CONTRIBUTION OF ALASKAN, CANADIAN, AND TRANSBOUNDARY SOCKEYE STOCKS TO CATCHES FROM SOUTHEAST ALASKA DISTRICTS 101-108, 1986 BASED ON ANALYSIS OF SCALE PATTERNS

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ABSTRACT

Mixed stocks of sockeye salmon (*Oncorhynchus nerka*) harvested in 1986 southern Southeast Alaska net fisheries were classified to nation and/or stock of origin using linear discriminant function analysis of scale patterns and age composition data. An estimated 284 thousand (34%) of the classified catch was of Alaskan origin, 550 thousand (65%) were bound for the Canadian Nass and Skeena Rivers, and 6 thousand (1%) were of transboundary Stikine River (including Tahltan Lake stock) origin. Of the 284 thousand Alaskan sockeye approximately 119 thousand were Alaska II type (mostly McDonald Lake) fish while 165 thousand were from other Alaskan systems. Separate Nass and Skeena River contribution estimates are presented for some districts. Stock contribution estimates are presented by age class and week for all major fisheries.

KEY WORDS: sockeye salmon, *Oncorhynchus nerka*, linear discriminant function, scale pattern analysis, Southeastern Alaska, Canada, and stock allocation.

INTRODUCTION

Commercial net fisheries in southern Southeast Alaska harvest mixed stocks of sockeye salmon (Oncorhynchus nerka) that originate in both Alaskan and Canadian lakes, rivers and streams (Rich and Morton 1930; Verhoeven 1952; Norenberg 1959; Logan 1967; Simpson 1968; Hoffman et al. 1983, 1984). Since the implementation of the US-Canada Pacific Salmon Treaty it has become evident that improved knowledge of stock dynamics and increased management efficiency is required effectively manage fisheries as well as meet treaty goals. Rebuilding of depleted Alaskan stocks requires stock specific harvest and production analysis. While Canadian stocks are usually more productive and generally have not undergone the declines that some Alaska stocks have, it is still useful for Canadian management to know the migratory timing and interception rates for Canadian stocks in Alaskan fisheries

Sockeye salmon caught in southern Southeast Alaska are native to numerous relatively small and a few moderately productive Alaskan systems in the immediate vicinity (Figure 1). Substantial numbers of Canadian Nass and Skeena River sockeye are also commonly harvested. The Nass and Skeena Rivers lie entirely within British Columbia and flow into Chatham Sound just south of the Alaska border. Transboundary Stikine River sockeye, which are typically found in identifiable numbers only in District 106, contibute relatively minor numbers of fish to area catches. The Stikine River originates in British Columbia, Canada and flows into Frederick Sound, north of Wrangell, Alaska. In some years south-migrating stocks of sockeye salmon, thought to be predominately bound for the Fraser River in southern British Columbia, may be caught in some Southeast Alaskan fisheries. Contributions of these south-migrating stocks are estimated separately in years when they are present in substantial numbers. Rarely sockeye salmon returning to northern Southeast Alaska and to systems as distant as Prince William Sound, Alaska, and Washington State may also be taken but separate contribution estimates of these stocks are not feasible.

The purpose of this study is to determine the contributions of major sockeye stocks to the Alaskan commercial fishery catches from Districts 101 through 108 (Figure 2). Linear discriminant function analysis of scale patterns is used to distinguish the stock groups. Significant and persistent differences between stock groups originating in Alaska and Canada continue to be documented in the patterns of growth during freshwater and early marine life history (Marshall et al. 1984; Oliver et al. 1983, 1984; Oliver and Walls 1985; Oliver and Jensen 1986; Oliver and McGregor 1986). Sockeye salmon from Alaskan stocks grow more slowly during their lacustrine residence than do fish from Canadian stocks. Persistent differences in the number and width of circuli in the spring "plus growth" zone also exist between stock groups. These differences in growth allow easy and

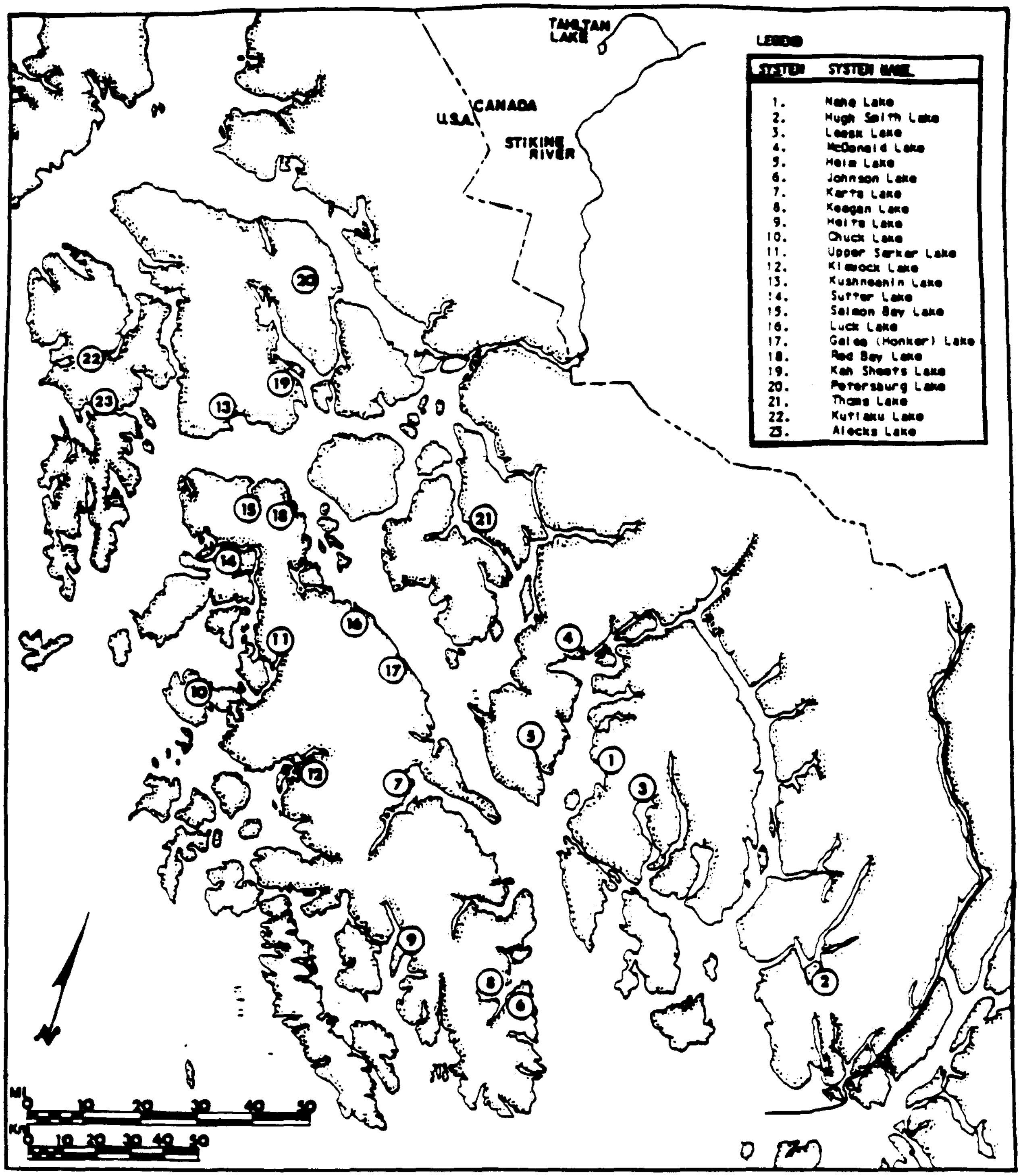

FIGURE 1. Major sockeye salmon systems of Southeast Alaska; numbers identify lakes where scales are collected for scale pattern standards.

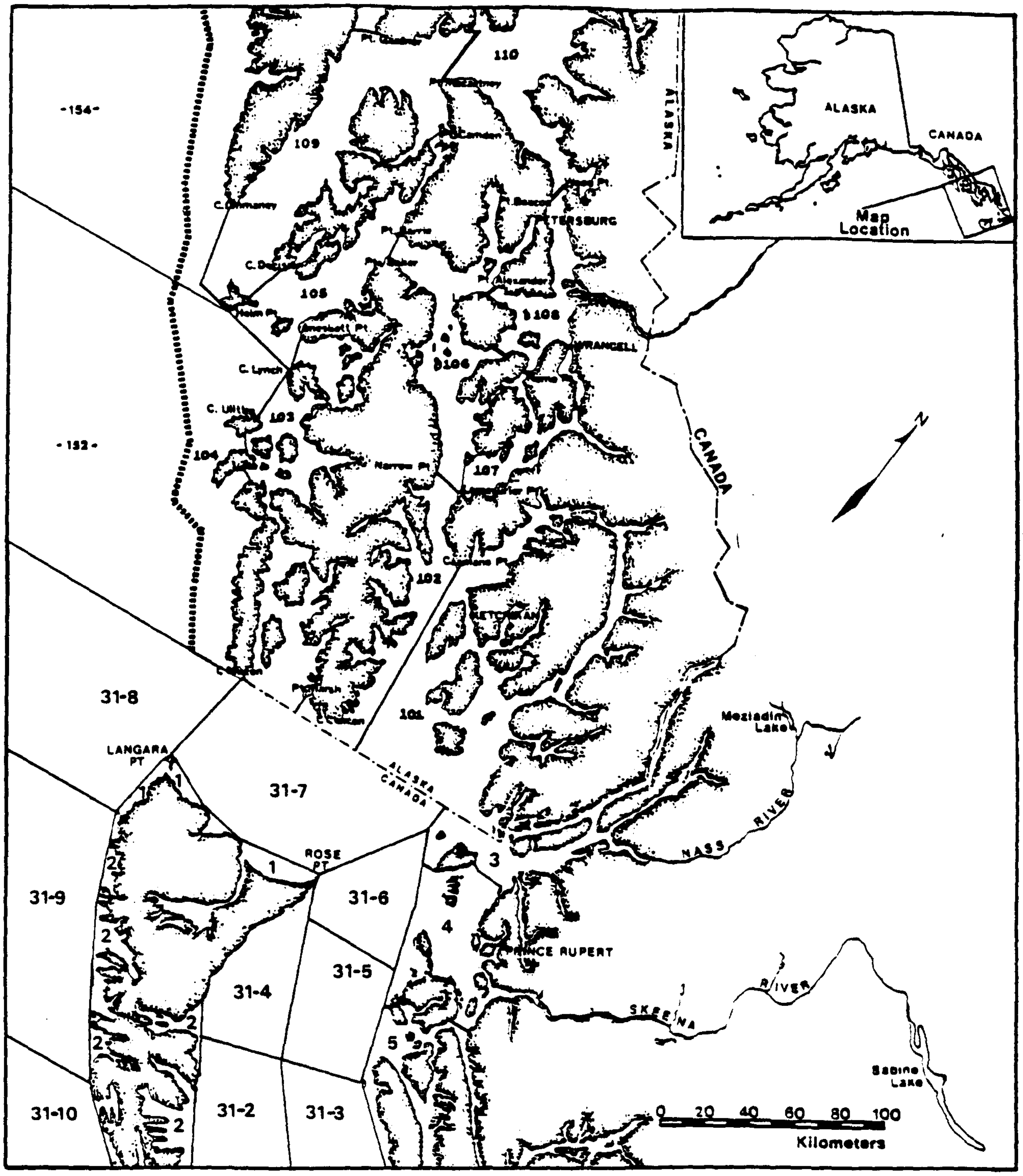

FIGURE 2. Fishery management districts in southern Southeast Alaska and northern British Columbia waters.

accurate separation of Canadian and Alaskan stocks (Oliver et al. 1983, Marshall et al. 1984, 1986). While the differences in scale patterns between Alaskan and Canadian groups of stocks is much greater than the differences within these groups, further separation of component stocks is possible. Alaskan stocks have been divided into "Alaskan I" and "Alaskan II" types based on their scale patterns: Alaska I consists of many different streams in southeast Alaska. The Alaska II pattern is typified by fish from McDonald Lake, currently the major producer of sockeye salmon in southern Southeast Alaska.

MATERIALS AND METHODS

Collection and Preparation of Scale Samples

Random samples of up to 700 scales per district per statistical week were collected whenever fishery openings occured. Not all districts or portions thereof are open every week. Alaska statistical weeks are used in recording catches and are hereafter refered to as "weeks". They are Julian weeks, are numbered sequentially from January 1, and run from 12:00 A.M. Sunday to 11:59 P.M. Saturday. Scales sampled from the spawning escapements of stocks contributing to the commercial catches are used to build standards. Approximately 500 scales were collected from each of 23 lake systems throughout Southeast Alaska (Figure 2). While 1000 scales from the Tahltan weir escapement, 500 from the non-Tahltan Stikine escapements, and approximately 1000 to 1500 each from test fisheries operating in the lower reaches of the Nass and Skeena Rivers (Figure 2).

Scales were taken from the left side of the fish approximately two rows above the lateral line on the diagonal downward from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (INPFC 1963). Scales on salmon fry first develop in this area, and thus, for purposes of ageing and digitizing it is the prefered area. Scales were mounted on gum cards and impressions made in cellulose acetate (Clutter and Whitesel 1956).

Age Determination and Measurement of the Scales

Individual fish ages, from the 700 fish catch samples, are determined from scale images magnified to 70 power on a microfiche reader and are recorded in European notation. The sample size used for the scale pattern analysis varies on a weekly basis and is dependent on age composition. Generally 100 age 1.3 fish and as many scales as possible (up to 100) from each of the age 1.2, 2.2, and 2.3 age groups are analyzed for each district and week. Scale images magnified at 100X were projected onto a Talos or a CalComp Digitizing Tablet using equipment similar to that described by Ryan and Christie (1976). Measurements were made and recorded with an IBM microcomputercontrolled digitizing system with fortran programs written by Robert Conrad (ADF&G Anchorage) and modified by Larry Talley (ADF&G Douglas).

Previous studies have established that an axis approximately perpendicular to the anterior edge of the unsculptured posterior field is best for consistently measuring sockeye scales (Clutter and Whitesel 1956; Narver 1963). This axis is approximately 20 degrees dorsal or ventral from the anterior-posterior axis and all circuli counts and scale measurements in the lacustrine and first year marine zone were made along it. Marshall et al. (1984) have established the separability of major stock groups by measurements in three or four zones: 1) the scale center to the last circulus of the first freshwater annulus, 2) when present, the first circuli of the second year of freshwater growth to the end of the second freshwater annulus, 3) the plus growth or scale growth after the last freshwater annulus and before the first marine circulus (Mosher 1968), and 4) the first year marine growth (i.e. the first marine circulus to the end of the first marine annulus)(Figure 3). A total of 74 variables, including circuli counts, incremental distances, and ratios and/or combinations of the measured variables are calculated for samples with a single freshwater annular zone and 106 variables for samples with two freshwater annular zones.

Analytical Procedures

The ability to differentiate salmon stocks based on scale patterns depends upon the degree of difference in the scale characters between stocks (Marshall et al. 1987). Linear discriminant function (LDF) analysis of scale patterns has been used to estimate stock contributions to southern Southeast Alaska mixed stock sockeye salmon fisheries since 1982 (Oliver and Jensen 1986; Oliver and Walls 1985; Oliver et al. 1984).

In scale pattern analysis LDF is a multivariate technique that develops classification rules used to assign a sockeye salmon sampled in a mixed stock fishery to a stock of origin. The variables calculated from the circuli counts and incremental distances on scales from fish of known origin provide a set of measurements used to define these rules. A sample of p selected scale variables from a number of salmon stocks or stock groups defines a region in p-space characteristic of that group of fish. Based on probability theory the established regions in p-space, one per stock group, are uniquely defined or separated by decision surfaces. A sockeye salmon harvested in a mixed stock fishery may be classified according to which region its p-tuple occupies. The accuracy of classification depends upon the precision with which the regions defining each stock or group are described and the inherent separation between them. The LDF is the linear combination of p observed variables which maximizes the between-group variance relative to the within-group variance (Fisher 1936).

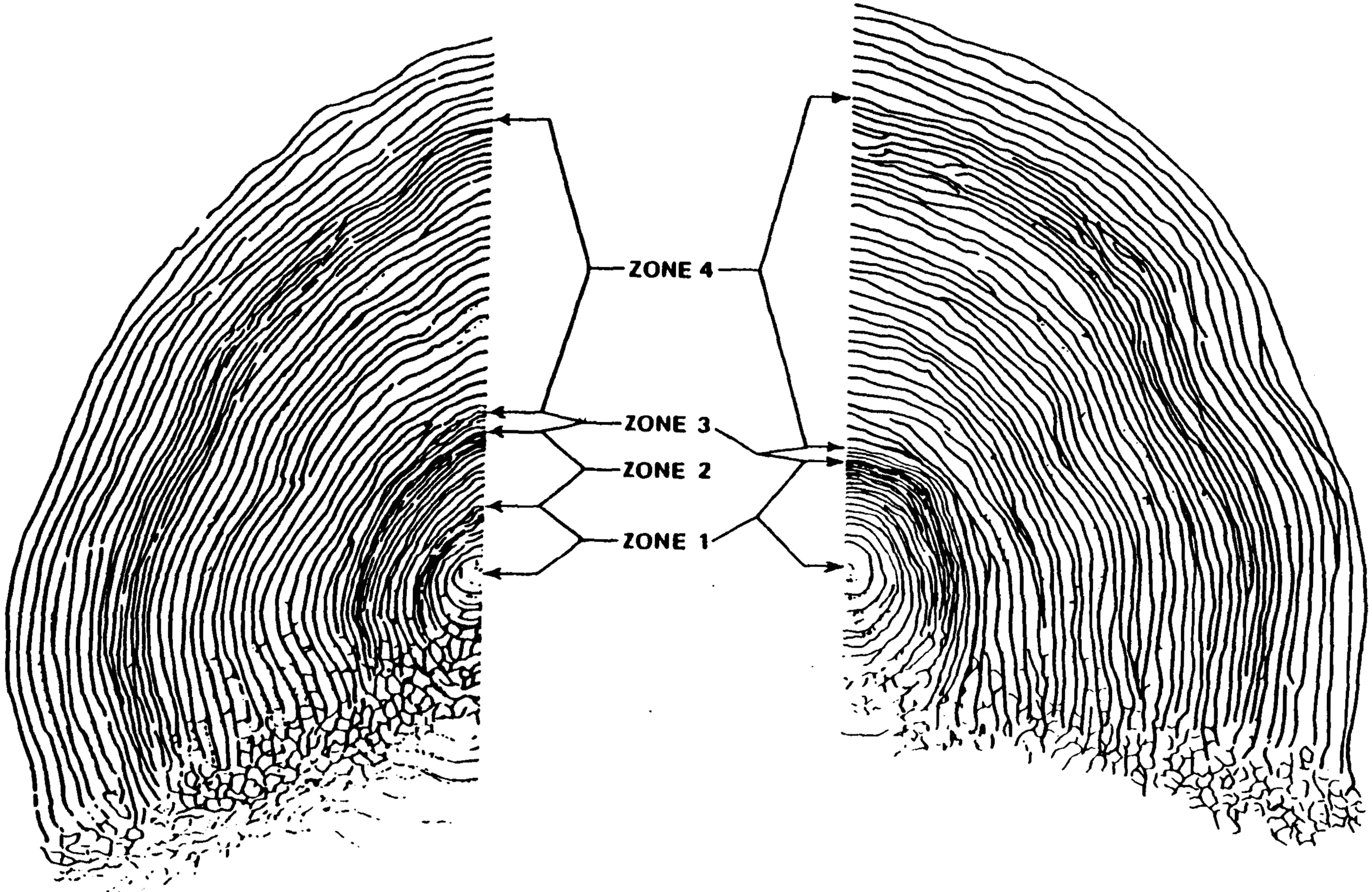

FIGURE 3. Typical scale for age 2. and 1. sockeye salmon with zones used for scale pattern analysis delineated.

The major assumptions underlying LDF analysis are: 1) the groups being investigated are discrete and identifiable; 2) the parent distributions of the measured variables are multivariate normal; and 3) the variance-covariance matrices for all groups are equal. Gilbert (1969) found LDF satisfactory if the variance-covariance matrices were not too different. In addition, large sample sizes appear to make the LDF robust to the assumption of common variance-covariance matrices (Isaacson 1954; Anas and Murai 1969). The method also appears to be robust to violations of the normality assumption for discrete distributions, however, it is not robust for continuous non-Gaussian parent distributions (Lachenbruch et al. 1973; Krzanowski 1977). Some preliminary results of a study comparing the accuracy of LDF, quadratic discriminant function, direct density estimation (Cook 1982), and nearest neighbor analysis in classifying our data indicate that the LDF has a slightly higher classification accuracy for the stock groups present in the mixed stock fisheries of Southeast Alaska. This again indicates that the above assumptions are met or that LDF is robust to violations of them.

Scale variables to be used in the LDF are selected with a stepwise regression. In this process, variables are added until the partial F-statistic of all variables available for entry into the model is less than 4.00 (Enslein et al. 1977). An almost unbiased estimate of classification accuracy for each LDF was determined using a leaving-one-out procedure (Lachenbruch 1967). One sample is 'left-out', the discriminant rule is estimated, and the 'left-out' sample is classified using the discriminant rule and checked to see if it was classified correctly. This procedure is repeated for all samples. Thus, when an LDF is run using the leaving-one-out procedure a classification matrix is developed which gives the proportion of correctly identified fish and the proportion of misclassification of each stock to each of the other stocks.

When more than two stock groups are being analyzed the stepwise regression procedure does not always result in maximum classification accuracies or the most balanced classification matrix. Frequently, well-separated groups are separated even further while poorly separated groups remain poorly separated (Habbema and Hermans 1977). Scale variables that provided the best discrimination between the groups that most often misclassified as each other were occasionally added to or substituted for other variables used in the LDF to provide either a better balance to the classification matrix or to increase the mean classification accuracy.

The proportional estimates of stock composition in the mixed stock harvests, referred to as first order estimates, were adjusted with a classification matrix correction procedure (Cook and Lord 1978). The fish in the mixed stock composition sample are classified with the LDF. The vector of proportional estimates for each stock or stock group and is multiplied by the classification matrix to give new estimates, referred to as second order estimates, for the true proportions of stocks and stock groups in the mixed stock fishery. In cases where second order estimated proportions for a stock group were less than zero, the entire catch sample was reclassified with a model excluding that stock group. This process was repeated until all second order estimated proportions were positive.

The variance and 90% confidence intervals of the second order estimates of stock proportions were computed according to Pella and Robertson (1979). The variance-covariance matrices for the misclassification matrix and for the mixed stock proportion vector are determined from the multinomial probability distribution. These two variance-covariance matrices are combined to give variances and covariances for the second order estimates of stock proportions. The variances for the proportions of each stock are the diagonal elements of this combined matrix, i.e. they are an additive combination of: 1) the sampling variation in estimation of the probability of assignment of the known stock group and 2) the sampling variation in estimation of the assignment composition of the mixed stock group.

Classification of Catches

The commercial catches are classified as to stock composition based on standards built from the 1986 escapements. Four major age groups, 1.2, 1.3, 2.2, and 2.3, generally contribute more than 98% of the commercial catches. Standards are built for each age class for the Alaska I, Nass and Skeena groups. Standards for age 1.2, 1.3, and 2.3 fish only are built for the Alaska II and non-Tahltan Stikine groups. Tahltan standards are built for age 1.3 and 2.3 fish only. Standards are not built for age classes which contributed only a minor fraction of the escapement for a given stock or stock group since insufficient scales were available to build them. Age specific models are used in the analysis to: 1) account for differences in age composition between stocks, 2) remove potential bias due to differences in migratory timing of different age fish, and 3) eliminate the effect of different environmental conditions on the scale patterns of different age fish. Stock contributions were estimated for each week to track temporal patterns, however, in some weeks catches are small and samples of the less common age groups are insufficient to classify unless pooled with the adjacent week's sample. The proportions of each stock from the catch sample are expanded to the week's catch by:

$$C_{ijt} = C_t * P_{it} * S_{ijt} \qquad (1)$$

where: C_{ijt} = estimated catch of fish of age i and group j in time period t
C_t = total catch in time period t,
P_{it} = estimated proportion of fish of age i in the catch in time period t, and
S_{ijt} = proportion of fish of age i and group j in the catch in time period t estimated with LDF.

The stock apportionment of the minor age groups not classified with LDF assumes that the proportion of the minor ages belonging to any given stock is equal to the combined proportion of all LDF classified age classes:

$$C_{mjt} = C_t * P_{mt} * S_{\cdot jt} \qquad (2)$$

where: C_{mjt} = estimated catch of fish of minor age classes of group j in time period t and
P_{mt} = estimated proportion of fish of minor age groups in the catch in time period t.

The variance (V) of the weekly ($C_{\cdot jt}$) and seasonal ($C_{\cdot j \cdot}$) stock composition estimates are approximated with the delta method (Seber 1982). The variance estimate is a function of the variances associated with the weekly 1) estimated age composition of the catch, 2) estimated stock composition of each age class classified with LDF, 3) age specific stock composition estimates, 4) sample size of the age composition, and 5) catch size. However, it is a minimum estimate of variance since it does not include any variance associated with the age classes not classified with LDF nor any variance for stocks contributing no fish during a given week.

Variances of the proportions of stock contributions are calculated by:

$$V(P_j) = P_j^2 * \left(\frac{V(C_j)}{C_j^2} + \frac{V(C.)}{C.^2}\right) \qquad (3)$$

where: P_j = Proportion of stock j or C_j/C.

RESULTS

Of the 897 thousand sockeye salmon caught in 1986 in the southern Southeast Alaska net fisheries (District 101 - 108), 843 thousand (94%) were identified to nation and/or stock of origin. An estimated 284 thousand (34%) of the 840 thousand fish identified were bound for systems in Alaska, 550 thousand (65%) were bound for the Canadian Nass and Skeena Rivers and 6 thousand (1%) were of transboundary Stikine River origin (including Tahltan Lake stocks)(Table 1). Weekly stock composition estimates by district are presented in Appendix A.

Table 1. Estimated contribution by stock group of origin of sockeye salmon harvested in net fisheries in Alaska Districts 101-108, 1986.

District	Type	Group	Estimated Number	Percent	Standard Error	90% C.I. 1/ Lower	90% C.I. 1/ Upper
101	Gillnet	Alaska I	8,173	5.6	1,804	5,205	11,141
		Alaska II	4,559	3.1	1,330	2,370	6,748
		Nass	108,325	74.4	3,658	102,307	114,343
		Skeena	24,574	16.9	3,362	19,043	30,105
		Total	145,631				
101	Seine	Alaska I	18,978	25.4	1,700	16,181	21,775
		Alaska II	31,283	41.9	1,593	28,662	33,904
		Nass	16,274	21.8	725	15,081	17,467
		Skeena	8,210	11	739	6,994	9,426
		Total	74,745				
102	Seine	Alaska I	3,229	27.3	356	2,642	3,816
		Alaska II	5,469	46.2	367	4,865	6,073
		Nass	1,998	16.9	321	1,469	2,527
		Skeena	1,144	9.7	243	743	1,545
		Total	11,840				
103	Seine	Alaska I	2,977	21.9	386	2,341	3,613
		Alaska II	6,821	50.3	378	6,199	7,443
		Nass	1,071	7.9	328	531	1,611
		Skeena	2,702	19.9	318	2,179	3,225
		Total	13,571				
104	Seine	Alaska I	66,181	14.9	6,858	54,898	77,464
		Alaska II	34,785	7.8	5,070	26,444	43,126
		Nass	119,231	26.9	12,942	97,940	140,522
		Skeena	223,793	50.4	12,678	202,937	244,649
		Total	443,990				
106-30	Gillnet	Alaska I	29,138	48.2	1,321	26,964	31,312
		Alaska II	14,737	24.4	4,709	12,859	16,615
		Nas/Ske	16,471	27.2	790	15,171	17,771
		Tahltan	11	0	53	0	98
		Stikine	105	0.2	166	0	379
		Total	60,462				
106-41	Gillnet	Alaska I	36,001	42.2	1,924	32,835	39,167
		Alaska II	20,458	24.0	1,631	17,774	23,142
		Nas/Ske	26,313	30.8	1,266	24,129	28,297
		Tahltan	2,070	2.4	873	633	3,507
		Stikine	501	0.6	594	0	1,478
		Total	85,243				
108	Gillnet	Alaska I	185	4.4	116	0	376
		Alaska II	745	17.8	311	233	1,257
		Nas/Ske	73	1.7	92	0	225
		Tahltan	405	9.7	112	220	590
		Stikine	2,779	66.4	322	2,248	3,310
		Total	4,187				
All Districts		Alaska I	164,862	19.6	7,675	152,236	177,488
		Alaska II	118,857	14.2	7,431	106,633	131,081
		Nass/Skeena	550,179	65.5	18,884	519,116	581,242
		Tahltan	2,486	0.3	880	1038	3,934
		Stikine	3,385	0.4	676	2273	4,497
		Total	839,669				

1/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in a like manner.

The proportion of Alaskan, Nass, Skeena, Tahltan and Stikine sockeye salmon harvested in the catch varied between gear types, districts, and time. Tahltan Lake and Stikine River sockeye salmon stocks were present in detectable levels in only District 106. Classification accuracies for models used are presented in Table 2.

District_101-11_Drift_Gillnet_Catch

The 1986 District 101-11 gillnet harvest of 146 thousand sockeye salmon was comprized of an estimated 13 thousand (9%) fish of Alaskan origin while 133 thousand (91%) were of Canadian Nass and Skeena River origin (Table 1). Maximum catch of all stocks occured in week 29 (13-19 July) when 42 thousand fish were taken. Maximum catch per boat day (CPUE) over all stocks was 53 fish in week 27 (29 June - 5 July).

Low numbers of Alaska I type fish were present throughout the season contributing less than a thousand fish to the catch in any week except for the period 13-26 July (weeks 29 and 30) when weekly contributions were estimated at 2 thousand fish (4% and 7% of the respective weeks catch). Total Alaska I contribution to the District 101-11 catch was estimated at 8 thousand fish. The maximum CPUE of Alaska I stocks occured in week 27 (29 June - 5 July) (Figures 4 and 5, Appendix A.1)

Alaskan II type stocks (mostly McDonald Lake) contributed an estimated 4.5 thousand (3%) of the seasons catch of 146 thousand fish in District 101-11. Only a few hundred Alaska II type fish a week were caught except during week 29 (13-19 July) when 2 thousand were harvested and week 31 (27 July - 2 Aug.) when one thousand were taken (5% and 7% respectively of the weekly catch). Maximum CPUE for Alaska II stocks occured in week 29 (13-19 July).

Nass River sockeye salmon dominated the District 101-11 catch throughout the season contributing an estimated 108 thousand fish (74%) of the seasons catch of 146 thousand. Catches of Nass River fish were greatest during week 29 (13-19 July) when they contributed 31 thousand (74%) of the week's catch of over 41 thousand fish. The maximum CPUE of Nass River stocks occured in week 28 (6-12 July) at 42 fish per boat day.

Estimated contributions of Skeena River sockeye salmon to the District 101-11 fishery were 25 thousand fish or 17% of the total season's catch. Skeena River sockeye salmon stocks were the second most common stock group taken in the district. Most Skeena River fish were taken in the early portion of the season. Skeena contributions reached a maximum in week 29 (13-19 July) with a catch of 7 thousand or 16% of the catch. Skeena River stocks continued to contribute several thousand fish a week to the catch through the period 3-9 August (week 32) before declining to a few hundred fish a week for the remainder of the season. The maximum CPUE for Skeena River stocks occured from 22-28 June (week 26) at 9 fish per boat day.

Table 2. Mean classification accuracies of the linear discriminant function anaylses used to estimate the contibution of groups to the catches of sockeye in Alaska Districts 101-108.

Stock Groups	Mean Classification Accuracy by Age 1.2	1.3	2.2	2.3
Alaska I vs Alaska II vs Nass vs Skeena	0.703	0.723		
Alaska I vs Nass vs Skeena	0.747	0.750		
Alaska I vs Alaska II vs Skeena	0.795	0.803		
Alaska I vs Alaska II vs Nass		0.813		0.800
Alaska II vs Nass vs Skeena	0.796	0.783		
Alaska I vs Nass/Skeena	0.897			
Alaska I vs Nass			0.885	0.881
Alaska I vs Skeena	0.954			
Alaska II vs Skeena		0.980		
Nass vs Skeena		0.755		

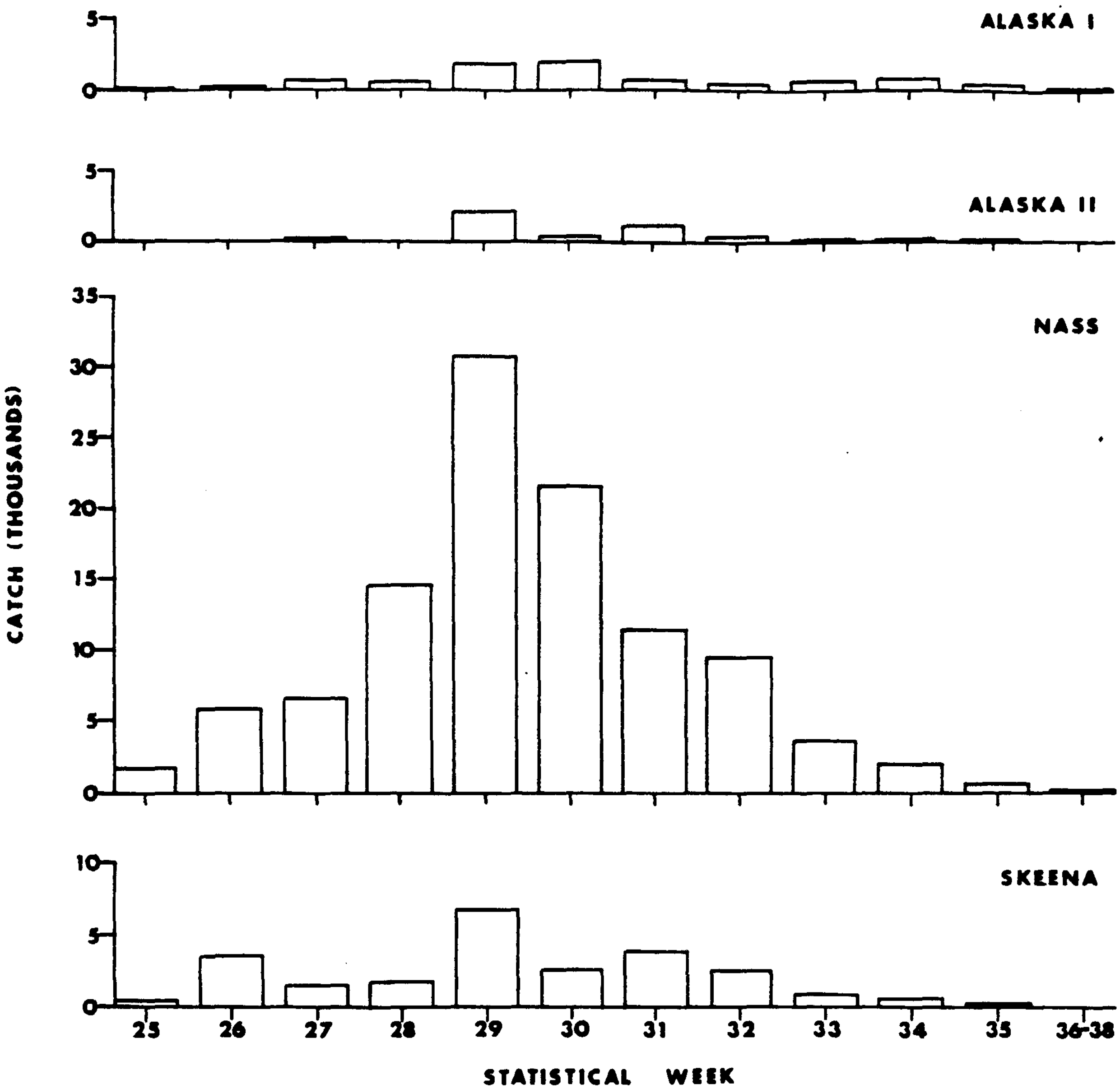

FIGURE 4. Weekly catch by stock in Alaska's District 101-11 drift gillnet fishery, 1986.

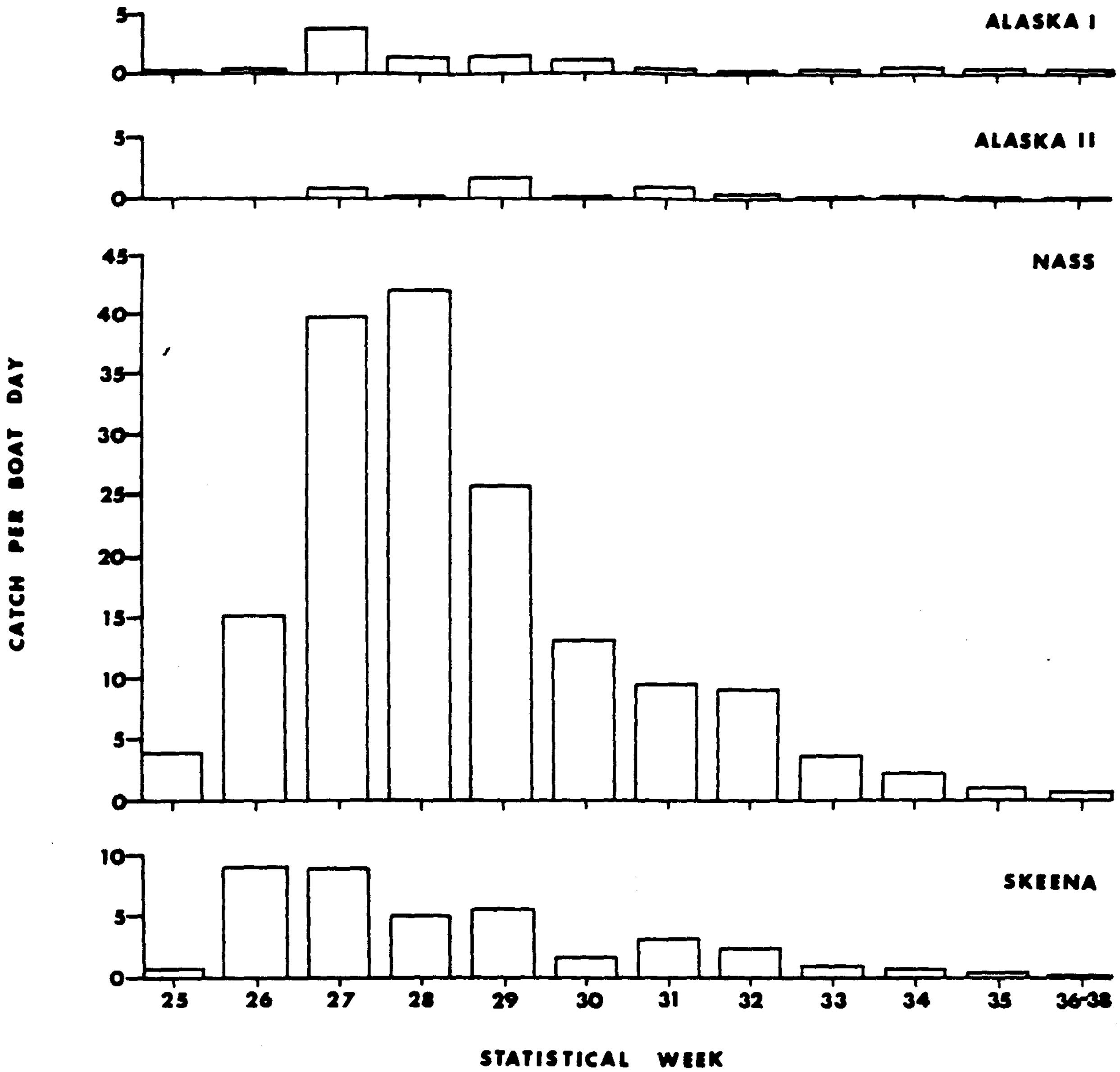

FIGURE 5. Weekly CPUE by stock in Alaska's District 101-11 drift gillnet fishery, 1986.

District_101_Purse_Seine_Catch

The 1986 District 101 purse seine fishery harvested 75 thousand sockeye salmon of which an estimated 50 thousand (67%) were of Alaskan origin and 24.5 thousand (33%) were of Canadian Nass and Skeena River origin (Table 1). The maximum CPUE of 8.8 fish per boat hour occured in the initial week of the season (6-12 July, week 28).

Alaska I stocks contributed an estimated 19 thousand fish or 25% to the seasons total catch. Contributions of Alaska I type fish were relatively low during the initial fishing period but rapidly increased to a maximum of 5 thousand fish or 48% of the weeks catch by week 31 (27 July - 3 August). Alaska I sockeye salmon then slowly declined in abundance in the catches through week 33 (10-16 August). The maximum CPUE of Alaska I stocks occured in week 31 (27 July - 3 August) (Figures 6 and 7, Appendix A.2).

An estimated 31 thousand fish or 42% of the District 101 seine catch were Alaska II fish (mostly McDonald Lake). Few Alaska II sockeye salmon were taken in the initial openings but contributions of these fish increased rapidly to a maximum of 5 thousand fish or 48% of the weekly catch by the period 27 July - 2 August (week 31). Contributions of Alaska II fish declined slowly through 16 August (week 33). The maximum CPUE for Alaska II stocks occured during week 32 (3-9 August).

Nass River sockeye salmon contributed 16 thousand fish or 22% of the 1986 District 101 seine catch. During the initial week of the fishery (6-12 July, week 28) they contributed an estimated 7 thousand fish (91%) of the weeks catch and during the second week (13-19 July, week 29) 2 thousand (50%). Contributions then fell to less than a thousand fish a week for the remainder of the season. The maximum CPUE for Nass River stocks occured during the first week of the season at 8 fish per boat hour.

Skeena River sockeye salmon contributed a few hundred fish a week to the catches in the early portion of the season, reaching a maximum contribution of 2 thousand (12%) during the period 27 July - 2 August (week 31). Numbers declined to about a thousand fish a week through 23 August (week 34) and were only a few hundred fish per week for the remainder of the season.

District_102_Purse_Seine_Catch

The catch of sockeye salmon in the District 102 seine fishery totaled approximately 33 thousand sockeye salmon. The 21 thousand fish taken from the beginning of the season through 9 August (week 32) could not be allocated to stock of origin due to a lack of samples. The remaining 12 thousand fish taken from week 33 through the end of the season were comprised of an estimated 9 thousand (75%) fish of Alaskan origin and 3 thousand (25%) of Canadian Nass and Skeena River origin (Table 1). Stock

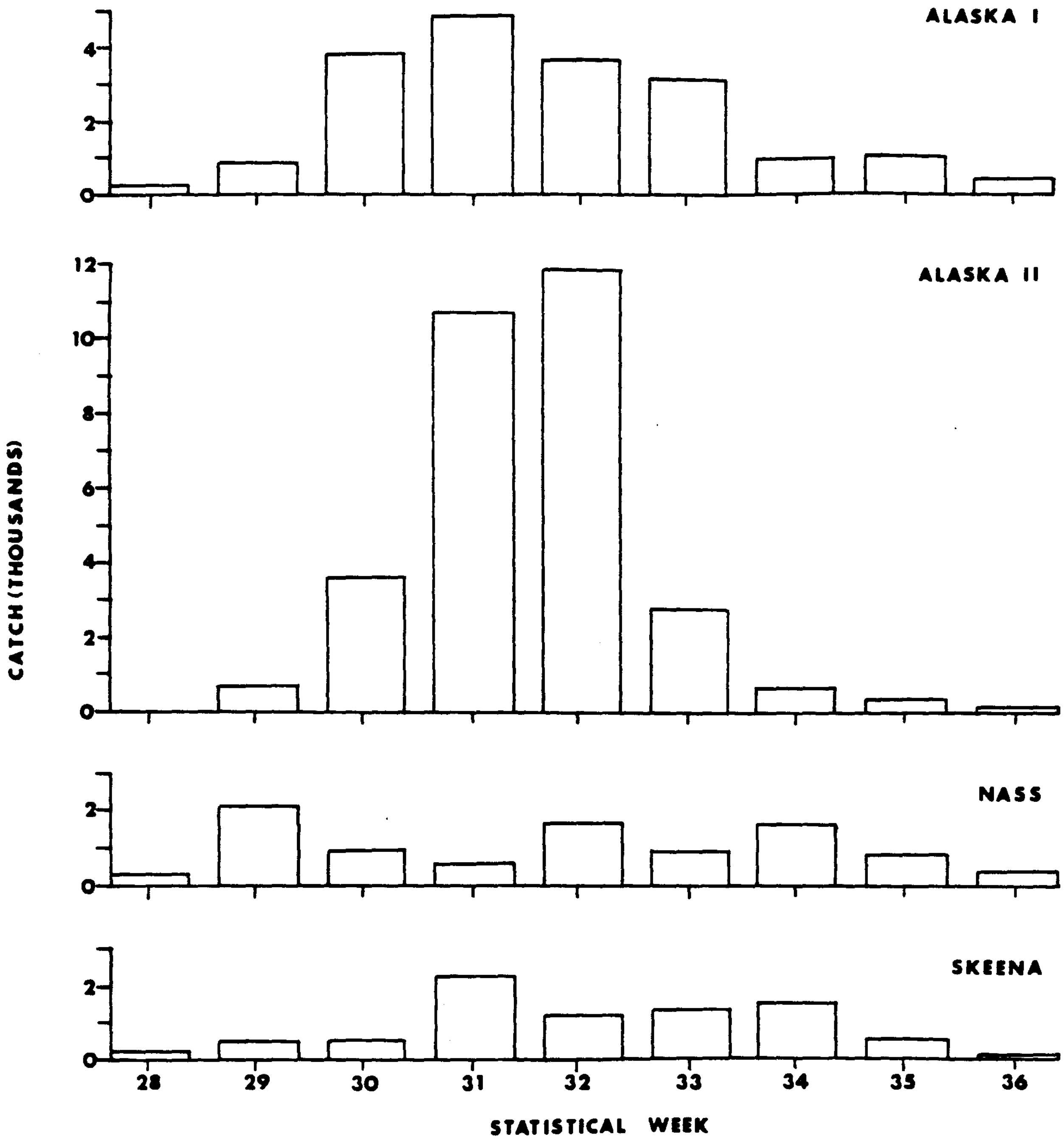

FIGURE 6. Weekly catch by stock in Alaska's District 101 purse seine fishery, 1986.

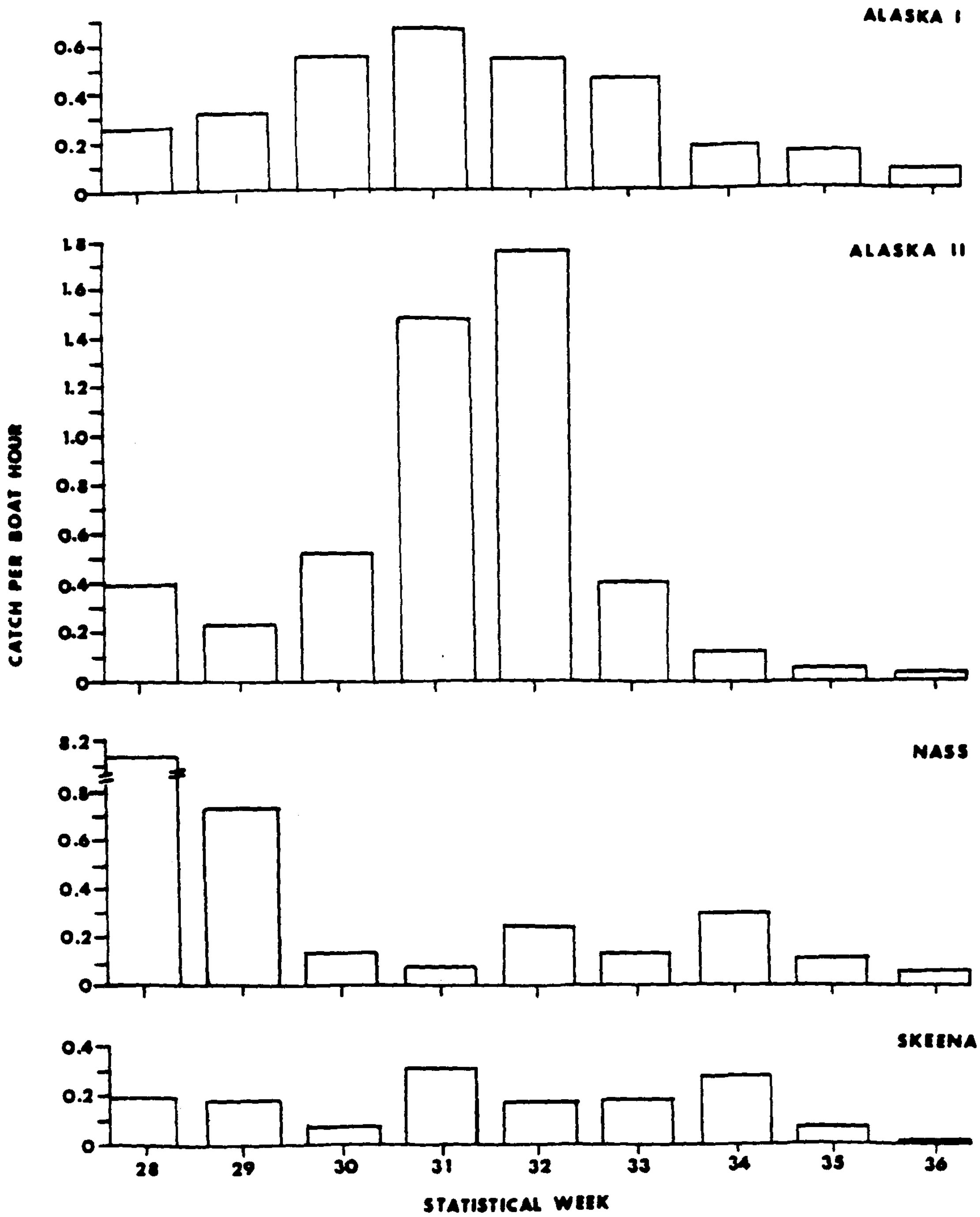

FIGURE 7. Weekly CPUE by stock in Alaska's District 101 purse seine fishery, 1986.

composition estimates in the latter portion of the season (17 August - 4 October) had to be pooled due to low catches. Alaska I stocks contributed an estimated 2 thousand fish (27%) to the catch during the period 10-16 August (week 33) and remained a important component of the catches throughout the remainder of the season. Alaska II type sockeye salmon (mostly McDonald Lake) were the most common stock in the catch contributing 3 thousand fish to the catch during the period 10-16 August and continuing to contribute a relatively large proportion until the end of the season. Nass River stocks contributed less than 2 thousand fish over the entire season while Skeena River contributions for the season were estimated at approximately 1 thousand fish (Appendix A.3)

District 103 Purse Seine Catch

Relatively low catches of sockeye salmon in the 1986 District 103 purse seine fishery resulted in small sample sizes necessitating pooling of the weekly stock composition estimates early and late in the season. The catch of 13.5 thousand sockeye salmon in District 103 was comprised of an estimated 10 thousand fish (72%) bound for Alaskan systems and 3.5 thousand (28%) bound for Canadian systems (Table 1). An estimated 7 thousand sockeye salmon (50% of the catch) were Alaskan II type (mostly McDonald Lake) while 3 thousand (22%) were from other Alaskan systems (Alaska I type). Nass River fish contributed 1 thousand (8%) fish and Skeena River, 2.5 thousand (20%) (Appendix B.4).

District 104 Purse Seine Catch

The catch of 444 thousand sockeye salmon in the 1986 District 104 purse seine fishery was comprised of 101 thousand (23%) Alaskan fish and 343 thousand (77%) Canadian Nass and Skeena River fish (Table 1). The maximum CPUE for all stocks combined occured in week 31 (27 July - 2 August) at 10.6 fish per boat hour.

Alaska I type stocks contributed an estimated 66 thousand fish (15%) to the seasons catch of 444 thousand. Catches of Alaska I type sockeye salmon were estimated at 2 thousand (31%) of the District 104 catch of 7 thousand in the initial opening 6-12 July (week 28) and increased to a maximum contribution of 17 thousand fish (17%) of a catch of 104 thousand during the period 27 July - 2 August, Alaska I stocks remained an important component of the catch throughout the end of the season. The maximum CPUE of Alaska I type stocks occured during the initial week of the season at 2.7 fish per boat hour. CPUE then dropped slightly for the next two weeks before increasing to 1.8 during the period 27 July - 2 August (week 31) (Figures 8 and 9, Appendix B.5).

Alaska II type stocks (mostly McDonald Lake) contributed 35 thousand fish (8%) to the season's catch. Estimated weekly contributions of McDonald Lake stocks to District 104 catches were less than 5 thousand fish except for the period 3-9 August (week 32) when they contributed 14 thousand (9%) to the catch of 154 thousand. While the proportion of McDonald Lake sockeye in

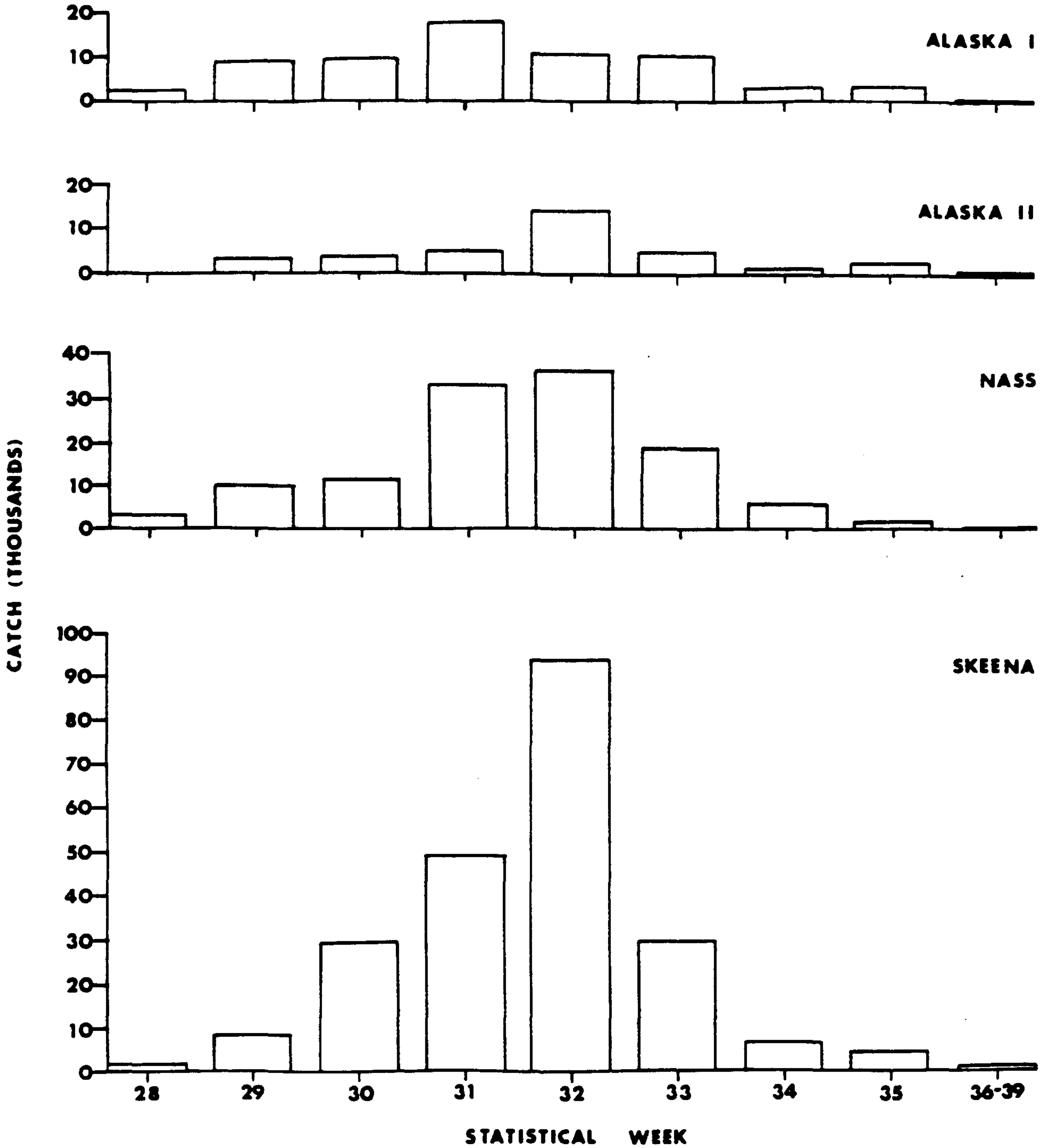

FIGURE 8. Weekly catch by stock in Alaska's District 104 purse seine fishery, 1986.

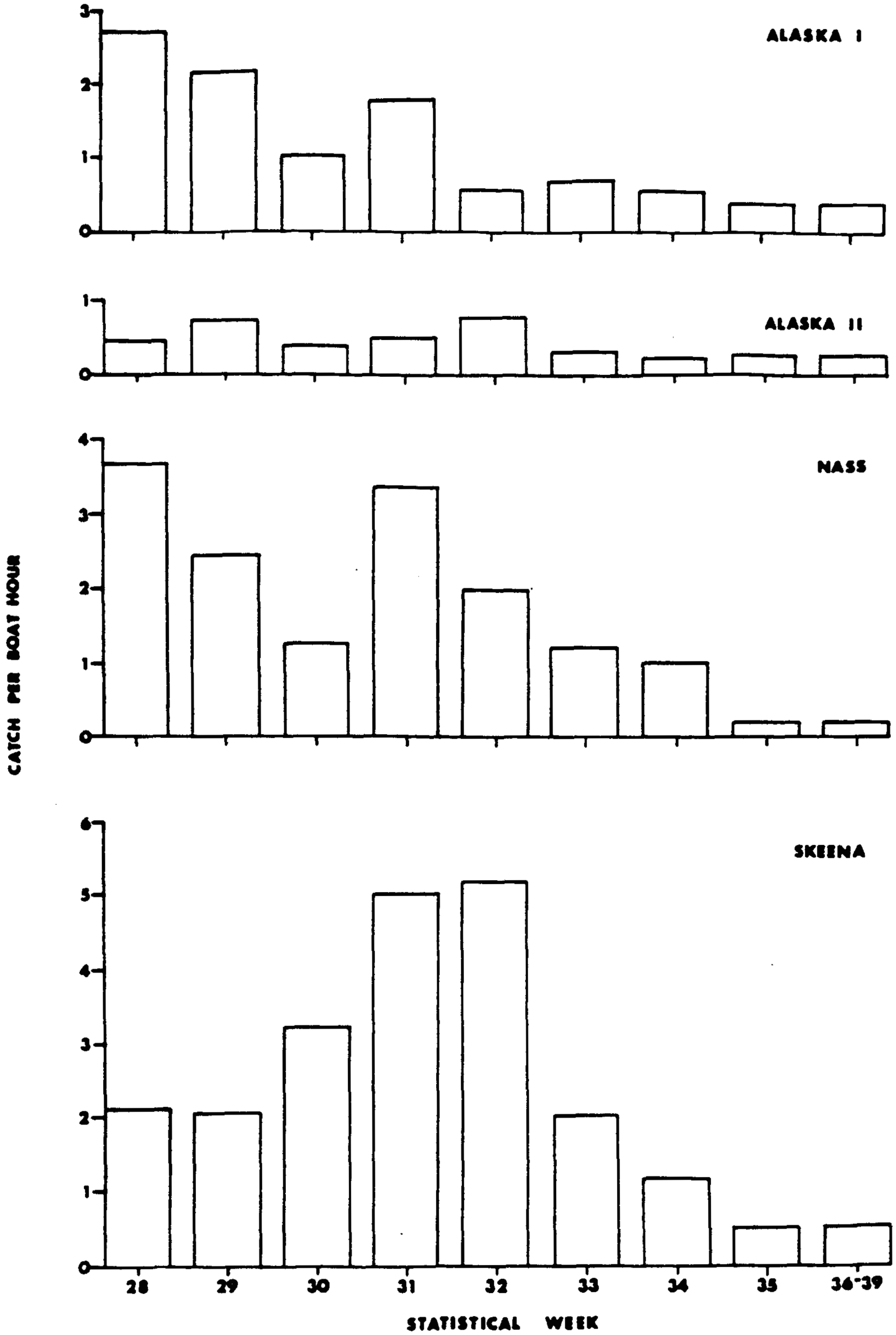

FIGURE 9. Weekly CPUE by stock in Alaska's District 104 purse seine fishery, 1986.

the catch increased later in the season, contributing 20% of the catch in late August and September the actual number of McDonald fish caught declined as did overall catches. The CPUE of McDonald Lake stocks was never greater than 0.8 fish per boat hour during the season with a maximum in week 32 (3-9 August).

Nass River stocks contributed an estimated 119 thousand fish (27%) to the catch over the season. Nass River sockeye salmon were the most numerous stock in early season catches and reached a maximum abundance earlier than than other stocks in District 104 contributing 36 thousand fish (24%) to the catch for the period 3-9 August (week 32). The CPUE of Nass River stocks was highest during the initial week of the season (6-12 July, week 28) at 3.6 fish per boat hour, rising to a second peak of 3.4 during the period 27 July - 2 August (week 31).

Skeena River stocks contributed 224 thousand (50%) of the seasons total catch of 444 thousand. Skeena River fish were the most common stock for all but the first two weeks of the season in District 104. Maximum catch of Skeena River sockeye salmon occured from 3-9 August (week 32) at an estimated 94 thousand fish 61% of the total catch of 154 thousand. CPUE of Skeena River stocks was relatively high early in the season and was over 5 fish per boat hour during the period 27 July - 9 Aug. (weeks 31 and 32). CPUE of this stock remained high relative to other stocks through the end of the season.

District_106_Drift_Gillnet_Catch

Of 146 thousand sockeye caught in the 1986 District 106 gillnet fisheries, 85 thousand (59%) were taken in District 106-41 (Sumner Strait) and 60 thousand (41%) in 106-30 (Clarence Strait) (Table 1).

Of the 60 thousand sockeye salmon harvested in the District 106-30 gillnet fishery an estimated 44 thousand (73%) were bound for Alaskan systems, 16 thousand (27%) were bound for the Canadian Nass and Skeena Rivers, and 116 (0.2%) were bound for the transboundary Stikine River system (including Tahltan Lake) (Appendix B.6 and B.7).

Alaska I type sockeye salmon contributed 29 thousand fish (48%) to the 1986 District 106-30 catch of 60 thousand and Alaska II (McDonald Lake) fish contributed 15 thousand (24%). Nass and Skeena River sockeye salmon contributed 16 thousand fish (27%) to the District 106-30 catch. Stikine River sockeye salmon stocks (not including Tahltan Lake stocks) contributed an estimated 1 hundred fish (0.2%). Very few Tahltan Lake fish were caught in District 106-30 in 1986.

Of a catch of 85 thousand sockeye salmon in 1986 in District 106-41 an estimated 56 thousand (66%) were bound for systems in Alaska, 26 thousand (31%) were bound for the Nass and Skeena Rivers in Canada, and 3 thousand (3%) were bound for the transboundary Stikine River (including Tahltan Lake stocks).

Alaska I sockeye salmon contributed 36 thousand fish (42%) to a catch of 85 thousand in District 106-41 fishery while Alaska II stocks accounted for 20 thousand (24%) of the catch. Canadian Nass and Skeena River sockeye salmon contributed 26 thousand fish 31% to the catch. Transboundary Tahltan Lake and Stikine River stocks contributed 2 thousand (2%) and 5 hundred (<1%), respectively

Detailed analyses of sockeye catches in District 106 and 108 as well as Canadian Stikine River catches are presented in Jensen et al. (1987).

District_108_Drift_Gillnet_Fishery_Catch

Of 4 thousand sockeye salmon taken in the District 108 gillnet fishery an estimated 9 hundred (22%) were of Alaskan origin, less than 100 (2%) were of Canadian Nass and Skeena River origin, and over 3 thousand (76%) were of transboundary Stikine River origin (including Tahltan Lake stocks).

DISCUSSION

Approximately 840 thousand of the 897 thousand sockeye salmon harvested in 1986 net fisheries in southern Southeast Alaska were (Districts 101-108) allocated to nation and/or stock of origin. The 57 thousand unallocated sockeye salmon were taken as incidental catches in seine fisheries which were of limited scope and duration, occured late in the season, and were generally targeted on pink salmon. The 1986 Alaska contribution of 284 thousand (34%) of a catch of 840 thousand is similar to Alaska contributions in previous years of 381 thousand (36%) of 1.05 million in 1985, 241 thousand (42%) of 573 thousand in 1984, 276 thousand (30%) of 920 thousand in 1983, and 334 thousand (43%) of 778 thousand in 1982.

Stock identification analyses in prior years have only distinguished between Alaskan and Canadian sockey stocks in most districts. Additional stock groups, Tahltan and Stikine River non-Tahltan fish, were added in districts where Stikine River fish were relatively numerous, e.g. Districts 106 and 108. In 1986 stock groups were further split in order to get a better idea of where the fish came from. The Canadian group was split into Nass River fish and Skeena River fish. The Alaskan group was also split in two, one group consisting of McDonald Lake fish and the other group the remainder of the Alaska stocks (Figure 2). Nass and Skeena River standards were combined for a single contribution estimate in District 106 because of mis-classification between Tahltan Lake stocks (accurate estimation of which is a primary objective of the District 106 analysis) and Nass and Skeena River stocks when estimated separately.

While the standard for the Alaska II group is formed exclusively of McDonald Lake samples a significant amount of misclassification may occur with other Alaskan stocks currently included in the Alaska I group. Because we were unable to quantify the extent of this misclassification or the stocks involved we felt more comfortable refering to the groups as Alaska I and Alaska II rather than Alaska I and McDonald Lake. McDonald Lake is by far the most productive sockeye salmon system in southern Southeast Alaska with an escapement greater than 100 thousand in recent years. Thus, contributions of Alaska II stocks should be viewed as an index of abundance of stocks primarily bound for McDonald Lake. Further analysis of similarities and differences of Alaskan stocks is planned and may result in further seprability of component Alaskan stocks. Most of the misclassification in the 4-way models is between groups of the same national origin. The modification of the discriminant models from 2-way Alaska vs. Nass/Skeena to 4-way Alaska I vs. Alaska II vs. Nass vs. Skeena changes national contribution rates by only a few hundred fish (Table 3).

Opening dates for the Southeast Alaska drift gillnet and purse seine fisheries are set by regulation respectively as the third Sunday in June and the first Sunday in July. Primary management objectives include meeting spawning escapement goals and compliance with provisions of the U.S.-Canada Pacific Salmon Treaty. Achievement of management objectives is accomplished through manipulation of fishing time and harvest areas. This manipulation of time and area openings affects stock composition of catches.

District 101-11 Drift Gillnet Catch

The 1986 District 101-11 gillnet harvest of 146 thousand sockeye salmon represents an average catch for this district where catches have ranged from a low of 88 thousand to a high of 191 thousand in the last 5 years.

Alaska I stocks contributed an estimated 8 thousand (6%) of the catch. Hugh Smith Lake, which is part of the Alaska I standard, is located just north of the District 101-11 fishery and has been the second most productive sockeye system in southern Southeast Alaska in recent years. The proximity and productivity of Hugh Smith Lake stocks may affect the magnitude of Alaska contributions to the District 101-11 fishery. In 1982, when the catch of Alaska fish in District 101-11 of 69 thousand fish was the highest in recent years (1982-1986), the Hugh Smith escapement of 57 thousand fish was also the highest. Similarly, District 101-11 Alaska catches (summed Alaska I and Alaska II) were the lowest in 1986 (13 thousand) when Hugh Smith escapement was the lowest (5 thousand).

Alaska II fish were the least abundant stock in the 1986 District 101-11 fishery contributing an estimated 5 thousand fish or 3% of the catch. McDonald Lake sockeye salmon contribute the great

Table 3. Comparison of the alternate model sockeye national origin estimates for District 101 drift gillnet and Districts 101 and 104 purse seine catches, 1986.

District	Type	4 Way Model	2 Way Model	4 Way Model Estimate	2 Way Model Estimate	Difference
101	Gillnet	AK.I AK.II	Alaska	12,732	11,555	1,177
		Nass Skeena	Nass/Skeena	132,899	134,076	
101	Seine	AK I AKII	Alaska	50,261	52,177	1,916
		Nass Skeena	Nass/Skeena	24,484	22,568	
104	Seine	AK I AKII	Alaska	100,966	108,524	7,558
		Nass Skeena	Nass/Skeena	343,024	335,466	

majority of fish allocated to the Alaska II group. The lake is located relatively far away from the fishery in upper Behn Canal.

The great majority of sockeye salmon taken in the 1986 District 101-11 fishery were of Nass River origin contributing 108 thousand (74%) of the catch. The magnitude of the Nass River contribution is not surprizing given the close proximity of the fishery to the river. Nass River stocks have a relatively early run timing and their contribution to the District 101-11 fishery was greatest early in the season. Strong returns of Nass River sockeye salmon taken in the District 101-11 fishery starting in week 28 (6-12 July) are also reflected in the District 101 seine fishery which opened that week and had Nass River stocks comprizing over 90% of the catch. The Skeena River is also relatively close to the district. In addition to the proximity of the rivers to the fishing districts much of the Nass and Skeena contributions to the fishery can be explained by the magnitude of their sockeye production which is much greater than systems in southern Southeast Alaska.

Skeena River stocks were the second most common stock taken in 1986 in District 101-11 contributing 25 thousand (17%) of the catch.

District_101_Purse_Seine_Catch

Areas and duration of openings in the District 101 seine fishery vary from week to week during the season. Areas and duration of openings also vary for the same week from year to year. Areas open and length of openings depend on the abundance and concentration of fish within the district. These differences make direct comparison of catch and stock composition estimates over time difficult unless the distribution of catch and effort within the district is known. The samples used to estimate stock contributions are drawn at random from the district as a whole and the specific location in the district where particular fish were caught is often not known. Thus, stock composition estimates for sub-districts of District 101 are not possible at this time.

The catch of 75 thousand sockeye salmon in the 1986 District 101 seine fishery is slightly less than the 5 year average of 80 thousand. The Alaskan contribution of 50 thousand fish is about average for the past 5 years although proportionally the Alaska contribution of 67% is slightly higher than the 5 year average of 59%.

Alaska I stocks contributed only a few hundred fish in the initial two weeks of the season (weeks 28-29, 6-19 July) when only the southeast portion of the district was open. Good catches occured in additional northern portions of the district opened in week 30 (20-26 July) and the catch of Alaska I stocks also increased to 4 thousand fish. Catches of Alaska I stocks remained at around 3 to 4 thousand fish a week for the next 3 weeks of the season (weeks 31-33, 27 July - 16 August) as the amount of the district open expanded north up Clarence Strait and sections of upper and lower Behm Canal were opened.

Alaska II stocks were uncommon in the first two weeks of the season. In week 31 and 32 (27 July - 9 August) when a section of upper Behm Canal near McDonald Lake was opened weekly catches of Alaska II stocks rose to 11 and 12 thousand fish a week respectively (59% and 65%). Much of the weekly District 101 catch of sockeye salmon was taken in those sections of Behm Canal open during these two weeks and it seems reasonable to assume that many of the Alaska II type fish were taken in these areas. Upper Behm Canal was closed in subsequent weeks and catches of Alaska II stocks declined rapidly to a few hundred fish a week for the remainder of the season.

Contributions of Nass River stocks were especially high during the initial week of the season when they accounted for 91% of the weekly catch. After this Nass River contributions declined steadily and were a relatively minor component of the harvest in the later portion of the season as catch and effort dispersed northward through the district. The relatively short initial opening and few boats fishing resulted in an extremely high CPUE of Nass River stocks of over 8 fish per boat hour for that period. Catches of Nass River fish in the District 101-11 gillnet fishery as well as catches in Canadian fisheries just across the border were also at a maximum early in the season.

Skeena River sockeye salmon generally do not contribute more than a few hundred fish to District 101 seine catches. Maximum catches of Skeena River stocks occured later in the season than did catches of other stocks.

District_102_Purse_Seine_Catch

The initial opening of District 102 occured in the second week (week 29, 13-19 July) of the general purse seine season in southern Southeast Alaska. We were unable to obtain samples from District 102 for the first 4 weeks it was open (weeks 29 through 32, 13 July - 9 August) when 21 thousand sockeye salmon were caught because they were mixed with fish from other districts before they could be sampled. Since 1982 generally very high proportions of Alaskan sockeye stocks are estimated in early season District 102 catches. Stock compositions in the later portion of the season were heavily Alaskan, as they have been since 1982.

District_103_Purse_Seine_Catch

High proportions of Alaskan fish are generally taken in the District 103 fishery as was the case in 1986. The initial opening in the District 103 purse seine fishery was relatively late in the season in week 32 (3-9 August). The fishery usually occurs relatively late in the year and the sockeye caught tend to be dark and close to spawning. The fishery is typically targeted on concentrations of pink salmon and also harvests incidental catches of other salmon species. The fishery occurs between the outer coastal islands and the west coast of Prince of Wales Island and, thus, is more of a terminal fishery and would be expected to harvest mostly Alaskan sockeye stocks. This has been the case since stock composition estimates for the district were begun in 1982.

District 104 Purse Seine Catch

All sections of the District 104 purse seine fishery are typically open throughout the season. Fishing effort in District 104 is generally concentrated near capes and headlands along the outer coast from Noyes to Dall Islands. There are no sockeye producing systems of any note in the area, however, there are several moderate producers located along the western shore of Prince of Wales Island. Substantial numbers of sockeye from the Canadian Nass and Skeena Rivers located just south of the Alaska-Canada border are commonly harvested in this fishery. Catches of northern migrating sockeye stocks in District 104 are uncommon and in general the direction of sockeye migration through the district seems to be to the south (Hoffman 1983, 1984). Catches in the district since 1982 have ranged from 285 thousand (1982) to 651 thousand (1983). Weather along the coast can significantly affect catches regardless of fishing effort or the abundance of fish. The 1986 District 104 purse seine catch of 444 thousand sockeye is about average for catches since 1982. In 1986 76% of the sockeye harvested in District 104 were of Nass and Skeena River origin. This is slightly higher than the average Canadian contribution estimated since 1982.

District 106 Drift Gillnet Catch

The primary objective of the District 106 scale pattern research is to estimate abundance of transboundary Stikine River and Tahltan Lake sockeye stocks. Under terms of the U.S.-Canada Pacific Salmon Treaty, in 1985 and 1986, 65% of any surplus Stikine sockeye salmon were reserved for U.S. harvest while 35% were to be allowed to pass through to the river where they would be available for Canadian harvest. For a detailed examination of the fisheries in this area as well as District 108 and Canadian fisheries in the Stikine River see Jensen et al. (1987).

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APPENDICES

Table A.1 Estimated contribution of sockeye salmon stocks originating in Alaska and Canada to Alaska's District 101-11 drift gillnet fishery, 1986.

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error 1/	90% C.I. Lower	Upper
6/15-6/21	Ak. I	22	59	14	4	10	109	5.5	56.2	17	201
Week 25	Ak. II	0	0	0	0	0	0	0.0	0.0	0	0
	Nass	59	799	343	270	141	1,612	81.5	143.9	1.375	1,849
	Skeena	80	139	0	0	39	258	13.0	134.7	36	480
	Total	161	997	357	274	190	1.979				
6/22-6/28	Ak. I	31	0	0	116	7	154	1.6	144.0	0	391
Week 26	Ak. II	0	0	0	0	0	0	0.0	0.0	0	0
	Nass	349	2.388	1.684	1.117	254	5.792	61.3	622.9	4.767	6.817
	Skeena	642	2.680	0	0	174	3.496	37.0	603.7	2.503	4.489
	Total	1,022	5.068	1.684	1.233	435	9.442				
6/29-7/05	Ak. I	110	379	0	133	11	633	7.1	345.6	64	1.202
Week 27	Ak. II	0	107	0	52	3	162	1.8	193.0	0	480
	Nass	363	2.335	2.901	903	109	6.611	74.4	517.9	5.759	7.463
	Skeena	917	533	0	0	27	1.477	16.6	420.7	785	2.169
	Total	1.390	3.354	2.901	1.088	150	8.883				
7/06-7/12	Ak. I	201	187	0	135	4	527	3.1	637.0	0	1.575
Week 28	Ak. II	0	0	0	28	0	28	0.2	77.0	0	155
	Nass	940	7.298	4.437	1.830	115	14.620	86.4	1283.8	12.508	16.732
	Skeena	1.091	642	0	0	15	1.748	10.3	1141.3	0	3.625
	Total	2.232	8.127	4.437	1.993	134	16.923				
7/13-7/19	Ak. I	93	859	92	765	5	1.814	4.4	1313.9	0	3.975
Week 29	Ak. II	573	1.312	0	262	6	2.153	5.2	1258.8	82	4.224
	Nass	1.088	16.194	9.109	4.434	88	30.913	74.3	2723.0	26.434	35.392
	Skeena	2.461	4.252	0	0	19	6.732	16.2	2577.0	2.493	10.971
	Total	4.215	22.617	9.201	5.461	118	41.612				
7/20-7/26	Ak. I	539	643	269	469	9	1.929	7.4	801.0	611	3.247
Week 30	Ak. II	310	0	0	0	1	311	1.2	254.5	0	730
	Nass	2.359	8.738	6.627	3.612	101	21.437	81.7	1618.9	18.774	24.100
	Skeena	1.036	1.514	0	0	12	2.562	9.8	1480.2	127	4.997
	Total	4.244	10.895	6.896	4.081	123	26.239				
7/27-8/02	Ak. I	191	0	110	329	7	637	3.7	455.5	0	1.386
Week 31	Ak. II	0	1.143	0	0	13	1.156	6.8	238.6	763	1.549
	Nass	2.467	1.771	5.108	1.990	128	11.464	67.0	873.9	10.026	12.902
	Skeena	2.366	1.448	0	0	45	3.859	22.5	689.2	2.725	4.993
	Total	5.024	4.362	5.218	2.319	193	17.116				
8/03-8/09	Ak. I	188	0	277	0	1	466	3.6	388.1	0	1.104
Week 32	Ak. II	0	374	0	0	1	375	2.9	115.9	184	566
	Nass	0	1.207	5.055	3.219	30	9.511	74.0	521.5	8.653	10.369
	Skeena	1.602	893	0	0	8	2.503	19.5	340.5	1.943	3.063
	Total	1.790	2.474	5.332	3.219	40	12.855				
8/10-8/16	Ak. I	167	139	220	92	5	623	11.9	177.3	331	915
Week 33	Ak. II	0	136	0	0	1	137	2.6	58.9	40	234
	Nass	0	404	1.893	1.309	29	3.635	69.2	197.7	3.310	3.960
	Skeena	622	230	0	0	7	859	16.3	113.9	672	1.046
	Total	789	909	2.113	1.401	42	5.254				
8/17-8/23	Ak. I	157	68	383	97	8	713	20.8	127.9	503	923
Week 34	Ak. II	0	66	0	62	2	130	3.8	52.4	44	216
	Nass	0	231	955	741	23	1.950	57.0	132.0	1.733	2.167
	Skeena	443	177	0	0	8	628	18.4	76.7	502	754
	Total	600	542	1.338	900	41	3.421				
8/24-8/30	Ak. I	71	41	204	79	6	401	27.2	56.9	307	495
Week 35	Ak. II	0	67	0	25	1	93	6.3	33.1	39	147
	Nass	0	173	296	129	9	607	41.2	61.0	507	707
	Skeena	287	81	0	0	6	374	25.4	50.2	291	457
	Total	358	362	500	233	22	1.475				
8/31-9/20	Ak. I	45	56	20	43	3	167	38.7	32.0	114	220
Wks 36-38	Ak. II	0	14	0	0	0	14	3.2	17.4	0	43
	Nass	0	34	88	47	4	173	40.0	31.9	121	225
	Skeena	27	49	0	0	2	78	18.1	26.9	34	122
	Total	72	153	108	90	9	432				
Fishery Total	Ak. I	1,815	2.431	1.589	2.262	76	8.173	5.6	1804.1	5.205	11.141
	Ak. II	883	3.219	0	429	28	4.559	3.1	1330.6	2.370	6.748
	Nass	7.625	41.572	38.496	19.601	1.031	108.325	74.4	3658.6	102.307	114.343
	Skeena	11.574	12.638	0	0	362	24.574	16.9	3362.6	19.043	30.105
	Total	21.897	59.860	40.085	22.292	1.497	145.631				

1/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in a like manner.

Table A.2 Estimated contribution of sockeye salmon stocks originating in Alaska and Canada to Alaska's District 101 seine fishery, 1986.

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error 1/	90% C.I. 1/ Lower	Upper
7/06-7/12	Ak. I	41	78	0	100	1	220	2.9	242.2	0	618
Week 28	Ak. II	0	332	0	0	2	334	4.4	169.8	55	613
	Nass	1.131	2.477	2.789	519	44	6.960	90.7	290.4	6.482	7.438
	Skeena	161	0	0	0	1	162	2.1	119.1	0	358
	Total	1.333	2.887	2.789	619	48	7.676				
7/13-7/19	Ak. I	457	140	201	88	14	900	21.4	196.7	576	1.224
Week 29	Ak. II	275	371	0	14	11	671	15.9	163.7	402	940
	Nass	266	984	654	182	31	2.117	50.3	177.9	1.824	2.410
	Skeena	510	0	0	0	9	519	12.3	114.8	330	708
	Total	1.508	1.495	855	284	65	4.207				
7/20-7/26	Ak. I	714	2.117	544	330	94	3.799	42.7	550.2	2.894	4.704
Week 30	Ak. II	802	2.208	0	499	89	3.598	40.5	507.7	2.763	4.433
	Nass	262	218	329	120	23	952	10.7	285.2	483	1.421
	Skeena	519	0	0	0	19	538	6.1	174.1	252	824
	Total	2.297	4.543	873	949	225	8.887				
7/27-8/02	Ak. I	1.328	1.491	1.316	617	48	4.800	26.1	1091.5	3.005	6.595
Week 31	Ak. II	1.925	7.047	0	1.684	107	10.763	58.5	1044.7	9.045	12.481
	Nass	0	0	436	157	6	599	3.3	187.4	291	907
	Skeena	1.265	959	0	0	24	2.248	12.2	450.3	1.507	2.989
	Total	4.518	9.497	1.752	2.458	185	18.410				
8/03-8/09	Ak. I	996	119	1.643	804	38	3.600	19.6	1031.2	1.904	5.296
Week 32	Ak. II	1.560	7.809	0	2.416	124	11.909	64.8	981.1	10.295	13.523
	Nass	524	0	687	469	18	1.698	9.2	351.9	1.119	2.277
	Skeena	609	560	0	0	14	1.183	6.4	364.0	584	1.782
	Total	3.689	8.488	2.330	3.689	194	18.390				
8/10-8/16	Ak. I	444	1.042	1.340	272	44	3.142	38.1	405.3	2.475	3.809
Week 33	Ak. II	510	1.291	0	949	41	2.791	33.8	362.8	2.194	3.388
	Nass	108	512	151	195	15	981	11.9	288.5	506	1.456
	Skeena	739	574	0	0	22	1.335	16.2	278.1	877	1.793
	Total	1.801	3.419	1.491	1.416	122	8.249				
8/17-8/23	Ak. I	37	322	528	80	16	983	20.2	189.5	671	1.295
Week 34	Ak. II	165	183	0	296	12	656	13.5	143.5	420	892
	Nass	389	547	445	264	30	1.675	34.4	237.1	1.285	2.065
	Skeena	561	959	0	0	30	1.550	31.9	234.4	1.164	1.936
	Total	1.152	2.011	973	640	88	4.864				
8/24-8/30	Ak. I	353	177	452	52	45	1.079	37.8	168.6	802	1.356
Week 35	Ak. II	107	154	0	94	15	370	13.0	122.7	168	572
	Nass	156	312	268	102	36	874	30.6	154.3	620	1.128
	Skeena	166	339	0	0	27	532	18.6	133.4	313	751
	Total	782	982	720	248	123	2.855				
8/31-9/06	Ak. I	119	86	189	42	19	455	37.7	99.0	292	618
Week 36	Ak. II	10	100	0	73	8	191	15.8	74.8	68	314
	Nass	75	94	152	79	18	418	34.6	85.5	277	559
	Skeena	63	71	0	0	9	143	11.8	55.8	51	235
	Total	267	351	341	194	54	1.207				
Fishery Total	Ak. I	4.489	5.572	6.213	2.385	319	18.978	25.4	1700.6	16.181	21.775
	Ak. II	5.354	19.495	0	6.025	409	31.283	41.9	1593.6	28.662	33.904
	Nass	2.911	5.144	5.911	2.087	221	16.274	21.8	725.4	15.081	17.467
	Skeena	4.593	3.462	0	0	155	8.210	11.0	739.0	6.994	9.426
	Total	17.347	33.673	12.124	10.497	1.104	74.745				

1/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in like manner.

Table A.3 Estimated contribution of sockeye salmon stocks originating in Alaska and Canada to Alaska's District 102 purse seine fishery, 1986. 1/

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error 2/	90% C.I. 2/ Lower	Upper
8/10-8/16 Week 33	Ak. I	0	359	1,319	318	24	2,020	27.2	298.2	1,529	2,511
	Ak. II	1,776	1,321	0	163	41	3,301	44.4	302.9	2,803	3,799
	Nass	533	144	190	283	14	1,164	15.6	261.4	734	1,594
	Skeena	0	940	0	0	13	953	12.8	230.0	575	1,331
	Total	2,309	2,764	1,509	764	92	7,438				
8/17-10/4 Wks 34-40	Ak. I	0	13	1,078	94	24	1,209	27.5	220.6	846	1,572
	Ak. II	1,406	672	0	49	41	2,168	49.3	221.4	1,804	2,532
	Nass	552	2	180	84	16	834	18.9	201.9	502	1,166
	Skeena	0	186	0	0	5	191	4.3	81.1	58	324
	Total	1,958	873	1,258	227	86	4,402				
Fishery Total	Ak. I	0	372	2,397	412	48	3,229	27.3	356.7	2,642	3,816
	Ak. II	3,182	1,993	0	212	82	5,469	46.2	367.4	4,865	6,073
	Nass	1,085	146	370	367	30	1,998	16.9	321.8	1,469	2,527
	Skeena	0	1,126	0	0	18	1,144	9.7	243.8	743	1,545
	Total	4,267	3,637	2,767	991	178	11,840				

1/ Contributions of sockeye salmon by area of origin were not estimated prior to statistical week 33 due to a lack of samples. The harvest during the unallocated weeks was 20,846 sockeye salmon.

2/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in a like manner.

Table A.4 Estimated contribution of sockeye salmon stocks originating in Alaska and Canada to Alaska's District 103 purse seine fishery, 1986.

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error 1/	90% C.I. 1/ Lower	Upper
8/03-8/16 Wks 32-33	Ak. I	419	144	497	36	13	1,109	26.6	256.0	688	1,530
	Ak. II	652	1,438	0	196	28	2,314	55.5	247.9	1,906	2,722
	Nass	0	146	37	17	2	202	4.8	119.1	6	398
	Skeena	290	249	0	0	7	546	13.1	127.6	336	756
	Total	1,361	1,977	534	249	50	4,171				
8/17-8/23 Week 34	Ak. I	386	117	516	140	33	1,192	23.2	265.8	755	1,629
	Ak. II	294	750	0	202	36	1,282	25.0	229.9	904	1,660
	Nass	49	356	169	33	17	624	12.1	260.1	196	1,052
	Skeena	1,032	946	0	0	61	2,039	39.7	272.5	1,591	2,487
	Total	1,761	2,169	685	375	147	5,137				
8/24-9/06 Wks 35-36	Ak. I	0	0	563	103	10	676	15.9	130.3	462	890
	Ak. II	1,509	1,521	0	148	47	3,225	75.7	177.3	2,933	3,517
	Nass	217	0	0	24	4	245	5.7	162.7	0	513
	Skeena	99	15	0	0	3	117	2.7	103.5	0	287
	Total	1,825	1,536	563	275	64	4,263				
Fishery Total	Ak. I	805	261	1,576	279	56	2,977	21.9	386.9	2,341	3,613
	Ak. II	2,455	3,709	0	546	111	6,821	50.3	378.3	6,199	7,443
	Nass	266	502	206	74	23	1,071	7.9	328.0	531	1,611
	Skeena	1,421	1,210	0	0	71	2,702	19.9	318.1	2,179	3,225
	Total	4,947	5,682	1,782	899	261	13,571				

1/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in a like manner.

Table A.5 Estimated contribution of sockeye salmon stocks originating in Alaska and Canada to Alaska's District 104 seine fishery, 1986.

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error 1/	90% C.I. 1/ Lower	Upper
7/06-7/12	Ak. I	503	1.167	354	133	40	2.197	30.5	342.9	1.633	2.761
Week 28	Ak. II	237	91	0	27	7	362	5.0	237.1	0	752
	Nass	384	1.313	680	508	53	2.938	40.9	379.5	2.314	3.562
	Skeena	278	1.384	0	0	33	1,695	23.6	367.2	1.091	2.299
	Total	1.402	3.955	1.034	668	133	7,192				
7/13-7/19	Ak. I	2,679	3.891	1.874	274	159	8.877	29.3	1472.7	6.454	11.300
Week 29	Ak. II	416	1,617	0	852	53	2.938	9.7	1103.9	1.122	4.754
	Nass	2.329	4.361	2.130	1.049	181	10,050	33.2	1610.1	7.401	12.639
	Skeena	2,895	5.386	0	0	161	8.442	27.9	1602.3	5.806	11.078
	Total	8.319	15.255	4.004	2.175	554	30.307				
7/20-7/26	Ak. I	2.818	3.314	2.246	809	71	9.258	17.2	2272.3	5.520	12.996
Week 30	Ak. II	842	1.460	0	1,074	26	3.402	6.3	1570.0	819	5.385
	Nass	728	5.869	1.687	3.206	90	11.580	21.6	3151.8	6.395	16.765
	Skeena	11.805	17.440	0	0	230	29.475	54.9	3368.6	23.934	35,016
	Total	16.193	28.083	3.933	5.089	417	53.715				
7/27-8/02	Ak. I	4.257	9.225	1.945	1.841	160	17.428	16.7	4469.9	10,075	24,781
Week 31	Ak. II	1,307	2.676	0	738	44	4.765	4.6	2905.0	0	9.544
	Nass	10,703	10.477	4.717	6.769	302	32.968	31.6	5865.5	23.313	42.617
	Skeena	14.139	34.565	0	0	460	49.164	47.1	6147.6	39.051	59,277
	Total	30.406	56.943	6.662	9.348	966	104.325				
8/03-8/09	Ak. I	799	0	5.748	3.781	186	10.514	6.8	3538.0	4.694	16.334
Week 32	Ak. II	2,646	7.556	0	3.742	251	14,195	9.2	3292.6	8,779	19.611
	Nass	7,289	5.255	10.770	11.964	638	35.916	23.3	10200.2	19.137	52.635
	Skeena	39,191	52,889	0	0	1.710	93,790	60.7	9707.4	77.821	109,759
	Total	49.925	65.700	16.518	19.487	2,785	154.415				
8/10-8/16	Ak. I	4.741	0	4.385	1.310	99	10.535	16.7	1867.4	7.463	13.607
Week 33	Ak. II	19	3.753	0	1.035	46	4.853	7.7	1479.6	2,419	7.287
	Nass	38	9.104	5.085	3,636	169	18,032	28.6	3886.8	11,638	24.426
	Skeena	14.241	15.154	0	0	284	29,679	47.0	3664.2	23,651	35.707
	Total	19,039	28,011	9.470	5.981	598	63,099				
8/17-8/23	Ak. I	946	0	1.613	512	37	3.108	19.6	495.2	2.293	3.923
Week 34	Ak. II	0	1.051	0	124	14	1.189	7.5	316.3	669	1.709
	Nass	3.195	1.105	600	502	65	5.467	34.4	1092.6	3.670	7.264
	Skeena	1.455	4.579	0	0	74	6.108	38.5	985.1	4.487	7.729
	Total	5.596	6.735	2.213	1.138	190	15.872				
8/24-8/30	Ak. I	2.090	80	897	300	23	3.390	28.3	712.5	2.218	4.562
Week 35	Ak. II	1.821	599	0	33	17	2.470	20.6	611.6	1.464	3.476
	Nass	0	952	357	492	11	1,812	15.1	288.6	1.337	2.287
	Skeena	3.345	942	0	0	30	4.317	36.0	491.9	3.508	5.126
	Total	7.256	2.573	1,254	825	81	11,989				
8/31-9/27	Ak. I	321	161	317	67	8	874	28.4	1692.6	0	3.658
Wks 36-39	Ak. II	559	38	0	7	7	611	19.9	172.5	327	895
	Nass	0	316	39	108	5	468	15.2	129.8	254	682
	Skeena	890	221	0	0	12	1.123	36.5	138.2	896	1,350
	Total	1,770	736	356	182	32	3,076				
	Ak. I	19.154	17.938	19,379	9,027	783	66.181	14.9	6858.9	54.898	77.464
Fishery	Ak. II	7,847	18.841	0	7,632	465	34.785	7.8	5070.6	26.444	43.126
Total	Nass	24.666	38.752	26.065	28.234	1.514	119.231	26.9	12942.7	97,340	140,522
	Skeena	88.239	132.560	0	0	2.994	223.793	50.4	12678.1	202.937	244.649
	Total	139.906	207,991	45.444	44.893	5.756	443.990				

1/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in like manner.

Table A.6 Estimated contributions of sockeye salmon stock groups to Alaska's Subdistrict 106-30 commericel drift gill net fishery, 19[illegible].

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard error a/	90% C.I. a/ Lower	Upper
6/15-6/21	Ak. I	176	324	39	14	0	553	85.9	43.5	481	625
Week 25	Ak. II	0	19	0	8	0	27	4.2	33.2	0	82
	Nas/Ske	2	34	23	5	0	64	9.9	26.6	20	108
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	178	377	62	27	0	644				
6/22-6/28	Ak. I	93	357	41	37	9	537	83.4	46.7	460	614
Week 26	Ak. II	21	1	0	23	1	46	7.1	37.7	0	108
	Nas/Ske	0	22	23	13	1	59	9.2	25.4	17	101
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	114	380	64	73	11	642				
6/29-7/05	Ak. I	642	2,405	276	125	91	3,539	82.4	266.8	3,100	3,978
Week 27	Ak. II	0	0	0	72	2	74	1.7	53.0	0	161
	Nas/Ske	55	276	152	173	17	673	15.7	157.8	413	933
	Tahltan	0	0	0	9	0	9	0.2	31.3	0	61
	Stikine	0	0	0	0	0	0	0.0			
	Total	697	2,681	428	379	110	4,295				
7/06-7/12 Week 28		No commercial fishery opening									
7/13-7/19	Ak. I	755	4,279	414	556	82	6,086	79.8	521.9	5,227	6,945
Week 29	Ak. II	64	661	0	375	15	1,115	14.6	441.6	389	1,841
	Nas/Ske	74	30	202	112	6	424	5.6	234.5	38	810
	Tahltan	0	0	0	2	0	2	.0	43.0	0	73
	Stikine	0	0	0	0	0	0	0.0			
	Total	893	4,970	616	1,045	103	7,627				
7/20-7/26	Ak. I	639	3,400	691	624	46	5,400	61.5	538.6	4,514	6,286
Week 30	Ak. II	183	1,096	0	795	18	2,092	23.8	457.5	1,339	2,845
	Nas/Ske	226	579	312	167	11	1,295	14.7	287.2	822	1,768
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	1,048	5,075	1,003	1,586	75	8,787				
7/27-8/02	Ak. I	892	2,579	1,392	691	36	5,590	39.0	796.7	4,279	6,901
Week 31	Ak. II	244	3,562	0	1,913	37	5,756	40.1	733.4	4,550	6,962
	Nas/Ske	673	1,487	372	442	19	2,993	20.9	458.2	2,239	3,747
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	1,809	7,628	1,764	3,046	92	14,339				
8/03-8/09	Ak. I	316	1,666	1,047	554	76	3,659	36.4	550.1	2,754	4,564
Week 32	Ak. II	234	2,320	0	725	71	3,350	33.3	492.2	2,540	4,160
	Nas/Ske	610	1,605	262	392	62	2,931	29.2	357.0	2,344	3,518
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	69	0	0	34	2	105	1.0	6.8	94	116
	Total	1,229	5,591	1,309	1,705	211	10,045				
8/10-8/16	Ak. I	207	843	618	356	18	2,042	35.2	263.9	1,608	2,476
Week 33	Ak. II	21	603	0	425	9	1,058	18.3	214.7	705	1,411
	Nas/Ske	728	1,221	378	346	23	2,696	46.5	204.7	2,359	3,033
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	956	2,667	996	1,127	50	5,796				
8/17-9/27	Ak. I	188	469	829	238	8	1,732	20.9	318.5	1,208	2,256
Wk 34-39	Ak. II	129	753	0	331	6	1,219	14.7	260.5	791	1,647
	Nas/Ske	1,136	2,470	965	740	25	5,336	64.4	285.1	4,867	5,805
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	1,453	3,692	1,794	1,309	39	8,287				
	Ak. I	3,908	16,322	5,347	3,195	366	29,138	48.2	1321.4	26,964	31,312
	Ak. II	896	9,015	0	4,667	159	14,737	24.4	1141.8	12,859	16,615
Fishery	Nas/Ske	3,504	7,724	2,689	2,390	164	16,471	27.2	790.1	15,171	17,771
Total	Tahltan	0	0	0	11	0	11	.0	53.2	0	98
	Stikine	69	0	0	34	2	105	0.2	166.8	0	379
	Total	8,377	33,061	8,036	10,297	691	60,462				

a/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in like manner.

Table A.7 Estimated contributions of sockeye salmon stock groups to Alaska's Subdistrict 106-41 commerical drift gill net fishery, 1986.

Dates	Group	Catch By Age Class					Total	Percent	Standard Error a/ of Total	90% C.I. a/	
		1.2	1.3	2.2	2.3	Other				Lower	Upper
6/15-6/21	Ak. I	253	1,166	96	130	14	1.659	85.3	70.5	1.543	1.775
Week 25	Ak. II	0	0	0	0	0	0	0.0			
	Nas/Ske	34	149	43	59	2	287	14.7	70.3	171	403
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	287	1,315	139	189	16	1.946				
6/22-6/28	Ak. I	425	1,694	177	198	33	2,527	82.9	154.9	2.272	2.782
Week 26	Ak. II	6	0	0	8	0	14	0.5	54.7	0	104
	Nas/Ske	61	265	23	89	6	444	14.6	124.6	239	649
	Tahltan	0	48	0	13	1	62	2.0	111.0	0	245
	Stikine	0	0	0	0	0	0	0.0			
	Total	492	2.007	200	308	40	3.047				
6/29-7/05	Ak. I	1,662	5.872	656	235	160	8.585	65.6	926.2	7.061	10.109
Week 27	Ak. II	0	363	0	163	10	536	4.1	637.7	0	1.585
	Nas/Ske	205	1,453	322	353	44	2.377	18.2	537.6	1.493	3.261
	Tahltan	0	960	0	193	22	1.175	9.0	630.5	138	2.212
	Stikine	0	0	0	412	8	420	3.2	537.5	0	1.304
	Total	1,867	8,648	978	1,356	244	13,093				
7/06-7/12 Week 28		No commercial fishery opening									
7/13-7/19 Week 29		No commercial fishery opening									
7/20-7/26	Ak. I	1,028	3.213	820	233	16	5.308	41.9	787.3	4.013	6.603
Week 30	Ak. II	102	3.017	0	1.420	14	4.553	35.9	710.4	3.384	5.722
	Nas/Ske	374	1,818	224	320	8	2,744	21.7	469.7	1.971	3,517
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	64	0	0	0	0	64	0.5	126.5	0	272
	Total	1,566	8,048	1,044	1,973	38	12,669				
7/27-8/02	Ak. I	1,374	3.418	1,978	563	36	7.369	38.3	1122.3	5.523	9.215
Week 31	Ak. II	0	4.469	0	2,087	33	6,589	34.2	995.0	4.952	8.226
	Nas/Ske	624	2,467	548	898	23	4,560	23.7	724.8	3.368	5.752
	Tahltan	0	708	0	0	4	712	3.7	583.5	0	1.672
	Stikine	16	0	0	0	0	16	0.1	217.6	0	374
	Total	2.014	11.062	2.526	3,548	96	19,246				
8/03-8/09	Ak. I	1.299	2,099	1.554	621	64	5.637	38.2	718.8	4.455	6,819
Week 32	Ak. II	0	3.238	0	1,166	52	4,456	30.2	657.2	3.375	5.537
	Nas/Ske	1,342	2,074	529	682	54	4.681	31.7	493.0	3,870	5,492
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	2.641	7.411	2.083	2.469	170	14,774				
8/10-8/16	Ak. I	286	1,133	1,516	393	27	3.355	23.9	613.4	2.346	4.364
Week 33	Ak. II	127	1,771	0	1,180	26	3.104	22.1	539.0	2.217	3.991
	Nas/Ske	1,301	3,882	1,069	1,172	62	7.486	53.2	519.5	6.631	8.341
	Tahltan	0	0	0	120	1	121	0.9	115.0	0	310
	Stikine	0	0	0	0	0	0	0.0			
	Total	1.714	6.786	2.585	2,865	116	14,066				
8/17-8/23	Ak. I	335	279	322	145	14	1,095	22.2	194.4	775	1.415
Week 34	Ak. II	0	677	0	237	12	926	18.8	172.3	643	1.209
	Nas/Ske	413	1,262	602	591	38	2,906	59.0	174.2	2.619	3.193
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	0	0	0	0	0	0	0.0			
	Total	748	2,218	924	973	64	4,927				
8/24-9/27	Ak. I	85	186	121	68	6	466	31.6	91.7	315	617
Wk 35-39	Ak. II	4	174	0	99	3	280	19.0	71.5	162	398
	Nas/Ske	121	351	177	70	9	728	49.4	75.0	605	851
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	1	0	0	0	0	1	0.1	26.7	0	45
	Total	211	711	298	237	18	1.475				
	Ak. I	6.745	19,060	7.240	2.586	370	36,001	42.2	1924.9	32.835	39.167
	Ak. II	239	13,709	0	6,360	150	20.458	24.0	1631.5	17.774	23.142
Fishery	Nas/Ske	4.475	13,721	3.537	4.234	246	26.213	30.8	1266.6	24.129	28.297
Total	Tahltan	0	1,716	0	326	28	2,070	2.4	873.8	633	3.507
	Stikine	81	0	0	412	8	501	0.6	594.1	0	1,478
	Total	11,540	48,206	10,777	13,918	802	85,243				

a/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% confidence intervals are affected in like manner.

Table A.8 Estimated contributions of sockeye salmon stock groups to Alaska's District 108 commerical drift gill net fishery, 1986.

Dates	Group	Catch By Age Class 1.2	1.3	2.2	2.3	Other	Total	Percent	Standard Error a/ of Total	90% C.I. a/ Lower	Upper
6/15-7/26	Ak. I	10	94	29	0	5	138	6.7	113.3	0	324
Wk 25-30	Ak. II	0	275	0	28	9	312	15.2	244.4	0	714
b/	Nas/Ske	9	22	9	8	1	49	2.4	91.3	0	199
	Tahltan	0	353	0	0	11	364	17.7	109.5	184	544
	Stikine	51	1,066	0	37	36	1,190	58.0	255.3	770	1,610
	Total	70	1,810	38	73	62	2,053				
7/27-8/02	Ak. I	0	0	12	8	1	21	3.1	11.8	2	40
Week 31	Ak. II	0	65	0	0	5	70	10.2	67.2	0	181
	Nas/Ske	0	0	3	2	0	5	0.7	7.3	0	17
	Tahltan	0	38	0	0	3	41	5.0	26.6	0	85
	Stikine	48	446	0	15	37	546	79.9	76.7	420	672
	Total	48	549	15	25	46	683				
8/03-9/13	Ak. I	0	0	12	11	3	26	1.8	26.5	0	70
Wk 32-37	Ak. II	26	291	0	0	46	363	25.0	180.5	66	560
b/	Nas/Ske	10	0	4	3	2	19	1.3	16.0	0	45
	Tahltan	0	0	0	0	0	0	0.0			
	Stikine	48	844	0	21	130	1,043	71.9	182.1	743	1,343
	Total	84	1,135	16	35	181	1,451				
	Ak. I	10	94	53	19	9	185	4.4	116.4	0	376
	Ak. II	26	631	0	28	60	745	17.8	311.2	233	1,257
Fishery	Nas/Ske	19	22	16	13	3	73	1.7	92.6	0	225
Total	Tahltan	0	391	0	0	14	405	9.7	112.7	220	590
	Stikine	147	2,356	0	73	203	2,779	66.4	322.8	2,248	3,310
	Total	202	3,494	69	133	289	4,187				

Actual Weekly Catches

Sub-District	Statistical week 25	26 c/	30	31	32	33	34	35	36	37
30-40	19	14	N/O	N/O	N/O	140	93	18	3	8
50-60	11	N/O	2,009	683	788	311	72	15	1	N/O
42									2	
Total	30	14	2,009	683	788	451	165	33	6	8

a/ The standard errors are minimum estimates since no estimates of the variance for stocks contributing 0 fish during a given week or for the 'other' age class are available. The 90% conficence intervals are affected in like manner.

b/ Small catches occured in some weeks and samples were insufficient to calculate stock compostions, therefore weeks 25, 26, and 30 were combined as were weeks 32-37. Actual catches by sub-district:

c/ There were no openings in Alaska's District 108 drift gill net fishery in weeks 27-29 in 1986.