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**REVIEW OF THE BRISTOL BAY  
SALMON FISHERY**

-1997-

**ANNUAL SALMON MANAGEMENT REPORT  
TO THE ALASKA BOARD OF FISHERIES**



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## INTRODUCTION

The Bristol Bay area includes all coastal waters and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1) and is the largest sockeye-producing region in the world. It also produces substantial returns of other salmon species as well as herring. The Togiak herring fishery is the State's largest sac roe fishery.

Bristol Bay is divided into five fishing districts: Togiak, Nushagak, Naknek/Kvichak, Egegik and Ugashik Districts. Associated with these districts are nine major rivers: Togiak, Igushik, Wood, Nushagak, Kvichak, Branch, Naknek, Egegik, and Ugashik Rivers (Figure 1). Several districts are divided into sections. Sections provide more management flexibility in controlling exploitation of individual stocks when more than one river system contributes to the district's return. The districts and sections are confined to areas near the river mouths in order to minimize interceptions of salmon destined for other areas. Fishing schedules are not the same for all districts and fishing times are established by regulation and emergency order (E.O.).

In the last 20 years (1977-1996), Bristol Bay commercial salmon harvests have averaged 25.1 million sockeye salmon, 117,000 chinook salmon, 1.1 million chum salmon, 1.6 million pink salmon (during even-numbered years), and 208,000 coho salmon.

Subsistence catches for the past 20 years have averaged approximately 168,000 salmon per year. In 1996, data indicates that approximately 142,000 salmon have been harvested by subsistence fishers. About 80% of the subsistence catch are sockeye salmon. Sport fisheries target on chinook and coho salmon, but pink, sockeye, and chum salmon are also taken.

The management objective for all districts in Bristol Bay is to achieve escapement goals for major salmon species while providing opportunities to harvest surplus fish.

## 1997 COMMERCIAL SALMON FISHERY

In 1997, the Bristol Bay commercial salmon fishery produced a cumulative harvest of 12.7 million fish (Table 4), worth approximately \$62,800,000 to the 1,020 set gillnet and 1,890 drift gillnet permit holders. This was the fourth lowest exvessel value for the last 20 years.

The 1997 sockeye salmon harvest of 12.3 million was the lowest harvest since 1978 and below the average harvest for all years (1893-1996) of 13.6 million and accounted for 97% of the total salmon harvest in Bristol Bay. The Egegik District was the top producer with a harvest of approximately 7.5 million sockeye salmon (Table 4). Sockeye salmon escapement in all but three systems was within 20% of the point goals. The Nushagak, Igushik and Kvichak were significantly under their point goals, the final escapements were 32%, 36% and 62% below their point goals, respectively (Table 5).

The chinook salmon return was below average in 1997. The commercial harvest of 76,300 fish was the seventh lowest in the past 20 years (Table 6), and 35% below the recent 20-year average. All districts experienced below average harvests. The Nushagak District had the largest harvest with

approximately 64,300 chinook salmon taken. Chinook salmon escapements were average to above average in most of the systems surveyed.

The 1997 chum salmon harvest of 307,000 was 75% below the 20-year average (Table 6). Chum salmon harvests have been declining since 1991. Escapements for all districts were average to below average.

Bristol Bay pink salmon return in strength during even-numbered years. The 1997 run produced a commercial harvest of only 100 (Table 6).

The Bay's coho salmon harvest was well below average in 1997. The catch of 50,000 fish was the lowest since 1995 (Table 6). The Egegik District had the largest catch with approximately 36,000 coho salmon taken.

### *SOCKEYE SALMON*

The 1997 sockeye salmon return to Bristol Bay of 19 million was the second lowest inshore return in the last 20 years (1977-1996). It was approximately 44% below the preseason forecast of 33.6 million (Table 7). Returns to all major river systems were significantly less than forecast with the exception of Wood River, which came in slightly above forecast. The inshore harvest of 12.3 million sockeye salmon was the lowest harvest since 1978.

#### **Naknek/Kvichak District**

The Naknek/Kvichak District total inshore return of 3.3 million sockeye salmon was 69% less than the preseason forecast of 10.8 million. This was due to a less than expected return of all ages of fish to the Kvichak and Naknek Rivers.

Preseason management strategy called for early fishing periods during the emergency order period in the Naknek Section. A restricted fishing schedule, 4-days per week, was used for three weeks before and two weeks after the emergency order period to promote the escapement of other species. Early fishing periods are used to assess early run strengths and effort levels. Harvest and effort levels in early June are usually low. The harvest during the pre-emergency order period was about 20,000 sockeye salmon.

In the Naknek/Kvichak District it is often difficult to harvest surplus Naknek sockeye salmon while not adversely affecting the Kvichak sockeye return. Early in the Emergency Order period there were 6 fishing periods in the Naknek Section to allow harvest on the forecasted run. Inseason run strength became more clear by July 2 and 3, subsequently the district was closed until further notice on July 4. The Kvichak run continued to lag for the remainder of the season. The Naknek run from July 4 to July 8 increased sufficiently to allow for fishing periods within the Naknek River Special Harvest Area. From July 9 until July 25 the fishery occurred in the river.

Of the district's catch of 603,000 sockeye, 35% was caught in the Naknek in-river fishery. The Kvichak River escapement of 1.5 million was 62% less than the goal of 4.0. The Naknek River escapement of 1,025,000 sockeye salmon was 2.5% greater than the point goal of 1.0 million.

### **Egegik District**

The 1997 Egegik District inshore sockeye salmon return of approximately 8.6 million was the lowest since 1988. The commercial harvest of 7.5 million sockeye salmon was the lowest catch since 1991.

The 1997 season began June 1 with very little fishing effort and no landings reported until June 9. Prior to the emergency order period, the harvest totaled 7,600 sockeye. Given the large Egegik forecast, a liberal approach to fishing time in late June was the management strategy adopted, 18 fishing periods occurred between June 17 and July 6. All but 3 of the 18 fishing periods were 8-hour periods. Egegik had the largest fleet with over 600 drifters on any average day in-season.

On July 4 it was announced that the Naknek-Kvichak District was closed until further notice, that closure triggered the western Loran line in Egegik moving from the 45135 line to the 45110 line on July 7. The fishery in Egegik continued at the 110 Loran line through July 28. Of the total sockeye harvested in Egegik, 30% were taken in the reduced area.

The Egegik River escapement of 1.1 million was 10% greater than the goal of 1.0 million.

### **Ugashik District**

The Ugashik District sockeye salmon return totaled approximately 2.0 million fish. The district's harvest of about 1.4 million fish was the lowest since 1988.

The Ugashik sockeye return ordinarily demonstrates the latest run-timing of east side Bristol Bay stocks. Catches before July 3 are typically low. This year's total catch during the pre-emergency order period was about average with 62,000 sockeye salmon taken.

Before and during the season fishers were advised the district would be managed more conservatively than in 1996 due to the smaller run forecasted.

Peak harvests in the fishery occurred July 6 and 7 with a combined landing of 479,000 sockeye. The fishery was conducted with fishing periods that ranged from 6 hours to 9 hours in length. During the emergency order period a total of 8 periods were fished. The emergency order period was extended from July 17 until July 28 to gain additional escapement.

The Ugashik river escapement was 618,000 or 12% below the point escapement goal of 700,000.

The fishery reverted to a 4-days-per-week fishing schedule beginning July 28. The last landing occurred on September 9.

### **Nushagak District**

The 1997 Nushagak District sockeye salmon inshore return of approximately 4.6 million fish was below the preseason forecast of 5.7 million (Tables 2 and 7). The district's sockeye harvest of 2.6 million was the lowest since 1988.

Before the season, fishers were advised that the fishery would be managed in a fashion similar to past years. The department projected average run strengths for Nushagak and Wood River sockeye, and a relatively strong return to the Igushik River. Given the expected strong Igushik return and the fact that escapements have exceeded the escapement goal in the past, fishery managers intended to increase the exploitation on Igushik River sockeye by scheduling more openings for the Igushik Section.

The directed sockeye fishery began June 20 with an Igushik Section opening, a total of three Igushik Section openings were given all based on high inriver test results. By July 6 escapement into Igushik river had dropped to 5 days behind schedule so the section was closed. The observed returns to the Wood and Nushagak Rivers showed that the Wood return was stronger than forecast, which resulted in a greater disparity between the Wood and Nushagak run strengths. Based on the differences between the two rivers and considering the two escapement ranges it was necessary to open the Wood River Special Harvest Area through an Emergency regulation. The first opening of the WRSOA was on July 9. The WRSOA was opened 37 times between July 9 and July 29, the fishing periods on average were 6 hours in duration. The district then closed for the rest of the season to protect a weak coho return.

The Wood River escapement was 1.5 million, which was 51% over the point goal of 1.0 million. Sockeye escapement into the Igushik River totaled 127,000, which was 36% under the point goal of 200,000. The Nushagak River sockeye escapement of 373,000 fish was within the management range, but 32% under the point escapement goal of 550,000 (Table 5).

### **Togiak District**

The Togiak District inshore sockeye salmon return 315,000 fish was 35% below the preseason forecast of 483,000. The districts sockeye salmon harvest of 144,000 was the lowest since 1989.

The salmon fishery is managed with the Togiak District Salmon Management Plan. The TDSMP calls for a 5 and ½ day per week fishing schedule from July 1 until July 16. Through July 5, 132 hours were fished; the fishery was restricted due to low escapements on July 7. On July 15 the fishery was closed until August 4 to attain additional sockeye salmon escapement. The sockeye escapement into Togiak Lake totaled 132,000 fish, which was 12% below the escapement goal of 150,000 (Table 5).

### *CHINOOK SALMON*

The Bristol Bay total commercial catch of 76,000 chinook salmon was the seventh lowest in the past 20 years and 35% below the recent 20-year average (Table 6). Approximately 64,000 chinook salmon or 84% of the Bay's harvest were taken in the Nushagak District. The Nushagak harvest was below average. Catches in other districts were all below average.

The chinook salmon harvest from the Togiak District was approximately 6,100 fish. This was about 30% the district's recent 20-year average of 21,000. The Togiak River chinook escapement was approximately 10,000.

The commercial chinook harvests in the Naknek/Kvichak, Egegik, and Ugashik districts were approximately 2,800, 2,000, and 1,100 fish, respectively. All three of the districts harvest were

below average. Total escapement counts are not obtained in these districts but aerial surveys provide an annual index of escapement abundance. The 1997 aerial counts revealed above average escapements for all three districts.

#### *CHUM SALMON*

The total Bristol Bay commercial catch of 307,000 chum salmon was 25% below the 20-year average of 1.2 million (Table 6). It was the smallest chum catch since 1974 and the sixth consecutive year with a harvest below one million fish.

The Nushagak District recorded the largest harvest of 181,000 chums. Compared to the recent 20-year average chum salmon catches by district, the 1997 chum harvests in all districts were substantially below average. Escapements were average to below average in all of the districts. Chum escapements to the Togiak, Naknek/Kvichak, Egegik and Ugashik Districts have been estimated with aerial surveys. The Nushagak escapement has been counted with sonar.

#### *PINK SALMON*

Bristol Bay pink salmon return in strength during even-numbered years. A typical catch in an even-numbered year is less than 1,000 pink salmon. While the catch on an odd year can average over 500,000.

#### *COHO SALMON*

In 1997, the total commercial catch of coho salmon was 50,000 fish, which was the lowest catch since 1995 (Table 6). The Nushagak District was closed to commercial harvest of coho salmon during the season when it became apparent that the run was poor and that the escapement goal might not be reached. Usually the Nushagak District produces over half of the Bay's commercial coho harvest, but in 1997 it contributed only 3,000 fish or 6% of the total harvest. The Egegik District produced the largest coho harvest in the Bay with a total of 36,000 fish.

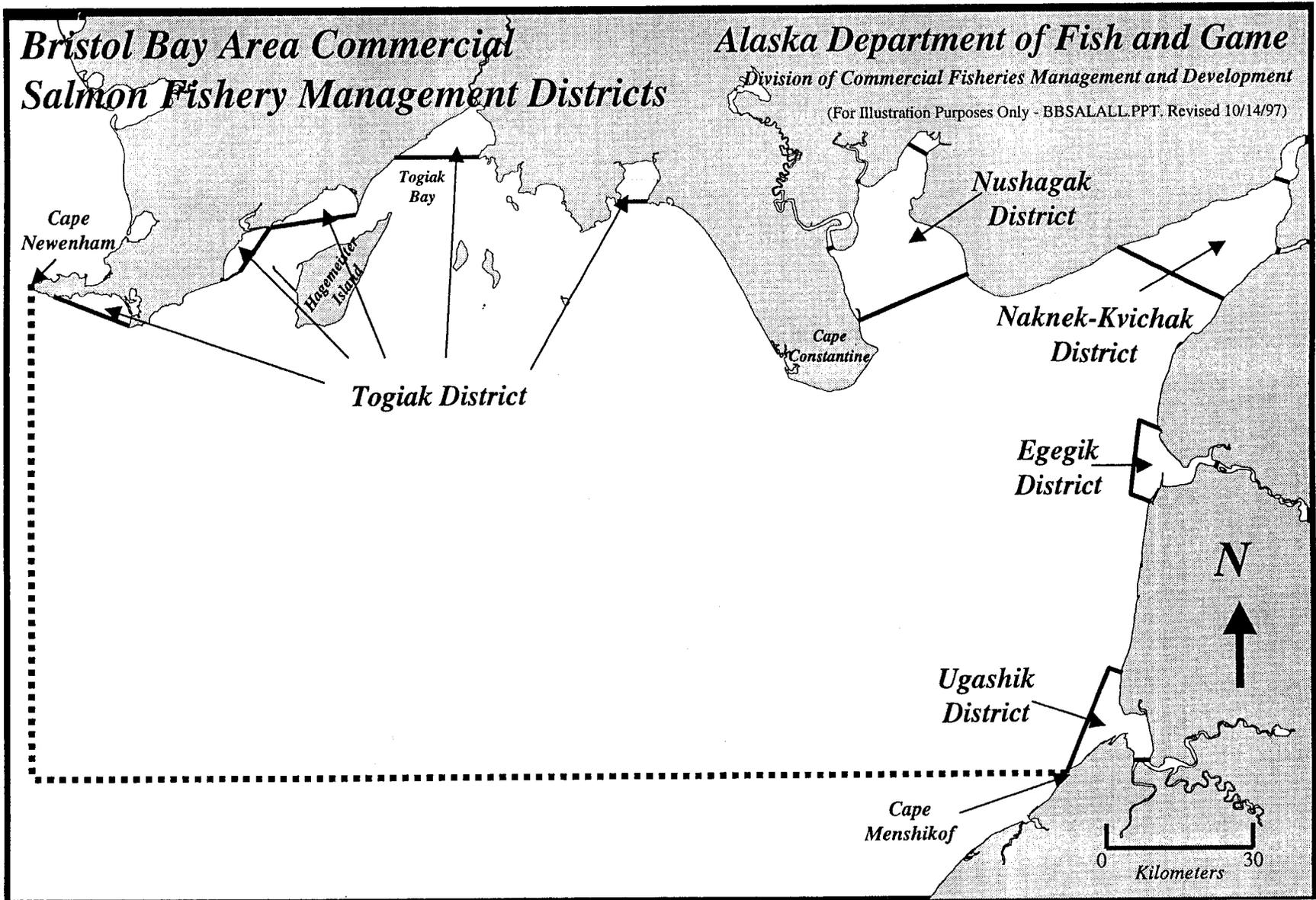


Figure 1. Bristol bay area commercial salmon fishery management districts.

Table 1. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1995.

District and River system	Commercial Harvest	Escapement	Total Inshore Return
<b>NAKNEK-KVICHAK DISTRICT:</b>			
Kvichak River	17,510	10,039	27,549
Branch River	438	216	654
Naknek River	2,468	1,111	3,579
<b>Total</b>	<b>20,416</b>	<b>11,366</b>	<b>31,782</b>
<b>EGEGIK DISTRICT</b>	<b>14,461</b>	<b>1,283</b>	<b>15,744</b>
<b>UGASHIK DISTRICT</b>	<b>4,501</b>	<b>1,321</b>	<b>5,822</b>
<b>NUSHAGAK DISTRICT:</b>			
Wood River	2,542	1,482	4,024
Igushik River	1,433	473	1,906
Nushagak River	475	281	756
<b>Total</b>	<b>4,450</b>	<b>2,236</b>	<b>6,686</b>
<b>TOGIAK DISTRICT</b>	<b>599</b>	<b>226</b>	<b>825</b>
<b>TOTAL BRISTOL BAY</b>	<b>44,427</b>	<b>16,432</b>	<b>60,859</b>

Table 2. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1996.

District and River system	Commercial Harvest	Escapement	Total Inshore Return
<b>NAKNEK-KVICHAK DISTRICT:</b>			
Kvichak River	2,007	1,451	3,458
Branch River	399	307	706
Naknek River	5,781	1,078	6,859
<b>Total</b>	<b>8,187</b>	<b>2,836</b>	<b>11,023</b>
<b>EGEGIK DISTRICT</b>	<b>10,842</b>	<b>1,076</b>	<b>11,918</b>
<b>UGASHIK DISTRICT</b>	<b>4,410</b>	<b>668</b>	<b>5,078</b>
<b>NUSHAGAK DISTRICT:</b>			
Wood River	3,380	1,650	5,030
Igushik River	1,102	401	1,503
Nushagak River	1,268	504	1,772
<b>Total</b>	<b>5,750</b>	<b>2,555</b>	<b>8,305</b>
<b>TOGIAK DISTRICT</b>	<b>382</b>	<b>213</b>	<b>595</b>
<b>TOTAL BRISTOL BAY</b>	<b>29,571</b>	<b>7,348</b>	<b>36,919</b>

Table 3. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1997.

District and River system	Commercial Harvest	Escapement	Total Inshore Return
<b>NAKNEK-KVICHAK DISTRICT:</b>			
Kvichak River	183	1,504	1,687
Branch River	26	271	297
Naknek River	394	1,026	1,420
<b>Total</b>	<b>603</b>	<b>2,801</b>	<b>3,404</b>
<b>EGEGIK DISTRICT</b>	<b>7,536</b>	<b>1,109</b>	<b>8,645</b>
<b>UGASHIK DISTRICT</b>	<b>1,407</b>	<b>618</b>	<b>2,025</b>
<b>NUSHAGAK DISTRICT:</b>			
Wood River	1,995	1,512	3,507
Igushik River	156	128	284
Nushagak River	467	373	840
Snake River		9	9
<b>Total</b>	<b>2,618</b>	<b>2,022</b>	<b>4,640</b>
<b>TOGIAK DISTRICT</b>	<b>144</b>	<b>171</b>	<b>315</b>
<b>TOTAL BRISTOL BAY</b>	<b>12,308</b>	<b>6,721</b>	<b>19,029</b>

<sup>a</sup> Preliminary data.

Table 4. Inshore commercial salmon harvest by district and species, in thousands of fish, Bristol Bay, 1997.<sup>a</sup>

<b>District</b>	<b>Sockeye</b>	<b>Chinook</b>	<b>Chum</b>	<b>Pink</b>	<b>Coho</b>	<b>Total</b>
Naknek-Kvichak	604	3	9	0	1	617
Egegik	7,536	2	53	0	36	7,627
Ugashik	1,407	1	16	0	8	1,432
Nushagak	2,618	64	181	0	3	2,866
Togiak	144	6	48	0	3	201
<b>Total</b>	<b>12,309</b>	<b>76</b>	<b>307</b>	<b>0</b>	<b>51</b>	<b>12,743</b>

<sup>a</sup> Preliminary data.

Table 5. Salmon escapements in thousands of fish, by river system and species, compared with escapement goals and ranges, Bristol Bay, 1997.

Species / River System	Actual <sup>a</sup>	Goal	Management Range	Percent Deviation <sup>b</sup>
<b>Sockeye Salmon</b>				
Kvichak	1,504	4,000	6,000 - 10,000	-62%
Branch	218	185	170 - 200	18%
Naknek	1026	1,000	800 - 1,400	3%
Egegik	1,109	1,000	800 - 1,200	11%
Ugashik	618	700	500 - 900	-12%
Wood	1,512	1,000	800 - 1,200	51%
Igushik	128	200	150 - 250	-36%
Nushagak	373	550	340 - 750	-32%
Togiak	132	150	100 - 200	-12%
Other <sup>c</sup>	37			
<b>Total</b>	<b>6,657</b>	<b>8,785</b>	<b>10,660 - 16,100</b>	<b>-24%</b>
<b>Chinook Salmon</b>				
Nushagak	<b>Total</b> 64	75	50 - 100	-15%
<b>Chum Salmon</b>				
Nushagak	2			
Togiak	94			
<b>Total</b>	<b>96</b>			
<b>Coho Salmon</b>				
Nushagak <sup>d</sup>	0	100		-100%
Togiak	21	50		-58%
Kulukak	5	15		-67%
<b>Total</b>	<b>26</b>	<b>165</b>		<b>-84%</b>

<sup>a</sup> Actual escapement numbers are based on final tower counts, Nushagak sonar counts, and aerial surveys of Branch, King Salmon, Dog Salmon, Kulukak, and Snake Rivers, as well as Togiak Tributaries.

<sup>b</sup> Percent deviation = (actual minus goal) \ goal X 100. Negative numbers indicate the percent below the goal.

<sup>c</sup> Includes Snake, Kulukak, Slug, Osviak, Matogak, Quigmy, Negukthlik, and Ungalikthluk Rivers, plus Togiak mainstem and tributaries.

<sup>d</sup> No Sonar estimate available

Table 6. Historical commercial salmon harvest by species, in thousands of fish, Bristol Bay, 1977-1997.

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1977	4,878	131	1,598	5	107	6,719
78	9,928	192	1,158	5,153	94	16,525
79	21,429	213	907	4	294	22,847
80	23,762	96	1,301	2,563	348	28,070
81	25,603	237	1,505	7	314	27,666
1982	15,104	254	921	1,492	620	18,391
83	37,372	199	1,632	0	128	39,331
84	24,710	102	2,023	3,366	575	30,776
85	23,703	120	1,068	0	163	25,054
86	15,776	94	1,227	401	182	17,680
1987	16,069	75	1,529	0	65	17,738
88	13,990	45	1,469	955	202	16,661
89	28,735	40	1,259	0	240	30,274
90	33,523	34	1,058	497	103	35,215
91	25,821	30	1,290	0	118	27,259
1992	31,879	69	921	500	192	33,561
93	40,462	86	838	0	73	41,459
94	35,265	140	833	91	179	38,297
95	44,427	100	950	0	45	45,522
96	29,650	88	842	38	124	30,742
1977-96 Ave.	25,104	117	1,216	1,506 <sup>b</sup>	208	27,489
1977-86 Ave.	20,227	164	1,334	2,595 <sup>b</sup>	283	23,306
1987-96 Ave.	29,982	71	1,099	416 <sup>b</sup>	134	31,673
1997 <sup>a</sup>	12,308	76	307	0	50	35,291

<sup>a</sup> Preliminary totals.

<sup>b</sup> Only even-numbered years used in calculation.

Table 7. Sockeye salmon preseason forecast compared to total inshore run, by river system, in thousands of fish, Bristol Bay, 1997. <sup>a</sup>

District and River system	Preseason Forecast	Actual Inshore Run	Percent Forecast Error <sup>b</sup>
<b>NAKNEK-KVICHAK DISTRICT:</b>			
Kvichak River	6,900	1,687	-76%
Branch River	578	297	-49%
Naknek River	3,325	1,420	-57%
<b>Total</b>	<b>10,803</b>	<b>3,404</b>	<b>-68%</b>
<b>EGEGIK DISTRICT</b>	<b>12,831</b>	<b>8,645</b>	<b>-33%</b>
<b>UGASHIK DISTRICT</b>	<b>3,804</b>	<b>2,025</b>	<b>-47%</b>
<b>NUSHAGAK DISTRICT:</b>			
Wood River	3,100	3,507	13%
Igushik River	1,011	284	-72%
Nushagak River	1,563	840	-46%
<b>Total</b>	<b>5,674</b>	<b>4,631</b>	<b>-18%</b>
<b>TOGIAK DISTRICT</b>	<b>483</b>	<b>315</b>	<b>-35%</b>
<b>TOTAL BRISTOL BAY</b>	<b>33,595</b>	<b>19,020</b>	<b>-43%</b>

<sup>a</sup> The inshore run data does not include the 1997 False Pass/Alaska Peninsula forecast nor actual harvest of Bristol Bay sockeye salmon.

<sup>b</sup> Percent Error = (Actual Inshore Run minus Preseason Forecast) \ Preseason Forecast X 100.