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Alaska Department of Fish and Game
Division of Commercial Fisheries
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Abundance, Age, Sex, and Size of Sockeye Salmon Catches and Escapements in Southeast Alaska in 1986

by
Scott A. McPherson
Andrew J. McGregor
and
Fred A. Bergander

State of Alaska

Steve Cowper, Governor

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AUTHORS

Scott A. McPherson is a Region I Fishery Biologist in charge of sockeye catch and escapement reporting and Lynn Canal sockeye stock identification for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 20, Douglas, AK 99824.

Andrew J. McGregor is a Region I Fishery Biologist in charge of Taku River sockeye studies for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 20, Douglas, AK 99824.

Fred E. Bergander is a Region I Fishery Biologist in charge of selected sockeye escapement projects for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 20, Douglas, AK 99824.

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ABSTRACT

Catch statistics and spawning escapement estimates for sockeye salmon (*Oncorhynchus nerka* Walbaum) in Southeast Alaska in 1986 are summarized. A total of 1,290,292 sockeye salmon were commercially harvested of which approximately 70% came from southern Southeast Alaska waters (Districts 101-108). The drift gill net and purse seine fleets harvested the vast majority of sockeye salmon, 51% and 44%, respectively. Gill net catches were highest in District 115, where 290,205 sockeye salmon were taken. Purse seine catches were highest in District 104, where 443,990 fish were harvested. Small numbers of sockeye salmon were also taken in commercial fish trap and troll fisheries, in Canadian commercial gill net and subsistence fisheries on the Taku and Stikine Rivers, and by sport and subsistence fishermen. Five-year--old sockeye salmon (1981 brood year) were the dominant year class taken by the gill net and purse seine fleets, although four- and six-year-old (1982 and 1980 brood years) fish contributed substantially to harvests in most districts. Large shifts in the age composition of the catches over time were apparent in both the gill net and purse seine fisheries. The average length of sockeye salmon by age class increased as the season progressed in both the gill net and purse seine catches. Females were generally shorter in length than males within specific age classes. The average weight of individual fish increased as the season progressed in many gill net and purse seine fisheries. The average weight of fish in the northern districts was greater than that observed in the southern districts. Differences in migratory timing were observed across districts and age classes in some fisheries. Spawning escapement estimates are listed for all sockeye salmon spawning systems in the region in which at least 25 fish were seen. The contribution of the 1981 and 1982 brood years predominated in the combined 55 escapement collections (52% and 39%, respectively). Contributions of the 1980 and 1983 brood years to escapements were also important for many systems. Escapements in northern Southeast Alaska were comprised of a higher percentage of older fish than escapements in the southern districts. Migratory timing of sockeye salmon through the 15 weirs in the region was determined and revealed a highly variable pattern between stocks both in the mean date of return and variance of mean date between runs.

KEY WORDS: Sockeye salmon; catch and escapement; age, sex, and size; Southeast Alaska; migratory timing

INTRODUCTION

Sockeye salmon (*Oncorhynchus nerka*) have been harvested commercially in Southeast Alaska since the 1880's. Catches peaked early in the history of the fishery, averaging 2.1 million sockeye salmon annually between 1896 and 1920 (ADF&G 1985b). Several periods of sharp declines in catches in the region were experienced over the next 30 years. From 1951 through 1980 catches remained fairly stable, averaging 803,000 fish annually. Catches have sharply increased over the last 5 years (1981 - 1985), averaging almost 1.3 million fish.

Commercial purse seine and gill net fleets currently harvest the vast majority of sockeye salmon taken in Southeast Alaska. Lesser numbers of fish are harvested commercially with fish traps and in the troll fishery. Almost without exception these fisheries harvest mixed stocks and species. Sockeye salmon are also harvested in subsistence and sport fisheries in Southeast Alaska, and although these catches are minor when compared to commercial harvests, exploitation rates are often high on individual stocks. Canadian commercial gill net fisheries have operated in the Canadian reaches of the Stikine and Taku Rivers since 1979. More than 100 systems (rivers or streams and their associated lakes) are known to produce sockeye salmon in Southeast Alaska.

Estimation of basic population attributes are essential to sound management. Age composition provides the basic data for age-specific stock contribution estimates, brood year returns, and exploitation rates. Size data can be used to monitor growth parameters, environmental variability, and gear selectivity. Migratory timing data can be used to identify interannual shifts in run timing.

The purposes of this investigation were to: 1) to develop pertinent data on the numbers, age, sex, and size composition of sockeye salmon in the harvest and escapement in Southeast Alaska in 1986; and 2) present migratory timing data for catches and escapements. These data provide basic population information for other concurrent studies and for future research and management considerations.

METHODS

Study Area Description

The study area consists of outside coastal waters of Southeast Alaska extending south from Cape Suckling to Cape Fairweather and both inside and outside waters extending south from Cape Fairweather to Dixon Entrance (Figure 1). The area is divided into eighteen coastal districts (101 though 116, 182 and 183) and six offshore districts (152, 154, 156, 157, 181 and 189). Inshore district net fisheries and escapements in the Yakutat Management Area are reported elsewhere.

Commercial, sport, and subsistence fisheries operated throughout the region. In 1986 commercial gill net harvests of salmon occurred in Districts 101, 102, 106, 108, 111, and 115 in 1986. Canadian gill net fisheries operated in the lower Canadian portions of the Taku and Stikine Rivers and on the upper Stikine River. Purse seines harvested sockeye salmon in Districts 101-107, 109, and 112-114 in 1986. The troll fleet operated throughout the region. The Metlakatla Indian Community operated gill net, purse seine, and troll fisheries within 3,000 ft of the Annette Island shoreline in District 101 (Subdistricts 24, 26, 28, and 42), as well as a small floating fish trap fishery in Subdistrict 28. Sport fishing occurred throughout Southeast Alaska, primarily near population centers in the region. Subsistence fishing was allowed at many sites in Southeast Alaska, primarily near the mouths of rivers and streams.

Abundance Data

Alaskan commercial catch data presented in this report were compiled by the Division of Commercial Fisheries, ADF&G, and originated from individual fish tickets tabulated as of 27 April, 1987. Catch data were edited for data entry and recording errors. However, embedded errors are sometimes found at a later date, and therefore, data file listings in the future may show minor differences from those given in this report. Catch data for Canadian commercial and subsistence fisheries on the upper Taku and Stikine Rivers were obtained from the Canadian Department of Fisheries and Oceans (S. Johnston, personal communication). Catches are assigned to a statistical week: begins at 00:00 AM each Sunday and ends the following Saturday at midnight. Statistical weeks are numbered sequentially beginning with the week encompassing the first Sunday in January. Inclusive dates for 1986 are shown in Appendix A.1.

Several methods were used to estimate total escapements to Southeast Alaska systems in 1986. Eleven Alaskan systems and four Canadian systems were weired, providing total counts of sockeye salmon to these systems. A mark-recapture tagging program was used to estimate the total Taku River escapement (McGregor and Clark 1987). Sockeye salmon were captured in fish wheels at Canyon Island (5 k from the Canadian border) and tagged. Tagged fish were recovered in the upstream Canadian commercial gill net fishery, and tagged to untagged ratios were used to derive an escapement estimate using the methods of Chapman and Junge (1956) and Darroch (1961). An estimate of escapement at McDonald Lake using Peterson mark-recapture procedures described in Robson and Regier (1964) was derived by Blankenbeckler (ADF&G, Commercial Fisheries Division, Ketchikan, personal communication). A second estimate for McDonald Lake was provided by Haddix (ADF&G, F.R.E.D. Division, Ketchikan, personal communication) who expanded foot survey counts to a total estimate based on correlations between stream life, foot survey data, and final weir counts conducted in previous years. The estimated escapement to the Stikine River was developed using a catch and CPUE data from commercial and test fisheries, sockeye enumeration from sonar studies, and stock composition estimates from scale pattern, genetic, and brain parasite analyses (Sands, N.J., ADF&G, Commercial Fisheries Division, Douglas, personal communication). Aerial, foot, and boat surveys provided the maximum daily escapement counts for most of the other important sockeye salmon

systems in the region; these counts should only be considered partial or relative indicators of escapement magnitude as they do not represent total escapements.

Age, Sex, and Length Data

Sockeye salmon were sampled for scales, sex, and length. Scales were taken from the 'preferred area' of the fish (INPFC 1963). Within the preferred area, we attempted, whenever possible, to sample the scale located on the left side of the fish two rows above the lateral line and along a diagonal downward from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Scales were mounted on gummed cards and impressions made in cellulose acetate (Clutter and Whitesel 1956).

Examination of scales provided age information for individual fish. Scales were magnified to 70 power on a microfiche reader and ages are recorded in European notation (numerals preceding the decimal refer to the numbers of freshwater annuli, numerals following the decimal are the numbers of marine annuli, and the total age is the sum of these two numbers plus one). Sex determination was based on examination of either gonads or external morphological features such as kipe development, belly shape, trunk depth, and jaw shape. Sex was not determined when there was an absence of external secondary maturation characteristics and the fish processor did not allow samplers to cut open the fish to examine gonads. This was especially true for purse seine catches in Necker Bay (Subdistrict 113-34).

Fish length was measured from the middle of the eye to the fork of the tail and was recorded to the nearest 5 mm, except that post-orbit to hypural plate measurements were taken for commercial catch samples in the Canadian Taku gill net fishery and in escapements to the Nakina River, Kuthai Lake, Little Trapper Lake, Little Tatsamenie Lake, the Hackett River in the Taku River drainage, and the Iskut River and Tahltan Lake in the Stikine River drainage. The lengths from the Taku River were converted to middle of the eye to fork of the tail (MEF) measurements according to the following equation developed from lengths taken from 200 sockeye salmon commercially caught in the Canadian commercial fishery on the Taku River in 1986:

$$MEF = 1.039767*(POH) + 45.30311 \text{ mm} \qquad (1)$$

where: MEF = mid-eye to fork of tail and

POH = post-orbit to hypural plate.

The lengths from the Stikine River were converted to MEF measurements according to equation (2) which is one of seven length relationships developed from 820 sockeye salmon commercially caught in Southeast Alaska in 1985 (Pahlke, K. 1985).

$$MEF = 1.103696*(POH) + 19.50277 \qquad (2)$$

All districts in which gill net catches occurred were sampled except for District 102 and the Annette Island portion of District 101. Purse seine

catches have been sampled in all districts that recorded catches, except in the Annette Island subdistricts of District 101. Fish trap, sport fish, and subsistence harvests have not been sampled because of the small magnitude of the harvests and the logistic difficulties involved in obtaining samples. Escapement samples have been collected either in weir traps or by dip nets, beach seining and carcass sampling. Fish wheels have been used to collect the Taku River escapement samples. The variety of collection methods used to sample escapements may introduce some bias into age composition estimates.

Age and sex compositions of salmon in the catches are computed for each fishery sampled. Sampling goals are to collect sufficient samples to estimate the proportion of each age class to within ± 5 percentage points 90% of the time in each stratum based on the standard binomial formulae (Cochran 1977) (Appendix A.2). A general goal of 700 fish per week (560 to be ageable) was met each week in the majority of the major districts. Sampling was structured by subdistricts in Districts 106 and 113 because catches were made in widely separated geographic areas and at different times of the season.

Age and sex compositions of the salmon were also computed for each escapement that was sampled. Most escapements were sampled over short periods of time, and these data are pooled into a single stratum. Some escapements were large enough (e.g., Taku River) to facilitate stratification by time to reflect more than one sampling period. This enabled temporal trends in age composition to be analyzed.

Totals from each sample period were summed by age and sex over the entire season for each fishery and each escapement having accurate data. When only partial escapement counts are available, a percentage breakdown of each sample by age and sex was tabulated. Standard errors of the age class proportions were calculated by standard binomial formulae. The age distribution and associated standard errors for the total commercial catch or escapement were estimated by weighting the sample age distribution and its standard error for each sampling period by the total commercial catch (or escapement) during the same sample period.

For each fishery and escapement having length data mean lengths and their standard errors were calculated for each sex and age class within sampling periods. Sampling goals from the catch were to collect sufficient numbers from each stratum in order to estimate the average length of each major (greater than 10% of the catch) age class to within ± 5 percentage points 90% of the time. A general sampling goal of 70 scales per week has been established for all districts, except in the District 111 and 115 gill net fisheries where stock-specific length composition estimates were desired. Unweighted mean length and standard error for the entire season was calculated for each age class by summing samples over all time periods within each age class.

Average weight data was obtained from the ADF&G fish ticket reporting system and is calculated by dividing the total pounds reported by the total fish reported.

Migratory Timing

Migratory timing (abundance as a function of time) is the driving force behind management decisions which selectively regulate time and areas open to fishing. Sockeye salmon migratory timing statistics for weired escapements and major net fisheries provided an index of relative timing.

The means and variances of the migratory timing and the associated migratory time density functions of sockeye salmon for weired escapements were derived by age and in total for fisheries with stratified age compositions according to methodology described by Mundy (1979, 1982). To calculate mean and variance, the empirical migratory time density is defined to be the time series of daily proportions, P_t:

where: $$P_t = n_t/N \qquad (3)$$

n_t = abundance during time interval t and

N = total annual abundance.

For a migration over a space of m days, the mean of t is estimated:

$$\hat{t} = \sum_{t=1}^{m} t \; P_t \qquad (4)$$

and its variance is estimated:

$$\hat{S}_t = \sum_{t=1}^{m} (t - \bar{t})^2 \; P_t \qquad (5)$$

The mean time of arrival (t) for weired escapements is expressed in days (central day), while for catches it is expressed in weeks (central week, based on statistical weeks). Catch, rather than CPUE, was used as the index of abundance because catchability is variable in the net fisheries of Southeast Alaska, exploitation is often greater than 70%, and CPUE calculation is not accurate under our present reporting system. Run time estimates which are dependent on catch (or CPUE) are influenced in part by management decisions.

RESULTS AND DISCUSSION

Harvest Data

Numbers of Fish

A total of 1,290,292 sockeye salmon were commercially harvested in Southeast Alaska in 1986 (Table 1). This equals the average catch for the 5-year period from 1981 to 1985, but is approximately 338,000 fish less than the 1985 harvest. The 1986 harvest was larger than any annual harvest during the period from 1946 to 1981. Approximately 70% of the catch (902,769 fish) came

from southern Southeast Alaska waters (Districts 101 - 108; Table 2). More than 100,000 sockeye salmon were harvested in the Southeast Region in each of 6 consecutive weeks, between 13 July and 23 August. Catches peaked during the week of 3 - 9 August, when 254,084 fish were harvested. Over the entire season, more sockeye salmon were taken in District 104 (444,616) than in any other district. Large catches were also taken in District 115 (290,206 fish), District 101 (256,603 fish including catches made on the Annette Island Fishery Reserve), and in District 106 (148,367 fish).

Commercial Gill Net Catch. Gill net fisheries harvested the majority of sockeye salmon taken commercially in Southeast Alaska in 1986, as was the case in 1984 and 1985 (McGregor and McPherson 1986; McPherson and McGregor 1986). A total of 686,499 sockeye salmon were harvested with gill nets in 1986, representing 51% of the sockeye salmon taken in the region (Table 1). The largest gill net harvest occurred in District 115, where 290,205 sockeye salmon were harvested (Table 3). This was a decline of approximately 80,000 fish from the record 1983 harvest; however, it represents the fourth largest catch from this district since statehood in 1959 (ADF&G 1987).

Results of scale pattern analysis (SPA) indicate that fish caught in District 115 bound for Chilkat Lake represented approximately 58% of the total commercial catch in the district, and that catches of both Chilkoot and Chilkat Lake sockeye salmon peaked during the week of 17 - 23 August (McPherson and Jones, 1987). The catch of 84,191 sockeye during the period 17 - 23 August represents the highest weekly catch ever recorded in the district. Chilkat and Chilkoot Lakes both experienced strong returns in 1986 which contributed to the high catches in the district. Exploitation rates for Chilkat Lake and Chilkoot Lake stocks were 0.88 and 0.56, respectively. Mean statistical weeks of harvest indicate that the 1986 returns from both systems were later than for any other year between 1981 and 1985. Catch levels in District 115 were below average during the first 7 fishing weeks, but rose rapidly the following week. Sockeye catches above 35,000 were recorded each week for the period from 10 August to 6 September.

A total of 173,576 sockeye salmon were harvested in District 101. Approximately 16% of the catch (27,920 fish) was taken in the Annette Island Fishery Reserve. The District 101 gill net fisheries target on mixed stocks from both Alaska and Canada. SPA results indicate that approximately 91% of the 1986 harvest (excluding the Annette Island Fishery Reserve catches) was destined for the Nass and Skeena Rivers in northern British Columbia (Oliver et al. 1987). Nass/Skeena stock contributions in this district have averaged 67% for the years 1982 to 1985.

The District 106 gill net harvest totaled 145,714 sockeye salmon. Due to poor early season catches of Stikine River stocks (as indicated by SPA) fishing time and area restrictions were employed to protect those stocks. Fishing was closed during the 4th week of the season and limited to Clarence Strait portions (Subdistrict 106-30) during the 5th week of the season. The Sumner Strait portion of the district (Subdistrict 106-41) was reopened the week of 20 - 26 July, and both subdistricts remained open for the duration of the season. Catches peaked in District 106 during the week of 27 July to 2 August, when 33,585 fish were taken. Fish harvested in this fishery have been shown to be bound for local systems such as the Stikine River and

numerous mainland and island lakes in Southeast Alaska, as well as to the Nass and Skeena Rivers of northern British Columbia. Based on SPA, approximately 73% of the harvest in Clarence Strait (Subdistrict 106-30) and approximately 66% of the harvest in Sumner Strait (Subdistrict 106-41) were fish bound for spawning systems in Alaska in 1986, according to (Jensen et al. 1988).

The District 111 drift gill net fleet harvested a total of 72,780 sockeye salmon in 1986. Weekly catches in excess of 10,000 fish occurred 13 - 19 July and 27 July to 2 August. Approximately 5% (3,944 fish) of the catch was taken during five supplemental 1-day openings which occurred the day following the regular weekly openings. The harvest of sockeye salmon was incidental as these openings were conducted to assess the availability of hatchery origin chum salmon in southern portions of the district. Using SPA McGregor and Walls (1987) found that 83% of the District 111 catch was bound for spawning sites in the Taku River drainage (30% for Mainstem Taku River, 27% for Little Trapper Lake, 20% for Tatsamenie Lake, and 6% for Kuthai Lake), while 17% was bound for Port Snettisham systems (9% for Crescent Lake and 8% for Speel Lake). The contributions of Snettisham stocks were much higher (44%) in the supplemental fishery in southern District 111 than in the traditional District 111 fishery openings (15%).

Small catches of sockeye salmon were recorded in Districts 108 (4,187 fish) and 102 (37 fish). District 108 was closed for much of the season to protect the Stikine River sockeye salmon return. SPA results show that 76% of the harvest in 108 was comprised of stocks bound for the Stikine River (Jensen et al. 1988).

Commercial Purse Seine Catch. Purse seine fisheries harvested 591,874 (44%) of the sockeye salmon taken in the region (Table 1). The largest catches were made in District 104 (Table 4). A total of 443,990 sockeye salmon were taken in this district, approximately the same number as in 1985, and 76% of the total 1986 purse seine harvest. Peak catches in District 104 were highest during the week of 3 - 9 August, when 154,415 sockeye salmon were caught. This fishery harvests mixed stocks of sockeye salmon bound for Southeast Alaska and Canada. SPA results indicate that almost 77% of the District 104 catch was bound for the Nass and Skeena Rivers (Oliver et al. 1987).

The District 101 purse seine harvest of sockeye salmon totaled 79,785 of which 5,040 were taken in the Annette Island Fishery Reserve. Catches were highest during the week 3 - 9 August. Catches were comprised primarily of Alaskan fish (67%) (Oliver et al. 1987).

A total of 32,684 sockeye salmon were taken in the District 102 purse seine fishery. Catches were highest during the week of 10 - 16 August when 7,436 fish were landed. Catches were comprised primarily of Alaskan fish (79%) (Oliver et al. 1987).

The District 103 purse seine fishery harvested 13,571 sockeye salmon. The bulk (96%) of the harvest was taken during the period 10 - 30 August. The 1986 harvest was comprised of approximately 72% Alaskan fish (Oliver et al. 1987).

The District 112 purse seine fishery harvested 8,377 sockeye salmon incidental to the harvest of pink (*Oncorhynchus gorbuscha*) and chum salmon (*Oncorhynchus keta*). This represents a decrease of 28,744 (77%) sockeye salmon from the 1985 harvest. In 1986 time and areas open to fishing were limited due to low abundance of pink salmon in northern Southeast Alaska.

A total of 6,730 sockeye salmon were taken in District 113. This district is very large and contains a great diversity of fishing areas on the outer coast and several large straits leading inland. The catch was distributed widely among subdistricts, although most fish (4,097) were taken in Subdistrict 34 (Necker Bay).

Less than 3,000 sockeye salmon were incidentally harvested in purse seine fisheries targeting on pink and chum salmon in Districts 105, 106, 107, 109, and 114.

Commercial Troll Catch. Sockeye salmon are taken incidentally by the troll fleet. A total of 6,890 fish were taken in 1986 (Table 1), almost two-thirds in District 113 (Table 5).

Commercial Trap Catch. Four floating fish traps were used to harvest sockeye salmon in the Annette Island Fishery Reserve in District 101. A total of 3,068 sockeye salmon were harvested in 1986. Catches were highest during 13 - 19 July when 969 fish were caught (Table 6). This is the only area in the Southeast Region where fish traps are legal gear for harvesting salmon.

Canadian Transboundary River Catch. A commercial gill net fishery in the Canadian portion of the Taku River harvested 14,739 sockeye salmon (Table 7), approximately the same number taken in 1985. Catches were highest during the week 20 - 26 July when 4,003 fish were caught. Results of SPA indicate that the catch was comprised of 40% Little Trapper Lake, 35% Mainstem Taku, 14% Tatsamenie Lake, and 11% Kuthai Lake fish (McGregor and Walls 1987).

Commercial gill net fisheries in the Canadian portion of the Stikine River exploit most of the Canadian stocks. In the Stikine River in 12,411 sockeye salmon were harvested in 1986 from the lower river commercial fishery in Canada (Table 7). Weekly catches in the lower river fishery exhibited two maxima, the first during the week 6 - 12 July and the second during 27 July - 2 August. Tahltan Lake fish dominated early season catches while other stocks comprised the majority of late season catches (Sands N.J., ADF&G, Division of Commercial Fisheries, Douglas, personal communication). On the upper Stikine River a subsistence fishery harvested 4,208 sockeye salmon and a commercial fishery harvested 815 in 1986.

Sport Catch. The sport catch of sockeye salmon in Southeast Alaska was estimated by M. Mills (ADF&G, Sport Fish Division, Anchorage, personal communication) to be 6,300 fish from all areas (Table 8).

Subsistence Catch. The sum of reported subsistence harvest of sockeye salmon in Southeast Alaska was 20,307 from all areas (Table 9). The true subsistence harvest was certainly higher since many permits (approximately 40%) were not returned to ADF&G.

Age, Sex, and Size Data

Gill Net Catch. Detailed age and length compositions of sockeye salmon in the catches for each district sampled are presented in McPherson (et al. 1988). Five- and six-year-old sockeye salmon (1981 and 1980 brood years) were the dominant year classes taken in the gill net fisheries, comprising 62% and 26%, respectively, of the total catch (Table 10). Spacial trends in age composition of sockeye salmon in the catches over all districts were similar to those exhibited by catches in 1982, 1983, 1984, and 1985 (McGregor 1983; McGregor et al. 1984; McGregor and McPherson 1986; McPherson and McGregor 1986). Age-1.3 sockeye salmon dominated in the catches from all districts, except 115, and comprised from 35.7% of the catch in District 115 to a maximum of 77.5% in the lower Stikine inriver fishery. Fish of this age class were, however, at the lowest or second- lowest levels of annual abundance for all fisheries for the years 1982 to 1986. Fish with no freshwater annuli (ages 0.2, 0.3, and 0.4) were common in the District 108 and 111 catches and were also found in appreciable numbers in Lynn Canal (District 115). Sockeye salmon that spent two winters in freshwater prior to migrating to sea (ages 2.1, 2.2, and 2.3) were far more common in the District 115, 101, and 106 catches (57.7%, 42.8%, and 29.6%, respectively) than in other districts. Four-year-old fish (primarily ages 0.3 and 1.2) represented between 13% and 34% of the catches in all districts, except District 115 (5%). This is 6 to 17% higher than what was observed in 1985.

Distinct shifts in age composition during the season were apparent (NSC = nonstatistical comparisons) in all nine gill net areas for which data could be stratified by sample period. Age-1.3 fish generally represented smaller proportions of the catches as the season progressed. Age-2.2 fish became more common later in the season in all districts where appreciable numbers of these fish were caught. Age-2.3 fish represented greater proportions of catches later in the season in each of the fisheries except the lower Stikine and Taku inriver fisheries where no consistent trend was observed. Age-0. fish increased in numbers in the catches during the season in District 108, District 111, and both Canadian inriver fisheries, but decreased in abundance in the District 101 and 115 catches and the southern supplemental District 111 catches.

Differences in the average length of the sockeye salmon existed within age classes between districts (Table 11). These length calculations should be viewed with caution as they are not weighted by period catches and the proportion of the catch sampled each week was variable. The individual stratified periods listed in the appendix tables are, however, correct for making comparisons between periods. Females exhibited less variance in size than males. Fish with three marine annuli were generally larger than fish with two marine annuli. In general, the Canadian Stikine River and the southern District 111 were the smallest and District 101 the largest fish within age classes.

Consistent changes in length composition with time were observed within specific age classes over the fishing season in most districts, unlike previous findings in 1983, 1984, and 1985 (McGregor et al. 1984; McGregor and McPherson 1986; McPherson and McGregor 1986). In the southern gill net fisheries of Districts 101, 106-30, and 106-41, the average length of age-2.2 and -2.3 fish increased by as much as 55 mm as the season progressed. In the northern gill net fisheries in Districts 111 (including the Taku River fishery) and 115, age-1.3 fish increased 19 to 41 mm in average length during the season. The average length of age-0.3 and-2.3 fish in the District 111 catch increased 22 to 30 mm while those aged 1.2 decreased approximately 40 mm. In the Canadian Taku River fishery age-2.3 fish also increased by 39mm in average length. Similar trends were observed in the District 115 fishery as in the southern gill net fisheries; age-2.2 and -2.3 fish increased by 37 to 81 mm.

Average lengths of females were generally smaller than those of males within specific age classes. The most notable exception to this occurred in age-1.2 fish where females were larger in fisheries in the Stikine River, District 111, southern District 111, the Taku River, and District 115. Within age-.2 fish, age-1.2 fish were shorter than age-2.2 fish in all districts (NSC) except the southern District 111 fishery and the Canadian Taku fishery. Within age-.3 fish, age-1.3 fish were shorter (NSC) than age 2.3 fish with the exception of fish in the District 108, District 111, and southern District 111 fisheries where there was no difference.

The average weight per sockeye salmon increased (NSC) as the season progressed in most gill net fisheries, except in Districts 106 and 108 where no obvious trends were apparent and in District 102 where catches were extremely low (Table 12). The average weight for a fish over the entire season was smallest in District 102 (5.92 lbs) and largest in District 115 (7.21 lbs). From the southernmost to the northernmost districts, average weight increased (NSC).

Purse Seine Catch. Detailed age and length compositions of the purse seine catches for each district sampled are presented in McPherson (et al. 1988). Generally younger aged the sockeye salmon have been taken in the purse seine catches in Southeast Alaska than in gill net catches. The two most common ages in the purse seine catches were 1.2 and 1.3, comprising 30% and 45% of the season's catch, respectively (Table 13). In the gill net catches the most common ages were 1.3 and 2.3 or 45% and 25%, respectively, (Table 10). Four- and five-year-old sockeye salmon (1982 and 1981 brood years) were the dominant year classes caught in the purse seine fisheries, comprising 31% and 58%, respectively, of the total harvest. Age-1.3 fish predominated in catches from all districts except the District 106 and Subdistrict 113-34 (Necker Bay) catches where age-1.2 and -2.2 fish, respectively, represented the dominant age class. Six- year-old fish (1980 brood year) were important contributors to catches in Districts 101, 104, 107, and 112. Age-0. fish were much less common in purse seine catches than in gill net fisheries. This is not surprising considering that age-0. fish typically spawn and rear in side sloughs and small tributaries along the mainstems of large rivers and that the gill net fisheries (Districts 108, 111, and 115), are essentially terminal harvest areas systems.

Distinct shifts (NSC) in age composition with time were apparent in four purse seine districts stratified by sample period. Age-1.3 fish represented a smaller proportion of the catches later in the season in Districts 102, 103, and 114. Age-2.2 fish became more common later in the season in Districts 102 and 112. The proportion of age-1.2 fish increased with time in the southern districts (102 - 104) and decreased in District 112. Age-2.3 fish decreased as the season progressed in District 102 and increased in District 112.

Differences (NSC) in average lengths of sockeye salmon within specific age classes occurred between districts (Table 14). Fish in Districts 109, 113, and 114 were somewhat smaller than fish of the same age in other districts. Average lengths of males were generally greater than those of females within specific age classes, except for age-1.2 fish where females were longer than males in most districts (NSC). As was observed in the gill net fisheries, length increased with ocean age.

Obvious temporal changes in average lengths of sockeye salmon within specific age classes were observed (NSC) in Districts 103, 104, and 112, while in Districts 101 and 102 no obvious trends were apparent. In District 103 age-2.2 fish increased and age-2.3 fish decreased in average length. In District 104 ages 1.2, 1.3, and 2.2 and in District 112 ages 0.3, 1.2, 2.2, and 2.2 all exhibited an increase in average length as the season progressed.

The average weight of sockeye salmon increased throughout the season in the purse seine fisheries in Districts 101, 104, and 113, while no obvious trends were observed in the other districts (Table 15). In the five districts in which greater than 50,000 pounds of sockeye salmon were harvested, fish in northern districts were larger than their southern counterparts, as was seen in the gill net fisheries. Of the major fishing districts, fish in District 112 were largest (6.32 lbs) and in District 102, the smallest (5.79 lbs).

Gill Net Test Fisheries Catches. Detailed age and length compositions of the gill net test fishery catches for each district sampled are presented in McPherson (et al. 1988). These data are stratified by statistical week due to the nature of the fisheries. The test fisheries in Subdistricts 106-30 (Clarence Strait) and 106-41 (Sumner Strait) were conducted only in the early portions of the season and exhibited age and length compositions very similar to those observed in the commercial catches for the respective fisheries. The test fisheries in Subdistrict 108-30 (area of District 108 between Zaremo and Mitkof Islands) and Subdistrict 108-50 (Frederick Sound) operated only early in the season and provided managers with an opportunity to evaluate stock composition and run strength at a time when District 108 was closed to fishing. Distinct differences in age composition between two subdistricts in District 108 within the same time strata suggest differences in stock composition. The test fishery in the Canadian portion of the Stikine River (108-70) operated though most of the season and exhibited trends similar to those observed in the commercial fishery.

Migratory Timing

Gill Net Fishery. Run timing analysis of the catches in the gill net fisheries provided mean dates (in statistical weeks, MSW) of migration which range between 29 and 31 (13 July to 2 August) for the various districts, except in District 115 where the MSW is 34 (August 10 - 16) (Table 16). This relatively late timing in District 115 was due to large catches of the later segment of the Chilkat Lake return and later than average timing of the Chilkoot return (McPherson and Jones, in press). The migration in Subdistrict 106-41 was the most dispersed (SD = 2.4 weeks) while that in the southern supplemental openings in District 111 was the least (SD = 1.3 weeks). Run timing among individual age classes within districts indicates that, in Districts 101, 106-41, and 115, the MSW increased with increasing freshwater age and, in Districts 106-30 and 108 timing across age classes was similar. In the Canadian fisheries on the Taku and Stikine Rivers and in the U.S. District 111 fishery, age 1. fish were harvested earliest. No apparent trends in differences in run timing across ocean ages was observed.

Purse Seine Fishery. Catches in the purse seine fisheries for which adequate sampling stratification existed show that overall run timing was similar (NSC) in all districts. The mean date of migration occurred in statistical week 31 (27 July to 2 August) in all districts except 103 where the MSW was 34 (17 - 23 August; Table 17). This fishery was not open during July and the first week of August) (Table 17). The harvest in District 104 was the most concentrated over a short period of time (SD = 1.4 weeks), while in District 112 it was the most disperse throughout the season (SD = 1.9 weeks). Fish with no freshwater annulus tended to arrive prior to age-1. and -2. fish in Districts 101 and 104, while fish aged 1. arrived prior to fish aged 0. and 2. in District 112. All age classes exhibited similar timing in District 104. No temporal trends among ocean ages were observed.

Escapement Data

Detailed age compositions, length compositions, and daily weir counts are presented in McPherson (et al. 1988).

Abundance Estimates

The largest estimated escapement occurred at McDonald Lake, ranging from 98,397 fish (stream life/foot survey) to 142,562 fish (mark-recapture) (Table 18). Large spawning escapements to the Taku (90,370 fish) and Chilkoot (88,024 fish) were observed. These estimates are comparable to those for the previous 3 years. Only 23,947 sockeye salmon were counted past the Chilkat Lake weir, which was approximately 59,000 below the average for 1976 to 1985. Two types of escapement estimates are presented in Table 18: total escapement estimates and relative or partial escapement estimates.

Age, Sex, and Size Composition

Five-year-old (primarily age 1.3) and four-year-old (primarily age 1.2) fish dominated in most of the 55 escapement collections (Table 19). Five-year-old fish were most abundant in 28 of the systems and four-year-old fish in 21 of the systems. In one system, Thoms Lake, these two age groups were equally abundant. In the remaining five systems three-year- old fish (primarily age 0.2) dominated the escapements to Tuskwa and Coffee's Sloughs in the Taku River and six-year-old (primarily age 2.3) fish were the most abundant year class in the escapements to Kah Sheets, Redoubt, and Chilkat Lakes.

Age-1. fish were the dominant freshwater age class in 73% of the escapement collections (Table 19). Age-0. and -1. fish dominated in 14% and 13%, respectively, of the escapement systems. Fish aged 0. were common in collections from along the mainstems of the three largest river systems in the region: the Chilkat, Taku, and Stikine. Age-2. fish dominated the escapement abundances in eight lake systems.

Age-.3 fish were the most prevalent ocean age in 35 of the 55 escapement collections. Younger fish were more prevalent in southern Southeast (Districts 101 - 108) where age-.2 fish dominated half of the 26 escapement collections from these districts. In northern districts (109 - 115) age-.2 fish were most abundant in only 7 (24%) of the 29 escapement collections and age .3 fish dominated in the remaining 22 collections.

Samples from eleven escapement systems were large enough to allow separation into time periods. Temporal trends in the age compositions were observed in all but three of the systems: Tahltan, Crescent and Chilkoot Lakes. Among the other eight systems no consistent patterns were observed, but within individual escapements the most common trends in relative abundance were: (1) an increase in age-2.3 fish with time in five of the systems; (2) a decrease in age-1.2 fish in four systems; (3) an increase in age-2.2 fish in three systems; and (4) in three systems an increase in age-1.3 fish and in another three systems a decrease in age- 1.3 fish (NSC). Age-2. fish increased significantly in the latter portions of the returns to Hugh Smith, Karta, Redoubt, and Chilkat Lakes and the Taku River.

Migratory Timing

Fifteen sockeye salmon weirs were operated in Southeast Alaska and in tributaries of the Taku and Stikine Rivers in western British Columbia. Dates of operation, final escapement counts, and run timing characteristics of these escapements are summarized in Table 20. The mean date of return to Karta River, 12 July, was the earliest of all the systems, while the mean date of the Chilkat Lake return, 17 September, was the latest. The Tahltan Lake return was the most concentrated (SD = 5 days), while the Salmon Bay Lake return was the most evenly distributed over time (SD = 20 days).

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TABLES AND FIGURES

Table 1. Harvest of sockeye salmon in Southeast Alaska, 1986.

Fishery	Number Harvested	Percent
Alaskan Commercial		
Gillnet	686,499	50.9
Purse Seine	591,874	43.9
Trap	3,068	0.2
Troll	6,890	0.5
Miscellaneous 1/	1,961	0.2
Subtotal	1,290,292	95.7
Canadian Transboundary		
Taku Commercial	14,739	1.1
Stikine Commercial	13,226	1.0
Stikine Subsistence	4,208	0.3
Subtotal	32,173	2.4
Sport	5,756	0.4
Alaskan Subsistence	20,307	1.5
Total	1,348,528	100.0

1/ Includes test fish catches, confiscated fish, hatchery harvests, etc.

Table 2. Total commercial harvest of sockeye salmon in Southeast Alaska by district and date, 1986. 1/

Inclusive Dates	Statistical Week	District 101 2/	102	103	104	105	106	107	108	Southern Southeast Total
June 8-June 14	24						60		3	63
June 15-June 21	25	2,125			2		2,640		40	4,807
June 22-June 28	26	9,951	1	2	8	1	3,774	2	54	13,793
June 29-July 5	27	10,289	1	2	6	8	17,508		142	27,956
July 6-July 12	28	29,637	7	2	7,216	1	430		148	37,441
July 13-July 19	29	53,353	3,487	5	30,525	3	7,891		270	95,534
July 20-July 26	30	40,691	5,496	6	53,780	5	21,457	2	2,104	123,541
July 27-Aug. 2	31	40,333	5,205	26	104,403	24	33,589	2	683	184,265
Aug. 3-Aug. 9	32	35,727	6,698	151	154,491	216	24,824	2	788	222,897
Aug. 10-Aug. 16	33	16,596	7,449	4,104	63,173	225	21,129	1,277	451	114,404
Aug. 17-Aug. 23	34	10,785	1,307	5,149	15,884	48	10,516		165	43,854
Aug. 24-Aug. 30	35	4,857	2,438	3,822	12,039		3,519		33	26,708
Aug. 31-Sept. 6	36	1,748	647	444	3,089	4	821		6	6,759
Sept. 7-Sept. 13	37	95					160		8	263
Sept. 14-Sept. 20	38	267	15				42			324
Sept. 21-Sept. 27	39	149					7			156
Sept. 28-Oct. 4	40		2							2
Oct. 5-Oct. 11	41									0
3/	51								2	2
Total		256,603	32,753	13,713	444,616	535	148,367	1,285	4,897	902,769

-Continued-

Table 2. (page 2 of 2)

Inclusive Dates	Statistical Week	District 109	110	111	112	113	114	115	Outside Troll 4/	Northern Southeast Total	Southeast Total
June 8-June 14	24									0	63
June 15-June 21	25			646		8	3	355		1,012	5,819
June 22-June 28	26	15		1,617	1	100	29	1,379	11	3,152	16,945
June 29-July 5	27	10	11	4,353	157	139	42	4,671	40	9,423	37,379
July 6-July 12	28	63	25	9,000	667	549	160	6,025	105	16,594	54,035
July 13-July 19	29	80	4	13,365	1,152	917	1,301	4,293	100	21,212	116,746
July 20-July 26	30	38	10	10,768	716	5,082	41	5,448	50	22,153	145,694
July 27-Aug. 2	31	60		16,059	577	1,082	46	4,907	93	22,824	207,089
Aug. 3-Aug. 9	32	1,835		5,368	1,593	2,677	49	19,578	87	31,187	254,084
Aug. 10-Aug. 16	33	200		4,973	3,286	404	31	53,112	75	62,081	176,485
Aug. 17-Aug. 23	34	48		3,668	247	40	11	84,191	6	88,211	132,065
Aug. 24-Aug. 30	35	17	2	2,448	8	114	133	35,784	34	38,540	65,248
Aug. 31-Sept. 6	36	1		384	1	30	81	54,211	24	54,732	61,491
Sept. 7-Sept. 13	37			81		5	7	9,925	2	10,020	10,283
Sept. 14-Sept. 20	38			51			2	5,173	1	5,227	5,551
Sept. 21-Sept. 27	39							708		708	864
Sept. 28-Oct. 4	40						1	384		385	387
Oct. 5-Oct. 11	41							62		62	62
3/	51									0	2
Total		2,367	52	72,781	8,405	11,147	1,937	290,206	628	387,523	1,290,292

1/ Includes catches by miscellaneous gear types in addition to trap, gillnet, purse seine, and troll.

2/ Includes catches made on the Annette Island Fishery Reserve in District 101.

3/ Catches reported incorrectly as occurring in statistical week 51.

4/ Includes catches made in Districts 116, 152, 154, 156, 157, 181, 183, 189.

Table 2. Total commercial harvest of sockeye salmon in Southeast Alaska, by district and date, 1986. 1/

Table 3. Total gill net harvest of sockeye salmon in Southeast Alaska by district and date, 1986. 1/

Inclusive Dates	Statistical Week	District 101	101 2/	102	106	108	111	115	Total
June 15-June 21	25	1,979	146	-	2,590	30	646	355	5,746
June 22-June 28	26	9,442	507	-	3,689	14	1,616	1,379	16,647
June 29-July 5	27	8,891	1,398	-	17,388	-	4,353	4,670	36,700
July 6-July 12	28	16,923	4,226	-	-	-	9,000	6,025	36,174
July 13-July 19	29	41,612	6,130	-	7,627	-	13,365	4,293	73,027
July 20-July 26	30	26,239	4,068	-	21,456	2,009	10,768	5,448	69,988
July 27-August 2	31	17,133	3,799	-	33,585	683	16,059	4,907	76,166
August 3-August 9	32	12,855	2,829	20	24,819	788	5,368	19,578	66,257
August 10-August 16	33	5,254	2,175	13	19,865	451	4,973	53,112	85,843
August 17-August 23	34	3,421	1,909	4	10,516	165	3,668	84,191	103,874
August 24-August 30	35	1,475	394	-	3,156	33	2,448	35,784	43,290
August 31-Sept. 6	36	328	95	-	816	6	384	54,211	55,840
Sept. 7-Sept. 13	37	72	19	-	158	8	81	9,925	10,263
Sept. 14-Sept. 20	38	32	225	-	42	-	51	5,173	5,523
Sept. 21-Sept. 27	39	-	-	-	7	-	-	708	715
September 28-October 4	40	-	-	-	-	-	-	384	384
October 5-October 11	41	-	-	-	-	-	-	62	62
Total		145,656	27,920	37	145,714	4,187	72,780	290,205	686,499

1/ Dash (-) indicates fishery not open for that particular stratum.

Table 4. Total purse seine harvest of sockeye salmon in Southeast Alaska by district and date, 1986. 1/

Inclusive Dates	Stat. Week	District 101	101 2/	102	103	104	105	106	107	109	112	113	114	Total
June 29-July 5	27	-	-	-	-	-	-	-	-	-	156	-	9	165
July 6-July 12	28	7,676	-	-	-	7,192	-	-	-	-	666	-	60	15,594
July 13-July 19	29	4,207	425	3,476	-	30,307	-	-	-	-	1,138	-	1,238	40,791
July 20-July 26	30	8,887	866	5,495	-	53,715	-	-	-	-	716	4,491	-	74,170
July 27-August 2	31	18,410	821	5,202	-	104,325	-	-	-	-	572	173	-	129,503
August 3-August 9	32	18,390	1,367	6,673	80	154,415	181	-	-	1,767	1,588	2,022	-	186,483
August 10-August 16	33	8,249	901	7,436	4,091	63,099	206	1,184	1276	182	3,286	34	-	89,944
August 17-August 23	34	4,864	469	1,300	5,137	15,872	48	-	-	44	247	6	-	27,987
August 24-August 30	35	2,855	83	2,438	3,820	11,989	-	357	-	17	8	4	97	21,668
August 31-Sept. 6	36	1,207	96	647	443	3,076	-	-	-	-	-	-	70	5,539
Sept. 7-Sept. 13	37	-	2	-	-	-	-	-	-	-	-	-	-	2
Sept. 14-Sept. 20	38	-	10	15	-	-	-	-	-	-	-	-	-	25
Sept. 21-Sept. 27	39	-	-	-	-	-	-	-	-	-	-	-	-	0
Sept. 28-October 4	40	-	-	2	-	-	-	-	-	-	-	-	1	3
Total		74,745	5,040	32,684	13,571	443,990	435	1,541	1,276	2,010	8,377	6,730	1,475	591,874

1/ Dash (-) indicates fishery no open for that particular stratum.

2/ Purse seine catch on the Annette Island Fishery Reserve in District 101, Subdistricts 24, 26, 28, and 42. Catch figures in addition to other District 101 purse seine catches reported in first column.

Table 5. Total troll harvest of sockeye salmon in Southeast Alaska by district and date, 1986.

Inclusive Dates	Stat. Week	District 101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	Outside Troll 1/	Total
June 15-June 21	25	0	0	0	2	0	0	0	0	0	0	0	0	8	3	0	0	13
June 22-June 28	26	2	1	2	8	1	0	2	0	15	0	1	1	100	29	0	11	173
June 29-July 5	27	0	1	2	6	8	3	0	0	10	1	0	1	139	33	1	40	245
July 6-July 12	28	5	7	2	24	1	1	0	0	63	14	0	1	549	96	0	105	868
July 13-July 19	29	10	11	5	218	3	1	0	1	80	4	0	0	917	63	0	100	1,413
July 20-July 26	30	6	1	6	65	5	1	2	0	38	0	0	0	591	41	0	50	806
July 27-Aug. 2	31	8	3	26	78	24	4	2	0	60	0	0	5	909	46	0	93	1,258
Aug. 3-Aug. 9	32	14	5	71	76	35	5	2	0	68	0	0	5	655	49	0	87	1,072
Aug. 10-Aug. 16	33	6	0	13	74	19	8	1	0	18	0	0	0	369	26	0	75	609
Aug. 17-Aug. 23	34	0	3	12	12	0	0	0	0	4	0	0	0	31	11	0	6	79
Aug. 24-Aug. 30	35	1	0	2	50	0	6	0	0	0	2	0	0	110	36	0	34	241
Aug. 31-Sept. 6	36	0	0	1	13	4	5	0	0	1	0	0	1	30	11	0	24	90
Sept. 7-Sept. 13	37	2	0	0	0	0	2	0	0	0	0	0	0	5	7	0	2	18
Sept. 14-Sept. 20	38	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	3
2/	51								2								0	2
Total		54	32	142	626	100	36	9	3	357	21	1	14	4,413	453	1	628	6,890

1/ Includes catches made in Districts 116, 152, 154, 156, 157, 181, 183, 189.

2/ Catch incorrectly reported as occurring in statistical week 51.

Table 6. Total trap harvest of sockeye salmon in Southeast Alaska by date, 1986.

Inclusive Dates	Statistical Week	Subdistrict 101-28
July 6 - July 12	28	807
July 13 - July 19	29	969
July 20 - July 26	30	625
July 27 - August 2	31	160
August 3 - August 9	32	154
August 10 - August 16	33	11
August 17 - August 23	34	122
August 24 - August 30	35	49
August 31 - September 6	36	22
September 7 - September 13	39	149
Total		3,068

Table 7. Canadian harvest of sockeye salmon from transboundary rivers by date and location, 1986.

		Taku River			Stikine River				
Inclusive Dates	Statistical Week	Commercial Catch	Days	Boats	Upper River Commercial Catch	Days	Lower River Commercial Catch	Days	Subsistence Catch
June 8 - 14	24	-	-	-	-	-	-	-	0
June 15 - 21	25	-	-	-	-	-	-	-	1
June 22 - 28	26	-	-	-	-	-	42	1	0
June 29 - July 5	27	697	1	7	0	1	715	2	4
July 6 - 12	28	2,096	3	8	10	1	3,193	2	79
July 13 - 19	29	1,924	3	10	20	1	1,742	1.5	243
July 20 - 26	30	4,003	3	11	193	1	1,693	1	1,380
July 27 - Aug. 2	31	2,907	2	10	485	1	3,111	2	1,418
August 3 - 9	32	1,195	1	10	50	1	945	1	805
August 10 - 16	33	808	1	8	57	1	511	1	173
August 17 - 23	34	1,000	2	7	-	-	337	1	105
August 24 - 30	35	109	1	2	-	-	122	1	0
August 31 - Sept. 6	36	-	-	-	-	-	-	-	0
Total		14,739	17	73	815	7	12,411	13.5	4,208

Table 8. Total estimated sport fish harvest of sockeye salmon in Southeast Alaska by area, 1986.

Area	Catch
Ketchikan	648
Prince of Wales Island	963
Kake-Petersburg-Wrangell	153
Sitka	366
Juneau	480
Haines-Skagway	3,135
Glacier Bay	11
Total	5,756

Table 9. Total reported subsistence harvest of sockeye salmon in Southeast Alaska, 1986.

Location Code	System	Numbers of Fish Reported 1/
101-30-075	Hugh Smith Lake	67
101-45-078	Carroll River	10
101-80-063	McDonald River	1,731
District 101 Total		1,808
102-20-040	Dolomi	18
102-30-067	Kegan Lake	138
102-60-087	Karta River	1,757
102-70-058	Thorne River	60
District 102 Total		1,973
103-25-020	Hetta Inlet	1,568
103-60-047	Klawock River	2,093
103-90-014	Sarkar	603
District 103 Total		4,264
105-43-002	Shipley Bay	511
District 105 Total		511
106-30-051	Hatchery Creek (Sweetwater)	274
106-41-010	Salmon Bay	95
106-41-030	Red Creek	18
District 106 Total		387
107-30-030	Thoms Creek	287
107-40-007	Mill Creek	50
District 107 Total		337
109-20-007	Gut Bay	562
109-20-013	Falls Lake	30
109-52-035	Pillar Bay	750
District 109 Total		1,342
112-12-025	Basket Bay	1,248
112-41-010	Trap Bay	3
112-67-058	Kanalku Bay	776
District 112 Total		2,027
113-13-001	Redfish Bay	100
113-22-008	Poltofski Lake	56
113-34-005	Necker Bay	931
113-41-032	Salmon Lake	71
113-41-043	Redoubt Bay	96
113-52-004	Lake Eva	88
113-59-004	Sitkoh Bay	682
113-61-003	Leo's Anchorage	42
113-72-002	Klag Bay	964
113-72-003	Lake Anna	107
113-73-003	Ford Arm	38
District 113 Total		3,175
115-32-000	Chilkat Saltwater	311
115-32-025	Chilkat River	1,384
115-32-031	Chilkat River (Klukwan)	1,148
115-33-000	Chilkoot Saltwater	1,640
District 115 Total		4,483
Total Southeast		20,307

1/ The number of sockeye salmon taken as reported on subsistence permits returned to ADF&G. Actual harvests are higher.

Table 10. Age composition of sockeye salmon in the commercial gill net harvest in Southeast Alaska and transboundary rivers, by district, 1986.

District	Sample Size		Brood Year and Age Class													Total
			1983		1982				1981			1980			1979	
			0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	
101	6,511	Percent	0.2	<0.1	0.4	15.0			41.1	27.5	0.1	15.3	0.2		0.1	
		Catch	278	34	554	21,897			59,860	40,085	144	22,292	333		154	145,631
106-30	4,537	Percent	<0.1	<0.1	0.5	13.9	<0.1		54.7	13.3	0.3	17.0	0.1	0.1	<0.1	
		Catch	23	28	324	8,377	13		33,061	8,036	192	10,297	49	46	16	60,462
106-41	5,220	Percent			0.3	13.5			56.5	12.6	0.5	16.3	0.1	0.1	<0.1	
		Catch			255	11,540			48,206	10,777	426	13,918	48	42	31	85,243
108	1,378	Percent	0.4		6.3	4.8			83.5	1.6	0.2	3.2				
		Catch	17		264	202			3,494	69	8	133				4,187
108 (Stikine)	1,841	Percent	1.1	0.1	1.7	11.2			77.5	2.8	0.2	5.4				
		Catch	142	12	208	1,394			9,622	344	22	667				12,411
111	6,683	Percent	0.5	<0.1	12.8	11.3	<0.1	0.1	61.5	1.4	0.3	11.9	<0.1	0.1	0.1	
		Catch	348	11	8,789	7,799	7	48	42,343	938	235	8,174	33	61	50	68,836
111 (South)	731	Percent	0.6		8.0	25.9		0.1	54.8	2.3	0.6	7.6		0.1		
		Catch	24		318	1,020		4	2,161	89	24	300		4		3,944
111 (Taku)	1,225	Percent	2.2	0.1	14.3	10.8		0.2	61.0	0.9	0.1	10.4				
		Catch	327	12	2,107	1,588		27	8,991	141	10	1,536				14,739
115	10,606	Percent	0.2		1.8	3.6		<0.1	35.7	17.9	0.2	39.7	0.7	0.1	0.1	
		Catch	437		5,114	10,552		21	103,609	51,961	546	115,180	2,103	301	381	290,205
Total	38,732	Percent	0.2	<0.1	2.6	9.4	<0.1	<0.1	45.4	16.4	0.2	25.2	0.4	0.1	0.1	
		Catch	1,596	97	17,933	64,369	20	100	311,347	112,440	1,607	172,497	2,566	454	632	685,658

Table 11. Average length of sockeye salmon in the commercial gill net catch in Southeast Alaska by sex, major age class, and district, 1986 1/.

Sex/ Age	Average Lengths (mm) by District								
					Stikine		South	Taku	
	101	106-30	106-41	108	108 2/	111	111 3/	111 4/	115
Male									
0.3	570.5	610.0	562.7	602.1	573.8	595.9	600.0	595.2	582.4
1.2	543.6	526.3	525.7	525.3	503.7	508.4	482.7	512.2	513.1
1.3	596.3	584.6	580.6	597.3	592.8	593.5	588.9	595.1	589.3
2.2	563.4	546.5	537.1	524.2	499.5	535.3	440.0	486.4	572.9
2.3	613.0	595.7	592.6	585.0	595.7	593.4	544.3	600.0	608.7
Female									
0.3	553.3		575.0	578.8	560.0	574.9	581.3	577.2	571.0
1.2	538.0	522.1	522.6	499.1	520.7	518.2	510.0	515.4	515.5
1.3	578.1	574.8	570.2	575.0	574.8	574.4	574.6	578.9	577.7
2.2	550.7	543.2	540.7	516.7	528.8	532.5		513.6	553.2
2.3	596.5	576.3	573.1	573.3	577.7	573.1	575.0	575.2	597.5
Sexes Combined									
0.3	562.4	610.0	568.8	587.0	569.2	583.8	585.0	585.5	577.6
1.2	534.6	524.9	524.5	515.0	511.9	512.9	490.3	513.5	514.0
1.3	585.9	579.8	575.2	585.5	581.7	583.7	582.2	586.3	583.6
2.2	556.2	545.3	538.6	521.7	514.1	534.8	440.0	503.2	562.1
2.3	605.1	587.0	582.9	578.0	582.9	584.1	557.1	588.2	603.0

1/ Sample sizes and standard errors are presented in Appendix Tables 1 - 18 in McPherson et al. (1988).

2/ Canadian Stikine inriver commercial gill net fishery.

3/ Southern U.S. District 111 fishery.

4/ Canadian Taku inriver commercial gill net fishery.

Table 12. Average weight of individual sockeye salmon harvested in the Southeast Alaska gill net fisheries by week, 1986.

Stat. Week	Average Weights (lbs) by District						
	101	101 1/	102	106	108	111	115
25	5.77	5.11		5.87	6.07	5.43	6.37
26	5.99	5.28		6.36	6.36	5.70	6.95
27	5.89	5.24		6.33		6.23	6.87
28	6.07	5.38				6.75	6.94
29	6.13	5.73		6.36		6.63	6.84
30	6.19	6.17		6.52	7.03	6.87	7.10
31	6.30	6.24		6.02	6.43	6.95	7.15
32	6.29	6.20	6.10	6.34	6.26	6.87	7.06
33	6.30	6.42	5.85	6.29	6.17	6.91	7.21
34	6.36	6.62	5.25	6.50	6.52	7.17	7.25
35	6.43	6.57		6.39	7.00	7.10	7.42
36	7.08	7.10		6.45	7.50	7.38	7.14
37	6.83	6.37		6.25	6.38	7.46	7.22
38	7.56	6.92		6.50		7.16	7.46
39				7.14			7.72
40							7.84
41							7.73
Average	6.16	5.97	5.92	6.29	6.70	6.78	7.21
Total Lbs. Caught	896,534	166,743	219	916,702	34,702	495,415	2,089,889

1/ Gillnet catch on the Annette Island Fishery Reserve in District 101, Subdistricts 24, 26, 28, and 42.

Table 13. Age composition of sockeye salmon in the commercial purse seine harvest in Southeast Alaska by district, 1986.

District	Sample Size		Brood Year and Age Class															
			1983		1982			1981				1980			1979			
			0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	1.5	2.4	3.3	Total
101	4,538	Percent	0.2	0.2	0.2	23.2	0.2	<0.1	45.0	16.2	<0.1	0.3	14.0	0.3	<0.1	<0.1	<0.1	
		Catch	142	126	184	17,347	182	8	33,673	12,124	12	195	10,497	194	18	6	37	74,745
102	699	Percent	0.1	0.4	0.1	32.9	0.2		35.0	21.1		0.4	9.8	0.2				
		Catch	17	127	17	10,753	63		11,439	6,889		126	3,201	52				32,684
103	1,226	Percent	0.1	0.6	0.1	36.5	0.7		41.9	13.1		0.1	6.6	0.3				
		Catch	7	87	7	4,947	102		5,682	1,782		16	899	42				13,571
104	6,507	Percent	<0.1	0.4	0.2	31.5	0.3		46.8	10.2		0.2	10.1	0.1	<0.1	<0.1	<0.1	
		Catch	209	1,927	889	139,906	1,435		207,991	45,444		707	44,893	355	32	186	16	443,990
105	44	Percent				27.3			36.4	22.7			13.6					
		Catch				118			159	98			60					435
106	624	Percent		1.4		33.2	2.7		29.2	22.9		0.3	10.1	0.2				
		Catch		22		513	42		449	353		4	156	2				1,541
107	299	Percent		4.3		13.0	3.3		42.8	18.4			18.1					
		Catch		55		166	43		547	234			231					1,276
109	196	Percent			1.5	24.5	0.5		55.6	8.2			9.7					
		Catch			31	492	10		1,118	164			195					2,010
112	754	Percent	0.5	0.2	6.8	27.4			34.3	11.4		0.3	18.5	0.6				
		Catch	43	20	567	2,293			2,871	958		29	1,547	49				8,377
113	188	Percent		1.6		14.9	2.1		19.7	37.2			19.1	3.7			1.6	
		Catch		42		392	56		518	981			504	98			42	2,633
113-34	259	Percent		0.4		10.0	0.8			84.2	0.4		0.8	3.5				
		Catch		16		411	32			3448	16		32	142				4,097
114	445	Percent	0.7		9.7	34.2			39.8	8.1		0.7	6.5	0.2		0.2		
		Catch	10		142	504			587	120		10	96	3		3		1,475
Total	15,779	Percent	0.1	0.4	0.3	30.3	0.3	<0.1	45.2	12.4	<0.1	0.2	10.6	0.2	<0.1	<0.1	<0.1	
		Catch	428	2,422	1,837	177,842	1,965	8	265,034	72,595	28	1,087	62,311	937	50	195	95	586,834

Table 14. Average length of sockeye salmon in the commercial purse seine catch in Southeast Alaska by sex, major age class, and district, 1986 1/.

Sex/ Age	Average Lengths (mm) by District											
	101	102	103	104	105	106	107	109	112	113	113-34	114
Male												
0.3				560.0				575.0	599.5			590.0
1.2	518.5	491.4	515.8	534.1	557.0	493.9	474.5	463.0	493.9	446.7		496.8
1.3	600.6	584.4	573.5	591.7	593.3	596.8	593.9	573.2	578.8	565.8		581.2
2.2	540.7	546.7	521.0	553.0	571.0	526.0	513.0	620.0	525.9	526.2		456.3
2.3	597.7	620.0	589.6	609.9	595.0	600.4	596.4	570.0	604.5	564.3		560.0
Female												
0.3	560.0	530.0		554.7					557.2			552.0
1.2	518.6	511.8	513.0	529.7	531.4	516.6	508.2	480.0	505.0	498.0		478.7
1.3	578.3	575.4	560.7	573.3	584.6	587.9	584.1	540.2	573.6	550.8		570.0
2.2	525.5	509.0	514.3	538.1	519.0	518.4	536.0	477.5	527.9	510.0		468.8
2.3	575.0	568.8	568.5	581.2	605.0	591.7	576.4	568.8	587.4	555.8		556.3
Sexes Combined												
0.3	560.0	530.0		555.2				575.0	579.5			555.5
1.2	518.6	506.5	514.3	531.3	542.1	506.5	494.2	473.5	498.4	470.0	400.0	487.1
1.3	587.7	578.6	565.9	580.7	586.3	591.7	587.7	553.6	576.7	554.3		574.3
2.2	532.4	529.5	517.6	546.1	545.0	522.8	524.0	525.0	527.0	518.7	421.5	462.5
2.3	586.5	585.8	580.8	597.4	601.7	597.8	584.2	569.4	597.1	560.0		557.0

1/ Sample sizes and standard errors are presented in Appendix Tables 19 - 42 in McPherson et al. (1988).

Table 15. Average weight of individual sockeye salmon harvested in the Southeast Alaska purse seine fisheries by week, 1986.

Stat. Week	Average Weights (lbs) by District											
	101	101 1/	102	103	104	105	106	107	109	112	113	114
27										6.03		5.33
28	5.77				5.44					5.81		6.27
29	5.71	5.00	5.32		5.85					6.54		4.70
30	5.92	5.10	5.77		5.84					5.76	3.55	
31	5.92	5.42	5.78		6.19					5.79	5.40	
32	5.89	6.00	5.83	7.01	6.20	6.29			5.89	6.35	5.44	
33	5.98	6.50	5.95	6.22	6.31	6.16	6.45	6.55	6.48	6.58	6.09	
34	5.99	5.87	5.70	5.94	6.36					5.99	5.83	
35	6.52	4.89	5.95	6.04	6.20	6.02	6.73		5.41	6.25	6.25	6.97
36	6.00	6.08	5.91	6.45	6.56				6.65			6.97
37		5.00	5.00									
38		6.10	6.50									
39												
40												7.00
Average	5.91	5.73	5.79	6.07	6.14	6.20	6.51	6.55	5.94	6.32	4.18	5.02
Total Lbs. Caught	442,043	28,869	189,274	82,431	2,726,391	2,697	10,035	8,360	11,940	52,905	28,145	7,410

1/ Purse seine catch on the Annette Island Fishery Reserve in District 101, Subdistricts 24, 26, 28, and 42.

Table 16. Mean statistical week (MSW) and standard deviation (SD) of sockeye migration through the gill net fisheries in Southeast Alaska, 1986.

		Brood year and age class													
		1983		1982			1981			1980			1979		
Fishery		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
101	MSW	25.9	31.5	27.0	29.9			29.0	29.9	29.2	30.0	30.3		29.8	29.5
	SD	0.6	1.1	2.1	2.0			1.8	2.1	1.9	2.1	2.9		1.5	2.0
106-30	MSW	31.0	29.5	31.2	31.1	32.0		30.8	31.6	28.8	31.3	32.6	31.7	28.4	31.0
	SD	0.0	0.5	1.3	2.4	0.0		2.1	2.2	2.5	1.9	2.3	0.8	1.2	2.2
106-41	MSW			28.9	30.7			30.4	31.4	30.5	31.1	31.3	32.0	33.3	30.7
	SD			2.8	2.5			2.5	2.2	2.6	2.2	4.0	0.0	0.4	2.4
108	MSW	31.8		31.8	31.3			31.0	30.7	30.9	30.8				31.0
	SD	1.2		1.3	1.3			1.3	1.1	1.2	1.2				1.3
108Can	MSW	30.5	31.5	31.2	30.5			29.7	30.7	31.5	29.3				29.8
	SD	1.5	1.9	1.8	1.8			1.8	1.3	1.8	1.6				1.8
111	MSW	30.7	33.0	31.3	29.8	28.0	28.9	30.0	31.3	30.8	30.9	34.1	30.4	33.9	30.3
	SD	1.8	0.0	2.1	2.5	0.0	0.4	2.1	2.7	2.5	2.4	1.1	1.3	0.9	2.2
111S	MSW	28.6		28.7	29.3		30.0	29.3	29.0	30.5	29.5		30.0		29.2
	SD	0.8		1.4	1.3		0.0	1.2	1.3	1.1	1.1		0.0		1.3
111Can	MSW	30.8	34.1	31.6	29.5		32.4	30.1	29.6	29.0	30.4				30.3
	SD	1.6	0.3	1.6	2.0		1.5	1.7	1.4	0.0	1.7				1.8
115	MSW	29.9		29.3	32.3		32.0	33.3	34.8	33.4	34.3	35.8	33.3	34.6	33.9
	SD	2.8		2.5	2.7		0.0	2.2	1.6	2.6	1.8	1.3	2.7	1.9	2.2

Inclusive dates for mean statistical weeks are:

Statistical week 25 (June 15 - 21)
Statistical week 26 (June 22 - 28)
Statistical week 27 (June 29 - July 5)
Statistical week 28 (July 6 - 12)
Statistical week 29 (July 13 - 19)
Statistical week 30 (July 20 - 26)
Statistical week 31 (July 27 - August 2)
Statistical week 32 (August 3 - 9)
Statistical week 33 (August 10 - 16)
Statistical week 34 (August 17 - 23)
Statistical week 35 (August 24 - 30)
Statistical week 36 (August 31 - September 6)

Table 17. Mean statistical week (MSW) and standard variation (SD) of sockeye migration through the purse seine fisheries in Southeastern Alaska, 1986.

		Brood year and age class															
		1983		1982			1981				1980			1979			
Fishery		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	1.5	2.4	3.3	Total
101	MSW	30.6	31.8	30.8	31.3	31.6	29.0	31.3	31.2	35.0	31.4	31.7	34.4	33.3	34.0	31.5	31.4
	SD	0.9	1.9	1.5	1.8	2.0	0.0	1.7	2.3	0.0	2.1	1.6	1.4	0.5	0.0	1.1	1.9
103	MSW	33.0	34.5	33.0	34.1	34.1		34.0	34.0		34.0	34.1	33.6				34.0
	SD	0.0	0.6	0.0	0.9	0.5		0.8	0.0		0.8	1.0	1.0				0.9
104	MSW	30.8	31.5	30.7	31.8	32.0		31.4	31.7		31.7	31.6	31.6	34.0	32.0	36.0	31.6
	SD	2.1	1.4	1.5	1.5	1.2		1.4	1.5		0.8	1.3	1.0	0.0	0.0	0.0	1.4
112	MSW	31.8	32.6	32.0	30.4			31.2	32.1		33.1	32.4	32.4				31.4
	SD	2.0	0.6	1.6	1.9			1.9	1.4		0.3	1.2	0.5				1.9

Inclusive dates for mean statistical weeks are:

Statistical week 29 (July 13 - 19)
Statistical week 30 (July 20 - 26)
Statistical week 31 (July 27 - August 2)
Statistical week 32 (August 3 - 9)
Statistical week 33 (August 10 - 16)
Statistical week 34 (August 17 - 23)
Statistical week 35 (August 24 - 30)
Statistical week 36 (August 31 - September 6)

Table 18. Weir counts or estimated escapement counts for Southeastern Alaska and transboundary river sockeye salmon systems, 1986. Abbreviations for types of surveys and escapement counts are as follows: (A) aerial, (B) boat, (F) foot, (T) tagging estimate, (W) weir.

Stream Number	Stream Name	Count	Method	Date
101-30-075	Hugh Smith-Sockeye Creek	2,312	W	6/9-10/28
		6,968	T 1/	
101-45-032	Leask Lake	503	F	7/18
101-75-030	Unuk River	186	F	8/14
101-80-068	McDonald Lake-Wolverine Creek	98,397	2/	
		142,562	T 3/	
		36,700	F	10/2
101-90-050	Naha River	10,612	W	6/23-8/17
102-20-040	Paul Lake	25	F	9/27
102-30-017	Johnson Creek	35	F	9/10-11
102-30-067	Kegan Lake Creek	300	F	9/28-29
102-60-087	Karta River	5,929	W	6/23-8/17
103-15-127	Klakas Lake Creek	503	A	8/7
103-25-047	Hetta Lake Creek	2,500	F	9/8-9
103-80-031	Chuck Lake Creek	1,000	F	9/20-22
103-90-010	Sarkar Lake	700	F	9/4-5
103-60-047	Klawock Lake	14,697	W	6/28-9/6
105-31-003	Kushneahin Lake Creek	108	F	9/11
105-42-014	Sutter Creek	130	F	9/14
106-10-010	Ratz Harbor Creek	1,500	A	8/08
106-10-034	Luck Creek-Luck Lake	600	F	8/31
106-41-010	Salmon Bay Lake Creek	8,967	W	6/23-10/21
106-41-012	Salmon Bay Lake S. Hd.	2,055	F	9/3
106-41-015	Salmon Bay Lake W. Hd.	1,430	F	9/4
106-41-030	Red Lake Creek	2,007	F	8/27
106-44-060	Petersburg Lake Creek	1,757	F	8/20
107-30-030	Thoms Lake Creek	1,420	F	9/8
108-40-020	Andrews Creek	445	F	8/14
108-70-020	Stikine River 4/	52,300	5/	
108-80-110	Tahltan Lake	20,280	W	7/27-9/6
109-20-013	Falls Creek-Baranof Island	3,000	A	7/30
109-52-035	Kutlaku Lake Creek	450	A	8/25
109-62-013	Alecks Creek	4,200	A	8/30
111-15-020	Windfall	1,114		
111-32-032	Taku River-total Canadian Drainage	90,370	T 6/	
111-32-066	Yehring Creek	276 7/	W	10/26
111-32-245	L. Trapper Lake	13,820	W	7/19-9/13
111-32-254	L. Tatsamenie Lake	11,368	W	8/4-9/30
111-32-260	Hackett River	1,004	W	8/3-10/8
111-32-270	Nahlin River	258	A	7/31
111-33-034	Speel Lake	5,857	W	7/19-8/29
111-35-006	Crescent Lake	3,405	W	7/13-8/28
111-50-042	Auke Creek	954	W	6/24-9/10
111-50-056	Steep Creek	1,166	F	8/8
112-12-025	Kook Creek Inlet	200	A	9/5
112-67-060	Kanalku Creek	1,250	A	9/11
113-13-001	Redfish Bay Head	2,000	A	8/21
113-34-005	Necker Bay Lake	2,000	A	8/8
113-41-043	Redoubt Lake Outlet	9,414	W	6/25-8/28
113-59-004	Sitkoh Lake Creek	100	A	8/29
113-72-002	Fish Camp-Klag Bay	200	A	7/31
113-73-003	Ford Arm Lake	25 8/	W	10/27
115-20-010	Berners River	40	A	8/8
115-20-020	Lace River	400	A	8/8
115-20-030	Antler-Gilkey River	300	A	8/8
115-32-032	Chilkat Lake Outlet	23,947	W	6/18-11/14
115-33-020	Chilkoot River	88,024	W	6/6-10/29

1/ Jerry Koerner, 1987. ADF&G, Comm. Fish Div., Ketchikan, Ak.; personal communication. Estimate based on modified Petersen mark - recapture method.

2/ Mike Haddix, 1987, ADF&G, F.R.E.D. Div., Ketchikan, Ak.; personal communication. Estimate based on stream life - foot survey.

3/ Dennis Blackenbeckler, 1987, ADF&G, Comm. Fish Div., Ketchikan, Ak; personal communication. Estimate based on Petersen mark - recapture method.

4/ Final Report, Report of the Canada/United States Transboundary Technical Committee.

5/ Estimate based on a combination of commercial and test catches, sonar, brain - parasite, genetic, and scale pattern data.

6/ Estimate based on Chapman - Junge and Darroch mark - recapture method.

7/ Incomplete count.

8/ Leon Shaul, ADF&G, Juneau; personal communication. Incomplete count.

Table 19. Sample size and percentage age composition of sockeye salmon in escapements to Southeast Alaska and transboundary rivers in 1986.

Stream Number	System Name	Sample Size	Brood Year and Age Class															
			1984	1983		1982			1981				1980			1979		
			0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	1.5	2.4	3.3
101-30-075	Hugh Smith	1934		0.1	0.2		65.5			11.6	18.0		0.6	4.0		0.1		
101-45-032	Leask	341					25.8	0.6		11.7	42.8			18.5	0.6			
101-80-070	McDonald	564				0.2	11.7	0.5		56.2	3.7			27.7				
101-90-050	Heckman (Naha)	810				0.3	14.1			74.9	2.4		0.8	7.5				
101-90-084	Helm	328			8.8		49.7	0.3		39.0	2.1							
102-30-017	Johnson	10					20.0			40.0	30.0			10.0				
102-30-067	Kegan	208			2.9		36.5	1.4		49.0	8.2			1.9				
102-60-087	Karta	446					4.0			78.7	1.6		0.9	14.4			0.4	
103-25-047	Hetta	414			0.7		50.0			45.2	2.2			1.9				
103-60-047	Klawock (weir)	633			0.5		27.6	0.2		60.7	6.8			4.1	0.2			
103-60-047	Klawock (egg take)	193					9.8			66.8	5.2			18.1				
103-80-031	Chuck	359			1.1		57.1			35.1	5.8			0.8				
103-90-014	Sarkar	371			1.3		33.4	1.3		5.4	51.5			6.7	0.3			
105-31-003	Kushneahin	79					84.8			7.6	6.3			1.3				
105-42-014	Sutter	63					42.9			31.7	6.3			19.0				
106-10-034	Luck	222			9.0		25.2	7.7		32.4	18.0			7.7				
106-30-051	Galea	237			2.1		51.5			23.6	18.1			4.2	0.4			
106-41-010	Salmon Bay	1257		0.1	0.1		25.1	0.1		60.6	5.6		0.7	7.3				
106-41-030	Red Bay	497			3.0		42.3	0.8		46.3	2.0		0.2	5.4				
106-42-010	Kah Sheets	18					16.7			11.1	27.8			44.5				
106-44-060	Petersburg	405			4.4		77.0	2.2		4.2	10.9			1.2				
107-30-030	Thoms	375			2.7		7.2	30.4		1.1	35.2	1.3		21.3	0.3			0.5
108-80	Stikine River																	
108-80-001	Mainstem	114		4.4		4.4	7.9			78.1	2.6			2.6				
108-80-003	Iskut	68					11.8			85.3	1.5			1.5				
108-80-060	Chutine R.	99				1.0	8.1			85.9			1.0	4.0				
108-80-061	Chutine L.	161					23.0			18.0	37.9			21.1				
108-80-110	Tahltan	719					1.0			89.9	1.1			8.0				
109-52-035	Kutlaku	424			1.4		48.3	0.2		43.9	5.7		0.2	0.2				
109-62-013	Alecks L.	369			1.1		36.0	0.5		47.7	8.4			6.2				
111-32-032	Taku (Canyon Is.)	3389		2.8	0.5	7.8	28.8	<0.1		50.2	2.1		0.3	7.5				
111-32-056	Fish Cr.	19			5.3	42.1	31.6			21.1								
111-32-066	Yehring Cr.	189		1.1	0.5	7.9	21.7			64.0	1.6			3.2				
111-32-201	S. Fork Slough	54	1.9	22.2	3.7	40.7	1.9			29.6								
111-32-203	Tuskwa Slough	48		54.2	2.1	14.6	22.9			6.3								
111-32-204	Coffee's Slough	24	8.3	50.0	4.2	20.8	12.5			4.2								
111-32-205	Shustahini Sl.	93		12.9		38.7	24.7			21.5	2.2							
111-32-207	Chum Salmon Sl.	5		20.0		40.0	20.0			20.0								
111-32-208	Canoe Slough	1								100.0								
111-32-209	Honakta Slough	50		24.0	2.0	38.0	16.0			14.0				6.0				
111-32-220	Nakina River (Kuthai Lake origin)	148					51.4			44.6	2.0			2.0				
111-32-222	Nakina River	62	1.6	3.2	3.2	29.0	22.6	1.6		32.3	1.6		1.6	3.2				
111-32-235	Kuthai Lake	73					57.5			38.4	2.7			1.4				
111-32-245	L. Trapper L.	671				0.1	5.5			77.5	1.3			15.5				
111-32-254	L. Tatsamenie Lake	723		1.0		0.8	9.4			73.0	0.8			14.9				
111-32-260	Hackett R.	124		16.9		22.6	21.0			38.7				0.8				
111-33-034	Speel	872		0.2		0.2	47.6			48.1	0.8		0.1	3.1				
111-35-006	Crescent	826		0.2		0.4	15.7		0.1	73.2	0.9		0.7	8.7			0.1	
111-50-042	Auke	403			0.5		6.9	6.2		6.9	67.5			11.9				
111-50-056	Steep	290		3.8	2.1	7.6	37.2	0.3		39.3	3.8		0.3	5.2				0.3
113-41-043	Redoubt	1285			0.6	0.1	18.5	1.8		10.7	21.1		0.1	45.0	1.3		0.2	0.7
113-73-003	Ford Arm	163			9.8	0.6	35.0	0.6		31.9	15.3			6.7				
115-24-020	Lace	189		2.6	2.1	35.4	12.7			46.0				1.1				
115-32-032	Chilkat L.	940					6.2	1.0		3.5	24.9			62.2	1.6			0.5
115-32-062	Chilkat R.	114		6.1		49.1	14.9		0.9	26.3			0.9	0.9			0.9	
115-33-020	Chilkoot	2147			<0.1		12.9			67.2	2.4		0.6	16.7			0.1	0.1

Table 20. Sockeye salmon run timing through weirs in Southeastern Alaska and transboundary river systems, 1986.

System	Dates of Operation	Count	Cumulative % Past Weir			Mean Date 1/	Standard Deviation 2/
			10%	50%	90%		
Hugh Smith	6/9-10/28	2,312	7/11	7/20	8/8	7/24	16.5
Naha	6/23-8/17	10,612	7/12	7/28	8/4	7/25	9.4
Karta	6/23-8/17	5,929	7/1	7/10	7/25	7/12	10.5
Klawock	6/28-9/6	4,697	7/7	7/9	8/3	7/17	13.1
Salmon Bay	6/23-10/21	8,967	7/27	8/21	9/20	8/22	20.2
Tahltan	7/27-9/6	20,280	8/1	8/4	8/11	8/5	5.0
Trapper	7/19-9/13	13,820	8/7	8/13	8/25	8/15	7.1
L. Tatsamenie	8/4-9/30	11,368	8/17	8/25	9/6	8/26	8.2
Hackett	8/3-10/8	1,004	8/17	8/31	9/20	9/2	11.8
Speel	7/19-8/29	5,857	7/31	8/10	8/13	8/9	6.2
Crescent	7/13-8/28	3,405	7/25	8/6	8/23	8/9	12.7
Auke	6/24-9/10	954	7/24	7/25	8/7	7/28	9.8
Redoubt	6/25-8/28	9,414	7/8	7/25	8/13	7/25	12.8
Chilkat	6/18-11/14	23,947	9/6	9/18	10/2	9/17	16.8
Chilkoot	6/6-10/29	88,024	7/22	8/9	9/2	8/11	16.5

1/ Rounded to nearest calendar date.

2/ Standard deviation of mean timing date.

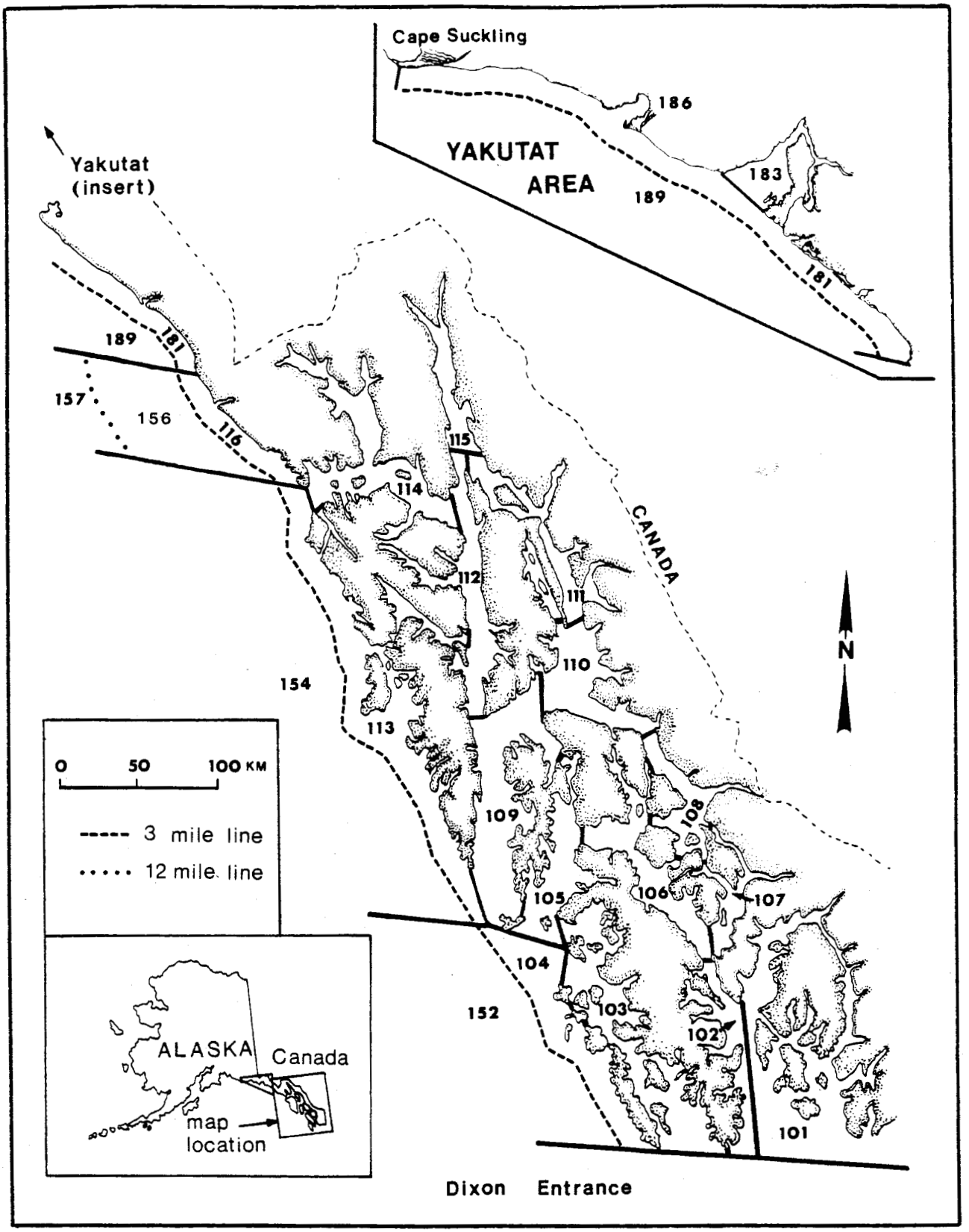

Figure 1. Map of Southeast Alaska showing the statistical fishing districts.

APPENDICES

Appendix Table A1. Numbered calendar weeks (i.e., Stat Weeks) used to report commercial catches, 1986.

Week Number	From	To	Week Number	From	To
1	Jan 1	Jan 4	28	Jul 6	Jul 12
2	Jan 5	Jan 11	29	Jul 13	Jul 19
3	Jan 12	Jan 18	30	Jul 20	Jul 26
4	Jan 19	Jan 25	31	Jul 27	Aug 2
5	Jan 26	Feb 1	32	Aug 3	Aug 9
6	Feb 2	Feb 8	33	Aug 10	Aug 16
7	Feb 9	Feb 15	34	Aug 17	Aug 23
8	Feb 16	Feb 22	35	Aug 24	Aug 30
9	Feb 23	Mar 1	36	Aug 31	Sep 6
10	Mar 2	Mar 8	37	Sep 7	Sep 13
11	Mar 9	Mar 15	38	Sep 14	Sep 20
12	Mar 16	Mar 22	39	Sep 21	Sep 27
13	Mar 23	Mar 29	40	Sep 28	Oct 4
14	Mar 30	Apr 5	41	Oct 5	Oct 11
15	Apr 6	Apr 12	42	Oct 12	Oct 18
16	Apr 13	Apr 19	43	Oct 19	Oct 25
17	Apr 20	Apr 26	44	Oct 26	Nov 1
18	Apr 27	May 3	45	Nov 2	Nov 8
19	May 4	May 10	46	Nov 9	Nov 15
20	May 11	May 17	47	Nov 16	Nov 22
21	May 18	May 24	48	Nov 23	Nov 29
22	May 25	May 31	49	Nov 30	Dec 6
23	Jun 1	Jun 7	50	Dec 7	Dec 13
24	Jun 8	Jun 14	51	Dec 14	Dec 20
25	Jun 15	Jun 21	52	Dec 21	Dec 27
26	Jun 22	Jun 28	53	Dec 28	Dec 31
27	Jun 29	Jul 5			

Appendix Table A2. Sample size needed to describe the age composition of a three, four, five, six, or seven-age class population of increasing size with a precision of ±5% and a probability of 0.10.

Population Size	Sample Size Needed With The Following Number of Groups[1]					
	2	3	4	5	6	7
500	218	238	251	261	267	273
1,000	278	312	334	352	364	376
1,500	307	349	376	399	414	429
2,000	323	370	401	427	445	462
2,500	334	384	418	446	466	485
3,000	341	394	430	460	481	501
3,500	347	402	439	470	492	513
4,000	351	408	446	478	501	523
4,500	355	412	452	485	508	530
5,000	358	416	456	490	513	537
6,000	362	422	463	498	522	546
7,000	365	426	468	504	529	554
8,000	367	430	472	509	534	559
9,000	369	432	476	512	538	563
10,000	371	434	478	515	541	567
15,000	375	441	486	524	551	578
20,000	378	444	490	529	556	583
25,000	379	446	492	531	559	587
30,000	380	447	494	533	561	589
35,000	381	448	495	535	563	591
40,000	381	449	496	536	564	592
45,000	382	449	496	537	565	593
50,000	382	450	497	537	566	594
60,000	383	451	498	538	567	595
70,000	383	451	498	539	567	596
80,000	383	451	499	539	568	597
90,000	383	452	499	540	568	597
100,000	384	452	499	540	569	597
infinite	385	454	502	543	572	601

[1] Based on Cochran (1977) using the following formula:

$$n' = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where: n' = adjusted sample size
n_0 = sample size needed for an infinitely large population
N = population size

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