
130-60
142-60
143
154-71
COSMOS
ZAREMBO I.
WRANGELL ISLAND
SUMNER
BAKER
144-22
144-61
142-30
PT. COLPOY
NESBITT
142-40
142-50
144-21
144-62
PRINCE OF WALES
ETOLIN ISLAND
141-10
144-63
INS PT.
115-20
115-10
154-81
144-30
144-70
GIUSKO ISLAND
CAPE DECISION
141-20
ATKINS PT.
LUCK
115-40
115-30
144-40
122-31
141-30
111-30
144-50
114-10
114-20
134°
133°
132°
57°
56°
40'
20'

GPO 993228

STATISTICAL AREA CHART

PREPARED BY: CHARLES J. DI COSTANZO MAY, 1957

MODIFICATIONS;

CORONATION ISLAND TO LISIANSKI STRAIT

SCALE 1:217,828

STEPHENS PASSAGE TO CROSS SOUND

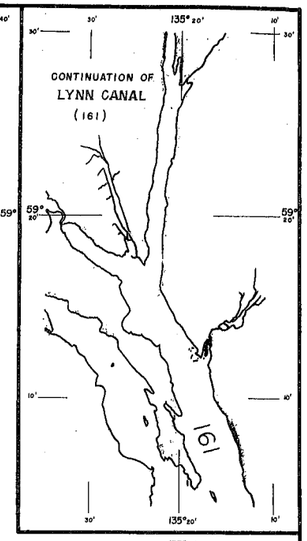
INCLUDING

LYNN CANAL

STATISTICAL AREA CHART

PREPARED BY; CHARLES J. DICOSTANZO MAY, 1957

MOIFICATIONS :



GPO 993228

(b) 1961 and 1962

KETCHIKAN DISTRICT
STATISTICAL AREAS
REVISED 1961

BY E.O. KLINKHART

122-31
121-10
122-11
122-12
NOYES IS.
122-13
121-11
BAKER IS.
122-14
SUMEZ IS.
121-12
PRINCE OF WALES ISLAND
ETOLIN ISLAND
114-20
CLEVELAND PENINSULA
114-10
113-10
113-20
CLARENCE STRAITS
113-30
CHASINA PT.
113-40
113-50
123-11
123-21
SUKKWAN IS.
121-13
DALL ISLAND
123-12
123-22
123-24
LONG IS.
121-14
123-23
CAPE CHACON
121-21
BEHM CANAL
111-10
111-20
REVILLAGIGEDO ISLAND
BELL IS.
BEHM CANAL
101-21
BUNTER BAY
101-39
101-33
PT. HIGGINS
112-10
101-13
KETCHIKAN
GRAVINA IS.
112-20
101-12
101-31
101-32
SMEATON BAY
101-11
ANNETTE IS.
ST. SYKES
BOCA DE QUADRA
101-41
101-42
101-44
DUKE IS.
112-30
101-43
CAPE FOX
101-51
101-52

GPO 993228

ETOLIN ISLAND TO MIDWAY ISLANDS
INCLUDING
SUMNER STRAIT

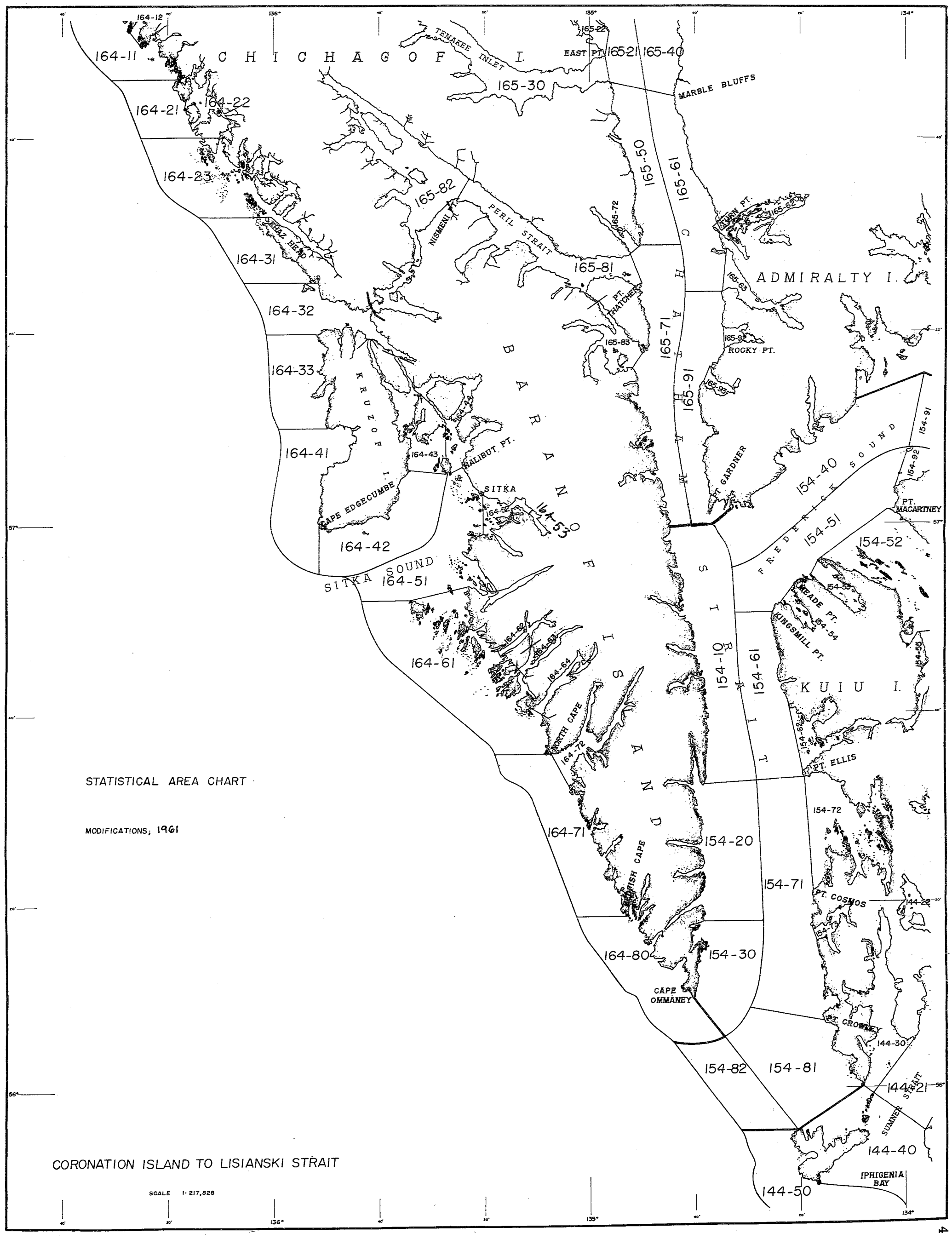
STATISTICAL AREA CHART

MODIFICATIONS - 1961

ADMIRALTY ISLAND
GLASS PENINSULA
STEPHENS PASSAGE
FREDERICK SOUND
KUPREANOF ISLAND
KUIU I.
MITKOF I.
ZAREMBO I.
WRANGELL ISLAND
ETOLIN ISLAND
SUMNER STRAIT
PRINCE OF WALES I.
CAPE FANSHAW
HOBART BAY
POINT ELLIS
COSMOS
CAPE DECISION
CAPE BENDEL
GRAND PT.
ASTLEY
HOBART
PT. COLPOYS
NESBITT
ALEXANDER
MITCHELL PT.
BARRIE
BAKER
HIGGINS PT.
GIUSKQ ISLAND
LUCK PT.
WATKINS PT.
SPADE PT.

154-40 154-41 154-42 154-43 154-44 154-45 154-46 154-47 154-51 154-52 154-53 154-54 154-55 154-56 154-61 154-62 154-71 154-81 154-91 154-92 154-93 154-94 154-95
144-10 144-21 144-22 144-30 144-40 144-50 144-61 144-62 144-63 144-70
153-60 153-40 153-50
142-10 142-20 142-30 142-40 142-50 142-60
143
122-31
130-10 130-11 130-20 130-30 130-40 130-50
115-10 115-20 115-30 115-40
141-10 141-20 141-30
111-30
114-10 114-20

GPO 993228



STATISTICAL AREA CHART

MODIFICATIONS; 1961

CORONATION ISLAND TO LISIANSKI STRAIT

SCALE 1: 217,828

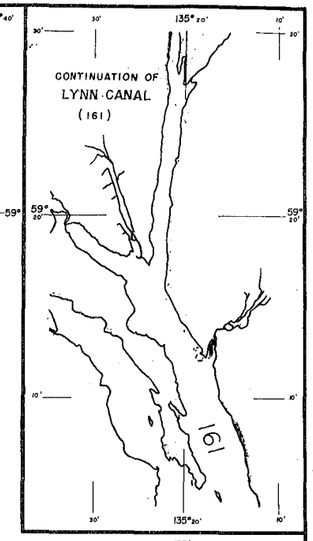
STEPHENS PASSAGE TO CROSS SOUND

INCLUDING

LYNN CANAL

STATISTICAL AREA CHART

MOIFICATIONS : 1961



GPO 999228

(c) 1963 onward.

A.D.F&G. STATISTICAL AREAS

KETCHIKAN CHART NO.1

REVISED 1963

ANESKETT PT.
KOSCIUSKO I.
HALIBUT HBR
103 - 90
LYNCH
HECETA I.
104-50
103-80
103-70
LULITKA
NOYLES I.
FERNANDO I.
LULU I.
BAKER I.
104-40
103-50
PT. SAN ROGUE
PT ARBOLEDA
SUEMEZ I.
EAGLE PT.
103-60
104-30
103-40
103-25
SUKKWAN I.
DALL I.
104-20
103-30
LONG I.
103-21
103-15
103-11
104-10
C. MUZON
MARSEN
102-10
C. CHACON
102-50
102-40
102-30
102-20
PRINCE OF WALES I.
106-20
106-10
106-90
101-90
ETOLIN I.
107-20
107-10
NARROW PT.
LEMESURIER PT.
102-80
102-70
102-60
101-80
101-90
ANNETTE I.
PT HIGGINS
101-47
101-29
GRAVINA I
101-27
101-43
101-45
101-95
REVILLAGIGEDO I.
101-75
101-71
101-51
101-41
101-39
101-23
DUKE
FOGGY PT.
101-25
101-21
101-11
TREE PT.
PORTLAND CANAL
101-15
INTERNATIONAL BOUNDRY
INTERNATIONAL WATERS 090

A.D.F. & G. STATISTICAL AREAS

SOUTHEASTERN ALASKA CHART NO. 2

REVISED 1963

A.D.F & G. STATISTICAL AREAS

SOUTHEASTERN ALASKA CHART NO. 3

REVISED 1963

CAPE FAIRWEATHER
LITUYA BAY
114-13
114-12
GLACIER BAY
114-70
114-11
DUNDAS BAY
114-60
C. SPENCER
114-21
PT. CAROLINE
EMESURIES I.
114-23
EXQUISITION INLET
PEARSANT I.
CROSS SOUND
113-94
HOKTAHEEN COVE
SURGE BAY
113-93
YAKOBI I.
113-91
113-92
TAKANIS BAY
COLUMN PT.
LISIANSKI INLET
PORT ALTHORP
IDAHO INLET
PT. ADOLPHUS
HOMESHORE
114-25
114-27
PELICAN
STAG BAY
LISIANSKI STRAIT
CHICHAGOF ISLAND
PT. SOPHIA
HOONAH
HOWARD BAY
PT. COUVERDEN
PORTLOCK HARBOR
113-81
KLAG BAY
KHAZ BAY
113-71
SLOCUM ARM
NORTH ARM HOONAH SOUND
USHK BAY
112-36
112-35
PT. AUGUSTUS
112-45
112-50
EAST PT.
HESPILITER BAY
PT. HEPBURN
ADMIRALTY ISLAND
DEEP BAY
113-64
113-61
SALISBURY SOUND
POGIBSHI PT.
RODMAN BAY
112-34
SAOOK BAY
112-33
SITKOH BAY
112-39
KRUZOF ISLAND
BARANOF ISLAND
NEVA PT.
NAKWASINA PASS
113-42
NAKWASINA SOUND
HANUS BAY
112-32
CATHERINE I.
KATLIAN BAY
113-44
EDGECUMBE
SITKA
113-41
SITKA SOUND
MITCHELL BAY
112-67
HOOD BAY
NORTH ARM
112-72
SOUTH ARM
112-73
CHAIK BAY
112-80
WHITEWATER BAY
112-90
PT. GARDNER
113-31
WEST CRAWFISH INLET
113-32
109-30
110-21
110-22
PYBUS BAY
PT. GAMBIER
GAMBIER BAY
110-23
MOLE HARBOR
111-13
PLEASANT BAY 111-12
WINDFALL HARBOR
111-16
GLASS PENINSULA
111-17
PT. STYLEMAN
111-35
SPEEL ARM
111-90 LIMESTONE INLET
PT. AMNER
GILBERT BAY
MIDWAY I.
TRACY ARM
ENDICOTT ARM
PT. WINDHAM
110-32
PT. HOBART
110-33
SKAGWAY
LUTAK INLET
115-33
CHILKOOT INLET
CHILKAT INLET
HAINES
115-32
115-34
FORT SEWARD
115-31
SULLIVAN I.
PT. SHERMAN
115-20
SEWARD BAY
115-10
LITTLE I.
LINCOLN I.
SHELTER I.
111-50
112-15
PT. RETREAT
MANSFIELD PENINSULA
OUTER PT.
DOUGLAS ISLAND
JUNEAU
YOUNG BAY
111-41
HAWK INLET
112-16
112-14
111-40
PT. BISHOP
111-32
TAKU INLET
PT. ARDEN
CORDOVA BAY
111-12
111-31
111-34
111-14
111-20
111-11
111-21
112-17
112-12
112-18
112-19
112-211
112-31
112-211