ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

-2002-

BRISTOL BAY

By

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Regional Information Report[1] No. 2A03-18

Alaska Department of Fish and Game
Division of Commercial Fisheries
333 Raspberry Road
Anchorage, AK 99518

April 2003

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Division.

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PREFACE

The 2002 Bristol Bay Management Report is the forty-first consecutive annual volume reporting on management activities of the Division of Commercial Fisheries 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 2002. 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 King Salmon office. Attention: Editor.

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ACKNOWLEDGEMENTS

The authors gratefully acknowledge the Commercial and Subsistence Fisheries staff of the Dillingham, King Salmon and Anchorage offices of the Alaska Department of Fish and Game for their contributions to this report. These Divisions employed 14 permanent employees and 67 seasonal employees in Bristol Bay during the 2002 season, each of which participated in various area management and research programs. In addition, Bristol Bay Economic Development Corporation provided two seasonal interns. Thanks are extended to all personnel for a successful season.

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ACKNOWLEDGEMENTS

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INTRODUCTION

Management Area Description

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

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 for individual species in certain districts.

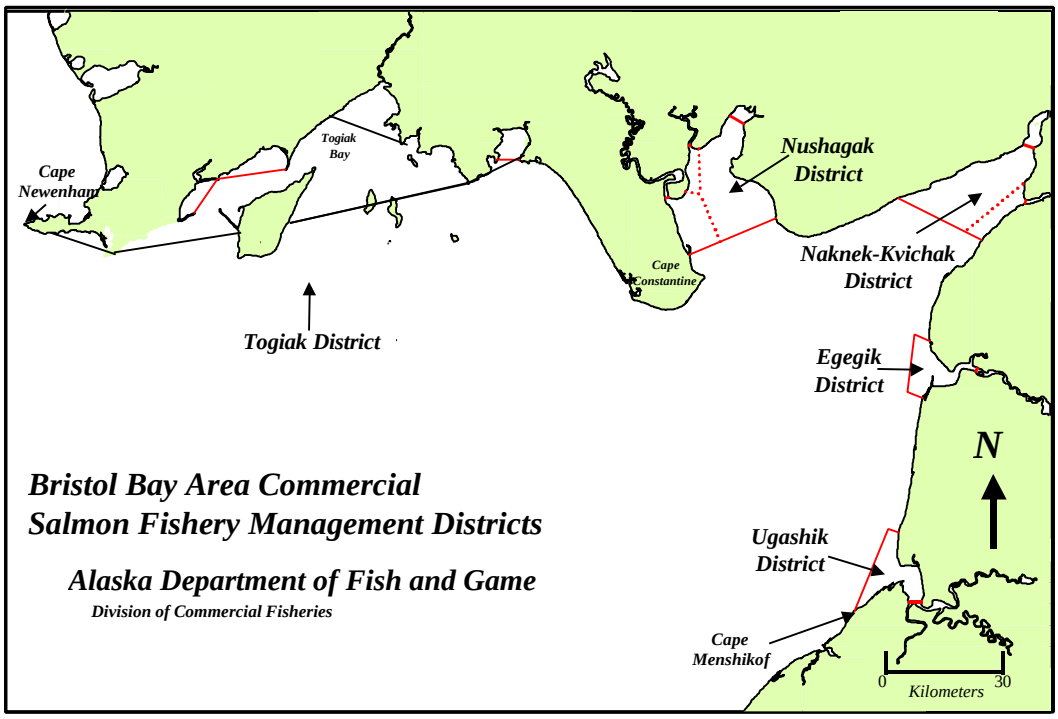

Figure 1.

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. Annual commercial catches (1982-2001) average nearly 25 million sockeye salmon, 88 thousand chinook, 1.0 million chum, 168 thousand coho, and 742 thousand (even-years only) pink salmon (Appendix Tables 4-8). Since 1992, the value of the commercial salmon harvest in Bristol Bay has averaged $117 million (Appendix Table 28), with sockeye salmon being the most valuable, worth an average $116 million. Subsistence catches average approximately 160 thousand salmon and comprised primarily of sockeye salmon (Appendix Table 30). Sport fisheries harvest all species of salmon, with most effort directed toward chinook and coho stocks. Approximately 45 thousand salmon are harvested annually by sportfishermen in Bristol Bay.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks with harvests directed at terminal areas around the mouths of major river systems. Each stock is managed to achieve a spawning escapement goal based on maximum sustained yield. Escapement goals are achieved by regulating fishing time and area by emergency order and/or adjusting weekly fishing schedules. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. Drift gillnet permits are the most numerous at 1,900 in Area T, of those 1,183 fished in 2002. There are a total of 1,006 setnet permits in Area T, of those 680 made deliveries in 2002, (Appendix Table 2 and 3).

2002 COMMERCIAL SALMON FISHERY

Run Strength Indicators

Fishery managers in Bristol Bay have several early indicators of sockeye run size, including: the preseason forecast, the False Pass fishery, the Port Moller test boat, the district test program, and the early performance of the commercial fishery. Evaluated individually, each of these pieces of information may not give a correct assessment of run size. Collectively they form patterns such as missing year classes, discrepancies with the forecast, or differences in run timing that can be important to the successful management of the commercial fishery.

Preseason Forecasts

Total inshore sockeye salmon production for Bristol Bay in 2002 was forecasted to be 16.8 million fish (Table 1). The bay sockeye harvest was predicted to reach approximately 9.7 million fish. Runs were expected to exceed spawning escapement goals for all river systems except the Kvichak River.

The 2002 Bristol Bay forecast is the sum of individual predictions for nine river systems (Kvichak, Branch, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak/Mulchatna and Togiak) and four age classes (age 1.2, 1.3, 2.2, and 2.3 sockeye salmon). Predictions for each age class returning to a river system were calculated by averaging results from simple linear regression models based on the relationship between adult returns and spawners or siblings from previous years. Also, regression models based on the relationship between returns and smolt were examined for Kvichak, Egegik and Ugashik Rivers. Adult escapement and return data from brood years 1972-1989 were used for all models. Results from a regression model were excluded from final forecast calculations if the slope of the line was not significantly different from zero ($R < 0.25$). Mean squared error (MSE) of the total run forecast was calculated using deviations of actual runs from published run predictions made from 1992 to 2001. Run predictions for the period 1992 to 2001 were based on similar methods used for the 2002 forecast. MSE was used to estimate the standard error and 80% confidence bounds of the total run forecast.

South Unimak/Shumagin Island Fishery

These fisheries were 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 January 2001. At that time the Board restructured the management plan. 5AAC. 09.365, the South Unimak/Shumagin Island June Fishery Management Plan states: (a) "The South Unimak and Shumagin Islands June fishery harvest both sockeye and chum salmon in a mixed stock fishery. These stocks of salmon are bound for Bristol Bay and the Arctic-Yukon-Kuskokwim region, as well as other areas across the North Pacific Ocean. These salmon stocks have historically been intercepted in significant numbers along the Alaska Peninsula. To ensure that none of these stocks are over harvested, it is necessary to restrain the interception of these stock as provided in the management plan in this section, and consistent with the Policy for the Management of Sustainable Salmon Fisheries (5AAC 39.222) and the Policy for the Mixed Stock Salmon Fisheries (5AAC 39.220)". The Board instituted a window type-opening scheme for commercial fishing in the Shumagin Islands and South Unimak fisheries from June 10 to June 24 such that: "commercial fishing periods may occur only from 6:00 a.m. to 10:00 p.m. and may not be open for more than (A) three days in any seven-day period. (B) 16-hours per day; (C) 48-hours in any seven-day period; (D) two consecutive 16-hour fishing periods in any seven-day period." The Board removed the previous regulations that were based on a chum cap and a percentage of the Bristol Bay preseason sockeye salmon forecast.

Preliminary catch information for 2002 indicates that the Shumagin Island fishery landed 235,000 sockeye, and the South Unimak fishery landed 356,000 sockeye (Appendix Table 29).

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 would fish specific loran stations on transect lines across the migration path of sockeye returning 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 influenced production capacity and the price paid to fishermen. The project was cut by ADF&G in 1986 and through voluntary funding from the industry, the Port Moller test fish project was resumed and has been operated by staff from the Fisheries Research Institute (FRI), University of Washington since 1987. Information concerning the project is shared with the department on a daily basis inseason and analyzed by the Commercial Fisheries research staff.

Economics and Market Production

In 2002, the exvessel value of the commercial salmon inshore harvest was estimated at $29.8 million (Appendix Table 28). The 1992 to 2001 average exvessel value of Bristol Bay commercial salmon fisheries is about $117 million.

During the 2002 season, 10 companies canned, 22 companies froze and 2 companies cured salmon in Bristol Bay. In addition, 13 companies exported fresh fish by air (Table 31). A total of 25 processors/buyers reported catches from Bristol Bay in 2002.

Run and Harvest Performance by Species

The combined commercial salmon harvest in Bristol Bay totaled 11.2 million fish in 2002. This was less than half the 20-year average of 26.6 million salmon (Appendix Table 9) for Bristol Bay.

Sockeye Salmon

The 2002 inshore sockeye return of 16.8 million fish matched the preseason forecast (Table 1). Actual runs were above forecast for all districts accept the Naknek/Kvichak, which was 18% below its projection, and the Nushagak District, which was 12 % below, forecast (Table 1).

Sockeye salmon dominated the inshore commercial harvest, and totaled 10.6 million fish (Tables 1 and 4). Sockeye escapement goals were met or exceeded in all systems but the Kvichak, Nushagak, and Igushik Rivers where spawning requirements have been defined (Table 1).

Chinook Salmon

Chinook salmon harvests in 2002 were below the recent 20-year averages in all districts (Appendix Table 5). The 2002 bay-wide commercial harvest of 44,000 chinook was well below the 20-year average of 87,500.

Chum Salmon

In 2002, the inshore commercial harvest of 461,100 chum salmon was the forth lowest in the last 20-years and well below the 20-year average of 1.0 million (Appendix Table 6). Chum salmon catches were below average in all districts.

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. The 2002 return produced a harvest of only 500 fish well below the 20-year average of 742,300 (Appendix Table 7).

Coho Salmon

The 2002 bay-wide commercial harvest of coho salmon totaled 8,800 fish, which was below the recent 20-year average of 167,500 (Appendix Table 8). Coho catches were below average in all districts.

SEASON SUMMARY BY DISTRICT

Naknek/Kvichak District

The forecast for the Naknek/Kvichak District for 2002 projected a total run of 4.4 million sockeye, 3.1 million for escapement and 1.3-million to harvest (Table 1). The forecast by river system was 1.8 million to the Kvichak River, 500 thousand expected to return to the Alagnak River and 2.0 million for the Naknek River. The escapement goals for these river systems are: minimum 2.0 million for the Kvichak River, 185 thousand aerial index for the Alagnak River

and a range of 800 thousand to 1.4 million for the Naknek River. This forecast projected no harvestable surplus from the Kvichak River, 1.0 million from the Naknek River and 300 thousand from the Alagnak River for a total projected harvest of 1.3-million. The actual total inshore return for 2002 was just over 3.7 million sockeye salmon, nearly 18% below the preseason forecast. The commercial catch of 1.4 million sockeye was all harvested within the Naknek River Special Harvest Area (NRSHA). The contribution of catch from the Kvichak was minimal due to steps taken at the beginning of the season. No forecasts are made for chinook, chum or coho salmon in the Naknek/Kvichak District. The commercial harvest of chinook salmon has been declining in the district in recent years, mainly due to the current mesh size restrictions that have been implemented since the mid-90's. Mesh restrictions are set by "Emergency Order" (E.O.) each year and prohibit gillnets with mesh size larger than 5.5 inches until July 31.

As described above, the 2002 total run forecast for the Kvichak River was only 1.8 million sockeye salmon, 200 thousand fish less then the minimum escapement goal. With the total run to the Kvichak River projected to be less than the minimum 2.0-million sockeye escapement goal, the department announced in a January 4 "News Release" the Naknek/Kvichak District would not open to commercial fishing on June 1. The Egegik and Ugashik Districts were moved into their respective special harvest areas due to the closure of commercial fishing in the Naknek/Kvichak District. To harvest the surplus Naknek stock, all periods would be conducted within the NRSHA. Based on the Naknek River harvest forecast of less then 1.0-million sockeye, no scheduled fishing periods for the NRSHA occurred before June 23. The preseason management strategy would observe subsistence catches in the Naknek River each tide for sockeye presence. Approximately June 18, test fishing in the Naknek Section would begin to detect sockeye presence outside the NRSHA.

Early run strength indicators, prior to catch information in Bristol Bay, comes from the South Peninsula commercial and the Port Moller test fishery; both begin around June 10. The Port Moller test fishery program projects run entry to Bristol Bay and the age composition of the run; this is then compared to the preseason forecast. In 2002, the South Peninsula fishery fished the new schedule based on the changes at the BOF in 2001, 16-hour periods with 36-hour period breaks between the fishing periods. There was no age composition taken from the commercial harvest. Catch information from the South Peninsula fishery provided no information for local Bristol Bay systems. However, the information collected from the Port Moller test fishery indicated a better than forecasted return to the Bay. The age composition from the Port Moller test fishery was as expected with 70% 3-ocean; typically, age composition early in the program is higher 3-ocean with a shift to 2-ocean occurring in late June.

Escapement monitoring projects were operational early due to the low run projection to Kvichak River and no commercial fishing expected to occur prior to June 27. The Naknek tower was operational at 12:00 midnight, June 19, and the Kvichak tower at 12:00 midnight, June 21 (Table 23). The earlier deployment would provide additional escapement assessment and help in determining the actual strength primarily to the Naknek River. With no commercial fishing periods set, the only way of determining sockeye run strength to the Naknek River would be

from subsistence catches in the Naknek River, test fishing in the Naknek Section with a few commercial boats and from early escapement numbers at the towers.

Subsistence fishing was slow the first two weeks of June with very few sockeye harvested. The first tide sampled by the district test boat was the morning of June 19. The vessel fished the Naknek Section only, looking primarily for presence of sockeye. Test fishing began at the mouth of the Naknek River and then moved out, towards the southern boundary. Very few fish were present (Table 6). Test fishing continued in the Naknek Section on June 22, with less than 100 sockeye caught from eight drifts. Catch rates increased on June 25 with nearly 500 sockeye harvested in the Naknek Section; however, the indices were still lower than expected with index points ranging from 18 to 835. Even with unimpressive test fish results in the Naknek Section, sockeye escapement past the Naknek tower was better than anticipated with daily counts exceeding the expected level f rom the first day of operation. The daily counts jumped from almost 14,000 on June 24 to over 62,000 on June 25 with the cumulative escapement at nearly 175,000 sockeye. Escapement past the Kvichak tower was below expectatons; through June 25, only 1,400 sockeye had passed the towerwith 6900 expected. The Kvichak inriver test fish project began fishing on June 21; no significant catches occurred until June 28, when 176 sockeye were caught between the two tides (Table 25).

Escapement continued ahead of the anticipated on the Naknek River while test fish results in the Naknek Section remained fairly flat. Test boats fished both tides on the 26 and 27 of June and averaged about 600 fish per tide. Escapement to the Naknek continued at levels exceeding the anticipated, and by 10:00 a.m. June 27 the cumulative was 198,000. This put the Naknek escapement more than 3-days ahead of schedule. At 3:00 p.m. it was announced the NRSHA would open to drift gillnet fishing on June 28 from 4:30 a.m. until 11:30 a.m., a 7.0-hour period. For set gillnet gear, the NRSHA would open for a 6.0-hour period from 4:00 p.m. until 10:00 a.m. Friday, June 28. As outlined in regulation for the NRSHA (5 AAC.06.360), drift gillnet gear fishes first followed by periods alternating between gear groups.

Escapement into the Naknek River continued at above projected rates, in spite of fishing each tide since the morning of June 28. By the morning of July 1, the cumulative escapement into the Naknek River was 625,000 (10:00 a.m.) which was nearly five days ahead of schedule.The anticipated cumulative through July 1 was 300,000 sockeye with a daily escapement of 60,000. To slow escapement down, two drift gillnet periods were announced for July 2. The set gillnet fleet would fish on the morning tide of July 3. However, escapement into the Kvichak River was not tracking as well as the Naknek River. The Kvichak escapement through 10:00 a.m. July 1 was only 70,000 sockeye; the projected escapement for the same time period was 250,000 sockeye. The Kvichak was now nearly three days behind the cumulative escapement goal curve, and with no indication of change from inriver test fish indices, it was apparent the NRSHA would remain in effect for the rest of the season.

To protect the quality of escapement for sockeye and other salmon species when the NRSHA is open, the BOF opted for an optimal escapement goal (OEG) of 800 thousand to 2.0 million

sockeye for the Naknek River. This would enable the department to pulse (multiple short periods) the fishery. The short periods would allow escapement of salmon without encountering fishing gear. To accomplish this, the drift gillnet fleet began near the 15-foot flood stage and ended at the 15-foot level on the ebb. For the set gillnet fleet, the fishery was centered on the 10-foot tides during both the flood and ebb. When runs to the Naknek were at a magnitude of 4 to 6-million, the upper OEG would come into effect. However, when runs to the Naknek are less than 3-million, escapements can be held to less than 1.4-million sockeye and yet continue with the pulse style fishery.

Once again, the drift fleet fished back-to-back tides on July 4; this was an attempt to slow escapement down, but had little effect. From July 5 through July 26, each gear group was fished equally. The Naknek tower ceased operation on July 15 with a total count of 1,263,918 sockeye past the tower; on the Kvichak River the tower ended operation on July 18 with a count of 703,536 sockeye. The sockeye escapement goal was met on the Naknek; however, on the Kvichak, it fell short of the 2.0-million goal. The Naknek/Kvichak District remained closed through 9:00 a.m. Monday, July 29. At that time, the Naknek Section opened to both drift and set gillnet gear to a schedule of 9:00 a.m. Mondays to 9:00 a.m. Fridays through September 30; however, there was no reported effort from the Naknek Section. The Kvichak Section was closed for the 2002 season.

The sockeye salmon harvest totaled just over 1.4 million (Appendix Table 4). The reported commercial harvest of 777 chinook was 14% of the recent 10-year average harvest of 3,700 (Appendix Table 5). The chum salmon harvest totaled 11,878 fish, which is less than the recent 10-year average of 120,000 (Appendix Table 6). There was no reported commercial harvest of coho salmon in the Naknek/Kvichak District (Appendix Table 8). Subsistence harvests are listed in Table 33.

Egegik District

The 2002 sockeye salmon run to the Egegik District of 5.64 million fish was the third smallest run recorded since 1982, but it was approximately 24% above the forecast of 4.55 million sockeye. Sockeye salmon runs to the Egegik District during the past four comparable cycle years, dating back to 1982, have ranged from 3.48 to 17.59 million fish with an average of 9.08 million. The 2002 run was 38% below the average for the recent cycle years (Appendix Table 14). The harvest of 4.60 million sockeye salmon was the 18th largest commercial harvest in the 106-year history of the fishery. An escapement of approximately 1.036 million fish was achieved, which was near the middle of the Biological Escapement Goal (BEG) range of 800 thousand to 1.4 million (Table 1).

The Alaska Department of Fish and Game (ADF&G) forecasted a Bristol Bay run of 16.76 million sockeye salmon in 2002, and a harvest of approximately 9.66 million. The projected Egegik District harvest of 3.45 million sockeye was 36% of the predicted Bay's harvest. However; last year's low price, rumors of a similar price for this seasons, and the expected

lower production, attracted only about 1,170 vessels to the Bay this season, of which approximately 350 decided to fish in the Egegik District (Table 10). The fact that the fishing area was reduced to the Egegik River Special Harvest Area (ERSHA) for the entire season, may have also reduced interest in fishing the Egegik District.

Commercial salmon fishing was opened in the Egegik District on June 3 (Table 12), but no landings occurred until June 5. Through June 14, sockeye salmon catches per delivery were not only above average but they were some of the highest on record for both set and drift gillnet gear. The total catch of approximately 22,000 through June 14 was the largest catch through this date on record. The fishery was allowed to close as scheduled at 9:00 a.m. on June 15 and it would stay closed until escapement numbers improved.

Daily inriver test fishing, which provides estimates of sockeye salmon passage into the lower portions of Egegik River, began on June 14 at the usual sites just upstream of Wolverine Creek (Table 26). The Egegik River counting towers began operation on June 18 (Table 23), and provided daily estimates of sockeye salmon passage into Becharof Lake. Initial inriver test fishing catches were low and stayed fairly low until June 24, when catches indicated that approximately 165,000 sockeye salmon were in the river and above the commercial fishing district (Table 26). The tower count was 106,000 through June 24; a brief 8-hour commercial fishing period was scheduled for 12:00 p.m., Tuesday, June 25.

Participation in the June 25 opening consisted of approximately 322 drift vessels; 172 set net deliveries were also made. The catch of approximately 164,000 sockeye salmon was about one third the 20-year average for this date. Sockeye salmon catches were 332 and 324 fish per delivery for set and drift gillnet fishers, respectively. The set gillnet catch was three times the average and for drift gillnet fishers it was about average. Inriver test fishing results through June 25 suggested that about 250,000 sockeye salmon had entered the Egegik River system. Adding these fish to the cumulative tower count of 204,000 resulted in a projected escapement for June 25 that was five days ahead of the expected level. The actual tower count for June 25 was 203,700 sockeye salmon; about two days ahead of the expected level. With the healthy escapement level, another 8-hour commercial fishing period was announced to start at 12:30 p.m. on June 26.

The June 26 harvest of 276,000 sockeye salmon was about half the 20-year average for this date. The escapement rate dropped off on June 26 with only one-tenth the inriver test fishing index of the previous two days (Table 26). However, with the escapement still several days ahead the expected level, another fishing period was announced for June 27 to start at 1:00 p.m..

The June 27 harvest of approximately 225,000 sockeye salmon was also about half the 20-year average, and brought the district's total harvest to approximately 684,000 fish. The cumulative harvest was also approximately half the 20-year average. The tower count was 442,000 through June 27 was still five days ahead of the expected level. Short fishing periods of eight hours or less were scheduled daily through July 1.

Catches ranged from 235,000 to 389,000 and all were below their 20-year averages. At this point, the escapement level was still tracking well, approximately four days ahead of the expected level. Drift gillnet catches were falling further behind their allocation and a second period was scheduled for that gear group starting on July 2. Drift gillnet fishers received more fishing time through July 5 and gained approximately 5% on their allocation targe. The July 2 to July 5 harvests ranged from 607,000 to 346,000 sockeye salmon and again all daily harvests were below the 20-year averages. The 607,000 sockeye harvest on July 2 was the largest daily catch recorded with the fishing district restricted to the Egegik River Special Harvest Area.

With the escapement level adequate and the harvest allocations balanced, one 8-hour period per day was scheduled for both gear types from July 6 to July 9. Catches remained modest ranging from 266,000 to 126,000 fish. The tower count was 918,000 through July 9. Drift gillnet fishers had once again fallen behind in their allocation and 13 more hours of fishing time was allotted to them over the next four days. Catches dropped off to under 100,000 fish per day for the next several days and dropped to under 5,000 on July 17 when the fall fishing schedule was implemented.

Sockeye salmon landings in the district continued throughout July and into August (Table 12), reaching a seasonal cumulative total catch of approximately 4.60 million fish. The counting towers ceased operation on July 16 and the final escapement count totaled 1.04 million sockeye salmon. This was approximately 5% under the midpoint of the BEG range, but 30% over the lower end of the goal. The escapement sex ratio was 50% males to 50% females. The allocation between gear groups was almost achieved with drift gillnet fishers taking approximately 85%, and set gillnet fishers taking approximately 15% of the sockeye harvest through July 17.

The age composition, in percent, of the 2002 Egegik District sockeye run was as follows:

Age Group	Catch	Escapement	Total
1.2	2	1	2
2.2	62	55	61
1.3	6	4	6
2.3	28	37	30
Other	2	3	1
Total	100	100	100

Most of the sockeye salmon run (91%) were age 2.2 and 2.3 fish that came from the 1997 and 1996 escapements of 1.11 million and 1.08 million fish. Egegik District commercial fishers harvested 82% of the Egegik inshore sockeye run, which was slightly below the recent 20-year average of 83%. Peak harvest dates were July 2, and 5, when 607,000 and 442,000 sockeye salmon were landed on those dates. Peak tower counts occurred on June 25 through June 27, when over 97,000 sockeye salmon were counted on each of those dates. The peak catch rate for

drift gillnet fishers was 47,800 sockeye salmon per hour on July 1, and for set gillnet fishers it was 13,000 sockeye salmon per hour, also on July 1. During the emergency order period from June 16 to July 17, a total of 202 hours were fished by drift gillnet fishers, or 27% of the 744 available hours. For set gillnet fishers, 172 hours or 23% of the available time was fished. This compares to 159 hours for drift gillnet fishers and 132 hours for set gillnet fishers last season. Peak drift gillnet effort was a little over 350 vessels from July 7 to July 8 (Table 10), and it was the least amount of drift effort for a season since 1984.

The commercial harvest of other salmon species in the Egegik District totaled 30,200 fish, or approximately 1% of the total harvest. The chinook harvest was approximately 276 fish, or 86% below the 1982 to 2001 (20-year) average of 2,030 (Appendix Table 5). The district chum harvest of approximately 22,500 fish was 77% below the recent 20-year average of 98,400 (Appendix Table 6). Almost no pink salmon harvest was reported. The coho salmon harvest of 7,500 fish was well below the recent 20-year average of 37,700 (Appendix Table 8). Interest in coho fishing was light this season, with less than eight drift gillnet and ten set gillnet permits recording landings.

Aerial surveys were conducted in the Egegik and King Salmon River systems to provide escapement indices for chinook, chum, and coho salmon. The resulting counts were 912 chinook, 757 chum, and 7,050 coho salmon. Chinook escapement indices ranged from below to above average in the streams surveyed. The chinook salmon count was 19% below the 20-year average while the chum salmon count was 89% below average, however; the chinook count was the largest count recorded in four years. The coho index represents an aerial count from several tributary streams of Becharof Lake and it was 56% above the 1997 to 2002 average count of 4,522.

In summary, the 2002 sockeye salmon season at Egegik was not very productive when compared to the last 20 years. Though the catch was the 18th largest on record, it was the fourth smallest harvest since 1982. For set gillnet fishers it was their 14th largest harvest on record; for drift gillnet fishers it was their 18th largest catch. Like the last two years, this year's run exhibited early run strength and weak late run strength.

Ugashik District

The 2002 inshore sockeye salmon run to the Ugashik District was approximately 2.48 million fish, or 6% above the forecast of 2.34 million (Table 1). Ugashik's run was the third best positive deviation from forecast in the Bay, with Togiak and Egegik Districts doing better. It was the second largest run in six years but only the 15th largest in 20 years. The commercial sockeye salmon catch of approximately 1.58 million fish was the second largest harvest in six years. The sockeye salmon escapement to the Ugashik River was approximately 892,000 fish, or in the middle of the BEG range of 500 thousand to 1.2 million. Comparable inshore returns over the last four cycles, dating back to 1982, have ranged from 2.06 million to 5.52 million fish

with an average of 3.18 million, making the 2002 run of 2.48 million 22% below the average for the last four cycle years (Appendix Table 15).

From June 3 through June 28, commercial fishing within the Ugashik District was reduced by approximately five square miles. The reduced area was based on the preseason forecast for the Kvichak River sockeye salmon; by regulation, when Kvichak River sockeye salmon can not support a 40% exploitation rate and still meet the minimum escapement goal for the system, Ugashik District is reduced by approximately five square miles. Initial landings occurred in the district on June 11 (Table 13) with only a few sockeye and chinook salmon landed. During the week of June 18, effort and sockeye catches increased, and by 4:00 p.m. June 22, the cumulative district harvest was approximately 29,600 sockeye salmon, 500 chinook salmon, and 3,700 chum salmon. Through June 23, the sockeye harvest was 54% below the recent 10-year (1992 to 2001) average of 64,500.

The preseason forecast for the Ugashik District suggested a harvest of 1.49 million sockeye salmon, which would have been the fourth smallest harvest in 20 years. Accordingly, commercial fishers were advised that fishing might not occur until July. With this advisory, less than ten drift vessels were registered for Ugashik on June 25 (Table 10).

Inriver test fishing, which operates about three miles upstream of Ugashik Village, started on June 24 and provided a daily estimate of sockeye salmon passage into the lower part of the Ugashik River. The counting tower project, operating about 24 miles upstream of Ugashik Village, started counting on June 29 or five days earlier than usual. After the first seven days, inriver test fishing results estimated approximately 10,000 fish up the Ugashik River, and the tower count was only 882 fish (Table 27). Inriver test fishing results improved slowly over the next several days until the cumulative index went over 1,000 points on July 4. The cumulative tower count was 18,000 sockeye salmon through July 4 and an additional 24,000 fish were estimated in the river. This level of escapement was slightly ahead of the 20-year average escapement for this date, and brief fishing periods were scheduled for July 5. Set gillnet fishers were allowed a 12-hour period while a 4-hour period was scheduled for drift gillnet fishers.

The total harvest of approximately 15,000 was minimal and only a fraction of the recent 20-year average catch for this date. However, inriver test fishing results continued to improve and the estimated escapement was tracking well with the expected level. Another fishing period was scheduled for July 6.

The July 6 catch of 30,000 was also well below the recent 20-year average catch for this date. Inriver test fishing results were still improving and the escapement level was still tracking well. Though drift gillnet effort was increasing it was still under 100 vessels. Brief fishing periods were allowed over the next two days. Though the July 7 catch of 112,000 was below average, but the July 8 catch of 226,000 was 43% above the recent 20-year average. Catches per drift delivery for both days were above average, however inriver test fishing results were slipping and the fishery closed as scheduled. It would stay closed on July 9 while a round of district test fishing was scheduled.

District test fishing results showed very good concentrations of fish from Dago Creek to above the inner district markers (Table 7). An aerial survey also confirmed good signs of fish within the District. Although inside test fishing results were still languishing, a brief fishing period was scheduled for July 10.

The July 10 opening was productive with approximately 251,000 sockeye salmon landed. Both drift and set gillnet catches per delivery were above average and the set gillnet catch was the highest on record for this date. An aerial survey revealed an excellent show of fish above the inner district markers all the way to Ugashik Village. It was estimated that at least the lower end of the escapement goal range, 500,000 fish, and that maybe even the mid-range, 850,000 fish, were in this area. Inriver test fishing results picked up on July 10 with 2,661 index points. Given this information, lots of fishing was scheduled over the next several days.

Inriver test fishing results soared to almost 7,000 index points on July 11 (Table 27) which was the second highest daily index in ten years. Results then dropped to 3,584 points on July 12, 1,373 points on July 13 and 594 points on July 14. The escapement tower count increased from 90,000 on July 10 to 719,000 on July 13. Catches ranged from 286,000 on July 11 and 12 to 24,000 on July 17. The July 11 and 12 catches of over 286,000 fish on each of those days were the best harvests for those dates in 12 years. The cumulative harvest through July 17 was 1.55 million, which was the seventh largest harvest in ten years, but the second largest catch in five years. Sockeye escapement reached 849,000 at the counting tower on July 17 and the district reverted to a weekly fishing schedule of 9:00 a.m. Mondays to 9:00 Fridays on Wednesday July 17.

Sockeye landings continued through August 13 until the final catch totaled 1.58 million. The final Ugashik River sockeye escapement count was 892,000 fish when the state run project ended on July 25. A federally funded project continued the tower operation through September and counted another 21,000 sockeye salmon. Additionally, 13,480 sockeye were counted during aerial surveys of the Dog Salmon and King Salmon rivers (Appendix Table 15).

At the end of the emergency order period, setnetters caught 12% of the sockeye harvest and drift gillnet fishers took 88%. This breakdown is a 2% discrepancy from the allocation. To achieve the established allocations, approximately 30,800 fish in the set gillnet catch needed to go to the drift gillnet harvest. Between June 23 and July 17, setnetters fished a total of 185.5 hours, or 49 hours more fishing time they had last year, while drift gillnetters fished a total of 151 hours, or 42.5 hours more fishing time than they fished last year.

The peak escapement counts at the counting towers occurred July 12 and July 13 when over 200,000 sockeye salmon were counted on each of those days. The sockeye salmon escapement sex ratio was 45% males to 55% females.

The age composition, in percent, of the 2002 Ugashik District sockeye salmon run was as follows:

Age Group	Catch	Escapement	Total
1.2	3	17	8
2.2	65	53	61
1.3	26	29	27
2.3	5	1	3
Other	1	0	1
Total	100	100	100

The commercial harvest of other salmon species totaled approximately 38,000 fish or 2% of the district's total harvest. The harvest of 738 chinook salmon was 75% below the 20-year (1982 to 2001) average of 2,900 (Appendix Table 5). Ugashik chinook salmon escapement indices were above average in the Dog Salmon and Ugashik Rivers, but below average in the King Salmon River. The chinook salmon index count of 3,635 was 16% below the 1980 to 2001 average of 4,339. The chum salmon harvest of approximately 37,000 fish was half the average. The chum salmon escapement index count of 21,700 was 28% below the average count of 30,200. The coho salmon harvest of 460 fish was well below the 20-year average of 25,000, but there was very little commercial effort for Ugashik coho salmon again this year, with no landings reported after August 16. The coho salmon escapement index count of 2,255 for the Upper and Lower Ugashik Lakes was 71% below the 1996 to 2001 average count of 7,700, however, survey conditions were marginal and the survey was conducted earlier than in past years. Preliminary results from the Federal coho tower project estimated that approximately 17,000 coho salmon had passed into Ugashik Lakes. Almost no pink salmon harvest was reported in the Ugashik District this season.

The Ugashik District fishery harvested approximately 64% of the sockeye return to the district in 2002, which was slightly below the 20-year (1982 to 2001) average rate of 71%. Peak catch per hour occurred on July 10 for drift gillnet fishers, when approximately 200,900 sockeye salmon were landed in four hours, or 50,220 fish per hour. For set gillnet fishers, peak catch also occurred on July 10 when approximately 50,700 sockeye salmon were landed in 13.5 hours, or 3,760 per hour. Peak catch per landing in the district occurred on July 8 for drift gillnet fishers and on July 10 for set gillnet fishers, when approximately 2,000 and 860 sockeye salmon, respectively, were taken per delivery.

A total of 14 buyers operated in the district during the season (Table 31), two more than last year. Nearly all of the catch was tendered to other districts for processing. Unlike some of the commercial fishers in the Egegik District, there were no delivery limits placed on Ugashik commercial fishers during the season.

Nushagak District

The 2002 Nushagak District total inshore sockeye salmon run was approximately 4.5 million fish, 14% under the preseason forecast of 5.2 million fish (Table 1). Commercial sockeye harvest, in the Nushagak District, reached 2.8 million, 18% below the preseason projected harvest of 3.3 million sockeye, and was the twelfth largest catch in the last 20 years. Total sockeye escapement in the district's three major river systems was 1.72 million or 91% of the combined escapement goal of 1.88 million.

In January 2001, the Alaska Board of Fisheries held it's meeting in Anchorage to consider proposed regulatory changes for the Bristol Bay salmon. These changes for the Nushagak District included a requirement to bag any additional gear over the legal limit in the Wood River Special Harvest Area (WRSHA) and a variable escapement goal for the Nushagak River contained in the Wood River Harvest Area Management Plan.

The variable escapement goal adopted for the Nushagak River was to achieve sockeye escapements within the BEG range of 340,000 to 760,000 when the preseason forecast is greater than 1 million fish. If the preseason forecast is below 1 million fish, then an OEG minimum of 235,000 sockeye is in effect when the ratio of Wood to Nushagak sockeye is projected to exceed 3:1. The first week of July, the department is to do an inseason assessment of Nushagak River sockeye run strength and adjust the escapement goal based on that assessment; if the inseason projection exceeds 1 million fish, the department shall manage for the BEG range of 340,000 to 760,000 fish. When the projection is below 1 million sockeye, the OEG minimum of 235,000 is in effect.

Chinook Salmon

Peak chinook salmon production in the early 1980's resulted in record commercial harvests and growth of the sport fishery. Declining run sizes and the question of how to share the burden of conservation among users precipitated the development of a management plan for Nushagak chinook salmon. Since 1992, the Nushagak-Mulchatna Chinook Salmon Management Plan (NMCSMP) has governed management of the Nushagak chinook salmon fisheries (5 AAC 06.361). The plan was adopted in 1992 and amended in 1995 and 1997.

The purpose of this management plan is to ensure an adequate spawning escapement of chinook salmon into the Nushagak River system. The plan directs the department to manage the commercial fishery for an inriver goal of 75,000 chinook salmon past the sonar site at Portage Creek. The inriver goal provides: (1) a biological escapement goal of 65,000 spawners, (2) a reasonable opportunity for inriver subsistence harvest and (3) a sport guideline harvest of 5,000 fish. The plan addresses poor run scenarios by specifying management actions to be taken in commercial, sport and subsistence fisheries, depending on the severity of the conservation concern. Management decisions are heavily dependent upon the estimates of inriver chinook

salmon escapement provided by sonar counters located at Portage Creek on the lower Nushagak River.

Trends in age composition of chinook spawning escapements in 1995 and 1996 raised concerns about the quality of chinook escapements in the Nushagak River. The proportion of large (age-5 through age-7) fish was less than desired, and the age composition of the escapement from the first half of the run differed substantially from the escapement from the second half of the run. In the early portion of the run, predominantly male chinook salmon of the younger age classes comprised the majority of the escapement, while the older age classes became prevalent in the latter portion of the escapement. Differences in age composition between escapement and total run, and between early and late-season escapement, result from size-selective harvests. To address this concern, the department adopted a strategy of allowing detectable pulses of chinook into the Nushagak River before opening a commercial period. Allowing untargeted fish into the river was intended to lessen the effects of selectivity in the commercial fishery and allow fish with a natural age distribution to enter the river. In November 1997, additional language, directing the department to allow pulses of chinook salmon into the Nushagak River that were not exposed to commercial fishing gear, was added to the NMCSMP.

The department adjusts commercial fishing time and area to harvest chinook salmon surplus to the inriver goal. Management decisions are based on the preseason forecast and inseason indicators of run strength, including commercial harvest performance, subsistence harvest rates and inriver passage rates by the sonar. To maintain quality and value, chinook salmon are commercially harvested early in the run before the majority of fish discolor and become soft, and before many fish migrate into the mainstem of the Nushagak River. Chinook escapement typically peaks 10 days after commercial harvests; at the time commercial harvests peak in the district, typically only 15% of the escapement has passed the sonar. This difference in run timing prohibits reliable estimates of run size until after the peak of the fishery. When a surplus is forecasted, early commercial openings are justified for quality concerns, and in accordance with the language in the NMCSMP.

The 2002 Nushagak District chinook salmon forecast was 130,000 fish. With an inriver goal of 75,000 fish, assuming an average lower river (below the sonar counter) subsistence harvest (10,000 to 12,000) and an average incidental harvest during the sockeye fishery (15,000 to 20,000) chinook salmon), approximately 20,000 surplus chinook salmon were expected to be available for a directed commercial harvest. In the preseason outlook, the possibility of directed chinook openings was going to be dependent on run timing and whether the department "could project, based on the Portage Creek sonar count, that the inriver goal would be achieved." Since 1999 there has been no directed commercial chinook fishery. Although a surplus was potentially available in 2002, the department wanted to be sure escapement goals would be met before a directed chinook opening was announced. A directed chinook opening, however, wasn't anticipated in 2002.

The sonar station at Portage Creek was up and running on June 8. The daily chinook count for June 9 was 7,957 with 4,700 chinook passing the counters on the 10th; the department ann-

ounced a chinook opening would be possible in the next few days. On the 13th, after several days of smaller chinook escapements, the decision was made not to fish. Daily chinook escapements remained below the expected level through June 18. The chinook escapement rate increased on the 19th; 20,000 chinook passed the sonar counters in the next 48 hours. The total escapement by the morning of June 21 was 37,687 chinook. With escapement six days ahead of schedule and the escapement projections exceeding the inriver goal, an opening was announced. A directed chinook opening (mesh restricted to 7.5 inches or greater) was announced for six hours beginning at 9:30 a.m. June 21. Early reports from the first opening indicated modest catches so a second opening was announced for six hours beginning at 10:00 a.m. June 22.

After two 6-hour openings the total chinook harvest was approximately 7,700 fish. Since the projections still indicated chinook escapement would exceed the 75,000 fish inriver goal, a 12-hour period was announced starting at 12:30 p.m. on June 24. The third directed chinook opening harvested 11,200 chinook. On June 25, the fourth and final directed chinook opening was announced, a 12-hour period starting at 2:30 p.m.

The four directed chinook openings harvested a total of 33,385 fish; an additional 6,000 were harvested incidentally during the remainder of the season. The total harvest of 39,382 chinook salmon in 2002 is 92% of the recent five year average and more than the combined harvest of the last 3 years (Appendix Table 20). The final escapement past the sonar counters at Portage Creek was 87,141 chinook (Table 24), 16% more than the 75,000 fish inriver goal. Although the subsistence and sport fish harvests are not available at this time, it's certain that the total chinook run exceeded the preseason forecast of 130,000.

Sockeye Salmon

From 1986 through the 1998 season, the Nushagak District sockeye fishery was managed to achieve a biological escapement goal range of 340,000 to 760,000 sockeye salmon in the Nushagak River and a range of between 700,000 to 1,200,000 sockeye salmon in the Wood River. The Alaska Board of Fisheries modified the Wood River Special Harvest Area Management Plan in March of 1999 to include language that directed the department to manage the Nushagak River for an optimum escapement goal (OEG) of no less than 235,000 sockeye when the ratio of Wood River to Nushagak River sockeye was projected to be greater than 3:1. This OEG was adopted by the Board of Fisheries for the 1999 and 2000 seasons to give “economic relief” to the Nushagak District permit holders by allowing a higher exploitation rate on the stronger Wood River sockeye stock in the district. The “variable” escapement goal for the Nushagak River, contained in the Wood River Special Harvest Area Management Plan, adopted in January 2001 and described above, replaced this previous OEG minimum goal (235,000 sockeye) for the Nushagak River. With a preseason forecast of 794,000 sockeye salmon, the Nushagak River would be managed for the OEG minimum of 235,000, at least until the run was reassessed in early July.

The department reviewed biological escapement goal ranges for all river systems again in October of 2000. As a result of that review, the upper end of the sockeye salmon BEG range for the Wood River was raised from 1.2 million to 1.5 million, changing the midpoint to 1.1 million; the upper end of the BEG range for the Igushik River was also raised from 250,000 to 300,000, changing the midpoint to 225,000 (Table 1).

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 5.2 million fish (Table 1), which was 89% of the 20-year average actual run of 5.93 million sockeye (Appendix Table 16). Strength of the forecasted Wood River run of 3.8 million was 14% above the 1982-2001 average run, while the Nushagak River sockeye run of 794,000 was expected to be just over half (55%) of the 10-year average. The forecasted run to Igushik River of 600,000 was also close to half (48%) of the 1982-2001 average level (Appendix Table 17). Management of the Igushik and Nushagak Sections as well as the WRSHA are discussed separately below.

Nushagak Section

There are virtually no tools available to manage Nushagak and Wood River stocks independently because run timing and migratory routes overlap to a high degree. The Wood River Special Harvest Area Management Plan was adopted in 1996 as a means to conserve coho salmon in the district while continuing to harvest surplus sockeye salmon in the Wood River. The regulatory framework of the WRSHA plan was used by the department in an emergency regulation during the 1997 season for sockeye management due to a large disparity in run strengths between Wood and Nushagak River sockeye salmon stocks. The Board then formally modified the plan in November 1997 to provide a stock specific management tool to target Wood River sockeye salmon. The plan allows opening the Wood River Special Harvest Area for the conservation of Nushagak River sockeye salmon. The Nushagak River sockeye escapement peaks slightly earlier than escapement in Wood River. If stock proportions in the escapement represent stock abundance in the district, and harvests are not stock selective, delaying the sockeye openings should help to conserve the Nushagak stocks. However, without an additional stock-specific means to exploit Wood River sockeye, surplus Wood River sockeye cannot be harvested without sacrificing the Nushagak River escapement goal particularly when the Wood River run is on the order of three (or greater) times as large as the Nushagak River run.

For at least the last sockeye life cycle, Wood River runs have been more than three times larger than Nushagak River runs due to high production in the Wood River system and decreased production in the Nushagak River system. Throughout these years, the department has attempted, relatively unsuccessfully, to keep sockeye escapement in the Wood River from exceeding the upper end of the escapement goal range, while simultaneously attempting to achieve at least the lower end of the BEG range in the Nushagak River. A ratio of 4.8:1 (Wood River to Nushagak River sockeye) was forecast for 2002. To conserve Nushagak stocks, the department would limit commercial fishing time early in the sockeye run. In accordance with

the "variable" escapement goal for the Nushagak River and based on the preseason forecast, the department would manage for the OEG minimum of 235,000 sockeye in the Nushagak River while attempting to keep the Wood River sockeye escapement below 1.5 million, the recently adopted upper end of its BEG range.

Although department staff intended to limit early harvest of sockeye, the strong chinook return necessitated directed chinook openings. The directed chinook openings require all permit holders to use 7.5 inch mesh or larger. In spite of these mesh restriction, after the fourth directed chinook opening, on June 26, a total of 117,310 sockeye had been harvested in the Nushagak Section. By midnight on June 26, 47,339 sockeye had passed the sonar camp at Portage Creek and 95,928 sockeye had passed the counting towers on the Wood River.

At noon on June 27, the first commercial opening without a mesh restriction was announced. In hopes of gaining a head start on the setnet allocation, a 6-hour, setnet only period was announced beginning at 3:30 p.m., on the 27th. The first driftnet period was from 4:00 a.m., until 8:00 a.m., on June 28. With 399 boats registered to fish in the Nushagak District, a 16-hour setnet period was also announced, to keep the harvest percentages in line with regulation. The setnet harvest on the 27th was 62,448 sockeye; the total harvest for the 28th was 348,945. These catches were above average and sockeye escapements continued above expected levels. Another 16-hour setnet and 4-hour driftnet period was announced for June 29.

On June 29, the Nushagak sockeye escapement was 4.5 days ahead of the 235,000 OEG minimum and two days ahead of the 340,000 BEG minimum. There were 452 vessels registered to fish in the Nushagak District and the harvest percentages were 59% driftnet and 37% Nushagak setnet. Department staff extended the setnet period in progress for 25 hours and announced a 6-hour driftnet period beginning at 6:00 p.m. that afternoon.

Late on the afternoon of June 29, the escapement rate past the Wood River towers increased to 20,000 sockeye per hour. With 192,000 fish passing the Wood River towers between midnight and 6:00 p.m., an apparent large push of fish was moving through the district. Department staff, in an 8:00 p.m. announcement, extended the driftnet period in progress for 18 hours.

The main concern for managers was the daily and cumulative escapements in the Nushagak River; these were above expected levels on June 30. The harvest numbers were good as well, although catch per unit effort did dip slightly below average. There were more vessels than usual (452) registered to fish in the Nushagak. Fishing periods of 12 and 25 hours, for driftnet and setnet respectively, were announced for July 1. The Nushagak sockeye escapement for the 30th was 42,000 fish, double the expected daily escapement for the 550,000 curve. It also turned out to be the peak day for sockeye escapement.

June 30 also turned out to be the peak day for sockeye harvest in the Nushagak District, with a catch of 409,142 fish. The catch on July 1, was 361,386; the daily sockeye escapement past the camp at Portage creek was 14,000 bringing the total to 172,339 almost 9 days ahead of the

235,000 curve and 3.5 days ahead of the 340,000 BEG minimum curve. Escapement into the Wood River system continued to be strong, a daily count of 132,132 sockeye, brought the cumulative escapement to 817,482. The peak escapement into the Wood River occurred on June 29, with 239,436 sockeye passing the towers.

With all escapements ahead of schedule, 25-hour extensions were announced for both set and drift gillnet fisheries. This announcement extended the driftnet opening until 7:00 p.m., July 2, and the senet opening until 8:00 a.m., July 3.

Nushagak sockeye escapement kept pace with the 235,000 OEG minimum curve on the first and second of July, but lost ground compared to the 340,000 curve, going from 3.5 days ahead to 2.5 days ahead from June 30 to July 2. With escapements and harvests still ahead of expectations, the set gillnet opening was extended 25 hours until 9:00 a.m., July 4, and another driftnet opening was announced beginning at 5:00 a.m., July 3, for 19 hours. Another 25-hour extension, until 10:00 a.m., July 5, to the setnet fishery was announced July 3. A 16-hour driftnet period was also announced, beginning 8:30 a.m., July 4. The harvest allocation was at 77% for drift gillnets and 22% for Nushagak setnets through July 3.

As stated previously, new regulations required the department to reevaluate the Nushagak River sockeye run strength during the first week of July. With the strong early showing of Nushagak sockeye it seemed likely that the inseason run projection would exceed the one million threshold that switched management objectives from the 235,000 OEG, to the 340,000 to 760,000 BEG range. Department staff met on the morning of July 4 to discuss the new projection and the implications. The July 3 sockeye escapement into the Nushagak River, which was only 4,484, one-fourth the expected escapement for the 235,000 curve, was also an issue. After much discussion, staff decided that there was enough information to confidently say that the total Nushagak sockeye run would exceed one million fish. Staff now had to manage for the 340,000 to 760,000 thousand BEG range.

The low escapement on July 3 continued through the 4th. When the run should be building towards a peak it seemed to be on the down side. This was also corroborated by a troubling absence of 3 ocean fish from the Port Moller test fishery. The Nushagak escapement was already behind the 550,000 mid-range curve and with a daily escapement of 20,000 fish less than expected, was now less than 2 days ahead of the 340,000 BEG minimum. With poor escapement on the 4th, and the likelihood of the daily escapement being 20,000 or more fish less than expected for a second day, department staff decided it was time to protect Nushagak sockeye by moving the fishery into the Wood River. The district harvest percentages ended up at 77% for driftnet and 22% for Nushagak setnets.

Wood River Special Harvest Area

Beginning at 12:00 p.m., on July 5, set gillnet fishing was allowed for 25-hours in the Wood River Special Harvest Area (WRSHA). In addition, three 8-hour drift gillnet fishing periods were announced, the first beginning at 12:00 p.m., on July 5. The next announcement was on July 6, and escapement was still very slow into the Nushagak River. Two more 8-hour drift gillnet periods were announced, as well as a 25-hour setnet extension.

By the morning of July 7, Nushagak escapement was officially below the 340,000 minimum curve. Harvest in the WRSHA was slow on July 5 and 6 as well as escapement into the Wood River. The cumulative Wood River escapement on the morning of July 7 was 1.17 million. The setnet fleet was extended for 25 hours and the driftnet fleet was extended for 17 hours, both periods closing at 3:00 p.m. on July 8. July 8, was the peak harvest day for the WRSHA fishery, 138,936 fish were caught. The driftnet extension was needed to help balance the harvest allocation, which indicated the set nets had harvested 57% of the fish in the WRSHA.

Although the drift gillnet fleet did gain some percentage points on July 8, they were still well below their allocation of 74.6%. The driftnet period was therefore extended for 25 hours. The setnet period was also extended, but only for 15 hours, until 6:00 a.m. July 9. Another setnet period was announced beginning at 12:00 p.m., July 9, for 19 hours.

Commercial fishing continued in the WRSHA for the drift gillnet fleet while the setnet fleet fished 19 hours every day. This was an attempt to bring the harvest percentages in line with allocation and minimize escapement into the Wood River. By July 11, the harvest percentages were 66% driftnet and 34% setnet. With the majority of the harvest taken, and daily catches declining, it was difficult to change the harvest percentages much and the final percentages were 67% driftnet and 33% setnet.

In an attempt to diminish the line fishery by distributing fish further up the Wood River, the driftnet fleet fishing time was reduced to 21 hours a day beginning July 11. The setnet fleet continued to fish 19 hours a day until July 14. After setnet fishing closed the morning of July 14, a 12-hour period was announced beginning at 8:00 p.m. and again at 9:00 p.m. on July 15. The drift fleet was given a 25-hour extension on July 15 and again on July 16. All fishing closed at midnight on July 17.

With allocation ratios no longer an issue after July 17, openings for both gear types where synchronized. A 12-hour opening began at 10:00 a.m. July 18, with another opening at 11:00 a.m. July 19. The last commercial opening in the WRSHA was announced on July 19, and scheduled for July 22, for 12 hours beginning at 5:00 a.m.

The final commercial sockeye harvest for the WRSHA was 360,578 by the driftnet fleet and 193,443 by set gillnets. The WRSHA was open almost continuously from July 5 until July 19 and then opened one more time on July 22 (Table 16). The 554,000 fish caught in the WRSHA

represent 20% of the total Nushagak District sockeye harvest for 2002. The final escapement for the Wood River, after the tower crew ceased operations on July 21, was 1.28 million sockeye (Table 23 and 28).

Igushik Section

The 2002 sockeye run forecast of 600,000, for Igushik River was 48% below the recent 10-year average of 1,260,000 fish (Appendix Table 17). Sockeye salmon escapements in the Igushik River from 1989 through 1999, with the exception of 1997 and 1998, exceeded the biological escapement goal range of 150,000 to 250,000 in spite of extensive commercial fishing in the Igushik Section (Appendix Table 1). In 1997, the Igushik sockeye run failed, as did most other river systems in Bristol Bay, with less than 300,000 fish in the total inshore return. In 1998, the final sockeye escapement of 216,000 fell within the BEG range. The d epartment reviewed sockeye biological escapement goal ranges for all river systems in Bristol Bay in October, 2000 and raised the upper boundary of the BEG range for the Igushik River to 300,000; this changed the resulting midpoint goal from 200,000 to 225,000 sockeye.

During the Bristol Bay staff meeting, in March 2001, in Anchorage, there was discussion regarding the funding available for the Igushik River test fish project. It was decided due to reductions, this inriver test fish project would not operate. Management of the Igushik Section sockeye salmon fishery would be conducted without the information provided by this project. As an alternative, solicitations were made for a permit holder that fished on Igushik Beach that would test fish a set gillnet for the department on a short-term vessel charter. In 2001, a willing and qualified candidate whose fishing site was close to the mouth of the Igushik River was chosen, and the 25 fathom gillnet was operated starting on June 18. In 2002, there was no one willing to participate in this program so department staff relied on subsistence harvest reports. Subsistence harvest reports indicated an increase in fish passage on June 17. Department staff landed on the beach and talked to local subsistence users. Based on the information learned from our visit, we announced a 25-hour commercial opening for set nets only in the Igushik Section beginning at 9:30 a.m., July 21.

The Igushik counting towers at the outlet of Amanka Lake were scheduled to be deployed on June 22, and be counting by June 23 or 24. The reported harvest from the first day of commercial fishing was 355 sockeye. Fishing on Igushik beach was continuous, with 25-hour extensions, until June 29, at 5:30 p.m. when the fishery closed because escapement was below expectations, with only 18 fish counted past the towers as of midnight June 28. The harvest in the commercial fishery was also below expectation with only 21,000 sockeye harvested by the June 29.

Department staff was concerned by the total lack of fish reaching the counting towers. Aerial surveys found no obvious impediments to fish passage, and few fish were observed in the clear water portion of the river below the counting towers. There was one more commercial

opening for the Igushik section on July 2 for 12 hours. The total harvest for the 2002 season was 24,882 sockeye and the final escapement of 123,156 was below the 150,000 BEG minimum.

In a post season analysis, department staff theorized that the low escapement 128,000 sockeye (Appendix Table 1), low water, and above average temperatures during the summer of 1997 combined to drastically reduce the spawning and survival of the parent year for the 2002 return. In addition, the poor showing of other 3 ocean stocks in the Nushagak and Wood Rivers indicated the 1997 brood year was not as successful as forecast.

Coho Salmon

The Nushagak Coho Salmon Management Plan (5 AAC 06.368) established spawning and inriver escapement goals and provides guidance to the department in managing sport, subsistence and commercial fisheries that harvest coho salmon.

The plan directs the department to manage the commercial fishery in the Nushagak District to achieve an inriver run goal of 100,000 coho salmon in the Nushagak River. The inriver run goal provides for a biological escapement goal of 90,000 coho and upriver sport and subsistence harvests. Based on parent year escapement of approximately 103,000 in 1998 and recent production trends, the 2002 coho return was not expected to be strong; in fact, a directed commercial coho salmon fishery was not expected. The coho plan directs the department to close "the directed coho salmon commercial fishery" by July 23 when the total inriver run in the Nushagak River is projected to be less than 100,000 but at least 60,000 coho.

In 2002, the commercial fishery closed in the WRSHA on July 22. With coho escapements behind the 100,000 fish curve there was no justification for a commercial fishery in the district. On July 30, coho escapement was 7 days ahead of the 60,000 fish curve. From then on, there was lower than expected daily escapement and by August 10 escapement was only projected to reach 60,000. Daily escapement continued to under perform, and on August 13, the department announced a reduction in subsistence fishing to three days per week. The sonar counters ceased operation on August 17, with a total coho count of 42,343 (Table 24). Shortly after the sonar counter ceased operation, subsistence catches of coho on local beaches improved dramatically. The increase in subsistence catches, after sonar counting operations had ended, was justification for reopening subsistence fishing to seven days per week.

Final reported commercial harvest of coho salmon was 84 fish (Table 14, Appendix Table 24). Final coho salmon escapement into the Nushagak River was estimated to be 66,300 fish.

Togiak District

The 2002 inshore sockeye run of 447,291 fish was the fifth smallest return to the Togiak District in the last 20 years. This return was 144% above the preseason forecast. District sockeye harvest was 247,784 fish, the sixth smallest catch since 1981. The escapement into Togiak Lake was 162,402, 8% above the mid-range of 150,000 sockeye.

The Togiak District is managed differently than other districts in Bristol Bay. This district uses a fixed fishing schedule of three days per week in the Kulukak Section, four days per week in Togiak River Section, and five days per week in the Osviak, Matogak and Cape Peirce Sections. The Togiak District Salmon Management Plan (TDSMP) adopted by the Alaska Board of Fisheries in January 1996 added 36 hours to the weekly schedule for the Togiak River Section between July 1 and July 16. This schedule is adjusted by emergency order, as necessary, to achieve desired escapement objectives. In addition, the TDSMP restricts the transfer in and out of the Togiak District by prohibiting permit holders that fished in any other district from fishing in the Togiak District until July 24. It also prohibits permit holders that had fished in the Togiak District from fishing in any other Bristol Bay district until July 24.

Sockeye Salmon

The 2002 inshore run to the Togiak River was forecasted at 310,000 sockeye salmon (Table 1), of which 73% were projected to be 3-ocean fish, the remaining 27% were predicted to be 2-ocean fish (Table 2). With a midpoint escapement goal of 150,000 sockeye for Togiak Lake, approximately 160,000 sockeye would potentially be available for harvest in the Togiak River Section. A harvest of this size would have been 42% of the 20-year average (Appendix Table 18). Smaller sockeye runs to other drainages in the district (primarily the Kulukak River) occur, but these are not included in the preseason forecast because age composition and escapement data are not complete. Unofficially, a contribution of 62,000 sockeye to the district harvest was projected from drainages other than the Togiak River.

Chinook Salmon

No formal forecast is issued for chinook salmon runs in the Togiak District. Recently, chinook run strengths, district wide, have declined from a high of almost 62,000, in 1983, to a low of less than 19,000, in 1997 (Appendix Table 21). Chinook escapements in the Togiak River drainage fell short of the regulatory escapement goal of 10,000 from 1986 through 1992. The chinook escapement goal was reached from 1993 to 1995 with extensive commercial fishing closures and mesh size restrictions. In 1996, with only minor reductions in the weekly fishing schedule, chinook escapement again fell short of the goal. The chinook escapement goal in the Togiak River has been achieved regularly since that time. Reducing the weekly schedule to 48

hours per week in late June seems to provide a good balance between commercial fishing time and closures that allow chinook escapement to be achieved.

Coho Salmon

A formal forecast is not produced for coho salmon in the Togiak District. Parent-year escapement estimates from aerial surveys of spawning coho are the only preseason indicator of run strength available. Coho salmon escapement for the parent year (1998) in the Togiak River was estimated at 25,335 (Appendix Table 25), which is barely half of the 50,000 escapement goal. The commercial harvest for the parent year was 52,783. The poor escapement but above average harvest for the parent year do not provide a clear picture of the 2002 return. A very conservative approach will be taken to ensure as many coho spawn as possible.

Season Summary

Chinook Salmon

Management's strategy for the last six years has been to reduce the weekly fishing schedule in all sections of the Togiak District during the last two weeks of June. This reduction, to 48 hours of fishing time, was aimed at decreasing the exploitation of chinook salmon. This was done again during the 2002 season for the Kulukak Section; in the Togiak River Section the regularly scheduled periods were reduced to 48 and 72 hours in the third and fourth week of June. The western sections, Cape Peirce, Osviak and Matogak remained open for the regularly scheduled periods.

Commercial fishing opened in the district with a regular weekly schedule on June 3. The first landings of the 2002 season were on June 11 (Table 18). Only 14 deliveries were made between June 17 and 19, the first week of reduced fishing. The harvest of 87 chinook salmon during the June 17 to 19th period, was well below the average catch per unit effort. The daily number of deliveries for this week was less than 20% of the average since the management plan change in 1996.

The fishery reopened on June 24 and was limited to 48 hours in the Kulukak Section and 72 hours in the Togiak Section. The seasons cumulative catch after the last delivery on Thursday, June 27 was 1,392 chinook salmon and 8,169 sockeye. The recent, six-year cumulative, average harvests for this date are 2,481 chinook and 12,159 sockeye. The number of deliveries during the last week of June was close to the average but catch per unit effort remained below average.

The highest catch per delivery, 9.2 chinook, occurred on June 24, but the largest daily catch occurred on June 25, when 494 chinook were harvested. The close of fishing on the 27th of

June marked the end of active management for chinook conservation. Fishing reopened again, with the increased weekly schedule, on July 1 with the focus on sockeye salmon management.

The total chinook harvest for the Togiak River Section was 2,675 fish (Table 18), with an additional 111 caught in the remainder of the Togiak District (Table 19, 20, 21). Escapement for the Togiak River and tributaries was estimated at 9,515 chinook salmon from aerial surveys. Figures are not yet available for sport or subsistence harvests so the preliminary exploitation rates do not include those numbers. Commercial exploitation of the Togiak River stock was 22%; the district wide commercial exploitation rate was 16%. The district wide escapement was 14,265 chinook salmon. An estimated 1,720 chinook escaped into the Kulukak River an additional 3,030 fish were estimated to have escaped into the Quigmy, Osviak, Matogak, Slug, Negukthlik and Ungalikthluk Rivers. The total district escapement was 23% higher than the 20-year average (Appendix Table 21). The combined total run for the district was 57% of the 20-year average and 70% of the 5-year average.

Sockeye Salmon

Commercial fishing opened with the regularly scheduled fishing periods on June 3, but the first deliveries occurred on June 11, (Table 18). Fishing effort remained below average during the reduced period the following week.

As mentioned above, the last two weekly fishing periods in June for the Togiak River and Kulukak sections were reduced for chinook conservation. After July 1, regularly scheduled fishing periods in the Kulukak Section was reduced to 48 hours for conservation of Kulukak River sockeye. Due to a shift in effort to the Kulukak Section and to conserve the Kulukak River sockeye stock, this reduction has become standard practice in recent years. By the end of June, the district wide sockeye harvest was 8,169 fish, one-third of expected levels. There was some fishing effort in the Osviak and Matogak sections during the last week of June. Five deliveries, for a total of 56 sockeye salmon, were reported.

At a preseason meeting in Togiak, department staff discussed the low forecast and the need for conservative management during the 2002 salmon season. Reduced fishing time in early July was anticipated. Operation of the Togiak counting towers began on July 3. The tower count for that day was 2,100 sockeye (Table 23). The harvest in June was 2,000 above expectations, the first day of tower counts were above expectations. Harvest reports for the first weekly fishing period in July also started coming in on July 2. These reports indicated below average catch per unit effort but a higher than expected total catch. On July 3, a decision needed to be made about the weekly fishing schedule. Although the harvest totals were more than expected, they were still lower than average as was the catch per unit effort. The 51 boats registered to fish in the Togiak District on July 3 also indicated an increase in effort from recent years. Based on this information, the apparent early but weak return of Nushagak three ocean fish, the generally lower than expected return of three ocean fish bay wide, and the low forecast it didn't seem like

the entire regularly scheduled fishing period was needed to harvest fish surplus to escapement needs. Therefore, the regular weekly fishing schedule was reduced by 33 hours and closed at 12:00 noon, on Friday, July 5. The total harvest after the first week of July was 52,338 sockeye approximately 20,000 fish above expectations.

Commercial fishing reopened on the 8th of July as scheduled; by the afternoon of July 9 the lagging escapement and the failure of other three ocean runs in the Bay prompted a reduction in the regularly scheduled fishing period. In a 6:00 p.m. announcement, the Kulukak Section was closed effective 9:00 a.m. July 10 and the Togiak River Section was closed effective 9:00 a.m. July 11. The other sections of the Togiak District, Osviak, Matogak and Cape Peirce remained opened for their regularly scheduled fishing periods.

By the morning of July 13 the escapement past the towers on the Togiak River was a day behind the expected escapement level and falling further behind. In addition, the number of vessels registered to fish in the Togiak District was increasing, from 62 to 74 in three days. These factors as well as the uncertainty associated with runs returning to 1.3 systems like Togiak necessitated conservative management. Therefore the regularly scheduled weekly fishing period beginning July 15 was canceled.

On July 19, it was announced that fishing would reopen in the Togiak District on July 22. The cumulative escapement past the towers was 83,664 (Table 23) one day behind the 150,000 fish escapement curve, but daily escapement had increased and we felt confident that the 100,000 fish minimum escapement goal would be achieved. Initially, the regularly scheduled fishing period was reduced to 36 hours with the possibility of an extension. On July 23, the reduced period was extended because of continued good escapements and better than expected catches (Table 9). The period was extended two additional times and eventually ran through 9:00 p.m. July 27. This equated to 36 hours more than the regularly scheduled period. The harvest for the week approached 70,000 sockeye, much more than anticipated. Several days of strong escapement also indicated fish had moved through the district during the closed period. The escapement through midnight July 27 was 131,000 sockeye.

Although Togiak District opened to all permit holders on July 24, with the reduced fishing schedule and the uncertainty around future fishing time, few vessels moved into the Togiak District. There are no requirements for registration after the July 24, but based on the number of deliveries, 57 driftnet deliveries on July 25, not all 74 boats that were there on July 13 stayed to fish.

The regularly scheduled period was allowed for the week of July 29, and eventually extended for 36 hours closing on August 3. This period resulted in a harvest of almost 45,000 sockeye, with the catch per unit effort far above average for the second week in a row. Counting operations ceased at the tower site on August 5. The total sockeye escapement past the towers was 162,402.

Fishing resumed as scheduled on August 5 in the Togiak River Section. Effort and harvest dropped considerably during this period and the only processor in the area announced they would cease operations at the end of the period on August 9. The final week of fishing produced an additional 8,000 harvest bringing the total sockeye harvest for the Togiak District, to 247,784 fish 155% of the preseason forecast.

Coho salmon

There was no directed coho fishery in the Togiak District during 2002. Parent year escapement in 1998 was very poor and though no formal forecast is issued for the Togiak River the coho return was not expected to be strong enough to support a commercial fishery. Final operations reports from processors indicated that there were 739 coho salmon caught by the last day of fishing, August 9.

Due to poor survey conditions only part of the Togiak District and none of the Togiak River drainage was surveyed to assess coho escapement in 2002. Of the streams that were surveyed, escapement was below average.

Summary

The 2002 sockeye harvest in the Togiak District was the fourteenth highest in the past 20 years (Appendix Table 4). The total sockeye run ranked 15 for the past 20 years (Appendix Table 18). Chinook harvests were 27% of the 10-year average, while harvest of chum and coho were 76% and 3% respectively of the 10-year averages (Appendix Tables 21, 22, 25). The 162,402 sockeye that were counted at the towers below Togiak Lake combined with the aerial survey estimate of 16,175 from the river below the towers equate to a total escapement of 178,577 sockeye for the Togiak River system. Aerial surveys indicated that 9,515 chinook escaped into the Togiak River drainage, just short of the chinook escapement goal of 10,000. Chum salmon escapement in the Togiak River and its tributaries was estimated to be 72,500; an additional 81,860 chum salmon were estimated to have escaped to other streams in the Togiak District. No escapement estimates were made for pink salmon. Coho salmon escapement surveys were only partially completed in 2002. Surveys were not done for the Togiak and Kulukak Rivers but the other streams in the Togiak District were surveyed. The estimate for these surveyed streams is 8,478 coho.

2002 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.

Regulations

Permits are required to harvest salmon for subsistence purposes in Bristol Bay. Since 1990, under state regulations, all Alaska State residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages (but see below). In 2002, with two exceptions, only gillnets were recognized as legal subsistence gear. In the Togiak District, spear fishing was also allowed. In 1998, the Board of Fisheries adopted new regulations for the taking of "redfish" (spawned sockeye salmon) in portions of the Naknek District. Gillnets, spears, and dipnets may be used along a 100 yard length of the west shore of Naknek Lake near the outlet to the Naknek River from August 20 through September 30; at Johnny's Lake from August 15 through September 25; and at the mouth of the Brooks River from October 1 through November 15. In the Bristol Bay Area in 2002, gillnet 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, except that nets were limited to 5 fathoms in the special "redfish" harvest areas in the Naknek District.

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 addition, all commercial districts were open for subsistence fishing in May and September, from Monday to Friday. 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.

On May 21, 2001, Deborah Liggett, the superintendent of Lake Clark National Park and Preserve, announced that the National Park Service (NPS) was prohibiting subsistence fishing with nets in the park and preserve, including all of Lake Clark, except by federally qualified local rural residents. This prohibition was a new enforcement action of a NPS regulation and applied to anyone who was not a permanent resident of Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, or Port Alsworth, or who did not have a Section 13.44 subsistence use permit issued by the park superintendent.

The Alaska Department of Fish and Game has continued to issue Bristol Bay subsistence salmon permits to any Alaska resident who requests one. However, the department informs

permit applicants that unless they live in one of the above-named communities or have a 13.44 permit, they need to take this NPS closure into account when they subsistence fished in waters of the park and preserve. The department also informs permittees that waters outside of national park and preserve boundaries remain open for subsistence salmon fishing to all permit holders.

Inseason Management

Due to extended closures to the commercial fishery in the Nushagak commercial fishing district, an emergency order opened the Nushagak commercial fishing district to subsistence salmon harvesting on 12:01 a.m. June 1, 2002. The commercial district was closed by emergency order to subsistence salmon fishing, except during commercial openings, effective 9 p.m. June 20. The Nushagak Section was reopened effective 3 p.m. on July 5 for the remainder of the season. By emergency orders, the Igushik Section of the Nushagak area was opened to subsistence fishing effective 8 p.m. June 30 and closed at 8 p.m. on July 1. It was reopened effective July 4 for the remainder of the season. Because of a planned commercial opening, the Wood River Special Harvest Area was closed to subsistence fishing by emergency order effective July 5. It opened again for subsistence fishing effective July 23 at 9 a.m.

Effective 9 a.m. August 15, an emergency order restricted subsistence fishing for salmon in the Nushagak commercial fishing district, local Dillingham beaches, the entire Nushagak River drainage and its tributaries, and the Wood River downstream of the Dragnet dock to three 24-hour periods per week. The restriction was intended to conserve coho salmon for spawning escapement in the Nushagak River because the spawning escapement was projected to be below 60,000 coho salmon. This action was in accordance with the Nushagak River Coho Salmon Management Plan (5 AAC 06.358[d][3]).

Because of an extended closure to commercial salmon fishing in the Togiak District, an emergency order opened subsistence fishing within the commercial fishing district from 3 p.m. June 21 until 9 p.m. June 23. Other emergency orders opened subsistence fishing in the Togiak commercial fishing district from 9 p.m. June 27 until 9 p.m. June 30; from 9 p.m. July 5 until July 7 at 9 p.m.; and from noon on July 13 until 9 p.m. on July 21. Effective 9 a.m. August 10, an emergency order opened the Togiak commercial fishing district to subsistence salmon fishing until further notice.

An emergency order opened the Naknek Section of the Naknek/Kvichak District and the Naknek River to subsistence fishing for three 24-hour periods per week, from 9 a.m. Saturdays until 9 a.m. Sundays, from 9 a.m. Mondays to 9 a.m. Tuesdays, and from 9 a.m. Wednesdays until 9 a.m. Thursdays, effective 9 a.m. Saturday June 29. This was to allow subsistence fishing opportunity when the Naknek/Kvichak District was closed to commercial fishing and commercial fishing was occurring in the Naknek River Special Harvest Area.

In the Egegik District, an additional subsistence fishing period was opened by emergency order at 2:00 p.m. on June 14 until 8:00 a.m. June 17. The department had been informed that some Egegik residents were having difficulty obtaining subsistence fishing locations within the district when the commercial fishery was open. These emergency orders provided subsistence fishing time during a commercial closure. Additional subsistence openings in the Egegik District were established by emergency orders from 10 a.m. June 17 to 3:00 p.m. June 18; 3:00 p.m. June 18 to 3:30 p.m. June 19; 3:30 p.m. June 19 to 4:00 p.m. June 20; 4:00 p.m. June 20 to 5:00 p.m. June 21; 5:00 p.m. June 21 until 5:00 p.m. June 22; 5:00 p.m. June 22 to 7:00 p.m. June 23; and 7:00 p.m. June 23 to 7:30 p.m. June 24. No emergency orders were issued for the Ugashik subsistence fishery in 2002.

Permit System

A permit system was gradually introduced throughout the Bristol Bay region in the late 1960s to document the harvest of salmon for subsistence. Much of the increase in the number of permits issued during these years reflects: 1) a greater compliance with the permitting and reporting requirements, 2) an increased level of effort expended by the department in making permits available (including a local system of vendors), 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 2002, a total of 1,093 permits were issued for the Bristol Bay Management Area, and of these, 994 (90.9 percent) were returned to the Department with harvest data (Table 33). The largest number of permits were issued for the Nushagak (520 permits) and Naknek/Kvichak (471 permits) districts. For the Nushagak District more permits were issued in 2002 than the long-term 20-year average (478), due in part to permits being available to all state residents since 1990. Compared to the last five years, however, the number of permits issued was down for the Nushagak District. Fewer permits were issued in the Naknek/Kvichak district than in any year since 1990, likely reflecting the National Park Service prohibition against non-drainage residents' subsistence fishing in the waters of Lake Clark National Park. About the same number of permits were issued for the Egegik District in 2002 (53) compared to the average for the past 10 years (51), while the number issued in the Ugashik District (23) was lower than the recent ten-year average (29). The number of permits issued for the Togiak District in 2002 (36) was lower than recent averages (44 permits on average for 1992 – 2001) (Appendix Table 30). In 2001, permit data for the Togiak District were supplemented by post-season household surveys conducted by the Division of Subsistence. Although these surveys were also being conducted for 2002, they were still underway when this report was prepared. Of all Bristol Bay Area subsistence permits issued in 2002, 917 (83.9 percent) were issued to residents of Bristol Bay communities, and 176 (16.1 percent) were issued to other Alaska residents.

Harvest

The estimated total Bristol Bay subsistence salmon harvest in 2002 was 109,587 fish (Table 33). This number was down from the 119,856 salmon estimated for 2001, and is the lowest estimated subsistence salmon harvest for the Bristol Bay Area since 1973, when 88,400 salmon were harvested, and the third-lowest since harvest records have been kept beginning in 1963 (the estimated subsistence harvest was 93,000 salmon in 1972). The 2002 harvest was 26.2% below the recent 10-year average of 148,583 salmon and about 31.2% below the recent 20-year average of 159,311 salmon.

The area-wide chinook harvest of 12,936 salmon was down from the recent ten-year average of 16,268 chinook. The area-wide harvest of 81,088 sockeye salmon was the lowest since 1973. The 2002 sockeye harvest was 30.3% below the recent 10-year average of 116,407 sockeyes. Compared to recent 10-year averages, subsistence harvests of pink and coho salmon were also down in 2002, while chum harvests were higher (Appendix Table 31).

In 2002, the Bristol Bay subsistence salmon harvest was composed of 74.0% sockeye, 11.8% chinook, 6.1% chum, 2.1% pink, and 6.0% coho salmon. Of the entire Bristol Bay Area subsistence salmon harvest in 2002, residents of Bristol Bay communities harvested 101,543 salmon (92.7%), and other Alaska residents harvested 8,044 salmon (8.3%).

In 2002 as over the last several decades, most of the Bristol Bay Area subsistence harvest was taken in the Naknek/Kvichak (51.7%) and the Nushagak (41.0%) districts. The Naknek/Kvichak total harvest of 56,632 salmon was the lowest since 1973 (when 43,000 salmon were harvested) and the third-lowest on record (the estimated harvest was 53,800 salmon in 1972). The 2002 subsistence salmon harvest in this district was 34.3% below the recent 10-year average of 86,174 fish (Appendix Table 31).

In 2002, Kvichak drainage residents, and other permit holders fishing in the Kvichak drainage portion of the Naknek/Kvichak District, harvested an estimated 33,001 sockeye salmon, compared to a recent 10-year average of 56,085 sockeyes and a 20-year average of 66,472 sockeyes. The 2002 subsistence harvest of sockeye salmon in the Kvichak drainage was the second-lowest since records have been kept beginning in 1963, just slightly above the estimate for 2001 of 32,808 sockeye. (The previous lows were 36,990 sockeyes in 2000 and 39,100 sockeyes in 1973.) Of Kvichak drainage communities, estimated sockeye harvests were down substantially at Levelock, Pedro Bay, Kokhanok, Iliamna/Newhalen, Nondalton and Port Alsworth compared to recent 10-year averages (Appendix Table 31). The number of permits issued to households with Port Alsworth addresses dropped to 22, from 30 in 2001 and 37 in 2000. This may be the result of seasonal Port Alsworth residents not obtaining permits because of the NPS prohibition against subsistence fishing in Lake Clark by non-local residents (see above). Sockeye salmon harvests by Port Alsworth subsistence permit holders dropped to 1,201 fish, compared to a recent 10-year average of 2,990 sockeyes. The number of permits

issued to households with non-Kvichak drainage addresses dropped in 2002 to 33, from 37 in 2001 and 48 in 2000, and the sockeye salmon harvest by these permittees fell to 1,578 fish compared to a recent 10-year average of 2,856 (Appendix Table 32). The NPS closure is likely at least partly responsible for this change as well.

In the Nushagak District, the total estimated subsistence harvest in 2002 was 44,897 salmon. The recent 10-year average is 49,499. The Nushagak chinook harvest in 2002 of 11,760 was about the same as 2001 (11,760) but still below the recent 10-year average of 13,529 chinook. The sockeye harvest of 22,777 was below the 10-year average (26,106) and the 20-year average (31,852) (Appendix Table 31). In 2002, subsistence salmon harvests in several Nushagak District communities were substantially lower than recent averages, most notably Ekwok and Koliganek (Appendix Table 33).

The estimated total subsistence salmon harvest for the Togiak District in 2002 of 3,878 fish was lower than both the recent 10-year average (4,401) and the 20-year average (5,135). This may reflect less participation in the harvest reporting program than in other recent years rather than an actual drop in subsistence harvests. The estimated subsistence harvest in the Ugashik District in 2002 was 1,821, lower than the 10-year average of 2,234. In the Egegik District, the estimated subsistence salmon harvest of 2,359 was down from the estimate of 3,653 salmon for 2001 and was lower than the recent ten-year average of 3,464 salmon (Appendix Table 31).

TABLES

Table 1. Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 2002.[a]

District and River System	Inshore Run			Escapement		Inshore Catch		
	Forecast	Actual	Percent Deviation[b]	Range	Actual	Projected Harvest	Actual	Percent Deviation[b]
NAKNEK-KVICHAK DISTRICT								
Kvichak River	1,845	704	1.62	2,000-10,000	704	0	0	
Branch River	492	335	0.47	170-200	335	307	0	
Naknek River	2,038	2,671	-0.24	800-1,400	1,264	938	1,407	-0.33
Total	4,375	3,710	0.18	6,970-11,600	2,303	1,245	1,407	-0.12
EGEGIK DISTRICT	4,550	5,639	-0.19	800-1,400	1,036	3,450	4,603	-0.25
UGASHIK DISTRICT	2,339	2,481	-0.06	500-1,200	892	1,489	1,576	-0.06
NUSHAGAK DISTRICT								
Wood River	3,794	3,692	0.03	700-1,200	1,284	2,694	2,409	0.12
Igushik River	600	208	1.88	150-300	123	375	85	3.41
Nushagak-Mulchatna	794	638	0.24	340-760	316	244	322	-0.24
Total	5,188	4,538	0.14	1,190-2,210	1,723	3,313	2,816	0.18
TOGIAK DISTRICT	310	410	-0.24	100-200	162	160	248	-0.35
TOTAL BRISTOL BAY	16,762	16,778	0.00	9,560-16,610	6,116	9,657	10,650	-0.09

[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 system in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table for the sake of comparisons. 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, escapement and inshore run. Totals may not equal column sums due to rounding.

[b] Percent deviation = (forecast - actual)/actual.

Table 2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2002.

District and River System	2-Ocean			3-Ocean			Other	Total
	1.2 (1998)	2.2 (1997)	Total	1.3 (1997)	2.3 (1996)	Total		
NAKNEK-KVICHAK DISTRICT								
Kvichak River	629	185	814	1,006	25	1,031	-	1,845
Branch River	200	82	282	202	8	210	-	492
Naknek River	337	504	841	935	262	1,197	-	2,038
Total	1,166	771	1,937	2,143	295	2,438	-	4,375
EGEGIK DISTRICT	355	2,399	2,754	1,312	484	1,796	-	4,550
UGASHIK DISTRICT	457	849	1,306	995	38	1,033	-	2,339
NUSHAGAK DISTRICT								
Wood River	2,493	60	2,553	1,233	8	1,241	-	3,794
Igushik River	78	22	100	488	12	500	-	600
Nushagak River	32	3	35	577	6	583	176	794
Total	2,603	85	2,688	2,298	26	2,324	176	5,188
TOGIAK DISTRICT	66	17	83	216	11	227		310
TOTAL BRISTOL BAY[a]								
Number	4,647	4,121	8,768	6,964	854	7,818	176	16,762
Percent	28	25	52	42	5	47	1	100

[a] 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, 2002.

District and River System		1.2	2.2	2-Ocean	1.3	2.3	3-Ocean	1.4	Total
NAKNEK-KVICHAK DISTRICT									
Kvichak River									
	Number	313	255	568	104	16	120	8	688
	Percent	45.5	37.1	82.6	15.1	2.3	17.4	1.2	100
Branch River									
	Number	156	50	206	115	9	124	2	330
	Percent	47.3	15.2	62.4	34.8	2.7	37.6	0.6	100
Naknek River									
	Number	602	792	1,394	822	342	1,164	105	2,558
	Percent	23.5	31.0	54.5	32.1	13.4	45.5	4.1	100
Total	Number	1,071	1,097	2,168	1,041	367	1,408	115	3,576
	Percent	30.0	30.7	60.6	29.1	10.3	39.4	3.2	100
EGEGIK DISTRICT									
	Number	100	3,450	3,550	311	1,668	1,979	38	5,529
	Percent	1.8	62.4	64.2	5.6	30.2	35.8	0.7	100
UGASHIK DISTRICT									
	Number	198	1,509	1,707	670	80	750	15	2,457
	Percent	8.1	61.4	69.5	27.3	3.3	30.5	0.6	100
NUSHAGAK DISTRICT									
Wood River									
	Number	2,799	158	2,957	646	13	659	55	3,616
	Percent	77.4	4.4	81.8	17.9	0.4	18.2	1.5	100
Igushik River									
	Number	139	10	149	51	4	55	4	204
	Percent	68.1	4.9	73.0	25.0	2.0	27.0	2.0	100
Nush-Mulchatna River									
	Number	300	13	313	245	4	249	56	562
	Percent	53.4	2.3	55.7	43.6	0.7	44.3	10.0	100
Total	Number	3,238	181	3,419	942	21	963	115	4,382
	Percent	73.9	4.1	78.0	21.5	0.5	22.0	2.6	100
TOGIAK DISTRICT[b]									
	Number	53	16	69	306	22	328	8	397
	Percent	13.4	4.0	17.4	77.1	5.5	82.6	2.0	100
TOTAL BRISTOL BAY[c]									
	Number	4,660	6,253	10,913	3,270	2,158	5,428	291	16,341
	Percent	28.5	38.3	66.8	20.0	13.2	33.2	1.8	100

[a] The inshore run data does not include the South Peninsula catch of Bristol Bay sockeye or immature high seas by-catch.

[b] Does not include rivers other than Togiak River.

[c] There are a few minor age classes or minor Bristol Bay drainages that are not included in this total.

Table 4. Inshore commercial catch and escapement of sockeye salmon, in numbers of fish, Bristol Bay, 2002.

District and River System	Catch	Escapement	Total Run
NAKNEK-KVICHAK DISTRICT			
Kvichak River	0	703,884	703,884
Branch River	0	335,661 [a]	335,661
Naknek River	1,407,621	1,263,918	2,671,539
Total	1,407,621	2,303,463	3,711,084
EGEGIK DISTRICT	4,602,925	1,036,092	5,639,017
UGASHIK DISTRICT	1,575,673	905,584 [b]	2,481,257
NUSHAGAK DISTRICT			
Wood River	2,408,744	1,283,682	3,692,426
Igushik River	85,148	123,156	208,304
Nushagak-Mulchatna	321,983	315,681	637,664
Total	2,815,875	1,722,519	4,538,394
TOGIAK DISTRICT [c]			
Togiak Lake	228,187	162,402	390,589
Togiak River/Tributaries	0	16,175	16,175
Kulukak System	19,112	8,500	27,612
Other Systems	511	12,430	12,941
Total	247,810	199,507	447,317
TOTAL BRISTOL BAY	10,649,904	6,167,165	16,817,069

[a] Aerial survey estimate.

[b] Includes Ugashik River Tower and aerial survey estimates from King Salmon and Dog Salmon rivers.

[c] Catch includes Togiak River Section only, "Other Systems" escapement includes Negukthlik, Ungalikthluk, Osviak, Matogak and Slug River systems.

Table 5 . Offshore test fishing catch indices of sockeye salmon, Port Moller, 2002.

Date	No. of Stations Fished	Sockeye Catch	Running Mean Length (mm)	Index [a] Daily	Index [a] Cum.
6/10	5	2	563	0.8	0.8
6/11	5	34	568	25	25.8
6/12	5	66	564	26	52
6/13	5	68	557	43	95
6/14	5	59	573	23	118
6/15	5	201	564	104	222
6/16	5	198	561	84	306
6/17	5	203	565	70	376
6/18	5	141	550	71	447
6/19	5	123	545	54	501
6/20	5	157	548	63	564
6/21	5	256	552	117	681
6/22	5	203	540	95	776
6/23	5	265	543	114	890
6/24	5	331	544	131	1,021
6/25	5	332	545	149	1,170
6/26	5	309	537	131	1,301
6/27	5	287	540	129	1,430
6/28	5	275	536	109	1,539
6/29	5	312	533	127	1,666
6/30	5	279	534	111	1,777
7/01	5	141	543	65	1,842
7/02	5	151	538	70	1,912
7/03	5	148	532	56	1,968
7/04	5	148	531	57	2,025

[a] Indices are based on fish/100 fathom-hours and was built using Sations 2 to 10.

Table 6. Summary of district sockeye salmon test fishing indices in the Naknek-Kvichak District, by index area and date, Bristol Bay, 2002.[a]

Date	Naknek R. Mouth	Pederson Point	Cutbank & Graveyard	Kvichak R. Mouth	Gravel Spit	Ships Anchorage	Half Moon Bay	Middle Naknek	Johnston Hill	Division Buoy	Deadman Sands	Low Point	Clark's Point
6/24	322							0	254	198			
6/29		615		211	589		755						
6/30		3,328			2,259	667	473						
7/01		497		1,157	249	1,067							
7/03		82		27	723	8							
7/05	2,363	198			10	1,341		15			38		
7/08	600	23						15			38		
7/09					725		2			120	3		
7/10	209	540	1,170		721	197	158		252		351		
7/11	414	20			366								
7/12	92	717			1,128	249		251					
7/13	235	586						53	121	115	40		
7/14	297												

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

Table 7. Summary of district sockeye salmon test fishing indices in the Ugashik District, by index area and date, Bristol Bay, 2002.a

Index Area	July 9
Bell Buoy	
Four Miles North of Cape Menshikof (Nearshore)	
Two Miles North of Cape Menshikof (Outerline) Three Miles South of South Spit (Nearshore)	
1.5 miles south of South Spit	
South Spit (Mid Channel)	
Dago Creek Mouth	2,422
Pilot Point	
Between Pilot Point and Muddy Point	1,542 [b]
Outer South Channel	
Inner South Channel	
Below inner district boundary line west side	
Below inner district boundary line east side	844
Above inner district boundary line east side	
Between Dog Salmon and King Salmon Rivers	2,500 [b]
Mouth of Dog Salmon River	

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

[b] Average of two or more drifts.

Table 8. Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 2002. a

Date	Hanson Point	Across Hanson Pt.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Pile Driver	Queen's Slough	Clark's Point	Upper W. Marker	Coffee Point	Kanakanak Bluff
6/21	0	367	2,089	0	0							0
	313	180	1,012	0	0							0
6/22	0	462	2,012	548	507							0
	0	0	710	463	875							350
6/23	723	714	2,655	676	1,552	3,243	14,333					
	1,135	1,056	1,029	458	804	9,424	10,366					
6/24	1,326	1,050	3,476	0	139					1,347		
	1,065	877	1,749	0	305					798		
6/25	489	712	1,228	2,714	5,814	6,807	15,092			906		
	989	2,102	1,924	1,829	8,136							
				1,304								
6/26	1,203	2,695	3,017	1,948	1,746	2,005	1,672			1,446		
	1,437	3,129	9,314	357	1,852							
6/27	1,729	1,746	8,327	1,527	563	8,367	2,427			771		
	1,698	2,687	10,323	2,182	0							
6/27	2,849	2,129	4,765	1,300	2,558							
	3,871	2,179	4,417	2,972								
6/28	1,029	2,982	6,118	221	0							
	1,957	4,035	4,938	0	202							
6/28	1,552	1,953	3,195	0	170							
	2,561	1,391										
	1,724	5,435										
6/29	1,875	6,042	3,891	354	3,554							
	4,478	4,000										
	3,149	2,430										
6/30	1,200	1,534	1509	0	0							
	2,400	1,246										

-continued-

Table 8. (page 2 of 2).

Date	Hanson Point	Across Hanson Pt.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Pile Driver	Queen's Slough	Clark's Point	Upper W. Marker	Coffee Point	Kanakanak Bluff
6/30	0	575										
7/1	4,660	1,438	3,550	3,579	17,395							1,736
	4,528	372	5,070									
7/2	805	1,342	3,442	0	497							
	1,500	1,184	6,279	0								
7/3	725	144	350	0	0							
	2,438	0	757									
7/5			0	0	365		337				0	
			366		340		0					
7/6			5,000	18,493	10,354	2,091	2,185					
			5,327	12,273	6,761							
7/7			5,932	1,124	15,750	14,266	18,750					
			3,956	5,100	24,915							
7/9			1,951	8,903	5,482	16,327	8,065					
			4,433	17,273	5,604	8,364	5,730					
7/10			6,726	2,149	3,645	13,208	16,331					
			7,336	1,229	4,569	18,881	10,333					
7/11			5,667	4,478	28,442	3,750	2,517					
			9,017	16,258	18,157	3,889	2,153					

[a] All indices expressed in number of fish/100 fathoms-hours to the nearest full index point. Indicies listed first for each station were recorded using 5 1/8 inch mesh gear, second with 4 3/4 inch gear.

Table 9. Commercial fishing emergency orders, by district and stat area, Bristol Bay, 2002.

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Naknek River Special Harvest Area						
Drift net						
AKN.16	June 28	4:30 a.m.	to	11:30 a.m.	June 28	7-hours
AKN.19	June 29	5:00 a.m.	to	12:00 p.m.	June 29	7-hours
AKN.21	June 30	4:30 a.m.	to	1:30 p.m.	June 30	9-hours
AKN.23	July 01	5:00 a.m.	to	2:00 p.m.	July 01	9-hours
AKN.25	July 02	6:00 a.m.	to	3:00 p.m.	July 02	9-hours
AKN.25	July 02	7:00 p.m.	to	3:00 a.m.	July 03	8-hours
AKN.27	July 03	7:30 p.m.	to	4:30 a.m.	July 04	9-hours
AKN.27	July 04	7:00 a.m.	to	4:00 p.m.	July 04	9-hours
AKN.29	July 05	8:30 a.m.	to	3:30 p.m.	July 05	7-hours
AKN.33	July 06	9:00 a.m.	to	4:00 p.m.	July 06	7-hours
AKN.36	July 07	10:00 a.m.	to	4:30 p.m.	July 07	6.5-hours
AKN.37	July 08	10:00 a.m.	to	6:00 p.m.	July 08	8-hours
AKN.40	July 09	11:00 a.m.	to	6:00 p.m.	July 09	7-hours
AKN.42	July 10	12:00 p.m.	to	6:30 p.m.	July 10	6.5-hours
AKN.45	July 11	1:00 p.m.	to	7:00 p.m.	July 11	6-hours
AKN.49	July 12	2:00 p.m.	to	8:00 p.m.	July 12	6-hours
AKN.52	July 13	3:00 p.m.	to	9:30 p.m.	July 13	6.5-hours
AKN.52	July 14	4:00 p.m.	to	10:30 p.m.	July 14	6.5-hours
AKN.58	July 16	5:00 a.m.	to	1:00 p.m.	July 16	8-hours
AKN.58	July 16	6:30 p.m.	to	12:30 a.m.	July 17	6-hours
AKN.58	July 18	7:00 a.m.	to	2:00 p.m.	July 18	7-hours
AKN.58	July 18	8:00 p.m.	to	4:00 a.m.	July 19	8-hours
AKN.60	July 24	1:00 p.m.	to	7:00 p.m.	July 24	6-hours
AKN.60	July 25	2:00 a.m.	to	9:00 a.m.	July 25	7-hours
AKN.60	July 25	2:00 p.m.	to	8:00 p.m.	July 25	6-hours
AKN.60	July 26	2:30 a.m.	to	9:00 a.m.	July 26	6.5-hours
Set net						
AKN.16	June 28	4:00 p.m.	to	10:00 p.m.	June 28	6-hours
AKN.19	June 29	4:30 p.m.	to	11:30 p.m.	June 29	7-hours
AKN.21	June 30	5:00 p.m.	to	12:30 a.m.	July 01	7.5-hours
AKN.23	July 01	6:00 p.m.	to	2:00 a.m.	July 02	8-hours
AKN.25	July 03	6:30 a.m.	to	3:30 p.m.	July 03	9-hours
AKN.27	July 04	8:30 p.m.	to	6:00 a.m.	July 05	9.5-hours

-Continued-

Table 9. (page 2 of 7).

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Naknek River Special Harvest Area						
Set net						
AKN.29	July 05	9:30 p.m.	to	6:30 a.m.	July 06	9-hours
AKN.33	July 06	10:00 p.m.	to	7:30 a.m.	July 07	9.5-hours
AKN.36	July 07	11:00 p.m.	to	8:00 a.m.	July 08	9-hours
AKN.37	July 08	11:30 p.m.	to	9:00 a.m.	July 09	9.5 hours
AKN.40	July 10	12:30 a.m.	to	10:00 a.m.	July 10	9.5-hours
AKN.42	July 11	1:00 a.m.	to	10:00 a.m.	July 11	9-hours
AKN.45	July 12	2:00 a.m.	to	11:00 a.m.	July 12	9-hours
AKN.49	July 13	2:30 a.m.	to	11:30 a.m.	July 13	9-hours
AKN.52	July 14	3:30 a.m.	to	12:30 p.m.	July 14	9-hours
AKN.52	July 15	4:00 a.m.	to	12:00 a.m.	July 16	20-hours
AKN.58	July 17	6:00 a.m.	to	3:00 a.m.	July 18	21-hours
AKN.58	July 19	7:30 a.m.	to	3:00 p.m.	July 19	7.5-hours
AKN.60	July 22	9:00 a.m.	to	9:00 a.m.	July 24	48-hours
Egegik Special Harvest Area						
Drift net						
AKN.02	June 01	9:00 a.m.	to	9:00 a.m.	June 14	weekly schedule [b]
AKN.13	June 25	12:00 p.m.	to	8:00 p.m.	June 25	8-hours
AKN.14	June 26	12:30 p.m.	to	8:30 p.m.	June 26	8-hours
AKN.15	June 27	1:00 p.m.	to	9:00 p.m.	June 27	8-hours
AKN.18	June 28	2:30 p.m.	to	10:30 p.m.	June 28	8-hours
AKN.20	June 29	3:30 p.m.	to	11:30 p.m.	June 29	8-hours
AKN.22	June 30	4:00 p.m.	to	11:30 p.m.	June 30	7.5-hours
AKN.24	July 01	5:30 p.m.	to	11:30 p.m.	July 01	6-hours
AKN.24	July 02	5:00 a.m.	to	12:00 p.m.	July 02	7-hours
AKN.26	July 02	6:00 p.m.	to	12:00 a.m.	July 03	6-hours
AKN.26	July 03	5:30 a.m.	to	12:30 p.m.	July 03	7-hours
AKN.28	July 03	6:30 p.m.	to	12:00 a.m.	July 04	5.5-hours
AKN.28	July 04	6:00 a.m.	to	2:00 p.m.	July 04	8-hours
AKN.30	July 04	7:00 p.m.	to	12:00 a.m.	July 05	5-hours
AKN.30	July 05	6:30 a.m.	to	2:30 p.m.	July 05	8-hours
AKN.32	July 05	8:00 p.m.	to	12:00 a.m.	July 06	4-hours
AKN.32	July 06	7:30 a.m.	to	3:30 p.m.	July 06	8-hours
AKN.35	July 07	8:30 a.m.	to	4:30 p.m.	July 07	8-hours
AKN.38	July 08	9:30 a.m.	to	5:30 p.m.	July 08	8-hours

-Continued-

Table 9. (page 3 of 7).

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Egegik Special Harvest Area						
Drift net						
AKN.41	July 09	10:00 a.m.	to	2:00 p.m.	July 09	4-hours
AKN.43	July 10	11:00 a.m.	to	7:00 p.m.	July 10	8-hours
AKN.46	July 11	12:00 a.m.	to	6:00 a.m.	July 11	6-hours
AKN.46	July 11	12:00 p.m.	to	8:00 p.m.	July 11	8-hours
AKN.50	July 12	12:30 a.m.	to	8:30 a.m.	July 12	8-hours
AKN.50	July 12	12:00 p.m.	to	8:00 p.m.	July 12	8-hours
AKN.53	July 13	2:00 p.m.	to	10:00 p.m.	July 13	8-hours
AKN.56	July 15	4:00 p.m.	to	12:00 a.m.	July 16	8-hours
AKN.59	July 16	4:00 a.m.	to	12:00 p.m.	July 16	8-hours
AKN.59	July 16	5:00 p.m.	to	11:00 p.m.	July 16	6-hours
AKN.59	July 17	5:00 a.m.	to	9:00 a.m.	July 17	4-hours
Egegik Special Harvest Area						
Set net						
AKN.02	June 01	9:00 a.m.	to	9:00 a.m.	June 14	weekly schedule [b]
AKN.13	June 25	12:00 p.m.	to	8:00 p.m.	June 25	8-hours
AKN.14	June 26	12:30 p.m.	to	8:30 p.m.	June 26	8-hours
AKN.15	June 27	1:00 p.m.	to	9:00 p.m.	June 27	8-hours
AKN.18	June 28	2:30 p.m.	to	10:30 p.m.	June 28	8-hours
AKN.20	June 29	3:30 p.m.	to	11:30 p.m.	June 29	8-hours
AKN.22	June 30	4:00 p.m.	to	11:30 p.m.	June 30	7.5-hours
AKN.24	July 01	5:30 p.m.	to	1:30 a.m.	July 02	8-hours
AKN.26	July 02	6:00 p.m.	to	2:00 a.m.	July 03	8-hours
AKN.28	July 03	6:30 p.m.	to	2:00 p.m.	July 04	19.5-hours
AKN.30	July 05	6:30 a.m.	to	2:30 p.m.	July 05	8-hours
AKN.32	July 06	7:30 a.m.	to	3:30 p.m.	July 06	8-hours
AKN.35	July 07	8:30 a.m.	to	4:30 p.m.	July 07	8-hours
AKN.38	July 08	9:30 a.m.	to	5:30 p.m.	July 08	8-hours
AKN.43	July 10	11:00 a.m.	to	7:00 p.m.	July 10	8-hours
AKN.46	July 10	7:00 p.m.	to	8:00 a.m.	July 11	13-hours
AKN.50	July 12	12:30 a.m.	to	8:30 a.m.	July 12	8-hours
AKN.53	July 13	1:30 a.m.	to	9:30 a.m.	July 13	8-hours
AKN.56	July 15	3:00 a.m.	to	11:00 a.m.	July 15	8-hours
AKN.59	July 16	4:00 a.m.	to	12:00 p.m.	July 16	8-hours
AKN.59	July 17	5:00 a.m.	to	9:00 a.m.	July 17	4-hours

-Continued-

Table 9. (page 4 of 7).

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Ugashik District						
Drift net						
AKN.04	June 01	9:00 a.m.	to	9:00 a.m.	June 14	weekly schedule[c]
AKN.04	June 18	5:00 a.m.	to	3:00 p.m.	June 18	10-hours
AKN.04	June 19	5:00 a.m.	to	3:00 p.m.	June 18	10-hours
AKN.04	June 20	5:30 a.m.	to	3:30 p.m.	June 20	10-hours
AKN.04	June 21	6:30 a.m.	to	4:30 p.m.	June 21	10-hours
AKN.04	June 22	8:00 a.m.	to	4:00 p.m.	June 22	8-hours
AKN.31	July 05	6:30 a.m.	to	10:30 a.m.	July 05	4-hours
AKN.34	July 06	7:00 p.m.	to	12:00 a.m.	July 07	5-hours
AKN.39	July 07	7:30 p.m.	to	12:00 a.m.	July 08	4.5-hours
AKN.39	July 08	9:00 a.m.	to	4:00 p.m.	July 08	7-hours
AKN.44	July 10	10:30 a.m.	to	2:30 p.m.	July 10	4-hours
AKN.48	July 11	11:30 a.m.	to	9:30 p.m.	July 11	10-hours
AKN.51	July 11	9:30 p.m.	to	10:00 p.m.	July 12	24.5-hours[d]
AKN.54	July 13	1:00 p.m.	to	11:00 p.m.	July 13	10-hours
AKN.55	July 13	11:00 p.m.	to	12:00 a.m.	July 15	25-hours[d]
AKN.57	July 15	12:00 a.m.	to	9:00 a.m.	July 17	57-hours[d]
Ugashik District						
Set net						
AKN.04	June 01	9:00 a.m.	to	9:00 a.m.	June 14	weekly schedule[c]
AKN.04	June 18	5:00 a.m.	to	3:00 p.m.	June 18	10-hours
AKN.04	June 19	5:00 a.m.	to	3:00 p.m.	June 18	10-hours
AKN.04	June 20	5:30 a.m.	to	3:30 p.m.	June 20	10-hours
AKN.04	June 21	6:30 a.m.	to	4:30 p.m.	June 21	10-hours
AKN.04	June 22	8:00 a.m.	to	4:00 p.m.	June 22	8-hours
AKN.31	July 05	6:00 a.m.	to	6:00 p.m.	July 05	12-hours
AKN.34	July 06	7:00 p.m.	to	7:00 a.m.	July 07	12-hours
AKN.39	July 08	9:00 a.m.	to	7:00 p.m.	July 08	10-hours
AKN.44	July 10	10:30 a.m.	to	6:30 p.m.	July 10	8-hours
AKN.47	July 10	6:30 p.m.	to	10:00 a.m.	July 11	15.5-hours[d]
AKN.48	July 11	10:00 a.m.	to	9:30 a.m.	July 11	11.5-hours[d]
AKN.51	July 11	9:30 p.m.	to	10:00 p.m.	July 12	24.5-hours[d]
AKN.54	July 13	1:00 p.m.	to	11:00 p.m.	July 13	10-hours
AKN.55	July 13	11:00 p.m.	to	12:00 a.m.	July 15	25-hours[d]
AKN.57	July 15	12:00 a.m.	to	9:00 a.m.	July 17	57-hours[d]

-Continued-

Table 9. (page 5 of 7).

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Nushagak District						
Nushagak Section						
Drift net						
DLG.03	June 21	9:30 a.m.	to	3:30 a.m.	June 21	6-hours [e]
DLG.07	June 22	10:00 a.m.	to	4:00 p.m.	June 22	6-hours [e]
DLG.09	June 24	12:30 p.m.	to	12:30 a.m.	June 25	12-hours [e]
DLG.11	June 26	2:30 a.m.	to	2:30 p.m.	June 26	12-hours [e]
DLG.17	June 28	4:00 a.m.	to	8:00 a.m.	June 28	4-hours
DLG.18	June 29	4:30 a.m.	to	8:30 a.m.	June 29	4-hours
DLG.19	June 29	6:00 p.m.	to	12:00 a.m.	June 30	6-hours
DLG.20	June 30	12:00 a.m.	to	6:00 p.m.	June 30	18-hours
DLG.21	July 01	6:00 a.m.	to	6:00 p.m.	July 01	12-hours
DLG.23	July 01	6:00 p.m.	to	7:00 p.m.	July 02	25-hours [e]
DLG.25	July 03	5:00 a.m.	to	12:00 a.m.	July 03	19-hours
DLG.28	July 04	8:30 a.m.	to	12:30 a.m.	July 05	16-hours
Nushagak Section						
Set net						
DLG.03	June 21	9:30 a.m.	to	3:30 a.m.	June 21	6-hours [e]
DLG.07	June 22	10:00 a.m.	to	4:00 p.m.	June 22	6-hours [e]
DLG.09	June 24	12:30 p.m.	to	12:30 a.m.	June 25	12-hours [e]
DLG.11	June 26	2:30 a.m.	to	2:30 p.m.	June 26	12-hours [e]
DLG.14	June 27	3:30 p.m.	to	9:30 p.m.	June 27	6-hours
DLG.17	June 28	4:00 a.m.	to	8:00 p.m.	June 28	16-hours
DLG.18	June 29	4:30 a.m.	to	8:30 p.m.	June 29	16-hours
DLG.19	June 29	8:30 p.m.	to	9:30 p.m.	June 30	25-hours
DLG.21	July 01	6:00 a.m.	to	7:00 a.m.	July 02	25-hours
DLG.23	July 02	7:00 a.m.	to	8:00 a.m.	July 03	25-hours [d]
DLG.25	July 03	8:00 a.m.	to	9:00 a.m.	July 04	25-hours [d]
DLG.28	July 04	9:00 a.m.	to	10:00 a.m.	July 05	25-hours [d]
Igushik Section						
Set net						
DLG.03	June 21	9:30 a.m.	to	10:30 a.m.	June 22	25-hours
DLG.07	June 22	10:30 a.m.	to	11:30 a.m.	June 23	25-hours [d]
DLG.08	June 23	11:30 a.m.	to	12:30 p.m.	June 24	25-hours [d]

-Continued-

Table 9. (page 6 of 7).

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Igushik Section						
Set net						
DLG.09	June 24	12:30 p.m.	to	1:30 p.m.	June 25	25-hours [d]
DLG.10	June 25	1:30 p.m.	to	2:30 p.m.	June 26	25-hours [d]
DLG.12	June 26	2:30 p.m.	to	3:30 p.m.	June 27	25-hours [d]
DLG.13	June 27	3:30 p.m.	to	4:30 p.m.	June 28	25-hours [d]
DLG.18	June 28	4:30 p.m.	to	5:30 p.m.	June 29	25-hours [d]
DLG.23	July 02	7:00 a.m.	to	7:00 p.m.	July 02	12-hours
Wood River Special Harvest Area						
Drift net						
DLG.29	July 05	12:00 p.m.		8:00 p.m.	July 05	8-hours
DLG.29	July 06	1:00 a.m.		9:00 a.m.	July 06	8-hours
DLG.29	July 06	1:00 p.m.		9:00 p.m.	July 06	8-hours
DLG.33	July 07	2:00 a.m.		10:00 a.m.	July 07	8-hours
DLG.33	July 07	2:00 p.m.		10:00 p.m.	July 07	8-hours
DLG.34	July 07	10:00 p.m.		3:00 p.m.	July 08	17-hours [d]
DLG.35	July 08	3:00 p.m.		4:00 p.m.	July 09	25-hours [d]
DLG.36	July 09	4:00 p.m.		5:00 p.m.	July 10	25-hours [d]
DLG.38	July 10	5:00 p.m.		6:00 p.m.	July 11	25-hours [d]
DLG.39	July 11	10:00 p.m.		7:00 p.m.	July 12	21-hours [h]
DLG.40	July 12	11:00 p.m.		8:00 p.m.	July 13	21-hours
DLG.43	July 13	12:00 a.m.		9:00 p.m.	July 14	21-hours
DLG.44	July 15	1:00 a.m.		10:00 p.m.	July 15	21-hours
DLG.45	July 15	10:00 p.m.		11:00 p.m.	July 16	25-hours [d]
DLG.46	July 16	11:00 p.m.		12:00 a.m.	July 17	25-hours [d]
DLG.47	July 18	10:00 a.m.		10:00 p.m.	July 18	12-hours
DLG.48	July 19	11:00 a.m.		11:00 p.m.	July 19	12-hours
DLG.51	July 22	5:00 a.m.		5:00 p.m.	July 22	12-hours
Wood River Special Harvest Area						
Set net						
DLG.29	July 05	12:00 p.m.		1:00 p.m.	July 06	25-hours
DLG.33	July 06	1:00 p.m.		2:00 p.m.	July 07	25-hours [d]
DLG.34	July 07	2:00 p.m.		3:00 p.m.	July 08	25-hours [d]
DLG.35	July 08	3:00 p.m.		6:00 a.m.	July 09	15-hours [d]
DLG.35	July 09	12:00 p.m.		7:00 a.m.	July 10	19-hours

-Continued-

Table 9. (page 7 of 7).

Number[a]	Start Date	Start Time	End Date	End Time	Effective time
Wood River Special Harvest Area					
Set net					
DLG.36	July 10	1:00 p.m.	8:00 a.m.	July 11	19-hours
DLG.38	July 11	2:00 p.m.	9:00 a.m.	July 12	19-hours
DLG.39	July 12	3:00 p.m.	10:00 a.m.	July 13	19-hours [f]
DLG.40	July 13	4:00 p.m.	11:00 a.m.	July 14	19-hours
DLG.44	July 14	8:00 p.m.	8:00 a.m.	July 15	12-hours
DLG.45	July 16	9:00 a.m.	9:00 p.m.	July 16	12-hours
DLG.46	July 17	9:00 a.m.	12:00 a.m.	July 17	15-hours
DLG.47	July 18	10:00 a.m.	10:00 p.m.	July 18	12-hours
DLG.48	July 19	11:00 a.m.	11:00 p.m.	July 19	12-hours
DLG.51	July 22	5:00 a.m.	5:00 p.m.	July 22	12-hours
Togiak District					
DLG.02	June 19	9:00 a.m.	9:00 a.m.	June 21	48 hours [g]
DLG.05	June 26	9:00 a.m.	9:00 a.m.	June 28	48 hours [g]
DLG.15	July 03	9:00 a.m.	9:00 a.m.	July 04	24 hours [g]
DLG.26	July 05	12:00 p.m.	9:00 a.m.	July 06	21 hours [g]
DLG.37	July 09	4:00 p.m.	8:00 a.m.	July 11	40 hours [g]
DLG.41	July 15	9:00 a.m.	9:00 a.m.	July 20	120 hours [h]
DLG.49	July 22	9:00 a.m.	9:00 a.m.	July 27	120 hours [h]
DLG.49	July 22	9:00 a.m.	9:00 a.m.	July 27	36 hours [g]
DLG.53	July 23	9:00 p.m.	9:00 a.m.	July 25	36 hours [i,d]
DLG.54	July 25	9:00 a.m.	9:00 a.m.	July 26	24 hours [i,d]
DLG.55	July 26	9:00 a.m.	9:00 a.m.	July 27	36 hours [i,d]
DLG.56	August 02	9:00 a.m.	9:00 p.m.	August 03	36 hours [d]
DLG.58	August 12	9:00 a.m.	9:00 p.m.		[h]

[a] Prefix code on emergency orders indicate where announcement originated. ("AKN" for King Salmon field office and "DLG" for Dillingham field office.)

[b] Weekly schedule: 9:00 a.m. Monday to 9:00 a.m. Wednesday and 9:00 a.m. Thursday to 9:00 a.m. Friday.

[c] Weekly schedule: 9:00 a.m. Monday until 9:00 a.m. Friday.

[d] Extends current fishing period.

[e] Gillnet mesh size is restricted to 7 and 1/2 inches or larger.

[f] Redefines the boundaries of the WRSHA from the existing visual ADF&G markers to GPS-derived boundaries using latitude and longitude definitions.

[g] Reduced the weekly fishing schedule in sections of the Togiak District.

[h] Cancels the weekly fishing schedule in sections of the Togiak District.

[i] Supersedes previous emergency order.

Table 10. Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2002.

Date	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total [a]
6/20	66	128	66	64	21	345
6/21	70	139	68	125	27	429
6/22	81	137	39	153	28	438
6/23	89	142	11	169	30	441
6/24	102	154	10	200	32	498
6/25	118	239	9	243	32	641
6/26	135	307	9	260	34	745
6/27	155	311	8	287	38	799
6/28	229	325	9	399	43	1,005
6/29	233	328	11	452	49	1,073
6/30	237	332	11	452	50	1,082
7/01 [b]						
7/02	241	335	11	465	56	1,108
7/03	244	334	11	460	56	1,105
7/04	251	327	16	449	60	1,103
7/05	257	334	22	399	60	1,072
7/06	255	335	38	379	61	1,068
7/07	252	350	64	366	62	1,094
7/08	250	351	105	348	62	1,116
7/09	241	333	134	331	62	1,101
7/10	242	309	152	325	62	1,090
7/11	238	229	181	314	71	1,033
7/12	243	192	220	298	74	1,027
7/13	245	185	317	298	74	1,119
7/14	255	187	356	299	74	1,171
Average	175	235	70	279	45	804

[a] Number of drift gillnet permit holders registered to fish in Bristol Bay districts by day.

[b] Numbers not available for 7/01.

Table 11. Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2002.

Date	Hours Fished		Effort		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set	Drift	Set						
6/19 [b]					114	0	0	0	0	114
6/22 [b]					89	0	0	0	0	89
6/25 [b]					487	0	0	0	0	487
6/26 [b]					1,685	0	0	0	0	1,685
6/27 [b]					1,684	1	0	0	0	1,685
6/28 [b]	7.0	6.0	279	206	83,631	25	557	0	0	84,213
6/29 [b]	7.0	7.0	239	225	122,610	38	781	0	0	123,429
6/30 [b]	9.0	7.0	232	267	182,497	44	966	0	0	183,507
7/01 [b]	9.0	6.5	284	246	219,124	62	769	3	0	219,958
7/02 [b]	14	2.0	371	67	107,142	19	1,255	0	0	108,416
7/03 [b]	7.5	9.0	132	161	68,791	42	517	1	0	69,351
7/04	9.0	3.5	447	62	152,993	15	1,120	1	0	154,129
7/05	7.0	8.5	259	217	86,325	26	483	0	0	86,834
7/06	7.0	8.5	238	197	65,674	53	456	0	0	66,183
7/07	6.5	8.5	215	192	68,825	37	515	0	0	69,377
7/08	8.0	8.5	234	186	57,748	45	361	0	0	58,154
7/09	7.0	9.0	166	187	56,200	22	673	0	0	56,895
7/10	6.5	9.5	141	132	29,806	46	697	1	0	30,550
7/11	6.0	9.0	122	136	26,904	40	899	0	0	27,843
7/12	6.0	9.0	66	123	20,839	69	349	0	0	21,257
7/13	6.5	9.0	78	93	23,695	101	418	0	0	24,214
7/14	6.5	9.0	68	97	11,705	18	403	0	0	12,126
7/15		20.0		147	6,654	17	89	1	0	6,761
7/16	8.0/5.5		76		4,808	2	350	0	0	5,160
7/17	0.5	18.0		60	2,382	12	182	0	0	2,576
7/18	7.0/4.0	3.0	37	21	2,968	18	24	0	0	3,010
7/19	4.0	7.5	15	23	1,691	16	15	3	0	1,691
7/22		15.0		11	182	4	0	0	0	186
7/23		24.0		14	368	5	0	2	0	375
7/24	6.0	9.0							0	0
Total			3,699	3,045	1,407,621	777	11,879	12	0	1,420,289

[a] The 2002 season was confined to the NRSHA.

[b] District test fish and cost recovery.

Table 12. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2002.

Date	Hours fished[b]	Effort[a]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/05 [c]	9		1						
6/10	15		3	336	3				
6/11	24	3	6	841					
6/12	9	1	5	1,318					1,318
6/13	15	15	15	10,102	2	392			10,496
6/14	9	13	12	6,274	10	261			6,545
6/16 [d]		1		84					84
6/17 [d]		1		151					151
6/23 [d]		1		158					158
6/24 [d]		1		321					321
6/25 [d]	8	322	172	164,197	42	2,089			166,328
6/26 [d]	8	311	151	275,624	27	1,552			277,203
6/27 [d]	8	330	126	225,191	26	1,619			226,836
6/28 [d]	8	310	176	389,345	19	1,721			391,085
6/29 [d]	8	335	173	309,339	21	607			309,967
6/30 [d]	7.5	306	145	234,901	13	1,204			236,118
7/1 [d]	6/6.5	305	155	375,607	14	1,183			376,804
7/2 [d]	13/7.5	644	166	607,120	9	2,304			609,433
7/3 [d]	12.5/7.5	583	110	345,949	22	1,271			347,242
7/4 [d]	13/8	588	105	377,647	11	1,212			378,870
7/5 [d]	12/8	614	145	441,553	9	1,311			442,873
7/6 [d]	8	396	139	266,239	7	528			266,774
7/7	8	326	127	125,722	9	315			126,046
7/8 [d]	8	312	155	156,627	6	620			157,253
7/9 [d]	4/0	293	0	76,740		546			77,286
7/10 [d]	8/13	215	123	52,902	3	912			53,817
7/11	14/8	156	81	27,678	8	623			28,309
7/12	16/8	84	77	50,746		465			51,211
7/13	8	56	76	34,558		424			34,982
7/15	8	56	73	19,709		520			20,229
7/16	6/8	51	44	9,186		296			9,482
7/17	19	27	36	4,546	7	205			4,758
7/18	24	12	44	4,582	1	179			4,762
7/19	9	5	8	835	1				836

(Continued)

Table 12 . (Page 2 of 2).

Date	Hours[b]	Effort[a]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/22	15	2	8	889					889
7/23	24	4	10	1,110					1,110
7/24	24	7	11	1,561					1,561
7/25	24	1	7	824					824
7/26 [c]	9		2						
7/29	15	4	1	448		5		109	562
7/30	24	5	8	617		33		315	965
7/31	24	2	4	99		26		116	241
8/1	24	5	4	509		18		365	892
8/2 [c]	9		2						
8/5	15	3	4	93		7		451	551
8/6	24	4	8	149		5		542	696
8/7	24	1	3	58				139	197
8/8	24	2	4	75		7		251	333
8/9 [c]	9		1						
8/12	15		3	5		1	1	580	587
8/13	24	10	5	31		8		1,929	1,968
8/14	24	6	4					1,167	1,167
8/15	24	6	1					1,329	1,329
8/16 [c]	9	1							
Total		6,736	2,739	4,602,925	276	22,469	1	7,468	4,633,139

[a] Number of deliveries.

[b] First number is drift gillnet hours, second number is set gillnet hours, otherwise hours are for both gear groups.

[c] Less than three permits, records are confidential.

[d] Cost recovery and/or test fish catches included.

Table 13. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2002.

Date	Hours[b]	Effort[a]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/11	24	4		134	38	6			178
6/12	24	4		361	82	21			464
6/13	24	3		79	91	3			173
6/14	9	5		663	55	51			769
6/18	10	48	1	6,438	78	960			7,476
6/19	10	59		8,565	23	1,279			9,867
6/20	10	65		4,663	46	533			5,242
6/21	10	55		4,536	44	364			4,944
6/22	8	27	2	4,192	36	455			4,683
7/5 [c]	4/12	16	39	14,840	30	427			15,297
7/6	5/5	42	4	30,022	1	1,988			32,011
7/7 [c]	4.5/7	72	23	112,230	46	1,068			113,344
7/8	7/10	105	38	225,651	29	1,328			227,008
7/9 [c]		1		2,727		2			2,729
7/10 [c]	4/13.5	167	59	251,186	8	1,318			252,512
7/11 [c]	12.5/24	174	64	286,182	11	2,698			288,891
7/12 [c]	22	398	47	286,093	16	5,452			291,561
7/13 [c]	11	245	28	93,516	49	3,201			96,766
7/14 [c]	24	349	33	99,517	5	5,155			104,677
7/15 [c]	24	240	36	61,600	13	3,669			65,282
7/16	24	147	26	35,394	5	2,039			37,438
7/17	24	91	21	24,462	14	2,203		27	26,706
7/18	24	67	17	16,242	14	1,593			17,849
7/19	9	22	1	2,389	3	250			2,642
7/22	15	16	5	2,615		532			3,147
7/23	24	10	2	863	1	177	1	1	1,043
7/29 [d]	15		1						
7/30 [d]	24		1						
7/31 [d]	24		1						
8/1 [d]	24		1						
8/13 [d]	24		1						
8/14 [d]	24		1						
8/15 [d]	24		1						
Total		2,432	453	1,575,673	738	36,772	1	464	1,613,648

[a] Number of deliveries.

[b] First number is drift gillnet hours fished , second number is set gillnet hours fished, otherwise hours are for both gear group

[c] District and/or inside test fishing.

[d] Less than three permits, records are confidential.

Table 14. Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2002.

	Time (*hrs*)		Effort[a]							
Date	Nushagak	Igushik	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/21	6.0	15.0	77	62	7,099	3,445	4,717	1	0	15,262
6/22	6.0	24.0	82	105	11,740	4,947	3,873	0	0	20,560
6/23	0	24.0	0	0	1,472	62	43	0	0	1,577
6/24	11.5	24.0	86	147	24,946	6,198	4,082	0	0	35,226
6/25	0.5	24.0	96	67	10,239	6,240	4,160	0	0	20,639
6/26	12.0	24.0	178	213	72,884	12,555	11,257	0	0	96,696
6/27	6.0	24.0	3	223	62,448	287	1,127	0	0	63,862
6/28	16.0	24.0	378	378	348,945	621	49,565	10	0	399,141
6/29	20.0	17.5	552	338	265,434	1,034	35,891	8	0	302,367
6/30	21.5	0.0	857	221	409,142	1,846	48,399	3	3	459,393
7/01	24.0	0.0	527	242	361,386	700	32,056	3	0	394,145
7/02	24.0	12.0 [b]	618	226	184,432	284	20,174	11	3	204,904
7/03	24.0		484	181	217,845	293	20,687	3	0	238,828
7/04	24.0		525	215	192,232	184	18,457	9	0	210,882
7/05	10.0 [c]		318	120	91,695	99	8,209	3	0	100,006
7/06			221	95	39,807	16	522	2	0	40,347
7/07			212	123	50,766	17	251	2	0	51,036
7/08			383	130	138,936	41	1,229	1	0	140,207
7/09			291	88	97,679	16	467	2	0	98,164
7/10			185	85	41,984	4	225	1	0	42,214
7/11			160	82	43,989	8	184	3	0	44,184
7/12			150	90	44,528	16	330	8	0	44,882
7/13			146	79	47,260	298	2,173	79	6	49,816
7/14			115	63	22,952	133	1,319	43	3	24,450
7/15			78	41	13,978	31	544	17	1	14,571
7/16			52	38	7,077	3	289	8	0	7,377
7/17			18	26	2,725	0	223	0	0	2,948
7/18			12	13	1,268	0	158	0	0	1,426
7/19			8	3	492	0	53	15	0	560
7/22			3	1	495	4	37	2	68	606
Total	205.5	212.5	6,815	3,695	2,815,875	39,382	270,701	234	84	3,126,276

[a] Effort is deliveries from processor catch reports by gear type.

[b] The Igushik Section closed.

[c] The Nushagak Section closed.

Table 15. Commercial sockeye salmon fishing time and setnet harvest numbers by date and statistical area, Nushagak District, Bristol Bay, 2002.

Date	Time (*hrs*)		Harvest						
	Nushagak	Igushik	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	Total
6/21	6.0	15.0	1,916	1,026	271	416	518	355	4,502
6/22	6.0	24.0	3,715	3,377	678	2,772	850	746	12,138
6/23		24.0						1,472	1,472
6/24	11.5	24.0	8,018	7,230	73	2,711	2,397	2,374	22,803
6/25	0.5	24.0	2,808	1,221		1,442	191	1,442	7,104
6/26	12.0	24.0	20,313	9,913	242	5,512	4,424	3,968	44,372
6/27	6.0	24.0	22,139	13,760	2,701	6,890	10,053	4,235	59,778
6/28	16.0	24.0	10,633	17,567	1,923	10,881	56,199	3,840	101,043
6/29	19.5	17.5	26,089	16,953	5,951	7,781	27,098	2,946	86,818
6/30	9.5	0.0	5,434	4,580	706	1,854	21,569		34,143
7/01	17.0	0.0	22,106	15,117	2,186	2,406	22,399		64,214
7/02	24.0	12.0	4,017	1,335	1,326	4,275	12,364	3,504	26,821
7/03	24.0		4,130	2,368	673	893	26,400		34,464
7/04	24.0		3,263	864	2,856	1,433	22,444		30,860
7/05	10.0		785	431	535	404	11,475		13,630
Total	186.0	212.5	135,366	95,742	20,121	49,670	218,381	24,882	544,162

Table 16. Commercial salmon catch by date and species, in numbers of fish, Wood River Special Harvest Area, Nushagak District, Bristol Bay, 2002.

	Time (*hrs*)		Effort [a]		Harvest [b]					
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/5	8.0	12.0	113	31	6883	8	160	1	0	7,052
7/6	16.0	24.0	220	95	39,347	16	522	2	0	39,887
7/7	18.0	24.0	211	123	50,136	17	251	2	0	50,406
7/8	24.0	24.0	381	130	133,694	41	1,229	1	0	134,965
7/9	24.0	6.0	290	88	97,535	16	467	2	0	98,020
7/10	24.0		184	85	41,824	4	225	1	0	42,054
7/11	20.0		159	82	43,827	8	182	3	0	44,020
7/12	20.0		150	90	44,528	16	330	8	0	44,882
7/13	20.0		146	79	47,260	298	2,173	79	6	49,816
7/14	21.0		115	63	22,952	133	1,319	43	3	24,450
7/15	23.0		78	41	13,978	31	544	17	1	14,571
7/16	24.0		52	38	7,077	3	289	8	0	7,377
7/17	24.0		18	26	2,725	0	223	0	0	2,948
7/18	12.0		12	13	1,268	0	158	0	0	1,426
7/19	12.0		8	3	492	0	53	15	0	560
7/20										0
7/21										0
7/22	12.0		3	1	495	4	37	2	68	606
Total	302.0	90.0	2,140	988	554,021	595	8,162	184	78	563,040

[a] Number of hours each section was opened to commercial fishing.

[b] Numbers of fish.

Table 17. Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2002.

Date[a]	Sockeye	Chinook	Chum	Pink	Coho	Total
6/11	15	1	10	0	0	26
6/12	17	0	14	0	0	31
6/13	27	0	29	0	0	56
6/17	67	43	178	0	0	288
6/18	223	44	156	0	0	423
6/19	138	0	31	0	0	169
6/24	1,465	408	2,672	0	0	4,545
6/25	2,914	510	4,772	5	0	8,201
6/26	2,938	340	3,750	0	0	7,028
6/27	1,124	108	904	0	0	2,136
6/28	56	5	803	0	0	864
7/1	10,276	218	7,406	1	0	17,901
7/2	15,251	219	8,851	2	0	24,323
7/3	10,552	173	9,202	0	0	19,927
7/4	10,898	66	6,196	0	0	17,160
7/5	6,414	73	3,836	5	0	10,328
7/6	56	0	246	0	0	302
7/8	11,225	102	6,283	1	0	17,611
7/9	26,995	228	14,429	6	0	41,658
7/10	19,057	94	16,650	0	0	35,801
7/11	8,236	67	6,006	1	0	14,310
7/12	153	12	360	0	0	525
7/13	149	1	234	0	0	384
7/22	9,063	6	3,698	0	0	12,767
7/23	18,091	11	6,392	0	0	24,494
7/24	9,815	3	2,961	15	0	12,794
7/25	13,859	12	3,211	0	1	17,083
7/26	8,465	6	1,392	0	0	9,863
7/27	6,556	5	796	0	0	7,357
7/29	8,585	4	1,199	0	1	9,789
7/30	9,819	10	1,214	0	2	11,045
7/31	11,474	3	1,491	0	0	12,968
8/1	7,819	8	1,233	0	11	9,071
8/2	7,271	3	1,404	0	48	8,726
8/3	789	2	102	0	2	895
8/5	1,607	0	344	44	96	2,091
8/6	2,450	1	444	88	130	3,113
8/7	1,263	0	177	89	101	1,630
8/8	900	0	24	8	71	1,003
8/9	1,738	0	182	14	276	2,210
Total	247,810	2,786	119,282	279	739	370,896

[a] See Table 9 for inseason adjustments to the regular weekly fishing schedules.

Table 18. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 2002.

Date	Effort [a]		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/11 [b]								
6/12 [b]								
6/13 [b]								
6/17	4	1	67	43	178	0	0	288
6/18	4	3	223	44	156	0	0	423
6/19 [b]								
6/24	20	22	1,369	390	2,569	0	0	4,328
6/25	28	52	2,251	497	4,592	3	0	7,343
6/26	24	61	2,938	340	3,750	0	0	7,028
6/27	7	11	1,124	108	904	0	0	2,136
7/1	40	53	7,685	203	6,557	0	0	14,445
7/2	65	58	10,150	199	7,688	2	0	18,039
7/3	66	57	9,636	168	9,019	0	0	18,823
7/4	60	55	10,898	66	6,196	0	0	17,160
7/5	32	37	6,414	73	3,836	5	0	10,328
7/8	48	51	9,718	94	5,238	1	0	15,051
7/9	84	84	21,257	216	12,515	0	0	33,988
7/10	97	81	16,600	89	15,643	0	0	32,332
7/11	40	48	8,070	49	5,692	1	0	13,812
7/22	62	25	9,063	6	3,698	0	0	12,767
7/23	79	34	18,091	11	6,392	0	0	24,494
7/24	29	41	9,815	3	2,961	15	0	12,794
7/25	76	33	13,859	12	3,211	0	1	17,083
7/26	31	25	8,465	6	1,392	0	0	9,863
7/27	23	15	6,556	5	796	0	0	7,357
7/29	46	24	8,585	4	1,199	0	1	9,789
7/30	60	36	9,819	10	1,214	0	2	11,045
7/31	52	43	11,474	3	1,491	0	0	12,968
8/1	37	41	7,819	8	1,233	0	11	9,071
8/2	42	34	7,271	3	1,404	0	48	8,726
8/3	6	2	789	2	102	0	2	895
8/5	20	5	1,607	0	344	44	96	2,091
8/6	22	16	2,450	1	444	88	130	3,113
8/7	16	9	1,263	0	177	89	101	1,630
8/8	5	4	900	0	24	8	71	1,003
8/9	15	7	1,738	0	182	14	276	2,210
Total	1,240	1,068	228,187	2,675	110,907	270	739	342,423

[a] Effort is number of deliveries by gear type on processor reports.

[b] Less than three permits, records are confidential.

Table 19. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 2002.

Date	Effort[b]		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/24	1	3	96	18	103	0	0	217
6/25	0	7	663	13	180	2	0	858
7/1	6	12	2,591	15	849	1	0	3,456
7/2	10	16	5,101	20	1,163	0	0	6,284
7/3	2	1	916	5	183	0	0	1,104
7/8	9	15	1,507	8	1,045	0	0	2,560
7/9	17	34	5,738	12	1,914	6	0	7,670
7/10	5	10	2,426	5	861	0	0	3,292
7/11 [c]								
Total	50	98	19,112	96	6,309	9	0	25,526

[a] Kulukak Section is open three days per week. See Table 9 for inseason adjustments to the weekly fishing schedule.

[b] Effort is number of deliveries by gear type on processor reports.

[c] Less than 3 permits, records are confidential.

Table 20. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 2002.

Date[a]	Sockeye	Chinook	Chum	Pink	Coho	Total
6/28	56	5	803	0	0	864
7/6	56	0	246	0	0	302
7/11	80	1	303	0	0	384
7/12	98	6	231	0	0	335
7/13	149	1	234	0	0	384
Total	439	13	1,817	0	0	2,269

[a] Matogak and Osviak Sections open five days per week. See Table 9 for inseason adjustments to the weekly fishing schedule.

Table 21. Commercial salmon catch by date and species, in numbers if fish, Osviak Section, Bristol Bay, 2002.

Date	Sockeye	Chinook	Chum	Pink	Coho	Total
7/10	31	0	146	0	0	177
7/12	41	2	103	0	0	146
Total	72	2	249	0	0	323

Table 22. Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2002.

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT						
Kvichak River						
Branch River						
Naknek River						
Total	1,407,621	777	11,879	12	0	1,420,289
EGEGIK DISTRICT	4,602,925	276	22,469	1	7,468	4,633,139
UGASHIK DISTRICT	1,575,673	738	36,772	1	464	1,613,648
NUSHAGAK DISTRICT						
Wood River						
Igushik River						
Nushagak-Mulchatna						
Total	2,815,875	39,382	270,701	234	84	3,126,276
TOGIAK DISTRICT						
Togiak Section	228,187	2,675	110,907	270	739	342,778
Kulukak Section	19,112	96	6,309	9	0	25,526
Matogak Section	439	13	1,817	0	0	2,269
Osviak Section	72	2	249	0	0	323
Total	247,810	2,786	119,282	279	739	370,896
TOTAL BRISTOL BAY	10,649,904	43,959	461,103	527	8,755	11,164,248

Table 23. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 2002.

	Kvichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/18					8,952	8,952								
6/19			7,374	7,374	4,464	13,416								
6/20			12,360	19,734	23,076	36,492								
6/21	162	162	1,056	20,790	22,464	58,956			12,318	12,318				
6/22	348	510	5,760	26,550	15,198	74,154			7,476	19,794				
6/23	570	1,080	4,842	31,392	5,034	79,188			15,246	35,040				
6/24	270	1,350	13,662	45,054	26,742	105,930			14,334	49,374				
6/25	54	1,404	62,736	107,790	97,776	203,706			27,156	76,530	18	18		
6/26	210	1,614	65,766	173,556	134,112	337,818			19,398	95,928	0	18		
6/27	162	1,776	80,622	254,178	104,328	442,146			135,234	231,162	0	18		
6/28	3,978	5,754	135,066	389,244	35,664	477,810	0	0	102,714	333,876	0	18		
6/29	11,796	17,550	119,064	508,308	32,274	510,084	828	828	239,436	573,312	0	18		
6/30	37,830	55,380	86,928	595,236	37,704	547,788	54	882	112,038	685,350	186	204		
7/01	37,494	92,874	125,976	721,212	17,142	564,930	432	1,314	132,132	817,482	912	1,116		
7/02	69,504	162,378	117,834	839,046	46,686	611,616	528	1,842	127,842	945,324	3,846	4,962		
7/03	137,400	299,778	30,576	869,622	83,286	694,902	7,620	9,462	69,366	1,014,690	9,480	14,442	2,100	2,100
7/04	63,054	362,832	91,500	961,122	66,132	761,034	8,760	18,222	72,834	1,087,524	12,582	27,024	4,356	6,456
7/05	26,184	389,016	79,674	1,040,796	10,422	771,456	4,722	22,944	46,458	1,133,982	5,766	32,790	1,620	8,076
7/06	55,704	444,720	57,702	1,098,498	26,892	798,348	7,494	30,438	37,524	1,171,506	7,854	40,644	1,350	9,426
7/07	31,824	476,544	40,314	1,138,812	27,528	825,876	34,380	64,818	23,904	1,195,410	7,452	48,096	1,266	10,692
7/08	22,872	499,416	22,404	1,161,216	44,352	870,228	9,756	74,574	9,846	1,205,256	9,156	57,252	1,452	12,144
7/09	47,868	547,284	15,786	1,177,002	48,060	918,288	5,106	79,680	7,902	1,213,158	9,132	66,384	1,176	13,320
7/10	27,036	574,320	15,006	1,192,008	33,642	951,930	10,482	90,162	6,180	1,219,338	10,068	76,452	4,872	18,192
7/11	11,394	585,714	28,530	1,220,538	20,460	972,390	124,362	214,524	10,830	1,230,168	5,448	81,900	6,162	24,354
7/12	22,290	608,004	15,882	1,236,420	4,548	976,938	297,156	511,680	11,106	1,241,274	4,854	86,754	2,682	27,036
7/13	58,614	666,618	11,556	1,247,976	5,388	982,326	206,850	718,530	11,448	1,252,722	7,902	94,656	2,364	29,400
7/14	20,736	687,354	9,474	1,257,450	10,992	993,318	52,458	770,988	7,008	1,259,730	7,692	102,348	1,380	30,780
7/15	7,626	694,980	6,468	1,263,918	28,914	1,022,232	27,084	798,072	4,776	1,264,506	6,216	108,564	3,732	34,512

(Continued)

Table 23. (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.
7/16	5,616	700,596			13,860	1,036,092	21,552	819,624	3,738	1,268,244	4,200	112,764	5,682	40,194
7/17	2,940	703,536					29,130	848,754	1,830	1,270,074	2,124	114,888	9,438	49,632
7/18	348	703,884					18,792	867,546	3,102	1,273,176	2,208	117,096	9,348	58,980
7/19							9,600	877,146	3,312	1,276,488	774	117,870	10,278	69,258
7/20							2,676	879,822	4,104	1,280,592	1,782	119,652	7,404	76,662
7/21							5,556	885,378	3,090	1,283,682	1,122	120,774	7,002	83,664
7/22							3,018	888,396			1,248	122,022	7,656	91,320
7/23							1,428	889,824			246	122,268	11,184	102,504
7/24							2,280	892,104			384	122,652	11,838	114,342
7/25											504	123,156	9,432	123,774
7/26													3,204	126,978
7/27													4,506	131,484
7/28													3,540	135,024
7/29													1,968	136,992
7/30													3,006	139,998
7/31													5,922	145,920
8/01													8,202	154,122
8/02													4,122	158,244
8/03													2,610	160,854
8/04													1,014	161,868
8/05													534	162,402

Table 24. Final daily and cumulative escapement estimates by species, Nushagak River sonar project, Bristol Bay, 2002.

	Sockeye		Chinook		Chum		Pink		Coho		Total	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/08	0	0	1,179	1,179	3,953	3,953	0	0	0	0	5,132	5,132
6/09	0	0	7,957	9,136	23,653	27,606	0	0	0	0	31,610	36,742
6/10	0	0	4,774	13,910	29,067	56,673	0	0	0	0	33,841	70,583
6/11	0	0	993	14,903	9,472	66,145	0	0	0	0	10,465	81,048
6/12	0	0	643	15,546	4,133	70,278	0	0	0	0	4,776	85,824
6/13	221	221	267	15,813	3,500	73,778	0	0	0	0	3,988	89,812
6/14	0	221	262	16,075	2,297	76,075	0	0	0	0	2,559	92,371
6/15	0	221	273	16,348	2,199	78,274	0	0	0	0	2,472	94,843
6/16	47	268	626	16,974	941	79,215	0	0	0	0	1,614	96,457
6/17	3	271	637	17,611	757	79,972	0	0	0	0	1,397	97,854
6/18	269	540	221	17,832	1,749	81,721	0	0	0	0	2,239	100,093
6/19	1,530	2,070	4,668	22,500	25,505	107,226	0	0	0	0	31,703	131,796
6/20	8,598	10,668	15,187	37,687	39,254	146,480	0	0	0	0	63,039	194,835
6/21	6,099	16,767	2,773	40,460	6,047	152,527	0	0	0	0	14,919	209,754
6/22	6,998	23,765	1,919	42,379	4,945	157,472	0	0	0	0	13,862	223,616
6/23	6,149	29,914	4,762	47,141	23,275	180,747	0	0	0	0	34,186	257,802
6/24	8,488	38,402	3,681	50,822	27,489	208,236	0	0	0	0	39,658	297,460
6/25	4,840	43,242	3,247	54,069	7,190	215,426	0	0	0	0	15,277	312,737
6/26	4,097	47,339	1,304	55,373	5,278	220,704	0	0	0	0	10,679	323,416
6/27	15,018	62,357	1,385	56,758	31,537	252,241	0	0	0	0	47,940	371,356
6/28	32,821	95,178	492	57,250	16,033	268,274	0	0	0	0	49,346	420,702
6/29	20,799	115,977	1,982	59,232	10,109	278,383	0	0	0	0	32,890	453,592
6/30	42,265	158,242	1,835	61,067	11,425	289,808	0	0	0	0	55,525	509,117
7/01	14,095	172,337	1,281	62,348	20,870	310,678	0	0	0	0	36,246	545,363
7/02	16,136	188,473	2,111	64,459	6,360	317,038	0	0	0	0	24,607	569,970
7/03	4,484	192,957	1,549	66,008	10,603	327,641	0	0	0	0	16,636	586,606
7/04	6,760	199,717	685	66,693	4,164	331,805	0	0	0	0	11,609	598,215
7/05	5,315	205,032	1,303	67,996	6,631	338,436	0	0	0	0	13,249	611,464

(Continued)

Table 24. (page 2 of 3).

	Sockeye		Chinook		Chum		Pink		Coho		Total	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/06	7,548	212,580	2,146	70,142	3,718	342,154	0	0	0	0	13,412	624,876
7/07	9,636	222,216	1,921	72,063	5,104	347,258	0	0	0	0	16,661	641,537
7/08	10,991	233,207	2,068	74,131	3,715	350,973	0	0	0	0	16,774	658,311
7/09	22,223	255,430	784	74,915	2,048	353,021	0	0	0	0	25,055	683,366
7/10	14,826	270,256	1,398	76,313	5,257	358,278	0	0	0	0	21,481	704,847
7/11	9,110	279,366	676	76,989	2,752	361,030	0	0	0	0	12,538	717,385
7/12	5,593	284,959	692	77,681	3,561	364,591	0	0	0	0	9,846	727,231
7/13	4,584	289,543	569	78,250	5,112	369,703	0	0	0	0	10,265	737,496
7/14	4,029	293,572	940	79,190	9,838	379,541	0	0	0	0	14,807	752,303
7/15	3,955	297,527	688	79,878	4,468	384,009	0	0	0	0	9,111	761,414
7/16	3,631	301,158	467	80,345	3,365	387,374	0	0	0	0	7,463	768,877
7/17	4,255	305,413	444	80,789	5,868	393,242	0	0	0	0	10,567	779,444
7/18	464	305,877	785	81,574	4,859	398,101	0	0	0	0	6,108	785,552
7/19	658	306,535	462	82,036	1,566	399,667	0	0	0	0	2,686	788,238
7/20	1,016	307,551	391	82,427	1,203	400,870	632	632	0	0	3,242	791,480
7/21	1,383	308,934	426	82,853	4,260	405,130	4,584	5,216	861	861	11,514	802,994
7/22	1,097	310,031	363	83,216	2,986	408,116	1,634	6,850	808	1,669	6,888	809,882
7/23	845	310,876	220	83,436	1,937	410,053	2,877	9,727	816	2,485	6,695	816,577
7/24	714	311,590	349	83,785	636	410,689	7,512	17,239	627	3,112	9,838	826,415
7/25	1,183	312,773	154	83,939	1,098	411,787	11,140	28,379	1,158	4,270	14,733	841,148
7/26	334	313,107	355	84,294	969	412,756	10,929	39,308	1,189	5,459	13,776	854,924
7/27	0	313,107	62	84,356	2,546	415,302	39,397	78,705	6,174	11,633	48,179	903,103
7/28	0	313,107	578	84,934	1,870	417,172	35,342	114,047	6,508	18,141	44,298	947,401
7/29	0	313,107	300	85,234	1,133	418,305	48,302	162,349	6,049	24,190	55,784	1,003,185
7/30	1,842	314,949	59	85,293	1,523	419,828	18,472	180,821	3,564	27,754	25,460	1,028,645
7/31	331	315,280	274	85,567	15	419,843	7,425	188,246	249	28,003	8,294	1,036,939
8/01	278	315,558	34	85,601	78	419,921	13,626	201,872	787	28,790	14,803	1,051,742

(Continued)

Table 24. (page 3 of 3).

	Sockeye		Chinook		Chum		Pink		Coho		Total	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/02	123	315,681	124	85,725	43	419,964	21,617	223,489	963	29,753	22,870	1,074,612
8/03	0	315,681	324	86,049	0	419,964	32,527	256,016	260	30,013	33,111	1,107,723
8/04	0	315,681	290	86,339	0	419,964	21,146	277,162	255	30,268	21,691	1,129,414
8/05	0	315,681	504	86,843	0	419,964	10,110	287,272	522	30,790	11,136	1,140,550
8/06	0	315,681	0	86,843	0	419,964	14,445	301,717	1,545	32,335	15,990	1,156,540
8/07	0	315,681	13	86,856	0	419,964	3,615	305,332	997	33,332	4,625	1,161,165
8/08	0	315,681	122	86,978	0	419,964	3,922	309,254	946	34,278	4,990	1,166,155
8/09	0	315,681	103	87,081	8	419,972	2,381	311,635	996	35,274	3,488	1,169,643
8/10	0	315,681	60	87,141	0	419,972	2,425	314,060	1,436	36,710	3,921	1,173,564
8/11	0	315,681	0	87,141	0	419,972	1,372	315,432	515	37,225	1,887	1,175,451
8/12	0	315,681	0	87,141	0	419,972	838	316,270	425	37,650	1,263	1,176,714
8/13	0	315,681	0	87,141	0	419,972	263	316,533	1,054	38,704	1,317	1,178,031
8/14	0	315,681	0	87,141	0	419,972	445	316,978	1,469	40,173	1,914	1,179,945
8/15	0	315,681	0	87,141	0	419,972	252	317,230	693	40,866	945	1,180,890
8/16	0	315,681	0	87,141	0	419,972	184	317,414	660	41,526	844	1,181,734
8/17	0	315,681	0	87,141	0	419,972	245	317,659	817	42,343	1,062	1,182,796

Table 25. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2002.

	Tower Count		Aerial Survey	River Test Fishing				
				Fish per	Index Points		Cumulative	Estimated
Date	Daily	Cum.	Total	Index Pt.[a]	Daily	Cum.	Escapement	River Fish[b]
6/21	162	162		49	0	0	0	
6/22	348	510		49	0	0	0	
6/23	570	1,080		49	11	11	539	
6/24	270	1,350		49	14	25	1,225	
6/25	54	1,404		49	3	28	1,372	
6/26	210	1,614		49	56	84	4,116	
6/27	162	1,776		49	428	512	25,088	
6/28	3,978	5,754		30	1,461	1,973	59,190	50,000
6/29	11,796	17,550		28	1,695	3,668	102,704	80,000
6/30	37,830	55,380		31	1,502	5,170	160,270	100,000
7/01	37,494	92,874		27	6,020	11,190	302,130	200,000
7/02	69,504	162,378	130,000	29	3,134	14,324	415,396	250,000
7/03	137,400	299,778		27	3,072	17,396	469,692	170,000
7/04	63,054	362,832		25	2,549	19,945	498,625	140,000
7/05	26,184	389,016		21	3,010	22,955	482,055	90,000
7/06	55,704	444,720		21	2,727	25,682	539,322	90,000
7/07	31,824	476,544		20	2,305	27,987	559,740	80,000
7/08	22,872	499,416		19	1,853	29,840	566,960	50,000
7/09	47,868	547,284		20	1,240	31,080	621,600	70,000
7/10	27,036	574,320		19	477	31,557	599,583	25,000
7/11	11,394	585,714		19	131	31,688	602,072	15,000
7/12	22,290	608,004		20	654	32,342	646,840	45,000
7/13	58,614	666,618		21	1,372	33,714	707,994	35,000
7/14	20,736	687,354		21	244	33,958	713,118	15,000
7/15	7,626	694,980		21	219	34,177	717,717	7,000
7/16	5,616	700,596						
7/17	2,940	703,536						
7/18	348	703,884						

[a] A three-year mean EPI of 49, based on a three year hindcasting MAPE analysis, was used through June 27. Thereafter, FPI's were based on lag-time relationships.

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

Table 26. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Egegik River, Bristol Bay, 2002.

	Tower Count		Aerial Survey	River Test Fishing				
					Index Points		Estimated	
Date	Daily	Cum.	Total	Fish per Index Pt.[a]	Daily	Cum.	Cumulative Escapement	Estimated River Fish[b]
6/14				67	12	12	804	
6/15				67	205	217	14,539	
6/16			21,200	67	199	416	27,872	
6/17				67	420	836	56,012	55,000
6/18	8,952	8,952	4,400	67	224	1,060	71,020	65,000
6/19	4,464	13,416		67	40	1,100	73,700	60,000
6/20	23,076	36,492		58	44	1,144	66,352	30,000
6/21	22,464	58,956		64	44	1,188	76,032	17,000
6/22	15,198	74,154		68	97	1,285	87,380	13,000
6/23	5,034	79,188		68	487	1,772	120,496	45,000
6/24	26,742	105,930		75	1,809	3,581	268,575	165,000
6/25	97,776	203,706	71000	83	1881	5,462	453,346	250,000
6/26	134,112	337,818		83	181	5,643	468,369	130,000
6/27	104,328	442,146	11,200	80	637	6,280	502,400	60,000
6/28	35,664	477,810		82	313	6,593	540,626	60,000
6/29	32,274	510,084	1,700	79	825	7,418	586,022	75,000
6/30	37,704	547,788		82	308	7,726	633,532	90,000
7/01	17,142	564,930		77	941	8,667	667,359	100000
7/02	46,686	611,616		78	836	9,503	741,234	130,000
7/03	83,286	694,902		80	426	9,929	794,320	100,000
7/04	66,132	761,034		80	236	10,165	813,200	50,000
7/05	10,422	771,456	5,800	78	476	10,641	829,998	50,000
7/06	26,892	798,348		79	42	10,683	843,957	40,000
7/07	27,528	825,876	11500	78	624	11,307	881,946	50000
7/08	44,352	870,228	25,500	81	370	11,677	945,837	75,000
7/09	48,060	918,288		82	169	11,846	971,372	50,000
7/10	33,642	951,930		82	593	12,439	1,019,998	60,000
7/11	20,460	972,390		80	130	12,569	1,005,520	40,000
7/12	4,548	976,938	1,200	79	42	12,611	996,269	20,000
7/13	5,388	982,326						
7/14	10,992	993,318	1,675					
7/15	28,914	1,022,232						
7/16	13,860	1,036,092						

[a] A three-year mean EPI of 49, based on a three year hindcasting MAPE analysis, was used through June 27. Thereafter, FPI's were based on lag-time relationships.

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

Table 27 . Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2002.

	Tower Count		Aerial Survey	River Test Fishing				
					Index Points		Estimated Cumulative	Estimated
Date	Daily	Cum.	Total	Fish per Index Pt.[a]	Daily	Cum.	Escapement	River Fish[b]
6/24				57	18	18	1,026	
6/25				57	24	42	2,394	
6/26				57	35	77	4,389	
6/27				57	28	105	5,985	
6/28				57	40	145	8,265	8,000
6/29	828	828		57	12	157	8,949	8,000
6/30	54	882		57	70	227	12,939	10,000
7/01	432	1,314		40	142	369	14,760	13,000
7/02	528	1,842		40	253	622	24,880	23,000
7/03	7,620	9,462		50	202	824	41,200	32,000
7/04	8,760	18,222		40	240	1,064	42,560	24,000
7/05	4,722	22,944	250	40	484	1,548	61,920	40,000
7/06	7,494	30,438		32	626	2,174	69,568	40,000
7/07	34,380	64,818		42	305	2,479	104,118	40,000
7/08	9,756	74,574	50	34	183	2,662	90,508	15,000
7/09	5,106	79,680		40	120	2,782	111,280	30,000
7/10	10,482	90,162		46	2,661	5,443	250,378	160,000
7/11	124,362	214,524		45	6948	12,391	557,595	350,000
7/12	297,156	511,680	33,000	43	3,584	15,975	686,925	175000
7/13	206,850	718,530		46	1,373	17,348	798,008	80,000
7/14	52,458	770,988	850	45	594	17,942	807,390	50,000
7/15	27,084	798,072		45	318	18,260	821,700	20,000
7/16	21,552	819,624						
7/17	29,130	848,754						
7/18	18,792	867,546						
7/19	9,600	877,146						
7/20	2,676	879,822						
7/21	5,556	885,378						
7/22	3,018	888,396						
7/23	1,428	889,824						
7/24	2,280	892,104						

[a] A three-year mean EPI of 49, based on a three year hindcasting MAPE analysis, was used through June 27. Thereafter, FPI's were based on lag-time relationships.

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on aerial surveys, catchability, etc.

Table 28. Comparison of daily sockeye salmon escapement estimates by tower count and aerial survey enumeration methods, Wood River, Bristol Bay, 2002.

Date	Tower Count		Aerial Surveys[a]		
	Daily	Cum.	Number	Visibility	Comments
6/21	12,318	12,318	2,500	fair	
6/22	7,476	19,794			
6/23	15,246	35,040			
6/24	14,334	49,374	100	poor	
6/25	27,156	76,530			
6/26	19,398	95,928	2,000	poor	muddy below Silver Salmon Creek
6/27	135,234	231,162	10,100	fair	
6/28	102,714	333,876			
6/29	239,436	573,312	25,900	fair	
6/30	112,038	685,350			
7/1	132,132	817,482			
7/2	127,842	945,324			
7/3	69,366	1,014,690			
7/4	72,834	1,087,524			
7/5	46,458	1,133,982			67 set nets 300 boats 153 fishing
7/6	37,524	1,171,506			
7/7	23,904	1,195,410			
7/8	9,846	1,205,256			
7/9	7,902	1,213,158			
7/10	6,180	1,219,338			
7/11	10,830	1,230,168			
7/12	11,106	1,241,274			
7/13	11,448	1,252,722			
7/14	7,008	1,259,730			
7/15	4,776	1,264,506			
7/16	3,738	1,268,244			
7/17	1,830	1,270,074			
7/18	3,102	1,273,176			
7/19	3,312	1,276,488			
7/20	4,104	1,280,592			
7/21	3,090	1,283,682			

[a] Estimated number of fish in clear water below the counting tower at the time of the survey.

Table 29. Comparison of daily sockeye salmon escapement estimates by tower count and aerial survey enumeration methods, Igushik River, Bristol Bay, 2002.

	Tower Count		Aerial Surveys				
Date	Daily	Cum.	Lower River	Lagoon	Upper River	Total	Visibility
6/24			0	0	0	0	Good
6/25	18	18					
6/26	0	18					
6/27	0	18					
6/28	0	18					
6/29	0	18	0	0	0	0	
6/30	186	204					
7/1	912	1,116					
7/2	3,846	4,962	0	0	850	850	fair
7/3	9,480	14,442					
7/4	12,582	27,024					
7/5	5,766	32,790	0	0	340	340	fair
7/6	7,854	40,644					
7/7	7,452	48,096					
7/8	9,156	57,252					
7/9	9,132	66,384					
7/10	10,068	76,452					
7/11	5,448	81,900					
7/12	4,854	86,754					
7/13	7,902	94,656					
7/14	7,692	102,348					
7/15	6,216	108,564					
7/16	4,200	112,764					
7/17	2,124	114,888					
7/18	2,208	117,096					
7/19	774	117,870					
7/20	1,782	119,652					
7/21	1,122	120,774					
7/22	1,248	122,022					
7/23	246	122,268					
7/24	384	122,652					
7/25	504	123,156					

Table 30. Comparison of daily sockeye salmon escapement estimates by tower count and aerial survey enumeration methods, Togiak River, Bristol Bay, 2002.

	Tower Count		Aerial Surveys				
Date	Daily	Cum.	Togiak to Gechiak	Gechiak to Ongivinuck	Ongivinuck to tower	Total	Visibility
7/03	2,100	2,100					
7/04	4,356	6,456					
7/05	1,620	8,076					
7/06	1,350	9,426					
7/07	1,266	10,692					
7/08	1,452	12,144					
7/09	1,176	13,320	1,575			1,575	poor
7/10	4,872	18,192					
7/11	6,162	24,354					
7/12	2,682	27,036					
7/13	2,364	29,400					
7/14	1,380	30,780	6,475	10,000	3,925	20,400	good
7/15	3,732	34,512					
7/16	5,682	40,194					
7/17	9,438	49,632					
7/18	9,348	58,980	16,650	17,200	11,600	45,450	good
7/19	10,278	69,258					
7/20	7,404	76,662					
7/21	7,002	83,664					
7/22	7,656	91,320					
7/23	11,184	102,504					
7/24	11,838	114,342					
7/25	9,432	123,774					
7/26	3,204	126,978					
7/27	4,506	131,484					
7/28	3,540	135,024					
7/29	1,968	136,992					
7/30	3,006	139,998					
7/31	5,922	145,920					
8/01	8,202	154,122					
8/02	4,122	158,244					
8/03	2,610	160,854					
8/04	1,014	161,868					
8/05	534	162,402					

Table 31. Commercial salmon processors and buyers operating in Bristol Bay, 2002.[a]

	Name of Operator/Buyer	Base of Operations	District[b]	Method[c]	Export
1	Alaska General Seafoods	Kenmore, WA	K,E,U	C	SEA,AIR
2	Al-Lou's Fish	Naknek, AK	K	F	AIR
3	Baywatch Seafoods LLC	Woodinville, WA	K,E,U,N	F	AIR
4	Coffee Point Seafoods, LLC	Cathlamet, WA	E	F	SEA
5	Finest Kind Seafoods	Vashon, WA	E	EF	AIR
6	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
7	Great Ruby Fish Company	Anchorage, AK	K	F	SEA,AIR
8	Icicle Seafoods, Inc.	Seattle, AK	K,E,U,N	F,C	SEA
9	Lady Marion Seafoods	Anchorage, AK	E	F	SEA
10	Leader Creek Fisheries	Seattle, WA	K,E,U,N,T	F,EF	SEA
11	Mable B I	Dillingham, AK	N	F	AIR
12	Nor Quest Seafoods, Inc.	Seattle, WA	K,E,U,N	F	SEA
13	Ocean Beauty Seafoods, Inc.	Seattle, WA	K,E,U,N	C,F,EF	SEA,AIR
14	Pacman Fisheries	Naknek, AK	K	S,F	AIR
15	Pederson Point	Seattle, WA	K,E,U,N	F	SEA
16	Peter Pan Seafoods, Inc.	Seattle, WA	K,E,U,N	C,EF,F,S	SEA
17	Snopak Products	Seattle, WA	K,E,U,N,T	C,F	SEA
18	Sockeye Alaska	Anchorage, AK	E,N	F	AIR
19	Togiak Fisheries	Seattle, WA	T	F	SEA,AIR
20	Trident Seafoods	Seattle, WA	K,U,N	C,F	SEA
21	Ugashik Wild Salmon Company	King Salmon, AK	U	C	AIR
22	Wards Cove Packing Company	Seattle, WA	K,E,U,N	C,F,EF	SEA,AIR
23	Wilson Fisheries	Dillingham, AK	N	F	AIR
24	Woodbine Alaska Fish Company	Monroe, WA	K,E,U,T	C,F	SEA
25	Yard Arm Knot	Seattle, WA	N,E,N,U	C,F	SEA

Canning=10; Freezing= 22; Fresh=5; Curing=2; Air Export=13; Sea Export=17

[a] Indicates operators with a processing facility in a district or operators from other areas buying fish and/or providing suport service for fishers in districts away from the facility.

[b] K=Naknek-Kvichak; E=Egegik; U=Ugashik; N=Nushagak; T=Togiak.

[c] Type of processing: C=canned; EF=export fresh; F=frozen; S=cured.

Table 32. Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2002.

Species	Total Catch (lbs.)	Mean Weight (lbs.)	Mean Price ($/lb.)	Exvessel Value ($)
Sockeye	65,019,014	6.11	0.45	29,258,556
Chinook	800,726	18.23	0.30	240,218
Chum	3,257,432	7.10	0.10	325,743
Pink	2,011	3.82	0.05	101
Coho	68,989	7.88	0.30	20,697
Total	69,148,172			29,845,314

Table 33. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2002.

Area and River System	Permits Issued [b]	Estimated Number of Salmon Harvested					
		Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK/KVICHAK DISTRICT	471	52,805	837	909	1,137	943	56,632
Naknek River	290	19,297	692	517	717	607	21,830
Kvichak River/Iliamna Lake:	180	33,001	134	388	420	337	34,280
Alagnak (Branch) River	3	35	0	0	0	0	35
Chekok	1	288	0	0	0	0	288
Igiugig	11	2,042	8	13	1	5	2,069
Iliamna Lake	28	3,913	3	0	0	0	3,917
Kijik	4	150	0	0	0	0	150
Kokhanok	28	10,221	32	21	10	16	10,300
Kvichak River	9	427	3	2	9	15	456
Lake Clark: General	28	2,365	0	0	0	0	2,365
Levelock	5	519	0	300	400	300	1,519
Newhalen River	40	6,634	88	52	0	0	6,774
Pedro Bay	15	2,590	0	0	0	0	2,590
Port Alsworth	6	422	0	0	0	0	422
Six Mile Lake	14	3,395	0	0	0	0	3,395
Naknek or Kvichak Unspecified	6	507	11	4	0	0	522
EGEGIK DISTRICT	53	1,892	65	34	12	356	2,359
UGASHIK DISTRICT	23	1,294	51	14	2	460	1,821
NUSHAGAK DISTRICT	520	22,777	11,281	5,096	1,179	4,565	44,897
Wood River	117	4,377	1,411	370	188	612	6,957
Lower Nushagak River	39	1,285	1,217	383	78	156	3,119
Upper Nushagak River	74	3,346	4,104	2,540	10	490	10,489
Dillingham Beaches	232	7,963	3,598	1,505	785	2,671	16,522
Nushagak Bay Commercial	66	2,556	717	260	93	496	4,121
Igushik/Snake River	30	3,029	213	29	2	129	3,402
Nushagak, Site Unspecified	5	221	22	9	23	12	287
TOGIAK DISTRICT	36	2,319	703	605	10	241	3,878
TOTAL BRISTOL BAY	1,093	81,088	12,936	6,658	2,341	6,565	109,587

[a] Harvests are extrapolated for all permits issued, based on those returned and on the area fished as recorded on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,093 permits issued for the management area, 994 were returned (90.9%).

[b] Sum of sites may exceed district totals, and sum of districts may exceed area total, because permittees may use more than one site.

APPENDIX
TABLES

Appendix Table 1. Escapement goals and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1982-2002.

	Kvichak River			Naknek River[a]		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1982			1,135			1,156
1983			3,570			888
1984	8,000	12,000	10,491	800	1,400	1,242
1985	8,000	12,000	7,211	800	1,400	1,850
1986	4,000	6,000	1,179	800	1,400	1,978
1987	4,000	6,000	6,066	800	1,400	1,062
1988	4,000	6,000	4,065	800	1,400	1,038
1989	6,000	10,000	8,318	800	1,400	1,612
1990	6,000	10,000	6,970	800	1,400	2,093
1991	4,000	8,000	4,223	800	1,400	3,579
1992	4,000	8,000	4,726	800	1,400	1,607
1993	4,000	8,000	4,025	800	1,400	1,536
1994	6,000	10,000	8,338	800	1,400	991
1995	6,000	10,000	10,039	800	1,400	1,111
1996	4,000	6,000	1,451			1,078
1997	4,000	6,000	1,504	800	1,400	1,026
1998	2,000	10,000	2,296	800	1,400	1,202
1999	6,000	10,000	6,197	800	1,400	1,625
2000	6,000	10,000	1,828	800	1,400	1,375
2001	2,000	10,000	1,095	800	1,400	1,830
20-Year Average	4,889	8,778	4,736	800	1,400	1,494
1982-91 Average	5,500	8,750	5,323	800	1,400	1,650
1992-01 Average	4,400	8,800	4,150	800	1,400	1,338
2002	2,000	10,000	704	800	1,400	1,264

	Egegik River			Ugashik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1982			1,035			1,158
1983			792			1,001
1984	800	1,200	1,165	500	900	1,241
1985	800	1,200	1,095	500	900	998
1986	800	1,200	1,151	500	900	1,001
1987	800	1,200	1,273	500	900	669
1988	800	1,200	1,599	500	900	643
1989	800	1,200	1,610	500	900	1,681
1990	800	1,200	2,191	500	900	730
1991	800	1,200	2,787	500	900	2,457
1992	800	1,200	1,945	500	900	2,174
1993	800	1,200	1,517	500	900	1,390
1994	800	1,200	1,897	500	900	1,081
1995	800	1,400	1,282	500	1,200	1,304
1996	800	1,400	1,076	500	1,200	668
1997	800	1,400	1,104	500	1,200	618
1998	800	1,400	1,111	500	1,200	891
1999	800	1,400	1,728	500	1,200	1,652
2000	800	1,400	1,032	500	1,200	620
2001	800	1,400	969	500	1,200	834
20-Year Average	800	1,278	1,418	500	1,017	1,141
1982-91 Average	800	1,200	1,470	500	900	1,158
1992-01 Average	800	1,340	1,366	500	1,110	1,123
2002	800	1,400	1,036	500	1,200	892

Appendix Table 1. (Page 2 of 2).

Year	Wood River Range Lower	Wood River Range Upper	Wood River Actual	Igushik River Range Lower	Igushik River Range Upper	Igushik River Actual
1982			976			424
1983			1,361			180
1984	700	1,200	1,003	150	250	185
1985	700	1,200	939	150	250	212
1986	700	1,200	819	150	250	309
1987	800	1,200	1,337	140	250	169
1988	800	1,200	867	140	250	170
1989	800	1,200	1,186	150	250	462
1990	700	1,200	1,069	150	250	366
1991	700	1,200	1,160	150	250	756
1992	700	1,200	1,286	150	250	305
1993	700	1,200	1,176	150	250	406
1994	700	1,200	1,472	150	250	446
1995	700	1,200	1,475	150	250	473
1996	700	1,200	1,650	150	250	401
1997	700	1,200	1,512	150	250	128
1998	700	1,200	1,756	150	250	216
1999	700	1,200	1,512	150	250	446
2000	700	1,200	1,300	150	250	413
2001	700	1,500	1,459	150	300	410
20-Year Average	717	1,217	1,266	149	253	344
1982-91 Average	738	1,200	1,072	148	250	323
1992-01 Average	700	1,230	1,460	150	255	364
2002	700	1500	1,284	150	300	123

Year	Nushagak River [b] Range Lower [c]	Nushagak River [b] Range Upper	Nushagak River [b] Actual	Togiak River Range Lower	Togiak River Range Upper	Togiak River Actual
1982			538			245
1983			319			192
1984	300	700	473	140	250	95
1985	300	700	429	140	250	137
1986	300	700	822	140	250	168
1987	300	700	163	100	200	250
1988	300	700	483	100	200	277
1989	300	700	513	100	200	84
1990	340	760	680	140	250	142
1991	340	760	493	140	250	255
1992	340	760	695	140	250	199
1993	340	760	715	140	250	177
1994	340	760	509	140	250	155
1995	340	760	281	140	250	186
1996	340	760	504	140	250	157
1997	340	760	373	100	200	132
1998	340	760	459	100	200	154
1999	235	760	393	100	200	156
2000	340	760	404	100	200	312
2001	340	760	804	100	200	297
20-Year Average	321	740	503	122	228	189
1982-91 Average	310	715	491	125	231	185
1992-01 Average	330	760	514	120	225	193
2002	340	760	316	100	200	162

[a] An Optimal escapement goal of up to 2.0 million sockeye set by the BOF in 2001, when fishing in the Naknek River Special Harvest Area.

[b] Actual escapement through 1988 is Nuyakuk River tower count, from 1989-present is based on sonar count at Portage Creek.

[c] The "Optimal Escapement Goal" of 235,000 sockeye set by the BOF in 1999.

Appendix Table 2. Salmon entry permit registration by gear and residency, Bristol Bay, 1982-2002.[a,b]

Year	Drift Net[c]					Set Net[c]					Total
	Resident		Non-Resident		Drift Total	Resident		Non-Resident		Set Total	
1982	1,048	(84)	776	(16)	1,824	741	(36)	216	(5)	957	2,781
1983	1,072	(79)	750	(16)	1,822	741	(33)	219	(3)	960	2,782
1984	1,049	(73)	771	(16)	1,820	743	(28)	219	(3)	962	2,782
1985	1,062	(83)	772	(13)	1,834	741	(24)	218	(4)	959	2,793
1986	1,060	(78)	778	(17)	1,838	739	(18)	223	(4)	962	2,800
1987	1,044	(75)	793	(16)	1,837	736	(14)	224	(4)	960	2,797
1988	1,033	(78)	806	(12)	1,839	731	(14)	227	(3)	958	2,797
1989	1,036	(77)	831	(14)	1,867	785	(14)	240	(4)	1,025	2,892
1990	1,039	(78)	839	(15)	1,878	783	(11)	243	(5)	1,026	2,904
1991	1,020	(74)	861	(14)	1,881	771	(8)	253	(4)	1,024	2,905
1992	998	(72)	885	(15)	1,883	774	(8)	251	(0)	1,025	2,908
1993	984	(65)	902	(16)	1,886	763	(8)	259	(0)	1,022	2,908
1994	972	(63)	915	(14)	1,887	760	(7)	259	(0)	1,019	2,906
1995	969	(62)	919	(13)	1,888	762	(8)	257	(0)	1,019	2,907
1996	966	(56)	925	(14)	1,891	760	(6)	257	(0)	1,017	2908
1997	959	(56)	940	(14)	1,899	757	(6)	262	(0)	1,019	2,918
1998	955	(43)	944	(12)	1,899	756	(6)	259	(0)	1,015	2,914
1999	937	(37)	961	(11)	1,898	750	(5)	264	(1)	1,014	2,912
2000	939	(25)	951	(7)	1,890	736	(5)	276	(0)	1,012	2,902
2001	960		923		1,883	731		279		1,010	2,893
20 Year Average	1,005		862		1,867	753		245		998	2,865
1982-91 Average	1,046		798		1,844	751		228		979	2,823
1992-01 Average	964		927		1,890	755		262		1,017	2,908
2002	950		928		1,878	727		279		1,006	2,884

[a] Total license/permit registration, however, not all permit's fished.

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

[c] Allowable gear per license/permit is measured in fathoms, 150 for drift and 50 for set with the following exceptions: 1968 and 1975 drift was 75 and setnet 25; 1969 drift was 125, no change for setnet; 1973 drift 25 and 12.5 for set.

Appendix Table 3. Salmon fishing interim-use and permanent entry permits, by gear type, Bristol Bay, 1982-2002.

Year	Permits Issued			Permits Fished	
	Interim -Use	Permanent	Total	Number	Percent
		Drift Gill Net			
1982	102	1,724	1,826	1,792	98%
1983	96	1,727	1,823	1,797	99%
1984	90	1,729	1,819	1,804	99%
1985	101	1,738	1,839	1,815	99%
1986	98	1,743	1,841	1,823	99%
1987	93	1,746	1,839	1,824	99%
1988	93	1,749	1,842	1,837	100%
1989	91	1,776	1,867	1,855	99%
1990	94	1,785	1,879	1,869	99%
1991	92	1,793	1,885	1,873	99%
1992	88	1,797	1,885	1,879	100%
1993	85	1,805	1,890	1,875	99%
1994	78	1,810	1,888	1,865	99%
1995	75	1,813	1,888	1,882	100%
1996	72	1,821	1,893	1,884	100%
1997	71	1,832	1,903	1,875	99%
1998	61	1,844	1,905	1,858	98%
1999	53	1,850	1,903	1,847	97%
2000	38	1,858	1,896	1,823	96%
2001	24	1,861	1,885	1,566	83%
Average	80	1,790	1,870	1,832	98%
2002	16	1,863	1,879	1,183	63%
		Set Gill Net			
1982	43	916	959	859	90%
1983	40	929	969	865	89%
1984	32	931	963	869	90%
1985	28	931	959	872	91%
1986	26	940	966	869	90%
1987	19	942	961	899	94%
1988	17	941	958	922	96%
1989	18	1,007	1,025	971	95%
1990	16	1,012	1,028	971	94%
1991	13	1,012	1,025	950	93%
1992	10	1,017	1,027	968	94%
1993	9	1,014	1,023	965	94%
1994	7	1,012	1,019	939	92%
1995	8	1,011	1,019	967	95%
1996	6	1,011	1,017	941	93%
1997	7	1,012	1,019	921	90%
1998	6	1,009	1,015	901	89%
1999	6	1,008	1,014	925	91%
2000	6	1,007	1,013	921	91%
2001	2	1,008	1,010	834	83%
Average	17	981	998	921	92%
2002	2	1004	1,006	680	68%

Appendix Table 4. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	5,005,802	2,447,514	1,139,192	5,916,187	595,696	15,104,391
1983	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
1985	8,179,093	7,537,273	6,468,862	1,307,889	209,766	23,702,883
1986	2,892,171	4,852,935	5,002,949	2,719,313	308,688	15,776,056
1987	4,986,002	5,356,669	2,128,652	3,254,720	342,732	16,068,775
1988	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
1990	17,272,224	10,371,762	2,149,009	3,532,543	197,589	33,523,127
1991	10,475,206	6,797,166	2,945,742	5,053,845	549,221	25,821,180
1992	9,395,948	15,646,575	3,320,966	2,789,741	726,446	31,879,676
1993	8,907,876	21,600,858	4,176,900	5,236,557	539,933	40,462,124
1994	16,327,858	10,750,213	4,352,797	3,393,143	400,039	35,224,050
1995	20,279,581	14,425,979	4,509,446	4,445,883	605,328	44,266,217
1996	8,211,983	10,809,115	4,411,055	5,693,523	462,621	29,588,297
1997	589,311	7,517,389	1,402,690	2,506,818	142,569	12,158,777
1998	2,595,439	3,528,845	730,247	2,990,597	190,446	10,035,574
1999	9,452,972	7,388,080	2,256,007	6,175,419	385,411	25,657,889
2000	4,727,061	7,029,397	1,538,790	6,367,208	794,996	20,457,452
2001	5,280,538	2,872,662	480,509	4,734,800	810,096	14,178,605
20-Year Average	9,398,797	8,311,835	2,884,570	3,886,276	454,147	24,935,624
1982-91 Average	10,220,737	6,466,758	3,051,199	3,339,182	402,505	23,480,381
1992-01 Average	8,576,857	10,156,911	2,717,941	4,433,369	505,789	26,390,866
2002	1,407,621	4,602,925	1,575,673	2,815,875	247,810	10,649,904

Appendix Table 5. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	12,425	4,834	7,170	195,287	33,786	253,502
1985	5,697	4,015	5,840	67,783	37,106	120,441
1986	3,188	1,883	2,982	65,783	19,880	93,716
1987	5,175	2,959	4,065	45,983	17,217	75,399
1988	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
1990	5,068	1,146	1,840	14,812	11,130	33,996
1991	3,584	510	589	19,718	6,039	30,440
1992	5,724	694	2,146	47,563	12,640	68,767
1993	7,477	1,478	3,075	62,976	10,851	85,857
1994	6,016	1,243	3,685	119,480	10,486	140,910
1995	5,084	760	1,551	79,942	11,981	99,318
1996	4,195	980	588	72,011	8,602	86,376
1997	2,839	2,047	1,084	64,294	6,114	76,378
1998	2,444	760	346	108,486	14,131	126,167
1999	1,295	712	1,638	10,893	11,919	26,457
2000	1,027	1,061	893	12,055	7,858	22,894
2001	904	950	989	11,568	9,937	24,348
20-Year Average	5,161	2,030	2,904	61,571	15,866	87,533
1982-91 Average	6,621	2,992	4,209	64,215	21,281	99,318
1992-01 Average	3,701	1,069	1,600	58,927	10,452	75,747
2002	777	276	738	39,382	2,786	43,959

Appendix Table 6. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	198,019	84,329	53,204	434,817	151,000	921,369
1983	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
1985	210,107	126,736	131,576	396,740	203,302	1,068,461
1986	262,925	94,666	111,112	488,375	270,057	1,227,135
1987	446,908	145,259	101,074	416,476	419,425	1,529,142
1988	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
1990	422,276	123,087	32,013	378,223	102,861	1,058,460
1991	443,189	75,892	60,299	463,780	246,589	1,289,749
1992	167,168	121,472	57,170	398,691	176,123	920,624
1993	43,684	70,628	73,402	505,799	144,869	838,382
1994	219,118	62,961	52,127	328,267	232,559	895,032
1995	236,472	68,325	62,801	390,158	221,126	978,882
1996	124,137	85,151	103,392	324,261	207,094	844,035
1997	8,719	53,139	16,379	185,620	47,459	311,316
1998	82,281	29,405	8,088	208,551	67,595	395,920
1999	259,922	74,890	68,004	170,795	111,677	685,288
2000	68,218	38,857	36,349	114,454	140,175	398,053
2001	16,472	33,579	43,394	526,602	211,701	831,748
20-Year Average	230,754	98,402	75,269	410,094	214,314	1,028,833
1982-91 Average	338,889	132,963	98,428	504,868	272,590	1,347,738
1992-01 Average	122,619	63,841	52,111	315,320	156,038	709,928
2002	11,879	22,469	36,772	270,701	119,282	461,103

Appendix Table 7. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	127,560	1,997	170	1,339,272	23,417	1,492,416
1983	51	92	0	137	204	484
1984	211,306	5,759	2,387	3,127,153	19,468	3,366,073
1985	39	51	3	48	316	457
1986	106,919	2,749	98	267,117	24,404	401,287
1987	5	0	30	2	20	57
1988	648,569	4,485	218	243,890	58,084	955,246
1989	75	6	29	156	172	438
1990	421,690	11,593	361	54,127	8,746	496,517
1991	102	15	2	69	117	305
1992	214,228	694	525	190,102	93,989	499,538
1993	86	2	2	83	240	413
1994	11,537	145	21	8,562	69,552	89,817
1995	55	1	1	120	294	471
1996	4,590	22	21	2,681	30,308	37,622
1997	39	2	0	50	27	118
1998	11,317	674	247	6,787	6,406	25,431
1999	11	0	3	52	2	68
2000	19,659	32	4	38,309	695	58,699
2001	23	0	0	308	97	428
20-Year Average [a]	177,738	2,815	405	527,800	33,507	742,265
1982-91 Average [a]	218,874	3,001	578	995,490	25,078	1,243,008
1992-01 Average [a]	52,266	313	164	49,288	40,190	142,221
2002	12	1	1	234	279	527

[a] Includes even numbered years only.

Appendix Table 8. Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	10,586	74,989	50,803	349,669	133,765	619,812
1983	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
1985	10,474	32,667	60,815	20,230	38,636	162,822
1986	5,824	33,607	25,770	68,568	48,306	182,075
1987	5,274	30,789	14,785	13,263	1,292	65,403
1988	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
1990	16,091	43,897	32,906	7,733	2,690	103,317
1991	17,527	47,486	42,622	5,574	4,531	117,740
1992	18,553	47,780	35,794	84,077	5,328	191,532
1993	1,779	41,603	2,387	14,345	12,615	72,729
1994	5,877	48,436	19,250	5,615	96,062	175,240
1995	981	21,772	13,800	4,896	8,917	50,366
1996	3,601	38,156	13,163	11,401	58,978	125,299
1997	718	35,470	7,156	4,110	2,970	50,424
1998	1,587	29,856	13,007	22,703	52,630	119,783
1999	303	11,464	2,289	2,836	2,653	19,545
2000	952	13,166	1,269	112,819	2,758	130,964
2001	3	12,603	976	3,218	284	17,084
20-Year Average	8,164	37,722	24,968	60,124	36,481	167,459
1982-91 Average	12,892	45,413	39,027	93,646	48,642	239,621
1992-01 Average	3,435	30,031	10,909	26,602	24,320	95,297
2002	0	7,468	464	84	739	8,755

Appendix Table 9. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	5,354,392	2,613,663	1,250,539	8,235,232	937,664	18,391,490
1983	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
1985	8,405,410	7,700,742	6,667,096	1,792,690	489,126	25,055,064
1986	3,271,027	4,985,840	5,142,911	3,609,156	671,335	17,680,269
1987	5,443,364	5,535,676	2,248,606	3,730,444	780,686	17,738,776
1988	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
1990	18,137,349	10,551,485	2,216,129	3,987,438	323,016	35,215,417
1991	10,939,608	6,921,069	3,049,254	5,542,986	806,497	27,259,414
1992	9,801,621	15,817,215	3,416,601	3,510,174	1,014,526	33,560,137
1993	8,960,902	21,714,569	4,255,766	5,819,760	708,508	41,459,505
1994	16,570,406	10,862,998	4,427,880	3,855,157	808,698	36,525,139
1995	20,522,297	14,516,875	4,587,276	4,920,284	847,600	45,394,332
1996	8,322,312	10,900,288	4,530,995	6,111,030	724,023	30,588,648
1997	616,084	7,626,863	1,432,200	2,866,890	200,676	12,742,713
1998	2,693,068	3,589,540	751,962	3,345,717	336,995	10,717,282
1999	9,714,503	7,475,146	2,327,941	6,359,995	511,662	26,389,247
2000	4,816,917	7,082,513	1,577,305	6,644,845	946,482	21,068,062
2001	5,297,940	2,919,794	525,868	5,276,496	1,032,115	15,052,213
20-Year Average	9,731,188	8,450,691	2,988,286	4,688,072	735,820	26,594,057
1982-91 Average	10,730,772	6,650,801	3,193,192	4,505,109	758,512	25,838,385
1992-01 Average	8,731,605	10,250,580	2,783,379	4,871,035	713,129	27,349,728
2002	1,420,289	4,633,139	1,613,648	3,126,276	370,896	11,164,248

Appendix Table 10. Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak			Egegik		Ugashik		Nushagak			WRSHA [a]		Togiak		Total	
	Drift	Setnet Section		Drift	Set	Drift	Set	Drift	Setnet Section		Drift	Set	Drift	Set	Drift	Set
		Naknek	Kvichak						Nushagak	Igushik						
1982	87	13		83	17	87	13	90	10				84	16	54	14
1983	92	8		86	14	93	7	86	14				80	20	86	14
1984	89	11		92	8	92	8	83	17				77	23	87	13
1985	87	13		93	7	96	4	65	35				75	25	90	10
1986	70	30		89	11	94	6	76	24				68	32	90	10
1987	86	14		91	9	93	7	80	20				66	34	90	10
1988	86	14		90	10	91	9	75	25				64	36	85	15
1989	89	11		90	10	87	13	58	42				55	45	87	13
1990	88	12		91	9	91	9	67	33				67	33	86	14
1991	89	11		91	9	89	11	76	24				64	36	86	14
1992	89	11		91	9	90	10	65	35				62	38	87	13
1993	84	16		93	7	90	10	72	28				54	46	86	14
1994	90	10		92	8	94	6	68	32				52	48	88	12
1995	89	11		90	10	95	5	68	32				52	48	87	13
1996	83	17		90	10	95	5	81	19				52	55	88	12
1997	73	27		87	13	88	12	70	30				37	63	87	13
1998	84	8	8	86	14	85	15	72	24	4	76	24	43	57	86	14
1999	85	8	7	85	15	89	11	70	24	6	78	22	53	47	82	18
2000	82	12	6	84	16	87	13	79	15	6	68	32	57	43	80	20
2001	[b]	[b]	[b]	86	14	80	20	78	17	5			66	34	80	20
20-Year Average	81	13		89	11	90	10	74	25				61	39	85	14
1982-91 Average	86	14		90	10	91	9	76	24				70	30	84	13
1992-01 Average	76	12		88	12	89	11	72	26				53	48	85	15
2002	[b]	[b]	[b]	85	15	88	12	77	23	1	67	33	62	38		
Allocation [c]	84	8	8	86	14	90	10	74	20	6	74	26	n.a.	n.a.	n.a.	n.a.

[a] Wood River Special Harvest Area (WRSHA), Nushagak District.

[c] Not applicable in the NRSHA fishery.

[c] BOF inacted current allocation plan in 1998.

Appendix Table 11. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak[a]	Egegik[b]	Ugashik[c]	Nushagak[d]	Togiak[e]	Total
1982	2,529,692	1,034,628	1,185,551	2,012,742	341,424	7,104,037
1983	4,554,496	792,282	1,001,358	1,948,474	239,610	8,536,220
1984	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
1985	9,179,014	1,095,204	1,006,407	1,684,760	190,082	13,155,467
1986	3,387,147	1,151,750	1,015,582	2,134,490	271,184	7,960,153
1987	7,281,896	1,273,553	686,894	1,895,961	316,076	11,454,380
1988	5,297,708	1,599,161	654,412	1,524,704	340,712	9,416,697
1989	9,676,244	1,611,566	1,713,281	2,189,501	125,080	15,315,672
1990	9,231,358	2,191,582	749,478	2,144,444	278,202	14,595,064
1991	8,078,885	2,786,925	2,482,001	2,419,488	320,713	16,088,012
1992	6,557,157	1,945,632	2,194,927	2,286,278	266,956	13,250,950
1993	5,908,799	1,517,000	1,413,454	2,296,789	242,475	11,378,517
1994	9,571,245	1,894,977	1,095,068	2,449,616	233,632	15,244,538
1995	11,365,573	1,282,508	1,321,108	2,254,231	240,266	16,463,686
1996	2,835,426	1,075,596	692,167	2,553,995 [f]	212,524	7,369,708
1997	2,747,511	1,104,004	656,641	2,021,529	171,373	6,701,058
1998	3,750,246	1,110,932	924,853	2,441,666	214,626	8,442,323
1999	8,303,878	1,727,772	1,662,042	2,269,861 [f]	231,196	14,194,749
2000	3,654,568	1,032,138	638,420	2,116,842 [f]	390,080	7,832,048
2001	3,194,708	968,872	866,368	2,679,432 [f]	303,346 [g]	8,981,598
20-Year Average	6,452,703	1,418,071	1,161,517	2,156,974	256,517	11,494,226
1982-91 Average	7,116,495	1,470,200	1,176,528	1,976,925	262,386	12,002,534
1992-01 Average	5,788,911	1,365,943	1,146,505	2,337,024	250,647	10,985,918
2002	2,303,463	1,036,092	905,584	1,722,519	199,507	6,167,165

[a] Includes Kvichak, Branch and Naknek Rivers.

[b] Includes Egegik River. Also includes King Salmon River in 1986-95, and Shosky Creek in 1988-2000.

[c] Includes Ugashik River. Also includes Mother Goose River system 1982-2000 and Dog Salmon River system in 1984-2000.

[d] Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.

[e] Includes Togiak River, Lake tributaries, Kulukak system and other miscellaneous river systems.

[f] Snake River not surveyed.

[g] Only partial and late survey of Togiak streams in 2001.

Appendix Table 12. Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1982-2002.

Year	Catch	Escapement				Total Run
		Kvichak[a]	Branch[b]	Naknek[a]	Total	
1982	5,005,802	1,134,840	239,300	1,155,552	2,529,692	7,535,494
1983	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
1985	8,179,093	7,211,046	118,030	1,849,938	9,179,014	17,358,107
1986	2,892,171	1,179,322	230,180	1,977,645	3,387,147	6,279,318
1987	4,986,002	6,065,880	154,210	1,061,806	7,281,896	12,267,898
1988	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
1990	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
1991	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
1992	9,395,948	4,725,864	224,643	1,606,650	6,557,157	15,953,105
1993	8,907,876	4,025,166	347,975	1,535,658	5,908,799	14,816,675
1994	16,327,858	8,337,840	242,595	990,810	9,571,245	25,899,103
1995	20,279,581	10,038,720	215,713	1,111,140	11,365,573	31,645,154
1996	8,211,983	1,450,578	306,750	1,078,098	2,835,426	11,047,409
1997	589,311	1,503,732	218,115	1,025,664	2,747,511	3,336,822
1998	2,595,439	2,296,074	252,200	1,202,172	3,750,446	6,345,885
1999	9,452,972	6,196,914	481,600	1,625,364	8,303,878	17,756,850
2000	4,727,061	1,827,780	451,300	1,375,488	3,654,568	8,381,629
2001	5,280,538	1,095,348	267,000	1,830,360	3,192,708	8,473,246
20 Year Average	9,398,797	4,736,264	244,947	1,471,402	6,452,613	15,851,410
1982-91 Average	10,220,737	5,322,726	189,105	1,604,664	7,116,495	17,337,233
1992-01 Average	8,576,857	4,149,802	300,789	1,338,140	5,788,731	14,365,588
2002	1,407,621	703,884	335,661	1,263,918	2,303,463	3,711,084

[a] Tower count

[b] Aerial survey estimates

Appendix Table 13. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1982-2002

Year	Kvichak		Branch		Naknek		Total Run[a]
	Number	%	Number	%	Number	%	
1982	2,993	40	772	10	3,770	50	7,535
1983	20,105	77	557	2	5,452	21	26,114
1984	23,014	87	555	2	2,926	11	26,495
1985	13,394	77	264	2	3,699	21	17,357
1986	1,966	31	399	6	3,913	62	6,278
1987	9,593	78	297	2	2,378	19	12,268
1988	6,720	77	320	4	1,739	20	8,779
1989	19,774	84	534	2	3,179	14	23,487
1990	17,521	66	555	2	8,427	32	26,503
1991	8,032	43	604	3	9,918	53	18,554
1992	10,445	65	487	3	5,021	31	15,953
1993	9,313	63	817	6	4,687	32	14,817
1994	22,232	86	634	2	3,033	12	25,899
1995	27,431	87	651	2	3,564	11	31,646
1996	3,458	31	706	6	6,860	62	11,024
1997	1,683	50	244	7	1,409	42	3,336
1998	3,412	54	388	6	2,546	40	6,346
1999	12,947	73	1,070	6	3,740	21	17,757
2000	2,862	34	731	9	4,789	57	8,382
2001	1,430	17	408	5	6,694	78	8,532
20 Year Average	10,916	61	550	4	4,387	35	15,853
1982-91 Average	12,311	66	486	4	4,540	30	17,337
1992-01 Average	9,521	56	614	5	4,234	39	14,369
2002	704	19	336	9	2,671	72	3,711

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

Appendix Table 14. Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, in numbers of fish, Bristol Bay, 1982-2002.

Year	Catch	Escapement			Total Run
		Egegik[a]	Shosky Cr.[b]	King Salmon[b] River	
1982	2,447,514	1,034,628			3,482,142
1983	6,755,256	792,282			7,547,538
1984	5,190,413	1,165,320		25	6,355,758
1985	7,537,273	1,095,204			8,632,477
1986	4,852,935	1,151,320		430	6,004,685
1987	5,356,669	1,272,978		575	6,630,222
1988	6,456,598	1,599,096	65		8,055,759
1989	8,901,994	1,610,916	50	600	10,513,560
1990	10,371,762	2,191,362		220	12,563,344
1991	6,797,166	2,786,880		45	9,584,091
1992	15,646,575	1,945,332		300	17,592,207
1993	21,600,858	1,516,980	20		23,117,858
1994	10,750,213	1,894,932	15	30	12,645,190
1995	14,425,979	1,281,678		830	15,708,487
1996	10,809,115	1,075,596			11,884,711
1997	7,517,389	1,103,964		40	8,621,393
1998	3,528,845	1,110,882		50	4,639,777
1999	7,388,080	1,727,772		625	9,116,477
2000	7,029,397	1,032,138			8,061,535
2001	2,872,662	968,862	10		3,841,534
20-Year Average	8,311,835	1,417,906	32	314	9,729,937
1982-91 Average	6,466,758	1,469,999	58	316	7,936,958
1992-01 Average	10,156,911	1,365,814	15	313	11,522,917
2002	4,602,925	1,036,092			5,639,017

[a] Tower count.

[b] Aerial survey index count.

Appendix Table 15. Inshore commercial catch and escapement of sockeye salmon in the Ugashik District by river system, in numbers of fish, Bristol Bay, 1982-2002.

Year	Catch	Escapement			Total Run
		Ugashik[a] River	King Salmon[b] River	Dog Salmon[b] River	
1982	1,139,192	1,157,526	28,025		2,324,743
1983	3,349,451	1,000,608	750		4,350,809
1984	2,658,376	1,241,418	17,100	11,800	3,928,694
1985	6,468,862	998,232	7,400	775	7,475,269
1986	5,002,949	1,001,492	4,310	9,780	6,018,531
1987	2,128,652	668,964	15,855	2,075	2,815,546
1988	1,523,520	642,972	8,360	3,080	2,177,932
1989	3,146,239	1,681,296	25,480	6,505	4,859,520
1990	2,149,009	730,038	11,340	8,100	2,898,487
1991	2,945,742	2,457,306	12,195	12,500	5,427,743
1992	3,320,966	2,173,692	13,425	7,810	5,515,893
1993	4,176,900	1,389,534	22,570	1,350	5,590,354
1994	4,352,797	1,080,858	8,885	5,325	5,447,865
1995	4,509,446	1,304,058	7,650	9,400	5,830,554
1996	4,411,055	667,518	7,230	17,419	5,103,222
1997	1,402,690	618,396	27,645	10,600	2,059,331
1998	730,274	890,508	27,425	6,920	1,655,127
1999	2,256,007	1,651,572	6,350	4,120	3,918,049
2000	1,538,790	620,040	12,900	5,480	2,177,210
2001	480,509	833,628	22,940	9,800	1,346,877
20-Year Average	2,884,571	1,140,483	14,392	7,380	4,046,088
1982-91 Average	3,051,199	1,157,985	13,082	6,827	4,227,727
1992-01 Average	2,717,943	1,122,980	15,702	7,822	3,864,448
2002	1,575,673	892,104[c]	11,460	2,020	2,481,257

[a] Tower count.

[b] Aerial survey.

[c] USFWS operated the counting tower from late July through September and estimated an additional 21,000 sockeye salmon.

Appendix Table 16. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in number of fish, Bristol Bay, 1982-2002.

Year	Catch	Escapement							Total Run
		Wood [a]	Igushik [a]	Nuyakuk [a]	Nush/Mul [b]	Nushagak [c]	Snake [d]	Total	
1982	5,916,187	976,470	423,768	537,864	63,000		11,640	1,411,878	7,328,065
1983	5,119,744	1,360,968	180,438	318,606	85,400		3,080	1,544,486	6,664,230
1984	1,992,681	1,002,792	184,872	472,596	120,586	593,182	33,840	1,814,686	3,807,367
1985	1,307,889	939,000	212,454	429,162	69,300		34,880	1,186,334	2,494,223
1986	2,719,313	818,652	307,728	821,898	168,340		16,780	1,143,160	3,862,473
1987	3,254,720	1,337,172	169,236	163,000	225,034	388,034	1,520	1,895,962	5,150,682
1988	1,706,716	866,778	170,454	319,992	163,208	483,200	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
1990	3,532,543	1,069,440	365,802			680,368	28,840	2,144,450	5,676,993
1991	5,053,845	1,159,920	756,126			492,522	10,920	2,419,488	7,473,333
1992	2,789,741	1,286,250	304,920			695,108		2,286,278	5,076,019
1993	5,236,557	1,176,126	405,564			715,099		2,296,789	7,533,346
1994	3,393,143	1,471,890	445,920			509,326	22,480	2,449,616	5,842,759
1995	4,445,883	1,482,162	473,382	69,702	211,605	281,307	17,380	2,254,231	6,700,114
1996	5,693,523	1,649,598	400,746	250,692	252,959	503,651		2,553,995	8,247,518
1997	2,618,170	1,512,396	127,704	272,982	100,053	373,035	8,394	2,021,529	4,639,699
1998	2,961,200	1,755,768	215,904	146,250	312,624	458,874	11,120	2,441,666	5,402,866
1999	6,175,419	1,512,426	445,536	81,006	311,899	392,905	[e]	2,350,867	8,526,286
2000	6,367,208	1,300,026	413,316	129,468	274,032	403,500	[e]	2,116,842	8,484,050
2001	4,734,800	1,458,732	409,596	184,044	619,493	803,537	[e]	2,671,865	7,406,665
20-year Average	3,890,373	1,266,149	343,754	299,804	212,681	517,942	16,661	2,035,919	5,926,292
1982-91 Average	3,339,182	1,071,760	323,249	437,588	127,838	525,121	17,388	1,727,470	5,066,652
1992-01 Average	4,441,564	1,460,537	364,259	162,021	297,524	513,634	14,844	2,344,368	6,785,932
2002	2,815,875	1,283,682	123,156	68,928	246,753	315,681	[e]	1,722,519	4,538,394

[a] Tower count.

[b] Aerial survey estimates 1982-83, and 1985. Escapement estimates for 1984, 1987-88, and 1995-2002, were derived from the difference between lower river sonar Nuyakuk Tower counts. Escapement estimates for 1986 based on the average ratio of Nuyakuk/Nushagak-Mulchatna river system in years when data was available

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

[d] Aerial survey estimate 1982-91, 1994-95 and 1997; weir count not surveyed in 1992, 1993 or 1996 due to lack of funding.

[e] Snake River escapement is not included this year beacause staff was unable to conduct aerial surveys.

Appendix Table 17. Inshore sockeye salmon total run by river system, in thousands of fish and percent, Nushagak District, 1982-2002.

Year	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		Total Run[a]
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
1982	3,471	44	1,818	23	2,079	26	550	7			12	0	7,930
1983	4,272	60	813	12	1,379	20	601	9			3	0	7,068
1984	1,982	52	435	11	906	24	451	12			34	1	3,808
1985	1,593	53	460	15	697	23	208	7			35	1	2,993
1986	1,772	37	877	18	1,762	36	425	9			17	0	4,853
1987	2,828	55	617	12	589	11	1,116	22			2	0	5,152
1988	1,749	54	406	13	649	20	424	13			4	0	3,232
1989	2,519	51	1,214	25					1,217	25	28	1	4,950
1990	2,610	46	1,280	23					1,757	31	29	1	5,647
1991	3,303	44	2,424	32					1,736	23	11	0	7,463
1992	2,481	49	794	16					1,802	35			5,077
1993	3,725	49	1,580	21					2,228	30			7,533
1994	2,957	51	1,300	22					1,543	27	42	1	5,800
1995	4,022	60	1,902	28					756	11	20	0	6,680
1996	5,030	61	1,502	18					1,771	21			8,303
1997	3,480	75	293	6					858	19	8	0	4,631
1998	3,949	73	585	11					869	16			5,403
1999	5,930	70	1,563	19					952	11			8,445
2000	5,278	62	1,748	21					1,458	17			8,484
2001	3,932	54	1,323	18	184	3	1,901	26	2,085	28			7,340
20-Year Average	3,344	55	1,147	18	1,031	20	710	13	1,464	23	19	0	6,040
1982-91 Average	2,610	50	1,034	18	1,152	23	539	11	1,570	26	18	0	5,310
1992-01 Average	4,078	60	1,259	18	184	3	1,901	26	1,432	22	23	0	6,770
2002	3,692	81	208	5	69	2	569	13	638	14			4,538

[a] Due to rounding, the district total runs may not equal the sum of the rows.

Appendix Table 18. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1982-2002.

	Catch				Escapement						
					Togiak						
Year	Togiak	Kulukak	Os/Mat[a]	Total	Lake[b]	River[c]	Tributaries[d]	Kulukak[e]	Other[f]	Total	Total Run
1982	581,718	13,952	26	595,696	244,824	3,450	40,400	52,750		341,424	937,120
1983	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
1985	133,263	44,120	32,383	209,766	136,542	3,600	13,340	36,600		190,082	399,848
1986	191,158	100,466	17,064	308,688	168,384	20,000	15,000	42,800	25,000	271,184	579,872
1987	274,613	45,401	22,718	342,732	249,676	10,400	18,200	37,800		316,076	658,808
1988	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
1990	168,688	27,311	1,590	197,589	141,977	17,540	29,605	49,600	39,480	278,202	475,791
1991[g]	522,090	33,425	6,437	561,952	254,683	15,980	7,740	23,940	18,370	320,713	882,665
1992	610,575	108,358	7,513	726,446	199,056	6,060	10,400	26,440	25,000	266,956	993,402
1993	475,799	58,616	5,518	539,933	177,185	4,600	11,330	31,800	17,560	242,475	782,408
1994	321,121	76,781	2,137	400,039	154,752	6,200	13,220	29,740	29,720	233,632	633,671
1995	527,143	76,056	2,129	605,328	185,718	6,520	18,988	14,620	14,420	240,266	845,594
1996	381,539	76,833	1,691	460,063	156,954	18,320	11,900	18,980	6,370	212,524	672,587
1997	91,847	49,277	2,976	144,100	131,682	12,300	8,325	7,950	6,370	166,627	310,727
1998	112,739	76,332	1,375	190,446	153,576	9,780	12,120	12,950	26,200	214,626	405,072
1999	346,749	38,662	0	385,411	155,898	10,800	29,438	12,300	22,760	231,196	616,607
2000	727,384	67,612	0	794,996	311,970	25,200	15,075	22,350	15,485	390,080	1,185,076
2001[h]	798,426	9,762	1,908	810,096	296,676	6,520	150	17,280	17,990	338,616	1,148,712
20-Year Average	387,481	60,640	6,610	454,732	188,381	11,715	16,351	28,361	20,363	258,043	712,775
1982-91 Average	335,630	57,452	10,696	403,778	184,415	12,800	19,607	37,280	27,617	262,386	666,164
1992-01 Average	439,332	63,829	2,525	505,686	192,347	10,630	13,095	19,441	18,188	253,700	759,386
2002	228,161	19,112	537	247,810	162,402	4,100	12,075	8,500	12,430	199,507	447,317

[a] Catches in the Osviak and Matogak sections were combined.

[b] Tower count.

[c] Aerial survey estimate.

[d] Aerial survey estimate includes Gechiak, Pungokepuk, Kemuk, Nayorurun, and Ongivinuck River systems. Aerial survey estimates prior to 1986 also include Ungalikthluk, Negukthluk, Matogak, Osviak, and other miscellaneous river systems when surveyed.

[e] Aerial survey estimate includes Kulukak River and Lake and Tithe Creek ponds.

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

[g] Catches are based on weekly processor reports. Fish tickets were not coded by section.

[h] Only the Ongivinuk River was surveyed in 2001 for sockeye escapement in tributaries.

Appendix Table 19. Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1982-2002.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1982	7,535,494	3,482,142	2,324,743	7,928,929	937,120	22,208,428
1983	26,113,868	7,547,538	4,350,809	7,068,218	827,818	45,908,251
1984	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
1985	17,358,107	8,632,477	7,475,269	2,992,649	399,848	36,858,350
1986	6,279,318	6,004,685	6,018,531	4,853,803	579,872	23,736,209
1987	12,267,898	6,630,222	2,815,546	5,150,681	658,808	27,523,155
1988	8,778,544	8,055,759	2,177,932	3,231,420	1,162,799	23,406,454
1989	23,486,200	10,513,560	4,859,520	4,977,686	214,012	44,050,978
1990	26,503,582	12,563,344	2,898,487	5,676,987	475,791	48,118,191
1991	18,554,091	9,584,091	5,427,743	7,473,333	869,934	41,909,192
1992	15,953,105	17,592,207	5,515,893	5,076,019	993,402	45,130,626
1993	14,816,675	23,117,858	5,590,354	7,533,346	782,408	51,840,641
1994	25,899,103	12,645,190	5,447,865	5,842,759	633,671	50,468,588
1995	31,645,154	15,708,487	5,830,554	6,700,114	845,594	60,729,903
1996	11,047,409	11,884,711	5,103,222	8,247,518	672,587	36,955,447
1997	3,336,822	8,621,393	2,059,331	4,639,699	310,727	18,967,972
1998	6,345,885	4,639,777	1,655,127	5,402,866	405,051	18,448,706
1999	17,738,850	9,116,477	3,918,049	8,445,280	615,114	39,833,770
2000	8,381,629	8,061,535	2,177,210	8,484,050	1,079,629	28,184,053
2001	8,473,246	3,841,534	1,346,877	7,339,116	1,122,439	22,123,212
20-Year Average	15,850,510	9,729,937	4,046,088	6,043,592	705,476	36,375,604
1982-91 Average	17,337,233	7,936,958	4,227,727	5,316,107	664,891	35,482,916
1992-01 Average	14,363,788	11,522,917	3,864,448	6,771,077	746,062	37,268,292
2002	3,711,084	5,639,017	2,481,257	4,538,394	447,317	16,817,069

Appendix Table 20. Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1982-2002.

	Harvests by Fishery				Inriver	Spawning	
Year	Commercial	Sport	Subsistence	Total	Abundance[a]	Escapement[b]	Total Run
1982	195,287	1,803	12,100	209,190		147,000	356,190
1983	137,123	2,003	11,800	150,926		161,730	312,656
1984	61,378	2,320	9,800	73,498		80,940	154,438
1985	67,783	1,838	7,900	77,521		115,720	193,241
1986	65,783	4,790	12,600	83,173	43,434	33,854	117,027
1987	45,983	4,458	12,200	62,641	84,309	75,891	138,532
1988	16,648	2,817	10,079	29,544	56,905	50,946	80,490
1989	17,637	3,613	8,122	29,372	78,302	72,601	101,973
1990	14,812	3,486	12,407	30,705	63,955	55,931	86,636
1991	19,718	5,551	13,627	38,896	104,351	94,733	133,629
1992	47,563	4,755	13,588	65,906	82,848	74,094	140,000
1993	62,976	5,899	17,709	86,584	97,812	86,706	173,290
1994	119,480	10,626	15,490	145,596	95,954	83,103	228,699
1995	79,943	4,951	13,701	98,595	85,622	77,018	175,613
1996	72,011	5,390	15,941	93,342	52,127	42,228	135,570
1997	64,156	3,497	15,318	82,971		82,000	164,971
1998	117,079	5,827	12,258	135,164	117,495	108,037	243,201
1999	10,893	4,237	10,057	25,187	62,331	54,703	79,890
2000	12,055	6,017	9,470	27,542	56,374	47,674	75,216
2001	11,568	5,899	26,939	44,406	99,155	82,672	127,078
20-Year Average	61,994	4,489	13,055	79,538	78,732	81,379	160,917
1982-91 Average	64,215	3,268	11,064	78,547	71,876	88,935	167,481
1992-01 Average	59,772	5,710	15,047	80,529	83,302	73,824	154,353
2002	39,382	5,000 [c]	11,281	55,663	87,141	78,290	133,953

[a] Inriver abundance estimated by sonar below the village of Portage Creek.

[b] Spawning escapement estimated from the following: 1997 - comprehensive aerial surveys. 1982-85 - correlation between index counts and total escapement estimates when aerial surveys were complete. 1986-96,98-01 - Inriver abundance estimated by sonar minus inriver harvests. Estimates for 1982-85 are rounded to the nearest thousand fish.

[c] Guide line harvest level used as estimate.

Appendix Table 21. Chinook salmon harvest, escapement and total runs in the Togiak District, in numbers of fish, Bristol Bay, 1982-2002.

Year	Harvests by Fishery				Spawning	Total
	Commercial	Sport	Subsistence	Total	Escapement[a]	Run
1982	33,786	231	400	34,417	17,000	51,417
1983	38,497	535	700	39,732	22,000	61,732
1984	22,179	87	600	22,866	26,000	48,866
1985	37,106	224	600	37,930	14,000	51,930
1986	19,880	525	700	21,105	8,000	29,105
1987	17,217	137	700	18,054	11,000	29,054
1988	15,606	0	429	16,035	10,000	26,035
1989	11,366	234	551	12,151	10,540	22,691
1990	11,130	172	480	11,782	9,107	20,889
1991	6,039	284	470	6,793	12,667	19,460
1992	12,640	271	1,361	14,272	10,413	24,685
1993	10,851	225	784	11,860	16,035	27,895
1994	10,486	663	904	12,053	19,353	31,406
1995	11,981	581	448	13,010	16,438	29,448
1996	8,602	790	471	9,863	11,476	21,339
1997	6,114	1,165	667	7,946	11,495	19,441
1998	14,131	763	782	15,676	11,666	27,342
1999	11,919	644	1,244	13,807	12,263	26,070
2000	7,858	470	1,116	9,444	16,897	26,341
2001	9,937	1,006	1,612	12,555	15,185	27,740
20-Year Average	15,866	450	751	17,068	14,077	31,144
1982-91 Average	21,281	243	563	22,087	14,031	36,118
1992-01 Average	10,452	658	939	12,049	14,122	26,171
2002	2,765	600 [b]	703	4,068	14,265	18,333

[a] Spawning escapement estimated from comprehensive aerial surveys. Estimates for 1982-1988 are rounded to the nearest thousand fish.

[b] Estimate.

Appendix Table 22. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1982-2002.[a]

	Nushagak District			Togiak District		
Year	Catch	Escapement [b]	Total Run	Catch	Escapement [c]	Total Run
1982	434,817	256,000	690,817	151,000	86,000	237,000
1983	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
1985	396,740	288,000	684,740	203,302	212,000	415,302
1986	488,375	168,275	656,650	270,057	330,000	600,057
1987	416,476	147,433	563,909	419,425	361,000	780,425
1988	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
1990	378,223	329,793	708,016	102,861	67,460	170,321
1991	463,780	287,280	751,060	246,589	149,210	395,799
1992	398,691	302,678	701,369	176,123	120,000	296,123
1993	505,799	217,230	723,029	144,869	98,470	243,339
1994	328,267	378,928	707,195	232,559	229,470	462,029
1995	390,158	212,612	602,770	221,126	163,040	384,166
1996	331,414	225,331	556,745	206,226	117,240	323,466
1997	185,620	61,456	247,076	47,459	106,580	154,039
1998	208,551	299,443	507,994	67,408	102,455	169,863
1999	170,795	242,312	413,107	111,677	116,183	227,860
2000	110,904	141,323	252,227	141,392	80,860 [d]	222,252
2001	526,602	564,373	1,090,975	211,701	252,610	464,311
20-Year Average	410,274	260,620	670,894	214,322	175,873	390,195
1982-91 Average	504,868	256,671	761,540	272,590	213,056	485,646
1992-01 Average	315,680	264,569	580,249	156,054	138,691	294,745
2002	270,701	419,969	690,670	119,282	154,360	273,642

[a] Escapement estimates supersede those previously reported.

[b] Escapements were estimated from the following: 1982-00- adjusted sonar estimates from Protage Creek site. Estimates for 1982-85 are rounded to the nearest thousand fish.

[c] 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 1982-88 rounded to the nearest thousand fish.

[d] No escapement counts were made for the Togiak River.

Appendix Table 23. Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1958-2002. [a]

		Escapement							
Year	Catch	Wood[b]	Igushik[c]	Nuyakuk[d]	Nush/Mul[e]	Nushagak[f]	Snake[g]	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
1962	880,424	25,000	12,000	493,914	6,100		6,000	543,014	1,423,438
1964	1,497,817	1,560	450	883,500	25,000		50	910,560	2,408,377
1966	2,337,066			1,442,424				1,442,424	3,779,490
1968	1,705,150			2,161,116				2,161,116	3,866,266
1970	417,834			152,580				152,580	570,414
1972	67,953			58,536				58,536	126,489
1974	413,613	44,800	7,500	529,216	3,100		900	585,516	999,129
1976	739,590	21,986	5,070	794,478	41,800		100	863,434	1,603,024
1978	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
1982	1,339,272	36,100	8,430	1,592,096	19,130		900	1,656,656	2,995,928
1984	3,127,153	81,400	6,190	2,760,312	73,050		5,500	2,926,452	6,053,605
1986	267,117					72,189		72,189	339,306
1988	243,890					494,610		494,610	738,500
1990	54,127					801,430		801,430	855,557
1992	190,102					[h]			
1994	7,337					191,772		191,772	199,109
1996	2,681					821,312		821,312	823,993
1998	6,808	942				132,402		133,344	140,152
2000	38,309					135,285		135,285	173,594
Average [i]	994,356	49,771	7,419	1,823,759	132,848	378,429	2,217	1,374,837	2,446,136
2002	234					317,659		317,893	

[a] Includes even-years only.

[b] Aerial survey estimate 1962 and 1974-84; tower count 1964.

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

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

[e] Aerial survey estimate.

[f] Sonar estimate from Portage Creek.

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

[h] No escapement estimate. Sonar project terminated early due to budget constraints.

[i] Only years and systems with escapement data were included in averages.

Appendix Table 24. Coho salmon harvest, escapement and total runs in the Nushagak Drainage, in numbers of fish, Bristol Bay, 1982-2002.

	Harvests by Fishery						Inriver	Spawning	Total
	Commercial	Subsistence[a]			Sport	Total	Run[b]	Escapement[c]	Run
Year	Harvest	Lower	Upper	Total	Total	Harvest			
1982	349,669	4919	3,125	8,044	503	358,216	302,647	299,019	657,235
1983	81,338	4002	878	4,880	1,498	87,716	41,669	39,293	127,009
1984	260,310	5885	1,564	7,449	473	268,232	142,841	140,804	409,036
1985	20,230	4360	1,646	6,006	130	26,366	89,862	88,086	114,452
1986	68,568	6533	2,617	9,150	1,576	79,294	52,722	48,529	127,823
1987	13,263	4149	1,209	5,358	1,007	19,628	24,923	22,707	42,335
1988	52,698	3515	1,112	4,627	557	57,882	134,069	132,400	190,282
1989	77,077	6971	1,159	8,130	2,392	87,599	84,628	81,077	168,676
1990	7,733	4856	766	5,622	438	13,793	141,704	140,500	154,293
1991	5,574	8915	1,275	10,190	874	16,638	42,965	40,816	57,454
1992	84,077	4962	1,534	6,496	752	91,325			91,325
1993	14,345	4463	387	4,850	194	19,389	42,742	42,161	61,550
1994	5,615	4302	406	4,708	1,143	11,466	82,019	80,470	91,936
1995	4,896	3233	478	3,711	725	9,332	46,340	45,137	54,469
1996	11,401	3603	1,080	4,683	3,488	19,572	187,028	182,460	202,032
1997	4,110			3,433	500	8,043	43,369	42869	50,912
1998	22,703	201	254	455	1,368	24,526	104,948	103194	127,720
1999	2,836	3,054	244	3,298	618	6,752	34,853	33,991	40,743
2000	112,819	3,811	768	4,579	2,219	119,617	213,062	210,075	329,692
2001	3,218	4,851	612	5,463	2,357	11,038	75,961	72,992	84,030
20-Year Average	60,124	4,557	1,111	5,557	1,141	66,821	99,387	97,188	159,150
1982-91 Average	93,646	5,411	1,535	6,946	945	101,536	105,803	103,323	204,859
1992-01 Average	26,602	3,609	640	4,168	1,336	32,106	92,258	90,372	113,441
2002	84			4,565	700 [d]	5,349	52,194	51,494	56,843

[a] Subsistence harvest estimated by expanding fishing permit returns; excludes estimates for the communities of Manokotak and Wood River. Estimates for 1982-1986 were based on community where permit was issued: 1987 based on community where permit issued and Nushagak watershed fishing site: 1988-present on community of residence and watershed fishing site.

[b] In river run estimated by sonar; sonar estimates expanded for years that terminated prior to August 25.

[c] Spawning escapement estimated by sonar minus sport and subsistence harvests upriver of Portage Creek sonar site.

[d] Estimate based on run strength. Final numbers not available at this time.

Appendix Table 25. Coho salmon harvest by fishery, escapement and total runs for the Togiak River, in numbers of fish, Bristol Bay, 1982-2002.

Year	Harvests by Fishery				Spawning	Total
	Commercial	Subsistence[a]	Sport	Total	Escapement[b]	Run
1982	108,000	1,300	524	109,824	69,900	179,724
1983	4,977	800	829	6,606		
1984	111,631	3,800	1,154	116,585	60,840	177,425
1985	35,765	1,500	0	37,265	33,210	70,475
1986	28,030	500	2,851	31,381	21,400	52,781
1987	1,284	1,600	183	3,067	16,000	19,067
1988	8,744	792	1,238	10,774	25,770	36,544
1989	35,814	976	416	37,206		
1990	2,296	1,111	367	3,774	21,390	25,164
1991	4,262	1,238	87	5,587	25,260	30,847
1992	3,918	1,231	251	5,400	80,100	85,500
1993	12,613	743	330	13,686		
1994	88,522	910	531	89,963		
1995	8,910	703	408	10,021		
1996	58,369	199	1,382	59,950	64,980	124,930
1997	2,976	260	780	4,016	20,625	24,641
1998	52,783	310	1,020	54,113	25,335	79,448
1999	2,653	217	1,109	3,979	3,855	7,834
2000	2,758	342	840	3,940		
2001	3,218	388	904	4,510		
20-Year Average	28,876	946	760	30,582	36,051	70,337
1982-91 Average	34,080	1,362	765	36,207	34,221	74,003
1992-01 Average	23,672	530	756	24,958	38,979	64,471
2002	739	241	756 [c]	1,736		

[a] Subsistence harvest estimated by expanding permit returns; Estimates for 1982-1987 were based on community where permit was issued; 1988 - present on community of residence.

[b] Expanded estimates from aerial surveys.

[c] Estimate.

Appendix Table 26. Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1982-2002.[a]

Year	Sockeye	Chinook	Chum	Pink	Coho
1982	6.4	19.6	6.7	3.5	7.3
1983	5.7	20.9	6.6		6.6
1984	5.6	20.5	6.8	3.2	7.5
1985	5.8	17.9	6.8		8.0
1986	6.0	18.8	6.7	3.5	6.7
1987	6.0	20.5	6.5		7.0
1988	6.2	18.7	7.0	3.6	7.8
1989	5.6	19.1	6.3		7.4
1990	5.7	16.9	6.3	3.8	7.5
1991	5.7	15.9	6.4		7.3
1992	5.7	16.8	6.4	3.7	7.0
1993	6.0	17.4	6.5		6.8
1994	5.5	18.0	6.5	3.7	8.2
1995	5.5	19.8	6.3	3.6	6.7
1996	6.3	18.0	7.3	3.5	6.8
1997	6.0	16.4	7.3	3.4	6.3
1998	5.7	17.7	6.4	3.3	8.4
1999	5.3	14.3	6.7	3.2	6.4
2000	6.1	15.7	6.9	3.7	7.6
2001	6.7	17.4	8.2	2.8	7.1
20-Year Average	5.9	18.0	6.7	3.5	7.2
1982-91 Average	5.9	18.9	6.6	3.5	7.3
1992-01 Average	5.9	17.2	6.9	3.4	7.1
2002	6.1	18.2	7.1	3.8	6.8

[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 ,1992 ,1995 an 1996 data extracted from the fish ticket system.

Appendix Table 27. Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1982-2002.

Year	Sockeye	Chinook	Chum	Pink	Coho
1982	0.70	1.23	0.35	0.22	0.71
1983	0.61	0.69	0.30	0.16	0.40
1984	0.69	1.03	0.30	0.22	0.71
1985	0.85	1.02	0.31	0.20	0.71
1986	1.42	1.03	0.31	0.15	0.68
1987	1.35	1.24	0.26		0.69
1988	1.93	1.05	0.43	0.34	1.14
1989	1.07	0.80	0.26	0.17	0.67
1990 [a]	1.04	0.91	0.26	0.27	0.74
1991	0.70	0.68	0.22	0.11	0.58
1992	1.04	0.89	0.24	0.12	0.58
1993	0.62	0.76	0.21	0.11	0.52
1994	0.70	0.47	0.22	0.04	0.45
1995	0.75	0.65	0.20	0.11	0.43
1996	0.75	0.50	0.10	0.05	0.30
1997	0.85	0.55	0.10	0.05	0.46
1998	1.10	0.50	0.10	0.10	0.50
1999	0.80	0.50	0.10	0.05	0.30
2000	0.64	0.48	0.09	0.08	0.38
2001	0.40	0.30	0.11	0.07	0.39
20-Year Average	0.90	0.76	0.22	0.14	0.57
1982-91 Average	1.04	0.97	0.30	0.20	0.70
1992-01 Average	0.76	0.56	0.15	0.08	0.43
2002	0.45	0.30	0.10	0.05	0.30

[a] Price paid in Nushagak District. Bristol Bay average unavailable.

Appendix Table 28. Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1982-2002.a

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1982	68,122	6,088	2,145	1,111	3,199	80,665
1983	129,900	2,853	3,216		337	136,306
1984	94,681	2,158	4,040	2,414	3,072	106,365
1985	115,402	2,188	2,218		923	120,731
1986	135,689	1,819	2,522	207	826	141,063
1987	130,847	1,912	2,594		314	135,667
1988	168,586	891	4,418	1,171	1,792	176,858
1989	173,963	609	2,029		1,186	177,787
1990	198,897	520	1,752	508	582	202,259
1991	103,750	328	1,807		499	106,384
1992	190,368	1,029	1,359	222	767	193,745
1993	152,034	1,131	989		257	154,411
1994	138,007	1,190	1,043	15	650	140,905
1995	183,262	1,272	1,240		129	185,903
1996	139,208	788	615	7	254	140,872
1997	61,728	689	200		150	62,767
1998	62,948	1,116	294	8	521	64,887
1999	109,495	186	438		38	110,157
2000	80,331	172	236	17	363	81,119
2001	38,250	127	656		48	39,081
20 Year Average	123,773	1,353	1,691	516 [b]	795	127,897
1982-91 Average	131,984	1,937	2,674	902 [b]	1,273	138,409
1992-01 Average	115,563	770	707	54 [b]	318	117,385
2002	29,164	240	330	0	18	29,752

[a] Value paid to fishermen. Derived from price per pound times commercial catch.

[b] Includes even-years only.

Appendix Table 29. South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1982-2002.[a]

	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
Year	Actual	Quota[b]	Chum	Actual	Quota[b]	Chum	Actual	Quota[b]	Chum
1982	1,670	1,850	934	451	408	160	2,121	2,258	1,094
1983	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
1985	1,495	1,380	345	367	305	134	1,862	1,685	479
1986	314	907	252	156	200	99	470	1,107	351
1987	652	635	406	141	140	37	793	775	443
1988	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
1990	1,091	1,087	455	256	240	64	1,347	1,327	519
1991	1,216	1,573	669	333	347	102	1,549	1,920	771
1992	2,047	1,959	324	410	432	102	2,457	2,391	426
1993	2,365	2,375	382	607	524	150	2,972	2,899	532
1994	1,001	2,938	374	460	648	208	1,461	3,586	582
1995	1,451	2,987	342	653	659	195	2,104	3,646	537
1996	572	2,564	129	446	566	228	1,018	3,130	357
1997	1,179	1,840	196	449	406	126	1,628	2,246	322
1998	975	1,529	195	314	336	50	1,289	1,865	245
1999	1,106	1,024	187	269	226	58	1,375	1,250	245
2000	892	1,650	169	359	363	70	1,251	2013	239
2001	271		185	130		149	401		334
20-yr Average	1,140	1,649	363	358	364	116	1,497	2,013	479
82-91 Average	1,094	1,247	478	306	275	98	1,399	1,523	576
92-01 Average	1,186	2,096	248	410	462	134	1,596	2,558	382
2002	356		201	235		178	591		379

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

[b] The sockeye quota management system was initiated in 1974, and is based on 8.3 % of the Bristol Bay projected inshore harvest and traditional harvest patterns. This quota system was removed in 2001.

Appendix Table 30. Subsistence salmon harvest by district and species, Bristol Bay, 1982-2002.[ab]

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			NAKNEK KVICHAK DISTRICT				
1982	350	71,400	1,100	600	900	1,000	75,000
1983	385	107,900	1,000	400	300	900	110,500
1984	382	115,200	900	600	1,300	600	118,600
1985	544	107,543	1,179	540	27	1,103	110,392
1986	412	77,283	1,295	695	2,007	650	81,930
1987	407	86,706	1,289	756	490	1,106	90,347
1988	391	88,145	1,057	588	917	813	91,520
1989	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
1991	518	97,101	1,152	1,105	191	1,056	100,605
1992	571	94,304	1,444	2,721	1,601	1,152	101,222
1993	560	101,555	2,080	2,476	762	2,025	108,898
1994	555	87,662	1,843	503	460	1,807	92,275
1995	533	75,644	1,431	1,159	383	1,791	80,407
1996	540	81,305	1,574	816	794	1,482	85,971
1997	533	85,248	2,764	478	422	1,457	90,368
1998	567	83,095	2,433	784	1,063	1,592	88,967
1999	528	85,315	1,567	725	210	856	88,674
2000	562	61,817	894	560	845	937	65,053
2001	506	57,250	869	667	383	740	59,909
20 Year Average	486	87,195	1,391	886	1,092 [c]	1,186	91,377
1982-1991 Average	427	93,071	1,093	684	1,231 [c]	988	96,579
1992-2001 Average	546	81,320	1,690	1,089	953 [c]	1,384	86,174
2002	471	52,805	837	909	1,137	943	56,632
			EGEGIK DISTRICT				
1982	19	2,400					2,400
1983	14	700					700
1984	24	500		100		300	900
1985	23	582	14	21	1	203	821
1986	41	1,052	69	58	21	319	1,519
1987	49	3,350	87	139	2	284	3,862
1988	52	1,405	97	87	54	333	1,976
1989	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
1991	70	4,549	82	141	32	430	5,234
1992	80	3,322	124	270	51	729	4,496
1993	69	3,633	128	148	15	905	4,829
1994	59	3,208	166	84	153	857	4,468
1995	60	2,818	86	192	100	690	3,886
1996	44	2,321	99	89	85	579	3,173
1997	34	2,438	101	21	5	740	3,304
1998	36	1,795	44	33	52	389	2,314
1999	42	2,434	106	35	2	806	3,384
2000	31	842	16	11	0	262	1,131
2001	57	2,493	111	105	16	928	3,653
20 Year Average	46	2,129	84	92	57 [c]	528	2,790
1982-1991 Average	40	1,728	65	83	38 [c]	327	2,116
1992-2001 Average	51	2,530	98	99	68 [c]	689	3,464
2002	53	1,892	65	34	12	356	2,359

(Continued)

Appendix Table 30. (page 2 of 3).

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			UGASHIK DISTRICT				
1982	11	400				300	700
1983	8	500				100	600
1984	8	500				200	700
1985	9	233	17	7		143	400
1986	27	1,080	83	48	21	335	1,567
1987	22	892	104	51	29	272	1,348
1988	23	1,400	84	55	35	330	1,904
1989	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
1991	38	1,403	121	168	42	614	2,348
1992	37	2,348	106	79	8	397	2,938
1993	39	1,766	86	107	24	495	2,478
1994	31	1,587	126	42	38	579	2,372
1995	20	1,513	56	18	6	290	1,883
1996	26	1,247	50	21	7	298	1,623
1997	28	2,785	169	39	23	311	3,327
1998	27	1,241	59	75	82	485	1,942
1999	25	1,365	35	5	0	271	1,675
2000	31	1,927	51	34	1	467	2,481
2001	24	1,197	61	8	2	357	1,624
20 Year Average	25	1,314	76	55	39 [c]	337	1,784
1982-1991 Average	21	930	70	72	59 [c]	279	1,333
1992-2001 Average	29	1,698	80	43	27 [c]	395	2,234
2002	23	1,294	51	14	2	460	1,821
			NUSHAGAK DISTRICT				
1982	376	34,700	12,100	11,400	7,300	8,900	74,400
1983	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
1985	406	38,000	7,900	4,000	600	6,100	56,600
1986	424	49,000	12,600	10,000	5,400	9,400	86,400
1987	474	40,900	12,200	6,000	200	6,200	65,500
1988	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
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
1991	528	33,161	13,627	4,688	292	10,784	62,552
1992	476	30,640	13,588	7,076	3,519	7,103	61,926
1993	500	27,114	17,709	3,257	240	5,038	53,358
1994	523	26,501	15,490	5,055	2,042	5,338	54,426
1995	484	22,793	13,701	2,786	188	3,905	43,373
1996	481	22,935	15,941	4,704	1,573	5,217	50,370
1997	538	25,080	15,318	2,056	218	3,433	46,106
1998	562	25,217	12,258	2,487	1,076	5,316	46,355
1999	548	29,387	10,057	2,409	124	3,993	45,969
2000	541	24,451	9,470	3,463	1,662	5,983	45,029
2001	554	26,939	11,760	3,011	378	5,993	48,080
20 Year Average	478	31,852	12,296	5,682	3,867 [c]	6,291	58,212
1982-1991 Average	435	37,599	11,064	7,733	5,760 [c]	7,451	66,926
1992-2001 Average	521	26,106	13,529	3,630	1,974 [c]	5,132	49,499
2002	520	22,777	11,281	5,096	1,179	4,565	44,897

(Continued)

Appendix Table 30. (page 3 of 3).

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			TOGIAK DISTRICT				
1982	50	1,900	400	300	400	1,300	4,300
1983	38	1,900	700	900	200	800	4,500
1984	41	3,600	600	1,700	500	3,800	10,200
1985	51	3,400	600	1,000	100	1,500	6,600
1986	29	2,400	700	800	100	500	4,500
1987	46	3,600	700	1,000		1,600	6,900
1988	29	2,413	429	716	45	792	4,395
1989	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
1991	43	3,517	470	553	27	1,238	5,805
1992	40	3,716	1,361	626	135	1,231	7,069
1993	38	2,139	784	571	8	743	4,245
1994	25	1,777	904	398	77	910	4,066
1995	22	1,318	448	425	0	703	2,894
1996	19	662	471	285	59	199	1,676
1997	31	1,440	667	380	0	260	2,747
1998	42	2,211	782	412	76	310	3,791
1999	76	3,780	1,244	479	84	217	5,804
2000	54	3,013	1,116	569	90	342	5,130
2001	92	4,162	1,612	367	61	388	6,590
20 Year Average	42	2,673	751	658	154 [c]	946	5,135
1982-1991 Average	40	2,924	563	865	221 [c]	1,362	5,868
1992-2001 Average	44	2,422	939	451	87 [c]	530	4,401
2002	36	2,319	703	605	10	241	3,878
			TOTAL BRISTOL BAY AREA				
1982	806	110,800	13,700	12,400	8,600	11,500	157,000
1983	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
1985	1,033	149,758	9,710	5,568	728	9,049	174,813
1986	933	130,815	14,747	11,601	7,549	11,204	175,916
1987	998	135,493	14,356	7,895	689	9,453	167,886
1988	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
1990	1,042	131,701	13,976	9,683	4,434	8,367	168,161
1991	1,197	139,731	15,452	6,655	584	14,122	176,544
1992	1,204	134,330	16,623	10,772	5,314	10,612	177,651
1993	1,206	136,207	20,787	6,559	1,049	9,206	173,808
1994	1,193	120,735	18,529	6,082	2,770	9,491	157,607
1995	1,119	104,086	15,722	4,580	677	7,378	132,443
1996	1,110	108,470	18,136	5,915	2,518	7,775	142,813
1997	1,166	116,991	19,159	2,974	668	6,201	145,992
1998	1,234	113,560	15,576	3,792	2,349	8,093	143,368
1999	1,219	122,281	13,009	3,653	420	6,143	145,506
2000	1,219	92,050	11,547	4,637	2,599	7,991	118,824
2001	1,226	92,041	14,412	4,158	839	8,406	119,856
20 Year Average	1,076	125,165	14,586	7,358	5,190 [c]	9,240	159,311
1982-1991 Average	963	136,256	12,821	9,404	7,270 [c]	10,350	172,835
1992-2001 Average	1,190	116,407	16,268	5,434	3,110 [c]	8,674	148,583
2002	1,093	81,088	12,936	6,658	2,341	6,565	109,587

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

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

[c] Includes even years only.

Appendix Table 31. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1982-2002. [a] [b]

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna-Newhalen[e]	Nondalton	Port Alsworth	Other [f]	Total
1982	5,400	1,900	8,200	16,600	13,500	11,200	4,500		61,300
1983	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	4,600		100,500
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500		86,500
1986	6,400	1,600	6,700	18,300	17,000	6,600	3,300		59,900
1987	5,700	[c]	7,300	16,500	27,500	11,800	3,200		72,000
1988	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
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	1,400	76,600
1991	1,029	1,712	9,739	17,184	29,094	4,163	2,755	1,110	66,786
1992	4,374	1,056	6,932	11,477	29,633	13,163	2,954	2,559	72,148
1993	4,699	1,397	6,226	18,810	19,067	17,890	3,254	2,780	74,123
1994	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,284	64,343
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	3,441	54,679
1996	1,120	2,309	5,219	14,011	14,787	11,856	3,263	2,307	54,872
1997	1,062	2,067	5,501	8,722	19,513	17,194	2,348	3,101	59,508
1998	2,454	1,659	3,511	10,418	16,165	13,136	2,678	3,635	53,656
1999	1,276	1,608	5,005	10,725	14,129	17,864	4,282	2,834	57,723
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	2,720	36,990
2001	908	779	2,118	9,447	8,132	7,566	1,958	1,901	32,808
20 Year Ave.	3,696	2,009	6,829	14,788	19,309	15,186	3,303	2,589	66,472
1982-91 Ave.	5,133	2,702	8,614	17,478	22,239	17,366	3,616	1,255	76,859
1992-01 Ave.	2,258	1,455	5,043	12,097	16,379	13,006	2,990	2,856	56,085
2002	625	2,138	2,687	9,847	9,417	5,508	1,201	1,578	33,001

[a] Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates from 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.

[e] Includes Chekok

[f] Subsistence harvests by non-Kvichak River watershed residents.

Appendix Table 32. Subsistence salmon harvest by community in numbers of fish, Nushagak District, Bristol Bay, 1982-2002.[ab]

Year	Dillingham[e]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other[f]	Total
1982	24,700	2,900	2,400	7,500	22,600	14,300		74,400
1983	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
1985	22,900	3,600	1,600	7,000	14,500	6,800		56,400
1986	31,900	5,500	6,900	7,800	26,400	8,200		86,700
1987	33,500	5,900	3,100	6,400	11,400	4,900		65,200
1988	29,600 [d]	5,500	2,400	6,100	11,700	5,700		61,000
1989	31,800 [d]	5,800	2,000	4,700	9,700	3,800		57,800
1990	28,860 [d]	6,600	2,300	4,900	9,900	8,000	700	61,260
1991	34,399 [d]	5,873	3,043	4,532	8,326	5,438	2,163	63,774
1992	31,702 [d]	4,317	2,184	5,971	11,325	3,708	2,635	61,842
1993	25,315 [d]	3,048	2,593	2,936	12,169	4,180	2,538	52,779
1994	30,145 [d]	3,491	2,289	4,343	8,056	4,513	2,322	55,159
1995	24,998 [d]	2,453	1,468	2,046	6,911	2,983	2,406	43,265
1996	27,161 [d]	3,883	1,733	2,866	8,892	3,319	2,113	49,967
1997	23,255 [d]	3,988	1,989	1,797	6,427	4,179	4,598	46,233
1998	24,072 [d]	4,069	1,112	3,555	5,419	3,166	4,958	46,351
1999	26,502 [d]	3,413	1,532	1,805	4,556	2,772	5,389	45,969
2000	27,931 [d]	3,173	1,111	3,946	3,715	2,792	2,362	45,029
2001	26,435 [d]	3,700	2,129	2,218	7,294	2,209	4,096	48,080
20 Year Ave.	27,789	4,330	2,319	4,671	11,224	6,068	3,023	58,215
1982-91 Ave.	28,826	5,107	2,824	6,193	14,973	8,754	1,432	66,963
1992-01 Ave.	26,752	3,553	1,814	3,148	7,476	3,382	3,342	49,467
2002	25,004 [d]	3,254	1,517	2,735	6,043	3,098	3,247	44,897

[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 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.

[e] Includes the village of Portage Creek and Clarks Point.

[f] Subsistence harvests by non-watershed residents.

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INTRODUCTION

This report reviews stock assessment activities, provides an overview of the Togiak District herring fishery from 1978 to 2001 and summarizes the 2002 season.

The Bristol Bay area includes all waters south of a line, extending west from Cape Newenham, east of the International Date Line in the Bering Sea and north of a line extending west from Cape Menshikof. The Bristol Bay area is divided into three herring fishing districts. The Bay District; including all waters east of the longitude of Cape Newenham, the Togiak District; including all waters between the longitude of Cape Newenham and the longitude of Cape Constantine, and the General District; including all waters west of the longitude of Cape Newenham. Togiak District spans approximately 192 km (Figure 1). Togiak village lies at the center of the district, 108 km west of Dillingham.

Pacific herring (*Clupea harengus pallasi*) have been documented throughout Bristol Bay, but the major concentration returns to the Togiak area each spring as the focus of herring sac roe and spawn-on-kelp fisheries. In Togiak District, herring are commercially harvested for sac roe using gillnets and purse seines while herring spawn on rockweed kelp *(Fucus distichus)* is harvested by hand.

The herring sac roe fishery began in Togiak District in 1967, followed by the first fishery for spawn on kelp in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. 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 rapid expansion of the Togiak herring fishery in 1977.

The Togiak herring fishery is the largest in Alaska. From 1979 to 2001, sac roe harvests averaged approximately 20,000 tons, worth an average of over $8 million annually. Spawn-on-kelp harvests, which have occurred in only 6 of the last 10 years, have averaged 365,000 lbs., worth about $329,000 to permit holders (Appendix Tables 6 & 7). In 2002, sac roe harvests brought $1.9 million to permit holders, which was a decline in value of the fishery from recent years. The spawn-on-kelp fishery was worth only $20 thousand.

STOCK ASSESSMENT

Methods

Since 1978, the department has conducted aerial surveys throughout the herring spawning migration to estimate abundance, timing and distribution of Pacific herring in the Togiak District. Surveys are conducted regularly from mid-April through May each year. Once herring are observed, surveys are conducted daily, weather permitting, until biomass declines and spawning activity subsides.

Aerial survey techniques used in Togiak have remained largely unchanged since 1978 and are described in Lebida and Whitmore (1985). Herring school surface area is estimated through a handheld tube with a measured grid and a known focal length from a known altitude. 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 ft^2 of surface area are applied to herring school surface areas to estimate the total biomass observed during each flight.

Volunteer test fisheries, originally implemented by the department to estimate roe quality, provide samples for age, size and sex composition analysis. Samples are also collected from commercial harvest for age composition and size analysis. After the season, results are used to revise biomass estimates.

Spawning Population

The status of the Togiak herring population is considered to be stable or showing a nominal decline. Annual biomass estimates range from 69,000 tons observed in 1980 to 239,000 tons documented in 1979 (Appendix Table 5). Abundance was estimated to be high in the late 1970's, declined in mid 1980's and remained relatively low and stable through 1991. Biomass levels from 1992 to 1994 increased to levels between 150,000 and 200,000 tons and estimates since 1995 range from 121,000 to 156,000 tons documented during the 1999 season.

From 1983 to 2000, herring were generally first observed in the district in early May, but were observed entering near shore areas as early as April 22 and as late as June 3. Biomass typically increases rapidly and peaks within 1 to 7 days of the first observation. In recent years, biomass declined rapidly following the peak observation, but herring continued to enter and exit the district for several weeks. Except for 2 years, spawn was first observed any time within 3 days of the first herring observation. Similar to trends observed for biomass, spawning in all but 2 years accelerated rapidly, peaked from 1 to 4 days after the first occurrence of spawn, then rapidly subsided. Small “spot” spawns have been observed as late as June 14.

Herring ages-2 through 20 have been observed in the Togiak District but herring generally recruit into the fishery at age-5. Herring abundance is related to year class survival. Two major recruitment events have occurred since the State began monitoring the biomass in 1978. The 1977 and 1978 year classes recruited into the fishery in 1982 and 1983 and comprised a substantial component of the biomass until the early 1990’s. Other lesser recruitment events have occurred since that time with the most recent being in 1993 appearing as age-7 herring in the 2001 season.

FISHERY OVERVIEW

Sac Roe Herring Fishery

Fishing and Industry Participation

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. Since fishing effort is not limited, effort levels can vary substantially each year. Herring market conditions are one of the leading factors influencing effort, but other factors also affect fleet size. Salmon and other markets indirectly affect effort in the herring fishery because the majority of participants in the Togiak sac roe herring fishery participate in salmon fisheries in Bristol Bay as well as other fisheries around Alaska. Herring prices paid to participants the prior year and run timing also influence effort.

Fishing effort in the sac roe fishery increased through the late 1980's (Appendix Table 1). Gillnet effort rose to over 300 vessels in 1989 then declined to the lowest levels observed since the inception of the fishery in 1993. With roe quality and marketability increasing, gillnet effort increased substantially to a peak gillnet effort of 461 vessels in 1996. Purse seine effort increased steadily from 1978 through 1989, when 310 vessels were observed. Since 1990, the purse seine fleet has decreased from approximately 300 vessels down to less than 100 vessels in the last 3 years. Gillnet vessels comprised the majority of the sac roe effort from 1978 to 1990 and more recently since 1996.

The Alaska Board of Fisheries reduced gear to limit harvesting capacity and control problems with waste. Prior to 1989, gillnet length was restricted to 150 fathoms. Permit holders were restricted to the use of one legal limit of gear, but up to 300 fathoms could be operated from a fishing vessel. Under these allowances, lost and abandoned nets accounted for substantial waste during some years. In 1989, the Board reduced the gillnet length limit to 100 fathoms per permit holder, disallowed the operation of more than one legal limit of gear from one vessel, and granted the Department the authority to reduce gillnet length to 50 fathoms inseason by emergency order. Gillnet depth remains unrestricted. In October 1989, the Board reduced purse seine length to 100 fathoms. In 1995, the Board restricted purse seine depth to 625 meshes, of which 600 could be no larger than one and one-half inches. These gear restrictions have helped reduce waste, control harvest and improve product quality for both gear types.

The Department first restricted herring gillnet length to 50 fathoms by emergency order in 1992 to maintain an orderly fishery, help ensure roe quality and minimize potential waste. From 1994 to 1997, gear length was restricted to 50 fathoms by emergency order during all gillnet openings. These restrictions appeared to control waste and preserve orderliness in the fishery without reducing harvesting capacity. In the fal1 of 1997, the Board restricted the length of a single herring gillnet and/or aggregate length of herring gillnets operated by a permit holder to 50 fathoms. However, through emergency order, the Department may allow use of 100 fathom gillnets.

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. Since 1987, the number of companies purchasing sac roe herring in Togiak has fluctuated but has shown a general decline with 8 companies participating in 2002. Since 1990, processing capacity reached a peak in 1996 of 4,850 tons per day and has since declined to 1,920 tons per day in 2002.

Harvest and Management Performance

The commercial sac roe and spawn-on-kelp harvests in the Togiak District have been regulated by emergency order since 1981. From 1981 to 1987, informal policies directed the department to ensure that minimum threshold biomass levels were observed before opening the herring fishery, and to manage the fishery so that exploitation did not exceed 20%. In 1988, the Board incorporated the threshold and exploitation rate policies into the Bering Sea Herring Fishery Management Plan (5 AAC 27.060) for Togiak and other Bering Sea fisheries. Herring biomass in Togiak has been estimated at levels well above threshold requirements since 1981.

Management of the Togiak fisheries has consistently limited overall exploitation to 20% or less of the estimated biomass. Annual exploitation rates slightly exceeded 20% in 1980, 1982, 1991, 1996 and 1998, but were at or below the maximum of 20% for all other years since 1981 (Appendix Table 2). Annual exploitation ranged from 22.3% to 7.9% and averaged 18% for the same period. Although the sac roe, spawn-on-kelp and Dutch Harbor food and bait fisheries take Togiak herring, only the sac roe harvests were used in calculating exploitation rates from 1981 to 1983. Estimates of herring biomass equivalent to spawn-on-kelp harvests and harvests in the Dutch Harbor fishery were not included when calculating exploitation rates until 1984 and 1988.

Herring purse seine and gillnet sac roe harvests are managed for allocation guidelines set forth in the Bristol Bay Herring Management Plan (BBHMP) (5 AAC 27.865). This plan states that, before opening the sac roe fishery, 1,500 short 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. After the spawn-on-kelp and the Dutch Harbor harvests are subtracted, the remaining harvestable surplus is allocated to the Togiak sac roe fishery: 30% of the harvestable surplus to the gillnet fleet, and 70% to the purse seine fleet. From 1988 through 2000, these percentages were set at 25% gillnet, 75% purse seine. The Board modified these allocation percentages to the current ratio in 2001. To achieve gillnet and purse seine ratios, the Department adjusts fishing time and area for each gear type.

The Board of Fisheries and the industry have directed the Department to give product quality and fishery value an equal priority with exploitation objectives. Management Guidelines for Commercial Herring Sac Roe Fisheries (5 AAC 27.059) state the Department may manage sac roe fisheries to enhance product value by opening areas in which sampling has demonstrated high herring roe content and large herring size, and to minimize harvest of recruit size herring. The BBHMP also states that the primary objective in the sac roe fishery is to prosecute an orderly, manageable fishery while striving for the highest level of product quality and a minimum of waste. Given these regulations and comments from industry, the Department considers maximizing quality and value primary objectives in the Togiak fishery.

The Department has used volunteer test fishing as a means to maximize roe harvest quality since 1982. Test fishing procedures developed and became more organized and systematic from 1982 to 1989. By 1990, the Department had established standard test fishing areas and sample sizes, coordinated test fishing start times between areas, coordinated and assisted in transporting samples to roe technicians and established criteria required for opening an area. Since then, the Department has opened to commercial fishing only areas that have documented high quality roe.

Standardizing and streamlining test fishing procedures resulted in reduced turnaround time for sample results, reduced time required between test fishing and opening an area to commercial fishing and helped ensure high mature roe percentages in harvests. From 1979 to 2000, gillnet harvests averaged approximately 9.3% mature roe. Purse seine harvests for this period averaged 9.5% mature roe (Appendix Table 1). Overall gillnet harvest area has gradually been reduced since the late 1980's and early 1990's due to lack of complete test fishing coverage or poor quality results in some areas of the district. From 1994 to 2001, gillnet fishing was opened almost exclusively in the area between Right Hand Point and Kulukak Bay. This reduction in area increases competition among the gillnet fleet, especially when fishing effort is high.

Unlike purse seine harvest quality, mature roe percent in gillnet harvests increased substantially in 1993. Mature roe content in gillnet harvests from 1993 to 1997 averaged over 3% higher than harvests from 1981 to 1992, and ranged from 10 to 12.5%. This difference may partially be attributed to management efforts, but is primarily due to an apparent shift to larger gillnet mesh sizes. Prior to 1993, gillnets with mesh sizes smaller than 3 inches (stretched) were common. Gillnets with 3 1/8-inch mesh and larger have since become standard gear. This shift to larger mesh appears to have increased the percentage of female herring caught by herring gillnets from 44% (1982-1992) to 57% (1993-1996) to 59% (1997-2000).

In 1992, over 20,000 tons of herring were harvested by purse seines in one 20-minute period. This magnitude combined with a limited processing capacity resulted in holding times up to 7 days and large-scale deterioration of flesh and roe quality in the 1992 harvest. Increasing demand for high quality product and recognition by the Department and industry of the deterioration in quality associated with extended holding times led to the Department adding holding time to quality criteria for management purposes. Limiting individual harvests not to exceed 3 days of processing capacity became a management objective since 1993. The Board addressed this issue in 1995 by reducing the allowable depth of purse seine gear.

To provide harvest opportunity, while controlling purse seine harvest rate, requires intensive management by the Department to account for rapid changes in biomass distribution and other factors affecting harvest capacity. Since 1995, the Department initially limited the area considered for an opening using test fish results. Aerial surveys were then conducted over a limited area immediately prior to scheduled announcement times, to assess the harvesting capacity of the fleet. Management decisions for time and area were primarily based on aerial survey assessment. Fishing duration announcements occurred with minimal (1 hour or less) notice.

The impact of reducing purse seine depth and fishing areas on product quality is difficult to measure. However, these two factors have controlled individual period harvests to a level that has not exceeded 3 days of production capacity since 1995. Industry comments suggest that the gear and area limitations strongly contributed to higher product quality and value. Limiting harvests

during individual fishing periods resulted in a larger number of openings over a longer time period. Purse seine fishing time from 1988 to 1992 totaled less than 10 hours. Fishing time totaled 75.5 hours from 1993 to 1998. Area limitations also heightened competition within the purse seine fleet.

Spawn -on-Kelp Fishery

Similar to the sac roe fishery, the spawn-on-kelp harvest in the Togiak District has been regulated by emergency order since 1981. Since 1984, the spawn-on-kelp fishery was managed under guidelines provided in 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 1) rotate harvest areas (Figure 2) on a 2 to 3 year basis; 2) ensure product quality; and 3) include the herring equivalent to the spawn-on-kelp harvest when calculating exploitation.

Fishing effort in the spawn-on-kelp fishery increased steadily since its inception, and peaked at 532 participants in 1991 (Appendix Table 4). The fishery became limited to interim use and permanent permit holders in 1990. Following the 1991 season, the Board limited the role of non-permit holders in the spawn-on-kelp fishery to assisting with transporting kelp after the period closure. By 1993, most permits issued for this fishery became permanent, stabilizing the number of permits at approximately 300.

From 1984 to 2001, the fishery was opened for all years except 1985, 1997, 1998, 2000 and 2001. Actual harvests exceeded the 350,000-lb. guideline harvest level by more than 10% in six years and fell short in three (Appendix Table 7). For the four other years in which a fishery occurred, actual harvests were within 10% of the guideline. The 2 to 3 year rotation schedule for kelp harvest areas was adhered to in all years except 1987. In 1987, area K 9 was opened after harvest in area K 10 fell short of the harvest guideline. The western half of area K 9 was opened the previous year.

To ensure product quality the Department, industry representatives and permit holders collect spawn-on-kelp samples to display at a public meeting each season, usually after the peak of herring spawning has occurred. Management decisions are based on comments from industry and users regarding sample quality.

2002 SEASON SUMMARY

Biomass Estimation

Aerial surveys of the Togiak District began April 23, 2002. Herring were first reported in the district on the evening of May 1; Department staff confirmed the presence of approximately 10,000 tons of herring on May 2 in several areas including the upper Nushagak Peninsula, Kulukak, Ungalikthluk and Togiak Bays. Threshold biomass of 35,000 tons was observed the

following day on May 3. The peak biomass survey occurred on May 11 and produced an estimate of 45,167 tons. Although biomass decreased after the peak survey, significant biomass remained in the district through the first week of June.

Spawn was first observed May 1, in Middle Bay in the Anchor Point area, and over 2 miles of spawn was documented in the same area on May 2. The largest amount of spawn observed during any single day in 2002 was 8.9 miles on May 12. Spawn was observed on all of the following surveys, the last of which occurred on June 4.

Age Composition

A total of 7,130 herring were sampled for age, size and sex data from May 3 to May 15, 2002. Samples were collected from the test purse seine fishery, commercial purse seine fishery, and the commercial gill net fishery. Length frequency analysis was used to differentiate between age classes. A sample size of 5,390 was collected from the commercial purse seine fishery. Age-4, -5, -6, -7, -8 and –9 and older herring contributed 12.1, 35.2, 15.9, 7.9, 4.6 and 24.3% of the sample, respectively. Average weight of the commercial purse seine sample was 293g. Sex composition was divided 50.3% male and 49.7% female.

A total of 1,264 fish were sampled from the commercial gill net fishery. Age-4, -5, -6, -7, -8 and –9 and older herring contributed 0.1, 1.4, 3.2, 9.1, 13.8 and 72.4% of the sample, respectively. Average weight of the commercial gillnet sample was 407g. Sex composition was divided 46.9% male and 53.1% female.

A sample size of 475 fish was collected from the purse seine test fishery. Age-4, -5, -6, -7, -8 and –9 and older herring contributed 19.6, 47.4, 11.8, 5.5, 3.3 and 12.4% of the sample, respectively. Average weight of the test purse seine sample was 249g. The sex ratio was divided 49.3% male and 50.7% female.

There was a shift from older to younger fish on May 5 in the Nunavachak Section commercial purse fishery. There was a smaller shift from older to younger fish in the Hagemeister Section commercial purse seine fishery on May 7, and a more substantial shift on May 10. During the final commercial purse seine openings, age-5 and –6 fish were the predominant age classes.

Sac Roe Fishery

The Togiak District herring fisheries are managed in accordance with the Bristol Bay Herring Management Plan (5 AAC 27.865). The plan specifies a maximum allowable exploitation rate of 20% and allocates the harvestable surplus to those fisheries taking the Togiak herring stock. The 2002 preseason forecasted biomass was 120,196 tons. The projected harvest guideline for each fishery was as follows: 1,500 ton herring equivalent or 350,000 lbs. of product for the spawn-on-kelp fishery; 1,578 tons for the Dutch Harbor food and bait fishery; and the remaining 20,961 tons to the sac roe fishery. The management plan, modified in January 2001, specifies that the Department will manage the sac roe fishery so that 70% of the removal is taken by purse seines, 14,673 tons, and 30% of the removal is taken by gillnets, 6,288 tons. The Department's inseason

biomass surveys did not exceed the forecasted level. Therefore, the above harvest guidelines were applied throughout the fishery.

During the winter of 2002, climatic conditions were relatively normal, but with heavy snowfall in southwest Alaska. The Bering Sea ice pack had receded north of Cape Newenham by mid March; the Togiak District was ice free and showing areas with water temperatures of 1° Celsius as early as April 1. These factors indicated an arrival time for herring in the Togiak District similar to the most recent 3 years, somewhere around the last few days of April. The temperature model based on April mean air temperatures from Cape Newenham that the Department uses to predict spawning for Togiak herring was projecting peak spawning around May 3-5. Timing of the migration and spawning activity turned out to be normal.

Reduced processing capacity, small fleet size, companies organizing their purse seine fleets as cooperatives (co-ops) and partial pumping of purse seine sets were issues that received considerable preseason attention. The Department polled processing companies preseason to assess processing capacity for the 2002 season. Department staff held a teleconference on April 30 to discuss these issues with processing companies and permit holders. After considerable discussion with companies regarding dead loss associated with partial pumping of seine sets, both ADF&G and Fish and Wildlife Protection staff advised companies and permit holders that anyone responsible for releasing dead herring would be cited for wanton waste. Purse seine openings of long duration, in an area as large as possible were management considerations desired by companies to allow the benefits of the seine cooperatives to be realized.

Company registration for processors intending to buy herring and spawn-on-kelp product in the Togiak District began in Dillingham May 1; prior to Department staff moving to the field office at Togiak Fisheries shore plant. Registration continued in Togiak from May 3 through May 5, with eight companies registering to buy gillnet and purse seine sac roe herring, and one company registering to buy spawn-on-kelp product. Based on information supplied by companies upon registration in Togiak, industry had the ability to process 1,915 tons of sac roe herring each day. Processing capacity in 2002 showed a 10% decrease from the previous season, and was the lowest level recorded since the Department began monitoring capacity in 1990. Given the large harvestable surplus available, processing capacity was a factor in trying to maintain product quality while prosecuting the fishery to harvest the guideline for each gear group.

After conducting an aerial survey on the morning of May 1, under poor survey conditions, (the weather had remained too poor to fly from April 27 through April 30) and observing no herring, the Department received reports on the evening of May 1 that herring were present in the Togiak District. Department staff observed approximately 10,000 tons of herring between the upper Nushagak Peninsula and Tongue Point on May 2. The first processing vessels and tenders to arrive on grounds were observed on the May 1 survey. On May 3, after an unsuccessful morning survey, management staff conducted a late afternoon aerial survey. 37,700 tons of herring were observed, exceeding the threshold biomass of 35,000 tons on grounds.

Purse Seine

Test fishing with purse seines began on the afternoon of May 3 when, while conducting an aerial survey, Department staff set three vessels on schools of herring in the Nunavachak Bay area. Sample results ranged between 6% and 9.9% mature roe. Since the threshold biomass was documented later that afternoon and marketable quality herring were present, the requirements had been met to conduct a commercial herring fishery in the Togiak District. At 8:30 p.m., the first 30-minute purse seine opening (PS 1) was announced to begin at 10:00 p.m., May 3, in the area between Ungalikthluk Bay and Right Hand Point. Although the 4 vessels that were on grounds retained no herring, the samples from earlier that afternoon indicated that marketable quality herring were available in the Nunavachak Bay area.

On the morning of May 4, the weather worsened with very low ceilings, poor visibility and rain showers. This weather pattern precluded any further aerial surveys until May 8. The helicopter leased by the Department arrived midday on May 4 and sat idle for the next several days. However, since herring with high quality roe had been documented the previous day in Nunavachak Bay, another purse seine opening (PS 2), 1-hour in duration, was announced at 10:00 a.m. to begin at 11:30 a.m. The open area was expanded eastward to include Kulukak Bluffs.

Preliminary reports from processors that afternoon indicated that only 150 tons of herring averaging 9.7% mature roe were taken in the second seine opening. The low harvest was primarily due to the there being less than 10 seine vessels in the area that were able to participate in the fishery. With favorable reports of mature roe being harvested from the second opening, a third purse seine period (PS 3) was announced at 4:00 p.m.; a two-hour opening beginning at 7:00 p.m. The open area (from Right Hand Point to the east entrance to Ungalikthluk Bay) was reduced from the morning period; the area east of Right Hand Point was eliminated due to a gillnet test fishery in progress in that area.

Catch reports from both of Saturday's purse seine openings were compiled on the morning of May 5. The harvest from the first opening was 185 tons while harvest from the second opening exceeded 500 tons. Harvest accumulated slowly due to the small number of purse seine vessels participating. Another purse seine opening (PS 4), three hours in duration, was announced at 9:30 a.m. to begin at 11:00 a.m., May 5, in the same areas as the previous period. Included in the morning announcement was an advisory to the purse seine fleet that we would be expanding the open area westward in subsequent seine openings. The fourth purse seine opening resulted in a harvest of over 800 tons of herring averaging 10.5% mature roe. Seventeen deliveries were reported for PS 4, showing that more of the purse seine fleet was arriving on grounds.

At 2:00 p.m. the afternoon of May 5, another 3-hour purse seine opening (PS 5) was announced beginning at 7:00 p.m. Two areas were opened for purse seines: 1) From the base of Asigyukpak (Oosik) Spit to Togiak Reef, and 2) from Anchor Point to Right Hand Point. Herring had been reported by vessels looking in the western portion of the Togiak District, however, no test fishing had been done to verify mature roe content. When catch reports were received the following morning, May 6, approximately 350 tons were reported taken with the majority of the harvest coming from the westernmost open area. The cumulative purse seine harvest through May 5 was 1,850 tons with 9.5 hours of fishing time. With a cumulative gillnet harvest of 450 tons, the harvest percentage for purse seines was 80%.

With a small purse seine fleet of just over 30 vessels and the low processing capacity, the strategy for Togiak herring in 2002 was to keep fishing while high quality herring were available. Another 3-hour purse seine opening (PS 6) was announced to begin at 10:00 a.m., May 6, with one of the open areas extended westward to Cape Newenham. Weather was still a factor affecting efficiency of the purse seine fleet since low ceilings and rain hampered the ability of spotters to find fish and direct the purse seine vessels onto herring. Preliminary catch reports the afternoon of May 6 indicated a successful harvest of over 1,100 tons with average roe content of 9.7% and average size of 301 grams from the morning seine period. The harvest was split between the two open areas; the herring coming from the Nunavachuk Bay area showed a shift to younger age class fish while the herring taken in the western open area around Asigyukpak (Oosik) Spit were larger, older herring.

Another 3-hour purse seine opening (PS 7) was announced at 1:00 p.m. to begin at 6:00 p.m. that evening with the same open areas as the morning seine period. Most of the seine fleet had shifted to the westernmost open area and with the large harvest from the morning period some companies were restricting how much herring they would purchase. Almost 400 tons of additional harvest was taken in the evening period of May 6. However, both roe content and size improved over the morning period when the harvest split between areas. Average roe content was 10.5% and the herring averaged 336 grams.

On the morning of May 7, catch reports indicated a total purse seine harvest of 3,361 tons; the gillnet harvest through May 6 was 1,011 tons. This brought the harvest percentage by gear type to 77% purse seine, 23% gillnet, which is moving farther away from those specified in the Bristol Bay Herring Management Plan. Another 3-hour seine opening (PS 8) was announced beginning at 10:00 a.m. in the same two areas as the openings on May 6. This opening was extended for 7 hours in a later announcement; purse seine periods of this duration are unprecedented in the recent history of the Togiak District. Fleet size and the reduced processing capacity prompted the Department to allow openings of longer duration to test and find quality herring. Harvest reported from this 10-hour opening was over 1,500 tons of herring with an average mature roe content of 10.39% and average weight of 305 grams. Younger age class herring were starting to show in the harvest in the western portion of the district as indicated by the reduction in average weight.

A 4-hour purse seine period (PS 9) was announced to begin at 9:00 a.m., May 8 in two areas; from Cape Newenham to Togiak Reef and from Anchor Point to Right Hand Point. At 12:00 noon, this seine opening was extended another 9 hours until 10:00 p.m. Mid-period reports indicated that some larger herring were being taken in the western portion of the district. Catch reports by 7:30 a.m. on the morning of May 9 showed a harvest of over 1,800 tons of herring averaging 10.35% mature roe content and an average weight of 323 grams. This brought the total purse seine harvest to 6,700 tons. Since gillnet harvest through May 8 was 2,404 tons, the harvest percentages were 74% purse seine, 26% gillnet. Management action was warranted to attempt to increase the gillnet proportion of the sac roe harvest.

Another 4-hour seine opening (PS 10) was announced for the morning of May 9 beginning at 9:00 a.m. in the same two areas as previous openings. In a 12:00 noon announcement, this opening was also extended 4 hours until 5:00 p.m. An additional 1,800 tons of herring were taken in this 8-hour seine period, which brought the total purse seine harvest to 8,500 tons. With a small gillnet

harvest the same day, the harvest percentages became further skewed in favor of purse seines, 77% purse seine, 23% gillnet. A reduction in fishing time for the purse seine fleet was warranted, while increasing fishing time for gillnets.

A 4-hour opening (PS 11) was announced beginning at 10:00 a.m., May 10 and only the western open area from Cape Newenham to Togiak Reef was allowed. Nunavachak Bay was added to the open area allowed for gillnets in order to increase their proportion of the sac roe harvest. Approximately 1,200 tons of herring averaging 11.0% mature roe with an average weight of 307 grams were taken in the this opening. Although the gillnet harvest for the day was over 1,000 tons and the gillnet harvest percentage moved closer to 30%, further reduction in purse seine fishing time was warranted to achieve the ratio specified in the Bristol Bay Herring Management Plan.

On May 11, a 2-hour purse seine opening (PS 12) was allowed beginning at 10:00 a.m. in the same area as the previous day. Catch reports the following morning showed a harvest of 1,150 tons with an average mature roe percentage of 10.6%, and average weight of 306 grams. This brought the total purse seine harvest to 10,885 tons or 75% of the harvest guideline. With increased gillnet catches over the last two days, harvest ratio between gear types was back to 70% purse seine, 30% gillnet. Approximately 3,800 tons remained of the purse seine sac roe harvest guideline.

In an 11:00 a.m. announcement on May 12, a 1-hour purse seine opening (PS 13) was scheduled to begin at 1:00 p.m. Open area was reduced to concentrate the fleet in an area where larger herring had been taken, between Cape Peirce and Tongue Point. Reports of sets from the afternoon seine opening averaging under 300 grams were of concern to the management staff, although reported harvest late that afternoon was very light at approximately 50 tons. Another purse seine opening (PS 14), 2 hours in duration was announced to begin at 8:30 p.m., Sunday, May 12. Discussion with processors and radio transmissions between fleet managers and tenders indicated that a lot of sets with younger age class herring averaging in the mid 200-gram range were being turned away. A harvest of 400 tons with an average roe percentage of 10.1%, and average weight of 292 grams was reported from PS 14, bringing the total harvest to 11,340 tons or 77% of the harvest guideline of 14,673 tons.

An 11:00 a.m. announcement on May 13 advised the fleet and processing companies of the Department's concern over the high incidence of Age-5 herring showing in sets being released. Another 2-hour purse seine opening (PS 15) was announced to begin at 1:00 p.m., Monday, May 13 between Cape Newenham and Togiak Reef. If this purse seine opening resulted in a large percentage of the sets falling in the mid 200 gram range (Age 5 & 6 herring) in body weight, then the Department would close the fishery rather than continue wrapping and harvesting recruit age class herring.

Catch reports from the afternoon's opening of May 13 were even less favorable regarding average weight of the herring taken. Harvest was just over 400 tons with average roe maturity of 10.2%; average weight had dropped to 276 grams. The purse seine fishery was closed for the remainder of the 2002 season.

In the course of the fishery, fifteen purse seine openings were allowed totaling a record 57.5 hours of fishing time, the longest period of time allowed since the fishery was managed using

emergency orders. Purse seine sac roe harvest was approximately 11,758 tons with a weighted average of 10.3% mature roe. This harvest was 2,900 tons or 20% below the preseason guideline, while the overall roe percentage was one of the highest achieved in the purse seine fishery. The purse seine harvest ultimately accounted for 69.1% of the total sac roe harvest. Approximately 37 purse seine vessels participated in the fishery.

Management of the Togiak purse seine fishery was modified in 2002 to allow the opportunity for the cooperative fleets to maximize both quality and utilization of available processing capacity. This change in management strategy included longer duration openings and larger open areas, which, given the past history of purse seine harvest, was a leap of faith on the part of the management staff; it was done after considerable preseason discussion with both company representatives and purse seine permit holders. Assurances were made that the companies exerted strict control over their respective fleets, and that individual period harvests would not be greater than the combined processing capacity. With the small fleet size of 37 seine vessels, the liberal "cooperative" strategy worked throughout the fishery. However, the fact that most of the boats had a secondary market gave permit holders incentive to wrap and harvest more herring than their primary market could process. This issue needs more attention and preseason discussion between the Department and processing companies. It is the Department's view that with a larger purse seine fleet, the liberal management approach that has been allowed under the guise of "cooperative management" could lead to large individual period harvests, longer holding times and reduced product quality.

Gillnet Summary

Gillnet test fishing was conducted on May 4, collecting information on roe maturity in Kulukak Bay in the eastern portion of the district. The test fishery had light volume but samples averaged 11.3% mature roe. The first commercial gillnet opening for the 2002 Togiak sac roe herring fishery began at 7:30 p.m. on the evening of May 4 and lasted four hours. The open area was from Right Hand Point to Egg Island inside Kulukak Bay. The harvest from this period was light with only 201 tons of 10.0% mature roe herring harvested from 33 deliveries. Poor weather prevented Department staff from conducting any aerial surveys for the first several days of the fishery. A reliable vessel count wasn't available until May 8 when 82 gillnet vessels were observed.

With good quality herring available on the grounds, no further test fishing was conducted, however, permit holders were advised to use caution when deploying gear to avoid poor quality fish. A second gillnet opening was announced to begin at 11:00 a.m. on May 5. This opening was the same duration and area as the previous opening, but the allowable gear was increased to 100 fathoms. Catches were again light, 53 deliveries for 243 tons with mature roe percentage increasing slightly to 10.3%. The 100-fathom allowable gear limit was maintained for the remainder of the 2002 season.

After two gillnet openings, the harvest percentages were 19% gillnet and 81% purse seine; the percentages specified in the Bristol Bay Herring Management Plan being 30/70 for gillnet/purse seine. The 4-hour gillnet period (GN 3) that began on the morning of May 6, was extended for four hours and resulted in a harvest of 567 tons. The mature roe percentage increased to 10.8 %, and the percentage of the total harvest caught by gillnets increased to 23%.

The gillnet fleet had two periods, totaling 20 hours of fishing time, over the next two days, May 7 and 8. The combined harvest of 1,393 tons, during GN 4 and GN 5, increased the gillnet catch percentage to 26%. The poor weather that had limited surveys started to improve on May 8 and Department staff was finally able to survey the gillnet grounds. A vessel count revealed 82 gillnet vessels on the grounds.

Poor weather on May 9 reduced fishing effort to 29 deliveries and resulted in a harvest of 34 tons of 11.0% mature roe after 14 hours of fishing. The harvest percentage for gillnets slipped back 4% to 22.3%.

The decrease in gillnet allocation percentage triggered an increase in fishing area for the gillnet fleet on May 10; the open area was expanded west to the east entrance of Ungalikthluk Bay and the fleet was given 14 hours of fishing time. No vessels fished in the expanded area but catch in the original area increased, and the May 10 harvest was 1,023 tons of 11.10% mature roe herring, which increased the gillnet percentage of the total harvest by 4% to 26%.

On May 11 the open area for gillnet fishing was increased again, this time west to Anchor Point. Gillnet period 8 went for 14 hours and though no vessels went west of Right Hand Point, there were 157 deliveries for 1,244 tons of 11.00% mature roe herring. The peak harvest day for the Togiak herring gillnet fleet in 2002 occurred on May 11. The size of herring harvested on May 11 had decreased from a high of 429-gram average weight on May 4, to 408 grams. The harvest percentage for the gillnet fleet was 30.2% after fishing was completed on May 11.

May 12 was the ninth day of the herring gillnet fishery in 2002. The harvest rate slowed considerably, and 12 hours of fishing resulted in a harvest of 446 tons of herring. This increased the gillnet harvest percentage to 31.2%. Gillnet period 10 on May 13 was the final gillnet period of the 2002 Togiak sac roe herring fishery. The harvest from this 12-hour period was 112 tons of 400 gram 10.9% mature roe herring. Some vessels were starting to shift to smaller mesh gear to increase catch volume, and open area had been reduced back to the area between Right Hand Point and Egg Island.

The gillnet season officially closed at 9:30 p.m. on May 13. Although only 5,263 of the 6,288 gillnet quota had been harvested, the fishery was closed because there were no longer commercial quality herring available to the purse seine fleet. Under 5 AAC 27.865 BRISTOL BAY HERRING MANAGEMENT PLAN (8) …The Department is directed to manage for a removal of 30 percent of the harvestable surplus by the gillnet fleet and 70 percent by the purse seine fleet. To maintain those percentages inseason, the commissioner shall make adjustments to fishing periods and fishing areas by emergency order. Since the harvest percentage was already at 30.9%/69.1% and the purse seine fishery was closing, the gillnet fishery was also closed to maintain the harvest percentages.

A total of eight companies purchased gillnet sac roe herring; a total of 102 hours of fishing time was allowed in the Togiak District during the 2002 season. The final season harvest, based on final company reports, totaled 5,263 tons with a weighted average of 10.8% mature roe and an average weight of 414 grams. The peak gillnet vessel count was 82 vessels but during the first several days of the fishery, less than half that number were on the grounds.

Spawn-on-Kelp

There was one company registered to purchase spawn-on-kelp product in 2002, but stated that they were interested in only a limited amount. Department staff decided that there would need to be a market for at least 30 metric tons of product before a commercial opening would be feasible. Kelp surveys were done on May 10, 11 and 13. On May 13, buyers determined there was commercially marketable spawn-on-kelp product available and an opening was announced for the evening of May 14. Since there was only a market for 30 metric tons of product, the opening was scheduled for two hours duration. The opening resulted in 50 deliveries for 67,793 pounds. Department staff observed approximately 65 participants picking kelp.

Exploitation

The 2002 herring fisheries were managed for a maximum exploitation rate of 20% of the preseason forecast. Combining the sac roe harvest (16,806 tons), spawn-on-kelp harvest (67,793 pounds with an actual harvest equivalent of 260 tons) and test fish harvest (243 tons) resulted in an exploitation of 17,309 tons. The Dutch Harbor food and bait fishery harvested 2,846 tons, exceeding the guideline harvest of 1,578 tons. The total harvest for 2002 is be 20,155. Based on the preseason forecasted biomass of 120,196 tons, the 2002 exploitation would be calculated at 16.8%.

Exvessel Value

The projected exvessel value of the 2002 Togiak herring fishery is approximately $1.9 million. This is based on grounds prices of $129 per ton for gillnet fish, $101 per ton for purse seine fish and $0.30 per pound for spawn-on-kelp and does not include any post-season adjustments. A value of $1.9 million is the lowest recorded value for the Togiak Herring fishery, just 43% of the recent five-year average of $4.38 million.

LITERATURE CITED

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

TABLES

Table 1. Daily observed estimates (tons) of herring by index area, Togiak District, 2002.

Date	Start Time	Survey Rating[a]	Miles of Spawn	Estimated Biomass by Index Area[b] NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CN	HAG	WAL	Daily Total
23-Apr	15:25	3.1															
26-Apr	10:42	3.4															
1-May	10:20	4.5															
2-May	12:30	2.4	2	4,937		348	511	1,173	3,883								10,851
3-May	9:20	3.4			46	12	611	80		30	164	425					1,369
3-May	17:40	2.6	6	80	11,832	8,803	6,176	380	8,334	757	1,345						37,707
8-May	13:45	[d]	1														
10-May	10:40	3.7	4		146	684		856		300	1,478	2,700					6,163
11-May	9:50	1.8	7		5,423	8,479	534	4,013	4,057	8,942	9,452	705	1,583	142	1,838		45,167
12-May	11:32	1.5	9	2,891	4,286	7,067	3,168	417	16,784	5,991	1,150				1,391		43,145
15-May	10:35	1.1	1	1,608	4,267	3,989	3,071	423	10,418	2,880	2,034	1,229	34		9,272		39,225
25-May	11:40	4.4	1		359		254		134						145		891
4-Jun	10:00	2.7	2	1		1,116	1,364	262			149						2,892
Total		2.9	32	9,517	26,359	30,498	15,689	7,604	43,610	18,900	15,772	5,059	1,617	142	12,646	PEAK	45,167

[a] 1= Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory

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

[c] Vessel count and spawn survey only.

Table 2. Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2002.

Emergency Order Number	Area[a]		Date and Time					Duration
Herring Sac Roe Gillnet								
DLG-04	Egg Island to Right Hand Pt.		5/04	7:30 p.m.	to	5/04	11:30 p.m.	4 hrs.
DLG-06	Egg Island to Right Hand Pt.		5/05	11:00 a.m.	to	5/05	3:00 p.m.	4 hrs.
DLG-09	Egg Island to Right Hand Pt.		5/06	10:00 a.m.	to	5/06	2:00 p.m.	4 hrs.
DLG-11	Egg Island to Right Hand Pt.	extension	5/06	2:00 p.m.	to	5/06	6:00 p.m.	4 hrs.
DLG-13	Egg Island to Right Hand Pt.		5/07	10:00 a.m.	to	5/07	2:00 p.m.	4 hrs.
DLG-15	Egg Island to Right Hand Pt.	extension	5/07	2:00 p.m.	to	5/07	10:00 p.m.	8 hrs.
DLG-17	Egg Island to Right Hand Pt.		5/08	9:00 a.m.	to	5/08	1:00 p.m.	4 hrs.
DLG-19	Egg Island to Right Hand Pt.	extension	5/08	1:00 p.m.	to	5/08	5:00 p.m.	4 hrs.
DLG-21	Egg Island to Right Hand Pt.		5/09	9:00 a.m.	to	5/09	1:00 p.m.	4 hrs.
DLG-23	Egg Island to Right Hand Pt.	extension	5/09	1:00 p.m.	to	5/09	7:00 p.m.	6 hrs.
DLG-24	Egg Island to Right Hand Pt.	extension	5/09	7:00 p.m.	to	5/09	11:00 p.m.	4 hrs.
DLG-25	Egg Island to Ungalikthluk Bay		5/10	9:00 a.m.	to	5/10	9:00 p.m.	12 hrs.
DLG-27	Egg Island to Ungalikthluk Bay	extension	5/10	9:00 p.m.	to	5/10	11:00 p.m.	2 hrs.
DLG-28	Egg Island to Anchor Pt.		5/11	9:00 p.m.	to	5/11	9:00 p.m.	12 hrs.
DLG-30	Egg Island to Anchor Pt.	extension	5/11	9:00 p.m.	to	5/11	11:00 p.m.	2 hrs.
DLG-31	Egg Island to Anchor Pt.		5/12	9:00 a.m.	to	5/12	9:00 p.m.	12 hrs.
DLG-33	Egg Island to Right Hand Pt.		5/13	9:30 a.m.	to	5/13	9:30 p.m.	12 hrs.
Herring Sac Roe Purse Seine								
DLG-01	Right Hand Point to Ungalikthluk Bay		5/03	10:00 p.m.	to	5/03	10:30 p.m.	.5 hrs.
DLG-02	Kulukak Bay to Ungalikthluk Bay		5/04	11:30 a.m.	to	5/04	12:30 p.m.	1 hrs.
DLG-03	Right Hand Point to Ungalikthluk Bay		5/04	7:00 p.m.	to	5/04	9:00 p.m.	2 hrs.
DLG-05	Right Hand Point to Ungalikthluk Bay		5/05	11:00 a.m.	to	5/05	2:00 p.m.	3 hrs.
DLG-07	Right Hand Point Togiak Reef		5/05	7:00 p.m.	to	5/05	10:00 p.m.	3 hrs.
DLG-08	Right Hand Pt. to Cape Newenham		5/06	10:00 a.m.	to	5/06	1:00 p.m.	3 hrs.
DLG-10	Right Hand Pt. to Cape Newenham		5/06	6:00 p.m.	to	5/06	9:00 p.m.	3 hrs.
DLG-12	Right Hand Pt. to Cape Newenham		5/07	10:00 a.m.	to	5/07	1:00 p.m.	3 hrs.
DLG-14	Right Hand Pt. to Cape Newenham	extension	5/07	1:00 p.m.	to	5/07	8:00 p.m.	7 hrs.
DLG-16	Right Hand Pt. to Cape Newenham		5/08	9:00 a.m.	to	5/08	1:00 p.m.	4 hrs.
DLG-18	Right Hand Pt. to Cape Newenham	extension	5/08	1:00 p.m.	to	5/08	10:00 p.m.	9 hrs.
DLG-20	Right Hand Pt. to Cape Newenham		5/09	9:00 a.m.	to	5/09	1:00 p.m.	4 hrs.
DLG-22	Right Hand Pt. to Cape Newenham	extension	5/09	1:00 p.m.	to	5/09	5:00 p.m.	4 hrs.
DLG-26	Togiak Reef to Cape Newenham		5/10	10:00 a.m.	to	5/10	2:00 p.m.	4 hrs.
DLG-29	Togiak Reef to Cape Newenham		5/11	10:00 a.m.	to	5/11	2:00 p.m.	4 hrs.
DLG-32	Tongue Pt. to Cape Newenham		5/12	1:00 p.m.	to	5/12	2:00 p.m.	1 hrs.
DLG-34	Togiak Reef to Cape Newenham		5/12	8:30 p.m.	to	5/12	10:30 p.m.	2 hrs.
DLG-35	Togiak Reef to Cape Newenham		5/13	1:00 p.m.	to	5/13	3:00 p.m.	2 hrs.
Herring Spawn on Kelp[b]								
DLG-36	K-9		5/14	11:00 p.m.	to	5/15	1:00 a.m.	2 hrs.

[a] Area descriptions are approximate. Precise boundaries are described in Emergency Orders.

Table 3. Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 2002.

Date	Duration	Periods	Kulukak	Nunavachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham	Total	Total Roe %
				Purse Seine						
3-May	0:30	1[c]							0	
4-May	3:00	2,3	29.1 (9.70)	672 (8.70)					701	(8.74)
5-May	6:00	4,5		1179 (9.27)		76 (8.70)			1,254	(9.24)
6-May	6:00	6,7		420 (8.68)		1,150 (8.38)	52 (6.10)		1,622	(8.39)
7-May	10:00	8		101 (9.70)	103 (7.40)	1,352 (9.30)	52 (9.40)		1,609	(9.21)
8-May	13:00	9		390 (9.60)[b]	6 (10.80)	1,228 (9.20)			1,623	(9.30)
9-May	8:00	10				1,827 (10.30)			1,827	(10.30)
10-May	4:00	11				1,190 (10.20)	89 (10.40)		1,279	(10.21)
11-May	2:00	12				747 (9.00)	100 (10.50)		848	(9.18)
12-May	3:00	13,14			32 (8.00)	481 (8.95)			513	(8.89)
13-May	2:00	15	45 (10.70)[a]	144 (8.00)[a]		315 (7.60)			504	(7.99)
14-May						54 (10.58)[a]			54	(10.58)
Subtotal	57:30		74 (10.31)	2,905 (9.05)	141 (7.70)	8,420 (9.41)	293 (9.50)		11,833	(9.30)
				Gillnet						
4-May	4:00	1	224 (10.00)						224	(10.00)
5-May	4:00	2	240 (10.00)						240	(10.00)
6-May	8:00	3	547 (12.10)						547	(12.10)
7-May	12:00	4	975 (11.00)						975	(11.00)
8-May	8:00	5	368 (10.30)						368	(10.30)
9-May	14:00	6	110 (11.40)						110	(11.40)
10-May	14:00	7	939 (11.00)						939	(11.00)
11-May	14:00	8	1,222 (10.80)						1,222	(10.80)
12-May	12:00	9	478 (10.20)						478	(10.20)
13-May	12:00	10	113 (10.10)						113	(10.10)
Subtotal	102:00:00		5,216 (10.90)						5,216	(10.90)
				Combined						
4-May			253 (9.97)	672 (8.70)					925	(9.05)
5-May			240 (10.00)	1,179 (9.28)		76 (8.70)			1,494	(9.37)
6-May			547 (12.10)	420 (8.69)		1,150 (8.38)	52 (6.10)		2,169	(9.32)
7-May			975 (11.00)	101 (9.07)	103 (7.40)	1,352 (9.30)	52 (9.40)		2,584	(9.88)
8-May			368 (10.30)	390 (9.60)[b]	6 (10.80)	1,228 (9.20)			1,992	(9.48)
9-May			110 (11.40)			1,827 (10.30)			1,937	(10.53)
10-May			939 (11.00)			1,190 (10.20)	89 (10.40)		2,217	(10.55)
11-May			1,222 (10.80)			747 (9.00)	100 (10.50)		2,069	(10.14)
12-May			478 (10.20)		32 (8.00)	481 (8.95)			991	(9.52)
13-May			158 (10.37)[a]	144 (8.00)		315 (7.60)			617	(8.54)
14-May						54 (10.58)[a]			54	(10.58)
Total			5,290 (10.84)	2,906 (9.03)	141 (7.68)	8,419 (9.40)	293 (9.50)		17,049	(9.77)

[a] Includes test fish harvest which is conducted during closed commercial periods.
[b] Includes 40 tons documented waste.
[c] No commercial harvest reported during this period.

Table 4. Herring total run and commercial catch by year class, Togiak District, 2002[a,b]

Year Class	Age	Total Run (tons)	Total Run %	Harvest (tons)	Harvest %	Escapement (tons)	Escapement %
1982	20			10	0.06		
1983	19			0	0.00		
1984	18			3	0.02		
1985	17			13	0.08		
1986	16			43	0.25		
1987	15			146	0.86		
1988	14			347	2.04		
1989	13			435	2.55		
1990	12			826	4.85		
1991	11			1,222	7.17		
1992	10			1,642	9.63		
1993	9			3,686	21.62		
1994	8			1,291	7.57		
1995	7			749	4.39		
1996	6			3,555	20.85		
1997	5			2,942	17.26		
1998	4			139	0.82		
1999	3			0	0.00		
2000	2			0	0.00		
Total				17,048	100		

[a] Does not include harvest in the Dutch Harbor food and bait fishery.

[b] Total run estimates not available. Seasons aerial assessment was hampered by poor weather preventing adequate biomass assessment to calculate season's biomass estimate.

Table 5. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2002.

			Product Purchased		
			Sac Roe		
	Operator/Buyer	Base of Operation	Gillnet	Purse Seine	Spawn-on-Kelp
1	Trident Seafoods	S/P Naknek, P/V Alaska Packer	X	X	
2	Leader Creek Fisheries	S/P Naknek	X	X	
3	Peter Pan Seafoods, Inc.	P/V Steller Sea	X	X	
4	Norquest Seafoods, Inc.	P/V Aleutian Falcon/Pribilof	X	X	
5	Icicle Seafoods	P/V Arctic Star, Bering Star, Discovery	X	X	
6	Woodbine	S/P Egegik	X	X	
7	Y.A.K. Inc.	S/P Pedersen Pt.	X	X	
8	Snopac Products Inc.	P/V Snopac	X	X	
9	Pedersen Pt.	S/P Pedersen Pt.			X

APPENDIX
TABLES

Appendix Table 1. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1982-2002.

Year	Companies	Daily Processing Capacity[a]	Fishery Dates	Gillnet					Purse Seine					Total Harvest
				Effort[a]	Duration (hrs.)	Harvest	C.P.U.E.	Roe%	Effort[a]	Duration (hrs.)	Harvest	C.P.U.E.	Roe%	
1982	33		5/14-5/24	200	60.0	7,105	0.6	7.4	135	36.0	14,716	3.0	9.5	21,821
1983	23		5/3-5/11	250	42.0	5,344	0.5	6.9	150	14.0	21,442	10.2	9.3	26,786
1984	25		5/18-5/21	300	35.0	4,934	0.5	8.4	196	11.0	14,485	6.7	10.2	19,419
1985	23		5/23-5/25	302	11.0	4,482	1.3	7.4	155	3.0	21,330	45.9	10.0	25,812
1986	23		5/14-5/15	209	10.0	3,448	1.6	8.8	209	1.0	12,828	61.4	9.9	16,276
1987	18		4/27-5/6	148	36.0	2,685	0.5	8.6	111	5.5	12,845	21.0	8.9	15,530
1988	22		5/17	300	4.0	3,695	3.1	8.3	239	0.5	10,472	87.6	10.9	14,167
1989	19		5/9-5/14	320	5.0	2,844	1.8	7.8	310	3.0	9,415	10.1	8.5	12,259
1990	16	3,100	5/8-5/20	277	66.0	3,072	0.2	9.0	221	3.0	9,158	13.8	9.7	12,230
1991	16	3,350	5/10-5/17	170	14.0	3,182	1.3	8.5	200	3.0	11,788	19.6	10.0	14,970
1992	18	3,700	5/20-5/27	274	25.5	5,030	0.7	8.8	301	0.3	20,778	230.1	9.2	25,808
1993	12	2,500	4/27-5/9	75	144.5	3,564	0.3	10.1	140	33.8	14,392	3.0	9.6	17,956
1994	16	3,300	5/11-5/20	146	76.0	7,462	0.7	12.0	240	4.6	22,853	20.7	9.4	30,315
1995	22	4,350	5/7-5/15	250	33.5	6,995	0.8	12.0	254	12.2	19,737	6.4	10.1	26,732
1996	19	4,850	5/3-5/8	461	18.0	6,863	0.8	11.1	268	2.4	18,008	27.8	9.0	24,871
1997	18	4,200	5/2-5/6	336	24.0	5,164	0.6	11.8	231	6.4	18,649	12.6	9.4	23,813
1998	15	2,475	4/29-5/10	152	46.0	5,952	0.9	12.5	123	16.5	16,824	8.3	9.6	22,776
1999	12	2,400	5/18-5/26	171	28.0	4,858	1.0	11.5	96	4.7	15,020	33.3	9.2	19,878
2000	12	2,100	5/6-5/14	227	67	5,442	0.36	10.56	90	15.75	14,632	10.32	10.13	20,074
2001	11	2255	5/6-5/13	96	84	6481	0.8	10.64	64	26.0	15320	9.2	9.2	21,801
1982-01 Average	19			233	41	4,930	1	10	187	10	15,735	32	10	20,665
1996-01 Average	15	3,047		241	45	5,793	1	11	145	12	16,409	17	9	22,202
2002	8	1,920	5/3-5/13	82	102	5,216	0.62	10.9	37	57.5	11,833	5.56	9.3	17,089

[a] Peak aerial survey count.

Appendix Table 2. Exploitation of Togiak herring stock, 1982-2002.

Year	Biomass Estimate[a] (short tons)	S-O-K Herring Equivalent	Dutch Harbor Food/Bait	Sac Roe				Total Harvest	Exploitation Rate
				Gillnet	Purse Seine	Waste	Total		
1982	97,902			7,105	14,716		21,821	21,821	22.3%
1983	141,782			5,344	21,442		26,786	26,786	18.9%
1984	114,880	1,552		4,934	14,485		19,419	20,971	18.3%
1985	131,400	0		4,482	21,330		25,812	25,812	19.6%
1986	94,700	1,446		3,448	12,828		16,276	17,722	18.7%
1987	88,400	1,309		2,685	12,845		15,530	16,839	19.0%
1988	134,717	1,782	2,004	3,695	10,472		14,167	17,953	13.3%
1989	98,965	2,499	3,081	2,844	9,415		12,259	17,839	18.0%
1990	88,105	1,617	820	3,072	9,158		12,230	14,667	16.6%
1991	83,329	1,310	1,325	3,182	11,788		14,970	17,605	21.1%
1992	156,955	1,482	1,949	5,030	20,778		25,808	29,239	18.6%
1993	193,847	1,481	2,790	3,564	14,392		17,956	22,227	11.5%
1994	185,454	1,134	3,349	7,462	22,853		30,315	34,798	18.8%
1995	149,093	996	1,748	6,995	19,737		26,732	29,476	19.8%
1996	135,585	1,899	2,239	6,863	18,008		24,871	29,009	21.4%
1997	144,887	0	1,950	5,164	18,299	350	23,813	25,763	17.8%
1998	121,000	0	1,994	5,952	16,424	400	22,776	24,770	20.5%
1999	156,183	1,605	2,398	4,858	14,799	221	19,878	23,881	15.3%
2000	130,904	0	2,014	5,464	14,857	100	20,421	22,435	17.1%
2001	119,818	0	1439	6,481	15,630	219	22,330	23,769	19.8%
1982-01 Average	128,395	1,117	2,079	4,931	15,713		20,709	23,169	18.3%
1996-01 Average	134,730	584	2,006	5,797	16,336		22,348	24,938	18.7%
2002	120,196	260	2,846	5,216	11,833 [b]	40	17,089	20,195	16.8%

[a] Preseason forecast unless peak biomass estimate inseason exceeded preseason forecast

[b] Includes 243 tons testfish harvest.

Appendix Table 3. Age composition of inshore herring, Togiak District, 1982-2002.

	Age Composition (%)[a]							Total [b]
Year	3 [c]	4	5	6	7	8	9 +	Run (tons)
1982		16	51	3	1	17	12	97,902
1983		5	37	45	2	2	9	141,782
1984		2	2	28	42	4	24	114,880
1985		1	1	8	35	42	13	131,400
1986			1	2	15	44	38	94,770
1987				8	10	28	54	88,400
1988		2	5	1	13	5	74	134,717
1989			5	11	4	15	65	98,965
1990	[d]	[d]	[d]	6	11	3	80	88,105
1991		7	1	1	16	18	57	83,329
1992	[d]	10	20	1	1	15	53	156,955
1993		[d]	6	23	1	1	67	193,847
1994		[d]	2	12	28	3	55	185,454
1995		1	4	7	24	30	35	[e]
1996		[d]	3	5	7	21	64	[e]
1997	[d]	7	5	12	11	10	55	144,887
1998		[d]	4	5	10	11	70	[e]
1999	[d]	[d]	1	13	9	12	65	157,026
2000	[d]	[d]	1	2	17	16	63	[e]
2001		5	21	5	4	27	39	146,209
2002		1	25	28	4	5	36	[e]

[a] Age composition in 1979-92 is weighted by aerial survey data and weight at age.

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

[c] Includes age 1, 2 and 3 herring.

[d] Contribution of age class is less than 0.5%.

[e] Age contribution of the commercial purse seine harvest (by weight) was used to represent the total run for the 1995, 1996, 1998, 2000 and 2002 fishing seasons. Aerial surveys to determine abundance were hampered by poor weather conditions preventing calculation of a final seasons biomass estimate.

Appendix Table 4. Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1982-2002.

Year	Companies	Fishery Dates	Hours	Effort[a]	Area	Total Harvest in pounds	Herring Equivalent (in tons)	Openings	Average roe %
1982	8	5/21-5/23	39.0	214	K 3 - K 9	234,924		2	8.8
1983	4	5/5-5/7	52.0	125	K 3 - K 9	270,866		3	8.9
1984[b]	6	5/21-5/24	16.0	330	K 4, K 9	406,586	1,552	3	9.8
1985		no fishery							9.6
1986	6	5/18-5/21	21.0	204	K 7, K 8, K 9	374,142	1,446	4	9.7
1987	5	4/29-5/4	6.6	187	K 9, K 10	307,307	1,309	5	8.8
1988	10	5/20	6.0	259	K 4, K 8	489,320	1,782	1	10.3
1989	11	5/14	4.0	487	K 9	559,780	2,499	1	8.3
1990	7	5/11	3.0	481	K 8	413,844	1,617	1	9.5
1991	7	5/13	2.5	532	K 4	348,357	1,310	1	9.7
1992	5	5/23	3.3	386	K 9	363,600	1,482	2	9.1
1993	2	5/1-5/2	7.0	173	K 8	383,000	1,481	2	9.7
1994	3	5/13-5/14	7.5	204	K 5	308,400	1,134	2	10.0
1995	5	5/11-5/14	14.5	188	K 2, K 3	281,600	996	3	10.6
1996	3	5/9-5/10	12.0	200	K 8, K 9	455,800	1,899	2	9.6
1997		no fishery							
1998		no fishery							
1999	1	5/23	8.0	130	K 9	419,563	1,605	2	9.8
2000		no fishery							
2001		no fishery							
1982-01 Average			8.7	214		368,661	1,433	2	9.8
1996-01 Average			8.0	130		419,563	1,605	2	9.8
2002	1	5/14	2.0	50	K9	67,793	260	1	9.7

[a] 1978 - 1989 and 1992 - 1996, number of permits fished based on fish tickets. 1990 and 1991, peak aerial survey count.

[b] Management plan adopted by Board of Fisheries setting 350,000 lb. harvest guideline, specifying 2 to 3 year rotation, and including spawn-on-kelp herring equivalent in exploitation rate.

Appendix Table 5. Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1982-2002.

Year	Preseason Forecast[a]	Biomass Estimate	Spawn Estimates	
			Observations	Miles
1982		97,902	103	39
1983		141,782	189	60
1984	106,422	114,880	171	61
1985	81,899	131,400	141	43
1986	86,310	94,700	182	67
1987	61,100	88,400	160	76
1988	54,500	134,717	107	61
1989	80,100	98,965	69	53
1990	56,000	88,105	94	66
1991	55,000	83,329	90	70
1992	60,214	156,955	160	97
1993	148,786	193,847	76	53
1994	142,497	185,454	80	72
1995	149,093	149,093 [b]	70	59
1996	135,585	135,585 [b]	99	73
1997	125,000	144,887	79	59
1998	121,000	121,000 [b]	42	33
1999	90,000	156,183	33	56
2000	130,904	130,904 [b]	71	46
2001	119,818	146,209 [c]	100	57
1984-01 Average	100,235	130,812	101	61
1996-01 Average	120,385	139,128	71	54
2002	120,196	120,196 [b]	79	32

[a] 1993-2002 forecasts based on Age Structured Analysis. Previous years based on age composition, abundance, average growth and mortality rates. Forecasts for Togiak herring not provided prior to 1984.

[b] Inseason biomass estimate precluded by weather conditions. Inseason management used preseason forecast.

[c] Peak biomass estimate was not available during the commercial fishery and the harvest guideline was based on the preseason forecast.

Appendix Table 6. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1982-2002.[a]

Year	Herring		Spawn-on-Kelp	Total
	Sac Roe	Food/Bait		
1982	6,070	105	176	6,351
1983	10,450	67	284	10,801
1984	7,178	33	203	7,414
1985	13,696	41	[b]	13,737
1986	8,648	12	187	8,847
1987	8,614	49	166	8,829
1988	14,103	3	346	14,452
1989	4,983	19	448	5,450
1990	6,494	9	360	6,863
1991	6,173	21	383	6,577
1992	8,818	26	254	9,098
1993	5,218	3	268	5,489
1994	9,090	0	212	9,302
1995	16,713	0	362	17,075
1996	14,395	5	510	14,910
1997	4,306	0	[b]	4,306
1998	3,986	0	[b]	3,986
1999	6,211	0	315	6,526
2000	4,000	0	[b]	4,000
2001	3,090	0	[b]	3,090
1982-01 Average	8,112	20	298	8,355
1996-01 Average	5,998	1	413	6,136
2002	1,880	0	20	1,900

[a] Exvessel value (value paid to the fisherman) is derived by multiplying price/ton by the commercial harvest. These estimates do not include any postseason adjustments to fishermen from processors and should therefore be treated as minimum estimates.

[b] Fishery not conducted.

Appendix Table 7. Guideline and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984-2002.

Year	Gillnet Sac Roe			Purse Seine Sac Roe			Spawn-on-Kelp		
	Guideline[a]	Actual	Difference[b]	Guideline[a]	Actual	Difference[b]	Guideline[a]	Actual	Difference[b]
1984							350,000	406,586	16%
1985							350,000	[c]	
1986							350,000	374,142	7%
1987							350,000	307,307	-12%
1988	5,647	3,695	-35%	16,943	10,472	-38%	350,000	489,320	40%
1989	3,376	2,844	-16%	10,128	9,415	-7%	350,000	559,780	60%
1990	2,993	3,072	3%	8,980	9,158	2%	350,000	413,844	18%
1991	3,143	3,182	1%	9,429	11,788	25%	350,000	348,357	0%
1992	5,662	5,030	-11%	16,985	20,778	22%	350,000	363,600	4%
1993	6,570	3,564	-46%	19,709	14,392	-27%	350,000	383,000	9%
1994	6,277	7,462	19%	18,832	22,853	21%	350,000	308,400	-12%
1995	6,582	6,995	6%	19,747	19,737	0%	350,000	281,600	-20%
1996	5,956	6,863	15%	17,868	18,008	1%	350,000	455,800	30%
1997	5,464	5,164	-5%	16,391	18,649	14%	350,000	[c]	
1998	5,280	5,952	13%	15,840	16,824	6%	350,000	[c]	
1999	6,914	4,858	-30%	20,741	15,020	-28%	350,000	419,563	20%
2000	5,738	5,464	-5%	17,215	14,857	-14%	350,000	[c]	
2001	6,268	6,481	3%	14,624	15,849	8%	350,000	[c]	
1988-01 Average	5,419	5,045	-6%	15,959	15,557	1%	350,000	393,177	12%
2002	6,288	5,216	-17%	14,673	11,833 [d]	-19%	350,000	67,793	-81%

[a] Harvest guideline derived from inseason biomass estimate when available, or preseason forecast when weather precluded an inseason estimate.

[b] Actual minus guideline divided by guideline.

[c] No fishery conducted

[d] Includes testfish harvest of 243 tons and documented waste of 40 tons.

FIGURES

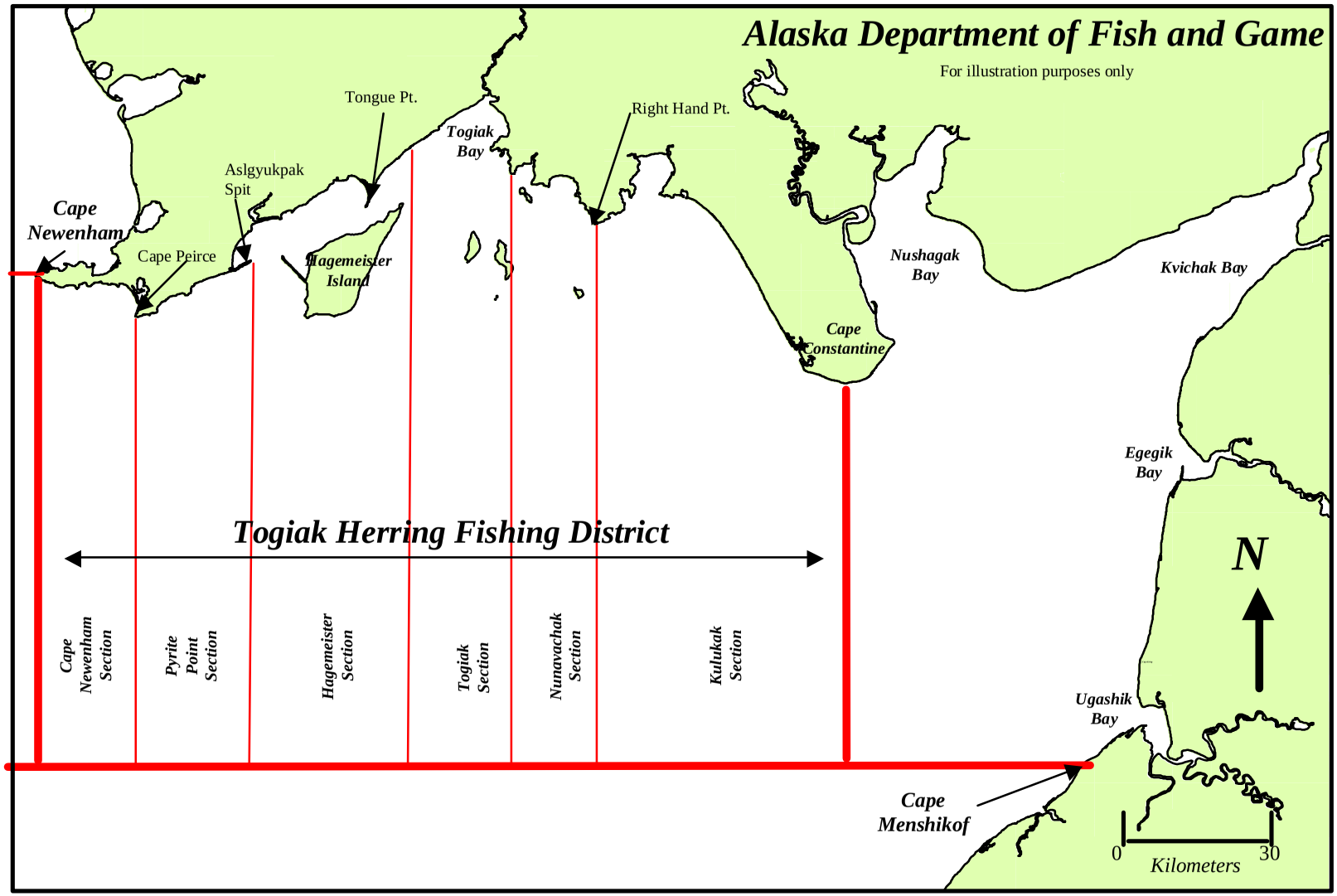

Figure 1. Togiak Herring District, Bristol Bay.

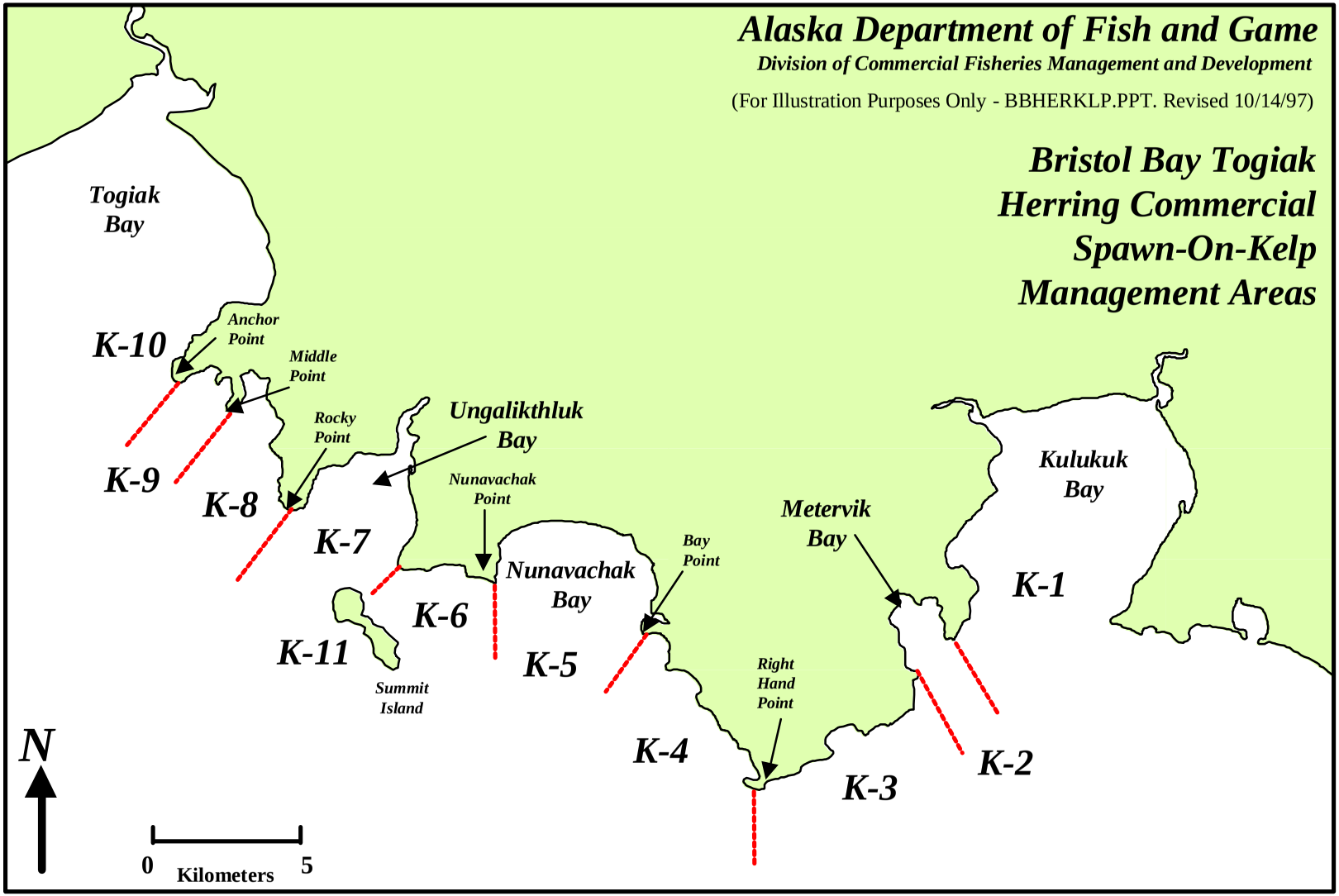

Figure 2. Spawn -on -kelp management areas (K-1 through K-11), Togiak District, Bristol Bay.