4K89-31

ALASKA PENINSULA - ALEUTIAN ISLANDS MANAGEMENT AREA

SAC-ROE HERRING REPORT

TO THE

ALASKA BOARD OF FISHERIES

By: Len Schwarz

Regional Information Report[1] No. 4K89-31

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

November 1989

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries

AREA DESCRIPTION

The Peninsula/Aleutian Management Area is described as statistical Area "M", which includes South Peninsula and Aleutian waters west of Kupreanof Point to the International Date Line and North Peninsula waters extending from the International Date Line east to Cape Menshikof (Figure 1).

1989 SEASON SUMMARY

By regulation, the commercial herring sac-roe season in Area "M" extends from April 15 through July 15. However, the opening of the Port Moller District was delayed by emergency order until May 29. During the 1989 season commercial deliveries on the Alaska Peninsula occurred from May 13 through June 23. The total Peninsula harvest of 1,055 short tons (s.t.) was above the recent 5 year average of 875 tons; no sac-roe harvest occurred in the Aleutian Islands (Table 1). Seventeen purse seine vessels made deliveries to the five companies that bought fish. The average roe recovery was 9%. The average price per ton was $447 for 10% roe recovery making the fishery worth approximately $424,000 to the fishermen.

NORTH PENINSULA

Historical Perspective:

The observed presence of commercial quantities of sac-roe herring on the North Peninsula has been centered around Port Moller and Herendeen Bay. No commercial herring landings occurred in the area until 1982 when 506 tons were harvested (Table 1).

Prior to 1982, there had been reports that in some years herring were present during the spring near the Peter Pan dock in Port Moller, however abundance was unknown. Numerous schools of herring were documented in the Herendeen Bay Area during 1976 through department aerial surveys. The first year that aerial surveys were able to locate herring schools in Port Moller Bay was 1984. In past years, fishing vessels destined for the Togiak fishery frequently stopped in the Port Moller Area to prospect for herring. Since 1982, a commercial sac-roe fishery has developed in both Moller and Herendeen Bays and along the Bering Sea coast eastward from Port Moller (Table 2). The run timing of these stocks appear to be later than the Togiak stocks.

1989 NORTH PENINSULA SUMMARY

The entire North Peninsula opened to commercial herring fishing by regulation on April 15, however the opening of the Port Moller District was delayed until May 29. On May 28 a 249 ton harvest occurred just north of the Port Moller District boundary. After May 28 all the harvest occurred in the Port Moller District. From May 28 to June 23, 8 seiners harvested 744.7 tons (Table 3). For the first time since 1985, Port Moller was not inundated by seine vessels immediately after the Togiak season closed. During the 1986 through 1988 seasons, there was an average of 52 vessels present although only a small percentage actually made landings. The average roe recovery was 9.6% with an average price of $425, with $42 for every percentage point above or below 10%. The North Peninsula fishery was worth approximately $304,500 to the fishermen.

Preseason:

Prior to the 1989 sac-roe herring season, a harvest guideline of 225 tons was established in the Port Moller District. In 1986 a trend began of increasing fishing effort effectively harvesting the early returning fish stocks. In order to shift fishing pressure from the earlier arriving smaller stocks, to a later arriving more abundant stock, the Port Moller District opening was to be delayed until May 30. A stipulation was added that the fishery would be opened if, due to run timing, a large biomass was spotted before May 30.

Fishery:

On May 28 a harvest of 248 tons occurred in the Port Heiden District. N o herring were observed after this and it's probable that the biomass moved into the Port Moller District (Figure 2).

On May 29 a department survey documented a biomass of 1,300 tons in the Port Moller District near Bear River. As stated in the Preseason Management Plan, the Port Moller District would open prior to May 30 if a significant biomass was present. On May 29 a 6 hour opening occurred where 313 tons where harvested near the Port Moller processing facility.

On May 30, the biomass was estimated at 2,500 tons (Table 4) (May 30 biomass estimate plus harvest on May 28 and 29). The harvest of 561 tons represented an exploitation of over 20% and the fishery was closed until additional biomass could be documented in the area.

From June 9 through June 12 industry pilots reported small groups of herring (200-300 tons) moving into Moller and Herendeen Bays, spawning, and then leaving. Departmental surveys conducted on June 13 and 16 documented over 300 tons on each flight. This information established the biomass estimate at 3,195 tons, bringing the exploitation rate below 20% The Port Moller herring district was reopened on June 16 and an additional

harvest of 184 tons was made between June 16 and June 23. The season closed by regulation on July 15, resulting in a harvest of 735 tons.

Biomass:

From May 19 through June 16, thirteen aerial surveys were flown in the Port Moller District (Table 4). In past years, biomass estimates have been difficult to obtain due to poor weather, muddy water, and the rapid arrival and departure of fish. (See 1988 AMR). The 1989 season was exceptional in that fish were visible in significant numbers on 6 different surveys.

A large biomass was spotted on May 28 and 29 in the Bear River Section. On May 30, 1,102 tons were spotted in Herendeen Bay, 15 tons around Deer Island and 822 tons in Moller Bay. These estimates added with the catch of 561 taken prior to May 30 put the estimated biomass at 2,500 tons. Fish spotted in Herendeen and Moller Bay on June 13 and Moller Bay on June 16 were added to the May 30 estimate to bring the total estimated season biomass to 3,195 tons.

There were industry reports of small amounts of herring spawning and leaving the area from June 9 through 12. Also larva studies conducted for NOAA indicated that some spawning occurred on May 15, before aerial survey observations began. Both of these events indicate that the 3,195 ton estimate is a minimum figure. The harvest of 744.7 tons represent a 23% exploitation of the 3,195 ton minimum biomass estimate.

Age Class

The age class structure of the fish that arrived in late May and were primarily harvested along the Bering Sea coast between the Port Moller cannery and Three Hills, was dominated by older fish. Age 6, 8, and 11+ were evenly represented and accounted for over

70% of the sample taken (Table 5, Figure 3). These fish provided 75% of the harvest.

During the latter half of June, samples were taken from the head of Moller and Herendeen Bays. Both of these samples were dominated by age 5 fish (Figure 4).

SOUTH PENINSULA

Historical Perspective

The South Peninsula herring sac-roe fishery started to develop in 1979. Significant landings occurred in 1980 (453 tons), and peaked in 1981 (716 tons) (Table 1). A Board of Fisheries regulation closed the South Peninsula sac-roe fishery in 1983 in favor of a food and bait fishery. The food and bait fishery did not develop and the sac-roe season was reopened during the 1984 season. During the years in which a commercial harvest occurred, landings were reported from 18 separate geographical locations, of these only Canoe Bay produced an annual harvest (Table 7). Beginning in 1984, the Board of Fisheries directed through regulation that this fishery would be managed to allow for a sac-roe as well as food and bait harvest. The sac-roe harvest was allocated 75% of the allowable harvest with the remaining 25% allocated to the food and bait fishery. To date, the food and bait fishery has not developed.

From 1981 through 1989 ADF&G has deployed field crews along the South Peninsula for the purpose of developing biological data and to monitor the commercial fishery. Crews have been stationed in Canoe Bay each season (1981-1989) and intermittently in the other harvest locations or in locations of suspected commercial fishery potential. The crews have been successful in collecting samples and documenting spawning. Aerial fixed wing surveys have been utilized with limited success, primarily due to the large area involved and the sporadic and unpredictable appearance of the fish.

1989 South Peninsula Summary

Harvest guidelines were established preseason based on past fishing performanc, age class data and general information on stock size gathered from Department and industry aerial surveys. Areas where little information on stock size was known were left open for exploration.

The commercial sac-roe fishery on the South Peninsula occurred in 7 locations: Canoe Bay, Pavlof Bay, Lenard Harbor, Stepovak, Shumagin Islands, Balboa Bay, and Dolgoi Island (Table 7, Figure 2). The majority of harvest (48%) came from Canoe Bay. From May 13 to June 17, 310 tons were harvested by 12 seine vessels. The average roe recovery was 7.7% with an average price of $500/ton for 10% roe recovery making the value of the fishery approximately $113,000 to the fishermen.

Intensive aerial surveys to document spawning biomass on the South Peninsula are not possible because of the large area involved, the sporadic and unpredictable appearance of fish, and because the fishery takes place during the middle of the June sockeye salmon fishery, when the availability of personnel is limited. Table 9 lists the surveys that were flown. Surface area of schools sighted is recorded in the form of R.A.I. (relative abundance index) units. R.A.I. units are an expression of total surface area of sighted herring schools in terms of small schools (surface area equal to 538^2 ft.). No attempt is made to convert these units into tonnages due to the lack of conversion factors for deep waters. Many of the schools sighted could have been capelin.

Age Class Composition

As expected, the Canoe Bay fishery was dominated by the younger age classes. Age 4 made up over half of the samples taken. Samples were also taken in the Shumagin Islands and Stepovak Bay. Although the 4 year old age class was strong in both of these areas, age 5 was the dominant age class (Table 10, Figure 5).

Table 1. ALASKA PENINSULA-ALEUTIAN ISLAND AREA HERRING SAC-ROE HARVESTS (Short Tons)

Year	South Peninsula	Aleutian Islands	North Peninsula	Total
1979	10	-	-	10
1980	454	-	-	454
1981	716	-	-	716
1982	138	-	506	644
1983	-	-	627	627
1984	211	-	431	642
1985	345	-	716	1,061
1986	281	-	889	1,170
1987	319	-	512	831
1988	377	-	294	671
1989	310	-	745	1,055

Table 2. ANNUAL HARVEST OF PORT MOLLER HERRING BY GEOGRAPHICAL AREA

Location	1983	1984	1985	1986	1987	1988	1989
Deer Island	-	-	73	41.5		-	-
Herendeen Bay	510	181	100	112.5	160.8[a]	8.2	67.0
Moller Bay	36	250	256	261.4	344.3	285.5	116.3
Bear River/E. Bering Sea Coast	81	-	287	473.5	7.3	-	561.4
TOTAL	627	431	716	888.9	512.4	293.7	744.7

[a]At least 11 tons were taken around Deer Island.

Table 3. 1989 NORTH PENINSULA COMMERCIAL SAC-ROE HERRING HARVEST (Short Tons)

Date	Area of Catch	Harvest	Roe %
May 28	Three Hills	248.5	9.8
May 29	Entrance Point	312.9	9.8
June 16	Herendeen Bay	31.0	9.4
June 17	Herendeen Bay	36.0	8.1
June 17	Moller Bay	88.5	8.6
June 23	Moller Bay	27.8	10.0
North Pacific Totals		744.7	9.6

Table 4. 1988 ALASKA DEPARTMENT OF FISH AND GAME NORTH PENINSULA HERRING AERIAL SURVEYS BIOMASS ESTIMATES (Short tons)

Date	Deer Island			Herendeen Bay			Moller Bay			Bear River		
	RAI[a]	Tons[b]	Rating[c]	RAI	Tons	Rating	RAI	Tons	Rating	RAI	Tons	Rating
5/19	0	0	4	0	0	4			4			
5/22	0	0	4	0	0	3	0	0	4	0	0	3
5/23	0	0	3	0	0	2	0	0	3		N/A	
5/25	0	0	3	0	0	2	0	0	2	0	0	3
5/29							0	0	0	433	1,300	2
5/29							0	0	2	266	799	2
5/30 A.M.	10	15[d]	2	725	1,102[d]	2	105	172	2	0	0	2
5/30 P.M.	0	0	2	10	15	2	318	822[d]	2	0	0	2
5/31	0	0	3	0	0	3	5	7	3	0	0	2
6/2	0	0	3	0	0	2	5	7	2	0	0	2
6/13	0	0	3	30	46[d]	2	110	284[d]	2			
6/15							112	170	2			
6/16				19	49	2	270	365[d]	2			

R.A.I. units express the entire surface area of sighted herring schools in terms of small schools (surface area equal to 538^2 ft.). For example 10 R.A.I. units is equivalent to 10 small herring schools each with a surface area of 538^2 ft.

[a] Relative Abundance Index: small school (less than 538^2 ft) = 1 R.A.I. unit
medium school (532^2 ft to $4,841^2$ ft) = 5 R.A.I. units
large school (square ft./538^2 ft)

[b] Tons: RAI units are multiplied by 1.52 (schools in water less than 16 ft.)
2.58 (schools in water 16 ft - 26 ft)

[c] Rating (of survey conditions): 1) Excellent; 2) Good; 3) Fair; 4) Poor; 5) Unsatisfactory

[d] Used in calculating peak biomass estimate.

Table 5. NORTH PENINSULA SAC-ROE HERRING AGE CLASS COMPOSITION FROM COMMERCIAL SEINE SAMPLES, 1989

Date	Sample Size		Age Class 3	4	5	6	7	8	9	10	11+
OUTER MOLLER/BEAR RIVER[a]											
May 28	606		-	-	19	86	30	148	48	79	196
May 29	1,097		-	1	76	361	70	257	77	90	165
TOTAL	1,703	%	-	-	6	26	6	24	7	10	21
HERENDEEN BAY											
June 16	108	%	-	2	62	22	5	1	1	-	7
MOLLER BAY											
June 17	67		-	1	38	16	1	1	2	2	6
June 23	113		1	-	82	18	5	1	2	2	2
Total	180	%	1	1	67	19	3	1	2	2	4

[a]/Samples taken on May 28 were taken near Three Hills. Samples taken on May 29 were taken near Bear River and the Port Moller cannery.

Table 6. PERCENT AGE CLASS COMPOSITION OF NORTH PENINSULA COMMERCIAL HERRING SAMPLES BY GEOGRAPHIC AREA BY YEAR

	AGE CLASS								
Year	3	4	5	6	7	8	9	10	11
HERENDEEN BAY									
1985	5	49	21	15	6	4	-	-	-
1986	-	3	25	13	20	21	17	1	-
1987	2	4	22	24	17	13	10	6	2
1988	3	23	30	22	9	4	3	3	2
1989	-	2	62	22	5	1	1	-	7
INNER MOLLER BAY									
1985	1	12	8	15	33	27	2	-	1
1986	1	7	21	12	18	19	20	1	1
1987	2	11	13	22	12	11	17	11	-
1988	1	30	29	12	6	5	5	8	5
1989	1	1	67	19	3	1	2	2	4
OUTER MOLLER/ BEAR RIVER									
1985	1	26	16	20	17	17	1	1	-
1986	-	2	22	13	21	23	18	1	-
1987	2	48	9	14	5	11	8	3	-
1988	-NO FISH HARVESTED IN THIS SECTION-								
1989	-	-	6	26	6	24	7	10	21

Table 7. SUMMARY OF SOUTH PENINSULA HERRING SAC-ROE LANDINGS BY AREA

Location	1982	1983[a]	1984	1985	1986[b]	1987	1988	1989
Granville								39.2
Island Bay[c]								
Ramsey Bay[c]			30	11			.3[d]	
Clarks Bay[c]		CLOSED						
Orzenoi Bay[c]								
American Bay[c]								
Balboa Bay	5	TO	25				11	17.4
Beaver Bay								
Little Coal Bay		SAC						
Pavlof				95	61	91.7	69.3	52.7
Canoe Bay	133	ROE	156	239	140.5	117.7	236.5	148.4
Volcano/Dolgoi Island					13		17	
Iliasik Is.		FISH						
Belkofski Bay					8	37.8	12	
King Cove		ING						
Lenard Harbor					59	59.5	30.7	8.6
Dolgoi Harbor						12.3		5.2
Shumagin Islands								38.5
TOTAL	138		211	345	281.5	319.0	376.8	310.0

[a]/The entire South Peninsula was closed to sac-roe herring fishing in 1983 in favor of a bait fishery that never developed.

[b]/Stepovak Bay (Kupreanof Point to Swedania Point) was closed in 1986 and 1987 due to declining biomass trends.

[c]/These bays are located inside Stepovak Bay.

[d]/Seven tons of green herring dumped on May 7, two tons dumped on May 11.

Table 8. 1989 SOUTH PENINSULA COMMERCIAL SAC-ROE HERRING CATCHES (Short Tons)

Area	Date	Tons	Roe %
Canoe Bay	May 28	4.3	6.5
	31	5.5	8.7
	June 3	12.3	7.9
	4	1.3	7.9
	5	12.5	8.2
	8	46.5	8.1
	9	35.5	7.1
	10	10.5	7.4
	12	20.0	8.2
	TOTAL	148.4	7.8
Pavlof Bay	June 12	18.7	8.2
	18	5.5	8.0
	19	28.5	6.2
	TOTAL	52.7	7.1
Stepovk	May 19	39.2	9.0
Shumagin Isl.	May 13	38.5	7.4
Lenard Harbor	June 17	8.6	8.9
Balboa	May 18	1.5	10.0
	19	5.0	9.0
	21	10.9	9.0
	TOTAL	17.4	9.1
Dolgoi Isl.	May 26	2.1	7.2
	June 1	3.1	7.8
	TOTAL	5.2	7.6
	TOTAL	310.0	7.7

Table 9. ALASKA DEPARTMENT OF FISH AND GAME SOUTH PENINSULA AERIAL SURVEYS[a] 1989

Area	Date	RAI[b]	Conditions
Canoe Bay	May 24	15	2
	June 13	15	1
	June 15	12	2
	June 16	37	2
Balboa Bay	May 22	0	2
	May 24	0	2
Fox Bay	May 22	0	2
San Diego	May 22	0	2
Stepovak	May 22	0	2

[a] Species identification is difficult, many of schools spotted probably were capelin.

[b] RAI = (Relative Abundance Index) units express the entire surface area of sighted herring schools in terms of small schools (surface area equal to 538^2 ft.). For example 10 RAI units is equivalent to 10 small herring schools each with a surface area of 538^2 ft.

Relative Abundance Index: small school (less than 538^2 ft) = 1 R.A.I. unit
medium school (532^2 to $4,841^2$ ft) = 5 R.A.I. units
large school (square ft/538^2 ft)

Tons: R.A.I. units are multiplied by 1.52 (schools in water less than 16 ft)
2.58 (schools in water 16 ft - 26 ft)

No conversion was made from R.A.I. to tons on the South Peninsula because water depths were greater than 26 feet.

Rating (of survey conditions): 1) Excellent; 2) Good; 3) Fair; 4) Poor; 5) Unsatisfactory

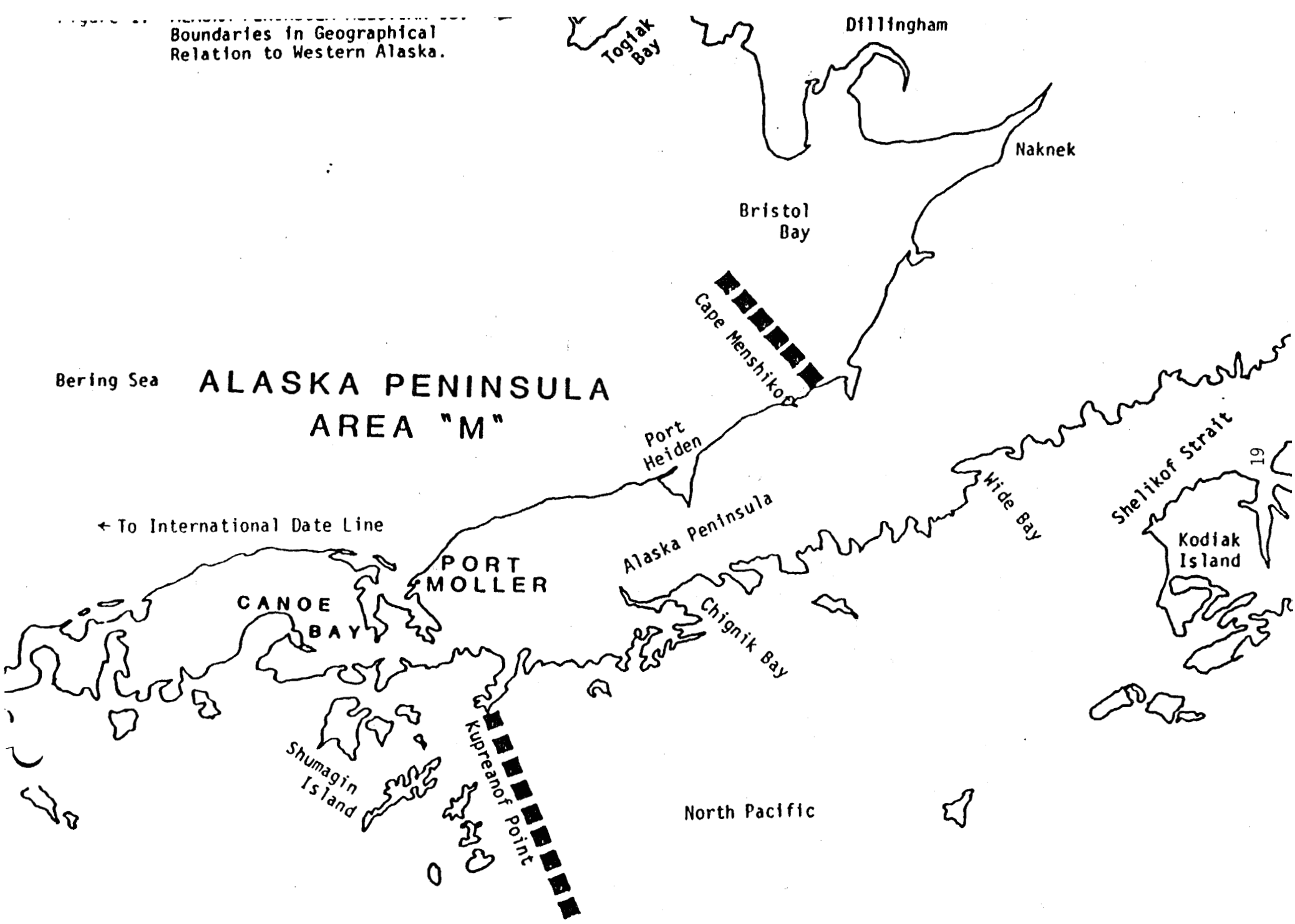
Table 10. SOUTH PENINSULA SAC-ROE HERRING AGE CLASS COMPOSITION FROM COMMERCIAL SEINE SAMPLES, 1989

Date	Area	Sample Size		Age Class								
				3	4	5	6	7	8	9	10	11
				Number of Samples								
May 28	Canoe Bay	71		5	32	16	12	1	-	4	1	-
June 2		22		1	9	8	2	-	-	2	-	-
3		47		3	34	5	1	-	-	3	1	-
8		81		5	41	22	7	-	1	3	1	1
9		57		3	40	9	3	-	-	1	-	1
				Percent								
	Total	278	%	6	56	22	9	-	-	5	1	1
May 20	Stepovak	60		3	31	50	13	-	-	-	2	-
June 13	Shumagins	115		1	15	79	1	-	-	3	-	2

Table 11. PERCENT AGE CLASS COMPOSITION OF SOUTH PENINSULA COMMERCIAL HERRING SAMPLES BY YEAR IN CANOE BAY

	AGE CLASS								
Year	3	4	5	6	7	8	9	10	11
1985	1	3	81	7	6	1	1	0	1
1986	6	-	3	82	6	2	-	1	-
1987	25	28	1	5	34	3	3	-	-
1988	24	31	20	-	1	16	4	2	1
1989	6	56	22	9	-	-	5	1	1

Boundaries in Geographical
Relation to Western Alaska.



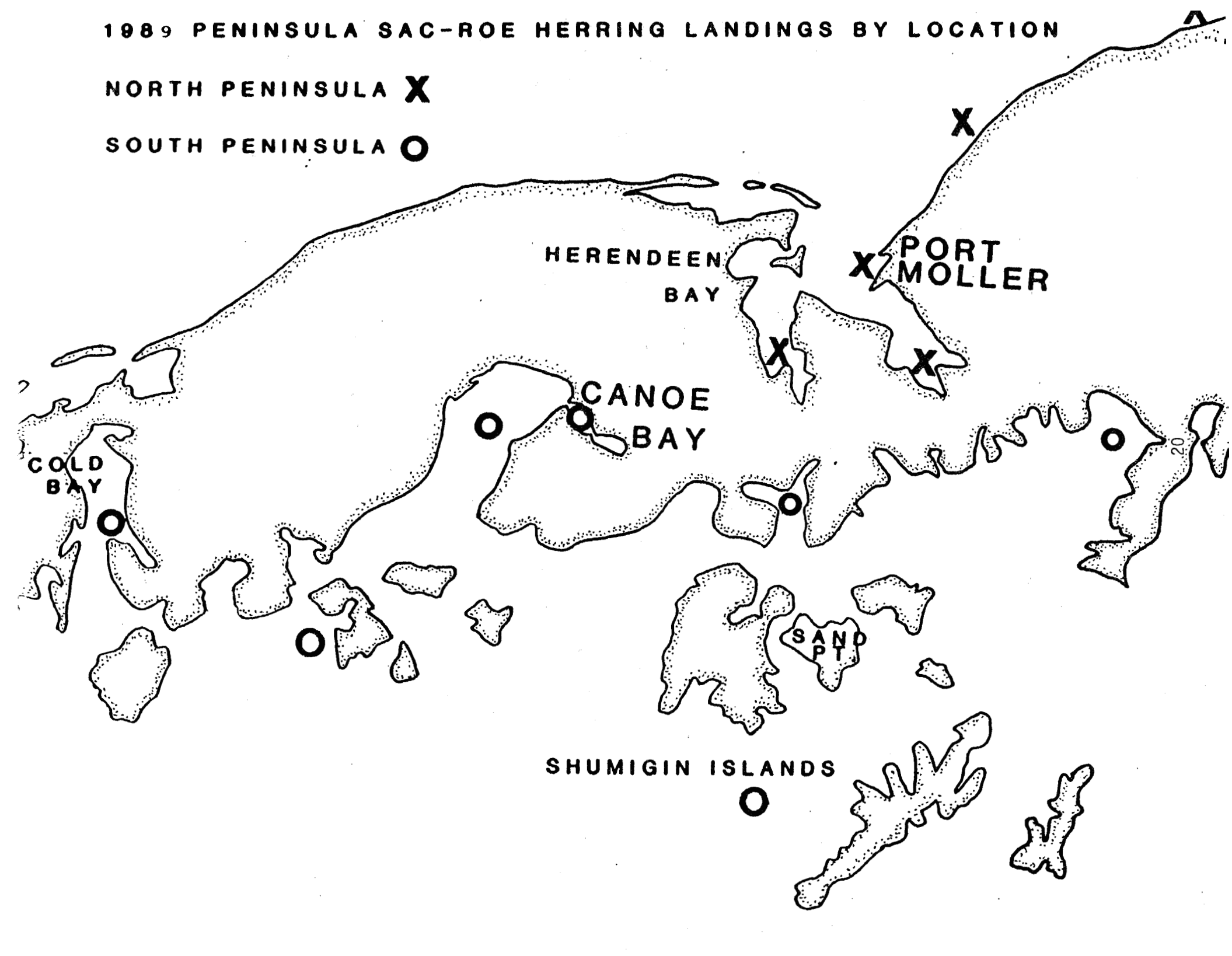

1989 PENINSULA SAC-ROE HERRING LANDINGS BY LOCATION
NORTH PENINSULA X
SOUTH PENINSULA O
HERENDEEN BAY
PORT MOLLER
CANOE BAY
COLD BAY
SAND PT
SHUMIGIN ISLANDS
20

Figure 3. COMMERCIAL SAC-ROE HERRING AGE FREQUENCY BEAR RIVER SECTION BY YEAR

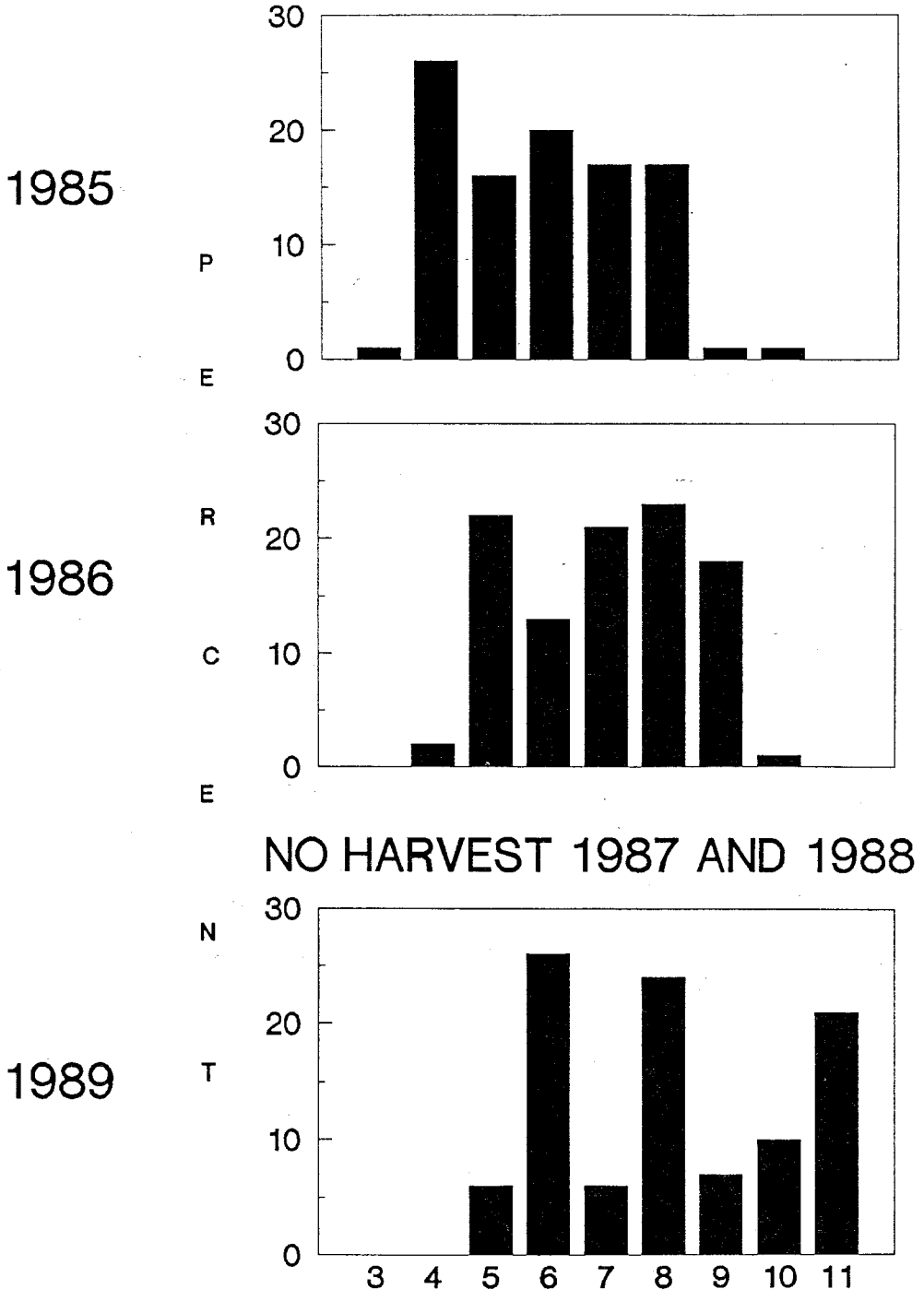


Figure 4.

NORTH PENINSULA COMMERCIAL SAC-ROE HERRING AGE FREQUENCY COMPARISONS BY AREA BY YEAR

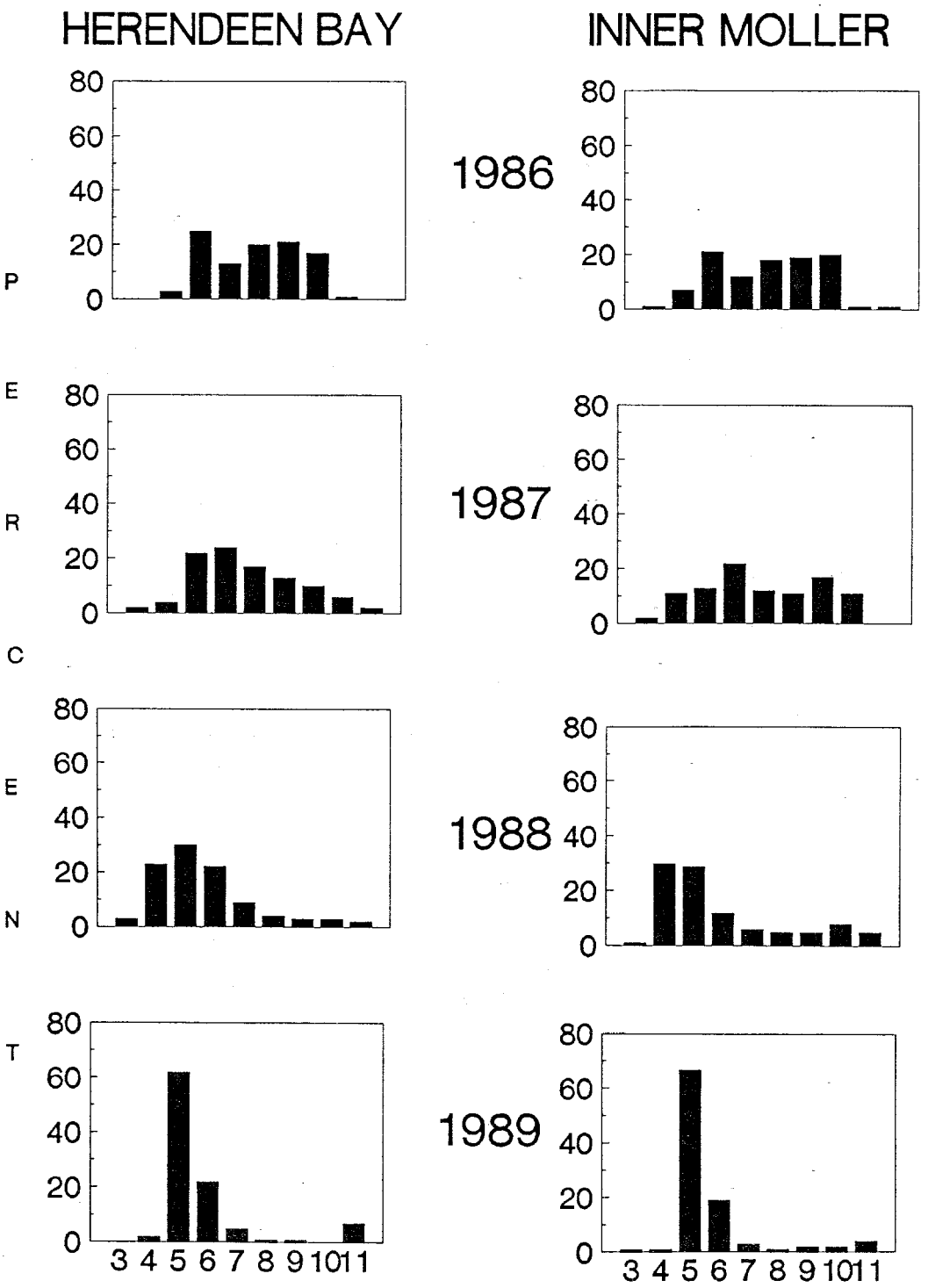


Figure 5. CANOE BAY COMMERCIAL SAC-ROE HERRING AGE FREQUENCY