

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT
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BRISTOL BAY AREA

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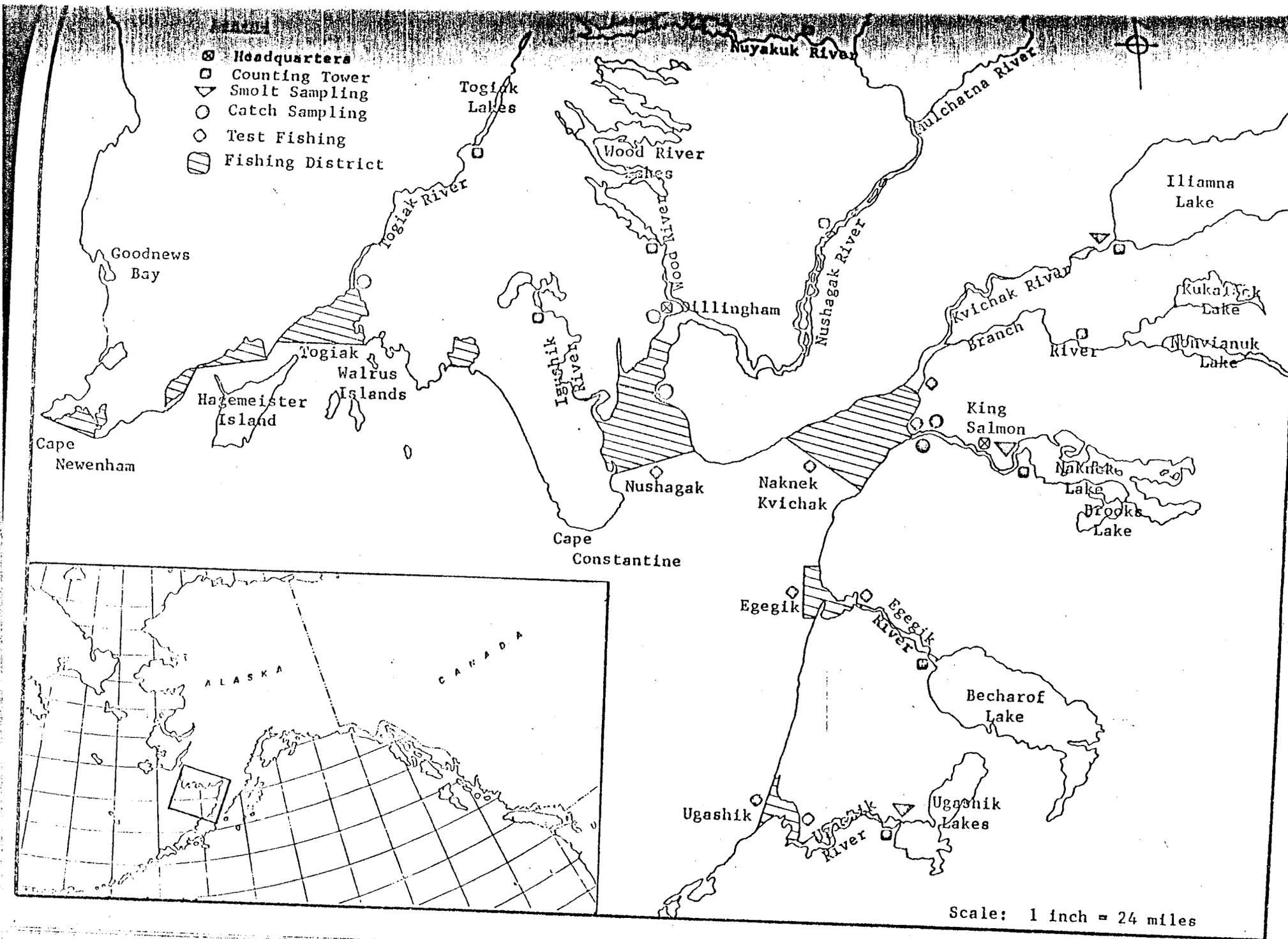
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INTRODUCTION

Bristol Bay's lake and river systems produce the largest red salmon runs in the world, however, all five species of pacific salmon are commercially caught in Bristol Bay's five fishing districts (see preface map). Activity is intense during the relatively short season. Issuance of over 40 emergency orders for varied-length fishing periods during the one-month emergency order period (from mid-June to mid-July) is not uncommon. Fishing activity commences in early June on king salmon with most effort concentrated in the Nushagak district. The king salmon run generally peaks during the last two weeks in June and effort then shifts to red salmon in all fishing districts. The red salmon run generally begins during the last week in June, peaks around July 4, and is essentially over by mid-July. Timing of the chum salmon and red salmon runs are nearly identical, although chum catches are usually sustained an additional week as red catches diminish. Pink salmon runs occur only during even years in Bristol Bay and again, most effort is concentrated in the Nushagak district. Pink fishing commences in mid-June and is essentially over by the second week in August. Little fishing activity exists after the close of the pink salmon run. Residents of the Bristol Bay area comprise the bulk of the fishing effort on the coho salmon runs, which begin in mid-July and last through the month of August. Peak catches are generally made from the last week of July through mid-August, but run timing varies considerably between districts.

Red salmon runs, because of their magnitude and commercial value, are the target for the bulk of management and research activities and commercial fishing effort in Bristol Bay. Other salmon species, however, constitute an important part of Bristol Bay's commercial salmon fishery, a fishery which has had an average annual first wholesale value of over \$30,000,000 during the past 12 years.

1971 SEASON SUMMARY

Management of the commercial fishery, particularly on red salmon, was especially difficult because the run was slow in developing and peaked approximately one week later than usual. The red salmon inshore forecast proved to be quite accurate, however, and escapement goals were achieved in all rivers (Table 1).

Indices of run development are obtained by in-season analyses of catch, effort and escapement data provided by the Department's programs - offshore, outside and inside test fishing, catch and escapement sampling, enumeration of escapement by aerial surveys and tower counts, and aerial fishing-district surveys - and cannery catch reports. Data from these sources are collected continually during the season and the commercial fishery is managed on an hourly basis.

The test fishing program conducted 20 to 70 miles offshore from Port Moller demonstrated its value and usefulness as a management tool. Offshore test fishing indices derived during the 1971 season provided a reasonable approximation of run timing and overall magnitude approximately 8 days before red salmon reached Bristol Bay fishing districts. These indices were especially significant in 1971 due to the late arrival of the run. The run, which usually peaks inshore around July 4, had hardly begun to develop at that time. Cumulative catch and escapement through July 4 was below 2,000,000 and it would have been logical to assume the run would fall well below the forecasted level if the offshore test fishing indices had not been available.

The forecasted inshore red salmon run was 15,170,000 with an escapement goal range of from 4,571,000 to 7,201,000 (Table 1). The inshore run totaled 15,825,000 comprised of a 9,584,000 catch and a 6,241,000 escapement (Table 2, Figure 1). Regulation of catch and escapement from June 16 through July 17, was accomplished by issuance of 42 emergency orders permitting varied-length fishing periods in respective districts (Table 4).

The total inshore forecast was only 4.3% below the actual run and individual river system forecasts were also more generally accurate than in past years (Table 1). Only the Naknek and Ugashik River forecasts, of the major river system forecasts, deviated more than 20% from the actual run.

Actual age composition of the red salmon run (Appendix Table 33) varied considerably from the forecasted age composition. Shortage in one age class, however, was generally countered by excess in another age class and the resultant total of 2-ocean and 3-ocean fish comprising the actual run was approximately the same as forecasted.

The total salmon catch (all species, all districts) of 10,397,000 ranked seventh in catches from the past 20 years and was approximately one million over the 20-year average (Appendix Table 10). Red salmon constituted 92% of the total salmon catch, king salmon 1%, chum salmon 7% and coho salmon less than .2%. The red salmon catch totaled 9,584,000 and ranked sixth in catches since 1952 (Appendix Table 5). The 123,000 king salmon catch was approximately 30,000 above the 20-year average and ranked fourth (Appendix Table 6). The chum salmon catch of 677,000 ranked sixth in catches from the past 20 years and was approximately 187,000 above the 20-year average (Appendix Table 7). Pink salmon runs occur only during the even years in Bristol Bay. The coho catch totaled only 13,000 and was the 4th-from-the-lowest coho catch in the past 20 years (Appendix Table 9).

The total Bristol Bay salmon catch resulted in a case pack of 779,000. Approximately 4% of the total catch was marketed as fresh, frozen or cured salmon. Nearly 54% of the coho catch was marketed as fresh, frozen or cured products, as was 29% of the king catch. Only 3% of the red and chum salmon catches were marketed in this manner (Table 13). The wholesale value of all fishery products--case pack; fresh, frozen or cured products; salmon roe; and herring roe-on-kelp--was \$40,327,000 (Appendix Table 17). Comparatively, only 1% of this amount (approximately \$410,000) was allocated for Department of Fish and Game, commercial fisheries research and management programs in Bristol Bay during 1971.

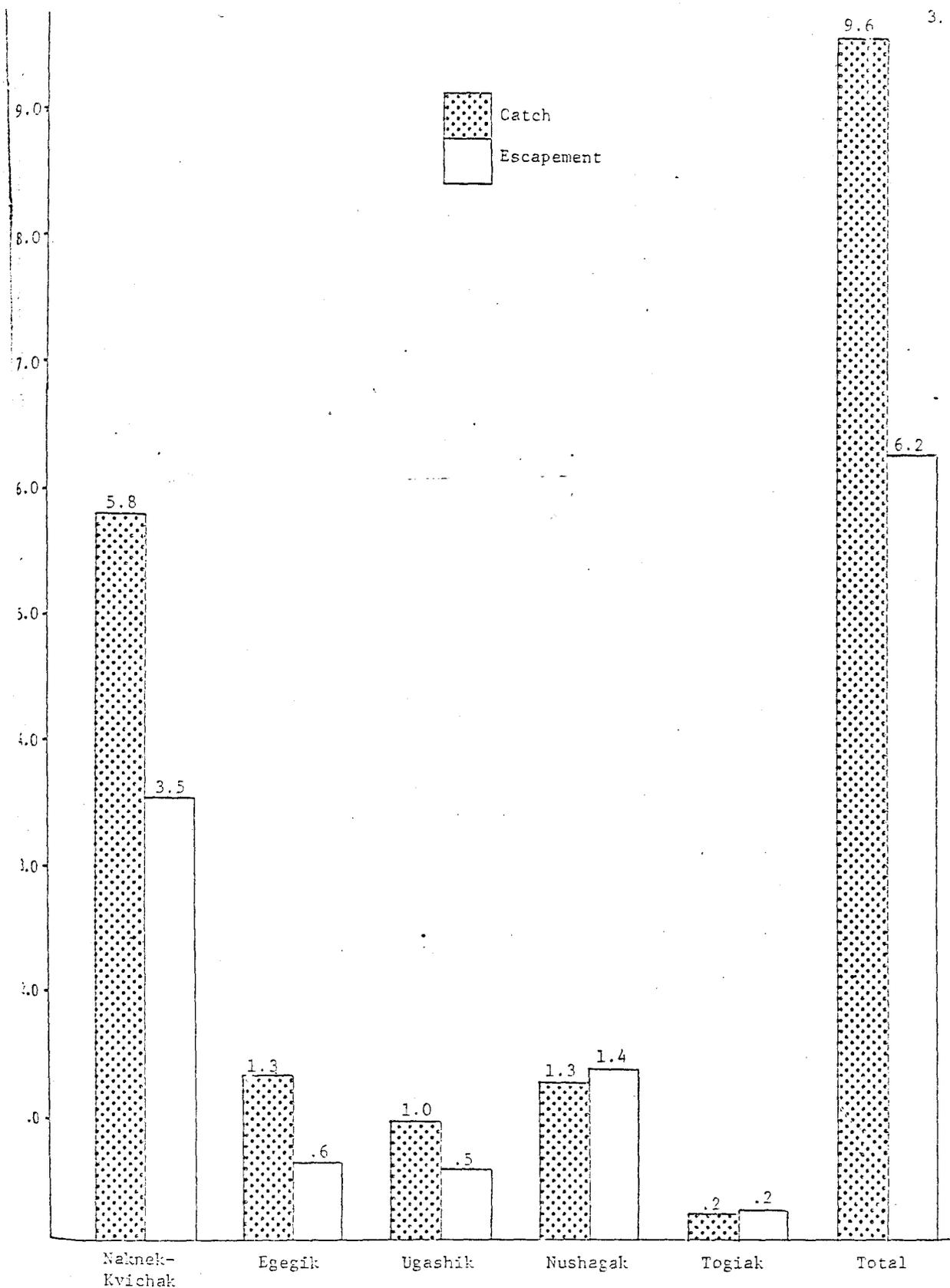


FIGURE 1. Bristol Bay red salmon catch and escapement by district, 1971.

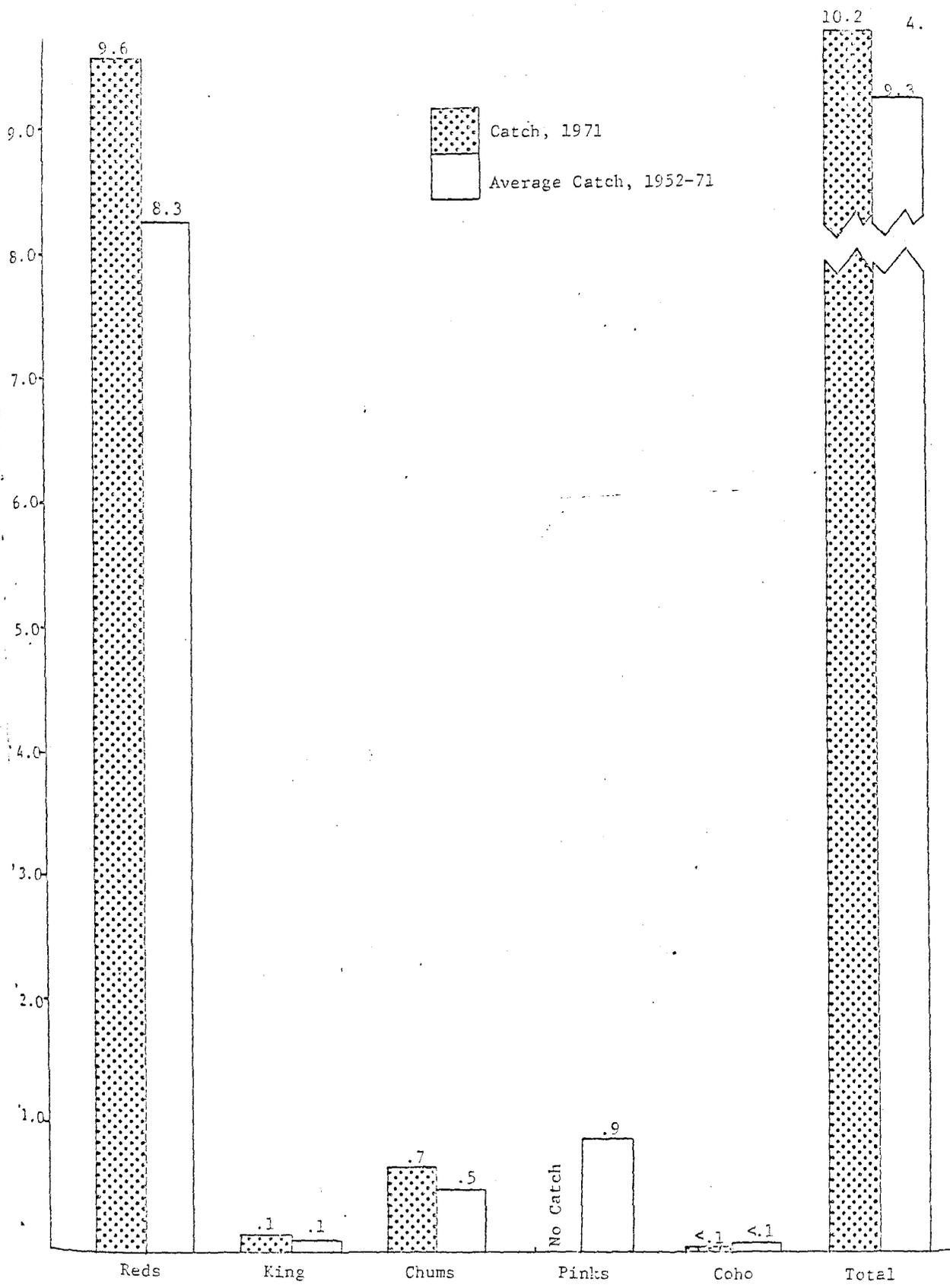


FIGURE 2. Bristol Bay commercial catch by species compared to average catch, 1952-71.

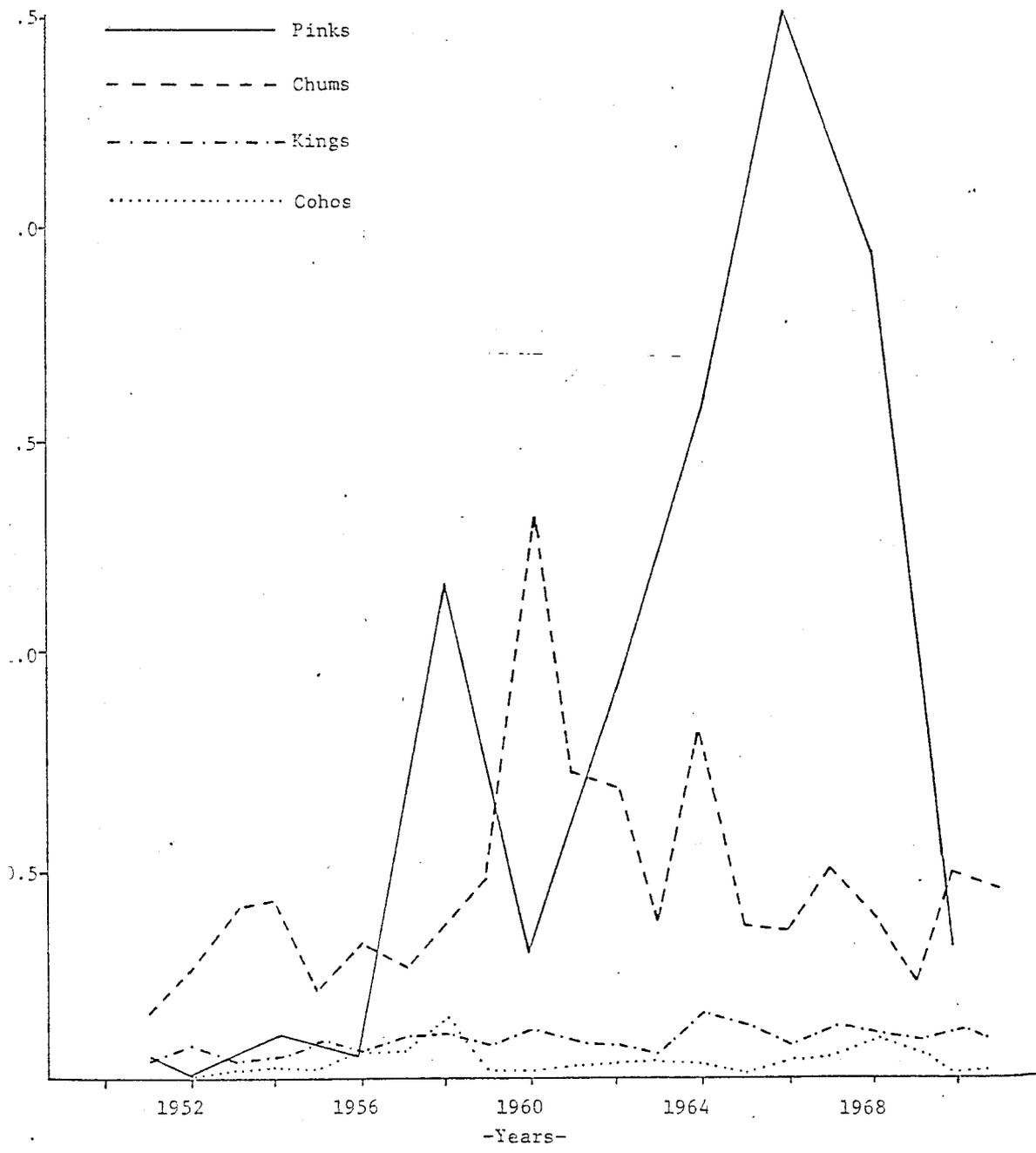


FIGURE 3. Bristol Bay commercial catch by species, excluding red salmon, 1951-71.

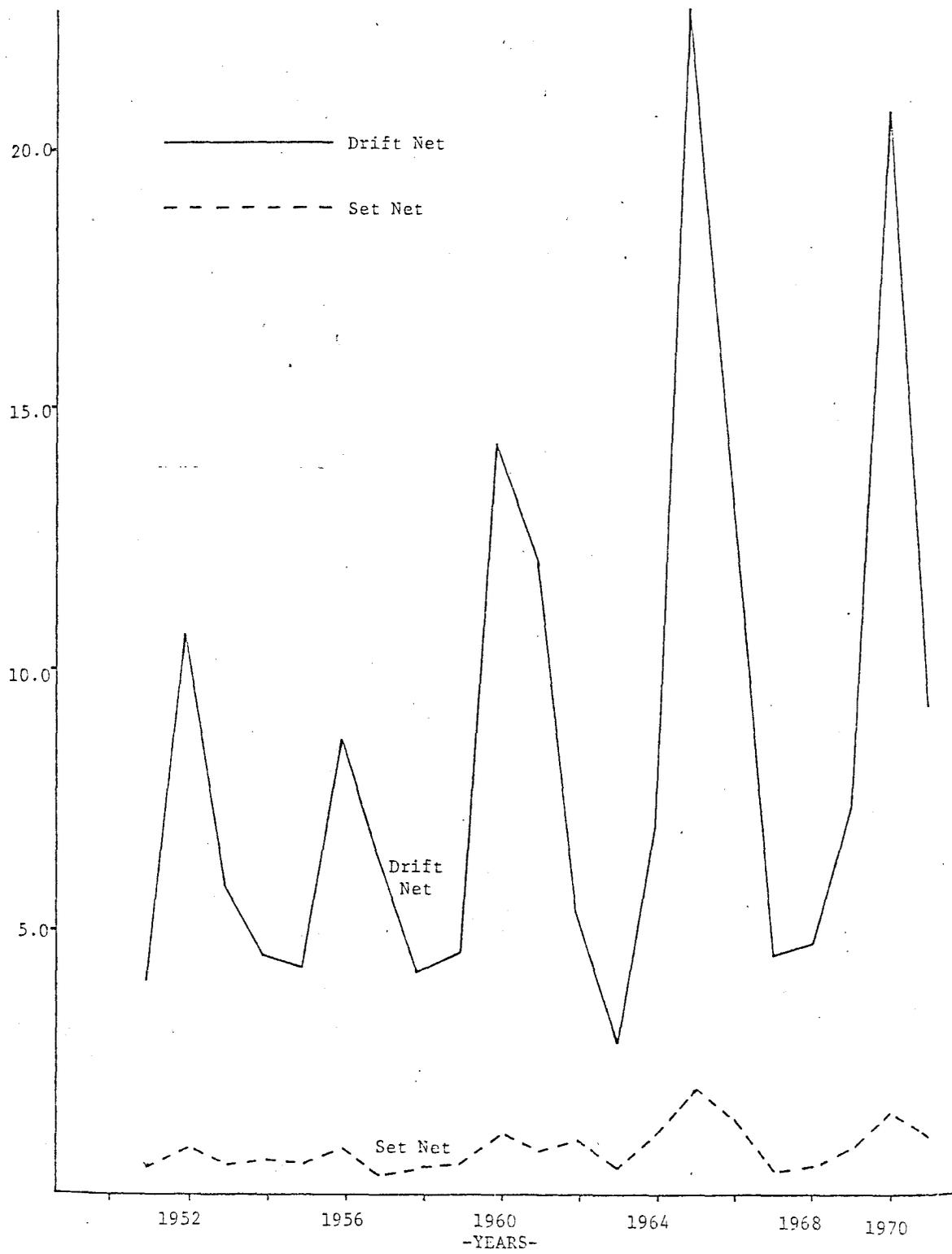


FIGURE 4. Bristol Bay commercial catch by type of gear, all species combined, 1951-71.

Average red salmon catches during the past 10 years were higher than average catches during the period 1952-61, indicating a reversal of the catch trend decrease exhibited from the early 1940's to the mid 1950's (Appendix Table 5, Figure 5). King salmon catches since 1962 averaged higher than any previous 10-year period since 1900-1909 and 1910-1919. The average king salmon catch for 1962-71 was 109,000 compared to considerably lower 10-year averages since 1930 (Appendix Table 6). Chum salmon catches during the past 10 years average higher than for any previous 10-year period since 1910-1919 (Appendix Table 7). The pink salmon run began shifting to an even-year-only run just prior to 1920. Average even-year pink catches for the past 10 years were higher than for any 10-year period since 1920-1929 (Appendix Table 8). The average coho salmon catch for the 10-year period 1962-1971, was only slightly above the previous 10-year's average, but considerably above the average for the 1930-1949 period (Appendix Table 9).

No significant regulation changes were imposed during the 1971 season. The general district and extensions of the Naknek-Kvichak and Egegik districts established for the 1970 peak-year run did not exist in 1971 and all district boundaries were the same as in 1969.

Gear registration in 1971 (Table 3) was approximately the same as in 1970 and has been relatively stable since 1963 (Appendix Table 4). Drift fishermen were permitted to use 150 fathoms of gear in 1971, and set net fishermen were permitted to use 50 fathoms. Legislation to limit gear by setting qualifications to enter the fishery was again attempted in 1971, but was declared unconstitutional before the season and consequently had no effect on gear registration in Bristol Bay.

Processing of fishery products in Bristol Bay during 1971 was accomplished by 25 operators. Thirteen shore canneries operated 41 of the 43 available canning lines (Table 17). Salmon roe was processed at most canneries. One floating cannery and five freezer ships operated during the season and a total of 14 operators were involved in producing fresh, frozen and cured salmon for market.

Department of Fish and Game, commercial fisheries, research and management programs operative during 1971 included escapement enumeration and sampling, catch sampling, smolt enumeration, spawning ground surveys, fecundity studies and test fishing (offshore and inshore).

DISTRICT SUMMARIES

NAKNEK-KVICHAK DISTRICT

The extended district boundaries established for the 1970 season were eliminated during 1971 and the boundaries were the same as in 1969. Pre-season gear registration totaled 1,228 units, consisting of 870 drift nets and 358 set nets (Table 3). Approximately the same number of units fished this district during the peak of the season (Table 5).

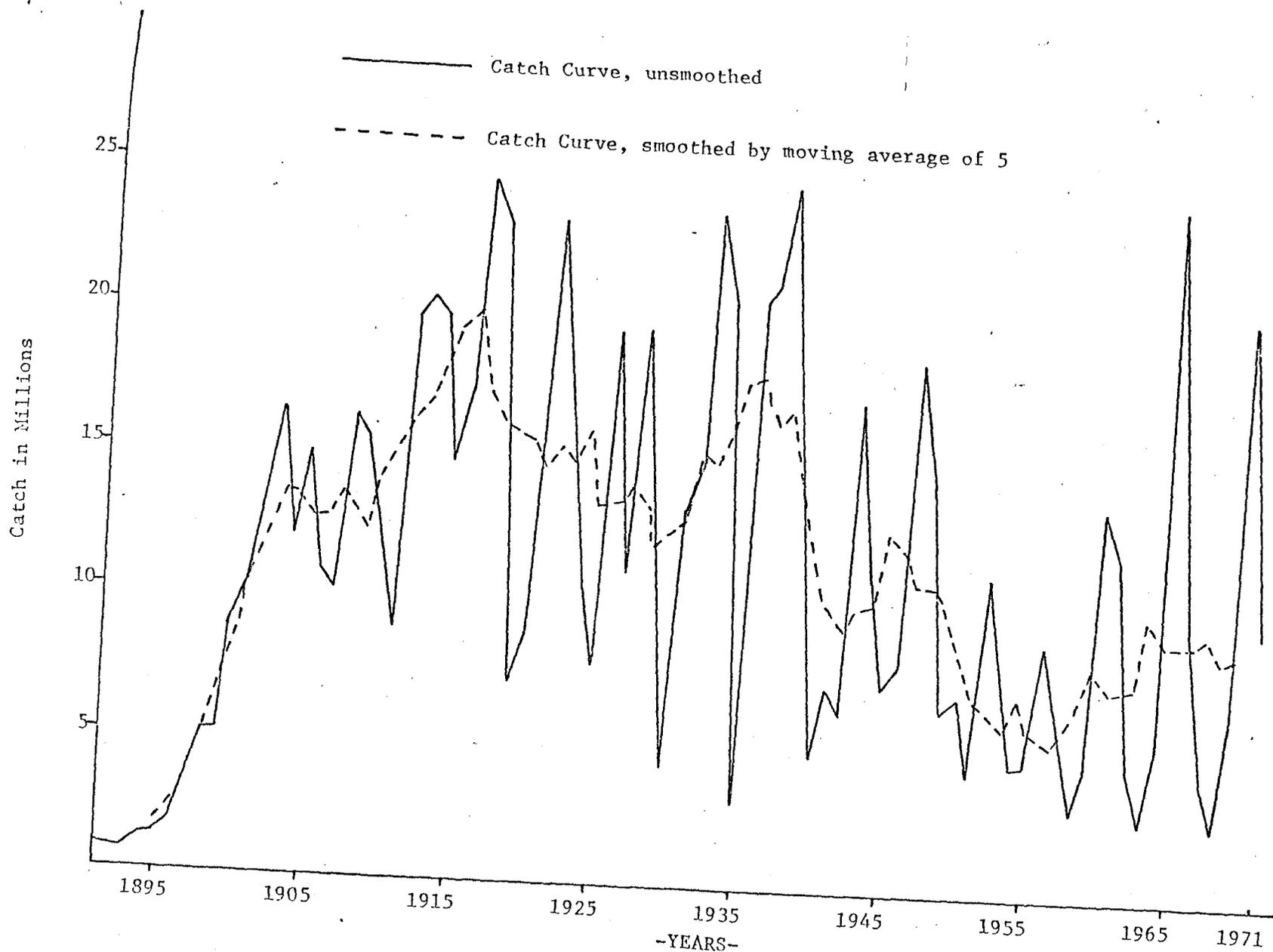


FIGURE 5. Commercial catch of Bristol Bay red salmon, 1893-71.

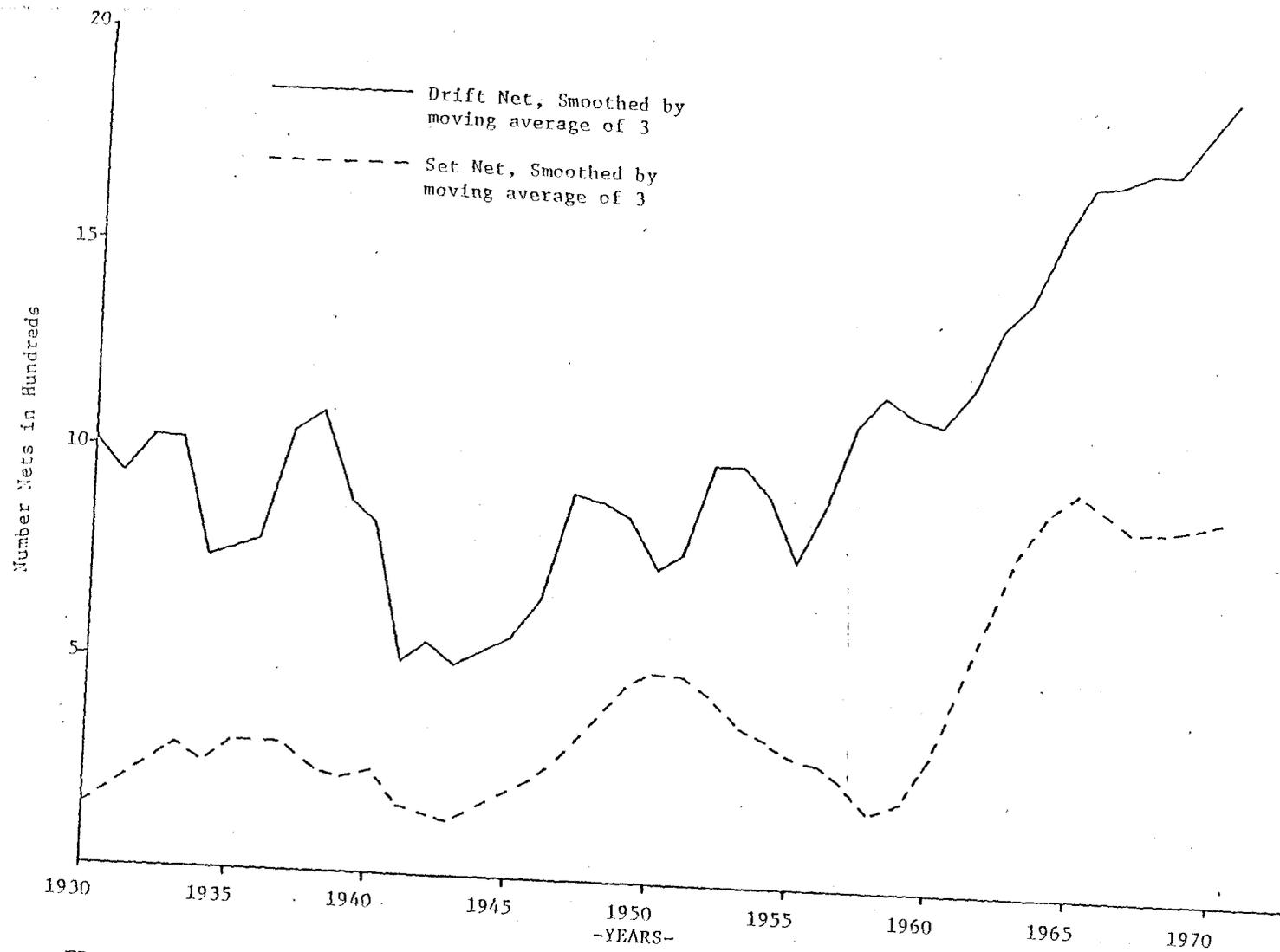


FIGURE 6. Number of commercial drift and set nets registered for Bristol Bay, 1930-71.

The district's red salmon run developed and peaked about a week later than average, as it did in most other districts. Significant catches, however, were made over a relatively lengthy period (2 weeks), making the task of management less difficult than if the run had peaked over a short time period as it usually has in the past.

The Naknek-Kvichak district red salmon forecast was 8,889,000 and the actual run was 9,368,000 or approximately 5% above forecast. Escapements nearly identical to pre-season goals were achieved in the three rivers contributing to this district's run--Kvichak, Branch and Naknek (Table 1).

Management

Emergency order fishing time totaled 405 hours during the 1971 season in the Naknek-Kvichak district (Table 4).

Standard fishing periods of 48 or 24 hours, with alternating 24-hour closures, were permitted in the entire district through July 5. It was apparent, prior to this, that the run was either late or short of forecast. Cumulative catch to this date was 1,652,000 while indices of escapements were negligible on the Naknek River. The Naknek section remained closed four days from July 5 through 9, during which time the Kvichak section was opened for 12 hours. Offshore test fishing catches from the Port Moller area indicated fair numbers of fish were still due to reach Bristol Bay fishing districts. Inshore, however, escapement was still lagging far behind catches although the escapement indices were improving. The cumulative catch through July 8 was 2,254,000. Naknek River escapement was building, but had only reached a fourth of the goal. Aerial surveys and test fishing indicated Kvichak escapement was also building. Daily catches through July 8 had not indicated a run build-up of any magnitude.

The Naknek section was opened for set net fishing only for 12- and 13-hour periods on July 9 and 10, respectively, while the Kvichak section remained closed until a 12-hour fishing period 11:00 a.m., July 12. The set net-only openings in the Naknek section, preceded by the 4-day closure, had been restrictive enough to permit the Naknek River escapement to build considerably. The escapement count through July 10 was 684,000 or just over two-thirds the escapement goal and indications were that the escapement was still building. The Naknek section was opened to all gear immediately after the 13-hour period on July 10, and except for a 24-hour closure (July 11-12) was open to fishing the remainder of the season. Cumulative escapement counts at the Naknek counting tower were 801,000 and 855,000 on July 11 and 12, respectively, and by the end of the season reached 936,000.

The Kvichak River run was slower in developing. The district catch totaled approximately 4,000,000 at the close of the July 12 fishing period, nearly 80% of the projected harvest for the season. Escapement past the Kvichak River counting tower on July 12 totaled 1,000,000 or less than half the escapement goal. Test fishing at Naknek and aerial surveys, however, indicated good numbers of fish were in the river between the fishing district and the counting tower. Peak catches had been made by the Port Moller test fishing boat on July 7 and 8, indicating run strength which should reach the fishing districts approximately July 15. The Kvichak section was opened for

12-hour periods on July 13 and 15, respectively, during which catches held up to previous daily catches. The tower escapement count reached 1,500,000 by July 15, and test fishing at Nakeen and aerial surveys of the river indicated approximately 1,000,000 fish were in the river between the fishing district and the counting tower. Fishing was extended at the close of the 12-hour fishing period July 15, and the Kvichak section was open the remainder of the season. Final escapement for the Kvichak River was 2,387,000 and the season red salmon catch for the Naknek-Kvichak district was 5,857,000.

Catch

The district catch for all species was 6,019,000 fish, 6% above the 20-year average (Appendix Table 10). This catch comprised 58% of the 1971 Bristol Bay total catch.

Red salmon accounted for 97% of the district's total catch and 61% of Bristol Bay's total red salmon catch. The red salmon catch was 6% above the 20-year average (Appendix Table 5). Age composition of the red salmon catch was 9% 4-year fish from the 1967 parent-year escapement, 76% 5-year fish from 1966 and 15% 6-year fish from 1965. Average weight of red salmon caught was 5.5 pounds (Appendix Table 18). The sex ratio of the catch was 42% males and 58% females (Appendix Table 26).

The district's king salmon catch of 10,000 equaled the 20-year average (Appendix Table 6). Very little fishing effort is directed specifically toward king salmon in the Naknek-Kvichak district.

The chum salmon catch of 151,000 was 28% above the 20-year average and accounted for 3% of the total district catch (Appendix Table 7).

The coho catch, less than 100 fish, was 95% below the 20-year average. Coho catches for the past three years have been far below average (Appendix Table 9).

Escapement

Escapement in this district is monitored by counting towers on the Kvichak, Branch and Naknek Rivers, by test fishing near Nakeen on the Kvichak River and by aerial surveys of the Kvichak River.

Escapements within range goals were achieved in all three rivers (Table 1). The Naknek River escapement of 936,000 was approximate to the 17-year average. Kvichak River escapement totaled 2,387,000 and was well below the 17-year average and considerably below the peak-plus-1 year escapements in 1966 and 1961 (Appendix Table 21). The Department, however, had achieved an exceptionally high non-peak year Kvichak River escapement in 1969 in attempt to re-establish historical patterns of 2 or 3 productive brood years per 5-year cycle. The 1971 escapement goal was purposefully reduced to the minimum productive level because of the large 1969 and 1970 escapements. It was assumed that the lake nursery area was being fully utilized by fry and fingerlings from these two large escapements.

The age composition of the Kvichak River escapement was 5% 4-year fish from the 1967 parent year escapement, 79% 5-year fish and 16% 6-year fish; Branch River, 3% 3-year fish, 53% 4-year fish and 41% 5-year fish, 3% 6-year fish; and Naknek River, 12% 4-year fish, 74% 5-year fish and 14% 6-year fish. Escapement sex ratios were 39% male and 61% female, 47% male and 53% female, and 38% male and 62% female for the Kvichak, Branch and Naknek Rivers, respectively.

EGEGIK DISTRICT

The 1971 Egegik district was smaller than in 1970, but the same size as in 1969, which has been standard for the past several years.

The 499 units of gear registered for the Egegik district exceeded the 1970 registration by 30 units (Table 3). Drift gill net registrants increased by 47 units over 1970 while set nets decreased by 17 units. The highest period catch of 293,000 red salmon occurred on July 8, when the highest number of units were fishing (Table 6). Total gear registration was evenly divided between residents and non-residents.

The inshore red salmon forecast for the district in 1971 was 2,113,000 (Table 1). The actual run was 1,941,000, 8.1% below forecast and 4.4% below the 20-year average.

Management

The unusual nature of the migration in 1971 necessitated cautious management of the fishery. The run was 5-6 days later than normal and developed over a longer period of time without the characteristic surge of fish during the peak that makes an orderly harvest difficult to obtain. The result was many open periods spaced by short closures, a pattern much preferred by industry, fishermen and the Department. Canneries do not get slugged with fish; cannery workers and fishermen get rested between periods; and the Department can keep an accurate account of catch and escapement.

The 1971 run was one of the best in terms of accurate management. A prevailing onshore wind during the entire season kept the fish shoreward where their movements could be accurately monitored by test fishing boats. The fish followed traditional district entry patterns which accurately indicated the stage of run development. Once inside the river, however, the migration pattern deviated considerably from normal.

The fish held in the lower river rather than migrating swiftly to the lagoon and once in the lagoon they held for up to 10 days before continuing past the counting tower. During this time the fish were actively migrating between the lagoon and the upper river. A probable explanation is that low water temperatures caused the fish to hold in the lagoon instead of entering the river above the lagoon. They often moved between the lower river, lower lagoon, upper lagoon and upper river within the same day, apparently in conjunction with the tidal influence which affects the lagoon but not the river above. This migrational phenomenon was suspected on July 7 and confirmed by multiple aerial surveys conducted July 9.

Because of unusually late tower counts, escapement estimates formulated and subsequently used in management decisions were based on test boat indices and aerial survey observations. These escapement indicators proved to be quite accurate in 1971.

The lengthy season was uncharacteristic of past Egegik runs. Generally, a fast increase to a surge of fish at the peak, with a quick tapering off, is the characteristic profile of the run. Maximum fishing effort began with the first emergency order period opening and continued at a maximum level through July 15 (Table 6). After the July 15 period, fishing effort began to decrease. Catches steadily increased during the first six periods to the peak catch of 293,000 red salmon on July 8. The following four periods produced significant, though decreasing catches. The number of fishing periods permitted during the emergency order period is, alone, indicative of the elongated run. Over 200 hours of fishing time was allowed during the emergency order period (Table 4).

The cumulative catch through June 26 was 78,800 reds. No fish had passed the tower nor were in the lagoon on this date and the inside test boat indicated an escapement of only 29,000 fish. After a 26-hour closure the district was opened for 24 hours on June 27. At the end of this period the cumulative catch and indicated escapement were 141,000 and 57,000 fish, respectively, indicating a normal steady increase in run development. Another 24-hour period was permitted on June 29-30. The results of this opening and the subsequent closure indicated that the run was developing slower than normal. Approximately 700 fish were counted in the lagoon July 1. Offshore test boat catches indicated the run was yet to peak and a 24-hour period was permitted July 1-2, with a 24-hour period on July 4-5. Aerial lagoon survey estimates were 31,500 fish on July 4 and 117,000 on July 5. These counts reinforced the feeling that the run was progressing, but slightly later than normal. Since the normal peak-run surge was expected soon and the catch was well ahead of the escapement, fishing periods were reduced to 12-hours in length July 7. Significant test fishing catches near the southern district boundary were indicative of the early stages of the run. False Pass and offshore test boat catches also suggested that the run had not yet peaked at this time.

The 12-hour period, July 7-8, produced the highest catch to date of 293,000 reds. Fish had not yet passed the tower and weather prohibited a lagoon survey on that day. The cumulative tower count was 18 fish on July 9, while the estimated lagoon count was 133,500. The cumulative catch was now 972,000 reds, 64% of the projected catch goal. Inside test fishing indicated an escapement to date of 302,300 fish, 20% of the escapement goal.

An unprecedented fishing period for set nets only was permitted in the Egegik district on July 10. The set nets served as a test fishery to determine if appreciable numbers of fish were still in the district while reducing the possibility of a large catch, which may have been the case if the total registered effort had been allowed to fish. The 48-hour waiting period for transferring to and from the Ugashik district had been waived at this same time to enhance harvesting the Ugashik run which was too large for the local fleet there to handle.

Test fishing indicated an additional 129,000 escapement on July 10. The next fishing period began 11:00 a.m., July 11, after considering the options of waiting an additional 12 or 24 hours for an opening. An opening 12 hours later would have resulted in a night opening, which the Department avoids when possible, and a 24-hour delay could have resulted in exceeding the escapement goal. The tower count, test fishing catch and lagoon survey count July 11, indicated that at least the lower end of the escapement goal range would be achieved.

The catch-per-unit-effort data from a 12-hour opening, July 14-15, revealed that the run had peaked approximately July 8. Another 12-hour fishing period was permitted on July 16-17, and the district then remained closed over the weekend. Beginning 9:00 a.m., July 19, fishing was allowed on a 5-day-per-week basis by regulation. Red salmon catches diminished to practically nothing by July 25. Escapement counts continued until July 28.

Catch

The district catch for all species was 1,336,865 fish, 6% above the 20-year average (Appendix Table 10). This catch comprised 13% of the 1971 Bristol Bay total catch of all species.

The catch of 1,306,682 red salmon accounted for 98% of the district's total catch and 14% of Bristol Bay's total red salmon catch. The red salmon catch was 7% above the 20-year average (Appendix Table 5). Age composition of the red salmon catch was 3% 4-year fish from the 1967 parent-year escapement, 61% 5-year fish from 1966 and 36% 6-year fish from 1965 (Appendix Table 29). Average weight of red salmon caught was 6.3 pounds (Appendix Table 18). The sex ratio of the catch was 44% males and 56% females (Appendix Table 26).

The district's king salmon catch of 2,187 fish was 27% below the 20-year average (Appendix Table 6). No fishing effort is directed specifically toward king salmon in the district and all kings are caught incidentally to the red catch.

The chum salmon catch of 27,073 equaled the 20-year average and accounted for 2% of the total district catch (Appendix Table 7).

The coho catch was 923 and was 70% below the 20-year average. Coho catches for the previous 3 years had been far above average (Appendix Table 9).

Escapement

Escapement in the district is monitored by counting towers, test fishing and aerial surveys of the Egegik lagoon and river. The red salmon escapement of 634,014 was 6% above the 600,000 goal and 21% below the 20-year average escapement. Escapement/return relationships have indicated that escapements larger than 600,000 are not necessarily more productive.

The age composition of the Egegik escapement was 3% 4-year fish from the 1967 parent year escapement, 58% 5-year fish and 39% 6-year fish. Escapement sex ratios were 52% males and 48% females.

UGASHIK DISTRICT

The Ugashik district fishing boundaries remained unchanged from the 1970 season.

Total gill net registration in 1971 was 127 units, four less than in 1970 (Table 3). This represented 9 more drift nets and 13 fewer set nets than in the previous year. Residents accounted for 72% of the total gear registration. Approximately 60 boats and 15 set nets actually fished. The number of boats rose to a maximum of 115 on July 15-18, when fishermen transferred to the Ugashik district to help harvest the run (Table 7).

Management

The commercial harvest began with a 48-hour opening June 24-26, at the beginning of the emergency order period (Table 4). A total of 5,329 reds were caught (Table 7). The openings through July 2 consisted alternately of one day of fishing followed by one day of closure. It was evident from set net catches at Pilot Point on July 1 that good numbers of fish, pushed by the inshore wind that prevailed most of the season, were entering the district. The next fishing period was opened for 36 hours beginning July 3. No fish had reached the tower or lagoon by this date.

No inside or outside test fishing boats were operating in the Ugashik district in 1971. The 11 set net sites located in the Ugashik River at Ugashik Village were closely evaluated as an indicator of escapement. Fish concentrations in the river below the lagoon were also relied on as an escapement indicator.

A 24-hour fishing period beginning July 6 was subsequently extended five consecutive times in 24-hour increments through July 11. Lagoon counts on July 6 revealed fish were moving into the lagoon. The village set nets were making excellent catches and at times were being sunk by the weight of fish caught. Aerial surveys outside the district in clear water revealed a considerable number of fish were still approaching the district. The Ugashik district run is normally the latest to peak. The strong early showing and continuance of good catches indicated that the run was well above the prediction.

It appeared by July 7, that the Ugashik district fleet would be unable to harvest the run since all fishermen had been placed on catch limits by cannery operators. The normal 48-hour waiting period required when transferring to or from the Ugashik district was waived on July 7 to allow immediate additional effort from other districts. The catch was effectively reduced by 70% when the largest operator in the district suspended operations from 1:00 p.m., July 9, through 10:00 a.m., July 10, a 21-hour suspension,

due to over-capacity catches, though the fishery remained open. Only 50,000 fish were estimated to be in the lagoon on July 10, however, there were good indications of fish moving into the lower river. The catch on this date totaled 479,500 fish, approximately 74% of the total predicted catch (Table 1).

As a precaution, the season was allowed to close July 11. After a 26-hour closure a 12-hour fishing period was permitted July 12. The 48-hour waiting period for district transfers was reinstated on July 13. Two 24-hour periods were announced, separated by a 1-day closure. The second period was to end July 16. However, it was extended and the 48-hour waiting period was again waived. Lagoon counts had increased to 154,000 fish and 200,000-300,000 fish were estimated to be in the lower river. Significant tower counts did not begin until July 17, but increased from 43,000 the first day to 195,800 the second day. On this date the escapement goal was virtually assured and the fishery reverted by regulation to 5-day-per-week fishing. Fishing was permitted by emergency order July 24-26, to allow fishing late reds during the weekend.

The final escapement count was 529,752 or 6% above the 500,000 goal. The catch of 954,068 reds brought the total run figure to 1,483,820 or 29% above the forecast.

Catch

The district catch for all species was 969,822 fish, 107% above the 20-year average (Appendix Table 10). This catch comprised 9% of the 1971 Bristol Bay total catch of all species.

The catch of 954,068 red salmon accounted for 98% of the district's total catch and 10% of Bristol Bay's total red salmon catch. The red salmon catch was 115% above the 20-year average (Appendix Table 5). Age composition of the red salmon catch was 2% 4-year fish from the 1967 parent-year escapement, 87% 5-year fish from 1966 and 11% 6-year fish from 1965 (Appendix Table 30). Average weight of red salmon caught was 6.4 pounds (Appendix Table 18). The sex ratio of the catch was 43% males and 57% females (Appendix Table 26).

The district's king salmon catch of 779 fish was 65% below the 20-year average (Appendix Table 6). No fishing effort is directed specifically toward king salmon in the district and all kings are caught incidentally during the red salmon fishery.

The chum salmon catch of 14,506 fish was 34% below the 20-year average and accounted for 2% of the total district catch (Appendix Table 7).

The coho catch was 469 fish, 74% below the 20-year average. Coho catches for the previous three years were well above average (Appendix Table 9).

Escapement

Escapement in the district is monitored by counting towers, by test fishing and aerial surveys of the Ugashik lagoon and river. The escapement of 529,752 reds was 6% above the 500,000 goal and nearly equaled the 18-year average.

The age composition of the Egegik escapement was 5% 4-year fish from the 1967 parent-year escapement, 89% 5-year fish and 6% 6-year fish. Escapement sex ratios were 46% males and 54% females.

NUSHAGAK DISTRICT

The Nushagak district fishing boundaries remained unchanged from 1970, and no boundary relocations were implemented during the course of the salmon season.

The Igushik section was again managed separately from the remainder of the Nushagak district, while the Snake River section remained closed for the eleventh straight year in an effort to protect the expected small red salmon return.

The emergency order period began on June 16 and continued through July 17. During this 32-day period, the Nushagak district was open to fishing for 346 hours or 46% of the time, while the Igushik section was open an additional 48 hours for a total of 394 hours (52%) (Table 4). A 5-day-per-week fishery was allowed both prior to and after the emergency order period. Fishing time during the season was controlled by issuance of 16 emergency orders (Table 4). One emergency regulation, issued under the Administrative Procedure Act, was used late in the season to allow un-restricted movement of the fishing fleet into the Nushagak fishery.

Pre-season fishing gear registration for the district was 815 gill nets, including both drift and set net gear, identical to the amount of gear registered in 1970 (Table 3). Of this total, 83% were resident fishermen and 17% non-resident. With the exception of Togiak, the Nushagak fishery has the highest percentage of resident fishermen among the four major districts (Table 3). Of the 233 set nets registered for fishing in 1971, only about 150 actually participated in the fishery (Table 8). Many resident fisherman license both drift and set net gear but do not use their set net gear. Thus, the pre-season set net registration is always higher than the number in actual use (Tables 3 and 8).

As in 1970, about one-half of the Nushagak fishing fleet (290 boats) transferred to other districts in the Bay. From July 5-17, the period of peak catches, 260 to 340 boats participated in the Nushagak fishery (Table 8). Many of these boats were double-end sailboat conversions and skiffs (number estimated at 150).

The highest effort recorded for drift and set net gear, based on fish ticket delivery tabulation, indicated that 341 units of drift and 150 units of set net gear participated in the fishery at the peak of the red salmon run (July 5-17), (Table 8). The large discrepancy between pre-season gear registration and actual gear in use during the season is accounted for by the transferring of gear to other fishing districts and by double-registrants as discussed above. The amount of gear in use at the peak of the red salmon run since 1966 has been: 1966- 473; 1967 - 569; 1968 - 556; 1969 - 499; 1970 - 430; and 1971 - 491.

The district inshore red salmon forecast of 2,655,000 had 1,644,000 assigned to Wood River; 565,000 to Igushik River; 293,000 to Nuyakuk River; and 153,000 to Snake River and the Nushagak-Mulchatna system combined (Table 1). The total return based on preliminary apportionment of the commercial catch by river system was: Wood - 1,612,000; Igushik - 503,000; Nuyakuk - 384,000; and Snake/Nushagak-Mulchatna - 112,000; for a total run of 2,611,000. This return was within 2% of the forecasted district run (Table 1) and 15% higher than the average run of 2,277,000 for the last 10-years (Appendix Table 5).

Pre-season harvest levels were again predicted for king, chum and coho salmon stocks of the Nushagak district. The projected king salmon harvest was 85,000; while chum and coho salmon harvest levels were estimated at 280,000 and 35,000 fish, respectively. The king salmon harvest was 83,000 or only 2,000 fish below the projection, while the coho harvest of 8,000 was well below the expected level (Table 11). Market conditions, fishing effort and a weak run contributed to the low coho salmon harvest. The 360,000 chum salmon harvest was over 80,000 higher than the anticipated catch.

Six processors bought salmon in the Nushagak in 1971. Three major canneries operated 11 canning lines while five operators purchased fresh-frozen and cured fish (Table 17).

Management

The late timing of the Nushagak salmon run in 1971 was comparable to the 1956 run. The red salmon fishery usually peaks around July 4 with good catches several days prior to this date. In 1971, the first respectable red salmon catch was not made until July 5, and the red run did not peak until July 9 (Table 8). In a "normal" year, the first good catch usually occurs sometime in the last week of June. The lateness of the salmon run (all species exhibited the same tendency) resulted in untold management problems.

The king salmon harvest prior to commencement of the emergency field regulation period (June 16) was approximately 11,000 fish, 59% lower than the average catch (27,000) for this stage of the run. The fishery was consequently extended for 72 hours, which in affect created a 5-day opening (June 14-19) for the Nushagak fleet (Table 4). At the weekend closure on June 19, the cumulative king salmon catch was 17,000 or still well below the past average by this date.

After a closure of 48 hours, the Nushagak was re-opened for a 48-hour period on June 21-23 (Table 4). Catches were poor (4,000) for the period and the district was allowed to close at 9:00 a.m., June 23. Surveys of subsistence nets showed conclusively that no kings were moving up-river. After a 53-hour closure, the fishery was re-opened for a 24-hour period on June 25-26 (Table 4). Cumulative king salmon catches through June 23 were only 21,000 compared to the long-term average of 55,000. The first 24-hours of the fishery beginning on June 25 produced light catches under calm weather conditions. Upon examination of Kanakanak beach subsistence nets which were producing good catches, a decision was made to extend the fishery for 28-hours, to 6:00 p.m. on June 27. The 52-hour fishery on June 25-27 produced a catch of 27,000 king salmon (most caught during the last 24 hours) and brought the cumulative king harvest to 48,000 fish, still below the long-term average for this date (Table 8).

After a 48-hour closure, the season was re-opened for 24 hours on June 29-30. The 17,000 kings caught during this opening proved it to be the last major king period and many fishermen began converting to red salmon gear. The cumulative king catch of 66,000 through June 30 was exactly equal to the long-term average harvest. Subsequent steady catches of kings through July 12 (Table 8) brought the king salmon catch at seasons end up to recent-year total harvests (Appendix Table 6).

Through June 30, only 71,000 red salmon had been caught, compared to the long-term average of 220,000. Continued aerial surveillance of both Wood and Igushik Rivers and the Igushik set net beach (a consistent early producer) failed to show any significant numbers of fish. It wasn't until June 29 at Igushik River, and July 7 at Wood River that the first fish were sighted by aerial survey. The cumulative red salmon catch of 22,000 through June 30 from the Igushik set net beach was also well below the average harvest for this date. Consideration of a period extension for the Igushik section on June 30 was dispelled when the catch rate failed to show improvement (Table 10).

The entire Nushagak district was opened for a 24-hour period on July 2-3, based on the small red salmon harvest, the large Nushagak forecast and reduced effort. The subsequent catch of only 41,000 reds and 31,000 chums was disappointing. The cumulative red salmon catch was now only 113,000 and well below the average by this date.

Another 24-hour opening was announced for July 5-6 for the same reasons as the preceding period. All drift effort was concentrated in Middle and West channels mid-way between Ekuk Bluff and the red salmon boundary line. The catch for this period was 159,000 red salmon, of which 23,000 came from Igushik beach (Tables 8 and 10).

When the Igushik section showed considerable improvement in rate of catch (23,000 fish for 24 hours as compared to the 24-hour catch of 10,000 on July 2-3), fishing time in that section was extended for an additional 24 hours. The Nushagak section closed at 9:00 a.m. on July 6, due to relatively poor catches and low escapement into Wood River

(5,000 fish through July 6). The Igushik section was extended again for 24 hours to 9:00 a.m. July 8 (Table 4), when it became apparent that the rate of catch was holding up. The 29,000 red salmon caught in the Igushik section July 6-8, brought the cumulative Igushik beach catch to 84,000 fish and the total Nushagak Bay catch to 357,000 (Tables 8 and 10).

The Nushagak test fishing boat made six 30-minute drifts on July 7. On two drifts near Queen Slough and Ekuk Light, 592 and 694 reds, respectively, were caught. Based on: a) the good showing well inside the district, b) the relative low red catch to date (357,000) and good forecast (2,655,000), c) the 52-hour closure in the Nushagak section, and d) estimated amount of fishing effort (250 boats and 170 set nets), it was decided to open the Nushagak section for a 12-hour period on July 8, with a strong possibility of an extension if catches were good. The Igushik section, which had been open since 9:00 a.m. July 5, was extended for 14 hours to match the Nushagak section opening (Table 4). The Wood and Igushik River escapements, although very low through July 7 (Wood-13,000 and Igushik-16,000), were thought to be adequate. Experience has shown that the Department has the necessary flexibility to assure adequate escapements, especially in Wood River. There was, however, some concern over the fate of the "normally" earlier Igushik red salmon run.

The 12-hour fishing period beginning on July 8 showed strong catches being made all along Combine Flats to just beyond Ekuk Bluff. No fishing effort existed south of Ekuk Bluff, and catches from set nets along Ekuk beach were poor except for the Ekuk Bluff nets (Table 10). Based on: a) good early catches well inside the district, b) reduced catches from Ekuk Bluff south and c) an increase in the Wood River counts (15,000 through 6:00 p.m.) and fairly good showing in Wood River (over 7,000 counted on 4:00 p.m. aerial survey), the entire fishery was extended for 12 hours to 11:00 a.m. July 9 (Table 4). The entire district catch slightly exceeded 251,000 red salmon, with Igushik beach contributing 21,000 fish (Tables 8 and 10). At the end of the 24-hour period July 9, the Nushagak cumulative red catch was 609,000, with Igushik beach showing 105,000 fish caught (Tables 8 and 10).

The primary concern as of July 9 was the rather poor and inconsistent showing on Igushik beach. With over 105,000 reds caught through July 9, and the last 24-hour period producing only 21,000 fish compared to 29,000 the previous period, there was considerable concern that the peak of the run had already passed (Table 10). The cumulative red salmon escapements through July 9 were 92,000 for Wood River and 28,000 for Igushik River.

The test boat made 11 drifts on July 10, and caught over 1,600 red salmon. Over 1,400 of these fish were caught in three drifts in the vicinity of Nushagak Bluff (859 fish), off Clark's Point (422 fish) and off Ekuk Light (155 fish). Although the test boat catches were poor farther south (7 drifts and 86 reds), the good catches inside and good showing past the Wood River tower (38,000 daily escapement through 6:00 p.m. July 10) prompted a decision to announce a 24-hour fishing period for July 11-12. With only 775,000 reds accounted for in combined catch and escapement, and a forecast of 2,655,000, there remained nearly 2,000,000 fish to account for if the forecast was reasonably accurate.

The period on July 11-12, produced over 289,000 red salmon (Table 8), which brought the cumulative catch to almost 900,000. Igushik beach produced over 42,000 reds during the same period and dispelled any notion that the peak of the run had already past (Table 10).

Continued aerial surveillance of Wood and Igushik Rivers between July 11 and 14, showed a steady but fluctuating daily count (July 11-74,000; July 12-134,000; July 13-58,000 and July 14-94,000) for Wood River and a poor daily count for Igushik River (700 to 3,000 fish per day). By the evening of July 14, a decision was made to open the Nushagak section only for 24 hours beginning July 15. This decision was based on: a) estimate of 500,000 fish past Wood River through July 14, with another 100-200,000 past the fishery, b) test boat catch of 687 reds in seven drifts, all inside Nushagak Bluff, c) fishery closed for 76 hours, and d) possibility of a good harvest of chum salmon. It was decided to keep Igushik section closed based on a 36,000 cumulative escapement through July 14, and a poor showing in the river and lagoon area.

The situation completely changed after a mid-day aerial survey of Wood and Igushik Rivers on July 15. The Wood River survey showed 33,000 fish in steady bands and numerous finners and jumpers in muddy water. The Igushik River survey showed strong for the first time (3,600 fish in river and lagoon area with a "strong" showing in the lower lagoon and river). The Wood River accumulative escapement through 2:00 p.m., July 15 was 578,000 with every factor pointing to attainment of the escapement goal (750,000). The rate of escapement in the Igushik River had picked-up, and relying heavily on the July 15 aerial survey count, it was estimated that the Igushik River final escapement would fall within the management escapement range of 100 to 200,000 (Table 1). With the foregoing in mind, the entire Nushagak district was opened effective at 6:00 p.m., until further notice (Table 4).

The red salmon catch from 6:00 p.m., July 15, to season's end amounted to 358,000 fish, with 55,000 coming from Igushik beach (Table 8 and 10). The season catch was 1,257,000 reds (203,000 reds from Igushik beach and 150,000 from Ekuk beach), and escapements of 851,000 and 211,000 were achieved in the Wood and Igushik Rivers, respectively (Table 1).

On July 19, the 48-hour waiting period for transfers between districts was waived for any of the Nushagak fleet wishing to return to the Nushagak district.

The weather during the 1971 season was generally good, with continuous periods of cool weather. Major storms, which often interrupt fishing time, were not a factor in 1971.

Over-all preliminary age composition of the Nushagak red salmon catch and escapement combined was 32% 4-year fish from the 1967 parent-year escapement, 64% 5-year fish from 1966 and 4% 6-year fish from 1965 (Appendix Table 31).

Catch

The Nushagak district commercial catch of all species of salmon was 1,708,000 and represented 16% of the total Bristol Bay catch for 1971 (Table 11). This catch was 1% lower than the 20-year average of 1,733,000 for the district (Appendix Table 10).

The red salmon catch of 1,257,000 represented 13% of the Bristol Bay total harvest and was 29% higher than the average catch of 971,000 since 1952 (Appendix Table 5). Preliminary age composition of the district red salmon catch was 32% 4-year fish from the 1967 parent-year escapement, 64% 5-year fish from 1966 and 4% 6-year fish from 1965. Preliminary sex ratio composition of the Nushagak catch was 44% males and 56% females, while the preliminary average weight (as determined by A.D.F.G. sampling-unweighted) for reds caught in the Nushagak section was 6.3 pounds and 6.9 pounds for reds caught in the Igushik section, and 6.5 pounds over-all (Appendix Table 18). Cannery derived weights varied between 5.9 and 6.1 pounds over-all.

The Nushagak district king salmon catch of 83,000 was the sixth largest catch in the last 20 years and was 21% higher than the average catch of 68,000 for this period (Appendix Table 6). Over 33% or 676,000 pounds were marketed as fresh-frozen or mild-cured products. The balance was canned and produced a case pack of over 13,000 (Table 13). Preliminary average weight of kings sampled randomly throughout the season was 24.4 pounds, while the preliminary sex ratio was 47% males and 53% females (Appendix Table 18 and 26).

The total catch of 360,000 chum salmon was 48% higher than the average district catch of 243,000 for the past 20 years (Appendix Table 7). Preliminary average weight was 6.7 pounds, while the preliminary sex ratio of the commercial catch was 43% males and 57% females (Appendix Tables 18 and 26).

Late season catches of coho salmon amounted to over 8,000 fish and were 71% lower than the 20-year average harvest of 28,000 (Appendix Table 9). As in 1970, the catch in 1971 was influenced by an extremely poor market, lack of fishing effort and, in general, a poor returning run.

Escapement

Counting towers were maintained on Wood, Igushik and Nuyakuk Rivers for the purpose of enumerating red salmon escapement into these systems. Aerial surveys were employed to determine red salmon escapement into the Snake River system, where a tower station is not maintained. The counting tower on the Nushagak River was not manned this season due to the extremely high and turbid water conditions.

The Nushagak-Mulchatna red salmon escapement was estimated using previous escapement data and the ratio between the Nushagak and Nuyakuk red salmon escapements.

Total red salmon escapement to the district was 1,353,000 or 52% of the total run (Table 2). The final escapement and percent of the district total by system were: Wood - 851,000 (63%); Igushik - 211,000 (16%); Nuyakuk - 224,000 (16%); Nushagak-Mulchatna - 58,000 (4%); and Snake - 9,000 (1%) (Table 2). The 1971 total district escapement was 9% higher than the 20-year average of 1,245,000 (Appendix Table 23).

Escapements within the desired range were obtained in all systems except Igushik, and Nuyakuk. Escapement into the Nuyakuk River system cannot be controlled directly, as the Nushagak section (where Nuyakuk and Wood River fish predominate) is managed for the more important Wood River run. The Nuyakuk run exceeded the forecast by 100,000 fish and in the course of obtaining adequate escapement into the Wood River system, the Nuyakuk escapement exceeded the upper end of the escapement range by some 61,000 fish (Tables 1 and 2). The Igushik River escapement exceeded the upper end of the escapement range by 11,000 fish. However, because of the extremely late run and unusual delay factor once the fish were in the river, the escapement obtained in the Igushik system is considered well within acceptable limits.

Preliminary analysis of scales from those systems sampled showed that the major age classes of the red salmon escapement to the major rivers were: Wood - 44% 4-year fish from the 1967 parent-year escapement, 52% 5-year fish from 1966 and 4% 6-year fish from 1965; Igushik - 17% 4-year fish, 77% 5-year fish and 6% 6-year fish; Nuyakuk - 1% 4-year fish, 96% 5-year fish and 3% 6-year fish. Over-all preliminary age composition of the Nushagak district red salmon escapement was 32% 4-year fish from the 1967 parent-year escapement, 64% 5-year fish from 1966 and 4% 6-year fish from 1965. Preliminary sex ratios of the major river systems sampled were: Wood - 51% males and 49% females; Igushik - 42% males and 58% females; and Nuyakuk - 36% males and 64% females (Appendix Table 26).

Red salmon escapements were sampled at three locations to determine the average weight. Preliminary weight analysis shows that the fish averaged: Wood - 5.2 pounds; Igushik - 6.8 pounds; and Nuyakuk - 7.0 pounds.

King salmon surveys, to determine escapement indices comparable to previous years, were adversely affected by weather conditions and a direct comparison between years was not possible. Indications are, however, that the spawning king salmon escapement was light compared to previous years.

Chum salmon escapement estimates were not derived due to the non-operation of the Nushagak River counting tower where the majority of the chums are enumerated. However, data collected from various surveys indicates a very good chum salmon escapement.

TOGIK DISTRICT

The Togiak district is comprised of five sections (Cape Peirce, Osviak, Matogak, Togiak and Kulukak) and the majority of the commercial harvest is made in the Togiak section. In 1971, only 4% of the total harvest originated in the outlying sections.

The Togiak district is not managed under the same concept as the other Bristol Bay districts. Togiak open fishing periods are set in advance and adjusted accordingly as needed during the course of the salmon season. In 1971, the Togiak section weekly fishing periods were 4 days in length, while the other 4 sections were open 5 days each week. Because of the exceptionally good red salmon forecast (363,000), the Togiak section fishing time was extended early in the season to 5-days-per-week. Effective July 5, fishing time in Osviak and Matogak sections (which are primarily chum salmon producers) was allowed on a 7-days-per-week basis to encourage fishing effort on these stocks of fish.

Pre-season gear registration, drift and set nets combined, totaled 109 units for this district in 1971, 16 more units than in 1970 (Table 3). The highest effort recorded for drift and set net gear, based on fish ticket delivery tabulation, indicated that 101 units of gear participated in the fishery at the peak of the run (Table 9).

The majority of the drift fleet of double-end sailboat conversions and skiffs fished Togiak section, while 7 units of gear operated in the Osviak area and 13 units in the Kulukak area. The duration of fishing effort in the Osviak and Kulukak sections was very short due to the exceptionally good run in the Togiak section. The Togiak salmon fishery is entirely a resident fishery, primarily from two area villages, Togiak and Twin Hills.

The total district inshore red salmon forecast was 363,000 (Table 1). Total run to the district in 1971 (excluding escapements to the Togiak tributaries and Kulukak River system which were not included in the forecast) was 400,000 reds, 10% higher than the forecast (Tables 1 and 2), and over 113,000 fish or 40% higher than the average total run of 287,000 fish for the last 10 years (Appendix Table 24).

Management

The early season fishery at Togiak was a re-enactment of the 1970 season. Atypically large king salmon catches were made during the 14-day open period between June 21 and July 10 (Table 9). The catches were so large that, when coupled with exceptional catches of red and chum salmon, the local cannery was unable to handle all fish caught. Although fishing was not suspended by the cannery, a limit of 10 kings per day was placed on all fishermen beginning July 5. The Department received complaints from numerous sources that large numbers of king salmon were being thrown away by local fishermen.

The Togiak district red salmon run, like runs to other Bristol Bay fishing districts, was approximately 7 days late. Normally, the peak of the Togiak red salmon run occurs between July 2-12, while the 1971 peak catches were made during July 19-24 (Table 9).

Strong catches of red salmon were made during the 5-day weekly period July 5-10, (54,000), and continued for the next 3 weekly fishing periods (Table 9). However, the 110,000 fish catch through July 15, was estimated to be equal to the long-term average of 71,000 reds, when the lateness of the run was taken into consideration. Consequently on July 13, with an estimated 110,000 red cumulative catch by the weekend, an escapement past the Togiak River tower (200 fish through July 12), and a poor aerial survey count in the river below the tower on July 12 (5,000 fish), the Togiak section was closed at 9:00 a.m. on July 15, creating a 4-day weekend closure (Table 4). Additionally, the local cannery placed a 300-fish limit on all fishermen for 8 hours, between 10:00 p.m., July 14 and 6:00 a.m., July 15, due to heavy catches of salmon.

Normal fishing resumed the following week, and when the Togiak River escapement rate began to increase tremendously the weekend closures were lifted on July 23-26, and the following weekend, July 30-August 2 (Table 4).

Good red and chum salmon catches continued through July 31, and then began tapering off, signifying the approach of the end of the salmon season at Togiak (Table 9).

Weather was not a limiting factor for the fishery in the Togiak district during 1971. Local storms probably affect the Togiak fishing fleet to a greater extent than other fleets in Bristol Bay due to the lack of large boats in the fishery. As usual, most fishing activities took place during the daylight hours only.

Over-all preliminary age composition of the Togiak red salmon catch and escapement combined was 1% 4-year fish from the 1967 parent-year escapement, 96% 5-year fish from 1966 and 3% 6-year fish from 1965 (Appendix Table 32).

Catch

The Togiak district commercial catch for all species of salmon was 363,000. This catch represented 3% of the total Bristol Bay catch for 1971, and was 53% higher than the 18-year average of 237,000 for the area (Appendix Table 10). Togiak River section accounted for 348,000 fish, while Osviak and Kulukak sections contributed 4,000 and 11,000 respectively (Table 9).

Red salmon contributed 58% of the district harvest in 1971. The 209,000 fish catch was the third largest in the history of the fishery, 62% above the 17-year average of 129,000 and 29% above the last 10-year average catch of 162,000 (Appendix Table 5). Preliminary age composition of the district red salmon catch was 2% 4-year fish from the 1967 parent-year escapement, 95% 5-year fish from 1966 and 3% 6-year fish from 1965. Preliminary sex ratio of the commercial catch was 38% males and 62% females, while the average weight of reds sampled randomly throughout the season was 7.0 pounds (Appendix Tables 18 and 26).

The 27,000 king salmon harvest was the second largest in the history of the fishery. This catch was 171% higher than the 17-year average catch of 10,000 and 81% higher than the previous 10-year average catch of 15,000 (Appendix Table 6). The Togiak king salmon catch accounted for 22% of the total Bay catch in 1971. Preliminary sex ratio of the commercial catch was 55% males and 45% females, while the preliminary average weight of kings sampled randomly from the catch was 24.0 pounds (Appendix Table 18).

The total catch of 124,000 chum salmon was the fifth largest in the history of the fishery and was 37% higher than the average catch of 90,000 for the past 18-years (Appendix Table 7). The chum salmon harvest centered in the Togiak River section (118,000) while the usually strong chum producers, Osviak and Kulukak, produced only 6,000 fish (Table 9). Preliminary sex ratio of the commercial chum catch was 49% males and 51% females, while the average weight was 7.2 pounds (Appendix Table 18).

Escapement

A counting tower was again maintained on the Togiak River to enumerate red salmon escapement into Togiak Lake, while red, chum and king salmon escapements in the remainder of the Togiak district were estimated from aerial surveys.

The Togiak River red salmon escapement goal was 115,000 fish, with a management range of 90 to 140,000 (Table 1). The final red salmon escapement past the Togiak River counting tower was 191,000 fish, or 89% of the district escapement of 213,000 (Appendix Table 24). Total red salmon escapement to the district was 71% higher than the 20-year average of 125,000 (Appendix Table 20). Preliminary age composition of the red salmon escapement was 95% 5-year fish from the 1966 parent-year escapement and 5% 6-year fish from 1965. Preliminary sex ratio of the red escapement was 40% males and 60% females, while the average weight of fish sampled at the Togiak River tower was 7.6 pounds.

King salmon escapement, which was derived from aerial survey indices, was estimated to be approximately 15 to 20,000, with the majority of the fish spawning in the main Togiak River and connecting tributaries.

Chum salmon aerial surveys of seven streams in the western portion of the district (west of Togiak River) in 1971 produced an escapement estimate of 107,000 or 47% of the total district chum escapement, as compared to 66,000 or 27% in 1970. Togiak River and five connecting tributaries received a spawning escapement of 56,000 chums or 24% of the district escapement, as compared to 134,000 or 56% in 1970. Three streams east of Togiak River contributed 66,000 spawning chums or 29% of the district total, as compared to 41,000 and 17% in 1970. Total estimated chum salmon escapement for the entire district (16 streams surveyed) was 229,000, as compared to 241,000 in 1970.

OTHER FISHERIESHERRING FISHERY

The 1971 Togiak herring fishery was limited to a herring roe-on-kelp operation. One operator (Table 17) harvested over 51,000 pounds of kelp with herring spawn attached (Table 16). The 1971 production was the second largest since the fishery was initiated in 1968 (Appendix Table 39). As in previous years, the roe-on-kelp fishery was limited in time (5 days), and was again centered in Metervik Bay of the Togiak district.

The estimated wholesale value of the roe-on-kelp production to the processor was \$21,000 (Appendix Table 17).

SUBSISTENCE FISHERY

Salmon subsistence catches for personal use and dog food consumption have been recorded since 1963 in Bristol Bay (Appendix Table 38). This subsistence fishery is primarily centered around the Naknek-Kvichak and Nushagak drainages where local inhabitants, especially outlying villagers, are still dependent on salmon for winter dog food and augmentation to their own diets. Salmon subsistence catches in the two major drainages approach 100,000 to 170,000 fish annually.

In the Togiak district, the only other area where considerable subsistence fishing takes place, main reliance is placed on sea-run char, which apparently winter in the Togiak River. From interviews with knowledgeable persons in the Togiak area, it is conservatively estimated that over 100,000 char are harvested annually from the Togiak River with small mesh gill nets between September and May. It is further estimated that between 5,000 to 10,000 salmon of all species are taken for subsistence purposes, almost all of which originate from the Togiak River drainage.

Considerable winter fishing takes place through the ice in all districts of Bristol Bay. Winter catches consist primarily of arctic char, white fish, pike, burbot and some rainbow and grayling. However, the large area involved and the sporadic fishing efforts have precluded efforts to monitor these catches.

The 1971 subsistence salmon catch was over 120,000 fish of all species for the Naknek-Kvichak and Nushagak districts (Appendix Table 38). Since 1963, the average subsistence salmon harvest for the two major districts has averaged 133,000 fish of all species, with over 58% coming from the Naknek-Kvichak area (Appendix Table 38).

FISHERY BY-PRODUCTS

The salmon egg industry has continued to grow from a small scale operation in 1966, to a million dollar enterprise in 1969 (Appendix Table 19). In 1971, salmon eggs were processed at 12 shore-based canneries and two floaters, with production estimated at over 1,876,000 pounds and valued at approximately \$1,951,000 (Table 15).

Total egg production in 1971 equalled production in 1970, a peak-year on Naknek-Kvichak. Overall, the 1971 production of 1,876,000 pounds was 62% higher than the 5-year average production of 1,160,000 pounds (Appendix Table 19).

MISCELLANEOUS

Production of fresh-frozen red, king and chum salmon continued to accelerate in Bristol Bay in 1971, with 10 operators involved in fresh, frozen or some form of cured fishery products (Table 13). Total production of all fresh, frozen and cured salmon amounted to 367,000 fish and 2,816,000 pounds, primarily red salmon from Naknek-Kvichak and king salmon from Nushagak (Table 13). Total production of all species in 1971 was 80% higher than the 10-year average production (1962-71) of 203,000 fish (Appendix Table 13).

Fresh-frozen and cured production of king salmon, primarily from Nushagak district, amounted to 35,000 fish weighing 857,000 pounds, down slightly from 1970 when 874,000 pounds were produced (Table 13).

Production of red, chum and coho salmon, which were primarily frozen, amount to 332,000 fish and 1,959,000 pounds, mostly from Naknek-Kvichak district (Table 13). This is a decrease of 46% from the 1970 production of 3,631,000 pounds.

The first wholesale value to the processors of all fresh-frozen and cured commercial production was estimated to be \$1,397,000 down 31% from the 1970 value of \$2,017,000 (Appendix Table 17).

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TABLE 1. Final 1971 Bristol Bay sockeye salmon runs by system compared with the pre-season predictions, escapement goals and predicted catch. (in millions of fish)

System	Predicted Inshore Run ^{1/}	Actual Inshore Run	Run Deviation From Prediction	Run % Deviation From Prediction	Escape- ment Goal	Escapement Range	Actual Escape- ment	Predicted Catch	Actual Catch
Kvichak	6.349	6.152	-.197	- 3.1	2.500	2.000-3.000	2.387	3.849	3.764
Branch ^{2/}	.351	.509	+.158	+45.0	.166	.122- .212	.187	.185	.322
Waknek	2.189	2.706	+.517	+23.6	.900	.700-1.100	.936	1.289	1.771
Total	8.889	9.368	+.479	+ 5.4	3.566	2.822-4.312	3.510	5.323	5.857
Egeqik	2.113	1.941	-.172	- 8.1	.600	.400- .800	.634	1.513	1.307
Ugashik ^{3/}	1.150	1.484	+.334	+29.0	.500	.400- .600	.530	.650	.954
Wood	1.644	1.612	-.032	- 1.9	.750	.600- .900	.851	.894	.760
Igushik	.565	.503	-.062	-11.0	.150	.100- .200	.211	.415	.292
Snake ^{2/}	.024	.016	-.008	-33.3	.011	.008- .014	.009	.013	.008
Nuyakuk ^{2/}	.293	.384	+.091	+31.1	.132	.105- .163	.224	.161	.160
Nush.-Mulch. ^{2/}	.129	.096	-.033	-25.6	.059	.046- .072	.058	.070	.038
Total	2.655	2.610	-.045	- 1.7	1.102	.859-1.349	1.353	1.553	1.258
Togiak ^{4/}	.363	.422	+.059	+16.2	.115	.090- .140	.213	.248	.209
Total Bristol Bay	15.170	15.825	+.655	+ 4.3	5.883	4.571-7.201	6.241	9.287	9.585

^{1/} Final Bristol Bay red salmon forecast of run for 1971. Alaska Department of Fish and Game, edited by Robert D. Paulus.

^{2/} These systems cannot be managed separately from the major system in their district. Consequently, the harvest rates are merely the harvest rates anticipated for the major system in the district; the corresponding escapement goals do not necessarily coincide with the escapement levels which would be achieved if these systems could be managed independently.

^{3/} Excluding Mother Goose system red salmon run.

^{4/} Excluding red salmon runs to the Togiak tributaries and Kulukak system.

Note: Due to rounding, some totals in this table do not agree with actual, final catch and escapement data as presented in Table 2.

TABLE 2. Bristol Bay red salmon catch and escapement, 1971.^{1/}

District and River System	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River	764,861	2,387,392	6,152,253
Branch River	321,781	187,302	509,083
Naknek River	1,770,736	935,754	2,706,490
Total	5,857,378	3,510,448	9,367,826
<u>EGEGIK DISTRICT</u>	1,306,682	634,014	1,940,696
<u>UGASHIK DISTRICT</u>	954,068	529,752	1,483,820
<u>NUSHAGAK DISTRICT</u>			
Wood River	760,363	851,202	1,611,565
Igushik River	291,577	210,960	502,537
Snake River	7,541	8,500	16,041
Nuyakuk River	159,614	224,382	383,996
Nushagak-Mulchatna	37,704	58,338	96,042
Total	1,256,799	1,353,382	2,610,181
<u>TOGLAK DISTRICT</u>			
Togiak River		190,842	
Togiak Tributaries		9,400	
Kulukak System		13,000	
Total	209,060	213,242	422,302
<u>TOTAL BRISTOL BAY</u>	9,583,987	6,240,838	15,824,825

^{1/} Final catch and escapement data, however, apportionment of inshore catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary.

TABLE 3. Bristol Bay pre-season gear registration by district and type of gear, 1971.^{1/}

District	Type of Gear		Total
	Drift	Set	
<u>NAKNEK-KVICHAK</u>			
Resident	341	316	657
Non-resident	<u>529</u>	<u>42</u>	<u>571</u>
TOTAL	870	358	1,228
<u>ELEGIK</u>			
Resident	125	101	226
Non-resident	<u>158</u>	<u>65</u>	<u>223</u>
TOTAL	283	166	449
<u>UGASHIK</u>			
Resident	49	43	92
Non-resident	<u>28</u>	<u>7</u>	<u>35</u>
TOTAL	77	50	127
<u>NUSHAGAK</u>			
Resident	444	221	665
Non-resident	<u>115</u>	<u>22</u>	<u>137</u>
TOTAL	559	243	802
<u>TOGIAK</u>			
Resident	75	29	104
Non-resident	<u>1</u>	<u>0</u>	<u>1</u>
TOTAL	76	29	105
<u>BRISTOL BAY</u>			
Resident	1,034	710	1,744
Non-resident	<u>831</u>	<u>136</u>	<u>967</u>
TOTAL	1,865	846	2,711

^{1/} Based upon gear license count - registration at start of season - does not incorporate district transfers.

TABLE 4. Bristol Bay emergency order fishing periods by district, 1971.^{1/}

NAKNEK-KVICHAK DISTRICT				NUSHAGAK DISTRICT			
Date & Time		Hours		Date & Time		Hours	
June 24	Noon - June 26	Noon	48	June 16	9 am - June 19	9 am	72
June 27	2 pm - June 28	2 pm	24	June 21	9 am - June 23	9 am	48
June 29	4 pm - June 30	4 pm	24	June 25	2 pm - June 26	2 pm	24
July 1	6 pm - July 2	6 pm	24	June 26	2 pm - June 27	6 pm	28
July 4	7 am - July 5	7 am	24	June 29	6 pm - June 30	6 pm	24
July 10	Midnight - July 11	Noon	12	July 2	7 am - July 3	7 am	24
July 16	4 pm - July 19	9 am	65	July 5	9 am - July 6	9 am	24
July 24	9 am - July 26	9 am	48	July 8	11 pm - July 9	11 am	12
<u>KVICHAK SECTION ONLY:</u>				July 11	2 pm - July 12	2 pm	24
July 7	10 pm - July 8	10 am	12	July 15	6 pm - July 17	9 am	39
July 10	Noon - July 10	Midnight	12	July 17	9 am - July 19	9 am	48
July 13	3 pm - July 14	3 am	12	July 24	9 am - July 26	9 am	48
July 15	4 pm - July 16	4 am	12	<u>IGUSHIK SECTION ONLY:</u>			
July 16	4 am - July 16	4 pm	12	July 6	9 am - July 7	9 am	24
<u>NAKNEK SECTION ONLY:</u>				July 7	9 am - July 8	9 am	24
July 9	11 pm - July 10	11 am	12 ^{2/}	July 8	9 am - July 8	11 pm	14
July 10	11 am - July 10	Midnight	13 ^{2/}	<u>NUSHAGAK SECTION ONLY:</u>			
July 12	1 am - July 16	4 pm	99	July 8	11 am - July 8	11 pm	12
				July 15	6 pm - July 16	6 pm	24
<u>UGASHIK DISTRICT</u>				<u>EGEGIK DISTRICT</u>			
Date & Time		Hours		Date & Time		Hours	
June 24	11 am - June 26	11 am	48	June 24	11 am - June 26	11 am	48
June 27	1 pm - June 28	1 pm	24	June 27	1 pm - June 28	1 pm	24
June 29	3 pm - June 30	3 pm	24	June 29	3 pm - June 30	3 pm	24
July 1	5 pm - July 2	5 pm	24	July 1	5 pm - July 2	5 pm	24
July 3	7 pm - July 5	7 am	36	July 4	6 am - July 5	6 am	24
July 6	6 am - July 7	6 am	24	July 7	7 am - July 7	7 pm	12
July 7	6 am - July 8	6 am	24	July 8	8 am - July 8	8 pm	12
July 8	6 am - July 9	6 am	24	July 10	10 am - July 10	10 pm	12 ^{2/}
July 9	6 am - July 10	6 am	24	July 11	11 am - July 11	11 pm	12
July 10	6 am - July 11	6 am	24	July 14	4 pm - July 15	4 am	12
July 11	6 am - July 11	10 am	4	July 16	5 pm - July 17	5 am	12
July 12	Noon - July 12	Midnight	12	July 24	9 am - July 26	9 am	48
July 13	1 pm - July 14	1 pm	24				
July 15	2 pm - July 16	2 pm	24				
July 16	2 pm - July 17	9 am	19				
July 17	9 am - July 19	9 am	48				
July 24	9 am - July 26	9 am	48				

(Continued)

TABLE 4. (Continued)

TOGIAK DISTRICT

Togiak River Section:

- (a) Fishing was permitted on a five-days-per-week basis (from 9:00 a.m. Monday until 9:00 a.m. Saturday) until further notice beginning Wednesday, June 30.
- (b) Fishing was prohibited from 9:00 a.m. Thursday, July 15 to 9:00 a.m. Monday, July 19.
- (c) Fishing was permitted from 9:00 a.m. Friday, July 23 to 9:00 a.m. Monday, July 26.
- (d) Fishing was permitted from 9:00 a.m. Friday, July 30 to 9:00 a.m. Monday, August 2.

Cape Pierce, Osviak, Matogak and Kulukak Sections:

- (a) Fishing was permitted in the Osviak and Matogak sections on a seven-days-per-week basis until further notice beginning Friday, July 9.

1/ Emergency order period: Naknek-Kvichak, Egegik, and Ugashik districts - 9:00 a.m. June 23 to 9:00 a.m. July 17; Nushagak district - 9:00 a.m. June 16 to 9:00 a.m. July 17.

2/ Set nets only.

TABLE 5. Naknek-Kvichak district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	Total
6/21-23	48	80	20	2,375	174	20			2,569
6/24-26	48	503	91	77,261	1,291	1,037			79,589
6/27-28	24	589	109	39,822	105	519			40,446
6/29-30	24	794	136	450,995	1,073	5,681			457,749
7/1-2	24	884	143	266,270	172	3,309			269,751
7/4-5	24	941	145	816,407	617	3,734			820,758
7/7-8 ^{1/}	12	947	51	602,264	367	3,582			606,213
7/9-10	25 ^{2/}	272	154	273,971	195	1,910			276,076
7/11	12 ^{3/}	919	139	780,282	1,034	5,558			786,874
7/12-13	47 ^{4/}	900	130	959,124	627	14,511			974,262
7/14-15	48 ^{5/}	869	160	769,569	1,185	17,383			788,137
7/16-19	4 days	822	168	660,131	1,519	34,164	1		695,815
7/20-25	6 days	313	137	146,115	1,294	21,719			169,128
7/26-31	5 days	62	29	11,421	443	20,148		42	32,054
8/2-7	5 days	39	17	1,371	158	18,190	1	47	19,767
Totals				5,857,378	10,254	151,465	2	89	6,019,188
Percent of District Catch				97.3	0.2	2.5	+	+	100.0

1/ Only Kvichak section open.

2/ Kvichak section open only 12 hours of this period, Naknek section open to set nets only.

3/ Naknek section open for set nets only.

4/ Kvichak section open only 9 hours of this period.

5/ Kvichak section open only 11 hours of this period.

TABLE 6. Egegik district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					Total
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	
6/21-23	48	117	73	13,362	418	247			14,027
6/24-26	48	208	85	65,438	552	1,025			67,015
6/27-28	24	206	84	62,489	189	876			63,554
6/29-30	24	200	81	75,582	122	1,143			76,847
7/1-2	24	213	91	64,066	105	1,352			65,523
7/4-5	24	211	86	161,547	221	2,064			163,832
7/7	12	192	83	237,087	147	2,301			239,535
7/8	12	214	87	293,298	115	2,996			296,409
7/10	12 ^{1/}	62 ^{2/}	93	26,665	17	352			27,034
7/11	12	206	92	200,832	111	3,431			204,374
7/14-15	12	182	82	67,934	113	2,264			70,311
7/16-17	12	88	56	21,508	33	3,198			24,739
7/19-25	7 days	73	50	15,850	29	5,003			20,882
7/26-31	5 days	5	2	576	8	333		92	1,009
8/2-7	5 days	2	3	369	3	355		154	881
8/9-14	5 days	2	2	79	4	133		677	893
Totals				1,306,682	2,187	27,073	0	923	1,336,865
Percent of District Catch				97.7	0.2	2.0	0	0.1	100.0

^{1/} Open for set nets only.

^{2/} Set net caught fish delivered on an ADF&G number.

TABLE 7. Ugashik district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					Total
		Drift	Set	Reds	Kings	Chums	Pinks	Conos	
6/24-26	48	12	6	5,329	93	83			5,505
6/27-28	24	35	7	5,596	121	145			5,862
6/29-30	24	35	5	12,352	63	180			12,595
7/1-2	24	45	8	31,677	22	482			32,181
7/3	5	9	6	3,724	2	43			3,769
7/4	24	54	17	26,846	155	616			27,617
7/5	7	52	15	24,791	60	760			25,611
7/6	18	36	14	35,678	7	707			36,392
7/7	24	50	16	75,655	15	696			76,366
7/8	24	38	14	47,841	11	435			48,287
7/9	24	69	15	110,571	16	1,014			111,601
7/10	24	67	15	95,439	8	881			96,328
7/11	10	86	18	98,924	20	906			99,850
7/12	12	21	4	20,742	3	198			20,943
7/13-14	24	85	21	191,121	90	1,910			193,121
7/15-18	82	115	15	140,627	66	3,696			144,389
7/19-25	7 days	42	9	27,098	27	1,660			28,785
7/26-7/31	5 days								
8/2-8/7	5 days								
8/9-8/14	5 days		1	57				469	620
Totals				954,068	779	14,506	0	469	969,822
Percent of District Catch				98.4	+	1.5	0	+	100.0

TABLE 8. Nushagak district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					Total
		Drift	Set	Reds	Rings	Chums	Pinks	Cohos	
5/31-6/5	5 days	17			257				257
6/7-12	5 days	81			840				840
6/14-19	5 days	255	1	9	15,642	1			15,652
6/21-23	48	207	54	1,450	4,316	39			5,805
6/25/27	48	354	126	22,243	27,375	9,370	2		58,990
6/29-30	24	301	139	47,693	17,070	41,404			106,167
7/2-3	24	249	137	41,359	1,624	30,947			73,930
7/5-6	24	262	137	159,099	2,922	47,164	3		209,188
7/6-8 ¹ / ₇	50	160	79	85,339	691	94	3		86,127
7/8-9	24	286	135	251,710	7,211	45,757			304,678
7/11-12	24	301	143	289,568	2,265	60,877	5		352,715
7/15-17	54	341	150	245,709	1,548	78,678	5	7	325,947
7/18-24	7 days	320	144	105,488	903	40,597	12	702	147,702
7/25-31	6 1/2 days	49	51	5,844	68	4,430	5	3,596	13,943
8/2-7	5 days	26	25	1,240	33	626	2	3,614	5,515
8/9-14	5 days	7	9	48	4	31		117	200
Totals				1,256,799	82,769	360,015	37	8,036	1,707,656
Percent of District Catch				73.6	4.8	21.1	+	0.5	100.0

✓ Igushik section only.

TABLE 9. Togiak district catch by species, period, and amount of gear fished, 1971.

Period	Hours ^{2/}	No. Nets Fished		Catch by Species					Totals
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	
6/14-18	4 days	29	1	240	534				774
6/21-25	4 days	87	3	1,435	5,549	471	1		7,456
6/28-7/3	5 days	86	4	12,558	11,563	3,474	28		27,623
7/5-10	5 days	98	3	54,115	4,949	13,555	60	1	72,680
7/12-15	3 days	86	2	41,713	2,528	13,531	21		57,793
7/19-24	5 1/2 days	82	1	61,203	1,452	34,308	34	3	97,000
7/25-31	7 days	93	2	32,442	373	37,649	22	3	70,489
8/1-6	6 days	65	1	4,535	72	19,418	6	36	24,067
8/9-13	4 days	23		552	6	688	1	72	1,319
8/16-20	4 days	16		222		717		794	1,733
8/23-27	4 days	13		45		36		2,283	2,364
Totals				209,060	27,026	123,847	173	3,192	363,298
Percent of District Catch				57.5	7.4	34.1	0.1	0.9	100.0

^{1/} Includes 3,623 Osviak section fish: 626 reds, 55 kings, 2,938 chums and 4 pinks; and 11,112 Kulukak section fish: 7,927 reds, 866 kings, 2,313 chums and 6 pinks.

^{2/} Osviak and Kulukak sections were open 5 days-per-week, while the Togiak River section section was open 4 days-per-week.

TABLE 10. Commercial catch of red salmon by period from Ekuk beach and Igushik beach, Nushagak district, 1971.

Period	Hours	Red Salmon Catch by Period	
		Ekuk Beach ^{1/}	Igushik Beach ^{2/}
6/14-19	5 days	5	
6/21-23	48	142	1,076
6/25-27	48	2,186	9,733
6/29-30	24	3,086	10,757
7/2-3	24	2,225	10,313
7/5-6	24	5,770	22,984
7/6-8	50	^{-3/}	28,799
7/8-9	24	22,355	21,316
7/11-12	24	31,724	42,606
7/15-17	54	58,262	40,586
7/18-24	7 days	21,106	14,366
7/25-31	6 1/2 days	2,453	
8/2-7	5 days	341	
8/9-14	5 days	28	
Total		149,683	202,536

^{1/} Approximate fishing effort was 80 set nets. Red salmon accounted for 92% of total catch; catches of other species included 477 kings, 9,537 chums, 22 pinks and 3,330 cohos.

^{2/} Approximate fishing effort was 60 set nets and 25 drift skiffs. Red salmon accounted for 99% of total catch; catches of other species included 1,677 kings, 640 chums, 12 pinks and 6 cohos.

^{3/} Igushik section only.

TABLE 11. Bristol Bay commercial catch by district and species, 1971.^{1/}

District and River System	Catch by Species					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>NAKNEK-KVICHAK</u>						
Kvichak	3,764,861					
Branch	321,781					
Naknek	<u>1,770,736</u>					
TOTAL	5,857,378	10,254	151,465	2	89	6,019,188
<u>EGEGIK</u>	1,306,682	2,187	27,073	0	923	1,336,865
<u>UGASHIK</u>	954,068	779	14,506	0	469	969,822
<u>NUSHAGAK</u>						
Wood	760,363					
Igushik	291,577					
Snake	7,541					
Nuyakuk	159,614					
Nush.-Mul. Sys.	<u>37,704</u>					
TOTAL	1,256,799	82,769	360,015	37	8,036	1,707,656
<u>TOGLAK</u>	209,060	27,026	123,847	173	3,192	363,298
Totals	9,583,987	123,015	676,906	212	12,709	10,396,829
Specie Percent	92.2	1.2	6.5	+	0.1	100.0

^{1/} Apportionment of the inshore salmon catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary.

TABLE 12. Bristol Bay commercial catch by district, type of gear and species, 1971.

District	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Totals	%
NAKNEK-KVICHAK	Drift	5,426,491	93	8,273	81	130,725	86	1	50	68	76	5,565,558	92
	Set	430,887	7	1,981	19	20,740	14	1	50	21	24	453,630	8
	TOTALS	5,857,378		10,254		151,465		2		89		6,019,188	
EGEGIK	Drift	1,136,963	87	1,846	84	21,290	79	0	0	488	53	1,160,587	87
	Set	169,719	13	341	16	5,783	21	0	0	435	47	176,278	13
	TOTALS	1,306,682		2,187		27,073		0	0	923		1,336,865	
UGASHIK	Drift	847,793	89	680	87	12,620	87	0	0	0	0	861,093	89
	Set	106,275	11	99	13	1,886	13	0	0	469	100	108,729	11
	TOTALS	954,068		779		14,506		0	0	469		969,822	
NUSHAGAK	Drift	968,780	77	81,418	98	346,586	96	9	24	4,435	55	1,401,228	82
	Set	288,019	23	1,351	2	13,429	4	28	76	3,601	45	306,428	18
	TOTALS	1,256,799		82,769		360,015		37		8,036		1,707,656	
TOGIK	Drift	207,897	99	26,849	99	123,478	100	170	98	3,192	100	361,586	100
	Set	1,163	1	177	1	369	+	3	2	0	0	1,712	+
	TOTALS	209,060		27,026		123,847		173		3,192		363,298	
BRISTOL BAY	Drift	8,587,924	90	119,066	98	634,699	94	180	85	8,183	64	9,350,052	90
	Set	996,063	10	3,949	2	42,207	6	32	15	4,526	36	1,046,777	10
	TOTALS	9,583,987		123,015		676,906		212		12,709		10,396,829	

TABLE 13. Bristol Bay salmon case pack and commercial catch of fresh-frozen and cured fish by species and company, 1971.^{1/}

Name of Company	Pack and Catch by Species					Total
	Reds	Kings	Chums	Pinks	Cohos	
	<u>CASE PACK^{2/}</u>					
Alaska Packers Association (N/K)	86,815	225	2,317	0	0	89,357
Alaska Packers Association (Egegik)	60,942	205	1,714	0	0	62,861
Bumble Bee Seafoods	70,799	615	2,843	0	0	74,257
Briggs-Way Company	10	0	0	0	29	39
Columbia-Wards Fisheries	51,397	2,173	9,248	0	617	63,435
Kayak Packing Company	11,787	78	1,242	0	4	13,111
Nelbro Packing Company	65,171	775	1,727	0	0	67,673
New England Fish Company (N/K)	87,916	543	1,292	0	0	89,751
New England Fish Company (Egegik)	31,362	93	674	0	0	32,129
Peter Pan Seafoods ^{3/}	56,709	4,678	14,313	0	74	75,774
Queen Fisheries, Inc.	42,401	6,468	9,857	0	34	58,760
Red Salmon Company	73,721	334	1,915	0	0	75,970
Togiak Fisheries, Inc.	16,452	6,886	9,012	0	0	32,350
Whitney-Fidalgo Seafoods	43,040	48	801	0	0	43,889
TOTALS	698,522	23,121	56,955	0	758	779,356
	<u>FRESH-FROZEN AND CURED^{4/}</u>					
Clark Fishing & Packing (Salted)	503	2	0	0	0	505
Columbia-Wards Fisheries (Frozen)	1,303	9,698	1,308	2	3,224	15,562
D & M Packing Company (Frozen)	41,320	1,619	601	0	0	43,540
Double Star Fisheries (Frozen) ^{5/}	64,894	30	0	0	0	64,924
Grindle Saltery (Salted)	1,984	58	1,996	0	902	4,940
New England Fish Co., N/K (Frozen) ^{5/}	142,415	0	3,139	0	0	145,554
Northern Processor's, Inc. (Frozen) ^{5/}	42,157	6,015	1,139	0	1	49,312
Peter Pan Seafoods (Fresh) ^{3/}	0	10,539	0	0	0	10,539
Peterson, W. A. (Salted) ^{5/}	0	292	0	0	0	292
Togiak Fisheries, Inc. (Frozen & Mild-Cured) ^{5/}	10,028	6,875	11,843	1	3,271	32,018
TOTALS	304,631	35,128	20,026	3	7,398	367,186

(Continued)

TABLE 13. (Continued)

Name of Company	Pack and Catch by Species					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>Summary</u>						
Fresh Fish Totals	0	10,539	0	0	0	10,539
Frozen Fish Totals	302,144	17,362	18,030	3	6,496	344,035
Cured Fish Totals	2,487	7,227	1,996	0	902	12,612
TOTALS	304,631	35,128	20,026	3	7,398	367,186
Average Round Weight in Pounds ^{6/}	5.8	24.4	7.0	3.5	7.0	
Fresh-Frozen-Cured Production in Pounds ^{7/}	1,766,860	857,123	140,182	11	51,786	2,815,962

1/ All data extracted from "Final Operations Report" for Bristol Bay (BB-CF/33) unless otherwise noted, and is preliminary in nature.

2/ Case pack given in 48 - 1 lb. cans per case and includes only fish canned in Bristol Bay.

3/ Formerly "Pacific Alaska Fisheries, Inc."

4/ Fresh-frozen and cured fish production given in numbers of fish and summarized by type of processing.

5/ Data extracted from processor's catch reports.

6/ Preliminary data from A.D.F.G.

7/ Preliminary production in pounds derived by using over-all average round weight for 1971.

TABLE 14. Salmon transported out of Bristol Bay for processing, by species and company, 1971.^{1/}

Company	Number of Fish ^{2/}			Total	Final Destination
	Reds	Kings	Chums ^{3/}		
Alaska Packers Association	50,711	2	395	51,108	Larson Bay, Alaska
Peter Pan Seafoods (N/K)	202,651	246	-	202,897	False Pass, Alaska
Peter Pan Seafoods (Nush) ^{4/}	12,406	10,791	3,459	26,656	King Cove, Alaska & Seattle, Washington
Red Salmon Company	67,296	4	-	67,300	Alitak, Alaska
Kenai Packers	182,289	128	3,720	186,137	Kenai, Alaska
Whitney-Fidalgo Seafoods	20,182	477	-	20,659	Anchorage, Alaska
TOTAL	535,535	11,648	7,574	554,757	

^{1/} Includes only fish exported from Bristol Bay in fresh or brined condition by either air transportation or sea-going tender.

^{2/} Data extracted from Final Operations Report for Bristol Bay (BB-CF/33).

^{3/} Most operators did not apply chum percent to red-chums reported. No adjustments were made due to the low number of chums involved.

^{4/} Airlift to processing destination (King salmon only airlifted to Seattle, Washington), formerly "Pacific Alaska Fisheries, Inc."

TABLE 15. Bristol Bay salmon egg production and estimated wholesale value of finished product by fishing district, company and species, 1971.^{1/}

Company	District ^{2/}	Pounds of Eggs by Species					Estimated Value to Processor ^{3/}
		Reds	Kings	Chums	Cohos	Total	
Alaska Packers Association	Naknek-Kvichak	164,626	924	8,294	0	173,844	\$ 180,798
Bumble Bee Seafoods	"	123,487	2,612	11,388	0	137,487	142,986
Nelbro Packing Company	"	138,741	3,831	4,719	0	147,291	153,183
New England Fish Company	"	200,168	2,288	5,227	0	207,683	215,990
Red Salmon Company	"	145,821	848	6,882	0	153,551	159,693
Whitney-Fidalgo Seafoods	"	87,053	853	2,328	0	90,234	93,843
Sub-Total		859,896	11,356	38,838	0	910,090	946,493
Alaska Packers Association	Egegik	152,321	393	6,971	0	159,685	166,072
Kayak Packing Company	"	27,462	400	7,458	0	35,320	36,733
New England Fish Company	"	67,847	297	2,721	0	70,865	73,700
Sub-Total		247,630	1,090	17,150	0	265,870	276,505
Columbia-Wards Fisheries	Nushagak	127,314	19,602	42,988	814	190,718	198,347
D & M Packing Company	"	0	1,963	0	0	1,963	2,042
Peter Pan Seafoods	"	115,560	36,238	52,525	0	204,323	212,496
Queen Fisheries, Inc.	"	102,747	34,515	48,114	26	185,402	192,818
Sub-Total		345,621	92,318	143,627	840	582,406	605,703
Togiak Fisheries, Inc. ^{4/}	Togiak	40,980	20,490	54,770	1,150	117,390	122,086
Grand-Total		1,494,127	125,254	254,385	1,990	1,875,756	\$1,950,787

^{1/} Basic production data extracted from "Final Operations Report" for Bristol Bay (BB-CF/33). Does not include egg production from fish processed outside Bristol Bay. All data is preliminary.

^{2/} Indicates fishing district in which eggs were processed.

^{3/} Value not reported. Estimated by A.D.F.G. to be \$1.04 per lb. (1970 price).

^{4/} Company did not file report on egg production, therefore, egg production was estimated by A.D.F.G.

TABLE 16. Togiak district herring roe-on-kelp production by day, 1971.

Date	Number Deliveries	Production in Pounds	
		Daily	Accumulative
May 26	5	4,325	4,325
27	5	6,415	10,740
28	11	16,615	27,355
29	11	12,290	39,645
31	11	12,150	51,795
Totals	43	51,795	51,795

TABLE 17. Bristol Bay fishery operators by district, 1971.^{1/}

Name of Operator	Location	No. of Lines ^{2/}		Size	Comments
		A	O		
<u>NAKNEK-KVICHAK DISTRICT</u>					
Alaska Packers Association Box AA Blaine, Washington 98230	South Naknek	4	4	1 lb. tall	Canned salmon
		1	1	1/2 lb. flat	Salmon roe
Bumble Bee Seafoods Box 60 Astoria, Oregon 97103	South Naknek	3	2	1 lb. tall	Canned salmon
		2	2	1/2 lb. flat	Salmon roe
D & M Packing Company 659 Northlake Way Seattle, Washington 98105	Naknek River M/V "Bering"			None	Fresh and frozen salmon
Kayak Packing Company 659 Northlake Way Seattle, Washington 98105	Kvichak River M/V "Kayak"	1	1	1 lb. tall	Canned salmon
Kenai Packers 1455 N. Northlake Place Seattle, Washington 98103	South Naknek			None	Fish camp and buying station only
Marubeni-Iida (Amer.) Inc. 1516 IBM Building Seattle, Washington 98101	Naknek (New England Fish)			None	Salmon roe
Mitsui & Company 2201 SEA 1st Bank Bldg. 1001 -4th Avenue Seattle, Washington 98104	Naknek (Nelbro & Red Salmon) (Whitney-Fidalgo)			None	Salmon roe
Nelbro Packing Company 657 N.E. Northlake Way Seattle, Washington 98105	Naknek	2	1	1 lb. tall	Canned salmon
		2	2	1/2 lb. flat	
New England Fish Company Pier 89 Seattle, Washington 98119	Pederson Point	3	3	1 lb. tall	Canned and frozen salmon
		2	2	1/2 lb. flat	
Peter Pan Seafoods 1220 Dexter Horton Bldg. Seattle, Washington 98105	South Naknek (Warren) Naknek			None	Operated as fish camps only
				None	
Red Salmon Company Box 30, University Station Seattle, Washington	Naknek	4	3	1 lb. tall	Canned salmon

(Continued)

TABLE 17. (Continued)

Name of Operator	Location	No. of Lines		Size	Comments
		A	O		
Toshoku, Ltd. 465 California Street San Francisco, Calif. 94104	South Naknek (A.P.A. & Bumble Bee)			None	Salmon roe
Whitney-Fidalgo Seafoods P. O. Box 99008 Seattle, Washington 98199	Naknek	2	2	1 lb. tall	Canned salmon
<u>ELEGIK DISTRICT</u>					
Melvin Achley 6802 N.E. 137th Street Vancouver, Washington 98660	Egegik			None	Salted salmon
Alaska Packers Association	Egegik	3	3	1 lb. tall	Canned salmon Salmon roe
Clark Fishing and Packing P. O. Box 37 Naknek, Alaska 66633	Egegik			None	Salted salmon
Columbia Ward Fisheries 88 E. Hamlin Street Seattle, Washington 98102	Egegik			None	Operated as fish camp only
D & M Packing Company	Egegik M/V "Bering"			None	Fresh and frozen salmon
Grindle Saltery P. O. Box 43 Egegik, Alaska 99579	Egegik			None	Salted salmon
Kayak Packing Company	Big Creek M/V "Kayak"	1	1	1 lb. tall	Canned salmon
Marubeni-Iida, Inc.	Egegik (D & M Packing & (Kayak)			None	Salmon roe
Peterson, W. A. Company 118 Boston Street Seattle, Washington 98109	Egegik			None	Frozen salmon

(Continued)

TABLE 17. (Continued)

Name of Operator	Location	No. of Lines		Size	Comments
		A	O		
<u>UGASHIK DISTRICT</u>					
Alaska Packers Association	Pilot Point			None	Operated as fish camp
Briggs-Way Ugashik, Alaska 99683	Ugashik	1	1	1/2 lb. glass	Canned salmon
Double Star Fisheries 3862 Railway Avenue Everett, Washington 98201	Ugashik River M/V "Polor Bear" M/V "Double Star"			None	Frozen salmon
<u>NUSHAGAK DISTRICT</u>					
Alaska Packers Association	Clarks Point			None	Operated as fish camp
Columbia-Wards Fisheries	Ekuk M/V "Double Star"	3	-	1 lb. tall 1 -1/2 lb.	Canned and frozen salmon. Salmon roe
D & M Packing Company	Nushagak Bay M/V "Bering"			None	Frozen salmon Salmon roe
New England Fish Company	Dillingham			None	Operated as fish camp
Northern Processor's, Inc. 1500 Westlake N. Seattle, Washington 98109	Nushagak Bay M/V "Aleutian Fjord"			None	Frozen salmon Salmon roe
Peter Pan Seafoods, Inc.	Dillingham	2	-	1 lb. tall 1 -1/2 lb.	Canned and salmon. Salmon roe
Queen Fisheries, Inc. Building C-3 Fishermen's Terminal Seattle, Washington 98119	Clarks Slough	1	-	1 lb. tall 2 -1/2 lb. 1 -1/4 lb.	Canned salmon Salmon roe
Western Alaska Enterprises, Inc. 825 West 8th Avenue Anchorage, Alaska 99501	Dillingham (P.P.S.)			None	Salmon roe
Whitney-Fidalgo Seafoods, Inc.	Nushagak Bay M/V "Homer"			None	Frozen salmon Salmon roe

(Continued)

TABLE 17. (Continued)

Name of Operator	Location	No. of Lines		Comments	
		A	O		Size
<u>TOGLIAK DISTRICT</u>					
Arctic Roe P. O. Box 234 King Salmon, Alaska 99613	Kulukak Bay			None	Herring roe and herring roe-on- kelp
Queen Fisheries, Inc.	Togiak Bay			None	Canned salmon Salmon roe
Togiak Fisheries, Inc. 614 Lowman Building Seattle, Washington 98104	Togiak			1 -1/2 lb. 1 -1/4 lb.	Canned, frozen & cured salmon Salmon roe
Total lines available		<u>1 lb.</u>	<u>1/2 lb.</u>	<u>1/4 lb.</u>	
	Naknek-Kvichak	19	7	0	
	Egegik	4	0	0	
	Ugashik	0	1	0	
	Nushagak	6	4	1	
	Togiak	<u>0</u>	<u>1</u>	<u>1</u>	
	Total	29	13	2	
Total lines operated					
	Naknek-Kvichak	16	7	0	
	Egegik	4	0	0	
	Ugashik	0	1	0	
	Nushagak	6	4	1	
	Togiak	<u>0</u>	<u>1</u>	<u>1</u>	
	Total	26	13	2	

1/ Indicates only operators with a physical plant or processing facility in a district. Most non-operating canneries used as fishing bases. Several companies may utilize fishing effort in districts additional to these indicated.

2/ A - indicates number of lines available for operation.
O - indicates number of lines actually operated.

APPENDIX
TABLES

APPENDIX TABLE 1. Bristol Bay red salmon forecast and return, 1960-71.

Year	Forecast ^{1/}		Inshore Return ^{4/}	% Return of Forecast	
	F.R.I. ^{2/}	A.D.F.&G. ^{3/}		F.R.I.	A.D.F.&G.
1960	46,000,000	34,400,000	36,409,000	79	106
1961	18,700,000	43,600,000	18,116,000	97	42
1962	9,400,000	19,900,000	10,423,000	111	52
1963	15,300,000	8,600,000	6,905,000	45	80
1964	19,300,000	17,400,000	10,938,000	57	63
1965 ^{5/}	26,500,000	27,780,000	53,129,000	200	191
1966	34,000,000	31,271,000	17,553,000	52	56
1967	21,500,000	13,749,000	10,353,000	48	75
1968	10,500,000	10,409,000	8,010,000	76	77
1969	16,200,000	21,274,000	19,043,000	118	90
1970	57,200,000	55,812,000	39,399,000	69	71
1971	18,100,000	15,170,000	15,825,000	87	104

^{1/} Japanese harvest was not subtracted from either forecast until 1965.

^{2/} Forecast by Fisheries Research Institute based on purse seine data gathered south of Adak. Not broken down by river system. Included North Peninsula and Bristol Bay red salmon from 1960-64.

^{3/} Inshore river system forecast by the Department, except 1960, which was by F.R.I. Forecast based on cycle analyses, smolt production and ratio of 2-ocean to 3-ocean age return.

^{4/} Inshore Bristol Bay catch plus escapement.

^{5/} Togiak, Snake and Nushagak-Mulchatna included for the first time in forecast.

(Data Sources: 1 and 5 - from published records)

APPENDIX TABLE 2. Comparison of inshore and high seas catches with total Bristol Bay red salmon return, 1955-71. (in millions)

Year	Bristol Bay Catch	Japanese Catch of Bristol Bay Red Salmon ^{1/}	Total Catch	Bristol Bay Escapement	Bristol Bay Total Return ^{4/}	% Japanese Catch of Total Catch	% Japanese Catch of Total Bristol Bay Run
1955	4.549	1.869 ^{2/}	6.418	3.094	9.512	29.1	19.6
1956	8.881	2.358	11.239	14.967	26.206	21.0	9.0
1957	6.276	7.186	13.462	4.734	18.196	53.4	39.5
1958	2.986	.379	3.365	2.783	6.148	11.3	6.2
1959	4.608	.615	5.223	8.280	13.503	11.8	4.6
1960	13.705	3.758	17.463	22.704	40.167	21.5	9.4
1961	11.914	6.129	18.043	6.202	24.245	34.0	25.3
1962	4.718	.960	5.678	5.705	11.383	16.9	8.4
1963	2.871	1.001	3.872	4.033	7.905	25.9	12.7
1964	5.596	.315	6.947	5.341	12.288	19.4	11.0
1965	24.255	6.952	31.207	28.873	60.080	22.3	11.6
1966	9.314	1.694	11.007	8.239	19.246	15.4	8.8
1967	4.331	.923	5.253	6.022	11.275	17.6	8.2
1968	2.793	.885	3.678	5.217	8.895	24.1	9.9
1969	6.622	2.031	8.653	12.421	21.074	23.5	9.6
1970	20.721	3.912	24.633	18.679	43.312	15.9	9.0
1971	9.584	1.827 ^{3/}	11.411	6.241	17.652	16.0	10.4
17-Year Total	143.724	42.794	187.552	163.535	351.087		
17-Year Average	8.454	2.517	11.032	9.620	20.652	22.3	12.5

^{1/} Includes immature red salmon caught in previous year, revised data exclusive of 1955.

^{2/} Includes only mature salmon caught in 1955.

^{3/} Preliminary.

^{4/} Includes Bristol Bay catch and escapement and Japanese catch.

(Data Sources: 1, 2, 8, 11 and 12)

APPENDIX TABLE 3. Japanese high seas catches of red salmon of Bristol Bay origin, 1952-71. (in thousands of fish)

Year	Matures ^{1/}	Immatures ^{2/}	Total
1952	367	34	401
1953	406	0	406
1954	600	0	600
1955	1,869	0	1,869
1956	2,358	742	3,100
1957	6,444	13	6,457
1958	366	50	416
1959	565	118	683
1960	3,640	310	3,950
1961	5,819	127	5,946
1962	833	72	905
1963	929	60	989
1964	255	851	1,106
1965	6,101	162	6,263
1966	1,532	57	1,589
1967	866	21	887
1968	864	791	1,655
1969	1,240	556	1,796
1970	3,356	1,017	4,373
1971 ^{3/}	810	640	1,450

^{1/} Includes the May and June 1-10 catches east of 170° E, the June 11-20 catches east of 175° E, and the June 21-30 catches east of 180°.

^{2/} Includes red salmon taken on high seas at times and in areas where immature Bristol Bay reds are in large majority. These are mostly .2 age fish that otherwise would be expected to mature and return to Bristol Bay as .3's. Includes July and August catches east of 170°, and June 21-30 catches between 175° E and 180°.

^{3/} Preliminary (Data Source: 11)

APPENDIX TABLE 4. Bristol Bay license statistics, 1962-71.

	1962	1963	1964	1965	1966	1967	1968 ^{1/}	1969 ^{2/}	1970	1971
COMMERCIAL FISHING LICENSES:										
Resident	1,993	2,258	2,494	2,124	2,763	1,862	2,094	2,418	2,563	2,493
Non-resident	933	1,344	1,231	1,674	1,501	1,560	1,243	1,696	1,860	1,837
TOTAL	2,926	3,602	3,725	3,798	4,264	3,422	3,337	4,114	4,423	4,330
VESSEL LICENSES:										
<u>Fishing Vessels</u>										
Resident	1,031	1,209	1,161	1,164	1,217	1,184	1,158	1,241	1,288	1,228
Non-resident	386	581	605	648	883	776	672	749	916	864
TOTAL	1,417	1,790	1,766	1,812	2,100	1,960	1,830	1,990	2,204	2,092
<u>Scows</u>										
Resident	30	33	15	17	20	8	9	17	22	9
Non-resident	19	32	35	57	43	53	20	51	37	59
TOTAL	49	65	50	74	63	61	29	68	59	68
GEAR LICENSES:										
<u>Resident</u>										
150 F. Drift Net	715	766	815	800	875	836	-	883	901	867
100 F. Drift Net	76	148	132	116	144	129	973	227	156	167
50 F. Set Net	619	773	793	868	826	686	722	804	747	710
TOTAL	1,410	1,687	1,740	1,784	1,845	1,651	1,695	1,914	1,804	1,744
<u>Non-resident</u>										
150 F. Drift Net	383	509	639	626	762	678	-	721	746	770
100 F. Drift Net	17	36	50	51	84	56	711	97	78	61
50 F. Set Net	20	116	137	125	139	144	117	166	143	136
TOTAL	420	661	826	802	985	878	828	984	967	967
Total Gear	1,830	2,348	2,566	2,586	2,830	2,529	2,523	2,898	2,771	2,711
Total Licenses Sold	6,222	7,805	8,107	8,270	9,257	7,972	7,719	9,070	9,457	9,201
Total License Revenues Collected	\$87,725	\$92,250	\$113,359	\$128,385	\$146,265	\$153,820	\$127,085	\$169,320	\$179,985	\$176,845

^{1/} Maximum allowable licensed gear per licensee was 100 fathoms for drifters and 25 fathoms for set netters.

^{2/} Maximum allowable licensed gear per licensee was 125 fathoms for drifters and 50 fathoms for set netters.

(Data Source: 2)

APPENDIX TABLE 5. Bristol Bay red salmon catch, by district, 1952-71.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1952	9,401,060	886,852	280,146	698,071	-	11,266,129
1953	3,738,839	1,234,600	688,720	449,341	-	6,111,500
1954	1,819,666	1,437,791	1,067,531	315,357	12,280	4,652,625
1955	2,564,341	622,885	240,817	1,054,978	66,085	4,549,106
1956	5,987,750	1,187,099	341,499	1,263,186	101,933	8,881,467
1957	4,578,643	814,459	350,858	491,498	40,044	6,275,502
1958	922,611	500,684	433,813	1,092,156	36,402	2,985,666
1959	1,689,425	662,391	423,414	1,719,687	113,202	4,608,119
1960	9,847,848	1,446,884	752,634	1,517,988	139,648	13,705,002
1961	8,166,983	2,686,076	357,223	511,483	192,161	11,913,926
1962	2,281,284	638,862	243,159	1,461,766	92,945	4,718,016
1963	957,902	695,582	188,695	842,744	186,213	2,871,136
1964	2,243,701	1,103,935	576,768	1,420,941	250,775	5,596,120
1965	19,139,567	3,179,559	925,690	793,323	217,100	24,255,239
1966	5,397,538	2,101,174	445,458	1,170,271	199,799	9,314,240
1967	2,337,226	1,070,942	163,744	657,711	101,107	4,330,730
1968	1,216,858	671,554	82,457	749,281	72,699	2,792,849
1969	4,655,072	889,322	169,845	773,207	134,252	6,621,698
1970	17,803,805	1,403,509	171,541	1,188,534	153,377	20,720,766
1971	5,857,378	1,306,682	954,068	1,256,799	209,060	9,583,987
20-Year Total	110,607,497	24,540,842	8,858,080	19,428,322	2,319,082	165,753,823
1952-61 Total	48,717,166	11,479,721	4,936,655	9,113,745	701,755	74,949,042
1962-71 Total	61,890,331	13,061,121	3,921,425	10,314,577	1,617,327	90,804,781
20-Year Average	5,530,375	1,227,042	442,904	971,416	128,838 ^{1/}	8,287,691
1952-61 Average	4,871,717	1,147,972	493,666	911,375	87,719	7,494,904
1962-71 Average	6,189,033	1,306,112	392,143	1,031,458	161,733	9,080,478

^{1/} 18-Year average for Togiak.

(Data Sources: 2, 3 and 12)

APPENDIX TABLE 6. Bristol Bay king salmon catch, by district, 1952-71.

Year	Nakenk- Kvichak	Eeetik	Ugashik	Nushagak	Togiak	Total
1952	11,404	972	632	39,848	-	52,856
1953	13,848	743	463	27,502	-	42,556
1954	7,101	9,777	1,093	38,045	-	56,016
1955	11,448	3,079	3,160	56,463	1,279	75,429
1956	6,006	1,448	616	57,441	866	66,377
1957	5,524	4,139	883	79,122	1,752	91,420
1958	8,391	3,155	2,368	87,245	2,048	103,207
1959	15,298	3,282	5,493	54,299	5,917	84,289
1960	17,778	2,991	2,209	81,416	7,309	111,703
1961	10,206	3,266	3,483	60,953	10,748	88,656
1962	8,816	2,070	2,929	61,283	8,949	84,047
1963	4,713	2,355	3,030	45,979	6,192	62,269
1964	12,902	3,618	3,694	108,606	10,716	139,536
1965	9,793	2,313	4,042	85,910	10,909	112,967
1966	5,456	1,949	1,916	58,184	9,967	77,472
1967	3,705	2,285	1,582	96,240	13,381	117,193
1968	6,398	3,472	2,153	78,201	13,499	103,723
1969	19,016	2,801	2,107	80,803	20,181	124,908
1970	19,037	3,765	1,498	87,547	28,664	140,511
1971	10,254	2,187	779	82,769	27,026	123,015
20-Year Total	207,094	59,667	44,130	1,367,856	179,403	1,858,150
1952-61 Total	107,004	32,852	20,400	582,534	29,919	772,509
1962-71 Total	100,090	26,815	23,730	785,522	149,484	1,085,641
20-Year Average	10,355	2,983	2,207	68,393	9,967 ^{1/}	92,908
1952-61 Average	10,700	3,285	2,040	58,233	4,274	77,251
1962-71 Average	10,009	2,682	2,373	78,552	14,948	108,564

^{1/} 18-year average for Togiak district.

(Data Sources: 2, 8 and 12)

APPENDIX TABLE 7. Bristol Bay chum salmon catch, by district, 1952-71.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1952	93,835	18,060	19,651	117,875	-	249,421
1953	212,112	26,724	21,027	127,483	-	387,346
1954	138,016	62,040	39,384	159,852	1,352	400,644
1955	39,405	23,238	51,280	97,521	735	212,179
1956	93,841	16,713	6,934	172,546	25,483	315,517
1957	45,620	12,849	13,226	143,461	44,186	259,342
1958	119,324	12,089	12,714	193,688	20,277	358,092
1959	200,458	29,407	20,185	186,891	44,575	481,516
1960	304,286	62,837	51,415	642,099	255,320	1,315,957
1961	182,398	57,429	30,928	267,176	190,001	727,932
1962	176,712	23,053	22,040	290,633	165,107	677,545
1963	100,408	14,807	10,554	167,161	77,167	370,097
1964	153,644	23,496	30,688	463,309	131,371	802,508
1965	45,430	11,188	14,971	177,434	111,521	360,544
1966	57,273	32,085	29,100	129,344	95,410	343,212
1967	49,606	11,039	14,104	338,286	63,322	476,357
1968	43,187	16,193	17,624	178,786	108,001	363,791
1969	42,535	7,835	1,995	214,235	66,389	332,989
1970	120,279	43,854	17,969	435,033	100,711	717,846
1971	151,465	27,073	14,506	360,015	123,847	676,906
20-Year Total	2,369,834	532,009	440,295	4,862,828	1,624,775	9,829,741
1952-61 Total	1,429,295	321,386	266,744	2,108,592	581,929	4,707,946
1962-71 Total	940,539	210,623	173,551	2,754,236	1,042,846	5,121,795
20-Year Average	118,492	26,600	22,015	243,141	90,265 ^{1/}	491,487
1952-61 Average	142,930	32,139	26,674	210,859	72,741	470,795
1962-71 Average	94,054	21,062	17,355	275,424	104,285	512,180

^{1/} 18-year average for Togiak district

(Data Sources: 2, 8 and 12)

APPENDIX TABLE 8. Bristol Bay pink salmon catch, by district, 1952-71.

Year	Naknek- Kvichak	Eeesik	Ugashik	Nushagak	Togiak	Total
1952	6,277	-	1,000	6,852	-	14,129
1953	7	2	-	3	-	12
1954	1,925	-	-	99,207	1,850	102,982
1955	-	-	-	9	-	9
1956	511	4	-	91,457	-	91,972
1957	2	24	-	3	-	29
1958	19,666	492	-	1,113,794	1,590	1,135,542
1959	25	6	78	137	55	301
1960	10,582	-	-	289,781	1,669	302,032
1961	42	3	-	248	245	538
1962	32,436	43	1	880,424	1,030	913,934
1963	56	1	2	226	176	461
1964	49,127	606	18	1,497,817	2,001	1,549,569
1965	514	-	-	95	91	700
1966	142,221	8	11	2,337,066	13,545	2,492,851
1967	20	-	-	265	829	1,114
1968	218,732	211	-	1,705,150	11,743	1,935,836
1969	205	5	1	263	1,396	1,870
1970	28,301	41	-	417,834	10,735	456,911
1971	2	-	-	37	173	212
10-Year Total ^{1/}	509,778	1,405	1,030	8,439,382	44,163	8,995,758
1952-60 Total ^{1/}	38,961	496	1,000	1,601,091	5,109	1,646,657
1962-70 Total ^{1/}	470,817	909	30	6,838,291	39,054	7,349,101
10-Year Average ^{1/}	50,978	141	103	843,938	4,907 ^{2/}	899,576
1952-60 Average	7,792	99	200	320,218	1,277	329,331
1962-70 Average	94,163	182	6	1,367,658	7,811	1,469,820

^{1/} Includes only even-numbered years.

^{2/} 9-year average for Togiak district.

(Data Sources: 2, 8 and 12)

APPENDIX TABLE 9. Bristol Bay coho salmon catch, by district, 1952-71.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1952	11	-	2,936	2,067	-	5,014
1953	660	1,761	-	2,195	-	4,616
1954	111	2,932	70	20,423	-	23,536
1955	123	4,208	2,777	13,920	-	21,028
1956	887	8,573	-	53,999	-	63,459
1957	1,619	4,056	-	61,454	1,616	68,745
1958	3,624	4,370	746	127,088	-	135,828
1959	40	1,388	1,397	12,779	1,731	17,335
1960	197	2,421	-	13,457	65	16,140
1961	426	3,533	16	16,653	5	20,633
1962	2,474	3,828	4,553	28,418	11	39,284
1963	6,823	910	2,743	29,648	1,138	41,262
1964	3,133	775	380	26,416	5,859	36,563
1965	3,053	945	713	2,851	521	8,083
1966	4,096	1,932	533	11,517	15,864	33,942
1967	1,175	1,044	1,901	31,517	18,159	53,796
1968	7,357	6,507	5,771	48,867	24,872	93,374
1969	17	5,548	9,292	37,799	28,720	81,376
1970	53	7,027	1,695	3,688	2,027	14,490
1971	89	923	469	8,036	3,192	12,709
20-Year Total	35,968	62,681	35,992	552,792	103,780	791,213
1952-61 Total	7,698	33,242	7,942	324,035	3,417	376,334
1962-71 Total	28,270	29,439	28,050	228,757	100,363	414,879
20-Year Average	1,798	3,134	1,800	27,640	5,766 ^{1/}	39,561
1952-61 Average	770	3,324	794	32,404	427	37,633
1962-71 Average	2,827	2,944	2,805	22,876	10,036	41,488

^{1/} 18-year average for Togiak district.

(Data Sources: 2, 8 and 12)

APPENDIX TABLE 10. Bristol Bay total salmon catch, by district, all species, 1952-71.

Year	Nainnek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1952	9,512,587	905,884	304,365	864,713	-	11,587,549
1953	3,965,466	1,263,830	710,210	606,524	-	6,546,030
1954	1,966,819	1,512,540	1,108,078	632,884	15,482	5,235,803
1955	2,615,317	653,410	298,034	1,222,891	68,099	4,857,751
1956	6,088,995	1,213,837	349,049	1,638,629	128,282	9,418,792
1957	4,631,408	835,527	364,967	775,538	87,598	6,695,038
1958	1,073,616	520,790	449,641	2,613,971	60,317	4,718,335
1959	1,905,246	696,474	450,567	1,973,793	165,480	5,191,560
1960	10,180,691	1,515,133	806,258	2,544,741	404,011	15,450,834
1961	8,360,055	2,750,307	391,650	856,513	393,160	12,751,685
1962	2,501,722	667,856	272,682	2,722,524	268,042	6,432,826
1963	1,069,902	713,655	205,024	1,085,758	270,886	3,345,225
1964	2,462,507	1,132,430	611,548	3,517,089	400,722	8,124,296
1965	19,198,357	3,194,005	945,416	1,059,613	340,142	24,737,533
1966	5,606,584	2,137,148	477,018	3,706,382	334,585	12,261,717
1967	2,391,732	1,085,310	181,331	1,124,019	196,798	4,979,190
1968	1,492,532	697,937	108,005	2,760,285	230,814	5,289,573
1969	4,716,845	905,511	183,240	1,106,307	250,938	7,162,841
1970	17,971,475	1,458,196	192,703	2,132,636	295,514	22,050,524
1971	6,019,188	1,336,865	969,822	1,707,656	363,298	10,396,829
20-Year Total	113,731,044	25,196,645	9,379,608	34,652,466	4,274,168	187,233,931
1952-61 Total	50,300,200	11,867,732	5,232,819	13,730,197	1,322,429	82,453,377
1962-71 Total	63,430,844	13,328,913	4,146,789	20,922,269	2,951,739	104,780,554
20-Year Average	5,686,552	1,259,832	468,980	1,732,623	237,454 ^{1/}	9,361,697
1952-61 Average	5,030,020	1,186,773	523,282	1,373,020	165,304	8,245,338
1962-71 Average	6,343,084	1,332,891	414,679	2,092,227	295,174	10,478,055

^{1/} 18-year average for Togiak district.

(Data Sources: 2, 9 and 12)

APPENDIX TABLE 11. Bristol Bay catch by species and type of gear, 1952-71.

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
1952	Drift	10,409,579	92	49,636	94	228,042	91	10,902	77	4,411	88	10,702,570	92
	Set	856,550	8	3,220	6	21,379	9	3,227	13	603	12	884,979	8
	TOTAL	11,266,129		52,856		249,421		14,129		5,014		11,587,549	
1953	Drift	5,510,006	90	38,371	90	359,772	91	5	42	2,075	45	5,901,229	90
	Set	601,494	10	4,185	10	36,574	9	7	58	2,541	55	644,801	10
	TOTAL	6,111,500		42,556		387,346		12		4,616		6,546,030	
1954	Drift	4,158,295	89	53,276	95	365,421	91	59,037	57	12,268	58	4,648,297	89
	Set	494,330	11	2,740	5	35,223	9	43,945	43	11,268	42	587,506	11
	TOTAL	4,652,625		56,016		400,644		102,982		23,536		5,235,803	
1955	Drift	4,032,547	89	69,960	93	194,909	92	0	0	12,531	60	4,309,947	89
	Set	516,559	11	5,469	7	17,270	8	9	100	8,497	40	547,804	11
	TOTAL	4,549,106		75,429		212,179		9		21,028		4,857,751	
1956	Drift	8,098,397	91	63,939	96	298,094	94	72,911	79	53,205	84	8,586,546	91
	Set	783,070	9	2,438	4	17,423	6	19,061	21	10,254	16	832,246	9
	TOTAL	8,881,467		66,377		315,517		91,972		63,459		9,418,792	
1957	Drift	5,916,811	94	89,615	98	253,013	98	2	7	63,350	92	6,322,791	94
	Set	358,691	6	1,805	2	6,329	2	27	93	5,395	8	372,247	6
	TOTAL	6,275,502		91,420		259,342		29		68,745		6,695,038	
1958	Drift	2,765,251	93	101,290	98	345,260	96	895,219	79	120,302	89	4,227,322	90
	Set	220,415	7	1,917	2	12,832	4	240,323	21	15,526	11	491,013	10
	TOTAL	2,985,666		103,207		358,092		1,135,542		135,828		4,718,335	
1959	Drift	4,065,995	88	79,644	94	422,086	88	187	62	6,341	37	4,574,253	88
	Set	542,124	12	4,645	6	59,430	12	114	38	10,994	63	617,307	12
	TOTAL	4,608,119		84,289		481,516		301		17,335		5,191,560	

(Continued)

APPENDIX TABLE 11. (Continued)

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
1960	Drift	12,747,132	93	107,138	96	1,178,351	90	200,303	66	5,612	35	14,238,536	92
	Set	957,870	7	4,565	4	137,606	10	101,729	34	10,528	65	1,212,298	8
	TOTAL	13,705,002		111,703		1,315,957		302,032		16,140		15,450,834	
1961	Drift	11,171,226	94	83,800	95	685,833	94	342	64	8,016	39	11,949,217	94
	Set	742,700	6	4,856	5	42,099	6	196	36	12,617	61	802,468	6
	TOTAL	11,913,926		88,656		727,932		538		20,633		12,751,685	
1962	Drift	3,941,097	84	78,486	93	609,396	90	776,392	85	25,424	65	5,430,795	84
	Set	776,919	16	5,561	7	68,149	10	137,542	15	13,860	35	1,002,031	16
	TOTAL	4,718,016		84,047		677,545		913,934		39,284		6,432,826	
1963	Drift	2,470,038	86	57,647	93	315,324	85	243	53	19,495	47	2,862,747	86
	Set	401,098	14	4,622	7	54,773	15	218	47	21,767	53	482,478	14
	TOTAL	2,871,136		62,269		370,097		461		41,262		3,345,225	
1964	Drift	4,802,031	86	131,108	94	694,089	86	1,359,747	88	25,544	70	7,012,519	86
	Set	794,089	14	8,428	6	108,419	14	189,822	12	11,019	30	1,111,777	14
	TOTAL	5,596,120		139,536		802,508		1,549,569		36,563		8,124,296	
1965	Drift	22,366,334	92	106,511	94	317,265	88	613	88	4,514	56	22,795,237	92
	Set	1,888,905	8	6,456	6	43,279	12	87	12	3,569	44	1,942,296	8
	TOTAL	24,255,239		112,967		360,544		700		8,083		24,737,533	
1966	Drift	8,293,143	89	73,602	95	297,942	87	2,223,891	89	25,871	76	10,914,449	89
	Set	1,021,097	11	3,870	5	45,270	13	268,960	11	8,071	24	1,347,268	11
	TOTAL	9,314,240		77,472		343,212		2,492,851		33,942		12,261,717	
1967	Drift	3,870,379	89	113,234	97	454,942	96	827	74	43,763	81	4,483,145	90
	Set	460,351	11	3,959	3	21,415	4	287	26	10,033	19	496,045	10
	TOTAL	4,330,730		117,193		476,357		1,114		53,796		4,979,190	

(Continued)

APPENDIX TABLE 11. (Continued)

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohes	%	Total	%
1968	Drift	2,524,950	90	101,137	98	345,133	95	1,715,761	89	70,808	76	4,757,789	90
	Set	267,899	10	2,586	2	18,658	5	220,075	11	22,566	24	531,784	10
	TOTAL	2,792,849		103,723		363,791		1,935,836		93,374		5,289,573	
1969	Drift	5,844,530	88	119,631	96	315,977	95	1,574	84	60,829	75	6,342,541	89
	Set	777,168	22	5,277	4	17,012	5	296	16	20,547	25	820,300	11
	TOTAL	6,621,698		124,908		332,989		1,870		81,376		7,162,841	
1970	Drift	19,351,116	93	132,576	94	678,896	94	375,522	82	6,478	45	20,544,588	93
	Set	1,369,650	7	7,935	6	38,950	6	81,389	18	8,012	55	1,505,936	7
	TOTAL	20,720,766		140,511		717,846		456,911		14,490		22,050,524	
1971	Drift	8,587,924	90	119,066	98	634,699	94	180	85	8,183	64	9,350,052	90
	Set	996,063	10	3,949	2	42,207	6	32	15	4,526	36	1,046,777	10
	TOTAL	9,583,987		123,015		676,906		212		12,709		10,396,829	
Total 1952-71	Drift	150,926,781	91	1,769,667	95	8,985,444	91	7,689,685	85	579,020	73	169,954,570	91
	Set	14,827,042	9	88,483	5	844,297	9	1,306,073	15	212,193	27	17,279,361	9
	TOTAL	165,753,823		1,858,150		9,829,741		8,995,758		791,213		187,233,931	
Total 1952-61	Drift	68,875,239	92	736,669	95	4,321,781	92	1,238,372	75	288,111	77	75,460,708	92
	Set	6,073,803	8	35,840	5	386,165	8	408,285	25	88,223	23	6,992,669	8
	TOTAL	74,949,042		772,509		4,707,946		1,646,657		376,334		82,453,377	
Total 1962-71	Drift	82,051,542	90	1,032,998	95	4,663,663	91	6,451,313	88	290,909	70	94,493,862	90
	Set	8,753,239	10	52,643	5	458,132	9	897,788	12	123,970	30	10,286,692	10
	TOTAL	90,804,781		1,085,641		5,121,795		7,349,101		414,879		104,780,554	
Average 1952-71	Drift	7,546,339	91	88,484	95	449,272	91	768,969	85	28,951	73	8,497,729	91
	Set	741,352	9	4,424	5	42,215	9	130,607	15	10,610	27	863,968	9
	TOTAL	8,287,691		92,908		491,487		899,576		39,561		9,361,697	

(Continued)

APPENDIX TABLE 11. (Continued)

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
Average 1952-61	Drift	6,887,524	92	73,667	95	432,178	92	247,674	75	28,811	77	7,546,071	92
	Set	607,380	8	3,584	5	38,617	8	81,657	25	8,822	23	699,267	8
	TOTAL	7,494,904		77,251		470,795		329,331 ^{1/}		37,633		8,245,238	
Average 1962-71	Drift	8,205,154	90	103,300	95	466,367	91	1,290,262	88	29,091	70	9,449,386	90
	Set	875,324	10	5,264	5	45,813	9	179,558	12	12,397	30	1,028,669	10
	TOTAL	9,080,478		108,564		512,180		1,469,820 ^{1/}		41,488		10,478,055	

^{1/} Even years only.

(Data Sources: 2 and 14)

APPENDIX TABLE 12. Bristol Bay case pack by species, 1952-71.

Year	48 1-lb. Cans Per Case					Total
	Reds	Kings	Chums	Pinks	Cohos	
1952	715,083	11,380	31,457	1,339	793	760,052
1953	445,535	8,050	37,052	3	333	490,973
1954	308,405	9,266	32,232	4,732	2,839	357,474
1955	312,284	13,089	20,701	0	1,928	348,002
1956	529,726	9,386	24,450	3,918	4,133	571,613
1957	471,979	16,285	23,940	0	4,220	516,424
1958	241,099	24,844	34,954	61,740	10,555	373,192
1959	332,713	17,364	42,812	0	2,582	395,471
1960	854,807	19,566	103,569	12,055	3,073	993,070
1961	926,441	15,501	51,828	0	1,980	995,750
1962	361,226	16,797	58,571	38,638	2,941	478,173
1963	217,901	9,495	34,157	2	4,296	265,851
1964	372,928	25,677	70,523	67,431	5,024	541,583
1965	1,447,771	24,248	31,826	0	338	1,504,183
1966	737,948	14,850	28,814	95,071	2,345	879,028
1967	334,177	19,499	45,321	8	3,100	402,105
1968	229,514	12,971	36,638	63,011	4,321	346,455
1969	457,911	17,860	30,997	33	2,198	508,999
1970	1,117,163	19,401	58,766	16,772	802	1,212,904
1971 ^{1/}	698,522	23,121	56,955	0	758	779,356
20-Year Total	11,113,133	328,650	855,563	364,702 ^{2/}	58,559	12,720,658
1952-61 Total	5,138,072	144,731	402,995	83,784	32,436	5,802,021
1962-71 Total	5,975,061	183,919	452,568	280,923	26,123	6,918,637
20-Year Average	555,657	16,433	42,778	18,235 ^{2/}	2,928	636,033
1952-61 Average	513,807	14,473	40,300	8,378	3,244	580,202
1962-71 Average	597,506	18,392	45,257	28,092	2,612	691,864

^{1/} Preliminary data from "Final Operation Report" for Bristol Bay (BB-CF/33). Includes only fish canned in Bristol Bay.

^{2/} Even-year only.

(Data Sources: 1, 3 and 8)

APPENDIX TABLE 13. Bristol Bay catch of fresh, frozen and cured fish, by species and district, 1952-71.^{1/}

Year	Catch in Number of Fish					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>NAKNEK-KVICHAK DISTRICT</u>						
1952	1,378,113	416	10,191	2,020	1	1,390,741
53	219,069	132	3,871	-	-	223,072
54	97,896	277	598	2	-	98,773
55	158,809	730	6,464	-	123	166,126
56	628,642	912	12,779	-	53	642,386
57	655,418	717	7,077	2	-	663,214
58	4,843	324	-	105	345	5,617
59	122	283	-	-	-	405
1960	325,119	242	1,744	8	-	327,113
61	176,435	313	-	-	534	177,282
62	4,430	4,366	281	-	-	9,077
63	14,541	5	2	2	150	14,700
64	15,994	1,159	19	264	193	17,629
65	41,264	825	-	-	17	42,106
66	14,486	260	-	-	-	14,746
67	-	-	-	-	-	-
68	214	103	24	139	197	677
69	17,770	147	114	-	-	18,031
1970	489,112	348	5,449	10,764	7	505,680
71	224,587	161	4,248	-	1	228,997
20-Year Total	4,466,864	11,720	52,861	13,302 ^{2/}	1,621	4,546,372
20-Year Average	223,343	586	2,643	1,330 ^{2/}	81	227,319
<u>EGEGIK DISTRICT</u>						
1952	174,770	37	2,962	-	-	177,769
53	375,012	138	12,081	2	1,761	388,994
54	762,970	8,939	44,861	-	2,932	819,702
55	280,174	1,870	9,898	-	4,138	296,080
56	157,880	729	3,139	4	8,573	170,325
57	96,989	3,050	1,824	24	4,056	105,943
58	2,739	1,795	344	365	7,479	12,722
59	9,960	1,761	306	-	5,717	17,744
1960	742	-	-	-	840	1,582
61	181,256	209	3	-	2,385	183,853
62	-	1,520	-	-	820	2,340
63	397	-	-	-	2,394	2,791
64	44,921	1,194	921	12	1,224	48,272
65	3,310	58	15	-	1,836	5,219

(Continued)

APPENDIX TABLE 13. (Continued)

Year	Catch in Numbers of Fish					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>EGEGIK DISTRICT - (Con't)</u>						
1966	1,155	256	15	-	2,679	4,111
67	1,798	200	-	-	900	2,898
68	1,207	27	57	204	6,579	8,074
69	7,212	1,015	994	-	2,790	12,011
1970	33,041	556	2,889	40	1,023	37,549
71	3,278	354	1,996	-	902	6,530
20-Year Total	2,138,811	23,708	82,311	625 ^{2/}	59,028	2,304,509
20-Year Average	106,941	1,185	4,116	63 ^{2/}	2,951	115,225
<u>UGASHIK DISTRICT</u>						
1952	15,000	8	-	1,000	-	16,008
53	99,454	1	2,861	-	-	102,316
54	4,358	-	-	-	-	4,358
55	16,981	16	2,997	-	-	19,994
56	-	-	-	-	-	-
57	-	-	-	-	-	-
58	2,839	766	-	-	730	4,335
59	1,676	1,160	147	-	748	3,731
1960	2,969	937	-	-	-	3,906
61	6,916	960	417	-	-	8,293
62	19,711	35	2,624	-	4,061	26,431
63	12,331	1,433	2,030	-	2,850	18,644
64	30,551	2,350	3,268	-	3,200	39,369
65	41,174	2,558	623	-	-	44,355
66	28,608	740	14,300	3	43	43,694
67	26,704	833	6,956	-	1,010	35,503
68	17,473	1,072	7,670	-	5,841	32,056
69	45,308	1,999	1,527	-	7,440	56,274
1970	105,818	1,499	26,454	-	-	133,771
71	64,894	30	-	-	-	64,924
20-Year Total	542,765	16,397	71,874	1,003 ^{2/}	25,923	657,962
20-Year Average	27,138	820	3,594	100 ^{2/}	1,296	32,898
<u>NUSHAGAK DISTRICT</u>						
1952	310	11	-	-	-	321
53	21,587	1,212	2,013	1	2,031	26,844
54	3,086	8,903	310	58	1,414	13,771
55	65,001	19,533	6,085	-	214	90,833
56	223,787	24,410	21,895	9,179	1,796	281,067

(Continued)

APPENDIX TABLE 13. (Continued)

Year	Catch in Numbers of Fish					Total
	Reds	Kings	Chums	Pinks	Conos	
<u>NUSHAGAK DISTRICT - (Con't)</u>						
1957	12,991	25,421	5,163	-	1,982	45,557
58	1,059	4,352	-	-	405	5,816
59	679	4,604	121	-	2,449	7,853
1960	960	2,537	103	-	-	3,600
61	1,410	9,941	378	-	577	12,306
62	1,386	3,282	48	-	4,259	8,975
63	10,482	8,733	10,896	1	462	30,574
64	-	390	-	-	-	390
65	-	-	-	-	-	-
66	42	613	315	-	876	1,846
67	5,307	19,653	3,590	-	4,834	33,384
68	32,250	16,761	2,406	127	10,381	61,925
69	42,971	28,841	13,748	35	30,595	116,190
1970	1,351	33,813	2,197	124	48	37,533
71	1,844	27,708	1,939	2 ^{2/}	3,224	34,717
20-Year Total	426,503	240,718	71,207	9,522 ^{2/}	65,547	813,502
20-Year Average	21,325	12,036	3,560	952 ^{2/}	3,277	40,675
<u>TOGIAK DISTRICT</u>						
1954	4,926	-	675	807	-	6,408
55	-	-	-	-	-	-
56	-	-	-	-	-	-
57	165	-	-	-	1,616	1,781
58	-	-	-	-	-	-
59	-	-	-	-	-	-
1960	19,505	3,443	30,052	-	-	53,000
61	9,986	63	4,529	6	-	14,584
62	3,518	624	3,646	3	-	7,791
63	-	-	-	-	-	-
64	1,880	3,931	-	-	4,339	10,150
65	-	-	-	-	-	-
66	58	4	36	1	12,483	12,582
67	29	-	27	-	17,786	17,842
68	5,822	4,724	10,042	-	25,574	46,162
69	6,055	8,729	43,028	2	26,433	84,247
1970	-	5,613	15,603	-	877	22,093
71	10,028	6,875	11,843	1	3,271	32,018
18-Year Total	61,972	34,006	119,481	814 ^{2/}	92,379	308,658
18-Year Average	3,443	1,889	6,638	90 ^{2/}	5,132	17,148

(Continued)

APPENDIX TABLE 13. (Continued)

Year	Catch in Numbers of Fish					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>TOTAL BRISTOL BAY</u>						
1952	1,568,193	472	13,153	3,020	1	1,584,839
53	715,122	1,483	20,826	3	3,792	741,226
54	873,236	18,119	46,444	867	4,346	943,012
55	520,965	22,149	25,444	-	4,475	573,033
56	1,010,309	26,051	37,813	9,183	10,422	1,093,778
57	765,563	29,188	14,064	26	7,654	816,495
58	11,480	7,237	344	470	-8,959	28,490
59	12,437	7,808	574	-	8,914	29,733
1960	349,295	7,159	31,899	8	840	389,201
61	376,003	11,486	5,327	6	3,496	396,318
62	29,045	9,827	6,599	3	9,140	54,614
63	37,751	10,171	12,928	3	5,856	66,709
64	93,346	9,024	4,208	276	8,956	115,810
65	85,748	3,441	638	-	1,853	91,680
66	44,349	1,873	14,672	4	16,081	76,979
67	33,838	20,686	10,573	-	24,530	89,627
68	56,966	22,687	20,199	470	48,572	148,894
69	119,316	40,731	59,411	37	67,258	286,753
1970	629,322	41,829	52,592	10,928	1,955	736,626
71	304,631	35,128	20,026	3	7,398	367,186
20-Year Total	7,636,915	326,549	397,734	25,307 ^{2/}	244,498	8,631,003
1952-61 Total	6,202,603	131,152	195,888	13,583 ^{2/}	52,899	6,596,125
1962-71 Total	1,434,312	195,397	201,846	11,724 ^{2/}	191,599	2,034,878
20-Year Average	381,846	16,327	19,887	2,531 ^{2/}	12,225	431,550
1952-61 Average	620,260	13,115	19,589	1,358 ^{2/}	5,290	659,613
1962-71 Average	143,431	19,540	20,185	1,172 ^{2/}	19,160	203,488

1/ Includes fresh, frozen, salted and mild-cured fish.

2/ Even-year-only.

(Data Sources: 1 and 14)

APPENDIX TABLE 14. Bristol Bay fish per case, by species, 1952-71.^{1/}

Year	Reds	Kings	Chums	Pinks	Cohos
1952	13.69	5.12	10.34	13.37	10.57
1953	11.91	5.22	10.16	23.09	10.30
1954	12.04	4.79	10.26	18.47	10.69
1955	12.77	4.13	9.84	-	11.17
1956	12.91	4.15	11.50	20.93	12.64
1957	11.79	3.81	10.21	-	-
1958	12.30	4.20	9.40	18.20	12.80
1959	12.80	4.10	11.40	23.00	7.80
1960	14.58	6.19	12.58	17.27	11.34
1961	11.93	4.43	11.25	19.19	7.39
1962	12.45	4.66	11.47	25.80	12.10
1963	12.15	5.49	11.36	-	12.21
1964	13.57	5.31	11.01	25.58	12.58
1965	15.75	4.28	12.31	-	9.08
1966	12.62	5.22	11.91	26.22	14.47
1967	12.96	6.01	10.51	13.93	17.35
1968	11.65	6.25	9.36	30.29	10.37
1969	13.55	4.67	8.82	-	6.42
1970	15.31	4.51	11.27	26.59	15.63
1971 ^{2/}	12.52	3.75	11.40	-	7.01
20-Year Total	25,925	9,629	21,636	24,931	21,192
1952-61 Total	12,672	4,614	10,694	11,483 ^{3/}	9,470
1962-71 Total	13,253	5,015	10,942	13,448	11,722
20-Year Average	12.96	4.81	10.82	12.47	10.60
1952-61 Average	12.67	4.61	10.69	11.48 ^{3/}	9.47
1962-71 Average	13.25	5.02	10.94	13.45	11.72

^{1/} Mesh size dropped to 5-3/8 inches in 1962, previously it had been 5-1/2 inches.

^{2/} Preliminary data compiled by A.D.F.G.

^{3/} Even year only.

(Data Sources: 1 and 3)

APPENDIX TABLE 15. Bristol Bay fish prices paid to fishermen, by species, 1962-71
(in dollars).^{1/}

Species	Price Per Fish						Price Per Pound		
	1962	1963	1964-65	1966	1967	1968	1969	1970	1971
<u>Independent Fishermen</u>									
Reds	1.04	1.08	1.09	1.13	1.18	1.18	.24	.24	.26
Kings, Large	3.75	3.75	3.75	3.87	3.87	3.87			
Med.	1.87	1.87	1.87	1.94	1.94	1.94	.18	.18	.20 ^{2/}
Small	1.00	1.00	1.00	1.00	1.03	1.03			
Chums	.56	.58	.58	.60	.60	.60	.11	.11	.12
Pinks	.31	.32	.32	.33	.33	.33	.11	.11	.12
Cohos ^{2/}	1.04	1.08	1.09	1.13	1.18	1.18	.18	.18	.20 ^{3/}
<u>Company Fishermen</u>									
Reds	.64	.67	.67	.70	.73	.74	.14	.14	.16
Kings, Large	2.70	2.70	2.70	2.40	2.78	2.78			
Med.	2 for 1	2 for 1	2 for 1	1.20	1.39	1.39	.11	.11	.12
Small				.64	.69	.69			
Chums	.36	.37	.37	.37	.37	.37	.06	.06	.08
Pinks	-	-	-	.20	.17	.17	.06	.06	.08
Cohos	.64	.67	.67	.70	.73	.74	.14	.14	.16

^{1/} Prices rounded to nearest hundredth of a dollar.

^{2/} Price is for fish to be canned; price for fish to be frozen (caught before June 26) is \$.24.

^{3/} Prior to July 19 price paid is \$.26.

(Data source: 1)

APPENDIX TABLE 16. Wholesale value of Bristol Bay case pack by species, 1952-71.^{1/}

Year	Value in Dollars by Species					Total
	Reds	Kings	Chums	Pinks	Conos	
1952	20,379,900	284,500	503,300	25,400	17,100	21,210,200
1953	12,029,400	193,200	518,700	100	6,700	12,748,100
1954	8,789,500	231,700	483,500	94,600	65,300	9,664,600
1955	10,149,200	366,500	372,600	-	50,100	10,938,400
1956	17,745,800	276,900	513,500	92,100	117,800	18,746,100
1957	15,811,300	464,100	478,800	-	116,100	16,870,300
1958	8,197,400	708,100	594,200	1,296,500	290,300	11,086,500
1959	12,144,000	512,200	899,100	-	78,800	13,634,100
1960	31,200,500	616,300	2,330,300	295,300	95,300	34,537,700
1961	34,929,100	561,200	1,473,700	15,100	75,400	37,054,500
1962	12,402,500	523,700	1,521,300	1,023,000	105,700	15,576,200
1963	8,994,000	290,600	762,300	-	152,100	10,199,000
1964	11,060,500	794,500	1,415,200	1,694,500	116,400	15,081,100
1965	54,092,900	739,800	717,100	-	11,200	55,561,000
1966	27,079,400	453,000	721,400	2,662,000	69,000	30,984,800
1967	14,858,600	713,200	1,283,500	300	126,800	16,982,400
1968	9,251,700	441,000	1,055,200	2,015,700	320,000	13,083,600
1969	19,525,300	620,300	857,700	1,000	76,300	21,080,600
1970	48,239,100	721,100	1,687,200	547,600	29,800	51,224,800
1971 ^{2/}	32,132,000	890,200	1,794,100	-	28,400	34,844,700
20-Year Total	409,012,100	10,402,100	19,982,700	9,748,000 ^{2/}	1,948,600	451,108,700
1952-61 Total	171,376,100	4,214,700	8,167,700	1,803,900	912,900	186,490,500
1962-71 Total	237,636,000	6,187,400	11,815,000	7,944,100	1,035,700	264,618,200
20-Year Average	20,450,605	520,105	999,135	487,400 ^{2/}	97,430	22,555,435
1952-61 Average	17,137,610	421,470	816,770	180,390	91,290	18,649,050
1962-71 Average	23,763,600	618,740	1,181,500	794,410	103,570	26,461,820

^{1/} Includes only fish canned in Bristol Bay.^{2/} Includes even years only.^{3/} Preliminary data by A.D.F.G.

(Data Sources: 1, 3, 10, 13 and 15)

APPENDIX TABLE 17. Bristol Bay wholesale value of all fishery products, 1960-71.^{1/}

Year	Estimated Wholesale Value ^{2/}				Total Value
	Canned ^{3/}	Salmon Others ^{4/}	Roe ^{5/}	Herring ^{6/}	
1960	\$ 34,538,000	\$ 719,000	-	-	\$ 35,257,000
1961	37,055,000	1,152,000	-	-	38,207,000
1962	15,576,000	229,000	-	-	15,805,000
1963	10,199,000	222,000	-	-	10,421,000
1964	15,081,000	366,000	-	-	15,447,000
1965	58,169,000	182,000	-	-	58,351,000
1966	32,020,000	209,000	167,000	-	32,396,000
1967	17,333,000	391,000	585,000	27,000	18,336,000
1968	13,331,000	634,000	685,000	68,000	14,718,000
1969	22,022,000	1,213,000	998,000	15,000	24,248,000
1970	59,670,000	2,017,000	1,956,000	17,000	63,660,000
1971 ^{7/}	36,958,000	1,397,000	1,951,000	21,000	40,327,000
Total	\$351,952,000	\$8,731,000	\$6,342,000	\$148,000	\$367,173,000
Average	\$ 29,329,000	\$ 728,000	\$1,057,000	\$ 30,000	\$ 30,598,000

^{1/} Wholesale value to the processor; rounded to nearest \$1,000.

^{2/} Value by product derived from annual "Alaska Catch and Production Commercial Fisheries Statistics".

^{3/} Includes fish shipped out of Bristol Bay for canning in 1965-66 and 1969 to 1971; from 1960-64 and 1967-68 data on fish shipped out is unavailable.

^{4/} Includes fresh, frozen, mild-cured and salted products.

^{5/} Prior to 1966 roe production was insignificant.

^{6/} Fishery initiated in 1967.

^{7/} Preliminary data from A.D.F.G.

(Data Sources: 1 and 3)

APPENDIX TABLE 18. Average round weight (in pounds) of commercial catch by district and species, 1963-71.

	DISTRICT									
	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak	
	Sample Size	Ave. Wt.	Sample Size	Ave. Wt.	Sample Size	Ave. Wt.	Sample Size	Ave. Wt.	Sample Size	Ave. Wt.
<u>Red Salmon</u>										
1963	284	6.2	204	6.4	105	6.2	128	6.1	-	-
1964	1,318	5.2	524	5.9	438	5.3	5,051	6.2	2,148	6.5
1965	564	4.6	417	5.2	315	5.3	-	-	1,394	6.0
1966	129	6.3	293	6.4	98	6.5	359	6.3	1,146	6.9
1967	542	5.9	187	6.3	237	6.3	376	5.9	266	7.0
1968	414	5.8	277	6.1	292	5.9	467	6.5	626	7.0
1969	271	5.5	262	5.7	268	5.4	540	5.6	510	5.8
1970	272	5.0	270	4.4	292	4.8	922	5.9	300	5.8
1971	297	5.5	1,073	6.3	276	6.4	831	6.5	633	7.0
<u>King Salmon</u>										
1964	-	-	-	-	-	-	258	14.7	39	15.9
1965	-	-	-	-	-	-	347	20.1	257	21.8
1966	-	-	-	-	-	-	796	18.3	147	20.7
1967	-	-	-	-	-	-	971	21.0	32	21.3
1968	-	-	-	-	-	-	558	22.2	212	25.4
1969	-	-	-	-	-	-	474	21.0	110	21.7
1970	-	-	-	-	-	-	312	22.1	150	18.8
1971	124	17.9	-	-	-	-	340	24.4	150	24.0
<u>Chum Salmon</u>										
1964	-	-	-	-	-	-	-	-	14	7.0
1965	-	-	-	-	-	-	74	6.1	188	6.8
1966	-	-	-	-	-	-	44	8.6	442	7.5
1967	-	-	-	-	-	-	447	6.6	265	7.0
1968	-	-	-	-	-	-	462	6.9	303	7.4
1969	-	-	-	-	-	-	395	6.1	360	6.8
1970	-	-	-	-	-	-	310	6.6	310	6.6
1971	-	-	-	-	-	-	360	6.7	320	7.2
<u>Pink Salmon</u>										
1964	-	-	-	-	-	-	225	3.2	-	-
1966	-	-	-	-	-	-	299	3.1	-	-
1968	-	-	-	-	-	-	644	3.2	-	-
1970	-	-	-	-	-	-	359	2.8	-	-
<u>Coho Salmon</u>										
1964	-	-	-	-	-	-	39	6.8	-	-
1966	-	-	-	-	-	-	399	7.5	-	-
1967	-	-	-	-	-	-	473	7.0	-	-
1968	-	-	-	-	-	-	129	7.6	-	-
1969	68	7.0	198	7.1	219	7.8	195	6.5	239	8.7
1970	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	-

¹/ Red salmon data weighted by age composition. Other species data unweighted arithmetic averages.

(Data Sources: 1, 2 and 3)

APPENDIX TABLE 19. Bristol Bay salmon egg production and value by species, 1966-71.^{1/}

Year	Number Operators	Pounds of Eggs by Species ^{2/}					Total	Value of Finished Product ^{3/}
		Reds	Kings	Chums	Pinks	Conos		
1966	3	-	-	-	-	-	181,635	\$166,802
1967	10	143,128	122,377	236,774	-	29,797	532,076	585,284
1968	8	264,867	58,855	152,900	76,658	32,156	585,436	684,960
1969	14	708,025	92,284	98,412	-	25,365	924,086	998,013
1970	16	1,497,065	91,354	255,154	36,013	1,648	1,881,234	1,956,483
1971 ^{4/}	14	1,494,127	125,254	254,385	-	1,990	1,875,756	1,950,787
5-Year Total ^{5/}		4,107,212	490,124	997,625	112,671 ^{6/}	90,956	5,798,588	6,175,527
5-Year Average ^{5/}		821,442	98,024	199,525	22,534 ^{6/}	18,191	1,159,717	\$1,235,105

^{1/} Basic production data extracted from "Bristol Bay Final Operations Report" (BE-CF/33) and "Alaska Fishery Operators Annual Report" (FG-122). Does not include egg production from fish processed outside Bristol Bay.

^{2/} Reported in both gross and net weights; whenever available net weight (after water-loss and dehydration) was used.

^{3/} Value reflects amount received by operating processors for the raw product. Value extracted from annual "Alaska Catch and Production Statistics", and does not match previously reported figures which were preliminary.

^{4/} Preliminary production and estimated value.

^{5/} Five-year total and average (1967-71).

^{6/} Two-year total and average.

(Data Sources: 1 and 3)

APPENDIX TABLE 20. Bristol Bay red salmon escapements by district, 1952-71.

Year	Naknek- Kvichak ^{1/}	Egegik	Ugashik ^{2/}	Nushagak	Togiak ^{3/}	Total
1952	6,073,178	756,921	651,209	433,800	102,000	8,017,108
1953	603,148	519,098	1,056,361	828,542	102,000	3,109,149
1954	1,040,167	507,298	458,635	691,624	77,000	2,774,724
1955	700,546	271,039	76,982	1,933,755	112,000	3,094,322
1956	11,999,913	1,104,268	425,295	1,212,101	225,000	14,966,577
1957	3,604,050	391,207	214,802	498,727	25,000	4,733,786
1958	907,553	246,354	279,546	1,277,933	72,000	2,783,386
1959	3,737,238	1,072,459	219,228	3,041,885	209,640	8,280,450
1960	16,698,911	1,798,764	2,341,400	1,673,258	192,010	22,704,343
1961	4,146,963	701,538	366,439	859,633	127,454	6,202,027
1962	3,394,580	1,027,482	274,026	937,698	71,552	5,705,338
1963	1,447,422	997,602	397,004	1,063,856	127,596	4,033,480
1964	2,555,424	849,576	482,770	1,339,004	114,674	5,341,448
1965	25,218,744	1,444,608	997,862	1,099,266	112,786	28,873,266
1966	4,965,965	804,246	714,836	1,630,726	122,998	8,238,771
1967	4,174,474	636,864	243,930	875,452	91,330	6,022,050
1968	3,774,534	338,654	70,896	976,664	56,418	5,217,166
1969	9,907,896	1,015,554	160,380	1,212,586	125,066	12,421,482
1970	14,844,868	919,734	735,024	1,966,156	212,896	18,678,678
1971	3,510,448	634,014	529,752	1,353,382	213,242	6,240,838
20-Year Total	123,306,022	16,037,280	10,696,377	24,906,048	2,492,662	177,438,389
1952-61 Total	49,511,667	7,368,946	6,089,897	12,451,258	1,244,104	76,665,872
1962-71 Total	73,794,355	8,668,334	4,606,480	12,454,790	1,248,558	100,772,517
20-Year Average	6,165,301	801,864	534,819	1,245,302	124,633	8,871,919
1952-61 Average	4,951,167	736,895	608,990	1,245,126	124,410	7,666,587
1962-71 Average	7,379,436	866,833	460,648	1,245,479	124,856	10,077,252

^{1/} 1952-54 aerial surveys: Naknek and Kvichak rivers only; Branch River included from 1955 on.

^{2/} Includes Mother Goose system beginning in 1960 and 1967.

^{3/} 1952-53 and 1956-58 includes Togiak Lakes only. 1954-55 includes only Ongivinuck system and 1959 to date includes all Togiak tributaries. Kulukak system included 1961 to date.

(Data Sources: 1, 5, 6, 7, 11 and 14)

APPENDIX TABLE 21. Catch and escapement of red salmon in the Naknek-Kvichak district by river system, 1955-71.

Year	Escapement by River System			Total	Catch	Total Run
	Kvichak ^{1/}	Branch ^{2/}	Naknek ^{3/}			
1955	250,546	171,500	278,500	700,546	2,564,341	3,264,887
1956	9,443,318	784,000	1,772,595	11,999,913	5,987,750	17,987,663
1957	2,842,810	126,595	634,655	3,604,060	4,578,643	8,182,693
1958	534,785	94,650	278,118	907,553	922,611	1,830,164
1959	680,000	825,431	2,231,807	3,737,238	1,689,425	5,426,663
1960	14,630,000	1,240,530	828,381	16,698,911	9,847,848	26,546,759
1961	3,705,849	90,036	351,078	4,146,963	8,166,983	12,313,946
1962	2,580,884	90,630	723,066	3,394,580	2,281,284	5,675,864
1963	338,760	203,304	905,358	1,447,422	957,902	2,405,324
1964	957,120	248,700	1,349,604	2,555,424	2,243,701	4,799,125
1965	24,325,926	175,020	717,798	25,218,744	19,139,567	44,358,311
1966	3,775,184	174,336	1,016,445	4,965,965	5,397,538	10,363,503
1967	3,216,208	202,626	755,640	4,174,474	2,337,226	6,511,700
1968	2,557,440	193,872	1,023,222	3,774,534	1,216,858	4,991,392
1969	8,394,204	182,490	1,331,202	9,907,896	4,655,072	14,562,968
1970	13,935,306	177,060	732,502	14,844,868	17,803,805	32,648,673
1971	2,387,392	187,302	935,754	3,510,448	5,857,378	9,367,826
17-Year Total	94,555,732	5,168,082	15,865,725	115,589,539	95,647,932	211,237,471
1955-61 Total	32,087,308	3,332,742	6,375,134	41,795,184	33,757,601	75,552,785
1962-71 Total	62,468,424	1,835,340	9,490,591	73,794,355	61,890,331	135,684,686
17-Year Average	5,562,102	304,005	933,278	6,799,385	5,626,349	12,425,734
1955-61 Average	4,583,901	476,106	910,733	5,970,741	4,822,514	10,793,255
1962-71 Average	6,246,842	183,534	949,059	7,379,436	6,189,033	13,568,469

^{1/} Tower counts 1955-71.

^{2/} Aerial survey estimate 1955-56; tower count 1957-71.

^{3/} Weir count 1955-56; tower count 1957-71.

(Data Sources: 1, 2, 5, 8, 11, 12 and 14)

APPENDIX TABLE 22. Catch and escapement of red salmon in the Egegik and Ugashik districts by river system, 1952-71.

Year	Egegik District			Ugashik District				
	Escapement	Catch	Total Run	Escapement		Catch	Total Run	
	Egegik ^{1/}			Ugashik ^{2/}	Mother Goose ^{3/}	Total		
1952	756,921	886,852	1,643,773	651,209	-	651,209	280,146	931,355
1953	519,098	1,234,600	1,753,698	1,056,361	-	1,056,361	688,720	1,745,081
1954	507,298	1,437,791	1,945,089	458,635	-	458,635	1,067,531	1,526,166
1955	271,039	622,885	893,924	76,982	-	76,982	240,817	317,799
1956	1,104,268	1,187,099	2,291,367	425,295	-	425,295	341,499	766,794
1957	391,207	814,459	1,205,666	214,802	-	214,802	350,858	565,660
1958	246,354	500,684	747,038	279,546	-	279,546	433,813	713,359
1959	1,072,459	662,391	1,734,850	219,228	-	219,228	423,414	642,642
1960	1,798,764	1,446,884	3,245,648	2,304,200	37,200	2,341,400	752,634	3,094,034
1961	701,538	2,686,076	3,387,614	348,639	17,800	366,439	357,223	723,662
1962	1,027,482	638,862	1,666,344	255,426	18,600	274,026	243,159	517,185
1963	997,602	695,582	1,693,184	388,254	8,750	397,004	188,695	585,699
1964	849,576	1,103,935	1,953,511	472,770	10,000	482,770	576,768	1,059,538
1965	1,444,608	3,179,559	4,624,167	996,612	1,250	997,862	925,690	1,923,552
1966	804,246	2,101,174	2,905,420	704,436	10,400	714,836	445,458	1,160,294
1967	636,864	1,070,942	1,707,806	238,830	5,100	243,930	163,744	407,674
1968	338,654	671,554	1,010,208	70,896	-	70,896	82,457	153,353
1969	1,015,554	889,322	1,904,876	160,380	-	160,380	169,845	330,225
1970	919,734	1,403,509	2,323,243	735,024	-	735,024	171,541	906,565
1971	634,014	1,306,682	1,940,696	529,752	-	529,752	954,068	1,483,820
20-Year Total	16,037,280	24,540,842	40,578,122	10,587,277	109,100	10,696,377	8,858,080	19,554,457
1952-61 Total	7,368,946	11,479,721	18,848,667	6,034,897	55,000	6,089,897	4,936,655	11,026,552
1962-71 Total	8,668,334	13,061,121	21,729,455	4,552,380	54,100	4,606,480	3,921,425	8,527,905
20-Year Average	801,864	1,227,042	2,028,906	529,364	13,638	543,002	442,904	977,723
1952-61 Average	736,895	1,147,972	1,884,867	603,490	27,500	630,990	493,666	1,102,655
1962-71 Average	866,833	1,306,112	2,172,946	455,238	9,017	464,255	392,143	852,791

^{1/} Weir count 1952-56; tower count 1957-71.

^{2/} Weir count 1952-56; tower count 1957-71.

^{3/} Aerial survey estimate 1960-67.

(Data Sources: 1, 2, 7, 8, 11, 12 and 14)

Year	Escapement by River System					Total	Catch	Total Run
	Wood ^{1/}	Igushik ^{2/}	Snake ^{3/}	Nuyakuk ^{4/}	Nushagak-Mulchatna ^{5/}			
1952	226,800	150,000	4,000	38,000	15,000	433,800	698,071	1,131,871
1953	515,542	100,000	4,000	189,000	20,000	828,542	449,341	1,277,883
1954	570,624	80,000	4,000	29,000	8,000	691,624	315,357	1,006,981
1955	1,382,755	500,000	30,000	16,000	5,000	1,933,755	1,054,978	2,988,733
1956	733,101	400,000	4,000	30,000	5,000	1,212,101	1,263,186	2,475,287
1957	288,727	130,000	3,000	67,000	10,000	498,727	491,498	990,225
1958	960,455	107,478	9,000	196,000	5,000	1,277,933	1,092,156	2,370,089
1959	2,209,266	643,808	139,950	48,861	-	3,041,885	1,719,687	4,761,572
1960	1,016,073	495,087	16,598	145,500	-	1,673,258	1,517,988	3,191,246
1961	460,737	294,252	4,856	79,788	20,000	859,633	511,483	1,371,116
1962	873,888	15,660	1,760	37,890	8,500	937,698	1,461,766	2,399,464
1963	721,404	92,184	37,960	166,608	45,700	1,063,856	842,744	1,906,600
1964	1,076,112	128,532	12,436	103,224	18,700	1,339,004	1,420,941	2,759,945
1965	675,156	180,840	12,000	203,070	28,200	1,099,266	793,323	1,892,589
1966	1,208,682	206,360	4,500	161,010	50,174	1,630,726	1,170,271	2,800,997
1967	515,772	281,772	11,000	20,250	46,658	875,452	657,711	1,533,163
1968	649,344	194,508	4,100	96,642	32,070	976,664	749,281	1,725,945
1969	604,338	512,328	9,300	69,828	16,792	1,212,586	773,207	1,985,793
1970	1,161,964	370,920	23,800	364,648	44,824	1,966,156	1,188,534	3,154,690
1971	851,202	210,960	8,500	224,382	58,338	1,353,382	1,256,799	2,610,181
20-Year Total	16,741,942	5,094,689	344,760	2,286,701	437,956	24,906,048	19,428,322	44,334,370
1952-61 Total	8,404,080	2,900,625	219,404	839,149	88,000	12,451,258	9,113,745	21,565,003
1962-71 Total	8,337,862	2,194,064	125,356	1,447,552	349,956	12,454,790	10,314,577	22,769,367
20-Year Average	837,097	254,734	17,238	114,335	24,331	1,245,302	971,416	2,216,719
1952-61 Average	840,408	290,063	21,940	83,915	11,000	1,245,126	911,375	2,156,500
1962-71 Average	833,786	219,406	12,536	144,755	34,996	1,245,479	1,031,458	2,276,937

1/ Aerial survey estimate 1952; tower count 1953-71.

2/ Aerial survey estimate 1952-57; tower count 1958-71.

3/ Aerial survey estimate 1952-59 and 1965-71; tower count 1960-64.

4/ Aerial survey estimate 1952-58; tower count 1959-71.

5/ Aerial survey estimate 1952-58 and 1961-65; tower count 1966-71.

(Data Sources: 1, 2, 5, 6, 8, 12 and 14)

APPENDIX TABLE 24. Catch and escapement of red salmon in the Togiak district by river system, 1952-71.

Year	Escapement by River System			Total	Catch	Total Run
	Togiak ^{1/}	Tributaries ^{2/}	Kulukak ^{3/}			
1952	102,000	-	-	102,000	-	102,000
1953	102,000	-	-	102,000	-	102,000
1954	57,000	20,000	-	77,000	12,280	80,280
1955	104,000	8,000	-	112,000	66,085	178,085
1956	225,000	-	-	225,000	101,933	326,933
1957	25,000	-	-	25,000	40,044	65,044
1958	72,000	-	-	72,000	36,402	108,402
1959	178,740	30,900	-	209,640	113,202	322,842
1960	162,810	29,200	-	192,010	139,648	331,658
1961	95,454	26,800	5,200	127,454	192,161	319,615
1962	47,352	14,600	9,600	71,552	92,945	164,497
1963	102,396	13,800	11,400	127,596	186,213	313,809
1964	95,574	9,300	9,800	114,674	250,775	365,449
1965	88,386	8,100	16,300	112,786	217,100	329,886
1966	91,098	13,100	18,800	122,998	199,799	322,797
1967	69,330	12,000	10,000	91,330	101,107	192,437
1968	42,918	7,000	6,500	56,418	72,699	129,117
1969	109,266	7,400	8,400	125,066	134,252	259,318
1970	192,096	10,800	10,000	212,896	153,377	366,273
1971	190,842	9,400	13,000	213,242	209,060	422,302
20-Year Total	2,153,262	220,400	119,000	2,492,662	2,319,082	4,811,744
1952-61 Total	1,124,004	114,900	5,200	1,244,104	701,755	1,945,859
1962-71 Total	1,029,258	105,500	113,800	1,248,558	1,617,327	2,865,885
20-Year Average	107,663	14,693	10,819	124,633	128,838	240,587
1952-61 Average	112,400	22,980	5,200	124,410	87,719	194,586
1962-71 Average	102,926	10,550	11,380	124,856	161,733	286,589

^{1/} Aerial survey estimate 1952-59; tower count 1960-71.

^{2/} Aerial survey estimate 1954-55 and 1959-71.

^{3/} Aerial survey estimate 1961-71.

(Data Sources: 1, 2, 5, 8, 12 and 14)

APPENDIX TABLE 25. Inshore return of Bristol Bay red salmon by district, 1952-71.

Year	Catch and Escapement by District					
	<u>Naknek- Kvichak</u> ^{1/}	<u>Egegik</u>	<u>Ugashik</u>	<u>Nushagak</u>	<u>Togiak</u>	<u>Total</u>
1952	15,474,238	1,643,773	931,355	1,131,871	102,000	19,283,237
1953	4,341,987	1,753,698	1,745,081	1,277,883	102,000	9,220,649
1954	2,859,833	1,945,089	1,526,166	1,006,981	89,280	7,427,349
1955	3,264,887	893,924	317,799	2,988,733	178,085	7,643,428
1956	17,987,663	2,291,367	766,794	2,475,287	326,933	23,848,044
1957	8,182,693	1,205,666	565,660	990,225	65,044	11,009,288
1958	1,830,164	747,038	713,359	2,370,089	108,402	5,769,052
1959	5,426,663	1,734,850	642,642	4,761,572	322,842	12,888,569
1960	26,546,759	3,245,648	3,094,034	3,191,246	331,658	36,409,345
1961	12,313,946	3,387,614	723,662	1,371,116	319,615	18,115,983
1962	5,675,864	1,666,344	517,185	2,399,464	164,497	10,423,354
1963	2,405,324	1,693,184	585,699	1,906,600	313,809	6,904,662
1964	4,799,125	1,953,511	1,059,538	2,759,945	365,449	10,937,568
1965	44,358,311	4,624,167	1,923,552	1,892,589	329,886	53,128,505
1966	10,363,503	2,905,420	1,160,294	2,800,997	322,797	17,553,011
1967	6,511,700	1,707,806	407,674	1,533,163	192,437	10,352,780
1968	4,991,392	1,010,208	153,353	1,725,945	129,117	8,010,015
1969	14,562,968	1,904,876	330,225	1,985,793	259,318	19,043,180
1970	32,648,673	2,323,243	906,565	3,154,690	366,273	39,399,444
1971	9,367,826	1,940,696	1,483,820	2,610,181	422,302	15,824,825
20-Year Total	233,913,519	40,578,122	19,554,457	44,334,370	4,811,744	343,192,212
1952-61 Total	98,228,833	18,848,667	11,026,552	21,565,003	1,945,859	151,614,914
1962-71 Total	135,684,686	21,729,455	8,527,905	22,769,367	2,865,885	191,577,298
20-Year Average	11,695,676	2,028,906	977,723	2,216,719	240,587	17,159,611
1952-61 Average	9,822,883	1,884,867	1,102,655	2,156,500	194,586	15,161,491
1962-71 Average	13,568,469	2,172,946	852,791	2,276,937	286,589	19,157,730

^{1/} 1952-54 Branch River escapement not included.

(Data Sources: 1, 2, 5, 6, 7, 8, 11, 12 and 14)

APPENDIX TABLE 26. Sex composition of Bristol Bay red salmon catch and escapement by district, 1963-71.

Year	1963		1964		1965	
	Percent		Percent		Percent	
	Male	Female	Male	Female	Male	Female
<u>NAKNEK-KVICHAK</u>						
Kvichak R. Escapement	52.07	47.93	58.26	41.74	42.91	57.08
Branch R. Escapement	40.16	59.84	38.21	61.79	49.17	50.83
Naknek R. Escapement	45.46	54.54	41.66	58.34	48.44	51.56
Naknek-Kvichak Catch	47.97	52.03	53.85	46.15	61.36	38.64
System Total	46.94	53.06	50.49	49.51	50.99	49.01
<u>ELEGIK</u>						
Egegik R. Escapement	49.22	50.78	46.16	53.84	30.06	69.94
Egegik Catch	47.10	52.90	51.18	48.82	58.80	41.20
System Total	48.35	51.65	49.00	51.00	49.82	50.18
<u>UGASHIK</u>						
Ugashik R. Escapement	43.60	56.40	44.53	55.47	33.73	66.27
Ugashik Catch	51.80	48.20	59.73	40.27	60.32	39.68
System Total	46.26	53.74	52.88	47.12	46.54	53.46
<u>NUSHAGAK</u>						
Wood R. Escapement	42.60	57.40	38.69	61.31	38.35	61.65
Igushik R. Escapement	44.90	55.10	35.91	64.09	36.53	63.47
Nuyakuk R. Escapement	47.10	52.90	45.39	54.61	41.10	58.90
Snake R. Escapement	49.20	50.80	53.49	46.51	-	-
Nushagak Catch	41.96	58.04	49.90	50.10	41.96	58.04
Igushik Catch	-	-	47.90	52.10	39.73	60.27
System Total	42.98	57.02	44.69	55.31	39.94	60.06
<u>TOGIAK</u>						
Togiak R. Escapement	53.76	46.24	52.53	47.47	46.22	53.78
Togiak Catch	42.62	57.38	49.09	50.91	36.40	63.60
System Total	46.57	53.43	50.04	49.96	39.24	60.76
<u>BRISTOL BAY</u>						
Escapement	46.31	53.69	45.03	54.97	41.97	58.03
Catch	45.90	54.10	52.71	47.29	60.12	39.88
Total	46.14	53.86	48.98	51.02	50.27	49.73

APPENDIX TABLE 26. (Continued)

Year	1966		1967		1968	
	Percent		Percent		Percent	
	Male	Female	Male	Female	Male	Female
<u>NAKNEK-KVICHAK</u>						
Kvichak R. Escapement	42.32	57.68	53.35	46.65	51.96	48.04
Branch R. Escapement	43.00	57.00	47.66	52.34	44.90	55.10
Naknek R. Escapement	44.26	55.74	46.99	53.01	55.20	44.80
Naknek-Kvichak Catch	35.94	64.06	47.23	52.77	48.44	51.56
System Total	39.20	60.80	48.90	51.10	51.49	48.51
<u>EGEGIK</u>						
Egegik R. Escapement	46.35	53.65	46.94	53.06	45.81	54.19
Egegik Catch	32.88	67.12	42.62	57.38	44.80	55.20
System Total	36.61	63.39	41.87	58.13	45.14	54.86
<u>UGASHIK</u>						
Ugashik R. Escapement	38.03	61.97	42.96	57.04	46.72	53.28
Ugashik Catch	38.31	61.69	44.37	55.63	51.29	48.71
System Total	38.14	61.86	43.53	56.47	49.18	50.82
<u>NUSHAGAK</u>						
Wood R. Escapement	39.96	60.04	41.41	58.59	47.07	52.93
Igushik R. Escapement	47.60	52.40	46.28	53.72	49.37	50.63
Nuyakuk R. Escapement	38.35	61.65	40.11	59.89	45.94	54.06
Nushagak-Mulchatna R. Escapement	-	-	-	-	53.55	46.45
Nushagak Catch	55.89	44.11	43.87	56.13	50.10	49.90
Igushik Catch	47.25	52.75	40.78	59.22	47.66	52.34
System Total	55.50	44.50	43.44	56.56	48.36	51.64
<u>TOGIAK</u>						
Togiak R. Escapement	37.50	62.50	43.96	56.04	55.63	44.37
Togiak Catch	31.28	68.72	35.69	64.31	37.33	62.67
System Total	33.23	66.77	38.50	61.50	44.12	55.88
<u>BRISTOL BAY</u>						
Escapement	42.26	57.74	48.64	51.36	51.09	48.91
Catch	37.72	62.28	43.73	56.27	47.59	52.41
Total	39.84	60.16	46.57	53.43	49.87	50.13

Year	1969 ^{1/}		1970 ^{2/}		1971 ^{2/}	
	Percent		Percent		Percent	
	Male	Female	Male	Female	Male	Female
<u>NAKNEK-KVICHAK</u>						
Kvichak R. Escapement	52.30	47.70	39.50	60.50	41.73 ^{3/}	58.27 ^{3/}
Branch R. Escapement	44.72	55.28	45.52	54.48	47.30 ^{3/}	52.70 ^{3/}
Naknek R. Escapement	47.08	52.92	47.78	52.22	39.11 ^{3/}	60.89 ^{3/}
Naknek-Kvichak Catch	48.24	51.76	52.78	47.22	41.90 ^{3/}	58.10 ^{3/}
System Total	50.43	49.57	46.90	53.10	41.88 ^{3/}	58.12 ^{3/}
<u>ELEGIK</u>						
Egegik R. Escapement	42.78	57.22	28.14	71.86	51.79 ^{3/}	48.21 ^{3/}
Egegik Catch	47.27	52.73	55.76	44.24	42.41 ^{3/}	57.59 ^{3/}
System Total	44.88	55.12	44.65	55.35	44.16 ^{3/}	55.84 ^{3/}
<u>UGASHIK</u>						
Ugashik R. Escapement	47.98	52.02	56.72	43.28	47.88 ^{3/}	52.12 ^{3/}
Ugashik Catch	46.86	53.14	61.42	38.58	42.60 ^{3/}	57.40 ^{3/}
System Total	47.40	52.60	57.61	42.39	44.45 ^{3/}	55.55 ^{3/}
<u>NUSHAGAK</u>						
Wood R. Escapement	43.86	56.14	48.47	51.53	50.54 ^{3/}	49.46 ^{3/}
Igushik R. Escapement	44.07	55.93	39.15	60.85	42.21 ^{3/}	57.79 ^{3/}
Nuyakuk R. Escapement	47.57	52.43	35.24	64.76	36.18 ^{3/}	63.82 ^{3/}
Nushagak-Mulchatna R. Escapement	49.56	50.44	37.48	62.52	-	-
Snake R. Escapement	-	-	-	-	-	-
Nushagak Catch	52.70 ^{3/}	47.30 ^{3/}	43.20	56.80	43.52 ^{3/}	56.48 ^{3/}
Igushik Catch	48.20 ^{3/}	51.80 ^{3/}	46.68	53.32	45.37 ^{3/}	54.63 ^{3/}
System Total	47.28	52.72	43.95	56.05	43.45 ^{3/}	56.55 ^{3/}
<u>TOGIK</u>						
Togiak R. Escapement	50.45	49.55	44.55	55.45	40.41 ^{3/}	59.59 ^{3/}
Togiak Catch	56.88	43.12	45.48	54.52	38.27 ^{3/}	61.73 ^{3/}
System Total	53.99	46.01	44.96	55.04	38.76 ^{3/}	61.24 ^{3/}
<u>BRISTOL BAY</u>						
Escapement	50.00	50.00	40.52	59.48	42.76 ^{3/}	57.24 ^{3/}
Catch	48.69	51.31	52.72 ^{4/}	47.28 ^{4/}	38.68 ^{3/}	61.32 ^{3/}
Total	49.54	50.46	46.94	53.06	39.89 ^{3/}	60.11 ^{3/}

1/ Minor river escapements in Ugashik, Nushagak and Togiak districts were included in some years and not in others depending on adequacy of escapement data.

2/ Preliminary.

3/ Data preliminary and not weighted.

4/ Includes General District data of 66.28% males and 33.72% females.

APPENDIX TABLE 27. Sex composition of pink salmon catch and escapement in the Nushagak district, 1960-70.^{1/}

Year	No. of Samples	No. in Sample		Percent		No. of Fish		Total
		Males	Females	Males	Females	Males	Females	
<u>CATCH</u>								
1960	6	514	127	80.2	19.8	232,404	57,377	289,781
1962	1	151	160	48.6	51.4	427,886	452,538	880,424
1964	19	560	255	68.7	31.3	1,029,000	468,817	1,497,817
1966	38	589	430	54.6	45.4	1,275,629	1,275,629	2,337,066
1968	19	846	215	82.9	17.1	1,413,534	291,616	1,705,150
1970	16	694	594	55.9	44.1	233,743	184,091	417,834
<u>ESCAPEMENT^{2/}</u>								
1960	-	-	-	32.4 ^{3/}	67.6 ^{3/}	47,434	98,966	146,400
1962	2	13	36	26.5	73.5	143,895	399,105	543,000
1964	52	717	1,180	37.8	62.2	344,184	566,356	910,540
1966	41	463	741	36.7	63.3	529,221	913,203	1,442,424
1968	4	288	797	28.6	71.4	617,771	1,543,345	2,161,116
1970	25	317	448	41.0	59.0	62,566	90,014	152,580
<u>SYSTEM TOTAL</u>								
1960	6	514	127	64.2	35.8	279,838	156,343	436,181
1962	3	164	196	40.2	59.8	571,781	851,643	1,423,424
1964	71	1,277	1,435	57.0	43.0	1,373,184	1,035,173	2,408,357
1966	79	1,052	1,171	47.8	52.2	1,804,850	1,974,640	3,779,490
1968	23	1,134	1,012	52.5	47.5	2,031,305	1,834,961	3,866,266
1970	41	1,011	1,042	51.9	48.1	296,309	274,105	570,414

^{1/} Even years only.

^{2/} Sex ratio derived from sampling of Nuyakuk River escapement.

^{3/} Sex composition interpolated for 1960 escapement by taking geometric mean of 1962 and 1964 ratios.

(Data Source: 1)

APPENDIX TABLE 28. Age composition of red salmon catch and escapement combined
Naknek-Kvichak district, 1963-71.

Age Class	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₁ 0.2	-	0.02	-	-	-	-	0.02	-	-	
3 ₂ 1.1	0.07	0.22	0.04	-	0.22	0.68	0.20	0.01	0.12	
4 ₁ 0.3	-	0.03	+	-	0.01	-	-	-	0.04	
4 ₂ 1.2	30.96	56.30	1.32	2.66	5.32	47.09	66.07	4.78	7.94	
4 ₃ 2.1	0.31	2.91	0.01	0.06	0.18	2.46	3.63	+	0.04	
5 ₂ 1.3	10.01	14.24	2.32	9.37	6.45	9.76	3.19	2.26	35.19	
5 ₃ 2.2	25.13	21.32	94.96	22.51	69.60	25.53	22.64	90.25	41.01	
6 ₂ 1.4	0.09	0.01	-	-	0.04	0.03	-	-	0.19	
6 ₃ 2.3	33.23	4.78	1.34	65.29	17.99	13.87	4.16	2.60	15.38	
6 ₄ 3.2	0.17	0.07	+	0.09	0.07	0.44	0.07	0.10	0.09	
7 ₃ 2.4	0.01	-	-	-	0.01	-	-	-	-	
7 ₄ 3.3	0.02	0.10	0.01	0.02	0.11	0.14	0.02	-	-	
Total Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 29. Age composition of red salmon catch and escapement combined, Egegik district, 1963-71.

Age Class	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₂ 1.1	-	0.02	-	-	0.03	+	-	-	-	-
4 ₁ 0.3	-	-	0.05	-	0.03	-	-	0.30	0.16	
4 ₂ 1.2	3.74	21.89	1.57	0.68	0.82	10.53	4.99	2.26	3.90	
4 ₃ 2.1	0.09	1.06	-	0.01	0.10	0.54	1.83	0.05	-	
5 ₂ 1.3	3.67	7.81	5.33	6.85	3.60	9.34	2.18	2.91	49.98	
5 ₃ 2.2	41.67	50.75	85.14	13.68	50.15	45.08	70.09	81.47	22.16	
5 ₄ 3.1	0.40	0.02	-	-	-	0.09	0.05	-	-	
6 ₂ 1.4	-	-	-	0.02	0.06	-	0.03	-	-	
6 ₃ 2.3	46.28	14.70	7.59	76.49	41.13	31.18	16.21	9.96	23.59	
6 ₄ 3.2	3.56	0.77	0.27	1.52	1.45	2.38	3.66	2.98	-	
7 ₃ 2.4	-	-	-	0.02	0.01	+	-	-	-	
7 ₄ 3.3	0.59	2.98	0.05	0.73	2.62	0.86	0.96	0.07	0.21	
Total Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 30. Age composition of red salmon catch and escapement combined, Ugashik district, 1963-71.

Age Class	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₁ 0.2	-	-	-	-	-	-	0.16	-	-	
3 ₂ 1.1	-	0.04	0.02	-	0.10	0.01	0.10	-	-	
4 ₁ 0.3	-	0.03	0.11	0.11	-	0.12	-	0.11	-	
4 ₂ 1.2	2.63	61.37	11.06	6.01	2.97	17.30	23.74	76.20	2.69	
4 ₃ 2.1	-	1.00	0.11	0.16	0.03	5.71	0.47	-	-	
5 ₂ 1.3	15.42	3.35	11.55	37.74	28.68	11.32	3.00	3.09	84.52	
5 ₃ 2.2	66.47	28.21	71.99	19.13	41.46	50.32	68.23	18.70	5.69	
6 ₂ 1.4	0.28	-	0.01	0.02	0.23	0.03	0.03	-	0.07	
6 ₃ 2.3	14.67	5.84	5.15	36.76	26.37	14.94	4.19	1.90	6.96	
6 ₄ 3.2	0.53	-	-	0.03	0.03	0.13	0.05	-	0.07	
7 ₃ 2.4	-	-	-	-	0.06	0.05	-	-	-	
7 ₄ 3.3	-	0.16	-	0.04	0.07	0.07	0.03	-	-	
Total Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 31. Age composition of red salmon catch and escapement combined, Nushagak district, 1963-71.

Age	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₁	0.2	0.25	0.09	0.03	0.01	0.11	0.17	0.13	0.03	-
3 ₂	1.1	0.34	-	0.08	-	0.04	0.06	0.34	-	-
4 ₁	0.3	3.38	1.25	1.93	0.38	1.84	1.02	0.83	1.55	1.77
4 ₂	1.2	53.78	59.11	15.65	32.98	47.38	31.20	43.20	32.93	29.92
4 ₃	2.1	0.50	0.01	-	0.05	0.06	0.03	0.03	-	-
5 ₁	0.4	-	0.01	-	0.03	0.10	0.07	-	-	-
5 ₂	1.3	34.89	21.00	70.52	59.46	40.73	58.82	30.40	52.71	60.26
5 ₃	2.2	5.91	16.10	8.24	1.50	7.44	5.59	22.64	9.80	3.91
5 ₄	3.1	-	-	-	-	-	+	-	-	-
6 ₂	1.4	-	-	0.03	0.08	0.14	0.35	+	-	-
6 ₃	2.3	0.95	2.43	3.52	5.44	2.16	2.62	2.43	2.98	4.14
6 ₄	3.2	+	-	-	0.02	-	-	-	-	-
7 ₃	2.4	+	-	-	-	-	0.02	-	-	-
7 ₄	3.3	-	-	-	0.05	-	0.05	-	-	-
Total										
Percent		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 32. Age composition of red salmon catch and escapement combined, Togiak district, 1963-71.

Age Class	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₁ 0.2	-	0.24	-	-	0.06	0.12	0.36	0.33	-	-
3 ₂ 1.1	-	0.01	-	-	0.06	0.07	-	-	-	-
4 ₁ 0.3	0.09	0.66	0.75	2.03	1.05	0.81	0.45	1.40	-	-
4 ₂ 1.2	40.21	52.06	24.76	14.37	24.01	31.60	56.86	52.29	1.28	-
4 ₃ 2.1	-	-	-	-	0.01	-	0.01	-	-	-
5 ₁ 0.4	-	-	-	0.01	0.06	-	-	-	-	-
5 ₂ 1.3	32.20	24.90	66.41	63.90	59.76	47.78	20.82	37.84	95.49	-
5 ₃ 2.2	16.87	15.43	6.36	4.55	2.85	13.57	15.36	7.14	0.01	-
6 ₂ 1.4	-	-	-	0.07	0.40	0.08	0.02	-	-	-
6 ₃ 2.3	10.16	6.70	1.72	15.04	11.65	5.94	6.10	1.00	3.22	-
6 ₄ 3.2	0.38	-	-	-	-	-	0.02	-	-	-
7 ₃ 2.4	-	-	-	-	0.08	-	-	-	-	-
7 ₄ 3.3	0.09	-	-	0.03	0.01	0.03	-	-	-	-
Total Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 33. Age composition of red salmon catch and escapement combined, Bristol Bay, 1963-71.

Age Class	Percent by Year and Age Class									
	1963	1964	1965	1966	1967	1968	1969	1970 ^{1/}	1971 ^{1/}	
3 ₁ 0.2	0.07	0.04	+	+	0.02	0.04	0.04	0.01	-	
3 ₂ 1.1	0.12	0.10	0.04	-	0.15	0.44	0.19	0.01	0.07	
4 ₁ 0.3	0.93	0.35	0.08	0.11	0.30	0.23	0.09	0.16	0.36	
4 ₂ 1.2	28.41	51.19	2.35	7.61	11.06	38.23	56.72	8.96	10.71	
4 ₃ 2.1	0.27	1.57	0.01	0.05	0.14	1.72	2.97	0.01	-	
5 ₁ 0.4	-	+	-	0.01	0.02	0.01	-	-	-	
5 ₂ 1.3	16.62	14.08	5.75	19.82	12.91	20.92	6.15	6.68	47.10	
5 ₃ 2.2	27.14	25.76	89.63	17.14	54.84	23.98	28.09	80.89	28.20	
5 ₄ 3.1	0.10	0.01	-	-	-	0.01	0.01	-	-	
6 ₂ 1.4	0.05	0.01	+	0.02	0.08	0.10	+	-	-	
6 ₃ 2.3	25.12	6.13	2.11	54.79	19.67	13.52	5.21	3.03	13.45	
6 ₄ 3.2	1.01	0.17	0.02	0.31	0.29	0.58	0.42	0.25	0.08	
7 ₃ 2.4	+	-	-	-	0.01	0.01	-	-	-	
7 ₄ 3.3	0.16	0.59	0.01	0.14	0.51	0.21	0.11	+	0.03	
Total Percent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

^{1/} Preliminary data.

(Data Source: 4)

APPENDIX TABLE 34. Kvichak River red salmon smolt outmigration, 1955-71.

Year of Seaward Migration	Age I		Age II		24-Hour ^{1/} Index Points	Index Net Catch
	Percent	Mean Length in mm	Percent	Mean Length in mm		
1955	7.3	89.0	92.7	109.0	7.8	259,978
1956	39.2	92.0	60.8	116.0	2.3	77,660
1957	72.3	96.0	27.7	120.0	0.9	30,907
1958	97.9	84.0	2.1	114.0	100.0	3,333,953
1959	2.9	80.0	97.1	99.0	85.9	2,863,876
1960	10.0	91.0	90.0	108.0	18.4	614,003
1961	72.2	91.8	27.8	117.2	1.1	36,164
1962	94.0	82.0	6.0	110.0	36.1	1,203,000
1963	2.7	83.3	97.3	98.3	126.9	4,229,431
1964	22.0	87.0	78.0	108.0	61.8	2,061,586
1965	3.6	90.0	96.4	108.9	54.4	1,812,555
1966	91.0	94.0	9.0	114.0	8.3	275,761
1967	92.8	86.4	7.2	118.3	92.6	3,088,742
1968	10.6	87.9	89.4	104.5	183.7	6,123,683
1969	52.3	92.5	47.7	109.3	34.1	1,135,344
1970	38.3	90.8	61.7	110.2	14.5	483,638
1971	93.5	89.9	6.5	111.0	57.8	1,927,984
Average	47.2	88.7	52.8	110.3	50.2	1,738,721

^{1/} One index point = 33,340 smolts.

(Data Sources: 1 and 5)

APPENDIX TABLE 35. Naknek River red salmon smolt outmigration, 1956-71.

Year of Seaward Migration	Age I		Age II		Outmigration Estimate
	Percent	Mean Length in mm	Percent	Mean Length in mm	
1956	84.4	94.0	15.6	103.0	6,000,000
1957	57.9	111.0	42.1	112.0	3,040,416
1958	96.4	91.0	3.6	114.0	10,060,200
1959	80.5	97.0	19.5	106.0	12,465,487
1960	53.1	99.0	46.6	109.0	6,691,377
1961	77.8	103.0	22.2	113.0	5,612,647
1962	48.6	105.0	51.4	112.0	16,462,216
1963	40.6	98.0	58.5	114.0	14,900,855
1964	31.1	97.0	68.8	110.0	7,228,339
1965	59.6	99.0	40.0	114.0	24,708,672
1966	33.8	101.0	66.2	112.0	9,212,910
1967	43.5	113.0	56.2	119.0	9,407,200
1968	41.2	99.0	56.7	108.0	18,596,039
1969	59.8	100.0	40.2	112.0	11,546,017
1970	55.2	100.0	44.8	114.0	3,652,864
1971	74.0	102.0	26.0	120.0	10,974,144
Totals	937.5	1,609.0	658.4	1,792.0	170,559,383
Average	58.6 ^{1/}	100.6	41.2 ^{1/}	112.0	10,659,961

^{1/} Age III smolt amounted to 0.3% in 1960; 0.9% in 1963; 0.1% in 1964; 0.4% in 1965; 0.3% in 1967; 2.1% in 1968; 0.0% in 1969; 0.0% in 1970; 0.0% in 1971.

(Data Sources: 1 and 11)

APPENDIX TABLE 36. Ugashik River red salmon smolt outmigration, 1956-71.^{1/}

Year of Seaward Migration	Age I		Age II ^{5/}		Index ^{3/} Points	Index ^{4/} Net Catch	Outmigration Estimate
	Percent	Mean Length in mm	Percent	Mean Length in mm			
1956	11.0	-	89.0	-	-	-	-
1957	4.0	-	96.0	-	-	-	-
1958 ^{2/}	98.1	93.0	1.9	112.0	100.0	301,232	11,659,905
1959	87.3	90.0	12.7	120.0	36.5	109,982	2,887,002
1960	59.7	90.0	39.3	108.0	75.1	226,317	5,503,646
1961	20.4	90.0	79.6	112.0	52.3	157,441	3,802,079
1962	80.7	88.0	19.3	112.0	103.1	310,616	16,692,089
1963	46.3	89.8	53.7	104.3	305.2	919,451	33,750,496
1964	80.1	92.2	19.8	118.3	68.1	205,145	9,990,048
1965	28.8	93.7	71.2	114.1	57.4	172,893	3,640,115
1966	-	-	-	-	-	-	-
1967	52.5	87.5	47.5	113.1	30.9	93,068	5,137,063
1968	93.1	92.8	6.9	112.6	145.9	439,587	42,205,912
1969	59.7	97.4	40.3	121.2	21.3	63,999	5,048,673
1970	57.5	97.0	42.5	124.8	-	-	1,304,722
1971	-	-	-	-	-	-	-
Total	779.2	1,101.4	619.7	1,372.4	995.8	2,999,731	141,621,750
Average	55.7	91.8	44.3	114.4	90.5	272,703	11,801,813

^{1/} Smolt project not operated in 1966 and 1971.

^{2/} Base year: assigned value of 100.0.

^{3/} One index point = 3,012.32 smolts.

^{4/} Three-hour index period, 10:00 p.m. to 1:00 a.m.

^{5/} 1.0% Age III in 1960; 0.1% Age III in 1963 and 1964.

(Data Sources: 1 and 11)

APPENDIX TABLE 37. Wood River red salmon smolt outmigration, 1951-71.^{1/}

Year of Seaward Migration	Age I ^{2/}		Age II ^{2/}		Index Points	Two-Hour Index Net Catch
	Percent	Mean Length in mm	Percent	Mean Length in mm		
1951	80.0	91.0	20.0	-	9.9	16,809
1952 ^{3/}	99.0	87.0	1.0	-	100.0	170,034
1953	95.3	86.0	4.7	103.0	296.1	503,444
1954	95.8	87.0	4.2	107.0	438.6	745,832
1955	98.0	85.0	2.0	102.0	221.7	377,032
1956	78.4	82.0	21.6	95.0	329.3	559,932
1957	80.7	77.0	19.3	93.0	144.0	244,831
1958	65.0	82.0	35.0	102.0	249.1	423,580
1959	93.5	87.9	6.5	105.0	59.1	100,450
1960	99.4	88.0	0.6	114.0	223.3	379,668
1961	93.0	81.7	7.0	102.1	518.7	881,911
1962	86.0	80.1	14.0	97.6	177.6	301,892
1963	84.3	82.6	15.7	102.1	88.9	151,206
1964	98.8	83.7	1.2	104.2	568.6	966,807
1965	92.0	85.5	8.0	106.1	217.7	370,112
1966	94.3	77.1	5.7	101.2	147.1	250,049
1967 ^{4/}	60.4	77.7	39.6	89.9	80.4	136,783 ^{5/}
1968	-	-	-	-	-	-
1969	91.8	-	8.2	-	54.6	92,813 ^{6/}
1970	78.8	82.7	21.2	92.9	54.0	91,851 ^{7/}
1971	-	-	-	-	-	-
Total ^{8/}	1,433.5	1,343.6	166.5	1,434.3	3,789.7	6,443,589
Average ^{8/}	89.6	84.0	10.4	102.5	236.9	402,724

^{1/} Age and length weighted by index net catch.

^{2/} Age I-II indicates number winters in freshwater.

^{3/} Base year-one index point = 1,700.34 smolt.

^{4/} Full-fledged smolt program terminated after 1966 season. In 1967, 69 and 70 the program was operated in conjunction with the U.S. Bureau of Commercial Fisheries smolt marking program, and these data are not comparable with previously collected data.

^{5/} Index catch from June 16-27 inclusive.

^{6/} Index catch from June 14-July 1 inclusive.

^{7/} Index catch from June 6-22 inclusive.

^{8/} 16-year average, 1951-66.

(Data Sources: 1 and 5)

APPENDIX TABLE 38. Subsistence catch of salmon, for Bristol Bay, by district and species, 1963-71.^{1/}

Year	Catch by Species					Total
	Reds	Kings	Chums	Pinks	Cohos	
<u>NAKNEK-KVICHAK DISTRICT</u>						
1963	61,700	500	100	+	400	62,700
1964	85,900	500	+	1,100	800	88,300
1965	71,900	500	100	+	300	72,800
1966	74,500	600	300	2,700	400	78,500
1967	68,500	500	100	+	500	69,600
1968	71,000	500	100	300	200	72,100
1969	76,300	400	100	+	400	77,200
1970	108,200	300	700	100	200	109,500
1971	66,400	300	100	+	100	66,900
Total	684,400	4,100	1,600	4,200	3,300	697,600
Average	76,000	500	200	1,100 ^{2/}	400	77,500
<u>NUSHAGAK DISTRICT</u>						
1963	41,200	3,600	8,500	+	3,900	57,200
1964	31,800	2,900	8,700	4,100	4,900	52,400
1965	47,500	4,600	18,400	200	5,400	76,100
1966	23,600	3,700	6,000	4,900	2,400	40,600
1967	34,900	3,700	14,000	800	4,000	57,400
1968	30,000	6,600	8,600	5,800	1,900	52,900
1969	27,700	7,100	8,200	100	7,100	50,200
1970	38,200	6,900	8,800	1,000	1,000	56,700
1971	42,400	4,400	4,200	+	2,300	53,200
Total	317,300	43,500	85,400	17,700	32,900	496,700
Average	35,300	4,800	9,500	4,400 ^{2/}	3,700	55,200

^{1/} Subsistence fishing is insignificant in the Egegik and Ugashik districts of Bristol Bay, while preliminary data indicates that the Togiak district catches fall in the range of 5-10,000 salmon.

^{2/} Even year average.

(Data Source: 1)

APPENDIX TABLE 39. Bristol Bay commercial herring catch and herring roe-on-kelp production, 1967-71.^{1/}

Year	Number Operators	Number		Catch and Production in Pounds
		Fishermen	Deliveries	
<u>HERRING^{2/}</u>				
1967	1	27	100	268,902
1968	2	37	130	181,765
1969	2	23	40	94,481
1970	3	17	27	55,195
1971	-	-	-	-
Totals	8	103	297	600,343
Average	2	26	74	150,086
<u>HERRING ROE-ON-KELP^{3/}</u>				
1968	1	1	6	54,600
1969	1	3	20	10,125
1970	1	5	23	38,855
1971	1	12	43	51,795
Totals	4	21	92	155,375
Average	1	5	23	38,844

^{1/} All herring and kelp harvest and production has originated in the Togiak district.

^{2/} Catch in pounds reflects only the female herring; most males were discarded and not weighed. Herring roe fishery was not conducted in 1971.

^{3/} Harvest of roe-on-kelp has been limited to rockweed kelp (Fucus furcatus).

(Data Source: 1)