ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

BRISTOL BAY AREA

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ANNUAL MANAGEMENT REPORT

- 1966 -

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PREFACE

The 1966 Bristol Bay Management Report reflects a return to the 1964 report format. A brief description of the fishery by district is followed by individual species account, and then the field programs are outlined in general terms. Some changes in program operations or emphasis have occurred and these changes are indicated.

Data listed in the tables supercedes previous reports. Continual checking of source references and updating preliminary figures previously published involves some changes every year. All figures for 1966 are final. Additionally, some new data tables not previously published have been incorporated in this report.

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INTRODUCTION

Red salmon runs to Bristol Bay continue to vary significantly from predicted runs, particularly to the highly cyclic and variable Kvichak River system. Inshore runs to all other river systems were in close agreement to predicted values in 1966.

Though the total inshore run of 17.5 million red salmon was only 55% of the 31.2 million predicted, escapements totalled 80% of pre-season goals. Escapements within desired ranges were achieved in all river systems with the exception occurring in the Kvichak River, where the escapement fell short of the 1966 range.

Fishing effort continued to increase for the sixth consecutive year since 1960. License sales increased in all categories with revenues totalling $161,145. Licensed fishermen, vessels and gear have all increased 100% since 1960.

There were 13 shore canneries, five floating canneries or freezers and seven other small operators canning, salting or shipping fresh fish during the season.

The reported wholesale value of the finished product in 1966 was $33,950,000. Estimated direct income to the State from case pack taxes and fishing licenses combined totalled $1,179,645. The 1965-1966 fiscal year management operating budget for the Division of Commercial Fisheries in Bristol Bay is $190,000.

Field program activities were essentially similar to those of 1965. Emphasis was placed upon improving field camp facilities and program techniques to upgrade quality and accuracy of basic data. Statistical field testing of partial hour escapement counts was conducted; new trapping techniques to increase escapement samples in some river systems were attempted; continued correlations between visual counts of salmon passing counting towers and experimental electronic salmon counters were conducted for the second year toward development of a working field model for production and use in Alaskan rivers.

While red salmon heavily dominate the Bristol Bay fishery generally, pink salmon runs, occurring in even years only, have been increasing significantly in both size and importance during recent cycle years. The 1966 run produced a record catch and escapement to the Nushagak district. By percent, the total Bristol Bay salmon catch by species was composed of 76% reds, 20% pinks, 3% chums with kings and cohos making up the remaining 1%.

The total salmon harvest of 12.3 million was well above the 16 year average of 8.9 million. By species, kings, chums and cohos were about average while reds were 16% above the 16 year average. The record pink salmon catch was three times greater than the 8 cycle year average covering the past 16 years.

DISTRICT SUMMARIES

NAKNEK-KVICHAK DISTRICT

The Naknek-Kvichak fishing district boundaries in 1966 were identical with those of 1965. No changes were necessary during the fishing season.

The district prediction of 23.285 million red salmon was divided into 21.227 for the Kvichak, 1.867 for the Naknek and .191 for the Branch River. The total runs by river system were; Kvichak - 7.943, Naknek - 2.109 and Branch - .310 million for a total of 10.363, or 45%, of the predicted run for the district.

Licensed fishing gear, including drift and set gill nets, totalled 1,172 units, 180 units above 1965. Peak fishing activity occurred during a 24 hour period July 2-3 when 1,278 vessels produced a record 24 hour catch of 2,303,885 red salmon.

In spite of the good prediction for the district, reports from high seas sampling, Aleutian area fishing and the first week of regulation fishing were not encouraging. During the first week of field regulation, from June 20 through June 25, two 48 hour periods produced only 120,000 reds. A 12 hour period on June 28 was encouraging with set nets doing particularly well after a 65 hour closure, which allowed available fish to be well up onto the beaches at the opening. The total catch for this period was 637,000 reds. Fifty hours later another 12 hour period resulted in a disappointing catch of only 347,000. However, gusty 50 mile per hour winds came up during this period making fishing difficult and hazardous, and many boats ran into the Naknek River for shelter.

On the basis that catches had been small, fishing effort considerably reduced due to the severe weather, and any escapement surveys questionable as long as the poor weather held, a 24 hour period was scheduled for July 2, 25 hours after the last period closed on July 1. It was felt that by having the district open, any sudden change in the run status would be recognized quickly, and that it was still early enough in the season to react and catch the normal peak of the run around July 4 for the bulk of the escapement. Surveys over the fishery plus early preliminary catch reports did not appear impressive on Saturday, July 2, during the first part of the period. However, late the next day it became apparent that a large catch had occurred. The combination of a major storm probably pushing a large body of fish into the fishery in a very short period of time, plus the massive effort of gear present in this district combined to produce the record catch.

Once the weather calmed, catch figures were confirmed and assessment of the escapement was possible, the fishery was left closed for 76 hours to build up the escapements. On July 6 another opening for 12 hours was implemented with set nets only allowed in the Naknek section to help insure

more escapement while testing for any run strength at the same time. Set nets from the mouth of the Naknek River to Koggiung at the mouth of the Kvichak River were heavily loaded with fish while drift boats were making excellent catches right on the shoreline along the west side of Kvichak Bay. With this promising outlook for strength, the period was extended for an additional 12 hours to catch one more tide. The period catch of 1,200,000 was good, but marked the end of the 1966 run for all practical purposes to this district. A 12 hour period on July 8-9 saw a catch of 394,000 fish, but another 12 hour period 74 hours later produced only half as many fish.

The final run breakdown based on age composition data from the catch and escapement established the total Kvichak River run at 7.943 million reds. Of this total, 4.168 were taken in the catch and 3.775 entered Iliamna Lake for the spawning grounds. The Branch River run totalled 310,000 with a catch of 136,000 and an escapement of 174,000. The Kvichak escapement was not as large as we had hoped to obtain, but unusual circumstances combined to prevent as exact control as was desired. The Naknek River run of 2.109 million was almost evenly divided between catch and escapement for satisfactory results.

It is interesting to note that the characteristics of the 1966 Kvichak run matched those of 1961 almost exactly. A brief, strong showing of fish early in the season, followed by a sudden and sharp decline in numbers.

CATCH

The total district catch for all species was 5.6 million salmon which represented 46% of the total 1966 harvest for Bristol Bay. This district catch of 5.6 million was 400 thousand above the past 16 year catch average.

Red Salmon

Making up by far the bulk of the district catch as usual, the catch of 5.3 million red salmon in the Naknek-Kvichak district represented 57% of the total red catch for the Bay in 1966.

Six year fish from the 1960 brood year dominated both the Kvichak and Naknek runs, 71% and 53% respectively with the balance made up mainly of 5 year fish from the 1961 escapement.

King Salmon

The 1966 catch of 5,456 king salmon is the third poorest catch recorded since 1951. Catches were light and scattered throughout the fishing season,

indicating a general reduction in numbers rather than some other factor effecting the lower catch. There is no indication or concern at this point that this is anything other than a normal fluctuation in abundance as past records indicate (Table 13).

Chum Salmon

The low catch of 57,000 chum salmon marks the second consecutive year of sharply reduced catches of this species with an average catch of 125,000 for the past 16 years. From 1958 through 1964, catches averaged 176,000, but a slump similar in magnitude to that currently being experienced occurred for three years from 1955 through 1957 (Table 14).

Pink Salmon

Though a very minor species for this district with only limited effort generally, the unusually large pink salmon run experienced this year in the Nushagak district was felt to a comparative degree in the Naknek-Kvichak with a catch four times greater than the 7 cycle year average (Table 15).

Coho Salmon

Though the least numerous and important species in this district, both effort and catches have been slowly picking up in recent years. This is due to small operators remaining open later in the season to process this species appearing in August, usually well after larger canneries have ceased operations.

ESCAPEMENT

Red Salmon

The Department of Fish and Game operates escapement counting towers on the Kvichak, Branch and Naknek rivers that flow into the Naknek-Kvichak district.

As indicated earlier, the Kvichak system escapement fell short of the pre-season goal for this off-cycle year. Based on the few past years performance with accurate total return data available, it appears that escapements in excess of 4 million are required to attain a minimum threshold level of abundance that will maintain a fishery while providing adequate escapement.

The Branch River escapement was 174,000 or 5% of the Kvichak escapement, about a normal proportion. Since the Branch River is tributary

to the Kvichak, any separate management is not possible. Escapement is random and incidental to that of the Kvichak system.

Escapement to the Naknek River followed almost exactly the pattern of 1964 with 64% of the total escapement passing the tower from July 5-7. The 1,016,445 red salmon escapement was 92,000 above the past 12 year average, and right at the upper end of the desired range.

Other Species

Chum, pink and coho salmon escapements are not enumerated in these systems, due mainly to the small numbers of fish involved plus other practical limitations. Assessment of king salmon escapements are now being conducted on the Naknek and Branch River systems by the Sport Fish Division.

EGEGIK DISTRICT

The Egegik district boundaries have remained the same since 1964, and no changes were made during the 1966 season.

The system forecast called for 3.175 million red salmon. The actual inshore run of 2.905 is remarkably close when some allowance for high seas catches is considered.

Licensed gear, both drift and set gill nets totalled 501 units, 70 more than in 1965. The amount of gear actually fishing at any given time during the season varies considerably due to district transfers, vessel breakdowns, etc., particularly in the Egegik district which receives the earliest red run. This tends to create heavy gear effort early which tapers off as the Naknek-Kvichak and Nushagak runs develop. Peak fishing effort was recorded during a 24 hour period June 28-29 with 436 vessels. However, the largest catch was made July 5-6 during a 24 hour period when 453,000 salmon were caught.

Due to the relatively small area of the fishing district and the tendency of the fish to move through the district rapidly, plus the consistent good runs, Egegik district usually enjoys more fishing time than either the adjacent Naknek-Kvichak or Ugashik districts.

Egegik district also usually has more regularly-spaced fishing periods, with 24 hour periods being the rule rather than the exception, as in the larger Nushagak and Naknek-Kvichak districts where large numbers of fish can buildup. It is not very likely that half the seasons catch would be taken in one fishing period in the Egegik district as can and does occur in the larger districts.

During the field regulation period from June 20 to July 17, seven fishing periods were effected to produce the bulk of the 2.137 million total salmon catch (Table 6). The first significant catch occurred during the 24 hour period of June 28-29 with good catches at the start of the period. However, the strong showing was short-lived and catches soon became spotty. Average catches for the period ran about 600 per drift vessel. Fifty hours later another 24 hour period produced average catches of 1,400 fish per vessel and a total catch of 432,578 salmon. Thereafter, three 24 hour fishing periods were interspaced with 26 hour closures for catches of 425,000, 449,000 and 288,000 each to essentially complete the well-above average season (Table 29).

The only deterrent to an otherwise ideal season for the Egegik district occurred on July 3 when all companies imposed a 2,000 fish per boat catch limit. This was due to the large catch during the July 2-3 period in the Naknek-Kvichak district which plugged canneries and scows.

CATCH

Total district catch for all species was 2.137 million salmon, or 17% of the Bristol Bay catch for 1966. This catch was 47% greater than the 16 year average.

Red Salmon

Red Salmon normally comprise about 95% or more of the district catch, and accounted for 98% of the catch in 1966. The 2.101 million catch represented 23% of the total for Bristol Bay.

Six year fish from the 1960 brood year made up 78% of the run, and five year fish from the 1961 parent year accounted for 21%.

King Salmon

The average king salmon catch for Egegik over the past 16 years is 2,844 (Table 13). The 1966 catch of 1,949 is the lowest catch here since 1956, somewhat paralleling the low Naknek-Kvichak catch.

Chum Salmon

This species fluctuates considerably in abundance in the Egegik system, but the 1966 catch of 32,000 was slightly above average (Table 14).

Pink Salmon

This species is virtually non-existent in this district and there are not enough caught to warrant reporting.

Coho Salmon

Coho or silver salmon are also a minor species. The 1,932 reported catch in 1966 was an increase over the three previous years, but most likely reflects variation in effort. Any effort is limited mainly to two or three small operators that may salt this species after the red salmon fishery is over.

ESCAPEMENT

Red Salmon

The 1966 escapement goal range was 800,000-1,200,000. The final escapement was 804,000 red salmon, slightly below the 15 year average (Table 29). Escapement counts peaked at two periods, on July 3 and 4 when 17% of the total passed into Becharof Lake, and during a three day spurt from July 8 to 10 when 62% more of the total passed the counting towers.

Other Species

The few other species in the Egegik River system either do not pass the tower, or else are so few in numbers that counts are not significant.

UGASHIK DISTRICT

No fishing district boundary changes were made in this district in 1966, either by regulation or emergency order during the season.

The district prediction was for 1.230 million red salmon. The total run of 1.160 million established this as one of the closest forecasts ever recorded for a Bristol Bay system.

The licensed fishing gear for the Ugashik district totalled 236 units of both drift and set gill net, only 13 units more than 1965. Ugashik normally does not experience great fluctuations in effort due to transfers as do the Egegik, Naknek-Kvichak and Nushagak districts. The runs here are of a smaller magnitude than these other districts, the district is the smallest in area, and the timing of the runs is a little later than the other districts.

The Ugashik district fishery had nine open periods during the field regulation season from June 20 to July 17 for a total of 220 fishing hours. This was one more fishing period than the Egegik district and 16 hours more than in the Naknek-Kvichak district for the same period of time (Table 4).

The migration behavior of red salmon in the Ugashik River is quite different than in the Egegik River, though the two are very similar in physical characteristics, being about the same length, muddy and headed by a large, shallow lagoon just below the lake outlet in each system. The salmon that pass through the Egegik fishing district can normally be counted by aerial survey in the lagoon 1 to 2 days later. However, in the Ugashik system the fish delay entering the clear-water lagoon for several days and beyond a week. Fortunately, test fishing vessels sampling in both rivers just above the inner fishing boundaries, have been giving reliable estimates of escapements as the fish enter the rivers.

In 1966, the pattern of catches and test fishing indications were consistent with the actual abundance of red salmon. Through a series of fishing periods that gradually decreased in allowable fishing time, the catches were slow, but steadily increased per unit of time. Then on July 6-7 a 12 hour period was extended an additional 12 hours on a strong showing of fish and the resultant 24 hour catch of 206,867 reds accounted for 46% of the seasons total. Thereafter, two 12 hour fishing periods were allowed for the balance of the field regulation season, adding only 76,000 additional reds to the total catch (Table 7).

CATCH

The Ugashik district catch for all species was 477,018 salmon representing 4% of the total Bristol Bay harvest in 1966. The 16 year average is 507,000 for the district (Table 17).

Red Salmon

Reds accounted for 93% of the district catch and represented 5% of the total Bristol Bay red salmon catch. The 445,458 final red catch is just about average for over the past 16 years (Table 12).

The age composition of the catch and escapement combined was composed of 57% 5 year fish from the 1961 brood year, 37% 6 year fish from 1960 and 6% 4 year fish from 1962.

King Salmon

The 1966 king catch was considerably lower than 1965 and is the lowest recorded catch since 1957, following the general trend of lower

abundance for the minor king salmon systems along eastern Bristol Bay (Table 13).

Chum Salmon

Chum salmon vary considerably in abundance in the Ugashik district, somewhat comparable to the Egegik district, both in pattern and magnitude (Table 14). The 1966 catch was 5,000 above the 16 year average.

Pink Salmon

Like the Egegik system, pink salmon are so scarce in this system that they are inconsequential.

Coho Salmon

The coho catches are quite erratic and small, reflecting variations in limited effort rather than actual abundance of fish. The 16 year average catch is 2,760 (Table 16).

ESCAPEMENT

The 1966 escapement goal was 850,000 red salmon with a range from 700,000-1,000,000. The final escapement, including the Mother Goose Lake system was 714,836, 142,000 above the 16 year average.

Red Salmon

The tower counts peaked from July 20-22 when 37% of the total escapement passed into Lower Ugashik Lake. Two other smaller peak periods occurred; one during July 11-12 when 22% passed, and again on July 17 when 11% were counted past the towers.

Other Species

No escapement enumeration is made on other species in this system.

NUSHAGAK DISTRICT

The fishing area in the Nushagak district, which covers approximately 400 square miles, remained similar to that of 1965 with the exception of an inner boundary extension to allow additional harvest of red salmon late in the season.

The Snake River section was closed to fishing for the sixth consecutive year in order to protect the small run of red salmon that enter this system. The Igushik River section was open to fishing for the same amount of time as the larger Nushagak section, except on July 6, when the section was closed for an additional 34 hours to insure attainment of the escapement goal.

Initial gear registration for the district was 819 gill nets, including both drift and set net gear, 24 units less than in 1965. Of the 277 set nets registered for fishing in 1966, only about 210 participated in the fishery, the remainder being drift fishermen who licensed both types of gear and did not use their set net gear.

The district prediction of 3.3 million red salmon had 2.4 million assigned to Wood River, .6 million to Igushik River, .2 million to Nuyakuk River and .1 million between the Snake River and Nushagak-Mulchatna systems. The actual total run was 2.8 million or 85% of the prediction.

Commercial fishing for early run king salmon was not begun until June 13, two weeks later than normal. Price negotiations between fishermen and processors were stalled during the early king salmon season and fishing did not begin until well after the king run was in progress.

Two fishing periods of 24 hours each were allowed during the week of June 19-25, the first week of field announcement regulations. The total catch was only 8,700 red salmon for both periods, considerably below the average catch of 77,000 for this stage of the run. The second week of field regulation, June 26 to July 2, saw only 36 hours of fishing time allowed due to (1) the relative lateness of the red salmon run, (2) the Departments wish to protect early run stocks, and (3) the heavy harvest of king salmon in what appeared to be a late run.

Test fishing efforts were intensified accordingly and a large volume of fish was found to be building up in the vicinity of Etolin Point on the outer marker. A 12 hour fishing period on July 2 resulted in heavy catches and the period was extended for an additional 15 hours. The total catch for the 27 hour period was 322,000 red salmon.

Escapement counts on Wood River began to build up rapidly on July 3 and 4, and by July 5, 410,000 red salmon had been counted past the fishery. A 24 hour fishing period on July 5-6 produced heavy catches and the escapement count on Wood River had risen to 580,000 on July 6, with many more fish in the river below the counting tower. Fishing was extended again on July 6 and remained open to continuous fishing thereafter when it became apparent that the Department escapement goals were assured.

Fishing effort in the district decreased steadily throughout the king and red salmon seasons due to three factors: (1) relatively large

red salmon prediction for the Kvichak and Egegik districts; (2) early season closure of the district to enable the Department to secure escapement from the early run stocks of red salmon; and (3) the relative lateness of the red salmon run to the district.

Although the amount of gear fluctuated with each fishing period, reliable estimates of fishing effort present were 190 boats and 190 set nets. Effectiveness of the fishing fleet was further reduced by very strong winds which presisted from June 30 to July 7. The Nushagak set net fishery took a much larger portion of the catch than in previous years. This was due to weather and that all but about 20 of the fishing boats were skiffs and small double-end sailboat conversions.

Fishing vessels which had transferred from the Nushagak district earlier in the season, began to transfer back to the Nushagak in the third week of July in anticipation of an expected large pink salmon run. Although a formal prediction is not made on pink salmon returns to the Nushagak, Department estimates placed the expected return at 2.3 million fish.

Fishing effort continued to build and by July 23, the peak of the pink salmon run, over 570 boats and skiffs and 160 set nets had taken over 1.2 million pink salmon. The pink salmon harvest was heavy through the end of July and when fishing terminated on August 6 a record catch of 2.3 million pink salmon had been harvested.

CATCH

Total catch of all salmon species for the Nushagak district in 1966 was 3.7 million which was 30% of the total Bristol Bay harvest and the largest harvest of all salmon species since 1944 in this district.

Red Salmon

The red salmon catch of 1.2 million contributed 32% of the total district harvest and was 20% higher than the 16 year average.

Age composition of the Wood River system commercial catch and escapement combined was composed of 5 year fish (51%) from the 1961 brood year with the remainder from the 1962 spawning escapement. As expected age composition for both the Igushik and Nuyakuk River systems was composed of over 82% 5 year fish.

King Salmon

The Nushagak king salmon catch of 58,000 was equal to the 16 year average for this district. The total catch would undoubtedly have been

10,000-15,000 fish higher had the fishing fleet operated during the first two weeks of the season. However, due to the price dispute no kings were caught during this period. Age composition of the catch was 16% 4 year fish, 32% 5 year fish, and 49% 6 year fish.

Chum Salmon

The chum salmon catch of 129,000 was the smallest since 1965 and was well below the 16 year average catch. Over 74% of the chum salmon catch were 4 year fish.

Pink Salmon

The 1966 harvest of 2.3 million pink salmon was the largest catch on record, as was the pack of 88,000 cases. Pink salmon contributed over 63% of the total district catch. The small fish ran over 25 per case and averaged 3.1 pounds each. Sex ratio sampling showed that 55% of the catch were males and 45% females.

Coho Salmon

The coho salmon catch of 12,000 was considerably less than the 16 year average. Sampling of the commercial catch showed that the cohos averaged 7.5 pounds and 96% were 4 year fish.

SUBSISTENCE CATCH

Subsistence fishing for dog food and human consumption is carried out each season in all village areas in the Nushagak district. Although subsistence fish requirements are much less than in the past, many inhabitants of upriver villages in the district still depend on subsistence fish for dog team food and human diet supplement.

Since subsistence fish are taken from salmon stocks which have escaped the commercial fishery, these requirements must be considered when setting escapement goals.

Subsistence catches in the Nushagak district have previously been recorded in 1963, 1964 and 1965. Salmon catches in these years were 57,000, 52,000, and 76,000 respectively, with red salmon accounting for over 60% of the catch. In 1966 the subsistence fish catch for all species was 41,000. Breakdown of the catch by species was 24,000 red salmon, 4,000 kings, 6,000 chums, 5,000 pinks, and 2,000 coho salmon. With the advent of gasoline snow travelers and better diet variety, the subsistence catch is expected to decline in future years.

FRESHWATER COMMERCIAL FISHERY

Limited exploratory freshwater fishing has taken place in the Nushagak district for the past few years. In April of 1966 a small commercial effort was initiated in the Tikchik Lakes region. Fishing took place during two-month periods in the spring (April-May), and the fall (September-October), and then terminated due to lake freeze-up. The expected winter fishery has so far failed to materialize due to marketing and transportation problems. A total of four fishermen in approximately two months of effort caught 20,000 pounds of fish. Humpback whitefish constituted 62% or 11,000 pounds of the total catch while lake trout accounted for 30% and 6,000 pounds. Northern pike and arctic char accounted for the remaining 8% and 3,000 pounds.

Samples of the catch revealed that the average weight for whitefish was 4.1 pounds while lake trout averaged 4.8 pounds and pike and char, 9.0 and 4.5 pounds respectively.

ESCAPEMENT

Red Salmon

Counting towers are maintained on the Wood, Igushik, Nuyakuk and Nushagak Rivers for the purpose of enumerating red salmon escapements into these systems. Aerial surveys are employed to determine escapement into areas without towers, namely the Snake River system. The tower on the Nushagak-Mulchatna River system was operated for the first time in 1966 and was successful in enumerating escapements of red, chum, king and pink salmon.

Escapement goals were achieved in all systems of the Nushagak district in 1966. Total escapement into Wood River reached 1.2 million which was 74% of the district total. Igushik and Nuyakuk Rivers received escapements of 206,000 and 161,000 red salmon respectively, 13% and 10% of the district total. The remainder of the Nushagak escapement (55,000) spawned in the Snake River and Nushagak-Mulchatna River system. Total escapement to the district was 1.6 million, the largest since 1960.

Aerial surveys were later conducted in the district to determine spawning ground distribution and utilization for red salmon.

Chum Salmon

The chum salmon run in the Nushagak district spawns primarily in the Nushagak-Mulchatna River system. With the location of a counting tower on the Nushagak River near Ekwok in 1966, enumeration of most chum salmon stocks was possible. A total of 40,000 chums were counted past the tower, however, this estimated escapement is minimal due to very poor counting

conditions encountered in 1966. Most probable total escapement to the district was in the range of 60,000-80,000 chum salmon.

King Salmon

King salmon counted past the Nushagak River tower totaled 9,000 which again is a minimal estimate. Counting was not possible until June 28 due to high water conditions, but king salmon were first taken by subsistence nets upriver from the tower location on May 20. Evidently a good share of the king run had already passed upriver before the tower was operational. Difficulty was also experienced counting kings as they migrate farther from shore. Most probable total escapement to the district after analysis of spawning ground surveys, commercial and subsistence catches and partial tower counts is 30,000-50,000 king salmon.

Pink Salmon

Pink salmon are counted on the Nuyakuk River as they continue on their way to their spawning grounds in the upper portion of the river. Just over 1.4 million pink salmon were counted past the Nuyakuk tower. Subsequent aerial surveys showed that all but approximately 150,000 spawned in the Nuyakuk River, with the remainder spawning in the Tikchik River.

Sex composition of the escapement as determined from a 1,214 fish sample at the Nuyakuk tower was 37% males and 63% females.

TOGIAK DISTRICT

The fishing area in the Togiak district remained similar to that of 1965 and no boundary changes were employed during the 1966 season. Of seven subsections open to fishing in 1966 only three were fished: Togiak, Osviak and Kulukak, with the Togiak River section accounting for over 90% of the commercial catch.

Initial gear registration for the district was 102 gill nets, including both drift and set net gear, which was 5 units more than 1965. The majority of the fishing fleet are double-end sailboat conversions and they concentrated their fishing efforts in the Togiak River section. Seven set nets were fished in the Osviak section, the first effort in this area since 1961.

All of the Togiak district was placed on 5 day-per-week fishing in 1966. However, to obtain escapement goal requirements, the Togiak River section was closed for a total of five additional days.

The district prediction of 313,000 red salmon proved to be very accurate with 323,000 run estimated in the catch plus escapement.

The commercial season proceeded as expected. With the increasing effort in the district additional closed periods were needed in 1966 to insure adequate escapement to the spawning grounds. Aerial survey flights of the Togiak River were flown throughout the season to check on red salmon escapement not yet counted through the tower. These flights proved to be extremely important in the management of the fishery. A tagging project was initiated in 1966 to determine migration timing between the fishery and the counting tower, some 65 miles upriver. Preliminary analysis indicates that it takes about 10 to 14 days for most red salmon to ascend the river.

CATCH

Total catch of all salmon species for the Togiak district in 1966 was 335,000, well above the 13 year average. The Togiak River section accounted for 303,000 fish while the Osviak and Kulukak section contributed 20,000 and 12,000 fish respectively.

Red Salmon

The 1966 catch of 200,000 red salmon is the fourth consecutive year catches have exceeded the average season catch of 127,000. Red salmon accounted for 60% of the total catch in 1966.

Age composition analysis of combined catch and escapement showed that 68% were 5 year fish from the 1961 brood year while 16% and 15%, respectively, were 4 year and 6 year fish.

King and Chum Salmon

A king salmon harvest of 10,000 was achieved for the third straight year with the majority being taken in the Togiak River section. Age composition of the catch was composed of 3% 4 year fish, 41% 5 year fish and 55% 6 year fish.

Chum salmon runs to the Togiak district are second in size only to the Nushagak district of Bristol Bay. The chum salmon catch of 95,000 was larger than the average catch but smaller than catches of recent years. Most chum salmon were taken in the Togiak River section with the Osviak section producing approximately 17,000 chums this season. Over 72% of the run were 4 year old fish.

Pink and Coho Salmon

Late season catches of pink and coho salmon both were record harvests for the Togiak district. The pink salmon catch in 1966 was 14,000, while

16,000 cohos were taken in late season efforts. Many of the coho salmon were flown to Anchorage where they were frozen and sold to fresh fish markets.

ESCAPEMENT

Red Salmon

Togiak River red salmon are enumerated from a counting tower at Togiak Lake, while aerial surveys are employed to estimate escapements in the Togiak tributaries and Kulukak River system.

An escapement goal of 115,000 red salmon was established on the basis of a predicted return of 313,000. Although individual river system goals were not achieved in all cases the total district escapement was 123,000. Togiak Lake (Togiak River) accounted for 74% of the total district escapement.

Aerial surveys were later conducted in the district to determine spawning ground distribution and utilization.

King, Chum, Pink and Coho Salmon

Aerial surveys of other species of salmon in 1966 was much reduced over previous years due to adverse weather conditions and inadequate operating funds. Aerial surveys were flown on several important chum salmon streams in the district, and during management aerial flights some data was recorded in terms of excellent, good or poor escapements.

Chum salmon surveys of Osviak and Metogak Rivers produced estimates of 15,000 and 20,000 in these two areas respectively. The Quigmy River chum population was approximately 5,000 while several smaller streams had combined spawning escapements of 8,000 chum salmon. Total observed chum salmon escapement was 46,000. The Togiak River, usually a good producer, had a fair chum escapement while the Kulukak River had an excellent chum spawning population. Total estimated chum salmon escapement for the entire district was between 75,000 and 100,000.

Spawning population of king and coho salmon were not enumerated although escapements were thought to be comparable with previous years.

Pink salmon were observed spawning in the Togiak River, the only area of importance in the district. An estimated 30,000 were counted and is considered a reliable estimate.

FIELD PROGRAMS

Information essential to the immediate and future management and research of the Bristol Bay fishery resources was collected by 55 seasonal employees engaged in conducting six separate field programs at 25 different stations in 1966. Individual field programs are summarized below.

Escapement Enumeration and Sampling stations were maintained on 10 major river systems in Bristol Bay in 1966. Visual counting was conducted on a 24-hour schedule with actual tallies made during 10 minutes of every hour from each bank. These counts have proven to give a reliable estimate of the escapement. All tower sites in 1966 remained in the same locations as those of 1965. One new escapement enumeration station was established on the Nushagak River. In addition to counting the escapement of red salmon, the tower crews sample the daily migration of red salmon to determine sex and age composition of the escapement. Beach seines and traps are used to capture migrating salmon and the crews attempt to sample 200 live fish each day. Each fish is measured, sexed and a scale sample removed.

Smolt Outmigration Studies were conducted on three systems in 1966; Wood, Kvichak and Naknek Rivers. The Ugashik River smolt station was not operated in 1966. The ultimate objective of these programs is to provide an estimate of the total smolt population which would serve as a measure of spawning success and survival. Only the Naknek and Ugashik programs are providing such an estimate at present. The sampling programs on the larger Wood and Kvichak Rivers provide only a measure of relative abundance of smolt from year to year. In addition to obtaining an index or an estimate of the total smolt migration, smolt studies provide useful information on: (1) condition index of the smolt, (2) age composition of the smolt outmigration, and (3) future adult returns. All smolt programs in Bristol Bay are now being carefully evaluated. Many changes in sampling methods have evolved and ways and means are being sought to improve the smolt programs.

Catch Sampling stations were operated at five locations in 1966 to sample the commercial catch of the five fishing districts in Bristol Bay. This program consists of one man located at a cannery to obtain representative samples of fish caught in the commercial fishery. These fish are measured, weighed, sexed and a scale sample collected. As in escapement sampling, the basic objective is to provide enough information to construct a breakdown of the fish by age groups. In 1966, an additional catch sampling station was initiated at the Pacific Alaska Fisheries Cannery in Dillingham to sample king, chum and coho salmon species caught in the Nushagak district.

Test Fishing programs are presently being conducted in four of the five fishing districts in Bristol Bay. The test fishing program in 1966

was composed of three "inside" and four "outside" test boats. The "inside" test fishing projects are conducted on the Kvichak, Egegik and Ugashik Rivers where there is need for escapement estimates prior to the delayed tower counts. The escapement test fishing project has proven to be invaluable aid to management in balancing fishing periods to assure adequate escapements. The "outside" test fishing program, which is operated only during periods closed to fishing, is a sampling scheme to test for the presence or absence of fish, provide same measure of the magnitude of the run prior to entering the fishery and to locate zones of migration. "Outside" test fishing has been useful in determining a general picture of the runs at a crucial time when there is little information or means to determine the status of a particular run. In general, the test fishing programs are helping to develop a more exact idea of the migration patterns, the changes in these patterns for different years, timing of runs and related information which is useful to the management of the fishery.

Spawning Ground Surveys and Inventories are conducted each year in the Nushagak, Togiak, Egegik and Ugashik districts. Surveys in other areas of Bristol Bay are handled by other agencies. Spawning ground surveys provide estimates of abundance and distribution of salmon species in the various important spawning areas. In systems where counting towers are not situated, aerial surveys are used to determine spawning escapements as well as distribution. In 1966, red salmon escapement estimates by aerial methods were determined for the Mother Goose system in the Ugashik district, Snake River in the Nushagak district and Togiak tributaries and Kulukak River system in the Togiak district. Aerial surveys were also conducted in some areas to determine escapement of other species of salmon. Watershed inventories are presently in progress where time and funds allow.

Red Salmon Egg and Larvae Mortality Studies have been carried on in Bristol Bay intermittently since 1960, however a new winter survival program was initiated in 1966 in the Nushagak district to monitor effects of winter environment on eggs and larvae. Permanent sampling areas (index streams) were established in six different areas in the Wood River Lakes, and additional index streams will be established next winter. Over 90 samples taken from these index streams in the Wood River Lakes showed an overall average unweighted mortality of 35%. Many samples were taken in marginal spawning areas and the percent mortality is believed to be high. Red salmon population estimates will be made in the index areas next season and all egg and larvae data weighted to eliminate a biased sample. Three index areas were established at Iliamna Lake on the Kvichak River system in 1966 and subsequent sampling showed mortalities in excess of 45%, however, marginal spawning areas were again involved in the sampling effort. Future egg and larvae winter mortality studies are planed on a continuing and comparable basis with that of 1966.

TABLE 1 --BRISTOL BAY LICENSE STATISTICS, 1960-1966

	1960	1961	1962	1963	1964	1965	1966	1967
COMMERCIAL FISHING LICENSES								
Resident	1,422	2,112	1,993	2,258	2,494	2,124	2,763	1,862
Non-resident	745	1,506	933	1,344	1,231	1,674	1,501	1,560
TOTAL	2,167	3,618	2,926	3,602	3,725	4,098	4,264	3,422
VESSEL LICENSES								
Fishing vessels								
Resident	804	1,058	1,031	1,209	1,161	1,181	1,227	1,184
Non-resident	350	665	386	581	605	722	902	776
TOTAL	1,154	1,723	1,417	1,790	1,766	1,903	2,129	1,960
Scows								
Resident	22	14	30	33	15	1/	10	8
Non-resident	28	46	19	32	35	-	24	53
TOTAL	50	60	49	65	50	-	34	61
GEAR LICENSES								
Resident								
150 F. drift net	561	674	715	766	815	800	875	836
100 F. drift net	89	106	76	148	132	116	144	129
50 F. set net	345	496	619	773	793	868	826	686
TOTAL	995	1,276	1,410	1,687	1,740	1,784	1,845	1,651
Non-resident								
150 F. drift net	342	600	383	509	639	626	762	678
100 F. drift net	22	38	17	36	50	51	84	56
50 F. set net	0	10	20	116	137	125	139	144
TOTAL	364	648	420	661	826	802	985	878
TOTAL GEAR	1,359	1,924	1,830	2,348	2,566	2,586	2,830	2,529
TOTAL LICENSES SOLD 2/	4,730	7,325	6,222	7,805	8,107	8,587	9,257	7,965
TOTAL LICENSE REVENUES COLLECTED	$72,075	--	$87,725	$92,250	$113,359	$131,895	$161,145	

1/ Scows included with vessel licenses

2/ Information on total license sales indicates only those licenses sold in Bristol Bay

TABLE 2 --BRISTOL BAY PRE-SEASON GEAR REGISTRATION
BY DISTRICT, 1966

Fishing District	150 F. Drift	100 F. Drift	50 F. Set	Total
	1966	1966	1966	1966
NAKNEK-KVICHAK				
Resident	291	52	306	649
Non-resident	491	17	15	523
TOTAL	782	69	321	1,172
EGEGIK				
Resident	79	18	176	273
Non-resident	145	21	62	228
TOTAL	224	39	238	501
UGASHIK				
Resident	54	16	91	161
Non-resident	38	6	31	75
TOTAL	92	22	122	236
NUSHAGAK				
Resident	357	58	246	661
Non-resident	87	40	31	158
TOTAL	444	98	277	819
TOGIAK				
Resident	94	0	7	101
Non-resident	1	0	0	1
TOTAL	95	0	7	102
BRISTOL BAY				
Resident	875	144	826	1,845
Non-resident	762	84	139	985
TOTAL	1,637	228	965	2,830

TABLE 3 --GEAR REGISTRATION BY DISTRICT AND FISHING PERIOD, 1966

Naknek-Kvichak District

Period	Number		
	Drift Net	Set Net	Total
6/6-18	4	3	7
20-22	480	142	622
23-25	650	136	786
28	834	148	982
6/30-7/1	864	180	1,044
2-3	1,074	204	1,278
6-7	1,003	206	1,209
8-9	940	162	1,102
11	672	153	825
12	446	132	578
18-23	360	140	500
25-30	37	29	66
8/1-6	40	53	93

Egegik District

Period	Number		
	Drift Net	Set Net	Total
6/6-18	38	7	45
20-22	213	98	311
23-25	275	138	413
28-29	291	145	436
7/1-2	278	149	427
3-4	268	131	399
5-6	274	119	393
7-8	266	143	409
10-17	250	148	398
18-23	48	48	96
7/25-	4	4	8

Ugashik District

Period	Number		
	Drift Net	Set Net	Total
6/6-18	18	2	20
20-22	58	23	81
23-25	83	43	126
28-29	92	55	147
7/2-3	76	56	132
5	19	47	66
6-7	78	67	145
12	87	50	137
15	89	55	144
18-23	80	62	142
25-30	17	6	23
8/17	4	4	8

Nushagak District

Period	Number		
	Drift Net	Set Net	Total
6/1-11	13	0	13
13-18	173	45	218
20-21	242	119	361
22-23	310	129	439
25-26	272	142	414
29-30	276	154	430
7/2-3	218	166	384
5-9	268	205	473
10-16	409	197	606
17-23	578	160	738
25-26	437	93	530
28-30	368	93	461
7/31-8/6	237	90	327
6-13	1	0	1
15-20	11	4	15
22-27	3	0	3

Togiak District

Period	Number		
	Drift Net	Set Net	Total
-6/18	34	6	40
20-25	96	6	102
6/27-7/2	98	7	105
7/4-9	101	5	106
12-15	111	8	119
18-21	111	7	118
25-29	110	0	110
8/1-6	63	2	65
8-13	72	1	73
15-20	35	0	35
22-27	43	0	43
8/29-	37	0	37

TABLE 4 --BRISTOL BAY FISHING PERIODS, 1966

NAKNEK-KVICHAK DISTRICT

Date & Time			Hours
June 20	10 AM - June 22	10 AM	48
June 23	1 PM - June 25	1 PM	48
June 28	6 AM - June 28	6 PM	12
June 30	8 PM - July 1	8 AM	12
July 2	9 AM - July 3	9 AM	24
KVICHAK SECTION; Set nets only in the Naknek section:			
July 6	1 PM - July 7	1 AM	12
July 7	1 AM - July 7	1 PM	12
Naknek-Kvichak District:			
July 8	2 PM - July 9	2 AM	12
July 11	4 AM - July 11	4 PM	12
July 12	4 AM - July 12	4 PM	12

Total fishing hours during regulatory period, June 20 - July 17: 204

UGASHIK DISTRICT

Date & Time			Hours
June 20	10 AM - June 22	10 AM	48
June 23	1 PM - June 25	1 PM	48
June 28	5 AM - June 29	5 AM	24
June 29	5 AM - June 29	8 PM	15
July 2	9 AM - July 3	9 AM	24
July 5	11 AM - July 5	12 PM	13
July 6	12 N - July 6	12 PM	12
July 6	12 PM - July 7	12 N	12
July 12	4 AM - July 12	4 PM	12
July 15	8 AM - July 15	8 PM	12

Total fishing hours during regulatory period, June 20 - July 17: 220

EGEGIK DISTRICT

Date & Time			Hours
June 20	10 AM - June 22	10 AM	48
June 23	1 PM - June 25	1 PM	48
June 28	5 AM - June 29	5 AM	24
July 1	7 AM - July 2	7 AM	24
July 3	9 AM - July 4	9 AM	24
July 5	11 AM - July 6	11 AM	24
July 7	12 N - July 8	12 N	24
July 10	2 AM - July 16	12 PM	166

Total fishing hours during regulatory period, June 20 - July 17: 382

NUSHAGAK DISTRICT

Date & Time			Hours
June 20	10 AM - June 22	10 AM	48
June 22	2 PM - June 23	2 PM	24
June 25	6 PM - June 26	6 PM	24
June 29	10 PM - June 30	10 AM	12
July 2	11 AM - July 2	11 PM	12
July 2	11 PM - July 3	2 PM	15
July 5	2 PM - July 6	5 PM	27
NUSHAGAK SECTION ONLY:			
July 6	5 PM - July 7	5 PM	24
July 7	5 PM - July 8	6 PM	25
UGASHIK SECTION ONLY			
July 8	3 AM - July 9	3 AM	24
NUSHAGAK DISTRICT:			
July 8	6 PM - July 16	12 PM	150

Total fishing hours during regulatory period, June 20 - July 17: 409

TOGIAK DISTRICT

Date & Time			Hours
June 20	9 AM - June 25	9 AM	120
June 27	9 AM - July 2	9 AM	120
July 4	9 AM - July 9	9 AM	120
July 11	9 AM - July 15	2 PM	101
July 18	9 AM - July 21	9 AM	72
[illegible]	[illegible]	[illegible]	[illegible]
Aug. 1	9 AM - Back on 5 day week		

During the fishing season the Togiak River, Ungalikthluk and Nunavarchak sections were closed to fishing for a total of 91 hours in addition to the regular 48 hour weekend closures. The [illegible], Canik, Matogak, and Cape Peirce sections remained open for fishing 5 days a week throughout the season.

TABLE 5 --NAKNEK-KVICHAK DISTRICT FINAL CATCH
BY SPECIES AND PERIOD, 1966

Period	Hours	Reds	Kings	Chums	Pinks	Cohos	Chum %[1/]	Total
6/6-18		1	110					111
6/20-22	48	36,746	1,125	615	2		1.6	38,488
6/23-25	48	83,714	570	671	2	1	.8	84,958
6/28	12	637,748	1,045	4,562			.7	643,355
6/30-7/1	12	347,253	275	1,661			.5	349,189
7/2-7/3	24	2,303,885	672	4,916			.2	2,309,473
7/6-7/7	24	1,236,168	312	5,532			.4	1,242,012
7/8-7/9	12	394,122	147	2,456			.6	396,725
7/11	12	155,621	322	7,127			4.4	163,070
7/12	12	154,576	255	4,413	12		2.8	159,256
7/18-23		45,058	346	17,412	10,282	53	27.9	73,151
7/25-30		1,900	227	4,429	37,186	331	70.0	44,073
8/1-6		746	50	3,479	94,737	3,711	82.3	102,723
TOTAL		5,397,538	5,456	57,273	142,221	4,096	1.1	5,606,584
PERCENT OF DISTRICT CATCH		96.3	0.1	1.0	2.5	0.1		100.0

1/ Based on mixed reds and chums

TABLE 6 --EGEGIK DISTRICT FINAL CATCH
BY SPECIES AND PERIOD, 1966

Period	Hours	Reds	Kings	Chums	Pinks	Cohos	Chum %[1/]	Total
6/6-18		2,991	400	131			4.2	3,52
20-22	48	30,949	368	843			2.7	32,16
23-25	48	126,248	474	2,032			1.6	128,75
28-29	24	195,493	239	2,654			1.3	198,38
7/1-2	24	423,733	145	8,700			2.0	432,57
3-4	24	425,649	88	1,857			.4	427,59
5-6	24	449,912	52	3,314			.7	453,27
7-8	24	288,618	40	2,909			1.0	291,56
10-17		154,156	124	8,813			5.4	163,09
18-23		3,409	19	832	8	4	19.6	4,27
7/25-		16				1,928		1,94
TOTAL		2,101,174	1,949	32,085	8	1,932	1.5	2,137,14
PERCENT OF DISTRICT CATCH		98.3	0.1	1.5	+	0.1		100.0

1/ Based on mixed reds and chums

TABLE 7 --UGASHIK DISTRICT FINAL CATCH
BY SPECIES AND PERIOD, 1966

Period	Hours	Reds	Kings	Chums	Pinks	Cohos	Chum %[1/]	Total
6/6-18		55	359	5			8.3	419
20-22	48	2,414	429	288			10.7	3,131
23-25	48	12,124	393	619			4.6	13,136
28-29	39	27,329	233	3,529			11.4	31,091
2-3	24	64,710	104	1,013			1.5	65,827
5	13	35,445	5	754			2.1	36,204
6-7	24	206,867	76	4,494			2.1	211,437
12	12	52,127	53	3,830			6.8	56,010
15	12	24,381	92	6,254			20.4	30,727
18-23		16,025	148	6,653	8	4	29.3	22,838
25-30		3,596	24	1,500	3	42	29.4	5,165
8/1-		385		161		487	29.5	1,033
TOTAL		445,458	1,916	29,100	11	533	6.1	477,018
PERCENT OF DISTRICT CATCH		93.4	.4	6.1	+	.1		100.0

1/ Based on mixed reds and chums

TABLE 8 --NUSHAGAK DISTRICT FINAL CATCH
BY SPECIES AND PERIOD, 1966

Period	Hours	Reds	Kings	Chums	Pinks	Cohos	Chum %[1/]	Total
6/6-11		3	595					598
13-18		1,200	26,006	306			20.3	27,512
20-21	24	3,021	4,904	1,779	1		37.1	9,705
22-23	24	4,459	5,808	6,397	1		58.9	16,665
25-26	24	12,219	16,469	24,661	1		66.9	53,350
29-30	12	18,844	891	4,561	5		19.5	24,301
7/2-3	27	321,790	1,342	12,633	532		3.8	336,297
5-9	106	434,674	705	21,837	598		4.8	457,814
10-16	7 days	313,485	702	21,753	11,980	58	6.5	347,978
17-23	7 days	49,273	568	27,664	1,189,090	273	36.0	1,266,868
25-26	36	4,957	102	2,057	429,922	1,380	29.3	438,418
28-30	63	3,541	52	4,152	353,046	3,517	54.0	364,308
7/31-8/6	6 days	2,804	39	1,544	351,590	5,517	35.5	361,494
8/6-27		1	1		300	772		1,074
TOTAL		1,170,271	58,184	129,344	2,337,066	11,517	10.0	3,706,382
PERCENT OF DISTRICT CATCH		31.6	1.6	3.5	63.1	.2		100.0

1/ Based on mixed reds and chums

TABLE 9 --TOGIAK DISTRICT FINAL CATCH
BY SPECIES AND PERIOD, 1966[1/]

Period	Hours	Reds	Kings	Chums	Pinks	Cohos	Chum %[2/]	Total
6/13-18	5 days	292	750	745	1		71.8	1,788
20-25	5 days	4,584	3,025	7,851	24		63.1	15,484
6/27-7/2	5 days	23,280	3,338	17,655	185		43.1	44,458
7/4-9	5 days	54,473	1,886	14,709	293		21.3	71,361
12-15	3 days	59,178	690	19,267	446		24.6	79,581
18-21	4 days	38,995	216	25,059	2,006	5	39.1	66,281
25-29	5 days	10,395	49	6,521	1,657	12	38.5	18,634
8/1-6	5 days	6,919	6	2,775	1,404	493	28.6	11,597
8-13	5 days	1,585	3	789	7,528	2,823	33.2	12,728
15-20	5 days	63	2	24	1	4,075	27.6	4,165
8/22-		35	2	15		8,456	30.0	8,508
TOTAL		199,799	9,967	95,410	13,545	15,864	32.3	334,585
PERCENT OF DISTRICT CATCH		59.7	3.0	28.5	4.1	4.7		100.0

1/ Includes 19,620 Osviak fish: 2,057 reds, 328 kings, 16,784 chums and 451 pinks. Includes 12,210 Kulukak fish: 7,263 reds, 25 kings, 4,094 chums, 810 pinks and 18 coho.

2/ Based on mixed reds and chums

TABLE 10 --SUMMARY OF BRISTOL BAY FINAL CATCH
BY DISTRICT AND SPECIES, 1966

District and Sub-District	Reds	Kings	Chums	Pinks	Cohos	Chum %[1/]	Total
NAKNEK-KVICHAK							
Kvichak	4,168,575						
Branch	136,301						
Naknek	1,092,662						
Total	5,397,538	5,456	57,273	142,221	4,096	1.1	5,606,584
EGEGIK	2,101,174	1,949	32,085	8	1,932	1.5	2,137,148
UGASHIK	445,458	1,916	29,100	11	533	6.1	477,018
NUSHAGAK							
Wood	754,734						
Igushik	238,888						
Snake	2,808						
Nuyakuk	132,536						
Nush.-Mulchat.	41,305						
Total	1,170,271	58,184	129,344	2,337,066	11,517	10.0	3,706,382
TOGIAK	199,799	9,967	95,410	13,545	15,864	32.3	334,585
TOTAL	9,314,240	77,472	343,212	2,492,851	33,942	3.6	12,261,717

1/ Based on mixed reds and chums.

Species	Percent of Season Total
Reds	76.0
Kings	.6
Chums	2.8
Pinks	20.3
Cohos	.3

TABLE 11 --RED SALMON CATCH BY TYPE OF GEAR, BRISTOL BAY, 1966

District	Catch and Percent		
	Drift Net	Set Net	Total
Naknek-Kvichak	5,039,526 93.4%	358,012 6.6%	5,397,538 100.0%
Egegik	1,848,803 88.0%	252,371 12.0%	2,101,174 100.0%
Ugashik	370,000 83.1%	75,458 16.9%	445,458 100.0%
Nushagak	839,726 71.8%	330,545 28.2%	1,170,271 100.0%
Togiak	195,088 97.6%	4,711 2.4%	199,799 100.0%
TOTAL	8,293,143 89.0%	1,021,097 11.0%	9,314,240 100.0%

TABLE 12 --COMPARATIVE BRISTOL BAY RED SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	2,926,413	644,551	318,629	436,950	-	4,326,543
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	2,546,341	622,885	240,817	1,054,978	66,085	4,549,106
1956	5,987,750	1,187,108	341,499	1,263,186	101,933	8,881,476
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	695,558	188,695	842,744	186,283	2,871,182
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
16 Year Average	5,727,848	1,240,210	477,190	952,483	126,820 1/	7,876,899

1/ 13 year average for Togiak district

TABLE 13 --COMPARATIVE BRISTOL BAY KING SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	5,009	342	606	34,226	-	40,183
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
16 Year Average	9,606	2,844	2,289	61,033	6,388[1/]	80,561

1/ 12 year average for Togiak district

TABLE 14 --COMPARATIVE BRISTOL BAY CHUM SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	38,844	15,439	16,843	85,624	-	156,750
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
16 Year Average	125,100	27,591	24,434	213,881	89,423 1/	463,663

1/ 13 year average for Togiak district

TABLE 15 --COMPARATIVE BRISTOL BAY PINK SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	11	-	-	23	-	34
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
8 Year Average[1/]	32,843	144	129	789,527	2,711[2/]	825,354

1/ Includes only even years
2/ 7 year average for Togiak district

TABLE 16 --COMPARATIVE BRISTOL BAY COHO SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	1,404	2,520	35,683	2,856	-	42,463
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
16 Year Average	1,793	2,760	3,284	26,609	2,681 1/	36,121

1/ 10 year average for Togiak district

TABLE 17 --COMPARATIVE BRISTOL BAY SALMON CATCH IN NUMBERS OF FISH BY DISTRICT, 1951-1966

ALL SPECIES

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	2,971,681	662,852	371,761	559,679	-	4,565,973
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	1,213,846	349,049	1,638,629	128,282	9,418,801
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	713,631	205,024	1,085,758	270,956	3,345,271
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
16 Year Average	5,256,934	1,273,479	507,267	1,450,996	225,914[1/]	8,870,062

1/ 13 year average for Togiak district

TABLE 18 --JAPANESE HIGH SEAS CATCHES OF RED SALMON
BOUND FOR BRISTOL BAY
(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	60	1,929
1956	2,751	1,724	4,475
1957	7,661	341	8,002
1958	1,011	152	1,163
1959	1,069	1,187	2,256
1960	4,005	966	4,971
1961	4,975	61	5,036
1962	1,312	268	1,580
1963	1,016	826	1,842
1964	617	1,836	2,453
1965	6,166	737	6,903

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°.

TABLE 19 --BRISTOL BAY FISH PRICE BY SPECIES, 1960-1966[1/]

Species	Year						
	1960	1961	1962	1963	1964	1965	1966
Independent Fishermen							
Reds	.95	1.00	1.04	1.08	1.09	1.09	1.13
Kings, Large	3.50	3.68	3.75	3.75	3.75	3.75	3.87
Med.	1.75	1.84	1.87	1.87	1.87	1.87	1.94
Small	--	1.00	1.00	1.00	1.00	1.00	1.04
Chums	.51	.54	.56	.58	.58	.58	.60
Pinks	.29	.30	.31	.32	.32	.32	.33
Cohos	.95	1.00	1.04	1.08	1.09	1.09	1.13
Company Fishermen							
Reds	.58	.62	.64	.67	.67	.67	.70
Kings, Large	2.53	2.66	2.70	2.70	2.70	2.70	2.40
Med. (	2 for 1	2 for 1	2 for 1	2 for 1	2 for 1	2 for 1	1.20
Small(							.64
Chums	.33	.34	.36	.37	.37	.37	.37
Pinks	.16	--	--	--	--	--	.20
Cohos	.58	.62	.64	.67	.67	.67	.70

1/ Price rounded to nearest hundreth

TABLE 20 --BRISTOL BAY CASE PACK BY SPECIES, 1951-1966

48 1-lb. cans per case

Year	Reds	Kings	Chums	Pinks	Coho	Total
1951	309,936	4,661	15,744	0	4,366	334,707
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	16,767	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 1/ 2/	734,893	14,835	28,853	94,831	2,365	875,777
16 Year Average	536,420	15,027	40,166	35,585 3/	3,236	612,644

1/ Preliminary data

2/ Does not include the following cases packed from Bristol Bay fish transported outside the area for processing: Reds - 27,348 cases; Kings - 33 cases; Chums - 1,200 cases; Pinks - 2,645 cases; Silvers - 19 cases

3/ Average pink case pack includes even years only

TABLE 21 --BRISTOL BAY FISH PER CASE BY SPECIES, 1951-1966

Year	Reds	Kings	Chums	Pinks	Cohos
1951	11.87	4.53	10.87	18.16	10.29
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[3/]	12.62	5.20	11.97	26.40	15.77
16 Year Average	12.82	4.73	11.00	20.75[1/]	11.12[2/]

1/ Average fish per case includes even years only; 7 year average
2/ 15 year average
3/ Preliminary

TABLE 22 --BRISTOL BAY FROZEN AND CURED FISH, 1961-1966

COMPARATIVE CATCH

Year	Reds	Kings	Chums	Pinks	Cohos	Total
1961	170,745	11,585	348	-	-	182,678
1962	27,926	4,510	2,665	-	4,073	39,174
1963	34,641	3,917	11,690	1	4,028	54,277
1964	80,787	9,011	3,295	276	8,956	102,325
1965	85,728	3,506	15	-	2,476	91,725
1966	44,118	1,928	4,794	4	15,430	66,274
6 Year Average	73,991	5,743	3,801	-	6,993 1/	89,409

1/ 5 year average

TABLE 23 --COMMERCIAL FRESHWATER FISHERIES CATCH FROM THE TIKCHIK LAKE SYSTEM OF BRISTOL BAY, APRIL THROUGH OCTOBER, 1966 1/

	WHITEFISH		LAKE TROUT		PIKE		CHAR		ALL SPECIES	
	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
Month										
April	320	1,338	123	602	7	78			450	2,018
May	898	3,496	459	2,087	9	113			1,366	5,696
Sub-Total	1,218	4,834	582	2,689	16	191			1,816	7,714
% Comp.	67.1		32.0		0.9		0.0		100.0	
Av. Wt.	4.0		4.6		11.9					
Month										
September	126	575	200	931	60	628	7	33	393	2,167
October	1,368	5,819	510	2,592	238	2,015	30	133	2,146	10,559
Sub-Total	1,494	6,394	710	3,523	298	2,643	37	166	2,539	12,726
% Comp.	58.8		28.0		11.7		1.5		100.0	
Av. Wt.	4.3		5.0		8.9		4.5			
TOTAL	2,712	11,228	1,292	6,212	314	2,834	37	166	4,355	20,440
% Comp.	62.3		29.7		7.2		0.8		100.0	
Av. Wt.	4.1		4.8		9.0		4.5			

1/ Round weight to nearest tenth of a pound

TABLE 24 --SUMMARY OF 1966 BRISTOL BAY RED SALMON ESCAPEMENT GOALS

	Predicted Return[1]	1966 Goal	Management Escapement Range
NAKNEK-KVICHAK DISTRICT			
Kvichak River	21,227,000	6,000,000	5,000,000 - 7,000,000
Naknek River	1,867,000	800,000	700,000 - 1,000,000
Alagnak (Branch) River	191,000	53,000	50,000 - 100,000
Total	23,285,000	6,853,000	5,750,000 - 8,100,000
NUSHAGAK DISTRICT			
Wood River	2,416,000	900,000	700,000 - 1,100,000
Igushik River	553,000	200,000	150,000 - 300,000
Snake River	11,000	11,000	
Nuyakuk River	241,000	150,000	100,000 - 200,000
Nushagak-Mulchatna	47,000	20,000	10,000 - 30,000
Total	3,268,000	1,281,000	960,000 - 1,630,000
EGEGIK DISTRICT	3,175,000	1,000,000	800,000 - 1,200,000
UGASHIK DISTRICT[3]	1,230,000	850,000	700,000 - 1,000,000
TOGIAK DISTRICT			
Togiak River	313,000	120,000	100,000 - 180,000
Togiak Tributaries	30,000[2]	15,000	10,000 - 20,000
Kulukak System	10,000[2]	5,000	5,000 - 10,000
Total	353,000	140,000	115,000 - 210,000
TOTAL JOINT PREDICTION	32,654,000	10,124,000	8,325,000 - 12,190,000
TOTAL BAY PREDICTION	32,694,000		

1/ Bristol Bay Red Salmon Forecast of Run for 1966, Alaska Department Fish and Game, Informational Leaflet 82.

2/ System prediction by Alaska Department Fish and Game. Not included in joint Bristol Bay prediction.

3/ Excluding Mother Goose system return.

TABLE 25 --COMPARATIVE RED SALMON ESCAPEMENT COUNTS BY RIVER SYSTEM, 1960-1966

River	1960	1961	1962	1963	1964	1965	1966
Kvichak River	14,630,000	3,705,849	2,580,884	338,760	957,120	24,325,926	3,775,184
Branch River	1,240,530	90,036	90,630	203,304	248,700	175,020	174,336
Naknek River	828,381	351,078	723,066	905,358	1,349,604	717,798	1,016,445
Egegik River	1,798,764	701,538	1,027,482	997,602	849,576	1,444,608	804,246
Ugashik River	2,304,200	348,639	255,426	388,254	472,770	996,612	704,436
Mother Goose System	37,200 1/	17,800 1/	18,600 1/	8,750 1/	10,000 1/	1,250 1/	10,400 1/
Wood River	1,016,073	460,737	873,888	721,404	1,076,112	675,156	1,208,682
Igushik River	495,087	294,252	15,660	92,184	128,532	180,840	206,360
Snake River	16,598	4,856	1,760	37,960	12,436	12,000 1/	4,500 1/
Nuyakuk River	145,500	79,788	37,890	166,608	103,224	203,070	161,010
Nushagak-Mulchatna System	--	20,000 1/	8,500 1/	45,700 1/	78,700 1/	28,200 1/	50,174
Togiak River	162,810	95,454	47,352	102,396	95,574	88,386	91,098
Togiak Tributaries	29,200 1/	26,800 1/	14,600 1/	13,800 1/	9,300 1/	8,100 1/	13,100 1/
Kulukak System	--	5,200 1/	9,600 1/	11,400 1/	9,800 1/	16,300 1/	18,800 1/
TOTAL ESCAPEMENT	22,704,343	6,202,027	5,705,338	4,033,480	5,341,448	28,873,266	8,238,771

1/ Aerial survey estimate

TABLE 26 --COMPARATIVE BRISTOL BAY RED SALMON ESCAPEMENT IN NUMBERS OF FISH BY DISTRICT, 1951-1966

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	-	-	205,881	539,600	51,000	796,481
1952	-	756,921	651,209	433,800	102,000	1,943,930
1953	-	519,098	1,056,361	828,542	102,000	2,506,001
1954	-	507,298	458,635	691,624	77,000	1,734,557
1955	529,046	271,039	76,982	1,933,755	112,000	2,922,822
1956	11,215,913	1,104,230	425,295	1,212,101	225,000	14,182,539
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
Average	6,535,151	832,828	572,642 1/	1,191,338	115,294 2/	9,500,138 3/

1/ Includes Mother Goose system beginning in 1960.
2/ 1951-1953 and 1956-1958 includes Togiak Lakes only. 1954-1955 includes only Ongivinuk system and 1959 to date includes all Togiak tributaries. Kulukak system included 1961 to date.
3/ 12 year average, 1955 through 1966.

TABLE 27 --SUMMARY OF BRISTOL BAY RED SALMON CATCH AND ESCAPEMENT, 1966[1/]

	Escapement		Catch	Total Return
	System	District		
NAKNEK-KVICHAK DISTRICT				
Kvichak River	3,775,184			
Naknek River	1,016,445			
Alagnak River	174,336			
		4,965,965	5,397,538	10,363,503
EGEGIK DISTRICT		804,246	2,101,174	2,905,420
UGASHIK DISTRICT				
Ugashik Lakes	704,436			
Mother Goose System	10,400			
		714,836	445,458	1,160,294
NUSHAGAK DISTRICT				
Wood River	1,208,682			
Igushik River	206,360			
Snake River	4,500			
Tikchik Lakes	161,010			
Nush.-Mulchatna System	50,174			
		1,630,726	1,170,271	2,800,997
TOGIAK DISTRICT				
Togiak River	91,098			
Togiak Tributaries	13,100			
Kulukak System	18,800			
		122,998	199,799	322,797
TOTAL BRISTOL BAY		8,238,771	9,314,240	17,553,011

1/ Final catch and escapement data

TABLE 28 --CATCH AND ESCAPEMENT OF RED SALMON
IN THE NAKNEK-KVICHAK DISTRICT BY RIVER SYSTEM, 1955-1966

Year	Escapement by River System				Catch	Total Return
	Kvichak	Branch	Naknek	Total		
1955	250,546	-	278,500	529,046	2,564,341	3,093,387
1956	9,443,318	-	1,772,595	11,215,913	5,987,750	17,203,663
1957	2,842,810	126,595	634,645	3,604,050	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	3,200,000		725,000			
Average	5,339,515	326,923	923,949	6,535,151	5,314,799	12,683,283

TABLE 29 --CATCH AND ESCAPEMENT OF RED SALMON
IN THE EGEGIK AND UGASHIK DISTRICTS BY RIVER SYSTEM, 1951-1966

Year	Egegik District			Ugashik District				
	Escapement	Catch	Total Return	Escapement			Catch	Total Return
	Egegik			Ugashik	Mother Goose	Total		
1951		644,551	--	205,881	--	205,881	318,629	524,510
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	1,104,230	1,187,108	2,291,338	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	695,558	1,693,160	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	600,000			220,000				
Average	832,828	1,240,210	2,112,749	566,142	14,857	572,642	477,190	1,049,833

TABLE 30 --CATCH AND ESCAPEMENT OF RED SALMON
IN THE NUSHAGAK DISTRICT BY RIVER SYSTEM, 1951-1966

Year	Escapement by River System						Catch	Total Return
	Wood	Igushik	Snake	Nuyakuk	Nushagak-Mulchatna	Total		
1951	457,600	40,000	3,000	39,000	--	539,600	436,950	976,550
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	773,101	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
Average	838,558	222,763	18,191	96,872	18,406	1,191,338	952,483	2,143,821

TABLE 31 --CATCH AND ESCAPEMENT OF RED SALMON
IN THE TOGIAK DISTRICT BY RIVER SYSTEM, 1951-1966

Year	Escapement by River System				Catch	Total Return
	Togiak	Tributaries	Kulukak	Total		
1951	51,000	--	--	51,000	--	51,000
1952	102,000	--	--	102,000	--	102,000
1953	102,000	--	--	102,000	--	102,000
1954	57,000	20,000	--	77,000	12,280	89,280
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	186,283	313,879
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
Average	99,988	17,380	11,850	115,294	126,820	218,335

TABLE 32 --TOTAL BRISTOL BAY RETURN OF RED SALMON BY DISTRICT, 1951-1966

Year	Catch and Escapement by District					Total Return Bristol Bay
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
1951	--	--	524,510	976,550	51,000	--
1952	--	1,643,773	931,355	1,131,871	102,000	--
1953	--	1,753,698	1,745,081	1,277,883	102,000	--
1954	--	1,945,089	1,526,166	1,006,981	89,280	--
1955	3,093,387	893,924	317,799	2,988,733	178,085	7,471,928
1956	17,203,663	2,291,338	766,794	2,475,287	326,933	23,064,015
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	1,693,160	585,699	1,906,600	313,879	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
16 Year Average	12,683,283	2,112,749[2/]	1,049,833	2,143,821	218,335	17,806,273[1/]

1/ 12 year average
2/ 15 year average

TABLE 33 --SEX COMPOSITION OF BRISTOL BAY
RED SALMON RUN, 1966

District	Percent		Number of Fish		
	Males	Females	Males	Females	Total
NAKNEK-KVICHAK					
Kvichak R. Escapement	42.32	57.68	1,597,769	2,177,415	3,775,184
Branch R. Escapement	43.00	57.00	74,969	99,367	174,336
Naknek R. Escapement	44.26	55.74	449,889	566,556	1,016,445
Catch	35.94	64.06	1,939,880	3,457,658	5,397,538
System Total	39.20	60.80	4,062,507	6,300,996	10,363,503
EGEGIK					
Egegik R. Escapement	46.35	53.65	372,782	431,464	804,246
Catch	32.88	67.12	690,868	1,410,306	2,101,174
System Total	36.61	63.39	1,063,650	1,841,770	2,905,420
UGASHIK[1/]					
Ugashik R. Escapement	38.03	61.97	267,910	436,526	704,436
Catch	38.31	61.69	170,646	274,812	445,458
System Total	38.14	61.86	438,556	711,338	1,149,894
NUSHAGAK[2/]					
Wood R. Escapement	39.96	60.04	483,015	725,667	1,208,682
Igushik R. Escapement	47.60	52.40	98,227	108,133	206,360
Nuyakuk R. Escapement	38.35	61.65	61,753	99,257	161,010
Catch	55.50	44.50	649,449	520,822	1,170,271
System Total	47.06	52.94	1,292,444	1,453,879	2,746,323
TOGIAK[3/]					
Togiak R. Escapement	37.50	62.50	34,162	56,936	91,098
Catch	31.28	68.72	62,493	137,306	199,799
System Total	33.23	66.77	96,655	194,242	290,897
BRISTOL BAY					
Escapement	42.26	57.7	3,440,476	4,701,321	8,141,797
Catch	37.72	62.28	3,513,336	5,800,904	9,314,240
Total	39.84	60.16	6,953,812	10,502,225	17,456,037

1/ Mother Goose River system escapement not included
2/ Nushagak-Mulchatna and Snake River systems not included
3/ Togiak Tributaries and Kulukuk River system not included

TABLE 34 --AGE COMPOSITION OF RED SALMON CATCH AND ESCAPEMENT COMBINED, BRISTOL BAY, 1966

Age Group	Percent by District					
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total Bristol Bay
3_1 0.2	--	--	--	0.01	--	0.00
4_1 0.3	--	--	0.11	0.38	2.03	0.11
4_2 1.2	2.66	0.68	6.01	32.98	14.37	7.61
4_3 2.1	0.06	0.01	0.16	0.05	--	0.05
5_1 0.4	--	--	--	0.03	0.01	0.01
5_2 1.3	9.37	6.85	37.74	59.46	63.90	19.82
5_3 2.2	22.51	13.68	19.13	1.50	4.55	17.14
6_2 1.4	--	0.02	0.02	0.08	0.07	0.02
6_3 2.3	65.29	76.49	36.76	5.44	15.04	54.79
6_4 3.2	0.09	1.52	0.03	0.02	--	0.31
7_3 2.4	--	0.02	--	--	--	0.00
7_4 3.3	0.02	0.73	0.04	0.05	0.03	0.14
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 35 --RED SALMON SMOLT DATA FROM THE KVICHAK RIVER SYSTEM 1955-1966

Year of Seaward Migration	Age I		Age II		24 Hour Index Points [1]	Index Net Catch [2]
	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
Average	42.9	88.3	57.1	110.2	42.0	1,399,906

1/ One index point = 33,340 smolts

2/ For derivation of 24 hour index catch figures refer to: Pennoyer and Seibel, 1965. 1964 Kvichak River Red Salmon Smolt Studies, Alaska Department of Fish and Game Informational Leaflet No. 58.

TABLE 36 --COMPARATIVE AGE, LENGTH, AND OUTMIGRATION ESTIMATES OF RED SALMON SMOLT FROM THE NAKNEK RIVER SYSTEM, 1956-1966*

Year of Seaward Migration	Age I[1]		Age II[2]		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
Average	60.3[2]	99.5	39.5[2]	110.8	10,580,284

* Age and length weighted by night's catch

1/ Number winters in freshwater

2/ Age III smolt amounted to 0.3% in 1960; 0.9% in 1963; 0.1% in 1964; 0.4% in 1965

TABLE 37 --COMPARATIVE AGE, LENGTH AND INDEX NET CATCHES OF RED SALMON SMOLT FROM THE WOOD RIVER SYSTEM, 1951-1966*

Year of Seaward Migration	Age I[1]		Age II[1]		Index Points[3]		Two Hour Index Net Catch
	Percent	Mean Length	Percent	Mean Length	Unadjusted	Adjusted	
1951	80.0	91.0	20.0	--	9.9	9.9	16,809
1952[2]	99.0	87.0	1.0	--	100.0	100.0	170,034
1953	95.3	86.0	4.7	103.0	296.1	296.1	503,444
1954	95.8	87.0	4.2	107.0	438.6	438.6	745,832
1955	98.0	85.0	2.0	102.0	221.7	221.7	377,032
1956	78.4	82.0	21.6	95.0	329.3	326.6	559,932
1957	80.7	77.0	19.3	93.0	144.0	165.5	244,831
1958	65.0	82.0	35.0	102.0	249.1	230.9	423,580
1959	93.5	87.9	6.5	105.0	59.1	60.5	100,450
1960	99.4	88.0	0.6	114.0	223.3	223.3	379,668
1961	93.0	81.7	7.0	102.1	518.7	518.7	881,911
1962	86.0	80.1	14.0	97.6	177.6	177.6	301,892
1963	84.3	82.6	15.7	102.1	88.9	88.9	151,206
1964	98.8	83.7	1.2	104.2	568.6	332.2	966,807
1965	92.0	85.5	8.0	106.1	217.7	296.2	370,112
1966	94.3	77.1	5.7	101.2	147.1	133.4	250,049
Average	89.6	84.0	10.4	102.5	173.4[4]		402,724

* Age and length weighted by index net catch
1/ Number winters in freshwater
2/ One index point = 1,700.34 smolt
3/ Two hour index period, 9 to 11 p.m.
4/ Geometric mean

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