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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

-1984-

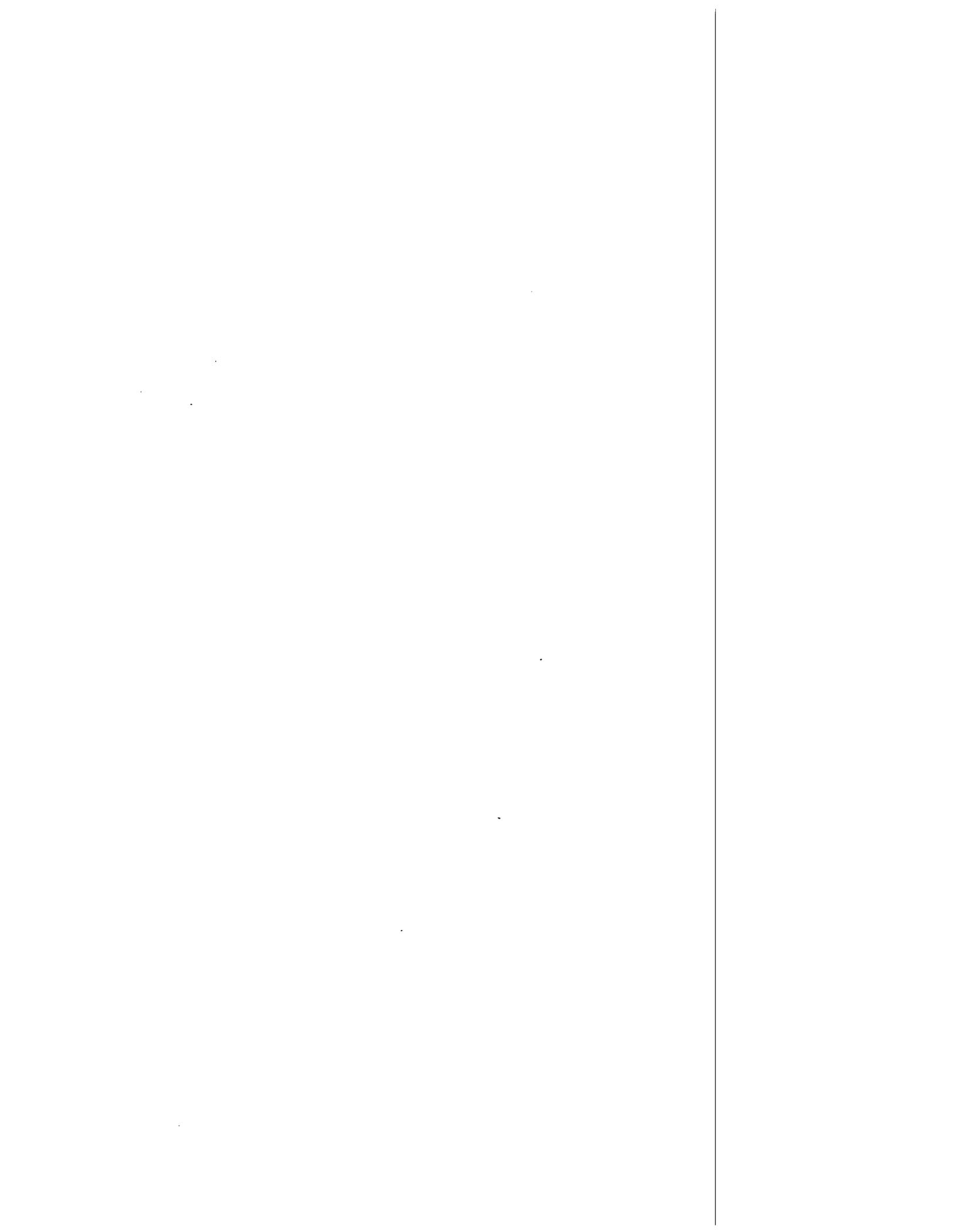
BRISTOL BAY AREA

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April, 1985



MEMORANDUM

State of Alaska

TO: Report Recipients

DATE: April 25, 1985

FILE NO:

TELEPHONE NO: 842-5227

FROM: Michael L. Nelson *MAN*
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SUBJECT: 1984 Bristol Bay Annual
Management Report

The attached report represents our continuing and most recent efforts to update and upgrade fishery statistics useful in describing the Bristol Bay salmon and herring fisheries.

Many of the new data tables first included in 1975 have been continued, and the major reorganization of fishery statistics which began in 1981, has been continued with this edition of the Bristol Bay annual management report. I believe this new revised edition will be most useful in explaining and describing management rationale, as well as a better source for compiled catch, escapement and production information on all species of fish harvested in Bristol Bay.

This report is not intended for the general public and is for Inter-Departmental Use Only. It will be distributed only within Department circles with certain exceptions. Please route needed corrections or comments to me here in Dillingham.

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PREFACE

The 1984 Bristol Bay Management Report is the twenty-fifth consecutive annual volume reporting on and detailing management activities of the Division of Commercial Fisheries staff in Bristol Bay. This review emphasizes a descriptive account of the administration of the Bristol Bay commercial fishery resources, as well as outlining management objectives and procedures. Our basic objective in producing this document is to assist in creating a better understanding of the commercial fisheries management program in Bristol Bay.

Extensive reorganization of the documentation in this review, which was begun in 1975, represents our continued efforts to update and evaluate all information deemed necessary to fully explain the rationale behind management decisions formulated in 1984. The extensive set of tables and appendix tables represent our efforts to update past information and to record material previously unlisted that may be useful and informative. All narrative and data tabulations in this volume are combined under separate SALMON and HERRING sections to aid in the use of this document as a reference source.

Fishery data contained in this report supersedes information in previous reports. All 1983-84 catch data are preliminary pending receipt of final computer listings from fish ticket catches.

Data tabulation has been divided between current year TABLES (1984) and comparative APPENDIX TABLES (1965-84) in an effort to increase the ease with which this report may be used for reference purposes. Data reference sources on all appendix tables are numbered to correspond with document numbers in the Literature Cited section. Appendix tables generally include data over a 20-year time span (1965-84), except where information is not available. This report is considered to be "FOR INTER-DEPARTMENTAL USE ONLY".

Corrections or comments on the contents of this report should be directed to the area office at Dillingham, Attention: Editor.

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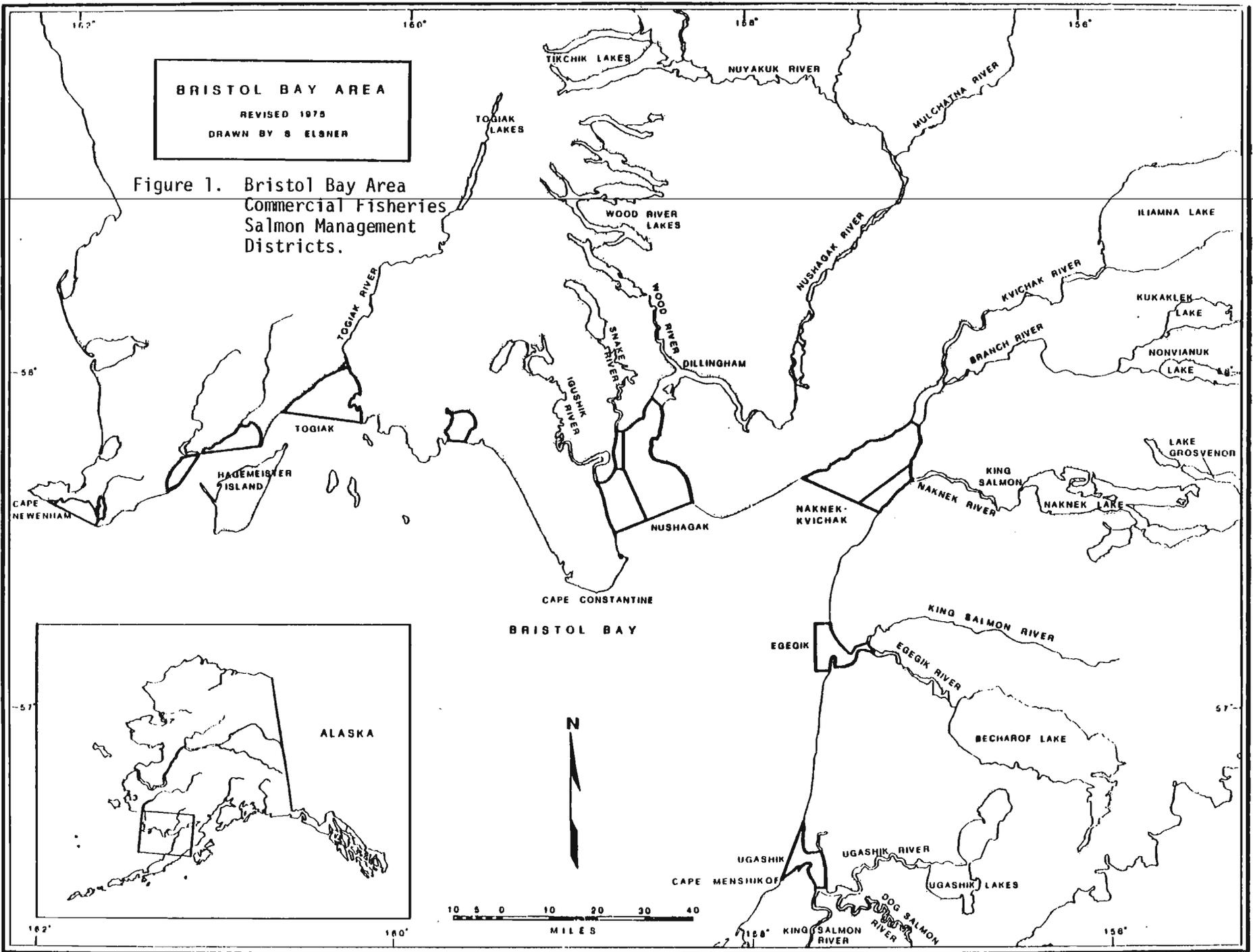


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ANNUAL MANAGEMENT REPORT
BRISTOL BAY SALMON FISHERY
1984

INTRODUCTION

The Bristol Bay area, which includes all coastal waters and inland drainages east of a line from Cape Newenham to Cape Menshikof, is the largest sockeye salmon producing region in the world (Figure 1). In addition to substantial returns of other salmon species, the Togiak herring fishery has developed into the State's largest sac roe fishery.

The area wide salmon catch during the 1984 season amounted to 30.6 million fish of all species, the second largest catch on record, and was equal to 168 million pounds valued at over \$106 million to participating fishermen. Sockeye salmon dominated the commercial catch, accounting for 24.7 million, the fourth largest catch on record. The Bristol Bay catch in 1984 accounted for 23% of the Statewide commercial catch, and helped to make 1984 the largest Alaska salmon catch since records were first maintained in the late 1800's.

The management objective for all districts in Bristol Bay is the achievement of escapement goals for major salmon species while at the same time allowing for the orderly harvest of all fish surplus to spawning requirements. Escapement objectives were met in 1984 in all river systems, except Togiak River, where spawning requirements have been defined.

Runs of all species, except king salmon, equaled or exceeded preseason expectations and were highlighted by the second consecutive large off-peak year sockeye return of 41.1 million fish. The total sockeye return in 1984 was the fourth largest ever recorded for Bristol Bay, with only peak year total returns in 1965 (53.1 million) and 1980 (62.5 million) and last years off-peak return of 45.8 million exhibiting larger runs.

FISHERY RUN STRENGTH INDICATORS

A total of 31.1 million sockeye salmon were forecast to return to Bristol Bay in 1984 (Table 1). A run of this magnitude would exceed that of the comparable cycle year average return of 20.1 million fish, and a potential harvestable surplus of 16.3 million sockeye would be considerably above the comparable cycle year average harvest of 8.8 million and similar to the peak year average harvest of 18.4 million.

Several independent forecasts for the 1984 return of sockeye salmon to Bristol Bay were available, and ranged from 11.2 to 53.4 million fish (Appendix B). A synopsis of key areas to watch as the run developed inseason in 1984 is provided in Appendix B, Table 3. A departure from the forecasted age composition would be a clear indication of forecast error, and careful monitoring of the early age composition should provide suitable warning of other than anticipated run strength.

Japanese High Seas Fishery

Since 1974 the Japanese high seas mothership gill net fishery has seen a decreased high seas exploitation rate of Bristol Bay sockeye, brought on by bilateral negotiations between Japan and the United States and through renegotiation of the INPFC treaty. The mothership fleet was restricted again in 1984 by area and time restraints, which drastically altered past fishing patterns, and significantly reduced the interception rate of Bristol Bay sockeye.

Total Japanese high seas harvest by the mothership fleet from the 1984 Bristol Bay sockeye run included 240,000 fish caught as immatures in 1983, and 51,000 fish harvested as matures in 1984, or 291,000 fish and 1% of the total Bay run (Appendix Tables 4 and 5). This level of interception is well

The South Unimak quota was 1.1 million sockeye and the Shumagin quota was 245,000 (Appendix Table 54). The June quotas were further broken down into weekly time period quotas so that the catch would be spread out over the entire month. The actual catches were 1.1 million and 257,000 for the South Unimak and Shumagin Islands fisheries, respectively (Appendix Table 54).

Both Shumagin and South Unimak fishing success is highly dependent on weather conditions, which in turn affect migratory patterns of fish as they pass these cape fishery areas. Southerly winds tend to set fish onshore, and high fishing success from moderate sized runs can be obtained if these conditions persist.

The 1984 South Unimak and Shumagin Islands June fisheries were very brief. Only 104 hours were allowed at South Unimak while the Shumagin Islands received 128 hours, and only 56 hours were allowed during the peak of the run in each fishery. The South Unimak catch quota was essentially taken in only two fishing periods on June 12-13 (593,000) and June 19 (464,000). The brief amount of time required to harvest the guideline harvest levels was due to: (1) a large abundance of sockeye moving along the South Peninsula, (2) a very high gear level, and (3) good fishing weather. The gear level in both South Unimak and Shumagin Islands combined was approximately 100 purse seiners, 138 driftnetters, and 8 set gillnetters who fished either of these fisheries on a regular basis. The large build up of purse seine gear has greatly changed the South Unimak and Shumagin Islands fisheries. With the historical amount of gear, liberal fishing time would have been anticipated during the past two seasons. However, daily catch rates are now so high that very little fishing time can be allowed even with a large quota.

A total of 109,000 and 228,000 chums were harvested incidentally to sockeye in the Shumagin Islands and South Unimak fisheries respectively. This is a considerable decrease over the previous four years and was due basically to the brief amount of fishing time needed to reach the sockeye guideline harvest levels (Appendix Table 54).

In the Shumagins, purse seiners accounted for 95% of the sockeye and virtually all of the chum catch. Set gill nets are the only other legal gear in the Shumagins. At South Unimak purse seiners caught 63% of the sockeye and 60% of the chums, while drift gillnetters accounted for 36% of the sockeye and 40% of the chum catch. Set gillnetters took 1% of the sockeye catch and a negligible number of chums.

Age composition samples from the commercial catch in both areas revealed conflicting results when compared to age compositions from the preseason standard and composite ADFG forecasts, sampling at Port Moller, and the actual inshore age composition structure in Bristol Bay:

Category	Sample Size	Age Class in Percent					
		4(2)	5(3)	2-Oc	5(2)	6(3)	3-Oc
<u>ADFG Forecast</u>							
Standard	-	25	30	55	33	12	45
Composite	-	27	33	60	30	10	40
<u>South Peninsula Catch</u>							
Gill Net	302	13	56	69	19	10	29
Purse Seine	1,826	25	56	81	12	7	19
<u>Port Moller Test Catch</u>	1,002	10	40	50	27	22	49
<u>Bristol Bay</u>							
Catch	9,617	11	53	64	22	13	25
Escapement	(14,000 Est)	21	55	76	16	6	24
Total Run	(23,617 Est)	15	54	69	20	10	30

As in 1983, the large early season sockeye catches and lengthy closed periods required to remain within the weekly guideline harvest quotas, made it difficult to judge continuing run strength and timing of the run as it approached Bristol Bay. The short fishing schedules in both fisheries also inhibited our ability to analyze age composition of the incoming run. Of more

inhibited our ability to analyze age composition of the incoming run. Of more immediate concern was the possibility that the short intense fishing schedules might impact one particular Bristol Bay run segment or river system, and in fact, age composition samples from the South Unimak purse seine fishery suggests that age 4(2) sockeye were harvested at a higher proportion (25%) than the actual inshore Bay harvest (11%) and the total run (15%).

If South Unimak age composition data is to be useful in describing the incoming Bristol Bay sockeye age structure, sampling will have to occur over the entire population as it passes South Unimak. A well designed purse seine sampling test fishing program conducted during closed periods may be a cost effective and efficient method to obtain, not only age-weight-length data, but may also lead to a better understanding of run magnitude and timing.

Port Moller Test Fishing Project

The Department's Port Moller test boat provides information on sockeye and chum salmon run timing and magnitude and age and size composition of the incoming run one week in advance of the inshore fishery.

Port Moller test fishing information produced conflicting estimates of both sockeye salmon run timing and size this season. Average lengths and weights of sockeye caught indicated that the run would probably not exceed preseason expectations. However, estimated travel time of sockeye between the Port Moller transect and inshore fishing districts was difficult to determine, and this made run size difficult to estimate. Warmer than average water temperatures indicated that travel time would be seven days or less and, therefore, that the run would be less than or equal to the preseason forecast estimate. However, comparison of accumulative abundance curves from Port Moller and inshore districts suggested that travel time was at least 8 to 10 days and, therefore, the run would be greater than the preseason forecast estimate. By July 5, the

last day of the Port Moller sampling program, daily test fishing catches had fallen to less than 1% of the total season catch. Examination of the accumulative catch indicated that half of the total sockeye run had passed the Port Moller transect by June 24, 2 to 3 days earlier than the average midpoint date of June 26 to 27. This information, along with warm water temperatures and early attainment of South Unimak/Shumagin Islands catch quotas, supported the theory that run timing was earlier than normal and that run size would be less than or equal to the preseason forecast estimate.

Continuous age composition sampling from the initiation of sampling at Port Moller on June 12, indicated that age 4(2) sockeye were running less than 10% compared to the forecast of 27% (Table 2). This possibility was pointed out in the preseason forecast analysis as one of the major age classes that might deviate significantly from the forecast (Appendix B). With this knowledge those systems with high proportions of 4(2) sockeye in the forecast, primarily Kvichak and Wood River, were watched carefully as the run developed. The ability to accurately predict the age composition of the inshore sockeye return early in the season has continued potential for inseason evaluation of the forecast, and helps to point out where forecast run magnitude may be in error.

In 1984, 198 chum salmon were caught during sampling at Port Moller, generating only 112 total index points including values interpolated for missed fishing time (Table 7). The season chum forecast based upon the historic mean of 11,600 inshore fish per index point (1968-83, excluding 1979) was 1.3 million, only 54% of the actual run of 2.4 million (Appendix Table 7). No catchability adjustments have been used to describe any variability about the historic mean return per index value because of the relative stability in Bristol Bay chum salmon weight and length. The failure of the Port Moller project, for the second consecutive year, to adequately identify chum salmon run strength is not understood, but net avoidance and general migration tendencies of chums to run deep may offer some explanation.

below the recent 10 year (1975-84) average of 634,000, and only one-sixth of the interception rate prior to reduced fishing by the mothership fleet (Appendix Table 5). In addition, the continuing relatively low level of sockeye catches first established in 1979, by the Japanese land-based gill net fleet was also due to the renegotiation of the INPFC treaty (Appendix Table 3).

The Fisheries Agency of Japan also provided catch per unit of effort (CPUE) data from their high seas research vessels on immature sockeye salmon in waters south of the Aleutian Islands from which a comparative forecast of Bristol Bay run size was made. These forecasts totaled 11.2 and 14.4 million, compared to the standard ADF&G forecast of 41.5 million (Appendix B, Table 1). The high seas forecasts were much lower than either the standard ADF&G or the final pooled forecast of 31.1 million. The high seas forecasts were dominated by 3-ocean returns, and even more disturbing was the lack of 2-ocean sockeye, which were expected to contribute over 1/2 of the return in 1984 (Appendix B, Table 2). Japanese high seas research vessels sampled a little further offshore (south) than they normally fish in 1983, and based on historical sampling, the 1-ocean immature fish might have been under represented in the catches. If this were the case then the 2-ocean return of the ADF&G data-based forecasts would be more indicative of the return (Appendix B, Table 2). Japanese and Russian fishing vessels also reported that ocean temperatures were 5 degrees below normal, and lowered temperatures have depressed sockeye returns in the past. The distribution of immature sockeye may have changed in response to these temperature anomalies, in which case the CPUE reported by the Japanese may not have been indicative of actual abundance. The actual sockeye salmon total return of 28.4 million 2-ocean fish was almost 10 million more than the forecast, while the 3-ocean return of 12.2 million fish was within 1% of the forecast (Tables 2 and 3).

Of particular concern to inshore domestic fishery managers in 1980 was the drastic increase seen in the interception of king salmon by the high seas mothership fleet. From 1965-79 the average king harvest was only 239,000 fish, but this interception rate increased three-fold in 1980 to 704,000 kings, the highest since the inception of the mothership fishery in 1952. Over 54% of the total king harvest in 1980 (or 380,000) were estimated to be of Western Alaska origin (Appendix Table 6). In response to concerns by the U. S., Japan voluntarily agreed to limit king salmon harvests by the mothership fishery by agreeing to self-regulatory measures for a three year period (1981-83), which restricts the king harvest to 110,000 fish per year during this time. Actual mothership king harvests during this period were 88,000, 107,000 and 87,000, respectively (Appendix Table 6).

After data presented to the U. S. in March of 1983 by scientists of the Japanese Fishery Agency, indicating a sharp increase in king salmon abundance in the area east of 180 degrees longitude from late June to early July, the U. S. again requested the Government of Japan to voluntarily restrict the Japanese mothership fishery to open areas of the Bering Sea west of 180 degrees longitude after late June. In addition to "better verification" of high seas salmon catches, the Japanese Government agreed to a new, slightly reduced three year voluntary catch limit of 100,000 king salmon per year, with no more than 30,000 kings from the central Bering Sea area.

South Unimak/Shumagin Fishery

The inseason development of the Unimak/Shumagin June cape intercept sockeye fishery is closely monitored by Bristol Bay fishery managers because this fishery can be helpful in showing migration timing, relative abundance, age composition and fish size of the incoming Bristol Bay run. These intercept fisheries were again managed under a guideline quota harvest policy originally adopted in 1974 by the Alaska Board of Fisheries to prevent over harvest of sockeye runs to individual river systems in Bristol Bay.

FISHERY HARVEST POTENTIAL

Commercial fishing effort in 1984 was expected to be near peak record levels of recent years in recognition of the large forecast sockeye return. Over 2,700 units of gill net gear registered, although not all of this effort actually participated in the fishery (Appendix Table 9). Estimate of peak fishing effort on July 1-5 showed that actual drift effort was approximately 98% of that registered, and set net effort was 91% of available registered gear. In 1983, approximately 96% of preseason registered effort participated at one time in the fishery, and participation in 1984 was equal or higher (Appendix Table 9).

Other than sockeye and Nushagak pink salmon, formal total run forecasts for other salmon species returning to Bristol Bay are not generally published because good escapement data are limited for these species. However, catch projections are put together based on relative estimates of parental run size, average age composition data, and recent relative productivity patterns. Catch potential and actual harvests for all species in 1984 were as follows:

<u>Species</u>	<u>Harvest in 1,000's of Fish</u>	
	<u>Potential</u>	<u>Actual</u>
Sockeye	16,331	24,684
King	200	102
Chum	1,000	1,839
Pink	1,000	3,389
Coho	200	580
Total	18,731	30,594

The catch of all species of salmon was 30.6 million, second only to the previous record of 39.1 million in 1983 (Appendix Table 15). The total run of sockeye to Bristol Bay was 41.1 million, and this unexpected return was mostly due to large runs to the Kvichak (22.8 million), Egegik (6.5 million) and Ugashik (3.9 million) River systems (Table 4). The catch of chum, pink and coho salmon were record or near record catches, whereas the catch of king salmon was down from the recent high catches.

The salmon canning industry made all of the Bay's available canning lines operational, which numbered 17 1-lb. talls, 18 1/2-lb. flats, and 3 1/4-lb. flats in 11 plants (Table 37). In addition to the land-based canning operations, 48 companies operated in the Bristol Bay area in 1984 in the fresh export, brine or refrigerated sea water (RSW) export, frozen and cured salmon marketing areas (Table 37). A total of 59 processors/buyers reported catches in Bristol Bay in 1984 compared with 62 in 1983 and 72 in 1982.

Even though 1984 saw high daily salmon catches no harvest was lost due to processor limits or suspensions. Post season analysis showed that daily sustained processing production in 1984 amounted to 1.2 million fish for 19 days from June 27 through July 15, compared with 2.1 million fish in 1983, 1.2 million in 1982 and 1.6 million in 1981.

FISHERY ECONOMICS AND MARKET PRODUCTION

Unlike previous seasons, when price disputes delayed or tied up virtually the entire fishery until an agreement was reached, one major fishermen's group, the Alaska Independent Fishermen's Marketing Association (AIFMA), concluded a three-year (1983-85) price agreement with processors which ties the final price to the value of the product for the preceeding year. The other major fishermen's association, Western Alaska Cooperative Marketing Association (WACMA), concluded price agreements in May of 1984, and as a result, the early spring of 1984 was devoid of a "price war" for the second straight year.

Final fish prices in 1984 have yet to be determined, however, AIFMA association began with a base price of \$.58 per pound for sockeye, \$.25 for chums and \$.50 for kings, and tied the final price to the value of the product from August, 1984 through March 15, 1985 (Appendix Table 45:). The other major association (WACMA) agreed upon a final price of \$.665 for sockeye and coho, and \$.32 for chums (Appendix Table 45). Exvessel value (or value to the fishermen) of the 1984 Bristol Bay salmon fishery harvest, as established from Department records, was \$106.1 million (Table 41).

The increasing trend of salmon production in the frozen/cured processing category continued in 1984. Frozen salmon production in Bristol Bay totaled 74.7 million pounds of all species in 1984, down significantly from 1983 (109.0 million pounds), but well above 1979-82 when 42.9, 38.3, 54.7 and 68.0 million pounds were processed in this manner (Table 38 and Appendix Table 49). The heavy daily sockeye production in 1984 resulted in a dramatic increase of canned production over previous years; however, the shift in emphasis from canning to frozen and fresh markets declined slightly and is shown below by comparing the percent of total Bristol Bay production of all species by product types since 1978:

Type of Production	Percent of Total Production						
	1978	1979	1980	1981	1982	1983	1984
Canned	63	36	34	38	15	21	38
Frozen/Cured	12	32	27	36	61	53	47
Fresh Export	9	18	18	13	21	14	6
Brine/RSW Export	16	14	21	13	3	12	9

1984 COMMERCIAL SALMON FISHERY

All five species of Pacific salmon are found in Bristol Bay and are the focus of commercial, subsistence and sport fisheries. The sockeye salmon run is the most significant, but there are also important runs of king, chum, coho, and in even-years, pink salmon. Numerically, based on 20 year data (1965-84), the average annual commercial catches are as follows: 12.8 million sockeye salmon; 125,000 kings; 862,000 chums; 148,000 cohos; and 2.0 million even-year pink salmon (Appendix Tables 10-14). Subsistence catches average approximately 150,000 salmon per year, mostly sockeye, while sport fisheries operate to varying degrees of intensity on all species of salmon, with most effort directed toward king and coho salmon stocks.

Sockeye Salmon

The sockeye salmon run progressed evenly and pretty much on schedule through the South Unimak/Shumagin cape fisheries and past the Department's test fishing site at Port Moller. Preseason run timing based on: (1) Adak-Cold Bay air temperatures indicated a July 3-4 peak for Naknek-Kvichak and July 5 for Nushagak district; (2) South Unimak/Shumagin sockeye catches indicated that peak catches would occur between June 26 and July 3 based on the 13-day lag time between South Unimak and Bristol Bay; while (3) the Department Port Moller test boat basically suggested a nearly normal run timing. Actual run timing in the Naknek-Kvichak and Nushagak districts peaked on July 5. In addition to run timing information, the Port Moller test fish program gives indications of run size (magnitude) and age composition of the sockeye run one week in advance of the inshore Bristol Bay fishery. Sampling of the sockeye run as it passed Port Moller showed that age 4(2) sockeye were running well under that expected, while run magnitude was estimated at 28 to 32 million, or within 3 to 10% of the preseason forecast.

By the second week of July daily catch and escapement levels had still not declined, and it became apparent that run timing was, in fact, later than expected, and that total run size would be greater than forecast, at least for the east side districts. Total sockeye salmon return to Bristol Bay was 41.1 million, about 10.0 million more than the preseason forecast (Table 1). Sockeye returns to all three east side districts, Naknek-Kvichak, Egegik and Ugashik, were about 30 to 100% above preseason expectations, while returns to both west side districts, Nushagak and Togiak, were about 25% below expectations. The less than expected return of sockeye to west side districts was primarily due to the low returns of the 4(2) age class from the record 1980 spawning escapement. Failure of within season forecasting methods to indicate that returns to these districts would be below preseason expectations made it difficult to meet spawning goal requirements.

Actual returns of sockeye compared to forecasted returns in 1984 are presented by river system below:

River System	In Millions of Fish		
	Forecasted Return	Actual Return	Percent Error
Kvichak	16.7	22.8	36%
Naknek	3.0	2.9	4%
Egegik	3.5	6.5	83%
Ugashik	1.9	3.9	105%
Wood	2.7	2.2	18%
Igushik	0.8	0.4	48%
Nuyakuk	1.6	1.0	35%
Togiak	0.5	0.3	26%
Total	31.1	41.1	32%

Sockeye escapement preseason goals were obtained or closely met in all major manageable systems except Togiak River, where the escapement was 95,000, or 63% of the preseason goal (Table 1). The exceptional return to Kvichak River was due to continued good survival of the 1979 brood year escapement of 11.2 million (Table 3). There appears to be a cycle shift in the Kvichak due to the large prepeak escapement in 1979, as well as good lacustrine growing conditions that contributed to a much higher fraction of 2-year old smolts than are normally produced from large escapements to this system.

The total Bay sockeye run in 1984 was 32% above forecast, compared with the 20 year average forecast error of 45% (Appendix Table 1).

King Salmon

Over 101,000 king salmon were commercially harvested in 1984, and the total harvest was slightly under the past 20 year average of 125,000 (Appendix Table 11). The Nushagak district, which normally accounts for over 70% of the Bristol Bay total return, produced a catch of 61,000 and escapement of 81,000 while Togiak district contributed a catch of 22,000 and escapement of 26,000 (Appendix Table 39).

Although total escapement estimates are not available for the smaller king salmon producing districts in the Bay, it is reasonable to assume that total runs have averaged well over 300,000 kings in recent years (1976-84) throughout Bristol Bay. In 1984 approximately 250,000 kings returned to all river systems (catch and estimated escapement combined), and the outlook for the next several years is promising due to good brood escapements in recent years.

Chum Salmon

The chum salmon harvest in Bristol Bay was 1.8 million and was the largest harvest in the history of the fishery. All time record catches were established in four of Bristol Bay's five districts: Naknek-Kvichak - 426,000, previous best was 387,000 in 1939; Egegik - 183,000, previous best was 127,000 in 1983; Ugashik - 211,000, previous best was 105,000 in 1983; and Togiak - 339,000, previous high was 323,000 in 1983 (Appendix Table 12). Nushagak district produced an above average harvest of 680,000 chums.

Escapements were strong in all districts where chum escapement surveys are conducted: Naknek-Kvichak - minimum of 100,000

Egegik - minimum of 26,000
Ugashik - minimum of 169,000
Nushagak - 362,000
Togiak - 204,000

Pink Salmon

The pink salmon return in 1984 was exceptionally strong, especially in Nushagak district, where the total run exceeded 6.0 million fish, second in size only to the large run of 13.7 million in 1978 (Appendix Table 41).

Preseason expectations for the Nushagak district were for a pink salmon harvest of over 700,000 after escapement requirements were met. The actual return to Nushagak amounted to 6.1 million fish, with 3.2 million in the commercial harvest and an escapement of 2.9 million (Appendix Table 41).

Both Naknek-Kvichak and Togiak districts showed strong returns as well, and escapement requirements were achieved or exceeded in all river systems where escapement objectives have been identified.

Coho Salmon

The commercial coho harvest for all districts of 580,000 fish combined was the second largest in the history of the fishery, with the record catch of 620,000 occurring in 1982. The Nushagak and Togiak districts accounted for over 76% of the area wide harvest and was highlighted by a catch of 171,000 fish in the Togiak district which broke the previous record of 151,000 reported in 1980. Coho catches at Egegik (66,000) and Ugashik districts (69,000) were also record or near record catches (Appendix Table 14).

A sharp increase in coho harvests in recent years has been attributed to greater late season fishing effort and processing capacity; however, the run of this species was strong in all systems this season and escapements throughout the area also appeared to be large. Extensive inseason closures in both Nushagak and Togiak districts were required this year to obtain escapement needs.

Aerial escapement surveys were initiated for the first time at Togiak in 1980 in recognition of the increased late season fishing pressure. Aerial survey indices and weir enumeration counts indicate a total district coho escapement of 104,000. Escapement goals in the two major river systems, Togiak and Kulukak, were set at 50,000 and 15,000, respectively. Actual escapements into these systems were: Togiak - 61,000 and Kulukak - 32,000.

At Nushagak, where sonar gear was used to enumerate salmon into the Nushagak River, over 171,000 coho had escaped the fishery through August 26. The Nushagak district coho escapement of 171,000 and commercial harvest of 272,000 provided a total run of 443,000 fish. The escapement goal to this large river system is 150,000.

Total escapement estimates are not available from the east side systems but minimal aerial surveying indicates adequate escapements.

1984 DISTRICT INSEASON SALMON MANAGEMENT SUMMARIES

Naknek-Kvichak District

The 1984 forecast to the Naknek-Kvichak district was for a harvest of 8.8 million out of a total run of just under 20 million (Table 1). Escapement goals were revised for both Kvichak River (10.0 million) and Naknek River (1.0 million) after a mid-winter workshop/meeting concerning escapement requirements throughout Bristol Bay (Appendix C). The forecasted age composition for the district was dominated by 2-ocean fish (72%) (Table 2).

The actual run to the district was over 26.1 million sockeye consisting of a harvest of 14.2 million and an escapement of 11.9 million (Table 4). Although the actual 2-ocean age composition of the run was close to that forecast, the Kvichak River was predominantly 5(3) year olds (75%), while the Naknek River was much higher in both 2-ocean age classes (Tables 2 and 3).

Preseason management strategy called for a conservative approach to fishing periods because of the increased escapement goals to both rivers. The South Unimak and Shumagin fisheries were both very strong with weekly quotas being obtained in one or two days fishing. The Port Moller offshore test boat began fishing on June 12, and catches were moderate until June 17 when they rose dramatically. Catches remained strong through June 20 and an estimated

5.3 million fish had passed the project site as of that date (Table 5). The Kvichak River inside test fish program began on June 20 but no catches were made until June 23 (Table 29). Escapements past Naknek and Kvichak River towers through June 22 were 10,000 and less than 1,000, respectively (Table 24), while the commercial catch through June 22 was over 383,000 (Table 12). Very few fish were entering the rivers, but apparently were milling in and out of the district. The fishery was subsequently allowed to close at 9:00 a.m., June 23, to improve the escapement trend.

The Kvichak River inside test catch on June 23 provided an index of 19, with the fish averaging just over 4 pounds. The total commercial catch up to the closure on June 23 was 480,000 (Table 12). The estimated passage past the Port Moller test site through June 23 was 4.6 million, with the fish averaging just under 5.9 pounds and consisting primarily of 5 year old fish (5(3) and 5(2) with the 4(2) age class much under forecast. Escapement trends past the Kvichak and Naknek towers were still low.

Good catches were made on the morning tide of June 24 by the inside Kvichak test boat (Table 29). The age composition of this catch suggested a smaller than forecast age 4(2) run or a larger than forecast age 5(3) run. Port Moller catches remained strong and an estimated 5.3 million sockeye had passed the area through June 24. Meanwhile, the tower counts had begun to increase with counts through June 24 of 1,000 past Kvichak and 18,000 past Naknek.

Port Moller test fish catches remained strong on June 25 and passage was estimated at 12.7 million through that date. Indications from Port Moller and the South Unimak fishery indicated a total run near or above forecast; however, fish were still not moving into the rivers as evidenced by decreased inside test fish catches on June 25 and a continuing low passage past the counting towers (Tables 24 and 29).

The largest catch of the season was made by the Port Moller test boat on June 26. The index of 118 was generated from a catch of 235 sockeye, and led to an estimate through June 26 of 19.6 million sockeye past Port Moller (Table 5). Sockeye escapement estimates through June 26 were 305,000 past the Kvichak inside test fish site, 86,000 past Kvichak tower and 46,000 past Naknek tower.

The first indication that sockeye were beginning to ascend the rivers came on the late night tide on June 27. Kvichak inside test indices were six times higher than the previous days (Table 29), and there had been many jumpers in the lower Naknek River and near Graveyard. Port Moller test catches dropped on June 27 and the estimate through that date was back down to 13.7 million. It was felt that because of the holding pattern of the fish, an accurate lag time to the Bay was difficult to determine at this time. Escapements past the counting towers through June 27 were 121,000 on the Kvichak and 68,000 on the Naknek, with an estimate past the Kvichak inside test fish site through June 27 of 629,000 (Table 29).

Aerial surveys on June 28 showed 797,000 sockeye in the Kvichak River, while Naknek River showed large numbers of fish along both banks. The Naknek River daily escapement count through 3:00 p.m. was 94,000, nearly two days ahead of the long-term average. A 12 hour fishing period for the Naknek section only was announced to begin at 11:00 a.m. on June 29 (Table 11). Sockeye escapements through June 28 were 133,000 past Kvichak tower and 200,000 past Naknek.

A survey of the fishery on June 29 showed that catches were fair and good numbers of fish were being caught near the beach. An aerial estimate of Kvichak River on the same day indicated 1.7 million sockeye were in the river, and coupled with the tower escapement through 3:00 p.m. of 400,000, gave a total escapement estimate of 2.1 million, 21% of the goal (Table 29). The age class composition of the Kvichak sockeye run was showing a large percentage of 5(3) fish from the 1979 escapement of over 11 million. A 12 hour extension of fishing time for the Naknek section was announced to run consecutively with a 12 hour opening of the Kvichak section (Table 11).

Through June 29 Port Moller test fish was estimating an accumulative passage rate of 21.8 million. Kvichak inside test was estimating 2.3 million sockeye escapement while tower counts stood at 804,000 past Kvichak and 351,000 past Naknek. The fishery was allowed to close on schedule, and the estimated catch during the preceding 24 hours of fishing was just over 1.0 million fish (Table 12).

The Naknek River escapement had reached 390,000 by 2:00 p.m., June 30, which was 39% of the goal and over three days ahead of the long-term average. An aerial survey of the Kvichak River on June 30 produced an estimate of 1.4 million while the tower count through 2:00 p.m. was 1.5 million (Table 29). A 12 hour Naknek section only opening was announced to begin at 1:00 p.m. on July 1 (Table 11).

The estimated sockeye passage at Port Moller through June 30 had now reached 23.5 million fish with good catches still being made on July 1 (Table 5). An aerial survey of Kvichak River on July 1 indicated 1.2 million fish were present, and combined with a tower count through 2:00 p.m. gave a total escapement of 3.5 million, 35% of the escapement goal (Table 29). A survey of the fishing district showed stronger catches than last period although the beaches were lighter. Large catches were being made around Libbyville, which may have been Kvichak fish being intercepted as they moved through the upper Naknek section. Another 12 hour extension in the Naknek section coupled with a 12 hour period in the Kvichak section was announced for July 2 (Table 11).

Kvichak inside test fish indices began to drop on July 2, and the district was allowed to close on schedule at 1:00 p.m. on July 2. The Kvichak escapement through July 2 was 3.1 million while the Naknek escapement stood at 494,000. It was noted that the sex ratio past Naknek tower was heavily skewed in favor of males (70%), which would require close monitoring as the run progressed.

Fishery run strength indicators improved on July 3 as Kvichak inside test fish indices increased to over 5,000 index points and produced an estimated escapement of 5.4 million, and there were large numbers of jumpers near the mouth of the Naknek River and off Libbyville. The commercial catch during the last 24 hour period was 1.7 million bringing the accumulative sockeye catch to 3.2 million (Table 12). Escapements past Kvichak and Naknek towers through 6:00 a.m. on July 4 were 3.8 million and 602,000, respectively, and both systems were 2 to 3 days ahead of the long-term average escapement for this date (Table 24). Sockeye from the large catches at Port Moller on June 26 should be arriving in the Bay at this time, and a 12 hour opening for the entire district was announced to start at 4:00 p.m., July 4 (Table 11).

A district survey on July 4 showed strong catches on the west side beaches but very little drift effort in the vicinity. Most of the fleet was on the east side of the district from Naknek River to Graveyard and they were doing very well, while vessels south of the Naknek River were doing fair. An aerial survey of the Kvichak River produced an estimate of 1.7 million sockeye and a total escapement of 5.8 million through 6:00 p.m., July 4 (Table 29). Kvichak inside test fish was forecasting an escapement of 5.4 million through July 3, with fair catches still occurring on July 4, while the Naknek escapement was 774,000 through 6:00 p.m., July 4. Based on the promising catch and escapement trends, fishing time was extended in the entire district an additional 12 hours (Table 11).

Kvichak inside test fishing indices again dropped on July 4 and the estimated escapement past the site was now 6.5 million (Table 29). Tower counts through July 4 were 4.3 million past Kvichak (43% of the goal) and 817,000 past Naknek (82% of the goal). The commercial harvest for July 4 was estimated to be 774,000, and a 12 hour extension was announced for the Naknek section only, however, by 9:00 p.m., July 5, the Naknek River escapement had reached 951,000 and another 12 hour extension was announced for that section only (Table 11).

The fishery was allowed to close at 4:00 p.m., July 6 to allow additional escapement into the Naknek River to help balance the sex ratio of the escapement and to protect Kvichak fish from being intercepted in the Naknek section. Escapement estimates through July 6 included 7.7 million past the Kvichak inside test fish site, 6.0 million past Kvichak tower and 977,000 past Naknek tower. Kvichak River inside indices increased on July 6 and there were jumpers reported off Pederson Point. With the commercial catch estimated at just over 6.0 million, and continued signs of fish moving into and out of the district, another 12 hour fishing period was announced to begin at 8:00 p.m., July 7 (Table 11). By 2:00 p.m. on July 7 additional information was received which prompted an extension and revised starting time on the fishing period. The Kvichak escapement now totaled 6.5 million sockeye past the tower with an additional 1.0 - 1.2 million fish in the river, and the inside test fish indices averaged nearly 3,600 on the morning tide (Table 29). Meanwhile, Naknek River had reached the escapement goal (998,000).

The Kvichak tower count had reached 7.0 million sockeye by 10:00 a.m., July 8 while the inside test fish indices were still high. An aerial survey of the Kvichak River the morning of July 8 produced an estimate of 1.4 million (Table 29). With very little fishing effort taking place on the west side of the district, the entire area was opened to fishing for an additional 24 hours (Table 11).

The commercial catch through July 8 was nearing 8.0 million sockeye, and the escapement count past Kvichak tower through July 9 was 8.4 million with an additional 436,000 in the river, while the inside test fish indices dropped to 538 on July 9 and continued to fall the first tide on July 10 (Table 29). In order to achieve the escapement goal the entire district was allowed to close at 8:00 p.m., July 10 and reopened 26 hours later (Table 11).

The total commercial sockeye catch through the last fishing period on July 10 was now near 10.5 million (Table 12). Inside Kvichak test fish indices picked up again on the morning tide of July 11, while the Kvichak tower escapement count had reached 9.2 million, still several days ahead of the long-term average (Table 29). The Naknek escapement goal had been reached and fishing was extended an additional 12 hours (Table 11).

A district survey showed that commercial catches were high, and with a Kvichak escapement through 2:00 p.m., July 12 of 9.3 million, and with an additional 300,000 fish estimated in the river by aerial survey, a 25 hour fishing period extension was announced at 4:00 p.m., July 12 (Table 11 and 29). Commercial sockeye catches remained high and it was apparent that the escapement goal in the Kvichak River would be met, therefore, one more 24 hour extension was announced before the district was opened until the end of the emergency order period (Table 11).

The final commercial sockeye catch was 14.2 million, 62% more than forecast and the fifth year out of the last six where catches have exceeded 10 million fish. Commercial fishing effort peaked on July 8 when 950 drift units and 315 set units participated (Table 12). A total of 33 processor/buyers operated in the district, down significantly from previous years (Table 37). Production from the district was broken down as follows: 32.9 million pounds frozen and cured, 2.7 million pounds exported by air, 12.4 million pounds exported by tenders, and the remainder was canned (Tables 38 and 39). An average of 798,000 fish per day were processed between June 29 and July 14 (Table 22).

Final sockeye escapements to the district river systems were 10.5 million in the Kvichak and 1.2 at Naknek, while the Branch River escapement was estimated by aerial surveys at 215,000 (Table 4). The total sockeye run to these three systems, including preliminary catch allocations, were 22.8 million to the Kvichak River, 2.9 million to the Naknek River, and 539,000 to the Branch River (Table 4). The total district run of 26.2 million was 31% above forecast and the fifth largest run in the past 20 years.

Commercial harvests of other species in 1984 included 9,000 king salmon, 426,000 chums, 207,000 pinks, and 3,000 cohos (Table 23). The chum salmon catch was a record harvest, breaking the old record of 387,000 in 1939. Altogether, these species of salmon accounted for 4% of the entire district salmon catch. Limited aerial surveys indicate that escapements were adequate for all species in all areas surveyed.

Preliminary results of the subsistence fishery indicate a total of 119,000 salmon being harvested by 382 permit holders, which was the second highest catch in the past 20 years (Appendix Table 55). The Naknek personal use fishery harvested an estimated 555 salmon by 31 permit holders, which was both a record harvest and the largest number of participants recorded since its inception in 1982.

Egegik District

The 1984 sockeye salmon run to the Egegik district totaled 6.5 million fish, the second largest run on record for the district (Appendix Table 21). It exceeded the preseason forecast of 3.5 million fish by 3.0 million and yielded a harvest of 5.3 million fish (Table 1). This season marked the sixth consecutive year in which sockeye harvests at Egegik have exceeded 2.0 million fish, well above the long-term 87 year average catch of 1.2 million. An escapement of 1.2 million sockeye was achieved, exceeding the newly established point goal of 1.0 million by 17%, but well within the newly established range (0.8 to 1.2 million) and above the 20 year mean of 850,000 (Appendix Table 21). Total sockeye returns during comparable cycle years dating back to 1954 have ranged from 1.4 to 3.3 million with a mean of 2.0 million fish, so the 1984 cycle return ranks as the largest on record and was more than three times the long term cycle year average.

The preseason Egegik district forecast indicated the run would be fairly well distributed across all major age groups with an anticipated harvest level of approximately 2.5 million sockeye (Tables 1 and 2). Considering these factors and based on very optimistic early run strength indicators from the South Unimak/Shumagin Islands interception fisheries, a fairly liberal initial approach to district management was adopted.

As there was no price dispute between major fishermen's organizations and processors (the 1983 price agreement was for a multi-year package and was still in effect for 1984) both entities were anxious to begin operations as soon as fish arrived.

Initial commercial sockeye landings occurred in Egegik village set nets on June 1. Small catches were registered throughout early June, but increased June 18 when a majority of the local drift fleet entered the fishery (Table 13).

The Egegik drift fleet normally averages 125 boats by the June 23 onset of the "emergency order period" (1977-83 average) but totaled 340 boats on June 22 in 1984. This increase was due to three factors: (1) the Egegik district had a forecast harvest of 2.5 million fish and this run generally peaks slightly ahead of the other major districts; (2) the Kvichak district had a 10.0 million fish escapement goal and conservative early season management of the district was anticipated by fishermen so some moved to Egegik to fish while awaiting Kvichak openings; and (3) there was also a prolonged closure (June 14-22) in the Nushagak district to obtain necessary king escapement levels and approximately 120 boats moved over to Egegik rather than wait out this closure. The larger than normal Egegik fleet complicated early season management as its efficiency was unknown. Further, with it came at least a dozen "spotter" aircraft. These "spotters" directed their respective fleets to areas within the district where boats were observed making good catches and this increased the efficiency of these subscriber fleets beyond historical levels.

By the onset of the "emergency order period" on June 23, a harvest of 346,000 sockeye (14% of the preseason forecast) had been attained (Table 13). Escapement past the Egegik River counting tower totaled 20,000 fish (2% of the escapement goal). Port Moller test fish results seven days earlier (June 16) indicated an increasing rate of passage which should arrive inshore soon. Considering the need for additional early run fish in the escapement, the larger than normal fleet size, and the unknown harvest efficiency of such a fleet, the fishery was allowed to close at 9:00 a.m., June 23.

Escapement through June 25 increased to 30,000 fish with another 116,000 estimated in the river between the inside test fish site and the counting tower (Table 30). An onshore wind at 20 K was predicted for the evening of June 26 and was expected to drive fish inshore. Additionally, the Port Moller test fish indices jumped dramatically (peaked) on June 26 leading managers to believe that the run timing was right on schedule. The fishery reopened at 7:00 p.m., June 26 for 24 hours (Table 11). June 27 dawned foggy and calm. A total of 301 drift boats and 203 set nets were observed fishing at 10:00 a.m. Drift catches were excellent off Red Bluff and at the south outside Egegik line. An estimated 50,000 sockeye were observed in Egegik lagoon, and inside test fish results to date indicated 176,000 fish had entered the Egegik River (Table 30). The fishery closed at 7:00 p.m., June 27 so that catch results could be evaluated and to allow further early season fish in the escapement. The 24 hour June 26-27 fishery yielded a catch of 779,000 sockeye, bringing the season's catch total to 1.1 million (44% of the preseason goal). Normally 44% of the total catch in this district has been attained by July 3 (1966-81 average) so the accumulative catch totals indicated either that the run was early or larger than expected. Age composition data (both catch and escapement) indicated a larger than anticipated return of the 4(2) age component and a smaller than expected return of the 5(2) age fish. Questions about fleet efficiency were

pretty much settled by the massive June 26-27 catch. To this point in the history of the fishery that catch was the largest ever recorded in the district over a 24 hour period.

The fishery remained closed June 28. Numerous reports were received about a large mass of fish milling all day right off the beach at Coffee Point. Accumulative escapement past the counting tower increased to 84,000 fish and inside test fish results to date indicated 251,000 fish had entered the lower river. The fishery reopened for 24 hours at noon June 29 (Table 11).

This opening represented a significant departure from the opening strategy utilized during the past three years as it was made on a +8.1 ft. holdover low tide as opposed to the normal procedure of waiting for a minus tide or very low holdover low tide for an opening (Appendix E). There was a good deal of concern expressed by north outside beach setnetters regarding their ability to set their nets at such high water levels. An aerial survey however, at 4:30 p.m., June 29, indicated only six set nets less than normal were fishing that area. Subsequently, most setnetters responding to the question of opening times reported that this tide was their most profitable set of the season as the fish were catchable to all gear types at the opening time. The June 29-30 opening yielded another large catch of 693,000 fish bringing the season's total up to 1.8 million (73% of the preseason catch forecast). A total of 540 units of gear, the season's peak effort, participated in this June 29 opening (Table 13). Escapement past the tower through June 30 totaled 168,000 fish (17% of the point goal). Test fish indices increased substantially on June 29-30 indicating another 440,000 fish had entered the lower river. An aerial survey of the Egegik River and lagoon at 11:00 a.m., July 1, indicated 65,000 fish present in the lagoon and many jumpers in Egegik River from the Egg Island upper district boundary to a point about five miles further upstream (Table 30). With that apparent escapement level as a basis the fishery was reopened for 14 hours at 10:00 p.m., July 1, on a -1.7 ft. low tide.

The Egegik sockeye run normally peaks July 2-3. With escapement apparently progressing well (total past the tower through July 1 equalled 235,000) and lots of fish reported by spotters, fishermen, and processors throughout the entire district the fishery was extended another 12 hours until midnight, July 2 (Table 11).

A district record 349 drift boats participated in the July 1-2 opening. Combined with the setnetters they harvested 803,000 sockeye (the 782,000 catch reported on July 2 represents the largest 24 hour harvest on record for this district) (Table 13). This brought the total season's harvest up to 2.6 million fish (5% above the preseason forecast harvest level). There were numerous protests from setnetters that this minus tide opening had allowed the drift fleet to harvest most of the available fish before the setnets had enough water to fish effectively and that opening a little later (into the flood) was far preferable to them in the future when such a large fleet was present.

Escapement past the tower through July 2 totaled 320,000 fish (32% of the point goal). With the preseason harvest forecast already exceeded and escapement past the tower still far short of the point goal, the fishery remained closed on July 3. Inside test fish indices dropped substantially on July 3 (Table 30). Evaluation of escapement past the tower versus inside test fish results to date indicated inside test fish indices were forecasting higher rates of escapement than were actually occurring, often an indication that fish have been milling in the lower river rather than migrating upstream.

The June 26 Port Moller peak was expected inshore between July 3-5 so the fishery was essentially put on hold until either a large push of fish was visually obvious in the district or the inside test fish indices increased dramatically. Escapement rates past the tower dropped from July 2 to July 3 and again from July 3 to July 4, so the fishery remained closed July 4-5 (Table 30). Results of test fishing July 4, as part of the Department's mesh size study, indicated there were fish in the district but not in outstanding strength.

Reports of a large showing of fish off Red Bluff and in the outer district July 5 prompted the dispatching of John Knutsen on the M/V "Anna Paul" to test fish the outer district (5 stations) for the Department. His results (Table 8) plus later aerial observations confirmed the presence of fish throughout the outer district. However, inside test fish results remained mediocre on July 4-5 so the fishery remained closed July 6.

Inside test fish indices increased substantially on July 6 (Table 30). Escapement past the tower through 6:00 p.m., July 6, totaled 505,000 fish (51% of the point goal). The outside test fish boat again was dispatched to fish the outer Egegik district waters July 6 and reported higher indices than July 5 at both the north and south outer district markers (Table 8). A boat count indicated approximately 130 drift boats had left the Egegik district over the past three days. Large numbers of fish were still reported jumping near shore at Coffee Point, so the fishery was reopened for 13 hours at 4:00 a.m., July 7, on a +3.5 ft. holdover low tide (Table 11).

The July 7 catch of 486,000 sockeye brought the season's total catch up to 3.1 million fish (Table 13). Escapement past the tower through July 7 totaled 568,000 fish, and when inside test fish indices dropped again on July 7, the fishery remained closed July 8.

Inside test fish indices increased dramatically on July 8 (Table 30). An aerial survey of Egegik lagoon (84,000 fish) confirmed that recent inside test fish results were reflective of increased rates of upstream migration rather than milling. This survey estimate, when added to the total tower count, confirmed that at least 652,000 fish were guaranteed in the escapement with an estimated 150-200,000 still present in murky waters below the lagoon. With this in mind, the fishery was reopened for 12 hours at 6:00 a.m., July 9, on a +5.7 ft. holdover low tide.

An aerial survey at 8:00 a.m., July 9, yielded an estimate of 171,000 sockeye in Egegik lagoon, and when added to the 657,000 past the tower through July 8 yielded a visually assured escapement total of 828,000 fish, with additional fish still present downstream (Table 30). Based on this information the fishery was extended 25 hours until 7:00 p.m., July 10 (Table 11).

Escapement totals continued to increase July 9-11 with the point goal of 1.0 million sockeye attained July 11. These increased escapement rates led to daily extensions of the fishery until July 12 when the fishery was opened until further notice and the waiting period was waived for fishermen entering the district (Table 11).

Sockeye catches on July 9 and 10 exceeded 400,000 fish each day and then began dropping gradually, and by July 17 were under 100,000 sockeye per day (Table 13). Small sockeye catches continued throughout July and August with the final landing occurring September 1 (Table 13). The season's peak daily catch occurred July 2 (782,000 fish), although the peak catch per hour (37,000 sockeye/hr.) and catch per unit effort per hour (109 sockeye/unit gear/hr.) both occurred July 7. Fishermen harvested 82% of the run, the third largest exploitation rate on record in the district and well above the 34 year average of 66%.

Escapement peaked July 9 with a daily high count of 133,000 fish. Counts remained high through July 12 and then dropped off rapidly (Table 24). When they dropped to less than 1,000 fish per day (July 20) counting was terminated. A total escapement of 1.2 million sockeye was attained (Table 24).

In spite of the fact that the 1984 run was essentially bi-modal (peaks June 27-July 2 and July 6-11) escapement was successfully obtained from all segments of the run. Also an adequate sex ratio of 48% males and 52% females was present in the escapement. Age groups 4(2) (19%) and 5(3) (48%) comprised 66% of the escapement while age groups 5(2) (3%) and 6(3) (29%) contributed 32%. This age structure was just about exactly opposite the preseason prediction of the 2-ocean/3-ocean returns (Table 2).

For the second consecutive year it was evident there was a tendency on the part of the fish to mill both in the lower Egegik River and in the district rather than migrate directly through the fishery, up the river, and into the escapement. This may have been influenced by the warmer than usual water temperatures similar to those observed in 1983. Comparison of the average July 1 water temperatures at Egegik tower over the last six years indicates the 1984 temperatures were substantially warmer (mean = 53 degrees F/11.5 degrees C) than the 6 year average (48.9 F/9.3 C).

July 1 Water Temperatures, in Degrees Fahrenheit/Celsius, Egegik River, 1979-84.

Year	Maximum	Minimum	Average
1979	50.0 F/10.0 C	46.4 F/ 8.0 C	48.2 F/ 9.0 C
80	42.8 F/ 6.0 C	42.8 F/ 6.0 C	42.8 F/ 6.0 C
81	58.1 F/14.5 C	41.9 F/ 5.5 C	50.0 F/10.0 C
82	46.4 F/ 8.0 C	42.8 F/ 6.0 C	44.6 F/ 7.0 C
83	59.0 F/15.0 C	50.0 F/10.0 C	54.5 F/12.5 C
84	55.9 F/13.0 C	50.0 F/10.0 C	53.0 F/11.5 C
Mean	52.0 F/11.1 C	45.7 F/ 7.6 C	48.9 F/ 9.3 C

The milling behavior made interpretation of inside test fish results difficult as the data during periods of milling indicated higher rates of escapement than were actually occurring. It also contributed to the efficiency of the fishery as it made fish very susceptible to harvest in the milling zones within the district.

In spite of 14 days in which catches exceeded 100,000 fish, processing capacity in the district was never inundated to the point that limits on fishermen were imposed. The peak daily catches (671,000 June 27, 782,000 July 2, and 482,000 July 7) were preceded by district closures that allowed processing to catch up or the situation might have been much different.

The commercial harvest of other salmon species in the district totaled 260,000 fish, 5% of the total district harvest. A record chum harvest of 183,000 fish highlighted the non-sockeye catch components, broke the previous record of 127,000 set in 1983, and was over three times the 20 year average (Appendix Table 12). The coho harvest of 66,000 fish, was the second largest on record (behind only the 1982 harvest of 75,000) and almost five times the 20 year average (Appendix Table 14). Peak coho harvest rates occurred during the week of August 10-15 (Table 13). The king harvest of 5,000 was the sixth largest on record (Appendix Table 11), and the pink harvest of 6,000 was the eighth largest recorded (record catch was 49,000 in 1905) for the district (Appendix Table 13).

Aerial escapement surveys for the non-sockeye salmon species in the drainages of the Egegik district, while only partial in coverage, did indicate good escapements of chums (26,000+), cohos (40,000+), and pinks (4,000+) (Table 28). The king escapement, however, totaled only 1,400. Most king spawning areas were surveyed and the small escapement is a matter of concern with regard to future management of the king stocks. More early season closures (possibly prior to the emergency order period) may be necessary to adequately protect king resources.

Thirty seven processors/buyers operated in the district during 1984 (Table 37), a 6% increase over 1982, and nearly twice the buying effort that was present in the district five years ago (1980 = 19 buyers).

Overall, the season was a successful one for management as the escapement goals were met for all species (with the possible exception of kings) and record or near record level catches were made of the three principal species present in the district. There were enforcement problems in the district highlighted by line violations at the North Egegik outside line and non-conformance with 48 hour transfer regulations. There were also problems with illegal gill netting of kings in closed waters up King Salmon and Egegik Rivers. A major complaint was registered by set net fishermen throughout the district to the

effect that their catch success had been extremely low. This was confirmed by beach buyers who reported lower than normal processing levels. Set net fishermen attributed their low success rates to the increased drift effort levels in the district during the early portion of the season. The "spotter plane" fleet also generated negative comments from both drift and set net fishermen and led to some alteration of the scheduling of management related aerial surveys to avoid competition for air space with the "spotters". There were no collisions or aircraft accidents reported during the season. At least three fishing vessels capsized and one small tender (a seine boat) burned during the season but no loss of life was reported associated with these mishaps.

Ugashik District

The 1984 sockeye run to the Ugashik district totaled 3.9 million fish the third largest run on record, behind only the 1983 and 1980 runs of 4.3 million and 4.2 million fish, respectively (Appendix Table 21). It more than doubled the preseason forecast of 1.9 million fish (Table 1) and yielded the second largest harvest, 2.7 million sockeye, in the 91 year history of the fishery. The escapement attained, 1.3 million fish, exceeded the new point goal of 700,000 by 81% and marks the sixth consecutive year that at least 1.0 million sockeye have reached the spawning grounds (Appendix Table 21). Compared to similar cycle years dating back to 1954 the 1984 run ranks as the largest on record exceeding the cycle year average of 1.4 million by nearly a factor of three.

The initial management outlook for the 1984 Ugashik district run was quite optimistic based on several factors including the very large sockeye returns to the district over the preceding five years, the large escapements obtained each of the past five years, and a forecast 1984 harvest of 1.2 million sockeye.

The preseason forecast predicted the bulk of the 1984 run would be five year old fish returning from the 1979 escapement, which had produced excellent age group 4(2) returns in 1983. There was some doubt about the forecasted level of age group 4(2) returns in 1984 (progeny from the 1980 escapement) with the possibility expressed that the return of these fish might exceed the 229,000 forecasted, and if so, the total run could be much greater than anticipated (Table 2). This percentage of 4(2's) was a key management parameter that was monitored over the course of the run throughout the season.

Initial sockeye landings occurred in Pilot Point set nets on June 11 (Table 14). Catches remained small throughout the mid-June weekly open periods and totaled 44,000 fish by the onset of the "emergency order period" on June 23 (Table 14). The fishery was closed June 23 to allow both kings and early run sockeye to enter the escapement.

The fishery was reopened at 7:00 p.m., June 26, for a 24 hour period to test fish distribution in the district and fleet efficiency parameters. Sixty four drift boats and 33 set nets (a normal level of effort) participated in the opening and harvested 110,000 sockeye, the first large catch of the season. Good catches were made at South Spit, the entrance to Ugashik Bay, and in some Ugashik village set nets.

Very little escapement occurred prior to June 27. The inside Ugashik River test fishery results indicated only 1,000 fish had passed the index sites and the tower count at the outlet of Lower Ugashik Lake totaled less than 1,000 fish (Table 31). As early escapement was needed and as the set net catches at Ugashik village indicated some fish were present in the lower river area the fishery was again closed at 7:00 p.m., June 27 (Table 11).

Tender operators and a local Fish and Game Advisory committee member reported an abundance of sockeye milling in the district from the Coast Guard bell buoy in to Smokey Point on June 28, and similar reports continued on June 29. After

considering these reports and also the need for age composition data of fish in the district, the fishery was reopened for 25 hours at 10:00 p.m., June 29 (Table 11).

The June 29-30 sockeye catch totaled 119,000 fish, bringing the season's total harvest up to 274,000 (23% of the preseason forecast). Normally only 8% of the season's catch is taken through June 30 so either a larger than expected run was in progress or the run was arriving early. Escapement counts at Ugashik River tower were slightly ahead of the 28 year long-term average, but not enough to indicate an early run. Age composition data from the June 29-30 catch closely approximated the preseason forecasts for 2-ocean age components, but was different than the forecasts for 3-ocean fish with the 6(3) component being higher than expected and the 5(2) component much less than anticipated. Ugashik village set net catches on June 30 were reported to be three times the magnitude of the June 27 catches, indicating that some fish were moving into the lower river.

Escapement past the counting tower through June 30 totaled 3,000 fish. Inside test fish results indicated only 4,000 fish had passed the index sites to date, so the fishery remained closed July 1 (Table 31). Escapement rates at the tower increased slightly July 1 and 2, although inside test fish indicators remained low. With 10,000 fish past the tower through 6:00 p.m., July 2, the fishery was reopened at 1:00 a.m., July 3 for 25 hours (Table 11).

The July 3-4 catch totaled 234,000 fish, bringing the season's sockeye catch up to 508,000 (42% of the preseason catch forecast) (Table 14). Aerial observations at 6:00 p.m., July 3, indicated good catches were made by drift boats from South Spit all the way inside Ugashik Bay to Dago Creek. Reports from Pilot Point set netters July 4 indicated good set net catches were made all the way to Pilot Point, but no further. Tower counts still totaled only 10,000 fish in the escapement but fish in the district were showing an increasing tendency toward upriver movement so the fishery was reopened again at 3:00 a.m., July 5, for 25 hours (Table 11).

The July 5-6 catch totaled 207,000 fish, bringing the season's accumulative harvest up to 715,000 (Table 14). Interest in the fishery was increasing with a net increase of 84 drift units transferring into the district since July 3. Daily escapement rates past the tower dropped to nearly zero July 4-6, but inside test fish indices began increasing slightly July 5-6 and the percentage of age group 4(2) fish in test fish catches was about three times the preseason predicted level in the fishery (an indicator of a larger than predicted return). With these factors considered, the fishery was reopened for 13 hours at 4:00 a.m., July 7 (Table 11).

The July 7 catch totaled 202,000 sockeye, bringing the season's total up to 917,000 fish (75% of the preseason catch forecast). Historically, the catch through July 7 averages 32% of the season's total and the escapement averages 4%. As the escapement past the tower through July 7 totaled only 10,000 fish (1% of the point goal) it was apparent that the run was not early. However, based on both the historical commercial catch performance and the larger than expected percentage of age group 4(2) fish in the escapement to date, it was becoming increasingly clear at this point that the run was going to exceed forecast levels.

The fishery reopened for 12 hours at 6:00 a.m., July 9, after a 37 hour closure (Table 11). Fog prevented an accurate aerial assessment of fish distribution patterns in the district and initial fleet success determinations. Some fish were observed in Pilot Point set nets all the way up the "cut bank" to the upper marker so some fish were obviously entering the lower river. A period catch of 253,000 sockeye was attained bringing the season's total up to 1.2 million (Table 14). The district was then closed again to promote additional escapement.

The fishery remained closed July 10. An aerial survey of Ugashik lagoon at 2:00 p.m., July 10, yielded an estimate of 57,000 sockeye just downstream of the counting tower. At 3:00 p.m., a survey of the upper end of the Ugashik district indicated lots of fish were jumping and moving from Dago Creek to King Salmon River with lesser numbers observed in closed waters shortly upstream. To facilitate the movement upriver of a large number of these fish the fishery was kept closed until 9:00 a.m., July 11, and then opened for 12 hours (Table 11).

Both inside test fish indices and tower counts jumped dramatically early July 11, indicating that fish were on the move throughout the river and ending an eight day lull at the tower (Table 31). Fishing was much slower in the district than during openings on July 7 and 9. A catch of 101,000 sockeye was reported from a fleet of 150 drift boats and 49 set nets (Table 14). This brought the season's catch total to 1.3 million fish, slightly above the preseason catch forecast. Numerous boats were reported fishing outside the seaward district line on fish milling in that area.

The tower count through July 11 totaled 155,000 sockeye (22% of the point goal). Inside test fish results through July 11 indicated only 123,000 fish had passed the index sites so it was obvious the test fishery was under forecasting fish passage. As many of sockeye were observed jumping in the lower Ugashik River (from Muddy Point to Ugashik village) on July 11, a 12 hour fishing period was announced for July 12, beginning at 10:00 a.m. (Table 11).

The July 12 catch totaled 87,000 fish, the second straight day of declining catch rates (Table 14). The inside test fish indices, however, continued to increase and tower counts through July 12 totaled 236,000 fish (34% of the point goal). As many fish were observed milling and jumping just outside the seaward district line and additional fish were observed jumping near shore between Egegik and Ugashik another 12 hour fishing period was announced for July 13, beginning at 11:00 a.m. (Table 11).

Catch rates picked up again July 13 with 178,000 fish harvested. This brought the season's total catch up to 1.5 million sockeye (Table 14). Inside test fish indices also continued to climb July 13, reaching a seasonal peak. With fish still entering the lower river, many fish still reported at Ugashik village, and continued reports from spotter pilots of fish moving into the outer district, fishing was extended for 24 hours, until 11:00 p.m., July 14 (Table 11).

The July 14 catch of 376,000 sockeye was the largest daily harvest in the district during the season (Table 14). It was taken by 177 drift boats and 56 set nets, peak effort levels for each gear type, and it plugged the tender capacities of at least two major buyers in the district. Escapement past the tower through noon, July 14, totaled 372,000 fish (53% of the point goal) with another couple of days of heavy escapement expected to follow, based on recent high inside test fish indices. Based on increasing catch rates, increasing tower counts, and continued aerial observations of large numbers of fish in and near the outer district areas the fishery was extended 25 hours until midnight, July 15.

Escapement through noon, July 15, totaled 554,000 fish, 79% of the point goal and exceeding the newly established lower range of 500,000. With processors reporting large catches and escapement rates quickly approaching desired levels the fishery was again extended 24 hours until midnight, July 16 (Table 11).

The July 15 catch of 309,000 sockeye was the second largest of the season and brought the district catch up to 2.2 million (Table 14). Inside test fish indices from July 13-15 had been dropping, and the first two sets of indices for July 16 were also low. The escapement rate past Ugashik tower dropped dramatically July 16 so the fishery was allowed to close for 9 hours from midnight, July 16, until 9:00 a.m., July 17, after which the "emergency order period" expired and the fishery returned to the normal five days per week fishing schedule. This short closure (one tide) was intended to stimulate some additional late run escapement but

as events turned out it proved unnecessary. The evening July 16 inside test fish drifts indicated another surge in escapement had already begun, but it was too late to cancel the closure.

The July 16 catch of 132,000 sockeye brought the season's total up to 2.4 million (twice the preseason forecast) but indicated that the run was beginning to wane, and catches July 17-18 further confirmed that the run was tailing off (Table 14). The July 16-17 surge of fish in the lower river arrived July 17-18 at the counting tower with 354,000 fish counted over that two day period (Table 31). The escapement goal of 700,000 sockeye was met and exceeded July 17 and the upper range of 900,000 was reached July 18.

Sockeye catches dropped to less than 10,000 fish per day by July 22. Small catches continued throughout the remainder of July and early August with the final landing of the season reported August 30, and the final catch totaling 2.7 million sockeye (Table 14).

The peak daily catch occurred July 14 (376,000 sockeye), with the peak sockeye catch per hour (21,000/hr.) occurring July 9 and the peak catch per unit of gear (2,041 sockeye per unit) occurring July 3. An overall exploitation rate of 68% was exerted by the fishery, well above the 58% long-term average.

The daily escapement rate peaked July 17 with a count of 231,000 sockeye attained. Escapement counts dropped fairly quickly after the peak and were terminated July 29 with a final total of 1.2 million achieved (Table 24). Both the new point escapement goal (700,000 fish) and the new range (500-900,000 fish) were exceeded but considering the run was twice the forecasted level, this is not surprising. Escapement was successfully obtained from all major segments of the run, and a sex ratio of 41% males and 59% females was achieved. An additional 12,000 sockeye were later aerially enumerated in the Dog Salmon River drainage and 17,000 were counted in the King Salmon River drainage bringing the total Ugashik system sockeye escapement to 1.3 million fish (Table 28).

The district catch of other salmon species totaled 285,000 fish, 10% of the total district salmon catch, and was highlighted by record harvest levels of both chums and cohos (Table 14). The chum catch of 211,000 almost doubled the previous record of 105,000 set in 1983 (Appendix Table 12). The catch peaked July 15 with a harvest of 22,000 chums. The coho harvest of 69,000 fish bettered the old record of 51,000 set in 1982 and exceeded the 20 year average of 12,000 by nearly a factor of six (Appendix Table 14). The king harvest of 5,000 fish was the eighth largest on record and well above the 20 year average of 3,000 (Appendix Table 11). The pink harvest totaled less than 1,000 fish.

Late season aerial surveys, while incomplete, did indicate adequate escapements of kings (9,000) and chums (169,000+) (Table 28). Insufficient surveying was accomplished to characterize coho escapements.

A total of 31 buyers/processors operated in the Ugashik district, a 29% increase over 1983 levels (Table 37). Overall, this receiver fleet was more than adequate to handle the daily district catches. There was one day (July 14) when two major processors were plugged, but fishermen were never placed on limits. As during recent years, nearly the entire catch was either frozen on floating processors, tendered to other districts, or flown to other areas for processing. Three floating processors remained in the district throughout August to buy cohos, one major reason the coho catch record was broken this season.

Enforcement in this district was again a major source of complaint from fishermen and processors alike. Reports of fishermen fishing outside district lines (both offshore and up the rivers), and lack of compliance with the 48 hour waiting period after transfers were the most common complaints registered. Spotter planes, as at Egegik, were also a major issue of concern.

In most regards the season was a very successful one for management as a very large run was harvested, and an adequate escapement was obtained for all species (with the possible exception of cohos). All major age groups in the run produced at higher levels than predicted, indicating continued better than

expected survival over several recent production years. The higher than anticipated return of age 4(2) sockeye was especially encouraging in light of the very large recent escapements allowed into the system. The large 1979 escapement (1.7 million) apparently did not adversely affect survival of progeny of the large 1980 escapement (3.3 million), at least as evidenced by the 4(2) return. Apparently the 1980 progeny survived well, smolted in large numbers (mostly in 1982) and returned in large numbers (1.1 million) in 1984.

Looking to the future, additional attention needs to be paid to early season king escapement monitoring to prevent over fishing of these stocks and the same is true of coho escapement monitoring. Catch sampling in both of these fisheries also needs additional emphasis.

Nushagak District

Management of Nushagak's salmon resource is made more difficult by the multi-species aspect of this district's salmon runs, and by the occurrence of more than one major sockeye salmon-producing river system. Nushagak district has been the second most important sockeye producer in Bristol Bay over the past 20 years, and has accounted for over 70% of Bristol Bay's commercial production of king salmon. Additionally, this district produces large numbers of chums (51% of the total Bay production), even-year pinks (86% of total) and coho salmon (51% of total).

Since 1978, and continuing through 1983, the Nushagak district average sockeye catch has increased to 4.9 million fish, well above the recent long-term (1965-77) average of 791,000, while the total run from 1978-83 has averaged 8.6 million compared with the previous long-term (1965-77) average of 2.1 million (Appendix Table 22). The recent six-year total run average of 8.6 million sockeye is higher than any previous six-year average in the long history of this fishery.

The preseason inshore sockeye salmon forecast to all river systems in 1984 totaled 5.2 million, with 2.7 million assigned to Wood River, 837,000 to Igushik River, 1.6 million to Nuyakuk River and 169,000 to Snake and Nushagak-Mulchatna Rivers combined (Table 1). The actual inshore district return of 4.0 million sockeye was only 76% of the preseason forecast (Table 1).

The Nushagak district commercial salmon season commences in late May with a sizable fishing fleet directing its efforts at the district's returning king salmon stocks. Since 1978 fishing effort on kings has increased dramatically and the larger effort has placed additional pressure on the king salmon resource. In 1984, fishing effort peaked on June 12-13, when 550 units of drift gear participated in the fishery (Table 15). Catch per unit of effort (CPUE) in the commercial fishery remained low all season long, and along with age structure analysis of the catch, and escapement trend results from inriver subsistence catches, strongly suggested a king run of less magnitude than expected.

The first Department "unofficial" forecast for Nushagak kings suggested a return of from 190,000 fish (sibling return) to 319,000 (return per spawner), and a weighted point return of 243,000. A forecast of this magnitude would be 40% greater than the long-term average total run since 1966, but 14% less than the average runs since 1978 when king production increased significantly (Appendix Table 39).

Through the regular weekend closure on June 9-10, 18,000 kings had been harvested, equal to the long-term average of 16,000 through this date (Table 15). Weather and water conditions were suggesting that the king run migration timing might be early, and in addition, the large expected fishing effort (500 to 600 drift units) was of concern if the run itself was under forecast. Both daily CPUE catch levels (10-15 kings per day per delivery) and age composition samples of the catch suggested a relatively poor showing of age 6(2) kings, which normally make up about 50% of the incoming run. The lack of 6(2) returns was not unexpected, as the 5(2) return in 1983 was also poor. Once the lack of the

6(2) age class was confirmed, a very conservative fishing schedule was announced in place of the regular June 11-16 five day weekly fishery. Based on the question of actual run strength, age structure, run timing, large efficient fishing effort, and a relatively low marginal escapement (estimated at about 4,000 kings through June 8), the regular weekly fishing schedule was modified by emergency order to allow a single 24 hour period for June 12-13 (Table 11).

Only 12,000 kings were taken in the June 12-13 24 hour period by 550 participating drift units, and with the commercial catch now over 30,000 kings, and showing a decreasing 6(2) age class structure (down to 35%) the fishery would remain closed until there was a significant increase in the escapement trend.

By June 15 over 9,000 fish had passed the Nushagak River sonar counters, but sampling and aerial surveys confirmed that the majority of these fish were chums (Table 25). A fairly lengthy closure was now anticipated to improve the king salmon escapement, and a "general announcement" (Table 11) to the fishing fleet was issued on June 18 reflecting the current king salmon run status. Experienced Nushagak king fishermen are aware that early season fishing period closures are often not entirely effective in providing increased escapement rates, as Nushagak kings traditionally "hold" in the district for varying periods of time. With the announcement of "no anticipation for a fishery opening in the immediate future", drift fishing effort began to transfer out of Nushagak to Naknek-Kvichak and Egegik districts, and by June 19, 300 drift units had left Nushagak to begin sockeye salmon fishing operations.

King salmon escapement trends are monitored on a daily basis from Dillingham area subsistence net catches, upriver subsistence catches at Lewis Point, and finally from king escapement index sonar counts on Nushagak River below the village of Portage Creek (Table 10). Through June 21 all escapement indicators showed conclusively that few kings had entered the escapement. Concern was now centered on the "specie mixing" that would occur if the kings delayed their

upriver migration much longer. Several options were considered: (1) a 12 hour fishing period for Igushik only to test sockeye run strength, and to keep the king catch down; and (2) a 6 hour district-wide fishing period during calm weather to minimize king catch, yet allow testing of early-arriving sockeye.

A 12 hour Igushik only period was eventually announced for June 23 (Table 11). With no change in king escapement trends, and with continuing fishermen reports of "fish finning at Ekuk", 26 kings taken in sockeye subsistence nets on Kanakanak beach, and 50 kings in one subsistence net at Nushagak Point, it was apparent that even a 6 hour Nushagak opening would result in a significant king harvest. With the current balance between catch (30,000) and apparent escapement (less than 5,000), fishing time in the entire district was not justified.

A moderate 15-20 K South wind on June 21 began the king movement through the district, and a SW 10-15 K wind on June 22 continued the upriver king migration. The early morning flood tide on June 22 saw Dillingham area subsistence net catches increase to 6 kings per net, while upriver nets at Lewis Point saw a 10 king CPUE (Table 10).

With no change in the king salmon age structure, it was becoming apparent that the king run might fall well below the forecast. If the 4(2) age class was weak, and the sibling king forecast was more representative of actual run strength, then a conservative approach would be maintained, even though the escapement trends were improving. If the escapement trends continued to improve at both Kanakanak beach and the Lewis Point area, then fishing time for the entire district was imminent. Subsequent subsistence CPUE on June 23 at Kanakanak and Lewis Point was 23 and 9, respectively, and Lewis Point continued to show respectable catches for the next four days (Table 10).

The June 23 Igushik only period was hampered by strong 15-25 K ESE winds, and the fishing effort of 220 drift units and 41 set nets caught 27,000 sockeye salmon, well under the 45-55,000 expected catch (Table 15). However, with the

Igushik River inside test fishery indicating an early-season escapement of 28,000 past the test fish site (14% of the escapement goal), the catch/escapement balance appeared to be on schedule.

A 12 hour fishing period for June 25 was subsequently announced for the entire district based on: (1) the need for age structure and run strength information on sockeye stocks bound for Wood and Nuyakuk Rivers after a 13 day closure to protect king stocks; (2) an attempt to hold down sockeye catches on early-run fish, as very large catches can be expected from June 26-27 on, and the "longer the closure, the larger the expected catch"; (3) good indications chums available as seen from subsistence catches, as well as good catch indices from the offshore Port Moller test boat (Table 7); and (4) a significant improvement in the king escapement, now estimated at approximately 30 to 50,000 fish, which was approaching the escapement requirement range of 50 to 100,000.

The June 25 catch of 12,000 kings, 211,000 sockeye and 107,000 chums showed that a strong push of kings and chums was taking place, and the sockeye catch fell well within that expected for this time period (Table 15).

Another 12 hour Igushik only period was announced for June 26, when over 51,000 sockeye (25% of the goal) were estimated to have passed the upriver test fishing site (Table 33). The Igushik section was subsequently extended for 13 hours, and the 25 hour period produced a disappointing catch of only 5,000 off Igushik beach (Table 16).

Aerial surveys conducted on June 26 of Wood and Nushagak Rivers showed 21,000 and 112,000 fish, respectively, and both rivers were well ahead of the accumulative curve needed to achieve escapement requirements (Tables 32 and 34).

A second 12 hour district-wide period was announced for June 27 based on: (1) adequate sockeye escapement into Wood River - minimum of 130,000, and Nushagak/Nuyakuk - minimum of 286,000, 57% of the new established goal of 550,000; and (2) continuing strong escapement test indices into Igushik River where over 36% of escapement requirements were thought to have been achieved (Tables 32-34).

The sockeye catch on June 27 of 214,000 was a disappointment, as based on the forecast, the catch should have been in the 350 to 400,000 range; however, another 105,000 chums were caught, confirming that a strong chum run was in progress (Table 15).

Escapement rates to all rivers began to decline June 27-29 due to the heavy fishing pressure, and the outside Nushagak test boat was sent on her first trip on June 29-30 to determine continuing run strength, especially in the inner district. Test boat catches on June 29 showed little strength and sockeye movement within the district; however, similar test sampling on June 30 showed heavy sockeye movement in the inside waters of the district from Combine Flats to Kakanak beach (presumably Wood River fish) to beyond Picnic Point on Nushagak River (Table 9).

Based on the heavy sockeye test boat catch indices in the upper district on June 30, which indicated that a significant escapement was occurring to both Wood and the Nushagak/Nuyakuk River systems, a 12 hour period was announced for July 1 (Tables 9 and 11).

Over 428,000 fish were caught during the July 1 period (303,000 sockeye, 3,000 kings and 124,000 chums), and although the sockeye catch was significant, the expected catch of 450 to 550,000 was not achieved (Table 15). At this point in the run, a real suspicion was growing that the Nushagak sockeye run forecast of 5.2 million would not be met.

Aerial surveillance continued on all river systems, and through July 1, the Nushagak River sonar escapement of 321,000 (through 12:00 noon) and aerial escapement estimate of 170,000 sockeye below the sonar totaled 491,000, or 89% of the combined Nushagak/Nuyakuk River systems escapement goal of 550,000 (Table 34). At Wood and Igushik Rivers, 27% and 53%, respectively, of sockeye escapement requirements had been met (Tables 32 and 33).

Along with daily aerial surveillance, the Nushagak outside test boat was dispatched on consecutive trips on July 2-3. Test boat catches on July 2 were light, while catches on July 3 showed considerable improvement, especially in the upper district at Kanakanak beach and Coffee Point on the west side (i.e.: primarily Wood River fish) (Table 9). Meanwhile, aerial surveillance of Wood River on July 2-3 showed steady improvement, with sockeye escapement reaching 40% of requirements through July 3 (Table 32). The Igushik River test fishing indices indicated that 68% of sockeye escapement requirements were met for that river through July 3 (Table 33).

Wood River age composition was running close to that expected (short on 5(3) sockeye), but the 5(3) age class made up only 11% of the total forecast to that river (Tables 2 and 3). However, Igushik River was showing an almost complete lack of 4(2) sockeye from the record 2.0 million escapement in 1980 (Tables 2 and 3). If the 4(2) age component to the Igushik system failed, a significant portion of the total run (24%) would be affected.

With escapements practically assured in the Nushagak/Nuyakuk River systems, good inside test boat index catches on the west side (Wood River fish!), and a strong SSW 15-25 K wind in progress, a decision to reopen the district for 12 hours on July 4-5 was reached (Table 11).

The sockeye catch on July 4-5 amounted to 289,000, bringing the accumulative catch to 1.1 million, and virtually assuring that the Nushagak sockeye run would not make forecast (Table 15). Fishermen began to transfer out of Nushagak district immediately after the period was over, confirmation from another source that the Nushagak sockeye run was beginning to wane.

Aerial surveillance of Wood River on July 5-6 indicated that the escapement rate was building and that 67% of the escapement goal would be achieved through July 6 (Table 32). The major concern at this point in time was the apparent strength of sockeye between the lower regions of Wood River and the inside fishing boundary line. The outside test fish boat was dispatched at 10:00 a.m.

on July 6 to help answer this question. Test boat index catches showed significant sockeye run strength, especially in the Kanakanak beach area to Grassy Island (Table 9). With Wood River indicating that 67% of the escapement goal would be achieved by midnight on July 6, and with heavy index catches just above the inside district boundary line, another 12 hour period was announced for July 7 (Table 11).

The July 7 fishery produced a sockeye catch of 255,000, bringing the accumulative catch to 1.4 million (Table 15). Igushik beach catches were poor, only 6,000 sockeye compared to 12,000 on the previous July 4-5 period (Table 16). It was now certain that the Nushagak sockeye run would not reach the forecast of 5.2 million; best estimate as of July 7 was for a total projected run of between 3.8 to 4.0 million fish.

The Nushagak outside test boat completed its final trip on July 8, and found good sockeye run strength in the inner district (Table 9). Wood River aerial surveys on July 8 indicated that over 80% of escapement requirements would be achieved by 12:00 midnight, July 8 (Table 32). Based on the good inside test boat index catches and the continuing steady escapement rate into Wood River, a 14 hour fishing period for the Nushagak section only was announced for July 9 (Table 9). The continued low daily escapement rate into the Igushik River system, where only 63% of the goal had been achieved, prompted a decision to keep the Igushik section closed to improve the escapement rate (Table 33).

Aerial surveys and daily escapement rates of Wood River on July 9-10 prompted two additional 24 hour and one 34 hour extension of fishing time for the Nushagak section only, and fishing time was eventually extended through the emergency order period (Table 11). The Igushik section remained closed through 9:00 a.m., July 17 (eight day closure) and then was allowed to reopen. Effective 3:00 p.m., July 10, the 48 hour waiting period was waived for those Igushik

beach set net fishermen who wished to relocate to another fishing site within Nushagak section (Table 11). A total of eight Igushik set net fishermen eventually took advantage of the 48 hour waiver and relocated their fishing sites. Sockeye catches off Igushik beach, after the closure was lifted on July 17, were less than 700 fish.

Continued daily assessment of the Igushik River sockeye run indicated that escapement requirements would be met (just barely). By the end of the season all of Nushagak district's major sockeye river systems had reached, or closely matched, escapement requirements: Wood - 1.003 million compared with a goal of 1.0 million; Igushik - 185,000 with a goal of 200,000; and Nuyakuk - 473,000 with a goal of 500,000 (Table 1). The district test fish program was instrumental again this season in defining fish movements within the upper district, and in obtaining escapement goals, especially in the Wood and Nuyakuk River systems.

The final sockeye salmon catch of 2.2 million and escapement of 1.8 million equaled a total run of 4.0 million fish and was the first substantial reduction in total run size after six consecutive years (1978-83) of outstanding returns (Table 4 and Figure 2). Initial analysis of the sockeye return to this district, indicates "very poor" production of age 4(2) fish from the large record escapements obtained in 1980 (Table 3).

A continuous fishing schedule was maintained between July 17-21 to harvest sockeye in excess of escapement requirements, as well as to help indicate run magnitude of Nushagak's even-year pink salmon return. The formal pink salmon preseason forecast to Nushagak district amounted to 1.2 million fish, and was based on the new Nushagak River pink fry trap program. In addition, a forecast based on the old escapement/return relationships without the more recent adjustments using water level and temperature data was also available (Appendix Table 2). Since the 1983 fry program was only the second attempt at forecasting based on total fry outmigration, the preliminary forecast of 1.2 million was difficult to evaluate. The old E/R method of forecasting gave forecast returns of 1.3 to

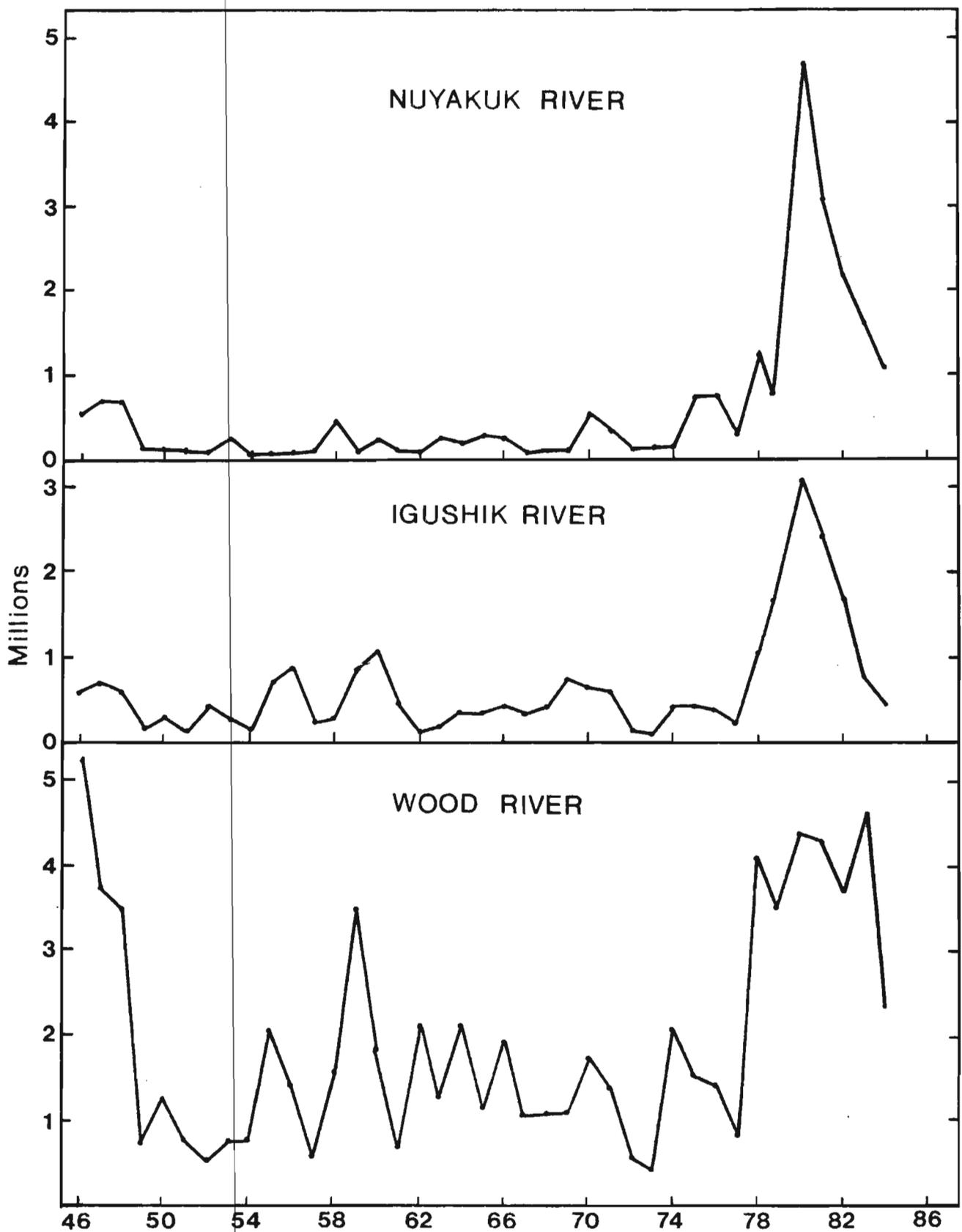


Figure 2. Total inshore return of sockeye by major river system, Nushagak district, Bristol Bay, 1946-84.

1.9 million, depending upon which years were selected as representative of the 1984 return. The 1982 pink salmon escapement of 1.7 million would normally not be expected to produce well, as 4 of 5 previous large escapements (1.4 to 9.4 million) averaged only 0.34 return per spawner (Appendix Table 42).

Through July 21 only 134,000 pinks had been harvested (compared to the long-term average of 364,000) due to the lack of the use of smaller mesh pink gear brought on by the continuing fair sockeye catches and lower prices paid for pinks (started at \$.11 to \$.18 per pound). Effective July 20 some district processors and buyers raised pink prices to \$.23 per pound to entice fishermen to change to smaller mesh pink salmon gear.

Daily pink catches for the weekly period from July 23-27 averaged 266,000 bringing the accumulative catch to 1.5 million through July 27 compared to the long-term average of 878,000 through July 28 (Table 15). The fishery was subsequently extended through the weekend closure on July 28-30 based on: (1) the strong continuing daily catches; and (2) over 370,000 pinks had passed the Portage Creek sonar site, with the river below the site estimated at 100 to 150,000 (Table 25).

Daily pink catches totaled 1.5 million from July 28 - August 3 and averaged 219,000 per day, peaking on July 24-25 (600,000) and July 27-28 (594,000) (Table 15). Meanwhile, the pink escapement past the sonar site through August 2 had increased to 1.1 million, just exceeding the escapement goal of 1.0 million (Table 25).

Normally under these circumstances, where pink escapement objectives had been met, fishing time would be extended through the weekend, but the coho salmon escapement of 16,000 through August 3 was not adequate when viewed with the harvest, 209,000 fish (Tables 15 and 25). Compounding the high coho harvest, which was over two times larger than the long-term average of 96,000 through August 5, was the large drift effort participating in the fishery (peaked on August 3 with 490 units of gear) (Table 15).

Fishing was allowed to resume on Monday, August 6, but was again closed 48 hours later, after 54,000 additional coho entered the harvest, bringing the total accumulative catch to 263,000 (Table 15). With the coho escapement estimated at 30,000 through August 7, a closure of undetermined length would be required to reach the escapement goal of 150,000 (Table 11). Subsequently the fishery was extended through 9:00 a.m., August 23 (15 day closure) to improve the coho escapement (Table 11).

Continued daily monitoring of the coho escapement at the Portage Creek sonar site showed a steady daily rate and slow climb toward the coho escapement goal of 150,000 fish (Table 25). A strong SSW 25-30 K wind on August 21-22 began a significant movement of fish past the sonar site on August 22, when over 26,000 coho passed the site. With an escapement of 130,000, (87% of the goal), and over 36 hours travel time between the fishery and sonar site, the escapement goal was assured, and resumption of fishing was allowed.

The final Nushagak district coho escapement eventually reached 171,000, and when totaled with the harvest of 272,000, equaled a total run of 443,000 (Appendix Table 43).

The Nushagak district pink run totaled 6.1 million, 3.2 million catch and 2.9 million escapement, was the second largest run on record and was almost double the long-term average of 3.4 million (Appendix Table 41).

Nushagak king salmon accounted for only 61,000 of the district harvest, while the escapement of 81,000 was well within the Nushagak escapement goal range of 50 to 100,000 (Appendix Table 31).

The Nushagak chum salmon catch of 680,000 was well above the long-term average of 438,000 for this district, while the chum escapement of 362,000 equaled a total run of 1.0 million compared to the long-term average of 719,000 (Appendix Tables 12 and 40).

In summary, Nushagak district saw the sockeye and king salmon runs totaling less than forecast, while stocks of chums, pinks and cohos were stronger than expected. Age composition analysis of the sockeye returns suggested that the record escapements in 1980 are producing very poorly. Although 5-year old sockeye will not return until 1985, this season's 4(2) return and smolt outmigrations from Wood River in 1982-83 suggests poor production from record escapements obtained in 1980.

Processing effort decreased in 1984 when 25 processors and buyers operated in Nushagak district compared with 36 in 1981, 41 in 1982 and 28 in 1983 (Table 37). In addition to the three major long established shore-based canneries, floating freezer ship operations totaled 12, compared to 16 in 1983, while air-lifted salmon operations also decreased from 15 in 1981-82 and 11 in 1983 to 10 in 1984 (Table 37).

The continuing gear conflict between Nushagak district drift and set net fishermen was addressed by the Board of Fisheries at the February, 1984 meeting. The Board adopted a proposal developed by the Nushagak Advisory Committee to limit set nets in Nushagak district to different distances from the mean high tide mark (Appendix F). However, in June of 1984 a State of Alaska Superior Court judge issued a preliminary injunction barring the State from enforcing the new regulation. Set net fishermen in 1984 conducted operations under the previous regulation in force in 1983 (5 AAC 06.331(i)).

Togiak District

The 1984 Togiak sockeye salmon forecast of 453,000 was down considerably from recent years, and the lowest since 1978 (Table 1). However, it closely matched the 20 year average return of 496,000 to this district (Appendix Table 24). With the new sockeye escapement goal in 1984 of 150,000 fish for Togiak Lake, a conservative management approach was indicated for this season. Togiak district is managed differently than other areas of Bristol Bay and has a fixed fishery schedule of four days per week in the Togiak section and five days per week in Kulukak, Osviak, Matogak and Cape Peirce sections. This fishing schedule is adjusted by emergency order, as needed, to achieve desired escapements.

By comparison to the other fishing districts in Bristol Bay, Togiak is the smallest, producing less than 3% of the total sockeye landed. An important producer of other salmon species, over the past 20 years, Togiak has averaged 18% of the kings, 20% of the chums and 30% of all cohos landed in Bristol Bay (Appendix Table 11-12 and 14).

Effort levels have remained somewhat stable during the main sockeye season for the last few years, at approximately 150 drift vessels and 40 set nets. However, there is an annual influx of larger (32 ft.) vessels from Nushagak and other districts in mid-July for sockeye and for the coho season, which peaks in late August and early September.

The first salmon landed at Togiak in 1984 was on June 12, but it was reported that due to price negotiations, fishermen had elected not to fish on June 7-8. At this early date almost no harvest was lost due to the low volume of fish in the district at that time. Processing capacity was adequate to handle the harvest this year and at no time did the lack of an available market reduce the catch. A total of 10 operators purchased salmon at Togiak in 1984 (Table 37).

The first week of July at Togiak saw the escapement following exactly on the desired curve to achieve the goal. The new sonar program in the lower portion of Togiak River was estimating that close to 30,000 sockeye had passed the site, but commercial catches were well down from recent years. On July 5-6 the catch rose sharply, and the final landings in Kululak section averaged 400 fish per delivery, just prior to the weekend closure. An aerial survey on Sunday, July 8, showed only fair numbers of sockeye in the lower portion of Togiak River, so an emergency order was issued that same evening extending the regular weekend closure an additional 24 hours in Togiak section only (Table 35).

For the week of July 9-14, the sockeye catch was good in Togiak section and excellent in Kulukak (Tables 18 and 19). The Togiak River escapement rate had begun to fall slightly under the curve necessary to reach the season end goal of 150,000, but by July 12 the accumulative sockeye passage at the sonar site was estimated at over 109,000, or 73% of the goal (Table 26). An emergency order was issued on July 12 extending the Togiak River section for 24 hours (Table 11).

By the week of July 16 the harvest in both Kulukak and Togiak sections had begun to drop off and the escapement rate was falling further below the desired curve. However, on July 15 the sockeye salmon estimated accumulated passage at the sonar site had reached 150,000, or 100% of the desired goal (Table 26). An aerial survey on July 20 showed many chum salmon in Togiak River and a low escapement of sockeye (Table 35). An emergency order was issued that same day, closing both Togiak and Kulukak sections until July 28 (Table 11). The record Kulukak catch and the heavy harvest along the southwest headlands of that section strongly suggested interception of Togiak bound sockeye, as documented in past seasons.

An aerial survey of Kulukak section on July 27 showed a sockeye escapement of 13,000 in Kulukak River and an exceptional 42,000 in the Kanik River/Tithe Creek ponds. On the same aerial survey the sockeye escapement in the

Togiak River was estimated at just over 22,000 (Table 35). The Togiak River tower count through July 27 was less than 80,000, so approximately 100,000 of the 150,000 goal were estimated to have escaped the fishery. An emergency order issued on July 27 extended the closure for an additional week in Togiak section until August 3, but allowed the Kulukak section to return to the regular weekly fishing schedule (Table 11).

It was clearly apparent by July 20 that the extremely large chum run had caused species apportionment problems with the sonar counts, which considerably over estimated the sockeye escapement. It was eventually discovered that beach seine samples taken during daylight hours were not reflective of the species composition of the considerable chum salmon escapement occurring at night. It was also evident that 1984 was witnessing the end of eight years of unusually large sockeye returns to the Togiak district.

The final catch totaled 319,000 sockeye for the entire district combined (Table 23). The Kulukak sockeye catch of 96,000 set a new record for that section, breaking the 1979 record of 67,000 by almost 30,000 fish. The Osviak section catch of just under 5,000 this season was second only to 1967 when over 5,000 sockeye were landed. Matogak section also had its second best year, but the 8,000 sockeye landed in 1984 was below 1974 when 11,000 were caught (Appendix Table 24). Good sockeye escapements were achieved in most river systems and totaled 201,000, but the final Togiak River tower count of 95,000 fell well short of the new goal of 150,000 (Table 4).

King salmon are not presently a targeted species at Togiak, and few fishermen use king gear in the early part of the season. Although this is an incidental harvest, the 1984 catch of 22,000 and the estimated escapement of 26,000 contributed almost 19% of the total Bristol Bay king salmon return (Appendix Table 39). This was equal to the long-term average catch of 23,000 at Togiak and well above the average escapement of 18,000.

The chum run was very large at Togiak in 1984 and the harvest of 339,000 broke the previous record of 323,000 set in 1983 (Appendix Table 12). The documented escapement of 204,000 was slightly below the long-term average, but appeared to be excellent and well distributed throughout the district (Appendix Table 12). The aerial survey technique used to estimate the chum salmon escapement in the Togiak area missed the peak of spawning in 1984 and due to all of the carcasses present, the Department observer felt that the population was greater than the 204,000 estimate.

Pink salmon in Togiak exhibit the same even-year cycle dominance that is demonstrated in the Nushagak district, although the run size is much smaller. The 1984 pink harvest of 21,000 was slightly below the average of 25,000, but this is not a targeted species and was an incidental catch, taken primarily in sockeye gear. Because of the necessary long closure in late July and early August to achieve needed sockeye escapement, even further protection was afforded the pink run. The resultant pink salmon escapement in the Togiak drainage was estimated at 260,000, the highest recorded since documentation began in 1974 (Table 5)

The coho salmon run in 1984 at Togiak was the largest ever documented in this district. The catch of 171,000 was the highest in the 30 year history of commercial harvest on this species, and exceeded the previous record of 151,000 landed in 1980 (Appendix Table 14). Estimated coho escapements totaling 104,000 also set a record for the district, but the data base is very limited (Appendix Table 43). Because of the later peak of abundance, large average size of the fish, and recent good prices, this fishery has attracted a considerable fleet that has exceeded 150 drift units in some years and over 30 set nets.

As early as August 6 the commercial harvest of coho began to significantly increase, and daily landings topped 2,000 (Table 17). An aerial survey on August 15 indicated 5,000 coho were present in the Kulukak River, 12,000 in Togiak River, 1,000 in Matogak River and 3,000 in the Osviak River (Table 36).

Due to concerns that the run was earlier than normal, the high catch (over 7,000 landed), the large fishing effort, and the apparent low escapement, an emergency order was issued on August 17 that reduced fishing time by 15 hours in the Kulukak, Osviak, Matogak and Cape Peirce sections, and extended the regular weekend closure in the entire district for an additional 24 hours until August 21 (Table 11).

Catches were strong the following week, but aerial surveillance continued to indicate almost no change in the coho escapement in the major river systems. On August 24 an emergency order reduced fishing time by 24 hours in the Kulukak, Osviak, Matogak and Cape Peirce sections, and extended the regular weekend closure for an additional 24 hours in the entire district, until August 28 (Table 11).

On August 27 coho escapement was estimated by aerial survey coverage at 6,000 in the Kulukak River, and 32,000 in the Togiak River drainage (Table 36). These counts were improved, but still well below the 50,000 goal for the Togiak River and 15,000 in the Kulukak system. An emergency order was issued August 27, which extended the district-wide closure already in effect for an additional 24 hours, and then reopened all sections except Kulukak for two days, followed by a district-wide closure (Table 11). In the public notice, it was stated that due to the large harvest, late date, and apparent high rate of exploitation, that further fishing time after this reduced opening was unlikely for the remainder of the season.

However, escapement trends improved to the point where a decision was reached to reopen the fishery on August 29. It was anticipated that the harvest would continue to drop off as it had just prior to the closure. Quite the contrary, the catch was excellent and the daily catch of over 14,000 coho on August 30, was the highest of the season (Table 17). An aerial survey on August 31 showed the coho escapement in the Kulukak River to be 11,000 and 40,000 in the Togiak River drainage (Table 36). In both systems the main body of fish were in the

lower portion of the river and just moving out of muddy water. With good numbers of fish still in the district and the weekend closure in effect, it was almost assured that the escapement goals would be met in both of these systems. The final emergency order was issued on August 31 and reopened the entire Togiak district effective September 3 to the regular weekly fishing schedule (Table 11).

The aerial surveillance program of all major district river drainages and the weir enumeration project in the Gechiak Creek drainage indicated a total district coho escapement of 104,000 fish (Appendix Table 43). Escapement goals in the two major river systems, Togiak and Kulukak, were set at 50,000 and 15,000, respectively. Actual coho escapement into these two systems were: Togiak - 61,000 and Kulukak - 32,000.

1984 SUBSISTENCE SALMON FISHERY

Historically, large numbers of salmon were harvested in Bristol Bay for feeding dog teams. This practice was greatly reduced with the introduction of the snow machine, but is recently increasing with the renewed interest in dog racing and sport mushing. Records of the subsistence removal in Bristol Bay's major river systems have been kept by the Department since 1963 when a permit system was initiated.

Subsistence catches of salmon in Bristol Bay normally range between 100-200,000 fish and have gradually increased in recent years (Appendix Table 55). Local population increases, better reporting and yearly influx of non-watershed participants have contributed to this increased harvest. Competition for resources and limited available fishing space has resulted in regulations in the Naknek River and Iliamna-Lake Clark drainages restricting salmon subsistence fishing to only those persons domiciled in those areas.

In 1982 a personal use fishery was allowed for the first time in Bristol Bay. It gave non-traditional subsistence users and non-watershed residents the opportunity to harvest salmon in times of surplus. The personal use fishery is only allowed on the Naknek River drainage and only when the sockeye escapement has reached 900,000 fish. During the 1984 season 31 personal use permits were issued and the harvest was 555 salmon.

Subsistence fishermen in Bristol Bay harvested 209,000 salmon in 1984, second only to 1980 when a record 213,000 were caught (Appendix Table 55). The harvest in 1984 exceeds the long-term Bristol Bay average of 152,000 since 1965 (Appendix Table 55). Due to large salmon escapements in all of the major river systems of Bristol Bay, subsistence fishermen were reportedly able to satisfy their requirements without difficulty.

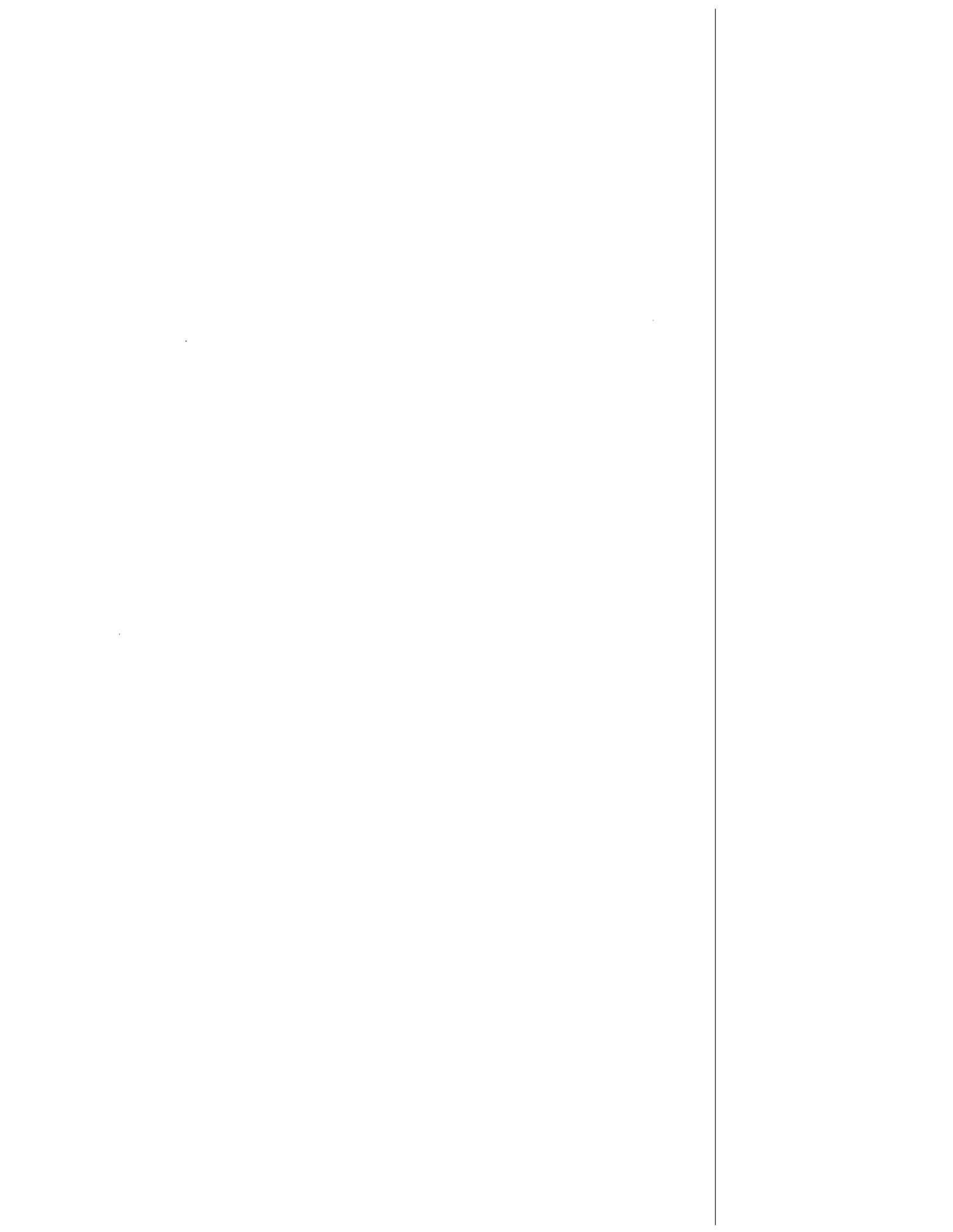
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TABLES



Table 1. Inshore run of sockeye salmon compared with the preseason forecast, escapement goals and forecast commercial catch, by river system and district, Bristol Bay, 1984.

District and River System	Number of Fish in Thousands									
	Inshore Forecast			Escapement 2/				Inshore Catch 2/		
	Forecast 1/	Actual	Run/Fore.	Goal	Range	Actual	Esc/Goal	Forecast	Actual	Catch/Fore.
NAKNEK-KVICHAK DISTRICT										
Kvichak River	16,704	22,782	1.36	10,000	8,000-12,000	10,491	1.05	6,704	12,292	1.83
Branch River 3/	305	539	1.77	185	170- 200	215	1.16	120	323	2.69
Naknek River	2,982	2,866	0.96	1,000	800- 1,400	1,242	1.24	1,982	1,623	0.82
Total 4/	19,991	26,187	1.31	11,185	8,970-13,600	11,948	1.07	8,806	14,238	1.62
EGEGIK DISTRICT	3,541	6,467	1.83	1,000	800- 1,200	1,165	1.17	2,541	5,301	2.09
UGASHIK DISTRICT	1,916	3,932	2.05	700	500- 900	1,270 5/	1.81	1,216	2,661	2.19
NUSHAGAK DISTRICT										
Wood River	2,666	2,186	0.82	1,000	700- 1,200	1,003	1.00	1,666	1,184	0.71
Igushik River	837	439	0.52	200	150- 250	185	0.93	637	254	0.40
Nuyakuk River	1,560	1,020	0.65	500	300- 700	473	0.95	1,060	547	0.52
Nushagak-Mul. Sys. 3/	152	259	1.70	50	40- 60	121	2.42	102	139	1.36
Snake River 3/	17	75	4.41	40	30- 50	34	0.85		41	41.00
Total 4/	5,232	3,979	0.76	1,790	1,220- 2,260	1,815	1.01	3,465	2,165	0.62
TOGIAC DISTRICT	453	520	1.15	150	140- 250	221 6/	1.47	303	319	1.05
TOTAL BRISTOL BAY 4/	31,133	41,084	1.32	14,825	11,630-18,210	16,400	1.11	16,331	24,684	1.51

1/ Final Bristol Bay sockeye salmon forecast of inshore run for 1984.

2/ Escapement data is final, while catch data is preliminary.

3/ These systems cannot be managed separately from the major system in the district. Consequently, the exploitation rates are merely the catch rates anticipated for the major system in the district; the corresponding escapement goals do not necessarily coincide with the escapement levels which would be achieved if these systems could be managed independently.

4/ Due to rounding, the totals may not equal the sum of the district totals.

5/ Including sockeye run to Mother Goose and Dog Salmon River systems.

6/ Including sockeye runs to the various tributaries and minor river systems of Togiak district.

Table 2. Inshore forecast of sockeye salmon age class return by river system and district, Bristol Bay, 1984.

District and River System	Number of Fish in Thousands										
	Age Class (Brood Year)					Age Class (Brood Year)					
	4(2)	(1980)	5(3)	(1979)	2-Ocean	5(2)	(1979)	6(3)	(1978)	3-Ocean	Total
NAKNEK-KVICHAK DISTRICT											
Kvichak River	6,041		7,314		13,355	2,982		367		3,349	16,704
Branch River	122		58		180	94		31		125	305
Naknek River	346		520		866	1,482		634		2,116	2,982
Total	6,509		7,892		14,401	4,558		1,032		5,590	19,991
EGEGIK DISTRICT	206		1,115		1,321	566		1,654		2,220	3,541
UGASHIK DISTRICT	229		858		1,087	684		145		829	1,916
NUSHAGAK DISTRICT											
Wood River	787		280		1,067	1,449		150		1,599	2,666
Igushik River	202		107		309	498		30		528	837
Nuyakuk River	327		47		374	1,162		24		1,186	1,560
Nush.-Mulch. Sys.	51	1/	3		54	82		16		98	152
Snake River	13		1		14	2		1		3	17
Total	1,380		438		1,818	3,193		221		3,414	5,232
TOGIAK DISTRICT	118		39		157	264		32		296	453
TOTAL BRISTOL BAY 2/	8,442		10,342		18,784	9,265		3,084		12,349	31,133

1/ Includes the 4(1) age class.

2/ Sockeye salmon of several minor age classes are expected to contribute an additional 1-2% to the total return.

Table 3. Inshore run of sockeye by age class, river system and district, Bristol Bay, 1984. 1/

District and River System	Number of Fish in Thousands by Age Class							Total
	4(2)	5(3)	2-Ocean	5(2)	6(3)	3-Ocean		
NAKNEK-KVICHAK DISTRICT								
Kvichak River								
Number	2,808	17,007	19,815	2,143	796	2,939	22,754	
Percent	12.3	74.7	87.1	9.4	3.5	12.9	100.0	
Branch River								
Number	98	31	129	272	136	408	537	
Percent	18.3	5.8	24.0	50.7	25.3	76.0	100.0	
Naknek River								
Number	683	760	1,443	899	489	1,388	2,831	
Percent	24.1	26.9	51.0	31.8	17.3	49.0	100.0	
Total	Number	3,589	17,798	21,387	3,314	1,421	4,735	26,122
	Percent	13.7	68.1	81.9	12.7	5.4	18.1	100.0
EGEGIK DISTRICT								
	Number	780	2,981	3,761	505	2,120	2,625	6,386
	Percent	12.2	46.7	58.9	7.9	33.2	41.1	100.0
UGASHIK DISTRICT								
	Number	1,140	1,387	2,527	814	498	1,312	3,839
	Percent	29.7	36.1	65.8	21.2	13.0	34.2	100.0
NUSHAGAK DISTRICT								
Wood River								
Number	473	27	500	1,617	114	1,731	2,231	
Percent	21.2	1.2	22.4	72.5	5.1	77.6	100.0	
Igushik River								
Number	19	15	34	426	17	443	477	
Percent	4.0	3.1	7.1	89.3	3.6	92.9	100.0	
Nuyakuk River								
Number	120	11	131	966	11	977	1,108	
Percent	10.8	1.0	11.8	87.2	1.0	88.2	100.0	
Total	Number	612	53	665	3,009	142	3,151	3,816
	Percent	16.0	1.4	17.4	78.9	3.7	82.6	100.0
TOGIK DISTRICT								
	Number	45	13	58	364	23	387	445
	Percent	10.1	2.9	13.0	81.8	5.2	87.0	100.0
TOTAL BRISTOL BAY								
	Number	6,166	22,232	28,398	8,006	4,204	12,210	40,608 2/
	Percent	15.2	54.8	69.9	19.7	10.4	30.1	100.0

1/ The inshore run data does not include the 1984 Japanese high seas catch of maturing Bristol Bay sockeye or the 1983 Japanese catch of immatures.

2/ Approximately 476,000 additional sockeye salmon of several minor age classes returning in 1984 are not included in this total.

Table 4. Inshore commercial catch and escapement of sockeye salmon,
Bristol Bay, 1984. 1/

District and River System	Number of Fish		
	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River	12,291,627	10,490,670	22,782,297
Branch River	323,201	215,370	538,571
Naknek River	1,623,127	1,242,474	2,865,601
Total	14,237,955	11,948,514	26,186,469
<u>EGEGIK DISTRICT</u>	5,301,198	1,165,320	6,466,518
<u>UGASHIK DISTRICT</u>			
Ugashik River		1,241,418	
Dog Salmon River		11,800	
Mother Goose System		17,100	
Total	2,661,330	1,270,318	3,931,648
<u>NUSHAGAK DISTRICT</u>			
Wood River	1,183,658	1,002,792	2,186,450
Igushik River	253,841	184,872	438,713
Nuyakuk River	547,070	472,596	1,019,666
Nushagak-Mul. Sys.	138,738	120,586	259,324
Snake River	41,360	33,840	75,200
Total	2,164,667	1,814,686	3,979,353
<u>TOGLIAK DISTRICT</u>			
Togiak Lake		95,448	
Togiak River and Tributaries		30,930	
Kulukak System		49,800	
Other Systems		24,600	
Total	318,863	200,778	519,641
<u>TOTAL BRISTOL BAY</u>	24,684,013	16,399,616	41,083,629

1/ Inshore catch and apportionment by river system to the Naknek-Kvichak and Nushagak districts is preliminary, while escapements are final.

Table 5. Inshore commercial catch and escapement of pink salmon,
Bristol Bay, 1984. 1/

District and River System	Number of Fish		
	Catch	Escapement	Total Run
<u>NAKNEK-KVICHAK DISTRICT</u>			
Kvichak River		165,000	
Branch River		1,000,000	
Naknek River		125,000	
Total	207,134	1,290,000	1,497,134
<u>EGEGIK DISTRICT</u>			
	5,679	4,000	9,679
<u>UGASHIK DISTRICT</u>			
	872	5	877
<u>NUSHAGAK DISTRICT</u>			
Wood River Drainage		81,400	
Igushik River		6,190	
Nuyakuk River 2/		2,602,182	
Nuyakuk River 3/		158,130	
Nushagak River		73,050	
Snake River		5,500	
Total	3,154,339	2,926,452	6,080,791
<u>TOGIK DISTRICT</u>			
Togiak River		260,150	
Osviak River		4,000	
Matogak River		5,800	
Total	20,550	269,950	290,500
TOTAL BRISTOL BAY	3,388,574	4,490,407	7,878,981

1/ Inshore district catches are preliminary, while escapements are final.

2/ Upriver from the counting station.

3/ Downriver from the counting station.

Table 6. Offshore test fishing catch indices and estimated inshore daily passage rate of sockeye salmon, Port Moller, Bristol Bay, 1984. 1/

Date	No. of Stations Fished	Sockeye Catch	Running Mean		Sockeye Salmon				Days Lag
			Weight (lbs.)	Length (mm)	Index 2/		Passage Rate 3/		
					Daily	Accum.	Daily	Accum.	
6/12	6	9	5.9	548	4	4	124	124	
13	5	25	5.5	545	14	18	362	472	
14	6	9	5.6	546	5	23	120	593	
15	5	18	5.9	552	9	33	191	666	
16	6	36	5.8	547	18	51	452	1,265	
17	5	119	5.8	546	55	106	1,395	2,676	
18	6	67	5.9	547	31	137	778	3,398	
19	5	58	5.9	548	27	165	638	3,838	
20	2	72	5.9	548	(55)	220	1,333	5,294	8
21	5	30	5.9	548	16	236	257	3,796	8
22	3	23	5.9	549	(12)	248	240	4,446	8
23	0	(30)	5.9	549	(30)	278	539	4,614	8
24	6	78	5.9	548	37	316	670	5,284	8
25	6	55	5.8	548	29	345	1,146	12,654	9
26	6	235	5.8	547	118	463	5,087	19,647	10
27	5	29	5.8	547	16	479	465	13,693	10
28	6	119	5.8	547	66	544	2,082	17,018	10
29	5	21	5.8	547	11	556	453	21,810	10
30	3	8	5.8	547	(6)	561	252	23,502	9
7/ 1	5	47	5.8	547	26	587	1,060	23,636	9
2	6	52	5.8	547	29	616	1,361	28,586	9
3	5	8	5.8	547	4	621	188	26,549	8
4	2	5	5.8	547	(5)	626	261	32,128	9
5	5	2	5.8	547	1	627	44	26,168	9
Total	114	1,155	5.8	547		627		26,168	

- 1/ Passage rates are those actually used inseason and adjusted daily as required.
2/ Indices expressed in fish/100 fathom hours and includes interpolations for missed days (in brackets) and stations.
3/ Estimated passage rate is expressed in thousands of fish and is adjusted throughout the season based on catchability and/or lag time.

Table 9. Summary of district sockeye salmon test fishing indices in the Nushagak district by index area and date, Bristol Bay, 1984. 1/

Index Area	Date										
	June 29		June 30		July 2		July 3		July 6		July 8
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	P.M.
Nushagak River				5,760							
Wood River											
Kanakanak Beach	40		2,540 2/		873		754 2/		2,520 2/		80 2/
Grassy Island	19		8,640	1,800	175		53		6,880	6,462	2,200 2/
Nushagak Point	0	34	5,160		320		517			2,580	3,376
Coffee Point	100 2/			2,160		576	120	1,813		640	
Combine Flats			7,040	2,256	303 2/	584	360	480		1,007 2/	2,839 2/
Clarks Point		946					152			560	
Ekuik Bluff	206	215 2/	204 2/		226			377		2,092 2/	
Schooner Ch. N.W.	533		28		185 2/			222 2/		945 2/	
Schooner Ch. S.E.											
Ships Ch. N.W.	100		23			57		366			
Ships Ch. S.E.											
Middle Ch. N.W.	98			680		55		286		84 2/	
Middle Ch. S.E.											
West Ch. N.W.						20		63		0	
West Ch. S.E.											
Dead Man's Spit											
Nichols Spit											

1/ All indices expressed in number of fish/100 fathom hours to the nearest full index point.

2/ Average of two consecutive drifts in the same index area.

Table 10. Daily king salmon catch per unit of effort in subsistence nets at Kanakanak Beach and Lewis Point, Nushagak district, 1984.

Date 1/	Wind 2/ Direction Knots		Catch Per Unit of Effort 3/			
			Kanakanak Beach		Lewis Point	
			CPUE	Effort 4/	CPUE	Effort 5/
6/ 5			0.5 6/			
5	SE	0- 5	0.4	30		
6	SE	0- 5	0	29		
6	S	5-10	0	31	0.4	8
7	S	5-10	0	31	0.1	7
7	S	0- 5	0.2	31	0.1	7
8			0 6/		0.4	8
8	S	0- 5	0	27		
9					0.1	8
9	NE	0- 3	0	28		
10		Calm	0	27	0	9
10	NW	0- 5	0	28		
11					0	9
11	SW	10-15	0	28	0.1	8
12	S	0- 3	0	28	0.1	8
12	SW	5-10	0	28	0	8
13	NE	10-15	0	27		
13	SE	10-15	0	33	0.1	8
14	S	0- 3	3.3	26	1.0	9
14			1.0 6/		0.6	8
15	SE	0- 3	0	27	0.7	19
15	S	10	0	21	0.4	
16					0.4	9
16					0.3	8
17					0.1	7
17					0.1	7
18	N	0- 5	1.5	6	0.3	10
18	SE	0- 3	3.6	5	0.3	8
19					1.2	10
20					0.5	5
20					0.6	8
21	SE	0- 3	0	7	0	5
21					0.1	8
22					2.0	8
22	SW	10-15	5.9	11	10.2	10

(continued)

Table 7. Offshore test fishing catch indices and estimated inshore daily passage rate of chum salmon, Port Moller, Bristol Bay, 1984.

Date	No. of Stations Fished	Chum Catch	Chum Salmon			
			Index 1/		Passage Rate 2/	
			Daily	Accumulative	Daily	Accumulative
6/12	6	10	5	5	47	47
13	5	2	1	6	11	57
14	6	12	6	12	63	120
15	5	15	8	20	77	197
16	6	14	7	27	70	267
17	5	10	5	32	47	314
18	6	13	6	38	60	374
19	5	14	7	45	74	448
20 3/	2	4	2	48	32	470
21	5	5	3	51	27	497
22 3/	3	2	1	51	11	508
23 3/	0			51		508
24	6	9	5	56	45	553
25	6	14	7	63	73	626
26	6	27	14	77	136	844
27	5	5	3	86	27	859
28	6	13	7	94	73	932
29	5	7	4	97	36	968
30 3/	3	2	2	100	23	991
7/ 1	5	12	7	106	66	1,057
2	6	4	2	109	22	1,079
3	5	1	1	109	5	1,085
4 3/	2	2	1	110	11	1,095
5	5	3	2	112	16	1,111
Total	114	207		112		1,111

1/ Indices expressed in fish/100 fathom hours.

2/ Estimated passage rate is expressed in thousands of fish, and is based on the historical average of 9,946 fish per adjusted index point (1979 not used in compiling average).

3/ Indices may not represent final interpolation for missed days and stations.

Table 8. Summary of district sockeye salmon test fishing indices in the Egegik district by index area and date, Bristol Bay, 1984. 1/

Index Area	Date	
	July 5	July 6
Coffee Point	133	
Red Bluff	1,509	
Ships Channel	393 2/	266 3/
North Marker	278	834 3/
South Marker	155	215 3/
Two Miles North of North Marker		191 3/

- 1/ All indices expressed in number of fish/100 fathom hours to the nearest full index point.
- 2/ Average of two consecutive drifts in the same index area.
- 3/ Several drop-outs of small sockeye noted on each drift, but not included in index values.

Table 11. (continued)

II. Commissioner's Announcements 1/			
Number	Effective Date		Description
AKN 01-84	July 12	9:00 a.m.	Waives the 48 hour waiting period for district transfers, changing type of gear fished, and relocation of set net sites in Egegik district as required under 5 AAC 06.370.
AKN 02-84	July 14	3:00 p.m.	Waives the 48 hour waiting period for district transfers, changing type of gear fished, and relocation of set net sites in Naknek-Kvichak district as required under 5 AAC 06.370.
DLG 01-84	July 10	3:00 p.m.	Waives the 48 hour waiting period for set net fishermen in the Igushik section of the Nushagak district, when relocating set net sites from Igushik section into Nushagak section.
III. General Announcements 1/			
Number	Date		Description
DLG 01	June 18	12:00 Noon	This is the ADF&G with an update on the Nushagak fishery: The Nushagak fishery is currently on hold to allow for adequate king salmon escapement. The sonar site near Portage Creek has tallied 18,000 counts to date, consisting of a mixture of kings, reds and chums. With a harvest of 30,000 kings and a desired escapement range of 50 to 100,000 fish, escapement is definitely inadequate at this time. We presently have no anticipation for any opening in the immediate future in the Nushagak district.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number	Date		Description
DLG 02	June 29	12:00 Noon	<p>This is the ADF&G in Dillingham with a general announcement concerning the status of the Nushagak fishery. The sockeye catch now stands at 550,000, which is well balanced with the escapement at this point in time. Escapement estimates to the three rivers are good and we are especially pleased with the main Nushagak River escapement of 170,000. Since the last fishing period, aerial surveys indicate the escapement rate to Wood River has significantly declined. We now need to see evidence of fish moving into the upper district and lower river before we can allow another opening. The test boat was sent out on the ebk this morning to determine if fish are in fact, moving into the upper district. We don't anticipate the long wait we experienced last year, as the fish appear to be migrating instead of holding. Because of the large difference between the two high tides, we strongly encourage fishermen to be prepared for a possible short notice opening, which may come on the smaller tide if necessary.</p>
DLG 03	June 30	8:20 a.m.	<p>Fishing time in Nushagak district is imminent. We recommend that all drift boat fishermen get their boats off on the morning's high water, and then standby for further announcements. Our test boat is out right now and is picking up fish on the inside, and depending upon these catches, we may be fishing very soon.</p>
DLG 04	July 6	12:00 Noon	<p>This is the ADF&G with a general announcement concerning the status of the sockeye salmon run in the Nushagak district. The Nushagak district catch stands at 1.1 million at this time and the last fishing period produced considerably less than expected if the run is at forecast level of 5.2 million fish. Escapement past the sonar site at Portage Creek is estimated at approximately 475,000 as of this morning and the Nuyakuk/main river goal has apparently been met.</p>

(continued)

Table 10. (continued)

Date 1/	Direction	Wind 2/ Knots	Catch Per Unit of Effort 3/			
			Kanakanak Beach		Lewis Point	
			CPUE	Effort 4/	CPUE	Effort 5/
6/23	SE	15-20	23.1	19	9.3	3
23					6.8	4
24					17.7	6
24					3.3	3
25					12.5	2
25	NE	10-15	2.5	11	5.0	1
26	N	5-10	3.8	12	13.7	3
26					2.0	1
27					10.3	3
27	S	5-10	0.1	12	0	1
28					17.5	2
Season Average CPUE and Effort			1.6	23	3.0	7

- 1/ Catches recorded at low water when nets are picked.
 2/ As recorded on Kananak Beach at time of survey.
 3/ Average number of kings per net (CPUE) at Kananak Beach in Dillingham, and at the lower fish camp location at Lewis Point on Nushagak River.
 4/ Total subsistence nets fishing on Kananak Beach.
 5/ Subsistence nets (index and non-index) monitored for CPUE.
 6/ Nets not checked; estimate from telephone survey.

Table 11. Emergency order commercial salmon fishing periods, Commissioner's announcements, and general announcements, by district, Bristol Bay, 1984.

I. Emergency Orders 1/

Number	Date and Time		Hours/Days Open
<u>NAKNEK-KVICHAK DISTRICT</u>			
AKN 05	June 29	11:00 p.m. to June 30	11:00 a.m. 12 hrs.
AKN 08	July 2	1:00 a.m. to July 2	1:00 p.m. 12 hrs.
AKN 11	July 4	4:00 p.m. to July 5	4:00 a.m. 12 hrs.
AKN 13	July 5	4:00 a.m. to July 5	4:00 p.m. 12 hrs.
AKN 17	July 7	8:00 p.m. to July 8	8:00 a.m. 12 hrs.
AKN 18	July 7	7:00 p.m. to July 8	7:00 p.m. 24 hrs. 2/
AKN 19	July 8	7:00 p.m. to July 9	7:00 p.m. 24 hrs.
AKN 20	July 9	7:00 p.m. to July 10	8:00 p.m. 25 hrs.
AKN 24	July 11	10:00 p.m. to July 12	10:00 a.m. 12 hrs.
AKN 28	July 12	10:00 a.m. to July 12	10:00 p.m. 12 hrs.
AKN 31	July 12	10:00 p.m. to July 13	11:00 p.m. 25 hrs.
AKN 33	July 13	11:00 p.m. to July 14	11:00 p.m. 24 hrs.
AKN 35	July 14	11:00 p.m. to July 17	9:00 a.m. 2 days, 10 hrs.
<u>Naknek Section Only</u>			
AKN 03	June 29	11:00 a.m. to June 29	11:00 p.m. 12 hrs.
AKN 06	July 1	1:00 p.m. to July 2	1:00 a.m. 12 hrs.
AKN 14	July 5	4:00 p.m. to July 6	4:00 a.m. 12 hrs.
AKN 15	July 6	4:00 a.m. to July 6	4:00 p.m. 12 hrs.
<u>EGEGIK DISTRICT</u>			
AKN 01	June 26	7:00 p.m. to June 27	7:00 p.m. 24 hrs.
AKN 02	June 29	12:00 Noon to June 30	12:00 Noon 24 hrs.
AKN 07	July 1	10:00 p.m. to July 2	12:00 Noon 14 hrs.
AKN 09	July 2	12:00 Noon to July 2	12:00 MN 12 hrs.
AKN 16	July 7	4:00 a.m. to July 7	5:00 p.m. 13 hrs.
AKN 20	July 9	6:00 a.m. to July 9	6:00 p.m. 12 hrs.
AKN 21	July 9	6:00 p.m. to July 10	7:00 p.m. 25 hrs.
AKN 23	July 10	7:00 p.m. to July 11	8:00 p.m. 25 hrs.
AKN 26	July 11	8:00 p.m. to July 12	10:00 p.m. 26 hrs.
AKN 29	July 12	10:00 p.m. to July 17	9:00 a.m. 4 days, 11 hrs.
AKN 37	July 21	9:00 a.m. to July 23	9:00 a.m. 48 hrs.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number	Date	Description
DLG 04	July 6 12:00 Noon (continued)	<p>Igushik River escapement is not strong and stands at 76,000 this morning, less than 1/2 of the goal and catches on the beach have been poor for this point in time. The Wood River escapement just reached 50% of the goal this morning, however, this morning's aerial survey indicated that the daily rate is increasing, which is encouraging. Continued aerial surveillance of the river will indicate whether this increasing trend will continue. The Nushagak outside test boat departed on this morning's tide and his catches will help to determine run strength and fish movement into the inner district. At this time indications are that we are looking at less than forecast in Nushagak district. However, if the Wood River escapement trend continues to increase and test boat catches are strong, things may not be as dire as they looked yesterday. Because of the date, caution is necessary at this time to insure that the Wood River escapement is met.</p>
DLG 05	Aug. 7 12:00 Noon	<p>This is the ADF&G with an announcement concerning fishing time in the Nushagak district. Through Monday, August 6th, the district catch stands at 220,000 coho, well above the recent 10-year average of 109,000. However, the escapement of 20,000 coho past the Portage Creek sonar site is not adequate to meet season escapement goals. The Nushagak district shall be closed to fishing from 9:00 a.m., Wednesday, August 8 until 9:00 a.m., Monday, August 13, 1984. If the coho escapement does not respond to this 5-day closure, additional closed time can be expected. We will announce next week's fishing schedule at 12:00 noon, on Sunday, August 12, 1984.</p>

(continued)

Table 11. (continued)

III. General Announcements 1/

Number	Date	Description
DLG 06	August 12 12:00 Noon	This is the ADF&G with an announcement concerning fishing time in the Nushagak district. Through Saturday, Aug. 11, the coho salmon escapement past the Portage Creek sonar site has totaled only 50,000, and the daily escapement rate is not adequate to meet season escapement goals without additional closure. The district coho salmon catch of 252,000 is the third largest ever; however, the large fleet working the Nushagak this season has effectively slowed the coho escapement to the point where additional protection will be required. Through this date approximately 80% of the coho run has been accounted for. To improve the escapement rate, the Nushagak district closure now in effect will be extended through 9:00 a.m., Wednesday, Aug. 15. If the coho escapement does not respond to this additional protection, continued closure can be expected. We will announce on Tuesday, August 15, if fishing will resume the following day.
DLG 07	August 14 9:00 a.m.	This the the ADF&G with an announcement concerning fishing time in the Nushagak district. The Nushagak district will remain closed to fishing until further notice. The daily coho salmon escapement rate past the Portage Creek sonar continues to drop with an accumulated total of 65,000 coho, less than half of the escapement requirement. We will continue to assess the daily escapement, and if it shows a marked improvement, we will announce fishing time. However, the fishery will remain closed from 9:00 a.m., Tuesday, August 14, until further notice.

- 1/ Prefix code on emergency orders and Commissioner's announcements and general announcements indicate where announcements originated ("AKN" for the King Salmon field office and "DLG" for the Dillingham field office).
- 2/ This emergency order supersedes emergency order No. 17.
- 3/ Closed to fishing.
- 4/ Reopens section(s) to the regular weekly fishing schedule.

Table 11. (continued)

I. Emergency Orders 1/

Number	Date and Time		Hours/Days Open
<u>UGASHIK DISTRICT</u>			
AKN 01	June 26	7:00 p.m. to June 27	7:00 p.m. 24 hrs.
AKN 04	June 29	10:00 p.m. to June 30	11:00 p.m. 25 hrs.
AKN 10	July 3	1:00 a.m. to July 4	2:00 a.m. 25 hrs.
AKN 12	July 5	3:00 a.m. to July 6	4:00 a.m. 25 hrs.
AKN 16	July 7	4:00 a.m. to July 7	5:00 p.m. 13 hrs.
AKN 20	July 9	6:00 a.m. to July 9	6:00 p.m. 12 hrs.
AKN 25	July 11	9:00 a.m. to July 11	9:00 p.m. 12 hrs.
AKN 27	July 12	10:00 a.m. to July 12	10:00 p.m. 12 hrs.
AKN 30	July 13	11:00 a.m. to July 13	11:00 p.m. 12 hrs.
AKN 32	July 13	11:00 p.m. to July 14	11:00 p.m. 24 hrs.
AKN 34	July 14	11:00 p.m. to July 15	12:00 MN 25 hrs.
AKN 36	July 15	12:00 MN to July 16	12:00 MN 24 hrs.
AKN 37	July 21	9:00 a.m. to July 23	9:00 a.m. 48 hrs.
<u>NUSHAGAK DISTRICT</u>			
DLG 01	June 11	9:00 a.m. to June 12	12:00 Noon;
	June 13	12:00 Noon to June 16	9:00 a.m. 4 days 3/
DLG 03	June 25	10:00 a.m. to June 25	10:00 p.m. 12 hrs.
DLG 05	June 27	11:00 a.m. to June 27	11:00 p.m. 12 hrs.
DLG 06	July 1	3:00 a.m. to July 1	3:00 p.m. 12 hrs.
DLG 07	July 4	6:00 p.m. to July 5	6:00 a.m. 12 hrs.
DLG 08	July 7	8:00 a.m. to July 7	8:00 p.m. 12 hrs.
DLG 17	July 28	9:00 a.m. to July 30	9:00 a.m. 48 hrs.
DLG 19	Aug. 8	9:00 a.m. to Aug. 13	9:00 a.m. 5 days 3/
DLG 20	Aug. 13	9:00 a.m. to Aug. 15	9:00 a.m. 48 hrs. 3/
DLG 21	Aug. 15	9:00 a.m. to Sept. 30	12:00 MN 46 days, 15 hrs. 3/
DLG 23	Aug. 23	9:00 a.m. to Aug. 27	9:00 a.m. 4 days
<u>Nushagak Section Only</u>			
DLG 09	July 9	9:00 a.m. to July 9	11:00 p.m. 14 hrs.
DLG 11	July 9	11:00 p.m. to July 10	11:00 p.m. 24 hrs.
DLG 12	July 10	11:00 p.m. to July 11	11:00 p.m. 24 hrs.
DLG 13	July 11	11:00 p.m. to July 13	9:00 a.m. 34 hrs.
DLG 14	July 13	9:00 a.m. to July 17	9:00 a.m. 4 days
<u>Igushik Section Only</u>			
DLG 02	June 23	9:00 a.m. to June 23	9:00 p.m. 12 hrs.
DLG 04	June 26	10:00 a.m. to June 26	10:00 p.m. 12 hrs.
DLG 05	June 26	10:00 p.m. to June 27	11:00 a.m. 13 hrs.

(continued)

Table 11. (continued)

I. Emergency Orders 1/

Number	Date and Time		Hours/Days Open
<u>TOGIAK DISTRICT</u>			
<u>Togiak River Section Only</u>			
DLG 10	July 9	9:00 a.m. to July 10	9:00 a.m. 24 hrs.3/
DLG 15	July 13	9:00 a.m. to July 14	9:00 a.m. 24 hrs.
DLG 16	July 23	9:00 a.m. to July 27	9:00 a.m. 4 days 3/
DLG 18	July 30	9:00 a.m. to Aug. 3	9:00 a.m. 4 days 3/
DLG 22	Aug. 20	9:00 a.m. to Aug. 21	9:00 a.m. 24 hrs.3/
DLG 24	Aug. 27	9:00 a.m. to Aug. 28	9:00 a.m. 24 hrs.3/
DLG 25	Aug. 28	9:00 a.m. to Aug. 29	9:00 a.m.; 24 hrs.3/
	Aug. 31	9:00 a.m. to Sept. 30	12:00 MN 30 days, 15 hrs.3/
DLG 26	Monday	9:00 a.m. to Friday	9:00 a.m. - 4/
<u>Kulukak Section Only</u>			
DLG 16	July 23	9:00 a.m. to July 28	9:00 a.m. 5 days 3/
DLG 22	Aug. 17	6:00 p.m. to Aug. 21	9:00 a.m. 3 days, 15 hrs.3/
DLG 24	Aug. 24	9:00 a.m. to Aug. 28	9:00 a.m. 4 days 3/
DLG 25	Aug. 29	9:00 a.m. to Aug. 31	9:00 a.m. 48 hrs.3/
DLG 26	Monday	9:00 a.m. to Saturday	9:00 a.m. - 4/
<u>Matogak, Osviak and Cape Peirce Sections Only</u>			
DLG 22	Aug. 17	6:00 p.m. to Aug. 21	9:00 a.m. 3 days, 15 hrs.3/
DLG 24	Aug. 24	9:00 a.m. to Aug. 28	9:00 a.m. 4 days 3/
DLG 25	Aug. 28	9:00 a.m. to Aug. 29	9:00 a.m.; 24 hrs.3/
	Aug. 31	9:00 a.m. to Sept. 30	12:00 MN 30 days, 15 hrs.3/
DLG 26	Monday	9:00 a.m. to Saturday	9:00 a.m. - 4/

(continued)

Table 12. Commercial salmon catch by period and species, Naknek-Kvichak district, Bristol Bay, 1984.

Period	Time	Effort 1/		Number of Fish					Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho	
6/ 4- 9	5 days				16				16
11-16	5 days			2,185	521	508			3,214
18	15 days			11,216	537	4,040			15,793
19	24 hrs.			20,272	906	3,668			24,846
20	24 hrs.			48,969	651	3,975			53,595
21	24 hrs.			158,258	637	7,738			166,633
22	24 hrs.			142,815	401	6,217			149,433
23	9 hrs.			96,841	405	4,543			101,789
29 2/	13 hrs.	625	176	494,148	164	7,179			501,491
30 2/	11 hrs.	625	315	544,294	129	6,872			551,295
7/ 1 3/	11 hrs.			516,223	104	7,277			523,604
2 3/	13 hrs.			1,201,526	388	17,800			1,219,714
4	8 hrs.			537,550	69	7,740			545,359
5 4/	24 hrs.	800	315	1,668,794	266	18,050			1,687,110
6 4/	16 hrs.			857,917	123	7,669	13		865,722
7	5 hrs.			255,453	29	3,943			259,425
8	24 hrs.	950	315	1,604,107	258	30,493	3		1,634,861
9	24 hrs.			1,169,295	225	22,564	1		1,192,085
10	20 hrs.	900	315	1,360,461	200	24,591	2		1,385,254
11-12	26 hrs.			964,582	270	21,975	10		986,837
13	24 hrs.			767,685	254	20,641	10		788,590
14	24 hrs.			614,778	230	16,013	7		631,028
15	24 hrs.			491,789	279	30,105	1,553		523,726
16	24 hrs.			400,649	452	22,098	861		424,060
17	24 hrs.			162,361	296	16,814	561		180,032
18	24 hrs.			57,494	226	14,690	552	3	72,965
19	24 hrs.			34,944	147	8,386	1,107	9	44,593
20-22	33 hrs.			27,808	198	15,268	5,859	9	49,142
23-28	5 days			25,540	774	74,877	185,161	349	286,701
30-8/4	5 days			1		181	105	53	340
6-11	5 days				23	283	11,329	1,128	12,763
13-18	5 days				13	29		568	610
20-25	5 days				7	8		686	701
Total				14,237,955	9,198	426,235	207,134	2,805	14,883,327
Percent of District	Catch			95.7	+	2.9	1.4	+	100.0

1/ Estimated fishing effort based on aerial surveys.

2/ Naknek section only from 11:00 a.m., June 29 until 11:00 p.m., June 29 followed by entire district until 11:00 a.m., June 30.

3/ Naknek section only from 1:00 p.m., July 1, until 1:00 a.m., July 2 followed by entire district until 1:00 p.m., July 2.

4/ Entire district until 4:00 p.m., July 5, followed by Naknek section only until 4:00 p.m., July 6.

Table 13. Commercial salmon catch by period and species, Egegik district, Bristol Bay, 1984.

Period	Time	Effort 1/		Number of Fish				Coho	Total
		Drift	Set	Sockeye	King	Chum	Pink		
5/28-6/2	5 days			5	19				24
6/ 4- 9	5 days		11	14	29				43
11	15 hrs.			157	17	9			183
12	24 hrs.			561	209	71			841
13	24 hrs.			1,286	205	89			1,580
14	24 hrs.			2,265	150	158			2,573
15	24 hrs.			3,641	205	317			4,163
16	9 hrs.			999	50	101			1,150
18	15 hrs.	169	38	32,790	284	3,455			36,529
19	24 hrs.			62,892	439	4,078			67,409
20	24 hrs.			55,509	364	3,438			59,311
21	24 hrs.			74,062	299	5,617			79,978
22	24 hrs.	340	138	66,715	248	4,342			71,305
23	9 hrs.			44,679	151	2,713			47,543
26-27	24 hrs.	301	203	779,312	607	17,333			797,252
29	12 hrs.	340	200	253,481	189	5,836			259,506
30	12 hrs.			439,122	243	10,499			449,864
7/ 1- 2	26 hrs.	349	189	802,612	339	15,304			818,255
7	13 hrs.	157	185	485,867	96	8,790			494,753
9	18 hrs.			458,202	35	9,917			468,154
10	24 hrs.			429,308	54	10,101			439,463
11	24 hrs.			262,750	44	6,159			268,953
12	24 hrs.	174	185	214,392	31	8,654			223,077
13	24 hrs.			192,326	31	7,100			199,457
14	24 hrs.	130		194,232	39	7,374			201,645
15	24 hrs.			184,350	36	9,845		1	194,232
16	24 hrs.			119,641	22	9,713			129,376
17	24 hrs.			62,668	43	6,455			69,166
18	24 hrs.	84		33,155	27	5,365			38,547
19	24 hrs.			14,601	29	2,143	46		16,819
20	24 hrs.			14,268	12	3,662		21	17,963
21	24 hrs.			5,965	19	1,062	108	148	7,302
22	24 hrs.			3,111	19	1,240	7	154	4,531
23	24 hrs.			1,173	12	1,271		224	2,680
24	24 hrs.			1,281	12	1,185		270	2,748
25	24 hrs.			489	18	1,202		618	2,327
26	24 hrs.			552	9	1,640		869	3,070

(continued)

Table 13. (continued)

Period	Time	Effort 1/		Number of Fish					Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho	
7/27	24 hrs.			497	7	1,410		1,109	3,023
28	9 hrs.			115	3	308		391	817
30	15 hrs.			348	4	912	85	1,818	3,167
31	24 hrs.	2	41	277	12	822	339	2,431	3,881
8/ 1	24 hrs.			336	7	543	330	2,127	3,343
2	24 hrs.			124	4	259	354	1,376	2,117
3	24 hrs.			179	5	356	644	2,163	3,347
4	9 hrs.			1		9	13	21	44
6	15 hrs.			105	2	394	278	2,730	3,509
7	24 hrs.			135	1	482	572	3,003	4,193
8	24 hrs.			161	5	428	427	2,857	3,878
9	24 hrs.			77	2	299	202	2,089	2,669
10	24 hrs.			44	3	192	196	2,789	3,224
11	9 hrs.			42	1	73	76	1,080	1,272
13	15 hrs.			59	2	128	347	5,005	5,541
14	24 hrs.			80	6	160	399	4,496	5,141
15	24 hrs.			28	4	85	257	3,260	3,634
16	24 hrs.			20	1	58	165	2,719	2,963
17	24 hrs.			28	1	43	92	2,454	2,618
18	9 hrs.			14	1	22	57	650	744
20	15 hrs.			12		20	70	1,998	2,100
21	24 hrs.			21		24	78	2,735	2,858
22	24 hrs.			20		12	72	1,822	1,926
23	24 hrs.			10		8	80	1,897	1,995
24	24 hrs.			13		11	102	1,791	1,917
25	9 hrs.			4		10	2	513	529
27	15 hrs.			5		3	48	934	990
28	24 hrs.			1		4	65	1,051	1,121
29	24 hrs.			2		1	20	1,060	1,083
30	24 hrs.			1	1	2	76	1,311	1,391
31	24 hrs.			1			45	699	745
9/ 1	9 hrs.			5		1	27	339	372
3- 9	5 days							2,539	2,539
10-15	5 days							535	535
17-22	5 days							82	82
Total				5,301,198	4,707	183,317	5,679	66,179	5,561,080
Percent of District Catch				95.3	0.1	3.3	0.1	1.2	100.0

1/ Estimated fishing effort based on aerial surveys.

Table 14. Commercial salmon catch by period and species, Ugashik district, Bristol Bay, 1984.

Period	Time	Effort 1/		Number of Fish					Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho	
6/ 4- 9	5 days	5	3		77				77
11	15 hrs.			4	68				72
12	24 hrs.			2	62				64
13	24 hrs.			17	147				164
14	24 hrs.			25	236				261
15	24 hrs.			4	41				45
16	9 hrs.			58	85				143
18	15 hrs.	22	4	838	391	311			1,540
19	24 hrs.			2,179	671	887			3,737
20	24 hrs.			5,520	497	1,856			7,873
21	24 hrs.			14,242	409	4,081			18,732
22	24 hrs.			14,004	317	4,349			18,670
23	9 hrs.			7,338	110	1,867			9,315
26-27	24 hrs.	64	33	110,290	212	11,864			122,366
29-30	25 hrs.			119,010	217	9,937			129,164
7/ 3-4	25 hrs.	52	40	234,359	191	16,226			250,776
5-6	25 hrs.			206,694	117	10,101			216,912
7	13 hrs.	100	40	202,243	51	6,809			209,103
9	12 hrs.		42	252,977	76	8,035			261,088
11	12 hrs.	150	49	101,285	83	4,681			106,049
12	12 hrs.	137	56	86,716	76	4,153	1		90,946
13	13 hrs.			177,837	25	5,299	1		183,162
14	24 hrs.	177	56	375,817	90	17,766			393,673
15	24 hrs.			309,114	82	22,208			331,404
16	24 hrs.			131,718	46	6,400			138,164
17	15 hrs.			111,114	85	8,950		51	120,200
18	24 hrs.	148	45	77,444	80	11,161		104	88,789
19	24 hrs.			44,145	40	9,785		116	54,086
20	24 hrs.			29,672	33	9,149		84	38,938
21	24 hrs.			19,677	36	8,324		24	28,061
22	24 hrs.			7,147	15	5,248	223	2	12,635
23	24 hrs.			5,809	13	3,778	120		9,720
24	24 hrs.			3,367	20	2,973			6,360
25	24 hrs.			2,450	20	2,122		30	4,622
26	24 hrs.			2,264	5	2,265		63	4,597
27	24 hrs.			1,896	5	2,161		49	4,111
28	9 hrs.			127	1	4		35	167
30	15 hrs.			457	2	396	3	111	969
31	24 hrs.			750	8	1,143		216	2,117
8/ 1	24 hrs.			504	4	492	9	126	1,135

(continued)

Table 14. (continued)

Period	Time	Effort 1/		Number of Fish					Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho	
8/ 2	24 hrs.			553	6	174		66	779
3	24 hrs.			179	4	243		57	483
4	9 hrs.			50		23		20	93
6	15 hrs.			154	2	36		106	298
7	24 hrs.			300	2	232		282	816
8	24 hrs.			397	2	529		302	1,230
9	24 hrs.			61	3	285		294	643
10	24 hrs.			76	2	944		609	1,631
11	9 hrs.			79		464		280	823
13	15 hrs.			342	2	761		1,605	2,710
14	24 hrs.			35	3	925		2,662	3,625
15	24 hrs.				1	264		1,648	1,913
16	24 hrs.				2	463	13	3,712	4,190
17	24 hrs.				4	286	50	5,749	6,089
18	9 hrs.					41	39	1,252	1,332
20	15 hrs.					49	63	2,826	2,938
21	24 hrs.					81	34	5,246	5,361
22	24 hrs.				1	45	26	3,289	3,361
23	24 hrs.			1	3	31	59	3,665	3,759
24	24 hrs.					17	48	5,466	5,531
25	9 hrs.							1,465	1,465
27	15 hrs.			7		5	66	2,284	2,362
28	24 hrs.					6	22	4,654	4,682
29	24 hrs.						44	3,975	4,019
30	24 hrs.			2		6	15	3,395	3,418
31	24 hrs.	15	14				13	2,208	2,221
9/ 1	9 hrs.						8	523	531
3	15 hrs.					1	1	1,845	1,847
4	24 hrs.				1	2	14	2,499	2,516
5	24 hrs.							1,678	1,681
6	24 hrs.							982	982
7	24 hrs.							914	914
8	9 hrs.							336	336
10	15 hrs.							506	506
11	24 hrs.							902	902
12	24 hrs.							246	246
13	24 hrs.							155	155
14	24 hrs.							74	74
Total				2,661,330	4,782	210,694	872	68,788	2,946,466
Percent of District Catch				90.3	0.2	7.2	+	2.3	100.0

1/ Estimated fishing effort based on aerial surveys.

Table 15. Commercial salmon catch by period and species, Nushagak district, Bristol Bay, 1984.

Period	Time	Effort 1/		Number of Fish					
		Drift	Set	Sockeye	King	Chum	Pink	Coho	Total
5/22	24 hrs.				1				1
24	24 hrs.				12				12
25	24 hrs.				32				32
26	9 hrs.				32				32
28	15 hrs.				21				21
29	24 hrs.				501				501
30	24 hrs.				655				655
31	24 hrs.				207				207
6/ 1	24 hrs.				236	1			237
2	9 hrs.				201	1			202
4	15 hrs.	132			2,472	6			2,478
5	24 hrs.	170			4,062	4			4,066
6	24 hrs.	165		3	1,510	9			1,522
7	24 hrs.	230		2	4,097	35			4,134
8	24 hrs.	342		17	3,386	61			3,464
9	9 hrs.	24		2	547	14			563
12-13	24 hrs.	550		384	12,461	689			13,534
23 2/	12 hrs.	220	41	26,972	918	3,942			31,832
25	12 hrs.	350	227	211,338	12,040	106,828	3		330,209
26 2/	14 hrs.	300	68	67,447	2,190	33,928			103,565
27 3/	23 hrs.	400		214,453	2,005	104,536	1		320,995
7/ 1	12 hrs.	400		302,580	2,623	123,685	15		428,903
4- 5	12 hrs.	434	259	288,578	1,795	67,649	1		358,023
7	12 hrs.	330	180	254,889	1,064	42,822	9		298,784
9 4/	15 hrs.	332	184	208,040	1,101	37,394	57	5	246,597
10 4/	24 hrs.			118,425	597	24,182	194	1	143,399
11 4/	24 hrs.	185	137	95,227	630	21,228	360	5	117,450
12 4/	24 hrs.			77,420	367	16,812	536	31	95,166
13 4/	24 hrs.	142	13	83,804	336	14,934	1,272	21	100,367
14 4/	24 hrs.	127		72,139	369	15,025	1,591	174	89,298
15 4/	24 hrs.	144		43,728	444	9,664	4,123	283	58,242
16 4/	24 hrs.	142		34,454	1,173	17,966	13,000	1,760	68,353
17 5/	24 hrs.	126		20,966	1,061	10,686	11,520	2,612	46,845
18	24 hrs.	163		11,786	392	5,970	24,467	1,890	44,505
19	24 hrs.	136		5,295	138	4,544	25,861	5,452	41,290
20	24 hrs.	130		6,583	133	2,679	34,887	5,715	49,997
21	9 hrs.			2,533	36	467	16,099	1,042	20,177
23	15 hrs.	371		2,559	203	3,975	178,982	13,500	199,219
24	24 hrs.	395		4,297	187	2,776	283,032	10,702	300,994
25	24 hrs.	379		2,719	269	2,015	316,939	10,601	332,543

(continued)

Table 15. (continued)

Period	Time	Effort 1/		Number of Fish					Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho	
7/26	24 hrs.	364		1,443	107	1,232	265,926	5,211	273,919
27	24 hrs.	361		891	102	905	282,671	6,128	290,697
28	24 hrs.	273		1,511	136	1,530	311,552	24,945	339,674
29	24 hrs.	325		1,116	48	175	157,238	35,361	193,938
30	24 hrs.	387		1,864	46	488	293,657	19,146	315,201
31	24 hrs.	450		785	16	496	214,103	35,900	251,300
8/ 1	24 hrs.	468		110	39	91	208,867	10,803	219,910
2	24 hrs.	454		109	29	108	184,449	12,681	197,376
3	24 hrs.	490		64	41	61	163,995	4,681	168,842
4	9 hrs.			36	5	16	23,700	666	24,423
6	15 hrs.	315		31	20	44	60,218	22,365	82,678
7	24 hrs.	445		30	20	123	57,851	26,268	84,292
8	9 hrs.			13	4	43	16,709	5,186	21,955
23	15 hrs.	67	29	11		1	152	1,112	1,276
24	24 hrs.	5		2	1	2	147	3,318	3,470
25	24 hrs.	11		3			31	1,322	1,356
26	24 hrs.	29				3	30	666	699
27	24 hrs.	54		3			72	274	349
28	24 hrs.	12					2	26	28
29	24 hrs.	15			1		2	185	188
30	24 hrs.	25		3	5			437	445
31	24 hrs.	1						35	35
9/ 1	9 hrs.	1		2				56	58
4	24 hrs.	1						60	60
5	24 hrs.	7						347	347
6	24 hrs.	4						131	131
7	24 hrs.	11						376	376
Total				2,164,667	61,124	679,845	3,154,339	271,570	6,331,545
Percent of District Catch				34.2	1.0	10.7	49.8	4.3	100.0

1/ Estimated fishing effort based on aerial surveys and on reliable CPUE data from selected processors; beginning July 14 drift effort totals includes some set nets.

2/ Igushik section only.

3/ Igushik section 12 midnight to 11 a.m., entire district 11 a.m. to 11 p.m.

4/ Nushagak section only.

5/ Nushagak section only 12 midnight to 9 a.m., entire district 9 a.m. to 12 midnight.

Table 16. Commercial sockeye salmon catch by period from Clarks Point, Ekuk and Igushik beaches, Nushagak district, Bristol Bay, 1984.

Period	Time	Number of Fish		
		Clarks Point Beach 5/	Ekuk Beach 6/	Igushik Beach 7/
6/ 3-13			106	
23 1/	12 hrs.			4,692
25	12 hrs.	150	2,811	3,110
26 1/	14 hrs.			2,130
27 2/	23 hrs.	226	12,881	2,530
7/ 1	12 hrs.	1,616	3,502	5,058
4- 5	12 hrs.	1,854	22,199	11,662
7	12 hrs.	3,039	20,061	6,031
9 3/	15 hrs.	2,155	23,892	
10 3/	24 hrs.	1,165	19,374	
11 3/	24 hrs.	411	10,249	
12 3/	24 hrs.	293	6,610	
13 3/	24 hrs.	539	12,935	
14 3/	24 hrs.	1,075	20,645	
15 3/	24 hrs.	373	7,623	
16 3/	24 hrs.	770	6,545	
17 4/	24 hrs.	249	5,072	
18	24 hrs.	142	2,397	
19	24 hrs.	52	770	
20	24 hrs.	15	947	
21	9 hrs.	14	589	
23	15 hrs.		184	
24	24 hrs.		387	
25	24 hrs.		267	
26	24 hrs.		227	
7/27-8/8			700	
Total		14,138	180,973	35,213

1/ Igushik section only.

2/ Igushik section only, 12 midnight to 11 a.m., entire district 11 a.m. to 11 p.m.

3/ Nushagak section only.

4/ Nushagak section only 12 midnight to 9 a.m., entire district 9 a.m. to 12 midnight.

5/ Approximate fishing effort was 20 set nets. Sockeye salmon accounted for 91.8% of the total beach catch; catch of other species included 153 kings, 710 chums, and 399 cohos.

6/ Approximate fishing effort was 85 set nets. Sockeye salmon accounted for 45.6% of the total beach catch; catch of other species included 963 kings, 6,744 chums, 194,304 pinks and 13,769 cohos.

7/ Approximate fishing effort was 7 skiffs and 68 set nets. Sockeye salmon accounted for 91.4% of the total beach catch; catch of other species included 199 kings and 3,127 chums.

Table 17. Commercial salmon catch by period and species, Togiak district, Bristol Bay, 1984.

Period 1/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
6/12	124	859	269			1,252
13	171	464	312			947
14	247	368	280			895
15	118	380	423			921
16	15	13	29			57
18	973	959	1,874			3,806
19	1,232	1,485	2,601			5,318
20	1,859	1,190	4,336			7,385
21	1,917	1,131	4,927	3		7,978
22	2,123	808	4,673	4		7,608
23	95	29	129			253
25	3,715	1,424	4,862	10		10,011
26	7,751	2,427	10,406	19		20,603
27	8,871	1,501	18,895	43		29,310
28	7,716	1,358	17,874	33		26,981
29	3,711	432	7,188	12		11,343
7/ 2	7,039	767	17,445	43		25,294
3	9,842	1,087	20,998	113		32,040
4	11,717	822	21,312	103		33,954
5	15,709	889	18,110	156		34,864
6	16,627	243	10,162	87		27,119
7	3,195	14	2,635	59		5,903
9 2/	5,300	53	5,857	68		11,278
10	27,679	443	23,427	342		51,891
11	29,732	356	25,560	327		55,975
12	26,953	441	22,802	443	1	50,640
13 3/	20,524	261	13,893	197	1	34,876
14	5,070	78	2,755	16		7,919
16	20,679	169	16,961	268		38,077
17	21,156	286	13,929	554	1	35,926
18	18,125	222	13,426	863	22	32,658
19	18,100	255	13,616	894	2	32,867
20	9,328	196	6,128	957	1	16,610
21	882	7	422	67		1,378
23 4/	1,259	26	1,419	761	31	3,496
24	1,424	64	1,771	1,339	80	4,678
25	1,112	42	1,224	1,423	82	3,883
26	1,174	29	970	1,277	36	3,486
27	249	6	102	189	13	559
30 5/	467	2	309	662	185	1,625
31	900	21	701	1,315	525	3,462

(continued)

Table 17. (continued)

Period 1/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
8/ 1	609	27	348	917	501	2,402
2	111	1	53	147	169	481
3	2	1	8	8	24	43
6	346	21	276	531	2,261	3,435
7	769	49	882	1,627	5,592	8,919
8	811	69	927	1,705	7,960	11,472
9	302	26	345	774	4,767	6,214
10	400	28	461	720	6,516	8,125
11	42	4	37	76	1,080	1,239
13	34	5	39	82	1,495	1,655
14	173	23	203	420	13,240	14,059
15	96	18	160	251	12,280	12,805
16	94	16	134	220	14,963	15,427
17 6/	30	3	44	71	10,521	10,669
21	24	8	34	61	11,181	11,308
22	15	2	20	41	9,564	9,642
23	22	2	28	113	10,733	10,898
24 7/8/	11	1	13	39	4,620	4,684
29	44	3	5	15	9,301	9,368
30	17	2	16	48	14,132	14,215
31	6	2	3	25	7,080	7,116
9/ 3	8		3	2	5,989	6,002
4	7	1	7	8	6,245	6,268
5	3	1	6	2	4,510	4,522
6					1,651	1,651
7	7				3,328	3,335
8					265	265
Total	318,863	21,920	339,064	20,550	170,948	871,345
Percent of District Catch	36.6	2.5	38.9	2.4	19.6	100.0

- 1/ Togiak River section open 4 days per week, while other sections open 5 days per week.
- 2/ Togiak River section closed for 24 hours.
- 3/ Togiak River section extended for 24 hours.
- 4/ Togiak and Kulukak sections closed from 9 a.m. July 23 until 9 a.m. July 28.
- 5/ Togiak River section closed from 9 a.m. July 30 until 9 a.m. August 3.
- 6/ Entire Togiak district closed from 6 p.m. August 17 until 9 a.m. August 21.
- 7/ Entire Togiak district closed from 9 a.m. August 24 until 9 a.m. August 28.
- 8/ Entire Togiak district closed from 9 a.m. August 28 until 9 a.m. August 29.
Kulukak section closed until 9 a.m. September 3, when the entire district went back to the standard fishing schedule.

Table 18. Commercial salmon catch by period and species, Togiak section, Togiak district, Bristol Bay, 1984.

Period 1/	Number of Fish					
	Sockeye	King	Chum	Pink	Coho	Total
6/12	121	834	260			1,215
13	156	425	231			812
14	247	368	280			895
15	118	380	423			921
18	759	889	1,315			2,963
19	1,232	1,485	2,601			5,318
20	1,465	1,104	2,971			5,540
21	1,638	1,081	3,824	3		6,546
22	1,706	760	3,771	3		6,240
25	3,715	1,424	4,862	10		10,011
26	7,718	2,422	10,348	19		20,507
27	6,730	1,290	14,207	38		22,265
28	6,868	1,271	15,463	30		23,632
29	3,530	423	6,959	8		10,920
7/ 2	6,333	748	16,922	43		24,046
3	8,886	1,029	19,169	113		29,197
4	7,515	675	11,970	97		20,257
5	15,564	887	17,773	156		34,380
6	9,806	192	4,352	36		14,386
10 2/	12,359	316	14,439	127		27,241
11	17,918	311	21,019	207		39,455
12	16,873	367	18,834	266		36,340
13 3/	10,817	207	9,907	30		20,961
14	3,448	74	2,391			5,913
16	17,007	144	14,366	232		31,749
17	14,414	246	10,977	383	1	26,021
18	11,776	149	8,439	503		20,867
19	13,105	229	8,402	578	2	22,316
20 4/	6,673	170	3,894	734	1	11,472
8/ 6 5/	342	19	247	476	1,750	2,834
7	671	35	702	1,351	4,009	6,768
8	466	34	481	904	3,638	5,523
9	247	22	274	502	3,521	4,566
10	196	11	174	312	2,805	3,498

(continued)

Table 18. (continued)

Period 1/	Number of Fish					Coho	Total
	Sockeye	King	Chum	Pink			
8/13	34	4	34	66		816	954
14	119	5	124	156		5,800	6,204
15	84	10	127	158		6,076	6,455
16	86	9	116	182		10,036	10,429
17 6/	27	2	30	54		4,913	5,026
21	24	8	34	61		9,083	9,210
22	15	2	20	41		8,888	8,966
23	20	1	27	87		5,786	5,921
24 7/	10	1	11	30		2,245	2,297
29 8/	44	2	5	11		4,965	5,027
30	17	2	16	48		10,303	10,386
31	6	2	3	25		3,934	3,970
9/ 3	8		3	2		4,727	4,740
4	7	1	7	8		6,245	6,268
5	3	1	6	2		3,491	3,503
6						1,651	1,651
7	7					3,080	3,087
Total	210,930	20,071	252,810	8,092		107,766	599,669
Percent of Section Catch	35.2	3.3	42.2	1.3		18.0	100.0

- 1/ Togiak River section open 4 days per week, while other section open 5 days per week.
- 2/ Togiak River section closed 24 hours on 7/9.
- 3/ Togiak River section extended for 24 hours.
- 4/ Togiak and Kulukak sections closed from 9:00 a.m. July 23 until 9:00 a.m. July 28.
- 5/ Togiak River section closed from 9:00 a.m. July 30 until 9:00 a.m. August 3.
- 6/ Entire Togiak district closed from 6:00 p.m. August 17 until 9:00 a.m. August 21.
- 7/ Entire Togiak district closed from 9:00 a.m. August 24 until 9:00 a.m. August 28.
- 8/ Entire Togiak district closed from 9:00 a.m. August 28 until 9:00 a.m. August 29.

Table 19. Commercial salmon catch by period and species, Kulukak section, Togiak district, Bristol Bay, 1984.

Period 1/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
6/12	3	25	9			37
13	15	39	81			135
16	15	13	29			57
18	214	70	559			843
20	394	86	1,365			1,845
21	279	50	1,103			1,432
22	324	28	379	1		732
23	95	29	129			253
27	2,030	205	3,966	5		6,206
28	820	82	1,735	3		2,640
29	181	9	229	4		423
7/ 2	706	19	523			1,248
3	956	58	1,829			2,843
4	4,202	147	9,342	6		13,697
5	145	2	337			484
6	6,821	51	5,810	51		12,733
7	3,195	14	2,635	59		5,903
9	4,437	38	4,693	54		9,222
10	14,425	99	7,185	161		21,870
11	11,814	45	4,541	120		16,520
12	10,080	74	3,968	177	1	14,300
13	9,707	54	3,986	167	1	13,915
14	1,622	4	364	16		2,006
16	3,672	25	2,595	36		6,328
17	6,742	40	2,952	171		9,905
18	5,203	51	2,895	135	21	8,305
19	3,353	6	2,103	102		5,564
20	2,094	17	1,383	113		3,607
21 2/	882	7	422	67		1,378
30	261		177	292	91	821
31	275	9	202	282	105	873
8/ 1	200	9	81	234	95	619
2	68	1	34	81	135	319
3	2	1	8	8	24	43
6	4		12	25	259	300
7	24	1	17	44	183	269

(continued)

Table 19. (continued)

Period 1/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
8/ 8	273	22	303	581	2,351	3,530
9	26	2	20	206	613	867
10	15	1	19	64	977	1,076
11	2	1	4	16	274	297
13		1	5	16	679	701
14		6	10	65	2,187	2,268
15	2	5	8	46	1,379	1,440
16	4	1	10	22	1,728	1,765
17 3/	1	1	10	7	1,590	1,609
22					336	336
23		1		16	2,531	2,548
24 4/				4	1,553	1,557
9/ 3 5/					634	634
5					862	862
7					248	248
8					265	265
Total	95,583	1,449	68,067	3,457	19,122	187,678
Percent of Section Catch	50.9	0.8	36.3	1.8	10.2	100.0

1/ Kulukak section open 5 days per week.

2/ Togiak and Kulukak sections closed from 9:00 a.m. July 23 until 9:00 a.m. July 28.

3/ Entire Togiak district closed from 6:00 p.m. August 17 until 9:00 a.m. August 21.

4/ Entire Togiak district closed from 9:00 a.m. August 24 until 9:00 a.m. August 28.

5/ Entire Togiak district closed from 9:00 a.m. August 28 until 9:00 a.m. August 29. Kulukak section closed until 9:00 a.m. September 3, when the entire district went back to the standard fishing schedule.

Table 20. Commercial salmon catch by period and species, Matogak section, Togiak district, Bristol Bay, 1984.

Period 1/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
6/26	33	5	58			96
27	111	6	722			839
28	28	5	676			709
7/ 9	410	4	94			508
10	752	26	1,211	48		2,037
18	1,146	22	2,092	225	1	3,486
19	1,516	18	2,975	182		4,691
20	480	7	768	42		1,297
23	522	9	525	206	6	1,268
24	883	33	1,014	660	22	2,612
25	626	19	565	529	23	1,762
26	554	11	493	482	9	1,549
27	249	6	102	189	13	559
31	240	4	230	344	189	1,007
8/ 2	43		19	66	34	162
7	17	2	52	53	662	786
8	8	2	29	32	521	592
9			1	5	88	94
11					10	10
16	3		3	1	247	254
17 2/	1			2	199	202
23	2		1	10	2,416	2,429
24 3/					376	376
9/ 3 4/					628	628
Total	7,624	179	11,630	3,076	5,444	27,953
Percent of Section Catch	27.3	0.6	41.6	11.0	19.5	100.0

1/ Matogak section open 5 days per week.

2/ Entire Togiak district closed from 6:00 p.m. August 17 until 9:00 a.m. August 21.

3/ Entire Togiak district closed from 9:00 a.m. August 24 until 9:00 a.m. August 28.

4/ Entire Togiak district closed from 9:00 a.m. August 28 until 9:00 a.m. August 29.

Table 21. Commercial salmon catch by period and species, Osviak section, Togiak district, Bristol Bay, 1984.

Period 1/	Number of Fish					Coho	Total
	Sockeye	King	Chum	Pink			
6/22	93	20	523				636
7/ 9	453	11	1,070	14			1,548
10	143	2	592	6			743
19	126	2	136	32			296
20	81	2	83	68			234
23	737	17	894	555	25		2,228
24	541	31	757	679	58		2,066
25	486	23	659	894	59		2,121
26	620	18	477	795	27		1,937
30	206	2	132	370	94		804
31	385	8	269	689	231		1,582
8/ 1	409	18	267	683	406		1,783
6		2	17	30	252		301
7	57	11	111	179	738		1,096
8	64	11	114	188	1,450		1,827
9	29	2	50	61	545		687
10	189	16	268	344	2,734		3,551
11	40	3	33	60	796		932
14	54	12	69	199	5,253		5,587
15	10	3	25	47	4,825		4,910
16	1	6	5	15	2,952		2,979
17 2/	1		4	8	3,819		3,832
21					2,098		2,098
22					340		340
24 3/	1		2	5	446		454
29 4/		1		4	4,336		4,341
30					3,829		3,829
31					3,146		3,146
9/ 5					157		157
Total	4,726	221	6,557	5,925	38,616		56,045
Percent of Section Catch	8.4	0.4	11.7	10.6	68.9		100.0

1/ Osviak section open 5 days per week.

2/ Entire Togiak district closed from 6:00 p.m. August 17 until 9:00 a.m. August 21.

3/ Entire Togiak district closed from 9:00 a.m. August 24 until 9:00 a.m. August 28.

4/ Entire Togiak district closed from 9:00 a.m. August 28 until 9:00 a.m. August 29.

Table 22. Total commercial salmon catch by day and district, Bristol Bay, 1984. 1/

Date	Time	Number of Fish in Thousands					Total
		Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
> 6/11		+	+	+	18		18
12-19	6 days	44	114	6	14	13	191
20	24 hrs.	54	59	8		7	128
21	24 hrs.	167	80	19		8	274
22	24 hrs.	149	71	19		8	247
23	24 hrs.	102	48	9	32	+	191
24	24 hrs.						
25	24 hrs.				330	10	340
26	24 hrs.				104	21	125
27	24 hrs.		797	122	321	29	1,269
28	24 hrs.					27	27
29	24 hrs.	501	260			11	772
30	24 hrs.	551	450	129			1,130
7/ 1	24 hrs.	524			429		953
2	24 hrs.	1,220	818			25	2,063
3	24 hrs.			251		32	283
4	24 hrs.	545			358	34	937
5	24 hrs.	1,687		217		35	1,939
6	24 hrs.	866				27	893
7	24 hrs.	259	495	209	299	6	1,268
8	24 hrs.	1,635					1,635
9	24 hrs.	1,192	468	261	247	11	2,179
10	24 hrs.	1,385	439		143	52	2,019
11	24 hrs.		269	106	117	56	548
12	24 hrs.	987	223	91	95	51	1,447
13	24 hrs.	789	199	183	100	35	1,306
14	24 hrs.	631	202	394	89	8	1,324
15	24 hrs.	524	194	331	58		1,107
16	24 hrs.	424	129	138	68	38	797
17	24 hrs.	180	69	120	47	36	452
18	24 hrs.	73	39	89	45	33	279
19	24 hrs.	45	17	54	41	33	190
20-28	8 days	336	44	109	1,807	34	2,330
29-8/4	7 days	+	16	6	1,371	8	1,401
5-11	7 days	13	19	5	189	39	265
12-18	7 days	+	21	21		55	97
19-25	7 days	1	11	22	6	37	77
26-9/1	7 days		6	17	2	31	56
2- 8	5 days		3	8	1	22	34
9-15	5 days		1	2			3
17-22	5 days		+				+
Total		14,238	5,561	2,946	6,332	871	30,594

1/ Due to rounding the daily catches may not equal the sum of the district totals.

Table 23. Commercial salmon catch by district and species, Bristol Bay, 1984. 1/

District and River System	Number of Fish					Coho	Total
	Sockeye	King	Chum	Pink			
<u>NAKNEK-KVICHAK DISTRICT</u>							
Kvichak River	12,291,627						
Branch River	323,201						
Naknek River	1,623,127						
Total	14,237,955	9,198	426,235	207,134	2,805	14,883,327	
<u>EGEGIK DISTRICT</u>							
	5,301,198	4,707	183,317	5,679	66,179	5,561,080	
<u>UGASHIK DISTRICT</u>							
	2,661,330	4,782	210,694	872	68,788	2,946,466	
<u>NUSHAGAK DISTRICT</u>							
Wood River	1,183,658						
Igushik River	253,841						
Nuyakuk River	547,070						
Nushagak-Mulchatna	138,738						
Snake River	41,360						
Total	2,164,667	61,124	679,845	3,154,339	271,570	6,331,545	
<u>TOGIAK DISTRICT</u>							
Togiak Section	210,930	20,071	252,810	8,092	107,766	599,669	
Kulukak Section	95,583	1,449	68,067	3,457	19,122	187,678	
Osviak Section	4,726	221	6,557	5,925	38,616	56,045	
Matogak Section	7,624	179	11,630	3,076	5,444	27,953	
Total	318,863	21,920	339,064	20,550	170,948	871,345	
TOTAL BRISTOL BAY	24,684,013	101,731	1,839,155	3,388,574	580,290	30,593,763	
SPECIES PERCENT	80.7	0.3	6.0	11.1	1.9	100.0	

1/ Apportionment of the inshore sockeye salmon catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary.

Table 24. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 1984.

Date	Kvichak River		Naknek River		Egegik River		Ugashik River	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/16					0	0		
17			0	0	0	0		
18	0	0	0	0	0	0		
19	0	0	0	0	2,814	2,814	0	0
20	168	168	324	324	4,260	7,074	0	0
21	42	210	240	564	10,482	17,556	0	0
22	6	216	9,120	9,684	2,340	19,896	6	6
23	258	474	132	9,816	5,838	25,734	30	36
24	426	900	7,962	17,778	936	26,670	0	36
25	16,578	17,478	8,772	26,550	3,054	29,724	18	54
26	68,946	86,424	18,990	45,540	4,782	34,506	210	264
27	34,206	120,630	22,866	68,406	19,530	54,036	114	378
28	12,504	133,134	131,664	200,070	30,186	84,222	102	480
29	671,250	804,384	158,778	358,848	37,554	121,776	426	906
30	1,017,054	1,821,438	46,884	405,732	46,644	168,420	1,758	2,664
7/ 1	778,200	2,599,638	46,248	451,980	66,204	234,624	4,350	7,014
2	516,378	3,116,016	51,438	503,418	85,866	320,490	2,706	9,720
3	514,080	3,630,096	105,684	609,102	68,694	389,184	72	9,792
4	689,580	4,319,676	216,666	825,768	39,642	428,826	0	9,792
5	793,596	5,113,272	138,918	964,686	41,988	470,814	24	9,816
6	854,580	5,967,852	21,612	986,298	43,032	513,846	0	9,816
7	819,480	6,787,332	38,658	1,024,956	54,606	568,452	18	9,834
8	794,136	7,581,468	87,714	1,112,670	88,530	656,982	0	9,834
9	855,420	8,436,888	14,958	1,127,628	132,762	789,744	24	9,858
10	555,960	8,992,848	9,786	1,137,414	113,250	902,994	150	10,008
11	229,194	9,222,042	19,800	1,157,214	115,536	1,018,530	145,170	155,178
12	136,014	9,358,056	55,878	1,213,092	99,180	1,117,710	80,616	235,794
13	390,366	9,748,422	10,086	1,223,178	21,336	1,139,046	63,840	299,634
14	283,446	10,031,868	5,010	1,228,188	6,072	1,145,118	161,292	460,926
15	79,284	10,111,152	4,542	1,232,730	5,910	1,151,028	135,360	596,286
16	60,756	10,171,908	4,560	1,237,290	4,098	1,155,126	45,534	641,820
17	98,478	10,270,386	3,282	1,240,572	4,548	1,159,674	231,408	873,228
18	89,448	10,359,834	1,296	1,241,868	4,224	1,163,898	122,700	995,928
19	70,332	10,430,166	606	1,242,474	1,056	1,164,954	91,356	1,087,284
20	24,918	10,455,084			366	1,165,320	65,748	1,153,032
21	11,880	10,466,964					23,652	1,176,684
22	8,508	10,475,472					12,582	1,189,266
23	8,712	10,484,184					15,390	1,204,656
24	5,202	10,489,386					9,414	1,214,070
25	1,284	10,490,670					9,216	1,223,286
26							5,988	1,229,274
27							6,306	1,235,580
28							3,540	1,239,120
29							2,298	1,241,418
System Total		10,490,670		1,242,474		1,165,320		1,241,418

(continued)

Table 24. (continued)

Date	Wood River		Igushik River		Nuyakuk River		Togiak River	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/18	0	0						
19	0	0						
20	0	0	0	0				
21	0	0	0	0				
22	372	372	0	0				
23	1,896	2,268	6	6				
24	3,084	5,352	258	264				
25	55,242	60,594	2,490	2,754			0	0
26	55,710	116,304	7,356	10,110			0	0
27	20,376	136,680	7,152	17,262	0	0	0	0
28	5,016	141,696	9,516	26,778	0	0	42	42
29	4,506	146,202	7,356	34,134	600	600	444	486
30	33,822	180,024	7,986	42,120	1,896	2,496	396	882
7/ 1	64,194	244,218	5,118	47,238	18,654	21,150	672	1,554
2	72,690	316,908	5,982	53,220	56,100	77,250	630	2,184
3	55,440	372,348	6,060	59,280	17,130	94,380	246	2,430
4	60,486	432,834	6,438	65,718	8,568	102,948	792	3,222
5	40,554	473,388	7,740	73,458	28,542	131,490	1,674	4,896
6	136,950	610,338	9,960	83,418	53,040	184,530	1,026	5,922
7	91,974	702,312	8,130	91,548	44,064	228,594	3,186	9,108
8	83,994	786,306	9,774	101,322	31,014	259,608	1,824	10,932
9	83,922	870,228	9,084	110,406	33,858	293,466	3,246	14,178
10	51,378	921,606	6,750	117,156	45,336	338,802	2,886	17,064
11	29,784	951,390	6,486	123,642	31,872	370,674	3,546	20,610
12	10,494	961,884	6,372	130,014	30,576	401,250	6,450	27,060
13	8,172	970,056	6,600	136,614	24,336	425,586	6,426	33,486
14	3,954	974,010	7,020	143,634	15,888	441,474	5,064	38,550
15	1,800	975,810	8,364	151,998	11,202	452,676	4,470	43,020
16	3,834	979,644	6,438	158,436	6,408	459,084	2,658	45,678
17	3,936	983,580	3,618	162,054	3,516	462,600	3,096	48,774
18	1,872	985,452	4,878	166,932	1,968	464,568	4,248	53,022
19	792	986,244	4,788	171,720	702	465,270	5,832	58,854
20	1,680	987,924	3,168	174,888	540	465,810	3,822	62,676
21	2,052	989,976	2,730	177,618	1,410	467,220	3,552	66,228
22	2,928	992,904	2,400	180,018	1,098	468,318	2,142	68,370
23	3,618	996,522	1,542	181,560	648	468,966	1,620	69,990
24	4,302	1,000,824	1,272	182,832	576	469,542	1,122	71,112
25	1,170	1,001,994	1,062	183,894	768	470,310	2,244	73,356
26	732	1,002,726	486	184,380	738	471,048	2,088	75,444
27	66	1,002,792	492	184,872	636	471,684	4,236	79,680
28					546	472,230	2,448	82,128
29					180	472,410	2,592	84,720
30					102	472,512	1,002	85,722
31					84	472,596	984	86,706
8/ 1							1,164	87,870
2							1,032	88,902
3							738	89,640
4							1,236	90,876
5							1,236	92,112
6							600	92,712
7							1,380	94,092
8							690	94,782
9							552	95,334
10							114	95,448
System Total		1,002,792		184,872		472,596		95,448

Table 25. Daily salmon escapement sonar counts by species, Nushagak River, Bristol Bay, 1984. 1/

Date	Sockeye		Chum		Pink		Coho		Total	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/ 4	149	149	100	100					249	249
5	457									
6	574	1,181	383	787					957	1,968
7	591	1,772	394	1,181					985	2,953
8	662	2,394	415	1,596					1,037	3,990
9	624	3,018	416	2,012					1,040	5,030
10	450	3,468	300	2,312					750	5,780
11	385	3,853	257	2,569					642	6,422
12	433	4,286	289	2,858					722	7,144
13	493	4,779	328	3,186					821	7,965
14	787	5,566	524	3,710					1,311	9,276
15	1,440	7,006	960	4,670					2,400	11,676
16	1,528	8,533	1,018	5,689					2,546	14,222
17	3,478	12,011	331	6,020					3,809	18,031
18	1,380	13,391	1,380	7,401					2,761	20,792
19	2,519	15,911	504	7,904					3,023	23,815
20	1,544	17,455	309	8,213					1,853	25,668
21	1,019	18,473	29	8,243					1,048	26,716
22	3,030	21,503	19	8,262					3,049	29,765
23	3,475	24,979	2,824	11,085					6,299	36,064
24	11,295	36,274	7,530	18,615					18,825	54,889
25	83,644	119,918	13,207	31,822					96,851	151,740
26	54,222	174,140	26,651	58,473					80,873	232,613
27	48,318	222,458	23,750	82,223					72,068	304,681
28	14,201	236,659	67,031	149,254					81,232	385,913
29	18,904	255,563	89,225	238,479					108,129	494,042
30	44,465	300,028	17,242	255,721					61,707	555,749
7/ 1	31,261	331,289	10,212	265,933					41,473	597,222
2	58,296	389,585	8,093	274,025	549	549			66,937	664,159
3	22,133	411,718	17,438	291,464		549			39,571	703,730
4	8,840	420,558	6,965	298,428		549			15,805	719,535
5	37,884	458,441	11,430	309,859		549			49,314	768,849
6	55,571	514,012	4,015	313,874		549			59,586	828,435
7	15,876	529,888	9,355	323,229		549			25,231	853,666
8	14,680	544,568	7,234	330,463		549			21,914	875,580
9	14,618	559,186	3,765	334,228		549			18,383	893,963
10	15,366	574,552	2,561	336,789		549			17,927	911,890
11	5,264	579,816	2,507	339,296	251	799			8,022	919,912
12	3,175	582,992		339,296	794	1,593			3,969	923,881
13	1,465	584,456	932	340,228	266	1,859			2,663	926,544
14	909	585,365	578	340,806	165	2,025			1,652	928,196
15	691	586,056	440	341,246	126	2,150			1,256	929,452

(continued)

Table 25. (continued)

Date	Sockeye		Chum		Pink		Coho		Total	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
7/16	803	586,859	511	341,757	146	2,296			1,460	930,912
17	1,912	588,770	1,217	342,974	348	2,644			3,476	934,388
18	532	589,303	5,322	348,296	6,386	9,030	532	532	12,773	947,161
19	393	589,696	4,716	353,011	7,859	16,890	786	1,318	13,754	960,915
20	671	590,367	1,343	354,354	18,126	35,015	671	1,989	20,811	981,726
21	966	591,333	3,381	357,735	31,880	66,895	3,381	5,371	39,608	1,021,334
22	733	592,066	2,565	360,301	24,188	91,083	2,565	7,936	30,052	1,051,386
23	124	592,190	62	360,363	23,845	114,929	186	8,122	24,218	1,075,604
24	368	592,558	184	360,547	70,605	185,534	552	8,674	71,708	1,147,312
25	338	592,896	169	360,716	64,968	250,501	508	9,182	65,983	1,213,295
26	286	593,182	143	360,859	54,894	305,396	429	9,610	55,752	1,269,047
27		593,182	117	360,976	66,214	371,610	820	10,431	67,152	1,336,199
28		593,182	74	361,049	41,567	413,178	515	10,946	42,156	1,378,355
29		593,182	159	361,209	89,976	503,154	1,115	12,060	91,250	1,469,605
30		593,182	239	361,448	134,987	638,140	1,672	13,733	136,898	1,606,503
31		593,182	663	362,111	119,383	757,523	663	14,396	120,709	1,727,212
8/ 1		593,182		362,111	137,574	895,097	632	15,028	138,206	1,865,418
2		593,182		362,111	158,472	1,053,569	728	15,756	159,200	2,024,618
3		593,182		362,111	104,080	1,157,649	478	16,234	104,558	2,129,176
4		593,182	258	362,369	97,528	1,255,177	1,032	17,266	98,818	2,227,994
5		593,182		362,369	79,075	1,334,252	799	18,065	79,874	2,307,868
6		593,182		362,369	96,630	1,430,882	7,126	25,191	103,756	2,411,624
7		593,182		362,369	113,159	1,544,041	5,191	30,382	118,350	2,529,974
8		593,182		362,369	83,438	1,627,479	695	31,077	84,133	2,614,107
9		593,182		362,369	61,145	1,688,623	955	32,033	62,100	2,676,207
10		593,182		362,369	46,597	1,735,220	4,321	36,354	50,918	2,727,125
11		593,182		362,369	73,178	1,808,397	2,335	38,690	75,513	2,802,638
12		593,182		362,369	26,831	1,835,228	5,235	43,925	32,066	2,834,704
13		593,182		362,369	25,252	1,860,480	5,050	48,975	30,302	2,865,006
14		593,182		362,369	9,403	1,869,883	1,881	50,856	11,284	2,876,290
15		593,182		362,369	11,026	1,880,909	426	51,282	11,452	2,887,742
16		593,182		362,369	3,498	1,884,406	6,995	58,278	10,493	2,898,235
17		593,182		362,369	3,308	1,887,714	6,616	64,894	9,924	2,908,159
18		593,182		362,369	1,702	1,889,417	8,938	73,831	10,640	2,918,799
19		593,182		362,369	1,809	1,891,225	6,872	80,704	8,681	2,927,480
20		593,182		362,369	3,202	1,894,427	4,880	85,583	8,082	2,935,562
21		593,182		362,369	2,731	1,897,159	5,463	91,046	8,194	2,943,756
22		593,182		362,369	2,694	1,899,853	26,267	117,313	28,961	2,972,717
23		593,182		362,369	2,340	1,902,192	15,314	132,627	17,654	2,990,371
24		593,182		362,369	482	1,902,674	5,782	138,409	6,264	2,996,635
25		593,182		362,369	2,217	1,904,892	4,435	142,844	6,652	3,003,287
Total		593,182		362,369		1,904,892		142,844		3,003,287

1/ Sonar counts from 6/4 through 6/22 were apportioned using subsistence gillnet catch data from Lewis Point assuming a one day lag time. Sonar counts from 6/26 through 6/30 were expanded by 1.72 to adjust for an estimated undercount during that period. South bank sonar counts from 7/17 through 7/25 were expanded by 1.64 to adjust for an estimated undercount during that period.

Table 26. Daily salmon escapement sonar counts by species, Togiak River, Bristol Bay, 1984.

Date	Sockeye		Chum		Pink		Total	
	Daily	Accum.	Daily	Accum.	Pink	Accum.	Daily	Accum.
6/15	107	107	11	11			118	118
16	77	185	8	18			85	203
17	138	322	13	32			151	354
18	76	399	7	39			84	438
19	147	546	14	53			161	599
20	690	1,236	68	121			758	1,357
21	334	1,570	33	154			367	1,724
22	664	2,234	65	219			729	2,453
23	362	2,596	35	254			397	2,850
24	578	3,174	57	311			635	3,485
25	1,101	4,275	108	419			1,209	4,694
26	648	4,922	63	483			711	5,405
27	386	5,309	38	520			424	5,829
28	309	5,617	30	551			339	6,168
29	821	6,439	81	631			902	7,070
30	310	6,748	30	662			340	7,410
7/ 1	1,447	8,195		662			1,447	8,857
2	2,812	11,008	206	867			3,018	11,875
3	7,042	18,049	190	1,058			7,232	19,107
4	7,978	26,027		1,058			7,978	27,085
5	3,264	29,291		1,058			3,264	30,349
6	3,045	32,337	831	1,888			3,876	34,225
7	2,785	35,122	1,523	3,411			4,308	38,533
8	3,627	38,748	1,983	5,395			5,610	44,143
9	13,820	52,568	7,558	12,953			21,378	65,521
10	28,691	81,260	4,178	17,131	279	279	33,148	98,669
11	19,198	100,458	3,756	20,887	417	696	23,372	122,041
12	8,911	109,369	9,959	30,846	262	958	19,132	141,173
13	15,005	124,374	7,878	38,724	1,876	2,834	24,759	165,932
14	9,590	133,965	14,563	53,287	2,842	5,675	26,995	192,927
15	17,026	150,991	6,191	59,479	6,707	12,383	29,925	222,852
16	16,164	167,155	7,281	66,759	1,456	13,839	24,901	247,753
17	22,781	189,936	11,176	77,935	1,719	15,558	35,676	283,429
18	7,698	197,633	14,391	92,326	3,681	19,240	25,770	309,199
19	3,396	201,030	7,642	99,968	1,274	20,513	12,312	321,511
20	1,949	202,979	12,225	112,193	177	20,690	14,351	335,862
21	4,520	207,499	14,206	126,399	1,614	22,305	20,340	356,202
22	12,254	219,753	22,651	149,050	3,342	25,647	38,247	394,449
23	11,872	231,625	13,167	162,217	7,771	33,417	32,810	427,259
24	8,507	240,131	8,507	170,724	13,292	46,709	30,305	457,564
25	7,783	247,914	5,734	176,458	11,469	58,178	24,986	482,550
26	8,629	256,543	10,355	186,813	6,903	65,082	25,888	508,438
27	5,416	261,959	9,557	196,370	10,513	75,594	25,485	533,923
28	4,403	266,362	9,907	206,278	25,759	101,353	40,070	573,993
29	2,289	268,651	4,070	210,348	17,043	118,396	23,402	597,395
30	1,829	270,481	1,829	212,177	18,903	137,299	22,562	619,957
Total		270,481		212,177		137,299		619,957

Table 27. Daily pink salmon escapement tower counts, Nuyakuk River, Bristol Bay, 1984.

Date	Escapement Counts		Percent	
	Daily	Accumulative	Daily	Accumulative
7/ 7	6	6	.00	.00
8	36	42	.00	.00
9	0	42	.00	.00
10	6	48	.00	.00
11	0	48	.00	.00
12	24	72	.00	.00
13	0	72	.00	.00
14	24	96	.00	.00
15	84	180	.00	.01
16	174	354	.01	.01
17	126	480	.00	.02
18	198	678	.01	.03
19	450	1,128	.02	.04
20	480	1,608	.02	.06
21	714	2,322	.03	.09
22	1,236	3,558	.05	.14
23	3,240	6,798	.12	.26
24	7,866	14,664	.30	.56
25	15,018	29,682	.58	1.14
26	29,136	58,818	1.12	2.26
27	47,598	106,416	1.83	4.09
28	84,792	191,208	3.26	7.35
29	102,780	293,988	3.95	11.30
30	111,954	405,942	4.30	15.60
31	93,762	499,704	3.60	19.20
8/ 1	71,304	571,008	2.74	21.94
2	124,320	695,328	4.78	26.72
3	117,372	812,700	4.51	31.23
4	136,884	949,584	5.26	36.49
5	197,286	1,146,870	7.58	44.07
6	239,280	1,386,150	9.20	53.27
7	154,044	1,540,194	5.92	59.19
8	170,904	1,711,098	6.57	65.76
9	138,270	1,849,368	5.31	71.07
10	165,624	2,014,992	6.36	77.43
11	114,732	2,129,724	4.41	81.84
12	60,048	2,189,772	2.31	84.15
13	107,940	2,297,712	4.15	88.30
14	76,350	2,374,062	2.93	91.23
15	65,850	2,439,912	2.53	93.76
16	47,328	2,487,240	1.82	95.58
17	54,288	2,541,528	2.09	97.67
18	37,116	2,578,644	1.43	99.10
19	2,316	2,580,960	.09	99.18
20	9,876	2,590,836	.38	99.56
21	8,508	2,599,344	.33	99.89
22	2,838	2,602,182	.11	100.00
Totals: 1/		Accumulative		Percent
Tower Enumeration		2,602,182		94.27
Aerial Enumeration		158,130		5.73
System Total		2,760,312		100.00

1/ Tower enumeration through termination of counting on August 22. Aerial survey estimate of spawning pink salmon in Nuyakuk River below counting tower on Aug. 22.

Table 28. Salmon aerial survey escapement estimates by species, district and river system, Bristol Bay, 1984. 1/

District and River System	Number of Fish 2/									
	Sockeye		King		Chum		Pink		Coho	
	Index	Total	Index	Total	Index	Total	Index	Total	Index	Total
NAKNAK-KVICHAK DISTRICT										
Kvichak River			200				165,000			
Branch River		215,370	9,135		87,500		567,100	1,000,000	5,600	
Naknek River 3/			13,170		12,400		125,000		400	
Total		215,370	22,505		99,900		857,100	1,000,000	6,000	
EGEGIK DISTRICT										
Egegik River 4/	3,000		340		800		4,000		40,000	
King Salmon River 5/	25		1,060		25,600					
Total	3,025		1,400		26,400		4,000		40,000	
UGASHIK DISTRICT										
Dog Salmon River	11,800		836		750		5			
Mother Goose 6/	17,100		7,955		168,000					
Total	28,900		8,791		168,750		5			
NUSHAGAK DISTRICT										
Wood River 7/			90	270				81,400		
Muklung River	2,500	3,750	1,300	3,900						
Igushik River			230	690				4,500		
Nuyakuk River 8/							126,500	158,130		
Nushagak River 9/	64,900	97,350	13,980	41,940			48,700	73,050		
Mulchatna River 10/	28,700	43,050	9,880	29,640						
Snake River	16,920	33,840	220	660				5,500		
Total	113,020	177,990	25,700	77,100			175,200	322,580		
TOGIK DISTRICT										
Togiak River 11/	18,100	30,930	7,630	19,090	34,100	81,400	126,000	252,000	20,280	60,840
Ungalikthluk River 12/	5,300	10,600	700	2,770	5,100	12,750				
Kulukak River 13/	21,400	49,800	1,190	2,980	8,500	17,000			10,750	32,250
Quigmy River			30	80	6,300	12,600				
Matogak River	7,000	14,000	150	380	10,200	25,500	2,900	5,800	1,850	5,550
Osviak River			360	900	18,400	55,200	2,000	4,000	1,080	3,240
Slug River									670	2,010
Total	51,800	105,330	10,060	26,200	82,600	204,450	130,900	261,800	34,630	103,890
TOTAL BAY	196,745	498,690	68,456	103,300	377,650	204,450	1,167,205	1,584,380	80,630	103,890

- 1/ Detailed information on aerial survey derived escapements are published in annual summary reports.
2/ Aerial survey escapement estimates are categorized as: index - indices of total escapement; generally data is incomplete which will not allow determination of total escapement; total - aerial survey data is complete and does allow estimate of total escapement.
3/ Includes Paul's King Salmon and Big Creeks.
4/ Includes Shosky Creek.
5/ Includes Contact, Takayoto and Gertrude Creeks.
6/ Includes King Salmon River and Pumice, Old and Painter Creeks.
7/ Includes Youth and Sunshine Creeks, and Agulowak River.
8/ Below the counting tower.
9/ Includes Iowithla, Kokwok, Klutispaw, King Salmon and Chichitnok Rivers, and Klutuk Creek.
10/ Includes Stuyahok, Koktuli, Chilchitna, Chilikadrotna Rivers, and Mosquito Creek.
11/ Includes Gechiak and Pungokepuk Creeks and Kashaik, Narogurum and Ongivinuck Rivers.
12/ Includes Kukayachagak River.
13/ Includes Kulukak Lake and Tithe Creek ponds.

Table 29. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Kvichak River, Bristol Bay, 1984.

Escapement Enumeration Method in Thousands of Fish											
Date	Tower Count		Aerial Survey				River Test Fishing				
	Daily	Accum.	Nakeen to Index	Index to Index	Index to Tower	Total	Fish Per Index Pt.1/	Index Daily	Pts. Accum.	Accumulative Escapement	
6/20	+	+									
21	+	+									
22	+	+									
23	+	+					420	19	19	8	
24	+	1					126	1,269	1,288	163	
25	17	17	+	+	+	+2/	137	241	1,529	210	
26	69	86	8	36	56	100	164	329	1,858	305	
27	34	121	7	6	15	28	163	1,982	3,840	629	
28	13	133	446	351	+	797	198	5,822	9,662	1,918	
29	671	804	639	653	377	1,669	154	5,000	14,662	2,260	
30	1,017	1,821	323	589	456	1,368	158	1,067	15,729	2,491	
7/ 1	778	2,600	63	642	471	1,176	155	2,136	17,865	2,769	
2	516	3,116	317	488	288	1,093	198	3,423	21,288	4,217	
3	514	3,630	77	495	314	885	203	5,138	26,426	5,364	
4	690	4,320	464	857	356	1,676	222	2,996	29,422	6,532	
5	794	5,113	280	830	525	1,634	217	1,968	31,390	6,812	
6	855	5,968	162	492	393	1,047	226	2,895	34,285	7,743	
7	819	6,787					231	3,776	38,061	8,780	
8	794	7,581	411	578	375	1,363	242	2,671	40,732	9,838	
9	855	8,437	200	374	340	914	238	538	41,271	9,822	
10	556	8,993	42	156	238	436	229	217	41,488	9,501	
11	229	9,222					229	2,112	43,599	9,984	
12	136	9,358	102	126	66	294 2/	229	1,985	45,584	10,439	
13	390	9,748									
14	283	10,032									
15	79	10,111									
16	61	10,172									
17	98	10,270									
18	89	10,360									
19	70	10,430									
20	25	10,455									
Total		10,491							45,584	10,439	

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

2/ Poor survey conditions.

Table 30. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Egegik River, Bristol Bay, 1984.

Escapement Enumeration Method in Thousands of Fish								
Date	Tower Count		Aerial Survey		Fish Per Index Pt.1/	River Test Fishing Index Pts.		Accumulative Escapement
	Daily	Accum.	Lagoon	Total		Daily	Accum.	
	6/15			+		+		
16					83	116	116	9
17								
18					83	13	129	11
19	3	3			83	41	170	14
20	4	7						
21	10	18			83	36	206	17
22	2	20			83	30	236	20
23	6	26			83	85	321	27
24	1	27			83	504	825	68
25	3	30			83	826	1,651	146
26	5	35	19	19	74	345	1,996	148
27	20	54	50	50	73	414	2,410	176
28	30	84			73	1,029	3,439	251
29	38	122			70	2,273	5,712	400
30	47	168	48	48	70	2,974	8,686	608
7/ 1	66	235	65	65	70	1,007	9,693	679
2	86	320	105	105	72	2,086	11,779	848
3	69	389			74	599	12,378	916
4	40	429	32	32	76	1,385	13,763	1,046
5	42	471	63	63	76	1,596	15,359	1,167
6	43	514			72	3,319	18,678	1,345
7	55	568	42	42	72	1,708	20,386	1,468
8	89	657	84	84	72	3,343	23,729	1,708
9	133	790	171	171	72	2,690	26,419	1,902
10	113	903			72	301	26,720	1,924
11	116	1,019			72	130	26,850	1,933
12	99	1,118			72	98	26,948	1,940
13	21	1,139						
14	6	1,145						
15	6	1,151						
Total		1,167					26,948	1,940

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

Table 31. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Ugashik River, Bristol Bay, 1984.

Escapement Enumeration Method in Thousands of Fish								
Date	Tower Count		Aerial Survey		River Test Fishing			Accumulative Escapement
	Daily	Accum.	Lagoon	Total	Fish Per Index Pt.1/	Index Points		
						Daily	Accum.	
6/22	+	+						
23	+	+						
24	0	+			37	7	7	+
25	+	+			37	12	19	1
26	+	+			37	3	22	1
27	+	+			29	11	33	1
28	+	+			29	9	42	1
29	+	1			30	62	104	3
30	2	3			30	39	143	4
7/ 1	4	7			29	26	169	5
2	3	10			28	33	202	6
3	+	10			29	51	253	7
4	0	10			29	43	296	9
5	+	10			29	83	379	11
6	0	10			31	198	577	18
7	+	10			31	361	938	29
8	0	10			31	276	1,214	38
9	+	10			31	277	1,491	46
10	+	10	57	57	31	176	1,667	52
11	145	155	50	50	31	2,301	3,968	123
12	81	236	13	13	31	2,958	6,926	215
13	64	300			31	6,113	13,039	404
14	161	461			33	650	13,689	452
15	135	596			33	175	13,864	458
16	46	642			34	3,651	17,515	596
17	231	873			34	2,622	20,137	685
18	123	996			34	505	20,642	702
19	91	1,087						
20	66	1,153						
Total		1,241					20,642	702

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

Table 32. Daily sockeye salmon tower counts and aerial survey escapement estimates, Wood River, Bristol Bay, 1984.

Date	Escapement Enumeration Method in Thousands of Fish			
	Tower Count		Aerial Survey 1/	
	Daily	Accum.	Number	Comments
6/18	0	0		
19	0	0		
20	0	0		
21	0	0		
22	+	+		
23	2	2		
24	3	5		
25	55	61	25	Very poor vis.; est. total river at 100,000.
26	56	116	21	Good visibility.
27	20	137	6	Good/excellent vis.; no downriver strength.
28	5	142	1	Good vis.; no sign lower river.
29	5	146	+	Poor vis.; no sign lower river.
30	34	180	16	Poor vis.; minimal est.; out of muddy water 3-4 wide.
7/ 1	64	244	30	9:00 a.m. 5,000; 3:05 p.m. 30,000 fish below Belt Cr.
2	73	317	42	Good/excellent vis.; finners to Egg Island.
3	55	372	20	7:25 a.m. 20,000; 4:00 p.m. 16,000; est. river at 60-100,000.
4	60	433	61	3:00 p.m. 1,000; 5:55 p.m. 61,000; est. river at 50-60,000.
5	41	473	18	7:30 a.m. 18,000; 3:35 p.m. 4,000; 6:30 p.m. 14,000.
6	137	610	60	8:00 a.m. 38,000; 3:00 p.m. 22,000; 7:10 p.m. 60,000.
7	92	702	19	8:00 a.m. 13,000; 3:10 p.m. 19,000.
8	84	786	47	9:05 a.m. 47,000; 3:07 p.m. 11,000.
9	84	870	51	Good/excellent vis.; est. river at 80-100,000.
10	51	922	22	Fair visibility.
11	30	951	15	Fair visibility.
12	10	962	4	Poor visibility.
13	8	970		
14	4	974		
15	2	976		
Total		1,003		

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

Table 33. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Igushik River, Bristol Bay, 1984.

Escapement Enumeration Method in Thousands of Fish									
Tower Count		Aerial Survey 1/				River Test Fishing			Accumulative Escapement
Date	Daily	Accum.	Lagoon	River	Total	Fish Per Index Pt.2/	Daily	Accum.	
6/18						28	41	41	1
19						28	49	90	3
20	+	+				28	195	285	8
21	0	+				28	181	466	13
22	0	+				28	524	990	28
23	0	+				14	663	1,653	23
24	+	+				14	909	2,562	36
25	2	3	0	2	2	14	1,108	3,670	51
26	7	10	3	3	6	14	1,506	5,176	72
27	7	17	5	4	10	14	904	6,080	85
28	10	27	2	4	5	11	208	6,288	69
29	7	34	1	2	3	11	360	6,648	73
30	8	42	+	2	2	11	1,277	7,925	87
7/ 1	5	47	1	1	1	11	1,610	9,535	105
2	6	53				11	1,609	11,144	123
3	6	59				11	1,176	12,320	136
4	6	66				11	939	13,259	146
5	8	73	+	3	4	8	1,348	14,607	117
6	10	83				8	1,243	15,850	127
7	8	92	1	3	4	7	896	16,746	117
8	10	101	2	2	4	7	1,148	17,894	125
9	9	110	+	2	2	7	1,148	19,042	133
10	7	117	+	1	1	7	1,399	20,441	143
11	6	124	+	1	1	7	1,554	21,995	154
12	6	130	+	1	1	7	1,907	23,902	167
13	7	137	+	2	2	7	2,064	25,966	182
14	7	144				7	411	26,377	185
15	8	152							
Total		185						26,377	185

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

2/ Fish per index point was originally based on the historic relationship (average of 28.3 fish per index point from 1976-83) between escapements and test fishing indices, and was adjusted periodically during the season based on catchability and lag timing factors.

Table 34. Daily sockeye salmon sonar and tower counts and aerial survey escapement estimates, Nushagak/Nuyakuk Rivers, Bristol Bay, 1984.

Escapement Enumeration Method in Thousands of Fish						
Date	Nushagak River Sockeye Salmon Sonar Count 1/		Nuyakuk River Sockeye Salmon Tower Count		Aerial Survey Black Pt. to Portage Cr. 2/	
	Daily	Accum.	Daily	Accum.	Number	Comments
6/21		18				
22	3	22				
23	3	25				
24	11	36				
25	84	120				
26	54	174			112,000	Good/fair vis.; mostly sockeye/chums.
27	48	222	0	0	28,000	Poor vis.; minimal estimate.
28	14	237	0	0		
29	19	256	1	1	5,000	Poor vis.; mostly sockeye/chums.
30	44	300	2	2		
7/ 1	31	331	19	21	193,000	Mostly sockeye; est. total of 250-300,000.
2	58	390	56	77	88,000	Est. min. of 100,000 to max. of 150,000; 90% + are sockeye.
3	22	412	17	94		
4	9	421	9	103		
5	38	458	29	131		
6	56	514	53	185		
7	16	530	44	229		
8	15	545	31	260		
9	15	559	34	293		
10	15	575	45	339		
11	5	580	32	371		
12	3	583	31	401		
13	1	584	24	426		
14	1	585	16	441		
15	1	586	11	453		
16	1	587	6	459		
17	1	588	4	463		
18	+	589	2	465		
19	+	589	1	465		
20	+	589	1	466		
Total		591		473		

1/ Inseason preliminary sonar counts.

2/ Includes estimates of total salmon in clear water index areas in lower Nushagak River.

Table 35. Daily sockeye salmon tower counts and aerial survey escapement estimates, Togiak River, Bristol Bay, 1984.

Date	Enumeration Method in Thousands of Fish						Comments
	Tower Count		Aerial Survey 1/			Total	
	Daily	Accum.	Togiak to Pung.	Pungokepuk to Ongi.	Ongivinuck to tower		
7/ 1	1	2					
2	1	2					
3	+	2					
4	1	3					
5	2	5					
6	1	6					
7	3	9					
8	2	11	4,100	-	-	4,100	Fair visibility.
9	3	14					
10	3	17					
11	4	21					
12	6	27					
13	6	33					
14	5	39					
15	4	43					
16	3	46					
17	3	49					
18	4	53					
19	6	59					
20	4	63	9,400	4,400	6,100	19,900	Good visibility.
21	4	66					
22	2	68					
23	2	70					
24	1	71					
25	2	73					
26	2	75					
27	4	80	5,800	7,800	8,700	22,300	Fair visibility.
28	2	82					
29	3	85					
30	1	86					
31	1	87					
8/ 1	1	88					
2	1	89					
3	1	90					
4	1	91	0	1,700	3,000	4,700	Excellent visibility.
Total		95					

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

Table 36. Daily coho salmon weir and aerial survey escapement counts in Gechiak Creek and aerial survey coho escapement estimates by major river drainage, Togiak district, 1984.

Enumeration Method in Numbers of Fish									
Gechiak Creek									
Date	Weir Count		Aerial Survey	Aerial Survey by River Drainage					Comments
	Daily	Accum.		Togiak	Kulukak	Matogak	Osviak	Total	
8/12	23	48							
13	19	67	190	50				50	Exc. vis.
14	50	117							
15	63	180		10,860		1,200	2,600	14,660	Fair/exc. vis.
16	18	198							
17	104	302							
18	76	378							
19	51	429							
20	0	429							
21	100	529							
22	0	529							
23	79	608	1,300	11,500				11,500	Good vis.
24	274	882							
25	616	1,498							
26	145	1,643							
27	101	1,744	3,300	32,200	5,700	2,200	2,000	42,100	Fair/good vis.
28	83	1,827							
29	78	1,905							
30	138	2,043							
31	85	2,128	2,600	39,500	11,300			50,800	Good/exc. vis.
9/ 1	101	2,229							
2	10	2,239							
3	45	2,284							
4	60	2,344							
5	147	2,491		39,150	12,500			51,650	Good/fair vis.
6	33	2,524							
7	62	2,586							
8	432	3,018							
9	360	3,378							
10	375	3,753							
11	48	3,801							
12	138	3,939							
13	100	4,039							
14	402	4,441	3,000						
15	327	4,768							
16	129	4,897							
17	92	4,989							
18	1,011	6,000							
19	861	6,861							
20	10	6,871							
21	40	6,911							
22	787	7,698							
23	878	8,576							
24	1,070	9,646							
25	517	10,163							
26	55	10,218							
27	147	10,365	4,070						
28	96	10,461							
29	193	10,659							
30	120	10,774							
10/1	676	11,450							
2	38	11,488	4,580	20,280	10,750	1,850	1,080	33,960	Good/exc. vis.
3			4,750						
Total		11,488							

Table 37. Commercial salmon processors and buyers operating by district, Bristol Bay, 1984. 1/

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>NAKNEK-KVICHAK DISTRICT</u>							
1. Ak. Far East Corp.	Naknek		Shore				
2. Ak. Fresh Seafoods	M/V Provider		Floater				
3. All Alaskan Seafoods	M/V All Alaskan and Pacific Apollo		Floater				
4. Baranof Fisheries	M/V Baranof and Courageous		Floater				Con. w/Dutch Harbor Seafoods
5. Bering Pacific Coop.	M/V Western Pioneer, Pribilof and Trident		Floater			Sea	Tendered to King Cove & Larson Bay for canning.
6. Bristol Bay Seafoods	Naknek				Air		
7. Bristol Monarch	M/V Bristol Monarch and Pavlof		Floater				
8. Bumble Bee Seafoods	South Naknek	3-1 lb. 2-1/2 lb.	Shore				Con. w/Red Salmon and C.W.F.
9. Diamond Beauty Seafoods	Egegik					Sea	Tendered to Egegik, Kodiak & Dutch Harbor for canning.
10. Dagnet Fisheries	M/V Alaskan I		Floater		Air		
11. Dutch Harbor Seafoods	M/V Galaxy, Dipper and Viceroy		Floater				Con. w/Baranof.
12. Icicle Seafoods	P/V Arctic Star and Bering Star		Floater				
13. Kemp Pacific Fisheries	M/V Bering Trader		Floater				
14. Kenai Packers	Pederson Pt. and South Naknek		Shore			Sea	Tendered to Kodiak and Kenai for canning.
15. Marine Research	M/V Phoenix		Floater				
16. Nelbro Packing Co.	Naknek	1-1 lb. 3-1/2 lb. 1-1/4 lb.	Shore		Air		
17. New Fish Company	Dillingham				Air		
18. North Coast Seafood Proc.	M/V Polar Bear		Floater				Con. w/Polar Ice
19. Nuka Point Fisheries	M/V Nuka Island			Floater			
20. Ocean Fisheries	M/V Victoria M.		Floater				
21. Pacific Star Seafood	King Salmon				Air		
22. Peter Pan Seafoods	Naknek					Sea	Tendered to Dillingham King Cove & Larsen Bay for canning.
23. Polar Ice Seafoods	M/V Polar Ice		Floater				Con. w/North Coast Seafoods.
24. Polar Seafoods	Naknek				Air		
25. Queen Fisheries	Naknek		Shore		Air		Tendered to Dillingham for canning.
26. Red Salmon Co.	Naknek	2-1 lb. 2-1/2 lb.	Shore			Sea	Con. w/Bumble Bee and C.W.F.; tendered to Port Moller, Dutch Harbor & Alitak for canning.
27. Sea Alaska Products	South Naknek	2-1 lb. 2-1/2 lb.					
28. Sea Roe Fisheries	M/V Pribilof, Lafayette and Hawaiian Princess		Floater				
29. Trident Seafoods	P/V Neptune, Billiken, Tempest and M/V Bountiful		Floater			Sea	Tendered to Akutan for freezing.
30. Walrus Island Fish.	King Salmon				Air		
31. Whitney-Fidalgo Sea.	Naknek	1-1 lb. 1-1/2 lb.	Shore			Sea	Tendered to Kodiak for canning.
32. Winky's Pen. Fish.	King Salmon				Air		
33. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
Total Naknek-Kvichak District:		5	23	1	9	7	

(continued)

Table 39. Salmon transported out of the area for processing, by species and district, Bristol Bay, 1984. 1/

I. FRESH EXPORT BY AIR 2/ (in pounds)

District	No. Operators	Fresh/Brine Export					Total
		Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	9	2,657,933	17,966	3/	501	16,846	2,693,246
Egegik	7	2,532,488	43,729	3/	18,701	466,245	3,061,163
Ugashik	7	780,867	36,515	3/	15	4,863	822,260
Nushagak	10	1,066,285	332,898	164,371	59,070	9,530	1,632,154
Togiak	3	449,500	133,930	549,527	14,550	854,205	2,001,712
Total	26	7,487,073	565,038	713,898	92,837	1,351,689	10,210,535

II. BRINE EXPORT BY SEA 2/3/ (in number of fish and pounds)

District	Number		Number	
	Operators	Tenders	Fish	Pounds
Naknek-Kvichak	7	42	2,248,343	12,418,795
Egegik	4	9	268,914	1,599,402
Ugashik	2	2	91,113	509,591
Nushagak	2	2	64,149	392,156
Togiak				
Total	9	55	2,672,519	14,919,944

1/ Includes all fish exported from Bristol Bay in either brine or refrigerated sea water by sea-going tenders, or by air transportation.

2/ Export information extracted primarily from "Final Operations Reports" (BB-CF/303), and from catch and production reports or fish tickets if unavailable in final report form.

3/ Most processors report mixed sockeye and chums and complete specie breakdown is generally not available until fish are final processed.

Table 40. Average round weight of the commercial salmon catch, by species and district, Bristol Bay, 1984.

District	Average Round Weight in Pounds 1/					Total
	Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	5.41	19.95	6.41	3.64	6.03	
Egegik	5.79	18.69	6.85	3.75	6.94	
Ugashik	5.61	19.52	6.49	3.06	7.69	
Nushagak	6.16	20.78	6.54	3.18	6.60	
Togiak	6.80	20.32	7.80	3.78	8.94	
Weighted Average	5.60	20.45	6.77	3.21	7.45	
Total Weight of Catch, All Districts 2/	138,159	2,080	12,446	10,886	4,326	167,898

1/ Data extracted from "Bristol Bay Final Operations Report" (BB-CF/303) and "Bristol Bay Salmon Catch Reports" (BB-CF/301), and is weighted by the catch of each processor against the total catch.

2/ Total weight shown in thousands of pounds, and is derived from preliminary catch data.

Table 37. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>EGEGIK DISTRICT</u>							
1. Alaska Fish Producers	M/V Nicolle N.		Floater				
2. Alaska Fresh Seafoods	M/V Provider		Floater				
3. All Alaskan Seafoods	M/V All Alaskan and Pacific Apollo		Floater				
4. Bering Pacific Coop.	M/V San Michelle		Floater				
5. Big Creek Fish. & Pack.	Egegik		Floater		Air		Frozen on M/V Great Alaskan & Grizzly.
6. Bonanza Co.	Anchorage				Air		
7. Bristol Monarch	M/V Bristol Monarch		Floater				
8. Bumble Bee Seafoods	South Naknek						Tendered to Ekuk and So. Naknek for canning.
9. Columbia-Wards Fish.	Ekuk						Tendered to Ekuk for freezing.
10. Diamond Beauty Seafoods	Egegik	1-1 lb. 2-1/2 lb.				Sea	Tendered to Chignik for freezing & Kodiak and Cordova for canning.
11. Don Albright Co.	Egegik		Shore				
12. Dagnet Fisheries	M/V Alaskan I		Floater		Air		
13. Dutch Harbor Seafoods	M/V Viceroy		Floater				
14. FAVCO	Anchorage				Air		
15. Icicle Seafoods	P/V Bering Star		Floater				Tendered to Nushagak for freezing.
16. International Seafoods of Alaska	Egegik				Air		
17. Kenai Packers	Pedersen Pt.					Sea	Tendered to Pedersen Pt. for freezing and to Kodiak for canning.
18. Kemp Pacific Fisheries	M/V Bering Trader		Floater				
19. Kodiak Alaska Seafoods	M/V Lin J					Sea	Tendered to Uganik for canning.
20. Kvichak Seafoods	Egegik				Air		
21. Marine Research	M/V Phoenix		Floater				
22. North Coast Seafood Proc.	M/V Polar Bear		Floater				Con. w/Polar Ice.
23. Nuka Pt. Fisheries	P/V Marin I				Floater		
24. Ocean Fisheries	M/V Victoria M.		Floater				
25. Oceanic Seafoods	M/V Harvester		Floater				
26. Polar Ice Seafoods	M/V Polar Ice		Floater				Con. w/N. Coast Sea. Proc.
27. Queen Fisheries	Dillingham						Tendered to Nushagak for canning.
28. Red Salmon Co.	Naknek					Sea	Tendered to Naknek, Port Moller and Kodiak for canning.
29. Robert Burden Co.	M/V Westward		Floater				
30. Sea Alaska Products	South Naknek						Tendered to So. Naknek for canning.
31. Sea Roe Fisheries	M/V Pribilof		Floater				
32. Starbright	M/V Teddy		Floater				
33. Trident Seafoods	M/V Bountiful		Floater				
34. U.S. World Trade Corp.	M/V Northern Endeavor		Floater				
35. Whitney-Fidalgo Seafoods	Naknek						Tendered to Naknek for canning.
36. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
37. 10th & M Seafoods	Anchorage				Air		
Total Egegik District:		1	22	1	7	4	
<u>UGASHIK DISTRICT</u>							
1. Alaska Fish Producers	M/V Nicolle N.		Floater				
2. Alaska Fresh Seafoods	M/V Provider		Floater				
3. Alaska Ocean Products	M/V Arch Angel				Air		
4. All Alaskan Seafoods	M/V All Alaskan and Pacific Apollo		Floater		Air		
5. Briggs Way Co.	Ugashik	1-5 oz. glass					
6. Diamond Beauty Seafoods	Egegik						Tendered to Egegik for canning.
7. Dagnet Fisheries	M/V Alaskan I		Floater		Air		
8. Dutch Harbor Seafoods	M/V Viceroy		Floater				
9. Icicle Seafoods	P/V Bering Star		Floater				Tendered to Nushagak for freezing.
10. International Seafoods of Alaska	Egegik				Air		

(continued)

Table 37. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>UGASHIK DISTRICT (continued)</u>							
11. Kemp Pacific Fisheries	M/V Bering Trader		Floater				
12. Kodiak Alaska Seafoods	M/V Lin J					Sea	Tendered to Uganik for canning.
13. New Fish Co.	M/V Spartan						Tendered to Nushagak for freezing.
14. Nuka Pt. Fisheries	P/V Marin I				Floater		
15. Ocean Fisheries	M/V Victoria M.		Floater				
16. Oceanic Seafoods	M/V Harvester		Floater	Floater			
17. Pan Alaska Fisheries	M/V Royal Venture		Floater				
18. Polar Ice Seafoods	M/V Polar Ice		Floater				Con. w/N. Coast Sea Proc.
19. Queen Fisheries	Dillingham						Tendered to Nushagak for canning.
20. Robert Burden Co.	M/V Westward		Floater				
21. Sea Alaska Products	So. Naknek					Sea	Tendered to So. Naknek for canning and Akutan for freezing.
22. Sea Fisher Products	M/V Arctic Fisher		Floater				
23. Sea Roe Fisheries	M/V Pribilof		Floater				
24. Snopac Products	M/V Snopac		Floater				
25. Starbright	M/V Teddy		Floater				
26. Trident Seafoods	M/V Bountiful		Floater				
27. U.S. World Trade Corp.	M/V Northern Endeavor		Floater				
28. Walrus Is. Fisheries	King Salmon					Air	
29. Whitney-Fidalgo Seafoods	Naknek					Air	Tendered to Naknek for canning.
30. Winky's Pen. Fish.	King Salmon					Air	
31. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
Total Ugashik District:		1	19	2	7	2	
<u>NUSHAGAK DISTRICT</u>							
1. Alaska Far East Corp.	Naknek						Tendered to Naknek for freezing.
2. Alaska Fish Producers	M/V Nicolle N.		Floater				
3. Alaska Fresh Seafoods	Nushagak					Air	
4. All Alaskan Seafoods	M/V All Alaskan		Floater				
5. ANPAC	Anchorage					Air	
6. Columbia-Wards Fisheries	Ekuak	3-1 lb.	Shore			Air	
		1-1/2 lb.					
7. Cogdell, Ronald	Nushagak					Air	
8. Dillingham Fish. Co.	Dillingham				Shore	Air	
9. Dagnet Fisheries	Dillingham					Air	
10. Dutch Harbor Seafoods	Dillingham		Floater			Air	Tendered to Naknek for freezing on M/V Alaskan I.
11. Icicle Seafoods	Dillingham		Floater				Frozen on M/V Galaxy/Dipper/Viceroy.
12. Kemp Pacific Fisheries	Dillingham		Shore/ Floater				Frozen on P/V Bering Star.
13. Kenai Packers	Dillingham						Frozen on M/V Bering Trader.
14. New Fish Co.	Dillingham		Shore			Air	Tendered to Togiak for canning and Pedersen Pt. for freezing.
15. North Coast Seafood Proc.	M/V Polar Bear		Floater				a/k/a Bristol Bay Coastal Fisheries.
16. Nuka Pt. Fisheries	P/V Marin I				Floater		
17. Nushagak Fisheries	M/V Double Star		Floater				Con. w/C.W.F.
18. Ocean Fisheries	M/V Victoria M.		Floater				
19. Peter Pan Seafoods	Dillingham	2-1 lb.				Air	Sea
20. Queen Fisheries	Clarks Slough	2-1/2 lb.					
		1-1 lb.	Shore			Air	
		2-1/2 lb.					
		1-1/4 lb.					
21. Robert Burden Co.	M/V Westward		Floater				
22. Sea Ak. Products	Clarks Point						Sea
							Tendered to So. Naknek and King Cove for canning.
23. Sea Roe Fisheries	M/V Lafayette		Floater				
24. Trident Seafoods	P/V Neptune		Floater				
25. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
Total Nushagak District:		3	15	2	10	2	

(continued)

Table 37. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>TOGIK DISTRICT</u>							
1. All Alaskan Seafoods	M/V All Alaskan						Tendered to Nushagak for freezing.
2. Calista Emmonak Fish.	M/V Snowbird & Mokuhana		Floater				
3. Dagnet Fisheries	Dillingham				Air		Tendered to M/V Alaskan I for freezing.
4. Kemp Pacific Fisheries	Dillingham						Tendered to Dillingham for freezing.
5. Kemp Paulucci Seafoods	Togiak				Air		
6. Nuka Pt. Fisheries	P/V Marin I			Floater			
7. Peter Pan Seafoods	Dillingham				Air		Tendered to Dillingham for canning.
8. Queen Fisheries	Clarks Slough						Tendered to Nushagak for canning & freezing.
9. Togiak Fisheries	Togiak		1-1 lb. Shore				
10. Trident Seafoods	P/V Neptune		1-1/2 lb.				Tendered to Nushagak for freezing.
Total Togiak District:		1	2	1	3	0	

<u>FISHERY OPERATOR SUMMARY</u>										
		Number of Operators					Number of Canning Lines 2/			
District	(Total)	Processing Method			Export					Total
		Canned	Frozen	Cured	Fresh	Brine	1-lb.	1/2-lb.	1/4-lb.	
Naknek-Kvichak	(33)	5	23	1	9	7	9	10	1	20
Egegik	(37)	1	22	1	7	4	1	2		3
Ugashik	(31)	1	19	2	7	2			1	1
East Side	(51)	(7)	(33)	(2)	(18)	(9)	10	12	2	24
Nushagak	(25)	3	15	2	10	2	6	5	1	12
Togiak	(10)	1	2	1	3		1	1		2
West Side	(26)	(4)	(17)	(2)	(11)	(2)	7	6	1	14
TOTAL BAY	59	11	38	3	26	9	17	18	3	38

1/ Indicates operators with either a physical plant or processing facility in a district or those operators from other areas buying fish and/or providing tender and support service for fishermen in districts away from the facility.

2/ Number of canning lines available for operation.

Table 38. Case pack and commercial production of frozen and cured salmon by species and district, Bristol Bay, 1984. 1/

Category by District	No. Operators	Pack and Production 2/					
		Sockeye	King	Chum	Pink	Coho	Total
<u>I. CASE PACK (in 48 - 1 lb. talls)</u>							
Naknek-Kvichak	5	417,381	659	16,205	2,008		436,25
Egegik	1	60,147	35	3,321			63,50
Ugashik	1	48				16	64
Nushagak	3	163,904	900	34,756	95,447	9,272	304,27
Togiak	1	7,835	146	14,744	10,751	477	33,95
Total	11	649,315	1,740	69,026	108,206	9,765	838,05
<u>II. FROZEN (in pounds)</u>							
Naknek-Kvichak	23	31,456,544	125,607	3/ 605,133		3,307	32,190,59
Egegik	22	16,915,110	33,358	3/ 1,037		23,574	16,973,079
Ugashik	19	12,826,425	38,916	3/ 2,590		536,302	13,404,23
Nushagak	15	4,912,525	776,385	1,145,884	1,292,348	1,015,759	9,142,90
Togiak	2	1,244,934	282,148	752,503	38,403	640,339	2,958,327
Total	38	67,355,538	1,256,414	1,898,387	1,939,511	2,219,281	74,669,13
<u>III. CURED (in pounds)</u>							
Naknek-Kvichak	1	734,740	1,170	3/			735,910
Egegik	1	79,340	50	3/			79,39
Ugashik	2	533,658	25	3/			533,68
Nushagak	2	142,965	8,120	51,575	7,795	79,405	289,860
Togiak	1	118,245	2,835	80,340	750	135	202,30
Total	3	1,608,948	12,200	131,915	8,545	79,540	1,841,148
<u>IV. TOTAL FROZEN AND CURED (in pounds)</u>							
Naknek-Kvichak	24	32,191,284	126,777	3/ 605,133		3,307	32,926,50
Egegik	23	16,994,450	33,408	3/ 1,037		23,574	17,052,46
Ugashik	20	13,360,083	38,941	3/ 2,590		536,302	13,937,916
Nushagak	17	5,055,490	784,505	1,197,459	1,300,143	1,095,164	9,432,76
Togiak	3	1,363,179	284,983	832,843	39,153	640,474	3,160,63
Total	40	68,964,486	1,268,614	2,030,302	1,948,056	2,298,821	76,510,27

1/ Includes only fish processed in Bristol Bay.

2/ Pack and production data extracted primarily from "Final Operations Reports" (BB-CF/303), and from catch and production reports or fish tickets if unavailable in final report form.

3/ Included with sockeye production.

Table 41. Price paid per pound and exvessel value of the commercial salmon catch, by species and district, Bristol Bay, 1984. 1/

I. <u>PRICE PAID PER POUND</u>						
District	Average Price Paid Per Pound 2/					
	Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	\$.6769	\$.8918	\$.2993	\$.2183	\$.7780	
Egegik	.6981	.9060	.3331	.1968	.6550	
Ugashik	.7076	1.0537	.3143	.2378	.8033	
Nushagak	.6786	1.0666	.2850	.2240	.7194	
Togiak	.7069	1.0221	.2901	.1715	.6958	
Weighted Average	\$.6850	1.0342	.2972	.2231	.7147	
II. <u>EXVESSEL VALUE</u>						
District	Total Exvessel Value in 1,000's of Dollars 3/					
	Sockeye	King	Chum	Pink	Coho	Total
Naknek-Kvichak	\$ 52,140	\$ 164	\$ 818	\$ 165	\$ 13	\$ 53,299
Egegik	21,427	80	418	4	301	22,230
Ugashik	10,565	98	430	1	425	11,518
Nushagak	9,049	1,355	1,267	2,247	1,289	15,207
Togiak	1,533	455	767	13	1,063	3,832
Total	\$ 94,713	\$2,152	\$3,700	\$2,430	\$3,092	\$106,086

1/ Data extracted from "Bristol Bay Final Operations Report" (BB-CF/303).

2/ Average price per pound derived from individual company price schedules and is weighted by the catch of each processor against the total catch.

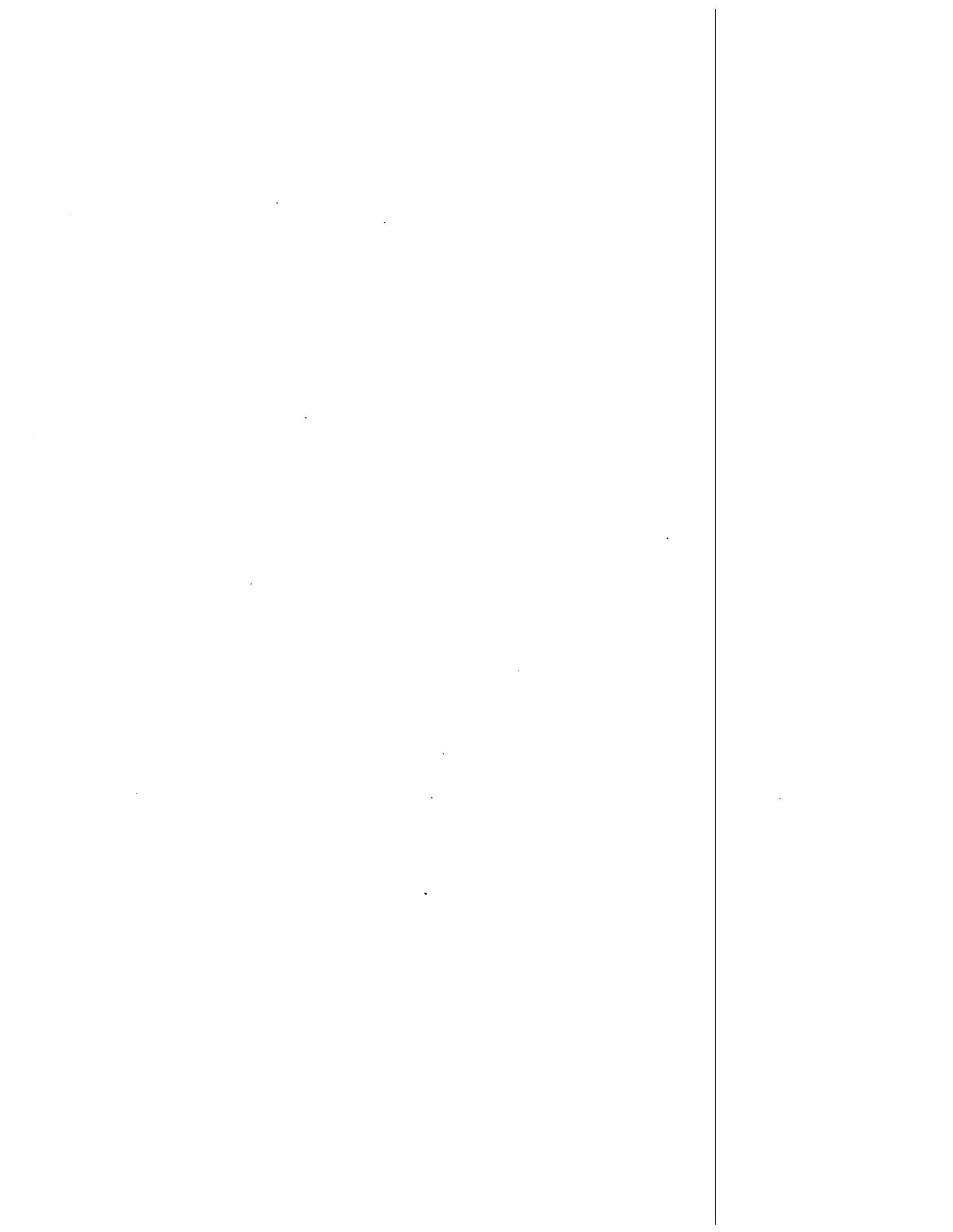
3/ Preliminary catch in pounds times district average price; totals may not equal sum of district value due to rounding.

Table 42. Subsistence salmon catch by species, district and village area, Bristol Bay, 1984.

Area	Permits Issued	Number of Fish 1/					Total
		Sockeye	King	Chum	Pink	Coho	
<u>NAKNEK-KVICHAK DISTRICT:</u>							
Naknek system 2/	209	14,700	800	500	1,100	600	17,600
Kvichak system:							
Levelock	20	8,100	100	100	300		8,600
Igiugig	7	6,300					6,300
Newhalen	45	15,900	+	+			15,900
Nondalton	44	29,100	+				29,100
Port Alsworth	17	4,600					4,600
Iliamna 3/							
Pedro Bay	17	12,100					12,100
Kokhanok	23	24,400					24,400
District Total	382	115,200	900	600	1,300	600	118,600
<u>EGEGIK DISTRICT</u>							
Egegik system 4/	24	500	+	100	+	300	900
<u>UGASHIK DISTRICT</u>							
Ugashik system 5/	8	500	+	+		200	800
<u>NUSHAGAK DISTRICT</u>							
Nushagak Bay 6/	331	13,700	4,400	1,900	4,500	5,900	30,500
Wood system 7/	24	2,100	100	100	200	100	2,600
Igushik system							
Manokotak	23	3,100	500	+	+	500	4,100
Nushagak system							
Portage Creek 8/							
Ekwok	10	4,200	900	1,200	400	600	7,200
New Stuyahok	37	9,900	2,200	2,400	1,200	900	16,500
Koliganek	13	10,400	1,600	4,800	200	100	17,100
District Total	438	43,300	9,800	10,300	6,600	8,100	78,000
<u>TOGIK DISTRICT</u>							
Togiak system 9/	41	3,600	600	1,700	500	3,800	10,200
TOTAL BRISTOL BAY	893	163,100	11,300	12,700	8,400	13,000	208,500

- 1/ Catches rounded to nearest 100 fish; the sum of the village total may not equal the district totals due to rounding.
- 2/ Includes the communities of Naknek, South Naknek and King Salmon.
- 3/ Included in with Newhalen catches.
- 4/ Includes the villages of Egegik and North Egegik.
- 5/ Includes the villages of Pilot Point and Ugashik.
- 6/ Includes the communities of Dillingham, Kanakanak, Clarks Point, Clarks Slough, (Queen), Eku, Igushik Beach and the Lewis Point fish camps.
- 7/ Includes the village of Aleknagik.
- 8/ Included in with Nushagak Bay catches.
- 9/ Includes the villages of Togiak and Twin Hills.

APPENDIX TABLES

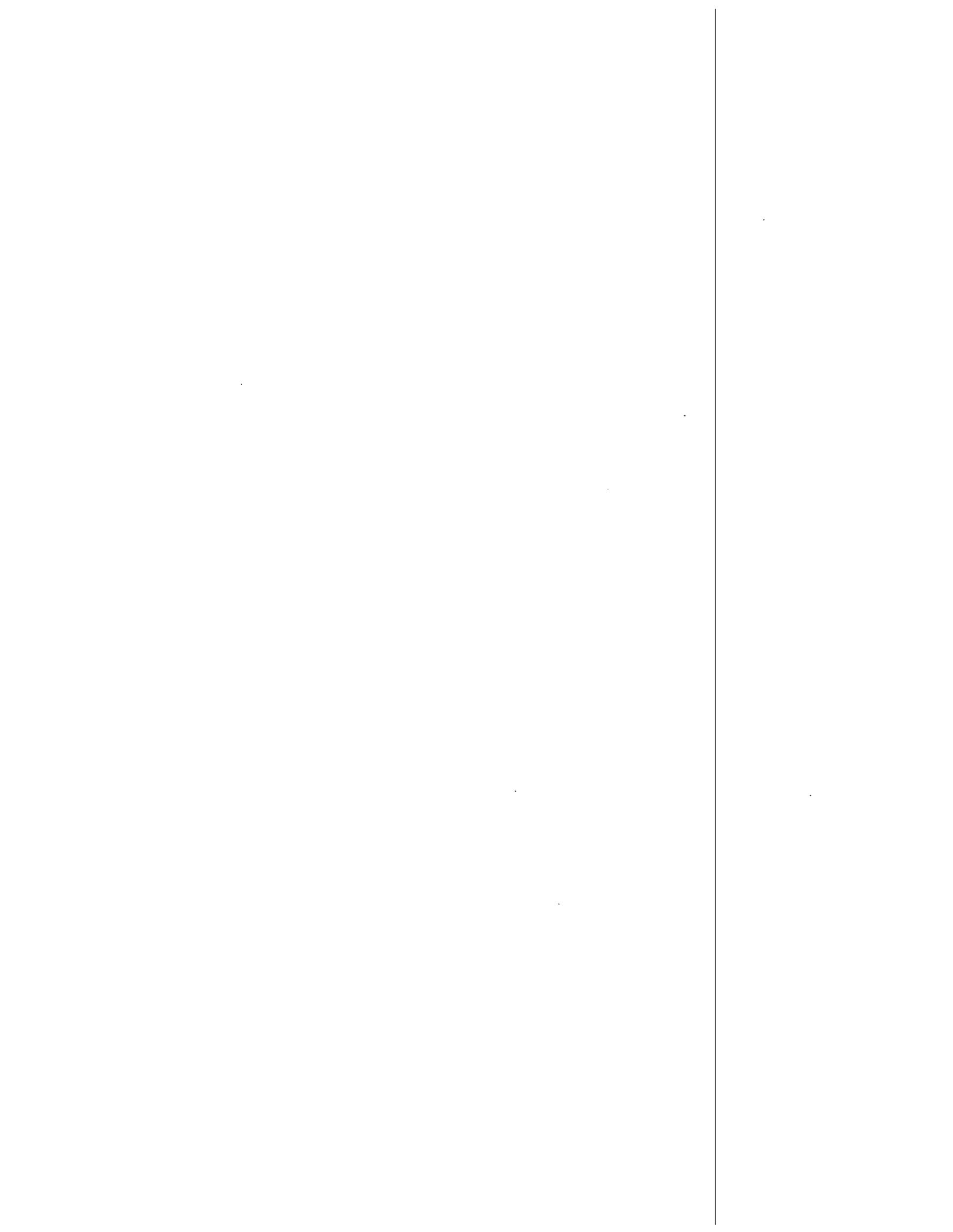


Appendix Table 1. Forecast and inshore sockeye salmon return, Bristol Bay, 1965-84.

Year	Number of Fish in Thousands				Percent Deviation from Forecast		
	Forecast 1/			Inshore Return 5/	FRI	ADF&G	Japanese
	FRI 2/	ADF&G 3/	Japanese 4/				
1965 6/	26,500	27,780		53,129	+100	+ 91	
66	34,000	31,271		17,553	- 48	- 44	
67	21,500	13,749		10,353	- 52	- 25	
68	10,500	10,409		8,010	- 24	- 23	
69	16,200	21,274		19,043	+ 18	- 10	
1970	57,200	55,812		39,399	- 31	- 29	
71	18,100	15,170		15,825	- 13	+ 4	
72	6,600	9,744		5,400	- 18	- 45	
73	5,800	6,194	9,500	2,444	- 58	- 61	- 74
74	3,900	5,004	7,600	10,966	+181	+119	+ 44
1975	12,100	11,960	21,600	24,232	+100	+103	+ 12
76	9,800	11,969	22,300	11,539	+ 18	- 4	- 48
77	8,800	8,380	19,300	9,722	+ 10	+ 16	- 50
78	16,500	11,534	22,600	19,924	+ 21	+ 73	- 12
79	14,740	22,650	22,300	39,904	+171	+ 76	+ 79
1980		54,542	73,600	62,489		+ 15	- 15
81		26,700	26,800	34,475		+ 29	+ 29
82		34,625	28,300	22,208		- 36	- 21
83		27,117	43,500	45,813 7/		+ 69	+ 5
84		31,133	14,362	41,084 7/		+ 32	+186
Average Percent Forecast Deviation 8/					58	45	48

- 1/ Estimated Japanese immature/mature catch was not subtracted from either forecast until 1965.
- 2/ Forecast by Fisheries Research Institute based on purse seine data gathered south of Adak, and is not broken down by river system. Program was terminated in 1980.
- 3/ Inshore river system forecast by the Department is based on cycle analysis, smolt production and ratio of 2-ocean to 3-ocean age return.
- 4/ Inshore "forecast" by the Department is based on CPUE data from Japanese research vessels. The "forecasts" for 1973-79 are not forecasts as data for these years went into the regression model that was used to make a "forecast" for these same years. The values for 1980-84 are actual geometric mean forecasts based on prior years' data.
- 5/ Inshore Bristol Bay catch plus escapement.
- 6/ Togiak, Snake and Nushagak-Mulchatna systems included for the first time in forecast.
- 7/ Preliminary.
- 8/ Absolute deviation without regard to sign.

(Literature Cited: 1, 5, 6, 7, and 16)



Appendix Table 2. Forecast and inshore pink salmon return, Nushagak district, Bristol Bay, 1966-84. 1/

Year	Number of Fish in Thousands			Percent Deviation from Forecast	
	Forecast 2/		Inshore 3/ Return	from Forecast	
	Escapement/Return	Fry		Escape/Return	Fry
1966	2,300		3,779	+ 64	
68	4,500		3,866	- 14	
1970	2,500		570	- 77	
72	1,400		126	- 91	
74	307		999	+225	
76	3,047		1,603	- 47	
78	3,193		13,735	+330	
1980	15,700		4,988	- 68	
82	9,200	2,752	2,996	- 67	+ 9
84	1,710	1,213	6,081 4/	+256	+401
Average Percent Forecast Deviation 5/				124	205

1/ Includes even-years only.

2/ Forecast based on escapement/return data from Nushagak/Nuyakuk River system and beginning in 1982, total fry production from Nushagak/Nuyakuk systems.

3/ Inshore Nushagak district catch plus escapement.

4/ Preliminary.

5/ Absolute deviation without regard to sign.

(Literature Cited: 1, 5 and 6)

Appendix Table 3. Commercial salmon catch by the Japanese mothership and land-based drift net high seas fisheries, by species, 1965-84. 1/

Year	Number of Fish in Thousands											
	Sockeye		King		Chum		Pink		Coho		Total	
	MS	LB	MS	LB	MS	LB	MS	LB	MS	LB	MS	LB
1965	12,038	159	185	93	6,036	8,330	4,429	29,142	1,177	1,913	23,865	39,637
66	7,254	703	208	112	8,562	11,848	2,553	16,032	469	1,458	19,046	30,153
67	8,087	2,566	128	110	6,837	11,078	7,781	23,051	226	1,329	23,059	38,134
68	6,373	2,769	362	88	8,107	8,457	3,823	15,899	898	1,421	19,563	28,634
69	5,935	2,495	554	83	7,721	4,908	6,972	23,610	1,306	3,328	22,488	34,424
1970	6,944	2,966	437	101	9,638	6,585	1,726	13,403	180	2,259	18,925	25,314
71	3,554	3,026	206	134	9,968	6,250	8,202	16,977	454	2,373	22,384	28,760
72	3,184	3,711	261	103	13,373	8,598	3,795	14,839	614	2,421	21,227	29,672
73	2,613	3,308	119	162	7,857	7,614	12,018	20,650	989	3,794	23,596	35,528
74	2,282	3,155	361	186	9,283	12,179	7,756	11,242	1,085	3,559	20,767	30,321
1975	2,171	2,969	162	135	7,367	11,480	14,654	15,347	356	3,550	24,710	33,481
76	2,266	3,291	283	201	10,436	10,646	7,207	10,879	828	2,751	21,020	26,690
77	1,508	1,289	93	146	5,996	6,230	9,100	15,041	79	1,722	16,776	24,428
78	1,882	1,292	105	210	3,802	3,488	1,853	7,846	609	2,512	8,251	15,349
79	2,186	756	126	161	3,277	2,661	3,405	11,190	281	1,199	9,275	15,967
1980	2,412	787	704	160	3,098	2,697	561	11,612	656	1,205	7,431	16,461
81	2,224	859	88	190	2,539	2,509	4,094	11,292	615	1,209	9,560	16,059
82	1,738	723	107	165	3,217	2,930	1,654	11,035	1,183	1,201	7,899	16,054
83	1,655	828	87	178	3,081	2,395	4,324	11,308	297	1,122	9,445	15,831
84 2/	1,597	305	82	92	3,276	2,214	1,430	9,727	786	894	7,171	13,232
20 Year Total	77,903	37,957	4,658	2,810	133,471	133,097	107,337	300,122	13,088	41,220	336,458	515,206
1965-74 Total	58,264	24,858	2,821	1,172	87,382	85,847	59,055	184,845	7,398	23,855	214,920	320,577
1975-84 Total	19,639	13,099	1,837	1,638	46,089	47,250	48,282	115,277	5,690	17,365	121,538	194,629
20 Year Average	3,895	1,898	233	141	6,674	6,655	5,367	15,006	654	2,061	16,823	25,760
1965-74 Average	5,826	2,486	282	117	8,738	8,585	5,906	18,485	740	2,386	21,492	32,058
1975-84 Average	1,964	1,310	184	164	4,609	4,725	4,828	11,528	569	1,737	12,154	19,463

1/ Mothership fishery (MS) and land-based fishery (LB).

2/ Preliminary.

(Literature Cited: 1 and 19)

Appendix Table 4. Japanese mothership commercial catch of maturing and immature sockeye salmon of Bristol Bay origin, 1965-84.

Year	Number of Fish in Thousands		
	Matures 1/	Immatures 2/	Total
1965	6,100	404	6,504
66	1,531	56	1,587
67	866	21	887
68	864	791	1,655
69	1,240	517	1,757
1970	3,451	1,207	4,658
71	842	592	1,434
72	710	214	924
73	625	259	884
74	251	708	959
1975	645	222	867
76	779	228	1,007
77	540	328	868
78	124	236	360
79	68	410	478
1980	180	681	861
81	137	380	517
82	63	228	291
83	96	240	336
84 3/	51	260	311
20 Year Total	19,163	7,982	27,145
1965-74 Total	16,480	4,769	21,249
1975-84 Total	2,683	3,213	5,896
20 Year Average	958	399	1,357
1965-74 Average	1,648	477	2,125
1975-84 Average	268	321	590

1/ Includes May and June 1-10 catches east of 170 degrees east, June 11-20 catches east of 175 degrees east, and June 21-30 catches east of 180 degrees.

2/ Includes sockeye salmon taken on the high seas at times and in areas where immature Bristol Bay sockeye salmon are in large majority. These are mostly .2 ocean age fish that otherwise would be expected to mature and return to Bristol Bay as .3 ocean fish. Includes July and August catches east of 170 degrees east, and June 21-30 catches between 170 degrees east and 180 degrees east.

3/ Preliminary.

(Literature Cited: 1 and 19)

Appendix Table 5. Inshore domestic and Japanese mothership high seas commercial catch of sockeye salmon of Bristol Bay origin, 1965-84.

Year	Number of Fish in Thousands					Percent Japanese Catch of:	
	Bristol Bay Catch			Bristol Bay		Total Catch	Total Bay Run
	Inshore	Japanese 1/	Total	Escapement	Total Return 2/		
1965	24,255	6,943	31,198	28,873	60,071	22	12
66	9,314	1,935	11,249	8,239	19,488	17	10
67	4,331	922	5,253	6,022	11,275	18	8
68	2,793	885	3,678	5,217	8,895	24	10
69	6,622	2,031	8,653	12,421	21,074	24	10
1970	20,721	3,968	24,689	18,679	43,368	16	9
71	9,584	2,049	11,633	6,241	17,874	18	12
72	2,416	1,302	3,718	2,984	6,702	35	19
73	761	839	1,600	1,683	3,283	52	26
74	1,362	510	1,872	9,603	11,475	27	4
1975	4,899	1,353	6,252	19,333	25,585	23	5
76	5,619	1,001	6,620	5,920	12,540	15	8
77	4,878	768	5,646	4,844	10,490	14	7
78	9,928	452	10,380	9,996	20,376	4	2
79	21,429	304	21,733	18,475	40,208	1	1
1980	23,762	590	24,352	38,727	63,079	2	1
81	25,603	818	26,421	8,872	35,293	3	2
82	15,104	443	15,547	7,104	22,651	3	2
83	37,277 3/	324 3/	37,601	8,536	46,137	1	1
84	24,684 3/	291 3/	24,975	16,400	41,375	1	1
20 Year Total	255,343	27,728	283,070	238,169	521,281		
1965-74 Total	82,159	21,384	103,543	99,962	203,505		
1975-84 Total	173,184	6,344	179,527	138,207	317,776		
20 Year Average	12,767	1,386	14,154	11,908	26,064	10	5
1965-74 Average	8,216	2,138	10,354	9,997	20,351	21	11
1975-84 Average	17,318	634	17,953	13,821	31,778	4	2

1/ Includes immature fish caught in previous year.

2/ Includes Bristol Bay catch and escapement and Japanese catch.

3/ Preliminary.

(Literature Cited: 1, 5, and 19)

Appendix Table 8. Salmon fishing license and entry permit registration by gear type and residency, Bristol Bay, 1965-84. 1/

Year	Drift Net 2/			Set Net 2/			Total
	Resident	Non-Resident	Total	Resident	Non-Resident	Total	
1965	916	677	1,593	868	125	993	2,586
66	1,019	846	1,865	826	139	965	2,830
67	965	734	1,699	686	144	830	2,529
68	973	711	1,684	722	117	839	2,523
69	1,110	818	1,928	804	166	970	2,898
1970	1,057	824	1,881	747	143	890	2,771
71	1,034	831	1,865	710	136	846	2,711
72	993	771	1,764	722	132	854	2,618
73 3/	2,041	1,162	3,203	902	108	1,010	4,213
74 4/	634(634)	238(238)	872	530(530)	95(95)	625	1,497
1975	1,217(450)	843(194)	2,060	751(159)	169(45)	920	2,980
76	987(69)	734(30)	1,721	625(5)	139(0)	764	2,485
77	999(52)	729(13)	1,728	684(15)	156(1)	840	2,568
78	1,039(66)	738(11)	1,777	749(16)	161(3)	910	2,687
79	1,046(73)	754(10)	1,800	764(19)	170(5)	934	2,734
1980	1,060(92)	767(18)	1,827	760(29)	187(5)	947	2,774
81	1,056(89)	771(18)	1,827	754(37)	202(5)	956	2,783
82	1,050(85)	774(15)	1,824	744(36)	213(5)	957	2,781
83	1,071(79)	750(16)	1,821	740(33)	220(3)	960	2,781
84	1,050(73)	768(16)	1,818	744(28)	218(3)	962	2,780
20 Year Total	21,317	15,240	36,557	14,832	3,140	17,972	54,529
1965-74 Total	10,742	7,612	18,354	7,517	1,305	8,822	27,176
1975-84 Total	10,575	7,628	18,203	7,315	1,835	9,150	27,353
20 Year Average	1,066	762	1,828	742	157	899	2,726
1965-74 Average	1,074	761	1,835	752	131	882	2,718
1975-84 Average	1,058	763	1,820	732	184	915	2,735

1/ Total license/permit registration; not all license/permittee's actually fished.

2/ Allowable gear per license/permit is 150 fathoms for drift and 50 fathoms for set with the following exceptions: 1968 and 1975 - 75 F. drift and 25 F. set; 1969 - 125 F. drift; 1973 - 25 F. drift and 12 1/2 F. set.

3/ Sliding gear scale in effect.

4/ Limited Entry went into effect. Figures in parenthesis are interim-use permits, and are included in the totals.

(Literature Cited: 2 and 15)

Appendix Table 9. Salmon fishing interim-use and permanent entry permits actually fished, by gear type, Bristol Bay, 1975-84.

Year	Number Permits Issued 1/			Number Permits Fished	
	Interim-Use	Permanent	Total	Number	Percent
<u>DRIFT GILL NET</u>					
1975	644	1,416	2,060	1,235	60
76	99	1,622	1,721	1,353	79
77	65	1,663	1,728	1,355	78
78	77	1,700	1,777	1,569	88
79	83	1,717	1,800	1,711	95
1980	110	1,717	1,827	1,762	96
81	107	1,720	1,827	1,783	98
82	100	1,724	1,824	1,791	98
83	95	1,726	1,821	1,797	99
84 2/	89	1,729	1,818	3/	
Average	147	1,673	1,820	1,595	88
<u>SET GILL NET</u>					
1975	204	716	920	445	48
76	5	759	764	501	66
77	16	824	840	495	59
78	19	891	910	650	71
79	24	910	934	768	82
1980	34	913	947	804	85
81	42	914	956	841	88
82	41	916	957	859	90
83	36	924	960	861	90
84 2/	31	931	962	3/	
Average	45	870	915	692	76
<u>TOTAL DRIFT/ SET GILL NET</u>					
1975	848	2,132	2,980	1,680	56
76	104	2,381	2,485	1,854	75
77	81	2,487	2,568	1,850	72
78	96	2,591	2,687	2,219	83
79	107	2,627	2,734	2,479	91
1980	144	2,630	2,774	2,566	93
81	149	2,634	2,783	2,624	94
82	141	2,640	2,781	2,650	95
83	131	2,650	2,781	2,658	96
84 2/	120	2,660	2,780	3/	
Average	192	2,543	2,735	2,287	84

1/ Number of permanent permits include unrenewed permits.

2/ Preliminary.

3/ Number of permits fished not available.

(Literature Cited: 15)

Appendix Table 6. Japanese mothership commercial catch of king salmon of western Alaska origin, 1965-84.

Year	Number of Fish in Thousands		
	Total Mothership Catch	Catch of Western Alaska Origin	
		Number	Percent
1965	185	106	57
66	208	112	54
67	128	70	55
68	362	226	62
69	554	435	79
1970	437	345	79
71	206	144	70
72	261	170	65
73	119	47	39
74	361	287	80
1975	162	109	67
76	283	168	59
77	93	65	70
78	105	31	30
79	126	65	52
1980	704	380	54
81	88	26	30
82	107	43	40
83	87	24	28
84 1/	82	31	38
20 Year Total	4,658	2,884	
1965-74 Total	2,821	1,942	
1975-84 Total	1,837	942	
20 Year Average	233	144	62
1965-74 Average	282	194	69
1975-84 Average	184	94	51

1/ Preliminary.

(Literature Cited: 1 and 19)

Appendix Table 7. Offshore test fishing catch indices at Port Moller and the inshore total run of sockeye and chum salmon, Bristol Bay, 1968-84. 1/

Year	Number of Stations Fished	Catch	Catch Indices 2/		Total Inshore Run 3/	Number Fish Per Adj. Index Pt.
			Actual	Adjusted		
<u>SOCKEYE SALMON</u>						
1968	128	522	227	306	8,010	26,200
69	101	1,287	549	603	19,043	31,600
70	98	1,033	603	823	39,399	47,900
71	84	858	545	681	15,825	23,200
72	69	120	66	98	5,400	55,100
1973	65	424	214	340	2,444	7,200
75	91	1,968	923	1,289	24,232	18,800
76	131	1,353	634	689	11,539	16,700
77	87	1,204	583	782	9,722	12,400
78	93	525	265	447	19,924	44,600
1979	85	1,422	827	1,034	39,904	38,600
80	151	782	411	527	62,489	118,600
81	109	1,311	684	1,052	34,475	32,800
82	118	1,150	612	759	22,208	29,300
83	131	1,134	511	645	45,813 4/	71,000
1984	114	1,085	556	614	41,084 4/	66,900
<u>CHUM SALMON</u>						
1968	128	175	84	93	812	8,700
69	101	132	63	78	548	7,000
70	98	169	78	106	1,232	11,600
71	84	124	69	86	1,132	13,200
72	69	100	55	66	1,022	15,500
1973	65	175	83	142	1,047	7,400
75	91	102	48	74	519	7,000
76	131	409	197	214	2,221	10,400
77	87	400	195	275	2,703	9,800
78	93	166	85	135	1,847	13,700
1979	85	50	26	32	1,366	42,700
80	151	421	222	276	2,685	9,700
81	109	392	186	218	2,013	9,200
82	118	325	176	208	1,263	6,100
83	131	100	48	54	1,796 4/	33,300
1984	114	198	102	112	2,405 4/	21,500

1/ Program not operated in 1974.

2/ Indices expressed in fish/100 fathoms hours. Adjusted indices include linear estimates for unfished stations and days.

3/ Inshore catch and escapement in thousands of fish. Chum salmon escapement estimates from Nushagak and Togiak districts only.

4/ Preliminary.

(Literature Cited: 1, 5, 11 and 13)

Appendix Table 10. Sockeye salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1965	19,139,567	3,179,559	925,690	793,323	217,100	24,255,239
66	5,397,538	2,101,174	445,458	1,170,271	199,799	9,314,240
67	2,337,226	1,070,942	163,744	657,711	101,107	4,330,730
68	1,216,858	671,554	82,457	749,281	72,699	2,792,849
69	4,655,072	889,322	169,845	773,207	134,252	6,621,698
1970	17,803,805	1,403,509	171,541	1,188,534	153,377	20,720,766
71	5,857,378	1,306,682	954,068	1,256,799	209,060	9,583,987
72	1,102,365	839,820	17,440	381,347	75,261	2,416,233
73	168,249	221,337	3,920	272,093	95,723	761,322
74	538,163	172,253	2,151	510,571	139,341	1,362,479
1975	3,085,416	964,024	14,558	645,902	188,914	4,898,814
76	2,547,276	1,329,788	174,923	1,265,422	301,883	5,619,292
77	2,167,214	1,780,567	92,623	619,025	218,451	4,877,880
78	5,123,668	1,207,294	7,995	3,137,166	452,016	9,928,139
79	14,991,826	2,257,332	391,118	3,327,346	460,984	21,428,606
1980	15,120,457	2,623,066	885,875	4,497,787	634,561	23,761,746
81	10,992,809	4,361,406	2,116,066	7,493,093	639,707	25,603,081
82	5,005,802	2,447,514	1,139,192	5,916,187	595,696	15,104,391
83 1/	21,314,327	6,740,310	3,341,978	5,296,322	584,092	37,277,029
84 1/	14,237,955	5,301,198	2,661,330	2,164,667	318,863	24,684,013
20 Year Total	152,802,971	40,868,651	13,761,972	42,116,055	5,792,886	255,342,534
1965-74 Total	58,216,221	11,856,152	2,936,314	7,753,138	1,397,719	82,159,543
1975-84 Total	94,586,750	29,012,499	10,825,658	34,362,917	4,395,167	173,182,991
20 Year Average	7,640,149	2,043,433	688,099	2,105,803	289,644	12,767,127
1965-74 Average	5,821,622	1,185,615	293,631	775,314	139,772	8,215,954
1975-84 Average	9,458,675	2,901,250	1,082,566	3,436,292	439,517	17,318,299

1/ Preliminary.

(Literature Cited: 1 and 5)

Appendix Table 11. King salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					Total
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
1965	9,793	2,313	4,042	85,910	10,909	112,967
66	5,456	1,949	1,916	58,184	9,967	77,472
67	3,705	2,285	1,582	96,240	13,381	117,193
68	6,398	3,472	2,153	78,201	13,499	103,723
69	19,016	2,801	2,107	80,803	20,181	124,908
1970	19,037	3,765	1,498	87,547	28,664	140,511
71	10,254	2,187	779	82,769	27,026	123,015
72	2,262	1,097	166	46,045	19,976	69,546
73	951	1,475	292	30,470	10,856	44,044
74	480	1,133	1,200	32,053	10,798	45,664
1975	964	237	111	21,454	7,226	29,992
76	4,064	1,138	338	60,684	29,744	95,968
77	4,373	3,694	2,167	85,074	35,218	130,526
78	6,930	3,126	5,935	118,548	57,000	191,539
79	10,415	5,547	9,568	157,321	30,022	212,873
1980	7,517	5,610	4,900	64,958	12,543	95,528
81	11,048	5,468	3,416	193,461	23,911	237,304
82	12,425	4,834	7,170	195,287	33,786	253,502
83 1/	9,942	4,843	8,608	139,400	38,360	201,153
84 1/	9,198	4,707	4,782	61,124	21,920	101,731
20 Year Total	154,228	61,681	62,730	1,775,533	454,987	2,509,159
1965-74 Total	77,352	22,477	15,735	678,222	165,257	959,043
1975-84 Total	76,876	39,204	46,995	1,097,311	289,730	1,550,116
20 Year Average	7,711	3,084	3,137	88,777	22,749	125,458
1965-74 Average	7,735	2,248	1,574	67,822	16,526	95,904
1975-84 Average	7,688	3,920	4,700	109,731	28,973	155,012

1/ Preliminary.

(Literature Cited: 1 and 5)

Appendix Table 12. Chum salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1965	45,430	11,188	14,971	177,434	111,521	360,544
66	57,273	32,085	29,100	129,344	95,410	343,212
67	49,606	11,039	14,104	338,286	63,322	476,357
68	43,187	16,193	17,624	178,786	108,001	363,791
69	42,535	7,835	1,995	214,235	66,389	332,989
1970	120,279	43,854	17,969	435,033	100,711	717,846
71	151,465	27,073	14,506	360,015	123,847	676,906
72	115,737	42,172	9,689	310,126	178,885	656,609
73	123,610	23,034	6,092	336,331	195,431	684,498
74	41,347	4,022	2,334	157,941	80,710	286,354
1975	79,740	4,094	1,634	152,891	87,058	325,417
76	317,550	46,955	9,924	801,064	153,559	1,329,052
77	340,228	83,121	4,456	899,701	270,649	1,598,164
78	185,451	44,480	1,449	651,743	274,967	1,158,090
79	196,398	38,004	12,174	440,279	219,942	906,797
1980	204,515	78,556	36,343	681,930	299,682	1,301,026
81	355,943	87,581	36,275	795,143	229,886	1,504,828
82	198,019	84,329	53,204	434,817	151,000	921,369
83 1/	325,884	123,860	108,374	586,166	322,670	1,466,954
84 1/	426,235	183,317	210,694	679,845	339,064	1,839,155
20 Year Total	3,420,432	992,792	602,920	8,761,110	3,472,704	17,249,958
1965-74 Total	790,469	218,495	128,384	2,637,531	1,124,227	4,899,106
1975-84 Total	2,629,963	774,297	474,536	6,123,579	2,348,477	12,350,852
20 Year Average	171,022	49,640	30,146	438,056	173,635	862,498
1965-74 Average	79,047	21,850	12,838	263,753	112,423	489,911
1975-84 Average	262,996	77,430	47,454	612,358	234,848	1,235,085

1/ Preliminary.

(Literature Cited: 1 and 5)

Appendix Table 13. Pink salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					Total
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
1965	514			95	91	700
66	142,221	8	11	2,337,066	13,545	2,492,851
67	20			265	829	1,114
68	218,732	211		1,705,150	11,743	1,935,836
69	205	5	1	263	1,396	1,870
1970	28,301	41		417,834	10,735	456,911
71	2			37	173	212
72	57,074	12		67,953	1,984	127,023
73	109		1	61	216	387
74	508,534	4,405	340	413,613	13,086	939,978
1975	6	9	2	126	279	422
76	264,631	4,121	116	739,590	28,085	1,036,543
77	19		5	3,017	1,476	4,517
78	734,880	11,430	530	4,348,336	57,524	5,152,700
79	134	6	9	1,787	1,913	3,849
1980	288,363	2,476	51	2,202,545	70,033	2,563,468
81	194	222	29	345	6,490	7,280
82	127,560	1,997	170	1,339,272	23,417	1,492,416
83 1/	15			120	255	390
84 1/	207,134	5,679	872	3,154,339	20,550	3,388,574
20 Year Total 2/	2,577,430	30,380	2,090	16,755,698	250,702	19,586,300
1965-74 Total	954,862	4,677	351	4,941,616	51,093	5,952,599
1975-84 Total	1,622,568	25,703	1,739	11,784,082	199,609	13,633,701
20 Year Average 2/	257,743	3,038	209	1,675,570	25,070	1,958,630
1965-74 Average	190,972	935	70	988,323	10,219	1,190,520
1975-84 Average	324,514	5,141	348	2,356,816	39,922	2,726,740

1/ Preliminary.

2/ Includes even-years only.

(Literature Cited: 1 and 5)

Appendix Table 14. Coho salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1965	3,053	945	713	2,851	521	8,083
66	4,096	1,932	533	11,517	15,864	33,942
67	1,175	1,044	1,901	31,517	18,159	53,796
68	7,357	6,507	5,771	48,867	24,872	93,374
69	17	5,548	9,292	37,799	28,720	81,376
1970	53	7,027	1,695	3,688	2,027	14,490
71	89	923	469	8,036	3,192	12,709
72	402	1,249		3,654	8,652	13,957
73	255	2,701	2,307	28,709	23,070	57,042
74	916	1,156	4,055	12,569	25,049	43,745
1975	43	951	4,595	7,342	33,350	46,281
76	1,195	2,321	3,561	6,778	12,791	26,646
77	2,883	2,685	3,884	52,562	45,201	107,215
78	913	2,256	2,024	44,740	44,338	94,271
79	12,355	15,148	17,886	129,607	119,403	294,399
1980	7,802	22,537	19,419	147,726	151,000	348,484
81	1,229	32,759	30,220	220,290	29,207	313,705
82	10,586	74,989	50,803	349,669	133,765	619,812
83 1/	82	21,585	7,797	80,858	5,681	116,003
84 1/	2,805	66,179	68,788	271,570	170,948	580,290
20 Year Total	57,306	270,442	235,713	1,500,349	895,810	2,959,620
1965-74 Total	17,413	29,032	26,736	189,207	150,126	412,514
1975-84 Total	39,893	241,410	208,977	1,311,142	745,684	2,547,106
20 Year Average	2,865	13,522	11,786	75,017	44,791	147,981
1965-74 Average	1,741	2,903	2,674	18,921	15,013	41,251
1975-84 Average	3,989	24,141	20,898	131,114	74,568	254,711

1/ Preliminary.

(Literature Cited: 1 and 5)

Appendix Table 15. Total salmon commercial catch by district, Bristol Bay, 1965-84.

Year	Number of Fish					Total
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
1965	19,198,357	3,194,005	945,416	1,059,613	340,142	24,737,533
66	5,606,584	2,137,148	477,018	3,706,382	334,585	12,261,717
67	2,391,732	1,085,310	181,331	1,124,019	196,798	4,979,190
68	1,492,532	697,937	108,005	2,760,285	230,814	5,289,573
69	4,716,845	905,511	183,240	1,106,307	250,938	7,162,841
1970	17,971,475	1,458,196	192,703	2,132,636	295,514	22,050,524
71	6,019,188	1,336,865	969,822	1,707,656	363,298	10,396,829
72	1,277,840	884,350	27,295	809,125	284,758	3,283,368
73	293,174	248,547	12,612	667,664	325,296	1,547,293
74	1,089,440	182,969	10,080	1,126,747	268,984	2,678,220
1975	3,166,169	969,315	20,900	827,715	316,827	5,300,926
76	3,134,716	1,384,323	188,862	2,873,538	526,062	8,107,501
77	2,514,717	1,870,067	103,144	1,659,379	570,995	6,718,302
78	6,051,842	1,268,586	17,933	8,300,533	885,845	16,524,739
79	15,211,128	2,316,037	430,755	4,056,340	832,264	22,846,524
1980	15,628,654	2,732,245	946,588	7,594,946	1,167,819	28,070,252
81	11,361,223	4,487,436	2,186,006	8,702,332	929,201	27,666,198
82	5,354,392	2,613,663	1,250,539	8,235,232	937,664	18,391,490
83 1/	21,650,250	6,890,598	3,466,757	6,102,866	951,058	39,061,529
84 1/	14,883,327	5,561,080	2,946,466	6,331,545	871,345	30,593,763
20 Year Total	159,013,585	42,224,118	14,665,472	70,884,860	10,880,207	297,668,312
1965-74 Total	60,057,167	12,130,838	3,107,522	16,200,434	2,891,127	94,387,088
1975-84 Total	98,956,418	30,093,350	11,557,950	54,684,426	7,989,080	203,281,224
20 Year Average	7,950,679	2,111,206	733,274	3,544,243	544,010	14,883,416
1965-74 Average	6,005,717	1,213,084	310,752	1,620,043	289,113	9,438,709
1975-84 Average	9,895,642	3,009,335	1,155,795	5,468,443	798,908	20,328,122

1/ Preliminary.

(Literature Cited: 1 and 5)

Appendix Table 16. Commercial salmon catch in percent by gear type and species, Bristol Bay, 1963-82.

Year	Catch in Percent by Gear Type and Species											
	Sockeye		King		Chum		Pink		Coho		Total	
	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set
1963	84	16	93	7	85	15	53	47	47	53	86	14
64	86	14	94	6	86	14	88	12	70	30	86	14
65	92	8	94	6	88	12	88	12	56	44	92	8
66	89	11	95	5	87	13	89	11	76	24	89	11
67	89	11	97	3	96	4	74	26	81	19	90	10
1968	90	10	98	2	95	5	89	11	76	24	90	10
69	88	12	96	4	95	5	84	16	75	25	89	11
70	93	7	94	6	94	6	82	18	45	55	93	7
71	90	10	98	2	94	6	85	15	64	36	90	10
72	93	7	98	2	95	5	75	25	84	16	93	7
1973	92	8	97	3	96	4	86	14	75	25	93	7
74	79	21	97	3	95	5	89	11	75	25	84	16
75	91	9	96	4	94	6	61	39	80	20	91	9
76	90	10	94	6	96	4	89	11	63	37	91	9
77	89	11	96	4	96	4	88	12	83	17	90	90
1978	88	12	97	3	95	5	89	11	76	24	89	11
79	87	13	94	6	92	8	73	27	79	21	88	12
80	86	14	89	11	91	9	88	12	78	22	86	14
81	84	16	92	8	92	8	67	33	73	27	85	15
82	87	13	92	8	90	10	74	26	74	26	86	14
20 Year Total	1,767	233	1,901	99	1,852	148	852 1/	148 1/	1,430	570	1,781	219
1963-72 Total	894	106	957	43	915	85	423	77	674	326	898	102
1973-82 Total	873	127	944	56	937	63	429	71	756	244	883	117
20 Year Average	88	12	95	5	93	7	85 1/	15 1/	72	29	89	11
1963-72 Average	89	11	96	4	92	8	85	15	67	33	90	10
1973-82 Average	87	13	94	6	94	6	86	14	76	24	88	12

1/ Includes even-years only.

(Literature Cited: 5)

Appendix Table 17. Commercial salmon catch in percent by gear type and district, Bristol Bay, 1963-82. 1/

Catch in Percent by Gear Type and District												
Year	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak		Total	
	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set	Drift	Set
1963	88	12	83	17	78	22	82	18	100		86	14
64	88	12	82	18	74	26	87	13	98	2	86	14
65	95	5	84	16	82	18	74	26	100		92	8
66	93	7	88	12	83	17	72	28	98	2	89	11
67	91	9	90	10	81	19	86	14	95	5	90	10
1968	85	15	93	7	81	19	91	9	98	2	90	10
69	91	9	80	20	82	18	83	17	99	1	89	11
70	96	4	84	16	76	24	77	23	99	1	93	7
71	92	8	87	13	89	11	82	18	100		90	10
72	94	6	90	10	46	54	93	7	100		93	7
1973	89	11	89	11	84	16	94	6	99	1	93	7
74	84	16	77	23	53	47	83	17	94	6	84	16
75	93	7	90	10	85	15	83	17	93	7	91	9
76	92	8	90	10	89	11	90	10	93	7	91	9
77	90	10	88	12	87	13	93	7	93	7	90	10
1978	90	10	83	17	94	6	89	11	87	13	89	11
79	90	10	77	23	83	17	84	16	86	14	88	12
80	89	11	71	29	88	12	87	13	86	14	86	14
81	88	12	76	24	89	11	83	17	82	18	85	15
82	86	14	81	19	84	16	87	13	86	14	86	14
20 Year Total	1,804	196	1,683	317	1,608	392	1,700	300	1,886	114	1,781	219
1963-72 Total	913	87	861	139	772	228	827	173	987	13	898	102
1973-82 Total	891	109	822	178	836	164	873	127	899	101	883	117
20 Year Average	90	10	84	16	80	20	85	15	94	6	89	11
1963-72 Average	91	9	86	14	77	23	83	17	99	1	90	10
1973-82 Average	89	11	82	18	84	16	87	13	90	10	88	12

1/ All salmon species combined.

(Literature Cited: 5)

Appendix Table 18. Sockeye salmon escapement by district, Bristol Bay, 1965-84.

Year	Number of Fish					Total
	Naknek-Kvichak 1/	Egegik	Ugashik 2/	Nushagak 3/	Togiak 4/	
1965	25,218,744	1,444,608	997,862	1,099,266	112,786	28,873,266
66	4,965,965	804,246	714,836	1,630,726	122,998	8,238,771
67	4,174,474	636,864	243,930	875,452	91,330	6,022,050
68	3,774,534	338,654	70,896	976,664	56,418	5,217,166
69	9,907,896	1,015,554	160,380	1,212,586	125,066	12,421,482
1970	14,844,868	919,734	735,024	1,966,156	212,896	18,678,678
71	3,510,448	634,014	529,752	1,353,382	213,242	6,240,838
72	1,747,668	546,402	79,428	528,650	81,970	2,984,118
73	618,510	328,842	38,988	581,307	114,930	1,682,577
74	5,889,750	1,275,630	61,854	2,267,468	108,492	9,603,194
1975	15,267,616	1,173,840	429,336	2,273,038	189,162	19,332,992
76	3,367,854	509,160	356,308	1,486,276	200,590	5,920,188
77	2,527,000	692,514	201,520	1,220,056	202,634	4,843,724
78	5,192,066	895,698	82,434	3,485,532	340,076	9,995,806
79	12,437,996	1,032,042	1,706,904	3,073,571	224,838	18,475,351
1980	25,447,866	1,060,860	3,335,284	8,310,438	572,450	38,726,898
81	3,632,788	694,680	1,327,699	2,850,637	365,910	8,871,714
82	2,529,692	1,034,628	1,185,551	2,012,742	341,424	7,104,037
83	4,554,496	792,282	1,001,364	1,948,492	239,610	8,536,244
84	11,948,514	1,165,320	1,270,318	1,814,686	200,778	16,399,616
20 Year Total	161,558,745	16,995,572	14,529,668	40,967,125	4,117,600	238,168,710
1965-74 Total	74,652,857	7,944,548	3,632,950	12,491,657	1,240,128	99,962,140
1975-84 Total	86,905,888	9,051,024	10,896,718	28,475,468	2,877,472	138,206,570
20 Year Average	8,077,937	849,779	726,483	2,048,356	205,880	11,908,436
1965-74 Average	7,465,286	794,455	363,295	1,249,166	124,013	9,996,214
1975-84 Average	8,690,589	905,102	1,089,672	2,847,547	287,747	13,820,657

1/ Includes Kvichak, Branch and Naknek Rivers.

2/ Includes Mother Goose River system 1965-67 and 1976-84; and Dog Salmon River system 1984.

3/ Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna and Snake Rivers.

4/ Includes Togiak River, Lake and tributaries, Kulukak system and other miscellaneous river systems.

(Literature Cited: 1 and 7)

Appendix Table 19. Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak district by river system, Bristol Bay, 1965-84.

Year	Number of Fish					
	Catch	Escapement			Total	Total Run
		Kvichak 1/	Branch 2/	Naknek 1/		
1965	19,139,567	24,325,926	175,020	717,798	25,218,744	44,358,311
66	5,397,538	3,775,184	174,336	1,016,445	4,965,965	10,363,503
67	2,337,226	3,216,208	202,626	755,640	4,174,474	6,511,700
68	1,216,858	2,557,440	193,872	1,023,222	3,774,534	4,991,392
69	4,655,072	8,394,204	182,490	1,331,202	9,907,896	14,562,968
1970	17,803,805	13,935,306	177,060	732,502	14,844,868	32,648,673
71	5,857,378	2,387,392	187,302	935,754	3,510,448	9,367,826
72	1,102,365	1,009,962	151,188	586,518	1,747,668	2,850,033
73	168,249	226,554	35,280	356,676	618,510	786,759
74	538,163	4,433,844	214,848	1,241,058	5,889,750	6,427,913
1975	3,085,416	13,140,450	100,480	2,026,686	15,267,616	18,353,037
76	2,547,276	1,965,282	81,822	1,320,750	3,367,854	5,915,130
77	2,167,214	1,341,144	100,000	1,085,856	2,527,000	4,694,214
78	5,123,668	4,149,288	229,400	813,378	5,192,066	10,315,734
79	14,991,826	11,218,434	294,200	925,362	12,437,996	27,429,823
1980	15,120,457	22,505,268	297,900	2,644,698	25,447,866	40,568,323
81	10,992,809	1,754,358	82,210	1,796,220	3,632,788	14,625,597
82	5,005,802	1,134,840	239,300	1,155,552	2,529,692	7,535,494
83	21,314,327 3/	3,569,982	96,220	888,294	4,554,496	25,868,823
84	14,237,955 3/	10,490,670	215,370	1,242,474	11,948,514	26,186,469
20 Year Total	152,802,971	135,531,736	3,430,924	22,596,085	161,558,745	314,361,716
1965-74 Total	58,216,221	64,262,020	1,694,022	8,696,815	74,652,857	132,869,078
1975-84 Total	94,586,750	71,269,716	1,736,902	13,899,270	86,905,888	181,492,638
20 Year Average	7,640,149	6,776,587	171,546	1,129,804	8,077,937	15,718,080
1965-74 Average	5,821,622	6,426,202	169,402	869,682	7,465,286	13,286,900
1975-84 Average	9,458,675	7,126,972	173,690	1,389,927	8,690,589	18,149,264

1/ Tower count.

2/ Tower count 1965-76 and aerial survey estimates 1977-84.

3/ Preliminary.

(Literature Cited: 1, 7 and 14)

Appendix Table 22. Inshore commercial catch and escapement of sockeye salmon in the Nushagak district by river system, Bristol Bay, 1965-84.

Year	Number of Fish							Total Run
	Catch	Escapement					Total	
		Wood 1/	Igushik 1/	Nuyakuk 1/	Nush/Mul 2/	Snake 3/		
1965	793,323	675,156	180,840	203,070	28,200	12,000	1,099,266	1,892,589
66	1,170,271	1,208,682	206,360	161,010	50,174	4,500	1,630,726	2,800,997
67	657,711	515,772	281,772	20,250	46,658	11,000	875,452	1,533,163
68	749,281	649,344	194,508	96,642	32,070	4,100	976,664	1,725,945
69	773,207	604,338	512,328	69,828	16,792	9,300	1,212,586	1,985,793
1970	1,188,534	1,161,964	370,920	364,648	44,824	23,800	1,966,156	3,154,690
71	1,256,799	851,202	210,960	224,382	58,336	8,500	1,353,382	2,610,181
72	381,347	430,602	60,018	28,596	7,434	2,000	528,650	909,997
73	272,093	330,474	59,508	110,016	80,394	915	581,307	853,400
74	510,571	1,708,836	358,752	154,614	30,000	15,266	2,267,468	2,778,039
1975	645,902	1,270,116	241,086	669,918	82,400	9,518	2,273,038	2,918,940
76	1,265,422	817,008	186,120	425,220	45,200	12,728	1,486,276	2,751,698
77	619,025	561,828	95,970	232,554	320,400	9,304	1,220,056	1,839,081
78	3,137,166	2,267,238	536,154	576,666	87,400	18,074	3,485,532	6,622,698
79	3,327,346	1,706,352	859,560	360,120	139,100	8,439	3,073,571	6,400,917
1980	4,497,787	2,969,040	1,987,530	3,026,568	290,800	36,500	8,310,438	12,808,255
81	7,493,093	1,233,318	591,144	834,204	177,400	14,571	2,850,637	10,343,730
82	5,915,187	976,470	423,768	537,864	63,000	11,640	2,012,742	7,928,929
83	5,295,322 4/	1,360,968	180,438	318,606	85,400	3,080	1,948,492	7,244,814
84	2,164,667 4/	1,002,792	184,872	472,596	120,586	33,840	1,814,686	3,979,353
20 Year Total	42,115,054	22,301,500	7,722,608	8,887,372	1,806,568	249,075	40,967,125	83,083,179
1965-74 Total	7,753,137	8,136,370	2,435,966	1,433,056	394,882	91,381	12,491,657	20,244,794
1975-84 Total	34,362,917	14,165,130	5,286,642	7,454,316	1,411,686	157,694	28,475,468	62,838,385
20 Year Average	2,105,803	1,115,075	386,130	444,369	90,328	12,454	2,048,356	4,154,159
1965-74 Average	775,314	813,637	243,597	143,306	39,488	9,138	1,249,166	2,024,479
1975-84 Average	3,436,292	1,416,513	528,664	745,432	141,169	15,769	2,847,547	6,283,839

1/ Tower count.

2/ Aerial survey estimates 1965 and 1977-83; tower counts 1966-70 and 1973-74 and sonar count 1984. Tower not operated in 1971-72 and 1975-76; escapement estimates for these years were based on the average ratio of Nuyakuk/Nushagak-Mulchatna River system in those years when data was available.

3/ Aerial survey estimate 1965-72, 1980 and 1982-84: weir count 1973-79 and 1981.

4/ Preliminary.

(Literature Cited: 1, 7, and 13)

Appendix Table 23. Inshore sockeye salmon total run by river system, Nushagak district, Bristol Bay, 1965-84.

Year	Number of Fish in Thousands and Percent of Total Run										Total Run
	Wood		Igushik		Nuyakuk		Nush-Mul.		Snake		
	Number	%	Number	%	Number	%	Number	%	Number	%	
1965	1,144	60	314	17	364	19	50	3	20	1	1,892
66	1,963	70	445	16	294	11	91	3	7	+	2,800
67	1,046	68	300	20	53	3	123	8	11	1	1,533
68	1,056	61	439	26	168	10	59	3	4	+	1,726
69	1,056	53	752	38	129	6	39	2	9	1	1,985
1970	1,758	56	671	21	604	19	97	3	24	1	3,154
71	1,438	55	619	24	432	17	113	4	9	+	2,611
72	587	65	157	17	146	16	17	2	3	+	910
73	444	52	96	11	176	21	136	16	1	+	853
74	2,132	77	421	15	172	6	36	1	19	1	2,780
1975	1,493	51	387	13	889	30	133	5	17	1	2,919
76	1,443	52	328	12	856	31	101	4	24	1	2,752
77	825	45	149	8	365	20	486	26	13	1	1,838
78	4,059	61	1,075	16	1,262	19	194	3	33	1	6,623
79	3,544	55	1,814	28	743	12	282	5	18	+	6,401
1980	4,488	35	3,072	24	4,720	37	473	4	55	+	12,808
81	4,251	41	2,314	22	3,076	30	654	6	48	+	10,343
82 2/	3,617	45	1,828	23	2,290	29	235	3	42	+	8,012
83 2/	4,547	63	678	9	1,572	22	436	6	12	+	7,245
84 2/	2,186	55	439	11	1,020	26	259	6	75	2	3,979
20 Year Total	43,077		16,298		19,331		4,014		444		83,164
1965-74 Total	12,624		4,214		2,538		761		107		20,244
1975-84 Total	30,453		12,084		16,793		3,253		337		62,920
20 Year Average	2,154	52	815	20	967	23	201	5	22	+	4,159
1965-74 Average	1,262	62	421	21	254	13	76	4	11	+	2,024
1975-84 Average	3,045	48	1,208	19	1,679	27	325	5	34	1	6,291

1/ Due to rounding of river system total runs, the district total run may not equal the actual shown on Appendix Table 22.

2/ Preliminary apportionment.

(Literature Cited: 1 and 7)

Appendix Table 24. Inshore commercial catch and escapement of sockeye salmon in the Togiak district by river system, Bristol Bay, 1965-84.

Year	Number of Fish									
	Catch			Escapement						
	Togiak	Kulukak Os/Mat 1/		Togiak		Tribu-	Kulukak 5/	Total	Total Run	
			Total	Lake 2/	River 3/	taries 4/				
1965	213,835	3,265		217,100	88,386		8,100	16,300	112,786	329,886
66	190,479	7,263	2,057	199,799	91,098		13,100	18,800	122,998	332,797
67	71,512	24,379	5,216 6/	101,107	69,330		12,000	10,000	91,330	192,437
68	65,475	2,618	4,606	72,699	42,918		7,000	6,500	56,418	129,117
69	129,615	3,411	1,226	134,252	109,266		7,400	8,400	125,066	259,318
1970	152,748		629	153,377	192,096		10,800	10,000	212,896	366,273
71	200,507	7,927	626	209,060	190,842		9,400	13,000	213,242	422,302
72	51,354	17,244	6,663	75,261	74,070		4,500	3,400	81,970	157,231
73	75,694	15,551	4,478	95,723	95,730		11,200	8,000	114,930	210,653
74	110,886	13,615	14,840	139,341	82,992	12,000	8,600	4,900	108,492	247,833
1975	184,856	3,821	237	188,914	160,962	12,200	7,400	8,600	189,162	378,076
76	293,016	4,822	4,045	301,883	158,190	15,000	16,200	11,200	200,590	502,473
77	201,004	16,252	1,195	218,451	133,734	4,400	24,400	40,100	202,634	421,085
78	422,100	29,668	248 6/	452,016	273,576	15,000	17,600	33,900	340,076	792,092
79	393,337	66,629	1,018	460,984	171,138	14,200	12,900	26,600	224,838	685,822
1980	591,470	42,811	280	634,561	461,850	27,900	37,000	45,700	572,450	1,207,011
81	620,288	19,246	173	639,707	208,080	21,150	77,900	58,780	365,910	1,005,617
82	581,718	13,952	26	595,696	244,824	3,450	40,400	52,750	341,424	937,120
83	531,953	50,300	1,839	584,092 7/	191,520	7,200	13,920	26,970	239,610	823,702
84	210,930	95,583	12,350	318,863 7/	95,448	15,830	39,700	49,800	200,778	519,641
20 Year Total	5,292,777	438,357	61,752	5,792,886	3,136,050	148,330	379,520	453,700	4,117,600	9,910,486
1965-74 Total	1,262,105	95,273	40,341	1,397,719	1,036,728	12,000	92,100	99,300	1,240,128	2,637,847
1975-84 Total	4,030,672	343,084	21,411	4,395,167	2,099,322	136,330	287,420	354,400	2,877,472	7,272,639
20 Year Average 8/	264,639	21,918	3,250	289,644	156,803	13,485	18,976	22,685	205,880	495,524
1965-74 Average	126,211	9,527	4,482	139,772	103,673	12,000	9,210	9,930	124,013	263,785
1975-84 Average	403,067	34,308	2,141	439,517	209,932	13,633	28,742	35,440	287,747	727,264

1/ Catches in the Osviak and Matogak sections were combined.

2/ Tower count.

3/ Aerial survey estimate.

4/ Aerial survey estimate includes Gechiak, Pungokepuk, Ongivinuck, Ungalikthluk/Kukayachagak, and other miscellaneous river systems.

5/ Aerial survey estimate includes Kulukak River and Lake and Tithe Creek ponds.

6/ Includes 25 fish from Cape Peirce section in 1967 and 248 in 1978.

7/ Preliminary.

8/ Only years and systems with catch/escapement data were included in calculating averages.

(Literature Cited: 1, 7, and 13)

Appendix Table 25. Inshore total return of sockeye salmon by district, Bristol Bay, 1965-84.

Year	Commercial Catch and Escapement in Numbers of Fish					
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1965	44,358,311	4,624,167	1,923,552	1,892,589	329,886	53,128,505
66	10,363,503	2,905,420	1,160,294	2,800,997	322,797	17,553,011
67	6,511,700	1,707,806	407,674	1,533,163	192,437	10,352,780
68	4,991,392	1,010,208	153,353	1,725,945	129,117	8,010,015
69	14,562,968	1,904,876	330,225	1,985,793	259,318	19,043,180
1970	32,648,673	2,323,243	906,565	3,154,690	366,273	39,399,444
71	9,367,826	1,940,696	1,483,820	2,610,181	422,302	15,824,825
72	2,850,033	1,386,222	96,868	909,997	157,231	5,400,351
73	786,759	550,179	42,908	853,400	210,653	2,443,899
74	6,427,913	1,447,883	64,005	2,778,039	247,833	10,965,673
1975	18,353,032	2,137,864	443,894	2,918,940	378,076	24,231,806
76	5,915,130	1,838,948	531,231	2,751,698	502,473	11,539,480
77	4,694,214	2,473,081	294,143	1,839,081	421,085	9,721,604
78	10,315,734	2,102,992	90,429	6,622,698	792,092	19,923,945
79	27,429,822	3,289,374	2,098,022	6,400,917	685,822	39,903,957
1980	40,568,323	3,683,926	4,221,159	12,808,225	1,207,011	62,488,644
81	14,625,597	5,056,086	3,443,765	10,343,730	1,005,617	34,474,795
82	7,535,494	3,482,142	2,324,743	7,925,929	937,120	22,205,428
83 1/	25,868,823	7,532,592	4,343,342	7,244,814	823,702	45,813,273
84 1/	26,186,469	6,466,518	3,931,648	3,979,353	519,641	41,083,629
20 Year Total	314,361,716	57,864,223	28,291,640	83,083,179	9,910,486	493,508,244
1965-74 Total	132,869,078	19,800,700	6,569,264	20,244,794	2,637,847	182,121,683
1975-84 Total	181,492,638	38,063,523	21,722,376	62,838,385	7,272,639	311,386,561
20 Year Average	15,718,086	2,893,211	1,414,582	4,154,159	495,524	24,675,412
1965-74 Average	13,286,908	1,980,070	656,926	2,024,479	263,785	18,212,168
1975-84 Average	18,149,264	3,806,352	2,172,238	6,283,839	727,264	31,138,656

1/ Preliminary catch.

(Literature Cited: 1, 7, and 17)

Appendix Table 20. Inshore sockeye salmon total run by river system, Naknek-Kvichak district, Bristol Bay, 1965-84.

Year	Number of Fish in Thousands and Percent of Total Run							
	Kvichak		Branch		Naknek		Total Run 1/	
	Number	%	Number	%	Number	%		
1965	42,112	95	414	1	1,832	4	44,358	
66	7,944	77	311	3	2,109	20	10,364	
67	5,017	77	269	4	1,225	19	6,511	
68	2,945	59	255	5	1,791	36	4,991	
69	12,155	83	273	2	2,135	15	14,563	
1970	30,517	94	407	1	1,726	5	32,650	
71	6,152	66	509	5	2,706	29	9,367	
72	1,352	48	183	6	1,315	46	2,850	
73	248	31	37	5	501	64	786	
74	4,582	71	225	4	1,621	25	6,428	
1975	14,746	80	114	1	3,493	19	18,353	
76	3,423	58	137	2	2,354	40	5,914	
77	2,081	44	150	3	2,463	53	4,694	
78	7,965	77	455	5	1,896	18	10,316	
79	24,637	90	573	2	2,219	8	27,429	
1980	35,248	87	561	1	4,759	12	40,568	
81	6,989	48	311	2	7,326	50	14,626	
82 2/	2,635	35	667	9	4,215	56	7,517	
83 2/	19,922	77	552	2	5,395	21	25,869	
84 2/	22,784	87	537	2	2,866	11	26,187	
20 Year Total	253,454		6,940		53,947		314,341	
1965-74 Total	113,024		2,883		16,961		132,868	
1975-84 Total	140,430		4,057		36,986		181,473	
20 Year Average	12,673	81	347	2	2,697	17	15,717	
1965-74 Average	11,302	85	288	2	1,696	13	13,287	
1975-84 Average	14,043	78	406	2	3,699	20	18,147	

1/ Due to rounding of river system total runs, the district total run may not equal the actual shown on Appendix Table 19.

2/ Preliminary apportionment.

(Literature Cited: 1 and 7)

Appendix Table 21. Inshore commercial catch and escapement of sockeye salmon in the Egegik and Ugashik district by river system, Bristol Bay, 1965-84.

Year	Number of Fish							
	Egegik District			Ugashik District				
	Catch	Escapement		Catch	Escapement			Total
Egegik 1/		Total Run	Ugashik 1/		Mother Goose 2/	Total		
1965	3,179,559	1,444,608	4,624,167	925,690	996,612	1,250	997,862	1,923,552
66	2,101,174	804,246	2,905,420	445,458	704,436	10,400	714,836	1,160,294
67	1,070,942	636,864	1,707,806	163,744	238,830	5,100	243,930	407,674
68	671,554	338,654	1,010,208	82,457	70,896		70,896	153,353
69	889,322	1,015,554	1,904,876	169,845	160,380		160,380	330,225
1970	1,403,509	919,734	2,323,243	171,541	735,024		735,024	906,565
71	1,306,682	634,014	1,940,696	954,068	529,752		529,752	1,483,820
72	839,820	546,402	1,386,222	17,440	79,428		79,428	96,868
73	221,337	328,842	550,179	3,920	38,988		38,988	42,908
74	172,253	1,275,630	1,447,883	2,151	61,854		61,854	64,005
1975	964,024	1,173,840	2,137,864	14,558	429,336		429,336	443,894
76	1,329,788	509,160	1,838,948	174,923	341,808	14,500	356,308	531,231
77	1,780,567	692,514	2,473,081	92,623	201,486	34	201,520	294,143
78	1,207,294	895,698	2,102,992	7,995	70,434	12,000	82,434	90,429
79	2,257,332	1,032,042	3,289,374	391,118	1,700,904	6,000	1,706,904	2,098,022
1980	2,623,066	1,060,860	3,683,926	885,875	3,321,384	13,900	3,335,284	4,221,159
81	4,361,406	694,680	5,056,086	2,116,066	1,326,762	937	1,327,699	3,443,765
82	2,447,514	1,034,628	3,482,142	1,139,192	1,157,526	28,025	1,185,551	2,324,743
83	6,740,310 3/	792,282	7,532,592	3,341,978 3/	1,000,614	750	1,001,364	4,343,342
84	5,301,198 3/	1,165,320	6,466,518	2,661,330 3/	1,241,418	28,900 4/	1,270,318	3,931,648
20 Year Total	40,868,651	16,995,572	57,864,223	13,761,972	14,407,872	121,796	14,529,668	28,291,640
1965-74 Total	11,856,152	7,944,548	19,800,700	2,936,314	3,616,200	16,750	3,632,950	6,569,264
1975-84 Total	29,012,499	9,051,024	38,063,523	10,825,658	10,791,672	105,046	10,896,718	21,722,376
20 Year Average	2,043,433	849,779	2,893,211	688,099	720,394	10,150	726,483	1,414,582
1965-74 Average	1,185,615	794,454	1,980,070	293,631	361,620	5,583	363,295	656,926
1975-84 Average	2,901,250	905,102	3,806,352	1,082,566	1,079,167	11,672	1,089,672	2,172,238

1/ Tower count.

2/ Aerial survey estimate.

3/ Preliminary.

4/ Includes 11,800 sockeye from Dog Salmon River.

5/ Only years and systems with escapement data were included in calculating averages.

(Literature Cited: 1 and 7)

Appendix Table 26. Inshore sockeye salmon forecast, actual run and deviation, escapement goals and deviation, in the Kvichak and Naknek River systems, Bristol Bay, 1965-84.

Year	Number of Fish in Thousands											
	Kvichak River						Naknek River					
	Inshore Run			Escapement			Inshore Run			Escapement		
	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/
1965	13,170	42,112	+ 220	8,000	24,326	+ 204	3,070	1,832	- 40	800	718	- 10
66	21,227	7,944	- 63	6,000	3,775	- 37	1,867	2,109	+ 13	800	1,016	+ 27
67	3,993	5,017	+ 26	3,500	3,216	- 8	2,564	1,225	- 52	1,000	756	- 24
68	874	2,945	+ 237	874	2,557	+ 193	2,295	1,791	- 22	1,000	1,023	+ 2
69	12,780	12,155	- 5	6,000	8,394	+ 40	2,741	2,135	- 22	1,000	1,331	+ 33
1970	43,732	30,517	- 30	19,000	13,935	- 27	2,904	1,726	- 41	1,000	733	- 27
71	6,349	6,152	- 3	2,500	2,387	- 5	2,189	2,706	+ 24	900	936	+ 4
72	3,859	1,352	- 65	2,000	1,010	- 50	1,446	1,315	- 9	800	587	- 27
73	2,396	248	- 90	2,000	227	- 89	936	501	- 46	800	357	- 55
74	3,029	4,582	+ 51	6,000	4,434	- 26	647	1,621	+ 151	800	1,241	+ 55
1975	6,338	14,746	+ 133	14,000	13,140	- 6	1,144	3,493	+ 205	800	2,027	+153
76	4,593	3,423	- 25	2,000	1,965	- 2	1,883	2,354	+ 25	800	1,321	+ 65
77	2,269	2,081	- 8	2,000	1,341	- 33	2,097	2,463	+ 17	800	1,086	+ 36
78	5,089	7,965	+ 57	2,000	4,149	+ 107	1,697	1,896	+ 12	800	813	+ 2
79	12,349	24,637	+ 100	6,000	11,218	+ 87	1,744	2,219	+ 27	800	925	+ 16
1980	40,064	35,248	- 12	14,000	22,505	+ 61	2,703	4,759	+ 76	800	2,665	+233
81	10,419	6,989	- 33	2,000	1,754	- 12	3,345	7,326	+ 119	800	1,796	+125
82 2/	13,079	2,635	- 80	2,000	1,135	- 43	3,812	4,215	+ 106	800	1,156	+ 45
83 2/	9,738	19,922	+ 105	2,000	3,570	+ 79	2,944	5,395	+ 83	800	888	+ 11
84 2/	16,704	22,784	+ 36	10,000	10,491	+ 5	2,982	2,866	- 4	1,000	1,242	+ 24
20 Year Total	232,051	253,454	1,379 3/	111,874	135,529	1,114 3/	45,010	53,947	1,094 3/	17,100	22,617	974 3/
1965-74 Total	111,409	113,024	790	55,874	64,261	679	20,659	16,961	420	8,900	8,698	264
1975-84 Total	120,642	140,430	589	56,000	71,268	435	24,351	36,986	674	8,200	13,919	710
20 Year Average	11,603	12,673	69 3/	5,594	6,776	56 3/	2,251	2,697	55 3/	855	1,131	49 3/
1965-75 Average	11,141	11,302	79	5,587	6,426	68	2,066	1,696	42	890	870	26
1975-84 Average	12,064	14,043	59	5,600	7,127	44	2,435	3,699	67	820	1,392	71

1/ Percent deviation = deviation from goal/forecast divided by goal/forecast.

2/ Preliminary catch apportionment.

3/ Absolute deviation without regard to sign.

(Literature Cited: 1 and 7)

Appendix Table 27. Inshore sockeye salmon forecast, actual run and deviation, escapement goals and deviation, in the Egegik and Ugashik River systems, Bristol Bay, 1965-84.

Number of Fish in Thousands													
Year	Egegik River						Ugashik River						
	Inshore Run			Escapement			Inshore Run			Escapement			
	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/	
1965	4,180	4,624	+ 11	1,000	1,445	+ 45	3,680	1,924	- 48	800	998	+ 25	
66	3,175	2,905	- 9	1,000	804	- 20	1,230	1,160	- 6	850	714	- 16	
67	2,381	1,708	- 28	1,000	637	- 36	933	408	- 56	850	244	- 71	
68	2,093	1,010	- 52	1,000	339	- 66	1,050	153	- 85	750	71	- 91	
69	1,972	1,905	- 3	700	1,016	+ 45	712	330	- 54	400	160	- 60	
1970	4,050	2,323	- 43	1,000	920	- 8	1,252	907	- 28	700	735	+ 5	
71	2,113	1,941	- 8	600	634	+ 6	1,150	1,484	+ 29	500	530	+ 6	
72	1,575	1,386	- 12	600	546	- 9	265	97	- 63	450	79	- 82	
73	1,009	550	- 45	500	329	- 34	188	43	- 77	188	39	- 79	
74	169	1,448	+ 757	600	1,276	+ 113	90	64	- 29	500	62	- 88	
1975	1,400	2,138	+ 53	600	1,174	+ 96	259	444	+ 71	500	429	- 14	
76	1,357	1,839	+ 36	600	509	- 15	689	531	- 23	500	356	- 29	
77	1,607	2,473	+ 54	600	693	+ 16	257	294	+ 14	500	202	- 60	
78	1,524	2,103	+ 38	600	896	+ 49	247	90	- 64	500	82	- 84	
79	2,171	3,289	+ 52	600	1,032	+ 72	983	2,098	+ 113	500	1,707	+ 241	
1980	3,445	3,684	+ 7	600	1,061	+ 77	1,488	4,221	+ 184	500	3,335	+ 567	
81	3,173	5,056	+ 59	600	695	+ 16	3,029	3,444	+ 14	500	1,328	+ 166	
82 2/	4,236	3,482	- 18	600	1,035	+ 73	2,065	2,325	+ 13	500	1,186	+ 137	
83 2/	3,415	7,533	+ 121	600	792	+ 32	4,177	4,343	+ 4	500	1,001	+ 100	
84 2/	3,541	6,467	+ 83	1,000	1,165	+ 17	1,916	3,932	+ 105	700	1,270	+ 81	
20 Year Total	48,586	57,864	1,489 3/	14,400	16,998	845 3/	25,660	28,292	1,080 3/	11,188	14,528	2,002 3/	
1965-74 Total	22,717	19,800	968	8,000	7,946	382	10,550	6,570	475	5,988	3,632	523	
1975-84 Total	25,869	38,064	521	6,400	9,052	463	15,110	21,722	605	5,200	10,896	1,479	
20 Year Average	2,429	2,893	74 3/	720	850	42 3/	1,283	1,415	54 3/	559	726	100 3/	
1965-74 Average	2,272	1,980	97	800	795	38	1,055	657	48	599	363	52	
1975-84 Average	2,587	3,806	52	640	905	46	1,511	2,172	61	520	1,090	148	

1/ Percent deviation = deviation from goal/forecast divided by goal/forecast.

2/ Preliminary catch apportionment.

3/ Absolute deviation without regard to sign.

4/ Includes Mother Goose Lake and Dog Salmon River.

(Literature Cited: 1 and 7)

Appendix Table 28. Inshore sockeye salmon forecast, actual run and deviation, escapement goals and deviation, in the Wood and Igushik River systems, Bristol Bay, 1965-84.

Number of Fish in Thousands													
Year	Wood River						Igushik River						
	Inshore Run			Escapement			Inshore Run			Escapement			
	Forecast	Actual	Percent	Goal	Actual	Percent	Forecast	Actual	Percent	Goal	Actual	Percent	
			Deviation 1/			Deviation 1/			Deviation 1/			Deviation 1/	
1965	970	1,144	+ 18	500	675	+ 35	570	314	- 45	250	181	- 28	
66	2,416	1,963	- 19	900	1,209	+ 34	553	445	- 20	200	206	+ 3	
67	2,484	1,046	- 58	1,100	516	- 53	153	300	+ 96	153	282	+ 84	
68	2,536	1,056	- 58	1,000	649	- 35	272	439	+ 61	150	195	+ 30	
69	1,618	1,056	- 35	750	604	- 19	424	752	+ 77	200	512	+ 156	
1970	1,865	1,758	- 6	1,000	1,162	+ 16	680	671	- 1	200	371	+ 86	
71	1,644	1,438	- 13	750	851	+ 13	565	619	+ 10	150	211	+ 41	
72	1,414	587	- 58	750	431	- 43	422	157	- 63	150	60	- 60	
73	779	444	- 43	700	330	- 53	320	96	- 70	150	60	- 60	
74	399	2,132	+ 434	800	1,709	+ 114	73	421	+ 477	150	359	+ 139	
1975	1,497	1,493	0	800	1,270	+ 59	445	387	- 13	150	241	+ 61	
76	1,205	1,443	+ 20	800	817	+ 2	324	328	+ 1	150	186	+ 24	
77	958	825	- 14	800	562	- 30	408	149	- 63	150	96	- 36	
78	1,720	4,059	+ 136	800	2,267	+ 183	243	1,075	+ 342	150	536	+ 257	
79	2,579	3,544	+ 37	800	1,706	+ 113	857	1,814	+ 112	150	860	+ 473	
1980	2,338	4,488	+ 92	800	2,969	+ 271	1,425	3,072	+ 116	150	1,988	+1,225	
81	2,336	4,251	+ 82	800	1,233	+ 54	1,994	2,314	+ 16	150	591	+ 294	
82 2/	4,900	3,617	- 26	800	976	+ 22	1,827	1,828	0	150	424	+ 183	
83 2/	3,256	4,547	+ 40	1,000	1,361	+ 36	640	678	+ 6	200	180	- 10	
84 2/	2,666	2,186	- 18	1,000	1,003	0	837	439	- 48	200	185	- 8	
20 Year Total	39,580	43,077	1,207 3/	16,650	22,300	1,185 3/	13,032	16,298	1,637 3/	3,353	7,724	3,258 3/	
1965-74 Total	16,125	12,624	742	8,250	8,136	415	4,032	4,214	920	1,753	2,437	687	
1975-84 Total	23,455	30,453	465	8,400	14,164	770	9,000	12,084	717	1,600	5,287	2,571	
20 Year Average	1,979	2,154	60 3/	833	1,115	59 3/	652	815	82 3/	168	386	163 3/	
1965-74 Average	1,613	1,262	74	825	814	42	403	421	92	175	244	69	
1975-84 Average	2,346	3,045	47	840	1,416	77	900	1,208	72	160	529	257	

1/ Percent deviation = deviation from goal/forecast divided by goal/forecast.

2/ Preliminary catch apportionment.

3/ Absolute deviation without regard to sign.

(Literature Cited: 1 and 7)

Appendix Table 29. Inshore sockeye salmon forecast, actual run and deviation, escapement goals and deviation, in the Nuyakuk and Togiak River systems, Bristol Bay, 1965-84.

Year	Number of Fish in Thousands											
	Nuyakuk River						Togiak River					
	Inshore Run			Escapement			Inshore Run			Escapement 2/		
	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/	Forecast	Actual	Percent Deviation 1/	Goal	Actual	Percent Deviation 1/
1965	300	364	+ 21	200	203	+ 2	280	302	+ 8	150	88	- 41
66	241	294	+ 22	150	161	+ 7	313	282	- 10	120	91	- 24
67	128	53	- 59	80	20	- 75	180	141	- 22	90	69	- 23
68	400	168	- 58	200	97	- 52	222	108	- 51	110	43	- 61
69	334	129	- 61	150	70	- 53	180	239	+ 33	100	109	+ 9
1970	400	604	+ 51	214	365	+ 71	272	345	+ 27	100	192	+ 92
71	293	432	+ 47	132	224	+ 70	363	391	+ 8	115	191	+ 66
72	137	146	+ 7	71	29	- 59	126	125	- 1	70	74	+ 6
73	166	176	+ 6	150	110	- 27	119	171	+ 44	80	96	+ 20
74	158	172	+ 9	250	155	- 38	297	194	- 35	100	83	- 17
1975	320	889	+ 178	250	670	+ 168	178	346	+ 94	100	161	+ 61
76	506	856	+ 69	250	425	+ 70	273	451	+ 65	100	158	+ 58
77	249	365	+ 47	250	233	- 7	255	335	+ 31	100	134	+ 34
78	310	1,262	+ 307	250	577	+ 131	289	696	+ 141	100	274	+ 174
79	786	743	- 5	250	360	+ 44	467	564	+ 21	100	171	+ 71
1980	2,167	4,720	+ 118	250	3,027	+1,111	531	1,053	+ 98	100	462	+ 362
81	1,192	3,076	+ 158	250	834	+ 234	647	827	+ 28	100	208	+ 108
82 3/	2,603	2,290	- 12	250	538	+ 115	937	809	- 14	100	245	+ 145
83 3/	1,586	1,572	- 1	300	319	+ 6	589	723	+ 23	100	192	+ 92
84 3/	1,560	1,020	- 35	500	473	- 5	453	306	- 32	150	95	- 37
20 Year Total	13,836	19,331	1,271 4/	4,397	8,890	2,345 4/	6,971	8,408	786 4/	2,085	3,136	1,501 4/
1965-74 Total	2,557	2,538	341	1,597	1,434	454	2,352	2,298	239	1,035	1,036	359
1975-84 Total	11,279	16,793	930	2,800	7,456	1,891	4,619	6,110	547	1,050	2,100	1,142
20 Year Average	692	967	64 4/	220	445	117 4/	349	420	39 4/	104	157	75 4/
1965-74 Average	256	254	34	160	143	45	235	230	24	104	104	36
1975-84 Average	1,128	1,679	93	280	746	189	462	611	55	105	210	114

1/ Percent deviation = deviation from goal/forecast divided by goal/forecast.

2/ Does not include Togiak River and tributaries.

3/ Preliminary catch apportionment.

4/ Absolute deviation without regard to sign.

(Literature Cited: 1 and 7)

Appendix Table 30. Kvichak River sockeye salmon escapement and return by brood year, Bristol Bay, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	9,433	14	23,509	12,755	1,316		37,594	3.98
57	2,843	7	226	3,437	262	2	3,934	1.38
58	535		70	179	27	20	296	0.55
59	680		194	318	13		525	0.77
60	14,630		1,397	46,236	6,279	6	54,008	3.69
1961	3,706	1	317	2,415	666		3,399	0.92
62	2,581		96	4,473	406	7	5,252	2.04
63	339		49	676	354	19	1,098	3.24
64	957	8	2,083	2,662	681	11	5,445	5.69
65	24,326	23	9,787	32,066	1,345	2	43,223	1.78
1966	3,775	15	481	5,255	346	1	6,098	1.62
67	3,216		329	1,007	77		1,413	0.44
68	2,557		271	131	156	2	560	0.22
69	8,394		141	4,460	593	10	5,204	0.62
70	13,935	1	83	14,337	1,222	11	15,654	1.12
1971	2,387		260	2,192	284		2,736	1.15
72	1,010		248	1,351	302		1,901	1.88
73	227		587	1,244	568		2,399	10.59
74	4,434	10	6,539	18,365	769	5	25,688	5.79
75	13,140	5	5,822	29,461	565		35,853	2.73
1976	1,965	5	5,107	4,627	253		9,992	5.08
77	1,341	47	1,840	1,041	91		3,019	2.25
78	4,149		1,729	2,343	823		(4,895)	(1.18)
79	11,218	58	17,560	19,216			(36,834)	(3.28)
80	22,505	2	2,830				(2,832)	(0.13)
1981	1,754							
82	1,135							
83	3,570							
84	10,491							
Total	171,233	196	81,555	210,607	17,398	96	309,852	
1956-77 Total	112,411	136	59,436	189,048	16,575	96	265,291	
Average 3/	5,110	6	2,702	8,593	753	4	12,059	2.36
Percent		+	22.4	71.3	6.2	+	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye.

All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 31. Branch River sockeye salmon escapement and return by brood year, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	784	5	1,825	435	64		2,329	2.97
57	127		5	65	13	1	84	0.66
58	95		39	53	52		144	1.52
59	825		275	387	95	6	763	0.92
60	1,241		101	313	30		444	0.36
1961	90	10	86	187			283	3.14
62	91	19	117	90	19		245	2.69
63	203		189	163	2		354	1.74
64	249	5	91	199	17	1	313	1.26
65	175	6	98	162	19		285	1.63
1966	174	13	264	243	10		530	3.04
67	203	9	278	8	7		381	1.88
68	194	8	117	33	3		161	0.84
69	182		5	155	24		184	1.01
70	177		73	75	2		150	0.84
1971	187	2	26	57	36	2	123	0.66
72	151	1	87	24	13		125	0.83
73	35		96	141	2		239	6.83
74	215	4	292	143	26		465	2.16
75	100	15	403	302	32		752	7.52
1976	82	26	203	167	49		445	5.42
77	100	24	126	639	12		801	8.01
78	229		92	102	139		(333)	(1.45)
79	294	3	441	309			(753)	(2.56)
80	298		98				(98)	(0.33)
1981	82							
82	239							
83	96							
84	215							
Total	7,133	150	5,427	4,531	666	10	10,784	
1956-77								
Total	5,680	147	4,796	4,120	527	10	9,600	
Average 3/	258	7	218	187	24	+	436	1.69
Percent		1.6	50.0	42.9	5.5	+	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye.

All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

Literature Cited: 1, 14, and 18)

Appendix Table 32. Naknek River sockeye salmon escapement and return by brood year, Bristol Bay, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	1,773	1	458	1,615	324	2	2,400	1.35
57	635		51	821	680	3	1,555	2.45
58	278		106	735	176	13	1,030	3.71
59	2,232		325	1,077	854		2,256	1.01
60	828	1	1,366	1,294	1,237	3	3,901	4.71
1961	351		231	1,033	624	11	1,899	5.41
62	723		72	564	399	1	1,036	1.43
63	905		137	1,180	610	1	1,928	2.13
64	1,350	1	421	1,350	202	4	1,978	1.47
65	718	5	554	1,043	475	3	2,080	2.90
1966	1,016	5	683	2,205	565	1	3,459	3.40
67	756		309	918	317	1	1,545	2.04
68	1,023	3	141	288	314	2	748	0.73
69	1,331		52	1,251	1,174	3	2,480	1.86
70	733		172	2,134	371		2,677	3.65
1971	936	1	418	1,930	1,800	16	4,165	4.45
72	587	3	242	391	577	1	1,214	2.07
73	357		448	1,102	592		2,142	6.00
74	1,241	2	231	1,230	753	5	2,221	1.79
75	2,027	1	424	3,077	1,543	8	5,053	2.49
1976	1,321	4	1,026	5,378	1,354	27	7,789	5.90
77	1,086	10	599	2,148	429	5	3,191	2.94
78	813	1	289	2,675	511		(3,476)	(4.28)
79	925	4	2,329	1,679			(4,012)	(4.34)
80	2,645	1	697				(698)	(0.26)
1981	1,796	4					(4)	(0.00)
82	1,156							
83	888							
84	1,242							
Total	31,672	47	11,781	37,118	15,881	110	64,937	
1956-77 Total	22,207	37	8,466	32,764	15,370	110	56,747	
Average 3/	1,009	2	385	1,489	699	5	2,579	2.56
Percent		+	14.9	57.7	27.1	0.2	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye.

All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 33. Egegik River sockeye salmon escapement and return by brood year, Bristol Bay, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	1,104	6	1,961	3,902	700	32	6,601	5.98
57	391		35	1,092	1,005	64	2,196	5.61
58	246		41	866	334	19	1,260	5.11
59	1,072		68	1,176	653	69	1,966	1.83
60	1,799	7	452	4,676	2,528	51	7,714	4.29
1961	702		81	657	806	14	1,558	2.22
62	1,027		20	1,001	399	56	1,476	1.44
63	998		17	635	595	13	1,260	1.26
64	850	1	117	1,490	382	52	2,042	2.40
65	1,445		133	2,003	941	46	3,123	2.16
1966	804		235	1,269	825	23	2,352	2.92
67	637		59	854	592	17	1,522	2.39
68	339		38	161	303	13	515	1.52
69	1,016		13	1,185	1,378	112	2,688	2.65
70	920		59	874	262	37	1,232	1.34
1971	634		46	1,537	1,017	53	2,653	4.18
72	546		60	1,579	1,241	18	2,898	5.31
73	329		74	697	878	4	1,653	5.02
74	1,276		147	2,277	533	3	2,960	2.32
75	1,174		153	2,520	791	3	3,467	2.95
1976	509	2	644	3,662	757		5,065	9.95
77	693	2	795	2,384	666	13	3,860	5.57
78	896		371	6,218	2,190		(8,779)	(9.80)
79	1,032	3	692	3,504			(4,199)	(4.07)
80	1,061	1	820				(821)	(0.77)
1981	695							
82	1,035							
83	792							
84	1,165							
Total	25,187	22	7,131	46,219	19,776	712	75,250	
1956-77								
Total	18,511	18	5,248	36,497	17,586	712	60,061	
Average 3/	841	1	239	1,659	799	32	2,730	3.25
Percent		+	8.7	60.8	29.3	1.2	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye. All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 34. Ugashik River sockeye salmon escapement and return by brood year, Bristol Bay, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	425	13	3,066	869	37		3,985	9.38
57	215		34	446	106	2	588	2.73
58	280		58	537	67		662	2.36
59	219		16	340	160	1	517	2.36
60	2,341		660	1,820	471	1	2,952	1.26
1961	366		233	728	117		1,078	2.95
62	274		73	306	26		405	1.48
63	397		13	109	22		144	0.36
64	483		37	255	19	9	320	0.66
65	998		82	275	179		536	0.54
1966	715	1	678	1,396	19		2,094	2.93
67	244		52	85	33		170	0.70
68	71		13	26	4		43	0.61
69	160		4	57	27	2	90	0.56
70	735		5	256	29	1	291	0.40
1971	530		176	497	123	1	797	1.50
72	79		33	176	35	4	248	3.14
73	39		18	21	50		89	2.28
74	62		19	603	84		706	11.39
75	429	3	1,442	2,184	302	1	3,932	9.17
1976	356		2,005	2,507	398	3	4,913	13.80
77	202	2	542	1,709	188	5	2,446	12.11
78	82		238	1,213	514		(1,965)	(23.96)
79	1,707	19	2,963	2,220			(5,202)	(3.05)
80	3,335	1	1,193				(1,194)	(0.36)
1981	1,328	2					(2)	(0.00)
82	1,186							
83	1,001							
84	1,270							
Total	19,529	41	13,65	18,635	3,010	30	35,369	
1956-77								
Total	9,620	19	9,259	15,202	2,496	30	27,006	
Average 3/	437	1	421	691	113	1	1,228	2.81
Percent		0.1	34.3	56.3	9.2	0.1	100.0	

1/ Includes aerial estimates of King Salmon River escapements 1960-67, and 1976-84 and Dog Salmon River escapement 1984. Includes estimates of Japanese high seas catch of Bristol Bay sockeye. All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 35. Wood River sockeye salmon escapement and return by brood year, Bristol Bay, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	773		752	616			1,368	1.77
57	289		147	296			443	1.53
58	960	1	1,957	467	33		2,458	2.56
59	2,209		903	752	68	4	1,727	0.78
60	1,016	6	1,416	1,111	99		2,632	2.59
1961	461		251	1,124	29	2	1,406	3.05
62	874	2	886	506	43		1,437	1.64
63	721		574	722	44		1,340	1.86
64	1,076	1	382	696	72	7	1,158	1.08
65	675	3	487	997	199	4	1,690	2.50
1966	1,209	7	926	799	55		1,787	1.48
67	516	3	577	214	68		862	1.67
68	649	1	419	397	26		843	1.30
69	604		61	642	105	1	809	1.34
70	1,162	2	1,534	1,082	30		2,648	2.28
1971	851	2	442	757	63		1,264	1.49
72	431	3	771	602	39		1,415	3.28
73	330	2	211	1,130	33		1,376	4.17
74	1,709	7	2,902	2,022	60		4,991	2.92
75	1,270	55	1,543	2,275	674		4,547	3.58
1976	817	3	2,145	2,868	271		5,287	6.47
77	562	19	948	2,234	14		3,215	5.72
78	2,267		1,176	1,762	122		(3,060)	(1.35)
79	1,706	8	2,811	1,678			(4,497)	(2.64)
80	2,969	3	473				(476)	(0.16)
1981	1,233							
82	976							
83	1,361							
84	1,003							
Total	30,679	128	24,694	25,749	2,147	18	52,736	
1956-77								
Total	19,164	117	20,234	22,309	2,025	18	44,703	
Average 3/	871	5	920	1,014	92	1	2,032	2.33
Percent		0.3	45.3	49.9	4.5	+	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye.

All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 36. Igushik River sockeye salmon escapement and return by brood year, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	400		163	506	40		709	1.77
57	130		2	54	20		76	0.58
58	107		13	91	28		132	1.23
59	644		92	246	27		365	0.57
60	495		62	341	61		464	0.94
1961	294		32	404	7		443	1.51
62	16		32	144	14		190	11.88
63	92		168	290	23		481	5.23
64	129		174	586	54		814	6.31
65	181		313	647	123		1,083	5.98
1966	206		79	484	11	2	576	2.80
67	282		78	95	14		187	0.66
68	195		82	97	13		192	0.98
69	512		1	399	114		514	1.00
70	371		25	259	50		334	0.90
1971	211		55	220	27		302	1.43
72	60		89	114	19		222	3.70
73	60		19	621	24		664	11.07
74	359		454	1,057	23		1,534	4.27
75	241		759	2,580	508		3,847	15.96
1976	186		521	1,677	214		2,412	12.97
77	96		318	1,596	10		1,924	20.04
78	536		54	354	17		(425)	(0.79)
79	860		323	451			(774)	(0.90)
80	1,988		19				(19)	(0.01)
1981	591							
82	424							
83	180							
84	185							
Total	10,031		3,927	13,313	1,441	2	18,683	
1956-77 Total	5,267		3,531	12,508	1,424	2	17,465	
Average 3/	239		161	569	65	+	794	3.32
Percent			20.3	71.7	8.0	+	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye. All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 37. Nuyakuk River sockeye salmon escapement and return by brood year, 1956-84. 1/

Brood Year	Escapement	Return by Year					Total	Return Per Spawner 2/
		3	4	5	6	7		
1956	30		210	153			363	12.10
57	67		4	13	1		18	0.27
58	196		85	343	12		440	2.24
59	49		54	61	11		126	2.57
60	146	4	148	387	11		550	3.77
1961	80	1	67	297	1		366	4.58
62	38		20	43	2		65	1.71
63	167		13	167	6		186	1.11
64	103	1	15	67	2		85	0.83
65	203		87	596	54		737	3.63
1966	161	1	115	409	17		542	3.37
67	20	1	9	132	6		148	7.40
68	97		30	176	8		214	2.21
69	70	3	20	85	8		116	1.66
70	365		89	872	103		1,064	2.92
1971	224	1	105	794	43	1	944	4.21
72	29		59	304	144		507	17.48
73	110		44	1,014	1		1,059	9.63
74	155		117	244			361	2.33
75	670	10	505	4,432	225	1	5,173	7.72
1976	425	1	382	2,724	269		3,376	7.94
77	233		304	1,959	53		2,316	9.94
78	577		107	1,077	15		(1,199)	(2.08)
79	360	1	377	996			(1,374)	(3.82)
80	3,027	1	120				(121)	(0.04)
1981	834							
82	538							
83	319							
84	473							
Total	9,766	25	3,086	17,345	992	2	21,450	
1956-77								
Total	3,638	23	2,482	15,272	977	2	18,756	
Average 3/	165	1	113	694	44	+	853	5.17
Percent		0.1	13.3	81.4	5.2	+	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye. All escapements and returns are rounded to the nearest thousand fish.

2/ Returns in parenthesis are incomplete.

3/ Averages and percentages computed from 1956-77.

(Literature Cited: 1 and 18)

Appendix Table 38. Togiak River sockeye salmon escapement and return by brood year, 1956-84. 1/

Brood Year	Escapement 2/	Return by Year						Return Per Spawner 3/
		3	4	5	6	7	Total	
1956	225		107	311	15	1	434	1.93
57	25	2	50	91	37		180	7.20
58	72	4	65	174	25		268	3.72
59	210		129	147	8		284	1.35
60	192		186	292	50		528	2.75
1961	122	1	84	226	19		330	2.70
62	62		50	102	8	1	161	2.60
63	116		42	79	23	4	148	1.28
64	105		40	115	17		172	1.64
65	96		149	201	40		390	4.06
1966	104	1	194	375	10	1	581	5.59
67	81	1	22	100	37		160	1.98
68	50		47	151	17		215	4.30
69	117		33	159	15		207	1.77
70	203		55	260	66	1	382	1.88
1971	200		107	353	66	2	528	2.64
72	79	1	87	165	98		351	4.44
73	107	1	146	391	16		554	5.18
74	104	1	248	358	47	1	655	6.30
75	181		270	873	51		1,194	6.60
1976	189		173	587	145		905	4.79
77	163		210	569	15		794	4.87
78	305		129	517	24		(670)	(2.19)
79	198	2	271	385			(658)	(3.32)
80	527		45				(45)	(0.09)
1981	307							
82	270							
83	205							
84	126							
Total	4,742	14	2,939	6,981	849	11	10,794	
1956-77								
Total	2,803	12	2,494	6,079	825	11	9,421	
Average 4/	127	1	113	276	38	1	428	3.37
Percent		0.1	26.4	64.5	8.9	0.1	100.0	

1/ Includes estimates of Japanese high seas catch of Bristol Bay sockeye. All escapements and returns are rounded to the nearest thousand fish.

2/ Includes Togiak Lake, Togiak River and tributary spawners.

3/ Returns in parenthesis are incomplete.

4/ Averages and percentages computed from 1956-77.

(Literature Cited: 1, 13, and 18)

Appendix Table 39. Inshore commercial catch and escapement of king salmon in the Nushagak and Togiak districts, Bristol Bay, 1966-84. 1/

Year	Number of Fish					
	Nushagak District			Togiak District		
	Catch	Escapement 2/	Total Run	Catch	Escapement 3/	Total Run
1966	58,184	40,000 a/	98,184	9,967		
67	96,240	65,000 b/	161,240	13,381	10,000	23,381
68	78,201	70,000	148,201	13,499	16,000	29,499
69	80,803	35,000	115,803	20,181	8,000	28,181
70	87,547	50,000	137,547	28,664	15,000	43,664
1971	82,769	40,000 4/	122,769	27,026	20,000	47,026
72	46,045	25,000	71,045	19,976	14,000	33,976
73	30,470	35,000	65,470	10,856	11,000	21,856
74	32,053	70,000	102,053	10,798	15,000	25,798
75	21,454	70,000	91,454	7,226	11,000	18,226
1976	60,684	100,000	160,684	29,744	14,000	43,744
77	85,074	65,000	150,074	35,218	20,000	55,218
78	118,548	130,000	248,548	57,000	40,000	97,000
79	157,321	95,000	252,321	30,022	20,000	50,022
80	64,958	141,000	205,958	12,543	12,000	24,543
1981	193,461	150,000	343,461	23,911	27,000	50,911
82	195,287	147,000	342,287	33,786	17,000	50,786
83	139,400 5/	162,000	301,400	38,360 5/	22,000	60,360
84	61,124 5/	81,000	142,124	21,920 5/	26,000	47,920
19 Year Total	1,689,623	1,571,000	3,260,623	444,078	318,000	752,111
1966-75 Total	613,766	500,000	1,113,766	161,574	120,000	271,607
1976-84 Total	1,075,857	1,071,000	2,146,857	282,504	198,000	480,504
19 Year Average	88,928	82,684	171,612	23,373	17,667	41,784
1966-75 Average	61,377	50,000	111,377	16,157	13,333	30,179
1976-84 Average	119,540	119,000	238,540	31,389	22,000	53,389

- 1/ Escapement estimates are based on data collected on comprehensive aerial surveys of the spawning grounds; these escapement estimates supersede previously reported escapements, and are rounded to the nearest thousand fish.
- 2/ Comprehensive aerial coverage was begun in 1968; escapements prior to 1968 were derived from:
- a/ tower enumeration data from Nushagak River, and estimate of total escapement accounted for by tower enumeration;
 - b/ tower enumeration data, minimal aerial survey coverage, and general run strength indicators (commercial and subsistence catches).
- 3/ Comprehensive aerial survey coverage was begun in 1967.
- 4/ Aerial escapement precluded by adverse weather; however, the escapement was estimated from average mean exploitation rates from 1966-70 and 1972-76.
- 5/ Preliminary.

(Literature Cited: 1, 5 and 13)

Appendix Table 40. Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak districts, Bristol Bay, 1966-84. 1/

Year	Number of Fish					
	Nushagak District			Togiak District		
	Catch	Escapement 2/	Total Run	Catch	Escapement 3/	Total Run
1966	129,344	80,000	209,344	95,410		
67	338,286	200,000	538,286	63,322	179,000	242,322
68	178,786	100,000	278,786	108,001	348,000	456,001
69	214,235	130,000	344,235	66,389	85,000	151,389
70	435,033	273,000	708,033	100,711	241,000	341,711
1971	360,015	226,000	586,015	123,847	229,000	352,847
72	310,126	195,000	505,126	178,885	170,000	348,885
73	336,331	200,000	536,331	195,431	163,000	358,431
74	157,941	100,000	257,941	80,710	161,000	241,710
75	152,891	80,000	232,891	87,058	114,000	201,058
1976	801,064	500,000	1,301,064	153,559	392,000	545,559
77	899,701	609,000	1,508,701	270,649	496,000	766,649
78	651,743	293,000	944,743	274,967	396,000	670,967
79	440,279	166,000	606,279	219,942	293,000	512,942
80	681,930	969,000	1,650,930	299,682	415,000	714,682
1981	795,143	177,000	972,143	229,886	331,000	560,886
82	434,817	256,000	690,817	151,000	86,000	237,000
83	586,166 4/	164,000	750,166	322,670 4/	165,000	487,670
84	679,845 4/	362,000	1,041,845	339,064 4/	204,000	543,000
19 Year Total	8,583,676	5,080,000	13,663,676	3,361,183	4,468,000	7,733,709
1966-75 Total	2,612,988	1,584,000	4,196,988	1,099,764	1,690,000	2,694,354
1976-84 Total	5,970,688	3,496,000	9,466,688	2,261,419	2,778,000	5,039,355
19 Year Average	451,772	267,368	719,141	176,904	248,222	429,651
1966-75 Average	261,299	158,400	419,699	109,976	187,778	299,373
1976-84 Average	663,410	388,444	1,051,854	251,269	308,667	559,928

1/ Escapement estimates are based on data collected on comprehensive aerial surveys of the spawning grounds; these estimates supersede previously reported escapements, and are rounded to the nearest thousand fish.

2/ Comprehensive aerial coverage was begun in 1977; escapements were derived from:

- 1966 - tower enumeration data from Nushagak River; and estimate of total escapement accounted for by tower enumeration;
- 1967 - tower enumeration data, and proportion of escapement to catch in 1966 and 1968;
- 1968 and 1973-74 - tower enumeration and aerial survey data;
- 1970-72 - average catch/escapement ratio for 1968-69 and 1973-81;
- 1975-78 - aerial survey data; and
- 1979-84 - adjusted sonar estimate from Portage Creek site.

3/ Comprehensive aerial survey coverage was begun in 1967.

4/ Preliminary.

(Literature Cited: 1, 5 and 13)

Appendix Table 41. Inshore commercial catch and escapement of pink salmon in the Nushagak district by river system, Bristol Bay, 1958-84. 1/

Year	Number of Fish							Total	Total Run
	Catch	Escapement							
		Wood 2/	Igushik 3/	Nuyakuk 4/	Nush/Mul 5/	Snake 6/			
1958	1,113,794			4,000,000				4,000,000	5,113,794
60	289,781			146,359				146,359	436,140
62	880,424	25,000	12,000	493,914	6,100	6,000		543,014	1,423,438
64	1,497,817	1,560	450	883,500	25,000	50		910,560	2,408,377
66	2,337,066			1,442,424				1,442,424	3,779,490
68	1,705,150			2,161,116				2,161,116	3,866,266
1970	417,834			152,580				152,580	570,414
72	67,953			58,536				58,536	126,489
74	413,613	44,800	7,500	529,216	3,100	900		585,516	999,129
76	739,580	21,986	5,070	794,478	41,800	100		863,434	1,603,024
78	4,348,336	205,000	16,210	8,390,184	771,600	3,483		9,386,477	13,734,813
1980	2,202,545	31,150	3,500	2,626,746	123,000	800		2,785,196	4,987,741
82	1,339,272	36,100	8,430	1,592,096	19,130	900		1,656,656	2,995,928
84	3,154,339 7/	81,400	6,190	2,760,312	73,050	5,500		2,926,452	6,080,791
14 Year Total	20,507,514	446,996	59,350	26,031,461	1,062,780	17,733		27,618,320	48,125,834
14 Year Average 8/	1,464,822	55,875	7,419	1,859,390	132,848	2,217		1,972,737	3,437,560

1/ Includes even-years only.

2/ Aerial survey estimate 1962 and 1974-84; tower count 1964.

3/ Aerial survey estimate 1962-80; aerial survey estimate and tower count 1976 and 1982-84.

4/ Tower count 1960-84; aerial survey estimate 1958, and below counting tower 1962-64 and 1974-84.

5/ Aerial survey estimate.

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

7/ Preliminary.

8/ Only years and systems with escapement data were included in calculating averages.

(Literature Cited: 1, 5, 13 and 20)

Appendix Table 42. Nushagak district pink salmon escapement and return by brood year, Bristol Bay 1958-84. 1/

Brood Year	Number of Fish		Return Per Spawner
	Escapement	Return	
1958	4,000	436	0.11
1960	146	1,423	9.75
62	543	2,408	4.43
64	911	3,779	4.15
66	1,442	3,866	2.68
68	2,161	570	0.26
1970	153	126	0.82
72	59	999	16.93
74	586	1,603	2.74
76	863	13,735	15.92
78	9,386	4,988	0.53
1980	2,785	2,996	1.08
82	1,657	6,081 2/	3.67
84	2,926		
Total	27,618	43,010	
1958-82 Total	24,692	43,010	
Average 3/	1,899	3,308	1.74

1/ Includes even-years only. All escapements and returns are rounded to the nearest thousand fish.

2/ Preliminary.

3/ Averages and percentages computed from 1958-82.

(Literature Cited: 1, 5, 13 and 20)

Appendix Table 43. Inshore commercial catch and escapement of coho salmon in the Nushagak and Togiak districts, Bristol Bay, 1980-84. 1/

Year	Number of Fish					
	Nushagak District			Togiak District		
	Catch	Escapement 2/	Total Run	Catch	Escapement 3/	Total Run
1980	147,726	232,000	379,726	151,000	96,000 a/	247,000
81	220,290	180,000 a/	400,290	29,207	61,000 b/	90,207
82	349,669	234,000	583,669	133,765	81,000 a/	214,765
83	80,858 4/	51,000	131,858	5,681 4/	c/	
84	271,570 4/	171,000	442,570	170,948 4/	104,000 d/	274,948
5 Year Total	1,070,113	868,000	1,938,113	490,601	342,000	826,920
5 Year Average	214,023	173,600	387,623	98,120	85,500	206,730

- 1/ Escapement estimates are based on data collected from sonar enumeration and on comprehensive aerial surveys of the spawning grounds; these escapement estimates supersede previously reported escapements and are rounded to the nearest thousand fish.
- 2/ Sonar enumeration was begun in 1980; however, since sonar enumeration does not cover the complete season, a proportional method is used to estimate escapement after the sonar operation has terminated;
- a/ sonar enumeration precluded by lack of funding; however, the escapement was estimated from average mean exploitation rates from 1980 and 1982-84.
- 3/ Comprehensive aerial survey coverage was begun in 1980; however, aerial coverage has been limited to:
- a/ Togiak and Kulukak River drainages;
- b/ Togiak, Kulukak, Ungalikthluk/Kukayachagak and Nunavachak drainages;
- c/ aerial escapement precluded by adverse weather and water conditions;
- d/ Togiak, Kulukak, Slug, Osviak and Matogak River drainages.
- 4/ Preliminary.

(Literature Cited: 1, 5 and 13)

Appendix Table 44. Average round weight of the commercial salmon catch by district and species, Bristol Bay, 1965-84.

Species and Year	Average Round Weight 1/					Average Bristol Bay 2/
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
SOCKEYE SALMON						
1965						4.5
66						6.1
67						6.3
68				6.4		5.6
69	5.1	5.5		5.5	5.5	5.3
1970	4.8	4.8		5.7	5.8	4.9
71	5.6	5.9		6.2	7.0	6.0
72	6.1	6.0	6.1	6.0	6.4	6.0
73	6.7	7.1	7.3	7.1	7.9	7.1
74	5.5	5.7	5.2	5.7	7.0	5.8
1975	5.2	5.7	5.2	6.1	6.7	5.5
76	5.8	5.9	6.2	6.6	7.5	6.1
77	6.63	6.33	6.76	7.49	7.88	6.69
78	5.50	6.31	6.20	6.29	7.32	5.93
79	5.76	5.98	5.97	6.12	7.15	5.87
1980	5.44	5.57	5.51	6.11	6.82	5.62
81	6.07	6.01	6.25	6.40	6.75	6.19
82	6.26	6.40	6.51	6.40	7.36	6.40
83	5.52	5.82	5.73	5.87	6.65	5.66
84	5.41	5.79	5.61	6.16	6.80	5.60
KING SALMON						
1965						14.6
66						19.5
67						21.0
68				21.6		17.7
69	18.0			19.2	23.0	19.7
1970	21.5	19.6		18.3	17.0	18.4
71	27.0	21.7		21.7	22.3	22.1
72	25.5	21.6	17.3	19.8	21.1	20.3
73	23.5	21.4	21.0	22.6	24.1	23.0
74	20.8	18.6	20.7	23.2	21.0	22.4
1975	25.0	19.5	18.1	18.8	14.0	17.8
76	27.6	18.6	13.5	18.7	12.1	17.0
77	30.50	22.12	23.80	23.36	20.76	22.87
78	28.32	23.64	29.20	22.34	26.10	23.91
79	21.75	21.16	22.72	21.06	22.20	21.32
1980	20.47	20.96	21.89	19.61	18.02	19.69
81	20.76	18.61	18.93	19.63	13.14	18.98
82	19.39	18.46	20.07	20.40	15.40	19.55
83	20.81	20.19	21.51	20.96	20.69	20.91
84	19.95	18.69	19.52	20.78	20.32	20.45

(continued)

Appendix Table 44. (continued)

Species and Year	Average Round Weight 1/					Average Bristol Bay 2/
	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	
<u>CHUM SALMON</u>						
1965						7.0
66						7.5
67						6.8
68						6.3
69		6.1	5.4	6.0	5.7	5.9
1970	5.8	6.5		5.9	6.3	5.9
71	6.5			6.4	6.7	6.5
72	6.5	6.4	5.7	6.5	6.6	6.5
73	7.3	6.9	7.7	7.0	7.3	7.1
74	6.4	6.4	7.2	6.2	7.4	6.6
1975	6.3	6.2	6.1	6.1	6.6	6.3
76	5.9	5.8		6.9	7.1	6.8
77	7.32	6.46	6.70	7.33	8.21	7.43
78	6.58	6.70	6.20	7.08	8.05	7.21
79	6.81	7.20	7.52	6.24	7.79	6.78
1980	6.23	6.60	6.27	5.94	6.68	6.19
81	6.52	6.77	7.16	6.58	7.41	6.72
82	6.31	6.61	6.83	6.67	7.30	6.71
83	6.05	6.70	6.33	6.43	7.56	6.61
84	6.41	6.85	6.49	6.54	7.80	6.77
<u>PINK SALMON</u>						
1966						3.1
68						3.0
70	2.9			3.0	3.7	3.0
72	3.4			3.1	3.8	3.1
74	4.3	3.9	4.1	3.6	4.4	4.0
1976	3.7	3.8		3.3	4.1	3.4
78	3.59	3.20	3.30	3.11	3.77	3.19
80	3.57	3.41		3.36	3.80	3.39
82	3.56		4.08	3.45	3.52	3.46
84	3.64	3.75	3.06	3.18	3.78	3.21

(continued)

Appendix Table 44. (continued)

Species and Year	Average Round Weight 1/					Average Bristol Bay 2/
	Naknek- Kvichak	Egegik	Ugashik	Nushagak	Togiak	
<u>COHO SALMON</u>						
1965						6.3
66						7.5
67						7.0
68		8.6	9.1	7.3	8.8	8.5 3/
69		6.3	7.6	6.2	8.7	7.0
1970				5.7	8.2	6.8
71				6.3		6.3
72		6.1		6.3	7.6	7.0
73	5.6	6.3	6.8	6.0	7.5	6.7
74	6.7	6.5	7.2	6.7	8.6	7.9
1975	6.7	7.2	7.2	6.1	9.2	8.6
76	5.5	6.9		6.0	8.3	7.6
77				6.46	9.35	7.80
78	6.38	6.25		6.79	8.19	7.45
79	5.16	7.27	8.41	6.71	9.04	7.78
1980	6.84	6.79	7.80	6.08	7.95	7.01
81	6.17	6.32	7.59	6.02	7.75	6.35
82	7.18	7.07	7.72	6.81	8.65	7.31
83		6.68	7.15	6.52	7.14	6.62
84	6.03	6.94	7.69	6.60	8.94	7.45

1/ Average weight in pounds is weighted by the number of fish in the catch of each processor.

2/ Average weight in 1965-68 from annual "Alaska Catch and Production Commercial Fisheries Statistics" (Statistical Leaflet Series), and 1969-84 weighted by district from processor catch reports.

3/ Weighted by district from processor annual reports.

(Literature Cited: 4 and 10)

Appendix Table 45. Salmon prices paid to fishermen by species, Bristol Bay, 1965-84. 1/

Species	Price Per Fish in Dollars 2/					Price Per Pound in Dollars 2/																
	1965	1966	1967	1968		1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	
	INDEPENDENT FISHERMEN					AIFMA																
SOCKEYE	1.09	1.13	1.18	1.19	Canned Fresh/Frozen	.24	.24	.26	.27	.35	.48	.37	.52	.595	.68	.80 1.25	.57	.75	.70	.58	.58	
KING																						
Large	3.75	3.87	3.87	3.87																		
Medium	1.87	1.94	1.94	1.94	Canned	.18	.18	.20	.20	.28	.33	.35	.41	.45	.50	.55	.57	.75	.75	.50	.50	
Small	1.00	1.00	1.03	1.03	Fresh/Frozen			.24	.24		.45	.40	.45	.65	.55		1.25	1.30				
CHUM	.58	.60	.60	.60	Canned Fresh/Frozen	.11	.11	.12	.12	.18	.30	.18	.32	.375	.40	.55 .55	.34	.42	.32	.25	.25	
PINK	.32	.33	.33	.33		.11	.11	.12	.12	.18	.28	.19	.31	.36	.33	.33	.25	-	.18	-	-	
COHO	1.09	1.13	1.18	1.19	Canned Fresh/Frozen	.20	.20	.26	.27	.35						.70		.75	.70	-	-	
	COMPANY FISHERMEN					WACMA																
SOCKEYE	.67	.70	.73	.74	Canned Fresh/Frozen	.14	.14		.16	.17	.22	.30	.45	.475	.595	.68	.80 1.25	.57	.65	.56	.65	.665
KING																						
Large	2.70	2.40	2.78	2.78																		
Medium	(2/1)	1.20	1.39	1.39	Canned	.11	.11		.12	.13	.18	.21	.35	.41	.45	.50	.52	.45		.75	-	-
Small		.64	.69	.69	Fresh/Frozen								.40	.46	.65	.70	1.00		1.15	1.17	-	-
CHUM	.37	.37	.37	.37	Canned Fresh/Frozen	.06	.06		.08	.08	.11	.19	.30	.32	.36	.38	.41 .55	.34	.38	.32	.32	.32
PINK	-	.20	.17	.17		.06	.06	.08	.13	.11	.18	.28	.308	.308	.33	-	.25	-	.30	3/	-	-
COHO	.67	.70	.73	.74	Canned Fresh/Frozen	.14	.14		.16	.13	.19	.26		.45	.475	.70		.65			.65	.665
													.38	.405	.5325	.62	1.05	.75				

1/ Company/independent fishermen classification was in effect through 1974; beginning in 1975 all fishermen are hereafter considered to be independent and the majority negotiated prices with the processors through the two active fishermen's groups in Bristol Bay (AIFMA - Alaska Independent Fishermen's Marketing Assn.; and WACMA - Western Alaska Cooperative Marketing Assn.).

2/ Prices per fish and per pound represent a fixed base level price structure, and does not include any subsequent additional payments.

3/ Only a limited number of operators paid this price.

(Literature Cited: 9)

Appendix Table 46. Exvessel value of the commercial salmon catch by species, Bristol Bay, 1965-84. 1/

Year	Estimated Exvessel Value in Thousands of Dollars 2/					
	Sockeye	King	Chum	Pink	Coho	Total
1965	\$ 26,438	\$ 371	\$ 209	\$ +	\$ 9	\$ 27,027
66	10,525	262	206	823	38	11,854
67	5,110	336	286	+	63	5,795
68	3,296	357	218	639	110	4,620
69	8,423	443	216	+	103	9,185
1970	24,368	465	466	151	18	25,468
71	14,951	652	528	+	16	16,147
72	3,914	339	512	47	20	4,832
73	1,892	284	829	+	115	3,120
74	3,793	460	567	1,053	142	6,015
1975	11,047	214	615	+	151	12,027
76	17,139	742	2,892	1,093	82	21,948
77	19,434	1,940	4,275	50	445	26,145
78	40,034	3,206	3,173	5,424	435	52,273
79	128,992	4,541	2,480	5	2,387	138,405
1980	76,118	1,881	2,738	2,173	1,392	84,302
81	120,907	5,557	4,106	7	1,461	132,037
82	68,122	6,088	2,145	1,111	3,199	80,665
83 3/	128,677	2,891	2,894	+	306	134,769
84 3/	94,713	2,152	3,700	2,430	3,092	106,086
20 Year Total	\$ 807,893	\$ 33,181	\$ 33,055	\$ 14,944 4/	\$ 13,584	\$ 902,720
1965-74 Total	102,710	3,969	4,037	2,713	634	114,063
1975-84 Total	705,183	29,212	29,018	12,231	12,950	788,657
20 Year Average	\$ 40,395	\$ 1,659	\$ 1,653	\$ 1,494 4/	\$ 679	\$ 45,136
1965-74 Average	10,271	397	404	543	63	11,406
1975-84 Average	70,518	2,921	2,902	2,446	1,295	78,866

1/ Value paid to the fishermen.

2/ Exvessel value derived from price per fish or pounds times commercial catch.

3/ Preliminary.

4/ Includes even-years only.

(Literature Cited: 1, 5, 9 and 10)

Appendix Table 47. Salmon case pack by species, Bristol Bay, 1965-84. 1/

Year	48 1-lb. Cans Per Case					Coho	Total
	Sockeye	King	Chum	Pink			
1965	1,447,771	24,248	31,826			338	1,504,183
66	737,948	14,850	28,814	95,071		2,345	879,028
67	334,177	19,499	45,321	8		3,100	402,105
68	229,514	12,971	36,638	63,011		4,321	346,455
69	457,911	17,860	30,997	33		2,198	508,999
1970	1,117,163	19,401	58,766	16,772		802	1,212,904
71	694,199	23,118	56,852			437	774,606
72	197,495	9,666	53,756	5,002		547	266,466
73	61,429	1,946	42,044			1,456	106,875
74	87,723	6,461	23,789	39,550		7,012	164,535
1975	290,646	1,920	22,667			373	315,606
76	393,698	6,889	104,935	36,616		1,068	543,206
77	353,133	3,119	137,838	5		2,383	496,478
78	551,648	6,982	76,926	163,230		2,916	801,702
79	688,882	3,058	34,517			1,236	727,693
1980	571,347	820	63,616	48,055		3,767	687,605
81	783,222	5,304	66,430	30		943	855,929
82	193,321	1,700	17,320	26,789		7,510	246,640
83	800,390	6,178	47,227	7		705	854,507
84	649,315	1,740	69,026	108,206		9,765	838,052
20 Year Total	10,730,932	187,730	1,049,305	602,302 2/		53,222	12,533,574
1965-74 Total	5,455,330	150,020	408,803	219,406		22,556	6,166,156
1975-84 Total	5,275,602	37,710	640,502	382,896		30,666	6,367,418
20 Year Average	536,547	9,387	52,465	60,230 2/		2,661	626,679
1965-74 Average	545,533	15,002	40,880	43,881		2,257	616,616
1975-84 Average	527,560	3,771	64,050	76,579		3,067	636,742

1/ Includes only fish canned in Bristol Bay.

2/ Includes even-years only.

(Literature Cited: 1, 4, and 17)

Appendix Table 48. Salmon fish per case by species, Bristol Bay, 1965-84.

Year	Fish Per Case				
	Sockeye	King	Chum	Pink 1/	Coho
1965	15.75	4.28	12.31		9.08
66	12.06	4.52	11.33	26.92	11.90
67	12.37	4.27	11.69		12.56
68	12.34	4.20	11.17	26.86	11.71
69	14.18	4.70	12.78		13.05
1970	15.01	5.11	13.02	26.00	11.73
71	12.62	3.99	11.83		11.07
72	12.35	4.46	12.00	26.76	12.28
73	10.57	4.23	11.27		12.33
74	12.38	3.91	12.04	19.52	9.64
1975	13.18	5.02	12.69		10.19
76	11.84	5.06	11.72	24.04	10.06
77	10.51	4.20	9.68		7.29
78	12.43	3.99	11.25	28.03	10.41
79	12.60	3.64	11.32		10.01
1980	12.53	3.88	12.82	23.95	10.76
81	11.66	5.21	11.21		7.46
82	11.48	3.53	10.60	23.52	10.22
83	12.50	3.90	11.30		10.65
84	12.53	3.72	12.08	25.43	10.08
20 Year Total	25,089	8,582	23,411	25,103	21,248
1965-74 Total	12,963	4,367	11,944	12,606	11,535
1975-84 Total	12,126	4,215	11,467	12,497	9,713
20 Year Average	12.54	4.29	11.71	25.10	10.62
1965-74 Average	12.96	4.37	11.94	25.21	11.54
1975-84 Average	12.13	4.22	11.47	24.99	9.71

1/ Includes even-years only.

(Literature Cited: 1)

Appendix Table 49. Commercial production of frozen salmon by species, Bristol Bay, 1965-84. 1/

Year	Production in Pounds					Coho	Total
	Sockeye	King	Chum	Pink			
1965	367,461	19,360	4,361				391,182
66	262,825	10,628	107,250	12		322	381,037
67	201,146	356,223	69,910			40,908	668,187
68	99,120	184,222	48,485				331,827
69	421,248	353,256	6,537			7,669	788,710
1970	3,234,500	535,159	175,504	33,368		50	3,978,581
71	1,812,864	356,422	115,388	12		40,925	2,325,611
72	54,571	362,653	60,466	790		24,308	502,788
73	186,663	557,422	307,790	11		98,115	1,150,001
74	147,475	281,821	7,212	113,241		582	550,331
1975	101,751	230,045	133,339			444,344	909,479
76	883,620	570,837	163,030	215,176		117,603	1,950,266
77	586,098	1,155,791	336,283	258		235,607	2,314,037
78	6,306,661	1,848,951	761,029	1,580,236		145,355	10,642,232
79	38,031,872	2,291,378	1,231,334	2,451		1,350,300	42,907,335
1980	31,855,642	1,189,870	1,391,797	3,040,765		828,114	38,306,188
81	49,613,633	2,602,066	1,371,467	2,652		1,065,573	54,655,391
82	57,636,789	3,045,713	2,183,075	2,346,198		2,746,413	67,958,188
83	103,432,084	2,723,637	2,372,852	5,929		415,890	108,950,392
84	67,355,538	1,256,414	1,898,387	1,939,511		2,219,281	74,669,131
20 Year Total	362,591,561	19,931,868	12,745,496	9,269,297 2/		9,781,359	414,330,894
1965-74 Total	6,787,873	3,017,166	902,903	147,411		212,879	11,068,255
1975-84 Total	355,803,688	16,914,702	11,842,593	9,121,886		9,568,480	403,262,639
20 Year Average	18,129,578	996,593	643,845	926,930 2/		489,068	20,716,545
1965-74 Average	678,787	301,717	90,290	2,948		21,288	1,106,826
1975-84 Average	35,580,369	1,691,470	1,184,259	1,824,377		956,848	40,326,264

1/ Includes only fish processed in Bristol Bay.

2/ Includes even-years only.

(Literature Cited: 3)

Appendix Table 50. Commercial production of cured salmon by species, Bristol Bay, 1965-84. 1/

Year	Production in Pounds					
	Sockeye	King	Chum	Pink	Coho	Total
1965	18,405	30,879	105		11,674	61,063
66	7,283	9,964	645		21,623	39,515
67	11,850	4,410	1,802		6,300	24,362
68	210,006	142,645	77,963	1,504	270,286	702,404
69	330,443	394,217	371,321	133	409,114	1,505,228
1970	37,298	153,503	86,795	509	14,026	292,131
71	14,922	148,354	12,778		5,682	181,736
72	10,526	3,959	8,614	32	28,547	51,678
73	23,851	4,617	27,768		17,539	73,775
74	24,977	5,402	2,505	65	4,530	37,479
1975	11,863	20,660	81			32,604
76	4,210	62	90			4,362
77	3	20	90		3,171	3,284
78	680,402	4,664	17,388	97,390	3,410	803,254
79	3,651,146	16,824	136,585	403	1,000	3,805,958
1980	4,242,063	9,603	286,113	9,649	6,653	4,554,081
81	4,956,561	23,663	148,051		6,526	5,134,801
82	3,222,798	75,752	277,013	12,780	1,466	3,589,809
83	5,045,048	22,259	266,005		595	5,333,907
84	1,608,948	12,200	131,915	8,545	79,540	1,841,148
20 Year Total	24,112,603	1,083,657	1,853,627	130,474 2/	891,682	28,072,579
1965-74 Total	689,561	897,950	590,296	2,110	789,321	2,969,371
1975-84 Total	23,423,042	185,707	1,263,331	128,364	102,361	25,103,208
20 Year Average	1,205,630	54,183	92,681	13,047 2/	44,584	1,403,629
1965-74 Average	68,956	89,795	59,030	422	78,932	296,937
1975-84 Average	2,342,304	18,571	126,333	25,673	10,236	2,510,321

1/ Includes only fish processed in Bristol Bay.

2/ Includes even-years only.

(Literature Cited: 3)

Appendix Table 51. Fresh export of salmon by air transportation, by species, Bristol Bay, 1965-84. 1/

Year	Production in Pounds					Coho	Total
	Sockeye	King	Chum	Pink			
1965							
66	421	15,932	2,145			98,663	117,161
67	183	73,773	184			124,502	198,642
68	9,884	74,693	806			1,717	87,100
69		75,293	2,372			217	77,882
1970	676	185,564	661				186,901
71		232,912					232,912
72	20,754	359,533	6,442			4,837	391,566
73	163,447	326,372	238,851	183		134,260	863,113
74	253,879	253,695	35,102	104,230		15,116	662,022
1975	374,588	128,032	71,744	45		10,313	584,722
76	498,014	445,386	213,118	96,038		22,559	1,275,115
77	997,899	1,134,791	961,537	14,438		409,058	3,517,723
78	5,149,427	1,548,439	984,408	1,967,420		341,212	9,990,906
79	22,838,654	1,652,904	1,176,549	3,822		933,539	26,605,468
1980	23,284,065	514,638	617,989	612,276		1,196,502	26,225,470
81	25,943,037	1,302,979	817,991	9,385		800,432	28,873,824
82	20,416,684	2,056,650	1,027,817	166,672		1,576,761	25,244,584
83	26,641,032	978,050	552,536	35		248,582	28,420,235
84	7,487,073	565,038	713,898	92,837		1,351,689	10,210,535
20 Year Total	134,079,717	11,924,704	7,424,150	3,039,473 2/		7,269,959	163,765,881
1965-74 Total	449,244	1,597,767	286,563	104,230		379,312	2,817,299
1975-84 Total	133,630,473	10,326,937	7,137,587	2,935,243		6,890,647	160,948,582
20 Year Average	6,703,986	596,235	371,208	303,947 2/		363,498	8,188,294
1965-74 Average	44,924	159,777	28,656	20,846		37,931	281,730
1975-84 Average	13,363,047	1,032,694	713,759	587,049		689,065	16,094,858

1/ Includes all fish exported out of Bristol Bay by air in fresh condition regardless of final processing.

2/ Includes even-years only.

(Literature Cited: 3)

Appendix Table 52. Brine export of salmon by sea-going transportation, Bristol Bay, 1965-84. 1/

Year	Number 2/		Brine Export	
	Operators	Tenders	Number	Pounds
1965			994,966	4,486,175
66			389,595	2,168,233
67			127,818	807,144
68			97,404	466,488
69			297,973	1,592,593
1970	7	(60)	2,712,837	13,327,829
71	5	(12)	523,784	3,162,326
72	1	(1)	59,750	365,386
73	0	0	0	0
74	2	(2)	78,620	456,430
1975	5	(20)	933,728	5,135,799
76	5	(21)	728,420	4,466,126
77	5	15	623,523	3,603,382
78	9	(33)	1,602,224	9,304,376
79	12	(61)	2,987,456	17,557,354
1980	14	101	4,987,000	27,780,210
81	18	80	3,300,118	20,512,734
82	8	27	565,891	3,582,904
83	13	85	4,428,741	25,199,944
84	9	55	2,672,519	14,919,944
20 Year Total	113	573	28,112,367	158,895,377
1965-74 Total	15	75	5,282,747	26,832,604
1975-84 Total	98	498	22,829,620	132,062,773
20 Year Average	8 3/	38 3/	1,405,618	7,944,769
1965-74 Average	3	15	528,275	2,683,260
1975-84 Average	10	50	2,282,962	13,206,277

1/ Includes only fish exported from Bristol Bay in brine or chilled sea water by sea-going tenders for eventual processing.

2/ Number of operators and tenders unavailable prior to 1970. Figures in parenthesis are estimates.

3/ Fifteen year average.

(Literature Cited: 3)

Appendix Table 53. Commercial production and disposition of sockeye salmon, Bristol Bay, 1965-84. 1/

Sockeye Salmon Production in Thousands of Pounds and Percent											
Year	Canned		Frozen		Cured		Fresh		Export 2/		Total
	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Brine 3/		
									Pounds	%	
1965	104,278	96	367	+	18	+			4,486	4	109,149
66	54,379	96	263	+	7	+	+	+	2,168	4	56,817
67	26,264	96	201	1	12	+	+	+	807	3	27,824
68	14,865	95	98	1	201	1	10	+	466	3	15,649
69	32,750	93	421	1	331	1			1,593	5	35,095
1970	84,932	84	3,236	3	37	+	1	+	13,328	13	101,534
71	52,514	91	1,813	3	15	+			3,162	5	57,504
72	14,045	97	55	+	11	+	21	+	365	3	14,497
73	5,030	97	187	3	24	+	163	3			5,405
74	7,020	89	147	2	25	+	254	3	456	6	7,902
1975	21,319	79	102	+	12	+	375	1	5,136	19	26,944
76	28,426	83	884	3	4	+	498	1	4,466	13	34,278
77	27,495	84	586	2	+	+	988	3	3,603	11	32,682
78	37,136	63	6,307	11	680	1	5,149	9	9,304	16	58,576
79	44,350	35	38,032	30	3,651	3	22,839	18	17,557	14	126,429
1980	46,379	35	31,856	24	4,242	3	23,284	17	27,780	21	133,541
81	57,456	36	49,614	31	4,957	3	25,943	17	20,513	13	158,483
82	11,808	12	57,637	60	3,223	3	20,417	21	3,583	4	96,668
83 4/	50,689	24	103,432	49	5,045	2	26,641	13	25,200	12	211,007
84 4/	46,787	34	67,356	49	1,609	1	7,487	5	14,920	11	138,159
20 Year Total	767,922		362,594		24,113		134,080		158,893		1,447,603
1965-74 Total	396,077		6,788		690		449		26,831		430,836
1975-84 Total	371,845		355,806		23,423		133,631		132,062		1,016,767
20 Year Average	38,396	53	18,130	25	1,206	2	6,704	9	7,945	11	72,380
1965-74 Average	39,608	92	679	2	69	+	45	+	2,683	6	43,084
1975-84 Average	37,185	37	35,581	35	2,342	2	13,363	13	13,206	13	101,677

1/ Frozen and cured production includes some mixed fish (mostly chums).

2/ Includes all sockeye exported out of Bristol Bay regardless of final processing.

3/ Primarily sockeye salmon with minimal numbers of king and chum salmon.

4/ Preliminary.

(Literature Cited: 1, 3 and 4)

Appendix Table 54. South Unimak and Shumagin Island sockeye and chum salmon preseason quota and actual commercial catch, Alaska Peninsula, 1965-84. 1/

Year	In Thousands of Fish								
	South Unimak			Shumagin Islands			Total		
	Sockeye			Sockeye			Sockeye		
	Actual	Quota	2/ Chum	Actual	Quota	2/ Chum	Actual	Quota	Chum
1965	568		121	207		45	775		166
66	528		215	54		17	582		232
67	186		73	69		51	255		124
68	342		115	233		51	575		166
69	781		254	76		13	857		267
1970	1,530		403	153		49	1,683		452
71	565		554	45		115	610		669
72	443		468	76		108	519		576
73	239		189	23		23	262		212
74	60	50	15		25		60	75	15
1975	190	165	65	49	50	36	239	215	101
76	235	350	327	72	75	74	307	425	401
77	193	195	93	46	42	22	239	237	115
78	419	428	105	68	94	18	487	522	123
79	683	900	64	179	200	41	862	1,100	105
1980	2,731	2,513	457	572	555	71	3,303	3,068	528
81	1,474	1,442	521	351	318	54	1,825	1,760	575
82	1,670	1,850	934	451	408	160	2,121	2,258	1,094
83	1,545	1,469	615	416	324	169	1,961	1,793	784
84	1,131	1,111	228	257	245	109	1,388	1,356	337
20 Year Total	15,513		5,816	3,397		1,226	18,910		7,042
1965-74 Total	5,242	50	2,407	936	25	472	6,178	75	2,879
1975-84 Total	10,271	10,423	3,409	2,461	2,311	754	12,732	12,734	4,163
20 Year Average	776		291	170		61	946		352
1965-74 Average	524		241	94		47	618		288
1975-84 Average	1,027	1,042	341	246	231	75	1,273	1,273	416

1/ South Unimak includes statistical area 284 in June and July, while Shumagin Islands includes statistical area 282 in June only.

2/ The sockeye quota system of management commenced in 1974, and is based on the final Bristol Bay projected inshore harvest and prior traditional harvest patterns.

(Literature Cited: 12)

Appendix Table 55. Subsistence catch of salmon by district and species, Bristol Bay, 1965-84.

Year	Permits Issued	Number of Fish 1/					Coho	Total
		Sockeye	King	Chum	Pink			
<u>NAKNEK-KVICHAK DISTRICT</u>								
1965		71,900	500	100	+	300	72,800	
66		74,500	600	300	2,700	400	78,500	
67		68,500	500	100	+	500	69,600	
68		71,000	500	100	300	200	72,100	
69		76,300	400	100	+	400	77,200	
1970	145	108,200	300	700	100	200	109,500	
71	137	66,400	200	+	+	100	66,700	
72	170	52,200	400	400	700	100	53,800	
73	219	41,600	600	300	+	500	43,000	
74	263	102,600	1,000	1,100	1,600	200	106,500	
1975	301	122,600	700	300	+	200	123,800	
76	346	82,200	900	900	1,500	600	86,100	
77	352	81,400	1,300	600	100	300	83,700	
78	392	93,000	1,200	1,000	1,400	300	96,900	
79	424	75,000	1,200	600		1,200	78,000	
1980	759	88,200	1,500	1,200	2,100	800	93,800	
81	649	85,100	1,000	400	100	1,100	87,700	
82	350	71,400	1,100	600	900	1,000	75,000	
83	385	107,900	1,000	400	300	900	110,500	
84	382	115,200	900	600	1,300	600	118,600	
20 Year Total	5,274	1,655,200	15,800	9,800	12,700 2/	9,900	1,703,800	
20 Year Average	352	82,800	800	500	1,300 2/	500	85,200	
<u>EGEGIK DISTRICT</u>								
1972	2					100	100	
73	3					100	100	
74	7	300	+	+		+	300	
75	3	200	+	+	+	+	200	
76 3/	2							
1977	20	100	+	100	+	200	400	
78	13	200		100		200	500	
79	8	300				100	400	
80	3	100					100	
81	4	+	+			+	+	
1982	19	2,400	+			+	2,400	
83	14	700	+			+	700	
84	24	500	+	100	+	300	900	
13 Year Total	122	4,800	+	300	+	1,000	6,100	
13 Year Average	9	500	+	+	+	100	500	

(continued)

Appendix Table 55. (continued)

Year	Permits Issued	Number of Fish 1/					Total
		Sockeye	King	Chum	Pink	Coho	
<u>UGASHIK DISTRICT</u>							
1964	2	300					300
66	4	1,000					1,000
67	5	700	+	100	+	500	1,300
68	8	300	+	100	+	300	700
69	3	100				200	300
1970	9	1,400	+	+		+	1,400
71	9	300		+		100	400
72	13	200	100	100	+	300	700
73	14	200	+	100	+	600	900
74	8	200	100	+	+	500	800
1975	1	700	+	+	+	1,200	1,900
76	21	1,200	100	100	100	300	1,800
77	19	1,000	100	300	+	500	1,900
78	8	500	100	100	+	900	1,600
79	8	200	+	+	+	100	300
1980	10	200	+	+	+	200	400
81	12	600	+	+		200	800
82	11	400	+	+	+	300	700
83	8	500	+	+		100	600
84	8	500	+	+		200	800
20 Year Total	181	10,500	500	900	100 2/	6,500	18,600
20 Year Average	9	500	+	+	+ 2/	300	900

(continued)

Appendix Table 55. (continued)

Year	Permits Issued	Number of Fish 1/					Total
		Sockeye	King	Chum	Pink	Coho	
<u>NUSHAGAK DISTRICT</u>							
1965	121	47,500	4,600	18,400	200	5,400	76,100
66	110	23,600	3,700	6,000	4,900	2,400	40,600
67	128	34,900	3,700	14,000	800	4,000	57,400
68	115	30,000	6,600	8,600	5,800	1,900	52,900
69	162	27,700	7,100	8,200	100	7,100	50,200
1970	147	41,100	6,300	9,400	1,500	900	59,200
71	164	42,400	4,400	4,200	+	2,300	53,300
72	168	24,100	4,000	8,200	1,200	1,000	38,500
73	216	28,000	6,600	7,600	100	2,200	44,500
74	261	41,200	7,900	10,200	4,300	4,700	68,300
1975	340	47,300	7,100	5,600	1,300	4,300	65,600
76	317	34,700	6,900	7,200	2,700	2,100	53,600
77	306	43,300	5,200	7,300	200	4,500	60,500
78	331	33,200	6,600	14,300	11,100	2,500	67,700
79	364	40,200	8,900	6,800	500	5,200	61,600
1980	425	76,800	11,800	11,700	7,600	5,100	113,000
81	395	44,600	11,500	10,200	2,300	8,700	77,300
82	376	34,700	12,100	11,400	7,300	8,900	74,400
83	389	38,400	11,800	9,200	500	5,200	65,100
84	438	43,200	9,800	10,300	6,600	8,100	78,000
20 Year Total	5,273	776,900	146,600	188,800	53,000 2/	86,500	1,257,800
20 Year Average	264	38,800	7,300	9,400	5,300 2/	4,300	62,900
<u>TOGLAK DISTRICT</u>							
1965	36	4,600	100	1,600	100	2,200	8,600
74	68	7,400	1,200	2,000	500	1,800	12,900
75	41	4,600	800	1,600	+	2,800	9,800
76	30	2,800	500	900	100	500	4,800
77	41	2,100	400	800	+	1,100	4,400
1978	29	900	300	700	300	500	2,700
79	25	800	200	300	+	700	2,000
80	46	3,600	900	300	300	1,200	6,300
81	52	1,900	400	800	100	2,200	5,400
82	50	1,900	400	300	400	1,300	4,300
1983	38	1,900	700	900	200	800	4,500
84	41	3,600	600	1,700	500	3,800	10,200
12 Year Total	497	36,100	6,500	11,900	2,100	18,900	75,900
12 Year Average	41	3,000	500	1,000	300 2/	1,600	6,300

Appendix Table 55. (continued)

Year	Permits Issued	Number of Fish 1/					Total
		Sockeye	King	Chum	Pink	Coho	
<u>TOTAL BRISTOL BAY</u>							
1965		119,400	5,100	18,500	200	5,700	148,900
66		99,100	4,300	6,300	7,600	2,800	120,100
67		104,100	4,200	14,200	800	5,000	128,300
68		101,300	7,100	8,800	6,100	2,400	125,700
69		104,100	7,500	8,300	100	7,700	127,700
1970	301	150,700	6,600	10,100	1,600	1,100	170,100
71	310	109,100	4,600	4,200	+	2,500	120,400
72	353	76,500	4,500	8,700	1,900	1,400	93,000
73	452	69,800	7,200	8,000	100	3,300	88,400
74	607	151,700	10,200	13,300	6,400	7,200	188,800
1975	686	175,400	8,600	7,500	1,300	8,500	201,300
76	716	120,900	8,400	9,100	4,400	3,500	146,300
77	738	127,900	7,000	9,100	300	6,600	150,900
78	773	127,600	8,100	16,200	12,700	4,400	169,000
79	829	116,500	10,300	7,700	500	7,300	142,300
1980	1,243	168,600	14,100	13,100	10,000	7,300	213,100
81	1,112	132,100	13,000	11,500	2,600	12,200	171,400
82	806	110,800	13,700	12,400	8,600	11,500	157,000
83	834	149,400	13,500	10,500	900	7,100	181,400
84	893	163,000	11,300	12,700	8,400	13,000	208,400
20 Year Total	10,653	2,478,000	169,300	210,200	67,700 2/	120,500	3,052,500
1965-74 Total	2,023	1,085,800	61,300	100,400	23,600	39,100	1,311,400
1975-84 Total	8,630	1,392,200	108,000	109,800	44,100	81,400	1,741,100
20 Year Average	710	123,900	8,500	10,500	6,800 2/	6,000	152,600
1965-74 Average	405	108,600	6,100	10,000	4,700	3,900	131,100
1975-84 Average	863	139,200	10,800	11,000	8,800	8,100	174,100

1/ Catches rounded to nearest hundred fish; the sum of the columns may not equal the total, due to rounding.

2/ Includes even-years only.

(Literature Cited: 1 and 8)

Appendix Table 56. Subsistence catch of sockeye salmon by village, Kvichak River drainage, Bristol Bay, 1965-84.

Year	Number of Fish by Village 1/							Total
	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna- Newhalen	Nondalton	Port Alsworth	
1965	1,000 2/	3,300	9,800	10,200	9,700	35,500		69,500
66	600	1,200	6,000	10,500	6,600	45,800		70,700
67	1,400	3,400	9,900	10,200	9,100	29,600		63,600
68	1,400	4,800	9,800 2/	10,200 2/	8,700	33,700		68,600
69	1,000 2/	5,100	4,200	15,000	4,900	44,000		74,200
1970	1,600 2/	11,200	11,200	22,300	16,400	42,900		105,600
71	1,600 2/	6,500	10,100	12,800	8,500	22,100		61,600
72	1,600 2/	2,200	4,000	8,300	10,000	24,100		50,200
73	4,800	2,200	2,900	9,200	10,200	8,500	1,300	39,100
74	8,600	6,200	14,400	21,500	16,400	29,500	1,500	98,100
1975	5,300	6,400	8,300	18,000	26,700	48,700	2,100	115,500
76	5,300	6,800	4,400	17,100	16,300	20,500	5,500	75,900
77	2,600	6,000	5,600	14,300	11,400	27,200	4,900	72,000
78	8,900	8,800	11,200	23,700	11,000	17,300	3,000	83,900
79	4,400	6,600	3,500	16,200	15,900	14,700	4,200	65,500
1980	6,100	8,100	7,400	22,600	11,100	11,300	6,000	72,600
81	6,600	5,400	9,700	16,500	15,400	15,200	6,800	75,600
82	5,400	1,900	8,200	16,600	13,500	11,200	4,500	61,300
83	4,800	3,300	10,400	20,100	23,800	29,400	4,700	96,500
84	8,100	6,300	12,100	24,400	15,900	29,100	4,600	100,500
20 Year Total	81,100	105,700	163,100	319,700	261,500	540,300		1,520,500
1965-74 Total	23,600	46,100	82,300	130,200	100,500	315,700		701,200
1975-84 Total	57,500	59,600	80,800	189,500	161,000	224,600	46,300	819,300
20 Year Average	4,100	5,300	8,200	16,000	13,100	27,000		76,000
1965-74 Average	2,400	4,600	8,200	13,000	10,100	31,600		70,100
1975-84 Average	5,800	6,000	8,100	19,000	16,100	22,500	4,600	81,900

1/ Catches rounded to nearest hundred fish.

2/ Catch interpolated.

(Literature Cited: 1 and 8)

Appendix Table 57. Subsistence catch of salmon by village, Nushagak district, Bristol Bay, 1965-84.

Year	Number of Fish by Village 1/						Total 3/
	Dillingham 2/	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	
1965	42,200	13,300	7,100	4,400	3,600	4,400	76,100
66	19,000	7,600	4,800	3,200	2,500	3,200	40,600
67	34,700	11,600	5,800	3,900	800	1,200	57,400
68	31,400	10,500	5,200	3,500	700	1,000	52,900
69	33,500	7,700	3,900	2,600	1,300	800	50,200
1970	33,300	8,100	1,200	10,700	3,000	2,900	59,200
71	18,100	8,600	4,200	10,400	5,600	6,400	53,300
72	12,600	3,900	800	6,700	7,000	7,500	38,500
73	19,700	4,700	1,100	8,600	6,800	3,600	44,500
74	23,900	11,600	2,300	10,500	11,800	8,200	68,300
1975	22,100	7,100	2,300	6,800	19,200	8,100	65,600
76	17,700	8,400	2,000	9,000	11,100	5,400	53,600
77	15,700	8,100	1,500	8,000	20,900	6,300	60,500
78	27,700	3,200	2,700	12,900	14,200	7,000	67,700
79	20,600	7,400	1,000	7,200	17,200	8,200	61,600
1980	47,900	8,200	3,500	10,400	22,200	20,800	113,000
81	23,900	6,700	2,900	8,800	23,600	11,400	77,300
82	24,700	2,900	2,400	7,500	22,600	14,300	74,400
83	20,100	5,300	1,900	5,800	18,700	13,300	65,100
84	30,500	4,100	2,600	7,200	16,500	17,100	78,000
20 Year Total 4/	519,300	149,000	59,200	148,100	229,300	151,100	1,257,800
1965-74 Total	268,400	87,600	36,400	64,500	43,100	39,200	541,000
1975-84 Total	250,900	61,400	22,800	83,600	186,200	111,900	716,800
20 Year Average	26,000	7,500	3,000	7,400	11,500	7,600	62,900
1965-74 Average	26,800	8,800	3,600	6,500	4,300	3,900	54,100
1975-84 Average	25,100	6,100	2,300	8,400	18,600	11,200	71,700

1/ Catches rounded to nearest hundred fish.

2/ Includes the village of Portage Creek.

3/ Due to rounding of village totals, district totals may not equal the sum of village catches.

4/ Over the past 20 years the average Nushagak subsistence catch was composed of 62% sockeye, 11% king, 15% chum, 8% pink and 7% coho salmon.

APPENDIX A

BRISTOL BAY SALMON MANAGEMENT OUTLOOK FOR 1984

The inshore sockeye salmon forecast for 1984 of 31.1 million will allow a potential commercial harvest of 16.3 million after escapement requirements are met (Table 1). The combined sockeye escapement goals for all eleven of the major river systems in Bristol Bay total 14.8 million.

The projected sockeye harvest of 16.3 million fish will surpass the average catch of 8.8 million for the previous comparable four cycle year average. Large numbers of sockeye will be in excess of escapement requirements in all districts. Ultimate fishing time allowed in the various districts will depend upon actual run strength; however, early season fishing time will be necessary to gauge district run strength and to allow the processors and fishermen adequate break in time for an efficient operation.

King and chum salmon returns are expected to be strong as well, producing a total harvest in excess of 200,000 and 1.0 million, respectively. The even-year pink salmon run to Nushagak district in 1984 is expected to produce 0.9 to 2.6 million fish from the 1982 brood year escapement of 1.7 million. Close scrutiny of the pink run will be necessary because of large differences in the past between forecasts and actual returns. The coho salmon return to Bristol Bay in 1984 should be stronger than 1983, when 117,000 fish were commercially harvested. The 1984 harvest should equal or exceed the previous 10 year average harvest of 200,000.

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

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May 2, 1984

Subject: BRISTOL BAY SOCKEYE SALMON SPAWNING ESCAPEMENT GOAL REVISIONS

From: Stephen M. Fried, Project Leader, Bristol Bay Salmon Research

The purpose of this notice is to provide a brief account and explanation of recent changes in desired spawning escapement goals for sockeye salmon stocks of the freshwater systems draining into Bristol Bay commercial fishing districts. Escapement goal changes were based upon information and recommendations from fishery scientists and managers participating in an interagency workshop held in King Salmon, Alaska, during January 1984. In attendance were ADF&G research and management staff for Bristol Bay as well as representatives from the U.S. Fish & Wildlife Service, University of Alaska (School of Fisheries, Juneau), and University of Washington (Fisheries Research Institute). Some recommendations were modified after further discussions among ADF&G Area, Regional, and Headquarters staff, and a short presentation of escapement goal revisions was presented to the Alaska Board of Fisheries during their meeting in Anchorage, February 1984. The following is a summary of findings and recommendations.

During the early 1970's disastrously low returns of sockeye salmon to Bristol Bay caused a commercial fishing industry crisis. However, since 1975, sockeye salmon runs to Bristol Bay have increased enormously. Three factors appear to be responsible for the decline and subsequent recovery: high seas fishery interceptions were substantial during the 1960's and early 1970's, but were sharply curtailed in 1974 and again in 1978; ocean temperatures were below normal during the 1960's and early 1970's, but rose to average and then above average levels beginning in the mid-1970's; increased spawning escapements were allowed into systems such as the Wood, Nuyakuk and Ugashik, which had previously been subject to overfishing. To maintain current high levels of sockeye salmon production, it is necessary to continually evaluate available information and revise management practices accordingly. Review and revision of sockeye salmon spawning escapement goals is an integral part of this procedure.

To determine spawning escapement levels which result in maximum sustained sockeye salmon production, historic data (1956-1978 brood years) was used to calculate the spawner-recruitment relationships for major Bristol Bay salmon stocks (i.e. the number of returning adults produced by different numbers of spawners). This allowed optimal goals to be set for seven systems: Ugashik, Egegik, Naknek, Nuyakuk, Wood, Igushik, and Togiak (Table 1).

Insufficient information was available to warrant escapement goal revisions for three systems: Branch, Nushagak-Mulchatna, and Snake. Determination of a suitable long-term escapement goal policy for the Kvichak system, the greatest producer of sockeye salmon within Bristol Bay, awaits completion of contracted studies by investigators at University of Washington (F.R.I.). Past management of the Kvichak system has been based upon a policy of allowing cyclic escapements, rather than a single optimal level each year. Historic run size information available for this system follows a five year abundance cycle with low returns during three consecutive years (off-cycle years), a moderately high return during the fourth year (subdominant year), and the highest return during the fifth year (dominant year). In the past investigators felt that this abundance cycle was natural (i.e. inherent within the system) and set escapement goals to reflect this: a 2.0 million spawner goal for each off-cycle year, a 6.0 million spawner goal for the subdominant year, and the highest goal (8.0 million in 1965, 19.0 million in 1970, and 14.0 million in 1975 and 1980) for the dominant year. However, recent information from preliminary studies suggest that cyclic escapement goals may enhance, or actually cause, cyclic abundance patterns. Therefore, it may be possible to at least smooth out the cycle by allowing relatively high levels of escapement into the system during several consecutive years (5.0 to 10.0 million spawners per year). This would have to be accomplished over a relatively long time period, since returns during off-cycle years would be low at first. Findings of studies by University of Washington investigators will not be available for Department review until sometime this summer. However, a goal of 10.0 million spawners has been adopted for the Kvichak system for 1984 since, even if Kvichak sockeye salmon stocks do cycle naturally, there is evidence that 1984 rather than 1985 may be the dominant year within the cycle.

APPENDIX B

BRISTOL BAY SOCKEYE SALMON FORECAST EVALUATION FOR 1984 (Informational Leaflet No. 228, December 1983).

Several independent forecasts of the returns of sockeye salmon to Bristol Bay in 1984, together with confidence intervals, relative accuracy, and a critique of each forecast method are available (Appendix B, Table 1). These forecasts are: (1) the standard forecast made by the Bristol Bay research staff, Alaska Department of Fish and Game (ADF&G); (2) a forecast based on the Bristol Bay return of sibling age classes in 1983; (3) a forecast based on the arithmetic mean catch per effort from variable mesh gill net sampling by Japanese research vessels south of the Aleutian Islands; (4) a forecast based on the geometric mean catch per effort from variable mesh gill net sampling by Japanese south of the Aleutian Islands; (5) a forecast based on a relation between estimated total Bristol Bay parent escapement, mean June air temperature at Cold Bay during the two years prior to year of return and total Bristol Bay return; and (6) a forecast based on a relationship between the mean air temperature in 5 above and the mean length of 2-ocean immature sockeye salmon caught in the Japanese gill net sampling south of the Aleutians.

The forecasts for the 1984 return of sockeye salmon to Bristol Bay made with the available methods detailed above ranged from 11.2 to 53.4 million (Appendix B, Table 1). A pooled forecast making use of all of this information was calculated from the average of the available forecasts weighted by the inverse of the variance (the standard deviation squared). In this forecast, the two available high seas forecasts were combined into one forecast. The pooled forecast of the total run to Bristol Bay in 1984 is 31.1 million.

Forecasts by major age class were available for four of the available forecasts (Appendix B, Table 2). The major difference between the standard ADF&G and the return from sibling age classes was the relatively low 4_2 component due to the low Bay-wide return of 3_2 jacks in 1983. The high seas forecast is much lower than either the standard ADF&G or the return of sibling age classes. The high seas forecast is dominated by 3-ocean returns; however, it is much lower than the other two forecasts. Particularly bleak are the 2-ocean returns in the high seas forecast, with 4_2 's being roughly one-fourth as abundant as 5_3 's.

The various pieces of information used to generate these available forecasts (Appendix B, Table 1) in the chronological order of their availability starting from the least recent to the most recent are: parent escapement, smolt outmigration estimates, returns from sibling age classes, and the length and CPUE of immature sockeye salmon in the Japanese high seas gill net sampling. In general, the more recent the information the lower the return forecast based on that information. In view of this pattern and the fact that the standard pooled forecast was used as the forecast to present to the industry, the pooled forecast was allocated to age class and river system based on the following. The forecast to the Kvichak was taken to be that from the standard ADF&G method. It was felt that more recent information was considered in that forecast, since many forecasts based on return per spawner were dropped in view of apparent cycle changes to the Kvichak. The difference between the Kvichak forecast and the pooled total Bay forecast was allocated to the remaining age classes and river systems by relative abundance in the

standard ADF&G forecast. Unfortunately, if the actual returns in 1984 are significantly lower than the standard ADF&G forecast of 41.5 million, the age and river system composition of the lower return will be very different from the pooled forecast allocated to age class and river system based on the above method.

This is not an ideal template from which to set early management decisions in 1984 and analyze anomalous age composition and river system run strengths that emerge in 1984. For this reason the synopsis of key areas to watch in 1984 are couched relative to the standard ADF&G forecast (Appendix B, Table 3).

In general, based on the high sea's data, a lower return of 3-ocean fish than that forecasted by the standard ADF&G methods is expected. The high seas forecast of the 2-ocean return needs to be clarified. Fisheries Research Institute (FRI) staff feels that the Japanese were a little further offshore (south) than they normally sample, and based on the historical Adak sampling, that 1-ocean immature fish would be under-represented in the catches. If this were the case then the 2-ocean return should be more indicative than the other forecasts. FRI feels that the 2-ocean immature sockeye were adequately sampled, and there is cause for concern in the low high sea's forecast 3-ocean returns.

The pattern of temperatures reported by the Japanese and supplemented by FRI observers on Russian fishing vessels in that area were very anomalous during the summer of 1983. Temperatures tended to decline as one moved offshore south of the Aleutians. Temperatures offshore were 5° below normal. This is cause for concern, as returns appear to have been depressed in the past by low temperature. Alternatively the distribution of immature sockeye may have changed in response to these temperature anomalies, in which case the CPUE reported by the Japanese may not be indicative of abundance.

The age composition of the 2-ocean returns based on the return of sibling age classes, and the age composition of the 1-ocean immatures caught in the Japanese high seas sampling indicate that returns of 4₂'s may be depressed relative to the standard ADF&G forecast. This is a cause for concern since a relatively large return of 4₂'s to the Kvichak is expected based on smolt studies. If this occurs there will be difficulties in 1985 meeting the peak year escapement goal.

Appendix B, Table 1. Summary of available forecasts of the 1984 return of sockeye salmon to Bristol Bay (in millions of fish).

Forecast Methods	Forecast	Standard Deviation	Confidence Limits
Escapement Temperature Model	53.4	9.1	40.3 - 64.3
Standard ADF&G	41.5	11.8	21.6 - 53.6
Temperature Length of 2-Ocean Fish	24.9	7.4	14.8 - 36.0
Bay-wide Return ^{1/} from Sibling Age Class	31.0	11.1	14.6 - 44.8
Japanese Gill Net ^{1/} Sampling Geometric Mean	14.4	8.9	1.86 - 27.7
Japanese Gill Net ^{1/} Arithmetic Mean	11.2	9.0	0 - 24.5
Pooled Estimate ^{2/}	31.139	10.2	17.6 - 44.6

^{1/} Age composition available.

^{2/} The pooled estimate is the average of the individual estimates weighted by the inverse of the standard deviation squared.

Appendix B, Table 2. Total 1984 Bristol Bay sockeye forecast by major age class for each of the alternative forecast methods.

Forecast Methods		4 ₂	5 ₃	Total 2-Ocean	5 ₂	6 ₃	Total 3-Ocean	Total
Standard ADF&G	No. (Thousands)	10,169	12,521	22,690	13,788	5,031	18,826	41,514
	Percent	24.5	30.2	54.7	33.2	12.1	45.3	
Bay-wide Return From Sibling Age Classes	No. (Thousands)	3,698	10,425	14,123	15,472	1,448	16,920	31,043
	Percent	11.9	33.6	45.5	49.8	4.7	54.5	
Japanese CPUE Arithmetic Mean	No. (Thousands)	622	1,918	2,540	6,326	2,290	8,618	11,158
	Percent	5.6	17.2	22.8	56.7	20.5	72.0	
Japanese CPUE Geometric Mean	No. (Thousands)	1,250	3,853	5,103	6,796	2,463	9,259	14,362
	Percent	8.7	26.8	35.5	47.3	17.2	64.5	

Appendix B, Table 3. Key areas to watch in 1984 where forecast is likely to be in error. Synopsis summarizing inconsistencies among forecast techniques.

System	Age Class	Forecast (Millions)	Synopsis	Possible Departure From Forecast
Kvichak	4 ₂	6.0	High R/S, high smolt, low return of 3 ₂ , low 4 ₂ component in high seas forecast.	Lower Return
	5 ₂	3.0	Low smolt, large return of 4 ₂ in 1983, Kvichak 5 ₂ returns of this magnitude have occurred only in 1957 and 1961 following the 1956 and 1960 cycle year returns of 4 ₂ , low 3-ocean high seas forecast.	Lower Return
Naknek	4 ₂	0.6	Possible large 1-check smolt outmigration in 1982.	Higher Return
	5 ₂	2.6	Low R/S, heavy 4 ₂ return in 1983, low 3-ocean high seas forecast.	Lower Return
	6 ₃	1.1	Low 3-ocean high seas forecast.	Lower Return
Egegik	4 ₂	0.4	Possible large return 1-check smolt outmigration in 1982.	Higher Return
	5 ₂	1.0	Low R/S, large of 4 ₂ in 1983, low 3-ocean high seas forecast.	Lower Return
	6 ₃	2.8	Record return of 5 ₃ in 1983, low 3-ocean high seas forecast.	Lower Return
Ugashik	4 ₂	0.4	Low R/S assumed for 1980 escapement, moderate return of 3 ₂ .	Higher Return
	5 ₃	1.5	Higher R/S, low return of 4 ₃ .	Unknown
	5 ₂	1.2	Low 3-ocean high seas forecast	Lower Return
Wood	4 ₂	1.4	Low 4 ₂ component in high seas forecast.	Lower Return
	5 ₂	2.6	Low 3-ocean high seas forecast	Lower Return
Nuyakuk	5 ₂	2.0	Low R/S large return of 4 ₂ in 1983, low 3-ocean high seas forecast.	Lower Return

BRISTOL BAY ESCAPEMENT GOAL REVISION

Table 1. Projected 1984 Bristol Bay sockeye salmon harvests based upon the pre-season forecast and revised escapement goals.

River System	Run Forecast (Millions)	Spawning Escapement Goal (Millions)	Projected Catch (Millions)
Kvichak	16.704	10.000	6.704
Branch	0.305	0.185	0.120
Naknek	2.982	1.000	1.982
Total	19.991	11.185	8.806
Egegik	3.541	1.000	2.541
Ugashik	1.916	0.700	1.216
Wood	2.666	1.000	1.666
Igushik	0.837	0.200	0.637
Nuyakuk	1.560	0.500	1.060
Nush./Mulchatna	0.152	0.050	0.102
Snake	0.017	0.040	0.000
Total	5.232	1.790	3.465
Togiak	0.453	0.150	0.303
Grand Total	31.133	14.825	16.331



STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99502
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June 7, 1984

Subject: BRISTOL BAY SPECIAL STUDY - GILL NET MESH SIZE SELECTIVITY FOR SOCKEYE SALMON

From: Stephen M. Fried, Project Leader, Bristol Bay Research

A minimum gill net mesh size limitation of 5-3/8 inches has been in effect during the sockeye salmon commercial fishing season in Bristol Bay since 1961. The purpose of this regulation has been to increase the catch of male sockeye salmon, which attain a greater size than females. Since studies have shown that good spawning success could be achieved when males were less abundant than females on the spawning grounds, it was hoped that the minimum mesh size regulation would allow the commercial catch to be maximized without adversely affecting future salmon production. However, recent changes in average sockeye salmon size and gill net mesh manufacturing have made it necessary to examine the effectiveness and usefulness of the minimum mesh size regulation to determine whether changes in the regulation are needed.

During the last five years, most Alaskan salmon stocks have been exhibiting increased production. In Bristol Bay, sockeye salmon runs have been two to three times more abundant than during comparable historic periods. Since the average size of sockeye salmon decreases as the population numbers increase, a greater proportion of sockeye salmon may be able to escape capture by the fishing fleet by swimming through the gill net meshes. This not only results in decreased efficiency by the fleet, but may lower the reproductive potential of such escaping salmon. It is possible that salmon which manage to pass through the maze of gill nets by swimming through the meshes may be stressed and physically exhausted. These salmon may not be able to effectively defend territories, dig adequate redds, or, in general, perform as well as salmon not subjected to fishing pressure. Additionally, it is not known whether the minimum mesh size regulation has been effective in significantly skewing the spawning population towards larger numbers of females, or whether this has played a role in maximizing the catch or the production of the population. Another factor which has emerged during the last few years is increasing use of extremely elastic mesh material by net manufacturers. This enables construction of gill nets with small unstretched mesh size (5-3/16 inches with some material) that will stretch to 5-3/8 inches when measured according to regulation. These nets will certainly select for different segments of the sockeye population than would a more traditional net made of less elastic material.

To determine the effectiveness of current minimum mesh size restrictions, and evaluate the need for changes in this regulation, the Department is conducting field studies in Bristol Bay in conjunction with the University of Alaska. Four different mesh sizes (4-7/8 inches, 5-1/8 inches, 5-3/8 inches, and 5-5/8 inches) and two types of material (NICHIMO Dynamono and ClearMulti) will be fished several times during the season. All sockeye captured will be measured for length, girth and weight, identified according to sex, and aged from scale samples. This information will be used to determine the selectivity curves for each mesh size and material type as well as the fishing efficiency. Sampling will be done within Egegik District, since all major size and age classes of sockeye are projected to be present within this area in 1984. Additionally, an analysis of historic data has been undertaken to determine whether selective effects can be detected within past years by examining the segment of the population the fishery targeted upon and the segment of the population that escaped to spawn. Results of these studies will be available by December 1984.

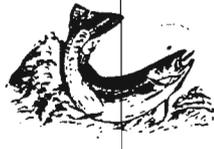
If anyone would like further details of these studies, or would be interested in allowing us to use their vessel under a short term contract, please contact either Steve Fried or Brian Bue at the ADF&G King Salmon office (telephone no. 246-3341). Tentative dates for operating our experimental gill nets are: June 20 and 27; July 4, 11 and 18.

MUSHAGAK BAY DISTRICT
CORRECTION TABLE

To correct the TIME and HEIGHT for HIGH or LOW tides for the points given below, add or subtract TIME and FEET from the MUSHAGAK District Tide Table.

POINT	TIME		FEET	
	High	Low	High	Low
BRISTOL BAY				
Port Moller	0:00	0:00	0:00	0:00
Entrance Point	+0:33	-4:59	+0:56	+0:94
Port Heiden	+0:03	-2:55	+0:52	+1:04
EGEGIK RIVER				
Entrance	+1:30	-1:13	+0:92	+0:86
Kegekik	+1:04	+0:36	+0:63	+0:32
Middle River	+1:04	+0:36	+0:63	+0:32
Kvichak Bay	+0:50	-0:50	0:00	0:00
NAKNEK RIVER				
Entrance	+0:19	+0:26	+2:24	-0:3
Norakus Point	+0:11	+1:37	+0:30	+0:36
Omakstala Point	+0:12	+3:23	+0:37	+0:12
Naknek Air Base	+0:37	+1:46	+0:13	+0:08
KVICHAK RIVER				
Naknek	+0:04	+2:01	+0:30	+0:28
Kvichak	+0:33	+2:49	+0:33	+0:33
Levickok	+0:27	+4:34	+0:48	+0:20
MUSHAGAK BAY				
Protection Point	+0:12	-0:22	-2:6	0:0
Snaq Point	+0:48	+1:07	+0:2	-0:4
Black Rock	+0:07	-0:07	-0:1	+0:70
Wairus Islands	+0:07	-0:07	-0:1	+0:70
ST. LAWRENCE ISLAND				
Entrance	+0:37	-3:22	+0:12	+0:08
Komai River Est.	+0:06	-3:54	+0:08	+0:08
Niyrakpak Lagoon	+0:33	-3:57	+0:08	+0:08

▲ No low water falls below -2 feet.
* Multiply height of District Tide by proper ratio to correct height of High or Low Tides.



HIGH Tides MUSHAGAK District
MAY 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 Tues	●	3:50	17.5	3:15	14.1
2 Wed	●	4:35	18.3	3:53	13.5
3 Thur	●	5:17	19.1	4:32	13.2
4 Fri	●	6:01	19.8	5:14	13.1
5 Sat	●	6:44	20.4	6:00	13.2
6 SUN	●	7:27	20.9	6:48	13.5
7 Mon	●	8:12	21.2	7:42	14.0
8 Tues	●	8:58	21.4	8:44	14.6
9 Wed	●	9:47	21.3	9:48	15.4
10 Thur	●	10:34	21.0	10:56	18.5
11 Fri	●	11:23	20.5	—	—
12 Sat	●	0:02	17.7	12:13	19.7
13 SUN	●	1:08	19.1	1:03	18.9
14 Mon	●	2:13	20.4	1:55	17.9
15 Tues	●	3:15	21.5	2:48	17.0
16 Wed	●	4:15	22.3	3:43	16.1
17 Thur	●	5:10	22.7	4:39	15.4
18 Fri	●	6:03	22.8	5:35	14.7
19 Sat	●	6:55	22.5	6:31	14.3
20 SUN	●	7:43	21.9	7:25	14.0
21 Mon	●	8:29	21.2	8:22	13.8
22 Tues	●	9:15	20.4	9:18	13.8
23 Wed	●	9:56	19.5	10:14	14.0
24 Thur	●	10:36	18.6	11:09	14.5
25 Fri	●	11:14	17.7	—	—
26 Sat	●	0:06	15.2	11:50	18.7
27 SUN	●	0:57	16.0	12:27	15.8
28 Mon	●	1:50	17.0	1:04	15.0
29 Tues	●	2:39	17.9	1:44	14.3
30 Wed	●	3:23	18.9	2:18	13.7
31 Thur	●	4:09	19.7	3:02	13.3

NU-5
* BIGGER THE DOT - BETTER THE FISHING

LOW Tides MUSHAGAK District
MAY 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 Tues	●	10:00	6.8	9:49	1.8
2 Wed	●	10:51	7.0	10:27	1.4
3 Thur	●	11:39	7.1	11:05	1.0
4 Fri	●	12:25	7.0	11:46	0.5
5 Sat	●	—	—	1:13	6.8
6 SUN	●	0:32	0.1	1:59	6.4
7 Mon	●	1:21	-0.1	2:45	5.8
8 Tues	●	2:13	-0.1	3:30	4.9
9 Wed	●	3:08	0.2	4:19	3.7
10 Thur	●	4:05	0.8	5:08	2.4
11 Fri	●	5:06	1.7	5:57	0.9
12 Sat	●	6:09	2.7	6:49	-0.6
13 SUN	●	7:15	3.6	7:39	-1.8
14 Mon	●	8:18	4.3	8:30	-2.6
15 Tues	●	9:22	4.8	9:23	-3.0
16 Wed	●	10:23	5.1	10:14	-3.0
17 Thur	●	11:23	5.1	11:05	-2.5
18 Fri	●	12:21	5.1	11:58	-1.8
19 Sat	●	—	—	1:14	5.0
20 SUN	●	0:47	-0.9	2:06	4.9
21 Mon	●	1:38	0.2	2:55	4.7
22 Tues	●	2:28	1.3	3:41	4.4
23 Wed	●	3:19	2.5	4:25	3.9
24 Thur	●	4:11	3.7	5:08	3.4
25 Fri	●	5:03	4.8	5:50	2.8
26 Sat	●	5:56	5.8	6:29	2.2
27 SUN	●	6:48	6.6	7:09	1.6
28 Mon	●	7:46	7.2	7:49	1.1
29 Tues	●	8:41	7.6	8:28	0.6
30 Wed	●	9:34	7.8	9:07	0.1
31 Thur	●	10:24	7.8	9:49	-0.3

DAYLIGHT TIME

HIGH Tides MUSHAGAK District
JUNE 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 Fri	●	4:52	20.5	3:49	13.2
2 Sat	●	5:34	21.2	4:39	13.2
3 SUN	●	6:19	21.6	5:31	13.4
4 Mon	●	7:03	22.0	6:31	13.8
5 Tues	●	7:49	22.0	7:35	14.4
6 Wed	●	8:34	21.9	8:42	15.2
7 Thur	●	9:20	21.5	9:49	16.3
8 Fri	●	10:06	20.8	10:58	17.5
9 Sat	●	10:56	20.0	—	—
10 SUN	●	0:04	18.9	11:45	19.0
11 Mon	●	1:09	20.2	12:37	17.9
12 Tues	●	2:11	21.2	1:30	16.9
13 Wed	●	3:07	22.0	2:25	15.9
14 Thur	●	4:03	22.4	3:17	15.0
15 Fri	●	4:55	22.4	4:14	14.3
16 Sat	●	5:46	22.2	5:10	13.8
17 SUN	●	6:32	21.7	6:04	13.4
18 Mon	●	7:17	21.1	6:58	13.2
19 Tues	●	8:04	20.4	7:54	13.2
20 Wed	●	8:34	19.6	8:47	13.5
21 Thur	●	9:09	18.8	9:44	14.0
22 Fri	●	9:47	18.0	10:38	14.7
23 Sat	●	10:20	17.2	11:32	15.7
24 SUN	●	10:55	16.4	—	—
25 Mon	●	0:25	16.7	11:33	15.6
26 Tues	●	1:14	17.7	12:09	15.0
27 Wed	●	2:03	18.8	12:51	14.4
28 Thur	●	2:49	19.7	1:36	14.1
29 Fri	●	3:34	20.5	2:25	13.9
30 Sat	●	4:21	21.2	3:17	13.9

NU-6
* BIGGER THE DOT - BETTER THE FISHING

LOW Tides MUSHAGAK District
JUNE 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 Fri	●	11:14	7.6	10:29	-0.6
2 Sat	●	12:03	7.2	11:17	-0.8
3 SUN	●	—	—	12:48	6.6
4 Mon	●	0:07	-0.8	1:34	5.7
5 Tues	●	0:58	-0.5	2:23	4.6
6 Wed	●	1:54	0.1	3:11	3.1
7 Thur	●	2:53	1.1	3:57	1.5
8 Fri	●	3:52	2.3	4:48	-0.1
9 Sat	●	4:55	3.5	5:37	-1.5
10 SUN	●	6:01	4.6	6:27	-2.6
11 Mon	●	7:06	5.4	7:19	-3.3
12 Tues	●	8:11	6.0	8:09	-3.5
13 Wed	●	9:12	6.2	9:01	-3.4
14 Thur	●	10:12	6.2	9:51	-2.7
15 Fri	●	11:09	6.1	10:40	-1.9
16 Sat	●	12:00	5.9	11:31	-0.9
17 SUN	●	—	—	12:54	5.6
18 Mon	●	0:17	0.2	1:41	5.3
19 Tues	●	1:05	1.3	2:23	4.8
20 Wed	●	1:54	2.5	3:07	4.2
21 Thur	●	2:43	3.8	3:46	3.5
22 Fri	●	3:35	4.9	4:27	2.7
23 Sat	●	4:25	6.0	5:07	1.9
24 SUN	●	5:19	6.9	5:46	1.2
25 Mon	●	6:15	7.6	6:25	0.5
26 Tues	●	7:10	8.1	7:05	-0.1
27 Wed	●	8:07	8.3	7:47	-0.7
28 Thur	●	9:57	8.3	8:30	-1.2
29 Fri	●	8:50	8.1	9:16	-1.6
30 Sat	●	10:40	7.6	10:03	-1.8

DAYLIGHT TIME

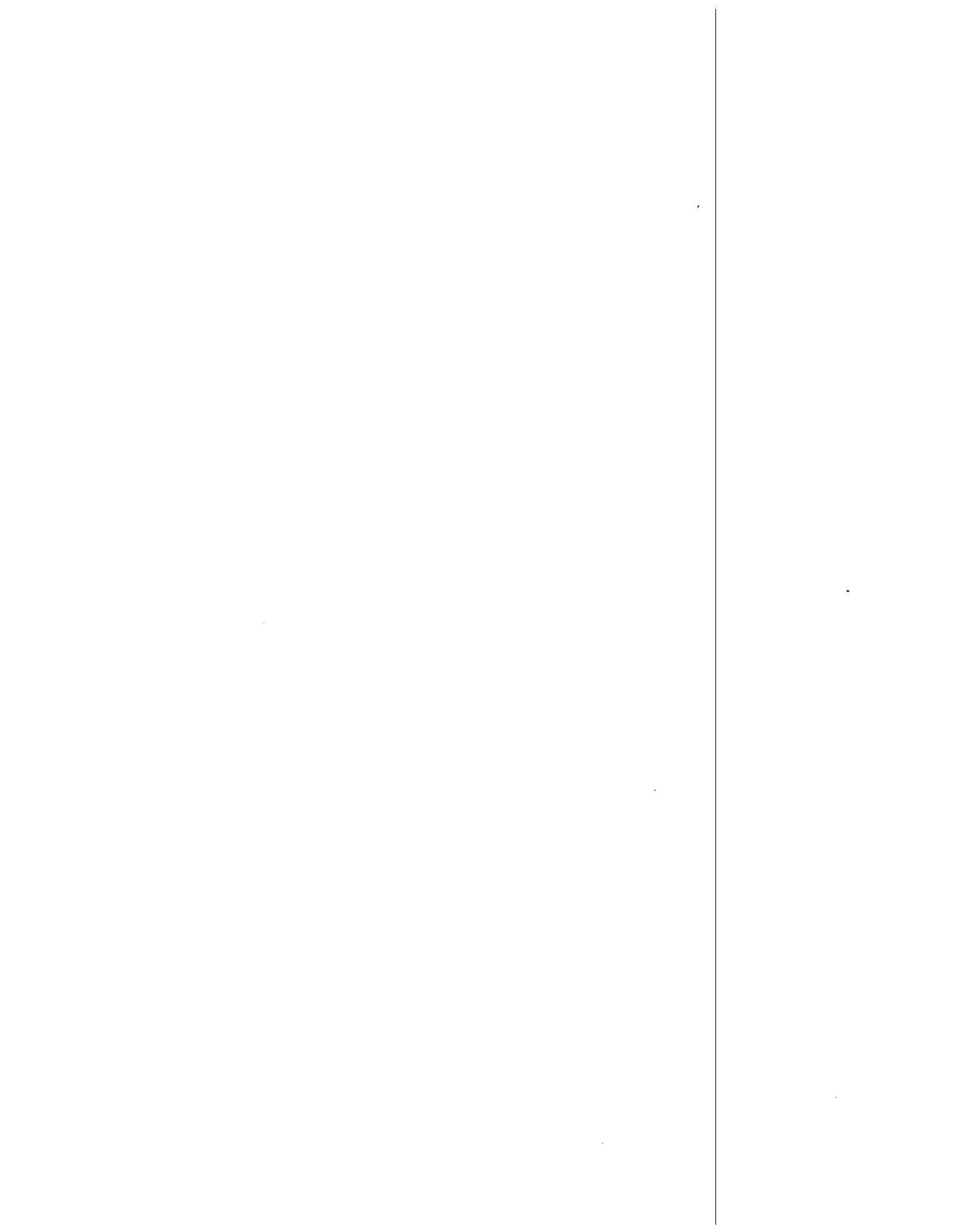
HIGH Tides MUSHAGAK District
JULY 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 SUN	●	5:06	21.8	4:14	14.1
2 Mon	●	5:52	22.1	5:19	14.4
3 Tues	●	6:38	22.2	6:24	15.0
4 Wed	●	7:22	22.1	7:32	15.7
5 Thur	●	8:08	21.7	8:41	16.7
6 Fri	●	8:56	21.0	9:49	17.8
7 Sat	●	9:42	20.2	10:56	19.0
8 SUN	●	10:31	19.2	11:58	20.1
9 Mon	●	11:23	18.1	—	—
10 Tues	●	1:01	20.9	12:15	17.1
11 Wed	●	2:00	21.4	1:12	16.1
12 Thur	●	2:55	21.6	2:08	15.3
13 Fri	●	3:48	21.6	2:59	14.5
14 Sat	●	4:39	21.3	3:54	13.9
15 SUN	●	5:21	20.9	4:47	13.5
16 Mon	●	6:05	20.4	5:37	13.2
17 Tues	●	6:44	19.8	6:33	13.2
18 Wed	●	7:19	19.1	7:25	13.5
19 Thur	●	7:51	18.4	8:18	14.0
20 Fri	●	8:26	17.7	9:10	14.7
21 Sat	●	8:58	17.0	10:02	15.5
22 SUN	●	9:33	16.4	10:54	16.5
23 Mon	●	10:09	15.9	11:43	17.4
24 Tues	●	10:47	15.4	—	—
25 Wed	●	0:35	18.4	11:30	15.1
26 Thur	●	1:24	19.2	12:12	15.0
27 Fri	●	2:13	20.0	1:02	14.9
28 Sat	●	3:00	20.7	2:00	15.0
29 SUN	●	3:46	21.3	2:58	15.3
30 Mon	●	4:33	21.6	3:46	15.6
31 Tues	●	5:21	21.8	5:12	16.2

NU-7
* BIGGER THE DOT - BETTER THE FISHING

LOW Tides MUSHAGAK District
JULY 1984

DATE DAY	DOTS GUIDE	A.M. TIME	FT.	P.M. TIME	FT.
1 SUN	●	11:31	6.9	10:55	-1.7
2 Mon	●	12:16	5.8	11:48	-1.2
3 Tues	●	—	—	1:06	4.4
4 Wed	●	0:43	-0.3	1:54	2.7
5 Thur	●	1:42	0.8	2:45	1.0
6 Fri	●	2:42	2.2	3:34	-0.6
7 Sat	●	3:45	3.5	4:24	-2.0
8 SUN	●	4:49	4.7	5:16	-2.9
9 Mon	●	5:52	5.7	6:08	-3.4
10 Tues	●	6:55	6.3	6:59	-3.5
11 Wed	●	7:58	6.6	7:51	-3.2
12 Thur	●	8:57	6.7	8:42	-2.5
13 Fri	●	9:53	6.7	9:31	-1.7
14 Sat	●	10:48	6.6	10:20	-0.7
15 SUN	●	11:37	6.3	11:05	0.4
16 Mon	●	12:23	5.9	11:51	1.5
17 Tues	●	—	—	1:07	5.4
18 Wed	●	0:37	2.6	1:47	4.8
19 Thur	●	1:25	3.7	2:25	4.0
20 Fri	●	2:14	4.8	3:04	3.2
21 Sat	●	3:03	5.8	3:43	2.3
22 SUN	●	3:55	6.7	4:22	1.5
23 Mon	●	4:47	7.4	5:02	0.7
24 Tues	●	5:41	7.9	5:44	-0.1
25 Wed	●	6:36	8.2	6:26	-0.8
26 Thur	●	7:29	8.3	7:12	-1.4
27 Fri	●	8:18			



APPENDIX F. ALASKA BOARD OF FISHERIES REGULATORY ACTION AND MANAGEMENT
POLICY CHANGES FOR THE 1984 COMMERCIAL AND SUBSISTENCE
SALMON FISHING SEASON, BRISTOL BAY.

The Alaska Board of Fisheries adopted, amended or rejected the following proposed regulations concerning Bristol Bay at the annual winter Board meeting, (February, 1984):

1. A proposal to change the notification requirements for district transfers (48 to 24 hours), and to allow the transferee to fish in the original district during the transfer waiting period was rejected by the Board on a 0-6 vote.
2. A proposal to change the seaward fishing boundaries of the Egegik and Ugashik district to LORAN lines was rejected on a 0-6 vote.
3. A proposal to limit set nets in Nushagak district to different distances from the mean high tide mark was amended and then adopted on a 6-1 vote.



ANNUAL MANAGEMENT REPORT

BRISTOL BAY HERRING,
HERRING SPAWN ON KELP AND
CAPELIN FISHERIES

1984

INTRODUCTION

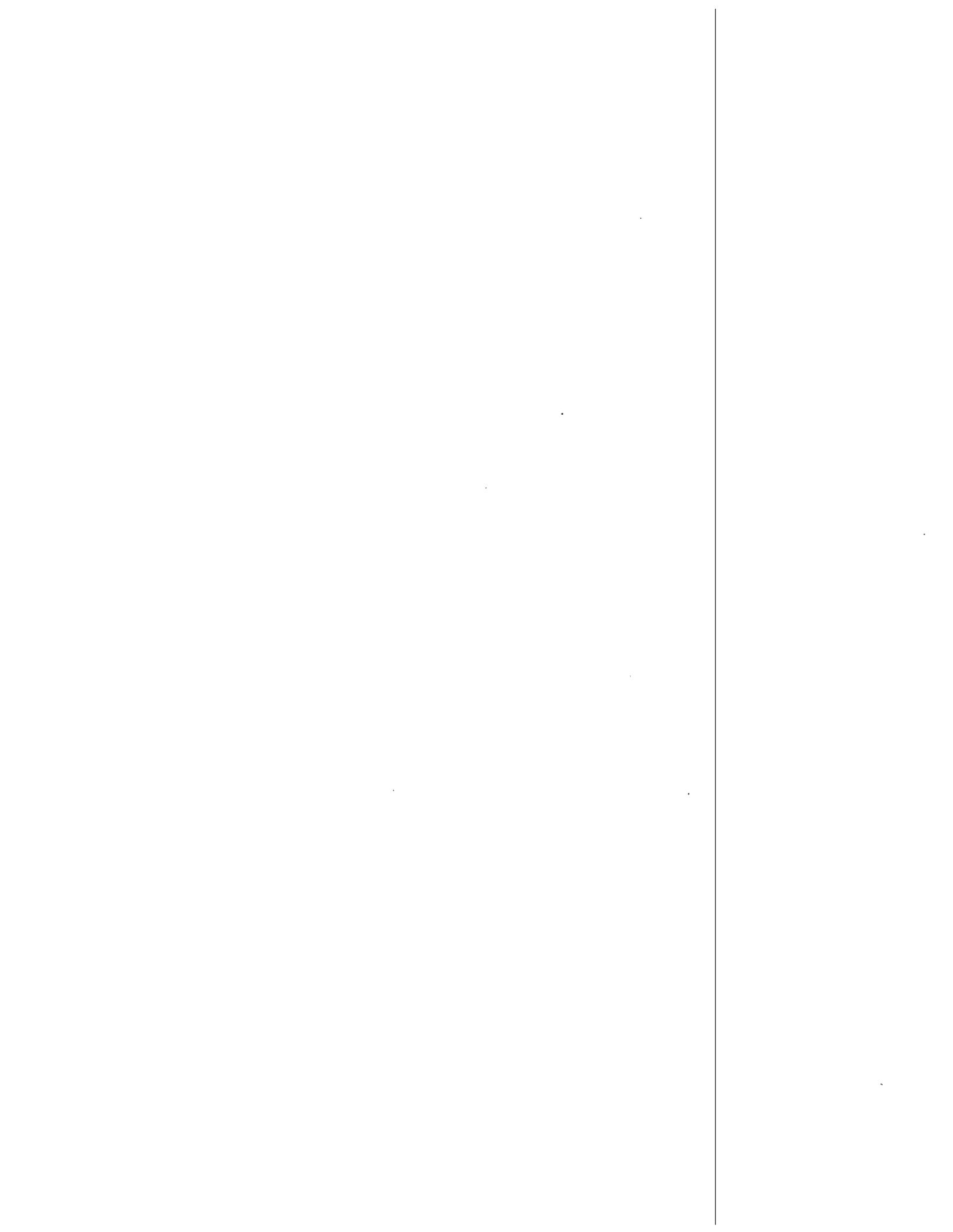
The Bristol Bay sac roe herring fishery began in 1967 and was followed by the spawn on kelp fishery in 1968. The capelin fishery did not really develop until 1984, but small commercial deliveries date back to the 1960's. For the first 10 years effort levels and the number of processors remained small and the herring sac roe fishery did not operate in 1971 and 1976, due to poor market conditions (Appendix Table 2).

Favorable market conditions and additional incentives provided by the Fishery Conservation and Management Act of 1976 (the 200 mile limit) resulted in a major expansion of the Togiak herring fishery in 1977 (Appendix Table 2).

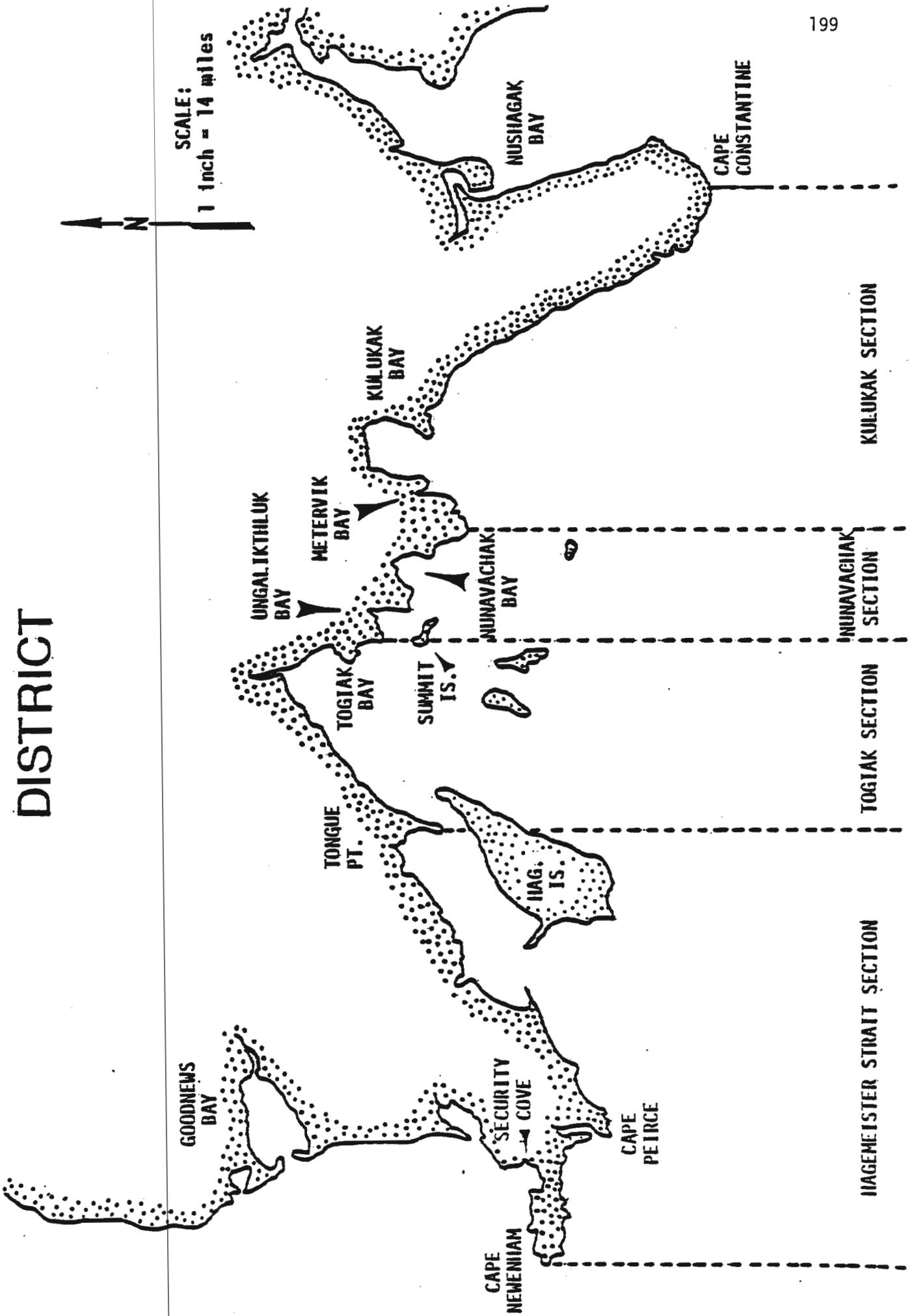
Herring have been reported in all districts of Bristol Bay, but the major concentration occurs in and around Togiak where the commercial fishery is centered (Figure 1). Legal gear types include purse seines, which are limited to 150 fathoms in length, and gill nets which are also limited to 150 fathoms, but two permit holders may both operate that amount of gear from a single vessel. The spawn on kelp harvest method is limited to hand picking or by hand held rakes.

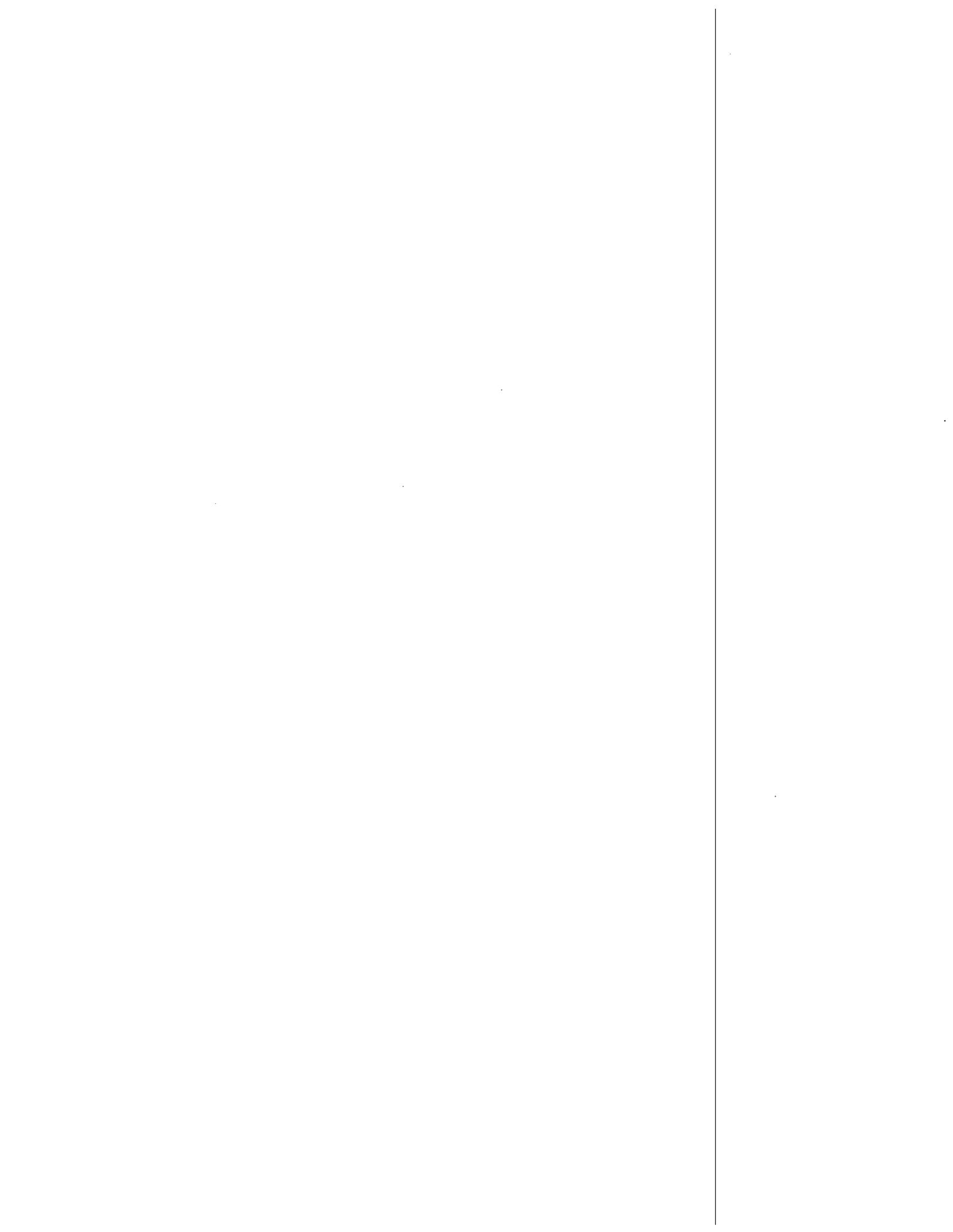
Since 1981, the herring and spawn on kelp harvests have been regulated by emergency order, with the designated season from April 25 to June 30. A regulatory management plan, 5 AAC 27.865, and a management directive to the staff, set the policies by which this fishery is managed (Appendix A).

The spawn on kelp management plan was revised prior to the 1984 season and sets the maximum allowable harvest at 350,000 pounds (Appendix C). The new plan further directs that the herring spawn on kelp harvest be included in calculating the total exploitation on this stock (Table 4).



TOGIAK HERRING FISHING DISTRICT





Because the capelin fishery is new and developing, few regulations restrict this activity and the management plan for this species mainly addresses additional protections for herring. (Reference capelin plan Appendix D, page 213, Annual Management Report, 1982, Bristol Bay).

1984 Inseason Herring/Kelp/Capelin Management

Due to a warm spring and an early breakup in 1984 there was no ice present and the fleet was able to travel to the fishing grounds without difficulty. However, a cooling trend in late April slowed the warming water temperatures and presumably delayed the arrival of the herring. As a result, those vessels that arrived on grounds as early as April 13 had a considerable wait until the fishery first opened on May 18 (Table 2).

Aerial surveys were initiated on April 19, somewhat earlier than normal, due to the clear weather and lack of ice cover but the first herring were not sighted until May 2 (Table 1). By April 19 the Summit Island field camp was operational and test netting with variable mesh gill nets was initiated within a few days. By April 30 all three Department field camps were operational and test fishing, but no samples were obtained until May 6. To increase the opportunity to obtain samples, several volunteer commercial gill net vessels were employed with Department observers aboard.

On May 11 a sample of 60 herring were obtained from the Kulukak area. All fish were large, older age class, and green immature roe. The fleet size was growing rapidly each day as well as the number of companies registered to purchase herring, and as early as May 5 the on grounds holding capacity had already exceeded 20,000 s. tons.

By May 13 test gill nets were catching small amounts of herring at all three camps and the samples were still large, old, and filled with immature roe. May 14 brought gale force winds, and gusts to 50 mph from the ESE. By May 15 the

weather had cleared and immediately spotters began to report herring showing in various areas. Several test boats were able to land large samples of herring from near Tongue Point and Nunavachak Bay. By the evening of May 15 the water temperature at Summit Island had reached 39 degrees F and one commercial spotter reported a good showing of herring around Hagemeister Island. At first light on May 16 several purse seine test boats made multiple sets near Tongue Point and in Togiak Bay. Gill net samples were also landed from the Kulukak area and all proved to be green (immature).

The herring biomass in the Togiak area on May 16 was estimated at 59,000 s. tons, the first major showing of the season (Table 1). High winds (25-40 K) on May 17 precluded sampling with volunteer vessels, but a gill net sample at Tongue Point showed some improvement in the roe recovery from the previous day. An aerial survey in the afternoon reported some spawning from Ungalikthluk Bay to Anchor Point (Table 1).

The storm had subsided by early May 18 and a fleet of 10 test boats were deployed throughout the district. Samples were collected from all areas and a public roe sampling was scheduled for 2:00 p.m. on Nunavachak beach. By this time major spawns were occurring from west Nunavachak Bay to Anchor Point, with others reported on the mainland side of Hagemeister Island and on Asigyukpak Spit. A total of 24 separate bags of herring samples were tested and roe recoveries ranged from 0.8% to 10.2%. About half of the registered companies were present at the roe testing along with many pilots and fishermen, totaling an estimated 200-300 observers.

With the amount of observed spawning throughout the district and the good roe recoveries of the samples, it was clearly time to fish. At the regular 6:15 p.m. radio schedule with the fleet, the first opening was announced for the gill netters to begin fishing that same night at 9:00 p.m., to be followed by the purse seiners the next morning (Table 2). To prevent any covert operations on herring, the capelin fishery was closed by emergency order for a period of hours before and after each herring opening.

During the roe testing on the beach, a low level aerial survey was flown in the helicopter to determine the approximate fishing effort. The potential fishing effort was estimated at 196 purse seiners and 300 gill net vessels (Appendix Table 2). The morning of May 19 brought many calls from gill net vessels that couldn't retrieve their gear for various reasons and at least 30 boats still had nets in the water after the closure. Patrol vessels Woldstad and Public Safety I issued several citations and some gear was seized. A case was also prosecuted on a purse seine vessel fishing after a closure that ultimately resulted in a fine for the offender, but much more effort is needed in this area. The herring harvest for the May 18-19 period, totaled 7,700 s. tons, and although roe recoveries varied from area to area, they were generally the best ever reported at Togiak (Table 3).

The biomass survey on May 19 estimated over 80,000 tons of herring present on the fishing grounds, and with a large harvestable surplus still available, the second opening was announced at 5:00 p.m. for fishing at 6:00 p.m. that same day (Table 2). Many gill net vessels were still waiting to deliver their catch from the first fishing period and that market appeared to be approaching saturation. Because spawning was continuous throughout the district, to delay the purse seine fleet further to allow the gill net fleet to fish first, was not reasonable and would have resulted in a lower value product, therefore both gear types were allowed to start fishing at the same time (Table 2). Due to a surplus of fish from the first opening, one major gill net buyer limited their fleet to five tons per delivery and specified that the boats could not deliver again until after 6:00 a.m. on May 20. There was much concern by the staff that this would result in more gill nets fishing after the next closure, however, this was not the case and only five vessels were observed with gear still in the water. The May 19 herring harvest amounted to 6,400 s. tons, bringing the accumulative harvest to 14,100 s. tons (Table 3).

At 7:45 a.m., May 20, a new biomass estimate of 92,000 tons was reported and the fleet was immediately put on standby for one hour. Spawning continued throughout the district and although the tides were not ideal, the next opening was announced at 9:00 a.m. for the fishery to reopen at 11:00 a.m. (Table 2). Much of the gill net market was plugged at the time so the purse seine fleet was allowed to fish first so the roe quality would not be lost due to further delays.

A helicopter aerial survey was conducted on May 20 of those beaches that were believed to have a surplus of kelp available for harvest (Figure 2). A new spawn on kelp management plan was in effect for the 1984 season which allowed a harvest in selected areas, of 350,000 pounds (Appendix C). Area K-7 had mostly sub-tidal spawn that was unavailable to the fleet and K-10 had almost no spawn on the plants. Area K-9 was not a high priority for harvest because some commercial removal had occurred there in 1983, but the observable plant cover was good and herring spawn was common over most of the beach.

At 6:15 p.m., May 20, the first spawn on kelp opening was announced for area K-4 and K-9, starting at 12:00 noon, May 21 (Table 2). The tide cycle was very poor for this harvest, with large hold-overs during the daylight hours. However, further delay was risky at this point due to potential loss of product quality from silt pollution, should a storm develop. A large effort participated in the first kelp opening (Appendix Table 5), and there was a short term problem with the lack of available markets as several potential kelp buyers were still pumping herring. Ultimately another buyer provided a tender from the west end of the district and a total of 158,000 pounds were landed (Table 4).

By 1:00 a.m. on May 21 processor catches indicated that there was still a harvestable surplus of herring available. The third commercial opening (May 20) didn't produce as well as expected (1,500 s. tons) because the purse seine fleet had caught and released many spawn outs and the short duration of the fishery didn't allow time for multiple sets (Tables 2 and 3). Several purse seine sets

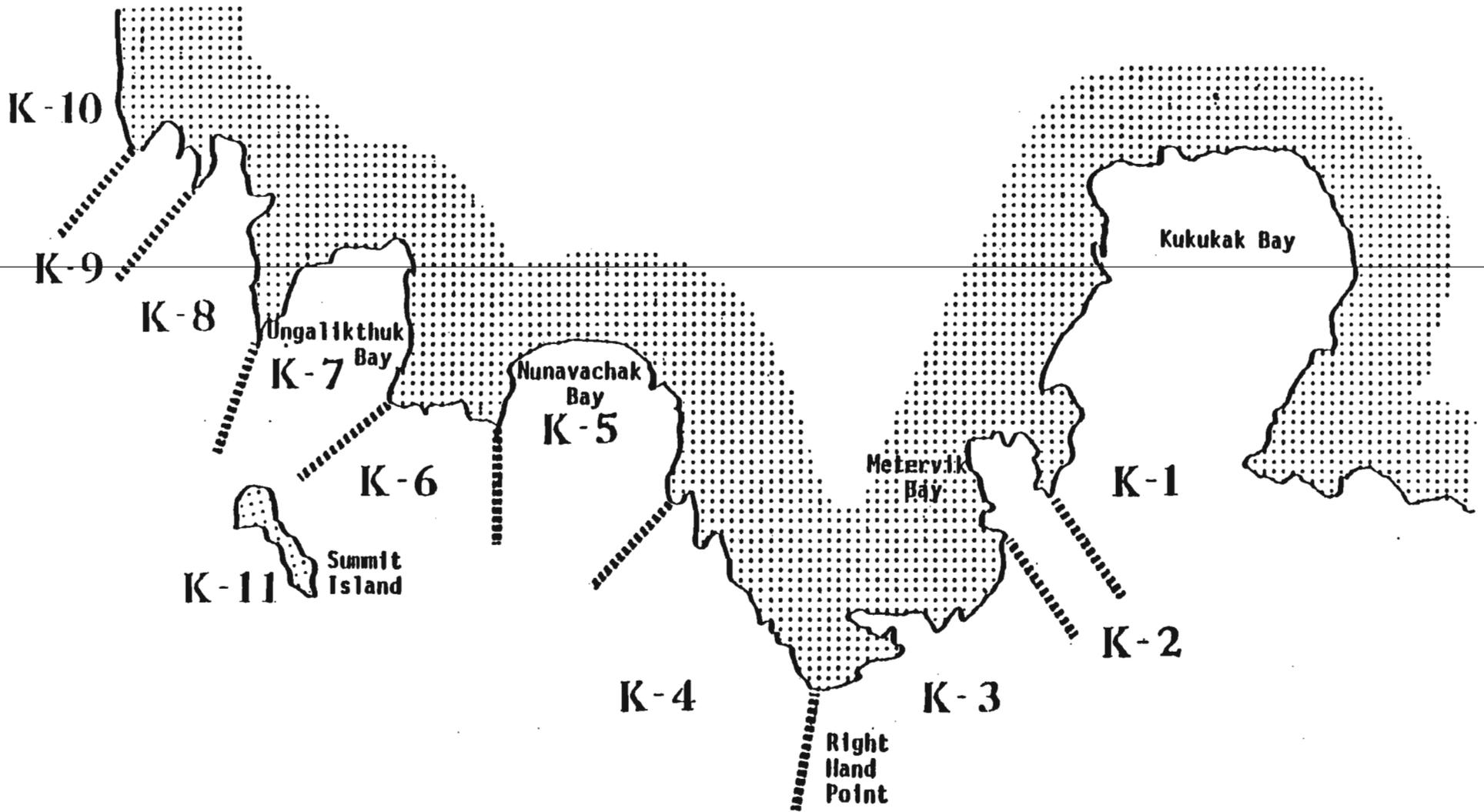
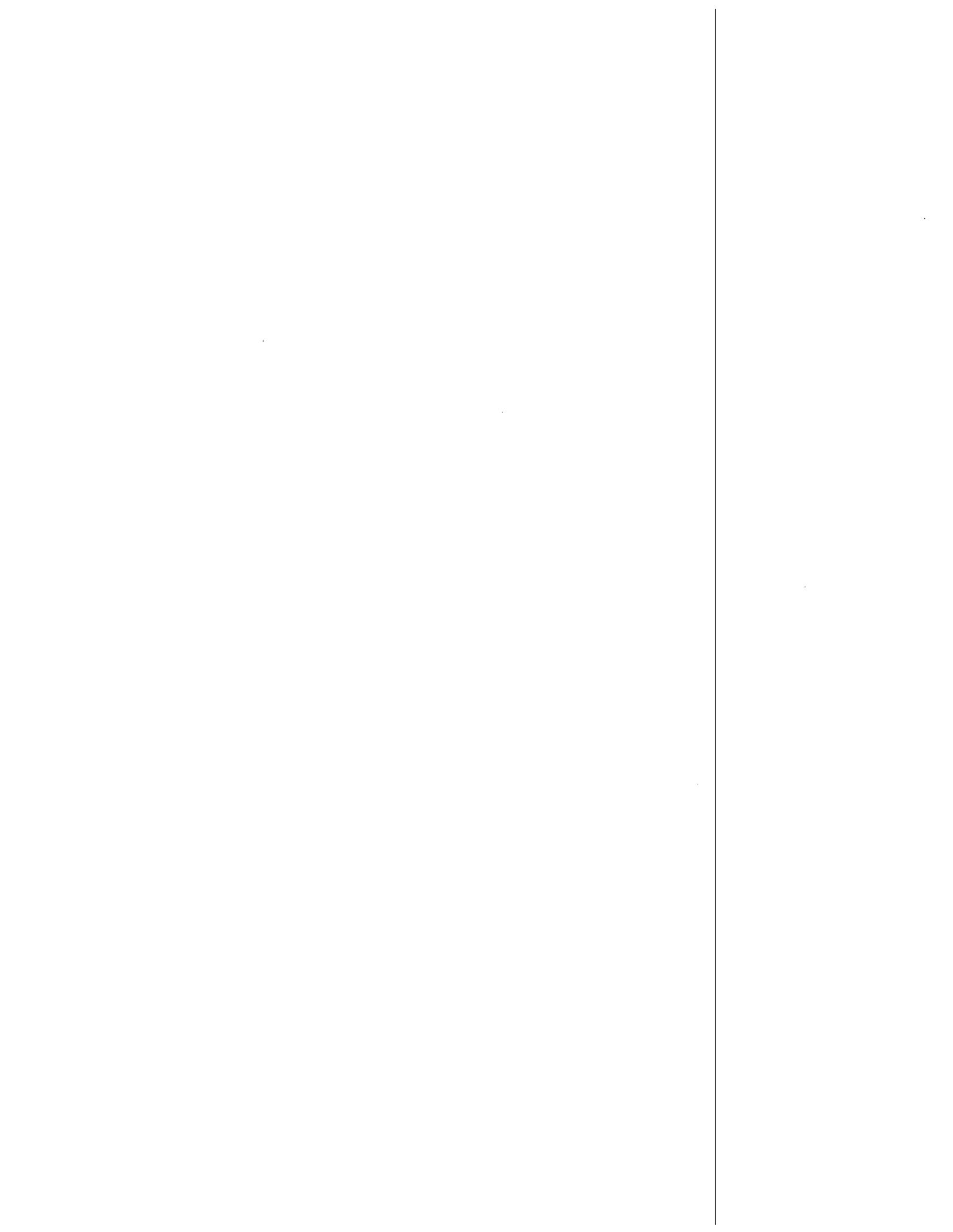


Figure 2.
 HERRING SPAWN-ON-KELP MANAGEMENT AREAS (K-1 THROUGH K-11)



were reportedly made on capelin by mistake and capelin sightings were also reported in Nunavachak and the western part of the district.

The fourth and final commercial herring opening was announced at 9:00 a.m., May 21 for that same afternoon (Table 2). Due to the stage of the tide and continued spawning in many areas, both gear types were allowed to start fishing at the same time, so that further delay would not result in lost roe recovery.

The harvest for the last opening was estimated at 3,700 tons bringing the accumulative harvest to 19,300 s. tons (Table 3). With the added harvest for the kelp removal (1,600 s. tons) and a small amount of waste (150 s. tons), the maximum 20% exploitation allowed by the management plan was eminent. By May 22 it was becoming difficult to distinguish new herring biomass from the large volume of recovering spent fish, and the rapidly increasing tonnage of capelin throughout the area.

On the regular 6:15 p.m. radio schedule with the fleet, a second spawn on kelp opening was announced in areas K-4 and K-9 from 3:00 to 7:00 a.m., May 23 (Table 2). Approximately 101,000 pounds were harvested during this holdover tide, but the quality was reported as "only fair". This left approximately 90,000 pounds remaining of the 350,000 pound quota. The low tides were beginning to improve and two additional tenders were prepared to purchase kelp, so it was likely the remaining surplus would be harvested in one final opening. At 6:15 p.m. on May 23 the third kelp opening was announced for the following day (Table 2). In a very short harvest period approximately 148,000 pounds was landed, bringing the season total to 407,000 pounds (Table 4). Spawn on kelp prices were down this year compared to 1983, but participants still landed over \$200,000 worth of product (Appendix Table 7).

The evening of May 23 brought the first capelin landings of the 1984 season and this fishery continued to operate unrestricted until May 31 when the fleet voluntarily stopped fishing (Table 5). The sorting process to remove the males was very slow and proved to be the limiting factor in the quantity of capelin harvested.

Late in the afternoon of May 25 many schools were reported in the area off Kulukak Point. Four test boats were deployed and most of the fish sampled proved to be capelin or spawn out herring. Small quantities of herring continued to appear until early June but the biomass remained low and aerial surveys were terminated on June 4 with the final tonnage estimated at 115,000 s. tons. Clearly some of the later herring were new biomass, but no definitive change was observable in the quantity, maturity, or age of the samples, and aerial estimates were further complicated by the large volume of capelin and recovering spent herring remaining in the district.

Numerous oil spills and large volumes of trash continue to be a major enforcement problem at Togiak. Personnel from the Department of Environmental Conservation and the U.S. Coast Guard were again stationed on the fishing grounds this season, but with limited visible effect. A voluntary trash clean up on Nunavachak beaches resulted in the removal of over 30 cubic yards of material, but an aggressive program is still needed before there is a serious negative impact on the local environment.

The age composition during the 1984 season was composed heavily of 6 and 7 year old herring (72%), and no significant new recruitment was documented (Table 6). A minor shift in the age composition over time was detectable post-seasonally, but not to the point that would have allowed a differential harvest on the young vs. old age herring.

Exvessel value of the herring harvest in 1984 amounted to \$7.2 million, second only to 1983's record harvest, and the combined herring/kelp exvessel value totaled \$7.4 million (Appendix Table 7).

TABLES



Table 1. Summary of herring aerial survey total run biomass estimates and observations of herring spawn, Togiak district, Bristol Bay, 1984.

Date	Survey Rating 1/	Census Area Surveyed 2/	Number Herring Schools Observed				Herring Biomass Est. 3/4/		Herring Spawn		
			Small	Med.	Large	Total	Formula	Staff	No.	Each	Accum.
4/19	E/ G	KUL-TOG									
23	E/ G	NUS-MAT									
25	G/ F	NUS-HAG									
28	F/ P	NUS-TON									
30	G	NUS-HAG									
5/ 1	F/ P	NUS-TOG									
2	F/VP	NUS-MAT			5	5	130	200			
3	G/ P	NUS-OSV		5		5	35				
4	E/ G	NUS-HAG		1		1	7				
5	E/ G	NUS-MAT									
7	E/ G	NUS-MAT									
9	G/ F	NUS-OSV	11	6		17	58	25	1	+	+
11	G/ F	NUS-OSV									
13	F/ P	NUS-OSV	6	4		10	36	45			
15	P/VP	NUS-UNG									
16	G/ P	NUS-HAG	6	159	419	584	59,257	54,000	1	0.3	0.3
17	P/VP	NUS-TOG		3	86	89	7,157		1	0.5	0.8
18 (AM)	F/ P	NUS-HAG	9	97	147	253	12,204		13	9.7	10.5
18 (PM)	G/ F	NUS-TOG		86	184	270	50,654	50,700	11	7.9	18.4
19 (AM)	G/ F	NUS-CN	8	753	470	1,231	35,755	34,400	36	13.9	32.3
19 (PM)	G/ P	NUS-TOG					92,100	87,600	35	10.7	43.0
20	G/VP	NUS-OSV	12	675	787	1,474	91,830	93,700	8	1.3	44.3
21	V/ P	NUS-MET									44.3
22	E/VP	NUS-PYR	3	205	53	261	6,493	7,100	5	1.2	45.5
23	G/VP	NUS-PYR	29	237	25	291	4,016	4,300	3	1.4	46.9
24	E/ F	CON-HAG		133	5	138	2,943	4,200	6	2.2	49.1
25 (PM)	G/ F	NUS-HAG	7	448	45	500	7,736	8,500	3	1.4	50.5
25 (PM)	V/ P	NUS-MET			30	30	1,674	1,500			50.5
26 (AM)	F/ P	NUS-HAG		337	38	375	2,015	5,000	11	3.1	53.6
26 (PM)	F/VP	NUN-OSV		106	32	138	3,692	4,300	3	1.0	54.6
27	F/ P	NUS-HAG		175	29	204	4,347	4,300	8	1.2	55.8
28	E/ P	NUS-HAG		81	10	91	-5,300-		3	0.1	55.9
29 (PM)	G/ F	NUS-HAG	6	98	41	145	3,310	4,700	2	0.2	56.1
30 (PM)	E/ F	NUS-HAG	16	307	55	378	6,412	8,100	4	0.5	56.6
31	E/ G	NUS-HAG	20	588	60	668	9,586	12,750	12	4.1	60.7
6/ 1	E	NUS-PYR	10	333	2	345	3,855	3,550	3	0.5	61.2
4	F/VP	NUS-MAT							2	0.2	61.4

1/ Survey rating: VP=Very Poor; P=Poor; F=Fair; G=Good; and E=Excellent.

2/ Inclusive census areas: CON - Cape Constantine; NUS - Nushagak Peninsula; KUL - Kulukak; MET - Metervik; NUN - Nunavachak; UNG - Ungalikthluk; TOG - Togiak; TON - Tongue Point; MAT - Matogak; OSV - Osviak; HAG - Hagemeister; PYR - Pyrite Point; and CN - Cape Newenham.

3/ Short tons.

4/ Formula: Total RAI's x conversion factors of 1.3, 2.4, and 3.4 tons, by census area and fish density/distribution;

Staff: Personal estimates by experienced Department spotters.

Table 2. Emergency order commercial herring sac roe and herring spawn on kelp fishing periods, Togiak district, Bristol Bay, 1984.

Emergency Orders 1/							
Number	K Area	Date, Time and Gear			Hours/Days Open		
<u>I. HERRING SAC ROE</u>							
DLG 01		May 18	9 p.m.	- May 19	9 a.m.	Gill Net	12 hours
		May 19	12 N	- May 19	4 p.m.	Purse Seine	4 hours
DLG 02		May 19	6 p.m.	- May 19	10 p.m.	Purse Seine	4 hours
		May 19	6 p.m.	- May 20	6 a.m.	Gill Net	12 hours
DLG 03		May 20	11 a.m.	- May 20	12 N	Purse Seine	1 hour
		May 20	3 p.m.	- May 20	8 p.m.	Gill Net	5 hours
DLG 05		May 21	4 p.m.	- May 21	6 p.m.	Purse Seine	2 hours
		May 21	4 p.m.	- May 21	10 p.m.	Gill Net	6 hours
<u>II. HERRING SPAWN ON KELP</u>							
DLG 04	K4 and K9	May 21	12 N	- May 21	8 p.m.		8 hours
DLG 06	K4 and K9	May 23	3 a.m.	- May 23	7 a.m.		4 hours
DLG 07	K4 and K9	May 24	4 p.m.	- May 24	8 p.m.	(K-4)	4 hours
		24	5 p.m.	- May 24	7 p.m.	(K-9)	2 hours

1/ Prefix code on emergency orders indicate where announcements originated ("DLG" for Dillingham).

Table 5. Inshore commercial capelin catch by date, Togiak district, Bristol Bay, 1984.

Date	Number of Deliveries 1/	Short Tons			
		Landed Weight After Sorting 2/		Estimated Total Catch 3/	
		Daily	Accum.	Daily	Accum.
5/23	2	13	13	32	32
24	2	13	26	32	64
25	4	34	60	85	149
26	4	80	140	222	371
27	6	63	203	167	538
28	4	137	340	381	919
29	6	113	453	311	1,230
30	1	6	459	15	1,245
31	4	30	489	76	1,321
Total	33	489	489	1,321	1,321

1/ Number of tender deliveries. Actual number of fish tickets written = 15. Actual number of purse seine sets approx. = 42.

2/ Landed weight has been sorted to recover females for marketing. Sorting recovery of the total catch was estimated at 35-40%.

3/ Total catch includes both males and females. Males rejected by sorter either ground or returned to the water with presumably high mortality.

Table 6. Herring total run biomass and inshore commercial catch by year class, Togiak district, Bristol Bay, 1984.

		Total Run and Catch by Year Class							
Year Class	Age	Total Run		Catch		Escapement in Short Tons			
		Short Tons	Percent	Short Tons	Percent	Short Tons			
1975	9	14,245	13	2,664	14	11,581			
76	8	5,973	5	753	4	5,220			
77	7	46,182	40	8,820	46	37,362			
78	6	37,222	32	6,406	33	30,816			
79	5	9,190	8	637	3	8,553			
80	4	1,953	2	20	+	1,933			
81	3	115	+	-	-	115			
Total		114,880	100	19,300	100	95,580			

Table 3. Inshore commercial herring catch and roe recovery by period and gear type, Togiak district, Bristol Bay, 1984.

Period	Time GN/PS	Short Tons			Roe Percent		
		Gill Net	Purse Seine	Total	Gill Net	Purse Seine	Total 1/
5/18-19	12/ 4 hrs.	2,904	4,816	7,720	7.3	11.6	10.0
5/19-20	12/ 4 hrs.	1,210	5,159	6,369	8.0	10.3	9.9
5/20	5/ 1 hs.	309	1,235	1,544	9.0	10.0	9.8
5/21	6/ 2 hrs.	477	3,190	3,667	8.9	9.9	9.8
Total	35/11 hrs.	4,900	14,400	19,300	8.4	10.2	9.8
Percent of Catch		25.1	74.9	100.0			

1/ Weighted by catch and gear type.

Table 4. Commercial herring spawn on kelp harvest by day and area, Togiak district, Bristol Bay, 1984.

Date	Time K-4/ K-9	Harvest in Pounds by Beach Kelp Area		Daily Total	
		K-4	K-9	Pounds	Short Tons
5/21	8/ 8 hrs.	20,997	136,910	157,907	79
5/23	4/ 4 hrs.	57,574	43,500	101,074	50
5/24	4/ 2 hrs.	137,452	10,153	147,605	74
Total	16/14 hrs.	216,023	190,563	406,586*	203

*According to the 1984 Board of Fisheries guidelines the desired harvest of spawn on kelp was 350,000 lbs. which can be equated to 1,492 short tons of spawning herring biomass (at 1983's 8.8% roe recovery). Using the same equations:

1984 Harvest Spawn on Kelp	406,586 lbs.
- Estimated Plant Weight (25%)	-101,646 lbs.
<u>Weight of Eggs Harvested</u>	<u>304,940 lbs. = 152 s.t.</u>

1984 Average Roe Recovery = 9.8%

So 152 short tons of eggs were produced by

$9.8 = \frac{100}{152} \cdot X = 1,552$ short tons of spawning herring biomass.

152 X

This number (1,552 s. tons) will be added to the herring harvest and included in calculating the % of exploitation.

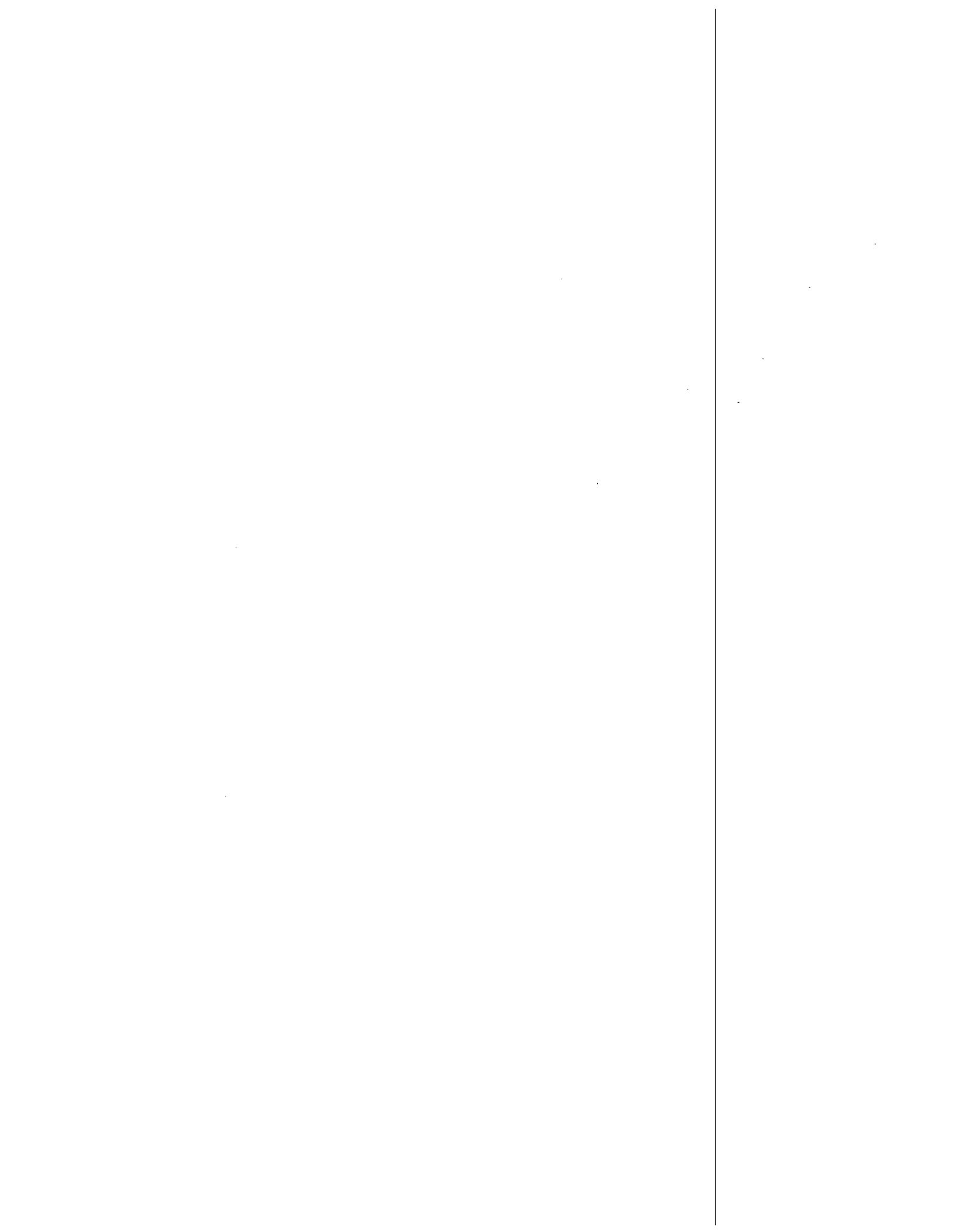
Table 7. Commercial herring sac roe and herring spawn on kelp processors and buyers operating in the Togiak district, Bristol Bay, 1984. 1/

Name of Operator/Buyer	Base of Operations	Processing Method		Brine Export	Comments
		Frozen	Cured		
A. HERRING SAC ROE					
1. Alaska Fish Producers	M/V Donald E	Floater			
2. Alaska Herring Coop.	M/V Ebisu Maru	Floater			Joint venture w/U.S. gillnetters.
3. All Alaskan Seafoods	M/V All Alaskan	Floater			
4. Aleutian Cold Storage	F/V Anahita			Sea	Tendered to Sand Pt. for freezing.
5. Blue Pacific	F/V Pioneer	Shore			Tendered to Ekuk, So. Naknek, D. Harbor and balance frozen on M/V Royal Venture.
6. Bristol Monarch	M/V Bristol Monarch	Floater			
7. Coldwater Harvesters	F/V Little Comfort		Floater		
8. Daerim	M/V Patricia Lee	Floater			
9. Dragnet	M/V Alaskan I	Floater			
10. Dutch Harbor Seafoods	M/V Galaxy	Floater			
11. Icicle Seafoods	F/V Arctic Star	Floater			
12. JX Fisheries	M/V Pavlof	Floater			Tendered to Naknek and Dlg. for freezing.
13. Kemp Pacific	M/V Bering Trader	Floater			
14. Kodiak King Crab	M/V Shelikof Straits	Floater		Sea	Tendered to Kodiak and Naknek for freezing.
15. New West Fisheries	M/V Denali			Sea	Frozen at Peter Pan plants at Pt. Moller and King Cove.
16. Northcoast Seafood Proc.	M/V Polar Bear	Floater	Floater		Mostly frozen, but a small amount stripped on grounds.
17. Pan Alaska	M/V Royal Venture	Floater		Sea	
18. Sea Roe Fisheries	M/V Pribilof	Floater			
19. Seward Marine Services	M/V Odyssey			Sea	
20. Starbright Fish. Inc.	M/V Teddy	Floater			
21. Togiak-Nuka Point	Togiak Fisheries	Shore			Tendered to Ekuk, Togiak Fish., and Peterson Pt. for freezing.
22. Trident Seafood Corp.	M/V Bountiful	Floater		Sea	Tendered to Akutan, the balance frozen on grounds.
23. Ursin Seafoods	M/V Alex D.			Sea	Tendered to Kodiak.
24. Western Pioneer	M/V Western Pioneer	Floater			
Total Togiak District:		19	2	7	
B. HERRING SPAWN ON KELP					
1. Alaska Ocean Products	F/V Ark Angel		Floater		
2. Alaska Roe on Kelp	M/V Resurrection		Floater		
3. Coldwater Harvesters	F/V Little Comfort		Floater		
4. Northcoast Seafood Proc.	F/V Polar Bear		Floater		
5. Nuka Point Fisheries	F/V Marin I		Floater		
6. Togiak Eskimo Seafoods	Togiak		Shore		
Total Togiak District:			6		

1/ Indicates operators with either a physical plant or processing facility in a district or those operators from other areas buying herring or kelp and for providing tender and support service for fishermen in areas away from the facility.



APPENDIX TABLES



Appendix Table 1. Surface area and biomass conversion estimates of herring schools, by aerial survey, in the Togiak district, Bristol Bay, 1978-84.

Year	Month/ Day	Est. of Tons Per 538 ft. sq.1/	School Size in Feet	Weight of Catch in Short Tons	Actual or Est. Weight of Catch	Fish Condition	Location of Purse Seine Set	Water Depth in Feet
1978	5/13	7.39	2/	2/	Estimated	2/	Nunavachak Bay	2/
	18	12.13	80 x 60	110	Estimated	2/	Nunavachak Bay	2/
1979	5/ 4	2.65	40 dia.	6	Actual	Ripe	Ungalikthluk Bay	20
1980	5/15	1.32	60 x 40	6	Actual	Ripe	Ungalikthluk Bay	10
	15	1.76	40 x 30	4	Estimated	Spawn-outs	Ungalikthluk Bay	26
	16	1.21 3/	220 x 50	21	Actual	Spawn-outs	Nunavachak Bay	16.
	16	1.32	65 x 20	3	Estimated	Fish lost	1 Mile West Ungalikthluk Pt.	16
	20	3.31	70 x 70	30	Estimated	Ripe	East of Eagle Bay	20
	20	2.87	150 x 75	59	Estimated	Fish lost	Eagle Bay	20
1981	5/ 3	1.21	400 x 200	88	Actual	Ripe	West Side, Tongue Pt.	7
	8	1.87	80 x 30	8	Actual	Spawn-outs	Togiak Bay, Mouth	20
	10	4.41	150 x 60	44	Actual	Ripe	Asigyukpak Spit Bight	26
1982	5/15	2.09	200 x 150	110	Estimated	Green	Kulukak Bay	26
1983	4/30	1.21	150 x 80	60	Estimated	Green	Togiak Bay	13
	30	1.10	350 x 143	100.	Estimated	Green	Togiak Bay	10
	30	1.65	60 x 30	3	Estimated	Green	Togiak Bay	26
	5/11	1.98	200 x 200	140	Estimated	Ripe and Spawn-outs	Togiak Bay	10
	18	1.87	300 x 50	50	Estimated	Spawn-outs	Nushagak Peninsula	13
	18	2.43	60 x 60	15	Estimated	Spawn-outs	Nushagak Peninsula	13

2.83 Mean All Estimates and Water Depths Greater Than 26 Ft.

1.52 Mean Estimates at 16 ft. or less Water Depth

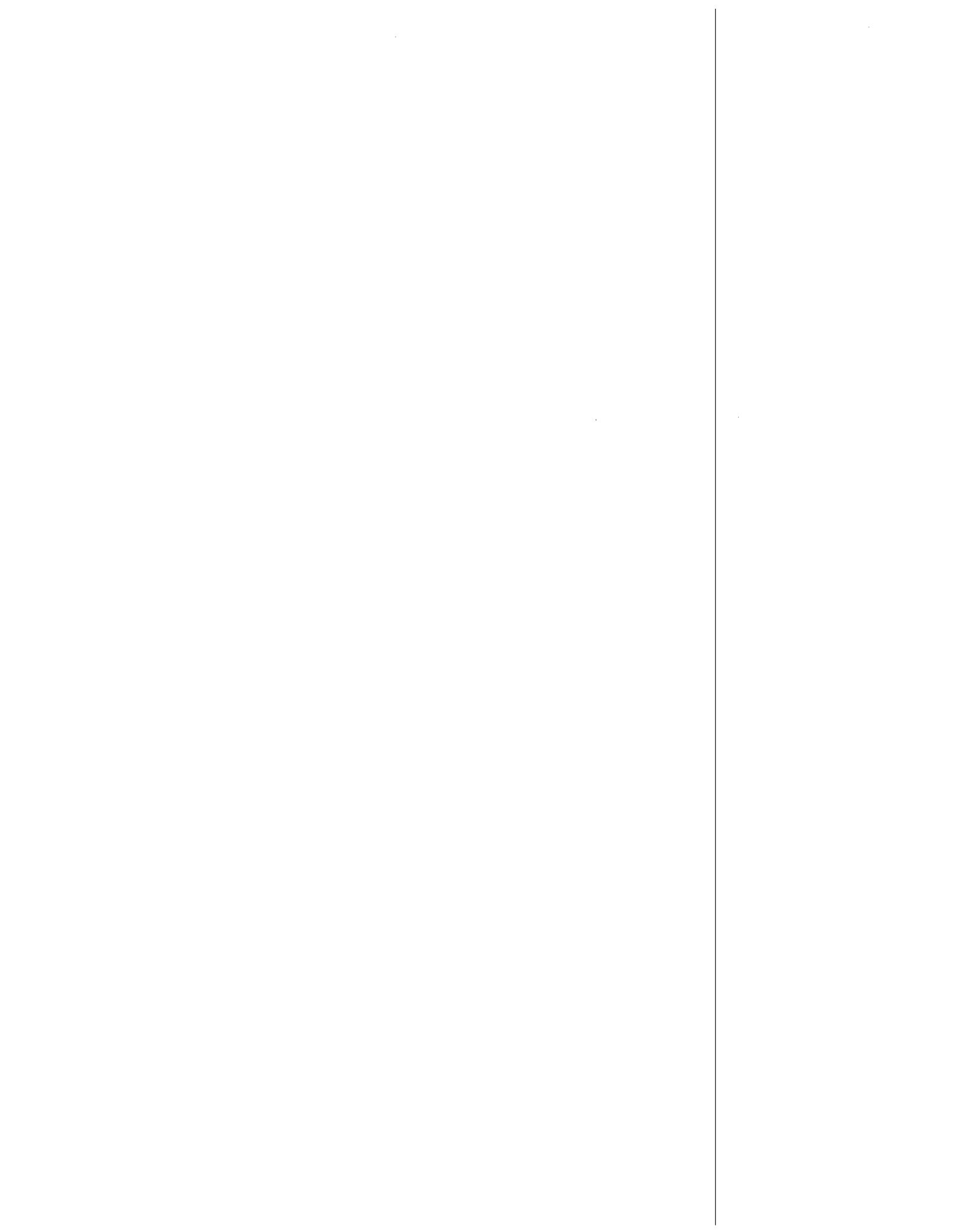
2.58 Mean Estimates at 16-26 ft. Water Depth

1/ Short tons of fish per 538 ft. sq. of surface area.

2/ Incomplete data.

3/ Average of 2 observers estimates.

(Literature Cited: 1)



Appendix Table 2. Inshore commercial catch of herring by gear type and product, Togiak district, Bristol Bay, 1967-84.

Year	Numbers of Processors	Units of Gear 1/		Percent Catch by Gear and Product Type				Total Catch in Short Tons 2/
		Gill Net	Purse Seine	Gear		Product		
				Gill Net	Purse Seine	Sac Roe	Food/Bait	
1967	1	27		100		100		135
68	2	35	2	75	25	100		90
69	2	22	1	38	62	100		47
70	3	16	1	67	33	100		28
71 3/								
1972	1	18	1	40	60	100		80
73	2	26	1	100		100		51
74	3	10	1	16	84	100		123
75	2	39		100		100		56
76 3/								
1977	6	43	6	11	89	100		2,795
78	16	40	25	8	92	100		7,734
79	33	350	175	40	60	92	8	11,152 4/
80	27	363	140	16	84	85	15	19,596 4/
81	28	106	83	18	82	99	1	12,542
1982	33	200	135	31	69	93	7	21,489
83	23	250	150	19	81	97	3	26,996 4/
84	25	300	196	25	75	98	2	19,300
16 Year Total	207	1,845	917					122,214
1967-76 Total	16	193	7					610
1977-84 Total	191	1,652	910					121,604
16 Year Average	13	115	57	23	77	94	6	7,638
1967-76 Average	2	24	1	65	35	100	0	76
1977-84 Average	24	207	114	23	77	94	6	15,201

1/ Number of units derived from fish tickets until 1979-84, when they were estimated by aerial survey.

2/ Catch not comparable, as harvest prior to 1973 reflects females only; most males were discarded and not weighed.

3/ Fishery not conducted.

4/ Preliminary.

(Literature Cited: 1)



Appendix Table 3. Estimated total run biomass and inshore commercial catch of herring, Togiak district, Bristol Bay, 1978-84.

Year	RAI 1/	Total Run Biomass and Catch in Short Tons						
		Run	Harvest	Percent				Run Harvested
				Roe Recovery				
				Gill Net	Purse Seine	Total		
1978	47,463	190,292	7,734			8.2	4.1	
79	151,737	239,022	11,152 2/			8.6	4.7	
80	16,812	68,686	19,596 2/3/			9.2	28.5 3/	
81	87,486	158,650	12,542	6.7	10.1	9.1	7.9	
82	55,123	97,902	21,489	7.4	9.5	8.8	22.0	
83	97,909	141,782	26,996 2/	6.9	9.3	8.9	19.1	
84	64,835	114,880	19,300	8.4	10.2	9.8	16.8 4/	

1/ R.A.I. = relative abundance indices; number of fish schools equivalent to 538 sq. ft. surface area, unadjusted for presence of non-herring pelagic schools.

2/ Preliminary.

3/ Does not include 5,700 short tons of waste.

4. Overall exploitation rate = 18.3% based on an adjusted total harvest of 21,006 s.t. (19,300 s.t. sac roe harvest, 154 s.t. wastage, 1,552 s.t. herring equivalent of spawn on kelp).

(Literature Cited: 1)



Appendix Table 4. Age composition of the inshore herring run, Togiak district, Bristol Bay, 1977-84.

Age	Age Composition in Percent 1/							
	1977	1978	1979	1980	1981	1982	1983	1984
3	4	11 2/	3	3	2		+	+
4	49	44	9	2	48	16	4	2
5	37	33	43	2	5	56	33	8
6	3	9	35	39	1	3	47	32
7	3	1	9	37	25	1	2	40
8	3	1	+	15	15	13	2	5
9+	1	1	1	2	4	11	12	13
Catch (s.t.)	2,795	7,734	11,152 3/	19,596 3/	12,542	21,489	26,996 3/	19,300
Run (s.t.) 4/		190,292	239,022	68,686	158,650	97,902	141,782	114,880

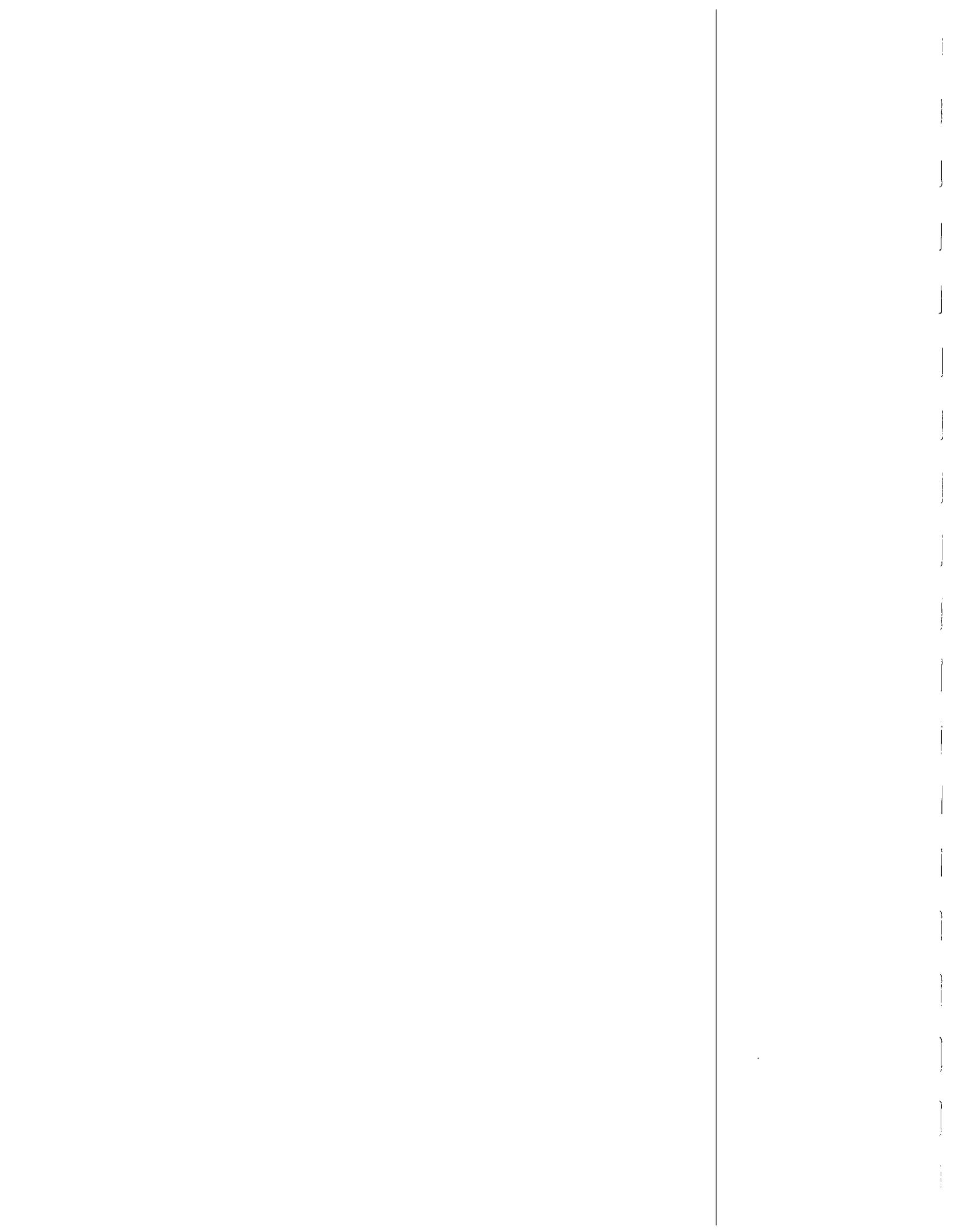
1/ Age composition in 1977-78 based on number sampled, and not weighted by weight at age and aerial biomass estimates; while age composition in 1979-84 is weighted by weight at age and aerial biomass estimates.

2/ Includes age 1, 2 and 3.

3/ Preliminary.

4/ Estimate of total run, including commercial catch and escapement.

(Literature Cited: 1)



Appendix Table 5. Commercial harvest of herring spawn on kelp in the Togiak district, Bristol Bay, 1968-84.

Year	Number of Processors	Number		Harvest	
		Fishermen	Deliveries	Pounds	Short Tons
1968	1	1	6	54,600	27
69	1	3	20	10,125	5
70	1	5	23	38,855	19
71	1	12	43	51,795	26
72	1	12	32	64,165	32
1973	1	10	11	11,596	6
74	3	26	49	125,646	63
75	2	44	98	111,087	56
76	5	49	118	295,780	148
77	5	59	266	275,774	138
1978	11	160	349	329,858	165 1/
79	16	100	228	414,727	207 1/
80	21	78	186	189,662	95 1/
81	7	111	277	370,534	185
82	8	124	171	240,894	120
1983	4	131	255	275,079	138
84	6	240	395	406,586	203
17 Year Total	94	1,165	2,527	3,266,763	1,633
1968-77 Total	21	221	666	1,039,423	520
1978-84 Total	73	944	1,861	2,227,340	1,114
17 Year Average	6	69	149	192,163	96
1968-77 Average	2	22	67	103,942	52
1978-84 Average	10	135	266	318,191	159

1/ Preliminary.

(Literature Cited: 1)



Appendix Table 6. Aerial observations of herring spawnings in the Togiak district, Bristol Bay, 1978-84. 1/

Date	1978		1979		1980		1981		1982		1983		1984	
	No.	Miles												
4/30			2	2.5			9	3.0			0			
5/ 1	1	0.4					6	2.3			0			
2			21	8.3	11	4.0	12	1.9			10	3.6		
3	1	0.4	14	5.0	8	3.0	12	6.8			30	9.3		
4			8	3.1			4	2.9			40	12.5		
5			1	1.3	0		6	2.5			27	7.5		
6					3	0.9	0				8	2.9		
7			3	0.6	3	1.2	2	0.4	0		8	1.5		
8	2	1.8			1	0.2	3	1.0			8	1.9		
9			2	0.4			5	1.4					1	+
10			0				0		0					
11	9	7.7			0						3	3.5		
12	3	1.5	0		0		15	4.8	0		9	5.4		
13	12	8.6			0		6	3.8	0		0			
14	11	5.6	0		2	2.3	10	4.7	0					
15					6	4.0	2	1.5	0		2	1.0		
16			0		4	1.2	0		1	0.1	4	0.5	1	0.3
17			0						4	0.7	9	2.0	1	0.5
18	11	4.2							29	7.3	19	6.1	24	17.6
19	3	2.5			1	0.3			16	5.2	7	1.7	71	24.6
20					4	0.9			19	14.0	0		8	1.3
21			0						3	2.0			0	
22					2	0.5			3	1.5			5	1.2
23							10	2.1	11	3.3	0		3	1.4
24									5	1.4			6	2.2
25	8	4.2							1	0.3	1	0.1	3	1.4
26	2	2.2	1	0.7			3	0.2	0		1	0.1	14	4.1
27					3	0.3			0		2	0.1	8	1.2
28	0								0				3	0.1
29					8	1.6			0				2	0.2
30	6	1.6							0		0		4	0.5
31					2	0.8			0				12	4.1
6/ 1									7	2.6	0		3	0.5
2	1	0.5							0					
3							1	0.8	4	0.2	1	+		
4													2	0.2
5														
6														
7					6	3.1								
Total	70	41.2	52	21.9	64	24.3	106	40.1	103	40.6	189	59.7	171	61.4

1/ Survey area covers Nushagak Peninsula to Cape Newenham, and shows the number of individual herring spawnings and linear miles of spawn.

(Literature Cited: 1)



Appendix Table 7. Exvessel value of the commercial herring and spawn on kelp harvest, Togiak district, Bristol Bay, 1967-84. 1/

Year	Estimated Exvessel Value in Thousands of Dollars 2/			
	Herring			
	Sac Roe	Food/Bait	Spawn on Kelp	Total
1967	\$ 11	\$	\$	\$ 11
68	7		8	15
69	4		1	5
70	2		6	8
71			8	8
1972	4		9	13
73	2		2	4
74	24		19	43
75	9		22	31
76			127	127
1977	447		116	563
78	2,635		120	2,755
79	6,561	180	249	6,990
80	3,055	150	95	3,300
81	3,988	1	250	4,239
1982	6,070	105	176	6,351
83	10,450	67	284	10,801
84	7,178	33	203	7,414
18 Year Total	\$ 40,447	\$ 536	\$ 1,695	\$ 42,678
1967-76 Total	63		202	265
1977-84 Total	40,384	536	1,493	42,413
18 Year Average	\$ 2,528	\$ 89	\$ 100	\$ 2,371
1967-76 Average	8		22	27
1977-84 Average	5,048	89	187	5,302

1/ Value paid to the fishermen.

2/ Exvessel value derived from price per pound times commercial harvest.

(Literature Cited: 1)



APPENDIX A

BRISTOL BAY HERRING/KELP OUTLOOK FOR 1985

A harvestable surplus of herring at Togiak is anticipated in 1985. Age 7 and 8 year fish are expected to dominate due to the strong returns from the 1977-78 brood years observed in 1984. Because methods to forecast actual returns are still being developed, and estimates of recruitment are not available, harvest levels will be adjusted during the season according to observed herring biomass. If it is not possible to determine herring abundance using aerial survey methods, stock abundance will be assessed using information from test and commercial catches along with spawn deposition observations.

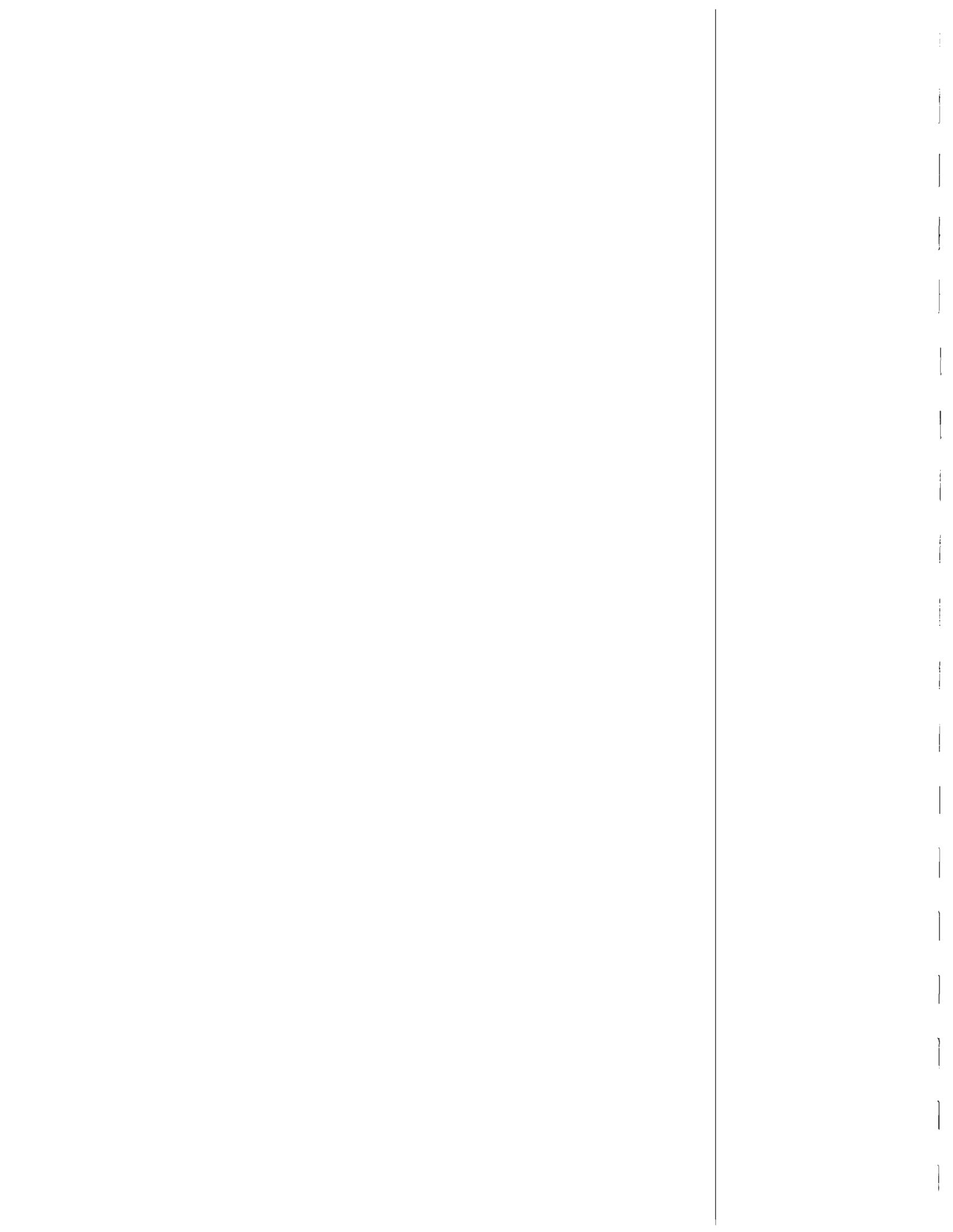
As initiated during 1981, different management strategies will be applied to early run, old age herring (age 5 and above) and late run, young age herring (age 4 and below), provided these two population components arrive on the grounds at different times.

The 1985 season's projected return, based upon observed 1984 returns, is 82,000 s. tons, which would allow a maximum projected harvest of 16,400 s.t. (20% exploitation rate). No indication of a strong new year class about to recruit was observed at Togiak or Dutch Harbor in 1984. Multiple storms that occurred in the spring of 1981 may have adversely affected the 40 linear miles of spawn observed that season, making a large showing of age 4 herring possible, but unlikely in 1985.

Fishing will not be allowed until a 5,500 s.ton biomass of older age herring has been observed and spawning has started. This management policy will allow a normal onshore migration, assure commencement of spawning increase roe quality and quantity while minimizing waste. Harvest of old age herring will be 10 to 20% of the estimated biomass. A more conservative management approach will be taken in the harvest of young, newly recruited herring since they will contribute to future harvests and provide future spawning stock. A minimum observed biomass of 22,000 s.tons of younger age herring must be present before fishing is allowed. A graduated harvest rate of up to 20% of the biomass of these younger age herring will be allowed after the 22,000 s.ton threshold is reached.

The Togiak herring spawn on kelp fishery will be regulated in a manner similar to 1984 and the same management plan will be in effect. If sufficient spawning is observed throughout the district, a harvest of herring spawn on kelp will be allowed in specific areas judged to have adequate deposition and a good standing crop of plant cover. Openings will be regulated by emergency order and the season's quota will be 350,000 pounds of spawn on kelp.

If a capelin fishery develops at Togiak in 1985, it will be managed similar to 1984 and the season will be open unless closed by emergency order. Little is known about the capelin stocks that spawn near Togiak and some applied research is planned for this season. It does appear that this stock also demonstrates a strong three year line similar to Atlantic capelin. For example, the strong capelin run that was documented at Togiak in 1981 produced the large return observed in 1984. In 1982, few capelin were sighted at Togiak on the herring aerial surveys, so the run may not be strong in 1985. However, "miles of spawning capelin" were reported along the beaches south of Port Moller in 1982 and it is unknown whether these stocks spawn in the same location each year.



APPENDIX B

ALASKA BOARD OF FISHERIES
BRISTOL BAY HERRING MANAGEMENT DIRECTIVE

The Bristol Bay herring and herring spawn on kelp fishery will be managed within the following guidelines:

1. A minimum threshold level of biomass for conservation of the stocks will be maintained;
2. Differing harvest rates for older (5 yrs. or greater) and younger age class (4 yrs. or less) herring will be used;
3. The commercial harvest will not begin until the start of spawning, thus insuring the opportunity for the highest roe recovery; and
4. The harvest management should minimize wastage of the resource.

Therefore, the Department staff will take the following action given the specified circumstances:

1. When the total daily observed biomass of early season older age class herring exceeds 5,500 short tons, and some spawning has occurred, the season will open and the harvest rate will be from 10% to 20% of the observed biomass;
2. When the total observed biomass of later season younger age class herring exceeds 22,000 short tons, a harvest rate of up to 20% will be allowed;
3. The number of openings allowed in the herring spawn on kelp fishery will be based on the fishing time in the herring fishery, and density and distribution of observed spawn;
4. Whenever possible, openings for both gear types shall be initiated at low water, or the beginning of the flood tide;
5. Whenever possible, separate openings shall be announced for gill nets and purse seines;
6. Whenever possible, gill nets shall be allowed to fish first and all openings shall begin during the hours of daylight;
7. When purse seine openings are one hour or less, gill net openings shall be at least five hours in duration; and
8. In emergency situations such as pending bad weather or a likely loss of roe recovery due to further delay, the staff shall time openings as the situation requires.

It is the expressed intent of the Board to fully utilize harvestable surpluses in the inshore fishery.



APPENDIX C

MANAGEMENT PLAN TO REGULATE THE HERRING
SPAWN ON KELP HARVEST IN THE BRISTOL BAY AREA

Management of the Togiak herring spawn on kelp harvest will center upon a level of exploitation not to exceed 350,000 pounds. The number of openings allowed in the spawn on kelp fishery will be based on the extent of fishing time in the herring fishery, and the density and distribution of observed spawn on kelp.

Contracted studies by the University of Alaska, Juneau, suggest a 2 to 3 year rotational harvest of those areas picked, to preserve the plant community by allowing for a recovery period after removal.

This management plan will provide for a continued level of harvest by the participants, while stabilizing at a conservative level, the removal of spawn from potential herring production. This management strategy will further reduce the impact on the plant community, and minimize the damage to unharvested spawn and plants.

A spawn on kelp harvest of 350,000 pounds is equivalent to the production from 1,492 s. tons of herring. The spawn on kelp removal will be included in the calculation of the percent of herring biomass harvested.

When possible, spawn on kelp harvests will be timed to insure the best quality product, thus providing the highest return to the participants.

APPENDIX D. ALASKA BOARD OF FISHERIES REGULATORY ACTION AND MANAGEMENT
POLICY CHANGES FOR THE 1984 COMMERCIAL AND SUBSISTENCE
HERRING FISHING SEASON, BRISTOL BAY.

1. A proposal to change the harvest allocation of the sac roe fishery between gill net and purse seine fishermen was not adopted. However, the management directive was amended by the Board to include:
 - A. whenever possible, openings for both gear types shall be initiated at low water, or the beginning of the flood tide;
 - B. whenever possible, separate openings shall be announced for gill nets and purse seines;
 - C. whenever possible, gill nets shall be allowed to fish first and all openings shall begin during the hours of daylight;
 - D. when purse seine openings are one hour or less, gill net openings shall be at least five hours in duration; and
 - E. in emergency situations, such as pending bad weather or a likely loss of roe recovery due to further delay, the staff shall time openings as the situation requires.

