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AGE, SEX AND SIZE COMPOSITION OF PACIFIC HERRING, (Clupea pallasii), FROM SOUTHEASTERN ALASKA DURING FALL, WINTER AND SPRING, 1973-1974

By:
Stanley A. Moberly

1974

ALASKA DEPARTMENT OF FISH AND GAME
Subport Building, Juneau, Alaska 99801

James W. Brooks
Commissioner

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, 1973-74

By

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INTRODUCTION

This represents the fourth 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 required.

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 1973-74 fishing season are the principal management tools (Table 1).

In District 1, Subdistrict 1E was to be open by emergency order prior to spawning. The herring were not located by either the department vessel or fishermen prior to spawning. A short fishing period was allowed on April 27-29, but no herring were taken.

Subdistrict 1B was never opened since no herring were located prior to spawning.

Subdistrict 13B was opened on April 13 for a harvest of 600 tons. The fishery was closed as the catch approached this quota. The final harvest was

Figure 1. Annual harvest of Southeastern Alaska herring.

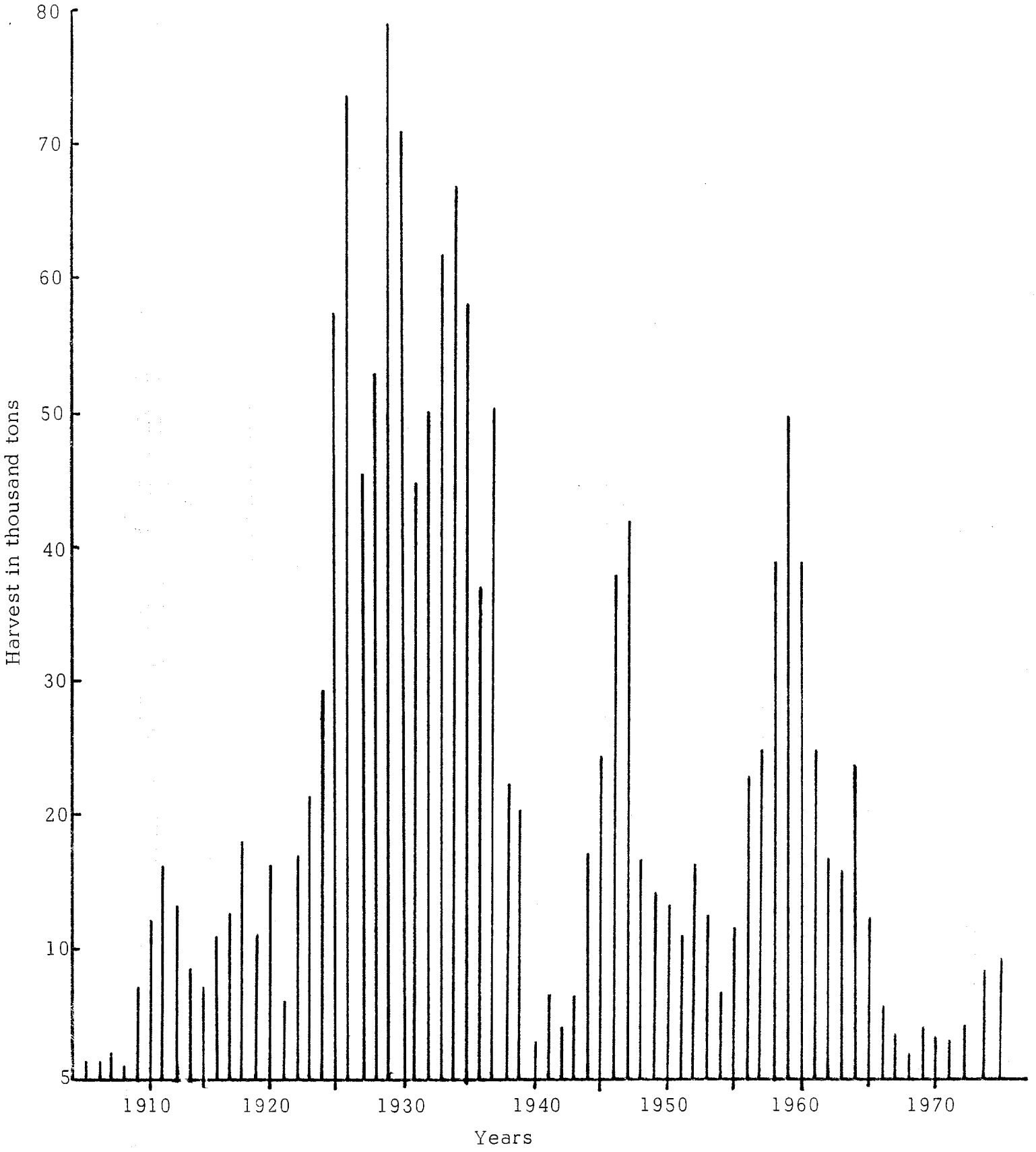

Table 1. Southeastern Alaska and Yakutat herring fishery regulations, 1973-74.

District	Season	Quota
1A, 1C, 1D, 1F, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11B, 11C, 12, 13A, 13C, 14, 15A, 15B, 16	October 1 February 28	None
1B, 1E, 11D, 13B, 15C	Established by emergency order	Not more than 2500 short tons in aggregate.
11A	Established by emergency order	Not more than 120 short tons.
Yakutat	October 1 February 28	None

712.4 tons (see Table 2).

Subdistrict 11A was handled by Alaska Board of Fish and Game action. The quota was set for 120 tons for the spring of 1974. The final harvest was 123.4 tons (see Table 2). Harvesting was accomplished by herring pounds. A permit to operate was required. Subdistrict 11D (Seymour Canal) was regulated similar to 13B. The harvest took place on May 5 with a tentative quota set at 900 tons. The final harvest was 903.8 tons (Table 2).

Subdistrict 15C was regulated by two openings. One near Bridget Cove where a harvest of 90.1 tons occurred and one near Eagle River where 233.3 tons were harvested.

When possible, quotas were established using hydroacoustics as the technique for assessment. A description of the equipment used in these assessments is given in the Department progress reports (Moberly and Thorne, 1971 and 1972) and described by Nunnallee (1973) and Moberly and Thorne (1974).

The fisheries are conducted with purse seines, gillnets and one stationary pound net during the winter and early spring months. Twenty-eight seine vessels, two gillnetters and one herring pound participated in the fishery during 1973-74. This compares to ten seine vessels and two pounds in 1970-71, 12 seine vessels and two pounds in 1971-72, and 22 seine vessels and two pounds in 1972-73. The increase in fishing gear during 1973-74 is attributed to the high prices paid for herring ripe with roe. Most of 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, Nadzaheen, Tongass Narrows, Thorne Arm, Cascade Inlet, Deer Island, Anita Bay, Burnett Inlet, Scow Bay, Sarheen Bay, Tenakee Inlet, Tebenkof Bay, Pt. Camden, Hood Bay, Lisianski Inlet, Pt. Fredrick, Whitestone Harbor, Fools Inlet, Pt. Houghton and Flynn Cove. Stocks fished primarily for roe were Katlian Bay, Seymore Canal, Auke Bay, Eagle River and Bridget Cove.

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

Table 2. Commercial herring catch in short tons for Southeastern Alaska and Yakutat, 1973-74.

Fishing Location	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Total by Area
Carroll Inlet			45.8	270.1	409.6						725.5
George Inlet				25.5	21.6	363.3					410.4
Ward Cove			30.7	29.4		130.1					190.2
Moth Cove		33.5	165.0	24.2							222.7
Nadzaheen				47.2		74.0					121.2
Tongass Narrows			123.4			46.0					169.4
Thorne Arm			145.1	9.6							154.7
Cascade Inlet		110.1	53.4			32.5					196.0
Deer Island						454.4					454.4
Anita Bay						108.5					108.5
Burnett Inlet			63.5	44.6		94.7					202.8
Scow Bay	98.8	163.9									262.7
Sarheen Bay				36.4		449.7	34.0				520.1
Tebenkof Bay			559.7	72.4							632.1
Pt. Camden		584.2									584.2
Hood Bay			208.8								208.8
Seymour Canal									903.8		903.8
Auke Bay-Eagle R.								233.3			233.3
Carr's Pound									113.8	9.6	123.4
Bridget Cove								90.1			90.1
Tenakee Inlet				159.9							159.9
Lisianski Inlet					262.9						262.9
Katlian Bay (Sitka)								712.4			712.4
Kelp Bay					74.5						74.5
Pt. Fredrick						113.0					113.0
Whitestone Harbor						185.4					185.4
Flynn Cove						87.9					87.9
Fools Inlet						80.7					80.7
Pt. Houghton					150.8	190.6					341.4
Total by Month	98.8	891.7	1395.4	719.3	919.4	2410.8	34.0	1035.8	1017.6	9.6	8532.4

obtain biomass estimates of herring which are densely schooled in the wintering areas. The techniques are described in the Department's Informational 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 indicator 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 age 2, 3, and 4 for Southeast Alaska herring. Immatures (juveniles) appear to school separately. No juvenile population received a harvest during 1973-74. 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 1972 and collected in the fall of 1973, two growing seasons were assumed, and the fish recorded as age 2. If the same fish had been collected in the spring of 1974 (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 17 separate areas. The remaining two samples were obtained by sampling on the spawning grounds in the McFarland Islands and Farragut Bay, where no commercial fishery occurred (Figure 2).

Ketchikan Area

Six concentrations of herring were sampled between October 13, 1973 and February 5, 1974 in the Ketchikan area (Tables 3-9). All samples were collected from the commercial purse seine fishery on the wintering grounds.

Two samples were collected from George Inlet. One on December 13, 1973 and one on February 5, 1974. The two samples are presented separately (Tables 4 and 5) because of the difference observed in growth and age composition. Presented in Tables 6 and 7 are data from Thorne Arm and Bold Island - Nadzaheen area, respectively. The areas are close geographically (Figure 2) and as more data is collected it is possible these two areas will be considered a single population.

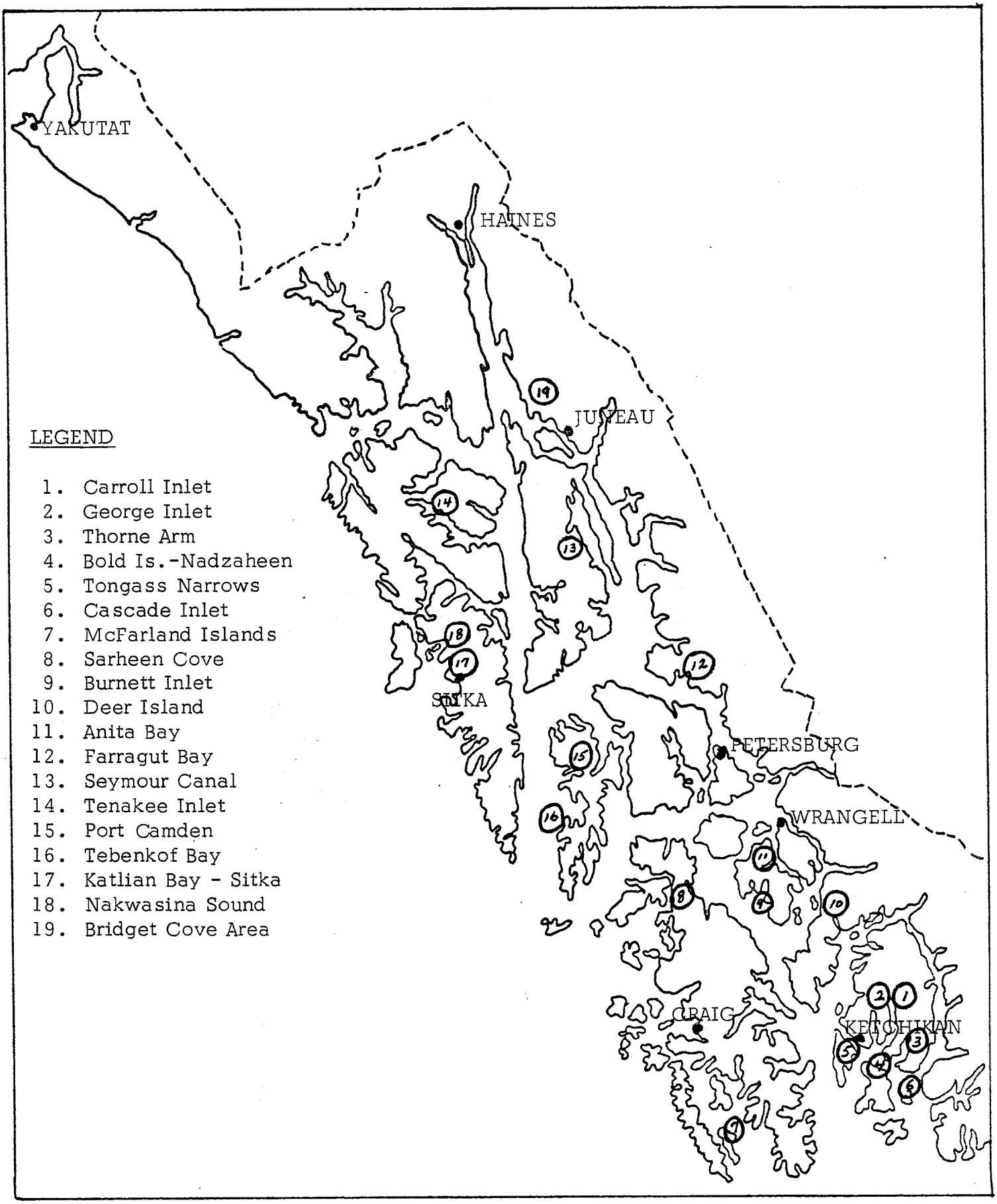

Figure 2. Sampling locations of Southeastern Alaska herring studies, winter and spring, 1973-74.

Table 3. Age, size and sex composition of 257 herring collected from the commercial purse seine fishery from Carroll Inlet, Alaska, December 17, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972	1	0.8	151	34	1	0.7	128	24	0.8
III	1971	8	6.8	176	67	7	5.0	172	67	5.8
IV	1970	68	57.6	186	83	75	54.0	187	85	55.6
V	1969	3	2.5	206	118	6	4.3	211	123	3.5
VI	1968	18	15.3	216	136	24	17.3	217	137	16.3
VII	1967	11	9.3	223	167	20	14.4	230	170	12.1
VIII	1966	2	1.7	229	164	2	1.4	238	196	1.6
IX	1965	2	1.7	230	156	1	0.7	250	230	1.2
X	1964	3	2.5	240	199	2	1.4	240	211	1.9
XI	1963	2	1.7	238	209	1	0.7	228	165	1.2
Totals		118				139				
Mean Length				197.2				200.3		
Mean Weight					107.0				112.3	
Sex composition - 44.4% males and 55.6% females										

Table 4. Age, size and sex composition of 256 herring collected from the commercial purse seine fishery of George Inlet, Alaska, December 13, 1973 (sample #1).

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	7	5.5	175	71	7	5.4	172	86	5.5
IV	1970	34	26.8	190	94	26	20.2	189	88	23.4
V	1969	5	3.9	205	126	5	3.9	210	129	3.9
VI	1968	28	22.0	222	151	33	25.6	227	160	23.8
VII	1967	30	23.6	228	168	36	27.9	230	175	25.8
VIII	1966	7	5.5	229	177	9	7.0	241	196	6.3
IX	1965	7	5.5	234	182	7	5.4	240	207	5.5
X	1964	5	3.9	247	214	2	1.6	243	197	2.7
XI	1963	3	2.4	243	199	4	3.1	243	201	2.7
XII	1962	1	0.8	243	197					0.4
Totals		127				129				
Mean Length				222				200		
Mean Weight					142				151	
Sex composition - ? % males and ? % females										

Table 5. Age, size and sex composition of 199 herring collected from the commercial purse seine fishery of George Inlet, Alaska, February 5, 1974 (subsampled from 246 fish) (sample #2).

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972	1	1.2	150	36	15	13.2	148	35	8.0
III	1971	15	17.6	176	66	20	17.5	170	60	17.6
IV	1970	59	69.4	180	74	64	56.1	183	74	61.8
V	1969	5	5.9	191	83	8	7.0	187	81	6.5
VI	1968	4	4.7	207	126	2	1.8	219	141	3.0
VII	1967	1	1.2	211	124	4	3.5	216	127	2.5
VIII	1966					1	0.9	225	148	0.5
Totals		85				114				
Mean Length				181				178		
Mean Weight					76				72	
Sex composition - 47.2% males and 52.8% females										

Table 6. Age, size and sex composition of 439 herring collected from the commercial purse seine fishery in Thorne Arm, Alaska, October 13, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972					2	0.9	147	40	0.4
III	1971	31	14.9	174	72	32	13.9	171	70	14.4
IV	1970	159	76.4	181	85	155	67.1	183	86	71.5
V	1969	6	2.9	194	108	8	3.5	197	106	3.2
VI	1968	8	3.8	205	124	19	8.2	211	136	6.2
VII	1967	4	1.9	212	133	10	4.3	214	147	3.2
VIII	1966					2	0.9	225	173	0.5
IX	1965					1	0.4	225	185	0.2
X	1964					1	0.4	233	192	0.2
XI	1963									
XII	1962					1	0.4	252	239	0.2
Totals		208				231				
Mean Length				182.0				186.0		
Mean Weight					87.1				94.9	
Sex composition - 46.7% males and 53.3% females										

Table 7. Age, size and sex composition of 534 herring collected from the commercial purse seine fishery at Bold Island - Nadzaheen area, Alaska, November 5 and December 6, 1973.

		Males				Females				
				Mean				Mean		
Age	Year	Frequency		Length	Weight	Frequency		Length	Weight	Combined
Group	Class	No.	%	mm	gm	No.	%	mm	gm	percent
II	1972					1	0.4	170	65	0.2
III	1971	35	13.3	174	77	35	12.9	174	69	13.1
IV	1970	177	67.3	184	87	177	65.3	185	82	66.3
V	1969	6	2.3	189	89	2	0.7	180	81	1.5
VI	1968	17	6.4	214	133	25	9.2	210	133	7.9
VII	1967	19	7.2	219	157	25	9.2	223	160	8.2
VIII	1966	4	1.5	225	175	2	0.7	237	168	1.1
IX	1965	1	0.4	224	158	2	0.7	227	169	0.6
X	1964	3	1.1	235	190	1	0.4	230	165	0.7
XI	1963	1	0.4	237	218	1	0.4	240	205	0.4
Totals		263				271				
Mean Length				188.9				190.1		
Mean Weight					98.0				95.1	
Sex composition - 49.1% males and 50.9% females										

Table 8. Age, size and sex composition of 329 herring collected from the commercial purse seine fishery in Tongass Narrows, Alaska, November 9, 1973.

		Males				Females				
				Mean				Mean		
Age	Year	Frequency		Length	Weight	Frequency		Length	Weight	Combined
Group	Class	No.	%	mm	gm	No.	%	mm	gm	percent
II*	1972	1	0.9	155	48	2	1.7	143	36	1.3
III	1971	30	27.8	166	60	32	27.6	167	59	27.7
IV	1970	57	52.8	180	78	64	55.2	181	75	54.0
V	1969	6	5.6	191	93	4	3.4	207	112	4.5
VI	1968	9	8.3	213	132	6	5.2	212	132	6.7
VII	1967	4	3.7	217	145	3	2.6	229	171	3.1
VIII	1966	1	0.9	236	176	3	2.6	226	141	1.8
IX	1965					1	0.9	210	102	0.4
X	1964					1	0.9	230	134	0.4
Totals		108				116				
Mean Length				181.1				181.8		
Mean Weight					82.4				80.4	
Sex composition - 46.6% males and 53.4% females										

* (105 II year olds not sexed - mean length 134.3 mm and mean weight 29.8 gm).

Table 9. Age, size and sex composition of 463 herring collected from the commercial purse seine fishery in Cascade Inlet, Alaska, October 17, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972					4	1.5	140	36	0.9
III	1971	19	9.5	173	74	26	9.9	174	80	9.7
IV	1970	122	60.7	183	87	147	56.1	183	86	58.1
V	1969	7	3.5	205	125	8	3.1	195	104	3.2
VI	1968	21	10.4	217	150	25	9.5	216	141	9.9
VII	1967	19	9.5	221	164	37	14.1	224	168	12.1
VIII	1966	7	3.5	228	186	6	2.3	225	163	2.8
IX	1965	2	1.0	238	206	3	1.1	240	214	1.1
X	1964	2	1.0	222	173	4	1.5	240	211	1.3
XI	1963	2	1.0	238	215	2	0.8	254	251	0.9
Totals		201				262				
Mean Length				192.8				194.1		
Mean Weight					103.1				110.3	
Sex composition - 43.8% males and 56.2% females										

Prince of Wales Island Area

For the first time in several years a commercial fishery occurred on the west coast of Prince of Wales Island (Figure 2) in the area of Sarheen Cove. Two separate samples were collected from the commercial purse seine fishery. These were analyzed separately and judged to be almost identical and therefore are presented as one sample (Table 11). The adult fish in this sample were extremely small relative to other samples throughout Southeast Alaska.

Presented in Table 10 is the age and growth data collected from the McFarland Island area. This sample was collected by fishing a variable mesh gillnet set from a float plane during active spawning. The present sex composition was heavily in favor of the males (62.7%). This phenomena was reported (Moberly, 1973) during 1970-71 fishing season in the McFarland Island and Nossuck Bay. A high incident of males was also observed during the 1971-72 fishing season in Kwain Bay, Craig and Rocky Bay (Moberly, 1974) and in Rocky Bay (Moberly, 1974) during the 1972-73 fishing season. In all cases sampling was done during active spawning.

Table 10. Age, size and sex composition of 108 herring collected by variable mesh gillnet from float plane, McFarland Island, Alaska, April 15, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	1	1.5	174	51					0.9
IV	1970	24	35.3	197	90	10	25.0	202	102	31.5
V	1969	11	16.2	215	123	9	22.5	224	151	18.5
VI	1968	12	17.6	221	130	8	20.0	223	158	18.5
VII	1967	10	14.7	223	133	9	22.5	230	170	17.6
VIII	1966	8	11.8	235	161	4	10.0	238	182	11.1
IX	1965	2	2.9	279	184					1.9
Totals		68				40				
Mean Length				214.4				221.0		
Mean Weight					120.1				148.5	

Sex composition - 62.7% males and 37.3% females

Table 11. Age, size and sex composition (samples 1 and 2 combined) of 316 herring collected from the commercial purse seine fishery from Sarheen Cove, Alaska, February 27, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972					1	0.7	141	36	0.3
III	1971	15	8.6	166	62	10	7.0	157	52	7.9
IV	1970	35	20.1	176	74	30	21.1	176	74	20.6
V	1969	29	16.7	184	85	31	21.8	184	86	19.0
VI	1968	39	22.4	187	91	29	20.4	188	89	21.5
VII	1967	11	6.3	189	97	8	5.6	194	106	6.0
VIII	1966	18	10.3	191	101	14	9.9	190	98	10.1
IX	1965	19	10.9	193	103	18	12.7	197	107	11.7
X	1964	5	2.9	199	115					1.6
XI	1963	1	0.6	191	99	1	0.7	205	116	0.6
XII	1962									
XIII	1961	2	1.1	197	109					0.6
Totals		174				142				
Mean Length				184.2				183.7		
Mean Weight					88.5				86.8	

Sex composition - 54.5% males and 45.5% females

Wrangell Area

Three concentrations of herring were sampled in the Wrangell area. The Burnett Inlet area was fished for the first time (Table 2) and a sample was collected (Table 12). Deer Island (Table 13) and Anita Bay (Table 14) were sampled as in past years. The past data shows good comparison in the Deer Island area. The 1967, 1968 and 1970 year classes still dominate the population.

Anita Bay shows four relatively strong year classes in 1967-1970. This differs somewhat from the past data. The sample collected during the 1972-73 season showed good strength in the four year classes 1965-1968.

Petersburg Area

Two concentrations of herring were sampled in the Petersburg area; Farragut Bay (Table 15) and Seymour Canal (Table 16). The Farragut Bay area was not fished commercially during the 1973-74 season.

The sample that was collected was collected by a subsistence herring pound operated by one of the local fishermen. This area has normally received a 200 ton harvest each spring, but new regulations adopted closed the district before the fish were available to the gear.

For the fourth season in a row, the 1965 year class dominated the Farragut Bay population. When this area was first sampled during the 1970-71 season, the 1965 year class (6 year olds) comprised 61.3% of the population. The following season as 7 year olds, they comprised 57.4%, during the 1972-73 season, 47.0% and this past season, 29.7%. Some interesting information on natural mortality will be derived when this population is examined in greater detail.

The Seymour Canal population was sampled from the commercial purse seine fishery. The 1965 year class dominated this sample as it has for essentially the past four seasons. Since the 1971-72 season three year classes have dominated the samples: 1965-1968. In the three years mentioned, these four year classes have contributed 81.0% in 1971-72; 83.8% in 1972-73; and 75.1% in 1973-74.

Lower Chatham Strait Area

This was the first season the commercial fishery has fished the lower Chatham Strait area. Two areas were fished; Pt. Camden (Table 17) and

Table 12. Age, size and sex composition of 198 herring collected from the commercial purse seine fishery in Burnett Inlet, Alaska, November 19, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	1	1.2	150	55	5	4.4	169	65	3.0
IV	1970	15	17.9	182	81	34	29.8	183	80	24.7
V	1969	15	17.9	210	129	13	11.4	211	127	14.1
VI	1968	29	34.5	212	135	30	26.3	218	142	29.8
VII	1967	12	14.3	217	142	17	14.9	221	149	14.6
VIII	1966	7	8.3	218	155	7	6.1	220	155	7.1
IX	1965	4	4.8	226	168	8	7.0	232	188	6.1
X	1964	1	1.2	222	154					0.5
Totals		84				114				
Mean Length				207.6				205.9		
Mean Weight					129.0				125.3	

Sex composition - 42.9% males and 47.1% females

Table 13. Age, size and sex composition of 384 herring collected from the commercial fishery at Deer Island, Alaska, February 4-9, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	1	0.6	179	73	4	1.9	177	68	1.3
IV	1970	48	27.1	190	88	59	28.5	187	84	27.9
V	1969	12	6.8	204	107	15	7.2	207	115	7.0
VI	1968	43	24.3	214	127	68	32.9	217	133	28.9
VII	1967	42	23.7	213	129	42	20.3	221	139	21.9
VIII	1966	14	7.9	219	144	8	3.9	225	161	4.7
IX	1965	10	5.6	218	137	7	3.4	225	163	4.4
X	1964	5	2.8	225	155	4	1.9	228	171	2.3
XI	1963	1	0.6	243	168					0.3
XII	1962	1	0.6	256	228					0.3
Totals		177				207				
Mean Length				207.9				233.1		
Mean Weight					119.6				121.7	

Sex composition - 46.3% males and 53.7% females

Table 14. Age, size and sex composition of 453 herring collected from the commercial purse seine fishery in Anita Bay, Alaska, February 23, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	4	1.8	174	64	3	1.3	179	68	1.5
IV	1970	59	25.9	186	81	58	25.8	187	83	25.8
V	1969	32	14.0	198	97	24	10.7	207	111	12.4
VI	1968	57	25.0	204	108	75	33.3	211	119	29.1
VII	1967	35	15.4	207	113	28	12.4	214	125	13.9
VIII	1966	18	7.9	212	122	18	8.0	118	131	7.9
IX	1965	13	5.7	217	134	10	4.4	220	135	5.1
X	1964	3	1.3	225	156	6	2.7	227	150	2.0
XI	1963	5	2.2	228	160	2	0.9	219	140	1.5
XII	1962	1	0.4	236	188					0.2
XIII	1961					1	0.4	206	117	0.2
XIV	1960	1	0.4	228	160					0.2
Totals		228				225				
Mean Length				200.9				205.9		
Mean Weight					104.5				112.6	

Sex composition - 50.0% males and 50.0% females

Table 15. Age, size and sex composition of 212 herring collected from the subsistence fishery in Farragut Bay, Alaska, May, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972					1	0.7	162	64	0.5
III	1971	14	20.0	164	53	8	5.6	167	54	10.4
IV	1970	13	18.6	182	67	19	13.4	184	73	15.1
V	1969	2	2.9	176	101	4	2.8	205	100	2.8
VI	1968	18	25.7	208	107	38	26.8	211	119	26.4
VII	1967	2	2.9	205	131	6	4.2	216	130	3.8
VIII	1966	4	5.7	216	136	9	6.3	226	145	6.1
IX	1965	14	20.0	222	144	49	34.5	223	142	29.7
X	1964	3	4.3	231	137	6	4.2	231	181	4.2
XI	1963					2	1.4	243	164	0.9
Totals		70				142				
Mean Length				197.3				211.1		
Mean Weight					100.6				123.1	

Sex composition - 33.2% males and 66.8% females

Table 16. Age, size and sex composition of 303 herring collected from the commercial purse seine fishery in Seymour Canal, Alaska, May 5, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	9	6.4	161	51	4	2.5	174	72	4.3
IV	1970	4	2.9	186	85	14	8.6	175	78	6.0
V	1969	11	7.9	185	84	13	8.0	195	111	7.9
VI	1968	34	24.3	201	113	28	17.3	207	132	20.5
VII	1967	19	13.5	204	120	14	8.6	209	137	10.9
VIII	1966	30	21.4	208	127	34	21.0	211	141	21.2
IX	1965	25	17.9	209	131	43	26.5	217	142	22.5
X	1964	6	4.3	212	140	6	3.7	216	152	4.0
XI	1963	2	1.4	209	127	2	1.2	207	13ɔ	1.3
XII	1962	1	0.7	216	144	4	2.5	223	167	1.7
Totals		141				162				
Mean Length				200.8				206.6		
Mean Weight					116.9				132.6	
Sex composition - 51.6% males and 48.4% females										

Table 17. Age, size and sex composition of 267 herring collected from the commercial purse seine fishery of Port Camden, Alaska, October 23, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
IV	1970	1	0.7	173	67	1	0.8	185	92	0.7
V	1969	9	6.5	192	105	7	5.5	195	107	6.0
VI	1968	49	35.3	196	114	49	38.3	201	120	36.7
VII	1967	10	7.2	206	133	16	12.5	209	143	9.7
VIII	1966	24	17.3	210	145	9	7.0	213	144	12.4
IX	1965	44	31.7	209	143	43	33.6	218	160	32.6
X	1964	2	1.4	237	230	3	2.3	213	149	1.9
Totals		139				128				
Mean Length				203				205		
Mean Weight					131				138	
Sex composition - 52.6% males and 47.4% females										

Tebenkof Bay (Table 18). From these two areas 584.2 tons were harvested in Pt. Camden and 559.7 tons from Tebenkof Bay (Table 2).

Sitka Area

Samples were collected from several locations in the Sitka area immediately prior and during the fishery in April. All the samples were combined and presented in Table 19. The 1970 year class dominated the sample, contributing 72.5%. This year class contributed 83.5% as 3 year olds during the 1972-73 season.

A sample was collected from Nakwasina Sound during test fishing on April 2 (Table 20). The fish in this sample were smaller than the Sitka fish nearby. Quite possibly this is a local or resident stock. The 1970 year class contributed 78.3% to the sample. The 1970 year class appears to have had very good success throughout Southeast Alaska.

Upper Chatham Strait Area

As in the 1972-73 season, the only herring population sampled was from Tenakee Inlet (Table 21). The fish were much smaller than expected compared to the previous years data (Moberly, 1974). During 1972-73 the fish averaged 92.1 grams. During 1973-74 the sample mean weight was 77.9 grams. The age and growth in this area compares with the sample collected for Sarheen Inlet (Table 11). It would be interesting to examine why in these two populations the older fish do not weigh more than the 3 and 4 year old fish do over most of the remainder of Southeast Alaska.

Juneau Area

Presented in Table 22 is the data collected from Bridget Cove in April. This data compares favorably with the past data collected at Tee Harbor.

Yakutat Area

Herring were not fished commercially in the Yakutat area during the 1973-74 season.

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Table 18. Age, size and sex composition of 394 herring collected from the commercial purse seine fishery, Tebenkof Bay, Alaska, November 28, 1973.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	10	5.7	181	79	12	5.5	178	75	5.6
IV	1970	53	30.5	192	100	68	30.9	196	104	30.7
V	1969	27	15.5	205	124	32	14.5	207	125	15.0
VI	1968	21	12.1	209	135	33	15.0	209	133	13.7
VII	1967	9	5.2	212	140	19	8.6	215	145	7.1
VIII	1966	23	13.2	223	169	22	10.0	224	166	11.4
IX	1965	29	16.7	228	179	30	13.6	222	162	15.0
X	1964	2	1.1	226	171	4	1.8	234	195	1.5
Totals		174				220				
Mean Length				207.0				207.2		
Mean Weight					132.6				130.2	
Sex composition - 45.1% males and 54.9% females										

Table 19. Age, size and sex composition of 1,006 herring collected from the test fishery and commercial purse seine fishery between Sitka and Katlian Bay, Alaska, April 4 and 14, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
II	1972	2	0.4	152	36	2	0.4	151	39	0.4
III	1971	15	3.2	176	66	16	3.0	176	67	3.1
IV	1970	339	72.0	197	98	390	72.9	199	105	72.5
V	1969	43	9.1	205	113	54	10.1	210	124	9.6
VI	1968	34	7.2	222	150	33	6.2	224	156	6.7
VII	1967	12	2.5	208	167	19	3.6	231	166	3.1
VIII	1966	8	1.7	236	187	14	2.6	239	194	2.2
IX	1965	5	1.1	236	176	4	0.7	237	182	0.9
X	1964	9	1.9	239	183	1	0.2	225	167	1.0
XI	1963	2	0.4	251	221					0.2
XII	1962	2	0.4	252	213	2	0.4	247	217	0.4
Totals		471				535				
Mean Length				201.6				203.1		
Mean Weight					108.4				114.2	
Sex composition - 48.6% males and 51.4% females										

Table 20. Age, size and sex composition of 300 herring collected from the test fishery in Nakwasina Sound (Sitka), Alaska, April 2, 1974. (Samples collected by F/V LOVELY JOANN).

		Males				Females				
				Mean				Mean		
Age	Year	Frequency		Length	Weight	Frequency		Length	Weight	Combined
Group	Class	No.	%	mm	gm	No.	%	mm	gm	percent
II	1972	5	3.1	141	32	4	2.9	146	33	3.0
III	1971	10	6.3	171	58	9	6.4	171	60	6.3
IV	1970	126	78.8	192	88	109	77.9	195	97	78.3
V	1969	6	3.8	198	101	9	6.4	210	117	5.0
VI	1968	7	4.4	207	123	6	4.3	213	123	4.3
VII	1967	5	3.1	230	160	1	0.7	202	107	2.0
VIII	1966					1	0.7	247	195	0.3
IX	1965									
X	1964	1	0.6	235	152	1	0.7	249	206	0.7
Totals		160				140				
Mean Length				191.7				194.6		
Mean Weight					90.0				98.7	

Sex composition - 53.5% males and 46.5% females (1 male not aged)

Table 21. Age, size and sex composition of 206 herring collected from the commercial purse seine fishery in Tenakee Inlet, Alaska, December 17, 1973.

		Males				Females				
				Mean				Mean		
Age	Year	Frequency		Length	Weight	Frequency		Length	Weight	Combined
Group	Class	No.	%	mm	gm	No.	%	mm	gm	percent
III	1971	12	13.5	165	59	21	17.9	165	60	16.0
IV	1970	8	9.0	182	81	8	6.8	178	74	7.8
V	1969	18	20.2	178	70	19	16.2	180	74	18.0
VI	1968	38	42.7	184	80	53	45.3	184	79	44.2
VII	1967	3	3.4	178	69	3	2.6	183	74	2.9
VIII	1966	3	3.4	186	80	7	6.0	190	91	4.9
IX	1965	3	3.4	199	103	2	1.7	200	103	2.4
X	1964	3	3.4	202	103	3	2.6	200	104	2.9
XI	1963	1	1.1	205	118	1	0.9	206	110	1.0
Totals		89				117				
Mean Length				181.5				180.6		
Mean Weight					77.8				77.9	

Sex composition - 43.1% males and 56.9% females

Table 22. Age, size and sex composition of 374 herring collected from the commercial purse seine fishery of Bridget Cove (Sunset Cove), Alaska, April 22, 1974.

		Males				Females				
				Mean				Mean		
Age Group	Year Class	Frequency No.	%	Length mm	Weight gm	Frequency No.	%	Length mm	Weight gm	Combined percent
III	1971	9	5.1	169	62	3	1.5	182	81	3.2
IV	1970	15	8.5	187	84	6	8.1	195	100	8.3
V	1969	23	13.1	201	110	18	9.1	201	107	11.0
VI	1968	79	44.9	208	122	83	41.9	214	131	43.3
VII	1967	26	14.8	214	137	35	17.7	219	144	16.3
VIII	1966	11	6.3	219	149	16	8.1	221	151	7.2
IX	1965	4	2.3	222	154	10	5.1	225	154	3.7
X	1964	6	3.4	229	159	7	3.5	233	177	3.5
XI	1963	2	1.1	241	174	6	3.0	230	173	2.1
XII	1962	1	0.6	217	145	4	2.0	238	178	1.3
Totals		176				198				
Mean Length				206.5				214.4		
Mean Weight					122.1				136.3	
Sex composition - 47.7% males and 52.3% females										

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