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Alaska Peninsula Salmon 2001

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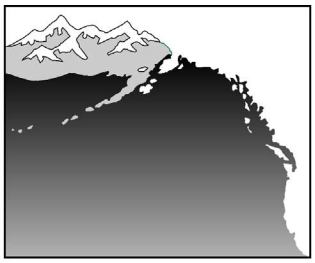

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ACKNOWLEDGMENTS

Many thanks go to Patti Nelson, Mark Witteveen, and Joe Dinnocenzo of the Alaska Department of Fish and Game's (ADFG) Kodiak office for providing much of the Alaska Peninsula data necessary for this report.. Thanks also to Slim Morstad and Fred West of ADFG for providing preliminary 2001 catch and escapement statistics for Bristol Bay, and also Wes Jones and Fred Bue for sent us A-Y-K escapement estimates for recent years.

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KEY WORDS

Bear Lake, Bristol Bay, chum salmon, False Pass, sockeye salmon

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Introduction

The salmon fisheries on the Alaska Peninsula have a long history dating back to the early 1900s. The June fisheries in the Shumagin Islands and south of Unimak Island, which are collectively called the False Pass fishery or South Peninsula June fishery, target on non-local sockeye salmon (*Oncorhynchus nerka*) primarily bound for Bristol Bay (Fig. 1; Eggers et al. 1991, Rogers 1990). Non-local chum salmon (*O. keta*) are also caught by the purse seine and gillnet fleets. In recent years, the June fisheries have been restricted by quotas on both species. However, in 2001 no quotas nor caps were in place, but the fishery had closers in place. Unfortunately, a price dispute negated much of the fishing effort. After June, most of the gillnet fleet moves to the north side of the peninsula to target on local stocks of sockeye while the seine fleet targets primarily on pink (*O. gorbuscha*) salmon in August. In 2001, much of the gillnet fleet moved to the north side earlier than normal.

The salmon fisheries on the Alaska Peninsula have frequently been subject to proposed restrictions at annual meetings of the Alaska Board of Fisheries by fishermen from other areas of Alaska. Claims are often made that catches of non-targeted salmon, chum salmon in the June fishery, sockeye and coho (*O. kisutch*) salmon in the post-June fishery, and Bristol Bay sockeye salmon_in the north side fishery have significantly impacted other coastal fisheries.

Since 1992, we have (1) sampled the chum salmon catches in the False Pass fisheries to measure biological attributes (age, length, weight, condition), (2) estimated the annual runs of sockeye and chum salmon in the North Pacific, and (3) estimated the relative impact of the False Pass catches on coastal stocks. Since 1995, we have (1) examined the spatial and temporal distribution of Bristol Bay sockeye off the coast of the north side of the Alaska Peninsula, (2) compared the biological characteristics between local North Peninsula stocks and Bristol Bay stocks, (3) compared the age compositions in the two fisheries, and (4) investigated the salmon productivity of the North Peninsula with studies of the Bear Lake and Ilnik system sockeye salmon stocks.

This report summarizes the results of investigations in 2001. For the most part, this means adding one more line to existing data sets; however, the lack of fishing in 2001 did not provide for any catch sampling. Recent studies of the North Peninsula stocks by Ramstad (1998) and Witteveen (1998) have been followed by a new study of the spawning populations in Bear Lake (Fig. 1)..

Methods

False Pass

The accuracy of estimates of the annual runs (catch and escapement) of sockeye and chum salmon to major North Pacific regions varies considerably. Annual catch statistics for sockeye and chum salmon since the 1950s are fairly accurate (probably within 10%) for most North American regions and Japan, but less so for Russia. There are accurate annual escapement estimates for sockeye salmon for most runs since the mid-1950s, but estimates for chum salmon escapements are either lacking, inaccurate, or only available for recent years. For most regions of Alaska, except the Arctic-Yukon-Kuskokwim (A-Y-K), chum salmon runs coincide with more valuable sockeye or more numerous pink salmon runs and therefore receive less monitoring for escapement. However, chum salmon runs can be estimated in these situations from the chum salmon catch and the rate of exploitation on the targeted species (Rogers 1987). The most important statistics for management are usually the most recent statistics, and these are only available in preliminary form or in-house reports. This report relies heavily on 2001 ADF&G reports, and website and unpublished data from management biologists. Much of these statistics is presented in the Appendix Tables 1-11.

Annual runs of chum salmon to North Pacific regions from 1970 to 2001 were estimated primarily from catch and escapement statistics presented in Rogers (1999). Sockeye salmon exploitation rates were utilized in Bristol Bay even though some aerial and sonar estimates of chum salmon escapement were available (Nushagak and Togiak). Sonar estimates of chum salmon escapement were available for the Yukon River, and the total run in 2001 was estimated by ADFG to be larger than the 2000 run. We revised the Yukon runs by subtracting subsistence catches from eacapements estimated from sonar near the river mouth. The run was then obtained by adding the commercial and subsistence catches to the escapement. Expanded aerial survey and weir counts from selected spawning areas were used to estimate escapements in the Kotzebue, Norton Sound, and Kuskokwim regions. Aerial survey estimates were used for most estimates of chum salmon

escapements to central Alaska; otherwise, assumed exploitation rates and chum salmon catches were used to estimate chum salmon runs.

Chum salmon from the 2001 False Pass catches (June 15–30) were not sampled for scales and lengths. Catch statistics for the False Pass fisheries of past years were obtained from Witteveen et al. (2001). Mr. Witteveen (ADFG, Kodiak) provided preliminary catches by gear, area, and date for 2001.

North Peninsula

Bristol Bay run timing past Port Moller was estimated annually (1987–2001) by combining inshore run statistics collected by ADFG (e.g., Stratton and Crawford 1994) with Port Moller test boat catches collected by Fisheries Research Institute (Rogers 1995). The test boat catches were also used to examine annual variation in the onshore–offshore distribution of the Bristol Bay run along the North Peninsula, the age composition of sockeye, and the sockeye/chum species composition. The onshore–offshore distribution was measured by the percentage that the index catch at station 2 (the innermost station) contributed to the total daily index (the sum of the catches at stations 2, 4, 6, and 8)

The annual age compositions of sockeye caught in the North Peninsula fisheries were provided weekly for two subdistricts: Bear River (Harbor Point to Cape Seniavin) and Ilnik/Three Hills (Cape Seniavin to Strogonof Point). Age compositions from the subdistricts were averaged through July 11 by weighting the subdistrict compositions by the catch (Murphy et al. 2001). Age compositions for North Peninsula escapements were estimated by weighting the individual river age compositions by the number in the escapement, and age compositions in the Bristol Bay catches were calculated from annual run statistics provided by D. Gray (ADFG Anchorage) and ADFG (2001).

During 2001 our study of Bear Lake sockeye salmon continued with the completion of the field component of Chris Boatright's thesis work. This work will follow up the work of Kristina Ramstad to understand the apparent high productivity of Bear Lake sockeye compared with the Bristol Bay lakes by comparing the life history and marine survival of early and late spawning stocks with productivity and environmental measures. Mr. Boatright and one technician made two visits to Bear Lake from June to November in 2001. A project overview and some preliminary results are included in this report.

Results

False Pass

Abundance

The False Pass sockeye salmon catch was regulated by a quota set at 8.3% of the forecasted Bristol Bay catch. Since the inception of a chum salmon cap in 1986, the quota had been caught only 40% of the time and the catch did not reach 8.3% of the actual Bristol Bay catch until 1997 (Table 1). Three factors contribute to the inability of the fishery to achieve an allotment of 8.3% of the Bristol Bay catch: (1) a tendency for underestimating preseason forecasts, (2) a high abundance of chum salmon with a low chum salmon cap (quota), and (3) the availability of migratory Bristol Bay sockeye. During 1994–96, the low availability of Bristol Bay sockeye was likely the main factor. While fishing occurred nearly every day, the 1994–96 catches were about 2 million fish short of the quotas. In 1997 and 1998, Bristol Bay sockeye appeared to be more available than usual as the catches exceeded 8.3% of the Bristol Bay catches although they were still below the preseason quotas. The 1999 run of 40 million was close to the recent 10-year average and much higher than the ADFG preseason forecast (25 million), and the quota was reached by June 21. In 2001, there was no quota nor very much fishing because fishermen were on strike for a higher price than offered by processors. The catch was well below 8.3% of the Bristol Bay catch (Table 2). The False Pass fishery depends only on those Bristol Bay sockeye that are returning from ocean rearing in the Gulf of Alaska (Rogers 1987). Most Bristol Bay sockeye begin their homeward migration west of the fishery (south of the Aleutian Islands). A shift in the oceanic distribution from east to west or a shift from a nearshore to an offshore migratory route would result in variable availability to the Shumagin and South Unimak fisheries from year to year. Low chum salmon abundance has also improved the sockeye catches in the False Pass fisheries. The Western Alaska runs are correlated with the False Pass catch of sockeye but not the catch of chums (Fig. 2). The spring weather at Cold Bay (near False Pass) has not been significantly correlated with the performance of the False Pass catches, except to note that 1997–98 were years of warm air and water temperature (Figs. 3 and 4).

Omitting the 1990 and 1994–96 observations as outliers, the catch-per-unit-effort (CPUE) of sockeye salmon at South Unimak explained 80% of the annual variation in the Bristol Bay runs (Fig. 5). This correlation was very good and provided a method of forecasting the Bristol Bay run about 2 weeks in advance of their arrival in the bay (Eggers and Shaul 1987). Recent changes in the South Unimak fleet (effort by gear) may also have contributed to the recent poor correlation between CPUE and the size of the Bristol Bay run (Fig. 3). Purse seine effort was greatly reduced relative to drift gillnet effort following 1995 largely because purse seines did not fish in the early part of the season. Although the sockeye CPUE no longer appears reliable as a forecast tool, the age composition of the sockeye salmon catch at False Pass has been useful in forecasting the Bristol Bay runs (Table 3). The ages in the small 2001 catch are not available because no scales were collected.

The chum salmon percentages in the False Pass catches since 1997 have all been below average, whereas the chum salmon percentages in Western Alaska were well above average in 1997–98 but below average in 1999 and 2000 and near average in 2001 (Table 4). Runs were exceptionally small in 1997–98 for both species, but the sockeye runs in 1999 and 2000 were relatively large (Table 5) and combined with very small chum runs to most of Western Alaska. The Arctic/Yukon runs of chum salmon were again very small in 2001 (Tables 6 and 7); however, a preliminary estimate of the Japanese chum salmon return in 2001 indicates that the run was about average. Preliminary estimates for the 2001 Russian chum salmon run were estimated from the catch in metric tons and indicated an average run of chum salmon. Noteworthy is the relatively large chum run to the Nushagak River in Bristol Bay of 1.1 million (Table 8).

Age and length

Since no age, weight, or length samples were collected from the False Pass catch in 2001, we can only comment on the large chum run to the Nushagak District in Bristol Bay. In that run, which was the largest since 1984, 3-ocean chum salmon were prominent. The Bristol Bay sockeye runs were also predominately 3-ocean fish; however, the sockeye were larger than average in 2001 while the chums in the Nushagak were just of average size.

The Nushagak River is the only chum salmon stock with reliable escapement and return statistics. The Nushagak catch of 540,000 in 2001 was also the largest since 1984. Until the 2001 return, all chum salmon returns since 1988 had been below the Ricker curve and the small escapements since 1996 would indicate small returns for the next 5 years (Fig. 6). The return from the 1998 brood year escapement of 62,000 was exceptional as 910,000 age-0.3 returned in 2001 with age-0.4 chum to return in 2002.

North Peninsula

Bear Lake

During 2001 the field component of our current study of Bear Lake sockeye salmon was completed. To facilitate a clear understanding of the project and the subsequent results, an overview with preliminary results follows.

The goal of our research in the Bear Lake system is to gain a better understanding of the high productivity in sockeye salmon adult runs compared with other sockeye systems in Western Alaska. Given the lack of documented research on Bear Lake, we chose to study the system by examining life-history variation for the sockeye runs within the lake. Life history is simply a set of characteristics. We are interested in the ways these characteristics interact with the environment to determine success in terms of suvival and, ultimately, population productivity

Bear Lake is characterized by a bimodal adult migration of sockeye. These temporally isolated runs have long been recognized as “early” and “late” by processors and state fisheries managers. This life-history trait was readily apparent from escapement data generated by ADFG (Fig. 7). Although there are over 20 years of data that establish this bimodal adult migration, there is little documented data on these runs after the salmon migrate past the state-managed weir. For this reason, the current Bear Lake project was designed with two primary objectives.

The first objective is to examine the relationship between adult migration date and spawner distribution with respect to time and location. This part of the project will determine the migratory structure of Bear Lake’s early and late runs. The goal is to generate data to answer the following questions: (1) Do early adult migrants spawn significantly earlier than late adult migrants, and (2) do early and late sockeye spawn in different locations? We have completed the field component of this part of the project through field observation of tagged adult sockeye. The tagging experiment consisted of seven tagging periods spaced equally across the entire adult migration period while the entire system was observed uniformly for all tagging periods. This information was then used to define various population components within the early and late adult migrations, as well as to provide a necessary component for completing our second objective.

The second objective is to examine the relationship between time of spawning and juvenile emergence timing. Given a clear answer to the questions presented in the tagging study, we can assess emergence timing for early and late run progeny by recording the temperature regimes of different spawning grounds within the Bear Lake system. Juvenile emergence timing is imperative to yearclass survival for sockeye salmon because they rear in lakes. Early life-history theory for sockeye dictates that life-history characteristics such as juvenile emergence timing have evolved to coincide with the biological timing (e.g., plankton cycles) of their natal habitat. It is generally accepted that populations of sockeye rearing within a common nursery habitat (lake) will emerge at approximately the same time, such that everyone regardless of specific population will emerge to exploit a window of maximum food availability in their natal system. Maximum food availability would give way to good growth and a bigger fish, and ultimately increased likelihood of survival. The goal for this part of the project is to generate data to determine whether there is significantly different emergence timing between progeny of early adult migrants and late adult migrants.

The work with juvenile emergence for Bear Lake sockeye salmon has three components: (1) documentation of time and place of spawning for the various components of the early and late runs, (2) a record of temperature regimes for the spawning grounds in the Bear Lake system and use of a mathematical model (Beacham and Murray 1990) to esti-

mate emergence date, and (3) a laboratory experiment to record specific rates of embryonic development for Bear Lake sockeye. The mathematical model was based on Beacham and Murray_(1990), who compared 10 various models used to estimate rates of embryonic development in Pacific salmon and evaluated goodness of fit for each model by examining the residual sum of squares between observed and predicted values. We chose the model with the lowest residual sum of squares. We have completed parts one and two and are close to completing the third part. Preliminary results indicate a significant difference in emergence timing between progeny of early run and late run sockeye (Fig. 8) that are not accounted for by significantly different rates of embryonic development (Fig. 9).

By examining these aspects of the life histories of sockeye salmon returning to the Bear Lake system, we are left with the following questions about these populations: Does a significant difference in juvenile emergence timing translate to differential rates of survival between the early and late runs in either the freshwater or marine environments? If these rates of survival do not differ, what are the mechanisms that allow sockeye runs with alternate life-history strategies to be productive within a single lake system.

Abundance and Distribution

Rogers (1996) described the sockeye salmon fisheries along the north side of the Alaska Peninsula and the offshore migration of Bristol Bay salmon into the bay and the inshore migration out of the bay for Ugashik and North Peninsula stocks. The 2001 sockeye runs to the North Peninsula (1.8 million) were the smallest since 1987, especially for the early and late runs to Bear Lake. The runs also appeared to be early in arriving, as were the Bristol Bay runs (Table 9). As usual, most of the early catch was made during the first half of July (Table 10). The runs to the north side of the Alaska Peninsula show some correlation, as all runs were low in 1997 and 1998, came back up in 1999, and then dropped again in 2001. Ages 1.3 and 2.3 were dominant in the early Bear River run in 2001 while age 2.2 was dominant in the late run (Table 11). Ages 2.2 and 1.3 were most abundant in the early escapements. In the Ugashik escapement, the nearest Bristol Bay system, age 1.3 sockeye represented over 80%. In contrast to the peninsula systems, there were no age 0.2 nor 0.3 sockeye at Ugashik (Table 12).

The vulnerability of Bristol Bay sockeye salmon to the North Peninsula fisheries from Port Moller to Ilnik may be dependent on the offshore distribution and timing of the Bristol Bay run. The run past Port Moller was 4 days earlier than average in 2000 and in 2001, the earliest timing since we began fishing offshore in 1987;_80% had passed Port Moller by June 30 (Table 9). The water temperatures in June off Port Moller were above average in both years and the Bristol Bay runs were early in both years. The Port Moller test fishery offers some measure of offshore distribution. Throughout the 2000 migration past Port Moller, the sockeye were concentrated well offshore as the catches were consistently highest at station 10 and lowest at station 2 (the innermost station). In 2001 the distribution was more normal with the highest catches made at the middle two stations (4 and 6). There has been no correlation between the distribution off Port Moller and the North Peninsula catches (Rogers 1999). We also have seen no correlation in the ages of sockeye off Port Moller and in Bristol Bay with the ages in the North Peninsula catch. The 2001 ages from ADFG show the typical pattern of a decreasing percent of age 0.3.and an increase in the percent age 2.2 during the fishing season (Table 10).

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FIGURES

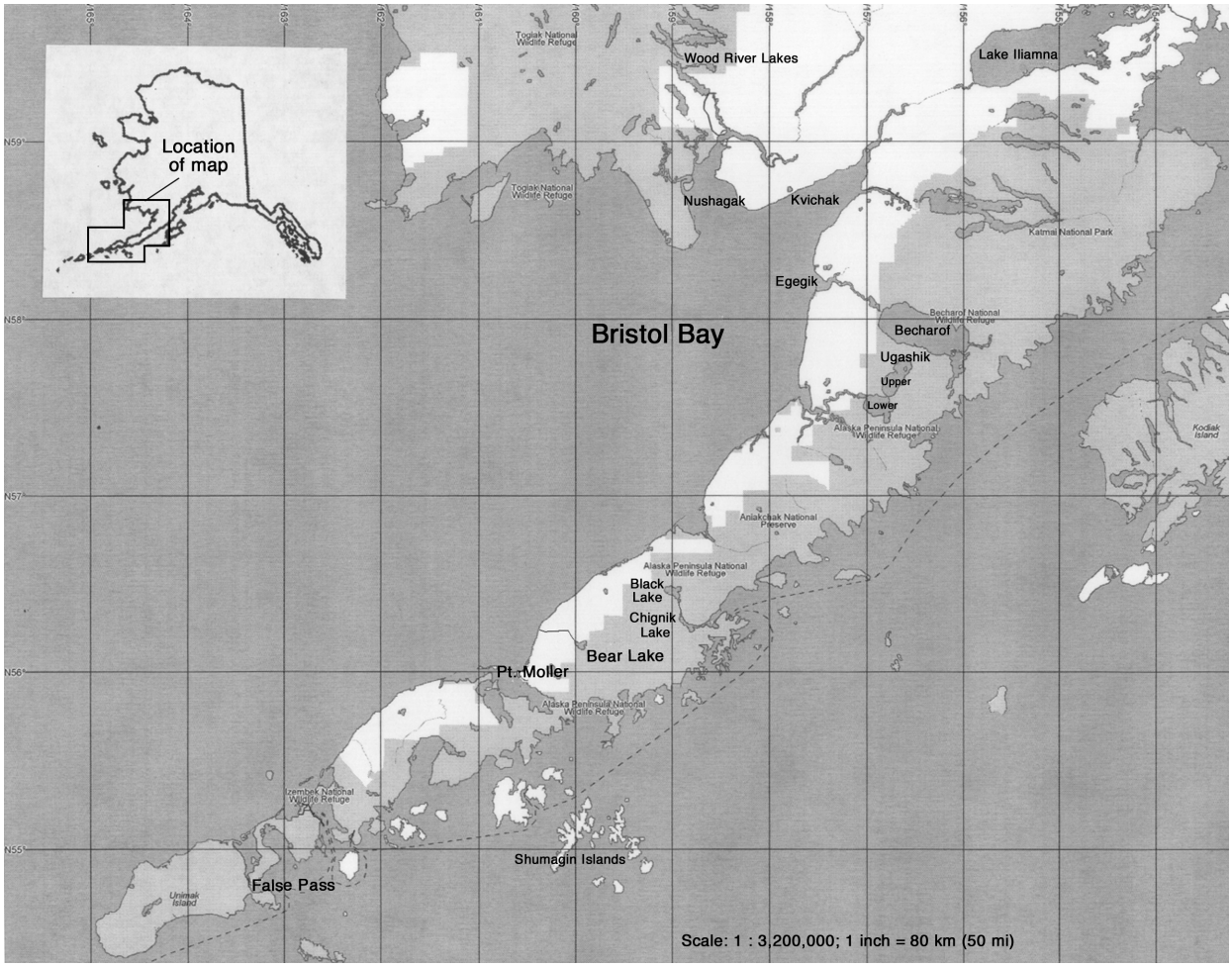

FIGURE 1. Map of Alaska Peninsula and Bristol Bay.

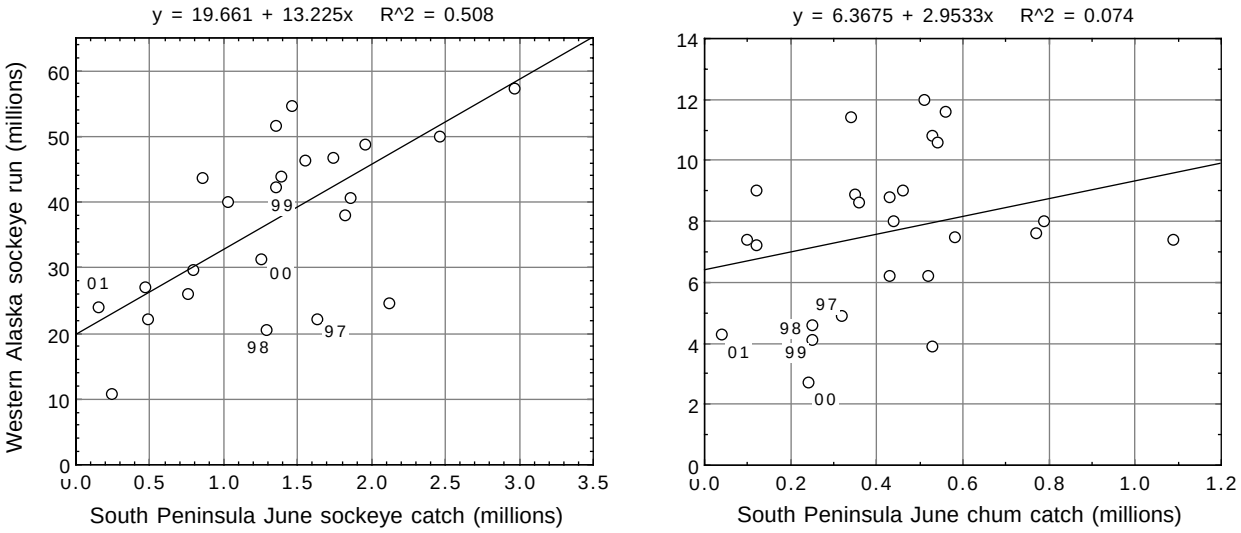

FIGURE 2. Correlation between Western Alaska salmon runs and South Peninsula salmon catches.

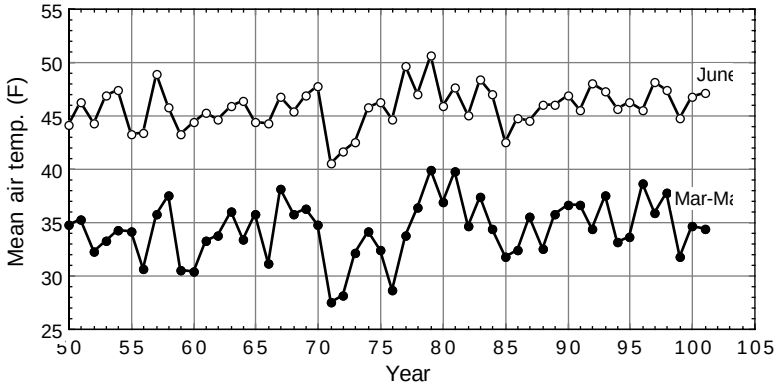

FIGURE 3. Mean air temperatures (°F) at Cold Bay during early spring and for June, 1950–2001.

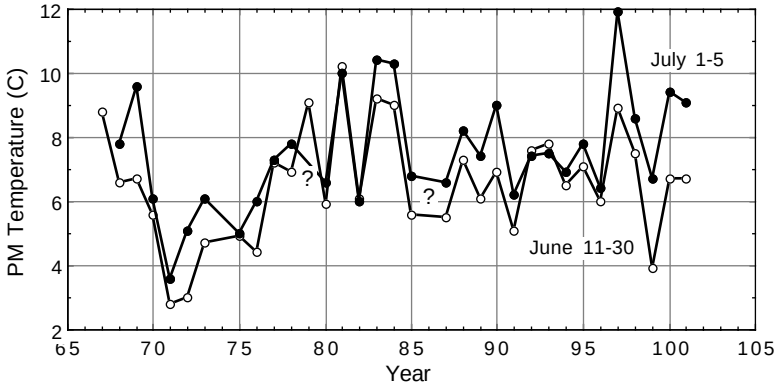

FIGURE 4. Mean surface temperatures off Port Moller during June 11–30 and early July, 1967–2001.

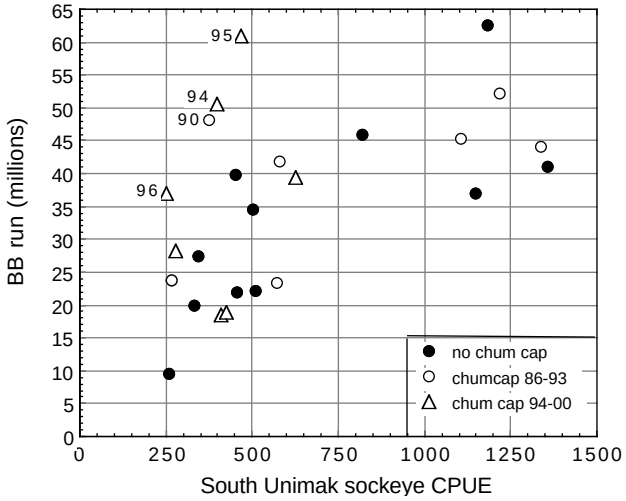

FIGURE 5. Bristol Bay sockeye runs plotted on sockeye CPUE.

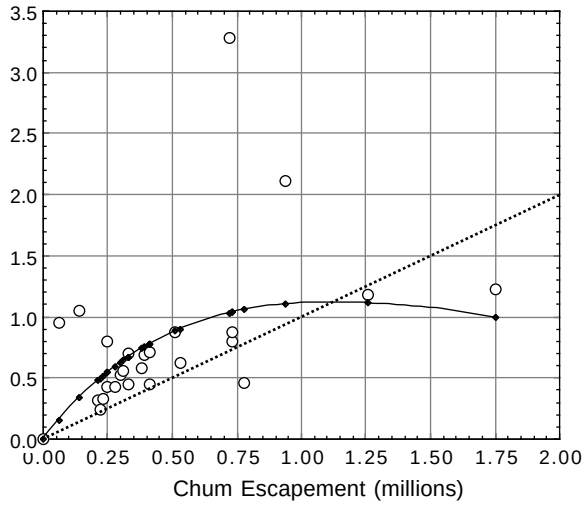

FIGURE 6. Nushagak chum salmon escapement–return relationship.

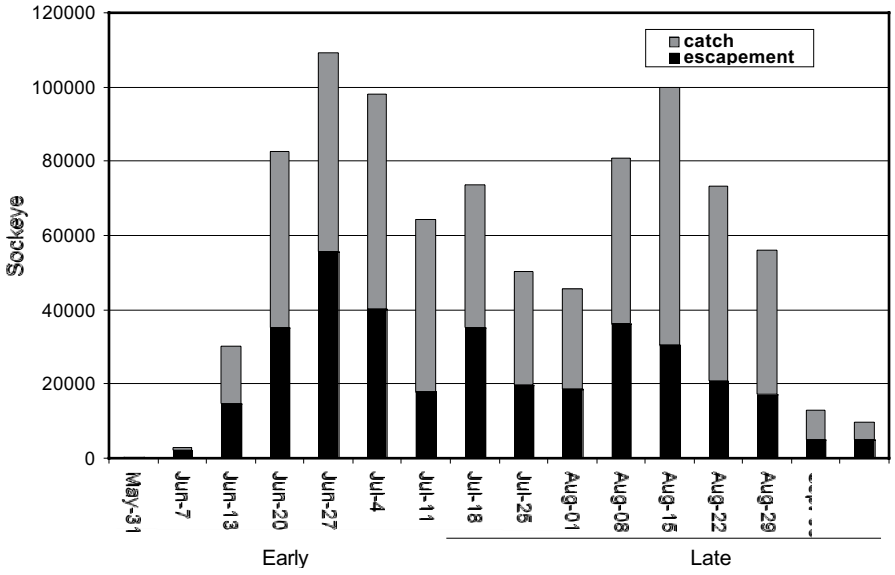

FIGURE 7. Annual sockeye salmon run to the Bear River/Section, Alaska Peninsula. Bars represent 5-year average, 1996–2000.

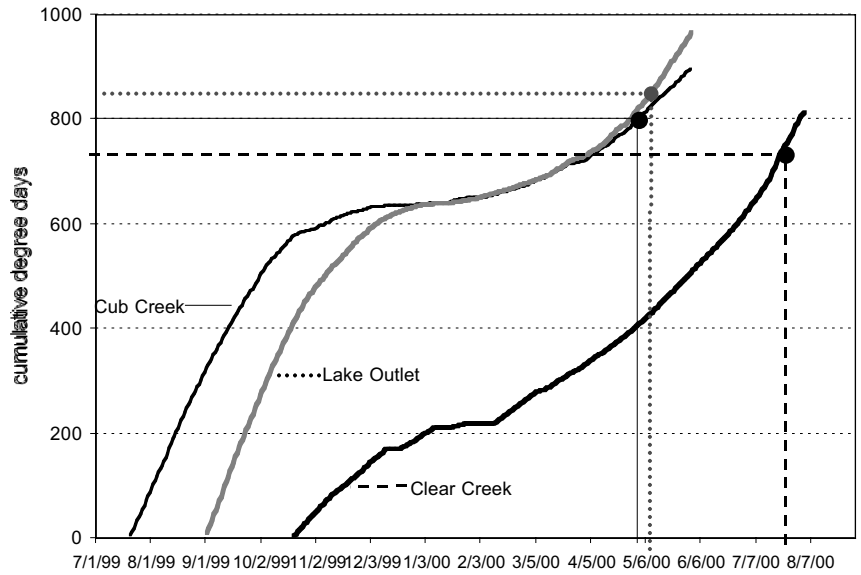

FIGURE 8. Curves of degree day accumulation (degree days are thermal units used to measure salmonid embryonic development; one degree day = degrees C >freezing/24hrs) for sockeye populations returning to Cub Creek, Lake Outlet, and Clear Creek in the Bear Lake system. The Cub Creek population makes up the earliest spawning component of Bear Lake's "early" sockeye run. The Lake Outlet population makes up the latest spawning component of Bear Lake's "early" sockeye run. The Clear Creek population makes up Bear Lake's "late" sockeye run. ● = estimated time of juvenile emergence.

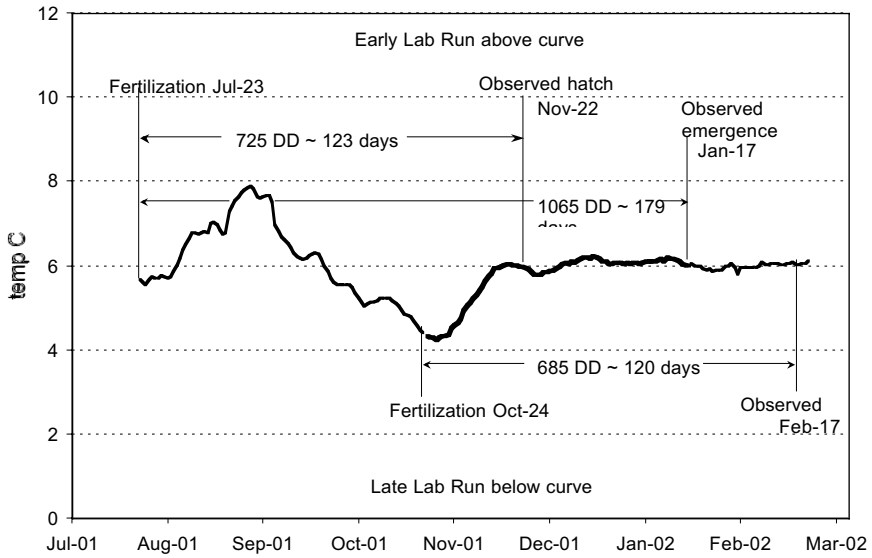

FIGURE 9. Temperature profile for Bear Lake "early" and "late" run sockeye incubated under a fixed temperature regime. Hatching and emergence dates (no emergence date for late run) for embryos of each run given by date, number of days, and degree day accumulation. Average temperature for the early lab run = 5.90°C and average temperature for late lab run = 5.71°C. Note: The variation between time of hatching for the early lab run and the late lab run is ~40 degree days, which at an average temperature of 5.8°C is a difference of 6.89 days. The variation in temperature regimes for these lab runs is .19°C, which accounts for ~-2 of the 6.89 days; the remaining .89 of a day is assumed to be a rounding error.

Tables

TABLE 1. False Pass fishery catches, the pre-season quotas and actual Bristol Bay catches.

	Sockeye salmon (millions)									
	Bristol Bay		False Pass					Chum salmon (1,000s)		
Year	Run	Catch	Catch	Quota	8.3%	C-Q	C-8.3%	Catch	Cap	Catch-cap
77	9.72	4.88	.24	.24	.42	.00	-.19	116		
78	19.92	9.93	.49	.52	.86	-.04	-.38	122		
79	39.90	21.43	.85	1.10	1.85	-.25	-1.00	104		
80	62.49	23.76	3.21	3.07	2.24	.14	.97	509		
81	34.47	25.60	1.82	1.76	2.28	.06	-.46	564		
82	22.21	15.10	2.12	2.26	1.43	-.14	.69	1095		
83	45.91	37.37	1.96	1.79	3.26	.17	-1.30	786		
84	41.11	24.71	1.39	1.36	2.17	.03	-.78	337		
85	36.86	23.70	1.79	1.69	2.12	.11	-.33	434		
86	23.74	15.78	.47	1.11	1.35	-.64	-.88	352	400	-48
87	27.52	16.07	.79	.78	1.40	.02	-.61	443	0	0
88	23.42	13.99	.76	1.54	1.22	-.79	-.47	527	500	27
89	44.05	28.74	1.74	1.46	2.53	.28	-.79	455	500	-45
90	48.12	33.52	1.35	1.33	2.89	.02	-1.55	519	600	-81
91	41.91	25.82	1.55	1.92	2.27	-.37	-.72	773	600	173
92	45.22	31.88	2.46	2.39	2.85	.07	-.39	426	700	-274
93	52.22	40.46	2.97	2.90	3.60	.07	-.63	532	700	-168
94	50.58	35.22	1.46	3.59	3.04	-2.13	-1.58	582	700	-118
95	60.89	44.43	2.11	3.65	3.65	-1.54	-1.55	537	700	-163
96	37.00	29.57	1.03	3.13	2.54	-2.10	-1.51	360	700	-340
97	18.89	12.31	1.63	2.25	1.16	-.62	.47	322	700	-378
98	18.35	10.00	1.29	1.87	.94	-.58	.35	246	375	-129
99	39.50	25.90	1.38	1.30	2.26	.08	-.88	245	375	-130
00	28.30	20.50	1.25	2.01	1.81	-.76	-.56	240	350	-110
01	22.03	14.03	0.15	none	1.18		-1.03	36	no cap	
86-00 average	36.36	24.89	1.40	2.08	2.17	-0.60	-0.77	412	527	-119

TABLE 2. False Pass sockeye catches, 1981–2001.

Year	Bristol Bay Run*	Bristol Bay Catch	Unimak quota	Unimak catch	% of BB + FP catch	Shum-agin quota	Shum-agin catch	% of BB+FP catch	Total quota	Total catch	% of BB+FP catch	% of BB run	FP chum catch	Chum quota
81	34.3	25.60	1.442	1.470	5.36	.318	.351	1.28	1.760	1.821	6.64	5.31	.564	
82	22.0	15.10	1.850	1.668	9.69	.408	.451	2.62	2.258	2.119	12.31	9.63	1.095	
83	45.6	37.37	1.469	1.547	3.93	.324	.416	1.06	1.793	1.963	4.99	4.30	.786	
84	40.6	24.71	1.111	1.131	4.33	.245	.257	0.98	1.356	1.388	5.32	3.42	.337	
85	36.5	23.70	1.380	1.455	5.71	.305	.336	1.32	1.685	1.791	7.03	4.91	.434	
86	23.6	15.78	.907	.315	1.94	.200	.156	0.96	1.107	.471	2.90	2.00	.352	.400
87	27.3	16.07	.635	.653	3.87	.140	.141	0.84	.775	.794	4.71	2.91	.443	
88	23.2	13.99	1.263	.474	3.21	.279	.282	1.91	1.542	.756	5.13	3.26	.527	.500
89	43.9	28.73	1.199	1.348	4.42	.264	.397	1.30	1.463	1.745	5.73	3.97	.455	.500
90	47.8	33.52	1.087	1.091	3.13	.240	.256	0.73	1.327	1.347	3.86	2.82	.519	.600
91	42.2	25.82	1.573	1.216	4.44	.347	.333	1.22	1.920	1.549	5.66	3.67	.773	.600
92	45.1	31.88	1.959	2.046	5.96	.432	.412	1.20	2.391	2.458	7.16	5.45	.426	.700
93	52.1	40.46	2.375	2.367	5.45	.524	.607	1.40	2.899	2.974	6.85	5.71	.532	.700
94	50.3	35.22	2.938	1.001	2.73	.648	.460	1.25	3.586	1.461	3.98	2.90	.582	.700
95	60.8	44.43	2.987	1.451	3.12	.659	.654	1.41	3.646	2.105	4.52	3.46	.537	.700
96	37.0	29.57	2.564	.572	1.87	.566	.456	1.49	3.130	1.028	3.36	2.78	.360	.700
Average	43.0	29.97	1.858	1.222	3.82	.410	.400	1.27	2.268	1.622	5.10	3.69	.515	
97	18.9	12.31	1.840	1.179	8.46	.406	.449	3.22	2.246	1.628	11.68	8.62	.322	.700
98	18.3	10.00	1.529	.975	8.64	.336	.314	2.78	1.865	1.289	11.42	7.04	.246	.325
99	39.5	25.90	1.024	1.106	4.05	.226	.269	0.99	1.300	1.375	5.04	3.48	.245	.325
00	28.3	20.51	1.649	.890	4.09	.364	.355	1.63	2.013	1.245	5.72	4.40	.240	.325
01	22.0	14.03	none	.122	0.86	none	.029	0.20	none	.151	1.06	.69	.036	none

Sources: Witteveen et al (2001) for False Pass and Bristol Bay area management reports.
* Bristol Bay run excluding jacks
South Unimak quota was 6.8% of forecasted Bristol Bay catch
Shumagin quota was 1.5% of forecasted Bristol Bay catch
Combined quota ws 8.3% of forecasted catch
Gear depth limitations imposed from 1990 to present
Fishery closed early because chum salmon cap was reached in 1986, 88, and 91.

TABLE 3. Comparison of age compositions of sockeye salmon in Bristol Bay runs with ages from the False Pass fishery, in-season Port Moller test boat and the ADF&G pre-season forecast 1987–2001.

Year		Age composition (%) 1.2	2.2	1.3	2.3	all .2	all .3	Bristol Bay run (millions)
1990	ADF&G pre-f'cast	19	42	26	13	61	39	25.4
	Moller in-f'cast	10	37	24	26	48	52	56.0
	False Pass catch	16	37	20	25	53	45	
	Bristol Bay run	14	41	21	20	56	43	47.8
1991	ADF&G pre-f'cast	28	25	31	16	53	47	30.0
	Moller in-f'cast	12	14	55	13	28	71	37.0
	False Pass catch	21	33	36	6	54	46	
	Bristol Bay run	19	20	46	11	39	60	42.1
1992	ADF&G pre-f'cast	19	39	27	13	58	42	37.1
	Moller in-f'cast	8	35	31	22	43	53	45.0
	False Pass catch	6	35	25	30	42	58	
	Bristol Bay run	13	34	27	22	47	50	44.9
1993	ADF&G pre-f'cast	23	41	21	14	64	35	41.8
	Moller in-f'cast	7	27	19	44	34	65	42.0
	False Pass catch	14	46	14	23	61	38	
	Bristol Bay run	13	33	18	33	46	53	51.9
1994	ADF&G pre-f'cast	14	43	19	22	57	43	52.5
	Moller in-f'cast	7	42	20	28	50	50	46.0
	False Pass catch	8	34	33	22	42	57	
	Bristol Bay run	8	56	14	18	65	34	50.1
1995	ADF&G pre-f'cast	16	53	17	13	69	31	55.1
	Moller in-f'cast	14	51	15	19	65	34	49.2
	False Pass catch	19	57	12	11	76	24	
	Bristol Bay run	16	56	12	15	72	27	60.7
1996	ADF&G pre-f'cast	18	36	26	19	54	48	43.4
	Moller in-season	8	13	51	24	21	79	41.0
	False Pass catch	15	24	38	20	39	61	
	Bristol Bay run	10	13	51	24	23	76	36.9
1997	ADF&G pre-f'cast	22	31	25	20	53	47	33.6
	Moller in-season	9	26	33	27	36	62	35.0
	False Pass catch	19	44	23	11	64	36	
	Bristol Bay run	20	34	26	18	54	44	18.9
1998	ADF&G pre-f'cast	25	32	24	18	57	43	30.2
	Moller in-season	19	9	38	33	28	72	30.7
	False Pass catch	14	9	39	37	24	76	
	Bristol Bay run	34	13	29	22	47	52	18.2
1999	ADF&G pre-f'cast	26	41	25	8	67	34	24.9
	Moller in-season	43	26	21	8	69	30	35.3
	False Pass catch	56	18	22	3	74	25	
	Bristol Bay run	51	24	17	7	75	24	39.5
2000	ADF&G pre-f'cast	20	27	37	16	47	53	35.4
	Moller in-season	14	20	53	12	34	66	42.7
	False Pass catch	26	20	42	7	46	54	
	Bristol Bay run	18	10	57	15	28	72	28.3
2001	ADF&G pre-f'cast	20	31	33	16	51	49	22.8
	Moller in-season	2	5	80	10	7	91	ca 20
	False Pass catch							no samples
	Bristol Bay run	4	3	81	9	7	91	22.0
Means	ADF&G pre-f'cast	21	37	25	16	58	42	37.2
90-00	Moller in-season	14	27	33	23	41	58	41.8
	False Pass catch	19	32	28	18	52	47	
	Bristol Bay run	20	30	29	19	50	49	39.9

Age composition for Port Moller is for June 11-30 only, whereas the forecast is the one issued about July 2-3.
Forecasts and runs do not include jacks (1-ocean fish).

TABLE 4. Percent chums in sockeye and chum salmon catches and runs, 1977–2001.

	Bristol Bay Run			Western Alaska Run			South Peninsula June Catch			Port Moller Test Boat CPUE		
Year	Sockeye	Chum	%C	Sockeye	Chum	%C	Sockeye	Chum	%C	Sockeye	Chum	%C
77	9.6	4.0	29.4	10.8	9.0	45.5	0.24	0.12	32.4	6.9	2.3	25.0
78	19.8	2.3	10.4	22.1	7.2	24.6	0.49	0.12	19.7	3.2	0.8	20.0
79	39.8	1.7	4.0	43.6	7.4	14.5	0.85	0.10	10.5	9.6	0.2	2.0
80	62.4	3.3	5.1	65.4	12.0	15.5	3.21	0.51	13.7	4.6	1.6	25.8
81	34.3	2.1	5.8	37.9	11.6	23.4	1.82	0.56	23.5	7.6	2.0	20.8
82	22.1	1.3	5.7	24.6	7.4	23.1	2.12	1.09	34.0	5.1	1.1	17.7
83	45.7	2.2	4.5	48.8	8.0	14.1	1.96	0.78	28.5	4.4	0.4	8.3
84	40.7	3.5	7.8	43.9	11.4	20.6	1.39	0.34	19.7	27.1	5.0	15.6
85	36.6	2.0	5.3	40.7	8.8	17.8	1.79	0.43	19.4	15.9	0.9	5.4
86	23.6	2.2	8.6	27.1	8.9	24.7	0.47	0.35	42.7			
87	27.3	2.9	9.5	29.7	8.0	21.2	0.79	0.44	35.8	11.1	0.8	6.7
88	23.2	2.5	9.8	26.0	10.8	29.3	0.76	0.53	41.1	7.0	1.1	13.6
89	43.9	2.2	4.9	46.8	9.0	16.1	1.75	0.46	20.8	18.9	1.0	5.0
90	47.8	1.7	3.4	51.6	6.2	10.7	1.35	0.52	27.8	23.4	1.3	5.3
91	42.2	2.0	4.5	46.3	7.7	14.3	1.55	0.77	33.2	17.5	1.6	8.4
92	45.0	1.4	3.0	49.9	6.2	11.1	2.46	0.43	14.7	24.4	1.7	6.4
93	52.1	1.0	1.9	57.2	4.1	6.7	2.97	0.53	15.1	30.3	1.4	4.5
94	50.3	1.3	2.5	54.7	7.4	11.9	1.46	0.58	28.4	22.7	1.5	6.2
95	60.7	1.4	2.3	65.5	11.4	14.8	2.11	0.54	20.4	30.0	0.8	2.6
96	37.0	1.2	3.0	40.1	8.7	17.8	1.03	0.36	25.9	22.5	1.6	6.4
97	18.9	0.6	2.9	22.1	4.9	18.1	1.63	0.32	16.2	20.8	3.2	13.3
98	18.4	0.8	4.1	20.6	4.5	17.9	1.29	0.25	16.2	13.8	1.6	10.4
99	39.4	1.0	2.6	42.3	4.2	9.0	1.35	0.25	15.6	19.0	1.0	5.0
00	28.3	0.5	1.7	31.3	2.7	7.9	1.25	0.24	16.1	15.9	1.4	8.1
01	22.0	1.8	7.6	23.9	4.3	15.2	0.15	0.04	19.5	23.0	3.2	12.2
Means 83-01	37.0	1.7	4.7	40.4	7.2	15.8	1.45	0.43	24.1	19.3	1.6	8.0

TABLE 5. Annual sockeye salmon runs to the eastern Bering Sea, 1970–2001.

	Kuskokwim		Bristol Bay runs					Bristol Bay	North Penin.	Total	South Peninsula June catch	
Year	Catch	Run	Togiak	Nushagak	Nak/Kvi	Egegik	Ugashik	Total	Run	Run	Number	%
70	.013	.03	.37	3.15	32.65	2.32	.91	39.40	.64	40.1	1.65	3.4
71	.006	.02	.42	2.61	9.37	1.94	1.48	15.82	.79	16.6	.46	2.3
72	.004	.01	.16	.91	2.85	1.39	.10	5.41	.37	5.8	.50	6.8
73	.005	.01	.21	.85	.79	.55	.04	2.44	.35	2.8	.25	7.0
74	.028	.07	.25	2.78	6.43	1.45	.06	10.97	.58	11.6	.00	0.0
75	.018	.05	.38	2.92	18.35	2.14	.44	24.23	.75	25.0	.24	0.8
76	.014	.04	.50	2.75	5.92	1.84	.53	11.54	1.17	12.7	.31	2.0
77	.019	.05	.42	1.84	4.69	2.47	.29	9.71	1.01	10.8	.24	1.9
78	.014	.04	.79	6.62	10.32	2.10	.09	19.92	2.11	22.1	.49	1.9
79	.039	.10	.69	6.40	27.43	3.29	2.10	39.91	3.55	43.6	.85	1.6
80	.043	.11	1.21	12.81	40.57	3.68	4.22	62.49	2.78	65.4	3.21	4.0
81	.106	.27	1.01	10.34	14.63	5.06	3.44	34.48	3.19	37.9	1.82	3.9
82	.096	.24	.94	7.93	7.54	3.48	2.32	22.21	2.15	24.6	2.12	6.8
83	.089	.22	.83	7.07	26.11	7.55	4.35	45.91	2.67	48.8	1.96	3.3
84	.081	.20	.52	3.81	26.50	6.36	3.93	41.12	2.56	43.9	1.39	2.6
85	.121	.30	.40	2.99	17.36	8.63	7.48	36.86	3.50	40.7	1.79	3.6
86	.142	.36	.58	4.85	6.28	6.01	6.02	23.74	3.04	27.1	.47	1.5
87	.171	.43	.66	5.15	12.27	6.63	2.82	27.53	1.77	29.7	.79	2.2
88	.150	.38	1.16	3.23	8.85	8.01	2.19	23.44	2.14	26.0	.76	2.4
89	.080	.20	.21	5.05	23.56	10.31	4.90	44.03	2.53	46.8	1.74	3.1
90	.204	.41	.52	5.71	26.36	12.28	2.89	47.76	3.45	51.6	1.35	2.2
91	.202	.40	.80	7.69	18.64	9.59	5.50	42.22	3.71	46.3	1.55	2.8
92	.194	.39	.80	5.19	15.89	17.62	5.53	45.03	4.44	49.9	2.46	4.0
93	.167	.33	.70	7.62	14.78	23.34	5.67	52.11	4.87	57.3	2.97	4.2
94	.191	.38	.50	5.86	25.83	12.70	5.45	50.34	3.96	54.7	1.46	2.2
95	.198	.40	.73	6.69	31.78	15.73	5.81	60.74	4.35	65.5	2.11	2.7
96	.120	.24	.67	8.30	11.02	11.92	5.10	37.01	2.88	40.1	1.03	2.1
97	.123	.25	.24	4.64	3.36	8.67	1.99	18.90	2.97	22.1	1.63	5.9
98	.129	.26	.36	5.40	6.30	4.67	1.62	18.35	1.98	20.6	1.29	5.1
99	.080	.16	.61	8.49	17.23	9.15	3.92	39.40	2.70	42.3	1.35	2.6
00	.100	.20	1.07	8.55	8.33	8.14	2.17	28.26	2.80	31.3	1.25	3.3
01	.059	.12	1.13	7.29	8.44	3.83	1.34	22.03	1.78	23.9	.15	0.5
Means												
70-79		.04	.42	3.08	11.88	1.95	.60	17.94	1.13	19.1	.50	2.8
80-89		.27	.75	6.32	18.37	6.57	4.17	36.18	2.63	39.1	1.61	3.3
90-00		.31	.64	6.74	16.32	12.16	4.15	40.01	3.46	43.8	1.68	3.4

Kuskokwim run estimated by catch/ 0.4 (1970-89) and catch/0.5 (1990-01).
South Peninsula percent= (SP catch*.85)/ (SP catch*.85+ WA total)*100.

TABLE 6. North Pacific runs of sockeye salmon, 1970–2001.

Year	Bristol Bay run	Alaska Runs		Japan High Seas Catch	Russian Run	North Pacific Total Run	SE Alaska BC and Wash.	Total Pacific Run	Percent Western Alaska
		Western	Central						
70	39	42	7	10	3	62	9	71	59
71	16	17	6	7	2	32	12	44	39
72	5	6	5	7	1	19	8	27	22
73	2	3	4	6	1	14	15	29	10
74	11	12	4	5	1	22	14	36	33
75	24	25	3	5	2	35	7	42	60
76	12	13	7	6	1	27	10	37	35
77	10	11	10	3	3	27	13	40	28
78	20	22	9	3	4	38	14	52	42
79	40	44	7	3	3	57	12	69	64
80	62	68	8	3	4	83	7	90	76
81	34	40	10	3	4	57	15	72	56
82	22	26	14	3	3	46	20	66	39
83	46	51	15	2	5	73	10	83	61
84	41	45	14	2	7	68	11	79	57
85	37	42	15	1	8	66	23	89	47
86	24	27	17	1	6	51	18	69	39
87	27	30	22	1	8	61	11	72	42
88	23	27	17	<1	5	49	10	59	46
89	44	48	17	<1	6	71	24	95	51
90	48	53	18	<1	12	83	24	107	50
91	42	48	19	<1	8	75	20	95	51
92	45	52	23	0	10	85	18	103	50
93	52	60	19	0	10	89	29	118	51
94	50	56	16	0	8	80	20	100	56
95	61	67	17	0	10	94	12	106	63
96	37	41	20	0	13	74	15	89	46
97	19	24	18	0	9	51	22	73	33
98	18	23	14	0	8	45	7	52	44
99	39	44	20	0	8	72	5	77	57
2000	28	32	12	0	6	50	6	56	58
2001	22	24	14	0	11	49	6	55	44
Means									
70-79	18	20	6	6	2	33	11	45	39
80-89	36	40	15	2	6	63	15	77	51
90-99	41	47	18	0	10	75	17	92	50

Western Alaska includes Bristol Bay, North Peninsula and 85% of South Peninsula catch.
Japan high seas catches since1992 are included in Russian run.

TABLE 7. North Pacific runs of chum salmon, 1970–2001.

Year	Bristol Bay run	Alaska Runs		Japan catch		Russian Run (Catch/.5)	North Pacific Total Run	SE Alaska B.C. and Wash.	Total Pacific Run	Percent Asia
		Western	Central	High seas	Coastal					
70	1.7	6.0	5.2	17	7	7	43	11	54	59
71	1.3	4.7	6.6	17	10	7	45	7	52	65
72	1.6	4.7	4.5	22	9	4	45	17	62	57
73	2.2	6.5	3.5	16	12	3	41	15	56	56
74	1.6	6.8	1.9	22	13	5	48	10	58	68
75	1.4	8.4	2.1	19	20	4	54	5	59	74
76	2.8	7.5	3.4	22	12	8	53	9	62	68
77	4.0	9.0	5.9	12	15	9	51	5	56	64
78	2.3	7.2	4.3	7	18	11	47	9	56	64
79	1.7	7.4	4.0	6	28	12	58	4	62	75
80	3.3	12.0	5.1	6	26	7	56	11	67	58
81	2.1	11.6	8.3	6	34	9	69	6	75	66
82	1.3	7.4	8.9	7	30	7	60	9	69	63
83	2.2	8.0	7.0	6	37	12	70	6	76	73
84	3.5	11.4	6.5	6	38	7	69	13	82	62
85	2.0	8.8	5.5	4	51	12	82	17	99	68
86	2.2	8.9	8.1	3	49	14	83	17	100	66
87	2.9	8.0	6.2	3	43	13	73	12	85	69
88	2.5	10.8	8.7	2	51	13	86	20	106	63
89	2.2	9.0	4.9	1	55	13	83	9	92	74
90	1.8	6.2	4.6	1	68	13	93	13	106	78
91	2.1	7.7	5.2	1	60	10	84	11	95	75
92	1.5	6.2	4.4	0	46	17	73	16	89	70
93	1.1	4.1	3.8	0	61	21	90	21	111	74
94	1.5	7.4	6.0	0	69	26	108	21	129	73
95	1.4	11.4	6.5	0	78	24	120	20	140	73
96	1.2	8.7	6.0	0	87	25	127	30	157	71
97	0.6	4.9	5.6	0	74	18	103	18	121	76
98	0.9	4.5	4.1	0	61	16	86	27	113	68
99	1.1	4.2	6.3	0	50	15	75	25	100	65
2000	0.5	2.7	9.7	0	46	10	68	26	94	59
2001	1.8	4.3	8.2	0	60	16	89	*10*	99	77
Means										
70-79	2.1	6.8	4.1	16	14	7	48	9	58	65
80-89	2.4	9.6	6.9	4	41	11	73	12	85	66
90-99	1.3	6.5	5.3	0	65	18	96	20	116	72

Western Alaska includes Bristol Bay, North Peninsula, Yukon-Kuskokwim regions and 75% of June catch south of the Alaska Peninsula.
Japan high seas catches since 1992 included in Russian runs.
Japan coastal catch includes in-river catch (hatchery returns).
Russian runs since 1993 from aerial surveys for escapements plus catches.
2000 numbers are preliminary from agencies.

TABLE 8. Age composition, mean length and mean weight of chum salmon from Nushagak catches.

	age 0.2			age 0.3			age 0.4			0.5	Number (millions)		
											Chum salmon		Sockeye
Year	%	Length	Weight	%	Length	Weight	%	Length	Weight	%	catch	run	run
66	10.5		1.81	75.5		3.88	14.0		4.07	0.0	.13	.31	2.80
67	3.6	534	2.39	89.2	574	2.97	7.2	590	3.29	0.0	.34	.79	1.53
68	6.9	552	2.83	65.9	584	3.17	27.1	597	3.32	0.1	.18	.43	1.68
69	21.3	529	2.31	73.9	564	2.82	4.8	594	3.38	0.0	.21	.54	1.99
70	1.1	531	3.33	96.5	568	2.95	2.4	610	3.60	0.0	.44	1.14	3.15
71	5.5	542	2.28	68.5	570	2.91	26.0	585	3.15	0.0	.36	.84	2.61
72	8.2	551	2.72	67.9	579	3.09	23.5	590	3.14	0.4	.31	.74	0.91
73	0.2			71.6	575	3.08	26.7	592	3.39	1.5	.34	1.10	0.85
74	16.3	533	2.36	42.4	576	3.11	39.6	594	3.25	1.7	.16	.89	2.78
75	24.3	530	2.37	73.9	563	2.93	1.7	585	2.88	0.1	.15	.68	2.92
76	9.3	542	2.45	84.1	580	3.02	6.6	601	3.30	0.0	.80	1.74	2.75
77	3.1	553	2.52	93.3	583	3.26	3.6	596	3.53	0.0	.90	2.65	1.84
78	2.3	541	2.55	40.6	587	3.23	57.1	617	3.95	0.0	.65	1.38	6.62
79	6.7	532	2.33	62.8	568	2.93	29.9	599	3.33	0.6	.44	.85	6.40
80	0.9	523	2.29	98.3	558	2.94	0.8	588	3.01	0.0	.68	1.65	12.81
81	0.3			61.0	566	2.95	38.7	596	3.58	0.0	.80	.97	10.34
82	1.3			44.2	572		53.5	576		1.0	.44	.69	7.93
83	2.0	535		34.5	571	3.18	61.5	585	3.45	2.0	.72	.89	7.07
84	1.6	528		87.2	562	3.07	10.0	584	4.06	1.2	.85	1.21	3.81
85	32.7	572	2.92	54.4	573	3.19	12.4	571	2.96	0.5	.40	.69	2.99
86	0.3			85.2	558	2.93	14.5	574	3.39	0.0	.49	.66	4.85
87	0.0			40.2	560	3.02	57.3	582	3.37	2.5	.42	.56	5.15
88	6.9	535	2.65	62.3	566	3.07	30.0	580	3.40	0.8	.37	.56	3.23
89	0.4			82.0	557	2.82	17.3	577	3.35	0.3	.52	.90	5.05
90	0.5			78.8	553	2.87	20.2	587	3.47	0.5	.31	.64	5.71
91	2.3	526	2.47	67.4	548	2.71	30.3	573	3.18	0.0	.47	.70	7.69
92	0.2	479		55.2	549	2.80	44.1	565	2.97	0.4	.31	.62	5.19
93	0.2	502		42.6	545	2.61	53.6	570	2.94	3.6	.41	.63	7.62
94*	0.4	512		51.2	553	2.81	47.0	562	2.83	1.5	.29	.67	5.86
95	7.1	533	2.44	52.7	552	2.75	36.6	568	3.06	3.6	.36	.58	6.70
96	0.2	545		77.2	566	3.17	21.8	592	3.63	0.8	.32	.55	8.30
97	0.7	510		69.5	556	2.83	29.3	574	3.05	0.5	.18	.24	4.63
98	1.2	541		86.0	569	2.90	12.1	590	3.40	0.6	.24	.54	5.40
99	0.0			67.6	573	3.16	31.6	582	3.18	0.7	.13	.37	8.49
00	7.8	561		65.2	580	3.21	27.0	590	3.45	0.0	.11	.25	8.55
01	0.0			87.4	565	3.15	12.6	575	3.28	0.0	.54	1.10	7.29
Means 70-01	4.5	533	2.55	67.2	566	2.99	27.5	585	3.31	0.8	.43	.87	5.48

Sources: Yuen and Nelson (1984), annual ADF&G reports on Bristol Bay salmon; e.g. Stratton and Crawford (1994); and B. Cross (ADF&G) for 1993-1999.

*About 55% of catch made with king salmon gear. AWL statistics are for sockeye gear (7/1-21).

TABLE 9. Timing of Bristol Bay sockeye runs and between Bristol Bay and Port Moller.

	Mean date of run (July)					Mean date	Days P.M. to	P.M. mean temp. (C)
Year	Egegik	Nak/Kvi	Nush.	Wt'd mean	Ugashik	at P.M.*	B.B.	6/11 to 7/5
85	2.1	3.0	4.3	2.9	7.0	27.1	5.8	5.8
86	6.6	6.4	8.3	7.0	8.4			
87	3.4	5.5	4.3	4.7	9.4	25.5	9.2	5.7
88	1.5	2.0	5.1	2.3	10.6	26.8	5.5	7.5
89	3.4	1.4	3.0	2.1	8.8	27.0	5.1	6.3
90	6.0	5.0	6.4	5.5	10.1	28.0	7.5	7.3
91	4.1	3.6	5.4	4.1	8.0	25.8	8.3	5.3
92	5.4	5.0	6.0	5.3	12.6	26.7	8.6	7.6
93	0.3	0.6	1.4	0.6	6.6	25.3	5.3	7.7
94	6.4	7.0	8.0	7.0	12.3	28.0	9.0	6.6
95	4.4	5.0	4.0	4.7	11.3	26.3	8.4	7.3
96	1.4	3.6	3.6	2.8	5.6	25.9	6.9	6.1
97	2.6	4.4	5.3	3.7	8.4	27.1	6.6	9.5
98	4.4	7.8	6.0	6.1	13.3	28.2	8.0	7.7
99	3.8	4.8	6.4	4.9	9.4	27.5	7.3	4.7
00	-0.6	2.1	2.5	1.3	5.5	22.5	8.0	7.1
01	-1.0	0.0	1.0	0.2	4.9	23.0	7.0	7.4
Means 1987-99	3.6	4.3	5.0	4.1	9.7	26.8	7.4	6.9

* Date in June of 50% of index through July 5.

TABLE 10. Age compositions in the Northern District by week, 2001.

Section	Week ending	2-ocean				3-ocean				4-ocean			Catch 1,000s
		0.2	1.2	2.2	3.2	0.3	1.3	2.3	3.3	0.4	1.4	2.4	
Nelson Lagoon													
June	13	.000	.076	.127	.003	.076	.342	.366	.003	.000	.007	.004	4
	20	.000	.149	.262	.003	.032	.244	.305	.002	.000	.000	.003	13
	27	.000	.210	.322	.007	.018	.125	.314	.002	.000	.000	.002	39
July	4	.000	.213	.391	.005	.018	.112	.258	.002	.000	.000	.001	58
	11	.000	.208	.446	.003	.017	.118	.204	.002	.000	.000	.001	43
	18	.000	.190	.400	.002	.014	.201	.188	.003	.001	.000	.000	19
	25	.002	.188	.263	.001	.034	.346	.163	.001	.001	.002	.000	8
Aug.	1	.001	.165	.121	.001	.038	.510	.159	.000	.001	.004	.000	2
	8	.001	.148	.081	.002	.022	.569	.171	.000	.000	.003	.000	3
	15												0
	22												0
Sept.	12												0
Total number		0	38	69	1	4	30	47	0	0	0	0	189
Proportion		.000	.199	.363	.004	.021	.160	.249	.002	.000	.000	.001	
Harbor Point to Stoganof Point													
June	27	.000	.022	.110	.000	.038	.542	.261	.000	.011	.016	.000	75
July	4	.001	.031	.095	.004	.079	.534	.207	.003	.023	.017	.007	162
	11	.000	.046	.126	.002	.011	.395	.384	.001	.008	.020	.006	197
	18	.000	.022	.279	.000	.006	.279	.547	.000	.000	.011	.017	36
	25	.000	.033	.215	.000	.007	.132	.598	.003	.000	.007	.004	40
Aug.	1	.000	.040	.285	.001	.005	.122	.523	.001	.001	.013	.005	35
	8												0
	15	.002	.024	.566	.000	.004	.036	.357	.001	.000	.004	.002	73
	22	.008	.006	.627	.000	.003	.026	.329	.001	.000	.000	.000	95
	29	.004	.014	.584	.000	.001	.023	.369	.000	.000	.003	.001	86
Sept.	5	.005	.009	.583	.000	.002	.040	.358	.000	.000	.000	.002	62
Total number		1	23	264	1	19	234	302	1	6	10	4	864
Proportion		.000	.027	.306	.001	.022	.271	.349	.001	.007	.011	.004	
Ugashik catch		.000	.161	.054	.001	.003	.657	.082	.000	.001	.036	.000	528
Ugasahik escape.		.000	.078	.022	.000	.000	.832	.066	.000	.000	.002	.000	837

Source: R. Murphy, ADF&G Kodiak

TABLE 11. Age compositions in early and late-run escapements to Bear Lake.

	Early run (through July 11)						Escape-ment	Late run (August 2 to end)						Escape-ment
Year	1.2	1.3	2.1	2.2	2.3	other	(1000s)	1.2	1.3	2.1	2.2	2.3	other	(1000s)
85	.062	.136	.094	.541	.152	.015	202	.012	.006	.045	.826	.103	.008	156
86	.056	.071	.002	.439	.428	.004	121	.005	.013	.015	.734	.233	.000	98
87	.030	.201	.001	.537	.225	.006	117	.020	.037	.002	.554	.387	.000	81
88	.000	.077	.011	.230	.682	.000	117	.007	.011	.134	.550	.297	.001	140
89	.020	.001	.071	.269	.573	.066	135	.017	.001	.077	.787	.111	.007	178
90	.154	.020	.013	.368	.390	.055	147	.039	.008	.002	.854	.073	.024	232
91	.032	.336	.046	.512	.069	.005	293	.110	.020	.101	.681	.067	.021	65
92	.038	.037	.055	.577	.271	.022	168	.003	.003	.150	.712	.104	.028	194
93	.015	.038	.009	.323	.593	.022	194	.013	.008	.193	.439	.316	.031	194
94	.012	.072	.055	.271	.548	.042	163	.000	.018	.005	.831	.094	.052	173
95	.036	.003	.075	.386	.485	.015	130	.007	.006	.148	.659	.176	.004	84
96	.045	.034	.122	.581	.212	.006	188	.010	.006	.163	.467	.211	.143	97
97	.056	.034	.170	.484	.249	.007	215	.010	.003	.207	.667	.096	.017	145
98	.002	.047	.072	.382	.447	.050	225	.016	.004	.089	.700	.183	.008	190
99	.059	.106	.034	.508	.285	.008	232	.020	.006	.011	.671	.179	.113	131
00	.299	.063	.030	.274	.330	.004	185	.069	.089	.088	.641	.104	.009	91
01	.003	.324	.080	.264	.311	.018	177	.010	.036	.236	.507	.194	.017	123
Means	.054	.094	.055	.409	.368	.020	177	.022	.016	.098	.664	.172	.028	140

TABLE 12. Age compositions of sockeye salmon from North Peninsula rivers in July 1994–2001.

		1-ocean			2-ocean				3-ocean			4-ocean			Escape.
Year	River	1.1	2.1	3.1	0.2	1.2	2.2	3.2	0.3	1.3	2.3	0.4	1.4	2.4	1,000s
94	Ilnik	.000	.000	.000	.000	.083	.000	.000	.350	.317	.033	.017	.117	.083	75
	Sandy	.017	.002	.000	.000	.899	.019	.000	.001	.060	.001	.000	.001	.000	115
	Bear (early)	.006	.060	.000	.000	.012	.477	.000	.000	.057	.366	.000	.002	.020	262
	Nelson	.000	.047	.000	.000	.020	.843	.005	.000	.010	.069	.000	.004	.001	325
	Combined	.005	.040	.000	.000	.153	.516	.002	.034	.063	.156	.002	.014	.015	777
	Ugashik esc.				.000	.127	.660	.002	.000	.031	.161	.000	.000	.001	1081
95	Ilnik	.000	.000	.000	.022	.129	.010	.000	.125	.650	.037	.015	.012	.000	38
	Sandy	.033	.000	.000	.006	.320	.030	.000	.000	.603	.007	.000	.000	.000	124
	Bear (early)	.000	.112	.000	.000	.027	.424	.000	.000	.006	.416	.000	.006	.009	221
	Nelson	.001	.086	.000	.001	.013	.826	.002	.000	.014	.056	.000	.000	.002	338
	Combined	.006	.075	.000	.003	.076	.523	.001	.007	.146	.157	.001	.002	.004	721
	Ugashik esc.				.003	.479	.314	.000	.000	.126	.075	.000	.000	.000	1304
96	Ilnik	.000	.000	.000	.006	.033	.006	.000	.676	.259	.000	.013	.007	.000	62
	Sandy	.008	.001	.000	.012	.521	.000	.000	.077	.372	.005	.000	.003	.000	64
	Bear (early)	.002	.142	.000	.000	.046	.576	.000	.000	.032	.197	.000	.000	.005	247
	Nelson	.002	.065	.000	.001	.139	.651	.005	.001	.054	.082	.000	.000	.000	250
	Combined	.002	.082	.000	.002	.131	.490	.002	.076	.098	.112	.001	.001	.002	623
	Ugashik esc.				.001	.084	.073	.000	.013	.747	.074	.000	.000	.000	692
97	Ilnik	.043	.000	.000	.048	.034	.001	.000	.217	.403	.006	.234	.014	.000	83
	Sandy	.099	.001	.000	.017	.572	.005	.000	.042	.260	.002	.000	.001	.001	38
	Bear (early)	.006	.170	.000	.000	.056	.484	.001	.000	.034	.249	.000	.000	.000	253
	Nelson	.005	.023	.000	.000	.115	.617	.000	.001	.107	.128	.001	.001	.000	190
	Combined	.017	.084	.000	.008	.107	.425	.000	.035	.128	.156	.035	.002	.000	564
	Ugashik esc.				.000	.194	.452	.000	.001	.227	.097	.000	.002	.000	618
98	Ilnik	.002	.000	.000	.044	.451	.000	.000	.262	.231	.001	.008	.001	.000	42
	Sandy	.059	.000	.000	.034	.527	.003	.000	.035	.338	.000	.000	.000	.000	50
	Bear (early)	.006	.148	.000	.000	.062	.387	.000	.000	.054	.343	.000	.000	.000	232
	Nelson	.007	.138	.000	.000	.128	.376	.000	.001	.127	.223	.000	.000	.000	165
	Combined	.011	.117	.000	.007	.165	.311	.000	.026	.123	.238	.001	.000	.000	489
	Ugashik esc.				.003	.289	.165	.000	.004	.203	.303	.000	.000	.001	925

TABLE 12—cont.

Year	River	1-ocean			2-ocean				3-ocean			4-ocean			Escape.
		1.1	2.1	3.1	0.2	1.2	2.2	3.2	0.3	1.3	2.3	0.4	1.4	2.4	1,000s
99	Ilnik	.002	.000	.000	.021	.096	.000	.000	.266	.585	.001	.021	.008	.000	75
	Sandy	.027	.001	.000	.024	.693	.014	.000	.118	.121	.002	.000	.000	.000	58
	Bear (early)	.010	.070	.001	.000	.089	.523	.001	.000	.076	.227	.000	.000	.003	223
	Nelson	.002	.040	.000	.000	.052	.810	.000	.006	.038	.050	.000	.002	.000	202
	Combined	.008	.043	.000	.005	.139	.504	.001	.050	.135	.109	.003	.002	.000	558
	Ugashik esc.				.000	.776	.110	.000	.003	.070	.038	.000	.001	.004	1647
00	Ilnik	.000	.000	.000	.018	.019	.002	.000	.444	.457	.037	.010	.013	.000	95
	Sandy	.014	.003	.000	.024	.463	.019	.000	.197	.274	.006	.000	.000	.000	40
	Bear (early)	.000	.038	.000	.000	.265	.352	.001	.000	.068	.275	.000	.001	.000	169
	Nelson	.002	.002	.000	.000	.356	.495	.008	.004	.039	.093	.000	.001	.000	183
	Combined	.002	.014	.000	.005	.267	.310	.003	.104	.150	.138	.002	.003	.000	487
	Ugashik esc.				.002	.168	.069	.000	.003	.697	.060	.000	.002	.000	639
01	Ilnik	.006	.000	.000	.009	.018	.002	.000	.444	.243	.054	.167	.056	.002	58
	Sandy	.010	.000	.000	.000	.224	.061	.000	.027	.639	.039	.002	.007	.000	39
	Bear (early)	.001	.111	.000	.000	.004	.294	.000	.000	.249	.328	.000	.005	.008	177
	Nelson	.003	.029	.001	.025	.152	.416	.001	.033	.241	.094	.003	.001	.000	202
	Combined	.003	.054	.000	.012	.087	.291	.000	.070	.277	.172	.022	.010	.003	476
	Ugashik esc.	.000	.000	.000	.000	.078	.022	.000	.000	.832	.066	.000	.002	.000	837

Source: P. Nelson, C. Hicks,and R Murphy ADF&G Kodiak

Appendix Tables

APPENDIX TABLE 1. Chum salmon escapement estimates in the A-Y-K, 1994-2001.

Stock	River	Year							
		1994	1995	1996	1997	1998	1999	2000	2001
Yukon summer	Pilot station sonar		3638		1343	746	939	433	394
	Andrdeafsky east weir	201	172	109	51	68	32	24	
	Andrdeafsky west								
	Anvik sonar	1129	1339	933	609	472	441	206	227
	Rodo	48	47	77	3				
	Nulato tower	145	237	137	158	49	30	24	
	Gisasa weir	51	137	158	32	18	10	11	18
	Kaltag tower		77	51	48	8	5	7	
	Clear Creek tower		117	101	76		11	19	4
	Chena tower/tagging		4	13	9	6	9	4	5
	Salcha tower/tagging	39	31	75	36	17	23	21	20
	Salcha aerial		1	10					
Yukon fall	Pilot Point sonar		1071		522	353	405	254	360
	Toklat	74	55	19	15	16	5	5	6
	Delta	23	21	14	8	8	17	4	14
	Chandalar sonar		281	208	200	76	89	66	110
	Sheenjek sonar	153	235	248	80	33	14	30	54
	Fishing Branch weir	65	52	77	27	14	12	5	22
	Canada main stem tags	102	158	123	85	46	62	55	34
	South Koyukuk weir		19	22	>11				
Kuskokwim	Kogrugluk weir	46	31	48	8	36	14	11	31
	Aniak sonar	388		302	263	279	178	144	326
	Tuluksak weir	16							19
	Goodnews weir	35	34	40	17	29	20	15	27
	Kanektok air	10	16	7	3		10		11
	Kanektok tower			71	51				
	Kwithlok tower/weir			27	11			12	
	George weir			22	6		12	3	12
	Tatlawiksuk weir					36	10	7	24
	Takotna tower/weir		3	3	2			1	5
Kotzebue	Noatak		147	307			59		
	Ely		8	30					
	Kelly River and lake		8	1			3		
	Squirrel		10	11	5		14		
	Salmon		14	24	2		5		
	Tutuksuk		4	22	1		3		
	Upper Kobuk		36	75	10		27		11
	Kobuk CPUE	1219	1188	2581	797	538	1357	1481	1574
Norton Sound	Sinuk	1	3	2			2		4
	Nome weir		2	3	5	2	1	4	3
	Flambeau	5	7	5			<1	1	4
	Eldorado tower				14	14	4	12	12
	Fish	17	13	6			<1		3
	Boston	4	4	4			0		4
	Niukluk tower		86	80	57	46	35	30	31
	Kwiniuk tower	33	43	28	20	24	9	13	17
	Tubutulik		17	11					1
	North tower			10	7	2	6	5	7
	Shaktoolik		9	7		6	2		2
	Snake tower		4	3	6	11	<1	2	2

Numbers are from Linda Branian, ADF&G and the AYK staff (Anc., AK) Feb. 26, 2002

APPENDIX TABLE 2. Bristol Bay chum salmon catches, sockeye exploitation and estimated chum runs.

	Nushagak			Togiak			Nak/Kvi			Egegik			Ugashik			Bristol Bay run	
Year	Chum catch	Catch/ expl.	ADFG Run	Chum catch	Catch/ expl.	ADFG Run	Chum catch	Catch/ expl.	ADFG Run	Chum catch	Catch/ expl.	ADFG run	Chum catch	Catch/ expl.	ADFG run	Catch/ expl.	ADFG
70	.44	1.14	.71	.10	.22	.34	.120	.22		.044	.07		.018	.09		1.75	
71	.36	.75	.59	.12	.24	.35	.151	.24		.027	.04		.014	.02		1.29	
72	.31	.74	.51	.18	.38	.35	.116	.30		.042	.07		.010	.06		1.53	
73	.34	1.06	.54	.20	.44	.36	.124	.59		.023	.06		.006	.07		2.22	
74	.16	.89	.26	.08	.14	.24	.041	.51		.004	.03		.002	.07		1.64	
75	.15	.68	.23	.09	.18	.20	.080	.47		.004	.01		.002	.07		1.41	
76	.80	1.74	1.30	.15	.25	.55	.318	.74		.047	.07		.010	.03		2.82	
77	.90	2.65	1.51	.27	.52	.77	.340	.74		.083	.12		.004	.01		4.03	
78	.65	1.38	.94	.27	.47	.67	.185	.37		.044	.08		.001	.01		2.31	
79	.44	.85	.61	.22	.33	.51	.196	.36		.038	.06		.012	.06		1.65	
80	.68	1.94	1.65	.30	.57	.71	.205	.55	.21	.079	.11		.036	.17	.05	3.35	
81	.80	1.11	.97	.23	.36	.56	.356	.47	.43	.088	.10		.036	.06	.04	2.11	
82	.43	.57	.69	.15	.23	.24	.198	.30	.21	.084	.12	.10	.053	.11	.11	1.34	1.35
83	.73	1.01	.89	.32	.45	.49	.352	.42	.36	.127	.14	.14	.105	.14	.14	2.17	2.02
84	.85	1.63	1.21	.34	.55	.54	.447	.81	.50	.178	.22	.20	.211	.31	.38	3.52	2.83
85	.40	.91	.68	.20	.38	.42	.210	.45	.23	.127	.15	.13	.132	.15	.16	2.04	1.62
86	.49	.88	.66	.27	.51	.60	.263	.57	.30	.095	.12	.10	.111	.13	.12	2.21	1.78
87	.42	.67	.56	.42	.81	.78	.447	1.09	.46	.145	.18	.17	.101	.13	.13	2.88	2.10
88	.37	.70	.56	.47	.66	.88	.296	.74	.36	.238	.30	.25	.095	.14	.15	2.53	2.20
89	.52	.93	.90	.20	.49	.35	.311	.53	.32	.136	.16	.14	.085	.13	.10	2.24	1.81
90	.38	.61	.71	.10	.18	.17	.422	.65	.47	.123	.15	.14	.032	.04	.04	1.64	1.53
91	.46	.68	.75	.25	.38	.40	.443	.79	.49	.076	.11	.07	.060	.11	.07	2.07	1.78
92	.40	.71	.62	.18	.24	.29	.167	.28	.34	.121	.14	.12	.057	.09	.10	1.46	1.47
93	.50	.72	.63	.14	.21	.25	.044	.08	.04	.071	.07	.05	.073	.10	.08	1.17	1.05
94	.33	.56	.67	.23	.35	.46	.219	.35	.26	.063	.07	.06	.052	.07	.08	1.40	1.53
95	.39	.55	.58	.22	.31	.39	.236	.37	.39	.068	.07	.06	.063	.08	.07	1.38	1.49
96	.32	.47	.55	.21	.30	.32	.124	.17	.27	.083	.09	.09	.103	.12	.13	1.15	1.36
97	.18	.32	.24	.05	.11	.15	.009	.05		.053	.06		.016	.02		.56	N/A
98	.21	.43	.54	.07	.18	.17	.082	.12		.029	.03		.008	.02		.78	N/A
99	.12	.18	.37	.11	.17	.23	.273	.48		.075	.09		.071	.12		1.04	N/A
00	.11	.15	.25	.14	.20	.22	.050	.08		.020	.02		.020	.03		.48	N/A
01	.54	.87	1.10	.21	..29	.46	.040	.07	.11	.031	.04	.03	.050	.14	.08	1.41	1.78
Means																	
70-79	.45	1.19	.72	.17	.32	.43	.17	.45		.04	.06		.01	.05		2.07	
80-89	.57	1.04	.88	.29	.50	.56	.31	.59	.34	.13	.16	.15	.10	.15	.14	2.44	1.96
90-99	.33	.52	.57	.16	.24	.28	.20	.33	.32	.08	.09	.08	.05	.08	.08	1.27	1.46

Source: ADF&G (2001)

APPENDIX TABLE 3. Estimated chum salmon runs to areas of Central Alaska, 1970-2001.

	South Peninsula			Chignik			Kodiak			Cook Inlet			Prince William Sound			Total
Year	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	run
70	0.55	0.28	0.83	0.46	0.23	0.69	0.92		1.88	1.00		1.43	0.23	0.10	0.33	5.16
71	0.86	0.34	1.20	0.35	0.47	0.82	1.54		3.14	0.48		0.69	0.57	0.17	0.74	6.59
72	0.21	0.25	0.46	0.08	0.19	0.27	1.16		2.37	0.71		1.01	0.05	0.30	0.35	4.46
73	0.09	0.21	0.30	0.01	0.12	0.13	0.32		0.65	0.78		1.11	0.73	0.55	1.28	3.48
74	0.07	0.26	0.33	0.03	0.15	0.18	0.25		0.51	0.42		0.60	0.09	0.20	0.29	1.91
75	0.03	0.19	0.22	0.02	0.13	0.15	0.08		0.16	0.97		1.39	0.10	0.05	0.15	2.07
76	0.12	0.33	0.45	0.08	0.21	0.29	0.74		1.51	0.52		0.74	0.37	0.08	0.45	3.44
77	0.13	0.77	0.90	0.11	0.15	0.26	1.07	0.98	2.05	1.38		1.97	0.57	0.15	0.72	5.90
78	0.42	0.60	1.02	0.12	0.10	0.22	0.81	0.64	1.45	0.65		0.93	0.49	0.16	0.65	4.27
79	0.38	0.41	0.79	0.18	0.18	0.36	0.36	0.80	1.16	0.87		1.24	0.33	0.10	0.43	3.98
80	0.84	0.36	1.20	0.31	0.23	0.54	1.08	1.10	2.18	0.46		0.66	0.41	0.09	0.50	5.08
81	1.20	0.38	1.58	0.58	0.24	0.82	1.35	0.98	2.33	1.17		1.67	1.75	0.15	1.90	8.30
82	1.17	0.39	1.56	0.39	0.26	0.65	1.26	1.36	2.62	1.63		2.33	1.34	0.37	1.71	8.87
83	0.92	0.45	1.37	0.16	0.10	0.26	1.09	1.09	2.18	1.27		1.81	1.03	0.39	1.42	7.04
84	1.31	0.70	2.01	0.06	0.37	0.43	0.65	0.90	1.55	0.76		1.09	1.20	0.23	1.43	6.51
85	0.91	0.50	1.41	0.03	0.06	0.09	0.43	0.96	1.39	0.78		1.11	1.31	0.19	1.50	5.50
86	1.40	0.54	1.94	0.18	0.05	0.23	1.13	1.17	2.30	1.19		1.70	1.68	0.23	1.91	8.08
87	0.93	0.62	1.55	0.13	0.08	0.21	0.68	0.85	1.53	0.48		0.69	1.91	0.34	2.25	6.23
88	1.38	0.50	1.88	0.27	0.36	0.63	1.43	0.95	2.38	0.94		1.34	1.84	0.59	2.43	8.66
89	0.54	0.31	0.85	0.00	0.14	0.14	0.02	1.53	1.55	0.14		1.00	0.99	0.32	1.31	4.85
90	0.72	0.35	1.07	0.27	0.25	0.52	0.58	0.53	1.11	0.36		0.51	0.96	0.41	1.37	4.58
91	0.80	0.59	1.39	0.26	0.47	0.73	1.03	1.04	2.07	0.33		0.47	0.33	0.25	0.58	5.24
92	0.88	0.34	1.22	0.22	0.57	0.79	0.68	0.59	1.27	0.38		0.54	0.33	0.27	0.60	4.42
93	0.51	0.40	0.91	0.12	0.26	0.38	0.59	0.26	0.85	0.12		0.17	1.19	0.27	1.46	3.77
94	1.59	0.58	2.17	0.21	0.37	0.58	0.74	0.61	1.35	0.30		0.43	1.06		1.51	6.04
95	1.18	0.73	1.91	0.38	0.35	0.73	1.52	0.52	2.04	0.53		0.76	0.76		1.09	6.53
96	0.42	0.61	1.03	0.10	0.35	0.45	0.54	0.74	1.28	0.16		0.23	2.39	0.58	2.97	5.96
97	0.29	0.81	1.10	0.16	0.59	0.75	0.52	0.46	0.98	0.09		0.13	2.22	0.37	2.59	5.55
98	0.47	0.74	1.21	0.13	*0.40*	0.53	0.32	0.37	0.69	0.10		0.14	1.27	*0.30*	1.57	4.14
99	0.60	0.73	1.33	0.14	*0.40*	0.54	0.91	*0.90*	1.81	0.18		0.26	1.96	*0.35*	2.31	6.25
00	0.79	0.40	1.19	0.13	*0.40*	0.53	1.18	*0.80*	1.98	0.20		0.29	5.09	*0.60*	5.69	9.68
01	1.00	*0.80*	1.80	0.20	*0.40*	0.60	1.05	*0.85*	1.90	0.17		0.24	3.14	*0.55*	3.69	8.23
Means																
70-79	0.29	0.36	0.65	0.14	0.19	0.34	0.73	0.81	1.49	0.78		1.11	0.35	0.19	0.54	4.13
80-89	1.06	0.48	1.54	0.21	0.19	0.40	0.91	1.09	2.00	0.88		1.34	1.35	0.29	1.64	6.91
90-99	0.75	0.59	1.33	0.20	0.40	0.60	0.74	0.60	1.35	0.26		0.36	1.25	0.35	1.61	5.25

Sources: C. Swanton (ADF&G, personal comunication)
Cook Inlet run estimated from catch and mean sockeye salmon harvest rate,0.7.
Kodiak runs for 1970-76 and 1990-91 estimated from catch and mean harvest rate of .49 (1977-88).
South Peninsula catch for post-June only (M. Witteveen, ADF&G, Kodiak, AK, pers. comm.).

APPENDIX TABLE 4. Catches of chum salmon in the Yukon River in thousands of fish, 1970-2001.

	Summer chum		Fall chum				Total	Total		Escapement			Total chum run		
			Commercial		Subsistence		comm-	subsis-		Sum-					
Year	Commercial	Subsistence	U.S.	Canada	U.S.	Canada	ercial	tance	Total	mer	Fall	Total	Summer	Fall	Comb.
70	137	167	210	2	56	2	349	225	574						
71	100	171	190	2	57	15	292	243	535						
72	136	108	152	3	36	5	291	149	440						
73	286	161	232	3	54	7	521	222	743						
74	590	228	290	3	94	9	883	331	1214	*632*	*592*	1224	994	782	1776
75	710	212	275	2	87	19	987	318	1305	*1952*	*1394*	3346	2450	1565	4015
76	601	187	156	1	72	4	758	263	1021	*1033*	*504*	1537	1447	585	2032
77	535	160	258	4	83	8	797	251	1048	*791*	*619*	1410	1166	790	1956
78	1078	197	247	3	95	7	1328	299	1627	*766*	*500*	1266	1647	648	2295
79	820	196	378	9	233	13	1207	442	1649	*696*	*997*	1693	1320	1138	2458
80	1068	272	298	9	173	13	1375	458	1833	*1104*	*490*	1594	1900	611	2511
81	1280	208	478	15	189	7	1773	404	2177	*2300*	*592*	2892	3372	889	4261
82	717	261	225	11	133	5	953	399	1352	*1156*	*387*	1543	1612	485	2097
83	995	240	308	26	193	3	1329	436	1765	*902*	*523*	1425	1657	661	2318
84	866	231	211	23	175	6	1100	412	1512	*1785*	*450*	2235	2420	503	2923
85	934	265	270	36	206	5	1240	476	1716	*1648*	*636*	2284	2317	731	3048
86	1189	291	140	11	164	3	1340	458	1798	1933	583	2516	2831	567	3398
87	623	270	0	41	362	4	664	636	1300	826	596	1422	1179	271	1450
88	1620	199	137	30	159	3	1787	361	2148	1773	424	2197	3194	429	3623
89	1457	167	285	18	231	5	1760	403	2163	1604	606	2210	2894	673	3567
90	509	116	134	28	185	6	671	307	978	932	*547*	1479	1325	518	1843
91	650	119	254	31	169	4	935	292	1227	1233	*561*	1794	1764	673	2437
92	544	125	19	19	111	2	582	238	820	*1314*	*478*	1792	1733	403	2136
93	140	105	0	8	77	6	148	188	336	*1068*	292	1360	1103	217	1320
94	259	132	8	30	130	8	297	270	567	2120	831	2951	2247	731	2978
95	874	119	283	39	170	1	1196	290	1486	3439	1071	4510	4194	1222	5416
96	677	103	108	20	128	3	805	234	1039	1946	943	2889	2520	940	3460
97	228	100	58	9	92	8	295	200	495	1343	522	1865	1471	489	1960
98	29	98	0	*0*	*100*	*5*	29	203	232	746	353	1099	677	248	925
99	29	100	2	*5*	*120*	*5*	36	225	261	939	405	1344	868	287	1155
00	7	100	0	0	*25*	*5*	7	130	137	433	254	687	340	224	564
01	0	*85*	0	0	*36*	*2*	0	123	137	435	360	795	350	322	672

APPENDIX TABLE 5. Estimates of A-Y-K chum salmon runs, 1970-2001.

	Yukon summer				Yukon fall				Kotzebue				Norton Sound				Kuskokwim				Total
Year	Catch	Escape.	Run	u	Catch	Escape.	Run	u	Catch	Esc Idx	Run	u	Catch	Esc Idx	Run	u	Catch	Esc Idx	Run	u	Run
70	304		921	.33	270		818	.33	174	170	599	.29	130	249	752.5	.17	308		604	.51	3694.4
71	271		821	.33	264		800	.33	170	80	370	.46	153	115	440.5	.35	215		422	.51	2853.1
72	244		739	.33	196		594	.33	184	126	499	.37	115	76	305	.38	217		425	.51	2562.5
73	447		1355	.33	296		897	.33	394	62	549	.72	131	86	346	.38	354		694	.51	3841.1
74	818	632	1450	.56	396	592	988	.40	643	251	1270.5	.51	168	81	370.5	.45	471		924	.51	5002.5
75	922	1952	2874	.32	383	1394	1777	.22	579	156	969	.60	221	86	436	.51	400		784	.51	6840.3
76	788	1033	1821	.43	233	504	737	.32	184	63	341.5	.54	104	36	194	.54	457		896	.51	3989.6
77	695	791	1486	.47	353	619	972	.36	209	37	301.5	.69	227	83	434.5	.52	496		973	.51	4166.5
78	1275	766	2041	.62	374	500	874	.43	132	56	272	.49	201	107	468.5	.43	401		786	.51	4441.8
79	1016	696	1712	.59	633	997	1630	.39	158	28	228	.69	150	45	262.5	.57	457	855	1569	.29	5401
80	1340	832	2172	.62	493	490	983	.50	378	215	915.5	.41	201	96	441	.46	724	1328	2450	.30	6961.9
81	1488	2092	3580	.42	689	592	1281	.54	700	159	1097.5	.64	202	119	499.5	.40	640	752	1618	.40	8075.6
82	978	895	1873	.52	374	387	761	.49	450	63	607.5	.74	206	77	398.5	.52	513	667	1380	.37	5020.1
83	1235	662	1897	.65	530	523	1053	.50	186	139	533.5	.35	333	115	620.5	.54	442	269	792	.56	4895.7
84	1097	1554	2651	.41	415	450	865	.48	336	94	571	.59	154	154	539	.29	632	522	1311	.48	5936.6
85	1199	1383	2582	.46	517	636	1153	.45	534	68	704	.76	144	81	346.5	.42	322	321	739	.44	5524.8
86	1480	1642	3122	.47	318	583	901	.35	532	59	679.5	.78	166	75	353.5	.47	489	310	892	.55	5948
87	893	556	1449	.62	407	596	1003	.41	123	24	183	.67	110	57	252.5	.44	674	266	1020	.66	3907.3
88	1819	1574	3393	.54	330	424	754	.44	367	82	572	.64	112	35	199.5	.56	1562	522	2241	.70	7159.1
89	1624	1437	3061	.53	532	606	1138	.47	261	81	463.5	.56	53	64	213	.25	935	311	1339	.70	6214.8
90	625	816	1441	.43	353	547	900	.39	171	55	308.5	.55	85	52	215	.40	632	279	995	.64	3859.2
91	769	1114	1883	.41	458	561	1019	.45	255	124	565	.45	115	73	297.5	.39	595	442	1170	.51	4934.1
92	669	1189	1858	.36	151	478	629	.24	303	53	435.5	.70	103	40	203	.51	525	207	794	.66	3919.6
93	245	963	1208	.20	91	292	383	.24	88	67	255.5	.34	63	77	255.5	.25	143	89	259	.55	2360.7
94	391	1988	2379	.16	176	831	1007	.17	168	64	328	.51	43	99	290.5	.15	449	604	1234	.36	5238.7
95	993	3320	4313	.23	493	1071	1564	.32	307	227	874.5	.35	84	128	404	.21	784	*800*	1824	.43	8979.5
96	780	1846	2626	.30	259	943	1202	.22	182	470	1357	.13	45	102	300	.15	389	463	991	.39	6475.9
97	328	1243	1571	.21	167	693	860	.19	201	*98*	446	.45	61	*100*	311	.20	108	319	523	.21	3710.7
98	127	648	775	.16	105	438	543	.19	71	*98*	316	.22	30	129	352.5	.09	339	350	794	.43	2780.5
99	129	839	968	.13	134	400	534	.25	155	*70*	330	.47	22	18	67	.33	145	300	535	.27	2434
00	107	333	440	.24	33	300	333	.10	178	*80*	378	.47	16	25	79	.20	100	172	324	.31	1553.1
01	85	350	435	.20	52	425	477	.11	210	*80*	410	.51	10	88	230	.04	77	399	596	.13	2147.7
means																					
70-79	678	978	1522	.43	340	768	1009	.34	283	103	540	.54	160	96	401	.43	378	855	808	.49	4279.3
80-89	1315	1263	2578	.52	461	529	989	.46	387	98	633	.61	168	87	386.4	.43	693	527	1378	.51	5964.4
90-99	615	1565	2180	.30	287	630	917	.30	215	98	461	.48	82	78	278	.32	521	404	1046	.53	4882

Norton Sound and Kotzebue escapements estimated by index x 2.5
Kuskowkwim district escapement estimated by index x 1.3 (1979-2000) and the average harvest rate (.51).

APPENDIX TABLE 6. Catches of chum salmon on the Bering Sea coast of Alaska.

	A-Y-K Region					Bristol Bay					North	Subsistence catch				Western
Year	Kotze-bue	Norton Sound	Yukon River	Kusko-kwim	Total	Togiak	Nush-agak	Naknek/ Kvichak	Egegik	Ugashik	Alaska Peninsula	Kotze-bue	Norton Sound	Yukon River	Kusko-kwim	Alaska Total
70	159	107	347	61	674	101	435	120	44	18	50	*15*	23	225	247	1952
71	155	131	290	99	675	124	360	151	27	15	64	*15*	22	243	116	1812
72	169	101	288	97	655	179	310	116	42	10	85	*15*	14	149	120	1695
73	379	124	518	185	1206	195	336	124	23	6	156	*15*	7	222	179	2469
74	628	164	883	194	1869	81	158	41	4	2	34	*15*	4	331	277	2816
75	564	213	987	224	1988	87	153	80	4	2	9	*15*	8	318	176	2840
76	160	96	758	233	1247	154	801	318	47	10	74	24	8	263	224	3170
77	193	200	797	298	1488	271	900	340	83	4	129	16	27	251	198	3707
78	119	189	1292	282	1882	275	652	185	44	1	164	13	12	299	119	3646
79	142	138	1148	296	1724	220	440	196	38	12	66	16	12	442	161	3327
80	366	181	1375	559	2481	300	682	205	79	36	700	12	20	458	165	5138
81	677	170	1773	483	3103	230	795	356	88	36	709	23	28	404	157	5929
82	416	183	953	323	1875	151	435	198	84	53	331	34	19	399	190	3769
83	176	319	1329	295	2119	323	725	352	127	105	349	10	*14*	436	147	4707
84	320	146	1100	489	2055	337	850	447	178	211	805	16	*16*	412	143	5470
85	521	135	1240	225	2121	203	397	210	127	132	667	13	*19*	476	96	4461
86	261	147	1340	349	2097	270	488	263	95	111	271	36	*19*	458	143	4251
87	109	102	664	603	1478	419	416	447	145	101	369	14	*15*	636	71	4111
88	353	107	1787	1444	3691	470	371	296	238	95	393	14	*15*	361	154	6098
89	256	43	1760	802	2861	203	524	311	136	85	157	5	*10*	403	146	4841
90	163	65	671	523	1422	103	378	422	123	32	126	8	20	307	131	3072
91	240	87	935	502	1764	247	464	443	76	60	191	15	28	292	96	3676
92	289	84	582	437	1392	176	399	167	121	57	342	14	19	238	99	3024
93	73	54	148	95	370	145	506	44	71	73	135	15	*9*	188	62	1618
94	153	18	297	361	829	232	328	219	63	52	84	*15*	25	270	77	2194
95	291	43	1196	707	2237	223	390	236	68	63	99	*16*	41	290	69	3732
96	82	10	805	298	1195	207	324	124	83	103	67	100	35	234	91	2563
97	143	34	295	67	539	47	181	9	53	16	97	58	27	200	41	1268
98	55	16	29	267	367	68	209	82	29	8	70	*50*	14	*203*	*72*	1172
99	139	8	49	73	269	109	120	273	75	71	50	*25*	14	*225*	*72*	1303
00	160	6	7	50	223	141	111	53	16	22	91	*18*	*10*	*130*	*50*	865
01	210	31	0	22	263	212	537	40	31	50	.17	*17*	*15*	*137*	*55*	1357
Means																
70-79	267	146	731	197	1341	169	455	167	36	8	83	16	14	274	182	2743
80-89	346	153	1332	557	2388	291	568	309	130	97	475	18	18	444	141	4878
90-99	163	42	501	333	1038	156	330	202	76	54	126	32	23	245	81	2362

Yukon River includes Canadian catches. Italics for estimates of missing data.
Other catches through 1996 are from INPFC Statistical Yearbooks (e.g. INPFC,1993) and annual reports. 2000 catches are preliminary from ADF&G. Bristol Bay from ADF&G. A-Y-K region from reports to BOF and ADF&G staff.

APPENDIX TABLE 7. Annual catches of chum salmon in Bering Sea fisheries.

Year	Kotz-ebue	Norton Sound	Yukon River	Arctic/ Yukon Region	Kusko-kwim	Togiak	Nush-agak	Naknek/ Kvichak	Egegik	Ugashik	Bristol Bay Total	North Alaska Penins.
70	.17	.13	.57	.87	.31	.10	.44	.12	.04	.02	.72	.05
71	.17	.15	.53	.85	.22	.12	.36	.15	.03	.02	.68	.06
72	.18	.12	.44	.74	.22	.18	.31	.12	.04	.01	.66	.08
73	.39	.13	.74	1.26	.36	.20	.34	.12	.02	.01	.69	.16
74	.64	.17	1.20	2.01	.47	.08	.16	.04	.00	.00	.28	.03
75	.58	.22	1.30	2.10	.40	.09	.15	.08	.00	.00	.32	.01
76	.18	.10	1.02	1.30	.46	.15	.80	.32	.05	.01	1.33	.07
77	.21	.23	1.05	1.49	.50	.27	.90	.34	.08	.00	1.59	.13
78	.13	.20	1.57	1.90	.40	.28	.65	.18	.04	.00	1.15	.16
79	.16	.15	1.58	1.89	.46	.22	.44	.20	.04	.01	.91	.07
80	.38	.20	1.82	2.40	.72	.30	.68	.20	.09	.04	1.31	.70
81	.70	.18	2.17	3.05	.64	.23	.80	.36	.09	.04	1.52	.71
82	.45	.21	1.35	2.01	.51	.15	.44	.20	.08	.05	.92	.33
83	.19	.33	1.76	2.28	.44	.32	.72	.35	.13	.11	1.63	.35
84	.34	.15	1.51	2.00	.63	.34	.85	.45	.18	.21	2.03	.80
85	.53	.14	1.71	2.38	.32	.20	.40	.21	.13	.13	1.07	.67
86	.30	.16	1.80	2.26	.49	.27	.49	.26	.09	.11	1.22	.27
87	**.12**	**.11**	**1.30**	**1.53**	**.67**	**.42**	**.42**	**.45**	**.15**	**.10**	**1.54**	**.37**
88	.37	.11	2.15	2.63	1.56	.47	.37	.30	.24	.09	1.47	.39
89	.26	.05	2.16	2.47	.94	.20	.52	.31	.14	.08	1.25	.16
90	.17	.07	.98	1.22	.63	.10	.38	.42	.12	.03	1.05	.13
91	.26	.10	1.23	1.59	.60	.25	.46	.44	.07	.06	1.28	.19
92	.30	.09	.82	1.21	.52	.18	.40	.17	.12	.06	.93	.34
93	.09	.06	.34	.49	.14	.14	.51	.04	.07	.07	.83	.14
94	.17	.03	.57	.77	.45	.23	.33	.22	.06	.05	.89	.08
95	.31	.06	1.49	1.86	.78	.22	.39	.24	.07	.06	.98	.10
96	.18	.03	1.04	1.25	.39	.21	.32	.12	.08	.10	.84	.07
97	.20	.06	.50	.76	.27	.05	.18	.01	.05	.02	.31	.10
98	.07	.03	.23	.33	.34	.07	.21	.08	.03	.01	.39	.07
99	.16	.02	.26	.44	.15	.11	.12	.27	.07	.07	.64	.05
00	.18	.02	.14	.34	.10	.14	.11	.05	.02	.02	.34	.09
01	.23	.05	.14	.42	.08	.21	.54	.04	.03	.05	.87	.17
Means												
70-79	.28	.16	1.00	1.44	.38	.17	.46	.17	.03	.01	.83	.08
80-89	.36	.16	1.77	2.30	.69	.29	.57	.31	.13	.10	1.40	.48
90-99	.19	.06	.75	.99	.43	.16	.33	.20	.07	.05	.81	.13

APPENDIX TABLE 8. Western and Central Alaska chum salmon runs, 1970-2001, in millions.

	Western Alaska				South	Central Alaska					West./	Percent
Year	Bristol Bay	North Penin.	AYK Region	TOTAL	Penin. June C	PWS	Cook Inlet	Kodiak	Chignik/ So. Penin.	TOTAL	Central TOTAL	South Penin.
70	1.7	.2	3.7	5.6	.5	.3	1.4	1.9	1.5	5.1	11.2	4.5
71	1.3	.2	2.9	4.4	.5	.7	.7	3.1	2.0	6.5	11.4	4.4
72	1.5	.2	2.6	4.3	.5	.4	1.0	2.4	.7	4.5	9.3	5.4
73	2.2	.3	3.8	6.3	.2	1.3	1.1	.7	.4	3.5	10.0	2.0
74	1.6	.1	5.0	6.7	.0	.3	.6	.5	.5	1.9	8.6	0.0
75	1.4	.1	6.8	8.3	.1	.1	1.4	.2	.4	2.1	10.5	1.0
76	2.8	.4	4.0	7.2	.4	.5	.7	1.5	.7	3.4	11.0	3.6
77	4.0	.8	4.2	9.0	.1	.7	2.0	2.0	1.2	5.9	15.0	0.7
78	2.3	.5	4.4	7.2	.1	.7	.9	1.4	1.3	4.3	11.6	0.9
79	1.7	.4	5.4	7.5	.1	.4	1.2	1.2	1.2	4.0	11.6	0.9
80	3.3	1.5	7.0	11.8	.5	.5	.7	2.2	1.7	5.1	17.4	2.9
81	2.1	1.2	8.1	11.4	.6	1.9	1.7	2.3	2.4	8.3	20.3	3.0
82	1.3	.8	5.0	7.1	1.1	1.7	2.3	2.6	2.2	8.8	17.0	6.5
83	2.2	.7	4.9	7.8	.8	1.4	1.8	2.2	1.6	7.0	15.6	5.1
84	3.5	1.7	5.9	11.1	.3	1.4	1.1	1.6	2.4	6.5	17.9	1.7
85	2.0	1.0	5.5	8.5	.4	1.5	1.1	1.4	1.5	5.5	14.4	2.8
86	2.2	.5	6.0	8.7	.4	1.9	1.7	2.3	2.2	8.1	17.2	2.3
87	2.9	.9	3.9	7.7	.4	2.2	.7	1.5	1.8	6.2	14.3	2.8
88	2.5	.9	7.2	10.6	.5	2.4	1.3	2.4	2.5	8.6	19.7	2.5
89	2.2	.4	6.2	8.8	.5	1.3	1.0	1.6	1.0	4.9	14.2	3.5
90	1.8	.4	3.9	6.1	.5	1.4	.5	1.2	1.6	4.7	11.3	4.4
91	2.1	.5	4.9	7.5	.8	.6	.5	2.1	2.1	5.3	13.6	5.9
92	1.5	.7	3.9	6.1	.4	.6	.5	1.2	2.0	4.3	10.8	3.7
93	1.1	.5	3.4	5.0	.5	1.5	.2	1.3	1.3	4.3	9.8	5.1
94	1.5	.6	5.2	7.2	.6	1.5	.4	1.3	2.8	6.0	13.8	4.3
95	1.4	.9	9.0	11.3	.5	1.1	.8	2.0	2.6	6.5	18.3	2.7
96	1.2	.9	6.5	8.6	.4	3.0	.2	1.3	1.5	6.0	15.0	2.7
97	.6	.5	3.7	4.8	.3	2.6	.1	1.0	1.9	5.6	10.7	2.8
98	.8	.8	2.8	4.4	.2	1.6	.1	.7	1.7	4.1	8.7	2.3
99	1.0	.7	2.4	4.1	.2	2.3	.3	1.8	1.9	6.3	10.6	1.9
00	.5	.6	1.6	2.7	.2	5.7	.3	2.0	1.7	9.7	12.6	1.6
01	1.8	.3	2.2	4.3	.1	3.7	.2	1.9	2.4	8.2	12.6	0.8
Means												
70-79	2.1	.3	4.3	6.7	.3	.5	1.1	1.5	1.0	4.1	11.0	2.3
80-89	2.4	1.0	6.0	9.4	.6	1.6	1.3	2.0	1.9	6.9	16.8	3.3
90-99	1.8	.6	4.6	6.5	.4	1.6	.4	1.4	1.9	5.3	12.3	3.6

APPENDIX TABLE 9. Annual catches of chum salmon by Asian fisheries.

	Russia						Japan			
	Catch (1,000s m.t.)			Catch (millions of fish)			Catch (millions of fish)			
	Okhotsk	Bering		Okhotsk	Bering		USSR/Japan	High-seas		Asia
Year(s)	Sea	Sea	Total	Sea	Sea	Total	coastal	Mothership	Landbased	Total
1925-29	52.53	10.65	63.18	15.01	2.88	17.89	14.5	0	0	32
1930-39	62.72	14.39	77.11	17.92	3.89	21.81	19.7	2.19	4.56	48
1940-49	46.82	14.45	61.27	13.38	3.91	17.28	6.4	1.01	2.63	27
1950-59	46.07	7.83	53.90	13.16	2.12	15.28	3.5	9.87	3.66	32
1960-69	24.87	4.91	29.78	7.11	1.33	8.43	4.9	7.48	9.66	30
1970-79	11.89	4.63	16.52	2.43	1.08	3.51	14.4	8.1	7.9	34
1980-89	10.88	10.22	21.09 #	2.61	2.83	5.44	41.0	2.3	2.0	51
1990-99	16.27	6.16	22.43	4.53	1.85	6.4	66.5	.0	.3	73.2
70	14.70	4.50	19.20	2.78	.89	3.67	7.2	9.64	7.53	28
71	13.48	3.33	16.81	2.68	.73	3.41	10.2	9.97	6.78	30
72	8.65	3.12	11.77	1.72	.48	2.20	8.6	13.37	8.84	33
73	7.45	2.52	9.97	1.09	.59	1.68	11.6	7.86	7.75	29
74	9.83	2.81	12.64	1.75	.58	2.33	13.0	9.28	12.35	37
75	8.38	3.39	11.77	1.14	.84	1.98	19.9	7.37	11.76	41
76	13.13	2.45	15.58	3.23	.74	3.97	12.4	10.44	11.43	38
77	14.28	6.17	20.45	2.65	1.64	4.29	15.2	6.00	6.23	32
78	19.17	8.04	27.21	3.74	1.66	5.40	18.2	3.80	3.49	31
79	9.87	9.93	19.80	3.54	2.60	6.14	28.0	3.28	2.86	40
80	8.58	5.98	14.56	2.01	1.50	3.51	25.7	3.10	3.17	35
81	8.37	6.51	14.88	2.36	2.34	4.70	33.5	2.54	3.09	44
82	8.07	6.21	14.28	1.62	1.75	3.37	30.0	3.22	3.52	40
83	6.85	15.25	22.10	1.87	4.35	6.22	37.1	3.08	2.61	49
84	4.39	9.35	13.74	1.20	2.52	3.72	37.8	3.28	2.52	47
85	13.93	11.34	25.27	2.84	3.37	6.21	50.9	2.84	1.57	62
86	12.76	14.77	27.53	2.87	4.16	7.03	46.0	1.93	1.04	56
87	13.50	13.76	27.26	2.96	3.48	6.44	42.7	1.82	1.09	52
88	16.30	10.50	26.80	4.25	2.47	6.72	51.0	.89	.91	60
89	16.00	8.50	24.50	4.11	2.33	6.44	55.0	.61	.75	63
90	13.89	13.18	27.07	3.28	3.40	6.68	68.0	.00	1.15	76
91	14.05	3.66	17.71	3.65	1.29	4.94	60.0	.00	.84	66
92	11.20	6.40	17.60	2.89	1.88	4.77	46.0	.00	.00	51
93	15.59	7.38	22.97	4.74	2.35	7.09	61.0	.00	.00	68
94	20.92	7.20	28.12	6.34	2.18	8.52	69.0	.00	.17	78
95	22.62	5.62	28.24	6.44	1.74	8.18	78.0	.00	.17	86
96	11.84	3.70	15.54	3.53	1.18	4.71	87.0	.00	.17	92
97	14.74	3.53	18.27	4.40	1.10	5.50	85.0	.00	.17	91
98	21.19	3.95	25.14	6.50	1.30	7.80	59.3	.00	.20	67
99	16.65	6.99	23.64	3.50	2.10	5.60	52.0	.00	.20	58
00	19.18	13.35	32.53	5.79	4.21	10.00	46.0	.00	*.15*	56
01				3.80	4.30	8.10	*35.0*	.00	*.00*	43

Bering Sea is East Kamchatka plus the Anadyr River; all other runs included in Okhotsk Sea.
Sources: Russian catches (m.t.) through 1988 from VINRO (Moscow, USSR) and 1989-1991 from TINRO (Vladivostok, Russia). Catches for 1992-2000 from reports to NPAFC.
Japanese catches through 1992 from INPFC Statistical Yearbooks and do not include freshwater catches.
Japan catches 1997-99 from annual reports to NPAFC and 2000 is a preliminary estimate.

APPENDIX TABLE 10. Estimates of annual sockeye salmon runs to areas of Central Alaska, 1970-2001.

	South Peninsula			Chignik			Kodiak			Cook Inlet			Prince William Sound			Total
Year	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	Catch	Escape.	Run	run
70	0.06	0.02	0.08	1.82	0.66	2.48	0.92		1.88	0.75	0.30	1.05	1.24	0.52	1.76	7.25
71	0.22	0.02	0.24	1.32	0.90	2.22	0.48		0.98	0.66	0.70	1.36	0.74	0.46	1.20	6.00
72	0.05	0.01	0.06	0.44	0.56	1.00	0.22		0.45	0.94	0.73	1.67	0.98	0.33	1.31	4.49
73	0.06	0.01	0.07	0.97	0.78	1.75	0.17		0.35	0.70	0.69	1.39	0.47	0.45	0.92	4.48
74	0.17	0.10	0.27	0.80	0.72	1.52	0.42		0.86	0.52	0.45	0.97	0.74	0.22	0.96	4.58
75	0.00	0.05	0.05	0.43	0.62	1.05	0.14		0.29	0.71	0.47	1.18	0.55	0.16	0.71	3.28
76	0.02	0.09	0.11	1.33	0.89	2.22	0.64		1.31	1.72	0.88	2.60	1.01	0.22	1.23	7.47
77	0.06	0.06	0.12	2.14	0.95	3.09	0.62	1.27	1.89	2.15	1.44	3.59	0.94	0.49	1.43	10.12
78	0.07	0.06	0.13	1.83	0.72	2.55	1.07	1.00	2.07	2.78	0.86	3.64	0.51	0.27	0.78	9.17
79	0.28	0.05	0.33	1.15	0.70	1.85	0.63	1.41	2.04	0.99	0.94	1.93	0.37	0.33	0.70	6.85
80	0.37	0.05	0.42	0.95	0.59	1.54	0.65	1.83	2.48	1.64	1.22	2.86	0.21	0.62	0.83	8.13
81	0.32	0.05	0.37	2.29	0.74	3.03	1.29	1.40	2.69	1.55	1.33	2.88	0.78	0.65	1.43	10.40
82	0.18	0.04	0.22	1.78	0.92	2.70	1.20	1.60	2.80	3.39	1.41	4.80	2.36	0.81	3.17	13.69
83	0.52	0.06	0.58	2.44	0.87	3.31	1.23	1.30	2.53	5.24	1.48	6.72	0.91	0.76	1.67	14.81
84	0.53	0.05	0.58	3.60	0.87	4.47	1.95	1.47	3.42	2.38	1.43	3.81	1.30	0.75	2.05	14.33
85	0.29	0.05	0.34	1.14	0.75	1.89	1.84	2.55	4.39	4.34	1.75	6.09	1.46	0.79	2.25	14.96
86	0.69	0.05	0.74	1.98	0.77	2.75	3.19	2.00	5.19	5.02	1.35	6.37	1.29	0.68	1.97	17.02
87	0.46	0.04	0.50	2.43	0.80	3.23	1.81	1.68	3.49	9.75	2.62	12.37	1.74	0.80	2.54	22.13
88	0.72	0.07	0.79	0.90	0.68	1.58	2.70	1.30	4.00	7.15	1.76	8.91	0.77	0.66	1.43	16.71
89	0.91	0.08	0.99	1.30	0.94	2.24	1.29	3.17	4.46	5.17	2.49	7.66	1.18	0.78	1.96	17.31
90	1.04	0.10	1.14	2.44	0.77	3.21	5.25	1.60	6.85	3.77	1.45	5.22	0.91	0.70	1.61	18.03
91	0.57	0.12	0.69	2.47	1.04	3.51	5.70	2.20	7.90	2.50	1.46	3.96	1.74	0.76	2.50	18.56
92	0.87	0.10	0.97	1.61	0.77	2.38	4.17	1.97	6.14	9.28	1.74	11.02	1.77	0.80	2.57	23.08
93	0.64	0.10	0.74	2.25	0.70	2.95	4.38	1.71	6.09	4.99	1.72	6.71	1.85	0.97	2.82	19.31
94	0.54	0.12	0.66	1.62	0.80	2.42	2.88	2.04	4.92	3.64	1.93	5.57	1.51	0.90	2.41	15.98
95	0.82	0.13	0.95	1.72	0.75	2.47	4.49	1.84	6.33	3.14	1.51	4.65	1.52	0.76	2.28	16.68
96	0.47	0.07	0.54	1.91	0.74	2.65	4.92	1.80	6.72	4.05	1.59	5.64	3.00	1.04	4.04	19.59
97	0.57	0.10	0.67	0.76	0.78	1.54	2.47	1.79	4.26	4.32	2.13	6.45	4.13	1.30	5.43	18.35
98	0.88	0.09	0.97	1.05	0.70	1.75	3.62	1.78	5.40	1.47	1.63	3.10	1.72	1.04	2.76	13.98
99	1.64	0.10	1.74	3.12	0.70	3.82	4.65	1.81	6.46	3.19	1.50	4.69	2.04	*1.20*	3.24	19.95
00	0.79	*0.09*	0.88	1.77	0.83	2.60	2.91	1.43	4.34	0.82	1.30	2.12	1.43	*0.80*	2.23	12.17
01	0.41	*0.08*	0.49	1.50	1.11	2.61	2.66	1.84	4.50	2.14	1.16	3.30	2.27	*0.81*	3.08	13.98
Means																
70-79	0.10	0.05	0.15	1.22	0.75	1.97	0.53	1.23	1.21	1.19	0.75	1.94	0.76	0.35	1.10	6.37
80-89	0.50	0.05	0.55	1.88	0.79	2.67	1.72	1.83	3.55	4.56	1.68	6.25	1.20	0.73	1.93	14.95
90-98	0.71	0.10	0.81	1.77	0.78	2.54	4.21	1.86	6.07	4.13	1.68	5.81	2.02	0.92	2.94	18.17

Cook Inlet includes Upper and Lower Cook Inlet management areas; PWS includes Copper & Bering rivers.
Sources: Miscellaneous reports to Alaska BOF.
Kodiak runs for 1970-76 estimated from catch and mean harvest rate of .49 (1977-88).

APPENDIX TABLE 11. Nushagak District chum and sockeye salmon statistics, 1966-2001.

	Chum salmon								Sockeye salmon			
		Escapement				Rate of	Mean weight (kg)		Rate of exploitation		Mean weight (kg)	
Year	Catch	Air/tower	Sonar	Adjusted	Run	exploit.	age .3	all fish	age .3	all fish	age .3	all fish
66	129	80			209	.62	3.88	3.88	.49	.42	3.06	2.84
67	338	200			538	.63	2.97	2.97	.51	.43	3.02	2.62
68	179	100			279	.64	3.17	3.19	.48	.42	3.30	3.03
69	214	130			344	.62	2.82	2.76	.38	.39	3.05	2.56
70	435	273			708	.61	2.95	2.97	.46	.38	2.86	2.60
71	360	226			586	.61	2.91	2.95	.53	.43	3.11	2.90
72	310	195			505	.61	3.09	3.06	.58	.42	2.98	2.50
73	336	200			536	.63	3.08	3.16	.34	.31	3.46	3.50
74	158	100			258	.61	3.11	3.06	.14	.18	3.06	2.50
75	153	80			233	.66	2.93	2.79	.22	.22	3.17	2.90
76	801	500			1301	.62	3.02	2.98	.50	.46	3.39	3.00
77	900	609			1509	.60	3.26	3.25	.36	.34	3.60	3.50
78	652	293			945	.69	3.23	3.63	.54	.47	3.39	2.85
79	440	100	166	--	606	.73	2.93	3.01	.50	.52	3.09	2.87
80	682	1053	332	969	1651	.41	2.94	2.94	.37	.35	2.96	2.97
81	795	--	143	177	972	.82	2.95	3.19	.74	.72	3.17	3.08
82	435	--	230	256	691	.63		3.00	.76	.75	3.09	3.09
83	725	--	106	164	889	.82	3.18	3.34	.81	.73	3.00	2.71
84	850	--	362	--	1212	.70	3.07	3.16	.55	.54	3.00	2.91
85	397	--	214	288	685	.58	3.19	3.07	.51	.44	3.11	2.56
86	488	--	168	200	688	.71	2.93	2.95	.57	.56	3.01	3.17
87	416	--	147	--	563	.74	3.02	3.14	.77	.63	2.97	2.91
88	371	--	186	--	557	.67	3.07	3.09	.49	.53	3.17	3.00
89	523	--	378	--	901	.58	2.82	2.91	.58	.56	3.08	2.78
90	378	--	330		708	.53	2.87	2.95	.64	.62	3.05	2.76
91	464	--	252		716	.65	2.71	2.77	.65	.69	2.86	2.58
92	399	--	303		702	.57	2.80	2.88	.63	.56	2.71	2.42
93	506	--	217		723	.70	2.61	2.80	.68	.70	3.01	2.67
94*	328	--	379		707	.46	3.06	3.35	.67	.59	2.84	2.72
95	390	--	213		603	.65	2.75	2.85	.71	.65	2.74	2.36
96	324	--	225		549	.59	3.17	3.27	.71	.69	3.01	2.67
97	181	--	61		242	.75	2.83	2.89	.60	.57	2.98	2.70
98	209	--	300		509	.41	2.90	2.96	.50	.55	2.83	2.17
99	120	--	242		362	.33	3.16	3.16	.77	.74	2.91	2.44
00	111	--	141		252	.44	3.21	3.28	.78	.75	3.01	2.68
01	537	--	565		1102	.49	3.15	3.17	.84	.60	3.03	2.98
Means												
70-79	455	258			719	.63	3.05	3.09	.42	.37	3.21	2.91
80-89	568		227		881	.65	3.02	3.08	.62	.58	3.06	2.92
90-99	330		252		582	.57	2.89	2.99	.66	.64	2.89	2.55

Data sources: Yuen and Nelson (1984), ADF&G (2000), and personal comunication with ADF&G, Anchorage for 2000.
* About 54% of chum catch in 1994 was made with large mesh king salmon gear. Wts. with sockeye gear = 2.81 kg & 2.83 kg.