

**ALASKA DEPARTMENT OF FISH AND GAME**

**DIVISION OF COMMERCIAL FISHERIES**

**ANNUAL MANAGEMENT REPORT**

**-2000-**

**BRISTOL BAY AREA**



**Regional Information Report<sup>1</sup> No. 2A01-10**

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## **PREFACE**

The 2000 Bristol Bay Management Report is the forty-first consecutive annual volume reporting on management activities of the Division of Commercial Fisheries staff in Bristol Bay. The report emphasizes a descriptive account of the information, decisions, and rationale used to manage the Bristol Bay commercial salmon and herring fisheries, and outlines basic management objectives and procedures. We have included all information deemed necessary to fully explain the rationale behind management decisions formulated in 2000. All narrative and data tabulations in this volume are combined under separate SALMON and HERRING sections to aid in the use of this document as a reference source. The extensive set of tables has been updated to record previously unlisted data for easy reference. Fisheries data in this report supersedes information in previous reports. Corrections or comments should be directed to the King Salmon office. Attention: Editor.

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## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES.....	x
LIST OF APPENDIX TABLES.....	xi
LIST OF FIGURES.....	xii
INTRODUCTION.....	1
<i>Management Area Description</i> .....	1
<i>Overview of the Bristol Bay Salmon Fisheries</i> .....	2
2000 COMMERCIAL SALMON FISHERY .....	2
<i>Run Strength Indicators</i> .....	2
<i>Economics and Market Production</i> .....	4
<i>Run and Harvest Performance by Species</i> .....	4
<i>Season Summary by District</i> .....	5
Naknek-Kvichak District.....	5
Egegik District.....	7
Ugashik District.....	12
Nushagak District.....	16
Togiak District .....	26
2000 SUBSISTENCE SALMON FISHERY .....	29
<i>Regulations</i> .....	29
<i>Inseason Management</i> .....	29
LIST OF REFERENCES.....	32
2000 BRISTOL BAY HERRING FISHERY .....	119

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
<u>In-season Management:</u>	
1. Sockeye Forecast and Inshore Run .....	34
2. Sockeye Forecast by Age Class.....	35
3. Sockeye Inshore Run by Age Class.....	36
4. Sockeye Catch, Escapement, and Total Run.....	37
5. Port Moller Test Fishing (Sockeye) .....	38
6. Naknek-Kvichak District Test Fishing.....	39
7. Egegik District Test Fishing .....	40
8. Ugashik District Test Fishing .....	41
9. Nushagak District Test Fishing.....	43
10. Fishery Announcements.....	44
11. Drift Permit Registration by District .....	54
<u>Salmon Commercial Catch by Period, Species, and District:</u>	
12. Naknek-Kvichak.....	55
13. Egegik.....	56
14. Ugashik.....	58
15. Nushagak .....	60
16. Nushagak Beach Set Net .....	61
17. WRSHA.....	62
18. Togiak .....	63
19. Togiak River Section.....	64
20. Kulukak Section.....	65
21. Matogak Section.....	66
22. Osviak Section.....	66
23. Summary Catch by District and Species.....	67
<u>Salmon Escapement by Species and River System:</u>	
24. Sockeye Daily Escapement by River System.....	68
25. Salmon Daily Sonar Escapement, Nushagak River.....	70
<u>Salmon Escapement Summary by River System:</u>	
26. Kvichak.....	73
27. Egegik.....	74
28. Ugashik.....	75
29. Wood.....	76
30. Igushik .....	77
31. Togiak .....	78
<u>Miscellaneous:</u>	
32. Processors and Buyers Operating by District.....	79
33. Salmon Mean Weight, Price Per Pound and Exvessel Value .....	80
34. Subsistence Salmon Catch by Species and Area.....	81

## LIST OF APPENDIX TABLES

<u>Table</u>	<u>Page</u>
<u>Miscellaneous:</u>	
1. Sockeye Escapement Goals by River System.....	83
2. Chinook Forecast and Inshore Return.....	85
3. Entry Permit Registration by Gear Type .....	86
4. Entry Permits Actually Fished.....	87
<u>Inshore Salmon Commercial Catch by District and Species</u>	
5. Sockeye .....	88
6. Chinook .....	89
7. Chum.....	90
8. Pink .....	91
9. Coho.....	92
10. Total .....	93
11. Sockeye Catch by Gear Type/District .....	94
<u>Inshore Sockeye Catch and Escapement by District and River System:</u>	
12. Escapement by District.....	95
13. Naknek/Kvichak District C/E.....	96
14. Naknek/Kvichak District Total Run .....	97
15. Egegik District.....	98
16. Ugashik District.....	99
17. Nushagak District C/E.....	100
18. Nushagak District Total Run.....	101
19. Togiak District Total Run .....	102
20. Total Bristol Bay Return.....	103
<u>Inshore Catch and Escapement by District and Species</u>	
21. Chinook Salmon C/E, Total Run, Nushagak District.....	104
22. Chinook Salmon C/E, Total Run, Togiak District.....	105
23. Chum Salmon C/E, Nushagak and Togiak Districts.....	106
24. Nushagak District Pink Salmon C/E.....	107
25. Coho Salmon C/E, Nushagak .....	108
26. Coho Salmon C/E, Togiak District .....	109
<u>Miscellaneous:</u>	
27. Salmon Average Weight.....	110
28. Average Price Per Pound.....	111
29. Exvessel Value of Salmon Fishery.....	112
30. South Unimak/Shumagin Salmon Catch .....	113
31. Subsistence Salmon Catch by District.....	114
32. Subsistence Sockeye Catch by Community, Kvichak River Drainage.....	117
33. Subsistence Salmon Catch by Community, Nushagak District .....	118

## LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1. Bristol Bay Area Commercial Fisheries Salmon Management Districts.....	1

**BRISTOL BAY**

**SALMON**

**FISHERY**

## INTRODUCTION

### *Management Area Description*

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

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

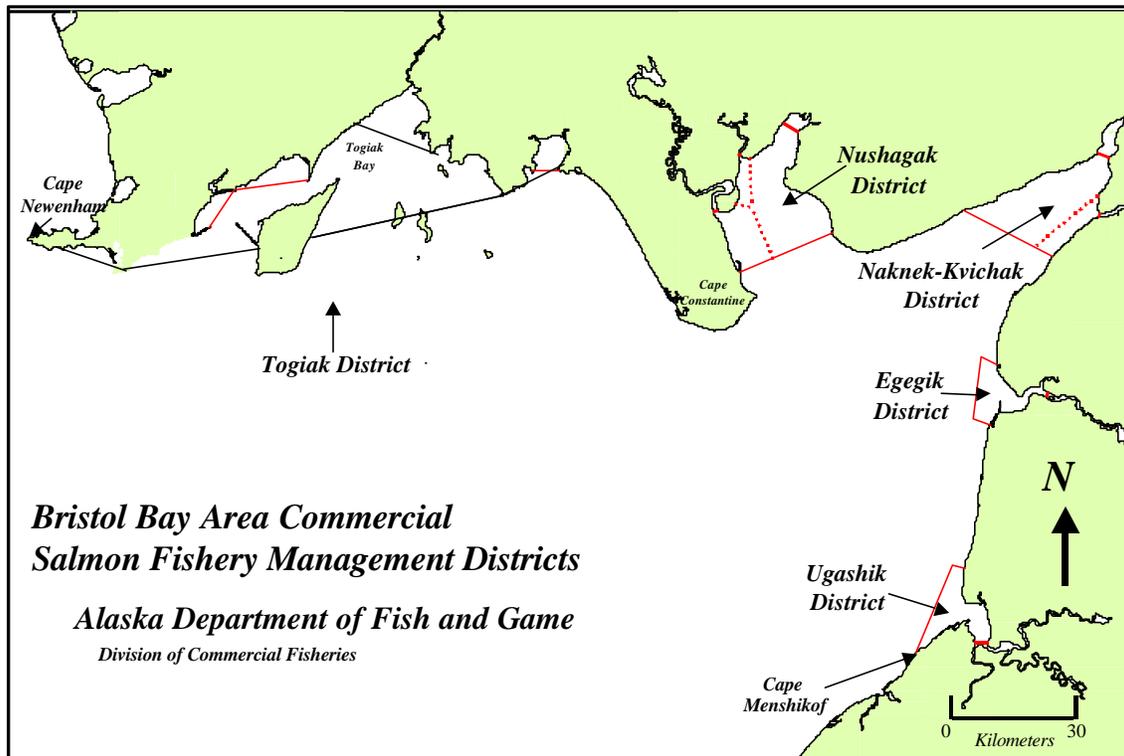


Figure 1.

## ***Overview of the Bristol Bay Salmon Fisheries***

The five species of pacific salmon found in Bristol Bay are the focus of major commercial, subsistence and sport fisheries. Annual commercial catches (1980-1999) average 25.7 million sockeye salmon, 102 thousand chinook, 1.1 million chum, 193 thousand coho, and 1.0 million (even-years only) pink salmon (Appendix Tables 5-9). Since 1990, the value of the commercial salmon harvest in Bristol Bay has averaged \$136 million, with sockeye salmon being the most valuable, worth an average \$134 million (Appendix Table 29). Subsistence catches average approximately 130 thousand salmon and are also comprised primarily of sockeye salmon (Appendix Table 31). Sport fisheries harvest all species of salmon, with most effort directed toward chinook and coho stocks. Approximately 45,000 salmon are harvested annually by sportfishermen in Bristol Bay.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks with harvests directed at terminal areas around the mouths of major river systems. Each stock is managed to achieve a spawning escapement goal based on maximum sustained yield. Escapement goals are achieved by regulating fishing time and area by emergency order and/or adjusting weekly fishing schedules. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. Drift gillnet permits are the most numerous at 1,906 in Area T, of those 1,890 registered in 2000. Setnet permits registered in 2000 totaled 1,012 (Appendix Table 3 and 4).

## **2000 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 2000 was forecasted to be 33.4 million fish (Table 1). The inshore sockeye harvest was predicted to reach approximately 22.3 million fish. Runs were expected to exceed spawning escapement goals for all river systems.

The 2000 Bristol Bay forecast is the sum of individual predictions for nine river systems (Kvichak, Branch, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak/Mulchatna and Togiak) and four age classes (age 1.2, 1.3, 2.2, and 2.3 sockeye salmon). Predictions for each age class returning to a river system were calculated by averaging results from simple linear regression models based on the relationship between adult returns and spawners or siblings from previous years. Also, regression models based on the relationship between returns and smolt were examined for Kvichak, Egegik and Ugashik Rivers. Adult escapement and return data from brood years 1972-1989 were used for all models. Results from a regression model were excluded from final forecast calculations if the slope of the line was not significant 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 1988 to 1999. Run predictions for the period 1988 to 1999 were based on similar methods used for the 2000 forecast. MSE was used to estimate the standard error and 80% confidence bounds of the total run forecast.

### ***South Unimak/Shumagin Island Fishery***

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

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

The management plan was brought before the Board for review in February 1988. At that time the Board elected to maintain a traditional harvest pattern, and set maximum allowable harvest levels at 6.8% of the forecasted inshore harvest for Bristol Bay for the South Unimak fishery, and 1.5% of the forecasted harvest for the Shumagin Island fishery. In addition the Board set a maximum allowable catch of chums that could occur during the South Unimak/Shumagin Islands June Fishery. The "chum cap" often changes, recently, it was lowered from 700,000 to a floating cap that can range from 350,000 to 650,000 fish depending on a Arctic-Yukon-Kuskokwim (A-Y-K) harvest projection based on the previous year's harvest of summer chum salmon in A-Y-K. For 2000 the chum cap was 350,000 to 400,000.

The sockeye harvest allocation for the South Peninsula June fishery this season was 2,013,000 (1,024,000 for South Unimak and 226,000 for the Shumagins), based on the 2000 projected harvest in Bristol Bay (Appendix Table 30). Preliminary catch information indicates that the Shumagin Island fishery landed 269,200 sockeye, and the South Unimak fishery landed 1,106,200 sockeye. The total catch for the June fishery of 1,375,400 was slightly more than 7% above the allocation. Due to the low incidental harvest of chum salmon (245,000) in the directed sockeye fishery, the allowable floating cap was not breached.

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

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

### ***Economics and Market Production***

In 2000, the exvessel value of the commercial salmon inshore harvest was estimated at \$81.1 million (Appendix Table 29). The 1980 to 1999 average exvessel value of Bristol Bay commercial salmon fisheries is about \$133 million.

During the 2000 season, 8 companies canned, 29 companies froze and 4 companies cured salmon in Bristol Bay. In addition, and 9 companies exported fresh fish by air (Table 33). A total of 31 processors/buyers reported catches from Bristol Bay in 2000.

### ***Run and Harvest Performance by Species***

The combined commercial salmon harvest in Bristol Bay totaled 21.1 million fish in 2000. This was still less than the 20-year average of 27.6 million salmon (Appendix Table 10) for Bristol Bay.

#### **Sockeye Salmon**

The 2000 inshore sockeye return of 28.3 million fish was approximately 18% below the preseason forecast of 33.4 million (Table 1). Actual runs to the Naknek/Kvichak District was 79% below the projected, and in the Ugashik District the run was nearly half the projected. In the Egegik District the run was only slightly above the forecast (2%), in the Nushagak District the runs were 35% above forecast and Togiak was 42% above the forecast (Table 1).

Sockeye salmon dominated the inshore commercial harvest, and totaled 20.5 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 (Table 1).

#### **Chinook Salmon**

Chinook salmon harvests in 2000 were below the recent 20-year averages in all districts (Appendix Table 6). The 2000 bay-wide commercial harvest of 22,894 chinook was the smallest since 1944 and well below the 20-year average of 101,800.

#### **Chum Salmon**

In 2000, the inshore commercial harvest of 398,053 chum salmon was the third lowest in the last 20-years and well below the 20-year average of 1.1 million (Appendix Table 7). Chum salmon catches were below average in all districts.

#### **Pink Salmon**

Bristol Bay has a dominant even-year pink salmon cycle. The 2000 return produced a harvest of only 58,700 fish well below the 20-year average of 1.0 million (Appendix Table 8).

#### **Coho Salmon**

The 2000 bay-wide commercial harvest of coho salmon totaled 142,500 fish, which was below the recent 20-year average of 193,200 (Appendix Table 9). Coho catches were below average in all the districts but the Nushagak District.

## SEASON SUMMARY BY DISTRICT

### Naknek/Kvichak District

The Naknek/Kvichak District's total inshore return for 2000 was 8.3 million sockeye salmon; 45% less than the preseason forecast of 15.0 million (Table 1&2). The Kvichak contribution was 2.9 million (68% below forecast), the Alagnak was 733 thousand (233% above) and the Naknek was 4.7 million (9% below). The concern for 2000; this was the peak year for the Kvichak and the return was the lowest peak year return since 1955. The age-2 component, which was forecast to be over sixty percent of the return for the Kvichak, came in at less than 1 million fish (Table 3). The age-2 component was weak in all the east-side Bristol Bay systems, excluding the Alagnak River. In addition, in response to the guidelines established in the "Sustainable Salmon Fisheries Policy" (2000), staff has classified the Kvichak River sockeye salmon stock as a stock of concern. This classification is based on the definition of "yield concern" found in the policy.

The management of the Naknek/Kvichak District falls under basically, four management plans; a general bay-wide plan and three district specific plans. The bay-wide plan 5 AAC 06.355 BRISTOL BAY COMMERCIAL SET AND DRIFT GILLNET SOCKEYE SALMON FISHERIES MANAGEMENT AND ALLOCATION PLAN is to ensure adequate escapement for all systems and to distribute the harvestable surplus of sockeye. The other three plans are the specific Naknek/Kvichak allocation plan, the Naknek River Special Harvest Area (NRSHA) and the Egegik River Special Harvest Area (ERSHA). The allocation plan: 5 AAC 06.364 NAKNEK/KVICHAK DISTRICT COMMERCIAL SET AND DRIFT GILLNET SOCKEYE SALMON FISHERIES MANAGEMENT PLAN describes several principals to manage the district to achieve an allocation between gear types of the harvestable surplus. The allocations are 84% drift and 16% set of which is divided up 8% Naknek Section setnet and 8% Kvichak Section setnet. The second management plan 5 AAC 06.360 NAKNEK RIVER SOCKEYE SALMON SPECIAL HARVEST AREA MANAGEMENT PLAN: describes the steps to take to meet the escapement objectives in the Kvichak system and provide opportunity to harvest Naknek River salmon stocks that are in excess of the spawning goals. And the final plan 5 AAC 06.359. EGEGIK RIVER SOCKEYE SALMON SPECIAL HARVEST AREA MANAGEMENT PLAN: describes when the district would be reduced to Loran C line 110 in response to Kvichak escapement. Based on the 2000 forecast, it was expected that the escapement goals and harvest would be obtained and the NRSHA would most likely not be used.

The preseason management strategy beginning on June 24 was for early fishing periods in the Naknek Section, only. The fishing schedule prior to June 24 was 4-days per week, 9:00 a.m. Monday to 9:00 a.m. Friday (Table 11). This schedule also goes into effect on July 17 at 9:00 a.m. unless superseded by "E.O" until September 30 when the commercial salmon season closes. Early fishing periods are used to assess early run strengths and effort levels. All fishing periods following 9:00 a.m. June 23 were restricted to the Naknek Section only until run strength and escapements begin in the Kvichak. Harvest and effort levels are typically low in early June. However, in 2000, the harvest during the pre-emergency order period was 640,200 sockeye the fourth highest on record through June 23 (Table 13).

Prior to fish entering the districts, data flow begins as early as June 10 when typically the South Unimak begins the June sockeye fishery. Under 5 AAC 09.365. SOUTH UNIMAK AND SHUMAGIN ISLANDS JUNE SALMON MANAGEMENT PLAN (b) the South Unimak is allocated 6.8 percent; Shumigan Islands 1.5 percent of the harvestable surplus of Bristol Bay bound stocks. Age composition from the catch is collected and compared to the Bristol Bay forecast for any inconsistencies. In 2000, the age composition from the commercial catch at South Unimak of 2-ocean was 48% the Bristol Bay forecast was 48% and for 3-ocean the forecast was 52% the age composition of the catch was 49%. The expected make-up of the 2-ocean component to the Bay was predominately 2.2 making up 28% followed by 1.2 at 20%. The actual South Unimak harvest proportion was 26.5 % 1.2 and 21.5% 2.2, this fell within the projected level. This early information is just a quick glance at any major discrepancies to

the forecasts age composition and what's actually there. No serious conclusions can be drawn from this one piece of information, weather and fishing patterns in South Unimak can mask the real age composition of the run.

Following the South Unimak fishery, Port Moller test fishery begins approximately June 10 to 12. This program projects run entry to Bristol Bay and also age composition of the run which is compared to forecast. In 2000, indices were very low in the traditional stations used. However, sites outside the traditional stations (2 to 8) had higher catch rates (Table 6). It was determined that fish were traveling much further offshore than traditionally observed. Age composition of the Port Moller catch started off high in 3-ocean, which is a typical occurrence with a shift to 2-ocean by late June. However, by late June the shift to 2-ocean didn't occur. Due to the offshore pattern seen, many questions rose: 1) were the 2-ocean missing from the return 2) were they traveling separately from the 3-ocean 3) was the Port Moller test fishery missing the bulk of the return. Comparing South Unimak and Port Moller age compositions there were clearly a difference. Which was right wouldn't be determined until the run reached the Bay.

Within the Naknek/Kvichak District there are two main systems, the Naknek River and the Kvichak River. Within the Kvichak drainage there is a smaller component, the Alagnak River. With the close proximity of these two systems (Kvichak and Naknek) one of the difficulties in managing is harvesting surplus sockeye from one river system and minimizing catch from the weaker system. The recent trend has been a stronger Naknek River; it is difficult to harvest surplus Naknek sockeye salmon while not adversely affecting the Kvichak sockeye return.

In 1986, with the projection of a poor Kvichak return and a Naknek River return with available surplus, the BOF adopted a plan for the Naknek/Kvichak District, which created a special harvest area within the Naknek River. The plan was used in 1986, however the escapement goal for the Kvichak River was not met. The total return for the Kvichak was less than the minimum escapement goal of 5-million sockeye. Since then, the NRSHA has been used just five times, 1996-2000, the Kvichak escapement goal being met two out of the five years. Again, in those five years the total return was less than the minimum BEG, three out of the five years. When the total return exceeded the minimum escapement goal, the in-river plan can work. The management plan has changed over time, when to enact the plan, gear groups fish separately and when the set gillnet fleet enter the NRSHA, Egegik District is reduced to the 110 line.

The forecast for 2000 projected a surplus of 3.5-million sockeye for the Kvichak River and 4-million for the Naknek River. Based on this, the preseason management strategy was to fish the Naknek Section only, post June 23 fish heavy up front reducing early Naknek escapement and then in late June back off and take escapement in both systems when a higher proportion of Kvichak fish would be in the district. By fishing the Naknek Section only through most of the season with drift gillnet gear, the allocation split would most likely be achieved and little fishing other than with set gillnet gear in the Kvichak Section would be needed.

The fishery opened on June 1, the first delivery occurred on June 9 in the Naknek Section and June 19 in the Kvichak Section. Escapement into the Naknek River was slow early due to the 4-day a week schedule with a cumulative escapement through June 23 of 1,524 sockeye (Table 25). In contrast, the catch through June 23 was 640,200 sockeye, the fourth highest on record. Escapement rates on the Naknek increased following the closure on June 23 and by midnight June 24, 44,634 sockeye had past the tower and by midnight June 25, the cumulative escapement was 173,000. The projected escapement through June 25 based on a 1.1 million-goal curve was 35,000. With escapement above the projected commercial fishing occurred during the morning tide of June 25. Escapement remained above the projected though the morning tide on July 3. The Naknek Section was open for fishing with both gear groups through the morning of July 3.

The Kvichak River however, was not showing the strength the Naknek River did early in the run. The in-river test fish project began on June 21 and the first substantial index point was not until June 28 which provided an inriver estimate of 250,000 (Table 27). The tower count through June 28 was only 42,000 sockeye; based on the inriver estimate, the projected cumulative tower count through June 30 would be 300,000 sockeye. Test fish indices dropped off on June 29 but increased on June 30. The in-river estimate for June 30 was 500,000 sockeye that with the 144,000 past the tower projected a count of nearly 650,000 by July 2. As stated in the 5 AAC 06.360 NAKNEK

RIVER SOCKEYE SALMON SPECAIL HARVEST AREA MANAGEMENT PLAN; when the Kvichak escapement falls two or more days behind schedule in escapement the NRSHA goes into effect. The projection through July 2 was for escapement into the Kvichak to be less than 2 days behind the escapement curve. With that it was announced that the Kvichak Section would open to set gillnet gear on the morning tide of July 1. Test fish indices again climbed on July 1 projecting an in-river estimate of 650,000 sockeye. Based on the building indices, escapement less than 2-days behind the escapement goal curve and the Kvichak Section closed since June 23, the Kvichak section was open to set gillnet gear only on July 1.

Test fish indices soon dropped off and tower counts weren't matching the previous inriver estimates. By July 2, Kvichak escapement was falling and was slightly more than 2-days behind its escapement goal curve and based on inriver estimates would be falling further behind. Harvest from the July 1 and July 2 set gillnet periods were less than favorable with harvest of 48,600 and 44,800 respectively. On July 3, with the Kvichak falling further behind it's escapement goal curve the Naknek/Kvichak District closed to commercial fishing. As it stood through July 2, the Naknek/Kvichak drift gillnet allocation was 85% Naknek Section set gillnet 12% and Kvichak Section set gillnet 3%. Escapement into the Naknek River continued on course and by July 3 was only slightly ahead of the curve; in addition over 3.0 million sockeye had been harvested in the Naknek Section alone. Based on the current strength it was projected that the minimum 800,000 goal for the Naknek River would be met in 2000. With that, the NRSHA was open to drift gillnet gear the evening of July 3. The Naknek/Kvichak District was reopened to set gillnet gear of 25-fathoms or less. The Kvichak Section remained open until the morning of July 6 when the Naknek/Kvichak District closed until further notice. At that time the Egegik Special Harvest Area went into effect. The next fishing period for set gillnet gear would be in the NRSHA.

When both gear groups go into the NRSHA, the department will fish drift and set gillnet gear separately to the extent practicable, alternate fishing periods between the gear groups. The allocation plan pertains to District fishing not inriver but will to the extent practicable follow the allocation plan of 84% drift and 16% set gillnet, however, escapement levels is first priority. From July 7 through July 24, the NRSHA was the only area open to commercial fishing, periods were for the most part occurring on a daily basis and gear groups were fished separate through the season. The final escapement count for the Naknek River was 1,375,500 sockeye just under the upper range of 1.4-million. The final escapement count in the Kvichak was 1,827,800 far short of the minimum goal of 6.0-million.

A total of 23 buyers purchased fish in the Naknek-Kvichak District in 2000 (Table 33). The sockeye salmon harvest totaled 4.7 million, significantly less than the 1999 catch of 9.5 million (Appendix Table 5). The chum salmon harvest totaled 68,218 fish, which is less the recent 10-year average of 200,000 (Appendix Table 7). The reported commercial harvest of 1,027 chinook was only 23% of the recent 10-year average catch of 4,400 chinook. The coho salmon harvest reached nearly 1,000 fish, far below the 10-year average catch of 6,700 (Appendix Table 9). Subsistence catches are listed in Table 35; harvest levels were less than average.

To put the current trends of the Kvichak in perspective, the 20-year average total return to the Kvichak is 7.5 million for off-cycle and 23.0 million for pre and peak years. The harvest for off-cycle years is 4.3 million and for pre/peak years 12.3 million sockeye. For the past 5-years 1996-2000 the Kvichak has met it's escapement goals only twice 1998 and 1999, and both of those years the drift fleet fished in the NRSHA to meet the escapement goals.

### ***Egegik District***

The 2000 sockeye salmon run to the Egegik District of 8.1 million fish was the thirteenth largest on record, and was slightly greater than the forecast of 7.9 million sockeye. Sockeye salmon runs to the Egegik District during the past four comparable cycle years, dating back to 1980, have ranged from 3.7 to 15.7 million fish with an average of 10.2 million. The 2000 run was thus 21% below the average for the recent cycle years (Appendix Table 15). The harvest of 7.1 million sockeye salmon was the eleventh largest commercial harvest in the 104 year history of the fishery. An escapement of approximately 1.03 million fish was achieved, which was within the Biological Escapement Goal (BEG) range of 0.8 to 1.4 million (Table 1).

The Alaska Department of Fish and Game (ADF&G) forecasted a total inshore run to Bristol Bay of 33.4 million sockeye salmon in 2000, with a surplus of approximately 22.2 million. The projected Egegik District harvest of 6.8 million sockeye was 31% of the predicted Bay-wide harvest (Table 1). Lingering memories of poor fishing at the beginning of the season in 1999 contributed to reduced effort in the Egegik district early in the season.

Commercial salmon fishing was opened in the Egegik District on June 1 (Table 14), but no landings occurred until June 12. Sockeye salmon catches per unit of set gillnet effort were average to slightly above average through June 16. The fishery was allowed to close as scheduled at 9:00 a.m. on June 16.

Daily inriver test fishing, which provides estimates of sockeye salmon passage into the lower portions of Egegik River, began on June 14 at the usual sites just upstream of Wolverine Creek (Table 28). The Egegik River counting towers, which provide daily estimates of sockeye salmon passage into Becharof Lake, began operation on June 19 (Table 25).

Initial inriver test fishing catches were low, but by June 19, catches indicated that approximately 96,000 sockeye salmon had passed through the commercial fishing district and were making their way up the river. (Table 28). In addition, 6,200 sockeye salmon were estimated to have passed the counting towers on June 19. With an Egegik inshore forecast of 7.9 million sockeye salmon and approximately 102,000 salmon having passed through the commercial fishing district, a brief 8-hour commercial fishing period was scheduled for at 2:00 p.m. June 20.

Participation in the June 20 opening consisted of 223 drift vessels (Table 12) and 113 setnet permits. The catch of approximately 275,000 sockeye salmon (Table 14), was well above the recent 20-year average for this date of 110,000 fish. Sockeye salmon catches per delivery were well above average for both set and drift gillnet fishers at 358 and 770 fish per delivery, respectively. Inriver test fishing results through June 20 suggested that about 128,000 sockeye salmon had entered the Egegik River system. Adding these fish to the accumulated tower count resulted in a projected escapement for June 22 that was six days ahead of schedule. The actual tower count for June 20 of 12,300 sockeye salmon was one day ahead of schedule. With the excellent commercial harvest on June 20 and the healthy escapement situation, another brief commercial fishing period was announced to start at 3:00 p.m. on June 21.

The June 21 harvest of 178,000 sockeye salmon was also well above average. However, the inriver test fish index fell to an average of 177 index points for the day and the tower count dropped such that escapement returned to scheduled levels. The fishery closed as planned and stayed closed on June 22. The cumulative inriver index indicated an escapement of about 140,000 fish. Allowing for a two day travel time to the counting towers, this level of escapement was three to four days ahead of schedule. Entertaining a travel time of four days put the escapement one day ahead of schedule. Given this information another brief 8-hour commercial fishing period was announced to start at 3:30 a.m. on June 23.

The June 23 harvest of approximately 207,000 sockeye salmon was above average for this date and brought the district's total harvest to about 670,000 fish. Fishing opportunity was switched to the early morning tide because it was the higher of the two daily tides and was believed to be the more productive one. It also provided the most water for fishing for the 550 vessels registered to the Egegik District. The inriver test fishing index continued to decline and the fishery was closed as scheduled; it remained closed on June 24 pending better abundance indicators.

On the morning of June 24 inriver indices picked up dramatically to an average of 1600 points. If the indices held up for the evening's tide, it could mean an additional 120,000 fish to the escapement. However the evening tides, for the previous three days, did not reveal as much fish movement as did the morning tides, and it was not anticipated that the test fishing results for the evening tide of June 24 would prove better than the morning results. The outcome for the evening test fishing drifts would not be known until about 12:30 a.m. on June 25. However, the morning's test fish indices were strong enough to warrant some fishing time and an 8-hour fishing period was announced at noon on June 24 to start at 5:00 a.m. on June 25.

The test fishing indices for the evening of June 24 were the highest observed in three years. An estimated 250,000 sockeye salmon moved into the Egegik River on June 24. Harvest for the 5:00 a.m. June 25 opening of approximately 940,000 sockeye salmon was very good with large catches well inside the district. Inriver test fishing indices remained high with the morning's drifts on June 25 averaging 2500 points. At 12:00 p.m. June 25, an announcement was made to extend commercial fishing for set gillnet fishers and to allow drift gillnet fishers their second period of the day. A 5 ½-hour period was scheduled for drift gillnet fishers to start at 6:30 p.m., with a subsequent period set for 5:30 a.m. the next morning.

The total sockeye salmon harvest for June 25 was approximately 940,000 fish. It was the third largest harvest for this date on record and brought the cumulative harvest to 1.6 million. Inriver test fishing began to slow down, but escapement past the tower continued to climb. Through June 25 the tower count was 185,000 sockeye salmon and was three days ahead of the expected level for that date. Commercial fishing was again extended for set gillnet fishers until 2:30 p.m., June 27, and two more periods were scheduled for drift gillnet fishers, one for the evening tide on June 26 and the other for the morning tide on June 27.

Harvest for June 26 and 27 was approximately 800,000 fish. Tower escapement counts increased dramatically, with 159,000 passing the tower on the 26<sup>th</sup> and 202,000 on the 27<sup>th</sup>, bringing the cumulative escapement count to 550,000, or about half way to the midpoint of the BEG range. This level of escapement would normally be observed nine days later. Allowing for two days earlier than normal run timing, escapement was still well ahead of schedule, and opportunity for set gillnet fishers was extended until 3:30 p.m. June 28 while drift gillnet fishers were given another period on the morning tide of June 28. The setnet proportion of the total harvest was approximately 10%, or 4% less than their allocation.

The June 28 fishing effort produced a harvest of approximately 735,000 sockeye salmon. With escapement levels ahead of schedule additional fishing time was given. The setnet opening was extended until 4:00 p.m. June 29 and drift gillnet fishers were allowed 7 and 8 hour fishing periods on the next two tides. Harvest on the 29<sup>th</sup> was also very good with approximately 915,000 sockeye salmon taken. Set net harvest had slipped to 9% of the total catch and it was announced at 3:00 p.m., June 29, that set gillnet fishers would be fishing until further notice. With the tower count still several days ahead of expected levels, drift gillnet fishers were given another 8-hour period that would start at 9:30 a.m. on June 30.

The June 30 harvest of 415,000 sockeye salmon was half the catch of the previous day. Though inriver test fishing indices were about the same as those on the previous day, it was apparent that the rate of escapement was about to decrease. Indeed, on July 1, inriver test fishing indices dropped by 70% to an average of only 57 points and no drift fishing was scheduled for the that day. Set gillnet fishers, however, fished the whole day, but harvested only 22,000 sockeye salmon, which did not affect the overall setnet percentage of the catch. With an increase in inriver test fishing indices on the early morning tide of July 2 and the escapement past the tower still well ahead of schedule, a 4-hour period was scheduled for drift gillnet fishers on the afternoon's tide. Set gillnet fishers fished continuously.

Harvest for July 2 was approximately 132,000 sockeye salmon and was well below the recent 20-year average of 806,000 for this date. Drift gillnet fishers caught 120,000 sockeye salmon and set gillnet fishers harvested only 13,000 fish. Inriver test fishing indices declined during the afternoon's tide and the daily tower count dropped to under 10,000 fish. Drift fishing was closed as scheduled and stayed closed through July 3. Set gillnet fishers continued fishing as their harvest percentage remained unchanged.

Set gillnet fishers harvested approximately 115,000 sockeye salmon on July 3. This was the largest set gillnet harvest on record for this date and the fourth largest single day harvest for set gillnet fishers ever. The district's total sockeye salmon harvest had reached 4.5 million fish. The set gillnet proportion of the harvest increased from 9% to 12%. The tower count was still several days ahead of schedule and an aerial survey on the afternoon of July 3 revealed a strong showing of fish from Low point to Coffee Point. The drift fleet had fished only 4 hours of the last six tides and with the latest abundance information, a 4½ -hour drift period was schedule to start at 2:00 a.m. July 4.

According to 5 AAC 06.359 EGEKIK RIVER SOCKEYE SALMON SPECIAL HARVEST AREA MANAGEMENT PLAN, Egegik commercial fishers were also advised at the 8:00 p.m. announcement on July 3, that the 48-hour notification period for the closure of the area between Loran C line 45135 and 45110 had begun. The inriver test fish index on the morning of July 4 averaged 833 index points, and was the strongest escapement indicator since June 25. At 9:00 a.m. the second drift period for the day, a 7 ½ -hour fishing period, was announced to start at 1:30 p.m.

The July 4 harvest totaled approximately 788,000 sockeye salmon which was the fifth largest harvest on record for this date. Set gillnet fishers took approximately 185,000 sockeye salmon, and that was their largest single day harvest ever. Inriver test fishing indices continued to increase, and an estimated 170,000 fish entered the Egegik River on July 4. At 8:00 p.m., another 7 ½ -hour drift fishing period was announced for July 5. Set gillnet proportion of the total harvest was 14%, but in anticipation of fishing time for drift gillnet fishers, set gillnet fishers were allowed to remain fishing.

The July 5 harvest totaled 350,000 sockeye salmon. Set gillnet harvest remained high with approximately 77,000 sockeye salmon caught, increasing the setnet proportion of the total harvest to 15%. The tower count increased to approximately 750,000 sockeye salmon. Inriver test fishing indices for July 5 averaged 302 index points, resulting in an estimated 135,000 fish in the river. With the lower end of the BEG range assured, and the large numbers of fish estimated to be in the river on the last four tides, drift gillnet fishers were allowed fishing time on the next two tides. A 5-hour and 7-hour period were scheduled for July 6. Commercial fishers in the Egegik District were also informed that starting at 12:30 p.m., on July 6, the district would be configured at the 45110 line because of the concern that escapement into the Kvichak River would fall short of the BEG.

The July 6 harvest was approximately 205,000 fish with set gillnet fishers harvesting about 46,000 or 22% of the total. Inriver test fish indices declined, as were the tower counts. Total escapement was still about three days ahead of expected levels, however. Tower counts added to the estimated number of fish present in the river gave a total sockeye escapement of approximately 900,000 fish. Two 5-hour drift fishing periods, one on each tide, were scheduled for July 7. Set gillnet fishers remained in the water.

The July 7 harvest was only 95,000 fish and was about one fifth of the average for that date. Set gillnet harvest was approximately 23,000 or 24% of the total. The setnet proportion of the daily harvests remained high because setnet sites on the outside beaches had little competition from drift gillnet vessels restricted by the 110 line. With the total set gillnet harvest approximately 1% above their allocation, it was announced at 8:00 p.m., July 7, that the setnet fishery would close at 1:00 p.m. on July 8. The set net fishery was closed for the first time since June 25. A 5-hour fishing period for drift gillnet fishers, starting at 6:00 p.m., July 8, and a 10-hour period for set gillnet fishers starting at 5:30 a.m., July 9, were also announced.

The July 8 harvest was very low with only about 49,000 sockeye salmon taken, and it was one of the lowest harvests for this date in the last 20 years. Set gillnet harvest dropped to about 8% of the day's total with only 4,100 sockeye salmon harvested. Harvest on July 9 was also low with set gillnet fishers taking only about 4,000 fish in their 10-hour period. Tower counts declined to under 7,000 sockeye salmon per day for the last three days, but inriver test fish indices increased on the evening tide of July 9 and on the morning tide of July 10. With set gillnet harvest still ahead on their allocation, a 5-hour drift gillnet only period was scheduled for 6:30 a.m., July 10.

The drift gillnet harvest was reflective of the increasing movement of sockeye salmon into the Egegik River as indicated by the increasing indices of the inriver test fishery. The drift harvest for the 5-hour period on July 10 was approximately 199,000 sockeye salmon, which was 43% under the recent 20-year average for this date of 348,000. The 20-year average fishing time for July 10 was, however, 15¼ hours compared to the 5-hour period allowed in 2000. The harvest of 199,000 on July 10 was also significantly larger than any July 10 harvest from 1960 to 1983, where catches averaged 64,000 sockeye salmon for periods that averaged 21 1/2 hours.

The district's total sockeye harvest had reached approximately 6.2 million fish after the 5 hour period on July 10. A 9-hour set gillnet-only opening was announced to start at 8:00 p.m. on July 10 and a 5-hour drift gillnet only period was set to start at 7:00 a.m. on July 11. Reported set gillnet harvest for July 10 was approximately 30,000 fish, with 120,000 being reported for July 11. The July 11 drift gillnet harvest was approximately 143,000 sockeye salmon. The set gillnet harvest of 120,000 on July 11 was the largest recorded for this date. The drift gillnet harvest was also higher than any harvest on July 11 prior to 1983. Inriver test fishing revealed a steady movement of numerous sockeye salmon into the Egegik River on July 10 and July 11. With an estimate of 79,000 and 62,000 fish, respectively, entering the river on each of those days. The next fishing period for set gillnet fishers, another 9-hour period, was scheduled to start at 8:30 p.m. July 11. For drift gillnet fishers, another 5-hour period was scheduled for 7:30 a.m., July 12.

Setnet sockeye harvest for July 12 was approximately 70,000 fish, bringing the season's total setnet harvest to 1.1 million or approximately 16.6% of the district's total harvest. Drift gillnet fishers harvested approximately 46,000 sockeye salmon. The setnet harvest was the fourth largest on record for this date. If the setnet harvest of 1.1 million constituted 16% of the total harvest, then the drift fleet's harvest was over a million fish under the allocated value. A drift gillnet fishing period was therefore announced for the morning of July 13. Through July 12 the tower count was 917,000 sockeye salmon, with an additional 125,000 sockeye salmon in the river bringing the total escapement to approximately 1.04 million.

The July 13 harvest was not very high with only 48,000 sockeye salmon harvested. The recent 20-year average sockeye harvest for this date was 215,000. The tower escapement count was 950,000 sockeye salmon as of 6:00 p.m., July 13 and an additional 100,000 fish were estimated in the river. Another 5-hour drift gillnet only period was scheduled for July 14.

The July 14 harvest was also low with only 40,000 sockeye salmon harvested. Average harvest for this date was approximately 200,000. At the presiding catch rate it became apparent that the drift fleet harvest would not reach the allocated value by July 17, and set gillnet fishers were advised that they would remain closed until 9:00 a.m. July 17. Four fishing periods were scheduled for drift gillnet fishers between July 15 and July 17. Harvests remained low with catches averaging only about one fifth of the average. As a result, drift gillnet fishers received only a little over 84% of the 7 million harvest up to the 17 of July. The imbalance in allocated harvest between setnet and drift gillnet groups was 140,000 fish. At 9:00 a.m. Monday, July 17, the fishery reverted to its fall fishing schedule of 9:00 a.m. Mondays until 9:00 a.m. Fridays.

Sockeye salmon landings in the district continued throughout July and into August (Table 14), reaching a preliminary seasonal cumulative total of about 7,050,900. The counting towers ceased operation on July 17 and the final escapement count totaled 1,032,138 sockeye salmon. This was approximately 6% under the midpoint of the BEG range. The escapement sex ratio was 53% males to 47% females.

The age composition of the 2000 Egegik District sockeye run was as follows:

<u>Age Group</u>	<u>Catch</u>	<u>Escapement</u>	<u>Total</u>
1.2	5%	8%	6%
2.2	18%	25%	19%
1.3	39%	31%	38%
2.3	38%	35%	37%
<u>Other</u>	0%	1%	0%
<b>Totals</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Most of the sockeye salmon run (57%) were age 2.2 and 1.3 fish and came from the 1995 escapement of 1.28 million fish. The second largest component (37%) were age 2.3 fish and came from the 1994 brood year which had an escapement of 1.97 million. Egegik District commercial fishers harvested 87% of the Egegik inshore sockeye run, which was 5% above the recent 20-year average of 83%. There were several peaks and valleys in the harvest and

escapement. Peak harvest dates were June 25, 28, and 29, and July 4 with over 700,000 sockeye salmon landed on each of those days. Peak tower count dates were June 25, 26 and 27, and July 5 and 12 with over 60,000 sockeye salmon counted on each of those days. The peak catch rate for drift gillnet fishers was 67,000 sockeye salmon per hour on June 29, and for set gillnet fishers it was 14,300 sockeye salmon per hour on July 11. During the emergency order period, June 16 to July 17, a total of 192 hours were fished in the district by drift gillnet fishers or 26% of the 744 available hours. For set gillnet fishers, 372 hours or 50% of the available time was fished. This compares to 196 hours for drift gillnet fishers and 318 hours for set gillnet fishers fished in 1999. Peak drift gillnet effort was around 700 vessels from June 24 to June 29 (Table 12).

The commercial harvest of other salmon species in the Egegik District totaled 53,000 fish, or less than 1% of the total harvest. The chinook harvest totaled approximately 1,061 or 55% below the 1980 to 1999 (20-year) average of 2,484 (Appendix Table 6). The district chum harvest of approximately 39,000 fish was 63% below the recent 20-year average of 103,087 (Appendix Table 7). A total of 32 pink salmon were reported harvested this season. The district coho salmon harvest of 13,200 fish was well below the recent 20-year average of 39,200 (Appendix Table 9). However, interest in coho fishing was minimal this season with less than ten drift vessels and 12 set gillnetters fishing in August.

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 560 chinook, 1,179 chum, and 4,870 coho salmon. Chinook escapement indices were below average in all but one index stream. The chinook count was 51% below the 20-year average while the chum salmon count was 86% below average. The coho index represents the total count for several tributary streams of Becharof Lake and it was 15% above the 1997 to 1999 average count of 4,220.

A total of 23 buyers operated in the district this season, which was three more than the previous two seasons (Table 33). Sockeye salmon harvest was not particularly large on any given day, but there was some concern by some setnet buyers about being able to keep up with the harvest on July 4. Set gillnet fishers harvested approximately 115,000 sockeye salmon on July 3 and 185,000 on July 4. The July 4<sup>th</sup> harvest was the largest single day set gillnet harvest on record for the Egegik District. The concern was somewhat abated when the set net harvest decreased to only 77,000 the next day.

In summary, the salmon season at Egegik was very productive with the eleventh largest harvest on record. For set gillnet fishers it was their fifth largest harvest on record. Drift gillnet fishing time between June 23 and July 17 was 22% below average for the last ten years, but set gillnet fishing time was 51% above their average and the most time allowed since 1983. This year's Egegik run was particularly challenging to manage because of the high variability in fish abundance through the season and because of the rapid decline in the abundance towards the end of the run. The drift fleet fished only 4 hours between June 30 and July 4, much below the average for the usually highly productive period.

### ***Ugashik District***

The 2000 inshore sockeye salmon run to the Ugashik District was approximately 2.2 million fish, or 49% below the forecast of 4.3 million (Table 1). It was the third time in the last five years that the Ugashik inshore run was significantly smaller than the forecast. For the 2000 season, it was the worst negative deviation from forecast of any of the districts in the Bay. It was the third worst inshore run for the district in the last 20 years, beaten only by the dismal returns in 1997 and 1998. The commercial sockeye salmon catch of approximately 1.5 million fish was the sixth smallest harvest in 20-years. The sockeye salmon escapement to the Ugashik River was approximately 620 thousand fish and was 24% over the lower end of the BEG range. Comparable inshore returns over the last four cycles, dating back to 1980, have ranged from 2.9 to 7.5 million fish with an average of 5.1 million. The 2000 run of 2.2 million was thus 57% below the average for the last four cycle years. (Appendix Table 16).

The preseason forecast for the Ugashik District suggested a harvest of 3.4 million sockeye salmon, which would have been the seventh largest harvest in 20 years. Accordingly, commercial fishers were advised that fishing in late

June after the 23<sup>rd</sup> was possible, with good indications of sockeye salmon abundance within the district. Inriver test fishing started on June 24 and District test fishing began on June 25. With the potential for fishing time in late June, there was some interest in the Ugashik District, but only 12 drift vessels decided to start their season on June 24 in the district (Table 12).

Initial landings occurred in the district on June 12 (Table 15) with only a few sockeye and chinook salmon landed. During the week of June 19, effort and sockeye catches increased, and by 9:00 a.m. June 23, the cumulative district harvest was approximately 82,000 sockeye, and 740 chinook salmon. There were also about 6,300 chum salmon taken. The 2000 sockeye harvest through June 23 was 58% above the recent 10- year (1990 to 1999) average of 52,000.

Inriver test fishing, operating about three miles upstream of Ugashik Village, started on June 24 and provided a daily estimate of sockeye salmon passage into the lower part of the Ugashik River. Over the next three days, inriver test fishing documented about 6,000 fish entering the Ugashik River (Table 29). However, District test fishing on June 25 revealed indices of over 500 points each at two locations, Smoky Point and South Spit (Table 9), which are in the middle of the district. District test fishing on June 26 also showed a fair abundance of fish at South Spit. With a relatively small fleet size and an expected surplus of 3.4 million fish an 8-hour period was announced for the drift fleet to start at 5:30 a.m. June 27. Because set gillnet harvests accounted for less than 1% of the total harvest at this time, set gillnet fishers received a 24-hour period starting at the same time.

The June 27 sockeye salmon harvest was approximately 43,000 fish, 15% of this harvest, or 6,500 fish, being represented by 29 set gillnet deliveries. This raised the proportion of the harvest taken to date by the set gillnet fishers to approximately 5%. The fisheries closed as scheduled and more district test fishing was scheduled for June 28. District test fishing results suggested a dramatic increase in abundance on the 28<sup>th</sup>, with indices ranging from 138 to 1,487 and with an average of 527. Large indices of 724 and 517 resulted from test fishing well inside the district along the beach between Muddy Point and Pilot Point. The largest index, 1,487 points, came from fishing the ebbing tide at Smoky Point. The next commercial fishing period for set gillnet fishers was scheduled to start at 7:00 p.m. June 28 and to last 24 ½ hours. A 10-hour period was scheduled for drift gillnet fishers to start at 7:30 a.m. on the morning of June 29.

The June 28 setnet harvest was approximately 6,900 sockeye salmon, and the reported setnet harvest on the 29<sup>th</sup> was about 23,000. A hundred drift gillnet fishers caught approximately 203,000 sockeye. The set gillnet proportion of the season's total harvest was approximately 8%, drift gillnet fishers took approximately 92% of the catch. Inriver test fishing indices increased a little from the previous days and averaged 174 points on June 29, translating into 10,000 fish and bringing the cumulative estimate of fish in the river to approximately 18,000. Both fisheries closed as scheduled and district test fishing was scheduled for June 30.

District test fishing results for June 30 revealed large numbers of fish in the river upstream the district markers. A high index of 1103 points resulted from a test drift at the mouth of the Dog Salmon River just downstream of Ugashik Village. Inriver test fishing, upstream from Ugashik Village, averaged 747 index points for June 30 and indicated that an additional 43,000 sockeye were safely upstream of the Ugashik Village fishery. The proportion of the harvest taken by setnetters was approximately 8% and 92% for drift gillnet fishers. Setnetters were given a 37-hour period that started at 9:30 a.m. on July 1.

The July 1 harvest was approximately 9,000 sockeye salmon, with 14,000 being harvested on July 2. The set gillnet proportion of the harvest increased to about 13%. Inriver test fishing indices rose dramatically with an average of 1,271 points for July 1 and 1,785 points for July 2. The cumulative estimate of fish in the river through July 2 was about 220,000. District test fishing indices were fairly low for July 1 and 2 though indices rose for the northern outer part of the district on July 2. This location was close to the area where large numbers of fish were observed prior to the movement of high numbers of fish into Ugashik River on June 30 and July 1. A 25-hour set gillnet period and a 10-hour drift gillnet period were announced to start at 11:30 a.m. July 3.

The July 3 harvest was approximately 303,000, of which drift gillnet fishers harvested about 97%. The setnet season's cumulative proportion of the harvest dropped to about 8%. This was the third largest harvest on record for the Ugashik District for this date, and well above the recent ten and twenty year averages of 198,000 and 281,000 sockeye salmon. Inriver test fishing still showed substantial movement of fish into the river, revealing a 1,380 index average for July 3. The Ugashik tower count of sockeye salmon for July 3 was 58,800, about 8 days ahead of the expected level for this date. It was the largest count for this date on record. Setnet opportunity was extended until 2:30 p.m. July 6 and the drift gillnet fleet was given another 10-hour period scheduled to start at 12:30 p.m. on July 4.

The July 4 harvest was nearly half the catch of July 3<sup>rd</sup> with a reported 171,000 sockeye salmon taken. There were approximately 210 drift and 49 set gillnet deliveries. This harvest was 12% below the 20-year average for July 4 of 181,000. The total sockeye catch for the district to date was approximately 873,000 fish, which was well above the 20-year average harvest of 211,000 through July 4. Escapement was also well ahead of the expected level, with 68,000 counted by the towers on July 4, bringing the cumulative escapement count to 127,000. Escapement was 9 days ahead of the expected level. The July 4 tower count was also the largest ever recorded for that date. In only three years in the last twenty, have tower counts in the first few days of the season come remotely close to those found for 2000. Strong early tower counts were also observed for the 1985, 1989 and 1996 seasons, for which the total inshore sockeye runs to the Ugashik system were 7.5, 4.9, and 5.1 million fish, respectively. In addition to the large escapement past the tower, approximately 200,000 sockeye salmon were estimated to reside in the river. Though inriver test fishing indices were declining, and averaging only 178 index points on July 4, the next fishing period for drift gillnet fishers, a 7-hour period, was scheduled for 1:30 p.m. July 5.

The July 5 harvest was approximately 233,000 sockeye salmon and was the fifth largest recorded on this date. The drift fleet had grown to nearly 300 vessels and drift gillnet fishers took about 97% of the day's catch. The setnet cumulative harvest dropped to 7% of the season's total. Opportunity for set gillnet fishers was extended until further notice, but no opening was scheduled for the drift fleet as inriver test fishing and tower counts were declining. District test fishing was planned for July 6.

District test fishing on July 6 provided indices averaging 172 index points, and inriver test fishing results fell to an average of only 30 index points. Set gillnet harvest was 11,000 sockeye salmon and was considered low, considering the lack of competition from drift gillnet fishers. The tower counts for July 5 and 6 were 40,000 and 11,000, respectively. Set gillnet fishers continued fishing for the next six days until July 12, when the proportion of total harvest attributed to setnet fishing reached about 11%. Both setnet and drift gillnet fishers subsequently waited for abundance to increase. District test fishing occurred daily but never provided indices averaging more than 300 points. From July 7 to July 15, daily inriver test fishing indices ranged from 21 to 440 points with the estimate of fish in the river ranging from 2,000 to 30,000 sockeye salmon. By July 7, it was also determined that the inriver estimate was biased high by over 100,000 fish, dropping the cumulative escapement estimate to 180,000. This discovery removed the possibility of drift fishing in the near future. The finding was particularly puzzling given the early strength of the migration past the towers on July 3-5, and that no drastic adjustments to the fish per index (fpi) parameter were needed to estimate the Egegik inriver fish. The Ugashik fpi dropped from 58 to 31 on July 7. Tower counts averaged 8,000 fish per day from July 7 to July 15 with a range of 2,000 to 23,000. The recent 10-year average escapement for this period is 84,000 fish per day. The total tower count through July 15 was 250,000.

On July 14, district test fishing results averaged 614 index points with two drifts providing around 3800 points each. On July 15, district test fishing revealed that the fish observed in the outer district were making their way into the river. High indices were observed at the district's inner boundary and just upstream of it. Given the magnitude of the indices and the location of their origin, it was projected that at least the lower end of the sockeye BEG range, 500,000 fish, would be reached, and an 8-hour drift period and a 25-hour set gillnet period were scheduled for July 16.

The July 16 opening was fairly productive with about 330,000 sockeye salmon harvested. There were some water-marked fish in the catch, indicating that fish had been milling in the district for some time. Drift gillnet fishers took

approximately 89% of the catch. Set gillnet fishers increased their season's total proportion of the harvest to about 12%. The escapement past the tower totaled 268,000 sockeye salmon through July 16 and both fisheries closed as scheduled. The emergency order (EO) period was extended beyond 9:00 a.m., July 17, to keep the fishery closed.

Tower escapement counts increased on July 17, 18, and 19 and brought the cumulative escapement to 481,000. The minimum escapement level was achieved on July 20 when 33,500 sockeye salmon passed the counters. Inriver test fishing operated through July 20 and district test fishing made its last drifts on July 21. Inriver test fishing results averaged about 1,100 points on each of the last three days indicating that about 40,000 fish per day had entered the river. None of the district test fishing results in the final days were very high and averaged less than 100 points per day. Commercial fishers were advised that the fishery would probably be closed for an extended period. The set gillnet proportion of the harvest was 12% or 2% above their allocation and set gillnet fishers were advised that they would likely no longer fish as long as the district was under EO.

Because the test fishing projects had been terminated for the season, the Ugashik fleet was advised that the department may use them for brief fishing periods during the week of July 24 to gauge run-strength and provide harvest on the King Salmon River and Dog Salmon River sockeye populations. By Tuesday, July 25, the tower count reached 594,000 sockeye salmon and a 5-hour period for drift gillnet fishers was scheduled to start at 4:00 p.m. that afternoon.

Catches for the July 25 opening were very low. Only 1,700 sockeye salmon were harvested by approximately 32 drift vessels and the fishery closed as scheduled. Tower counts also declined before the project stopped counting after July 27. With the Ugashik River run about 97% complete, the small drift fleet was allowed a 41-hour period starting at 6:00 a.m., Thursday, July 27 to allow some harvest opportunity on sockeye salmon destined for the King Salmon and Dog Salmon Rivers. The district would then open with the fall fishing schedule for both gear groups starting at 9:00 a.m. on Monday, July 31.

The final Ugashik River sockeye escapement count was 620,000 fish. However, given the large numbers of salmon counted on the first few days of operation of the tower project, it is likely that numerous fish entered Ugashik Lakes prior to the first day of counting.

At the end of June 1 through July 28 season, setnetters had caught 12.6% and the drift fishers 87.4% of the total harvest. This breakdown corresponds to an overharvest of about 3% for set gillnet fishers and an underharvest of 3% for drift gillnet fishers. To achieve the established allocations, approximately 40,000 fish in the set gillnet catch would have had to have been harvested by the drift gillnet fleet.

During the EO period, between June 24 and July 17, setnetters fished a total of 322 hours, while drift gillnetters fished a total of 53 hours. Between July 25 and July 28 drift gillnet fishers were allowed 46 more hours of fishing time, but the sockeye runs were virtually complete by then. Only about 4,200 sockeye salmon were caught during the 46 hours of fishing. For setnetters, this was the largest amount of fishing time allowed in 17 years. For drift gillnet fishers, it was the second lowest amount of fishing time allowed in over 20-years.

Sockeye escapement counts to the Dog Salmon and King Salmon Rivers were 5,500 and 12,900 sockeye salmon, respectively, bringing the Ugashik drainage sockeye salmon escapement total to 638,000 (Appendix Table 16). The peak counts at the counting tower occurred on July 3 through July 5 and July 17 through July 20. Approximately 167,000 and 247,000 sockeye salmon were tallied in those two periods, respectively. The sockeye salmon escapement sex ratio was 49% males to 51% females.

The age composition of the 2000 Ugashik District sockeye salmon run was as follows:

<u>Age Group</u>	<u>Catch</u>	<u>Escapement</u>	<u>Total</u>
1.2	7%	17%	10%
2.2	8%	7%	8%
1.3	69%	70%	69%
2.3	15%	6%	12%
Other	<u>1%</u>	<u>0%</u>	<u>1%</u>
Totals	100%	100%	100%

The commercial harvest of other salmon species totaled approximately 40,000 fish or 2.6% of the total district's harvest. The harvest of 893 chinook salmon was 70% below the 20-year (1980 to 1999) average of 3,226 (Appendix Table 6). Ugashik chinook salmon escapement indices were below average. An aerial survey count of 1,324 was 71% below the 1980 to 1998 average of 4,500. The chum salmon harvest of approximately 36,300 fish was about half the average, while the coho salmon harvest of 1,300 fish was well below the 20-year average of 27,300. There was very little commercial effort on Ugashik coho salmon this season with no landings reported after August 15. The coho salmon escapement index count of 4,400 for the Upper and Lower Ugashik Lakes was 83% above the average count for 1999, 1998 and 1997 of 2,400. Chum salmon escapement indices were half the average with a cumulative drainage count of 15,800. Pink salmon harvest in the Ugashik District was reported at only four fish.

The Ugashik District fishery harvested approximately 71% of the sockeye return to the district in 2000 which was slightly above the 20-year (1980 to 1999) average removal rate of 67%. Peak catch per hour occurred on July 16 for drift gillnet fishers, when approximately 295,000 sockeye salmon were landed in eight hours, or 36,000 per hour. For set gillnet fishers, peak catch also occurred on July 16 when approximately 36,000 sockeye salmon were landed in 13.5 hours, or 2,600 per hour. Peak catch per landing in the district occurred on June 29 for both drift and set gillnet fishers when approximately 1,980 and 516 sockeye salmon, respectively, were taken per delivery.

A total of 16 buyers operated in the district during the season (Table 33), three less than last year. Nearly all of the catch was tendered to other districts for processing. There were no reported instances of a lack of processing capacity during the season.

### ***Nushagak District***

The 2000 Nushagak District total inshore sockeye salmon run was approximately 8.5 million fish, 56% over the preseason forecast of 5.49 million (Table 1). Commercial sockeye harvest reached 6.4 million, 59% over the preseason projected harvest of 4.05 million sockeye, and was the second largest catch in the history of the Nushagak District fishery (replacing 1999, which was previously the second largest harvest). Total sockeye escapement in the district's three major river systems was 2.12 million or 47% over the combined escapement goal of 1.44 million. Exvessel value of the sockeye fishery in the Nushagak District exceeded \$24.3 million for the 2000 season.

In March 2000, the Alaska Board of Fisheries changed the calculation period for the Nushagak District sockeye salmon allocation plan. Instead of the former September 30 ending date for the calculation period, which was in accordance with the "end of the emergency order period" language originally adopted for the other districts, an ending date of July 17 was adopted for the Nushagak District for the 2000 season. The optimum escapement goal (OEG) minimum of 235,000 sockeye for the Nushagak River, adopted by the Board in March of 1999 in the interest of "economic relief" to the commercial users in the Nushagak District, was in effect for the final season this year. The Department expressed opposition to the OEG at the time it was adopted and has maintained that position. The OEG was below the biological escapement goal (BEG) range derived from a thirty-year data set. This BEG range had been the management objective since 1990. The impacts of this OEG will be reviewed by the Board and the Department during the 2000/2001 Board cycle.

## **Chinook**

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

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

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

The Department adjusts commercial fishing time and area to harvest chinook salmon surplus to the inriver goal. Management decisions are based on the preseason forecast and inseason indicators of run strength, including commercial harvest performance, subsistence harvest rates and inriver passage 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; by the time commercial harvests peak in the district, typically only 15% of the escapement has passed the sonar. This difference in run timing prohibits reliable estimates of run size until after the peak of the fishery. Early commercial openings are justified on forecasted surplus, quality concerns and in accordance with the added language in the NMCSMP.

The 2000 Nushagak District chinook salmon forecast was only 101,000 fish. With an inriver goal of 75,000 fish, assuming an average lower river (below the sonar counter) subsistence harvest (10,000 - 12,000) and an average incidental harvest during the sockeye fishery (15,000 chinook salmon), no surplus chinook salmon were expected to be available for a directed commercial harvest. Due to the low likelihood of a commercial chinook fishery, the subsistence monitoring project previously operated at Lewis Point to detect pulses of chinook passage into the Nushagak River was not conducted during the 2000 season.

Unrestricted harvest potential in the sport fishery, given an inriver abundance of 75,000 fish, has been demonstrated to be over 10,000 chinook salmon, or twice the guideline harvest level of 5,000 chinook. Included in the November, 1997 amendments to the NMCSMP were restrictions intended to reduce the harvest in the sport fishery to the guideline harvest level prescribed in the management plan.

No directed commercial chinook salmon openings were allowed during the 2000 season. The cumulative chinook escapement started to lag behind expected levels from the beginning of the sonar project during the second week of June, and continued to vary between two and four days behind expected levels into the last week of June when sockeye abundance in the district began to increase. Commercial harvest for the season totaled 12,060 chinook salmon, all taken incidentally during the sockeye fishery.

Between June 22 and June 25, with the cumulative chinook salmon escapement in the Nushagak River at approximately 11,000 fish, the Commercial Fisheries and Sport Fisheries divisions discussed restrictions or closures of the sport fishery for the Nushagak River in accordance with actions prescribed in the Nushagak-Mulchatna Chinook Salmon Management Plan. The Division of Commercial Fisheries, also following management actions prescribed in the plan relative to the subsistence fishery, was considering restricting the subsistence fishery for chinook salmon in the Nushagak River drainage. However, with a daily passage of over 5,000 chinook on June 25, the projected chinook escapement again exceeded 40,000 chinook salmon and no subsistence restrictions were necessary.

Final sonar escapement estimate was 56,374 chinook salmon (Table 25). The 2000 inshore chinook salmon run to the Nushagak River was approximately 85,000 fish, based on preliminary catch figures from the subsistence and sport fisheries, or 84% of the preseason forecast (Appendix Tables 2 and 21).

## **Sockeye**

In the past, the Nushagak District sockeye fishery has been managed to achieve a biological escapement goal of 340,000 to 760,000 spawners in the Nushagak River and 1 million (range 700 thousand to 1.2 million) spawners in the Wood River. The Alaska Board of Fisheries modified the Wood River Special Harvest Area Management Plan in March of 1999 to include language that directed the Department to manage the Nushagak River for an optimum escapement goal (OEG) of no less than 235,000 sockeye when the ratio of Wood River to Nushagak River sockeye was projected to be greater than 3:1. This OEG was adopted by the Board of Fisheries to give economic relief to the Nushagak District permit holders. Since the preseason forecast for the two rivers exceeded the 3:1 ratio, the management objective for the Nushagak River in 2000 was to achieve sockeye escapement of at least 235,000 fish. The Igushik River run can be managed independently to a large degree by opening and closing the Igushik Section of the Nushagak District to harvest or conserve that stock. Sockeye returning to the Igushik River are managed for a biological escapement goal of 200,000 fish (range 150,000 to 250,000).

The preseason forecast for the inshore sockeye run to the Nushagak District totaled 5.49 million salmon (Table 1), which was 14% below the 20-year average actual run of 6.4-million sockeye. Strength of the forecasted Wood River run (3.23 million) was 3% below the 1980-99 average actual return, while the Nushagak River sockeye run (744 thousand) was expected to be 48% below the recent 10-year average actual return of 1.43 million. The forecasted return to Igushik River (1.5 million) was about 13% above the 1990-99 average (Appendix Table 18). Management of the Igushik and Nushagak Sections are discussed separately below.

## **Nushagak Section**

Few tools exist 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 stocks. The Board then formally modified the plan in November 1997 to provide a stock specific management tool to target Wood River sockeye salmon. The plan allows opening the Wood River for the conservation of Nushagak River sockeye salmon. The Nushagak River sockeye escapement peaks slightly earlier than escapement in Wood River. If stock proportions in the escapement represent stock abundance in the district, and harvests are not stock selective,

delaying the sockeye openings should help to conserve the Nushagak stocks. However, without an additional stock-specific means to exploit Wood River sockeye, surplus Wood River sockeye cannot be harvested without sacrificing the Nushagak River escapement goal particularly when the Wood River run is on the order of three times as large (or greater) than the Nushagak River run.

For at least the last sockeye life cycle, Wood River runs have been more than three times larger than Nushagak River runs due to high production in the Wood River system and decreased production in the Nushagak River system. In each of these years, the Department has attempted 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 higher ratio (4.3:1) of Wood River to Nushagak River sockeye was forecast for 2000. To conserve Nushagak stocks, the department would limit commercial fishing time early in the sockeye run. The department would make every effort to achieve the new OEG minimum of 235,000 sockeye in the Nushagak River while attempting to harvest surplus Wood River sockeye in the district and the Wood River Special Harvest Area.

Beginning June 21<sup>st</sup>, test fishing was conducted in the upper portion of the district on almost every tide. High individual indices were observed in the lower Wood River across from Hansen Point (5,000+ index points) and on the upper west side of the district below Bradford Point (over 7,000+ index points) beginning on the morning tide of June 26<sup>th</sup>, but no other test fish stations above the district indicated a strong presence of sockeye (Table 10). Based on these first elevated indices, the fishery was put on short notice effective 7:00 a.m., June 26<sup>th</sup>. Sockeye escapement in the Wood River was building slowly, commensurate with the 1 million sockeye midpoint curve, and showed a rate increase the morning of June 26. Igushik River sockeye escapement past the counting towers was already ahead of the 200,000 fish midpoint curve, and the test fish project in the lower Igushik River had been catching substantial numbers of sockeye, yielding inriver estimates above expected levels. Nushagak River sockeye escapement was running about 2 days behind the 235,000 minimum curve.

Testfish indices in the upper portion of the district and between the district and the Wood River continued to increase through June 27<sup>th</sup> reaching levels of 15,000 – 18,000 index points at Pile Driver Creek and Picnic Point. Through 12:00 midnight June 27, the Wood River escapement totaled 71,000 sockeye salmon (Table 25), two days ahead of the 1 million curve, while just over 9,000 sockeye were estimated in the Nushagak River (Table 26), which was 3 days behind the 235,000 minimum curve. Igushik River had a cumulative escapement of 65,000 sockeye past the towers, and was several days ahead of the 200,000 sockeye midpoint curve.

Drift effort early in the season was above average. By June 28, the drift gillnet fleet registered 366 vessels in the Nushagak District (Table 12). During the afternoon of June 28<sup>th</sup>, Department staff flew an aerial survey of the lower Nushagak and Wood Rivers and observed a strong presence of sockeye salmon in both rivers. The testfish vessel, “Ms. Mindy”, reported test fish indices of 16,000 at Pile Driver Creek and 15,000 at Picnic Point. Sockeye salmon were beginning to push above the district and into both the Wood and Nushagak Rivers. At 6:00 p.m., June 28, in addition to further openings in the Wood River Special Harvest Area, which had been fishing since June 26, the first opening (6 hours) in the Nushagak Section was announced to begin at 10:30 p.m. that evening for both drift and set gillnets.

Early reports, the morning of June 29, indicated that harvest from the commercial opening in the Nushagak Section was heavy. With the strong showing of sockeye in the Nushagak River on the previous day, the cumulative sockeye escapement through June 28 had risen to 70,000 or 3 ½ days ahead of the 235,000 minimum curve. Wood River cumulative sockeye escapement continued to increase with 256,000 fish through June 28<sup>th</sup>, and was several days ahead of expected levels. To maintain control over the movement of sockeye into the Wood and Nushagak Rivers, and make adjustments to the allocation percentages between drift and set gillnets, another opening for the Nushagak Section (19 ½ hrs. for set gillnets, 12 hours for drift) was announced beginning at 10:00 a.m., June 29 for both gear types. This turned out to be the peak day for sockeye harvest with over 965,000 fish taken between the Nushagak District and the WRSWA.

Escapement rates in the Nushagak River and the Wood River continued increasing through June 29; another commercial opening for both gear types (19 ½ hours for set gillnets, 13 hours for drift gillnets) was announced for the Nushagak Section the morning of June 30 beginning at 11:00 a.m. Due to elevated escapement rates continuing in both Wood and Nushagak River through June 30, this opening was extended 25 hours for set gillnets in the Nushagak Section, with another 8-hour drift opening announced for July 1. Sockeye harvest had reached 2.3 million for the Nushagak District through June 30.

Daily sockeye escapement in the Wood River was being kept at manageable levels by continued commercial openings in the WRSWA; through June 30, the cumulative escapement of over 390,000 fish was running approximately 4 days ahead of the midpoint goal (1 million) curve. The Nushagak River sockeye escapement had reached 189,000 through June 30, and this was approximately 9 days ahead of the 235,000 OEG minimum curve and 5 days ahead of the 340,000 fish (low end of the BEG range) curve. Therefore, the commercial opening in progress in the Nushagak Section was extended 25 hours for set gillnets with another 8-hour drift gillnet opening being announced for July 2<sup>nd</sup>. Sockeye harvest for July 1 reached 700,000, bringing the total to 3 million. A few companies reported having to invoke limits for a short time in the Nushagak District.

Nushagak River sockeye escapement reached 220,000 through July 1, well ahead of the OEG curve and even a few days ahead of the lower end of the BEG range curve (340,000). Wood River had reached 441,000 sockeye; four days ahead of the midpoint goal (1 million) curve. At noon on July 2<sup>nd</sup>, a 25-hour extension to the set gillnet opening in progress and a 21-hour extension to the drift gillnet opening in the Nushagak Section was announced.

The sockeye harvest from July 2 was reported at 620,000 on the morning of July 3. This brought the cumulative sockeye harvest to 3.7 million, very close to the long-term average harvest for an entire season. With all rivers ahead of their respective escapement goal curves, additional fishing time was warranted in all fisheries in the Nushagak District. At 12:00 noon, July 3<sup>rd</sup>, the staff announced extensions in both the set and drift gillnet fisheries in the Nushagak Section through the evening of July 4. Nushagak River sockeye escapement had reached 249,000 through July 3, 5 days ahead of the 340,000 curve; Wood River had reached 597,000, or 4 days ahead of the 1 million curve, and the Igushik River was at 146,000 or 9 days ahead of the midpoint goal (200,000) curve.

Almost 500 drift gillnet vessels were registered to fish in the Nushagak District by July 4. With an apparent Kvichak run failure unfolding in the Naknek/Kvichak District, and low catches occurring in the Egegik and Ugashik Districts, additional attention was drawn to the large catches reported in the Nushagak District. Transfer agents were busy transferring drift vessels into the Nushagak. With sockeye allocation percentages favoring drift gillnets, a 25-hour extension for set gillnets and an 8-hour drift opening was announced for the Nushagak Section on July 5. Igushik Section was fishing continuously with both gear types, and the WRSWA closed to both gear types at 3:00 p.m., July 5 with daily Wood River sockeye escapements being controlled by the liberal fishing schedule in the district. Commercial sockeye harvest had reached 4.4 million through July 5.

Through July 5, Nushagak River cumulative sockeye escapement was 268,000 fish, still 4 days ahead of expected levels. Wood River daily sockeye escapements had diminished with openings in the WRSWA and concurrent openings in the district; cumulative escapement had reached 623,000 sockeye, 3 days ahead of the million curve. All information sources indicated the sockeye returns to all river systems in the Nushagak District were stronger than forecast, and that additional fishing time was warranted to harvest the surplus sockeye salmon. Another 25-hour extension to the set gillnet fishery and another 8-hour opening for drift gillnets in the Nushagak Section was announced for July 6.

Sockeye escapements were building as expected in both the Nushagak River, which had a cumulative total of 273,000 through July 7, and the Igushik River, which had surpassed its midpoint goal on July 4 reaching 345,000 through July 7. The Wood River sockeye escapement, however, was not building as expected with daily passage rates of less than 20,000 fish from July 4 through July 7. Cumulative sockeye escapement was 644,000 fish through July 7, which was only one day ahead of the point goal curve. The set gillnet fishery in the Nushagak Section was allowed to close as scheduled at 12:30 a.m., July 8, and the next opening was announced for 7:30 p.m. that evening,

after a 19-hour closure. The drift gillnet fishery in the Nushagak Section also closed as scheduled at 3:00 p.m., July 7, and the 4-hour drift gillnet opening announced to start at 10:00 a.m., July 8 was postponed until 9:30 p.m., constituting a 30-hour closure. The closures were planned to allow some additional passage of sockeye salmon through the district and into the Wood River. Passage rates increased slightly in the Wood River but cumulative escapement began to lag behind the level needed to achieve the 1-million midpoint goal.

After the 4-hour drift opening above ended at 1:30 a.m., July 9, it was announced that further drift openings would be postponed until additional sockeye escapement was observed in the Wood River. Set gillnets in the Nushagak Section closed as scheduled at 9:30 p.m., July 10 and no additional openings were allowed through July 11. Department staff conducted an aerial survey the afternoon of July 11 and observed a relatively strong showing of sockeye in the lower Wood River; test fish indices that afternoon were high in the Grassy Island and Picnic Point areas, but not in the lower Wood River. A 7-hour opening for set gillnets was announced at 6:00 p.m., July 11 to begin at 10:00 a.m., July 12; the strategy being to gauge the abundance of sockeye present in the upper district but not stop the flow. With a drift fleet numbering approximately 600 vessels, it was decided that any drift opening would be postponed, since the allocation percentages already favored that gear group. Wood River cumulative sockeye escapement was at 766,000 fish through July 11, now more than 1 day behind the desired level. The management staff wanted to allow another 250,000 sockeye into the Wood River to bring the sockeye escapement up to the 1 million fish level.

Test fish indices the morning of July 12 were high (> 20,000 index points) again in the area of Grassy Island and Picnic Point, but relatively low (< 3,000 index points) in the lower Wood River. Further test fishing activities conducted on the afternoon tide yielded increased indices in both areas. By the afternoon of July 12, after a closure of the Nushagak Section spanning two flood tides, the sockeye passage rate at the Wood River towers began to increase. At 6:00 p.m., July 12, an additional 7-hour set gillnet opening in conjunction with a 2-hour drift opening was announced to begin at 11:00 p.m. for the Nushagak Section. Later that evening, after receiving the 6:00 p.m. counts from the Wood River counting towers showing passage rates in excess of a thousand fish per hour on both banks, staff announced a 25-hour extension to the set gillnet opening and a 21 ½-hour extension to the drift gillnet opening set to begin at 11:00 p.m. There was discussion about whether to open the WRSWA that evening, and the decision was to try to harvest the surplus in the district, adhering to the “minimize Wood River openings” resolution expressed by the Nushagak Fish and Game Advisory Committee.

The next morning, after receiving the midnight to 6:00 a.m. counts (163,000 sockeye) from Wood River towers, a 9:00 a.m. announcement allowing openings in the Wood River Special Harvest Area for both drift and set gillnets was released. Twelve hours was allowed for drift gillnets beginning at 12:00 noon, and 8 hours for set gillnets beginning at 1:00 p.m., July 13. Differential fishing time was due to the sockeye allocation percentages for the WRSWA being in favor of set gillnets.

Reports from companies on July 13 indicated that harvest from the period in progress in the Nushagak Section was excellent. But the Wood River tower passage rate continued to increase. By 3:00 p.m., July 13, it was evident that additional fishing time was warranted in both the Nushagak Section and the WRSWA to harvest surplus sockeye salmon. Set gillnets in the Nushagak Section were extended until further notice while drift gillnets were allowed 12-hour openings daily through July 16. This was a further attempt to adjust the sockeye allocation percentages for the Nushagak District, which still favored the drift gillnet gear group. Also that afternoon, both gear types were given 24-hour extensions in the Wood River Special Harvest Area resulting in continuous fishing for both gear groups. This pattern continued in the WRSWA through midnight, July 20.

July 13 turned out to be the peak day for Wood River sockeye escapement with a daily count of over 430,000 fish bringing the cumulative total to 1.25 million, surging over the upper end of the BEG range. However, with continuous fishing in both the district and the WRSWA, the passage rate subsided quickly on July 14, and ultimately reached a final figure of 1.3 million sockeye on July 22 when the counting towers ceased operation. Nushagak River sockeye escapement also showed a spike resulting from the two tide closure in the Nushagak Section on July 11. Daily sockeye escapements past the sonar counters at Portage Creek reached 40,000 and 30,000 on July 13 and 14,

respectively. These brought the cumulative total to over 370,000 sockeye and well within the BEG range. Final sockeye escapement for the Nushagak River reached 403,500 fish.

Nushagak District sockeye harvest had reached 6.1 million through July 13, just short of the 1999 season harvest of 6.2 million, which was second largest ever for the Nushagak. Continuous fishing continued for both gear types (drift gillnets went to continuous fishing in the Nushagak Section on July 18, when no further adjustment in the sockeye allocation percentages was observed) in the Nushagak District in both the Nushagak Section and the Igushik Section through midnight July 26, when the single remaining processing company ceased buying operations and left Nushagak District. Final sockeye harvest reached 6.37 million and became the second largest harvest for the Nushagak District.

The Nushagak District Commercial Set and Drift Gillnet Sockeye Salmon Fisheries Management and Allocation Plan specified a target sockeye allocation by gear type of 74% by drift gillnets and 26% by set gillnets. The 26% allocation for set gillnets was further subdivided into 20% for Nushagak Section set gillnets, and 6% for Igushik Section set gillnets. Differential fishing time for the two gear types was invoked throughout most of the season in order to achieve the specified harvest percentages. With the early Igushik Section only openings yielding over 300,000 sockeye to the drift fleet, the sockeye allocation percentage was skewed heavily in favor of the drift fleet before there were any setnet openings in the Nushagak Section. Beginning on June 28 with the first opening in the Nushagak Section, set gillnets were allowed to fish almost continuously through July 26, while drift gillnets were allowed mostly 8 and 12-hour openings daily throughout the same time period. The final sockeye allocation percentages calculated for the Nushagak District were: 79% by drift gillnets, 15% by Nushagak Section set gillnets, and 6% by Igushik Section set gillnets.

### **Wood River Special Harvest Area**

In January 1996, the Alaska Board of Fisheries adopted the Wood River Sockeye Salmon Special Harvest Area Management Plan to conserve Nushagak River coho salmon while providing an opportunity to harvest surplus Wood River sockeye during the late portion of the run. It was under this management plan that the fishery was conducted in 1996. In 1997, the commercial fishing occurred in the Wood River under an emergency regulation that used the WRSMA predominantly for sockeye management. After the 1997 season, the Board modified the WRSMA Management Plan to include provisions and criteria for sockeye salmon management, specifically to harvest surplus Wood River sockeye while conserving Nushagak River bound sockeye salmon. The plan was modified again in March of 1999 to eliminate the concurrent district opening language and include an OEG of no less than 235,000 sockeye in the Nushagak River when the projected ratio of Wood to Nushagak River sockeye exceeded 3:1. This OEG minimum was adopted for two seasons with direction to the Department to evaluate its impact on Nushagak River production, and report back to the Board in January 2001.

Peak effort levels in Wood River occurred June 26, during the first Wood River opening. One hundred and seventeen drift gillnet vessels were counted with approximately 70 actively fishing, along with 85 set nets. Effort levels were substantially less after June 28 when the Nushagak District began regular openings.

The Wood River was opened to commercial fishing 9 ½ days between June 26 and July 5, and 8 days between July 13 and July 20; fishing time was 356 hours for drift gillnets and 371 hours for set gillnets. In all but the first two of these openings, fishing was permitted concurrently in the Nushagak Section. Opening times and duration were changed as the season progressed to maximize exploitation of Wood River sockeye and distribute fish throughout the harvest area prior to each opening. Based on the experience with opening times during the 1997 and 1998 Wood River fisheries, openings around low water improved efficiency of both gear types. Overall exploitation of Wood River sockeye salmon in the WRSMA in 2000 was estimated at 56%. Early periods prior to opening the Nushagak District showed greater efficiency with exploitation rates of up to 88% when drift and set gillnet effort levels were high.

The sockeye salmon allocation plan that went into effect in 1998 for the Nushagak District also applied to the WRSHA. The plan called for a target allocation percentage of 74% to drift gillnets and 26% to set gillnets in the Wood River fishery. For most of the commercial openings during the 2000 season, starting on June 26, drift and set gillnets were allowed equal fishing time. Due apparently to reduced drift effort and relatively stable set gillnet effort in the WRSHA, catch rates for the two gear types were different from previous years. After the first series of openings ending July 5, the allocation percentage favored set gillnets (33%), so more time was given to drift gillnets in the Wood River Special Harvest Area beginning on July 13. However, with the high sockeye escapement rate observed at the Wood River towers on July 13, and the Wood River sockeye escapement exceeding the upper end of the BEG range, both gear types were allowed continuous fishing until closing at midnight on July 20. Final sockeye harvest by gear type in the WRSHA was 68% by drift nets and 32% by set gillnets.

Commercial harvest in the Wood River totaled approximately 1.25 million sockeye salmon (Table 18) in 2000. Daily sockeye harvests peaked June 28 with 387,000 fish taken and declined to approximately 1,000 sockeye when WRSHA closed on July 20. This was the second season that the Wood River fishery performed up to expectations of the management staff and showed a level of efficiency that could control the sockeye escapement when needed. Impacts to other species of salmon and resident species in the Wood River continue to be a concern with an inriver fishery. There is little data on the size of chinook, chum and coho salmon stocks in the Wood River and less data available on resident species populations. Sockeye salmon represented 99.5% of the 2000 commercial harvest in the Wood River. Harvests of other species included approximately 800 chinook, 9,000 chum and 1,100 coho salmon.

### **Igushik Section**

The 2000 sockeye run forecasted for Igushik River was 13% above the recent 10-year average of 1.5 million fish. Sockeye salmon escapements in the Igushik River from 1989 through 1999, with the exception of 1997, exceeded the biological escapement goal range (150,000 – 250,000) in spite of extensive commercial fishing in the Igushik Section (Appendix Table 1). In 1997, the Igushik sockeye run failed, as did most other river systems in Bristol Bay, with less than 300,000 fish in the total inshore return.

The first sockeye were detected in the Igushik River on June 16, the first day of test fishing (Table 31). On June 19, the Igushik test fish project produced an elevated daily index which yielded an inriver estimate of over 3,000 sockeye past the test fish site in the lower Igushik River. Based on this elevated index and the preseason forecast, a 12-hour Igushik Section only opening was announced for both drift and set gillnets beginning at 5:00 a.m., June 21. Harvest from this first opening was relatively low, with approximately 10,000 sockeye being taken. Inriver test fish indices declined for several days, however, on June 24, when the Igushik counting towers on the upper Igushik River began counting, almost 1,900 sockeye passed within the first 24 hours. Then on June 25, the inriver test fish project caught over 100 sockeye, yielding an index of over 500. This produced an inriver estimate of 20,000 sockeye. A 12-hour opening was announced for both drift and set gillnets in the Igushik Section. Harvest from this second Igushik opening was very strong, with over 185,000 sockeye taken. Daily sockeye escapement passing the counting towers continued to increase; on June 27, over 40,000 sockeye were counted, bringing the cumulative count to 65,000 fish. This was approximately 9 days ahead of expected levels to reach the 200,000 fish midpoint goal.

Test fish indices declined after the “spike” on June 25, and dropped to almost zero on June 28 and 29. Additionally, the daily sockeye escapement at the counting towers declined after the June 27 “spike”, to less than 4,000 fish on June 29. With indications from the test fish project that relatively few sockeye were moving into the Igushik River and unusually low daily counts at the counting towers, conservatism descended upon the management staff. Cumulative sockeye escapement was approximately 94,000 through June 29. The set gillnet fishery in the Igushik Section, having fished continuously since 7:00 a.m., June 26, was closed at 11:00 p.m., June 29. The drift gillnet fishery also closed at 10:30 p.m., June 29.

On June 30, the catch from the inriver testfish project increased slightly indicating some movement of sockeye into the lower Igushik River; inriver estimate was approximately 6,000 fish, but passage at the counting towers was still flat. The next day the testfish project caught over 200 sockeye, yielding a daily index of 2,400; this drove the inriver estimate to 120,000 sockeye. An opening for set gillnets in the Igushik Section was announced to begin at 1:00 a.m., July 1, after a two-tide closure. This was followed by an announcement for a drift gillnet opening beginning at 8:00 p.m., July 1. The commercial opening on July 1 resulted in the peak set gillnet harvest of over 50,000 sockeye. Both drift and set gillnets fished continuously from July 1 through midnight July 26.

Daily escapement at the counting towers began with a slight increase on July 2, followed by substantial increases with a peak daily count of 58,000 sockeye on July 5. The midpoint goal of 200,000 sockeye was exceeded on July 4. Sockeye escapement continued at elevated levels for the next several days, declining to below 10,000 fish a day on July 10. The counting towers were operated through July 22, and the final cumulative sockeye escapement was 413,000 fish, 65% over the upper end of the biological escapement goal range.

Commercial fishing time in Igushik Section totaled 723 hours for set gillnets and 677 hours for drift gillnets. Although total drift harvest cannot be estimated for Igushik Section for those periods when both Nushagak Section and Igushik Section are opened simultaneously, approximately 325,000 sockeye were taken by drift gillnets in Igushik-only openings, before the Nushagak Section opened. Igushik Section set net harvests totaled approximately 248,000 sockeye salmon (Table 17), which is above the recent 10-year (1989-1998) average. The 2000 Igushik River sockeye return, estimated at 1.75 million, came in at 13% above the preseason forecast.

The new sockeye allocation plan specified a target of 6% of the sockeye harvest of the Nushagak District to be taken by Igushik Section setnets. Management actions directed at achieving this target consisted of trying to maximize the fishing time for set gillnets, while allowing enough drift gillnet effort to control escapement levels. The early periods between June 26 and June 29 were generally continuous fishing for set gillnets, while drift gillnets were allowed 12-hour periods daily. After the two-tide break on June 30, both gear types fished continuously to harvest sockeye surplus to escapement needs. The final sockeye harvest percentage for Igushik Section set gillnets was 6%.

Sockeye runs to Nushagak District systems totaled 8.54 million, 56% above the 2000 forecast and well above the recent 10-year average (Table 4, Appendix Table 18). Wood River comprised the majority (62%) of the sockeye return, followed by Igushik (21%) and Nushagak (17%).

The sockeye harvest of approximately 6.37 million for Nushagak District was 59% above the forecast and approximately 65% above the 1980-1999 average of 3.9 million. It replaced 1999 as the second largest harvest on record for the Nushagak District; second only to 1981. Sockeye escapement in the three major Nushagak District river systems reflected the disparity in run strengths (Appendix Tables 1 and 17). Escapement in the Wood River (1.3 million) exceeded the upper range of the Wood River goal by 8%. In the Nushagak River, the management objective of exceeding an OEG minimum of 235,000 fish for 2000 was achieved; the final escapement estimate (403,500) fell within the BEG range (340,000 – 760,000). The midpoint goal for the Igushik River was exceeded; escapement in that system (413,000) was 65% above the upper end of the BEG range.

Although the 2000 Nushagak River escapement was within the desired BEG range, sockeye escapement into Nuyakuk River (129,000) was much less than the desired level. This tributary to the Nushagak River system, with large nursery lakes available for rearing sockeye fry, has been the major sockeye producing component in the past. Sockeye escapements between 300,000 and 500,000 in the Nuyakuk River produce the largest yields for the commercial fishery.

### **Sockeye Allocation Plan Performance**

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

<b>Nushagak District Sockeye Allocation Plan Performance</b>					
<b>Year</b>	<b>Nushagak Drift</b>	<b>Nushagak Section Set</b>	<b>Igushik Section Set</b>	<b>Wood River Drift</b>	<b>Wood River Set</b>
<b>Allocation %</b>	<b>74</b>	<b>20</b>	<b>6</b>	<b>74</b>	<b>26</b>
1998	72	23.5	4.5	76	24
1999	69.5	24	6.5	78	22
2000	79	15	6	68	32
<b>3 yr. Average</b>	<b>73.5</b>	<b>20.8</b>	<b>5.7</b>	<b>74</b>	<b>26</b>

### **Coho Salmon**

The Nushagak Coho Salmon Management Plan 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 182,000 spawners in 1996 and recent production trends, the 2000 coho return was expected to be relatively strong. The coho plan directs the Department, when the total inriver run in the Nushagak River is projected to be less than 100,000 but at least 60,000, to close “the directed coho salmon commercial fishery” by July 23. In 2000, after the sockeye fishery closed on July 26, commercial fishing resumed in the Nushagak District on July 31 with a directed coho salmon fishery. Through July 30, the cumulative coho salmon escapement past the Portage Creek sonar counters was 20,700 fish, which was 5 days ahead of the level needed to achieve the inriver goal.

The opening announced to begin on July 31 was a 44 1/2 –hour opening through 9:00 a.m., August 2 for both gear types in the entire Nushagak District. Coho escapement in the Nushagak River started off strong with daily counts of over 1,000 coho beginning on July 16 and stayed well ahead of the 100,000 fish inriver goal curve. On August 1, with coho escapement at approximately 25,000 fish, still approximately 3 days ahead of schedule, a 49 1/2-hour extension for both gear types was announced through 10:30 a.m., August 4. Harvest rates averaged over 7,000 coho per period, with 20 to 30 vessels participating.

Beginning the morning of August 1, the Portage Creek sonar project reported an increased passage rate for coho salmon; probably resulting from a strong southwesterly wind the previous day in the district. Daily counts for the next three days continued at about 30,000 coho per day, so by the afternoon of August 3, when considering further extensions for the Nushagak District commercial fishery, with a cumulative coho escapement of over 100,000 (inriver goal was exceeded August 2), the decision was moot. A week-long extension was announced through the afternoon of August 11.

Extensions continued as the coho escapement continued to increase; on August 18 with daily catches still averaging 5,000 coho, a final extension through August 22 was announced after checking with the buyer that was providing a tender to the Nushagak District. The company confirmed that they would retain a tender in the district through August 22. At noon on August 21, the Department received word that the tender had left the district and there was no further market for coho salmon. The Department closed the district to commercial fishing effective 12:00 noon, August 21, and advised the fleet that no further openings were expected for the 2000 season.

Final reported commercial harvest of coho salmon was over 113,000 fish (Table 16, Appendix Table 25). Final coho salmon escapement into the Nushagak River was estimated to be 172,846 fish.

## ***Togiak District***

The 2000 inshore sockeye run of 1,183,581 fish was the second largest return to the Togiak District on record. This return was 71% above the preseason forecast. District sockeye harvest was 793,501 fish, second only to 1988 in the last 20 years. The escapement into Togiak Lake was 311,970, 56% above the upper end of the Biological Escapement Goal (BEG).

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

## ***Forecast***

### **Sockeye**

The 2000 inshore run to the Togiak River was forecasted at 692,000 sockeye salmon (Table 1), of which 78% were projected to be 3-ocean fish, the remaining 22% were predicted to be 2-ocean fish (Table 2). With an escapement goal range of 100-200 thousand sockeye for Togiak Lake, and an additional 25,000 fish (20-year average) spawning in the tributaries below, approximately 517 thousand sockeye would potentially be available for harvest in the Togiak River Section. A harvest of this size would have been slightly better than the 20-year average and the best harvest since 1995 (Appendix Table 19). 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 71,000 sockeye to the district harvest was projected from drainages other than the Togiak River.

### **Chinook**

No formal forecast is issued for chinook salmon runs in the Togiak District. Recently, chinook run strengths, district wide, have declined from a high of almost 62,000 in 1983 to a low of less than 19,000 in 1997 (Appendix table 22). Chinook escapements in the Togiak River drainage fell short of the regulatory escapement goal (10,000) from 1986 through 1992. The chinook goal was reached from 1993 to 1995, with extensive commercial 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 closure that allows chinook escapement to be achieved.

### **Coho**

A formal forecast is not produced for coho salmon in the Togiak District. Parent-year escapement estimates from aerial surveys of spawning coho are the only preseason indicator of run strength available. Coho salmon escapement for the parent year (1996) in the Togiak River was estimated at 64,980 (Appendix Table 26), which is significantly above the 50,000-escapement goal. The commercial harvest for the parent year was 58,978. The excellent escapement and harvest for the parent year indicated a good return for the 2000 coho salmon run.

## *Season Summary*

### **Chinook**

The management's strategy for the last four years has been to reduce the weekly fishing schedule during the last two weeks of June, to 48 hours for all sections of the district to decrease the exploitation of chinook salmon. This was done again during the 2000 season. The weekly fishing period, beginning June 19, was the first fishing period with a buyer present, and permit holders fishing, therefore it closed after 48 hours.

Commercial fishing opened in the district with a regular weekly schedule on June 1. The first landings of the 2000 season were on June 19 (Table 19). By the last delivery of the week, on June 21, the cumulative catch was 910. This was just above the recent four-year average (1996-1999), under the new management strategy, of 879 fish. The number of deliveries was 75% of the 20-year average for this same time as well.

The fishery reopened on June 26 and was again limited to 48 hours. The seasons cumulative catch after the last delivery on Wednesday, June 28 was 2,875. The recent average for this date is 2,972. There were 34 drift permits and 59 setnet permits registered to fish in the Togiak District as of 10:00 a.m. June 28. During the remainder of the week, with the fishery closed for chinook conservation, subsistence fishing in the commercial fishing district was allowed by emergency order.

The highest catch per delivery, 10.4 chinook, occurred on June 26, but the largest daily catch occurred on July 4, when 926 chinook were harvested. The close of fishing on the 28<sup>th</sup> of June marked the end of active management for chinook conservation. Fishing reopened again, with the increased weekly schedule, on the 3<sup>rd</sup> of July with the focus on sockeye salmon management.

The total chinook harvest for the Togiak River Section was 7,254 fish (Table 20), with an additional 604 caught in the Kulukak Section (Table 21). Escapement for the Togiak River and tributaries was estimated at 11,813 chinook salmon from aerial surveys. Figures are not yet available for sport or subsistence harvests so the preliminary exploitation rates do not include those numbers. Commercial exploitation of the Togiak River stock was 38%; the district wide commercial exploitation rate was 32%. The district wide escapement was 16,897 chinook salmon. An estimated 850 chinook escaped into the Kulukak River an additional 4,234 fish were estimated to have escaped into the Quigmy, Osviak, Matogak, Slug, Negukthlik and Ungalikthluk Rivers. The total district escapement is 17% higher than the 20-year average (Appendix Table 22). The combined total run for the district was 77% of the 20-year average but 2% higher than the 5-year average.

### **Sockeye**

Commercial harvests of sockeye salmon began on June 19 in both the Kulukak and Togiak River Sections (Tables 19, 20 and 21). After the first 48-hour period cumulative catches in the Kulukak Section were 179% of the 1969-2000 long-term average. The weekly harvest of 9,000 sockeye for the Togiak River Section was more than three times the long-term average.

As mentioned above, the last two weekly fishing periods in June for the Togiak District were reduced for chinook conservation, after July 1, regularly scheduled fishing periods in the Kulukak Section were reduced to 48 hours for conservation of Kulukak River sockeye. Due to a shift in effort to the Kulukak Section and to conserve the Kulukak River sockeye stock, this reduction has become standard practice in recent years. By the end of June, the District wide sockeye harvest was slightly more than 51,000 fish, 67% above expected levels. Operation of the Togiak counting towers began on July 4. The tower count for that day was 5,370 sockeye (Table 25). The July 5 count was 21,246.

Tower counts and commercial catches were strong to this point; by July 7, the date when any extension would have been announced, there was still some concern that early run timing and weak returns seen in other districts of Bristol Bay may also occur in the Togiak District. The weekly fishing period in the Togiak River Section was, therefore, allowed to close, for 36 hours, as scheduled on the evening of July 8.

Commercial fishing reopened on the 10<sup>th</sup> of July for the regularly scheduled fishing period in the Togiak River Section and the reduced period in the Kulukak Section. The other sections of the Togiak District, Osviak, Matogak and Cape Peirce were also opened but there were no catches reported in these sections in 2000 (Tables 22 and 23). Catches in both the Kulukak and Togiak River Sections were excellent. Escapement past the counting towers on the Togiak River was 107,000 (Table 25) by the morning of July 14, well ahead of the 150,000-escapement curve. On July 14, it was announced that the commercial fishing period in the Togiak River Section would be extended for 36 hours (Table 11); thus invoking continuous fishing through the beginning of the next regularly scheduled fishing period. There were 41 drift permits and 65 setnet permits registered to fish in the Togiak District prior to July 21.

Sockeye escapement past the towers and catches both continued at above average rates. The midpoint escapement goal was achieved on July 18. On July 19 it was announced that the district transfer restrictions would be waived on, July 21, as specified by the Togiak District Salmon Management Plan. It was also announced that commercial fishing would be extended for the maximum allowable period of 48 hours (Table 11). This extended the fishery from the regularly scheduled close of 9:00 a.m. Friday, July 21 until 9:00 a.m. Sunday, July 23. The Kulukak Section had closed 24 hours early at 9:00 a.m. July 19. An effort count on July 24 revealed 98 drift boats and 45 setnets in the Togiak River Section, an additional four setnets and 18 drift boats were seen in the Kulukak Section.

Total commercial sockeye harvest in the Togiak District as of the close of fishing on July 21 was approximately 610,000 fish (Table 19). Cumulative tower escapement was 251,580. Though the escapement goal had been achieved in the Togiak River, there was still some concern for Kulukak River sockeye. On July 24 it was announced that the Kulukak Section would close 24 hours early. Commercial fishing, in the Togiak River Section, was extended again on July 26 for the maximum allowable 48-hour period. Catch rates declined during this week and some buyers ceased operations. There were no catches reported in the Kulukak Section after July 26 (Table 21). The Togiak District closed for commercial fishing on August 16 because there was no longer a market available for commercially caught salmon. There were several days between August 1 and the closure that there were no catches reported because there was no processor available to buy fish.

The counting towers on the Togiak River were pulled out on August 1, after three consecutive days of counts less than one percent of the cumulative tower escapement count. The final escapement count at the towers was 311,970.

The total sockeye escapement in the Togiak River drainage for 2000 was 352,245 (Appendix table 19). An additional 37,835 sockeye were estimated in The Kulukak River and other streams in the Togiak District. The final sockeye harvest for the Togiak District was 795,000 fish, 67,612 were caught in the Kulukak Section and the remainder in the Togiak River Section. The total run for the Togiak District was estimated at 1,185,000. The district wide exploitation rate was 67%; the exploitation rate for the Togiak River was very similar.

## **Coho**

There was no directed coho fishery in the Togiak District this year due to lack of a market. There were roughly 2,750 coho salmon caught by the last day of fishing, August 15. The 20-year average for that day is 6,371 (Appendix Tables 9 and 26). Effort was less than half of average for the last few days of fishing when the coho catch started to increase. There were no aerial surveys done to assess coho escapement this year due to poor weather and lack of a survey plane. In a brief conversation with one sport fishing lodge operator it was learned that coho sport fishing in the Togiak River was good.

The sockeye harvest and total return to the Togiak District was the second best since 1980 (Appendix Table 5). Chinook harvests were 76% of the 10-year average, while harvest of chum, pink and coho were 91, 2 and 11% respectively of the 10-year averages. The 10-year average for pinks only includes even years. Sockeye escapement

into the Togiak River was over 300,000 fish. The chinook escapement goal of 10,000 was exceeded by 1,800 fish. No escapement estimates were made for other species.

## **2000 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, all Alaska State residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages. In 2000, 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 2000, 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.

### ***Inseason Management***

Due to extended closures to the commercial fishery in the Nushagak commercial fishing district, an emergency order opened the district to subsistence salmon harvesting from noon June 1 until further notice. This subsistence opening was closed by emergency order effective 9 p.m. June 20. Another emergency order opened this area to subsistence fishing from 12 p.m. June 23 until 9 p.m. June 25. By emergency order effective August 21, subsistence fishing in the Nushagak commercial fishing district was opened until 12 a.m. October 1, due to the closure of the commercial fishery for the rest of the year.

In the Nushagak District, the Wood River Special Harvest Area was opened to commercial salmon fishing beginning 6 p.m. June 26. Consistent with the provisions of the Wood River Special Harvest Area Management Plan (5 AAC 06.358), subsistence fishing in this area was closed by emergency order effective 5 p.m. June 26. With the conclusion of commercial openings in the special harvest area, it was reopened to subsistence fishing by emergency order effective 12 a.m. July 21.

Because of an extended closure to commercial salmon fishing in the Togiak District, an emergency order opened subsistence fishing within the commercial fishing district from noon June 28 until Saturday July 1. Effective 9 a.m.

August 16, an emergency order opened the Togiak commercial fishing district to subsistence salmon fishing for the remainder of the season, due to the closure of the commercial fishery for the rest of the year.

An emergency order opened the Naknek Section of the Naknek/Kvichak District to subsistence fishing for two 24-hour periods per week, from 9 a.m. Saturday until 9 a.m. Sunday and from 9 a.m. Tuesday until 9 a.m. Wednesday, effective 9 a.m. Saturday, July 15 until 9 a.m. Sunday, July 23. This was to allow subsistence fishing opportunity when the Naknek Section was closed to commercial fishing and commercial fishing was occurring in the Naknek River Special Harvest Area.

In the Egegik District, an additional subsistence fishing period was opened by emergency order at 8 a.m. on June 18, and extended through 9 p.m. June 19 by two additional emergency orders. 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.

No emergency orders were issued for the Ugashik subsistence fishery in 2000.

### ***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 2000, a total of 1,219 permits were issued for the Bristol Bay Management Area, and of these, 1,109 (91.0 percent) were returned to the Department with harvest data. The largest number of permits were issued for the Naknek/Kvichak (562 permits) and Nushagak (541 permits) and districts. For the Nushagak and Naknek/Kvichak districts, more permits were issued in 2000 than the long-term 20 year average, due in part to permits being available to all state residents since 1990. Fewer permits were issued for the Egegik District in 2000 (31) than the average for the past 10 years (56), while the number issued in the Ugashik District was the same as the recent 10-year average (31). The number of permits issued for the Togiak District (54) was considerably higher than recent averages, reflecting a more complete involvement by local subsistence fishers in the harvest reporting program for that district than has been the case in the past (Appendix Table 31). Of all permits, 1,012 (83.0 percent) were issued to residents of Bristol Bay communities, and 207 (17.0 percent) were issued to other Alaska residents.

### ***Harvest***

The estimated total Bristol Bay subsistence salmon harvest in 2000 was 118,824 fish (Table 35). This number is the lowest estimated subsistence salmon harvest for the Bristol Bay Area since 1973, when 88,400 salmon were harvested, and the third-lowest since harvest records have been kept beginning in 1963 (the estimated subsistence harvest was 93,000 salmon in 1972). The 2000 harvest was 24% below the recent 10-year average of 156,389 salmon and about 29% below the recent 20-year average of 166,602 salmon.

The area-wide chinook harvest of 13,009 salmon was the lowest since 1989, and below the recent 20-year average of 14,643 chinook salmon. The area-wide harvest of 92,050 sockeye salmon was the lowest since 1973. The 2000 sockeye harvest was about 25% below the recent 10-year average of 122,809 sockeyes. Compared to recent 10-year averages, subsistence harvests of chum, pink, and coho salmon were also down in 2000 (Appendix Table 31).

In 2000, the Bristol Bay subsistence salmon harvest was composed of 77.5% sockeye, 9.7% chinook, 3.9% chum, 2.2% pink, and 6.7% coho salmon. Of the entire Bristol Bay Area harvest, residents of Bristol Bay communities harvested 110,990 salmon (93.4%), and other Alaska residents harvested 7,834 salmon (6.6%).

In 2000 as over the last several decades, most of the subsistence harvest was taken in the Naknek/Kvichak (54.7%) and the Nushagak (37.9%) districts. The Naknek/Kvichak total harvest of 65,053 salmon was the lowest since 1973 (when 43,000 salmon were harvested) and the third-lowest on record (the estimated harvest was 53,800 salmon in 1972). The 2000 subsistence salmon harvest in this district was 30% below the recent 10-year average of 93,332 fish (Appendix Table 31).

In 2000, Kvichak drainage residents, and other permit holders fishing in the Kvichak drainage portion of the Naknek/Kvichak District, harvested an estimated 36,990 sockeye salmon, compared to a recent 10-year average of 63,444 sockeyes and a 20-year average of 70,392 sockeyes. The 2000 subsistence harvest of sockeye salmon in the Kvichak drainage was the lowest since records have been kept beginning in 1963. The previous low was 39,100 sockeyes in 1973. Of Kvichak drainage communities, estimated sockeye harvests were down substantially at Levelock, Pedro Bay, Kokhanok, Iliamna/Newhalen, and Nondalton, compared to 10-year averages, but were similar to 10-year averages in Igiugig and Port Alsworth (Appendix Table 32). Levelock residents received approximately 10,000 pounds of salmon (about 2,000 fish) from the ADF&G test fishery in 2000.

In the Nushagak District, the total estimated subsistence harvest in 1999 was 45,029 salmon. The recent 10-year average is 52,660. The Nushagak chinook harvest in 2000 of 9,470 was the lowest since 1989, and was down notably from the 15,318 chinook estimated for 1997 and the 12,258 harvested in 1998. The sockeye harvest of 24,452 was below the 10-year average (27,583) and 20-year average (35,353) (Appendix Table 31). In 2000, subsistence salmon harvests in several Nushagak District communities were substantially lower than recent averages, most notably Aleknagik, New Stuyahok, and Koliganek (Appendix Table 33).

The estimated total subsistence salmon harvest for the Togiak District in 2000 of 5,130 fish was down slightly from the previous year, but exceeds the recent 10-year average and is very similar to the 20-year average. The estimated subsistence harvest in the Ugashik District in 2000 was 2,481, very similar to the 10-year average of 2,276. In the Egegik District the estimated subsistence salmon harvest of 1,131 in 2000 was less than a third of the recent 10-year average and the lowest estimated subsistence harvest for that district since 1985. However, the number of permits issued for this district has continued to drop since peaking at 80 in 1992; 31 permits were issued for 2000 (Appendix Table 31).

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# 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, 2000.<sup>a</sup>

District and River System	Inshore Run			Escapement				Inshore Catch		
	Forecast	Actual	Percent Deviation <sup>b</sup>	Mid-point Objective	Range	Actual	Percent Deviation <sup>b</sup>	Projected Harvest	Actual	Percent Deviation <sup>b</sup>
<u>NAKNEK-KVICHAK DISTRICT</u>										
Kvichak River	9,450	2,861	230%	6,000	6,000-10,000	1,828	228%	3,454	1,034	234%
Branch River	420	731	-43%	185	170-200	451	-59%	207	279	-26%
Naknek River	5,160	4,789	8%	1,100	800-1,400	1,375	-20%	4,058	3,414	19%
Total	15,030	8,381	79%	7,285	6,970-11,600	3,654	99%	7,719	4,727	63%
<u>EGEGIK DISTRICT</u>										
	7,930	8,083	-2%	1,100	800-1,400	1,032	7%	6,830	7,051	-3%
<u>UGASHIK DISTRICT</u>										
	4,270	2,177	96%	850	500-1,200	638	33%	3,420	1,539	122%
<u>NUSHAGAK DISTRICT</u>										
Wood River	3,230	5,278	-39%	1,100	700-1,200	1,300	-15%	2,231	3,978	-44%
Igushik River	1,515	1,748	-13%	200	150-250	413	-52%	1,315	1,335	-1%
Nushagak-Mulchatna	745	1,458	-49%	235	340-760	404	-42%	194	1,054	-82%
Total	5,490	8,484	-35%	1,535	1,190-2,210	2,117	-27%	3,740	6,367	-41%
<u>TOGIK DISTRICT</u>										
	692	1,185	-42%	150	100-200	352	-57%	542	795	-32%
<b>TOTAL BRISTOL BAY</b>										
	33,412	28,310	18%	10,920	9,560-16,610	7,793	40%	22,251	20,479	9%

<sup>a</sup> The Bristol Bay inshore forecast does not include several minor river systems, including the Snake River drainage in Nushagak District, and the Kulukak, Osviak, Slug River system in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table for the sake of comparison. Togiak 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 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.

<sup>b</sup> 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, 2000.

District and River System	2-Ocean			3-Ocean			Other	Total
	1.2 (1996)	2.2 (1995)	Total	1.3 (1995)	2.3 (1994)	Total		
<u>NAKNEK-KVICHAK DISTRICT</u>								
Kvichak River	2,841	3,290	6,131	1,746	1,577	3,323	-	9,454
Branch River	199	52	251	147	24	171	-	422
Naknek River	395	629	1,024	3,414	720	4,134	-	5,158
Total	3,435	3,971	7,406	5,307	2,321	7,628	-	15,034
<u>EGEGIK DISTRICT</u>								
EGEGIK DISTRICT	792	3,590	4,382	1,175	2,372	3,547	-	7,929
<u>UGASHIK DISTRICT</u>								
UGASHIK DISTRICT	567	1,390	1,957	1,764	549	2,313	-	4,270
<u>NUSHAGAK DISTRICT</u>								
Wood River	1,292	212	1,504	1,598	128	1,726	-	3,230
Igushik River	254	49	303	1,161	51	1,212	-	1,515
Nushagak River	102	3	105	629	10	639	-	744
Total	1,648	264	1,912	3,388	189	3,577	-	5,489
<u>TOGIAC DISTRICT</u>								
TOGIAC DISTRICT	125	26	151	505	36	541	-	692
<u>TOTAL BRISTOL BAY<sup>a</sup></u>								
Number	6,567	9,241	15,808	12,139	5,467	17,606	-	33,414
Percent	20	28	47	36	16	53	-	100

<sup>a</sup> 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, 2000.<sup>a</sup>

District and River System	1.2	2.2	2-Ocean	0.3	1.3	2.3	3-Ocean	Total
<u>NAKNEK-KVICHAK DISTRICT</u>								
Kvichak River								
Number	344	538	882	0	1,734	243	1,977	2,859
Percent	12.0	18.8	30.8	0.0	60.7	8.5	69.2	100
Branch River								
Number	382	116	498	0	189	40	229	727
Percent	52.5	16.0	68.5	0.0	26.0	5.5	31.5	100
Naknek River								
Number	326	145	471	0	3,791	517	4,308	4,779
Percent	6.8	3.0	9.9	0.0	79.3	10.8	90.1	100
Total								
Number	1,052	799	1,851	0	5,714	800	6,514	8,365
Percent	12.6	9.6	22.1	0.0	68.3	9.6	77.9	100
<u>EGEGIK DISTRICT</u>								
Number	467	1,508	1,975	0	3,080	3,012	6,092	8,067
Percent	5.8	18.7	24.5	0.0	38.2	37.3	75.5	100
<u>UGASHIK DISTRICT</u>								
Number	216	170	386	5	1,511	268	1,784	2,170
Percent	10.0	7.8	17.8	0.2	69.6	12.4	82.2	100
<u>NUSHAGAK DISTRICT</u>								
Wood River								
Number	2,538	136	2,674	0	2,510	89	2,599	5,273
Percent	48.1	2.6	50.7	0.0	47.6	1.7	49.3	100
Igushik River								
Number	161	14	175	0	1,548	25	1,573	1,748
Percent	9.2	0.8	10.0	0.0	88.6	1.4	90.0	100
Nush-Mulchat. River								
Number	471	32	503	1	894	52	947	1,450
Percent	32.5	2.2	34.7	0.1	61.7	3.6	65.3	100
Total								
Number	3,170	182	3,352	1	4,952	166	5,119	8,471
Percent	37.4	2.1	39.6	0.0	58.5	2.0	60.4	100
<u>TOGIAK DISTRICT<sup>b</sup></u>								
Number	82	10	92	1	978	7	986	1,078
Percent	7.6	0.9	8.5	0.1	90.7	0.6	91.5	100
<u>TOTAL BRISTOL BAY<sup>c</sup></u>								
Number	4,987	2,669	7,656	7	16,235	4,253	20,495	28,151
Percent	17.7	9.5	27.2	0.0	57.7	15.1	72.8	100

<sup>a</sup> The inshore run data does not include the South Peninsula catch of Bristol Bay sockeye or immature high seas by-catch

<sup>b</sup> Does not include rivers other than Togiak River.

<sup>c</sup> There are a few minor age classes or minor Bristol Bay drainages that are not included in this total.

**Table 4.** Inshore commercial catch and escapement of sockeye salmon, Bristol Bay, in numbers of fish, 2000.

District and River System	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River	1,033,814	1,827,780	2,861,594
Branch River	279,553	451,300	730,853
Naknek River	3,413,694	1,375,488	4,789,182
Total	4,727,061	3,654,568	8,381,629
<u>EGEGIK DISTRICT</u>			
	7,050,899	1,032,138 <sup>a</sup>	8,083,037
<u>UGASHIK DISTRICT</u>			
	1,538,790	638,420 <sup>b</sup>	2,177,210
<u>NUSHAGAK DISTRICT</u>			
Wood River	3,977,728	1,300,026	5,277,754
Igushik River	1,335,179	413,316	1,748,495
Nushagak-Mulchatna	1,054,301	403,500	1,457,801
Total	6,367,208	2,116,842	8,484,050
<u>TOGIAK DISTRICT <sup>c</sup></u>			
Togiak Lake	727,384	311,970	1,039,354
Togiak River/Tributaries	0	40,275	40,275
Kulukak System	67,612	22,350	89,962
Other Systems	0	15,485	15,485
Total	794,996	390,080	1,185,076
TOTAL BRISTOL BAY	20,478,954	7,832,048	28,311,002

<sup>a</sup> Includes only Egegik River Tower counts.

<sup>b</sup> Includes Ugahik River Tower and aerial survey estimates from King Salmon and Dog Salmon rivers.

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

**Table 5.** Offshore test fishing catch indices of sockeye salmon, Port Moller, Bristol bay, 2000.

Date	No. of Stations Fished	Sockeye Catch	Running Mean	Index <sup>a</sup>	
			Length (mm)	Daily	Cum.
6/10	5	72	562	29.4	29.4
6/11	5	52	569	21	50.4
6/12	5	175	554	68	118
6/13	5	165	560	58.1	177
6/14	5	115	565	43.5	220
6/15	5	164	554	65.2	285
6/16	5	121	541	49.9	335
6/17	5	121	541	46.8	382
6/18	5	159	555	68.6	451
6/19	5	143	552	55.3	506
6/20	Did not fish			66	572
6/21	5	239	552	41	613
6/22	5	274	553	100	713
6/23	5	316	553	125	838
6/24	5	237	554	88	926
6/25	5	205	554	85	1,010
6/26	5	150	554	61	1,071
6/27	5	279	542	70	1,141
6/28	5	351	554	89	1,230
6/29	5	331	551	65	1,295
6/30	5	248	552	68	1,363
7/01	5	210	546	53	1,416
7/02	5	194	549	51	1,467
7/03	5	145	560	58	1,525
7/04	5	79	551	33	1,558
7/05	5	107	548	45	1,603
7/06	5	92	532	37	1,640
7/07	5	94	545	37	1,677
7/08	5	47	545	20	1,698

<sup>a</sup> Indices are based on fish/100 fathom-hours and was built using Stations 2 to 10 for 2000.

**Table 6.** Summary of district sockeye salmon test fishing indices in the Naknek-Kvichak District, by index area and date, Bristol Bay, 2000.<sup>a</sup>

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

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

**Table 7.** Summary of district sockeye salmon test fishing in the Egegik District, by index area and date, 2000.<sup>a</sup>

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	Date
Index Area	

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(No District Test Fishing was conducted in 2000.)

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Table 8. Summary of district sockeye salmon test fishing in the Ugashik District, by index area and date, Bristol Bay, 2000.<sup>a</sup>

Index Area	June			July		
	25	26	28	2	6	7
Cape Grieg (Nearshore)	46			393		
Four Miles North of Smoky Point Nearshore				32	245	375
Four Miles North of Smoky Point (Outer line)	201	0		66		
Two Miles North of Smoky Point (Outer line)	0				142 <sup>b</sup>	
Smoky Point Bar North Side Inshore	516	44	1,487	55 <sup>b</sup>	101	0
Smoky Point Bar Offshore end		133	344	751	55	328
Smoky Point Entrance				0		13 <sup>b</sup>
Mid Outer Line		40		32	25	480
Bell Buoy					51	
Four Miles North of Cape Menshikof (Nearshore)	13	279		60	20	193
Two Miles North of Cape Menshikof (Outerline)		4		111		186
41 Three Miles South of South Spit (Nearshore)	418	360		0	372 <sup>b</sup>	1,822
1.5 miles south of South Spit	422					
South Spit (Mid Channel)	510	357			492 <sup>b</sup>	<sup>b</sup>
Dago Creek Mouth		0	249		0	0
Pilot Point			227	0	0	0
Between Pilot Point and Muddy Point			724			
Outer South Channel	4		138		5	0 <sup>b</sup>
Inner South Channel					10	23
Below inner district boundary line west side						
BelowAbove inner district boundary line east side	0		517		5	18
Above inner districtboundary line east side						
Between Dog Salmon and King Salmon Rivers						
Mouth of Dog Salmon River						

(Continued)

Table 8. (Page 2 of 2).

Index Area	July										
	9	10	11	12	13	14	15	18	19	21	
Cape Grieg (Nearshore)											
Four Miles North of Smoky Point Nearshore	595										31
Four Miles North of Smoky Point (Outer line)									44		
Two Miles North of Smoky Point (Outer line)		338 <sup>b</sup>		667 <sup>b</sup>							
Smoky Point Bar North Side Inshore	604	40				20		47			5
Smoky Point Bar Offshore end	420	120		184				13			0
Smoky Point Entrance		115	28	42	74 <sup>b</sup>	387 <sup>b</sup>				0	
Mid Outer Line	257	98				3797					
Bell Buoy				876							
Four Miles North of Cape Menshikof (Nearshore)			580	309						0	0
Two Miles North of Cape Menshikof (Outerline)	309							58	9		
42 Three Miles South of South Spit (Nearshore)		1045 <sup>b</sup>	444	258	70			5	14		
1.5 miles south of South Spit	1538							9			
South Spit (Mid Channel)	19	222	214	1223		1029		8 <sup>b</sup>	49		
Dago Creek Mouth	27	68	0		28 <sup>b</sup>	1332 <sup>b</sup>		19	128		18
Pilot Point	0	98 <sup>b</sup>	10 <sup>b</sup>	21 <sup>b</sup>	33 <sup>b</sup>	118 <sup>b</sup>	311				
Between Pilot Point and Muddy Point											
Outer South Channel	22 <sup>b</sup>	120	4		5				40		
Inner South Channel		54 <sup>b</sup>									
Above inner district boundary line west side	19		4								
Above inner district boundary line east side	18	15	137	18 <sup>b</sup>	275 <sup>b</sup>	212 <sup>b</sup>	1314	0			84
Below inner district boundary line east side				39							
Between Dog Salmon and King Salmon Rivers		62	81 <sup>b</sup>	144 <sup>b</sup>	672 <sup>b</sup>	77 <sup>b</sup>	970	185 <sup>b</sup>	180 <sup>b</sup>		14
Mouth of Dog Salmon River		112					345	202 <sup>b</sup>	80		9

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

<sup>b</sup> Average of two or more drifts.

**Table 9.** Summary of district sockeye salmon test fishing indices in the Nushagak District, by index area and date, 2000. <sup>a</sup>

Date	Hanson Point	Across Hanson Pt.	Tule Point	Sheep Island	Picnic Point	Grassy Island	Lower Grassy Is.	Nushagak Point	Queen's Slough	Pile Driver	Clark's Point	Ekuk Bluff	Upper W. Marker
6/21	235	173	0		0	0			0	0			0
	0	0	0		0	0			0	0			0
6/21	0	0	0		0	0			0	0			
	0	0	0		0	0				0			
6/23	0	0	414		0	0		0		0			0
	0	469	0			0		0		0			0
6/23	0	202	0										0
	0												
6/25	203	0	397		0	0		800		573			388
								465					198
6/26	3014	5272	3415		0	433				2,015			0
	3,468	3,358	1,124		0	0				5,366			
6/26	4,163									185			
	1,333												
6/27	0	0	2,913		15,577	10,518				18,505			
			1,556		16,757	19,059				16,607			
6/28			4,060		15,000	2,824				5,235			5,333
			3,721		14,872	14,054				15,897			6,667
6/29			16,667		17,838	32,621							
			17,476		18,608	65,757							
6/30		6,732	12,414		223	550							
		2,927			0								
7/1			3,303	1,810	0	0							
			3,939	5,481	580								
7/1			6,900	5,816									
			12,522										
7/2			538	282	271	0							
			7,403	1,690	0	0							
			6,342	934									
7/3													
7/4													
7/5			657	395	0	0							
7/6	811	446	0		0	0							
	949	251	201		0	0							
7/7	6,480	397											
		460											
7/8	4,426	3,000			260	0							
	4,098	2,353			0	804							
		2,878			566								
7/9	2,038	1,280			1,807	1,796							
	3,610												
7/10	3,321	369			0	0							
	2,129	408			219	0							
7/11	1,346	1,858			25,854	17,586							
		1,550											
7/12	2,966	325			1,098	21,094							
	2,441	5,619			40,714	20,000							
		7,598											

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

**Table 10.** Commercial Fishing Emergency Orders, by district and stat area Bristol Bay, 2000.

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Naknek/Kvichak District</u></b>						
Drift net						
AKN.01	June 01	9:00 a.m.	to	June 23	9:00 a.m.	weekly schedule <sup>b,c</sup>
AKN.31				July 03	1:30 p.m.	<sup>1</sup>
AKN.61				July 24	9:00 a.m.	weekly schedule <sup>n</sup>
Set net						
AKN.01	June 01	9:00 a.m.	to	June 23	9:00 a.m.	weekly schedule <sup>b,c</sup>
AKN.27	July 01	6:00 p.m.	to	July 02	7:00 p.m.	25-hours
AKN.30	July 02	7:00 p.m.	to	July 03	10:30 a.m.	15.5-hours
AKN.31				July 03	1:30 p.m.	<sup>1</sup>
AKN.61				July 24	9:00 a.m.	weekly schedule <sup>n</sup>
<b><u>Naknek Section</u></b>						
Drift net						
AKN.11	June 25	7:00 a.m.	to	June 25	3:00 p.m.	8-hours
AKN.13	June 25	8:00 p.m.	to	June 26	3:00 a.m.	7-hours
AKN.13	June 26	8:00 a.m.	to	June 26	3:00 p.m.	7-hours
AKN.14	June 26	3:00 p.m.	to	June 27	3:30 p.m.	24.5-hours
AKN.17	June 27	11:00 p.m.	to	June 28	5:30 a.m.	6.5-hours
AKN.17	June 28	10:00 a.m.	to	June 28	4:00 p.m.	6-hours
AKN.19	June 28	11:00 p.m.	to	June 29	7:00 a.m.	8-hours
AKN.19	June 29	10:00 a.m.	to	June 29	4:30 p.m.	6.5-hours
AKN.23	June 29	11:00 p.m.	to	June 30	8:00 a.m.	9-hours
AKN.23	June 30	11:00 a.m.	to	June 30	7:00 p.m.	8-hours
AKN.25	June 30	7:00 p.m.	to	June 30	8:00 p.m.	1-hours <sup>d</sup>
AKN.25	July 01	12:00 a.m.	to	July 01	9:00 a.m.	9-hours
AKN.25	July 01	11:00 a.m.	to	July 01	8:00 p.m.	9-hours
AKN.27	July 02	1:00 a.m.	to	July 02	9:30 a.m.	8.5-hours
AKN.27	July 02	12:00 p.m.	to	July 02	9:00 p.m.	9-hours
AKN.30	July 03	1:30 a.m.	to	July 03	10:30 a.m.	9-hours
Set net						
AKN.11	June 25	6:00 a.m.	to	June 25	3:00 p.m.	9-hours <sup>a</sup>
AKN.13	June 25	3:00 p.m.	to			
AKN.17				June 28	4:00 p.m.	
AKN.19	June 28	4:00 p.m.	to	June 29	4:30 p.m.	24.5-hours
AKN.23	June 29	4:30 p.m.	to	June 30	5:30 p.m.	25-hours
AKN.25	June 30	5:30 p.m.	to	July 01	6:00 p.m.	24.5-hours
<b><u>Kvichak Section</u></b>						
Set net						
AKN.25	July 01	11:00 a.m.	to	July 01	6:00 p.m.	7-hours
AKN.31	July 03	1:30 p.m.	to	July 04	11:00 a.m.	21.5-hours <sup>t</sup>
AKN.35	July 04	11:00 a.m.	to	July 05	12:00 p.m.	25-hours

-continued-  
44

**Table 10.** (page 2 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Naknek River Special Harvest Area</u></b>						
Drift net						
AKN.31	July 03	1:30 p.m.	to	July 03	10:00 p.m.	8.5-hours
AKN.31	July 04	3:00 a.m.	to	July 04	11:00 a.m.	8-hours
AKN.35	July 04	2:30 p.m.	to	July 04	11:00 p.m.	8.5-hours
AKN.35	July 05	4:00 a.m.	to	July 05	12:00 p.m.	8-hours
AKN.38	July 05	4:00 p.m.	to	July 05	10:00 p.m.	6-hours
AKN.42	July 06	6:00 p.m.	to	July 07	12:00 a.m.	6-hours
AKN.51	July 11	10:30 p.m.	to	July 12	5:00 a.m.	6.5-hours
AKN.52	July 12	5:00 a.m.	to	July 12	6:00 p.m.	13-hours
AKN.54	July 13	4:00 a.m.	to	July 13	9:00 a.m.	5-hours
AKN.55	July 13	3:00 p.m.	to	July 13	7:00 p.m.	4-hours
AKN.56	July 14	10:00 a.m.	to	July 14	7:00 p.m.	9-hours
AKN.59	July 14	7:00 p.m.	to	July 14	11:00 p.m.	4-hours <sup>d</sup>
AKN.59	July 15	10:00 a.m.	to	July 15	10:00 p.m.	12-hours
AKN.61	July 16	11:00 a.m.	to	July 16	11:00 p.m.	12-hours
AKN.61	July 17	9:00 a.m.	to	July 19	8:00a.m.	47-hours
<b><u>Naknek River Special Harvest Area</u></b>						
Set net						
AKN.44	July 07	7:00 p.m.	to	July 08	1:00 a.m.	6-hours
AKN.48	July 10	9:00 p.m.	to	July 11	4:00 p.m.	19-hours
AKN.54	July 12	10:30 p.m.	to	July 13	3:30 a.m.	5-hours
AKN.55	July 13	10:00 a.m.	to	July 13	2:30 p.m.	4.5-hours
AKN.56	July 14	12:00 a.m.	to	July 14	8:00 a.m.	8-hours
AKN.59	July 15	12:00 a.m.	to	July 15	9:30 a.m.	9.5-hours
AKN.61	July 16	12:00 a.m.	to	July 16	10:00 a.m.	10-hours
AKN.61	July 17	12:00 a.m.	to	July 17	8:00 a.m.	8-hours
AKN.61	July 19	9:00 a.m.	to	July 21	9:00 a.m.	48-hours
<b><u>Egegik District</u></b>						
Drift net						
AKN.02	June 01	9:00 a.m.	to	June 16	9:00 a.m.	weekly schedule
AKN.07	June 20	2:00 p.m.	to	June 20	10:00 p.m.	8-hours
AKN.08	June 21	3:00 p.m.	to	June 21	11:00 p.m.	8-hours
AKN.09	June 23	3:30 a.m.	to	June 23	11:30 a.m.	8-hours
AKN.10	June 25	5:00 a.m.	to	June 25	1:00 p.m.	8-hours
AKN.12	June 25	6:30 p.m.	to	June 26	12:00 a.m.	5.5-hours
AKN.12	June 26	5:30 a.m.	to	June 26	2:00 p.m.	8.5-hours

**Table 10.** (page 3 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Egegik District</u></b>						
Drift net						
AKN.15	June 26	7:00 p.m.	to	June 27	12:00 a.m.	5-hours
AKN.15	June 27	6:30 a.m.	to	June 27	2:30 p.m.	8-hours
AKN.18	June 28	6:30 a.m.	to	June 28	3:30 p.m.	9-hours
AKN.20	June 28	9:00 p.m.	to	June 29	4:00 a.m.	7-hours
AKN.20	June 29	8:00 a.m.	to	June 29	4:00 p.m.	8-hours
AKN.24	June 30	9:30 a.m.	to	June 30	5:30 p.m.	8-hours
AKN.28	July 02	12:30 p.m.	to	July 02	4:30 p.m.	4-hours
AKN.33	July 04	2:00 a.m.	to	July 04	6:30 a.m.	4.5-hours
AKN.34	July 04	1:30 p.m.	to	July 04	9:00 p.m.	7.5-hours
AKN.36	July 05	3:00 p.m.	to	July 05	10:30 p.m.	7.5-hours
AKN.40	July 06	12:30 p.m.	to			<sup>h</sup>
AKN.41	July 06	3:30 a.m.	to	July 06	8:30 a.m.	5-hours
AKN.41	July 06	4:00 p.m.	to	July 06	11:00 p.m.	7-hours
AKN.43	July 07	4:00 a.m.	to	July 07	9:00 a.m.	5-hours
AKN.43	July 07	5:00 p.m.	to	July 07	10:00 p.m.	5-hours
AKN.45	July 08	6:00 p.m.	to	July 08	11:00 p.m.	5-hours
AKN.46	July 10	6:30 a.m.	to	July 10	11:30 a.m.	5-hours
AKN.47	July 11	7:00 a.m.	to	July 11	12:00 p.m.	5-hours
AKN.49	July 12	7:30 a.m.	to	July 12	12:30 p.m.	5-hours
AKN.53	July 13	9:00 a.m.	to	July 13	2:00 p.m.	5-hours
AKN.57	July 14	9:30 a.m.	to	July 14	2:30 p.m.	5-hours
AKN.60	July 15	10:30 a.m.	to	July 15	3:30 p.m.	5-hours
AKN.62	July 15	11:30 p.m.	to	July 16	6:30 a.m.	7-hours
AKN.62	July 16	11:30 a.m.	to	July 16	5:30 p.m.	6-hours
AKN.62	July 17	12:00 a.m.	to	July 17	9:00 a.m.	9-hours
AKN.65	July 17	9:00 a.m.	to			<sup>b,l</sup>
Set net						
AKN.02	June 01	9:00 a.m.	to	June 16	9:00 a.m.	weekly schedule <sup>g</sup>
AKN.07	June 20	2:00 p.m.	to	June 20	10:00 p.m.	8-hours
AKN.08	June 21	3:00 p.m.	to	June 21	11:00 p.m.	8-hours
AKN.09	June 23	3:30 a.m.	to	June 23	11:30 a.m.	8-hours
AKN.10	June 25	5:00 a.m.	to	June 25	1:00 p.m.	8-hours
AKN.12	June 25	1:00 p.m.	to	June 26	2:00 p.m.	25-hours <sup>d</sup>
AKN.15	June 26	2:00 p.m.	to	June 27	2:30 p.m.	24.5-hours <sup>d</sup>
AKN.18	June 27	2:30 p.m.	to	June 28	3:30 p.m.	25-hours <sup>d,e</sup>

**Table 10.** (page 4 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Egegik District</u></b>						
set net						
AKN.20	June 28	3:30 p.m.	to	June 29	4:00 p.m.	24.5-hours <sup>d,e</sup>
AKN.24	June 29	4:00 p.m.	to			<sup>d,e</sup>
AKN.40	July 06	12:30 p.m.	to			<sup>h</sup>
AKN.45			to	July 08	1:00 p.m.	<sup>l</sup>
AKN.45	July 09	5:30 a.m.	to	July 09	3:30 p.m.	10-hours
AKN.47	July 10	8:00 p.m.	to	July 11	5:00 a.m.	9-hours
AKN.49	July 11	8:30 p.m.	to	July 12	5:30 a.m.	9-hours
AKN.65	July 17	9:00 a.m.	to			<sup>b,l</sup>
<b><u>Ugashik District</u></b>						
Drift net						
AKN.03	June 01	9:00 a.m.	to	June 23	9:00 a.m.	weekly schedule <sup>b,k</sup>
AKN.16	June 27	5:30 a.m.	to	June 27	1:30 p.m.	8-hours
AKN.22	June 29	7:30 a.m.	to	June 29	5:30 p.m.	10-hours
AKN.29	July 03	11:30 a.m.	to	July 03	9:30 p.m.	10-hours
AKN.32	July 04	12:30 p.m.	to	July 04	10:30 p.m.	10-hours
AKN.37	July 05	1:30 p.m.	to	July 05	8:30 p.m.	7-hours
AKN.63	July 17	9:00 a.m.	to	Sept 30	11:59 p.m.	<sup>q</sup>
AKN.64	July 16	10:30 a.m.	to	July 16	6:30 p.m.	8-hours
AKN.66	July 25	4:00 p.m.	to	July 25	9:00 p.m.	5-hours
AKN.67	July 27	6:00 a.m.	to	July 28	11:00 p.m.	41-hours
AKN.68	July 31	9:00 a.m.	to			weekly schedule <sup>b,k</sup>
Set net						
AKN.03	June 01	9:00 a.m.	to	June 23	9:00 a.m.	weekly schedule <sup>b,k</sup>
AKN.16	June 27	5:30 a.m.	to	June 28	5:30 a.m.	24-hours
AKN.21	June 28	7:00 p.m.	to	June 29	7:30 p.m.	24.5-hours
AKN.26	July 01	9:30 a.m.	to	July 02	10:30 p.m.	37-hours
AKN.29	July 03	11:30 a.m.	to	July 04	12:30 p.m.	25-hours
AKN.32	July 04	12:30 p.m.	to	July 06	2:30 p.m.	50-hours
AKN.39	July 06	2:30 p.m.	to			<sup>d</sup>
AKN.50	July 12	7:00 a.m.	to			<sup>l</sup>
AKN.63	July 17	9:00 a.m.	to	Sept. 30	11:59 p.m.	<sup>q</sup>
AKN.64	July 16	10:30 a.m.	to	July 17	11:30 a.m.	25-hours <sup>b,k</sup>
AKN.68	July 31	9:00 a.m.	to			weekly schedule

-Continued-

**Table 10.** (page 5 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Nushagak District</u></b>						
<b><u>Nushagak Section</u></b>						
Drift net						
DLG.13	June 28	10:30 p.m.	to	June 29	4:30 a.m.	6 hrs.
DLG.14	June 29	10:00 a.m.	to	June 29	10:00 p.m.	12 hrs. <sup>c</sup>
DLG.15	June 30	11:00 a.m.	to	July 1	12:00 a.m.	13 hrs. <sup>c</sup>
DLG.16	July 1	12:00 p.m.	to	July 1	8:00 p.m.	8 hrs. <sup>c,d</sup>
DLG.17	July 2	1:00 p.m.	to	July 2	9:00 p.m.	8 hrs. <sup>c</sup>
DLG.19	July 2	9:00 p.m.	to	July 3	6:00 p.m.	21 hrs. <sup>c,d</sup>
DLG.20	July 3	6:00 p.m.	to	July 4	7:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.22	July 5	4:00 a.m.	to	July 5	12:00 p.m.	8 hrs. <sup>c</sup>
DLG.23	July 6	8:00 a.m.	to	July 6	4:00 p.m.	8 hrs. <sup>c</sup>
DLG.24	July 7	9:00 a.m.	to	July 7	3:00 p.m.	6 hrs. <sup>c</sup>
DLG.25	July 8	9:30 p.m.	to	July 9	1:30 a.m.	4 hrs. <sup>c</sup>
DLG.32	July 12	11:00 p.m.	to	July 13	1:00 a.m.	2 hrs.
DLG.33	July 13	1:00 a.m.	to	July 13	10:30 p.m.	21.5 hrs. <sup>d</sup>
DLG.35	July 13	10:30 p.m.	to	July 14	12:00 p.m.	13.5 hrs. <sup>d</sup>
DLG.35	July 15	5:00 a.m.	to	July 15	5:00 p.m.	12 hrs.
DLG.35	July 16	5:00 a.m.	to	July 16	5:00 p.m.	12 hrs.
DLG.35	July 17	6:00 a.m.	to			<sup>e</sup>
DLG.48	July 27	12:00 a.m.	to			<sup>l</sup>
DLG.49	July 31	12:30 p.m.	to	August 2	9:00 a.m.	44.5 hrs. <sup>p</sup>
DLG.51	August 2	9:00 a.m.	to	August 4	10:30 a.m.	49.5 hrs. <sup>p,d</sup>
DLG.53	August 4	10:30 a.m.	to	August 11	5:00 p.m.	174.5 hrs. <sup>p,d</sup>
DLG.54	August 11	5:00 p.m.	to	August 14	7:00 p.m.	98 hrs. <sup>p,d</sup>
DLG.55	August 15	7:00 p.m.	to	August 18	9:30 p.m.	74.5 hrs. <sup>p,d</sup>
DLG.58	August 18	9:30 p.m.	to	August 22	11:59 p.m.	98.5 hrs. <sup>p,d</sup>
DLG.59	August 21	12:00 noon	to			<sup>l</sup>
Set net						
DLG.13	June 28	10:30 p.m.	to	June 29	4:30 a.m.	6 hrs.
DLG.14	June 29	10:00 a.m.	to	June 29	5:30 a.m.	19.5 hrs. <sup>c</sup>
DLG.15	June 30	11:00 a.m.	to	July 1	6:30 a.m.	19.5 hrs. <sup>c</sup>
DLG.16	July 1	6:30 a.m.	to	July 2	7:30 a.m.	25 hrs. <sup>c,d</sup>
DLG.17	July 2	7:30 a.m.	to	July 3	8:30 a.m.	25 hrs. <sup>c,d</sup>
DLG.19	July 2	8:30 a.m.	to	July 4	9:30 a.m.	25 hrs. <sup>c,d</sup>
DLG.20	July 3	9:30 a.m.	to	July 4	9:30 p.m.	12 hrs. <sup>c,d</sup>
DLG.22	July 5	9:30 p.m.	to	July 5	10:30 p.m.	25 hrs. <sup>c,d</sup>

-Continued-

**Table 10.** (page 6 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Nushagak Section</u></b>						
Set net						
DLG.23	July 6	10:30 p.m.	to	July 6	11:30 p.m.	25 hrs. <sup>c,d</sup>
DLG.24	July 7	11:30 p.m.	to	July 8	12:30 a.m.	25 hrs. <sup>c,d</sup>
DLG.25	July 8	7:30 p.m.	to	July 9	8:30 p.m.	25 hrs. <sup>c</sup>
DLG.27	July 9	8:30 p.m.	to	July 10	9:30 p.m.	25 hrs. <sup>d</sup>
DLG.31	July 12	10:00 a.m.	to	July 12	5:00 p.m.	7 hrs.
DLG.32	July 13	11:00 p.m.	to	July 13	6:00 a.m.	7 hrs.
DLG.33	July 13	6:00 a.m.	to	July 14	7:00 a.m.	25 hrs. <sup>d</sup>
DLG.35	July 14	7:00 a.m.	to			<sup>e,d</sup>
DLG.48	July 27	12:00 a.m.	to			<sup>l</sup>
DLG.49	July 31	12:30 p.m.	to	August 2	9:00 a.m.	44.5 <sup>p</sup>
DLG.51	August 2	9:00 a.m.	to	August 4	10:30 a.m.	49.5 <sup>p,d</sup>
DLG.53	August 8	10:30 a.m.	to	August 11	5:00 p.m.	174.5 <sup>p,d</sup>
DLG.54	August 11	5:00 p.m.	to	August 15	7:00 p.m.	98 hrs. <sup>p,d</sup>
DLG.55	August 15	7:00 p.m.	to	August 18	9:30 p.m.	74.5 hrs. <sup>p,d</sup>
DLG.58	August 18	9:30 p.m.	to	August 22	11:59 p.m.	98.5 hrs. <sup>p,d</sup>
DLG.59	August 21	12:00 noon				<sup>l</sup>
<b><u>Igushik Section</u></b>						
Drift net						
DLG.04	June 21	5:00 a.m.	to	June 21	5:00 p.m.	12 hrs.
DLG.07	June 26	7:00 a.m.	to	June 26	7:00 p.m.	12 hrs.
DLG.08	June 27	8:00 a.m.	to	June 27	8:00 p.m.	12 hrs. <sup>c</sup>
DLG.10	June 28	9:30 a.m.	to	June 28	9:30 p.m.	12 hrs. <sup>c</sup>
DLG.12	June 28	9:30 p.m.	to	June 29	10:30 p.m.	25 hrs. <sup>c,d</sup>
DLG.18	July 1	8:00 p.m.	to	July 2	9:00 p.m.	25 hrs.
DLG.19	July 2	9:00 p.m.	to	July 3	10:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.20	July 3	10:00 p.m.	to	July 4	11:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.22	July 4	11:00 p.m.	to	July 6	12:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.23	July 6	12:00 a.m.	to	July 7	1:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.24	July 7	1:00 a.m.	to	July 8	2:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.25	July 8	2:00 a.m.	to	July 9	3:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.26	July 9	3:00 a.m.	to	July 10	4:00 a.m.	25 hrs. <sup>d</sup>
DLG.27	July 10	4:00 a.m.	to	July 11	5:00 a.m.	25 hrs. <sup>d</sup>
DLG.28	July 11	5:00 a.m.	to	July 12	6:00 a.m.	25 hrs. <sup>d</sup>
DLG.30	July 12	6:00 a.m.	to	July 12	7:00 a.m.	25 hrs. <sup>d</sup>
DLG.32	July 12	7:00 a.m.	to	July 14	8:00 a.m.	25 hrs. <sup>d</sup>

**Table 10.** (page 7 of 10)

Number <sup>a</sup>	Start Date	Start Time	End Date	End Time	Effective time
<b><u>Igushik Section</u></b>					
Drift net					
DLG.35	July 14	8:00 a.m.	to		e,d
DLG.48	July 27	12:00 a.m.	to		l
DLG.49	July 31	12:30 p.m.	to	August 2 9:00 a.m.	44.5 <sup>p</sup>
DLG.51	August 2	9:00 a.m.	to	August 4 10:30 a.m.	49.5 <sup>p,d</sup>
DLG.53	August 4	10:30 a.m.	to	August 11 5:00 p.m.	174.5 <sup>p,d</sup>
DLG.54	August 11	5:00 p.m.	to	August 15 7:00 p.m.	98 hrs. <sup>p,d</sup>
DLG.55	August 15	7:00 p.m.	to	August 18 9:30 p.m.	74.5 hrs. <sup>p,d</sup>
DLG.58	August 18	9:30 p.m.	to	August 22 11:59 p.m.	98.5 hrs. <sup>p,d</sup>
DLG.59	August 21	12:00 noon	to		l
Set net					
DLG.04	June 21	5:00 a.m.	to	June 21 5:00 p.m.	12 hrs.
DLG.07	June 26	7:00 a.m.	to	June 26 7:00 p.m.	12 hrs.
DLG.08	June 26	7:00 p.m.	to	June 27 9:00 p.m.	26 hrs. <sup>c,d</sup>
DLG.10	June 27	9:00 a.m.	to	June 28 10:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.12	June 28	10:00 p.m.	to	June 29 11:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.16	July 1	1:00 a.m.	to	July 1 1:00 p.m.	12 hrs. <sup>c</sup>
DLG.17	July 1	1:00 p.m.	to	July 2 1:00 a.m.	12 hrs. <sup>c,d</sup>
DLG.18	July 2	1:00 a.m.	to	July 3 2:00 a.m.	25 hrs. <sup>d</sup>
DLG.19	July 3	2:00 a.m.	to	July 4 3:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.20	July 4	3:00 a.m.	to	July 5 4:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.22	July 5	4:00 a.m.	to	July 6 5:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.23	July 6	5:00 a.m.	to	July 7 6:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.24	July 7	6:00 a.m.	to	July 8 7:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.25	July 8	7:00 a.m.	to	July 9 8:00 a.m.	25 hrs. <sup>c,d</sup>
DLG.26	July 9	8:00 a.m.	to	July 10 9:00 a.m.	25 hrs. <sup>d</sup>
DLG.27	July 10	9:00 a.m.	to	July 11 10:00 a.m.	25 hrs. <sup>d</sup>
DLG.28	July 11	10:00 a.m.	to	July 12 11:00 a.m.	25 hrs. <sup>d</sup>
DLG.30	July 12	11:00 a.m.	to	July 13 12:00 p.m.	25 hrs. <sup>d</sup>
DLG.32	July 13	12:00 p.m.	to	July 14 1:00 p.m.	25 hrs. <sup>d</sup>
DLG.35	July 14	1:00 p.m.	to		e,d
DLG.48	July 27	12:00 a.m.	to		l
DLG.49	July 31	12:30 p.m.	to	August 2 9:00 a.m.	44.5 <sup>p</sup>
DLG.51	August 2	9:00 a.m.	to	August 4 10:30 a.m.	49.5 <sup>p,d</sup>

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**Table 10.** (page 8 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Igushik Section</u></b>						
Set net						
DLG.53	August 4	10:30 a.m.	to	August 11	5:00 p.m.	174.5 <sup>p,d</sup>
DLG.54	August 11	5:00 p.m.	to	August 15	7:00 p.m.	98 hrs. <sup>p,d</sup>
DLG.55	August 15	7:00 p.m.	to	August 18	9:30 p.m.	74.5 hrs. <sup>p,d</sup>
DLG.58	August 18	9:30 p.m.	to	August 22	11:59 p.m.	98.5 hrs. <sup>p,d</sup>
DLG.59	August 21	12:00 noon	to			1
<b><u>Wood River Special Harvest Area</u></b>						
Drift net						
DLG.08	June 26	6:00 p.m.		June 27	6:00 a.m.	12 hrs.
DLG.10	June 26	3:00 p.m.	to	June 28	3:00 a.m.	12 hrs. <sup>c</sup>
DLG.10	June 27	7:00 a.m.	to	June 28	7:00 p.m.	12 hrs. <sup>c</sup>
DLG.12	June 28	7:00 p.m.	to	June 29	4:00 a.m.	9 hrs. <sup>c,d</sup>
DLG.12	June 29	8:00 a.m.	to	June 29	8:00 p.m.	12 hrs. <sup>c</sup>
DLG.14	June 29	8:00 p.m.	to	June 30	5:00 a.m.	9 hrs. <sup>c,d</sup>
DLG.14	June 30	9:00 a.m.	to	June 30	9:00 p.m.	12 hrs. <sup>c</sup>
DLG.15	June 30	9:00 p.m.	to	July 1	6:00 a.m.	9 hrs. <sup>c,d</sup>
DLG.15	July 1	10:00 a.m.	to	July 1	10:00 p.m.	12 hrs. <sup>c</sup>
DLG.17	July 1	10:00 p.m.	to	July 2	7:00 a.m.	9 hrs. <sup>c,d</sup>
DLG.17	July 2	11:00 a.m.	to	July 2	11:00 p.m.	12 hrs. <sup>c</sup>
DLG.19	July 3	11:00 a.m.	to	July 4	12:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.20	July 4	12:00 p.m.	to	July 5	1:00 a.m.	13 hrs. <sup>c,d</sup>
DLG.22	July 5	1:00 a.m.	to	July 5	3:00 p.m.	14 hrs. <sup>c,d</sup>
DLG.34	July 13	12:00 p.m.	to	July 14	12:00 a.m.	12 hrs.
DLG.35	July 14	12:00 a.m.	to	July 15	12:00 a.m.	24 hrs. <sup>d</sup>
DLG.37	July 15	12:00 a.m.	to	July 16	12:00 a.m.	24 hrs. <sup>d</sup>
DLG.38	July 16	12:00 a.m.	to	July 17	1:00 a.m.	25 hrs. <sup>d</sup>
DLG.39	July 17	1:00 a.m.	to	July 18	2:00 a.m.	25 hrs. <sup>d</sup>
DLG.41	July 18	2:00 a.m.	to	July 19	3:00 a.m.	25 hrs. <sup>d</sup>
DLG.42	July 19	3:00 a.m.	to	July 20	3:00 a.m.	25 hrs. <sup>d</sup>
DLG.44	July 20	3:00 a.m.	to	July 21	12:00 a.m.	21 hrs. <sup>d</sup>

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**Table 10.** (page 9 of 10)

Number <sup>a</sup>	Start Date	Start Time		End Date	End Time	Effective time
<b><u>Wood River Special Harvest Area</u></b>						
Set net						
DLG.08	June 26	6:00 p.m.	to	June 27	6:00 a.m.	12 hrs.
DLG.10	June 27	3:00 p.m.	to	June 28	3:00 a.m.	12 hrs. <sup>c</sup>
DLG.10	June 28	7:00 a.m.	to	June 28	7:00 p.m.	12 hrs. <sup>c</sup>
DLG.12	June 28	7:00 p.m.	to	June 29	8:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.14	June 29	8:00 p.m.	to	June 30	9:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.15	June 30	9:00 p.m.	to	July 1	10:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.17	July 1	10:00 p.m.	to	July 2	11:00 p.m.	25 hrs. <sup>c,d</sup>
DLG.19	July 3	11:00 a.m.	to	July 4	12:00 p.m.	25 hrs. <sup>c</sup>
DLG.20	July 4	12:00 p.m.	to	July 5	1:00 a.m.	13 hrs. <sup>c,d</sup>
DLG.22	July 5	1:00 a.m.	to	July 5	3:00 p.m.	14 hrs. <sup>c,d</sup>
DLG.34	July 13	1:00 p.m.	to	July 13	9:00 p.m.	8 hrs.
DLG.35	July 13	9:00 p.m.	to	July 14	9:00 p.m.	24 hrs. <sup>d</sup>
DLG.37	July 14	9:00 p.m.	to	July 15	9:00 p.m.	24 hrs. <sup>d</sup>
DLG.38	July 15	9:00 p.m.	to	July 16	9:00 p.m.	24 hrs. <sup>d</sup>
DLG.39	July 16	9:00 p.m.	to	July 17	9:00 p.m.	24 hrs. <sup>d</sup>
DLG.41	July 17	9:00 p.m.	to	July 19	3:00 p.m.	30 hrs. <sup>d</sup>
DLG.42	July 19	3:00 a.m.	to	July 20	3:00 a.m.	25 hrs. <sup>d</sup>
DLG.44	July 20	3:00 a.m.	to	July 21	12:00 a.m.	21 hrs. <sup>d</sup>
<b><u>Togiak District</u></b>						
Drift and Set						
DLG.02	June 21	9:00 a.m.	to	June 23	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.06	June 26	9:00 a.m.	to	June 28	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.21	July 5	9:00 a.m.	to	July 6	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.29	July 10	9:00 a.m.	to	July 12	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.36	July 15	9:00 p.m.	to	July 17	9:00 a.m.	weekly schedule <sup>n</sup>
DLG.40	July 17	9:00 a.m.	to	July 19	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.42	July 21	9:00 a.m.	to	July 23	9:00 a.m.	weekly schedule <sup>n,o</sup>
DLG.46	July 21	9:00 a.m.	to	July 26	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.47	July 28	9:00 a.m.	to	July 31	9:00 a.m.	weekly schedule <sup>n</sup>
DLG.50	July 31	9:00 a.m.	to	August 2	9:00 a.m.	weekly schedule <sup>m</sup>
DLG.52	August 4	9:00 a.m.	to	August 6	9:00 a.m.	weekly schedule <sup>n</sup>
DLG.57	August 15	11:59 p.m.	to			<sup>1</sup>

-Continued-

**Table 10.** (page 10 of 10)

Number <sup>a</sup>	Start Date	Start Time	End Date	End Time	Effective time
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<sup>a</sup> Prefix code on emergency orders indicate where announcement originated. ("AKN" for King Salmon field office and "DLG" for Dillingham field office.)

<sup>b</sup> Weekly schedule: 9:00 a.m. Monday until 9:00 a.m. Friday.

<sup>c</sup> Restricts mesh size to five and one-half inches or less through July 17.

<sup>d</sup> Extends current fishing period.

<sup>e</sup> Opens commercial fishing until further notice.

<sup>f</sup> Reduces set gillnets to 25-fathoms in length.

<sup>g</sup> 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.

<sup>h</sup> Moves the Egegik outside boundary to the 110 line.

<sup>i</sup> Moves Egegik outside boundary to the 135.

<sup>j</sup> Restrict mesh size to seven and one-half inches or larger.

<sup>k</sup> This emergency order supersedes and rescinds a previous emergency order.

<sup>l</sup> Closes commercial fishing until further notice.

<sup>m</sup> Reduces the weekly fishing schedule in specific sections of the District.

<sup>n</sup> Closes the Naknek/Kvichak District until 9:00 a.m., July 24.

<sup>o</sup> Waives the district transfer restrictions as described in regulation 5 AAC 06.370 (k) (2).

<sup>p</sup> Restricts mesh size to five and three-eighths inches or larger for conservation of pink salmon.

<sup>q</sup> Extends the emergency order period.

<sup>r</sup> Extends the weekly fishing schedule in specific sections of the district.

**Table 11.** Daily district registration of drift gillnet permit holders by district, 2000.

Date	Nakek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total <sup>a</sup>
6/19	200	96	72	37	14	419
6/20	339	202	84	37	14	676
6/21	407	202	94	52	14	769
6/22	384	439	37	160	24	1044
6/23	379	553	15	182	25	1154
6/24	387	674	12	204	28	1305
6/25	481	718	12	235	29	1475
6/26	513	738	13	293	29	1586
6/27	506	688	32	339	29	1594
6/28	506	675	50	366	34	1631
6/29	488	671	95	403	34	1691
6/30	491	641	106	427	34	1699
7/01	490	614	137	440	34	1715
7/02	484	577	151	455	34	1701
7/03	445	547	171	476	33	1672
7/04	371	511	190	495	33	1600
7/05	346	502	223	539	33	1643
7/06	341	483	304	555	35	1718
7/07	343	459	342	556	35	1735
7/08	342	384	375	555	39	1695
7/09	350	349	403	569	39	1710
7/10	348	334	429	589	39	1739
7/11	348	329	437	593	41	1748
7/12 <sup>b</sup>						
7/13	364	342	393	598	41	1738
7/14	382	363	391	584	41	1761
7/15	387	340	399	565	41	1732
7/16	397	310	403	547	41	1698
Average	401	472	199	402	32	1505

<sup>a</sup> Number of drift gillnet permit holders registered to fish in Bristol Bay districts by day. 1,890 drift permits were active in 2000.

<sup>b</sup> Numbers not available for 7/12.

**Table 12.** Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, 2000.

Date	Time (hours)	Sockeye	Chinook	Chum	Pink	Coho	Total
6/09	9	16	0	0	0	0	16
6/12	15	2	0	0	0	0	2
6/13	24	244	4	0	0	0	248
6/14	24	4,223	2	0	0	0	4,225
6/15	24	4,477	11	4	0	0	4,492
6/16	9	10,222	0	1	0	0	10,223
6/19	15	172,790	29	1,964	0	0	174,783
6/20	24	69,418	80	514	0	0	70,012
6/21	24	65,574	67	785	0	0	66,426
6/22	24	143,576	14	733	0	0	144,323
6/23	9	169,694	5	822	0	0	170,521
6/24 <sup>a</sup>		917	1	0	0	0	918
6/25 <sup>b,c</sup>	18	334,773	17	1,750	0	0	336,540
6/26 <sup>b,c</sup>	24	245,704	24	1,254	0	0	246,982
6/27 <sup>b,c</sup>	24	195,020	40	993	0	0	196,053
6/28 <sup>b,c</sup>	24	288,868	33	1,320	0	0	290,221
6/29 <sup>a,b,c</sup>	24	466,291	17	2,150	0	0	468,458
6/30 <sup>a,b,c</sup>	24	628,371	37	2,080	0	0	630,488
7/01 <sup>a,b,c,d</sup>	24	336,089	39	1,645	0	0	337,773
7/02 <sup>a,c,d</sup>	24	303,603	68	1,936	0	0	305,607
7/03 <sup>a,c,d,e</sup>	21	170,603	54	823	0	0	171,480
7/04 <sup>e,f</sup>	24	36,663	23	465	0	0	37,151
7/05 <sup>a,e,i</sup>	18	247,202	25	963	0	0	248,190
7/06 <sup>i</sup>	6	183,245	15	478	0	0	183,738
7/07 <sup>g</sup>	5	17,928	6	155	0	0	18,089
7/08 <sup>g</sup>	1	8,045	5	0	0	0	8,050
7/09 <sup>a</sup>		3,023	0	0	0	0	3,023
7/10 <sup>a,g</sup>	3	6,900	0	23	0	0	6,923
7/11 <sup>a,i,g</sup>	17.5	81,116	76	548	0	0	81,740
7/12 <sup>a,i,g</sup>	19.5	173,055	18	905	0	0	173,978
7/13 <sup>a,i,g</sup>	17	93,345	27	928	1	0	94,301
7/14 <sup>i,g</sup>	19	65,753	10	823	2	0	66,588
7/15 <sup>a,i,g</sup>	21.5	52,605	18	632	0	0	53,255
7/16 <sup>i,g</sup>	22	35,129	23	582	1	0	35,735
7/17 <sup>i,g</sup>	23	20,787	23	388	0	0	21,198
7/18 <sup>i</sup>	24	7,244	16	232	6	0	7,498
7/19 <sup>i,g</sup>	23	3,437	27	93	13	3	3,573
7/20 <sup>g</sup>	24	2,486	66	69	13	5	2,639
7/21 <sup>g</sup>	9	508	24	23	23	4	582
7/24	15	48,890	17	26,494	3,899	100	79,400
7/25	24	23,253	33	13,704	5,836	337	43,163
7/26	24	2,807	17	1,051	3,190	88	7,153
7/27	24	2,580	12	782	5,330	317	9,021
7/28	9	576	4	106	1,345	35	2,066
8/21	15	0	0	0	0	16	16
8/22	24	0	0	0	0	24	24
8/23	24	0	0	0	0	13	13
8/24	24	0	0	0	0	3	3
8/28	15	2	0	0	0	2	4
9/12	24	2	0	0	0	3	5
9/13	24	3	0	0	0	1	4
9/14	24	2	0	0	0	1	3
<b>Total</b>		<b>4,727,061</b>	<b>1,027</b>	<b>68,218</b>	<b>19,659</b>	<b>952</b>	<b>4,816,917</b>
<b>% of District Catch</b>		<b>98.1</b>	<b>0.0</b>	<b>1.4</b>	<b>0.4</b>	<b>0.0</b>	<b>100</b>

<sup>a</sup> District test fish and cost recovery.

<sup>u</sup> Naknek section set net.

<sup>c</sup> Naknek section drift net

<sup>a</sup> Naknek/Kvichak set net

<sup>e</sup> Kvichak section set net.

<sup>i</sup> Naknek River Special Harvest Area; drift net.

<sup>g</sup> Naknek River Special Harvest Area; set net.

**Table 13.** Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2000.

Date	Hours <sup>b</sup>	Effort <sup>a</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/01	15								
6/02	9								
6/05	15								
6/06	24								
6/07	9								
6/08	15								
6/09	9								
6/12	15	1	4	264	7				271
6/13	24	2	11	376	58				434
6/14	9	2	6	486	19				505
6/15	15	8	10	2,632	28				2,660
6/16	9	11	6	4,718	67				4,785
6/18 <sup>e</sup>		1		99					
6/19 <sup>e</sup>		1		142					
6/20	8	223	113	275,269	64	3,239			278,572
6/21	8	352	109	177,810	114	2,473			180,397
6/22 <sup>e</sup>		1		3,206					
6/23	8	513	96	206,531	52	1,501			208,084
6/25	13.5/19	685	176	939,178	79	3,824			943,081
6/26	12.5/24	674	161	418,747	45	2,433			421,225
6/27	8/24	690	157	374,718	43	1,884			376,645
6/28	12/24	668	120	735,279	49	3,225			738,553
6/29	12/24	668	170	915,167	40	3,982			919,189
6/30	8/24	593	164	415,609	129	2,140			417,878
7/01 <sup>c</sup>	24	1	156	22,085	33	277			22,395
7/02	4/24	513	152	131,936	41	710			132,687
7/03 <sup>c</sup>	24	1	169	114,939	50	878			115,867
7/04	12/24	490	174	788,359	33	2,354			790,746
7/05	7.5/24	443	151	349,014	23	1,665			350,702
7/06	12/24	477	168	205,564	28	1,655			207,247
7/07	10/24	413	158	95,416	13	1,161			96,590
7/08	5/13	333	100	48,753	8	530			49,291
7/09 <sup>c</sup>	10	2	114	4,673	8	108			4,789
7/10	5/4	290	60	228,715	1	914			229,630
7/11	5/8.5	295	161	262,716	9	2,828			265,553
7/12	5/5.5	280	147	116,102	10	976			117,088
7/13 <sup>d</sup>	5	289		48,508	1	22			48,531
7/14 <sup>d</sup>	5	289		39,860	2	23			39,885
7/15 <sup>d</sup>	5	219		29,140		7			29,147
7/16 <sup>d</sup>	12.5	139		27,096	2	9			27,107
7/17	24/15	73	65	15,006	1				15,007
7/18	24	68	81	19,359					19,359
7/19	24	70	74	14,927	3				14,930
7/20	24	55	52	8,387		4			8,391
7/21	9	14	17	1,621		1			1,622

(Continued)

Table 13. (Page 2 of 2)

Date	Hours <sup>b</sup>	Effort <sup>a</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/24	15	19	26	3,086					3,086
7/25	24	10	25	1,870				82	1,952
7/26	24	6	15	843				53	896
7/27	24	4	7	530		6		37	573
7/28	9	1	5	137				12	149
7/31	15	6	11	527		2		271	800
8/01	24	2	11	485	1	2	6	470	964
8/02	24	1	6	82		1	1	86	170
8/03	24	2	4	106				117	223
8/04 <sup>f</sup>	9	1	1						
8/07	15	6	8	160		1	2	1,052	1,215
8/08	24	5	10	136		7	3	961	1,107
8/09	24	5	11	78		3		863	944
8/10	24	6	9	69		4	7	948	1,028
8/11 <sup>f</sup>	9		2						
8/14	15	5	9	55		3	2	1,229	1,289
8/15	24	2	11	77			2	1,079	1,158
8/16	24	5	9	126		4	5	871	1,006
8/17	24	4	6	15		1		959	975
8/18 <sup>f</sup>	9		1						
8/21	15	4	9	10				1,252	1,262
8/22	24	4	7					548	548
8/23	24	5	8	12				849	861
8/24	24	4	7	17				923	940
8/25 <sup>f</sup>	9		1						
8/28 <sup>f</sup>	15	1							
8/29	24								
8/30	24								
8/31	24								
9/01	9								
Total		9,955	3,521	7,050,899	1,061	38,857	32	13,166	7,104,015
% of District Catch				99	0	1	0	0	100

<sup>a</sup> Permits fished.

<sup>b</sup> First number is drift gillnet hours fished , second number is set gillnet hours fished.

<sup>c</sup> Set gillnets only.

<sup>d</sup> Drift gillnets only.

<sup>e</sup> Test fishing.

<sup>f</sup> Three or less permits fished, records are confidential.

**Table 14.** Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2000.

Date	Hours	Effort <sup>a</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
6/01	15								
6/02	9								
6/05	15								
6/06	24								
6/07	24								
6/08	24								
6/09	9								
6/12	15	7		279	47				326
6/13	24	6		67	48	1			116
6/14	24	24		3,408	104	61	2		3,575
6/15	24	22		2,244	194	35			2,473
6/16	9	17		812	92	6			910
6/19	15	65	1	17,342	157	1,510			19,009
6/20	24	68	1	28,481	33	1,869			30,383
6/21	24	67		18,562	49	1,500			20,111
6/22	24	29	1	9,430	16	1,350			10,796
6/23	9	4		926					926
6/25 <sup>b</sup>		1							
6/26 <sup>b</sup>		1							
6/27	8/18.5	30	18	43,525	21	1,076			44,622
6/28 <sup>b,c</sup>	10.5	1	15	7,735	2	7			7,744
6/29	10/19.5	101	24	226,561	2	5,870			232,433
6/30 <sup>b</sup>		10		15,719					15,719
7/01 <sup>b,c</sup>	14.5	1	37	9,305	19				9,324
7/02 <sup>b,c</sup>	22.5	1	43	14,891	37	12			14,940
7/03	10/12.5	175	17	302,957	5	7,169			310,131
7/04	10/24	189	35	169,812	12	4,934			174,758
7/05	7/24	298	38	232,802	10	4,097			236,909
7/06 <sup>b,c</sup>	24.0	2	37	12,264	7	40			12,311
7/07 <sup>b,c</sup>	24.0	1	34	8,097	12	19			8,128
7/08 <sup>b,c</sup>	24.0	1	36	8,574	5	24			8,603
7/09 <sup>b,c</sup>	24.0	1	33	11,324	4	12			11,340
7/10 <sup>b,c</sup>	24.0	2	41	16,748	2	21			16,771
7/11 <sup>b,c</sup>	24.0	2	43	15,361	6	6	1		15,374
7/12 <sup>b,c</sup>	7.0	2	39	8,013		26			8,039
7/13 <sup>b</sup>		1							
7/14 <sup>b</sup>		1							
7/15 <sup>b</sup>		1							
7/16	8/13.5	397	46	331,688	5	6,376			338,069
7/17 <sup>b,c</sup>	11.5	1	40	11,243					11,243
7/18 <sup>b,e</sup>		1							
7/19 <sup>b</sup>		1							
7/25 <sup>d</sup>	5	32		1,709		64		2	1,775
7/27 <sup>d</sup>	18	9		736		46		8	790

(Continued)

Table 14. (Page 2 of 2)

Date	Hours	Effort <sup>a</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
7/28 <sup>d</sup>	23	10		1,794	3	46		14	1,857
7/31	15	3	4	391		32		59	482
8/01	24	4	2	331				43	374
8/02	24								
8/03	24								
8/04	9								
8/07	15								
8/08	24								
8/09	24								
8/10	24	6		298		38		854	1,190
8/11	9								
8/14 <sup>e</sup>	15	1							
8/15 <sup>e</sup>	24	1							
8/16	24								
8/17	24								
8/18	9								
<b>Total</b>		<b>1,597</b>	<b>587</b>	<b>1,538,790</b>	<b>893</b>	<b>36,349</b>	<b>4</b>	<b>1,269</b>	<b>1,577,305</b>
<b>% of District Catch</b>				<b>98</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>100</b>

<sup>a</sup> Permits fished.

<sup>b</sup> Test Fishing.

<sup>c</sup> Set gillnet fishing only.

<sup>d</sup> Drift gillnet fishing only.

<sup>e</sup> Three or less permits fished, records are confidential.

**Table 15.** Commercial salmon fishing time, effort and harvest by date, Nushagak District, 2000.

Date	Time (hrs)				Effort <sup>c</sup>		Harvest <sup>d</sup>					Total
	District <sup>a</sup>	Nushagak <sup>b</sup>	Igushik <sup>b</sup>	WRSHA <sup>b</sup>	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	
6/21			12.0		66	2	9,942	538	1,686			12,166
6/26			17.0	6.0	285	86	195,292	512	2,933			198,737
6/27			24.0	15.0	290	121	166,775	808	2,279			169,862
6/28	1.5	1.5	24.0	20.0	334	159	464,415	331	3,633			468,379
6/29	16.5	18.5	23.0	12.0	402	257	966,693	3,741	19,026	2		989,462
6/30	13.0	18.5		12.0	298	218	505,979	857	10,038			516,874
7/01	8.0	24.0	23.0	24.0	391	238	706,577	549	10,022	7		717,155
7/02	11.0	24.0	24.0	23.0	375	242	587,420	443	9,982	3		597,848
7/03	24.0	24.0	24.0	13.0	472	189	351,162	648	8,935	6		360,751
7/04	19.0	24.0	24.0	24.0	468	212	144,642	518	4,157	1	1	149,319
7/05	8.0	24.0	24.0	15.0	460	214	256,275	271	5,551	7		262,104
7/06	8.0	24.0	24.0		527	195	431,153	400	5,273	10		436,836
7/07	6.0	24.0	24.0		534	238	364,631	356	5,267	2		370,256
7/08	2.5	5.0	24.0		149	175	73,543	136	1,089	7		74,775
7/09	1.5	24.0	24.0		494	230	189,132	560	3,436	25	4	193,157
7/10		21.5	24.0		148	227	73,068	410	1,237	36		74,751
7/11			24.0		186	55	45,975	20	746		1	46,742
7/12	1.0	8.0	24.0		247	229	187,305	159	2,900	24	32	190,420
7/13	24.0	24.0	24.0	12.0	528	277	321,079	419	6,972	177	2,574	331,221
7/14	12.0	24.0	24.0	24.0	424	203	172,569	99	3,130	207	517	176,522
7/15	12.0	24.0	24.0	24.0	241	154	69,570	37	1,190	129	924	71,850
7/16	12.0	24.0	24.0	24.0	201	137	27,267	27	973	149	928	29,344
7/17	18.0	24.0	24.0	24.0	82	115	19,358	15	674	269	1,022	21,338
7/18	24.0	24.0	24.0	24.0	63	111	14,638	14	658	1,647	782	17,739
7/19	24.0	24.0	24.0	24.0	34	79	8,788	19	591	2,937	2,689	15,024
7/20	24.0	24.0	24.0	24.0	23	59	4,728	10	257	3,502	5,091	13,588
7/21	24.0	24.0	24.0		8	15	2,911	78	1,013	3,488	2,385	9,875
7/22	24.0	24.0	24.0		4	9	1,276	5	83	3,670	867	5,901
7/23	24.0	24.0	24.0		1	13	1,932	44	45	6,543	1,196	9,760
7/24	24.0	24.0	24.0		3	11	1,051	2	101	4,243	749	6,146
7/25	24.0	24.0	24.0		1	14	1,128	17	28	3,327	598	5,098
7/26	24.0	24.0	24.0		6	0	281		58	2,083	34	2,456
7/31	11.5	11.5	11.5		20	6	93		486	1,166	5,043	6,788
8/01	24.0	24.0	24.0		24	9	192			2,149	8,111	10,452
8/02	24.0	24.0	24.0		12	3	18	1	2	530	6,065	6,616
8/03	24.0	24.0	24.0		18	0	3			212	8,942	9,157
8/04	24.0	24.0	24.0		16	0	5	1	1	248	2,843	3,098
8/05	24.0	24.0	24.0		13	0	2			176	958	1,136
8/06	24.0	24.0	24.0		4	3	75			610	304	989
8/07	24.0	24.0	24.0		7	3	22			254	3,091	3,367
8/08	24.0	24.0	24.0		24	4	42	4	1	223	12,545	12,815
8/09	24.0	24.0	24.0		13	3	18		1	19	1,185	1,223
8/10	24.0	24.0	24.0		14	5	29			18	2,699	2,746
8/11	24.0	24.0	24.0		13	6	38			23	3,485	3,546
8/13	24.0	24.0	24.0		8	4					5,018	5,018
8/14	24.0	24.0	24.0		12	6	7			15	9,016	9,038
8/15	24.0	24.0	24.0		20	4	19	1		36	7,603	7,659
8/16	24.0	24.0	24.0			6	28			74	210	312
8/17	24.0	24.0	24.0		21	4	4			8	7,526	7,538
8/18	24.0	24.0	24.0		23	6	1	1			6,735	6,737
8/19	24.0	24.0	24.0		8	4	5			22	828	855
8/20	24.0	24.0	24.0		4	8	36			25	218	279
8/21	24.0	24.0	24.0									
8/22	24.0	24.0	24.0									
<b>Total</b>	<b>929.5</b>	<b>1116.5</b>	<b>1238.5</b>	<b>344.0</b>	<b>8,019</b>	<b>4,568</b>	<b>6,367,208</b>	<b>12,055</b>	<b>114,454</b>	<b>38,309</b>	<b>112,819</b>	<b>6,644,845</b>
% of District Catch							95.8%	0.2%	1.7%	0.6%	1.7%	100.0%

<sup>a</sup> Number of hours the Nushagak District was opened to commercial fishing.

<sup>b</sup> Number of hours each section was opened to commercial fishing. WRSHA = Wood River Special Harvest Area.

<sup>c</sup> Effort is deliveries from processor catch reports by gear type.

<sup>d</sup> Numbers of fish.

<sup>e</sup> Mesh sizes less than seven and one half inches prohibited for the protection of sockeye salmon.

**Table 16.** Commercial sockeye salmon fishing time and setnet harvest by date and statistical area, Nushagak District, 2000.

Date	Time (hrs)				Harvest <sup>c</sup>							Total
	District <sup>a</sup>	Nushagak <sup>b</sup>	Igushik <sup>b</sup>	WRSHA <sup>b</sup>	Combine Flats	Queen Slough	Coffee Point	Clark's Point	Ekuk Beach	Igushik Beach	WRSHA	
6/21			12.0							190		190
6/26			17.0	6.0						16,893	1,092	17,985
6/27			24.0	15.0						17,977	11,381	29,358
6/28	1.5	1.5	24.0	20.0	433			444		11,255	87,779	99,911
6/29	16.5	18.5	23.0	12.0	27,376	7,177	8,098	14,061	35,716	28,775	51,755	172,958
6/30	13.0	18.5		12.0	4,516	1,040	3,526	4,858	18,243	25,779	47,326	105,288
7/01	8.0	24.0	23.0	24.0	16,025	707	20,624	3,519	9,580	51,074	46,433	147,962
7/02	11.0	24.0	24.0	23.0	16,358	2,594	19,184	12,547	68,095	10,649	39,898	169,325
7/03	24.0	24.0	24.0	13.0	5,299	743	4,259	1,253	5,414		28,832	45,800
7/04	19.0	24.0	24.0	24.0	905	312	1,638	602	4,131	4,848	9,426	21,862
7/05	8.0	24.0	24.0	15.0	675	52	2,345	716	3,453	5,963	1,382	14,586
7/06	8.0	24.0	24.0		850	168	529	1,977	17,710	2,326		23,560
7/07	6.0	24.0	24.0		6,575	3,259	7,149	9,962	31,956	3,438		62,339
7/08	2.5	5.0	24.0		10,581	5,284	3,311	4,051	13,434	6,346		43,007
7/09	1.5	24.0	24.0		16,694	4,497	4,428	4,880	8,533	3,492		42,524
7/10		21.5	24.0		8,448	1,504	3,373	6,429	28,780	4,784		53,318
7/11			24.0							5,384		5,384
7/12	1.0	8.0	24.0		51,346	13,228	3,792	12,031	37,765	5,587		123,749
7/13	24.0	24.0	24.0	12.0	14,684	11,323	739	3,292	19,366	21,413	16,593	87,410
7/14	12.0	24.0	24.0	24.0	2,741	119	3,119	1,415	19,236	10,792	19,764	57,186
7/15	12.0	24.0	24.0	24.0	2,159	345		2,315	11,157	2,932	9,130	28,038
7/16	12.0	24.0	24.0	24.0	601	44	798	374	4,251	2,630	3,580	12,278
7/17	18.0	24.0	24.0	24.0	179	8	1,500	270	3,044	3,056	2,046	10,103
7/18	24.0	24.0	24.0	24.0	547	74	946	386	3,382	1,220	1,213	7,768
7/19	24.0	24.0	24.0	24.0	127	75	831	65	2,576	930	281	4,885
7/20	24.0	24.0	24.0	24.0	294	52	495	58	704		186	1,789
7/21	24.0	24.0	24.0		363		145	96	959			1,563
7/22	24.0	24.0	24.0		223				594			817
7/23	24.0	24.0	24.0		973		214		657			1,844
7/24	24.0	24.0	24.0		694	7						701
7/25	24.0	24.0	24.0		512			323	283			1,118
7/26	24.0	24.0	24.0									-
7/31	11.5	11.5	11.5					24	11			35
8/01	24.0	24.0	24.0		5	91		39	8			143
8/02	24.0	24.0	24.0					12	4			16
8/03	24.0	24.0	24.0									
8/04	24.0	24.0	24.0									
8/05	24.0	24.0	24.0									
8/06	24.0	24.0	24.0					20	55			75
8/07	24.0	24.0	24.0						16			16
8/08	24.0	24.0	24.0						13			13
8/09	24.0	24.0	24.0			14				4		18
8/10	24.0	24.0	24.0			15			12			27
8/11	17.0	17.0	17.0			31				7		38
Total	682.5	869.5	991.5	344.0	190,183	52,763	91,043	86,019	349,138	247,744	378,097	1,394,987
% of District Catch					13.6%	3.8%	6.5%	6.2%	25.0%	17.8%	27.1%	100.0%

<sup>a</sup> Number of hours the Nushagak District Drift gillnet was opened to commercial fishing .

<sup>b</sup> Number of hours each section was opened to commercial fishing. WRSHA = Wood River Special Harvest Area.

<sup>c</sup> Numbers of fish.

**Table 17.** Commercial salmon fishing time, effort and harvest by date, Wood River Special Harvest Area, 2000.

Date	Time (hrs)		Effort <sup>a</sup>		Harvest <sup>b</sup>					Total
	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	
6/26	6.0	6.0	37	24	6,800	4	66	0	0	6,870
6/27	15.0	15.0	47	78	41,789	18	242	0	0	42,049
6/28	20.0	20.0	338	213	387,497	155	2,794	0	0	390,446
6/29	20.0	12	190	140	200,555	129	1,381	0	0	202,065
6/30	20.0	12	106	104	126,915	118	1,101	0	0	128,134
7/01	20.0	24.0	101	128	129,772	117	907	0	0	130,796
7/02	19.0	23.0	66	111	68,154	104	468	0	0	68,726
7/03	13.0	13.0	73	99	62,698	75	480	0	0	63,253
7/04	24.0	24.0	63	80	20,847	25	190	0	0	21,062
7/05	15.0	15.0	20	49	2,651	8	39	0	0	2,698
62 7/13	12.0	12.0	166	54	85,810	19	560	1	562	86,952
7/14	24.0	24.0	226	86	68,069	24	500	1	2	68,596
7/15	24.0	24.0	121	53	25,308	18	205	8	381	25,920
7/16	24.0	24.0	54	45	9,130	6	136	9	14	9,295
7/17	24.0	24.0	33	38	4,448	1	65	6	44	4,564
7/18	24.0	24.0	16	24	2,632	0	37	26	61	2,756
7/19	24.0	24.0	6	5	645	0	10	19	15	689
7/20	24.0	24.0	4	5	1,635	3	11	29	48	1,726
Total	352.0	344.0	1,667	1,336	1,246,055	824	9,192	99	1,127	1,257,297
%					99.1%	0.1%	0.7%	0.0%	0.1%	100.0%

<sup>a</sup> Effort is deliveries from processor catch reports by gear type.

<sup>b</sup> Numbers of fish.

**Table 18.** Commercial salmon catch by date and species, in numbers of fish, Togiak District, 2000.

Date <sup>a</sup>	Sockeye	Chinook	Chum	Pink	Coho	Total
6/19	2,718	284	659	0	0	3,661
6/20	4,702	411	911	0	0	6,024
6/21	3,555	215	1,094	0	0	4,864
6/26	15,674	919	5,122	0	0	21,715
6/27	16,337	654	5,670	0	0	22,661
6/28	8,352	392	3,332	0	0	12,076
7/03	28,021	814	4,166	0	0	33,001
7/04	35,120	926	8,896	2	0	44,944
7/05	17,415	697	6,797	0	0	24,909
7/06	21,729	600	12,578	0	0	34,907
7/07	19,898	251	7,785	0	0	27,934
7/08	21,400	185	4,897	0	1	26,483
7/10	32,506	196	3,545	0	0	36,247
7/11	47,407	307	10,379	0	0	58,093
7/12	43,120	148	7,803	1	0	51,072
7/13	43,833	120	4,576	0	0	48,529
7/14	33,306	65	3,328	2	0	36,701
7/15	14,787	19	697	0	0	15,503
7/16	11,081	19	338	0	0	11,438
7/17	36,075	108	3,067	5	0	39,255
7/18	42,727	94	4,403	11	0	47,235
7/19	24,925	43	2,812	1	0	27,781
7/20	37,846	71	2,302	9	0	40,228
7/21	48,045	79	7,858	50	0	56,032
7/22	32,536	59	6,661	78	0	39,334
7/23	17,378	37	2,511	80	1	20,007
7/24	20,667	32	4,397	55	0	25,151
7/25	24,699	36	3,014	112	0	27,861
7/26	17,241	15	2,404	114	0	19,774
7/27	13,802	18	2,283	22	0	16,125
7/28	9,301	8	684	0	0	9,993
7/29	15,034	12	1,599	0	2	16,647
7/30	6,883	0	687	0	0	7,570
7/31	7,896	15	894	0	32	8,837
8/01	7,623	4	1,042	70	23	8,762
8/02	1,119	0	26	5	0	1,150
8/03	1,089	0	67	0	0	1,156
8/04	1,452	0	178	0	8	1,638
8/05	1,460	2	304	0	13	1,779
8/06	332	0	19	28	120	499
8/08	1,526	0	80	16	230	1,852
8/09	1,843	0	188	18	545	2,594
8/10	882	0	60	0	168	1,110
8/14	468	1	15	1	459	944
8/15	1,186	2	47	15	1,156	2,406
<b>Total</b>	<b>794,996</b>	<b>7,858</b>	<b>140,175</b>	<b>695</b>	<b>2,758</b>	<b>946,482</b>
<b>% of District Total</b>	<b>84.0%</b>	<b>0.8%</b>	<b>14.8%</b>	<b>0.1%</b>	<b>0.3%</b>	<b>100.0%</b>

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

**Table 19.** Commercial salmon catch by date and species, in numbers of fish, Togiak Section, 2000.

Date	Effort <sup>a</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/19	9	24	2,532	276	658	0	0	3,466
6/20	11	36	4,495	408	908	0	0	5,811
6/21	11	17	2,099	159	969	0	0	3,227
6/26	18	53	10,219	799	4,077	0	0	15,095
6/27	23	50	8,757	551	4,374	0	0	13,682
6/28	18	28	3,963	363	2,831	0	0	7,157
7/03	18	58	22,049	691	2,362	0	0	25,102
7/04	39	89	28,805	846	6,984	2	0	36,637
7/05	38	77	15,520	689	6,558	0	0	22,767
7/06	45	105	21,729	600	12,578	0	0	34,907
7/07	43	94	19,898	251	7,785	0	0	27,934
7/08	35	99	21,400	185	4,897	0	1	26,483
7/10	37	80	26,948	168	2,880	0	0	29,996
7/11	50	109	35,998	274	9,553	0	0	45,825
7/12	65	101	36,019	144	7,689	0	0	43,852
7/13	61	117	43,833	120	4,576	0	0	48,529
7/14	40	111	33,306	65	3,328	2	0	36,701
7/15	4	47	14,787	19	697	0	0	15,503
7/16	4	33	11,081	19	338	0	0	11,438
7/17	33	90	36,075	108	3,067	5	0	39,255
7/18	65	124	42,430	94	4,399	11	0	46,934
7/19	55	92	24,707	43	2,812	1	0	27,563
7/20	32	120	37,846	71	2,302	9	0	40,228
7/21	108	100	48,045	79	7,858	50	0	56,032
7/22	177	91	32,536	59	6,661	78	0	39,334
7/23	71	23	17,378	37	2,511	80	1	20,007
7/24	102	49	19,378	29	4,176	12	0	23,595
7/25	125	44	20,388	32	2,795	22	0	23,237
7/26	82	19	13,267	13	2,116	11	0	15,407
7/27	81	24	13,802	18	2,283	22	0	16,125
7/28	41	19	9,301	8	684	0	0	9,993
7/29	63	19	15,034	12	1,599	0	2	16,647
7/30	25	10	6,883	0	687	0	0	7,570
7/31	36	23	7,896	15	894	0	32	8,837
8/01	57	24	7,623	4	1,042	70	23	8,762
8/02		13	1,119	0	26	5	0	1,150
8/03	8	0	1,089	0	67	0	0	1,156
8/04	9	4	1,452	0	178	0	8	1,638
8/05	10	5	1,460	2	304	0	13	1,779
8/06	4	0	332	0	19	28	120	499
8/08	17	6	1,526	0	80	16	230	1,852
8/09	13	14	1,843	0	188	18	545	2,594
8/10	13	5	882	0	60	0	168	1,110
8/14	14	1	468	1	15	1	459	944
8/15	27	10	1,186	2	47	15	1,156	2,406
Total	#####	2,257	727,384	7,254	130,912	458	2,758	868,766
% of Section Total			83.7%	0.8%	15.1%	0.1%	0.3%	100.0%

<sup>a</sup> Effort is deliveries from processor catch reports by gear type.

**Table 20.** Commercial salmon catch by date and species, in numbers of fish, Kulukak Section, 2000.

Date	Effort <sup>b</sup>		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/19	<sup>c</sup> 0					0	0	0
6/20	<sup>c</sup> 0					0	0	0
6/21	0	5	1,456	56	125	0	0	1,637
6/26	7	16	5,455	120	1,045	0	0	6,620
6/27	7	18	7,580	103	1,296	0	0	8,979
6/28	6	17	4,389	29	501	0	0	4,919
7/3	5	19	5,972	123	1,804	0	0	7,899
7/4	5	19	6,315	80	1,912	0	0	8,307
7/5	2	13	1,895	8	239	0	0	2,142
7/10	2	11	5,558	28	665	0	0	6,251
7/11	4	11	11,409	33	826	0	0	12,268
7/12	2	9	7,101	4	114	1	0	7,220
7/18	<sup>c</sup> 0			0		0	0	0
7/19	<sup>c</sup> 0			0		0	0	0
7/24	11		1,289	3	221	43	0	1,556
7/25	11	4	4,311	4	219	90	0	4,624
7/26	14	6	3,974	2	288	103	0	4,367
<b>Total</b>	<b>76</b>	<b>153</b>	<b>67,612</b>	<b>604</b>	<b>9,264</b>	<b>237</b>	<b>0</b>	<b>77,717</b>
<b>% of Section Total</b>			<b>87.0%</b>	<b>0.8%</b>	<b>11.9%</b>	<b>0.3%</b>	<b>0.0%</b>	<b>100.0%</b>

<sup>a</sup> Kulukak Section open three days per week. See Table 11 for inseason adjustments to the weekly fishing schedule.

<sup>b</sup> Effort is number of deliveries by gear type on processor reports.

<sup>c</sup> 3 or less permits, records are confidential.

**Table 21.** Commercial salmon catch by date and species, in numbers of fish, Matogak Section, 2000.

Date <sup>a</sup>	Sockeye	Chinook	Chum	Pink	Coho	Total
No Commercial Fishing Effort Occurred						
Total	0	0	0	0	0	0
% of Section Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

<sup>a</sup> Matogak and Osviak Sections open five days per week. See Table 11 for inseason adjustments to the weekly fishing schedule.

**Table 22.** Commercial salmon catch by date and species, in numbers if fish, Osviak Section, 2000.

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

**Table 23.** Commercial salmon catch by district and species, in number of fish, Bristol Bay, 2000.

District and River System	Sockeye	Chinook	Chum	Pink	Coho	Total
<u>NAKNEK-KVICHAK DISTRICT</u>						
Kvichak River	1,033,814					
Branch River	279,553					
Naknek River	3,413,694					
Total	4,727,061	1,027	68,218	19,659	952	4,816,917
<u>EGEGIK DISTRICT</u>	7,050,899	1,061	38,857	32	13,166	7,104,015
<u>UGASHIK DISTRICT</u>	1,538,790	893	36,349	4	1,269	1,577,305
<u>NUSHAGAK DISTRICT</u>						
Wood River	3,977,728					
Igushik River	1,335,179					
Nushagak-Mulchatna	1,054,301					
Total	6,367,208	12,055	114,454	38,309	112,819	6,644,845
<u>TOGIAK DISTRICT</u>						
Togiak Section	727,384	7,254	130,912	458	2,758	868,766
Kulukak Section	67,612	604	9,263	237		77,716
Matogak Section						
Osviak Section						
Total	794,996	7,858	140,175	695	2,758	946,482
TOTAL BRISTOL BAY	20,478,954	22,894	398,053	58,699	130,964	21,089,564
PERCENT	97.1%	0.1%	1.9%	0.3%	0.6%	100.0%

**Table 24.** Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 2000.

Date	Kvichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/18														
6/19					6,234	6,234								
6/20					6,096	12,330								
6/21			444	444	9,018	21,348								
6/22			258	702	7,428	28,776			978	978				
6/23	108	108	822	1,524	13,974	42,750			588	1,566				
6/24	72	180	43,110	44,634	48,984	91,734			492	2,058	1,890	1,890		
6/25	30	210	128,400	173,034	94,056	185,790			6,234	8,292	5,760	7,650		
6/26	3,360	3,570	71,004	244,038	159,468	345,258			57,552	65,844	16,812	24,462		
6/27	17,904	21,474	10,950	254,988	201,906	547,164			5,586	71,430	40,704	65,166		
6/28	20,412	41,886	26,154	281,142	45,234	592,398			184,968	256,398	24,024	89,190	0	0
6/29	24,600	66,486	46,668	327,810	18,210	610,608			56,694	313,092	4,842	94,032	0	0
6/30	77,280	143,766	84,384	412,194	7,758	618,366			80,388	393,480	3,504	97,536	0	0
7/01	70,440	214,206	52,908	465,102	23,580	641,946			48,162	441,642	4,584	102,120	0	0
7/02	175,920	390,126	14,082	479,184	9,660	651,606			27,456	469,098	9,396	111,516	0	0
7/03	216,582	606,708	11,124	490,308	23,940	675,546	58,800	58,800	128,376	597,474	34,572	146,088	0	0
7/04	94,992	701,700	8,736	499,044	21,894	697,440	67,980	126,780	18,762	616,236	54,210	200,298	5,370	5,370
7/05	23,508	725,208	8,046	507,090	65,730	763,170	40,206	166,986	6,924	623,160	58,902	259,200	21,246	26,616
7/06	6,582	731,790	46,062	553,152	16,638	779,808	11,058	178,044	7,578	630,738	54,222	313,422	15,348	41,964
7/07	2,436	734,226	86,364	639,516	6,360	786,168	3,636	181,680	13,110	643,848	32,166	345,588	11,634	53,598
7/08	3,408	737,634	27,150	666,666	5,832	792,000	2,142	183,822	45,210	689,058	17,484	363,072	7,614	61,212
7/09	52,848	790,482	39,702	706,368	3,906	795,906	2,388	186,210	32,142	721,200	11,052	374,124	3,108	64,320
7/10	78,900	869,382	139,272	845,640	10,080	805,986	1,746	187,956	24,510	745,710	6,804	380,928	3,606	67,926
7/11	22,188	891,570	334,566	1,180,206	49,020	855,006	6,438	194,394	20,670	766,380	3,138	384,066	3,618	71,544
7/12	189,360	1,080,930	77,904	1,258,110	62,124	917,130	13,542	207,936	60,126	826,506	3,072	387,138	17,136	88,680
7/13	277,434	1,358,364	55,716	1,313,826	44,952	962,082	22,950	230,886	431,304	1,257,810	2,844	389,982	18,774	107,454
7/14	150,540	1,508,904	40,410	1,354,236	49,224	1,011,306	7,248	238,134	12,456	1,270,266	2,706	392,688	8,898	116,352
7/15	141,762	1,650,666	7,428	1,361,664	13,494	1,024,800	11,814	249,948	8,640	1,278,906	4,242	396,930	9,186	125,538

(Continued)

Table 24. (Page 2 of 2)

Date	Kvichak River		Naknek River		Egegik River		Ugashik River		Wood River		Igushik River		Togiak River	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/16	62,418	1,713,084	8,904	1,370,568	3,210	1,028,010	17,574	267,522	5,094	1,284,000	3,822	400,752	8,634	134,172
7/17	46,374	1,759,458	4,920	1,375,488	4,128	1,032,138	70,968	338,490	3,942	1,287,942	3,036	403,788	10,440	144,612
7/18	31,824	1,791,282					84,078	422,568	3,084	1,291,026	5,124	408,912	25,926	170,538
7/19	22,770	1,814,052					58,938	481,506	2,646	1,293,672	1,830	410,742	40,122	210,660
7/20	8,532	1,822,584					33,492	514,998	2,724	1,296,396	1,134	411,876	25,920	236,580
7/21	2,616	1,825,200					22,998	537,996	3,630	1,300,026	858	412,734	15,000	251,580
7/22	1,854	1,827,054					19,272	557,268			582	413,316	13,542	265,122
7/23	726	1,827,780					16,158	573,426					14,286	279,408
7/24							18,822	592,248					11,868	291,276
7/25							10,254	602,502					6,240	297,516
7/26							9,756	612,258					2,994	300,510
7/27							4,284	616,542					3,810	304,320
7/28							3,498	620,040					3,042	307,362
7/29													1,422	308,784
7/30													1,242	310,026
7/31													1,080	311,106
8/01													864	311,970
8/02														
8/03														
8/04														

69

**Table 25.** Final daily and cumulative escapement estimates by species, Nushagak River sonar project, 2000.

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/09												
6/10	73	73	309	309	529	529	0	0	0	0	911	911
6/11	46	119	171	480	410	939	0	0	0	0	627	1,538
6/12	67	186	197	677	552	1,491	0	0	0	0	816	2,354
6/13	245	431	872	1,549	1,743	3,234	0	0	0	0	2,860	5,214
6/14	86	517	292	1,841	665	3,899	0	0	0	0	1,043	6,257
6/15	54	571	273	2,114	369	4,268	0	0	0	0	696	6,953
6/16	261	832	1,107	3,221	2,236	6,504	0	0	0	0	3,604	10,557
6/17	386	1,218	2,791	6,012	4,290	10,794	0	0	0	0	7,467	18,024
6/18	140	1,358	938	6,950	1,117	11,911	0	0	0	0	2,195	20,219
6/19	453	1,811	1,895	8,845	3,804	15,715	0	0	0	0	6,152	26,371
6/20	724	2,535	2,855	11,700	6,188	21,903	0	0	0	0	9,767	36,138
6/21	405	2,940	1,419	13,119	3,382	25,285	0	0	0	0	5,206	41,344
6/22	264	3,204	928	14,047	2,326	27,611	0	0	0	0	3,518	44,862
6/23	124	3,328	546	14,593	1,054	28,665	0	0	0	0	1,724	46,586
6/24	94	3,422	428	15,021	889	29,554	0	0	0	0	1,411	47,997
6/25	1,968	5,390	7,699	22,720	15,690	45,244	0	0	0	0	25,357	73,354
6/26	16,742	22,132	5,441	28,161	14,334	59,578	0	0	0	0	36,517	109,871
6/27	4,247	26,379	1,098	29,259	3,637	63,215	0	0	0	0	8,982	118,853
6/28	45,905	72,284	2,412	31,671	11,077	74,292	0	0	0	0	59,394	178,247
6/29	70,221	142,505	2,291	33,962	17,056	91,348	0	0	0	0	89,568	267,815
6/30	46,978	189,483	2,451	36,413	18,172	109,520	356	356	0	0	67,957	335,772
7/01	30,858	220,341	3,354	39,767	4,925	114,445	0	356	0	0	39,137	374,909
7/02	13,997	234,338	1,560	41,327	2,261	116,706	0	356	0	0	17,818	392,727
7/03	13,110	247,448	1,767	43,094	2,180	118,886	0	356	0	0	17,057	409,784
7/04	15,431	262,879	2,162	45,256	2,445	121,331	0	356	17	17	20,055	429,839
7/05	6,656	269,535	874	46,130	948	122,279	0	356	38	55	8,516	438,355
7/06	4,479	274,014	820	46,950	693	122,972	0	356	25	80	6,017	444,372
7/07	2,530	276,544	610	47,560	430	123,402	0	356	18	98	3,588	447,960
7/08	2,535	279,079	535	48,095	415	123,817	0	356	15	113	3,500	451,460
7/09	3,630	282,709	414	48,509	524	124,341	42	398	37	150	4,647	456,107
7/10	5,121	287,830	414	48,923	677	125,018	52	450	35	185	6,299	462,406
7/11	2,581	290,411	238	49,161	314	125,332	33	483	24	209	3,190	465,596

(Continued)

Table 25. (page 2 of 3).

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/12	5,086	295,497	334	49,495	627	125,959	30	513	27	236	6,104	471,700
7/13	41,229	336,726	951	50,446	3,505	129,464	53	566	72	308	45,810	517,510
7/14	27,279	364,005	1,252	51,698	3,875	133,339	70	636	2,187	2,495	34,663	552,173
7/15	4,694	368,699	391	52,089	687	134,026	33	669	324	2,819	6,129	558,302
7/16	4,880	373,579	408	52,497	705	134,731	44	713	353	3,172	6,390	564,692
7/17	3,903	377,482	291	52,788	626	135,357	461	1,174	794	3,966	6,075	570,767
7/18	3,771	381,253	297	53,085	616	135,973	492	1,666	813	4,779	5,989	576,756
7/19	2,562	383,815	308	53,393	449	136,422	470	2,136	674	5,453	4,463	581,219
7/20	2,157	385,972	203	53,596	359	136,781	424	2,560	612	6,065	3,755	584,974
7/21	2,294	388,266	181	53,777	374	137,155	390	2,950	592	6,657	3,831	588,805
7/22	1,812	390,078	181	53,958	283	137,438	517	3,467	883	7,540	3,676	592,481
7/23	1,986	392,064	111	54,069	301	137,739	804	4,271	1,111	8,651	4,313	596,794
7/24	2,332	394,396	87	54,156	343	138,082	466	4,737	756	9,407	3,984	600,778
7/25	1,421	395,817	68	54,224	221	138,303	1,066	5,803	1,351	10,758	4,127	604,905
7/26	238	396,055	33	54,257	79	138,382	1,565	7,368	1,417	12,175	3,332	608,237
7/27	291	396,346	55	54,312	95	138,477	1,964	9,332	1,782	13,957	4,187	612,424
7/28	1,202	397,548	198	54,510	403	138,880	8,009	17,341	7,414	21,371	17,226	629,650
7/29	1,027	398,575	466	54,976	359	139,239	7,018	24,359	6,900	28,271	15,770	645,420
7/30	827	399,402	72	55,048	269	139,508	6,018	30,377	6,099	34,370	13,285	658,705
7/31	183	399,585	136	55,184	177	139,685	12,026	42,403	5,223	39,593	17,745	676,450
8/01	1,035	400,620	339	55,523	336	140,021	18,467	60,870	28,732	68,325	48,909	725,359
8/02	1,071	401,691	370	55,893	353	140,374	20,656	81,526	32,757	101,082	55,207	780,566
8/03	1,031	402,722	323	56,216	328	140,702	17,769	99,295	27,150	128,232	46,601	827,167
8/04	769	403,491	156	56,372	433	141,135	13,169	112,464	19,085	147,317	33,612	860,779
8/05	9	403,500	0	56,372	89	141,224	9,588	122,052	10,097	157,414	19,783	880,562
8/06	0	403,500	0	56,372	16	141,240	3,307	125,359	3,509	160,923	6,832	887,394
8/07	0	403,500	0	56,372	12	141,252	1,428	126,787	1,611	162,534	3,051	890,445
8/08	0	403,500	0	56,372	9	141,261	1,715	128,502	1,786	164,320	3,510	893,955
8/09	0	403,500	0	56,372	6	141,267	1,336	129,838	1,459	165,779	2,801	896,756
8/10	0	403,500	0	56,372	8	141,275	803	130,641	1,026	166,805	1,837	898,593
8/11	0	403,500	0	56,372	6	141,281	647	131,288	782	167,587	1,435	900,028
8/12	0	403,500	0	56,372	7	141,288	591	131,879	694	168,281	1,292	901,320
8/13	0	403,500	0	56,372	12	141,300	707	132,586	955	169,236	1,674	902,994

(Continued)

71

Table 25. (page 3 of 3).

Date	Sockeye		Chinook		Chum		Pink		Coho		Total	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
8/14	0	403,500	0	56,372	8	141,308	1,096	133,682	1,312	170,548	2,416	905,410
8/15	0	403,500	0	56,372	5	141,313	525	134,207	713	171,261	1,243	906,653
8/16	0	403,500	0	56,372	5	141,318	687	134,894	1,035	172,296	1,727	908,380
8/17	0	403,500	0	56,372	6	141,324	393	135,287	553	172,849	952	909,332

**Table 26.** Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2000.

Date	Tower Count		Aerial Survey Total	Fish per Index Pt. <sup>a</sup>	River Test Fishing		Cumulative Escapement	Estimated River Fish <sup>b</sup>
	Daily	Cum.			Index Points Daily	Cum.		
6/21				105	0	0	0	
6/22				105	4	4	420	
6/23	108	108		105	3	7	735	
6/24	72	180		105	17	24	2,415	
6/25	30	210		105	668	692	72,555	70,000
6/26	3,360	3,570		105	657	1,349	141,645	140,000
6/27	17,904	21,474		105	16	1,365	143,325	140,000
6/28	20,412	41,886		105	1,196	2,561	268,905	250,000
6/29	24,600	66,486		105	284	2,845	298,725	400,000
6/30	77,280	143,766		105	3,390	6,235	654,675	500,000
7/01	70,440	214,206	377,510	105	4,407	10,642	1,117,410	650,000
7/02	175,920	390,126	489,710	49	495	11,137	545,713	300,000
7/03	216,582	606,708		49	124	11,261	551,789	100,000
7/04	94,992	701,700		54	12	11,273	608,742	10,000
7/05	23,508	725,208		55	18	11,291	621,005	10,000
7/06	6,582	731,790		56	-	11,291	632,296	10,000
7/07	2,436	734,226		56	1,492	12,783	715,848	70,000
7/08	3,408	737,634		56	1,107	13,890	777,840	100,000
7/09	52,848	790,482		54	184	14,074	759,996	70,000
7/10	78,900	869,382		55	1,561	15,635	859,925	100,000
7/11	22,188	891,570		56	2,950	18,585	1,040,760	350,000
7/12	189,360	1,080,930		62	4,118	22,703	1,407,586	350,000
7/13	277,434	1,358,364		66	5,295	27,998	1,847,868	500,000
7/14	150,540	1,508,904		53	3,664	31,662	1,678,086	500,000
7/15	141,762	1,650,666	126,250	56	5,488	37,150	2,080,400	300,000
7/16	62,418	1,713,084		51	3,033	40,183	2,049,333	125,000
7/17	46,374	1,759,458						
7/18	31,824	1,791,282						
7/19	22,770	1,814,052						
7/20	8,532	1,822,584						
7/21	2,616	1,825,200						
7/22	1,854	1,827,054						
7/23	726	1,827,780						

<sup>a</sup> The 1985-99 mean escapement per index point relationship (105 EPI) was used until July 2 when lag-time relationships began to prove more accurate.

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

**Table 27.** Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey, and river test fishing enumeration methods, Egegik River, 2000.

Date	Tower Count		Aerial Survey	Fish per Index Pt. <sup>a</sup>	River Test Fishing		Estimated Cumulative Escapement	Estimated River Fish <sup>b</sup>
	Daily	Cum.	Total		Daily	Cum.		
6/14				77	13	13	1,001	
6/15				77	33	46	3,542	
6/16				77	37	83	6,391	
6/17				77	151	235	18,095	
6/18				77	335	570	43,890	40,000
6/19	6,234	6,234		77	683	1,252	96,404	96,000
6/20	6,096	12,330	6,650	77	406	1,659	127,743	113,000
6/21	9,018	21,348	18,100	77	177	1,836	141,372	120,000
6/22	7,428	28,776		77	52	1,888	145,376	100,000
6/23	13,974	42,750		77	86	1,975	152,075	100,000
6/24	48,984	91,734		77	3,294	5,269	405,713	300,000
6/25	94,056	185,790	317,600 <sup>c</sup>	77	1,391	6,660	512,820	300,000
6/26	159,468	345,258		77	123	6,783	522,291	200,000
6/27	201,906	547,164	153,000	77	128	6,911	532,147	20,000
6/28	45,234	592,398		77	95	7,006	539,462	40,000
6/29	18,210	610,608	38,200	90	231	7,237	651,330	40,000
6/30	7,758	618,366		89	220	7,457	663,673	40,000
7/01	23,580	641,946		91	57	7,514	683,774	40,000
7/02	9,660	651,606		87	218	7,732	672,684	30,000
7/03	23,940	675,546	10,500	90	14	7,746	697,140	25,000
7/04	21,894	697,440		90	1,912	9,658	869,220	185,000
7/05	65,730	763,170	34,800	98	302	9,961	976,178	150,000
7/06	16,638	779,808		80	55	10,015	801,200	30,000
7/07	6,360	786,168	4,600	78	34	10,050	783,900	7,000
7/08	5,832	792,000		79	47	10,097	797,663	7,000
7/09	3,906	795,906		79	136	10,233	808,407	10,000
7/10	10,080	805,986		79	1,000	11,232	887,328	10,000
7/11	49,020	855,006		83	744	11,976	994,008	100,000
7/12	62,124	917,130	25,000	81	947	12,924	1,046,844	125,000
7/13	44,952	962,082		80	593	13,517	1,081,360	125,000
7/14	49,224	1,011,306	800					
7/15	13,494	1,024,800						
7/16	3,210	1,028,010	180					
7/17	4,128	1,032,138						
7/18		1,032,138						
7/19		1,032,138						
7/20		1,032,138						

<sup>a</sup> Fish per index point was based on historical average (77), estimates of fpi using early tower counts and aerial surveys (6/29 - 7/12), or by fitting test fish run timing to tower count timing (7/13).

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

<sup>c</sup> Count includes 300,000 estimated in the Egegik River.

**Table 28.** Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey, and river test fishing enumeration methods, Ugashik River, 2000.

Date	Tower Count		Aerial Survey	Fish per Index Pt. <sup>a</sup>	River Test Fishing		Estimated	Estimated River Fish <sup>b</sup>
	Daily	Cum.	Total		Index Points	Cum.	Cumulative Escapement	
6/24				58	54	54	3,132	
6/25				58	32	86	4,988	
6/26				58	17	103	5,974	6,000
6/27			20	58	10	113	6,554	7,000
6/28				58	27	140	8,120	8,000
6/29			375	58	174	314	18,212	18,000
6/30				58	676	990	57,420	60,000
7/01				58	1,271	2,261	131,138	135,000
7/02				58	1,785	4,046	234,668	220,000
7/03	58,800	58,800	34,200	58	1,380	5,426	314,708	260,000
7/04	67,980	126,780	35,800	58	176	5,602	324,916	200,000
7/05	40,206	166,986	10,820 <sup>d</sup>	58	67	5,669	328,802	50,000
7/06	11,058	178,044		58	30	5,699	330,542	10,000
7/07	3,636	181,680	970	31	21	5,720	177,320	2,000
7/08	2,142	183,822		31	95	5,815	180,265	4,000
7/09	2,388	186,210		32	105	5,920	189,440	8,000
7/10	1,746	187,956		32	161	6,081	194,592	15,000
7/11	6,438	194,394		32	228	6,309	201,888	15,000
7/12	13,542	207,936	7,200	34	221	6,530	222,020	20,000
7/13	22,950	230,886		36	340	6,870	247,320	30,000
7/14	7,248	238,134	700	36	356	7,226	260,136	30,000
7/15	11,814	249,948		36	439	7,665	275,940	30,000
7/16	17,574	267,522	400	36	2,347	10,012	360,432	100,000
7/17	70,968	338,490		33	1,602	11,614	383,262	75,000
7/18	84,078	422,568	27,400	35	1,071	12,685	443,975	70,000
7/19	58,938	481,506		40	1,182	13,867	554,680	90,000
7/20	33,492	514,998		42	1,034	14,901	625,842	No Estimate
7/21	22,998	537,996	3,600 <sup>e</sup>					
7/22	19,272	557,268						
7/23	16,158	573,426						
7/24	18,822	592,248	3,600					
7/25	10,254	602,502						
7/26	9,756	612,258						
7/27	4,284	616,542						
7/28	3,498	620,040						

<sup>a</sup> Fish per index point was based on historical average (58), estimates of fpi using early tower counts and aerial surveys (&7/07 - 7/18), or by fitting test fish run timing to tower count timing (7/18 - 7/19).

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

<sup>c</sup> No estimate because based on fitting test fish run timing to tower counts the estimate would have been zero.

<sup>d</sup> Count includes 3,000 estimated in the Ugashik River.

<sup>e</sup> Count includes 2,800 estimated in the Ugashik River.

**Table 29.** Daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods, in thousands of fish, Wood River, 2000.

Date	Tower Count		Aerial Surveys <sup>a</sup>		Comments
	Daily	Cum.	Number	Visibility	
22-Jun	1.0	1.0			
23-Jun	0.6	1.6			
24-Jun	0.5	2.1			
25-Jun	6.2	8.3			
26-Jun	57.6	65.9	7.7	good	no visibility below Muklung
27-Jun	5.6	71.5			
28-Jun	184.9	256.4			
29-Jun	56.7	313.1			
30-Jun	80.4	393.5			
01-Jul	48.2	441.7			
02-Jul	27.5	469.1			
03-Jul	128.4	597.5			
04-Jul	18.8	616.2			
05-Jul	6.9	623.2			
06-Jul	7.6	630.8			
07-Jul	13.1	643.9			
08-Jul	45.2	689.1			
09-Jul	32.1	721.2			
10-Jul	24.5	745.7			
11-Jul	20.7	766.4			
12-Jul	60.1	826.5			
13-Jul	431.3	1,257.8			
14-Jul	12.5	1,270.3			
15-Jul	8.6	1,278.9			
16-Jul	5.1	1,284.0			
17-Jul	3.9	1,288.0			
18-Jul	3.1	1,291.0			
19-Jul	2.6	1,293.7			
20-Jul	2.7	1,296.4			
21-Jul	3.6	1,300.0			
22-Jul		1,300.0			
23-Jul		1,300.0			

<sup>a</sup> Estimated number of fish in clear water below the counting tower at the time of the survey.

**Table 30.** Daily sockeye salmon escapement estimates by tower, aerial survey, and river test fishing enumeration methods, in thousands of fish, Igushik River, Bristol Bay, 2000.

Date	Tower Count		Aerial Surveys <sup>a</sup>					River Test Fishing				
	Daily	Cum.	Lower River	Lagoon	Upper River	Total	Visibility	Fish per Index Pt. <sup>b</sup>	Index Points		Estimated Cumulative Escapement	Estimated River Fish <sup>c</sup>
									Daily	Cum.		
16-Jun								17	17	17	0	
17-Jun								17	17	17	0	0
18-Jun								17	138	156	0	0
19-Jun								17	406	562	0	0
20-Jun								17	85	647	0	0
21-Jun								17	29	676	0	0
22-Jun								17	6	682	111	100
23-Jun								17	177	859	0	100
24-Jun	1,890	1,890						17	229	1,088	1,292	1,300
25-Jun	5,760	7,650						17	517	1,605	1,555	1,500
26-Jun	16,812	24,462						17	260	1,865	8,778	5,000
27-Jun	40,704	65,166						17	176	2,041	29,422	15,000
28-Jun	24,024	89,190						17	2	2,043	47,849	25,000
29-Jun	4,842	94,032		50	250	300	Good	17	0	2,043	73,190	35,000
30-Jun	3,504	97,536						17	238	2,281	123,672	60,000
01-Jul	4,584	102,120						47	2078	4,359	162,704	60,000
02-Jul	9,396	111,516						50	2541	6,900	217,848	110,000
03-Jul	34,572	146,088	650	1000	1700	3350	Good	48	805	7,705	176,076	150,000
04-Jul	54,210	200,298						30	157	7,862	198,484	140,000
05-Jul	58,902	259,200						24	74	7,936	221,813	85,000
06-Jul	54,222	313,422						31	50	7,986	292,961	115,000
07-Jul	32,166	345,588						38	0	7,986	338,881	115,000
08-Jul	17,484	363,072						41	6	7,992	324,884	60,000
09-Jul	11,052	374,124						45	10	8,002	360,090	
10-Jul	6,804	380,928										
11-Jul	3,138	384,066										
12-Jul	3,072	387,138										
13-Jul	2,844	389,982										
14-Jul	2,706	392,688										
15-Jul	4,242	396,930										
16-Jul	3,822	400,752										
17-Jul	3,036	403,788										
18-Jul	5,124	408,912										
19-Jul	1,830	410,742										
20-Jul	1,134	411,876										
21-Jul	858	412,734										
22-Jul	582	413,316										

<sup>a</sup> Estimated number of fish in clear water below the counting tower at the time of the survey.

<sup>b</sup> The historic mean fish per index (17) was used until July 1 when lag-time relationships began to prove more accurate.

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

**Table 31.** Comparison of daily sockeye salmon escapement estimates by tower and aerial survey enumeration methods in numbers of fish, Togiak River, 2000.

Date	Tower Count		Aerial Surveys <sup>a</sup>			Total	Visibility
	Daily	Cum.	Togiak to Gechiak	Gechiak to Ongivinuck	Ongivinuck to tower		
7/04	5,370	5,370	N/A	N/A	N/A		Poor
7/05	21,246	26,616					
7/06	15,348	41,964					
7/07	11,634	53,598					
7/08	7,614	61,212					
7/09	3,108	64,320					
7/10	3,606	67,926	4,550	5,300	1,300	11,150	poor to good
7/11	3,618	71,544					
7/12	17,136	88,680					
7/13	18,774	107,454					
7/14	8,898	116,352					
7/15	9,186	125,538					
7/16	8,634	134,172					
7/17	10,440	144,612					
7/18	25,926	170,538					
7/19	40,122	210,660					
7/20	25,920	236,580					
7/21	15,000	251,580					
7/22	13,542	265,122					
7/23	14,286	279,408					
7/24	11,868	291,276	N/A	N/A	2700	2700	poor
7/25	6,240	297,516					
7/26	2,994	300,510					
7/27	3,810	304,320					
7/28	3,042	307,362					
7/29	1,422	308,784					
7/30	1,242	310,026					
7/31	1,080	311,106					
8/01	864	311,970					
8/02		311,970					
8/03		311,970					
8/04		311,970					

<sup>a</sup> Unexpanded counts of fish in clear water index areas immediately below the counting tower at the time of the survey.

**Table 32.** Commercial salmon processors and buyers operating in Bristol Bay, 2000.<sup>a</sup>

	Name of Operator/Buyer	Base of Operations	District <sup>b</sup>	Method <sup>c</sup>	Export
01	Alaska General Seafoods	Kenmore, WA	K,E,U	C,F,EF	SEA/AIR
02	Al-Lou's Fish	Naknek, AK	K	F	N/A
03	Arctic Salmon	Kenai, AK	T	F	SEA
04	Aurora Salmon	Anchorage, AK	E	F	SEA
05	Finest King Seafoods	Vashon Island, WA	K	EF	AIR
06	Clarks Fish Company	Cathlamet, WA	E	F	SEA
07	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
08	Fishing Company of Alaska	Seattle, AK	E,N	F	SEA
09	Favco Inc.	Anchorage, AK	K	S,EF	AIR
10	Great Ruby Fish Company	Anchorage, AK	E	F	AIR
11	Icicle Seafoods, Inc.	Seattle, AK	K,E,U,N	F	SEA
12	Inlet Salmon	Kenai, AK	K,E,U,N	F	SEA
13	International Seafoods of Alaska	Seattle, WA	E	F	SEA
14	Lady Marian Seafoods, Inc.	Anchorage, AK	K	F	AIR
15	Leader Creek Fisheries	Seattle, WA	K,E,U	F	SEA
16	New West Fisheries	Bellingham, WA	K,E,U	F	SEA
17	NorQuest Seafoods, Inc.	Seattle, WA	K,E,U,N	F	SEA
18	Ocean Beauty Seafoods, Inc.	Seattle, WA	K,E,U,N	F,EF	SEA,AIR
19	Pacman Fisheries	Naknek, AK	K	S	AIR
20	Pederson Point	Seattle, WA	K,E	F	SEA
21	Peter Pan Seafoods, Inc.	Seattle, WA	K,E,U,N	C,EF,F,S	SEA
22	Snopak Products	Seattle, WA	K,E,U,N	F	SEA
23	Select Salmon	Monerey, CA	K,E,U	F	SEA
24	Togiak Fisheries	Seattle, WA	T	F	SEA
25	Trident Seafoods	Seattle, WA	K,E,U,N	C,EF,F	SEA
26	Triton Fisheries Inc.	Kenai, AK	K,E,U,N	F,EF	AIR
27	Ugashik Wild Salmon	Ugashik, AK	U	C,EF	N/A
28	Unisea, Inc.	Redmond, WA	K,E,U,N	C,F	SEA
29	Wards Cove Packing Ekuk	Seattle, WA	N	C,F	AIR
30	Wards Cove Packing Naknek	Seattle, WA	K	F	SEA
31	Wards Cove Packing Red Salmon	Seattle, WA	K,E,N	C,F,S,EF	SEA
32	Woodbine Alaska Fish Company	Rio Vista, CA	K,E,U,N,T	C,F	SEA
33	Yard Arm Knot	Seattle, WA	K,E,U,N	F	SEA

Number of processors:31; Canning= 8; Freezing= 29; Fresh= 9 ; Curing= 4; Air Export= 9; Sea Export= 24

<sup>a</sup> 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.

<sup>b</sup> K= Naknek-Kvichak; E= Egegik; U= Ugashik; N= Nushagak; T= Togiak.

<sup>c</sup> Type of processing: C= canned; EF= export fresh; F= frozen; S= cured.

**Table 33.** Mean round weight, price per pound, and total exvessel value of the commercial salmon catch, Bristol Bay, 2000<sup>a</sup>

Species	Total Catch (lbs.)	Mean Weight <sup>o</sup> (lbs.)	Mean Price (\$/lb.)	Exvessel Value (\$)
Sockeye	125,516,903	6.11	0.64	80,330,818
Chinook	358,682	15.67	0.48	172,167
Chum	2,623,982	6.88	0.09	236,158
Pink	208,154	3.66	0.08	16,652
Coho	954,053	7.61	0.38	362,540
Total	129,661,774			81,118,336

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

<sup>o</sup> Mean price is a "weighted" average across the major processors.

Table 34. Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2000.\*

Area and River System	Permits Issued	Estimated Number of Salmon Harvested					Total
		Sockeye	Chinook	Chum	Pink	Coho	
NAKNEK-KVICHAK DISTRICT	562	61,817	894	560	845	937	65,053
Naknek River <sup>1</sup>	350	24,827	736	502	756	858	27,680
Kvichak River/Iliamna Lake:	212	36,990	158	58	89	78	37,373
Alagnak River	1	60	12	15	0	0	87
Chekok	1	294	0	0	0	0	294
Igiugig	6	889	3	10	0	0	902
Iliamna Lake	24	3,415	3	0	0	0	3,418
Kokhanok	25	6,956	4	1	1	0	6,961
Kvichak River	20	2,047	8	17	23	20	2,115
Lake Clark	51	4,993	1	0	0	0	4,994
Levelock	15	1,989	81	4	64	51	2,190
Newhalen River	37	5,990	45	11	2	8	6,055
Nondalton Village	7	5,033	0	0	0	0	5,033
Pedro Bay	7	1,285	0	0	0	0	1,285
Port Alsworth	5	342	0	0	0	0	342
Six Mile Lake	13	3,697	0	0	0	0	3,697
EGEGIK DISTRICT <sup>2</sup>	31	842	16	11	0	262	1,131
UGASHIK DISTRICT <sup>3</sup>	31	1,927	51	34	1	467	2,481
NUSHAGAK DISTRICT	541	24,451	9,470	3,463	1,662	5,983	45,029
Wood River <sup>4</sup>	110	4,351	1,938	321	201	1,229	8,039
Lower Nushagak River <sup>5</sup>	28	947	1,123	153	37	217	2,477
Upper Nushagak River <sup>6</sup>	50	2,514	1,941	1,488	159	768	6,871
Dillingham Beaches <sup>7</sup>	238	10,747	2,872	934	1,030	2,933	18,516
Nushagak Bay Commercial <sup>8</sup>	75	2,402	1,052	357	180	445	4,435
Igushik/Snake River	27	2,871	333	25	10	175	3,416
Nushagak, Site Unspecified	13	619	211	184	45	216	1,276
TOGIK DISTRICT <sup>9</sup>	54	3,013	1,116	569	90	342	5,130
TOTAL BRISTOL BAY	1,219	92,050	13,009	3,653	420	6,143	118,824

\* Harvests are extrapolated for all permits issued, based on those returned and on the area fished as first recorded. on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,219 permits issued for the management area, 1,109 were returned (91.0%).

<sup>1</sup> Includes Mile 5 North, Naknek River General, Powerline-North, North and South Savonoski, South Naknek Beach, and Telephone Point-North.

<sup>2</sup> Includes Egegik river and beach

<sup>3</sup> Includes Point Point and Ugashik

<sup>4</sup> Includes Drognet, Aleknagik area, Muklung River, Red Bluff, and Upper and Lower Wood River General

<sup>5</sup> Includes Black Point, Grassy Island, and Lewis Point

<sup>6</sup> Includes Ekwok Area, Kokwok River, New Stuyahok Area, Koliganek Area, Mulchatna River, and Portage Creek

<sup>7</sup> Includes Bradford Point, City Dock, Kanakanak, Scandinavia, Skinner, Snag Point, and Squaw Creek

<sup>8</sup> Includes Clark's Point, Ekuk, Etolin Point, Nushagak Point, Protection Point, and Queen's Slough.

<sup>9</sup> Includes Togiak village and Togiak River

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

# **APPENDIX**

## **TABLES**

**Appendix Table 1.** Escapement goals and actual counts of sockeye salmon by river system, Bristol Bay, 1980-2000

Year	Kvichak River					Naknek River				
	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>
Lower	Upper	Lower	Upper			Lower	Upper			
1980	14,000			22,505	61	800			2,645	231
1981	2,000			1,754	(12)	800			1,796	125
1982	2,000			1,135	(43)	800			1,156	45
1983	2,000			3,570	79	800			888	11
1984	10,000	8,000	12,000	10,491	5	1,000	800	1,400	1,242	24
1985	10,000	8,000	12,000	7,211	(28)	1,000	800	1,400	1,850	85
1986	5,000	4,000	6,000	1,179	(76)	1,000	800	1,400	1,978	98
1987	5,000	4,000	6,000	6,066	21	1,000	800	1,400	1,062	6
1988	5,000	4,000	6,000	4,065	(19)	1,000	800	1,400	1,038	4
1989	8,000	6,000	10,000	8,318	4	1,000	800	1,400	1,612	61
1990	6,000	6,000	10,000	6,970	16	1,000	800	1,400	2,093	109
1991	4,000	4,000	8,000	4,223	6	1,000	800	1,400	3,579	258
1992	6,000	4,000	8,000	4,726	(21)	1,000	800	1,400	1,607	61
1993	5,000	4,000	8,000	4,025	(20)	1,000	800	1,400	1,536	54
1994	8,000	6,000	10,000	8,338	4	1,000	800	1,400	991	(1)
1995	10,000	6,000	10,000	10,039	0	1,000	800	1,400	1,111	11
1996	4,000	4,000	6,000	1,451	(64)	1,000			1,078	8
1997	4,000	4,000	6,000	1,504	(62)	1,000	800	1,400	1,026	3
1998	2,000	2,000	10,000	2,296	15	1,100	800	1,400	1,202	9
1999	6,000	2,000	10,000	6,197	3	1,100	800	1,400	1,625	48
20 yr Ave.	5,900	4,750	8,625	5,803	(7)	970	800	1,400	1,556	62
1980-89	6,300	5,667	8,667	6,629	(1)	920	800	1,400	1,527	69
1990-99	5,500	4,200	8,600	4,977	(12)	1,020	800	1,400	1,585	56
2000	6,000	2,000	10,000	1,828	(70)	1,100	800	1,400	1,375	25

Year	Egegik River					Ugashik River				
	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>
Lower	Upper	Lower	Upper			Lower	Upper			
1980	600			1,061	77	500			3,321	564
1981	600			695	16	500			1,327	165
1982	600			1,035	73	500			1,158	132
1983	600			792	32	500			1,001	100
1984	1,000	800	1,200	1,165	17	700	500	900	1,241	77
1985	1,000	800	1,200	1,095	10	700	500	900	998	43
1986	1,000	800	1,200	1,151	15	700	500	900	1,001	43
1987	1,000	800	1,200	1,273	27	700	500	900	669	(4)
1988	1,000	800	1,200	1,599	60	700	500	900	643	(8)
1989	1,000	800	1,200	1,610	61	700	500	900	1,681	140
1990	1,000	800	1,200	2,191	119	700	500	900	730	4
1991	1,000	800	1,200	2,787	179	700	500	900	2,457	251
1992	1,000	800	1,200	1,945	95	700	500	900	2,174	211
1993	1,000	800	1,200	1,517	52	700	500	900	1,390	99
1994	1,000	800	1,200	1,897	90	700	500	900	1,081	54
1995	1,000	800	1,400	1,282	28	700	500	1,200	1,304	86
1996	1,000	800	1,400	1,076	8	700	500	1,200	668	(5)
1997	1,000	800	1,400	1,104	10	700	500	1,200	619	(12)
1998	1,100	800	1,400	1,111	1	850	500	1,200	891	5
1999	1,100	800	1,400	1,728	57	850	500	1,200	1,647	94
20 yr Ave.	930	800	1,263	1,406	51	675	500	994	1,300	102
1980-89	840	800	1,200	1,148	39	620	500	900	1,304	125
1990-99	1,020	800	1,300	1,664	64	730	500	1,050	1,296	79
2000	1,100	800	1,400	1,032	(6)	850	500	1,200	620	(27)

(Continued)

Appendix Table 1. (Page 2 of 2)

Year	Wood River					Igushik River				
	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>
		Lower	Upper				Lower	Upper		
1980	800			2,969	271	150			1,988	1,225
1981	800			1,233	54	150			591	294
1982	800			976	22	150			424	183
1983	1,000			1,361	36	200			180	(10)
1984	1,000	700	1,200	1,003	0	200	150	250	185	(8)
1985	1,000	700	1,200	939	(6)	200	150	250	212	6
1986	800	700	1,200	819	2	200	150	250	309	55
1987	1,200	800	1,200	1,337	11	200	140	250	169	(16)
1988	800	800	1,200	867	8	200	140	250	170	(15)
1989	1,000	800	1,200	1,186	19	200	150	250	462	131
1990	1,000	700	1,200	1,069	7	200	150	250	366	83
1991	1,000	700	1,200	1,160	16	200	150	250	756	278
1992	1,000	700	1,200	1,286	29	200	150	250	305	53
1993	1,000	700	1,200	1,176	18	200	150	250	406	103
1994	1,000	700	1,200	1,472	47	200	150	250	446	123
1995	1,200	700	1,200	1,475	23	200	150	250	473	137
1996	1,200	700	1,200	1,650	38	200	150	250	401	101
1997	1,000	700	1,200	1,512	51	200	150	250	128	(36)
1998	1,000	700	1,200	1,756	75.6	200	150	250	216	8
1999	1,000	700	1,200	1,512	51	200	150	250	446	123
20 yr Ave.	980	719	1,200	1,338	39	193	149	250	432	141
1980-89	920	750	1,200	1,269	42	185	147	250	469	185
1990-99	1,040	700	1,200	1,407	35	200	150	250	394	97
2000	1,000	700	1,200	1,300	30	200	150	250	413	107

Year	Nushagak Riv. <sup>b</sup>					Togiak River				
	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>	Point Goal	Range		Actual	Percent Deviation <sup>a</sup>
		Lower <sup>c</sup>	Upper				Lower	Upper		
1980	250			3,027	1,111	100			462	362
1981	250			834	234	100			208	108
1982	250			538	115	100			245	145
1983	300			319	6	100			192	92
1984	500	300	700	473	(5)	150	140	250	95	(37)
1985	500	300	700	429	(14)	150	140	250	137	(9)
1986	500	300	700	822	64	150	140	250	168	12
1987	500	300	700	163	(67)	150	100	200	250	67
1988	500	300	700	320	(36)	150	100	200	277	85
1989	500	300	700	513	3	150	100	200	84	(44)
1990	500	340	760	680	36	150	140	250	142	(5)
1991	500	340	760	493	(1)	150	140	250	255	70
1992	550	340	760	695	26	150	140	250	199	33
1993	550	340	760	715	30	150	140	250	177	18
1994	550	340	760	509	(7)	150	140	250	155	3
1995	550	340	760	281	(49)	150	140	250	186	24
1996	550	340	760	525	(5)	150	140	250	157	5
1997	550	340	760	373	(32)	150	100	200	132	(12)
1998	550	340	760	459	(17)	150	100	200	154	3
1999	550	235	760	312	(43)	150	100	200	156	4
20 yr Ave.	473	318	738	624	67	140	125	231	192	46
1980-89	405	300	700	744	141	130	120	225	212	78
1990-99	540	330	760	504	(6)	150	128	235	171	14
2000	550	340	760	404	(27)	150	100	200	390	160

<sup>a</sup> Percent deviation = (actual minus goal) / goal (multiplied by 100).

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

<sup>c</sup> The "Optimal Escapement Goal of 235,000 sockeye set by the BOF in 1999.

**Appendix Table 2.** Forecast and inshore chinook salmon return, in thousands of fish, Nushagak District, 1980-2000.

Year	Forecast			Inshore Run <sup>a</sup>	Forecast Error (%)		
	Spawner Recruit	Mean Percent	Sibling		Spawner Recruit	Mean Percent	Sibling
1980	329	206	162	219	50	-6	-26
1981	339	230	198	356	-5	-35	-44
1982	319	256	213	356	-10	-28	-40
1983	322	266	224	313	3	-15	-28
1984	236	319	165	154	53	107	7
1985	308	434	162	193	60	125	-16
1986	299	543	168	119	151	356	41
1987	353	366	125	140	152	161	-11
1988			139	80			74
1989			129	102			26
1990			116	88			32
1991			120 <sup>b</sup>	135			-11
1992			196 <sup>b</sup>	142			38
1993			139 <sup>b</sup>	175			-21
1994 <sup>c</sup>			151 <sup>b</sup>	229			-34
1995 <sup>c</sup>			177 <sup>b</sup>	178			-1
1996 <sup>c</sup>			150 <sup>b</sup>	135			11
1997 <sup>c</sup>			157 <sup>b</sup>	226			-31
1998 <sup>c</sup>			159 <sup>b</sup>	237			-33
1999 <sup>c</sup>			214 <sup>b</sup>	79			171
Mean Percent Error					57	83	5
2000 <sup>c</sup>			101 <sup>b</sup>	68 <sup>d</sup>			49

<sup>a</sup> Inshore Nushagak River run includes commercial, subsistence and sport harvests below the sonar, and in river run estimated by sonar at Portage Creek.

<sup>b</sup> Adjusted (reduced) by the average forecast error from 1984 to the current year.

<sup>c</sup> Mean returns were used to predict age 1.1 and age 1.2, other year classes were forecast using sibling data.

<sup>d</sup> Preliminary

(Sources: 1, 4, 5, 6, and 14)

**Appendix Table 3.** Salmon entry permit registration by gear and residency, Bristol Bay, 1980-2000.<sup>a,b</sup>

Year	Drift Net <sup>c</sup>			Set Net <sup>c</sup>			Total
	Resident	Non-Resident	Drift Total	Resident	Non-Resident	Set Total	
1980	1,061 (92)	765 (18)	1,826	758 (29)	189 (5)	947	2,773
1981	1,056 (98)	770 (18)	1,826	751 (37)	204 (5)	955	2,781
1982	1,048 (84)	776 (16)	1,824	741 (36)	216 (5)	957	2,781
1983	1,072 (79)	750 (16)	1,822	741 (33)	219 (3)	960	2,782
1984	1,049 (73)	771 (16)	1,820	743 (28)	219 (3)	962	2,782
1985	1,062 (83)	772 (13)	1,834	741 (24)	218 (4)	959	2,793
1986	1,060 (78)	778 (17)	1,838	739 (18)	223 (4)	962	2,800
1987	1,044 (75)	793 (16)	1,837	736 (14)	224 (4)	960	2,797
1988	1,033 (78)	806 (12)	1,839	731 (14)	227 (3)	958	2,797
1989	1,036 (77)	831 (14)	1,867	785 (14)	240 (4)	1,025	2,892
1990	1,039 (78)	839 (15)	1,878	783 (11)	243 (5)	1,026	2,904
1991	1,020 (74)	861 (14)	1,881	771 (8)	253 (4)	1,024	2,905
1992	998 (72)	885 (15)	1,883	774 (8)	251 (0)	1,025	2,908
1993	984 (65)	902 (16)	1,886	763 (8)	259 (0)	1,022	2,908
1994	972 (63)	915 (14)	1,887	760 (7)	259 (0)	1,019	2,906
1995	969 (62)	919 (13)	1,888	762 (8)	257 (0)	1,019	2,907
1996	966 (56)	925 (14)	1,891	760 (6)	257 (0)	1,017	2,908
1997	959 (56)	940 (14)	1,899	757 (6)	262 (0)	1,019	2,918
1998	955 (43)	944 (12)	1,899	756 (6)	259 (0)	1,015	2,914
1999	937 (37)	961 (11)	1,898	750 (5)	264 (1)	1,014	2,912
20 Year Average	1,016	845	1,861	755	237	992	2,853
1980-89 Average	1,052	781	1,833	747	218	965	2,798
1990-99 Average	980	909	1,889	764	256	1,020	2,909
2000	939 (25)	951 (7)	1,890	736 (5)	276 (0)	1,012	2,902

<sup>a</sup> Total license/permit registration, however, not all permit's fished.<sup>b</sup> Limited Entry went into effect in 1974. Figure in parenthesis are interim-use permits, and are included in the totals.<sup>c</sup> 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.

(Source: 10)

**Appendix Table 4.** Salmon fishing interim-use and permanent entry permits, by gear type, Bristol Bay, 1980-2000.

Year	Permits Issued			Permits Fished	
	Interim -Use	Permanent	Total	Number	Percent
<b>Drift Gill Net</b>					
1980	110	1,719	1,829	1,764	96%
1981	107	1,722	1,829	1,785	98%
1982	100	1,726	1,826	1,792	98%
1983	94	1,729	1,823	1,797	99%
1984	89	1,731	1,820	1,804	99%
1985	96	1,740	1,836	1,815	99%
1986	95	1,745	1,840	1,823	99%
1987	91	1,748	1,839	1,824	99%
1988	90	1,751	1,841	1,837	100%
1989	91	1,778	1,869	1,855	99%
1990	93	1,787	1,880	1,869	99%
1991	88	1,795	1,883	1,873	99%
1992	87	1,799	1,886	1,879	100%
1993	81	1,807	1,888	1,875	99%
1994	77	1,813	1,890	1,865	99%
1995	75	1,816	1,891	1,882	100%
1996	70	1,824	1,894	1,884	99%
1997	68	1,835	1,903	1,875	99%
1998	55	1,847	1,902	1,858	98%
1999	52	1,854	1,906	1,847	97%
Average	85	1,778	1,864	1,840	99%
2000 <sup>a</sup>	38	1,861	1,899	1852	98%
<b>Set Gill Net</b>					
1980	34	915	949	807	85%
1981	42	916	958	841	88%
1982	41	918	959	859	90%
1983	31	931	962	865	90%
1984	31	933	964	869	90%
1985	28	935	963	872	91%
1986	22	944	966	869	90%
1987	18	949	967	899	93%
1988	17	949	966	922	95%
1989	18	1,017	1,035	971	94%
1990	16	1,023	1,039	971	93%
1991	12	1,024	1,036	950	92%
1992	8	1,031	1,039	968	93%
1993	8	1,032	1,040	965	93%
1994	7	1,032	1,039	939	90%
1995	8	1,033	1,041	967	93%
1996	6	1,034	1,040	941	90%
1997	7	1,035	1,042	921	88%
1998	6	1,035	1,041	901	87%
1999	6	1,057	1,041	925	89%
Average	18	987	1,004	911	91%
2000 <sup>a</sup>	6	1,037	1,043	942	90%

<sup>a</sup> Preliminary

(Source: 10)

**Appendix Table 5.** Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	15,120,457	2,623,066	885,875	4,497,787	634,561	23,761,746
81	10,992,809	4,361,406	2,116,066	7,493,093	639,707	25,603,081
82	5,005,802	2,447,514	1,139,192	5,916,187	595,696	15,104,391
83	21,559,372	6,755,256	3,349,451	5,119,744	588,208	37,372,031
84	14,546,710	5,190,413	2,658,376	1,992,681	322,126	24,710,306
1985	8,179,093	7,537,273	6,468,862	1,307,889	209,766	23,702,883
86	2,892,171	4,852,935	5,002,949	2,719,313	308,688	15,776,056
87	4,986,002	5,356,669	2,128,652	3,254,720	342,732	16,068,775
88	3,480,836	6,456,598	1,523,520	1,706,716	822,087	13,989,757
89	13,809,956	8,901,994	3,146,239	2,788,185	88,932	28,735,306
1990	17,272,224	10,371,762	2,149,009	3,532,543	197,589	33,523,127
91	10,475,206	6,797,166	2,945,742	5,053,845	549,221	25,821,180
92	9,395,948	15,646,575	3,320,966	2,789,741	726,446	31,879,676
93	8,907,876	21,600,858	4,176,900	5,236,557	539,933	40,462,124
94	16,327,858	10,750,213	4,352,797	3,393,143	400,039	35,224,050
1995	20,279,581	14,425,979	4,509,446	4,445,883	605,328	44,266,217
96	8,211,983	10,809,115	4,411,055	5,693,523	462,621	29,588,297
97	589,311	7,517,389	1,402,690	2,506,818	142,569	12,158,777
98	2,595,439	3,528,845	730,247	2,990,597	190,446	10,035,574
99	9,452,972	7,388,080	2,256,007	6,175,419	385,411	25,657,889
20-Year Average	10,204,080	8,165,955	2,933,702	3,930,719	437,605	25,672,062
1980-89 Average	10,057,321	5,448,312	2,841,918	3,679,632	455,250	22,482,433
1990-99 Average	10,350,840	10,883,598	3,025,486	4,181,807	419,960	28,861,691
2000	4,727,061	7,050,899	1,538,790	6,367,208	794,996	20,478,954

(Sources: 1 and 4)

**Appendix Table 6.** Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	7,517	5,610	4,900	64,958	12,543	95,528
1981	11,048	5,468	3,416	193,461	23,911	237,304
1982	12,425	4,834	7,170	195,287	33,786	253,502
1983	8,955	4,758	9,276	137,123	38,497	198,609
1984	8,972	4,680	4,767	61,378	22,179	101,976
1985	5,697	4,015	5,840	67,783	37,106	120,441
1986	3,188	1,883	2,982	65,783	19,880	93,716
1987	5,175	2,959	4,065	45,983	17,217	75,399
1988	6,538	3,103	3,444	16,648	15,606	45,339
1989	6,611	2,034	2,112	17,637	11,366	39,760
1990	5,068	1,146	1,840	14,812	11,130	33,996
1991	3,584	510	589	19,718	6,039	30,440
1992	5,724	694	2,146	47,563	12,640	68,767
1993	7,477	1,478	3,075	62,976	10,851	85,857
1994	6,016	1,243	3,685	119,480	10,486	140,910
1995	5,084	760	1,551	79,942	11,981	99,318
1996	4,195	980	588	72,011	8,602	86,376
1997	2,839	2,047	1,084	64,294	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
20-Year Average	5,993	2,484	3,226	73,311	16,799	101,812
1980-89 Average	7,613	3,934	4,797	86,604	23,209	126,157
1990-99 Average	4,373	1,033	1,654	60,018	10,389	77,467
2000	1,027	1,061	893	12,055	7,858	22,894

(Sources: 1 and 4)

**Appendix Table 7.** Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980 - 2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	204,515	78,556	36,343	681,930	299,682	1,301,026
1981	355,943	87,581	36,275	795,143	229,886	1,504,828
1982	198,019	84,329	53,204	434,817	151,000	921,369
1983	351,769	127,490	105,171	725,060	322,691	1,632,181
1984	447,259	178,096	210,611	850,114	336,660	2,022,740
1985	210,107	126,736	131,576	396,740	203,302	1,068,461
1986	262,925	94,666	111,112	488,375	270,057	1,227,135
1987	446,908	145,259	101,074	416,476	419,425	1,529,142
1988	295,571	237,888	94,545	371,196	470,132	1,469,332
1989	310,869	136,185	84,673	523,903	203,178	1,258,808
1990	422,276	123,087	32,013	378,223	102,861	1,058,460
1991	443,189	75,892	60,299	463,780	246,589	1,289,749
1992	167,168	121,472	57,170	398,691	176,123	920,624
1993	43,684	70,628	73,402	505,799	144,869	838,382
1994	219,118	62,961	52,127	328,267	232,559	895,032
1995	236,472	68,325	62,801	390,158	221,126	978,882
1996	124,137	85,151	103,392	324,261	207,094	844,035
1997	8,719	53,139	16,379	181,253	47,459	306,949
1998	82,281	29,405	8,088	208,551	67,595	395,920
1999	259,922	74,890	68,004	170,795	111,677	685,288
20-Year Average	254,543	103,087	74,913	451,677	223,198	1,107,417
1980-89 Average	308,389	129,679	96,458	568,375	290,601	1,393,502
1990-99 Average	200,697	76,495	53,368	334,978	155,795	821,332
2000	68,218	38,857	36,349	114,454	140,175	398,053

(Sources: 1 and 4)

**Appendix Table 8.** Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	288,363	2,476	51	2,202,545	70,033	2,563,468
1981	194	222	29	345	6,490	7,280
1982	127,560	1,997	170	1,339,272	23,417	1,492,416
1983	51	92	0	137	204	484
1984	211,306	5,759	2,387	3,127,153	19,468	3,366,073
1985	39	51	3	48	316	457
1986	106,919	2,749	98	267,117	24,404	401,287
1987	5	0	30	2	20	57
1988	648,569	4,485	218	243,890	58,084	955,246
1989	75	6	29	156	172	438
1990	421,690	11,593	361	54,127	8,746	496,517
1991	102	15	2	69	117	305
1992	214,228	694	525	190,102	93,989	499,538
1993	86	2	2	83	240	413
1994	11,537	145	21	8,562	69,552	89,817
1995	55	1	1	120	294	471
1996	4,590	22	21	2,681	30,308	37,622
1997	39	2	0	50	27	118
1998	11,317	674	247	6,787	6,406	25,431
1999	11	0	3	52	2	68
20-Year Average <sup>a</sup>	204,608	3,059	410	744,224	40,441	992,742
1980-89 Average <sup>a</sup>	276,543	3,493	585	1,435,995	39,081	1,755,698
1990-99 Average <sup>a</sup>	132,672	2,626	235	52,452	41,800	229,785
2000	19,659	32	4	38,309	695	58,699

<sup>a</sup> Includes even numbered years only.

(Sources: 1 and 4)

**Appendix Table 9.** Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	7,802	22,537	19,419	147,726	151,000	348,484
1981	1,229	32,759	30,220	220,290	29,207	313,705
1982	10,586	74,989	50,803	349,669	133,765	619,812
1983	7,282	25,954	7,816	81,338	5,711	128,101
1984	3,209	66,589	68,451	260,310	176,053	574,612
1985	10,474	32,667	60,815	20,230	38,636	162,822
1986	5,824	33,607	25,770	68,568	48,306	182,075
1987	5,274	30,789	14,785	13,263	1,292	65,403
1988	29,988	48,981	52,355	52,698	18,468	202,490
1989	22,668	49,175	33,942	77,077	56,972	239,834
1990	16,091	43,897	32,906	7,733	2,690	103,317
1991	17,527	47,486	42,622	5,574	4,531	117,740
1992	18,553	47,780	35,794	84,077	5,328	191,532
1993	1,779	41,603	2,387	14,345	12,615	72,729
1994	5,877	48,436	19,250	5,615	96,062	175,240
1995	981	21,772	13,800	4,896	8,917	50,366
1996	3,601	38,156	13,163	11,401	58,978	125,299
1997	718	35,470	7,156	4,110	2,970	50,424
1998	1,587	29,856	13,007	22,703	52,630	119,783
1999	303	11,464	2,289	2,836	2,653	19,545
20-Year Average	8,568	39,198	27,338	72,723	45,339	193,166
1980-89 Average	10,434	41,805	36,438	129,117	65,941	283,734
1990-99 Average	6,702	36,592	18,237	16,329	24,737	102,598
2000	952	13,166	1,269	112,819	2,758	130,964

(Sources: 1 and 4)

**Appendix Table 10.** Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1980 - 2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	15,628,654	2,732,245	946,588	7,594,946	1,167,819	28,070,252
1981	11,361,223	4,487,436	2,186,006	8,702,332	929,201	27,666,198
1982	5,354,392	2,613,663	1,250,539	8,235,232	937,664	18,391,490
1983	21,927,429	6,913,550	3,471,714	6,063,402	955,311	39,331,406
1984	15,217,456	5,445,537	2,944,592	6,291,636	876,486	30,775,707
1985	8,405,410	7,700,742	6,667,096	1,792,690	489,126	25,055,064
1986	3,271,027	4,985,840	5,142,911	3,609,156	671,335	17,680,269
1987	5,443,364	5,535,676	2,248,606	3,730,444	780,686	17,738,776
1988	4,461,502	6,751,055	1,674,082	2,391,148	1,384,377	16,662,164
1989	14,150,179	9,089,394	3,266,995	3,406,958	360,620	30,274,146
1990	18,137,349	10,551,485	2,216,129	3,987,438	323,016	35,215,417
1991	10,939,608	6,921,069	3,049,254	5,542,986	806,497	27,259,414
1992	9,801,621	15,817,215	3,416,601	3,510,174	1,014,526	33,560,137
1993	8,960,902	21,714,569	4,255,766	5,819,760	708,508	41,459,505
1994	16,570,406	10,862,998	4,427,880	3,855,157	808,698	36,525,139
1995	20,522,297	14,516,875	4,587,276	4,920,284	847,600	45,394,332
1996	8,322,312	10,900,288	4,530,995	6,111,030	724,023	30,588,648
1997	616,084	7,626,863	1,432,200	2,866,890	200,676	12,742,713
1998	2,693,068	3,589,540	751,962	3,345,717	336,995	10,717,282
1999	9,714,503	7,475,146	2,327,941	6,359,995	511,662	26,389,247
20-Year Average	10,574,939	8,311,559	3,039,757	4,906,869	741,741	27,574,865
1980-89 Average	10,522,064	5,625,514	2,979,913	5,181,794	855,263	25,164,547
1990-99 Average	10,627,815	10,997,605	3,099,600	4,631,943	628,220	29,985,183
2000	4,816,917	7,104,015	1,577,305	6,644,845	946,482	21,089,564

(Sources: 1 and 4)

**Appendix Table 11.** Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak			Egegik		Ugashik		Nushagak			WRSHA <sup>a</sup>		Togiak		Total <sup>b</sup>	
	Drift	Setnet	Section	Drift	Set	Drift	Set	Drift	Setnet	Section	Drift	Set	Drift	Set	Drift	Set
	Naknek	Kvichak						Nushagak	Igushik							
1980	88	12		69	31	87	13	85	15				83	17	86	14
1981	86	14		77	23	89	11	81	19				79	21	86	14
1982	87	13		83	17	87	13	90	10				84	16	87	13
1983	92	8		86	14	93	7	86	14				80	20	90	10
1984	89	11		92	8	92	8	83	17				77	23	90	10
1985	87	13		93	7	96	4	65	35				75	25	90	10
1986	70	30		89	11	94	6	76	24				68	32	85	15
1987	86	14		91	9	93	7	80	20				66	34	87	13
1988	86	14		90	10	91	9	75	25				64	36	86	14
1989	89	11		90	10	87	13	58	42				55	45	86	14
1990	88	12		91	9	91	9	67	33				67	33	87	13
1991	89	11		91	9	89	11	76	24				64	36	86	14
1992	89	11		91	9	90	10	65	35				62	38	88	12
1993	84	16		93	7	90	10	72	28				54	46	87	13
1994	90	10		92	8	94	6	68	32				52	48	88	12
1995	89	11		90	10	95	5	68	32				52	48	87	13
1996	83	17		90	10	95	5	81	19				52	55	86	14
1997	73	27		87	13	88	12	70	30				37	63	82	18
1998	84	8	8	86	14	85	15	72	24	4	76	24	43	57	80	20
1999	85	8	7	85	15	89	11	70	24	6	78	22	53	47	81	19
20-Year Average	86	14		88	12	91	9	74	25				63	37	86	14
1980-89 Average	86	14		86	14	91	9	78	22				73	27	87	13
1990-99 Average	85	15		90	10	91	9	71	28				54	47	85	15
2000	82	12	6	84	16	87	13	79	15	6	68	32				
Allocation <sup>c</sup>	84	8	8	86	14	90	10	74	20	6	74	26	n.a.	n.a.	n.a.	n.a.

<sup>a</sup> Wood River Special Harvest Area (WRSHA), Nushagak District.

<sup>b</sup> Percentages based on total fish caught per gear group.

<sup>c</sup> BOF inacted current allocation plan in 1998.

**Appendix Table 12.** Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak <sup>a</sup>	Egegik <sup>b</sup>	Ugashik <sup>c</sup>	Nushagak <sup>d</sup>	Togiak <sup>e</sup>	Total
1980	25,447,866	1,060,920	3,335,254	8,310,438	572,450	38,726,928
1981	3,632,788	694,680	1,327,699	2,850,637	365,910	8,871,714
1982	2,529,692	1,034,628	1,185,551	2,012,742	341,424	7,104,037
1983	4,554,496	792,282	1,001,358	1,948,474	239,610	8,536,220
1984	11,948,514	1,165,345	1,270,318	1,814,686	200,778	16,399,641
1985	9,179,014	1,095,204	1,006,407	1,684,760	190,082	13,155,467
1986	3,387,147	1,151,750	1,015,582	2,134,490	271,184	7,960,153
1987	7,281,896	1,273,553	686,894	1,895,961	316,076	11,454,380
1988	5,297,708	1,599,161	654,412	1,524,704	340,712	9,416,697
1989	9,676,244	1,611,566	1,713,281	2,189,501	125,080	15,315,672
1990	9,231,358	2,191,582	749,478	2,144,444	278,202	14,595,064
1991	8,078,885	2,786,925	2,482,001	2,419,488	320,713	16,088,012
1992	6,557,157	1,945,632	2,194,927	2,286,278	266,956	13,250,950
1993	5,908,799	1,517,000	1,413,454	2,296,789	242,475	11,378,517
1994	9,571,245	1,894,977	1,095,068	2,449,616	233,632	15,244,538
1995	11,365,573	1,282,508	1,321,108	2,254,231	240,266	16,463,686
1996	2,835,426	1,075,596	692,167	2,553,995 <sup>†</sup>	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 <sup>†</sup>	231,196	14,194,749
20-Year Average	7,564,272	1,405,801	1,319,425	2,475,215	268,763	13,033,476
1980-89 Average	8,293,537	1,147,909	1,319,676	2,636,639	296,331	13,694,091
1990-99 Average	6,835,008	1,663,693	1,319,174	2,313,790	241,196	12,372,861
2000	3,654,568	1,032,138	638,420	2,116,842 <sup>†</sup>	390,080	7,832,048

<sup>a</sup> Includes Kvichak, Branch and Naknek Rivers.

<sup>b</sup> Includes Egegik River. Also includes King Salmon River in 1986-95, and Shosky Creek in 1988-2000.

<sup>c</sup> Includes Ugashik River. Also includes Mother Goose River system 1980-2000 and Dog Salmon River system in 1984-2000.

<sup>d</sup> Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.

<sup>e</sup> Includes Togiak River, Lake tributaries, Kulukak system and other miscellaneous river systems.

<sup>†</sup> Snake River not surveyed.

(Sources: 1, 6, and 9)

**Appendix Table 13.** Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District by river system, in numbers of fish, Bristol Bay, 1980-2000.

Year	Catch	Escapement			Total	Total Run
		Kvichak <sup>a</sup>	Branch <sup>b</sup>	Naknek <sup>a</sup>		
1980	15,120,457	22,505,268	297,900	2,644,698	25,447,866	40,568,323
1981	10,992,809	1,754,358	82,210	1,796,220	3,632,788	14,625,597
1982	5,005,802	1,134,840	239,300	1,155,552	2,529,692	7,535,494
1983	21,559,372	3,569,982	96,220	888,294	4,554,496	26,113,868
1984	14,546,710	10,490,670	215,370	1,242,474	11,948,514	26,495,224
1985	8,179,093	7,211,046	118,030	1,849,938	9,179,014	17,358,107
1986	2,892,171	1,179,322	230,180	1,977,645	3,387,147	6,279,318
1987	4,986,002	6,065,880	154,210	1,061,806	7,281,896	12,267,898
1988	3,480,836	4,065,216	194,630	1,037,862	5,297,708	8,778,544
1989	13,809,956	8,317,500	196,760	1,161,984	9,676,244	23,486,200
1990	17,272,224	6,970,020	168,760	2,092,578	9,231,358	26,503,582
1991	10,475,206	4,222,788	277,589	3,578,508	8,078,885	18,554,091
1992	9,395,948	4,725,864	224,643	1,606,650	6,557,157	15,953,105
1993	8,907,876	4,025,166	347,975	1,535,658	5,908,799	14,816,675
1994	16,327,858	8,337,840	242,595	990,810	9,571,245	25,899,103
1995	20,279,581	10,038,720	215,713	1,111,140	11,365,573	31,645,154
1996	8,211,983	1,450,578	306,750	1,078,098	2,835,426	11,047,409
1997	589,311	1,503,732	218,115	1,025,664	2,747,511	3,336,822
1998	2,595,439	2,296,074	252,200	1,202,172	3,750,446	6,345,885
1999	9,452,972	6,196,914	481,600	1,625,364	8,303,878	17,756,850
20 Year Average	10,204,080	5,803,089	228,038	1,533,156	7,564,282	17,768,362
1980-89 Average	10,057,321	6,629,408	182,481	1,481,647	8,293,537	18,350,857
1990-99 Average	10,350,840	4,976,770	273,594	1,584,664	6,835,028	17,185,868
2000	4,727,061	1,827,780	451,300	1,375,488	3,654,568	8,381,629

<sup>a</sup> Tower count

<sup>b</sup> Aerial survey estimates

(Sources: 1, 6, and 9)

Appendix Table 14. Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1980-2000.

Year	Kvichak		Branch		Naknek		Total Run <sup>a</sup>
	Number	%	Number	%	Number	%	
1980	35,248	87	561	1	4,759	12	40,568
1981	6,989	48	311	2	7,326	50	14,626
1982	2,993	40	772	10	3,770	50	7,535
1983	20,105	77	557	2	5,452	21	26,114
1984	23,014	87	555	2	2,926	11	26,495
1985	13,394	77	264	2	3,699	21	17,357
1986	1,966	31	399	6	3,913	62	6,278
1987	9,593	78	297	2	2,378	19	12,268
1988	6,720	77	320	4	1,739	20	8,779
1989	19,774	84	534	2	3,179	14	23,487
1990	17,521	66	555	2	8,427	32	26,503
1991	8,032	43	604	3	9,918	53	18,554
1992	10,445	65	487	3	5,021	31	15,953
1993	9,313	63	817	6	4,687	32	14,817
1994	22,232	86	634	2	3,033	12	25,899
1995	27,431	87	651	2	3,564	11	31,646
1996	3,458	31	706	6	6,860	62	11,024
1997	1,683	50	244	7	1,409	42	3,336
1998	3,412	54	388	6	2,546	40	6,346
1999	12,947	73	1,070	6	3,740	21	17,757
20 Year Average	12,814	65	536	4	4,417	31	17,767
1980-89 Average	13,980	69	457	3	3,914	28	18,351
1990-99 Average	11,647	62	616	4	4,921	34	17,184
2000	2,862	34	731	9	4,789	57	8,382

<sup>a</sup> Due to rounding of river system total runs, the district total run may not equal the sum of the rows.

(Sources: 1 and 6)

**Appendix Table 15.** Inshore commercial catch and escapement of sockeye salmon in the Egeg by river system, 1980-2000.

Year	Catch	Escapement			Total Run
		Egegik <sup>a</sup>	Shosky Cr. <sup>1</sup>	King Salmon <sup>b</sup> River	
1980	2,623,066	1,060,920			3,683,986
1981	4,361,406	694,680			5,056,086
1982	2,447,514	1,034,628			3,482,142
1983	6,755,256	792,282			7,547,538
1984	5,190,413	1,165,320		25	6,355,758
1985	7,537,273	1,095,204			8,632,477
1986	4,852,935	1,151,320		430	6,004,685
1987	5,356,669	1,272,978		575	6,630,222
1988	6,456,598	1,599,096	65		8,055,759
1989	8,901,994	1,610,916	50	600	10,513,560
1990	10,371,762	2,191,362		220	12,563,344
1991	6,797,166	2,786,880		45	9,584,091
1992	15,646,575	1,945,332		300	17,592,207
1993	21,600,858	1,516,980	20		23,117,858
1994	10,750,213	1,894,932	15	30	12,645,190
1995	14,425,979	1,281,678		830	15,708,487
1996	10,809,115	1,075,596			11,884,711
1997	7,517,389	1,103,964	40		8,621,393
1998	3,528,845	1,110,882	50		4,639,777
1999	7,388,080	1,727,772			9,115,852
20-Year Ave.	8,165,955	1,405,636	40	339	9,571,756
1980-89 Ave.	5,448,312	1,147,734	58	408	6,596,221
1990-99 Ave.	10,883,598	1,663,538	31	285	12,547,291
2000	7,050,899	1,032,138			8,083,037

<sup>a</sup> Tower count.

<sup>b</sup> Aerial survey index count.

(Sources: 1 and 6)

**Appendix Table 16.** Inshore commercial catch and escapement of sockeye salmon in the Ugashik District by river system, 1980-2000.

Year	Catch	Escapement			Total Run
		Ugashik <sup>a</sup> River	King Salmon River	Dog Salmon <sup>b</sup> River	
1980	885,875	3,321,354	13,900		4,221,129
1981	2,116,066	1,326,762	937		3,443,765
1982	1,139,192	1,157,526	28,025		2,324,743
1983	3,349,451	1,000,608	750		4,350,809
1984	2,658,376	1,241,418	17,100	11,800	3,928,694
1985	6,468,862	998,232	7,400	775	7,475,269
1986	5,002,949	1,001,492	4,310	9,780	6,018,531
1987	2,128,652	668,964	15,855	2,075	2,815,546
1988	1,523,520	642,972	8,360	3,080	2,177,932
1989	3,146,239	1,681,296	25,480	6,505	4,859,520
1990	2,149,009	730,038	11,340	8,100	2,898,487
1991	2,945,742	2,457,306	12,195	12,500	5,427,743
1992	3,320,966	2,173,692	13,425	7,810	5,515,893
1993	4,176,900	1,389,534	22,570	1,350	5,590,354
1994	4,352,797	1,080,858	8,885	5,325	5,447,865
1995	4,509,446	1,304,058	7,650	9,400	5,830,554
1996	4,411,055	667,518	7,230	17,419	5,103,222
1997	1,402,690	618,396	27,645	10,600	2,059,331
1998	730,274	890,508	27,425	6,920	1,655,127
1999	2,256,007	1,651,572	6,350	4,120	3,918,049
20-Year Ave.	2,933,703	1,300,205	13,342	7,347	4,253,128
1980-89 Ave.	2,841,918	1,304,062	12,212	5,669	4,161,594
1990-99 Ave.	3,025,489	1,296,348	14,472	8,354	4,344,663
2000	1,538,790	620,040	12,900	5,480	2,177,210

<sup>a</sup> Tower count.

<sup>b</sup> Aerial survey.

(Sources: 1, 6 and 9)

**Appendix Table 17.** Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in number of fish, 1980-2000.

Year	Catch	Escapement						Total	Total Run
		Wood <sup>a</sup>	Igushik <sup>a</sup>	Nuyakuk <sup>a</sup>	Nush/Mul <sup>b</sup>	Nushagak <sup>c</sup>	Snake <sup>d</sup>		
1980	4,497,787	2,969,040	1,987,530	3,026,568	290,800		36,500	4,993,070	9,490,857
1981	7,493,093	1,233,318	591,144	834,204	177,400		14,571	1,839,033	9,332,126
1982	5,916,187	976,470	423,768	537,864	63,000		11,640	1,411,878	7,328,065
1983	5,119,744	1,360,968	180,438	318,606	85,400		3,080	1,544,486	6,664,230
1984	1,992,681	1,002,792	184,872	472,596	120,586		33,840	1,221,504	3,214,185
1985	1,307,889	939,000	212,454	429,162	69,300		34,880	1,186,334	2,494,223
1986	2,719,313	818,652	307,728	821,898	168,340		16,780	1,143,160	3,862,473
1987	3,254,720	1,337,172	169,236	163,000	225,033		1,520	1,507,928	4,762,648
1988	1,706,716	866,778	170,454	319,992	163,208		4,320	1,041,552	2,748,268
1989	2,788,185	1,186,410	461,610			513,421	28,060	2,189,501	4,977,686
1990	3,532,543	1,069,440	365,802			680,368	28,840	2,144,450	5,676,993
1991	5,053,845	1,159,920	756,126			492,522	10,920	2,419,488	7,473,333
1992	2,789,741	1,286,250	304,920			695,108		2,286,278	5,076,019
1993	5,236,557	1,176,126	405,564			715,099		2,296,789	7,533,346
1994	3,393,143	1,471,890	445,920			509,326	22,480	2,449,616	5,842,759
1995	4,445,883	1,482,162	473,382	69,702	211,605	281,307	17,380	2,254,231	6,700,114
1996	5,693,523	1,649,598	400,746	250,692	252,959	503,651		2,553,995	8,247,518
1997	2,618,170	1,512,396	127,704	272,982	100,053	373,035	8,394	2,021,529	4,639,699
1998	2,961,200	1,755,768	215,904	146,250	312,624	458,874	11,120	2,441,666	5,402,866
1999	6,175,419	1,512,426	445,536	81,006	311,899	392,905	<sup>e</sup>	2,350,867	8,526,286
20-year Ave.	3,934,817	1,338,329	431,542	553,180	182,301	510,511	17,770	2,064,868	5,999,685
1980-89 Ave.	3,679,632	1,269,060	468,923	769,321	151,452	513,421	18,519	1,807,845	5,487,476
1990-99 Ave.	4,190,002	1,407,598	394,160	164,126	237,828	510,220	16,522	2,321,891	6,511,893
2000	6,367,208	1,300,026	413,316	129,468	274,032	403,500	<sup>e</sup>	2,116,842	8,484,050

<sup>a</sup> Tower count.

(Sources: 1, 6,10 and 11)

<sup>b</sup> Aerial survey estimates 1977-83, 1985, and 1987. Escapement estimates for 1984, 1988, and 1995-99, were derived from the difference between lower river sonar estimates and Nuyakuk Tower counts. Escapement estimates for 1976 and 1986 based on the average ratio of Nuyakuk/Nushagak-Mulchatna river system in years when data was available.

<sup>c</sup> Total escapements from 1989 on are determined for the entire Nushagak River drainage using Portage Creek sonar estimates.

<sup>d</sup> Aerial survey estimate 1980, 1982-91, 1994-95 and 1997; weir count 1975-79 and 1981, not surveyed in 1992, 1993 or 1996 due to lack of funding.

<sup>e</sup> Snake River escapement is not included this year because staff was unable to conduct aerial surveys.

100

**Appendix Table 18.** Inshore sockeye salmon total run by river system, in thousands of fish and percent, Nushagak District, 1980-2000.

Year	Wood		Igushik		Nuyakuk		Nush-Mul		Nushagak		Snake		Total Run <sup>a</sup>
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	
1980	4,529	35	3,126	24	4,826	38	291	2			37	0	12,809
1981	4,568	44	2,229	22	3,319	32	177	2			52	1	10,345
1982	3,471	44	1,818	23	2,079	26	550	7			12	0	7,930
1983	4,272	60	813	12	1,379	20	601	9			3	0	7,068
1984	1,982	52	435	11	906	24	451	12			34	1	3,808
1985	1,593	53	460	15	697	23	208	7			35	1	2,993
1986	1,772	37	877	18	1,762	36	425	9			17	0	4,853
1987	2,828	55	617	12	589	11	1,116	22			2	0	5,152
1988	1,749	54	406	13	649	20	424	13			4	0	3,232
1989	2,519	51	1,214	24					1,217	24	28	1	4,978
1990	2,610	46	1,280	23					1,757	31	29	1	5,676
1991	3,303	44	2,424	32					1,736	23	11	0	7,474
1992	2,481	49	794	16					1,802	35			5,077
1993	3,725	49	1,580	21					2,228	30			7,533
1994	2,957	51	1,300	22					1,543	26	42	1	5,842
1995	4,022	60	1,902	28					756	11	20	0	6,700
1996	5,030	61	1,502	18					1,771	21			8,303
1997	3,480	75	293	6					858	18	8	0	4,639
1998	3,949	73	585	11					869	16			5,403
1999	5,930	70	1,563	19					952	11	<sup>b</sup>		8,445
20-Year Ave.	3,339	53	1,261	19	1,801	26	471	9	1,408	23	22	0	6,413
1980-89 Ave.	2,928	49	1,200	17	1,801	26	471	9	1,217	24	22	0	6,317
1990-99 Ave.	3,749	58	1,322	20					1,427	22	22	0	6,509
2000	5,278	62%	1,748	21%		0%		0%	1,458	17%	<sup>b</sup>		8,484

<sup>a</sup> Due to rounding, the district total runs may not equal the sum of the rows.

<sup>b</sup> Snake River escapement is not included this year because staff was unable to conduct aerial surveys.

(Sources: 1 and 6)

**Appendix Table 19.** Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, 1980-2000.

Year	Catch				Escapement						Total Run
	Togiak	Kulukak	Os/Mat <sup>a</sup>	Total	Togiak			Kulukak <sup>c</sup>	Other <sup>f</sup>	Total	
					Lake <sup>b</sup>	River <sup>c</sup>	Tributaries <sup>u</sup>				
1980	591,470	42,811	280	634,561	461,850	27,900	37,000	45,700		572,450	1,207,011
1981	620,288	19,246	173	639,707	208,080	21,150	77,900	58,780		365,910	1,005,617
1982	581,718	13,952	26	595,696	244,824	3,450	40,400	52,750		341,424	937,120
1983	529,775	55,906	2,527	588,208	191,520	7,200	13,920	26,970		239,610	827,818
1984	213,213	96,709	12,204	322,126	95,448	15,830	39,700	49,800		200,778	522,904
1985	133,263	44,120	32,383	209,766	136,542	3,600	13,340	36,600		190,082	399,848
1986	191,158	100,466	17,064	308,688	168,384	20,000	15,000	42,800	25,000	271,184	579,872
1987	274,613	45,401	22,718	342,732	249,676	10,400	18,200	37,800		316,076	658,808
1988	673,408	143,112	5,567	822,087	276,612	18,800	13,600	31,700		340,712	1,162,799
1989	68,375	14,116	6,441	88,932	84,480	15,200	4,560	20,840		125,080	214,012
1990	168,688	27,311	1,590	197,589	141,977	17,540	29,605	49,600	39,480	278,202	475,791
1991 <sup>h</sup>	522,090	33,425	6,437	549,221	254,683	15,980	7,740	23,940	18,370	320,713	869,934
1992	610,575	108,358	7,513	726,446	199,056	6,060	10,400	26,440	25,000	266,956	993,402
1993	475,799	58,616	5,518	539,933	177,185	4,600	11,330	31,800	17,560	242,475	782,408
1994	321,121	76,781	2,137	400,039	154,752	6,200	13,220	29,740	29,720	233,632	633,671
1995	527,143	76,056	2,129	605,328	185,718	6,520	18,988	14,620	14,420	240,266	845,594
1996	381,539	76,833	1,691	460,063	156,954	18,320	11,900	18,980	6,370	212,524	672,587
1997	91,847	49,277	2,976	144,100	131,682	12,300	8,325	7,950	6,370	166,627	310,727
1998	112,739	76,332	1,375	190,446	153,576	9,780	12,120	12,950	26,200	214,626	405,051
1999	346,749	38,662	0	385,411	155,898	10,800	29,438	12,300	22,760	231,196	616,607
20-Year Ave.	371,779	59,875	6,537	437,554	191,445	12,582	21,334	31,603	21,023	268,526	706,079
1980-89 Ave.	387,728	57,584	9,938	455,250	211,742	14,353	27,362	40,374	25,000	296,331	751,581
1990-99 Ave.	355,829	62,165	3,137	419,858	171,148	10,810	15,307	22,832	20,625	240,722	660,577
2000	727,384	67,612	0	794,996	311,970	25,200	15,075	22,350	15,485	390,080	1,185,076

<sup>a</sup> Catches in the Osviak and Matogak sections were combined.

<sup>b</sup> Tower count.

<sup>c</sup> Aerial survey estimate.

<sup>d</sup> 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.

<sup>e</sup> Aerial survey estimate includes Kulukak River and Lake and Tithe Creek ponds.

<sup>f</sup> 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.

<sup>g</sup> Catches are Based on weekly processor reports. Fish tickets were not coded by section.

(Source: 1, 6, and 10)

**Appendix Table 20.** Inshore total run of sockeye by district, in numbers of fish, Bristol Bay, 1980-2000.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1980	40,568,323	3,683,986	4,221,129	12,808,225	1,207,011	62,488,674
1981	14,625,597	5,056,086	3,443,765	10,343,730	1,005,617	34,474,795
1982	7,535,494	3,482,142	2,324,743	7,928,929	937,120	22,208,428
1983	26,113,868	7,547,538	4,350,809	7,068,218	827,818	45,908,251
1984	26,495,224	6,355,758	3,928,694	3,807,367	522,904	41,109,947
1985	17,358,107	8,632,477	7,475,269	2,992,649	399,848	36,858,350
1986	6,279,318	6,004,685	6,018,531	4,853,803	579,872	23,736,209
1987	12,267,898	6,630,222	2,815,546	5,150,681	658,808	27,523,155
1988	8,778,544	8,055,759	2,177,932	3,231,420	1,162,799	23,406,454
1989	23,486,200	10,513,560	4,859,520	4,977,686	214,012	44,050,978
1990	26,503,582	12,563,344	2,898,487	5,676,987	475,791	48,118,191
1991	18,554,091	9,584,091	5,427,743	7,473,333	869,934	41,909,192
1992	15,953,105	17,592,207	5,515,893	5,076,019	993,402	45,130,626
1993	14,816,675	23,117,858	5,590,354	7,533,346	782,408	51,840,641
1994	25,899,103	12,645,190	5,447,865	5,842,759	633,671	50,468,588
1995	31,645,154	15,708,487	5,830,554	6,700,114	845,594	60,729,903
1996	11,047,409	11,884,711	5,103,222	8,247,518	672,587	36,955,447
1997	3,336,822	8,621,393	2,059,331	4,639,699	310,727	18,967,972
1998	6,345,885	4,639,777	1,655,127	5,402,866	405,051	18,448,706
1999	17,738,850	9,116,477	3,918,049	8,445,280	615,114	39,833,770
20-Year Average	17,767,462	9,571,787	4,253,128	6,410,031	706,004	38,708,414
1980-89 Average	18,350,857	6,596,221	4,161,594	6,316,271	751,581	36,176,524
1990-99 Average	17,184,068	12,547,354	4,344,663	6,503,792	660,428	41,240,304
2000	8,381,629	8,083,037	2,177,210	8,484,050	1,079,629	28,205,555

(Sources: 1 and 6)

**Appendix Table 21.** Chinook salmon harvest, escapement and total runs in the Nushagak District, 1980-2000.

Year	Harvests by Fishery				Inriver Abundance <sup>a</sup>	Spawning Escapement <sup>b</sup>	Total Run
	Commercial	Sport	Subsistence	Total			
1980	64,958	757	11,800	77,515		141,000	218,515
1981	193,461	1,220	11,500	206,181		150,000	356,181
1982	195,287	1,803	12,100	209,190		147,000	356,190
1983	137,123	2,003	11,800	150,926		161,730	312,656
1984	61,378	2,320	9,800	73,498		80,940	154,438
1985	67,783	1,809	7,900	77,492		115,720	193,212
1986	65,783	5,314	12,600	83,697	43,434	35,200	118,897
1987	45,983	3,258	12,428	61,669	84,309	78,217	139,886
1988	16,648	2,817	10,187	29,652	56,905	50,803	80,455
1989	17,637	3,613	8,122	29,372	78,302	73,095	102,467
1990	14,812	3,083	12,407	30,302	63,955	57,549	87,851
1991	19,718	5,551	13,627	38,896	104,351	96,378	135,274
1992	47,563	4,755	13,588	65,906	82,848	76,334	142,240
1993	62,976	5,899	17,709	86,584	97,812	88,568	175,152
1994	119,480	10,626	15,490	145,596	95,954	83,328	228,924
1995	79,943	4,951	13,701	98,595	85,622	79,147	177,742
1996	72,011	5,391	15,941	93,343	52,127	44,864	138,207
1997	64,294	3,498	15,318	83,110		82,000	165,110
1998	108,486	5,828	12,258	125,744	117,495	100,237	225,981
1999	10,893	4,238	4,906	20,037	62,331	59,331	79,368
20-Yr Mean	73,311	3,937	12,159	89,365	78,880	90,072	179,437
5-Yr Mean	67,125	4,781	12,425	84,166	79,394	73,116	157,282
2000 <sup>c</sup>	12,055	5,000 <sup>c</sup>	9,244 <sup>d</sup>	26,299	56,374	47,399	73,698

<sup>a</sup> Inriver abundance estimated by sonar below the village of Portage Creek.

<sup>b</sup> Spawning escapement estimated from the following: 1977-81, 97 - comprehensive aerial surveys. 1982-85 - correlation between index counts and total escapement estimates when aerial surveys were complete. 1986-96,98,99 - Inriver abundance estimated by sonar minus inriver harvests. Estimates for 1977-85 are rounded to the nearest thousand fish.

<sup>c</sup> Guide line harvest level used as estimate.

<sup>d</sup> Estimate.

(Sources: 1, 4 and 10)

**Appendix Table 22.** Chinook salmon harvest, escapement and total runs in the Togiak District, 1980-2000.

Year	Harvests by Fishery			Total	Spawning Escapement <sup>a</sup>	Total Run
	Commercial	Sport	Subsistence			
1980	12,543	34	900	13,477	12,000	25,477
1981	23,911		400	24,311	27,000	51,311
1982	33,786	231	400	34,417	17,000	51,417
1983	38,497	535	700	39,732	22,000	61,732
1984	22,179	46	600	22,825	26,000	48,825
1985	37,106	925	600	38,631	14,000	52,631
1986	19,880	618	700	21,198	8,000	29,198
1987	17,217	338	700	18,255	11,000	29,255
1988	15,606		429	16,035	10,000	26,035
1989	11,366	234	551	12,151	10,540	22,691
1990	11,130	445	480	12,055	9,107	21,162
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	402	471	9,475	11,476	20,951
1997	6,114	1,163	667	7,944	11,495	18,609
1998	14,131	845	782	15,758	11,666	27,424
1999	11,919	750	700 <sup>b</sup>	13,369	12,263	25,632
20-Yr Mean	16,799	477	652	17,881	14,423	32,262
5-Yr Mean	10,549	748	614	11,911	12,668	24,413
2000 <sup>b</sup>	7,858		884	8,742	16,897	25,639

<sup>a</sup> Spawning escapement estimated from comprehensive aerial surveys. Estimates for 1976-1988 are rounded to the nearest thousand fish.

<sup>b</sup> Preliminary.

(Sources: 1, 4 and 9)

**Appendix Table 23.** Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1980-2000.<sup>a</sup>

Year	Nushagak District			Togiak District		
	Catch	Escapement <sup>d</sup>	Total Run	Catch	Escapement <sup>c</sup>	Total Run
1980	681,930	969,000	1,650,930	299,682	415,000	714,682
1981	795,143	177,000	972,143	229,886	331,000	560,886
1982	434,817	256,000	690,817	151,000	86,000	237,000
1983	725,060	164,000	889,060	322,691	165,000	487,691
1984	850,114	362,000	1,212,114	336,660	204,000	540,660
1985	396,740	288,000	684,740	203,302	212,000	415,302
1986	488,375	168,275	656,650	270,057	330,000	600,057
1987	416,476	147,433	563,909	419,425	361,000	780,425
1988	371,196	186,418	557,614	470,132	412,000	882,132
1989	523,903	377,512	901,415	203,178	143,890	347,068
1990	378,223	329,793	708,016	102,861	67,460	170,321
1991	463,780	287,280	751,060	246,589	149,210	395,799
1992	398,691	302,678	615,712	176,123	120,000	296,123
1993	505,799	217,230	632,109	144,869	98,470	243,339
1994	328,267	378,928	707,195	232,559	229,470	462,029
1995	390,158	212,612	602,770	221,126	163,040	384,166
1996	331,414	225,331	556,745	206,226	117,240	323,466
1997	181,253	61,456	242,709	47,459	106,580	154,039
1998	208,551	299,443	507,994	67,408	102,455	169,863
1999	170,795	242,312	413,107	111,677	116,183	227,860
20-Year Ave.	452,034	282,635	725,840	223,146	196,500	419,645
1980-89 Ave.	568,375	309,564	877,939	290,601	265,989	556,590
1990-99 Ave.	335,693	255,706	573,742	155,690	127,011	282,701
2000 <sup>a</sup>	114,454	141,323	255,777	140,175	80,860 <sup>e</sup>	221,035

<sup>a</sup> Escapement estimates supersede those previously reported.

<sup>d</sup> Escapements were estimated from the following:  
 1976-78 - aerial survey data;  
 1979-99 - adjusted sonar estimate from Portage Creek site.  
 Estimates for 1976-85 are rounded to the nearest thousand fish.

<sup>c</sup> Escapement estimates based on aerial surveys; however, surveys were not conducted in 1986 due to budget constraints. Estimate based on catch/escapement proportion using most recent 10-year average data. Estimates for 1976-88 rounded to the nearest thousand fish.

<sup>a</sup> Preliminary.

<sup>e</sup> No escapement counts were made for the Togiak River.  
 (Sources: 1, 4 and 9)

**Appendix Table 24.** Inshore commercial catch and escapement of pink salmon in the Nushagak District by river system, in numbers of fish, 1961-2000. <sup>h</sup>

Year	Catch	Escapement						Total	Total Run
		Wood <sup>a</sup>	Igushik <sup>b</sup>	Nuyakuk <sup>c</sup>	Nush/Mul <sup>d</sup>	Nushagak <sup>e</sup>	Snake <sup>f</sup>		
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								
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
Average <sup>g</sup>	1,044,674	49,771	7,419	1,823,759	132,848	418,953	2,217	1,443,701	2,687,111
2000	38,309					135,285		135,285	173,594

<sup>a</sup> Aerial survey estimate 1962 and 1974-84; tower count 1964.

<sup>b</sup> Aerial survey estimate 1962-80; aerial survey estimates and tower count 1976 and 1982-84.

<sup>c</sup> Tower count 1960-84; aerial survey estimate 1958, and below counting tower 1962-64 and 1982-84.

<sup>d</sup> Aerial survey estimate.

<sup>e</sup> Sonar estimate from Portage Creek.

<sup>f</sup> Aerial survey estimate 1962-64, 1974-76 and 1980-84, and weir count 1978.

<sup>g</sup> Only years and systems with escapement data were included in averages.

<sup>h</sup> Includes even-years only.

<sup>i</sup> No escapement estimate. Sonar project terminated early due to budget constraints.

(Sources: 1, 4, 10, and 16)

**Appendix Table 25.** Coho salmon harvest, escapement and total runs in the Nushagak Drainage, 1980-2000.

Year	Harvests by Fishery							Inriver Run <sup>b</sup>	Spawning Escapement <sup>c</sup>	Total Run	
	Commercial	Subsistence <sup>a</sup>		Total	Lower	Sport Upper	Total				
		Lower	Upper								
1980	147,726	3259	840	4,099		551	551	152,376	96,759	95,368	247,744
1981	220,290	4795	3,135	7,930		389	389	228,609	144,992	141,468	370,077
1982	349,669	4919	3,125	8,044		503	503	358,216	297,779	294,151	652,367
1983	81,338	4002	878	4,880		1,498	1,498	87,716	39,261	36,885	124,601
1984	260,310	5885	1,564	7,449		473	473	268,232	142,841	140,804	409,036
1985	20,230	4360	1,646	6,006		130	130	26,366	84,034	82,258	108,624
1986	68,568	6533	2,617	9,150		1,576	1,576	79,294	49,676	45,483	124,777
1987	13,263	4149	1,209	5,358		1,007	1,007	19,628	23,484	21,268	40,896
1988	52,698	3515	1,112	4,627		557	557	57,882	131,840	130,171	188,053
1989	77,077	6971	1,159	8,130		2,392	2,392	87,599	84,658	81,107	168,706
1990	7,733	4856	766	5,622		438	438	13,793	141,704	140,500	154,293
1991	5,574	8915	1,275	10,190		874	874	16,638	39,733	37,584	54,222
1992	84,077	4962	1,534	6,496		752	752	91,325			
1993	14,345	4463	387	4,850		194	194	19,389	42,742	42,161	61,550
1994	5,615	4302	406	4,708		1,143	1,143	11,466	82,019	80,470	91,936
1995	4,896	3233	478	3,711		725	725	9,332	46,340	45,137	54,469
1996	11,401	3603	1,080	4,683		3,488	3,488	19,572	187,028	182,460	202,032
1997	4,110			3,433	105	395	500	8,043	57,096	56701	64,744
1998	22,703	201	254	455	321	1047	1,368	24,082	104,948	103194	127,276
1999	2,836	1,000	250	1,250		618	618	4,704	34,853	33,985	38,689
1980-1999 Avg	72,723	4,417	1,248	5,554	213	938	959	79,213	96,410	94,271	172,847
1990-1999 Avg	16,329	3,948	714	4,540	213	967	1,010	21,834	81,829	80,244	94,357
2000	112,819	3,000	2,710	5,710	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	118,529	172,846	167,136	285,665

<sup>a</sup> Subsistence harvest estimated by expanding fishing permit returns; excludes estimates for the communities of Manokotak and Wood River. Estimates for 1976-1986 were based on community where permit was issued; 1987 based on community where permit issued and Nushagak watershed fishing site; 1988- present on community of residence and Nushagak watershed fishing site.

<sup>b</sup> In river run estimated by sonar through August 25 for 1982-1999. 1980 and 1981 estimated by applying exploitation rates of .602 to commercial harvest. Sonar estimates expanded for some years when the project terminated prior to August 25.

<sup>c</sup> Spawning escapement estimated by sonar minus sport and subsistence harvests upriver of Portage Creek sonar site.

<sup>d</sup> No estimate available at this time by Sport fish.

**Appendix Table 26.** Coho salmon harvest by fishery, escapement and total runs for the Togiak River, 1980-2000.

Year	Harvests by Fishery				Spawning Escapement <sup>b</sup>	Total Run
	Commercial	Subsistence <sup>a</sup>	Sport	Total		
1980	111,829	1,200	258	113,287	65,130	178,417
1981	19,504	2,200	119	21,823	43,500	65,323
1982	108,000	1,300	524	109,824	69,900	179,724
1983	4,977	800	294	6,071		
1984	111,631	3,800	1,295	116,726	60,840	177,566
1985	35,765	1,500	342	37,607	33,210	70,817
1986	28,030	500	2,851	31,381	21,400	52,781
1987	1,284	1,600	409	3,293	16,000	19,293
1988	8,744	792	1,238	10,774	25,770	36,544
1989	35,814	976	1,976	38,766		
1990	2,296	1,111	367	3,774	21,390	25,164
1991	4,262	1,238	500	6,000	25,260	31,260
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	1,400	59,968	64,980	124,948
1997	2,976	260	746	3,982	20,625	24,901
1998	52,783	310	700	53,793	25,335	79,128
1999	2,653	500	1,151 <sup>c</sup>	4,304	3,855	8,159
1980-1999 Avg.	35,144	1,094	785	37,022	38,486	77,302
1995-1999 Avg.	25,138	394	881	26,414	28,699	59,284
2000 <sup>c</sup>	2,758	263	n/a	3,021	n/a	

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

<sup>b</sup> Expanded estimates from aerial surveys.

<sup>c</sup> Preliminary.

(Sources: 1, 4, and 9)

**Appendix Table 27.** Average round weight (lbs.) of the commercial salmon catch by species, Bristol Bay, 1980-2000.<sup>a</sup>

Year	Sockeye	Chinook	Chum	Pink	Coho
1980	5.6	19.7	6.2	3.4	7.0
1981	6.2	19.0	6.7		6.4
1982	6.4	19.6	6.7	3.5	7.3
1983	5.7	20.9	6.6		6.6
1984	5.6	20.5	6.8	3.2	7.5
1985	5.8	17.9	6.8		8.0
1986	6.0	18.8	6.7	3.5	6.7
1987	6.0	20.5	6.5		7.0
1988	6.2	18.7	7.0	3.6	7.8
1989	5.6	19.1	6.3		7.4
1990	5.7	16.9	6.3	3.8	7.5
1991	5.7	15.9	6.4		7.3
1992	5.7	16.8	6.4	3.7	7.0
1993	6.0	17.4	6.5		6.8
1994	5.5	18.0	6.5	3.7	8.2
1995	5.5	19.8	6.3	3.6	6.7
1996	6.3	18.0	7.3	3.5	6.8
1997	6.0	16.4	7.3	3.4	6.3
1998	5.7	17.7	6.4	3.3	8.4
1999	5.3	14.3	6.7	3.2	6.4
20-Year Average	5.8	18.3	6.6	3.5	7.2
1980-89 Average	5.9	19.5	6.6	3.4	7.2
1990-99 Average	5.7	17.1	6.6	3.5	7.1
2000	6.1	15.7	6.9	3.7	7.6

<sup>a</sup> Prior to 1991 and after 1992, averages are weighted by the number of fish reported by each buyer on Bristol Bay Final Operations Report BB-CF/303. 1991, 1992, 1995 and 1996 data is extracted from the fish ticket system.

(Sources: 1, 3, and 7)

**Appendix Table 28.** Average price paid per pound for Bristol Bay salmon, 1980-2000.

Year	Sockeye	Chinook	Chum	Pink	Coho
1980	\$0.57	\$1.00	\$0.34	\$0.25	\$0.57
1981	\$0.76	\$1.23	\$0.41	\$0.29	\$0.73
1982	\$0.70	\$1.23	\$0.35	\$0.22	\$0.71
1983	\$0.61	\$0.69	\$0.30	\$0.16	\$0.40
1984	\$0.69	\$1.03	\$0.30	\$0.22	\$0.71
1985	\$0.85	\$1.02	\$0.31	\$0.20	\$0.71
1986	\$1.42	\$1.03	\$0.31	\$0.15	\$0.68
1987	\$1.35	\$1.24	\$0.26		\$0.69
1988	\$1.93	\$1.05	\$0.43	\$0.34	\$1.14
1989	\$1.07	\$0.80	\$0.26	\$0.17	\$0.67
1990 <sup>a</sup>	\$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 <sup>b</sup>	\$0.80	\$0.50	\$0.10	\$0.05	\$0.30
20-Year Average	\$0.92	\$0.84	\$0.25	\$0.16	\$0.59
1979-88 Average	\$1.00	\$1.03	\$0.33	\$0.22	\$0.70
1989-98 Average	\$0.83	\$0.64	\$0.18	\$0.10	\$0.49
2000 <sup>c</sup>	0.64	0.48	0.09	0.08	0.38

<sup>a</sup> Price paid in Nushagak District. Bristol Bay average unavailable.

<sup>b</sup> Based on 1999 Final Operations Reports.

<sup>c</sup> Based on 2000 Final Operations Reports.

(Sources: 1, and 2)

**Appendix Table 29.** Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1980-2000.<sup>a</sup>

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1980	\$76,118	\$1,881	\$2,738	\$2,173	\$1,392	\$84,302
1981	\$120,907	\$5,557	\$4,106		\$1,461	\$132,031
1982	\$68,122	\$6,088	\$2,145	\$1,111	\$3,199	\$80,665
1983	\$129,900	\$2,853	\$3,216		\$337	\$136,306
1984	\$94,681	\$2,158	\$4,040	\$2,414	\$3,072	\$106,365
1985	\$115,402	\$2,188	\$2,218		\$923	\$120,731
1986	\$135,689	\$1,819	\$2,522	\$207	\$826	\$141,063
1987	\$130,847	\$1,912	\$2,594		\$314	\$135,667
1988	\$168,586	\$891	\$4,418	\$1,171	\$1,792	\$176,858
1989	\$173,963	\$609	\$2,029		\$1,186	\$177,787
1990	\$198,897	\$520	\$1,752	\$508	\$582	\$202,259
1991	\$103,750	\$328	\$1,807		\$499	\$106,384
1992	\$190,368	\$1,029	\$1,359	\$222	\$767	\$193,745
1993	\$152,034	\$1,131	\$989		\$257	\$154,411
1994	\$138,007	\$1,190	\$1,043	\$15	\$650	\$140,905
1995	\$183,262	\$1,272	\$1,240		\$129	\$185,903
1996	\$139,208	\$788	\$615	\$7	\$254	\$140,872
1997	\$61,728	\$689	\$200		\$150	\$62,767
1998	\$62,948	\$1,116	\$294	\$8	\$521	\$64,887
1999	\$109,495	\$186	\$438		\$38	\$110,157
<hr/>						
20 Year Average	\$127,696	\$1,710	\$1,988	\$712 <sup>b</sup>	\$917	\$132,703
1980-89 Average	\$121,422	\$2,596	\$3,003	\$1,415 <sup>b</sup>	\$1,450	\$129,178
1990-99 Average	\$133,970	\$825	\$974	\$127 <sup>b</sup>	\$385	\$136,229
<hr/>						
2000	\$80,331	\$172	\$236	\$17	\$363	\$81,119

<sup>a</sup> Value paid to fishermen. Derived from price per fish or pound times commercial catch.

<sup>b</sup> Includes even-years only.

(Sources: 1, 4, and 7)

**Appendix Table 30.** South Unimak and Shumigan Island preseason sockeye allocation, actual sockeye and chum harvest in thousands of fish, Alaska Peninsula, 1980-2000.<sup>a</sup>

Year	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
	Actual	Quota <sup>b</sup>	Chum	Actual	Quota <sup>b</sup>	Chum	Actual	Quota <sup>b</sup>	Chum
1980	2,731	2,513	457	572	555	71	3,303	3,068	528
1981	1,474	1,442	521	351	318	54	1,825	1,760	575
1982	1,670	1,850	934	451	408	160	2,121	2,258	1,094
1983	1,545	1,469	615	416	324	169	1,961	1,793	784
1984	1,131	1,111	228	257	245	109	1,388	1,356	337
1985	1,495	1,380	345	367	305	134	1,862	1,685	479
1986	314	907	252	156	200	99	470	1,107	351
1987	652	635	406	141	140	37	793	775	443
1988	474	1,263	465	282	279	62	756	1,542	527
1989	1,348	1,199	408	397	264	48	1,745	1,463	456
1990	1,091	1,087	455	256	240	64	1,347	1,327	519
1991	1,216	1,573	669	333	347	102	1,549	1,920	771
1992	2,047	1,959	324	410	432	102	2,457	2,391	426
1993	2,365	2,375	382	607	524	150	2,972	2,899	532
1994	1,001	2,938	374	460	648	208	1,461	3,586	582
1995	1,451	2,987	342	653	659	195	2,104	3,646	537
1996	572	2,564	129	446	566	228	1,018	3,130	357
1997	1,179	1,840	196	449	406	126	1,628	2,246	322
1998	975	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
20-yr Average	1,292	1,682	394	379	371	111	1,671	2,053	506
80-89 Average	1,283	1,377	463	339	304	94	1,622	1,681	557
90-99 Average	1,300	1,988	325	420	438	128	1,720	2,426	454
2000	892	1,650	169	359	363	70	1,251	2,013	239

<sup>a</sup> South Unimak includes statistical area 284 in June and July, while Shumigan Islands includes includes statistical area 282 in June only.

<sup>b</sup> 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.

(Source: 8)

Appendix Table 31. Subsistence salmon harvest by district and species, Bristol Bay, 1980-00. <sup>a b</sup>

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK KVICHAK DISTRICT							
1980	759	88,200	1,500	1,200	2,100	800	93,800
81	649	85,100	1,000	400	100	1,100	87,700
82	350	71,400	1,100	600	900	1,000	75,000
83	385	107,900	1,000	400	300	900	110,500
84	382	115,200	900	600	1,300	600	118,600
1985	544	107,543	1,179	540	27	1,103	110,392
86	412	77,283	1,295	695	2,007	650	81,930
87	407	86,706	1,289	756	490	1,106	90,347
88	391	88,145	1,057	588	917	813	91,520
89	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
91	518	97,101	1,152	1,105	191	1,056	100,605
92	571	94,304	1,444	2,721	1,601	1,152	101,222
93	560	101,555	2,080	2,476	762	2,025	108,898
94	555	87,662	1,843	503	460	1,807	92,275
1995	533	75,644	1,431	1,159	383	1,791	80,407
96	540	81,305	1,574	816	794	1,482	85,971
97	533	85,248	2,764	478	422	1,457	90,368
98	567	83,095	2,433	784	1,063	1,592	88,967
99	528	85,315	1,567	725	210	856	88,674
20 Year Average	503	89,907	1,428	905	1,217 <sup>c</sup>	1,197	94,204
1980-1989 Average	469	91,458	1,129	647	1,445 <sup>c</sup>	1,000	95,076
1990-1999 Average	537	88,356	1,727	1,163	990 <sup>c</sup>	1,394	93,332
2000	562	61,817	894	560	845	937	65,053
EGEGIK DISTRICT							
1980	3	100					100
81 <sup>d</sup>	4						
82	19	2,400					2,400
83	14	700					700
84	24	500		100		300	900
1985	23	582	14	21	1	203	821
86	41	1,052	69	58	21	319	1,519
87	49	3,350	87	139	2	284	3,862
88	52	1,405	97	87	54	333	1,976
89	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
91	70	4,549	82	141	32	430	5,234
92	80	3,322	124	270	51	729	4,496
93	69	3,633	128	148	15	905	4,829
94	59	3,208	166	84	153	857	4,468
1995	60	2,818	86	192	100	690	3,886
96	44	2,321	99	89	85	579	3,173
97	34	2,438	101	21	5	740	3,304
98	36	1,795	44	33	52	389	2,314
99	42	2,434	106	35	2	806	3,384
20 Year Average	42	2,071	87	96	65 <sup>c</sup>	519	2,690
1980-1989 Average	28	1,303	63	73	38 <sup>c</sup>	309	1,601
1990-1999 Average	56	2,762	99	110	76 <sup>c</sup>	646	3,670
2000	31	842	16	11	0	262	1,131

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Appendix Table 31. (page 2 of 3)

Year	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
UGASHIK DISTRICT							
1980	10	200				200	400
81	12	600				200	800
82	11	400				300	700
83	8	500				100	600
84	8	500				200	700
1985	9	233	17	7		143	400
86	27	1,080	83	48	21	335	1,567
87	22	892	104	51	29	272	1,348
88	23	1,400	84	55	35	330	1,904
89	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
91	38	1,403	121	168	42	614	2,348
92	37	2,348	106	79	8	397	2,938
93	39	1,766	86	107	24	495	2,478
94	31	1,587	126	42	38	579	2,372
1995	20	1,513	56	18	6	290	1,883
96	26	1,247	50	21	7	298	1,623
97	28	2,785	169	39	23	311	3,327
98	27	1,241	59	75	82	485	1,942
99	25	1,365	35	5	0	271	1,675
20 Year Average	23	1,197	79	60	44 <sup>c</sup>	316	1,638
1980-1989 Average	15	711	64	39	28 <sup>c</sup>	229	1,001
1990-1999 Average	31	1,683	86	70	51 <sup>c</sup>	402	2,276
2000	31	1,927	51	34	1	467	2,481
NUSHAGAK DISTRICT							
1980	425	76,800	11,800	11,700	7,600	5,100	113,000
81	395	44,600	11,500	10,200	2,300	8,700	77,300
82	376	34,700	12,100	11,400	7,300	8,900	74,400
83	389	38,400	11,800	9,200	500	5,200	65,100
84	438	43,200	9,800	10,300	6,600	8,100	78,000
1985	406	38,000	7,900	4,000	600	6,100	56,600
86	424	49,000	12,600	10,000	5,400	9,400	86,400
87	474	40,900	12,200	6,000	200	6,200	65,500
88	441	31,086	10,079	8,234	6,316	5,223	60,938
89	432	34,535	8,122	5,704	407	8,679	57,447
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
91	528	33,161	13,627	4,688	292	10,784	62,552
92	476	30,640	13,588	7,076	3,519	7,103	61,926
93	500	27,114	17,709	3,257	240	5,038	53,358
94	523	26,501	15,490	5,055	2,042	5,338	54,426
1995	484	22,793	13,701	2,786	188	3,905	43,373
96	481	22,935	15,941	4,704	1,573	5,217	50,370
97	538	25,080	15,318	2,056	218	3,433	46,106
98	562	25,217	12,258	2,487	1,076	5,316	46,355
99	548	29,387	10,057	2,409	124	3,993	45,969
20 Year Average	464	35,353	12,400	6,453	4,461 <sup>c</sup>	6,382	63,072
1980-1989 Average	420	43,122	10,790	8,674	6,643 <sup>c</sup>	7,160	73,469
1990-1999 Average	508	27,583	14,010	4,233	2,279 <sup>c</sup>	5,605	52,676
2000	541	24,451	9,470	3,463	1,662	5,983	45,029

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Appendix Table 31. (page 3 of 3)

	Permits Issued	Sockeye	Chinook	Chum	Pink	Coho	Total
TOGIAK DISTRICT							
1980	46	3,600	900	300	300	1,200	6,300
81	52	1,900	400	800	100	2,200	5,400
82	50	1,900	400	300	400	1,300	4,300
83	38	1,900	700	900	200	800	4,500
84	41	3,600	600	1,700	500	3,800	10,200
1985	51	3,400	600	1,000	100	1,500	6,600
86	29	2,400	700	800	100	500	4,500
87	46	3,600	700	1,000		1,600	6,900
88	29	2,413	429	716	45	792	4,395
89	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
91	43	3,517	470	553	27	1,238	5,805
92	40	3,716	1,361	626	135	1,231	7,069
93	38	2,139	784	571	8	743	4,245
94	25	1,777	904	398	77	910	4,066
1995	22	1,318	448	425	0	703	2,894
96	19	662	471	285	59	199	1,676
97	31	1,440	667	380	0	260	2,747
98	42	2,211	782	412	76	310	3,791
99	76	3,780	1,244	479	84	217	5,804
20 Year Average	40	2,589	680	666	175 <sup>c</sup>	1,080	5,134
1980-1989 Average	42	2,754	598	841	269 <sup>c</sup>	1,467	5,845
1990-1999 Average	37	2,425	761	492	81 <sup>c</sup>	692	4,422
2000	54	3,013	1,116	569	90	342	5,130
TOTAL BRISTOL BAY AREA							
1980	1,243	168,600	14,100	13,100	10,000	7,300	213,100
81	1,112	132,100	13,000	11,500	2,600	12,200	171,400
82	806	110,800	13,700	12,400	8,600	11,500	157,000
83	834	149,400	13,500	10,500	900	7,100	181,400
84	893	163,000	11,300	12,700	8,400	13,000	208,400
1985	1,033	149,758	9,710	5,568	728	9,049	174,813
86	933	130,815	14,747	11,601	7,549	11,204	175,916
87	998	135,493	14,356	7,895	689	9,453	167,886
88	936	124,449	11,746	9,680	7,367	7,491	160,733
89	955	127,408	9,725	7,356	799	12,210	157,498
1990	1,042	131,701	13,976	9,683	4,434	8,367	168,161
91	1,197	139,731	15,452	6,655	584	14,122	176,544
92	1,204	134,330	16,623	10,772	5,314	10,612	177,651
93	1,206	136,207	20,787	6,559	1,049	9,206	173,808
94	1,193	120,735	18,529	6,082	2,770	9,491	157,607
1995	1,119	104,086	15,722	4,580	677	7,378	132,443
96	1,110	108,470	18,136	5,915	2,518	7,775	142,813
97	1,166	116,991	19,159	2,974	668	6,201	145,992
98	1,234	113,560	15,576	3,792	2,349	8,093	143,368
99	1,219	122,281	13,009	3,653	420	6,143	145,506
20 Year Average	1,072	130,996	14,643	8,148	5,930 <sup>c</sup>	9,395	166,602
1980-1989 Average	974	139,182	12,588	10,230	8,383 <sup>c</sup>	10,051	176,815
1990-1999 Average	1,169	122,809	16,697	6,067	3,477 <sup>c</sup>	8,739	156,389
2000	1,219	92,050	13,009	3,653	420	6,143	118,824

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

<sup>b</sup> 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.

<sup>c</sup> Includes even years only. <sup>d</sup> No permits returned. 116

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

Appendix Table 32. Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1980-00. <sup>a,b</sup>

Year	Iliamna-					Port			Total
	Levelock	Igiugig	Pedro Bay	Kokhanok	Newhalen <sup>e</sup>	Nondalton	Alsworth	Other <sup>1</sup>	
1980	6,100	8,100	7,400	22,600	11,100	11,300	6,000		72,600
81	6,600	5,400	9,700	16,500	15,400	15,200	6,800		75,600
82	5,400	1,900	8,200	16,600	13,500	11,200	4,500		61,300
83	4,800	3,300	10,400	20,100	23,800	29,400	4,700		96,500
84	8,100	6,300	12,100	24,400	15,900	29,100	4,600		100,500
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500		86,500
86	6,400	1,600	6,700	18,300	17,000	6,600	3,300		59,900
87	5,700	<sup>c</sup>	7,300	16,500	27,500	11,800	3,200		72,000
88	3,500	<sup>c</sup>	5,500	14,400	29,800	20,700	3,200	<sup>d</sup>	77,100
89	5,100	1,200	6,700	13,000	24,700	18,500	2,200	<sup>d</sup>	71,400
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	1,400	76,600
91	1,029	1,712	9,739	17,184	29,094	4,163	2,755	1,110	66,786
92	4,374	1,056	6,932	11,477	29,633	13,163	2,954	2,559	72,148
93	4,699	1,397	6,226	18,810	19,067	17,890	3,254	2,780	74,123
94	1,467	1,201	8,747	15,771	15,553	15,246	3,074	3,284	64,343
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	3,441	54,679
96	1,120	2,309	5,219	14,011	14,787	11,856	3,263	2,307	54,872
97	1,062	2,067	5,501	8,722	19,513	17,194	2,348	3,101	59,508
98	2,454	1,659	3,511	10,418	16,165	13,136	2,678	3,635	53,656
99	1,276	1,608	5,005	10,725	14,129	17,864	4,282	2,834	57,723
20 Year Average	4,212	2,606	7,487	15,912	19,894	15,535	3,685	2,645	70,392
1980-89 Average	5,830	3,900	8,690	18,430	20,100	16,870	4,300		77,340
1990-99 Average	2,594	1,571	6,284	13,393	19,688	14,200	3,070	2,645	63,444
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	2,720	36,990

<sup>a</sup> Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates from 1991 are rounded to the nearest hundred fish.

<sup>b</sup> 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.

<sup>c</sup> No permits issued.

<sup>d</sup> No permits issued. Only residents of the Naknek/Kvichak watershed could obtain subsistence permits.

<sup>e</sup> Includes Chekok

<sup>1</sup> Subsistence harvests by non-Kvichak River watershed residents.

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

Appendix Table 33. Subsistence salmon harvest by community, Nushagak District, Bristol Bay, 1980-00. <sup>a b</sup>

Year	Dillingham <sup>1</sup>	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other <sup>2</sup>	Total
1980	47,900	8,200	3,500	10,400	22,200	20,800		113,000
81	23,900	6,700	2,900	8,800	23,600	11,400		77,300
82	24,700	2,900	2,400	7,500	22,600	14,300		74,400
83	20,100	5,300	1,900	5,800	18,700	13,300		65,100
84	30,500	4,100	2,600	7,200	16,500	17,100		78,000
1985	22,900	3,600	1,600	7,000	14,500	6,800		56,400
86	31,900	5,500	6,900	7,800	26,400	8,200		86,700
87	33,500	5,900	3,100	6,400	11,400	4,900		65,200
88	29,600 <sup>d</sup>	5,500	2,400	6,100	11,700	5,700	<sup>c</sup>	61,000
89	31,800 <sup>d</sup>	5,800	2,000	4,700	9,700	3,800	<sup>c</sup>	57,800
1990	28,860 <sup>d</sup>	6,600	2,300	4,900	9,900	8,000	700	61,260
91	34,399 <sup>d</sup>	5,873	3,043	4,532	8,326	5,438	2,163	63,774
92	31,702 <sup>d</sup>	4,317	2,184	5,971	11,325	3,708	2,635	61,842
93	25,315 <sup>d</sup>	3,048	2,593	2,936	12,169	4,180	2,538	52,779
94	30,145 <sup>d</sup>	3,491	2,289	4,343	8,056	4,513	2,322	55,159
1995	24,998 <sup>d</sup>	2,453	1,468	2,046	6,911	2,983	2,406	43,265
96	27,161 <sup>d</sup>	3,883	1,733	2,866	8,892	3,319	2,113	49,967
97	23,255 <sup>d</sup>	3,988	1,989	1,797	6,427	4,179	4,598	46,233
98	24,072 <sup>d</sup>	4,069	1,112	3,555	5,419	3,166	4,958	46,351
99	26,502 <sup>d</sup>	3,413	1,532	1,805	4,556	2,772	5,389	45,969
20 Year Average	28,660	4,732	2,477	5,323	12,964	7,428	2,982	63,075
1980-89 Average	29,680	5,350	2,930	7,170	17,730	10,630		73,490
1990-99 Average	27,641	4,114	2,024	3,475	8,198	4,226	2,982	52,660
2000	27,931	3,173	1,111	3,946	3,715	2,792	2,362	45,029

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

<sup>b</sup> 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.

<sup>c</sup> No permits issued. Only residents of the Nushagak watershed could obtain subsistence permits.

<sup>d</sup> Includes permits issued in Clarks Point and Ekuuk.

<sup>1</sup> Includes the village of Portage Creek and Clarks Point.

<sup>2</sup> Subsistence harvests by non-watershed residents.

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

**2000**

**BRISTOL BAY**

**HERRING**

**FISHERY**

# TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES .....	III
LIST OF APPENDIX TABLES .....	III
LIST OF FIGURES .....	IV
INTRODUCTION .....	119
STOCK ASSESSMENT .....	119
<i>Methods</i> .....	119
<i>Spawning Population</i> .....	120
FISHERY OVERVIEW .....	120
<i>Sac Roe Herring Fishery</i> .....	120
<i>Fishing and Industry Participation</i> .....	120
<i>Harvest and Management Performance</i> .....	121
<i>Spawn-on-Kelp Fishery</i> .....	122
2000 SEASON SUMMARY .....	123
<i>Sac Roe Fishery</i> .....	124
<i>Purse Seine Sac Roe</i> .....	125
<i>Gillnet Sac Roe</i> .....	127
<i>Spawn-on-Kelp</i> .....	128
<i>Exploitation and Value</i> .....	128
LITERATURE CITED .....	129

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Daily observed estimates (tons) of herring by index area, Togiak District, 2000 .....	130
2. Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2000 .....	131
3. Commercial herring harvest (tons) by fishing section and gear type, and fishing period, Togiak District, 2000.....	132
4. Preliminary herring total run and commercial catch by year class, Togiak District, 2000 .....	133
5. Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2000.....	134

## APPENDIX TABLES

1. Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1979-2000 .....	135
2. Exploitation (tons) of Togiak herring, 1979-2000 .....	136
3. Age composition of the inshore herring run, Togiak District, 1978-2000 .....	137
4. Herring spawn on kelp industry participation, fishing effort, area and harvest, Togiak District, 1979-2000 .....	138
5. Aerial survey estimates of herring biomass and spawn deposition, Togiak District, 1979-2000 .....	139
6. Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1979-2000.....	140
7. Guidelines and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984-2000 .....	141

**LIST OF FIGURES**

<u>Figure</u>	<u>Page</u>
1. Togiak Herring District, Bristol Bay .....	142
2. Spawn-on-kelp management areas (K-1 through K-11), Togiak District, Bristol Bay ..	143

## INTRODUCTION

This report reviews stock assessment activities, provides an overview of the Togiak District herring fishery from 1978 to 1999 and summarizes the 2000 season.

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

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

The herring sac roe fishery began in Togiak District in 1967, followed by the first fishery for spawn on kelp in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. Increased interest, favorable market conditions and additional incentives provided by the Fishery Conservation and Management Act of 1976 (the 200-mile limit) resulted in a rapid expansion of the Togiak herring fishery in 1977.

The Togiak herring fishery is the largest in Alaska. From 1979 to 1999, sac roe harvests averaged over 19,000 tons, worth an annual average of over \$8 million. Spawn-on-kelp harvests in the most recent 10 years have averaged 372,000 lbs., worth about \$333,000 to permit holders. In 2000, sac roe harvests brought \$4.0 million to permit holders, which was a decline in value of the fishery from recent years. No spawn-on-kelp fishery was conducted. The kelp fishery occurred in 1999, but had not been held since 1996 due to a lack of quality product and industry interest (Appendix Table 6).

## STOCK ASSESSMENT

### Methods

Since 1978, the department has conducted aerial surveys throughout the herring spawning season to estimate abundance, timing and distribution of pacific herring in the Togiak District. Surveys are conducted regularly from approximately April 16 until May 15 each year. Once herring are observed, surveys are conducted daily, weather permitting, until biomass declines and spawning activity subsides.

Aerial survey techniques used in Togiak have remained largely unchanged since 1978 and are described in Lebeda and Whitmore (1985). Herring school surface area is estimated through a handheld tube with a measured grid and a known focal length from a known altitude. Standard conversion factors of 1.52 tons (water depths of 16 ft or less), 2.58 tons (water depths between 16 and 26 ft) and 2.83 tons (water depths greater than 26 ft) per 538 ft<sup>2</sup> of surface area are applied to herring school surface areas to estimate the total biomass observed during each flight.

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

## **Spawning Population**

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

From 1983 to 1999, herring were generally first observed in the district in early May, but were observed entering near shore areas as early as April 22 and as late as June 3. Biomass increased rapidly and peaked within 1 to 7 days of the first observation in all but 2 years. In recent years, biomass declined rapidly following the peak observation, but herring continued to enter and exit the district for several weeks. Except for 2 years, spawn was first observed any time within 3 days of the first herring observation. Similar to trends observed for biomass, spawning in all but 2 years accelerated rapidly, peaked from 1 to 4 days after the first occurrence of spawn, then rapidly subsided. Small "spot" spawns have been observed as late as June 7.

Herring ages-2 through 20 have been observed in the Togiak District but herring generally recruit into the fishery at age-5. Herring abundance is related to year class survival. Two major recruitment events have occurred since the State began monitoring the biomass in 1978. The 1977 and 1978 year classes recruited into the fishery in 1982 and 1983 and comprised a substantial component of the biomass until the early 1990's. Other lesser recruitment events have occurred since that time with the most recent being in 1993 appearing as age-7 herring in the 2000 season.

## **FISHERY OVERVIEW**

### **Sac Roe Herring Fishery**

#### **Fishing and Industry Participation**

Unlike most herring fisheries in Alaska, the Togiak sac roe fishery is not a limited entry fishery. Gillnets, purse seines and hand purse seines are legal gear. Since fishing effort is not limited, effort levels can vary substantially each year. Herring market conditions are one of the leading factors influencing effort, but other factors also affect fleet size. Salmon and other markets indirectly affect effort in the herring fishery because the majority of herring fishers in Togiak participate in the Bristol Bay salmon and other fisheries. Herring prices paid to fishers the prior year and run timing also influence effort.

Fishing effort in the sac roe fishery increased through the late 1980's (Appendix Table 1). Gillnet effort rose to over 300 vessels in 1989 then declined to the lowest levels observed since the inception of the fishery in 1993. With roe quality and marketability increasing, gillnet effort increased substantially to a peak gillnet effort of 461 vessels in 1996. Purse seine effort increased steadily from 1978 through 1989, when 310 vessels were observed. Since 1990, the purse seine fleet has fluctuated between 120 and 300 vessels. Gillnet vessels comprised the majority of the sac roe effort from 1978 to 1990 and more recently since 1996.

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

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

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. Since 1987, 12 to 22 companies purchase herring or spawn on kelp each year in Togiak. Processing capacity since 1990 ranged from 2,100 to 4,850 tons per day.

### **Harvest and Management Performance**

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

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

Herring purse seine and gillnet sac roe harvests are managed for allocation guidelines set forth in the Bristol Bay Herring Management Plan (BBHMP) (5 AAC 27.865). This plan states that, before opening the sac roe fishery, 1,500 short tons must be set aside for the spawn-on-kelp fishery, and 7% of the remaining available harvest is allocated to the Dutch Harbor food and bait fishery. After the spawn-on-kelp and the Dutch Harbor harvests are subtracted, the remaining harvestable surplus is allocated to the Togiak sac roe fishery: 25% of the harvestable surplus to the gillnet fleet, and 75% to the purse seine fleet. The Board adopted these guidelines in 1988. To achieve gillnet and purse seine ratios, the department adjusts fishing time and area for each gear type.

This method has generally been successful in achieving sac roe harvest allocations. From 1988 to 1999, annual gillnet harvests were distributed above and below guideline allocations, and averaged 7% less than allocations (Appendix Table 7). Annual harvests exceeded guideline harvest levels by as much as 19% and fell short by as much as 46%. For the same period, purse seine harvests exceeded guideline harvests in seven of the 12 years. Differences between actual and guideline purse seine harvests ranged from -38% to 25%, and averaged 1%. From 1988 to 1999, 24% of all sac roe harvest was taken by gillnets and 76% by purse seines.

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 a primary objective in the Togiak fishery.

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

Standardizing and streamlining test fishing procedures resulted in reduced turnaround time for sample results, reduced time required between test fishing and opening an area to commercial fishing and helped ensure high mature roe percentages in harvests. From 1979 to 1999, gillnet harvests averaged approximately 9.3% mature roe. Purse seine harvests for this period averaged 9.5% mature roe (Appendix Table 1). Overall gillnet harvest area has gradually been reduced since the late 1980's and early 1990's due to lack of complete test fishing coverage or poor quality results in some areas of the district. From 1994 to 1997, gillnet fishing was opened almost exclusively in the area between Right Hand Point and Kulukak Bay. This reduction in area increases competition among the gillnet fleet, especially when fishing effort is high.

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

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

Since 1993, the department has limited the purse seine fishing time and area to reduce holding times to 3 days or less. To provide harvest opportunity while controlling purse seine harvest rate, requires intensive management by the Department to account for rapid changes in biomass distribution and other factors affecting harvest capacity. Since 1995, the Department initially limited the area considered for an opening using test fish results. Aerial surveys were then conducted over a limited area immediately prior to scheduled announcement times, to assess the harvesting capacity of the fleet. Management decisions for time and area were primarily based on aerial survey assessment. Fishing duration announcements occurred with minimal (1 hour or less) notice. As an example, the duration of the final 1995 purse seine opening was shortened from 1.5 hours to 1 hour with no notice, at the beginning of the fishing period.

The impact of reducing purse seine depth and fishing areas on product quality is difficult to measure. However, these two factors have controlled individual period harvests to a level that has not exceeded 3 days of production capacity. Industry comments suggest that the gear and area limitations strongly contributed to higher product quality and value. Limiting harvests during individual fishing periods resulted in a larger number of openings over a longer time period. Purse seine fishing time from 1988 to 1992 totaled less than 10 hours. Fishing time totaled 75.5 hours from 1993 to 1998. Area limitations also heightened competition within the purse seine fleet.

### **Spawn-on-Kelp Fishery**

Similar to the sac roe fishery, the spawn-on-kelp harvest in the Togiak District has been regulated by emergency order since 1981. Since 1984, the spawn-on-kelp fishery was managed under guidelines provided in the Togiak

District Herring Spawn on Kelp Management Plan (5 AAC 27.834). The plan essentially provides for an allocation of 350,000 lbs. of product, equivalent to 1,500 tons of herring, to this fishery. The plan also directs the department to 1) rotate harvest areas (Figure 2) on a 2 to 3 year basis; 2) ensure product quality; and 3) include the herring equivalent to the spawn-on-kelp harvest when calculating exploitation.

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

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

To ensure product quality the department, industry representatives and fishers 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.

## **2000 SEASON SUMMARY**

### **Biomass Estimation**

Aerial surveys of the Togiak District began April 18, 2000. The department first observed herring April 24, when 281 tons were documented in the bight of Togiak Bay. Biomass increased to an estimated 37,488 tons May 5, and the peak biomass of 81,995 tons was observed May 8 under fair conditions. Although biomass decreased significantly after the peak survey, herring persisted in the district well into June.

Spawn was first observed May 6, in the Metervik, Ungalikthluk, Nunavachak and Hagemeister areas with seven linear miles of spawn documented that day. The largest amount of spawn observed during any single day in 2000 was 15.8 miles on May 7. Spawn was observed on the next four surveys (8, 11, 12, and 25 of May). No spawn was observed on the final survey conducted June 1, but local pilots reported spawn as late as June 14. Through May 25, 45.7 miles of spawn were documented.

### **Age Composition**

A total of 7,000 herring were sampled during the 2000 season for size, sex and age data. Samples were collected from the purse seine test fishery, commercial purse seine fishery and the commercial gill net fishery. Several periods of the commercial gill net fishery were not sampled, as the transfer of samples to the ADF&G field site did not occur. Length frequency analyses indicate the commercial gillnet fishery targeted older herring in the biomass with 62% of the samples age -9 and older followed in magnitude by herring ages 7-8 at 33%. Average weight of gillnet caught samples was 371g.

Forty –six percent of the commercial purse seine samples were age-9 and older, and 44% were comprised of ages 7-8. The contribution of age 7-8 herring and herring older than age-9 in the samples corresponds to the dominance of age-7 and age-9 and older herring in the forecasted age composition. Average weight of purse seine caught herring was 339g.

Of interest this season was the presence of very small herring in the commercial purse seine samples. These herring ranged from 100-130 g and are believed to be fish younger than age-5. Some of the samples were sexually mature but most were herring that had never spawned. The presence of these small fish may have resulted from an

irregular entry pattern of the biomass this season, or may indicate eventual recruitment of a strong year class. The significance of these younger herring in the harvest can only be ascertained by tracking year class strength of the biomass in future years and cannot be determined at this time.

### *Sac Roe Fishery*

The Togiak District herring fisheries are managed in accordance with the Bristol Bay Herring Management Plan (5 AAC 27.865). The plan specifies a maximum allowable exploitation rate of 20% and allocates the harvestable surplus to those fisheries taking the Togiak herring stock. The 2000 preseason forecasted biomass was 130,904 tons. The projected harvest guideline for each fishery was as follows: 1,500 ton herring equivalent or 350,000 lbs. of product for the spawn-on-kelp fishery; 1,728 tons for the Dutch Harbor food and bait fishery; and the remaining 22,953 tons to the sac roe fishery. The management plan states that the department will manage the sac roe fishery so that 75% of the removal is taken by purse seines, 17,215 tons, and 25% of the removal is taken by gillnets, 5,738 tons. The department's inseason biomass surveys did not exceed the forecasted level. Therefore, the above harvest guidelines were applied throughout the fishery.

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

In January of 2000, climatic conditions and Bering Sea ice pack were indicating another late arrival for herring in the Togiak District. In fact, conditions were unusual enough that the Bering Sea crab fishery was postponed from its normal start of January 15 to at least April 1 due to ice cover. However, a warming trend and numerous successive days of sunshine and warm winds in March and early April removed the shorefast ice and warmed inshore water temperatures, resulting in relatively normal run timing.

Processing capacity and interpretation of the Bristol Bay Herring Management Plan were issues that received considerable attention preseason. The department was asked to poll the processors preseason to see if sufficient processing capacity would be available for the 2000 season. Preseason discussions also took place regarding interpretation and application of the allocation language in the management plan. Since the marketability of gillnet product has increased in recent years due to the usually high mature roe percentage and large carcass size, some industry representatives and gillnet proponents favored setting the preseason harvest guidelines, 75% of the sac roe harvest for purse seines and 25% of the sac roe harvest for gillnets, then allowing both gear groups to pursue those harvest guidelines independently of the other gear group. A review of the Bristol Bay Herring Management Plan since its adoption in 1980, clearly showed that the intent of the Board of Fisheries was for "inseason" management actions to bring the allocation percentages towards the 75/25 ratio, including restricting the harvest of one gear type in order to achieve the prescribed percentage for the other gear type. A public meeting was announced by the department to be held on the beach at Nunavachuk to discuss application of the allocation language within the management plan and the department's management strategy to maximize harvest with the limited processing capacity available on grounds. The concept of "limited capacity" openings in which commercial periods would be allowed even when only a few of the 12 companies and their fleet would be able to participate in the opening was explained. This approach was an attempt by the department to keep all companies' processing capacity fully utilized.

Company registration for processors intending to buy herring and spawn-on-kelp product in the Togiak District began May 1, after Department staff moved to the field office at Togiak Fisheries shoreplant. From May 1 through May 5, twelve companies registered to buy gillnet and purse seine sac roe herring, one of which also registered to buy spawn-on-kelp product. Based on information supplied by companies upon registration in Togiak, industry could process 2,100 tons of sac roe herring each day. Processing capacity in 2000 was the lowest level recorded since the department began monitoring capacity in 1990. Given the large harvestable surplus available, processing capacity was a factor in trying to maintain product quality while conducting the fishery to harvest the entire guideline for each gear group.

Approximately 300 tons of herring were first observed between Tongue Point and Togiak Reef on April 24. The first processing vessels and tenders to arrive on grounds were counted on an April 27 survey. Approximately 37,000 tons of herring were observed on May 5, which exceeded the threshold of 35,000 tons needed to prosecute a commercial sac roe fishery. By May 8, when the peak herring biomass of 82,000 tons was observed on an aerial survey, 10 processing vessels, over 90 purse seine and 227 gillnet vessels were counted in the Togiak District.

### **Purse Seine**

Test fishing with purse seines began on the afternoon of May 2 and was conducted in various areas each day with samples continuing to show all immature roe until late May 5, when samples from outer Togiak Bay started showing a low percentage of mature roe.

By the afternoon of May 6, with water temperatures being reported by vessels in various locations in the Togiak District at approximately 4 degrees Celsius; purse seine test fish samples showed a considerable increase in mature roe percentages. An aerial survey was flown in the morning with department staff documenting available biomass on grounds increasing to at least 57,000 tons. Test fishing was being conducted over a large portion of the district from Asigyukpak (Oosik) Spit to Kulukak Bluffs; purse seine samples from the Kulukak Bluffs area showed the highest quality roe reaching a high of 13% and averaging over 10% mature roe.

In a 6:30 p.m. announcement on May 6, the first commercial purse seine opening was scheduled for 10:30 p.m. that evening in the area from Right Hand Point to Kulukak Bluffs. Duration of 20 minutes for the opening was announced at 9:30 p.m. Over 1,200 tons of herring with an overall average mature roe percentage of 10.5% were taken during this first purse seine period.

On the morning of May 7, a large herring biomass was visible in Nunavachak Bay. A couple of test sets were made with samples ranging from 6.5 to 13.0% mature roe; showing high quality herring were available for harvest in the bay. A purse seine opening beginning at 1:00 p.m. was announced at 10:00 a.m. The open area was restricted to the eastern quarter of Nunavachak Bay at 12:00 p.m. due to the movement of a large herring biomass into the bay from the west. Duration of the opening was restricted to 10 minutes due to a very impressive showing of biomass that had moved into the open area. The second purse seine opening resulted in a harvest of over 5,500 tons of herring averaging 10% mature roe.

By the morning of May 8, reports of processing capacity problems were being relayed to department staff from several processing companies. With a substantial gillnet harvest on May 7, in addition to approximately 6,800 tons of herring taken with purse seines in the preceding 36 hours, the majority of the companies registered were unable to purchase herring if further openings occurred on May 8. In fact only 3 companies reported that they would purchase herring from an opening allowed that day. The first "limited capacity" opening was held for those purse seine permit holders that had markets available. A 15-minute purse seine opening between the Pinnacle and Right Hand Point in Nunavachak Bay beginning at 3:00 p.m. was announced at 1:00 p.m.

According to the vessel lists provided to the department during company registration, the 3 companies purchasing herring during this opening had a total of 29 purse seine vessels fishing for them. However, on an aerial survey conducted during the opening, 52 vessels were observed participating in the opening in some manner. Only 200 tons of herring averaging 10.7% mature roe were taken. Although another "limited capacity" purse seine opening

was considered for later that evening, information on harvest and remaining capacity took awhile to compile from the participating companies and the decision was made to delay the next purse seine opening until the following day.

On the morning of May 9, representatives from several of the major processors came in to the field office to express their desire to “stand down” for the day. Discussion amongst department staff ensued regarding the merits of allowing “limited capacity” openings versus standing down to allow the major processors to catch up with processing. In a 9:30 a.m. announcement, the fleet was advised that another “limited capacity” opening was being considered in a larger area farther west, between Asigyukpak (Oosik) Spit and Anchor Point beginning at 1:00 p.m.

Only three of the 12 companies registered, with a total of 10 purse seine vessels, would be participating in this opening.

During the opening, 51 purse seine vessels were observed “participating” in some manner, and 30 sets were made.

The resulting harvest was 550 tons of herring averaging 10.9% mature roe. Another “limited capacity” opening was announced at 6:30 p.m. in the same area beginning at 8:30 p.m. and lasting 30 minutes. This 6:30 p.m. announcement was an opportunity for the gillnet fleet to express their discontent with the department’s application of the allocation language in the Bristol Bay Herring Management Plan. The gillnet fleet was standing down for the day, while the purse seine fleet was having openings to bring the harvest closer to the 75/25 ratio prescribed in the plan. The purse seine fleet needed an additional 4,000 tons to achieve this ratio due to the large gillnet harvest on May 8. The evening purse seine opening resulted in another 200 tons of herring being taken with an overall average of 10.7% mature roe.

In an effort to bring the harvest ratio up to the proportions specified in 5 AAC 27.865 Bristol Bay Herring Management Plan, additional time and area were allowed for the next purse seine opening on May 10. At 11:00 a.m. on May 10, the department announced a 1-hour opening from the longitude of Cape Peirce to the east end of Kulukak Bluffs, approximately 70 miles of coastline, beginning at 3:00 p.m. The 11:00 a.m. announcement provided additional opportunity for the gillnet permit holders to express their frustration with the department’s application of the allocation mechanism in the management plan. More companies and vessels participated in this afternoon opening with a resulting harvest of close to 1,000 tons with mature roe percentages dropping to 9.7%. Another 1-hour opening in the same area was announced at 6:30 p.m. to begin at 8:30 p.m. An additional 800 tons of herring were harvested with mature roe percentages increasing to 10.2%.

Purse seine harvest through May 10 was approximately 9,500 tons while the gillnet harvest was approximately 4,000 tons; bringing the percentage of harvest by gear type to 70% purse seine, 30% gillnet. The purse seine gear type was still approximately 2,500 tons short of achieving the specified ratio. With increased emphasis on achieving this ratio as quickly as possible to minimize down time for the gillnet fleet, additional time and area was allowed for the next purse seine period on May 11. A 3-hour opening from Cape Newenham to Right Hand Point (roughly 75 miles of coastline) was announced at 11:00 a.m. to begin at 1:00 p.m. The strategy behind not opening the area from Right Hand Point to Kulukak Bluffs was to keep purse seines out of that area, in case we achieved the mandated ratio and could allow a gillnet fishery in the area that evening. The 3-hour opening produced a small harvest of approximately 250 tons of herring averaging 9.8% mature roe.

In order to harvest the remaining tonnage required by purse seines to allow both gear types to participate in the fishery again, an even larger area was opened for the evening purse seine period on May 11. Virtually the entire district was opened for a 3-hour period beginning at 8:00 p.m. A request for volunteers for a gillnet test fishery the following morning was also included in the 7:00 p.m. announcement. The evening purse seine period resulted in a harvest of 1,700 tons of 10% mature roe herring, which brought the harvest ratio to approximately 74% purse seine; 26% gillnet. This was close enough to the ratio specified in the management plan to proceed with the gillnet test fishery the following morning.

On May 12, the next purse seine opening was scheduled for 1:00 p.m. for 3 hours between Cape Newenham and Right Hand Point; leaving the area from Right Hand Point to Kulukak Bluffs available for a planned gillnet opening.

A complete flood tide had occurred since this area had been fished with purse seines. The afternoon purse seine opening resulted in a harvest of 1,500 tons averaging 10.5% mature roe.

Three additional 1-hour purse seine openings were allowed; 2 openings on May 13 and one final opening on May 14. The open area was between Cape Newenham and Right Hand Point, or all of the Togiak District that wasn't being fished by gillnets. The combined harvest from the last three openings was approximately 1,700 tons with the herring from all 3 periods exceeding 10% mature roe.

In the course of the fishery, thirteen purse seine openings were allowed totaling 15 hours and 45 minutes of fishing time. Purse seine sac roe harvest was approximately 14,632 tons with a weighted average of 10.3% mature roe. This harvest was 2,500 tons or 15% below the preseason guideline, while the roe percentage was one of the highest achieved in the purse seine fishery in the last 10 years. The purse seine harvest ultimately accounted for 73% of the total sac roe harvest. Although, a peak count of 90 purse seine vessels was documented on an aerial survey and is the best number available, 93 deliveries were reported on one purse seine opening.

### ***Gillnet***

Gillnet test fishing began with the evening tide on May 3 to begin collecting information on roe maturity in the eastern portion of the district. At this time the biomass available on grounds was documented at 30,000 tons, which was less than the 35,000 tons required for a fishery.

The test fishery on the evening of May 3 resulted in samples that ranged from 0 to 8% mature roe. Without commercially acceptable roe available, commercial fishing was not scheduled and another test fishery was announced for 12:00 noon on May 4. An aerial survey was conducted in the early morning to assist the gillnet fleet with finding concentrations of herring. Aerial survey results from May 4 indicated that there was not an appreciable increase in biomass from the 30,000 tons documented on May 3. Managers surveyed again on May 5, solicited volunteers for test fishing, and directed their activities based on the results of the survey.

On the early aerial survey of May 5, 37,000 tons of herring biomass were documented and 116 gillnet vessels were counted on the grounds. The majority of the biomass was seen in Togiak and Kulukak Bays. A testfishing effort was started on the early flood, however, testfishing by the gillnet fleet from Kulukak Bluffs to Right Hand Point did not yield any samples. Testfishing resumed on May 6, but samples were of poor commercial quality and partially green. Testfishing by the gillnet fleet continued on May 7 in the area between Right Hand Point and Kulukak Bluffs. Samples ranged from 9.4 to 10% mature roe. The first commercial period for the gillnet fleet was announced, a 4-hour opening to begin at 1:00 p.m. in this same area. Over 200 gillnet vessels were observed on grounds prior to the first opening.

After the first opening, companies reported a preliminary harvest of 1,242 tons of 10% average roe from 244 deliveries. On May 8 another test fishery was conducted from Right Hand Point to Kulukak Bluffs. Samples collected ranged from 9.1 to 14.8% with an overall average of 12.4% mature roe. With commercially acceptable roe available, the second opening for the gillnet fleet was announced for four hours, from 2:00 p.m. until 6:00 p.m. Companies reported mid-period samples with mature roe averaging over 10%, so the decision was made to extend the period for four hours, from 6:00 p.m. until 10:00 p.m. An aerial survey reported 227 permit holders participating in the fishery.

Final processor verbal reports, from the second period, brought the total gillnet harvest to 3,974 tons. With the purse seine harvest totaling 7,400 tons, the total sac roe harvest on May 9 was 65% purse seine and 35% gillnet. The Bristol Bay herring management plan specifies that "the department manage for the removal of 25% of the surplus by the gillnet fleet and 75% of the surplus by the purse seine fleet." With this in mind, the gillnet fleet was put on hold in order for the purse seine gear group to balance the allocation percentages.

Several tides of purse seine fishing occurred while the gillnet fleet waited for the percentages of catch between gear groups to become balanced. On May 12, the gear allocation was close to the prescribed allocation percentages, so an early morning test fishery was initiated in the area between Right Hand Point and Kulukak

Bluffs. Volunteer test fishermen caught samples that had an average of 11.1% mature roe. With commercial quality fish available, a four hour gillnet opening, from 2:00 to 6:00 p.m., was held from Right Hand Point to the Loran C line 32580 near Kulukak Bluffs. An early morning vessel count reported 131 gillnetters remaining in the district, the remainder of the gillnet fleet had departed for Security Cove around Cape Newenham from the Togiak District.

With companies reporting a light harvest, a four-hour extension was given. The period was allowed to close at 10:00 p.m. to allow managers to get final harvest figures from processing companies. When the final results were tallied from the eight hour opening on May 12, the season gillnet harvest was 4,250 tons, which was 25% of the overall sac roe harvest of 17,200 tons. A fourth gillnet opening was allowed for four hours, from 10:00 a.m. until 2:00 p.m. on May 13. An aerial survey was flown that documented only 75 gillnet vessels participating. Catches for this period were light but of good roe quality; therefore, the period was extended for eight hours.

The total gillnet harvest through May 13 was 4,300 tons. The fifth period for gillnet permit holders was announced for May 14 for four hours, beginning at 11:00, from Right Hand Point to Loran line 32580 near the Kulukak Bluffs. The amount of gillnet gear allowed was increased from 50 to 100 fathoms by emergency order. This period was extended for six hours because of light harvest. On May 15, gillnet fishing continued with a four-hour period, which began at 11:00 a.m., with a nine-hour extension, until 12:00 midnight.

On May 16, a final 12-hour gillnet period was allowed, from 12:00 noon until midnight. With 440 tons remaining on the preseason harvest guideline, it was announced that this would be the final period for the gillnet fleet for 2000.

The gillnet harvest for 2000 season reached 5,442 tons and averaged 10.5% mature roe. Seven gillnet openings occurred, with five extensions. Herring gillnets fished a total of 67 hours. The 2000 harvest of 5,442 tons was slightly below the recent five-year average of 5,966 tons, and comprised 27% of the sac roe harvest.

### ***Spawn on kelp***

There was no spawn-on-kelp fishery in 2000. The single processor registered to purchase spawn-on-kelp product found no kelp with suitable coverage or marketable quality. This was largely due to a storm that stirred up sediment that adhered to the kelp, rendering the product unmarketable. Samples were collected twice from various areas almost a week apart, but no suitable samples were found. On May 15, the Department announced that there would be no spawn-on-kelp fishery for the 2000 season, after the company intending to buy kelp left the district.

### **Exploitation**

The 2000 herring fisheries were managed not to exceed a maximum exploitation rate of 20% of the inseason observed peak biomass. Combining the sac roe harvest (20,074 tons), testfish harvest (408 tons) and the Dutch Harbor food and bait fishery (2,014 tons harvested on July 15) resulted in an exploitation of 22,496 tons. Based on the preseason forecasted biomass of 130,904 tons, the 2000 exploitation was calculated at 17.19%.

### **Exvessel value**

The ex-vessel value of the 2000 Togiak herring fishery was \$ 4.0 million. The value does not include any post-season adjustments to fishermen from processors and should therefore be considered a minimum. The 2000 ex-vessel value was less than half the average value from 1995-1999, and was the second lowest since 1995. This value is for the sac roe fishery only; there was no spawn on kelp fishery. Prices paid for sac roe herring in 2000 were low relative to previous years; base prices ranged from \$100 to \$200 per ton for 10% mature roe.

## **LITERATURE CITED**

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

**Table 1.** Daily observed estimates (tons) of herring by index area, Togiak District, 2000.

Date	Start Time	Survey Rating <sup>a</sup>	Miles of Spawn	Estimated Biomass by Index Area <sup>b</sup>													Daily Total	
				NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYT	CN	HAG	WAL		
18-Apr	10:33	2.8																
21-Apr	13:45	2.2																
24-Apr	13:45	3.5							281									281
25-Apr	11:00	1.8							141									141
27-Apr	11:00	3.0							363									363
29-Apr	18:05	1.3							111	89								200
01-May	15:20	2.1							8									8
03-May	10:05	2.0		5,085	4,255	312		199	544	6,762					9,449			26,606
04-May	10:00	3.7		660	2,726			3	13,134	3,718					639			20,880
04-May	18:50	3.6			61			134							103			298
05-May	11:00	1.0		1,371	6,711	6			21,784	5,447	1,695				433			37,447
06-May	10:12	1.8	7	2,702	6,425	1,726	2,056	5,308	13,093	1,886	9,116	2,471	354		855			45,992
07-May	8:00	2.8	15.8												27			27
08-May	10:05	2.5	11.1	6,196	5,737	3,008	6,993	8,223	27,223	7,297	3,320	2,267			8,298	3,434		78,562
11-May	8:30	3.9	8.8	121	537	285	42	94	1,322									2,401
12-May	11:05	2.4	1.5	249	2,333	85		1,092										3,759
25-May	14:50	3.0	1.5	36	538	994	73	23	439	71								2,174
01-Jun	10:10	3.7		20	108	2	72	5	32	2					4			245
<b>Total</b>			45.7														PEAK	81,995

<sup>a</sup> 1= Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory

<sup>b</sup> 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; CN - Cape Newenham.

**Table 2.** Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2000.

Emergency Order Number	Area <sup>a</sup>		Date and Time				Duration	
Herring Sac Roe Gillnet								
DLG-02	Right Hand Point to Kulukak Bluffs		5/07	1:00 p.m.	to	5/07	5:00 p.m.	4 hrs.
DLG-04	Right Hand Point to Kulukak Bluffs		5/08	2:00 p.m.	to	5/08	6:00 p.m.	4 hrs.
DLG-06	Right Hand Point to Kulukak Bluffs	extention	5/08	6:00 p.m.	to	5/08	10:00 p.m.	4 hrs.
DLG-14	Right Hand Point to Kulukak Bluffs		5/12	2:00 p.m.	to	5/12	6:00 p.m.	4 hrs.
DLG-15	Right Hand Point to Kulukak Bluffs	extention	5/12	6:00 p.m.	to	5/12	10:00 p.m.	4 hrs.
DLG-17	Right Hand Point to Kulukak Bluffs		5/13	10:00 a.m.	to	5/13	2:00 p.m.	4 hrs.
DLG-18	Right Hand Point to Kulukak Bluffs	extention	5/13	2:00 p.m.	to	5/13	10:00 p.m.	8 hrs.
DLG-20	Right Hand Point to Kulukak Bluffs		5/14	11:00 a.m.	to	5/14	3:00 p.m.	4 hrs.
DLG-22	Right Hand Point to Kulukak Bluffs	extention	5/14	3:00 p.m.	to	5/14	9:00 p.m.	6 hrs.
DLG-24	Right Hand Point to Kulukak Bluffs	extention	5/15	3:00 p.m.	to	5/16	12:00 a.m.	9 hrs.
DLG-25	Right Hand Point to Kulukak Bluffs		5/16	12:00 p.m.	to	5/17	12:00 a.m.	12 hrs.
Herring Sac Roe Purse Seine								
DLG-01	Kulukak Bluffs to Right Hand Point		5/06	10:30 p.m.	to	5/06	10:50 p.m.	20 min.
DLG-03	Eastern Nunavachak to Right Hand Point		5/08	3:00 p.m.	to	5/08	3:15 p.m.	15 min.
DLG-05	Western Nunavachak to Right Hand Point		5/09	1:00 p.m.	to	5/09	1:30 p.m.	30 min.
DLG-07	Anchor Point to Oosik Spit		5/09	1:00 p.m.	to	5/09	1:30 p.m.	30 min.
DLG-08	Anchor Point to Oosik Spit		5/09	8:30 p.m.	to	5/09	9:00 p.m.	30 min.
DLG-09	Cape Peirce to Kulukuk Bluffs		5/10	3:00 p.m.	to	5/10	4:00 p.m.	60 min.
DLG-10	Cape Peirce to Kulukuk Bluffs		5/10	8:30 p.m.	to	5/10	9:30 a.m.	60 min.
DLG-11	Cape Newenham to Right Hand Point		5/11	1:00 p.m.	to	5/11	4:00 p.m.	3 hrs.
DLG-12	Cape Newenham to Kulukak Bay		5/11	8:00 p.m.	to	5/11	11:00 p.m.	3 hrs.
DLG-13	Cape Newenham to Right Hand Point		5/12	1:00 p.m.	to	5/12	4:00 p.m.	3 hrs.
DLG-16	Cape Newenham to Right Hand Point		5/13	11:00 a.m.	to	5/13	12:00 noon	1 hrs.
DLG-19	Cape Newenham to Right Hand Point		5/13	8:30 p.m.	to	5/13	9:30 p.m.	1 hrs.
DLG-21	Cape Newenham to Right Hand Point		5/14	1:00 p.m.	to	5/14	2:00 p.m.	1 hrs.
Herring Spawn on Kelp <sup>b</sup>								

<sup>a</sup> Area descriptions are approximate. Precise boundaries are described in Emergency Orders.

<sup>b</sup> No Kelp fishery due to poor quality and no buyers.

**Table 3.** Commercial herring harvest (tons) by fishing section, gear type, and date Togiak District, Bristol Bay, 2000.

Date	Time (hours)	Periods	Kulukak	Nunavachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham	Total	Total Roe %
Purse Seine										
06-May	0:20	1	1252 (9.3)						1,252	(9.3)
07-May	0:10	2		5,577 (8.9) <sup>a,b</sup>					5,577	(8.9)
08-May	0:15	3		232 (9.6)					232	(8.5)
09-May	1:00	4,5			40 (14.4)	706 (10.6)			746	(9.4)
10-May	2:00	6,7	1,223 (8.8)	22 (10.2)	41 (8.3)	555 (9.6)			1,841	(8.7)
11-May	6:00	8,9	1,191 (8.8)	44 (9.9)	327 (9.5)	377 (8.4)			1,938	(8.2)
12-May	3:00	10	17 (9.5) <sup>a</sup>			1,380 (9.7)	99 (9.6)		1,496	(9.3)
13-May	2:00	11,12				373 (9.6)	489 (9.3) <sup>a</sup>		862	(9.9)
14-May	1:00	13				644 (9.3)	267 (8.1)		911	(9.0)
15-May				23 (8.3) <sup>a</sup>	79 (9.1) <sup>a</sup>				102	(8.9)
Subtotal	15:45		3,682 (9.0)	5,898 (8.9)	488 (10.0)	4,034 (9.6)	855 (9.0)		14,957	(9.2)
Gillnet										
07-May	4:00	1	1,406 (10.2)						1,406	(10.2)
08-May	8:00	2	2,510 (10.5)						2,510	(10.5)
12-May	8:00	3	329 (10.6)						329	(10.6)
13-May	12:00	4	321 (11.0)						321	(11.0)
14-May	10:00	5	316 (11.3)						316	(11.3)
15-May	13:00	6	444 (11.8)						444	(11.8)
16-May	12:00	7	140 (12.3)						140	(12.3)
Subtotal	19:00		5,464 (10.7)						5,464	(10.7)
Total										
06-May			1,252 (9.3)						1,252	(9.3)
07-May			1,406 (10.2)	5,577 (8.9)					6,983	(9.2)
08-May			2,510 (10.5)	232 (9.6)					2,742	(10.4)
09-May					40 (14.4)	706 (10.6)			746	(10.8)
10-May			1,223 (8.8)	22 (10.2)	41 (8.3)	555 (9.6)			1,841	(9.0)
11-May			1,191 (8.9)	44 (9.9)	327 (9.5)	377 (8.4)			1,938	(8.9)
12-May			346 (10.6)			1,380 (9.7)	99 (9.6)		1,825	(9.9)
13-May			321 (11.0)			373 (9.6)	489 (9.3)		1,182	(9.9)
14-May			316 (11.3)			644 (9.3)	267 (8.1)		1,227	(9.6)
15-May			444 (11.8)	23 (8.3) <sup>a</sup>	79 (9.1) <sup>a</sup>				546	(11.3)
16-May			140 (12.3)						140	(12.3)
Total			9,147 (10.0)	5,898 (9.0)	488 (10.0)	4,034 (9.6)	855 (9.0)		20,421	(9.6)

<sup>a</sup> Includes test fish harvest which is conducted during closed commercial periods.

<sup>b</sup> includes 100 tons of documented deadloss

**Table 4.** Preliminary herring total run and commercial catch by year class, Togiak District, 2000<sup>a,b</sup>

Year Class	Age	Total Run		Harvest		Escapement	
		(tons)	%	(tons)	%	(tons)	%
1982	18			36	0.2%		
1983	17			97	0.5%		
1984	16			142	0.7%		
1985	15			354	1.7%		
1986	14			1,463	7.2%		
1987	13			2,124	10.4%		
1988	12			1,802	8.8%		
1989	11			2,767	13.5%		
1990	10			2,067	10.1%		
1991	9			2,407	11.8%		
1992	8			3,080	15.1%		
1993	7			3,352	16.4%		
1994	6			354	1.7%		
1995	5			183	0.9%		
1996	4			193	0.9%		
1997	3			4	0.0%		
1998	2			0	0.0%		
<b>Total</b>		<b>0</b>	<b>0%</b>	<b>20,425</b>	<b>100%</b>	<b>0</b>	<b>0%</b>

<sup>a</sup> Does not include harvest in the Dutch Harbor food and bait fishery.

<sup>b</sup> Total run estimates not available. Seasons aerial assessment was hampered by poor weather preventing adequate biomass assessment to calculate a final season's biomass estimate.

**Table 5.** Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2000.<sup>a</sup>

Operator/Buyer	Base of Operation	Product Purchased		
		Gillnet	Purse Seine	Spawn-on-Kelp <sup>b</sup>
1 Capilano	S/P Naknek	X		
2 Icicle Seafood, Inc.	P/V Bering Star/Discovery Star	X	X	
3 Leader Creek Fisheries	S/P Naknek		X	
4 New West Fisheries, Inc.	P/V New West	X	X	
5 Norquest Seafoods, Inc.	P/V Alution Falcon/Pribilof	X	X	
6 Ocean Beauty Seafoods	S/P Naknek	X	X	
7 Peter Pan Seafoods, Inc.	P/V Steller Sea/Blue Wave	X	X	
8 Snopac Products, Inc.	P/V Snowpac	X	X	
9 Trident Seafoods	P/V Alaska Packer/Sea Alaska	X	X	
10 Unisea, Inc.	S/P Naknek	X	X	
11 Wards Cove Packing	S/P Naknek	X	X	
12 Woodbine	P/V Woodbine	X	X	
13 Y.A.K. Inc.	S/P Naknek	X	X	

<sup>a</sup> Operators that registered in the Togiak District.

<sup>b</sup> No Spawn-on-Kelp buyers available due to poor quality.

**Appendix Table 1.** Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1979-2000.

Year	Companies	Daily Processing Capacity <sup>a</sup>	Fishery Dates	Gillnet					Purse Seine					Total Harvest
				Effort <sup>b</sup>	Duration (hrs.)	Harvest <sup>c</sup>	C.P.U.E.	Roe% <sup>d</sup>	Effort <sup>b</sup>	Duration (hrs.)	Harvest <sup>c</sup>	C.P.U.E.	Roe% <sup>d</sup>	
1979	33		5/1-6/1	350	768.0	4,459	0.0	8.6	175	696.0	6,667	0.1	8.6	11,126
1980	27		4/25-5/16	363	384.0	4,150	0.0	8.0-11.0	140	384.0	20,366	0.4	8.0-11.0	24,516
1981 <sup>e</sup>	28		5/2-5/16	106	101.0	2,338	0.2	6.7	83	101.0	10,151	1.2	10.1	12,489
1982	33		5/14-5/24	200	60.0	7,105	0.6	7.4	135	36.0	14,716	3.0	9.5	21,821
1983	23		5/3-5/11	250	42.0	5,344	0.5	6.9	150	14.0	21,442	10.2	9.3	26,786
1984	25		5/18-5/21	300	35.0	4,934	0.5	8.4	196	11.0	14,485	6.7	10.2	19,419
1985	23		5/23-5/25	302	11.0	4,482	1.3	7.4	155	3.0	21,330	45.9	10.0	25,812
1986	23		5/14-5/15	209	10.0	3,448	1.6	8.8	209	1.0	12,828	61.4	9.9	16,276
1987	18		4/27-5/6	148	36.0	2,685	0.5	8.6	111	5.5	12,845	21.0	8.9	15,530
1988	22		5/17	300	4.0	3,695	3.1	8.3	239	0.5	10,472	87.6	10.9	14,167
1989	19		5/9-5/14	320	5.0	2,844	1.8	7.8	310	3.0	9,415	10.1	8.5	12,259
1990	16	3,100	5/8-5/20	277	66.0	3,072	0.2	9.0	221	3.0	9,158	13.8	9.7	12,230
1991	16	3,350	5/10-5/17	170	14.0	3,182	1.3	8.5	200	3.0	11,788	19.6	10.0	14,970
1992	18	3,700	5/20-5/27	274	25.5	5,030	0.7	8.8	301	0.3	20,778	230.1	9.2	25,808
1993	12	2,500	4/27-5/9	75	144.5	3,564	0.3	10.1	140	33.8	14,392	3.0	9.6	17,956
1994	16	3,300	5/11-5/20	146	76.0	7,462	0.7	12.0	240	4.6	22,853	20.7	9.4	30,315
1995	22	4,350	5/7-5/15	250	33.5	6,995	0.8	12.0	254	12.2	19,737	6.4	10.1	26,732
1996	19	4,850	5/3-5/8	461	18.0	6,863	0.8	11.1	268	2.4	18,008	27.8	9.0	24,871
1997	18	4,200	5/2-5/6	336	24.0	5,164	0.6	11.8	231	6.4	18,649	12.6	9.4	23,813
1998	15	2,475	4/29-5/10	152	46.0	5,952	0.9	12.5	123	16.5	16,824	8.3	9.6	22,776
1999	12	2,400	5/18-5/26	171	28.0	4,858	1.0	11.5	96	4.7	15,020	33.3	9.2	19,878
1979-99 Ave.	21	3,423		246	92	4,649	1	9.3	189	64	15,330	30	9.5	19,423
1994-99 Ave.	17	3,596		253	37.6	6,216	1	11.8	202	8	18,515	18	9	24,731
2000	12	2,100	5/6-5/14	227	67	5,442	0.36	10.56	90	15.75	14,632	10.32	10.13	20,074

<sup>a</sup> Number of tons per day based on companies registered.

<sup>b</sup> Peak aerial survey count.

<sup>c</sup> Sources: 1988-2000: Fish ticket data  
1980-87: Sandone and Brannian, 1988.  
1978-79: ADF&G, 1981 and 1982.

<sup>d</sup> Source: 1989-2000: Fish ticket data  
1978-88: ADF&G, 1997.

<sup>e</sup> Fishery managed by emergency order from 1981 to present.

**Appendix Table 2.** Exploitation of Togiak herring stock, 1979-2000.

Year	Biomass Estimate <sup>a</sup> (short tons)	S-O-K Herring Equivalent	Dutch Harbor Food/Bait	Sac Roe			Total Harvest	Exploitation Rate
				Gillnet	Purse Seine	Total		
1979	239,022			4,459	6,667	11,126	11,126	4.7%
1980	68,686			4,150	20,366	24,516	24,516	35.7%
1981	158,650			2,338	10,151	12,489	12,489	7.9%
1982	97,902			7,105	14,716	21,821	21,821	22.3%
1983	141,782			5,344	21,442	26,786	26,786	18.9%
1984	114,880	1,552		4,934	14,485	19,419	20,971	18.3%
1985	131,400	0		4,482	21,330	25,812	25,812	19.6%
1986	94,700	1,446		3,448	12,828	16,276	17,722	18.7%
1987	88,400	1,309		2,685	12,845	15,530	16,839	19.0%
1988	134,717	1,782	2,004	3,695	10,472	14,167	17,953	13.3%
1989	98,965	2,499	3,081	2,844	9,415	12,259	17,839	18.0%
1990	88,105	1,617	820	3,072	9,158	12,230	14,667	16.6%
1991	83,329	1,310	1,325	3,182	11,788	14,970	17,605	21.1%
1992	156,955	1,482	1,949	5,030	20,778	25,808	29,239	18.6%
1993	193,847	1,481	2,790	3,564	14,392	17,956	22,227	11.5%
1994	185,454	1,134	3,349	7,462	22,853	30,315	34,798	18.8%
1995	149,093	996	1,748	6,995	19,737	26,732	29,476	19.8%
1996	135,585	1,899	2,239	6,863	18,008	24,871	29,009	21.4%
1997	144,887	0	1,950	5,164	18,649	23,813	25,763	17.8%
1998	121,000	0	1,994	5,952	16,824	22,776	24,770	20.5%
1999	156,183	1,605	2,398	4,858	15,020	19,878	23,881	15.3%
1979-99 Ave	132,550	1,257	2,137	4,649	15,330	19,979	23,373	18.0%
1994-99 Ave	148,700	939	2,280	6,216	18,515	24,731	27,950	17.8%
2000	130,904	0	2,014	5,464	14,957	20,421	22,435 <sup>b</sup>	17.1%

<sup>a</sup> Preseason forecast unless peak biomass estimate inseason exceeded preseason forecast

<sup>b</sup> 2000 includes testfish harvest of 368 tons and documented waste of 100 tons

**Appendix Table 3.** Age composition of the inshore herring, Togiak District, 1978-2000.

Year	Age Composition (%) <sup>a</sup>							Total <sup>b</sup> Run (tons)
	3 <sup>†</sup>	4	5	6	7	8	9 +	
1978		47	36	11	1	3	2	190,292
1979	1	4	48	31	13	1	2	239,022
1980	8	5	1	37	35	12	2	68,686
1981	1	50	7	1	22	14	5	158,650
1982		16	51	3	1	17	12	97,902
1983		5	37	45	2	2	9	141,782
1984		2	2	28	42	4	24	114,880
1985		1	1	8	35	42	13	131,400
1986			1	2	15	44	38	94,770
1987				8	10	28	54	88,400
1988		2	5	1	13	5	74	134,717
1989			5	11	4	15	65	98,965
1990				6	11	3	80	88,105 <sup>g</sup>
1991		7	1	1	16	18	57	83,329
1992		10	20	1	1	15	53	156,955 <sup>c</sup>
1993			6	23	1	1	67	193,847 <sup>d</sup>
1994			2	12	28	3	55	185,454 <sup>d</sup>
1995		<sup>†</sup>	4	7	24	30	35	<sup>e</sup>
1996		<sup>d</sup>	3	5	7	21	64	<sup>e</sup>
1997		7	5	12	11	10	55	144,887 <sup>c</sup>
1998		<sup>d</sup>	4	5	10	11	70	<sup>e</sup>
1999		<sup>c</sup>	<sup>d</sup>	1	12	9	66	188,264 <sup>e</sup>
2000		<sup>c</sup>	1	1	2	17	63	<sup>e</sup>

<sup>a</sup> Age composition in 1979-92 is weighted by aerial survey data and weight at age.

<sup>b</sup> Includes commercial catch, escapement, and documented waste.

<sup>c</sup> Contribution of age 3 herring is less than 0.5%.

<sup>d</sup> Contribution of age 4 herring is less than 0.5%.

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

<sup>†</sup> Includes age 1, 2 and 3 herring.

<sup>g</sup> Contributions of age groups 3, 4 and 5 are less than 5% each.

**Appendix Table 4.** Herring spawn-on-kelp industry participation, fishing effort, area and harvest, Togiak District, 1979-2000.

Year	Companies	Fishery Dates	Hours	Effort <sup>a</sup>	Area	Total Harvest in pounds	Herring Equivalent (in tons)	Openings	Average roe %
1979	16	5/4-5/23		100	Togiak District	414,727			0.1
1980 <sup>b</sup>	21	5/2-5/13		78	K 3 - K10	189,662			9.2
1981	7	5/5-5/13		108	K 3 - K 9	378,207			9.1
1982	8	5/21-5/23	39.0	214	K 3 - K 9	234,924		2	8.8
1983	4	5/5-5/7	52.0	125	K 3 - K 9	270,866		3	8.9
1984 <sup>c</sup>	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
1989-98 Ave.	5		6.9	309		392,660	1,558	2	9.6
1994-98 Ave.	3		11.5	173		385,654	1,500	2	10.0
2000		no fishery							

<sup>a</sup> 1978 - 1989 and 1992 - 1996, number of permits fished based on fish tickets. 1990 and 1991, peak aerial survey count.

<sup>b</sup> 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.

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

**Appendix Table 5.** Aerial survey estimates of herring biomass and spawn deposition, Togiak Districts, 1979-2000.

Year	Preseason Forecast <sup>a</sup>	Biomass Estimate	Spawn Estimates	
			Observations	Miles
1979		239,022	52	22
1980		68,686	64	24
1981		158,650	106	40
1982		97,902	103	39
1983		141,782	189	60
1984	106,422	114,880	171	61
1985	81,899	131,400	141	43
1986	86,310	94,700	182	67
1987	61,100	88,400	160	76
1988	54,500	134,717	107	61
1989	80,100	98,965	69	53
1990	56,000	88,105	94	66
1991	55,000	83,329	90	70
1992	60,214	156,955	160	97
1993	148,786	193,847	76	53
1994	142,497	185,454	80	72
1995	149,093	<sup>b</sup> 149,093	70	59
1996	135,585	<sup>b</sup> 135,585	99	73
1997	125,000	144,887	79	59
1998	121,000	<sup>b</sup> 121,000	42	33
1999	90,000	156,183	33	56
<hr/>				
1979-99 Average	97,094	214,657	107	56
1994-99 Average	127,196	162,175	74	59
<hr/>				
2000	130,904	<sup>b</sup> 130,904	71	46

<sup>a</sup> 1993-2000 forecasts based on Age Structured Analysis. Previous years based on age composition, abundance, average growth and mortality rates. Forecasts for Togiak herring not provided prior to 1984.

<sup>b</sup> Biomass estimate precluded by weather conditions. Inseason management used preseason forecast.

**Appendix Table 6.** Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1979-2000.<sup>a</sup>

Year	Herring		Spawn-on-Kelp	Total
	Sac Roe	Food/Bait		
1979	6,561	180	249	6,990
1980	3,055	150	95	3,300
1981	3,988	1	250	4,239
1982	6,070	105	176	6,351
1983	10,450	67	284	10,801
1984	7,178	33	203	7,414
1985	13,696	41	<sup>b</sup>	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	<sup>b</sup>	4,306
1998	3,986	0 <sup>c</sup>	<sup>b</sup>	3,986
1999	6,211	0 <sup>d</sup>	315	6,526
1979-99 Average	8,036	38	282	8,312
1994-99 Average	9,117	1	350	9,351
2000	4,000	0	<sup>b</sup>	4,000

<sup>a</sup> 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.

<sup>b</sup> Fishery not conducted.

<sup>c</sup> 400 ton dead loss reported, no commercial value.

<sup>d</sup> 221 ton dead loss reported, no commercial value.

**Appendix Table 7.** Guideline and actual harvests of sac roe herring (tons) and spawn-on-kelp (lbs), Togiak District, 1984-2000.

Year	Gillnet Sac Roe			Purse Seine Sac Roe			Spawn-on-Kelp		
	Guideline <sup>a</sup>	Actual	Difference <sup>b</sup>	Guideline <sup>a</sup>	Actual	Difference <sup>b</sup>	Guideline <sup>a</sup>	Actual	Difference <sup>b</sup>
1984							350,000	406,586	16%
1985							350,000	<sup>c</sup>	
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	<sup>c</sup>	
1998	5,280	5,952	13%	15,840	16,824	6%	350,000	<sup>c</sup>	
1999	6,914	4,858	-30%	20,741	15,020	-28%	350,000	419,563	20%
Average	5,322	4,890	-7%	15,966	15,591	1%	350,000	390,978	12%
2000	5,738	5,464	-5%	17,215	14,857	<sup>d</sup> -14%	350,000	<sup>c</sup>	

<sup>a</sup> Harvest guideline derived from inseason biomass estimate when available, or preseason forecast when weather precluded an inseason estimate.

<sup>b</sup> Actual minus guideline divided by guideline.

<sup>c</sup> No fishery conducted

<sup>d</sup> Includes testfish harvest of 368 tons and documented waste of 100 tons.

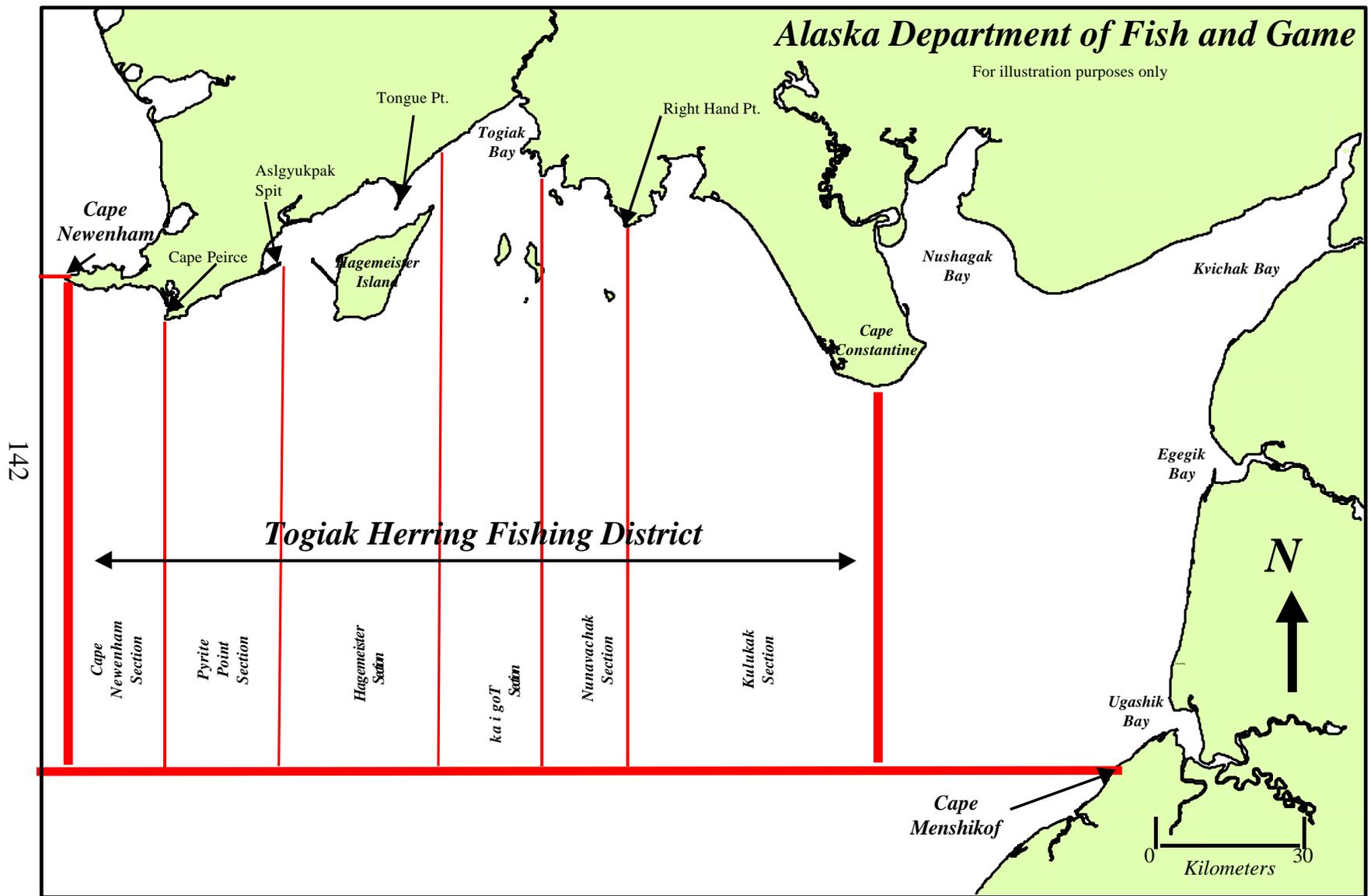


Figure 1. Togiak Herring District, Bristol Bay.

*Alaska Department of Fish and Game*

*Division of Commercial Fisheries Management and Development*

(For Illustration Purposes Only - BBHERKLP.PPT. Revised 10/14/97)

***Bristol Bay Togiak  
Herring Commercial  
Spawn-On-Kelp  
Management Areas***

143

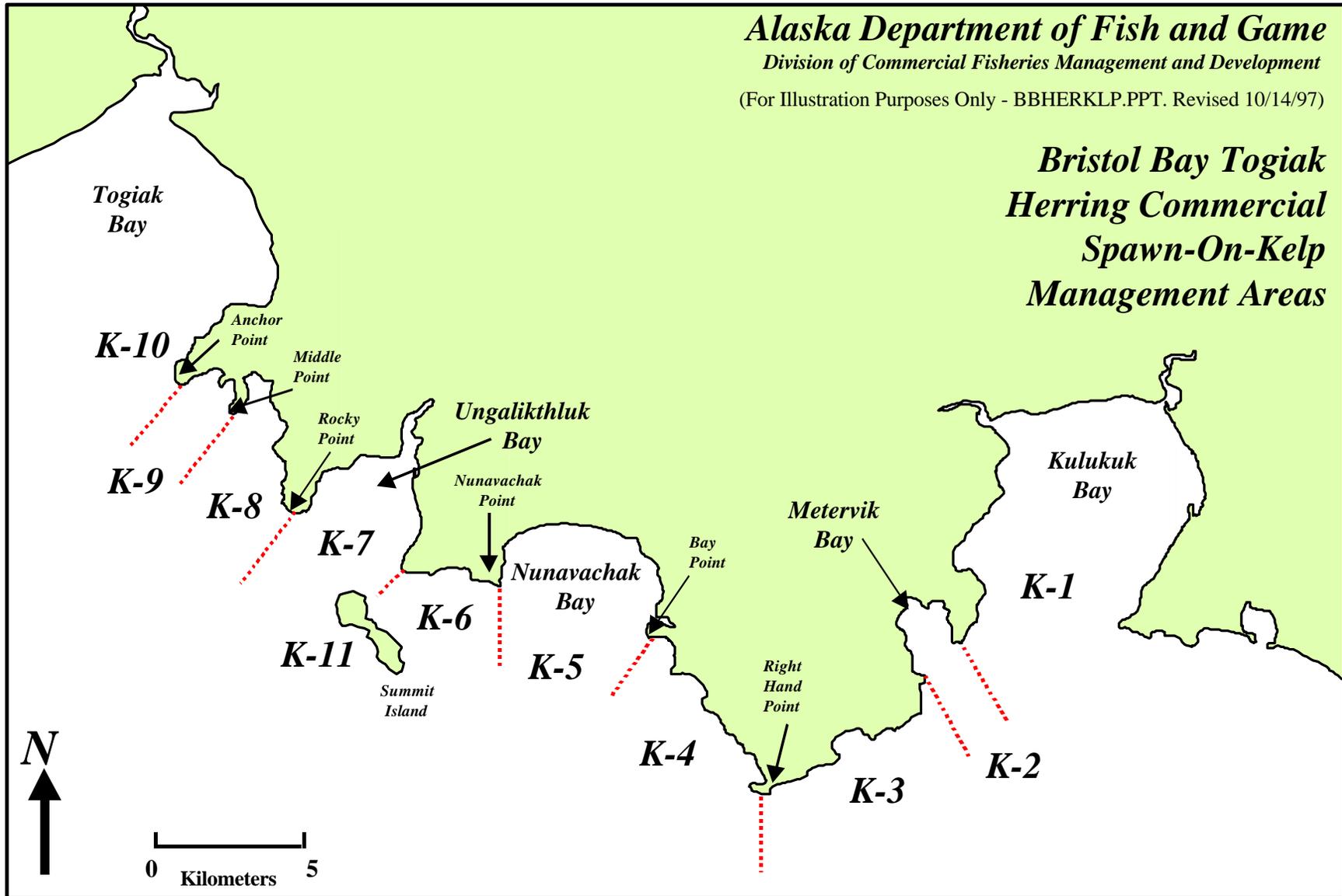


Figure 2. Spawn-on-kelp management areas (K-1 through K-11), Togiak District, Bristol Bay.

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