



AGE, SEX AND SIZE COMPOSITION OF PACIFIC HERRING,  
(Clupea pallasii), FROM SOUTHEASTERN ALASKA DURING  
FALL, WINTER AND SPRING, 1972-1973

By:  
Stanley A. Moberly

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## ADF&G TECHNICAL DATA REPORTS

This series of reports is designed to facilitate prompt reporting of data from studies conducted by the Alaska Department of Fish and Game, especially studies which may be of direct and immediate interest to scientists of other agencies.

The primary purpose of these reports is presentation of data. Description of programs and data collection methods is included only to the extent required for interpretation of the data. Analysis is generally limited to that necessary for clarification of data collection methods and interpretation of the basic data. No attempt is made in these reports to present analysis of the data relative to its ultimate or intended use.

Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revisions will be made via errata sheets. Major revisions will be made in the form of revised reports.

AGE, SEX AND SIZE COMPOSITION OF PACIFIC HERRING, Clupea pallasii,  
FROM SOUTHEASTERN ALASKA DURING FALL, WINTER AND SPRING, 1972-73

By

Stanley A. Moberly, Fishery Biologist  
Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Ketchikan, Alaska

INTRODUCTION

This represents the third in a series of reports designed to annually discuss conditions of Southeastern Alaska herring, Clupea pallasii, stocks as determined by age composition and recruitment within those stocks. The format of this report is intended to provide the basis for the discussion of stock trends as additional years' data are acquired.

Historical Use of the Stocks

The historical use of the herring stocks is briefly described in the first report of this series (Moberly, 1973). Figure 1 shows the commercial harvest since 1900 in Southeast Alaska.

Description of Present Fishery

Southeastern Alaska herring fisheries are regulated by fishing district. Seasons and quotas as defined for the 1972-73 fishing season are the principal management tools (Table 1).

In District 1, subdistrict 1E was opened by emergency order on April 9 and closed when a 200 ton quota was filled.

In District 7 the quota was set by emergency order and closed when 775 tons were taken.

When possible quotas were established using hydroacoustics as the technique for assessment. A description of the equipment used in these first assessments is given in the Department's Informational Leaflet (Moberly and

Figure 1. Annual harvest of Southeastern Alaska herring.

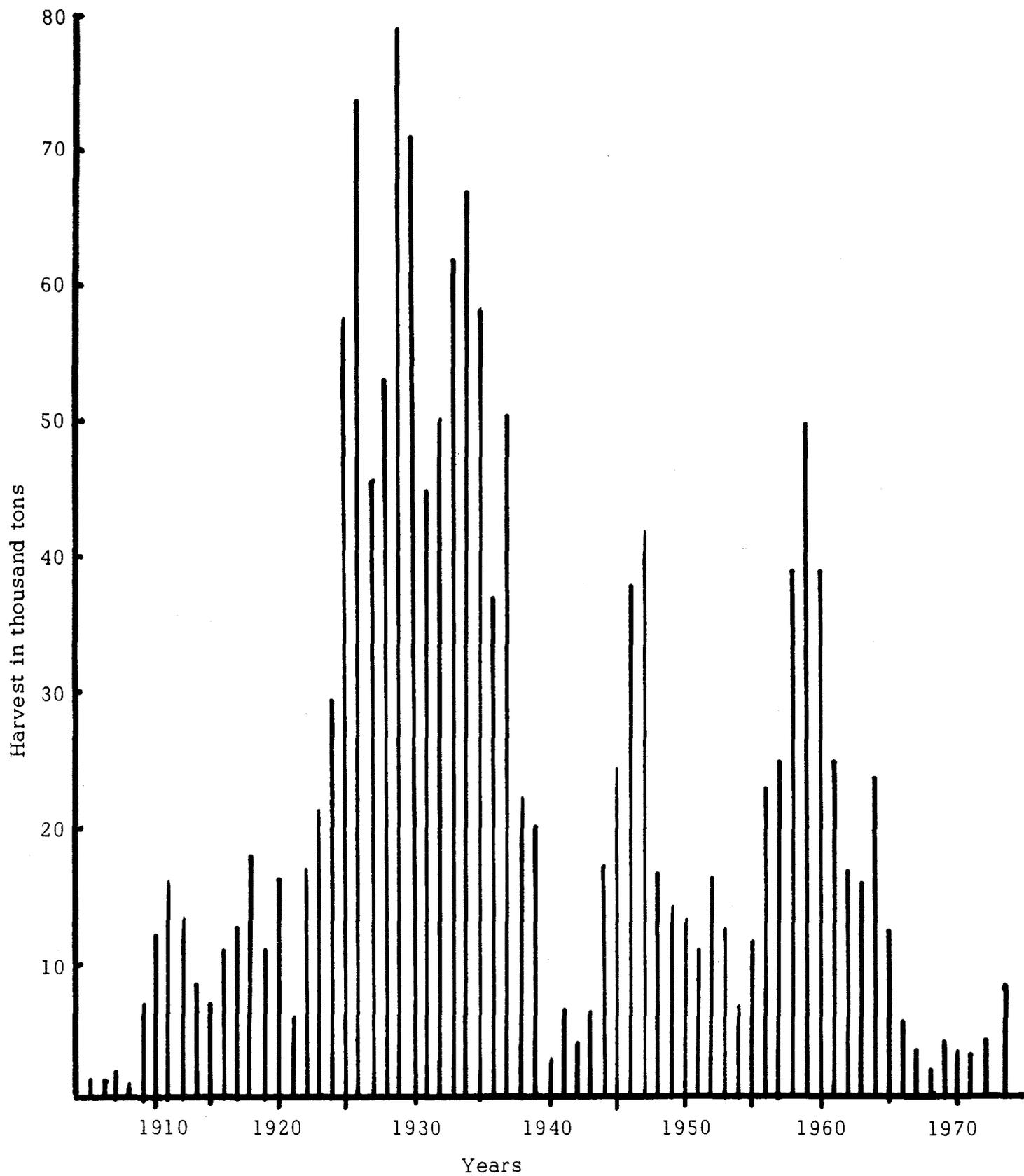


Table 1. Southeastern Alaska and Yakutat herring fishery regulations, 1972-73.

District	Season	Quota
2, 3, 4, 5, 9, 14, 16	June 1 - February 28	None
1	June 1 - February 28	None
6	June 1 - February 28	None
7	No closed season	None
8	June 1 - February 28	None
10	No closed season	200 tons
11A	No closed season	500 tons
11D	No closed season	500 tons
12	June 1 - February 28	None
13A	No closed season	100 tons
13B	No closed season	600 tons
15	No closed season	300 tons
Yakutat	No closed season	None

Thorne, 1974) and progress reports (Moberly and Thorne, 1971 and 1972) and described by Nunnallee (1973).

The stocks managed by hydroacoustical assessment were Carroll Inlet, Ward Cove, Deer Island, Anita Bay, Katlian Bay and Auke Bay. Assessment also was made on the Boca de Finas wintering stock but no fishing occurred on this stock.

The level of harvest was generally in the range of 10 to 15% of the estimated standing crop, except for Deer Island when the fishing mortality may have reached 55% of the standing crop.

The fisheries are conducted with purse seines and stationary pound nets during the winter and early spring months. Twenty-two seine vessels and two herring pounds participated in the fishery during 1972-73. This compares to 10 seine vessels and two pounds in 1970-71 and 12 seine vessels and two pounds in 1971-72. The increase in fishing gear during 1972-73 is attributed to the high prices paid for herring ripe with roe. The fish with roe were exported in the round to the oriental market.

Stocks fished primarily for food and bait were Carroll Inlet, George Inlet, Ward Cove, Bold Island - Moth Bay, Deer Island, Anita Bay, Scow Bay, Tenakee Inlet and Yakutat. Stocks fished primarily for roe were Helm Bay, Farragut Bay, Seymour Canal, Auke Bay and Bridget Cove.

Katlian Bay has been fished for roe in the past two years, however, during 1972-73 the harvest took place before the herring were ripe and thus the fish were sold as bait.

### Biological Studies

Herring have been studied for more than half a century in Southeast Alaska. Many of the major scientists and their work are listed in the first data report (Moberly, 1973).

The current studies consist of two phases. One phase utilizes special hydroacoustical gear aboard a state-owned vessel to locate and obtain biomass estimates of herring which are densely schooled in the wintering areas. The techniques are described in the Department's Information Leaflet (Moberly and Thorne, 1974). The second phase, which is reported in this series of data reports (Moberly, 1973 and 1974), is directed toward annually sampling known stocks for the determination of age, sex and size composition of the herring within each stock. This study phase is concerned with recruitment as an indi-

cator of stock condition and the mortality of individual age groups. These objectives are intended to provide data directly to management decisions.

Recruitment to the adult (mature) population occurs at ages 2, 3, and 4 for Southeast Alaska herring. Immatures (juveniles) appear to school separately. Only one juvenile population received a harvest during 1972-73. This harvest was from the Eastern Channel near Sitka and amounted to 17.1 tons (Table 2). Recruitment to the mature stocks is generally complete by age 4, and it is that group which best depicts relative strength of each particular year class.

## METHODS

### Collection of Herring

Herring for age and growth analysis were collected by several methods. The herring from the commercial purse seine fishery provided most of the samples with those fish being collected from the processors at the location the catch was landed. Some herring were collected on the spawning grounds just prior to or during active spawning by a small purse seine or a variable mesh gillnet.

When the variable mesh gillnet was used it was set for a very short period of time to help prevent saturation of any particular mesh size. When possible, repeated sets were made until a sufficient sample was obtained. All fish were frozen for later examination in the laboratory.

### Laboratory Methods

In the laboratory herring were thawed immediately prior to examination. The length of each fish from tip of snout to the caudal peduncle was recorded to the nearest whole millimeter on a caliper measuring board. The weight was taken from an electronic balance to the nearest whole gram. Sex was determined by dissection and a readable (non-regenerated) scale was selected for age determination. Scales were cleaned and dipped in a solution of 10% mucilage glue and water and placed unsculptured side down for permanent mounting on glass slides. Aging was done using a dissecting microscope, but original readings were not verified by a second reader. The fish were assigned an anniversary date for each complete growing season. All samples collected were taken after growth had ceased in the fall and before growth had resumed in the spring. For example, if a fish was hatched in the spring of 1969 and collected in the fall of 1970, two growing seasons were assumed, and the fish

Table 2. Commercial herring catch in short tons for Southeastern Alaska and Yakutat, winter and spring, 1972-73.

Fishing Location	Short Tons Per Month									Total
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	
Carroll Inlet				65.4	129.5	389.4	32.0			616.3
George Inlet					554.7					554.7
Ward Cove					80.4	272.8				303.2
Helm Bay								194.1		194.1
Bold Island (Moth Bay)						130.0				130.0
Deer Island			83.5	521.4	6.6	163.2				774.7
Anita Bay							41.6			41.6
Scow Bay	0.9	114.2	190.7		76.1	219.1	30.0	3.6		634.6
Farragut Bay								199.4		199.4
LaConte			5.5							5.5
Katlial Bay							597.1			597.1
Eastern Channel							17.1			17.1
Lisianski Inlet								100.0		100.0
Seymour Canal								377.1	129.1	506.2
Tenakee Inlet (Long Bay)		138.2	67.6							205.8
Auke Bay								497.4		497.4
Bridget Cove								301.2		301.2
Yakutat								55.2	102.6	157.8
Totals	0.9	252.4	374.3	586.8	847.3	1174.5	717.8	1728.0	231.7	5886.7

recorded as age 2. If the same fish had been collected in the spring of 1971 (before growth had resumed), it still would have been recorded as age 2.

All scales and original data are filed and available for review upon request.

## RESULTS

This section presents age, size and sex composition data for each of 21 samples collected from 19 locations throughout Southeast Alaska.

It is not the intent of this report to prepare lengthy comment on this data, but rather to document the data for future reference when discussing various stocks.

Herring were sampled from the commercial harvest in 16 separate areas. The remaining five samples were obtained by sampling on the spawning grounds, where no commercial fishery occurred (Figure 2).

### Ketchikan Area

Six concentrations of herring were sampled between January 3 and May 2 in the Ketchikan area. Samples from Carroll Inlet (Table 3), George Inlet (Table 4), Ward Cove (Table 5) were collected from the commercial purse seine fishery on the wintering grounds. For the first time, in the spring of 1973, a commercial harvest took place on the stock in Helm Bay during April when the herring were suitable for sale as roe herring. The quota was set at 200 tons and was filled in one night of fishing on April 11 (Table 6). On May 2, during active spawning in the Helm Bay area, a second sample was collected by variable mesh gillnet (Table 7). The age and growth data shows few similarities between the two samples (Tables 6 and 7).

The sixth sample was collected during active spawning in Smugglers Cove on Annette Island on April 9 (Table 8). These fish showed some similarities to the Carroll Inlet (Table 3) and George Inlet (Table 4) fish. A mark and recovery experiment would help determine if this spawning population and the wintering populations are related.

The 1970 year class dominated the samples in the Ketchikan area. Also, quite a few fish were collected from the 1971 year class and this may be an indication of considerable strength during that year.

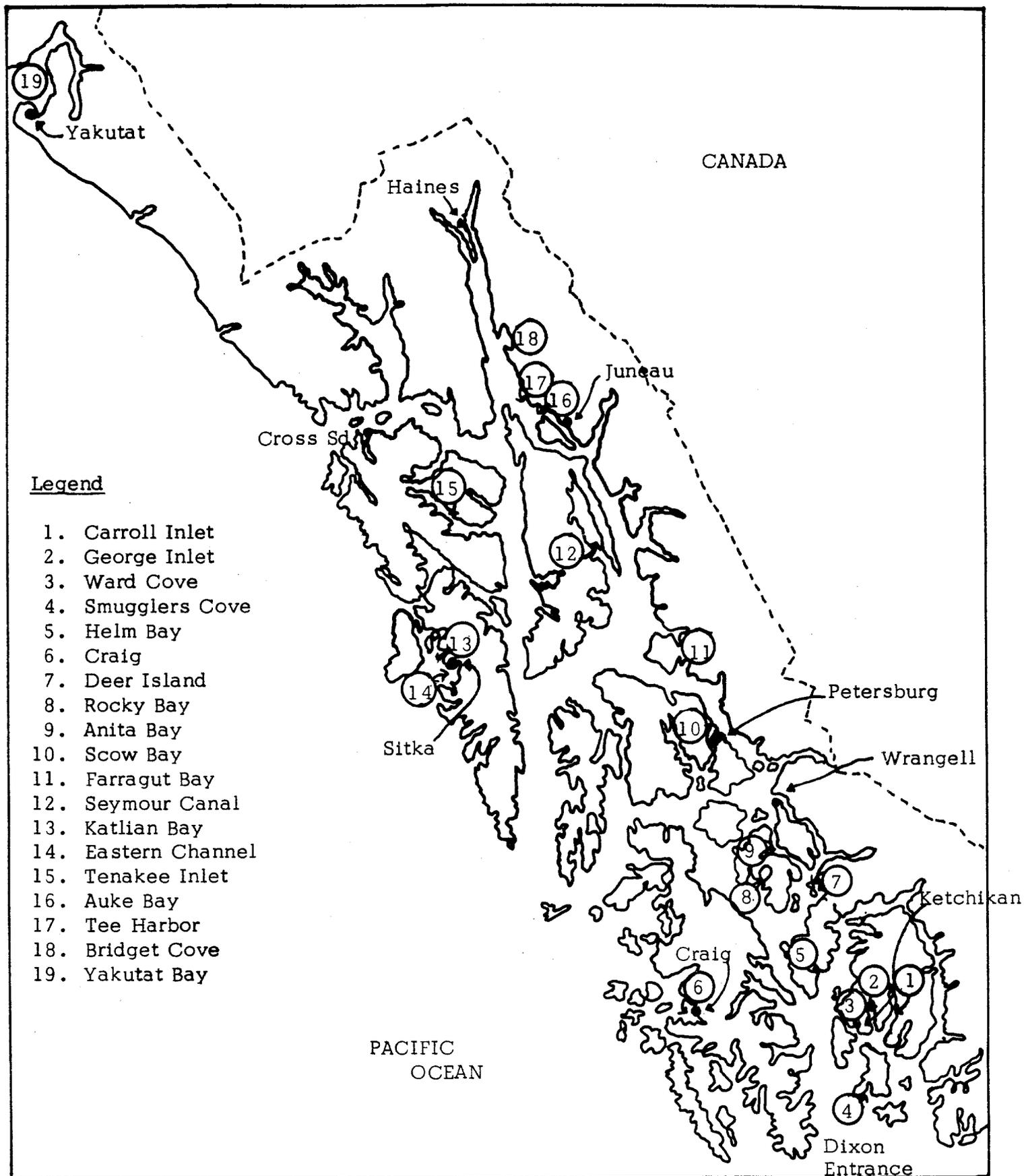


Figure 2. Sampling locations of Southeastern Alaska herring studies, winter and spring of 1972-73.

Table 3. Age, sex, weight and standard length composition of 927 herring collected from the commercial purse seine fishery of Carroll Inlet, Alaska, January 3 and 24, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II*	1971	13	2.6	154	43	14	3.3	147	35	2.9
III*	1970	243	48.3	171	62	234	55.2	171	61	54.4
IV	1969	13	2.6	188	83	12	2.8	197	98	2.7
V	1968	94	18.7	207	119	55	13.0	206	116	16.1
VI	1967	105	20.9	213	137	77	18.2	218	146	19.6
VII	1966	10	2.0	221	159	11	2.6	225	159	2.3
VIII	1965	9	1.8	232	183	3	0.7	226	165	1.3
IX	1964	8	1.6	233	176	12	2.8	237	188	2.2
X	1963	6	1.2	242	211	4	0.9	254	218	1.1
XI	1962					1	0.2	247	204	0.1
XII	1961	1	0.2	246	237	1	0.2	213	142	0.1
XIII	1960									
XIV	1959	1	0.2	267	236					0.1
Totals		503				424				
Mean Length				190.5				188.5		
Mean Weight				96.6				92.7		
Sex Composition - 54.2% males and 45.8% females										
* 40 II sex not determined - 141 mm, 32 grams, 47 III sex not determined - 162 mm, 51 grams.										

Table 4. Age, sex, weight and standard length composition of 445 herring collected from the commercial purse seine fishery of George Inlet, Alaska, January 14, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II*	1971	20	8.4	151	39	20	9.7	154	39	17.8
III*	1970	172	72.3	168	57	165	79.7	169	56	69.1
IV	1969	15	6.3	186	71	10	4.8	169	66	4.8
V	1968	21	8.8	197	99	7	3.4	200	99	5.4
VI	1967	9	3.8	201	109	4	1.9	214	131	2.5
VII	1966					1	0.5	219	130	0.2
VIII	1965	1	0.4	200	118					0.2
Totals		238				207				
Mean Length				171.7				168.5		
Mean Weight				62.8				58.1		
Sex Composition - 53.1% males and 46.9% females										
* 52 II sex could not be determined - 141 mm, 30 grams, 20 III sex could not be determined - 144 mm, 33 grams.										

Table 5. Age, sex, weight and standard length composition of 469 herring collected from the commercial purse seine fishery of Ward Cove, Alaska, January 21, 1973. (Subsampled from 1,065 fish.)

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II*	1971	4	1.7	154	44	3	1.3	155	42	1.5
III*	1970	93	39.6	171	59	87	37.2	171	61	38.4
IV	1969	16	6.8	196	93	21	9.0	195	92	7.9
V	1968	55	23.4	206	113	66	28.2	207	117	25.8
VI	1967	43	18.3	217	138	44	18.8	218	140	18.6
VII	1966	16	6.8	218	143	4	1.7	222	146	4.3
VIII	1965	5	2.1	232	178	2	0.9	238	177	1.5
IX	1964	3	1.3	234	183	4	1.7	241	191	1.5
X	1963					3	1.3	242	206	0.6
Totals		235				234				
Mean Length				194.5				195.8		
Mean Weight						98.0				100.6
Sex Composition - 51.5% males and 48.5% females										

\*32 age II fish, sex not determined - 144 mm, 33 grams, 40 age III fish, sex not determined - 156 mm, 43 grams.

Table 6. Age, sex, weight and standard length composition of 607 herring collected from the commercial purse seine fishery of Helm Bay, Alaska, April 11, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II	1971	1	0.4	155	45					0.2
III	1970	58	23.9	174	66	37	17.6	174	68	21.0
IV	1969	5	2.1	204	125	5	2.4	198	104	2.2
V	1968	38	15.6	205	123	37	17.6	213	135	16.6
VI	1967	92	37.9	216	137	85	40.5	217	148	39.1
VII	1966	18	7.4	222	153	15	7.1	218	145	7.3
VIII	1965	12	4.9	229	162	16	7.6	227	174	6.2
IX	1964	10	4.1	233	172	9	4.3	232	177	4.2
X	1963	5	2.1	235	179	6	2.9	235	184	2.4
XI	1962	3	1.2	234	193					0.7
XII	1961									
XIII	1960	1	0.4	246	180					0.2
Totals		243				210				
Mean Length				206.0				210.3		
Mean Weight						122.9				134.5
Sex Composition - 59.5% males and 40.5% females										

Table 7. Age, sex, weight and standard length composition of 265 herring collected by variable mesh gillnet from Helm Bay, Alaska, May 2, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II	1971	1	0.7	158	46					0.4
III	1970	101	68.2	165	53	69	59.0	167	58	64.2
IV	1969	3	2.0	173	61	5	4.3	168	65	3.0
V	1968	8	5.4	202	117	9	7.7	213	133	6.4
VI	1967	19	12.8	209	134	22	18.8	212	136	15.5
VII	1966	4	2.7	216	157	2	1.7	220	129	2.3
VIII	1965	3	2.0	218	150	4	3.4	229	192	2.6
IX	1964	4	2.7	224	165	4	3.4	229	178	3.0
X	1963	3	2.0	227	156	1	0.9	230	162	1.5
XI	1962	1	0.7	228	199	1	0.9	233	146	0.8
XII	1961									
XIII	1960	1	0.7	247	162					0.4
Totals		148				117				
Mean Length				179.1				185.3		
Mean Weight					78.9				90.0	
Sex Composition - 55.6% males and 44.4% females										

Table 8. Age, sex, weight and standard length composition of 340 herring collected by variable mesh gillnet from Smugglers Cove (Annette Island), Alaska, April 19, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	105	53.0	176	59	62	43.7	177	60	49.1
IV	1969	8	4.0	198	90	8	5.6	202	93	53.8
V	1968	25	12.6	214	109	22	15.5	211	116	13.8
VI	1967	43	21.7	218	122	34	23.9	215	129	22.6
VII	1966	8	4.0	226	141	5	3.5	235	172	3.8
VIII	1965	4	2.0	231	138	6	4.2	233	175	2.9
IX	1964	1	0.5	239	159	4	2.8	239	170	1.5
X	1963	2	1.0	262	208	1	0.7	233	188	0.9
XI	1962	2	1.0	229	146					0.6
Totals		198				142				
Mean Length				195.7				199.2		
Mean Weight					87.9				99.8	
Sex Composition - 59.2% males and 40.8% females										

### Prince of Wales Island Area

No commercial fishery occurred on the west coast of Prince of Wales Island during the winter and spring of 1971-72. Sampling was done in the Craig area in conjunction with monitoring the spawn on kelp harvest (Table 9). A sample was not collected from the McFarland Island area.

The sample from the Craig area was collected with a small purse seine on March 22 and 27. The Craig stock shows good strength in the 1966 through 1969 year classes. The sample from the previous season showed strength in the year classes from 1965 through 1968 and in 1970-71 from 1964 through 1967. In all three seasons the strength is shown in ages 4 through 7.

### Wrangell Area

Samples were collected from the commercial fishery at Deer Island (Table 10), the spawning grounds at Rocky Bay (Table 11), the commercial fishery at Anita Bay (Table 12), and the commercial fishery in Scow Bay (Table 13). Good strength is shown in the 1967, 1968 and 1970 year classes from Deer Island. The mean weight of the population was down slightly from the previous years because of the strong influence of the 1970 year class.

For the second year in a row a sample was collected from Rocky Bay during active spawning by variable mesh gillnet. The 1967 year class still dominates this stock. The 1964 and 1965 year classes still comprise 32.1% of the stock, compared to 38.3% the year before. The males made up 70.3% of the samples, as was the case in 1971-72 when they comprised 69.5%. It is not known if this is a naturally occurring phenomena or if selectivity of the gear or time of the sampling is responsible. Another possibility is that the role of the males and females in the spawning act does not occur simultaneously. The samples from Rocky Bay do not compare well with the samples from Deer Island. Probably the fish sampled from Rocky Bay winter in nearby Barnett Inlet.

The third sample from this area was collected from the commercial purse seine fishery in Anita Bay (Table 12). No fishing occurred in Anita Bay during the 1971-72 season, therefore, a sample was not obtained. However, it is interesting to compare the 1972-73 sample with the one collected in 1970-71. The 1965 through 1968 year classes still dominate the sample as in 1970-71.

The sample from Scow Bay, Wrangell Narrows (Table 13) compares well with the sample collected from this area the previous season. The 1965 year class still shows good strength, followed by a relatively weak 1966 year class. Good strength is also shown in the year classes 1967 through 1970.

Table 9. Age, sex, weight and standard length composition of 502 herring collected by small purse seine at Craig, Alaska, March 22 and 27, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II	1971	1	0.3	175	61					0.2
III	1970	23	7.6	175	68	20	9.9	183	79	8.6
IV	1969	40	13.3	193	88	41	20.2	196	93	16.1
V	1968	46	15.3	205	111	35	17.2	208	123	16.1
VI	1967	91	30.2	213	134	53	25.6	217	146	28.5
VII	1966	55	18.3	217	144	33	16.3	218	149	17.5
VIII	1965	25	8.3	221	153	9	4.4	221	159	6.7
IX	1964	16	5.3	232	138	8	3.9	230	180	4.4
X	1963	2	0.7	226	152	3	1.5	234	185	1.0
XI	1962	2	0.7	223	160	1	0.5	218	117	0.6
XII	1961									
XIII	1960					1	0.5	222	129	0.2
Totals		299				203				
Mean Length				210.0				209.0		
Mean Weight						123.7				127.4
Sex Composition - 59.9% and 40.1% females										

Table 10. Age, sex, weight and standard length composition of 347 herring collected from the commercial purse seine fishery of Deer Island, Alaska, December 9 to 29, 1972.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II*	1971	4	2.5	157	51	1	0.5	164	59	1.7
III*	1970	51	31.3	168	61	51	27.7	170	64	30.9
IV	1969	6	3.7	189	94	10	5.4	192	101	4.5
V	1968	40	24.5	203	110	40	21.7	205	118	22.5
VI	1967	38	23.3	207	128	58	31.5	214	143	27.0
VII	1966	10	6.1	214	142	12	6.5	216	156	6.2
VIII	1965	8	4.9	219	153	6	3.3	221	152	3.9
IX	1964	5	3.1	223	173	5	2.7	229	184	2.8
X	1963	1	0.6	222	152	1	0.5	241	199	0.6
Totals		163				184				
Mean Length				193.4				199.3		
Mean Weight						103.2				115.3
Sex Composition - 47.6% males and 52.4% females										

\* 1 II sex not determined - 134 mm, 26 grams.

\*\* 8 III sex not determined - 161 mm, 49 grams.

Table 11. Age, sex, weight and standard length composition of 212 herring collected by variable mesh gillnet in Rocky Bay, Alaska, April 23, 1973\*.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	7	4.7	184	64	2	3.1	184	71	4.2
IV	1969	3	2.0	195	83					1.4
V	1968	15	10.1	218	118	6	9.4	221	133	9.9
VI	1967	60	40.5	219	125	30	46.9	222	138	42.5
VII	1966	12	8.1	224	133	5	7.8	223	134	8.0
VIII	1965	25	16.9	227	140	8	12.5	229	160	15.6
IX	1964	24	16.2	228	148	11	17.1	228	148	16.5
X	1963	1	0.7	224	112	2	3.1	239	186	1.4
XI	1962	1	0.7	237	171					0.5

Totals 148 64  
 Mean Length 220.2 223.1  
 Mean Weight 127.6 141.1  
 Sex Composition - 70.3% males and 29.7% females

\* Set made from float plane. Several sets made for a short time, each to avoid saturation of any one mesh size. Sampling done during active spawning.

Table 12. Age, sex, weight and standard length composition of 330\* herring collected from the commercial purse seine fishery of Anita Bay, Alaska, March 7, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	3	2.1	178	74	3	2.8	182	78	2.4
IV	1969	9	6.3	189	88	8	7.5	184	87	6.8
V	1968	43	30.1	197	102	35	32.7	198	109	31.2
VI	1967	44	30.8	204	117	32	29.9	203	122	30.4
VII	1966	24	16.8	208	123	6	5.6	208	127	12.0
VIII	1965	11	7.7	204	115	17	15.9	211	138	11.2
IX	1964	7	4.9	209	125	4	3.7	207	135	4.4
X	1963	1	0.7	192	106	2	1.9	234	175	1.2
XI	1962	1	0.7	222	130					0.4

Totals 143 107  
 Mean Length 201.5 201.7  
 Mean Weight 111.1 118.2  
 Sex Composition - 53.1% males and 46.9% females

\* 36 males and 44 females not aged.

Table 13. Age, sex, weight and standard length composition of 468 herring collected from the commercial purse seine fishery of Scow Bay, Alaska, February 22, 1973 \*\*.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	49	20.7	159	55	55	27.8	162	57	23.9
IV	1969	39	16.5	176	76	36	18.2	175	80	17.2
V	1968	43	18.1	188	96	38	19.2	192	101	18.6
VI	1967	35	14.8	190	105	17	8.6	193	105	12.0
VII	1966	11	4.6	203	129	8	4.0	205	122	4.4
VIII	1965	38	16.0	205	132	29	14.6	212	135	15.4
IX	1964	11	4.6	208	144	5	2.5	211	140	3.7
X	1963	4	1.7	216	154	3	1.5	211	146	1.6
XI	1962	1	0.4	216	146	4	2.0	222	157	1.1
XII	1961	3	1.3	213	155	3	1.5	229	187	1.4
XIII	1960	1	0.4	220	160					0.2
XIV	1959	2	0.8	217	166					0.5
Totals		237				198				
Mean Length				186.1		186.1				
Mean Weight					97.8		95.4			
Sex Composition - 52.0% males and 48.0% females										

\* 8 smelt in sample.

\*\* 17 females were not recorded except for calculation of sex composition.  
16 males were not recorded except for calculation of sex composition.

#### Petersburg Area

Samples were collected from the same two locations as in the past two seasons, Farragut Bay (Table 14) and Seymour Canal (Table 15).

The Farragut Bay herring are interesting in the fact that the 1965 year class is still dominating the population. When this stock was first sampled in 1970-71, the 1965 year class (6 year olds) comprised 61.3% of the population. The following year as 7 year olds, this year class comprised 57.4% and this season 47.0%. The mean weight of these fish has increased from 115 grams to 132 grams to 142 grams. It should be interesting also to see if the 1965 year class will dominate as 9 year olds during the 1973-74 season.

Table 14. Age, sex, weight and standard length composition of 464 herring collected from the commercial herring pound of Farragut Bay, Alaska, April 23, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	20	7.7	156	49	5	2.5	158	55	5.4
IV	1969	3	1.1	189	93	1	0.5	187	88	0.9
V	1968	61	23.4	199	112	53	26.1	203	125	24.6
VI	1967	7	2.7	203	125	6	3.0	208	138	2.8
VII	1966	25	9.6	213	145	16	7.9	221	166	8.8
VIII	1965	124	47.5	216	149	94	46.3	221	164	47.0
IX	1964	14	5.4	212	143	16	7.9	227	184	6.5
X	1963	6	2.3	230	188	11	5.4	233	195	3.7
XI	1962	1	0.4	244	238					0.2
XII	1961					1	0.5	246	232	0.2
Totals		261				203				
Mean Length				206.9				215.7		
Mean Weight				132.0				153.6		
Sex Composition - 55.4% males and 44.6% females										

Table 15. Age, sex, weight and standard length composition of 460 herring collected from the commercial purse seine fishery of Seymour Canal, Alaska, May 1, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
IV	1969	7	2.9	186	80	5	2.3	190	87	2.6
V	1968	44	18.0	199	106	42	19.5	201	114	18.7
VI	1967	29	11.8	204	115	26	12.1	209	124	12.0
VII	1966	43	17.6	211	132	36	16.7	210	130	17.2
VIII	1965	88	35.9	211	129	77	35.8	215	134	35.9
IX	1964	15	6.1	210	126	14	6.5	218	149	6.3
X	1963	7	2.9	215	135	8	3.7	221	153	3.3
XI	1962	5	2.0	230	184	3	1.4	234	205	1.7
XII	1961	4	1.6	216	136	2	0.9	221	167	1.3
XIII	1960	1	0.4	209	127					0.2
XIV	1959	2	0.8	214	143	2	0.9	218	159	0.9
Totals		245				215				
Mean Length				207.8				215.4		
Mean Weight				123.7				130.4		
Sex Composition - 52.5% males and 47.5% females										

The Seymour Canal sample compared well with the previous two seasons. The 1965 year class still dominates the population but the 1966, 1967, and 1968 year classes are well represented also. This stock first supported a commercial harvest in 1970-71 of 76.4 tons. The next season the harvest was 472.6 tons and this season, 506.2 tons. Assessment of this stock has been attempted since the 1970-71 season without success. Another attempt will be made to locate and assess this stock on their wintering grounds during the 1973-74 season.

### Sitka Area

Herring samples were collected from Katlian Bay and the Eastern Channel area during the 1972-73 season. The sample from the commercial fishery in Lisianski Inlet was not taken.

The Katlian stock has been sampled since the 1969-70 fishery with good comparison each year until the 1972-73 season (Table 16). Since the 1969-70 season, the 1964 through 1967 year classes have been well represented with the 1965 year class being smaller than the 1964 or 1966 year classes. The sample collected from the commercial fishery in 1972-73 however, showed 83.5% of the population to be from the 1970 year class (3 year olds). This is a tremendous increase in individuals. The dominance of this year class overshadowed the remaining year classes. The data was also compiled with the 3 year olds removed and again this seasons data compared favorably with the past three seasons.

On April 23 a sample was collected from the spawning herring near Katlian with a small beach seine. This sample (Table 17) was nearly identical to the sample collected in April from the commercial fishery, thereby adding to the evidence that the herring that winter in Katlian Bay are the same herring that spawn in the vicinity.

As in the past season (1971-72), a sample was taken from the fishery in the Eastern Channel area (Table 18). It is thought that these fish, which are juveniles, are the same stock of fish as in Katlian Bay. When they become mature they join the adult stock. The 1970 year class comprised 83.0% of the sample. Marking studies planned in the future will help identify this group of fish.

### Upper Chatham Strait Area

Since the major resumption of herring fishing in Southeast Alaska, this

Table 16. Age, sex, weight and standard length composition of 503 herring collected from the commercial purse seine fishery of Katlian Bay, Alaska, March 26, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	205	86.5	180	70	215	80.8	179	71	83.5
IV	1969	9	3.8	199	97	15	5.6	195	98	4.8
V	1968	14	5.9	217	126	21	7.9	212	124	7.0
VI	1967	3	1.3	220	143	7	2.6	226	149	2.0
VII	1966	4	1.7	230	156	5	1.9	240	185	1.8
VIII	1965					2	0.8	239	182	0.4
IX	1964					1	0.4	240	204	0.2
X	1963	2	0.8	245	182					0.4
Totals		237				266				
Mean Length				185.1				185.9		
Mean Weight						77.7				82.0
Sex Composition - 47.1% males and 52.9% females										

Table 17. Age, sex, weight and standard length composition of 255 herring collected from small purse seine at Katlian Bay, Alaska, April 23, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	105	77.8	180	72	93	77.5	183	79	77.6
IV	1969	12	8.9	194	85	10	8.3	192	100	8.6
V	1968	6	4.4	211	113	9	7.5	216	134	5.9
VI	1967	1	0.7	237	193	3	2.5	227	183	1.6
VII	1966	7	5.2	231	171	2	1.7	234	184	3.5
VIII	1965	2	1.5	238	180					0.8
IX	1964	2	1.5	239	182	2	1.7	234	207	1.6
X	1963									
XI	1962									
XII	1961					1	0.8	257	254	0.4
Totals		135				120				
Mean Length				187.3				189.3		
Mean Weight						84.0				93.2
Sex Composition - 52.9% males and 47.1% females										

Table 18. Age, sex, weight and standard length composition of 288 herring collected from the commercial purse seine fishery of Eastern Channel, Alaska, March 29, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II	1971					3	1.5	169	49	1.0
III	1970	69	78.4	177	59	170	85.0	179	61	83.0
IV	1969	14	15.9	177	59	13	6.5	186	69	9.4
V	1968	3	3.4	194	80	14	7.0	197	80	5.9
VI	1967	2	2.3	212	120					0.7
Totals		83				200				
Mean Length				167.9				180.6		
Mean Weight				61.3				62.4		
Sex Composition - 30.2% males and 69.8% females										

is the first area along Chatham Straits that has been fished. Since the Chatham Strait area was a major herring fishing area in the past, it is assumed that fishing will again take place in the area. The straits will be divided into upper and lower with the split taking place at Frederick Sound.

The one area that was fished was Seal Cove in Tenakee Inlet on November 2. The 1968 year class dominated the sample (Table 19) with 71.0% (5 year olds).

#### Juneau Area

Three samples were collected from the commercial fishery in the Juneau area. Fishing that occurred in District 11A took place in the vicinity of Auke Bay (Table 20) and in the Tee Harbor area (Table 21). The third sample came from Bridget Cove (Table 22) in District 15C.

There has been considerable differences of opinion about the degree of mingling between these three areas. There are definite differences in the age and growth data, but the proximity of the areas to one another does offer the opportunity for a high degree of mixing. Only mark and recapture studies will answer this question with some certainty. Until that time, the samples from these areas will be dealt with separately.

Table 19. Age, sex, weight and standard length composition of 507 herring collected from the commercial purse seine fishery of Tenakee Inlet, Alaska, November 2, 1972.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	13	5.5	173	70	17	6.3	164	59	5.9
IV	1969	20	8.5	181	84	21	7.7	174	72	8.2
V	1968	168	71.5	186	95	192	70.6	183	87	71.0
VI	1967	21	8.9	198	117	15	5.5	189	100	7.2
VII	1966	11	4.8	208	136	9	3.3	207	135	3.9
VIII	1965	1	0.4	207	142	6	2.2	201	119	1.4
IX	1964					3	1.1	204	127	0.6
X	1963	1	0.4	204	130	5	1.8	204	126	1.0
XI	1962					2	0.7	193	94	0.4
XII	1961					1	0.4	198	122	0.2
XIII	1960									
XIV	1959					1	0.4	204	106	0.2
Totals		235				272				
Mean Length				187.4				183.2		
Mean Weight						97.0				87.9
Sex Composition - 46.4% males and 53.6% females										

Table 20. Age, sex, weight and standard length composition of 290 herring collected from the fishery of Auke Bay, Alaska, April 14, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
II	1971	4	2.8	128	41					1.4
III	1970	40	28.2	162	56	40	27.0	165	63	27.6
IV	1969	23	16.2	178	73	34	23.0	176	76	19.7
V	1968	58	40.8	183	82	48	32.4	183	91	36.9
VI	1967	5	3.5	189	94	16	10.8	191	112	7.2
VII	1966	3	2.1	205	112	1	0.7	186	88	1.4
VIII	1965	5	3.5	206	127	5	3.4	214	142	3.4
IX	1964	3	2.1	203	120	2	1.4	222	159	1.7
X	1963	1	0.7	231	188	2	1.4	239	208	1.0
Totals		142				148				
Mean Length				177.0				179.5		
Mean Weight						76.5				86.4
Sex Composition - 49.1% males and 50.9% females										

Table 21. Age, sex, weight and standard length composition of 338 herring collected from the fishery of Tee Harbor, Alaska, April 20, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	3	1.8	174	67	1	0.6	195	87	1.2
IV	1969	13	7.9	196	93	10	5.7	196	99	6.8
V	1968	84	51.2	207	116	80	46.0	208	125	48.5
VI	1967	28	17.1	213	129	32	18.4	217	144	17.8
VII	1966	10	6.1	226	153	21	12.1	213	143	9.2
VIII	1965	8	4.9	223	152	14	8.0	229	182	6.5
IX	1964	8	4.9	223	156	8	4.6	225	176	4.8
X	1963	3	1.8	238	187	4	2.3	230	185	2.1
XI	1962	4	2.4	223	155	4	2.3	226	174	2.4
XII	1961	2	1.2	248	228					0.6
XIII	1960	1	0.6	247	220					0.3
Totals		164				174				
Mean Length				210.7				213.1		
Mean Weight				126.3				138.4		
Sex Composition - 48.5% males and 51.5% females										

Table 22. Age, sex, weight and standard length composition of 479 herring collected from the commercial purse seine fishery of Bridget Cove, Alaska, April 14, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	4	2.0	158	49	3	1.1	176	70	1.5
IV	1969	13	6.3	185	78	9	3.3	188	93	4.6
V	1968	114	55.6	201	110	139	50.7	205	124	52.8
VI	1967	36	17.6	210	130	50	18.2	213	143	18.0
VII	1966	14	6.8	219	146	23	8.4	220	157	7.7
VIII	1965	8	3.9	223	161	19	6.9	227	175	5.6
IX	1964	7	3.4	227	174	16	5.8	231	185	4.8
X	1963	3	1.5	224	173	8	2.9	229	180	2.3
XI	1962	4	2.0	236	189	5	1.8	244	218	1.9
XII	1961	2	1.0	236	195	2	0.7	242	218	0.8
Totals		205				274				
Mean Length				204.9				211.6		
Mean Weight				120.0				139.6		
Sex Composition - 43.1% males and 56.9% females										

Also operating as in past years was the commercial pound in Auke Bay. This is simply an anchored net that is opened to allow herring to enter and then the fish are held alive till sold for bait or roe purposes when ripe. This pound did fish in the spring of 1973, however a sample of fish was not obtained.

### Yakutat Area

Herring were again fished commercially in the Yakutat area during the 1972-73 season. This is the second time in many years, the first being during the spring of 1971.

A sample was collected from the commercial purse seine fishery (Table 23). In comparing the sample with the spring of 1971, the 1966, 1967, and 1968 year classes are still well represented with the 1969 year class being weak. In the spring of 1973 sample, however, the 1970 year class (3 year olds) dominated the sample with 54.2%.

Table 23. Age, sex, weight and standard length composition of 491 herring collected from the commercial purse seine fishery of Yakutat Bay, Alaska, May 4, 1973.

Age Group	Year Class	Males				Females				Combined percent
		Frequency		Mean		Frequency		Mean		
		No.	%	Length mm	Weight gm	No.	%	Length mm	Weight gm	
III	1970	134	51.0	183	69	132	57.9	178	73	54.2
IV	1969	18	6.8	198	99	11	4.8	193	96	5.9
V	1968	22	8.4	213	131	30	13.2	214	136	10.6
VI	1967	28	10.6	223	155	23	10.1	224	162	10.4
VII	1966	27	10.3	233	180	18	7.9	232	184	9.2
VIII	1965	6	2.3	231	177	4	1.8	241	212	2.0
IX	1964	16	6.1	235	182	5	2.2	235	195	4.3
X	1963	6	2.3	240	197	3	1.3	237	209	1.8
XI	1962	5	1.9	233	192	1	0.4	237	187	1.2
XII	1961	1	0.4	245	211	1	0.4	247	237	0.4
Totals		263				228				
Mean Length				199.6				196.0		
Mean Weight				112.1				108.5		
Sex Composition - 53.3% males and 46.7% females										

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