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DIVISION OF COMMERCIAL FISHERIES MANAGEMENT AND DEVELOPMENT

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-1994-

BRISTOL BAY AREA

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PREFACE

The 1994 Bristol Bay Management Report is the thirty-fifth 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 1994. 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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Management Area Description

The Bristol Bay management area includes all coastal waters and inland drainages 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 runs are important to the fisheries as well.

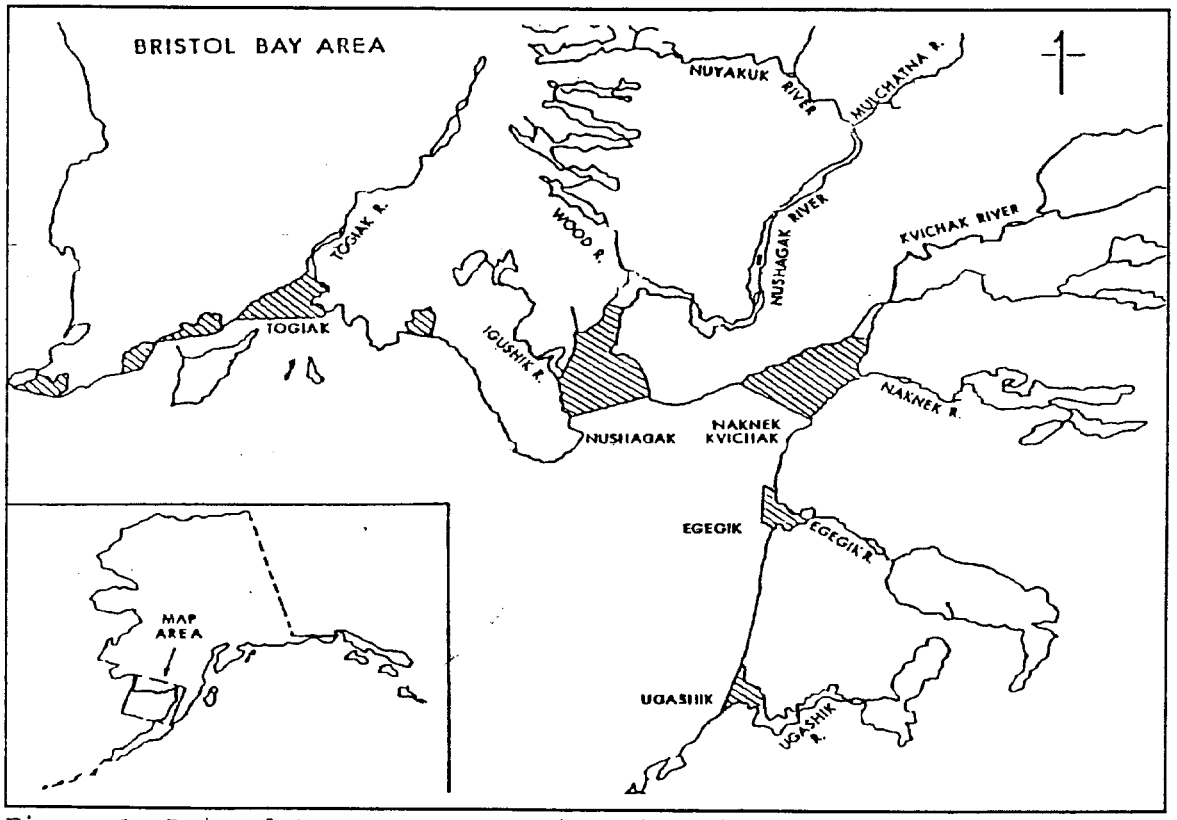

Figure 1. Bristol Bay Area Commercial Fisheries Salmon Management Districts.

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 1,877 drift permits were registered in 1994. Setnet permits registered in 1994 totaled 999 (Appendix Table 3). Annual commercial catches (1974-1993) average 20,231,282 million sockeye salmon, 109,360 chinook, 1,182,306 chum, 196,761 coho, and 1,690,377 (even years only) pink salmon (Appendix Tables 5-9). The value of the annual commercial salmon harvest in Bristol Bay has averaged $152 million since 1984, and sockeye salmon are the most valuable, worth an average $146 million.

Annual subsistence catches average approximately 173,000 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.

1994 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 variances 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 1994 was forecasted to be 52.4 million fish (Table 1). A run of that size would be 36% above the 20-year (1974-93) mean inshore run (33.3 million), and 27% greater than recent 10-year mean inshore run (38.4 million; Appendix Table 20). The inshore sockeye harvest was predicted to reach approximately 39.6 million fish. Runs were expected to exceed spawning escapement goals for all river systems. The projected inshore harvest for sockeye salmon was 35% greater than the previous 10-year mean (25.5 million; Appendix Table 5).

The 1994 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 (1984-93). To further correct this tendency of under forecasting, the 1994 forecasts by river were increased by their respective prediction errors for the years 1984-93. The 1994 adjustments by river resulted in an overall increase of 39.4% 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 for the South Unimak and Shumagin Island fisheries at 6.8% and 1.5%, respectively, of the forecasted inshore harvest for Bristol Bay. In

addition the Board set a maximum allowable catch of chums that could occur during the South Unimak/Shumagin Island 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 3,586,000 (2,938,000 for South Unimak and 648,000 for the Shumagins), based on the 1994 projected harvest in Bristol Bay. Preliminary catch information indicates that the Shumagin Island fishery landed 460,000 sockeye, and the South Unimak fishery landed 1,001,000 sockeye. The total catch for the June fishery of 1,461,000 was just 41% of the total allocation. Due to the low incidental harvest of chum salmon (582,000) in the directed sockeye fishery, the allowable cap of 700,000 was not exceeded. A total of 262 hours of fishing time was allowed during a total of 14 days at South Unimak. The Shumagin fishery was allowed a total of 249 hours of fishing time during 13 days. In summary, even though the amount of fishing time was the greatest allowed in the last ten years of the fishery less than half the allocation was caught. The Bristol Bay sockeye run was below forecast level but by just 7.8%. The sockeye were not available in large numbers to the June South Peninsula fishery. A possible explanation could have been the severe changes in currents and colder inshore water temperatures than normal reported by the fishers fishing in the area.

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 recently operated by staff from the Fisheries Research Institute (FRI), University of Washington. 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 ultimately enjoyed a sockeye harvest of 25.8 million (Appendix Table 5) from a total run of 41.9 million (Appendix Table 20). There have been no further price disputes since 1991.

The value of the combined commercial salmon inshore harvest in 1994 was estimated at $140.4 million to participating fishermen. Less than the record $202.3 million paid during the 1990 season, but considerably better than the $110.3 million paid on average for the years 1974 to 1993. This was the twelfth consecutive year that the exvessel value has exceeded $100 million.

During the 1994 season in Bristol Bay, 8 companies canned, 28 companies froze and 4 companies cured salmon. In addition, 9 companies exported fresh fish by air, and 10 companies shipped salmon out by sea in refrigerated sea water (RSW) or brine (Table 34). A total of 36 processors/buyers reported catches in Bristol Bay 1994 compared with 72, 62, 59, 59, 48, 30, 57, 42, 37, 36, 32 and 33 in the years 1982-1993 (ADF&G 1982-93).

Run and Harvest Performance by Species

The combined commercial salmon harvest in Bristol Bay totaled 36.5 million fish in 1994 . That catch was the third largest in the past 20 years (Appendix Table 10).

Sockeye Salmon

The 1994 inshore sockeye run of 50.5 million fish was approximately 4% less than the preseason forecast (Table 1). Runs to individual districts were: 14% more than the forecast for the Naknek/Kvichak District, 48% less than the forecast for the Egegik District, 2% less than the forecast for the Ugashik District, 9% greater than the forecast for the Nushagak District, and 5% less than the forecast for the Togiak District (Table 1).

Sockeye salmon dominated the inshore commercial harvest, and totaled 35.2 million fish (Table 4). Sockeye escapement goals were met or exceeded in all river systems where spawning requirements have been defined except the Naknek River and the Nushagak-Mulchatna drainage (Table 1).

Chinook Salmon

Chinook catches in 1994 were below the 20 year averages in all districts except in Ugashik and Nushagak (Appendix Table 6). The 1994 bay-wide commercial harvest of 140,000 chinook was the largest reported since 1983.

Chum Salmon

The inshore commercial harvest of 833,000 chum salmon was the fourth smallest since 1974 and well below the 20-year average of 1.2 million (Appendix Table 7). Chum catches in all districts of Bristol Bay were less than average in 1994 (Appendix Table 7).

Pink Salmon

Bristol Bay has a dominant even-year pink run, preseason it was thought that the pink runs would return in strength in 1994. However the commercial harvest of 91,000 pinks Bay wide is the lowest recorded in the last 20 years.

Coho Salmon

The 1994 bay-wide commercial harvest of coho salmon totaled 179,000 fish, which was close to the 20 year average of 197,000 (Appendix Table 9). Coho catches were average in all districts of Bristol Bay, except Nushagak were the total catch was 8% of the 20 year average and Togiak were the catch was twice the 20 year average.

Season Summary By District

Naknek-Kvichak District

The total run of sockeye salmon to the Naknek-Kvichak District was projected at nearly 22.2 million fish (Table 1). Escapement goals were set at 8.0 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. The district harvest forecast totaled nearly 13 million sockeye. The actual run to the district totaled 25.8 million sockeye, and the actual harvest totaled over 16.2 million. The 1994 catch was the third largest in the Naknek-Kvichak District over a twenty year period from 1974-1994 (Appendix Table 13).

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, 1994 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 1994 salmon season in the Naknek-Kvichak District started by regulation on June 1, but the first recorded commercial landings did not occur until June 9, and consisted of small catches of chinook and chum salmon (Table 14). The first significant catches of sockeye occurred on June 20 after the three-day weekend closure. The weekly fishing schedule ended at 9:00 a.m. Thursday, June 23 with the harvest totaling 37,414 sockeye, 1,997 chinook and 2,045 chums. The sockeye catch for the pre-emergency order period was just 30% of normal. With such a small harvest in the district during the pre-emergency order period there was concern that the run could be three days or more behind historical run timing.

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, and the Kvichak Tower began their counts on June 23 (Table 25). The

inside test fish project started drifting on June 24, one sockeye was caught. A test boat was sent out on June 24 to assess the build up of fish in the district (Table 8). The indices showed very little strength anywhere in the district. The test fishing exercise was repeated on June 25 with very similar results. On June 26 the concentrations of fish both in the Kvichak section near Gravel Spit and in the middle of the Naknek section increased compared to the previous days test fishing effort. The following day (June 27) an index of over 700 occurred near Gravel spit. Two test fish boats were sent out on June 28. The largest indices occurred in the middle of the Naknek section and on the Johnson Hill line (Table 8). A similar test fishing effort was conducted on June 29. Indices had increased significantly over the previous day, in the Ships Anchorage and along Johnson Hill the indices were over 2,000. As of 9:00 p.m. June 29 the fleet was put on short notice with the possibility of an opening occurring with only a 2-hour notice. Two test boats were sent out on the 30 of June, a similar pattern of test sets were conducted. The indices dropped as compared to the day before. The Naknek Tower passage through June 30 was 18,078 sockeye, the Kvichak Tower had an escapement of 24,948 sockeye.

Early in the day on July first the fleet was told that they were still on short notice and that two test boats were in the district fishing. The indices in the Naknek section had increased dramatically over the previous day. One of the test boats fished in the river during the flood. The indices around the Peter Pan dock showed a substantial movement of fish into the river. In addition to the test fish indices there were several reports of a significant show of jumpers at the mouth of the Naknek during the flood. At 9 p.m. a short notice announcement was made for an 8 hour period starting at 11:00 p.m.. Because of the short notice announcement the King Salmon and Dillingham offices stayed open until 10 p.m. to accept blue cards. The catch for the period totaled 690,000 sockeye (Table 14), the escapement past the Naknek tower for the next 24 hours totaled more than 150,000 fish. With escapement rates of 4,000 fish an hour past the Naknek tower a period was announced for the Naknek Section starting at 8:30 p.m. July 2 for 13 hours.

The Port Moller test fishery on July 2 estimated that 32 million fish had passed in route to Bristol Bay (Table 6). The Kvichak inside test fish project showed a large push of fish on July 2. An aerial survey in the morning of July 3 confirmed the inriver fish with an estimate of 1.2 million. With the additional fish on the afternoon tide, 10% of the escapement goal would have been assured. A district wide opening was announced to begin at 9:30 p.m., July 3 for 10 hours. The Newhalen Tower project that was operated by FRI began on July 4, the first daily count totaled 500 sockeye.

The Naknek River escapement through July 4 was 374,000 fish, the Kvichak River escapement totaled 1.5 million. The Naknek Section was reopened at 8:30 a.m. July 5 for 10 hours. An aerial survey of the Kvichak river in the morning of July 4 produced an estimate of 1.8 million fish (Table 27). Since the Kvichak River escapement had increased by 750,000 fish since the last Kvichak Section opening, which was in excess of the minimum of 600,000,

per the "Kvichak Section Set Gill Net Allocation Plan" an 11-hour opening was announced for Kvichak Section setnets only. The setnet only period would open at 10:30 p.m. July 5. A district wide opening was announced at the same time to begin at 9:30 a.m. July 6 and continue for 10 hours.

Through July 5 the Naknek escapement was 1.5 days ahead of schedule and the Kvichak escapement was 2 days ahead. A survey of the Kvichak River on the morning of July 5 estimated 1.3 million (Table 27). The district wide opening that occurred on July 6 produced the first catch over a million fish, it totaled 1.17 million (Table 14). An extension was announced for the district for an additional 16 hours. The Newhalen Tower project had their peak count on July 6 with a daily of 319,819 for an accumulative count of 320,991 fish. The catch for July 7 totaled more than 1.5 million fish. An aerial survey of the Kvichak river estimated 1.35 million inriver fish when combined with a tower count of over 4.0 million (Table 25) put the overall escapement 3 days ahead of schedule. The Naknek river escapement had fallen off to the point where it was lagging a half day behind schedule. A commercial fishing period was announced for the Kvichak section only for 22 hours. This was the first time since 1979 that a Kvichak section only fishing period had been warranted. The Naknek section opened at 11:00 a.m. July 8 for an 11 hour period, this opening was based on the section being closed for two tides to allow fish to enter the escapement. The catch for July 8 was the highest of the season, a total of 1.9 million fish were harvested (Table 14). The Kvichak section was extended 24 hour based on the escapement being 3 days ahead of schedule and the inside test fish indices still showing strong pushes of fish on each tide.

An aerial survey of the Kvichak river was flown in the morning of July 9, 1.3 million fish were observed. It became obvious that the 600 drift boats registered to fish the district could not sufficiently slow the Kvichak run to the point that a closure would be justified. With this in mind the Kvichak section was extended an additional 24 hours until 10:00 p.m. July 10. The Naknek section was opened at 12 noon July 9 for 10 hours. The escapement past the tower through July 8 was 622,000 fish, placing the escapement on schedule. The catch for July 9 was 1.3 million sockeye (Table 14). July 9 was the last day that the Port Moller test boat fished, through July 9 the cumulative passage was 47.9 million fish. In shore through July 9, 29.4 million fish had been accounted which using the Port Moller numbers left an approximate 18 million yet to come.

The Naknek river escapement as of 6:00 a.m. July 10 was 690,000 fish, placing the escapement on schedule. The Naknek section was given a 10 hour period starting at 1:00 p.m. July 10. The district wide catch for July 10 was 1.4 million fish, this was the fifth day in a row that the district wide daily catch exceeded 1 million fish. The total districts harvest know totaled 9.2 million. The Kvichak section was extended again, this time for 26 hours until 12 midnight July 11. The Kvichak tower count through July 10 ,was 6.5 million fish which was three and a half days ahead of schedule.

By July 11 the drift fleet had increased in numbers to 800 boats. The catch for July 11 was 955,000 fish which brought the total catch to 10.1 million. The catch totaled more than 75% of the preseason forecasted catch. The Naknek section had been closed for two tides, the escapement totaled 735,000 fish by the morning of July 11 which was still on schedule. A 12.5 hour opening for the Naknek section was announced to begin at 3:00 p.m. July 12. The Kvichak section was extended an additional 25 hours until 1:00 a.m. July 13. The July 12 catch for the district totaled 640,000 fish. Through July 12 the Kvichak rivers escapement totaled 7.3 million fish, which was over 90% of the end of the season goal of 8.0 million. The Newhalen Tower project had their second largest passage on July 12, 315,000 fish were counted bringing the cumulative count to 1.6 million. This appeared to be the second peak in counts, the first being on July 6.

The Kvichak section was allowed to close as scheduled at 1:00 a.m. July 13. This was the first closure since July 7. Over 3.5 million sockeye escaped into the Kvichak River between July 7 and July 12 despite continuous fishing in the Kvichak section. Poor visibility prevented an accurate aerial survey of the Kvichak River. The inside test fish project estimated 200,000 fish in the river. The fleet was told to standby on short notice and told if escapement rates increased into to the Kvichak River a short notice announcement could be possible. The next tides drifts from the inside test fish project showed very little movement into the lower river. An announcement was made at 12:00 noon July 13 for a 25 hour period in the Kvichak section and a 12 hour period for the Naknek section, both would begin at 4:00 p.m. July 13. The Naknek River escapement was 800,000, a half day behind schedule. The Kvichak escapement totaled 7.45 million including in-river fish which was 4 days ahead of schedule.

The total catch for the district on July 14 was 687,000 fish, this was the largest catch for that day during the last 20 years. The total districts catch now exceeded 12.0 million. The Kvichak section was extended until 7:00 p.m. July 16. The Naknek section was opened on July 15 and 16 for two ten hour periods. The Kvichak section was extended beyond the end of the regular E.O. period until 9:00 a.m. July 18 when the regular weekly fishing schedule of four days a week would resume. The Naknek escapement through July 21 was 985,000 fish, just 15,000 fish short of the escapement goal of 1.0 million. The Kvichak escapement through July 21 totaled 8.2 million fish which was 200,000 past the escapement goal of 8.0 million. Catches for the previous three days had averaged more than 175,000 fish. Based on the need to harvest the fish that are in excess of the escapement needs, commercial fishing in the entire district was extended 51 hours until 12 noon Sunday, July 24. The cumulative catch through July 24 was 15.8 million which was 20% greater than the preseason forecasted catch. The Kvichak escapement totaled 8.34 million, the Naknek escapement totaled 991,000.

Effective July 25 the regular weekly fishing schedule of 9:00 a.m. Monday until 9:00 a.m. Friday was reduced by a day. The reduction in fishing time was a response to a recent trend of declining coho numbers. After July 27, historically coho salmon catches have become significant. With the current fishing effort being 20% higher than

average and the fact that the season was closed completely last year on August 6, a conservative approach was warranted for this season.

The last deliveries in the district occurred on August 16. A total of 24 buyers purchased fish in the Naknek-Kvichak District in 1994. The sockeye harvest totaled 16.3 million, the third highest catch in the last twenty years (Appendix Table 13). The chum harvest totaled 200,823 fish, which is just below the recent 20-year average of 266,000 (Appendix Table 7). The commercial harvest of 6,127 chinook was the second highest catch since 1984 (Appendix Table 6). Subsistence catches are listed in Table 36 are average and do not reflect anything out of the ordinary.

Egegik District

The 1994 sockeye salmon run to the Egegik District totaled 12.8 million fish, the third largest run on record (high was 23.1 million in 1993). In spite of the large magnitude of the run it fell well short of the preseason forecast of 18.8 million sockeye, but yielded the third largest commercial harvest recorded over the 100-year history of the fishery, 10.8 million fish (Table 1). An escapement of approximately 2.0 million fish was attained, the fourth largest on record, well above the 1.0 million fish point goal. Total Egegik District sockeye runs during the past eight comparable cycle years dating back to 1954 have ranged from 1.4 to 11.0 million fish with a mean of 3.8 million, so the 1994 run ranks largest on record for this cycle-year (approximately 3 times the cycle-year average).

The 1994 ADF&G preseason Bristol Bay sockeye salmon forecast projected a total inshore run of 52.4 million fish, and a harvestable surplus of approximately 39.6 million fish. The Egegik District forecast harvest of 17.8 million sockeye comprised 45% of the projected bay-wide harvest, the largest harvestable surplus in the bay (Table 1). This represented the largest sockeye harvest ever predicted for the Egegik District and hence the fishing public was very interested in the management philosophy to be employed in the district for the season. There were no new Board of Fisheries actions pertaining to the district over the winter so the regulations in effect were the same as in 1992 and 1993. The only anticipated management changes announced for the season were; 1) an experimental shortening of early season fishing periods from 10 hours to 8 hours by fishing less of the ebb tides, and 2) some slight adjustments in the timing of openings versus tide stage per results of a survey conducted over winter amongst the setnet gear group (drifters were not surveyed as they have fishable waters somewhere in the district at any tide stage). As the season approached, fishermen were informed that due to some improvement in Egegik chinook salmon escapements the past two 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 15 at the usual sites just upstream of Wolverine Creek (Table 28). Initial test fishing drifts yielded modest sockeye catches. A June 14 aerial survey of Egegik River/Lagoon yielded an estimate of approximately 500 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 20 (Table 25).

The commercial fishery was kept closed from the onset of the emergency order period through June 22 as escapement indicators were modest and a management goal of obtaining 10% of the sockeye escapement from the early portion of the run had not yet been met. Inriver test fishing results began to increase June 21 and by the morning of June 22 it appeared fairly certain that 100,000 sockeye would be safely in Egegik River shortly, so a short commercial "shakedown" opening (8 hours) was scheduled for June 23.

Participation in the June 23 opening was high with approximately 691 drift and 163 set net deliveries reported. The catch was very modest totaling only 52,000 sockeye (Table 15). An aerial survey of Egegik Lagoon late in the afternoon of June 23 confirmed approximately 9,000 sockeye present, but survey conditions were too poor to permit an estimate of fish in Egegik River proper. A survey of the fishing district was conducted just prior to close of the period and there did not appear to be any setnetters unable to access their gear for purposes of removing it in time to comply with the announced closing time (an important factor impacting the use of short openings). Inriver test fishing results June 23 dropped below previous levels. Given that drop in escapement rate and the low harvest indications for the period the fishery closed on schedule June 23 and remained closed June 24.

Sockeye harvest results through June 23 from the South Unimak and Shumagin Islands intercept fisheries were quite modest leading to uncertainty regarding overall 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. Additionally, through June 23 the Port Moller sockeye test fishery results were running below recent years' levels, and in fact were below average for all years in the data base. Based on these signals a very conservative approach to early management of the Egegik sockeye run might have appeared appropriate, however, given the huge Egegik forecast, and the fact that Egegik District sockeye escapements the past six years have been well above desired point goals, a more liberal approach to fishing time was the management tactic selected for late-June. Another 8-hour fishing period was announced for the district commencing at 1:00 p.m. June 25.

The June 25 opening was about twice as productive as the preceding one (Table 15). It yielded a catch of 123,000 sockeye bringing the cumulative catch up to 178,000, slightly below the 1960-1992 average June 25 cumulative catch of 201,000 sockeye. Most of the harvest took place in outer district waters along the west line in spite of SW winds at about 20 mph which produced a moderate surf. Effort was similar to that of June 23. A mid-afternoon aerial survey of Egegik Lagoon yielded an estimate of 22,000 sockeye in the lagoon but survey conditions were too marginal to permit an estimate of fish in the river downstream. Given the indications of a relatively small catch and the modest escapement observations the fishery was allowed to close on schedule.

Historically the cumulative Egegik River sockeye escapement count past the counting towers through June 25 has averaged 33,000 fish, with a high of 621,000 in 1993. Through June 25, 1994 it totaled 38,000 fish, just a little above average. Given this fairly average sockeye escapement, the slightly below average cumulative catch, and the continuing below average Port Moller test fishing indices there was no significant data apparent at this point to confirm Egegik having an abnormally large sockeye run. The fishery remained closed June 26.

The escapement rate increased again on June 26 with inriver test fishing suggesting approximately 169,000 sockeye had entered Egegik River thus far and with 109,000 counted past Egegik River counting towers. The June 26 Port Moller test fish results improved to slightly above average levels indicating the main body of sockeye was perhaps a little later than usual. Given these factors another 8-hour fishing period was scheduled for June 27.

The June 27 opening commenced at 3:00 p.m. under light northerly winds and partly sunny skies. Catches were again lower than expected with 188,000 sockeye landed. Best catches were recorded by the drift fleet (averaged 191 sockeye/delivery) from outer district waters while setnets did poorly throughout the district (averaged 51 sockeye per delivery). Once again the fishery closed on schedule...and it remained closed June 28.

Peak drift gillnet registration for the Egegik District occurred June 28 at 881 drifters (Table 13). The cumulative sockeye escapement count past Egegik River tower through 2:00 p.m. June 28 totaled 132,000 fish, a level normally reached historically on or about July 2...indicating the escapement was about 4 days ahead of schedule. The cumulative commercial sockeye harvest totaled 366,000 fish, slightly above the historic level of 336,000. With additional fish indicated present inriver(test fishing suggested 44,000 between the fishery and the counting tower), another 8-hour fishing period was announced scheduled to commence at 4:30 a.m. June 29. The interval between openings was reduced from three tide cycles to 2 tide cycles for this opening due to the above average escapement level.

The June 29 opening commenced under sunny nearly calm conditions. Fishing success was reportedly very poor during the early hours of the period but improved after the turn of the tide, particularly at the south line. Drift and

set deliveries averaged 178 and 37 sockeye respectively. A total catch of 153,000 sockeye was reported. The fishery closed on schedule but due to escapement being well ahead of schedule another 8-hour period was announced for June 30.

The June 30 opening commenced at 6:00 p.m. under sunny skies and 15-25 mph SE winds. Reports from the opening during the late evening of June 30 indicated reasonably good drift catches were taken from outer Egegik Bay waters all along the west line. Drift gillnet deliveries averaged 553 sockeye while setnet deliveries improved a little to 78 sockeye/delivery. Inriver test fishing results indicated a little greater level of sockeye entry into Egegik River but not a large surge of fish so the opening appeared to have been timed successfully. Fishermen caught 494,000 sockeye during the opening bringing the cumulative district sockeye harvest to 1.0 million fish, 6% of the district forecast harvest. The period closed on schedule at 2:00 a.m. July 1.

By 6:00 p.m. July 1 the sockeye count past Egegik River counting towers totaled 209,000 fish, a level normal for July 3. Cumulative Port Moller test fishing index values were improving quickly with indices suggesting a total cumulative passage of 31 million fish, with more coming. The Naknek-Kvichak sockeye run had not yet materialized in strength and commercial fishing was still on hold in that district pending arrival of some early escapement components. However, a huge school of sockeye was repeatedly reported by spotter pilots during the day, milling just west of Deadman Sands and the Naknek-Kvichak District. It was described by one experienced spotter as being "so large that it was a once in a lifetime spectacle". Fishing in the Ugashik District thus far had been limited but had produced a catch of 112,000 sockeye. Escapement was estimated at 5,000 sockeye in Ugashik River. With these factors in mind another 8-hour commercial fishing period was announced for the Egegik District commencing at 6:00 a.m. July 2.

The July 2 opening began under overcast skies and SW winds at 10-15 mph. Catch success was good throughout the outer district drift nets and in setnets along the outer beaches. It was poor from inner bay setnets. Drifters averaged 1,633 sockeye/delivery while outer beach setnets averaged 325/delivery and inner bay setnets averaged 30/delivery. In total the opening yielded 1,455,000 sockeye, the single largest daily catch of the season, bringing the cumulative catch to 2.5 million sockeye, a level normally reached on approximately July 9. The period closed on schedule at 2:00 p.m. July 2.

The sockeye run to inshore Bristol Bay waters really began to manifest itself on July 3. Fish began pouring into escapements in many Bay systems, including Egegik River (Table 28). The Port Moller test fishery results suggested nearly 40 million sockeye had passed into the bay and thus far approximately 8 million of these had been accounted for either in catches or escapements, so roughly 32 million sockeye were expected to make an appearance inshore within a few days.

During the morning of July 3 several persons reported visually observing large numbers of sockeye moving into inner Egegik Bay and Egegik River. Based on these observations, and based on the progress of both the catch and escapement in the district, an 8-hour fishing period was scheduled commencing at 8:30 p.m. July 3. An aerial survey of Egegik Lagoon/River at 8:30 p.m. confirmed the presence of approximately 278,000 sockeye moving up the river.

The July 3 opening commenced under drizzle and SE winds at 10 mph. Initial sets throughout the district were good but catch success quickly tailed-off thereafter. The fishery operated on the tail of a strong push of fish that entered the river on the preceding flood tide. It yielded a catch of 438,000 sockeye, with drifters averaging 416 sockeye/delivery and setnetters registering 213/delivery. Inner and outer beach setnets averaged about the same delivery totals. The period closed on schedule at 4:30 a.m. July 4.

The July 3-4 catch from the district brought the cumulative Egegik sockeye catch to 2.9 million, a level normally attained on or about July 12. The surge of fish into Egegik River noted July 3 arrived at the counting towers on July 4. By 2:00 p.m. on July 4 the cumulative count past the towers totaled 363,000 sockeye, a level normally achieved on or about July 6. With both the catch and escapement occurring at above normal levels another 8-hour fishing period was scheduled for July 5, and the interval between openings was reduced further from two tide cycles to one tide cycle to slow sockeye escapement rates.

The July 5 opening began at 8:15 a.m. under 10 mph SW winds. It was a productive opening with fish moderately well distributed through-out the district at its onset. An aerial survey of the district was flown about 2 hours into the period and fish were noted in both inner and outer district nets. Driftnet catches appeared best in the outer entrance channel (Ships Channel) while the best setnet catches were noted from the outer beaches and along the "Cutbank" just downstream of Egg Island. Aerial observations and inriver test fishing indicated another pulse of fish into Egegik River had just occurred and the fishery caught the tail of that movement. A catch of 932,000 sockeye was achieved with drift gillnets averaging 1,063/delivery and set gillnets averaging 132/delivery. In spite of improving catch levels in adjacent districts the Egegik fleet continued to hold at early season levels with 842 drift deliveries and 223 setnet deliveries recorded.

By 2:00 p.m. July 5 the cumulative sockeye escapement past Egegik River counting tower totaled 576,000 fish and another 173,000 had been visually confirmed downstream during the morning's aerial survey. With approximately 750,000 sockeye virtually assured in the escapement another 8-hour fishing period was scheduled for July 6.

The July 6 opening commenced at 9:00 a.m. with fair-to-good catch success reported. An aerial survey of the district was conducted about two hours into the opening and inner district setnets were observed performing

moderately well. Outside beach setnet success appeared moderate from Red Bluff to Coffee Point, but was poor north of Red Bluff. Initial drift success was noticeably highest from the outer west line, the outer north line, and the South Channel (inside Goose Point). Approximately 75,000 sockeye were observed upriver in Egegik Lagoon. The opening yielded a catch of 882,000 sockeye bringing the cumulative catch to 4.7 million fish, 27% of the preseason harvest forecast. The period closed on schedule at 5:00 p.m. July 6.

Through 2:00 p.m. July 6 the cumulative sockeye escapement count past Egegik River tower totaled 755,000 fish. Adding the 75,000 noted during the day's aerial survey brought the visually assured total to 830,000 fish. Inriver test fish indices suggested 921,000 had entered the river to date. With the lower range of the sockeye escapement goal (800,000 fish) obtained and the escapement point goal of 1.0 million fish being approached another adjustment to the fishing schedule appeared warranted at this point...so the next fishing period was scheduled as a 21-hour opening beginning at 10:00 a.m. July 7, following a one tide cycle "window closure". The major considerations affecting continuation of short window closures at this juncture were; the need for escapement re-building from a chronically weak Egegik chum run, the need for continued escapement components from a rebuilding Egegik chinook run, the need to allow Egegik sockeye to distribute throughout the district for the benefit of all user groups, and the need to provide opportunity for northbound and southbound sockeye to pass by the Egegik District.

Through midnight July 6 the Naknek-Kvichak District sockeye harvest totaled 3.7 million fish. The Kvichak River sockeye escapement totaled 3.5 million fish (on schedule), and the Naknek River escapement totaled 469,000 fish (about 2 days behind schedule). The Ugashik District sockeye harvest totaled 387,000 fish and the Ugashik sockeye escapement was just getting started, a normal situation. Port Moller test fishing results suggested approximately 43 million sockeye had passed headed for inshore Bristol Bay waters, indicating either a total run somewhat smaller than the 52.4 million predicted, or a run much later than usual if forecast was to be reached. Approximately 16 million sockeye had been accounted for from inshore Bristol Bay waters thus far so roughly 27 million were anticipated inshore over the next 7-10 days.

The July 7 opening was very productive. An aerial survey of the district was conducted at noon and catch success appeared good from inner district drift and setnets. Setnets south of Red Bluff along the outer beach appeared to be doing well as were west line drift nets. North flats setnets were doing poorly. Fish were observed in abundance north and west of the district. Fish were continuing to pass into Egegik River and an estimated 155,000 were observed between the upriver fishing boundary and Egegik counting towers. A daily harvest of just over 1 million sockeye was recorded. Drift gillnet deliveries averaged 1,006 sockeye while setnet deliveries averaged 210. The period continued through 7:00 a.m. July 8 with another 488,000 sockeye landed July 8.

By 9:00 a.m. July 8 the Egegik District sockeye escapement point goal of 1 million fish had been reached so

fishermen were advised the 48-hour waiting period for transfers into the Egegik District was waived, and another 21-hour fishing period was announced commencing at 11:00 p.m. July 8. This opening was scheduled an hour earlier than usual into the incoming flood tide due to forecasted 20-25 knot SW winds which were expected to push the big flood tide (19 ft) inshore more quickly than normal.

Per Murphy's Law the July 8-9 period opened under SE winds 20-30 knots which held the tide out rather than accelerating it as the earlier weather forecast had suggested. Many setnetters were very disappointed in having to set their nets an hour before prime fishing time arrived at their sites and seeing the drift fleet operating farther offshore catching the fish that might have been more available to setnets an hour later. That's what happens when one tries to outguess the weather when it comes to setting fishing schedules to maximize fishermen's safety. An aerial survey of the district at 10:30 a.m. July 9 documented good drift and setnet catch success from the innermost waters of Egegik Bay. Outer district success appeared "spotty". Fishing effort in the district was noticeably less than previously with district registration totaling only 523 drift fishermen (Table 13) due to fishermen dispersing to other districts (primarily the Naknek-Kvichak). The period yielded a catch of 1,049,000 sockeye bringing the cumulative catch to 7.3 million fish (41% of the preseason district harvest forecast). The opening closed on schedule at 8:00 p.m. July 9.

Through midnight July 9 the Kvichak River sockeye escapement totaled 5.8 million fish, still slightly ahead of schedule for an 8.0 million escapement. The Naknek River escapement totaled 676,000 sockeye, about 3 days behind schedule for a 1 million fish escapement. The Naknek-Kvichak catch totaled 8.3 million sockeye. The Ugashik River sockeye escapement totaled approximately 7,000 fish past the counting towers with another 85,000 estimated in the river, based on inriver test fishing. The Ugashik District sockeye catch totaled 1.2 million fish. None of these adjacent district sockeye runs appeared to be facing any serious biological problems. The cumulative Egegik sockeye escapement had risen to 1.3 million fish. The next Egegik District fishing period (21 hours) was scheduled for July 10-11.

The July 10 opening commenced at 12:15 p.m. and an aerial survey conducted at the onset of the period yielded observations of moderate initial drift and setnet catches from inner district waters. Setnet catches appeared moderate from Bishop Creek on the outer north beach to the Cutbank near Egg Island. There were also some good initial drift net catches at the north line and south line. North flats setnets did poorly and some north beach setnetters/buyers suggested longer window closures to put more fish into the inner district waters. Although longer window closures would have provided a greater opportunity for chum salmon to escape they would also have added substantially to the sockeye escapement which was already well above the desired point goal. Given those considerations, and the migratory pattern being exhibited by sockeye this season (more movement through main channels as opposed to movement along beaches), the recommendation was not implemented. The July 10 daily catch totaled 539,000

sockeye and another 289,000 were delivered at the close of the period July 11. Another one tide cycle "window closure" was subsequently employed and the next fishing period (20 hours) was scheduled for July 12.

By the morning of July 12 the Kvichak River sockeye escapement count had reached 7.1 million fish. The Naknek River escapement totaled 750,000 sockeye, and the Ugashik River escapement totaled 313,000 past counting towers with another 110,000 estimated inriver. The Egegik River sockeye escapement had reached 1.5 million, the point at which continuous fishing in the district can be implemented. However, due to the 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 this option was not selected and the practice of alternating 20-21 hour openings with one tide cycle closures was continued. This tactic was employed four times over the interval from July 12-17 as the sockeye run began to tail-off and it afforded fishermen a lot of opportunity to harvest excess sockeye while still providing some "windows of opportunity" for chum escapement to occur. Additionally, it rotated openings from the larger flood tide to the smaller flood tide every other period, which helps distribute the catch through-out the district. 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 9.9 million fish, 56% of the preseason district harvest forecast. After one last short window closure on the afternoon of Sunday July 17 the fishery reverted to its normal fall fishing schedule (9:00 a.m. Mondays until 9:00 a.m. Fridays).

Sockeye landings continued in the district throughout July and August (Table 15), reaching a preliminary seasonal cumulative total of 10,798,450 fish. ADF&G personnel continued sockeye escapement counts at Egegik River tower through July 21 recording a total count of 1,897,932 fish. Counting was then turned over to personnel of the U.S. Fish & Wildlife Service and they continued counts through September 11 registering a final cumulative count for the season of 1,967,730 sockeye. Aerial surveys of Shosky Creek and King Salmon River added another 45 fish to this, bringing the total Egegik drainage sockeye escapement to 1,967,775 fish. There was one peak passage period at Egegik tower, the 6-day interval from July 4-9 yielding an average daily passage of 182,000 fish. There were eight days during which daily total counts at Egegik River tower exceeded 100,000 fish this season. Each segment of the run was fairly well represented in the escapement. The escapement sex ratio was comprised of 43% males and 57% females.

The age composition of the 1994 Egegik District sockeye run was as follows:

Age Group	Catch	Escapement
1.2	3%	6%

2.2	44%	62%
1.3	4%	1%
2.3	46%	25%
Other	3%	6%
Totals	100%	100%

The run was about equally comprised of progeny from the 1988 escapement of 1.61 million sockeye (6-year old fish) and the 1989 escapement of 1.61 million (5-year old fish). A fairly substantial showing of Age Group 2.1 jacks (3.3% of the escapement) from the 1990 escapement of 2.2 million fish was evident.

Egegik District fishermen harvested 84.6% of the Egegik inshore sockeye run, well above the 1952-1993 (42-year) average of 77.1%. Preliminary catch data indicates drift gillnets took 92% of the sockeye harvest while set gillnets took 8%. Historically, over the period 1960-1993, drift gillnets have taken an average of 89% of the catch while set gillnets have averaged 11%. The 9,954,000 sockeye delivered by drift fishermen was the third largest volume on record for that gear type over the history of the district. The 844,000 sockeye delivered by setnet fishermen was the seventh largest on record for that gear group. Peak day in the harvest based on volume landed (1.46 million sockeye), and catch per hour, was July 2. Peak catch per delivery for drift and set gillnets occurred July 2 with averages of 1,633 and 251 sockeye per delivery respectively. During the Emergency Order Period (June 16-July 17), a total of 210 hours were fished in the district, 28% of the 744 hours available. This total was down considerably from the 305 hours fished in 1993.

The commercial harvest of other salmon species in the Egegik District totaled 107,000 fish, 1% of the total harvest. The chinook harvest totaled approximately 1,200 fish, less than half the 1974-1993 (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-July 9. Additionally, keeping the district closed to fishing from 9:00 a.m. June 16 until 11:00 a.m. June 23 provided the peak of the chinook run the opportunity to enter the escapement (part of the chinook escapement rebuilding program). Historically, roughly 30% of the chinook harvest has occurred during days that were closed during this time period in 1994. The district chum harvest totaled 57,000 fish, the second lowest harvest since 1979 and only 61% of the 20-year average of 94,000 (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. Normally a small harvest averaging around 5,000 pinks is obtained during even-numbered years. Pinks were available in the district but the low price offered for them was probably the main reason they were not targeted by fishermen. The district coho salmon harvest totaled 48,000 fish, well above the 20-year average of 31,000 but close

to the recent 10-year average (1984-1993) of 44,000 (Appendix Table 9).

Aerial surveys were conducted of the Egegik and King Salmon Rivers to provide escapement indices for chinook, chum, and coho salmon. The resultant escapement indices totaled 2,328 chinook, 4,179 chum, and 7,412 coho salmon. The chinook index is the highest recorded since surveys were begun in 1982, nearly twice the 1981-1993 mean index of 1,234. The chum index (the sum of two surveys), is far below the 1982-1993 mean index of 13,325. While "window closures" probably helped the chum escapement somewhat the escapement is still in need of rebuilding assistance. The coho index (funded by the U.S. Fish & Wildlife Service) represents the first system-wide index on record for this species. It was comprised of 978 coho noted in the King Salmon River drainage and 6,434 observed in the Egegik River drainage (6,203 of these observed in areas upstream of the Egegik River counting tower). Additionally, the U.S. Fish & Wildlife Service conducted escapement counts at Egegik River from ADF&G counting towers during the interval from July 22 through September 11. Based on ADF&G counts from June 20-July 21 and the U.S. Fish & Wildlife Service counts thereafter, a total of 10,140 coho and 21,282 pink salmon escaped into the Egegik River rapids during the counting period.

A total of 31 buyers operated in the district this season (Table 34). 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 retrospect, the season at Egegik was very productive when compared to historic levels, but somewhat disappointing to some fishermen and buyers in that it fell far short of the preseason harvest forecast. Companies that geared up for extra production prior to the season had to compete hard to meet more normal production levels. Additionally, the migration pattern of sockeye through the district was different in 1994 than that shown in 1992-1993. Fish were not abundant right along the north beach as in 1992-1993 but instead seemed to enter Egegik Bay more often in the Ships Channel and even at times from the south past Goose Spit. They were distributed a little more equitably on both sides of the bay than during 1992-1993 when most were caught along the north side of the bay. The shorter openings during the early part of the sockeye season were blamed by some north outside beach fishermen for a dramatic drop in their catch performance. However, their performance did not measure up to previous years' levels even during the longer openings later in the season when curtailment of the last two hours of the ebb was not in effect. The problem they faced was mainly the different migratory path of the fish. The shorter periods did cut down to some degree on the anti-social behavior exhibited by fishermen at the north line. It also protected the first northerly push of fish at the south line as the end of the ebb was in progress at the north line, it led to shorter delivery times for the harvested product, and it probably helped limit interception to a limited degree. It really did not get as true a test of its impact on north line activity as it would have had the bulk of fish

entering the Egegik District been along the north beach as it was in 1992 and 1993. It did not seem to present a serious obstacle to setnet fishermen being able to retrieve their nets legally prior at the end of the shorter periods (prior to low water).

After obtaining three reasonably good chinook escapements consecutively the early season (pre-June 16) fishing schedule in 1995 should be 4-days per week as was done this year. Emphasis on obtaining chum salmon escapement whenever it can be accomplished without generating too large a loss to the sockeye fishery is necessary in 1995 after below average escapements three of the last four years. The sockeye escapement of approximately 2.0 million this season was again greater than the desired upper range, but in light of the massive volume of the run and the degree to which it was exploited an escapement of this magnitude is probably not unhealthy for the system. A reevaluation of the district's escapement goal in light of large returns during the past decade is planned for this coming fall. Limited limnological sampling visits to Becharof Lake during the fall of 1994 were conducted by a team from the University of Alaska Juneau, with assistance from ADF&G and U.S. Fish & Wildlife Service. Baseline water chemistry and productivity data were gathered and bathymetric work continued. The results will be made available later this winter by the university.

Scales from Egegik District sockeye catches and the escapement were gathered during the 1994 season and will be analyzed during the winter of 1994-1995. Results of these studies will be reported separately in the spring of 1995 by the investigators. The results should provide a better understanding of interception totals in the district during the 1994 season and be useful in planning future management.

Ugashik District

The 1994 sockeye salmon run to the Ugashik District totaled 5.5 million fish, nearly right at the preseason forecast of 5.6 million (Table 1). Fishermen harvested 4.4 million sockeye, the third largest harvest recorded over the 102-year history of the fishery, and an escapement of 1.1 million fish was attained. Comparable cycle-year sockeye runs over the last eight cycles dating back to 1954 have ranged from 64,000 to 4.9 million fish with an average of 1.8 million, so the 1994 run was 3 times the cycle year average.

The preseason forecast for the Ugashik District was quite optimistic suggesting a harvest of 4.9 million sockeye. However, compared to the much larger harvests expected in the Naknek-Kvichak and Egegik districts, this was not an attractive enough prediction to generate a large amount of early season fleet interest in the district. Fishermen were made aware that management of the district would be similar to that employed in 1993 but with possibly a little more fishing time during late June and early July. Regulations in effect for the season were the same as in 1993. Over the winter and spring considerable concern was expressed by some Ugashik district fishermen regarding a

potential lack of buyers willing to service the district. Given these factors as the season began most fishermen chose to begin fishing elsewhere with the option of transferring into the district as conditions warranted.

Initial landings occurred in the district June 2 (Table 16) with a few chinook landed. Small catches were reported for the remainder of that week as only a few fishermen worked their gear. By June 16, sockeye were exceeding chinook in the catch but the fleet was still minimal. The 4-days per week early season fishing schedule continued until June 23 as a few fishermen concentrated on sockeye in outer district waters. By the onset of the emergency order period at 9:00 a.m. June 23, the cumulative district harvest totaled approximately 17,000 sockeye, 3,200 chinook, and 2,000 chum salmon. These pre-emergency order period cumulative salmon catches were all quite average compared to the 34 years (1960-1993) for which daily catch data exists. The district was allowed to close at the onset of the emergency order period pending the arrival of a stronger showing of sockeye in the district and the river.

The inriver test fishery, operating about three miles upstream of Ugashik Village, commenced June 25 providing daily estimates of sockeye passage into the lower section of Ugashik River. Inriver test fishing results (Table 29) over the next several days documented a very low level of fish entry into the Ugashik River system so the commercial fishery remained closed. During this time nearly all the drift gillnet fleet transferred from the Ugashik District to other areas (Table 13) to take advantage of early season fishing opportunities elsewhere prior to the arrival of the main Ugashik run.

The fishery remained closed through June 26 as inriver test fishing (Table 29) showed little evidence of Ugashik bound sockeye moving into lower river waters, and test fishing in the commercial district from June 24 & 26 indicated a few sockeye were present but not moving into inner areas of Ugashik Bay (Table 10). With only a few drift fishermen available to fish district waters, a 12-hour fishing period was allowed June 27-28 to serve as a test fishery providing age and size data for run composition analysis.

The June 27 opening began at 2:00 p.m. under light North winds and overcast skies. An aerial survey of the fishery was conducted at 5:30 p.m. yielding a count of 33 drift boats and 36 setnets fishing. Catch success appeared to be a little better than expected from outer district drift fishermen, but was very meager from inner district setnets upriver of Smoky Point. The period closed on schedule at 2:00 a.m. July 28 yielding a catch of 17,000 sockeye. A total of 12 tenders were noted in the district during the opening representing eight companies so processing presence was not at all limiting in the district.

District test fishing was again conducted June 29 yielding results slightly higher than those of the earlier tests (average index = 82 sockeye/100 f/hour, versus indices of 59 and 11 for June 24 and June 26 respectively). Inriver

test fishing suggested about 4,000 sockeye had passed the test fish site upriver of Ugashik village. Sockeye scale samples from the June 27 opening indicated a higher percentage of 3-ocean fish and a lower percentage of 2-ocean fish than was forecast for the district, however, the number of samples was so limited (given the small catch) that results were not considered particularly indicative of the overall run composition. More data was necessary so another 12-hour fishing period was scheduled for June 30.

The June 30 period commenced at 4:00 p.m. under SE winds at 20-30 knots. An aerial survey of the district 3 hours into the opening yielded an effort count of 75 drift boats and 52 setnets. Catch success appeared moderate to good for drift boats throughout outer district areas but poor for inner bay setnets. A survey over Ugashik Lagoon and the outlet of Lower Ugashik Lake confirmed the presence of roughly a thousand sockeye in the upper river area. The period closed on schedule at 4:00 a.m. July 1 and yielded a catch of 78,000 sockeye. Drift gillnet fishermen averaged 918 sockeye/delivery while setnet fishermen averaged 29/delivery.

The fishery remained closed for the remainder of July 1-2. Sockeye escapement counting at the Ugashik River counting towers, located just downstream of the Lower Ugashik Lake outlet, began July 2. Another district test fishing round was conducted July 2 (9 drifts) yielding a much improved average index of 498 sockeye/100 f/hour, with quite attractive indices throughout the northern half of the outer district. It also indicated a pulse of fish (index = 690) had pushed inshore into the South Channel of inner Ugashik Bay (Table 10). Given this indication that fish abundance was building in the district and that a pulse was poised in inner bay waters ready to move into Ugashik River, and given the small fleet available in the district, another 12-hour fishing period was scheduled for July 3.

The July 3 period commenced at 6:00 a.m. under SE winds at 10-15 knots, and produced rather poorly compared to the previous opening. Drift fishermen averaged 628 sockeye/delivery while setnet fishermen averaged 19/delivery. Low ceilings prevented an aerial survey of the district. The period yielded a total catch of 64,000 sockeye bringing the cumulative sockeye catch to 176,000 fish. The fishery closed on schedule at 6:00 p.m. and another district test fishing round was scheduled for July 4.

The winds on July 4 switched to light westerlies but 11 stations were test fished in the district yielding an average index of 96 sockeye/100 f/hour. The low indices were so widespread that another test fishing round was scheduled for July 5 and the fishery remained closed.

The July 5 district test fishing (10 stations tested) yielded an average index of 224 sockeye/100 f/hour. The best index (840) was obtained nearshore just north of the Ugashik Bay entrance. Given the presence of fish near the bay entrance, the small fleet, the large district forecast, and the publicized strategy of fishing the district a little more

aggressively than in past years, another 12-hour fishing period was scheduled for July 6.

The July 6 opening began at 8:30 a.m. under 20-25 knot SW winds. An aerial survey of the district was conducted shortly before noon and observations indicated the drift fleet was doing very well north of the Ugashik Bay entrance all the way to Cape Grieg. Setnet success was again very poor inside Ugashik Bay itself, indicating fish were still milling on the outside and not yet ready to move into Ugashik River. Given these observations the period closed on schedule at 8:30 p.m. and another round of district test fishing was arranged for July 7. The July 6 catch totaled 342,000 sockeye, bringing the cumulative catch to 518,000.

The escapement past Ugashik tower through midnight July 6 totaled 1,400 sockeye, well below the historic average of 20,000 for this date. Based on inriver test fishing indices, another 7,000 fish were indicated downriver but above the test fishing site (Table 29). The July 7 district test fish round sampled 9 stations (10 drifts) and yielded an average index of 254 sockeye/100 f/hour. The most productive station was about midway along the outer district line with an index of 1,378 generated. An improved trickle of fish into the inner bay and lower end of Ugashik River was verified, but given the need to obtain a better front end escapement component at this point the fishery remained closed July 7 and another round of district test fishing was scheduled for July 8, with emphasis directed at sampling stations from the inner portions of Ugashik Bay.

Inriver test fishing indices began to improve July 8 confirming the observations of fish moving into the river documented by the district test boat July 7. At 9:00 a.m. the fleet was put on "short notice" for potential openings later in the day if district test indices were high. The district test boat fished three stations during the small midday flood tide yielding an average index of 1,381 sockeye/100 f/hour. Large indices were obtained at the south entrance to Ugashik Bay (1,883) and in the lower portion of Ugashik River just downstream from the mouth of the Dog Salmon River (1,795). A moderate index (466) was obtained at the north entrance to Ugashik Bay. Sally Hamm, the test fish technician, reported seeing lots of sockeye jumping and moving through the inner district during the test fishing circuit, and at about noon reports from Pilot Point setnet fishermen, local drift fishermen, and spotter pilots all further confirmed a large movement of fish into the inner areas of Ugashik Bay. Given the documented presence of a strong pulse of fish moving into Ugashik River, a weather forecast for 20 knot westerly winds (expected to push fish inshore), and the presence of only a small fishing fleet (Table 13), a "short notice" fishing announcement was made at 3:00 p.m. July 8 permitting a 14-hour fishing period beginning at 9:00 p.m. July 8. An aerial survey of the district shortly prior to the opening further confirmed the presence of large numbers of fish in the inner bay area, at the bay entrance, and through-out the northern half of the district. A pass over the south entrance to Ugashik Bay yielded an estimate of 100 sockeye jumpers in the air observed per second observed for a couple of miles from South Spit towards a shore feature fishermen call "The Bumps".

The July 8-9 opening was very productive for both gear groups. Drift and setnet deliveries averaged 1,810 and 311 sockeye respectively. Given the strong catches reported overnight from the fishery a 12-hour extension of the period was announced at 8:00 a.m. July 9, and catch success remained high in the district July 9. An aerial survey of the fishery conducted at 11:00 a.m. documented very good setnet catches from inner bay waters while drift fleet success was characterized as good through-out the outer district, particularly around the bay entrance areas. The fishery closed on schedule at 11:00 p.m. July 9. The July 8-9 catch totaled 627,000 sockeye, bringing the cumulative catch to 1.1 million fish, 23% of the preseason harvest prediction.

Inriver test fish indices jumped dramatically on July 9 as the pulse of sockeye moved up Ugashik River (Table 29). The escapement at Ugashik River counting tower also began to show an increased rate of passage. Given the good catch success, the indications of a strong showing of fish in Ugashik River, the over-all run indications from around Bristol Bay suggesting the peak of the run was a little later than normal, and the large forecast for the district, a 24-hour fishing period was scheduled for the Ugashik District commencing at noon July 10.

The July 10-11 opening began under SE winds of 10-15 knots. An aerial survey of the fishery was conducted at 1:30 p.m. and catch success appeared distinctly less than during the past two days from most inner district setnets, except those at Ugashik village. Some drift fishermen were still making good catches in the area of the bay entrance but results were quite spotty elsewhere. Drift effort totaled 140 boats and setnet effort totaled 65 setnets. The 24-hour period was allowed to close on schedule at noon July 11, yielding a catch of 325,000 sockeye.

Inriver test fishing indices continued to climb July 10 and remained high July 11. Sockeye passage at Ugashik tower increased substantially July 10 and July 11 reaching a total of 314,000 fish (44% of the escapement point goal) by midnight July 11. This level of escapement is more normally attained on or about July 15 so the escapement was now about 4 days ahead of schedule. The sockeye migration lag-time between the inriver test fish site and Ugashik tower appeared to be 1-2 days at this point indicating an unusually fast movement of sockeye up the Ugashik River. Normal lag-time in the river for these fish is about 6 days and it has been as long as 12 days in some cases. July 11 has historically been the peak day for sockeye catch in the Ugashik District. With the escapement progressing ahead of schedule another 12-hour fishing period was announced for July 12.

The July 12 period opened at 1:00 p.m. under 20-25 knot east winds and yielded moderate drift catches, but only fair setnet success. A total catch of 159.000 sockeye was reported bringing the cumulative catch to 1.6 million, well above the long-term average cumulative catch of 825,000 sockeye for this date. Sockeye escapement passage at Ugashik River counting tower continued to climb reaching 521,000 fish by midnight July 12. Inriver test fishing success dropped considerably July indicating the commercial fishery was depressing the sockeye entry rates into Ugashik River.

With the escapement having reached a level normally attained July 19 another 12-hour fishing period was announced for July 13.

The July 13 opening began at 2:00 p.m. under NW winds at 10-15 knots. An aerial survey of the district at 4:00 p.m. documented a strong surge of fish moving into inner district waters, particularly in the South Channel area (the pattern of strong movement up the South Channel had also been observed by several fishermen during the July 8 pulse of fish into the inner bay). Drift boats were observed making very good sets in that area. Setnets were also faring well from Smoky Point all the way to just below the "Cutbank", but showed only modest success farther up the bay. Good fish abundance was also apparent in the northern half of the outer district. Given the strength of the push of fish into the district the period was extended another 13 hours until 3:00 p.m. July 14. The July 13 daily catch totaled 468,000 sockeye.

Escapement counts at Ugashik tower climbed to 571,000 sockeye by midnight July 13 and by 6:00 p.m. July 14 reached almost 600,000 fish. Given the strength of escapement and the performance of the fishery, two extensions of the fishery were announced July 14 prolonging the fishing period until 4:00 p.m. July 15. A total of 559,000 sockeye were caught July 14 bringing the cumulative catch to 2.7 million, 55% of the preseason catch prediction.

The July 15 fishery occurred under easterly winds at 30-50 knots, creating very "lumpy" sea conditions. Fish abundance was still reported as being fairly good in outer district waters, but catch success was noticeably declining in inner Ugashik Bay areas. Given the sea conditions and the declining rate of sockeye escapement during the July 13-15 interval, the fishing period was allowed to close as scheduled at 4:00 p.m. July 15. This closure, however, was only scheduled to provide a small escapement increment and to allow a "window of opportunity" for fish to distribute a little better through-out the district prior to the next opening. Inriver test fish indices in Ugashik River increased substantially July 15, perhaps due to the effects of the winds. The next opening (12 hours) was scheduled for July 16.

The July 16 opening began at 4:00 a.m. under continued east winds at 20-30 knots. Catch performance was slightly better than during the previous day, although very few setnets participated due to the winds. Catch volume (263,000 sockeye) suggested the run was tailing-off. The cumulative sockeye escapement count at Ugashik tower was approaching the desired point goal so another 12-hour fishing period was scheduled for July 17, over-lapping a portion of the normal weekend closure that follows expiration of the Emergency Order Period (9:00 a.m. July 17).

The July 17 opening commenced at 5:00 a.m. under light NE winds and rainy conditions. It yielded a catch of 139,000 sockeye bringing the cumulative catch to 3.3 million, 68% of the preseason harvest prediction. The 700,000

fish sockeye escapement point goal was reached at 11:00 a.m. July 17. The period closed on schedule at 5:00 p.m. July 17 and since the emergency order period had expired the district fishery reverted back to its normal fall schedule (9:00 a.m. Mondays through 9:00 a.m. Fridays). However, a slight adjustment was made to the Monday, July 18 opening time, moving it up from 9:00 a.m. to 6:00 a.m. to allow all gear groups maximum benefit of the tide.

Fishing effort dropped fairly quickly over the next week as catches tailed-off and the number of buyers operating in the district declined. However, just as most fishermen were leaving Bristol Bay figuring the sockeye season was over, another pulse of fish came storming into Ugashik River July 26. Catches by the remaining drift fleet averaged 910 sockeye/delivery July 26. Sockeye catches by setnet fishermen averaged 289/delivery July 26 and 296/delivery July 27, confirming that this pulse of fish was committed to Ugashik River and not bound for some other area.

Sockeye landings in the district continued through early September reaching a preliminary cumulative total of 4,369,432 fish, the third largest harvest on record. Sockeye escapement counts at Ugashik tower continued through July 28, eventually totaling 1,080,858 fish. An additional 5,325 and 8,885 sockeye were later counted in the Dog Salmon and King Salmon Rivers during aerial surveys August 11, bringing the Ugashik drainage sockeye escapement total to 1,095,068. Peak day at the counting tower was July 12 with a daily tally of 207,000 sockeye. Based on approximately 2,200 fish sampled at the counting tower, the sex ratio in the escapement was 40% males to 60% females.

Age composition of the Ugashik District sockeye run was as follows:

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

The six year old fish (Table 3) were progeny of the 1988 escapement of 654,000 fish (Appendix Table 16), and the five year old fish were produced by a parent escapement of 1,713,000 in 1989. Approximately 2% of the escapement was comprised of jacks.

Fishermen in the Ugashik District harvested 80% of the sockeye run in 1994, far above the 1949-93 mean

exploitation rate of 60%. Peak day in the fishery based on volume landed was July 9 with approximately 569,000 sockeye landed. However, the sockeye run was strongly bi-modal with a second peak July 13-14. Peak catch per hour occurred July 13 with 468,165 sockeye landed in 11 hours (42,560 hour). Peak reported catch-per-unit-effort in the district occurred July 6 for drift gillnets (2,036 sockeye/delivery) and July 9 for set gillnets (358 sockeye/delivery). Based on preliminary catch totals it appears drift gillnets took 94% of the sockeye harvest while set gillnets took 6%. The 34-year (1960-93) average percentages of the sockeye harvest by gear type are 91% for drift and 9% for set gillnet respectively. The fishery was open 176 hours (31%) of the 576 hours available during the emergency order period.

The commercial harvest of other salmon species during the season totaled 73,000 fish, approximately 2% of the total district harvest. The chinook harvest of approximately 3,800 fish was almost right at the 1974-1993 (20-year) average of 3,700 (Appendix Table 6). The chum harvest totaled 49,000 fish, somewhat below the 20-year average harvest of 61,000 (Appendix Table 7). The pink salmon harvest was negligible, normal for this district (Appendix Table 8), and the coho harvest totaled approximately 20,000 fish, well below the 1984-1993 average harvest of 37,000 (Appendix Table 9). The main reason for the lackluster Ugashik District coho harvest was a record setting coho catch in the nearby Cinder River Section of the Alaska Peninsula District. The better catch results "next door" attracted buyers and nearly the entire fishing fleet away from the Ugashik District during most of the coho season.

Escapement surveys flown in the Ugashik District August 11 yielded total indices of 9,199 chinook, and 31,567 chums. The chinook index was well above the 1980-1993 mean of 5,100 fish, and the chum index was a little below the 1980-1993 mean of 38,000 fish. The chinook run to the district appears to have been above average while the chum run was smaller than average. No aerial surveys were flown this season to document coho escapements in the mainstem Ugashik and King Salmon Rivers due to budget constraints, but local drainage residents reported coho were fairly abundant in spawning areas.

A total of 21 buyers operated in the district during the season (Table 34). Nearly all the catch was either frozen on floating processors or tendered to other districts for processing. No new shore-based canning or freezer operations were operated in the district. There were no reported instances of lack of processing capacity during the sockeye run (as mentioned above processing was a little scarce at times during the fall coho season). The quality of sockeye in the catch was reportedly good again this season even though the run continued late into July.

In retrospect, the salmon fishery in the Ugashik District was very productive in 1994. The strategy of authorizing a little more fishing ti[illegible] prior to the main arrival of sockeye in Ugashik River worked well this season. It held the interest of both processors and fishermen in the district and probably helped keep escapement levels closer to the point goal than over the past couple of years. Interception of sockeye bound for other districts may have increased

due to this management approach but that won't be determined until the results of Stock Identification studies are completed over the winter of 1994-95. The much higher percentage of Age Group 2.3 sockeye appearing in the Ugashik District catch than in the Ugashik River escapement (catch 46% versus escapement 16%) would lead one to suspect an interception situation. If so, the most likely donor this season would have been the Egegik District where approximately 62% of the Age Group 2.3 sockeye were accounted for. Whether or not Ugashik bound sockeye were intercepted in significant numbers in other nearby fishing districts is currently unknown. The preseason concerns regarding processing capacity for the district did not materialize once the season began. Both gear groups had markets in the district for the entire sockeye season. The new Assistant Area Biologist, Keith Weiland, spent the season becoming familiar with the district and has been assigned management of the Ugashik District for the 1995 season.

Nushagak District

The forecast for the 1994 chinook salmon run to Nushagak District totaled 151,000 fish, 88% of the recent 20-year average run of 171,000 to this district (Appendix Table 30). The chinook forecast is typically within 20% of the actual run size. The Nushagak fishery is managed for an inriver goal of 75,000 chinook in the Nushagak River, which 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 76,000 fish was available to the commercial and lower river subsistence fisheries. In recent years the subsistence harvest has averaged nearly 12,000 chinook (Appendix Table 39). Subtracting the average down-river subsistence harvest and an allowance for incidental harvest of chinook salmon (15-20,000 fish) in the sockeye fishery, approximately 45,000 to 50,000 fish were available for a directed commercial fishery.

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 5.3 million salmon. The forecast included 2.3 million for Wood River, 1.5 million for Igushik River, and 1.5 million for Nushagak/Mulchatna River runs (Table 1). The projected inshore harvest totaled 3.6 million sockeye, 20% greater than the recent 10-year average of 3.0 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. Analysis of past age compositions have 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. Where the 3-ocean component is projected or found to comprise 60% or more of the age composition of the escapement, the goal may be reduced 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 56% of the 1994 sockeye run to the Wood River system was expected to be 3-ocean fish, while 44% was expected to be 2-ocean sockeye. The actual age composition of the 1994 Wood River escapement totaled 56% 3-ocean and 44% 2-ocean sockeye (Table 2); no adjustment was necessary and the escapement goal remained at 1.0 million. Nushagak and Igushik River sockeye runs are managed to achieve biological escapement goals of 550,000 and 200,000 spawners.

The outlook for coho salmon in the Nushagak District was fair to poor. A return of 137,000 fish was expected based on past relationships between spawners and returns. The commercial fishery for coho salmon is managed to achieve a provisional inriver escapement goal of 100,000 coho at Portage Creek sonar, which includes a biological escapement goal of 90,000 spawners and additional fish for inriver subsistence and sport harvests. A projected surplus of 37,000 coho was available for lower river subsistence and commercial harvests based on spawner return analysis. However, a return of only 15,000 coho was projected based on sibling returns. Zero age-1.1 fish were observed in escapement samples at Portage Creek. Consequently, the outlook for the primary age group (age-2.1) was essentially zero.

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 they are exposed to freshwater. Fishing is allowed in early June to ensure quality, and to allow harvest while fish are at their peak value to the industry, before run size can be estimated. With the marked improvement in the chinook runs in 1992 and 1993, and forecasted harvestable surplus, a conservative amount of fishing time was anticipated before escapement rates became significant.

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 large forecast for the Igushik River component prompted an aggressive management strategy designed to increase exploitation on that stock. 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 three years. Therefore it became more imperative to increase exploitation of the Igushik stocks in 1994. Fishermen were advised to anticipate openings in the Igushik Section to harvest sockeye surplus to the Igushik escapement goal.

Due to the poor outlook, low sibling return in 1993, poor recent brood year production, declining run size and poor success in achieving desired escapement levels, fishermen were advised prior to the season that little, if any, directed commercial fishing would take place for coho salmon.

Chinook escapement rates were intensively monitored in season using subsistence catches on local beaches and at

Lewis Point, and sonar enumeration counts at Portage Creek. Since a limited commercial chinook fishery in early June was likely, an emergency order was issued on May 19 allowing residents the opportunity to harvest subsistence salmon in the commercial district from May 20 through June 7 (Table 12). Subsistence catches of chinook had been reported on Dillingham beaches by May 27.

The first large subsistence catches of chinook were reported near Dillingham, in Wood River and in the commercial district on June 6. Catch rates averaged 14 chinook per net on the beaches near Dillingham. The first commercial opening of 1994 was announced for June 8 following the subsistence catches. Winds were strong (20-30 k) from the northeast during the opening, especially in the upper district. The harvest of approximately 9,700 chinook (Table 17) by 147 vessels and 28 set nets during that fishing period was the highest documented for that date (previous max = 7,617 chinook). Quality was marginal, based on reports from several buyers and fishermen of a large number of blushed chinook.

Winds remained calm throughout the next five days, and subsistence harvests and escapement rates at the Portage Creek sonar remained very low. Since the likelihood of a commercial opening was not imminent, the district was opened to subsistence fishing for a 25-hour period beginning June 13. Less than 2,000 chinook had passed the Portage Creek sonar through June 15, lagging the expected level by five days (Table 26).

Wind increased from the south on June 15, followed by an increase in subsistence catches that evening at Dillingham. Nets at Kanakanak Beach averaged 4-5 fish per net, while those at Scandinavian Beach netted 10-35 fish each. By the morning tide on June 16, nets averaged 17 and 22 chinook per net at Kanakanak and Scandinavian Beaches, and one fisherman reported his catch at 80 chinook. Subsistence catches on the same tide at Lewis Point averaged 7-10 fish per net - the first significant harvest there in several days. Sonar counts at Portage Creek finally began to increase at 11:00 a.m. June 16.

Preliminary estimate of the June 16 escapement was 9,600 chinook, a record level for that date. Cumulative escapement was estimated at that time at over 12,000 chinook. Through 8:00 a.m. June 17, an additional 14,000 salmon had passed the sonar, most of which were assumed to be chinook. Due to the sharp pulse of fish at the sonar, chinook escapement was estimated to be greater than desired levels, based on average run timing.

The second commercial opening of the season was announced to begin the evening of June 17 for 11 hours. The resulting chinook harvest of over 52,000 fish was the largest ever documented for a single period in Bristol Bay. The chum harvest (21,543 fish) was well above average as well. An aerial survey during the opening observed 290 drift boats and 84 set nets fishing, the highest drift effort observed during the 1994 season. Following the second opening, the cumulative harvest totaled 62,000 chinook salmon, well above the level available to the directed

fishery, based on the pre-season forecast.

Sonar counts declined the evening of June 17, but the estimated escapement through that date of 22,000 chinook, like the chinook harvest, was well above the expected level. Subsistence harvests and sonar rates on June 18 dropped considerably, and remained low but steady through June 21.

Cumulative escapement through June 21 totaled 34,000 chinook, and escapement rates began to increase again early June 22. Subsistence catches of chinook salmon improved to moderate levels on the Dillingham beaches the afternoon of June 21, and again on the morning tide June 22. More significantly, subsistence catches at Lewis Point averaged greater than 40 chinook per net on the morning tide - the highest rate reported at that location to date. Those subsistence catches indicated another large movement of fish into the escapement, and the high escapement rates at the sonar were expected to continue. The third opening of the season was scheduled for 10 hours, beginning at 12:30 a.m. June 23.

Fishing effort had decreased to 240 drift boats, and the harvest of 11,500 chinook was much lower than the previous harvest, but still over twice the average for that date. The sockeye harvest of 17,000 fish was a notable increase since the prior opening, and the chum harvest of 37,000 fish was again above average.

Sockeye were beginning to appear on June 22 at the Wood River tower and at the Igushik River test site. Subsistence catches several days prior contained small numbers of sockeye, and as many as 10 per net. On the afternoon tide June 22, over 40 sockeye were reported in one subsistence net on Scandinavian Beach. Mesh size was not restricted in any of the commercial openings to date, including the June 23 opening, to observe sockeye strength in the district. Reports from companies and fishermen indicated that approximately one third of the fleet was using small mesh in the June 23 commercial opening, but sockeye harvests and escapement through June 23 were comparable to expected levels.

Chinook escapement increased June 22, and totaled 42,000 fish through midnight, compared to an expected level of 14,000 fish. In fact, the largest percentage of the chinook escapement past the sonar for the same period in any prior year was 32%. Therefore, total escapement was projected to reach a minimum of 126,000 chinook, and it appeared probable that the escapement goal would be exceeded. The Nushagak District was opened again to commercial fishing for a 12-hour period, beginning at 1:30 a.m. June 24, with the intent of harvesting surplus chinook while the abundance of sockeye remained low.

Escapement rates for chinook salmon remained strong; escapement totaled 47,000 chinook through midnight June 23. Sockeye escapement totaled 10,000 fish in the Nushagak River, similar to the expected level of 11,600 fish

for that system. Preliminary reports during the opening in progress indicated some mixed sockeye and chum present in deliveries, but not a large increase in the abundance of sockeye. In response to the high chinook escapement rates, the opening in progress was extended an additional 12.5 hours.

Fishing effort continued to decrease to 189 drift boats, as observed during an aerial survey of the fishery June 24. Company reports during the opening indicated a predominance of chum salmon in the harvest, and an increase in chinook catches in the afternoon, coincident with an increase in wind. By evening, company reports indicated that the sockeye to chum ratio was climbing, but that chum salmon remained the predominant species in the harvest. Catches of chinook continued to remain strong. Approximately one-half of the fleet was reportedly using small mesh gear at this time. With southwest winds forecasted to continue, another extension was announced for an additional eight hours of fishing time, to close at 10:00 a.m. June 25.

Reports the morning of June 25 indicated that most of the fleet had anchored during the night. Escapement at Portage Creek through June 24 totaled 50,000 chinook, and subsistence catches on the Dillingham beaches increased on the morning tide (three nets at Scandinavian Beach averaged 26 chinook each) indicating another movement past the district. However, sockeye escapement at Portage Creek had not shown an increase. The total of 13,000 sockeye in the Nushagak River on June 24 was beginning to lag expected levels, and low numbers of sockeye were observed June 25 during aerial surveys of the lower Wood and Nushagak Rivers (Table 31). At 3:00 p.m. June 25, a 10-hour period was announced to begin at 3:00 a.m. June 26. Mesh size in this opening was restricted to large mesh gillnets only; gillnets with a mesh size of less than 6 3/4 in were prohibited to take advantage of chinook surplus to escapement needs yet protect early sockeye. Although the Board of Fisheries specifically granted the department this management tool in 1992, this was the first time that tool was used.

The mesh restriction had apparently succeeded in reducing sockeye exploitation; company reports throughout the opening indicated that chinook salmon dominated the deliveries. Sockeye escapement rates remained low, and the opening was extended four times, with small mesh nets prohibited, while chinook remained the most abundant species in the commercial harvests. Sockeye were reportedly beginning to increase in the harvest again on June 27, and fishermen were reportedly targeting sockeye near the outer district boundary with 6 3/4" nets. When preliminary catch estimates indicated that the sockeye catch had exceeded chinook in the June 27 harvest, the district was left to close at 2:00 p.m. June 28. Following the closure, management focused on sockeye salmon.

Early test fish indices at Port Moller were low and indicated a late or weak sockeye run to Bristol Bay. Nushagak District test boat operations began June 26 with little success through June 28 (Table 11). Aerial surveys of the Nushagak and Wood Rivers also documented very few fish moving into the rivers.

Sockeye were reported in the lower district near the closure on June 28, and a building volume of sockeye salmon outside of the district was reported throughout the next several days. Test fishing took place every tide beginning June 28 in the Nushagak District, and produced fair indices on morning tides June 29 and 30 near Nushagak Point, but fish appeared to be milling, and catches at other stations were very low. Escapement rates remained low at the Wood River tower and at Nushagak sonar through June 30, and the fleet remained on hold (Table 25 and Table 26).

The Igushik River tower count totaled 9,400 sockeye through 6:00 a.m. June 30. That level of escapement lagged expected levels by two days, but compared favorably to five day lags observed in Wood and Nushagak Rivers. An additional 14,000 fish were projected inriver, based on catch indices at the Igushik River test fish project (Table 32). Since escapement rates lead those in other rivers, and the inriver escapement was estimated at greater than 10% of the escapement goal (200,000), an opening was scheduled for July 1 in Igushik Section only in keeping with the intent of increasing exploitation on that stock this season.

The 9-hour Igushik opening in Igushik Section produced over 64,000 sockeye, a good volume for that section on July 1. Winds had increased from the southwest prior to the opening. Inriver test fish projections for the Igushik River decreased on July 1. However, the district test boat obtained the best indices to date on July 1, with fair catches above and in the upper portion of the district. Most fish appeared to be milling, and approximately one-half of the stations fished did not catch any sockeye. Escapement counts at Wood River and at Portage Creek began to increase noticeably for the first time of the season that evening. Bands of fish were observed in places during an evening aerial survey of the Nushagak River, despite poor survey conditions, and chum salmon appeared to be the dominant species passing the sonar.

Test fish catches early on July 2 continued to improve, but most fish still appeared to be milling. An aerial survey documented some sign in the lower Nushagak River that morning, and the first significant sighting of fish in the Wood River. Subsistence catches on the local beaches greatly improved on the morning tide, when one net at Scandinavian Beach reportedly caught over 200 sockeye. Throughout the morning, fish were reported on the Dillingham beaches and similar reports were called in from Clark's Point and Ekuk. Test boat indices early in the afternoon had improved greatly over the early morning drifts; the highest index to date (14,585) was recorded at Grassy Island. Sockeye were caught at all stations and all fish appeared to be moving upriver against an ebb tide. Escapement rates at the Wood River tower increased sharply during the afternoon, and that evening an 8-hour period was announced for the district, to begin at 9:30 p.m..

The Igushik inriver test fish project also documented the highest index of the season during the afternoon on July 2, indicating the strongest push yet into that river. Following the afternoon drifts, the inriver escapement was projected at 40,000 sockeye, and the tower count through midnight totaled 17,000 fish. With total escapement

estimated at 57,000 sockeye, the Igushik River continued to lead escapements in the other rivers, and another opening in Igushik Section became justified. Shortly after the district closure on July 3, an opening was announced for the Igushik Section in response to the apparent increase in escapement.

Preliminary reports for the district-wide opening indicated a harvest of approximately 184,000 sockeye. Through midnight July 2, escapement at Nushagak and Wood Rivers totaled 44,000 and 58,000 fish. From midnight through 2:00 p.m., 37,000 unapportioned counts had accumulated at Portage Creek. Based on the results of a morning aerial survey, counts in both rivers were expected to continue at the same rate through the remainder of the day, and cumulative sockeye escapement was expected to reach 200,000 sockeye through July 3. A 12-hour period was scheduled to begin at 10:30 p.m. in the entire district. The opening was expected to bring the ratio of catch to escapement into line with that of the forecast (2:1).

July 3 harvest totaled 249,000 sockeye. Preliminary reports indicated a harvest of 74,000 sockeye for the previous Igushik Section opening. A large push of fish was observed inriver at the test fish site and by evening July 3, escapement projected past the Igushik test site was 200,000 sockeye, equivalent to the escapement goal for that system. Since escapement in the Igushik River would likely exceed the escapement goal, an extension was announced early on July 4 to extend the period in progress in the Nushagak District for 24 hours in the Igushik Section only - the remainder of the district closed as scheduled at 10:30 a.m..

Overnight escapement rates had remained steady, but fishing was reportedly slow in the district opening July 4. Fishing success and catch to escapement ratio was unknown at the time Igushik Section was extended. Based on preliminary catch reports, sockeye harvest from the district-wide opening totaled 246,000 fish, while harvests during the Igushik Section extension declined from the previous Igushik Section opening to 39,000 sockeye. These estimates were based on daily processor reports, and are tallied by day in Table 17.

Escapement rates in Wood and Nushagak Rivers continued to remain steady through July 4, in spite of the commercial openings. Additional sign was observed at Grassy Island on a morning survey above the district, indicating steady migration past the commercial district. Harvests through July 3 and escapements in the three rivers through July 4 left a catch to escapement ratio of approximately 1:1. Therefore, another opening was scheduled for the entire district to increase the catch to escapement ratio to a level similar to that of the forecast.

The opening began at 10:30 a.m. July 5. The July 5 daily catch of 279,000 sockeye included fish caught in the Igushik Section opening and the district-wide opening. The 287 drift boats and 283 setnets observed fishing in the July 5 Nushagak District opening was the largest fishing effort documented during the sockeye season. Fishing appeared to be spotty for most of the period, but success increased prior to the closure.

Early on July 6, 250,000 sockeye were estimated past the Igushik River test fish site, and the tower count had increased to 48,000 fish. To limit further escapement in the Igushik River, the Igushik Section was again opened to commercial fishing for an extensive 24.5-hour period, beginning at 11:00 a.m. July 6. Harvest from that opening totaled nearly 68,000 sockeye.

Test boat participation was hampered due to the Igushik opening, but test fishing was conducted from a set net skiff early on July 6. Test fishing was limited to stations above the district, and indices were low at each station fished. Morning survey results indicated low numbers of fish in the lower Nushagak and Wood Rivers, and the Wood River tower and sonar counts had decreased overnight.

Another test boat was sent out in the afternoon, with much greater success. In fact, the highest index of the season was obtained during a drift at Grassy Island. Fish were caught at all stations and all appeared to moving upriver. At 6:00 p.m. an emergency order was issued, opening the Nushagak District for 10 hours beginning at midnight, July 6. The latest escapement totaled 271,000 and 170,000 sockeye in the Wood and Nushagak Rivers through 2:00 p.m.. Escapement in both rivers was less than one-third of the respective goals; rates at Nushagak sonar had remained low and steady, while those at Wood River had increased late morning; from 6:00 a.m. to 2:00 p.m., 34,000 sockeye had passed the tower. Although escapement in both rivers lagged expected levels by several days, passage rates were expected to increase soon as a result of the test boat success that afternoon.

Harvest from the July 7 opening was the largest to date and totaled 368,000 sockeye. Reports from fishermen indicated that a large volume of fish was present outside of the district and in the lower district early in the period, but catches in the upper district and on the beaches were poor. An afternoon test boat confirmed that movement in the upper district and above was light. Tower counts dropped off through the remainder of the day.

By late afternoon July 7, reports of heavy fish activity along the Ekuk Beach had been received over marine VHF. Reports continued to the same effect throughout evening for Ekuk and south in the district. By morning July 8, heavy sign was reported at Clark's Point and in Queen's Slough. A test boat left Dillingham at 5:00 a.m. July 8 and had very little success above the district, indicating that the volume had not moved above the district. Working south, a good volume of fish was documented at Nushagak Point, but fish were moving down river. Good indices were obtained along Combine Flats and Queen's Slough, but fish at those locations also appeared to be milling, not moving into the escapement.

Shortly after beginning an afternoon survey of the lower rivers at 1:00 p.m., heavy fish sign was observed just above the district along Grassy Island. Another test boat was deployed at 4:20 p.m.. After documenting few fish in the stations fished in Wood River, the test boat worked its way from Tule Point south towards the district. Heavy

indices were obtained along the shore from Tule Point south to the district, with over 32,000 index points at Picnic Point. Those test sets clearly indicated the largest volume of the season moving into the rivers.

After the large test sets, the district was opened at the next available tide stage for a 9-hour period. Fishing began at 1:30 a.m.. Wind had increased from the south overnight to 25 knots in Dillingham by morning. Early fishing success was low, based on reports from companies and fishermen. Catches in the upper district and on the beaches were reportedly good, but lower district drift catches were slow.

Through July 7, the catch to escapement ratio approximated 2:1. However, the strong push of fish evidenced by the July 7 test fish catches was likely to greatly increase escapement, in turn lowering the catch:escapement ratio. Weather was apparently decreasing fleet efficiency, and effort had declined based on a survey July 7. Large early morning subsistence catches on the Dillingham beaches July 9 confirmed that fish were continuing to move through the district in spite of the fishery in progress. At 8:00 a.m. July 9, with no chance to conduct an aerial survey above the district due to weather, an extension was issued for an additional 9-hour period, to close at 7:30 p.m. that evening.

Counts at Wood River tower began to increase the morning of July 9, and over 80,000 sockeye had passed the project between 6:00 a.m. and 10:00 a.m.. Counts continued into the afternoon averaging 20,000 fish per hour, and counts at Portage Creek began to increase as well. At 6:00 p.m., the fishery was extended for an additional 14.5 hours, and was scheduled to close at 10:00 a.m. July 10.

The movement of fish observed on July 8 and 9 was the largest of the season. Weather conditions and fishing success improved throughout July 9; the daily harvest totaled 574,000 sockeye and 11,000 chums, and the chinook harvest of 3,400 fish was the largest daily harvest for that species since the directed chinook fishery in June. Escapement on July 9 totaled 300,000 sockeye at Wood River tower; by midnight 65% of the Wood River escapement goal had been achieved. High escapement rates continued, and the July 10 count at Wood River totaled 140,000 fish through 10:00 a.m., bringing the cumulative escapement to 790,000 sockeye for that system. Escapement in the Nushagak River totaled 256,000 sockeye through midnight July 9, and 44,000 unapportioned fish were tallied July 10 through 6:00 a.m.. In response to the continuing high rates, the district was once again extended, this time for 26 hours, to close at 12:00 noon July 11.

Escapement rates remained high in Wood River throughout the afternoon July 10, and by 6:00 p.m., escapement totaled 950,000 sockeye at the Wood River tower site. Daily escapement at that time was estimated at 124,000 salmon in the Nushagak River, and the Igushik sockeye escapement totaled 104,000 sockeye. Given escapement rates throughout the day, the Wood River escapement goal was projected to be met overnight, and at 8:00 p.m. July

10, the fishery was extended for an additional 25 hours, to close at 1:00 p.m. July 12. The July 10 harvest of 434,000 sockeye was less than the harvest taken the previous day.

The Wood River escapement goal was reached early on July 11, and the sockeye escapement in the Nushagak River through July 11 was estimated at 413,000 sockeye. Although the Nushagak River had not achieved the escapement goal for that system, the fishery was extended throughout the next week to prevent Wood River escapement from greatly exceeding its goal. Catch rates varied throughout the remainder of the season, and fishing effort declined substantially. Daily harvests gradually declined to 37,000 sockeye July 14. On that date, several fishermen reported less than 50 boats in the entire district.

On Friday July 15, fishing in the Nushagak District was extended into the weekend, and on July 16, another emergency order extended the fishery until 9:00 a.m. Monday, July 18. Fishermen were advised that the fishery would continue on the regulatory post-emergency order schedule of five days per week until coho harvests became significant. Sockeye escapement in the Nushagak River had reached 79% of the goal at that time. The coho harvest at that point was quite low, but daily sockeye catches were extraordinary; sockeye harvests on July 15 and 16 were the largest ever documented for those dates.

Sockeye catches declined after July 16, but remained well above average. The July 17 harvest totaled 74,000 sockeye, and the daily coho harvest increased to 385 fish. Cumulative coho harvest at that time was above the expected level, and coho escapement in the Nushagak River totaled 1,097 fish, slightly better than the expected level of 800 fish. However, reports from fishermen on July 18 indicated that additional coho were being mixed with sockeye in deliveries, and that actual coho catches were larger than reported.

The July 18 sockeye harvest of 86,000 sockeye was a record for that date, and an additional 950 coho were harvested. Coho harvests increased July 19 to 1,560 fish. A record number of 48,000 sockeye were again harvested July 20, with an additional 3,300 coho.

Through July 19, preliminary estimates of coho escapement in the Nushagak River totaled 750 fish, compared to an expected level of 1,500 fish for that date. Weather was forecasted (8:00 a.m.) to deteriorate through July 20, with winds increasing to SE 25, raising the risk of increasing catch rates of coho salmon. At this point, an emergency order was written closing the district to commercial fishing at midnight, July 20. Sockeye harvests, although still at extraordinary levels for the time period, had been decreasing each day coincident with increasing coho harvests, coho escapement was lagging expected levels, and companies and fishermen indicated that the number of coho were actually under reported due to the relative volume of sockeye.

With further commercial fishing possible, but not imminent, the subsistence fishery in the commercial district was opened for several days on July 22 and again on July 26 and August 3. By August 7, coho escapement in the Nushagak River was estimated at only 22,982 fish, just over 50% of the 42,000 fish expected by that date. The escapement for the entire season, using the mean proportion and preliminary August 7 count, was projected to reach only 52,000 coho - approximately 50% of the inriver goal. On August 8, an emergency order was issued that limited subsistence fishing in the entire Nushagak River drainage, including the commercial district and the portion of Wood River below the dock at Dragnet, to three days per week. The emergency order became effective at 9:00 a.m. August 10.

Escapement rates began to improve on August 10 at Portage Creek, and on August 11, 29,000 coho passed the sonar site. Cumulative escapement through August 11 was estimated at 72,500 coho, which in turn increased the projected total escapement, based on mean run timing, to 123,000 coho. At 12:00 noon August 12, all restrictions on the subsistence fishery were rescinded by emergency order, and the commercial district was opened to subsistence fishing seven days per week for the remainder of the season.

The 1994 chinook return to the Nushagak District was the sixth largest on record, and 52% larger than the forecasted run (Appendix Table 2). The size of the run increased for the fourth consecutive year. The commercial harvest of 118,600 chinook salmon in the Nushagak District was the largest since 1983, the sixth largest ever, and 60% above the recent 20-year average of 74,000. Commercial openings were scheduled on nine days in June to harvest chinook salmon. Quality problems were evident from the first period, when blushed fish were present, and continued through June. Demand, similar to 1993, remained low on the fresh market and the price paid to fishermen averaged only $.47 per pound (Table 35). Chinook escapement totaled 95,954 in the Nushagak River, exceeding the inriver goal by over 20,000 fish.

Restrictions placed on small mesh gillnets (<6 3/4 in mesh) were used for the first time to harvest surplus chinook and protect early Nushagak River sockeye, with apparent success. Chinook to sockeye ratio in the harvests from June 23 through June 25 was 0.65:1, compared to a ratio of 1:1 for the period June 26 through June 28, when small mesh nets were prohibited. The mesh restriction enabled the harvest of over 14,000 chinook with a minimal incidental sockeye harvest. However, fishermen reported targeting sockeye and chum with 6 3/4" nets, in effect decreasing the effectiveness of this tool as a means of conserving sockeye.

The 1994 sockeye harvest totaled 3.43 million, 3% less than the forecast (Table 1). Escapement in Wood River totaled 1, 471,890 in Wood River, 47% above the escapement goal and the largest escapement to that system since 1980. Escapement past Portage Creek sonar totaled 509,326 fish, or 93% of the Nushagak River goal. In spite of opening Igushik Section during six days in the early portion of the sockeye season, Igushik River sockeye

escapement (445,920) exceeded the goal for that system for the sixth consecutive year. Preliminary reports indicated a sockeye harvest for all Igushik Section openings of approximately 300,000 fish.

Chum salmon cannot be managed in Nushagak District due to their complete overlap with the sockeye run. Due to a good demand on the fresh market, there was considerable interest by the industry in harvesting chums in 1994, and much of the harvest was flown out fresh. The final harvest of 293,000 chum was well below the 20-year average Nushagak District harvest of 527,000 fish (Appendix Table 7).

The preliminary chum salmon escapement at the Portage Creek sonar site was estimated at 379,000, slightly greater than the optimum 350,000 that appears to produce the best return (Appendix Table 31). Most of the chum salmon returning to the Nushagak District are four years old. Therefore, the 1990 escapement of 330,000 produced a return per spawner of roughly 2 to 1, depending upon the contribution from the other year classes. The 1994 chum salmon run was less than the 20-year average of 817,000 fish.

Pink salmon return to Nushagak systems in even years. Although pink runs have been low in recent years, runs have generally been increasing since 1986 (Appendix Table 33). This trend was not continued in 1994, however. In fact, the pink harvest of 9,000 fish was one of the lowest ever documented in the district during an even-numbered year, and the total run was the second lowest documented for even years, at only 200,800 fish.

The July 20 closure in 1994 was by far the most aggressive action taken for the conservation of coho salmon in the past several decades. Closures in recent years have typically occurred between July 23 and July 25, when daily sockeye catches are much lower. The strong late-season sockeye catches were an unusual complication in the management of the fishery. Sockeye continued to migrate through the district in spite of the commercial fishery. At the time of the closure, Wood River escapement totaled nearly 1.4 million. Following the closure, an additional 73,000 sockeye were documented past Wood River tower, prior to the termination of the project on July 24. The early closure did not greatly contribute to the escapement in Wood River in excess of the goal.

The 1994 season was the third year during which the subsistence fishery has been restricted due to low coho abundance. The effect of the restriction was limited, and resulted in only 24 hours during which fishing for subsistence was not permitted in the Nushagak River drainage.

Ultimately, 82,000 coho passed the sonar site before the project was terminated on August 25 (Table 26), 18% less than the inriver goal of 100,000 fish. Commercial harvest totaled 6,800, and, excluding lower river sport and subsistence harvests, the total run was less than the amount necessary for escapement (Appendix Table 34). 1994 marked the third consecutive year, during which escapement was monitored, that the coho run numbered less than

the inriver escapement goal. The majority of coho of four years old, and, like chum salmon that returned in 1994, most of the coho run was produced from the 1990 escapement of 163,000.

Counting towers at Wood River were operated from August 1 through August 25, courtesy of outside funding. The project was operated as part of a feasibility study to determine whether counting towers were a viable method for counting coho into Wood River, and, if so, to estimate coho escapement into the Wood River system. Although species identification problems occurred, 13,500 coho were estimated (Brookover and Brannian in press). Sockeye escapement was estimated for the time period at 11,400 fish. The sockeye escapement estimated in August was not included in total run summaries or brood year tables to be consistent with past year data.

Togiak District

The 1994 inshore sockeye run to the Togiak River was forecasted to reach 518,000 sockeye salmon, of which 66% were projected to be 3-ocean fish and 34% 2-ocean fish (Table 2). With an escapement goal of 150,000 at Togiak Lake, 368,000 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 1994 in the Togiak Section was similar to the average (1974-1993) harvest of 362,000 fish (Appendix Table 19). Therefore a relatively moderate management approach was indicated 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 goal was reached in 1993, commercial closures and mesh size restrictions were necessary; and runs since 1991 had increased only moderately. Therefore, restrictions similar to those applied to the chinook fishery from 1991-93 were planned for the 1994 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 in the parent year (1990) was estimated at only 21,000 fish, less than 50% of the escapement goal of 50,000 fish. Low parent year escapement was the basis for a cautious management strategy for coho salmon in 1994.

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 may be adjusted by emergency order as necessary to achieve desired escapement objectives.

Through several public meetings in Togiak, department staff reiterated the concern for chinook stocks within the district. Staff announced that fishermen should again anticipate a mesh size reduction effective the entire season. In addition, a closure was scheduled to begin Monday, June 21 in all sections of the district for approximately ten days, to reduce the exploitation on chinook salmon. Staff also announced that since no inseason indicators of chinook escapement are available, and the sockeye catch typically begins in earnest during the week of July 1, the management focus would shift then to sockeye salmon. The regular fishing schedule would resume on or about July 1.

Prior to the season, the maximum allowable gillnet mesh size was reduced by emergency order to 5 1/2 inches for all sections of the Togiak District, and on June 1 fishing opened on the regular weekly schedule.

The first landings of the 1994 season occurred on June 3 (Table 20). By the close of fishing on June 17, the cumulative chinook catch in Togiak Section (926 fish) was well below the historical average for that date. Effort (number of deliveries) was relatively low and catch rates (number of fish per delivery) had started out above the long-term average, but had declined to average. No definitive information on run strength was apparent at this point in the season, but a conservative approach was still called for to achieve the escapement goal. The department announced via public radio on June 17 that the Togiak District would close to commercial fishing from June 20 through June 30, as planned.

Interest in subsistence fishing within district waters has been expressed previously, in numerous public meetings. In the June 17 announcement, department staff also announced that waters of the district, although closed to commercial fishing, would open for a 2-day subsistence fishing period beginning 9:00 a.m. Monday, June 20. Subsistence fishing was permitted to provide residents an opportunity to harvest salmon for home use and to collect catch information that might provide an indication of run strength.

Subsistence chinook catches were reported to be good at the beginning of the week. Nets averaged 10-20 chinook/net. while subsistence sockeye catches were minimal (1 or 2 fish/net).

Initial test catches at Port Moller were less than during recent years, and commercial sockeye catches in the Shumagin and South Peninsula were relatively weak. These early signs indicated a potentially late or weak sockeye run to Bristol Bay.

A second subsistence period was announced for district waters June 23, to begin at 9:00 a.m June 24 and end at 9:00 a.m. June 26. Reports from this period indicated fair catches of both chinook and sockeye, increasing from those at the beginning of the week. Based on reports from the two subsistence openings, passage rates for both species of fish appeared to increasing as the week of closure progressed.

The first aerial survey of the Kulukak and Togiak Rivers was conducted June 28 under poor conditions, with small schools of sockeye mixed with chums observed in the lower portions of Togiak River. Sockeye and chinook estimates in the Kulukak River were above average.

Sockeye salmon escapements exceeded the goal in the Togiak River from 1991-93, when restrictions were implemented early in the season 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 run strength of sockeye could be determined in season; the staff announced on June 28, a 36-hour opening beginning 12:01 a.m., Friday, July 1 until 12:00 noon, Saturday, July 2.

The daily sockeye harvests and catch per delivery, during this 36-hour opening, were low; indicating a weak and/or late sockeye run to both Togiak and Kulukuk Sections. Cumulative catch had reached 8,300 in Togiak (less than 20% of the average), and 2,800 in Kulukuk (approximately 36% of the average) through July 2.

A second aerial survey was conducted on July 3; good conditions prevailed in the Togiak drainage and only 700 fish were counted. Poor survey conditions were encountered in the Kulukuk drainage and only 300 sockeye were observed.

The weekly fishing period beginning July 4, following the 36-hour opening, adhered to the normal fishing schedule in all sections of the district. Daily commercial catches of sockeye salmon in the Togiak Section continued well below average levels, with effort running slightly above average. Tower counts at Togiak Lake began well below expected numbers for the first week of operation. Kulukuk Section catch rates and number of deliveries had risen to above average during the week, indicating moderate run strength there, and run timing was later than normal. A regular weekly fishing period with no restrictions or extensions was fished ir all sections. No commercial fishing effort was reported in sections of the district west of Togiak.

The third aerial survey of the season was conducted on July 6, under excellent conditions. Fish were observed in all sections of the Togiak River; the inriver abundance of sockeye salmon had increased to approximately 3,600 fish

during the week of commercial fishing. The number of sockeye salmon in Kulukuk River and Kulukuk Lake had reached 9,000 fish during the weekly fishing period.

When the district opened on July 11, daily catches and effort levels were above the long-term average, although catch per delivery was still below average.

Daily escapement past the counting towers on the Togiak River began to increase substantially during the week of July 11; the cumulative escapement reached 26,000 by the end of that week, which was tracking about 6 days behind the expected level along with cumulative harvest. Improved conditions contributed to a higher number of fish (22,000) observed in the Togiak River on an aerial survey on July 13, indicating high passage rates would continue. Based on the increased showing of fish in the river, and elevated catch rates in the commercial fishery, the district was extended 27 hours through 12:00 noon on Saturday, July 16. All sections would resume the regular weekly schedule on Monday, July 18.

By July 16, the cumulative sockeye harvest for Togiak Section had reached 123,000 - only 30% of the pre-season harvest forecast; historically, 65% of the harvest has occurred by this date. Run timing for Togiak Section appeared to be later than normal. The high daily catches, combined with almost double the normal effort, continued in the Kululuk Section; and the cumulative catch there totaled 47,000 sockeye. Run strength for Kulukuk was showing to be stronger than normal.

An aerial survey on July 19 revealed over 30,000 sockeye holding in the lower two sections of the Togiak River. This would likely result in continued high passage rates for at least the next 10 days. The cumulative sockeye escapement through July 19 was 37,000 fish. The Kulukuk River drainage contained over 15,000 sockeye towards the desired escapement level of 35,000.

A normal fishing schedule without modification occurred for the week of July 18. High effort levels and above average daily sockeye catches, occurred in both Togiak and Kulukuk Sections. Passage rates at the counting towers continued to build, and 11,000 fish were counted on July 21.

Cumulative sockeye escapement past the counting towers had exceeded 62,000 through the close of the period on July 22; and after reviewing the harvest rates for the 4-day opening, it was apparent that the sockeye run to the Togiak River was close to forecast and late. Considering lag time from the fishery, and estimating the exploitation rate on the fish passing through the fishery, it was apparent that additional fishing time over the regular schedule was called for to harvest the surplus.

On July 23, an announcement opening the fishery 4 1/2 hours early on Monday, July 25 was issued. Catch rates and daily catches were assessed early in the opening; both exceeded the long-term average by a considerable margin. Continued high passage rates were observed at the counting towers; the escapement had reached 76,000 by the end of the first day of the weekly fishing period.

An aerial survey on July 26 showed a decline in numbers of sockeye visible in the Togiak River from the peak survey on July 19; however, the passage rates at the counting towers remained high. On July 27, the daily count increased to 9,000 fish, bringing the cumulative total to over 90,000 fish.

By July 28, the third day of the weekly period, it was apparent that an extension was necessary to harvest surplus sockeye, and achieve the escapement goal. Another announcement was issued extending the Togiak Section an additional 39 hours through 12:00 midnight, July 30. Although catch rates in Kulukuk were still high, the aerial survey had not shown a large escapement; therefore no extension was announced for Kulukuk or other sections west of Togiak.

The daily sockeye count for July 28 in the Togiak River peaked at 16,000 fish, and catch rates remained well above average throughout the extension. By the close of the period, on July 30, the cumulative escapement had reached 120,000; and the cumulative catch had reached 279,000 sockeye salmon.

The regular fishing period opened 9:00 a.m., Monday, August 1. Passage rates of sockeye past the Togiak counting towers declined from the July 28 peak, but continued to remain at 4,000 to 5,000 per day, yielding a cumulative escapement of 129,000 through August 1. Daily catches continued to surpass long-term average levels throughout the weekly period.

By August 4, although passage rates were declining slightly, the daily tower counts still exceeded 3,000 fish per day. The escapement goal was projected to be achieved within the next few days. Daily catches and catch rates in the fishery were still well-above average for this date, and additional fishing time was warranted to harvest fish surplus to the escapement goal. An announcement was issued August 4 extending the fishing period 39 hours, through 12:00 midnight, August 6.

Through the close of fishing on August 6, cumulative sockeye escapement in the Togiak River had reached 148,000 fish. The commercial sockeye harvest in the Togiak section had increased to 312,000 fish or 85% of the forecasted harvest. Kulukuk Section sockeye harvest had reached 75,000 fish, which was 75% over the long-term average for that date. With the sockeye escapement goal virtually achieved, and a cautious management strategy planned 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 8. The daily catch for August 8 was 1,200 sockeye and 800 coho. Sockeye daily catches declined through the week, while daily coho catches increased and were expected to dominate the catch by the end of the period. Effort was higher than normal for this date, due to the late sockeye run. Exploitation of coho was thought to be higher than average. On August 9, an announcement was made reducing the weekly fishing period by 24 hours in the Togiak section.

The commercial catch rates provide the only indication of coho run strength available in early August. Aerial surveys are generally not productive for coho salmon in the Togiak River until late August 20, due to low numbers of coho and high numbers of other salmon species until then. Daily catch and effort levels for the reduced weekly period were double the average, and catch per delivery was at or above average. The cumulative harvest of 7,600 coho for the Togiak section through August 11 was about three times the average for that date; coho run strength appeared to be good.

The weekly commercial fishing period began on August 15 without modification. Several buyers were operating mainly in the Togiak section. The daily catches, and catch per delivery continued at approximately double the average levels, supporting the impression of a moderately strong coho return.

The weekly fishing period opened on August 22. An aerial survey flown that day documented less than 4,000 coho in the Togiak River mainstem. On August 23, the daily catch surged to over 12,000 coho, bringing the cumulative harvest to 47,000 fish in the Togiak Section. Although the coho catch was relatively strong, the elevated effort levels, and low numbers of fish observed in the river, caused concern regarding the exploitation of coho throughout the district. An announcement was issued on August 24, reducing the weekly period in all sections by 24 hours.

Catch rates for the week of August 29 were still unusually high; effort was 3 to 4 times the average level. Only 9,000 coho were observed in the Togiak River during an aerial survey on August 29. The coho escapement observed in the Togiak River, was below the expected level (expected level = 10,000, based on aerial survey results obtained when the Togiak River escapement goal has been achieved for coho salmon). An emergency order was issued on August 30 reducing the weekly fishing period, again by 24 hours. The commercial fishing period closed 9:00 a.m., Thursday, September 1. The cumulative harvest had reached 81,000 coho, which was 3 times the average harvest for that date. Catch per delivery had declined to average levels.

Effort levels were still well above average when the weekly commercial fishing period opened on September 5. Daily catches for the first two days accounted for an additional 4,000 coho. To ensure that desired escapement

levels would be achieved for coho systems throughout the district, the last emergency order was issued shortening the weekly period by 24 hours in all sections.

Fishing effort, based on the number of deliveries, was below average from the beginning of the season until the extended closure in late June. However, effort during July increased dramatically and continued well above average as fishermen transferred to Togiak District after sockeye runs had peaked in other districts. The largest observed drift effort was documented July 26, with 93 vessels actively fishing in Togiak Section. The largest observed setnet count also occurred on July 26, with 73 setnets in Togiak Section. In Kulukak Section, the largest effort observed occurred on July 19, with 5 drift vessels and 12 setnets counted. The July 26 district total of 73 setnets confirmed the rise in setnet effort that has occurred over the past several years. The 265 deliveries (set and drift combined) that occurred on July 26 comprised the peak number in Togiak Section, and 59 deliveries also on July 26 in Kulukak comprised the largest number in that section.

The preliminary district sockeye harvest totaled 401,052 fish (Table 20), the lowest since 1990, and slightly below the 1974-1993 average of 416,000 (Appendix Table 5). The Togiak Section sockeye catch (321,293) was 12% below the 20-year average, while the Kulukak sockeye catch (77,410) was 65% above the long-term (1974-1993) average for that section (Appendix Table 19).

Escapement enumeration at Togiak Lake ended on August 9 when the tower project terminated. Togiak Lake escapement was estimated at 154,752 sockeye, 3% 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 174,172 sockeye. This escapement plus the Togiak Section catch yielded a total run to Togiak Section of 495,465 sockeye, 5% less than the preseason forecast. Escapement into the Kulukak Section totaled 29,740, 18% over the recent 10-year average.

The 1994 Togiak District harvest of 10,629 chinook was approximately 65% of the 1984-1993 average (Appendix Table 6). For the second time since 1985, the chinook escapement in the Togiak River achieved the desired goal (10,000). The escapement of 15,115 chinook was at least partially due to the restrictions imposed on the commercial fishery. Commercial exploitation of the Togiak River stock in 1994 was 39% (not considering sport and subsistence harvests), less than the average (1980-1993) of 60%. Postseason aerial escapement estimates of chinook salmon on the spawning grounds were comparable to long-term average levels in most systems in the district. Escapement estimates totaled 2,088 for Kulukak River, with an additional 2,115 estimated in the Quigmy, Osviak, Matogak, Negukthlik, and Ungaliktniuk Rivers. The total district escapement of 19,353 chinook is the highest documented since 1984, 19% above the long-term average, and 51% higher than the 1984-1993 average of 12,776. The combined total run to Togiak District of 29,982 chinook salmon was 2% above the recent 10-year

average, and improved for the third consecutive year. It was the highest documented since 1985 (Appendix Table 30).

The 1994 Togiak District chum harvest of 232,492 was similar to the 1974-1993 average (Appendix Table 7). The commercial catch combined with the district-wide aerial escapement estimate of 229,470 fish produced a total run of 461,962 chum, approximately 96% of the 1974-1993 mean (Appendix Table 31).

The 1994 pink salmon catch of 70,029 fish was 71% above the recent (1984-93) even year average for the Togiak District.

The 1994 commercial catch of coho salmon in the Togiak District (96,606 fish) was the largest since 1984, and twice the 1980-1993 average. Post-season 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 fair to good. Comparative counts from previous years are provided in Appendix Table 34.

1994 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. 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 1994, only gillnets were recognized as legal subsistence gear, except in the Togiak district 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 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. The Nushagak commercial district, starting in 1988, has been opened for subsistence fishing by emergency order during extended commercial closures, and this year the Togiak, Ugashik, and Egegik commercial districts were opened by emergency order during extended commercial closures or before the first commercial opening.

Inseason Management

District-wide, 13 emergency orders relating to subsistence were issued, nine in the Nushagak drainage (Table 12). Within the Nushagak commercial district subsistence fishing was allowed by emergency order from 6:00 a.m. May 20 until midnight June 7 and 4:00 p.m. June 13 until 5:00 p.m. June 14. In addition, the Dillingham beaches were opened by emergency order for seven day per week fishing from 9:00 a.m. June 16 until 9:00 a.m. July 2. In the past, the Dillingham beaches have been restricted to a three day per week schedule from June 16 to July 17 by regulation. This regulation was adjusted by the Board of Fisheries in 1994, and was implemented through emergency order to reflect the board's intent, shortening the duration of the three day per week schedule on the Dillingham beaches from July 2 to July 17. Subsistence fishing was again authorized in the Nushagak commercial district beginning on July 22 after the district was closed to commercial fishing on July 20. Subsistence fishing was allowed from 9:00 a.m. July 22 until 3:00 p.m. July 25; 4:30 p.m. July 26 until midnight July 28; and 9:00 a.m. August 3 until 6:00 p.m. August 6. Due to poor coho returns, an emergency order effective August 10 reduced the fishing time in the Nushagak River to three 24-hour openings per week while at the same time opening the commercial district to subsistence fishing on the same three day per week schedule. This emergency order was rescinded on August 12 at noon, and the commercial district was open to subsistence fishing continuously from noon on August 12 until midnight September 30, due to improved coho returns.

In the Togiak commercial district emergency orders authorized subsistence fishing from 9:00 a.m. June 20 until 9:00 a.m. June 22 and 9:00 a.m. June 24 to 9:00 a.m. June 26. One emergency order opened the Egegik commercial district to subsistence fishing on a 9:00 a.m. Monday to 9:00 a.m. Friday schedule, May 16 to May 31. Mesh size could not be larger than 5-1/2 inches. The Ugashik commercial district was opened by emergency order for weekly subsistence fishing from 9:00 a.m. Monday until 9:00 a.m. Friday, May 16 to May 31.

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 the 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 are 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. In 1994, a total of 1,193 permits were issued for Bristol Bay; the largest number were for the Nushagak and Naknek/Kvichak districts. All districts, except Togiak, issued more permits in 1994 than the average for the past ten years, due in part to permits being available to all state residents.

Harvest

The total Bristol Bay subsistence salmon harvest in 1994 was 157,607 fish. This number is below both the recent 20-year and 10-year average of 169,062, due primarily to the sockeye harvests. The chinook and coho harvests were above the recent 10-year averages.

Most of the harvests were taken in the Naknek Kvichak (58%) and the Nushagak (34%) districts. The Naknek Kvichak total harvest of 92,275 fish was somewhat below the recent 10-year average, 96,409. In the Nushagak District the total harvest was 54,426, just above last years 20-year low of 53,358, the recent 10-year average being 62,147. All species, except chinook salmon, were harvested in the Nushagak District at levels below their recent 10-year averages, with the sockeye harvest of 26,501 near the historical lows of 23,600 in 1966 and 24,100 in 1972. The Nushagak chinook harvest of 15,490 was above the recent 10-year average of 12,372 fish. Harvests of all species except chinook salmon in the Togiak District were below the recent 10-year averages. Harvests in the Ugashik District have remained stable over the past nine years. In the Egegik District, the total salmon harvest has increased substantially since 1991. In 1994, Egegik harvests of all salmon species was above recent 10-year averages, and in the case of coho salmon it was double the 10-year average.

In 1994, the subsistence salmon harvest was composed of 76.6% sockeye, 11.7% chinook, 3.9% chum, 6.0% coho, and 1.8% pink. This harvest represents 0.3% of the total 1994 salmon run, and 0.4% 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, 1994 projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 1994.[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]
NAKNEK-KVICHAK DISTRICT										
Kvichak River	17,783	22,178	-20%	8,000	6,000-10,000	8,338	-4%	9,783	13,841	-29%
Branch River	490	633	-23%	185	170-200	243	-24%	305	390	-22%
Naknek River	3,878	3,023	28%	1,000	800-1,400	991	1%	2,878	2,032	42%
Total	22,151	25,834	-14%	9,185	6,970-11,600	9,572	-4%	12,966	16,263	-20%
EGEGIK DISTRICT	18,852	12,696	48%	1,000	800-1,200	1,968	-49%	17,852	10,798	65%
UGASHIK DISTRICT	5,575	5,450	2%	700	500-900	1,081	-35%	4,875	4,369	12%
NUSHAGAK DISTRICT										
Wood River	2,350	2,988	-21%	1,000	700-1,200	1,472	-32%	1,350	1,516	-11%
Igushik River	1,474	1,311	12%	200	150-250	446	-55%	1,274	865	47%
Nushagak-Mulchatna	1,485	1,560	-5%	550	340-760	508	8%	935	1,052	-11%
Total	5,309	5,859	-9%	1,750	1,190-2,210	2,426	-28%	3,559	3,433	4%
TOGIAK DISTRICT	518	495	5%	150	140-250	174	-14%	368	321	15%
TOTAL BRISTOL BAY	52,405	50,334	4%	12,785	9,630-16,160	15,221	-16%	39,620	35,184	13%

[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 seperatley 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.
[b] Includes Mother Goose and Dog Salmon River systems.

Table 2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 1994.

District and River System	Age Class (Brood Year) 1.2 (1990)	2.2 (1989)	2-Ocean	Age Class (Brood Year) 1.3 (1989)	2.3 (1988)	3-Ocean	Other	Total
NAKNEK-KVICHAK DISTRICT								
Kvichak River	3,099	11,802	14,901	2,021	861	2,882	0	17,783
Branch River	233	49	282	186	22	208	0	490
Naknek River	869	775	1,644	1,264	970	2,234	0	3,878
Total	4,201	12,626	16,827	3,471	1,853	5,324	0	22,151
EGEGIK DISTRICT	631	7,402	8,033	1,750	9,070	10,820	0	18,853
UGASHIK DISTRICT	894	2,420	3,314	1,465	796	2,261	0	5,575
NUSHAGAK DISTRICT								
Wood River	917	119	1,036	1,250	64	1,314	0	2,350
Igushik River	223	81	304	1,108	62	1,170	0	1,474
Nushagak River	123	20	143	743	13	756	586	1,485
Total	1,263	220	1,483	3,101	139	3,240	586	5,309
TOGIAK DISTRICT	143	30	173	308	37	345	0	518
TOTAL BRISTOL BAY[1]								
Number	7,132	22,698	29,830	10,095	11,895	21,990	586	52,406
Percent	14	43	57	19	23	42		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, 1994.[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	1,501	18,466	19,967	10	1,563	535	2,108	22,075
	Percent	6.8	83.7	90.5	0.0	7.1	2.4	9.5	100
Branch River									
	Number	255	175	430	0	160	41	201	631
	Percent	40.4	27.7	68.1	0.0	25.4	6.5	31.9	100
Naknek River									
	Number	395	1,132	1,527	0	866	522	1,388	2,915
	Percent	13.6	38.8	52.4	0.0	29.7	17.9	47.6	100
Total	Number	2,151	19,773	21,924	10	2,589	1,098	3,697	25,621
	Percent	8.4	77.2	85.6	0.0	10.1	4.3	14.4	100
EGEGIK DISTRICT									
	Number	395	5,981	6,376	2	430	5,480	5,912	12,288
	Percent	3.2	48.7	51.9	0.0	3.5	44.6	48.1	100
UGASHIK DISTRICT									
	Number	338	2,427	2,765	12	370	2,180	2,562	5,327
	Percent	6.3	45.6	51.9	0.2	6.9	40.9	48.1	100
NUSHAGAK DISTRICT									
Wood River									
	Number	1,083	13	1,096	10	1,821	33	1,864	2,960
	Percent	36.6	0.4	37.0	0.3	61.5	1.1	63.0	100
Igushik River									
	Number	156	59	215	3	1,055	35	1,093	1,308
	Percent	11.9	4.5	16.4	0.2	80.7	2.7	83.6	100
Nush-Mulchat. River									
	Number	35	1	36	745	664	8	1,417	1,453
	Percent	2.4	0.1	2.5	51.3	45.7	0.6	97.5	100
Total	Number	1,274	73	1,347	758	3,540	76	4,374	5,721
	Percent	22.3	1.3	23.5	13.2	61.9	1.3	76.5	100
TOGIAK DISTRICT									
	Number	99	7	106	23	307	52	382	488
	Percent	20.3	1.4	21.7	4.7	62.9	10.7	78.3	100
TOTAL BRISTOL BAY[1]									
	Number	4,257	28,261	32,518	805	7,236	8,886	16,927	49,445
	Percent	8.6	57.2	65.8	1.6	14.6	18.0	34.2	100

1 Approximately 889,000 additional sockeye salmon of several minor age classes, or returning to minor Bristol Bay drainages, in 1994 are not included in this total.

a The inshore run data does not include the 1994 False Pass/Alaska Peninsula catch of Bristol Bay sockeye or any high seas by-catch of immatures.

Table 4. Inshore commercial catch and escapement of sockeye salmon, Bristol Bay, in numbers of fish, 1994.[a]

District and River System	Catch	Escapement	Total Run
NAKNEK-KVICHAK DISTRICT			
Kvichak River	13,840,448	8,337,840	22,178,288
Branch River	390,094	242,595	632,689
Naknek River	2,032,083	990,810	3,022,893
Total	16,262,625	9,571,245	25,833,870
EGEGIK DISTRICT	10,798,450	1,967,775 [b]	12,766,225
UGASHIK DISTRICT	4,369,432	1,095,068	5,464,500
NUSHAGAK DISTRICT			
Wood River	1,516,229	1,471,890	2,988,119
Igushik River	864,945	445,920	1,310,865
Nushagak-Mulchatna	1,051,834	508,186	1,560,020
Snake		20,920	20,920
Total	3,433,008	2,446,916	5,879,924
TOGIAK DISTRICT			
Togiak Lake	321,293	154,752	476,045
Togiak River/Tributaries		19,420	19,420
Kulukak System	77,410	29,740	107,150
Other Systems[1]	2,349		
Total	401,052	203,912	604,964
TOTAL BRISTOL BAY	35,264,567	15,284,916	50,549,483

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, 1994

District and River System		Catch [1]		Escapement [2]		Total Run
NAKNEK-KVICHAK DISTRICT						
Kvichak River						
Branch River						
Naknek River						
Total		12,213		0		0
EGEGIK DISTRICT		72		21,282 [a]		
UGASHIK DISTRICT		117		425		
NUSHAGAK DISTRICT						
Wood River						
Nushagak River				191,772 [b]		
Total		9,024		191,772		0
TOGIAK DISTRICT						
Togiak Section		63,609				0
Kulukak Section		5,350				0
Matogak Section		931				0
Osviak Section		139				0
Total		70,029		88,000 [c]		0
TOTAL BRISTOL BAY	0	91,455	0	301,479	0	0

[1] Inshore district catches are preliminary and escapement figures are final.
[2] Estimated by aerial survey unless otherwise noted.
[a] Tower count.
[b] Sonar count.
[c] Includes only Togiak River and its tributaries.

Table 6. Offshore test fishing catch indices and estimated inshore daily passage rate of sockeye salmon, Port Moller, Bristol Bay, 1994.

Date	No. of Stations Fished	Sockeye Catch	Running Mean Length (mm)	Index[1]		Passage Rate[2]	
				Daily	Cum.	Daily	Cum.
6/11	4	12	545	6	6	96	96
12	4	7	538	3	9	55	151
13	4	13	543	6	15	110	261
14	4	22	542	10	25	180	441
15	4	47	543	21	46	367	808
16	4	41	540	20	66	349	1,157
17	4	26	540	12	78	210	1,367
18	4	78	538	35	113	608	1,975
19	4	121	539	52	165	900	2,875
20	4	109	540	43	208	746	3,621
21	(0)	201	540	87	295	1,521	5,142
22	4	234	538	100	395	1,757	6,899
23	4	344	538	155	550	2,707	9,606
24	(0)	267	538	123	673	2,153	11,759
25	4	227	538	110	783	1,929	13,688
26	4	264	537	121	904	2,110	15,798
27	4	293	537	124	1,028	2,162	17,960
28	4	320	537	136	1,164	2,371	20,331
29	4	304	537	133	1,297	2,320	22,651
30	4	538	537	224	1,521	3,927	26,578
7/1	4	320	537	151	1,672	2,635	29,213
2	4	362	538	167	1,839	2,914	32,127
3	4	243	539	123	1,962	2,146	34,273
4	4	490	539	218	2,180	3,818	38,091
5	(0)	308	539	150	2,330	2,616	40,707
6	4	273	539	133	2,463	2,335	43,042
7	4	226	539	108	2,571	1,892	44,934
8	4	255	539	120	2,691	2,100	47,034
9	4	102	539	53	2,744	928	47,962

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 retirn per Port Moller index (1985, 1987-1993) of 17,500 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, 1994.

Date	No. of Stations Fished	Chum Catch	Index [1]		Passage Rate [2]	
			Daily	Cum.	Daily	Cum.
6/11	4	33	15	15	177	177
12	4	5	3	18	31	208
13	4	4	2	20	23	231
14	4	6	3	23	34	265
15	4	30	13	36	161	426
16	4	17	8	44	101	527
17	4	20	9	53	111	638
18	4	21	10	63	116	754
19	4	17	7	70	88	842
20	4	15	6	76	72	914
21	(0)	22	9	85	114	1,028
22	4	26	11	96	136	1,164
23	4	30	13	109	157	1,321
24	(0)	17	8	117	96	1,417
25	4	9	5	122	55	1,472
26	4	6	3	125	34	1,506
27	4	4	7	132	36	1,542
28	4	6	3	135	34	1,576
29	4	7	3	138	39	1,615
30	4	9	4	142	45	1,660
7/1	4	10	5	147	60	1,720
2	4	8	4	151	47	1,767
3	4	13	7	158	81	1,848
4	4	13	7	165	79	1,927
5	(0)	9	4	169	54	1,981
6	4	6	3	172	36	2,017
7	4	3	1	173	17	2,034
8	4	4	2	175	24	2,058
9	4	7	4	179	45	2,103

[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, 1987-1993) of 12,174 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, 1994. ▪

Date	Naknek R. Mouth	Pederson Point	Cutbank & Graveyard	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
06/24/93		7			93			169	96	56	28						
06/25/93	34	153							35	332	120						
06/26/93					319			373		47							
06/27/93		8			711				82								
06/28/93		5				18		1,297	671	235	569						
06/29/93	156	399		645	335	2,596		224	2,443			104					
06/30/93	171						937	1,089	297	592				104	5	18	160
07/01/93	198	74		349	1,253	1,003		2,122		212				10	660		

▪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, 1994.[a]

Index Area	Date
	No District Test Fishing Done in 1994.

[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, 1994.

Index Area	June			July				
	24	26	29	2	4	5	7	8
Two Miles North of Cape Grieg		0	0	998	629			
Cape Grieg (Nearshore)		0	14	833				
Four miles North of Smoky Point Nearshore		0			387	592		
Four miles North of Smoky Point (Outer line)			240	975				
Two Miles North of Smoky Point (Outer Line)								
Smoky Point Bar North Side Inshore		4	14	690	4	840	484	
Smoky Point Bar Offshore end			78		9	169	198	
Smoky Point Entrance	18		0		11 ♭	50	106 ♭	466
Mid Outer Line	128	4	45	13	4	236	1,378	
Bell Buoy								
Four Miles North of Cape Menshikof (Nearshore)								
Two Miles North of Cape Menshikof (Outer Line)	76	46	64	177	0	21		
Three Miles South of South Spit (Nearshore)	43	0	427	30	0	37	4	
South Spit (Mid Channel)	30	32	15	80	0	286	22	1,883
Dago Creek Mouth								
Pilot Point			0			4	89	
Outer South Channel				690	0	0	0	
Inner South Channel								
King Salmon River (Lower								
Dog Salmon River							157	1,795
Cutbank Below Ugashik								

♦ All indices expressed in number of fish/100 fathom hours to the nearest full index point.
♭ Average of two drifts.

Table 11. Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 1994.[a]

Date	Start Time	Wood River W	Wood River E.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Pile Driver	Queen Slough	Clark's Point	Ekuk	Ekuk Bluff	Ships Ch. N.W.	Middle Ch. N.W.	Snag Point	Peter Pan	Kanak-anak
06/26/94	19:22		670	0	0	389	0	0									
06/27/94	20:15	228	390 0	257	0	0		0									
06/28/94	21:14	0	267	0	0	0	0	0									
06/29/94	10:02	346	0	392 0	0	0	4,317	2,697 6,875 331		1,104	0	126	0 167	0 0 39			0 0
06/29/94	22:35	348	277	0 0	0	0	0	0									
06/30/94	10:49	373	0	0 0	0	0 550 275	0	5,650 2,488 949		0	622	0	0	18			0
06/30/94	23:30	0	524 480	810	0	0	1,310	1,736									
07/01/94	11:24	0	5,727	1,892	0	0	0	3,662		1,667					1,026	906	3,214
07/02/94	00:32	1,545	1,417	661	845	8,000	3,820	7,466									222
07/02/94	11:27	1,814	1,991			14,585	1,991	1,420		453 238	968	5,574			1,818	921	
07/04/94	14:40	577	1,622 1,801														
07/06/94	04:56	974	320	1,371	2,373	150	3,642										857
07/06/94	14:50	2,954	3,028	6,923	2,596 3,699	15,600	1,920										
07/07/94	15:35	0	244	0	0	393	0	363									
07/08/94	06:20	0	424	147	0	317	14,742	3,100	723 12,958	11,489							
07/08/94	16:29	553	515	4,120 26,055	32,571	26,301	5,946 0 242										

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

Table 12. Emergency order commercial salmon fishing periods, by district, Bristol Bay, 1994.

Number[1]	Date and Time					Hours/Days Open
NAKNEK-KVICHAK DISTRICT						
AKN. 04	June 01	12:01 a.m.	to	July 17	9:00 a.m.	[2]
AKN. 17	July 03	9:30 p.m.	to	July 04	7:30 a.m.	10 hrs
AKN. 21	July 06	9:30 a.m.	to	July 06	7:30 p.m.	10 hrs
AKN. 24	July 06	7:30 p.m.	to	July 07	11:30 a.m.	16 hrs
AKN. 61	July 22	9:00 a.m.	to	July 24	NOON	51 hrs
AKN. 62	July 25	9:00 a.m.	to	Sept 30	MIDNIGHT	[3]
Naknek Section						
AKN. 13	July 01	11:00 p.m.	to	July 02	7:00 a.m.	8 hrs
AKN. 14	July 02	8:30 p.m.	to	July 03	9:30 a.m.	13 hrs
AKN. 19	July 05	8:30 a.m.	to	July 05	6:30 p.m.	10 hrs
AKN. 27	July 08	11:00 a.m.	to	July 08	10:00 p.m.	11 hrs
AKN. 31	July 09	NOON	to	July 09	10:00 p.m.	10 hrs
AKN. 36	July 10	1:00 p.m.	to	July 10	11:00 p.m.	10 hrs
AKN. 38	July 12	2:30 a.m.	to	July 12	3:00 p.m.	12.5 hrs
AKN. 44	July 13	4:00 p.m.	to	July 14	4:00 a.m.	12 hrs
AKN. 55	July 16	7:00 p.m.	to	July 17	5:00 a.m.	10 hrs
Kvichak Section						
AKN. 20	July 05	10:30 p.m.	to	July 06	9:30 a.m.	11 hrs[4]
AKN. 26	July 07	MIDNIGHT	to	July 08	10:00 p.m.	22 hrs
AKN. 28	July 08	10:00 p.m.	to	July 09	10:00 p.m.	24 hrs
AKN. 35	July 09	10:00 p.m.	to	July 10	10:00 p.m.	24 hrs
AKN. 37	July 10	10:00 p.m.	to	July 11	MIDNIGHT	26 hrs
AKN. 39	July 11	MIDNIGHT	to	July 13	1:00 a.m.	25 hrs
AKN. 45	July 13	4:00 p.m.	to	July 14	5:00 p.m.	25 hrs
AKN. 49	July 15	5:00 a.m.	to	July 15	6:00 p.m.	13 hrs
AKN. 51	July 15	6:00 p.m.	to	July 16	7:00 p.m.	25 hrs
AKN. 54	July 16	7:00 p.m.	to	July 18	9:00 a.m.	38 hrs
EGEGIK DISTRICT						
AKN. 01	May 16	9:00 a.m.	to	May 31	MIDNIGHT	SUBSISTENCE
AKN. 03	June 01	12:01 a.m.	to	June 16	9:00 a.m.	[2]
AKN. 05	June 23	11:00 a.m.	to	June 23	7:00 p.m.	8 hrs[2]
AKN. 06	June 25	1:00 p.m.	to	June 25	9:00 p.m.	8 hrs[2]
AKN. 07	June 27	3:00 p.m.	to	June 27	11:00 p.m.	8 hrs[2]
AKN. 09	June 29	4:30 a.m.	to	June 29	12:30 p.m.	8 hrs[2]
AKN. 10	June 30	6:00 p.m.	to	July 01	2:00 a.m.	8 hrs[2]
AKN. 12	July 02	6:00 a.m.	to	July 02	2:00 p.m.	8 hrs[2]
AKN. 16	July 03	8:30 p.m.	to	July 04	4:30 a.m.	8 hrs[2]
AKN. 18	July 05	8:15 a.m.	to	July 05	4:15 p.m.	8 hrs[2]
AKN. 22	July 06	9:00 a.m.	to	July 06	5:00 p.m.	8 hrs[2]
AKN. 25	July 07	10:00 a.m.	to	July 08	7:00 a.m.	21 hrs[2]
AKN. 29	July 08	11:00 p.m.	to	July 09	8:00 p.m.	21 hrs[2]
CA-KS-01	July 08	9:00 a.m.	to	July 17	9:00 a.m.	[5]
AKN. 33	July 10	12:15 p.m.	to	July 11	9:15 a.m.	21 hrs
AKN. 40	July 12	2:00 a.m.	to	July 12	10:00 p.m.	20 hrs
AKN. 42	July 13	3:30 p.m.	to	July 14	11:30 a.m.	20 hrs
AKN. 48	July 15	4:00 a.m.	to	July 15	MIDNIGHT	20 hrs
AKN. 52	July 16	6:00 p.m.	to	July 17	2:00 p.m.	20 hrs
AKN. 57	July 18	6:30 a.m.	to	July 18	9:00 a.m.	2.5 hrs[6]
AKN. 59	July 22	9:00 a.m.	to	July 23	10:30 a.m.	25.5 hrs
AKN. 63	July 24	12:30 p.m.	to	July 25	9:00 a.m.	20.5 hrs

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Table 12. (Page 2 of 3)

Number[1]	Date and Time				Hours/Days Open
UGASHIK DISTRICT					
AKN. 02	May 16	9:00 a.m.	to May 31	MIDNIGHT	SUBSISTENCE
AKN. 08	June 27	2:00 p.m.	to June 28	2:00 a.m.	12 hrs
AKN. 11	June 30	4:00 p.m.	to July 01	4:00 a.m.	12 hrs
AKN. 15	July 03	6:00 a.m.	to July 03	6:00 p.m.	12 hrs
AKN. 23	July 06	8:30 a.m.	to July 06	8:30 p.m.	12 hrs
AKN. 30	July 08	9:00 p.m.	to July 09	11:00 a.m.	14 hrs
AKN. 32	July 09	11:00 a.m.	to July 09	11:00 p.m.	12 hrs
AKN. 34	July 10	NOON	to July 11	NOON	24 hrs
AKN. 41	July 12	1:00 p.m.	to July 13	1:00 a.m.	12 hrs
AKN. 43	July 13	2:00 p.m.	to July 14	2:00 a.m.	12 hrs
AKN. 46	July 14	2:00 a.m.	to July 14	3:00 p.m.	13 hrs
AKN. 47	July 14	3:00 p.m.	to July 15	3:00 a.m.	12 hrs
AKN. 50	July 15	3:00 a.m.	to July 15	4:00 p.m.	13 hrs
AKN. 53	July 16	4:00 a.m.	to July 16	4:00 p.m.	12 hrs
AKN. 56	July 17	5:00 a.m.	to July 17	5:00 p.m.	12 hrs
AKN. 58	July 18	6:00 a.m.	to July 18	9:00 a.m.	3 hrs
AKN. 60	July 22	9:00 a.m.	to July 23	10:30 a.m.	25.5 hrs
AKN. 64	July 23	10:30 a.m.	to July 25	9:00 a.m.	46.5 hrs
NUSHAGAK DISTRICT					
DLG. 01	May 20	6:00 a.m.	to June 07	MIDNIGHT	SUBSISTENCE
DLG. 03	June 08	12:30 p.m.	to June 08	10:30 p.m.	10 hrs
DLG. 04	June 13	4:00 p.m.	to June 14	5:00 p.m.	SUBSISTENCE
DLG. 05	June 16	9:00 a.m.	to July 02	9:00 a.m.	SUBSISTENCE
DLG. 06	June 17	8:00 p.m.	to June 18	7:00 a.m.	11 hrs
DLG. 09	June 23	12:30 a.m.	to June 23	10:30 a.m.	10 hrs
DLG. 10	June 24	1:30 a.m.	to June 24	1:30 p.m.	12 hrs
DLG. 12	June 24	1:30 p.m.	to June 25	2:00 a.m.	12.5 hrs
DLG. 13	June 25	2:00 a.m.	to June 25	10:00 a.m.	8 hrs
DLG. 14	June 26	3:00 a.m.	to June 26	1:00 p.m.	10 hrs[6]
DLG. 15	June 26	1:00 p.m.	to June 27	1:00 a.m.	12 hrs[6]
DLG. 16	June 27	1:00 a.m.	to June 27	1:00 p.m.	12 hrs[6]
DLG. 17	June 27	1:00 p.m.	to June 28	1:00 a.m.	12 hrs[6]
DLG. 18	June 28	1:00 a.m.	to June 28	2:00 p.m.	13 hrs[6]
DLG. 21	July 02	9:30 p.m.	to July 03	5:30 a.m.	8 hrs
DLG. 23	July 03	10:30 p.m.	to July 04	10:30 a.m.	12 hrs
DLG. 25	July 05	10:30 a.m.	to July 05	6:30 p.m.	8 hrs
DLG. 27	July 06	12:00 a.m.	to July 07	10:00 a.m.	10 hrs
DLG. 29	July 09	1:30 a.m.	to July 09	10:30 a.m.	9 hrs
DLG. 30	July 30	10:30 a.m.	to July 09	7:30 p.m.	9 hrs
DLG. 31	July 09	7:30 p.m.	to July 10	10:00 a.m.	14.5 hrs
DLG. 32	July 10	10:00 a.m.	to July 11	NOON	26 hrs
DLG. 33	July 11	NOON	to July 12	1:00 p.m.	25 hrs
DLG. 34	July 12	1:00 p.m.	to July 13	2:00 p.m.	25 hrs
DLG. 35	July 13	2:00 p.m.	to July 14	2:00 p.m.	24 hrs
DLG. 36	July 14	2:00 p.m.	to July 15	3:00 p.m.	25 hrs
DLG. 38	July 15	3:00 p.m.	to July 17	9:00 a.m.	42 hrs
DLG. 39	July 17	9:00 a.m.	to July 18	9:00 a.m.	12 hrs
DLG. 40	July 20	MIDNIGHT	to Sept 30	MIDNIGHT	CLOSURE
DLG. 41	July 22	9:00 a.m.	to July 25	3:00 a.m.	SUBSISTENCE
DLG. 43	July 26	4:30 p.m.	to July 28	MIDNIGHT	SUBSISTENCE
DLG. 45	Aug 03	9:00 p.m.	to Aug 06	6:00 p.m.	SUBSISTENCE
DLG. 47	Aug 10	9:00 a.m.	to Sept 30	MIDNIGHT	SUBSISTENCE[7]
DLG. 49	Aug 12	NOON	to Sept 30	MIDNIGHT	SUBSISTENCE[8]
DLG. 50	Aug 12	NOON	to Sept 30	MIDNIGHT	SUBSISTENCE

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Table 12. (Page 3 of 3)

Number[1]	Date and Time				Hours/Days Open	
Igushik Section						
DLG. 20	July 01	7:00 a.m.	to	July 01	4:00 p.m.	9 hrs
DLG. 22	July 03	9:00 a.m.	to	July 03	5:00 p.m.	8 hrs
DLG. 24	July 04	10:30 a.m.	to	July 05	10:30 a.m.	24 hrs
DLG. 26	July 06	11:00 a.m.	to	July 07	11:30 a.m.	24.5 hrs
TOGIAK DISTRICT						
DLG. 02	June 01	9:00 a.m.	to	Sept 30	MIDNIGHT	[2]
DLG. 07	June 20	9:00 a.m.	to	June 30	MIDNIGHT	CLOSURE
DLG. 08	June 20	9:00 a.m.	to	June 22	9:00 a.m.	SUBSISTENCE
DLG. 11	June 24	9:00 a.m.	to	June 26	9:00 a.m.	SUBSISTENCE
DLG. 19	July 01	12:01 a.m.	to	July 02	NOON	36 hrs[2]
Togiak Section						
DLG. 38	July 15	9:00 a.m.	to	July 17	NOON	27 hrs[2]
DLG. 42	July 25	4:30 a.m.	to	July 25	9:00 a.m.	4.5 hrs
DLG. 44	July 29	9:00 a.m.	to	July 30	MIDNIGHT	39 hrs
DLG. 46	Aug 05	9:00 a.m.	to	Aug 06	MIDNIGHT	39 hrs
DLG. 48	Aug 11	9:00 a.m.	to	Aug 12	9:00 a.m.	CLOSURE
DLG. 51	Aug 25	9:00 a.m.	to	Aug 26	9:00 a.m.	CLOSURE
DLG. 52	Sept 01	9:00 a.m.	to	Sept 02	9:00 a.m.	CLOSURE
DLG. 53	Sept 08	9:00 a.m.	to	Sept 09	9:00 a.m.	CLOSURE
Kulukak Section						
DLG. 28	July 07	9:00 a.m.	to	July 08	9:00 a.m.	24 hrs[2]
Matogak, Osviak and Cape Pierce Sections						
DLG. 51	Aug 26	9:00 a.m.	to	Aug 27	9:00 a.m.	CLOSURE
DLG. 52	Sept 02	9:00 a.m.	to	Sept 03	9:00 a.m.	CLOSURE
DLG. 53	Sept 09	9:00 a.m.	to	Sept 10	9:00 a.m.	CLOSURE

[1] Prefix code on emergency orders indicate where announcements originated ("AKN." for King Salmon field office and "DLG." for Dillingham field office).
[2] Prohibits the use of gillnet mesh larger than 5-1/2".
[3] Establishes a three day per week fishing schedule from 9:00 a.m. Mondays to 9:00 a.m. Thursday.
[4] Commercial setnets only.
[5] Waives the 48-hour transfer period into Egegik District.
[6] Prohibits the use of gillnet mesh smaller than 6-3/4".
[7] Reduces subsistence fishing to a three day per week schedule from 9:00 a.m. Mondays to 9:00 a.m. Tuesdays; 9:00 a.m. Wednesdays to 9:00 a.m. Thursdays; 9:00 a.m. Fridays to 9:00 a.m. Saturdays.
[8] Recinds emergency order DLG. 47.

Table 13. Daily district registration of drift gillnet fishermen by district, Bristol Bay, 1994.[a]

Date	Nakek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
6/14	125	113	14	239	19	510
15						
16	127	114	15	240	19	515
17	196	174	22	256	22	670
18						
19	235	231	19	261	23	769
20						
21	361	419	38	249	23	1,090
22						
23	338	656	25	304	20	1,343
24	342	751	16	295	20	1,424
25	353	819	16	297	20	1,505
26	369	839	18	295	21	1,542
27	386	850	26	289	21	1,572
28	405	881	36	284	21	1,627
29	417	861	40	281	21	1,620
30	455	836	45	287	23	1,646
7/01	465	826	82	296	23	1,692
2	542	813	94	300	24	1,773
3	554	813	100	303	24	1,794
4	562	801	105	299	25	1,792
5	565	779	108	299	25	1,776
6	573	777	113	300	28	1,791
7	592	718	115	291	33	1,749
8	602	590	117	273	33	1,615
9	660	523	132	274	33	1,622
10	765	448	149	275	33	1,670
11	792	434	185	268	33	1,712
12	800	428	217	261	33	1,739
13	769	403	250	221	32	1,675
14	778	406	298	208	35	1,725
15	804	391	341	205	51	1,792
16	811	390	360	205	56	1,822
17	818	404	352	207	60	1,841
Average	519	583	115	269	28	1,514

[a] Total indicates number of drift gillnet permit holders legal to fish each day in the districts (transferees not included). There were 1,876 drift permits licensed for this year.

Table 14. Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 1994.

Date	Time	Sockeye	Chinook	Chum	Pink	Coho	Total
6/9	24 hrs.		1	1			2
6/13	15 hrs.	48	52	22	3		125
6/14	24 hrs.	189	147	57			393
6/15	24 hrs.	449	476	210			1,135
6/16	24 hrs.	616	115	81			812
6/17	9 hrs.	175	14	18			207
6/20	15 hrs.	4,657	180	431			5,268
6/21	24 hrs.	13,268	652	498			14,418
6/22	24 hrs.	14,446	327	386			15,159
6/23	9 hrs.	3,566	33	341			3,940
6/24 a		77					77
6/25 a		104					104
6/26 a		288		3			291
6/27 a		402					402
6/28 a		620	5	11			636
6/29 a		1,439					1,439
6/30 a		2,201	12	13			2,226
7/1 a		3,854	3	23			3,880
7/2 b	11.5 hrs	688,791	114	1,648			690,553
7/3 b	12 hrs.	673,067	88	4,580			677,735
7/4 b	7.5 hrs.	336,436	264	1,651			338,351
7/5 d	11.5 hrs.	778,938	115	2,572			781,625
7/6 d	24 hrs.	1,173,054	287	3,292	1		1,176,634
7/7 d	11.5 hrs.	1,515,810	238	6,253			1,522,301
7/8 d	22 hrs.	1,891,826	462	9,988	7	1	1,902,284
7/9 d	22 hrs.	1,303,411	208	7,324			1,310,943
7/10 d	24 hrs	1,394,297	301	9,486	7		1,404,091
7/11 c	24 hrs	956,784	204	8,040	4		965,032
7/12 d	24 hrs.	639,084	184	6,520	14		645,802
7/13 d	9 hrs.	417,869	124	4,783	6		422,782
7/14 d	17 hrs.	686,679	235	8,248			695,162
7/15 c	19 hrs.	858,190	189	14,892	5		873,276
7/16 d	24 hrs.	567,358	130	10,125	16		577,629
7/17 d	24 hrs.	907,345	125	20,398	8	1	927,877
7/18	24 hrs.	441,660	86	9,706	6	1	451,459
7/19	24 hrs.	156,712	82	4,383	11	2	161,190
7/20	24 hrs.	192,154	113	7,410	32	2	199,711
7/21	24 hrs.	230,980	141	11,430	17	10	242,578
7/22	24 hrs.	194,036	100	16,297	44	20	210,497
7/23	24 hrs.	103,120	79	9,687	99	74	113,059
7/24	12 hrs.	37,343	29	4,035	38	27	41,472
7/25	15 hrs.	24,965	47	5,942	356	485	31,795
7/26	24 hrs.	21,450	44	4,875	454	471	27,294
7/27	24 hrs.	14,571	50	1,980	547	371	17,519
7/28	9 hrs.	3,415	23	746	235	228	4,647
8/1	15 hrs.	2,243	5	232	274	333	3,087
8/2	24 hrs.	2,034	16	829	1,968	876	5,723
8/3	24 hrs.	939	16	558	1,967	1,073	4,553

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8/4	9 hrs.	868	2	430	962	271	2,533
8/8	15 hrs.	124	2	132	1,307	541	2,106
8/9	24 hrs.	500	1	76	2,379	1,130	4,086
8/10	24 hrs.	146	2	164	1,362	834	2,508
8/11	9 hrs.	23	4	16	84	69	196
8/15	15 hrs.	4				14	18
8/16	24 hrs.					7	7
Total		16,262,625	6,127	200,823	12,213	6,841	16,488,629
% of District Catch		98.6	0.0	1.2	0.1	0.0	100

[a] 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, 1994.

Date	Hrs.	Effort[1] Drift	Effort[1] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/06	15.00	0	1	2	1	0	0	0	3
07	24.00	0	1	0	1	0	0	0	1
08	24.00	0	1	1	0	0	0	0	1
09	24.00	0	2	12	2	0	0	0	14
13	15.00	3	10	313	32	0	0	0	345
14	24.00	8	15	465	22	8	0	0	495
15	24.00	5	11	660	13	7	0	0	680
16	9.00	1	0	220	0	31	0	0	251
18 [a]	0.00	1	0	340	0	0	0	0	340
19 [a]	0.00	1	0	343	2	0	0	0	345
20 [a]	0.00	1	0	150	4	0	0	0	154
21 [a]	0.00	1	0	116	0	0	0	0	116
22 [a]	0.00	1	0	170	0	2	0	0	172
23	8.00	691	163	51,501	120	731	0	1	52,353
24 [a]	0.00	1	0	68	0	0	0	0	68
25	8.00	757	161	123,227	95	950	0	0	124,272
26 [a]	0.00	2	0	1,780	2	0	0	0	1,782
27	8.00	887	186	187,616	200	1,100	0	0	188,916
29	8.00	823	159	153,493	131	1,085	0	0	154,709
30	6.00	[b]	[b]	75,968	47	284	0	0	76,299
7/01	2.00	838	194	417,991	44	1,293	0	0	419,328
02	8.00	866	194	1,455,265	72	2,836	0	0	1,458,173
03	3.50	[b]	[b]	66,049	4	131	0	0	66,184
04	4.50	770	270	372,142	91	1,133	0	0	373,366
05	8.00	842	223	931,942	47	2,220	0	0	934,209
06	8.00	819	234	881,909	50	2,225	0	0	884,184
07	14.00	1,129	415	1,015,213	34	2,605	0	0	1,017,852
08	8.00	279	92	488,088	18	1,481	0	0	489,587
09	20.00	940	438	1,048,892	33	3,795	0	0	1,052,720
10	11.75	631	340	538,925	22	2,318	0	0	541,265
11	9.25	253	96	288,773	13	949	0	0	289,735
12	20.00	686	357	450,806	26	2,607	1	0	453,440
13	8.50	456	269	162,566	8	1,047	0	0	163,621
14	11.50	245	74	194,574	12	1,160	1	0	195,747
15	20.00	609	307	451,280	15	3,644	1	1	454,941
16	6.00	131	106	241,347	1	1,937	0	0	243,285
17	14.00	554	235	311,538	5	2,052	0	0	313,595
18	17.50	423	190	208,442	13	1,450	0	0	209,905
19	24.00	304	206	114,887	7	1,255	1	2	116,152
20	24.00	195	189	166,465	9	4,129	0	0	170,603
21	24.00	215	165	140,936	2	4,763	0	0	145,701
22	24.00	142	129	86,806	3	3,122	0	0	89,931
23	10.50	92	70	34,127	2	511	4	29	34,673
24	11.50	58	81	25,731	3	312	0	4	26,050
25	24.00	130	125	37,376	4	634	10	146	38,170
26	24.00	79	98	24,079	1	538	0	139	24,757

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Table 15. (Page 2 of 2)

Date	Hrs.	Effort[1]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/27	24.00	50	99	15,723	0	279	0	275	16,277
28	24.00	38	79	15,134	1	402	0	595	16,132
29	9.00	7	33	3,993	2	33	0	125	4,153
8/01	15.00	33	83	3,939	1	199	42	1,201	5,382
02	24.00	30	59	2,836	3	371	12	1,403	4,625
03	24.00	16	76	1,417	1	239	0	1,417	3,074
04	24.00	16	59	877	0	144	0	1,296	2,317
05	9.00	0	21	345	1	81	0	495	922
08	15.00	17	43	361	1	106	0	1,911	2,379
09	24.00	8	63	259	1	92	0	1,580	1,932
10	24.00	15	56	209	2	110	0	1,768	2,089
11	24.00	21	56	340	1	279	0	2,874	3,494
12	9.00	3	18	43	0	64	0	585	692
15	15.00	25	39	124	1	144	0	2,991	3,260
16	24.00	28	38	104	4	142	0	3,244	3,494
17	24.00	18	60	60	1	86	0	3,284	3,431
18	24.00	18	59	30	0	81	0	3,148	3,259
19	9.00	0	12	3	0	3	0	769	775
22	15.00	7	22	9	0	7	0	1,531	1,547
23	24.00	18	29	35	0	8	0	2,903	2,946
24	24.00	14	26	11	0	7	0	2,526	2,544
25	24.00	7	19	3	0	0	0	1,824	1,827
26	9.00	0	9	1	0	0	0	207	208
29	15.00	12	19	0	0	0	0	2,417	2,417
30	24.00	8	22	0	0	0	0	2,357	2,357
31	24.00	5	15	0	0	0	0	1,555	1,555
9/01	24.00	6	13	0	0	0	0	1,241	1,241
02	9.00	0	9	0	0	0	0	338	338
05	15.00	4	8	0	0	0	0	1,076	1,076
06	24.00	3	12	0	0	0	0	725	725
07	24.00	0	1	0	0	0	0	102	102
08	24.00	0	1	0	0	0	0	85	85
09	9.00	0	1	0	0	0	0	22	22
12	15.00	0	1	0	0	0	0	64	64
13	24.00	0	1	0	0	0	0	70	70
14	24.00	0	1	0	0	0	0	45	45
15	24.00	0	1	0	0	0	0	47	47
16	9.00	0	1	0	0	0	0	42	42
Total	1,286.50	15,296	6,971	10,798,450	1,231	57,222	72	48,460	10,905,435
% of District Catch				99	0	1	0	0	100

[1] Estimated number of deliveries based on daily oral company reports. Preliminary.
[a] ADF&G test fishing catches.
[b] Included in totals recorded for subsequent day.

Table 16. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 1994.

Date	Hrs.	Effort: Drift	Effort: Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/02	24.0	1	0	0	34	0	0	0	34
03	9.0	2	0	0	34	0	0	0	34
06	15.0	2	0	0	40	0	0	0	40
07	24.0	2	0	0	63	0	0	0	63
08	24.0	2	0	0	49	0	0	0	49
09	24.0	1	1	0	65	0	0	0	65
13	15.0	2	2	22	13	0	0	0	35
14	24.0	6	1	21	291	2	0	0	314
15	24.0	6	2	285	349	12	0	0	646
16	24.0	1	1	339	268	24	0	0	631
17	9.0	6	2	694	16	9	0	0	719
20	15.0	28	5	1,652	890	290	0	0	2,832
21	24.0	28	4	7,221	512	936	0	0	8,669
22	24.0	49	6	5,257	410	566	0	0	6,233
23	9.0	4	0	1,301	120	176	0	0	1,597
24 [a]	0.0	1	0	74	0	0	0	0	74
26 [a]	0.0	1	0	18	0	2	0	0	20
27	10.0	[b]	[b]	3,746	112	377	0	0	4,235
28	2.0	39	36	13,172	38	762	0	0	13,972
29 [a]	0.0	1	0	149	0	31	0	0	180
30	8.0	[b]	[b]	11,459	46	572	0	0	12,077
7/01	4.0	85	28	66,759	16	691	0	0	67,466
02 [a]	0.0	1	0	603	0	18	3	0	624
03	12.0	103	31	63,675	71	1,551	0	0	65,297
04 [a]	0.0	1	0	495	0	26	0	0	521
05 [a]	0.0	1	0	540	0	5	0	0	545
06	12.0	164	46	342,018	60	2,616	0	0	344,694
08	3.0	87	53	58,014	1	169	0	0	58,184
09	23.0	278	167	568,607	32	3,637	0	0	572,276
10	12.0	156	82	180,064	21	2,384	1	0	182,470
11	12.0	163	58	144,690	10	2,059	0	0	146,759
12	11.0	226	62	158,675	21	2,273	5	1	160,975
13	11.0	317	72	468,165	25	4,914	0	0	473,104
14	24.0	432	144	559,387	31	4,720	0	0	564,138
15	16.0	367	45	251,835	27	2,241	1	0	254,104
16	12.0	312	4	262,929	1	3,252	0	0	266,182
17	12.0	298	37	138,561	7	1,837	0	1	140,406
18	18.0	250	61	142,232	15	1,956	1	0	144,204
19	24.0	321	78	219,866	15	2,245	1	0	222,127
20	24.0	246	57	158,481	9	1,144	2	0	159,636
21	24.0	166	77	50,166	4	681	0	0	50,851
22	24.0	80	33	41,974	2	650	0	1	42,627
23	24.0	104	19	57,074	1	868	21	33	57,997
24	24.0	59	29	29,953	6	276	13	39	30,287
25	24.0	105	33	51,429	7	695	17	48	52,196
26	24.0	128	30	108,747	4	1,053	13	57	109,874

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Table 16. (Page 2 of 2)

Date	Hrs.	Effort[1]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/27	24.0	182	52	118,627	6	1,179	5	51	119,868
28	24.0	84	7	52,425	7	763	0	126	53,321
29	9.0	18	0	14,425	0	228	0	57	14,710
8/01	15.0	55	8	5,978	4	269	26	503	6,780
02	24.0	31	8	4,410	3	273	1	422	5,109
03	24.0	27	3	1,634	0	311	0	240	2,185
04	24.0	0	5	916	0	161	5	175	1,257
05	9.0	1	0	77	0	24	0	6	107
08	15.0	0	7	204	0	1	0	126	331
09	24.0	0	4	36	0	0	0	21	57
10	24.0	0	5	45	0	0	0	21	66
11	24.0	0	4	14	0	0	0	8	22
12	9.0	0	4	2	0	0	0	12	14
15	15.0	0	5	44	0	0	0	219	263
16	24.0	2	13	88	0	10	0	1,281	1,379
17	24.0	1	5	76	0	12	2	393	483
18	24.0	27	11	63	0	0	0	3,131	3,194
19	9.0	15	3	13	1	0	0	1,021	1,035
22	15.0	0	8	0	0	0	0	739	739
23	24.0	2	11	0	0	0	0	1,050	1,050
24	24.0	3	11	0	0	0	0	1,289	1,289
25	24.0	0	10	0	0	0	0	1,180	1,180
26	9.0	1	6	1	0	0	0	658	659
29	15.0	0	9	0	0	0	0	1,643	1,643
30	24.0	2	5	0	0	0	0	787	787
31	24.0	0	1	0	0	0	0	411	411
9/01	24.0	14	4	2	0	0	0	1,923	1,925
02	9.0	7	1	3	0	0	0	875	878
05	15.0	3	2	0	0	0	0	633	633
06	24.0	3	1	0	0	0	0	537	537
07	24.0	0	2	0	0	0	0	175	175
08	24.0	0	2	0	0	0	0	47	47
Total	1,306	5,110	1,523	4,369,432	3,757	48,951	117	19,940	4,442,197
% of District Catch				98	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, 1994.

Date	Time Hrs.	Effort[1] Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/08	10	147	28	150	9,697	741	0	0	10,588
6/17	4	290	84	56	2,284	893	0	0	3,233
6/18	7			3,118	50,081	21,543			74,742
6/23	10	240		16,870	11,482	37,249	8	0	65,609
6/24	22.5	189	139	29,745	16,334	73,771	1	0	119,851
6/25	10			7,972	7,663	13,608	0	0	29,243
6/26[a]	21	115	44	5,000	5,390	3,476	0	0	13,866
6/27[a]	24			5,649	5,464	2,952	0	0	14,065
6/28[a]	14			4,207	3,491	3,516	1	0	11,215
7/01[b]	9			64,328	124	5,012	0	0	69,464
7/02	2.5			2,575	7	52	0	0	2,634
7/03[c]	15	188	31	248,548	784	20,259	19	0	269,610
7/04[d]	24			231,935	742	12,011	26	0	244,714
7/05[e]	18.5	287	283	279,474	283	12,238	27	1	292,023
7/06[b]	13			67,797	40	2,771	11	0	70,619
7/07[f]	11.5	253	91	368,070	148	19,409	86	0	387,713
7/09	22.5			573,845	3,441	11,250	32	4	588,572
7/10	24	247	172	433,773	246	8,618	65	4	442,706
7/11	24			139,091	139	5,210	122	9	144,571
7/12	24			114,902	158	6,051	222	20	121,353
7/13	24			50,445	72	3,234	460	4	54,215
7/14	24			37,896	59	2,144	429	19	40,547
7/15	24			288,439	181	10,991	613	202	300,426
7/16	24			205,189	110	8,312	207	335	214,153
7/17	24			74,090	53	1,485	581	385	76,594
7/18	24			86,453	72	2,956	1,644	950	92,078
7/19	24			45,095	56	1,955	2,418	1,560	51,084
7/20	24			48,293	42	1,498	2,052	3,321	55,206
Total				3,433,008	118,643	293,205	9,024	6,814	3,860,694
% of District Catch				88.9%	3.1%	7.6%	0.2%	0.2%	100.0%

1 Estimated fishing effort based on aerial survey count.
a Gillnets with mesh size less than 6-3/4" prohibited.
b Igushik Section only.
c Igushik Section fished 8 hours, Nushagak Section fished 7 hours.
d Igushik Section fished 13.5 hours, Nushagak Section fished 10.5 hours.
e Igushik Section fished 10.5 hours, Nushagak Section fished 8 hours.
f Igushik Section fished 1.5 hours, Nushagak Section fished 10 hours.

Table 18. Commercial sockeye salmon catch by date in numbers of fish, from setnet areas, Nushagak District, Bristol Bay, 1994.

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
6/08	10	0	0	0	0	0	0	0	0
6/17	4	14	0	8	0	0	0	0	22
6/18	7	92	0	90	6	63	562	0	813
6/23	10	742	169	406	259	622	1,010	0	3,208
6/24	22.5	456	277	68	385	3,356	2,913	0	7,455
6/25	10	115	4	139	51	827	2,359	0	3,495
6/26[a]	21	365	247	564	306	1,442	671	0	3,595
6/27[a]	24	741	417	627	203	1,521	925	0	4,434
6/28[a]	14	421	114	247	35	1,765	500	0	3,082
7/01[b]	9	0	0	0	0	0	13,829	0	13,829
7/02	2.5	2,215	0	149	0	0	0	0	2,364
7/03[c]	15	11,455	8,626	3,360	4,781	15,334	13,881	0	57,437
7/04[d]	24	9,770	10,657	3,425	4,454	8,253	6,012	0	42,571
7/05[e]	18.5	8,154	10,170	3,114	744	7,949	5,737	0	35,868
7/06[b]	13	0	0	0	0	0	2,936	0	2,936
7/07[f]	11.5	2,466	470	325	659	1,922	2,428	0	8,270
7/09	22.5	70,464	16,130	32,003	19,041	64,515	36,094	0	238,247
7/10	24	19,189	4,271	23,975	9,378	61,696	28,852	0	147,361
7/11	24	3,290	1,124	11,180	1,507	8,589	27,939	0	53,629
7/12	24	1,863	337	5,981	812	4,940	13,676	0	27,609
7/13	24	752	638	763	255	4,042	6,285	0	12,735
7/14	24	772	78	736	521	3,352	5,611	0	11,070
7/15	24	1,434	816	21,673	1,705	24,084	13,089	0	62,801
7/16	24	2,991	339	28,229	1,464	38,096	10,473	0	81,592
7/17	24	311	33	11,782	270	11,198	13,767	0	37,361
7/18	24	57	160	10,049	259	9,281	14,487	11,168	45,461
7/19	24	645	153	1,825	699	4,848	9,393	10,253	27,816
7/20	24	844	375	11,103	1,070	13,927	5,995	3,494	36,808
Total		139,618	55,605	171,821	48,864	291,622	239,424	24,915	971,869
% of District Catch		14.4%	5.7%	17.7%	5.0%	30.0%	24.6%	2.6%	100.0%

[1] Sockeye salmon accounted for 96% of the total beach catch. Other species landed included 625 Chinook; 4,157 Chum; 467 Pink; 14 Coho.

[2] Sockeye salmon accounted for 98% of the total beach catch. Other species landed included 226 Chinook; 960 Chum; 189 Pink; 3 Coho.

[3] Sockeye salmon accounted for 96% of the total beach catch. Other species landed included 1,265 Chinook; 4,204 Chum; 1,177 Pink; 218 Coho.

[4] Sockeye salmon accounted for 94% of the total beach catch. Other species landed included 312 Chinook; 2,985 Chum; 4 Pink; 0 Coho.

[5] Sockeye salmon accounted for 95% of the total beach catch. Other species landed included 853 Chinook; 9,497 Chum; 3,494 Pink; 1,159 Coho.

[6] Sockeye salmon accounted for 99% of the total beach catch. Other species landed included 1,432 Chinook; 487 Chum; 63 Pink; 0 Coho.

[7] Sockeye salmon accounted for 99% of the total beach catch. Other species landed included 2 Chinook; 134 Chum; 36 Pink; 1 Coho.

[a] Gillnets with mesh size less than 6-3/4" prohibited.

[b] Igushik Section only.

[c] Igushik Section fished 8 hours, Nushagak Section fished 7 hours.

[d] Igushik Section fished 13.5 hours, Nushagak Section fished 10.5 hours.

[e] Igushik Section fished 10.5 hours, Nushagak Section fished 8 hours.

[f] Igushik Section fished 1.5 hours, Nushagak Section fished 10 hours.

Table 19. Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 1994.

Date1	Sockeye	Chinook	Chum	Pink	Coho	Total
6/03	0	1	0	0	0	1
6/08	3	17	2	0	0	22
6/09	0	26	1	0	0	27
6/10	1	13	2	0	0	16
6/13	64	38	43	0	0	145
6/14	63	245	85	0	0	393
6/15	110	269	90	0	0	469
6/16	69	274	78	1	0	422
6/17	41	118	46	1	0	206
7/01	6,930	1,901	11,539	114	0	20,484
7/02	3,927	659	6,115	119	0	10,820
7/04	11,995	1,093	4,447	123	0	17,658
7/05	15,519	1,341	9,327	325	0	26,512
7/06	11,062	808	8,842	270	0	20,982
7/07	19,631	826	11,754	380	0	32,591
7/08	8,634	517	7,576	179	0	16,906
7/11	24,311	520	7,045	569	0	32,445
7/12	25,082	505	19,882	746	0	46,215
7/13	18,894	370	13,817	873	0	33,954
7/14	10,640	234	16,586	530	0	27,990
7/15	9,440	100	9,239	481	0	19,260
7/16	4,288	28	2,234	115	0	6,665
7/18	20,127	99	14,643	964	0	35,833
7/19	23,680	72	15,741	1,093	0	40,586
7/20	14,988	69	11,965	1,249	1	28,272
7/21	22,205	78	11,238	1,553	2	35,076
7/22	13,142	33	5,497	1,480	2	20,154
7/23	76	1	170	70	0	317
7/25	19,047	64	10,609	4,355	16	34,091
7/26	18,782	32	7,495	6,482	5	32,796
7/27	17,568	36	5,920	7,161	34	30,719
7/28	12,944	46	5,382	6,485	86	24,943
7/29	10,782	24	2,804	4,434	78	18,122
7/30	9,595	25	1,986	4,896	92	16,594

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Table 19. (Page 2 of 2)

Date[1]	Sockeye	Chinook	Chum	Pink	Coho	Total
8/01	5,400	9	990	2,732	241	9,372
8/02	9,801	37	2,235	5,925	435	18,433
8/03	6,342	12	1,527	3,841	497	12,219
8/04	7,048	17	1,685	4,115	771	13,636
8/05	4,674	13	844	2,819	537	8,887
8/06	5,339	16	1,046	2,637	1,008	10,046
8/08	1,269	8	243	627	871	3,018
8/09	1,258	2	286	304	938	2,788
8/10	1,501	5	314	658	1,483	3,961
8/11	810	1	244	344	1,767	3,166
8/12	95	1	23	46	693	858
8/13	33	0	1	16	110	160
8/15	689	2	153	151	5,665	6,660
8/16	760	2	212	230	6,973	8,177
8/17	498	3	102	83	4,283	4,969
8/18	372	5	80	79	2,846	3,382
8/19	620	4	107	38	4,166	4,935
8/20	42	0	6	4	1,420	1,472
						0
8/22	122	0	38	39	5,957	6,156
8/23	314	4	46	147	12,196	12,707
8/24	68	1	24	44	3,925	4,062
8/25	45	1	5	8	1,060	1,119
8/26				5	678	683
8/29	79	1	19	23	12,022	12,144
8/30	91	0	21	24	10,987	11,123
8/31	65	1	29	19	5,230	5,344
9/01	33	0	3	20	1,848	1,904
9/02	0	0	0	3	232	235
9/05	2	0	1	0	1,058	1,061
9/06	15	1	4	0	3,065	3,085
9/07	11	0	1	0	1,810	1,822
9/08	7	1	2	0	404	414
9/12	8	0	1	0	724	733
9/13	1	0	0	0	390	391
Total	401,052	10,629	232,492	70,029	96,606	810,808
% of District Total	49.5%	1.3%	28.7%	8.6%	11.9%	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, 1994.

Date[1]	Effort[2] Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/03			0	1	0	0	0	1
6/08			3	12	2	0	0	17
6/09			0	26	1	0	0	27
6/10			1	13	2	0	0	16
6/13			2	11	3	0	0	16
6/14			41	227	65	0	0	333
6/15			60	244	72	0	0	376
6/16			69	274	78	1	0	422
6/17			41	118	46	1	0	206
7/01			4,929	1,798	10,375	71	0	17,173
7/02			3,166	606	5,675	91	0	9,538
7/04			9,346	994	3,464	78	0	13,882
7/05			11,251	1,149	7,385	190	0	19,975
7/06	26	48	7,746	695	7,132	176	0	15,749
7/07			10,604	723	10,389	287	0	22,003
7/08			4,327	480	7,000	137	0	11,944
7/11			17,155	447	5,935	365	0	23,902
7/12			19,771	421	17,777	495	0	38,464
7/13	27	55	12,017	289	11,667	546	0	24,519
7/14			9,133	222	16,452	470	0	26,277
7/15			9,152	98	8,935	403	0	18,588
7/16			4,030	28	2,014	65	0	6,137
7/18			17,549	74	14,008	907	0	32,538
7/19	57	47	17,894	54	14,862	964	0	33,774
7/20			11,718	53	11,194	1,159	0	24,124
7/21			21,341	77	11,058	1,548	2	34,026
7/22			12,877	29	4,909	1,318	0	19,133
7/25			17,073	51	10,208	4,091	16	31,439
7/26	93	73	14,726	25	7,239	5,989	5	27,984
7/27			13,442	30	5,663	6,302	32	25,469
7/28			9,741	44	5,094	5,728	62	20,669
7/29			10,604	24	2,757	4,336	69	17,790
7/30			9,443	24	1,958	4,769	82	16,276

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Table 20. (Page 2 of 2)

Date	Effort[2] Drift	Effort[2] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
8/01			4,108	7	827	2,033	168	7,143
8/02			8,272	34	2,141	5,492	410	16,349
8/03			4,704	7	1,399	3,459	411	9,980
8/04			6,466	13	1,637	3,953	725	12,794
8/05			4,674	13	844	2,819	537	8,887
8/06			5,339	16	1,046	2,637	1,008	10,046
8/08			1,239	8	239	617	858	2,961
8/09			1,258	2	286	304	938	2,788
8/10			1,501	5	314	658	1,483	3,961
8/11			707	1	215	272	786	1,981
8/15			683	2	150	149	5,468	6,452
8/16			760	2	212	230	6,780	7,984
8/17			498	3	102	83	4,283	4,969
8/18			370	5	80	75	2,283	2,813
8/19			615	3	106	33	2,806	3,563
8/22			122	0	38	39	5,957	6,156
8/23			314	4	46	147	12,196	12,707
8/24			68	1	24	44	3,925	4,062
8/25			39	1	5	3	839	887
8/29			73	1	18	19	11,736	11,847
8/30			91	0	21	24	10,987	11,123
8/31			65	1	29	19	4,987	5,101
9/01			31	0	3	13	1,232	1,279
9/05			2	0	1	0	1,058	1,061
9/06			15	1	4	0	3,065	3,085
9/07			11	0	1	0	1,810	1,822
9/08			7	1	2	0	404	414
9/12			8	0	1	0	724	733
9/13			1	0	0	0	390	391
Total			321,293	9,492	213,210	63,609	88,522	696,126
% of Section Total			46.2%	1.4%	30.6%	9.1%	12.7%	100.0%

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

2 Effort estimated by aerial surveys inseason.

Table 21. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 1994.

Date[1]	Effort[2] Drift	Effort[2] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/13			62	27	40	0	0	129
6/14			22	18	20	0	0	60
6/15			50	25	18	0	0	93
7/01			1,936	102	1,093	43	0	3,174
7/02			761	53	440	28	0	1,282
7/04			2,649	99	983	45	0	3,776
7/05			4,268	192	1,942	135	0	6,537
7/06	3	16	3,316	113	1,710	94	0	5,233
7/07			9,027	103	1,365	93	0	10,588
7/08			4,307	37	576	42	0	4,962
7/11			7,156	73	1,110	204	0	8,543
7/12			5,311	84	2,105	251	0	7,751
7/13	3	14	6,877	81	2,150	327	0	9,435
7/14			1,507	12	134	60	0	1,713
7/18			2,548	25	625	45	0	3,243
7/19	5	12	5,756	18	871	119	0	6,764
7/20			3,270	16	771	90	1	4,148
7/21			864	1	180	5	0	1,050
7/25			1,875	13	384	234	0	2,506
7/26			4,056	7	256	493	0	4,812
7/27			3,956	6	227	779	2	4,970
7/28			2,931	2	208	622	2	3,765
8/01			1,292	2	163	699	73	2,229
8/02			1,529	3	94	433	25	2,084
8/03			1,472	5	118	337	84	2,016
8/04			582	4	48	162	46	842
8/08			30	0	4	10	13	57
8/18							266	266
Total			77,410	1,121	17,635	5,350	512	102,028
% of Section Total			75.9%	1.1%	17.3%	5.2%	0.5%	100.0%

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

2 Effort estimated by aerial surveys inseason.

Table 22. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 1994.

Date[1]	Sockeye	Chinook	Chum	Pink	Coho	Total
7/01	65	1	71	0	0	137
7/15	288	2	304	78	0	672
7/16	258	0	220	50	0	528
7/18	30	0	10	12	0	52
7/19	30	0	8	10	0	48
7/22	265	4	588	162	2	1,021
7/23	76	1	170	70	0	317
7/25	99	0	17	30	0	146
7/27	170	0	30	80	0	280
7/28	220	0	52	90	13	375
7/29	178	0	47	98	9	332
7/30	39	0	6	42	3	90
8/03	166	0	10	45	2	223
8/11	100	0	29	68	962	1,159
8/12	89	1	15	44	589	738
8/13	32	0	1	13	96	142
8/15	6	0	3	2	197	208
8/16					193	193
8/18	2	0	0	4	297	303
8/19	5	1	1	5	1,360	1,372
8/20	42	0	6	4	1,360	1,412
8/25	6	0	0	5	221	232
8/26	0	0	0	5	678	683
8/29	6	0	1	4	286	297
8/31	0	0	0	0	243	243
9/01	2	0	0	7	616	625
9/02	0	0	0	3	232	235
Total	2,174	10	1,589	931	7,359	12,063
% of Section Total	18.0%	0.1%	13.2%	7.7%	61.0%	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, 1994.

Date[1]	Sockeye	Chinook	Chum	Pink	Coho	Total
6/08	0	5	0	0	0	5
7/28	52	0	28	45	9	134
7/30	113	1	22	85	7	228
8/11	3	0	0	4	19	26
8/12	6	0	8	2	104	120
8/13	1	0	0	3	14	18
8/20	0	0	0	0	60	60
Total	175	6	58	139	213	591
% of Section Total	29.6%	1.0%	9.8%	23.5%	36.0%	100.0%

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

Table 24. Commercial salmon catch by district and species, in numbers of fish, Bristol Bay, 1994

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT						
Kvichak River	13,840,448					
Branch River	390,094					
Naknek River	2,032,083					
Total	16,262,625	6,127	200,823	12,213	6,841	16,488,629
EGEGIK DISTRICT	10,798,450	1,231	57,222	72	48,460	10,905,435
UGASHIK DISTRICT	4,369,432	3,757	48,951	117	19,940	4,442,197
NUSHAGAK DISTRICT						
Wood River	1,516,229					
Igushik River	864,945					
Nushagak-Mulchatna	1,051,834					
Total	3,433,008	118,643	293,205	9,024	6,814	3,860,694
TOGIAK DISTRICT						
Togiak Section	321,293	9,492	213,210	63,609	88,522	696,126
Kulukak Section	77,410	1,121	17,635	5,350	512	102,028
Matogak Section	2,174	10	1,589	931	7,359	12,063
Osviak Section	175	6	58	139	213	591
Total	401,052	10,629	232,492	70,029	96,606	810,808
TOTAL BRISTOL BAY	35,264,567	140,387	832,693	91,455	178,661	36,507,763
PERCENT	96.6%	0.4%	2.3%	0.3%	0.5%	100.0%

[a] Preliminary

Table 25. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 1994

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.
6/19									0	0				
20									0	0				
21			54	54					0	0				
22			1,110	1,164	816	816			1,326	1,326	54	54		
23	42	42	132	1,296	264	1,080			672	1,998	234	288		
24	24	66	600	1,896	4,938	6,018			228	2,226	126	414		
25	78	144	3,246	5,142	32,052	38,070			1,470	3,696	456	870		
26	738	882	1,698	6,840	71,178	109,248			3,150	6,846	918	1,788		
27	6,744	7,626	1,596	8,436	17,364	126,612			3,444	10,290	906	2,694		
28	16,254	23,880	660	9,096	10,890	137,502			1,902	12,192	2,700	5,394		
29	762	24,642	1,644	10,740	5,712	143,214			1,332	13,524	2,994	8,388		
30	306	24,948	7,338	18,078	35,088	178,302			1,008	14,532	1,734	10,122		
7/ 1	504	25,452	15,558	33,636	31,410	209,712			6,078	20,610	1,836	11,958		
2	3,630	29,082	89,922	123,558	4,578	214,290			37,530	58,140	4,782	16,740		
3	224,208	253,290	188,568	312,126	29,520	243,810	228	228	65,616	123,756	3,042	19,782		
4	1,295,892	1,549,182	61,512	373,638	221,826	465,636	480	708	62,094	185,850	12,912	32,694	0	0
5	1,176,840	2,726,022	37,368	411,006	184,764	650,400	252	960	41,190	227,040	15,552	48,246	0	0
6	790,896	3,516,918	58,176	469,182	178,818	829,218	480	1,440	64,890	291,930	11,310	59,556	0	0
7	754,686	4,271,604	40,092	509,274	180,138	1,009,356	258	1,698	34,182	326,112	13,686	73,242	192	192
8	859,236	5,130,840	113,640	622,914	151,176	1,160,532	120	1,818	21,102	347,214	6,198	79,440	558	750
9	689,646	5,820,486	53,082	675,996	176,892	1,337,424	4,830	6,648	301,710	648,924	8,484	87,924	648	1,398
10	652,626	6,473,112	43,278	719,274	79,404	1,416,828	101,970	108,618	346,830	995,754	21,198	109,122	144	1,542
11	584,610	7,057,722	30,180	749,454	106,392	1,523,220	204,678	313,296	113,472	1,109,226	51,924	161,046	672	2,214
12	209,814	7,267,536	44,736	794,190	100,008	1,623,228	207,204	520,500	35,484	1,144,710	45,864	206,910	1,650	3,864
13	62,394	7,329,930	17,670	811,860	42,348	1,665,576	50,076	570,576	13,812	1,158,522	39,528	246,438	3,306	7,170
14	52,074	7,382,004	17,880	829,740	43,422	1,708,998	24,162	594,738	15,018	1,173,540	38,232	284,670	6,420	13,590
15	113,484	7,495,488	23,196	852,936	50,148	1,759,146	31,284	626,022	13,020	1,186,560	16,776	301,446	7,656	21,246
16	44,664	7,540,152	30,714	883,650	23,088	1,782,234	63,144	689,166	64,572	1,251,132	8,688	310,134	4,884	26,130
17	90,924	7,631,076	39,672	923,322	21,774	1,804,008	38,490	727,656	73,746	1,324,878	13,788	323,922	5,016	31,146
18	220,458	7,851,534	44,376	967,698	45,642	1,849,650	38,982	766,638	39,300	1,364,178	22,794	346,716	3,702	34,848
19	247,620	8,099,154	11,790	979,488	21,366	1,871,016	56,484	823,122	18,426	1,382,604	22,650	369,366	2,544	37,392
20	69,474	8,168,628	2,868	982,356	11,622	1,882,638	88,884	912,006	16,170	1,398,774	18,198	387,564	5,736	43,128
21	24,558	8,193,186	8,454	990,810	15,294	1,897,932	100,134	1,012,140	17,436	1,416,210	11,394	398,958	10,698	53,826
22	72,264	8,265,450					19,836	1,031,976	28,884	1,445,094	10,260	409,218	8,538	62,364
23	72,390	8,337,840					12,942	1,044,918	14,796	1,459,890	7,422	416,640	5,826	68,190
24							8,454	1,053,372	12,000	1,471,890	7,194	423,834	3,024	71,214
25							6,330	1,059,702			10,242	434,076	4,464	75,678
26							3,216	1,062,918			7,194	441,270	5,310	80,988
27							4,668	1,067,586			4,650	445,920	8,754	89,742
28							13,272	1,080,858					15,702	105,444
29													8,826	114,270
30													5,880	120,150

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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													4,722	124,872
8/ 1													3,942	128,814
2													3,786	132,600
3													2,334	134,934
4													2,742	137,676
5													4,902	142,578
6													5,556	148,134
7													3,066	151,200
8													2,436	153,636
9													1,116	154,752
Total		8,337,840		990,810		1,897,932		1,080,858		1,471,890		445,920		154,752

•From 7/22/94 0000 hours until 9/11/94 additional fish counted by USF&WS personnel.

Table 26. Daily salmon escapement estimates, Nushagak River sonar, Nushagak River, 1994.

	Sockeye		Chinook		Chum		Pink		Coho		Total	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/09	5	5	374	374	362	362	0	0	0	0	741	741
10	6	11	351	725	255	617	0	0	0	0	612	1,353
11	7	18	375	1,100	367	984	0	0	0	0	749	2,102
12	5	23	413	1,513	442	1,426	0	0	0	0	860	2,962
13	4	27	248	1,761	318	1,744	0	0	0	0	570	3,532
14	12	39	126	1,887	183	1,927	0	0	0	0	321	3,853
15	10	49	86	1,973	213	2,140	0	0	0	0	309	4,162
16	442	491	6,597	8,570	5,901	8,041	0	0	0	0	12,940	17,102
17	951	1,442	13,555	22,125	20,237	28,278	0	0	0	0	34,743	51,845
18	1,239	2,681	2,687	24,812	6,514	34,792	0	0	0	0	10,440	62,285
19	2,661	5,342	4,565	29,377	15,354	50,146	0	0	0	0	22,580	84,865
20	1,218	6,560	2,807	32,184	7,312	57,458	0	0	0	0	11,337	96,202
21	647	7,207	1,475	33,659	4,009	61,467	0	0	0	0	6,131	102,333
22	1,830	9,037	7,989	41,648	27,174	88,641	0	0	0	0	36,993	139,326
23	1,415	10,452	5,402	47,050	18,933	107,574	0	0	0	0	25,750	165,076
24	2,703	13,155	3,233	50,283	16,333	123,907	0	0	0	0	22,269	187,345
25	2,625	15,780	3,377	53,660	15,897	139,804	0	0	0	0	21,899	209,244
26	2,768	18,548	4,082	57,742	17,462	157,266	0	0	0	0	24,312	233,556
27	3,354	21,902	1,861	59,603	9,175	166,441	0	0	0	0	14,390	247,946
28	2,779	24,681	1,315	60,918	7,725	174,166	0	0	0	0	11,819	259,765
29	1,976	26,657	1,045	61,963	5,530	179,696	0	0	0	0	8,551	268,316
30	2,089	28,746	957	62,920	5,566	185,262	0	0	0	0	8,612	276,928
7/01	3,143	31,889	974	63,894	7,442	192,704	0	0	0	0	11,559	288,487
02	12,185	44,074	4,378	68,272	46,488	239,192	0	0	0	0	63,051	351,538
03	41,736	85,810	3,319	71,591	16,785	255,977	121	121	0	0	61,961	413,499
04	51,759	137,569	2,016	73,607	11,018	266,995	0	121	0	0	64,793	478,292
05	23,759	161,328	2,319	75,926	16,547	283,542	258	379	0	0	42,883	521,175
06	22,208	183,536	2,153	78,079	8,063	291,605	0	379	0	0	32,424	553,599
07	22,030	205,566	1,758	79,837	7,176	298,781	0	379	0	0	30,964	584,563
08	18,918	224,484	1,463	81,300	5,729	304,510	0	379	0	0	26,110	610,673
09	30,097	254,581	1,519	82,819	14,793	319,303	672	1,051	0	0	47,081	657,754
10	128,121	382,702	3,061	85,880	22,801	342,104	2,340	3,391	426	426	156,749	814,503
11	22,288	404,990	1,496	87,376	6,060	348,164	335	3,726	125	551	30,304	844,807
12	11,051	416,041	1,026	88,402	3,270	351,434	268	3,994	112	663	15,727	860,534
13	8,748	424,789	932	89,334	2,667	354,101	256	4,250	96	759	12,699	873,233
14	6,121	430,910	764	90,098	2,369	356,470	262	4,512	155	914	9,671	882,904
15	2,858	433,768	411	90,509	1,117	357,587	151	4,663	81	995	4,618	887,522
16	3,451	437,219	461	90,970	1,340	358,927	172	4,835	103	1,098	5,527	893,049
17	14,088	451,307	1,016	91,986	5,197	364,124	194	5,029	142	1,240	20,637	913,686
18	11,342	462,649	693	92,679	2,675	366,799	168	5,197	566	1,806	15,444	929,130
19	5,247	467,896	295	92,974	900	367,699	562	5,759	546	2,352	7,550	936,680
20	4,015	471,911	365	93,339	750	368,449	570	6,329	458	2,810	6,158	942,838

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Table 26. (Page 2 of 2)

	Sockeye		Chinook		Chum		Pink		Coho		Total	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/21	3,419	475,330	303	93,642	606	369,055	365	6,694	358	3,168	5,051	947,889
22	2,741	478,071	401	94,043	679	369,734	1,095	7,789	465	3,633	5,381	953,270
23	3,081	481,152	370	94,413	769	370,503	1,206	8,995	539	4,172	5,965	959,235
24	2,797	483,949	242	94,655	688	371,191	1,059	10,054	493	4,665	5,279	964,514
25	6,579	490,528	403	95,058	1,652	372,843	2,432	12,486	1,212	5,877	12,278	976,792
26	6,159	496,687	351	95,409	1,759	374,602	3,288	15,774	1,843	7,720	13,400	990,192
27	6,420	503,107	317	95,726	1,828	376,430	3,507	19,281	1,970	9,690	14,042	1,004,234
28	2,058	505,165	74	95,800	642	377,072	14,964	34,245	1,996	11,686	19,734	1,023,968
29	2,440	507,605	47	95,847	114	377,186	6,889	41,134	973	12,659	10,463	1,034,431
30	186	507,791	29	95,876	173	377,359	32,461	73,595	466	13,125	33,315	1,067,746
31	286	508,077	16	95,892	196	377,555	16,177	89,772	1,235	14,360	17,910	1,085,656
8/01	226	508,303	18	95,910	218	377,773	32,832	122,604	2,874	17,234	36,168	1,121,824
02	112	508,415	25	95,935	102	377,875	16,842	139,446	1,143	18,377	18,224	1,140,048
03	77	508,492	9	95,944	44	377,919	2,644	142,090	906	19,283	3,680	1,143,728
04	71	508,563	10	95,954	40	377,959	2,380	144,470	813	20,096	3,314	1,147,042
05	121	508,684	0	95,954	38	377,997	6,886	151,356	2,246	22,342	9,291	1,156,333
06	83	508,767	0	95,954	40	378,037	6,417	157,773	2,009	24,351	8,549	1,164,882
07	106	508,873	0	95,954	123	378,160	9,052	166,825	2,707	27,058	11,988	1,176,870
08	99	508,972	0	95,954	53	378,213	7,751	174,576	2,405	29,463	10,308	1,187,178
09	40	509,012	0	95,954	2	378,215	2,138	176,714	1,635	31,098	3,815	1,190,993
10	180	509,192	0	95,954	13	378,228	6,980	183,694	9,751	40,849	16,924	1,207,917
11	121	509,313	0	95,954	473	378,701	5,131	188,825	28,753	69,602	34,478	1,242,395
12	0	509,313	0	95,954	33	378,734	360	189,185	1,922	71,524	2,315	1,244,710
13	0	509,313	0	95,954	16	378,750	162	189,347	920	72,444	1,098	1,245,808
14	0	509,313	0	95,954	17	378,767	150	189,497	884	73,328	1,051	1,246,859
15	0	509,313	0	95,954	14	378,781	100	189,597	706	74,034	820	1,247,679
16	0	509,313	0	95,954	10	378,791	106	189,703	590	74,624	706	1,248,385
17	0	509,313	0	95,954	11	378,802	95	189,798	584	75,208	690	1,249,075
18	0	509,313	0	95,954	8	378,810	85	189,883	446	75,654	539	1,249,614
19	3	509,316	0	95,954	21	378,831	360	190,243	1,065	76,719	1,449	1,251,063
20	2	509,318	0	95,954	17	378,848	258	190,501	1,012	77,731	1,289	1,252,352
21	2	509,320	0	95,954	26	378,874	441	190,942	1,422	79,153	1,891	1,254,243
22	3	509,323	0	95,954	25	378,899	453	191,395	1,492	80,645	1,973	1,256,216
23	2	509,325	0	95,954	16	378,915	251	191,646	708	81,353	977	1,257,193
24	1	509,326	0	95,954	12	378,927	114	191,760	582	81,935	709	1,257,902
25	0	509,326	0	95,954	1	378,928	12	191,772	84	82,019	97	1,257,999
Total		509,326		95,954		378,928		191,772		82,019		1,257,999 [a]

[a] An additional 641 whitefish and 2,360 other fish were counted passing the sonar site in 1994.

Table 27. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 1994.

	Tower Count		Aerial Survey	River Test Fishing			
					Index Points		
Date	Daily	Cum.	Total	Fish per Index Pt.[1]	Daily	Cum.	Cumulative Escapement
6/23	42	42					
24	24	66		108	3	3	0
25	78	144		108	211	214	23,112
26	738	882		108	16	230	24,840
27	6,744	7,626		108	0	230	24,840
28	16,254	23,880		108	4	234	25,272
29	762	24,642		108	158	392	42,336
30	306	24,948		108	228	620	66,960
7/ 1	504	25,452		109	792	1412	153,908
2	3,630	29,082	65,000	108	10523	11935	1,288,980
3	224,208	253,290	1,100,000	108	9908	21843	2,359,044
4	1,295,892	1,549,182	1,800,000	129	3685	25528	3,293,112
5	1,176,840	2,726,022	1,300,000	116	4843	30371	3,523,036
6	790,896	3,516,918	1,050,000	128	5365	35736	4,574,208
7	754,686	4,271,604	1,350,000	141	1312	37048	5,223,768
8	859,236	5,130,840	1,000,000	145	6258	43306	6,279,370
9	689,646	5,820,486	1,300,000	137	5042	48348	6,623,676
10	652,626	6,473,112		143	2038	50386	7,205,198
11	584,610	7,057,722		144	755	51141	7,364,304
12	209,814	7,267,536		144	755	51896	7,473,024
13	62,394	7,329,930		143	1073	52969	7,574,567
14	52,074	7,382,004	145,000	143	322	53291	7,620,613
15	113,484	7,495,488		142	2119	55410	7,868,220
16	44,664	7,540,152					
17	90,924	7,631,076					
18	220,458	7,851,534					
19	247,620	8,099,154					
20	69,474	8,168,628					
21	24,558	8,193,186					
22	72,264	8,265,450					
23	72,390	8,337,840					
Total		8,337,840				55,410	7,868,220

[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, 1994.

	Tower Count		Aerial Survey		River Test Fishing			
Date	Daily	Cum.	Lagoon	Total	Fish per Index Pt.[1]	Index Points Daily	Index Points Cum.	Cumulative Escapement
6/14			1	1				
15					73	47	47	3
16					73	23	70	5
17					73	136	206	15
18					73	79	285	21
19					73	68	353	26
20					73	136	489	36
21		0			73	341	830	61
22	1	1			73	326	1,156	84
23	0	1	9	9	73	175	1,331	97
24	5	6			73	45	1,376	100
25	32	38	22	22	73	634	2,010	147
26	71	109			82	45	2,055	169
27	17	126	3	3	95	532	2,587	246
28	11	137			68	71	2,658	181
29	6	143			71	156	2,814	200
30	35	178	15	15	68	891	3,705	252
7/01	31	209			81	39	3,744	303
02	5	214	1	1	76	239	3,983	303
03	29	243	53	278	86	1,573	5,556	478
04	222	465	148	170	116	200	5,756	668
05	185	650	77	174	112	2,048	7,804	874
06	179	829	75	75	106	881	8,685	921
07	180	1,009	75	155	119	974	9,659	1,149
08	151	1,160	55	55	126	129	9,788	1,233
09	177	1,337			142	848	10,636	1,510
10	79	1,416	20	21	147	1,105	11,741	1,726
11	106	1,522			138	179	11,920	1,645
12	100	1,622	18	18	137	857	12,777	1,750
13	42	1,664						
14	43	1,707						
15	50	1,757						
16	23	1,780						
17	22	1,802						
18	46	1,848						
19	21	1,869						
20	12	1,881						
21	15	1,896						
22 [b]	4	1,900						
Total		1,900			134 [a]			1,750

[1] The 1985-93 mean fish per index point relationship (73 fpi) was used until June 26 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 took over counting duties beginning at 0001 hours July 22 and counted through 2400 hours September 11 enumerating an additional 69,798 sockeye. That brought the season's total sockeye count past Egegik Tower to 1,967,730 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, 1994.

	Tower Count		Aerial Survey		River Test Fishing			
					Fish per	Index Points		Cumulative
Date	Daily	Cum.	Lagoon	Total	Index Pt. [1]	Daily	Cum.	Escapement
6/24							0	0
25					53	15	15	1
26					53	22	37	2
27			[b]	[b]	53	14	51	3
28					53	20	71	4
29					53	6	77	4
30			1	1	53	14	91	5
7/01					53	14	105	6
02		0			53	21	126	7
03	0	0			53	13	139	7
04	0	1			53	0	139	7
05	0	1			53	8	147	8
06	0	1	[b]	[b]	53	5	152	8
07	0	2	[b]	[b]	53	71	223	12
08	0	2	1	1	53	165	388	21
09	5	7	10	66	15	1,322	1,710	26
10	102	109			90	1,545	3,255	293
11	205	314			90	1,229	4,484	404
12	207	521	8	12	137	656	5,140	704
13	50	571			119	830	5,970	710
14	24	595	1	1	99	376	6,346	628
15	31	626			98	1,020	7,366	722
16	63	689			93	357	7,723	718
17	38	727			94	343	8,066	758
18	39	766						
19	56	822						
20	89	911						
21	100	1,011						
22	20	1,031						
23	13	1,044						
24	8	1,052						
25	6	1,058						
26	3	1,061						
27	5	1,066						
28	13	1,079						
Total		1,081			95 [a]			

[1] The 1985-93 mean fish per index point relationship (53 fpi) was used until July 9 when lag-time relationships appeared to be more accurate.

[a] Calculated using the tower count through July 18 allowing for a 1-day lag between inside test and tower passage.

[b] Less than 500 fish.

Table 30. Inseason comparison of ocean age composition of sockeye salmon escapement using length frequency and scale analysis methods, Wood River, Bristol Bay, 1994.

Date	2-Ocean (%) Length Frequency	2-Ocean (%) Scales[1]	3-Ocean (%) Length Frequency	3-Ocean (%) Scales[1]	LF Sample Size	Scale Sample Size[2]
7/01	n/a	46.4	n/a	53.0	n/a	166
7/02	54.0	41.6	46.0	54.5	194	154
7/05	66.0	56.4	34.0	42.5	533	280
7/08	85.0	72.5	15.0	25.6	335	262
7/09	62.0	43.7	38.0	55.8	240	174
7/10	n/a	40.7	n/a	58.1	n/a	351
7/11	71.0	58.8	39.0	39.2	240	199
7/13	76.0	66.5	24.0	32.3	305	248
Final	66.0	47.2	34.0	51.6	3123	1834
ADF&G Forecast		44.0		56.0		

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, 1994.

	Tower Count		Aerial Surveys[1]		
Date	Daily	Cum.	Number	Visibility	Comments
6/19	a	a			
20	a	a			
21	a	a			
22	1	1			
23	1	2	0	Fair	
24	a	2			
25	1	4	0	Good	
26	3	7	a	Good	
27	3	10	a	Good-Exc	
28	2	12	0	Good	Below Muklulng only
29	1	14	0		Lower river only
30	1	15	a	Good	150 schooled mouth of Silver Salmon
7/01	6	21	a	Poor	150 schooled mouth of Silver Salmon
02	38	58	4	Fair	2 jumpers, 1 finner in lower river
03	66	124	10	Poor-Fair	2 jumpers, fish visible in lower river
04	62	186	1	Poor	
05	41	227	1	Fair-Poor	
06	65	292	0	Fair	
07	34	326	3	Exc	
08	21	347	a	Fair	
09	302	649			
10	347	996	25	Poor	Continuous on right bank, 6-7 wide
11	113	1,109			
12	35	1,145			
13	14	1,159			
14	15	1,174			
15	13	1,187			
16	65	1,251			
17	74	1,325			
18	39	1,364			
19	18	1,383			
20	16	1,399			
21	17	1,416			
22	29	1,445			
23	15	1,460			
24	12	1,472			
Total		1,472			

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, 1994.

	Tower Count		Aerial Surveys[1]					River Test Fishing			
			Lower		Upper			Fish per	Index Points		Cumulative
Date	Daily	Cum.	River	Lagoon	River	Total	Visibility	Index Pt.[2]	Daily	Cum.	Escapement
6/17								187	0	0	0
6/18								187	2	2	0
6/19								187	0	2	0
6/20								187	0	2	0
6/21								187	10	12	2
6/22	▪	▪						187	0	12	2
6/23	▪	▪	▪	0	▪	▪	Good	187	0	12	2
6/24	▪	▪						187	4	16	3
6/25	▪	1	▪	0	▪	▪	Fair	187	6	22	4
6/26	1	2						143	2	24	3
6/27	1	3	▪	▪	▪	▪	Exc	215	9	33	7
6/28	3	5	0	▪	▪	▪	Good	424	0	33	14
6/29	3	8	▪	▪	1	1	Exc	664	0	33	22
6/30	2	10	▪	▪	▪	1	Exc	454	2	35	16
7/01	2	12						730	35	70	51
7/02	5	17						497	278	348	173
7/03	3	20	▪	▪	▪	1	Fair-Poor	587	48	396	232
7/04	13	33						535	38	434	232
7/05	16	48	▪	▪	2	3	V Poor	684	13	447	306
7/06	11	60						513	4	451	231
7/07	14	73	1	1	1	3	Good	236	8	459	108
7/08	6	79						350	197	656	230
7/09	8	88						194	1,102	1,758	341
7/10	21	109	▪	0	1	1	V Poor	166	252	2,010	334
7/11	52	161						115	257	2,267	261
7/12	46	207						106	50	2,317	246
7/13	40	246						108	23	2,340	253
7/14	38	285									
7/15	17	301									
7/16	9	310									
7/17	14	324									
7/18	23	347									
7/19	23	369									
7/20	18	388									
7/21	11	399									
7/22	10	409									
7/23	7	417									
7/24	7	424									
7/25	10	434									
7/26	7	441									
7/27	5	446									
Total		446									

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

2 The 1988-1989, 1991-1993 mean fish per index point relationship (187 fpi) was used until June 26 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, 1994.

	Tower Count		Aerial Surveys[1]					
Date	Daily	Cum.	Togiak to Gech.	Gechiak to Ongi.	Ongivinuck to tower	Total	Visibility	Comments
6/28			140	80	0	220	Poor	Mixed chum and sockeye
7/03			160	480	300	940	Good	Mixed chum and sockeye
7/04	0	0						
7/05	0	0						
7/06	0	0	2,075	1,340	180	3,595	Exc	Mixed chum and sockeye
7/07	▪	▪						
7/08	1	1						
7/09	1	1						
7/10	▪	2	6,540	1,960	440	8,940	Fair	Mixed chum and sockeye
7/11	1	2						
7/12	2	4						
7/13	3	7	12,800	5,205	3,770	8,975	Fair-Good	Mixed chum and sockeye
7/14	6	14						
7/15	8	21						
7/16	5	26						
7/17	5	31						
7/18	4	35						
7/19	3	37	13,200	17,000	4,100	34,300	Fair	Mixed chum and sockeye
7/20	6	43						
7/21	11	54						
7/22	9	62						
7/23	6	68						
7/24	3	71						
7/25	4	76						
7/26	5	81	300	7,800	3,800	11,900	Fair-Poor	Includes traveling sockeye only.
7/27	9	90						
7/28	16	105						
7/29	9	114						
7/30	6	120						
7/31	5	125						
8/01	4	129						
8/02	4	133						
8/03	2	135						
8/04	3	138						
8/05	5	143						
8/06	6	148						
8/07	3	151						
8/08	2	154						
8/09	1	155						
Total		155						

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

▪ Less than 500 fish.

Table 34. Commercial salmon processors and buyers operating in Bristol Bay, 1994.[a]

Name of Operator/Buyer	Base of Operations	District[1]	Method[2]	Export
1. AK Pacific Products	Egegik, AK	E	F,S	Sea
2. Alaskan Gourmet Sfds.	Anchorage, AK	N	S	
3. Alaskan Leader	Kodiak, AK	K,E,U,N,T	C	Sea
4. Alaskan Shores Fish	Seattle, WA	E	F	Sea
5. All Alaskan Seafoods	Seattle, WA	K,E,U,N,T	F	Sea
6. Arctic Alaska Fish.	Dutch Harbor, AK	K,E,U	F,T	Sea
7. Bering Pacific Co-op	Everett, WA	K,E,U	F	Sea
8. Big Creek Fish, Inc.	Warden, WA	E	F	Sea
9. C Fisheries	Seattle, WA	K,E,U	F	Sea
10. Clark's Fish Co.	Cathlamet, WA	E	EF	Air
11. Dragnet Fisheries Co.	Kenai, AK	K,E,U,N,T	F	Sea
12. Full Moon Fisheries	Fairbanks, AK	U	EF	Air
13. Icicle Seafoods	Seattle, WA	K,E,U,N	EF,F,T	Air,Sea
14. Inlet Fisheries	Kenai, AK	K,E,U,N,T	EF,F	Air,Sea
15. International Seaf.	Seattle, WA	E	EF,F	Air,Sea
16. J-N-R Fish	Kenai, AK	E	F	Sea
17. King Crab	Seattle, WA	K,E,U,N	C,EF,F,T	Sea
18. Nelbro Packing Co.	Kenmore, WA	K,E	C	Sea
19. New West Fish, Inc.	Bellingham, WA	K,E,U	F	Sea
20. North Alaska Fish.	Wasilla, AK	T		Air
21. North Coast Seafoods	Seattle, WA	K,E,U,N,T	F	Sea
22. NorQuest Seafoods	Seattle, WA	K,E,U	F	Sea
23. Oceantrawl Inc.	Seattle, WA	K,E,U,	F,S	Sea
24. Pan Pacific Seafoods	Seattle, WA	K,E,U	F	Sea
25. Pederson Point	Seattle, WA	K,E	F,T	Sea
26. Peter Pan Seafoods	Seattle, WA	K,E,U,N,T	C,EF,F,S,T	Air,Sea
27. Quality First Sfds.	King Salmon, AK	K,E,U	EF,F,T	Sea
28. Regal Fish	Seattle, WA	E,U,	F	Sea
29. Snopac Products	Seattle, WA	K,E,U	F,T	Sea
30. Togiak Fisheries	Seattle, WA	T	EF,F	Air,Sea
31. Trident Seafoods	Seattle, WA	K,E,U,N	C	Sea
32. Ugashik Wild Salmon	Anchorage, AK	U	C,EF	
33. Unisea, Inc.	Redmond, WA	K,E,U,N	EF,F	Sea
34. Wards Cove Co.	Seattle, WA	K,E,N,T	C,EF,F,T	Air,Sea
35. Woodbine	Rio Vista, CA	K,E,U,N,T	C,EF,F	Sea
36. YAK, Inc.	Seattle, WA	K,E,U	F,T	Sea

Number of processors: Canning =6; Freezing =29; Curing =3; Air transport =9; Sea transport =11

[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 the commercial salmon catch, Bristol Bay, 1994.[a]

Species	Total Catch (lbs.)	Mean Weight (lbs.)	Mean Price ($/lb.)	Exvessel Value ($)
Sockeye	196,566,371	5.54	.70	138,007,308
Chinook	2,533,795	18.03	.47	1,190,025
Chum	4,639,606	6.47	.22	1,042,607
Pink	339,885	3.73	.04	14,936
Coho	1,454,389	8.18	.45	650,497
Total	205,534,046			140,905,373

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

Table 36. Subsistence salmon catch by species, in number of fish, by district and location fished, Bristol Bay, 1994.[a]

Area and River System	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT							
Naknek River[1]	346	23,461	1,680	466	423	1,311	27,341
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	209	64,201	163	37	37	496	64,934
Total N/K	555	87,662	1,843	503	460	1,807	92,275
EGEGIK DISTRICT[2]	59	3,208	166	84	153	857	4,468
UGASHIK DISTRICT[3]	31	1,587	126	42	38	579	2,372
NUSHAGAK DISTRICT							
Wood River[4]	87	4,557	2,350	478	241	610	8,236
Lower Nushagak River[5]	33	1,172	2,380	177	43	119	3,891
Upper Nushagak River[6]	50	4,305	3,774	2,464	19	184	10,746
Dillingham Beaches[7]	263	10,858	5,388	1,340	1,264	3,111	21,961
Nushagak Bay Commercial[8]	62	3,065	1,103	566	234	1,083	6,051
Igushik	28	2,544	495	30	241	231	3,541
Total Nushagak	523	26,501	15,490	5,055	2,042	5,338	54,426
TOGIAK DISTRICT[9]	25	1,777	904	398	77	910	4,066
TOTAL BRISTOL BAY	1,193	120,735	18,529	6,082	2,770	9,491	157,607

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, Red Bluff, Hansen Point, Aleknagik Area, Muklung River, 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 Bradford Point, Icicle, Kanakanak, Scandanavia, Snag Point, and Squaw Creek.
8 Includes Clark's Point, Coffee Point, Ekuk, Nushagak Point, Protection 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, 1974-94.

Year	Kvichak River					Naknek River				
	Point Goal	Range Lower	Range Upper	Actual	Percent Deviation[1]	Point Goal	Range Lower	Range Upper	Actual	Percent Deviation[1]
1974	6,000			4,434	(26)	800			1,241	55
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
20 yr Avg.	5,800			6,124	5	900			1,575	75
1974-83	5,200			6,521	21	800			1,390	74
1984-93	6,400	5,200	8,600	5,727	(11)	1,000	800	1,400	1,760	76
1994	8,000	6,000	10,000	8,338	4	1,000	800	1,400	991	(1)

Year	Egegik River					Ugashik River				
	Point Goal	Range Lower	Range Upper	Actual	Percent Deviation[1]	Point Goal	Range Lower	Range Upper	Actual	Percent Deviation[1]
1974	600			1,276	113	500			62	(88)
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
20 yr avg	800			1,276	58	600			1,130	89
1974-83	600			916	53	500			961	92
1984-93	1,000	800	1,200	1,635	63	700	500	900	1,298	85
1994	1,000	800	1,200	1,968	97	700	500	900	1,081	54

Appendix Table 1. (Page 2 of 2)

Year	Wood River Point Goal	Wood River Range Lower	Wood River Range Upper	Wood River Actual	Wood River Percent Deviation [1]	Igushik River Point Goal	Igushik River Range Lower	Igushik River Range Upper	Igushik River Actual	Igushik River Percent Deviation
1974	800			1,709	114	150			359	139
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
20 yr avg	900			1,286	46	178			440	164
1974-83	820			1,487	82	155			546	261
1984-93	980	730	1,200	1,084	10	200	148	250	334	67
1994	1,000	700	1,200	1,472	47	200	150	250	446	123

Year	Nushagak River [2] Point Goal	Nushagak River [2] Range Lower	Nushagak River [2] Range Upper	Nushagak River [2] Actual	Nushagak River [2] Percent Deviation [1]	Togiak River Point Goal	Togiak River Range Lower	Togiak River Range Upper	Togiak River Actual	Togiak River Percent Deviation
1974	250			155	(38)	100			83	(17)
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
20 yr avg	383			622	93	125			194	64
1974-83	255			714	183	100			209	109
1984-93	510	316	724	530	3	150	128	235	178	19
1994	550	340	760	509	(7)	150	140	250	155	3

1 Percent deviation = (actual minus goal) / goal (multiplied by 100).

2 Actual escapement from 1974-88 is based on the Nuyakuk River tower count, and from 1989-present is based on sonar count at Portage Creek.

Appendix Table 2. Forecast and inshore chinook salmon return, in thousands of fish, Nushagak District, Bristol Bay, 1974-94.

Year	Forecast: Spawner Recuit	Forecast: Mean Percent	Forecast: Sibling	Inshore Run [1]	Forecast Error (%): Spawner Recruit	Forecast Error (%): Mean Percent	Forecast Error (%): 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	155	36	-31	-6
78	254	105	111	255	-0	-59	-56
1979	348	147	182	261	33	-44	-30
80	329	206	162	218	51	-6	-26
81	339	230	198	355	-5	-35	-44
82	319	256	213	354	-10	-28	-40
83	322	266	224	311	4	-14	-28
1984	236	319	165	152	55	110	9
85	308	434	162	192	60	126	-16
86	299	543	168	122	145	345	38
87	353	366	125	143	147	156	-13
88			139	84			65
1989			129	104			24
90			116	91			27
91			120 [a]	141			-15
92			196 [a]	144			36
93 [b]			139 [a]	178			-22
Mean Percent Error					64	41	-9
1994 [b]			151 [a]	230 [c]			-34

1 Inshore Nushagak River commercial catch, subsistence catch, and escapement (does not include sport harvest).

a Adjusted (reduced) by the average forecast error (-19.35%) from 1984-92.

b Mean returns were used to predict age 1.1 and age 1.2, other year classes forecast using sibiling data.

c Preliminary

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

Appendix Table 3. Salmon entry permit registration by gear and residency, Bristol Bay, 1974-1994. [a]

Year	Drift Net [1] Resident	Drift Net [1] Non-Resident	Drift Net [1] Total	Set Net [1] Resident	Set Net [1] Non-Resident	Set Net [1] Total	Total
197 [b]	634 (634)	238 (238)	872	530 (530)	95 (95)	625	1,497
75	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
1979	1,046 (73)	754 (10)	1,800	764 (19)	170 (5)	934	2,734
80	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
1984	1,050 (73)	768 (16)	1,818	744 (28)	218 (3)	962	2,780
85	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
198 [e]	1,031 (77)	830 (14)	1,861	772 (14)	235 (4)	1,007	2,868
90 [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
20 Year Ave.	1,025	765	1,790	729	202	931	2,720
1974-83 Ave.	1,016	710	1,726	710	171	881	2,607
1984-93 Ave.	1,034	820	1,854	748	232	980	2,833
199 [j]	973 (63)	904 (14)	1,877	746 (7)	253 (0)	999	2,876

[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. 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.

Appendix Table 4. Salmon fishing interim-use and permenant entry permits actually fished, by gear type, Bristol Bay, 1975-94.

Year	Permits Issued			Permits Fished	
	Interim - Use	Permanent	Total	Number	Percent
		Drift Gill Net			
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		
Average	120	1,718	1,838		
1994 ▪	77	1,800	1,877		
		Set Gill Net			
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		
Average	32	916	947		
1994 ▪	7	992	999		

▪ Preliminary

(Source: 14)

Appendix Table 5. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	538,163	172,253	2,151	510,571	139,341	1,362,479
75	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
1979	14,991,826	2,257,332	391,118	3,327,346	460,984	21,428,606
80	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
1984	14,546,710	5,190,413	2,658,376	1,992,681	322,126	24,710,306
85	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
1989	13,809,956	8,901,994	3,146,239	2,788,185	88,932	28,735,306
90	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
20-Year Ave.	8,753,901	5,830,537	2,084,758	3,145,722	416,364	20,231,282
1974-83 Ave.	8,113,200	2,389,850	817,395	3,253,224	421,976	14,995,646
1984-93 Ave.	9,394,602	9,271,224	3,352,122	3,038,219	410,752	25,466,919
1994 a	16,262,625	10,798,450	4,369,432	3,433,008	401,052	35,264,567

aPreliminary.

(Sources: 1 and 5)

Appendix Table 6. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	480	1,133	1,200	32,053	10,798	45,664
75	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
1979	10,415	5,547	9,568	157,321	30,022	212,873
80	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
1984	8,972	4,680	4,767	61,378	22,179	101,976
85	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
1989	6,611	2,034	2,112	17,637	11,366	39,760
90	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
20-Year Ave.	6,260	2,902	3,747	74,312	22,138	109,360
1974-83 Ave.	6,717	3,555	4,408	106,596	27,875	149,151
1984-93 Ave.	5,803	2,250	3,086	42,028	16,401	69,569
1994 [a]	6,127	1,231	3,757	118,643	10,629	140,387

[a] Preliminary.

(Sources: 1 and 5)

Appendix Table 7. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	41,347	4,022	2,334	157,941	80,710	286,354
75	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
1979	196,398	38,004	12,174	440,279	219,942	906,797
80	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
1984	447,259	178,096	210,611	850,114	336,660	2,022,740
85	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
1989	310,869	136,185	84,673	523,903	203,178	1,258,808
90	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
20-Year Ave.	266,046	95,427	60,972	526,693	233,167	1,182,306
1974-83 Ave.	227,096	59,863	26,297	574,057	209,014	1,096,328
1984-93 Ave.	304,996	130,991	95,648	479,330	257,320	1,268,283
1994 [a]	200,823	57,222	48,951	293,205	232,492	832,693

[a] Preliminary.

(Sources: 1 and 5)

Appendix Table 8. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	508,534	4,405	340	413,613	13,086	939,978
75	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
1979	134	6	9	1,787	1,913	3,849
80	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
1984	211,306	5,759	2,387	3,127,153	19,468	3,366,073
85	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
1989	75	6	29	156	172	438
90	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
20-Year Ave.[1]	352,668	4,971	480	1,292,575	39,684	1,690,377
1974-83 Ave[1]	384,794	4,886	241	1,808,671	38,429	2,237,021
1984-93 Ave[1]	320,542	5,056	718	776,478	40,938	1,143,732
1994 [a]	12,213	72	117	9,024	70,029	91,455

[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, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	916	1,156	4,055	12,569	25,049	43,745
75	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
1979	12,355	15,148	17,886	129,607	119,403	294,399
80	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
1984	3,209	66,589	68,451	260,310	176,053	574,612
85	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
1989	22,668	49,175	33,942	77,077	56,972	239,834
90	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
20-Year Ave.	8,830	31,167	25,705	82,825	48,235	196,761
1974-83 Ave.	4,520	18,076	14,426	105,262	59,982	202,266
1984-93 Ave.	13,139	44,257	36,983	60,388	36,489	191,255
1994 [a]	6,841	48,460	19,940	6,814	96,606	178,661

[a] Preliminary.

(Sources: 1 and 5)

Appendix Table 10. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	1,089,440	182,969	10,080	1,126,747	268,984	2,678,220
75	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
1979	15,211,128	2,316,037	430,755	4,056,340	832,264	22,846,524
80	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
1984	15,217,456	5,445,537	2,944,592	6,291,636	876,486	30,775,707
85	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
1989	14,150,179	9,089,394	3,266,995	3,406,958	360,620	30,274,146
90	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
20-Year Ave.	9,211,406	5,962,539	2,175,428	4,476,128	740,307	22,565,808
1974-83 Ave.	8,543,971	2,473,819	862,652	4,944,016	739,097	17,563,556
1984-93 Ave.	9,878,842	9,451,258	3,488,203	4,008,239	741,518	27,568,060
1994 *	16,488,629	10,905,435	4,442,197	3,860,694	810,808	36,507,763

* Preliminary.

(Sources: 1 and 5)

Appendix Table 11. Commercial Sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1974-94.

Year	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak		Total	
	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set
1974	82	18	78	22	50	50	73	27	91	9	75	25
75	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
20-Year Ave.	88	13	87	13	88	12	77	23	75	25	83	17
1974-1983 Ave.	90	10	83	17	88	12	84	16	85	15	86	14
1984-1993 Ave.	86	14	91	9	91	9	72	28	65	35	81	19
1994 *	90	10	92	8	94	6	68	32	52	48	79	21

* Preliminary data

(Source: 5)

Appendix Table 12. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak[1]	Egegik[2]	Ugashik[3]	Nushagak[4]	Togiak[5]	Total
1974	5,889,750	1,275,630	61,854	2,267,468	108,492	9,603,194
75	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
1979	12,437,996	1,032,042	1,706,904	3,073,571	224,838	18,475,351
80	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
1984	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
85	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
1,989	9,676,244	1,611,566	1,713,287	2,189,501	125,080	15,315,678
90	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
20-Year Ave.	7,869,692	1,275,631	1,143,751	2,465,920	266,872	13,021,867
1974-83 Ave.	8,084,712	916,133	968,825	2,892,825	278,519	13,141,015
1984-93 Ave.	7,654,672	1,635,129	1,318,678	2,039,015	255,226	12,902,719
1994 *	9,571,245	1,967,775	1,095,068	2,448,056	233,632	15,315,776

[1] Includes Kvichak, Branch and Naknek Rivers.
[2] Includes Egegik River. Also includes King Salmon River in 1986-93, and Shosky Creek in 1988-93.
[3] Includes Ugashik River. Also includes Mother Goose River system 1976-93 and Dog Salmon River system in 1984-93.
[4] Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.
[5] Includes Togiak River, Lake and tributaries, Kulukak system and other miscellaneous river systems.
*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, 1974-94.

Year	Catch	Escapement				Total Run
		Kvichak [1]	Branch [2]	Naknek [1]	Total	
1974	538,163	4,433,844	214,848	1,241,058	5,889,750	6,427,913
75	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
1979	14,991,826	11,218,434	294,200	925,362	12,437,996	27,429,822
80	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
1984	14,546,710	10,490,670	215,370	1,242,474	11,948,514	26,495,224
85	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
1989	13,809,956	8,317,500	196,760	1,161,984	9,676,244	23,486,200
90	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
91 [3]	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
92 [3]	9,329,663	4,725,864	224,643	1,606,650	6,557,157	15,886,820
93 [3]	8,866,866	4,025,166	347,975	1,535,658	5,908,799	14,775,665
20 Year Ave.	8,748,537	6,124,318	193,226	1,478,236	7,795,780	16,544,317
1974-83 Ave.	8,113,200	6,521,289	173,638	1,389,785	8,084,712	16,197,913
1984-93 Ave.	9,383,873	5,727,347	212,815	1,558,646	7,498,808	16,882,680
1994 [3]	16,262,625	8,337,840	242,595	990,810	9,571,245	25,833,870

[1] Tower count
[2] Tower count 1974-76 and aerial survey estimates 1977-94
[3] 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, 1974-94.

Year	Kvichak Number	Kvichak %	Branch Number	Branch %	Naknek Number	Naknek %	Total Run [1]
1974	4,582	71	225	4	1,621	25	6,428
75	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
1979	24,637	90	573	2	2,219	8	27,430
80	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
1984	23,014	87	555	2	2,926	11	26,495
85	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
90	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
20 Year Ave.	12,120	67	434	3	4,061	30	16,615
1974-83 Ave.	12,277	67	386	3	3,535	30	16,198
1984-93 Ave.	11,963	67	483	3	4,587	30	17,033
1994 [a]	22,178	86	633	2	3,023	12	25,834

[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, 1974-94.

Year	Catch	Escapement			Total Run
		Egegik[1]	Shosky Cr.[2]	King Salmon[2]	
1974	172,253	1,275,630			1,447,883
75	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
1979	2,257,332	1,032,042			3,289,374
80	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
1984	5,190,413	1,165,320		25	6,355,758
85	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
1989	8,901,994	1,610,916	50	600	10,513,560
90	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
20-Year Ave.	5,830,537	1,275,536			7,106,190
1974-83 Ave.	2,389,850	916,133			3,305,983
1984-93 Ave.	9,271,224	1,634,939	23	314	10,906,396
1994 [a]	10,798,450	1,967,730	15	30	12,766,225

[1] Tower count.
[2] Aerial survey index count.
[a] 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, 1974-94.

Year	Catch	Escapement			Total Run
		Ugashik [1]	King Salmon [2]	Dog Salmon [2]	
1974	2,151	61,854			64,005
75	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
1979	391,118	1,700,904	6,000		2,098,022
80	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
1984	2,658,376	1,241,418	17,100	11,800	3,928,694
85	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
1989	3,146,239	1,681,302	25,480	6,505	4,859,526
90	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
20-Year Ave.	2,084,760	1,129,853	10,709	3,189	3,228,511
1974-83 Ave.	817,398	961,211	7,615		1,786,224
1984-93 Ave.	3,352,122	1,298,495	13,804	6,378	4,670,798
1994 [3]	4,369,432	1,080,858	8,885	5,325	5,464,500

[1] Tower count.
[2] Aerial survey.
[3] 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, 1974-94.

		Escapement							
Year	Catch	Wood[1]	Igushik[1]	Nuyakuk[1]	Nush/Mul[2]	Nushagak[3]	Snake[4]	Total	Total Run
1974	510,571	1,708,836	358,752	154,614	30,000		15,266	2,267,468	2,778,039
76	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
1979	3,327,346	1,706,352	859,560	360,120	139,100		8,439	3,073,571	6,400,917
80	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
1984	1,992,681	1,002,792	184,872	472,596	120,586		33,840	1,814,686	3,807,367
85	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
1989	2,788,185	1,186,410	461,610			513,421	28,060	2,189,501	4,977,686
90	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
20-year Ave.	3,145,722	1,285,686	439,967	622,865[5]	137,838[5]		16,571	2,465,920	5,611,641
1974-83 Ave.	3,253,224	1,487,117	546,052	713,633[5]	132,110[5]		13,912	2,892,825	6,146,049
1984-93 Ave.	3,038,219	1,084,254	333,881	441,330[5]	149,293[5]	619,303[6]	19,895	2,039,015	5,077,234
1994	3,433,008[7]	1,471,890	445,920			509,326	20,920[7]	2,448,056	5,881,064

[1] Tower count.
[2] Tower count 1974, aerial survey estimates 1977-83, 1985, and 1987. Escapement estimates for 1984 and 1988 were derived from the difference between lower river sonar estimates and Nuyakuk Tower counts. Tower not operated in 1975-76, escapement estimates for these years and 1986 were based on the average ratio of Nuyakuk/Nushagak-Mulchatna river system in years when data was available.
[3] Escapement to Nuyakuk and Nushagak-Mulchatna rivers can not be calculated after 1988; total runs from 1989 on are determined for the entire Nushagak River drainage using Portage Creek sonar estimates.
[4] Aerial survey estimate 1980, 1982-86, 1989-91, 1994; weir count 1974-79 and 1981, not surveyed in 1992 or 1993 due to lack of funding.
[5] Preliminary.
[6] Averages thru 1988.
[7] Average 1989 thru 1993.

(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, 1974-94.

Year	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		Total Run[1]
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
1974	2,099	76	442	16	187	7	34	1			15	1	2,777
75	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
1979	3,638	57	1,842	29	764	12	138	2			18	0	6,400
80	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
1984	1,982	52	435	11	906	24	451	12			20	1	3,794
85	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
1989	2,519	51	1,214	24					1,217	24	28	1	4,978
90	2,647	46	1,267	22					1,771	31	29	1	5,714
91 *	3,423	45	2,478	32					1,781	23	11	0	7,692
92 *	2,525	49	815	16					1,848	36	1	0	5,189
93 *	3,763	49	1,598	21					2,263	30			7,624
20-Year Ave.	2,770	51	1,117	18	1,369	23	345	8	1,776	29	19	0	5,634
1974-83 Ave.	3,061	53	1,216	17	1,593	23	255	6			22	0	6,146
1984-93 Ave.	2,480	49	1,017	18	921	23	525	12	1,776	29	16	0	5,122
1994	2,988	51	1,311	22					1,561	27	21		5,881

[1] Due to rounding, the district total runs may not equal the sum of the rows.
* 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, 1974-94.

	Catch				Escapement						
					Togiak						
Year	Togiak	Kulukak	Os/Mat[1]	Total	Lake[2]	River[3]	Tributaries[4]	Kulukak[5]	Other[6]	Total	Total Run
1974	110,886	13,615	14,840	139,341	82,992	12,000	8,600	4,900		108,492	247,833
75	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 [7]	452,016	273,576	15,000	17,600	33,900		340,076	792,092
1979	393,337	66,629	1,018	460,984	171,138	14,200	12,900	26,600		224,838	685,822
80	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
1984	213,213	96,709	12,204	322,126	95,448	15,830	39,700	49,800		200,778	522,904
85	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
1989	68,375	14,116	6,441	88,932	84,480	15,200	4,560	20,840		125,080	214,012
90	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 [8]	33,425 [8]	6,437 [8]	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 [9]	199,056	6,060	10,400	26,440	25,000	266,956	971,102
93	473,501	64,432	5,518	543,451 [9]	177,185	4,600	11,330	31,800	17,560	242,475	785,926
20-Year Ave.	362,174	46,752	7,135	415,425	193,545	13,026	20,990	33,041		266,872	682,297
1974-83 Ave	392,845	26,672	2,459	421,976	208,687	13,250	25,632	30,950		278,519	700,495
1984-93 Ave	331,504	66,832	11,812	408,874	178,404	12,801	16,348	35,132	25,082	255,226	664,100
1994	321,293	77,410	2,349	401,052	154,752	6,200	13,220	29,740	29,720	233,632	634,684

[1] Catches in the Osviak and Matogak sections were combined.
[2] Tower count.
[3] Aerial survey estimate.
[4] Aerial survey estimate includes Gechiak, Pungokepuk, 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 icluded under tributaries when surveyed.
[7] Includes 248 fish from Cape Pierce Section.
[8] Based on weekly processor reports. Fish tickets were not coded by section.
[9] Preliminary.

(Source: 1, 7, and 13)

Appendix Table 20. Inshore total run of sockeye by district, in numbers of fish, Bristol Bay, 1974-94.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1974	6,427,913	1,447,883	64,005	2,778,039	247,833	10,965,673
75	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
1979	27,429,822	3,289,374	2,098,022	6,400,917	685,822	39,903,957
80	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
1984	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
85	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
1989	23,486,200	10,513,560	4,859,526	4,977,686	214,012	44,050,984
90	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
20-Year Ave.	16,618,229	7,118,671	3,235,625	5,621,747	682,297	33,276,569
1974-83 Ave.	16,197,913	3,305,983	1,786,221	6,146,049	700,495	28,136,661
1984-93 Ave.	17,038,545	10,931,358	4,685,029	5,097,445	664,100	38,416,477
1994 *	25,833,870	12,766,225	5,464,500	5,881,064	634,684	50,580,343

* Preliminary.

(Sources: 1 and 7)

Appendix Table 21. Kvichak River sockeye salmon escapement and return by brood year, Bristol Bay, 1955-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Return Per Spawner
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		9,923 [b]	2.44
89	8,318	31	2,300	20,466			22,797 [b]	2.74
1990	6,970	14	1,635				1,649 [b]	0.24
91	4,222	1					1 [b]	0.00
92	4,726							
93	4,025							
94	8,338							
Total[1]	185,940	285	103,778	278,297	29,205	88	411,653	
Average[1]	5,635	9	3,145	8,433	885	3	12,474	2.21
Percent[1]		0	25	68	7	0	100	

[1] Averages and percentages computed from years with complete returns, 1955-87.

[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, 1955-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Return Per Spawner
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		622 [b]	3.19
89	197 [c]	5	353	349			707 [b]	3.59
1990	169 [c]	2	262				264 [b]	1.56
91	278 [c]	0					0 [b]	0.00
92	225 [c]							
93	348 [c]							
94	243 [c]							
Total[1]	7,807	159	7,887	7,033	791	6	15,876	
Average[1]	237	5	239	213	24	0	481	2.03
Percent[1]		1	50	44	5	0	100	

[1] Averages and percentages computed from years with complete returns, 1955-87.

[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] 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, 1953-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Return Per Spawner
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 [b]	5.19
88	1,038	0	285	1,306	580		2,171 [b]	2.09
89	1,162	1	229	2,077			2,307 [b]	1.99
1990	2,093	0	451				451 [b]	0.22
91	3,579	14					14 [b]	0.00
92	1,607							
93	1,536							
94	991							
Total[1]	37,926	62	17,994	67,738	30,253	231	116,278	
Average[1]	1,084	2	514	1,935	864	7	3,322	3.07
Percent[1]		0	15	58	26	0	100	

[1] Averages and percentages computed from years with complete returns, 1953-87.

[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, 1953-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Spawner
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		18,944 [b]	11.74
89	1,612	1	644	6,548			7,193 [b]	4.46
1990	2,192	0	474				474 [b]	0.22
91	2,787	5					5 [b]	0.00
92	1,946							
93	1,517							
94	1,968							
Total[1]	30,004	40	15,010	105,532	52,654	891	174,127	
Average[1]	857	1	429	3,015	1,504	25	4,975	5.80
Percent[1]		0	9	61	30	1	100	

[1] Averages and percentages computed from years with complete returns, 1953-87.

[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, 1953-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Spawner
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		5,702 [b]	8.72
89	1,713	10	724	2,865			3,599 [b]	2.10
1990	749	1	375				376 [b]	0.50
91	2,482	7					7 [b]	0.00
92	2,195							
93	1,413							
94	1,095							
Total[1]	23,829	60	19,701	47,669	12,283	100	79,813	
Average[1]	681	2	563	1,362	351	3	2,280	3.35
Percent[1]		0	25	60	15	0	100	

[1] Averages and percentages computed from years with complete returns, 1953-87.

[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, 1953-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Spawner
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		3,237 [b]	3.73
89	1,186	5	2,316	1,958			4,279 [b]	3.61
1990	1,069	11	1,123				1,134 [b]	1.06
91	1,160	12					12 [b]	0.01
92	1,286							
93	1,176							
94	1,472							
Total[1]	36,244	182	37,385	40,319	3,084	8	80,978	
Average[1]	1,036	5	1,068	1,152	88	0	2,314	2.23
Percent[1]		0	46	50	4	0	100	

[1] Averages and percentages computed from years with complete returns, 1953-87.

[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, 1953-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Spawner
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		1,344 [b]	7.91
89	462	0	525	1,186			1,711 [b]	3.70
1990	366	1	163				164 [b]	0.45
91	756	0					0 [b]	0.00
92	305							
93	406							
94	446							
Total[1]	11,400	6	6,306	21,642	2,085	5	30,044	
Average[1]	326	0	180	618	60	0	858	2.64
Percent[1]		0	21	72	7	0	100	

1 Averages and percentages computed from years with complete returns, 1953-87.

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, 1978-94.[a]

Brood Year	Escapement	Return by Year 3	4	5	6	7	Total	Spawner
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 [d]	71	779	1,581	70		2,501 [b]	5.18
89	513 [d]	69	614	746			1,429 [b]	2.79
1990	680 [d]	53	812				865 [b]	1.27
91	495 [d]	10					10 [b]	0.02
92	695 [d]							
93	715 [d]							
94	509 [d]							
Total[1]	8,966	472	6,352	8,394	838	2	16,058	
Average[1]	897	47	635	839	84	0	1,606	1.79
Percent[1]		3	40	52	5	0	100	

[1] Averages and percentages computed from years with complete returns, 1978-87.

[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 tower 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 tower 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, 1953-94.[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		619 [b]	2.03
89	104	0	168	336			504 [b]	4.85
1990	189	1	126				127 [b]	0.67
91	278	4					4 [b]	0.01
92	216							
93	193							
94	174							
Total[1]	5,711	15	4,135	11,101	1,344	4	16,599	
Average[1]	163	0	118	317	38	0	474	2.91
Percent[1]		0	25	67	8	0	100	

[1] Averages and percentages computed from years with complete returns, 1953-87.

[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, 1974-94.[a]

	Nushagak District			Togiak District		
Year	Catch	Escapement [1]	Total Run	Catch	Escapement [2]	Total Run
1974	32,053	70,000	102,053	10,798	15,000	25,798
75	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
1979	157,321	95,000	252,321	30,022	20,000	50,022
80	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
1984	61,378	81,000	142,378	22,179	26,000	48,179
85	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
1989	17,637	78,302	95,939	11,366	10,540	21,906
90	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
20-Year Ave.	74,312	96,946	171,258	22,138	16,288	38,426
1974-83 Ave.	106,596	113,000	219,596	27,875	19,800	47,675
1984-93 Ave.	42,028	80,892	122,920	16,401	12,776	29,178
1994	118,643 [c]	95,954	214,597	10,629 [c]	19,353	29,982

1 Escapements were estimated from the following:
1974-81 - comprehensive aerial surveys.
1982-85 - correlation between index counts and total escapement estimates when aerial surveys were complete.
1986-93 - sonar estimate.
Estimates for 1974-85 are rounded to the nearest thousand fiish.

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, 1974-94.[a]

	Nushagak District			Togiak District		
Year	Catch	Escapement [1]	Total Run	Catch	Escapement [2]	Total Run
1974	157,941	100,000	257,941	80,710	161,000	241,710
75	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
1979	440,279	166,000	606,279	219,942	293,000	512,942
80	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
1984	850,114	362,000	1,212,114	336,660	204,000	540,660
85	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
1989	523,903	377,512	901,415	203,178	143,890	347,068
90	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
20-Year Ave.	526,693	299,031	816,895	233,167	247,352	480,519
1974-83 Ave.	574,057	331,400	905,457	209,014	284,900	493,914
1984-93 Ave.	479,330	266,662	728,334	257,320	209,803	467,123
1994	293,205 [b]	378,928	672,133	232,492 [b]	229,470	461,962

1 Escapements were estimated from the following:
1974 - tower enumeration and aerial survey data;
1975-78 - aerial survey data;
1979-94 - adjusted sonar estimate from Portage Creek site.
Estimates for 1974-85 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, 1959-94.[a]

Brood Year	Escapement[2]	Returns By Year[1] 1.1	1.2	1.3	1.4	1.5	Total Return[3]	Return Per Spawner
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	155,101	1.19
79	95,000	3,137	49,377	70,843	87,467	11,738	223,390	2.35
1980	141,000	205	11,241	48,427	55,218	3,102	118,735	0.84
81	150,000	967	33,684	46,274	83,487	7,342	172,303	1.15
82	147,000	1494	4081	36112	31689	5805	79360	0.54
83	161,730	109	16706	20488	51815	1461	90922	0.56
84	80,940	703	17346	27405	22117	1844	69604	0.86
1985	115,720	3243	18121	37249	45394	2012	106104	0.92
86	35,482	27	27046	51602	45299	1921	123745	3.49
87	78,714	517	36745	54031	68926	4989	165377	2.10
88	51,380	699	35989	61371	105183		203276	3.96
89	73,878	2110	40382	84393				
1990	59,363	593	31569					
91	96,628	1468						
92	76,895							
93	90,913							
94	88,554							
Average	80,627	741	25,053	55,235	74,237	7,275	166,202	2.81
Percent		0	15	33	45	4		

1 Escapement age compostion for 1966-1980 and 1986 estimated from commercial catch age composition. Subsistence catch age composition from 1966-1981 and 1990 estimated from commercial catch age composition.

2 Escapements for 1968-1970 and 1972-1981 were estimated from comphrehensive aerial surveys. Escapements for 1982-1985 were estimated form the correlation between index counts and total escapement when aerial surveys were complete. Escapements for 1986-1993 are sonar estimates less the sport and subsistence harvest above the sonar si

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

4 Mean escapements calculated from all escapement from 1966-1993. Mean total return calculated from from 1963-1986. Mean return per spawner calcluated from 1966-1986.

a Estimated of inshore return include estimates of escapement, commerical catch, and subsistence catch.

b Escapement for 1966 estimated from a counting tower on the Nushagak River. Tower counts expanded to account for the proportion of the total escapement not inlcuded in the tower count.

c Escapement for 1967 estimated from a combination of tower counts, minimal aerial surveys, and run strength.

d Escapement for 1971 estimated from average mean expoitation rates 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.

		Escapement							
Year	Catch	Wood[1]	Igushik[2]	Nuyakuk[3]	Nush/Mul[4]	Nushagak[5]	Snake[6]	Total	Total Run
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
	190,102					[b]			
Average[7]	1,179,754	55,875	7,419	1,859,390[c]	132,848[c]	456,076	2,217	1,705,091	2,943,059
1994	9,024					191,772		191,772	200,796

1 Aerial survey estimate 1982 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.
8 Includes even-years only.
b No escapement estimate. Sonar project terminated early due to budget constraints.
c Preliminary.

(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, 1980-94.[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	45,169	4,531	38,160 [b]	42,691
92	84,077	[c]		5,328	118,020 [b]	123,348
93	14,345	42,742 [j]	56,986	12,615	[i]	
Average	100,207	108,458	199,993	48,898	73,487	128,876
1994	6,814 [k]	82,019	88,833	96,606 [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, Kuklukak, 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, and 8/25/93.

[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, 1974-1994.[a]

Year	Sockeye	Chinook	Chum	Pink	Coho
1974	5.8	22.4	6.6	4.0	7.9
75	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
1979	5.9	21.3	6.8		7.8
80	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
1984	5.6	20.5	6.8	3.2	7.5
85	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
1989	5.6	19.1	6.3		7.4
90	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
20-Year Ave.	5.9	21.4	6.7	3.5	7.4
1974-83 Ave.	6.0	24.6	6.7	3.5	7.5
1984-93 Ave.	5.8	18.3	6.6	3.6	7.3
1994	5.5	18.0	6.5	3.7	8.2

[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, 1974-1993.[a]

	Sockeye	Chinook	Chum	Pink	Coho
1974					
75					
76					
77					
78	$0.68	$0.70	$0.38	$0.33	$0.62
1979	$1.03	$1.00	$0.41	$0.33	$1.05
80	$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
1984	$0.69	$1.03	$0.30	$0.22	$0.71
85	$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
1989	$1.07	$0.80	$0.26	$0.17	$0.67
90 [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
20-Year Ave.	$0.94	$0.95	$0.31	$0.22	$0.69
1974-83 Ave.	$0.73	$0.97	$0.36	$0.26	$0.68
1984-93 Ave.	$1.07	$0.94	$0.28	$0.19	$0.70
1994	$0.70	$0.47	$0.22	$0.04	$0.45

[a] Data for 1974-1977 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, 1974-94.[a]

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1974	3,793	460	567	1,053	142	6,015
75	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
1979	128,992	4,541	2,480		2,387	138,400
80	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
1984	94,681	2,158	4,040	2,414	3,072	106,365
85	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
1989	173,963	609	2,029		1,186	177,787
90	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
20 Year Ave.	103,985	2,003	2,497	1,398 [c]	1,012	110,267
1974-83 Ave.	61,549	2,748	2,621	2,171 [c]	1,003	69,006
1984-93 Ave.	146,422	1,259	2,373	754 [c]	1,022	151,527
1994 [b]	138,007	1,190	1,043	15	650	140,905

[a] Value paid to fishermen. Derviced 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, 1974-94.[a]

	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
Year	Actual	Quota[1]	Chum	Actual	Quota[1]	Chum	Actual	Quota[1]	Chum
1974	60	50	15		25		60	75	15
75	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
1979	683	900	64	179	200	41	862	1,100	105
80	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
1984	1,131	1,111	228	257	245	109	1,388	1,356	337
85	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
1989	1,348	1,199	408	397	264	48	1,745	1,463	456
90	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
20-yr Avg.	1,067	1,143	357	285	253	82	1,337	1,396	434
74-83 Avg.	920	936	320	245	209	72	1,140	1,145	384
84-93 Avg.	1,213	1,349	393	321	298	91	1,534	1,647	484
1994	1,001	2,938	374	460	648	208	1,461	3,586	582

[a] South Unimak includes statistical area 284 in June and July, while Shumigan Islands includes 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, 1974-94.[a,b]

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			NAKNEK KVICHAK DISTRICT				
1974	263	102,600	1,000	1,100	1,600	200	106,500
75	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
1979	424	75,000	1,200	600		1,200	78,000
80	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
1984	382	115,200	900	600	1,300	600	118,600
85	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
1989	411	87,103	970	693	277	1,927	90,970
90	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	108,898
20-Year Ave.	444	92,833	1,163	907	922 [c]	888	96,621
1974-83 Ave.	422	90,940	1,090	710	1,000 [c]	660	94,200
1984-93 Ave.	466	94,727	1,235	1,104	860 [c]	1,116	99,041
1994	555	87,662	1,843	503	460	1,807	92,275
			EGEGIK DISTRICT				
1974	7	300					300
75	3	200					200
76[d]	2						
77	20	100		100		200	400
78	13	200		100		200	500
1979	8	300				100	400
80	3	100					100
81[d]	4						
82	19	2,400					2,400
83	14	700					700
1984	24	500		100		300	900
85	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
1989	50	1,636	50	33	1	414	2,134
90	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
20-Year Ave.	31	1,413	70	107	22 [c]	365	1,799
1974-83 Ave.	9	538		100		167	625
1984-93 Ave.	52	2,113	70	108	22 [c]	425	2,738
1994	59	3,208	166	84	153	857	4,468

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Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			UGASHIK DISTRICT				
1974	8	200	100			500	800
75	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
1979	8	200				100	300
80	10	200				200	400
81	12	600				200	800
82	11	400				300	700
83	8	500				100	600
1984	8	500				200	700
85	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
1989	22	1,309	32	35	2	214	1,592
90	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
20-Year Ave.	18	900	83	99	42 e	379	1,412
1974-83 Ave.	11	550	100	167	100 e	430	1,080
1984-93 Ave.	28	1,334	76	77	35 e	342	1,861
1994	31	1,587	126	42	38	579	2,372
			NUSHAGAK DISTRICT				
1974	261	41,200	7,900	10,200	4,300	4,700	68,300
75	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
1979	364	40,200	8,900	6,800	500	5,200	61,600
80	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
1984	438	43,200	9,800	10,300	6,600	8,100	78,000
85	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
1989	432	34,535	8,122	5,704	407	8,679	57,447
90	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
20-Year Ave.	403	39,752	10,392	8,048	3,228 e	6,187	67,607
1974-83 Ave.	350	43,440	8,980	9,390	3,780 e	5,120	70,710
1984-93 Ave.	456	36,064	11,803	6,707	2,676 e	7,255	64,504
1994	523	26,501	15,490	5,055	2,042	5,338	54,426

Appendix Table 39. (page 3 of 3)

	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
				TOGIAK DISTRICT			
1974	68	7,400	1,200	2,000	500	1,800	12,900
75	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
1979	25	800	200	300		700	2,000
80	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
1984	41	3,600	600	1,700	500	3,800	10,200
85	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
1989	40	2,825	551	891	112	976	5,355
90	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
20-Year Ave.	41	2,960	624	862	187 [a]	1,320	5,915
1974-83 Ave.	42	2,790	580	860	271 [a]	1,290	5,710
1984-93 Ave.	39	3,130	668	864	121 [a]	1,349	6,120
1994	25	1,777	904	398	77	910	4,066
				TOTAL BRISTOL BAY			
1974	607	151,700	10,200	13,300	6,400	7,200	188,800
75	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
1979	829	116,500	10,300	7,700	500	7,300	142,300
80	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
1984	893	163,000	11,300	12,700	8,400	13,000	208,400
85	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
1989	955	127,408	9,725	7,356	799	12,210	157,498
90	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
20-Year Ave.	937	137,690	12,266	9,943	4,231 [a]	9,016	173,146
1974-83 Ave.	834	138,090	10,690	11,040	4,770 [a]	7,560	172,150
1984-93 Ave.	1,040	137,289	13,842	8,847	3,691 [a]	10,471	174,141
1994	1,193	120,735	18,529	6,082	2,770	9,491	157,607

[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 esimates 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.

Appendix Table 40. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1974-94.[a,b]

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna-Newhalen	Nondalton	Port Alsworth	Other 1	Total
1974	8,600	6,200	1,400	21,500	16,400	29,500	1,500		98,100
75	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
1979	4,400	6,600	3,500	16,200	15,900	14,700	4200		65,500
80	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
1984	8,100	6,300	12,100	24,400	15,900	29,100	4600		100,500
85	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
1989	5,100	1,200	6,700	13,000	24,700	18,500	2,200	[d]	71,400
90	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
20-Year Ave.	5,410	4,354	7,540	17,749	19,765	19,456	3,818	1,962	78,698
1974-83 Ave.	5,800	5,950	7,010	18,660	16,150	22,500	4,320		81,690
1984-93 Ave.	5,020	2,358	8,070	16,837	23,379	16,412	3,316	1,962	75,706
1994	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,264	64,343

1 Subsistence harvests by non-watershed residents.

[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.

Appendix Table 41. Subsistence salmon catch by village area, Nushagak District, Bristol Bay, 1974-94.[a,b]

Year	Dillingham[1]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other[2]	Total
1974	23,900	11,600	2,300	10,500	11,800	8,200		68,300
75	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
1979	20,600	7,400	1000	7,200	17,200	8,200		61,600
80	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
1984	30,500	4,100	2,600	7,200	16,500	17,100		78,000
85	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
1989	31,800 [d]	5,800	2,000	4,700	9,700	3,800	[c]	57,800
90	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
20-Year Ave.	27,239	5,957	2,561	7,222	15,671	8,541	2,009	67,593
1974-83 Ave.	24,430	6,890	2,250	8,690	18,150	10,300		70,710
1984-93 Ave.	30,048	5,024	2,872	5,754	13,192	6,783	2,009	64,476
1994	30,145 [d]	3,491	2,289	4,343	8,056	4,513	2322	55,159

[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 Ekuk.

[1] Includes the village of Portage Creek.

[2] Subsistence harvests by non-watershed residents.

BRISTOL BAY

HERRING

FISHERY

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INTRODUCTION

Pacific herring Clupea harangus pallasi 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 17,000 tons, worth $7.3 million annually. Spawn on kelp harvests average 405;000 lbs since 1984, worth $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 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 fishery[1]. 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 1993.

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

[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.

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.

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

Spawning Population

Spawning biomass of herring in the Togiak District averages (1978-93) 130,102 tons (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. Biomass levels 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 fishery.

Run timing in 1994 was more typical than progression observed in 1992 and 1993 (Table 1). Aerial surveys in 1994 began April 18 and continued through May 16. The first herring were observed on May 8 near Hagemeister Island. Biomass increased steadily until May 12, when the peak biomass of 148,716 tons was observed. Approximately 40,000 tons were observed along the Nushagak Peninsula on May 12, apparently exiting the district. Since a harvest of 17,200 tons had accumulated prior to the May 12 survey, total biomass was estimated in season at 165,916 tons. By May 16, only 19,000 tons were estimated on the grounds. Spawning activity began May 10, and peaked May 12, when 23 linear miles were documented (Appendix Table 5). No new spawn was observed on the final survey May 16.

Total spawning biomass was estimated post-season at 185,454 tons, 30% over the preseason forecast of 142,497 tons and the fourth largest biomass documented. Age 6 and 7 herring comprised about 40% of the biomass, while an additional 55% were age 9 or older (Table 5, Appendix Table 3). Average weight was 342 grams. A total of 71.9 miles of spawn were observed during the course of the season.

No capelin were observed during department surveys in 1994. Commercial spotters continued to survey for capelin after department surveys were terminated May 16. Based on company reports, capelin were first observed by commercial spotters June 3.

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 Bristol Bay Herring Management Plan (5 AAC 27.865.) was adopted by the board. 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 harvests do not exceed 20% exploitation, and maximizing harvest quality.

Sac Roe Fishery

Sac roe harvests from 1978 through 1993 average approximately 17,000 tons annually, and range from 7,700 to 26,300 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 (1984-93) of 19 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 (1978-93) 238 and 168 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 9.2% for both gear types combined (Appendix Table 2). Historically, purse seine harvests average 9.7% mature roe, while gillnet harvests average 8.3% mature roe. Gillnet harvest roe percentages have increased in recent years and continue to exceed purse seine harvest percentages.

Large harvestable surpluses and fleet sizes have resulted in very high levels of fleet efficiency in recent years, specifically in the purse seine fishery. Herring harvested for sac roe in 1992 and 1994 were held for up to seven days before processing, and product quality suffered as a result. Fishery managers have responded by attempting to reduce fleet efficiency and holding time. Fishing time and area was more restrictive in recent years, primarily in the purse seine fishery. Additionally, volunteer test fisheries were conducted up to three times each day to assess and monitor roe quality by area.

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 for an allocation of 350,000 lbs 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 (1984-93) 405,000 lbs and range from 307,000 to 560,000 lbs. Effort since 1984 averaged 338 permit holders. The effect of limited entry can be seen in 1993, when only 173 permit holders landed product.

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). 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. Although several companies were interested in purchasing herring in Togiak in 1993, only one company participated. The 1993 harvest was small due to limited fishing success.

1994 SEASON SUMMARY

The 1994 herring run to the Togiak District was projected to reach 142,497 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 18,832 tons, gillnet sac roe 6,277 tons, spawn on kelp 175 tons (350,000 lbs), and Dutch Harbor food and bait 1,890 tons.

Guideline harvest levels were revised in season, based on the peak biomass survey estimate (May 12; 148,700 tons) and the accumulated harvest reported through May 11 (17,740 tons). The exploitation rate remained at 20%, and the harvestable surplus was re-allocated, as outlined in the Bristol Bay Herring Management Plan, as follows: purse seine sac roe 22,073 tons, gillnet sac roe 7,358 tons, spawn on kelp 175 tons (350,000 lbs), and Dutch Harbor food and bait 2,215 tons.

Herring Sac Roe Fishery

A strong preseason forecast and limited processing capacity contributed to the issue of harvest quality in the 1994 sac roe fishery. Prior to the season, companies reported that the number of fishing vessels, most notably gillnet, with a confirmed market would be smaller in 1994. For the second 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 1994 sac roe fisheries to limit the quantity held to an amount that would not exceed three days of production.

The first department survey was flown April 18. Conditions appeared normal for the period, with shelf ice present, little marine life and no fish observed. Department surveys documented fish on the grounds in late April. Species could not be verified, and those fish were presumed to be smelt. Fishing and processing vessels began to arrive on the grounds during late April, and department staff arrived May 2.

Sixteen companies registered to buy herring and capelin products in Togiak District: 15 to buy purse seine caught herring and 10 to buy gillnet caught herring (Table 6). Industry had the capacity to freeze 3,300 tons of sac roe herring per day, based on company registration statistics. Processing capacity was comparable to levels in recent years, and exceeded the level documented in 1993.

Herring were first reported by a commercial spotter on May 8. A department survey that afternoon documented 5,460 tons (Table 1). The majority of herring observed were entering the district near Hagemeister Island.

Beginning May 10, purse seine test fisheries were confined in area to concentrate the fleet and allow the department to react quickly once roe maturity reached acceptable levels. Test fish effort was initially concentrated in the portion of the district east of Tongue Point due to low roe quality and biomass observed in the western areas. The intention was to further narrow the area under consideration for a purse seine opening to an area with a limited biomass comprised of mature herring.

By the morning of May 10, purse seine roe samples contained an average 3.0% mature roe. Herring were beginning to concentrate near shore, and biomass was building. Based on an afternoon aerial survey, biomass throughout the district had increased to 76,000 tons, and the first spawns had developed. By evening, roe maturity in purse seine test samples averaged 3.6%.

By mid-afternoon May 10, over 1,000 tons of herring had moved near shore east of Right Hand Point. Samples from an evening gillnet test fishery in that area contained primarily immature roe.

Gillnet samples from the morning test fishery May 11 averaged 7.5%, 8.2% and 9.9% in the Anchor Point, Metervik Bay and Kulukak Bluff areas. The first gillnet opening was announced at 9:00 a.m., immediately after

company representatives reported test fishing results (Table 2). The opening was scheduled for 11:00 a.m. and included the Kulukak Bluff and Metervik Bay area. The period was announced two hours in advance to allow vessels in the Anchor Point area time to move to the area opened. The duration was held to 2 hours as a precautionary measure to allow the department to assess roe quality in the fishery, with the intention of re-opening the same area later in the day, should the harvest contain high quality roe. Allowable gear was limited to 50 fathoms due to the small area opened and the fleet size.

Purse seine sample quality early on May 11 varied. The average mature roe content had increased to 6.3%, exceeding the average immature roe (4.6%) for the first time. A cursory survey of the eastern district estimated the available biomass in that area at approximately 40,000 tons, with 35,000 tons located near Anchor and Rocky Points. Biomass in other areas of the eastern district appeared to be minimal, but the extent of spawn had increased to 21 miles.

The first purse seine opening was announced at 10:45 a.m. May 11. Fishing was permitted for a 15-minute period in the portion of the district east of Quigmy River, beginning at 1:30 p.m.. The advance notice was liberal to delay the opening to a mid-flood tide stage, thereby allowing the mature roe % to continue to increase. Because of the risk of vessels becoming stranded on the following ebb tide, the opening was not delayed any longer.

Soon after the closure of the gillnet fishery, companies buying gillnet herring indicated that roe quality in the initial deliveries averaged 10% or better. By 5:00 p.m., most gillnet vessels had delivered their catch, and preliminary reports from companies indicated the gillnet harvest was relatively small and purse seine fishing success was high. At 5:00 p.m. the Metervik Bay and Kulukak Bluffs areas were re-opened for the gillnet fleet for a 6-hour period, beginning at 6:00 p.m..

The magnitude of the May 11 purse seine harvest became evident in the early evening. The estimated harvest totaled 15,660 tons, with 9.5% average mature roe (Table 3). The extent of the harvest was larger than expected, partly due to the large fleet size and excellent spotting conditions. However, during the three hours prior to the opening, a large volume of herring had moved from closed waters in Ungalikthluk Bay east into Nunavachak Bay, where they became accessible to the purse seine fleet. At the time the opening was announced, these herring were obscured by heavy spawn in Ungalikthluk Bay. The May 11 gillnet harvest totaled 2,080 tons and averaged 11.2% mature roe. Due to the volume of fish harvested in the fisheries on May 11, the gillnet fishery closed as scheduled at 12:00 midnight.

Early on May 12, all companies indicated that they would buy no herring for at least two days. Several companies continued to take purse seine deliveries from fishermen who had not yet delivered. The peak biomass of 148,716 tons was documented later that day, as was the peak daily spawn coverage of 23 linear miles. Following this survey, the in season biomass estimate was revised to include the peak biomass estimate and the harvest estimate for May 11. Based on the revised maximum allowable harvest and cumulative harvest estimates, nearly 7,000 tons remained available to purse seines, and 5,400 tons remained available to gillnets.

No further test fishing was conducted until the morning of May 15. Most companies polled the morning of May 14 indicated that they would not be finished processing the May 11 harvest until May 16, and would not be able to buy herring until May 15.

The gillnet test fishery in the morning of May 15 was largely hampered by weather, but some high quality samples were collected along Kulukak Bluffs. A follow-up attempt to collect samples west of Right Hand Point failed, and at 11:00 a.m. a gillnet opening was announced for the area from Right Hand Point to and including the Kulukak Bluffs. The duration was 4 hours, beginning at 12:00 noon. Mid-period samples indicated that harvest quality during the opening was high, averaging greater than 10%. The fishery was extended three times for a total duration of 14 hours. The fishery closed at 2:00 a.m. May 16, after most companies indicated that they would suspend buying operations at that time. The harvest from the May 15 opening and extensions totaled over 1,800 tons at 12.2% mature roe.

Purse seine test fish samples from the eastern district early on May 15 contained mixed quality, with immature, mature, and spawned out fish present. A cursory survey of the eastern district estimated 3,000 tons in the area, and therefore, risk of a large harvest was not great. The area from Anchor to Right Hand Point was opened to commercial fishing to harvest the available high quality fish in the area, prior to moving the fleet to the western portion of the district. The opening began at 5:00 p.m. and lasted 30 minutes. The resulting harvest was light, with a large number of sets reportedly released due to the presence of spawn outs. Due to the abundance of spawn outs present in the eastern district, the fleet was notified that only the western district would be considered for the next purse seine opening.

Purse seine samples collected early on May 16 west of Tongue Point averaged 12.2% mature roe. The biomass visible in the area west of Tongue Point was estimated at 3,000 tons, and again the risk of a large harvest was minimal. An opening was announced at 10:00 a.m., to begin at 12:00 noon on the mid-ebb tide stage. A gale warning precluded any further delay and the area from Tongue Point west was fished for 1.5 hours.

Tendering capacity available for gillnet-caught fish was limited to 900 tons in the morning of May 16, based on company reports. Samples in the morning test fishery averaged an extremely high 16% mature roe. Therefore, an opening was announced at 12:30 p.m. for 1:00 p.m., again in the Metervik Bay and Kulukak Bluff area. The duration was 4 hours, with the likelihood of an extension should roe quality remain high in the fishery. Short notice was given due to an impending gale warning.

Companies buying gillnet herring were polled mid-period. Although roe quality remained quite high in the gillnet fishery, several companies had suspended buying operations, and available processing capacity was becoming more limited. The fishery was extended for 5 hours, then allowed to close at 10:00 p.m. May 16. The resulting harvest totaled 1,148 tons at 12.6% mature roe.

Meanwhile, most companies indicated high quality and low volume in the purse seine fishery, and at 3:00 p.m., another opening was announced to begin at 6:00 p.m. in the same area, this time for 2.0 hours. Harvest resulting from the May 16 purse seine openings totaled 5,198 tons, leaving approximately 1,200 tons remaining in the maximum allowable harvest.

No fisheries were considered May 17, due to the extent of the purse seine and gillnet harvests on May 16. High winds persisted through the early morning and afternoon on May 17. Several gillnet vessels had yet to deliver at 3:00 p.m., and a test fishery planned for evening did not materialize due to weather conditions.

Gillnet samples collected the morning of May 18 were of high quality, averaging 13.4%, but volume was reportedly very light. Test fishing between Nunavachak Bay and Right Hand Point was unsuccessful, and a morning survey documented very little biomass between Anchor Point and Right Hand Point. Survey conditions east of Right Hand Point were very poor, but some fish were observed in Metervik Bay. The Kulukak Bluffs and Metervik Bay areas were opened to gillnet for a 4-hour period, beginning at 12:00 noon. Companies were again requested to report roe quality of the initial deliveries.

A cursory survey of the area west of Tongue Point documented a reduced fleet of 180 purse seiners on May 18. Fish were visible west of Tongue Point, at Estes Point and west of Oosik Spit. Visibility was hampered by wind and low ceilings, and fishermen were advised to standby at the top of every hour for a possible announcement, pending an improvement in the weather. At 12:00 noon, a 20-minute opening was announced to begin at 1:00 p.m. in the area from Tongue Point west to Oosik Spit.

Again, sample quality from the gillnet fishery in progress remained high, at 12.2% in Metervik Bay and 15.6% along the Kulukak Bluffs. The opening was extended three times, for a total duration of 33 hours. The opening was allowed to close at 9:00 p.m. May 19 because the gillnet harvest was approaching the maximum allowable harvest. The resulting harvest totaled 2,106 tons at 12.6% mature roe. The cumulative harvest estimate (7,190 tons) remained 170 tons shy of the maximum allowable harvest.

A gillnet test fishery the afternoon of May 20 produced samples with an average of 11.9% mature roe, and the final gillnet opening was scheduled for 6 hours, to begin at 7:00 p.m. in the area between Right Hand Point and Kulukak Bluffs. Companies indicated that volume during the fishery was light and roe quality high, and the opening was extended for an additional six hours. The resulting harvest totaled 283 tons, at 12.2% average mature roe.

The 1994 sac roe harvest (both gear types combined) was the largest ever in Togiak District, reaching 30,316 tons (Table 3). Purse seine vessels landed a total of 22,853 tons and the gillnet fleet landed 7,463 tons of sac roe herring. Both purse seine and gillnet harvest guidelines were met.

Six gillnet openings occurred, with 9 extensions. Herring gillnets fished a total of 76 hours, primarily in the area from Right Hand Point to the mouth of the Kulukak River. Gear was restricted to 50 fathoms in each opening, due the relatively small areas fished and the potential for herring waste. Five purse seine periods were held, for a total of 4 hours and 35 minutes of fishing time. Opening durations for purse seines varied from 15 minutes to 2 hours.

The roe quality of the gillnet harvest was the highest in the history of the fishery for the second consecutive year, and again exceeded roe quality in the purse seine harvest. Roe quality in the gillnet harvest averaged 12.1% mature roe, purse seine harvests averaged 9.5%, and, overall, harvest roe quality averaged 10.2%.

The peak purse seine effort of 240 vessels was comparable to levels observed in recent years, while the peak effort of 146 gillnet vessels was 39% below the 1984-93 average (Appendix Table 1). The peak gillnet effort was below average due largely to limited market conditions.

Although the initial purse seine opening on May 11 was restricted to 15 minutes and a portion of the district's area, the resulting harvest from that period totaled nearly 15,700 tons. Most companies processed herring from the May 11 harvests for up to five days; some loss in quality was reported. Vessels were observed holding fish over 48 hours following the May 11 closure. Consequently, the gillnet and purse seine fisheries did not re-open until May 15, by which time most of the May 11 harvest had been processed. Subsequent openings resulted in lower individual harvest quantities, and no further extended delays were necessary.

Waste was estimated at 350 tons for the purse seine fishery, based on aerial observations of carcass piles. The estimate is considered minimal since carcasses are visible only in shallow areas, and is included in the purse seine harvest in Table 1. An additional fifty tons of herring waste was estimated in the gillnet fishery based on reports of vessels that were unable to market their catch following the first gillnet opening on May 11.

Spawn on Kelp Fishery

Spawning was first observed May 10, and by May 12, nearly 50 linear miles had been documented (Table 1). Kelp samples were gathered that evening by industry representatives and department staff, and displayed at a public meeting at 12:00 noon, May 13 at the department office on the grounds. Samples from several areas between Anchor Point and Right Hand Point were examined by industry representatives, and samples from Nunavachak Bay (K-5) were judged the highest quality by representatives.

The spawn on kelp fishery was opened for 4 hours in area K-5 on the next available tide since product quality was acceptable to industry representatives (Table 2). Favorable weather was predicted. The opening began at 11:00 p.m. May 13, two hours before low tide.

An aerial survey counted 204 people participating in the fishery, while 212 permit holders delivered product. Effort during the 1994 fishery was the lowest observed since 1987 (Table 4, Appendix Table 4). Despite a 2-hour extension, the maximum allowable harvest was not met, and a second opening was announced the following day, again for the next available low tide. Prior to that opening, however, on shore winds had increased, causing product quality to deteriorate. After taking several deliveries, buyers warned kelp harvesters that they would take no more product, and ceased operations.

The 1994 spawn on kelp fishery occurred over two periods with one extension (7.5 hrs.). Two hundred and four permit holders harvested 308,400 lbs of product, equivalent to 1,113 tons of herring, entirely within Area K-5. The actual harvest was 88% of the maximum allowable harvest and 19% below the recent 10-year average. The harvest level was reduced this season due to heavy on shore winds just prior to the second period, causing silt to render the product unacceptable. The purchase of kelp product was halted by the two companies participating. Overall quality was reported by participating companies to be good.

Capelin Fishery

3 tons were harvested by purse seines June 7, shortly after commercial spotters reported the first capelin sightings. On June 9, the buyer and fishermen ceased all operations due to low abundance, poor fishing success, small average size and high male percentage. Capelin landed reportedly averaged 65 fish/kilo.

EXPLOITATION

Togiak fisheries were managed for a maximum exploitation of 20%, based on the in season biomass estimate. The in season biomass estimate was revised post season to 185,454 tons. Exploitation is based on the post season revision and includes total sac roe harvest (29,916 tons), herring biomass equivalent of the spawn on kelp harvest (1,113 tons), and estimated waste (400 tons) from those fisheries. In addition, the Dutch Harbor food and bait harvest (3,335 tons) is included. Following the 1994 Togiak fisheries, the estimated exploitation on the Togiak biomass was 19% (Appendix Table 2).

EX-VESSEL VALUE

The 1994 Togiak fisheries were valued together at $9.3 million (Appendix Table 6). The commercial value of the sac roe fishery was the highest since 1988, and the fourth largest in the history of the fishery. The value of the sac roe harvest to fishermen was estimated at $9.1 million. Ex-vessel values of the gillnet and purse seine harvests were $2.7 and $6.4 million. Ex-vessel value of the spawn on kelp fishery was estimated at $212,000, approximately 73% of the 1984-93 average value. These estimates do not include any post-season adjustments to fishermen from processors, and should therefore be treated as minimum estimates.

Sac roe prices paid to fishermen were estimated at approximately $300/ton for 10% mature roe, with an adjustment of $30/ton for each percentage point difference above or below 10%. No purchase of herring at bait price was reported. Spawn on kelp sold for $0.70/lb, and capelin sold for $50/ton.

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BRISTOL BAY HERRING FISHERY

Tables 1-6

Table 1. Daily observed estimates (tons) of herring by index area, Togiak District, Bristol Bay, 1994.[a]

Date	Time Surveyed	Survey Conditions	Miles of Spawn	Estimated Biomass by Index Area[b,c] NUS	KUK	MET	NUK	UGL	TOG	TNG	MTG	HAG	OSK	PYR	CN	WAL	Daily Total (tons)
4/18	pm	Fair	0.0	0	0	0	0	0	0	0	0	0					0
4/21	pm	Fair-Good	0.0	0	0	0	0	0	0								0
4/25	am	Good-Excel.	0.0	0	0	0	0	0	0	0		0					0
4/30	pm	Good	0.0	0	0	0	0	0	0	0	0	0				0	0
5/02	pm	Poor	0.0	0	0	0	0	0	0	0	0	0	0				0
5/03	pm	Fair	0.0		0	0	0	0	0	0	0						0
5/05	pm	Fair	0.0		0	0	0	0	0	0	0	0	0			0	0
5/06	pm	Fair	0.0						0	0	0	0				0	0
5/08	am	Fair	0.0	0	0	0	0	0	0	0	0		0	0			0
5/08	pm	Fair	0.0									2,110				3,351	5,461
5/09	am	Fair	0.0	3,574	6,499	259	2,428	379	1,030	12,580	0	716				6,805	34,270
5/09	pm	Fair	0.0	6,178	3,849	928	750	4,304	16,338	5,696	268	13,474					51,784
5/10	pm	Fair	3.8	10,306	9,358	1,905	303	9,002	13,981	7,397	10,541	9,676	3,172	126			75,767
5/11	am[d]		21.0														
5/12	am	Fair	23.0	43,235	16,191	12,909	6,943	2,988	12,383	8,746	2,112	21,001	8,842	9,484	274	3,609	148,716
5/13	am[d]		18.8														
5/14	am	Fair	5.3	22,015	5,922	4,593	5,427	5,120	14,862	4,562	5,128	23,280	6,405	472			97,786
5/16	am	Fair	0.0		2,809	1,153	445	3,890	6,784	602	2,962	94	175	83			18,998
		Total	71.9														

[a] Togiak District Pacific herring biomass was estimated at 185,454 short tons.
[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.
[c] Smelt schools observed Tog 4/21, 4/25, 4/30; Ugl 5/05; Tng 5/05, 5/06; MTG 5/02; Hag 4/30, 5/05; Osk 5/02.
[d] Spawn survey.

Table 2. Emergency order commercial fishing periods for herring sac roe and herring spawn on kelp, Togiak District, Bristol Bay, 1994.

Emergency Order Number	Area[1]	Date and Time	Duration
Herring Sac Roe Gillnet			
DLG-01	Eagle Bay to Kulukak Bluffs[2,3]	5/11 11:00 a.m. - 5/11 1:00 p.m.	2.0 hrs
DLG-03	"	5/11 6:00 p.m. - 5/11 MIDNIGHT	6.0 hrs
DLG-07	Right Hand Pt to Kulakuk Bluffs[2,3]	5/15 NOON - 5/15 4:00 p.m.	4.0 hrs
DLG-08[a]	"	5/15 4:00 p.m. - 5/15 6:00 p.m.	2.0 hrs
DLG-10[a]	"	5/15 6:00 p.m. - 5/15 8:00 p.m.	2.0 hrs
DLG-11[a]	"	5/15 8:00 p.m. - 5/16 2:00 a.m.	6.0 hrs
DLG-13	Metervik Bay to Kulukak Bluffs[2,3]	5/16 1:00 p.m. - 5/16 5:00 p.m.	4.0 hrs
DLG-15[a]	"	5/16 5:00 p.m. - 5/16 10:00 p.m.	5.0 hrs
DLG-16	Right Hand Pt to Kulukak R[2,3]	5/18 NOON - 5/18 4:00 p.m.	4.0 hrs
DLG-18[a]	"	5/18 4:00 p.m. - 5/18 9:00 p.m.	5.0 hrs
DLG-19[a]	"	5/18 9:00 p.m. - 5/19 9:00 a.m.	12.0 hrs
DLG-20[a]	"	5/19 9:00 a.m. - 5/19 3:00 p.m.	6.0 hrs
DLG-21[a]	"	5/19 3:00 p.m. - 5/19 9:00 p.m.	6.0 hrs
DLG-22	Right Hand Pt to Kulukak Bluffs[2,3]	5/20 7:00 p.m. - 5/21 1:00 a.m.	6.0 hrs
DLG-23[a]	"	5/21 1:00 a.m. - 5/21 7:00 a.m.	6.0 hrs
Herring Sac Roe Purse Seine			
DLG-02	Quigmy River to Kulukak	5/11 1:30 p.m. - 5/11 1:45 p.m.	15 min
DLG-09	Anchor Pt to Right Hand Pt	5/15 5:00 p.m. - 5/15 5:30 p.m.	30 min
DLG-12	C Newenham to Tongue Pt	5/16 NOON - 5/16 1:30 p.m.	1.5 hrs
DLG-14	"	5/16 6:00 p.m. - 5/16 8:00 p.m.	2.0 hrs
DLG-17	Oosik Spit to Tongue Pt	5/18 1:00 p.m. - 5/18 1:20 p.m.	20 min
Herring Spawn-on-Kelp			
DLG-04	K-5	5/13 11:00 p.m. - 5/14 3:00 a.m.	4.0 hrs
DLG-05[a]	K-5	5/14 3:00 a.m. - 5/14 5:00 a.m.	2.0 hrs
DLG-06	K-5	5/14 10:00 p.m. - 5/14 11:30 p.m.	1.5 hrs

[1] Area descriptions are approximate. Precise boundaries are described in Emergency Orders.
[2] Metervik Bay opened.
[3] Gillnet length reduced to 50 fathoms.
[a] Extension.

Table 3. Commercial inshore herring harvest (tons) by fishing section and gear type, Togiak District, Bristol Bay, 1994. Weighted roe percentage is listed in parentheses.[a]

Date	Time (hours)	Fishing Section: Kulukak	Nunavachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham	Total
Purse Seine								
5/11	0.25	1,518 (9.2)	10,278 (9.4)[b]	3,864 (9.2)[c]				15,660 (9.5)
5/15	0.50		193 (10.3)	309 (10.1)				502 (10.2)
5/16	3.50				5,173 (10.1)		25 (11.5)	5,198 (10.1)
5/18	0.33				1,376 (10.3)			1,376 (9.8)
5/19[d]					111 (9.6)			111 (9.6)
5/27[d]				6 (10.2)				6 (10.2)
Total	4.58	1,518 (9.2)	10,471 (9.4)	4,178 (9.3)	6,661 (10.1)		25 (11.5)	22,853 (9.5)
Gill Net								
5/11	8.00	2,080 (11.2)[•]						2,080 (11.2)
5/15	14.00	1,846 (12.2)						1,846 (12.2)
5/16	9.00	1,148 (12.6)						1,148 (12.6)
5/18	33.00	2,106 (12.6)						2,106 (12.6)
5/20	12.00	283 (12.2)						283 (12.2)
Total	76.00	7,463 (12.1)						7,463 (12.1)
Combined Gear								
5/11	8.25	3,598 (10.4)	10,278 (9.4)	3,864 (9.2)				17,740 (9.6)
5/15	14.50	1,846 (12.2)	193 (10.3)	309 (10.1)				2,348 (11.6)
5/16	12.50	1,148 (12.6)			5,173 (10.1)		25 (11.5)	6,346 (11.2)
5/18	33.33	2,106 (12.6)			1,376 (10.3)			3,483 (11.7)
5/19[d]					111 (9.6)			111 (9.6)
5/20	12.00	282.5 (12.2)						283 (12.2)
5/27[d]				6 (10.2)				6(10.2)
Total	80.58	8,980 (11.6)	10,471 (9.4)	4,178 (9.2)	6,661 (10.1)	0	25 (11.5)	30,316 (10.2)

[a] Catches for multiple fishing periods for the same day are combined.
[b] Includes 350 tons deadloss.
[c] Includes 205 tons ground into fish meal.
[d] ADF&G test fish harvest.
[•] Includes 50 tons deadloss.

Table 4. Commercial herring spawn on kelp harvest by date, Togiak District, Bristol Bay, 1994.[a]

Date	Area	Hrs	Permits	Landings	Harvest (st)	Equivalent Herring Biomass (st)[b]
5/13	K-5	4.0	181	201	150.4	1,105.9
5/14	K-5	3.5	11	11	3.8	27.9
Total		7.5	184	212	154.2	1,133.8

[a] Spawn-on-kelp was harvested only in Kelping Area K-5.

[b] 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;

Harvested Egg Biomass = 0.75 (Spawn-on-kelp biomass)

For 1994;

$$\text{Herring Equivalent} = \frac{100(113.48)}{10.2}$$

$$= 1{,}112.5 \text{ tons}$$

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, 1994.[a,b]

Year Class	Age	Total Run Short Tons	%	Catch Short Tons	%	Escapement Short Tons	%
1976	18	946	0.5%	92	0.3%	854	0.5%
77	17	5,238	2.8%	638	2.1%	4,600	3.0%
78	16	15,184	8.2%	2,276	7.5%	12,909	8.3%
79	15	4,584	2.5%	669	2.2%	3,916	2.5%
80	14	6,281	3.4%	965	3.2%	5,316	3.4%
1981	13	8,193	4.4%	1,346	4.4%	6,848	4.4%
82	12	8,013	4.3%	1,584	5.2%	6,429	4.1%
83	11	23,851	12.9%	3,702	12.2%	20,150	13.0%
84	10	24,239	13.1%	4,364	14.4%	19,876	12.8%
85	9	5,970	3.2%	1,269	4.2%	4,701	3.0%
1986	8	4,819	2.6%	934	3.1%	3,886	2.5%
87	7	53,004	28.6%	8,459	27.9%	44,551	28.7%
88	6	21,704	11.7%	3,485	11.5%	18,223	11.7%
89	5	2,920	1.6%	479	1.6%	2,441	1.6%
90	4	510	0.3%	53	0.2%	457	0.3%
1991	3	0	0.0%	1	0.0%	0	0.0%
92	2	0	0.0%	0	0.0%	0	0.0%
Total		185,454	100.0%	30,316	100.0%	155,154	100.0%

[a] Reported harvest and revised biomass estimate are final.
[b] Does not include harvest in the Dutch Harbor food and bait fishery.

Table 6. Commercial herring sac roe, herring spawn on kelp and capelin processors and buyers operating in Togiak District, Bristol Bay, 1994.[a]

Operator/Buyer	Base of Operations	Product Purchased				Processing Method		
		Sac Roe						
		Gillnet	Purse Seine	Spawn-on-Kelp	Capelin	Frozen	Cured	Brine Export
1. Cook Inlet Processing	M/V Ranger		X			Floater		
2. Dragnet Fisheries, Inc.	M/V Jackie M	X	X			Shore		
3. Icicle Seafoods, Inc.	P/B Discovery Star	X	X			Floater		
4. King Crab, Inc.	M/V Ocean Pride	X	X			Shore		
5. Norquest Seafoods, Inc	M/V Pribilof	X	X			Floater		
6. New West Fisheries, Inc.	P/V New West	X	X			Floater		
7. Northcoast Sfd. Proc.	P/V Polar Bear	X	X	X		Floater		
8. Pan Pacific Seafoods	P/V Pacific Producer	X	X			Floater		
9. Peter Pan Seafoods Inc.	P/V Blue Wave	X	X			Floater		
10. Prime Alaska Seafoods[1]								
11. Snopac Products, Inc.	P/V Snopac		X			Floater		
12. Togiak Fisheries, Inc.			X	X	X	Shore		
13. Trident Seafoods	P/B Neptune	X	X			Floater		
14. Unisea, Inc.	P/V Omnisea		X			Floater		
15. Woodbine Ak. Fish Co.	M/V Woodbine	X	X			Shore/Floater		
16. YAK, Inc.	P/B Yard Arm Knot	X	X			Floater		

[1] Processor registered, but did not purchase any herring product.
[a] Operators that registered in the Togiak Herring District.

BRISTOL BAY HERRING FISHERY

Appendix Tables 1-6

Appendix Table 1. Commercial herring catch by gear type and product Togiak District, Bristol Bay, 1974-94.

Year	Number of Processors	Units of Gear[1] Gill-Net	Units of Gear[1] Purse Seine	Percent Catch Gear Gill-Net	Percent Catch Gear Purse Seine	Percent Catch Product Sac Roe	Percent Catch Product Food/Bait	Inshore Catch[2] (tons)
1974	3	10	1	16	84	100	0	123
75	2	39	0	100	0	100	0	56
76[a]								
77	6	43	6	11	89	100	0	2,795
78	16	40	25	8	92	100	0	7,734
1979	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
1984	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
1989	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	14,970
92	18	274	301	19	81	98	2	25,808
93	12	75	140	20	80	100	0	17,925
20-Year Ave.	19	199	147	25	75	97	3	14,497
1974-83 Ave.	19	156	79	29	71	96	4	11,274
1984-93 Ave.	19	238	208	22	78	98	2	17,398
1994	16	146	240	25	75	100	0	30,316

[1] Units of gear derived from fish tickets in years prior to 1979. From 1979 to present, units of gear equals peak aerial count.
[2] Data for some years includes ADF&G harvests and waste.
[a] Fishery not conducted.

Appendix Table 2. Estimated total run biomass and inshore commercial catch, in tons, Togiak District, Bristol Bay, 1978-94.

Year	Total Run Biomass[1]	Inshore Catch	Roe Recovery (%) Gill-Net	Purse Seine	Mean	Percent Exploitation[2]
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
Avg	130,102	17,030	8.3	9.7	9.2	17
1994	185,454	30,316	12.1	9.5	10.2	19

[1] The total run biomass represents the aerial survey estimate of the inshore spawning 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/bait fishery), all documented waste, and the equivalent herring harvest of the spawn-on-kelp removal, by the total run biomass.

Appendix Table 3. Age composition of the inshore herring run, Togiak District, Bristol Bay, 1977-94.

Year	Age Composition (%)[1]							Total Run (st)[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	28	42	4	24	114,880
85		1	1	8	35	42	13	131,400
86			1	2	15	44	38	94,770
1987				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]

[1] Age composition in 1978-92 is weighted by area based on aerial survey data and by weight at age; age composition in 1977 is not weighted by aerial survey data.

[2] Includes commercial catch, escapement, and documented waste.

[a] Includes age 1, 2 and 3.

[b] Contributions of age 1, 2, 3, 4 and 5, are less than 5% each.

[c] Contribution of age 3 herring is than 0.5%.

[d] Contribution of age 4 herring is than 0.5%

Appendix Table 4. Commercial harvest of herring spawn on kelp, Togiak District, Bristol Bay, 1974-94.

Year	Processors	Permit Holders[1]	Deliveries	Harvest (lbs)
1974	3	26	49	125,646
75	2	44	98	111,087
76	5	49	118	295,780
77	5	75	266	275,774
78	11	160	349	329,858
1979	16	100	228	414,727
80	21	78	186	189,662
81	7	108	277	378,207
82	8	214	167	234,924
83	4	125	257	270,866
1984	6	330	412	406,587
85[a]				
86	3	204	351	374,142
87	5	187	334	307,307
88	10	259	330	489,320
1989	11	487	330	559,780
90	7	481[b]	286	413,844
91	7	532[b]	248	348,357
92	5	386	267	363,600
93	2	173	313	383,000
20-Year Ave.	7	211	256	330,130
1974-83 Ave.	8	98	200	262,653
1984-93 Ave.	6	338	319	405,104
1994	2	184	212	308,400

[1] Derived from fish ticket data, unless specified otherwise.
[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, 1978-94.a

Date	1978 No.	1978 Miles	1979 No.	1979 Miles	1980 No.	1980 Miles	1981 No.	1981 Miles	1982 No.	1982 Miles	1983 No.	1983 Miles	1984 No.	1984 Miles	1985 No.	1985 Miles	1986 No.	1986 Miles	1987 No.	1987 Miles
4/24																			15	2.9
25																			17	5.2
26																			15	3.4
27																			24	4.3
28																			0	
29																			0	
30			2	2.5			9	3.0			0								7	1.7
5/ 1	1	0.4					6	2.3			0								0	
2			21	8.3	11	4.0	12	1.9			10	3.6								
3	1	0.4	14	5.0	8	3.0	12	6.8			30	9.3							21	10.7
4			8	3.1			4	2.9			40	12.5							15	6.3
5			1	1.3	0		6	2.5			27	7.5							21	23.9
6							0				8	2.9							9	8.4
7			3	0.6	3	0.9	2	0.4	0		8	1.5							7	3.3
8	2	1.8			3	1.2	3	1.0			8	1.9								
9			2	0.4	1	0.2	5	1.4					1	+					0	
10			0				0		0										2	0.4
11	9	7.7			0						3	3.5							6	4.7
12	3	1.5	0		0		15	4.8	0		9	5.4								
13	12	8.6			0		6	3.8	0		0						2	0.8		
14	11	5.6	0		2	2.3	10	4.7	0								29	13.8	1	0.6
15					6	4.0	2	1.5	0		2	1.0					53	18.2		
16			0		4	1.2	0		1	0.1	4	0.5	1	0.3			34	11.1		
17			0						4	0.7	9	2.0	1	0.5			24	11.7		
18	11	4.2							29	7.3	19	6.1	24	17.6			3	0.6		
19	3	2.5			1	0.3			16	5.2	7	1.7	71	24.6			1	0.6		
20					4	0.9			19	14.0	0		8	1.3	3	0.2	3	0.6		
21			0						3	2.0			0		8	2.0	11	4.2		
22					2	0.5			3	1.5			5	1.2	13	2.3	4	0.5		
23							10	2.1	11	3.3	0		3	1.4	48	14.2	4	1.5		
24									5	1.4			6	2.2	25	11.7	11	2.6		
25	8	4.2							1	0.3	1	0.1	3	1.4	17	5.2				
26	2	2.2	1	0.7			3	0.2	0		1	0.1	14	4.1	23	7.3				
27					3	0.3			0		2	0.1	8	1.2			0			
28	0								0				3	0.1						
29					8	1.6			0				2	0.2	0					
30	6	1.6							0		0		4	0.5			3	0.3		
31					2	0.8			0				12	4.1						
6/ 1									7	2.6	0		3	0.5	4	0.5				
2	1	0.5							0											
3							1	0.8	4	0.2	1	+								
4													2	0.2						
5																				
6																	0			
7					6	3.1														
8																				
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 No.	1988 Miles	1989 No.	1989 Miles	1990 No.	1990 Miles	1991 No.	1991 Miles	1992 No.	1992 Miles	1993 No.	1993 Miles	1994 No.	1994 Miles
4/18													0	
19													0	
24											0			
25											1	0.3	0	
26											14	5.1		
27											23	21.3		
28											16	13.0		
29									0		11	6.0		
30											7	4.0	0	
5/ 1									0		3	2.2		
2									0				0	
3											1	1.5	0	
4											0			
5									0		0		0	
6									0		0		0	
7					1	0.8			0		0			
8			4	4.2	11	8.3							0	
9			11	11.9	63	37.1	3	1.0	0				0	
10			15	12.9	6	3.3	24	17.8	0				8	3.8
11	0		7	10.0	5	1.7	21	24.5					21	21.0
12	0		9	3.6	2	1.8	24	20.8					17	23.0
13	0		4	3.2	0		5	2.1	0				26	18.8
14	2	1.5			3	4.0	1	0.5					8	5.3
15					1	1.0	1	0.1	0					
16	11	3.5	1	0.8	0		1	0.5	0				0	
17	20	22.8							0					
18	30	12.9			0		0		0					
19	26	9.1			0				5	7.0				
20					0		2	0.2	29	19.4				
21	3	0.9							55	34.2				
22	9	4.1							24	8.5				
23	1	3.5							28	14.9				
24	5	2.8	18	5.9			5	1.0	9	8.8				
25									6	2.5				
26									3	1.3				
27									1	0.3				
28					1	7.0	0							
29														
30														
31					1	0.7	2	0.5						
6/ 1														
2														
3														
4														
5							1	0.5						
6														
7														
8							0							
Total	107	61.1	69	52.5	94	65.7	90	69.5	160	96.9	95	53.3	80	71.9

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, 1974-94.[a]

Year	Herring		Spawn on Kelp	Total
	Sac Roe	Food/Bait		
1974	24	0	19	43
75	9	0	22	31
76	[b]	[b]	127	127
77	447	0	116	563
78	2,635	0	120	2,755
1979	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
1984	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
1989	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	5,539
20-Year Ave.	6,167	38	214	6,100
1974-83 Ave.	3,693	56	146	3,520
1984-93 Ave.	8,392	22	291	8,681
1994	9,095	0	212	9,302

[a] Exvessel value (value paid to the fisherman) is derived by multiplying price per pound by the commercial harvest.
[b] Fishery not conducted.

BRISTOL BAY HERRING FISHERY

Figures

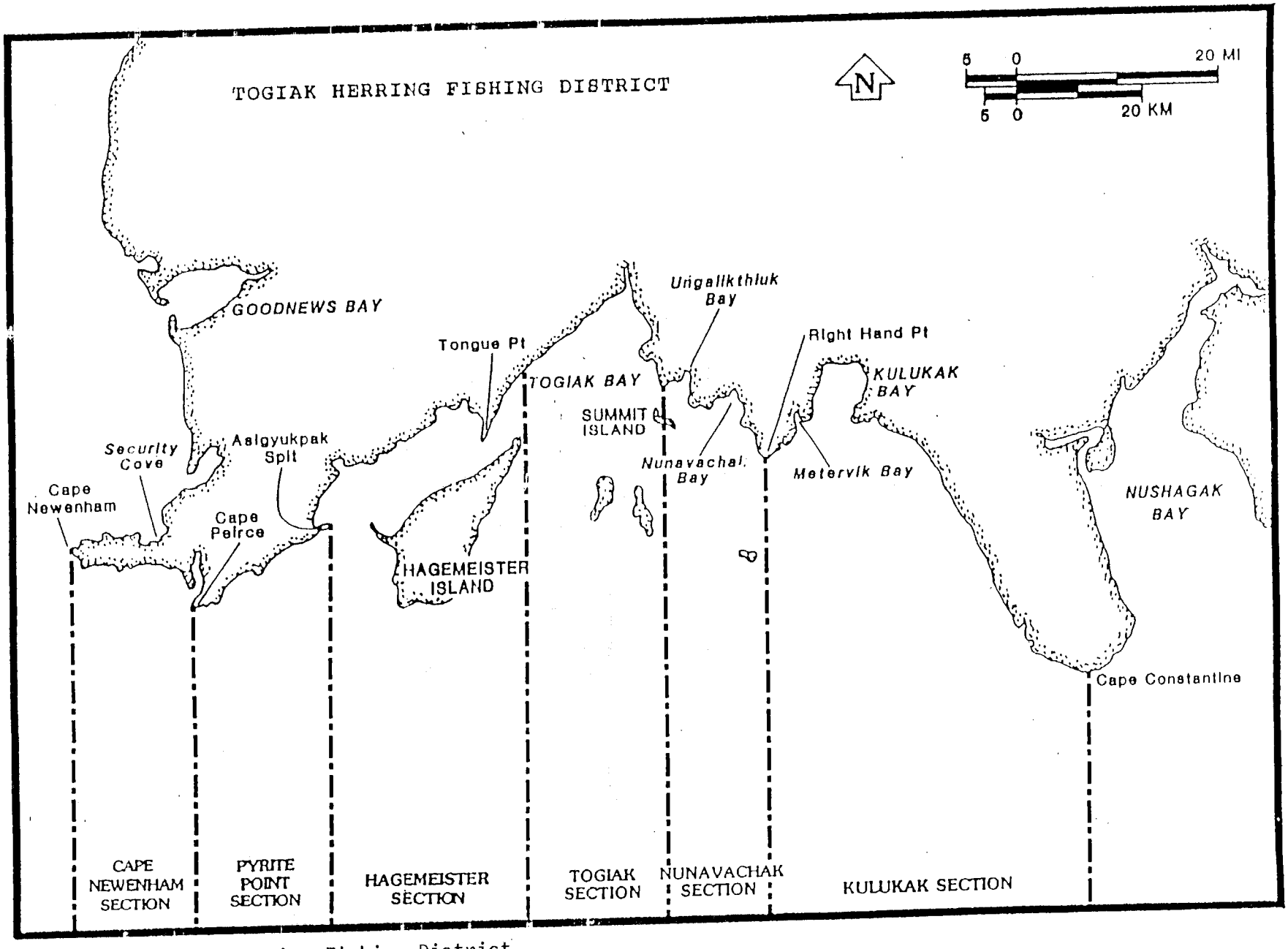

Figure 1. Togiak Herring Fishing District.

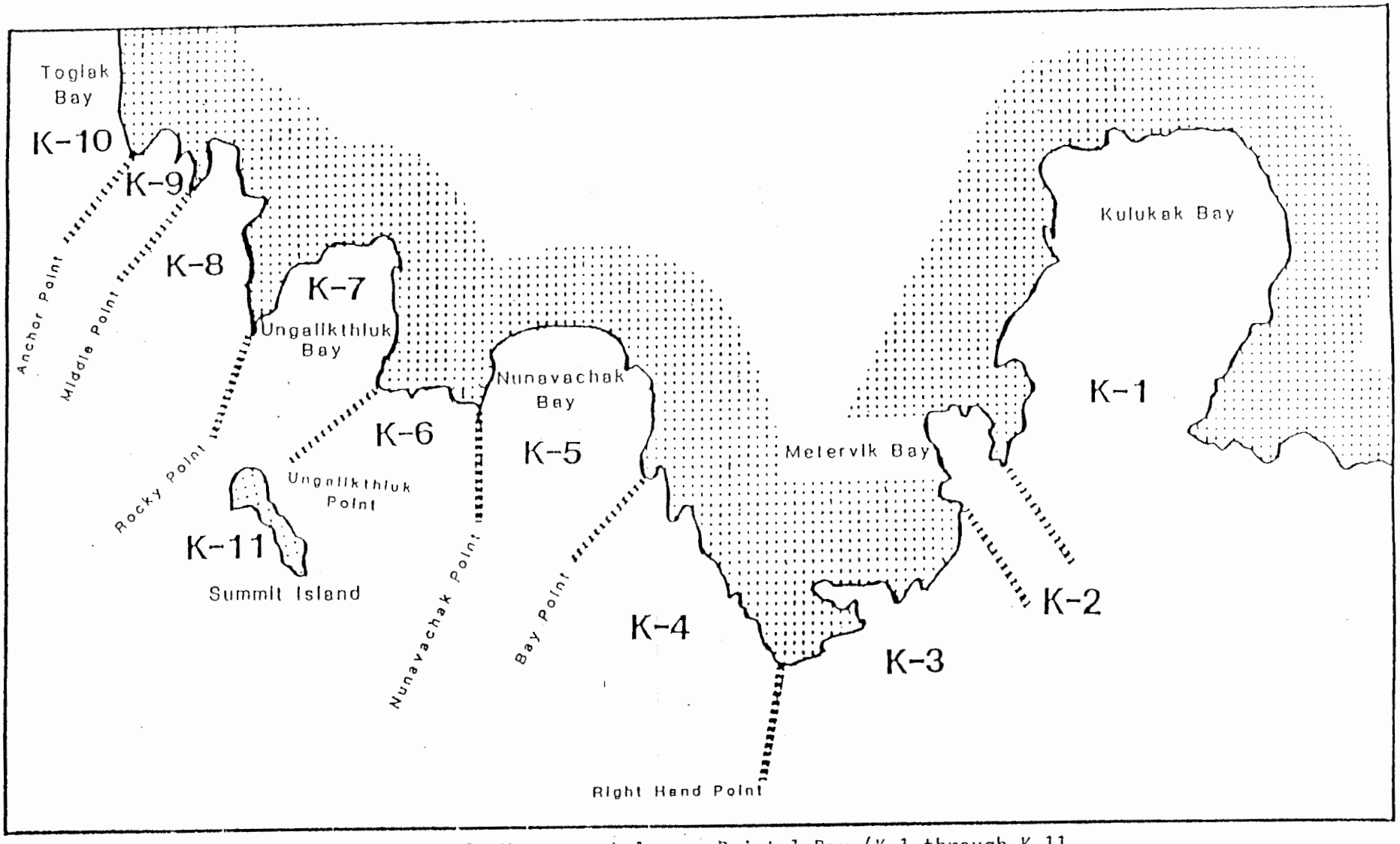

Figure 2. Togiak District Spawn on Kelp Management Areas, Bristol Bay (K-1 through K-11.

BRISTOL BAY TOGIAK DISTRICT SPAWN ON KELP MANAGEMENT AREAS (K-1 through K-11)