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DIVISION OF COMMERCIAL FISHERIES MANAGEMENT AND
DEVELOPMENT

ANNUAL MANAGEMENT REPORT

-1995-

BRISTOL BAY AREA



Regional Information Report¹ No. 2A96-06

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PREFACE

The 1995 Bristol Bay Management Report is the thirty-sixth consecutive annual volume reporting on management activities of the Division of Commercial Fisheries Management and Development staff in Bristol Bay. The report emphasizes a descriptive account of the information, decisions, and rationale used to manage the Bristol Bay commercial salmon and herring fisheries, and outlines basic management objectives and procedures. We have included all information deemed necessary to fully explain the rationale behind management decisions formulated in 1995. All narrative and data tabulations in this volume are combined under separate SALMON and HERRING sections to aid in the use of this document as a reference source. The extensive set of tables has been updated to record previously unlisted data for easy reference. Fisheries data in this report supersedes information in previous reports. Corrections or comments should be directed to the Anchorage office, Attention: Editor.

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BRISTOL BAY SALMON FISHERY

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INTRODUCTION

Management Area Description

The Bristol Bay management area includes all coastal waters and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1). The area includes six major river systems: Naknek, Kvichak, Egegik, Ugashik, Nushagak, and Togiak. Collectively, these rivers are home to the largest commercial sockeye salmon fishery in the world. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year, but chinook, chum, coho, and (in even-years) pink salmon returns are important to the fisheries as well.

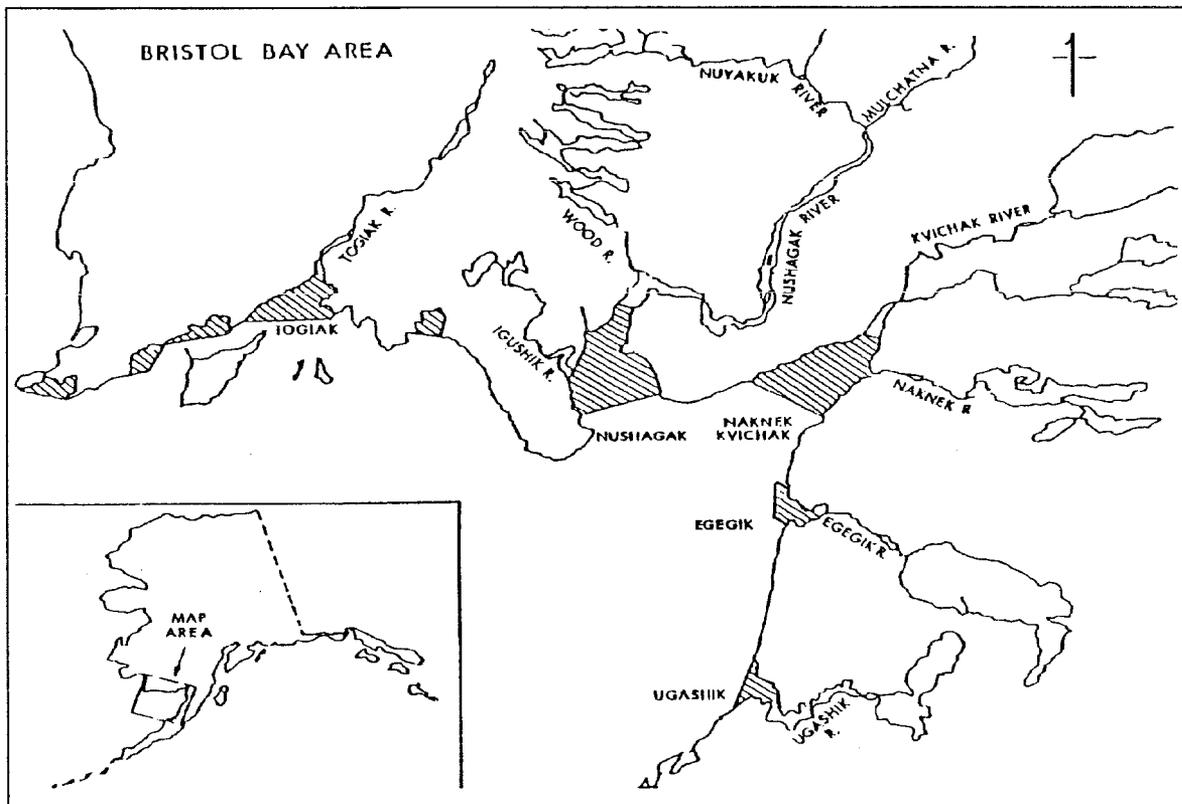


Figure 1. Bristol Bay Area Commercial Fisheries Salmon Management Districts.

The Bristol Bay area is divided into five management districts (Naknek-Kvichak, Egegik, Ugashik, Nushagak, and Togiak) that correspond to the major river drainages. The management objective for each river is to achieve desired escapement goals for the major salmon species while harvesting all fish in excess of the escapement requirement through orderly fisheries. In addition, regulatory management plans have been adopted by species for some districts.

Overview of the Bristol Bay Salmon Fisheries

The five species of Pacific salmon found in Bristol Bay are the focus of major commercial, subsistence and sport fisheries.

Legal gear for the commercial salmon fishery includes both drift (150f) and set (50f) gillnets. Drift fishermen are the most numerous, and 1,886 drift permits were registered in 1995. Setnet permits registered in 1995 totaled 1,021 (Appendix Table 3). Annual commercial catches (1975-1994) average 22 million sockeye salmon, 114 thousand chinook, 1.2 million chum, 203 thousand coho, and 1.6 million (even-years only) pink salmon (Appendix Tables 5-9). The value of the annual commercial salmon harvest in Bristol Bay has averaged \$155 million since 1985, and sockeye salmon are the most valuable, worth an average \$151 million.

Annual subsistence catches average approximately 172 thousand salmon and are also comprised primarily of sockeye salmon (Appendix Table 39). Sport fisheries operate to varying degrees of intensity on all species of salmon, with most effort directed toward chinook and coho stocks. Approximately 46,000 salmon are harvested annually by sportfishermen in Bristol Bay, including the eastern shores of Kuskokwim Bay, and the Kuskokwim River downstream from the Aniak River.

1995 COMMERCIAL SALMON FISHERY

Run Strength Indicators

Fishery managers in Bristol Bay have several early indicators of sockeye run size, including: the preseason forecast, the False Pass fishery, the Port Moller test boat, the district test program, and the early performance of the commercial fishery. Evaluated individually, each of these pieces of information may not give a correct assessment of run size. Collectively they form patterns such as missing year classes, discrepancies with the forecast, or differences in run timing that can be important to the successful management of the commercial fishery. Management success is easily measured after the season by comparing actual escapements to the goals published for the individual river systems and species.

Preseason Forecasts

Total inshore sockeye salmon production for Bristol Bay in 1995 was forecasted to be 55.1 million fish (Table 1). A run of that size would be 56% above the 20-year (1975 - 1994) average inshore run of 35.3 million, and 40% greater than recent 10-year average inshore run of 39.4 million (Appendix Table 20). The inshore sockeye harvest was predicted to reach approximately 40.3 million fish. Runs were expected to exceed spawning escapement goals for all river systems. The projected inshore harvest for sockeye salmon was 52% greater than the previous 10-year average of 26.5 million (Appendix Table 5).

The 1995 forecast was based on spawner-return, sibling-return, and smolt-return relationships for each river where data were available. Return information prior to 1978 was omitted in calculations for east side river systems, but was included in calculations for west side river systems. Using recent years production data rather than all data reduced prediction errors for east side rivers during years tested (1984-1994). To further correct this tendency of under forecasting, the 1995 forecasts by river were increased by their respective prediction errors for the years 1984-94. The 1995 adjustments by river resulted in an overall increase of 32.9% for the total Bristol Bay forecast.

South Unimak/Shumagin Island Fishery

The inseason development of the South Unimak/Shumagin Island intercept sockeye fishery is closely monitored by Bristol Bay fishery managers for indications of migration timing, relative abundance, age composition and fish size in the incoming Bristol Bay run. Indications from these fisheries give the terminal fisheries managers notice of what to expect, and provides advanced warning of any potential differences that may exist between actual and forecasted run statistics. However, data obtained from these two fisheries have not always given an accurate picture of the Bristol Bay run size. Onshore winds tend to move the fish into areas more accessible to the fleet, resulting in a higher catch per unit of effort, and high winds affect the fleet's ability to harvest their quota. Those variables in addition to unusual fish size or run timing can make the information difficult to interpret.

These fisheries are managed under a guideline harvest (quota) specified in 5 AAC 09.365, the South Unimak/Shumagin Islands June Fishery Management Plan, initially adopted in 1974 by the Alaska Board of Fisheries. The original intent of the Alaska Board of Fisheries was to prevent over harvest of sockeye runs bound for individual river systems in Bristol Bay.

The management plan was brought before the Board for review in February 1988. At that time the Board elected to maintain a traditional harvest pattern, and set maximum allowable harvest levels at 6.8% of the forecasted inshore harvest for Bristol Bay for the South Unimak fishery, and 1.5% of the forecasted harvest for the Shumagin Island fishery. In addition the Board set a maximum allowable catch of chums that could occur during the South Unimak/Shumagin Islands June Fishery. The "chum cap" has changed a great deal over the years, but presently it is set at 700,000 chums.

The sockeye harvest allocation for the South Peninsula June fishery this season was 3,646,000 (2,987,000 for South Unimak and 659,000 for the Shumagins), based on the 1995 projected harvest in Bristol Bay. Preliminary catch information indicates that the Shumagin Island fishery landed 654,000 sockeye, and the South Unimak fishery landed 1,451,000 sockeye. The total catch for the June fishery of 2,105,000 was 42% under the total allocation. Due to the low incidental harvest of chum salmon (537,000) in the directed sockeye fishery, the allowable cap of 700,000 was not exceeded. A total of 362 hours of fishing time was allowed during a total of 18 days at South Unimak. The Shumagin fishery was allowed a total of 355 hours of fishing time during 17 days. In summary, even though the amount of fishing time was the greatest allowed in the last ten years of the fishery only 58% of the allocation was caught. Though the Bristol Bay sockeye return was 7.3% above forecast, the sockeye were not available in large numbers to the June South Peninsula fishery. For reasons unknown, Bristol Bay sockeye salmon were not very accessible to this fishery in 1995.

Port Moller Test Fishery

For many years the Department of Fish and Game ran a test fish program out of the community of Port Moller. A large vessel fished specific loran stations on a transect line across the migration path of sockeye on route to Bristol Bay. Data collected was used to estimate run strength, timing, age and size composition. Though the performance was not always good, the project was very popular with salmon processors as it gave an additional indication of run size, which influences production capacity and the price paid to fishermen.

Through voluntary funding from the industry, the Port Moller test fish project was resumed and has been operated by staff from the Fisheries Research Institute (FRI), University of Washington since 1987. When the project changed leadership a newer more modern type of gear was employed, and a different method of fishing was used. Though the program is still plagued with gaps in the data due to unfishable weather and equipment breakdowns, recent data collected has provided a more accurate assessment of run size. Information concerning the project is shared with the department on a daily basis inseason and analyzed extensively by the Commercial Fisheries research staff in King Salmon.

Economics and Market Production

Until 1991, price disputes had not been a factor in the Bristol Bay salmon fishery for many years. This was due to the large increase in the number of floating fish processors and the establishment of individual market agreements with small groups of fishermen. However, a large expected reduction in the sockeye price in 1991 resulted in a major price dispute between fishermen and processors. A settlement was achieved and the fishery harvested approximately of 25.8 million sockeye salmon (Appendix Table 5) from a total run of 41.9 million (Appendix Table 20). There have been no price disputes since 1991.

In 1995, the exvessel value of the commercial salmon inshore harvest was estimated at \$185.9 million (Appendix Table 37). It was the third largest exvessel value on record with only the 1990 value of \$202.3 million and the 1992 value of \$193.7 million being larger. The 1975 to 1994 average exvessel value of Bristol Bay commercial salmon fisheries is about \$117 million. This was the thirteenth consecutive year that the exvessel value has exceeded \$100 million.

During the 1995 season, 10 companies canned, 37 companies froze and 6 companies cured salmon in Bristol Bay. In addition, 13 companies exported fresh fish by air, and 12 companies shipped salmon out by sea in refrigerated sea water (RSW) or brine (Table 34). A total of 43 processors/buyers reported catches from Bristol Bay in 1995 compared with 72, 62, 59, 59, 48, 30, 57, 42, 37, 36, 32, 33 and 36 in the years 1982 to 1994 (ADF&G AMRs 1982-94).

Run and Harvest Performance by Species

The combined commercial salmon harvest in Bristol Bay totaled 45.5 million fish in 1995. That catch was not only the largest in the last 20 years (Appendix Table 10), but it is the largest harvest ever recorded for Bristol Bay.

Sockeye Salmon

The 1995 inshore sockeye return of 60.7 million fish was approximately 10% more than the preseason forecast of 55.1 million (Table 1). Actual runs to individual districts were: 3% more than the forecast for the Naknek/Kvichak District, 20% more than the forecast for the Egegik District, 7% more than the forecast for the Ugashik District, 27% greater than the forecast for the Nushagak District, and 44% more than the forecast for the Togiak District (Table 1).

Sockeye salmon dominated the inshore commercial harvest, and totaled 44.4 million fish (Table 4). Sockeye escapement goals were met or exceeded in all river systems where spawning requirements have been defined except in the Nushagak-Mulchatna drainage (Table 1).

Chinook Salmon

Chinook salmon harvests in 1995 were below the recent 20-year averages in all districts except in Nushagak (Appendix Table 6). Though the 1995 bay-wide commercial harvest of 99,700 chinook was below the 20-year average of 114,000, it was the second largest catch reported since 1986.

Chum Salmon

In 1995, the inshore commercial harvest of 949,700 chum salmon was the seventh smallest since 1975 and well below the 20-year average of 1.2 million (Appendix Table 7). Chum salmon catches in Ugashik and Togiak Districts were about average, while harvests in all of the other districts were below average (Appendix Table 7).

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. The 1995 return produced a harvest of only 530 fish which is average for an off-cycle year (Appendix Table 8).

Coho Salmon

The 1995 bay-wide commercial harvest of coho salmon totaled 45,000 fish, which was 78% below the recent 20-year average of 203,000 (Appendix Table 9). Coho catches were well below average in all districts. Low abundance, a low price, and midseason closures were all factors in the below average production.

Season Summary By District

Naknek-Kvichak District

The total run of sockeye salmon to the Naknek-Kvichak District was projected at nearly 30.8 million fish (Table 1). Escapement goals were set at 10.0 million (range 6.0-10.0 million) for the Kvichak River and 1.0 million (range 0.8-1.4 million) for the Naknek River (App. Table 1). The district harvest forecast totaled 19.6 million sockeye. The actual run to the district totaled 31.8 million sockeye, and the actual harvest totaled over 20.4 million. The 1995 catch was the third largest on record for the Naknek-Kvichak District.

Preseason management strategy for sockeye salmon called for some openings early in the season to monitor both run size and age composition in the district. Catches and age composition at False Pass and Port Moller were monitored for marked differences from the forecast. Commercial catches and age class in the Egegik and Ugashik Districts were also closely monitored.

No forecast is made for chinook salmon in the Naknek-Kvichak District. Chinook catches have been declining in the district in recent years, though effort levels have increased (Appendix Table 6). Due to a 500% increase in effort over the last twenty years observed during the pre-emergency order fishery and a 200% increase noted in the post-emergency order fishery, it was necessary to reduce the weekly fishing schedule from five to four days per week. In addition, on June 1, 1995 an emergency order went into effect that prohibited the use of gillnet mesh larger than 5.5 inches until July 17, to afford additional protection to the chinook salmon stocks.

The 1995 salmon season in the Naknek-Kvichak District started by regulation on June 1, but the first recorded commercial landings did not occur until June 12 and consisted of small catches of sockeye and chinook salmon (Table 14). The first significant catches of sockeye occurred on June 19 after the three-day weekend closure. The weekly fishing schedule ended at 9:00 a.m. Thursday, June 23 with the harvest totaling 195,795 sockeye, 1,606 chinook and 6,186 chums. The sockeye catch for the pre-emergency order period was 25% greater than the recent 20-year average.

The emergency order period in the Naknek-Kvichak District started at 9:00 a.m. on June 23. On June 21 the Naknek tower project started counting, the Kvichak tower began their counts on June 23 (Table 25). The inside test fish project started drifting on June 21 (Table 27). In the morning of June 24 a stock I.D. test boat was fishing a transect just offshore of Libbyville when they started to catch a good volume of fish. The department technician onboard observed that throughout the day the volume off fish seemed to increase. In the morning of June 25 a district test boat was sent out to fish the east side of the district (Table 8). The highest indices were recorded at the cutbank and on the Johnson Hill line at the beginning of the flood. The Naknek tower count had jumped to 9,500 fish an hour by 2 p.m.. At 3 p.m. an announcement was made opening the Naknek Section for a 11.5-hour period.

The catch for the period totaled 270,000 sockeye (Table 14). Escapement past the Naknek tower as of 6:00 a.m. June 26 was 145,000 sockeye. An aerial survey of the Kvichak River in the late morning of the 26th produced an estimate of 650,000 fish. A 10-hour fishing period was announced for the entire district. The period was extended in the morning of June 27 for an additional 12 hours. Escapement past the Kvichak tower through June 27 was 315,000 fish, the Naknek tower count stood at 225,000 fish (Table 25). The catch for the June 26-27 fishing period totaled over 1.1 million, this is the largest catch for those dates on record. The Port Moller test fishery on June 27 estimated that 25 million fish had passed in route to Bristol Bay (Table 6).

The Naknek Section was opened for eleven hours on June 28, escapement past the Naknek tower through the 28 was 240,000 sockeye which was 2 days ahead of schedule (Table 25). A second 12.5-hour Naknek Section opening was given on June 29. The Kvichak River's escapement was lagging by a day, the total escapement through June 29 was 940,000 fish. The peak daily district registration occurred on June 30 when 943 drift fishers were legal to fish (Table 13).

The Naknek Section was extended for an additional 12 hours, at the same time a Kvichak setnet only period was announced for 12.5 hours. The setnet only period was announced due to the allocation plan that pertains to the Kvichak setnet fishery. The district wide catch totaled 856,000 fish bringing the seasons catch to 4.0 million. The Naknek Section was extended again for 12.5 hours on June 30. The Kvichak Section was opened to both gear types at the same time based on an aerial survey of the Kvichak River which produced an estimate of 850,000 fish which when combined with the tower escapement brought the total to over 2.0 million fish. The catch totaled 1.3 million for July 1 (Table 14). The Naknek Section was extended until 3:30 a.m. July 2, the Kvichak section was open to both gear types the last 12.5 hours of the extension. The Naknek Section reopened for a 12-hour period on July 2, starting at 4:00 p.m. The fleet was told to standby at 10:00 p.m. July 2 for a possible announcement for an extension. The catches in the Naknek section were flat so the period was allowed to close as scheduled. The Naknek tower count through July 2 was 356,000, the Kvichak tower count stood at 2.4 million with an estimated 500,000 fish in the river.

The Naknek Section opened for a 11.5-hour period on July 3, the fishers in the Kvichak Section were told to standby at 8:00 p.m. for an announcement. At 8:00 p.m. it was announced the Naknek Section would close as scheduled, the Kvichak Section would open for setnets only for 10 hours. Escapement rates into the Naknek River had slowed to the point that a two tide closure seemed necessary rather than a one tide closure. On July 4 the fleet was told to standby for a possible short notice opening on the evening tide. To prevent excess escapement during the second tide closure a test boat fished in the Naknek River during the beginning of the second flood in the evening of July 4. The test boat had several large indices near the Peter Pan dock (Table 8). At 8:00 p.m. a period was announced to begin at 9:00 p.m., it would be for the Naknek Section only and last eight hours. A total of 700,000 fish were caught on July 4 bringing the district's total catch to 7.2 million fish. A Naknek section opening of 11.5 hours was announced on July 5, the Kvichak Section was opened at the same time for setnets only based on the escapement in the Kvichak River having reached the minimum goal of 4.0 million. In accordance to the allocation plan, from this point on any time a Naknek section period was scheduled the Kvichak Section would open at the same time with only the setnets fishing. The Naknek-Kvichak District was extended an additional 10 hours until 6:30 a.m. July 7.

The catch for July 6 totaled 1.9 million fish, this would turn out to be the largest single days catch of the year. The Kvichak tower count through July 7 was 4.9 million with an additional 2.0 million fish in the river (Table 27). The Naknek tower count was 660,000 fish. An aerial survey of the Kvichak River was flown in the morning of July 8 and

2.2 million fish were observed. This was the largest daily aerial estimate since 1980 when over 22.0 million fish escaped. The district reopened to fishing for 25 hours on July 8. The Port Moller test fish program had estimated that over 53.0 million sockeye had passed en route to Bristol Bay (Table 6).

The catch for the district through July 9 was 12.6 million fish. The Naknek tower count had exceeded the lower end of its escapement range of 800,000 by 40,000 fish. The district reopened for a 13-hour period on July 10. Through July 10 the Kvichak tower count totaled 7.7 million fish, the largest daily passage of the season occurred on July 9 when 1.1 million fish passed the tower, the passage rate averaged over 45,000 fish an hour. A 13.5-hour period was announced for the entire district on July 11. The catch for July 11 was over 1.2 million fish bringing the total district catch to 15.4 million fish. Inside test fish indices had been dropping off since July 9, the daily Kvichak tower counts had dropped to less than 400,000 fish. Based on these reasons the Naknek Section along with the Kvichak setnets were opened for a 13.5-hour period on July 12. The Naknek tower count through July 12 was 965,000 fish with a daily escapement of 68,000 fish. To try and slow the Naknek escapement a 24.5-hour extension was given to the Naknek Section and the Kvichak setnets. An additional 25-hour extension was given until July 15 when the district would open to both gear types for 14.5 hours. Inside test fish indices had improved from July 11 through the 13, the Kvichak tower count totaled 8.7 million fish through July 14. The Naknek Section along with the Kvichak setnets were extended for an additional 25 hours. The catch through July 15 was 18.3 million fish.

On July 16 the Naknek tower escapement totaled over 1.02 million fish, 1.0 million being the point goal, the Naknek Section and the Kvichak setnets were opened for 12 hours until 4:00 a.m. July 17. Through July 16 the Kvichak tower count stood at 9.0 million, with an additional 175,000 fish in the river. The point goal was 10.0 million which left 800,000 fish yet to be accounted for, based on this shortfall the emergency order period was extended until further notice. The Naknek Section along with the Kvichak setnets were extended for 74.5 hours until 6:30 a.m. July 20 at which time the emergency order period was rescinded. The Kvichak River's escapement through July 19 totaled 9.7 million fish, historically an additional 3.5 percent has escaped after July 19. The catch through July 20 was 19.5 million just 150,000 fish short of the forecasted harvest. As of 6:30 a.m. July 20 the district went to its regular weekly fishing schedule of four days a week, Monday 9:00 a.m. until Friday 9:00 a.m..

Total fishing time during the E.O. period is as follows: 1) 260.5 hours Naknek Section only, 2) 135.0 hours Naknek-Kvichak district, 3) 209.5 hours Kvichak s Section setnets only. The Naknek tower counted through midnight July 21. A total of 1,111,140 sockeye were counted, which was slightly over the point goal of 1.0 million but within the upper range of 1.4 million. The Kvichak tower counted through July 26, a total of 10,038,720 sockeye were counted which is 38,720 over the 10.0 million point goal.

The week of July 24-28 saw catches of sockeye drop to a daily total of approximately 20,000 fish. Coho catches were somewhat lower than normal, however; historically, significant catches do not begin until the first week of August. Effort levels were low with combined gear deliveries averaging 250 a day. Only four buyers were buying during the last week of July. Two buyers remained in the district for the next week of fishing. Deliveries dropped off sharply to a daily combined total of 70.

The last deliveries in the district occurred on August 4. A total of 27 buyers purchased fish in the Naknek-Kvichak District in 1995. The sockeye harvest totaled 20.4 million, the third highest catch on record (highest was 21.6 million caught in 1983). The chum harvest totaled 237,524 fish, which is just below the recent 20-year average of 266,000 (Appendix Table 7). The commercial harvest of 5,339 chinook was slightly lower than the recent 10-year average catch of 5,800 chinook (Appendix Table 6). Coho salmon catches totaled 981, the lowest catch since 1978 and far below the 20-year average catch of 8,830. Some possible reasons for this drop in catch are, first, effort levels were below average late in the season, and second, the district normally has deliveries until the middle August which is when the bulk of the coho are caught. Subsistence catches listed in Table 36 are about 16% below the recent 20-year average of 95,900 salmon (Appendix Table 39).

Egegik District

The 1995 sockeye salmon run to the Egegik District totaled 15.7 million fish, the third largest run on record (high was 23.1 million in 1993). It exceeded the preseason forecast of 13.1 million sockeye, and yielded the third largest commercial harvest recorded over the 101-year history of the fishery, 14.5 million fish (Table 1). An escapement of approximately 1.3 million fish was attained, slightly above the 1.0 million fish point goal. Total Egegik District sockeye runs during the past eight comparable cycle years dating back to 1955 have ranged from 0.9 to 12.6 million fish with a mean of 4.8 million, so the 1995 run ranks largest on record for this cycle-year (a little over 3 times the cycle-year average).

The 1995 ADF&G preseason Bristol Bay sockeye salmon forecast projected a total inshore run of 55.1 million fish, and a harvestable surplus of approximately 40.3 million fish. The projected Egegik District harvest of 12.1 million sockeye comprised 30% of the predicted bay-wide harvest, the second largest harvestable surplus in the bay (Table 1).

The Board of Fisheries met during January 1995 but made no major changes to the regulations in effect for the district. They rejected proposals that would have curtailed ebb fishing to varying degrees in the district, and they maintained current district boundaries. The most significant new regulatory language adopted addressed factors that could lead to reduction of outer Egegik District boundaries in response to biological concerns in

adjacent districts...a situation not expected to occur during the 1995 season. Thus, for the most part, regulations were the same as those in effect the past two seasons. As the season approached, fishermen were informed that due to improvement in Egegik chinook salmon escapements the past three years the fishing season during June would start on schedule, but with use of large mesh gillnets prohibited.

The commercial salmon season commenced in the district on June 1 with the first landings recorded June 6 (Table 15). Only a very limited fishing effort and small catches of sockeye, chinook, and chum salmon were reported through 9:00 a.m. June 16, when district management went under emergency order.

Daily test fishing to provide estimates of sockeye passage into the lower portions of Egegik River began June 16 at the usual sites just upstream of Wolverine Creek (Table 29). Initial test fishing drifts yielded above average sockeye catches. A June 19 aerial survey of Egegik River/Lagoon yielded an estimate of approximately 3,000 sockeye in the lagoon, an average showing for the earliest fish in the escapement. None were noted in Egegik River upstream of the lagoon. The Egegik River salmon counting towers, providing daily estimates of sockeye passage into Becharof Lake, began operation June 19 (Table 26).

The commercial fishery was kept closed from the onset of the emergency order period through June 18 to provide an opportunity for early-run sockeye and mid-run chinook to enter the escapement. Given the very large forecast, the smaller than usual fleet (only 228 drift vessels registered for Egegik on June 18), and a desire to distribute the sockeye escapement a little later into the run than during the past few years, not as much emphasis (compared to the last decade) was placed on obtaining 10% of the sockeye escapement from the earliest portion of the run prior to beginning heavy exploitation of the sockeye run. Inriver test fishing results through June 17 were four times greater than average so the first emergency order fishing period (10 hours) was scheduled for June 19. This "shakedown" opening was the earliest announced since the Egegik District emergency order period dates were advanced from June 23 to June 16 in 1990.

Participation in the June 19 opening was modest with approximately 220 drift and 92 setnet deliveries reported. However, the catch of approximately 80,000 sockeye (Table 15), was the largest ever taken in the district on that date. Sockeye catch per delivery data from both gear groups for the day were well above historic averages (driftnet catch = 326 sockeye/delivery vs. historic average of 109; setnet catch = 100 sockeye/delivery vs. historic average of 23). Inriver test fishing results through June 19 suggested roughly 60,000 to 65,000 sockeye had entered the Egegik River system...a good showing for so early in the run. Port Moller test fishing results through June 19 yielded the highest cumulative indices on record dating back to 1985. Given these strong performance indicators another 10-hour commercial opening was scheduled for June 21.

The June 21 opening commenced at 6:30 a.m. under good fishing conditions (high overcast, light westerly winds 5-10 mph). An aerial survey of the fishery was flown at 10:00 a.m. (high water) and light catch success was noted throughout the district. Fleet size was double June 19 levels (455 drift and 142 setnet deliveries reported) but fish abundance was more modest. The fishing period was allowed to close on schedule. A catch of 67,000 sockeye was taken, the fifth largest catch on record from the district for that date. Sockeye escapement past Egegik River counting tower through June 21 totaled 21,000 fish, with another 97,000 indicated downriver based on inriver test fishing results. Given these results the fishery remained closed June 22 but another 10-hour fishing period was scheduled for June 23.

The June 23 opening commenced at 8:00 a.m. Reported catch success was quite good from driftnets in the outer district, particularly at the southern end. North line fishing was poor and setnets didn't produce well throughout most of the district. A total of 602 drift deliveries and 134 setnet deliveries were reported yielding a catch of 374,000 sockeye. Once again this was the largest sockeye catch ever reported for the district for June 23, and it brought the cumulative catch through June 23 to 526,000 (average cumulative sockeye catch through this date has been 178,000). Additionally, the cumulative chinook catch totaled approximately 400 fish, a very weak chinook catch, partially due to restrictions placed on the use of large mesh gear (a measure taken to protect chinook passing through the fishery). The chum catch remained undetermined at this point as few companies were separating chum salmon from sockeye salmon.

Sockeye harvest results through June 23 from the South Unimak and Shumagin Islands intercept fisheries were very modest leading to uncertainty in some quarters regarding over-all run characteristics. Fish size was reportedly unusually small in some of the daily catches and some of the test fisheries from the South Unimak and Shumagin Islands areas. However, the Port Moller test fishing boat was still registering the second largest indices on record indicating strong fish movement past that area. None of the other districts of Bristol Bay were performing with unexpected sockeye strength yet. Given these factors, the management approach for the Egegik sockeye run utilized a short fishing period every other day (fishing every fourth tide cycle). Thus the fishery remained closed June 24 and the next opening (10 hours) was scheduled for June 25.

The June 25 opening began at 9:00 a.m. under overcast skies and west winds at 10-15 mph. A strong push of fish into inner Egegik Bay was in progress as the period commenced and nets (both gear types) throughout the district were very productive. A total of 619 boats, the largest fleet of the season (Table 13), were registered for the district. The catch from this opening totaled 986,000 sockeye, the second largest catch ever recorded from the district for June 25, bringing the cumulative catch to 1.5 million, far above the 1960 to 1994 average cumulative catch for the date of 300,000 sockeye. A survey of Egegik River and Egegik Lagoon at noon yielded estimates of 45,000 and 36,000 fish respectively, bringing the visually confirmed sockeye escapement to at least

107,000 fish. Given indications that a relatively large catch had been obtained the fishery was allowed to close on schedule.

Historically, the cumulative Egegik River sockeye escapement count past counting towers through June 25 has averaged 33,000 fish, with a high of 621,000 in 1993. Through June 25, 1995 it totaled 55,000 fish, the third largest count on record for this date. Given that fairly large sockeye escapement component, the well above average cumulative catch, and the continuing above average Port Moller test fishing indices, there was ample indication at this point to suggest that Egegik was experiencing a very strong sockeye run. As it was evident that the rate of escapement needed to be slowed somewhat the fishing schedule rotation was advanced from fishing every fourth to fishing every third tide cycle in the district. The next 10-hour fishing period was announced for late evening June 26.

The escapement rate increased again on June 26 with inriver test fishing suggesting approximately 293,000 sockeye had entered Egegik River thus far and with 137,000 of these counted past Egegik River counting towers. The June 26 Port Moller test fish results were the second highest on record indicating good run strength should be expected in inner Bristol Bay waters around the 4th of July, the traditional peak of the bay fishery.

The June 26 opening commenced at 11:15 p.m. under SE winds 15-30 mph and partly sunny skies. Catches were again strongest from inner Egegik Bay waters as another pulse of sockeye into Egegik River was in progress at the opening. Catches were somewhat spotty from outer district waters. The opening closed on schedule at 9:15 a.m., June 27 yielding a catch of 510,000 sockeye.

The cumulative sockeye escapement count past Egegik River tower through midnight June 27 totaled 225,000 fish, a level normally reached historically on or about July 3...indicating the escapement was about 6 days ahead of schedule. The cumulative commercial sockeye harvest totaled 2.0 million fish, more than four times the historic average level of 493,000. With additional fish indicated present inriver (test fishing suggested 141,000 between the fishery and the counting tower), another 10-hour fishing period was announced scheduled to commence at 11:30 a.m. June 28.

The June 28 opening commenced under sloppy seas and easterly winds at 20-40 mph. An aerial survey of the fishery was conducted at 2:30 p.m. and observations of fleet success suggested good catches were being made from drift boats throughout much of the district. Good setnet success was noted from just outside Coffee Point all the way upriver to the inner marker along the north bank of Egegik Bay. Setnets along the southern bank of the inner bay were not as productive, and setnets along the north outer beach appeared to be doing relatively poorly. Counts at the counting tower were increasing rapidly (152,000 fish counted during the first 18 hours of

the day), so at 6:00 p.m. an announcement was broadcast extending the fishery another 13.5 hours until 11:00 a.m. June 29.

The June 28-29 opening yielded a total catch of 1.4 million sockeye, bringing the cumulative catch to 3.4 million. After fishing 23.5 hours over these two days the fishery closed on schedule. However, due to further large increases in the escapement count (cumulative count as of 10:00 a.m. June 29 was 436,000 fish...a level normally attained on about July 7) the fishing schedule rotation was again advanced by a tide cycle (from fishing every third to fishing every other tide cycle) and the next opening (10 hours) was announced for 1:30 a.m. June 30.

The sockeye runs to other eastside districts had begun to show some strength by this point. The Naknek-Kvichak District catch totaled 2.9 million fish (right on schedule), and the Ugashik catch stood at 410,000 (three days ahead of schedule). The cumulative 1995 Port Moller test fish indices were still the second highest on record. Inshore age composition data from the Egegik District catch showed a reasonably close match with the forecast for the major age group, age 2.2 sockeye. Catch to date comprised 61% age 2.2, versus a forecast estimate of 59%. Escapement at Egegik River tower showed 53.5 % age group 2.2 fish. So all signals were still positive for a very large Egegik District run.

The June 30 opening commenced under drizzle, 15-25 mph SE winds, and near darkness, at 1:30 a.m. An aerial survey of the fishery was conducted from 7:30 to 8:15 a.m. and once again fishing success appeared to be quite good from inner Egegik Bay setnets (particularly those on the north side), inner bay drift boats, and North line drift boats. The escapement past Egegik tower as of 6:00 a.m. June 30 totaled 530,000 fish (53% of the desired point goal) putting it about nine days ahead of its more usual performance curve, so at 9:00 a.m. June 30 an announcement was made extending the fishery another 12 hours until 11:30 p.m. June 30. Fishermen caught 955,000 sockeye during this opening bringing the cumulative district sockeye harvest to 4.3 million fish, 36% of the preseason forecast harvest for the district. The period closed on schedule after 22 hours of fishing.

By 6:00 p.m. June 30 the sockeye count past Egegik River counting towers totaled 627,000 fish, a level normally reached on July 9. Cumulative Port Moller test fishing index values were still near record levels with indices suggesting a total cumulative passage of 37 million fish, and still at least a week of strong fish movement was expected past that location. With these factors in mind, another 10-hour commercial fishing period was announced for the Egegik District scheduled to commence at 1:45 p.m. July 1.

The July 1 opening occurred under SE winds at about 30 mph. Catch success observed from an airplane about three hours into the opening appeared to be moderate in driftnets and poor to fair in the setnets. Best catches

were noted near the north line. During the survey lots of fish were noted moving south along the beach towards the district from the north, so a 12.25-hour extension was announced during the evening allowing the fishery to continue until 12:00 noon July 2. The 22.25-hour opening effectively curtailed the rate of sockeye entry into the lower portions of Egegik River as test fish indices dropped significantly (Table 29). It produced a catch of 875,000 sockeye.

By 3:00 p.m. July 2 the sockeye escapement past Egegik River counting tower had reached 736,000 fish (74% of the point escapement goal), the second largest count on record for this date. The district cumulative commercial sockeye harvest was also the second largest on record totaling approximately 5.2 million fish. Given these factors, and with the peak of the run due to arrive shortly, a 10-hour commercial opening was announced scheduled to commence at 3:00 a.m. July 3, following a single tide cycle closure.

The July 3 opening commenced under SW winds at 10-15 mph. Initial sets throughout the district were moderate but catch success from inner district waters quickly tailed-off thereafter. Good catch success continued for drift boats along the west line and at the outer district corners throughout the period. With the rate of escapement into the river slowing substantially, the practice of permitting one tide cycle closures between openings seemed to be producing desired results. Given the above factors the fishing period closed on schedule at 1:00 p.m. July 3, and the next 10-hour period was announced to begin at 3:45 a.m. July 4. The July 3 catch totaled 581,000 sockeye.

The July 4 opening commenced under westerly winds at 10-20 mph and sunshine. A strong push of sockeye into the inner bay and lower portion of Egegik River was in progress at the opening and catch success by both gear types throughout the district was very good. An aerial survey conducted at 8:30 a.m. to 9:15 a.m. confirmed the strong fishery performance, and once again the inriver test fishing indices began to climb noticeably. With 757,000 sockeye (76% of the desired point escapement goal) already accounted for past Egegik River counting tower through midnight July 3 it was necessary at this point to extend the fishing period to prevent unnecessary escapement from occurring. A 12-hour extension was announced at mid-morning permitting the fishery to continue until 1:45 a.m. July 5. This 22-hour opening yielded a catch of 1.2 million fish, the largest daily catch of the season, bringing the cumulative catch to 7.0 million sockeye (58% of the preseason district harvest forecast).

Through July 4 the sockeye catch in adjacent districts totaled 7.2 million fish in the Naknek-Kvichak District and 1.2 million in the Ugashik District. Both districts' catch and escapement were performing nearly on schedule. The Port Moller test fishery indicated an estimated 49 million sockeye had passed that location bound for inshore Bristol Bay waters, so all factors continued to look good for reaching the district forecasts and

escapements. The cumulative Egegik sockeye escapement count through July 4 totaled 836,000 fish. Given these factors a 22-hour fishing period in the Egegik District was scheduled commencing at 5:30 p.m. July 5.

The July 5 opening began under sunny skies and light SE winds. It was a very productive opening with fish moderately well distributed throughout most of the district at its onset. An aerial survey of the district was flown about an hour into the period and fish were noted in both inner and outer district nets. Driftnet catches appeared best in the area between the Wards Cove cannery and Coffee Point and at the North line early in the opening while the best setnet catches were noted from the outer beaches and along the inner bay as far upriver as the Wards Cove cannery. Aerial observations upriver yielded an estimate of 36,000 sockeye in Egegik Lagoon. Inriver test fishing success dropped dramatically from levels registered the preceding day so it's apparent the opening was timed appropriately to prevent another large movement of fish into the river. The fishing period closed on schedule at 3:30 p.m. July 6 yielding a catch of approximately 1.4 million sockeye. In spite of these catch levels, the Egegik District fleet had dropped to approximately 460 boats. By this time, the fleet was more attracted to the peak cycle year return of the Kvichak River run in the Naknek-Kvichak District.

By noon July 6 the cumulative sockeye escapement past Egegik River counting tower totaled slightly over 900,000 fish (91% of the point goal) and the cumulative district sockeye harvest was approaching 8.4 million fish, so another 10-hour fishing period was scheduled for July 7. The period was scheduled for 10 hours rather than 22 hours at this point in order to provide a little more opportunity for chum salmon to pass through the district and into the escapement.

The July 7 opening commenced at 6:00 a.m. under SW winds 20-30 mph. Catch success was reportedly poor from inner bay waters but good from outer district setnets and very good from drift boats along the outer district (both north and south ends) during the ebb. The opening yielded a catch of slightly over 1 million sockeye and closed on schedule at 4:00 p.m. July 7. Given the large catch, another 10-hour opening was announced scheduled to begin at 6:15 a.m. July 8.

The July 8 opening occurred under sunny skies and light easterly winds (5-15 mph). An aerial survey conducted at 10:30 a.m. provided indications of somewhat "spotty" catch success around the district. Good drift boat and setnet success was noted from the northern portion of the district, and setnets were observed performing fairly well along the outer north beach all the way to Coffee Point and just upstream to the "Scow Chute". Upriver setnet catches appeared to be quite small. Drift boats along the west line were also noted with good sets. Another 31,000 sockeye were noted upriver of the fishery (Egegik River and Lagoon combined) but not yet to the counting tower site. Again the fishery was allowed to close on schedule, yielding a catch of 462,000

sockeye. This brought the district cumulative catch to 9.9 million sockeye (82% of the preseason harvest forecast), the second largest district harvest on record for this date.

Through 2:00 p.m. July 8 the Egegik River cumulative sockeye escapement count totaled 957,000 fish (96% of the escapement point goal) and additional fish were continuing to pass the inriver test fishing site downriver. The average attainment date of this escapement level has been July 17 historically. Due to both the high level of escapement and the very large cumulative catch another 10-hour fishing period was announced for July 9.

The July 9 period opened at 7:15 a.m. under overcast skies and 20 mph SE winds. By 9:00 a.m. July 9 the Egegik District sockeye escapement point goal of 1 million fish had been reached at the counting towers, so fishermen were advised that the 48-hour waiting period for transfers into the Egegik District was waived. The period ended on schedule and yielded a catch of only 248,000 sockeye. Another 10-hour fishing period was announced for July 10.

Through midnight July 9 the Kvichak River sockeye escapement totaled 7.0 million fish, still on schedule for a 10.0 million escapement. The Naknek River escapement totaled 839,000 sockeye, about 3 days ahead of schedule for a 1 million fish escapement. The Naknek-Kvichak commercial catch totaled 12.6 million sockeye. The Ugashik River sockeye escapement totaled approximately 143,000 fish past the counting towers with another 60,000 estimated downriver. The Ugashik District sockeye catch totaled 2.3 million fish. None of these adjacent district sockeye runs appeared to be facing any serious biological problems. The last day of test fishing from the Port Moller test boat was July 9 and the final cumulative passage estimate past Port Moller was 55.1 million fish. Thus far 39.9 million of those fish had been accounted for within Bristol Bay, so another 15 million fish were still expected. Egegik sockeye escapement had risen to 1.1 million fish. The upper range of the sockeye escapement goal at Egegik is 1.4 million fish.

The July 10 opening commenced at 8:15 a.m. under overcast and nearly calm conditions. An aerial survey conducted two hours into the period yielded observations of moderate initial drift and setnet catches. Setnet catches appeared moderate from the outer north beach to the mouth of King Salmon River (inner bay). There were also some good initial driftnet catches along the west and south lines. Not much fish volume was noted in Egegik River itself during this survey. The period was allowed to close at 6:15 p.m. and a catch of 656,000 sockeye was recorded. Another one tide cycle "window closure" was subsequently employed, to permit sockeye dispersal within the district and to allow continued opportunity for chum salmon escapement, and the next fishing period (10 hours) was scheduled for July 11. A fishing vessel damaged by a collision with another fishing boat was grounded and abandoned near the north district line during the July 10 opening. It subsequently sank at that location.

The July 11 fishing period opened at 9:45 a.m. under light SW winds and fog patches. Reports from the fishery indicated that initial sets by both gear types were quite successful from inner bay waters. Later in the afternoon the ebb fishery near the north line was reportedly very productive. At about 5:00 p.m. a spotter pilot report was received of a diesel sheen approaching the north line, emanating from the fishing boat that was damaged and sank July 10. The boat had been carried farther north overnight by the tides and its fuel was ebbing back towards the north line with the tide. An announcement was issued warning fishermen of this situation and requesting them to take measures to avoid contaminating their catches and their nets. Spill response authorities were notified. The spill was small and dispersed quickly enough that it was not detectable by July 12. The fishery was allowed to continue as scheduled until 7:45 p.m. July 11. It yielded a catch of 737,000 sockeye, bringing the district cumulative catch to 11.5 million fish, 95% of the preseason harvest projection. Another 10-hour fishing period was announced for July 12.

Through midnight July 11 the Ugashik River sockeye escapement totaled 166,000 fish past counting towers with another 90,000 estimated inriver, right on schedule. The Egegik River sockeye escapement had reached 1.1 million. Due to previously stated concerns regarding attainment of better chum and chinook escapements, and due to the continuing need to distribute fish as well as possible throughout the district, the practice of alternating 10-hour openings with one tide cycle closures was continued at this point. This tactic was employed five times over the interval from July 12 to July 17 as the sockeye run began to tail-off. It afforded fishermen a lot of opportunity to harvest excess sockeye while still providing "windows of opportunity" for chum escapement to occur. Inriver test fishing was discontinued after July 12 as sockeye escapement needs were met.

By the end of the Emergency Order Period, July 17, the district cumulative sockeye catch totaled approximately 13.6 million fish, 12% above the preseason district harvest forecast. At 9:00 a.m. Monday, July 17, the fishery reverted to its normal fall fishing schedule, 9:00 a.m. Mondays until 9:00 a.m. Fridays.

Sockeye landings in the district continued throughout July and August (Table 16), reaching a preliminary seasonal cumulative total of 14,461,228 fish. ADF&G personnel continued salmon escapement counts at Egegik River tower through August 30 recording a total count of 1,281,678 sockeye, and 7,470 coho salmon. Counting after July 22 was funded by the U.S. Fish & Wildlife Service. Aerial surveys of Shosky Creek and King Salmon River added another 830 sockeye to the above total, bringing the Egegik drainage total sockeye escapement estimate to 1,282,508 fish. There was one peak passage period at Egegik tower, the 6-day interval from June 26 to July 1, yielding an average daily passage of 113,000 fish. There were three days during which daily total counts at Egegik River tower exceeded 100,000 fish. Each segment of the run was fairly well represented in the escapement. The escapement sex ratio was 41% males to 59% females.

The age composition of the 1995 Egegik District sockeye run was as follows:

<u>Age Group</u>	<u>Catch</u>	<u>Escapement</u>
1.2	8%	9%
2.2	58%	65%
1.3	6%	3%
2.3	25%	19%
Other	<u>3%</u>	<u>4%</u>
Totals	100%	100%

The sockeye run was comprised primarily (65%) of progeny from the 1990 escapement of 2.19 million fish (5-year olds) with the 1989 escapement of 1.61 million producing an additional 26% (6-year olds). An average showing of age 2.1 jacks (1.5% of the escapement) from the 1991 escapement of 2.79 million fish was evident, suggesting these may have survived well and will be a stronger contributor in 1996.

Egegik District fishermen harvested 91.9% of the Egegik inshore sockeye run, well above the 1952-1994 (43-year) average of 77.5%. Preliminary catch data indicates drift gillnets took 90% of the sockeye harvest while set gillnets took 10%. Historically, over the period 1960-1994, drift gillnets have taken an average of 89% of the catch while set gillnets have averaged 11%. The 13,054,000 sockeye salmon delivered by drift fishermen was the third largest volume on record for that gear type, and the 1,407,000 sockeye delivered by setnet fishermen was the second largest catch on record for that gear group. Peak day in the fishery based on volume landed (1.22 million sockeye) was July 4, but peak catch per hour, 104,000/hr, occurred July 7. Peak catch per delivery for drift gillnets occurred July 7 with an average of 1,800 sockeye per delivery. June 25 yielded the peak catch per delivery for setnets, with an average of 409 sockeye per delivery. During the emergency order period, June 16 to July 17, a total of 279 hours were fished in the district, 38% of the 744 hours available. This total was a 33% increase from the 210 hours fished in 1994.

The commercial harvest of other salmon species in the Egegik District totaled 85,000 fish, less than 1% of the total harvest. The chinook harvest totaled approximately 700 fish, less than a quarter of the 1975 to 1994 (20-year) average of 2,900 (Appendix Table 6). Part of this below average chinook harvest was due to the prohibition of gillnets with mesh sizes larger than 5.5 inches in the fishery from June 1 to July 5. Additionally, keeping the district closed to fishing from 9:00 a.m. June 16 until 5:00 a.m. June 19 helped provide some peak run chinook the opportunity to enter the escapement (part of the chinook escapement re-building program). The district chum harvest totaled 63,000 fish, the second lowest harvest since 1979 and only 64% of the recent 20-year average of 98,000 (Appendix Table 7). Window closures were provided throughout the commercial fishery during late June and most of July, partially implemented to promote chum escapement, and these may have

contributed in limiting the chum catch to some extent. However, the overall chum run was well below average. Essentially no pink salmon were harvested this season, normal for an odd numbered year cycle. The district coho salmon harvest totaled 22,000 fish, well below the recent 20-year average of 34,000 (Appendix Table 9). The smaller than usual harvest rates, and the proclivity exhibited by some fishermen in the district to ignore weekend closure regulations lead to curtailment of the commercial coho fishery effective at 9:00 a.m., August 25. This measure became necessary in order to protect and promote needed escapements into both the Egegik and King Salmon Rivers.

Aerial surveys were conducted in the Egegik and King Salmon River drainages to provide escapement indices for chinook, chum, and coho salmon. The resultant escapement indices totaled 1,373 chinook, 2,403 chum, and 5,258 coho salmon. The chinook index was slightly above the 1981 to 1994 average of 1,319. The chum index (the sum of two surveys), is far below the 1982 to 1994 average index of 12,433. While "window closures" probably helped the chum escapement somewhat the escapement is still very much in need of rebuilding assistance. The coho index (funded by the U.S. Fish & Wildlife Service) represents the second system-wide index on record for this species. It was conducted September 27 to 29 and was comprised of 450 coho salmon noted in the King Salmon River drainage and 4,808 observed in the Egegik River drainage (4,740 of these observed in areas upstream of the Egegik River counting tower). Additionally, the department conducted escapement counts at Egegik River from counting towers during the interval from June 19 through August 30. Based on these counts, a total of 7,470 coho salmon escaped into the Egegik River rapids during the counting period. Adding elements from the two counting methods together at least 7,988 coho salmon can be accounted for in the system-wide escapement.

A total of 32 buyers operated in the district this season, down from 35 in 1994 (Table 33). Most of the harvest was taken aboard floating freezer processors or tendered to other districts for processing. There were no additional high volume shore-based buyers. There were no reports this season of individual buyers in the district reaching processing capacity limits leading to suspensions of buying, or of any processors placing fishermen on delivery limits at any time.

In summary the salmon season at Egegik was very productive. Fish volume was high, drift fleet size was smaller than recent years' levels and their success was very high, setnet catch performance was high, processors were able to handle the catches efficiently, and escapement needs were met in most cases (except for chums). Continued emphasis in the future on obtaining chum salmon escapement whenever it can be accomplished without generating too large a loss to the sockeye fishery is necessary as below average escapements have been recorded in four of the last five years. An inseason measure of chum escapement into King Salmon River would be very helpful in that regard. The sockeye escapement of approximately 1.3 million was within the

management range but quite a bit smaller than the escapements that have produced the massive returns over the last five years. Continued evaluation of the district's sockeye escapement goal in light of the large returns during the past decade should be emphasized.

Scales from Egegik District sockeye catches and escapement were gathered during the 1995 season and will be analyzed during the winter of 1995-1996. Results of these studies will be reported separately in the spring of 1996 by the investigators and should provide a better understanding of interception rates in the district during the 1995 season.

Ugashik District

The 1995 Ugashik District total inshore sockeye salmon return was approximately 5.8 million fish, or 7% above the preseason forecast of 5.4 million (Table 1). The commercial sockeye harvest of approximately 4.5 million fish was the third largest harvest ever recorded. The sockeye escapement was approximately 1.3 million fish. Comparable cycle-year sockeye returns over the last eight cycles dating back to 1955 have ranged from 318 thousand to 7.5 million fish with an average of 2.7 million, so the 1995 run was over twice the cycle-year average.

With the preseason forecast for the Ugashik District suggesting a harvest of 4.7 million sockeye salmon and the history of Ugashik sockeye salmon movement into the river that is equivalent to a sudden tidal wave, the management approach to effect such a large expected harvest and have some control over the wave, was to fish early and fish often. Accordingly, commercial fishers were advised that fishing periods in late June and early July would be possible with good indications of sockeye salmon abundance within the district. Given this approach, a larger than normal number of drift vessels decided to start their season at the onset of the emergency order period in the Ugashik District.

Initial landings occurred in the district June 12 (Table 16) with a few chinook salmon landed. Small catches were reported for the remainder of that week as only a few driftnet permits were actually fishing. During the week of June 19, effort and sockeye catches were increasing and by the onset of the emergency order period, at 9:00 a.m. June 23, the cumulative district harvest was approximately 61,000 sockeye, 1,100 chinook, and 1,100 chum salmon. These pre-emergency order period cumulative catches were above the recent 35-year (1960 to 1994) average for sockeye salmon, but below average for chinook and chum salmon. The district was allowed to close at the onset of the emergency order period pending the arrival of a stronger showing of sockeye salmon in the district.

The inriver test fishery, operating about three miles upstream of Ugashik Village, started June 24 and provided a daily estimate of sockeye passage into the lower section of Ugashik River. Over the next several days, inriver test fishing documented a very low level of fish entry into the Ugashik River (Table 29). On June 25, district test fishing (Table 10) indicated a fair abundance of sockeye salmon in the district and a 12-hour period was announced for June 26, beginning at 9:30 a.m..

A total of 64 vessels were registered for the district and 15 setnet landings were made during the first emergency order opening of the season. The June 26 opening yielded a harvest of approximately 93 thousand sockeye salmon. Though the catch was very good, inriver test fishing indicated that only about 1,000 sockeye had entered the lower Ugashik River and the fishery was allowed to close as schedule. The Ugashik River counting towers would not be operational for another week.

District test fishing continued on June 28 and again indicated a fair number of sockeye salmon showing in the district. At 6:00 p.m. a second emergency order fishing period was announced for the 29th. The 12-hour period began at 12:00 noon and produced a harvest of approximately 260,000 sockeye salmon. An estimated 97 vessels and 22 setnetters participated in this opening. An aerial survey of the fishery at 5:00 p.m. revealed that most of the fleet's fishing activity was taking place between Smokey Point and South Spit, well inside the district's western boundary line. Inner district setnets had very poor catches, but setnetters fishing along the Southern Spit did considerably better. Drift vessels averaged around 2,000 fish per delivery while setnetters averaged about 160 per delivery. Inriver test fishing was improved only slightly (Table 29) and indicated that about 4,000 sockeye salmon had now entered the river. The fishery closed as scheduled.

District test fishing continued on June 30 and once again showed a good number of sockeye salmon within the district. Catches at two sampling points above the inner district markers indicated that fish were moving into the river and inriver test fishing estimated that 9,000 fish were now in the lower river. With the total harvest for the district at around 420 thousand sockeye salmon or 9% of the expected harvest of 4.7 million, another 12-hour opening was scheduled for 1:30 p.m. July 1.

An aerial survey of the fishery at 6:00 p.m. revealed again good catches along the South Spit from both drift and setnet gear. There was also quit a bit of seal activity in the south channel. Setnet catches near King Salmon River and at Ugashik Village were fair, while cutbank catches were looking poor. The average setnet catch was 194 sockeye salmon per delivery which was the second highest catch per delivery on record for this date. Driftnet vessels average about 1,500 sockeye salmon per delivery. The fishery was allowed to close as scheduled, but fishers were advised that the next possible opening could occur as early as 2:00 p.m. July 2.

Through July 1 inriver test fishing had indicated that approximately 24,000 sockeye salmon had escaped. On the morning of July 2, an estimated 17,000 more fish passed the test fishing site. The total district harvest through the last period now stood at approximately 680 thousand fish, or 14% of the expected harvest. At 9:00 a.m., another 12-hour fishing period was announced to start at 2:00 p.m.. Fishing success was again good with driftnet landings averaging 1,700 sockeye salmon per delivery and setnet gear landing 225 fish per delivery. The fishery closed as scheduled and fishers were asked to standby at 8:00 p.m. July 3 for the next possible announcement.

District test fishing continued on July 3 and produced extremely positive results. The highest fishing index ever recorded for the Ugashik District, 4,542 points, was collected from one drift made near South Spit. Two other very good indices of 352 and 653 points were recorded from two drifts above the inner district boundary line between Muddy Point and Dog Salmon River (Table 10). The department observer aboard the test fishing vessel witnessed that 80% of the fish they caught above the inner district line were bucking the ebb tide to move up river. At 8:00 p.m., the fifth 12-hour opening of the emergency order period was announced for July 4 beginning at 2:30 a.m..

During this opening, approximately 167 drift vessels were registered for the district and each landed about 1,600 sockeye salmon apiece. Setnet catches were not as productive as the last opening and averaged only 99 sockeye salmon per landing. The harvest for this period was about 271 thousand sockeye salmon bringing the district's total catch to approximately 1.5 million fish. The fishery closed on schedule at 2:30 p.m. and another round of district test fishing was arranged for July 5.

Eight test fish stations were sampled in the district and yielded an average index of 236 sockeye/100 f/hour. The best index of 1,135 was obtained at 10:30 p.m. just below Ugashik Village indicating that a good push of fish were heading up river. Through July 5, inriver test fishing had accrued a total of 1,559 index points indicating that escapement was now around 125 thousand fish. The Ugashik tower count was approximately 11,500 (Table 25) or one day ahead of schedule. With a total of about 25 million fish passing Port Moller 10 days earlier (Table 6), it was now apparent that some of this abundance was showing in the Ugashik District. At 9:00 a.m. on July 6 a 25-hour fishing period, beginning at 4:30 p.m., was announced.

The 25-hour opening was a productive one with approximately 754 thousand sockeye harvested. Approximately 207 drift vessels fished this opening and made 457 deliveries averaging 1,600 fish per landing. Setnetters, however, did not do so well and averaged only 165 fish per delivery for 85 landings. The district's total harvest was now approximately 2.2 million sockeye salmon, or 46% of the expected harvest. The fishery closed on schedule at 5:30 p.m. July 7.

The escapement past Ugashik tower through July 7 totaled 89.4 thousand sockeye salmon and was two days ahead of schedule. Based on inriver test fishing indices, another 89 thousand fish were indicated downriver but above the test fishing site (Table 29). By 10:00 a.m. July 8, the total estimated escapement was around 203 thousand or 29% of the goal. This amount of escapement was about two to three days ahead of schedule and another fishing period was scheduled for 12-hours beginning at 6:30 a.m. July 9.

The July 9 opening was not as productive as the previous opening . The total period harvest was approximately 285 thousand sockeye salmon with driftnetters averaging 1,200 fish per delivery and setnetters averaging 110. The fishery closed as scheduled bringing the districts total harvest to approximately 2.5 million sockeye salmon or about 53% of the expected harvest. To date, approximately 93% of the return had been harvested and the managing approach at this time became tempered with caution.

For the next five days, very little escapement was gained as large minus tides backed fish in the district well outside of its boundaries. Aerial surveys revealed that the number of fish in the district was building with time, but very few fish were actually making it into the river. Commercial fishers and processors were both pressing for an opening, but with a lack of fish movement, only 29% of the escapement goal past the tower, and very few fish indicated in the lower river, no opening would be imminent. District test fishing occurred everyday since the 10 of July and had the same results: there were fish in the district but they were not entering the river. Things began to changed on the afternoon flood tide of July 14. The inriver test fish crew was sent to sample the area between Dog Salmon and King Salmon Rivers. They obtained an average index of 1,584 points which meant that approximately 126,000 fish were present in that area. Their results the results of the district test fishing vessel (Table 10) showed that a good number of fish were now entering the river. An aerial survey flown at 3:30 p.m. also revealed good signs of fish in the lower river between King Salmon River and Ugashik Village. With the positive test fishing and aerial survey results, and an estimated 2.9 million fish still expected to return to Ugashik, a 13-hour fishing period was announced starting at 11:00 p.m., July 14.

There were approximately 382 drift vessels legal to fish the Ugashik District at the beginning of this period This was very productive fishing period with a total harvest of about 813 thousand sockeye salmon. In fact, it was the largest 12-hour harvest ever recorded for the Ugashik District. Driftnet catches averaged 1,728 sockeye salmon per delivery, and setnet catches averaged 232. An aerial survey of the fishery conducted at 7:00 a.m. did not reveal any indication of strong catches by either drift or setnet fishers. As of July 15, the sockeye escapement past the Ugashik tower was approximately 209 thousand with only another 60 thousand fish estimated inriver below the counting tower, the fishery was allowed to close as on schedule at 12:00 noon July 15. The district's total catch was now approximately 3.1 million sockeye salmon or 66% of the preseason harvest prediction.

Though inriver test fish indices increased substantially on July 16, averaging 2,343 points (Table 29), the resulting estimated total sockeye escapement of 400 thousand was still 300 thousand fish short of the escapement goal. The emergency order period, which would have expired at 9:00 a.m. on July 17, was therefore extended until further notice. By regulation, however; district registration was no longer required after 9:00 a.m., July 17, and this became an issue of great concern to a number of Ugashik fishers who feared an onslaught of drift vessels.

An aerial survey conducted on the afternoon of July 16 revealed an impressive show of 'jumpers' along the South Spit for an area of approximately five square miles. 'Jumpers' were also seen from Cape Greig to Cape Menshikof. For the second night in a row, inriver test fishing at the King Salmon and Dog Salmon confluence was again indicating the presence of a large number of fish in this area. Test drifts averaged 1,830 index points which represented another 146 thousand fish. Given these signs of abundance, another fishing period was scheduled for 2:00 p.m., Monday, July 17.

The July 17 fishing period opened after the district registration requirement was lifted. The onslaught of drift vessels that Ugashik fishers feared was verified when an aerial survey conducted at 4:30 p.m. revealed that approximately 641 drift vessels were now fishing the Ugashik District. Catch success was mixed for drift vessels. Some of the 294 vessels fishing the inner district had very good catches while harvests for vessels fishing near the South Spit looked slow. Several outer district driftnet fishers also had good catches. The July 17 harvest averaged about 920 fish per delivery for driftnet gear and 525 fish for setnet gear. Besides revealing very good to excellent catches for most setnetters, the aerial survey also disclosed that lots of fish were present in the lower river just above the district boundary line. Indeed, another round of test fishing between King Salmon and Dog Salmon Rivers the evening of July 17 indicated that the number of fish in this area was still strong. Given this information, a 13-hour extension of the current fishing period was announced at 8:00 p.m..

When the 25.5-hour period closed at 3:30 p.m. July 18, a total of approximately 870 thousand sockeye salmon had been landed, bringing the cumulative harvest to about 3.9 million fish. The tower count as of 12:00 noon was approximately 317 thousand and there was another estimated 360 thousand fish inriver below the tower site. With the point escapement goal almost achieved, the fishery was scheduled to reopen after an 11.5 hour closure at 3:00 a.m. July 19.

The Ugashik District fishery remained open from July 19 to July 28. During this time, approximately 545 thousand sockeye salmon were harvested bring the season's total to about 4.5 million fish. Sockeye landings in the district continued through August reaching a preliminary cumulative total of 4,501,100 fish, the third largest harvest on record. Sockeye escapement counts at Ugashik tower continued through July 27 and totaled

approximately 1,304,000 fish. An additional 9,400 sockeye salmon in Dog Salmon River, and 7,700 sockeye salmon in King Salmon River were later counted during aerial surveys, August 14, bringing the Ugashik drainage sockeye escapement total to 1,321,100. The peak sockeye counts at the counting tower occurred July 18, 19, and 20 with over 200 thousand sockeye tallied on each of those days. The management objective of avoiding a large pulse of escapement, again fell short this year. The sockeye escapement sex ratio was 55% males to 45% females.

The age composition of the Ugashik District sockeye return was as follows:

<u>Age Group</u>	<u>Catch</u>	<u>Escapement</u>
1.2	5%	13%
2.2	39%	66%
1.3	8%	3%
2.3	46%	16%
Other	<u>2%</u>	<u>2%</u>
Totals	100%	100%

The commercial harvest of other salmon species totaled approximately 78,000 fish or 2% of the total district's harvest. The harvest of 1,530 chinook salmon was 61% below the 20-year (1975 to 1994) average of 3,900 (Appendix Table 6). Ugashik chinook escapement indices were mostly below average. The total drainage count of 2,840 was 48% below the 1980 to 1994 average of 5,460. Only Ugashik and Dog Salmon Rivers had chinook counts that were slightly above average. The chum salmon harvest of approximately 63,300 fish was average, while the coho harvest of 12,800 fish was 52% below the recent 20-year average (Appendix Tables 7 and 9). Chum salmon escapement indices were well below average with a cumulative drainage count of only 9,800. Pink salmon harvest in the Ugashik District was negligible in 1995 (Appendix Table 8).

The Ugashik District fishery harvested approximately 77% of the sockeye return in 1995 which was above the recent 20-year (1975-1994) removal rate average of 66%. Peak catch per hour occurred July 15 when approximately 813 thousand sockeye salmon were landed in 12 hours, or 68,000 per hour. Peak catch per unit effort in the district occurred July 7 for drift gillnets with 3,426 sockeye salmon landed per permit. For set gillnets, peak catch occurred on July 17 with approximately 737 sockeye salmon landed per permit. Based on preliminary catch totals it appears drift gillnets took about 95% of the sockeye harvest while set gillnets caught 5%. The 20-year (1975 to 1994) average percentages of the sockeye harvest by gear type are 90% for drift and 10% for set gillnet. The fishery was open 98 hours or 17% of the 576 hours available during the emergency order period.

A total of 23 buyers operated in the district during the season (Table 34), two more than last year. Nearly all the catch was either frozen on floating processors or tendered to other districts for processing. There were no reported instances of lack of processing capacity during the sockeye season. The strategy of allowing a little more fishing time early in the emergency order period held the interest of both commercial fishers and processors, and the quality of the 1.2 million sockeye caught by July 4 was reported excellent.

Nushagak District

The forecast for the 1995 chinook salmon run to Nushagak District totaled 177,000 fish, similar to the 20-year average run to this district (Appendix Table 30). The department manages the Nushagak fishery for an inriver goal of 75,000 chinook in the Nushagak River. This inriver goal accounts for a biological escapement goal of 65,000 spawners and additional fish harvested in subsistence and sport fisheries above the sonar enumeration site at Portage Creek. A projected surplus of 102,000 fish was available to the commercial and lower river subsistence fisheries. In recent years the subsistence harvest has averaged nearly 11,000 chinook (Appendix Table 46). Subtracting the average downriver subsistence harvest and an allowance for incidental harvest of chinook salmon (15-20,000 fish) in the sockeye fishery, approximately 70,000 to 80,000 fish were available for a directed commercial fishery. 1995 marked the fourth consecutive year that a directed commercial fishery was expected for chinook salmon.

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 5.3 million salmon, nearly identical the 1994 forecast (Table 1). Strength of the Igushik and Wood River components were anticipated to be average, but the Nushagak River run was expected to be less than the 1990 to 1994 average; 1.2 million compared to 1.8 million fish. Age composition of recent Nushagak River runs and recent aerial survey results of the Tikchik Lake spawning populations suggest that distribution of spawners is changing in the Nushagak system. The effects of such a change are unknown, but may adversely impact Nushagak sockeye production. The projected inshore harvest totaled 3.5 million sockeye, 10% greater than the recent 10-year average of 3.2 million (Appendix Table 5).

A variable escapement policy is in place for the Wood River system that allows fishery managers to adjust the sockeye escapement goal to optimize spawner distribution. Age composition analysis has shown that 3-ocean sockeye tend to spawn primarily in the rivers and large creeks of the Wood River system, while 2-ocean sockeye spawn primarily on lake beaches and small creeks. The variable escapement policy sets the desired escapement range at 800,000 to 1.2 million fish. When the department projects the 3-ocean component to comprise 60% or more of the age composition of the escapement, it may reduce the goal to 800,000 fish. If more than 60% of the escapement consists of 2-ocean sockeye, the department may adjust the goal upward to

1.2 million. About 48% of the 1995 sockeye run to the Wood River system was expected to be 3-ocean fish, while 52% was expected to be 2-ocean sockeye (Table 2). No inseason adjustment to the Wood River goal was anticipated based on the forecast.

Nushagak and Igushik River sockeye runs are managed to achieve biological escapement goals of 550,000 and 200,000 spawners. The Nushagak River goal is based on fish enumerated at a sonar site at Portage Creek. It includes 500,000 fish for the Nuyakuk/Tikchik system and 50,000 spawners for the tributaries of the upper Nushagak and Mulchatna Rivers.

The outlook for coho salmon in the Nushagak District was poor. A return of 83,000 fish was expected based on past relationships between spawners and returns. The department intended to manage the commercial coho salmon fishery to achieve an inriver escapement goal of 100,000 coho at Portage Creek sonar. The inriver escapement goal provides for a biological escapement goal of 90,000 spawners and additional fish for inriver subsistence and sport harvests. No projected surplus was anticipated for commercial harvests based on spawner return analysis.

The Board of Fisheries addressed Bristol Bay salmon proposals at a meeting in January. Two regulations were implemented that affected the 1995 season in the Nushagak District. First, the Board implemented a weekly subsistence fishing schedule during May and October within commercial district boundaries. Fishing was permitted during May and October, from 9:00 a.m. Mondays to 9:00 a.m. Fridays. The intent of the Board was to provide people residing within commercial districts the opportunity to harvest fish during these months; prior to the regulatory change, subsistence fishing was permitted only during commercial periods or by emergency order. Second, the emergency order period in the Nushagak District was extended through September 30. Prior to the Board meeting, the emergency order period ended at 9:00 a.m. July 17, at which time fishing in the Nushagak District resumed a 5-day weekly fishing schedule. As a result of this change, the department would manage the Nushagak District on an emergency order basis for the entire season, including the later portion when the coho and pink salmon fishery takes place.

Quality is a critical issue with chinook salmon; most markets are for fresh fish and chinook salmon have a tendency to watermark (become blushed pink or red) after exposure to freshwater. Managers allow fishing in early June to ensure quality and peak value, before run size can be estimated. With the marked improvement in the chinook runs in 1992 to 1994 and forecasted harvestable surplus, managers anticipated fishing time before escapement rates became significant.

Management strategy applied to the chinook fishery changed prior to the 1995 season. From 1991 to 1994, managers typically scheduled commercial fishing time after subsistence catch rates near Dillingham spiked, indicating passage of a large number of chinook salmon above the district. Annual chinook escapements have exceeded the inriver goal of 75,000 fish since the directed chinook fishery revived in 1992. Additionally, the recent chinook runs have been above average and stable. To avoid large movements of chinook into the river at any one time, managers intended to open the fishery during extended lulls in passage and following inriver pulses indicated by subsistence catch rates.

The department intended to minimize exploitation early in the sockeye run, when Nushagak River stocks are assumed to be more vulnerable to harvest, due to the relatively low forecast for Nushagak River sockeye. Additionally, the forecast for the Igushik River run and large escapements in recent years prompted an aggressive management strategy to increase exploitation on that stock.¹ Managers advised fishermen to anticipate openings in the Igushik Section to harvest sockeye surplus to the Igushik River escapement goal.

Due to the poor coho outlook, poor recent brood year production, declining run size and poor success in achieving escapement goals, managers advised fishermen that little or no directed commercial fishing would take place for coho salmon.

The new Board of Fisheries regulation permitted subsistence fishing in the commercial fishing district during May on a weekly basis, from 9:00 a.m. Mondays to 9:00 a.m. Fridays. Since a limited commercial chinook fishery in early June was likely, an emergency order was issued on May 31 allowing subsistence fishing to continue in the commercial district through June 6 (Table 12).

Staff intensively monitored subsistence chinook catches on local beaches and at Lewis Point, and sonar counts of chinook at Portage Creek. Subsistence catch rates in the lower rivers near Dillingham remained low throughout early June during calm weather. On June 6, staff extended subsistence fishing in the commercial district until 6:00 a.m. June 8.

The first and second commercial openings of the season occurred on June 8 and June 13, for 8- and 7-hour durations (Table 17). Unlike commercial openings for chinook salmon in recent years, managers scheduled these openings with little indication of chinook escapement in the lower river subsistence areas. The intent of these openings was to harvest some of the volume in the district to avoid a large build-up, and uncontrolled

¹ Sockeye production in the Igushik system has declined considerably when escapements exceed the upper range of the escapement goal. Since 1989, escapement in the Igushik system has exceeded the point goal every year, and exceeded the upper range in four years. Therefore it remained imperative to increase exploitation of the Igushik stocks in 1995.

surges of fish into the river. Openings were timed to correspond with openings in recent years to obtain comparable catch rates to use as a potential run strength indicator.

Harvest resulting from the first opening was low, in spite of a drift fleet estimated at 209 vessels by aerial survey. Winds during the first opening and at the start of the second were calm. Mid-way into the June 13 opening, winds increased from the south to 20 knots. Fishermen landed nearly 15,000 chinook in the second opening, when 293 vessels were observed fishing.

Fishermen reported the first large subsistence catches of chinook near Dillingham and in Wood River on June 14 during a 5-10 knot wind from the south. Catch rates averaged over ten fish per net each tide on June 14 and 15 on both Kanakanak and Scandanavian Beach. Nets on one tide at Scandanavian Beach averaged 69 fish. Lewis Point nets reportedly picked up the evening of June 14, and averaged nearly 50 fish per net on June 15.

Prior to the increase in subsistence catches, chinook escapement at Portage Creek was similar to expected levels (Table 26). Chinook counts began to increase June 14, when 1,000 passed the sonar, and continued to increase through the early morning June 15. By 2:00 p.m. June 15, the daily un-apportioned count totaled 3,700 fish.

The third commercial opening was announced for ten hours beginning at 3:30 a.m. June 16, following the increase in subsistence catches and corresponding increase observed at the sonar site. High passage rates at the sonar site continued through 10:00 a.m. June 16. Chinook escapement at that time totaled over 5,000 fish, and was two days ahead of expected levels.

Chinook harvest prior to the June 16 opening was well behind expected levels, assuming forecasted run strength and average timing. Companies reported very slow fishing during the opening, under calm weather conditions.

Therefore, staff issued an emergency order mid-period, extending the opening in progress for an additional seven hours. Weather conditions remained calm, and fishing was reportedly slow during the entire period. The harvest of approximately 17,400 chinook (Table 17) was the largest daily chinook harvest of the entire season. Effort reached the season peak during this opening, when 347 vessels were observed during an aerial survey.

Three commercial openings occurred between June 18 and June 22, for durations of seven to eight hours each. These openings were scheduled with the intent of keeping cumulative catch and escapement levels similar to those expected based on the pre-season forecast and average timing.

Weather during this period remained calm, and harvests ranged from 7,000 to 9,000 chinook per opening. Fishing effort declined following the June 16 opening, as fishermen began to anticipate the approach of the

sockeye season. By June 22, drift effort had declined to 170 vessels. Market conditions also worsened during this period; most companies reduced prices paid for chinook salmon to \$.60 to \$.65 per pound, down from the previous \$.70 to \$.75 per pound.

Mesh size was unregulated through June 22; fishermen could use mesh of their choice. Prior to June 19, mesh size used in the fishery was predominantly large mesh (6 3/4 inches and greater) gear. The use of small mesh gear apparently increased June 19. Considering reports from companies and fishermen, approximately 20 to 30% of the gillnets in use June 19 were small mesh sockeye gear. The sockeye:chinook ratio approximated 1:1 in the June 19 harvest.

Small fish dominated chinook escapement samples collected at the sonar site, consistent with reports from subsistence and sport fishermen inriver. Age 1.2 chinook comprised 40% of the chinook escapement from June 14 to June 19, based on samples collected during that period. Age composition of the harvest contained a much smaller component of these small fish (11-15%), indicating a high exploitation rate on larger, more productive age classes. However, staff expected age composition of the escapement to decrease when the fleet switched from large to small mesh gear in the pending sockeye fishery.

Inseason chinook run strength assessment was difficult through July 22. Catch rates through this date were not useful; weather conditions were consistently calm during each opening, openings were timed differently than past years, and effort was much larger than during recent years. Few signs indicated chinook run strength different from forecast.

Following the June 22 opening, cumulative catch and escapement estimates for chinook salmon were within one day of expected levels. Subsistence catch rates of chinook salmon near Dillingham were low, and passage at the Portage Creek sonar was steady and moderate. Subsistence catch rates increased the morning of June 24 for the second time of the month. Nets at Scandanavian and Kakanak Beach averaged over 12 and 7 chinook salmon per net.

Sockeye and chum salmon began to appear June 20 to June 22. Subsistence fishermen began to report sockeye salmon in nets June 20, and the Port Moller test boat results indicated a strong early portion of the sockeye run (Table 6). Commercial sockeye and chum catch increased in the district June 22; 28,000 sockeye and 30,000 chum taken that day greatly outnumbered the chinook harvest of less than 9,000 fish.

Greater numbers of sockeye salmon were beginning to show in the rivers and district on June 24. One small mesh subsistence net near Dillingham held over 30 sockeye salmon, large mesh nets were consistently catching

sockeye, and a report from a subsistence fisherman at Grassy Island indicated a moderate volume there. Counts at the Wood River counting tower increased that day - the daily passage totaled 2,100 fish (Table 25). Subsistence catches reported at Igushik Beach indicated a moderate to large number of sockeye in the lower Igushik River; 21 sockeye and 4 chinook salmon were reported in one net late on June 21 there. In response to the increasing number of sockeye salmon, the first test boat of the season was scheduled to test waters above the district for sockeye run strength June 25 (Table 11).

Sockeye and chinook runs appeared in strength early on June 25. Subsistence catch rates continued to increase overnight. Over 20 chinook salmon per net were observed on the Dillingham beaches, and Lewis Point catches increased on the morning tide, with one net reported at over 80 chinook. Passage rates surged at Portage Creek in the morning, with 5,000 fish estimated through 10:00 a.m..

The morning test boat caught sockeye at every station fished, and most fish appeared to be moving upriver against the ebb tide. Moderate indices were obtained above the district, ranging from 230 to 4,265 points. In addition, the Igushik inriver test fishery obtained an extremely large index June 25, indicating an inriver escapement of 30,000 sockeye below the counting tower (Table 32).

Managers considered three possible scenarios as a result of the increased number of chinook and sockeye; 1) a district-wide opening restricted to large mesh gillnets only, to target chinook salmon and conserve the anticipated weak run of Nushagak sockeye; 2) an opening only in Igushik Section with mesh size unrestricted to target Igushik sockeye and harvest available chinook in that area, and; 3) a district-wide opening with mesh size unrestricted to target chinook and sockeye salmon.

At noon, staff announced a 10-hour opening, beginning at 12:30 a.m. June 26, with gillnets restricted to 6 3/4 inches and larger. Managers elected to target chinook salmon as escapement, indicated by subsistence catch rates and sonar passage, was now expected to exceed the desired inriver run goal of 75,000 fish. The volume of fish present in the test boat catches did not appear to warrant concern for an extremely large movement of sockeye into Wood River. Managers desired to conserve the early portion of the sockeye run when possible to afford protection to the Nushagak sockeye run. Therefore, there was not an imminent reason to open the district to all mesh sizes. The Igushik Section was not opened exclusively because of logistical concerns associated with restricting mesh size afterwards, should a large mesh opening be warranted.

Fishermen were advised prior to the opening to standby mid-period for a possible extension in fishing, or a short closure followed by another opening, with or without a mesh size restriction. This was the first time in Bristol Bay that the department entertained a potential short-notice mesh size change, announced during an opening.

Most fishermen apparently headed the warning of an impending mesh size change, and stored gear on tenders prior to the opening.

Another test boat fished the upper district and lower rivers early on June 26, while the large-mesh opening was in progress. A very large volume of sockeye was evident after the first several drifts. Indices above the district ranged up to 39,000 index points - the highest recorded for this date in the history of the test boat project. Escapement in Wood River increased early on June 26; by 10:00 a.m., over 30,000 had passed the counting tower. Sockeye escapement at Igushik River tower also increased, but not to the degree of the increase at Wood River, and sockeye escapement in the Nushagak River also increased, but remained well below expected levels. Similar to sockeye runs in other districts in Bristol Bay and as indicated by the Port Moller test fish project, the early portion of the returns to Nushagak District appeared to be strong.

At 8:00 a.m. June 26, the department announced a 12-hour opening beginning at 12:15 p.m., districtwide, with no mesh restriction. Chinook escapement in the Nushagak River was also strong; over 13,000 chinook were estimated for June 25, bringing the cumulative escapement to 30,000 chinook, and hourly passage rates appeared to remain high on June 26. However, the volume of sockeye evidenced in and above the district warranted an opening to limit Wood River escapement to desired levels.

Fishing throughout the first (large-mesh) period on June 26 was reported to be slow, but improved the second opening, when mesh size restrictions were lifted. Effort was estimated at 188 drift boats from an aerial survey.

Over 100,000 sockeye, 6,500 chinook and 13,000 chum salmon were landed in both openings. Based on reports from fishermen and companies, the majority of chinook were harvested during the first, large mesh only opening, while most of the sockeye were harvested during the second opening, when mesh size was unrestricted.

In this sense the restriction on small mesh gillnets appeared to limit incidental sockeye harvests while targeting chinook salmon.

High escapement rates continued at Wood River tower through the morning of June 27. Through 6:00 a.m., Wood River escapement totaled 136,000 sockeye, five days ahead of expected levels. Igushik escapement rates also remained high, and inriver indices June 26 indicated that sockeye were continuing to move into the lower portion of that river. At 9:00 a.m. June 27, the department announced a 10-hour period, to begin at 1:00 p.m. that day in an attempt to stem the movement of fish into Wood River.

As early as June 27, the Nushagak River run was showing signs of weakness. Age composition analysis completed that afternoon documented less than 5% age 0 freshwater sockeye salmon in the June 26 catch, but over 66% in the June 26 escapement sampled at the Nushagak River sonar site. Based on the age composition

of the June 26 catch and escapement, the catch that day appeared to be predominantly Wood River, and possibly Igushik River sockeye. The predominance of Wood River sockeye in the runs to the Nushagak District systems was supported by escapement trends throughout June 27: counts at Wood River remained as strong as the previous day, Igushik escapement rates continued to increase, but Nushagak River escapement began to decrease by late morning.

The catch:escapement ratio on June 27 was less than 1:1, compared with the forecasted ratio of 2:1. By 6:00 p.m., the Wood River tower count totaled 212,000 sockeye, 6 days ahead of expected levels. Counts in that river were expected to continue at high rates based on the results of an afternoon aerial survey (Table 31). Igushik escapement totaled over 20,000 sockeye just for that day, putting the cumulative escapement nearly one week ahead of expected levels. With the low fishing effort present and current escapement rates, it became obvious that considerable fishing time would be necessary to stem the migration of sockeye into the Wood and Igushik Rivers, while the presence of Nushagak River sockeye was low in the district. The opening in progress was extended for an additional 12 hours, until 11:00 a.m. June 28, and then extended again the morning of June 28, until 11:00 p.m. that evening.

Through June 27, escapement in the Nushagak River totaled 79,000 sockeye, 1.5 days ahead of schedule. Escapement in the Wood and Igushik Rivers remained at nearly one week ahead of expected levels. Passage at the Wood River tower and at Nushagak sonar began to slow the evening of June 27, and declined to low rates by June 28. However, hourly passage continued at high rates throughout June 28 in the Igushik River. Escapement in that river was approaching 50% of the escapement goal, and the inriver test project obtained the highest index of the season that afternoon. At 8:00 p.m., the department announced an extension for the Igushik Section only, for an additional 15.5 hours, until 2:30 p.m. June 29.

Scale samples collected from the June 27 catch and escapement continued to indicate a predominance of Wood River fish. Age 0 freshwater sockeye salmon comprised less than 3% of the catch, and 40% of the Nushagak escapement. Age 1.2 sockeye dominated the catch (58%) and Wood River escapement (64%) (Table 30).

Sockeye harvest through June 28 was estimated at 810,000 fish. Fishermen's reports indicated that fishing success improved the morning of June 28, and remained good throughout the day. However, weather deteriorated by mid-afternoon, and boats began to anchor up. Most of the drift effort had reportedly stopped fishing by evening, and a spotter reported only 30-40 boats fishing at 10:00 p.m..

Counts at Wood River tower increased again in the morning June 29, and test boat drifts in the lower river indicated high rates would continue. At 10:00 a.m., staff announced that the entire district would reopen at

2:30 p.m. for 9 hours. By 6:00 p.m., escapement in Wood River totaled 308,000 sockeye, and Igushik River totaled 82,000. At 8:00 p.m., the department announced another extension, this time for 15.5 hours, until 3:00 p.m. June 30. Morning test boat catches, age composition analysis and escapement rates in the three rivers all indicated a strong predominance of Wood River sockeye.

By midnight, June 29, the commercial harvest totaled 950,000 sockeye. Escapement reached 350,000 sockeye at Wood River, and remained at nearly one week ahead of expected levels. Passage rates early on June 30 increased again, likely a result of the Nushagak Section closure June 29. Morning tower counts averaged nearly 8,000 fish per hour. Nushagak River escapement through June 29 totaled 95,000 sockeye, and remained one day ahead of expected levels. The ratio of Wood River to Nushagak River escapement at this time was slightly less than 4:1. With the increase in escapement rates in Wood River, commercial fishing was extended again until 1:00 a.m. July 1.

Wood River escapement continued at high to moderate rates for the next several days in spite of continuous commercial fishing in the district. Extensions were announced each evening, from June 30 through July 3.

Igushik River escapement reached the goal on July 2, and totaled 246,000 sockeye through 6:00 p.m. July 3. Cumulative escapement through 6:00 p.m. July 3 at Wood River totaled 530,000 sockeye and was approximately 4-5 days ahead of schedule. However, passage rates slowed to less than 1,000 fish per hour. That evening, an extension was announced for 17.5 hours for Igushik Section only, and following that period, the entire district would re-open for an additional 10 hours, from 6:30 p.m. July 4 to 4:30 a.m. July 5. The Nushagak Section was allowed to close for over one tide with the hope that a movement of fish past the district would benefit the lagging Nushagak River escapement, which now totaled approximately 140,000 sockeye.

Fishing was reported as slow to moderate throughout most of July 3, but activity increased prior to the Nushagak Section closure. Much of the drift effort was concentrated on the outer line, but fish were reported late in the period moving up as far as the top of the channels. The daily sockeye catch increased relative to the July 2 catch, and totaled 221,000 sockeye. Fishermen reported an increase in fish size, possibly signaling an increase in the age 1.3 component. To date, the Igushik River contained the majority of age 1.3 fish in the escapement. Few had been observed in Nushagak and Wood River samples.

On July 4, department staff began to manage Igushik and Nushagak Sections independently. Fishing in Igushik Section was extended for 24 hours, until 4:30 a.m. July 6; setnet catches at Igushik Beach were remaining at high levels, indicating that movement into the river was continuing. Catches were good at the opening of the Nushagak Section as observed from an aerial survey. Drift boats and upper end setnets were doing well.

Test boats were largely unavailable at this time, due primarily to the extensive fishing time. To provide an indication of run strength above the district, the department launched an ADF&G skiff to test several stations above the district after the Nushagak Section re-opened. Moderate indices were observed above the district and in Wood River. Test catches at Grassy Island indicated milling fish, but catches in the lower Wood River indicated fish moving upstream. Heavy catches in the upper district and test boat success above indicated movement of fish above the district, and an extension for Nushagak Section was issued at midnight July 4 for an additional 11 hours of fishing time, from 4:30 a.m. to 3:30 p.m. July 5, to limit the size of this apparent movement of fish into Wood River. To remain aware of volume above the district, the department scheduled another test skiff for the morning of July 6.

Again due to the fishery in progress, a department skiff was launched to test the waters above the district. Heavy indices were observed at Grassy Island, but fish were moving downstream. Moderate to heavy indices were observed in Wood River, and fish there were moving upriver. A survey flown that morning documented an increasing volume of fish in the upper Wood River, heavy setnet catches in the upper district, and some fish sign at Picnic Point. All indications at this time signaled continued and strengthening movement into Wood River. At 1:00 p.m. July 5, another extension for the Nushagak Section was announced, for 13 hours, to close at 4:30 a.m. July 6, coincident to the Igushik Section closure.

Hourly passage rates did not increase to the extent managers expected, based on earlier test fish indices and upper district catches. A survey conducted of the Wood and Nushagak River the evening of July 5 documented a lighter number of fish in the Wood River than observed that morning, and a very poor number in the Nushagak River. Cumulative escapement totaled 576,000 sockeye at Wood River through 6:00 p.m., while the Nushagak River totaled only 150,000 sockeye. Nushagak Section was left to close as scheduled at 4:30 a.m. July 6. However, Igushik Section was extended for an additional 24 hours, with the intention of further extensions should Nushagak Section remain closed.

Although escapement past the district appeared to be slow, an ADF&G skiff was launched again the evening of July 6 to test fish above the district. Fish were caught at all stations fished, but indices were light. Light indices were obtained again in a morning test fishery on July 7. The area fished was more extensive, reaching south to Pile Driver Creek. A moderately large index was obtained in Wood River, but fish were observed hitting the net going downstream.

Winds increased during the day to southeast at 30 knots. Winds were reported at 40 knots, gusting to 50 in Igushik Section, and most of the drift effort reportedly quit fishing in the morning. However, catches in the early morning in that section were reportedly good, with some deliveries averaging 4,000 lb.. With escapement

well over the goal, and fish moving into the river, the section was extended for another 25 hours. Later, jumpers were reported at Clark's Point, and one person at Ekuk reported jumpers there. Considerable effort was made to employ a test boat for the evening ebb. Finally, a test boat was signed on, and test fishing began at midnight.

Results of the test fishery were ambiguous. No fish were caught at most stations, but weather conditions hampered the boats ability to get close to shore. Without getting close to shore, the test boat methods and results are inconsistent with those typical of the district test boat program. Moderate indices were observed in Wood River and at Kanakanak Beach, but fish were observed going downstream.

At 10:00 a.m. July 7, a subsistence fisherman at Scandanavian Beach reported over 100 sockeye in one net, less than 10 fathoms in length, in less than five minutes. Shortly afterwards, counts at Wood River were reported: hourly counts increased from 1,800/hr at 0600 to 12,000/hr at 0800. Obviously, fish had moved past the district during overnight, undetected in the early morning test drifts.

The earliest a possible opening could occur was not until the evening, due to the tide stage. A test boat was sent out immediately, to verify abundance in the lower rivers and document the extent of the volume. Heavy indices were observed in the lower Nushagak River at Tule Point, across from Tule Point, at Picnic Point and along Grassy Island. Volume at Kanakanak appeared moderate to heavy. At 5:00 p.m., staff announced that the Nushagak Section would re-open for 18 hours, beginning at 8:30 p.m.. The large indices obtained throughout the lower rivers prompted the extended duration.

Through July 6, the sockeye catch totaled 2.6 million, while escapement counts stood at 641,000 in Wood River, 162,000 in the Nushagak and 279,000 in Igushik River. Catch:escapement ratio at that time was slightly greater than the forecasted 2:1 ratio. The ratio of Wood River to Nushagak River escapement was approximately 4:1, or double the expected ratio based on the forecast, and the Nushagak District catch samples continued to indicate a predominance of Wood and Igushik River sockeye. At this point in the season, the Nushagak River run appeared weak, the ratio of catch:escapement was in line with the forecast, and the total run to the district was not expected to be much different in size than forecast.

Commercial fishing was extended on a daily basis until it was closed for the season on July 21. Daily escapement counts in Wood River soared to 238,000 on July 7, and remained high for the next two days. Unfortunately, escapement in the Nushagak River did not increase proportionately. From July 7 through July 9, the Nushagak River sockeye escapement totaled 85,000 fish, compared to 625,000 sockeye counted in the Wood

River during the same period. Based on these counts, the Wood:Nushagak River escapement ratio increased to over 7:1.

Escapement samples at Wood River indicated over 70% age 1.2 sockeye. The formal escapement goal therefore became the upper end of the escapement goal range, or 1.2 million. That goal was reached at the end of the 3-day push of fish, on July 9. At that time, Nushagak escapement totaled 247,000 sockeye, or less than 50% of the goal for that system.

Prior to 1995, the emergency order period expired at 9:00 a.m. July 17. However, the Board of Fisheries in January approved a regulation that effectively extended the emergency order period for the entire fishing season, June 1 through September 30, in the Nushagak District. Thus, commercial fishing did not resume a 5-day weekly fishing schedule after 9:00 a.m. July 17 this year, as it did in past years.

Managers continued to issue extensions on a daily basis by emergency order after July 17. Age composition of the catch and escapement was intensively monitored for signs of strength in the Nushagak River component. The percentage of age 0 freshwater fish, thought to be bound for the upper Nushagak tributaries, declined in the catch throughout the remainder of the season. Based on age composition analysis of the catch and escapement, and relative daily escapements into the two rivers, the ratio of Wood River to Nushagak River sockeye appeared to increase throughout the duration of the fishery.

Sockeye catches declined after July 15, but remained well above average. The July 19 harvest estimate totaled 39,000 sockeye, and the daily coho harvest increased to 600 fish. Cumulative coho escapement in the Nushagak River totaled 600 fish through July 19, considerably less than the expected level of 1,600 fish.

Managers set an objective to not exceed 10% of the expected coho run in the commercial catch in 1995. With the poor anticipated run of approximately 83,000 fish, recent poor production and escapements, and actual runs less than anticipated, managers anticipated closing the commercial fishery when coho catches reached the range of 5,000 to 10,000 fish. The cumulative coho harvest through July 19 of 2,600 fish was larger than the expected level. However, reports from fishermen as early as July 15 indicated that actual coho catches were larger than reported.

Winds increased on July 19 and 20 from the southeast, and sockeye to coho ratios in the catch decreased, based on reports from fishermen. Coho catches were improving July 20, while catches of sockeye were remaining steady or decreasing. Due to the uncertainty of catch estimates, the potential for a large coho catch, and lagging

coho escapement, the district was left to close at 2:00 p.m. July 21. Fishermen were advised to standby for another possible opening, pending catch reports for July 20 and 21.

Catch was estimated at 5,200 coho salmon through July 20. The preliminary daily harvest estimate July 20 included 32,000 sockeye and 2,500 coho salmon. The daily coho harvest reported for July 20 was the highest of the season. Coho harvest for July 21 was estimated at 700 coho, bringing the cumulative estimate to 5,900 fish. This estimate was expected to increase once mixed deliveries were sorted on processing lines, and final catch estimates became available. Since the cumulative coho harvest neared 10% of the anticipated run, no further openings were anticipated unless actual run strength could be determined to be much larger than expected in early August. Fishermen were advised of the poor likelihood of further commercial fishing on July 22.

With further commercial fishing possible, but not likely, the subsistence fishery in the commercial district was opened from 9:00 a.m. July 26 through September 30.

Coho escapement lagged expected levels through late July and early August. On August 5, a sharp increase was observed, when daily passage jumped to over 9,000 coho. Counts dropped in the following days, and on August 9, were 1 day behind expected levels, at 31,000 fish.

Total coho escapement was projected on August 9, using run timing analysis and linear regression techniques. On August 9, total coho escapement was projected to fall between 55,000 and 75,000 coho. However, slow passage rates continued and by August 12, total escapement was projected to fall between 50,000 and 60,000 fish inriver. On August 12, the department announced that subsistence fishing would be restricted to three days per week in the entire Nushagak River drainage, including the commercial district and the portion of Wood River below the dock at Dagnet. The emergency order became effective at 12:01 a.m. August 14.

Daily passage continued to decline through August 17. When total escapement projections fell below 50,000 coho, the Nushagak River drainage was closed to subsistence fishing entirely. The emergency order was announced at 12:00 noon August 18, and effective at 9:00 a.m. August 19. In response to public requests to harvest sockeye salmon spawnouts in the Nushagak River, an emergency order was issued allowing subsistence fishing for sockeye salmon only in the portion of the Nushagak River upstream of Portage Creek. That emergency order became effective at 12:01 a.m. August 29.

The 1995 chinook run to the Nushagak District was similar to the forecast, and average 1975 to 1994 levels (Appendix Tables 2 and 30). The size of the run decreased relative to 1994, but was the second largest run since 1985, and similar to runs experienced since 1992.

A directed commercial fishery occurred for the fourth consecutive year since runs have rebounded in size. The commercial harvest of 80,200 chinook salmon in the Nushagak District was the second largest since 1983, 7% larger than the recent 20-year average 75,000, but slightly less than the expected, based on the forecast. Seven commercial openings were scheduled in June to harvest chinook salmon. Peak effort during the chinook fishery in June increased for the fourth consecutive year to 347 drift vessels, observed June 16. Demand, similar to 1993 and 1994, remained low on the fresh market and the price paid to fishermen averaged \$.65 per pound (Table 35).

A small mesh gillnet (< 6 3/4 inch mesh) restriction was implemented during one opening on June 26, 1995. That opening was immediately followed by another with mesh size unrestricted, and catch was combined for the two openings. Preliminary catch reports indicated that the chinook harvest was predominantly taken in the first, when small mesh was restricted. The majority of sockeye were harvested during the second opening, when mesh size was unrestricted. The small mesh restriction appeared to be useful in targeting chinook salmon and minimizing incidental sockeye harvest.

The inriver chinook run totaled 85,662 in the Nushagak River, exceeding the inriver goal by over 10,000 fish. Samples collected at the Portage Creek sonar site documented a large percentage of small chinook salmon, relative to other recent years. Age 1.3 and 1.4 chinook typically comprise the majority of the escapement (35% and 39%, based on the 1988-94 average). The 1995 age 1.4 component (42%) was slightly larger than average. The age 1.2 group comprised 40% of the 1995 escapement, nearly twice the average of 22%. Perhaps the most striking characteristic of the 1995 inriver run was the small component of age 1.3 fish. That component represented only 16% of the fish enumerated at the sonar site, less than half of the average.

Sockeye runs to the Nushagak District in 1995 totaled 6.7 million, 26% greater than the forecasted run. The Nushagak runs were the seventh largest in the past 20 years and well above the average of 5.8 million (Appendix Table 17). The 1995 season was marked with a severe imbalance in the run strength relative to the three rivers in the district; sockeye runs to Wood and Igushik River were very strong, while the Nushagak River run was less than 50% of the average (Appendix Table 18). The imbalance in run strength became obvious early in the run, after the first push of fish June 26. Further, the Nushagak River component appeared to decline in strength through the season. Early escapement ratios were estimated at 4:1 Wood River to Nushagak. After July 7, that ratio increased to greater than 10:1.

The 1995 sockeye harvest totaled 4.45 million, 27% greater than the forecast (Table 1). The setnet proportion of the harvest totaled 32%, similar to recent year proportions (Table 18). The setnet harvest in Igushik Beach

was the largest ever recorded for that statistical area, totaling nearly 500,000 sockeye salmon. Drift effort remained low after the chinook fishery; peak effort observed during July totaled 234 drift boats and 254 set nets.

The sockeye season was marked with extensive fishing time and an early closure. Directed sockeye fishing began June 26, when escapement rates in Wood and Igushik Rivers jumped to above average levels. Commercial fishing re-opened June 27, and continued either in Igushik Section or in the entire district, until the season was closed July 21. The Nushagak Section closed for three brief periods, while fishing continued in Igushik Section. The Nushagak Section closed June 28 (two tides) after Wood River tower rates subsided, July 4 (two tides), and July 6 (two days). Low effort and large sockeye runs to the Wood and Igushik River were the factors most responsible for fishing time.

The department revised the Wood River escapement goal to 1.2 million sockeye in season according to the Wood River escapement goal policy. However, once the strong Wood River run and weak Nushagak run became obvious, management strategy focused on balancing the shortfall of escapement in the Nushagak River with surplus in the Wood River to provide for additional fish in the Nushagak River. The age composition of the 1995 Wood River escapement totaled 27% 3-ocean and 73% 2-ocean sockeye (Tables 2 and 3). Escapement in Wood River totaled 1,474,740, 47% above the escapement goal and the largest escapement to that system since 1980.

In spite of continuous fishing from June 27 on and several openings in Igushik Section only, Igushik River sockeye escapement reached 473,373 exceeded the goal for that system for the seventh consecutive year.

Escapement enumerated at the Portage Creek sonar totaled 281,307 sockeye salmon (Table 26). The 1995 sockeye escapement was just over 50% of the goal and the poorest count since the inception of the sonar project (Appendix Tables 1 and 17). The Nuyakuk River escapement, monitored by a counting tower for the first time since 1988, totaled less than 70,000 fish. This level equates to 14% of the former goal for that system, the poorest escapement documented in that system since 1972 and the fifth lowest in the history of the Nuyakuk tower project. Historically, Nuyakuk River sockeye comprised a majority of Nushagak River stocks. Nuyakuk River spawners comprised only 25% of the Nushagak River sockeye run in 1995.

The department cannot manage chum salmon independently from sockeye salmon in the Nushagak District due to their complete overlap with the sockeye run. The final harvest of 363,370 chum salmon was below the 20-year average Nushagak District harvest of 535,000 fish (Appendix Table 7). The preliminary chum escapement at the Portage Creek sonar site totaled 212,612, 68% of the 20-year average escapement (Appendix Table 31). Most of the chum salmon returning to the Nushagak District are four years old. Therefore, the 1991

escapement of 287,000 produced a return per spawner of roughly 2 to 1, depending upon the contribution from the other year classes. The 1995 chum run was less than the 20-year (19975-1994) average of 839,000 fish.

The coho run, including sport fishing and subsistence harvests, totaled at 55,000, 39% less than the amount necessary to meet the Biological Escapement Goal (BEG) of 90,000 (Appendix Table 34). 1995 marked the fourth consecutive year that the documented coho run numbered less than the inriver escapement goal. The majority of coho that return to Nushagak River are four years old; the 1991 escapement of 39,595 fish produced most of the 1995 coho run. Return per spawner in 1995 was greater than 1:1 for the first time in several years, but the stock status of Nushagak River coho salmon remains very poor.

The July 21 closure in 1995 marked the second year that the fishery was curtailed for coho conservation when daily harvests of sockeye salmon greatly exceeded those of coho. Closures in most recent years have typically occurred between July 23 and July 25, when daily sockeye catches are much lower. Similar to 1994, strong late-season sockeye catches presented an unusual complication in the management of the fishery. Sockeye continued to migrate through the district in spite of the commercial fishery, based on reports of large subsistence sockeye catches following the closure. However, the Wood River tower project terminated shortly after the closure, and the extent of escapement into Wood River afterwards remains unknown.

1995 was the second year during which the subsistence fishery closed in the Nushagak River and district, and the fourth year during which the subsistence fishery was restricted due to low coho abundance. The effect of the restriction is difficult to measure, but likely resulted in savings of some coho salmon.

Ultimately, 46,340 coho passed the sonar site before the project terminated on August 25 (Table 26), 46% of the inriver goal of 100,000 fish. Commercial harvest totaled 4,896 coho salmon, taken incidentally in the sockeye fishery.

Togiak District

The 1995 inshore sockeye run to the Togiak River was forecasted to reach 506,000 sockeye salmon, of which 74% were projected to be 3-ocean fish and 26% 2-ocean fish (Table 2). With an escapement goal of 150,000 at Togiak Lake, 356,000 sockeye were potentially available as harvestable surplus in the Togiak River Section. Smaller sockeye runs to other drainages in the district (primarily Kulukak Section) occur, but these are not included in the forecast because age composition and escapement data are not complete. The projected sockeye harvest for 1995 in the Togiak Section was similar to the average (1975-1994) harvest of 362,000 fish (Appendix Table 19), therefore, a moderate management approach was planned for that species.

No formal forecast is issued for chinook salmon runs in the Togiak River. Chinook run strength declined from 1984 through 1991; and chinook escapements in the Togiak River fell short of the goal (10,000) from 1985 through 1992. Although the chinook goal was reached in 1993 and 1994, commercial closures and mesh size restrictions were necessary; runs since 1991 have increased moderately. Therefore, a reduced weekly schedule in late June, instead of complete closures, and mesh size restrictions were planned for the 1995 season.

A formal forecast is not produced for coho salmon in the Togiak District. Parent-year escapement estimates from aerial surveys of spawning coho are the only preseason indicator of run strength available. Coho salmon escapement for the parent-year (1991) in the Togiak River was estimated to be only 25,600 fish, approximately 51% of the escapement goal of 50,000 fish. Coho escapement for the entire Togiak District was estimated at only 38,000 fish for 1991. Low parent-year escapement was the basis for a cautious management strategy for coho salmon in 1995.

Togiak District is managed differently than other areas of Bristol Bay. The district uses a fixed fishing schedule of three days per week in the Kulukak Section, four days per week in Togiak Section, and five days per week in the Osviak, Matogak, and Cape Pierce Sections. This schedule is adjusted by emergency order as necessary to achieve escapement objectives.

At a public meeting in early June in Togiak, department staff reiterated the concern for chinook stocks within the district. Staff announced that fishermen should again anticipate a mesh size restriction effective for the entire season. In addition, a reduction in the weekly fishing schedule during the last two weeks of June for all sections of the district was anticipated to reduce the harvest of chinook salmon. Staff also announced that since the sockeye catch typically begins in earnest during the first week of July, the management focus would then shift to sockeye salmon. The regular fishing schedule would resume at that time.

Prior to the season, the maximum allowable gillnet mesh size was reduced by emergency order to 5 ½ inches for all sections of the Togiak District. Fishing opened with a regular weekly schedule on June 1.

The first landings of the 1995 season occurred on June 5 (Table 20). By the close of fishing on June 16, the cumulative chinook catch in Togiak Section of 843 fish was only 69% of the historical average for that date. The number of deliveries and the number of fish per delivery were average. No definitive indications of chinook run strength were apparent at this point in the season; since 10 days of closure had been necessary to achieve the goal in 1994, a conservative approach was called for this season to achieve the escapement goal. The department announced via public radio on June 16 that commercial fishing would be allowed for 48 hours of the weekly fishing schedule in the Togiak District from June 19 through June 21.

Based on the 1994 chinook run to the Togiak River of approximately 25,000 fish (15,000 escapement, 10,000 catch) and an increasing run trend, staff expected a chinook run of similar size. The management strategy planned for 1995 was to harvest 5,000 additional chinook salmon during late June. Effort levels increased in the chinook fishery the third week in June along with overall abundance; the resulting chinook harvest reached 2,450 fish in the Togiak River Section for the 48-hour opening ending June 21.

Interest in subsistence fishing within district waters was expressed previously, in numerous public meetings. In the June 16 announcement, department staff also announced that waters of the district, although closed to commercial fishing, would open for subsistence fishing beginning 9:00 a.m. Thursday, June 22 until 12:00 midnight Sunday, June 25. Subsistence fishing was permitted to provide residents an opportunity to harvest salmon for home use; an additional period was allowed from 9:00 a.m., June 28 until 9:00 a.m., July 1.

Cumulative chinook harvest for Togiak District through June 21 was 3,500 fish, which was well below average for that date, while effort had increased to average levels. The department announced a 36-hour opening for the week of June 26. Togiak River Section chinook harvest from this opening was an additional 2,450 fish. The preseason plan of taking an additional 5,000 chinook during the last two weeks of June had been achieved.

Initial sockeye test catches at Port Moller were at record levels, and commercial sockeye catches in the Shumagin and South Peninsula were strong. These were early indications of a strong return of sockeye salmon to Bristol Bay.

The first aerial survey of the Kulukak and Togiak Rivers was conducted July 2 under good conditions; approximately 1,200 sockeye were observed in the lower portions of Togiak River, while 650 sockeye were counted in the Kulukak drainage. Both drainages contained mixed chum and chinook along with the sockeye estimates. These numbers were average for this date in both drainages.

Sockeye salmon escapements exceeded the goal in the Togiak River from 1991 to 1994, when restrictions were implemented in late June for the conservation of chinook salmon. Limited efficiency of the small gillnet fleet, and extended lag time from the district to the counting tower, necessitated increasing fishing exploitation early in the sockeye run to control escapement in excess of the desired goal. Therefore, the intent was to extend fishing time beyond the regular schedule soon after July 1, the average 50% point of the commercial chinook catch, but before overall sockeye run strength could be assessed in season.

Daily sockeye harvest and catch per delivery, during the weekly fishing period beginning July 3, remained low in the Togiak River Section, but improved in Kulukak Section; there was no indication of a strong sockeye return to Togiak District.

Cumulative sockeye catch was only 6,400 in Togiak River Section (less than 15% of the recent 20-year average), and 4,300 in Kulukak Section (approximately 56% of the recent 20-year average) through July 2. Due to a below average forecast, and lagging cumulative sockeye catches in the Togiak District, the normal weekly fishing schedule was adhered to the week of July 3.

An estimated 17,500 sockeye were observed in the Togiak River on an aerial survey on July 9. The weekly fishing period beginning July 10, began to show strong daily catches in both Togiak River and Kulukak Sections, but cumulative sockeye catches in the Togiak River Section remained well below average levels, with effort running slightly above average. Tower counts at Togiak Lake started at average levels but continued to increase the first week of operation. On July 12, over 12,000 sockeye were counted past the towers, which put Togiak River escapement a day ahead of the expected level. Kulukak Section catch rates and number of deliveries had risen to above average during the week, indicating moderate run strength there. On July 13, a 37-hour extension (9:00 a.m., Friday through 10:00 p.m., Saturday) for Togiak River Section only was announced.

The third aerial survey of the season was conducted on July 11, under excellent conditions. Fish were observed in all sections of the Togiak River; staff estimated approximately 16,000 fish in the mainstem below the counting towers. Daily counts would remain strong for several days with the observed abundance. The number of sockeye salmon in Kulukak River and Kulukak Lake had reached 3,300 fish, which was below average escapement for this date.

Cumulative sockeye harvest through July 15 had risen to 167,000 fish the Togiak River Section and 45,000 for the Kulukak Section. This was about 70% of the average for Togiak River Section and was 50% above average for Kulukak Section.

Daily escapement past the counting towers on the Togiak River began to increase substantially during the week of July 12; the cumulative escapement reached 42,000 by that date, which was tracking about 1 ½ days ahead of the expected level. An aerial survey on July 18 revealed over 22,000 sockeye holding in the Togiak River. This would likely result in continued high passage rates for several days. Based on the increased showing of fish in the river, and elevated catch rates in the commercial fishery, the district was opened five hours early for the weekly period of July 17. On July 20, a 72-hour extension was announced for the Togiak River Section

extending from 9:00 a.m., Friday through to the beginning of the next weekly period at 9:00 a.m., Monday, July 24. All other sections would close at their normal time.

Through July 23, the cumulative sockeye harvest for Togiak River Section had reached 334,000 - or 94% of the pre-season harvest forecast; historically, 86% of the harvest had occurred by this date. Daily catches continued to exceed 20,000 sockeye throughout the extension. Sockeye escapement at the Togiak Lake counting towers was still in the 3,000 to 5,000 fish per day range, while the cumulative escapement exceeded the sockeye escapement goal of 150,000 fish on July 23.

After reviewing the harvest rates for the week-long opening, it was apparent that the sockeye run to the Togiak River was larger than forecast and late. High effort levels and above average daily sockeye catches, occurred in both Togiak and Kulukuk Sections. Considering lag time from the fishery, and estimating the exploitation rate on the fish passing through the fishery, it was obvious that additional fishing time over the regular schedule was warranted for the week of July 24 to harvest the surplus.

On July 26, an announcement extending the fishery in Togiak River Section from 9:00 a.m., Friday, through 7:00 p.m., Saturday, July 29 a 34-hour extension. Cumulative sockeye harvest for the section had reached 394,000 through July 26, and continued high passage rates of over 2,000 sockeye per day were observed at the counting towers; the escapement had reached 170,000 by the end of the first extension. Daily sockeye harvest in Togiak River Section continued to average close to 20,000 fish throughout the extension. A further extension was announced on July 28; commercial fishing would now remain open from 7:00 p.m., Saturday through the start of the normal weekly fishing period at 9:00 a.m., Monday, July 31.

By the beginning of the next weekly fishing period, cumulative sockeye salmon harvest for Togiak District had reached 537,000 fish, while daily catches remained at the 10,000 fish level. Escapement counted past the Togiak towers had exceeded 172,000 sockeye salmon with daily counts still over 2,000 fish per day. Another extension was announced on August 3 extending the fishing period for the Togiak River Section only from 9:00 a.m., Friday through midnight Saturday, August 5 (39 hours). Continuous fishing in the Togiak River Section had been in effect since 4:00 a.m., July 17, and would continue through midnight, August 5; a 20-day period.

Through the close of fishing on August 5, cumulative sockeye escapement in the Togiak River had reached 184,000 fish. The commercial sockeye harvest in the Togiak River Section had increased to 501,000 fish or 41% over the forecasted harvest. Kulukuk Section sockeye harvest had reached 76,500 fish, which was 75% over the long-term average for that date. District-wide sockeye harvest had reached 580,000 fish. With the sockeye escapement goal exceeded by 23%, sockeye daily catches declining below 5,000 fish per day, and a

conservative management outlook for coho salmon due to the poor parent year spawning escapement, management emphasis shifted to coho in the Togiak District.

The next weekly fishing period opened 9:00 a.m. Monday, August 7, counting operations at Togiak Lake were terminated the same day. The Togiak River Section daily catch for August 7 was 4,500 sockeye and 350 coho. Sockeye catches declined slowly throughout the week, while daily coho catches increased; cumulative coho harvest reached 3,300 for Togiak River Section by the close of the normal weekly fishing period on August 11, an average catch for this date. Effort was double the average for this date due to the large and late sockeye run.

Aerial surveys are generally not productive to assess coho salmon abundance in the Togiak River until mid to late August, due to low numbers of coho and high numbers of other salmon species until that time. The commercial catch rates provide the only indication of coho run strength available in early August. Catch per delivery had maintained average levels through the weekly fishing period beginning August 7, therefore, no reduction in the fishing schedule was implemented.

The next weekly commercial fishing period began on August 14. Several buyers were operating in Togiak and Kulukak Bays. The daily catches and catch per delivery began to lag below average, supporting the impression of a moderately weak coho return. On August 15, a reduction in the weekly fishing period was announced; all sections except Kulukak would be reduced by 24 hours. Togiak River Section would close 9:00 a.m., Thursday, August 17. Cumulative coho harvest for Togiak River Section through the close of the fishing period was 5,400 fish. This was two days behind expected levels, and historically only 18% of the coho harvest had occurred by this date.

The next weekly fishing period opened on August 21. An aerial survey flown the next day documented little accumulation of coho salmon in the Togiak River mainstem. On August 22, the department announced that Togiak River Section would close to commercial salmon fishing at 9:00 a.m., Wednesday, August 23, a 48-hour reduction in the weekly schedule. Although daily coho catches during the week had been average, the low numbers of fish observed in the river caused concern regarding the exploitation of coho throughout the district. Fishermen were advised in the earlier announcement that unless the number of coho increased significantly, the district would be closed until further notice.

An aerial survey flown on August 25 showed approximately 3,500 coho salmon in the mainstem Togiak River, below the confluence with the Ongivinuck River. With a coho salmon escapement goal of 50,000 fish, and the low numbers of coho showing in the river to date, the department announced on August 26 that all sections of Togiak District would close until further notice.

Togiak District cumulative coho harvest had reached 8,917 fish through the close of fishing on August 23; which was 4 days behind and 59% of the expected level. Effort had dropped to average or below the last two weeks of the coho fishery, partly due to the poor preseason outlook, and the declining sockeye component. Only two buyers were operating in Togiak after the first week of August, and one of them stopped buying the following week.

Fishing effort, based on the number of deliveries, was below average at the beginning of the season through late June. However, during the sockeye fishery in July, both drift and setnet effort increased to above average as fishermen transferred to Togiak District after sockeye runs had peaked in other districts. The largest observed drift effort was documented July 24, with 53 vessels actively fishing in Togiak Section. The largest observed setnet count also occurred on July 24, with 62 setnets in Togiak Section. In Kulukak Section, the largest effort observed occurred on July 18, with 10 drift vessels and 23 setnets counted. The 192 deliveries (set and drift combined) that occurred on July 14 comprised the peak number in Togiak Section, and 69 deliveries also on July 18 in Kulukak comprised the largest number in that section.

The preliminary district sockeye harvest totaled 598,964 fish (Table 19), the fifth highest since 1975, and 40% above the 1975 to 1994 average of 429,399 (Appendix Table 5). The Togiak River Section sockeye catch of 520,324 fish was 40% above the 1975 to 1994 average, while the Kulukak sockeye catch of 76,503 was 53% above the 20-year (1975-1994) average for that section (Appendix Table 19). Matogak Section received commercial fishing effort on only eight days throughout the 1995 season, producing a sockeye harvest of 2,137 fish (Table 22).

Escapement enumeration at Togiak Lake ended on August 7 when the tower project terminated. Togiak Lake sockeye salmon escapement was estimated at 185,718 fish, 23% above the escapement goal (Table 33, Appendix Table 1 and 19). Combining the final tower escapement with the escapement estimate for the tributaries and main river stem resulted in a Togiak Drainage escapement of 211,226 sockeye. This escapement plus the Togiak River Section catch yielded a total run to the Togiak River of 731,550 sockeye, 45% above the preseason forecast. Escapement into the Kulukak Section totaled 14,620, or 21% below the recent 10-year average, and the lowest escapement since 1976.

The 1995 Togiak District harvest of 11,929 chinook was approximately 78% of the 1985-1994 average (Appendix Table 6 & 30). For the third year since 1985, the chinook escapement in the Togiak River reached the desired goal (10,000). The escapement of 12,600 chinook was at least partially due to the restrictions imposed on the commercial fishery. Commercial exploitation of the Togiak River chinook stock in 1995 was 49% (not considering sport and subsistence harvests), less than the 1980 to 1994 average of 53%. Postseason

aerial escapement estimates of chinook salmon on the spawning grounds were comparable to long-term average levels in most systems in the district, with the exception of a low return to Kulukak River. Escapement estimates totaled 1,075 for Kulukak River, with an additional 2,763 estimated in the Quigmy, Osviak, Matogak, Slug, Negukthlik, and Ungalikthluk Rivers combined. The total district escapement of 16,438 chinook is the second highest since 1984, equal to the long-term average, and 36% higher than the 1985 to 1994 average of 12,112. The combined total run to Togiak District of 28,367 chinook salmon was 4% above the recent 10-year average, and still showing an increase in run strength since the low in 1991. It was the second highest chinook total run recorded since 1985 (Appendix Table 30).

The 1995 Togiak District chum salmon harvest of 223,329 was within 8% of the 1975 to 1994 average (Appendix Table 7). The commercial catch combined with the district-wide escapement estimate of 163,040 fish determined from aerial survey produced a total run estimate of 386,369 chum salmon, approximately 84% of the 1975 to 1994 average (Appendix Table 31).

The 1995 pink salmon catch for Togiak District was negligible (328 fish), but normal for odd-numbered years in Bristol Bay.

The 1995 commercial catch of coho salmon in the Togiak District (8,917 fish) was one of the poorest since 1980, and only 17% of the 1980 to 1994 average. Poor parent-year escapement was a contributing factor to poor coho returns. Postseason aerial survey estimates of spawning escapement were precluded by high water and poor fall weather conditions. Based on commercial catch rates, reports from sport and subsistence users, and partial surveys, coho escapement in the Togiak River appeared to be poor to fair. Comparative counts from previous years are provided in Appendix Table 34.

1995 SUBSISTENCE SALMON FISHERY

In spite of numerous social, economic, and technological changes, Bristol Bay residents continue to depend on salmon and other fish species as an important source of food. Residents have relied on fish to provide nourishment and sustenance for thousands of years. Subsistence harvests still provide important nutritional, economic, social, and cultural benefits to most Bristol Bay households. All five species of salmon are utilized for subsistence purposes in Bristol Bay, but the most popular are sockeye, chinook, and coho salmon. Many residents continue to preserve large quantities of fish through traditional methods such as drying and smoking, and fish are also frozen, canned, salted, pickled, fermented, and eaten fresh. In some communities, significant numbers of fish are put up for dog teams as well.

Regulations

Permits are required to harvest salmon for subsistence purposes in Bristol Bay. Since 1990, all Alaska state residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages. In 1995, only gillnets were recognized as legal subsistence gear, except in the Togiak district, where spear fishing was also allowed. Net lengths were limited to 10 fathoms in the Naknek, Egegik, and Ugashik Rivers, Dillingham beaches, and within the Nushagak commercial district during emergency openings. Up to 25 fathoms could be used in the remaining areas.

In Dillingham, and in the Naknek, Egegik, and Ugashik Rivers, subsistence fishing was limited to several fishing periods per week during the peak of the sockeye run. All commercial districts were open for subsistence fishing during commercial openings. In recent years, declining chinook and coho stocks resulted in longer commercial closures and some residents had an increasingly difficult time obtaining fish for home use. Starting in 1988, the Nushagak commercial district has been opened for subsistence fishing by emergency order during extended commercial closures. This year the Togiak commercial district was opened by emergency order during extended commercial closures or before the first commercial opening. During May and September, subsistence fishing was also permitted within commercial district boundaries, as a result of a Board of Fisheries action, from 9:00 a.m. Mondays to 9:00 a.m. Fridays.

Inseason Management

Districtwide, 13 emergency orders related to subsistence were issued, 11 in the Nushagak drainage (Table 12). Within the Nushagak commercial district subsistence fishing was allowed by emergency order from 12:01 a.m. June 1 until 1:00 p.m. June 6 and 1:00 p.m. June 6 until 6:00 a.m. June 8. It was again opened from 8:00 p.m. June 10 until 7:00 a.m. June 12, 12:01 a.m. until 12:00 noon, June 14, 5:00 p.m. June 17 until 1:00 a.m. June 18, 6:00 p.m. June 18 until 2:00 a.m. June 19, and 9:00 p.m. June 21 until 6:00 a.m. June 22.

Subsistence fishing was again authorized in the Nushagak commercial district beginning on July 26 after the district was closed to commercial fishing on July 21. Subsistence fishing was allowed from 9:00 a.m. July 26 until midnight September 30. Due to poor coho returns, an emergency order effective at 9:00 a.m. on August 14 until September 30 reduced the fishing time in the Nushagak commercial district, the Nushagak River, and downriver from Dagnet Fisheries on Wood River to three 24-hour openings per week. However, coho projections continued to decline, and an emergency order, effective at noon on August 19, closed the Nushagak commercial district, the Nushagak River, and downriver of the Dagnet Fisheries on Wood River to subsistence salmon fishing until October 31.

An emergency order issued for the Nushagak District for 9:00 a.m. August 30 opened a portion of the Nushagak River drainage, upstream of Portage Creek, to subsistence fishing for sockeye salmon only, for three 24-hour periods a week for the remainder of the season.

In the Togiak commercial district, two emergency orders authorized subsistence fishing from 9:00 a.m. June 22 until midnight June 25 and 9:00 a.m. June 28 until 9:00 a.m. July 1.

Permit System

A permit system was gradually introduced throughout the region in the late 1960's to document the harvest of salmon for subsistence. Much of the increase in the number of permits issued during these years reflect: 1) a greater compliance with permitting and reporting requirements, 2) an increased level of effort expended by the department in making permits available, contacting individuals, and reminding them to return the harvest forms, and 3) a growing regional population. Most fishermen were obtaining permits and reporting their catches; and overall permit returns have averaged between 85 and 90%. However, fish removed for home use from commercial catches are not included in most reported subsistence harvest totals. Also, fish caught later in the season, such as coho and spawning salmon are probably not documented as consistently as chinook and sockeye salmon.

In 1995, a total of 1,119 permits were issued for Bristol Bay; the largest number were for the Nushagak and Naknek/Kvichak Districts. All districts, except Ugashik and Togiak, issued more permits in 1995 than the average for the past 10 years, due in part to permits being available to all state residents.

Harvest

The 1995 Bristol Bay subsistence salmon harvest was 132,443 fish. This number is below both the 20-year average and recent 10-year average of 169,062 fish, due primarily to a reduced sockeye harvest. Only the chinook harvest was above the recent 10-year average.

Most of the harvest was taken in the Naknek/Kvichak (61%) and Nushagak (33%) Districts. The Naknek/Kvichak total harvest of 80,407 fish was below the recent 10-year average of 96,409 fish. Nushagak District total harvest reached a historic low of 43,373 fish, 30% below the recent 10-year average of 62,147 fish. Harvests for all species in the Nushagak District, except chinook salmon, were harvested at levels below their recent 10-year averages; the sockeye harvest of 22,793 fish was a historical low, as was the chum harvest of 2,786 fish. The Nushagak chinook harvest of 13,701 was 11% above the recent 10-year average of 12,372

fish. Reported harvests of all species in the Togiak District were below their recent 10-year averages. Harvests in the Ugashik district have remained stable over the past 10 years. In the Egegik District, the total salmon harvest increased substantially beginning in 1991 and remained high in 1995, with harvests of all species, except chinook, above their recent 10-year averages.

In 1995, the subsistence salmon harvest consisted of 78.6% sockeye, 11.9% chinook, 3.4% chum, 5.6% coho, and 0.5% pink salmon. This harvest represents 0.2% of the total 1995 salmon run, and 0.3% of the total Bristol Bay harvest.

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BRISTOL BAY SALMON FISHERY

Tables 1-36

Table 1. Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and Bristol Bay, 1995 projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 1995.^a

District and River System	Inshore Run			Escapement			Inshore Catch			
	Forecast	Actual ¹	Percent Deviation ²	Goal	Range	Actual ¹	Percent Deviation ²	Projected Harvest	Actual ¹	Percent Deviation ²
<u>NAKNEK-KVICHAK DISTRICT</u>										
Kvichak River	25,060	27,549	-9%	10,000	6,000-10,000	10,039	0%	15,060	17,510	-14%
Branch River	484	654	-26%	185	170-200	216	-14%	299	438	-32%
Naknek River	5,283	3,579	48%	1,000	800-1,400	1,111	-10%	4,283	2,468	74%
Total	30,827	31,782	-3%	11,185	6,970-11,600	11,366	-2%	19,642	20,416	-4%
<u>EGEGIK DISTRICT</u>										
Total	13,061	15,728	-17%	1,000	800-1,400	1,283	-22%	12,061	14,461	-17%
<u>UGASHIK DISTRICT</u>										
Total	5,405	5,805	-7%	700	500-1,200	1,321	-35%	4,705	4,501	5%
<u>NUSHAGAK DISTRICT</u>										
Wood River	2,927	4,025	-27%	1,000	700-1,200	1,482	-33%	1,927	2,542	-24%
Igushik River	1,125	1,906	-41%	200	150-250	473	-58%	925	1,433	-35%
Nushagak-Mulchatna	1,219	757	61%	550	340-760	281	96%	669	475	41%
Total	5,271	6,688	-21%	1,750	1,190-2,210	2,236	-22%	3,521	4,450	-21%
<u>LOGIAK DISTRICT</u>										
Total	506	731	-31%	150	140-250	211	-29%	356	520	-32%
TOTAL BRISTOL BAY										
Total	55,070	60,734	-9%	14,785	9,630-16,160	16,417	-10%	40,285	44,348	-9%

¹ Unless otherwise noted, inshore total runs and catches are preliminary, while escapement data is final.

² Percent deviation = (forecast - actual)/actual.

³ These systems cannot be managed separately from the major system in the district.

^a The Bristol Bay inshore forecast does not include several minor river systems, including the Snake River drainage in Nushagak District, and the Kulukak, Osviak, Matogak, and Slug River systems in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table for the sake of comparison. Therefore, actual District totals reported here may represent only a portion of the District, and actual Bristol Bay totals reported here include only a portion of the District, and actual Bristol Bay totals reported here include only a portion of the Bristol Bay catch, catch, escapement, and inshore run. Totals may not equal column sums due to rounding.

Table 2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 1995.

District and River System	Age Class (Brood Year)			Age Class (Brood Year)			Other	Total
	1.2 (1991)	.2 (1990)	2-Ocean	1.3 (1990)	.3 (1989)	3-Ocean		
<u>NAKNEK-KVICHAK DISTRICT</u>								
Kvichak River	3,278	18,308	21,586	2,014	1,459	3,473	0	25,059
Branch River	196	54	250	205	28	233	0	483
Naknek River	985	1,109	2,094	2,000	1,188	3,188	0	5,282
Total	4,459	19,471	23,930	4,219	2,675	6,894	0	30,824
<u>EGEGIK DISTRICT</u>								
	1,065	7,748	8,813	1,181	3,068	4,249	0	13,062
<u>UGASHIK DISTRICT</u>								
	1,620	1,823	3,443	727	1,235	1,962	0	5,405
<u>NUSHAGAK DISTRICT</u>								
Wood River	1,279	253	1,532	1,378	17	1,395	0	2,927
Igushik River	186	43	229	850	46	896	0	1,125
Nushagak River	93	19	112	657	4	661	446	1,219
Total	1,558	315	1,873	2,885	67	2,952	446	5,271
<u>TOGIK DISTRICT</u>								
	107	24	131	352	23	375	0	506
<u>TOTAL BRISTOL BAY¹</u>								
Number	8,809	29,381	38,190	9,364	7,068	16,432	446	55,068
Percent	16	53	69	17	13	30		99

¹ Sockeye salmon of several minor age classes are expected to contribute an additional 1-2% to the total return.

Table 3. Inshore run of sockeye salmon by age class, river system and district, in thousands of fish, Bristol Bay, 1995.^a

District and River System		1.2	2.2	2-Ocean	0.3	1.3	2.3	3-Ocean	Total
NAKNEK-KVICHAK DISTRICT									
Kvichak River	Number	2,593	20,546	23,139	4	1,141	3,241	4,386	27,525
	Percent	9.4	74.6	84.1	0.0	4.1	11.8	15.9	100
Branch River	Number	193	321	514	0	118	16	134	648
	Percent	29.8	49.5	79.3	0.0	18.2	2.5	20.7	100
Naknek River	Number	527	1,310	1,837	0	1,183	553	1,736	3,573
	Percent	14.7	36.7	51.4	0.0	33.1	15.5	48.6	100
Total	Number	3,313	22,177	25,490	4	2,442	3,810	6,256	31,746
	Percent	10.4	69.9	80.3	0.0	7.7	12.0	19.7	100
EGEGIK DISTRICT									
	Number	1,329	9,283	10,612	2	841	3,915	4,758	15,370
	Percent	8.6	60.4	69.0	0.0	5.5	25.5	31.0	100
UGASHIK DISTRICT									
	Number	193	2,230	2,423	0	670	934	1,604	4,027
	Percent	4.8	55.4	60.2	0.0	16.6	23.2	39.8	100
NUSHAGAK DISTRICT									
Wood River	Number	2,535	277	2,812	9	1,151	37	1,197	4,009
	Percent	63.2	6.9	70.1	0.2	28.7	0.9	29.9	100
Igushik River	Number	306	177	483	1	1,364	51	1,416	1,899
	Percent	16.1	9.3	25.4	0.1	71.8	2.7	74.6	100
Nush-Mulchat. River	Number	166	17	183	126	241	4	371	554
	Percent	30.0	3.1	33.0	22.7	43.5	0.7	67.0	100
Total	Number	3,007	471	3,478	136	2,756	92	2,984	6,462
	Percent	46.5	7.3	53.8	2.1	42.6	1.4	46.2	100
TOGIK DISTRICT^b									
	Number	180	72	252	2	434	40	476	728
	Percent	24.7	9.9	34.6	0.3	59.6	5.5	65.4	100
TOTAL BRISTOL BAY¹									
	Number	8,022	34,233	42,255	144	7,143	8,791	16,078	58,333
	Percent	13.8	58.7	72.4	0.2	12.2	15.1	27.6	100

¹Approximately 806,000 additional sockeye salmon of several minor age classes, or returning to minor Bristol Bay drainages, in 1995 are not included in this total.

^a The inshore run data does not include the 1995 False Pass/Alaska Peninsula catch of Bristol Bay sockeye or any high seas by-catch of immatures.

^b Does not include rivers other than Togiak River.

Table 4. Inshore commercial catch and escapement of sockeye salmon, Bristol Bay, in numbers of fish, 1995.^a

District and River System	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River	17,509,862	10,038,720	27,548,582
Branch River	437,921	215,713	653,634
Naknek River	2,467,647	1,111,140	3,578,787
Total	20,415,430	11,365,573	31,781,003
<u>EGEGIK DISTRICT</u>	14,461,228	1,282,508 ^b	15,743,736
<u>UGASHIK DISTRICT</u>	4,501,076	1,321,108	5,822,184
<u>NUSHAGAK DISTRICT</u>			
Wood River	2,542,377	1,482,162	4,024,539
Igushik River	1,432,580	473,382	1,905,962
Nushagak-Mulchatna	475,380	281,307	756,687
Snake		17,380	17,380
Total	4,450,337	2,254,231	6,704,568
<u>TOGIK DISTRICT</u>			
Togiak Lake	520,324	185,718	706,042
Togiak River/Tributaries		25,508	25,508
Kulukak System	76,503	14,620	91,123
Other Systems ¹	2,137		2,137
Total	598,964	225,846	824,810
TOTAL BRISTOL BAY	44,427,035	16,449,266	60,876,301

¹ Catch includes Matogak and Osviak Sections; escapement includes Negukthlik, Ungalikthluk, Osviak, Matogak and Slug River systems.

^a Inshore catch apportionment by river system is preliminary until results from scale pattern analysis become available; escapements are final unless noted otherwise.

^b Includes Egegik River Tower count and peak aerial counts for King Salmon River Shosky Creek.

Table 5. Inshore commercial catch and escapement of pink salmon, in numbers of fish, Bristol Bay 1995. ^a

District and River System	Catch	Escapement	Total Run
	(insignificant catch in 1995)		

^a Bristol Bay produces insignificant numbers of pink salmon in odd numbered years; only small numbers were taken incidental to other species in 1995.

Table 6. Offshore test fishing catch indices and estimated inshore daily passage rate of sockeye salmon, Port Moller, Bristol Bay, 1995.

Date	No. of Stations Fished	Sockeye Catch	Running Mean		Index ¹		Passage Rate ²	
			Length (mm)		Daily	Cum.	Daily	Cum.
6/11	0	70	0		32	32	580	580
12	4	73	537		32	64	584	1,164
13	4	71	542		31	95	576	1,740
14	4	162	540		70	165	1,282	3,022
15	4	128	538		53	218	979	4,001
16	4	191	536		77	295	1,419	5,420
17	4	134	535		57	352	1,054	6,474
18	4	291	531		133	485	2,439	8,913
19	4	232	531		106	591	1,943	10,856
20	4	127	530		54	645	990	11,846
21	4	251	530		100	745	1,833	13,679
22	4	188	530		85	830	1,571	15,250
23	4	273	529		117	947	2,148	17,398
24	4	180	529		81	1,028	1,486	18,884
25	4	235	528		106	1,134	1,948	20,832
26	4	278	528		120	1,254	2,206	23,038
27	4	281	529		129	1,383	2,365	25,403
28	4	305	529		141	1,524	2,589	27,992
29	4	381	529		184	1,708	3,377	31,369
30	4	259	530		127	1,835	2,328	33,697
7/1	4	376	530		175	2,010	3,219	36,916
2	4	331	530		163	2,173	2,997	39,913
3	4	346	529		170	2,343	3,136	43,049
4	4	265	530		126	2,469	2,315	45,364
5	4	246	530		116	2,585	2,141	47,505
6	4	360	530		153	2,738	2,813	50,318
7	4	239	530		118	2,856	2,169	52,487
8	4	106	530		51	2,907	931	53,418
9	4	206	530		91	2,998	1,673	55,091

¹ Indices expressing in fish/100 fathom hours and include interpolations for missed days and stations (in parentheses).

² Passage rate is based on the mean inshore return per Port Moller index (1985, 1987-1994) of 18,400 fish multiplied by the daily index.

Table 7. Offshore test fishing catch indices and estimated inshore daily passage rate of chum salmon, Port Moller, Bristol Bay, 1995.

Date	No. of Stations Fished	Chum Catch	Index ¹		Passage Rate ²	
			Daily	Cum.	Daily	Cum.
6/11	0	4	2	15	21	21
12	4	3	1	16	15	36
13	4	6	3	19	31	67
14	4	9	4	23	46	113
15	4	12	5	28	58	171
16	4	10	4	32	48	219
17	4	4	2	34	20	239
18	4	4	2	36	22	261
19	4	5	3	39	30	291
20	4	4	2	41	21	312
21	4	11	5	46	52	364
22	4	8	4	50	43	407
23	4	5	2	52	25	432
24	4	5	2	54	26	458
25	4	4	2	56	21	479
26	4	4	2	58	20	499
27	4	12	5	63	64	563
28	4	13	6	69	68	631
29	4	20	5	74	56	687
30	4	1	1	75	6	693
7/1	4	6	3	78	33	726
2	4	3	2	80	17	743
3	4	2	1	81	12	755
4	4	1	1	82	6	761

¹ Indices expressed in fish/100 fathom hours and include interpolations for missed days and stations (in parentheses)

² Passage rate is based on the mean inshore return per Port Moller index (1985, 1987-1994) of 11,694 fish multiplied by the daily index.

Table 8. Summary of district sockeye salmon test fishing indices in the Naknek-Kvichak District, by index area and date, Bristol Bay, 1995.^a

Date	Naknek R. Mouth	Pederson Point	utbank & raveyard	Salmon Flats	Gravel Spit	Ships Anchorage	Half Moon Bay	Middle Naknek	Johnson Hill	Division Buoy	Deadman Sands	Low Point	Clark's Point	Naknek River Inside Stations				
														Red Salmon Cannery	Peter Pan	Leader Creek	Morakas Point	
06/25/95	6		1,969					293	1,752	69								
06/29/95															201	600	750	215
07/04/95															206	1,425		

^a All indices expressed in numbers of fish/100 fathoms-hour to the nearest whole index point.

Table 9. Summary of district sockeye salmon test fishing in the Egegik District, by index area and date
Bristol Bay, 1995.^a

	<u>Date</u>
Index Area	

(No District Test Fishing was conducted in 1995.)

^a All indices expressed in number of fish /100 fathom hours to the the nearest full index point.

Table 10. Summary of district sockeye salmon test fishing in the Ugashik District, by index area and date, Bristol Bay, 1995.^a

Index Area	June				July								
	25	28	30		3	5	10	11	12	13	14	15	16
Two Miles North of Cape Grieg	449	483											
Cape Grieg (Nearshore)	1,063	462	518										
Four Miles North of Smoky Point Nearshore	146	441											
Four Miles North of Smoky Point (Outer line)	27	270					390						
Smoky Point Bar North Side Inshore		38					392 b	165					
Smoky Point Bar Offshore end							713						
Smoky Point													
Smoky Point Entrance	4	4	21		51	32	0	22 b	5 b	25			
Mid Outer Line	151						233	53					
Bell Buoy	545												
Two Miles North of Cape Menashikof (Outerline)								208					
Three Miles South of South Spit (Nearshore)			339					133		1,062			
South Spit (Mid Channel)	219	222					24			520	979 b		221
Dago Creek Mouth						4					12	338	
Pilot Point			27				0			17	556		62
Between Pilot Point and Muddy Point							292					269	3,103
Between South Spit and Outer South Channel					4,542								
Outer South Channel			1,101			116	138	169	190 b	1,004	498		564 b
Inner South Channel						62							
Above inner district boundary line near Muddy Point			42		352	99			9 b	13	378 b		793 b
Dog Salmon River			38		653	156		47	34 b	70	690		
Curbank Below Ugashik						1,135							

^a All indices expressed in number of fish/100 fathom hours to the nearest full index point.

^b Average of two or more drifts.

Table 11. Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 1995. ^a

Date	Start Time	Wood River W.	Wood River E.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Combine Flats	Pile Driver	Queen Slough	Clark's Point	Upperline West	Upperline East	Ekuk Bluff	Ships Ch. N.W.	Middle Ch. N.W.	Snag Point	Peter Pan	Kanak-anak	
06/25/95	05:17	3,333 759	234	741	4,000 4,265	3,057		5,180												
06/26/95	04:26	4,231	1,408	3,303 7,347 33,273 38,692	20,971	448 2,087		0												
06/29/95	06:56	6,122 3,923	5,528	1,013 215	0															
07/04/95	10:03	0	0	0	0	0 0			1,319 1,745		258 1,030								0	
07/04/95	21:45	2,055	1,152	267	218	4,500 2,514 8,000														
07/05/95	11:10	3,636	6,122		366	12,837 11,129														
07/05/95	22:58	2,320	1,758	1,376 267	1,728	1,076 3,482														
07/06/95	11:39	612	5,938		0 0	273 0 216		1,169 0	1,096		874	26	37						727	
07/07/95	00:18	0	4,348		0	0 0														1,587
07/07/95	10:45			9,954 7,072 22,609	2,517 14,694	13,500 8,000												700	6,224	

^a All indices expressed in number of fish/100 fathoms-hours to the nearest full index point.

Table 12. (Page 1 of 4) Emergency order commercial salmon fishing period, by district, Bristol Bay, 1995.

Number ¹	Date and Time				Effective time
NAKNEK-KVICHAK DISTRICT					
AKN. 02	June 01	12:01 a.m.	to	July 17	09:00 a.m. ²
AKN. 10	June 27	12:30 a.m.	to	June 27	10:30 a.m. 10 hrs.
AKN. 11	June 27	10:30 a.m.	to	June 27	10:30 p.m. 12 hrs.
AKN. 13	June 28	12:30 p.m.	to	June 28	11:30 p.m. 11 hrs.
AKN. 16	June 29	1:30 p.m.	to	June 30	2:00 p.m. 12.5 hrs.
AKN. 21	June 30	2:00 p.m.	to	July 01	02:30 a.m. 12.5 hrs.
AKN. 25	July 01	3:00 p.m.	to	July 02	03:30 a.m. 12.5 hrs.
AKN. 46	July 07	8:00 p.m.	to	July 08	08:00 a.m. 12 hrs.
AKN. 49	July 08	9:00 p.m.	to	July 09	10:00 p.m. 25 hrs.
AKN. 51	July 10	09:30 a.m.	to	July 10	10:30 p.m. 13 hrs.
AKN. 54	July 11	10:30 a.m.	to	July 11	12:00 midnight 13.5 hrs. ³
AKN. 72	July 17	09:00 a.m.	to	Sept 30	12:00 midnight ³
AKN. 81	July 20	06:30 a.m.	to	Sept 30	12:00 midnight ⁴
Naknek Section					
AKN. 07	June 25	11:30 p.m.	to	June 26	11:00 a.m. 11.5 hrs.
AKN. 18	June 30	02:00 a.m.	to	June 30	2:00 p.m. 12 hrs.
AKN. 22	July 01	02:30 a.m.	to	July 01	3:00 p.m. 12.5 hrs.
AKN. 28	July 02	4:00 p.m.	to	July 02	04:00 a.m. 12 hrs.
AKN. 30	July 03	5:00 p.m.	to	July 04	04:30 a.m. 11.5 hrs.
AKN. 35	July 04	9:00 p.m.	to	July 05	05:00 a.m. 8 hrs.
AKN. 37	July 05	6:30 p.m.	to	July 06	05:00 a.m. 11.5 hrs.
AKN. 38	July 06	06:00 a.m.	to	July 06	4:00 p.m. 10 hrs.
AKN. 43	July 06	4:00 p.m.	to	July 07	06:30 a.m. 14.5 hrs.
AKN. 55	July 12	11:30 a.m.	to	July 13	01:00 a.m. 13.5 hrs.
AKN. 57	July 13	01:00 a.m.	to	July 14	01:30 a.m. 24.5 hrs.
AKN. 61	July 14	01:30 a.m.	to	July 15	02:30 a.m. 25 hrs.
AKN. 65	July 15	02:30 a.m.	to	July 16	03:30 a.m. 25 hrs.
AKN. 69	July 16	4:00 p.m.	to	July 17	04:00 a.m. 12 hrs.
AKN. 73	July 17	04:00 a.m.	to	July 18	05:00 a.m. 25 hrs.
AKN. 77	July 18	05:00 a.m.	to	July 19	06:00 a.m. 25 hrs.
AKN. 83	July 19	06:00 a.m.	to	July 20	06:30 a.m. 24.5 hrs.
Kvichak Section					
AKN. 19	June 30	01:30 a.m.	to	June 30	2:00 p.m. 12.5 hrs.
AKN. 32	July 04	02:30 a.m.	to	July 04	12:30 p.m. 10 hrs.
AKN. 39	July 05	5:30 p.m.	to	July 06	06:00 a.m. 12.5 hrs.
AKN. 40	July 06	06:00 a.m.	to	July 06	4:00 p.m. 10 hrs.
AKN. 44	July 06	4:00 p.m.	to	July -07	06:30 a.m. 14.5 hrs.
AKN. 56	July 12	11:30 a.m.	to	July 13	01:00 a.m. 13.5 hrs.
AKN. 58	July 13	01:00 a.m.	to	July 14	01:30 a.m. 24.5 hrs.
AKN. 62	July 14	01:30 a.m.	to	July 14	12:00 noon 10.5 hrs.
AKN. 63	July 14	12:00 noon	to	July 15	02:30 a.m. 14.5 hrs.
AKN. 66	July 15	02:30 a.m.	to	July 16	03:30 a.m. 25 hrs.
AKN. 70	July 16	4:00 p.m.	to	July 17	04:00 a.m. 12 hrs.
AKN. 74	July 17	04:00 a.m.	to	July 18	05:00 a.m. 25 hrs.
AKN. 78	July 18	05:00 a.m.	to	July 19	06:00 a.m. 25 hrs.
AKN. 84	July 19	06:00 a.m.	to	July 20	06:30 a.m. 24.5 hrs.
EGEGIK DISTRICT					
AKN. 01	June 01	00:01 a.m.	to	June 16	09:00 a.m. ²
AKN. 03	June 19	05:00 a.m.	to	June 19	3:00 p.m. 10 hrs. ²
AKN. 04	June 21	06:30 a.m.	to	June 21	4:30 p.m. 10 hrs. ²
AKN. 05	June 23	08:00 a.m.	to	June 23	6:00 p.m. 10 hrs. ²
AKN. 06	June 25	09:00 a.m.	to	June 25	7:00 p.m. 10 hrs. ²
AKN. 09	June 26	11:15 p.m.	to	June 27	09:15 a.m. 10 hrs. ²
AKN. 12	June 28	11:30 a.m.	to	June 28	9:30 p.m. 10 hrs. ²
AKN. 14	June 28	9:30 p.m.	to	June 29	11:00 a.m. 13.5 hrs. ²
AKN. 17	June 30	01:30 a.m.	to	June 30	11:30 a.m. 10 hrs. ²
AKN. 20	June 30	11:30 a.m.	to	June 30	11:30 p.m. 12 hrs. ²
AKN. 24	July 01	1:45 p.m.	to	July 01	11:45 p.m. 10 hrs. ²

-continued-

Table 12. (Page 2 of 4)

Number	Date and Time			Hours/Days Open
AKN. 26	July 01	11:45 p.m.	to July 02	12:00 noon 12 hrs. ²
AKN. 29	July 03	03:00 a.m.	to July 03	1:00 p.m. 10 hrs. ²
AKN. 31	July 04	03:45 a.m.	to July 04	1:45 p.m. 10 hrs. ²
AKN. 34	July 04	1:45 p.m.	to July 05	01:45 a.m. 12 hrs. ²
AKN. 36	July 05	5:30 p.m.	to July 06	3:30 p.m. 22 hrs.
AKN. 42	July 07	06:00 a.m.	to July 07	4:00 p.m. 10 hrs.
AKN. 45	July 08	06:15 a.m.	to July 08	4:15 p.m. 10 hrs.
AKN. 48	July 09	07:15 a.m.	to July 09	5:15 p.m. 10 hrs.
AKN. 50	July 10	08:15 a.m.	to July 10	6:15 p.m. 10 hrs.
AKN. 52	July 11	09:45 a.m.	to July 11	7:45 p.m. 10 hrs.
AKN. 53	July 12	10:45 a.m.	to July 12	8:45 p.m. 10 hrs.
AKN. 59	July 13	11:45 a.m.	to July 13	9:45 p.m. 10 hrs.
AKN. 60	July 14	1:00 p.m.	to July 14	11:00 p.m. 10 hrs.
AKN. 64	July 15	2:00 p.m.	to July 15	12:00 midnight 10 hrs.
AKN. 67	July 16	3:30 p.m.	to July 17	09:00 a.m. 17.5 hrs.
AKN.85	Aug. 25	09:00 a.m.	to Sept 30	12:00 midnight CLOSURE
UGASHIK DISTRICT				
AKN. 8	June 26	09:30 a.m.	to June 26	9:30 p.m. 12 hrs.
AKN. 15	June 29	12:00 noon	to June 29	12:00 midnight 12 hrs.
AKN. 23	July 01	1:30 p.m.	to July 02	01:30 a.m. 12 hrs.
AKN. 27	July 02	2:00 p.m.	to July 03	02:00 a.m. 12 hrs.
AKN.33	July 04	02:30 a.m.	to July 04	2:30 p.m. 12 hrs.
AKN. 41	July 06	4:30 p.m.	to July 07	5:30 p.m. 13 hrs.
AKN.47	July 09	06:30 a.m.	to July 09	6:30 p.m. 12 hrs.
AKN. 68	July 14	11:00 p.m.	to July 15	12:00 noon 13 hrs. ¹⁷
AKN. 71	July 17	09:00 a.m.		
AKN. 75	July 17	2:00 p.m.	to July 18	02:30 a.m. 12.5 hrs.
AKN. 76	July 18	02:30 a.m.	to July 18	3:30 p.m. 13 hrs.
AKN. 79	July 19	03:00 a.m.	to July 20	04:30 a.m. 25.5 hrs.
AKN. 80	July 20	04:30 a.m.	to July 24	09:00 a.m. 100.5 hrs. ⁵
AKN. 82	July 24	09:00 a.m.		
NUSHAGAK DISTRICT				
DLG. 01	June 01	12:01 a.m.	to June 06	1:00 p.m. SUBSISTENCE
DLG. 03	June 06	1:00 p.m.	to June 08	06:00 a.m. SUBSISTENCE
DLG. 04	June 09	08:30 a.m.	to June 09	4:30 p.m. 8 hrs.
DLG. 05	June 10	8:00 p.m.	to June 12	07:00 a.m. SUBSISTENCE
DLG. 06	June 13	12:30 p.m.	to June 13	7:30 p.m. 7 hrs.
DLG. 07	June 14	12:01 a.m.	to June 14	12:00 p.m. SUBSISTENCE
DLG. 08	June 16	03:30 a.m.	to June 16	1:30 p.m. 10 hrs.
DLG. 09	June 16	1:30 p.m.	to June 16	9:00 p.m. 7.5 hrs.
DLG. 12	June 17	5:00 p.m.	to June 18	01:00 a.m. SUBSISTENCE
DLG. 13	June 18	05:00 a.m.	to June 18	1:00 p.m. 8 hrs.
DLG. 14	June 18	6:00 p.m.	to June 19	02:00 a.m. SUBSISTENCE
DLG. 15	June 19	7:00 p.m.	to June 20	02:00 a.m. 7 hrs.
DLG. 16	June 21	9:00 p.m.	to June 22	06:00 a.m. SUBSISTENCE
DLG. 17	June 22	08:30 a.m.	to June 22	3:30 p.m. 7 hrs.
DLG. 18	June 26	12:30 a.m.	to June 26	09:30 a.m. 9 hrs. ⁶
DLG.19	June 26	12:15 p.m.	to June 27	12:15 a.m. 12 hrs.
DLG. 20	June 27	1:00 p.m.	to June 27	11:00 p.m. 10 hrs.
DLG. 21	June 27	11:00 p.m.	to June 28	11:00 a.m. 12 hrs.
DLG. 22	June 28	11:00 a.m.	to June 28	11:00 p.m. 12 hrs.
DLG. 24	June 29	2:30 p.m.	to June 29	11:30 p.m. 9 hrs.
DLG. 25	June 29	11:30 p.m.	to June 30	3:00 p.m. 15.5 hrs.
DLG. 26	June 30	3:00 p.m.	to July 01	01:00 a.m. 10 hrs.
DLG. 27	July 01	01:00 a.m.	to July 02	01:00 a.m. 24 hrs.
DLG. 28	July 02	01:00 a.m.	to July 03	01:00 a.m. 24 hrs.
DLG. 29	July 03	01:00 a.m.	to July 04	01:00 a.m. 24 hrs. ¹⁸
DLG. 30	July 04	1:30 p.m.	to July 05	04:30 a.m. 10 hrs. ¹⁸
DLG. 34	July 05	04:30 a.m.	to July 05	3:30 p.m. 11 hrs. ⁷

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Table 12. (Page 3 of 4)

Number	Date and Time				Hours/Days Open	
DLG. 35	July 05	3:30 p.m.	to	July 06	04:30 a.m.	13 hrs. ⁷
DLG. 38	July 07	8:30 p.m.	to	July 08	2:30 p.m.	18 hrs.
DLG. 39	July 08	2:30 p.m.	to	July 09	2:30 p.m.	24 hrs.
DLG. 40	July 09	2:30 p.m.	to	July 10	3:30 p.m.	25 hrs.
DLG. 41	July 10	3:30 p.m.	to	July 11	4:30 p.m.	25 hrs.
DLG. 42	July 11	4:30 p.m.	to	July 12	5:30 p.m.	25 hrs.
DLG. 43	July 12	5:30 p.m.	to	July 13	7:00 p.m.	25.5 hrs.
DLG. 44	July 13	7:00 p.m.	to	July 14	8:00 p.m.	25 hrs.
DLG. 46	July 14	8:00 p.m.	to	July 15	9:00 p.m.	25 hrs.
DLG. 47	July 15	9:00 p.m.	to	July 16	10:00 p.m.	25 hrs.
DLG. 49	July 16	10:00 p.m.	to	July 17	11:00 p.m.	25 hrs.
DLG. 50	July 17	11:00 p.m.	to	July 18	12:00 midnight	25 hrs.
DLG. 51	July 18	12:00 midnight	to	July 20	01:30 a.m.	25.5 hrs.
DLG. 52	July 20	01:30 a.m.	to	July 21	02:30 a.m.	25 hrs.
DLG. 53	July 21	02:30 a.m.	to	July 21	2:00 p.m.	11.5 hrs.
DLG. 55	July 26	09:00 a.m.	to	Sept 30	12:00 midnight	SUBSISTENCE
DLG. 59	Aug 14	09:00 a.m.	to	Sept 30	12:00 midnight	SUBSISTENCE ⁸
DLG. 60	Aug 19	09:00 a.m.	to	Oct 31	12:00 midnight	SUBSISTENCE ⁹
DLG. 64	Aug 30	09:00 a.m.	to	Sept 30	12:00 midnight	SUBSISTENCE ¹⁰
Igushik Section						
DLG. 23	June 28	11:00 p.m.	to	June 29	2:30 p.m.	15.5 hrs.
DLG. 30	July 04	01:00 a.m.	to	July 05	04:30 a.m.	17.5 hrs. ¹⁸
DLG. 33	July 05	04:30 a.m.	to	July 06	04:30 a.m.	24 hrs.
DLG. 36	July 06	04:30 a.m.	to	July 07	04:30 a.m.	24 hrs.
DLG. 37	July 07	04:30 a.m.	to	July 08	05:30 a.m.	25 hrs.
TOGIAK DISTRICT						
DLG. 02	June 01	09:00 a.m.	to	Sept 30	12:00 midnight	²
DLG. 10	June 21	09:00 a.m.	to	June 24	09:00 a.m.	72 hrs. ¹¹
DLG. 11	June 22	09:00 a.m.	to	June 25	12:00 midnight	SUBSISTENCE ¹²
DLG. 31	June 27	9:00 p.m.	to	July 01	09:00 a.m.	96 hrs. ¹¹
DLG. 32	June 28	09:00 a.m.	to	July 01	09:00 a.m.	SUBSISTENCE ¹²
DLG. 48	July 17	04:00 a.m.	to	July 17	09:00 a.m.	5 hrs. ¹³
DLG. 54	July 21	09:00 a.m.	to	July 24	09:00 a.m.	72 hrs. ¹³
DLG. 56	July 28	09:00 a.m.	to	July 29	7:00 p.m.	34 hrs. ¹³
DLG. 57	July 29	7:00 p.m.	to	July 31	09:00 a.m.	38 hrs. ¹³
DLG. 58	Aug 04	09:00 a.m.	to	Aug 05	12:00 midnight	39 hrs. ¹³
DLG. 63	Aug 28	09:00 a.m.	to	Sept 30	12:00 midnight	CLOSURE ¹¹
Togiak River Section						
DLG. 45	July 14	09:00 a.m.	to	July 15	10:00 p.m.	37 hrs. ¹⁴
DLG. 61	Aug 17	09:00 a.m.	to	Aug 18	09:00 a.m.	72 hrs. ¹⁵
DLG. 62	Aug 23	09:00 a.m.	to	Aug 25	09:00 a.m.	48 hrs. ¹⁶
Matogak Section						
DLG. 61	Aug 17	09:00 a.m.	to	Aug 19	09:00 a.m.	24 hrs. ¹⁵
DLG. 62	Aug 23	09:00 a.m.	to	Aug 26	09:00 a.m.	48 hrs. ¹⁷
Osviak Section						
DLG. 61	Aug 17	09:00 a.m.	to	Aug 19	09:00 a.m.	24 hrs. ¹⁵
DLG. 62	Aug 23	09:00 a.m.	to	Aug 26	09:00 a.m.	48 hrs. ¹⁸
Cape Pierce Section						
DLG. 61	Aug 17	09:00 a.m.	to	Aug 19	09:00 a.m.	24 hrs. ¹⁵
DLG. 62	Aug 23	09:00 a.m.	to	Aug 26	09:00 a.m.	48 hrs. ¹⁹

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Table 12. (Page 4 of 4) Emergency order commercial salmon fishing period, by district, Bristol Bay, 1995

01. Prefix code on emergency orders indicate where announcements originated. ("AKN" for King Salmon field office and "DLG" for Dillingham field office).
02. Prohibits the use of gill net mesh larger than 5 1/2 inches.
03. Extends the Emergency Order period in the Naknek-Kvichak District.
04. Rescinds emergency order AKN.81, Naknek-Kvichak District to a four day a week fishing period.
05. Rescinds the extension of the emergency order period in the Ugashik District.
06. Gillnets are restricted to 6 3/4 inch mesh and larger.
07. Extends the commercial fishery in the Nushagak Section of the Nushagak District.
08. Restricts Subsistence fishing in the Nushagak Commercial Fishing District, all waters of the Nushagak River, and that portion of the Wood River downriver of the dock at Dragnet Fisheries to three days per week.
09. Closed the Nushagak Commercial Fishing District, the Nushagak River, and that portion of the Wood River downriver of the dock at Dragnet Fisheries to Subsistence salmon fishing.
10. Opens a portion of Nushagak River drainage to subsistence fishing for sockeye salmon only for the remainder of the season.
10. Opens a portion of Nushagak River drainage to subsistence fishing for sockeye salmon only for the remainder of the season.
11. Closes all sections of the Togiak District to commercial harvest until further notice.
12. Opens all sections of the Togiak District to Subsistence salmon fishing.
13. Opens commercial salmon fishing in the Togiak District.
14. Extends commercial salmon fishing in the Togiak River Section of the Togiak District.
15. Reduced the weekly fishing schedule for commercial harvest of salmon by 24 hours.
16. Reduced the weekly fishing schedule for commercial harvest of salmon by 48 hours.
17. Extends the Emergency Order period in the Ugashik District.
18. Extended Commercial Fishing in Igushik Section for 17.5 hours, and opened the Nushagak District for 10 hours.

Table 13. Daily district registration of drift gillnet fishermen by district, Bristol Bay, 1995.

Date	Nakek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total °
6/13	123	76	20	296	17	532
14	149	85	22	357	17	630
15	194	99	25	373	24	715
16	239	107	27	374	25	772
17	248	114	27	366	25	780
18	353	228	35	315	25	956
19	388	248	36	314	25	1,011
20	480	320	54	253	26	1,133
21	535	479	55	236	26	1,331
22	573	525	52	237	25	1,412
23	582	562	50	221	24	1,439
24	591	590	40	203	23	1,447
25	642	619	48	203	23	1,535
26	815	613	64	204	23	1,719
27	845	549	79	207	24	1,704
28	876	498	88	205	24	1,691
29	894	487	97	222	25	1,725
30	943	476	108	224	25	1,776
7/01	925	469	118	245	26	1,783
02	907	463	137	264	26	1,797
03	903	464	153	265	26	1,811
04	890	458	175	263	26	1,812
05	884	458	192	263	27	1,824
06	876	457	199	265	27	1,824
07	872	441	207	266	27	1,813
08	870	423	214	267	27	1,801
09	842	383	233	240	28	1,726
10	845	337	268	228	29	1,707
11	851	329	339	228	34	1,781
12	871	362	335	225	39	1,832
13	828	360	331	224	39	1,782
14	756	369	333	218	42	1,718
15	753	371	405	217	48	1,794
16	749	379	452	220	50	1,850
17	754	371	458	220	50	1,853
Average	681	388	156	255	28	1,509

° Total indicates number of drift gillnet permit holders legal to fish each day in the districts (transferees not included). There were 1,891 drift permits licensed for this year.

Table 14. Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 1995.

Date	Time	Sockeye	Chinook	Chum	Pink	Coho	Total
6/12	15 hrs.	64	7				71
6/13	24 hrs.	374	17	1			392
6/14	24 hrs.	954	120	4			1,078
6/15	24 hrs.	1,296	156	23			1,475
6/16	9 hrs.	308	25	3			336
6/19	15 hrs.	21,385	326	672			22,383
6/20	24 hrs.	23,227	220	745			24,192
6/21	24 hrs.	33,041	343	1,009			34,393
6/22	24 hrs.	57,005	237	2,080			59,322
6/23	9 hrs.	58,141	155	1,680			59,976
6/25 ^a	11.5 hrs	5,380					5,380
6/26 ^b	11 hrs	264,964	53	1,275			266,292
6/27 ^d	10 hrs	1,112,634	203	6,369			1,119,206
6/28 ^d	11 hrs	655,402	74	3,247			658,723
6/29 ^{ad}	10.5 hrs	793,488	49	2,564			796,101
6/30 ^d	12.5 hrs	856,115	287	3,951			860,353
7/ 1 ^d	10.5 hrs	1,312,534	320	7,079			1,319,933
7/ 2 ^d	11.5 hrs	760,821	97	4,529			765,447
7/3 ^b	11.5 hrs.	438,556	54	1,462			440,072
7/ 4 ^{ab}	12 hrs.	693,867	98	2,030			695,995
7/ 5 ^b	5.5 hrs.	1,050,581	71	5,917			1,056,569
7/ 6 ^b	24 hrs.	1,924,947	355	13,339			1,938,641
7/ 7 ^d	10.5 hrs.	827,034	40	4,259			831,333
7/ 8 ^d	11 hrs.	870,998	78	5,460			876,536
7/ 9 ^d	22 hrs.	1,410,241	194	19,181			1,429,616
7/10 ^d	13 hrs	1,267,189	142	10,104			1,277,435
7/11 ^d	13.5 hrs	1,269,111	117	10,219			1,279,447
7/12 ^b	13.5 hrs.	1,000,365	152	7,464			1,007,981
7/13 ^b	24 hrs.	431,722	158	2,487	2		434,369
7/14 ^b	24 hrs.	939,724	127	16,728	1		956,580
7/15 ^b	24 hrs.	923,326	201	20,747	1		944,275
7/16 ^b	11.5 hrs.	315,545	79	2,566			318,190
7/17 ^b	24 hrs.	348,419	83	3,154			351,656
7/18 ^b	24 hrs.	203,842	93	1,765	2		205,702
7/19 ^b	24 hrs.	162,978	101	4,241	2		167,322
7/20	24 hrs.	231,757	139	36,170	3		268,069
7/21	9 hrs.	41,290	45	3,679			45,014
7/24	15 hrs.	30,960	60	9,493	6	39	40,558
7/25	24 hrs.	25,641	82	3,892	8	63	29,686
7/26	24 hrs.	17,262	72	4,073	6	54	21,467
7/27	24 hrs.	17,005	53	6,936	7	181	24,182
7/28	9 hrs.	6,194	21	2,816	4	57	9,092
7/31	15 hrs.	2,604	7	1,743	6	101	4,461
8/1	24 hrs.	3,395	20	991	8	160	4,574
8/2	24 hrs.	2,371	7	877	4	167	3,426
8/3	24 hrs.	1,211	8	455	1	133	1,808
8/4	9 hrs.	226		45		26	297
Total		20,415,430	5,339	237,524	61	981	20,659,335
% of District Catch		98.8	0.0	1.1	0.0	0.0	100

^a District Test fishing

^b Naknek Section only.

^c Kvichak section only.

^d Naknek-Kvichak district.

Table 15. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 1995.

Date	Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/06	24.00	0	1	5	3	1	0	0	9
07	24.00	0	0	0	0	0	0	0	0
08	24.00	0	1	4	5	0	0	0	9
09	9.00	0	1	16	4	0	0	0	20
12	15.00	0	8	322	12	0	0	0	334
13	24.00	0	18	1,182	46	11	0	0	1,239
14	24.00	1	19	1,493	71	6	0	0	1,570
15	24.00	1	18	1,094	49	0	0	0	1,143
16	9.00	1	5	1,115	11	23	0	0	1,149
19	10.00	220	92	79,653	101	749	0	0	80,503
20	0.00	0	0	0	0	0	0	0	0
21	10.00	455	142	67,405	73	652	0	0	68,130
22 °	0.00	1	0	250	0	0	0	0	250
23	10.00	602	134	373,669	38	1,283	0	0	374,990
24 °	0.00	1	0	215	0	0	0	0	215
25	10.00	686	269	986,336	19	2,063	0	0	988,418
26	0.75	0	0	0	0	0	0	0	0
27	9.25	650	245	510,127	21	1,439	0	0	511,587
28	12.50	527	188	724,942	21	1,533	0	0	726,496
29	11.00	524	170	626,861	24	1,632	0	0	628,517
30	22.00	887	402	955,301	29	2,786	0	0	958,116
7/01	10.25	603	215	545,247	14	1,408	0	0	546,669
02	12.00	308	92	329,808	11	866	0	0	330,685
03	10.00	483	187	580,975	5	1,928	0	0	582,908
04	20.25	917	433	1,224,334	17	3,675	0	0	1,228,026
05	8.25	662	274	627,169	8	1,753	0	0	628,930
06	15.50	366	106	728,048	8	1,670	0	0	729,726
07	10.00	544	207	1,040,762	11	3,113	0	0	1,043,886
08	10.00	469	273	462,078	4	1,856	0	0	463,938
09	10.00	399	203	247,734	8	941	0	0	248,683
10	10.00	387	211	656,467	4	3,838	0	0	660,309
11	10.00	422	262	737,418	9	2,843	0	0	740,270
12	10.00	423	276	521,867	5	2,022	0	0	523,894
13	10.00	422	225	402,972	8	1,540	0	0	404,520
14	10.00	406	206	473,543	2	2,647	0	0	476,192
15	10.00	397	232	360,226	3	1,911	0	0	362,140
16	8.50	376	206	300,841	3	1,314	0	0	302,158
17	24.00	383	268	287,504	4	1,947	0	0	289,455
18	24.00	477	237	282,976	7	2,482	0	0	285,465
19	24.00	447	209	134,634	4	3,455	0	0	138,093
20	24.00	201	154	83,256	2	4,171	0	0	87,429
21	9.00	94	43	14,622	1	1,334	0	0	15,957
24	15.00	130	68	26,345	0	700	0	3	27,048
25	24.00	67	87	17,604	1	986	0	36	18,627
26	24.00	24	78	15,486	2	353	0	7	15,848
27	24.00	29	79	10,701	2	514	0	51	11,268

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Table 15. (Page 2 of 2)

Date	Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/28	9.00	6	27	3,767	0	116	0	21	3,904
31	15.00	15	21	3,637	2	146	0	564	4,349
8/01	24.00	21	31	3,908	0	116	0	769	4,793
02	24.00	17	29	2,812	1	115	0	947	3,875
03	24.00	7	16	841	0	9	0	425	1,275
04	9.00	0	4	118	1	0	0	75	194
07	15.00	12	23	912	0	63	0	1,855	2,830
08	24.00	10	28	578	2	47	0	1,518	2,145
09	24.00	3	20	520	0	16	0	1,432	1,968
10	24.00	6	19	479	0	20	0	1,408	1,907
11	9.00	0	1	27	0	0	0	26	53
14	15.00	5	17	243	0	44	0	1,465	1,752
15	24.00	6	22	283	0	24	0	1,705	2,012
16	24.00	3	17	236	1	17	0	1,995	2,249
17	24.00	7	12	69	3	7	0	1,640	1,719
18	9.00	0	0	0	0	0	0	0	0
21	15.00	3	15	43	0	0	0	2,270	2,313
22	24.00	3	16	55	0	0	0	1,465	1,520
23	24.00	3	16	54	0	0	0	1,135	1,189
24	24.00	0	10	32	0	1	0	679	712
25	9.00	0	5	7	0	0	0	281	288
Total	1,032.25	14,119	6,893	14,461,228	680	62,186	0	21,772	14,545,866
% of District Catch				99	0	0	0	0	100

¹ Estimated number of deliveries based on daily oral company reports. Preliminary.

° ADF&G test fishing catches.

Table 16. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 1995.

Date	Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
1-Jun	24.0	0	0	0	0	0	0	0	0
2-Jun	9.0	0	0	0	0	0	0	0	0
5-Jun	15.0	0	0	0	0	0	0	0	0
6-Jun	24.0	0	0	0	0	0	0	0	0
7-Jun	24.0	0	0	0	0	0	0	0	0
8-Jun	24.0	0	0	0	0	0	0	0	0
9-Jun	9.0	0	0	0	0	0	0	0	0
12-Jun	15.0	5	0	9	88	0	0	0	97
13-Jun	24.0	12	0	29	272	2	0	0	303
14-Jun	24.0	9	0	13	188	0	0	0	201
15-Jun	24.0	10	0	41	93	0	0	0	134
16-Jun	9.0	6	0	8	67	0	0	0	75
19-Jun	15.0	36	3	3,811	109	125	0	0	4,045
20-Jun	24.0	46	3	3,356	137	97	0	0	3,590
21-Jun	24.0	46	1	10,308	166	180	0	0	10,654
22-Jun	24.0	40	0	29,869	22	488	0	0	30,379
23-Jun	9.0	29	0	13,893	9	222	0	0	
25-Jun ^a	0.0	1	0	550	2	4	0	0	556
26-Jun	12.0	78	15	93,420	67	527	0	0	94,014
27-Jun	0.0	0	0	0	0	0	0	0	0
28-Jun ^a	0.0	1	0	519	0	2	0	0	521
29-Jun	12.0	130	48	262,768	51	1,326	0	0	264,145
30-Jun ^a	0.0	1	0	472	0	0	0	0	472
1-Jul	10.5	24	60	81,551	44	481	0	0	82,076
2-Jul	11.5	130	65	219,103	59	1,547	1	0	220,710
3-Jul ^a	2.0	152	1	215,400	16	1,269	0	0	216,685
4-Jul	12.0	169	34	270,944	6	2,041	0	0	272,991
5-Jul ^a	0.0	1	0	384	2	6	0	0	392
6-Jul	7.5	57	31	57,881	8	346	0	0	58,235
7-Jul	17.5	400	54	696,435	18	6,978	0	0	703,431
8-Jul	0.0	0	0	0	0	0	0	0	0
9-Jul	12.0	220	63	284,669	16	4,425	0	0	289,110
10-Jul ^a	0.0	1	0	3,996	0	16	0	0	4,012
11-Jul ^a	0.0	4	0	3,839	0	9	0	0	3,848
12-Jul ^a	0.0	4	0	2,193	1	7	0	0	2,201
13-Jul ^a	0.0	2	0	2,139	0	16	0	0	2,155
14-Jul ^a	1.0	1	0	1,022	0	8	0	0	1,030
15-Jul ^{ab}	12.0	479	82	813,341	20	5,460	0	0	818,821
16-Jul ^a	0.0	1	0	1,633	0	2	0	0	1,635
17-Jul	10.0	412	107	453,452	5	6,802	0	0	460,259
18-Jul	15.5	720	80	415,131	9	6,532	0	0	421,672
19-Jul	21.0	393	83	166,336	12	8,448	0	0	174,796
20-Jul	24.0	411	68	130,056	12	3,770	0	0	133,838
21-Jul	24.0	346	50	80,542	4	2,769	0	4	83,319
22-Jul	24.0	313	52	54,242	9	2,666	0	0	56,917
23-Jul	24.0	167	33	45,420	6	2,326	0	0	47,752
24-Jul	24.0	107	38	33,433	3	1,746	1	0	35,183
25-Jul	24.0	89	29	19,060	2	759	0	1	19,822

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Table 16. (Page 2 of 2)

Date	Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total	
		Drift	Set							
26-Jul	24.0	50	32	8,796	0	269	0	0	9,065	
27-Jul	24.0	38	27	7,395	0	690	0	0	8,085	
28-Jul	9.0	5	0	414	0	57	0	0	471	
31-Jul	15.0	23	27	4,984	0	200	0	229	5,413	
1-Aug	24.0	28	19	4,572	4	377	0	421	5,374	
2-Aug	24.0	11	8	1,923	0	141	0	321	2,385	
3-Aug	24.0	12	8	830	0	53	0	63	946	
4-Aug	9.0	0	0	0	0	0	0	0	0	
7-Aug	15.0	3	3	266	0	66	0	302	634	
8-Aug	24.0	10	5	265	2	47	0	365	679	
9-Aug	24.0	5	0	36	0	14	0	212	262	
10-Aug	24.0	15	0	0	0	0	0	197	197	
11-Aug	9.0	5	0	0	0	0	0	0	0	
14-Aug	15.0	0	0	0	0	0	0	0	0	
15-Aug	24.0	6	6	91	0	0	0	667	758	
16-Aug	24.0	4	5	55	0	0	0	314	369	
17-Aug	24.0	26	9	121	0	0	0	2,655	2,776	
18-Aug	9.0	0	0	0	0	0	0	0	0	
21-Aug	15.0	5	7	27	0	0	0	988	1,015	
22-Aug	24.0	2	2	0	0	0	0	166	166	
23-Aug	24.0	6	7	0	0	0	0	1,280	1,280	
24-Aug	24.0	13	0	20	0	0	0	2,338	2,358	
25-Aug	9.0	5	1	13	0	0	0	705	718	
28-Aug	15.0	4	6	0	0	0	0	1,035	1,035	
29-Aug	24.0	2	5	0	0	0	0	512	0	
30-Aug	24.0	(2)	2	0	0	0	0	69	0	
31-Aug	24.0	0	0	0	0	0	0	0	0	
1-Sep	9.0	0	0	0	0	0	0	0	0	
Total	1,159	5,329	1,179	0	4,501,076	1,529	63,316	2	12,844	4,578,767
% of District Catch				99	0	1	0	0	100	

¹ Estimated number of deliveries based on daily company oral reports. Preliminary.

^a ADF&G test fishing catches.

^b Included in totals recorded for subsequent day.

Table 17. Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 1995.

Date	Time Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
9-Jun	8.00	209	12		2,234	6			2,240
13-Jun	7.00	293	26	435	14,952	121			15,508
16-Jun	17.50	347	47	3,393	17,419	1,510			22,322
18-Jun	8.00	255	48	3,279	7,839	2,919			14,037
19-Jun	7.00			7,541	7,146	6,484			21,171
22-Jun	7.00	170	114	28,056	8,670	30,439			67,165
25-Jun	^a			55	8	18			81
26-Jun	^b 20.75	188		104,798	6,484	13,153	2		124,437
27-Jun	11.25			162,364	2,240	33,439			198,043
28-Jun	^c 24.00			475,814	3,363	45,624			524,801
29-Jun	^d 24.00			181,765	493	7,687	1		189,946
30-Jun	24.00			184,739	1,302	18,068			204,109
1-Jul	24.00			265,078	1,031	16,565			282,674
2-Jul	24.00			119,829	446	11,154	3	2	131,434
3-Jul	24.00	231		221,186	910	18,753	2		240,851
4-Jul	^e 24.00	234		267,116	487	15,386	5		282,994
5-Jul	24.00			478,019	1,524	36,492	1	2	516,038
6-Jul	^f 24.00			133,711	494	8,740	3		142,948
7-Jul	^g 24.00	219	254	48,834	38	765			49,637
8-Jul	24.00			90,494	200	5,902	5		96,601
9-Jul	24.00			176,090	200	9,783	7	4	186,084
10-Jul	24.00			278,701	488	11,963	11	4	291,167
11-Jul	24.00			203,296	252	10,477	3	54	214,082
12-Jul	24.00			232,187	253	10,937	11	86	243,474
13-Jul	24.00			108,939	256	6,064	16	52	115,327
14-Jul	24.00			220,310	245	8,936	8	121	229,620
15-Jul	24.00	94	167	175,573	328	8,871	9	245	185,026
16-Jul	24.00			82,650	179	5,893	4	120	88,846
17-Jul	24.00			54,169	199	5,162	9	287	59,826
18-Jul	24.00	57	140	49,456	133	3,562	10	523	53,684
19-Jul	24.00			40,599	115	3,878	9	568	45,169
20-Jul	24.00			38,722	212	3,520	8	2,216	44,678
21-Jul	14.00			13,139	40	1,099	12	612	14,902
Total				4,450,337	80,180	363,370	139	4,896	4,898,922
% of District Catch				90.8%	1.6%	7.4%	0.0%	0.1%	100.0%

¹ Estimated fishing effort based on aerial survey count.

^a ADF&G test fish harvest.

^b Gillnets with mesh size less than 6-3/4" prohibited for 9-hour opening, from 12:30 a.m. to 9:30 a.m..

^c Nushagak District fished 23 hours, Igushik Section fished 1 hour.

^d Igushik Section fished 14.5 hours, Nushagak District fished 9.5 hours.

^e Igushik Section fished 17.5 hours, Nushagak District fished 6.5 hours.

^f Nushagak District fished 4.5 hours, Igushik Section fished 19.5 hours.

^g Igushik Section fished 20.5 hours, Nushagak District fished 3.5 hours.

Table 18. Commercial sockeye salmon catch by date in numbers of fish, from setnet areas, Nushagak District, Bristol Bay, 1995.

Date	Time (Hrs.)	Combine Flats ¹	Queen Slough ²	Coffee Point ³	Clark's Point Beach ⁴	Ekuk Beach ⁵	Igushik Beach ⁶	Snake River Beach ⁷	Daily Total
6/09	8	0	0	0	0	0	0	0	0
6/13	7	0	0	0	0	34	328	0	362
6/16	17.50	9	0	10	45	364	2,196	0	2,624
6/18	8	106	0	63	31	98	2,069	0	2,367
6/19	7	54	0	32	35	364	2,196	0	2,681
6/22	7	1,396	1,396	57	959	2,286	4,445	0	10,539
6/26 ^c	20.75	32,613	5,509	6,307	4,308	9,374	24,862	0	67,792
6/27	11.25	3,457	4,227	2,053	2,167	8,383	23,868	0	44,155
6/28 ^b	24	10,816	3,493	23,878	4,666	49,438	23,404	0	115,695
6/29 ^c	24	18,439	6,892	10,448	1,999	14,334	43,922	0	96,034
6/30	24	10,793	1,628	11,901	3,117	11,529	31,886	0	70,854
7/01	24	13,244	579	13,354	743	23,132	16,740	0	67,792
7/02	24	8,231	232	4,854	2,114	6,196	17,114	0	38,741
7/03	24	9,396	380	1,690	950	3,931	10,733	0	27,080
7/04 ^d	24	36,777	3,065	54	7,428	12,763	15,910	0	75,997
7/05	24	33,860	2,417	2,829	10,862	43,085	24,729	0	117,782
7/06 ^e	24	4,568	0	900	760	11,626	27,266	0	45,120
7/07 ^f	24	7,584	742	4,525	1,848	1,410	23,698	0	39,807
7/08	24	9,912	3,874	7,458	2,825	9,792	13,828	0	47,689
7/09	24	1,320	56	2,647	1,173	9,242	11,520	0	25,958
7/10	24	8,038	394	30,381	4,704	20,394	33,217	0	97,128
7/11	24	3,127	940	2,778	1,983	23,186	20,873	0	52,887
7/12	24	4,987	1,057	4,874	2,355	9,440	27,267	0	49,980
7/13	24	1,166	209	1,615	808	10,995	18,538	0	33,331
7/14	24	3,366	303	2,802	3,252	42,030	22,026	0	73,779
7/15	24	3,741	699	8,466	2,169	27,784	18,132	0	60,991
7/16	24	1,319	155	7,637	1,482	14,885	11,962	0	37,440
7/17	24	5,101	69	3,016	1,633	7,479	5,312	2,016	24,626
7/18	24	2,026	74	661	1,249	15,815	9,076	609	29,510
7/19	24	1,538	566	1,495	1,429	16,538	4,906	0	26,472
7/20	24	1,548	456	2,794	2,567	21,125	2,953	0	31,443
7/21	14	911	186	588	536	7,410	1,455	0	11,086
Total		239,443	39,598	160,167	70,197	434,462	496,431	2,625	1,442,923
% of District Catch		16.6%	2.7%	11.1%	4.9%	30.1%	34.4%	0.2%	100.0%

¹ Sockeye salmon accounted for 96% of the total beach catch. Other species landed included 2,004 Chinook; 6,430 Chum; 8 Pink; 27 Coho.

² Sockeye salmon accounted for 96% of the total beach catch. Other species landed included 336 Chinook; 1,199 Chum; 1 Pink; 4 Coho.

³ Sockeye salmon accounted for 95% of the total beach catch. Other species landed included 2,644 Chinook; 6,483 Chum; 18 Pink; 37 Coho.

⁴ Sockeye salmon accounted for 93% of the total beach catch. Other species landed included 252 Chinook; 5,398 Chum; 0 Pink; 0 Coho.

⁵ Sockeye salmon accounted for 97% of the total beach catch. Other species landed included 1,119 Chinook; 12,519 Chum; 101 Pink; 1,386 Coho.

⁶ Sockeye salmon accounted for 99.8% of the total beach catch. Other species landed included 555 Chinook; 358 Chum; 0 Pink; 0 Coho.

⁷ Sockeye salmon accounted for 96% of the total beach catch. Other species landed included 7 Chinook; 105 Chum; 0 Pink; 0 Coho.

^a Gillnets with mesh size less than 6-3/4" prohibited for a 9-hour opening, from 12:30 a.m. to 09:30 a.m..

^b Igushik Section fished 1 hour, Nushagak District fished 23 hours.

^c Igushik Section fished 14.5 hours, Nushagak District fished 9.5 hours.

^d Igushik Section fished 17.5 hours, Nushagak District fished 6.5 hours.

^e Igushik Section fished 19.5 hours, Nushagak District fished 4.5 hours.

^f Igushik Section fished 20.5 hours, Nushagak District fished 3.5 hours.

Table 19. Commercial salmon catch by date and species, in numbers of fish
Togiak District, Bristol Bay, 1995.

Date ¹	Sockeye	Chinook	Chum	Pink	Coho	Total
6/05	0	6	1	0	0	7
6/06	0	7	0	0	0	7
6/07	0	3	0	0	0	3
6/08	0	10	0	0	0	10
6/09	0	3	0	0	0	3
6/12	7	45	5	0	0	57
6/13	13	293	26	0	0	332
6/14	25	216	8	0	0	249
6/15	39	202	51	0	0	292
6/16	8	64	13	0	0	85
6/19	370	1,374	572	0	0	2,316
6/20	466	1,058	1,000	0	0	2,524
6/21	286	223	302	0	0	811
6/26	3,414	821	1,315	1	0	5,551
6/27	6,188	1,865	5,048	0	0	13,101
7/03	7,829	1,072	7,147	4	0	16,052
7/04	11,972	748	14,568	4	0	27,292
7/05	15,310	467	11,380	8	0	27,165
7/06	13,728	334	9,167	9	0	23,238
7/07	2,148	21	281	1	0	2,451
7/08	71	1	86	0	0	158
7/10	19,481	451	9,473	8	0	29,413
7/11	29,042	435	16,453	23	0	45,953
7/12	28,603	336	14,195	19	0	43,153
7/13	25,939	296	11,998	18	0	38,251
7/14	25,238	229	9,427	26	0	34,920
7/15	22,015	137	5,901	14	0	28,067
7/17	32,887	156	12,537	10	0	45,590
7/18	28,906	181	16,278	20	0	45,385
7/19	30,846	133	10,373	32	0	41,384

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Date ¹	Sockeye	Chinook	Chum	Pink	Coho	Total
7/20	24,788	90	8,463	15	2	33,358
7/21	23,587	103	10,082	17	2	33,791
7/22	26,327	90	8,654	9	0	35,080
7/23	22,311	36	4,656	6	0	27,009
7/24	24,373	32	4,838	6	0	29,249
7/25	20,131	53	3,076	12	0	23,272
7/26	21,471	45	3,433	4	1	24,954
7/27	22,128	37	3,090	7	14	25,276
7/28	23,385	51	5,195	9	21	28,661
7/29	13,955	28	3,163	5	14	17,165
7/30	9,588	18	1,843	4	14	11,467
7/31	10,224	15	2,299	4	37	12,579
8/01	11,026	32	1,934	6	55	13,053
8/02	7,917	23	1,214	6	118	9,278
8/03	4,647	18	731	4	59	5,459
8/04	4,596	10	434	4	92	5,136
8/05	4,913	8	474	4	154	5,553
8/07	4,545	15	341	1	335	5,237
8/08	4,796	11	630	2	608	6,047
8/09	3,004	12	457	3	473	3,949
8/10	2,455	6	303	3	763	3,530
8/11	889	2	230	0	554	1,675
8/14	574	1	11	0	269	855
8/15	817	0	62	0	579	1,458
8/16	842	5	76	0	846	1,769
8/17	199	1	35	0	424	659
8/21	279	0	0	0	1,236	1,515
8/22	320	0	0	0	2,131	2,451
8/23	46	0	0	0	116	162
Total	598,964	11,929	223,329	328	8,917	843,467
% of District						
Total	71.0%	1.4%	26.5%	0.0%	1.1%	100.0%

¹ See table 12 for inseason adjustments to the regular weekly fishing schedule

Table 20. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 1995.

Date ¹	Effort ²		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/05	1		0	6	1	0	0	7
6/06		2	0	7	0	0	0	7
6/07		1	0	3	0	0	0	3
6/08		2	0	10	0	0	0	10
6/09		1	0	3	0	0	0	3
6/12		9	7	45	5	0	0	57
6/13	12	16	13	293	26	0	0	332
6/14	5	18	25	216	8	0	0	249
6/15	5	15	36	199	20	0	0	255
6/16	3	4	8	64	13	0	0	85
6/19	20	34	292	1,309	342	0	0	1,943
6/20	31	37	347	972	600	0	0	1,919
6/21	4	16	126	173	168	0	0	467
6/26	9	38	1,921	675	626	0	0	3,222
6/27	50	68	3,689	1,769	4,177	0	0	9,635
7/03	29	59	5,648	932	5,652	3	0	12,235
7/04	51	86	7,986	555	11,325	4	0	19,870
7/05	48	88	5,983	351	8,714	8	0	15,056
7/06	51	90	9,182	294	7,846	8	0	17,330
7/07		21	2,148	21	281	1	0	2,451
7/10	39	82	17,688	406	8,213	5	0	26,312
7/11	61	136	22,709	393	15,490	15	0	38,607
7/12	62	123	20,472	295	13,250	14	0	34,031
7/13	72	115	23,357	283	11,640	18	0	35,298
7/14	63	132	25,238	229	9,427	26	0	34,920
7/15	45	117	22,015	137	5,901	14	0	28,067
7/17	59	88	27,835	128	9,994	8	0	37,965
7/18	91	94	21,298	153	12,531	19	0	34,001
7/19	95	103	23,274	113	9,182	22	0	32,591
7/20	70	100	21,806	76	8,247	14	2	30,145
7/21	95	101	23,587	103	10,082	17	2	33,791
7/22	82	108	25,565	90	8,514	9	0	34,178
7/23	72	73	22,311	36	4,656	6	0	27,009
7/24	98	77	23,823	31	4,501	6	0	28,361
7/25	73	77	17,674	43	2,491	8	0	20,216

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Table 20. (Page 2 of 2)

Date ¹	Effort ²		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
7/26	70	88	17,872	41	3,168	3	1	21,085
7/27	81	89	19,797	35	2,947	4	14	22,797
7/28	92	99	22,835	49	5,125	9	21	28,039
7/29	44	66	13,955	28	3,163	5	14	17,165
7/30	52	62	9,588	18	1,843	4	14	11,467
7/31	73	72	9,839	13	2,227	4	37	12,120
8/01	79	96	10,152	30	1,843	6	55	12,086
8/02	67	103	7,387	20	1,183	6	117	8,713
8/03	46	82	4,647	18	731	4	59	5,459
8/04	35	64	4,596	10	434	4	92	5,136
8/05	30	49	4,913	8	474	4	154	5,553
8/07	30	39	4,545	15	341	1	335	5,237
8/08	46	54	4,796	11	630	2	608	6,047
8/09	27	54	3,004	12	457	3	473	3,949
8/10	20	48	2,455	6	303	3	763	3,530
8/11	24	5	803	2	230	0	548	1,583
8/14	9	14	574	1	11	0	269	855
8/15	13	33	817	0	62	0	579	1,458
8/16	11	28	842	5	76	0	846	1,769
8/17	4	9	199	1	35	0	424	659
8/21	15	5	279	0	0	0	1,236	1,515
8/22	17	8	320	0	0	0	2,131	2,451
8/23	1	5	46	0	0	0	116	162
Total			520,324	10,736	199,206	287	8,910	739,463
% of Section								
Total			70.4%	1.5%	26.9%	0.0%	1.2%	100.0%

¹ Togiak River Section open four days per week. See Table 12 for inseason adjustments to the weekly fishing schedule.

² Effort is number of deliveries inseason from processors.

Table 21. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 1995.

Date ¹	Effort ²		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/19	1	11	78	65	230	0	0	373
6/20	1	20	119	86	400	0	0	605
6/21	1	11	160	50	134	0	0	344
6/26		16	1,493	146	689	1	0	2,329
6/27		22	2,499	96	871	0	0	3,466
7/03	2	32	2,168	140	856	1	0	3,165
7/04	5	46	3,986	193	3,243	0	0	7,422
7/05	7	54	9,327	116	2,666	0	0	12,109
7/06	3	31	4,546	40	1,321	1	0	5,908
7/10	2	30	1,793	45	1,260	3	0	3,101
7/11	4	43	6,333	42	963	8	0	7,346
7/12	2	49	8,131	41	945	5	0	9,122
7/13	1	14	2,582	13	358	0	0	2,953
7/17	14	31	5,052	28	2,543	2	0	7,625
7/18	25	45	7,608	28	3,747	1	0	11,384
7/19	13	43	7,572	20	1,191	10	0	8,793
7/20		13	2,982	14	216	1	0	3,213
7/24	9	5	550	1	337	0	0	888
7/25	15	28	2,457	10	585	4	0	3,056
7/26	7	31	3,599	4	265	1	0	3,869
7/27	12	13	2,331	2	143	3	0	2,479
7/31	4	1	385	2	72	0	0	459
8/01	6	2	676	0	77	0	0	753
8/02	1	3	76	1	9	0	1	87
Total			76,503	1,183	23,121	41	1	100,849
% of Section								
Total			75.9%	1.2%	22.9%	0.0%	0.0%	100.0%

¹ Kulukak Section open three days per week. See Table 12 for inseason adjustments to the weekly fishing schedule.

² Effort is number of deliveries reported inseason from processors.

Table 22. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 1995.

Date ¹	Sockeye	Chinook	Chum	Pink	Coho	Total
6/15	3	3	31	0	0	37
7/03	13	0	639	0	0	652
7/08	71	1	86	0	0	158
7/22	762	0	140	0	0	902
7/28	550	2	70	0	0	622
8/01	198	2	14	0	0	214
8/02	454	2	22	0	0	478
8/11	86	0	0	0	6	92
Total	2,137	10	1,002	0	6	3,155
% of Section						
Total	67.7%	0.3%	31.8%	0.0%	0.2%	100.0%

¹ Matogak Section open five days per week. See Table 12 for inseason adjustments to the weekly fishing schedule.

Table 23. Commercial salmon catch by date and species, in numbers of fish, Osviak Section, Bristol Bay, 1995.

Date	Sockeye	Chinook	Chum	Pink	Coho	Total
Total	0	0	0	0	0	0
% of Section						
Total						

(Osviak section was open to fishing 1995, but no commercial harvest occurred.)

Table 24. Commercial salmon catch by district and species, in numbers of fish, Bristol Bay, 1995.^a

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
<u>NAKNEK-KVICHAK DISTRICT</u>						
Kvichak River	17,509,862					
Branch River	437,921					
Naknek River	2,467,647					
Total	20,415,430	5,339	237,524	61	981	20,659,335
<u>EGEGIK DISTRICT</u>	14,461,228	680	62,186	0	21,772	14,545,866
<u>UGASHIK DISTRICT</u>	4,501,076	1,529	63,316	2	8,467	4,574,390
<u>NUSHAGAK DISTRICT</u>						
Wood River	2,542,377					
Igushik River	1,432,580					
Nushagak-Mulchatna	475,380					
Total	4,450,337	80,180	363,370	139	4,896	4,898,922
<u>TOGIAK DISTRICT</u>						
Togiak Section	520,324	10,736	199,206	287	8,910	739,463
Kulukak Section	76,503	1,183	23,121	41	1	100,849
Matogak Section	2,137	10	1,002	0	6	3,155
Osviak Section	0	0	0	0	0	0
Total	598,964	11,929	223,329	328	8,917	843,467
TOTAL BRISTOL BAY	44,427,035	99,657	949,725	530	45,033	45,521,980
PERCENT	97.6%	0.2%	2.1%	0.0%	0.1%	100.0%

^a Preliminary

Table 25. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 1995.

Date	Kivlichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/19					456	456								
20					4,686	5,142								
21			0	0	15,516	20,658			126	126				
22			1,158	1,158	2,052	22,710			450	576				
23	0	0	1,284	2,442	78	22,788			600	1,176	306	306		
24	0	0	1,416	3,858	3,600	26,388			2,136	3,312	558	864		
25	60	60	130,218	134,076	28,476	54,864			16,602	19,914	2,322	3,186		
26	41,346	41,406	66,198	200,274	81,684	136,548			94,710	114,624	6,060	9,246		
27	319,944	361,350	25,686	225,960	88,326	224,874			104,196	218,820	27,354	36,600		
28	362,952	724,302	11,592	237,552	188,766	413,640			23,502	242,322	29,484	66,084		
29	217,164	941,466	42,264	279,816	115,818	529,458			104,904	347,226	26,922	93,006		
30	172,302	1,113,768	37,572	317,388	122,076	651,534			99,630	446,856	41,712	134,718		
7/1	496,818	1,610,586	12,402	329,790	79,986	731,520			36,390	483,246	38,592	173,310		
2	727,884	2,338,470	26,394	356,184	6,894	738,414			27,990	511,236	51,600	224,910		
3	459,504	2,797,974	9,858	366,042	18,528	756,942	3,078	3,078	20,454	531,690	24,972	249,882	780	780
4	307,452	3,105,426	32,166	398,208	78,906	835,848	4,644	7,722	12,690	544,380	12,048	261,930	1,290	2,070
5	241,008	3,346,434	142,962	541,170	56,136	891,984	3,810	11,532	40,284	584,664	9,804	271,734	3,966	6,036
6	637,032	3,983,466	93,672	634,842	41,226	933,210	22,038	33,570	56,040	640,704	6,960	278,694	3,384	9,420
7	954,258	4,937,724	25,614	660,456	2,976	936,186	53,806	89,376	238,458	879,162	6,594	285,288	3,630	13,050
8	992,880	5,930,604	156,126	816,582	65,376	1,001,562	41,676	131,052	240,792	1,119,954	12,942	298,230	1,890	14,940
9	1,090,020	7,020,624	23,688	840,270	61,818	1,063,380	12,288	143,340	145,896	1,265,850	24,882	323,112	3,660	18,600
10	663,348	7,683,972	10,854	851,124	5,220	1,068,600	11,664	155,004	47,496	1,313,346	25,998	349,110	5,106	23,706
11	322,104	8,006,076	46,740	897,864	23,634	1,092,234	11,358	166,362	29,226	1,342,572	13,758	362,868	6,606	30,312
12	163,656	8,169,732	68,088	965,952	21,480	1,113,714	17,988	184,350	22,488	1,365,060	16,266	379,134	12,282	42,594
13	260,928	8,430,660	23,040	988,992	14,844	1,128,558	9,768	194,118	22,512	1,387,572	13,320	392,454	11,088	53,682
14	227,700	8,658,360	4,776	993,768	11,166	1,139,724	7,812	201,930	13,722	1,401,294	11,022	403,476	7,344	61,026
15	220,332	8,878,692	23,172	1,016,940	4,362	1,144,086	5,850	207,780	14,346	1,415,640	9,282	412,758	4,434	65,460
16	139,254	9,017,946	9,318	1,026,258	8,904	1,152,990	23,940	231,720	29,352	1,444,992	7,026	419,784	4,674	70,134
17	113,472	9,131,418	50,232	1,076,490	10,872	1,163,862	45,906	277,626	14,310	1,459,302	7,668	427,452	3,642	73,776
18	116,496	9,247,914	5,922	1,082,412	5,850	1,169,712	278,538	556,164	7,332	1,466,634	7,566	435,018	5,574	79,350
19	264,048	9,511,962	8,010	1,090,422	7,374	1,177,086	357,996	914,160	5,682	1,472,316	9,564	444,582	16,848	96,198
20	191,010	9,702,972	6,984	1,097,406	6,498	1,183,584	222,102	1,136,262	4,284	1,476,600	10,140	454,722	18,936	115,134
21	85,392	9,788,364	13,734	1,111,140	4,290	1,187,874	90,858	1,227,120	3,798	1,480,398	10,158	464,880	19,716	134,850
22	87,276	9,875,640			32,268	1,220,142	22,278	1,249,398	1,764	1,482,162	8,502	473,382	12,756	147,606
23	43,074	9,918,714			24,972	1,245,114	12,546	1,261,944					5,832	153,438
24	35,502	9,954,216			14,784	1,259,898	6,822	1,268,766					4,476	157,914
25	39,882	9,994,098			5,964	1,265,862	10,374	1,279,140					3,024	160,938
26	44,622	10,038,720			1,104	1,266,966	13,602	1,292,742					2,826	163,764
27					1,308	1,268,274	11,316	1,304,058					2,226	165,990
28					546	1,268,820							2,736	168,726
29					1,032	1,269,852							1,176	169,902
30					1,218	1,271,070							2,250	172,152

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Table 25. (Page 2 of 2)

Date	Kvichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/31					3,720	1,274,790							1,518	173,670
8/ 1					1,140	1,275,930							2,754	176,424
2					660	1,276,590							4,644	181,068
3					672	1,277,262							2,028	183,096
4					342	1,277,604							960	184,056
5					300	1,277,904							828	184,884
6					126	1,278,030							510	185,394
7					726	1,278,756							324	185,718
8					234	1,278,990								
9					300	1,279,290								
10					96	1,279,386								
11					408	1,279,794								
12					354	1,280,148								
13					162	1,280,310								
14					414	1,280,724								
15					138	1,280,862								
16					18	1,280,880								
17					42	1,280,922								
18					198	1,281,120								
19					36	1,281,156								
20					66	1,281,222								
21					66	1,281,288								
22					54	1,281,342								
23					54	1,281,396								
24					36	1,281,432								
25					42	1,281,474								
26					78	1,281,552								
27					54	1,281,606								
28					18	1,281,624								
29					18	1,281,642								
30 ^a					36	1,281,678								
Total		10,038,720		1,111,140		1,281,678		1,304,058		1,482,162		473,382		185,718

^a Daily count is an estimate because six hours of the day were not counted.

Table 26. Final daily and cumulative escapement estimates by species, Nushagak River sonar project, 1995.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/08	36	36	40	40	88	88	0	0	0	0	164	164
6/09	96	132	172	212	258	346	0	0	0	0	526	690
6/10	140	272	161	373	324	670	0	0	0	0	625	1,315
6/11	64	336	125	498	175	845	0	0	0	0	364	1,679
6/12	68	404	125	623	186	1,031	0	0	0	0	379	2,058
6/13	104	508	193	816	293	1,324	0	0	0	0	590	2,648
6/14	202	710	409	1,225	595	1,919	0	0	0	0	1,206	3,854
6/15	995	1,705	3,896	5,121	3,125	5,044	0	0	0	0	8,016	11,870
6/16	606	2,311	2,029	7,150	1,884	6,928	0	0	0	0	4,519	16,389
6/17	522	2,833	1,329	8,479	1,472	8,400	0	0	0	0	3,323	19,712
6/18	729	3,562	1,143	9,622	1,757	10,157	0	0	0	0	3,629	23,341
6/19	798	4,360	1,444	11,066	1,967	12,124	0	0	0	0	4,209	27,550
6/20	437	4,797	1,291	12,357	1,275	13,399	0	0	0	0	3,003	30,553
6/21	377	5,174	1,190	13,547	1,111	14,510	0	0	0	0	2,678	33,231
6/22	301	5,475	636	14,183	818	15,328	0	0	0	0	1,755	34,986
6/23	443	5,918	976	15,159	1,168	16,496	0	0	0	0	2,587	37,573
6/24	1,430	7,348	1,701	16,860	3,151	19,647	0	0	0	0	6,282	43,855
6/25	9,495	16,843	12,525	29,385	22,478	42,125	0	0	0	0	44,498	88,353
6/26	24,849	41,692	16,726	46,111	50,089	92,214	0	0	0	0	91,664	180,017
6/27	36,906	78,598	6,242	52,353	18,394	110,608	0	0	0	0	61,542	241,559
6/28	9,701	88,299	3,175	55,528	7,509	118,117	0	0	0	0	20,385	261,944
6/29	8,465	96,764	2,630	58,158	6,426	124,543	0	0	0	0	17,521	279,465
6/30	12,221	108,985	3,195	61,353	8,561	133,104	0	0	0	0	23,977	303,442
7/01	16,971	125,956	3,110	64,463	10,535	143,639	0	0	0	0	30,616	334,058
7/02	8,510	134,466	1,888	66,351	6,408	150,047	0	0	0	0	16,806	350,864
7/03	10,376	144,842	2,117	68,468	7,832	157,879	0	0	0	0	20,325	371,189
7/04	7,911	152,753	1,281	69,749	4,351	162,230	0	0	0	0	13,543	384,732
7/05	3,097	155,850	839	70,588	1,910	164,140	0	0	0	0	5,846	390,578
7/06	6,548	162,398	762	71,350	3,392	167,532	0	0	0	0	10,702	401,280
7/07	12,049	174,447	1,845	73,195	7,703	175,235	76	76	0	0	21,673	422,953
7/08	48,281	222,728	3,337	76,532	18,750	193,985	0	76	347	347	70,715	493,668
7/09	24,353	247,081	1,869	78,401	5,325	199,310	0	76	0	347	31,547	525,215
7/10	5,606	252,687	1,096	79,497	2,097	201,407	0	76	378	725	9,177	534,392

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Table 26. (p 2 of 3)

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/11	8,590	261,277	1,444	80,941	2,989	204,396	0	76	585	1,310	13,608	548,000
7/12	3,930	265,207	962	81,903	1,639	206,035	0	76	244	1,554	6,775	554,775
7/13	1,780	266,987	516	82,419	819	206,854	0	76	99	1,653	3,214	557,989
7/14	1,231	268,218	261	82,680	507	207,361	0	76	67	1,720	2,066	560,055
7/15	1,088	269,306	223	82,903	449	207,810	0	76	57	1,777	1,817	561,872
7/16	1,453	270,759	332	83,235	638	208,448	0	76	77	1,854	2,500	564,372
7/17	1,230	271,989	255	83,490	523	208,971	0	76	64	1,918	2,072	566,444
7/18	656	272,645	154	83,644	283	209,254	0	76	35	1,953	1,128	567,572
7/19	632	273,277	162	83,806	282	209,536	0	76	31	1,984	1,107	568,679
7/20	607	273,884	135	83,941	253	209,789	0	76	31	2,015	1,026	569,705
7/21	443	274,327	122	84,063	204	209,993	0	76	22	2,037	791	570,496
7/22	753	275,080	228	84,291	365	210,358	0	76	35	2,072	1,381	571,877
7/23	522	275,602	134	84,425	245	210,603	0	76	22	2,094	923	572,800
7/24	869	276,471	225	84,650	384	210,987	0	76	49	2,143	1,527	574,327
7/25	1,579	278,050	196	84,846	428	211,415	0	76	1,715	3,858	3,918	578,245
7/26	1,201	279,251	155	85,001	337	211,752	0	76	1,225	5,083	2,918	581,163
7/27	197	279,448	23	85,024	35	211,787	0	76	554	5,637	809	581,972
7/28	360	279,808	24	85,048	68	211,855	0	76	581	6,218	1,033	583,005
7/29	56	279,864	31	85,079	27	211,882	0	76	1,377	7,595	1,491	584,496
7/30	70	279,934	33	85,112	35	211,917	0	76	1,750	9,345	1,888	586,384
7/31	53	279,987	28	85,140	26	211,943	0	76	1,311	10,656	1,418	587,802
8/01	34	280,021	15	85,155	10	211,953	0	76	652	11,308	711	588,513
8/02	62	280,083	36	85,191	23	211,976	0	76	1,332	12,640	1,453	589,966
8/03	46	280,129	20	85,211	11	211,987	0	76	832	13,472	909	590,875
8/04	30	280,159	10	85,221	16	212,003	0	76	716	14,188	772	591,647
8/05	315	280,474	96	85,317	197	212,200	0	76	8,274	22,462	8,882	600,529
8/06	253	280,727	103	85,420	133	212,333	0	76	6,208	28,670	6,697	607,226
8/07	78	280,805	43	85,463	36	212,369	0	76	1,791	30,461	1,948	609,174
8/08	29	280,834	12	85,475	8	212,377	0	76	559	31,020	608	609,782
8/09	31	280,865	14	85,489	8	212,385	0	76	546	31,566	599	610,381
8/10	43	280,908	17	85,506	27	212,412	0	76	1,132	32,698	1,219	611,600
8/11	70	280,978	25	85,531	46	212,458	0	76	1,892	34,590	2,033	613,633
8/12	33	281,011	9	85,540	26	212,484	0	76	999	35,589	1,067	614,700

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Table 26. (p 3 of 3)

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/13	114	281,125	29	85,569	62	212,546	0	76	2,766	38,355	2,971	617,671
8/14	54	281,179	15	85,584	23	212,569	0	76	1,159	39,514	1,251	618,922
8/15	23	281,202	6	85,590	11	212,580	0	76	523	40,037	563	619,485
8/16	25	281,227	7	85,597	9	212,589	0	76	509	40,546	550	620,035
8/17	20	281,247	7	85,604	8	212,597	0	76	443	40,989	478	620,513
8/18	36	281,283	11	85,615	6	212,603	0	76	559	41,548	612	621,125
8/19	24	281,307	7	85,622	9	212,612	0	76	499	42,047	539	621,664
8/20	0	281,307	0	85,622	0	212,612	0	76	434	42,481	434	622,098
8/21	0	281,307	0	85,622	0	212,612	0	76	581	43,062	581	622,679
8/22	0	281,307	0	85,622	0	212,612	0	76	521	43,583	521	623,200
8/23	0	281,307	0	85,622	0	212,612	0	76	1,468	45,051	1,468	624,668
8/24	0	281,307	0	85,622	0	212,612	0	76	1,058	46,109	1,058	625,726
8/25	0	281,307	0	85,622	0	212,612	0	76	231	46,340	231	625,957
Total	281,307		85,622		212,612		76		46,340		625,957 ^a	

^a An additional 785 whitefish and 2,596 other fish (Arctic char and rainbow trout) were counted passing the sonar site in 1995.

Table 27. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, in thousands of fish, Kvichak River, Bristol Bay, 1995.

Date	Tower Count		Aerial Survey	Fish per Index Pt. ¹	River Test Fishing		Cumulative Escapement
	Daily	Cum.	Total		Daily	Cum.	
6/21				111	0		
22				111	0		
23	0	0		111	4	4	
24	0	0		111	7	11	0
25	60	60		111	3236	3247	360,417
26	41,346	41,406	650,000	111	5392	8639	958,929
27	319,944	361,350	865,000	111	969	9608	1,066,488
28	362,952	724,302		111	42	9650	1,071,150
29	217,164	941,466		111	3826	13476	1,495,836
30	172,302	1,113,768	850,000	115	5645	19121	2,198,915
7/ 1	496,818	1,610,586	1,200,000	119	1260	20381	2,425,339
2	727,884	2,338,470		122	2071	22452	2,739,144
3	459,504	2,797,974	325,000	136	1068	23520	3,198,720
4	307,452	3,105,426		138	4292	27812	3,838,056
5	241,008	3,346,434	1,000,000	142	8061	35873	5,093,966
6	637,032	3,983,466	2,100,000	143	4662	40535	5,796,505
7	954,258	4,937,724		137	6474	47009	6,440,233
8	992,880	5,930,604	2,200,000	146	3016	50025	7,303,650
9	1,090,020	7,020,624	1,400,000	149	955	50980	7,596,020
10	663,348	7,683,972		152	795	51775	7,869,800
11	322,104	8,006,076		158	1282	53057	8,383,006
12	163,656	8,169,732	285,000	155	1372	54429	8,436,495
13	260,928	8,430,660	200,000	157	3000	57429	9,016,353
14	227,700	8,658,360	350,000	155	806	58235	9,026,425
15	220,332	8,878,692		153	521	58756	8,989,668
16	139,254	9,017,946	175,000	154	821	59577	9,174,858
17	113,472	9,131,418		154	1342	60919	9,381,526
18	116,496	9,247,914	300,000	154	1636	62555	9,633,470
19	264,048	9,511,962					
20	191,010	9,702,972					
21	85,392	9,788,364					
22	87,276	9,875,640					
23	43,074	9,918,714					
24	35,502	9,954,216					
25	39,882	9,994,098					
26	44,622	10,038,720					
Total		10,038,720				62,555	9,633,470

¹ Fish per index point was based on lag time and/or catchability factors.

Table 28. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey, and river test fishing enumeration methods, in thousands of fish, Egegik River, Bristol Bay, 1995.

Date	Tower Count		Aerial Survey		Fish per Index Pt. ¹	River Test Fishing		Estimated Cumulative Escapement
	Daily	Cum.	Lagoon	Total		Daily	Cum.	
6/14								
15								0
16					79	35	35	3
17					79	339	374	30
18					79	236	610	48
19			3	3	79	210	820	65
20	5	5			79	241	1,061	84
21	16	21	17	17	79	428	1,489	118
22	2	23			79	158	1,647	130
23	0	23			79	372	2,019	160
24	4	27			79	282	2,301	182
25	28	55	36	81	36	798	3,099	112
26	82	137			70	1,087	4,186	293
27	88	225			70	1,036	5,222	366
28	189	414	97	97	89	1,516	6,738	600
29	116	530			101	193	6,931	700
30	122	652	48	48	97	937	7,868	763
7/01	80	732	1	1	105	199	8,067	847
02	7	739			93	54	8,121	755
03	19	758	1	1	93	322	8,443	785
04	79	837	14	29	103	1,006	9,449	973
05	56	893	36	36	106	57	9,506	1,008
06	41	934			98	76	9,582	939
07	3	937			98	347	9,929	973
08	65	1,002	5	31	102	602	10,531	1,074
09	62	1,064			104	215	10,746	1,118
10	5	1,069	2	2	101	49	10,795	1,090
11	24	1,093			100	562	11,357	1,136
12	21	1,114	3	3	103	412	11,769	1,212
13	15	1,129						
14	11	1,140	4	4				
15	4	1,144						
16	9	1,153						
17	11	1,164						
18	6	1,170						
19	7	1,177						
20	6	1,183						
21	4	1,187						
22 ^b	32	1,219						
Total		1,219			97 ^a			

¹ The 1985-93 mean fish per index point relationship (73 fpi) was used until June 25 when lag-time relationships began to prove more accurate.

^a Calculated using the tower count through July 14 allowing for a 2-day lag between inside test passage and tower passage.

^b The USFWS funded counting duties beginning at 0001 hours July 23 and counted through 1600 hours August 30 enumerating an additional 61,536 sockeye. That brought the season's total sockeye count past Egegik Tower to 1,281,678 fish.

Table 29. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey, and river test fishing enumeration methods, in thousands of fish, Ugashik River, Bristol Bay, 1995.

Date	Tower Count		Aerial Survey		Fish per Index Pt. ¹	River Test Fishing		Cumulative Escapement
	Daily	Cum.	Lagoon	Total		Index Points Daily	Cum.	
6/24					80	8	8	0
25			0	.1	80	4	12	1
26					80	4	16	1
27					80	2	18	1
28					80	5	23	2
29			0	0	80	28	51	4
30					80	62	113	9
7/01			0	0	80	185	298	24
02					80	227	525	42
03	3	3			80	182	707	57
04	5	8			80	284	991	79
05	4	12	1	3	80	568	1,559	125
06	22	34			80	471	2,030	162
07	56	90	2	17	80	197	2,227	178
08	42	132			74	126	2,353	174
09	12	144	.1	.6	84	208	2,561	215
10	12	156			81	722	3,283	266
11	11	167			81	371	3,654	296
12	18	185	2	2	74	197	3,851	285
13	10	195	0	.2	66	144	3,995	264
14	8	203			57	195	4,190	239
15	6	209			55	633	4,823	265
16	24	233	4	4	58	2,343	7,166	416
17	46	279	1	1	69	2,460	9,626	664
18	279	558	7	65	77	4,170	13,796	1,062
19	358	916	15	45	81	2,056	15,852	1,284
20	222	1,138						
21	91	1,229						
22	22	1,251						
23	13	1,264						
24	7	1,271						
25	10	1,281						
26	14	1,295						
27	11	1,306						
Total		1,306					15,852	1,284

¹ The 1991-94 mean fish per index point relationship was 89 fpi, the 1985-94 mean fish per index point relationship was 58 fpi, as a compromise, 80 fpi was used until July 9 when lag-time relationships appeared to be more accurate.

Table 30. Inseason comparison of ocean age composition of sockeye salmon escapement using length frequency and scale analysis methods, Wood River, Bristol Bay, 1995.

Date	2-Ocean (%)		3-Ocean (%)		LF Sample Size	Scale Sample Size ²
	Length Frequency	Scales ¹	Length Frequency	Scales ¹		
26-Jun	50.9	66.9	49.1	33.1	320	275
28-Jun	66.0	66.5	34.0	32.1	200	140
29-Jun	86.4	81.0	13.6	19.0	236	155
1-Jul	71.9	76.0	28.1	23.0	270	221
2-Jul	79.3	84.0	20.7	15.0	116	101
3-Jul	74.6	71.0	25.4	28.0	240	205
4-Jul	85.0	81.0	15.0	16.0	120	100
5-Jul	83.3	82.0	16.7	16.0	120	104
6-Jul	91.7	89.0	8.3	12.0	120	102
7-Jul	74.9	71.0	25.1	29.0	359	319
8-Jul	80.3	70.9	19.7	29.1	400	340
9-Jul	75.2	63.4	24.8	35.4	210	164
10-Jul	79.3	70.9	20.7	27.7	159	141
11-Jul	82.6	73.8	17.4	23.1	155	134
12-Jul	70.1	59.1	29.9	39.4	77	66
15-Jul	88.8	74.0	11.2	23.0	143	118
Final	75.8	72.0	24.2	27.3	3,245	2,685
ADF&G Forecast		53.0		47.0		

¹ Will not total 100% due to a small number of zero check fish that are not included.

² Actual number of readable scales.

Table 31. Comparison of daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods, in thousands of fish, Wood River, Bristol Bay, 1995.

Date	Tower Count		Aerial Surveys ¹		
	Daily	Cum.	Number	Visibility	Comments
6/21	a	a			
22	a	1			
23	1	1			
24	2	3			
25	17	20	a	Fair-Poor	
26	95	115	14	Good	Heaviest at top of River
27	104	219	17	Poor	Heaviest at top of River
28	24	242	1	Fair-Good	No fish sighted below Silver Salmon Creek
29	105	347			
30	100	447			
7/01	36	483			
02	28	511	2	Good	
03	20	532	2	Good	
04	13	544	1	Good-Exc	
05	40	585	4	Exc	Not continuous but may be heavy volume
06	56	641	3	Poor	
07	238	879	67	Poor	Some visible below Muklung
08	241	1,120			
09	146	1,266			
10	47	1,313			
11	29	1,343			
12	22	1,365			
13	23	1,388			
14	14	1,401			
15	14	1,416			
16	29	1,445	2	Fair	Some staging to spawn
17	14	1,459			
18	7	1,467			
19	6	1,472			
20	4	1,477			
21	4	1,480			
22	2	1,482			
Total		1,482			

¹ Estimated number of fish in clear water below the counting tower at the time of the survey.

^a Less than 500 fish.

Table 32. Comparison of daily sockeye salmon escapement estimates by tower, aerial survey and river test fishing enumeration methods, in thousands of fish, Igushik River, Bristol Bay, 1995.

Date	Tower Count		Aerial Surveys ¹				River Test Fishing			
	Daily	Cum.	Lower River	Lagoon	Upper River	Total Visibility	Fish per Index Pt. ²	Index Points Daily	Index Points Cum.	Cumulative Escapement
6/18							87	0	0	0
6/19							87	3	3	°
6/20							87	2	5	°
6/21							87	2	7	°
6/22							87	0	7	°
6/23	°	°					87	4	11	1
6/24	2	1					87	29	39	3
6/25	2	3	°		°	1 Good	87	267	306	27
6/26	6	9	1	°	°	2 Good	87	163	469	41
6/27	27	37					87	132	601	52
6/28	29	66	°	0	2	2 Poor	140	568	1,170	166
6/29	27	93					154	1,021	2,191	300
6/30	42	135					115	327	2,518	285
7/01	39	173					114	90	2,608	295
7/02	52	225					102	21	2,630	269
7/03	25	250					95	29	2,659	255
7/04	12	262					99	17	2,676	267
7/05	10	272					103	24	2,700	279
7/06	7	279					104	122	2,822	296
7/07	7	285					105	729	3,551	375
7/08	13	298					105	58	3,610	381
7/09	25	323								
7/10	26	349								
7/11	14	363								
7/12	16	379								
7/13	13	392								
7/14	11	403								
7/15	9	413								
7/16	7	420								
7/17	8	427								
7/18	8	435								
7/19	10	445								
7/20	10	455								
7/21	10	465								
7/22	9	473								
Total		473								

¹ Estimated number of fish in clear water below the counting tower at the time of the survey.

² The 1991-92, 1994 mean fish per index point relationship (87 fpi) was used until June 28 when lag-time relationships began to prove more accurate.

° Less than 500 fish.

Table 33. Comparison of daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods, in thousands of fish, Togiak River, Bristol Bay, 1995.

Date	Tower Count		Aerial Surveys ¹					Comments
	Daily	Cum.	Togiak to Gech.	Gechiak to Ongi.	Ongivinuck to tower	Total	Visibility	
7/02			340	620	180	1,140	Good	Mixed chum, sockeye, and chinook
7/03	1	1						
7/04	1	2						
7/05	4	6						
7/06	3	9						
7/07	4	13						
7/08	2	15						
7/09	4	19	6,200	9,100	2,200	17,500	Good	Mixed chum, sockeye, and chinook
7/10	5	24						
7/11	6	30	4,000	8,850	3,200	16,050	Fair	Mixed chum and sockeye
7/12	12	42						
7/13	11	53	4,200	8,400	4,000	16,600	Good	Mixed chum and sockeye
7/14	7	60						
7/15	4	64						
7/16	5	69						
7/17	4	73						
7/18	5	78	2,400	15,200	4,600	22,200	Good	Mixed chum and sockeye
7/19	17	95						
7/20	19	114						
7/21	20	134						
7/22	13	147						
7/23	6	153						
7/24	4	157						
7/25	3	160						
7/26	3	163						
7/27	2	165						
7/28	3	168						
7/29	1	169						
7/30	2	171						
7/31	1	172						
8/01	3	175						
8/02	5	180						
8/03	2	182						
8/04	1	183						
8/05	1	184						
8/06	1	185						
8/07	^a							
Total		185						

¹ Unexpanded counts of fish in clear water index areas immediately below the counting tower at the time of the survey.

^a Less than 500 fish.

Table 34. Commercial salmon processors and buyers operating in Bristol Bay, 1995.^a

Name of Operator/Buyer	Base of Operations	District ¹	Method ²	Export
1. Alaska Smoked Salmon	Anchorage, AK	N	EF	AIR
2. Alaskan Frontier Co.	Edmonds, WA	K,E,U	F	SEA
3. Alaska Pacific Prod.	Egegik, AK	E	EF,S	SEA
4. Alaskan Shores Fish	Olympia, WA	K	F	SEA
5. All Alaskan Seafoods	Seattle, WA	K,E,N,U	F	SEA
6. Baypack Fisheries	Seattle, WA	K,E,U	F	SEA
7. Big Creek	Warden, WA	E	F	SEA
8. Clipper Fisheries	Seattle, WA	K,E,U	F	SEA
9. C Fisheries	Lynnwood, WA	K,E,U	EF,F	SEA
10. Clark's Fish Co.	Cathlamet, WA	K,E	F	SEA
11. D & D Entered	Gig Harbor, WA	K,E	F	SEA
12. Deep Creek Custom Pack.	Ninilchik, AK	K	F,C,EF,S	AIR
13. Dagnet Fisheries Co.	Kenai, AK	K,E,N	F,EF	SEA,AIR
14. Favco Inc.	Anchorage, AK	K	EF	AIR
15. Friedman Family Fish.	Baltimore, MD	N	F	AIR
16. Fish Business Co.	Seattle, AK	N	EF	AIR
17. Inlet Salmon	Kenai, AK	K,E,U	EF,F	SEA,AIR
18. International Seafoods.	Seattle, WA	E,U	EF,F	SEA
19. Icicle Seafoods	Seattle, WA	K,E,U,N	EF,F	SEA
20. NorQuest Seafoods	Seattle, WA	K,E,U	F	AIR,SEA
21. Nelbro Packing Co.	Kenmore, WA	K,E	C,F	SEA
22. New West Fish, Inc.	Bellingham, WA	K,E,U	F	SEA
23. North Alaska Fisheries	Wasilla, AK	T	EF,F	AIR
24. North Coast Seafoods	Seattle, WA	K,E,U,N,T	F	SEA
25. Ocean Beauty	Seattle, WA	K,E,U	EF,F,C	SEA,AIR
26. Oceantrawl Inc.	Seattle, WA	K,E,U,N,T	F	SEA,AIR
27. Pavlof Inc.	Seattle, WA	U	F	SEA
28. Pan Pacific Seafoods	Seattle, WA	K,E,U	F	SEA
29. Pederson Point	Seattle, WA	K,E,N	F	SEA
30. Peter Pan Seafoods	Seattle, WA	K,E,U,N,T	C,EF,F,S	SEA,AIR
31. Quality First Sfds.	King Salmon, AK	K,E	EF,F	SEA
32. Snowline Salmon	Seattle, WA	K,E,U,N	S	AIR
33. Snopac Products	Seattle, WA	K,E	F	SEA
34. Togiak Fisheries	Seattle, WA	T	EF,C	SEA,AIR
35. Trident Seafoods	Seattle, WA	K,E,U,N	C,F	SEA
36. Unisea, Inc.	Redmond, WA	K,E,U,N,T	F,EF	AIR
37. W.C.P. Red Salmon	Seattle, WA	K,N	C,F	SEA
38. W.C.P./Ekuk	Seattle, WA	N	C,F,EF	SEA,AIR
39. W.C.P./South Naknek	Seattle, WA	K,E,N	C,EF,F,S,T	SEA,AIR
40. Woodbine Alaska Fish	Egegik, AK	K,E,U,T	C,F	SEA
41. Wild Pacific	Anchorage, AK	E,U	F	SEA
42. Western Sea	Seattle, WA	K,E,U	F	SEA
43. YAK, Inc.	Seattle, WA	K,E,U	F	SEA

Number of processors: Canning =10 Freezing =37 Curing =6 Air Export=17 Sea Export=34

^a Indicates operators with either a physical plant or processing facility in a district or those operators from other areas buying fish and/or providing tender and support service for fishermen in districts away from the facility.

¹ K=Naknek-Kvichak; E=Egegik; U=Ugashik; N=Nushagak; T=Togiak.

² Type of processing: C=canned; EF=export fresh; F=frozen; S=cured; T=tendered.

Table 35. Mean round weight, price per pound, and total exvessel value of commercial salmon catch, Bristol Bay, 1995.^a

Species	Total Catch (lbs.)	Mean Weight (lbs.)	Mean Price (\$/lb.)	Exvessel Value (\$)
Sockeye	244,348,693	5.50	0.75	183,261,519
Chinook	1,956,267	19.63	0.65	1,271,573
Chum	6,201,704	6.53	0.20	1,240,341
Pink	1,871	3.53	0.11	206
Coho	300,370	6.67	0.43	129,159
Total	252,808,905			185,902,798

^a Data is preliminary and is extracted from "Bristol Bay Final Operations Report (BB-CF/303). Price information reflects on-ground values; price changes bonuses may occur later.

Table 36. Subsistence salmon harvest by species, in number of fish, by district and location, Bristol Bay, Alaska, 1995. ^{a b}

Area and River System	Permits Issued	HARVEST					Total
		Sockeye	Chinook	Chum	Pink	Coho	
NAKNEK-KVICHAK DISTRICT							
Naknek River ¹	332	22,088	1,199	493	241	1,013	25,034
Kvichak River							
Chekok	2	1,200	0	0	0	0	1,200
Igiugig	2	100	0	0	0	0	100
Iliamna Lake	24	4,832	2	0	9	0	4,843
Kijik	5	2,376	0	0	0	0	2,376
Kokhanok	23	16,175	7	2	2	479	16,665
Kvichak River	23	3,141	23	35	26	16	3,241
Lake Clark	22	2,505	12	0	0	0	2,517
Levelock	6	1,232	59	0	0	0	1,291
Newhalen River	40	13,216	57	0	0	0	13,273
Nondalton	25	8,570	3	0	0	0	8,573
Pedro Bay	16	8,747	0	0	0	1	8,748
Port Alsworth	21	2,107	0	0	0	0	2,107
Subtotal	201	53,556	232	666	142	777	55,373
TOTAL NAKNEK/KVICHAK	533	75,644	1,431	1,159	383	1,790	80,407
EGEGIK DISTRICT ²	60	2,818	86	192	100	690	3,886
UGASHIK DISTRICT ³	20	1,513	56	18	6	290	1,883
NUSHAGAK DISTRICT							
Wood River ⁴	73	3,807	1,161	311	29	581	5,889
Lower Nushagak River ⁵	33	1,955	2,135	237	0	233	4,560
Upper Nushagak River ⁶	52	2,296	2,419	1,022	1	222	5,960
Dillingham Beaches ⁷	242	9,643	6,163	839	112	2,180	18,937
Nushagak Bay Commercial ⁸	56	3,038	1,409	349	12	560	5,368
Igushik	28	2,054	414	28	34	129	2,659
TOTAL NUSHAGAK	484	22,793	13,701	2,786	188	3,905	43,373
TOGIAK DISTRICT ⁹	22	1,318	448	425	0	703	2,894
TOTAL BRISTOL BAY	1,119	104,086	15,722	4,580	677	7,378	132,443

^a Harvests are extrapolated for all permits issued, based on those returned.

^b Harvest estimates are based on the area fished, as first recorded on the permit.

¹ Includes Mile 5 North, Naknek Beach-North, Naknek River General, Naknek Kvichak Commercial, Powerline-North, North and South Savonoski, South Naknek Beach, and Telephone Point-North.

² Includes Egegik village and beach.

³ Includes Pilot Point and Ugashik.

⁴ Includes Dragnet, Aleknagik Area, Muklung River, Silver Salmon Creek, and Upper and Lower Wood River General.

⁵ Includes Black Point, Grassy Island, and Lewis Point.

⁶ Includes Ekwok Area, Kokwok River, New Stuyahok Area, Koliganek Area, and the Portage Creek Area.

⁷ Includes Icicle, Kanakanak, Olsonville, Scandinavia, Skinner, Snag Point, and Squaw Creek.

⁸ Includes Clark's Point, Ekuk, Etolin Point, Nushagak Point, and Queen's Slough.

⁹ Includes Togiak village and Togiak River.

Source: Bristol Bay Subsistence Permit Data Base, ADF&G

BRISTOL BAY SALMON FISHERY

Appendix Tables 1- 41

Appendix Table 1. Escapement goals and actual counts of sockeye salmon by river system, Bristol Bay, 1975-95.

Year	Kvichak River					Naknek River				
	Point Goal	Range		Actual	Percent Deviation ¹	Point Goal	Range		Actual	Percent Deviation ¹
		Lower	Upper				Lower	Upper		
1975	14,000			13,140	(6)	800			2,027	153
1976	2,000			1,965	(2)	800			1,321	65
1977	2,000			1,341	(33)	800			1,086	36
1978	2,000			4,149	107	800			813	2
1979	6,000			11,218	87	800			925	16
1980	14,000			22,505	61	800			2,645	231
1981	2,000			1,754	(12)	800			1,796	125
1982	2,000			1,135	(43)	800			1,156	45
1983	2,000			3,570	79	800			888	11
1984	10,000	8,000	12,000	10,491	5	1,000	800	1,400	1,242	24
1985	10,000	8,000	12,000	7,211	(28)	1,000	800	1,400	1,850	85
1986	5,000	4,000	6,000	1,179	(76)	1,000	800	1,400	1,978	98
1987	5,000	4,000	6,000	6,066	21	1,000	800	1,400	1,062	6
1988	5,000	4,000	6,000	4,065	(19)	1,000	800	1,400	1,038	4
1989	8,000	6,000	10,000	8,318	4	1,000	800	1,400	1,612	61
1990	6,000	6,000	10,000	6,970	16	1,000	800	1,400	2,093	109
1991	4,000	4,000	8,000	4,223	6	1,000	800	1,400	3,579	258
1992	6,000	4,000	8,000	4,726	(21)	1,000	800	1,400	1,607	61
1993	5,000	4,000	8,000	4,025	(20)	1,000	800	1,400	1,536	54
1994	8,000	6,000	10,000	8,338	4	1,000	800	1,400	991	(1)
20 yr Ave.	5,900			6,319	6	910			1,562	72
1975-84	5,600			7,127	24	820			1,390	71
1985-94	6,200	5,000	8,400	5,512	(11)	1,000	800	1,400	1,735	73
1995	10,000	6,000	10,000	10,039	0	1,000	800	1,400	1,111	11
Year	Egegik River					Ugashik River				
	Point Goal	Range		Actual	Percent Deviation ¹	Point Goal	Range		Actual	Percent Deviation ¹
		Lower	Upper				Lower	Upper		
1975	600			1,174	96	500			429	(14)
1976	600			509	(15)	500			342	(32)
1977	600			693	16	500			201	(60)
1978	600			896	49	500			70	(86)
1979	600			1,032	72	500			1,701	240
1980	600			1,061	77	500			3,321	564
1981	600			695	16	500			1,327	165
1982	600			1,035	73	500			1,158	132
1983	600			792	32	500			1,001	100
1984	1,000	800	1,200	1,165	17	700	500	900	1,241	77
1985	1,000	800	1,200	1,095	10	700	500	900	998	43
1986	1,000	800	1,200	1,151	15	700	500	900	1,001	43
1987	1,000	800	1,200	1,273	27	700	500	900	669	(4)
1988	1,000	800	1,200	1,613	61	700	500	900	643	(8)
1989	1,000	800	1,200	1,611	61	700	500	900	1,681	140
1990	1,000	800	1,200	2,191	119	700	500	900	730	4
1991	1,000	800	1,200	2,787	179	700	500	900	2,457	251
1992	1,000	800	1,200	1,945	95	700	500	900	2,174	211
1993	1,000	800	1,200	1,517	52	700	500	900	1,390	99
1994	1,000	800	1,200	1,968	97	700	500	900	1,081	54
20 yr Ave.	820			1,310	57	610			1,181	96
1975-84	640			905	43	520			1,079	109
1985-94	1,000	800	1,200	1,715	72	700	500	900	1,282	83
1995	1,000	800	1,400	1,283	28	700	500	1,200	1,321	89

Appendix Table 1. (Page 2 of 2)

Year	Wood River					Igushik River				
	Point Goal	Range		Actual	Percent Deviation ¹	Point Goal	Range		Actual	Percent Deviation
1975	800			1,270	59	150			241	61
1976	800			817	2	150			186	24
1977	800			562	(30)	150			96	(36)
1978	800			2,267	183	150			536	257
1979	800			1,706	113	150			860	473
1980	800			2,969	271	150			1,988	1,225
1981	800			1,233	54	150			591	294
1982	800			976	22	150			424	183
1983	1,000			1,361	36	200			180	(10)
1984	1,000	700	1,200	1,003	0	200	150	250	185	(8)
1985	1,000	700	1,200	939	(6)	200	150	250	212	6
1986	800	700	1,200	819	2	200	150	250	308	54
1987	1,200	800	1,200	1,337	11	200	140	250	169	(16)
1988	800	800	1,200	867	8	200	140	250	170	(15)
1989	1,000	800	1,200	1,186	19	200	150	250	462	131
1990	1,000	700	1,200	1,069	7	200	150	250	366	83
1991	1,000	700	1,200	1,160	16	200	150	250	756	278
1992	1,000	700	1,200	1,286	29	200	150	250	305	53
1993	1,000	700	1,200	1,176	18	200	150	250	406	103
1994	1,000	700	1,200	1,472	47	200	150	250	446	123
20 yr Ave.	910			1,274	43	180			444	163
1975-84	840			1,416	71	160			529	246
1985-94	980	730	1,200	1,131	15	200	148	250	360	80
1995	1,200	700	1,200	1,475	23	200	150	250	473	137
Year	Nushagak River ²					Tagiak River				
	Point Goal	Range		Actual	Percent Deviation ¹	Point Goal	Range		Actual	Percent Deviation
1975	250			670	168	100			161	61
1976	250			425	70	100			158	58
1977	250			233	(7)	100			134	34
1978	250			577	131	100			274	174
1979	250			360	44	100			171	71
1980	250			3,027	1,111	100			462	362
1981	250			834	234	100			208	108
1982	250			538	115	100			245	145
1983	300			319	6	100			192	92
1984	500	300	700	473	(5)	150	140	250	95	(37)
1985	500	300	700	429	(14)	150	140	250	137	(9)
1986	500	300	700	822	64	150	140	250	168	12
1987	500	300	700	163	(67)	150	100	200	250	67
1988	500	300	700	320	(36)	150	100	200	277	85
1989	500	300	700	513	3	150	100	200	84	(44)
1990	500	340	760	680	36	150	140	250	142	(5)
1991	500	340	760	493	(1)	150	140	250	255	70
1992	550	340	760	695	26	150	140	250	199	33
1993	550	340	760	715	30	150	140	250	177	18
1994	550	340	760	509	(7)	150	140	250	155	3
20 yr Ave.	398			640	95	128			197	65
1975-84	280			746	187	105			210	107
1985-94	515	320	730	534	3	150	128	235	184	23
1995	550	340	760	281	(49)	150	140	250	186	24

¹ Percent deviation = (actual minus goal) / goal (multiplied by 100).² Actual escapement from 1974-88 is based on the Nuyokuk River tower count, and from 1989-present is based on sonar count at Port Creek.

Appendix Table 2. Forecast and inshore chinook salmon return, in thousands of fish, Nushagak District, Bristol Bay, 1974-95.

Year	Forecast			Inshore Run ¹	Forecast Error (%)		
	Spawner Recruit	Mean Percent	Sibling		Spawner Recruit	Mean Percent	Sibling
1974	266	164	77	110	142	49	-30
75	284	131	68	99	187	32	-31
76	249	126	118	168	48	-25	-30
77	211	107	146	156	35	-31	-6
78	254	105	111	256	-1	-59	-57
1979	348	147	182	262	33	-44	-31
80	329	206	162	219	50	-6	-26
81	339	230	198	356	-5	-35	-44
82	319	256	213	356	-10	-28	-40
83	322	266	224	313	3	-15	-28
1984	236	319	165	154	53	107	7
85	308	434	162	193	60	125	-16
86	299	543	168	119	151	356	41
87	353	366	125	140	152	161	-11
88			139	81			72
1989			129	103			25
90			116	90			29
91			120 ^a	135			-11
92			196 ^a	143			37
93			139 ^a	177			-21
1994 ^b			151 ^a	233			-35
Mean Percent Error					64	42	-10
1995 ^b			177 ^a	188 ^c	64	42	-6

¹ Inshore Nushagak River run includes commercial, subsistence (below sonar), and sport harvest plus escapement.

^aAdjusted (reduced) by the average forecast error (-19.35%) from 1984-92.

^bMean returns were used to predict age 1.1 and age 1.2, other year classes were forecast using sibling data.

^cPreliminary

(Sources: 1, 5, 6, 7, and 16)

Appendix Table 3. Salmon entry permit registration by gear and residency, Bristol Bay, 1975-1995.^a

Year	Drift Net ¹			Set Net ¹			Total
	Resident	Non-Resident	Total	Resident	Non-Resident	Total	
1975 ^b	1,217 (450)	843 (194)	2,060	751 (159)	169 (45)	920	2,980
76	987 (69)	734 (30)	1,721	625 (5)	139 (0)	764	2,485
77	999 (52)	729 (13)	1,728	684 (15)	156 (1)	840	2,568
78	1,039 (66)	738 (11)	1,777	749 (16)	161 (3)	910	2,687
79	1,046 (73)	754 (10)	1,800	764 (19)	170 (5)	934	2,734
1980	1,060 (92)	767 (18)	1,827	760 (29)	187 (5)	947	2,774
81	1,056 (89)	771 (18)	1,827	754 (37)	202 (5)	956	2,783
82	1,050 (85)	774 (15)	1,824	744 (36)	213 (5)	957	2,781
83	1,071 (79)	750 (16)	1,821	740 (33)	220 (3)	960	2,781
84	1,050 (73)	768 (16)	1,818	744 (28)	218 (3)	962	2,780
1985	1,061 (83)	772 (13)	1,833	733 (24)	217 (4)	950	2,783
86	1,059 (78)	775 (17)	1,834	727 (18)	223 (4)	950	2,784
87 ^c	1,054 (76)	782 (16)	1,836	730 (14)	220 (4)	950	2,786
88 ^d	1,035 (78)	802 (12)	1,837	727 (14)	222 (3)	949	2,786
89 ^e	1,031 (77)	830 (14)	1,861	772 (14)	235 (4)	1,007	2,868
1990 ^f	1,039 (78)	841 (15)	1,880	773 (10)	243 (5)	1,016	2,896
91 ^g	1,022 (74)	855 (14)	1,877	760 (8)	245 (4)	1,005	2,882
92 ^h	1,006 (71)	874 (15)	1,880	765 (10)	245 (5)	1,010	2,890
93 ⁱ	978 (65)	901 (16)	1,879	746 (8)	252 (0)	998	2,877
94 ^j	973 (63)	904 (14)	1,877	746 (7)	253 (0)	999	2,876
20 Year Ave.	1,042	798	1,840	740	210	949	2,789
1975-84 Ave.	1,058	763	1,820	732	184	915	2,735
1985-94 Ave.	1,026	834	1,859	748	236	983	2,843
1995 ^k	971 (64)	917 (11)	1,888	764 (8)	257 (0)	1,021	2,909

¹ Allowable gear per license/permit is 150 fathoms for drift and 50 fathoms for set with the following exceptions: 1968 and 1975 - 75 F. drift and 25 F. set; 1969 - 125 F. drift; and 1969 - 125 F. Drift; 1973 - 25 F. drift and 12 1/2 F. set.

^a Total license/permit registration; not all license/permittee's actually fished.

^b Limited Entry went into effect in 1974. Figures in parenthesis are interim-use permits, and are included in the totals.

^c Does not include 2 drift and 11 setnet permits available but not renewed.

^d Does not include 1 drift and 8 setnet permits.

^e Does not include 5 drift and 20 setnet permits.

^f Does not include 3 drift and 14 setnet permits.

^g Does not include 4 drift and 20 setnet permits.

^h Does not include 4 drift and 14 setnet permits.

ⁱ Does not include 7 drift and 18 setnet permits.

^j Does not include 7 drift and 15 setnet permits.

^k Does not include 2 drift and 14 setnet permits.

Appendix Table 4. Salmon fishing Interim-use and permanent entry permits actually fished, by gear type, Bristol Bay, 1975-95.

Year	Permits Issued			Permits Fished	
	Interim - Use	Permanent	Total	Number	Percent
<u>Drift Gill Net</u>					
1975	644	1,416	2,060	1,235	60%
76	99	1,622	1,721	1,353	79%
77	65	1,663	1,728	1,355	78%
78	77	1,700	1,777	1,369	77%
79	83	1,717	1,800	1,711	95%
1980	110	1,717	1,827	1,762	96%
81	107	1,720	1,827	1,783	98%
82	100	1,724	1,824	1,791	98%
83	95	1,726	1,821	1,797	99%
84	89	1,729	1,818	1,798	99%
1985	95	1,738	1,833	1,813	99%
86	91	1,743	1,834	1,800	98%
87	91	1,745	1,836	1,799	98%
88	88	1,749	1,837	1,839	100%
89	91	1,770	1,861	1,860	100%
1990	93	1,787	1,880		
91	88	1,789	1,877		
92	86	1,794	1,880		
93	81	1,798	1,879		
94	77	1,801	1,878		
Average	120	1,718	1,838		
1995 ^a	75	1,811	1,886		
<u>Set Gill Net</u>					
1975	204	716	920	445	48%
76	5	759	764	501	66%
77	16	824	840	495	59%
78	19	891	910	650	71%
79	24	910	934	768	82%
1980	34	913	947	804	85%
81	42	914	956	841	88%
82	41	916	957	859	90%
83	36	924	960	861	90%
84	31	931	962	866	90%
1985	28	922	950	872	92%
86	22	928	950	872	92%
87	18	943	950	872	92%
88	17	932	949	922	97%
89	18	989	1,007	973	97%
1990	12	1,001	1,016		
91	12	993	1,005		
92	15	1,002	1,010		
93	8	998	1,006		
94	7	994	1,001		
Average	32	916	947		
1995 ^a	8	999	1,007		

^a Preliminary

(Source: 14)

Appendix Table 5. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay 1975-95.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	3,085,416	964,024	14,558	645,902	188,914	4,898,814
76	2,547,276	1,329,788	174,923	1,265,422	301,883	5,619,292
77	2,167,214	1,780,567	92,623	619,025	218,451	4,877,880
78	5,123,668	1,207,294	7,995	3,137,166	452,016	9,928,139
79	14,991,826	2,257,332	391,118	3,327,346	460,984	21,428,606
1980	15,120,457	2,623,066	885,875	4,497,787	634,561	23,761,746
81	10,992,809	4,361,406	2,116,066	7,493,093	639,707	25,603,081
82	5,005,802	2,447,514	1,139,192	5,916,187	595,696	15,104,391
83	21,559,372	6,755,256	3,349,451	5,119,744	588,208	37,372,031
84	14,546,710	5,190,413	2,658,376	1,992,681	322,126	24,710,306
1985	8,179,093	7,537,273	6,468,862	1,307,889	209,766	23,702,883
86	2,892,171	4,852,935	5,002,949	2,719,313	308,688	15,776,056
87	4,986,002	5,356,669	2,128,652	3,254,720	342,732	16,068,775
88	3,480,836	6,456,598	1,523,520	1,706,716	822,087	13,989,757
89	13,809,956	8,901,994	3,146,239	2,788,185	88,932	28,735,306
1990	17,272,224	10,371,762	2,149,009	3,532,543	197,589	33,523,127
91	10,475,206	6,797,166	2,945,742	5,053,845	549,221	25,821,180
92	9,395,948	15,646,575	3,320,966	2,789,741	726,446	31,879,676
93	8,907,876	21,600,858	4,176,900	5,236,557	539,933	40,462,124
94	16,327,858	10,750,213	4,352,797	3,393,143	400,039	35,224,050
20-Year Ave.	9,543,386	6,359,435	2,302,291	3,289,850	429,399	21,924,361
1975-84 Ave.	9,514,055	2,891,666	1,083,018	3,401,435	440,255	17,330,429
1985-94 Ave.	9,572,717	9,827,204	3,521,564	3,178,265	418,543	26,518,293
1995 ^a	20,415,430	14,461,228	4,501,076	4,450,337	598,964	44,427,035

^a Preliminary.

(Sources: 1 and 5)

Appendix Table 6. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	964	237	111	21,454	7,226	29,992
76	4,064	1,138	338	60,684	29,744	95,968
77	4,373	3,694	2,167	85,074	35,218	130,526
78	6,930	3,126	5,935	118,548	57,000	191,539
79	10,415	5,547	9,568	157,321	30,022	212,873
1980	7,517	5,610	4,900	64,958	12,543	95,528
81	11,048	5,468	3,416	193,461	23,911	237,304
82	12,425	4,834	7,170	195,287	33,786	253,502
83	8,955	4,758	9,276	137,123	38,497	198,609
84	8,972	4,680	4,767	61,378	22,179	101,976
1985	5,697	4,015	5,840	67,783	37,106	120,441
86	3,188	1,883	2,982	65,783	19,880	93,716
87	5,175	2,959	4,065	45,983	17,217	75,399
88	6,538	3,103	3,444	16,648	15,606	45,339
89	6,611	2,034	2,112	17,637	11,366	39,760
1990	5,068	1,146	1,840	14,812	11,130	33,996
91	3,584	510	589	19,718	6,039	30,440
92	5,724	694	2,146	47,563	12,640	68,767
93	7,477	1,478	3,075	62,976	10,851	85,857
94	6,016	1,243	3,685	119,480	10,486	140,910
20-Year Ave.	6,537	2,908	3,871	78,684	22,122	114,122
1975-84 Ave.	7,566	3,909	4,765	109,529	29,013	154,782
1985-94 Ave.	5,508	1,907	2,978	47,838	15,232	73,463
1995 ^a	5,339	680	1,529	80,180	11,929	99,657

^a Preliminary.

(Sources: 1 and 5)

Appendix Table 7. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	79,740	4,094	1,634	152,891	87,058	325,417
76	317,550	46,955	9,924	801,064	153,559	1,329,052
77	340,228	83,121	4,465	899,701	270,649	1,598,164
78	185,451	44,480	1,449	651,743	274,967	1,158,090
79	196,398	38,004	12,174	440,279	219,942	906,797
1980	204,515	78,556	36,343	681,930	299,682	1,301,026
81	355,943	87,581	36,275	795,143	229,886	1,504,828
82	198,019	84,329	53,204	434,817	151,000	921,369
83	351,769	127,490	105,171	725,060	322,691	1,632,181
84	447,259	178,096	210,611	850,114	336,660	2,022,740
1985	210,107	126,736	131,576	396,740	203,302	1,068,461
86	262,925	94,666	111,112	488,375	270,057	1,227,135
87	446,908	145,259	101,074	416,476	419,425	1,529,142
88	295,571	237,888	94,545	371,196	470,132	1,469,332
89	310,869	136,185	84,673	523,903	203,178	1,258,808
1990	422,276	123,087	32,013	378,223	102,861	1,058,460
91	443,189	75,892	60,299	463,780	246,589	1,289,749
92	167,168	121,472	57,170	398,691	176,123	920,624
93	43,684	70,628	73,402	505,799	144,869	838,382
94	219,118	62,961	52,127	328,267	232,559	895,032
20-Year Ave.	274,934	98,374	63,462	535,210	240,759	1,212,739
1975-84 Ave.	267,687	77,271	47,125	643,274	234,609	1,269,966
1985-94 Ave.	282,182	119,477	79,799	427,145	246,910	1,155,513
1995 ^a	237,524	62,186	63,316	363,370	223,329	949,725

^a Preliminary.

(Sources: 1 and 5)

Appendix Table 8. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	6	9	2	126	279	422
76	264,631	4,121	116	739,590	28,085	1,036,543
77	19	0	5	3,017	1,476	4,517
78	734,880	11,430	530	4,348,336	57,524	5,152,700
79	134	6	9	1,787	1,913	3,849
1980	288,363	2,476	51	2,202,545	70,033	2,563,468
81	194	222	29	345	6,490	7,280
82	127,560	1,997	170	1,339,272	23,417	1,492,416
83	51	92	0	137	204	484
84	211,306	5,759	2,387	3,127,153	19,468	3,366,073
1985	39	51	3	48	316	457
86	106,919	2,749	98	267,117	24,404	401,287
87	5	0	30	2	20	57
88	648,569	4,485	218	243,890	58,084	955,246
89	75	6	29	156	172	438
1990	421,690	11,593	361	54,127	8,746	496,517
91	102	15	2	69	117	305
92	214,228	694	525	190,102	93,989	499,538
93	86	2	2	83	240	413
94	11,537	145	21	8,562	69,552	89,907
20-Year Ave. ¹	301,815	4,530	446	1,251,213	38,375	1,596,379
1975-84 Ave. ¹	325,348	5,157	651	2,351,379	39,705	2,722,240
1985-94 Ave. ¹	278,281	3,904	240	151,047	37,045	470,518
1995 ^a	61	0	2	139	328	530

¹ Includes even numbered years only.

^a Preliminary.

(Sources: 1 and 5)

Appendix Table 9. Coho salmon commercial catch by district, in numbers of fish,
Bristol Bay, 1975-95.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	43	951	4,595	7,342	33,350	46,281
76	1,195	2,321	3,561	6,778	12,791	26,646
77	2,883	2,685	3,884	52,562	45,201	107,215
78	913	2,256	2,024	44,740	44,338	94,271
79	12,355	15,148	17,886	129,607	119,403	294,399
1980	7,802	22,537	19,419	147,726	151,000	348,484
81	1,229	32,759	30,220	220,290	29,207	313,705
82	10,586	74,989	50,803	349,669	133,765	619,812
83	7,282	25,954	7,816	81,338	5,711	128,101
84	3,209	66,589	68,451	260,310	176,053	574,612
1985	10,474	32,667	60,815	20,230	38,636	162,822
86	5,824	33,607	25,770	68,568	48,306	182,075
87	5,274	30,789	14,785	13,263	1,292	65,403
88	29,988	48,981	52,355	52,698	18,468	202,490
89	22,668	49,175	33,942	77,077	56,972	239,834
1990	16,091	43,897	32,906	7,733	2,690	103,317
91	17,527	47,486	42,622	5,574	4,531	117,740
92	18,553	47,780	35,794	84,077	5,328	191,532
93	1,779	41,603	2,387	14,345	12,615	72,729
94	5,877	48,436	19,250	5,615	96,062	175,240
20-Year Ave.	9,078	33,531	26,464	82,477	51,786	203,335
1975-84 Ave.	4,750	24,619	20,866	130,036	75,082	255,353
1985-94 Ave.	13,406	42,442	32,063	34,918	28,490	151,318
1995 ^o	981	21,772	12,844	4,896	8,917	49,410

^o Preliminary.

(Sources: 1 and 5)

Appendix Table 10. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	3,166,169	969,315	20,900	827,715	316,827	5,300,926
76	3,134,716	1,384,323	188,862	2,873,538	526,062	8,107,501
77	2,514,717	1,870,067	103,144	1,659,379	570,995	6,718,302
78	6,051,842	1,268,586	17,933	8,300,533	885,845	16,524,739
79	15,211,128	2,316,037	430,755	4,056,340	832,264	22,846,524
1980	15,628,654	2,732,245	946,588	7,594,946	1,167,819	28,070,252
81	11,361,223	4,487,436	2,186,006	8,702,332	929,201	27,666,198
82	5,354,392	2,613,663	1,250,539	8,235,232	937,664	18,391,490
83	21,927,429	6,913,550	3,471,714	6,063,402	955,311	39,331,406
84	15,217,456	5,445,537	2,944,592	6,291,636	876,486	30,775,707
1985	8,405,410	7,700,742	6,667,096	1,792,690	489,126	25,055,064
86	3,271,027	4,985,840	5,142,911	3,609,156	671,335	17,680,269
87	5,443,364	5,535,676	2,248,606	3,730,444	780,686	17,738,776
88	4,461,502	6,751,055	1,674,082	2,391,148	1,384,377	16,662,164
89	14,150,179	9,089,394	3,266,995	3,406,958	360,620	30,274,146
1990	18,137,349	10,551,485	2,216,129	3,987,438	323,016	35,215,417
91	10,939,608	6,921,069	3,049,254	5,542,986	806,497	27,259,414
92	9,801,621	15,817,215	3,416,601	3,510,174	1,014,526	33,560,137
93	8,960,902	21,714,569	4,255,766	5,819,760	708,508	41,459,505
94	16,570,406	10,862,998	4,427,880	3,855,157	808,698	36,525,139
20-Year Ave.	9,985,455	6,496,540	2,396,318	4,612,548	767,293	24,258,154
1975-84 Ave.	9,956,773	3,000,076	1,156,103	5,460,505	799,847	20,373,305
1985-94 Ave.	10,014,137	9,993,004	3,636,532	3,764,591	734,739	28,143,003
1995 ^a	20,659,335	14,545,866	4,574,390	4,898,922	843,467	45,521,980

^a Preliminary.

(Sources: 1 and 5)

Appendix Table 11. Commercial Sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1975-95.

Year	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak		Total	
	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set
1975	94	6	90	10	80	20	80	20	92	8	87	13
76	93	7	91	9	90	10	85	15	92	8	90	10
77	90	10	88	12	90	10	85	15	89	11	88	12
78	91	9	84	16	88	12	85	15	84	16	86	14
1979	90	10	78	22	84	16	82	18	82	18	83	17
80	88	12	69	31	87	13	85	15	83	17	82	18
81	86	14	77	23	89	11	81	19	79	21	82	18
82	87	13	83	17	87	13	90	10	84	16	86	14
83	92	8	86	14	93	7	86	14	80	20	87	13
1984	89	11	92	8	92	8	83	17	77	23	87	13
85	87	13	93	7	96	4	65	35	75	25	83	17
86	70	30	89	11	94	6	76	24	68	32	79	21
87	86	14	91	9	93	7	80	20	66	34	83	17
88	86	14	90	10	91	9	75	25	64	36	81	19
1989	89	11	90	10	87	13	58	42	55	45	76	24
90	88	12	91	9	91	9	67	33	67	33	81	19
91	89	11	91	9	89	11	76	24	64	36	82	18
92	89	11	91	9	90	10	65	35	62	38	79	21
93	84	16	93	7	90	10	72	28	54	46	79	21
94	90	10	92	8	94	6	68	32	52	48	79	21
20-Year Ave.	88	12	87	13	90	10	77	23	73	27	83	17
1975-84 Ave.	90	10	84	16	88	12	84	16	84	16	86	14
1985-94 Ave.	86	14	91	9	92	9	70	30	63	37	80	20
1995 ^a	89	11	90	10	95	5	68	32	52	48	79	21

^a Preliminary data

Appendix Table 12. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek-Kvichak ¹	Egegik ²	Ugashik ³	Nushagak ⁴	Togiak ⁵	Total
1975	15,267,616	1,173,840	429,336	2,273,038	189,162	19,332,992
76	3,367,854	509,160	356,308	1,486,276	200,590	5,920,188
77	2,527,000	692,514	201,520	1,220,056	202,634	4,843,724
78	5,192,066	895,698	82,434	3,485,532	340,076	9,995,806
79	12,437,996	1,032,042	1,706,904	3,073,571	224,838	18,475,351
1980	25,447,866	1,060,860	3,335,284	8,310,438	572,450	38,726,898
81	3,632,788	694,680	1,327,699	2,850,637	365,910	8,871,714
82	2,529,692	1,034,628	1,185,551	2,012,742	341,424	7,104,037
83	4,554,496	792,282	1,001,364	1,948,492	239,610	8,536,244
84	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
1985	9,179,014	1,095,192	1,006,407	1,684,796	190,082	13,155,491
86	3,387,147	1,151,750	1,015,582	2,133,398	271,184	7,959,061
87	7,281,896	1,273,553	686,894	1,895,961	316,076	11,454,380
88	5,297,708	1,612,745	654,412	1,524,752	340,712	9,430,329
89	9,676,244	1,611,566	1,713,287	2,189,501	125,080	15,315,678
1990	9,231,358	2,191,582	749,478	2,144,498	278,202	14,595,118
91	8,078,885	2,786,925	2,482,016	2,419,486	320,713	16,088,025
92	6,557,157	1,945,632	2,194,927	2,286,278	266,956	13,250,950
93	5,908,799	1,517,000	1,413,454	2,296,789	242,475	11,378,517
94	9,571,245	1,967,775	1,095,068	2,448,056	233,632	15,315,776
20-Year Ave.	8,053,767	1,310,238	1,195,412	2,474,949	273,129	13,307,496
1975-84 Ave.	8,690,589	905,105	1,089,672	2,847,547	287,747	13,820,660
1985-94 Ave.	7,416,945	1,715,372	1,301,153	2,102,352	258,511	12,794,333
1995 ^a	11,365,573	1,282,508	1,321,108	2,254,231	240,266	16,463,686

¹ Includes Kvichak, Branch and Naknek Rivers.

² Includes Egegik River. Also includes King Salmon River in 1986-95, and Shosky Creek in 1988-95.

³ Includes Ugashik River. Also includes Mother Goose River system 1976-95 and Dog Salmon River system in 1984-95.

⁴ Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.

⁵ Includes Togiak River, Lake and tributaries, Kulukak system and other miscellaneous river systems.

^a Preliminary.

(Sources: 1, 7, and 12)

Appendix Table 13. Inshore commercial catch and escapement of sockeye salmon in the Naknek Kvichak District by river system, in numbers of fish, Bristol Bay, 1975-95.

Year	Catch	Escapement			Total	Total Run
		Kvichak ¹	Branch ²	Naknek ¹		
1975	3,085,416	13,140,450	100,480	2,026,686	15,267,616	18,353,032
76	2,547,276	1,965,282	81,822	1,320,750	3,367,854	5,915,130
77	2,167,214	1,341,144	100,000	1,085,856	2,527,000	4,694,214
78	5,123,668	4,149,288	229,400	813,378	5,192,066	10,315,734
79	14,991,826	11,218,434	294,200	925,362	12,437,996	27,429,822
1980	15,120,457	22,505,268	297,900	2,644,698	25,447,866	40,568,323
81	10,992,809	1,754,358	82,210	1,796,220	3,632,788	14,625,597
82	5,005,802	1,134,840	239,300	1,155,552	2,529,692	7,535,494
83	21,559,372	3,569,982	96,220	888,294	4,554,496	26,113,868
84	14,546,710	10,490,670	215,370	1,242,474	11,948,514	26,495,224
1985	8,179,093	7,211,046	118,030	1,849,938	9,179,014	17,358,107
86	2,892,171	1,179,322	230,180	1,977,645	3,387,147	6,279,318
87	4,986,002	6,065,880	154,210	1,061,806	7,281,896	12,267,898
88	3,480,836	4,065,216	194,630	1,037,862	5,297,708	8,778,544
89	13,809,956	8,317,500	196,760	1,161,984	9,676,244	23,486,200
1990	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
91 [□]	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
92 [□]	9,329,663	4,725,864	224,643	1,606,650	6,557,157	15,886,820
93 [□]	8,866,866	4,025,166	347,975	1,535,658	5,908,799	14,775,665
94 [□]	16,262,625	8,337,840	242,595	990,810	9,571,245	25,833,870
20 Year Ave.	9,534,760	6,319,518	194,614	1,539,635	8,053,767	17,588,527
1975-84 Ave.	9,514,055	7,126,972	173,690	1,389,927	8,690,589	18,204,644
1985-94 Ave.	9,555,464	5,512,064	215,537	1,689,344	7,416,945	16,972,410
1995 [□]	20,415,430	10,038,720	215,713	1,111,140	11,365,573	31,781,003

¹ Tower count

² Tower count 1975-76 and aerial survey estimates 1977-95

[□] Preliminary apportionment.

(Sources: 1, 7, 13 and 15)

Appendix Table 14. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1975-95.

Year	Kvichak		Branch		Naknek		Total Run ¹
	Number	%	Number	%	Number	%	
1975	14,746	80	114	1	3,493	19	18,353
76	3,423	58	137	2	2,354	40	5,915
77	2,081	44	150	3	2,463	52	4,694
78	7,965	77	455	4	1,896	18	10,316
79	24,637	90	573	2	2,219	8	27,430
1980	35,248	87	561	1	4,759	12	40,568
81	6,989	48	311	2	7,326	50	14,626
82	2,993	40	772	10	3,770	50	7,536
83	20,105	77	557	2	5,452	21	26,114
84	23,014	87	555	2	2,926	11	26,495
1985	13,394	77	264	2	3,699	21	17,358
86	1,966	31	399	6	3,913	62	6,279
87	9,593	78	297	2	2,378	19	12,268
88	6,720	77	320	4	1,739	20	8,779
89	19,774	84	534	2	3,179	14	23,487
1990	17,439	66	551	2	8,369	32	26,359
91 ^a	8,061	43	607	3	9,970	53	18,638
92 ^a	10,404	65	485	3	4,997	31	15,886
93 ^a	9,265	63	813	6	4,698	32	14,776
94 ^a	22,178	86	633	2	3,023	12	25,834
20 Year Ave.	13,000	68	454	3	4,131	29	17,586
1975-84 Ave.	14,120	69	419	3	3,666	28	18,205
1985-94 Ave.	11,879	67	490	3	4,597	30	16,966
1995 ^a	27,549	87	654	2	3,579	11	31,782

¹ Due to rounding of river system total runs, the district total run may not equal the sum of the rows.

^a Preliminary apportionment.

(Sources: 1 and 7)

Appendix Table 15. Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, Bristol Bay, 1975-95.

Year	Catch	Escapement			Total Run
		Egegik ¹	Shosky Cr. ²	King Salmon ² River	
1975	964,024	1,173,840			2,137,864
76	1,329,788	509,160			1,838,948
77	1,780,567	692,514			2,473,081
78	1,207,294	895,698			2,102,992
79	2,257,332	1,032,042			3,289,374
1980	2,623,066	1,060,860			3,683,926
81	4,361,406	694,680			5,056,086
82	2,447,514	1,034,628			3,482,142
83	6,755,256	792,282			7,547,538
84	5,190,413	1,165,320		25	6,355,758
1985	7,537,273	1,095,192			8,632,465
86	4,852,935	1,151,750		430	6,005,115
87	5,356,669	1,272,978		575	6,630,222
88	6,456,598	1,612,680	65		8,069,343
89	8,901,994	1,610,916	50	600	10,513,560
1990	10,371,762	2,191,362	0	220	12,563,344
91	6,797,166	2,786,880	0	45	9,584,091
92	15,646,575	1,945,332	0	300	17,592,207
93	21,600,858	1,516,980	20		23,117,858
94	10,750,213	1,967,730	15	30	12,717,988
20-Year Ave.	6,359,435	1,310,141			7,669,695
1975-84 Ave.	2,891,666	905,102			3,796,771
1985-94 Ave.	9,827,204	1,715,180	21	314	11,542,619
1995 ^o	14,461,228	1,281,678	0	830	15,743,736

¹ Tower count.

² Aerial survey index count.

^o Preliminary.

(Sources: 1 and 7)

Appendix Table 16. Inshore commercial catch and escapement of sockeye salmon in the Ugashik District by river system, Bristol Bay, 1975-95.

Year	Catch	Escapement			Total Run
		Ugashik ¹ River	King Salmon ² River	Dog Salmon ² River	
1975	14,588	429,336			443,924
76	174,923	341,808	14,500		531,231
77	92,623	201,486	34		294,143
78	7,995	70,434	12,000		90,429
79	391,118	1,700,904	6,000		2,098,022
1980	885,875	3,321,384	13,900		4,221,159
81	2,116,066	1,326,762	937		3,443,765
82	1,139,192	1,157,526	28,025		2,324,743
83	3,349,451	1,000,614	750		4,350,815
84	2,658,376	1,241,418	17,100	11,800	3,928,694
1985	6,468,862	998,232	7,400	775	7,475,269
86	5,002,949	1,001,492	4,310	9,780	6,018,531
87	2,128,652	668,964	15,855	2,075	2,815,546
88	1,523,520	642,972	8,360	3,080	2,177,932
89	3,146,239	1,681,302	25,480	6,505	4,859,526
1990	2,149,009	730,038	11,340	8,100	2,898,487
91	2,945,742	2,457,306	12,195	12,500	5,427,743
92	3,320,966	2,173,692	13,425	7,810	5,515,893
93	4,176,900	1,389,534	22,570	1,350	5,590,354
94	4,381,253	1,080,858	8,885	5,325	5,476,321
20-Year Ave.	2,303,715	1,180,803	11,153	3,455	3,499,126
1975-84 Ave.	1,083,021	1,079,167	9,325	1,180	2,172,693
1985-94 Ave.	3,524,409	1,282,439	12,982	5,730	4,825,560
1995 ^a	4,501,076	1,304,058	7,650	9,400	5,822,184

¹ Tower count.

² Aerial survey.

^a Preliminary.

(Sources: 1 and 7)

Appendix Table 17. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1975-95.

Year	Catch	Escapement						Total	Total Run
		Wood ¹	Igushik ¹	Nuyakuk ¹	Nush/Mul ²	Nushagak ³	Snake ⁴		
1,975	645,902	1,270,116	241,086	669,918	82,400		9,518	2,273,038	2,918,940
76	1,265,422	817,008	186,120	425,220	45,200		12,728	1,486,276	2,751,698
77	619,025	561,828	95,970	232,554	320,400		9,304	1,220,056	1,839,081
78	3,137,166	2,267,238	536,154	576,666	87,400		18,074	3,485,532	6,622,698
79	3,327,346	1,706,352	859,560	360,120	139,100		8,439	3,073,571	6,400,917
1,980	4,497,787	2,969,040	1,987,530	3,026,568	290,800		36,500	8,310,438	12,808,225
81	7,493,093	1,233,318	591,144	834,204	177,400		14,571	2,850,637	10,343,730
82	5,916,187	976,470	423,768	537,864	63,000		11,640	2,012,742	7,928,929
83	5,119,744	1,360,968	180,438	318,606	85,400		3,080	1,948,492	7,068,236
84	1,992,681	1,002,792	184,872	472,596	120,586		33,840	1,814,686	3,807,367
1,985	1,307,889	939,000	212,454	429,162	69,300		34,880	1,684,796	2,992,685
86	2,719,313	818,652	307,728	821,898	168,340		16,780	2,133,398	4,852,711
87	3,254,720	1,337,172	169,236	163,000	225,033		1,520	1,895,961	5,150,681
88	1,706,716	866,778	170,454	319,992	163,208		4,320	1,524,752	3,231,468
89	2,788,185	1,186,410	461,610			513,421	28,060	2,189,501	4,977,686
1,990	3,532,543	1,069,440	365,850			680,368	28,840	2,144,498	5,677,041
91	5,053,845	1,159,920	756,126			492,520	10,920	2,419,486	7,473,331
92	2,789,741	1,286,250	304,920			695,108		2,286,278	5,076,019
93	5,236,557	1,176,126	405,564			715,099		2,296,789	7,533,346
94	3,393,143	1,471,890	445,920			509,326	22,480	2,449,616	5,842,759
20-year Ave.	3,289,850	1,273,838	444,325	656,312 ^b	145,541 ^b		16,972	2,475,027	5,764,877
1975-84 Ave.	3,401,435	1,416,513	528,664	745,432	141,169		15,769	2,847,547	6,248,982
1985-94 Ave.	3,178,265	1,131,164	359,986	433,513 ^b	156,470 ^b	600,974 ^c	18,475	2,102,508	5,280,773
1995	4,450,337 ^a	1,482,162	473,382	69,702	211,605	281,307	17,380	2,254,231	6,704,568

¹ Tower count.

² Aerial survey estimates 1977-83, 1985, and 1987. Escapement estimates for 1984, 1988 and 1995 were derived from the difference between lower river sonar estimates and Nuyakuk Tower counts. Escapement estimates for 1975-76 and 1986 based on the average ratio of Nuyakuk/Mushagak-Mulchatna river system in years when data was available.

³ Total escapements from 1989 on are determined for the entire Nushagak River drainage using Portage Creek sonar estimates.

⁴ Aerial survey estimate 1980, 1982-91, 1994-95; weir count 1975-79 and 1981, not surveyed in 1992 or 1993 due to lack of funding.

^a Preliminary.

^b Averages thru 1988.

^c Average 1989 thru 1994.

(Sources: 1, 7, and 13)

Appendix Table 18. Inshore sockeye salmon total run by river system, in thousands of fish and percent, Nushagak District, Bristol Bay, 1975-95.

Year	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		Total Run ¹
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
1975	1,640	56	319	11	868	30	82	3			10	0	2,919
76	1,438	52	345	13	845	31	100	4			24	1	2,752
77	834	45	146	8	358	19	488	27			12	1	1,838
78	4,117	62	1,084	16	1,302	20	87	1			33	0	6,623
79	3,638	57	1,842	29	764	12	138	2			18	0	6,400
1980	4,529	35	3,126	24	4,826	38	291	2			37	0	12,809
81	4,568	44	2,229	22	3,319	32	177	2			52	1	10,345
82	3,471	44	1,818	23	2,079	26	550	7			12	0	7,930
83	4,272	60	813	12	1,379	20	601	9			3	0	7,068
84	1,982	52	435	11	906	24	451	12			34	1	3,808
1985	1,593	53	460	15	697	23	208	7			35	1	2,993
86	1,772	37	877	18	1,762	36	425	9			17	0	4,853
87	2,828	55	617	12	589	11	1,116	22			2	0	5,152
88	1,749	54	406	13	649	20	424	13			4	0	3,232
89	2,519	51	1,214	24					1,217	24	28	1	4,978
1990 ^o	2,647	46	1,267	22					1,771	31	29	1	5,714
91 ^o	3,423	45	2,478	32					1,781	23	11	0	7,692
92 ^o	2,525	49	815	16					1,848	36	1	0	5,189
93 ^o	3,763	49	1,598	21					2,263	30			7,624
94 ^o	2,988	51	1,311	22					1,561	27			5,860
20-Year Ave.	2,815	50	1,160	18	1,453	24	367	8	1,740	28	20	0	5,789
1975-84 Ave.	3,049	51	1,216	17	1,665	25	297	7			24	0	6,249
1985-94 Ave.	2,581	49	1,104	20	924	23	543	13	1,740	28	16	0	5,329
1995 ^o	4,025	60	1,906	28					757	11	17	0	6,705

¹ Due to rounding, the district total runs may not equal the sum of the rows.

^o Preliminary apportionment.

(Sources: 1 and 7)

Appendix Table 19. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1975-95.

Year	Catch				Escapement						Total Run
	Togiak	Kulukak	Os/Mat ¹	Total	Togiak					Total	
					Lake ²	River ³	Tributaries ⁴	Kulukak ⁵	Other ⁶		
1975	184,856	3,821	237	188,914	160,962	12,200	7,400	8,600		189,162	378,076
76	293,016	4,822	4,045	301,883	158,190	15,000	16,200	11,200		200,590	502,473
77	201,004	16,252	1,195	218,451	133,734	4,400	24,400	40,100		202,634	421,085
78	422,100	29,668	248 ^a	452,016	273,576	15,000	17,600	33,900		340,076	792,092
79	393,337	66,629	1,018	460,984	171,138	14,200	12,900	26,600		224,838	685,822
1980	591,470	42,811	280	634,561	461,850	27,900	37,000	45,700		572,450	1,207,011
81	620,288	19,246	173	639,707	208,080	21,150	77,900	58,780		365,910	1,005,617
82	581,718	13,952	26	595,696	244,824	3,450	40,400	52,750		341,424	937,120
83	529,775	55,906	2,527	588,208	191,520	7,200	13,920	26,970		239,610	827,818
84	213,213	96,709	12,204	322,126	95,448	15,830	39,700	49,800		200,778	522,904
1985	133,263	44,120	32,383	209,766	136,542	3,600	13,340	36,600		190,082	399,848
86	191,158	100,466	17,064	308,688	168,384	20,000	15,000	42,800	25,000	271,184	579,872
87	274,613	45,401	22,718	342,732	249,676	10,400	18,200	37,800		316,076	658,808
88	673,408	143,112	5,567	822,087	276,612	18,800	13,600	31,700		340,712	1,162,799
89	68,375	14,116	6,441	88,932	84,480	15,200	4,560	20,840		125,080	214,012
1990	168,688	27,311	1,590	197,589	141,977	17,540	29,605	49,600	39,480	278,202	475,791
91	522,090 ^b	33,425 ^b	6,437 ^b	549,221	254,683	15,980	7,740	23,940	18,370	320,713	869,934
92	596,728	99,223	8,195	704,146 ^c	199,056	6,060	10,400	26,440	25,000	266,956	971,102
93	473,501	64,432	5,518	543,451 ^c	177,185	4,600	11,330	31,800	17,560	242,475	785,926
94	321,293	77,410	2,349	401,052	154,752	6,200	13,220	29,740	29,720	233,632	634,684
20-Year Ave.	372,695	49,942	6,511	428,511	197,133	12,736	21,221	34,283		273,129	701,640
1975-84 Ave.	403,078	34,982	2,195	440,255	209,932	13,633	28,742	35,440		287,747	728,002
1985-94 Ave.	342,312	64,902	10,826	416,766	184,335	11,838	13,700	33,126	25,855	258,511	675,278
1995 ^c	520,324	76,503	2,137	598,964	185,718	6,520	18,988	14,620	14,420	240,266	839,230

¹ Catches in the Osviak and Matogak sections were combined.

² Tower count.

³ Aerial survey estimate.

⁴ Aerial survey estimate includes Gechiak, Pungokebuk, Kemuk, Nayorurun, and Ongivinuck River systems. Aerial survey estimates prior to 1986 also include Ungalikthluk, Negukthlik, Matogak, Osviak, and other miscellaneous river systems when surveyed.

⁵ Aerial survey estimate includes Kulukak River and Lake and Tithe Creek ponds.

⁶ Aerial survey estimate includes Matogak, Osviak, Slug, Negukthlik, and Ungalikthluk and Quigmy Rivers. Prior to 1986 estimates for these systems were included under tributaries when surveyed.

^a Includes 248 fish from Cape Pierce Section.

^b Based on weekly processor reports. Fish tickets were not coded by section.

^c Preliminary.

(Source: 1, 7, and 13)

Appendix Table 20. Inshore total run of sockeye by district, in numbers of fish, Bristol Bay, 1975-95.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1975	18,353,032	2,137,864	443,894	2,918,940	378,076	24,231,806
76	5,915,130	1,838,948	531,231	2,751,698	502,473	11,539,480
77	4,694,214	2,473,081	294,143	1,839,081	421,085	9,721,604
78	10,315,734	2,102,992	90,429	6,622,698	792,092	19,923,945
79	27,429,822	3,289,374	2,098,022	6,400,917	685,822	39,903,957
1980	40,568,323	3,683,926	4,221,159	12,808,225	1,207,011	62,488,644
81	14,625,597	5,056,086	3,443,765	10,343,730	1,005,617	34,474,795
82	7,535,494	3,482,142	2,324,743	7,928,929	937,120	22,208,428
83	26,113,868	7,547,538	4,350,815	7,068,236	827,818	45,908,275
84	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
1985	17,358,107	8,632,465	7,475,269	2,992,685	399,848	36,858,374
86	6,279,318	6,005,115	6,018,531	4,852,711	579,872	23,735,547
87	12,267,898	6,630,222	2,815,546	5,150,681	658,808	27,523,155
88	8,778,544	8,069,343	2,177,932	3,231,468	1,162,799	23,420,086
89	23,486,200	10,513,560	4,859,526	4,977,686	214,012	44,050,984
1990	26,503,582	12,563,344	2,898,487	5,677,041	475,791	48,118,245
91	18,554,091	9,584,091	5,427,758	7,473,331	869,934	41,909,205
92	15,886,820	17,622,868	5,550,022	5,187,259	971,102	45,218,071
93	14,775,665	23,336,814	5,698,523	7,624,224	785,926	52,221,152
94	25,833,870	12,766,225	5,464,500	5,881,064	634,684	50,580,343
20-Year Ave.	17,588,527	7,684,588	3,505,649	5,776,899	701,640	35,257,302
1975-84 Ave.	18,204,644	3,796,771	2,172,690	6,248,982	728,002	31,151,088
1985-94 Ave.	16,972,410	11,572,405	4,838,609	5,304,815	675,278	39,363,516
1995 ^a	31,781,003	15,743,736	5,822,184	6,704,568	839,230	60,890,721

^a Preliminary.

(Sources: 1 and 7)

Appendix Table 21. Kvichak River sockeye salmon escapement and return by brood year, Bristol Bay, 1955-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1955	251	0	265	689	550	0	1,504	5.99
56	9,433	14	24,273	13,440	1,308	0	39,035	4.14
57	2,843	8	243	3,577	261	2	4,091	1.44
58	535	0	77	183	26	3	289	0.54
59	680	0	213	323	11	0	547	0.80
1960	14,630	0	1,449	47,308	6,495	6	55,258	3.78
61	3,706	1	334	2,483	684	0	3,502	0.94
62	2,581	0	106	4,827	420	4	5,357	2.08
63	339	0	52	689	369	9	1,119	3.30
64	957	8	2,337	2,748	655	3	5,751	6.01
1965	24,326	25	10,337	33,422	1,241	1	45,026	1.85
66	3,775	15	513	5,347	385	1	6,261	1.66
67	3,216	0	356	1,084	87	0	1,527	0.47
68	2,557	0	293	112	137	2	544	0.21
69	8,394	0	137	4,543	613	11	5,304	0.63
1970	13,935	1	83	14,481	1,261	7	15,833	1.14
71	2,387	0	262	2,262	305	0	2,829	1.19
72	1,010	0	256	1,365	320	0	1,941	1.92
73	227	0	580	1,303	574	0	2,457	10.82
74	4,434	9	6,639	18,734	794	5	26,181	5.90
1975	13,140	5	5,985	31,495	601	0	38,086	2.90
76	1,965	5	5,352	4,941	277	0	10,575	5.38
77	1,341	54	1,941	1,144	99	0	3,238	2.41
78	4,149	0	1,851	2,475	828	6	5,160	1.24
79	11,218	58	18,407	20,165	3,512	0	42,142	3.76
1980	22,505	2	2,914	9,717	415	0	13,048	0.58
81	1,754	0	800	1,162	167	0	2,129	1.21
82	1,135	25	447	1,068	144	0	1,684	1.48
83	3,570	1	8,604	4,205	578	3	13,391	3.75
84	10,491	0	2,580	18,877	2,454	2	23,913	2.28
1985	7,211	11	1,083	14,654	1,572	17	17,337	2.40
86	1,179	10	720	2,479	1,350	4	4,563	3.87
87	6,066	33	4,289	6,995	712	2	12,031	1.98
88	4,065	15	2,532	6,806	570	6	9,929	2.44
89	8,318	31	2,300	20,466	3,338		26,135 ^b	3.14
1990	6,970	14	1,635	22,443			24,092 ^b	3.46
91	4,222	1	2,705				2,706 ^b	0.64
92	4,726	2					2 ^b	0.00
93	4,025							
94	8,338							
95	10,039							
Total ¹	190,005	300	106,310	285,103	29,775	94	421,582	
Average ¹	5,588	9	3,127	8,385	876	3	12,399	2.66
Percent ¹		0	25	68	7	0	100	
10-year (79-88) ave.								2.38

¹ Averages and percentages computed from years with complete returns, 1955-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 22. Branch River sockeye salmon escapement and return by brood year, Bristol Bay, 1955-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1955	172	0	788	263	44	0	1,095	6.37
56	784	5	1,885	458	41	0	2,389	3.05
57	127	0	5	66	13	1	85	0.67
58	95	0	43	53	52	0	148	1.56
59	825	0	302	387	76	2	767	0.93
1960	1,241	0	105	320	31	0	456	0.37
61	90	10	90	192	0	0	292	3.24
62	91	19	129	94	19	0	261	2.87
63	203	0	200	174	2	0	376	1.85
64	249	5	102	211	17	0	335	1.35
1965	175	6	104	171	17	0	298	1.70
66	174	13	282	274	11	0	580	3.33
67	203	9	301	97	7	0	414	2.04
68	194	8	127	43	3	0	181	0.93
69	182	0	5	160	25	0	190	1.04
1970	177	0	73	77	2	0	152	0.86
71	187	2	26	59	37	2	126	0.67
72	151	1	91	24	14	0	130	0.86
73	35	0	98	148	2	0	248	7.09
74	215	4	297	146	8	0	455	2.12
1975	100	15	415	343	2	0	775	7.75
76	82 ^c	26	211	188	55	0	480	5.85
77	100 ^c	27	142	699	12	0	880	8.80
78	229 ^c	1	102	107	147	0	357	1.56
79	294 ^c	3	464	329	3	0	799	2.72
1980	298 ^c	0	104	224	11	1	340	1.14
81	82 ^c	0	55	223	12	0	290	3.54
82	239 ^c	0	173	145	3	0	321	1.34
83	96 ^c	0	148	165	3	0	316	3.29
84	215 ^c	1	159	188	23	0	371	1.73
1985	118 ^c	3	357	203	8	0	571	4.84
86	230 ^c	1	346	461	8	0	816	3.55
87	154 ^c	0	158	341	83	0	582	3.78
88	195 ^c	1	154	424	43	0	622	3.19
89	197 ^c	5	353	349	16		723 ^b	3.67
1990	169 ^c	2	262	455			719 ^b	4.25
91	278 ^c	0	204				204 ^b	0.73
92	225 ^c	2					2 ^b	0.01
93	348 ^c							
94	243 ^c							
95	216 ^c							
Total ¹	8,002	160	8,041	7,457	834	6	16,498	
Average ¹	235	5	237	219	25	0	485	2.82
Percent ¹		1	49	45	5	0	100	
10-year (79-88) ave.								2.91

¹ Averages and percentages computed from years with complete returns, 1955-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapemen and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

^c Aerial estimates of escapement (all others are tower counts).

(Sources: 1 and 18)

Appendix Table 23. Naknek River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	285	0	24	316	248	1	589	2.07
54	799	0	104	2,431	587	16	3,138	3.93
1955	279	0	722	1,034	90	6	1,852	6.64
56	1,773	1	474	1,703	321	1	2,500	1.41
57	635	0	55	834	678	3	1,570	2.47
58	278	0	116	749	172	2	1,039	3.74
59	2,232	0	356	1,093	705	0	2,154	0.97
1960	828	1	1,418	1,322	1,279	3	4,023	4.86
61	351	0	242	1,060	642	8	1,952	5.56
62	723	0	80	581	412	1	1,074	1.49
63	905	0	145	1,223	634	1	2,003	2.21
64	1,350	1	472	1,399	188	1	2,061	1.53
1965	718	5	584	1,093	438	1	2,121	2.95
66	1,016	5	731	2,471	630	1	3,838	3.78
67	756	0	334	1,026	356	1	1,717	2.27
68	1,023	3	152	317	271	2	745	0.73
69	1,331	0	50	1,283	1,214	3	2,550	1.92
1970	733	1	173	2,163	382	0	2,719	3.71
71	936	1	422	1,987	1,847	17	4,274	4.57
72	587	3	248	402	611	1	1,265	2.16
73	357	0	494	1,143	598	0	2,235	6.26
74	1,241	2	235	1,254	789	5	2,285	1.84
1975	2,027	1	436	3,139	1,642	8	5,226	2.58
76	1,321	4	1,087	5,623	1,513	29	8,256	6.25
77	1,086	12	642	2,368	465	6	3,493	3.22
78	813	1	334	2,816	542	0	3,693	4.54
79	925	4	2,443	1,765	423	3	4,638	5.01
1980	2,645	1	737	2,695	837	2	4,272	1.62
81	1,796	4	791	3,041	949	3	4,788	2.67
82	1,156	3	188	1,358	484	9	2,042	1.77
83	888	0	171	820	485	1	1,477	1.66
84	1,242	1	492	2,125	1,825	5	4,448	3.58
1985	1,850	2	682	4,809	1,493	38	7,024	3.80
86	1,979	3	2,008	8,486	3,169	41	13,707	6.93
87	1,062	3	352	1,809	3,334	12	5,510	5.19
88	1,038	0	285	1,306	580	2	2,173	2.09
89	1,162	1	229	2,077	571		2,878 ^b	2.48
1990	2,093	0	451	2,579			3,030 ^b	1.45
91	3,579	14	549				563 ^b	0.16
92	1,607	0					0 ^b	0.00
93	1,536							
94	991							
95	1,111							
Total ¹	38,964	62	18,279	69,044	30,833	233	118,451	
Average ¹	1,082	2	508	1,918	856	6	3,290	3.28
Percent ¹		0	15	58	26	0	100	
10-year (79-88) ave.								3.43

¹ Averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 24. Egegik River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	519	0	26	475	591	12	1,104	2.13
54	507	0	15	1,202	728	45	1,990	3.93
1955	271	1	21	835	402	7	1,266	4.67
56	1,104	6	2,025	4,115	688	12	6,846	6.20
57	391	0	37	1,140	997	62	2,236	5.72
58	246	0	45	890	324	3	1,262	5.13
59	1,072	0	75	1,201	481	25	1,782	1.66
1960	1,799	8	469	4,775	2,609	51	7,912	4.40
61	702	0	85	675	819	10	1,589	2.26
62	1,027	0	22	1,019	403	30	1,474	1.44
63	998	0	18	652	581	7	1,258	1.26
64	850	1	132	1,524	315	12	1,984	2.33
1965	1,445	0	139	2,088	854	21	3,102	2.15
66	804	0	251	1,352	898	10	2,511	3.12
67	637	0	64	922	624	3	1,613	2.53
68	339	0	41	143	260	14	458	1.35
69	1,016	0	13	1,208	1,418	115	2,754	2.71
1970	920	0	59	885	270	25	1,239	1.35
71	634	0	46	1,586	1,044	56	2,732	4.31
72	546	0	60	1,570	1,311	18	2,959	5.42
73	329	0	76	713	887	4	1,680	5.11
74	1,276	0	149	2,324	550	3	3,026	2.37
1975	1,174	0	158	2,692	810	3	3,663	3.12
76	509	2	674	3,792	850	0	5,318	10.45
77	693	2	824	2,657	721	13	4,217	6.09
78	896	0	406	6,581	2,209	12	9,208	10.28
79	1,032	3	721	3,558	1,664	0	5,946	5.76
1980	1,061	1	843	6,801	930	0	8,575	8.08
81	695	0	615	4,237	1,458	7	6,317	9.09
82	1,035	4	1,004	3,670	1,658	4	6,340	6.13
83	792	3	1,755	5,998	2,850	38	10,644	13.44
84	1,165	1	701	7,520	5,064	52	13,338	11.45
1985	1,095	4	608	5,638	1,279	19	7,548	6.89
86	1,151	2	1,870	7,646	4,704	111	14,333	12.45
87	1,274	2	963	13,448	11,403	87	25,903	20.33
88	1,613	1	475	12,531	5,937	158	19,102	11.84
89	1,612	1	644	6,548	4,186		11,379 ^b	7.06
1990	2,192	0	474	10,478			10,952 ^b	5.00
91	2,787	5	1,406				1,411 ^b	0.51
92	1,946	6					6 ^b	0.00
93	1,517							
94	1,968							
95	1,283							
Total ¹	31,617	41	15,485	118,063	58,591	1,049	193,229	
Average ¹	878	1	430	3,280	1,628	29	5,367	5.75
Percent ¹		0	8	61	30	1	100	
10-year (79-88) ave.								10.55

¹ Averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 25. Ugashik River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	1,056	0	216	668	224	0	1,108	1.05
54	459	0	28	423	61	0	512	1.12
1955	77	0	19	151	7	0	177	2.30
56	425	13	3,167	916	37	0	4,133	9.72
57	215	0	38	459	105	2	604	2.81
58	280	0	64	549	66	0	679	2.43
59	219	0	18	347	132	1	498	2.27
1960	2,341 [†]	0	685	1,859	487	1	3,032	1.30
61	366	0	245	747	121	0	1,113	3.04
62	274	0	81	315	28	0	424	1.55
63	397	0	13	112	23	0	148	0.37
64	483	0	41	262	19	2	324	0.67
1965	998	0	87	287	164	0	538	0.54
66	715	1	725	1,568	22	0	2,316	3.24
67	244	0	56	94	34	0	184	0.75
68	71	0	14	22	3	0	39	0.55
69	160	0	4	58	28	2	92	0.58
1970	735	0	5	258	30	1	294	0.40
71	530	0	178	526	131	1	836	1.58
72	79	0	35	177	43	3	258	3.27
73	39	0	17	25	50	0	92	2.36
74	62	0	23	617	85	0	725	11.69
1975	429	3	1,488	2,296	327	1	4,115	9.59
13	356	0	2,087	2,775	444	3	5,309	14.91
77	202	2	604	1,880	202	5	2,693	13.33
78	82	0	259	1,276	529	0	2,064	25.17
79	1,707	20	3,084	2,322	576	5	6,007	3.52
1980	3,335	1	1,236	5,680	863	2	7,782	2.33
81	1,328	2	1,617	4,910	938	1	7,468	5.62
82	1,186	1	438	1,320	746	2	2,507	2.11
83	1,001	0	666	975	323	1	1,965	1.96
84	1,270	0	532	4,203	719	4	5,458	4.30
1985	1,006	3	516	1,697	486	5	2,707	2.69
86	1,015	6	555	4,374	1,838	15	6,788	6.69
87	687	8	860	3,521	2,392	43	6,824	9.93
88	654	3	492	2,889	2,318	10	5,712	8.73
89	1,713	10	724	2,865	974		4,573 ^b	2.67
1990	749	1	375	3,002			3,378 ^b	4.51
91	2,482	7	2,013				2,020 ^b	0.81
92	2,195	8					8 ^b	0.00
93	1,413							
94	1,095							
95	1,321							
Total [†]	24,483	63	20,193	50,558	14,601	110	85,525	
Average [†]	680	2	561	1,404	406	3	2,376	4.57
Percent [†]		0	24	59	17	0	100	
10-year (79-88) ave.								4.79

[†] Averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 26. Wood River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	516	0	301	471	36	1	809	1.57
54	571	0	1,237	1,225	67	0	2,529	4.43
1955	1,383	0	2,407	1,235	147	0	3,789	2.74
56	773	0	822	650	0	0	1,472	1.90
57	289	0	157	292	0	0	449	1.55
58	960	1	2,146	463	32	0	2,642	2.75
59	2,209	0	988	757	56	2	1,803	0.82
1960	1,016	6	1,474	1,146	108	0	2,734	2.69
61	461	0	266	1,209	21	1	1,497	3.25
62	874	2	994	459	49	0	1,504	1.72
63	721	0	537	844	46	0	1,427	1.98
64	1,076	1	458	685	74	2	1,220	1.13
1965	675	3	481	1,089	213	1	1,787	2.65
66	1,209	7	1,004	1,034	76	1	2,122	1.76
67	516	3	663	344	82	0	1,092	2.12
68	649	1	514	570	23	0	1,108	1.71
69	604	0	61	646	126	0	833	1.38
1970	1,162	2	1,539	1,232	26	0	2,799	2.41
71	851	3	475	774	50	0	1,302	1.53
72	431	4	801	663	46	0	1,514	3.51
73	330	2	213	1,223	48	0	1,486	4.50
74	1,709	3	2,965	2,119	76	0	5,163	3.02
1975	1,270	60	1,606	2,383	735	0	4,784	3.77
76	817	3	2,281	3,161	275	0	5,720	7.00
77	562	20	1,028	2,213	28	0	3,289	5.85
78	2,267	0	1,367	1,813	108	0	3,288	1.45
79	1,706	10	2,643	1,514	14	0	4,181	2.45
1980	2,969	0	453	1,050	102	0	1,605	0.54
81	1,233	0	626	1,197	86	0	1,909	1.55
82	976	4	522	886	26	0	1,438	1.47
83	1,361	1	1,945	1,171	77	0	3,194	2.35
84	1,003	0	586	1,374	37	0	1,997	1.99
1985	939	11	1,142	1,449	15	0	2,617	2.79
86	819	9	1,241	2,086	77	0	3,413	4.17
87	1,337	26	1,442	892	102	0	2,462	1.84
88	867	6	1,641	1,541	49	0	3,237	3.73
89	1,186	5	2,316	1,958	40	0	4,319 ^b	3.64
1990	1,069	11	1,123	1,481			2,615 ^b	2.45
91	1,160	12	2,649				2,661 ^b	2.29
92	1,286	11					11 ^b	0.01
93	1,176							
94	1,472							
95	1,482							
Total ¹	37,111	188	39,026	41,860	3,133	8	84,215	
Average ¹	1,031	5	1,084	1,163	87	0	2,339	2.56
Percent ¹		0	46	50	4	0	100	
10-year (79-88) ave.								2.29

¹ Total, averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 27. Igushik River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	100	0	98	20	68	1	187	1.87
54	80	0	175	473	113	1	762	9.53
1955	500	0	454	896	94	0	1,444	2.89
56	400	0	169	534	39	0	742	1.86
57	130	0	2	54	20	0	76	0.58
58	107	0	15	91	28	0	134	1.25
59	644	0	101	248	22	0	371	0.58
1960	495	0	62	355	57	0	474	0.96
61	294	0	34	386	17	0	437	1.49
62	16	0	28	290	9	0	327	20.44
63	92	0	257	225	25	0	507	5.51
64	129	0	163	718	49	0	930	7.21
1965	181	0	371	638	79	0	1,088	6.01
66	206	0	66	390	15	0	471	2.29
67	282	0	59	103	12	0	174	0.62
68	195	0	43	121	12	0	176	0.90
69	512	0	1	432	104	0	537	1.05
1970	371	0	27	211	71	0	309	0.83
71	211	0	48	225	30	0	303	1.44
72	60	0	93	115	21	0	229	3.82
73	60	0	19	676	30	0	725	12.08
74	359	0	449	1,096	29	0	1,574	4.38
1975	241	0	783	2,693	505	0	3,981	16.52
76	186	0	554	1,605	235	0	2,394	12.87
77	96	0	300	1,697	17	0	2,014	20.98
78	536	0	96	414	17	0	527	0.98
79	860	0	423	419	5	0	847	0.98
1980	1,988	0	20	296	56	0	372	0.19
81	591	0	188	787	50	0	1,025	1.73
82	424	0	64	443	12	0	519	1.22
83	180	1	151	361	31	0	544	3.02
84	185	0	41	697	40	1	779	4.21
1985	212	0	522	1,019	86	2	1,629	7.68
86	308	3	253	2,304	46	0	2,606	8.46
87	169	2	177	610	41	0	830	4.91
88	170	0	194	1,111	39	0	1,344	7.91
89	462	0	525	1,186	59		1,770 ^b	3.83
1990	366	1	163	1,595			1,759 ^b	4.81
91	756	0	320				320 ^b	0.42
92	305	0					0 ^b	0.00
93	406							
94	446							
95	473							
Total ¹	11,570	6	6,500	22,753	2,124	5	31,388	
Average ¹	321	0	181	632	59	0	872	4.98
Percent ¹		0	21	72	7	0	100	
10-year (79-88) ave.								4.03

¹ Averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 28. Nushagak River sockeye salmon escapement and return by brood year, Bristol Bay, 1978-95.^a

Brood Year	Escapement	Return by Year					Total	Spawner
		3	4	5	6	7		
1978	664 ^c	0	535	948	6	1	1,490	2.24
79	499 ^c	18	960	876	47	0	1,901	3.81
1980	3,317 ^c	19	530	574	160	0	1,283	0.39
81	1,012 ^c	9	307	1,492	118	0	1,926	1.90
82	601 ^c	35	515	945	68	0	1,563	2.60
83	404 ^c	100	722	680	19	0	1,521	3.76
84	593 ^c	10	277	599	26	0	912	1.54
1985	498 ^c	68	574	679	30	0	1,351	2.71
86	990 ^e	68	969	755	251	0	2,043	2.06
87	388 ^c	145	963	846	113	1	2,068	5.33
88	483 ^c	71	779	1,581	70	0	2,501	5.18
89	512 ^c	69	614	746	21		1,450 ^b	2.83
1990	680 ^c	53	812	371			1,236 ^b	1.82
91	495 ^c	10	326				336 ^b	0.68
92	695 ^c	82					82 ^b	0.12
93	715 ^d							
94	509 ^d							
1995	281 ^d							
Total ¹	9,449	543	7,131	9,975	908	2	18,559	
Average ¹	859	49	648	907	83	0	1,687	2.87
Percent ¹		3	38	54	5	0	100	
10-year (79-88) ave.								2.93

¹ Averages and percentages computed from years with complete returns, 1978-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

^c Escapement derived by addition of Nushagak-Mulchatna aerial survey estimates to Nuyakuk River lower counts.

^d Sonar estimates.

^e Escapement derived by adding Nuyakuk Tower count to a calculated total for the Nushagak-Mulchatna Rivers. Calculation was based on the historic ratio between Nuyakuk River lower counts and Nushagak-Mulchatna aerial survey estimates.

(Sources: 1 and 18)

Appendix Table 29. Togiak River sockeye salmon escapement and return by brood year, Bristol Bay, 1953-95.^a

Brood Year	Escapement	Return by Year					Total	Return Per Spawner
		3	4	5	6	7		
1953	102	0	33	93	16	0	142	1.39
54	77	0	20	157	19	0	196	2.55
1955	112	0	136	199	39	0	374	3.34
56	225	0	118	328	14	0	460	2.04
57	25	2	53	90	37	0	182	7.28
58	72	2	70	174	25	0	271	3.76
59	210	0	142	147	7	0	296	1.41
1960	192	0	194	296	52	0	542	2.82
61	122	1	88	231	20	0	340	2.79
62	62	0	55	107	8	0	170	2.74
63	116	0	44	84	24	0	152	1.31
64	105	0	44	125	6	0	175	1.67
1965	96	0	156	212	37	0	405	4.22
66	104	1	205	424	11	1	642	6.17
67	81	1	24	115	41	0	181	2.23
68	50	0	50	196	16	0	262	5.24
69	117	0	33	167	16	0	216	1.85
1970	203	0	55	282	71	1	409	2.01
71	200	0	110	379	69	0	558	2.79
72	79	1	95	172	36	0	304	3.85
73	107	1	161	460	32	0	654	6.11
74	104	0	274	381	48	1	704	6.77
1975	181	1	203	935	62	0	1,201	6.64
76	189	0	190	700	178	0	1,068	5.65
77	163	0	236	631	17	0	884	5.42
78	306	1	154	500	26	0	681	2.23
79	198	1	271	304	6	0	582	2.94
1980	527	0	49	236	20	0	305	0.58
81	307	2	65	260	17	0	344	1.12
82	289	0	125	269	31	0	425	1.47
83	213	1	288	935	23	0	1,247	5.85
84	151	0	35	113	21	0	169	1.12
1985	145	0	42	254	79	1	376	2.59
86	203	0	111	544	132	0	787	3.88
87	278	0	206	601	88	0	895	3.22
88	305	1	119	442	57	0	619	2.03
89	104	0	168	336	42	0	546 ^b	5.25
1990	189	1	126	525			652 ^b	3.45
91	278	4	190				194 ^b	0.70
92	216	1					1 ^b	0.00
93	193							
94	174							
95	211							
Total ¹	6,016	16	4,254	11,543	1,401	4	17,218	
Average ¹	167	0	118	321	39	0	478	3.31
Percent ¹		0	25	67	8	0	100	
10-year (79-88) ave.								2.48

¹ Averages and percentages computed from years with complete returns, 1953-88.

^a Includes estimates of False Pass and Japanese high seas catches of Bristol Bay sockeye. All escapements and returns rounded to the nearest thousand fish. Totals not adjusted for interceptions within Bristol Bay or the Alaska Peninsula.

^b Returns incomplete.

(Sources: 1 and 18)

Appendix Table 30. Inshore commercial catch and escapement of chinook in the Nushagak and Togiak Districts, in numbers of fish, Bristol Bay, 1975-95.^a

Year	Nushagak District			Togiak District		
	Catch	Escapement ¹	Total Run	Catch	Escapement ²	Total Run
1975	21,454	70,000	91,454	7,226	11,000	18,226
76	60,684	100,000	160,684	29,744	14,000	43,744
77	85,074	65,000	150,074	35,218	20,000	55,218
78	118,548	130,000	248,548	57,000	40,000	97,000
79	157,321	95,000	252,321	30,022	20,000	50,022
1980	64,958	141,000	205,958	12,543	12,000	24,543
81	193,461	150,000	343,461	23,911	27,000	50,911
82	195,287	147,000	342,287	33,786	17,000	50,786
83	137,123	162,000	299,123	38,497	22,000	60,497
84	61,378	81,000	142,378	22,179	26,000	48,179
1985	67,783	116,000	183,783	37,106	14,000	51,106
86	65,783	43,434	109,217	19,880	8,000 ^b	27,880
87	45,983	84,309	130,292	17,217	11,000	28,217
88	16,648	56,905	73,553	15,606	10,000	25,606
89	17,637	78,302	95,939	11,366	10,540	21,906
1990	14,812	63,955	78,767	11,130	9,107	20,237
91	19,718	104,357	124,075	6,039	12,667	18,706
92	47,563	82,848	130,411	12,640	10,413	23,053
93	62,976	97,812	160,788	10,851	16,035	26,886
94	119,480	95,954	215,434	10,486	19,353	29,839
20-Year Ave.	78,684	98,244	176,927	22,122	16,506	38,628
1975-84 Ave.	109,529	114,100	223,629	29,013	20,900	49,913
1985-94 Ave.	47,838	82,388	130,226	15,232	12,112	27,344
1995	80,180 ^c	85,622	165,802	11,929 ^c	16,438	28,367

¹ Escapements were estimated from the following:

1975-81 - comprehensive aerial surveys.

1982-85 - correlation between index counts and total escapement estimates when aerial surveys were complete.

1986-95 - sonar estimate.

Estimates for 1974-85 are rounded to the nearest thousand fish.

² Escapement estimates based on comprehensive aerial surveys. Estimates for 1974-88 are rounded to the nearest thousand fish.

^a Escapement estimates supersede those previously reported.

^b Minimal estimate based on incomplete data.

^c Preliminary.

(Sources: 1, 5 and 13)

Appendix Table 31. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, Bristol Bay, 1975-95.^a

Year	Nushagak District			Togiak District		
	Catch	Escapement ¹	Total Run	Catch	Escapement ²	Total Run
1975	152,891	80,000	232,891	87,058	114,000	201,058
76	801,064	500,000	1,301,064	153,559	392,000	545,559
77	899,701	609,000	1,508,701	270,649	496,000	766,649
78	651,743	293,000	944,743	274,967	396,000	670,967
79	440,279	166,000	606,279	219,942	293,000	512,942
1980	681,930	969,000	1,650,930	299,682	415,000	714,682
81	795,143	177,000	972,143	229,886	331,000	560,886
82	434,817	256,000	690,817	151,000	86,000	237,000
83	725,060	164,000	889,060	322,691	165,000	487,691
84	850,114	362,000	1,212,114	336,660	204,000	540,660
1985	396,740	288,000	684,740	203,302	212,000	415,302
86	488,375	168,275	656,650	270,057	330,000	600,057
87	416,476	147,433	563,909	419,425	361,000	780,425
88	371,196	186,418	557,614	470,132	412,000	882,132
89	523,903	377,512	901,415	203,178	143,890	347,068
1990	378,223	329,793	708,016	102,861	67,460	170,321
91	463,780	287,280	751,060	246,589	149,210	395,799
92	398,691	302,678	615,712	176,123	120,000	296,123
93	505,799	217,230	632,109	144,869	98,470	243,339
94	328,267	378,928	707,195	232,559	229,470	462,029
20-Year Ave.	535,210	312,977	839,358	240,759	250,775	491,534
1975-84 Ave.	643,274	357,600	1,000,874	234,609	289,200	523,809
1985-94 Ave.	427,145	268,355	677,842	246,910	212,350	459,260
1995	363,370 ^b	212,612	575,982	223,329 ^b	163,040	386,369

¹ Escapements were estimated from the following:

1975-78 - aerial survey data;

1979-95 - adjusted sonar estimate from Portage Creek site.

Estimates for 1975-85 are rounded to the nearest thousand fish.

² Escapement estimates based on aerial surveys; however, surveys were not conducted in 1986 due to budget constraints. Estimate based on catch/escapement proportion using most recent 10-year average data. Estimates for 1974-88 rounded to the nearest thousand fish.

^a Escapement estimates supersede those previously reported.

^b Preliminary.

(Sources: 1, 5 and 13)

Appendix Table 32. Escapement and inshore return of chinook salmon by brood year, in the Nushagak District, Bristol Bay, 1959-95.^a

Brood Year	Escapement ²	Returns By Year ¹					Total Return ³	Return Per Spawner
		1.1	1.2	1.3	1.4	1.5		
1959						1,833		
1960					48,853	8,115		
61				33,756	70,559	13,746		
62			16,739	43,677	76,254	6,977		
63			35,681	48,497	65,179	3,309	158,309	
64			9,269	31,565	33,141	876	80,119	
1965		761	14,242	83,564	83,778	3,481	188,675	
66	40,000 ^b	62	13,979	27,454	38,557	5,044	99,210	2.48
67	65,000 ^c	0	9,795	16,353	46,066	24,552	99,885	1.54
68	70,000	0	13,485	18,291	67,765	8,368	109,661	1.57
69	35,000	0	965	14,524	29,429	2,430	49,038	1.40
1970	50,000	0	1,385	56,699	73,517	4,043	138,688	2.77
71	40,000 ^d	0	2,433	55,755	94,828	12,572	174,720	4.37
72	25,000	0	33,264	52,295	125,392	7,275	229,380	9.18
73	35,000	0	2,204	82,126	105,777	13,089	203,196	5.81
74	70,000	0	23,817	42,053	51,264	2,174	124,992	1.79
1975	70,000	587	95,530	146,534	137,063	9,963	400,440	5.72
76	100,000	1,576	7,628	111,415	143,981	6,052	281,479	2.81
77	65,000	0	96,260	152,290	208,444	14,837	475,536	7.32
78	130,000	1,738	27,569	46,773	56,434	22,029	155,082	1.19
79	95,000	3,137	49,377	70,843	87,467	11,862	223,375	2.35
1980	141,000	205	11,241	48,427	56,050	3,045	119,407	0.85
81	150,000	967	33,684	45,639	83,042	6,617	170,207	1.13
82	147,000	1,494	3,770	35,478	28,479	5,136	74,357	0.51
83	161,730	118	17,639	20,856	49,525	1,454	89,931	0.56
84	80,940	682	20,894	27,879	21,995	1,826	73,465	0.91
1985	115,720	3,270	19,928	37,014	44,987	2,065	107,407	0.93
86	35,200	0	26,874	51,108	45,980	1,926	126,291	3.59
87	78,244	514	36,476	54,908	69,526	5,019	166,619	2.13
88	50,834	688	36,470	62,013	105,738	2,061	207,169	4.08
89	73,147	2,137	40,966	84,843	84,611		212,700	2.91
1990	57,629	593	31,752	34,361				
91	96,449	1,477	53,524					
92	76,512	926						
93	88,687							
94	83,408							
1995	74,702							
Average⁴	80,040	748	26,228	54,566	74,456	7,059	168,124	2.83
Percent		0	16	32	44	4		

¹ Age composition for spawners 1966-1980 and 1986 estimated from commercial harvest age composition. Subsistence harvest age composition from 1966-1981 and 1990 estimated from commercial harvest age composition.

² Spawning escapement for 1968-1970 and 1972-1981 was estimated from comprehensive aerial surveys. Escapements for 1982-1985 were estimated from the correlation between index counts and total escapement when aerial surveys were complete. Spawning escapement for 1986-1995 is sonar estimate less sport and subsistence harvests above the sonar site.

³ Total return estimates include all age classes, not just 1.1, 1.2, 1.3, 1.4 and 1.5.

⁴ Mean spawning escapement and return per spawner includes 1966-1993. Mean total return includes 1963-1986.

^a Estimated inshore return includes spawners and commercial, subsistence and sport harvests.

^b 1966 spawning escapement estimated from expanded tower counts on the Nushagak River.

^c 1967 spawning escapement estimated from a combination of tower counts, minimal aerial surveys, and run strength.

^d 1971 spawning escapement estimated from mean exploitation rate 1960-1970 and 1972-1976.

(Sources: 1, 7, and 13)

Appendix Table 33. Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1958-94.^a

Year	Catch	Escapement						Total	Total Run
		Wood ¹	Igushik ²	Nuyakuk ³	Nush/Mul ⁴	Nushagak ⁵	Snake ⁶		
1958	1,113,794			4,000,000				4,000,000	5,113,794
1960	289,781			146,359				146,359	436,140
62	880,424	25,000	12,000	493,914	6,100		6,000	543,014	1,423,438
64	1,497,817	1,560	450	883,500	25,000		50	910,560	2,408,377
66	2,337,066			1,442,424				1,442,424	3,779,490
68	1,705,150			2,161,116				2,161,116	3,866,266
1970	417,834			152,580				152,580	570,414
72	67,953			58,536				58,536	126,489
74	413,613	44,800	7,500	529,216	3,100		900	585,516	999,129
76	739,590	21,986	5,070	794,478	41,800		100	863,434	1,603,024
78	4,348,336	205,000	16,210	8,390,184	771,600		3,483	9,386,477	13,734,813
1980	2,202,545	31,150	3,500	2,626,746	123,000		800	2,785,196	4,987,741
82	1,339,272	36,100	8,430	1,592,096	19,130		900	1,656,656	2,995,928
84	3,127,153	81,400	6,190	2,760,312	73,050		5,500	2,926,452	6,053,605
86	267,117					72,189		72,189	339,306
88	243,890					494,610		494,610	738,500
1990	54,127					801,430		801,430	855,557
92	190,102					^b			
94	7,337					191,772		191,772	199,109
Average ⁷	1,118,047	55,875	7,419	1,859,390	132,848	390,000	2,217	1,621,018	2,790,618

¹ Aerial survey estimate 1962 and 1974-84; tower count 1964.

² Aerial survey estimate 1962-80; aerial survey estimates and tower count 1976 and 1982-84.

³ Tower count 1960-84; aerial survey estimate 1958, and below counting tower 1962-64 and 1982-84.

⁴ Aerial survey estimate.

⁵ Sonar estimate from Portage Creek.

⁶ Aerial survey estimate 1962-64, 1974-76 and 1980-84, and weir count 1978.

⁷ Only years and systems with escapement data were included in averages.

^a Includes even-years only.

^b No escapement estimate. Sonar project terminated early due to budget constraints.

(Sources: 1, 5, 13, and 19)

Appendix Table 34. Inshore commercial catch and escapement of coho salmon in the Nushagak and Togiak Districts, in numbers of fish, Bristol Bay, 1980-95.^a

Year	Nushagak District			Togiak District		
	Catch	Escapement ¹	Total Run	Catch	Escapement	Total Run
1980	147,726	232,000	379,726	151,000	96,000 ^b	247,000
81	220,290	^c		29,207	61,000 ^d	90,207
82	349,669	234,000	583,669	133,765	81,000 ^b	214,765
83	81,338	51,000	132,338	5,711		
84	260,310	171,000	431,310	176,053	104,000 ^e	280,053
1985	20,230	89,500	109,730	38,636	61,300 ^f	99,936
86	68,568	42,772	111,340	48,306	30,200 ^b	78,506
87	13,263	20,220	33,483	1,292	64,900 ^g	66,192
88	52,698	131,101	183,799	18,468	86,330 ^h	104,798
89	77,077	84,707	161,784	56,972	ⁱ	
1990	7,733	162,853 ^j	170,586	2,690	67,449 ^h	70,139
91	5,574	39,595 ^c	45,169	4,531	38,160 ^b	42,691
92	84,077			5,328	118,020 ^b	123,348
93	14,345	42,742	57,087	12,615	ⁱ	
94	5,615	82,019	87,634	96,062	ⁱ	
Average	93,901	106,424	191,358	52,042	73,487	128,876
1995	4,896 ^k	46,340	51,236	8,917 ^k	ⁱ	

- ¹ Sonar enumeration has not always covered the complete season; in these cases a proportional method was used to estimate escapement after the sonar operation terminated.
- ^a Escapement estimates based on data collected from sonar enumeration and aerial surveys of the spawning grounds; these escapement estimates supersede previously reported escapements.
- ^b Includes Togiak and Kulukak River drainages.
- ^c Sonar enumeration precluded by lack of funding and no estimate of escapement of total run is available.
- ^d Includes Togiak, Kulukak, Ungalikthluk/Kukayachagak and Nunavachak drainages.
- ^e Togiak, Kulukak, Slug, Osviak, and Matogak River drainages.
- ^f Togiak, Kulukak, Quigmy, Matogak, and Osviak River drainages.
- ^g Estimate of Togiak River drainage derived from sonar enumeration (USFWS) in conjunction with aerial surveys of Kulukak, Osviak, Matogak, Quigmy, and Ungalikthluk River drainages.
- ^h Togiak, Kulukak, Slug, Osviak, Matogak, Quigmy, Negukthlik, and Ungalikthluk.
- ⁱ No escapement estimate available due to adverse weather and water conditions, and no estimate of escapement or total run is available.
- ^j Special funding allowed the sonar project to operate until 9/12/90.
- ^k Catches are preliminary.

(Sources: 1, 5 and 13)

Appendix Table 35. Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1975-1995.^a

Year	Sockeye	Chinook	Chum	Pink	Coho
1975	5.5	17.7	6.3		8.6
76	6.1	58.9	6.8	3.4	7.6
77	6.7	22.9	7.4		7.8
78	5.9	23.9	7.2	3.2	7.5
79	5.9	21.3	6.8		7.8
1980	5.6	19.7	6.2	3.4	7.0
81	6.2	19.0	6.7		6.4
82	6.4	19.6	6.7	3.5	7.3
83	5.7	20.9	6.6		6.6
84	5.6	20.5	6.8	3.2	7.5
1985	5.8	17.9	6.8		8.0
86	6.0	18.8	6.7	3.5	6.7
87	6.0	20.5	6.5		7.0
88	6.2	18.7	7.0	3.6	7.8
89	5.6	19.1	6.3		7.4
1990	5.7	16.9	6.3	3.8	7.5
91	5.7	15.9	6.4		7.3
92	5.7	16.8	6.4	3.7	7.0
93	6.0	17.4	6.5		6.8
94	5.5	18.0	6.5	3.7	8.2
20-Year Ave.	5.9	21.2	6.6	3.5	7.4
1975-84 Ave.	6.0	24.4	6.8	3.3	7.4
1985-94 Ave.	5.8	18.0	6.5	3.7	7.4
1995	5.5	19.6	6.5		6.7

^a Prior to 1991 and after 1992, averages are weighted by the number of fish reported by each buyer on Bristol Bay Final Operations Report BB-CF/303. 1991 and 1992 data is preliminary and is extracted from the fish ticket system.

(Sources: 1, 4, and 9)

Appendix Table 36. Average price paid per pound for Bristol Bay salmon, 1978-1995.^a

	Sockeye	Chinook	Chum	Pink	Coho
1978	\$0.68	\$0.70	\$0.38	\$0.33	\$0.62
79	\$1.03	\$1.00	\$0.41	\$0.33	\$1.05
1980	\$0.57	\$1.00	\$0.34	\$0.25	\$0.57
81	\$0.76	\$1.23	\$0.41	\$0.29	\$0.73
82	\$0.70	\$1.23	\$0.35	\$0.22	\$0.71
83	\$0.61	\$0.69	\$0.30	\$0.16	\$0.40
84	\$0.69	\$1.03	\$0.30	\$0.22	\$0.71
1985	\$0.85	\$1.02	\$0.31	\$0.20	\$0.71
86	\$1.42	\$1.03	\$0.31	\$0.15	\$0.68
87	\$1.35	\$1.24	\$0.26		\$0.69
88	\$1.93	\$1.05	\$0.43	\$0.34	\$1.14
89	\$1.07	\$0.80	\$0.26	\$0.17	\$0.67
1990 ^b	\$1.04	\$0.91	\$0.26	\$0.27	\$0.74
91	\$0.70	\$0.68	\$0.22	\$0.11	\$0.58
92	\$1.04	\$0.89	\$0.24	\$0.12	\$0.58
93	\$0.62	\$0.76	\$0.21	\$0.11	\$0.52
94	\$0.70	\$0.47	\$0.22	\$0.04	\$0.45
20-Year Ave.	\$0.93	\$0.93	\$0.31	\$0.21	\$0.68
1975-84 Ave.	\$0.72	\$0.98	\$0.35	\$0.26	\$0.68
1985-94 Ave.	\$1.07	\$0.89	\$0.27	\$0.17	\$0.68
1995	\$0.75	\$0.65	\$0.20	\$0.11	\$0.43

^a Data prior to 1978 is unavailable. Price information for those years is reported in Annual Management Reports separately for company and independent fishermen.

^b Price paid in Nushagak District. Bristol Bay average unavailable.

(Sources: 1, 3, and 8)

Appendix Table 37. Exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1975-95.^a

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1975	\$11,047	\$214	\$615		\$151	\$12,027
76	\$17,139	\$742	\$2,892	\$1,093	\$82	\$21,948
77	\$19,434	\$1,940	\$4,275		\$445	\$26,094
78	\$40,034	\$3,206	\$3,173	\$5,424	\$435	\$52,272
79	\$128,992	\$4,541	\$2,480		\$2,387	\$138,400
1980	\$76,118	\$1,881	\$2,738	\$2,173	\$1,392	\$84,302
81	\$120,907	\$5,557	\$4,106		\$1,461	\$132,031
82	\$68,122	\$6,088	\$2,145	\$1,111	\$3,199	\$80,665
83	\$129,900	\$2,853	\$3,216		\$337	\$136,306
84	\$94,681	\$2,158	\$4,040	\$2,414	\$3,072	\$106,365
1985	\$115,402	\$2,188	\$2,218		\$923	\$120,731
86	\$135,689	\$1,819	\$2,522	\$207	\$826	\$141,063
87	\$130,847	\$1,912	\$2,594		\$314	\$135,667
88	\$168,586	\$891	\$4,418	\$1,171	\$1,792	\$176,858
89	\$173,963	\$609	\$2,029		\$1,186	\$177,787
1990	\$198,897	\$520	\$1,752	\$508	\$582	\$202,259
91	\$103,750	\$328	\$1,807		\$499	\$106,384
92 ^b	\$190,368	\$1,029	\$1,359	\$222	\$767	\$193,745
93 ^b	\$152,034	\$1,131	\$989		\$257	\$154,411
94 ^b	\$138,007	\$1,190	\$1,043	\$15	\$650	\$140,905
20 Year Ave.	\$110,696	\$2,040	\$2,521	\$1,303 ^c	\$1,038	\$117,011
1975-84 Ave.	\$70,637	\$2,918	\$2,968	\$2,443 ^c	\$1,296	\$79,041
1985-94 Ave.	\$150,754	\$1,162	\$2,073	\$354 ^c	\$780	\$154,981
1995	\$183,262	\$1,272	\$1,240		\$129	\$185,903

^a Value paid to fishermen. Derived from price per fish or pound times commercial catch.

^b Preliminary.

^c Includes even-years only.

(Sources: 1, 5, 8, and 9)

Appendix Table 38. South Unimak and Shumigan Island sockeye and chum salmon preseason and actual commercial catch, in thousands of fish, Alaska Peninsula, 1975-95.^a

Year	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
	Actual	Quota ¹	Chum	Actual	Quota ¹	Chum	Actual	Quota ¹	Chum
1975	190	165	65	49	50	36	239	215	101
76	235	350	327	72	75	74	307	425	401
77	193	195	93	46	42	22	239	237	115
78	419	428	105	68	94	18	487	522	123
79	683	900	64	179	200	41	862	1,100	105
1980	2,731	2,513	457	572	555	71	3,303	3,068	528
81	1,474	1,442	521	351	318	54	1,825	1,760	575
82	1,670	1,850	934	451	408	160	2,121	2,258	1,094
83	1,545	1,469	615	416	324	169	1,961	1,793	784
84	1,131	1,111	228	257	245	109	1,388	1,356	337
1985	1,495	1,380	345	367	305	134	1,862	1,685	479
86	314	907	252	156	200	99	470	1,107	351
87	652	635	406	141	140	37	793	775	443
88	474	1,263	465	282	279	62	756	1,542	527
89	1,348	1,199	408	397	264	48	1,745	1,463	456
1990	1,091	1,087	455	256	240	64	1,347	1,327	519
91	1,216	1,573	669	333	347	102	1,549	1,920	771
92	2,047	1,959	324	410	432	102	2,457	2,391	426
93	2,365	2,375	382	607	524	150	2,972	2,899	532
94	1,001	2,938	374	460	648	208	1,461	3,586	582
20-yr Ave.	1,114	1,287	374	294	285	88	1,407	1,571	462
75-84 Ave.	1,027	1,042	341	246	231	75	1,273	1,273	416
85-94 Ave.	1,200	1,532	408	341	338	101	1,541	1,870	509
1995	1,451	2,987	342	653	659	195	2,105	3,646	537

^a South Unimak includes statistical area 284 in June and July, while Shumigan Islands includes statistical area 282 in June only.

¹ The sockeye quota management system was initiated in 1974, and is based on the final Bristol Bay projected inshore harvest and traditional harvest patterns.

{Source: 11}

Appendix Table 39. Subsistence salmon harvest by district and species, Bristol Bay, 1975-95. ^{a b}

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK KVICHAK DISTRICT							
1975	301	122,600	700	300		200	123,800
76	346	82,200	900	900	1,500	600	86,100
77	352	81,400	1,300	600	100	300	83,700
78	392	93,000	1,200	1,000	1,400	300	96,900
79	424	75,000	1,200	600		1,200	78,000
1980	759	88,200	1,500	1,200	2,100	800	93,800
81	649	85,100	1,000	400	100	1,100	87,700
82	350	71,400	1,100	600	900	1,000	75,000
83	385	107,900	1,000	400	300	900	110,500
84	382	115,200	900	600	1,300	600	118,600
1985	544	107,543	1,179	540	27	1,103	110,392
86	412	77,283	1,295	695	2,007	650	81,930
87	407	86,706	1,289	756	490	1,106	90,347
88	391	88,145	1,057	588	917	813	91,520
89	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
91	518	97,101	1,152	1,105	191	1,056	100,605
92	571	94,304	1,444	2,721	1,601	1,152	101,222
93	560	101,555	2,080	2,476	762	2,025	108,896
94	555	87,662	1,843	503	460	1,807	92,275
20 Year Average	459	92,086	1,205	877	1,322	968	95,909
1975-1984 Average	434	92,200	1,080	660	1,440	700	95,410
1985-1994 Average	484	91,973	1,329	1,094	1,203	1,237	96,409
1995	533	75,644	1,431	1,159	383	1,791	80,407
EGEGIK DISTRICT							
1975	3	200					200
76 ^a	2						
77	20	100		100		200	400
78	13	200		100		200	500
79	8	300				100	400
1980	3	100					100
81 ^a	4						
82	19	2,400					2,400
83	14	700					700
84	24	500		100		300	900
1985	23	582	14	21	1	203	821
86	41	1,052	69	58	21	319	1,519
87	49	3,350	87	139	2	284	3,862
88	52	1,405	97	87	54	333	1,976
89	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
91	70	4,549	82	141	32	430	5,234
92	80	3,322	124	270	51	729	4,496
93	69	3,633	128	148	15	905	4,829
94	59	3,208	166	84	153	857	4,468
20 Year Average	33	1,575	87	105	64	400	2,031
1975-1984 Average	11	563		100		200	700
1985-1994 Average	55	2,384	87	107	64	481	3,095
1995	60	2,818	86	192	100	690	3,886

Appendix Table 39. (page 2 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
UGASHIK DISTRICT							
1975	1	700				1,200	1,900
76	21	1,200	100	100	100	300	1,800
77	19	1,000	100	300		500	1,900
78	8	500	100	100		900	1,600
79	8	200				100	300
1980	10	200				200	400
81	12	600				200	800
82	11	400				300	700
83	8	500				100	600
84	8	500				200	700
1985	9	233	17	7		143	400
86	27	1,080	83	48	21	335	1,567
87	22	892	104	51	29	272	1,348
88	23	1,400	84	55	35	330	1,904
89	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
91	38	1,403	121	168	42	614	2,348
92	37	2,348	106	79	8	397	2,938
93	39	1,766	86	107	24	495	2,478
94	31	1,587	126	42	38	579	2,372
20 Year Average	20	970	85	95	54 *	383	1,491
1975-1984 Average	11	580	100	167	100 *	400	1,070
1985-1994 Average	29	1,360	81	74	44 *	366	1,912
1995	20	1,513	56	18	6	290	1,883
NUSHAGAK DISTRICT							
1975	340	47,300	7,100	5,600	1,300	4,300	65,600
76	317	34,700	6,900	7,200	2,700	2,100	53,600
77	306	43,300	5,200	7,300	200	4,500	60,500
78	331	33,200	6,600	14,300	11,100	2,500	67,700
79	364	40,200	8,900	6,800	500	5,200	61,600
1980	425	76,800	11,800	11,700	7,600	5,100	113,000
81	395	44,600	11,500	10,200	2,300	8,700	77,300
82	376	34,700	12,100	11,400	7,300	8,900	74,400
83	389	38,400	11,800	9,200	500	5,200	65,100
84	438	43,200	9,800	10,300	6,600	8,100	78,000
1985	406	38,000	7,900	4,000	600	6,100	56,600
86	424	49,000	12,600	10,000	5,400	9,400	86,400
87	474	40,900	12,200	6,000	200	6,200	65,500
88	441	31,086	10,079	8,234	6,316	5,223	60,938
89	432	34,535	8,122	5,704	407	8,679	57,447
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
91	528	33,161	13,627	4,688	292	10,784	62,552
92	476	30,640	13,588	7,076	3,519	7,103	61,926
93	500	27,114	17,709	3,257	240	5,038	53,358
94	523	26,501	15,490	5,055	2,042	5,338	54,426
20 Year Average	416	39,017	10,771	7,791	5,576 *	6,219	66,913
1974-1984 Average	368	43,640	9,170	9,400	7,060 *	5,460	71,680
1985-1994 Average	465	34,394	12,372	6,182	4,092 *	6,978	62,147
1995	484	22,793	13,701	2,786	188	3,905	43,373

Appendix Table 39. (page 3 of 3)

	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
TOGIAC DISTRICT							
1975	41	4,600	800	1,600		2,800	9,800
76	30	2,800	500	900	100	500	4,800
77	41	2,100	400	800		1,100	4,400
78	29	900	300	700	300	500	2,700
79	25	800	200	300		700	2,000
1980	46	3,600	900	300	300	1,200	6,300
81	52	1,900	400	800	100	2,200	5,400
82	50	1,900	400	300	400	1,300	4,300
83	38	1,900	700	900	200	800	4,500
84	41	3,600	600	1,700	500	3,800	10,200
1985	51	3,400	600	1,000	100	1,500	6,600
86	29	2,400	700	800	100	500	4,500
87	46	3,600	700	1,000		1,600	6,900
88	29	2,413	429	716	45	792	4,395
89	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
91	43	3,517	470	553	27	1,238	5,805
92	40	3,716	1,361	626	135	1,231	7,069
93	38	2,139	784	571	8	743	4,245
94	25	1,777	904	398	77	910	4,066
20 Year Average	39	2,679	609	782	202 ^c	1,275	5,473
1975-1984 Average	39	2,410	520	830	320 ^c	1,490	5,440
1985-1994 Average	38	2,948	698	734	83 ^c	1,060	5,506
1995	22	1,318	448	425	0	703	2,894
TOTAL BRISTOL BAY							
1975	686	175,400	8,600	7,500	1,300	8,500	201,300
76	716	120,900	8,400	9,100	4,400	3,500	146,300
77	738	127,900	7,000	9,100	300	6,600	150,900
78	773	127,600	8,100	16,200	12,700	4,400	169,000
79	829	116,500	10,300	7,700	500	7,300	142,300
1980	1,243	168,600	14,100	13,100	10,000	7,300	213,100
81	1,112	132,100	13,000	11,500	2,600	12,200	171,400
82	806	110,800	13,700	12,400	8,600	11,500	157,000
83	834	149,400	13,500	10,500	900	7,100	181,400
84	893	163,000	11,300	12,700	8,400	13,000	208,400
1985	1,033	149,758	9,710	5,568	728	9,049	174,813
86	933	130,815	14,747	11,601	7,549	11,204	175,916
87	998	135,493	14,356	7,895	689	9,453	167,886
88	936	124,449	11,746	9,680	7,367	7,491	160,733
89	955	127,408	9,725	7,356	799	12,210	157,498
1990	1,042	131,701	13,976	9,683	4,434	8,367	168,161
91	1,197	139,731	15,452	6,655	584	14,122	176,544
92	1,204	134,330	16,623	10,772	5,314	10,612	177,651
93	1,206	136,207	20,787	6,559	1,049	9,206	173,808
94	1,193	120,735	18,529	6,082	2,770	9,491	157,607
20 Year Average	966	136,141	12,683	9,583	7,153 ^c	9,130	171,586
1975-1984 Average	863	139,220	10,800	10,980	8,820 ^c	8,140	174,110
1985-1994 Average	1,070	133,063	14,565	8,185	5,487 ^c	10,121	169,062
1995	1,119	104,086	15,722	4,580	677	7,378	132,443

^a Harvests are extrapolated for all permits issued, based on those returned. Harvests prior to 1985 are rounded to the nearest hundred fish.

^b Permit and harvest estimates prior to 1989 are based on the community where the permit was issued; estimates from 1989 to the present are based on the area fished, as first recorded on the permit.

^c Includes even years only.

^d No permits returned.

Source: Bristol Bay Subsistence Permit Data Base, ADF&G.

Appendix Table 40. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1975-95. ^{a b}

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna- Newhalen	Nondalton	Port Alsworth	Other ¹	Total
1975	5,300	6,400	8,300	18,000	26,700	48,700	2,100		115,500
76	5,300	6,800	4,400	17,100	16,300	20,500	5,500		75,900
77	2,600	6,000	5,600	14,300	11,400	27,200	4,900		72,000
78	8,900	8,800	11,200	23,700	11,000	17,300	3,000		83,900
79	4,400	6,600	3,500	16,200	15,900	14,700	4,200		65,500
1980	6,100	8,100	7,400	22,600	11,100	11,300	6,000		72,600
81	6,600	5,400	9,700	16,500	15,400	15,200	6,800		75,600
82	5,400	1,900	8,200	16,600	13,500	11,200	4,500		61,300
83	4,800	3,300	10,400	20,100	23,800	29,400	4,700		96,500
84	8,100	6,300	12,100	24,400	15,900	29,100	4,600		100,500
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500		86,500
86	6,400	1,600	6,700	18,300	17,000	6,600	3,300		59,900
87	5,700	^c	7,300	16,500	27,500	11,800	3,200		72,000
88	3,500	^c	5,500	14,400	29,800	20,700	3,200	^d	77,100
89	5,100	1,200	6,700	13,000	24,700	18,500	2,200	^d	71,400
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	1,400	76,600
91	1,029	1,712	9,739	17,184	29,094	4,163	2,755	1,110	66,786
92	4,374	1,056	6,932	11,477	29,633	13,163	2,954	2,559	72,148
93	4,699	1,397	6,226	18,810	19,067	17,890	3,254	2,780	74,123
94	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,284	64,343
20 Year Average	5,053	3,668	7,907	17,462	19,722	18,743	3,897	1,590	77,010
1975-84 Average	5,750	5,960	8,080	18,950	16,100	22,460	4,630		81,930
1985-94 Average	4,357	1,377	7,734	15,974	23,345	15,026	3,164	1,590	72,090
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	3,441	54,679

^a Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates prior to 1991 are rounded to the nearest hundred fish.

^b Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Kvichak District.

^c No permits issued

^d No permits issued. Only residents of the Naknek Kvichak watershed could obtain subsistence permits.

¹ Subsistence harvests by non-watershed residents.

(Source: Bristol Bay Subsistence Permit Data Base, ADF&G)

Appendix Table 41. Subsistence salmon harvest by community, Nushagak District, Bristol Bay, Alaska, 1975-95.^{a b}

Year	Dillingham ¹	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other ²	Total
1975	22,100	7,100	2,300	6,800	19,200	8,100		65,600
76	17,700	8,400	2,000	9,000	11,100	5,400		53,600
77	15,700	8,100	1,500	8,000	20,900	6,300		60,500
78	27,700	3,200	2,700	12,900	14,200	7,000		67,700
79	20,600	7,400	1000	7,200	17,200	8,200		61,600
1980	47,900	8,200	3,500	10,400	22,200	20,800		113,000
81	23,900	6,700	2,900	8,800	23,600	11,400		77,300
82	24,700	2,900	2,400	7,500	22,600	14,300		74,400
83	20,100	5,300	1,900	5,800	18,700	13,300		65,100
84	30,500	4,100	2,600	7,200	16,500	17,100		78,000
1985	22,900	3,600	1,600	7,000	14,500	6,800		56,400
86	31,900	5,500	6,900	7,800	26,400	8,200		86,700
87	33,500	5,900	3,100	6,400	11,400	4,900		65,200
88	29,600 ^d	5,500	2,400	6,100	11,700	5,700	^c	61,000
89	31,800 ^d	5,800	2,000	4,700	9,700	3,800	^c	57,800
1990	28,860 ^d	6,600	2,300	4,900	9,900	8,000	700	61,260
91	34,399 ^d	5,873	3,043	4,532	8,326	5,438	2,163	63,774
92	31,702 ^d	4,317	2,184	5,971	11,325	3,708	2,635	61,842
93	25,315 ^d	3,048	2,593	2,936	12,169	4,180	2,538	52,779
94	30,145 ^d	3,491	2,289	4,343	8,056	4,513	2322	55,159
20 Year Average	27,551	5,551	2,560	6,914	15,484	8,357	1,480	66,936
1975-84 Average	25,090	6,140	2,280	8,360	18,620	11,190		71,680
1985-94 Average	30,012	4,963	2,841	5,468	12,348	5,524	1,480	62,191
1995	24,998 ^d	2,453	1,468	2,046	6,911	2,983	2,406	43,265

^a Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates prior to 1991 are rounded to the nearest hundred fish.

^b Harvest estimates prior to 1990 are based on community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Nushagak District.

^c No permits issued. Only residents of the Nushagak watershed could obtain subsistence permits.

^d Includes permits issued in Clarks Point and Ekwok.

¹ Includes the village of Portage Creek.

² Subsistence harvests by non-watershed residents.

(Source: Bristol Bay Subsistence Permit Data Base, ADF&G)

BRISTOL BAY HERRING FISHERY

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INTRODUCTION

Pacific herring *Clupea harangus pallasii* have been documented throughout Bristol Bay, but the major concentration returns to the Togiak area each spring as the focus of two commercial fisheries (Figure 1). The herring sac roe fishery began in Bristol Bay in 1967, followed by the first fishery for herring spawn on rockweed kelp *Fucus spp.* in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. However, increased interest, favorable market conditions and additional incentives provided by the Fishery Conservation and Management Act of 1976 (the 200-mile limit) resulted in a major expansion of the Togiak herring fishery in 1977. Sac roe harvests since 1978 average over 17,800 tons, worth \$7.7 million annually. Spawn on kelp harvests average just under 400,000 lb. since 1985, worth over \$290,000 to participants each year.

Unlike most herring fisheries in Alaska, the Togiak sac roe fishery is not a limited entry fishery. Gillnets, purse seines and hand purse seines are legal gear. In October of 1989, the Alaska Board of Fisheries reduced the legal size of purse seines to 100 fathoms in length and 16 fathoms in depth. Gillnets were also reduced to a maximum of 100 fathoms in length per permit holder with only one compliment of gear allowed to operate from a single vessel. The amount of gillnet allowed on board a fishing vessel during an open period is limited to 100 fathoms, and the department now has emergency order authority to reduce the length of gillnet fished by a single vessel to 50 fathoms.

The Board of Fisheries adopted several regulations in January, 1995 that addressed purse seine gear and fishing methods. Maximum depth of herring purse seines was re-described from the previous limitation of 16 fathoms. The new regulation permitted no more than 625 meshes in depth, of which 600 may not have a mesh size larger than 1.5 inches. The Board also restricted the amount of purse seine gear carried on board to no more than one unit. The Board worded this regulation to apply to the entire season, not only to open fishing periods. Finally, the Board limited the amount of time that herring could be held in purse seines to 36 hours after the closure of a fishing period. These regulations were adopted to address management concerns over the high efficiency of the purse seine fleet, enforcement problems, and potential waste.

The Board also changed gillnet gear regulations in January. Minimum and maximum mesh size limits were increased to reduce potential harvests of low quality recruit herring and permit the use of larger mesh gillnets.

The spawn on kelp fishery became limited to holders of interim use and permanent permits in 1990. In October 1991, the Board of Fisheries limited the role of non-permit holders in the spawn on kelp fishery to that of assisting with

transporting kelp only after the close of the period. By 1993, the majority of permits became permanent. Spawn on kelp product may be harvested only by hand or hand-operated rakes.

The Bristol Bay Herring Management Plan states that the maximum exploitation of the Bristol Bay herring stock is 20%. Before opening the sac roe fishery, 1,500 tons must be set aside for the spawn on kelp fishery, and 7% of the remaining available harvest is allocated to the Dutch Harbor food and bait fishery¹. After the spawn on kelp and the Dutch Harbor food and bait harvests have been subtracted, the remaining harvestable surplus is allocated to the Togiak sac roe fishery: 25% to the gillnet fleet, and 75% to the purse seine fleet.

Capelin *Mallotus villosus*, like herring, return to coastal waters near Togiak to spawn each spring. Commercial harvests of capelin, documented as early as the 1960's, have been small and sporadic. The largest harvest was taken in 1984 and the most recent harvest occurred in 1994.

STOCK ASSESSMENT

Methods

Aerial surveys are conducted throughout the herring spawning season to determine relative abundance, timing and distribution of Pacific herring in the Togiak District. Location and extent of milt, number of fishing vessels, and visibility factors affecting survey quality are also recorded.

Data collection methods are similar to those used since 1978. Standard conversion factors of 1.52 tons (water depths of 16 ft or less), 2.58 tons (water depths between 16 and 26 ft) and 2.83 tons (water depths greater than 26 ft) per 538 ft² of surface area are used to convert observed herring school surface areas to biomass (Lebida and Whitmore 1985).

Herring from commercial harvests are sampled to determine age, size and sexual maturity of herring in the spawning biomass and catch. Volunteer fishermen, in cooperation with the department, provide test fish catch samples to industry roe technicians for roe quality evaluation. Samples from volunteer test fish catches are also collected by the department for age, size and sex analysis. Test fish data is used in post-season analysis to estimate total spawning biomass.

¹ A food and bait fishery occurs in July near Dutch Harbor on herring that, for management purposes, are considered part of the Togiak stock.

Capelin abundance is not estimated. Surface area of observed capelin schools is estimated, but surface area to biomass conversions have not been developed for this species, and surveys are usually terminated early in the capelin spawning run.

Spawning Population

Spawning biomass of herring in the Togiak District averages (1978-94) over 133,000 tons, based on aerial survey estimates adjusted post-season (Appendix Table 2). Annual estimates range from 69,000 tons observed in 1980 to 239,000 tons documented in 1979. Abundance estimated from aerial surveys was high in the late 1970's, declined in the mid 1980's and remained relatively low and stable through 1991. Aerial survey estimates from 1992 through 1994 increased substantially to levels between 150,000 and 200,000 tons; the 1993 biomass estimate was the second largest in the history of the survey program.

Aerial surveys in 1995 began April 20 and continued through May 12 (Table 1). One additional late season survey was conducted May 26. Poor weather and turbid water contributed to poor visibility throughout the season.

Run timing in 1995 was not well documented, but did not appear to be unusually early or late. The first herring (8,700 tons) were observed on May 2 in the eastern portion of Togiak Bay. Surveys prior to May 7 were unable to adequately document biomass because of poor survey conditions. By May 7, biomass appeared to increase; nearly 24,000 tons were visible in Togiak Bay and to the west. Observers documented 105,695 tons May 11 under marginal survey conditions. The May 11 survey estimate was the largest of the season. Approximately 43,000 tons were observed along the Nushagak Peninsula that day, apparently exiting the district.

Aerial surveys were unsuccessful in estimating biomass on the grounds in 1995. Since a harvest of 19,585 tons had accumulated prior to the May 11 survey, a total of 125,280 tons were accounted for in total. However, this estimate provides only a minimum idea of the biomass on the grounds, and does not represent actual biomass.

Spawning activity began May 3, one day after herring were first sighted. Spawning peaked May 10, when 14 linear miles were documented (Appendix Table 5). Over 60 miles of spawn were documented through the last survey on May 12. However, nearly 10 miles of new spawn was observed on the final survey, and spotters reported that spawning continued through at least May 29, 2.5 weeks after the last survey.

Age composition data from the purse seine harvest was used to represent the age composition of the total run during 1995. Age 7 and 8 year classes comprised 54% of the purse seine harvest, by weight (Table 5, Appendix Table 3), as expected in the forecast. Herring age 9 and older continued to represent a significant, but smaller portion of the

biomass than it has in recent years (35% by weight). Herring age 4, 5 and 6 were present in the harvest samples toward the end of the season. They represented 16% of the biomass. However, the significance of these age classes with respect to recruitment can not be estimated, because of the lack of biomass estimates in season.

No capelin were observed during department surveys in 1995. Commercial spotters continued to survey for capelin after department surveys were terminated May 12. Based on company reports, capelin were first observed by commercial spotters May 30. Capelin abundance was reported to be low, similar to reports in other recent years.

COMMERCIAL FISHERY OVERVIEW

Commercial sac roe and spawn on kelp fisheries have been regulated by emergency order since 1981 to achieve exploitation mandates by the Alaska Board of Fisheries and to address problems with wastage. In 1984, the Board of Fisheries adopted the Bristol Bay Herring Management Plan (5 AAC 27.865.). This regulatory management plan set the policies by which these fisheries are managed. Management objectives for the Togiak fisheries include providing for an orderly and manageable fishery, ensuring that harvest exploitation does not exceed 20% of the estimated biomass, and maximizing harvest quality.

Sac Roe Fishery

Sac roe harvests from 1978 through 1994 average approximately 17,800 tons annually, and range from 7,700 to 30,300 tons (Appendix Table 1). Industry participation in the fishery peaked between 1979 and 1982, when up to 33 processors registered to purchase herring in Togiak District. The number of companies declined in the mid-1980's and stabilized at an average (1985-94) of 18 companies.

Fishing time and area is regulated in an effort to divide the harvestable surplus using a 75%-25% allocation ratio for purse seine and gillnet vessels. The gillnet fleet is usually larger than the purse seine fleet, averaging (1978-94) 225 and 178 vessels, respectively. Purse seine vessels have generally accounted for 78% of the total harvest each year, with gillnet harvests comprising the remaining 22%.

Harvest roe recoveries average approximately 9.3% for both gear types combined (Appendix Table 2). Historically, purse seine harvests average 9.7% mature roe, while gillnet harvests average 8.5% mature roe. Gillnet harvest roe percentages have increased in recent years and continue to exceed purse seine harvest percentages.

Quality problems have developed in recent years, in response to large harvests and a limited processing ability on the grounds. Herring harvested for sac roe in 1992 and 1994 were held for up to seven days before processing, and sac roe and flesh quality suffered. Large available biomass and fleet sizes have resulted in very high levels of fishing efficiency, specifically in the purse seine fishery. Fishery managers responded by attempting to reduce fleet efficiency by restricting fishing time and area. Volunteer test fisheries were conducted up to three times each day to assess and monitor roe quality prior to opening an area to fishing. Mid-period assessments of roe quality were conducted for the past several years, and used to extend openings when quality was high. In January, the Board of Fisheries also responded to the concern by limiting purse seine depth and addressing enforcement problems.

Spawn on Kelp

The spawn on kelp fishery is managed under the direction of the Togiak District Herring Spawn on Kelp Management Plan (5 AAC 27.834). The plan essentially provides an allocation of 350,000 lb. of product, equivalent to 1,500 tons of herring, to this fishery. The plan also directs the department to rotate harvest areas on a two- to three-year basis and to ensure product quality (Figure 2).

Spawn on kelp harvests average (1985-94) 394,000 lb. and range from 307,000 to 560,000 lb.. Effort since 1985 averaged 338 permit holders. The effect of limited entry can be seen in 1993, when only 173 permit holders landed product. Effort from 1985-93, prior to limited entry, averaged 362 permit holders.

Capelin

Commercial fishing for capelin is open by regulation, not managed by emergency order, and is restricted by few regulations. There is no closed season for capelin. Historically, Togiak District harvests have been small and sporadic. Harvests were documented in only three years prior to 1980, each totaling less than 100 tons. Since 1980, harvests were documented in 1984 (1,321 tons) and 1986 (139 tons), and more recently in 1993 (31 tons) and 1994 (3 tons). Fisheries attempted in other years failed. Sporadic market conditions, processing limitations, and fluctuations in available capelin biomass have all contributed to limited annual harvests.

Market interest for capelin has increased since 1992, in part due to a recent decline of Atlantic capelin stocks. During years when capelin were harvested in Togiak, only 1-2 companies participated. Several companies were interested in purchasing capelin in Togiak in 1993, but only one company participated then and in 1994. Harvests those years were small due to limited fishing success.

1995 SEASON SUMMARY

The 1995 herring run to the Togiak District was projected to reach 149,093 tons. Based on the maximum exploitation of 20% and allocation guidelines in the Bristol Bay Management Plan (5AAC 27.865), the projected harvest by fishery was: purse seine sac roe 19,747 tons, gillnet sac roe 6,582 tons, spawn on kelp 175 tons (350,000 lb.), and Dutch Harbor food and bait 1,982 tons. Guideline harvest levels have been revised in season, based on the peak biomass survey estimate during most recent years. However, poor survey conditions prevented a reasonable biomass estimate in 1995; the herring fisheries were managed based on the preseason forecast.

The strong preseason forecast contributed to the concern for harvest quality in 1995. Based on reports from companies and fishermen, staff expected a larger fishing effort than in the past years as well. However, prior to the season companies reported that processing capacity on the grounds would not be as limited as in recent years. The actual effect of Board action limiting purse seine efficiency was unknown. For the third consecutive year, the department intended to control area in the purse seine fishery to limit individual harvests to a size that could be processed with little loss in quality. To enhance product quality and value, the department intended to manage the 1995 sac roe fisheries to limit the quantity held to an amount that would not exceed three days of production.

Herring Sac Roe Fishery

Offshore water temperatures in April were unusually cold. Earlier, the Bering Sea ice edge had reached latitudes farther south than observed in many years, and remained in south latitudes much longer than usual. NOAA reported unusually warm waters nearshore during late April. On May 1, several vessels reported surface temperatures at 5-6 c near Anchor Point on May 1. These observations supported a very unusual difference between nearshore and offshore water temperatures.

The department began conducting aerial surveys April 20. Herring were first spotted on May 2. Small schools (estimated at 8,700 tons total) were visible in the eastern section of Togiak Bay, and appeared to be entering the bay from the south (Table 1). One of the few vessels on the grounds at that time obtained a sample from those herring. Results showed that those samples contained predominantly immature roe, but mature roe was found in some females - unusual for the first herring.

Processors intending to buy herring product in the Togiak District began to register with the department on May 3, shortly after staff moved to the field office facility at Togiak Fisheries, Inc.. Twentytwo companies registered to buy

herring and capelin products in Togiak District within the next few days: 17 to buy purse seine caught herring and 19 to buy gillnet caught herring (Table 6). Industry had the capacity to freeze 4,350 tons of sac roe herring per day, based on company registration statistics. Registered processing capacity in 1995 was the highest reported in the past five years, and exceeded the level documented in 1994 by over 1,000 tons per day.

Winds blew from the northeast at 25-35 knots for the next week, obscuring inshore waters and preventing any reasonable biomass estimate. The first spawn was observed in Rocky Bay May 3, one day after the first herring were sighted. Herring observed in Togiak Bay that morning appeared to be migrating inshore toward Anchor Point. Few concentrations of biomass were observed in areas other than Togiak Bay prior to May 4. That afternoon, small concentrations were spotted at several other areas between Estes Point and Nunavachak Bay and adjacent to Hagemeister and High Islands. Spawning activity appeared to increase the morning of May 4, when 3.5 miles of spawn were observed on a department survey. However, the amount of visible spawn declined throughout the rest of the day, and no spawn was observed May 5.

Poor weather also hampered test fishing effort and success between May 3 and May 6. Over 45 purse seiners and 12 gillnetters volunteered to participate in test fisheries during this period. However, only 11 purse seine sets were successful. Quality of test fish samples was poor. Most sets contained predominantly immature roe, but high male percents and spawnouts also contributed to the poor quality. Gillnetters attempted to sample several locations during this period but were unsuccessful. Age composition of samples collected during this period was similar to the forecasted age composition. Length frequency analysis documented 54% age 9+ and 46% age 7-8 from samples collected May 4, and age composition of samples collected May 5 appeared to be identical.

Biomass appeared to increase in several areas May 7. Commercial pilots reported herring sightings at Nunavachak and Togiak Bays and west of Tongue Point, again under poor viewing conditions. A department survey was conducted from Nunavachak Bay west to Pyrite Point, including waters near Hagemeister Island. Biomass estimated during the survey was the largest to date; over 23,000 tons were observed. Most of the visible biomass was located east of Tongue Point, but sizable herring concentrations were documented in Togiak Bay and west of Tongue Point. Fishing vessel captains reported sonar sightings of fish offshore in the eastern portion of the district, which were not documented during the department survey.

Although biomass could not be estimated by aerial surveys, in season indicators pointed to a run size similar in magnitude to the forecast. Given the poor visibility, observations from aerial surveys did include a normal distribution of biomass and normal spawn progression, and reports from vessels with sonar confirmed the presence of large concentrations of herring not visible from the air. Age composition of samples collected from the test fisheries were very similar to the forecast. With these indications of healthy run strength, staff decided to manage the fishery based on the forecasted biomass and harvest allocations, unless a reasonable biomass estimate became possible later.

Samples collected May 7 contained noticeably higher mature roe content than samples collected during any prior test fishery. Samples collected in the eastern portion of the district averaged just over 5% mature roe, but quality varied among samples (range 2-8% mature roe). Samples from two sets west of Tongue Point averaged 5.5%, and were similar in quality. Five of nine purse seine test sets were successful. Only one gillnet sample was obtained early on May 7. However, quality of the sample was high, with an average 10.4% mature roe. That sample was obtained near Right Hand Point.

Department staff narrowed the area under consideration for a purse seine fishery to limit the efficiency of the fleet, relative to the increase in biomass. The western portion of the district was chosen for further testing and biomass assessment due to poor quality typically observed in early harvests east of Togiak Bay, variability in samples collected in the eastern portion the morning of May 7, and sonar reports of fish offshore, with untested quality. At 2:00 p.m., department staff requested test fish volunteers for the western portion of the district and advised fishermen and companies that an opening would be considered as early as 6:00 p.m..

Test fishing continued throughout May 7. Gillnet samples were collected from the areas east of Togiak Bay, and purse seiners collected samples from the areas west of Togiak Bay, including areas near Hagemeister Island. Purse seine samples obtained the evening of May 7 remained poor, but samples collected by gillnetters east of Right Hand Point continued to improve. Samples taken from Kulukak Bay, Metervik Bay and the beach from Metervik Bay to Right Hand Point averaged 10% to 12.7% mature roe by evening.

The first opening of the season was announced for herring gillnets based on test fish sample results. The gillnet opening encompassed the area from Kulukak Bay southwest to Right Hand Point, including Metervik Bay. Fishery managers typically limit fishing duration and restrict gear for initial gillnet openings each season to minimize the risk of poor quality. In this way, the harvest is limited, in the event that test fish results do not represent the actual fish quality in the area. The department opened the area for 2.5 hours, and restricted the allowable gear to 50 fathoms. Preliminary harvest estimates from the first totaled approximately 500 tons. Companies reported good harvest quality, with deliveries ranging from 9.5% to 12% mature roe.

Harvest results from the first gillnet opening confirmed the presence of high quality herring in the area, and prompted the second gillnet opening early the following morning. The second gillnet opening was scheduled for 3 hours in the same area, and gear was again restricted to 50 fathoms. Time and gear was limited again due to uncertainty associated with early season harvest quality, and the amount of time that had elapsed (8.5 hours) since the closure of the first fishing period; managers felt that there was enough risk of poor quality in the area to limit the harvest.

Fishery managers intended to assess harvest quality during this period, and evaluate the potential of an extension in fishing time. However, catches were reported as very light, and harvest quality remained unknown. With no information on harvest quality, fishing was left to close as scheduled and volunteer test fishermen were requested to test other areas, where biomass may be more concentrated.

Biomass in the western portion of the district was largely unknown the morning of May 8. Poor weather conditions continued to prohibit a reasonable biomass assessment by aerial survey. Pilots surveying the area reported few observations of herring throughout the morning. Vessels scouting for fish using sonar equipment reported few observations as well. However, thirteen of 17 purse seiners test fishing in the western portion of the district were successful in catching fish for sampling, indicating a potential increase in biomass in the western district.

Quality of samples collected by purse seiners was high near Hagemeister Island, but low along the mainland coast early May 8. Roe in purse seine samples collected along the northern shore of Hagemeister Strait, from Mount Aeolus west to Estes Point was predominantly immature. Test fishermen at Asigyukpak Spit were unsuccessful. Samples from five sets conducted on the northwest shoreline of Hagemeister ranged from 1.5% to 13.9% mature roe, and averaged 8.9% mature. Fishing effort was estimated at 254 purse seiners by aerial survey.

The first purse seine opening was announced based on the test fish results that morning. Fishing was permitted for 30 minutes beginning at 12:30 p.m. May 8. The area opened included all waters southwest of Ioran line 32710, which intersects the coastline near the base of Tongue Point. The waters opened generally included all waters of Hagemeister Strait, along the north shore of Hagemeister Island and the coast from east of Tongue Point west to Cape Newenham. The area opened encompassed waters more extensive than the area containing high quality samples to ease fleet congestion, given the reports of little biomass present. Managers reasoned that although quantity may be low, high quality herring were documented in the area, and an opening would provide the opportunity to harvest some high quality herring. In addition, a fishery at this time would provide information for managers to better assess biomass, fish quality and efficiency of the fleet, given the poor spotting and fishing conditions.

Based on the results of the first purse seine opening, roe quality in the western portion of the district was still poor, and fleet efficiency was very low, given the weather conditions and biomass in the area. Harvest from the purse seine opening totaled only 100 tons. Strong winds and turbid water hampered the efforts of spotters to locate fish and direct successful sets. Most successful sets were reported to contain immature roe. Few fishermen landed fish, and much of the fleet did not fish.

Managers intended to re-assess roe quality in the western portion of the district the afternoon of May 8 with a purse seine test fishery. However, strong winds continued and prohibited testing with purse seines for the remainder of the day. Given the poor success in the first seine opening and the continuing winds, staff concern over the risk of a large

purse seine harvest resulting in poor quality was low. Managers felt that considering a larger area was necessary to provide a reasonable opportunity for harvest under the existing conditions. Since an opening the evening of May 7 was unlikely, the department announced, at 6:30 p.m., that a morning fishery would be considered for all waters west of Right Hand Point. Purse seiners could use the evening to travel to new areas. Volunteer purse seine test vessels were requested to begin a test fishery at 6:30 a.m. to assess roe quality.

Volunteer gillnet test fishermen were requested even before the second gillnet opening ended. Fresh spawn was reported in Mud Bay the morning of May 8, prompting several boats to test that area, and east to Kulukak Bluffs. Two other vessels tested the area between Anchor and Rocky Point, for a total test fish effort of five boats. The two near Anchor Point were unsuccessful in obtaining any samples, but samples collected from the eastern area ranged from 7% to 17% mature roe, and averaged 12.7%. Fishing effort was estimated at 250 gillnetters, based on an aerial survey May 8.

The gillnet fishery was opened for the third time, following the results of the test fishery. The area opened included waters from Mud Bay to Kulukak Bluffs. Loran lines were used as east and west boundaries, and fishing was permitted for 4 hours, beginning at 5:00 p.m.. At this time, no harvest estimate was available for the morning gillnet opening. However, catches were reportedly light and total gillnet harvest was assumed to comprise only a fraction of the maximum allowable harvest. Department staff again intended to obtain mid-period roe quality samples from deliveries, to assess harvest quality. Opening duration was lengthened over previous periods to facilitate harvest sampling.

Accumulative harvest estimates and mid-period roe quality information became available during the third gillnet opening. Gillnet harvest prior to that opening was estimated at 900 tons, confirming that only a small portion of the allowable harvest was taken. Samples collected by industry during the period in progress indicated that quality continued to remain high. Companies reported that sampled deliveries ranged from 5.5% to 16% mature roe. During this period, department staff received comments that quality in small mesh gear was poor, and that immature roe remained present in some catches. Very few spawnouts were reported. This information prompted fishery managers to extend the period in progress for an additional 12 hours, until 9:00 a.m. May 9.

The purse seine test fishery conducted May 9 was plagued by unsuccessful sets, high males counts, spawnouts, and immature fish. Results indicated low volume, poor fleet efficiency and mixed quality. Two high quality sets were obtained in Nunavachak Bay, averaging 10.5%. Managers decided to open the area tested, except the northern portion of Togiak Bay. Fishing was permitted with purse seines in district waters west of Right Hand Point, with that exception. The second purse seine opening began at 11:30 p.m., for 30 minutes. Managers reasoned that some high quality herring were present on the grounds, fleet efficiency was low, and an opening at this time would provide an opportunity to harvest some high quality herring, in the event that fleet efficiency remained low and/or fish quality

remained mixed throughout the remainder of the season. Again, information obtained from this opening would be used in scheduling further openings. Area adjustments in successive openings would rely heavily on the fleets success during this period.

Preliminary estimates from the purse seine opening totaled 1,250 tons. Quality was reported to be good, and the majority of completed sets were pumped. Obviously, fleet efficiency did not pose a major threat to over harvest at this point, under the poor spotting and fishing conditions. Harvest results supported the presence of high quality herring on the grounds. Another purse seine opening was announced for the evening, but duration and start time would be announced following a biomass and visibility assessment in the eastern portion of the district. The opening encompassed district waters, with the exception of upper Togiak and Kulukak Bays, and Ungalikthluk Bay, which remained closed by regulation. The opening began at 6:00 p.m., with 30 minutes notice, and again lasted 30 minutes.

Harvest from the extended gillnet fishery was estimated at 2,900 tons, and roe quality was reported at over 11% mature. Preliminary estimates of total gillnet harvest at this time totaled 4,200 tons. With over 2,000 tons remaining in the allowable gillnet harvest, the department initiated another gillnet test fishery. Vessels were requested to test the area of their choice late in the afternoon May 9. No fishermen volunteered, a gillnet opening was not considered for the evening, and vessels were requested to test the morning of May 10.

Companies reported that fishermen were much more successful in the evening purse seine opening. However, numerous sets were rejected or released due to poor quality. Spotters reported an increase in visible biomass at Anchor Point and Quigmy River, which, based on immature roe present in deliveries from those areas, appeared to be newly arriving fish. At 9:00 p.m., the fleet was advised that purse seiners would be on 1-hour notice beginning at 8:00 a.m. May 10. Staff intended to assess biomass and fleet distribution early in the morning, and schedule a purse seine opening as early as 9:00 a.m..

At 9:00 a.m. May 10, staff announced openings for both purse seine and gillnet fleets. Gillnet test fish results indicated extremely high quality herring present from Mud Bay to Kulukak Bluffs earlier that morning, ranging over 20% mature roe in some samples. Again, managers intended to sample the harvest during the period in progress, and use that information to decide whether to extend fishing time. The gillnet fishery was opened for five hours, beginning at 10:00 a.m.. Purse seines were permitted 30 minutes, beginning at 11:00 a.m.. Fishing area remained the same as the previous opening, but excluded the area opened to gillnets.

Department staff issued the first of two extensions to the gillnet opening in progress at 2:00 p.m.. Roe quality throughout the extended period was reported to remain very high. Catch rates were assessed so as not to exceed the maximum allowable harvest. The two extensions totaled seven additional hours of fishing time, for a total opening duration of 12 hours.

Over 14 miles of spawn observed during the morning survey was the peak documented.

Catch estimates for the morning purse seine opening became available during the evening May 10. The preliminary estimate of the harvest from that period totaled over 5,000 tons, and quality during the period was the highest of the season, at over 10% mature roe.

Some companies voiced a concern that harvest on board vessels the afternoon of May 10 was beginning to exceed their ability to process without a loss in quality. By the evening of May 10, total sac roe harvest was estimated at approximately 16,000 tons. The majority of the harvest was landed prior to May 10. Fishery managers assumed that most of the harvest taken prior to May 10 was processed by the evening of May 10, given the reported industry processing capacity. Managers estimated that most companies at this time required roughly two days to process herring currently on board vessels.

The department advised purse seine fishermen to standby at 9:00 p.m. for a potential announcement for another opening. During an evening survey, the fleet was observed to split evenly between the eastern and western areas of the district. Viewing conditions had improved, however, and a sizable concentration of herring was observed onshore, near the Osviak River. A large portion of the fleet in the western district was either positioned near the biomass, or running in its direction. Reacting to the limited processing capacity and potential for a large harvest on these fish, and another concentration near Cape Pierce, managers scheduled the evening opening over the entire district, but limited the duration to ten minutes.

Harvest estimates for the May 10 fisheries became available early May 11. Preliminary estimates for the May 11 gillnet fishery totaled 2,541 tons, and several boats had yet to deliver. Total gillnet harvest was estimated at 6,582 tons, but with additional harvest not yet reported, the maximum allowable harvest for herring gillnets was assumed to have been met. Gillnet fishermen were advised at this time that further fishing time was unlikely. Harvest from the evening purse seine fishery was estimated at 3,200 tons. Including the harvest from the evening opening, total purse seine harvest was estimated at 13,229 tons; over 6,500 tons remained available as potential harvest for that fleet.

The majority of processors polled May 11 reported that two to four days would be required to process herring currently on board tenders and processors. Total harvest, including herring landed May 10, was estimated at nearly 20,000 tons. Half of the total, or 10,000 tons, was landed on May 10. On May 11, purse seine fishermen were advised that no fishing would occur that day due to the current processing load. Later that evening, fishermen were advised that an opening would be considered for the evening tide May 12 if available biomass remains strong. Should conditions deteriorate and available biomass diminish, an opening would be considered earlier, just after noon May 12, on the high slack tide.

Little biomass was visible in the morning May 12, and weather conditions were forecasted to deteriorate. At 10:00 a.m., staff announced that a purse seine opening would begin at 12:30 p.m. in the entire district, but the duration would be announced at 11:45 a.m., following an aerial assessment of visible biomass and fleet size and distribution. Duration was later announced for 20 minutes. Harvest from that opening was small, and spawnouts were observed in sets throughout the district.

Purse seine openings continued throughout the next several days. Two purse seine openings each day became a pattern, dictated by catch reporting logistics and tides. Openings were scheduled when tide currents were at or near slack in most cases. Managers assessed remaining allowable harvest and roe quality potential in determining when to schedule openings. Durations were based on assessments of potential fleet efficiency, made prior to each opening.

Finally, the last purse seine opening was announced at 8:00 a.m. May 15. Fishermen were advised that the opening would begin at 9:30 a.m., and duration of the opening would be announced at 9:00 a.m., pending results of an aerial survey assessment of fleet distribution and available biomass. Conditions during the survey were poor, with wind, rain and low overcast skies; little biomass was visible. At 9:00 a.m., staff announced that fishing would be permitted for 1.5 hours, in an attempt to harvest 1,200 tons remaining as potential harvest. However, cloud cover began to dissipate after 9:00 a.m., when the survey had ended, and by 9:30 a.m., large clear areas had developed. With the high potential for visibility to greatly improve, staff announced, at 9:30, that the duration of the opening just begun would be reduced from 1.5 hours to 1 hour. Fishery managers felt this reduction was necessary to avoid exceeding the maximum allowable harvest.

As stated in 5AAC 27.865 Bristol Bay Herring Management Plan (b) (1), "When circumstances preclude the department from adequately assessing the biomass, the fishery must be managed for an exploitation based on the pre-season projected return. No reasonable in season biomass was possible due to extremely poor visibility in 1995. Typically, the Togiak herring fisheries have been managed for the maximum exploitation allowed (20%). All in season indications pointed to a healthy run; biomass distribution and spawn progression appeared normal from aerial surveys, and the extent of spawn was similar to recent years. Reports from vessels equipped with sonar combined with aerial survey observations confirmed the presence of large concentrations of herring not visible from the air. Also, age composition of samples obtained in test fisheries and harvests was very similar to expected age composition. With no indications of run strength markedly different than forecast, the 1995 herring fisheries were managed for harvest allocations based on a 20% exploitation rate, the pre-season forecast, and guidelines set forth in the Bristol Bay Herring Management Plan.

The 1995 sac roe harvest (both gear types combined) was the second largest in the history of the Togiak fishery, reaching 26,732 tons (Table 3). Purse seine vessels landed a total of 19,737 tons and the gillnet fleet landed 6,996 tons of sac roe herring. Both purse seine and gillnet harvest guidelines were met.

Four gillnet openings occurred, with 3 extensions. Herring gillnets fished a total of 33.5 hours, primarily in the area from Mud Bay to the Kulukak Bluffs. Gear was restricted to 50 fathoms in each opening, due the moderate effort in relatively small areas and the potential for herring waste. Twelve purse seine periods were allowed, for a total of 13 hours and 20 minutes of fishing time. Opening durations for purse seines varied from 10 minutes to 4 hours. Large area restrictions were placed only on the first two periods; the remaining periods occurred essentially district-wide.

The roe quality of the gillnet harvest was the second highest in the history of the fishery, reaching at least 12% for the second consecutive year. Mature roe content in the gillnet harvest increased steadily throughout the openings, and peaked during the final gillnet opening, when it averaged 12.4%. Roe quality in the gillnet fishery again exceeded roe quality in the purse seine harvest. Roe quality in the gillnet harvest averaged 12.0% mature roe, purse seine harvests averaged 10.2%, and, overall, harvest roe quality averaged 10.9%. Purse seine quality fluctuated throughout the season, but, like gillnet, the earliest openings contained the poorest quality. Overall roe quality in 1995 was higher than any previous year.

The use of large mesh (greater than 3 in mesh) gillnets is one of the primary reasons for the increase in quality of gillnet-caught herring since 1993. The use of large mesh gear has increased since the early 1990's, and became most noticeable in 1993. In 1995, all gillnet fishermen participating in the volunteer test fishing activities used nothing less than 3 inch mesh. Roe recoveries since 1993 have averaged 11.5%, over 2% higher than pre-1993 levels.

The peak purse seine effort of 254 vessels in 1995 was comparable to levels observed in recent years. The peak effort of 250 gillnet vessels was typical of historical levels, but considerably larger than gillnet fleet sizes observed in the past three years (Appendix Table 1). Market conditions limiting the gillnet fleet size recently eased.

The purse seine fishery was managed more intensively in 1995, with respect to time. With few exceptions, the department allowed lead times, or time between fishing announcements and the actual openings, of at least one hour in past years. Fishing announcements included all pertinent information related to the opening such as opening time, duration, area, and any special gear restrictions. This season, managers reduced lead times, and in some cases announced opening times and areas, with durations to be announced later. Extending the decision-making period in this manner allowed staff to assess biomass, fish distribution, fleet distribution and visibility much closer in time to the fishery. This approach lead to better assessment of harvest potential before an opening, and improved the department's ability to limit individual harvests and quality problems.

Problems resulting from processing capacity bottlenecks were minimal for the first time since 1991. Mitigating factors included a relatively large processing capacity, new regulations limiting purse seine gear, and more intensive management. Poor visibility during most of the season also reduced the efficiency of the purse seine fleet. Together, these factors contributed to improved harvest quality and value in the 1995 sac roe fishery. No waste was observed.

Spawn on Kelp Fishery

Spawning began May 3 in the Middle Bay area, and by May 10, over 37 linear miles of spawn had been observed throughout the district. Areas with the heaviest deposition of spawn were from Metervik Bay to Right Hand Point (Figure 2). Kelp (*Fucus* sp.) samples were collected by department staff from areas K 2, K 3, K 4, K 8, and K 9, on the evening of May 10, and a public meeting with representatives of the 5 companies registered to buy spawn-on-kelp product and fishermen was scheduled for 9:00 a.m. on May 11. The product from areas K 2 and K 3 was judged by buyers and fishermen to be good quality, and the first spawn-on-kelp opening was announced for 4:30 p.m., May 11 in those two areas (Table 2). Effort counts were conducted by aerial survey; 233 people were observed participating. The opening was 5 hours in duration; and yielded 101 tons of high quality product (Table 4).

Department personnel again collected samples from areas K 2 and K 3 on the evening of May 12. Buyers were consulted and product samples were judged to be good quality. Wind was forecasted to switch from northeasterly to southwesterly by May 14; a factor which could impact product quality. A second 5-hour spawn-on-kelp opening was announced for 6:00 p.m., May 13. High winds kept effort to a minimum; a little over 1 ton of good quality product from 5 deliveries was taken.

With just over 200,000 lbs. of a 350,000 lb. quota taken, department personnel visited areas K2 and K3 and sampled the spawn-on-kelp, checking for grit from silt stirred up by the wind. The product was not silty, and a third opening was announced for 7:00 p.m. on May 14, in the same area previously opened. Another 38 tons of spawn-on-kelp product was harvested in the 4 1/2 hour opening, resulting in a cumulative harvest of 140.8 tons or 281,600 lbs.

The Togiak District Herring Spawn On Kelp Management Plan (5 AAC 27.834) sets the harvest guideline at 350,000 lbs., and specifies a two to three year rotation schedule for kelp harvest areas. Areas K 2 and K 3 had just been opened, K 5 was harvested in 1994, and K 8 in 1993. The management staff was concerned that opening of additional areas during the 1995 season to fulfill the quota would leave only a few kelp areas available for harvest the following year. After contacting the 5 companies buying spawn-on-kelp product, and discussing the situation with them, the decision was made to close the spawn-on-kelp fishery for 1995, rather than open additional areas.

The 1995 spawn-on-kelp fishery consisted of 3 periods (14.5 hours); 188 permit holders made 304 deliveries totalling 281,600 lbs. of product, equivalent to 996.2 tons of herring. All harvest was taken from Areas K-2 and K-3, was 80% of the allowable harvest, and was 22% below the 1978-94 average (Appendix Table 4).

Capelin Fishery

Small schools of capelin were observed by commercial spotters on May 30 in the Nunavachak Bay area.

Harvest by purse seine occurred in Nunavachak Bay on June 1, with less than 1,000 lbs. being taken.

Additional harvest in the same area was taken on June 2 yielding approximately 5 1/2 tons. Spotting efforts and harvest ceased on June 3 with the cumulative harvest of 6 tons. The capelin landed were too small for the roe market (60-65 fish/kg.), and were found to contain high percentage of males.

EXPLOITATION

The Togiak fisheries were managed for a maximum exploitation of 20%, based on the pre-season biomass forecast. Exploitation is based on the forecast and includes total sac roe harvest (26,733 tons), herring biomass equivalent of the spawn on kelp harvest (996 tons), and estimated waste (0 tons) from those fisheries. In addition, the Dutch Harbor food and bait harvest (1,752 tons) is included. Following the 1995 Togiak fisheries, the estimated exploitation on the Togiak biomass was 19.8% (Appendix Table 2).

EX-VESSEL VALUE

The 1995 Togiak fisheries generated a record value to fishermen of \$17.1 million (Appendix Table 6). The commercial value of the sac roe fishery was the highest since the inception of the fishery. The value of the sac roe harvest to fishermen was estimated at \$16.7 million. Ex-vessel values of the gillnet and purse seine harvests were \$4.7 and \$12.0 million. Ex-vessel value of the spawn on kelp fishery was estimated at \$362,000, approximately 45% greater than the 1978-94 average value. These estimates do not include any post-season adjustments to fishermen from processors, and should therefore be treated as minimum estimates.

Initial sac roe prices paid to fishermen were high relative to previous years, reaching \$600/ton for 10% mature roe, with an adjustment of \$60/ton for each percentage point difference above or below 10%. Spawn on kelp sold for up to \$1.50/lb., over double prices paid in recent years, and averaged \$1.25/l. overall.

LITERATURE CITED

Lebida, R.C. and D.C. Whitmore. 1985. Bering Sea Herring Aerial Survey Manual. Alaska Department of Fish and Game, CFMD, Bristol Bay Data Report 85-2, Anchorage.

BRISTOL BAY HERRING FISHERY

Tables 1-6

Table 1. Daily observed estimates (tons) of herring by index area, Togiak District, Bristol Bay, 1995.

Date	Start Time	Survey Rating ^a	Miles of Spawn	Estimated Biomass by Index Area ^b													Daily Total	
				NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CN	HAG	WAL		
04/20	18:00	3.1	0.0		0	0	0	0	0	0					0	0	0	
04/24	09:35	3.1	0.0		0	0	0	0	0	0					0	0	0	
04/28	13:30	3.8	0.0		0	0	0	0	0	0							0	
04/29	10:00	2.0	0.0		0	0	0	0	0	0	0				0	0	0	
05/01	17:30	2.0	0.0		0	0	0	0	0	0	0				0	0	0	
05/02	12:30	2.0	0.0		0	0	0	0	8,664	0					0	0	8,664	
05/03	09:20	3.0	0.5		0	0	0	363	4,958	0	0	0	0		0		5,321	
05/03	19:30	3.0		No tonnage estimate - biomass similar to previous two surveys														
05/04	07:05	3.0	3.5		0	0	0	1,419	815									2,234
05/04	14:15	2.9	1.8		0	0	18	2,553	3,925	83	9	0	0	0	42	131		6,762
05/05	15:50	3.9	0.0				0	23	175	33	2					0	0	232
05/07	12:30	3.1	5.8				31	641	3,841	13,105	4,294	8	0		1,630			23,550
05/07	08:45	4.0	4.0					0	0	0	0	0	0		0			0
05/09	08:30	3.4	7.3		0	0	0	0	0	0	0							0
05/10	07:30	3.3	14.3															
05/11	12:45	2.8	13.5	43,219	25,665	6,960	8,956	1,238	2,038	936	9,852	1,226	738	2,439	2,428			105,695
05/12	06:45	3.0	9.8															
Total			58.5															

^a 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory.

^b Index Areas: NUS - Nushagak Peninsula; KUK - Kulukak; MET - Metervik; NUK - Nunavachak; UGL - Ungalikthluk/Togiak; TOG - Togiak; TNG - Tongue Point; MTG - Matogak; HAG - Hagemeister; OSK - Osviak; PYT - Pyrite Point; CN - Cape Newenham.

Table 2. Emergency order commercial fishing periods for herring sac roe and herring spawn on kelp, Togiak District, Bristol Bay, 1995.

Emergency Order Number	Area ¹	Date and Time	Duration
Herring Sac Roe Gillnet			
DLG-01	Righthand Bay to Kulukak Bluffs ^{2,3}	5/07 10:30 p.m. - 5/08 1:00 a.m.	2.5 hrs
DLG-02	Righthand Bay to Kulukak Bluffs ^{2,3}	5/08 8:30 a.m. - 5/08 11:30 a.m.	3.0 hrs
DLG-04	Mud Bay to Kulukak Bluffs ^{2,3}	5/08 5:00 p.m. - 5/08 9:00 p.m.	4.0 hrs
DLG-05 ⁴	Mud Bay to Kulukak Bluffs ^{2,3}	5/08 9:00 p.m. - 5/09 9:00 a.m.	12.0 hrs
DLG-08	Mud Bay to Kulukak Bluffs ^{2,3}	5/10 10:00 a.m. - 5/10 3:00 p.m.	5.0 hrs
DLG-10 ⁴	Mud Bay to Kulukak Bluffs ^{2,3}	5/10 3:00 p.m. - 5/10 6:00 p.m.	3.0 hrs
DLG-11 ⁴	Mud Bay to Kulukak Bluffs ^{2,3}	5/10 6:00 p.m. - 5/10 10:00 p.m.	4.0 hrs
Herring Sac Roe Purse Seine			
DLG-03	Hagemeisterr Straight from Tongue Pt. To Oosik Spit	5/08 12:30 p.m. - 5/08 1:00 p.m.	30 min
DLG-06	Right Hand Pt. To Cape Newenham	5/09 11:30 a.m. - 5/09 12:00 p.m.	30 min
DLG-07	Togiak District except upper Togiak Bay & Kulukak Bay	5/09 6:00 p.m. - 5/09 6:30 p.m.	30 min
DLG-09	Togiak District except upper Togiak Bay, Kulukak Bay, and from Mud Bay to Kulukak Bluffs	5/10 11:00 a.m. - 5/10 11:30 a.m.	30 min
DLG-12	Togiak District except upper Togiak Bay & Kulukak Bay	5/10 10:15 p.m. - 5/10 10:25 p.m.	10 min
DLG-14	Togiak District except upper Togiak Bay & Kulukak Bay	5/12 12:30 p.m. - 5/12 12:50 p.m.	20 min
DLG-15	Togiak District except upper Togiak Bay & Kulukak Bay	5/12 8:00 p.m. - 5/12 8:30 p.m.	30 min
DLG-16	Togiak District except upper Togiak Bay & Kulukak Bay	5/13 8:30 a.m. - 5/13 10:30 a.m.	2.0 hrs
DLG-18	Togiak District except upper Togiak Bay & Kulukak Bay	5/13 7:30 p.m. - 5/13 10:30 p.m.	3.0 hrs
DLG-19	Togiak District except upper Togiak Bay & Kulukak Bay	5/14 9:00 a.m. - 5/14 1:00 p.m.	4.0 hrs
DLG-21	Togiak District except upper Togiak Bay & Kulukak Bay	5/14 8:30 p.m. - 5/14 8:50 p.m.	20 min
DLG-22	Togiak District except upper Togiak Bay & Kulukak Bay	5/15 9:30 a.m. - 5/15 11:00 a.m.	1.5 hrs
DLG-23 ⁵	Togiak District except upper Togiak Bay & Kulukak Bay	5/15 9:30 a.m. - 5/15 10:30 a.m.	1.0 hr.
Herring Spawn-on-Kelp			
DLG-13	K-2, K-3	5/11 4:30 p.m. - 5/11 9:30 p.m.	5.0 hrs
DLG-17	K-2, K-3	5/13 6:00 p.m. - 5/13 11:00 p.m.	5.0 hrs
DLG-20	K-2, K-3	5/14 7:00 p.m. - 5/14 11:30 p.m.	4.5 hrs

¹ Area descriptions are approximate. Precise boundaries are described in Emergency Orders.

² Metervik Bay opened.

³ Gillnet length reduced to 50 fathoms.

⁴ Period extensions.

⁵ Reduces the duration of the opening in progress.

Table 4. Commercial herring spawn on kelp harvest by date, Togiak District, Bristol Bay, 1995.

Date	Area	Hrs	Permits	Landings	Harvest(st)	Equivalent Herring Biomass(st) ^a
5/11	K-2, K-3	5.0	270	200	101.3	717.0
5/13	K-2, K-3	5.0	5	5	1.2	8.5
5/14	K-2, K-3	4.5	95	99	38.3	270.7
Total		14.0	370	304	140.8	996.2

^a Using a formula adopted by the 1984 Board of Fisheries, herring spawn on kelp harvest is converted to represent herring as follows:

$$\text{Herring Equivalent} = \frac{100 (\text{Harvested Egg Biomass})}{\text{Average Roe Recovery (in percent)}}$$

where;

$$\text{Harvested Egg Biomass} = 0.75 (\text{Spawn-on-kelp biomass})$$

For 1995;

$$\begin{aligned} \text{Herring Equivalent} &= \frac{100(105.6)}{10.6} \\ &= 996.2 \text{ tons} \end{aligned}$$

Herring equivalent is included in the herring harvest to calculate total exploitation.

Table 5. Herring total run and commercial catch by year class, Togiak District, Bristol Bay, 1995.^{a,b}

Year Class	Age	Total Run		Harvest ^c		Escapement	
		(tons)	%	(tons)	%	(tons)	%
1977	18	1,640	1.1%	334	1.2%	1,306	1.1%
78	17	2,087	1.4%	541	2.0%	1,546	1.3%
79	16	4,174	2.8%	1,011	3.8%	3,163	2.6%
1980	15	2,981	2.0%	920	3.4%	2,061	1.7%
81	14	3,875	2.6%	1,084	4.1%	2,791	2.3%
82	13	5,515	3.7%	1,638	6.1%	3,877	3.2%
83	12	9,838	6.6%	2,507	9.4%	7,331	6.0%
84	11	9,838	6.6%	2,403	9.0%	7,435	6.1%
1985	10	3,428	2.3%	903	3.4%	2,525	2.1%
86	9	8,198	5.5%	1,390	5.2%	6,808	5.6%
87	8	44,269	29.7%	6,833	25.6%	37,436	30.6%
88	7	36,071	24.2%	4,883	18.3%	31,188	25.5%
89	6	10,583	7.1%	1,396	5.2%	9,187	7.5%
1990	5	5,515	3.7%	753	2.8%	4,762	3.9%
91	4	1,043	0.7%	136	0.5%	907	0.7%
92	3	0	0.0%	0	0.0%	0	0.0%
93	2	0	0.0%	0	0.0%	0	0.0%
Total		149,054 ^d	100.0%	26,732	100.0%	122,319	100.0%

^a Poor weather conditions prevented estimation of biomass in 1995. Age composition of the purse seine fishery was applied to the forecasted biomass by which the fishery was managed, was used to represent the 1995 total run biomass age composition.

^b Does not include harvest in the Dutch Harbor food and bait fishery.

^c Includes both inshore gillnet and purse seine harvest.

^d Forecasted biomass.

Table 6. Commercial herring sac roe, herring spawn on kelp and capelin processors and buyers operating in Togiak District, Bristol Bay, 1995.^a

Operator/Buyer	Base of Operation	Product Purchased		
		Sac Roe		Spawn-on-Kelp
		Gillnet	Purse Seine	
1. C Fisheries	P/V Clipperton	X	X	
2. Capilano	M/V Sea Warrior	X		
3. Dragnet Fisheries, Inc.	M/V Jackie M	X	X	
4. Highliner Premium Bait	M/V Quicksilver	X		
5. Icicle Seafoods, Inc.	P/B Artic Star	X	X	
6. King Crab, Inc.	M/V Ocean Pride	X	X	
7. Nelbro Packing	M/V Stormy Sea	X	X	
8. New West Fisheries, Inc.	P/V New West	X	X	
9. North Alaska Fisheries	Togiak Plant			X
10. North Coast Sfd. Proc.	P/V Polar Bear	X	X	X
11. Norquest Seafoods, Inc	M/V Pribilof	X	X	
12. Pan Pacific Seafoods	P/V Pacific Producer	X	X	
13. Peter Pan Seafoods Inc.	P/V Blue Wave	X	X	
14. Prime Alaska Seafoods	F/V Rubicon			X
15. Snopac Products, Inc.	P/V Snopac	X	X	
16. Togiak Fisheries, Inc.	Togiak Plant		X	X
17. Trident Seafoods	P/B Neptune	X	X	
18. Unisea, Inc.	P/V Omnisea	X	X	
19. Wards Cove Packing	P/V Omnisea	X		
20. Western Sea Inc.	M/V Western Sea Inc.	X	X	X
21. Woodbine Ak. Fish Co.	M/V Woodbine	X	X	
22. YAK, Inc.	P/B Yard Arm Knot	X	X	

^a Operators that registered in the Togiak Herring District.

BRISTOL BAY HERRING FISHERY

Appendix Tables 1-6

Appendix Table 1. Commercial harvest of herring by gear type and product, Togiak District, Bristol Bay, Alaska, 1978-95.

Year	Number of Processors	Effort		Harvest				Inshore ² Total (tons)
		Units of Gear ¹		Percent by Gear		Product		
		Gill Net	Purse Seine	Gill-net	Purse seine	Sac Roe	Food/Bait	
1978	16	40	25	8	92	100	0	7,734
79	33	350	175	40	60	92	8	11,558
80	27	363	140	16	84	85	15	18,886
81	28	106	83	18	82	99	1	12,542
82	33	200	135	31	69	93	7	21,489
83	23	250	150	19	81	97	3	26,287
84	25	300	196	25	75	98	2	19,300
85	23	302	155	17	83	99	1	25,616
86	23	209	209	21	79	99	1	16,260
87	18	148	111	17	83	98	2	15,204
88	22	300	239	26	74	99	1	14,382
89	19	320	310	24	76	97	3	12,258
90	16	277	221	25	75	99	1	12,253
91	16	170	200	21	79	97	3	15,070
92	18	274	301	19	81	98	2	25,808
93	12	75	140	20	80	100	0	17,925
94	16	146	240	25	75	100	0	30,300
Mean (1978-94)	22	225	178	22	78	97	3	17,816
1985-94 Ave.	18	222	213	22	79	99	1	18,508
1995	22	250	254	26	74	100	0	26,733

¹ Derived from fish tickets in years prior to 1979. From 1979 to present, includes peak aerial survey count.

² Data for some years includes ADF&G harvests and waste.

Appendix Table 2. Estimated total run biomass and inshore commercial herring catch in tons, Togiak District, Bristol Bay, 1978-1995.

Year	Total Run Biomass ¹	Inshore Catch	Roe Recovery (%)			Percent Exploitation ²
			Gillnet	Purse Seine	Mean	
1978	190,292	7,734			8.2	4
79	239,022	11,558			8.6	5
80	68,686	18,886			9.2	35
81	158,650	12,542	6.7	10.1	9.1	8
82	97,902	21,489	7.4	9.5	8.8	22
1983	141,782	26,287	6.9	9.3	8.9	19
84	114,880	19,300	8.4	10.2	9.8	18
85	131,400	25,616	7.4	10.0	9.6	20
86	94,700	16,260	8.8	9.9	9.7	19
87	88,400	15,204	8.6	8.9	8.8	19
1988	134,717	14,382	8.3	10.9	10.3	13
89	98,965	12,258	8.0	8.6	8.4	18
90	88,105	12,253	9.1	9.7	9.6	17
91	83,329	14,970	8.8	10.1	9.9	21
92	156,955	25,808	8.8	9.2	9.2	19
1993	193,847	17,925	10.1	9.6	9.7	12
94	185,454	30,316	12.1	9.5	10.2	19
Average	133,358	17,811	8.5	9.7	9.3	17
1995 ³		26,732	12.0	10.2	10.6	20 ^{2,4}

¹ The total run biomass represents the aerial survey estimate of the inshore herring biomass for each year in the Togiak District, revised post-season.

² The percent exploitation is calculated by dividing the adjusted commercial harvest which includes all commercial landings (Togiak sac roe fishery and Dutch Harbor food and bait fishery), all documented waste, and the equivalent herring harvest of the spawn-on-kelp removal, by the total run biomass.

³ Aerial surveys for 1995 were hampered by poor weather conditions preventing an estimate of total run biomass.

⁴ The 1995 fishery was managed on the forecasted biomass estimate of 149,054 tons because of the inability to estimate abundance. The exploitation rate for the 1995 season was therefore based on the forecasted estimate of biomass.

Appendix Table 3. Age composition of the inshore herring run, Togiak District, Bristol Bay, 1978-1995.

Year	Age Composition (%) ¹							Total Run (tons) ²
	3 ^a	4	5	6	7	8	9+	
1977	4	49	37	3	3	3	1	
78		47	36	11	1	3	2	190,292
79	1	4	48	31	13	1	2	239,022
80	8	5	1	37	35	12	2	68,686
81	1	50	7	1	22	14	5	158,650
1982		16	51	3	1	17	12	97,902
83		5	37	45	2	2	9	141,782
84		2	2	28	42	4	24	114,880
85		1	1	8	35	42	13	131,400
86			1	2	15	44	38	94,770
87				8	10	28	54	88,400
88		2	5	1	13	5	74	134,717
89			5	11	4	15	65	98,965
90				6	11	3	80	88,105 ^b
91		7	1	1	16	18	57	83,329
1992		10	20	1	1	15	53	156,955 ^c
93			6	23	1	1	67	193,847 ^d
94			2	12	28	3	55	185,454 ^d
95		1	4	7	24	30	35	³

¹ Age composition in 1978-92 is weighted by aerial survey data and weight at age; composition for 1977 is not weighted by aerial survey data.

² Includes commercial catch, escapement, and documented waste.

^a Includes age 1, 2 and 3 herring.

^b Contributions of age groups 3,4 and 5 are less than 5% each.

^c Contribution of age 3 herring is less than 0.5%.

^d Contribution of age 4 herring is less than 0.5%.

³ Age contribution of the commercial purse seine harvest was used to represent the total run for the 1995 season. Aerial surveys to determine abundance were hampered by poor weather conditions, preventing calculation of a final season biomass estimate.

Appendix Table 4. Commercial harvest of herring spawn-on-kelp, Togiak District, Bristol Bay, Alaska, 1978-95.

Year	Processors	Permit Holders ¹	Deliveries	Harvest lbs.	Mature Roe % lbs.	Equivalent Herring Biomass ² estimate
1978	11	160	349	329,858	8.2%	1,508
79	16	100	228	414,727	8.6%	1,808
80	21	78	186	189,662	9.2%	773
81	7	108	277	378,207	9.1%	1,559
82	8	214	167	234,924	8.8%	1,001
83	4	125	257	270,866	8.9%	1,141
84	6	330	412	406,587	9.8%	1,556
85	^a				9.6%	
86	3	204	351	374,142	9.7%	1,446
87	5	187	334	307,307	8.8%	1,310
88	10	259	330	489,320	10.3%	1,782
89	11	487	330	559,780	8.4%	2,499
90	7	481 ^b	286	413,844	9.6%	1,617
91	7	532 ^b	248	348,357	9.9%	1,320
92	5	386	267	363,600	9.2%	1,482
93	2	173	313	383,000	9.7%	1,481
94	3	204	212	308,400	10.2%	1,134
1978-94 Average	8	252	284	360,786	9.3%	1,464
1985-94 Average	6	324	297	394,194	9.5%	1,563
1995	5	188	304	281,600	10.6%	996.2

¹ Based on fish tickets, unless specified otherwise.

² Based on the equation specified by the Board of Fisheries in 1984.

^a Fishery not conducted.

^b Estimated via aerial survey during the harvest; includes both limited entry interim use permit holders and crew members.

Appendix Table 5. Aerial observations of herring spawn in the Togiak District, Bristol Bay, 1978- 95.^a

Date	1978		1979		1980		1981		1982		1983		1984		1985		1986		1987	
	No.	Miles																		
24-Apr																			15	2.9
25-Apr																			17	5.2
26-Apr																			15	3.4
27-Apr																			24	4.3
28-Apr																			0	
29-Apr																			0	
30-Apr			2	2.5			9	3.0			0							7	1.7	
1-May	1	0.4					6	2.3			0								0	
2-May			21	8.3	11	4.0	12	1.9			10	3.6								
3-May	1	0.4	14	5.0	8	3.0	12	6.8			30	9.3						21	10.7	
4-May			8	1.3			4	2.9			40	12.5						15	6.3	
5-May			1		0		6	2.5			27	7.5						21	23.9	
6-May							0				8	2.9						9	8.4	
7-May			3	0.6	3	0.9	2	0.4	0		8	1.5						7	3.3	
8-May	2	1.8			3	1.2	3	1.0			8	1.9								
9-May			2	0.4	1	0.2	5	1.4					1+						0	
10-May			0				0		0										2	0.4
11-May	9	7.7			0						3	3.5							6	4.7
12-May	3	1.5	0		0		15	4.8	0		9	5.4								
13-May	12	8.6			0		6	3.8	0		0						2	0.8		
14-May	11	5.6	0		2	2.3	10	4.7	0								29	13.8	1	0.6
15-May					6	4.0	2	1.5	0		2	1.0					53	18.2		
16-May			0		4	1.2	0		1	0.1	4	0.5	1	0.3			34	11.1		
17-May			0						4	0.7	9	2.0	1	0.5			24	11.7		
18-May	11	4.2							29	7.3	19	6.1	24	17.6			3	0.6		
19-May	3	2.5			1	0.3			16	5.2	7	1.7	71	24.6			1	0.6		
20-May					4	0.9			19	14.0	0		8	1.3	3	0.2	3	0.6		
21-May			0						3	2.0			0		8	2.0	11	4.2		
22-May					2	0.5			3	1.5			5	1.2	13	2.3	4	0.5		
23-May							10	2.1	11	3.3	0		3	1.4	48	14.2	4	1.5		
24-May									5	1.4			6	2.2	25	11.7	11	2.6		
25-May	8	4.2							1	0.3	1	0.1	3	1.4	17	5.2				
26-May	2	2.2	1	0.7			3	0.3	0		1	0.1	14	4.1	23	7.3				
27-May					3	0.3			0		2	0.1	8	1.2			0			
28-May	0								0				3	0.1						
29-May					8	1.6			0				2	0.2	0					
30-May	6	1.6							0		0		4	0.5			3	0.3		
31-May					2	0.8			0				12	4.1						
1-Jun									7	2.6	0		3	0.5	4	0.5				
2-Jun	1	0.5							0											
3-Jun							1	0.8	4	0.2	1+									
4-Jun													2	0.2						
5-Jun																				
6-Jun																		0		
7-Jun					6	3.1														
8-Jun																				
Total	70	41.2	52	21.9	64	24.3	106	40.1	103	38.6	189	59.7	171	61.4	141	43.4	182	66.5	160	75.8

Appendix Table 5. (Continued)

Date	1988		1989		1990		1991		1992		1993		1994		1995	
	No.	Miles														
24-Apr											0				0	0
25-Apr											1	0.3	0			
26-Apr											14	5.1				
27-Apr											23	21.3				
28-Apr											16	13.0			0	0
29-Apr									0		11	6.0			0	0
30-Apr											7	4.0	0			
1-May									0		3	2.2			0	0
2-May									0				0		0	0
3-May											1	1.5	0		1	0.5
4-May											0				6	3.5
5-May									0		0		0		0	0
6-May									0		0		0			
7-May					1	0.8			0		0				4	5.8
8-May			4	4.2	11	8.3							0		2	4.0
9-May			11	11.9	63	37.1	3	1.0	0				0		12	7.3
10-May			15	12.9	6	3.3	24	17.8	0				8	3.8	20	14.3
11-May	0		7	10.0	5	1.7	21	24.5					21	21.0	14	13.5
12-May	0		9	3.6	2	1.8	24	20.8					17	23.0	11	9.8
13-May	0		4	3.2	0		5	2.1	0				26	18.8		
14-May	2	1.5			3	4.0	1	0.5					8	5.3		
15-May					1	1.0	1	0.1	0							
16-May	11	3.5	1	0.8			1	0.5	0				0			
17-May	20	22.8							0							
18-May	30	12.9			0		0		0							
19-May	26	9.1			0				5	7.0						
20-May					0		2	0.2	29	19.4						
21-May	3	0.9							55	34.2						
22-May	9	4.1							24	8.5						
23-May	1	3.5							28	14.9						
24-May	5	2.8	18	5.9			5	1.0	9	8.8						
25-May									6	2.5						
26-May									3	1.3						
27-May									1	0.3						
28-May					1	7.0	0									
29-May																
30-May																
31-May					1	0.7	2	0.5								
1-Jun																
2-Jun																
3-Jun																
4-Jun																
5-Jun							1	0.5								
6-Jun																
7-Jun																
8-Jun								0								
Total	107	61.1	69	52.5	94	65.7	90	69.5	160	96.9	95	53.3	80	71.9	70	58.5

^a Survey area covers Nushagak Peninsula to Cape Newenham.

Appendix Table 6. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, Bristol Bay, Alaska, 1978-95.^a

Year	Herring		Spawn-on-Kelp	Total
	Sac Roe	Food/Bait		
1978	2,635	0	120	2,755
79	6,561	180	249	6,990
80	3,055	150	95	3,300
81	3,988	1	250	4,239
82	6,070	105	176	6,351
83	10,450	67	284	10,801
84	7,178	33	203	7,414
85	13,696	41	^b	13,737
86	8,648	12	187	8,847
87	8,614	49	166	8,829
88	14,103	3	346	14,452
89	4,983	19	448	5,450
90	6,494	9	360	6,863
91	6,173	21	383	6,577
92	8,818	26	254	9,098
93	5,218	3	268	5,489
94	9,090	0	212	9,302
Average	7,398	42	250	7,676
1995	16,713	0	362	17,075

^a Exvessel value (value paid to the fisherman) is derived by multiplying price/lb by the commercial harvest.

^b Fishery not conducted.

BRISTOL BAY HERRING FISHERY

Figures

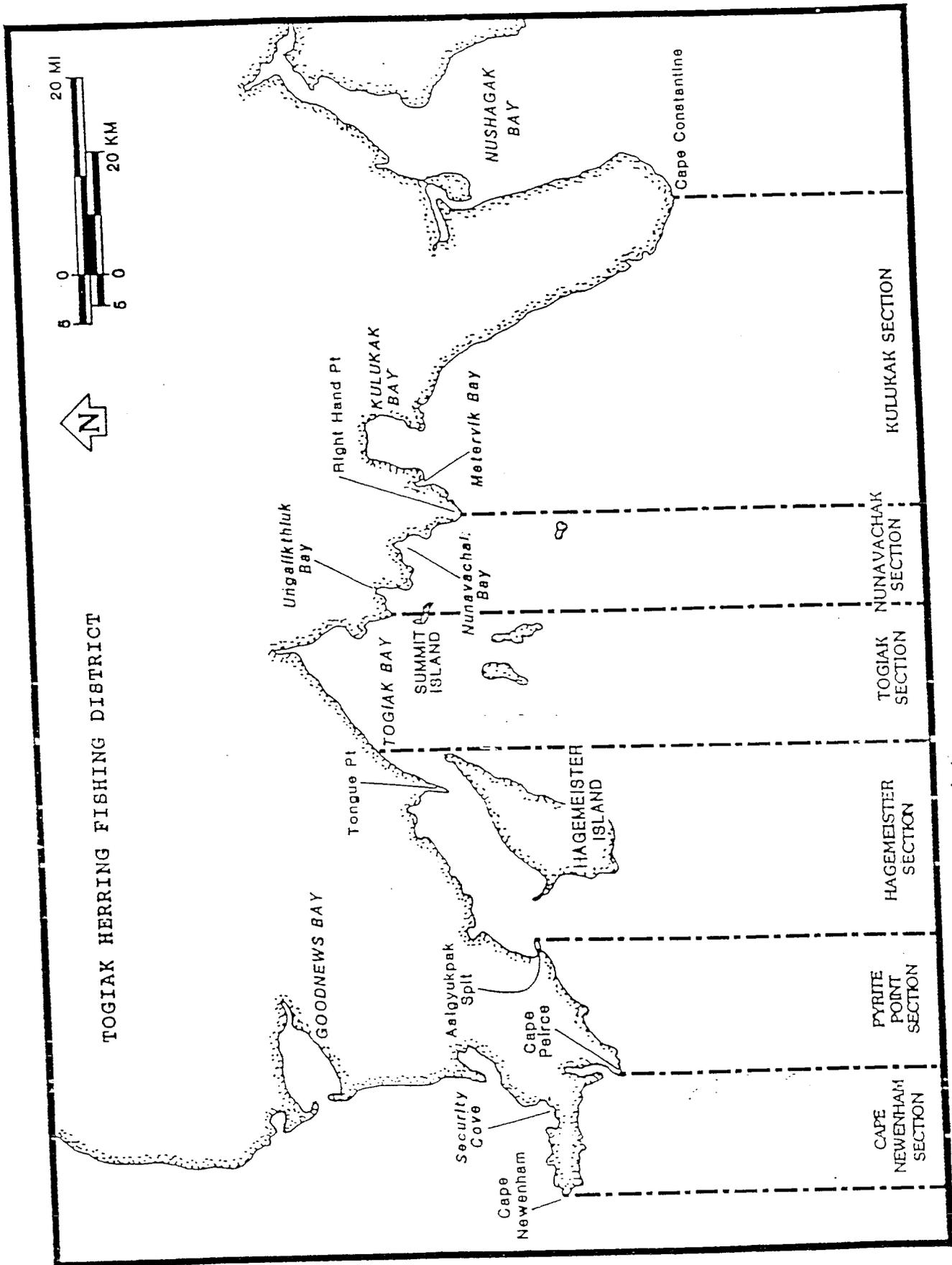


Figure 1. Togiak Herring Fishing District.

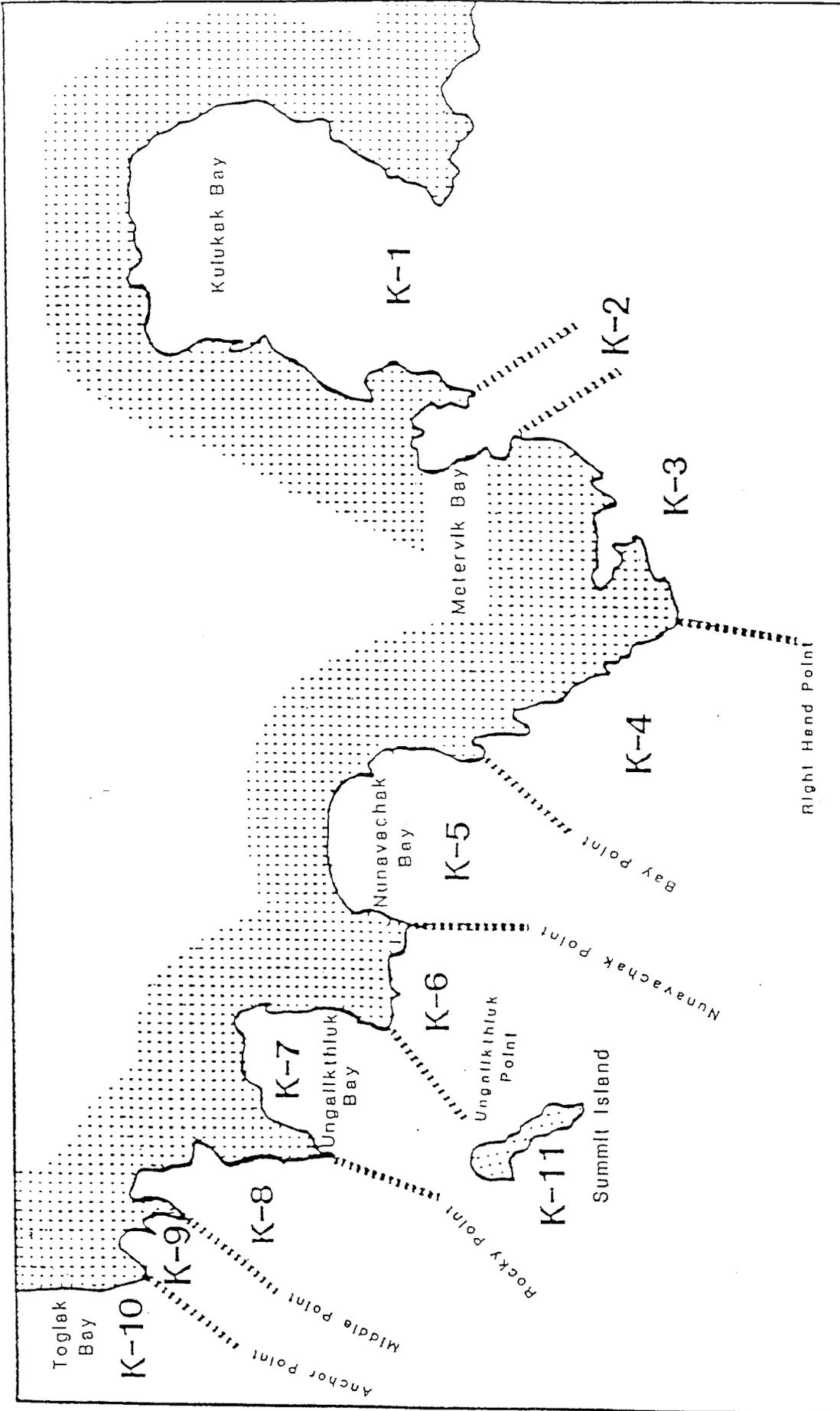


Figure 2. Togiak District Spawn on Kelp Management Areas, Bristol Bay (K-1 through K-11).
BRISTOL BAY TOGIK DISTRICT SPAWN ON KELP MANAGEMENT AREAS (K-1 through K-11)