ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

-2001-

BRISTOL BAY AREA

Regional Information Report[1] No. 2A02-18

STAFF

Egegik/Ugashik Area Management Biologist ..... **Keith A. Weiland**
Naknek/Kvichak Area Management Biologist ..... **Slim Morstad**
Nushagak Area Management Biologist ..... **James B. Browning**
Togiak Area Management Biologist ..... **Tim Sands**
Bristol Bay Assistant Area Management Biologist ..... **Cindy J. Anderson**

Research Project Leader ..... **Lowell Fair**
Research Biologist (East Side) ..... **Drew Crawford**
Research Biologist (East Side) ..... **Daniel Gray**
Assistant Research Biologist (East Side) ..... **Fred West**
Research Biologist (West Side) ..... **Lee McKinley**
Research Biologist (Herring) ..... **Fred West**

Regional Office: ..... **333 Raspberry Road, Anchorage, Alaska 99518**
Dillingham Area Office: ..... **P.O. Box 230, Dillingham, Alaska 99576**
King Salmon Area Office: ..... **P.O. Box 37, King Salmon, Alaska 99613**

May 2002

DISTRIBUTION LIST

No. Copies

Commercial Fisheries Division

Central Region:

Regional Staff:
Brady, Regnart, Bue 4

Bristol Bay Area Management Staff:
Browning, Sands, Weiland, Morstad,
Rolf, Klutsch 7

Bristol Bay Area Research Staff:
Fair, Crawford, Schwanke, West, Mckinley 4

Other Central Region Areas:
Hammstrom, Fox 2

Westward Region:

Kodiak Area Management Staff
Campbell 1

Arctic-Yukon-Kuskokwim Region:

Kuskokwim Area Management Staff 1

Juneau Headquarters:

Director 1
Deputy Director 1
Chief Fisheries Scientist 1
Fishery Information Officer 1

Libraries:

Juneau, Anchorage, King Salmon, Dillingham 4

Sport Fish Division

Fairbanks Regional Supervisor (Minard) 1
Anchorage Regional Supervisor (Clark) 1
Dillingham Area Biologist (Dunaway) 1

Subsistence Division

Anchorage (Fall) 1
Dillingham (Chythlook) 1

Others

U.S. Fish & Wildlife Service
King Salmon (Larson) 1
Dillingham (Archibeque) 1

continued

DISTRIBUTION LIST

No. Copies

U.S. National Park Service
Katmai National Park Office 1

Oregon State University, Library, Serials Department,
Corvallis, Oregon 97331 (Attention: Librarian) 1

College of Fisheries, Fisheries Research Institute
University of Washington
260 Fisheries Center
Seattle, Washington 98105 1

University of Alaska
School of Fisheries and Ocean Sciences
11120 Glacier Highway
Juneau, Alaska 99801 (Attention: Milo Adkison) 1

University of Alaska
Marine Advisory Program
PO Box 1549
Dillingham, Alaska 99576 (Attention: Terry Johnson) 1

Dillingham Public Library 1

Bristol Bay School Library
P. O. Box 169
Naknek. Alaska 99633 1

The Alaska Resources Library and Information Services (ARLIS) 1

Dept. of Commerce & Economic Development
Office of Commercial Fisheries Development
3601 C Street
Anchorage, AK 99503 (Attention: Robert Richardson) 1

Report Totals 45

PREFACE

The 2001 Bristol Bay Management Report is the forty-second 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 2001. 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 Dillingham office. Attention: Editor.

Tim Sands
Togiak/Nushagak Assistant Area Management Biologist
P.O. Box 230
Dillingham, AK 99576

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 2001 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.

Permanent Employees with the Commercial Fisheries Division

West Side	
James Browning	Nushagak Biologist
Tim Sands	Togiak Biologist
Arthur Reynolds	Maintenance Worker
Lola Rolf	Program Technician
East Side	
Carol Klutsch	Program Technician
Steve Morstad	Naknek/Kvichak Biologist
Anchorage	
Lowell Fair	Research Project Leader
Keith Weiland	Egegik/Ugashik Biologist
Frederick West	Herring and Salmon Research Biologist
Cindy Anderson	Fishery Biologist
Drew Crawford	Research Biologist
Lee McKinley	Research Biologist
Dan Gray	Research Biologist

Seasonal Employees with the Commercial Fisheries Division

West Side	
Brad Palach	Herring/Office Manager
Rachel Kline	Herring
Greg Runyan	Herring
Dan Traxinger	Field Camp Coord.
Dave Childs	Supply Technician
Stephanie Timmerman	Night Office Staff
Ben Fritze	BBEDC Intern
Katie Sechrist	Nushagak District Test Fish
Joe Winter	Wood Tower
Kevin Saunders	Wood Tower
Ilsa Bucher	Wood Tower
Jeff Todd	Igushik Tower
Bill Atwood	Igushik Tower
Zachary Browning	Igushik Tower
B. Carl Saunders	Togiak Tower
Logan Sander	Togiak Tower

Continued

ACKNOWLEDGEMENTS

Dustin Cloud	Togiak Tower
Mike Timmerman	Nuyakuk Tower
Brett Hansen	Nuyakuk Tower
Scott Yeats	Nuyakuk Tower
Konrad Mittelstadt	Nushagak Sonar
Simon Prennace	Nushagak Sonar
Chris Lillo	Nushagak Sonar
Ann Crane	Egegik Smolt/Nushagak Sonar
Chris Cavanaugh	Nushagak Sonar
Tom Layou	Nushagak Sonar
Lucas Hegg	Nushagak Sonar
Jeanette LeClair	Nushagak Catch Sampler
Andrea Ruby	Nushagak Catch Sampler
Susan McNeil	Togiak Catch Sampler

East Side

Mary Emery	Office Manager
Dannyel Kafer	Night-time Office Manager
Fred Tilly	Kvichak Smolt Eval./Tower Camp Coord.
Karen Saunders	Fish Ticket Editor
Cathy Tilly	Scale Reader
Charlette Fullinck	Scale Reader/Catch Sampler
Sally Hamm	District Test Fish
Susan McNeil	Kvichak Smolt/Field Camp Sup./Herring
Ryan Bill	Egegik Smolt/Naknek Tower
Tom Kerns	Ugashik Smolt/Naknek Tower
Warren Hill	Egegik Smolt
Matt Weaver	Ugashik Smolt
Andrew Johnson	Kvichak Smolt/Ugashik River Test Fish
Susan Klock	Egegik Smolt/Naknek Tower
Lawrence (Sonny) Traxinger	Kvichak River Test Fish
Kenneth (David) Nix	Kvichak River Test Fish
Brad Russell	Egegik River Test Fish
Dirk Middleton	Egegik River Test Fish
Andy Johnson	Ugashik River Test Fish
Greg Runyan	Ugashik River Test Fish
Frank Komarek	Test Fish Evaluation
Chris Cullings	Test Fish Evaluation
Rob Regnart	Kvichak Tower
Kiana Putman	Ugashik Smolt/Kvichak Tower
Thomas Asher	Kvichak Tower
James Marcum	Egegik Tower
Corrie Whitmore	Kvichak Smolt/Egegik Tower
Aaron Sandone	Egegik Tower
Ben Mulligan	Ugashik Tower
David Hren	Ugashik Tower
Casey Jacobs	Ugashik Tower

Continued

ACKNOWLEDGEMENTS

Michael Oexner	Alagnak Tower
Amy Brodersen	Catch Sampler
Bernice Nick	Catch Sampler
Cody Aloysius	Cost Recovery Test Fish
Bob Ulbrech	Cost Recovery Test Fish
Pat Regnart	Cost Recovery Test Fish
Kyle Belleque	BBEDC Intern
Alicia Active	BBEDC Intern

Permanent Employees with the Subsistence Division

James Fall	Subsistence Resource Program Manager
Molly Chythlook	Fish & Wildlife Technician
Eunice Dyasuk	Administrative Clerk
Dave Caylor	Analyst/Programmer
Ted Krieg	Subsistence Resource Specialist
Gretchen Jennings	Program Coordinator

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF APPENDIX TABLES

LIST OF FIGURES

Figures **Page**

BRISTOL BAY

SALMON

FISHERY

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.

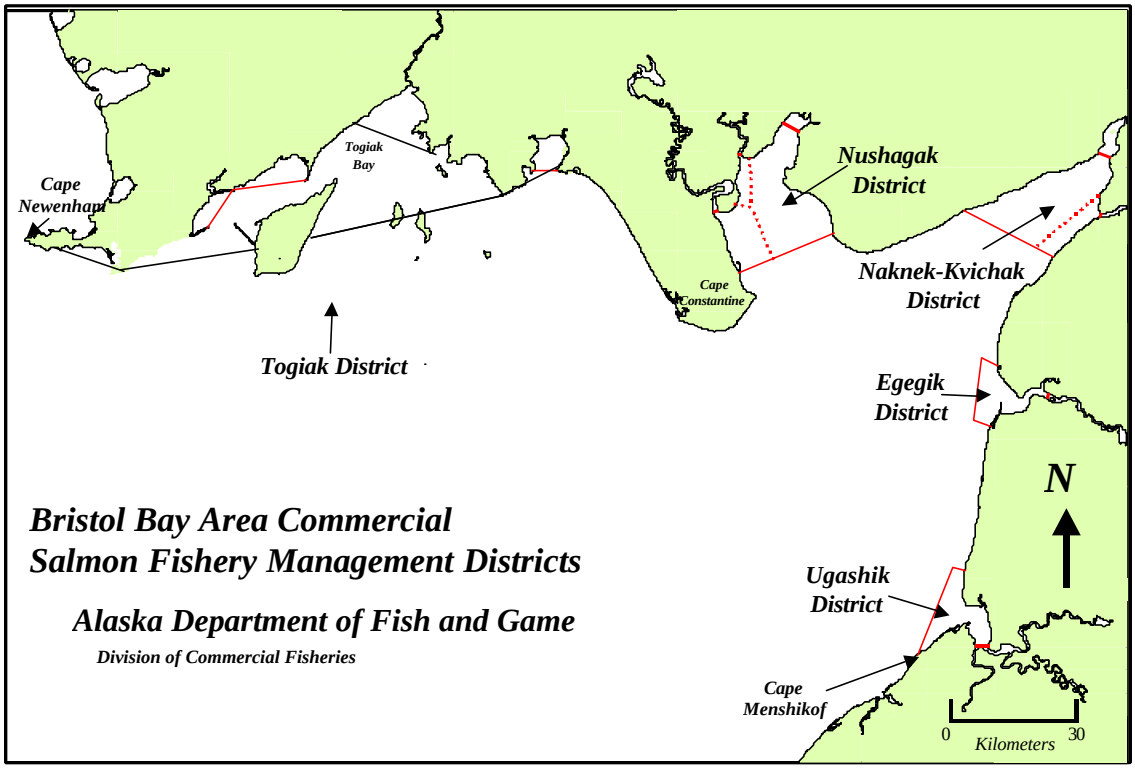


Figure 1.

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 (1981-2000) average 25.5 million sockeye salmon, 24 thousand chinook, 870 thousand chum, 17 thousand coho, and 742 thousand pink salmon, which return in numbers only in even years (Appendix Tables 4-8). Since 1991, the value of the commercial salmon harvest in Bristol Bay has averaged $133 million, with sockeye salmon being the most valuable, worth an average $128 million (Appendix Table 28). Subsistence catches average approximately 166 thousand salmon and are also 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 45,000 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 1,883 in Area T, of those 1,576 fished in 2001. Setnet permits registered in 2001 totaled 1,010 of which 837 reported landings (Appendix Table 2 and 3).

2001 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 2001 was forecasted to be 24.3 million fish (Table 1). The inshore sockeye harvest was predicted to reach approximately 17 million fish. Runs were expected to exceed spawning escapement goals for all river systems.

The 2001 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 1972-1997 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 1991 to 2000. Run predictions for the period 1991 to 2000 were based on similar methods used for the 2001 forecast. MSE was used to estimate the standard error and 80% confidence bounds of the total run forecast.

South Unimak/Shumagin Island Fishery

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

These fisheries 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 completely restructured the management plan. 5 AAC 09.365, the South Unimak/Shumagin Islands June Fishery Management Plan states: (a) "The South Unimak and Shumagin Islands June fisheries harvest both sockeye salmon 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 salmon stocks are overharvested, it is necessary to restrain the interception of these stocks as provided in the management plan in this section, and consistent with the Policy for the Management of Sustainable

Salmon Fisheries (5 AAC 39.222) and Policy for the Management of Mixed Stock Salmon Fisheries (5 AAC 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.

Due to the revised management plan there was no sockeye harvest allocation for the South Peninsula June fishery this season. In addition to the new window style openings there were price disputes that led to strikes and reduced fishing effort. Preliminary catch information indicates that the Shumagin Island fishery landed 129,482 sockeye, and the South Unimak fishery landed 270,783 sockeye.

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 en-route to Bristol Bay. Data collected was used to estimate run strength, timing, age, and size composition. Though the performance was not always good, the project was very popular with salmon processors as it gave an additional indication of run size, which influenced production capacity and the price paid to fishermen.

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

Economics and Market Production

In 2001, the exvessel value of the commercial salmon inshore harvest was estimated at $38.7 million (Appendix Table 28). The 1981 to 2000 average exvessel value of Bristol Bay commercial salmon fisheries is about $133 million.

During the 2001 season, 8 companies canned, 21 companies froze and 4 companies cured salmon in Bristol Bay. In addition, 8 companies exported fresh fish by air (Table 31). A total of 23 processors/buyers reported catches from Bristol Bay in 2001.

Run and Harvest Performance by Species

The combined commercial salmon harvest in Bristol Bay totaled 14.9 million fish in 2001. This was less than the 20-year average of 27.2 million salmon (Appendix Table 9) for Bristol Bay.

Sockeye Salmon

The 2001 inshore sockeye return of 22.2 million fish was approximately 10% below the preseason forecast of 24.3 million (Table 1). Actual returns to the Naknek/Kvichak District were 27% above what was projected. This figure is misleading, however, because the Naknek River return was 139% above forecast while the Kvichak return was less than half of the forecast. In the Ugashik District, the return was 61% of what was projected. In the Egegik District, the run was slightly above half of the forecast, while in the Nushagak District the actual return was only 6% below the forecast. Togiak returns were surprisingly strong for the second year in a row coming in at 141% above the forecast (Table 1).

Sockeye salmon dominated the inshore commercial harvest, and totaled 14 million fish (Tables 1 and 4). Sockeye escapement goals were met or exceeded in all systems where spawning goals have been defined, except the Kvichak River (Table 1).

Chinook Salmon

Chinook salmon harvests in 2001 were below the recent 20-year averages in all districts (Appendix Table 5). The 2001 bay-wide commercial harvest of 23,628 chinook was slightly above the 2000 harvest but significantly below the 20-year average of 98,180.

Chum Salmon

In 2001, the commercial harvest of 870,414 chum salmon was the highest since 1995. Although this year's harvest was 18% below the 20-year average of 1.1 million, it exceeded the recent 10-year average of 755,000 (Appendix Table 6). Chum salmon catches were well above the 10-year averages in the Nushagak and Togiak Districts, just below average in the Ugashik District and less than half the ten year average in the Naknek\Kvichak and Egegik Districts.

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. Therefore the 2001 return was not significant with a total of 549 pink salmon reported in the commercial harvest (Appendix Table 7).

Coho Salmon

The 2001 bay-wide commercial harvest of coho salmon totaled 17,139 fish, which was below the recent 20-year average of 182,290 (Appendix Table 8). Coho catches were below average in all the districts.

SEASON SUMMARY BY DISTRICT

Naknek/Kvichak District

The Board of Fisheries (BOF) met in Anchorage during the month of January 2001 to deliberate on Bristol Bay issues. Of primary importance was the Kvichak River; listed as a stock of concern and placed in the category of "yield concern". There were a number of proposals and recommendations centering on the Kvichak River. The following summary pertains to the main issues within the Naknek/Kvichak District. Since 1986, when sockeye runs to the Kvichak River were weak, the Department managed the District under 5 AAC.360**. Naknek River Sockeye Salmon Special Harvest Area Management Plan (NRSHA**). Several changes have occurred since its inception, all have been toward a more conservative approach.

Prior to 2001, the following conditions were required for the Department to open the NRSHA: the Kvichak River actual cumulative escapement was two or more days behind the anticipated escapement goal curve and it was projected that the Naknek River escapement would exceed 800,000. When these conditions were met, the Naknek/Kvichak District closed, then reopened with the drift fleet fishing in the NRSHA. Set gillnet gear was reduced from 50-fathoms to 25-fathoms; however, they remained out in the district. When the Department projected the minimum escapement goal for the Kvichak River would not be met, the Naknek/Kvichak District closed, set gillnet fishers were moved into the NRSHA and the Egegik District was reduced to the Loran C 110 line.

In 2001, the BOF took additional steps: when the Kvichak River cumulative escapement falls one or more days behind the anticipated escapement goal curve on or after June 27, and the Naknek River is projected to meet the minimum escapement of 800,000 sockeye, both the drift and set gillnet fishers move into the NRSHA and Egegik moves to the Egegik River Special Harvest Area (ERSHA). In addition, the BOF established an Optimal Escapement Goal (OEG) for the Naknek River of 800,000 to 2.0 million sockeye to protect the quality of escapement for sockeye and other salmon species when fishing occurs in the NRSHA.

The Naknek/Kvichak District's forecast for 2001 projected a total run of 6.1 million sockeye, 3.3 million for escapement and 2.8 million for harvest (Table 1). The projected escapements included 2.0 million for the Kvichak, 185,000 for the Alagnak River and a range of 800,000 to 1.4 million for the Naknek River. The forecast projected a harvest of 0.9 million sockeye from the Kvichak River, 1.7 million from the Naknek River and 0.3 million from the Alagnak River for a total harvest of 2.9 million. The actual total inshore return for 2001 was nearly 8.5 million sockeye salmon, 40% above the preseason forecast of 6.1 million (Tables 1&2). The Kvichak contribution was 1.4

million, less than half the forecast; the Alagnak was 410 thousand, 20% below forecast and the Naknek more than twice the forecast at 6.7 million. No forecasts are made for chinook, chum or coho salmon in the Naknek/Kvichak District. The harvest of chinook salmon has been declining in the district in recent years, mainly due to the decline in population and to the current mesh size restrictions that have been in regulation since the mid-90's. Mesh restrictions are implemented by "Emergency Order" (E.O.) each year and prohibit gillnets with mesh size larger than 5.5 inches until July 31.

Based on the low 2001 forecast and previous year's forecasts coming in less than projected, a more cautious approach was taken. In the past, the entire Naknek/Kvichak District opened for both gear groups with a schedule of 9:00 a.m. Mondays to 9:00 a.m. Fridays from June 1 to June 23. During 2001, only the Naknek Section was open to drift gillnet gear while the Naknek/Kvichak District was open to set gillnet gear. In addition, based on the 2001 forecast for the Naknek River an adjustment to the fishing schedule was also announced in April. The fishing schedule was reduced to two 48-hour periods from 9:00 a.m. Wednesday, June 13 to 9:00 a.m. Friday, June 15 and from 9:00 a.m. Wednesday, June 20 to 9:00 a.m. Friday, June 22. This schedule was based on the preseason forecast, with adjustments to be made inseason if the return appeared stronger than forecast. In the Naknek Section, the management strategy beginning on June 24 was for early fishing periods for drift gillnets only and both sections for set gillnet gear; however, periods would be based on actual escapement to each river system and catch rates in the district.

Early run strength indicators, prior to catch information in Bristol Bay, come from the South Peninsula fishery 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, which is then compared to the preseason forecast. In 2001, the South Peninsula fishery was on strike for most of the June fishery, so no early age composition information was available. The Port Moller test fish indices, fishing the traditional stations, were above average from the start. Age composition data from the Port Moller test fishery indicated nearly 90% of the catch were 3-ocean fish; typically, age composition early in the program is higher 3-ocean with a shift to 2-ocean occurring in late June.

The fishery opened for a 48-hour period from 9:00 a.m. Wednesday, June 13 until 9:00 a.m. Friday, June 15 with a harvest of 17,000 sockeye. The projected harvest for that time period was less than 3,000 sockeye. Commercial harvests weren't the only indicators pointing to a stronger than forecast run to the Naknek. Subsistence harvests were also above average for that time of year. With several early indications of an above average run to the Naknek River, an additional 24 hours was added to the fishing schedule during the week of June 17. The Naknek Section opened to both drift and set gillnet gear for a 72-hour period from 9:00 a.m. Tuesday, June 19 until 9:00 a.m. Friday, June 22. The Kvichak Section opened for the same time period, but was limited to set gillnet gear. The anticipated harvest for the week was 73,000 sockeye; the harvest from Tuesday's 15 hours of fishing was 110,000 sockeye. The total harvest from the 72-hour period was nearly 750,000 sockeye, the second highest harvest on record through June 22.

Based on the low run projection for the Kvichak River and changes to the management plan for the Naknek/Kvichak District (one day behind the escapement goal curve versus two days behind), the Kvichak Tower was deployed four days earlier than normal and was up and operational on June 20.

The earlier deployment would provide additional escapement assessment and help in determining the actual strength of the Kvichak run by June 27. The Naknek Tower went up as scheduled on June 21.

Escapement at the Naknek Tower through June 22 was 13,400; the anticipated cumulative through June 22 was 2,677 (Table 23). Escapement past the Kvichak tower through June 22 was 300 sockeye; the historical average is 276. Based on both catch and escapement, the Naknek/Kvichak District opened to set gillnet gear for a 6-hour period from 1:30 p.m. until 7:30 p.m. Saturday, June 23. The Naknek Section opened to drift gillnet gear only for a 5-hour period from 2:30 p.m. until 7:30 p.m. Saturday, June 23. The harvest from the June 23 period was 175,000, bringing the cumulative catch to nearly 950,000 sockeye. Escapement continued even with commercial fishing due to the strong run. The number of drift permits registered in the Naknek/Kvichak District for the June 23 fishing period was 267, which was about average for that time of year. Typically, between 250 to 300 boats fish in the Naknek/Kvichak District through the third week in June. Then depending on what happens in other districts, the number of permits fishing typically begins to rise. With the Naknek coming in as strong as it was, the number of boats was expected to climb.

Sockeye escapement rate continued to increase in the Naknek River, with a cumulative of 60,000 sockeye past the tower by 2:00 p.m. Saturday, June 23. The Kvichak River sockeye escapement rate did not increase; only 560 sockeye had passed the tower by 2:00 p.m. Saturday, June 23. Based on the Naknek River escapement, the fleet was put on short notice at 6:00 p.m. June 23 for a potential fishery as early as 2:30 p.m. Sunday, June 24. If escapement continued to climb on the Naknek, fishing would commence. By 6:00 a.m. June 24, escapement climbed to a cumulative of 145,000 sockeye, five days ahead of the curve. Kvichak only added an additional 80 fish, for a total of 640. With escapement continuing into the Naknek, the fishing period commenced with set gillnets fishing in both the Naknek and Kvichak Sections for 6-hours beginning at 2:30 p.m. Sunday, June 24. The drift gillnet fishery occurred only in the Naknek Section for 5-hours beginning at 3:30 p.m. June 24. The time separation was to balance the allocation between the gear groups. The harvest from the June 24th period was 138,000 sockeye in the Naknek Section and 12,000 from the Kvichak Section.

Based on the run strength (catch and escapement), timing, and age composition through June 23, it was apparent that the run to the Naknek River was larger than forecast. The Port Moller test fish indices through June 22 also indicated a run far larger than what was forecast. The age composition of the samples collected to date from the Port Moller test fishery remained nearly 90% 3-ocean. Utilizing catch and escapement throughout the Bay systems, it was felt that the run to Bristol Bay could possibly be three to four days early. This would be the earliest run timing ever recorded. With projected run timing three to four days early, and the 2-ocean component still well below the forecast, it was apparent that the 2 million sockeye salmon escapement goal for the Kvichak might fall short. The announcement at 12:00 noon on June 24, informed the industry that the Kvichak Section would most likely remain closed for the remainder of the season. The Naknek Section opened to set gillnets for an 8-hour period beginning at 3:30 a.m. Monday, June 25 and to drift gillnets for 7 hours, beginning at 4:30 a.m. Monday, June 25.

The Kvichak inriver test fish program began on June 20th. Sockeye harvested from the Kvichak test fish program were given to the Village of Levelock to supplement their subsistence harvest. The

first reported harvest occurred on June 21; only three sockeye were caught. The first substantial harvest at the Kvichak test fish site was on June 24 with 54 sockeye harvested. On June 25 with 61 sockeye harvested, the projected inriver escapement was 30,000 sockeye in the Kvichak River.

Escapement into the Naknek River through 10:00 a.m. on June 25 had reached 235,000 sockeye; the expected escapement level through June 25 was only 55,000. This put the cumulative sockeye escapement for the Naknek River nearly six days ahead of schedule. Escapement into the Kvichak River
was less astounding with a cumulative passage through 10:00 a.m., June 25 of 1,100 sockeye. The expected escapement level based on a normal run timing curve was 5,000 sockeye. If a three-day early run timing were applied to the Kvichak escapement, the projected escapement would be 44,000 sockeye. It was apparent that the run to the Kvichak was going to be less than forecast and would most likely not reach the minimum escapement goal of 2 million sockeye. With that, the Department minimized the harvest of Kvichak bound sockeye by reducing fishing time on the ebb tides in the Naknek Section while the Kvichak Section remained closed to commercial fishing. The Naknek Section opened to both gear types during each tide series from June 25 through the 1:00 p.m. closure on June 27.

An announcement at 12:00 noon June 27 summarized to the fleet and industry the current status of the Kvichak River, other eastside river conditions and the new regulations concerning the eastside districts. To date, approximately 2 million sockeye had been harvested in the Naknek/Kvichak District. The cumulative harvest from the Kvichak Section was 46,000 sockeye with the remaining coming from the Naknek Section. The escapement past the Naknek tower through 10:00 a.m. June 27 was 360,000, putting the escapement five days ahead of schedule. As for the Kvichak River, sockeye escapement through 10:00 a.m. June 27 was only 8,400 past the tower; the anticipated cumulative through June 27 was 23,800. The Kvichak remained more than one day behind the escapement goal curve based on normal run timing.

In addition to actual escapement past the Kvichak tower remaining more than one day behind schedule, other variables were pointing to a weak return to the Kvichak. Age composition of the Port Moller test fishery, commercial catch within the Naknek Section and escapement of both the Naknek and Kvichak Rivers continued to show 90% or more 3-ocean fish. The 2001 forecast for the Kvichak River projected the run would be 60% 2-ocean. With less than 10% of the catch and escapement 2-ocean, it was highly unlikely the Kvichak would meet its 2.0 million minimum goal. Therefore, the Naknek/Kvichak District closed and the NRSHA opened to drift gillnet gear for a 5.5-hour period beginning at 7:00 a.m., Thursday, June 28. Set gillnet gear was allowed for a 6-hour period beginning at 7:30 p.m., Thursday, June 28. In addition, when the Naknek/Kvichak District is closed to commercial fishing due to the conservation of Kvichak stocks, the Egegik District moves to the Egegik Special Harvest Area. This was also completed effective 1:01 p.m. Wednesday, June 27.

Also discussed at the BOF meeting in January was the additional harvest pressure placed on salmon when moving the fleet into the Naknek River. It has been noted during the fall aerial surveys that less than average escapement of chinook and chum salmon occurred in 2000. The below average escapements of these other species can be attributed to weaker than average run strengths and

increased exploitation in the inriver fishery. Chinook and chum salmon tend to mill in the river mouths making them more susceptible to the inriver fishery. To protect the quality of sockeye and other salmon species when the NRSHA is in effect, the BOF opted for an optimal escapement goal (OEG) of 800,000 to 2.0 million sockeye for the Naknek River. This would enable the Department to pulse the fishery. These pulse fisheries would allow escapement of salmon without encountering fishing gear. To accomplish this, the fishery for the drift gillnet fleet began near the 15 foot flood stage and ended at 15 feet on the ebb. For the set gillnet fleet, the fishery was centered on the 10-foot tides during both the flood and ebb.

Periods, in the NRSHA, alternated between gear groups fishing portions of each tide through June 30. The drift gillnet fleet fished the morning to afternoon tide while set gillnets fished the late evening to early morning flood. To equalize fishing time and allow each group the opportunity at the larger flood, a shift in the schedule occurred on July 1. The set gillnet fleet fished both tides on July 1, moving the drift gillnet fleet to the early morning tide. Escapement past the Naknek tower continued above the projected rate and by midnight June 30 approximately 780,000 sockeye had migrated past the tower. As for the Kvichak River, escapement remained below the projected level with only 85,700 past the tower. The anticipated cumulative escapement in the Naknek River through June 30 was 210,000; for the Kvichak River it was 126,400. However, even with the fleet fishing every tide, surplus escapement continued, causing concern that the 2 million upper end goal might be reached. To slow escapement, commercial fishing time was increased. Drift gillnet gear fished the 8 foot flood stage to the 8 foot ebb stage and set gillnets were also given additional fishing time.

By 2:00 p.m., July 2, escapement into the Naknek River was 940,000 sockeye; the projected escapement through July 2 was 360,000. Based on run strength and escapement to date, it was expected that the 2 million upper end of the OEG would be exceeded if additional management action wasn't taken. The drift gillnet fleet fished both tides on July 3 and the morning tide on July 4. The evening tide of July 4th was split with setnet gear fishing the flood, and drift gillnet gear fishing the ebb. During the next four tides, gear was alternated with set gillnet gear fishing the morning tide and drift gillnet gear fishing the evening tide. Daily escapement on the Naknek River dropped to 95,000 on July 4 but climbed to 164,000 on July 5 for a cumulative count of nearly 1.5 million. Through 11:00 a.m., July 6, the daily escapement had reached 25,000, indicating another high day. To minimize additional escapement, the drift gillnet fleet fished the two tides on July 7. From July 8 to July 20 periods were alternated between gear groups, either by splitting a single tide (July 10) or fishing set gillnet gear straight through two tides and drift gillnet gear parts of two tides. The Naknek/Kvichak District remained closed through 9:00 a.m. Monday, July 23. At that time, the Naknek Section opened to both drift and set gillnet gear on a schedule of 9:00 a.m. Mondays to 9:00 a.m. Fridays through September 28. The Kvichak Section remained closed. As for the Kvichak sockeye escapement, the final was slightly less than 1.1 million sockeye.

The Naknek/Kvichak District sockeye salmon harvest totaled approximately 5.3 million, 12% above the 2000 harvest of 4.7 million (Appendix Table 4). The chum salmon harvest totaled 40,000 fish, which is less than the recent 10-year average of 165,000 (Appendix Table 6). The reported commercial harvest of 914 chinook was 23% of the recent 10-year average harvest of 4,000 chinook. The reported commercial harvest of coho salmon in the Naknek/Kvichak District was only

five fish, far below the 10-year average harvest of 5,200 (Appendix Table 8). Subsistence harvests are listed in Table 33.To put the current trends of the Kvichak in perspective, the 20-year average total return to the Kvichak is 7.5 million for off-cycle years and 23.0 million for pre-peak and peak years. The harvest for off-cycle years is 4.3 million and for pre-peak and peak years is 12.3 million sockeye. For the past 6 years, 1996-2001, the Kvichak has met its sockeye escapement goal only twice (1998 and 1999) and both of those years, the drift gillnet fleet was restricted to fishing in the NRSHA in order to meet desired escapement levels.
Aerial surveys for chinook salmon were conducted on August 2 for Paul's Creek and King Salmon Creek, August 8 for Big Creek and August 29 for the Naknek main-stem spawners. The survey conditions were fair to good. The average aerial index for the Naknek Drainage is 5,000 chinook; the
actual observed index for 2001 was as follows: Paul's Creek 118, King Salmon Creek 413, Big Creek 2,009 and Naknek main-stem 3,800 for a total drainage-wide index of 6,340. The chinook goal was achieved for the 2001 season.

Egegik District

The 2001 sockeye salmon run to the Egegik District of 3.8 million fish was the smallest run recorded since 1982, and was only half the forecast of 7.6 million sockeye. Sockeye salmon runs to the Egegik District during the past four comparable cycle years, dating back to 1980, have ranged from 5 to 12 million fish with an average of 8.1 million. The 2001 run was 53% below the average for the recent cycle years (Appendix Table 14). The harvest of 2.8 million sockeye salmon was the twentieth largest commercial harvest in the 105-year history of the fishery. An escapement of approximately 969 thousand fish was achieved, which was within the Biological Escapement Goal (BEG) range of 0.8 to 1.4 million (Table 1).

The Alaska Department of Fish and Game (ADF&G) forecasted a Bristol Bay run of 24.3 million sockeye salmon in 2001, with a harvestable surplus of approximately 17 million. The projected Egegik District harvest of 6.5 million sockeye was 38% of the predicted Bay-wide harvest (Table 1). Memories of good early catches last year contributed to increased effort in the Egegik District early in the season.

Commercial salmon fishing was opened in the Egegik District on June 1 (Table 12), but no landings occurred until June 5. Through June 15, 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 fishery was allowed to close as scheduled at 9:00 a.m. on June 15, but it was anticipated that it would not stay closed for long.

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, but by June 17 catches indicated that approximately 50,000 sockeye salmon had passed through the commercial fishing district and were making their way up the river (Table 26). An aerial survey on June 14 revealed 1,900 sockeye salmon in the Egegik Lagoon, which was a very good count in this area for this date. Coupled with record catches in the commercial fishery during the previous week, a brief 8-hour commercial fishing period was scheduled for 7:30 a.m., Monday, June 18.

Participation in the June 18 opening consisted of approximately 314 drift vessels and 116 setnet permits. The catch of approximately 158,000 sockeye salmon was the largest on record for this date and well above the 20-year average of 26,000. Sockeye salmon catches were 116 and 463 fish per delivery for set and drift gillnet fishers, respectively, and four to five times the average catch per delivery for this date. Inriver test fishing results through June 19 suggested that about 100,000 sockeye salmon had entered the Egegik River system. Adding these fish to the cumulative tower count of 27,000 resulted in a projected sockeye escapement for June 19 that was seven days ahead of schedule. The actual tower count for June 19 of 26,800 sockeye salmon was three to four days ahead of schedule. With the excellent commercial harvest on June 18 and the healthy escapement, another brief commercial fishing period was announced to start at 10:00 a.m. on June 20.

The June 20 harvest of 233,000 sockeye salmon was also well above average and the second largest on record for this date. The escapement rate remained steady and an aerial survey revealed approximately 13,000 fish in the Egegik Lagoon. The fishery closed as scheduled and stayed closed on June 21. The cumulative inriver index indicated an escapement of about 174,000 fish through June 21. Allowing for a two-day travel time to the counting towers, this level of escapement was four to five days ahead of schedule. Another fishing period was announced for June 22 to start at 11:30 a.m.

The June 22 harvest of approximately 182,000 sockeye salmon was the third largest on record for this date, and brought the district's total harvest to approximately 594,000 fish. The cumulative harvest was also the third largest on record for this date and well above the recent 10-year average of 292,000. This level of harvest was a signal that the run was either early or strong, or perhaps both. Though the inriver test fishing index dropped off on June 23, it had been pretty steady for the previous four days and the escapement was ahead of expected levels. Another 8-hour fishing period was scheduled for 2:00 p.m. June 24.

The June 24 sockeye salmon harvest of approximately 332,000 fish was also the third highest on record for this date. Though inriver indices picked up slightly on June 24, the fishery stayed closed on June 25. Inriver test fishing on June 25 picked up dramatically to an average of 1,400 points, and an 8-hour fishing period was scheduled for June 26. Test fishing indices remained high on June 26 and another 8-hour period was scheduled for June 27. The two fishing periods recorded sockeye harvests of 203,000 and 307,000 fish, bringing the season's total harvest to approximately 1.5 million, or the sixth largest total for this date.

On June 25, Egegik commercial fishers were advised that the outer portion of the Egegik District could be closed as early as June 27. Because of the lagging Kvichak sockeye escapement, this area was closed at 1:00 p.m. on June 27, and it would remain closed until July 23. This action was taken

as part of a plan adopted by the Board of Fisheries in January to help conserve the Kvichak River sockeye salmon, which had been designated as a stock of concern. The final Kvichak escapement count was 1.1 million or 900,000 fish short of its goal. The Kvichak River was the only system in the Bay that did not meet its sockeye escapement goal.

Other evidence that closure of the outer portion of the Egegik District probably had little effect on the Kvichak sockeye run, is that the Egegik harvest of 909,000 sockeye salmon, between June 28 and July 7, compares favorably to the harvests of other years with similar run strengths and with no closures of the outer portion of the district. For example: in 1979, the total Egegik sockeye run was 3.3 million and the June 28 to July 7 harvest was 1 million; in 1980, the total Egegik run was 3.7 million and the June 28 to July 7 harvest was 970,000; in 1982 the total Egegik run was 3.5 million and the June 28 to July 7 catch was 600,000; and in 1998 the total run was 4.6 million and the June 28 to July 7 catch was 1.3
million. Looking at these data, an argument could be made for fishing the Egegik District at its full configuration.

Closing the outer portion of the Egegik District reduces the District's deep-water fishing area by approximately two-thirds. When this happens there is usually a fair number of drift vessels that leave the District, and this season the number went from 519 on 6/25 to 466 on June 27, or a drop of approximately 10%. Historically vessels numbers have declined from 3% to 19%, with the average drop at 11%. Though this year was the earliest that the outer part of the district was closed, the proportion of vessels leaving was about average.

Through June 27 the Egegik tower count was 321,000 sockeye salmon or about four to five days ahead of the expected level. An additional 90,000 were estimated in the river. Fishing time of eight hours per day was scheduled over the next several days until July 2. Catches ranged from 60,000 to 170,000 fish per period, and brought the total harvest to 1.9 million sockeye salmon through July 1. The total harvest was 49% below the 10-year average for this date. The tower escapement count of 519,000 was four days ahead of the expected level when applying normal run timing. The drift fleet had fallen 2% behind in their allocation and drift gillnet only periods were scheduled for the next three days.

Catches were slow for the first two days but picked up on July 4 and the drift gillnet fishers caught up on their allocation. At this point the escapement had slowed down, and with the feeling that the run timing was several days early, no fishing was scheduled for July 5. The escapement pictured improved when approximately 67,000 fish passed the counting towers on July 5. Inriver test fishing indices jumped to 1,820 points, the highest daily index for this season. The estimated cumulative escapement was approximately 785,000 or 5,000 below the lower end of the escapement goal range. With the escapement improving, the next fishing period for both gear groups was scheduled to begin at 12:00 p.m. on July 6.

The July 6 opening produced a harvest of approximately 121,000 sockeye salmon, about one fourth of the average number landed on this date. Set gillnet fishers took approximately 22% of the catch and pushed their overall harvest ahead of their allocation. With declining sockeye numbers, it became more important to keep the harvests between the two gear groups close to their allocations

or slightly ahead for drift gillnet fishers. With less fish available, set gillnet gear would catch more than their allocation on almost any given fishing period. Based on the allocation plan and with the cumulative escapement estimated at 878,000, the next fishing period, on July 7, was scheduled for drift gillnet fishers only.

The July 7 catch of 150,000 was slightly better than the July 6 catch and brought the drift gillnet harvest to 1% above their allocation. The tower count jumped to 828,000 sockeye salmon on July 7 and an additional 120,000 fish were estimated in the river below the counting towers. Both gear groups were allowed to fish on July 8.

The July 8 harvest was approximately 96,000 sockeye salmon and set gillnet fishers again took 22%. The tower count rose to 892,000 and 100,000 fish were estimated in the river. The projected sockeye escapement was close to 1 million fish. Fishing time was scheduled for the next three days giving the
drift gillnet fleet more fishing time to compensate for the anticipated higher proportion of set gillnet harvest.

The July 9, 10, 11 harvest was 127,000, 67,000 and 31,000, respectively (Table 12). The escapement was slowing down with a tower count of 946,000 and an inriver estimate of only 15,000 fish. No fishing was scheduled for July 12, but a brief period for both gear groups was allowed on July 13.

The July 13 catch of 15,000 sockeye salmon was the fifth lowest harvest, on record, for this date. The escapement had slowed to less than 1% per day since July 11 and now totaled 955,000. At the present rate of escapement and catch, it was clear that the Egegik run was pretty much over and that midpoint of the escapement goal range, 1.1 million, would not be achieved before the July 17. The fishery stayed closed until 9:00 a.m. on July 17, when the fall fishing schedule of 9:00 a.m. Mondays until 9:00 a.m. Fridays, went into effect.

Sockeye salmon landings in the district continued throughout July and into August (Table 12), reaching a preliminary seasonal cumulative total of about 2,862,000 fish. The counting towers ceased operation on July 16 and the final escapement count totaled 968,862 sockeye salmon. This was approximately 12% under the midpoint of the BEG range, but 21% over the lower end of the goal. The escapement sex ratio was 52% males to 48% females. The allocation between gear groups was achieved with drift gillnet fishers taking 86%, and set gillnet fishers taking 14% of the sockeye harvest through July 17.

The age composition of the 2001 Egegik District sockeye run was as follows:

2001 Egegik District Sockeye Age Composition			
Age Group	**Catch**	**Escapement**	**Total**
1.2	1%	1%	1%
2.2	13%	15%	13%
1.3	49%	37%	46%
2.3	36%	43%	38%
Other	1%	4%	2%
Totals	**100%**	**100%**	**100%**

Most of the sockeye salmon run (84%) were age 1.3 and 2.3 fish and came from the 1996 and 1995 escapements of 1.1 million and 1.28 million fish. Egegik District commercial fishers harvested 75% of the Egegik inshore sockeye run, which was 9% below the recent 20-year average of 84%. Peak harvest dates were June 24, and 27, when over 300,000 sockeye salmon were landed on each of those dates. Peak tower counts occurred on June 22, 23, 28 and 29, and July 5 through July 8, when over 50,000 sockeye salmon were counted on each of those dates. The peak catch rate for drift gillnet fishers was 49,400 sockeye salmon per hour on July 4, and for set gillnet fishers it was 6,700 sockeye salmon per hour on June 22. During the emergency order period from June 16 to July 17, a total of 159 hours were fished by drift gillnet fishers, or 21% of the 744 available hours. For set gillnet fishers, 132 hours or 18% of the available time was fished. This compares to 192 hours for drift gillnet fishers and 372 hours for set gillnet fishers last season. Peak drift gillnet effort was a little over 500 vessels from June 22 to June 25 (Table 10), and it was the least amount of drift effort for a season since 1983.

The commercial harvest of other salmon species in the Egegik District totaled 44,000 fish, or approximately 1.5% of the total harvest. The chinook harvest was approximately 933 fish, or 9% below the 1991 to 2000 (10-year) average of 1,024 (Appendix Table 5). The district chum harvest of approximately 31,000 fish was 55% below the recent 10-year average of 68,000 (Appendix Table 6). No pink salmon harvest was reported. The coho salmon harvest of 12,600 fish was well below the recent 10-year average of 33,500 (Appendix Table 8). Interest in coho fishing was light this season, with less than seven drift gillnet and fourteen 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 755 chinook, 2,234 chum, and 5,100 coho salmon. Chinook escapement indices were below average in all index streams. The chinook count was 35% below the 10-year average while the chum salmon count was 22% below average, however; both counts were the largest counts seen for those species in three years. The coho index represents a count for several tributary streams of Becharof Lake and it was 16% above the 1997 to 2000 average count of 4,382.

In summary, the 2001 sockeye salmon season at Egegik was not very productive. Though the catch was the 21st largest on record, it was the smallest harvest since 1982. For set gillnet fishers it was their 23rd largest harvest on record. Like last year, this year's run exhibited a strong early and weak late run strength, only this year's run was less than half the strength of last year's run.

Ugashik District

The 2001 sockeye salmon run to the Ugashik District was approximately 1.3 million fish, or 39% below the forecast of 2.2 million (Table 1). Ugashik was the second worst negative deviation from forecast in the Bay, only Egegik was worse. It was the fourth time in the last five years that the Ugashik run was significantly smaller than the forecast and it was the worst inshore run for the district in over 20 years. The commercial sockeye salmon catch of approximately 475,000 fish was the smallest harvest since 1979. The sockeye salmon escapement to the Ugashik River was approximately 834,000 fish, or right in the middle of the BEG range of 500,000 to 1.2 million. Comparable inshore returns over the last four cycles, dating back to 1981, have ranged from 3.4 to 6 million fish with an average of 5 million, making the 2001 run of 1.3 million 74% below the average for the last four cycle years (Appendix Table 15).

The preseason forecast for the Ugashik District suggested a harvest of 1.3 million sockeye salmon, which would have been the second smallest harvest in 20 years. Accordingly, commercial fishers were advised that fishing after June 22 would be minimal and might not occur for several days. With this advisory, less than ten drift vessels registered for Ugashik on June 24 (Table 10).

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 6:00 p.m. June 22, the cumulative district harvest was approximately 103,000 sockeye salmon, 708 chinook salmon, and 1,580 chum salmon. Through June 23, the sockeye harvest was almost twice the recent 10-year (1991 to 2000) average of 55,000.

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 towers are about 24 miles upstream of Ugashik Village and started operating on June 29, or five days earlier than usual. During the first three days, inriver test fishing documented about 8,000 fish entering the Ugashik River, but test fishing evaluation results indicated that maybe twice that number were in the river (Table 27). Set gillnet fishers were allowed fishing time on June 24 and 25 to help them catch up on their allocation and to give management another indication of how the Ugashik sockeye salmon run was progressing. The total harvest was minimal with only 5,000 and 3,000 sockeye salmon landed, but the catch per delivery was very good with 256 and 145 sockeye salmon landed per delivery for each of those days. This was well above the average of 25 sockeye salmon per delivery for June 24, and 42 for June 25. Set gillnet fishers were allowed to keep fishing, and with the small fleet of only 12 vessels a brief 4-hour period was scheduled on June 26 to test the abundance of sockeye salmon within the district.

The June 26 catch was disappointing with only 10,000 sockeye salmon landed. The average harvest for this date is approximately twice that volume but recent catches in 1995 and in 1996 were ten to fifteen times the 2001 harvest. The fishery closed as scheduled and commercial fishers were advised that until the escapement picture improved substantially, caution was warranted and Ugashik fishers would be standing down. The lack of age 2-ocean fish in the Port Moller test fishery supported a cautious approach. Inriver test fishing indicated few fish entering the Ugashik River through July 5, but on July 6 a test fishing boat was dispatched to test the district waters for

sockeye salmon abundance. The results were very good with indices ranging from 112 to 4,250 (Table 7). Fish were committing to the river in good numbers but the largest concentration was just below the inner district marker in the south channel. Inriver test fishing indices shot up dramatically averaging 3,400 points on July 6 and now indicated a sockeye escapement of approximately 160,000 fish. The tower count of 34,000 was on schedule with normal run timing, but when applying an earlier run timing the count would be behind expected levels. Another round of district test fishing was scheduled for the morning of July 7.

District test fishing concentrated in the inner part of the district and revealed that the abundance of fish seen there the day before had moved. Indeed, the inriver test fishing results were very strong averaging 4,600 points for the day and indicated very good numbers of fish moving up the Ugashik River. The cumulative escapement was estimated at over 300,000 fish (Table 27). With the escapement ahead of schedule, but the overall run strength still in question, a brief 2.5-hour drift gillnet and 6-hour set gillnet fishing period was scheduled for the afternoon of July 7.

The July 7 harvest was only 38,000 sockeye salmon with set gillnet gear taking approximately 74% of the catch. The average catch per set gillnet delivery was 590 sockeye salmon, or the second highest average per delivery for this date and well above the historical average of 280. The number of sockeye per drift delivery was 498 or about one third the historical average. The fishery closed as scheduled and commercial fishers were advised to standby at 10:00 a.m., Sunday, July 8 for the next possible announcement. Inriver test fishing continued to show strength and on the morning of July 8 and the estimated cumulative escapement was over 400,000. That escapement was well ahead of the expected level, and an 8-hour drift gillnet fishing period and 10-hour set gillnet period were announced for the afternoon of July 8.

The July 8 harvest of 50,000 was slightly better than the July 7 catch but it was still well below average. The set gillnet harvest was approximately 61% of the total harvest and averaged 437 sockeye salmon per delivery. The drift fleet was not having much success and it was apparent that the majority of sockeye salmon within the district were migrating close to the beaches. The escapement continued to show strength with the tower count at 131,000 and the estimated river fish (ERF) at 230,000. Inriver test fishing averaged 2,500 points on the morning tide of July 9, potentially increasing the total escapement by an additional 60,000 fish. Through July 8, the Ugashik set gillnet fishers had taken approximately 33% of the season's total sockeye harvest. Therefore, a 4-hour drift gillnet only fishery was scheduled for July 9.

The July 9 drift gillnet catch of 23,000 was slightly better than their July 8 catch of 18,000, but it did not make up much of the allocation imbalance, the drift gillnet fleet had gained only about 2% on their allocation. At this rate, it was doubtful that drift gillnet fishers would catch up. With the escapement level on track, drift gillnet only fishing periods of 8 and 16 hours were scheduled for the next two days.

The July 10 catch of 39,000 and the July 11 catch of 50,000 were both below the average harvest for these dates. The fleet size had grown to 140 vessels by July 11 and the average catch per delivery was only 360 sockeye salmon. The cumulative drift gillnet catch was now approximately 250,000 sockeye salmon, or 78% of the total catch. The escapement was not slowing down with

inriver indices averaging 3,000 and 2,300 points on July 10 and 11, respectively. The tower count was over 500,000 and an additional 200,000 sockeye salmon were estimated in the river. Even though set gillnet fishers were ahead on their harvest allocation, their help was needed to slow down the escapement. With over 700,000 fish in the escapement an 8-hour period for both set and drift gillnet gear was scheduled for July 12.

The July 12 harvest was approximately 31,000 sockeye salmon of which the set gillnet fishers took 21%. The tower count climbed to 682,000 through July 12, and inriver test fishing indicated that perhaps an additional 200,000 fish were in the river. Fishing for both gear groups was scheduled for the next three days. Catches remained small with less than 30,000 sockeye salmon landed on each day. Set gillnet harvest was slowing down as well with only 8 % of the harvest on July 14 and 3% on July 15. The July 15 cumulative escapement was estimated at 832,000 sockeye salmon. Inriver test fishing results indicated very little escapement with an average of only 140 points on July 14 and 77 points on July 15. With the escapement slowing down and the set gillnet harvest still well ahead on its allocation, a drift gillnet only period was scheduled for July 16.

The July 16 harvest of only 13,000 sockeye salmon was a signal that the Ugashik run was probably over. The harvest was about one tenth the average for this date. The tower escapement count was 794,000 sockeye salmon. The emergency order period closed, and the fall fishing schedule of 9:00 a.m. Mondays to 9:00 a.m. Fridays was announced to start at 9:00 a.m. on Tuesday July 17.

The final Ugashik River sockeye escapement count was 834,000 fish when the State ran project was ended. A federally funded tower project continued escapement counting through September 30, and estimated an additional 28,000 sockeye salmon. The federal count is questionable, but perhaps an additional 11,000 sockeye salmon may be added to State's escapement figure. Additionally, 33,000 sockeye were counted during aerial surveys of the Dog Salmon and King Salmon Rivers (Appendix Table 15).

At the end of emergency order period, setnetters had caught 20% of the sockeye harvest and drift gillnet fishers took 80%. These sockeye harvest percentages represent a 10% deviation from the allocation plan. To achieve the established allocations, approximately 49,000 fish caught by set gillnet fishers should have gone to the drift gillnet harvest. Between June 24 and July 17, setnetters fished a total of 136.5 hours, or 42% of the fishing time they had last year, while drift gillnetters fished a total of 108.5 hours, or over twice the time they fished last year.

The peak escapement counts at the counting towers occurred July 8 through July 13 when over 60,000 sockeye salmon were counted on each of those days. The sockeye salmon escapement sex ratio was 49% males to 51% females.

2001 Ugashik District Sockeye Age Composition			
Age Group	**Catch**	**Escapement**	**Total**
1.2	16%	18%	17%
2.2	5%	1%	3%
1.3	66%	75%	72%
2.3	8%	5%	6%
Other	5%	1%	2%
Totals	**100%**	**100%**	**100%**

The commercial harvest of other salmon species totaled approximately 53,000 fish or 10% of the district's total harvest. The harvest of 1,006 chinook salmon was 67% below the 20-year (1981 to 2000) average of 3,000 (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 3,842 was 12% below the 1981 to 2000 average of 4,360 but it was the best count in the last three years. The chum salmon harvest of approximately 50,000 fish was one-third the average, while the chum salmon escapement index count of 37,000 was 23% above the average count of 30,000. The coho salmon harvest of 1,030 fish was well below the 20-year average of 26,400. There was very little commercial effort for Ugashik coho salmon again this year, with no landings reported after August 22. The coho salmon escapement index count of 3,240 for the Upper and Lower Ugashik Lakes was 12% above the 1997 to 2000 average count of 2,900.

Results from the Federal tower project estimated approximately 3,600 coho salmon to Ugashik Lakes. No pink salmon harvest was reported in the Ugashik District this season, and no aerial survey was conducted. The Ugashik District fishery harvested approximately 35% of the sockeye return to the district in 2001 which was about half of the 20-year (1981 to 2000) average rate. Peak catch per hour occurred on July 9 for drift gillnet fishers, when approximately 26,000 sockeye salmon were landed in four hours, or 6,400 per hour. For set gillnet fishers, peak catch occurred on July 7 when approximately 28,000 sockeye salmon were landed in 6 hours, or 4,700 per hour. Peak catch per landing in the district occurred on July 8 for drift gillnet fishers and on July 7 for set gillnet fishers, when approximately 629 and 588 sockeye salmon, respectively, were taken per delivery.

A total of 12 buyers operated in the district during the season (Table 31), four less than last year. Nearly all of the catch was tendered to other districts for processing. There were no reports of a lack of processing capacity during the season.

Nushagak District

The 2001 Nushagak District total inshore sockeye salmon run was approximately 7.3 million fish, 6% under the preseason forecast of 7.8 million (Table 1). Commercial sockeye harvest reached 4.6 million, 22% below the preseason projected harvest of 5.9 million sockeye, and was the ninth largest catch in the history of the Nushagak District fishery. Total sockeye escapement in the district's three major river systems was 2.68 million or 43% over the combined escapement goal of

1.88 million. Exvessel value of the salmon fishery in the Nushagak District was approximately $12 million for the 2001 season.

In January 2001, the Alaska Board of Fisheries held it's mega-meeting in Anchorage to consider proposed regulatory changes for the Bristol Bay salmon and Togiak herring fisheries. 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, a redefinition of the Nushagak District boundary based on GPS-derived latitudes and longitudes, 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 – 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 - 760,000 fish; if 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 main stem 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. Early commercial openings are justified on forecasted surplus, quality concerns and in accordance with the added language in the NMCSMP.

The 2001 Nushagak District chinook salmon forecast was only 118,000 fish. With an inriver goal of 75,000 fish, assuming an average lower river (below the sonar counter) subsistence harvest (10,000 - 12,000) and an average incidental harvest during the sockeye fishery (15,000 – 20,000) chinook salmon), few if any surplus chinook salmon were expected to be available for a directed commercial harvest. Due to the low likelihood of a commercial chinook fishery, the subsistence-monitoring project
previously operated at Lewis Point to detect pulses of chinook passage into the Nushagak River was not conducted during the 2001 season.

No directed commercial chinook salmon openings were allowed during the 2001 season. The cumulative chinook escapement started ahead of expected levels from the beginning of the sonar project during the second week of June, and continued several days ahead of expected levels into the last week of June when sockeye abundance in the district began to increase. Commercial harvest for the season totaled 11,000 chinook salmon, all taken incidentally during the sockeye fishery.

The final sonar escapement estimate past the Portage Creek sonar counters was 99,155 chinook salmon (Table 24). The 2001 inshore chinook salmon run to the Nushagak River was approximately 126,000 fish, based on preliminary catch figures from the subsistence and sport fisheries, or 7% above the preseason forecast (Appendix Table 20).

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 spawners in the Nushagak River and a

range of between 700 thousand to 1.2 million spawners 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 1.4 million sockeye, the Nushagak River would be managed for the BEG range of 340,000 to 760,000 at least for the early portion of the fishery in 2001. 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.

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 7.8 million salmon (Table 1), which was 31% above the 20-year average actual run of 5.95 million sockeye. Strength of the forecasted Wood River run (5.1 million) was 51% above the 1981-2000 average actual return, while the Nushagak River sockeye run (1.4 million) was expected to be very close to the recent 10-year average actual return. The forecasted return to Igushik River (1.2 million) was also at the 1981-2000 average level (Appendix Table 17). Management of the Igushik and Nushagak Sections 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 times as large (or greater) than 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 3.6:1 (Wood River to Nushagak River sockeye) was forecast for 2001. 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 BEG range of 340,000 to 760,000 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.

Beginning June 21, test fishing was conducted with the contracted test fish vessel in the upper portion of the district on almost every tide. A high index was observed at Pile Driver Creek on the first day of test fishing, but no other test fish stations above the district indicated a strong presence of sockeye (Table 8). Based on increasing test fish indices in the areas of Nushagak Point and Tule Point on June 23, the fishery was put on short notice effective 12:01 a.m., June 24. Sockeye escapement in the Wood River reported from the counting towers, which began operation on June 21, was diverging above the 1 million sockeye midpoint curve, and showing a rate increase the morning of June 24. Nushagak River sockeye escapement through June 23 was also increasing rapidly and was bout 4 days ahead the 340,000 minimum curve.

Test fish indices in the upper portion of the district and between the district and the Wood River continued to increase on the morning of June 24, reaching levels of between 3,000 and 4,000 index points at Hansen Point in the lower Wood River and Tule and Picnic Point. At 12:00 noon, June 24, the first commercial opening was announced for the Nushagak Section allowing 4 hours for drift and 6 hours for set gillnets. The Wood River escapement totaled 75,000 sockeye salmon (Table 23), six days ahead of the 1 million curve, while over 70,000 sockeye were estimated in the Nushagak River (Table 24), which was over 7 days ahead of the 340,000 minimum curve.

Drift effort early in the season was well above average. By June 24, there were 365 drift gillnet vessels registered in the Nushagak District (Table 10). The test fish vessel, "Bean Counter", reported test fish indices between 4,000 and 10,000 in lower Wood River and at Tule Point on the Nushagak River above the confluence with the Wood on the morning of June 25. Hourly passage rates at both Wood River tower and the Portage Creek sonar project on the Nushagak River were increasing. Sockeye salmon were continuing to push above the district into both the Wood and Nushagak Rivers indicating early run timing. At 9:00 a.m., June 25, a second commercial opening (6 hours) in the Nushagak Section was announced to begin at 4:30 p.m. that afternoon for both drift and set gillnets. Drift effort had increased to 437 vessels by the afternoon of June 25. With passage rates in the Nushagak and Wood Rivers continuing to increase throughout the day, a 13-hour extension to the afternoon opening, allowing fishing for both gear types through 11:30 a.m., June 26, was included in a 6:00 p.m. announcement

Early reports, the morning of June 26, indicated that harvest from the ongoing commercial opening in the Nushagak Section was heavy. With the strong daily count of over 30,000 sockeye in the Nushagak River on the previous day, the cumulative sockeye escapement through June 25 had risen to 131,000 or 7 days ahead of the 340,000 BEG curve. Wood River had a daily count of over 145,000 sockeye bringing the cumulative escapement to 281,000 fish through June 25, and was eight days ahead of expected levels. To maintain control over the movement of sockeye into the Wood and Nushagak Rivers, another opening for the Nushagak Section (18 hrs. for both set and drift gillnets) was announced at 6:00 pm., June 26 to begin at 5:30 a.m. the next morning. Drift effort had risen to 548 vessels by the afternoon of June 26.

Sockeye escapement rates in the Nushagak River continued at an elevated level through June 26, yielding a daily count of 44,000 and a cumulative count of 186,000 sockeye and remaining about 8 days ahead of the BEG curve. The Wood River sockeye escapement decreased considerably on June 26 showing the effect of the heavy commercial fishing schedule since June 24. A daily count of 77,000 sockeye for a cumulative count of 358,000, kept the Wood River about 8 days ahead of the 1 million midpoint curve.

An 18-hour commercial opening was in progress the morning of June 27 as the radio schedule with Wood River tower and Portage Creek sonar was completed. Escapement rates had decreased in both river systems. A decision was made to wait to see how the harvest went during the current fishing period and also monitor escapement rates in the Wood and Nushagak Rivers the rest of the day. The fleet was advised the next announcement for any additional openings would be at 12:00 noon on June 28. June 27 turned out to be the second largest day for sockeye harvest with over 576,000 fish taken in the Nushagak District. Drift registration had increased to 604 vessels by the evening of June 27.

Nushagak River sockeye escapement had reached 224,000 through June 27, over nine days ahead of the BEG curve. Wood River escapement had reached 384,000 sockeye; seven days ahead of the midpoint goal (1 million) curve. In staff meetings held the morning of June 28, information was presented from the Port Moller test fishery indicating that there were almost no 2-ocean fish being caught. By this date at the Port Moller location, the 3-ocean fish should be tapering off while 2-ocean sockeye should be showing an increase in their proportion of the test fish sampled. This information was of concern to managers, particularly for those stocks that normally consist of a large 2-ocean component such as the Wood River. Additionally, the test fishery at Port Moller was indicating unusually early run timing; anywhere from 4 to 6 days earlier than normal. This meant that the portion of the sockeye run that had entered the Nushagak District through June 27 could be as high as 40 to 50 percent instead of the normal 12% by this date. The fact that 2-ocean sockeye usually comprise the latter half of the run, and the Wood River sockeye run was forecasted to be 70% 2-ocean fish, prompted managers to be concerned about the remaining number of Wood River sockeye still coming.

The announcement at noon, on June 28, advised permit holders there would be no further openings that day, but allowed a 6-hour set gillnet only opening beginning at 7:00 a.m., June 29 in the Nushagak Section. This single gear type opening was due to a disparity in the allocation

percentages between drift and set gillnets. The percentage of sockeye harvest taken by the drift gear type was approximately 85% when the allocation plan specifies 74%; Nushagak Section set gillnets had only taken 8% when the plan specifies 20%. Radio reports on the morning of June 28 from both Wood River tower camp and the Portage Creek sonar project indicated that passage rates had slowed considerably, particularly in the Wood River. Nushagak District sockeye harvest was currently at 1.4 million.

On the morning of June 29, as the sockeye escapement information was collected during the radio schedule from Wood River tower and the Portage Creek sonar project, concern regarding the 2-ocean failure and the corresponding impact on the Wood River grew. The daily sockeye escapement at Wood River was 5,000 for the previous day, which brought the cumulative escapement to 389,000 fish through June 28. Although this was approximately 6 days ahead of the 1 million midpoint goal curve given normal run timing, the unusually early run timing being indicated at Port Moller would make the current
escapement just at the midpoint goal curve, and the passage rate was dropping. Nushagak River daily sockeye escapement had also dropped below 10,000 on June 28 for a cumulative count of 229,000 which was about 8 days ahead of the BEG curve with normal run timing, but only 2 days ahead of the run timing being seen at Port Moller. The passage rate in that river system was also dropping. The announcement at 12:00 noon, June 29 advised the drift fleet that a drift opening was not imminent, and that another set gillnet only opening was being considered for later that evening in an attempt to balance allocation percentages, but the Department would like to monitor escapement and test fish indices throughout the day before committing to it. The drift fleet had increased to 697 vessels registered for the Nushagak District. A 6-hour set gillnet opening was announced to begin at 8:30 p.m. that evening in the Nushagak Section.

The test fish vessel, "Bean Counter", reported indices of over 5,000 points in the lower Wood River at 1:00 a.m. the morning of June 30 indicating that a strong movement of sockeye salmon were pushing through the district and into the Wood River while the current set gillnet only opening was in progress. This was positive news regarding more sockeye escapement coming to the Wood River; the Department's intent was to harvest some of these sockeye to slow the rate of entry, but allow the majority of the fish through the fishery. After receiving escapement information from Wood River tower and the Portage Creek sonar projects at 6:30 a.m., a 7:00 a.m. announcement allowed an additional 6-hour set gillnet only opening in the Nushagak Section beginning at 8:30 a.m. Sockeye passage rates had increased at both Wood River towers and the Portage Creek sonar project on the Nushagak River. These single gear type openings were showing the desired effect of balancing the allocation percentages, as well as taking only a portion of the sockeye migrating through the district, instead of harvesting virtually all the sockeye in the district with a drift opening with almost 700 drift vessels. Allocation percentages had shifted more inline with those specified in the allocation plan; through June 30, Nushagak drift now had 77% of the sockeye harvest, Nushagak Section set had 17%, and Igushik Section set had 6%. The allocation plan calls for management actions directed at achieving 74% of the sockeye harvest by Nushagak drift permit holders, 20% by Nushagak Section set gillnet permit holders, and 6% by Igushik Section set gillnet permit holders.

As the day progressed, reports from Wood River tower and Portage Creek indicated increased sockeye escapement rates into the Wood and Nushagak Rivers. In a 9:00 a.m. announcement, a 4-hour drift gillnet opening beginning at 11:00 a.m., June 30 was added to the set gillnet period in progress. The intent was to allow additional controlled escapement, but not have a large accumulation of sockeye in the district that could push suddenly for the river systems. Test fish indices that afternoon in the lower Nushagak River were between 10 and 15,000 index points, while the lower Wood River indices were between 5 and 10,000 index points. Cumulative sockeye escapement through June 29 was 394,000 fish for the Wood River, and 232,000 fish for the Nushagak River. This was a little over 5 days ahead of the midpoint curve for the Wood River given normal run timing but dropping behind the curve if run timing was as early as indicated by Port Moller information. Nushagak escapement was about 7 days ahead of the BEG curve with normal run timing, but only 1 day ahead when corrected.

Including the drift and set gillnet openings on June 30, sockeye harvest for the Nushagak District had reached 2 million through June 30, however, the 2-ocean failure being observed at Port Moller was of growing concern in the Nushagak District particularly for the latter half of the Wood River run. Although the daily count for the Wood River on June 30 was 151,000 sockeye, bringing the cumulative to 544,000 fish, passage rate had slowed and the number of Wood River sockeye left to enter the district was in doubt. The announcement at 9:00 a.m. on July 1 advised permit holders that the Department would be holding off any additional commercial openings for at least a tide to monitor sockeye escapement and test fish information in the upper portion of the district. Drift vessel registration for the Nushagak District had increased to 705 vessels by July 1. The following announcement at 6:00 p.m. extended the "hold" at least through the following morning.

Through July 1, Nushagak River cumulative sockeye escapement was 311,000 fish, still 4 days ahead of the BEG midpoint curve using normal run timing but beginning to fall behind the curve when corrected for early run timing. Wood River daily sockeye escapement was 63,000 for July 1; cumulative escapement had reached 608,000 sockeye, 5 days ahead of the midpoint curve using normal run timing, but just at or below the curve when corrected for early run timing. Test fish indices above the district showed there were milling sockeye present at most stations; however, milling fish don't yield reliable relative abundance information. All information sources indicated a conservative management approach would be advisable in light of the missing 2-ocean component and its contribution to the Wood River.

The 9:00 a.m. announcement on July 2 advised permit holders that the Nushagak Section would continue to be closed to commercial fishing while the Department monitored escapement rates and test fish indices in the upper portion of the district the rest of the morning. Sockeye escapement rates were flat and nominal in the Wood River as the morning progressed; however, test fish indices at Tule Point on the lower Nushagak were between 5 and 10,000 index points with fish "pushing". There had been no commercial fishing in the Nushagak Section for almost 50 hours, since 3:00 p.m. on June 30. The decision was made to allow a "minimal" opening with the intent to harvest a portion of the accumulation of sockeye in the district. In a 3:00 p.m. announcement, a 6-hour set gillnet opening and a 4-hour drift gillnet opening was scheduled to begin at 11:00 p.m. that evening.

The duration of this opening is recognized as the minimum amount of time that each gear type needs to set out and retrieve their respective gear. No increase in sockeye passage rate was reported for the Wood River on July 2; the daily count was 45,000 fish, bringing the cumulative count to 654,000. Portage Creek sonar reported a daily count of 37,000 sockeye for a cumulative count of 350,000 fish; thereby achieving the low end of the BEG range (340,000).

Early reports on the morning of July 3 indicated a substantial harvest from the opening that ended at 5:00 a.m. There was also a report of a noticeable increase in sockeye passage rate at the Wood River counting towers between 6:00 a.m. and 10:00 a.m. With this information, the decision was made to allow an additional short opening for both gear types beginning at 11:30 a.m., July 3; 6 hours for set gillnets and 4 hours for drift gillnets. As the day progressed, the passage rate of sockeye salmon past the Wood River towers continued to increase to over 10,000 fish per hour on each bank, or 100,000 fish in 4 hours! An extension of the commercial period in progress was announced at 3:00 p.m. for both gear
types. For set gillnets, the extension was for 18 hours and for drift gillnets the extension was for 20 hours; both gear types coming out of the water at 11:30 a.m., July 4. This was an attempt to harvest virtually all the sockeye in the district, since there was now evidence of an accumulation of sockeye above the district not available to harvest that would become escapement in the next 24 to 48 hours.

Through July 3, with a daily count of 309,000 fish, the cumulative sockeye escapement in the Wood River was 968,000 fish, virtually assuring achieving the 1.1 million midpoint goal. The Nushagak River also showed a marked increase in passage rate with a daily escapement of 80,000 fish bringing the total to 433,000 sockeye. With the elevated rate reported to be holding on the morning of July 4, expectations were to exceed the 550,000 midpoint goal on the Nushagak River as well. Sockeye harvest for the Nushagak District had reached 2.8 million through July 3, and 705 drift vessels were registered to fish in the district. A 25-hour extension for both gear types in the Nushagak Section was announced at 9:00 a.m. on July 4. This extension would allow commercial fishing through 12:30 p.m., July 5.

On July 2, the allocation percentages were very close to those specified in the sockeye allocation plan (5 AAC 06.367). Nushagak drift accounted for 75% of the harvest, Nushagak Section set gillnets had 19%, and Igushik Section set gillnets had 6%. However, as the commercial openings with both gear types increased in frequency and duration beginning the evening of July 2, the disparity in harvesting power between the set gillnets and a drift fleet of over 700 vessels began to skew the harvest in favor of the drift gillnets. By July 4, the drift percentage had increased to 82% while the Nushagak Section set gillnets had dropped to 15%. The fishing power of both gear types was needed, and the Department has always expressed that achieving the specified allocation percentages was secondary to controlling escapement levels. This was the situation for the Nushagak and Wood Rivers. Both river systems were approaching their midpoint BEG goals, and curtailing openings with drift gillnets to increase the harvest by the Nushagak Section set gillnets would have resulted in allowing large numbers of additional sockeye to pass through the district and add to the escapement.

Management actions directed at balancing the allocation percentages began with the 9:00 a.m. announcement on July 5, when the Nushagak Section closed to drift gillnets for a 6-hour period

between 12:30 and 6:30 p.m. while the set gillnets continued to fish and were extended 25 hours. Drift gillnets were then reopened in the Nushagak Section for a 19-hour period. A considerable number of negative comments from the set gillnet fishery, particularly from Queens Slough and the Combine were received regarding the lack of sockeye available for harvest in these areas due to the large and efficient drift fleet. The difficult task at hand for the management staff was to gauge how long to keep the drift fleet out of the water to let fish disperse to the upper portion of the district and yet not allow large additional escapement to occur. Over the next few days, the drift closures were increased in duration incrementally from 6 to 8 to 10 to 12 hours. Sockeye escapement rates began to decline from the elevated levels observed on July 3 and 4, however, both river systems were well above their midpoint goals after this large push of sockeye into the Wood and Nushagak Rivers. Wood River had a total of 1.35 million sockeye escapement through July 5, while the Nushagak River had a cumulative count of 644,000 sockeye by that time.

Subsistence fishing regulations for the local Dillingham beaches restrict the fishery to 3 24-hour periods per week from July 2 through July 17. On July 6, the Department announced that the subsistence fishery would return to the 7 days per week schedule effective 9:00 a.m., Saturday, July 7 due to the surplus of sockeye present. Both Wood and Nushagak Rivers had achieved their midpoint goals, and the Igushik River was expected to achieve the midpoint goal within the next 48 hours. This was done in accordance with the Board of Fisheries intent to provide subsistence opportunity when a surplus is available.

It now appeared that although 2-ocean sockeye were showing in very small numbers compared to forecasted levels as indicated by the Port Moller test fishery, the 3-ocean component was returning in much higher numbers than forecast. The latter half of the sockeye run returning to the Nushagak District including the Wood River stock was certainly not weak, but was comprised almost exclusively of 3-ocean fish. Attempts to increase the percentage of the sockeye harvest by Nushagak Section set gillnets, while trying to keep additional escapement to a minimum, dominated the fishing pattern for the next several days. On July 7 and 8, drift gillnets were allowed 6-hour periods in the Nushagak Section with an 18-hour closure between them in an attempt to disperse sockeye to the upper portions of the district, i.e. Combine and Nushagak Point. The 18-hour closure was too long and resulted in a noticeable increase in the daily sockeye escapements in both the Wood and Nushagak Rivers on July 9 and 10.

As of 6:00 a.m., July 8, Wood River sockeye escapement stood at 1.38 million fish, while Nushagak River had 690,000, and Igushik River had 275,000. The midpoint goals for all three river systems in the Nushagak District had been exceeded. As specified in 5 AAC 06.370 (f), the Department waived the 48-hour transfer requirement to transfer to the Nushagak District. Permit holders were still required to fill out the district transfer form; however, the transfer was effective immediately upon receipt by the Department. The 48-hour requirement for setnet permit holders to transfer within statistical areas of the Nushagak District was also waived by this announcement. Sockeye harvest for the Nushagak had reached 3.9 million fish.

By July 9, the fishing pattern in the Nushagak Section had stabilized around the allocation plan with set gillnets fishing continuously while the drift fleet was given 6 or 8-hour periods separated usually by 12-hour closures. Some increase in the set gillnet percentage of sockeye harvest was realized,

but it was an extremely difficult process with the size and efficiency of the drift fleet. Drift registration had decreased since the July 3 peak; however, we still had about 600 drift vessels fishing. Nushagak drift gillnets had 82% of the sockeye harvest; Nushagak Section set gillnets had 15%, and Igushik Section set gillnets had 4%. Management actions, directed at bringing these percentages closer to those specified in the allocation plan, continued.

In a 12:00 announcement on July 10, set gillnets in the Nushagak Section were extended until further notice and drift gillnets were allowed 12-hour periods each day. By this time, a considerable portion of the setnet effort, particularly on the upper portion of the district had pulled their gear making any efforts at increasing set gillnet percentage of the sockeye harvest virtually impossible.

Through July 12, cumulative sockeye escapements had reached 1.44 million in the Wood River and 750,000 in the Nushagak River. Sockeye harvest was at 4.5 million, and allocation percentages were: Nushagak drift – 79%; Nushagak Section set gillnet – 16%; Igushik Section set gillnet – 5%.

On July 15, with less than 500 drift vessels registered for Nushagak District and many of those anchored up in the Dillingham boat harbor or off Queen's Slough, commercial fishing with drift gillnets was also extended until further notice. This action marked the end of management actions directed at increasing the set gillnet allocation percentage. Final allocation percentages were Nushagak drift – 78%; Nushagak Section set – 17%; and Igushik Section set – 5%.

The Nushagak Section remained open to both gear types through 6:00 p.m., July 27, when commercial fishing was closed in accordance with the Nushagak River Coho Salmon Management Plan (5 AAC 06.368) when coho salmon escapement at the Portage Creek sonar project was projected to be below the 100,000 fish inriver goal curve based on early run timing. Although the plan calls for "the directed coho salmon fishery" to be closed on July 23, the vast majority of the fish being caught on that date were still sockeye so the fishery was allowed to continue until July 27. Final Nushagak District sockeye harvest reached 4.6 million fish, or 22% below the preseason forecast of 5.9 million.

Wood River Special Harvest Area

In January 1996, the Alaska Board of Fisheries adopted the Wood River Sockeye Salmon Special Harvest Area Management Plan to conserve Nushagak River coho salmon while providing an opportunity to harvest surplus Wood River sockeye during the latter portion of the run. It was under this management plan that the fishery was conducted in 1996. In 1997, the commercial fishing occurred in the Wood River under an emergency regulation that used the WRSHA predominantly for sockeye management. After the 1997 season, the Board modified the WRSHA Management Plan to

include provisions and criteria for sockeye salmon management, specifically to harvest surplus Wood River sockeye while conserving Nushagak River bound sockeye salmon. The plan was modified again in March of 1999 to eliminate the concurrent district opening language and include an OEG of no less than 235,000 sockeye in the Nushagak River when the projected ratio of Wood to Nushagak River sockeye exceeded 3:1. This plan was further modified in January 2001 as previously described to include the variable escapement goal for the Nushagak River and to require that any set or drift gear over the legal compliment in the WRSHA be contained in a net bag.

There were no openings in the WRSHA during the 2001 season. The sockeye run to the Nushagak River was strong, and allowed the fishery to occur entirely in the normal commercial fishing district.

Igushik Section

The 2001 sockeye run forecasted for Igushik River of 1.2 million was 12% below the recent 10-year average of 1.37 million fish. Sockeye salmon escapements in the Igushik River from 1989 through 1999, with the exception of 1997 and 1998, exceeded the biological escapement goal range (150,000 – 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 Department 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 that there was not enough money to operate the project, and therefore 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. 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. Subsistence harvests of sockeye salmon had been substantial on Igushik Beach since June 12. Some adjustment was made in net location on June 19 after clarifying with the permit holder that the net had to be staked to the shore. The permit holder reported that the net caught "lots of fish" on the afternoon tide, and in a 6:00 p.m. announcement, a 12-hour set gillnet opening was scheduled to begin at 11:30 a.m., June 20.

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 12-hour opening was over 10,000 sockeye, even though all the sites on Igushik Beach were not setup and ready to fish. Based on the performance of the first opening, a 17-hour set gillnet opening was announced beginning at 12:30 p.m., June 21. Historically, the set gillnet fishery in the Igushik Section has not been efficient

at exploiting the sockeye run to the extent necessary to harvest the surplus. Drift gillnets are needed to control the escapement. The amount of drift effort that is directed at Igushik Section depends on what other sections are open to drift gillnets. When Igushik Section is the only area open to drift gillnets, there is usually sufficient drift effort to exploit the sockeye run at the required level and control escapement.

Reported harvest from the set gillnet opening on June 21 was over 16,000 sockeye. In a 9:00 a.m. announcement on June 22, a 25-hour set gillnet opening in conjunction with an 11-hour drift gillnet opening was scheduled to begin at 1:30 p.m. No inriver information was available yet; sockeye are not usually visible by aerial survey until they reach the clear water portion of Igushik River, which is 5 – 7 days travel time up river just below Amanka Lake.

Sockeye harvest increased in the set gillnet fishery on June 22 to over 22,000 fish with another 20,000 taken in the drift fishery, indicating sustained and early abundance in the Igushik Section. On June 23, in a 12:00 noon announcement, a 25-hour extension for the set gillnet fishery and a 9-hour drift gillnet opening beginning the next morning was allowed.

The Igushik counting towers began counting at 8:00 a.m. on the morning of June 24 and observed considerable numbers of sockeye salmon passing the towers right away. Based on normal lag time from the fishery to the counting towers, these fish had entered the river prior to the fishery opening on June 20, indicating that the Igushik sockeye run timing was earlier than normal. A count of over 6,000 sockeye by 2:00 p.m. on June 24 was reported, when, historically, an average count for the entire day would be about 1,000. This resulted in a 6:00 p.m. announcement extending the drift gillnet fishery 16 hours through 4:30 p.m., June 25. Both gear types were now fishing continuously in the Igushik Section, although since the Nushagak Section had opened at 3:30 p.m., June 24 for a 4-hour drift gillnet period, drift gillnet effort would be light during that time.

After receiving the escapement information from Igushik towers the morning of June 25, a 9:00 a.m. announcement was issued extending both gear types in the Igushik Section for 25 hours through 5:30 p.m., June 26. Daily sockeye escapement for June 24 (only 16 hours since counting began @ 8:00 a.m.) reached 12,000 fish. The Igushik River sockeye run was very early or very strong or both.

This pattern continued with elevated sockeye escapement rates at the counting towers, and 25-hour extensions for both gear types in the Igushik Section. At 6:00 p.m., June 27, the Igushik Section was extended for both gear types until further notice. By that time, over 10,000 sockeye had passed the towers that day, and the cumulative sockeye escapement was over 50,000 fish, which was over 7 days ahead of the level needed to achieve the midpoint goal of 225,000 sockeye. Information from the Port Moller test fishery regarding the absence of 2-ocean sockeye held minimal concern for the Igushik stock since only about 20% of the forecasted return was 2-ocean fish. However, the early run timing indicated by this test fishery was pertinent when considering run performance relative to historical escapement curves. Continuous fishing with both gear types continued until June 30, when drift gillnet fishing closed at 3:00 p.m. with set gillnets closing at 7:00 p.m. This decision was based on the daily counts at Igushik towers dropping below 10,000 fish for the last 3 days, and the concerns regarding how much of the Igushik sockeye run could be left to enter the district if the run was 5 – 7 days early. Through June 29, cumulative sockeye escapement had reached 71,000 fish

and was still running about 7 days ahead of the midpoint goal curve based on normal run timing. Sockeye harvest from Igushik set gillnets had reached 94,000, however daily set gillnet catches had diminished to less than 5,000 over the last few days. So both catch and escapement had decreased dramatically at a time when these should be increasing.

The Igushik Section remained closed until July 2 when a 12-hour set gillnet only opening was announced to begin at 11:00 p.m.; a closure of 52 hours since 7:00 p.m., June 30. This opening was intended to "sample" the abundance of sockeye in the Igushik Section without harvesting the majority of what fish were present. The 9:00 a.m. announcement on July 3 extended the set gillnet opening 12 hours. By the afternoon of July 3, a report from the Igushik tower that the sockeye passage rate was showing a moderate increase was a positive note. A 3:00 p.m. announcement added a 12-hour extension to the set gillnet fishery and an 11-hour drift gillnet opening beginning at 12:00 midnight.

Escapement information from Igushik tower on the morning of July 4 indicated that the passage rate was increasing throughout the morning. The daily count for July 3 was 11,000 sockeye bringing the cumulative count to 111,000 fish, this figure having dropped to 5 days ahead of the normal midpoint goal curve. If corrected for early run timing, this figure would be close to the expected curve. Based on the increasing escapement rate and the previous inability of the Department to exploit the Igushik sockeye run sufficiently to keep escapement within the BEG range, a 25½-hour extension for both gear types was announced at 9:00 a.m., July 4. Both gear types were extended for 25 hours again the morning of July 5 when increasing passage rates were reported from the counting towers.

On July 6, as the allocation percentage for Igushik Section set gillnets began to drop below 6%, management action directed at increasing their harvest percentage was announced. Set gillnets were extended another 25 hours, while drift gillnet fishing closed for 8 hours before a subsequent 10-hour drift opening followed. The daily sockeye count at Igushik tower for July 5 was over 35,000 and the rate was still increasing through the morning of July 6. Through July 5, total sockeye escapement was over 165,000, surging to over 7 days ahead of the normal midpoint goal curve.

At 12:00 noon on July 7, the midpoint goal of 225,000 was exceeded on the Igushik River. The afternoon of July 9, the upper end of the BEG range was exceeded. Attempts to bolster the Igushik Section set gillnet sockeye harvest percentage with closures in the drift gillnet fishery in the Igushik Section continued between July 6 and July 13; initially a 6-hour opening was given on each flood tide, then 12-hour openings followed later by 18-hour openings. On July 13, it was announced that controlling escapement took precedence over the allocation plan and continuous fishing with both gear types was allowed beginning at 1:00 p.m. Cumulative sockeye escapement had reached 375,000.

Continuous fishing with both drift and set gillnet gear continued from July 13 until the entire district was closed in accordance with the Nushagak District Coho Salmon Management Plan at 6:00 p.m., July 27. Final sockeye escapement in the Igushik River reached 409,000 fish. Igushik Section set gillnet harvest reached 220,000, which ended up to be approximately 5% of the Nushagak District

sockeye harvest. Commercial fishing time in Igushik Section totaled 821.5 hours for set gillnets and 651 hours for drift gillnets. The 2001 Igushik River sockeye return, estimated at 1.32 million, came in at 10% above the preseason forecast.

The preliminary sockeye harvest estimate (4.61 million) for Nushagak District was 22% below the forecast and approximately 14% above the 1981-2000 average of 4.0 million. Sockeye escapement in the three major Nushagak District river systems reflected the strength of all three stocks (Appendix Tables 1 and 16). Escapement in the Wood River (1.46 million) fell with the BEG range. In the Nushagak River, the final escapement estimate (811,100) exceeded the BEG range (340,000 – 760,000) by 6%. The BEG range for the Igushik River was exceeded; escapement in that system (409,600) was 36% above the range.

Sockeye Salmon Allocation Plan Performance

Although sockeye allocation percentages by gear type are reported for each fishery within their respective sections, the following table summarizes the results of the sockeye allocation plan since its inception in 1998:

Nushagak District Sockeye Allocation Plan Performance

Year	Nushagak Drift	Nushagak Section Set	Igushik Section Set	Wood River Drift	Wood River Set
Allocation %	**74**	**20**	**6**	**74**	**26**
1998	72	23.5	4.5	76	24
1999	69.5	24	6.5	78	22
2000	79	15	6	68	32
2001	78	17	5	-	-
4 yr. Average	**74.6**	**19.9**	**5.5**	**74**	**26**

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 spawners and upriver sport and subsistence harvests. Based on parent year escapement of approximately 56,000 spawners in 1997 and recent production trends, the 2001 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 2001, the commercial fishery was allowed to continue through July 27 due to the fact that sockeye were the predominant species in the harvest. Nushagak District closed on July 27 based on the plan; at that time, the cumulative coho salmon escapement past the Portage Creek sonar counters was

8,800 which was slightly ahead of the level needed to reach the inriver goal based on normal run timing. However, the early run timing exhibited by sockeye salmon in the district caused concern that coho salmon may be early as well, and the escapement would fall below the desired escapement goal. When the closure was announced, the reported commercial coho salmon harvestwas less than 1,800 fish. The Department continued to monitor coho escapement into the Nushagak River throughout the first part of August in order to respond with a commercial opening if a surplus occurred. Strong daily escapements occurred on August 12 and 13 to bring the cumulative coho escapement back up close to the inriver goal curve; however, the daily rates dropped back to low levels after that date and no surplus occurred.

Final reported commercial harvest of coho salmon was 3,100 fish (Table 14, Appendix Table 24). Final coho salmon escapement into the Nushagak River was estimated to be 66,300 fish.

Togiak District

The 2001 inshore sockeye run of 1,122,439 fish was the second largest return to the Togiak District on record. This return was 141% above the preseason forecast. District sockeye harvest was 811,457 fish, second only to 1988. Sockeye escapement into Togiak Lake was 296,676, 48% above the upper end of the biological escapement goal (BEG).

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 adds 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.

Forecast

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 (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.

Sockeye Salmon

The 2001 inshore run to the Togiak River was forecasted at 466,000 sockeye salmon (Table 1), of which 71% were projected to be 3-ocean fish, the remaining 29% were predicted to be 2-ocean fish (Table 2). With a midpoint escapement goal of 150 thousand sockeye for Togiak Lake, approximately 316 thousand sockeye would potentially be available for harvest in the Togiak River Section. A harvest of this size would have been below the 20-year average by approximately 60,000 sockeye (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. With a forecast of this magnitude, management will be conservative until otherwise warranted.

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 (1997) in the Togiak River was estimated at 20,625 (Appendix Table 25), which is less than half of the 50,000-escapement goal. The commercial harvest for the parent year was 2,976. The poor escapement and harvest for the parent year indicate a poor return for 2001 is likely. 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 five 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 intended to decrease the exploitation of Togiak River chinook salmon. This was done again during the 2001 season for the Kulukak and Togiak River Sections. The western sections, Cape Peirce, Osviak and Matogak remained open for the regularly scheduled period.

Commercial fishing opened in the district with a regular weekly schedule on June 1. The first landings of the 2001 season were on June 14, a total of three chinook on two set net deliveries (Table 18). Effort picked up the next week with 5 drift and 41 set net deliveries and a catch of 428 kings during the 48-hour fishing period. This was 55% of the five-year average (1996-2000) of 879 fish. Forty-six deliveries in 48 hours was also well below average for this time. In 2001, there were 47 deliveries in 1 day during this period.

The fishery reopened on June 25 and was again limited to 48 hours. The seasons cumulative catch after the last delivery on Wednesday, June 27 was 2,464 chinook salmon. The recent, five year cumulative, average catch for this date is 2,484 chinook. There was an increase in deliveries during this weekly period and the total was very close to the five-year average. There were 46 drift permits registered to fish in the Togiak District as of 10:00 a.m. June 28.

The highest catch per delivery, 12.9 chinook, occurred on June 20, but the largest daily catch occurred on June 26, when 1,118 chinook were harvested. The close of fishing on the 28th of June marked the end of active management for chinook conservation. Fishing reopened again, with the increased weekly schedule, on the 2nd of July and the focus on sockeye salmon management.

The total chinook harvest for the Togiak River Section was 9,247 fish (Table 18), with an additional 421 caught in the remainder of the Togiak District (Table 19, 20, 21). Escapement for the Togiak River and tributaries was estimated at 13,110 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 41%; the district wide commercial exploitation rate was 35%. District wide 15,185 chinook were estimated as escapement. An estimated 825 chinook escaped into the Kulukak River an additional 1,250 fish were estimated to have escaped into the Quigmy, Osviak, Matogak, Slug, Negukthlik and Ungalikthluk Rivers. The total district escapement is 23% higher than the 20-year average (Appendix Table 21). The combined total run for the district was 86% of the 20-year average but 17% higher than the 5-year average.

Sockeye Salmon

Commercial fishing opened with the regularly scheduled fishing periods on June 4th but the first deliveries occurred on June 14. Twenty-one sockeye were delivered in two set net deliveries in the Togiak River Section (Table 18). Fishing effort increased during the reduced period the following week. Between June 18 and June 20 there were 48 deliveries and a total of 2,584 sockeye salmon, 625 of which came from 2 deliveries out of the Kulukak Section. The weekly harvest of 2,584 sockeye for the Togiak District was 93% of the long-term average. Effort for this same period was less than 30% of the average between 1969 and 2000.

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 were 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 29,187 fish, slightly below expected levels. There was some fishing effort in the Osviak and Matogak sections during the last week of June. Thirty deliveries, for a total of 1,908 sockeye salmon, were reported. This is the first time there has been commercial fishing effort in those sections since 1998.

At a preseason meeting in Togiak, Department staff discussed the low forecast and the need for conservative management during the 2001 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 3,384 sockeye (Table 23). Although the harvest in June had been below expectation, the first day of tower counts were above expectations, even considering early run timing. Harvest reports for the first weekly fishing period in July also started coming in on July 3. These reports indicated above average catch per unit effort and a higher than expected total catch.

Despite the preseason forecast and apparent early run timing, the decision was made on Wednesday, July 4, to allow fishing for the entire regularly scheduled period. This decision was based on the first day and a half of tower counts and commercial harvest data. The regularly scheduled period ended at 9:00 p.m., Saturday, July 7. The total harvest in the Togiak District through July 7 was 186,280 sockeye, more than 100,000 fish above forecast.

Commercial fishing reopened on the 9th of July for the regularly scheduled fishing period in the Togiak River Section and the reduced period in the Kulukak Section. The other sections of the Togiak District, Osviak, Matogak and Cape Peirce were also re-opened for their regularly scheduled fishing periods. From this point forward in the season all reported catches occurred in the Togiak River Section. Although there were boats observed fishing in the Kulukak Section there was no further catch reported from there. This is unusual because Kulukak has been an increasingly popular place to fish in recent years. The high catch rates in the Togiak River Section were keeping processors busy and no processors sent tenders over to the Kulukak Section to buy fish, likely reducing the effort in that section.

By July 9, the cumulative escapement past the towers was 60,000 (Table 23) eight days ahead of the curve. At this point it was apparent that the Togiak River sockeye salmon run was above forecasted levels. Catch rates continued at a record pace and escapement counts continued to get further ahead of the curve through the week. By mid-week the conservative preseason approach was discarded and commercial fishing was extended through the weekend and the next regularly scheduled commercial fishing period (Table 9).

By Saturday, July 14, the escapement past the counting towers was 127,000 sockeye (Table 23) and total catch was close to 450,000 sockeye, more than 100,000 above the forecast and still going strong. Although transfers to the Togiak District are restricted prior to July 24, there were some permits that had not been fished in other districts to this point in the season; several of these permits were being registered for the Togiak District. The number of drift permits registered to fish in the Togiak District gradually increased from 57 to 75 (Table 10) by July 14. This was unusual in the number of late season entrants in to the Togiak District.

Sockeye escapement past the towers and catches, both continued at above average rates. The midpoint escapement goal was achieved on July 19. On July 18 it was announced that the district transfer restrictions would be waived on, July 21, as specified by the Togiak District Salmon Management Plan. It was also announced that commercial fishing would be extended for the maximum allowable period of 48 hours (Table 9). This extended the fishery from the regularly scheduled close of 9:00 a.m. Friday, July 20 until 9:00 a.m. Sunday, July 22. The Kulukak Section

had closed 24 hours early at 9:00 a.m. July 18. On Friday morning, July 20, the main processor announced they would suspend buying until Monday. The other two processors who had been operating in the Togiak District were contacted to see if they would be able to buy fish while the main processor was shut down. After several conversations with all the processors operating in the Togiak District it was determined that there would not be any significant processing capacity available in the Togiak District until late on Saturday, July 21. Because the District was scheduled to open to all Bristol Bay permit holders on Saturday morning, and there would be no buyers available for commercially caught salmon, it was deemed necessary to supercede the previous emergency order that extended fishing time and close fishing on Friday evening.

Commercial fishing opened again on Monday, July 23 to all Bristol Bay salmon permit holders. Total commercial sockeye harvest in the Togiak District as of the close of fishing on July 21 was 614,269 sockeye (Tables 18-21). Cumulative tower escapement was 180,528. Commercial fishing, in the Togiak River Section, was extended again on July 27 for the maximum allowable 48-hour period. Overall catches were lower the last week of July due to a reduced effort, but catch per unit effort remained well above average. Fishing was extended again for 48 hours through 9:00 a.m., Sunday, July 29.

The regularly scheduled period opened again 9:00 a.m. Monday, July 30. Only one buyer was active in the Togiak District after July 28. The Togiak River Section closed as scheduled on Friday, August 3 because the buyer was unable to buy over the weekend. The counting towers below Togiak Lake were pulled out on August 3 also. The total sockeye escapement past the towers was 296,676 for the 2001 season.

The final week of commercial fishing in the Togiak District opened as scheduled on August 6. Catches were dropping off, as was effort. The regularly scheduled commercial fishing period was interrupted for a day and a half mid-week while the only remaining tender went to offload. Fishing closed for the season on Saturday morning, August 11. At this point, reported coho catches took a large jump from less than 100 per day to 834. The coho return was not expected to be large enough to sustain a directed commercial fishery, so commercial fishing was closed for the protection of coho salmon. The total sockeye harvest for 2001 in the Togiak District was 811,457; this is the second best harvest ever in the Togiak District and was 256% of the preseason forecast.

Coho Salmon

There was no directed coho fishery in the Togiak District this year. Parent year escapement in 1997 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 306 coho salmon caught by the last day of fishing, August 11. Inseason numbers however reported 834 coho caught on August 7. Despite verbally double-checking this report it was changed in the final report. At any rate commercial fishing remained closed.

There were no aerial surveys done to assess coho escapement this year due to poor weather and lack of a survey plane. In a brief conversation with one sport fishing lodge operator coho sport fishing in the Togiak River was described as slow but steady with two anglers catching 6 to 10 fish per day. This compares with 2000 when two anglers were catching 30 fish per day.

Summary

The sockeye harvest and total return to the Togiak District was the second best ever (Appendix Table 4). Chinook harvests were 76% of the 10-year average, while harvest of chum and coho were 91 and 11% respectively of the 10-year averages. Sockeye escapement into the Togiak River exceeded 300,000 fish. The chinook escapement goal of 10,000 was achieved. Chum salmon escapement in the Togiak River and its tributaries was estimated to be 168,950; an additional 83,660 chum salmon were estimated to have escaped to other streams in the Togiak District. No escapement estimates were made for pink salmon, as it is a non-pink year. Coho salmon escapement surveys were prevented by poor weather.

2001 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 2001, 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 2001, 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 continued to issue Bristol Bay subsistence salmon permits to any Alaska resident who requested one. However, the Department informed permit applicants that unless they lived in one of the above-named communities or had a 13.44 permit, they needed to take this NPS closure into account when they subsistence fished in waters of the park and preserve. The Department also informed permittees that waters outside of national park and preserve boundaries remained open for subsistence salmon fishing to all permit holders.

Inseason Management

Due to the lack of directed chinook salmon openings in the Nushagak commercial fishing district, an emergency order opened the Nushagak Section to subsistence salmon harvesting from 9 a.m. June 1 until 9 a.m. June 8. This opening was extended until 9 p.m. on June 15 and again until 9 p.m. on June 18. Effective 9 p.m. on June 20, the Nushagak Section was opened to subsistence fishing until further notice. It was closed by emergency order at 9 a.m. June 24. By emergency order effective 9 a.m. July 31, subsistence fishing in the Nushagak commercial fishing district was opened until further notice, due to the closure of the commercial fishery for the rest of the year.

An emergency order effective 9 a.m. July 7 removed the three 24-hour periods per week restriction on subsistence fishing on the Dillingham beaches and restored the 7 days per week subsistence fishing schedule. This action was due to strong returns of sockeye salmon to the Wood and Nushagak rivers and chinook salmon returns to the Nushagak River.

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 9 a.m. June 21 until 9 a.m. June 24. Another emergency order opened subsistence fishing in the Togiak commercial fishing

district from 9 a.m. June 28 until 9 a.m. July 1. Effective 9 a.m. August 12, an emergency order opened the Togiak commercial fishing district to subsistence salmon fishing for the remainder of the season, due to the closure of the commercial fishery for the rest of the year.

An emergency order opened the Naknek/Kvichak District 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 30. 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. An emergency order closed the Kvichak Section to subsistence fishing for the remainder of the 2001 season, effective 9 a.m. July 22. The same order opened the Naknek Section to the fall schedule of subsistence fishing, from 9 a.m. Mondays to 9 a.m. Fridays, through September 28, 2001, effective 9 a.m. July 23.

In the Egegik District, an additional subsistence fishing period was opened by emergency order at 4:30 p.m. on June 15 until 6 p.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 order for June 19 (8 a.m. to 8 p.m.), June 29 (5 p.m. to 10 p.m.), June 30 (6 p.m. to 8 p.m.), July 1 (7 p.m. to 11 p.m.), July 2 (6 a.m. to 8:30 a.m., and 8 p.m. to 11 p.m.), July 3 (7 a.m. to 9:30 a.m.), July 4 (8 p.m. to 11:30 p.m.), and July 5 (8 a.m. to 11 a.m.).

No emergency orders were issued for the Ugashik subsistence fishery in 2001.

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 2001, a total of 1,226 permits were issued for the Bristol Bay Management Area, and of these, 1,137 (92.7 percent) were returned to the Department with harvest data (Table 33). The largest number of permits were issued for the Nushagak (554 permits) and Naknek/Kvichak (506 permits) districts. For the Nushagak District more permits were issued in 2001 than the long-term 20-year average, due in part to permits being available to all state residents since 1990. 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. More permits were issued for the Egegik District in 2001 (57) than the average for the past 10 years (53), while the number issued in the Ugashik District (24) dropped slightly compared to recent years. The number of permits issued for the Togiak District (92) was considerably higher than recent averages, reflecting a more complete involvement by local subsistence fishers in the harvest reporting program for that district than has been the case in the past, and post-season household surveys conducted by the Division of Subsistence, the results of which were added to the subsistence permit data base (Appendix Table 30). Of all permits, 1,038 (84.7 percent) were issued to residents of Bristol Bay communities, and 188 (15.3 percent) were issued to other Alaska residents.

Harvest

The estimated total Bristol Bay subsistence salmon harvest in 2001 was 119,856 fish (Table 33). This number was slightly higher than the 118,824 salmon estimated for 2000, but is the second-lowest estimated subsistence salmon harvest for the Bristol Bay Area since 1973, when 88,400 salmon were harvested, and the fourth-lowest since harvest records have been kept beginning in 1963 (the estimated subsistence harvest was 93,000 salmon in 1972). The 2001 harvest was 20.9% below the recent 10-year average of 151,456 salmon and about 26% below the recent 20-year average of 161,888 salmon.

The area-wide chinook harvest of 14,412 salmon was up notably from 2000's total of 11,547, and was very similar to the recent 20-year average of 14,515 chinook salmon. The area-wide harvest of 92,041 sockeye salmon was the lowest since 1973 (the 2000 sockeye harvest was 92,050 fish). The 2001 sockeye harvest was 22.6% below the recent 10-year average of 118,844 sockeyes. Compared to recent 10-year averages, subsistence harvests of chum, pink, and coho salmon were also down in 2001 (Appendix Table 30).

In 2001, the Bristol Bay subsistence salmon harvest was composed of 76.8% sockeye, 12.0% chinook, 3.5% chum, 0.7% pink, and 7.0% coho salmon. Of the entire Bristol Bay Area harvest, residents of Bristol Bay communities harvested 109,858 salmon (91.7%), and other Alaska residents harvested 9,997 salmon (8.3%).

In 2001 as over the last several decades, most of the subsistence harvest was taken in the Naknek/Kvichak (50.0%) and the Nushagak (40.1%) districts. The Naknek/Kvichak total harvest of 59,909 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 2001 subsistence salmon harvest in this district was 33.6% below the recent 10-year average of 90,244 fish. The 2000 harvest of 65,053 total salmon was also well below recent and long-term averages for the district (Appendix Table 30).

In 2001, Kvichak drainage residents, and other permit holders fishing in the Kvichak drainage portion of the Naknek/Kvichak District, harvested an estimated 32,808 sockeye salmon, compared to a recent 10-year average of 59,483 sockeyes and a 20-year average of 68,611 sockeyes. The 2001 subsistence harvest of sockeye salmon in the Kvichak drainage was the lowest since records have been kept beginning in 1963. 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, Igiugig, 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 30 from 37 the previous year. 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 1,958 fish, compared to a recent 10-year average of 3,070 sockeyes. The number of permits issued to households with non-Kvichak drainage addresses dropped in 2001 to 37, from 48 in 2000, and the sockeye salmon harvest by these permittees fell to 1,901 fish compared to a recent 10-year average of 2,777 (Appendix Table 31). The NPS closure is likely at least partly responsible for this change as well.

In the Nushagak District, the total estimated subsistence harvest in 2001 was 48,080 salmon. The recent 10-year average is 50,946. The Nushagak chinook harvest in 2001 of 11,760 was up from 2000's 9,470, but still below the recent 10-year average of 13,716 chinook. The sockeye harvest of 26,939 was similar to the 10-year average (26,728) but below the 20-year average (32,735) (Appendix Table 32). In 2001, subsistence salmon harvests in several Nushagak District communities were substantially lower than recent averages, most notably Ekwok and Koliganek (Appendix Table 32).

The estimated total subsistence salmon harvest for the Togiak District in 2001 of 6,509 fish was the highest since 1992 (7,069) and exceeded both the recent 10-year average (4,323) and the 20-year average (5,075). This no doubt reflects the more complete participation in the harvest monitoring system by Togiak District subsistence fishers in 2001. The estimated subsistence harvest in the Ugashik District in 2001 was 1,624, lower than the 10-year average of 2,307. In the Egegik District, the estimated subsistence salmon harvest of 3,653 was up notably from the estimate of 1,131 salmon for 2000. Significantly more permits were issued for this district in 2001 (57) than in 2000 (31), approximating the recent 10-year average of 53. The increase in the number of participants in the fishery and the subsistence harvest in 2001 may reflect the increased fishing opportunity provided by emergency subsistence openings in the commercial fishing area (see above) (Appendix Table 30).

Subsistence Monitoring

In 2001 a program to obtain information about the subsistence fish harvests in the Togiak are was begun. This was a joint project between Bristol Bay Native Association, the U. S. Fish and Wildlife Service Togiak National Wildlife Refuge and ADF&G. This was the first year of the project and it began after a majority of subsistence fishing had been completed. Although a few scale samples were collected they were not enough to make any definitive statements about run composition. This project will run again in 2002 and with an earlier start should provide significantly more information.

LITERATURE CITED

ALASKA DEPARTMENT OF FISH AND GAME. 1975-2000. Division of Commercial Fisheries, Bristol Bay management files, unpublished records.

ALASKA DEPARTMENT OF FISH AND GAME. 1975-2000. Annual records listing fresh, frozen or cured salmon production and number of fish shipped out of Bristol Bay for processing (Tables). Division of Commercial Fisheries, Bristol Bay management files.

ALASKA DEPARTMENT OF FISH AND GAME 1974-75. Annual "Alaska Catch and Production Commercial Fisheries Statistics". Division of Commercial Fisheries, Statistics Section, Statistical Leaflet No.'s 23, 25, 26, 27, and 28.

ALASKA DEPARTMENT OF FISH AND GAME 1974-2000. Annual final computer catch printout summaries for Bristol Bay. Division of Commercial Fisheries, Statistics Section.

ALASKA DEPARTMENT OF FISH AND GAME 1975-2000. Annual Bristol Bay salmon forecast. Division of Commercial Fisheries, Informational Leaflet No.'s 164, 167, 169, 171, 173, 177, 183, 190, 197, 209, 229, 244, 247, 253, 255, and 259; Bristol Bay Data Report No.'s 85-1, 85-13, 86-9, 87-1, 87-5, 88-5, Regional Information Report No.'s 2K88-13, 2K90-01, 2A92-12, 2A93-01, 2A94-04, 2A94-28, 2A95-17, 2A96-32, 2A98-02, 2A99-03, 2A-00-38.

ALASKA DEPARTMENT OF FISH AND GAME 1974-2000. Annual "Bristol Bay Salmon Catch and Escapement Data Compilations". Division of Commercial Fisheries, Technical Data Report No.'s 24, 40, 43, 47, 88, 94, 128, 129, 175, 191 and Technical Fishery Report No.'s 89-06, 89-07, 90-14, 91-15, 92-17, 94-16.

ALASKA DEPARTMENT OF FISH AND GAME 1975-2000. Average weight by species from processor records (BB-CF Forms 301 and 303). Division of Commercial Fisheries, Bristol Bay Management Files.

ALASKA DEPARTMENT OF FISH AND GAME 1975-2000. Alaska Peninsula Area fisheries data. Division of Commercial Fisheries, Peninsula management files.

ALASKA DEPARTMENT OF FISH AND GAME 1975-2000. Annual "Spawning Ground Surveys in the Nushagak and Togiak Districts of Bristol Bay" and "Salmon Spawning Ground Surveys in the Bristol Bay Area", Division of Commercial Fisheries, Bristol Bay Data Report No.'s 52, 55, 59, 73, 81, 87, 93, 101, 84-6, 85-15; Regional Information Report No.'s 1/No. 2K88-04, 2K88-07, 2K88-14, 2K89-15, 2K90-04, 2A92-01, 2A93-08, 2A94-34, 2A96-31, 2A97-21, 2A98-34, 2A99-01, 2A00-04.

ALASKA DEPARTMENT OF FISH AND GAME COMMERCIAL FISHERIES ENTRY COMMISSION. 1975-2000 Data Files and unpublished records as maintained by the Entry Commission.

ALASKA DEPARTMENT OF FISH AND GAME 1985. "Bering Sea Herring Aerial Survey Manual" by R. C. Lebida and D. C. Whitmore, Division of Commercial Fisheries, Bristol Bay Data Report No. 85-2.

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, 2001.[a]

District and River System	Inshore Run			Escapement				Inshore Catch		
	Forecast	Actual	Percent Deviation[b]	Mid-point Objective	Range	Actual	Percent Deviation[b]	Projected Harvest	Actual	Percent Deviation[b]
NAKNEK-KVICHAK DISTRICT										
Kvichak River	2,885	1,430	50%	2,000	2,000 - 10,000	1,095	45%	885	325	63%
Branch River	498	410	18%	185	170 - 200	269	-45%	283	138	51%
Naknek River	2,782	6,657	-139%	1,100	800 - 2,000	1,830	-66%	1,682	4,782	-184%
Total	6,165	8,497	-38%	3,285		3,194	3%	2,850	5,245	-84%
EGEGIK DISTRICT	7,620	3,857	49%	1,100	800 - 1,400	969	12%	6,520	2,862	56%
UGASHIK DISTRICT	2,231	1,351	39%	850	500 - 1,200	866	-2%	1,381	476	66%
NUSHAGAK DISTRICT										
Wood River	5,139	3,932	23%	1,100	700 - 1,500	1,459	-33%	4,039	2,447	39%
Igushik River	1,238	1,323	-7%	225	150 - 300	410	-82%	1,013	904	11%
Nushagak-Mulchatna	1,432	2,085	-46%	550	340 - 760	811	-47%	882	1,259	-43%
Total	7,809	7,340	6%	1,875		2,680	-43%	5,934	4,610	22%
TOGIAK DISTRICT	466	1,122	-141%	150	100 - 200	303	-102%	316	811	-157%
TOTAL BRISTOL BAY	24,291	22,167	9%	7,260		8,012	-10%	17,001	14,004	18%

[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 comparison. Therefore, actual District totals reported here may represent only a portion of the District, and actual Bristol Bay totals reported here include only a portion of the District, and actual Bristol Bay totals reported here include 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)/forecast.

Table 2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2001.

District and River System	2-Ocean			3-Ocean			Other	Total
	1.2 (1996)	2.2 (1995)	Total	1.3 (1995)	2.3 (1994)	Total		
NAKNEK-KVICHAK DISTRICT								
Kvichak River	975	788	1,763	1,003	119	1,122	0	2,885
Branch River	270	72	342	127	29	156	0	498
Naknek River	429	620	1,049	1,196	537	1,733	0	2,782
Total	1,674	1,480	3,154	2,326	685	3,011	0	6,165
EGEGIK DISTRICT	663	3,084	3,747	990	2,883	3,873	0	7,620
UGASHIK DISTRICT	480	871	1,351	586	294	880	0	2,231
NUSHAGAK DISTRICT								
Wood River	1,610	1,982	3,592	1,478	69	1,547	0	5,139
Igushik River	155	39	194	995	49	1,044	18	1,256
Nushagak River	98	6	104	1,322	6	1,328		1,432
Total	1,863	2,027	3,890	3,795	124	3,919	18	7,827
TOGIAK DISTRICT	112	25	137	33	466	499	62	698
TOTAL BRISTOL BAY[a]								
Number	4,792	7,487	12,279	7,730	4,452	12,182	80	24,541
Percent	20	31	50	31	18	50	0	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, 2001.[a]

District and River System		1.2	2.2	2-Ocean	0.3	1.3	2.3	3-Ocean	Total
NAKNEK-KVICHAK DISTRICT									
Kvichak River									
	Number	129	19	148	4	1,198	76	1,278	1,426
	Percent	9.0	1.3	10.4	0.3	84.0	5.3	89.6	100
Branch River									
	Number	64	10	74	0	302	26	328	402
	Percent	15.9	2.5	18.4	0.0	75.1	6.5	81.6	100
Naknek River									
	Number	118	82	200	2	6,089	286	6,377	6,577
	Percent	1.8	1.2	3.0	0.0	92.6	4.3	97.0	100
Total	Number	311	111	422	6	7,589	388	7,983	8,405
	Percent	3.7	1.3	5.0	0.1	90.3	4.6	95.0	100
EGEGIK DISTRICT									
	Number	34	514	548	0	1,785	1,452	3,237	3,785
	Percent	0.9	13.6	14.5	0.0	47.2	38.4	85.5	100
UGASHIK DISTRICT									
	Number	232	36	268	2	976	82	1,060	1,328
	Percent	17.5	2.7	20.2	0.2	73.5	6.2	79.8	100
NUSHAGAK DISTRICT									
Wood River									
	Number	171	3	174	61	3,602	13	3,676	3,850
	Percent	4.4	0.1	4.5	1.6	93.6	0.3	95.5	100
Igushik River									
	Number	33	1	34	18	1,237	13	1,268	1,302
	Percent	2.5	0.1	2.6	1.4	95.0	1.0	97.4	100
Nush-Mulchat. River									
	Number	69	3	72	128	1,757	15	1,900	1,972
	Percent	3.5	0.2	3.7	6.5	89.1	0.8	96.3	100
Total	Number	273	7	280	207	6,596	41	6,844	7,124
	Percent	3.8	0.1	3.9	2.9	92.6	0.6	96.1	100
TOGIAK DISTRICT[b]									
	Number	43	4	47	5	999	66	1,070	1,117
	Percent	3.8	0.4	4.2	0.4	89.4	5.9	95.8	100
TOTAL BRISTOL BAY[c]									
	Number	893	672	1,565	220	17,945	2,029	20,194	21,759
	Percent	4.1	3.1	7.2	1.0	82.5	9.3	92.8	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, Bristol Bay, in numbers of fish, 2001.

District and River System		Catch	Escapement	Total Run
NAKNEK-KVICHAK DISTRICT				
Kvichak River		324,963	1,095,348	1,420,311
Branch River		137,986	269,000	406,986
Naknek River		4,781,612	1,830,360	6,611,972
	Total	5,244,561	3,194,708	8,439,269
EGEGIK DISTRICT		2,861,991	968,872 [a]	3,830,863
UGASHIK DISTRICT		475,803	866,368 [b]	1,342,171
NUSHAGAK DISTRICT				
Wood River		2,446,552	1,458,732	3,905,284
Igushik River		903,987	409,596	1,313,583
Nushagak-Mulchatna		1,259,223	811,104	2,070,327
	Total	4,609,762	2,679,432	7,289,194
TOGIAK DISTRICT [c]				
Togiak Lake		811,457	296,676	1,108,133
Togiak River/Tributaries		0	6,670 [d]	6,670
Kulukak System		9,532	17,280	26,812
Other Systems		1,908	17,990	19,898
	Total	822,897	338,616	1,161,513
TOTAL BRISTOL BAY		14,015,014	8,047,996	22,063,010

[a] Includes only Egegik River Tower counts.

[b] Includes Ugahik 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.

[d] Post peak survey mainstem and one trib only.

Table 5. Offshore test fishing catch indices of sockeye salmon, Port Moller, Bristol Bay, 2001.

Date	No. of Stations Fished	Sockeye Catch	Running Mean Length (mm)	Index [a] Daily	Index [a] Cum.
6/10	5	46	574	22.6	22.6
6/11	5	55	570	30.8	53.4
6/12	5	54	573	21.4	75
6/13	5	86	568	36.3	111
6/14	5	79	582	35.0	146
6/15	5	98	574	31.8	178
6/16	5	240	566	104.1	282
6/17	5	347	571	162.2	444
6/18	5	177	572	67.4	512
6/19	5	365	564	160.1	672
6/20	5	239	570	102.6	774
6/21	5	279	567	119.7	894
6/22	5	393	571	174.0	1,068
6/23	5	195	569	79.5	1,148
6/24	5	227	569	101.5	1,249
6/25	5	280	571	134.6	1,384
6/26	5	253	572	108.7	1,492
6/27	5	340	572	136.8	1,629
6/28	5	292	568	140.2	1,769
6/29	5	207	572	83.4	1,853
6/30	5	220	569	100.9	1,954
7/01	5	194	566	78.9	2,033
7/02	5	162	573	94.8	2,127
7/03	5	232	569	97.0	2,224
7/04	5	128	573	52.6	2,277
7/05	Did not fish			53.8	2,331
7/06	5	111	577	41.5	2,372
7/07	5	65	585	24.0	2,396
7/08	5	63	579	27.7	2,424
7/09	5	27	574	7.7	2,432

[a] Indices are based on fish/100 fathom-hours and was built using Sations 2 to 10 for 2001.

Table 6. Summary of district sockeye salmon test fishing indices in the Naknek-Kvichak District, by index area and date, Bristol Bay, 2001.[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
6/27	827							521	468	174			
6/29			123		97	21	431			76	310		

[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 in the Ugashik District, by index area and date, Bristol Bay, 2001.[a]

Index Area	July 6	July 7
Cape Grieg (Nearshore)		
Four Miles North of Smoky Point Nearshore		
Four Miles North of Smoky Point (Outer line)		
Two Miles North of Smoky Point (Outer line)		
Smoky Point Bar North Side Inshore		
Smoky Point Bar Offshore end		
Smoky Point Entrance	512	
Mid Outer Line		
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)	112	
Dago Creek Mouth	884	
Pilot Point	503	
Between Pilot Point and Muddy Point		76
Outer South Channel		
Inner South Channel	4,250	
Below inner district boundary line west side		
BelowAbove inner district boundary line east side		
Below inner districtboundary line east side	1,768	38
Between Dog Salmon and King Salmon Rivers	1,993	342 [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, 2001. [a]

Date	Upper Wood Reg. Marker	Hanson Point	Across Hanson Pt.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Below Nushagak Pt.	Pile Driver	Queen's Slough	Clark's Point	Upper W. Marker	Coffee Point	Kanakanak Bluff
6/21		531	738	410	0	440			10,000				1,172	
		357	1,216	0	0	205			1,953				598	
6/23		1,104	548	3,590	0	1,230			1,071				750	
		205	1,771		1,474	741								
6/23		1,721	1,453	3,362	256	233	3,264	2,629		896			1,299	
		2,422	1,003	2,553	0	253								
6/24		1,395	2,015	3,787	0	173			1,230			224		
		2,007	2,481	1,803	0	1,622		3,776						
6/24		1,758	2,529	2,727	1,882	6,588								
		1,654	4,286	2,158	366	6,180								
6/25		2,118	4,396	10,840	920	1,949								
		2,368	4,016	6,824	232	709								
6/25		1,687	1,771											
		1,628	4,268											
6/26		1,233	2,332	4,242	603	0								
		1,811	4,506	5,255	0	251								
6/27		1,369	1,423	2,578	0	0								
		1,008	876	938	0	209								
6/29		876	866	278	0	0								1,484
		238	822	217	0	198								
6/30		2,806	5,385		2,308	657								
		3,794	6,642		2,419	6,842								
6/30		218	4,269	8,754	1,406	8,442								
		698	5,370	7,045	3,855	6,695								
7/1		3,457	3,210		0	1,255								
		4,419	1,319		252	753								
7/1		486	1,660	5,455	1,538	1,967			4,743			1,386		
		1,527	1,423	2,466	750	5,259								
7/2		2,939	2,109		486	13,846			7,465			1,452		
		2,574	506		259	9,158								
7/2		3,984	2,366	4,269	13,800	30,000				5,381		2,358		
		1,846	1,538	1,556	16,994	19,394								
7/3		4,254	3,704		4,015	14,783								
		3,953	3,310		1,277	10,941								
7/4		4,662	1,702		720	0								
		6,067	2,472		738	0								
7/4		2,418	4,180		492	0								
		3,012	4,000		246	0								
7/5		4,015	1,714		0	0								
		1,042	1,433		0	0								
7/5		526	2,332		0	0								
		253	3,604		238	0								
7/6	241	237	0		0	0								
	0	440	0		0	0								

[a] All indices expressed in number of fish/100 fathoms-hours to the nearest full index point. Indicies listed first for each stateion 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, 2001.

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Naknek/Kvichak District						
Drift net						[c]
Set net						
AKN.03	June 13	9:00 a.m.	to	June 15	9:00 a.m.	48-hours [c]
AKN.06	June 19	9:00 a.m.	to	June 20	9:00 a.m.	24-hours
AKN.03	June 20	9:00 a.m.	to	June 22	9:00 a.m	48-hours
AKN.10	June 23	1:30 p.m.	to	June 23	7:30 p.m.	6-hours
AKN.13	June 24	2:30 p.m.	to	June 24	8:30 p.m.	6-hours
Naknek Section						
Drift net						
AKN.03	June 13	9:00 a.m.	to	June 15	9:00 a.m.	48-hours
AKN.06	June 19	9:00 a.m.	to	June 20	9:00 a.m.	24-hours
AKN.03	June 20	9:00 a.m.	to	June 22	9:00 a.m	48-hours
AKN.10	June 23	2:30 p.m.	to	June 23	7:30 p.m.	5-hours
AKN.13	June 24	3:30 p.m.	to	June 24	8:30 p.m.	5-hours
AKN.13	June 25	4:30 a.m.	to	June 25	11:30 a.m.	7-hours
AKN.15	June 25	4:00 p.m.	to	June 25	10:00 p.m.	6-hours
AKN.17	June 26	5:30 a.m.	to	June 26	12:30 p.m.	7-hours
AKN.20	June 26	5:00 p.m.	to	June 26	11:00 p.m.	6-hours
AKN.20	June 27	6:30 a.m.	to	June 27	1:00 p.m.	6.5-hours
AKN.68	July 23	9:00 a.m.	to	Sept. 28	9:00 a.m.	weekly schedule [b]
Set net						
AKN.13	June 25	3:30 a.m.	to	June 25	11:30 a.m.	8-hours
AKN.15	June 25	4:00 p.m.	to	June 25	10:00 p.m.	6-hours
AKN.17	June 26	4:30 a.m.	to	June 26	12:30 p.m.	8-hours
AKN.20	June 26	5:00 p.m.	to	June 26	11:00 p.m.	6-hours
AKN.20	June 27	5:30 a.m.	to	June 27	1:00 p.m.	7.5-hours
AKN.68	July 23	9:00 a.m.	to	Sept. 28	9:00 a.m.	weekly schedule [b]
Naknek River Special Harvest Area						
Drift net						
AKN.21	June 28	7:00 a.m.	to	June 28	12:30 p.m.	5.5-hours
AKN.24	June 29	8:00 a.m.	to	June 29	1:00 p.m.	5-hours
AKN.27	June 30	9:00 a.m.	to	June 30	2:00 p.m.	5-hours
AKN.30	July 01	11:00 p.m.	to	July 02	6:00 a.m.	7-hours [d]
AKN.34	July 02	11:30 p.m.	to	July 03	7:30 a.m.	8-hours

Continued

Table 9. (page 2 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
AKN.37	July 03	10:30 a.m.	to	July 03	5:30 p.m.	7-hours
AKN.37	July 04	12:30 a.m.	to	July 04	9:00 a.m.	8.5-hours
AKN.39	July 04	3:00 p.m.	to	July 04	7:30 p.m.	4.5-hours
AKN.40	July 05	10:30 a.m.	to	July 05	8:30 p.m.	10-hours
AKN.42	July 06	11:30 a.m.	to	July 06	9:00 p.m.	9.5-hours
AKN.44	July 07	2:30 a.m.	to	July 07	11:30 a.m.	9-hours
AKN.44	July 07	3:00 p.m.	to	July 07	10:00 p.m.	7-hours
AKN.47	July 08	3:30 p.m.	to	July 08	10:30 p.m.	7-hours
AKN.50	July 09	12:30 p.m.	to	July 09	11:00 p.m.	10.5-hours
AKN.53	July 10	8:30 a.m.	to	July 10	3:00 p.m.	6.5-hours
AKN.56	July 11	4:30 a.m.	to	July 11	2:30 p.m.	10-hours
AKN.59	July 12	6:00 a.m.	to	July 12	2:00 p.m.	8-hours
AKN.62	July 13	7:00 a.m.	to	July 13	1:00 a.m.	6-hours
AKN.65	July 14	7:30 a.m.	to	July 14	1:30 p.m.	6-hours
AKN.65	July 16	9:00 a.m.	to	July 16	2:00 p.m.	5-hours
AKN.65	July 16	10:00 p.m.	to	July 17	4:00 a.m.	6-hours
AKN.68	July 18	10:30 a.m.	to	July 18	3:00 p.m.	4.5-hours
AKN.68	July 18	11:30 p.m.	to	July 19	6:00 a.m.	6.5-hours
Set net						
AKN.21	June 28	7:30 p.m.	to	June 29	1:30 a.m.	6-hours
AKN.24	June 29	8:30 p.m.	to	June 30	3:00 a.m.	6.5-hours
AKN.27	June 30	9:30 p.m.	to	July 01	4:30 a.m.	7-hours
AKN.30	July 01	9:00 a.m.	to	July 01	3:30 p.m.	6.5-hours
AKN.34	July 02	10:00 a.m.	to	July 02	6:00 p.m.	8-hours
AKN.39	July 04	10:30 a.m.	to	July 04	2:30 p.m.	4-hours
AKN.40	July 05	12:30 a.m.	to	July 05	10:00 a.m.	9.5-hours
AKN.42	July 06	1:00 a.m.	to	July 06	11:00 a.m.	10-hours
AKN.47	July 08	2:30 a.m.	to	July 08	12:30 p.m.	10-hours
AKN.50	July 09	3:00 a.m.	to	July 09	12:00 p.m.	9-hours
AKN.53	July 10	3:30 a.m.	to	July 10	8:00 a.m.	4.5-hours
AKN.53	July 10	4:00 p.m.	to	July 11	12:00 a.m.	8-hours
AKN.56	July 11	5:00 p.m.	to	July 12	12:30 a.m.	7.5-hours
AKN.59	July 12	6:00 p.m.	to	July 13	1:30 a.m.	7.5-hours
AKN.62	July 13	7:00 p.m.	to	July 14	3:00 a.m.	8-hours
AKN.65	July 14	8:00 p.m.	to	July 16	5:00 a.m.	33-hours
AKN.68	July 17	9:00 a.m.	to	July 18	6:30 a.m.	21.5-hours
AKN.68	July 19	11:00 a.m.	to	July 20	9:00 a.m.	22-hours
Egegik District						
Drift net						
AKN.02	June 01	12:00 a.m.	to	June 15	9:00 a.m.	weekly schedule [g]

Continued

Table 9. (page 3 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
AKN.05	June 18	8:00 a.m.	to	June 18	4:00 p.m.	8-hours
AKN.08	June 20	10:00 a.m.	to	June 20	6:00 p.m.	8-hours
AKN.09	June 22	12:30 p.m.	to	June 22	7:30 p.m.	7-hours
AKN.11	June 24	2:00 p.m.	to	June 24	10:00 p.m.	8-hours
AKN.16	June 26	4:00 p.m.	to	June 27	12:00 a.m.	8-hours
AKN.19	June 27	4:00 a.m.	to	June 27	12:00 p.m.	8-hours
	July 23	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule [b]
Set net						
AKN.02	June 01	12:00 a.m.	to	June 15	9:00 a.m.	weekly schedule [g]
AKN.05	June 18	8:00 a.m.	to	June 18	4:00 p.m.	8-hours
AKN.08	June 20	10:00 a.m.	to	June 20	6:00 p.m.	8-hours
AKN.09	June 22	11:30 a.m.	to	June 22	7:30 p.m.	8-hours
AKN.11	June 24	2:00 p.m.	to	June 24	10:00 p.m.	8-hours
AKN.16	June 26	4:00 p.m.	to	June 27	12:00 a.m.	8-hours
AKN.19	June 27	4:00 a.m.	to	June 27	12:00 p.m.	8-hours
	July 23	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule [b]
Egegik Special Harvest Area						
Drift net						
AKN.23	June 28	5:00 a.m.	to	June 28	1:00 p.m.	8-hours
AKN.25	June 29	6:00 a.m.	to	June 29	2:00 p.m.	8-hours
AKN.28	June 30	6:30 a.m.	to	June 30	2:30 p.m.	8-hours
AKN.31	July 01	7:30 a.m.	to	July 01	3:30 p.m.	8-hours
AKN.33	July 02	8:30 a.m.	to	July 02	12:30 p.m.	4-hours
AKN.36	July 03	9:30 a.m.	to	July 03	1:30 p.m.	4-hours
AKN.38	July 04	10:00 a.m.	to	July 04	2:00 p.m.	4-hours
AKN.43	July 06	12:00 p.m.	to	July 06	8:00 p.m.	8-hours
AKN.45	July 07	1:00 p.m.	to	July 07	6:00 p.m.	5-hours
AKN.48	July 08	1:30 p.m.	to	July 08	9:30 p.m.	8-hours
AKN.51	July 09	5:00 a.m.	to	July 09	10:00 a.m.	5-hours
AKN.51	July 09	2:30 p.m.	to	July 09	10:30 p.m.	8-hours
AKN.54	July 10	5:00 a.m.	to	July 10	11:00 a.m.	6-hours
AKN.54	July 10	3:30 p.m.	to	July 10	11:30 p.m.	8-hours
AKN.57	July 11	5:30 a.m.	to	July 11	11:30 a.m.	6-hours
AKN.57	July 11	4:00 p.m.	to	July 11	11:00 p.m.	7-hours
AKN.61	July 13	4:30 p.m.	to	July 13	11:30 p.m.	7-hours
	July 17	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule
Set net						
AKN.23	June 28	5:00 a.m.	to	June 28	1:00 p.m.	8-hours

Continued

Table 9. (page 4 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
AKN.25	June 29	6:00 a.m.	to	June 29	2:00 p.m.	8-hours
AKN.28	June 30	6:30 a.m.	to	June 30	2:30 p.m.	8-hours
AKN.31	July 01	7:30 a.m.	to	July 1	3:30 p.m.	8-hours
AKN.43	July 06	12:00 p.m.	to	July 06	8:00 p.m.	8-hours
AKN.48	July 08	1:30 p.m.	to	July 08	9:30 p.m.	8-hours
AKN.51	July 09	2:30 p.m.	to	July 09	10:30 p.m.	8-hours
AKN.54	July 09	10:30 p.m.	to	July 10	11:00 a.m.	12.5-hours
AKN.57	July 11	3:30 a.m.	to	July 11	11:30 a.m.	8-hours
AKN.61	July 13	4:30 a.m.	to	July 13	12:30 p.m.	8-hours
	July 17	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule
Ugashik Disgtrict						
Drift net						
AKN.01	June 01	12:00 a.m.	to	June 15	9:00 a.m.	weekly schedule
AKN.01	June 18	7:30 a.m.	to	June 18	5:30 p.m.	10-hours
AKN.01	June 19	8:30 a.m.	to	June 19	6:30 p.m.	10-hours
AKN.01	June 20	9:30 a.m.	to	June 20	7:30 p.m.	10-hours
AKN.01	June 21	10:00 a.m.	to	June 21	8:00 p.m.	10-hours
AKN.01	June 22	10:00 a.m.	to	June 22	6:00 p.m.	8-hours
AKN.18	June 26	3:00 p.m.	to	June 26	7:00 p.m.	4-hours
AKN.46	July 07	1:30 p.m.	to	July 07	4:00 p.m.	2.5-hours
AKN.49	July 08	1:00 p.m.	to	July 08	9:00 p.m.	8-hours
AKN.52	July 09	2:00 p.m.	to	July 09	6:00 p.m.	4-hours
AKN.55	July 10	2:30 p.m.	to	July 10	10:30 p.m.	8-hours
AKN.58	July 11	7:00 a.m.	to	July 11	11:00 p.m.	16-hours
AKN.60	July 12	3:30 p.m.	to	July 12	11:30 p.m.	8-hours
AKN.63	July 13	5:30 a.m.	to	July 13	11:30 p.m.	18-hours
AKN.64	July 14	5:30 a.m.	to	July 14	11:30 p.m.	18-hours
AKN.66	July 15	5:30 a.m.	to	July 15	5:30 p.m.	12-hours
AKN.67	July 16	6:00 a.m.	to	July 16	4:00 p.m.	10-hours
	July 17	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule
Set net						
AKN.01	June 01	12:00 a.m.	to	June 15	9:00 a.m.	weekly schedule
AKN.01	June 18	7:30 a.m.	to	June 18	5:30 p.m.	10-hours
AKN.01	June 19	8:30 a.m.	to	June 19	6:30 p.m.	10-hours
AKN.01	June 20	9:30 a.m.	to	June 20	7:30 p.m.	10-hours
AKN.01	June 21	10:00 a.m.	to	June 21	8:00 p.m.	10-hours
AKN.01	June 22	10:00 a.m.	to	June 22	6:00 p.m.	8-hours
AKN.12	June 24	1:00 p.m.	to	June 24	11:30 p.m.	10.5-hours
AKN.14	June 24	11:30 p.m.	to	July 26	11:30 p.m.	48-hours

Continued

Table 9. (page 5 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time	
AKN.46	July 07	12:30 p.m.	to	July 07	6:30 p.m.	6-hours	
AKN.49	July 08	1:00 p.m.	to	July 08	11:00 p.m.	10-hours	
AKN.60	July 12	3:30 p.m.	to	July 12	11:30 p.m.	8-hours	
AKN.63	July 12	11:30 p.m.	to	July 13	4:30 p.m.	17-hours	
AKN.64	July 13	4:30 p.m.	to	July 14	5:30 p.m.	25-hours	
AKN.66	July 15	5:30 a.m.	to	July 15	5:30 p.m.	12-hours	
	July 17	9:00 a.m.	to	Sept 28	9:00 a.m.	weekly schedule	
Nushagak District							
DLG.46	9:00 a.m.	July 21	to				o
Nushagak Section							
Drift net							
DLG.13	3:30 p.m.	June 24	to	7:30 p.m.	June 24	4 hrs.	
DLG.15	4:30 p.m.	June 25	to	10:30 p.m.	June 25	6 hrs.	
DLG.16	10:30 p.m.	June 25	to	11:30 a.m.	June 26	13 hrs.	d
DLG.17	5:30 a.m.	June 27	to	11:30 p.m.	June 27	18 hrs.	
DLG.23	11:00 a.m.	June 30	to	3:00 p.m.	June 30	4 hrs.	
DLG.26	11:00 p.m.	July 2	to	3:00 a.m.	July 3	4 hrs.	
DLG.27	11:30 a.m.	July 3	to	3:30 p.m.	July 3	4 hrs.	
DLG.28	3:30 p.m.	July 3	to	11:30 a.m.	July 4	20 hrs.	d
DLG.29	11:30 a.m.	July 4	to	12:30 p.m.	July 5	25 hrs.	d
DLG.30	6:30 p.m.	July 5	to	1:30 p.m.	July 6	19 hrs.	
DLG.31	9:30 p.m.	July 6	to	7:30 a.m.	July 7	10 hrs.	
DLG.33	5:30 p.m.	July 7	to	11:30 p.m.	July 7	6 hrs.	
DLG.33	7:00 a.m.	July 8	to	1:00 p.m.	July 8	6 hrs.	
DLG.34	9:00 a.m.	July 7	to				u
DLG.36	7:30 a.m.	July 9	to	1:30 p.m.	July 9	6 hrs.	
DLG.37	6:00 a.m.	July 10	to	2:00 p.m.	July 10	8 hrs.	
DLG.38	5:00 p.m.	July 9	to	11:00 p.m.	July 9	6 hrs.	r
DLG.39	6:00 p.m.	July 10	to	6:00 a.m.	July 11	12 hrs.	
DLG.39	7:00 p.m.	July 11	to	7:00 a.m.	July 12	12 hrs.	
DLG.41	7:00 a.m.	July 12	to	3:00 p.m.	July 12	8 hrs.	d
DLG.41	7:00 a.m.	July 13	to	7:00 p.m.	July 13	12 hrs.	
DLG.42	9:00 a.m.	July 14	to	9:00 p.m.	July 14	12 hrs.	
DLG.43	9:30 a.m.	July 15	to	9:30 p.m.	July 15	12 hrs.	
DLG.45	9:30 p.m.	July 15	to				d,e
DLG.50	6:00 p.m.	July 27	to				l

Continued

Table 9. (page 6 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time
Set net						
DLG.13	3:30 p.m.	June 24	to	9:30 p.m.	June 24	6 hrs.
DLG.15	4:30 p.m.	June 25	to	10:30 p.m.	June 25	6 hrs.
DLG.16	10:30 p.m.	June 25	to	11:30 a.m.	June 26	13 hrs. [d]
DLG.17	5:30 a.m.	June 27	to	11:30 p.m.	June 27	18 hrs.
DLG.20	7:00 a.m.	June 29	to	1:00 p.m.	June 29	6 hrs.
DLG.21	8:30 p.m.	June 29	to	2:30 a.m.	June 30	6 hrs.
DLG.22	8:30 a.m.	June 30	to	2:30 p.m.	June 30	6 hrs.
DLG.26	11:00 p.m.	July 2	to	5:00 a.m.	July 3	6 hrs.
DLG.27	11:30 a.m.	July 3	to	5:30 p.m.	July 3	6 hrs.
DLG.28	5:30 p.m.	July 3	to	11:30 a.m.	July 4	18 hrs. [d]
DLG.29	11:30 a.m.	July 4	to	12:30 p.m.	July 5	25 hrs. [d]
DLG.30	12:30 p.m.	July 5	to	1:30 p.m.	July 6	25 hrs. [d]
DLG.31	1:30 p.m.	July 6	to	2:30 p.m.	July 7	25 hrs. [d]
DLG.33	2:30 p.m.	July 7	to	3:30 p.m.	July 8	25 hrs. [d]
DLG.34	9:00 a.m.	July 7	to			[u]
DLG.36	3:30 p.m.	July 8	to	4:30 p.m.	July 9	25 hrs. [d]
DLG.37	4:30 p.m.	July 9	to	5:30 p.m.	July 10	25 hrs. [d]
DLG.39	5:30 p.m.	July 10	to			[e]
DLG.50	6:00 p.m.	July 27	to			[l]
Igushik Section						
Drift net						
DLG.09	1:30 p.m.	June 22	to	12:30 a.m.	June 23	11 hrs.
DLG.10	3:30 p.m.	June 24	to	12:30 a.m.	June 25	9 hrs.
DLG.14	12:30 a.m.	June 25	to	4:30 p.m.	June 25	16 hrs. [d]
DLG.15	4:30 p.m.	June 25	to	5:30 p.m.	June 26	25 hrs. [d]
DLG.17	5:30 p.m.	June 26	to	6:30 p.m.	June 27	25 hrs. [d]
DLG.19	6:30 p.m.	June 27	to			[d,e]
DLG.23	3:00 p.m.	June 30	to			[l]
DLG.28	12:00 a.m.	July 4	to	11:00 a.m.	July 4	11 hrs.
DLG.29	11:00 a.m.	July 4	to	12:30 p.m.	July 5	25.5 hrs. [d]
DLG.30	12:30 p.m.	July 5	to	1:30 p.m.	July 6	25 hrs. [d]
DLG.31	9:30 p.m.	July 6	to	7:30 a.m.	July 7	10 hrs.
DLG.33	5:30 p.m.	July 7	to	11:30 p.m.	July 7	6 hrs.
DLG.33	7:00 a.m.	July 8	to	1:00 p.m.	July 8	6 hrs.
DLG.34	9:00 a.m.	July 7	to			[u]
DLG.36	6:30 p.m.	July 8	to	12:30 a.m.	July 9	6 hrs.

Continued

Table 9. (page 7 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time	
DLG.36	7:30 a.m.	July 9	to	1:30 p.m.	July 9	6 hrs.	
DLG.37	6:00 a.m.	July 10	to	6:00 p.m.	July 10	12 hrs.	
DLG.39	6:00 p.m.	July 10	to	6:00 a.m.	July 11	12 hrs.	d
DLG.39	6:00 p.m.	July 11	to	12:00 p.m.	July 12	18 hrs.	
DLG.41	7:00 p.m.	July 12	to	1:00 p.m.	July 13	18 hrs.	
DLG.42	1:00 p.m.	July 13	to				d,e
DLG.50	6:00 p.m.	July 27	to				l
Set net							
DLG.05	11:30 a.m.	June 20	to	11:30 p.m.	June 20	12 hrs.	
DLG.07	12:30 p.m.	June 21	to	5:30 a.m.	June 22	17 hrs.	
DLG.09	1:30 p.m.	June 22	to	2:30 p.m.	June 23	25 hrs.	
DLG.10	2:30 p.m.	June 23	to	3:30 p.m.	June 24	25 hrs.	d
DLG.13	3:30 p.m.	June 24	to	4:30 p.m.	June 25	25 hrs.	d
DLG.15	4:30 p.m.	June 25	to	5:30 p.m.	June 26	25 hrs.	d
DLG.17	5:30 p.m.	June 26	to	6:30 p.m.	June 27	25 hrs.	d
DLG.19	6:30 p.m.	June 27	to				d,e
DLG.25	7:00 p.m.	June 30	to				l
DLG.26	11:00 p.m.	July 2	to	11:00 a.m.	July 3	12 hrs.	
DLG.27	11:00 a.m.	July 3	to	11:00 p.m.	July 3	12 hrs.	d
DLG.28	11:00 p.m.	July 3	to	11:00 a.m.	July 4	12 hrs.	d
DLG.29	11:00 a.m.	July 4	to	12:30 p.m.	July 5	25.5 hrs.	d
DLG.30	12:30 p.m.	July 5	to	1:30 p.m.	July 6	25 hrs.	d
DLG.31	1:30 p.m.	July 6	to	2:30 p.m.	July 7	25 hrs.	d
DLG.33	2:30 p.m.	July 7	to	3:30 p.m.	July 8	25 hrs.	d
DLG.34	9:00 a.m.	July 7	to				u
DLG.36	3:30 p.m.	July 8	to	4:30 p.m.	July 9	25 hrs.	d
DLG.37	4:30 p.m.	July 9	to	5:30 p.m.	July 10	25 hrs.	d
DLG.39	5:30 p.m.	July 10	to				d,e
DLG.50	6:00 p.m.	July 27	to				l
Wood River Special Harvest Area[t]							
Togiak District							
Drift and Set							
DLG.04	9:00 a.m.	June 20	to	9:00 a.m.	June 22	48 hrs.	m
DLG.11	9:00 a.m.	June 27	to	9:00 a.m.	June 29	48 hrs.	m

Continued

Table 9. (page 8 of 8)

Number[a]	Start Date	Start Time		End Date	End Time	Effective time	
DLG.24	9:00 a.m.	July 4	to	9:00 a.m.	July 5	24 hrs.	m
DLG.35	9:00 a.m.	July 11	to	9:00 a.m.	July 12	24 hrs.	m
DLG.40	9:00 p.m.	July 14	to	9:00 a.m.	July 16	36 hrs.	n
DLG.44	9:00 a.m.	July 18	to	9:00 a.m.	July 19	24 hrs.	m
DLG.46	9:00 a.m.	July 20	to	9:00 a.m.	July 22	48 hrs.	n
DLG.46	9:00 a.m.	July 21	to				o
DLG.47	6:00 p.m.	July 20	to				k,l
DLG.48	9:00 a.m.	July 25	to	9:00 a.m.	July 26	24 hrs.	m
DLG.49	9:00 a.m.	July 27	to	9:00 a.m.	July 29	48 hrs.	n
DLG.52	9:00 a.m.	August 3	to				s
DLG.53	12:00 p.m.	August 8	to				l
DLG.53	12:00 p.m.	August 9	to				t
DLG.54	9:00 a.m.	August 10	to	12:00 noon	August 11	27 hrs.	n
DLG.55	12:00 noon	August 11	to				l

[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 until 9:00 a.m. Friday.
[c] Restricts mesh size to five and one-half inches or less through July 17.
[d] Extends current fishing period.
[e] Opens commercial fishing until further notice.
[t] No Commercial fishing was conducted in the Wood River Special Harvest Area in 2001.
[g] 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.
[k] This emergency order supersedes and rescinds a previous emergency order.
[l] Closes commercial fishing in specific area until further notice.
[m] Reduces the weekly fishing schedule in specific sections of the District.
[n] Extends the weekly fishing schedule in specific sections of the District.
[o] Waives the district transfer restrictions as described in regulation 5 AAC 06.370 (f) (k) (2).
[p] Restricts mesh size to five and three-eighths inches or larger for conservation of pink salmon.
[q] Extends the emergency order period.
[r] A six hour commercial fishing period was added to the Nushagak Section for drift gillnets.
[s] Closes commercial fishing in specific sections of the District.
[t] Opens commercial fishing in specific sections of the District.
[u] Waives the 48-hour waiting period required for a CFEC permit holder to transfer from one district or between statistical areas in the Bristol Bay management area to another.

Table 10. Daily district registration of drift gillnet permit holders by district, 2001.

Date	Ugashik	Egegik	Nakek-Kvichak	Nushagak	Togiak	Total [a]
6/17	27	185	71	27	25	335
6/18	50	357	116	37	25	585
6/19	54	401	208	50	28	741
6/20	54	489	245	77	29	894
6/21	54	495	265	123	31	968
6/22	46	528	261	202	34	1,071
6/23	6	508	291	269	38	1,112
6/24	5	515	301	365	38	1,224
6/25	7	508	329	448	41	1,333
6/26	12	478	333	485	42	1,350
6/27	12	543	340	551	42	1,398
6/28	12	413	319	596	46	1,386
6/29	15	397	324	629	47	1,412
6/30	15	393	329	688	50	1,475
7/01	16	385	338	705	51	1,495
7/02	20	377	343	703	53	1,496
7/03	24	370	352	705	53	1,504
7/04	24	342	369	699	53	1,487
7/05	24	338	378	677	54	1,471
7/06	27	334	411	666	54	1,492
7/07	28	323	435	634	55	1,475
7/08	32	320	441	587	56	1,436
7/09	58	298	453	555	59	1,423
7/10	141	230	441	513	68	1,393
7/11	164	215	462	501	72	1,414
7/12	242	214	481	496	75	1,508
7/13	245	206	490	496	76	1,513
7/14	245	205	508	494	76	1,528
7/15	248	205	532	495	77	1,557
7/16	248	205	532	495	77	1,557
7/17	249	206	535	494	78	1,562
7/18	249	207	538	491	78	1,563
Average	83	350	368	467	53	1,317

[a] Number of drift gillnet permit holders registered to fish in Bristol Bay districts by day. 1,883 drift permits were active in 2001.

Table 11. Commercial salmon catch by date and species, in numbers of fish, Naknek/Kvichak District, Bristol Bay, 2001.

Date	Hours Fished		Effort [a]		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set	Drift	Set						
6/13	15.0	15.0	41	21	8,018	76	23	0	0	8,117
6/14	24.0	24.0	36	56	5,917	14	17	0	0	5,948
6/15	9.0	9.0	13	17	2,898	1	29	0	0	2,928
6/19	15.0	15.0	177	76	110,204	88	385	0	0	110,677
6/20	24.0	24.0	280	204	166,915	193	536	3	0	167,647
6/21	24.0	24.0	351	265	291,418	114	779	0	0	292,311
6/22	9.0	9.0	230	104	173,970	32	611	0	0	174,613
6/23	5.0	6.0	280	210	175,120	23	909	0	0	176,052
6/24	5.0	6.0	286	185	151,129	33	353	0	0	151,515
6/25	13.0	14.0	576	264	437,812	15	1,486	0	0	439,313
6/26	13.0	14.0	547	270	512,225	12	4,652	0	0	516,889
6/27 [b]	6.5	7.5	373	218	277,964	8	2,802	0	0	280,774
6/28	5.0	4.5	293	112	92,853	1	298	0	0	93,152
6/29 [b]	5.0	5.0	285	245	133,532	8	354	0	0	133,894
6/30	5.0	8.5	287	275	217,515	9	1,342	0	0	218,866
7/01 [b]		11.0		392	82,386	16	161	0	0	82,563
7/02 [b]	6.5	8.0	339	325	318,576	12	773	0	0	319,361
7/03 [b]	14.5	0.0	657		400,560	6	2,346	0	0	402,912
7/04 [b]	13.0	4.5	665	237	328,600	20	2,985	0	0	331,605
7/05 [b]	10.0	9.5	414	276	292,272	16	1,742	0	0	294,030
7/06 [b]	9.5	10.0	404	223	293,037	30	2,169	0	0	295,236
7/07 [b]	16.0	0.0	803		293,313	16	2,408	0	0	295,737
7/08 [b]	7.0	10.0	410	233	189,481	12	1,353	0	0	190,846
7/09	10.5	9.0	390	228	166,812	26	3,115	0	0	169,953
7/10	6.5	12.5	183	266	50,347	15	1,460	1	0	51,823
7/11	10.0	7.0	239	147	35,856	18	1,622	2	0	37,498
7/12	8.0	6.5	160	120	20,619	21	898	2	2	21,542
7/13	6.0	6.5	94	90	9,839	25	442	3	1	10,310
7/14	6.0	7.0	66	49	7,876	10	482	0	0	8,368
7/15	0.0	24.0		126	10,220	28	255	12	2	10,517
7/16	7.0	5.0	60	57	8,204	4	1,174	0	0	9,382
7/17	4.0	15.0	35	35	4,558	0	625	0	0	5,183
7/18	5.0	6.5	18	39	3,796	5	3	0	0	3,804
7/19	6.0	13.0	6	20	1,633	0	0	0	0	1,633
7/20	0.0	9.0		22	1,648	3	0	0	0	1,651
7/23	15.0	15.0	5	15	1,353	0	416	0	0	1,769
7/24	24.0	24.0	11	26	1,752	3	454	0	0	2,209
7/25	24.0	24.0		17	768	1	96	0	0	865
Totals	386.0	422.5			5,280,996	914	39,555	23	5	5,321,493

[a] Preliminary numbers.

[b] Includes test fish harvest.

Table 12. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2001.

Date		Hours[b]	Effort[a] Drift	Effort[a] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
1-Jun		9								
4-Jun		15								
5-Jun	[e]	24		1						
6-Jun	[e]	9		1						
7-Jun	[e]	15		2						
8-Jun	[e]	9		2						
11-Jun		15	9	18	2,435	20	24			2,479
12-Jun		24	19	24	4,190	103	20			4,313
13-Jun		9	10	8	1,254	33	5			1,292
14-Jun		15	30	18	6,466	61	68			6,595
15-Jun		9	21	10	6,416	21	83			6,520
18-Jun		8	314	116	158,177	93	1,646			159,916
20-Jun		8	479	152	233,325	71	961			234,357
22-Jun		7/8	521	214	181,947	68	1,201			183,216
23-Jun	[c]				10,128					
24-Jun		8	537	218	332,479	56	1,334			333,869
25-Jun	[c]				8,068					
26-Jun		8	332	207	202,887	68	1,327			204,282
27-Jun		8	572	155	307,445	29	2,005			309,479
28-Jun		8	407	207	98,240	20	1,168			99,428
29-Jun		8	368	191	60,021	23	614			60,658
30-Jun		8	388	221	169,967	38	1,409			171,414
1-Jul		8	344	193	72,037	48	1,022			73,107
2-Jul	[d]	4/0	369		87,602	12	887			88,501
3-Jul	[d]	4/0	355		76,130	6	1,130			77,266
4-Jul	[d]	4/0	332		197,438	8	1,212			198,658
5-Jul										
6-Jul		8	287	199	121,378	18	1,338			122,734
7-Jul	[d]	5/0	327		150,364	18	5,628			156,010
8-Jul		8	286	221	95,662	33	1,304			96,999
9-Jul		13/9.5	505	179	126,620	21	1,743			128,384
10-Jul		14/11	442	169	67,062	17	1,659			68,738
11-Jul		13/8	258	119	30,670	12	2,046			32,728
12-Jul										
13-Jul		7/8	88	92	15,032	7	285			15,324
14-Jul										
15-Jul										
16-Jul										

Continued

Table 12. (Page 2 of 2)

Date	Hours[b]	Effort[a] Drift	Effort[a] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
17-Jul	15	30	110	13,536	9				13,545
18-Jul	24	40	79	12,206	4	218			12,428
19-Jul	24	2	41	2,215	1				2,216
20-Jul	9		8	440	1				441
23-Jul	15	6	12	1,341		26			1,367
24-Jul	24	15	22	2,991	1	87		36	3,115
25-Jul	24	7	13	1,474	1	39		89	1,603
26-Jul	24	4	9	827		49		46	922
27-Jul	9	2	6	577	1	32		7	617
30-Jul	15	2	4	172		35		97	304
31-Jul	24	1	6	232		9		132	373
1-Aug	24	2	5	273		29		289	591
2-Aug	24	2	5	292	1	29		321	643
3-Aug[e]	9		2						
6-Aug	15	4	8	233		44		1,394	1,671
7-Aug	24	3	10	304		84		1,211	1,599
8-Aug	24	5	8	196		32		1,503	1,731
9-Aug	24	6	8	177		56		1,092	1,325
10-Aug	9	1	3	45		2		110	157
13-Aug	15	6	8	89	1	12		865	967
14-Aug	24	3	13	93	1			1,183	1,277
15-Aug	24	2	12	70		9		1,369	1,448
16-Aug	24	3	9	64				1,133	1,197
17-Aug	9		4	4				388	392
20-Aug	15		5	50				1,242	1,292
21-Aug[e]	24		1						
Total		7,746	3,348	2,861,991	933	30,908		12,614	2,888,250
% of District Catch				99	0	1		0	100

[a] Number of deliveries.

[b] First number is drift gillnet hours fished , second number is set gillnet hours fished.

[c] Cost Recovery.

[d] Drift gillnets only.

[e] Less than three permits fished, records are confidential.

Table 13. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2001.

Date		Hours[b]	Effort[a] Drift	Effort[a] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/01		9								
6/04		15								
6/05		24								
6/06		24								
6/07		24								
6/08		9								
6/11		15	7		208	149	7			364
6/12		24	15		671	166	16			853
6/13		24	19		2,567	161	36			2,764
6/14		24	11		1,139	46	45			1,230
6/15		9	8		1,668	8	28			1,704
6/18		10	48		11,797	50	255			12,102
6/19		10	55	1	15,617	31	362			16,010
6/20		10	53	1	30,887	41	513			31,441
6/21		10	53	5	26,033	11	195			26,239
6/22		8	38	7	12,590	45	123			12,758
6/24	[c]	0/11		20	5,110	24	6			5,140
6/25	[c]	0/24		21	3,043	26	11			3,080
6/26		4/23.5	5	19	9,872	31	0			9,903
7/06	[d]				2,085	1	2			2,088
7/07		2.5/6	20	48	37,973	8	770			38,751
7/08		8/10	28	74	50,442	9	1,822			52,273
7/09	[e]	4/0	58		23,229	0	3,487			26,716
7/10	[e]	8/0	106		39,161	16	5,157			44,334
7/11	[e]	16/0	153		49,681	35	7,840			57,556
7/12		8/8.5	181	41	31,235	42	6,089			37,366
7/13		18/24	183	70	28,864	37	6,961			35,862
7/14		18/17.5	124	38	29,358	19	5,910			35,287
7/15		12	119	25	21,046	4	4,479			25,529
7/16	[e]	10/0	74		12,566	0	2,505			15,071
7/17		15	64	28	9,130	9	757			9,896
7/18		24	43	24	7,353	1	812			8,166
7/19		24	17	18	4,707	9	491		53	5,260
7/20		9	6	3	892	1	82			975
7/23		15	10	17	2,465	13	731			3,209
7/24		24	18	13	3,275	11	616		1	3,903
7/25		24	2	8	604	1	77			682
7/26		24	3	4	535	0	286		20	841
7/27		9								

(Continued)

Table 13. (Page 2 of 2)

Date	Hours[b]	Effort [a]		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/30	15								
7/31	24								
8/1	24								
8/2	24								
8/3	9								
8/6	15								
8/7	24								
8/8	24								
8/9	24								
8/10	9								
8/13 [f]	15		1						
8/14	24								
8/15 [f]	24		1						
8/16	24	3	2			4		621	625
8/17	9								
8/20	15								
8/21 [f]	24		1						
8/22 [f]	24		1						
Total		1,524	491	475,803	1,006	50,475		1,030	528,314
% of District Catch				90	0	10	0	0	100

[a] Number of deliveries.

[b] First number is drift gillnet hours fished , second number is set gillnet hours fished.

[c] Set gillnet fishing only.

[d] Test Fishing.

[e] Drift gillnet fishing only.

[f] Less than three permits fished, records are confidential.

Table 14. Commercial salmon fishing time, effort and harvest by date, Nushagak District, 2001.

	Time (*hrs*)			Effort[c]		Harvest[d]					
Date	Nushagak[a]	Igushik[a]	WRSHA[b]	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/20		12.0			60	10,447	14				10,461
6/21		11.5			87	16,030	32				16,062
6/22		16.0		59	102	41,435	61	717			42,213
6/23		24.0		108	109	53,307	151	1,931			55,389
6/24	6.0	24.0		269	219	161,709	2,437	35,563	1		199,710
6/25	7.5	24.0		581	245	223,870	1,734	41,431			267,035
6/26	11.5	24.0		672	241	297,117	1,906	55,917			354,940
6/27	18.0	24.0		863	393	576,708	646	51,587			628,941
6/28		24.0		415	105	122,041	206	15,584			137,831
6/29	9.5	24.0		393	555	232,701	514	9,698			242,913
6/30	9.0	19.0		719	539	264,570	565	28,638	4		293,777
7/01											0
7/02	1.0	1.0		17	12	11,051	7	1,280			12,338
7/03	17.5	24.0		1,320	673	651,601	444	57,532	3		709,580
7/04	24.0	24.0		1,086	356	347,465	361	33,009	100		380,935
7/05	24.0	24.0		802	319	332,896	290	28,520	23		361,729
7/06	24.0	24.0		832	279	359,355	216	36,042	14		395,627
7/07	24.0	24.0		895	269	260,365	144	22,708	4		283,221
7/08	24.0	24.0		720	310	147,302	180	13,536	31		161,049
7/09	24.0	24.0		937	465	204,992	300	32,404	40	1	237,737
7/10	24.0	24.0		488	334	79,328	184	13,209	24		92,745
7/11	24.0	24.0		293	252	44,166	102	8,499	19		52,786
7/12	24.0	24.0		388	244	56,725	160	17,240	21		74,146
7/13	24.0	24.0		241	244	32,324	110	10,172	16	7	42,629
7/14	24.0	24.0		138	162	23,196	73	5,642	19	6	28,936
7/15	24.0	24.0		88	146	21,961	102	5,360	29	64	27,516
7/16	24.0	24.0		88	137	12,396	53	5,021	26	23	17,519
7/17	24.0	24.0		39	60	5,222	5	2,139	12	8	7,386
7/18	24.0	24.0		30	27	6,503	10	1,085	2		7,600
7/19	24.0	24.0		17	14	3,838	4	515		100	4,457
7/20	24.0	24.0		9	14	1,542	5	359		55	1,961
7/21	24.0	24.0			6	492		25		3	520
7/22	24.0	24.0		8	10	1,639	4	382		210	2,235
7/23	24.0	24.0		9	12	1,611	7	452		725	2,795
7/24	24.0	24.0		10	13	1,456	2	342		346	2,146
7/25	24.0	24.0		4	6	943	6	95		70	1,114
7/26	24.0	24.0		4	7	553	3	112		166	834
7/27	18.0	18.0		2	17	906	12	226		1,400	2,544
Total	650.0	821.5	0.0	12,544	7,043	4,609,763	11,050	536,972	388	3,184	5,161,357
% of District Catch						89.3%	0.2%	10.4%	0.0%	0.1%	100.0%

[a] Number of hours each section was opened to commercial fishing. WRSHA = Wood River Special Harvest Area.

[b] No commercial fishing was conducted in WRSHA during 2001.

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

[d] Numbers of fish.

Table 15. Commercial sockeye salmon fishing time and setnet harvest by date and statistical area, Nushagak District, 2001.

Date	Time (*hrs*)			Harvest[b]							
	Nushagak[a]	Igushik[a]	WRSHA[a,c]	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	WRSHA[c]	Total
6/20		12.0							10,447		10,447
6/21		11.5							16,030		16,030
6/22		16.0							22,523		22,523
6/23		24.0							15,703		15,703
6/24	6.0	24.0		7,716	3,760	1,655	964	13,550	6,652		34,297
6/25	7.5	24.0		9,820	6,320	2,710	856	13,836	6,333		39,875
6/26	11.5	24.0		1,533	793	800	948	10,843	9,233		24,150
6/27	18.0	24.0		12,906	19,737	1,145	6,390	6,878	2,143		49,199
6/28		24.0						1,580	4,957		6,537
6/29	9.5	24.0		40,293	16,269	5,216	20,562	81,893	4,055		168,288
6/30	9.0	19.0		12,866	24,276	19,778	11,391	63,525	11,060		142,896
7/01											
7/02	1.0	1.0		4,405	236						4,641
7/03	17.5	24.0		46,872	42,620	19,252	11,223	41,605	27,705		189,277
7/04	24.0	24.0		3,566	2,421	2,625	1,099	7,027	13,039		29,777
7/05	24.0	24.0		627	163	856	826	11,629	5,530		19,631
7/06	24.0	24.0		259	98	156	312	7,832	5,784		14,441
7/07	24.0	24.0		364	400	8,203	852	7,548	6,518		23,885
7/08	24.0	24.0		924	111	278	1,268	14,048	15,453		32,082
7/09	24.0	24.0		8,455	3,916	4,154	6,960	47,569	13,433		84,487
7/10	24.0	24.0		1,012	574	1,942	1,507	16,608	8,140		29,783
7/11	24.0	24.0		860	226	720	671	5,744	3,219		11,440
7/12	24.0	24.0		643	189	1,094	534	5,074	3,717		11,251
7/13	24.0	24.0		1,935	279	1,060	535	4,988	2,536		11,333
7/14	24.0	24.0		523	151	424	408	3,504	1,697		6,707
7/15	24.0	24.0		933	136	846	277	8,095	2,098		12,385
7/16	24.0	24.0		297	103	530	151	2,844	1,262		5,187
7/17	24.0	24.0		194	434	233	59	1,451	545		2,916
7/18	24.0	24.0		41	60	103	49	3,789			4,042
7/19	24.0	24.0						1,394			1,394
7/20	24.0	24.0						706			706
7/21	24.0	24.0						492			492
7/22	24.0	24.0						1,215			1,215
7/23	24.0	24.0						1,084			1,084
7/24	24.0	24.0						1,124			1,124
7/25	24.0	24.0						870			870
7/26	24.0	24.0						443			443
7/27	18.0	18.0					33	857			890
Total	650.0	821.5	0.0	157,044	123,272	73,780	67,875	389,645	219,812	-	1,031,428
% of District Catch				15.2%	12.0%	7.2%	6.6%	37.8%	21.3%	0.0%	100.0%

[a] Number of hours each section was opened to commercial fishing. WRSHA = Wood River Special Harvest Area.

[b] Numbers of fish.

[c] No commercial fishing was conducted in WRSHA during 2001.

Table 16. Commercial salmon fishing time, effort and harvest by date, Wood River Special Harvest Area, 2001.

Date	Time (*hrs*)		Effort		Harvest					
	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total

(No Commercial Fishing was conducted in the Wood River Special Harvest Area in 2001.)

Table 17. Commercial salmon catch by date and species, in numbers of fish, Togiak District, 2001.

Date[a]	Sockeye	Chinook	Chum	Pink	Coho	Total
6/14	21	3	1	0	0	25
6/18	436	44	30	0	0	510
6/19	828	204	84	0	0	1,116
6/20	1,320	312	195	0	0	1,827
6/25	9,391	752	3,188	0	0	13,331
6/26	12,459	1,214	5,142	0	0	18,815
6/27	3,121	269	938	0	0	4,328
6/28	788	21	2,325	0	0	3,134
6/29	674	11	1,132	0	0	1,817
6/30	149	4	348	0	0	501
7/2	15,147	545	5,609	0	0	21,301
7/3	21,042	420	8,592	0	0	30,054
7/4	33,474	797	5,291	2	0	39,564
7/5	35,326	663	4,795	0	0	40,784
7/6	28,042	584	7,144	4	0	35,774
7/7	24,062	442	5,759	2	0	30,265
7/9	28,936	311	6,781	6	0	36,034
7/10	39,380	450	9,003	6	0	48,839
7/11	46,179	408	7,297	8	0	53,892
7/12	57,403	312	11,025	11	0	68,751
7/13	49,779	235	10,457	10	0	60,481
7/14	42,760	266	12,490	2	0	55,518
7/15	12,578	110	3,008	9	0	15,705
7/16	26,852	212	6,839	5	0	33,908
7/17	43,961	278	16,673	20	0	60,932
7/18	27,811	170	16,406	9	0	44,396
7/19	21,257	60	4,275	12	0	25,604
7/20	30,373	109	5,949	2	0	36,433
7/23	27,531	81	11,722	3	20	39,357
7/24	36,659	98	10,905	1	10	47,673
7/25	34,701	78	8,034	3	0	42,816
7/26	25,189	51	6,316	7	0	31,563
7/27	14,454	22	2,551	6	0	17,033
7/28	13,129	32	2,895	0	0	16,056
7/29	3,597	5	502	0	0	4,104
7/30	6,023	12	1,627	2	1	7,665
7/31	10,364	23	2,247	2	3	12,639
8/1	7,803	30	1,595	4	7	9,439
8/2	6,653	12	1,360	0	5	8,030
8/3	2,525	8	405	2	0	2,940
8/6	2,082	8	237	0	27	2,354
8/7	3,092	2	569	0	98	3,761
8/8	1,644	0	211	0	40	1,895
8/10	646	0	51	0	63	760
8/11	263	0	24	0	32	319
Total	809,904	9,668	212,027	138	306	1,032,043
% of District Total	78.5%	0.9%	20.5%	0.0%	0.0%	100.0%

[a.] See table 11 for inseason adjustments to the regular weekly fishing schedule.

Table 18. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, 2001.

Date	Effort[a]		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/14	0	2	21	3	1	0	0	25
6/18	1	10	436	44	30	0	0	510
6/19	1	20	828	204	84	0	0	1,116
6/20	3	11	695	180	88	0	0	963
6/25	24	51	6,975	657	2,311	0	0	9,943
6/26	42	65	8,686	1,118	3,574	0	0	13,378
6/27	15	36	2,215	258	698	0	0	3,171
7/02	44	76	14,334	507	4,682	0	0	19,523
7/03	50	90	20,015	413	7,152	0	0	27,580
7/04	85	126	33,205	791	5,189	2	0	39,187
7/05	76	107	35,326	663	4,795	0	0	40,784
7/06	54	76	28,042	584	7,144	4	0	35,774
7/07	57	70	24,062	442	5,759	2	0	30,265
7/09	54	121	28,936	311	6,781	6	0	36,034
7/10	80	157	39,380	450	9,003	6	0	48,839
7/11	76	182	46,179	408	7,297	8	0	53,892
7/12	105	182	57,403	312	11,025	11	0	68,751
7/13	102	143	48,226	235	10,300	10	0	58,771
7/14	97	146	42,760	266	12,490	2	0	55,518
7/15	26	58	12,578	110	3,008	9	0	15,705
7/16	67	86	26,852	212	6,839	5	0	33,908
7/17	124	110	43,961	278	16,673	20	0	60,932
7/18	106	80	27,811	170	16,406	9	0	44,396
7/19	30	84	21,257	60	4,275	12	0	25,604
7/20	50	44	30,373	109	5,949	2	0	36,433
7/23	107	97	27,531	81	11,722	3	20	39,357
7/24	162	119	36,659	98	10,905	1	10	47,673
7/25	155	111	34,701	78	8,034	3	0	42,816
7/26	128	84	25,189	51	6,316	7	0	31,563
7/27	85	58	14,454	22	2,551	6	0	17,033
7/28	61	39	13,129	32	2,895	0	0	16,056
7/29	17	6	3,597	5	502	0	0	4,104
7/30	39	23	6,023	12	1,627	2	1	7,665
7/31	65	40	10,364	23	2,247	2	3	12,639
8/01	46	36	7,803	30	1,595	4	7	9,439
8/02	38	35	6,653	12	1,360	0	5	8,030
8/03	14	7	2,525	8	405	2	0	2,940
8/06	13	6	2,082	8	237	0	27	2,354
8/07	25	11	3,092	2	569	0	98	3,761
8/08	16	4	1,644	0	211	0	40	1,895
8/10	8		646	0	51	0	63	760
8/11	4		263	0	24	0	32	319
Total	2,352	2,809	796,911	9,247	202,804	138	306	1,009,406
% of Section Total			78.9%	0.9%	20.1%	0.0%	0.0%	100.0%

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

Table 19. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, 2001. [a]

Date	Effort[b] Drift	Effort[b] Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/20 [c]	2							
6/25	3	20	2,416	95	877			3,388
6/26	5	26	3,773	96	1,568			5,437
6/27	3	2	609	9	233			851
7/2	3	6	813	38	927			1,778
7/3	4	2	1,027	7	1,440			2,474
7/4 [c]	1	2						
7/13 [c]	1	2						
Total	22	60	8,638	245	5,045	0	0	13,928
% of Section Total			62.0%	1.8%	36.2%	0.0%	0.0%	100.0%

[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] 3 or less permits, records are confidential.

Table 20. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, 2001.

Date[a]	Sockeye	Chinook	Chum	Pink	Coho	Total
6/27	297	2	7			306
6/28	676	19	1,680			2,375
6/29	674	11	1,132			1,817
6/30	149	4	348			501
Total	1,796	36	3,167	0	0	4,999
% of Section Total	35.9%	0.7%	63.4%	0.0%	0.0%	100.0%

[a] Matogak and Osviak Sections open five days per week. See Table 11 for inseason adjustments to the weekly fishing schedule.

Table 21. Commercial salmon catch by date and species, in numbers if fish, Osviak Section, 2001.

Date	Sockeye	Chinook	Chum	Pink	Coho	Total
6/28	112	2	645	0	0	759
Total	112	2	645	0	0	759
% of Section Total	14.8%	0.3%	85.0%	0.0%	0.0%	100.0%

Table 22. Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2001.

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT						
Kvichak River	324,963					
Branch River	137,986					
Naknek River	4,781,612					
Total	5,244,561	914	9,161	23	5	5,254,664
EGEGIK DISTRICT	2,861,991	933	9,836	0	12,614	2,885,374
UGASHIK DISTRICT	475,803	1,003	24,466	0	1,030	502,302
NUSHAGAK DISTRICT						
Wood River	2,446,552					
Igushik River	903,987					
Nushagak-Mulchatna	1,259,223					
Total	4,609,762	11,050	536,972	388	3,184	5,161,356
TOGIAK DISTRICT						
Togiak Section	796,911	9,247	202,804	138	306	1,009,406
Kulukak Section	11,085	383	5,411	0	0	16,879
Matogak Section	1,796	36	3,167	0	0	4,999
Osviak Section	112	2	645	0	0	759
Total	809,904	9,668	212,027	138	306	1,032,043
TOTAL BRISTOL BAY	14,002,021	23,568	792,462	549	17,139	14,835,739
PERCENT	94.4%	0.2%	5.3%	0.0%	0.1%	100.0%

Table 23. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 2001.

Date	Kvichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/18					16,788	16,788								
6/19					10,044	26,832								
6/20	30	30			10,662	37,494								
6/21	12	42	8,598	8,598	11,328	48,822			5,916	5,916				
6/22	258	300	4794	13,392	76,362	125,184			29,400	35,316				
6/23	282	582	73,380	86,772	51,804	176,988			39,420	74,736				
6/24	156	738	97,482	184,254	36,162	213,150			61,644	136,380	12,456	12,456		
6/25	1,380	2,118	76,776	261,030	18,906	232,056			144,846	281,226	16,338	28,794		
6/26	2,868	4,986	59,238	320,268	42,966	275,022			76,962	358,188	11,790	40,584		
6/27	9,300	14,286	69,474	389,742	45,876	320,898			26,076	384,264	13,146	53,730		
6/28	28,194	42,480	66,492	456,234	93,738	414,636			5,040	389,304	9,912	63,642		
6/29	15,708	58,188	152,514	608,748	50,652	465,288	2,934	2,934	4,398	393,702	7,782	71,424		
6/30	27,528	85,716	172,158	780,906	36,690	501,978	7,104	10,038	151,020	544,722	9,702	81,126		
7/01	67,926	153,642	120,846	901,752	17,148	519,126	5,862	15,900	63,708	608,430	11,772	92,898		
7/02	102,282	255,924	171,690	1,073,442	13,818	532,944	3,876	19,776	45,954	654,384	7,332	100,230		
7/03	53,562	309,486	116,736	1,190,178	11,334	544,278	5,358	25,134	309,186	963,570	11,010	111,240	3,384	3,384
7/04	86,358	395,844	95,328	1,285,506	9,420	553,698	3,066	28,200	324,816	1,288,386	18,720	129,960	8,280	11,664
7/05	68,628	464,472	163,986	1,449,492	66,846	620,544	1,386	29,586	68,190	1,356,576	35,430	165,390	14,388	26,052
7/06	130,092	594,564	64,272	1,513,764	96,462	717,006	4,782	34,368	20,856	1,377,432	42,108	207,498	7,500	33,552
7/07	95,646	690,210	63,492	1,577,256	111,828	828,834	21,306	55,674	5,376	1,382,808	37,920	245,418	8,322	41,874
7/08	57,180	747,390	67,428	1,644,684	63,690	892,524	75,300	130,974	4,860	1,387,668	37,194	282,612	8,256	50,130
7/09	81,852	829,242	95,082	1,739,766	39,798	932,322	108,018	238,992	14,472	1,402,140	29,238	311,850	9,696	59,826
7/10	48,690	877,932	26,616	1,766,382	10,452	942,774	144,642	383,634	25,314	1,427,454	18,624	330,474	10,902	70,728
7/11	71,598	949,530	17,202	1,783,584	3,450	946,224	160,836	544,470	6,462	1,433,916	16,374	346,848	17,850	88,578
7/12	45,270	994,800	14,874	1,798,458	654	946,878	137,880	682,350	5,052	1,438,968	19,374	366,222	20,538	109,116
7/13	18,564	1,013,364	11,586	1,810,044	8,358	955,236	60,390	742,740	3,366	1,442,334	15,414	381,636	12,018	121,134
7/14	7,992	1,021,356	9,414	1,819,458	4,362	959,598	27,624	770,364	2,286	1,444,620	9,882	391,518	6,348	127,482
7/15	3,108	1,024,464	10,902	1,830,360	5,724	965,322	16,122	786,486	3,114	1,447,734	5,838	397,356	5,760	133,242

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	6,168	1,030,632			3,540	968,862	7,848	794,334	4,530	1,452,264	4,218	401,574	4,776	138,018
7/17	30,258	1,060,890					6,594	800,928	2,334	1,454,598	3,084	404,658	3,828	141,846
7/18	10,842	1,071,732					11,322	812,250	2,352	1,456,950	3,084	407,742	6,522	148,368
7/19	11,088	1,082,820					3,972	816,222	1,782	1,458,732	714	408,456	13,308	161,676
7/20	12,528	1,095,348					2,532	818,754			720	409,176	11,700	173,376
7/21							2,226	820,980			420	409,596	7,152	180,528
7/22							1,410	822,390					6,150	186,678
7/23							1,920	824,310					9,522	196,200
7/24							3,960	828,270					15,120	211,320
7/25							5,358	833,628					19,926	231,246
7/26													23,808	255,054
7/27													19,506	274,560
7/28													7,158	281,718
7/29													3,468	285,186
7/30													2,112	287,298
7/31													1,188	288,486
8/01													2,136	290,622
8/02													4,734	295,356
8/03													1,320	296,676
8/04														

Table 24. Final daily and cumulative escapement estimates by species, Nushagak River sonar project, 2001.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/12	230	230	561	561	1,065	1,065	0	0	0	0	1,856	1,856
6/13	173	403	559	1,120	928	1,993	0	0	0	0	1,660	3,516
6/14	3,253	3,656	7,303	8,423	14,597	16,590	0	0	0	0	25,153	28,669
6/15	3,819	7,475	9,319	17,742	17,824	34,414	0	0	0	0	30,962	59,631
6/16	1,031	8,506	2,905	20,647	5,249	39,663	0	0	0	0	9,185	68,816
6/17	247	8,753	568	21,215	1,137	40,800	0	0	0	0	1,952	70,768
6/18	194	8,947	399	21,614	872	41,672	0	0	0	0	1,465	72,233
6/19	819	9,766	1,230	22,844	3,290	44,962	0	0	0	0	5,339	77,572
6/20	5,772	15,538	1,830	24,674	8,841	53,803	0	0	0	0	16,443	94,015
6/21	9,059	24,597	8,246	32,920	23,490	77,293	0	0	0	0	40,795	134,810
6/22	14,214	38,811	4,247	37,167	20,765	98,058	0	0	0	0	39,226	174,036
6/23	42,250	81,061	8,535	45,702	43,864	141,922	0	0	0	0	94,649	268,685
6/24	29,123	110,184	4,736	50,438	28,633	170,555	0	0	0	0	62,492	331,177
6/25	38,804	148,988	4,522	54,960	29,192	199,747	0	0	0	0	72,518	403,695
6/26	44,456	193,444	4,943	59,903	32,744	232,491	0	0	0	0	82,143	485,838
6/27	28,083	221,527	3,738	63,641	12,037	244,528	0	0	0	0	43,858	529,696
6/28	10,449	231,976	1,772	65,413	4,762	249,290	0	0	0	0	16,983	546,679
6/29	6,527	238,503	1,113	66,526	2,991	252,281	0	0	0	0	10,631	557,310
6/30	22,989	261,492	3,242	69,768	10,062	262,343	0	0	0	0	36,293	593,603
7/01	50,353	311,845	3,784	73,552	15,712	278,055	0	0	0	0	69,849	663,452
7/02	39,027	350,872	1,718	75,270	7,876	285,931	0	0	0	0	48,621	712,073
7/03	85,925	436,797	2,213	77,483	19,047	304,978	0	0	0	0	107,185	819,258
7/04	127,463	564,260	2,883	80,366	28,512	333,490	0	0	0	0	158,858	978,116
7/05	60,521	624,781	1,225	81,591	26,953	360,443	0	0	0	0	88,699	1,066,815
7/06	32,314	657,095	821	82,412	14,630	375,073	0	0	0	0	47,765	1,114,580

(Continued)

Table 24. (page 2 of 3).

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/07	30,063	687,158	945	83,357	14,176	389,249	0	0	0	0	45,184	1,159,764
7/08	11,410	698,568	904	84,261	12,882	402,131	0	0	0	0	25,196	1,184,960
7/09	15,791	714,359	929	85,190	18,939	421,070	0	0	0	0	35,659	1,220,619
7/10	17,238	731,597	1,125	86,315	19,411	440,481	0	0	0	0	37,774	1,258,393
7/11	8,273	739,870	651	86,966	9,898	450,379	0	0	0	0	18,822	1,277,215
7/12	6,604	746,474	525	87,491	7,687	458,066	0	0	0	0	14,816	1,292,031
7/13	4,814	751,288	367	87,858	5,841	463,907	0	0	0	0	11,022	1,303,053
7/14	6,326	757,614	446	88,304	8,119	472,026	0	0	0	0	14,891	1,317,944
7/15	7,171	764,785	1,005	89,309	9,892	481,918	0	0	110	110	18,178	1,336,122
7/16	8,297	773,082	1,309	90,618	11,582	493,500	0	0	484	594	21,672	1,357,794
7/17	5,340	778,422	990	91,608	8,079	501,579	0	0	382	976	14,791	1,372,585
7/18	7,388	785,810	1,048	92,656	10,033	511,612	0	0	730	1,706	19,199	1,391,784
7/19	7,647	793,457	1,015	93,671	9,551	521,163	0	0	614	2,320	18,827	1,410,611
7/20	4,081	797,538	592	94,263	5,057	526,220	0	0	489	2,809	10,219	1,420,830
7/21	3,126	800,664	421	94,684	3,850	530,070	0	0	306	3,115	7,703	1,428,533
7/22	6,315	806,979	743	95,427	7,193	537,263	0	0	416	3,531	14,667	1,443,200
7/23	979	807,958	462	95,889	4,995	542,258	0	0	6,723	10,254	13,159	1,456,359
7/24	784	808,742	342	96,231	3,779	546,037	0	0	4,553	14,807	9,458	1,465,817
7/25	165	808,907	162	96,393	1,181	547,218	0	0	2,780	17,587	4,288	1,470,105
7/26	179	809,086	162	96,555	1,242	548,460	0	0	2,763	20,350	4,346	1,474,451
7/27	144	809,230	134	96,689	1,008	549,468	0	0	2,235	22,585	3,521	1,477,972
7/28	83	809,313	85	96,774	597	550,065	0	0	1,364	23,949	2,129	1,480,101
7/29	34	809,347	60	96,834	245	550,310	0	0	630	24,579	969	1,481,070
7/30	51	809,398	57	96,891	349	550,659	0	0	774	25,353	1,231	1,482,301
7/31	201	809,599	215	97,106	1,440	552,099	0	0	3,369	28,722	5,225	1,487,526

(Continued)

Table 24. (page 3 of 3).

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/01	236	809,835	199	97,305	1,608	553,707	0	0	3,432	32,154	5,475	1,493,001
8/02	63	809,898	56	97,361	442	554,149	0	0	966	33,120	1,527	1,494,528
8/03	51	809,949	57	97,418	347	554,496	0	0	760	33,880	1,215	1,495,743
8/04	35	809,984	36	97,454	246	554,742	0	0	549	34,429	866	1,496,609
8/05	34	810,018	42	97,496	249	554,991	0	0	615	35,044	940	1,497,549
8/06	26	810,044	39	97,535	199	555,190	0	0	526	35,570	790	1,498,339
8/07	25	810,069	30	97,565	201	555,391	0	0	518	36,088	774	1,499,113
8/08	29	810,098	45	97,610	244	555,635	0	0	670	36,758	988	1,500,101
8/09	190	810,288	260	97,870	1,494	557,129	0	0	3,890	40,648	5,834	1,505,935
8/10	104	810,392	117	97,987	858	557,987	0	0	2,190	42,838	3,269	1,509,204
8/11	94	810,486	94	98,081	738	558,725	0	0	1,799	44,637	2,725	1,511,929
8/12	104	810,590	435	98,516	1,209	559,934	0	0	4,973	49,610	6,721	1,518,650
8/13	213	810,803	281	98,797	1,977	561,911	0	0	7,380	56,990	9,851	1,528,501
8/14	135	810,938	133	98,930	1,139	563,050	0	0	3,929	60,919	5,336	1,533,837
8/15	43	810,981	52	98,982	399	563,449	0	0	1,323	62,242	1,817	1,535,654
8/16	28	811,009	31	99,013	253	563,702	0	0	817	63,059	1,129	1,536,783
8/17	16	811,025	30	99,043	186	563,888	0	0	691	63,750	923	1,537,706
8/18	17	811,042	29	99,072	182	564,070	0	0	638	64,388	866	1,538,572
8/19	46	811,088	42	99,114	388	564,458	0	0	1,048	65,436	1,524	1,540,096
8/20	16	811,104	41	99,155	266	564,724	0	0	2,513	67,949	2,836	1,542,932
Total		811,104		99,155		564,724		0		67,949		1,542,932

Table 25. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2001.

	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]
6/20	30	30			0	0	0	
6/21	12	42		70	18	18	1,260	1,000
6/22	258	300		70	3	21	1,470	1,000
6/23	282	582		70	143	164	11,480	10,000
6/24	156	738		70	279	443	31,010	30,000
6/25	1,380	2,118		50	523	966	48,300	46,000
6/26	2,868	4,986		50	986	1,952	97,600	85,000
6/27	9,300	14,286		50	1929	3,881	194,050	150,000
6/28	28,194	42,480	30,000	23	634	4,515	103,845	50,000
6/29	15,708	58,188		16	1,224	5,739	91,824	30,000
6/30	27,528	85,716		19	1,398	7,137	135,603	50,000
7/01	67,926	153,642		32	2,349	9,486	303,552	150,000
7/02	102,282	255,924		32	1,838	11,324	362,368	100,000
7/03	53,562	309,486		39	1,820	13,144	512,616	200,000
7/04	86,358	395,844		35	4,027	17,171	600,985	200,000
7/05	68,628	464,472		39	1,222	18,393	717,327	200,000
7/06	130,092	594,564		40	871	19,264	770,560	140,000
7/07	95,646	690,210		42	2,514	21,778	914,676	140,000
7/08	57,180	747,390		40	3,676	25,454	1,018,160	200,000
7/09	81,852	829,242		41	1,574	27,028	1,108,148	200,000
7/10	48,690	877,932		39	1,184	28,212	1,100,268	140,000
7/11	71,598	949,530		36	507	28,719	1,033,884	80,000
7/12	45,270	994,800		35	507	29,226	1,022,910	35,000
7/13	18,564	1,013,364		35	507	29,733	1,040,655	20,000
7/14	7,992	1,021,356		35	18	29,751	1,041,285	10,000
7/15	3,108	1,024,464		35	20	29,771	1,041,985	1,500
7/16	6,168	1,030,632						
7/17	30,258	1,060,890						
7/18	10,842	1,071,732						
7/19	11,088	1,082,820						
7/20	12,528	1,095,348						
7/21	0	1,095,348						
7/22	0	1,095,348						

[a] Fish per index point was based on historical average (70), projected escapement and its relationship to historical FPI (50),or estimates of FPI using early tower counts and aerial surveys (6/28 - 7/15)

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate, less the cumulative tower count. On occasion, staff may adjust the ERF based on aerial surveys, test fishing catchability factors such as low or high water, etc.

Table 26. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey, and river test fishing enumeration methods, Egegik River, 2001.

	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			1,425	76	118	118	8,962	
6/15				76	46	164	12,478	
6/16				76	177	341	25,930	
6/17				76	380	721	54,812	
6/18	16,788	16,788	13,300	76	339	1,060	80,541	80,000
6/19	10,044	26,832		76	591	1,650	125,434	100,000
6/20	10,662	37,494	12,630	64	510	2,161	138,274	100,000
6/21	11,328	48,822		64	563	2,724	174,325	75,000
6/22	76,362	125,184	33,700	64	527	3,251	208,047	80,000
6/23	51,804	176,988		64	273	3,523	225,499	48,000
6/24	36,162	213,150	16,100	64	522	4,046	258,915	45,000
6/25	18,906	232,056		64	1,401	5,446	348,554	110,000
6/26	42,966	275,022		64	1,295	6,741	431,418	125,000
6/27	45,876	320,898	53,500	59	97	6,837	403,412	90,000
6/28	93,738	414,636		62	403	7,240	448,892	30,000
6/29	50,652	465,288	26,800	69	612	7,852	541,787	75,000
6/30	36,690	501,978		69	389	8,241	568,638	60,000
7/01	17,148	519,126	9,700	67	581	8,822	591,094	70,000
7/02	13,818	532,944		64	358	9,180	587,528	50,000
7/03	11,334	544,278		61	1,145	10,325	629,822	80,000
7/04	9,420	553,698	3,400	59	932	11,257	664,134	100,000
7/05	66,846	620,544		60	1,820	13,076	784,577	160,000
7/06	96,462	717,006	43,500	61	1,319	14,395	878,091	175,000
7/07	111,828	828,834	22,500	62	797	15,192	941,926	120,000
7/08	63,690	892,524	23,150	62	775	15,968	989,997	100,000
7/09	39,798	932,322		61	165	16,133	984,109	60,000
7/10	10,452	942,774		60	137	16,270	976,184	30,000
7/11	3,450	946,224		59	34	16,303	961,899	15,000
7/12	654	946,878	3,850	58	75	16,378	949,929	5,000
7/13	8,358	955,236						
7/14	4,362	959,598						
7/15	5,724	965,322						
7/16	3,540	968,862						
7/17		968,862	1,200					

[a] Fish per index point was based on historical average (76), FPI vs. escapement and projected escapement analysis (64), estimates of FPI using early tower counts and aerial surveys (6/27 - 7/11), or by fitting test fish run timing to tower count timing (7/12).

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate, less the cumulative tower count. On occasion, staff may adjust the ERF based on aerial surveys, test fishing catchability factors such as low or high water, etc.

Table 27. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey,and river test fishing enumeration methods, Ugashik River, 2001.

	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]
6/24			300	40	81	81	3,230	15,000
6/25				40	52	133	5,323	15,000
6/26				40	60	193	7,705	12,000
6/27			500	40	57	250	9,997	12,000
6/28				40	147	397	15,880	15,000
6/29	2,934	2,934		40	154	551	22,023	19,000
6/30	7,104	10,038		40	218	769	30,758	20,000
7/01	5,862	15,900		40	214	983	39,325	20,000
7/02	3,876	19,776		40	169	1,152	46,079	20,000
7/03	5,358	25,134		40	129	1,281	51,244	25,000
7/04	3,066	28,200		29	236	1,517	44,004	15,000
7/05	1,386	29,586		25	459	1,976	49,407	20,000
7/06	4,782	34,368	400	30	3,378	5,354	160,631	130,000
7/07	21,306	55,674	2,400	32	4,651	10,005	320,175	260,000
7/08	75,300	130,974	17,700	26	3,861	13,866	360,523	230,000
7/09	108,018	238,992		26	3,207	17,073	443,905	190,000
7/10	144,642	383,634		30	3,037	20,111	603,320	200,000
7/11	160,836	544,470		35	2,349	22,460	786,086	200,000
7/12	137,880	682,350	24,500	36	1,874	24,334	876,008	200,000
7/13	60,390	742,740		34	821	25,154	855,246	100,000
7/14	27,624	770,364		33	140	25,295	834,722	40,000
7/15	16,122	786,486		32	77	25,372	811,889	20,000
7/16	7,848	794,334		32	38	25,409	813,093	6,000
7/17	6,594	800,928	7,700					
7/18	11,322	812,250						
7/19	3,972	816,222						
7/20	2,532	818,754						
7/21	2,226	820,980						
7/22	1,410	822,390						
7/23	1,920	824,310						
7/24	3,960	828,270						
7/25	5,358	833,628						
7/26		833,628						

[a] Fish per index point was based on FPI vs. escapement and projected escapement analysis (40), subjective estimate of water level, estimates of fpi using early tower counts and aerial surveys (7/03 - 7/15), or by fitting test fish run timing to tower count timing (7/16).

[b] Estimated river fish (ERF) was based on the river test fish cumulative escapement estimate, less the cumulative tower count. On occasion, staff may adjust the ERF based on aerial surveys, test fishing catchability factors such as low or high water, test fishing evaluation results, etc.

Table 28. Daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods, in numbers of fish, Wood River, 2001.

Date	Tower Count		Aerial Surveys[a]		
	Daily	Cum.	Number	Visibility	Comments
6/21	5,916	5,916			
6/22	29,400	35,316			
6/23	39,420	74,736			
6/24	61,644	136,380	5,500	Good	Several jumpers in lower river
6/25	144,846	281,226	13,900	Good	Flood tide
6/26	76,962	358,188	1,500	Okay	Early flood tide
6/27	26,076	384,264	2,000	Okay	Poor in lower river
6/28	5,040	389,304			
6/29	4,398	393,702			
6/30	151,020	544,722			
7/1	63,708	608,430			
7/2	45,954	654,384	16,500	Fair	Ebb tide
7/3	309,186	963,570			
7/4	324,816	1,288,386			
7/5	68,190	1,356,576			
7/6	20,856	1,377,432			
7/7	5,376	1,382,808			
7/8	4,860	1,387,668			
7/9	14,472	1,402,140			
7/10	25,314	1,427,454			
7/11	6,462	1,433,916			
7/12	5,052	1,438,968			
7/13	3,366	1,442,334			
7/14	2,286	1,444,620			
7/15	3,114	1,447,734			
7/16	4,530	1,452,264			
7/17	2,334	1,454,598			
7/18	2,352	1,456,950			
7/19	1,782	1,458,732			

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

Table 29. Daily sockeye salmon escapement estimates by tower and aerial survey in numbers of fish, Igushik River, Bristol Bay, 2001.

	Tower Count		Aerial Surveys[a]				
Date	Daily	Cum.	Lower River	Lagoon	Upper River	Total	Visibility
6/20					50	50	Good
6/24	12,456	12,456					
6/25	16,338	28,794					
6/26	11,790	40,584					
6/27	13,146	53,730					
6/28	9,912	63,642					
6/29	7,782	71,424					
6/30	9,702	81,126					
7/1	11,772	92,898					
7/2	7,332	100,230					
7/3	11,010	111,240					
7/4	18,720	129,960			2000	2000	
7/5	35,430	165,390					
7/6	42,108	207,498					
7/7	37,920	245,418					
7/8	37,194	282,612			5000	5000	
7/9	29,238	311,850			3200	3200	
7/10	18,624	330,474					
7/11	16,374	346,848					
7/12	19,374	366,222					
7/13	15,414	381,636					
7/14	9,882	391,518					
7/15	5,838	397,356					
7/16	4,218	401,574					
7/17	3,084	404,658					
7/18	3,084	407,742					
7/19	714	408,456					
7/20	720	409,176					
7/21	420	409,596					

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

[b] The 2001 Igushik River Test Fishing program was discontinued due to lack of funding.

Table 30. Comparison of daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods in numbers of fish, Togiak River, 2001.

	Tower Count		Aerial Surveys [a]				
Date	Daily	Cum.	Togiak to Gechiak	Gechiak to Ongivinuck	Ongivinuck to tower	Total	Visibility
7/03	3,384	3,384					
7/04	8,280	11,664					
7/05	14,388	26,052					
7/06	7,500	33,552					
7/07	8,322	41,874					
7/08	8,256	50,130					
7/09	9,696	59,826					
7/10	10,902	70,728					
7/11	17,850	88,578					
7/12	20,538	109,116					
7/13	12,018	121,134					
7/14	6,348	127,482	Although some management				
7/15	5,760	133,242					
7/16	4,776	138,018	Surveys were flown in				
7/17	3,828	141,846					
7/18	6,522	148,368	2001, conditions did not permit				
7/19	13,308	161,676					
7/20	11,700	173,376					
7/21	7,152	180,528	any kind of fish count.				
7/22	6,150	186,678					
7/23	9,522	196,200					
7/24	15,120	211,320					
7/25	19,926	231,246					
7/26	23,808	255,054					
7/27	19,506	274,560					
7/28	7,158	281,718					
7/29	3,468	285,186					
7/30	2,112	287,298					
7/31	1,188	288,486					
8/01	2,136	290,622					
8/02	4,734	295,356					
8/03	1,320	296,676					

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

Table 31. Commercial salmon processors and buyers operating in Bristol Bay, 2001.[a]

	Name of Operator/Buyer	Base of Operations	District[b]	Method[c]	Export
1	Alaska General Seafoods	Kenmore, WA	K,E,N	C,F	SEA,AIR
2	Clarks Fish Company	Cathlamet, WA	E	F	SEA
3	Finest Kind Seafoods	Vashon, WA	K	EF	AIR
4	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
5	Great Ruby Fish Company	Anchorage, AK	K	F,S	SEA,AIR
6	Icicle Seafoods, Inc.	Seattle, AK	K,E,U,N	F	SEA
7	International Seafoods of Alaska	Kodiak, AK	E	F	SEA
8	Leader Creek Fisheries	Seattle, WA	K,E,N	F	SEA
9	Nor Quest Seafoods, Inc.	Seattle, WA	K,E,U,N	F	SEA
10	Ocean Beauty Seafoods, Inc.	Seattle, WA	K,E,U,N	C,F,EF	SEA,AIR
11	Pacman Fisheries	Naknek, AK	K	S	AIR
12	Pederson Point	Seattle, WA	K,E,U,N	F	SEA
13	Peter Pan Seafoods, Inc.	Seattle, WA	K,E,N	C,EF,F,S	SEA
14	Snopak Products	Seattle, WA	K,E,U,N	C,F	SEA
15	Sea Hawk Seafoods, Inc.	Seattle, WA	K,E,N	C,EF,F	SEA
16	Togiak Fisheries	Seattle, WA	T	F	SEA,AIR
17	Trident Seafoods	Seattle, WA	K,E,U,N	C,EF,F	SEA
18	Wards Cove Packing Ekuk	Seattle, WA	N	C,F	SEA
19	Wards Cove Packing Naknek	Seattle, WA	K,E,N	F,EF	SEA,AIR
20	Wards Cove Packing Red Salmon	Seattle, WA	K,E,N	F,EF	SEA,AIR
21	Wild Alaskan	Anchor Point, AK	N	F,EF	SEA
22	Woodbine Alaska Fish Company	Monroe, WA	K,E,U,N,T	C,EF,F,S	SEA
23	Yard Arm Knot	Seattle, WA	K,E	F	SEA

Number of processors:23; Canning= 8; Freezing= 21; Fresh=9; Curing= 4; Air Export=8; Sea Export=21

[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, 2001[a]

Species	Total Catch (lbs.)	Mean Weight[b] (lbs.)	Mean Price ($/lb.)	Exvessel Value ($)
Sockeye	94,312,892	6.73	0.40	37,819,470
Chinook	418,627	17.72	0.30	126,007
Chum	6,380,723	7.33	0.11	723,574
Pink	1,566	2.85	0.07	116
Coho	122,248	7.13	0.40	48,728
Total	101,236,056			38,717,895

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

[b] Mean price is a "weighted" average across the major processors.

Table 33. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2001. [a]

Area and River System	Permits Issued [b]	Estimated Number of Salmon Harvested					
		Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT	506	57,250	869	667	383	740	59,909
Naknek River [c]	299	24,092	769	551	343	707	26,463
Kvichak River/Iliamna Lake:	207	32,808	94	115	39	33	33,090
Alagnak River	3	51	1	0	0	0	52
Igiugig	9	543	7	22	0	4	577
Iliamna Lake	28	4,178	2	0	0	0	4,180
Kijik	5	540	0	0	0	0	540
Kokhanok	24	9,473	18	19	1	19	9,530
Kvichak River	13	920	19	71	38	10	1,058
Lake Clark: General	36	2,863	0	0	0	0	2,864
Levelock	9	1,081	44	3	0	0	1,127
Newhalen River	44	5,860	3	0	0	0	5,863
Nondalton Village	13	1,751	0	0	0	0	1,751
Pedro Bay	16	1,969	0	0	0	0	1,969
Port Alsworth	6	167	0	0	0	0	167
Six Mile Lake	12	3,412	0	0	0	0	3,412
Naknek or Kvichak Unspecified	8	350	5	1	0	0	356
EGEGIK DISTRICT [d]	57	2,493	111	105	16	928	3,653
UGASHIK DISTRICT [e]	24	1,197	61	8	2	357	1,624
NUSHAGAK DISTRICT	554	26,939	11,760	3,011	378	5,993	48,080
Wood River [f]	115	3,960	1,184	206	14	530	5,895
Lower Nushagak River [g]	48	1,543	1,777	207	20	364	3,910
Upper Nushagak River [h]	64	3,376	3,372	1,133	110	612	8,603
Dillingham Beaches [i]	256	10,283	3,715	1,074	108	3,097	18,276
Nushagak Bay Commercial [j]	73	3,533	1,078	311	121	1,185	6,228
Igushik/Snake River	40	3,626	492	46	5	149	4,318
Nushagak, Site Unspecified	15	618	142	34	0	56	850
TOGIAK DISTRICT [k]	92	4,162	1,612	367	61	388	6,590
TOTAL BRISTOL BAY	1,226	92,041	14,412	4,158	839	8,406	119,856

[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 1,226 permits issued for the management area, 1,137 were returned (92.7%).

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

[c] Includes Mile 5 North, Naknek River General, Powerline-North, North and South Savonoski, South Naknek Beach, and Telephone Point-North.

[d] Includes Egegik river and beach

[e] Includes Pilot Point and Ugashik

[f] Includes Dragnet, Aleknagik, Muklung River, Red Bluff, and Upper and Lower Wood River General

[g] Includes Black Point, Grassy Island, and Lewis Point

[h] Includes Ekwok, Kokwok River, New Stuyahok, Koliganek, Mulchatna River, and Portage Creek

[l] Includes Bradford Point, City Dock, Kanakanak, Scandinavia, Skinner, Snag Point, and Squaw Creek

[j] Includes Clark's Point, Ekuk, Etolin Point, Nushagak Point, Protection Point, and Queen's Slough.

[k] Includes Togiak village and Togiak River

Appendix

Tables

Appendix Table 1. Escapement goals and actual counts of sockeye salmon by river system, Bristol Bay, 1980-2001.

	Kvichak River			Naknek River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1981			1,754			1,796
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	800	1,400	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	2,000	10,000	6,197	800	1,400	1,625
2000	2,000	10,000	1,828	800	1,400	1,375
20 yr Ave.	4,588	8,706	4,769	800	1,400	1,492
1981-90	5,714	8,857	5,076	800	1,400	1,472
1991-00	3,800	8,600	4,463	800	1,400	1,513
2001	2,000	10,000	1,095	800	1,400	1,830

	Egegik River			Ugashik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1981			695			1,327
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	619
1998	800	1,400	1,111	500	1,200	891
1999	800	1,400	1,728	500	1,200	1,647
2000	800	1,400	1,032	500	1,200	620
20 yr Ave.	800	1,271	1,404	500	1,006	1,165
1981-90	800	1,200	1,261	500	900	1,045
1991-00	800	1,320	1,548	500	1,080	1,285
2001	800	1,400	969	500	1,200	866

Continued

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
1981			1,233			591
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
20 yr Ave.	718	1,200	1,254	149	250	353
1981-90	743	1,200	1,079	147	250	307
1991-00	700	1,200	1,430	150	250	399
2001	700	1,500	1,459	150	300	410

Year	Nushagak River Range Lower [c]	Nushagak River Range Upper	Nushagak River Actual	Togiak River Range Lower	Togiak River Range Upper	Togiak River Actual
1981			834			208
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	320	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	525	140	250	157
1997	340	760	373	100	200	132
1998	340	760	459	100	200	154
1999	235	760	312	100	200	156
2000	340	760	404	100	200	390
20 yr Ave.	320	739	493	124	229	188
1981-90	306	709	509	123	229	180
1991-00	330	760	477	124	230	196
2001	340	760	811	100	200	303

[a] Percent deviation= (actual minus goal) / goal (multiplied by 100).

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

[c] The "Optimual 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, 1981-2001.[a,b]

Year	Drift Net[c] Resident		Drift Net[c] Non-Resident		Drift Net[c] Total	Set Net[c] Resident		Set Net[c] Non-Resident		Set Net[c] Total	Total
1981	1,056	(98)	770	(18)	1,826	751	(37)	204	(5)	955	2,781
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	2,908
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	944	(25)	946	(7)	1,890	736	(5)	276	(0)	1,012	2,902
20-Year Ave.	1,010		854		1,864	754		242		996	2,860
1981-90 Ave.	1,050		789		1,839	749		223		972	2,811
1991-00 Ave.	970		920		1,890	759		260		1,019	2,909
2001	960		923		1,883	731		279		1,010	2,893

[a] Total license/permit registration with CFEC, 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, 1981-2001.

Year	Permits Issued			Permits Fished	
	Interim -Use	Permanent	Total	Number	Percent
		Drift Gill Net			
1981	107	1,722	1,829	1,785	98%
1982	100	1,726	1,826	1,792	98%
1983	94	1,729	1,823	1,797	99%
1984	89	1,731	1,820	1,804	99%
1985	96	1,740	1,836	1,815	99%
1986	95	1,745	1,840	1,823	99%
1987	91	1,748	1,839	1,824	99%
1988	90	1,751	1,841	1,837	100%
1989	91	1,778	1,869	1,855	99%
1990	93	1,787	1,880	1,869	99%
1991	88	1,795	1,883	1,873	99%
1992	87	1,799	1,886	1,879	100%
1993	81	1,807	1,888	1,875	99%
1994	77	1,813	1,890	1,865	99%
1995	75	1,816	1,891	1,882	100%
1996	70	1,824	1,894	1,884	99%
1997	68	1,835	1,903	1,875	99%
1998	55	1,847	1,902	1,858	98%
1999	52	1,854	1,906	1,847	97%
2000	38	1,885	1,923	1,830	95%
Average	82	1,787	1,868	1,843	99%
2001[a]	24	1,781	1,883	1,576	84%
		Set Gill Net			
1981	42	916	958	841	88%
1982	41	918	959	859	90%
1983	31	931	962	865	90%
1984	31	933	964	869	90%
1985	28	935	963	872	91%
1986	22	944	966	869	90%
1987	18	949	967	899	93%
1988	17	949	966	922	95%
1989	18	1,017	1,035	971	94%
1990	16	1,023	1,039	971	93%
1991	12	1,024	1,036	950	92%
1992	8	1,031	1,039	968	93%
1993	8	1,032	1,040	965	93%
1994	7	1,032	1,039	939	90%
1995	8	1,033	1,041	967	93%
1996	6	1,034	1,040	941	90%
1997	7	1,035	1,042	921	88%
1998	6	1,035	1,041	901	87%
1999	6	1,057	1,063	925	87%
2000	6	1,005	1,011	929	92%
Average	17	992	1,009	917	91%
2001[a]	2	967	1,010	837	83%

[a] Preliminary

Appendix Table 4. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	10,992,809	4,361,406	2,116,066	7,493,093	639,707	25,603,081
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	7,050,899	1,538,790	6,367,208	794,996	20,478,954
20-Year Average	9,684,411	8,387,347	2,966,348	4,024,190	445,627	25,507,923
1981-90 Average	10,272,498	6,223,182	2,968,232	3,583,107	411,553	23,458,571
1991-00 Average	9,096,324	10,551,512	2,964,464	4,465,273	479,701	27,557,274
2001	5,244,561	2,861,991	475,803	4,609,762	811,457	14,003,574

Appendix Table 5. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	11,048	5,468	3,416	193,461	23,911	237,304
1982	12,425	4,834	7,170	195,287	33,786	253,502
1983	8,955	4,758	9,276	137,123	38,497	198,609
1984	8,972	4,680	4,767	61,378	22,179	101,976
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	64,156	6,114	76,240
1998	2,444	760	346	117,079	14,131	134,760
1999	1,295	712	1,638	10,893	11,919	26,457
2000	1,027	1,061	893	12,055	7,858	22,894
20-Year Average	5,668	2,256	3,025	71,088	16,565	98,603
1981-90 Average	7,368	3,488	4,491	81,590	23,068	120,004
1991-00 Average	3,969	1,025	1,560	60,587	10,062	77,202
2001	914	993	1,003	11,050	9,668	23,628

Appendix Table 6. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	355,943	87,581	36,275	795,143	229,886	1,504,828
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	181,253	47,459	306,949
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
20-Year Ave.	247,728	101,102	74,913	423,303	215,223	1,062,269
1981-90 Ave.	330,165	134,132	96,025	538,005	270,919	1,369,246
1991-00 Ave.	165,291	68,072	53,801	308,601	159,527	755,291
2001	40,032	30,908	50,475	536,972	212,027	870,414

Appendix Table 7. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	194	222	29	345	6,490	7,280
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
20-Year Ave.[a]	177,738	2,815	405	527,800	33,507	742,265
1981-90 Ave.[a]	303,209	5,317	647	1,006,312	26,824	1,342,308
1991-00 Ave.[a]	52,266	313	164	49,288	40,190	142,221
2001	23	0	0	388	138	549

[a] Includes even numbered years only.

Appendix Table 8. Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	1,229	32,759	30,220	220,290	29,207	313,705
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
20-Year Ave.	8,225	38,730	26,430	70,978	37,927	182,290
1981-90 Ave.	11,263	43,941	37,786	115,118	51,110	259,217
1991-00 Ave.	5,188	33,519	15,074	26,838	24,744	105,362
2001	5	12,614	1,030	3,184	306	17,139

Appendix Table 9. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1981 - 2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	11,361,223	4,487,436	2,186,006	8,702,332	929,201	27,666,198
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	7,104,015	1,577,305	6,644,845	946,482	21,089,564
20-Year Ave.	10,034,352	8,530,148	3,071,293	4,859,364	730,674	27,225,831
1981-90 Ave.	10,772,933	6,407,438	3,106,867	4,821,044	770,782	25,879,064
1991-00 Ave.	9,295,772	10,652,858	3,035,718	4,897,684	690,567	28,572,598
2001	5,285,535	2,906,506	528,311	5,161,356	1,033,596	14,915,304

Appendix Table 10. Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak			Egegik		Ugashik		Nushagak			WRSHA [a]		Togiak		Total [b]	
	Drift	Setnet Section		Drift	Set	Drift	Set	Drift	Setnet Section		Drift	Set	Drift	Set	Drift	Set
		Naknek	Kvichak						Nushagak	Igushik						
1981	86	14		77	23	89	11	81	19				79	21	86	14
1982	87	13		83	17	87	13	90	10				84	16	87	13
1983	92	8		86	14	93	7	86	14				80	20	90	10
1984	89	11		92	8	92	8	83	17				77	23	90	10
1985	87	13		93	7	96	4	65	35				75	25	90	10
1986	70	30		89	11	94	6	76	24				68	32	85	15
1987	86	14		91	9	93	7	80	20				66	34	87	13
1988	86	14		90	10	91	9	75	25				64	36	86	14
1989	89	11		90	10	87	13	58	42				55	45	86	14
1990	88	12		91	9	91	9	67	33				67	33	87	13
1991	89	11		91	9	89	11	76	24				64	36	86	14
1992	89	11		91	9	90	10	65	35				62	38	88	12
1993	84	16		93	7	90	10	72	28				54	46	87	13
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	86	14
1997	73	27		87	13	88	12	70	30				37	63	82	18
1998	84	8	8	86	14	85	15	72	24	4	76	24	43	57	80	20
1999	85	8	7	85	15	89	11	70	24	6	78	22	53	47	81	19
2000	82	12	6	84	16	87	13	79	15	6	68	32	57	43	80	20
20-Year Average	85	14		89	11	91	9	74	25				62	38	86	14
1981-90 Average	86	14		88	12	91	9	76	24				72	29	87	13
1991-00 Average	85	13		89	11	90	10	72	26				53	48	85	16
2001	82	16	2	86	14	80	20	78	17	5	[d]	[d]	66	34	80	20
Allocation [c]	84	8	8	86	14	90	10	74	20	6			n.a.	n.a.	n.a.	n.a.

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

[b] Percentages based on total fish caught per gear group.

[c] BOF inacted current allocation plan in 1998.

[d] No commercial fishing was conducted in WRSHA during 2001.

Appendix Table 11. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak[a]	Egegik[b]	Ugashik[c]	Nushagak[d]	Togiak[e]	Total
1981	3,632,788	694,680	1,327,699	2,850,637	365,910	8,871,714
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
20-Year Ave.	6,474,607	1,404,362	1,184,583	2,165,535	259,645	11,488,732
1981-90 Ave.	6,671,886	1,260,975	1,061,098	2,020,040	266,906	11,280,905
1991-00 Ave.	6,277,329	1,547,748	1,308,068	2,311,030	252,384	11,696,559
2001	3,194,708	968,872	866,368	2,679,432 [f]	303,346 [g]	8,012,726

[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 1980-2000 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, 1981-2001.

Year	Catch	Escapement				Total Run
		Kvichak[a]	Branch[b]	Naknek[a]	Total	
1981	10,992,809	1,754,358	82,210	1,796,220	3,632,788	14,625,597
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
20 Year Ave.	9,684,411	4,769,215	235,708	1,469,695	6,474,617	16,159,028
1981-90 Ave.	10,272,498	5,075,883	169,567	1,426,435	6,671,886	16,944,383
1991-2000 Ave.	9,096,324	4,462,546	301,848	1,512,955	6,277,349	15,373,672
2001	5,280,996	1,095,348	267,000	1,830,360	1,095,348	6,376,344

[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, 1981-2001.

Year	Kvichak		Branch		Naknek		Total Run[a]
	Number	%	Number	%	Number	%	
1981	6,989	48	311	2	7326	50	14,626
1982	2,993	40	772	10	3770	50	7,535
1983	20,105	77	557	2	5452	21	26,114
1984	23,014	87	555	2	2926	11	26,495
1985	13,394	77	264	2	3699	21	17,357
1986	1,966	31	399	6	3913	62	6,278
1987	9,593	78	297	2	2378	19	12,268
1988	6,720	77	320	4	1739	20	8,779
1989	19,774	84	534	2	3179	14	23,487
1990	17,521	66	555	2	8427	32	26,503
1991	8,032	43	604	3	9918	53	18,554
1992	10,445	65	487	3	5021	31	15,953
1993	9,313	63	817	6	4687	32	14,817
1994	22,232	86	634	2	3033	12	25,899
1995	27,431	87	651	2	3564	11	31,646
1996	3,458	31	706	6	6860	62	11,024
1997	1,683	50	244	7	1409	42	3,336
1998	3,412	54	388	6	2546	40	6,346
1999	12,947	73	1070	6	3740	21	17,757
2000	2,862	34	731	9	4789	57	8,382
20 Year Ave.	11,194	63	545	4	4,419	33	16,158
1981-1990 Ave.	12,207	66	456	3	4,281	30	16,944
1991-2000 Ave.	10,182	59	633	5	4,557	36	15,371
2001	1,430,039	17	407,760	5	6,693,695	78	8,531,494

[a] Due to rounding of river system total runs, the district total run nay 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, 1981-2001.

Year	Catch	Escapement			Total Run
		Egegik[a]	Shosky Cr.[b]	King Salmon River[b]	
1981	4,361,406	694,680			5,056,086
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	7,050,899	1,032,138			8,083,037
20-Year Ave.	8,387,347	1,404,197	38 #	314	9,791,740
1981-90 Ave.	6,223,182	1,260,779	58 #	370	7,484,157
1991-00 Ave.	10,551,512	1,547,615	18 #	274	12,099,323
2001[c]	2,861,991	968,862		10	3,830,863

[a] Tower count.

[b] Aerial survey index count.

[c] Preliminary data.

Appendix Table 15. Inshore commercial catch and escapement of sockeye salmon in the Ugashik District by river system, 1981-2001.

Year	Catch	Escapement			Total Run
		Ugashik[a] River	King Salmon[b] River	Dog Salmon[b] River	
1981	2,116,066	1,326,762	937		3,443,765
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
20-Year Ave.	2,966,349	1,165,140	13,292	7,238	4,150,932
1981-90 Ave.	2,968,232	1,044,931	11,956	6,016	4,029,330
1991-00 Ave.	2,964,467	1,285,348	14,628	8,092	4,272,535
2001[c]	475,803	833,628[d]	22,940	9,800	1,342,171

[a] Tower count.

[b] Aerial survey.

[c] Preliminary data.

[d] USFWS operated the counting tower from late July until September and estimated an additional 28,000 sockeye salmon, however, many fish were seen milling in this area and perhaps only 11,000 sockeye salmon can be added to the total.

Appendix Table 16. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in number of fish, 1981-2001.

		Escapement							
Year	Catch	Wood [a]	Igushik [a]	Nuyakuk [a]	Nush/Mul [b]	Nushagak [c]	Snake [d]	Total	Total Run
1981	7,493,093	1,233,318	591,144	834,204	177,400		14,571	1,839,033	9,332,126
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		33,840	1,221,504	3,214,185
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	225,033		1,520	1,507,928	4,762,648
1988	1,706,716	866,778	170,454	319,992	163,208		4,320	1,041,552	2,748,268
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
20-year Ave.	4,028,288	1,254,878	352,831	346,244	181,103	501,593	16,522	1,921,056	5,949,344
1981-90 Ave.	3,583,107	1,079,100	306,751	487,165	134,033	596,895	17,753	1,522,983	5,106,090
1991-00 Ave.	4,473,469	1,430,656	398,912	158,350	243,862	482,533	14,059	2,319,130	6,792,599
2001	4,609,762	1,458,732	409,596	184,044	627,060	811,104	[e]	2,679,432	7,289,194

[a] Tower count.

[b] Aerial survey estimates 1977-83, 1985, and 1987. Escapement estimates for 1984, 1988, and 1995-99, were derived from the difference between lower river sonar estimates and Nuyakuk Tower counts. Escapement estimates for 1976 and 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 1980, 1982-91, 1994-95 and 1997; weir count 1975-79 and 1981, 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, 1981-2001.

Year	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		Total Run[a]
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
1981	4,568	44	2,229	22	3,319	32	177	2			52	1	10,345
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	24					1,217	24	28	1	4,978
1990	2,610	46	1,280	23					1,757	31	29	1	5,676
1991	3,303	44	2,424	32					1,736	23	11	0	7,474
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	26	42	1	5,842
1995	4,022	60	1,902	28					756	11	20	0	6,700
1996	5,030	61	1,502	18					1,771	21			8,303
1997	3,480	75	293	6					858	18	8	0	4,639
1998	3,949	73	585	11					869	16			5,403
1999	5,930	70	1,563	19					952	11	[b]		8,445
2000	5,278	62	1,748	21					1,458	17	[b]		8,484
20-Year Ave.	3,376	55	1,192	18	1,423	24	494	10	1,412	22	21	0	6,197
1981-90 Ave.	2,736	50	1,015	17	1,423	24	494	10	1,487	28	22	0	5,604
1991-00 Ave.	4,016	59	1,369	19					1,397	21	20	0	6,790
2001	3,932	54	1,323	18	184		1,901		2,085	28	[b]		7,340

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

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

Appendix Table 18. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, 1981-2001.

	Catch				Escapement						
					Togiak						
Year	Togiak	Kulukak	Os/Mat[a]	Total	Lake[b]	River[c]	Tributaries[d]	Kulukak[e]	Other[f]	Total	Total Run
1981	620,288	19,246	173	639,707	208,080	21,150	77,900	58,780		365,910	1,005,617
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	549,221	254,683	15,980	7,740	23,940	18,370	320,713	869,934
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	405,051
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
20-Year Ave.	378,574	61,115	6,523	445,576	183,951	12,447	20,238	30,436	20,561	259,408	704,982
1981-90 Ave.	345,450	56,034	10,069	411,553	179,754	13,317	26,623	40,764	32,240	266,906	678,459
1991-00 Ave.	411,699	66,195	2,978	479,598	188,147	11,576	13,854	20,107	18,226	251,910	731,506
2001[h]	811,457	9,532	1,908	822,897	296,676	6,520	150	17,280	17,990	338,616	1,161,513

[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 by district, in numbers of fish, Bristol Bay, 1981-2001.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1981	14,625,597	5,056,086	3,443,765	10,343,730	1,005,617	34,474,795
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	8,083,037	2,177,210	8,484,050	1,079,629	28,205,555
20-Year Ave.	16,158,128	9,791,740	4,150,932	6,193,823	699,635	36,994,258
1981-90 Ave.	16,944,383	7,484,157	4,029,330	5,603,147	678,459	34,739,476
1991-00 Ave.	15,371,872	12,099,323	4,272,535	6,784,498	720,812	39,249,040
2001	8,497,067	3,857,100	1,351,363	7,339,116	1,122,439	22,167,085

Appendix Table 20. Chinook salmon harvest, escapement and total runs in the Nushagak District, 1981-2001.

Year	Harvests by Fishery				Inriver Abundance[a]	Spawning Escapement[b]	Total Run
	Commercial	Sport	Subsistence	Total			
1981	193,461	1,220	11,500	206,181		150,000	356,181
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
20-Year Average	71,088	4,255	12,283	87,627	77,273	84,745	172,372
1981-90 Average	81,590	2,835	10,851	95,275	65,381	94,461	189,736
1996-00 Average	55,239	4,994	12,609	72,841	72,082	66,929	139,770
2001	11,050	5,000 [c]	26,939	42,989	99,155	83,571	126,560

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

[b] Spawning escapement estimated from the following: 1977-81, 97 - 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 1977-85 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, 1981-2001.

Year	Harvests by Fishery				Spawning	Total
	Commercial	Sport	Subsistence	Total	Escapement[a]	Run
1981	23,911	-	400	24,311	27,000	51,311
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	-	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	18,609
1998	14,131	763	782	15,758	11,666	27,424
1999	11,919	644	1,244	13,807	12,263	26,070
2000	7,858	470	1,116	9,444	16,897	26,341
20-Year Average	16,565	400	690	17,659	14,668	32,285
1981-90 Average	23,068	215	556	23,838	15,465	39,303
1996-00 Average	9,725	766	856	11,364	12,759	23,957
2001[b]	9,668	600 [c]	1,612	11,880	15,185	27,065

[a] Spawning escapement estimated from comprehensive aerial surveys. Estimates for 1976-1988 are rounded to the nearest thousand fish.

[b] Preliminary.

[c] Estimate

Appendix Table 22. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1981-2001.[a]

	Nushagak District			Togiak District		
Year	Catch	Escapement [b]	Total Run	Catch	Escapement [c]	Total Run
1981	795,143	177,000	972,143	229,886	331,000	560,886
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	615,712	176,123	120,000	296,123
1993	505,799	217,230	632,109	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	181,253	61,456	242,709	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[d]	114,454	141,323	255,777	140,175	80,860 [e]	221,035
20-Year Ave.	423,660	241,251	656,083	215,170	179,793	394,963
1981-90 Ave.	538,005	245,643	783,648	270,919	231,235	502,154
1991-00 Ave.	309,316	236,859	528,518	159,421	128,351	287,772
2001	536,972	564,373	1,101,345	212,027	252,610	464,637

[a] Escapement estimates supersede those previously reported.

[b] Escapements were estimated from the following: 1981-00- adjusted sonar estimates from Portage Creek site. Estimates for 1976-85 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 1976-88 rounded to the nearest thousand fish.

[d] Preliminary.

[e] 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, 1958-2001. [h]

Year	Catch	Escapement							Total Run
		Wood[a]	Igushik[b]	Nuyakuk[c]	Nush/Mul[d]	Nushagak[e]	Snake[f]	Total	
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					[i]			
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
Ave.[g]	994,356	49,771	7,419	1,823,759	132,848	378,429	2,217	1,374,837	2,446,136
2001	(No information avaliable - non-pink year.)								

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

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

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

[d] Aerial survey estimate.

[e] Sonar estimate from Portage Creek.

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

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

[h] Includes even-years only.

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

Appendix Table 24. Coho salmon harvest, escapement and total runs in the Nushagak Drainage, 1981-2001.

Year	Harvests by Fishery						Inriver Run[b]	Spawning Escapement[c]	Total Run
	Commercial Harvest	Subsistence[a] Lower	Upper	Total	Sport Total	Total Harvest			
1981	220,290	4795	3,135	7,930	389	228,609	144,992	141,468	370,077
1982	349,669	4919	3,125	8,044	503	358,216	297,779	294,151	652,367
1983	81,338	4002	878	4,880	1,498	87,716	39,261	36,885	124,601
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	84,034	82,258	108,624
1986	68,568	6533	2,617	9,150	1,576	79,294	49,676	45,483	124,777
1987	13,263	4149	1,209	5,358	1,007	19,628	23,484	21,268	40,896
1988	52,698	3515	1,112	4,627	557	57,882	131,840	130,171	188,053
1989	77,077	6971	1,159	8,130	2,392	87,599	84,658	81,107	168,706
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	39,733	37,584	54,222
1992	84,077	4962	1,534	6,496	752	91,325		-2,286	89,039
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	57,096	56596	64,639
1998	22,703	201	254	455	1,368	24,526	104,948	103194	127,276
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	172,846	169,859	289,476
20-Year Average	70,978	4,554	1,244	5,680	1,042	77,700	100,414	93,163	170,841
1981-90 Average	115,118	4,999	1,721	6,720	896	122,734	114,027	111,410	234,143
1991-00 Average	26,838	4,060	714	4,640	1,188	32,666	85,289	74,917	107,538
2001	3,184	4,851	612	5,463	1,000 [d]	9,647	65,272	63,660	73,307

[a] Subsistence harvest estimated by expanding fishing permit returns; excludes estimates for the communities of Manokotak and Wood River. Estimates for 1976-1986 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 Nushagak watershed fishing site.

[b] In river run estimated by sonar through August 25 for 1982-2001. 1981 estimated by applying exploitation rates of .602 to commercial harvest. Sonar estimates expanded for some years when the project 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, 1981-2001.

Year	Harvests by Fishery				Spawning Escapement[b]	Total Run
	Commercial	Subsistence[a]	Sport	Total		
1981	19,504	2,200	119	21,823	43,500	65,323
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	24,901
1998	52,783	310	1,020	53,793	25,335	79,128
1999	2,653	217	1,109	3,979	3,855	7,834
2000	2,758	342	840	3,940		
20-Year Average	29,690	1,037	721	31,432	36,583	69,975
1981-90 Average	35,605	1,458	768	37,831	36,501	78,313
1996-00 Average	23,908	266	1,026	25,136	28,699	59,198
2001[c]	306	388	400 [d]	694		

[a] Subsistence harvest estimated by expanding fishing permit returns; Estimates for 1976-1987 were based on community where permit was issued; 1988 - present on community of residence.

[b] Expanded estimates from aerial surveys.

[c] Preliminary.

[d] Estimate.

Appendix Table 26. Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1981-2001.[a]

Year	Sockeye	Chinook	Chum	Pink	Coho
1981	6.2	19.0	6.7		6.4
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
20-Year Ave.	5.9	18.1	6.7	3.5	7.2
1981-90 Ave.	5.9	19.2	6.6	3.5	7.2
1991-00 Ave.	5.8	17.0	6.7	3.5	7.2
2001	6.74	17.43	7.18	2.75	7.14

[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 is extracted from the fish ticket system.

Appendix Table 27. Average price paid per pound for Bristol Bay salmon, 1981-2001.

Year	Sockeye	Chinook	Chum	Pink	Coho
1981	$0.76	$1.23	$0.41	$0.29	$0.73
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	$0.00	$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 [b]	$0.80	$0.50	$0.10	$0.05	$0.30
2000 [c]	$0.64	$0.48	$0.09	$0.08	$0.38
20-Year Ave.	$0.92	$0.81	$0.24	$0.14	$0.58
1981-90 Ave.	$1.04	$1.02	$0.32	$0.20	$0.72
1991-00 Ave.	$0.79	$0.60	$0.16	$0.08	$0.45
2001	$0.40	$0.30	$0.11	$0.07	$0.39

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

[b] Based on 1999 Final Operations Reports.

[c] Based on 2000 Final Operations Reports.

Appendix Table 28. Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1981-2001.[a]

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1981	$120,907	$5,557	$4,106		$1,461	$132,031
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
20-Year Ave.	$127,906	$1,625	$1,863	$516 [b]	$866	$132,544
1981-90 Ave.	$133,699	$2,460	$2,904	$1,082 [b]	$1,369	$140,973
1991-00 Ave.	$122,113	$790	$822	$45 [b]	$363	$124,115
2001	$38,250	$127	$656	$0	$48	$39,081

[a] Value paid to fishermen. Derived from price per fish or 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, 1981-2001.[a]

	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
Year	Actual	Quota[b]	Chum	Actual	Quota[b]	Chum	Actual	Quota[b]	Chum
1981	1,474	1,442	521	351	318	54	1,825	1,760	575
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	1529	195	314	336	50	1289	1865	245
1999	1,106	1,024	187	269	226	58	1,375	1,250	245
2000	892	1650	169	359	363	70	1,251	2,013	239
20-yr Average	1,200	1,639	380	369	362	111	1,569	2,001	491
81-90 Average	1,119	1,234	463	307	272	94	1,427	1,507	557
91-00 Average	1,280	2,044	297	430	451	129	1,710	2,495	426
2001	271		185	130		149	401		334

[a] South Unimak includes statistical area 284 in June and July, while Shumigan Islands includes stitistical 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, 1981-01. [a] [b]

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			NAKNEK KVICHAK DISTRICT				
1981	649	85,100	1,000	400	100	1,100	87,700
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
20 Year Average	493	88,588	1,398	873	1,092 [c]	1,204	92,766
1981-1990 Average	440	91,871	1,078	613	1,231 [c]	993	95,289
1991-2000 Average	547	85,305	1,718	1,133	953 [c]	1,416	90,244
2001	506	57,250	869	667	383	740	59,909
			EGEGIK DISTRICT				
1981[d]	4						
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
20 Year Average	43	2,110	83	91	57 [c]	504	2,744
1981-1990 Average	34	1,414	62	75	38 [c]	312	1,769
1991-2000 Average	53	2,736	95	102	68 [c]	639	3,622
2001	57	2,493	111	105	16	928	3,653

Continued

Appendix Table 31. (page 2 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			UGASHIK DISTRICT				
1981	12	600				200	800
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
20 Year Average	24	1,284	77	58	39 [c]	329	1,743
1981-1990 Average	18	849	62	57	59 [c]	237	1,178
1991-2000 Average	30	1,718	86	59	27 [c]	421	2,307
2001	24	1,197	61	8	2	357	1,624
			NUSHAGAK DISTRICT				
1981	395	44,600	11,500	10,200	2,300	8,700	77,300
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
20 Year Average	470	32,735	12,283	6,041	3,867 [c]	6,427	59,673
1981-1990 Average	422	38,742	10,851	8,285	5,760 [c]	7,242	68,401
1991-2000 Average	518	26,728	13,716	3,798	1,974 [c]	5,611	50,946
2001	554	26,939	11,760	3,011	378	5,993	48,080

Continued

Appendix Table 31. (page 3 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
			TOGIAK DISTRICT				
1981	52	1,900	400	800	100	2,200	5,400
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
20 Year Average	40	2,560	690	680	154 [c]	1,037	5,075
1981-1990 Average	41	2,763	556	889	221 [c]	1,458	5,828
1991-2000 Average	39	2,357	825	470	87 [c]	615	4,323
2001	92	4,162	1,612	367	61	388	6,590
			TOTAL BRISTOL BAY AREA				
1981	1,112	132,100	13,000	11,500	2,600	12,200	171,400
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
20 Year Average	1,070	127,168	14,515	7,725	5,190 [c]	9,429	161,888
1981-1990 Average	954	135,492	12,576	9,888	7,270 [c]	10,157	172,321
1991-2000 Average	1,187	118,844	16,454	5,562	3,110 [c]	8,701	151,456
2001	1,226	92,041	14,412	4,158	839	8,406	119,856

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

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

[c] Includes even years only. [d] No permits returned. .

Appendix Table 31. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1981-01. [a] [b]

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna-Newhalen[e]	Nondalton	Port Alsworth	Other [f]	Total
1981	6,600	5,400	9,700	16,500	15,400	15,200	6,800		75,600
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
20 Year Ave.	3,980	2,266	7,208	15,140	19,673	15,568	3,545	2,652	68,611
1981-90 Ave.	5,690	3,163	8,610	17,410	20,870	18,470	4,020	1,400	77,740
1991-00 Ave.	2,270	1,549	5,805	12,870	18,475	12,665	3,070	2,777	59,483
2001	908	779	2,118	9,447	8,132	7,566	1,958	1,901	32,808

[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, Nushagak District, Bristol Bay, 1981-01.[ab]

Year	Dillingham[e]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other[f]	Total
1981	23,900	6,700	2,900	8,800	23,600	11,400		77,300
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	[c]	61,000
1989	31,800 [d]	5,800	2,000	4,700	9,700	3,800	[c]	57,800
1990	28,860 [d]	6,600	2,300	4,900	9,900	8,000	700	61,260
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
20 Year Ave.	27,662	4,480	2,358	5,000	12,040	6,528	2,926	59,676
1981-90 Ave.	27,776	5,190	2,810	6,620	16,500	9,350	700	68,316
1991-00 Ave.	27,548	3,771	1,905	3,380	7,580	3,705	3,148	51,037
2001	26,435	3,700	2,129	2,218	7,294	2,209	4,096	48,080

[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.

2001

BRISTOL BAY

HERRING

FISHERY

TABLE OF CONTENTS

Page

LIST OF TABLES

APPENDIX TABLES

LIST OF FIGURES

INTRODUCTION

This report reviews stock assessment activities, provides an overview of the Togiak District herring fishery from 1978 to 2000 and summarizes the 2001 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 2000, 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 2001, sac roe harvests brought $4.0 million to permit holders, which was a decline in value of the fishery from recent years. No spawn-on-kelp fishery was conducted.

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 increased rapidly and peaked within 1 to 7 days of the first observation in all but 3 years. 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 gillnet length limit to 100 fathoms per permit holder, restricted the operation of no more than 100 fathoms from one vessel, and granted the Department the authority to reduce 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 11 companies participating in 2001. Since 1990, processing capacity reached a peak in 1996 of 4,850 tons per day and has since declined to 2,100 tons per day in 2001.

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.

2001 SEASON SUMMARY

Biomass Estimation

Aerial surveys of the Togiak District began April 17, 2001. Department staff first observed herring April 26, when a total of 638 tons were documented in small schools in several areas of the district including Togiak, Kulukak and Metervik Bays as well as behind Tongue Point and along Hagemeister Island. Survey conditions were generally poor throughout the entire fishery due to poor water clarity caused by inclement weather. The peak biomass survey occurred on May 15, and produced an estimate of 67,244 tons. Large numbers of herring were present in the district through the end of May, and spawning herring were observed in the district well into June.

Spawn was first observed May 1, in Ungalikthluk Bay, with one linear mile of spawn recorded. The peak day of spawning, based on the most linear miles of spawn observed, was May 6 with 16.1 miles recorded. A total of 56.7 miles of spawn was documented throughout the 2001 season.

Age Composition

A total of 8,070 herring scales were collected for age, size and sex data from April 28 to May 14, 2001. Samples were collected from the purse seine test fishery, commercial purse seine fishery, and the commercial gillnet fishery. Commercial gillnet openings 5 and 7 were not sampled due to logistical difficulties in transferring samples to the ADF&G field site.

Post-season age composition and survey analysis resulted in a final total run biomass estimate of 146,209 tons (Table 1). Herring ages-4 through –18 were present in the 2001 total return. The total run biomass was primarily age-9 and older (38.8%). Age-8 herring was the largest single year class and represented 27.4% of the biomass. Age-5 herring followed in magnitude comprising 20.7% of the biomass. Mean weight of the total run biomass was 359g and mean length was 293mm. A major change in age composition from older to younger herring was observed in the commercial purse seine samples beginning May 10.

A total of 5,803 herring was sampled from the commercial purse seine fishery. Age-9 and older herring contributed 53.5%, ages 7-8 contributed 28.8%, and ages 5-6 contributed 15.1%. Mean weight of the commercial purse seine samples was 358g and mean length was 293mm. Sex composition was divided 52.0% M and 48.0% F.

Eight hundred ninety nine (899) fish were sampled from the commercial gillnet fishery. Age-9 and older herring contributed 49.8%, ages- 7-8 contributed 49.6% and ages- 5-6 only contributed 0.4%. Mean weight of the commercial gillnet samples was 391g and mean length was 302mm. Sex composition was divided 44.0% M and 56.0% F.

From the purse seine test fishery, 1,368 herring were sampled. Age-9 and older fish contributed 44.1%, ages 7-8 contributed 26.9%, ages 5-6 contributed 24.6%, and age-4 contributed 4.8% of the

samples. Mean weight of the test purse seine samples was 344g and mean length was 287mm. The sex composition was split 50%

The aerial survey conducted on May 15 observed a peak biomass of 67,000 tons. Commercial purse seine and purse seine test fishery age composition data from May 13 and 14 were comprised of 46.1% ages-5-6 and 12.5% age-4. The average weight was 233g. The substantial presence of these younger herring entering the district in conjunction with the peak biomass estimate may indicate the recruitment of several strong age classes. Future returns will determine the significance and strength of the 1996 and 1997 year 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 2001 preseason forecasted biomass was 119,818 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; 1,572 tons for the Dutch Harbor food and bait fishery; and the remaining 20,892 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, 14,624 tons, and 30% of the removal is taken by gillnets, 6,268 tons. The Department's inseason biomass surveys did not exceed the forecasted level. Therefore, the above harvest guidelines were applied throughout the fishery.

The Bristol Bay Herring Management Plan and other regulations direct the Department to conduct an orderly, manageable fishery and strive for the highest level of product quality with a minimum of waste. Industry representatives have stated that holding unprocessed fish more than three days results in a significant decline in product quality. To ensure a high quality sac roe harvest, management staff planned to use test fisheries to estimate mature roe percent within areas of the district; only areas with high quality roe will be opened to commercial fishing. The Department also intended to limit the amount of herring held on tenders or processing vessels to a level that could be processed in less than 3 days, by managing time and area for multiple openings, each with limited individual harvests.

During the winter of 2001, climatic conditions were unusually mild and the Bering Sea ice pack was much farther north than the National Weather Service had previously documented. Areas with unusually warm water temperatures of 3° and 4° Celsius were shown on sea surface temperature charts in Bristol Bay as early as March 1. These factors indicated an early arrival for herring in the Togiak District. However, the first two weeks of April returned to subfreezing temperatures with chill factors below zero in southwest Alaska; sheet ice began to reform holding inshore water temperatures down. Although Department staff, industry and fleet were prepared for an early herring fishery, timing of the migration and spawning activity were normal.

Processing capacity, Bristol Bay Herring Management Plan changes, and companies organizing their purse seine fleets as cooperatives (coops), were issues that received considerable attention preseason. The Department was asked to poll the processing companies prior to the season to see if sufficient processing capacity would be available for the 2001 season. Preseason discussions also took place regarding the management implications of each company's purse seine fleet fishing as a cooperative instead of fishing in an open, competitive mode. Department staff held a teleconference on April 18 to discuss this issue with processing companies and permit holders. Purse seine openings in excess of 1-hour duration, and as large an open area as possible were the two requests made by the companies to allow the benefits of the seine cooperatives to be realized. The "limited capacity" openings initiated by the Department during the 2000 season contributed to the companies' decision to attempt to handle their purse seine fleets as cooperatives. These "limited capacity" openings were held when a limited number of the companies had processing capacity left and only the permit holders fishing for those companies would be participating in these openings. This approach was an attempt by the Department to keep all companies' processing capacity fully utilized, thereby maximizing overall capacity on grounds. A beach meeting for permit holders, processors and staff was planned to be held in Nunavachak Bay prior to initiating fishing, but several factors including weather and logistics precluded conducting this meeting.

Company registration for processors intending to buy herring and spawn-on-kelp product in the Togiak District began in Dillingham April 26, before Department staff moved to the field office at Togiak Fisheries' shore plant. Registration continued in Togiak between April 29 and May 3; eleven companies registered to buy gillnet and purse seine sac roe herring. No companies registered to buy spawn-on-kelp product. Based on information supplied by companies upon registration in Togiak, industry could process 2,250 tons of sac roe herring each day. Processing capacity in 2001 showed a slight increase from the previous season (2,100 tons), which 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 conducting the fishery to harvest the entire guideline for each gear group.

Purse Seine

Test fishing with purse seines began on the afternoon of April 26 and was conducted in various areas for each of the next 9 days with samples continuing to show immature roe weight exceeding mature roe weight. On May 1, a storm brought subfreezing temperatures and 6 – 10 inches of snow to the Togiak District. These conditions interrupted test fishing activities and basically shut down the field office at Togiak Fisheries shore plant. Research staff was flown back to Dillingham while management staff temporarily relocated to Icicle Seafood's processing barge, Arctic Star. Staff returned on May 4, after living conditions improved slightly at Togiak Fisheries. On May 5, test fish samples from Nunavachak Bay resulted in mature roe percentages from 3.8% to 11% and from Kulukak Bay of between 8.0% and 13.3%.

On the morning of May 6, another aerial survey was conducted in an attempt to document threshold biomass of 35,000 tons on grounds. Due to turbid water conditions caused by wind, only 10,400 tons were observed. Department staff made an assessment based on the length of time herring had been on grounds, biomass observed to date, the amount of spawn observed, and the age structure of the test fish samples reported, that the available biomass had exceeded the 35,000 ton threshold level. A two-hour purse seine opening (PS 1) beginning at 2:00 p.m. between Right Hand Point and Anchor Point was announced. An opening of this duration represented a decision by management staff to attempt to allow the purse seine fleets of each company acting as a cooperative to find quality fish and make sets only on the amount of herring that the company could process in less than three days; in essence, a test of the control that companies exerted over their purse seine fleets.

Preliminary reports from processors indicated that over 1,300 tons of herring averaging 9.2% mature roe were taken in the first seine opening with a few of the sets released due to marginal roe quality. With favorable results reported from the first opening, a second purse seine period (PS 2) was announced at 6:30 p.m.; a two-hour opening beginning at 8:00 p.m. The open area (from Right Hand Point to Anchor Point) would be the same as the afternoon period with additional area from Asigyukpak (Oosik) Spit to Togiak Reef added. This area showed mature roe percentages exceeding immature roe percentages in test fish samples 24 hours earlier.

Final catch reports from both purse seine openings were compiled on the morning of May 7. The harvest from the first opening exceeded 1,550 tons while the second opening exceeded 2,200 tons; this was almost two days of current processing capacity. The third 2-hour purse seine opening (PS 3) was announced the morning of May 7 to begin at 2:00 p.m. in the same areas as the previous period. In a subsequent afternoon announcement, the period was delayed until 4:00 p.m. to give processors more time to process a portion of the herring taken the previous day. The third purse seine opening resulted in a harvest of over 1,550 tons of herring averaging 9.6% mature roe.

By the morning of May 8, with over 5,000 tons of purse seine herring taken and approximately 1,300 tons of gillnet herring taken, the allocation percentages between gear types was not as specified in the Bristol Bay Herring Management Plan, 70% purse seine, 30% gillnet. Purse seine percentage was 81% while gillnet was 19%. Additional gillnet fishing time was warranted while postponement of the next purse seine opening was planned. In a 6:30 p.m. announcement, the next purse seine opening (PS 4) was announced from 8:00 to 10:00 p.m. between Cape Newenham and Togiak Reef.

Final harvest reports from processors on the morning of May 9 indicated a purse seine catch of 925 tons averaging 9.75% mature roe. This brought the harvest percentages to 73% purse seine, 27% gillnet, much closer to the ratio specified in the management plan. Another 2-hour seine opening (PS 5) was announced beginning at 2:00 p.m. in two areas, from Cape Newenham to Togiak Reef and from Anchor Point to mid Nunavachak Bay.

With preliminary catch reports indicating a harvest of approximately 950 tons from the afternoon seine period, a second purse seine opening (PS 6) was announced to begin at 8:00 p.m., May 9 in the same

two areas. Roe quality and volume remained good in these areas and gillnet harvest had continued so that the allocation percentages were approaching the 70/30 ratio.

On the morning of May 10, catch reports indicated purse seine harvests of 950 and 600 tons from the two periods on the previous day. This brought total harvest to 8,200 tons by purse seines, 56% of the harvest guideline. Another 2-hour seine opening (PS 7) was announced beginning at 2:00 p.m. in the same areas previously opened. Preliminary reports from processors were requested by 6:30 p.m. in order to assess the potential for a second seine opening that evening. Reported harvest was only 325 tons averaging just over 8% mature roe; a high percentage of the sets made were released due to immature roe. The Department also received reports that companies were directing permit holders to release partially pumped sets. A warning to companies and permit holders that any dead loss associated with this activity would be prosecuted was included in the next announcement. Another 2-hour purse seine period (PS 8) was scheduled for 8:00 p.m. in the same open areas.

When catch reports were received from companies on the morning of May 11, less than a thousand tons had been taken in the two seine openings the previous day. A 2-hour opening (PS 9) was announced beginning at 12:00 noon. Approximately 1,000 tons of herring averaging 9% mature roe were taken in the afternoon opening. With a little more volume showing up towards the end of the period, another 2 hour opening (PS 10) was announced for 7:00 p.m. that evening. The open area was the same, Cape Newenham to Togiak Reef and Anchor Point to mid-Nunavachak Bay.

Reports of companies pumping partial sets and refusing to buy the remainder of the set continued to make waste an issue, and warnings regarding prosecution for waste were included in several announcements. Catch reports the morning of May 12 indicated that the harvest from the previous afternoon's seine opening was 960 tons with an average mature roe percentage of 8.9%, while the evening period resulted in a harvest of 1,970 tons with an average mature roe percentage of 8.75%. This brought the total purse seine harvest to 11,700 tons or 80% of the harvest guideline. Harvest ratio between gear types was 70.5% purse seine, 29.5% gillnet. A 2-hour purse seine opening (PS 11) was announced beginning at 12:00 noon in the area between Cape Newenham and Togiak Reef; the area from Anchor Point to mid Nunavachak Bay was eliminated due to the presence of younger age class (Age 5 & 6) herring averaging just over 200 grams in body weight. Most companies had no market for herring with carcass size this small, since most Togiak herring are marketed for reprocessing the carcass after removal of the egg skeins. Preliminary reports were requested from processors by 4:00 p.m. to assess the potential for a second purse seine period that evening.

Reports of sets from the afternoon seine opening averaging in the mid 200-gram range were of concern to the management staff. A total harvest of 745 tons with an average roe percentage of 7.6% was reported. In the 5:00 p.m. announcement, May 12, this concern was conveyed to the fleet. If the next purse seine opening resulted in a large percentage of the harvest falling in the mid-200 gram range (Age 5 & 6 herring) in body weight, then the Department would close the fishery rather than continue harvesting recruit age class herring. Total harvest including the afternoon opening on May 12 was 12,450 tons or 85% of the harvest guideline. Another 2-hour seine opening (PS 12) was scheduled for 7:00 p.m. that evening.

Catch reports from the previous evening's opening on the morning of May 13 were more favorable regarding average weight of the herring taken. Over 800 tons with average roe maturity of 9.75% were taken; average weight was over 340 grams. With the total purse seine harvest at 13,250 tons through May 12, one additional seine opening would likely complete the harvest guideline of 14,624 tons. The final purse seine opening (PS 13) was announced beginning at 12:00 noon, also 2 hours in duration. Open area was from Cape Newenham to Togiak Reef.

By 3:30 p.m., May 13, early catch reports indicated that the harvest had exceeded the remaining 1,375 tons; in the 5:00 p.m. announcement, the fleet was advised that the purse seine fishery was closed for the 2001 season. Harvest from the final seine opening was 2,380 tons with an average mature roe percentage of 8.25% and average carcass weight of 325 grams.

In the course of the fishery, thirteen purse seine openings were allowed totaling 26 hours of fishing time. Purse seine sac roe harvest was approximately 15,627 tons with a weighted average of 9.0% mature roe. This harvest was 1,000 tons or 7% above the preseason guideline, while the overall roe percentage was below that of recent years. The purse seine harvest ultimately accounted for 70.6% of the total sac roe harvest. Approximately 70 purse seine vessels participated in the fishery.

Management of the Togiak purse seine fishery was modified in 2001 to allow the opportunity for the cooperative fleets to maximize both quality and processing capacity. This change in management strategy, including longer duration openings and larger open areas, 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. The cooperative strategy worked throughout the first 11 of the 13 purse seine periods, but began to break down as total harvest approached the guideline harvest level. Permit holders began to make sets on fish when they had no market with their own company and were heard on the radio "fishing" for a market for herring that were being held in their seine. This activity jeopardized the success of the cooperative strategy and needs more attention by Department staff and by the companies interacting with their fleets in the future.

Gillnet

Gillnet test fishing began on May 6, collecting information on roe maturity in the eastern portion of the district. The test fishery had light volume but samples averaged 9.1% mature roe; a 4-hour commercial gillnet opening (GN 1) was held in the area from Right Hand Point to the Kulukak Bluffs on the evening of May 6. The opening began at 7:30 p.m. and approximately 100 vessels participated. The harvest from this period was light with only 170 tons of 10.8% mature roe herring harvested. Aerial survey results from May 6 did not indicate that there was an appreciable increase in biomass, although 16 miles of spawn was observed under poor survey conditions.

Another gillnet test fishery was started on the morning of May 7 in the area from Right Hand Point east to Kulukak Bluffs. Since the test fishery indicated a light volume of herring was available to the fleet, the area was expanded to include area west of Right Hand Point. Test fishing samples averaged 9.6% mature roe; consequently a 4-hour opening (GN 2) was announced. The legal amount of gear per boat was doubled to allow 100 fathoms of gear to be fished. On an aerial survey, Department staff counted 143 gillnet vessels participating in the fishery and observed additional biomass moving into the Kulukak Bay and Eagle Bay areas. Processors reported that mid-period samples continued to be of marketable quality; a 4-hour extension to the gillnet period in progress was announced. With sac roe quality remaining high and catch rates acceptable, a second extension of 2 hours was given, allowing fishing until 12:00 midnight, May 7.

Catch reports from both gear groups the morning of May 8 indicated that 82% of the herring harvest to date was by purse seines and 18% by gillnets. Bearing in mind the mandated allocation percentages of 70/30, another 8-hour gillnet period (GN 3) was announced for the fleet beginning at 12:00 noon with 100 fathoms of gear. The area was expanded from the west entrance of Nunavachak Bay to the western shore of Kulukak Bay. Reports indicated that roe quality during the opening was good and a 4-hour extension was announced. By the afternoon of May 8, some companies were reporting that they would not buy again until they were able to get product offloaded and processed.

Catch reports the morning of May 9 indicated that the 12-hour gillnet opening resulted in a harvest of 1,180 tons at 10.3% mature roe, which brought the season total for the gillnet fleet to 2,460 tons. The total preliminary harvest for both gear groups as of May 9 was 9,040 tons. The current harvest percentages were 73% purse seine and 27% for gillnet. Another 8-hour gillnet period (GN 4) was announced beginning at noon, within the area from the 160° W. longitude line where it intersects the north shore of Nunavachak Bay to the western shore of Kulukak Bay. Again, the use of 100 fathoms of gear was allowed. With the quality remaining acceptable, and the need to keep the gear group ratio balanced, a 4-hour extension was given allowing the gillnet fleet to continue fishing until midnight.

Verbal catch reports on the morning of May 10 indicated that the gillnet opening from May 9 resulted in a harvest of 1,053 tons at 9.9% mature roe. The total gillnet harvest to that point was 3, 515 tons. The total preliminary harvest totaled 11,729 tons with the purse seine harvest contributing 8,214 tons. The current harvest percentages were 70% seine gear and 30% gillnet gear. With approximately 2,700 tons remaining on the gillnet allocation, fishing continued.

An 8-hour gillnet opening (GN 5) was allowed from 1:00 p.m. until 9:00 p.m. on May 10 with the area and gear the same. The gillnet fleet continued to catch high quality herring during this period, which was extended for 4 hours, until 1:00 a.m. on May 11.

When verbal catch reports were completed for the fifth gillnet opening, the harvest totaled 573 tons of 10.5% average mature roe. It was apparent that the volume of herring available to the fleet had decreased considerably. This also was true for the purse seine fleet where younger age classes of fish were reported in the catch.

The Department announced further fishing for the gillnet fleet on May 11. The fleet was given 8 hours (GN 6) in the same area with 100 fathoms of gear. Again, with commercially acceptable fish present, this period was extended for 4 hours. Processors reported catches on May 12. The gillnet harvest from the sixth opening was 869 tons. This brought the gillnet harvest for the season to 4,892 tons. The gear allocation percentages were 70.5% purse seine and 29.5% gillnet.

Since the gear groups were still closely balanced, and fish were still available to both gear groups, another opening (GN 7), 9 hours in duration, was announced for the same area with 100 fathoms of gear. As fishing progressed, reports were received from the seine fleet that smaller fish were becoming more abundant. Catches from the gillnet fishery were light in some areas, probably due to smaller younger fish as well as poor conditions that prevented some of the fleet from fishing. As the wind decreased in the area, more permit holders resumed fishing. The gillnet period in progress was extended for 4 hours until 12:00 midnight, May 12.

After totaling catches reported on the morning of May 13, it was apparent the entire quota had not been caught. Managers felt that another gillnet period would be appropriate to attempt to harvest the remaining guideline harvest. A 9-hour period (GN 8) was announced beginning at 11:00 a.m. on May 13. As the weather improved during the day, a new wave of fish started moving into the district. Catches were reported to the Department during the opening, catch rates were steady and sac roe quality was good. Managers decided that with increased volume of fish showing on the grounds, it was likely that the preseason harvest guideline would be reached. The gillnet fleet was told that there would not be an extension and that fishing for the season would close at 8:00 p.m. on May 13.

A total of 9 companies purchased herring from the gillnet fleet, which fished a total of 84 hours in the Togiak District during the 2001 season. The final season harvest totaled 6,508 tons with a weighted average of 10.6% mature roe. This was above the five-year average of 5,655 tons as expected since the Board of Fisheries increased the allocation percentage for the gillnet gear group to 30% of the total Togiak sac roe allocation. The 2001 gillnet harvest comprised 29.4% of the sac roe harvest.

Spawn on kelp

There was no spawn-on-kelp fishery in 2001. There were no processors registered to purchase spawn-on-kelp product.

Exploitation

The 2001 herring fisheries were managed not to exceed a maximum exploitation rate of 20% of the inseason observed peak biomass. Combining the sac roe harvest (22,135 tons), testfish harvest (310 tons) and the Dutch Harbor food and bait fishery (1,439 tons plus 192 tons in test fishery) resulted in an exploitation of 24,076 tons. Based on the preseason forecasted biomass of 119,818 tons, the 2001 exploitation was calculated at 20.1%.

Exvessel value

The ex-vessel value of the 2001 Togiak herring fishery was approximately $2.6 million. The value does not include any post-season adjustments to fishermen from processors and should therefore be considered a minimum. The 2001 ex-vessel value was about one-third of the average value from 1996-2000, and was the lowest since 1995. This value is for the sac roe fishery only; there was no spawn on kelp fishery. Prices paid for sac roe herring in 2001 were low relative to previous years; base prices ranged from $100 to $135 per ton for 10% mature roe.

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, 2001.[a]

Date	Start Time	Survey Rating[b]	Miles of Spawn	Estimated Biomass by Index Area[c]													Daily Total
				NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CN	HAG	WAL	
17-Apr	16:25	3.9															
22-Apr	13:45	2.0															
24-Apr	13:35	3.0															
26-Apr	13:10	2.1			23	34			321	170	8				83		638
27-Apr	13:00	1.3			434				354	184					41		1,013
28-Apr	12:05	2.4				9	6		209	11					2		236
29-Apr	13:00	2.2			3	104			6	5							118
1-May	13:20	3.9	1					639		8							647
2-May	9:00	4.9															
4-May	11:30	2.7			558	27			881	76							1,542
5-May	11:50	3.0	4		690	107	1,910	1,638	381	598	1,860	835					8,020
6-May	9:35	3.0	16		2,857	235	2,297	1,068		65	2,706	1,199					10,426
7-May	16:10	2.8	10		1,806	1,122	14	252	1,995	912	865	952					7,916
8-May	8:00	2.0	7		1,212	60	132	93									1,496
8-May	14:00	1.7	9	518	3,182	1,482	215	2,828	6,773	951	1,743	738	65		260		18,755
9-May	12:00	2.6						209		3,116	165	410	2		19		3,921
10-May	13:07	3.4	3		5,136	298	498	1,349	9,234	996	26				451		17,989
11-May	12:00	1.3	0	1,050	1,409	222	456	4,747	2,850	6	49	88			653		11,529
15-May	15:15	1.5	4		3,997	20,154	18,914	2,106	5,766	7,815	2,351	2,391	3,681	70			67,244
18-May	9:40	2.6	1	1,168	3,881	3,317	334	152	1,592	956	57	1,710	117				13,283
29-May	13:25	3.0	2	2,677	3,870	13,035	169	1,732		152							21,635
Total			57													PEAK	67,244

[a] The 2001 Togiak District Pacific herring biomass was estimated at 146,209 (tons). This is the sum of:

1) A threshold biomass of 35,000 tons prior to the commercial fishery on May 6. Staff based their determination on levels of biomass observed since April 26, amount of spawn documented, and age composition of test fish samples through May 5.
2) A commercial harvest of 22,330 tons prior to the peak survey on May 15.
3) The peak biomass estimate of 67,244 tons on May 15 after the fishery.
4) A biomass estimate of 21,635 tons on May 29.

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

[c] 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.

Table 2. Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2001.

Emergency Order Number	Area[a]		Date and Time					Duration
Herring Sac Roe Gillnet								
DLG-02	Kulukak Bluffs to Right Hand Point		5/06	7:30 p.m.	to	5/06	11:30 p.m.	4 hrs.
DLG-04	Kulukak Bluffs to East Nunavachak Bay		5/07	2:00 p.m.	to	5/07	6:00 p.m.	4 hrs.
DLG-06	Kulukak Bluffs to East Nunavachak Bay	extension	5/07	6:00 p.m.	to	5/07	10:00 p.m.	4 hrs.
DLG-07	Kulukak Bluffs to Nunavachak Point	extension	5/07	10:00 p.m.	to	5/08	12:00 a.m.	2 hrs.
DLG-08	Kulukak Bluffs to East Nunavachak Bay		5/08	12:00 p.m.	to	5/08	8:00 p.m.	8 hrs.
DLG-09	Kulukak Bluffs to East Nunavachak Bay	extension	5/08	8:00 p.m.	to	5/09	12:00 a.m.	4 hrs.
DLG-11	Kulukak Bluffs to East Nunavachak Bay		5/09	12:00 p.m.	to	5/09	8:00 p.m.	8 hrs.
DLG-13	Kulukak Bluffs to East Nunavachak Bay	extension	5/09	8:00 p.m.	to	5/10	12:00 a.m.	4 hrs.
DLG-15	Kulukak Bluffs to East Nunavachak Bay		5/10	1:00 p.m.	to	5/10	9:00 p.m.	8 hrs.
DLG-17	Kulukak Bluffs to East Nunavachak Bay	extension	5/10	9:00 p.m.	to	5/11	1:00 a.m.	4 hrs.
DLG-19	Kulukak Bluffs to East Nunavachak Bay		5/11	12:00 p.m.	to	5/11	8:00 p.m.	8 hrs.
DLG-21	Kulukak Bluffs to East Nunavachak Bay	extension	5/11	8:00 p.m.	to	5/11	12:00 a.m.	4 hrs.
DLG-23	Kulukak Bluffs to East Nunavachak Bay		5/12	11:00 a.m.	to	5/12	8:00 p.m.	9 hrs.
DLG-25	Kulukak Bluffs to East Nunavachak Bay	extension	5/12	8:00 p.m.	to	5/13	12:00 p.m.	4 hrs.
DLG-27	Kulukak Bluffs to East Nunavachak Bay		5/13	11:00 a.m.	to	5/13	8:00 p.m.	9 hrs.
Herring Sac Roe Purse Seine								
DLG-01	Right Hand Point to Anchor Point		5/06	2:00 p.m.	to	5/06	4:00 p.m.	2 hrs.
DLG-03	Right Hand Point to Oosik Spit		5/06	8:00 p.m.	to	5/06	10:00 p.m.	2 hrs.
DLG-05	West Nunavachak Bay to Oosik Spit		5/07	4:00 p.m.	to	5/07	6:00 p.m.	2 hrs.
DLG-10	Togiak Reef to Oosik Spit		5/08	8:00 p.m.	to	5/08	10:00 p.m.	2 hrs.
DLG-12	West Nunavachak Bay to Oosik Spit		5/09	2:00 p.m.	to	5/09	4:00 p.m.	2 hrs.
DLG-14	West Nunavachak Bay to Oosik Spit		5/09	8:00 p.m.	to	5/09	10:00 p.m.	2 hrs.
DLG-16	West Nunavachak Bay to Cape Newenham		5/10	2:00 p.m.	to	5/10	4:00 p.m.	2 hrs.
DLG-18	West Nunavachak Bay to Cape Newenham		5/10	8:00 p.m.	to	5/10	10:00 p.m.	2 hrs.
DLG-20	West Nunavachak Bay to Cape Newenham		5/11	12:00 p.m.	to	5/11	2:00 p.m.	2 hrs.
DLG-22	West Nunavachak Bay to Cape Newenham		5/11	7:00 p.m.	to	5/11	9:00 p.m.	2 hrs.
DLG-24	West Nunavachak Bay to Cape Newenham		5/12	12:00 p.m.	to	5/12	2:00 p.m.	2 hrs.
DLG-26	West Nunavachak Bay to Cape Newenham		5/12	7:00 p.m.	to	5/12	9:00 p.m.	2 hrs.
DLG-28	West Nunavachak Bay to Cape Newenham		5/13	12:00 p.m.	to	5/13	2:00 p.m.	2 hrs.
Herring Spawn on Kelp[b]								

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

[b] No spawn on kelp fishery due to poor market conditions.

Table 3. Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 2001.

Date	Duration	Periods	Kulukak	Nunavachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham	Total	Total Roe %
					Purse Seine					
6-May	4:00	1,2		3365 (9.16)	38 (7.7)	256 (9.31)			3,660	(9.16)
7-May	2:00	3		72 (8.94)	393 (9.5)	1071 (9.59)			1,537	(9.54)
8-May	2:00	4				879 (9.9) [a]	119 (8.53)		997	(9.78)
9-May	4:00	5,6		31 (8.4)	95 (8.12)	764 (8.4)	590 (8.59)		1,480	(8.46)
10-May	4:00	7,8		20 (8.4)	72 (6.45)	420 (8.53)	547 (8.29)		1,058	(8.26)
11-May	4:00	9,10		146 (7.0)	80 (7.8)	1,827 (8.91) [b]	516 (9.18)	280 (8.37)	2,849	(8.78)
12-May	4:00	11,12				1,374 (8.99)			1,374	(8.99)
13-May	2:00	13				2,556 (8.55) [a,c]	220 (5.0)	70 [d]	2,846	(8.21)
16-May						49 (10.07) [a]			49	
Subtotal	26:00			3,634 (9.05)	678 (8.68)	9,195 (8.96)	1,991 (9.0)	351 (8.37)	15,849	(9.2)
					Gillnet					
6-May	4:00	1	167 (10.94)						167	(10.94)
7-May	10:00	2	1,144 (11.05)						1,144	(11.05)
8-May	12:00	3	1,193 (10.73)						1,193	(10.73)
9-May	12:00	4	1,175 (9.97)						1,175	(9.97)
10-May	12:00	5	504 (10.53)						504	(10.53)
11-May	12:00	6	1,045 (10.26						1,045	(10.26
12-May	13:00	7	83 (10.31)						83	(10.31)
13-May	9:00	8	1,169 (11.23)						1,169	(11.23)
Subtotal	84:00		6,481 (10.64)						6,481	(10.64)
					Combined					
6-May			167 (10.94)	3,365 (9.16)	38 (7.7)	256.3 (9.31)			3,827	(9.23)
7-May			1,144 (11.05)	72 (8.94)	393 (9.5)	1,071 (9.59)			2,681	(10.18)
8-May			1,193 (10.73)			879 (9.9) [a]	119 (8.53)		2,191	(10.28)
9-May			1,175 (9.97)	31 (8.4)	95 (8.12)	764 (8.4)	590 (8.59)		2,655	(9.13)
10-May			504 (10.53)	20 (8.4)	72 (6.45)	420 (8.53)	547 (8.29)		1,562	(8.99)
11-May			1,045 (10.26)	146 (7.0)	80 (7.8)	1,827 (8.91) [b]	516 (9.18)	280 (8.37)	3,894	(9.18)
12-May			83 (10.31)			1,374 (8.99)			1,456	(9.07)
13-May			1,169 (11.23)			2,556 (8.55) [a,c]	220 (5.0)	70 [d]	4,016	(9.9)
16-May						49 (10.07)			49	(10.07)
Total			6,481 (10.64)	3,634 (9.05)	678 (8.68)	9,195 (8.98)	1,991 (9.0)	351 (8.37)	22,330	(9.39)

[a] Includes test fish harvest which is conducted during closed commercial periods.
[b] Includes 8 tons of documented deadloss.
[c] Includes 140.6 tons documented deadloss.
[d] 70.3 tons of documented waste.

Table 4. Herring total run and commercial catch by year class, Togiak District, 2001[a]

Year Class	Age	Total Run (tons)	Total Run %	Harvest (tons)	Harvest %	Escapement (tons)	Escapement %
1983	18	6	0.0%	6	0.0%	0	0.0%
1984	17	31	0.0%	31	0.1%	0	0.0%
1985	16	288	0.2%	55	0.2%	233	0.2%
1986	15	440	0.3%	173	0.8%	267	0.2%
1987	14	3,252	2.2%	726	3.3%	2,526	2.0%
1988	13	6,882	4.7%	1,189	5.3%	5,693	4.6%
1989	12	9,756	6.7%	1,746	7.8%	8,010	6.5%
1990	11	9,934	6.8%	1,823	8.2%	8,111	6.5%
1991	10	13,999	9.6%	3,230	14.5%	10,769	8.7%
1992	9	12,092	8.3%	2,472	11.1%	9,620	7.8%
1993	8	40,045	27.4%	7,719	34.6%	32,326	26.1%
1994	7	5,592	3.8%	796	3.6%	4,796	3.9%
1995	6	6,770	4.6%	583	2.6%	6,187	5.0%
1996	5	30,217	20.7%	1,566	7.0%	28,651	23.1%
1997	4	6,905	4.7%	215	1.0%	6,690	5.4%
1998	3	0	0.0%	0	0.0%	0	0.0%
1999	2	0	0.0%	0	0.0%	0	0.0%
Total		146,209	100%	22,330	100%	123,879	100%

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

Table 5. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2001.[a]

	Operator/Buyer	Base of Operation	Product Purchased: Sac Roe: Gillnet	Product Purchased: Sac Roe: Purse Seine	Product Purchased: Spawn-on-Kelp[b]
1	Flagship Fisheries, Ltd.	S/P Naknek	X	X	
2	Icicle Seafood, Inc.	P/V Arctic Star	X	X	
3	Leader Creek Fisheries	S/P Naknek		X	
4	Norquest Seafoods, Inc.	P/V Aleutian Falcon/Pribilof	X	X	
5	Ocean Beauty Seafoods, Inc.	S/P Naknek	X	X	
6	Peter Pan Seafoods, Inc.	P/V Steller Sea	X	X	
7	Snopac Products, Inc.	P/V Snopac	X	X	
8	Trident Seafoods	P/V Alaska Packer	X	X	
9	Wards Cove Packing	S/P Ekuk	X	X	
10	Woodbine	S/P Egegik	X	X	
11	Y.A.K. Inc.	S/P Togiak		X	

[a] Operators that registered in the Togiak District.

[b] No spawn on kelp buyers due to poor market conditions.

Appendix

Tables

Appendix Table 1. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1979-2001.

Year	Companies	Daily Processing Capacity[a]	Fishery Dates	Gillnet					Purse Seine					Total Harvest
				Effort[b]	Duration (hrs.)	Harvest[c]	C.P.U.E.	Roe%[a]	Effort[b]	Duration (hrs.)	Harvest[c]	C.P.U.E.	Roe%[a]	
1979	33		5/1-6/1	350	768.0	4,459	0.0	8.6	175	696.0	6,667	0.1	8.6	11,126
1980	27		4/25-5/16	363	384.0	4,150	0.0	8.0-11.0	140	384.0	20,366	0.4	8.0-11.0	24,516
1981[e]	28		5/2-5/16	106	101.0	2,338	0.2	6.7	83	101.0	10,151	1.2	10.1	12,489
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
1979-00 Ave.	20	3,302		245	91	4,685	1	9.3	185	62	15,298	29	9.5	19,451
1994-00 Ave.	16	3,382		249	41.8	6,105	1	11.6	186	9	17,960	17	10	24,066
2001	11	2,255	5/6-5/13	96	84	6,481	0.80	10.64	64	26	15,320	9.21	9.2	21,801

[a] Number of tons per day based on companies registered.
[b] Peak aerial survey count.
[e] Fishery managed by emergency order from 1981 to present.

Appendix Table 2. Exploitation of Togiak herring stock, 1980-2001.

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		
1980	68,686			4,150	20,366		24,516	24,516	35.7%
1981	158,650			2,338	10,151		12,489	12,489	7.9%
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%
1980-00 Ave.	132,475	1,183	2,128	4,697	15,673		20,370	23,681	18.6%
1994-00 Ave.	146,158	805	2,242	6,108	17,854		23,962	27,009	17.8%
2001	119,818	0	1439	6,481	15,630 [b]	219	22,330	23,769	19.8%

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

[b] Includes 310 tons testfish harvest.

Appendix Table 3. Age composition of inshore herring, Togiak District, 1978-2001.

Year	Age Composition (%)[a] 3 [f]	4	5	6	7	8	9 +	Total [b] Run (tons)
1978		47	36	11	1	3	2	190,292
1979	1	4	48	31	13	1	2	239,022
1980	8	5	1	37	35	12	2	68,686
1981	1	50	7	1	22	14	5	158,650
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				6	11	3	80	88,105 [g]
1991		7	1	1	16	18	57	83,329
1992		10	20	1	1	15	53	156,955 [c]
1993			6	23	1	1	67	193,847 [d]
1994			2	12	28	3	55	185,454 [d]
1995		1	4	7	24	30	35	[e]
1996		[d]	3	5	7	21	64	[e]
1997		7	5	12	11	10	55	144,887 [c]
1998		[d]	4	5	10	11	70	[e]
1999		[c]	[d]	1	12	9	66	157,026 [h]
2000		[c]	1	1	2	17	63	[e]
2001		5	21	5	4	27	39	146,209

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

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

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

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

[g] Contributions of age groups 3, 4 and 5 are less than 5% each.

[h] The previous 1999 total run biomass estimate of 188,264 was reduced to 157,026. This determination was based on review of historical revised biomass estimates and reduced actual returns in subsequent years. The 1999 revised estimate of 157,026 is the sum of:

1) The revised peak biomass estimate of 124,946 on May 17. Staff determined that the original peak estimate of 157,026 was high and attributable to observer bias. The estimate was reduced by 20%.

2) Biomass estimate of 32,080 observed on May 23.

Appendix Table 4. Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1979-2001.

Year	Companies	Fishery Dates	Hours	Effort[a]	Area	Total Harvest in pounds	Herring Equivalent (in tons)	Openings	Average roe %
1979	16	5/4-5/23		100	Togiak District	414,727			0.1
1980[b]	21	5/2-5/13		78	K 3 - K10	189,662			9.2
1981	7	5/5-5/13		108	K 3 - K 9	378,207			9.1
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[c]	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							
1989-98 Ave.	5		6.9	309		392,660	1,558	2	9.6
1994-98 Ave.	3		11.5	173		385,654	1,500	2	10.0
2001	no fishery due to poor market conditions								

[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 in December, 1979 designating 10 kelp areas, and requiring emergency order closure when 10% of the standing biomass of kelp was harvested.

[c] 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, 1979-2001.

Year	Preseason Forecast[a]	Biomass Estimate	Spawn Estimates	
			Observations	Miles
1979		239,022	52	22
1980		68,686	64	24
1981		158,650	106	40
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	[b]149,093	70	59
1996	135,585	[b]135,585	99	73
1997	125,000	144,887	79	59
1998	121,000	[b]121,000	42	33
1999	90,000	156,183	33	56
2000	130,904	[b] 130,904	71	46
1979-99 Average	99,083	214,657	107	56
1994-99 Average	127,726	162,175	68	57
2001	119,818	[b] 119,818	100	57

[a] 1993-2000 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.

Appendix Table 6. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1980-2001.[a]

Year	Herring		Spawn-on-Kelp	Total
	Sac Roe	Food/Bait		
1980	3,055	150	95	3,300
1981	3,988	1	250	4,239
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
1979-99 Average	7,914	26	283	8,169
1994-99 Average	8,386	1	350	8,586
2001	3,090	0	[b]	3,090

[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, 1984-2001.

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]	
Average	5,354	4,934	-7%	16,062	15,535	1%	350,000	390,978	12%
2001	6,268	6,481	3%	14,624	15,849 [d]	8%	350,000	[c]	

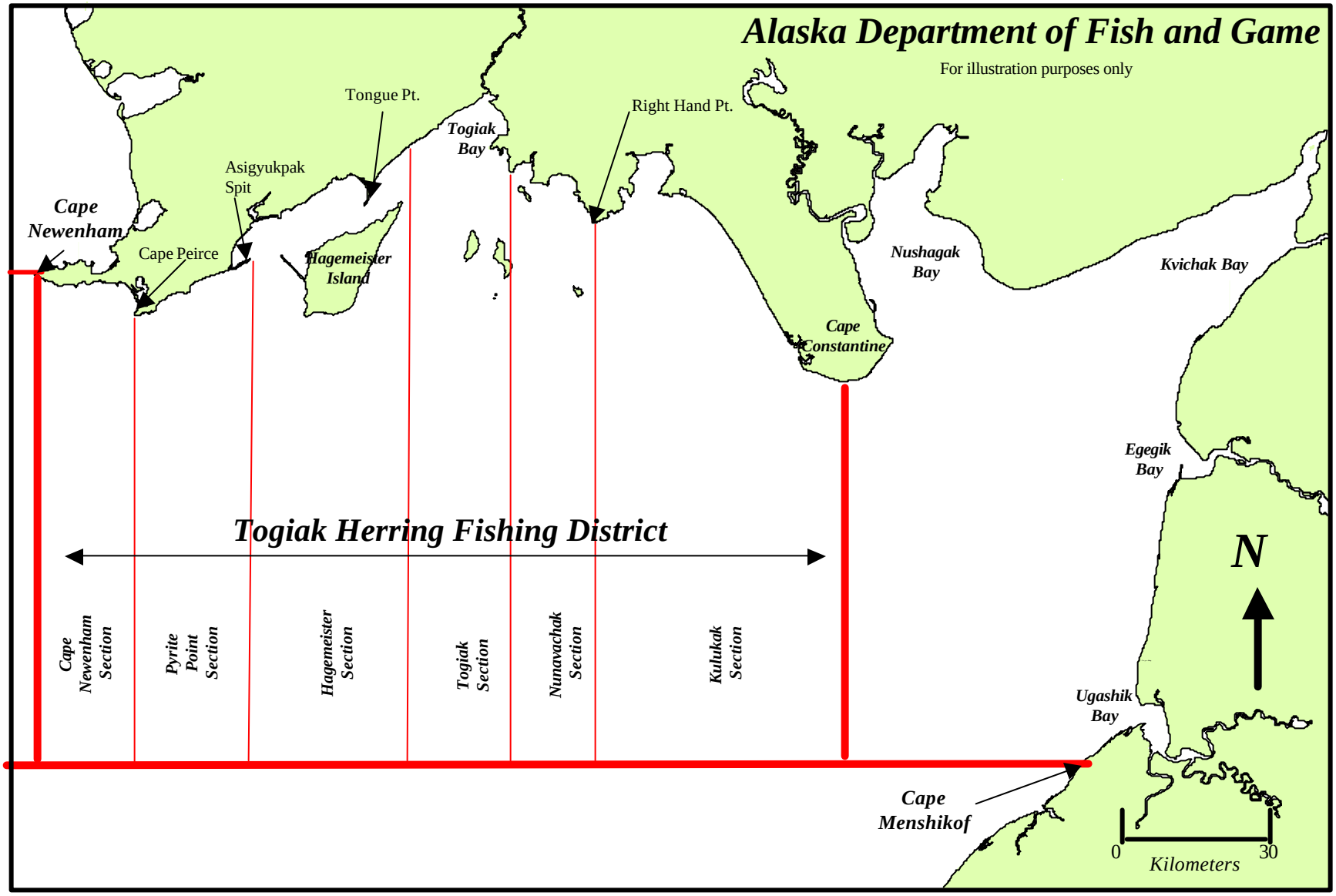
[a] Harvest guideline derived from inseason biomass estimate when available, or preseason forecast when weather precluded an inseason estimate.

[b] Actual minus guideline divided by guideline.

[c] No fishery conducted

[d] Includes testfish harvest of 310 tons and documented waste of 219 tons.

Figures



Revised 3/99

Figure 1. Togiak Herring District, Bristol Bay.

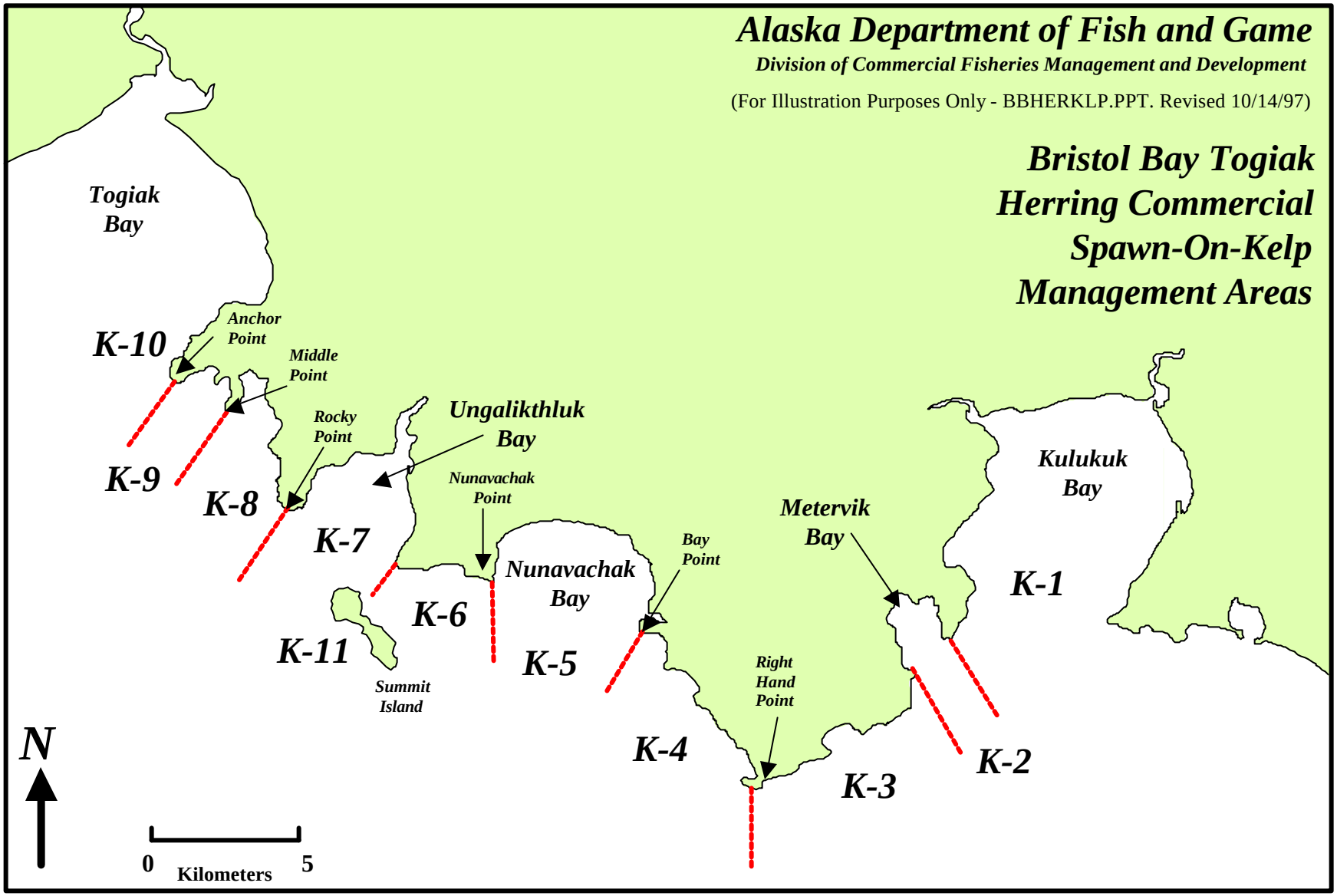


Figure 2. Spawn-on-kelp management areas (K-1 through K11), Togiak District, Bristol Bay.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington, VA 22203; or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 907-465-3646, or (FAX) 907-465-2440