

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
ANNUAL MANAGEMENT REPORT

-2003-

BRISTOL BAY AREA



Regional Information Report¹ No. 2A04-16

STAFF

Egegik/Ugashik Area Management Biologist.....Keith A. Weiland
Naknek River Area Management Biologist..... Slim Morstad
Nushagak Area Management Biologist..... Tim Sands
Togiak Area Management Biologist..... Charlotte Higgins

Research Project Leader..... Lowell Fair
Research Biologist (East Side)..... Drew Crawford
Research Biologist (East Side)..... Fred West
Research Biologist (West Side)..... Lee McKinley

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

April, 2004

¹Contribution 2A04-16 from the Anchorage Regional office. The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information reports in this series may contain preliminary data.

DISTRIBUTION LIST

No. Copies

Commercial Fisheries Division

Central Region:

Regional Staff:	3
Regnard, Browning, Edmundson	3
Bristol Bay Area Management Staff:	5
Morstad, Sands, Weiland, Higgins, Brito, Klutsch	5
Bristol Bay Area Research Staff:	2
Fair, West,	2
Other Central Region Areas:	2
Hammstrom, Fox	2

Westward Region:

Kodiak Area Management Staff	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

Anchorage Regional Supervisor (Stratten)	1
Dillingham Area Biologist (Dye)	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 (Continued)

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: Ole Mathisen)	1
University of Alaska Marine Advisory Program PO Box 1549 Dillingham, Alaska 99576	1
Dillingham Public Library	1
Bristol Bay School Library P. O. Box 169 Naknek, AK 99663	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 35

PREFACE

The 2003 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 2003. All narrative and data tabulations in this volume are combined in one section salmon followed by herring to aid in the use of this document as a reference source. The extensive set of tables has been updated to record previously unlisted data for easy reference. Fisheries data in this report supersedes information in previous reports. Corrections or comments should be directed to the King Salmon office. Attention: Editor.

Steve Morstad
Naknek/Kvichak Area Management Biologist
P.O. Box 37
King Salmon, AK 99613

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.

Permanent Employees with the Commercial Fisheries Division

West Side

Tim Sands
Charlotte Higgins
Arthur Reynolds
Karen Brito

Nushagak Biologist
Togiak Biologist
Maintenance Worker
Program Technician

East Side

Carol Klutsch
Steve Morstad

Program Technician
Naknek/Kvichak Biologist

Anchorage

Anica Estes
Tim Baker
Lowell Fair
Keith Weiland
Drew Crawford
Lee McKinley
Fredrick West
Corey Schwanke

Information Officer
Research Analyst
Research Project Leader
Egegik/Ugashik Biologist
Research Biologist
Research Biologist
Research Biologist
Research Biologist

Seasonal Employees with the Commercial Fisheries Division

West Side

Brad Palach
Katie Sechrist
Kiana Putman
Eric Barnhill
Wendy Sisson
Simon Prennace
Benjamin Fritze
Stephanie Timmerman
Matt Nevin
Joe Winter
Jeffrey Todd
Alana Shaw
Jim Maconochie
Phillip Carscallen
Daniel Costello
Shelley Schroeder
Dean Meili
Dustin Cloud
Jordan Baumgartner
Shelly Woods

Industry Liaison (Herring & Salmon)
Industry Liaison (Salmon)
Herring
Herring
Herring
Field Camp Coordinator
Supply Technician
Night Office Staff
BBEDC Intern
Wood River Tower
Wood River Tower
Wood River Tower
Igushik River Tower
Igushik River Tower
Igushik River Tower
Togiak River Tower
Togiak River Tower
Togiak River Tower
Nuyakuk River Tower (BBSRI)
Nuyakuk River Tower (BBSRI)

(continued)

ACKNOWLEDGEMENTS (Continued)

Lynnea Ford
Konrad Mittelstadt
Zachary Browning
Jeanette LeClair
Chris Cavanaugh
Lucas Hegg
Jaya Tressler
Ron Jensen
Erika Rodgers

East Side

Mary Emery
Marna McMurry
Fred Tilly
Karen Saunders
Cathy Tilly
Sally Hamm
Dan Roberts
Susan McNeil
Susan Klock
Greg Runyan
Charles Lochner
Chris Clark
Brad Russell
Dirk Middleton
Frank Komarek
Tor Christopherson
Casey Jacobs
Kiana Putman
Rob Regnart
Ryan Bill
Will Hinkley
Aaron Sandone
Robert Boyce
Haley Ohms
Ian Chang
David Hren
Chris Sewright
Kelsey Romig
Vitoon Towata
Justin Theriot

Permanent Employees with the Subsistence Division

James Fall
Ted Krieg
Molly Chythlook
Eunice Dyasuk
Dave Caylor

Nushagak River Tower (BBSRI)
Nushagak River Sonar
Nushagak District Test Fish

Office Manager
Night Office Staff
Kvichak Smolt/ Field Camp Coordinator
Fish Ticket Editor
Scale Reader
District Test Fish
District Test Fish
Herring/KvichakSmolt/Field Camp Supply
Kvichak Smolt/Naknek Tower
Kvichak River Test Fish
Kvichak River Test Fish
Kvichak River Test Fish
Egegik River Test Fish
Egegik River Test Fish
Ugashik River Test Fish
Ugashik River Test Fish
Kvichak Tower
Kvichak Tower/Herring
Kvichak Tower
Naknek Tower
Naknek Tower
Egegik Tower
Egegik Tower
Egegik Tower
Ugashik Tower
Ugashik Tower
Ugashik Tower
Cost Recovery Test Fish
Cost Recovery Test Fish
Cost Recovery Test Fish

Subsistence Resource Program Manager
Subsistence Resource Specialist
Fish & Wildlife Technician
Administrative Clerk
Analyst/Programmer

TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	ix
LIST OF FIGURES.....	xi
LIST OF APPENDICES.....	xii
INTRODUCTION.....	1
Management Area Description	1
Overview of the Bristol Bay Salmon Fisheries	2
2003 COMMERCIAL SALMON FISHERY	2
Run Strength Indicators	2
Preseason Forecasts.....	2
South Unimak and /Shumagin Island Fishery.....	3
Port Moller Test Fishery	3
Economics and Market Production.....	4
Run and Harvest Performance by Species.....	4
Season Summary by District.....	5
Naknek-Kvichak District.....	5
Egegik District.....	8
Ugashik District.....	11
Nushagak District	15
Togiak District.....	21
2003 SUBSISTENCE SALMON FISHERY	24
Regulations.....	25
Inseason Management.....	25
Permit System	26
Harvest.....	27
2003 BRISTOL BAY HERRING FISHERY	29
INTRODUCTION.....	30
Stock Assessment	31
Methods	31
Spawning Population.....	32
FISHERY OVERVIEW	32
Sac Roe Herring Fishery	32
Fishing and Industry Participation	32

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Gear Specification	33
Harvest and Management Performance	34
Spawn-on-Kelp Fishery	36
2003 SEASON SUMMARY	37
Biomass Estimation.....	37
Age Composition	38
Sac Roe Fishery.....	38
Purse Seine.....	39
Gillnet	42
Spawn-on-Kelp.....	44
Exploitation.....	45
Ex-vessel Value	45
LITERATURE CITED.....	46
TABLES.....	47
APPENDIX TABLES.....	90

LIST OF TABLES

<u>Table</u>	<u>Page</u>
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, 2003	48
2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2003	49
3. Inshore run of sockeye salmon by age class, river system and district, in thousands of fish, Bristol Bay, 2003	50
4. Inshore commercial catch and escapement of sockeye salmon, in numbers of fish, Bristol Bay, 2003	51
5. Summary of sockeye salmon test fishing indices in the Naknek/Kvichak District, by index area and date, Bristol Bay, 2003	52
6. Summary of district sockeye salmon test fishing indices in the Ugashik District, by index area and date, Bristol Bay, 2003	53
7. Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 2003	54
8. Commercial fishing emergency orders, by district and stat area, Bristol Bay, 2003	55
9. Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2003	63
10. Commercial salmon catch by date and species, in numbers of fish, Naknek/Kvichak District, Bristol Bay, 2003	64
11. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2003	65
12. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2003	67
13. Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2003	68
14. Commercial sockeye salmon fishing time and setnet harvest numbers by date and statistical area, Nushagak District, Bristol Bay, 2003	69

LIST OF TABLES (Continued)

<u>Table</u>	<u>Page</u>
15. Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2003	70
16. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 2003	71
17. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 2003	72
18. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 2003	73
19. Commercial salmon catch by date and species, in numbers of fish, Osviak Section, Bristol Bay, 2003	73
20. Commercial salmon catch by district and species, in numbers of fish, Bristol Bay, 2003	74
21. Daily sockeye salmon escapement tower counts by river system, eastside Bristol Bay, 2003 ...	75
22. Daily sockeye salmon escapement tower counts by river system, westside Bristol Bay, 2003 ..	76
23. Final daily and cumulative escapement estimate by species, Nushagak River sonar project, Bristol Bay, 2003	77
24. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2003	79
25. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Egegik River, Bristol Bay, 2003	80
26. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2003	81
27. Commercial salmon processors and buyers operating in Bristol Bay, 2003	82
28. Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2003	83
29. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2003	84

LIST OF TABLES (Continued)

<u>Table</u>	<u>Page</u>
30. Daily observed estimates (tons) of herring by index area, Togiak District, 2003	85
31. Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2003.....	86
32. Commercial herring harvest (tons) by fishing section and gear type, and fishing period, Togiak District, 2003	87
33. Preliminary herring total run and commercial catch by year class, Togiak District, 2003	88
34. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2003.....	89

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1. Bristol Bay Area Commercial Fisheries Salmon Management Districts.....	1
2. Togiak Herring District, Bristol Bay	30
3. Spawn-on-kelp management areas (K-1 through K-11), Togiak District, Bristol Bay.....	36
4. Number of purse seine sets made annually 1996-2003.....	42

LIST OF APPENDICES

<u>Appendix Table</u>	<u>Page</u>
1. Escapement goals and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 2003	91
2. Salmon entry permit registration by gear and residency, Bristol Bay, 1983-2003.....	93
3. Salmon fishing interim-use and permanent entry permits, by gear type, Bristol Bay, 1983-2003	94
4. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.....	95
5. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003	96
6. Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003	97
7. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003	98
8. Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.....	99
9. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.....	100
10. Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1983-2003	101
11. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1983-2003	102
12. Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1983- 2003	103
13. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1983- 2003	104
14. Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, in numbers of fish, Bristol Bay, 1983- 2003.....	105
15. Inshore commercial catch and escapement of sockeye salmon in the Ugashik District by river system, in numbers of fish, Bristol Bay, 1983- 2003.....	106
16. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1983- 2003.....	107

LIST OF APPENDICES (Continued)

<u>Appendix Table</u>	<u>Page</u>
17. Inshore sockeye salmon total run by river system, in thousands of fish and percent, Nushagak District, Bristol Bay, 1983-2003	108
18. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1983- 2003	109
19. Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1983-2003 ..	110
20. Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1983-2003	111
21. Chinook salmon harvest, escapement and total runs in the Togiak District, in numbers of fish, Bristol Bay, 1983-2003	112
22. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, Bristol Bay, 1983-2003	113
23. Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1958-2002	114
24. Coho salmon harvest, escapement and total runs in the Nushagak drainage, in numbers of fish, Bristol Bay, 1983-2003	115
25. Coho salmon harvest by fishery, escapement and total runs for the Togiak River, in numbers of fish, Bristol Bay, 1983-2003	116
26. Average round weights (lbs) of the commercial salmon catch by species, Bristol Bay, 1983-2003	117
27. Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1983-2003	118
28. Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1983-2003	119
29. South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1983-2003	120
30. Subsistence salmon harvest by district and species, Bristol Bay, 1983-2003	121
31. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1983-2003	124

LIST OF APPENDICES (Continued)

<u>Appendix Table</u>	<u>Page</u>
32. Subsistence salmon harvest by community, in numbers of fish, Nushagak District, Bristol Bay, 1983-2003.....	125
33. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1983-2003	126
34. Exploitation (tons) of Togiak herring, 1983-2003.....	127
35. Age composition of the inshore herring run, Togiak District, 1983-2003	128
36. Herring spawn on kelp industry participation, fishing effort, area and harvest, Togiak District, 1983-2003.....	129
37. Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1983-2003	130
38. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1983-2003	131
39. Guidelines and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984-2003.....	132

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.

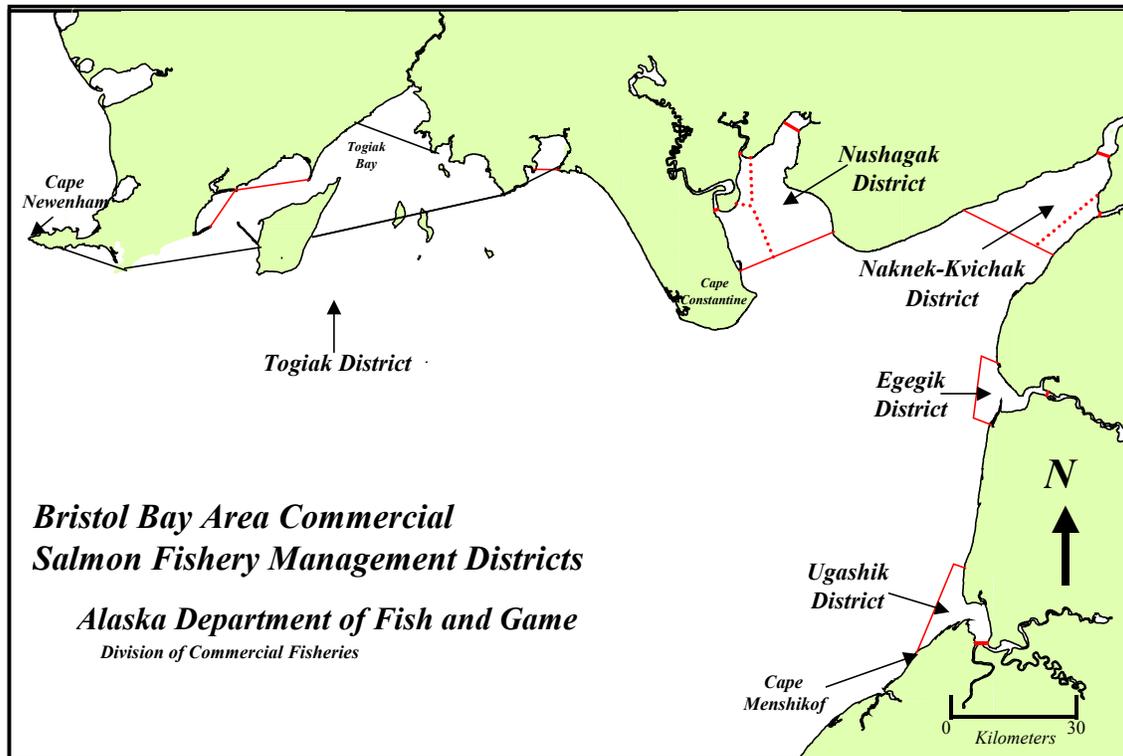


Figure 1. Bristol Bay area commercial fisheries salmon management districts.

Overview of the Bristol Bay Salmon Fisheries

The five species of Pacific salmon found in Bristol Bay are the focus of major commercial, subsistence and sport fisheries. Annual commercial catches (1983-2002) average nearly 25 million sockeye salmon, 84 thousand chinook, 1.0 million chum, 137 thousand coho, and 600 thousand (even-years only) pink salmon (Appendix Tables 4-8). Since 1983, the value of the commercial salmon harvest in Bristol Bay has averaged \$125 million, with sockeye salmon being the most valuable, worth an average \$122 million (Appendix Table 28). Subsistence catches average approximately 123 thousand salmon and comprised primarily of sockeye salmon (Appendix Table 30). Sport fisheries harvest all species of salmon, with most effort directed toward chinook and coho stocks. Approximately 45 thousand salmon are harvested annually by sportfishermen in Bristol Bay.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks with harvests directed at terminal areas around the mouths of major river systems. Each stock is managed to achieve a spawning escapement goal based on maximum sustained yield. Escapement goals are achieved by regulating fishing time and area by emergency order and/or adjusting weekly fishing schedules. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. Drift gillnet permits are the most numerous at 1,900 in Area T, of those 1,389 fished in 2003. There are a total of 1,040 setnet permits in Area T, of those 714 made deliveries in 2003, (Appendix Table 2 and 3).

2003 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 2003 was forecasted to be slightly more than 24.0 million (Table 1). The bay sockeye harvest was predicted to reach approximately 16.8 million fish. Runs were expected to exceed spawning escapement goals for all river systems in Bristol Bay.

The 2003 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) (Table 2). Predictions for each age class returning to

a river system were calculated by averaging results from simple linear regression models based on the relationship between adult returns and spawners or siblings from previous years. Also, regression models based on the relationship between returns and smolt were examined for Kvichak, Egegik and Ugashik Rivers. Adult escapement and return data from brood years 1972-1989 were used for all models. Results from a regression model were excluded from final forecast calculations if the slope of the line was not significantly different from zero ($R < 0.25$). Mean squared error (MSE) of the total run forecast was calculated using deviations of actual runs from published run predictions made from 1991 to 2002. Run predictions for the period 1993 to 2002 were based on similar methods used for the 2003 forecast. MSE was used to estimate the standard error and 80% confidence bounds of the total run forecast.

South Unimak/Shumagin Island Fishery

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

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

Preliminary catch information for 2003 indicates that the Shumagin Island fishery landed 117,000 sockeye, and the South Unimak fishery landed 336,000 sockeye (Appendix Table 29).

Port Moller Test Fishery

For many years the Department of Fish and Game ran a test fish program out of the community of Port Moller. A large vessel would fish specific loran stations on transect lines across the migration path of sockeye returning to Bristol Bay. Data collected was used to estimate run strength, timing, age, and size

composition. Though the performance was not always good, the project was very popular with salmon processors as it gave an additional indication of run size, which influenced production capacity and the price paid to fishermen. The project was cut by ADF&G in 1986 and through voluntary funding from the industry, the Port Moller test fish project was resumed and has been operated by staff from the Fisheries Research Institute (FRI), University of Washington since 1987. Information concerning the project is shared with the department on a daily basis inseason and analyzed by the Commercial Fisheries research staff.

Economics and Market Production

In 2003, the exvessel value of the commercial salmon inshore harvest was estimated at \$47.7 million. The 1993 to 2002 average exvessel value of Bristol Bay commercial salmon fisheries is about \$101 million (Appendix Table 28).

During the 2003 season, 8 companies canned, 20 companies froze and 3 companies cured salmon in Bristol Bay. In addition, 13 companies exported fresh fish by air (Table 27). A total of 24 processors/buyers reported catches from Bristol Bay in 2003.

Run and Harvest Performance by Species

The combined commercial salmon harvest in Bristol Bay totaled 15.8 million fish in 2003. This was better than half the 20-year average of 26.2 million salmon (Appendix Table 9) for Bristol Bay.

Sockeye Salmon

The 2003 inshore sockeye return of 26.4 million fish exceeded slightly the preseason forecast of 24.1 million (Table 1). Actual runs were above forecast for all but Egegik and Ugashik Districts.

Sockeye salmon dominated the inshore commercial harvest, and totaled 14.7 million fish (Tables 1 and 4). Sockeye escapement goals were met or exceeded in all systems but the Kvichak River where spawning requirements have been defined. The most spectacular return in 2003 was the Alagnak River where nearly 3.7 million sockeye past the tower, shattering the previous record set in 1960 when 1.24 million sockeye past the tower.

Chinook Salmon

Chinook salmon harvests in 2003 were below the recent 20-year averages in all districts (Appendix Table 5). The 2003 bay-wide commercial harvest of 47,000 chinook was well below the 20-year average of 83,700.

Chum Salmon

In 2003, the inshore commercial harvest of 940,000 chum salmon was the second highest in the past 10-years just below the 20-year average of 1.0 million (Appendix Table 6). Chum salmon catches were above average in all but the Naknek/Kvichak and Egegik Districts.

Pink Salmon

Pink salmon are a even year run to Bristol Bay only incidental harvest occur (Appendix Table 7).

Coho Salmon

The 2003 bay-wide commercial harvest of coho salmon totaled 43,000, which was below the recent 20-year average of 140,000 (Appendix Table 8). Effort for coho salmon was low indicating a poor return when in fact, all indications suggest an average to above average return in 2003 for all districts.

SEASON SUMMARY BY DISTRICT

Naknek/Kvichak District

The forecast for the Naknek/Kvichak District for 2003 projected a total run of 7.3 million sockeye, 3.3 million for escapement and 4.0-million to harvest (Table 1). The forecast by river system was 2.6 million to the Kvichak River, 800 thousand expected to return to the Alagnak River and 3.9 million for the Naknek River. The escapement goals for these river systems are: minimum 2.0 million for the Kvichak River, 185 thousand for the Alagnak River and a range of 800 thousand to 1.4 million for the Naknek River. The actual total inshore return for 2003 was just over 10.5 million sockeye salmon, nearly 30% above the preseason forecast. The commercial catch of just over 3.3-million sockeye occurred almost entirely within the Naknek River Special Harvest Area (NRSHA). The contribution of catch from the Kvichak and Alagnak Rivers was minimal due to the steps taken at the beginning of the season. No forecasts are made for chinook, chum or coho salmon in the Naknek/Kvichak District. The commercial harvest of chinook salmon has been declining in the district in recent years, mainly due to the current mesh size restrictions that have been implemented since the mid-90's. Mesh restrictions are set by "Emergency Order" (E.O.) each year and prohibit gillnets with mesh size larger than 5.5 inches until July 21.

As described above, the 2003 total run forecast for the Kvichak River was slightly in excess of the minimum escapement goal of 2.0 million sockeye salmon. The department would take a conservative approach to the season based on the forecast. In 2002, the forecast for the Kvichak River was only 1.8 million sockeye, less than the minimum 2.0-million sockeye escapement goal. With the poor projected return in 2002, the department announced in a January 4 "News Release" the Naknek/Kvichak District would not open to commercial fishing on June 1. However, with a projected surplus of nearly 600

thousand sockeye for 2003, the Naknek/Kvichak District would not close on June 1. To minimize potential harvest of Kvichak bound stocks the only area that would open to commercial fishing if a period was announced would be the Naknek Section of the Naknek/Kvichak District. There was no pre-arranged fishing schedule in the Naknek Section prior to June 23. Periods when announced, will be short from the 7-foot tide stage to high water slack. In addition to the restrictions for sockeye, mesh size restricted to five and one-half inches or smaller were in effect until 9:00 a.m. Monday, July 21 for the conservation of chinook salmon.

Early run strength indicators, prior to catch information in Bristol Bay, comes from the South Peninsula commercial and the Port Moller test fishery; both begin around June 10. The Port Moller test fishery program projects run entry to Bristol Bay and the age composition of the run; this is then compared to the preseason forecast. In 2003, the South Peninsula fishery fished the new schedule based on the changes at the BOF in 2001, 16-hour periods with 36-hour period breaks between the fishing periods. There was no age composition taken from the commercial harvest. Catch information from the South Peninsula fishery provided no information for local Bristol Bay systems. However, the information collected from the Port Moller test fishery indicated a better than forecasted return to the Bay. The age composition from the Port Moller test fishery were not as expected with a larger 2-ocean component up front rather than later. Typically, age composition early in the program is higher 3-ocean with a shift to 2-ocean occurring in late June.

Escapement monitoring projects were operational early due to the low run projection to Kvichak River and minimal commercial fishing expected early. The Naknek tower was operational at 12:00 midnight, June 18, and the Kvichak tower at 12:00 midnight, June 21 (Table 21). The earlier deployment would provide additional escapement assessment and help in determining the actual strength primarily to the Naknek River. With no commercial fishing periods set, the only way of determining sockeye run strength to the Naknek River would be from subsistence catches in the Naknek River, test fishing in the Naknek Section and from early escapement numbers at the towers.

Subsistence fishing was slow the first two weeks of June with very few sockeye harvested. The first tide sampled by the district test boat was the morning of June 16. The vessel fished the Naknek Section only, looking primarily for presents of sockeye. Test fishing began at the mouth of the Naknek River and then moved out, towards the southern boundary, few fish were present (Table 5). Test fishing continued in the Naknek Section on June 18 with moderate success, 680 sockeye harvested in 17 drifts. Catch rates increased on June 20 when nearly 930 sockeye were harvested from the same area; indices however, were still considered low and sporadic. Indices ranged from 0 to 497 out of the 16 drifts. Escapement past the Naknek tower was just slightly above the project this early in the run. Through midnight June 19 only 666 sockeye had past the tower and by midnight June 20 it rose to 3,810 sockeye. During the afternoon tide on June 21 the indices rose substantially ranging from 0 to 1,490. The number of drifts dropped to only seven with a harvest of nearly 3,000 sockeye. By 10:00 a.m. Sunday, June 22 the daily escapement estimate at the Naknek tower was slight more than 10,700 sockeye; bring the cumulative count to just over 15,000. This exceeded the projected cumulative estimate through June 22 of 3,200. One must take into account that these historic escapement curves were built when the districts were open to 4-day a week fishing schedule. Current escapements are occurring with no commercial fishing in the district. Based on current escapement on the Naknek River and test fishing results from the Naknek Section increasing substantially, a fishing period was announced at 12:00 noon Sunday, June 22, that the Naknek Section would open to both set and drift gillnet fishing for a 4-hour period from

8:00 p.m. Sunday, June 22 until 12:00 midnight. The harvest from the 4-hour period was slightly more than 120,000 sockeye salmon with the drift fleet harvesting nearly the entire catch.

Following the June 22 4-hour period, escapement into the Naknek River dropped significantly; the daily escapement for June 22 was nearly 28,500, for June 23 it dropped to less than 800 sockeye. Test fishing in the Naknek Section resumed on the June 24 with 1,356 sockeye harvested in 16 drifts. Indices ranged from 15 to 1,019 with the highest points near the mouth of the Naknek River. Escapement past the Naknek tower began slowly on June 24 with only 162 sockeye past the tower by 10:00 a.m., however by 2:00 p.m. the cumulative daily count rose to nearly 30,000. It was announced at 6:00 p.m. that the Naknek Section would again open this time a 4.5-hour period to both drift and set gillnet gear beginning at 8:30 a.m. Harvest from the June 25 period was nearly 100,000 sockeye, the set gillnet fleet harvested 12 percent of the catch.

While escapement into the Naknek Section was more than 3-days ahead of the cumulative escapement goal curve, the Kvichak River escapement was not as fortunate; through June 24 only 906 sockeye had past the tower; the anticipated through June 24 was 2,200. The Kvichak inriver test fish project began fishing on June 21, no significant catches occurred until June 28 when 396 sockeye were caught between the two tides (Table 24). Escapement continued ahead of the anticipated on the Naknek River, the cumulative escapement through midnight June 25 was 235,000 sockeye, more than four days ahead of the curve. The Kvichak escapement continued slowly with only 1,320 sockeye past the tower by midnight June 25. Based on the early run entry to the Naknek River and the Wood River, it was projected the run to the Bay was at least one day ahead of schedule putting the projected cumulative escapement for the Kvichak River at 38,000; far less than what was actually occurring. Based on 5 AAC 06.360, and current run entry patterns, the Naknek/Kvichak District was closed at 12:00 midnight June 26, all fishing periods after midnight would be in the Naknek River Special Harvest Area (NRSHA).

To protect the quality of escapement for sockeye and other salmon species when the NRSHA is open, the BOF opted for an optimal escapement goal (OEG) of 800 thousand to 2.0 million sockeye for the Naknek River. This would enable the department to pulse (multiple short periods) the fishery. The short periods would allow escapement of salmon without encountering fishing gear and minimize fishing during the low tides. To accomplish this, the drift gillnet fleet began fishing near the 15-foot flood stage and ended at or near the 15-foot on the ebb of the tide. For the set gillnet fleet, the fishery was centered on the 10-foot tides during both the flood and ebb. When runs to the Naknek were at a magnitude of 4 to 6-million the upper OEG would come into effect. However, when runs to the Naknek are less than 3-million, escapements can be held to less than 1.4-million sockeye and yet continue with the pulse style fishery.

Based on the current escapement into the Naknek River, it was projected the minimum escapement goal of 800,000 sockeye would be reached and exceeded if no fishing was to occur within in the NRSHA. With the 800,000 escapement projected to be exceeded in the Naknek River, the NRSHA opened to drift gillnet gear first at 11:00 a.m. June 26 for a 4.5-hour period, the set gillnet fleet fished for a 7.0-hour period beginning at 12:00 midnight June 27. On June 30, the actual escapement to the Naknek River was nearly three times the projected; which was more than seven days ahead of the cumulative escapement goal curve. Based on the current rate of escapement into the Naknek River, it was inevitable the upper end of the escapement goal (2.0 million sockeye) would be exceeded if no changes

were made to the current fishing schedule. To increase efficiency and fishing pressure the drift gillnet fleet fished both tides on July 1 and again the evening of July 3 and morning of July 4.

While the Naknek River escapement exceeded 1.4 million sockeye the evening of July 4, the Kvichak escapement was only at 820,000 sockeye; the projected escapement for the Kvichak River on July 4 was approximately 580,000. The Kvichak escapement was just shy of being two days ahead of schedule had not occurred since 1999. However, with no fishing out front in the commercial district, and the Naknek River and other systems in Bristol Bay were more than four days a head of schedule, it was felt the Kvichak was still projecting a below minimum escapement for the season. Also, the Alagnak River a small system that drains in the lower end of the Kvichak River was setting daily and potentially a season high record for escapement. The Department has been monitoring the Alagnak escapement for the past three years with a tower camp. Since 1976, escapement has been monitored with a single or two aerial surveys for the year during spawning in late August and/or early September. By July 4, the cumulative escapement into the Alagnak River was slightly less than 2-million sockeye. This far exceeds the previous record of 1.2 million in 1960. With current conditions in the other systems far ahead of schedule and the Kvichak only two days ahead, the Naknek/Kvichak District remained closed.

The NRSH remained open until the morning of July 21, when the Naknek Section of the Naknek Kvichak District opened to both drift and set gillnet gear to the fall schedule of 9:00 a.m. Monday to 9:00 a.m. Friday until September 31. There were a total of 135 deliveries for July 21 and 22 with roughly 18,500 sockeye harvested over the two days. Effort dropped drastically with 39 deliveries the rest of the week. There were only two-reported harvest following the closure on July 25 and those occurred August 11 and 12.

The sockeye return to the Alagnak River was record breaking for Bristol Bay in 2003. The final estimated escapement to the Alagnak River was 3,676,146 sockeye salmon. An aerial survey of the spawning systems on August 23 estimated nearly 700,000 unspawned dead sockeye, the majority were in Moraine Creek. The department hopes to continue a counting program on the Alagnak to monitor the effects of the large escapements.

The sockeye salmon harvest totaled just over 3.3 million (Appendix Table 4). The reported commercial harvest of 567 chinook was far below of the recent 10-year average harvest of 3,200 (Appendix Table 5). The chum salmon harvest totaled 34,500 fish, was up from the 2002 harvest (Appendix Table 6). There was only a reported commercial harvest of 42 coho salmon in the Naknek/Kvichak District (Appendix Table 8). Subsistence harvests are listed in Table 33.

Egegik District

The 2003 sockeye salmon run to the Egegik District of 3.44 million fish was the smallest run recorded since 1979, and it was approximately 47% below the forecast of 6.51 million sockeye. Sockeye salmon runs to the Egegik District during the past four comparable cycle years, dating back to 1983, have ranged from 4.64 to 23.12 million fish with an average of 10.84 million. The 2003 run was 68% below the average for the recent cycle years (Appendix Table 14). The harvest of 2.28 million sockeye salmon was the 24th largest commercial harvest in the 109-year history of the fishery. An escapement of

approximately 1.152 million fish was achieved, which was slightly over the mid-range of the Biological Escapement Goal (BEG) of 800 thousand to 1.4 million (Table 1).

The Alaska Department of Fish and Game (ADF&G) forecasted a Bristol Bay run of 24 million sockeye salmon in 2003, and a harvest of approximately 16.8 million. The projected Egegik District harvest of 5.41 million sockeye was 32% of the predicted Bay's harvest (Table 1). With a third of the Bay's predicted harvest, there was a fair amount of interest in fishing the Egegik District this season, and by June 23 most of the drift gillnet effort had registered to fish in Egegik.

Commercial salmon fishing was opened in the Egegik District on June 2 (Table 11), but no landings occurred until June 9. Through June 14, the total catch of approximately 6,200 was above average but well below the total catches for the last two years for this date. The fishery was allowed to close as scheduled at 9:00 a.m. on June 13 and it would stay closed until escapement numbers improved.

Daily inriver test fishing, which provides estimates of sockeye salmon passage into the lower portions of Egegik River, began on June 15 at the usual sites just upstream of Wolverine Creek (Table 25). The Egegik River counting towers began operation on June 18 (Table 21), and provided daily estimates of sockeye salmon passage into Becharof Lake. Initial inriver test fishing catches were low and stayed fairly low until June 19 and 20 when catches indicated that approximately 100,000 sockeye salmon were in the river and above the commercial fishing district. The tower count, however; was only 11,000 through June 19 and commercial fishing was held off until June 22 when brief commercial fishing periods were scheduled for both gear groups.

Participation in the June 22 opening consisted of approximately 384 drift vessels; 127 set net deliveries were made. The catch of approximately 126,000 sockeye salmon was about two thirds of the 20-year average for this date. Sockeye salmon catches were 58 and 314 fish per delivery for set and drift gillnet fishers, respectively. The set gillnet catch per delivery was well below average, but for drift gillnet fishers it was well above average. Inriver test fishing results remained somewhat the same until June 25 when fishing results averaged 2,554 index points. Another brief commercial fishing period was scheduled for June 26. This fishing period would take place in the reduced district fishing area, the Egegik River Special Harvest Area (ERSHA) because the Naknek River Special Harvest Area (NRSHA) was put into effective on June 26.

The June 26 harvest of 158,000 sockeye salmon was less than half the 20-year average for this date. The escapement rate dropped off after the June 25 push, but there were still good numbers of fish moving up the river with inriver test fishing averaging more than 1,000 index points over the next three days. The tower count was tracking well and was about a day and a half ahead of the expected level on June 27. So another brief fishing period was scheduled for June 28.

The June 28 harvest of approximately 171,000 sockeye salmon was also less than half the 20-year average, and brought the district's total harvest to approximately 462,000 fish. The cumulative harvest was one third the 20-year average. The tower count of 263,000 through June 28 was still approximately two days ahead of the expected level, but this year's run timing around the Bay was again looking like it was several days early. With that in mind, no fishing would be scheduled until escapement levels were also several days ahead of expected levels. Inriver test fishing results feel off over the next three days, but improved on July 2. Tower counts dropped too, but bounce well up

on July 1. A fishing period was finally scheduled for July 3. In the mean time, the four day break, over what would normally have been some peak fishing in Egegik, made a number of drift gillnet fishers nervous. Many decided to try their luck elsewhere and transferred out of the district.

The July 3 catch was approximately 284,000 of which 89,000 were taken by set gillnet fishers. An estimated 224,000 fish shot through the district and up the river on July 2 and 3. The tower count was 727,000 at the end of July 3, and even though set gillnet fishers were ahead in their harvest allocation, management did not want to risk another 100,000 fish moving past the fishery by taking the set gillnet fishers out of the water. For the 8-hour fishing period on July 4, set gillnet fishers landed 112,000 sockeye salmon while drift gillnet fishers landed 192,000. The tower escapement count went from two days ahead on June 28 to five days ahead on July 3 and six days ahead on July 4. It was just the escapement buffer that management was looking for with the projected early run timings. Fishing time was then scheduled every day through July 17 when the fall fishing schedule started. From July 5 to July 17, drift gillnet fished a total of 134.5 hours while set gillnet fishers fished a total of 72 hours. Even with more fishing time and landing over a million fish, drift gillnet fishers barely made any head way on catching up to their harvest allocation. With the midrange escapement objective in hand, it was not desirable to let too many fish slip by. So set gillnet fishers were allowed some fishing time even though they were ahead on their harvest allocation. The drift fleet is handicapped in catching up when there are few fish around. Small volumes of fish are usually tight to the beaches and fishing these areas is difficult, if not impossible, when set net running lines and anchoring systems left in the water. The final inseason harvest proportions were 19% for set gillnet fishers and 81% for drift gillnet fishers.

Sockeye salmon landings in the district continued throughout July and into August, reaching a seasonal cumulative total catch of approximately 2.28 million fish. The counting towers ceased operation on July 15 and the final escapement count totaled 1.15 million sockeye salmon. This was approximately 4% over the midrange of the BEG range. The escapement sex ratio was 54% males to 46% females.

The age composition of the 2003 Egegik District sockeye run was as follows:

Age Group	Catch	Escapement	Total
1.2	7	8	7
2.2	18	16	17
1.3	8	2	6
2.3	59	51	56
Other	9	23	14
Totals	100	100	100

Most of the sockeye salmon run (73.5%) were age 2.2 and 2.3 fish and came from the 1998 and 1997 escapements of 1.11 million for each of those years. Egegik District commercial fishers harvested 66% of the Egegik inshore sockeye run, which is well below the recent 20-year average of 84%. Peak harvest dates were July 3, and 4, when 284,000 and 304,000 sockeye salmon were landed on those dates. Peak tower counts occurred on July 1 through July 5, when over 100,000 sockeye salmon were counted on each of those dates. The peak catch rate for drift gillnet fishers was 24,300 sockeye salmon

per hour on July 3, and for set gillnet fishers it was 14,000 sockeye salmon per hour on July 4. During the emergency order period from June 16 to July 17, a total of 158 hours were fished by drift gillnet fishers, or 21% of the 744 available hours. For set gillnet fishers, 120 hours or 16% of the available time was fished. This compares to 202 hours for drift gillnet fishers and 172 hours for set gillnet fishers last season. Peak drift gillnet effort was a little over 490 vessels from June 23 to June 25 (Table 10). Approximately 50 vessels left before the ERSHA was placed into effect on June 26.

The commercial harvest of other salmon species in the Egegik District totaled 82,542 fish, or approximately 4% of the total harvest. The chinook harvest was approximately 130 fish, or 94% below the 1983 to 2002 (20-year) average of 2,067 (Appendix Table 5). The district chum harvest of approximately 41,900 fish was 56% below the recent 20-year average of 95,400 (Appendix Table 6). No pink salmon harvest was reported. The coho salmon harvest of 40,500 fish was 18% above the recent 20-year average of 34,300 (Appendix Table 8).

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 1,052 chinook, 5,150 chum, and 5,280 coho salmon. Chinook escapement indices ranged from below to above average in the streams surveyed. The chinook salmon index count was 4% below the 20-year average while the chum salmon count was 25% below average, however; the chinook count was the second largest count recorded in the last five years and the chum count was largest in ten years. The coho salmon index represents an aerial count from several tributary streams of Becharof Lake and it was 17% above the 1997 to 2002 average count of 4,522.

In summary, the 2003 sockeye salmon season at Egegik was not very productive one. The run was 47% below forecast. Though the catch of 2.28 million was the 24th largest on record, it was the smallest harvest in over twenty years and well below the twenty year average of 8.42 million sockeye salmon. Unlike the last three years, this year's run timing was only about one day early, instead of three to five days early.

Ugashik District

The 2003 inshore sockeye salmon run to the Ugashik District was approximately 2.53 million fish, or 20% less than the forecast of 3.15 million (Table 1). Ugashik and Egegik District runs were the only ones that came in under forecast, but for Ugashik it was the second largest run in seven years. The commercial sockeye salmon catch of approximately 1.74 million fish was also the second largest harvest in seven years. The sockeye salmon escapement to the Ugashik River was approximately 759 thousand fish, or 11% under the middle of the BEG range of 500 thousand to 1.2 million. Comparable inshore returns over the last four cycles, dating back to 1983 have ranged from 1.66 million to 5.59 million fish with an average of 3.44 million, making the 2003 run of 2.53 million 26% below the average for the last four cycle years. (Appendix Table 15).

Initial landings occurred in the district on June 9 (Table 12) with only a few sockeye and chinook salmon landed. During the week of June 16, effort and sockeye catches increased, and by 11:30 p.m. June 20, the

cumulative district harvest was approximately 200,000 sockeye salmon, 155 chinook salmon, and 10,200 chum salmon. Through June 23, this sockeye harvest was the highest on record and well over the recent 10-year (1993-2002) average of 65,400.

There are some people that think this early harvest was not Ugashik fish because escapement was not being documented, however; they do not understand the nature of Ugashik sockeye salmon. Ugashik sockeye can show up in the district and take several days to a week or more to actually move up the river. Waiting for that movement can result in a poor quality harvest and in excessive fish to the escapement. The Ugashik inriver test fishery did not start until June 22 and the escapement counting towers did not begin counting until June 28. From the very first day, both projects revealed fish moving by their respective areas. No one knows how many fish went by before they started their operations. The tower count on June 28 of 6,000 sockeye salmon was the highest every recorded for that date, as was the June 29 count of 30,400 which was 10 times the previous high count for that date, as was the June 30 count, the July 1 count, the July 2 count, etc.. This year's cumulative escapement counts were the highest on record for each day from June 28 through July 9. Although escapement documentation did not get started until after some good fishing occurred within the district, the record escapement levels through July 9 confirmed a run strength that was very good and a run timing that was much earlier than normal. The age composition of this catch mirrored well with the predicted age composition for the Ugashik run. This is another indication that this harvest was predominately Ugashik fish.

The preseason forecast for the Ugashik District suggested a harvest of 2.3 million sockeye salmon, which would have been the largest harvest in seven years. Accordingly, commercial fishers were advised that fishing time after June 23 would depend on the results of district and inriver test fishing and tower escapement levels. With this advisory, less than eleven drift vessels registered for Ugashik on June 25 (Table 9).

Inriver test fishing, which operates about three miles upstream of Ugashik Village, started on June 22 and provided a daily estimate of sockeye salmon passage into the lower part of the Ugashik River. The counting tower project, operating about 24 miles upstream of Ugashik Village, started counting on June 28 or six days earlier than usual. After the first six days, inriver test fishing results estimated approximately 45,000 fish up the Ugashik River or almost six times the number by this date last year. The first tower count on June 28, which was only a partial day's count, was only approximately 6,000 fish (Table 26), and the highest count ever recorded for this date. With a small fleet and excellent escapement numbers a fishing period was scheduled for June 28.

The total harvest of approximately 57,000 was the second highest recorded for this date. Set gillnet fishers did extremely well averaging almost 1,000 fish per permit, while the 12 drift gillnet fishers averaged almost 2,000 fish per permit. These were the highest catches per delivery for both gear groups ever recorded for this date. With inriver test results and tower counts doing very well another period was scheduled for June 29.

The June 29 opening produced a harvest of 94,000 sockeye salmon, which was the third highest catch for this date and the highest catch per delivery for set gillnet gear and the second highest catch per delivery for drift gillnet gear. Through June 29, the cumulative tower escapement count was 36,000, which was seven days ahead of the expected level with normal run timing. Inriver test fishing indices were still holding an

average of over 1,000 index points for the third day in a row and an estimated 70,000 fish were in the river. Another brief fishing period was announced and scheduled for June 30.

Interest was now being shifted to the Ugashik District, especially with Egegik on hold, and there were 76 drift gillnet landings made on June 30. The 76 landings averaged approximately 1,600 sockeye salmon, while 83 set gillnet landings averaged 450 sockeye salmon. If the Ugashik run timing was several days early, as were the indications for most of the runs in the Bay, then Ugashik's tower escapement level might only be tracking on schedule. Given this scenario, and the swelling of the drift fleet to over 140 vessels, a pause in fishing would occur until July 3. The tower count dropped to 20,000 on June 30 but popped up to 43,000 on July 1. Inriver test fishing results averaged over 2,000 index points on June 30 and July 1, but dropped off on the morning of July 2. An estimated 150,000 fish were in the river, while the cumulative tower count went to 100,000. On the morning of July 3 a district test fishing vessel indicated a very good abundance of fish at the confluence of Ugashik and Dog Salmon Rivers (Table 6). With the set gillnet fishers taking 20% of the harvest so far, or twice their allocation, the next fishing period would be a 4-hour period for drift gillnet fishers only.

The July 3 harvest was 221,000 for 192 drift gillnet landings bringing their harvest much closer to the drift allocation of 90%. The tower count was 219,000 through July 3 and still holding at several days ahead of the average level with normal run timing. Inriver test fishing averaged 1,271 index points on July 3 or slightly better than the day before. Fishing would stand down pending a little better pulse to the escapement.

The morning of July 4 showed a push of fish that was a threefold increase from the previous morning's inriver test fishing results. The day's average index shot up to 2,530 points indicating that perhaps 66,000 sockeye salmon entered the Ugashik River on July 4. Since the drift fleet was catching up nicely on their harvest allocation, and the drift vessels registered to fish Ugashik by July 5 had grown to almost 200, both gear groups were put in the water estimating that the drift fleet would continue to make headway on their slight allocation imbalance.

The July 5 opening produced a catch of approximately 145,000 of which the set gillnet fishers were reported to have taken approximately 9%. Inriver test fishing results soared to an index average of 2,889 points on July 5 and the tower count was steadily building at a rate of about 61,000 fish per day over the last four days. For July 5 the cumulative tower count was 343,000 sockeye salmon. Inriver test fishing results indicated that the daily escapement rate would likely continue for a few days and fishing time was given on a daily basis through the rest of the season. The escapement rate remained steady and strong through July 9 averaging 72,000 fish per day from July 6 through July 9. From July 6 through July 16, 833,000 sockeye salmon were landed by commercial fishers, while the escapement tower count reached 723,000 fish.

Sockeye landings continued through July 30 with the final catch totaling 1.74 million. The final Ugashik River sockeye escapement count was 758,000 fish when the State ran project ended on July 23. A federally funded project continued the tower operation through September and counted approximately 14,800 sockeye salmon. Additionally, 31,670 sockeye were counted during aerial surveys of the Dog Salmon and King Salmon rivers (Appendix Table 15).

By the end of emergency order period setnetters had caught approximately 11% of the sockeye harvest and drift gillnet fishers took 89%. This breakdown is a 1% discrepancy from the allocation. To achieve the

established allocations, approximately 17,100 fish in the set gillnet catch should have gone to the drift gillnet harvest. Between June 23 and July 17, setnetters fished a total of 152 hours, or 33.5 hours less fishing time they had last year, while drift gillnetters fished a total of 165 hours, or 14 hours more fishing time than they had last year.

The peak escapement counts at the counting towers occurred July 1 through July 9 when over 40,000 sockeye salmon were counted on each of those days. The 2003 escapement was the most evenly distributed escapement recorded since 1997. The escapement sex ratio was 44% males to 56% females.

The age composition of the 2003 Ugashik District sockeye salmon run was as follows:

Age Group	Catch	Escapement	Total
1.2	31	67	42
2.2	27	15	23
1.3	12	9	11
2.3	27	6	21
Other	3	3	3
Totals	100	100	100

The commercial harvest of other salmon species totaled approximately 56,000 fish or 3% of the district's total harvest. The harvest of 419 chinook salmon was 86% below the 20-year (1983-2002) average of 2,980 (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 3,293 was 24% below the 1980 to 2002 average of 4,308. The chum salmon harvest of approximately 55,000 fish was 26% below the average. The chum salmon escapement index count of 21,800 was 27% below the 1980 to 2002 average count of 29,800. The coho salmon harvest of 994 fish was well below the 20-year average of 22,000, but there was very little commercial effort for Ugashik coho salmon again this year, with no landings reported until August 18 and 19. The coho salmon escapement index count of 17,880 for the Upper and Lower Ugashik Lakes was 1.6 times the 1996 to 2002 average count of 6,900. The timing of this survey was very good with most coho salmon still schooled up below creek mouths. Preliminary results from the Federal coho tower project estimated that approximately 28,000 coho salmon had passed into Ugashik Lakes. No pink salmon harvest was reported in the Ugashik District this season.

The Ugashik District fishery harvested approximately 69% of the sockeye return to the district, which is the 20-year (1983-2002) average removal rate. Peak catch per hour occurred on July 4 for drift gillnet fishers, when approximately 221,200 sockeye salmon were landed in four hours, or 55,300 fish per hour. For set gillnet fishers, peak catch also occurred on June 29 when approximately 41,000 sockeye salmon were landed in 8 hours, or 5,100 per hour. Peak catch per landing occurred on June 28 for drift gillnet fishers and on June 29 for set gillnet fishers when approximately 2,000 and 520 sockeye salmon, respectively, were taken per delivery.

A total of 12 buyers operated in the district during the season (Table 27), or two less than last year. Nearly all of the catch was tendered to other districts for processing. There were no delivery limits placed on Ugashik commercial fishers during this season.

Nushagak District

The 2003 Nushagak District total inshore sockeye salmon run was approximately 9.0 million fish, 34% over the preseason forecast of 6.7 million fish (Table 1). Commercial sockeye harvest, in the Nushagak District, reached nearly 6.7 million, 39% above the preseason projected harvest of 4.9 million sockeye, and was the third largest catch in the last 100 years. Total sockeye escapement in the district's three major river systems was 2.24 million or 119% of the combined mid-range escapement goal of 1.88 million.

The variable escapement goal adopted for the Nushagak River was to achieve sockeye escapements within the Biological Escapement Goal (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 Optimum Escapement Goal (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. When the projection is below 1 million sockeye, the OEG minimum of 235,000 is in effect.

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 during the first half of the run

differed substantially from the escapement during 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 while allowing fish with a natural age distribution to enter the river. In November 1997, additional language, directing the department to allow pulses of chinook salmon into the Nushagak River that were not exposed to commercial fishing gear, was added to the NMCSMP.

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

The 2003 Nushagak District chinook salmon forecast was 148,000 fish. With an inriver goal of 75,000 fish, 73,000 chinook would theoretically be available for commercial harvest. This number was further reduced by harvest of chinook by subsistence and sport users. Sufficient surplus was available for planned directed chinook openings as soon as sonar counts indicated run strength was not dramatically below forecast. There were four directed chinook openings in 2002 between June 20 and June 26 and escapement goals were exceeded. In 2003, management strategy was to have openings earlier with more space between openings.

The sonar station at Portage Creek was operational on June 7. The daily chinook counts started off above expectations and continued to be high for the first five full days of counts. Based on this escapement, a commercial opening was announced for June 13. The first directed chinook opening was for 6 hours and resulted in a harvest of approximately 1,500 chinook from 28 deliveries. Chinook escapement past the sonar counter continued to be good for the next five days and on June 18, another directed chinook opening was announced for the following day. The second opening was five hours and resulted in 160 deliveries for just over 21,000 chinook and 7,000 sockeye.

Although the harvest of 21,000 chinook in one five hour period was higher than expected, the escapement past the sonar counters continued at a steady pace. The escapement of sockeye also began to increase. On June 22, there was another commercial opening. Although this opening was in response to an increase in sockeye escapement, there was no mesh restriction imposed so chinook gear was still legal. This was the case for the openings on June 23 as well. These two openings harvested approximately 5,000 chinook. With sockeye escapement and catch increasing, the decision to switch to sockeye management was made. All subsequent openings had a 5.5-inch or less mesh restriction. This reduced chinook harvest, especially on the larger fish.

Chinook escapement continued at a surprisingly steady pace; the peak escapement was on June 26 when 6,054 chinook were counted. Escapement remained strong throughout the operational period of the sonar, which ended on July 20. 1,375 chinook were counted on July 16 and 279 were counted on the last day of counts. The total chinook escapement for 2003 was 80,028; the total commercial harvest was 42,615.

Management plans for sockeye have changed over time, 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 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 1.5 million sockeye, the Nushagak River would be managed for the BEG range of 340,000 – 760,000 spawners at least until the run was reassessed in early July.

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

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 6.7 million fish, which was 16% higher than the 20-year average actual run of 5.8 million sockeye (Appendix Table 16). Strength of the forecasted Wood River run (4.4 million) was 29% above the 1983-2002 average actual return, while the Nushagak River sockeye run (1.5 million) was expected to be just over (107%) the 20-year average actual return. The forecasted return to Igushik River (833 thousand) was just over two-thirds (78%) of the 1983-2002 average level (Appendix Table 17). Management of the Igushik and Nushagak Sections as well as the WRSMA is 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 WRSMA 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 managers to open the Wood River Special Harvest Area for the conservation of Nushagak River sockeye salmon. The Nushagak River sockeye escapement peaks slightly earlier than escapement in Wood River. If stock proportions in the escapement represent stock abundance in the district and harvests are not stock selective, delaying the sockeye openings should help to conserve the Nushagak stocks. However, without an additional stock-specific means to exploit Wood River sockeye, surplus Wood River sockeye cannot be harvested without sacrificing the Nushagak River escapement goal particularly when the Wood River run is on the order of three (or greater) times as large as the Nushagak River run.

For at least the last sockeye life cycle, Wood River runs have been more than three times larger than Nushagak River runs due to high production in the Wood River system and decreased production in the Nushagak River system. Throughout these years, the department has attempted, relatively unsuccessfully, to keep sockeye escapement in the Wood River from exceeding the upper end of the escapement goal range, while simultaneously attempting to achieve at least the lower end of the BEG range in the Nushagak River. A ratio of 2.9:1 (Wood River to Nushagak River sockeye) was forecast for 2003. To conserve Nushagak stocks, the department plan was to 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 was managing for the BEG range of 340,000 – 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.

The counting project for the Wood River was in operation on June 20 and the sonar project on the Nushagak River was operational on June 7. On June 21, there was a significant push of fish past the Wood River counting towers, 73,300 sockeye. On the morning of June 22, it was obvious that a strong push of sockeye was still occurring in the Wood River. With the Nushagak sockeye escapement well above all escapement curves a six-hour commercial opening was announced for both set and drift gillnet fleets in the Nushagak Section. In order to retain flexibility, another six-hour opening was announced for set gillnets only beginning at 8:00 a.m. on June 23, Monday.

The decision to announce a second set gillnet only opening for Monday morning on Sunday night, before the first opening had started, was probably the only critical decision made for the rest of the 2003 commercial salmon season. On Monday morning it was apparent that sockeye escapement into both the Wood and Nushagak Rivers was well ahead of schedule and continued fishing was warranted. At the 9:00 a.m. announcement time the set gillnet fishery was extended for six-hours and the drift fleet was given word of a six-hour opening beginning at 11:00 a.m., just before book high tide.

The daily escapement for the Wood river system on June 23 was 131,000 bringing the cumulative to 292,000; similarly the Nushagak escapement was 79,000 for a cumulative of 151,000. These counts were received in the office on the morning of June 24; additionally the harvest information for the 23rd, 401,000 sockeye, was also received.

The harvest and escapement numbers were unprecedented for the 23rd of June. At the special 10:30 a.m. announcement the set gillnet period in progress was extended 18 hours and a 6 hour drift gillnet opening was announced. With steady escapement and reports of decent fishing, another drift gillnet period was announced for the morning of the 25th additionally, commercial fishing with set gillnets was extended for 25 hours. This began a period of continuous fishing with set gillnets that lasted until July 23.

Escapements and catch rates continued to be above average; at this point there were some concerns about run timing, but even considering 6 or 7 day early run timing, escapement was ahead of expectations. Commercial fishing continued with two drift gillnet periods per day totaling approximately 18 hours, until July 11 when fishing was extended until further notice. It was becoming more and more likely that we were having a strong and early run in the Nushagak District. The task now became controlling escapement and spreading out fish in the district so both gear types would have ample harvest opportunity.

In order to spread out fish while still fishing 18 hours a day with the drift fleet, drift openings were timed to begin on the ebb tide and maximize ebb fishing. Early in the season this resulted in some negative comments from the drift fleet but those comments soon diminished. At the same time the ebb openings allowed fish to get into the district and to the set gillnet sites. Although this probably did help with the harvest percentages, the final percentages fell far short of the allocation.

One of the main reasons for the set gillnet harvest being below the allocation percentage was the decreased set gillnet effort. By June 26, there were only 216 set gillnet permit holders registered to fish in the Nushagak District. This compares to the 291 that registered in 2000. The area with the largest decrease was the Igushik Section, with 43 permits registered, down from 81 in 2000. Additionally, aerial surveys counted less effort than what was registered, with a peak of only 30 nets seen at Igushik.

The decline in the set gillnet effort can be traced to the closing of the Wards Cove plant at Ekuk. The Wards Cove plant traditionally bought all the set gillnet fish from Ekuk and Igushik beaches. They allowed permit holders to pick their nets at low tide from the beach, so called “dry picked” because they were picked from the net after the tide receded or after the net was dragged up on the beach. A new buyer was found for Igushik that would buy only fish picked from a skiff, “wet picked”. Not everyone who traditionally fished at Igushik was willing or able to conform to the new standard so effort was reduced. Because of wind patterns pushing fish to the west side of the bay, most of the drift gillnet fleet fished on the west side of the Nushagak Section the first several days of the fishery. There is only one set gillnet area on the west side, Coffee Point, and while the catch was good from that area, other set gillnet sections reported slow fishing for the first several days.

With the set gillnet fleet behind in the quota from the beginning, managers tried to keep harvest percentages in line with allocation goals by using differential fishing time and maximizing ebb fishing for the drift fleet. The overriding concern however remained escapement. Escapement rates were somewhat slower from June 27 until July 1, but 300,000 sockeye escaped into the Wood River system between July 2 and July 4 bringing the total Wood River escapement to 1.2 million. Having surpassed the mid-range goal on the Wood River and being close to the mid-range goal on the Nushagak, the focus of management decisions became the harvesting of fish versus escapement needs. The pattern of openings shifted to include more flood tide fishing for the drift fleet, though fishing time remained about the same, 18 hours a day in two openings.

Fishing continued daily until July 11 when the drift fleet was extended until further notice. Fishing closed on July 23 and did not reopen. The final harvest was 6.7 million sockeye, the third largest harvest ever in the Nushagak District. The Wood River escapement was 1.46 million, just under the 1.5 million upper end of the escapement range. The Nushagak River sockeye escapement ended at 581,000 slightly over the mid-range goal of 550,000.

Igushik Section

The 2003 sockeye run forecast of 833,000 for Igushik River was 22% below the recent 20-year average of 1.07 million fish (Appendix Table 17). Sockeye salmon escapement in the Igushik River from 1989 through 2001, with the exception of 1997 and 1998, exceeded the biological escapement goal range (150,000 – 250,000) despite 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 2002 sockeye return, progeny of 1997 also failed, with a total return of 208,000 fish. 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. In 2001, a willing and qualified candidate whose fishing site was close to the mouth of the Igushik River was chosen, and the 25 fathom gillnet was operated starting on June 18. In 2002 and again in 2003, there was no one willing to participate in this program so department staff relied on subsistence harvest reports. On June 21, there was not much subsistence information available, the tower project was not yet operational, but there was increasing sockeye escapement in the Nushagak District. Since the Igushik return tends to be the first run of sockeye into Nushagak Bay, the decision was made to open the Igushik Section to fishing with set gillnets only.

This opening would serve as a test fishery and give managers information about run strength prior to the towers being operational and in the absence of the inriver test fishery. The harvest for the first several days was slow but catch rates picked up by the 25th and the harvest for the week was 40,000 sockeye, more than the entire harvest for 2002. Except for a 13-hour closure on the June 23-24 the Igushik Section remained open for fishing until July 23. The only buyer ceased buying operations on July 11 but permit holders still had the option of delivering their fish to the dock in Dillingham.

The drift fleet was given some fishing time in the Igushik Section. There were 16 openings for 124 hours of fishing time for the drift fleet in the Igushik Section in 2003. Since this drift harvest is not reported separately from the Nushagak Section harvest when both sections are open, there is no way to know how much drift effort was in the Igushik Section when it was open. The total harvest of Igushik sockeye in 2003 was estimated at 846,000 and the set gillnet harvest was reported as 142,000 sockeye. The total escapement was 194,000, below the mid-range goal of 225,000 but within the escapement goal range.

Nushagak District 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 34,000 spawners in 1999 and recent production trends, the 2003 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 2003 the sonar project on the Nushagak River ceased operation on July 21. Therefore, there was no coho count. In the absence of a coho count on the Nushagak, managers decided to watch subsistence harvest. Subsistence harvests were never exceptional and there was little interest expressed in the buying of coho, subsequently there was no commercial coho fishery in the Nushagak District in 2003. Final reported commercial harvest of coho salmon was 583 fish (Table 13, Appendix Table 24).

Togiak District

The 2004 inshore sockeye run of 967,061 fish was the fifth largest return to the Togiak District in the last 20 years (Appendix Table 18). This year’s return was 237% above the preseason forecast. District sockeye harvest was 706,008 sockeye salmon, the fifth largest since 1982. Escapement into Togiak Lake was 232,302, 16% above the range (100,000-200,000) 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 added 36 hours to the weekly schedule for the Togiak River Section between July 1 and July 16. This schedule is adjusted by emergency order, as necessary, to achieve desired escapement objectives. In addition, the TDSMP restricts the transfer in and out of the Togiak District by prohibiting permit holders that fished in any other district from fishing in the Togiak District until July 24. Conversely, it prohibits permit holders that have fished in the Togiak District from fishing in any other Bristol Bay district until July 24.

The 2003 inshore run to the Togiak River was forecasted at 409,000 sockeye salmon (Table 1), of which 74% were projected to be 3-ocean fish, the remaining 26% were predicted to be 2-ocean fish (Table 2). With a midpoint escapement goal of 150,000 sockeye for Togiak Lake, approximately 259,000 sockeye would potentially be available for harvest in the Togiak River Section. A harvest of this size would have been 57% of the 20-year average. 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 58,000 sockeye to the district harvest was projected from drainages other than the Togiak River.

As for chinook salmon in the Togiak District, no formal forecast is issued. Recently, chinook run strengths district-wide have declined from a high of almost 62,000 in 1983, to a low of less than 18,500 in 2003 (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.

Management strategy for chinook salmon the last seven years has been to reduce the weekly fishing schedule in sections of the Togiak District during the last two weeks of June. The Kulukak Section was reduced to 48 hours of fishing time and was aimed at decreasing the exploitation of chinook salmon. In the Togiak River Section, the regularly scheduled periods were reduced by 24 hours. The western sections, Cape Peirce, Osviak, and Matogak, remained open for the regularly scheduled periods.

Commercial fishing opened in the district with a regular weekly schedule on June 2. However, the first landings of the 2003 season were made on June 10 (Table 15). For that week, 39 chinook salmon were caught. The following week was the first of the season to which the reduced schedule was applied. The commercial harvest and effort for this period were well below average with 56 deliveries and 270 chinook salmon.

The fishery reopened on June 23 and continued to be on the reduced schedule. The season's cumulative catch after the last delivery on Thursday, June 26 was 1,200 chinook salmon. This was substantially lower than normal. The largest daily catch occurred on June 23, when 321 chinook were harvested. Catch per delivery and harvest were both substantially lower than the average. The close of fishing on the 27th of June marked the end of active management for chinook salmon. Fishing reopened with the increased weekly schedule on June 30th with the focus on sockeye salmon management.

The total chinook harvest for the Togiak River Section was 3,078 fish (Table 16), with an additional 153 caught in the remainder of the Togiak District (Table 17, 18, 19). The total number of Chinook salmon caught in the Togiak District was 66% lower than the 10-year average. Escapement for the Togiak River and tributaries could not be assessed in 2003 due to poor weather conditions. Figures are not yet available for sport or subsistence harvests so the preliminary exploitation rates do not include those numbers. An estimated 720 chinook migrated into the Kulukak River and an additional 1,898 fish were estimated in the Quigmy, Osviak, Matogak, Slug, Negukthlik and Ungalikthluk Rivers.

Commercial fishing for sockeye opened with the regularly scheduled fishing periods on June 2. Fishing effort remained below average during the following week. The first deliveries of the season occurred on June 10.

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. This reduction has become common practice in recent years due to a shift in effort to the Kulukak Section and conservation concerns for the Kulukak River sockeye stock. By the end of June, the District-wide sockeye harvest was 36,200 fish, more than 2 ½ times higher than expected levels. There was some fishing effort in the Osviak and Matogak sections during the last week of June. Four deliveries, for a total of 200 sockeye salmon, were reported.

Operation of the Togiak counting towers began on July 3. The tower count for that day was 4,014 sockeye salmon (Table 23), almost twice as high as the expected count. The harvest in June was above expectations as well, commercial fishing closed as scheduled on July 5th. The schedule was not extended because of the possibility that the Togiak District would experience early run timing as the other districts had. The total harvest after the first week of July was 137,000 sockeye, more than twice as high as expected.

Commercial fishing reopened on the 7th of July as scheduled after a weekend of steady escapement. The Kulukak Section remained on a reduced schedule for the conservation of Kulukak river sockeye salmon. Permit holders were advised to listen early in a week for potential changes in the fishing schedule for the Togiak Section. By July 10th, the cumulative escapement past the towers was over 31,000 sockeye and the total catch was over 237,000 sockeye salmon (based on preliminary catch reports). Based on the performance of the commercial fleet and the higher than expected counts at the counting towers, the fishing schedule was not adjusted and closed as scheduled on Saturday, July 12.

As with the previous week, when fishing commenced on Monday July 14th, the Kulukak Section was reduced to 48 hours and the Togiak Section was on “stand-by”. By the afternoon of July 17, escapement past the towers on the Togiak River was over 80,000 sockeye and catch was reported to be over 451,000. Both catch and escapement were still well ahead of expected levels. However, due to early run timing experienced in several other districts of the bay it was prudent to leave the fishing schedule unadjusted. On July 17th the fishing schedule changes, by regulation, to close at 9 a.m. Friday for the remainder of the season unless otherwise adjusted. Therefore, the Togiak River Section closed on Friday, July 18th.

On July 21st the Kulukak Section was further reduced to 24 hours because of the dramatic increase in effort in the Togiak District. Fishers were once again, advised to “stand-by” for adjustment to the schedule in the Togiak River Section to be announced. Three very strong pulses of escapement were experienced on July 21st, 22nd, and 23rd increasing the escapement dramatically to almost 173,000 fish. These three days of escapement comprised 39% of the cumulative escapement by July 23. On the morning of July 23rd, when escapement was over 149,000 sockeye, the Togiak River section was extended 48 hours, the maximum allowable extension to Sunday, July 27.

The Togiak District opened to all permit holders on July 24 and although there seemed to be a lot of interest in fishing there, deliveries did not increase. There are no requirements for registration after the 24th of July so increased effort is difficult to assess. There was a feeling that perhaps, since so many fish had been caught already, many of the local fleet were tired and therefore, not fishing.

Fishing reopened on July 28th in all sections but Kulukak, which remained closed for the remainder of the season. The Togiak Section was again extended 48 hours, until Sunday, August 3rd. Weekly catch

was 62,170 bringing the cumulative harvest through the last week of July to over 620,000. Final escapement for the season at the counting towers below Togiak Lake was 232,302 sockeye salmon on August 3rd when tower operation ceased. (Table 22).

The fishing schedule for the week of August 4th was extended 48 hours, closing on August 10th. Catch for the week was 13,500 sockeye salmon as effort declined dramatically. All but one processor had withdrawn from buying by this time. The Osviak, Matogak, and Cape Peirce Sections of the Togiak District were closed for the remainder of the season.

The final week of fishing was set for the regular fishing schedule, opening on August 11th but closed early on the 13th when the last remaining market withdrew. Harvest for the final week of fishing in the Togiak District was 650 bringing the total sockeye harvest for the Togiak District to 706,000 fish 275% of the preseason forecast.

There was no directed coho fishery in the Togiak District this year. Parent year escapement in 1999 was based on incomplete aerial survey data. Final operations reports from processors indicated that there were 961 coho salmon caught by the last day of fishing, August 13. Due to poor survey conditions the Togiak District was not surveyed to assess coho escapement in 2003.

The 2003 sockeye harvest in the Togiak District was the fifth highest in the past 20 years (Appendix Table 4); the total sockeye salmon run also ranked 5th among the last 20 years (Appendix Table 18). Commercial chinook harvest was 34% of the 10-year average, while harvest of chum and coho were 45% and 4% respectively of the 10-year averages (Appendix Tables 21, 22, 25). Although aerial surveys to assess escapement on most of the Togiak River could not be performed due to weather, 232,302 sockeye were counted at the towers below Togiak Lake and represent sufficient escapement. The Kulukak River experienced an escapement of 8,004 sockeye, which is above the 20-year average for that system. Only partial aerial surveys were performed for chinook salmon, therefore, escapement is difficult to assess. However, continued decline in catch and anecdotal reports warrant a continued conservative management strategy. Although only partial surveys were conducted for chum salmon, 30,090 fish were enumerated. Coho salmon escapement surveys were only partially completed in 2003. These surveys viewed 4,830, 4,860 and 2,040 for the Kulukak, Matogak, and Quigmy Rivers respectively.

2003 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 2003, 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 2003, gillnet lengths were limited to 10 fathoms in the Naknek, Egegik, and Ugashik rivers, Dillingham beaches, and within the Nushagak commercial district during emergency openings. Up to 25 fathoms could be used in the remaining areas, except that nets were limited to 5 fathoms in the special “redfish” harvest areas in the Naknek District.

In Dillingham and the Naknek, Egegik, and Ugashik rivers, subsistence fishing was limited to several fishing periods per week during the peak of the sockeye run. All commercial districts were open for subsistence fishing during commercial openings. In addition, all commercial districts were open for subsistence fishing in May and September, from Monday to Friday. In recent years, declining chinook and coho stocks resulted in longer commercial closures and some residents had an increasingly difficult time obtaining fish for home use. The Nushagak commercial district, starting in 1988, has been opened for subsistence fishing by emergency order during extended commercial closures.

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

The Alaska Department of Fish and Game has continued to issue Bristol Bay subsistence salmon permits to any Alaska resident who requests one. However, the department informs permit applicants that unless they live in one of the above-named communities or have a 13.44 permit, they need to take this NPS closure into account when they subsistence fish in waters of the park and preserve. The department also informs permittees that waters outside of national park and preserve boundaries remain open for subsistence salmon fishing to all permit holders.

Inseason Management

Due to extended closures to the commercial fishery in the Nushagak commercial fishing district, an emergency order opened the Nushagak commercial fishing district to subsistence salmon harvesting on 12:01 a.m. June 1, 2003. The commercial district was closed by emergency order to subsistence salmon fishing, except during commercial openings, effective 11:59 p.m. June 12. The commercial district was reopened to subsistence fishing effective 12:01 a.m. June 14 and closed, except during commercial openings, at 11:59 p.m. on June 18, and again at 1:00 p.m. June 20 until 12:01 a.m. June 22. Because a

directed commercial coho salmon fishery was not expected, the Nushagak commercial fishing district was opened by emergency order to subsistence salmon fishing beginning 12 noon July 23 until further notice.

Effective 9:00 a.m. July 11, 2003, an emergency order removed the three 24-hour periods per week restriction on subsistence fishing on the local Dillingham beaches and restored the 7 days per week subsistence fishing schedule. This was due to strong returns of sockeye salmon to the Wood and Nushagak rivers and a strong return of chinook salmon to the Nushagak River.

Due to an extended closure to the commercial salmon fishery in the Togiak District, the commercial fishing district was opened to subsistence fishing by emergency order from 9:00 p.m. June 19 until 9:00 p.m. June 22, 2003, and again from 9:00 p.m. June 26 until 9:00 p.m. June 29. Because of another extended closure to commercial salmon fishing in the Togiak District, an emergency order opened subsistence fishing within the commercial fishing district from 9:00 a.m. August 14 until October 31, 2003.

An emergency order opened the Naknek Section of the Naknek/Kvichak District and the Naknek River to subsistence fishing for three 24-hour periods per week, from 9 a.m. Saturdays until 9 a.m. Sundays, from 9 a.m. Mondays to 9 a.m. Tuesdays, and from 9 a.m. Wednesdays until 9 a.m. Thursdays, effective 9 a.m. Saturday June 28, 2003. 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. This emergency order also increased the Naknek River subsistence fishery to the same 3-day schedule as the Naknek Section.

In the Egegik District, an additional subsistence fishing period was opened by emergency order at 12:00 p.m. on June 13 until 5:00 p.m. June 20. The department had been informed that some Egegik residents were having difficulty obtaining subsistence fishing locations within the district when the commercial fishery was open. These emergency orders provided subsistence fishing time during a commercial closure. Additional subsistence openings in the Egegik District were established by emergency orders from 4:00 p.m. June 22 until 7:00 p.m. June 23; from 7:00 p.m. June 23 until 8:00 p.m. June 24; from 8:00 p.m. June 24 until 8:00 p.m. June 25; from 8:30 p.m. on June 27 until 11:30 p.m. June 27; from 9:30 p.m. on June 28 until 9:30 p.m. June 29; from 9:30 p.m. June 29 until 9:30 a.m. June 30; and from 7:00 p.m. June 30 until 12:30 p.m. July 3.

Effective 3 p.m. on June 23 until 9:00 p.m. on June 27, 2003, an emergency order opened the Ugashik District to subsistence salmon fishing while the district was closed to commercial fishing. The department had been informed that it was difficult for some elders to travel outside the commercial district from their fish camps in Ugashik.

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 2003, a total of 1,182 permits were issued for the Bristol Bay Management Area, and of these, 1,058 (89.5 percent) were returned to the Department with harvest data (Table 33). The largest number of permits were issued for the Nushagak (527 permits) and Naknek/Kvichak (489 permits) districts. For the Nushagak District more permits were issued in 2003 than the long-term 20-year average (483), due in part to permits being available to all state residents since 1990. Compared to the previous five years, however, the number of permits issued was down for the Nushagak District, except for 2002 when 520 permits were issued. Fewer permits were issued in the Naknek/Kvichak district in 2002 (471) and 2003 (489) 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. Slightly more permits were issued for the Egegik District in 2003 (62) compared to the average for the past 10 years (49), while the number issued in the Ugashik District (23) was lower than the recent ten-year average (27). The number of permits issued for the Togiak District in 2003 was 92, considerably higher than recent averages (44 permits on average for 1993 – 2002) (Appendix Table 30). As in 2001 (when 92 permits were issued) in 2003, permit data for the Togiak District were supplemented by post-season household surveys conducted by the Division of Subsistence. Of all Bristol Bay Area subsistence permits issued in 2003, 998 (84.3 percent) were issued to residents of Bristol Bay communities, and 184 (15.7 percent) were issued to other Alaska residents.

Harvest

The estimated total Bristol Bay subsistence salmon harvest in 2003 was 131,667 fish (Table 33). This number was up substantially from the 109,587 salmon estimated for 2002. The 2003 harvest was 5.3% below the recent 10-year average of 138,980 salmon and about 16.1% below the recent 20-year average of 156,940 salmon.

The area-wide chinook harvest of 21,231 salmon was up notably from the 12,936 chinook estimated for 2002, and is the highest estimate for chinook salmon since 1975, the first year for which reliable area-wide records of Bristol Bay subsistence salmon harvests are available. (The previous record chinook salmon harvest was 20,787 salmon in 1993.) The area-wide harvest of 95,690 sockeye salmon was up from the 2002 estimate of 81,088 sockeye (which was the lowest estimated harvest since 1973). The 2003 sockeye harvest was 12.0% below the recent 10-year average of 108,751 sockeyes. Compared to recent 10-year averages, subsistence harvests of pink salmon were also down in 2003 (returns of pink salmon to Bristol Bay are lower in odd-numbered years than in even-numbered years), while chum and coho harvests were slightly higher (Appendix Table 30).

In 2003, the Bristol Bay subsistence salmon harvest was composed of 72.7% sockeye, 16.1% chinook, 4.5% chum, 0.8% pink, and 5.9% coho salmon. Of the entire Bristol Bay Area subsistence salmon

harvest in 2003, residents of Bristol Bay communities harvested 120,629 salmon (91.6%), and other Alaska residents harvested 11,039 salmon (8.4%).

In 2003 as over the last several decades, most of the Bristol Bay Area subsistence harvest was taken in the Naknek/Kvichak (48.6%) and the Nushagak (41.8%) districts. The Naknek/Kvichak total harvest of 63,934 salmon was up from 2002, when the harvest was 56,632 salmon. However, the 2003 subsistence salmon harvest in this district was 21.8% below the recent 10-year average of 81,715 fish (Appendix Table 31).

In 2003, Kvichak drainage residents, and other permit holders fishing in the Kvichak drainage portion of the Naknek/Kvichak District, harvested an estimated 38,495 sockeye salmon, compared to a recent 10-year average of 52,170 sockeyes and a 20-year average of 65,057 sockeyes. The 2003 subsistence harvest of sockeye salmon in the Kvichak drainage was up slightly from 2001 and 2002, but was still well below historic levels. Of Kvichak drainage communities, estimated sockeye harvests were substantially lower at Levelock, Igiugig, Pedro Bay, Nondalton and Port Alsworth compared to recent 10-year averages, and somewhat lower at Kokhanok and Iliamna/Newhalen, although the estimated sockeye salmon harvest in the latter community was the highest since 1999 (Appendix Table 31). The number of permits issued to households with Port Alsworth addresses was 23 in 2003 (and 22 in 2002), down from 30 in 2001 and 37 in 2000. This may be the result of seasonal Port Alsworth residents not obtaining permits because of the NPS prohibition against subsistence fishing in Lake Clark by non-local residents (see above). Sockeye salmon harvests by Port Alsworth subsistence permit holders in 2003 totaled 1,370 fish, compared to a recent 10-year average of 2,815 sockeyes. The number of permits issued to households with non-Kvichak drainage addresses dropped in 2003 to 24, compared to 33 in 2002, 37 in 2001, and 48 in 2000, and the sockeye salmon harvest by these permittees fell to 1,591 fish compared to a recent 10-year average of 2,758 sockeye salmon (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 2003 was 55,076 salmon, the highest estimate since 1992. The recent 10-year average is 47,796 salmon. The Nushagak chinook harvest in 2003 of 18,686 far exceeded the recent 10-year average of 13,299 chinook and is the highest estimate on record. The sockeye harvest in the Nushagak District of 25,491 in 2003 was about the same as 10-year average (25,319) but below the 20-year average (31,256) (Appendix Table 30). In 2003, subsistence salmon harvests in most Nushagak District communities, with the exception of Ekwok, were up compared to recent years. Most notably, the estimated subsistence harvest of 10,817 salmon by New Stuyahok residents exceeded both the recent 10-year and 20-year averages, and was the highest estimated harvest for that community since 1993 (Appendix Table 32).

The estimated total subsistence salmon harvest for the Togiak District in 2003 of 7,428 fish was higher than both the recent 10-year average (4,082) and the 20-year average (5,114), and was the highest estimated subsistence salmon harvest for this district since 1984. This likely reflects at least in part the more complete participation in the harvest assessment program by local residents as a result of the post-season household surveys conducted in Togiak and Twin Hills. The estimated subsistence harvest in the Ugashik District in 2003 was 1,567, lower than the 10-year average of 2,123. In the Egegik District, the estimated subsistence salmon harvest of 3,663 was up from the estimate of 2,359 salmon for 2002 and was higher than the recent ten-year average of 3,250 salmon (Appendix Table 30).

2003

BRISTOL BAY

HERRING

FISHERY

INTRODUCTION

This report reviews stock assessment activities, provides an overview of the Togiak District herring fishery from 1978 to 2002 and summarizes the 2003 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 Constantine, 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.

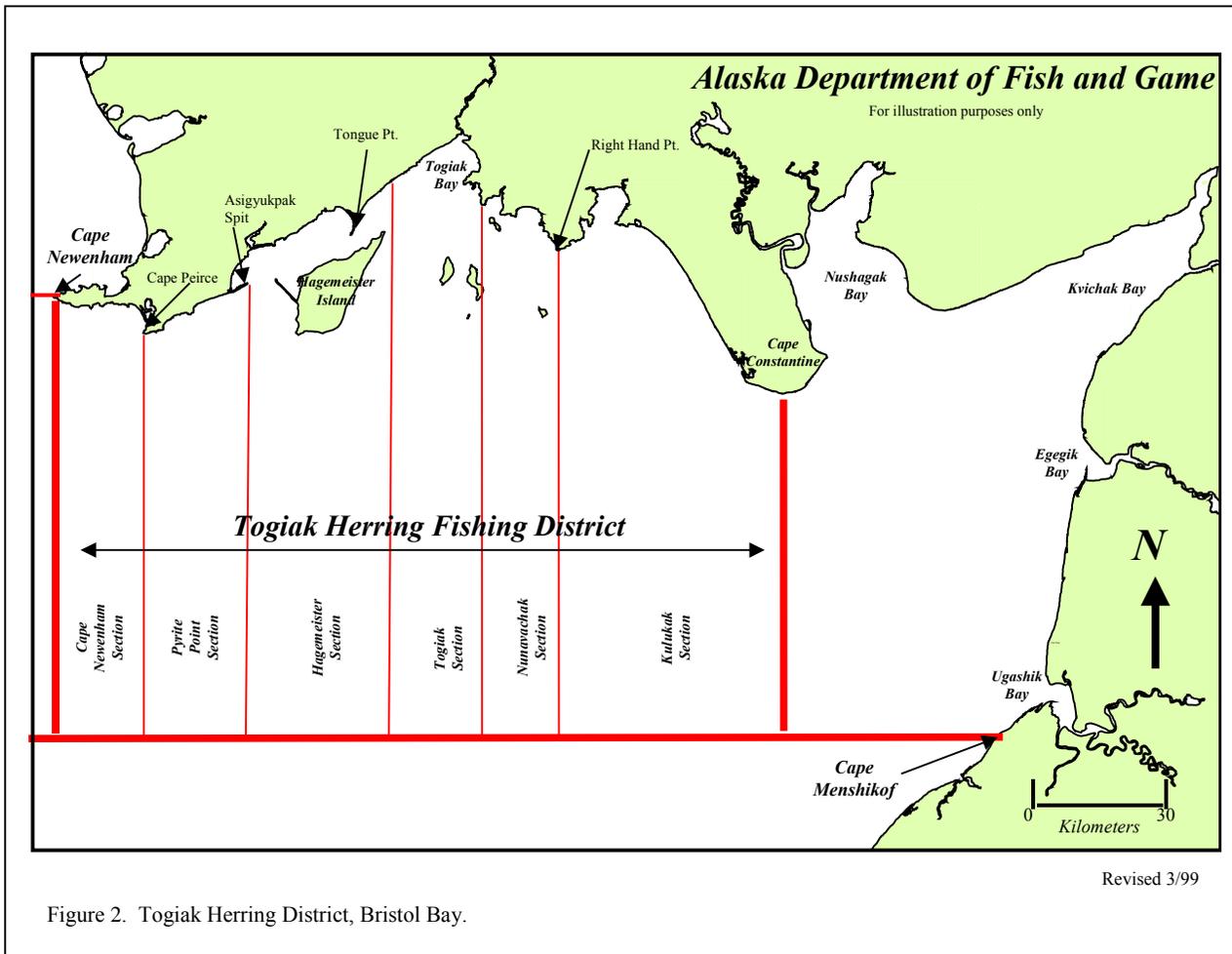


Figure 2. Togiak Herring District, Bristol Bay.

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

The herring sac roe fishery began in the 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 1983 to 2002, sac roe harvests averaged approximately 20,000 tons, worth an average of \$7.9 million annually. Spawn-on-kelp harvests, which have occurred in only 6 of the last 10 years, have averaged 370,000 lbs., worth about \$281,000 to permit holders (Appendix Tables 38 & 39). In 2003, sac roe harvests brought \$3.2 million to permit holders, the highest value since 2000. A spawn-on-kelp fishery occurred but harvest was small and the value was below \$10,000.

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 commercial fishing is completed.

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 ft² 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 sometimes used to revise biomass estimates.

Spawning Population

The status of the Togiak herring population is considered to be stable. Annual biomass estimates range from 83,000 tons in 1991 to 193,800 tons estimated in 1993 (Appendix Table 37). 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 estimated after the 2003 season.

From 1983 to 2003, herring were generally first observed in the district in early May, but were observed entering near shore areas as early as April 19 and as late as June 3. Biomass typically increases rapidly and peaks within 1 to 7 days of the first observation. In recent years, it has been difficult to get good surveys during the peak of the harvest; in 2002, the peak survey occurred after the fishery was completed. The herring run appears to be more protracted with lower peak biomass estimates but more herring around for a longer period of time. Except for three years, spawn was first observed any time within 3 days of the first herring observation. Spawning trends differ slightly from those observed for biomass, spawning in all but 2 years accelerated rapidly, peaked from 1 to 4 days after the first occurrence of spawn, spawning continued for a month generally but in less intense spot spawns. 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-9 herring in the 2003 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 in a given year, but other factors also influence fleet size. Since the majority of herring permit holders in Togiak participate in other fisheries like Bristol Bay salmon, the health of the salmon market and markets for other fish indirectly affect effort in the herring fishery. Herring prices paid to permit holders the prior year and run timing also affect effort. In the last three years processors

have developed cooperative fleets for the purse seine fishery. Processors in conjunction with the coop members exclude entrants into the fishery. This is beginning to happen in the gillnet fleet as well.

Fishing effort in the sac roe fishery increased through the late 1980's, decreased early in the 1990's, then increased again to a peak in 1996 and has declined since 1997 (Appendix Table 35). Gillnet effort increased to 300 vessels in 1989, declined to a low of 75 vessels in 1993, and then peaked in 1996 with 461 vessels and has since declined to a low in 2003 of 75. Purse seine effort increased steadily from 1978 through 1989, when 310 vessels were observed. From 1990 to 1997, the purse seine fleet has fluctuated between 200 and 300 vessels, and has declined to less than 100 vessels since 1998. In 2003, the total number of purse seines was 35, an all-time low.

Reduction in fleet size has led to the development of cooperative seine fisheries that focus on fish with high quality roe rather than on quantity. Reduced fleet size has led to changes in the way the fishery is managed; because fishing is less aggressive, managers can allow 12 hour openings leading to increased selectivity and smaller sets.

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. From 1987 through 1997, 16 to 22 companies have purchased herring or spawn-on-kelp in Togiak. Over the past 6 years, industry participation has steadily declined to a low in 2003 of 7 companies. Processing capacity on the grounds has also declined from a high of 4,850 tons per day in 1996 to a low in 2003 of 1,920 tons per day.

Gear Specifications

The Alaska Board of Fisheries has reduced gear to limit harvesting capacity and control problems with waste. Prior to 1989, gillnet length was restricted to 150 fathoms. Each permit holder was restricted to the use of one legal limit of gear, but up to 300 fathoms could be operated from a fishing vessel. Under these gear allowances, lost and abandoned nets accounted for substantial amounts of waste during some years. In 1989, the Board reduced the legal compliment of gillnet gear to a maximum of 100 fathoms in length per permit holder, restricted the operation from one vessel to 100 fathoms, and granted the department the authority to reduce length to 50 fathoms inseason. The Board transposed this regulation in 1992 when it restricted herring gillnet length to 50 fathoms but granted the department the ability to allow up to 100 fathoms of gear by emergency order. This change enabled the department to maintain an orderly fishery, helping ensure roe quality and minimizing potential waste. Gillnet depth remains unrestricted.

In October of 1989, the Board reduced purse seines to 100 fathoms in length and 16 fathoms in depth. In 1995, the Board further restricted purse seine depth to 625 meshes, of which 600 could be no larger than one and one-half inches. Depth was reduced in 1995 to control harvesting capacity. Adjustments in allowable gear have appeared to control waste and preserve order in the fishery without a substantial reduction in harvesting capacity.

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 through 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.

The average annual exploitation rate for the last 20 years slightly exceeded 20% but for the last 10 years has been 18.8% (Appendix Table 34). Annual exploitation ranged from 32% to 13.5% and hasn't exceeded 20% since 1998. 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.

Development of test fishing procedure sped the availability of results, reduced time required between test fishing and opening an area to commercial fishing, and helped ensure high roe quality in harvests.

Average mature roe percentage increased from a ten-year average of 9.45% (1984-1993) to 10.04% (1994-2003). However, average mature roe for the last three years declined to 9.96%. There is some indication the recent downturn in roe percentage of purse seine caught herring is due to increased post-season scrutiny. The inseason roe percentages have been much higher, but final percentages have been much lower.

As an indirect result of test fishing procedures, gillnet harvest area was gradually reduced in the late 1980's and early 1990's due to lack of successful test fishing or poor quality results in some areas of the district. From 1994 through 1997, gillnet fishing was opened almost exclusively in the area between Right Hand Point and Kulukak Bay. This reduction in area heightened competition among the gillnet fleet, especially during 1996 and 1997, when fishing effort was high. Since 1997, attempts have been made by management staff to spread gillnet harvest out to include areas west of Right Hand Point. However, it has proven difficult to dislodge the gillnet fleet from the protected anchorage of Metervik Bay not only to participate in test fisheries but even to fish in a commercial gillnet period.

Although average mature roe for gillnets has increased from 8.57% (1984-1993) to 11.4% (1994-2003), purse seine average mature roe has decreased from 9.69% (1984-1993) to 9.4% (1994-2003). Gillnet-caught herring quality rose sharply in 1993 and has remained high since 1993. Although some of this difference may be attributed to management efforts, most is due to an apparent shift to larger gillnet mesh sizes. Prior to 1993, gillnets with mesh sizes smaller than three inches (stretched) were common. Gillnets with 3-inch mesh and larger have since become standard gear. This shift to large-mesh gillnets appears to have increased the percentage of female herring caught by herring gillnets from 46.3% (1984-1993) to 58.5% (1994-2003).

In 1992, over 20,000 tons of herring were harvested by purse seines in one 20-minute period. This magnitude of harvest from a single opening, combined with a limited processing capacity, resulted in holding times up to seven days, and large-scale deterioration of flesh and roe quality. The poor product quality resulting from the 1992 harvest and increasing market demands for high quality roe, compelled the department to recognize quality problems associated with extended holding times of 3 days or longer. Limiting individual harvests not to exceed 3 days of processing capabilities became a management objective after 1992.

From 1992 until 2000 the department limited harvests by carefully controlling the open area and duration of each purse seine opening. Since 2000, the fishery has become much more self regulating in that processors have smaller fleets and are much more restrictive about how long they will hold herring before processing. The reduced processing capacity makes it impossible for the whole quota to be processed in less than ten days. In the 2003 herring fishery, there were nine 12-hour openings to begin the season. Then, with less than 2000 tons remaining on the quota, the department had two 1-hour openings and a final 10-minute opening. The 110 hours and 10 minutes total fishing time for the purse seine fleet in 2003 contrasts with the 20-minute opening in 1992.

Although controlling harvest used to be the major concern for managers, the last 3 years have been quite different from the olympic style openings of the early 1990's. The seine fleet is now divided into processor controlled cooperative fleets that harvest just enough herring to keep the processing lines full from day to day. This has allowed managers to open large areas of the district for up to 14 hours at a time without the concern of having more fish harvested than processing capacity can handle in a short

time. This is true for most of the fishery, but as the quota is approached managers do have to guard against a large grab.

The cooperative seine fleets allow the participants to maximize the value of the fishery by reducing operating costs and allowing processors to control harvest, enforce a maximum set size and be highly selective in the fish they choose to harvest. This has led to higher inseason estimates of roe quality; postseason estimates have not necessarily increased however.

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 3) 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.

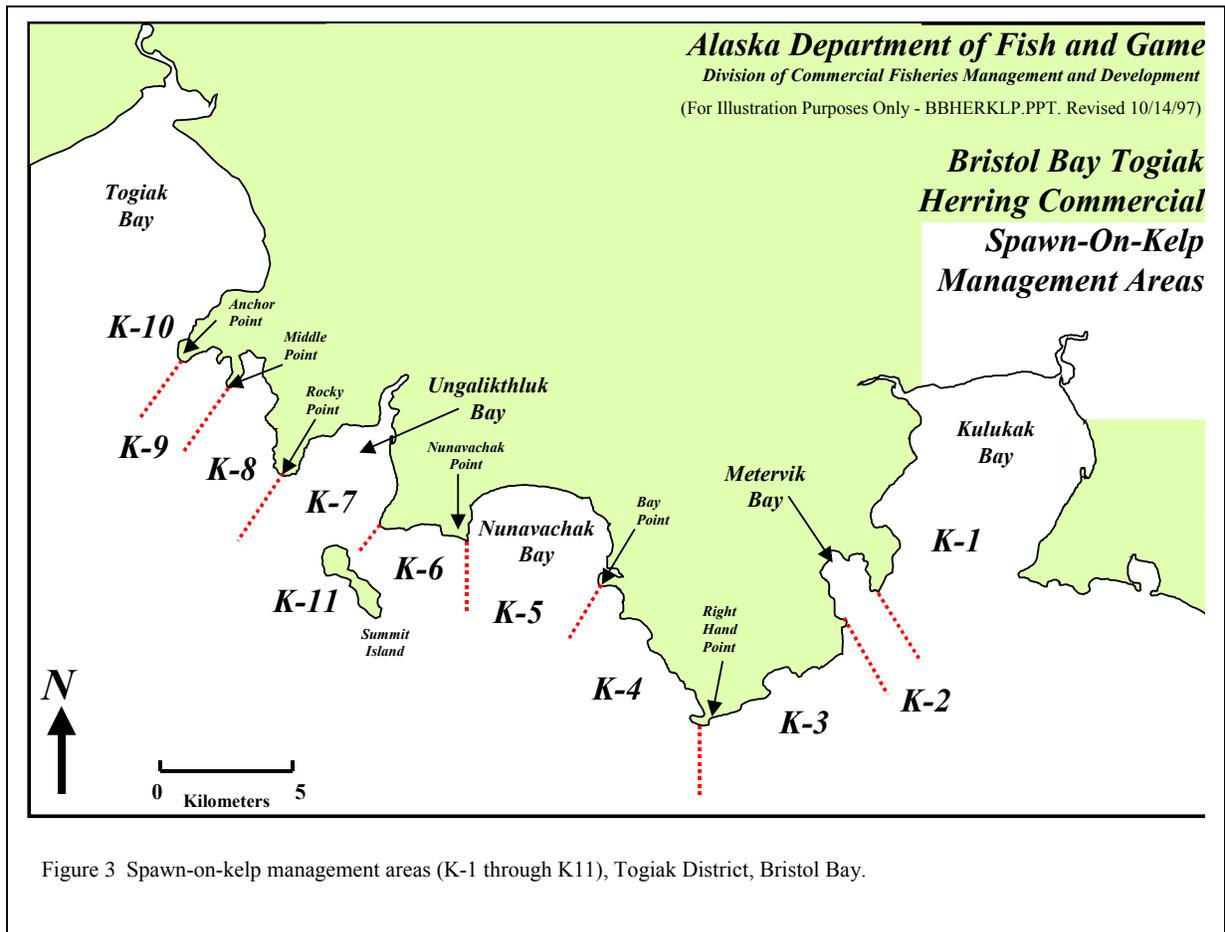


Figure 3 Spawn-on-kelp management areas (K-1 through K11), Togiak District, Bristol Bay.

Fishing effort in the spawn-on-kelp fishery increased steadily since its inception, and peaked at 532 participants in 1991 (Appendix Table 36). 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 2003, 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 by more than 10% in four (Appendix Table 39). For the 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.

2003 SEASON SUMMARY

Biomass Estimation

Aerial surveys of the Togiak District began April 16, 2003. Herring were first documented in the district on the afternoon of April 19, when approximately 100 tons of herring were observed at the northeast tip of Hagemeister Island. Herring were seen in the same location on the following day and were then observed in Ungalikthluk Bay on April 21. The first spawn was observed on April 23 in Ungalikthluk and Togiak Bays, but a complete survey was not possible because of heavy fog covering most of the district. In the few areas where visibility was good, 1,600 tons of herring and 0.6 miles of spawn were observed. Weather prevented a survey on April 24. Department staff deployed to the field office at Togiak Fisheries shoreplant on April 25.

Two aerial surveys were conducted on April 25. Weather and water conditions were poor for both surveys but 19,000 tons of herring were documented during the first survey and 10,000 tons during the second. Additionally, over 6 miles of spawn were documented. Although the threshold biomass of 35,000 tons of herring was not documented due to poor survey conditions, the length of time that herring had been on the grounds (7 days), combined with the amount of spawn that had been documented (6+ miles), managers stipulated that the threshold biomass was present and that commercial fishing could proceed.

Age Composition

Approximately 8,500 herring were sampled for age, size and sex information from April 25 to May 5, 2003. Samples were collected from the commercial purse seine fishery, commercial gillnet fishery, and test purse seine sets. Length frequency analysis, based on the last three years of age at length information, was used to differentiate between age classes.

A sample size totaling 6,500 herring was collected from the commercial purse seine fishery. Age 5-6 herring comprised 42% of the sample, age 7-8 comprised 24% of the sample and age 9+ fish comprised 34% of the sample. Samples collected from the commercial purse seine fishery averaged 357 g. Sex composition was divided 53.0% male and 47.0% female.

A total of 1,550 fish were sampled from the commercial gillnet fishery. Age 5-6 herring comprised 12% of the sample, age 7-8 comprised 35% of the sample and age 9+ herring comprised 53% of the sample. Average weight of herring sampled from the commercial gillnet harvest was 404 g. Sex composition was divided 45.8% male and 54.2% female.

A sample size of 400 fish was collected from the purse seine test fishery. Age 5-6 herring comprised 40% of the sample, age 7-8 comprised 21% of the sample and age 9+ fish comprised 39% of the sample. Samples collected from test purse seine sets averaged 334g. The sex ratio was divided 54.8% male and 45.2% female.

There was a small shift toward younger fish as the season progressed, but because of the extended duration of the commercial openings, these results are difficult to interpret. The relatively long purse seine openings provided the opportunity for purse seine permit holders to seek larger, higher-quality herring. Hence, any real change in the biomass age composition may not have been detected in our sampling efforts.

Sac Roe Fishery

The Togiak District herring fisheries are managed in accordance with the Bristol Bay Herring Management Plan (5 AAC 27.865), which was modified by the Alaska Board of Fisheries in January 2001. The plan specifies a maximum allowable exploitation rate of 20% and allocates the harvestable surplus to those fisheries harvesting the Togiak herring stock. The 2003 preseason forecasted biomass was 126,213 tons. The projected harvest guideline for each fishery was as follows: 1,500 tons herring equivalent or 350,000 lbs. of product for the spawn-on-kelp fishery; 1,662 tons for the Dutch Harbor food and bait fishery; and the remaining 22,081 tons to the sac roe fishery. The management plan was changed in 2001, to specify that the department will manage the sac roe fishery so that 70% of the removal is taken by purse seines (15,457 tons in 2003) and 30% of the removal is taken by gillnets (6,624 tons in 2003). The department's in-season 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. In recent years the seine fleet has been comprised of processor-organized cooperatives. For the 2003 season, management staff again planned to allow long-duration seine openings over a large area of the district and to let the processors limit harvest for their fleet based on processing capacity. Input from the fleet and industry indicated that this would slow the “race for fish” and allow for improved quality and value.

During the winter of 2002 - 2003, climatic conditions were abnormally warm; there was very little snowfall in southwestern Alaska and the ground was virtually snow free by the time of the first survey on April 16. The Bering Sea ice pack had receded north of Cape Newenham by mid-March, and there were large areas of 4° C. water in the Bering Sea. A cold snap from mid-March to early April cooled water temperatures and created some ice in the nearshore waters. By mid-April, the temperature had increased again and there was no ice observed during the first survey. These factors indicated an early arrival of herring in the Togiak District, but managers were unsure how early that arrival might be. A temperature model based on April mean air temperatures from Cape Newenham, and used by the department to predict spawning timing for Togiak herring, projected that the first spawn of one mile or greater would occur on April 29.

Department staff polled processing companies preseason to assess processing capacity for the 2003 season and to inquire about additional concerns or issues. The poll indicated that one less company would be participating in the 2003 Togiak herring fishery but processing capacity was estimated to be 1,975 tons per day, a slight increase. Although there were no major concerns preseason, department staff held a teleconference on March 27 to discuss the coming season with processing companies and permit holders. Department staff received input from teleconference participants on 12-hour seine openings versus 4-hour openings with extensions. There was also a request to allow processors to register by fax instead of in person. The greatest concern expressed by stakeholders regarded what would happen if the gillnet fleet was unable to keep up with the seine fleet in harvesting their allocation.

Company registration for processors intending to buy herring and/or spawn-on-kelp product in the Togiak District began on April 16 by fax. Several companies registered by fax this year and no problems were reported. Registration continued by fax and in person until seven companies had registered. Of the seven companies, all registered for the sac roe fishery and one also registered for spawn-on-kelp. Based on information supplied by companies upon registration in Togiak, industry had the ability to process 1,920 tons of sac roe herring each day. Processing capacity in 2003 showed no change from the previous season even though one less company participated in the fishery. As was the case last year, 1,920 tons of daily processing capacity is 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 enabling the fishery to harvest the guideline for each gear group.

Purse Seine

Test fishing with purse seines began on the afternoon of April 25; attempts to begin earlier were unsuccessful because there were no roe technicians on the grounds to sample fish and only one or two

vessels capable of making sets. The small fleet size and lack of spotter support slowed test-fishing operations. Test sets made on April 25 in Nunavachak Bay contained a number of herring that had already spawned. On the morning of Saturday April 26, two sets by Oosik (Asigyukpak) Spit captured herring with 10 and 12% mature roe. With commercial quality herring available in the Togiak District and the threshold biomass stipulated to, a commercial opening was warranted.

The first commercial purse seine opening of the 2003 season was set for 12 hours, from 10:00 a.m. until 10:00 p.m. on April 26. The open area was from Oosik Spit to Togiak Reef. In a 4:30 p.m. announcement, the open area was expanded westward to include the area from Oosik Spit to Cape Newenham. This mid-period expansion was in response to herring seen in the closed area that managers thought should be available to harvest. The harvest from the first seine opening was 1,186 tons of herring from 28 deliveries with an average weight of 396 grams and an average roe content of 10.4%.

For the next seven days, the seine fleet fished from 8:30 a.m. until 8:30 p.m. daily. The open area was from Cape Newenham to Togiak Reef and from the east entrance of Ungalikthluk Bay to Right Hand Point in six of the seven openings. This “wide-open” fishing schedule allowed the seine fleet time to search for quality herring. In some cases, boats would jig on fish, to test for quality and size, before setting. In other cases several companies sampled fish from one set so all companies would be able to obtain information about herring in a specific area from one set. This kind of cooperation probably reduced the number of sets made and also the number of sets released.

Feedback from several companies indicated that the long openings allowed them to take their time harvesting herring through the whole period. They did not have to rush and harvest fish in the morning because they knew they would have time in the evening to make sets. This increased product quality by allowing smaller sets to be made, which reduced damage to roe. It also allowed processors to minimize holding time for herring by harvesting them late in the day.

From April 26 until May 2 the fishery progressed well. Fleet size increased for the first few days from two seine vessels on April 25 to 35 seine vessels on May 1. The daily harvest, average weight, and roe content varied from day to day but remained high (Table 30). The pre-season forecast projected an average fish size of 291 grams. With the amount of spawn seen early, warm air and water temperatures, managers expected fish size to decrease, but average fish size remained >350 g throughout the fishery.

The fishery, which started in the western portion of the district on April 26, expanded to the eastern portion of the district in the area from Right Hand Point to Ungalikthluk Bay on April 27. Herring in the eastern and western portion of the district were harvested for the next several days. On May 3, the open area was reduced to exclude the area in the eastern portion of the district from Right Hand Point to Ungalikthluk Bay. This action was taken because no fish had been harvested from that portion of the district since April 29 due to smaller, younger herring being present.

After eight purse seine openings totaling 96 hours of fishing, 76% of the seine quota had been harvested. Instead of announcing the next day’s fishing period at 6:30 p.m. on May 3, managers waited until the following morning to evaluate harvest. On the morning of May 4, based on the evaluation of the remaining quota, another 12-hour period was announced from 10:00 a.m. until 10:00 p.m. Harvest was 1,637 tons of herring from 44 deliveries, with an average size of 385 grams and an average roe content

of 10.66%. This brought the total harvest to 13,370 tons or 87% of the preseason guideline harvest level (GHL). This harvest also put the seine fleet ahead of the 30/70 allocation level by 0.7%.

On Monday, May 5, catch reports indicated the seine fleet was ahead of the allocation and the gillnet fishery appeared to have slowed substantially. The gillnet fleet had harvested only 68 tons of herring in a 12 hour period on Sunday, May 4. Managers decided that another seine opening was not warranted until the gillnet fleet was able to harvest additional herring from their allocation. There was no purse seine opening on Monday, May 5; the seine fleet stood by to see what the gillnet fleet caught.

The next day, May 6, it was determined that gillnet harvest rate was sufficient to warrant another seine opening. With the capability of the seine fleet to harvest herring and the availability of tenders to hold several thousand tons, staff concluded that a 12-hour period was not warranted. Due to poor weather, managers abandoned a plan to hold a beach meeting on Tuesday morning with fishery stakeholders. Managers had hoped to discuss the possibility of a cooperative harvest plan to assure that the GHL would not be exceeded. With no cooperative management plan in place, managers announced an opening for the afternoon between Oosik Spit and Tongue Point with the final area and duration of the opening to be announced later.

When managers flew a survey to assess biomass for determination of the area and period duration, low ceilings and poor visibility severely limited the ability to make an assessment. The decision was made to allow a one-hour opening over the entire area. This opening, PS 10, resulted in a harvest of 100 tons. Another one hour opening was announced for 8:00 p.m., the evening of May 6, with the open area expanded to Cape Peirce. When the results of PS 11 were tabulated the harvest totaled 193 tons. This made the total seine harvest 13,663 tons or 88% of the GHL.

On the morning of May 7, managers decided to move the fleet east and assess the area between Ungalikthluk Bay and Kulukak Bay for a possible opening later in the day. After a morning survey under very poor conditions and a 300-foot ceiling, managers determined there was sufficient biomass available to allow an opening. Because of the poor spotting conditions, the entire area was left open, but with the only visible fish in Nunavachak Bay, it seemed likely that most of the effort would be concentrated there. Poor weather prevented staff from surveying to determine an appropriate duration for the period. With only limited information available from the morning survey and a few spotter reports, managers decided that a short opening was prudent. The period duration was set at 10 minutes.

The harvest from the 10-minute, PS 12, opening was 1,088 tons from 25 deliveries. The fish harvested averaged 334 grams and had an average roe content of 10.5%. This brought the total seine harvest to 14,751 tons, approximately 95.4% of the GHL. With just over 700 tons of the GHL left, managers decided another opening was not warranted. Since the fleet was able to harvest close to 1,100 tons in 10 minutes with poor conditions, it seemed likely that another opening would result in exceeding the GHL. Managers, therefore, decided to close the 2003 Togiak sac-roe herring seine fishery.

In 2003, there were 12 purse seine openings for a total fishing time of 110 hours and 10 minutes. The total harvest was 15,158 tons of herring with an overall average roe content of 8.9% and an overall average size of 362 grams. The harvest was 98.0% of the preseason GHL and the seine fleet harvested 69% of the total catch. The peak vessel count was 35 seine vessels.

Examination of the total number of sets made each year showed a declining trend (Figure 4). This is likely a result of fewer permit holders participating in the fishery as its value has decreased. For 2001-2003 the total number of sets made was calculated by adding the number of deliveries to the number of released sets. For years prior to 2001, data on released sets is not available. Inclusion of this information would only increase the total number of sets made. The main point is that the use of cooperative fleets and increased fishing time has not resulted in an increase in the total number of sets made.

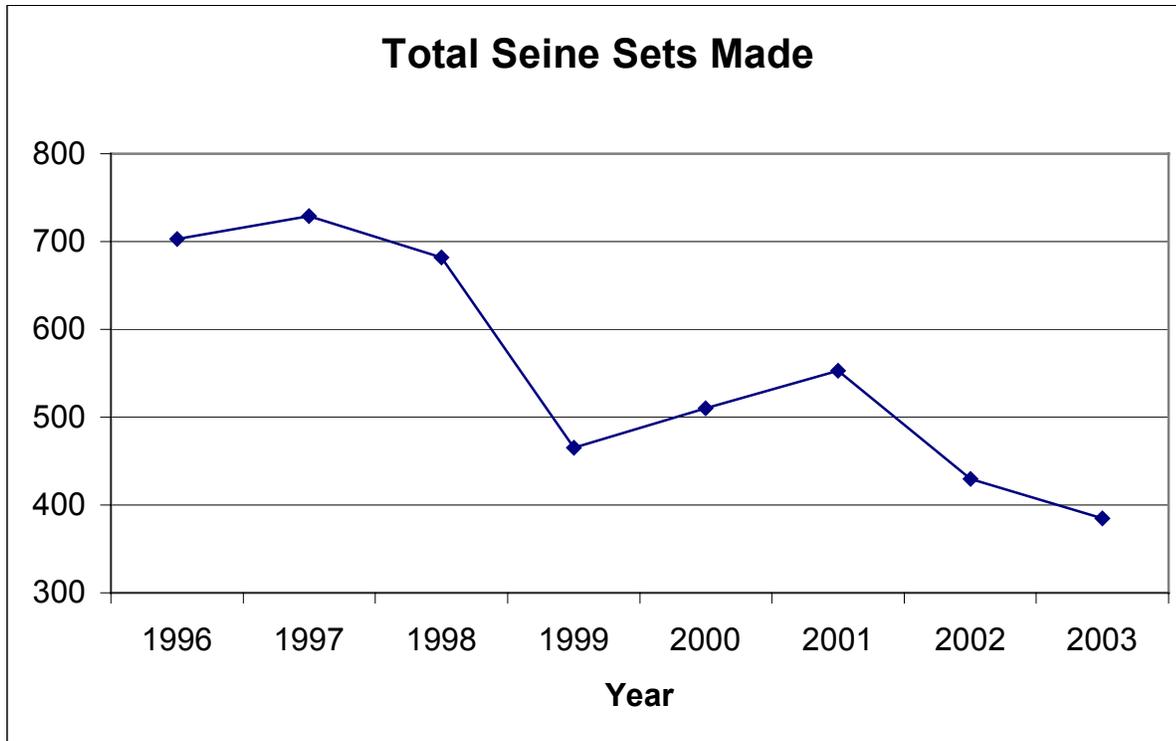


Figure 4. Number of purse seine sets made annually 1996-2003.

Gillnet

Gillnet test fishing was conducted beginning April 25, collecting information on roe maturity in the area between Metervik Bay and Right Hand Point. The test fishery samples obtained averaged 11.78% mature roe. The first commercial gillnet opening for the 2003 Togiak sac roe herring fishery began on the evening of April 25 at 6:30 p.m. and, after an extension, lasted ten hours. The open area was from Right Hand Point to the West Metervik Bay marker. The harvest from this period was small with only 122 tons of 9.8% mature roe herring harvested. One reason for the small harvest was low participation. Only seven vessels were observed participating in the fishery during an aerial survey. Although more vessels arrived during the opening, only 14 deliveries were reported.

The first gillnet opening closed at 4:30 a.m. on April 26. Managers wanted to increase the open area for the next gillnet period but test fish samples from the Kulukak Bay area were needed before opening it to commercial fishing. After test fish samples indicating quality herring were available in the Kulukak

Bluffs area (mature roe percentages of 13.6, 12.4 and 10.1%) were obtained, another commercial herring opening was announced. Gillnet period 2 began at 11:30 a.m. on April 26 in the area from Right Hand Point to Egg Island in Kulukak Bay. After mid-period reports indicated quality fish were being caught, the period in progress was extended until 10:30 p.m. making the total fishing time 11 hours.

Eighty-five deliveries and a harvest of 865 tons of herring were reported for the second gillnet period. The quality improved to 10.8% average roe content and average size was 442 grams. Department staff counted 37 gillnet vessels on April 26. This number increased to 76 vessels on April 30.

Preseason, there had been some concern that the gillnet fleet would not be able to harvest herring at a rate that would keep pace with the seine fleet relative to allocation percentages. These concerns prompted managers to fish aggressively early with the gillnet fleet. This aggressive management included extensions to most periods and fishing the entire season with 100 fathoms of gear. The third opening was no exception, originally scheduled for 6 hours it was extended for nine additional hours, for a total of 15 hours fishing time.

Gillnet period 3 resulted in the largest single period harvest of the season, 1,211 tons of herring in 133 deliveries. Average fish size remained high at 440 grams and 10.9% average roe content. Fishing continued with a fourth gillnet opening on April 28, a 6-hour period with a 9-hour extension. Catch rates slowed during this period and the harvest was only 666 tons of herring.

After a 6-hour period on the morning of April 29, mid-period reports indicated mixed fish (mature and spawned out herring) were being caught and quality was dropping. Managers let gillnet period 5 close as scheduled after only 6 hours. The fleet was asked to conduct test fish operations to evaluate the quality of herring available for harvest. Within a few hours, test fish results indicated commercial quality herring were still present, samples ranged from 10.35% - 12.4% mature roe. Although final harvest numbers from GN 5, were not yet available, another gillnet opening was scheduled to begin at 5:00 p.m. and close at 10:00 p.m.

The two gillnet periods of April 29 combined for a harvest of 688 tons of herring with an average roe content of 9.7%. This brought the total gillnet harvest to 3,552 or 54% of the gillnet GHL and gave the gillnet fleet 42% of the total harvest. While managers had wanted to get out ahead of the allocation ratio with the gillnet fleet, the probability of diminishing quality fish in the seine fishery also needed to be considered. With this in mind, managers reduced the fishing time allowed the gillnet fleet for the next several days.

Gillnet period 8, on April 30, was a six-hour opening that was extended for 5 hours. The total harvest after 11 hours of fishing was 472 tons of herring. Mature roe percent improved from the previous day to 10.8% and average weight held fairly steady at 430 grams. The allocation gap narrowed by almost 5% and the gillnet harvest now comprised 37.4% of the total harvest. Fishing continued over the next three days with the fleet harvesting 457, 577, and 415 tons respectively.

After the close of fishing on May 3, weather deteriorated. A six-hour opening was announced for the gillnet fleet for the next day. The gillnet period on May 4 was extended for an additional 6 hours, but the total harvest was just 68 tons of herring. Managers thought this might be the end of the 2003 Togiak

herring gillnet fishery. However, another opening was announced for Monday morning beginning at 6:00 a.m.

Early reports from the May 5 opening were equivocal, but as the day progressed it was apparent that there were still herring to be caught. Catch rates increased and the harvest for the 16 hours of gillnet fishing was 398 tons of herring with 11.4% average roe content. With 685 tons of gillnet fish left in the harvest allocation, another fishing period was announced.

Gillnet period 13 began at 6:00 a.m. on the morning of May 6. At 9:00 a.m., gillnet period 13 was extended for 7.5 hours, from 12 noon until 7:30 p.m. Beginning around 11:00 a.m., managers received reports of excellent fishing in the gillnet fishery. Due to poor weather conditions, a survey of the fishery was not possible. As additional reports of high catches and good quality fish came in, managers reconsidered the decision to extend the fishery for 7.5 hours. In a 2:30 p.m. announcement managers superseded the 9:00 a.m. announcement and announced the closure of the gillnet fishery at 4:00 p.m. When final harvest numbers were tallied, 679 tons of herring were harvested during gillnet period 13. This brought the total harvest to 6,618 tons of the 6,624-ton quota or 99.9%. Managers announced that there would be no further gillnet openings in 2003, and the gillnet fishery closed.

A total of seven companies purchased gillnet sac roe herring; 142 hours of fishing time was allowed for gillnets in the Togiak District during the 2003 season. The season harvest, based on final company reports, totaled 6,505 tons with a weighted average of 10.9% mature roe and an average weight of 423 grams. The peak gillnet vessel count was 76 vessels but during the first several days of the fishery, less than half that number were present on the grounds.

Spawn on Kelp

Only one company registered to purchase spawn-on-kelp in the Togiak District in 2003. The buyer was interested in more product this year, 40 to 80 tons, compared with only 30 tons in 2002.

Surveys of kelp beds were conducted on April 30 and May 2 in units K-3, K-4, K-5, K-8, and K-9. Samples from K-3, the area from Eagle Bay to Right Hand Point, were judged to be of the best quality. The buyer met with ADF&G staff on the morning of May 3 and reported that there was enough marketable kelp available for an opening in that area. Weather conditions had been good for the preceding two weeks but were forecasted to worsen in the near future. Therefore, the opening was set for 11:00 p.m., May 3.

There are 287 permit holders for the Togiak spawn-on-kelp fishery and approximately 62% renewed their permits for 2003. Due to the limited amount of spawn-on-kelp product desired by the buyer and the number of permit holders potentially available to participate in the fishery, the opening was limited to three hours. In 2002, a two-hour opening resulted in a 30-ton harvest at a harvest rate of 220 lbs/person/hour. The additional hour duration of the opening this year was deemed necessary to compensate for the expected reduction in effort; K-3, the open area for the kelp fishery, was much farther from the villages of Togiak and Twin Hills. The additional distance was expected to reduce participation.

The total amount of spawn-on-kelp harvested is confidential since only one processor participated. The lower than expected kelp harvest was likely due to a number of factors. The most favorable tide for kelping this year was well after dark. Additionally, the tide was relatively high (1.9 feet holdover) for kelp picking so much of the kelp was not exposed. The closest minus tide was not for another 1-½ weeks. Another factor that affected the harvest total was the distance between the kelping district and Togiak. Few people from Togiak and Twin Hills were willing to travel to Kulukak for the low price offered resulting in fewer participants.

Exploitation

The 2003 herring fisheries were managed for a maximum exploitation rate of 20% of the preseason forecast. Combining the sac roe harvest (21,663) tons with an average weight of 381 grams and an average roe percentage of 10.5%), spawn-on-kelp harvest (confidential) and, the Dutch Harbor food and bait harvest of 1,487 tons, making the 2003 total herring harvest 23,205 tons. Based on the preseason forecasted biomass of 126,213 tons, the 2003 exploitation rate is calculated at approximately 18.4%.

Exvessel Value

The projected exvessel value of the 2003 Togiak herring fishery is approximately \$3.2 million. This is based on grounds price estimate of \$150 per ton and does not include any post-season adjustments. Since the spawn-on-kelp harvest is confidential, it is not included in the exvessel estimate. A value of \$3.2 million is higher than the last two years but only 82% of the five-year average of \$3.9 million.

LITERATURE CITED

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

TABLES

Table 1. 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, 2003.^a

District and River System	Inshore Run			Escapement		Inshore Catch		
	Forecast	Actual	Percent Deviation ^b	Range	Actual	Projected Harvest	Actual	Percent Deviation ^b
<u>NAKNEK-KVICHAK DISTRICT</u>								
Kvichak River	2,575	1,723	0.49	2,000-10,000	1,687	575	36	14.97
Branch River	780	3,729	-0.79	170-200	3,676	595	53	10.23
Naknek River	3,907	5,091	-0.23	800-1,400	1,831	2,807	3,260	-0.14
Total	7,262	10,543	-0.31	6,970-11,600	7,194	3,977	3,349	0.19
<u>EGEGIK DISTRICT</u>								
	6,510	3,436	0.89	800-1,400	1,152	5,410	2,284	1.37
<u>UGASHIK DISTRICT</u>								
	3,151	2,529	0.25	500-1,200	790	2,301	1,739	0.32
<u>NUSHAGAK DISTRICT</u>								
Wood River	4,374	5,608	-0.22	700-1,500	1,471	3,274	4,137	-0.21
Igushik River	833	1,036	-0.20	150-300	190	608	846	-0.28
Nushagak-Mulchatna	1,521	2,264	-0.33	340-760	581	971	1,683	-0.42
Total	6,728	8,908	-0.24	1,190-2,560	2,242	4,853	6,666	-0.27
<u>TOGIK DISTRICT</u>								
	409	968	-0.58	100-200	262	259	706	-0.63
TOTAL BRISTOL BAY								
	24,060	26,384	-0.09	9,560-16,960	11,640	16,800	14,744	0.14

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

^b Percent deviation = (forecast - actual)/actual.

Table 2. Inshore forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2003.

District and River System	2-Ocean			3-Ocean			Other	Total
	1.2 (1999)	2.2 (1998)	Total	1.3 (1998)	2.3 (1997)	Total		
<u>NAKNEK-KVICHAK DISTRICT</u>								
Kvichak River	1,413	651	2,064	476	35	511	-	2,575
Branch River	589	17	606	156	18	174	-	780
Naknek River	260	548	808	2,056	1,043	3,099	-	3,907
Total	2,262	1,216	3,478	2,688	1,096	3,784	-	7,262
<u>EGEGIK DISTRICT</u>								
EGEGIK DISTRICT	302	3,223	3,525	747	2,238	2,985	-	6,510
<u>UGASHIK DISTRICT</u>								
UGASHIK DISTRICT	1,282	754	2,036	555	560	1,115	-	3,151
<u>NUSHAGAK DISTRICT</u>								
Wood River	1,598	262	1,860	2,445	69	2,514	-	4,374
Igushik River	186	43	229	584	20	604	-	833
Nushagak River	142	8	150	1,276	6	1,282	89	1,521
Total	1,926	313	2,239	4,305	95	4,400	89	6,728
<u>TOGIAC DISTRICT</u>								
TOGIAC DISTRICT	89	17	106	277	26	303		409
<u>TOTAL BRISTOL BAY^a</u>								
Number	5,861	5,523	11,384	8,572	4,015	12,587	89	24,060
Percent	24	23	47	36	17	52	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, 2003^a

District and River System		1.2	2.2	2-Ocean	1.3	2.3	3-Ocean	1.4	Total
<u>NAKNEK-KVICHAK DISTRICT</u>									
Kvichak River									
	Number	1,135	241	1,376	273	74	347	0	1,723
	Percent	65.9	14.0	79.9	15.8	4.3	20.1	0.0	100
Branch River									
	Number	975	460	1,435	1,794	478	2,272	22	3,729
	Percent	26.1	12.3	38.5	48.1	12.8	60.9	0.6	99
Naknek River									
	Number	839	588	1,427	2,076	1,569	3,645	19	5,091
	Percent	16.5	11.5	28.0	40.8	30.8	71.6	0.4	100
Total	Number	2,949	1,289	4,238	4,143	2,121	6,264	41	10,543
	Percent	28.0	12.2	40.2	39.3	20.1	59.4	0.4	100
<u>EGEGIK DISTRICT</u>									
	Number	242	589	831	201	1,936	2,137	3	2,971
	Percent	8.1	19.8	28.0	6.8	65.2	71.9	0.1	100
<u>UGASHIK DISTRICT</u>									
	Number	1,065	589	1,654	286	523	809	11	2,474
	Percent	43.0	23.8	66.9	11.6	21.1	32.7	0.4	100
<u>NUSHAGAK DISTRICT</u>									
Wood River									
	Number	1,751	173	1,924	3,454	204	3,658	26	5,608
	Percent	31.2	3.1	34.3	61.6	3.6	65.2	0.5	100
Igushik River									
	Number	207	27	234	731	58	789	5	1,028
	Percent	20.1	2.6	22.8	71.1	5.6	76.8	0.5	100
Nush-Mulchatna River									
	Number	423	63	486	1,621	86	1,707	19	2,212
	Percent	19.1	2.8	22.0	73.3	3.9	77.2	0.9	99
Total	Number	2,381	263	2,644	5,806	348	6,154	50	8,848
	Percent	26.9	3.0	29.9	65.6	3.9	69.6	0.6	99
<u>TOGIAC DISTRICT^b</u>									
	Number	133	23	156	723	84	807	5	968
	Percent	13.7	2.4	16.1	74.7	8.7	83.4	0.5	99
<u>TOTAL BRISTOL BAY^c</u>									
	Number	6,770	2,753	9,523	11,159	5,012	16,171	110	25,694
	Percent	26.3	10.7	37.1	43.4	19.5	62.9	0.4	100

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

^b Does not include rivers other than Togiak River.

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

Table 4. Inshore commercial catch and escapement of sockeye salmon, in numbers of fish, Bristol Bay, 2003.

District and River System	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River	35,742	1,686,804	1,722,546
Alagnak River	52,843	3,676,146 ^a	3,728,989
Naknek River	3,259,868	1,831,170	5,091,038
Total	3,348,453	7,194,120	10,542,573
<u>EGEGIK DISTRICT</u>			
	2,283,518	1,152,030	3,435,548
<u>UGASHIK DISTRICT</u>			
	1,738,559	790,152 ^b	2,528,711
<u>NUSHAGAK DISTRICT</u>			
Wood River	4,136,822	1,459,782	5,596,604
Igushik River	846,097	194,088	1,040,185
Nushagak-Mulchatna	1,682,999	580,534	2,263,533
Total	6,665,918	2,234,404	8,900,322
<u>TOGIK DISTRICT ^c</u>			
Togiak Lake		232,302	232,302
Togiak River/Tributaries	650,066		650,066
Kulukak System	55,081	8,004	63,085
Other Systems	861	21,545	22,406
Total	706,008	261,851	967,859
TOTAL BRISTOL BAY	14,742,456	11,632,557	26,375,013

^a The 2003 aerial survey estimate for the Alagnak drainage was 2,110,000 sockeye salmon..

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

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

Table 5. Summary of sockeye salmon test fishing indices in the Naknek/Kvichak District, by index area and date, Bristol Bay, 2003. ^a

Date	Naknek R. Mouth	Pederson Point	Cutbank & Graveyard	Half Moon Bay	Middle Naknek	Johnston Hill	Division Buoy	Deadman Sands
6/16	21				49	66	11	
6/18	100				179	12	163	
6/20	231	7			160	106	173	
6/21	1,164	0			698	31	12	
6/24	271				92		252	
6/28	269				157		549	
6/29	690				242	1,059	606	
6/30	376				209	173	754	
7/05	427				727	97	1,360	

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

Table 6. Summary of district sockeye salmon test fishing indices in the Ugashik District, by index area and date, Bristol Bay, 2003.^a

Index Area	June 22	July 1	July 2	July 3	July 4
Cape Grieg (Nearshore)	0				
Four Miles North of Smoky Point (Nearshore)	74				
Two Miles North of Smoky Point (Outer line)	47				
Smoky Point Bar North Side (Inshore)	41				
Smoky Point Entrance					496
Three Miles South of South Spit (Nearshore)					
1.5 miles south of South Spit					
South Spit (Mid Channel)					
Dago Creek Mouth		253			407
Pilot Point					
Between Pilot Point and Muddy Point					412
South Spit					542
Inner South Channel					
Below inner district boundary line west side					
Below inner district boundary line east side		662			
Above inner district boundary line east side			150		
Between Dog Salmon and King Salmon Rivers		338 ^b	555 ^b	1,028	754
Mouth of Dog Salmon River		1,085 ^b	281 ^b	1,272	1,762 ^b

^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 7. Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, Bristol Bay, 2003^a.

Date	Hanson Point	Across Hanson Pt.	Tule Point	Picnic Point	Grassy Island	Nushagak Point	Pile Driver	Queen's Slough	Clark's Point	Upper W. Marker	Coffee Point	Kanakanak Bluff
6/21	3,047	2,239	986	1,858	857		2,868					
	6,667	5,038	1,034	831								
6/22	1,734	958	4,032	18,846	12,734		1,930					
	1,895	2,951	4,428	10,052								
6/23	1,364	4,000	3,559	344	175							
	1,263	5,926										
6/24	4,272	2,913	5,473	0	164							
	4,538	4,286										
7/5	1,387	1,081	647	315	340							0
	169	1,067										
7/6	2,202	1,084	173	0	1,084							0
	2,157	915										

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

Table 8. Commercial fishing emergency orders, by district and stat area, Bristol Bay, 2003.

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
<u>Naknek/Kvichak District</u>						
Drift Net						
AKN.01	June 02	9:00 a.m.	to	July 21	9:00 a.m.	^b
Set Net						
AKN.01	June 02	9:00 a.m.	to	July 21	9:00 a.m.	^b
<u>Naknek Section</u>						
Drift Net						
AKN.08	June 22	8:00 p.m.	to	June 23	12:00 a.m.	4-hours
AKN.12	June 25	8:30 a.m.	to	June 25	1:00 p.m.	4.5-hours
Set Net						
AKN.08	June 22	8:00 p.m.	to	June 23	12:00 a.m.	4-hours
AKN.12	June 25	8:30 a.m.	to	June 25	1:00 p.m.	4.5-hours
<u>Naknek River Special Harvest District</u>						
Drift Net						
AKN.15	June 26	11:00 a.m.	to	June 26	3:30 p.m.	4.5-hours
AKN.16	June 28	1:00 a.m.	to	June 28	7:30 a.m.	6.5-hours
AKN.22	June 29	1:30 a.m.	to	June 29	8:30 a.m.	7.0-hours
AKN.25	June 30	2:00 a.m.	to	June 30	9:30 a.m.	7.5-hours
AKN.28	July 01	2:30 a.m.	to	July 01	11:00 a.m.	8.5-hours
AKN.28	July 01	2:00 p.m.	to	July 01	7:30 p.m.	5.5-hours
AKN.30	July 02	2:00 p.m.	to	July 02	10:00 p.m.	8-hours
AKN.31	July 03	1:30 p.m.	to	July 03	11:00 p.m.	9.5-hours
AKN.31	July 04	3:30 a.m.	to	July 04	2:30 p.m.	11-hours
AKN.36	July 05	3:30 a.m.	to	July 05	2:30 p.m.	11-hours
AKN.40	July 06	4:30 a.m.	to	July 06	2:30 p.m.	10-hours
AKN.44	July 07	5:00 a.m.	to	July 07	3:00 p.m.	10-hours
AKN.47	July 08	6:30 a.m.	to	July 08	3:00 p.m.	8.5-hours
AKN.50	July 09	7:30 a.m.	to	July 09	3:30 p.m.	8-hours
AKN.53	July 10	8:30 a.m.	to	July 10	4:30 p.m.	8-hours
AKN.56	July 11	9:00 a.m.	to	July 11	5:00 p.m.	8-hours
AKN.59	July 12	10:30 a.m.	to	July 12	6:00 p.m.	7.5-hours
AKN.62	July 13	11:30 a.m.	to	July 13	7:00 p.m.	7.5-hours
AKN.65	July 14	12:30 p.m.	to	July 14	7:30 p.m.	7-hours
AKN.65	July 15	2:00 a.m.	to	July 15	10:30 a.m.	8.5-hours

-Continued-

Table 8. (page 2 of 8)

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
<u>Naknek River Special Harvest District</u>						
Drift net						
AKN.68	July 16	2:30 p.m.	to	July 16	9:30 p.m.	7-hours
AKN.68	July 17	3:30 a.m.	to	July 17	12:30 p.m.	9-hours
AKN.71	July 18	4:30 p.m.	to	July 19	12:00 a.m.	7.5-hours
AKN.71	July 19	5:00 a.m.	to	July 19	1:30 p.m.	8.5-hours
<u>Naknek River Special Harvest Area</u>						
Set net						
AKN.15	June 27	12:00 a.m.	to	June 27	7:00 a.m.	7-hours
AKN.16	June 28	12:00 p.m.	to	June 28	5:00 p.m.	5-hours
AKN.22	June 29	12:30 p.m.	to	June 29	6:00 p.m.	5.5-hours
AKN.25	June 30	1:30 p.m.	to	June 30	7:00 p.m.	5.5-hours
AKN.28	July 02	3:00 a.m.	to	July 02	12:00 p.m.	9-hours
AKN.30	July 03	3:00 a.m.	to	July 03	1:00 p.m.	10-hours
AKN.31	July 04	4:00 p.m.	to	July 05	1:00 a.m.	9-hours
AKN.36	July 05	4:30 p.m.	to	July 06	2:00 a.m.	9.5-hours
AKN.40	July 06	5:30 p.m.	to	July 07	3:00 a.m.	9.5-hours
AKN.44	July 07	6:30 p.m.	to	July 08	4:00 a.m.	9.5-hours
AKN.47	July 08	8:00 p.m.	to	July 09	4:30 a.m.	8.5-hours
AKN.50	July 09	9:00 p.m.	to	July 10	5:30 a.m.	8.5-hours
AKN.53	July 10	10:00 p.m.	to	July 11	6:30 a.m.	8.5-hours
AKN.56	July 11	11:00 p.m.	to	July 12	8:00 a.m.	9-hours
AKN.59	July 13	12:00 a.m.	to	July 13	8:30 a.m.	8.5-hours
AKN.62	July 14	12:30 a.m.	to	July 14	9:30 a.m.	9-hours
AKN.65	July 15	1:30 p.m.	to	July 16	11:00 a.m.	21.5-hours
AKN.68	July 17	4:00 p.m.	to	July 18	1:00 p.m.	21-hours
AKN.71	July 19	5:30 p.m.	to	July 20	1:30 p.m.	20-hours
<u>Egegik District</u>						
Drift net						
AKN.02	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^c
AKN.06	June 22	6:00 a.m.	to	June 22	12:00 p.m.	6-hours
Set net						
AKN.02	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^c
AKN.06	June 22	5:30 a.m.	to	June 22	1:30 p.m.	8-hours

-Continued-

Table 8. (page 3 of 8)

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
<u>Egegik Special Harvest Area</u>						
Drift Net						
AKN.13	June 26	8:00 a.m.	to	June 26	2:00 p.m.	6-hours
AKN.18	June 28	11:00 a.m.	to	June 28	6:30 p.m.	7.5-hours
AKN.32	July 03	2:00 p.m.	to	July 03	10:00 p.m.	8-hours
AKN.35	July 04	3:30 p.m.	to	July 04	11:30 p.m.	8-hours
AKN.37	July 05	4:00 p.m.	to	July 05	11:00 p.m.	7-hours
AKN.38	July 06	4:00 a.m.	to	July 06	12:00 p.m.	8-hours
AKN.41	July 06	5:00 p.m.	to	July 06	11:30 p.m.	6.5-hours
AKN.42	July 07	5:00 a.m.	to	July 07	1:00 p.m.	8-hours
AKN.45	July 07	6:00 p.m.	to	July 07	11:30 p.m.	5.5-hours
AKN.45	July 08	5:30 a.m.	to	July 08	1:30 p.m.	8-hours
AKN.48	July 08	7:00 p.m.	to	July 08	11:30 p.m.	4.5-hours
AKN.48	July 09	6:30 a.m.	to	July 09	2:30 p.m.	8-hours
AKN.51	July 10	7:00 a.m.	to	July 10	10:00 p.m.	15-hours
AKN.54	July 11	8:00 a.m.	to	July 11	4:00 p.m.	8-hours
AKN.57	July 12	9:00 a.m.	to	July 12	5:00 p.m.	8-hours
AKN.60	July 13	10:00 a.m.	to	July 13	11:30 p.m.	13.5-hours
AKN.63	July 14	11:00 a.m.	to	July 14	7:00 p.m.	8-hours
AKN.66	July 15	12:30 p.m.	to	July 15	11:30 p.m.	11-hours
AKN.69	July 16	6:00 a.m.	to	July 16	9:00 p.m.	15-hours
Set net						
AKN.13	June 26	7:30 a.m.	to	June 26	3:30 p.m.	8-hours
AKN.18	June 28	10:30 a.m.	to	June 28	6:30 p.m.	8-hours
AKN.32	July 03	2:00 p.m.	to	July 03	10:00 p.m.	8-hours
AKN.35	July 04	3:30 p.m.	to	July 04	11:30 p.m.	8-hours
AKN.38	July 06	4:00 a.m.	to	July 06	12:00 p.m.	8-hours
AKN.42	July 07	5:00 a.m.	to	July 07	1:00 p.m.	8-hours
AKN.45	July 08	5:30 a.m.	to	July 08	1:30 p.m.	8-hours
AKN.48	July 09	6:30 a.m.	to	July 09	2:30 p.m.	8-hours
AKN.51	July 10	7:00 a.m.	to	July 10	3:00 p.m.	8-hours
AKN.54	July 11	8:00 a.m.	to	July 11	4:00 p.m.	8-hours
AKN.57	July 12	9:00 a.m.	to	July 12	5:00 p.m.	8-hours
AKN.60	July 13	10:00 a.m.	to	July 13	6:00 p.m.	8-hours
AKN.63	July 14	11:00 a.m.	to	July 14	7:00 p.m.	8-hours
AKN.66	July 15	12:30 p.m.	to	July 15	8:30 p.m.	8-hours

-Continued-

Table 8. (page 4 of 8)

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
<u>Ugashik District</u>						
Drift net						
AKN.03	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^d
AKN.03	June 16	12:00 p.m.	to	June 16	10:00 p.m.	10-hours
AKN.03	June 17	12:30 p.m.	to	June 17	10:30 p.m.	10-hours
AKN.03	June 18	1:30 p.m.	to	June 18	11:30 p.m.	10-hours
AKN.03	June 19	2:00 p.m.	to	June 19	12:00 a.m.	10-hours
AKN.03	June 20	3:30 p.m.	to	June 20	11:30 p.m.	8-hours
AKN.19	June 28	10:00 a.m.	to	June 28	6:00 p.m.	8-hours
AKN.24	June 29	11:00 a.m.	to	June 29	5:00 p.m.	6-hours
AKN.27	June 30	12:00 p.m.	to	June 30	6:00 p.m.	6-hours
AKN.33	July 03	1:30 p.m.	to	July 03	5:30 p.m.	4-hours
AKN.39	July 05	3:00 p.m.	to	July 05	11:00 p.m.	8-hours
AKN.43	July 06	4:00 p.m.	to	July 07	2:00 p.m.	22-hours
AKN.46	July 08	4:30 a.m.	to	July 08	4:30 p.m.	12-hours
AKN.49	July 09	5:30 a.m.	to	July 09	5:30 p.m.	12-hours
AKN.52	July 10	6:30 a.m.	to	July 10	10:30 p.m.	16-hours
AKN.55	July 11	7:30 a.m.	to	July 11	7:30 p.m.	12-hours
AKN.58	July 12	8:30 a.m.	to	July 12	8:30 p.m.	12-hours
AKN.61	July 13	9:30 a.m.	to	July 13	7:30 p.m.	10-hours
AKN.64	July 14	10:30 a.m.	to	July 14	8:30 p.m.	10-hours
AKN.67	July 15	11:30 a.m.	to	July 15	9:30 p.m.	10-hours
AKN.70	July 16	5:30 a.m.	to	July 16	10:30 p.m.	17-hours
<u>Ugashik District</u>						
Set net						
AKN.03	June 01	12:00 a.m.	to	June 13	9:00 a.m.	weekly schedule ^d
AKN.03	June 16	12:00 p.m.	to	June 16	10:00 p.m.	10-hours
AKN.03	June 17	12:30 p.m.	to	June 17	10:30 p.m.	10-hours
AKN.03	June 18	1:30 p.m.	to	June 18	11:30 p.m.	10-hours
AKN.03	June 19	2:00 p.m.	to	June 19	12:00 a.m.	10-hours
AKN.03	June 20	3:30 p.m.	to	June 20	11:30 p.m.	8-hours
AKN.19	June 28	10:00 a.m.	to	June 28	10:00 p.m.	12-hours
AKN.24	June 29	11:00 a.m.	to	June 29	7:00 p.m.	8-hours
AKN.27	July 30	12:00 p.m.	to	June 30	8:00 p.m.	8-hours
AKN.39	July 05	3:00 p.m.	to	July 05	11:00 p.m.	8-hours
AKN.43	July 06	4:00 p.m.	to	July 07	2:00 p.m.	22-hours

-Continued-

Table 8. (page 5 of 8)

Number ^a	Start Date	Start Time	End Date	End Time	Effective time
<u>Ugashik District</u>					
Set net					
AKN.46	July 08	4:30 a.m.	to July 08	4:30 p.m.	12-hours
AKN.49	July 09	5:30 a.m.	to July 09	5:30 p.m.	12-hours
AKN.52	July 10	6:30 a.m.	to July 10	10:30 p.m.	16-hours
AKN.55	July 11	7:30 a.m.	to July 11	7:30 p.m.	12-hours
AKN.58	July 12	8:30 a.m.	to July 12	8:30 p.m.	12-hours
AKN.61	July 13	9:30 a.m.	to July 13	7:30 p.m.	10-hours
AKN.64	July 14	10:30 a.m.	to July 14	8:30 p.m.	10-hours
AKN.67	July 15	11:30 a.m.	to July 15	9:30 p.m.	10-hours
AKN.70	July 16	5:30 a.m.	to July 16	10:30 p.m.	17-hours
<u>Nushagak District</u>					
<u>Nushagak Section</u>					
Drift net					
DLG. 03	June 13	11:30 a.m.	to June 13	5:30 p.m.	6 hours ^t
DLG. 07	June 19	5:30 p.m.	to June 19	10:30 p.m.	5 hours ^t
DLG. 13	June 22	9:00 p.m.	to June 23	3:00 a.m.	6 hours
DLG. 15	June 23	11:00 a.m.	to June 23	5:00 p.m.	6 hours
DLG. 17	June 24	12:00 p.m.	to June 24	6:00 p.m.	6 hours
DLG. 18	June 25	1:00 a.m.	to June 25	7:00 a.m.	6 hours
DLG. 19	June 25	12:00 p.m.	to June 25	10:00 p.m.	10 hours
DLG. 20	June 26	3:00 a.m.	to June 26	9:00 a.m.	6 hours
DLG. 23	June 26	2:00 p.m.	to June 27	12:00 a.m.	10 hours
DLG. 24	June 27	5:00 a.m.	to June 27	11:00 a.m.	6 hours
DLG. 25	June 27	3:00 p.m.	to June 27	11:00 p.m.	8 hours
DLG. 26	June 28	4:00am	to June 28	12:00 p.m.	8 hours
DLG. 27	June 28	4:00 p.m.	to June 29	12:00 a.m.	8 hours
DLG. 28	June 29	12:00 a.m.	to June 29	4:00 a.m.	4 hours ^e
DLG. 28	June 29	9:00 a.m.	to June 29	5:00 p.m.	8 hours
DLG. 29	June 30	1:00 a.m.	to June 30	10:00 a.m.	9 hours
DLG. 30	June 30	3:00 p.m.	to June 30	10:00 p.m.	7 hours
DLG. 30	July 01	3:00 a.m.	to July 01	11:00 a.m.	8 hours
DLG. 31	July 01	4:00 p.m.	to July 02	12:00 a.m.	8 hours
DLG. 31	July 02	4:00 a.m.	to July 02	12:00 p.m.	8 hours
DLG. 32	July 02	8:00 p.m.	to July 03	6:00 a.m.	10 hours
DLG. 32	July 03	10:00 a.m.	to July 03	6:00 p.m.	8 hours

-Continued-

Table 8. (page 6 of 8)

Number ^a	Start Date	Start Time	End Date	End Time	Effective time
<u>Nushagak Section</u>					
Drift net					
DLG. 32	July 02	8:00 p.m.	to July 03	6:00 a.m.	10 hours
DLG. 32	July 03	10:00 a.m.	to July 03	6:00 p.m.	8 hours
DLG. 34	July 03	10:00 p.m.	to July 04	6:00 a.m.	8 hours
DLG. 34	July 04	10:00 a.m.	to July 04	8:00 p.m.	10 hours
DLG. 35	July 05	12:00 a.m.	to July 05	6:00 a.m.	6 hours
DLG. 35	July 05	10:00 a.m.	to July 05	8:00 p.m.	10 hours
DLG. 36	July 06	12:00 a.m.	to July 06	6:00 a.m.	6 hours
DLG. 36	July 06	10:00 a.m.	to July 06	8:00 p.m.	10 hours
DLG. 37	July 07	12:00 a.m.	to July 07	7:00 a.m.	7 hours
DLG. 37	July 07	11:00 a.m.	to July 07	8:00 p.m.	9 hours
DLG. 38	July 08	12:00 a.m.	to July 08	9:00 a.m.	9 hours
DLG. 38	July 08	1:00 p.m.	to July 08	10:00 p.m.	9 hours
DLG. 39	July 09	2:00 a.m.	to July 09	9:00 a.m.	7 hours
DLG. 39	July 09	1:00 p.m.	to July 09	10:00 p.m.	9 hours
DLG. 40	July 10	2:00 a.m.	to July 10	9:00 a.m.	7 hours
DLG. 40	July 10	1:00 p.m.	to July 10	10:00 p.m.	9 hours
DLG. 43	July 11	3:00 a.m.	to July 11	10:00 a.m.	7 hours
DLG. 43	July 11	3:00 p.m.	to July 12	12:00 a.m.	9 hours
DLG. 44	July 12	12:00 a.m.			^J
DLG. 46	July 23	9:00 a.m.			^I
Set net					
DLG. 04	June 13	11:30 a.m.	to June 13	5:30 p.m.	6 hours ^t
DLG. 07	June 19	5:30 p.m.	to June 19	10:30 p.m.	5 hours ^t
DLG. 14	June 23	8:00 a.m.	to June 23	2:00 p.m.	6 hours
DLG. 15	June 23	2:00 p.m.	to June 23	8:00 p.m.	6 hours ^e
DLG. 16	June 24	9:00 a.m.	to June 24	5:00 p.m.	8 hours
DLG. 17	June 24	5:00 p.m.	to June 25	11:00 a.m.	18 hours ^e
DLG. 19	June 25	11:00 a.m.	to June 26	12:00 p.m.	25 hours ^e
DLG. 23	June 26	12:00 p.m.	to June 27	1:00 p.m.	25 hours
DLG. 25	June 27	1:00 p.m.	to June 28	2:00 p.m.	25 hours ^e
DLG. 27	June 28	2:00 p.m.	to June 29	3:00 p.m.	25 hours
DLG. 28	June 29	3:00 p.m.	to		^e
DLG. 46	July 23	9:00 a.m.			^I

-Continued-

Table 8. (page 7 of 8)

Number ^a	Start Date	Start Time	End Date	End Time	Effective time
<u>Igushik Section</u>					
Drift net					
DLG. 20	June 26	3:00 a.m.	to June 26	9:00 a.m.	6 hours
DLG. 23	June 26	2:00 p.m.	to June 27	12:00 a.m.	10 hours
DLG. 24	June 27	5:00 a.m.	to June 27	11:00 a.m.	6 hours
DLG. 25	June 27	3:00 p.m.	to June 27	11:00 p.m.	8 hours
DLG. 26	June 28	4:00 a.m.	to June 28	12:00 noon	8 hours
DLG. 27	June 28	4:00 p.m.	to June 29	12:00 a.m.	8 hours
DLG. 28	June 29	12:00 a.m.	to June 29	4:00 a.m.	4 hours ^e
DLG. 28	June 29	9:00 a.m.	to June 29	5:00 p.m.	8 hours
DLG. 29	June 30	1:00 a.m.	to June 30	10:00 a.m.	9 hours
DLG. 30	June 30	3:00 p.m.	to June 30	10:00 p.m.	7 hours
DLG. 30	July 01	3:00 a.m.	to July 01	11:00 a.m.	8 hours
DLG. 32	July 03	10:00 a.m.	to July 03	6:00 p.m.	8 hours
DLG. 34	July 03	10:00 p.m.	to July 04	6:00 a.m.	8 hours
DLG. 34	July 04	10:00 a.m.	to July 04	8:00 p.m.	10 hours
DLG. 35	July 05	12:00 a.m.	to July 05	6:00 a.m.	6 hours
DLG. 35	July 05	10:00 a.m.	to July 05	8:00 p.m.	10 hours
DLG. 46	July 23	9:00 a.m.			¹
Set net					
DLG. 12	June 22	7:30 a.m.	to June 23	8:30 a.m.	25 hours
DLG. 14	June 23	8:30 a.m.	to June 23	2:00 p.m.	5.5 hours ^e
DLG. 15	June 23	2:00 p.m.	to June 23	8:00 p.m.	6 hours ^e
DLG. 16	June 24	9:00 a.m.	to June 24	5:00 p.m.	8 hours
DLG. 17	June 24	5:00 p.m.	to June 25	11:00 a.m.	18 hours ^e
DLG. 19	June 25	11:00 a.m.	to June 26	12:00 p.m.	25 hours ^e
DLG. 23	June 26	12:00 p.m.	to June 27	1:00 p.m.	25 hours
DLG. 25	June 27	1:00 p.m.	to June 28	2:00 p.m.	25 hours ^e
DLG. 27	June 28	2:00 p.m.	to June 29	3:00 p.m.	25 hours
DLG. 28	June 29	3:00 p.m.			^e
DLG. 46	July 23	9:00 a.m.			¹

-Continued-

Table 8. (page 8 of 8)

Number ^a	Start Date	Start Time		End Date	End Time	Effective time
<u>Togiak District</u>						
Drift and Set						
DLG.05	June 16	9:00 a.m.	to	9:00 a.m.	June 18	48 hours ^g
DLG.05	June 16	9:00 a.m.	to	9:00 a.m.	June 19	72 hours ^g
DLG.08	June 23	9:00 a.m.	to	9:00 a.m.	June 25	48 hours ^g
DLG.08	June 23	9:00 a.m.	to	9:00 a.m.	June 26	72 hours ^g
DLG.22	June 30	9:00 a.m.	to	9:00 a.m.	July 02	48 hours ^g
DLG.33	July 07	9:00 a.m.	to	9:00 a.m.	July 09	48 hours ^g
DLG.41	July 14	9:00 a.m.	to	9:00 a.m.	July 16	48 hours ^g
DLG.45	July 21	9:00 a.m.	to	9:00 a.m.	July 22	24 hours ^g
DLG.48	July 25	9:00 a.m.	to	9:00 a.m.	July 27	48 hours ^e
DLG.49	August 01	9:00 a.m.	to	9:00 a.m.	August 03	48 hours ^{h,d}
DLG.50	August 08	9:00 a.m.	to	9:00 a.m.	August 10	48 hours ^{h,d}
DLG.51	August 13	12:00 p.m.	to	9:00 p.m.	August 13	48 hours ^k

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

^b Gillnet mesh size is restricted to 5 and 1/2 inches or less.

^c 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.

^d Weekly schedule: 9:00 a.m. Monday until 9:00 a.m. Friday.

^e Extends current fishing period.

^f Gillnet mesh size is restricted to 7 and 1/2 inches or larger.

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

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

ⁱ Supersedes previous emergency order.

^j Opens commercial fishing until further notice.

^k Closes commercial fishing until further notice.

Table 9. Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2003.

Date	Nakek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
6/20	66	166	140	148	39	559
6/21	73	255	17	156	41	542
6/22	93	418	13	181	41	746
6/23	236	491	11	293	41	1,072
6/24	247	457	12	328	46	1,090
6/25	272	438	11	385	49	1,155
6/26	288	449	11	431	50	1,229
6/27	288	451	11	465	54	1,269
6/28	297	436	13	482	55	1,283
6/29	267	401	24	489	55	1,236
6/30	264	379	36	485	55	1,219
7/01	265	327	114	492	57	1,255
7/02	268	256	142	493	57	1,216
7/03	285	232	165	512	58	1,252
7/04	321	233	188	488	60	1,290
7/05	319	237	194	448	60	1,258
7/06	313	237	227	435	61	1,273
7/07	304	242	270	425	61	1,302
7/08	299	255	307	415	64	1,340
7/09	297	252	323	403	65	1,340
7/10	298	254	319	400	72	1,343
7/11	309	251	315	399	77	1,351
7/12	320	236	284	380	84	1,304
7/13	351	240	276	381	86	1,334
7/14	388	247	277	375	86	1,373
7/15	403	247	279	373	87	1,389
7/16	410	243	261	369	92	1,375
7/17	420	243	244	365	94	1,366
Average	295	318	166	407	65	1,250

Table 10. Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2003.

Date	Hours Fished		Effort		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set	Drift	Set						
6/16 ^a					254	0	0	0	0	254
6/18 ^a					702	0	0	0	0	702
6/20 ^a					936	0	0	0	0	936
6/21 ^a					2,949	0	0	0	0	2,949
6/22 ^b	4.0	4.0	192	35	118,855	7	2319	0	0	121,181
6/24 ^a					1,356	0	0	0	0	1,356
6/25 ^{a,b}	4.5	4.5	258	104	99,102	4	1,139	0	0	100,245
6/26 ^c	4.5		255	0	21,770	10	399	0	0	22,179
6/27 ^c		7.0	0	155	40,010	16	197	0	0	40,223
6/28 ^{a,c}	6.5	5.0	276	168	70,714	33	897	0	0	71,644
6/29 ^{a,c}	7.0	5.5	260	190	143,756	37	1,088	0	0	144,881
6/30 ^{a,c}	7.5	5.5	251	200	182,080	18	1,035	0	0	183,133
7/01 ^{a,c}	8.5/5.5		260	0	431,578	16	2,457	0	0	434,051
7/02 ^{a,c}	8.0	9.0	255	194	419,404	52	2,151	0	0	421,607
7/03 ^{a,c}	9.5	10.0	288	169	319,243	11	2,926	0	0	322,180
7/04 ^{a,c}	11.0	9.0	318	174	250,057	16	3,742	0	0	253,815
7/05 ^{a,c}	11.0	8.5	317	185	149,718	36	1,354	0	0	151,108
7/06 ^{a,c}	10.0	8.5	299	178	282,075	13	2,082	0	0	284,170
7/07 ^{a,c}	10.0	8.5	281	172	136,050	18	1,079	0	0	137,147
7/08 ^{a,c}	8.5	8.5	237	152	55,364	18	667	0	0	56,049
7/09 ^{a,c}	8.0	8.5	228	163	108,297	9	1,190	0	0	109,496
7/10 ^{a,c}	8.0	7.5	211	158	131,009	12	1,706	0	0	132,727
7/11 ^{a,c}	8.0	7.5	155	140	53,617	12	675	0	0	54,304
7/12 ^{a,c}	7.5	8.0	166	133	67,862	20	1,034	0	0	68,916
7/13 ^c	7.5	8.5	163	120	43,014	12	968	0	0	43,994
7/14 ^c	7.0	9.0	154	108	87,668	10	1,582	0	0	89,260
7/15 ^c	8.5	10.5	114	106	47,539	23	964	0	0	48,526
7/16 ^c	7.0	11.0	121	97	26,784	8	879	0	1	27,672
7/17 ^c	8.0	8.0	59	68	9,846	26	280	0	0	10,152
7/18 ^c	7.5	13.0	53	50	12,360	23	1,121	1	1	13,506
7/19 ^c	8.5	6.5	49	18	9,073	8	0	19	0	9,073
7/20 ^c	0.0	13.5	0	25	3,659	1	4	2	0	3,666
7/21 ^b	15.0	15.0	55	13	8,749	47	39	2	0	8,837
7/22 ^b	24.0	24.0	49	18	9,697	36	206	0	4	9,943
7/23 ^b	24.0	24.0	5	17	1,846	5	158	0	0	2,009
7/24 ^b	24.0	24.0	7	8	1,431	9	85	0	3	1,528
7/25 ^b	9.0	9.0	1	1						
8/11 ^b	15.0	15.0	1	0						
8/12 ^b	24.0	24.0	1	0						
Total					3,348,453	567	34,481	24	42	3,383,567

^a District test fish and cost recovery.

^b Fishery was confined to the Naknek Section only.

^c Fishery was confined to the Naknek River Special Harvest Area.

^d Less than four permit holders fished, harvest confidential.

Table 11. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2003.

Date	Hours fished ^b	Effort ^a		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/09 ^c	15	1	2						
6/10	24	2	7	386		1			
6/11	9	3	6	302	3	1			
6/12	15	10	14	1,484	3	3			1,490
6/13	9	13	13	3,853	4	27			3,884
6/22	6/8	384	127	126,032	17	3,500			129,549
6/26	6/9	435	214	158,328	24	1,942			160,294
6/28 ^d	5.5/8	432	181	171,188	14	2,501			173,703
6/29 ^d		1		2,364					2,364
6/30 ^d		2		4,795					4,795
7/3 ^d	8	228	271	284,021	14	3,539			287,574
7/4 ^d	8	221	268	303,588	3	3,646			307,237
7/5 ^d	7/0	249		166,639	2	1,405			168,046
7/6 ^d	14.5/8	404	177	253,032	12	2,340			255,384
7/7 ^d	13/8	444	185	210,470	3	1,642			212,115
7/8 ^d	12.5/8	405	156	108,127	3	1,852			109,982
7/9	8	243	147	73,157	2	1,006			74,165
7/10	15/8	312	156	92,983	3	2,267			95,253
7/11 ^d	8	172	120	37,464	3	1,145			38,612
7/12 ^d	8	171	147	71,594	3	2,496			74,093
7/13	13.5/8	173	129	48,631	2	1,262			49,895
7/14	8	172	119	44,240	1	1,944			46,185
7/15	12/8	107	134	44,733	3	1,467			46,203
7/16	15/0	100		24,664	1	1,305			25,970
7/17	15	61	80	16,040		1,346			17,386
7/18	9	9	26	3,470	1	294			3,765
7/21	15	53	56	11,506	1	1,517			13,024
7/22	24	18	39	5,270					5,270
7/23	24	5	19	1,407					1,407
7/24	24	10	20	2,674				4	2,678
7/25	9		7	140					140
7/28	15	13	18	3,300	1	23		67	3,391
7/29	24	8	21	2,253	1			189	2,443
7/30	24	7	18	1,826				308	2,134

(Continued)

Table 11. (Page 2 of 2)

Date	Hours ^b	Effort ^a		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/31	24	6	14	1,697		93		228	2,018
8/1	9		4	104		19		43	166
8/4	15	4	18	581	1	282		2,145	3,009
8/5	24	6	16	182	1	282		1,657	2,122
8/6	24	10	17	175	1	425		2,469	3,070
8/7	24	8	15	300	2	218		2,253	2,773
8/8	9	1	7	51		73		401	525
8/11	15	9	17	81	1	452		3,938	4,472
8/12	24	12	8	69		510		4,228	4,807
8/13	24	7	13	33		398		2,786	3,217
8/14	24	11	14	24		261		3,395	3,680
8/15	9	4	7	24		177		1,634	1,835
8/18	15	8	15	51		90		6,803	6,944
8/19	24	9	15	24		53		2,858	2,935
8/20	24	9	12	2		103		5,099	5,204
Total		4,972	3,069	2,283,518	130	41,907	0	40,505	2,366,060

^a Number of deliveries.

^b For hours fished: first number is drift, second number is set gillnet, one number both gear groups equal time.

^c Less than four permits, records are confidential.

^d Test fish and cost recovery fish included.

Table 12. Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2003.

Date	Hours ^b	Effort ^a		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/09 ^c	15	1							
6/10	24	6		88	10	2			100
6/11	24	6		145	2	3			150
6/12	24	9		499	5	10			514
6/13	9	3		449	3	8			460
6/16	10	67		20,052	27	388			20,467
6/17	10	104		31,550	35	510			32,095
6/18	10	142	2	39,911	38	1,349			41,298
6/19	10	153	1	61,438	18	3,385			64,841
6/20	8	170	2	46,067	17	4,515			50,599
6/28	8/12	12	77	56,809	26	522			57,357
6/29	6/8	28	78	94,082	12	1,120			95,214
6/30	6/9	76	83	158,885	16	2,109			161,010
7/3	4/0	192		221,167	3	2,668			223,838
7/5 ^d	8	132	80	145,457	11	2,266			147,734
7/6 ^d	8	216	70	180,909	15	3,712			184,636
7/7 ^d	14	355	62	152,801	23	3,994			156,818
7/8 ^d	12	255	43	120,240	25	3,117			123,382
7/9	12	305	48	87,388	40	3,892			91,320
7/10	16	350	60	75,116	38	3,970			79,124
7/11	12	209	27	34,991	10	1,934			36,935
7/12	12	174	16	46,074	1	2,580			48,655
7/13	10	157	24	56,309	7	2,861			59,177
7/14	10	150	32	34,375	6	2,340			36,721
7/15	10	144	26	28,459	9	2,548			31,016
7/16	17/0	91		18,538	14	1,190			19,742
7/17	15	28	15	6,222		637			6,859
7/18	9	5	2	1,395		175			1,570
7/21	15	28	28	8,849	4	1,587			10,440
7/22	24	20	23	5,452	3	1,282			6,737
7/23	24	4	8	1,597		74			1,671
7/24	24	7	1	1,241	1				
7/25 ^c	9	2							
7/28	15	3	2	870					
7/29 ^c	24	1	2						
7/30 ^c	24		1						
8/18 ^c	15	1							
8/19 ^c	24	3							
Total		3,602	813	1,738,559	419	54,748	0	994	1,794,720

^a Number of deliveries.

^b For hours fished: first number is drift, second number is set gillnet, one number both gear groups equal time.

^c Less than four permits, records are confidential.

^d Test fish and cost recovery fish included.

Table 13. Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2003.

Date	Time (hrs) ^a		Effort ^b		Sockeye	Chinook	Chum	Pink	Coho	Total
	Nushagak	Igushik	Drift	Set						
6/13	6 / 6	0	26	2	137	1,565	114	0	0	1,816
6/19	5 / 5	0	114	46	7,382	21,443	3,898	0	0	32,723
6/22	3 / 3	0 / 16.5	2	54	4,865	196	845	0	0	5,906
6/23	9 / 12	0 / 20	509	202	403,903	4,741	58,268	0	2	466,914
6/24	6 / 15	0 / 15	304	164	244,722	1,377	37,236	0	0	283,335
6/25	16 / 24	0 / 24	736	339	347,775	1,783	41,045	1	0	390,604
6/26	16 / 24	16 / 24	403	345	303,628	1,024	27,157	1	0	331,810
6/27	14 / 24	14 / 24	1,041	365	658,048	1,570	54,873	1	0	714,492
6/28	16 / 24	16 / 24	610	291	285,729	410	15,922	0	0	302,061
6/29	12 / 24	12 / 24	706	344	615,046	829	49,655	2	0	665,532
6/30	16 / 24	16 / 24	893	435	716,543	1,017	51,412	2	0	768,974
7/1	16 / 24	8 / 24	681	439	594,246	1,078	44,171	7	0	639,502
7/2	12 / 24	0 / 24	486	274	340,391	761	33,369	1	0	374,522
7/3	16 / 24	10 / 24	786	292	485,631	869	50,547	77	0	537,124
7/4	16 / 24	16 / 24	687	282	338,530	440	36,951	14	2	375,937
7/5	16 / 24	16 / 24	575	216	293,134	509	40,894	9	0	334,546
7/6	16 / 24	0 / 24	491	211	318,802	531	49,654	8	5	369,000
7/7	16 / 24	0 / 24	518	256	136,776	371	25,076	4	0	162,227
7/8	18 / 24	0 / 24	498	209	134,898	397	21,569	2	77	156,943
7/9	16 / 24	0 / 24	400	203	131,730	492	25,456	9	3	157,690
7/10	16 / 24	0 / 24	386	226	90,989	362	17,236	10	2	108,599
7/11	16 / 24	0 / 24	77	182	26,344	149	4,717	3	6	31,219
7/12	24 / 24	0 / 24	208	116	77,767	167	19,858	2	6	97,800
7/13	24 / 24	0 / 24	132	124	33,512	103	8,520	6	142	42,283
7/14	24 / 24	0 / 24	116	121	35,008	217	9,397	3	17	44,642
7/15	24 / 24	0 / 24	82	84	16,408	97	6,627	0	3	23,135
7/16	24 / 24	0 / 24	48	47	12,235	53	3,575	0	181	16,044
7/17	24 / 24	0 / 24	13	33	2,630	10	495	0	3	3,138
7/18	24 / 24	0 / 24	5	24	2,017	21	659	0	60	2,757
7/19	24 / 24	0 / 24	3	14	1,928	5	91	0	13	2,037
7/20	24 / 24	0 / 24	0	20	2,085	19	256	6	29	2,395
7/21	24 / 24	0 / 24	1	12	2,445	6	495	20	2	2,968
7/22	24 / 24	0 / 24	4	12	232	2	153	0	0	387
7/23	9 / 9 ^c	0 / 9 ^d	1	2	402	1	120	0	30	553
Total	566 / 722	0.0	11,542	5986	6,665,918	42,615	740,311	188	583	7,449,615

^a For hours fished: first number is drift, second number is set gillnet.

^b Effort is deliveries from processor catch reports by gear type.

^c The Nushagak Section closed.

^d The Igushik Section closed.

Table 14. Commercial sockeye salmon fishing time and setnet harvest numbers by date and statistical area, Nushagak District, Bristol Bay, 2003.

Date	Harvest						Total
	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	
6/13	0	3	1	0	0	0	4
6/19	1,697	1,280	104	525	1,021	0	4,627
6/22	710	2,301	0	411	0	1,613	5,035
6/23	2,858	2,076	320	620	7,028	1,346	14,248
6/24	2,519	2,139	10,059	575	10,459	701	26,452
6/25	13,263	1,022	5,863	2,313	47,588	11,090	81,139
6/26	22,317	4,944	21,982	3,124	27,990	8,161	88,518
6/27	20,949	3,349	28,481	6,333	39,310	10,661	109,083
6/28	4,505	861	22,439	2,259	4,325	7,003	41,392
6/29	16,623	669	12,038	5,062	24,885	7,211	66,488
6/30	34,348	7,236	9,164	8,669	36,742	7,842	104,001
7/01	21,895	6,718	9,942	8,181	64,839	19,618	131,193
7/02	8,780	2,550	8,447	1,265	32,536	13,156	66,734
7/03	9,660	981	4,127	2,248	29,739	13,730	60,485
7/04	5,574	896	1,457	3,165	32,982	3,730	47,804
7/05	4,600	841	336	2,311	19,352	3,955	31,395
7/06	2,481	1,560	812	1,451	15,847	5,330	27,481
7/07	3,301	310	545	1,794	24,412	3,886	34,248
7/08	1,938	315	202	854	13,887	1,591	18,787
7/09	1,030	56	808	1,810	23,671	3,780	31,155
7/10	3,490	0	3,324	1,961	21,340	8,747	38,862
7/11	835	140	1,184	341	12,543	5,083	20,126
7/12	285	1,213	370	715	13,325	0	15,908
7/13	1,289	187	238	905	8,400	0	11,019
7/14	527	87	283	427	12,766	0	14,090
7/15	85	49	45	390	7,459	0	8,028
7/16	69	45	0	431	3,231	2163	5,939
7/17	0	637	0	26	1,239	882	2,784
7/18	0	0	16	22	1,507	465	2,010
7/19	0	192	0	66	1,165	316	1,739
7/20	0	115	0	224	1,407	368	2,114
7/21	0	72	0	0	973	0	1,045
7/22	0	70	0	0	1,163	0	1,233
7/23	0	0	0	0	369	0	369
Total	185,628	42,914	142,587	58,478	543,500	142,428	1,115,535

Table 15. Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2003.

Date ^a	Sockeye	Chinook	Chum	Pink	Coho	Total
6/10	15	2	0	0	0	17
6/11	40	13	2	0	0	55
6/12	138	24	3	0	0	165
6/13	84	0	0	0	0	84
6/16	524	77	6	0	0	607
6/17	894	95	24	0	0	1,013
6/18	721	74	14	0	0	809
6/19	522	17	8	0	0	547
6/23	3,065	352	447	1	0	3,865
6/24	8,628	229	915	1	0	9,773
6/25	8,453	295	591	0	0	9,339
6/26	2,657	99	250	0	0	3,006
6/30	10,501	228	1,126	2	0	11,857
7/1	18,355	184	1,577	0	0	20,116
7/2	12,919	157	730	0	0	13,806
7/3	18,639	124	1,097	3	0	19,863
7/4	25,692	225	1,662	0	0	27,579
7/5	25,206	83	1,397	3	0	26,689
7/7	37,631	175	2,332	4	0	40,142
7/8	40,886	180	4,151	1	0	45,218
7/9	22,313	75	4,042	0	0	26,430
7/10	28,775	50	2,068	0	0	30,893
7/11	30,826	51	2,545	0	0	33,422
7/12	29,246	36	2,638	0	0	31,920
7/14	41,994	50	3,800	8	0	45,852
7/15	39,294	57	4,071	0	0	43,422
7/16	36,956	41	4,709	1	0	41,707
7/17	27,024	27	2,855	6	0	29,912
7/18	5,096	4	234	1	0	5,335
7/21	23,093	23	2,982	0	0	26,098
7/22	31,925	38	4,567	0	0	36,530
7/23	16,776	24	1,834	0	0	18,634
7/24	21,529	19	2,072	1	1	23,622
7/25	32,503	20	3,627	0	0	36,150
7/26	16,532	18	1,534	0	0	18,084
7/27	9,533	1	809	0	0	10,343
7/28	10,757	9	1,173	0	3	11,942
7/29	17,184	28	1,907	0	6	19,125
7/30	11,670	4	1,415	0	4	13,093
7/31	7,743	3	1,014	0	0	8,760
8/1	7,873	2	603	0	0	8,478
8/2	5,479	1	339	0	8	5,827
8/3	2,124	0	67	0	1	2,192
8/4	2,478	1	199	0	24	2,702
8/5	4,246	4	257	0	179	4,686
8/6	2,483	3	203	0	39	2,728
8/8	2,359	3	112	0	280	2,754
8/9	1,885	5	117	0	416	2,423
8/10	88	1	7	0	22	118
8/11	291	0	1	0	32	324
8/12	363	0	21	0	32	416
Total	706,008	3,231	68,154	32	1,047	778,472

Table 16. Commercial salmon catch by date and species, in numbers of fish, Togiak Section, Bristol Bay, 2003.

Date	Effort ^a		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/10 ^b								
6/11 ^b								
6/12	1	4	138	24	3	0	0	165
6/13 ^b								
6/16	4	10	524	77	6	0	0	607
6/17	7	14	894	95	24	0	0	1,013
6/18	4	12	721	74	14	0	0	809
6/19	1	4	522	17	8	0	0	547
6/23	28	15	2,457	321	291	0	0	3,069
6/24	40	68	7,399	205	880	0	0	8,484
6/25	46	63	8,042	290	579	0	0	8,911
6/26	10	26	2,457	94	200	0	0	2,751
6/30	41	59	10,501	225	1,126	2	0	11,854
7/1	65	67	15,655	161	1,237	0	0	17,053
7/2	52	51	11,388	156	641	0	0	12,185
7/3	57	83	18,639	124	1,097	3	0	19,863
7/4	81	102	25,692	225	1,662	0	0	27,579
7/5	60	84	25,206	83	1,397	3	0	26,689
7/7	68	78	26,043	156	1,709	4	0	27,912
7/8	93	81	22,966	159	3,411	0	0	26,536
7/9	75	89	20,855	74	4,022	0	0	24,951
7/10	88	83	28,775	50	2,068	0	0	30,893
7/11	78	107	30,826	51	2,545	0	0	33,422
7/12	61	117	29,246	36	2,638	0	0	31,920
7/14	68	122	37,935	44	3,040	5	0	41,024
7/15	105	99	29,538	49	3,165	0	0	32,752
7/16	114	124	36,125	39	4,658	1	0	40,823
7/17	63	68	27,024	27	2,855	6	0	29,912
7/18	16	8	5,096	4	234	1	0	5,335
7/21	84	59	20,590	19	2,688	0	0	23,297
7/22	114	147	31,438	38	4,567	0	0	36,043
7/23	38	72	16,776	24	1,834	0	0	18,634
7/24	55	59	21,529	19	2,072	1	1	23,622
7/25	115	82	32,503	20	3,627	0	0	36,150
7/26	50	70	16,532	18	1,534	0	0	18,084
7/27	30	34	9,533	1	809	0	0	10,343
7/28	57	35	10,757	9	1,173	0	3	11,942
7/29	75	75	16,523	28	1,873	0	6	18,430
7/30	59	19	11,670	4	1,415	0	4	13,093
7/31	35	20	7,743	3	1,014	0	0	8,760
8/1	31	9	7,873	2	603	0	0	8,478
8/2	25	1	5,479	1	339	0	8	5,827
8/3	12	0	2,124	0	67	0	1	2,192
8/4	23	6	2,478	1	199	0	24	2,702
8/5	30	6	4,246	4	257	0	179	4,686
8/6	19	4	2,483	3	203	0	39	2,728
8/8	18	1	2,359	3	112	0	280	2,754
8/9	15	2	1,885	5	117	0	416	2,423
8/10 ^b								
8/11 ^b								
8/12 ^b								
Total	2,221	2,349	650,066	3,078	64,044	26	1,047	718,261

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

^b Less than three permits, records are confidential.

Table 17. Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, Bristol Bay, 2003.^a

Date	Effort ^b		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/23	4	7	608	31	156	1	0	796
6/24	0	12	1,229	24	35	1	0	1,289
6/25	0	3	411	5	12	0	0	428
6/30	1	0	0	3	0	0	0	3
7/1	3	18	2,700	23	340	0	0	3,063
7/2	2	8	1,531	1	89	0	0	1,621
7/7	8	34	11,588	19	623	0	0	12,230
7/8	11	31	17,920	21	740	1	0	18,682
7/9	2	4	1,458	1	20	0	0	1,479
7/14	13	2	4,059	6	760	3	0	4,828
7/15	32	7	9,756	8	906	0	0	10,670
7/16	4	0	831	2	51	0	0	884
7/21	3	20	2,503	4	294	0	0	2,801
7/22 ^c								487
Total	85	148	55,081	148	4,026	6	0	59,261

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

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

^c Less than 3 permits, records are confidential.

Table 18. Commercial salmon catch by date and species, in numbers of fish, Matogak Section, Bristol Bay, 2003.

Date ^a	Sockeye	Chinook	Chum	Pink	Coho	Total
6/26	200	5	50	0	0	255
7/29	661	0	34	0	0	695
Total	861	5	84	0	0	950

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

Table 19. Commercial salmon catch by date and species, in numbers of fish, Osviak Section, Bristol Bay, 2003.

Date	Sockeye	Chinook	Chum	Pink	Coho	Total
No Commercial Fishing Effort Occurred						0
						0
Total	0	0	0	0	0	0

Table 20. Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2003.

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
<u>NAKNEK-KVICHAK DISTRICT</u>						
Kvichak River	35,742					
Branch River	52,843					
Naknek River	3,259,868					
Total	3,348,453	567	34,481	24	42	3,383,567
<u>EGEGIK DISTRICT</u>	2,283,518	130	41,907	0	40,505	2,366,060
<u>UGASHIK DISTRICT</u>	1,738,559	419	54,748	0	994	1,794,720
<u>NUSHAGAK DISTRICT</u>						
Wood River	4,136,822					
Igushik River	846,097					
Nushagak-Mulchatna	1,682,999					
Total	6,665,918	42,615	740,311	188	583	7,449,615
<u>TOGIAK DISTRICT</u>						
Togiak Section	650,066	3,078	64,044	26	1,047	718,261
Kulukak Section	55,081	148	4,026	6	0	59,261
Matogak Section	861	5	84	0	0	950
Osviak Section	0	0	0	0	0	0
Total	706,008	3,231	68,154	32	1,047	778,472
TOTAL BRISTOL BAY	14,742,456	46,962	939,601	244	43,171	15,772,434

Table 21. Daily sockeye salmon escapement tower counts by river system, eastside Bristol Bay, 2003.

Date	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/18			42	42			186	186		
6/19			624	666			10,416	10,602		
6/20			3,144	3,810			19,590	30,192		
6/21			570	4,380			8,544	38,736		
6/22	18	18	28,434	32,814			17,826	56,562		
6/23	0	18	732	33,546	2,532	2,532	7,962	64,524		
6/24	888	906	73,044	106,590	150	2,682	11,934	76,458		
6/25	414	1,320	128,796	235,386	33,000	35,682	15,414	91,872		
6/26	4,926	6,246	39,360	274,746	11,778	47,460	46,494	138,366		
6/27	18,462	24,708	102,768	377,514	3,426	50,886	53,862	192,228		
6/28	18,102	42,810	175,362	552,876	63,798	114,684	70,782	263,010	5,958	5,958
6/29	69,972	112,782	62,064	614,940	321,738	436,422	62,124	325,134	30,360	36,318
6/30	171,006	283,788	142,800	757,740	194,574	630,996	28,140	353,274	20,424	56,742
7/01	130,044	413,832	150,060	907,800	218,472	849,468	111,414	464,688	42,570	99,312
7/02	66,798	480,630	234,900	1,142,700	237,156	1,086,624	115,446	580,134	57,324	156,636
7/03	121,938	602,568	200,568	1,343,268	378,654	1,465,278	146,868	727,002	62,508	219,144
7/04	216,594	819,162	59,328	1,402,596	493,116	1,958,394	166,296	893,298	52,914	272,058
7/05	146,808	965,970	32,154	1,434,750	363,114	2,321,508	140,034	1,033,332	71,052	343,110
7/06	167,394	1,133,364	29,370	1,464,120	179,418	2,500,926	25,980	1,059,312	70,356	413,466
7/07	92,070	1,225,434	86,070	1,550,190	207,132	2,708,058	27,042	1,086,354	82,452	495,918
7/08	107,466	1,332,900	32,700	1,582,890	236,160	2,944,218	19,602	1,105,956	73,668	569,586
7/09	100,086	1,432,986	45,318	1,628,208	78,030	3,022,248	7,722	1,113,678	63,924	633,510
7/10	30,498	1,463,484	77,652	1,705,860	61,374	3,083,622	19,680	1,133,358	28,464	661,974
7/11	37,158	1,500,642	31,632	1,737,492	220,650	3,304,272	7,242	1,140,600	25,704	687,678
7/12	62,940	1,563,582	26,346	1,763,838	93,858	3,398,130	3,474	1,144,074	10,512	698,190
7/13	30,378	1,593,960	22,428	1,786,266	52,110	3,450,240	3,294	1,147,368	4,086	702,276
7/14	18,600	1,612,560	24,894	1,811,160	41,712	3,491,952	2,700	1,150,068	9,294	711,570
7/15	14,130	1,626,690	20,010	1,831,170	51,270	3,543,222	1,962	1,152,030	5,322	716,892
7/16	20,202	1,646,892			75,690	3,618,912			6,462	723,354
7/17	21,588	1,668,480			24,408	3,643,320			8,274	731,628
7/18	12,576	1,681,056			7,656	3,650,976			54	731,682
7/19	1,416	1,682,472			7,716	3,658,692			4,548	736,230
7/20	2,118	1,684,590			11,850	3,670,542			4,218	740,448
7/21	2,214	1,686,804			5,604	3,676,146			6,684	747,132
7/22									8,136	755,268
7/23									3,264	758,532

Table 22. Daily sockeye salmon escapement tower counts by river system, westside Bristol Bay, 2003.

Date	Wood River		Igushik River		Nuyakuk River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/20	7,614	7,614						
6/21	73,284	80,898						
6/22	80,016	160,914						
6/23	131,496	292,410	630	630				
6/24	135,816	428,226	6,456	7,086				
6/25	152,616	580,842	3,888	10,974				
6/26	70,020	650,862	9,450	20,424				
6/27	69,978	720,840	25,512	45,936	2,880	2,880		
6/28	49,332	770,172	17,832	63,768	12,390	15,270		
6/29	26,514	796,686	16,602	80,370	17,928	33,198		
6/30	55,884	852,570	8,322	88,692	13,728	46,926		
7/01	52,554	905,124	4,860	93,552	6,810	53,736		
7/02	90,156	995,280	3,240	96,792	6,870	60,606		
7/03	94,734	1,090,014	6,132	102,924	4,428	65,034	4,014	4,014
7/04	107,610	1,197,624	11,226	114,150	3,450	68,484	3,354	7,368
7/05	42,912	1,240,536	12,732	126,882	3,516	72,000	3,504	10,872
7/06	32,070	1,272,606	8,898	135,780	3,276	75,276	2,808	13,680
7/07	26,556	1,299,162	6,624	142,404	5,430	80,706	3,618	17,298
7/08	16,866	1,316,028	6,438	148,842	8,682	89,388	3,576	20,874
7/09	21,456	1,337,484	4,188	153,030	6,654	96,042	10,428	31,302
7/10	27,516	1,365,000	2,706	155,736	4,428	100,470	12,246	43,548
7/11	18,372	1,383,372	2,934	158,670	2,832	103,302	4,302	47,850
7/12	14,700	1,398,072	7,236	165,906	2,442	105,744	3,078	50,928
7/13	11,502	1,409,574	6,438	172,344	1,662	107,406	4,194	55,122
7/14	21,690	1,431,264	2,976	175,320	2,058	109,464	3,372	58,494
7/15	17,952	1,449,216	2,172	177,492	2,088	111,552	5,436	63,930
7/16	8,838	1,458,054	3,156	180,648	1,506	113,058	12,558	76,488
7/17	1,728	1,459,782	3,876	184,524	834	113,892	9,852	86,340
7/18			2,244	186,768	588	114,480	6,102	92,442
7/19			2,760	189,528	264	114,744	4,650	97,092
7/20			3,054	192,582	468	115,212	8,256	105,348
7/21			1,506	194,088	780	115,992	17,604	122,952
7/22					504	116,496	22,326	145,278
7/23					150	116,646	27,660	172,938
7/24							12,942	185,880
7/25							7,428	193,308
7/26							4,542	197,850
7/27							5,202	203,052
7/28							4,254	207,306
7/29							4,212	211,518
7/30							3,756	215,274
7/31							6,330	221,604
8/01							5,514	227,118
8/02							3,120	230,238
8/03							2,064	232,302

Table 23. Final daily and cumulative escapement estimates by species, Nushagak River sonar project, Bristol Bay, 2003.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/07	65	65	193	193	22	22					280	280
6/08	290	355	1,032	1,225	257	279	0	0	0	0	1,579	1,859
6/09	443	798	1,773	2,998	427	706	0	0	0	0	2,643	4,502
6/10	376	1,174	2,304	5,302	375	1,081	0	0	0	0	3,055	7,557
6/11	280	1,454	1,205	6,507	338	1,419	0	0	0	0	1,823	9,380
6/12	0	1,454	531	7,038	49	1,468	0	0	0	0	580	9,960
6/13	0	1,454	446	7,484	19	1,487	0	0	0	0	465	10,425
6/14	0	1,454	366	7,850	199	1,686	0	0	0	0	565	10,990
6/15	98	1,552	1,811	9,661	34	1,720	0	0	0	0	1,943	12,933
6/16	106	1,658	1,529	11,190	19	1,739	0	0	0	0	1,654	14,587
6/17	3,541	5,199	2,377	13,567	3,151	4,890	0	0	0	0	9,069	23,656
6/18	7,598	12,797	4,291	17,858	5,600	10,490	0	0	0	0	17,489	41,145
6/19	4,119	16,916	2,773	20,631	5,190	15,680	0	0	0	0	12,082	53,227
6/20	3,443	20,359	2,994	23,625	4,222	19,902	0	0	0	0	10,659	63,886
6/21	9,853	30,212	2,049	25,674	11,584	31,486	0	0	0	0	23,486	87,372
6/22	41,818	72,030	2,749	28,423	22,038	53,524	0	0	0	0	66,605	153,977
6/23	78,962	150,992	2,244	30,667	9,438	62,962	0	0	0	0	90,644	244,621
6/24	41,316	192,308	3,671	34,338	10,139	73,101	0	0	0	0	55,126	299,747
6/25	52,701	245,009	4,866	39,204	26,322	99,423	0	0	0	0	83,889	383,636
6/26	42,533	287,542	6,053	45,257	2,345	101,768	0	0	0	0	50,931	434,567
6/27	27,905	315,447	4,328	49,585	11,819	113,587	0	0	0	0	44,052	478,619
6/28	34,842	350,289	3,170	52,755	14,918	128,505	0	0	0	0	52,930	531,549
6/29	18,552	368,841	2,794	55,549	7,894	136,399	0	0	0	0	29,240	560,789
6/30	14,068	382,909	1,758	57,307	8,495	144,894	0	0	0	0	24,321	585,110
7/01	19,014	401,923	1,883	59,190	11,916	156,810	0	0	0	0	32,813	617,923
7/02	18,946	420,869	4,029	63,219	20,842	177,652	0	0	0	0	43,817	661,740
7/03	49,433	470,302	2,264	65,483	13,141	190,793	0	0	0	0	64,838	726,578
7/04	42,629	512,931	2,293	67,776	7,008	197,801	0	0	0	0	51,930	778,508
7/05	14,427	527,358	1,136	68,912	9,967	207,768	0	0	0	0	25,530	804,038

(Continued)

Table 23. (page 2 of 2).

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/06	6,225	533,583	1,060	69,972	6,898	214,666	0	0	0	0	14,183	818,221
7/07	3,706	537,289	1,082	71,054	18,579	233,245	0	0	0	0	23,367	841,588
7/08	6,045	543,334	679	71,733	12,354	245,599	0	0	0	0	19,078	860,666
7/09	3,974	547,308	400	72,133	4,379	249,978	0	0	0	0	8,753	869,419
7/10	2,357	549,665	1,641	73,774	6,592	256,570	0	0	0	0	10,590	880,009
7/11	6,919	556,584	1,009	74,783	5,067	261,637	0	0	0	0	12,995	893,004
7/12	3,375	559,959	1,270	76,053	4,982	266,619	0	0	0	0	9,627	902,631
7/13	6,364	566,323	254	76,307	4,570	271,189	0	0	0	0	11,188	913,819
7/14	3,522	569,845	220	76,527	3,045	274,234	0	0	0	0	6,787	920,606
7/15	3,501	573,346	377	76,904	3,309	277,543	0	0	0	0	7,187	927,793
7/16	2,505	575,851	1,375	78,279	3,142	280,685	0	0	0	0	7,022	934,815
7/17	1,078	576,929	479	78,758	3,834	284,519	0	0	0	0	5,391	940,206
7/18	1,214	578,143	457	79,215	2,870	287,389	0	0	0	0	4,541	944,747
7/19	1,499	579,642	534	79,749	4,392	291,781	0	0	0	0	6,425	951,172
7/20	891	580,533	279	80,028	3,628	295,409	-	0	0	0	4,798	955,970

Table 24. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2003.

Date	Tower Count		Aerial Survey		River Test Fishing			Estimated River Fish ^b
	Daily	Cum.	Total	Fish per Index Pt. ^a	Daily	Cum.	Cumulative Escapement	
6/21	0	-		50	4	4	0	
6/22	18	18		35	208	212	0	
6/23	0	18		35	7	219	7,665	
6/24	888	906		20	43	262	5,240	4,000
6/25	414	1,320		20	233	495	9,900	6,000
6/26	4,926	6,246		21	135	630	13,230	7,000
6/27	18,462	24,708		50	374	1,004	50,200	25,000
6/28	18,102	42,810		35	5,792	6,796	237,860	200,000
6/29	69,972	112,782		35	5,256	12,052	421,820	300,000
6/30	171,006	283,788		34	2,977	15,029	510,986	225,000
7/01	130,044	413,832		34	3,143	18,172	617,848	200,000
7/02	66,798	480,630		32	5,804	23,976	767,232	280,000
7/03	121,938	602,568		31	6,122	30,098	933,038	330,000
7/04	216,594	819,162		31	4,243	34,341	1,064,571	250,000
7/05	146,808	965,970		31	3,907	38,248	1,185,688	220,000
7/06	167,394	1,133,364		32	3,213	41,461	1,326,752	200,000
7/07	92,070	1,225,434		32	2,855	44,316	1,418,112	180,000
7/08	107,466	1,332,900		32	1,771	46,087	1,474,784	140,000
7/09	100,086	1,432,986		32	2,685	48,772	1,560,704	130,000
7/10	30,498	1,463,484		31	5,435	54,207	1,680,417	175,000
7/11	37,158	1,500,642		29	2,528	56,735	1,645,315	150,000
7/12	62,940	1,563,582		29	485	57,220	1,659,380	90,000
7/13	30,378	1,593,960						
7/14	18,600	1,612,560						
7/15	14,130	1,626,690						
7/16	20,202	1,646,892						
7/17	21,588	1,668,480						
7/18	12,576	1,681,056						
7/19	1,416	1,682,472						
7/20	2,118	1,684,590						
7/21	2,214	1,686,804						

^a A preseason calculated mean FPI of 50, based on time series relationships of FPI values used within the last three to five years, was determined to be high inseason and downgraded. A mean of the last three years of season ending FPI's, resulting in an FPI of 35, was used from 22 June to 23 June. The FPI was downgraded further to 20, based on catch rates similar to last year, and was used through 25 June when lag time relationships became more accurate.

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

Table 25. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Egegik River, Bristol Bay, 2003.

Date	Tower Count		Aerial Survey	Fish per Index Pt. ^a	River Test Fishing		Estimated Cumulative Escapement	Estimated River Fish ^b
	Daily	Cum.	Total		Daily	Cum.		
6/15				70	110	110	7,700	
6/16				70	270	380	26,600	
6/17				70	292	672	47,040	45,000
6/18	186	186		70	333	1,005	70,350	70,000
6/19	10,416	10,602		70	545	1,550	108,500	100,000
6/20	19,590	30,192		70	427	1,977	138,390	105,000
6/21	8,544	38,736		40	238	2,215	88,600	50,000
6/22	17,826	56,562	975	38	91	2,306	87,628	30,000
6/23	7,962	64,524		35	654	2,960	103,600	40,000
6/24	11,934	76,458		35	654	3,614	126,490	55,000
6/25	15,414	91,872		28	2554	6,168	172,704	80,000
6/26	46,494	138,366	6,700	30	958	7,126	213,780	70,000
6/27	53,862	192,228		30	1,565	8,691	260,730	65,000
6/28	70,782	263,010	19,200	33	1,477	10,168	335,544	70,000
6/29	62,124	325,134	16,500	37	223	10,391	384,467	60,000
6/30	28,140	353,274	700	36	646	11,037	397,332	50,000
7/01	111,414	464,688		46	1444	12,481	574,126	105000
7/02	115,446	580,134		56	2,211	14,692	822,752	240,000
7/03	146,868	727,002	60,000	54	1,868	16,560	894,240	170,000
7/04	166,296	893,298		58	720	17,280	1,002,240	110,000
7/05	140,034	1,033,332	20,550	62	522	17,802	1,103,724	70,000
7/06	25,980	1,059,312		61	261	18,063	1,101,843	30,000
7/07	27,042	1,086,354		61	483	18,546	1,131,306	35000
7/08	19,602	1,105,956		61	268	18,814	1,147,654	30,000
7/09	7,722	1,113,678		60	206	19,020	1,141,200	20,000
7/10	19,680	1,133,358		60	531	19,551	1,173,060	30,000
7/11	7,242	1,140,600		59	117	19,668	1,160,412	10,000
7/12	3,474	1,144,074						
7/13	3,294	1,147,368						
7/14	2,700	1,150,068						
7/15	1,962	1,152,030						
7/21			4,750					

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

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

Table 26. Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2003.

Date	Tower Count		Aerial Survey		River Test Fishing			
	Daily	Cum.	Total	Fish per Index Pt. ^a	Index Points		Estimated	Estimated River Fish ^b
					Daily	Cum.	Escapement	
6/22			0	31	21	21	646	
6/23				31	43	64	1,974	
6/24				31	44	108	3,352	3,000
6/25				31	81	189	5,854	6,000
6/26			0	31	240	429	13,299	13,000
6/27				31	1,117	1,546	47,920	45,000
6/28	5,958	5,958	500	31	1,215	2,761	85,576	70,000
6/29	30,360	36,318	900	30	1,063	3,824	114,709	70,000
6/30	20,424	56,742	700	24	2,923	6,747	161,916	100,000
7/01	42,570	99,312		27	2,479	9,226	249,081	145,000
7/02	57,324	156,636		30	1,182	10,408	312,225	150,000
7/03	62,508	219,144	2,550	26	1,271	11,679	303,630	65,000
7/04	52,914	272,058		28	2,530	14,209	397,830	120,000
7/05	71,052	343,110	1,500	31	2,889	17,098	530,017	190,000
7/06	70,356	413,466		29	1,527	18,625	540,096	130,000
7/07	82,452	495,918		31	1,288	19,913	617,268	110,000
7/08	73,668	569,586		32	857	20,770	664,591	90,000
7/09	63,924	633,510		33	430	21,200	699,533	60,000
7/10	28,464	661,974		32	265	21,465	686,813	25,000
7/11	25,704	687,678		32	243	21,708	694,590	15,000
7/12	10,512	698,190		32	55	21,763	696,337	10,000
7/13	4,086	702,276		32	43	21,806	697,698	3,000
7/14	9,294	711,570						
7/15	5,322	716,892						
7/16	6,462	723,354						
7/17	8,274	731,628						
7/18	54	731,682						
7/19	4,548	736,230						
7/20	4,218	740,448						
7/21	6,684	747,132						
7/22	8,136	755,268						
7/23	3,264	758,532						
7/24								

^a A three-year mean EPI of 45, based on time series relationships of FPI values within the last three to five years, was determined to be high in season and downgraded. A six-year mean of season ending FPI's from years with the lowest water velocity measurements at Ugashik smolt resulted in an FPI of 31. This value was used through June 28 when lag time relationships became more accurate.

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

Table 27. Commercial salmon processors and buyers operating in Bristol Bay, 2003.^a

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

Canning=8; Freezing= 20; Fresh=7; Curing=3; Air Export=13; Sea Export=14

^a Indicates operators with a processing facility in a district or operators from other areas buying fish and/or providing support 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 28. Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2003^a.

Species	Total Catch (lbs.)	Mean Weight (lbs.)	Mean Price (\$/lb.)	Exvessel Value (\$)
Sockeye	93,369,988	6.33	0.50	46,542,708
Chinook	751,886	16.01	0.30	223,235
Chum	6,026,713	6.46	0.09	517,633
Pink	1,195	4.90	0.03	41
Coho	290,160	6.71	0.30	86,685
Total	100,439,942			47,370,302

^a Based on final fish ticket data.

Table 29. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2003. ^a

Area and River System	Permits Issued ^b	Estimated Number of Salmon Harvested					Total
		Sockeye	Chinook	Chum	Pink	Coho	
NAKNEK-KVICHAK DISTRICT	489	61,443	1,221	259	198	812	63,934
Naknek River	316	22,948	1,080	233	195	672	25,129
Kvichak River/Iliamna Lake	175	38,495	142	26	3	140	38,805
Alagnak (Branch) Rive	1	48	0	0	0	0	48
Igiugig	8	1,053	1	0	0	1	1,055
Iliamna Lake	38	7,049	0	0	0	0	7,049
Kijik	1	80	0	0	0	0	80
Kokhanok	29	9,990	89	16	3	73	10,170
Kvichak River	7	755	0	0	0	0	755
Lake Clark: General	33	2,949	0	0	0	0	2,949
Levelock	7	629	52	10	0	66	757
Newhalen River	27	7,934	0	0	0	0	7,934
Nondalton Village	6	1,938	0	0	0	0	1,938
Pedro Bay	10	2,144	0	0	0	0	2,144
Port Alsworth	4	464	0	0	0	0	464
Six Mile Lake	15	3,463	0	0	0	0	3,463
Naknek or Kvichak Unspeci	0	0	0	0	0	0	0
EGEGIK DISTRICT	62	3,240	84	32	10	297	3,663
UGASHIK DISTRICT	23	1,113	31	30	0	392	1,567
NUSHAGAK DISTRICT	527	25,491	18,686	5,064	403	5,432	55,076
Wood River	138	3,979	3,311	268	5	463	8,026
Lower Nushagak River	36	975	2,120	343	5	120	3,564
Upper Nushagak River	80	6,363	4,448	3,210	232	1,310	15,563
Dillingham Beaches	244	8,451	7,778	987	84	2,956	20,255
Nushagak Bay Commercial	56	1,665	672	210	68	539	3,155
Igushik/Snake River	30	3,882	357	45	9	44	4,337
Nushagak, Site Unspecified	2	176	0	0	0	0	176
TOGIAC DISTRICT	92	4,403	1,208	483	451	883	7,428
TOTAL BRISTOL BAY	1,182	95,690	21,231	5,868	1,062	7,816	131,667

^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 1,182 permits issued for the management area, 1,058 were returned (89.5%).

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

Table 30. Daily observed estimates (tons) of herring by index area, Togiak District, 2003.^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	CPN	HAG	WAL	
4/16	15:15	5.0															
4/19	11:30	3.5														108	108
4/20	11:15	4.7															
4/21	01:30	4.1														110	110
4/22	10:15	4.8					8	41									49
4/23	03:15	4.8	0.6				8	696	946								1,650
4/25	13:00	3.8	1.0			391	3,178	3,340	5,634	579	1,074	54		4,541	285		19,076
4/25	19:10	3.4	6.2			246	2,215	1,214	3,340	3,098	435	181					10,729
4/26	11:45	3.4	11.1			2,330	1,815	3,419	4,213	2,212	781	193	2,735				17,697
4/27	15:45	3.6	15.3			6	1	391		250	110	21	8			32	817
4/28	09:30	2.6	15.0		1,130	991	1,277	1,016	4,349	1,830	1,971	559	75		1,858		15,055
4/28 ^d	20:30		24.6														
4/29	09:45	2.7	10.9			941	260	2,418	1,942	14,527	9,585	5,076	1,400			338	36,487
4/30	09:45	2.2	1.3			639	174	154	1,324	243	3,775	4,093	1,436	8,459	488		20,785
5/01	09:45	2.9	1.9		6,180	2,146	2,652	298	1,444	6,666	1,214	2,404	2,606	282		297	26,189
5/13	13:00	4.5			6	254	5	144	229								636
5/16	15:30	3.1	3.6		754	66	2,855	712	354	597	239	11				132	5,719
5/30	12:30	2.2	3.2		31	229	3,237	983	9		2,309						6,798
Total			94.7													Peak	36,487

^a The 2003 Togiak District Pacific herring total run biomass could not be estimated from aerial survey information because of poor survey conditions.

^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 - Osviak; PYT - Pyrite Point; CPN - Cape Newenham.

^d Vessel count and spawn survey only.

Table 31. Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2003

Emergency Order									
Number	Area ^a			Date and Time				Duration	
Herring Sac Roe Gillnet									
DLG-01	Metervik Bay to Right Hand Pt.		4/25	6:30 p.m.	to	4/25	11:30 p.m.	5 hrs.	
DLG-02	Metervik Bay to Right Hand Pt.	extension	4/25	11:30 p.m.	to	4/26	4:30 a.m.	5 hrs.	
DLG-04	Egg Island to Right Hand Pt.		4/26	11:30 a.m.	to	4/26	5:30 p.m.	6 hrs.	
DLG-05	Egg Island to Right Hand Pt.	extension	4/26	5:30 p.m.	to	4/26	10:30 p.m.	5 hrs.	
DLG-07	Egg Island to Right Hand Pt.		4/27	7:00 a.m.	to	4/27	1:00 p.m.	6 hrs.	
DLG-09	Egg Island to Right Hand Pt.	extension	4/27	1:00 p.m.	to	4/27	10:00 p.m.	9 hrs.	
DLG-10	Egg Island to Right Hand Pt.		4/28	7:00 a.m.	to	4/28	1:00 p.m.	6 hrs.	
DLG-12	Egg Island to Right Hand Pt.	extension	4/28	1:00 p.m.	to	4/28	10:00 p.m.	9 hrs.	
DLG-13	Egg Island to Right Hand Pt.		4/29	7:00 a.m.	to	4/29	1:00 p.m.	6 hrs.	
DLG-15	Egg Island to Right Hand Pt.		4/29	5:00 p.m.	to	4/29	10:00 p.m.	5 hrs.	
DLG-16	Egg Island to Right Hand Pt.		4/30	7:00 a.m.	to	4/30	1:00 p.m.	6 hrs.	
DLG-18	Egg Island to Right Hand Pt.	extension	4/30	1:00 p.m.	to	4/30	6:00 p.m.	5 hrs.	
DLG-19	Egg Island to Right Hand Pt.		5/1	11:00 a.m.	to	5/1	5:00 p.m.	6 hrs.	
DLG-21	Egg Island to Right Hand Pt.	extension	5/1	5:00 p.m.	to	5/1	10:00 p.m.	5 hrs.	
DLG-23	Egg Island to Right Hand Pt.		5/2	12:00 p.m.	to	5/2	6:00 p.m.	6 hrs.	
DLG-24	Egg Island to Right Hand Pt.	extension	5/2	6:00 p.m.	to	5/2	10:00 p.m.	4 hrs.	
DLG-26	Metervik Bay to Egg Island		5/3	12:00 p.m.	to	5/3	7:30 p.m.	7.5 hrs.	
DLG-28	Metervik Bay to Egg Island	extension	5/3	7:30 p.m.	to	5/3	10:00 p.m.	2.5 hrs.	
DLG-30	Egg Island to Right Hand Pt.		5/4	10:00 a.m.	to	5/4	4:00 p.m.	6 hrs.	
DLG-31	Egg Island to Right Hand Pt.	extension	5/4	4:00 p.m.	to	5/4	10:00 p.m.	6 hrs.	
DLG-32	Egg Island to Right Hand Pt.		5/5	6:00 a.m.	to	5/5	12:00 p.m.	6 hrs.	
DLG-33	Egg Island to Right Hand Pt.	extension	5/5	12:00 p.m.	to	5/5	7:30 p.m.	7.5 hrs.	
DLG-34	Egg Island to Right Hand Pt.	extension	5/5	7:30 p.m.	to	5/5	10:00 p.m.	2.5 hrs.	
DLG-35	Egg Island to Ungalikthluk Bay		5/6	6:00 a.m.	to	5/6	12:00 p.m.	6 hrs.	
DLG-36	Egg Island to Ungalikthluk Bay	extension	5/6	12:00 p.m.	to	5/6	7:30 p.m.	7.5 hrs.	
DLG-37	Egg Island to Ungalikthluk Bay	closure	5/6	4:00 p.m.					
Herring Sac Roe Purse Seine									
DLG-03	Togiak Reef to Oosik Spit		4/26	10:00 a.m.	to	4/26	10:00 p.m.	12 hrs.	
DLG-06	Oosik Spit to Cape Newenham		4/26	6:30 a.m.	to	4/26	10:30 p.m.	3.5 hrs.	
DLG-08	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		4/27	8:30 a.m.	to	4/27	8:30 p.m.	12 hrs.	
DLG-11	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		4/28	8:30 a.m.	to	4/28	8:30 p.m.	12 hrs.	
DLG-14	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		4/29	8:30 a.m.	to	4/29	8:30 p.m.	12 hrs.	
DLG-17	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		4/30	8:30 a.m.	to	4/30	8:30 p.m.	12 hrs.	
DLG-20	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		5/1	8:30 a.m.	to	5/1	8:30 p.m.	12 hrs.	
DLG-22	Rt. Hand Pt.to Ung Bay/Tog Reef to C. New		5/2	8:30 a.m.	to	5/2	8:30 p.m.	12 hrs.	
DLG-25	Togiak Reef to Cape Newenham		5/3	8:30 a.m.	to	5/3	8:30 p.m.	12 hrs.	
DLG-29	Togiak Reef to Cape Newenham		5/4	10:00 a.m.	to	5/4	10:00 p.m.	12 hrs.	
DLG-38	Tongue Pt.to Oosik Spit		5/6	4:00 p.m.	to	5/6	5:00 p.m.	1 hrs.	
DLG-39	Tongue Pt.to Cape Pierce		5/6	8:00 p.m.	to	5/6	9:00 p.m.	1 hrs.	
DLG-40	Ungalikthluk to 159 degrees 30 min W. Long		5/7	3:30 p.m.	to	5/7	3:40 p.m.	10 min.	
Herring Spawn on Kelp ^b									
DLG-27	K-3		5/3	11:30 p.m.	to	5/4	2:30 a.m.	3 hrs.	

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

Table 32. Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 200

Date	Duration	Periods	Togiak				Pyrite Poi ^r	Cape Newenha ^m	Total	Total Roe %
			Kulukak	Numavaahak	Purse Seine	Hagemeiste ^r				
26-Apr	12:00	1				1,077.1 (8.20)	88.1 (8.00)			(8.18)
27-Apr	12:00	2		750.8 (8.00)		989.5 (8.60)	58.8 (8.50)		1,799	(8.35)
28-Apr	12:00	3		432.8 (9.30)		623.9 (8.80)			1,057	(9.00)
29-Apr	12:00	4		194.3 (6.80) ^b		645.9 (8.60)	155.4 (7.60)		996	(8.31)
30-Apr	12:00	5		62.0 ^c		1,517.2 (7.70)	236.5 (9.30)		1,816	(7.92)
1-May	12:00	6		146.0 ^d		1,834.9 (9.70) ^e	85.4 (10.60)		2,066	(9.74)
2-May	12:00	7				1,350.3 (8.20)	36.1 (10.60)		1,386	(8.26)
3-May	12:00	8				965.5 (8.90)	255.7 (10.50)	220.7 (5.60)	1,442	(8.68)
4-May	12:00	9				1,444.9 (10.80)			1,445	(10.80)
5-May						198.6 (9.06) ^a			199	(9.06)
6-May	1:00	10				221.7 (11.50)		1,165	222	(11.50)
6-May	1:00	11				138.3 (8.90)	55.3 (10.8)		194	(9.44)
7-May	:10	12		1009.5 (8.80)		224.5 (10.01) ^a			1,234	(9.02)
8-May				138.2 (9.00) ^a					138	(9.00)
Subtotal	110:10:00		0.0	2,733.6 (8.58)	0.0	11,232.3 (8.99)	971.3 (9.43)	220.7 (5.60)	15,158	(8.90)
<u>Gillnet</u>										
25-Apr	10:00	1	125.5 (9.70)						126	(9.70)
26-Apr	11:00	2	865.9 (11.00)						866	(11.00)
27-Apr	15:00	3	1,198.5 (11.00)						1,199	(11.00)
28-Apr	15:00	4	575.6 (10.60)						576	(10.60)
29-Apr	6:00	5	388.2 (9.80)						388	(9.80)
29-Apr	5:00	6	325.3 (9.90)						325	(9.90)
30-Apr	11:00	7	476.6 (11.00)						477	(11.00)
1-May	11:00	8	496.2 (11.40)						496	(11.40)
2-May	10:00	9	587.4 (10.90)						587	(10.90)
3-May	10:00	10	404.3 (11.30)						404	(11.30)
4-May	12:00	11	68.1 (11.70)						68	(11.70)
5-May	16:00	12	385.3 (11.80)						385	(11.80)
6-May	10:00	13	608.2 (11.10)						608	(11.30)
Subtotal	142:00:00		6,505.1 (10.90)						6,505	(10.90)
<u>Combined</u>										
			nun	tog	hag	py	cn			
25-Apr			125.5 (9.70)						126	(9.70)
26-Apr			865.9 (11.00)		1,077.1 (8.20)	88.1 (8.00)			2,031	(9.39)
27-Apr			1,198.5 (11.00)	750.8 (8.00)	989.5 (8.60)	58.8 (8.50)			2,998	(9.41)
28-Apr			(10.60)	432.8 (9.30)	623.9 (8.80)				1,632	(9.57)
29-Apr			(9.80)	194.3 (6.80) ^b	645.9 (8.60)	155.4 (7.60)			1,384	(8.77)
30-Apr			325.3 (9.90)	62.0 ^c	1,517.2 (7.70)	236.5 (9.30)			2,141	(8.23)
1-May		575.6	476.6 (11.00)	146.0 ^d	1,834.9 (9.70) ^e	85.4 (10.60)			2,543	(9.41)
2-May		388.2	496.2 (11.40)		1,350.3 (8.20)	36.1 (10.60)			1,883	(9.09)
3-May			587.4 (10.90)		965.5 (8.90)	255.7 (10.50)	220.7 (5.60)		2,029	(9.32)
4-May			404.3 (11.30)		1,444.9 (10.80)				1,849	(10.91)
5-May			68.1 (11.70)		198.6 (9.06) ^a				267	(9.72)
6-May			385.3 (11.80)		360.0 (10.50)	55.3 (10.8)			801	(11.14)
7-May			608.2 (11.10)	1009.5 (8.80)	224.5 (10.01) ^a				1,842	(9.71)
8-May			138.2 (9.00) ^a						138	(9.00)
Total			6,505.1 (10.90)	2,733.6 (8.58)	0.0	11,232.3 (8.99)	971.3 (9.43)	220.7 (5.60)	21,663	(9.45)

^a Includes test fish harvest which is conducted during closed commercial period

^b Includes 140.5 tons documented waste

^c Includes 62 tons documented waste

^d Includes 146 tons documented waste

^e Includes 31.2 tons documented waste

Table 33. Herring total run and commercial catch by year class, Togiak District, 2003^{a,b}

Year Class	Age	Total Run		Harvest		Escapement	
		(tons)	%	(tons)	%	(tons)	%
1983	20			0	0.0%		
1984	19			0	0.0%		
1985	18			0	0.0%		
1986	17			11	0.1%		
1987	16			161	0.7%		
1988	15			363	1.7%		
1989	14			438	2.0%		
1990	13			877	4.0%		
1991	12			1,299	6.0%		
1992	11			1,501	6.9%		
1993	10			3,137	14.5%		
1994	9			2,091	9.7%		
1995	8			1,348	6.2%		
1996	7			5,272	24.3%		
1997	6			4,895	22.6%		
1998	5			264	1.2%		
1999	4			6	0.0%		
2000	3			0	0.0%		
2001	2			0			
Total				21,663	100%		

^a Does not include harvest in the Dutch Harbor food and bait fishery, but does include harvest from test fishery.

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

Table 34. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2003

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

^a Operators that registered in the Togiak District.

APPENDIX

TABLES

Appendix Table 1. Escapement goals and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1983-2003.

Year	Kvichak River			Naknek River ^a		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1983			3,570			888
1984	8,000	12,000	10,491	800	1,400	1,242
1985	8,000	12,000	7,211	800	1,400	1,850
1986	4,000	6,000	1,179	800	1,400	1,978
1987	4,000	6,000	6,066	800	1,400	1,062
1988	4,000	6,000	4,065	800	1,400	1,038
1989	6,000	10,000	8,318	800	1,400	1,612
1990	6,000	10,000	6,970	800	1,400	2,093
1991	4,000	8,000	4,223	800	1,400	3,579
1992	4,000	8,000	4,726	800	1,400	1,607
1993	4,000	8,000	4,025	800	1,400	1,536
1994	6,000	10,000	8,338	800	1,400	991
1995	6,000	10,000	10,039	800	1,400	1,111
1996	4,000	6,000	1,451			1,078
1997	4,000	6,000	1,504	800	1,400	1,026
1998	2,000	10,000	2,296	800	1,400	1,202
1999	6,000	10,000	6,197	800	1,400	1,625
2000	6,000	10,000	1,828	800	1,400	1,375
2001	2,000	10,000	1,095	800	2,000	1,830
2002	2,000	10,000	704	800	2,000	1,264
20-Year Average	4,737	8,842	4,715	800	1,467	1,499
1983-92 Average	5,333	8,667	5,682	800	1,400	1,695
1993-02 Average	4,200	9,000	3,748	800	1,533	1,304
2003	2,000	10,000	1,687	800	2,000	1,831
Year	Egegik River			Ugashik River		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1983			792			1,001
1984	800	1,200	1,165	500	900	1,241
1985	800	1,200	1,095	500	900	998
1986	800	1,200	1,151	500	900	1,001
1987	800	1,200	1,273	500	900	669
1988	800	1,200	1,599	500	900	643
1989	800	1,200	1,610	500	900	1,681
1990	800	1,200	2,191	500	900	730
1991	800	1,200	2,787	500	900	2,457
1992	800	1,200	1,945	500	900	2,174
1993	800	1,200	1,517	500	900	1,390
1994	800	1,200	1,897	500	900	1,081
1995	800	1,400	1,282	500	1,200	1,304
1996	800	1,400	1,076	500	1,200	668
1997	800	1,400	1,104	500	1,200	618
1998	800	1,400	1,111	500	1,200	891
1999	800	1,400	1,728	500	1,200	1,652
2000	800	1,400	1,032	500	1,200	620
2001	800	1,400	969	500	1,200	834
2002	800	1,400	1,036	500	1,200	892
20-Year Average	800	1,284	1,418	500	1,026	1,127
1983-92 Average	800	1,200	1,561	500	900	1,260
1993-02 Average	800	1,360	1,275	500	1,140	995
2003	800	1400	1,152	500	1,200	759

Appendix Table 1. (Page 2 of 2)

Year	Wood River			Igushik River		
	Range		Actual	Range		Actual
	Lower	Upper		Lower	Upper	
1983			1,361			180
1984	700	1,200	1,003	150	250	185
1985	700	1,200	939	150	250	212
1986	700	1,200	819	150	250	309
1987	800	1,200	1,337	140	250	169
1988	800	1,200	867	140	250	170
1989	800	1,200	1,186	150	250	462
1990	700	1,200	1,069	150	250	366
1991	700	1,200	1,160	150	250	756
1992	700	1,200	1,286	150	250	305
1993	700	1,200	1,176	150	250	406
1994	700	1,200	1,472	150	250	446
1995	700	1,200	1,475	150	250	473
1996	700	1,200	1,650	150	250	401
1997	700	1,200	1,512	150	250	128
1998	700	1,200	1,756	150	250	216
1999	700	1,200	1,512	150	250	446
2000	700	1,200	1,300	150	250	413
2001	700	1,500	1,459	150	300	410
2002	700	1,500	1,284	150	300	123
20-Year Average	716	1,232	1,281	149	255	329
1983-92 Average	733	1,200	1,103	148	250	311
1993-02 Average	700	1,260	1,460	150	260	346
2003	700	1,500	1,460	150	300	194

Year	Nushagak River ^b			Togiak River		
	Range		Actual	Range		Actual
	Lower ^c	Upper		Lower	Upper	
1983			319			192
1984	300	700	473	140	250	95
1985	300	700	429	140	250	137
1986	300	700	822	140	250	168
1987	300	700	163	100	200	250
1988	300	700	483	100	200	277
1989	300	700	513	100	200	84
1990	340	760	680	140	250	142
1991	340	760	493	140	250	255
1992	340	760	695	140	250	199
1993	340	760	715	140	250	177
1994	340	760	509	140	250	155
1995	340	760	281	140	250	186
1996	340	760	504	140	250	157
1997	340	760	373	100	200	132
1998	340	760	459	100	200	154
1999	235	760	393	100	200	156
2000	340	760	404	100	200	312
2001	340	760	804	100	200	297
2002	340	760	316	100	200	162
20-Year Average	322	741	491	121	226	184
1983-92 Average	313	720	507	127	233	180
1993-02 Average	330	760	476	116	220	189
2003	340	760	581	100	200	232

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

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

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

Appendix Table 2. Salmon entry permit registration by gear and residency, Bristol Bay, 1983-2003. ^{a,b}

Year	Drift Net ^c			Set Net ^c			Total
	Resident	Non-Resident	Drift Total	Resident	Non-Resident	Set Total	
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	939 (25)	951 (7)	1,890	736 (5)	276 (0)	1,012	2,902
2001	960	923	1,883	731	279	1,010	2,893
2002	950	928	1,878	727	279	1,006	2,884
20 Year Average	1,003	867	1,869	754	247	1,000	2,870
1982-91 Average	1,046	800	1,846	752	230	982	2,828
1992-01 Average	964	927	1,890	755	262	1,017	2,908
2003	944	923	1,867	289	712	1,001	2,868

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

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

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

Appendix Table 4. Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	21,559,372	6,755,256	3,349,451	5,119,744	588,208	37,372,031
1984	14,546,710	5,190,413	2,658,376	1,992,681	322,126	24,710,306
1985	8,179,093	7,537,273	6,468,862	1,307,889	209,766	23,702,883
1986	2,892,171	4,852,935	5,002,949	2,719,313	308,688	15,776,056
1987	4,986,002	5,356,669	2,128,652	3,254,720	342,732	16,068,775
1988	3,480,836	6,456,598	1,523,520	1,706,716	822,087	13,989,757
1989	13,809,956	8,901,994	3,146,239	2,788,185	88,932	28,735,306
1990	17,272,224	10,371,762	2,149,009	3,532,543	197,589	33,523,127
1991	10,475,206	6,797,166	2,945,742	5,053,845	549,221	25,821,180
1992	9,395,948	15,646,575	3,320,966	2,789,741	726,446	31,879,676
1993	8,907,876	21,600,858	4,176,900	5,236,557	539,933	40,462,124
1994	16,327,858	10,750,213	4,352,797	3,393,143	400,039	35,224,050
1995	20,279,581	14,425,979	4,509,446	4,445,883	605,328	44,266,217
1996	8,211,983	10,809,115	4,411,055	5,693,523	462,621	29,588,297
1997	589,311	7,517,389	1,402,690	2,506,818	142,569	12,158,777
1998	2,595,439	3,528,845	730,247	2,990,597	190,446	10,035,574
1999	9,452,972	7,388,080	2,256,007	6,175,419	385,411	25,657,889
2000	4,727,061	7,029,397	1,538,790	6,367,208	794,996	20,457,452
2001	5,280,538	2,872,662	480,509	4,734,800	810,096	14,178,605
2002	1,418,938	4,610,374	1,573,234	2,840,031	233,743	10,676,320
20-Year Average	9,219,454	8,419,978	2,906,272	3,732,468	436,049	24,714,220
1983-92 Average	10,659,752	7,786,664	3,269,377	3,026,538	415,580	25,157,910
1993-02 Average	7,779,156	9,053,291	2,543,168	4,438,398	456,518	24,270,531
2003	3,348,453	2,283,518	1,738,559	6,665,918	706,008	14,742,456

Appendix Table 3 . Salmon fishing interim-use and permanent entry permits, by gear type, Bristol Bay, 1983-2003.

Year	Permits Issued			Permits Fished	
	Interim -Use	Permanent	Total	Number	Percent
Drift Gill Net					
1983	96	1,727	1,823	1,797	99%
1984	90	1,729	1,819	1,804	99%
1985	101	1,738	1,839	1,815	99%
1986	98	1,743	1,841	1,823	99%
1987	93	1,746	1,839	1,824	99%
1988	93	1,749	1,842	1,837	100%
1989	91	1,776	1,867	1,855	99%
1990	94	1,785	1,879	1,869	99%
1991	92	1,793	1,885	1,873	99%
1992	88	1,797	1,885	1,879	100%
1993	85	1,805	1,890	1,875	99%
1994	78	1,810	1,888	1,865	99%
1995	75	1,813	1,888	1,882	100%
1996	72	1,821	1,893	1,884	100%
1997	71	1,832	1,903	1,875	99%
1998	61	1,844	1,905	1,858	98%
1999	53	1,850	1,903	1,847	97%
2000	38	1,858	1,896	1,823	96%
2001	24	1,861	1,885	1,566	83%
2002	16	1,863	1,879	1,183	63%
Average	79	1,794	1,872	1,834	98%
2003	7	1,872	1,879	1,389	74%
Set Gill Net					
1983	40	929	969	865	89%
1984	32	931	963	869	90%
1985	28	931	959	872	91%
1986	26	940	966	869	90%
1987	19	942	961	899	94%
1988	17	941	958	922	96%
1989	18	1,007	1,025	971	95%
1990	16	1,012	1,028	971	94%
1991	13	1,012	1,025	950	93%
1992	10	1,017	1,027	968	94%
1993	9	1,014	1,023	965	94%
1994	7	1,012	1,019	939	92%
1995	8	1,011	1,019	967	95%
1996	6	1,011	1,017	941	93%
1997	7	1,012	1,019	921	90%
1998	6	1,009	1,015	901	89%
1999	6	1,008	1,014	925	91%
2000	6	1,007	1,013	921	91%
2001	2	1,008	1,010	834	83%
2002	2	1,004	1,006	680	68%
Average	16	985	1,000	924	92%
2003	1	1,040	1,041	714	69%

Appendix Table 5. Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
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	64,294	6,114	76,378
1998	2,444	760	346	108,486	14,131	126,167
1999	1,295	712	1,638	10,893	11,919	26,457
2000	1,027	1,061	893	12,055	7,858	22,894
2001	904	950	989	11,568	9,937	24,348
2002	969	268	612	39,473	2,801	44,123
20-Year Average	4,986	2,067	2,980	57,914	15,773	83,721
1983-92 Average	6,453	2,935	4,259	57,744	21,028	92,419
1993-02 Average	3,225	1,026	1,446	58,118	9,468	73,283
2003	567	130	419	42,615	3,231	46,962

Appendix Table 6. Chum salmon commercial catch by district, in numbers of fish,
Bristol Bay, 1983-2003.

Year	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	351,769	127,490	105,171	725,060	322,691	1,632,181
1984	447,259	178,096	210,611	850,114	336,660	2,022,740
1985	210,107	126,736	131,576	396,740	203,302	1,068,461
1986	262,925	94,666	111,112	488,375	270,057	1,227,135
1987	446,908	145,259	101,074	416,476	419,425	1,529,142
1988	295,571	237,888	94,545	371,196	470,132	1,469,332
1989	310,869	136,185	84,673	523,903	203,178	1,258,808
1990	422,276	123,087	32,013	378,223	102,861	1,058,460
1991	443,189	75,892	60,299	463,780	246,589	1,289,749
1992	167,168	121,472	57,170	398,691	176,123	920,624
1993	43,684	70,628	73,402	505,799	144,869	838,382
1994	219,118	62,961	52,127	328,267	232,559	895,032
1995	236,472	68,325	62,801	390,158	221,126	978,882
1996	124,137	85,151	103,392	324,261	207,094	844,035
1997	8,719	53,139	16,379	185,620	47,459	311,316
1998	82,281	29,405	8,088	208,551	67,595	395,920
1999	259,922	74,890	68,004	170,795	111,677	685,288
2000	68,218	38,857	36,349	114,454	140,175	398,053
2001	16,472	33,579	43,394	526,602	211,701	831,748
2002	19,180	23,516	35,792	276,845	112,987	468,320
20-Year Average	221,812	95,361	74,399	402,196	212,413	1,006,180
1983-92 Average	335,804	136,677	98,824	501,256	275,102	1,347,663
1993-02 Average	107,820	54,045	49,973	303,135	149,724	664,698
2003	34,481	41,907	54,748	740,311	68,154	939,601

Appendix Table 7. Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	51	92	0	137	204	484
1984	211,306	5,759	2,387	3,127,153	19,468	3,366,073
1985	39	51	3	48	316	457
1986	106,919	2,749	98	267,117	24,404	401,287
1987	5	0	30	2	20	57
1988	648,569	4,485	218	243,890	58,084	955,246
1989	75	6	29	156	172	438
1990	421,690	11,593	361	54,127	8,746	496,517
1991	102	15	2	69	117	305
1992	214,228	694	525	190,102	93,989	499,538
1993	86	2	2	83	240	413
1994	11,537	145	21	8,562	69,552	89,817
1995	55	1	1	120	294	471
1996	4,590	22	21	2,681	30,308	37,622
1997	39	2	0	50	27	118
1998	11,317	674	247	6,787	6,406	25,431
1999	11	0	3	52	2	68
2000	19,659	32	4	38,309	695	58,699
2001	23	0	0	308	97	428
2002	10	1	1	204	311	527
20-Year Average ^a	164,983	2,615	388	393,893	31,196	593,076
1983-92 Average ^a	320,542	5,056	718	776,478	40,938	1,143,732
1993-02 Average ^a	9,423	175	59	11,309	21,454	42,419
2003	24	0	0	188	32	244

^a Includes even numbered years only.

Appendix Table 8. Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	7,282	25,954	7,816	81,338	5,711	128,101
1984	3,209	66,589	68,451	260,310	176,053	574,612
1985	10,474	32,667	60,815	20,230	38,636	162,822
1986	5,824	33,607	25,770	68,568	48,306	182,075
1987	5,274	30,789	14,785	13,263	1,292	65,403
1988	29,988	48,981	52,355	52,698	18,468	202,490
1989	22,668	49,175	33,942	77,077	56,972	239,834
1990	16,091	43,897	32,906	7,733	2,690	103,317
1991	17,527	47,486	42,622	5,574	4,531	117,740
1992	18,553	47,780	35,794	84,077	5,328	191,532
1993	1,779	41,603	2,387	14,345	12,615	72,729
1994	5,877	48,436	19,250	5,615	96,062	175,240
1995	981	21,772	13,800	4,896	8,917	50,366
1996	3,601	38,156	13,163	11,401	58,978	125,299
1997	718	35,470	7,156	4,110	2,970	50,424
1998	1,587	29,856	13,007	22,703	52,630	119,783
1999	303	11,464	2,289	2,836	2,653	19,545
2000	952	13,166	1,269	112,819	2,758	130,964
2001	3	12,603	976	3,218	284	17,084
2002	0	7,099	464	93	754	8,410
20-Year Average	7,635	34,328	22,451	42,645	29,830	136,889
1983-92 Average	13,689	42,693	37,526	67,087	35,799	196,793
1993-02 Average	1,580	25,963	7,376	18,204	23,862	76,984
2003	42	40,505	994	583	1,047	43,171

Appendix Table 9. Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	21,927,429	6,913,550	3,471,714	6,063,402	955,311	39,331,406
1984	15,217,456	5,445,537	2,944,592	6,291,636	876,486	30,775,707
1985	8,405,410	7,700,742	6,667,096	1,792,690	489,126	25,055,064
1986	3,271,027	4,985,840	5,142,911	3,609,156	671,335	17,680,269
1987	5,443,364	5,535,676	2,248,606	3,730,444	780,686	17,738,776
1988	4,461,502	6,751,055	1,674,082	2,391,148	1,384,377	16,662,164
1989	14,150,179	9,089,394	3,266,995	3,406,958	360,620	30,274,146
1990	18,137,349	10,551,485	2,216,129	3,987,438	323,016	35,215,417
1991	10,939,608	6,921,069	3,049,254	5,542,986	806,497	27,259,414
1992	9,801,621	15,817,215	3,416,601	3,510,174	1,014,526	33,560,137
1993	8,960,902	21,714,569	4,255,766	5,819,760	708,508	41,459,505
1994	16,570,406	10,862,998	4,427,880	3,855,157	808,698	36,525,139
1995	20,522,297	14,516,875	4,587,276	4,920,284	847,600	45,394,332
1996	8,322,312	10,900,288	4,530,995	6,111,030	724,023	30,588,648
1997	616,084	7,626,863	1,432,200	2,866,890	200,676	12,742,713
1998	2,693,068	3,589,540	751,962	3,345,717	336,995	10,717,282
1999	9,714,503	7,475,146	2,327,941	6,359,995	511,662	26,389,247
2000	4,816,917	7,082,513	1,577,305	6,644,845	946,482	21,068,062
2001	5,297,940	2,919,794	525,868	5,276,496	1,032,115	15,052,213
2002	1,439,097	4,641,258	1,610,103	3,156,646	350,596	11,197,700
20-Year Average	9,535,424	8,552,070	3,006,264	4,434,143	706,467	26,234,367
1983-92 Average	11,805,583	8,206,520	3,430,774	4,402,729	850,487	28,696,093
1993-02 Average	7,895,353	9,132,984	2,602,730	4,835,682	646,736	25,113,484
2003	3,383,567	2,366,060	1,794,720	7,449,615	778,472	15,772,434

Appendix Table 10. Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak			Egegik		Ugashik		Nushagak		a		Togiak		Total		
	Drift	Setnet Section		Drift	Set	Drift	Set	Drift	Setnet Section		WRSHA	Set	Drift	Set	Drift	Set
		Naknek	Kvichak						Nushagak	Igushik						
1983	92	8		86	14	93	7	86	14				80	20	86	14
1984	89	11		92	8	92	8	83	17				77	23	87	13
1985	87	13		93	7	96	4	65	35				75	25	90	10
1986	70	30		89	11	94	6	76	24				68	32	90	10
1987	86	14		91	9	93	7	80	20				66	34	90	10
1988	86	14		90	10	91	9	75	25				64	36	85	15
1989	89	11		90	10	87	13	58	42				55	45	87	13
1990	88	12		91	9	91	9	67	33				67	33	86	14
1991		11		91	9	89	11	76	24				64	36	86	14
1992		11		91	9	90	10	65	35				62	38	87	13
1993	84	16		93	7	90	10	72	28				54	46	86	14
1994	90	10		92	8	94	6	68	32				52	48	88	12
1995	89	11		90	10	95	5	68	32				52	48	87	13
1996 ⁸⁹	83	17		90	10	95	5	81	19				52	55	88	12
1997 ⁸⁹	73	27		87	13	88	12	70	30				37	63	87	13
1998	84	8	8	86	14	85	15	72	24	4	79	21	43	57	86	14
1999	85	8	7	85	15	89	11	72	17	4	79	21	53	47	82	18
2000	82	12	6	84	16	87	13	78	12	4	70	30	57	43	80	20
2001	^b	^b	^b	85	14	80	20	79	17	4			66	34	80	20
2002	^b	^b	^b	85	15	88	12	75	17	1	66	34	62	38	79	21
20-Year Average	81	13		89	11	90	10	73	25				60	40	86	14
1983-92 Average	86	14		90	10	92	8	74	26				68	32	87	13
1993-02 Average	76	12		88	12	89	11	73	17	1	66	34	61	39	85	15
2003	^b	^b	^b	80	20	88	12	84	14	2			63	37	79	21
Allocation ^c	84	8	8	86	14	90	10	74	20	6	74	26	n.a.	n.a.	n.a.	n.a.

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

^c Not applicable in the NRSHA fishery.

^c BOF inacted current allocation plan in 1998.

Appendix Table 11. Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak ^a	Egegik ^b	Ugashik ^c	Nushagak ^d	Togiak ^e	Total
1983	4,554,496	792,282	1,001,358	1,948,474	239,610	8,536,220
1984	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
1985	9,179,014	1,095,204	1,006,407	1,684,760	190,082	13,155,467
1986	3,387,147	1,151,750	1,015,582	2,134,490	271,184	7,960,153
1987	7,281,896	1,273,553	686,894	1,895,961	316,076	11,454,380
1988	5,297,708	1,599,161	654,412	1,524,704	340,712	9,416,697
1989	9,676,244	1,611,566	1,713,281	2,189,501	125,080	15,315,672
1990	9,231,358	2,191,582	749,478	2,144,444	278,202	14,595,064
1991	8,078,885	2,786,925	2,482,001	2,419,488	320,713	16,088,012
1992	6,557,157	1,945,632	2,194,927	2,286,278	266,956	13,250,950
1993	5,908,799	1,517,000	1,413,454	2,296,789	242,475	11,378,517
1994	9,571,245	1,894,977	1,095,068	2,449,616	233,632	15,244,538
1995	11,365,573	1,282,508	1,321,108	2,254,231	240,266	16,463,686
1996	2,835,426	1,075,596	692,167	2,553,995 ^f	212,524	7,369,708
1997	2,747,511	1,104,004	656,641	2,021,529	171,373	6,701,058
1998	3,750,246	1,110,932	924,853	2,441,666	214,626	8,442,323
1999	8,303,878	1,727,772	1,662,042	2,269,861 ^f	231,196	14,194,749
2000	3,654,568	1,032,138	638,420	2,116,842 ^f	390,080	7,832,048
2001	3,194,708	968,872	866,368	2,679,432 ^f	303,346 ^g	8,981,598
2002	2,303,463	1,036,092	905,584	1,722,519	199,507	6,167,165
20-Year Average	6,441,392	1,418,145	1,147,518	2,142,463	249,421	11,447,382
1983-92 Average	7,519,242	1,561,300	1,277,466	2,004,279	254,939	12,617,226
1993-02 Average	5,363,542	1,274,989	1,017,571	2,280,648	243,903	10,277,539
2003	5,627,974	1,152,030	758,532	2,241,556	232,302	10,012,394

^a Includes counts from Kvichak tower, Branch aerial survey and Naknek tower.

^b Includes Egegik River. Also includes King Salmon River in 1986-95, and Shosky Creek in 1988-2001.

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

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

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

^f Snake River not surveyed.

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

Appendix Table 12. Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1983-2003.

Year	Catch	Escapement			Total	Total Run
		Kvichak ^a	Alagnak ^b	Naknek ^a		
1983	21,559,372	3,569,982	96,220	888,294	4,554,496	26,113,868
1984	14,546,710	10,490,670	215,370	1,242,474	11,948,514	26,495,224
1985	8,179,093	7,211,046	118,030	1,849,938	9,179,014	17,358,107
1986	2,892,171	1,179,322	230,180	1,977,645	3,387,147	6,279,318
1987	4,986,002	6,065,880	154,210	1,061,806	7,281,896	12,267,898
1988	3,480,836	4,065,216	194,630	1,037,862	5,297,708	8,778,544
1989	13,809,956	8,317,500	196,760	1,161,984	9,676,244	23,486,200
1990	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
1991	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
1992	9,395,948	4,725,864	224,643	1,606,650	6,557,157	15,953,105
1993	8,907,876	4,025,166	347,975	1,535,658	5,908,799	14,816,675
1994	16,327,858	8,337,840	242,595	990,810	9,571,245	25,899,103
1995	20,279,581	10,038,720	215,713	1,111,140	11,365,573	31,645,154
1996	8,211,983	1,450,578	306,750	1,078,098	2,835,426	11,047,409
1997	589,311	1,503,732	218,115	1,025,664	2,747,511	3,336,822
1998	2,595,439	2,296,074	252,200	1,202,172	3,750,446	6,345,885
1999	9,452,972	6,196,914	481,600	1,625,364	8,303,878	17,756,850
2000	4,727,061	1,827,780	451,300	1,375,488	3,654,568	8,381,629
2001	5,280,538	1,095,348	267,000	1,830,360	3,192,708	8,473,246
2002	1,407,621	703,884	335,661	1,263,918	2,303,463	3,711,084
20 Year Average	9,218,888	4,714,716	249,765	1,476,821	6,441,302	15,660,190
1983-92 Average	10,659,752	5,681,829	187,639	1,649,774	7,519,242	18,178,994
1993-02 Average	7,778,024	3,747,604	311,891	1,303,867	5,363,362	13,141,386
2003 ^c	3,348,453	1,686,804	2,110,000	1,831,170	5,627,974	8,976,427

^a Tower count

^b Aerial survey estimates

^c Tower count for Alagnak River in 2003 was 3,676,146 sockeye salmon

Appendix Table 13. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1983-2003

Year	Kvichak		Alagnak		Naknek		Total Run ^a
	Number	%	Number	%	Number	%	
1983	20,105	77	557	2	5,452	21	26,114
1984	23,014	87	555	2	2,926	11	26,495
1985	13,394	77	264	2	3,699	21	17,357
1986	1,966	31	399	6	3,913	62	6,278
1987	9,593	78	297	2	2,378	19	12,268
1988	6,720	77	320	4	1,739	20	8,779
1989	19,774	84	534	2	3,179	14	23,487
1990	17,521	66	555	2	8,427	32	26,503
1991	8,032	43	604	3	9,918	53	18,554
1992	10,445	65	487	3	5,021	31	15,953
1993	9,313	63	817	6	4,687	32	14,817
1994	22,232	86	634	2	3,033	12	25,899
1995	27,431	87	651	2	3,564	11	31,646
1996	3,458	31	706	6	6,860	62	11,024
1997	1,683	50	244	7	1,409	42	3,336
1998	3,412	54	388	6	2,546	40	6,346
1999	12,947	73	1,070	6	3,740	21	17,757
2000	2,862	34	731	9	4,789	57	8,382
2001	1,430	17	408	5	6,694	78	8,532
2002	704	19	336	9	2,671	72	3,711
20 Year Average	10,802	60	528	4	4,332	36	15,662
1983-92 Average	13,056	69	457	3	4,665	29	18,179
1993-02 Average	8,547	51	599	6	3,999	43	13,145
2003	1,723	16	2,110	35	5,090	48	8,923

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

Appendix Table 14. Inshore commercial catch and escapement of sockeye salmon in the Egegik District by river system, 1983-2003.

Year	Catch	Escapement			Total Run
		Egegik ^a	Shosky Cr. ^b	King Salmon ^b River	
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
2001	2,872,662	968,862	10		3,841,534
2002	4,610,374	1,036,092			5,646,466
20-Year Average	8,421,053	1,417,979	32	314	9,839,229
1983-92 Average	7,786,664	1,561,069	58	314	9,347,964
1993-02 Average	9,055,441	1,274,890	15	315	10,330,493
2003 ^c	2,283,518	1,152,030		90	3,435,638

^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, 1983-2003.

Year	Catch	Escapement			Total Run
		Ugashik ^a River	King Salmon ^b River	Dog Salmon ^b River	
1983	3,349,451	1,000,608	750		4,350,809
1984	2,658,376	1,241,418	17,100	11,800	3,928,694
1985	6,468,862	998,232	7,400	775	7,475,269
1986	5,002,949	1,001,492	4,310	9,780	6,018,531
1987	2,128,652	668,964	15,855	2,075	2,815,546
1988	1,523,520	642,972	8,360	3,080	2,177,932
1989	3,146,239	1,681,296	25,480	6,505	4,859,520
1990	2,149,009	730,038	11,340	8,100	2,898,487
1991	2,945,742	2,457,306	12,195	12,500	5,427,743
1992	3,320,966	2,173,692	13,425	7,810	5,515,893
1993	4,176,900	1,389,534	22,570	1,350	5,590,354
1994	4,352,797	1,080,858	8,885	5,325	5,447,865
1995	4,509,446	1,304,058	7,650	9,400	5,830,554
1996	4,411,055	667,518	7,230	17,419	5,103,222
1997	1,402,690	618,396	27,645	10,600	2,059,331
1998	730,274	890,508	27,425	6,920	1,655,127
1999	2,256,007	1,651,572	6,350	4,120	3,918,049
2000	1,538,790	620,040	12,900	5,480	2,177,210
2001	480,509	833,628	22,940	9,800	1,346,877
2002	1,573,234	892,104	11,460	2,020	2,478,818
20-Year Average	2,906,273	1,127,212	13,564	7,098	4,053,792
1983-92 Average	3,269,377	1,259,602	11,622	6,936	4,546,842
1993-02 Average	2,543,170	994,822	15,506	7,243	3,560,741
2003 ^c	1,738,559	758,532 ^d	27,620	4,000	2,528,711

^a Tower count.

^b Aerial survey.

^c Preliminary data.

^d USFWS operated the counting tower from late July through late September and estimated an additional 14,800 sockeye salmon.

Appendix Table 16. Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in number of fish Bristol Bay, 1983-2003.

Year	Catch	Escapement						Total	Total Run
		Wood ^a	Igushik ^a	Nuyakuk ^a	Nush/Mul ^b	Nushagak ^c	Snake ^d		
1983	5,119,744	1,360,968	180,438	318,606	85,400		3,080	1,544,486	6,664,230
1984	1,992,681	1,002,792	184,872	472,596	120,586	593,182	33,840	1,814,686	3,807,367
1985	1,307,889	939,000	212,454	429,162	69,300		34,880	1,186,334	2,494,223
1986	2,719,313	818,652	307,728	821,898	168,340		16,780	1,143,160	3,862,473
1987	3,254,720	1,337,172	169,236	163,000	225,034	388,034	1,520	1,895,962	5,150,682
1988	1,706,716	866,778	170,454	319,992	163,208	483,200	4,320	1,524,752	3,231,468
1989	2,788,185	1,186,410	461,610			513,421	28,060	2,189,501	4,977,686
1990	3,532,543	1,069,440	365,802			680,368	28,840	2,144,450	5,676,993
1991	5,053,845	1,159,920	756,126			492,522	10,920	2,419,488	7,473,333
1992	2,789,741	1,286,250	304,920			695,108		2,286,278	5,076,019
1993	5,236,557	1,176,126	405,564			715,099		2,296,789	7,533,346
1994	3,393,143	1,471,890	445,920			509,326	22,480	2,449,616	5,842,759
1995	4,445,883	1,482,162	473,382	69,702	211,605	281,307	17,380	2,254,231	6,700,114
1996	5,693,523	1,649,598	400,746	250,692	252,959	503,651		2,553,995	8,247,518
1997	2,506,818	1,512,396	127,704	272,982	100,053	373,035	8,394	2,021,529	4,528,347
1998	2,990,597	1,755,768	215,904	146,250	312,624	458,874	11,120	2,441,666	5,432,263
1999	6,175,419	1,512,426	445,536	81,006	230,893	311,899		2,269,861	8,445,280
2000	6,367,208	1,300,026	413,316	129,468	274,032	403,500		2,116,842	8,484,050
2001	4,734,800	1,458,732	409,596	184,044	627,060	811,104		2,679,432	7,414,232
2002	2,840,031	1,283,682	123,156	68,928	246,753	315,681		1,722,519	4,562,550
20-year Average	3,732,468	1,281,509	328,723	266,309	220,561	501,724	17,047	2,047,779	5,780,247
1983-92 Average	3,026,538	1,102,738	311,364	420,876	138,645	549,405	18,027	1,814,910	4,841,447
1993-02 Average	4,438,398	1,460,281	346,082	150,384	281,997	468,348	14,844	2,280,648	6,719,046
2003	6,665,918	1,471,086	189,936	116,646	463,888	580,534		2,241,556	8,907,474

^a Tower count.

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

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

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

^e Snake River escapement is not included this year because 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, 1983-2003.

Year	a											Total Run ^b	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number		
	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		
1983	4,272	60	813	12	1,379	20	601	9			3	0	7,068
1984	1,982	52	435	11	906	24	451	12			34	1	3,808
1985	1,593	53	460	15	697	23	208	7			35	1	2,993
1986	1,772	37	877	18	1,762	36	425	9			17	0	4,853
1987	2,828	55	617	12	589	11	1,116	22			2	0	5,152
1988	1,749	54	406	13	649	20	424	13			4	0	3,232
1989	2,519	51	1,214	25					1,217	25	28	1	4,950
1990	2,610	46	1,280	23					1,757	31	29	1	5,647
1991	3,303	44	2,424	32					1,736	23	11	0	7,463
1992	2,481	49	794	16					1,802	35			5,077
1993	3,725	49	1,580	21					2,228	30			7,533
1994	2,957	51	1,300	22					1,543	27	42	1	5,800
1995	4,022	60	1,902	28	70	1	686	10	756	11	20	0	6,680
1996	5,007	61	1,481	18	251	3	1,509	18	1,760	21			8,248
1997	3,365	74	291	6	273	6	591	13	864	19	8	0	4,520
1998	3,901	72	571	11	146	3	803	15	949	18	11	0	5,421
1999	5,930	70	1,563	19	81	1	871	10	952	11			8,445
2000	5,278	62	1,748	21	129	2	1,329	16	1,458	17			8,484
2001	3,987	54	1,315	18	184	2	1,928	26	2,112	28			7,414
2002	3,715	81	207	5	69	2	572	13	641	14			4,563
20-Year Average	3,350	57	1,064	17	513	11	822	14	1,413	22	19	0	5,868
1983-92 Average	2,511	50	932	18	997	22	538	12	1,628	29	18	0	5,024
1993-02 Average	4,189	64	1,196	17	150	2	1,036	15	1,326	20	20	0	6,711
2003	5,728	63	1,036	11	116	1	2,147	24	2,263	25			9,027

^a 1983 - 1988 Nuyakuk total run includes commercial catch and escapement. 1995 - 2003 Nuyakuk total run only includes escapement.

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

Appendix Table 18. Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1983-2003.

Year	Catch				Escapement						Total Run
	Togiak	Kulukak	Os/Mat ^a	Total	Togiak			Kulukak ^e	Other ^f	Total	
					Lake ^b	River ^c	Tributaries ^d				
1983	529,775	55,906	2,527	588,208	191,520	7,200	13,920	26,970		239,610	827,818
1984	213,213	96,709	12,204	322,126	95,448	15,830	39,700	49,800		200,778	522,904
1985	133,263	44,120	32,383	209,766	136,542	3,600	13,340	36,600		190,082	399,848
1986	191,158	100,466	17,064	308,688	168,384	20,000	15,000	42,800	25,000	271,184	579,872
1987	274,613	45,401	22,718	342,732	249,676	10,400	18,200	37,800		316,076	658,808
1988	673,408	143,112	5,567	822,087	276,612	18,800	13,600	31,700		340,712	1,162,799
1989	68,375	14,116	6,441	88,932	84,480	15,200	4,560	20,840		125,080	214,012
1990	168,688	27,311	1,590	197,589	141,977	17,540	29,605	49,600	39,480	278,202	475,791
1991 ^g	522,090	33,425	6,437	561,952	254,683	15,980	7,740	23,940	18,370	320,713	882,665
1992	610,575	108,358	7,513	726,446	199,056	6,060	10,400	26,440	25,000	266,956	993,402
1993	475,799	58,616	5,518	539,933	177,185	4,600	11,330	31,800	17,560	242,475	782,408
1994	321,121	76,781	2,137	400,039	154,752	6,200	13,220	29,740	29,720	233,632	633,671
1995	527,143	76,056	2,129	605,328	185,718	6,520	18,988	14,620	14,420	240,266	845,594
1996	381,539	76,833	1,691	460,063	156,954	18,320	11,900	18,980	6,370	212,524	672,587
1997	91,847	49,277	2,976	144,100	131,682	12,300	8,325	7,950	6,370	166,627	310,727
1998	112,739	76,332	1,375	190,446	153,576	9,780	12,120	12,950	26,200	214,626	405,072
1999	346,749	38,662	0	385,411	155,898	10,800	29,438	12,300	22,760	231,196	616,607
2000	727,384	67,612	0	794,996	311,970	25,200	15,075	22,350	15,485	390,080	1,185,076
2001 ^h	798,426	9,762	1,908	810,096	296,676	6,520	150	17,280	17,990	338,616	1,148,712
2002	214,094	19,112	537	233,743	162,402	4,100	12,075	8,500	12,430	199,507	433,250
20-Year Average	369,100	60,898	6,636	436,634	184,260	11,748	14,934	26,148	19,797	250,947	687,581
1983-92 Average	338,516	66,892	11,444	416,853	179,838	13,061	16,607	34,649	26,963	254,939	671,792
1993-02 Average	399,684	54,904	1,827	456,416	188,681	10,434	13,262	17,647	16,931	246,955	703,370
2003	650,066	55,081	861	706,008	232,302			8,004	21,545	261,851	967,859

^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, Negukthluk, 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 Ongivinuck River was surveyed in 2001 for sockeye escapement in tributaries.

Appendix Table 19. Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1983-2003.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1983	26,113,868	7,547,538	4,350,809	7,068,218	827,818	45,908,251
1984	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
1985	17,358,107	8,632,477	7,475,269	2,992,649	399,848	36,858,350
1986	6,279,318	6,004,685	6,018,531	4,853,803	579,872	23,736,209
1987	12,267,898	6,630,222	2,815,546	5,150,681	658,808	27,523,155
1988	8,778,544	8,055,759	2,177,932	3,231,420	1,162,799	23,406,454
1989	23,486,200	10,513,560	4,859,520	4,977,686	214,012	44,050,978
1990	26,503,582	12,563,344	2,898,487	5,676,987	475,791	48,118,191
1991	18,554,091	9,584,091	5,427,743	7,473,333	869,934	41,909,192
1992	15,953,105	17,592,207	5,515,893	5,076,019	993,402	45,130,626
1993	14,816,675	23,117,858	5,590,354	7,533,346	782,408	51,840,641
1994	25,899,103	12,645,190	5,447,865	5,842,759	633,671	50,468,588
1995	31,645,154	15,708,487	5,830,554	6,700,114	845,594	60,729,903
1996	11,047,409	11,884,711	5,103,222	8,247,518	672,587	36,955,447
1997	3,336,822	8,621,393	2,059,331	4,639,699	310,727	18,967,972
1998	6,345,885	4,639,777	1,655,127	5,402,866	405,051	18,448,706
1999	17,738,850	9,116,477	3,918,049	8,445,280	615,114	39,833,770
2000	8,381,629	8,061,535	2,177,210	8,484,050	1,079,629	28,184,053
2001	8,473,246	3,841,534	1,346,877	7,339,116	1,122,439	22,123,212
2002	3,722,401	5,646,466	2,478,818	4,562,550	433,250	16,843,485
20-Year Average	15,659,856	9,838,153	4,053,792	5,875,273	680,283	36,107,357
1983-92 Average	18,178,994	9,347,964	4,546,842	5,030,816	670,519	37,775,135
1993-02 Average	13,140,717	10,328,343	3,560,741	6,719,730	690,047	34,439,578
2003	8,976,427	3,435,638	2,528,711	8,907,474	967,061	24,815,311

Appendix Table 20. Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1983-2003.

Year	Harvests by Fishery			Total	Inriver Abundance ^a	Spawning Escapement ^b	Total Run
	Commercial	Sport	Subsistence				
1983	137,123	2,003	11,800	150,926		161,730	312,656
1984	61,378	2,320	9,800	73,498		80,940	154,438
1985	67,783	1,838	7,900	77,521		115,720	193,241
1986	65,783	4,790	12,600	83,173	43,434	33,854	117,027
1987	45,983	4,458	12,200	62,641	84,309	75,891	138,532
1988	16,648	2,817	10,079	29,544	56,905	50,946	80,490
1989	17,637	3,613	8,122	29,372	78,302	72,601	101,973
1990	14,812	3,486	12,407	30,705	63,955	55,931	86,636
1991	19,718	5,551	13,627	38,896	104,351	94,733	133,629
1992	47,563	4,755	13,588	65,906	82,848	74,094	140,000
1993	62,976	5,899	17,709	86,584	97,812	86,706	173,290
1994	119,480	10,626	15,490	145,596	95,954	83,103	228,699
1995	79,943	4,951	13,701	98,595	85,622	77,018	175,613
1996	72,011	5,390	15,941	93,342	52,127	42,228	135,570
1997	64,156	3,497	15,318	82,971		82,000	164,971
1998	117,079	5,827	12,258	135,164	117,495	108,037	243,201
1999	10,893	4,237	10,057	25,187	62,331	54,703	79,890
2000	12,055	6,017	9,470	27,542	56,374	47,674	75,216
2001	11,568	5,899	26,939	44,406	99,155	83,272	127,678
2002	39,473	3,693	11,281	54,447	87,141	79,790	134,237
20-Year Average	54,203	4,583	13,014	71,801	79,257	78,049	149,849
1983-92 Average	49,443	3,563	11,212	64,218	73,443	81,644	145,862
1993-02 Average	58,963	5,604	14,816	79,383	83,779	74,453	153,837
2003	42,615	5,000 ^c	18,686	66,301	80,028	67,993	134,294

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

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

^c Guide line harvest level used as estimate.

Appendix Table 21. Chinook salmon harvest, escapement and total runs in the Togiak District, in numbers of fish, Bristol Bay, 1983-2003.

Year	Harvests by Fishery				Spawning Escapement ^a	Total Run
	Commercial	Sport	Subsistence	Total		
1983	38,497	535	700	39,732	22,000	61,732
1984	22,179	87	600	22,866	26,000	48,866
1985	37,106	224	600	37,930	14,000	51,930
1986	19,880	525	700	21,105	8,000	29,105
1987	17,217	137	700	18,054	11,000	29,054
1988	15,606	0	429	16,035	10,000	26,035
1989	11,366	234	551	12,151	10,540	22,691
1990	11,130	172	480	11,782	9,107	20,889
1991	6,039	284	470	6,793	12,667	19,460
1992	12,640	271	1,361	14,272	10,413	24,685
1993	10,851	225	784	11,860	16,035	27,895
1994	10,486	663	904	12,053	19,353	31,406
1995	11,981	581	448	13,010	16,438	29,448
1996	8,602	790	471	9,863	11,476	21,339
1997	6,114	1,165	667	7,946	11,495	19,441
1998	14,131	763	782	15,676	11,666	27,342
1999	11,919	644	1,244	13,807	12,263	26,070
2000	7,858	470	1,116	9,444	16,897	26,341
2001	9,937	1,006	1,612	12,555	15,185	27,740
2002	2,801	76	703	3,580	14,265	17,845
20-Year Average	14,317	443	766	15,526	13,940	29,466
1983-92 Average	19,166	247	659	20,072	13,373	33,445
1993-02 Average	9,468	638	873	10,979	14,507	25,487
2003	3,231	592 ^b	1,208	5,031	5,668	10,699

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

^b Estimate.

Appendix Table 22. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1983-2003.^a

Year	Nushagak District			Togiak District		
	Catch	Escapement ^b	Total Run	Catch	Escapement ^c	Total Run
1983	725,060	164,000	889,060	322,691	165,000	487,691
1984	850,114	362,000	1,212,114	336,660	204,000	540,660
1985	396,740	288,000	684,740	203,302	212,000	415,302
1986	488,375	168,275	656,650	270,057	330,000	600,057
1987	416,476	147,433	563,909	419,425	361,000	780,425
1988	371,196	186,418	557,614	470,132	412,000	882,132
1989	523,903	377,512	901,415	203,178	143,890	347,068
1990	378,223	329,793	708,016	102,861	67,460	170,321
1991	463,780	287,280	751,060	246,589	149,210	395,799
1992	398,691	302,678	701,369	176,123	120,000	296,123
1993	505,799	217,230	723,029	144,869	98,470	243,339
1994	328,267	378,928	707,195	232,559	229,470	462,029
1995	390,158	212,612	602,770	221,126	163,040	384,166
1996	331,414	225,331	556,745	206,226	117,240	323,466
1997	185,620	61,456	247,076	47,459	106,580	154,039
1998	208,551	299,443	507,994	67,408	102,455	169,863
1999	170,795	242,312	413,107	111,677	116,183	227,860
2000	114,454	141,323	255,777	140,175	80,860 ^d	221,035
2001	526,602	564,373	1,090,975	211,701	252,610	464,311
2002	276,845	419,969	696,814	112,987	154,360	267,347
20-Year Average	402,553	268,818	671,371	212,360	179,291	391,652
1983-92 Average	501,256	261,339	762,595	275,102	216,456	491,558
1993-02 Average	303,851	276,298	580,148	149,619	142,127	291,746
2003	740,311	295,413	1,035,724	68,406	39,090 ^e	107,496

^a Escapement estimates supersede those previously reported.

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

^c Escapement estimates based on aerial surveys; however, surveys were not conducted in 1986 due to budget constraints. Estimate based on catch/escapement proportion using most recent 10-year average data. Estimates for 1982-88 rounded to the nearest thousand fish.

^d No escapement counts were made for the Togiak River.

^e Only a partial count was made for the Togiak River.

Appendix Table 23. Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1958-2003. ^a

Year	Catch	Escapement					Snake ^g	Total	Total Run
		Wood ^b	Igushik ^c	Nuyakuk ^d	Nush/Mul ^e	Nushagak ^f			
1958	1,113,794			4,000,000				4,000,000	5,113,794
1960	289,781			146,359				146,359	436,140
1962	880,424	25,000	12,000	493,914	6,100		6,000	543,014	1,423,438
1964	1,497,817	1,560	450	883,500	25,000		50	910,560	2,408,377
1966	2,337,066			1,442,424				1,442,424	3,779,490
1968	1,705,150			2,161,116				2,161,116	3,866,266
1970	417,834			152,580				152,580	570,414
1972	67,953			58,536				58,536	126,489
1974	413,613	44,800	7,500	529,216	3,100		900	585,516	999,129
1976	739,590	21,986	5,070	794,478	41,800		100	863,434	1,603,024
1978	4,348,336	205,000	16,210	8,390,184	771,600		3,483	9,386,477	13,734,813
1980	2,202,545	31,150	3,500	2,626,746	123,000		800	2,785,196	4,987,741
1982	1,339,272	36,100	8,430	1,592,096	19,130		900	1,656,656	2,995,928
1984	3,127,153	81,400	6,190	2,760,312	73,050		5,500	2,926,452	6,053,605
1986	267,117					72,189		72,189	339,306
1988	243,890					494,610		494,610	738,500
1990	54,127					801,430		801,430	855,557
1992	190,102					^h			
1994	7,337					191,772		191,772	199,109
1996	2,681					821,312		821,312	823,993
1998	6,808	942				132,402		133,344	140,152
2000	38,309					135,285		135,285	173,594
2002	204					317,659			
Average ⁱ	947,016	49,771	7,419	1,823,759	132,848	370,832	2,217	1,374,837	2,446,136

^a Includes even-years only.

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

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

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

^e Aerial survey estimate.

^f Sonar estimate from Portage Creek.

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

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

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

Appendix Table 24. Coho salmon harvest, escapement and total runs in the Nushagak Drainage, in numbers of fish, Bristol Bay, 1983-2003.

Year	Harvests by Fishery					Inriver Run ^b	Spawning Escapement ^c	Total Run	
	Commercial Harvest	Subsistence ^a		Sport Total	Total Harvest				
		Lower	Upper	Total					
1983	81,338	4002	878	4,880	1,498	87,716	41,669	39,293	127,009
1984	260,310	5885	1,564	7,449	473	268,232	142,841	140,804	409,036
1985	20,230	4360	1,646	6,006	130	26,366	89,862	88,086	114,452
1986	68,568	6533	2,617	9,150	1,576	79,294	52,722	48,529	127,823
1987	13,263	4149	1,209	5,358	1,007	19,628	24,923	22,707	42,335
1988	52,698	3515	1,112	4,627	557	57,882	134,069	132,400	190,282
1989	77,077	6971	1,159	8,130	2,392	87,599	84,628	81,077	168,676
1990	7,733	4856	766	5,622	438	13,793	141,704	140,500	154,293
1991	5,574	8915	1,275	10,190	874	16,638	42,965	40,816	57,454
1992	84,077	4962	1,534	6,496	752	91,325			91,325
1993	14,345	4463	387	4,850	194	19,389	42,742	42,161	61,550
1994	5,615	4302	406	4,708	1,143	11,466	82,019	80,470	91,936
1995	4,896	3233	478	3,711	725	9,332	46,340	45,137	54,469
1996	11,401	3603	1,080	4,683	3,488	19,572	187,028	182,460	202,032
1997	4,110			3,433	500	8,043	43,369	42869	50,912
1998	22,703	201	254	455	1,368	24,526	104,948	103194	127,720
1999	2,836	3,054	244	3,298	618	6,752	34,853	33,991	40,743
2000	112,819	3,811	768	4,579	2,219	119,617	213,062	210,075	329,692
2001	3,218	4,851	612	5,463	2,357	11,038	75,961	72,992	84,030
2002	93	4,054	511	4,565	1,416	6,074	52,194	50,267	56,341
20-Year Average	42,645	4,512	974	5,383	1,186	49,214	86,205	84,096	129,105
1983-92 Average	67,087	5,415	1,376	6,791	970	74,847	83,931	81,579	148,268
1993-02 Average	18,204	3,508	527	3,975	1,403	23,581	88,252	86,362	109,943
2003	583	120	1,310	5,432	1,547 ^d	7,562	N/A	N/A	N/A

^a Subsistence harvest estimated by expanding fishing permit returns; excludes estimates for the communities of Manokotak and Wood River.

Estimates for 1982-1986 were based on community where permit was issued: 1987 based on community where permit issued and Nushagak watershed fishing site: 1988-present on community of residence and watershed fishing site.

^b In river run estimated by sonar; sonar estimates expanded for years that terminated prior to August 25. Sonar stopped July 21 in 2003.

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

^d Estimate based on five year average. Final numbers not available at this time.

Appendix Table 25. Coho salmon harvest by fishery, escapement and total runs for the Togiak River, in numbers of fish, Bristol Bay, 1983-2003.

Year	Harvests by Fishery				Spawning Escapement ^b	Total Run
	Commercial	Subsistence ^a	Sport	Total		
1983	4,977	800	829	6,606		
1984	111,631	3,800	1,154	116,585	60,840	177,425
1985	35,765	1,500	0	37,265	33,210	70,475
1986	28,030	500	2,851	31,381	21,400	52,781
1987	1,284	1,600	183	3,067	16,000	19,067
1988	8,744	792	1,238	10,774	25,770	36,544
1989	35,814	976	416	37,206		
1990	2,296	1,111	367	3,774	21,390	25,164
1991	4,262	1,238	87	5,587	25,260	30,847
1992	3,918	1,231	251	5,400	80,100	85,500
1993	12,613	743	330	13,686		
1994	88,522	910	531	89,963		
1995	8,910	703	408	10,021		
1996	58,369	199	1,382	59,950	64,980	124,930
1997	2,976	260	780	4,016	20,625	24,641
1998	52,783	310	1,020	54,113	25,335	79,448
1999	2,653	217	1,109	3,979	3,855 ^d	7,834
2000	2,758	342	840	3,940		
2001	3,218	388	904	4,510		
2002	754	241	1,475	2,470		
20-Year Average	23,514	893	808	25,215	33,230	61,221
1983-92 Average	23,672	1,355	738	25,765	35,496	62,225
1993-02 Average	23,356	431	878	24,665	28,699	59,213
2003	961	883	1,090 ^c	2,934	6,900 ^d	9,834

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

^b Expanded estimates from aerial surveys.

^c Estimate.

^d Results of a partial survey

Appendix Table 26. Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1983-2003.

Year	Sockeye	Chinook	Chum	Pink	Coho
1983	5.7	20.9	6.6		6.6
1984	5.6	20.5	6.8	3.2	7.5
1985	5.8	17.9	6.8		8.0
1986	6.0	18.8	6.7	3.5	6.7
1987	6.0	20.5	6.5		7.0
1988	6.2	18.7	7.0	3.6	7.8
1989	5.6	19.1	6.3		7.4
1990	5.7	16.9	6.3	3.8	7.5
1991	5.7	15.9	6.4		7.3
1992	5.7	16.8	6.4	3.7	7.0
1993	6.0	17.4	6.5		6.8
1994	5.5	18.0	6.5	3.7	8.2
1995	5.5	19.8	6.3	3.6	6.7
1996	6.3	18.0	7.3	3.5	6.8
1997	6.0	16.4	7.3	3.4	6.3
1998	5.7	17.7	6.4	3.3	8.4
1999	5.3	14.3	6.7	3.2	6.4
2000	6.1	15.7	6.9	3.7	7.6
2001	6.7	17.4	8.2	2.8	7.1
2002	6.1	18.2	7.1	3.8	6.8
20-Year Average	5.9	17.9	6.8	3.5	7.2
1983-92 Average	5.8	18.6	6.6	3.6	7.3
1993-02 Average	5.9	17.3	6.9	3.4	7.1
2003	6.3	16.0	6.5	4.0	6.9

Appendix Table 27. Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1983-2003.

Year	Sockeye	Chinook	Chum	Pink	Coho
1983	0.61	0.69	0.30	0.16	0.40
1984	0.69	1.03	0.30	0.22	0.71
1985	0.85	1.02	0.31	0.20	0.71
1986	1.42	1.03	0.31	0.15	0.68
1987	1.35	1.24	0.26		0.69
1988	1.93	1.05	0.43	0.34	1.14
1989	1.07	0.80	0.26	0.17	0.67
1990 ^a	1.04	0.91	0.26	0.27	0.74
1991	0.70	0.68	0.22	0.11	0.58
1992	1.04	0.89	0.24	0.12	0.58
1993	0.62	0.76	0.21	0.11	0.52
1994	0.70	0.47	0.22	0.04	0.45
1995	0.75	0.65	0.20	0.11	0.43
1996	0.75	0.50	0.10	0.05	0.30
1997	0.85	0.55	0.10	0.05	0.46
1998	1.10	0.50	0.10	0.10	0.50
1999	0.80	0.50	0.10	0.05	0.30
2000	0.64	0.48	0.09	0.08	0.38
2001	0.40	0.30	0.11	0.07	0.39
2002	0.45	0.30	0.10	0.05	0.30
20-Year Average	0.89	0.72	0.21	0.13	0.55
1983-92 Average	1.07	0.93	0.29	0.19	0.69
1993-02 Average	0.71	0.50	0.13	0.07	0.40
2003	0.50	0.30	0.09	0.03	0.30

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

Appendix Table 28. Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1983-2003. ^a

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1983	129,900	2,853	3,216		337	136,306
1984	94,681	2,158	4,040	2,414	3,072	106,365
1985	115,402	2,188	2,218		923	120,731
1986	135,689	1,819	2,522	207	826	141,063
1987	130,847	1,912	2,594		314	135,667
1988	168,586	891	4,418	1,171	1,792	176,858
1989	173,963	609	2,029		1,186	177,787
1990	198,897	520	1,752	508	582	202,259
1991	103,750	328	1,807		499	106,384
1992	190,368	1,029	1,359	222	767	193,745
1993	152,034	1,131	989		257	154,411
1994	138,007	1,190	1,043	15	650	140,905
1995	183,262	1,272	1,240		129	185,903
1996	139,208	788	615	7	254	140,872
1997	61,728	689	200		150	62,767
1998	62,948	1,116	294	8	521	64,887
1999	109,495	186	438		38	110,157
2000	80,331	172	236	17	363	81,119
2001	38,250	127	656		48	39,081
2002	29,164	240	330	0	18	29,752
20 Year Average	121,826	1,061	1,600	415 ^b	636	125,351
1983-92 Average	144,208	1,431	2,596	754 ^b	1,030	149,717
1993-02 Average	99,443	691	604	9 ^b	243	100,985
2003	46,917	213	473		89	47,692

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

^b Includes even-years only.

Appendix Table 29. South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1983-2003^a

Year	South Unimak			Shumigan Island			Total		
	Sockeye		Chum	Sockeye		Chum	Sockeye		Chum
	Actual	Quota ^b		Actual	Quota ^b		Actual	Quota ^b	
1983	1,545	1,469	615	416	324	169	1,961	1,793	784
1984	1,131	1,111	228	257	245	109	1,388	1,356	337
1985	1,495	1,380	345	367	305	134	1,862	1,685	479
1986	314	907	252	156	200	99	470	1,107	351
1987	652	635	406	141	140	37	793	775	443
1988	474	1,263	465	282	279	62	756	1,542	527
1989	1,348	1,199	408	397	264	48	1,745	1,463	456
1990	1,091	1,087	455	256	240	64	1,347	1,327	519
1991	1,216	1,573	669	333	347	102	1,549	1,920	771
1992	2,047	1,959	324	410	432	102	2,457	2,391	426
1993	2,365	2,375	382	607	524	150	2,972	2,899	532
1994	1,001	2,938	374	460	648	208	1,461	3,586	582
1995	1,451	2,987	342	653	659	195	2,104	3,646	537
1996	572	2,564	129	446	566	228	1,018	3,130	357
1997	1,179	1,840	196	449	406	126	1,628	2,246	322
1998	975	1,529	195	314	336	50	1,289	1,865	245
1999	1,106	1,024	187	269	226	58	1,375	1,250	245
2000	892	1,650	169	359	363	70	1,251	2,013	239
2001	271		185	130		149	401		334
2002	356		201	235		178	591		379
20-yr Average	1,074	1,638	326	347	361	117	1,421	2,000	443
83-92 Average	1,131	1,258	417	302	278	93	1,433	1,536	509
93-02 Average	1,017	2,113	236	392	466	141	1,409	2,579	377
2003	336		121	117		161	453		282

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

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

Appendix Table 30. Subsistence salmon harvest by district and species, Bristol Bay, 1983-2003. a b

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK KVICHAK DISTRICT							
1983	385	107,900	1,000	400	300	900	110,500
1984	382	115,200	900	600	1,300	600	118,600
1985	544	107,543	1,179	540	27	1,103	110,392
1986	412	77,283	1,295	695	2,007	650	81,930
1987	407	86,706	1,289	756	490	1,106	90,347
1988	391	88,145	1,057	588	917	813	91,520
1989	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
1991	518	97,101	1,152	1,105	191	1,056	100,605
1992	571	94,304	1,444	2,721	1,601	1,152	101,222
1993	560	101,555	2,080	2,476	762	2,025	108,898
1994	555	87,662	1,843	503	460	1,807	92,275
1995	533	75,644	1,431	1,159	383	1,791	80,407
1996	540	81,305	1,574	816	794	1,482	85,971
1997	533	85,248	2,764	478	422	1,457	90,368
1998	567	83,095	2,433	784	1,063	1,592	88,967
1999	528	85,315	1,567	725	210	856	88,674
2000	562	61,817	894	560	845	937	65,053
2001	506	57,250	869	667	383	740	59,909
2002	471	52,805	837	909	1,137	943	56,632
20 Year Average	492	86,265	1,378	902	1,116 ^c	1,183	90,458
1983-1992 Average	449	95,361	1,127	896	1,371 ^c	1,003	99,202
1993-2002 Average	536	77,170	1,629	908	860 ^c	1,363	81,715
2003	489	61,443	1,221	259	198	812	63,934
EGEGIK DISTRICT							
1983	14	700					700
1984	24	500		100		300	900
1985	23	582	14	21	1	203	821
1986	41	1,052	69	58	21	319	1,519
1987	49	3,350	87	139	2	284	3,862
1988	52	1,405	97	87	54	333	1,976
1989	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
1991	70	4,549	82	141	32	430	5,234
1992	80	3,322	124	270	51	729	4,496
1993	69	3,633	128	148	15	905	4,829
1994	59	3,208	166	84	153	857	4,468
1995	60	2,818	86	192	100	690	3,886
1996	44	2,321	99	89	85	579	3,173
1997	34	2,438	101	21	5	740	3,304
1998	36	1,795	44	33	52	389	2,314
1999	42	2,434	106	35	2	806	3,384
2000	31	842	16	11	0	262	1,131
2001	57	2,493	111	105	16	928	3,653
2002	53	1,892	65	34	12	356	2,359
20 Year Average	47	2,104	83	89	52 ^c	519	2,788
1983-1992 Average	46	1,820	72	104	41 ^c	371	2,326
1993-2002 Average	49	2,387	92	75	60 ^c	651	3,250
2003	62	3,240	84	32	10	297	3,663

Continued

Appendix Table 30.(page 2 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
UGASHIK DISTRICT							
1983	8	500				100	600
1984	8	500				200	700
1985	9	233	17	7		143	400
1986	27	1,080	83	48	21	335	1,567
1987	22	892	104	51	29	272	1,348
1988	23	1,400	84	55	35	330	1,904
1989	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
1991	38	1,403	121	168	42	614	2,348
1992	37	2,348	106	79	8	397	2,938
1993	39	1,766	86	107	24	495	2,478
1994	31	1,587	126	42	38	579	2,372
1995	20	1,513	56	18	6	290	1,883
1996	26	1,247	50	21	7	298	1,623
1997	28	2,785	169	39	23	311	3,327
1998	27	1,241	59	75	82	485	1,942
1999	25	1,365	35	5	0	271	1,675
2000	31	1,927	51	34	1	467	2,481
2001	24	1,197	61	8	2	357	1,624
2002	23	1,294	51	14	2	460	1,821
20 Year Average	25	1,358	75	53	35 ^c	345	1,840
1983-1992 Average	23	1,124	75	73	46 ^c	289	1,557
1993-2002 Average	27	1,592	74	36	26 ^c	401	2,123
2003	23	1,113	31	30	0	392	1,567
NUSHAGAK DISTRICT							
1983	389	38,400	11,800	9,200	500	5,200	65,100
1984	438	43,200	9,800	10,300	6,600	8,100	78,000
1985	406	38,000	7,900	4,000	600	6,100	56,600
1986	424	49,000	12,600	10,000	5,400	9,400	86,400
1987	474	40,900	12,200	6,000	200	6,200	65,500
1988	441	31,086	10,079	8,234	6,316	5,223	60,938
1989	432	34,535	8,122	5,704	407	8,679	57,447
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
1991	528	33,161	13,627	4,688	292	10,784	62,552
1992	476	30,640	13,588	7,076	3,519	7,103	61,926
1993	500	27,114	17,709	3,257	240	5,038	53,358
1994	523	26,501	15,490	5,055	2,042	5,338	54,426
1995	484	22,793	13,701	2,786	188	3,905	43,373
1996	481	22,935	15,941	4,704	1,573	5,217	50,370
1997	538	25,080	15,318	2,056	218	3,433	46,106
1998	562	25,217	12,258	2,487	1,076	5,316	46,355
1999	548	29,387	10,057	2,409	124	3,993	45,969
2000	541	24,451	9,470	3,463	1,662	5,983	45,029
2001	554	26,939	11,760	3,011	378	5,993	48,080
2002	520	22,777	11,281	5,096	1,179	4,565	44,897
20 Year Average	483	31,256	12,255	5,367	3,255 ^c	6,074	56,737
1983-1992 Average	445	37,193	11,212	7,301	4,322 ^c	7,271	65,678
1993-2002 Average	525	25,319	13,299	3,432	1,506 ^c	4,878	47,796
2003	527	25,491	18,686	5,064	403	5,432	55,076

Continued

Appendix Table 30. (page 3 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
TOGIAC DISTRICT							
1983	38	1,900	700	900	200	800	4,500
1984	41	3,600	600	1,700	500	3,800	10,200
1985	51	3,400	600	1,000	100	1,500	6,600
1986	29	2,400	700	800	100	500	4,500
1987	46	3,600	700	1,000		1,600	6,900
1988	29	2,413	429	716	45	792	4,395
1989	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
1991	43	3,517	470	553	27	1,238	5,805
1992	40	3,716	1,361	626	135	1,231	7,069
1993	38	2,139	784	571	8	743	4,245
1994	25	1,777	904	398	77	910	4,066
1995	22	1,318	448	425	0	703	2,894
1996	19	662	471	285	59	199	1,676
1997	31	1,440	667	380	0	260	2,747
1998	42	2,211	782	412	76	310	3,791
1999	76	3,780	1,244	479	84	217	5,804
2000	54	3,013	1,116	569	90	342	5,130
2001	92	4,162	1,612	367	61	388	6,590
2002	36	2,319	703	605	10	241	3,878
20 Year Average	41	2,694	766	673	115 ^c	893	5,114
1983-1992 Average	39	3,106	659	897	168 ^c	1,355	6,145
1993-2002 Average	44	2,282	873	449	62 ^c	431	4,082
2003	92	4,403	1,208	483	451	883	7,428
TOTAL BRISTOL BAY AREA							
1983	834	149,400	13,500	10,500	900	7,100	181,400
1984	893	163,000	11,300	12,700	8,400	13,000	208,400
1985	1,033	149,758	9,710	5,568	728	9,049	174,813
1986	933	130,815	14,747	11,601	7,549	11,204	175,916
1987	998	135,493	14,356	7,895	689	9,453	167,886
1988	936	124,449	11,746	9,680	7,367	7,491	160,733
1989	955	127,408	9,725	7,356	799	12,210	157,498
1990	1,042	131,701	13,976	9,683	4,434	8,367	168,161
1991	1,197	139,731	15,452	6,655	584	14,122	176,544
1992	1,204	134,330	16,623	10,772	5,314	10,612	177,651
1993	1,206	136,207	20,787	6,559	1,049	9,206	173,808
1994	1,193	120,735	18,529	6,082	2,770	9,491	157,607
1995	1,119	104,086	15,722	4,580	677	7,378	132,443
1996	1,110	108,470	18,136	5,915	2,518	7,775	142,813
1997	1,166	116,991	19,159	2,974	668	6,201	145,992
1998	1,234	113,560	15,576	3,792	2,349	8,093	143,368
1999	1,219	122,281	13,009	3,653	420	6,143	145,506
2000	1,219	92,050	11,547	4,637	2,599	7,991	118,824
2001	1,226	92,041	14,412	4,158	839	8,406	119,856
2002	1,093	81,088	12,936	6,658	2,341	6,565	109,587
20 Year Average	1,091	123,680	14,547	7,071	4,564 ^c	8,993	156,940
1983-1992 Average	1,003	138,609	13,114	9,241	6,613 ^c	10,261	174,900
1993-2002 Average	1,179	108,751	15,981	4,901	2,515 ^c	7,725	138,980
2003	1,182	95,690	21,231	5,868	1,062	7,816	131,667

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

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

^c Includes even years only.

Appendix Table 31. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1983-0: a b

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna- Newhalen ^e	IVONQUAATON	Port Alsworth	Other ^f	Total
1983	4,800	3,300	10,400	20,100	23,800	29,400	4,700		96,500
1984	8,100	6,300	12,100	24,400	15,900	29,100	4,600		100,500
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500		86,500
1986	6,400	1,600	6,700	18,300	17,000	6,600	3,300		59,900
1987	5,700	^c	7,300	16,500	27,500	11,800	3,200		72,000
1988	3,500	^c	5,500	14,400	29,800	20,700	3,200	^d	77,100
1989	5,100	1,200	6,700	13,000	24,700	18,500	2,200	^d	71,400
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	1,400	76,600
1991	1,029	1,712	9,739	17,184	29,094	4,163	2,755	1,110	66,786
1992	4,374	1,056	6,932	11,477	29,633	13,163	2,954	2,559	72,148
1993	4,699	1,397	6,226	18,810	19,067	17,890	3,254	2,780	74,123
1994	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,284	64,343
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	3,441	54,679
1996	1,120	2,309	5,219	14,011	14,787	11,856	3,263	2,307	54,872
1997	1,062	2,067	5,501	8,722	19,513	17,194	2,348	3,101	59,508
1998	2,454	1,659	3,511	10,418	16,165	13,136	2,678	3,635	53,656
1999	1,276	1,608	5,005	10,725	14,129	17,864	4,282	2,834	57,723
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	2,720	36,990
2001	908	779	2,118	9,447	8,132	7,566	1,958	1,901	32,808
2002	625	2,138	2,687	9,847	9,417	5,508	1,201	1,578	33,001
20 Year Ave.	3,457	2,022	6,553	14,450	19,105	14,901	3,138	2,512	65,057
1983-92 Ave.	5,030	2,596	8,487	16,966	23,853	17,563	3,461	1,690	77,943
1993-02 Ave.	1,883	1,564	4,619	11,934	14,358	12,240	2,815	2,758	52,170
2003	737	1,081	2,135	9,771	13,824	8,016	1,370	1,591	38,495

^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, 1983-2003.

Year	Dillingham ^e	Manokotak	Aleknagik	Ekwok	New		Other ^f	Total
					Stuyahok	Koliganek		
1983	20,100	5,300	1,900	5,800	18,700	13,300		65,100
1984	30,500	4,100	2,600	7,200	16,500	17,100		78,000
1985	22,900	3,600	1,600	7,000	14,500	6,800		56,400
1986	31,900	5,500	6,900	7,800	26,400	8,200		86,700
1987	33,500	5,900	3,100	6,400	11,400	4,900		65,200
1988	29,600 ^d	5,500	2,400	6,100	11,700	5,700		61,000
1989	31,800 ^d	5,800	2,000	4,700	9,700	3,800		57,800
1990	28,860 ^d	6,600	2,300	4,900	9,900	8,000	700	61,260
1991	34,399 ^d	5,873	3,043	4,532	8,326	5,438	2,163	63,774
1992	31,702 ^d	4,317	2,184	5,971	11,325	3,708	2,635	61,842
1993	25,315 ^d	3,048	2,593	2,936	12,169	4,180	2,538	52,779
1994	30,145 ^d	3,491	2,289	4,343	8,056	4,513	2,322	55,159
1995	24,998 ^d	2,453	1,468	2,046	6,911	2,983	2,406	43,265
1996	27,161 ^d	3,883	1,733	2,866	8,892	3,319	2,113	49,967
1997	23,255 ^d	3,988	1,989	1,797	6,427	4,179	4,598	46,233
1998	24,072 ^d	4,069	1,112	3,555	5,419	3,166	4,958	46,351
1999	26,502 ^d	3,413	1,532	1,805	4,556	2,772	5,389	45,969
2000	27,931 ^d	3,173	1,111	3,946	3,715	2,792	2,362	45,029
2001	26,435 ^d	3,700	2,129	2,218	7,294	2,209	4,096	48,080
2002	25,004 ^d	3,254	1,517	2,735	6,043	3,098	3,247	44,897
20 Year Ave.	27,804	4,348	2,275	4,432	10,397	5,508	3,041	56,740
1983-92 Ave.	29,526	5,249	2,803	6,040	13,845	7,695	1,833	65,708
1993-02 Ave.	26,082	3,447	1,747	2,825	6,948	3,321	3,403	47,773
2003	26,955 ^d	4,214	2,044	2,291	10,817	5,721	3,034	55,076

^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.

Appendix Table 33. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1983-2003.

Year	Companies	Daily Processing Capacity ^a	Fishery Dates	Gillnet					Purse Seine					Total Harvest ^c
				Effort ^b	Duration (hrs.)	Harvest ^c	C.P.U.E.	Roe%	Effort ^b	Duration (hrs.)	Harvest ^c	C.P.U.E.	Roe%	
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	5,464	0.36	10.56	90	15.75	14,957	10.55	10.13	20,421
2001	11	2,255	5/6-5/13	96	84	6,481	0.8	10.64	64	26.0	15,849	9.5	9.2	22,330
2002	8	1,920	5/3-5/13	82	102	5,216	0.62	10.9	37	57.5	11,833	5.56	9.3 ^e	17,049
1983-02 Ave.	17	3,115		227	44	4,837	0.93	10	182	11	15,633	32	10	20,470
1993-02 Ave.	14	3,035		200	62	5,802	0.70	11	154	18	16,812	14	10	22,614
2003	7	1,920	4/25-5/7	75	142.0	6,505	0.6	10.9	35	110.17	15,158	3.9	8.9 ^e	21,663

^a Number of tons per day based on companies registered.

^b Peak aerial survey count.

^c Harvest total does include deadloss and test fish harvest.

^d Fishery managed by emergency order from 1981 to present.

^e Values are lower than inseason assessment due to more stringent post-season market scrutiny compared with previous years.

Appendix Table 34. Exploitation of Togiak herring stock, 1983-2003.

Year	Biomass Estimate ^a (short tons)	S-O-K Herring Equivalent	Dutch Harbor Food/Bait	Sac Roe			Total	Total Harvest	Exploitation Rate
				Gillnet	Purse Seine ^b	Waste ^c			
1983	114,210			5,344	21,442		26,786	26,786	23.5%
1984	106,422	1,552		4,934	14,485		19,419	20,971	19.7%
1985	114,604	0		4,482	21,330		25,812	25,812	22.5%
1986	86,310	1,446		3,448	12,828		16,276	17,722	20.5%
1987	64,462	1,309		2,685	12,845		15,530	16,839	26.1%
1988	128,959	1,782	2,004	3,695	10,472		14,167	17,953	13.9%
1989	80,100	2,499	3,081	2,844	9,415		12,259	17,839	22.3%
1990	71,879	1,617	820	3,072	9,158		12,230	14,667	20.4%
1991	55,000	1,310	1,325	3,182	11,788		14,970	17,605	32.0%
1992	129,256	1,482	1,949	5,030	20,778		25,808	29,239	22.6%
1993	164,130	1,481	2,790	3,564	14,392		17,956	22,227	13.5%
1994	148,716	1,134	3,349	7,462	22,853		30,315	34,798	23.4%
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	125,000	0	1,950	5,164	18,649	350	23,813	25,763	20.6%
1998	121,000	0	1,994	5,952	16,824	400	22,776	24,770	20.5%
1999	156,183	1,605	2,398	4,858	15,020	221	19,878	23,881	15.3%
2000	130,904	0	2,014	5,464	14,957	100	20,421	22,435	17.1%
2001	119,818	0	1,439	6,481	15,849	219	22,330	23,769	19.8%
2002	120,196	260	2,846	5,216	11,833	40	17,049	20,155	16.8%
1983-02 Ave.	116,091	1,072	2,130	4,837	15,633	222	20,470	23,086	20.6%
1993-02 Ave.	137,063	738	2,277	5,802	16,812	222	22,614	25,628	18.8%
2003	126,213	55	1,487	6,505	15,158	380	21,663	23,205	18.4%

^a Preseason forecast unless peak biomass estimate in season exceeded preseason forecast.

^b Includes testfish harvest.

^c Estimated waste, also included in purse seine harvest.

Appendix Table 35. Age composition of inshore herring, Togiak District, 1983-2003.

Year	Age Composition (%) ^a							Total ^b Run (tons)
	3 ^c	4	5	6	7	8	9 +	
1983		5	37	45	2	2	9	141,782
1984		2	2	28	42	4	24	114,880
1985		1	1	8	35	42	13	131,400
1986			1	2	15	44	38	94,770
1987				8	10	28	54	88,400
1988		2	5	1	13	5	74	134,717
1989			5	11	4	15	65	98,965
1990	d	d	d	6	11	3	80	88,105
1991		7	1	1	16	18	57	83,329
1992	d	10	20	1	1	15	53	156,955
1993		d	6	23	1	1	67	193,847
1994		d	2	12	28	3	55	185,454
1995		1	4	7	24	30	35	^e
1996		d	3	5	7	21	64	^e
1997	d	7	5	12	11	10	55	144,887
1998		d	4	5	10	11	70	^e
1999	d	d	1	13	9	12	65	157,026
2000	d	d	1	2	17	16	63	^e
2001		5	21	5	4	27	39	146,209
2002		1	25	28	4	5	36	^c
2003		^u	3	37	25	4	31	^c

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

^b Includes commercial catch, escapement, and documented waste.

^c Includes age 1, 2 and 3 herring.

^d Contribution of age class is less than 0.5%.

^e Age contribution of the commercial purse seine harvest (by weight) was used to represent the total run for the 1995, 1996, 1998, 2000, 2002 and 2003 fishing seasons. Aerial surveys to determine abundance were hampered by poor weather conditions preventing estimation of total biomass estimate.

Appendix Table 36. Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1983-2003.

Year	Companies	Fishery Dates	Hours	Effort ^a	Area	Total Harvest in pounds	Herring Equivalent (in tons)	Openings	Average roe %
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							
2001		no fishery							
2002	1	5/14	2.0	50	K9	67,793	260	1	9.8
1993-02 Ave.	3		8.5	158		319,359	1,229	2	9.9
1998-02 Ave.	1		5.0	90		243,678	933	2	9.8
2003	1	5/3-5/4	3.0	35	K-3	^d	^d	1	^d

^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.

^d Data confidential under Alaska Statute 16.05.815.

Appendix Table 37. Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1983-2003.

Year	Preseason Forecast ^a	Biomass Estimate	Spawn Estimates	
			Observations	Miles
1983		141,782	189	60
1984	106,422	114,880	171	61
1985	81,899	131,400	141	43
1986	86,310	94,700	182	67
1987	61,100	88,400	160	76
1988	54,500	134,717	107	61
1989	80,100	98,965	69	53
1990	56,000	88,105	94	66
1991	55,000	83,329	90	70
1992	60,214	156,955	160	97
1993	148,786	193,847	76	53
1994	142,497	185,454	80	72
1995	149,093	149,093 ^b	70	59
1996	135,585	135,585 ^b	99	73
1997	125,000	144,887	79	59
1998	121,000	121,000 ^b	42	33
1999	90,000	156,183	33	56
2000	130,904	130,904 ^b	71	46
2001	119,818	146,209 ^c	100	57
2002	120,196	120,196 ^b	79	32
1984-02 Average	101,285	130,830	105	60
1993-02 Average	128,288	148,336	73	54
2003	126,213	126,213 ^b	42	95

^a 1993-2003 forecasts based on Age Structured Analysis. Previous years based on age composition, abundance, average growth and mortality rates. Forecasts for Togiak herring not provided prior to 1984.

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

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

Appendix Table 38. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1983-2003.^a

Year	Herring		Spawn-on-Kelp	Total
	Sac Roe	Food/Bait		
1983	10,450	67	284	10,801
1984	7,178	33	203	7,414
1985	13,696	41	^b	13,737
1986	8,648	12	187	8,847
1987	8,614	49	166	8,829
1988	14,103	3	346	14,452
1989	4,983	19	448	5,450
1990	6,494	9	360	6,863
1991	6,173	21	383	6,577
1992	8,818	26	254	9,098
1993	5,218	3	268	5,489
1994	9,090	0	212	9,302
1995	16,713	0	362	17,075
1996	14,395	5	510	14,910
1997	4,306	0	^b	4,306
1998	3,986	0	^b	3,986
1999	6,211	0	315	6,526
2000	4,000	0	^b	4,000
2001	3,090	0	^b	3,090
2002	1,880	0	20	1,900
1983-02 Average	7,902	14	288	8,133
1993-02 Average	6,889	1	281	7,058
2003	3,200	0	7	3,207

^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 39. Guideline and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984-2003.

Year	Gillnet Sac Roe			Purse Seine Sac Roe			Spawn-on-Kelp		
	Guideline ^a	Actual	Difference ^b	Guideline ^a	Actual ^b	Difference ^c	Guideline ^a	Actual	Difference ^c
1984							350,000	406,586	16%
1985							350,000	^d	
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	^d	
1998	5,280	5,952	13%	15,840	16,824	6%	350,000	^d	
1999	6,914	4,858	-30%	20,741	15,020	-28%	350,000	419,563	20%
2000	5,738	5,464	-5%	17,215	14,957	-13%	350,000	^d	
2001	6,268	6,481	3%	14,624	15,849	8%	350,000	^d	
2002	6,288	5,216	-17%	14,673	11,833	-19%	350,000	67,793	-81%
1988-02 Average	5,477	5,056	-7%	15,874	15,316	-2%	350,000	369,935	6%
2003	6,624	6,505	-2%	15,457	15,158	-2%	350,000	^e	

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

^b Includes deadloss and test fish harvest.

^c Actual minus guideline divided by guideline.

^d No fishery conducted

^e Data confidential under Alaska Statute 16.05.815.

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. Fairfield Drive, Suite 300, 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.
