AGE, SEX, AND SIZE COMPOSITION OF PACIFIC HERRING

FROM COASTAL SPAWNING SITES IN THE ARCTIC-YUKON-KUSKOKWIM REGION, 2000

By

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ABSTRACT

During their 2000 spring spawning migration, Pacific herring *Clupea pallasi* were sampled from five of the eight commercial fishing districts within the Arctic-Yukon-Kuskokwim (AYK) Region of the Bering Sea. Between 6 May and 23 June, 9,434 herring were sampled for age, sex, and size information. Samples were collected using variable-mesh gillnets operated by Alaska Department of Fish and Game personnel, and from commercial gillnet, commercial purse seine, commercial beach seine and subsistence gillnet harvests. Throughout the region, age-7 or age-4 herring dominated the run biomass, and were the predominant age classes in numbers of fish. The percentage of recruit-aged herring (ages 2 through 5) in all AYK districts combined increased compared to 1999 levels, with recruits, comprising 35.0% of the return in numbers of fish. The total biomass in all AYK Districts combined was 59,134 tons and the total harvest was 6,531 tons, for an overall exploitation rate of 11.0%. The mean length within each age class generally decreased northward from Goodnews Bay to Norton Sound. In all gear types, males were more abundant than females.

KEY WORDS: *Clupea pallasi*, Bering Sea, biomass, population, commercial fishery

INTRODUCTION

The age, sex, and size composition data collected from Pacific herring *Clupea pallasi* in the Arctic-Yukon-Kuskokwim (AYK) Region of the Bering Sea is used to assess stock status, gain knowledge of population dynamics, formulate management plans, and facilitate inseason management decisions. The Alaska Department of Fish and Game (ADF&G) has conducted similar studies annually since 1976 (e.g., McBride et al. 1981, DuBois 2000).

The study area comprises the coastal waters of Alaska from Cape Newenham to Cape Prince of Wales (Figure 1). There are eight regulatory commercial fishing districts within the AYK Region: Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, and Nunivak Island Districts are located within the Kuskokwim Area, whereas Cape Romanzof, Norton Sound, and Port Clarence Districts are located within the Bering Sea-Kotzebue Area. Norton Sound is divided into seven subdistricts (Figure 2). AYK herring districts are identified and described in ADF&G (1999).

METHODS

Sampling Techniques

Samples were taken from the Goodnews Bay, Cape Avinof, Nelson Island, Nunivak Island, Cape Romanzof, and Norton Sound (St. Michael, Unalakleet, and Cape Denbigh Subdistricts) commercial fishing districts. Age composition data were not collected from the Security Cove and Port Clarence Districts in 2000.

Variable-mesh gillnets (VMG), consisting of 1.5, 2.0, 2.5, and 3.0 inch stretch-mesh panels, designed to sample age classes in proportion to their abundance, were used to sample the population. Gillnets are the only legal gear in the AYK Region, with the exception of Norton Sound where a portion of the harvest is normally taken using beach seine gear and Nunivak Island where purse seine gear was first fished cooperatively during the 2000 season. In the Kuskokwim herring districts, commercial samples were collected from gillnets with mesh sizes ranging from 2 7/8 to 3 1/4 inch. Samples were also collected from subsistence gillnet harvests in the Nelson Island District. In the Nunivak Island District samples were collected from commercial purse seine gear. In the Cape Romanzof and Norton Sound Districts, commercial samples were collected from gillnets with mesh sizes ranging from 2 7/8 to 3 1/4 inch and from 3 1/8 to 3 1/4 inch, respectively. In addition, commercial samples were collected from beach seine gear in the Unalakleet Subdistrict.

Data collection methods were similar to those described by Barton and Steinhoff (1980). Length, weight, sex, gonad weight, and gonad maturity index data were obtained from herring sampled from each gear type. Fish were measured to the nearest millimeter, weighed to the nearest gram, and aged by counting scale annuli viewed with a microfiche reader. Sample size goals were based on the methods of Thompson (1987). The sample size goal was 420 herring from each commercial gear type in each district or subdistrict per week. The commercial catch sample was collected from ten boats when possible. The sample goal for VMG catches was 60 fish per day. VMGs were fished for short durations to avoid saturating any one mesh size with fish. An effort was made to sample fish from several schools each day to promote representative sampling of the run.

Estimation of Biomass Age Composition

Aerial surveys were flown in each district to estimate herring biomass, spawn timing, and spawn distribution. Aerial survey procedures followed those outlined by Lebida and Whitmore (1985). Preseason projections, spawn deposition observations, and commercial and VMG catch rates were used to estimate the biomass in districts where aerial survey conditions precluded an accurate assessment.

The method used to estimate the age composition of the run biomass and escapement biomass is similar for all districts in 2000. The age composition of the escapement biomass was estimated from VMG catches. The age composition of the run biomass was estimated by combining harvests with escapement biomass for each age class. Because VMG sampling was not done in the Security Cove and Nunivak Island Districts, Goodnews Bay and Nelson Island data were used to estimate the age compositions, respectively. For each district, the number of herring in the run, harvest, and escapement was converted from tons using age-specific average weights of fish sampled from VMG and commercial and subsistence harvests.

RESULTS AND DISCUSSION

The timing of the spawning migration of herring in the northeastern Bering Sea is greatly influenced by climate and oceanic conditions, particularly the extent and distribution of the Bering Sea ice pack. Most herring appear soon after ice breakup, which generally occurs between late-April and mid-June. Spawning usually begins in the Security Cove District and progresses in a northerly direction. In some areas, spawning may continue as late as July.

ADF&G personnel examined 9,434 Pacific herring captured between 6 May and 23 June. The age, sex, and size data collected from herring sampled during this time are summarized in Appendices A.1 - A.18. Age 6 and older herring typically arrive and spawn earlier than younger herring

(Figure 3). This temporal spawning segregation has been observed in previous years (e.g.. DuBois 2000). An exception to this trend was observed in the Norton Sound District, where VMG catches from the Unalakleet Subdistrict during the first week had atypically high percentages of recruit-age herring (27 May – 2 June, 83.3%; Appendix A.16.) This pattern has been observed in some years (DuBois 2000) and is likely due to immature herring bound for other districts migrating through the Unalakleet District (C. Lean, retired Alaska Department of Fish and Game, Nome, personal communication).

The herring biomass for the region was assessed to be 59,134 tons in 2000. The herring biomass was distributed among the districts as follows: 8.9% in Security Cove, 10.7% in Goodnews Bay, 5.4% in Cape Avinof, 7.9% in Nelson Island, 5.9% in Nunivak Island, 5.9% in Cape Romanzof, and 55.3% in Norton Sound (Figure 4).

The commercial harvest was 6,531 tons, for an overall exploitation rate of 11.0% (Table 1). Gillnet fisheries accounted for 98.2%, beach seine 1.2% and purse seine 0.6% of the harvest. The Norton Sound commercial fisheries accounted for 68.7% of the AYK harvest in 2000 (Figure 4). This is an increase compared to 1998 and 1999 when the Norton Sound contribution to the total AYK harvest was 36.0% and 36.2%, respectively. However, the number of gillnet and beach seine fishers combined in Norton Sound District decreased 8% from 1999, and was 54% of the 5-year average (1995-1999) of 175 gillnet fishers. The remainder of the AYK commercial harvest was taken with commercial gillnets in the Security Cove (4.6%), Goodnews Bay (0.3%), Cape Avinof (5.8%), Nelson Island (12.4%), and Cape Romanzof (7.0%) districts. The commercial purse seine fisher in the Nunivak Island District accounted for 0.6% of the AYK total. There has not been a commercial sac roe fishery in the Port Clarence District since 1988 because buyers have not been present in the district.

For most districts, the large recruitment that was observed in 1982 was followed by nine years of reduced recruitment (Figures 5, 6). In 1992 and 1993, a substantial recruitment of herring was again observed in most districts. In 1997 and 1998, increased recruitment of age-4 herring (1997) and age-5 herring (1998) was again observed. In 1999, the AYK Region had record low recruitment (8.9%). In 2000, all districts had increased numbers of recruit herring (age 2 to 5) compared to 1999 levels. Recruitment ranged from 63.7% in the Cape Avinof District to 23.0% in the Cape Romanzof District (Figure 10). The AYK Region average recruitment of 35.0% is well above the 5-year average (1995-1999) recruitment level of 21.8%. Returns from the 1996 year class (age-4) are the largest component of the recruitment in all districts (Table 2, Figure 9).

Some differences in trends of Pacific herring year class abundance were evident among districts. Age-7 herring dominated the biomass in all districts except Cape Avinof (range: 16.8%-25.7%; Table 1; Figures 7, 8). Age-4 herring dominated the biomass in the Cape Avinof District (28.2%). In numbers of fish, age-4 was the dominant age class in the southerly districts of Security Cove, Goodnews Bay and Cape Avinof (range: 25.0%-44.3%, Table 2, Figure 9). Age-7 was the largest component in numbers of fish in the Nelson Island, Nunivak Island and Cape Romanzof Districts (range: 23.4%-23.8%). Age-4 and age-7 were nearly equal in numbers of fish in the Norton Sound District (24.9% and 24.5%, respectively).

The second most dominant age class in biomass was age-7 in Cape Avinof, and age-9 in the remainder of the Kuskokwim Districts (Tables 1, Figures 7, 8). Age-12 was second most dominant age class in the biomass of Cape Romanzof and Norton Sound. Comparing numbers of fish among districts, either age-4 or age-7 were the second most dominant age class, except for Cape Romanzof where age-9 was prevalent (Table 2, Figure 9).

The relative abundance of age-9 and older biomass was higher in the Cape Romanzof (61.9%) and Norton Sound (54.1%) districts than in the Kuskokwim districts (range 27.9%- 51.6%; Table 1, Figures 7, 8). The average age among all herring districts was 7.2 years. Cape Avinof had the youngest average age (5.5 years) while Cape Romanzof had the oldest average age (8.2 years).

Age-9 herring dominated the commercial harvest biomass in all Kuskokwim districts (range 23.4%-33.6%, Table 1, Figures 7, 8). In the northern districts of Cape Romanzof and Norton Sound age-12 herring dominated the commercial harvest (22.8% and 44.1%, respectively). In the AYK Region, age-9 and older herring comprised 83.1% of the commercial harvest, whereas recruit herring accounted for 0.3%. Larger, older-aged herring are targeted by the mesh size of gillnets utilized in the commercial fishery.

Throughout the region. mean length by district within age classes generally decreased in a southerly to northerly direction (Figures 12, 13). This trend parallels observations noted in previous years (DuBois 2000).

Overall, males outnumbered females in all gear types (Appendices A.1. - A.18). The percentages of male herring captured in variable-mesh gillnets were as follows: 52.4 in Goodnews Bay, 51.4 in Cape Avinof, 52.1 in Nelson Island, 58.6 in Cape Romanzof, 58.7 in Norton Sound, and 55.2 for all AYK districts combined. The percentages of male herring captured in commercial gillnets were as follows: 55.0 in Goodnews Bay, 42.9 in Cape Avinof, 53.2 in Nelson Island, 55.0 in Cape Romanzof, 50.8 in Norton Sound, and 51.7 for all AYK districts combined. It is atypical for males to outnumber females in the commercial gillnet harvest (DuBois 2000). Males also dominated the commercial purse and beach seine fisheries (53.8%), and the subsistence harvest samples from Nelson Island (59.9%)

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Table 1. Age composition of Pacific herring run, commercial harvest, and escapement biomass for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

	Security Cove		Goodnews Bay		Cape Avinof		Nelson Island		Nunivak Island		Cape Romanzof		Norton Sound		Arctic-Yukon-Kuskokwim	
Age	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons	% by weight	tons
							Run									
2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
3	0.1	6	0.1	8	3.7	120	1.1	53	1.1	40	0.0	1	0.8	249	0.8	478
4	12.0	627	12.0	760	28.2	906	7.8	366	7.8	273	6.4	224	12.2	3,998	12.1	7,153
5	3.8	201	3.8	243	9.1	293	5.3	249	5.3	186	5.3	187	4.9	1,594	5.0	2,951
6	4.8	250	4.8	304	5.4	173	7.9	370	7.9	276	1.8	62	1.3	417	3.1	1,853
7	16.8	878	16.8	1,064	16.8	540	25.2	1,178	25.2	879	22.7	793	25.7	8,398	23.2	13,730
8	11.0	575	11.0	697	8.8	283	13.8	644	13.8	480	1.9	66	1.0	342	5.2	3,088
9	14.9	781	14.9	947	11.0	352	17.0	793	17.0	592	16.6	581	14.7	4,801	15.0	8,846
10	14.3	748	14.3	906	11.1	356	14.3	668	14.3	498	15.4	538	7.8	2,560	10.6	6,273
11	12.1	634	12.1	769	4.4	141	5.8	269	5.8	201	6.3	221	4.9	1,594	6.5	3,829
12	4.8	252	4.8	306	1.3	40	1.4	64	1.4	48	18.2	636	22.3	7,291	14.6	8,637
13+	5.4	285	5.4	346	0.1	3	0.4	20	0.4	15	5.4	190	4.4	1,436	3.9	2,296
Total	100.0	5,237	100.0	6,348	100.0	3,210	100.0	4,672	100.0	3,487	100.0	3,500	100.0	32,680	100.0	59,134
							Commercial Harvest									
2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
3	0.0	0	0.0	0	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1
4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.2	10	0.1	10
5	0.0	0	0.0	0	0.9	3	0.0	0	2.0	1	0.2	1	0.1	5	0.2	10
6	2.7	8	2.7	1	5.4	20	0.9	8	3.4	1	0.2	1	0.1	3	0.6	41
7	14.0	42	14.0	3	23.0	87	14.2	115	22.0	9	17.4	87	10.6	477	12.5	819
8	11.9	35	11.9	2	15.1	57	10.0	81	9.8	4	0.8	4	0.9	42	3.4	225
9	23.4	70	23.4	5	24.0	91	33.6	271	29.2	12	21.4	107	18.8	845	21.4	1,401
10	23.0	69	23.0	5	16.5	62	24.2	195	25.9	11	19.3	96	10.0	448	13.6	886
11	10.8	32	10.8	2	9.4	35	13.7	111	5.1	2	8.8	44	8.0	358	9.0	585
12	5.6	17	5.6	1	4.4	16	3.0	25	2.7	1	22.8	114	44.1	1,980	33.0	2,154
13+	8.5	25	8.5	2	1.2	5	0.3	2	0.0	0	9.2	46	7.1	319	6.1	399
Total	100.0	299	100.0	20	100.0	377	100.0	807	100.0	41	100.0	500	100.0	4,487	100.0	6,531
							Escapement									
2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
3	0.1	6	0.1	8	4.2	120	1.4	53	1.2	40	0.0	1	0.9	249	0.9	477
4	12.7	627	12.0	760	32.0	906	9.5	366	7.9	273	7.5	224	14.1	3,988	13.6	7,143
5	4.1	201	3.8	243	10.2	289	6.4	249	5.4	185	6.2	186	5.6	1,588	5.6	2,941
6	4.9	242	4.8	303	5.4	153	9.4	363	8.0	275	2.0	61	1.5	415	3.4	1,812
7	16.9	836	16.8	1,061	16.0	454	27.5	1,063	25.2	870	23.5	706	28.1	7,921	24.5	12,910
8	10.9	540	11.0	695	8.0	226	14.6	563	13.8	476	2.1	62	1.1	301	5.4	2,863
9	14.4	711	14.9	942	9.2	262	13.5	521	16.8	580	15.8	474	14.0	3,956	14.2	7,446
10	13.7	679	14.2	901	10.4	294	12.2	472	14.2	488	14.7	442	7.5	2,112	10.2	5,387
11	12.2	602	12.1	766	3.7	105	4.1	158	5.8	199	5.9	177	4.4	1,236	6.2	3,244
12	4.8	236	4.8	305	0.8	24	1.0	39	1.3	46	17.4	522	18.8	5,311	12.3	6,483
13+	5.3	260	5.4	344	0.0	0	0.5	18	0.4	15	4.8	145	4.0	1,116	3.6	1,897
Total	100.0	4,938	100.0	6,328	100.0	2,833	100.0	3,865	100.0	3,446	100.0	3,000	100.0	28,193	100.0	52,603

Table 2. Percent age composition of Pacific herring spawning abundance, in number of fish, for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

Age	Security Cove	Goodnews Bay	Cape Avinof	Nelson Island	Nunivak Island	Cape Romanzof	Norton Sound	Arctic-Yukon Kuskokwim
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.4	0.4	9.1	3.9	3.9	0.1	2.4	1.3
4	25.0	25.0	44.3	16.5	16.5	13.9	24.9	12.3
5	5.9	5.9	10.3	7.7	7.7	9.0	7.6	3.8
6	5.5	5.5	4.6	8.5	8.5	2.2	1.5	1.7
7	16.4	16.4	12.0	23.8	23.8	23.4	24.5	10.9
8	9.7	9.7	5.4	11.6	11.6	1.8	0.9	2.1
9	11.8	11.8	6.1	12.9	12.9	14.5	11.6	5.7
10	10.4	10.4	5.5	10.1	10.1	12.8	5.9	3.8
11	8.3	8.3	2.0	3.8	3.8	4.8	3.3	2.1
12	3.1	3.1	0.6	0.9	0.9	13.6	14.6	4.8
13+	3.4	3.4	0.1	0.3	0.3	3.9	2.7	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	49.7

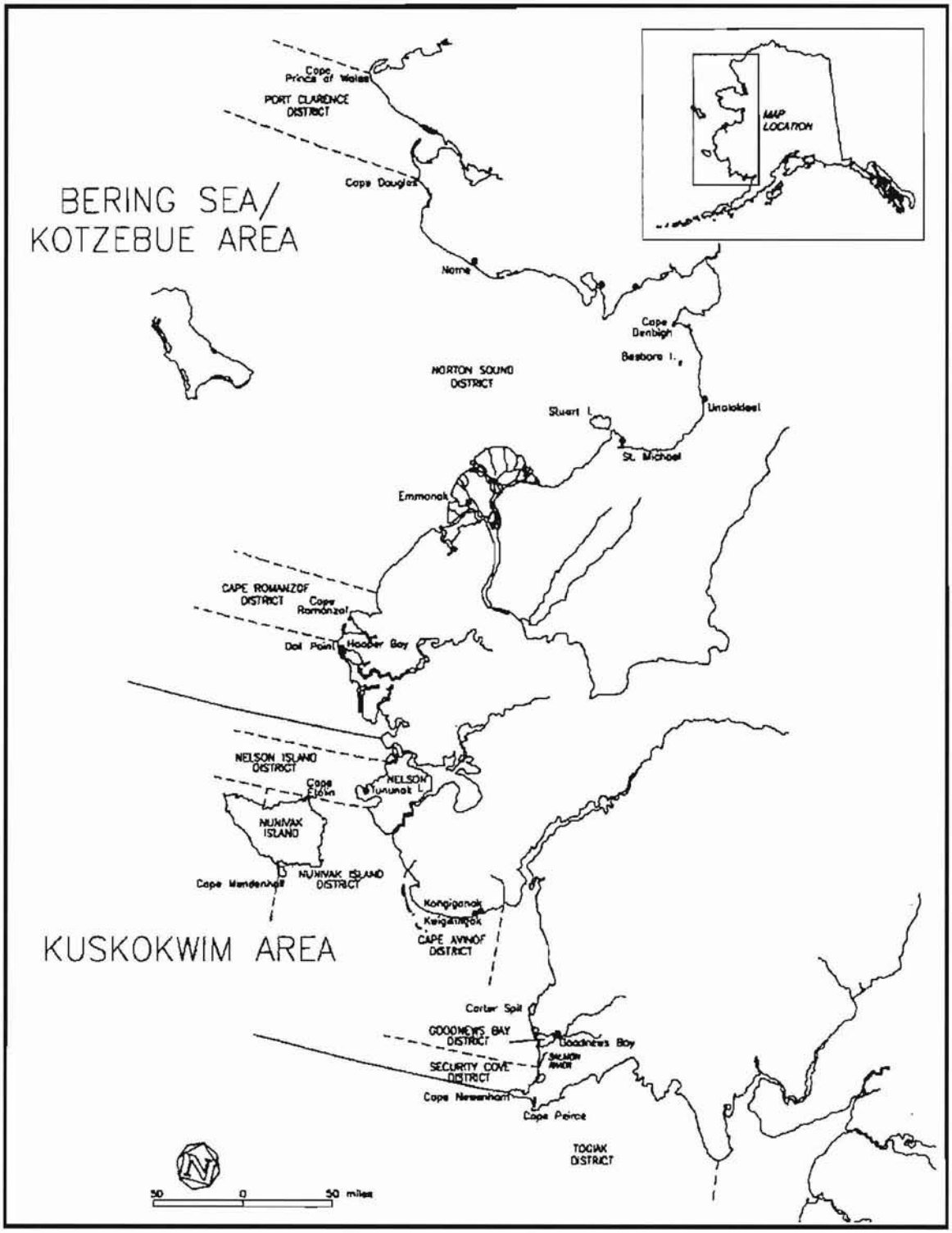


Figure 1. Commercial herring fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

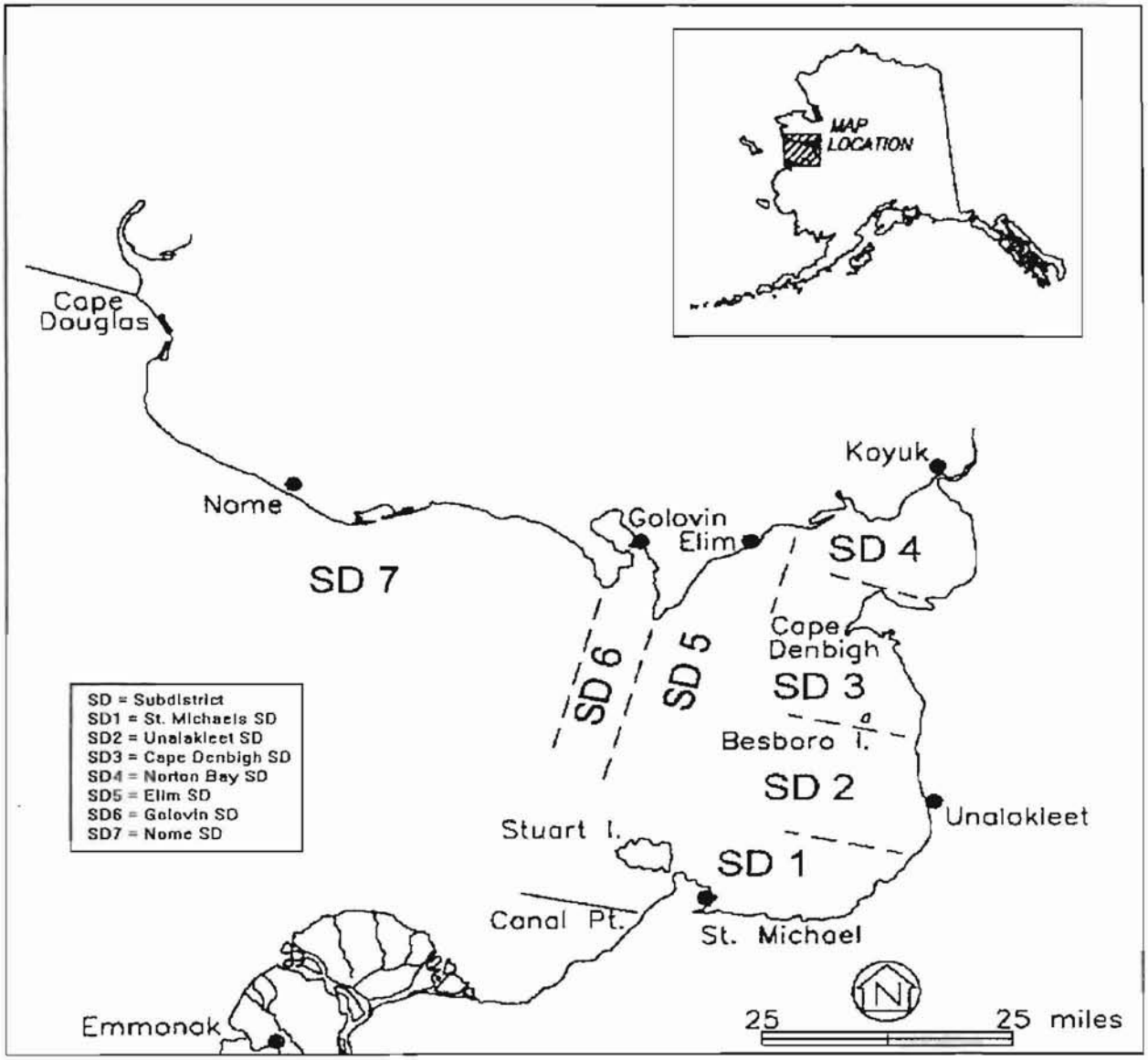


Figure 2. Commercial herring fishing subdistricts within the Norton Sound district, Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

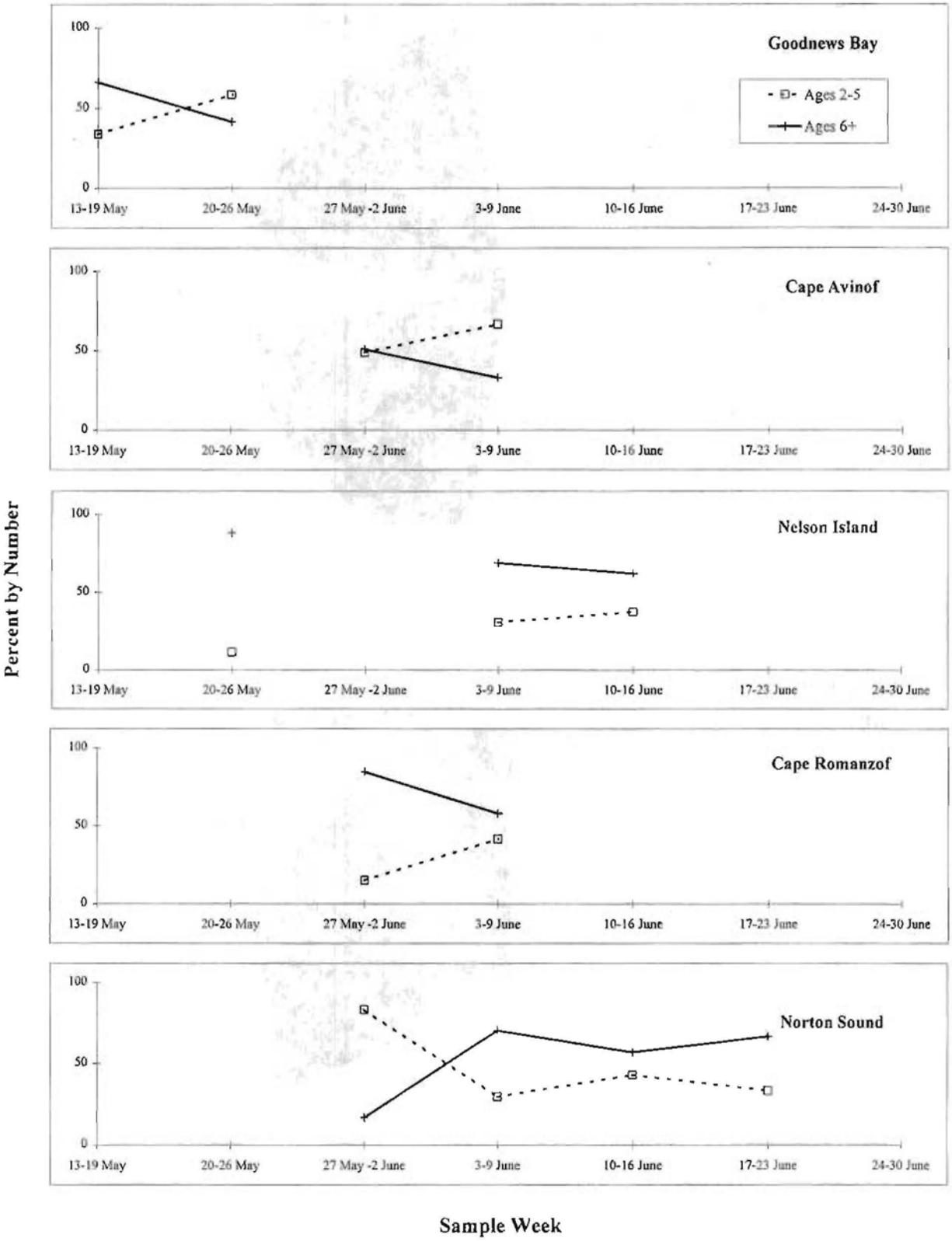
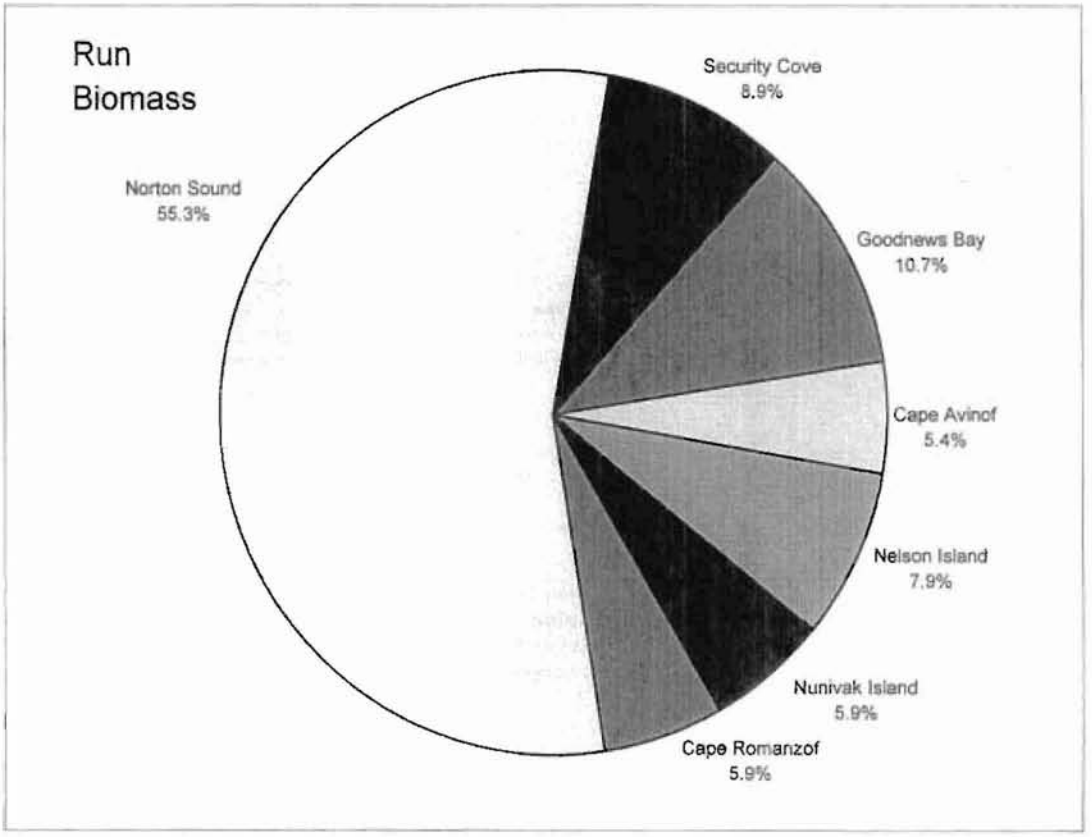


Figure 3. Spawning time comparison (based on variable-mesh gillnet data) of Pacific herring, grouped by by ages 2 to 5 and age 6 and older, for districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.



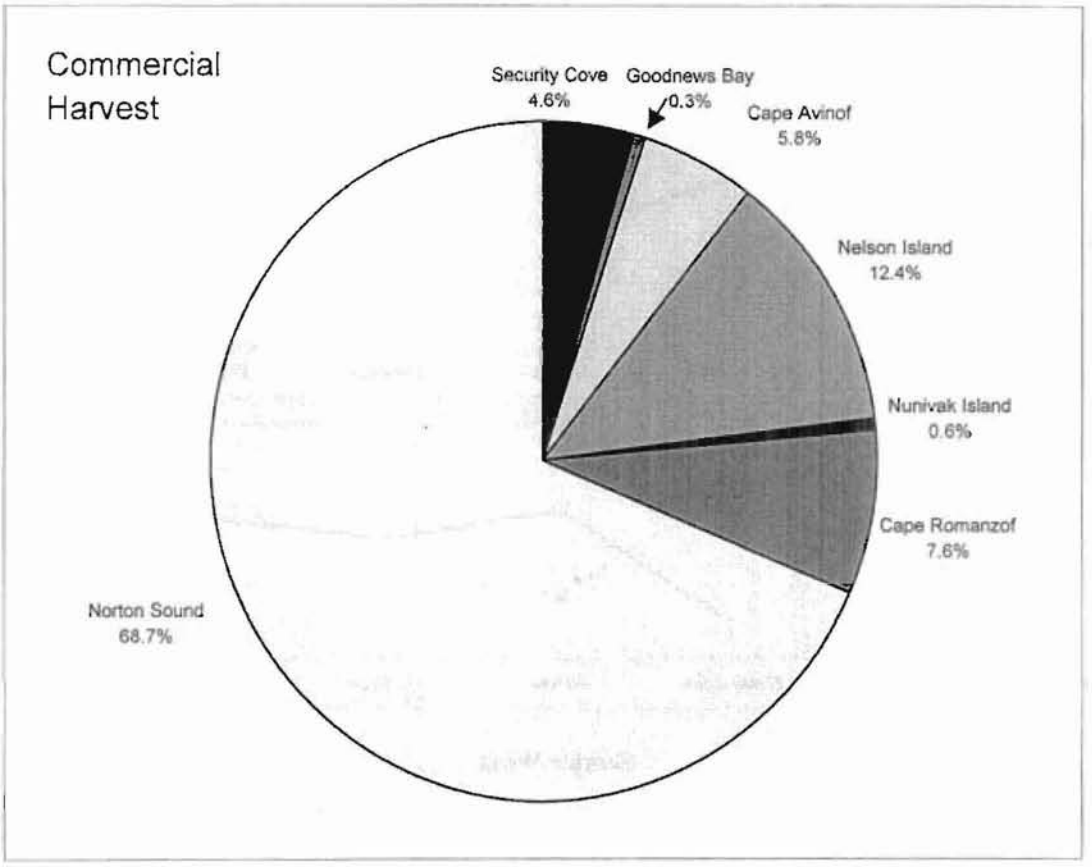


Figure 4. Pacific herring run biomass and commercial harvest distribution by commercial fishing district, Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

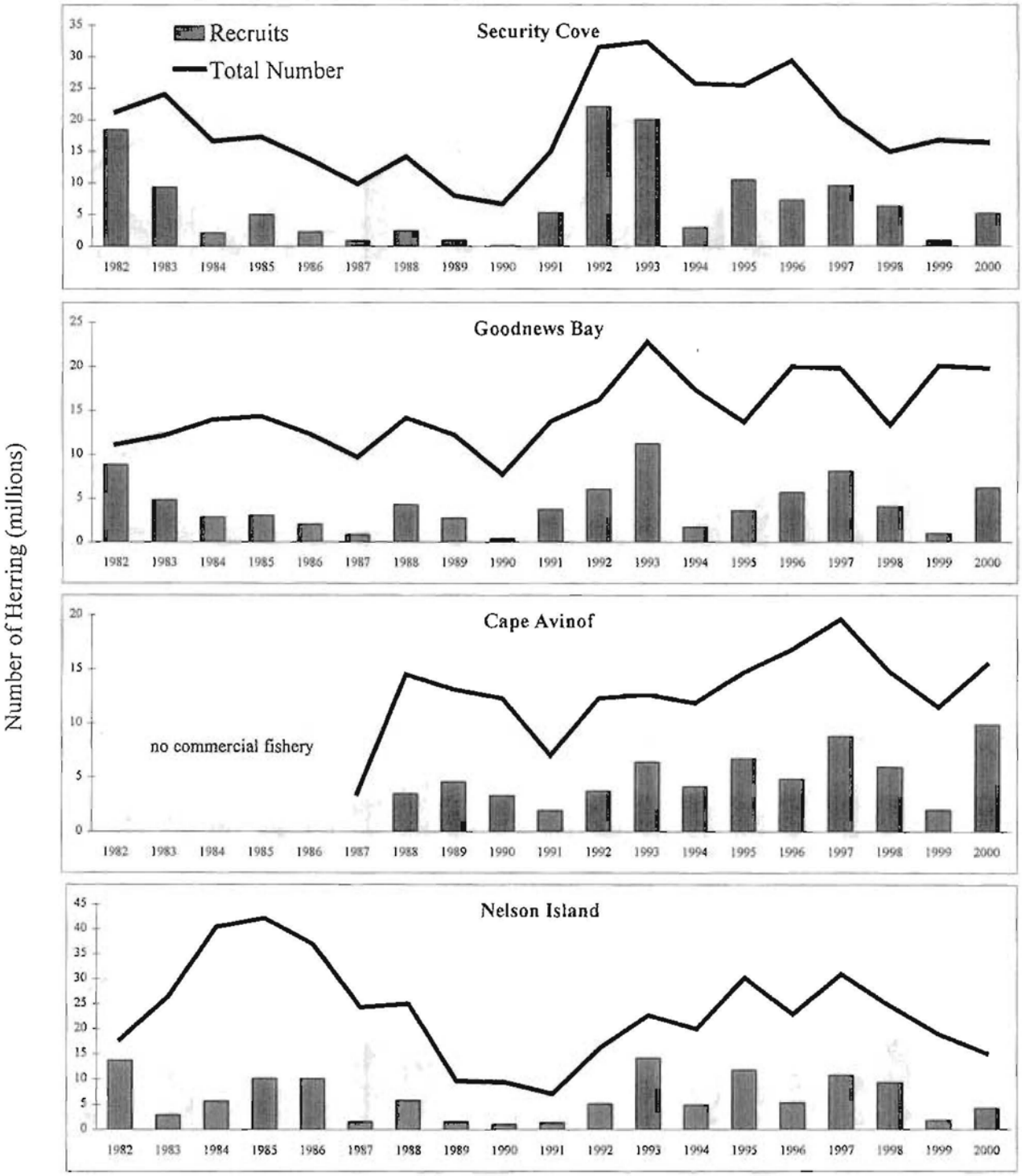


Figure 5. Pacific herring recruits, ages 2 through 5, compared to the total population from 1982 through 2000 for Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island Districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

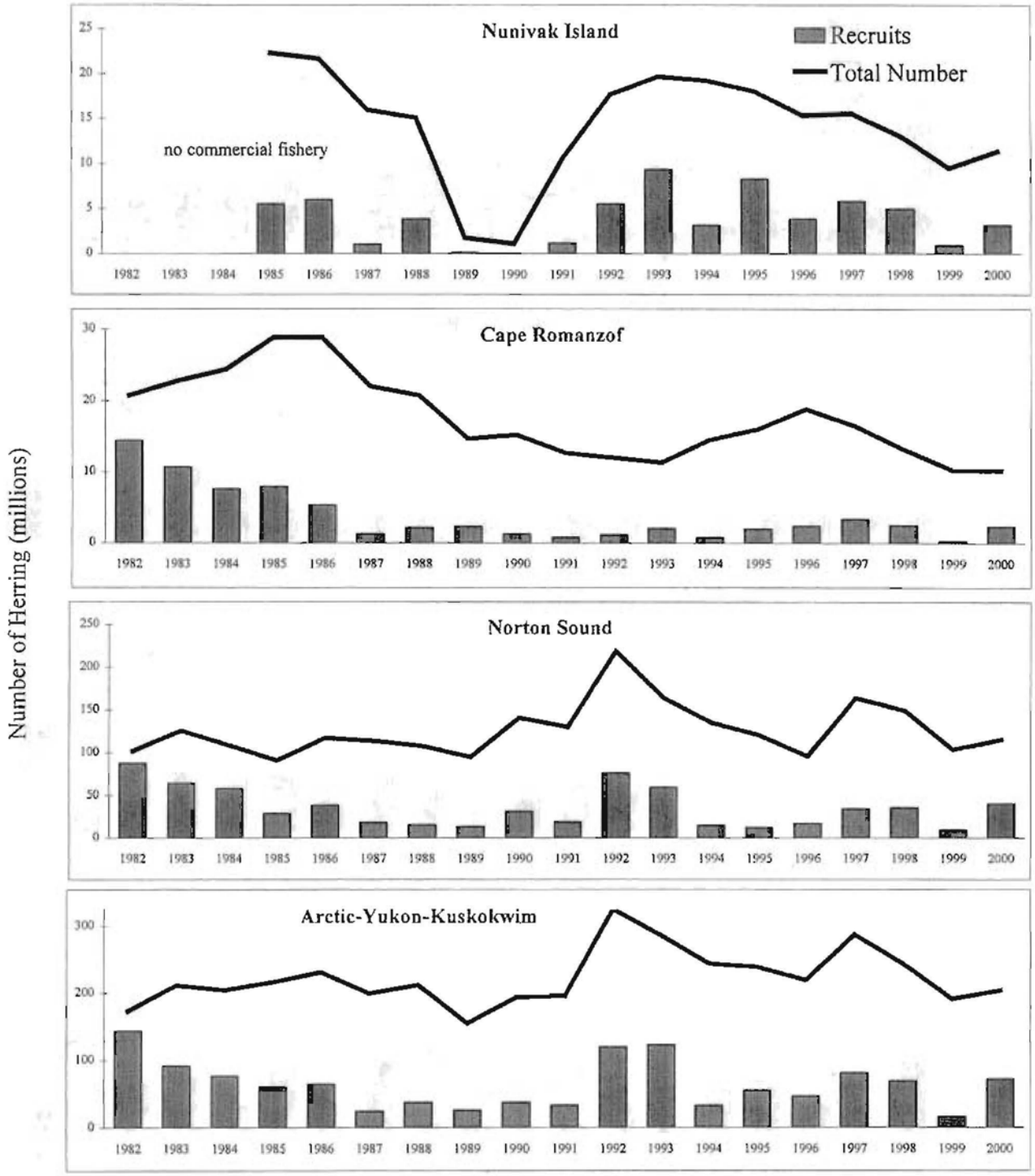


Figure 6. Pacific herring recruits, ages 2 through 5, compared to the total population from 1982 through 2000 for Nunivak Island, Cape Romanzof, and Norton Sound Districts, and the combined Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

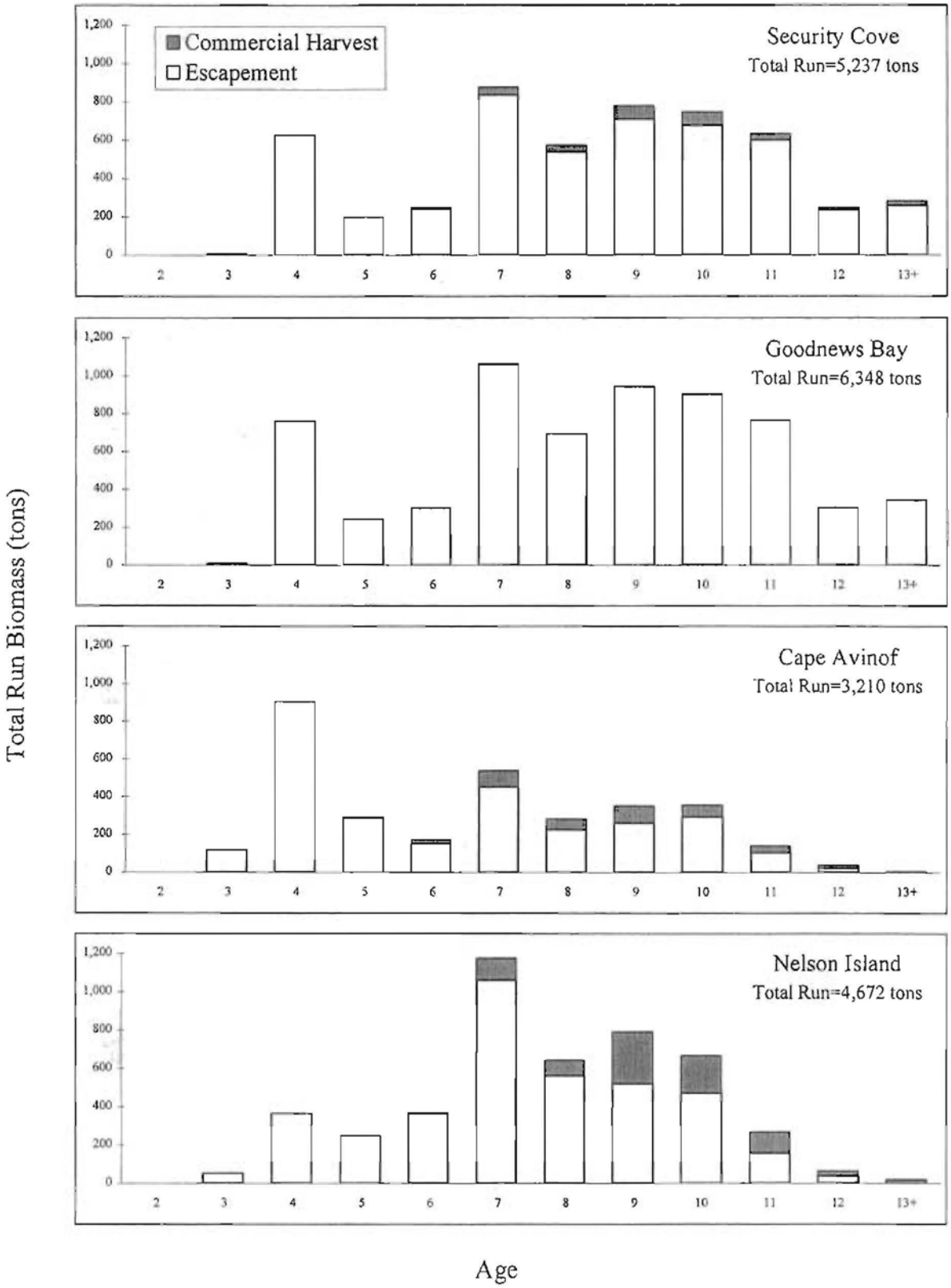


Figure 7. Abundance by age of Pacific herring for the total run, escapement and harvest biomass for the Security Cove, Goodnews Bay, Cape Avinof, and Nelson Island Districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

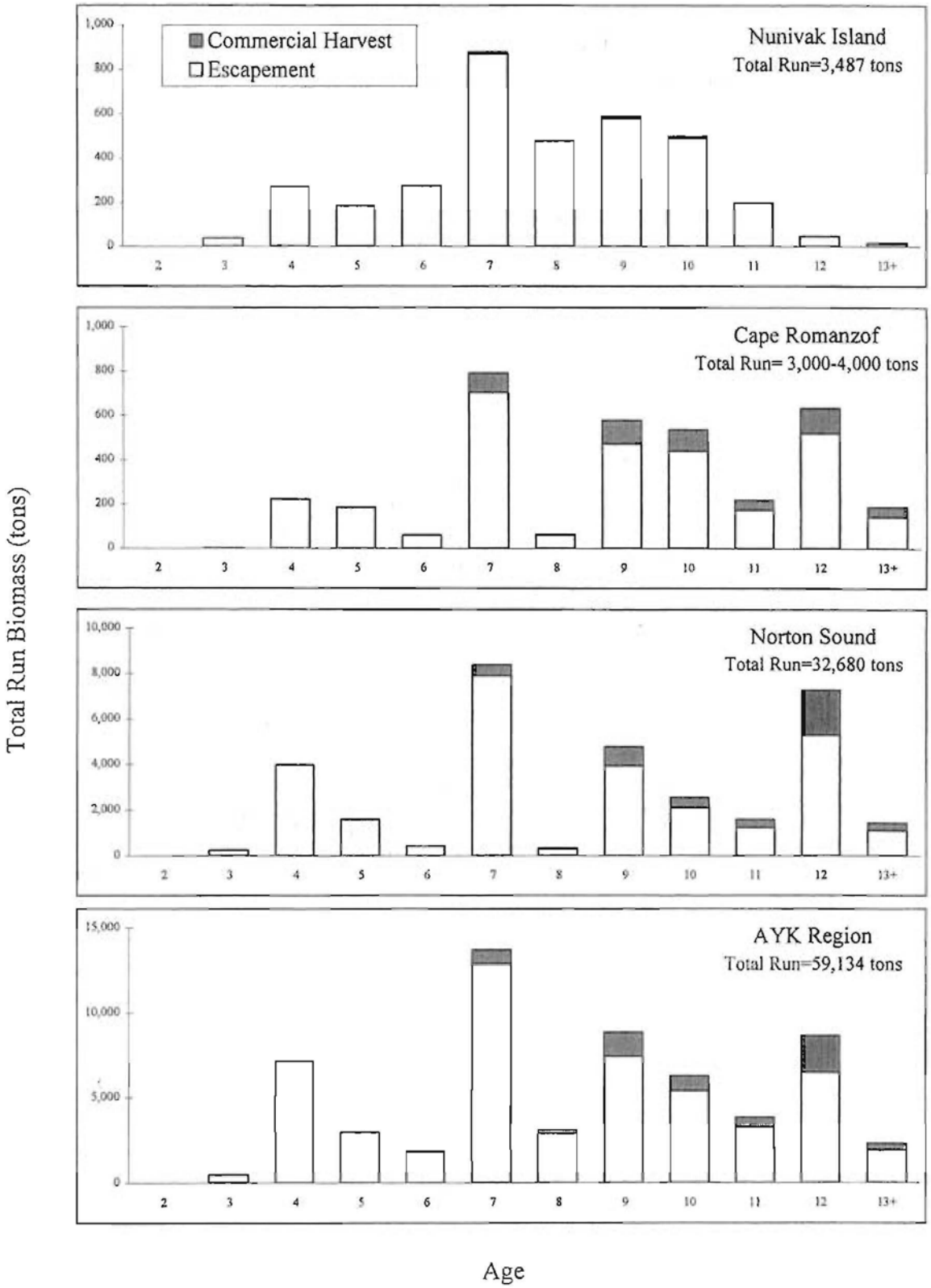


Figure 8. Abundance by age of Pacific herring for the total run, escapement and harvest biomass for the Nunivak Island, Cape Romanzof, Norton Sound Districts, and the combined Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

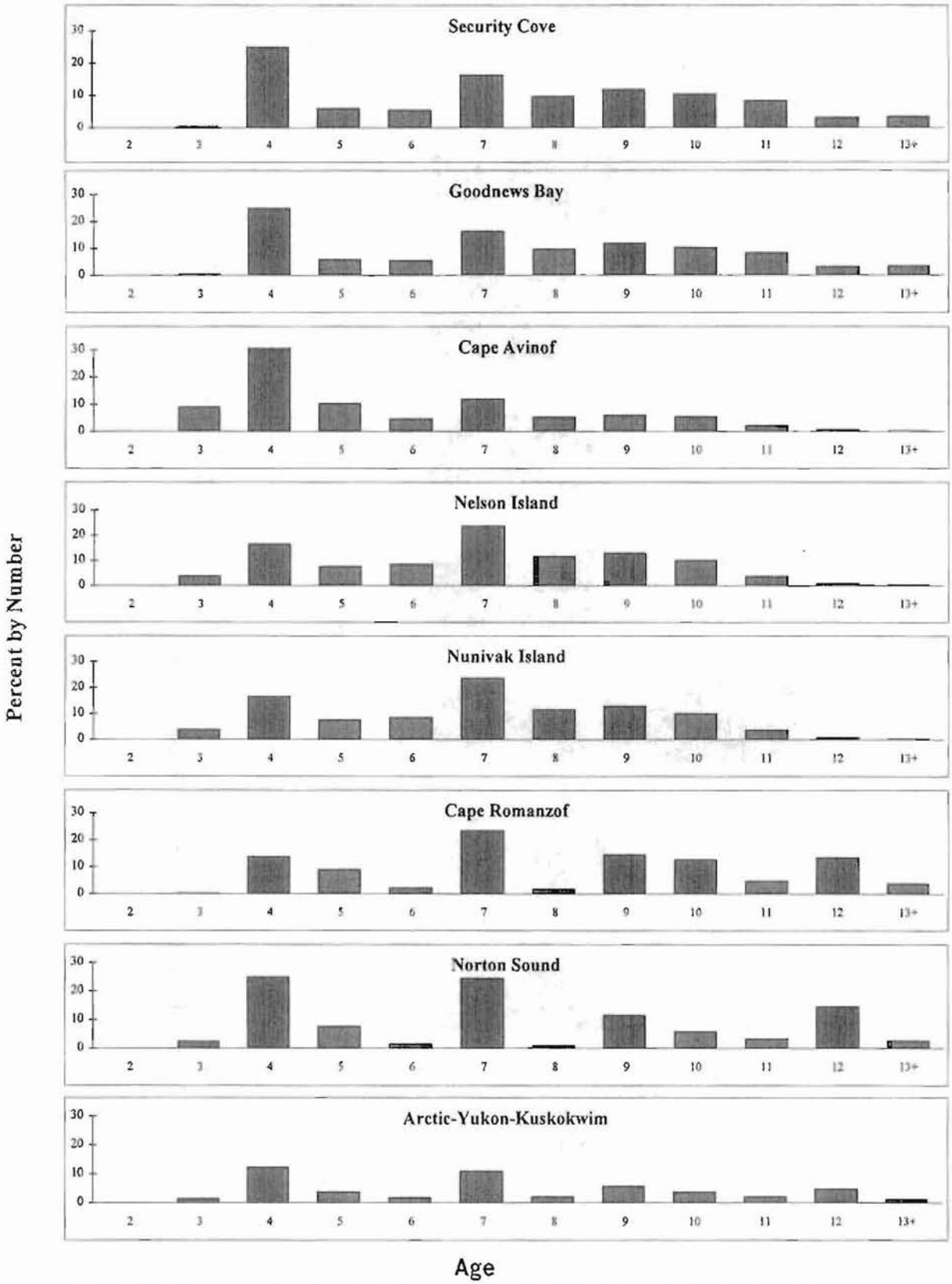


Figure 9. Age composition of Pacific herring spawning populations for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

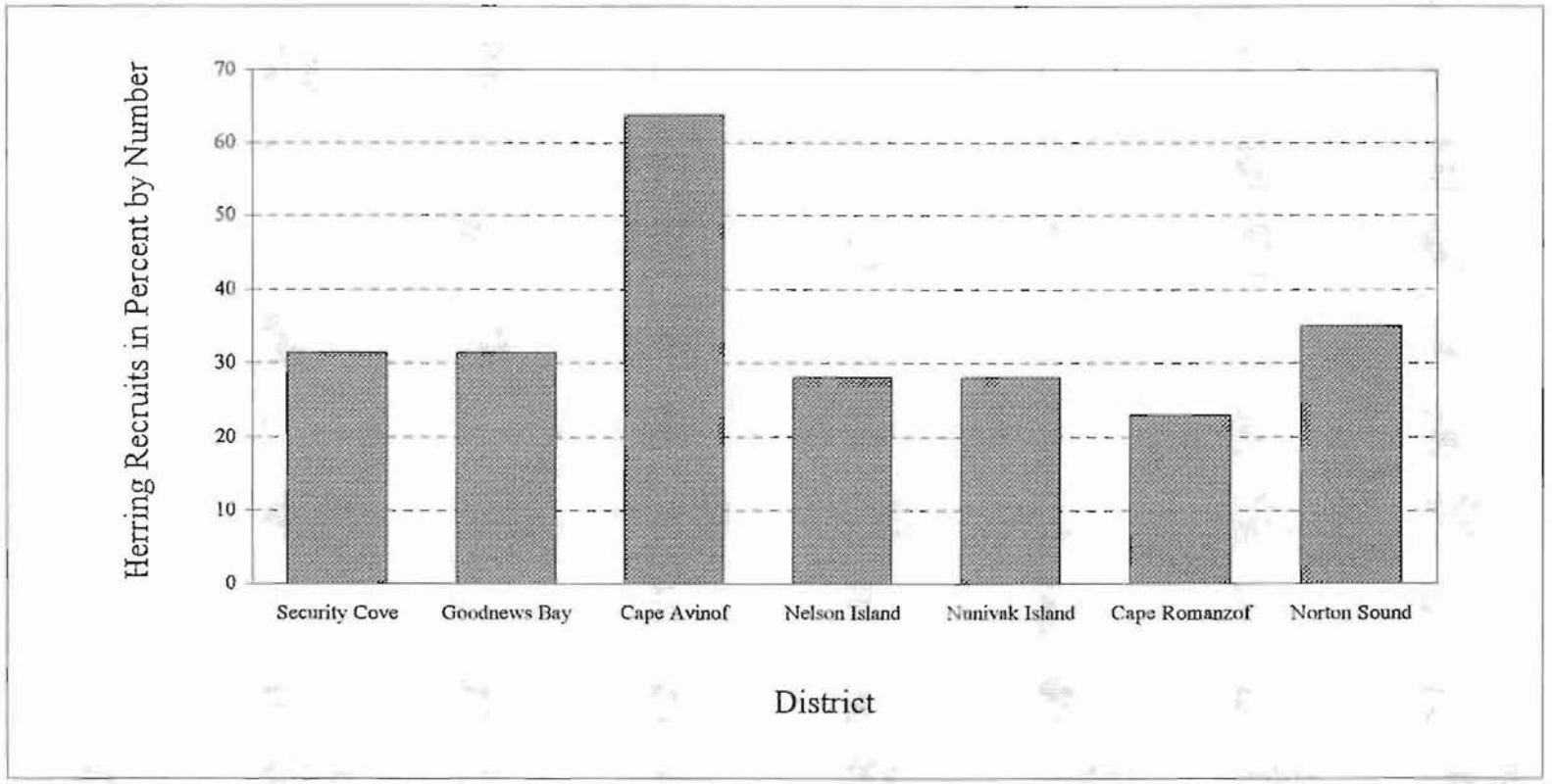


Figure 10. Pacific herring recruits (ages 2 through 5) for commercial fishing districts within the Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

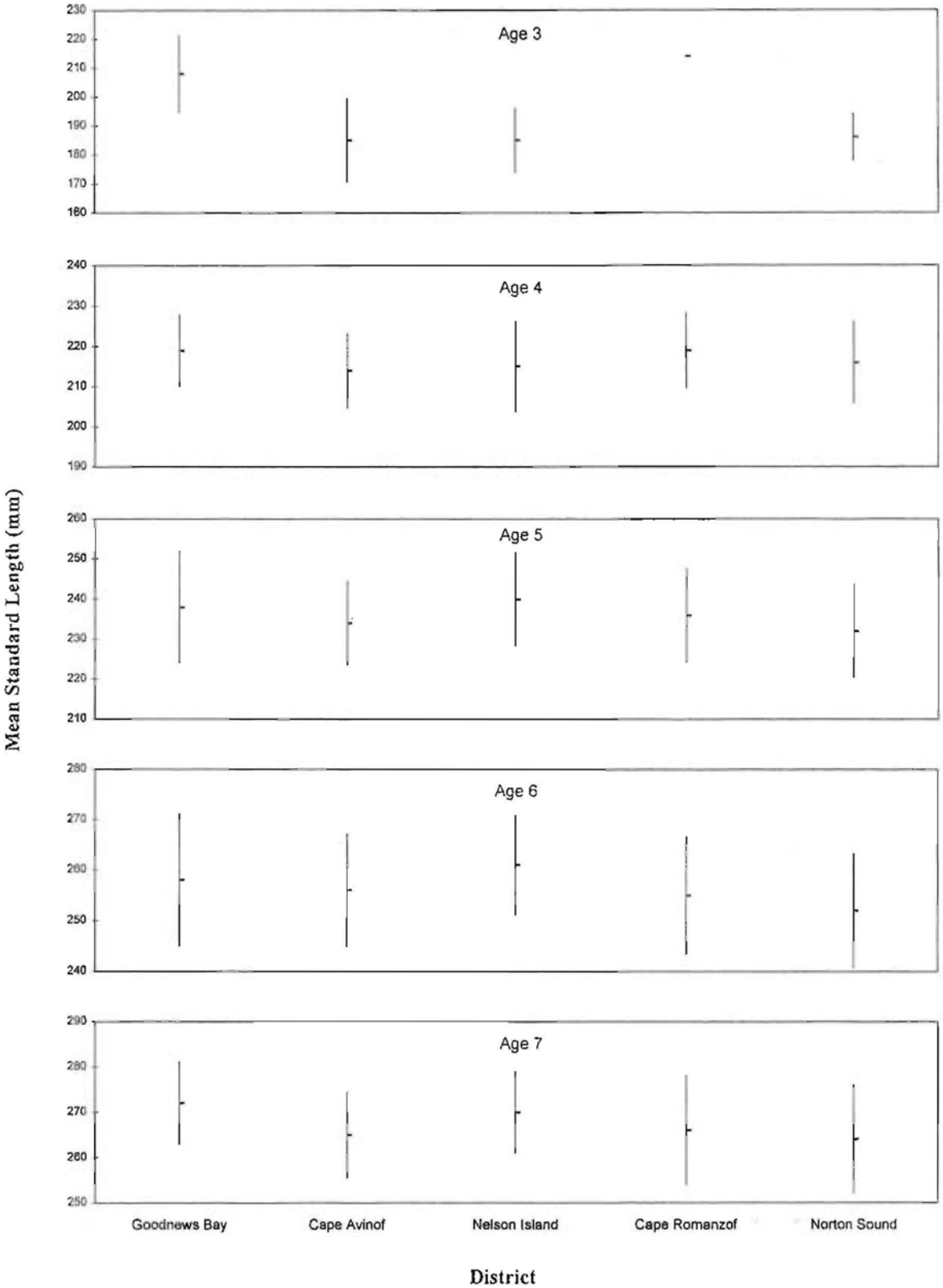


Figure 11. Mean standard length (+/- 1 SD) of Pacific herring by age class and commercial fishing district, ages 3 to 7, Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

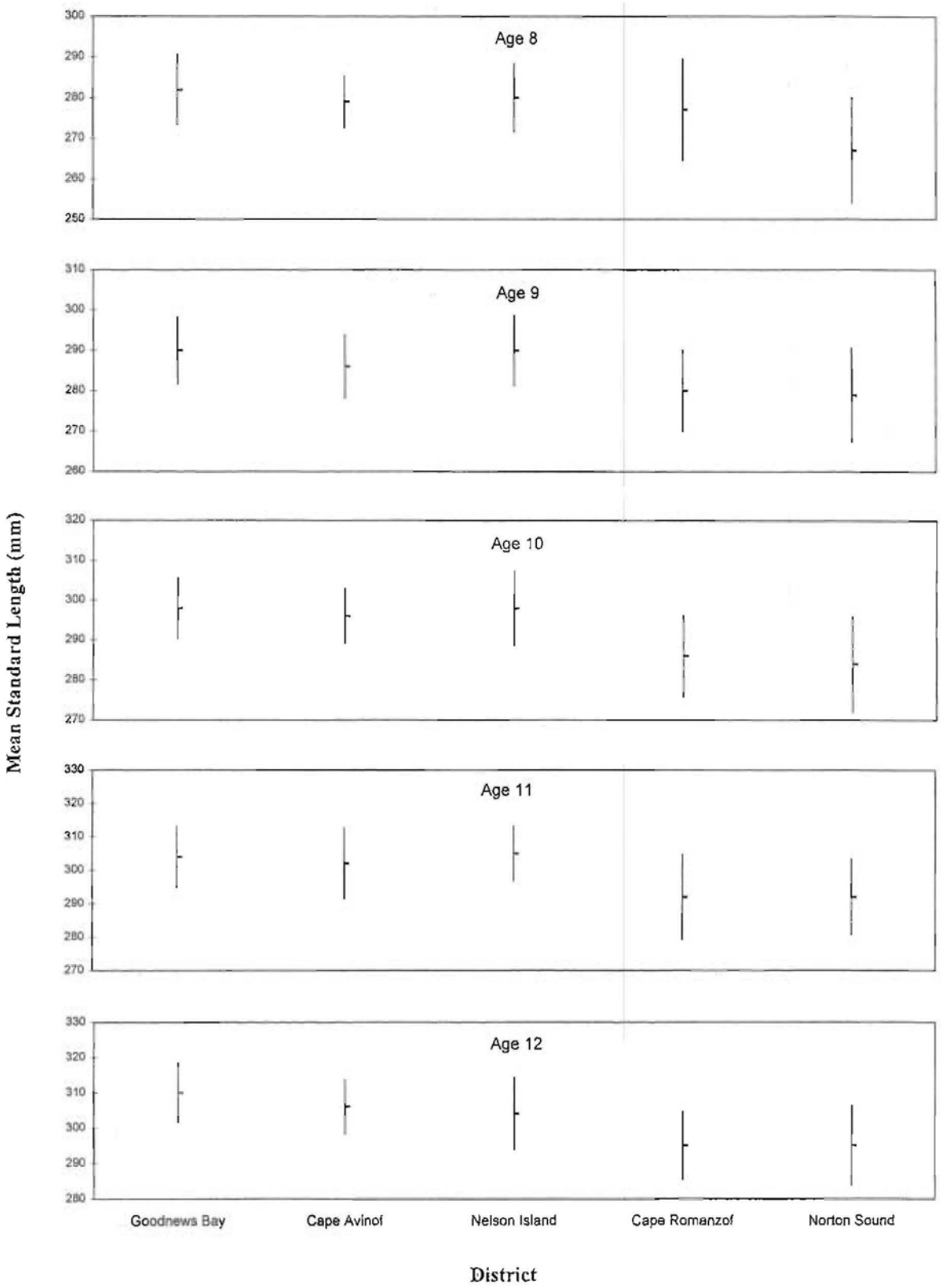


Figure 12. Mean standard length (+/- 1 SD) of Pacific herring by age class and commercial fishing district, ages 8 to 12, Arctic-Yukon-Kuskokwim Region, Alaska, 2000.

Appendix A.1. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Goodnews Bay District, 26 May, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6	0	4	0	4	4.1	248	41.6	4	255	6.4	4
	7	8	8	0	16	16.3	317	37.8	16	273	6.0	16
	8	5	7	0	12	12.2	359	35.8	12	285	6.7	12
26 May	9	13	10	0	23	23.5	370	44.8	23	290	9.1	23
	10	11	10	0	21	21.4	398	46.7	21	297	9.9	21
	11	8	2	0	10	10.2	393	46.6	10	301	10.2	10
	12	4	1	0	5	5.1	407	42.0	5	307	6.6	5
	13	3	2	0	5	5.1	449	20.5	5	317	8.3	5
	14	1	0	0	1	1.0	420		1	309		1
	15	1	0	0	1	1.0	432		1	313		1
	16											
	17											
Sample Total		54	44	0	98	100.0	370	58.4	98	291	15.8	98
Sex Composition		55.1	44.9									
Unaged		1	1	0	2	2.0	336	93.3	2	278	27.6	2
Sex Composition		50.0	50.0									

Appendix A.2. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Northwestern (Kipnuk) Section, Cape Avinof District, 4-7 June, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
4 June	2											
	3	0	1	0	1	1.3	73		1	194		1
	4											
	5											
	6	1	1	0	2	2.7	289	46.7	2	270	0.0	2
	7	12	9	0	21	28.0	305	27.1	21	276	6.9	21
	8	1	7	0	8	10.7	336	29.1	8	283	6.7	8
	9	9	10	0	19	25.3	348	22.8	19	290	5.9	19
	10	5	5	0	10	13.3	383	40.4	10	301	8.6	10
	11	6	1	0	7	9.3	407	38.1	7	311	5.2	7
	12	3	2	0	5	6.7	423	58.6	5	316	8.6	5
	13	1	1	0	2	2.7	415	54.4	2	322	1.4	2
	14											
	15											
	16											
	17											
Sample Total		38	37	0	75	100.0	346	60.3	75	290	19.1	75
5 June	2											
	3											
	4											
	5	2	0	0	2	2.7	213	0.7	2	253	1.4	2
	6	1	2	0	3	4.1	298	50.7	3	265	11.0	3
	7	10	9	0	19	25.7	285	25.2	19	267	7.2	19
	8	3	11	0	14	18.9	306	32.9	14	276	8.0	14
	9	7	6	0	13	17.6	353	49.9	13	287	11.2	13
	10	5	12	0	17	23.0	379	44.8	17	294	8.4	17
	11	2	3	0	5	6.8	384	47.7	5	304	6.6	5
	12	0	1	0	1	1.4	458		1	318		1
	13											
	14											
	15											
	16											
	17											
Sample Total		30	44	0	74	100.0	330	59.5	74	281	16.0	74
7 June	2											
	3											
	4											
	5	0	1	0	1	1.8	212		1	253		1
	6	2	6	0	8	14.0	277	20.3	8	264	6.2	8
	7	5	9	0	14	24.6	286	33.2	14	271	6.2	14
	8	3	8	0	11	19.3	314	44.1	11	276	9.4	11
	9	7	8	0	15	26.3	357	63.9	15	288	5.0	15
	10	1	2	0	3	5.3	351	2.5	3	299	1.0	3
	11	3	1	0	4	7.0	424	99.2	4	299	8.2	4
	12	1	0	0	1	1.8	428		1	300		1
	13											
	14											
	15											
	16											
	17											
Sample Total		22	35	0	57	100.0	323	66.0	57	279	13.4	57

-Continued-

Appendix A.2. (p. 2 of 2)

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	0	1	0	1	0.5	73		1	194		1
	4											
	5	2	1	0	3	1.5	212	0.6	3	253	1.0	3
	6	4	9	0	13	6.3	284	30.6	13	265	6.8	13
	7	27	27	0	54	26.2	293	29.2	54	272	7.8	54
All Periods Combined	8	7	26	0	33	16.0	316	37.1	33	277	8.6	33
4-7 June	9	23	24	0	47	22.8	352	45.9	47	289	7.5	47
	10	11	19	0	30	14.6	378	41.2	30	297	8.4	30
	11	11	5	0	16	7.8	404	58.3	16	305	7.9	16
	12	4	3	0	7	3.4	429	49.6	7	314	9.3	7
	13	1	1	0	2	1.0	415	54.4	2	322	1.4	2
	14											
	15											
	16											
	17											
All Samples Combined		90	116	0	206	100.0	334	62.1	206	284	17.1	206
Sex Composition		43.7	56.3									
Unaged		4	9	0	13	6.3	341	48.4	13	291	14.8	13
Sex Composition		30.8	69.2									

Appendix A.3. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Nelson Island District, 29-30 May, 2000.

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6	4	1	0	5	2.7	299	29.8	5	266	7.0	5
	7	15	17	0	32	17.2	320	26.2	32	276	6.7	32
	8	12	3	0	15	8.1	362	46.3	15	282	8.5	15
29 May	9	29	42	0	71	38.2	375	42.2	71	290	9.2	71
	10	23	16	0	39	21.0	401	43.8	39	296	7.9	39
	11	12	8	0	20	10.8	418	25.5	20	306	7.9	20
	12	3	1	0	4	2.2	423	46.2	4	308	3.6	4
	13											
	14											
	15											
	16											
	17											
Sample Total		98	88	0	186	100.0	373	50.5	186	290	12.7	186
	2											
	3											
	4											
	5											
	6											
	7	25	15	0	40	16.9	314	30.1	40	274	7.5	40
	8	17	13	0	30	12.7	352	30.6	30	283	6.8	30
30 May	9	30	41	0	71	30.0	384	33.1	71	291	8.6	71
	10	36	21	0	57	24.1	405	38.4	57	301	6.2	57
	11	15	16	0	31	13.1	439	39.5	31	310	6.2	31
	12	4	3	0	7	3.0	453	43.2	7	314	6.2	7
	13	0	1	0	1	0.4	470		1	315		1
	14											
	15											
	16											
	17											
Sample Total		127	110	0	237	100.0	383	53.3	237	293	14.0	237
	2											
	3											
	4											
	5											
	6	4	1	0	5	1.2	299	29.8	5	266	7.0	5
	7	40	32	0	72	17.0	316	28.4	72	275	7.2	72
All Periods Combined	8	29	16	0	45	10.6	355	36.3	45	283	7.3	45
29-30 May	9	59	83	0	142	33.6	379	38.1	142	290	8.9	142
	10	59	37	0	96	22.7	404	40.5	96	299	7.3	96
	11	27	24	0	51	12.1	431	36.0	51	309	7.1	51
	12	7	4	0	11	2.6	442	44.6	11	312	6.1	11
	13	0	1	0	1	0.2	470		1	315		1
	14											
	15											
	16											
	17											
All Samples Combined		225	198	0	423	100.0	379	52.2	423	291	13.5	423
Sex Composition		53.2	46.8									
Unaged		10	9	0	19	4.5	369	50.1	19	289	10.3	19
Sex Composition		52.6	47.4									

Appendix A.4. Age, sex, and size composition of herring sampled from the subsistence gillnet harvest, Nelson Island District, 8-13 June, 2000.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	1	0	0	1	2.4	204		1	212		1
	4	14	7	0	21	50.0	133	18.0	21	220	5.7	21
	5	8	5	0	13	31.0	170	38.2	13	234	12.6	13
	6	3	1	0	4	9.5	230	30.8	4	260	11.7	4
	7	2	0	0	2	4.8	218	7.1	2	250	7.1	2
	8	1	0	0	1	2.4	269		1	274		1
8 June	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		29	13	0	42	100.0	163	44.9	42	231	17.1	42
	2											
	3											
	4	4	4	0	8	4.9	211	46.2	8	246	16.0	8
	5	8	3	0	11	6.8	195	41.5	11	246	9.3	11
	6	20	14	0	34	21.0	235	40.1	34	258	12.6	34
	7	38	28	0	66	40.7	269	38.2	66	269	9.3	66
	8	7	6	0	13	8.0	318	40.6	13	278	8.0	13
9 June	9	11	7	0	18	11.1	339	46.4	18	288	9.7	18
	10	5	5	0	10	6.2	388	45.7	10	300	7.4	10
	11	1	1	0	2	1.2	390	90.5	2	305	9.2	2
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		94	68	0	162	100.0	275	64.8	162	269	17.7	162
	2											
	3	0	1	0	1	1.9	171		1	232		1
	4	7	4	0	11	20.4	134	16.6	11	220	9.1	11
	5	3	1	0	4	7.4	155	27.5	4	226	11.1	4
	6	3	5	0	8	14.8	256	39.4	8	262	6.8	8
	7	5	6	0	11	20.4	282	39.5	11	274	9.9	11
	8	3	4	0	7	13.0	307	62.9	7	277	6.3	7
10 June	9	3	5	0	8	14.8	333	32.6	8	290	6.7	8
	10	2	2	0	4	7.4	353	67.8	4	290	16.7	4
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		26	28	0	54	100.0	253	86.7	54	261	28.1	54

-Continued-

Appendix A.4. (p. 2 of 2)

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4	9	5	0	14	20.6	133	17.3	14	215	8.9	14
	5	6	3	0	9	13.2	181	21.9	9	240	4.3	9
	6	9	6	0	15	22.1	233	26.4	15	260	6.7	15
	7	9	8	0	17	25.0	279	28.3	17	275	8.3	17
	8	1	3	0	4	5.9	291	32.1	4	289	7.8	4
11 June	9	4	0	0	4	5.9	323	17.6	4	290	5.4	4
	10	4	1	0	5	7.4	337	40.8	5	295	6.2	5
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		42	26	0	68	100.0	234	71.3	68	258	27.7	68
	2											
	3											
	4	1	1	0	2	4.9	161	18.4	2	230	10.6	2
	5	1	0	0	1	2.4	153		1	240		1
	6	8	5	0	13	31.7	249	32.5	13	262	4.8	13
	7	8	8	0	16	39.0	286	39.0	16	273	10.6	16
	8	2	0	0	2	4.9	275	17.7	2	274	5.7	2
13 June	9	3	2	0	5	12.2	301	62.9	5	291	11.9	5
	10	0	2	0	2	4.9	327	29.0	2	293	1.4	2
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		23	18	0	41	100.0	268	52.8	41	270	16.7	41
	2											
	3	1	1	0	2	0.5	188	23.3	2	222	14.1	2
	4	35	21	0	56	15.3	145	35.5	56	223	13.4	56
	5	26	12	0	38	10.4	178	36.0	38	238	11.4	38
	6	43	31	0	74	20.2	239	36.0	74	260	9.9	74
	7	62	50	0	112	30.5	274	37.6	112	270	9.9	112
All Dates Combined	8	14	13	0	27	7.4	306	45.2	27	279	8.1	27
8-13 June	9	21	14	0	35	9.5	331	44.3	35	289	8.8	35
	10	11	10	0	21	5.7	363	51.4	21	296	9.5	21
	11	1	1	0	2	0.5	390	90.5	2	305	9.2	2
	12											
	13											
	14											
	15											
	16											
	17											
All Samples Combined		214	153	0	367	100.0	250	75.1	367	261	24.5	367
Sex Composition		58.3	41.7									
Unaged		38	16	0	54	14.7	239	71.3	54	257	21.6	54
Sex Composition		70.4	29.6									

Appendix A.5. Age, sex, and size composition of herring sampled from the commercial purse seine harvest, Nunivak Island District, 22-23 May, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
22 May	2											
	3											
	4											
	5	0	1	0	1	1.6	194		1	234		1
	6	1	1	0	2	3.2	227	9.9	2	247	7.1	2
	7	7	7	0	14	22.2	303	34.5	14	264	7.4	14
	8	4	2	0	6	9.5	352	23.8	6	277	8.2	6
	9	11	9	0	20	31.7	361	42.6	20	283	8.9	20
	10	5	9	0	14	22.2	411	36.1	14	291	9.1	14
	11	1	3	0	4	6.3	409	66.0	4	292	14.4	4
	12	1	1	0	2	3.2	431	18.4	2	314	8.5	2
	13											
	14											
	15											
	16											
	17											
Sample Total		30	33	0	63	100.0	356	63.1	63	279	16.6	63
23 May	2											
	3											
	4											
	5	1	1	0	2	6.9	223	4.2	2	243	4.2	2
	6	2	1	0	3	10.3	220	17.4	3	247	5.6	3
	7	4	5	0	9	31.0	317	28.3	9	270	6.0	9
	8	3	0	0	3	10.3	352	18.3	3	280	6.8	3
	9	1	5	0	6	20.7	372	46.2	6	286	13.0	6
	10	2	4	0	6	20.7	434	44.0	6	295	7.4	6
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		13	16	0	29	100.0	340	76.2	29	275	18.3	29
All Periods Combined 22-23 May	2											
	3											
	4											
	5	1	2	0	3	3.3	213	17.0	3	240	6.0	3
	6	3	2	0	5	5.4	223	13.8	5	247	5.3	5
	7	11	12	0	23	25.0	309	32.3	23	266	7.3	23
	8	7	2	0	9	9.8	352	20.9	9	278	7.5	9
	9	12	14	0	26	28.3	363	42.8	26	284	9.8	26
	10	7	13	0	20	21.7	418	39.0	20	292	8.6	20
	11	1	3	0	4	4.3	409	66.0	4	292	14.4	4
	12	1	1	0	2	2.2	431	18.4	2	314	8.5	2
	13											
	14											
	15											
	16											
	17											
All Samples Combined		43	49	0	92	100.0	351	67.5	92	278	17.1	92
Sex Composition		46.7	53.3									
Unaged		7	1	0	8	8.7	330	67.7	8	276	12.6	8
Sex Composition		87.5	12.5									

Appendix A.6. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Romanzof District, 29 May - 4 June, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	9	12	0	21	29.2	320	31.0	21	263	9.4	21
	8											
29 May	9	13	4	0	17	23.6	341	37.2	17	273	9.9	17
	10	8	8	0	16	22.2	364	35.8	16	279	8.6	16
	11	2	1	0	3	4.2	380	47.7	3	290	8.3	3
	12	4	6	0	10	13.9	418	50.9	10	290	12.7	10
	13	1	1	0	2	2.8	416	5.7	2	287	5.7	2
	14	1	0	0	1	1.4	467		1	289		1
	15	1	0	0	1	1.4	395		1	284		1
	16											
	17	0	1	0	1	1.4	478		1	304		1
Sample Total		39	33	0	72	100.0	359	52.5	72	276	14.0	72
	2											
	3											
	4											
	5	0	1	0	1	3.2	279		1	264		1
	6											
	7	6	2	0	8	25.8	317	17.1	8	279	6.0	8
	8	0	1	0	1	3.2	358		1	288		1
31 May	9	4	5	0	9	29.0	368	28.0	9	282	4.6	9
	10	2	4	0	6	19.4	388	30.7	6	296	7.1	6
	11	1	1	0	2	6.5	405	44.5	2	304	3.5	2
	12	2	2	0	4	12.9	451	18.8	4	304	5.4	4
	13											
	14											
	15											
	16											
	17											
Sample Total		15	16	0	31	100.0	368	50.9	31	288	11.8	31
	2											
	3											
	4											
	5											
	6	0	1	0	1	0.6	313		1	270		1
	7	18	17	0	35	19.3	326	26.3	35	276	8.2	35
	8											
2 June	9	18	27	0	45	24.9	364	29.9	45	287	8.0	45
	10	22	17	0	39	21.5	371	43.5	39	288	10.8	39
	11	8	6	0	14	7.7	400	38.6	14	295	6.7	14
	12	18	17	0	35	19.3	416	36.0	35	299	8.2	35
	13	6	1	0	7	3.9	405	39.3	7	301	9.8	7
	14	2	1	0	3	1.7	464	40.1	3	304	7.2	3
	15	1	1	0	2	1.1	519	19.1	2	317	0.7	2
	16											
	17											
Sample Total		93	88	0	181	100.0	376	49.6	181	289	12.2	181

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Appendix A.6. (p. 2 of 2)

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	3	6	0	9	8.2	333	18.2	9	267	10.4	9
	8	1	2	0	3	2.7	388	42.1	3	283	15.0	3
3 June	9	9	8	0	17	15.5	370	36.8	17	276	8.6	17
	10	14	5	0	19	17.3	392	35.8	19	281	10.5	19
	11	4	10	0	14	12.7	421	58.2	14	285	12.1	14
	12	20	13	0	33	30.0	412	34.0	33	286	7.5	33
	13	3	4	0	7	6.4	452	58.8	7	292	6.4	7
	14	1	0	0	1	0.9	436		1	291		1
	15	5	1	0	6	5.5	470	49.7	6	300	4.8	6
	16	0	1	0	1	0.9	440		1	294		1
	17											
Sample Total		60	50	0	110	100.0	402	51.0	110	283	11.5	110
	2											
	3											
	4											
	5											
	6											
	7	15	12	0	27	27.8	314	27.9	27	269	10.0	27
	8											
4 June	9	11	11	0	22	22.7	350	38.4	22	281	12.8	22
	10	9	6	0	15	15.5	368	32.2	15	284	14.2	15
	11	4	3	0	7	7.2	420	16.6	7	297	8.8	7
	12	11	9	0	20	20.6	406	37.4	20	292	10.7	20
	13	1	0	0	1	1.0	366		1	279		1
	14	0	1	0	1	1.0	409		1	288		1
	15	3	1	0	4	4.1	468	31.1	4	309	13.4	4
	16											
	17											
Sample Total		54	43	0	97	100.0	365	53.0	97	283	15.5	97
	2											
	3											
	4											
	5	0	1	0	1	0.2	279		1	264		1
	6	0	1	0	1	0.2	313		1	270		1
	7	51	49	0	100	20.4	322	26.8	100	271	10.6	100
All Periods Combined	8	1	3	0	4	0.8	381	37.6	4	285	12.5	4
29 May- 4 June	9	55	55	0	110	22.4	359	34.7	110	282	10.7	110
	10	55	40	0	95	19.3	375	39.0	95	285	11.6	95
	11	19	21	0	40	8.1	409	44.7	40	292	10.6	40
	12	55	47	0	102	20.8	414	37.1	102	293	10.7	102
	13	11	6	0	17	3.5	423	51.1	17	294	9.8	17
	14	4	2	0	6	1.2	451	34.5	6	297	9.3	6
	15	10	3	0	13	2.6	471	46.5	13	304	11.4	13
	16	0	1	0	1	0.2	440		1	294		1
	17	0	1	0	1	0.2	478		1	304		1
All Samples Combined		261	230	0	491	100.0	377	53.1	491	284	13.8	491
Sex Composition		53.2	46.8									
Unaged		55	29	0	84	17.1	368	48.0	84	285	14.0	84
Sex Composition		65.5	34.5									

Appendix A.7. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, St Michael Subdistrict, Norton Sound District, 7-13 June, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	6	1	0	7	11.5	321	15.7	7	285	7.4	7
	8											
7 June	9	3	8	0	11	18.0	366	21.0	11	293	5.5	11
	10	8	3	0	11	18.0	355	46.5	11	295	12.7	11
	11	7	3	0	10	16.4	376	34.8	10	298	7.1	10
	12	10	7	0	17	27.9	409	47.3	17	306	6.3	17
	13	1	0	0	1	1.6	365		1	290		1
	14	3	1	0	4	6.6	422	25.7	4	311	6.2	4
	15											
	16											
	17											
Sample Total		38	23	0	61	100.0	376	46.6	61	298	10.9	61
	2											
	3											
	4											
	5											
	6											
	7	6	6	0	12	7.1	322	27.6	12	276	7.8	12
	8	1	1	0	2	1.2	333	6.4	2	285	4.2	2
8 June	9	12	26	0	38	22.6	357	28.8	38	287	7.6	38
	10	11	7	0	18	10.7	376	30.2	18	293	8.0	18
	11	4	8	0	12	7.1	391	28.5	12	294	8.5	12
	12	44	33	1	78	46.4	407	31.8	77	301	9.5	78
	13	1	1	0	2	1.2	415	13.4	2	302	9.2	2
	14	2	2	0	4	2.4	438	40.2	4	304	2.2	4
	15	0	1	0	1	0.6	525		1	311		1
	16	1	0	0	1	0.6	393		1	317		1
	17											
Sample Total		82	85	1	168	100.0	385	42.6	167	295	11.6	168
	2											
	3											
	4											
	5											
	6											
	7	5	11	0	16	10.9	305	19.7	16	275	7.0	16
	8	0	3	0	3	2.0	353	29.6	3	288	10.1	3
11 June	9	11	20	0	31	21.1	369	35.2	31	295	8.9	31
	10	8	7	0	15	10.2	375	30.7	15	298	6.0	15
	11	5	4	0	9	6.1	381	27.9	9	299	8.3	9
	12	32	38	0	70	47.6	404	37.4	70	305	7.5	70
	13											
	14	1	1	0	2	1.4	470	66.5	2	316	9.9	2
	15											
	16	0	1	0	1	0.7	530		1	328		1
	17											
Sample Total		62	85	0	147	100.0	382	48.3	147	299	12.3	147

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Appendix A.7. (p. 2 of 2)

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	0	1	0	1	2.7	317		1	283		1
	8											
13 June	9	3	1	0	4	10.8	346	22.5	4	287	14.3	4
	10	0	1	0	1	2.7	393		1	297		1
	11	1	2	0	3	8.1	409	37.3	3	304	3.8	3
	12	9	14	2	25	67.6	416	39.2	25	303	7.0	25
	13											
	14	1	0	0	1	2.7	451		1	309		1
	15											
	16											
	17	0	2	0	2	5.4	521	82.0	2	330	10.6	2
Sample Total		14	21	2	37	100.0	411	52.8	37	302	11.6	37
	2											
	3											
	4											
	5											
	6											
	7	17	19	0	36	8.7	314	22.7	36	278	8.0	36
All Periods Combined	8	1	4	0	5	1.2	345	23.9	5	287	7.7	5
7-13 June	9	29	55	0	84	20.3	362	30.6	84	291	8.9	84
	10	27	18	0	45	10.9	371	35.1	45	295	8.9	45
	11	17	17	0	34	8.2	386	31.1	34	297	8.1	34
	12	95	92	3	190	46.0	407	36.4	189	303	8.5	190
	13	2	1	0	3	0.7	398	30.1	3	298	9.3	3
	14	7	4	0	11	2.7	439	38.1	11	309	6.8	11
	15	0	1	0	1	0.2	525		1	311		1
	16	1	1	0	2	0.5	462	96.9	2	323	7.8	2
	17	0	2	0	2	0.5	521	82.0	2	330	10.6	2
All Samples Combined		196	214	3	413	100.0	385	46.9	412	297	12.0	413
Sex Composition		47.8	52.2									
Unaged		61	60	0	121	29.3	386	43.5	121	298	12.6	121
Sex Composition		50.4	49.6									

Appendix A.8. Age, sex, and size composition of herring sampled from the commercial beach seine harvest, Unalakleet Subdistrict, Norton Sound District, 9 June, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	2											
	3	1	0	0	1	0.6	96		1	208		1
	4	24	14	0	38	24.4	127	22.1	38	221	10.4	38
	5	4	11	0	15	9.6	181	31.9	15	243	10.8	15
	6	5	1	0	6	3.8	224	30.6	6	260	10.5	6
	7	20	25	0	45	28.8	282	40.9	45	271	11.4	45
	8											
9 June	9	6	9	0	15	9.6	341	53.0	15	292	8.9	15
	10	7	3	0	10	6.4	366	51.7	10	295	10.8	10
	11	2	1	0	3	1.9	406	35.0	3	306	5.5	3
	12	11	12	0	23	14.7	420	54.6	23	304	11.3	23
	13											
	14											
	15											
	16											
	17											
Sample Total		80	76	0	156	100.0	265	111.5	156	264	32.5	156
Sex Composition		51.3	48.7									
Unaged		41	21	0	62	39.7	234	106.5	62	257	35.1	62
Sex Composition		66.1	33.9									

Appendix A.9. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Cape Denbigh Subdistrict,Norton Sound District, 9-10 June, 2000.

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	25	19	0	44	28.4	306	26.5	44	278	8.3	44
	8	2	1	0	3	1.9	314	24.8	3	274	6.5	3
9 June	9	23	11	0	34	21.9	342	37.6	34	285	8.0	34
	10	7	12	0	19	12.3	350	36.1	19	290	9.6	19
	11	5	5	0	10	6.5	382	44.0	10	296	11.2	10
	12	26	12	0	38	24.5	392	34.3	38	302	9.1	38
	13	2	0	0	2	1.3	437	21.9	2	312	17.7	2
	14	0	2	0	2	1.3	421	60.8	2	309	19.1	2
	15	0	2	0	2	1.3	498	2.1	2	319	13.4	2
	16	1	0	0	1	0.6	344		1	311		1
	17											
Sample Total		91	64	0	155	100.0	352	51.1	155	289	13.8	155
	2											
	3											
	4											
	5											
	6											
	7	8	11	0	19	10.0	301	25.1	19	274	5.3	19
	8											
10 June	9	16	19	0	35	18.4	355	40.5	35	286	9.9	35
	10	7	7	0	14	7.4	379	30.9	14	293	9.6	14
	11	4	11	0	15	7.9	415	41.9	15	300	9.8	15
	12	49	35	0	84	44.2	411	42.7	84	300	10.4	84
	13	7	5	0	12	6.3	430	34.4	12	308	6.4	12
	14	4	4	0	8	4.2	420	31.8	8	304	6.3	8
	15	0	1	0	1	0.5	447		1	316		1
	16	1	0	0	1	0.5	410		1	310		1
	17	1	0	0	1	0.5	496		1	329		1
Sample Total		97	93	0	190	100.0	390	54.4	190	295	13.4	190
	2											
	3											
	4											
	5											
	6											
	7	33	30	0	63	18.3	305	26.0	63	276	7.6	63
All Periods Combined	8	2	1	0	3	0.9	314	24.8	3	274	6.5	3
9-10 June	9	39	30	0	69	20.0	349	39.3	69	286	9.0	69
	10	14	19	0	33	9.6	362	36.6	33	291	9.5	33
	11	9	16	0	25	7.2	402	45.0	25	299	10.4	25
	12	75	47	0	122	35.4	405	41.1	122	301	10.0	122
	13	9	5	0	14	4.1	431	32.3	14	308	7.8	14
	14	4	6	0	10	2.9	420	34.6	10	305	8.7	10
	15	0	3	0	3	0.9	481	29.2	3	318	9.6	3
	16	2	0	0	2	0.6	377	46.7	2	311	0.7	2
	17	1	0	0	1	0.3	496		1	329		1
All Samples Combined		188	157	0	345	100.0	373	56.2	345	293	13.9	345
Sex Composition		54.5	45.5									
Unaged		52	50	0	102	29.6	371	52.7	102	292	13.1	102
Sex Composition		51.0	49.0									

Appendix A.10. Age, sex, and size composition of herring sampled from the commercial gillnet harvest, Norton Sound District combined, 7-13 June, 2000.

Sample Period	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
7 June	2											
	3											
	4											
	5											
	6											
	7	6	1	0	7	11.5	321	15.7	7	285	7.4	7
	8											
	9	3	8	0	11	18.0	366	21.0	11	293	5.5	11
	10	8	3	0	11	18.0	355	46.5	11	295	12.7	11
	11	7	3	0	10	16.4	376	34.8	10	298	7.1	10
	12	10	7	0	17	27.9	409	47.3	17	306	6.3	17
	13	1	0	0	1	1.6	365		1	290		1
	14	3	1	0	4	6.6	422	25.7	4	311	6.2	4
	15											
	16											
	17											
Sample Total		38	23	0	61	100.0	376	46.6	61	298	10.9	61
8 June	2											
	3											
	4											
	5											
	6											
	7	6	6	0	12	7.1	322	27.6	12	276	7.8	12
	8	1	1	0	2	1.2	333	6.4	2	285	4.2	2
	9	12	26	0	38	22.6	357	28.8	38	287	7.6	38
	10	11	7	0	18	10.7	376	30.2	18	293	8.0	18
	11	4	8	0	12	7.1	391	28.5	12	294	8.5	12
	12	44	33	1	78	46.4	407	31.8	77	301	9.5	78
	13	1	1	0	2	1.2	415	13.4	2	302	9.2	2
	14	2	2	0	4	2.4	438	40.2	4	304	2.2	4
	15	0	1	0	1	0.6	525		1	311		1
	16	1	0	0	1	0.6	393		1	317		1
	17											
Sample Total		82	85	1	168	100.0	385	42.6	167	295	11.6	168
9 June	2											
	3											
	4											
	5											
	6											
	7	25	19	0	44	28.4	306	26.5	44	278	8.3	44
	8	2	1	0	3	1.9	314	24.8	3	274	6.5	3
	9	23	11	0	34	21.9	342	37.6	34	285	8.0	34
	10	7	12	0	19	12.3	350	36.1	19	290	9.6	19
	11	5	5	0	10	6.5	382	44.0	10	296	11.2	10
	12	26	12	0	38	24.5	392	34.3	38	302	9.1	38
	13	2	0	0	2	1.3	437	21.9	2	312	17.7	2
	14	0	2	0	2	1.3	421	60.8	2	309	19.1	2
	15	0	2	0	2	1.3	498	2.1	2	319	13.4	2
	16	1	0	0	1	0.6	344		1	311		1
	17											
Sample Total		91	64	0	155	100.0	352	51.1	155	289	13.8	155

-Continued-

Appendix A.10. (p. 2 of 3)

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	8	11	0	19	10.0	301	25.1	19	274	5.3	19
	8											
10 June	9	16	19	0	35	18.4	355	40.5	35	286	9.9	35
	10	7	7	0	14	7.4	379	30.9	14	293	9.6	14
	11	4	11	0	15	7.9	415	41.9	15	300	9.8	15
	12	49	35	0	84	44.2	411	42.7	84	300	10.4	84
	13	7	5	0	12	6.3	430	34.4	12	308	6.4	12
	14	4	4	0	8	4.2	420	31.8	8	304	6.3	8
	15	0	1	0	1	0.5	447		1	316		1
	16	1	0	0	1	0.5	410		1	310		1
	17	1	0	0	1	0.5	496		1	329		1
Sample Total		97	93	0	190	100.0	390	54.4	190	295	13.4	190
	2											
	3											
	4											
	5											
	6											
	7	5	11	0	16	10.9	305	19.7	16	275	7.0	16
	8	0	3	0	3	2.0	353	29.6	3	288	10.1	3
11 June	9	11	20	0	31	21.1	369	35.2	31	295	8.9	31
	10	8	7	0	15	10.2	375	30.7	15	298	6.0	15
	11	5	4	0	9	6.1	381	27.9	9	299	8.3	9
	12	32	38	0	70	47.6	404	37.4	70	305	7.5	70
	13											
	14	1	1	0	2	1.4	470	66.5	2	316	9.9	2
	15											
	16	0	1	0	1	0.7	530		1	328		1
	17											
Sample Total		62	85	0	147	100.0	382	48.3	147	299	12.3	147
	2											
	3											
	4											
	5											
	6											
	7	0	1	0	1	2.7	317		1	283		1
	8											
13 June	9	3	1	0	4	10.8	346	22.5	4	287	14.3	4
	10	0	1	0	1	2.7	393		1	297		1
	11	1	2	0	3	8.1	409	37.3	3	304	3.8	3
	12	9	14	2	25	67.6	416	39.2	25	303	7.0	25
	13											
	14	1	0	0	1	2.7	451		1	309		1
	15											
	16											
	17	0	2	0	2	5.4	521	82.0	2	330	10.6	2
Sample Total		14	21	2	37	100.0	411	52.8	37	302	11.6	37

-Continued-

Appendix A.10. (p. 3 of 3)

Sample Period	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4											
	5											
	6											
	7	50	49	0	99	13.1	308	25.1	99	277	7.7	99
All Periods Combined	8	3	5	0	8	1.1	333	27.3	8	282	9.4	8
7-13 June	9	68	85	0	153	20.2	356	35.3	153	289	9.3	153
	10	41	37	0	78	10.3	367	35.8	78	294	9.3	78
	11	26	33	0	59	7.8	393	38.1	59	298	9.1	59
	12	170	139	3	312	41.2	406	38.2	311	302	9.2	312
	13	11	6	0	17	2.2	425	33.6	17	306	8.8	17
	14	11	10	0	21	2.8	430	36.8	21	307	7.9	21
	15	0	4	0	4	0.5	492	32.6	4	316	8.5	4
	16	3	1	0	4	0.5	419	79.0	4	317	8.3	4
	17	1	2	0	3	0.4	513	59.8	3	329	7.5	3
All Samples Combined		384	371	3	758	100.0	380	51.7	757	295	13.1	758
Sex Composition		50.9	49.1									
Unaged		113	110	0	223	29.4	379	48.4	223	296	13.2	223
Sex Composition		50.7	49.3									

Appendix A.11. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Goodnews Bay District, 6-26 May, 2000.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
6-12 May	2											
	3	0	1	0	1	0.2	136		1	222		1
	4	11	8	0	19	3.6	142	19.8	19	219	6.2	19
	5	6	6	0	12	2.3	193	44.5	12	238	16.7	12
	6	4	10	0	14	2.7	285	57.4	14	262	15.1	14
	7	35	44	0	79	15.1	314	37.6	79	272	9.5	79
	8	46	30	0	76	14.6	338	38.7	76	282	8.0	76
	9	64	42	0	106	20.3	369	42.0	106	290	7.9	106
	10	45	42	0	87	16.7	407	43.0	87	299	6.8	87
	11	41	38	0	79	15.1	430	48.7	79	306	7.2	79
	12	10	11	0	21	4.0	466	55.8	21	313	9.0	21
	13	5	11	0	16	3.1	473	51.7	16	317	7.3	16
	14	3	4	0	7	1.3	520	65.8	7	333	6.0	7
	15	2	1	0	3	0.6	503	59.7	3	325	9.9	3
	16	1	0	0	1	0.2	487		1	313		1
	17	1	0	0	1	0.2	562		1	335		1
Sample Total		274	248	0	522	100.0	367	85.7	522	288	23.0	522
13-19 May	2											
	3	1	0	0	1	0.2	128		1	214		1
	4	60	55	2	117	25.3	142	17.7	117	221	7.9	117
	5	23	15	0	38	8.2	188	33.6	38	239	12.2	38
	6	15	20	0	35	7.6	251	39.2	35	260	10.8	35
	7	38	43	0	81	17.5	293	46.0	81	273	8.9	81
	8	24	14	0	38	8.2	329	48.1	38	282	8.9	38
	9	24	20	0	44	9.5	358	43.5	44	291	8.5	44
	10	18	22	0	40	8.7	403	49.5	40	299	9.2	40
	11	22	12	0	34	7.4	408	57.7	34	302	11.1	34
	12	9	10	0	19	4.1	419	39.1	19	306	7.1	19
	13	9	2	0	11	2.4	436	50.9	11	316	7.1	11
	14	1	0	0	1	0.2	402		1	312		1
	15	1	1	0	2	0.4	469	31.8	2	321	1.4	2
	16											
	17	0	1	0	1	0.2	484		1	326		1
Sample Total		245	215	2	462	100.0	280	110.4	462	266	32.9	462
20-26 May	2											
	3	3	1	0	4	0.9	108	20.7	4	202	13.3	4
	4	113	108	0	221	49.7	137	20.7	221	218	9.6	221
	5	16	19	0	35	7.9	184	38.9	35	236	14.9	35
	6	19	11	0	30	6.7	237	51.4	30	255	14.0	30
	7	34	40	0	74	16.6	282	36.0	74	270	8.6	74
	8	14	10	0	24	5.4	307	52.0	24	280	10.7	24
	9	9	10	0	19	4.3	361	42.1	19	288	10.6	19
	10	11	10	0	21	4.7	361	49.3	21	297	9.1	21
	11	3	3	0	6	1.3	395	49.2	6	299	15.8	6
	12	3	2	0	5	1.1	445	99.9	5	313	7.5	5
	13	0	3	0	3	0.7	370	109.2	3	300	35.6	3
	14	2	0	0	2	0.4	419	41.0	2	314	9.2	2
	15	1	0	0	1	0.2	478		1	321		1
	16											
	17											
Sample Total		228	217	0	445	100.0	211	95.5	445	244	31.9	445

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Appendix A.11. (p. 2 of 2)

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	1											
	2											
	3	4	2	0	6	0.4	116	20.6	6	208	13.4	6
	4	184	171	2	357	25.0	139	19.8	357	219	9.0	357
	5	45	40	0	85	5.9	187	37.1	85	238	13.9	85
	6	38	41	0	79	5.5	251	49.9	79	258	13.1	79
	7	107	127	0	234	16.4	297	42.3	234	272	9.1	234
All Weeks Combined	8	84	54	0	138	9.7	330	45.0	138	282	8.7	138
6-26 May	9	97	72	0	169	11.8	366	42.4	169	290	8.4	169
	10	74	74	0	148	10.4	400	48.0	148	298	7.8	148
	11	66	53	0	119	8.3	422	52.3	119	304	9.2	119
	12	22	23	0	45	3.1	444	58.8	45	310	8.5	45
	13	14	16	0	30	2.1	449	64.2	30	315	12.5	30
	14	6	4	0	10	0.7	488	75.7	10	327	11.1	10
	15	4	2	0	6	0.4	488	44.0	6	323	6.7	6
	16	1	0	0	1	0.1	487		1	313		1
	17	1	1	0	2	0.1	523	55.2	2	331	6.4	2
All Samples Combined		747	680	2	1429	100.0	290	116.7	1429	267	34.4	1429
Sex Composition		52.3	47.7									
Unaged		50	44	0	94	6.6	317	113.9	94	276	33.1	94
Sex Composition		53.2	46.8									

Appendix A.12. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Avinof District, 27 May - 9 June, 2000.

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	9	3	0	12	12.8	78	14.9	12	187	10.2	12
	4	17	8	0	25	26.6	123	15.8	25	214	7.7	25
	5	1	8	0	9	9.6	169	23.3	9	234	8.9	9
	6	5	3	0	8	8.5	248	30.7	8	254	9.0	8
	7	5	5	0	10	10.6	268	39.3	10	264	10.9	10
	8	5	3	0	8	8.5	334	23.2	8	280	3.4	8
27 May - 2 June	9	5	6	0	11	11.7	353	41.3	11	284	7.9	11
	10	6	3	0	9	9.6	419	56.6	9	297	9.5	9
	11	1	0	0	1	1.1	457		1	304		1
	12	0	1	0	1	1.1	476		1	304		1
	13											
	14											
	15											
	16											
	17											
Sample Total		54	40	0	94	100.0	229	121.6	94	245	37.7	94
	2											
	3	17	20	0	37	8.3	78	18.4	37	184	15.7	37
	4	117	98	0	215	48.1	119	18.4	215	214	9.6	215
	5	25	22	0	47	10.5	166	32.9	47	234	10.9	47
	6	10	7	0	17	3.8	229	36.2	17	256	12.3	17
	7	25	30	0	55	12.3	264	32.2	55	265	9.5	55
	8	8	13	0	21	4.7	315	34.9	21	278	7.4	21
3-9 June	9	9	13	0	22	4.9	331	33.9	22	287	8.0	22
	10	12	9	0	21	4.7	359	44.4	21	296	5.9	21
	11	6	4	0	10	2.2	419	52.8	10	301	11.3	10
	12	0	2	0	2	0.4	392	75.7	2	308	10.6	2
	13											
	14											
	15											
	16											
	17											
Sample Total		229	218	0	447	100.0	182	96.6	447	234	34.4	447
	2											
	3	26	23	0	49	9.1	78	17.4	49	185	14.5	49
	4	134	106	0	240	44.4	120	18.1	240	214	9.4	240
	5	26	30	0	56	10.4	166	31.4	56	234	10.5	56
	6	15	10	0	25	4.6	235	35.0	25	256	11.2	25
	7	30	35	0	65	12.0	264	33.1	65	265	9.6	65
All Weeks Combined	8	13	16	0	29	5.4	321	32.8	29	279	6.5	29
27 May - 9 June	9	14	19	0	33	6.1	339	37.4	33	286	8.0	33
	10	18	12	0	30	5.5	377	54.8	30	296	7.0	30
	11	7	4	0	11	2.0	422	51.4	11	302	10.7	11
	12	0	3	0	3	0.6	420	72.4	3	306	7.8	3
	13											
	14											
	15											
	16											
	17											
All Samples Combined		283	258	0	541	100.0	190	102.8	541	236	35.2	541
Sex Composition		52.3	47.7									
Unaged		2	11	0	13	2.4	249	119.3	13	257	32.7	13
Sex Composition		15.4	84.6									

Appendix A.13. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Nelson Island District, 20 May - 16 June, 2000.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
20-26 May	2											
	3											
	4	13	6	0	19	6.0	153	16.9	19	225	7.0	19
	5	10	8	0	18	5.7	214	30.8	18	244	9.4	18
	6	16	11	0	27	8.5	268	29.5	27	261	6.8	27
	7	46	36	0	82	25.9	311	35.5	82	272	8.0	82
	8	24	18	0	42	13.2	352	29.8	42	281	7.6	42
	9	33	30	0	63	19.9	375	31.6	63	290	7.8	63
	10	25	15	0	40	12.6	398	37.6	40	297	7.6	40
	11	5	15	0	20	6.3	443	46.0	20	306	6.0	20
	12	3	2	0	5	1.6	434	51.9	5	305	12.8	5
	13											
	14	1	0	0	1	0.3	440		1	307		1
	15											
	16											
	17											
Sample Total		176	141	0	317	100.0	332	79.1	317	277	21.5	317
3- 9 June	2											
	3	6	5	0	11	2.8	83	17.0	11	187	12.5	11
	4	37	42	0	79	19.9	135	25.8	79	216	10.6	79
	5	18	15	0	33	8.3	192	41.0	33	239	14.5	33
	6	13	18	0	31	7.8	249	44.6	31	259	11.8	31
	7	52	45	0	97	24.4	292	44.2	97	270	9.8	97
	8	26	23	0	49	12.3	318	48.3	49	280	11.0	49
	9	12	30	0	42	10.6	352	45.3	42	288	10.6	42
	10	15	26	0	41	10.3	391	49.6	41	299	9.9	41
	11	5	5	0	10	2.5	410	44.3	10	301	12.4	10
	12	1	1	0	2	0.5	371	61.5	2	296	7.8	2
	13	1	1	0	2	0.5	439	36.8	2	319	15.6	2
	14											
	15											
	16											
	17											
Sample Total		186	211	0	397	100.0	267	100.8	397	261	32.7	397
10-16 June	2											
	3	20	13	0	33	7.8	82	17.1	33	184	10.7	33
	4	44	46	0	90	21.3	126	25.1	90	212	11.4	90
	5	24	12	0	36	8.5	187	31.0	36	240	9.7	36
	6	24	15	0	39	9.2	261	35.7	39	262	9.9	39
	7	54	37	0	91	21.6	286	36.2	91	269	9.1	91
	8	24	17	0	41	9.7	325	42.1	41	280	5.7	41
	9	18	24	0	42	10.0	368	41.1	42	293	7.6	42
	10	14	20	0	34	8.1	392	38.7	34	298	11.3	34
	11	5	8	0	13	3.1	408	31.4	13	306	7.2	13
	12	2	1	0	3	0.7	457	28.7	3	309	5.5	3
	13											
	14											
	15											
	16											
	17											
Sample Total		229	193	0	422	100.0	251	109.2	422	254	37.6	422

-Continued-

Appendix A.13. (p. 2 of 2)

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	26	18	0	44	3.9	82	16.9	44	185	11.1	44
	4	94	94	0	188	16.5	132	25.9	188	215	11.4	188
	5	52	35	0	87	7.7	194	36.2	87	240	11.7	87
	6	53	44	0	97	8.5	259	37.7	97	261	9.9	97
	7	152	118	0	270	23.8	296	40.4	270	270	9.1	270
All Weeks Combined	8	74	58	0	132	11.6	331	43.5	132	280	8.5	132
20 May - 16 June	9	63	84	0	147	12.9	366	39.6	147	290	8.8	147
	10	54	61	0	115	10.1	394	42.3	115	298	9.5	115
	11	15	28	0	43	3.8	425	44.2	43	305	8.2	43
	12	6	4	0	10	0.9	428	53.3	10	304	10.5	10
	13	1	1	0	2	0.2	439	36.8	2	319	15.6	2
	14	1	0	0	1	0.1	440		1	307		1
	15											
	16											
	17											
All Samples Combined		591	545	0	1136	100.0	279	104.1	1136	263	33.4	1136
Sex Composition		52.0	48.0									
Unaged		41	37	0	78	6.9	295	82.7	78	270	29.3	78
Sex Composition		52.6	47.4									

Appendix A.14. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Romanzof District, 27 May - 9 June, 2000.

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4	22	18	0	40	9.9	148	21.4	40	219	8.9	40
	5	13	8	0	21	5.2	192	23.8	21	234	11.5	21
	6	5	6	0	11	2.7	258	45.8	11	256	10.6	11
	7	57	54	0	111	27.5	298	41.7	111	264	12.8	111
	8	3	5	0	8	2.0	342	36.5	8	278	13.3	8
27 May- 2 June	9	38	21	0	59	14.6	350	39.8	59	279	10.7	59
	10	33	20	0	53	13.1	375	41.4	53	285	10.7	53
	11	13	9	1	23	5.7	394	39.6	23	290	11.9	23
	12	36	22	0	58	14.4	425	39.7	58	295	10.9	58
	13	6	5	0	11	2.7	416	60.9	11	298	16.6	11
	14	3	1	0	4	1.0	416	69.5	4	292	9.2	4
	15	0	3	0	3	0.7	509	38.1	3	321	8.1	3
	16	2	0	0	2	0.5	409	70.7	2	296	6.4	2
	17											
Sample Total		231	172	1	404	100.0	325	92.9	404	271	25.9	404
	2											
	3	1	0	0	1	0.4	138		1	214		1
	4	36	31	0	67	24.2	138	19.3	67	218	9.8	67
	5	30	17	1	48	17.3	180	32.8	47	237	11.9	48
	6	4	2	0	6	2.2	219	58.4	6	252	13.9	6
	7	30	21	0	51	18.4	292	37.2	51	270	9.4	51
	8	3	2	0	5	1.8	293	49.4	5	275	12.8	5
3-9 June	9	22	11	0	33	11.9	349	35.7	32	283	8.2	33
	10	18	10	0	28	10.1	361	43.8	28	287	9.4	28
	11	4	3	0	7	2.5	420	54.7	7	296	15.8	7
	12	19	9	0	28	10.1	385	38.9	28	295	7.0	28
	13	3	0	0	3	1.1	443	39.0	3	316	15.0	3
	14											
	15											
	16											
	17											
Sample Total		170	106	1	277	100.0	261	104.0	275	258	31.2	277
	2											
	3	1	0	0	1	0.1	138		1	214		1
	4	58	49	0	107	15.7	142	20.5	107	219	9.4	107
	5	43	25	1	69	10.1	183	30.7	68	236	11.7	69
	6	9	8	0	17	2.5	244	52.3	17	255	11.6	17
	7	87	75	0	162	23.8	296	40.3	162	266	12.1	162
All Weeks Combined	8	6	7	0	13	1.9	323	46.8	13	277	12.6	13
27 May- 9 June	9	60	32	0	92	13.5	350	38.2	91	280	10.1	92
	10	51	30	0	81	11.9	370	42.5	81	286	10.2	81
	11	17	12	1	30	4.4	400	44.0	30	292	12.8	30
	12	55	31	0	86	12.6	412	43.4	86	295	9.8	86
	13	9	5	0	14	2.1	422	56.7	14	302	17.5	14
	14	3	1	0	4	0.6	416	69.5	4	292	9.2	4
	15	0	3	0	3	0.4	509	38.1	3	321	8.1	3
	16	2	0	0	2	0.3	409	70.7	2	296	6.4	2
	17											
All Samples Combined		401	278	2	681	100.0	299	102.4	679	266	28.8	681
Sex Composition		59.1	40.9									
Unaged		30	26	1	57	8.4	308	92.7	56	269	26.8	56
Sex Composition		53.6	46.4									

Appendix A.15. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, St Michael Subdistrict, Norton Sound District, 3-16 June, 2000.

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4	23	18	0	41	20.9	130	18.8	41	214	8.5	41
	5	5	5	0	10	5.1	183	27.7	10	235	7.4	10
	6	2	2	0	4	2.0	240	32.3	4	249	11.2	4
	7	31	20	0	51	26.0	284	40.5	51	264	9.5	51
	8	1	1	0	2	1.0	239	47.4	2	257	28.3	2
3- 9 June	9	13	11	0	24	12.2	341	48.6	24	279	9.4	24
	10	8	7	0	15	7.7	350	45.0	15	283	10.3	15
	11	1	3	0	4	2.0	417	58.3	4	294	11.6	4
	12	26	18	0	44	22.4	407	47.5	44	293	9.2	44
	13	1	0	0	1	0.5	423		1	298		1
	14											
	15											
	16											
	17											
Sample Total		111	85	0	196	100.0	288	108.2	196	262	30.5	196
	2											
	3	8	10	0	18	5.0	86	13.5	18	188	5.6	18
	4	60	47	0	107	29.8	123	15.1	107	210	8.3	107
	5	21	24	0	45	12.5	165	29.0	45	230	9.6	45
	6	4	2	0	6	1.7	201	29.4	6	243	7.6	6
	7	46	33	0	79	22.0	265	42.1	79	260	11.5	79
	8	4	0	0	4	1.1	279	64.9	4	264	14.5	4
10-16 June	9	20	8	0	28	7.8	311	48.7	28	275	10.9	28
	10	10	10	0	20	5.6	340	36.5	20	281	11.7	20
	11	7	4	0	11	3.1	351	52.3	11	292	10.2	11
	12	19	13	0	32	8.9	376	59.3	32	293	9.2	32
	13	3	3	0	6	1.7	383	34.2	6	298	10.5	6
	14											
	15	1	0	0	1	0.3	354		1	300		1
	16	1	1	0	2	0.6	497	84.1	2	317	9.9	2
	17											
Sample Total		204	155	0	359	100.0	224	104.7	359	245	34.6	359
	2											
	3	8	10	0	18	3.2	86	13.5	18	188	5.6	18
	4	83	65	0	148	26.7	125	16.4	148	212	8.5	148
	5	26	29	0	55	9.9	168	29.4	55	231	9.3	55
	6	6	4	0	10	1.8	216	35.1	10	245	9.1	10
	7	77	53	0	130	23.4	273	42.3	130	261	10.9	130
All Weeks Combined	8	5	1	0	6	1.1	265	58.4	6	262	17.2	6
3-16 June	9	33	19	0	52	9.4	325	50.4	52	277	10.4	52
	10	18	17	0	35	6.3	344	40.0	35	282	11.0	35
	11	8	7	0	15	2.7	368	59.9	15	292	10.2	15
	12	45	31	0	76	13.7	394	54.6	76	293	9.2	76
	13	4	3	0	7	1.3	389	34.7	7	298	9.6	7
	14											
	15	1	0	0	1	0.2	354		1	300		1
	16	1	1	0	2	0.4	497	84.1	2	317	9.9	2
	17											
All Samples Combined		315	240	0	555	100.0	247	110.2	555	251	34.2	555
Sex Composition		56.8	43.2									
Unaged		69	49	0	118	21.3	283	102.4	118	263	29.1	118
Sex Composition		58.5	41.5									

Appendix A.16. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Unalakleet Subdistrict, Norton Sound District, 27 May - 16 June, 2000.

Sample Week	Age	Sex (number)				Percent of Total	Weight			Length		
		Male	Female	Unknown	Total		Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
27 May- 2 June	2											
	3											
	4	19	15	0	34	63.0	134	14.3	34	218	8.5	34
	5	7	4	0	11	20.4	161	27.2	11	229	9.6	11
	6	1	1	0	2	3.7	286	65.8	2	271	17.0	2
	7	3	3	0	6	11.1	276	26.5	6	266	6.2	6
	8											
	9											
	10	1	0	0	1	1.9	355		1	286		1
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		31	23	0	54	100.0	165	60.3	54	229	20.8	54
3- 9 June	2											
	3	1	0	0	1	0.3	101		1	207		1
	4	52	36	1	89	28.0	135	17.6	89	225	8.8	89
	5	12	6	0	18	5.7	190	23.6	18	246	7.3	18
	6	0	1	0	1	0.3	239		1	266		1
	7	48	24	0	72	22.6	284	52.3	72	274	14.6	72
	8	2	0	0	2	0.6	282	15.6	2	280	11.3	2
	9	21	17	0	38	11.9	342	38.5	38	289	12.3	38
	10	12	7	0	19	6.0	385	136.5	19	323	124.0	19
	11	11	4	0	15	4.7	389	49.9	15	297	13.0	15
	12	30	22	0	52	16.4	397	51.6	52	302	12.8	52
	13	6	0	0	6	1.9	415	59.5	6	312	14.9	6
	14	2	0	0	2	0.6	454	17.0	2	318	0.7	2
	15	2	1	0	3	0.9	481	61.0	3	322	16.0	3
	16											
	17											
Sample Total		199	118	1	318	100.0	278	117.9	318	270	45.9	318
10-16 June	2											
	3	4	3	0	7	2.1	84	19.2	7	189	8.7	7
	4	29	22	11	62	18.2	129	16.5	62	220	10.5	62
	5	11	7	7	25	7.3	162	45.6	25	236	17.2	25
	6	2	3	3	8	2.3	211	26.1	7	255	9.7	8
	7	45	33	29	107	31.4	258	42.5	107	268	11.1	107
	8	1	1	2	4	1.2	242	15.3	4	268	11.8	4
	9	15	15	22	52	15.2	305	30.9	52	283	9.6	52
	10	7	8	10	25	7.3	312	35.5	25	287	9.7	25
	11	4	2	4	10	2.9	367	19.2	10	291	12.8	10
	12	12	9	13	34	10.0	377	50.9	34	301	12.5	34
	13	0	1	1	2	0.6	438	56.6	2	325	12.7	2
	14	0	1	0	1	0.3	411		1	309		1
	15	0	1	0	1	0.3	447		1	308		1
	16	2	0	1	3	0.9	433	50.6	3	311	8.1	3
	17											
Sample Total		132	106	103	341	100.0	253	92.9	340	263	30.9	341

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Appendix A. 16. (p. 2 of 2)

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	5	3	0	8	1.1	86	18.8	8	192	10.2	8
	4	100	73	12	185	25.9	133	16.9	185	222	9.8	185
	5	30	17	7	54	7.6	171	38.0	54	238	14.4	54
	6	3	5	3	11	1.5	229	43.8	10	259	12.0	11
	7	96	60	29	185	25.9	269	47.6	185	270	12.8	185
All Weeks Combined	8	3	1	2	6	0.8	255	25.0	6	272	12.2	6
27 May - 16 June	9	36	32	22	90	12.6	321	38.8	90	286	11.1	90
	10	20	15	10	45	6.3	344	98.2	45	302	81.7	45
	11	15	6	4	25	3.5	380	41.4	25	295	13.0	25
	12	42	31	13	86	12.1	389	51.9	86	302	12.6	86
	13	6	1	1	8	1.1	421	55.7	8	315	14.8	8
	14	2	1	0	3	0.4	440	27.6	3	315	4.9	3
	15	2	2	0	4	0.6	473	52.6	4	318	14.8	4
	16	2	0	1	3	0.4	433	50.6	3	311	8.1	3
	17											
All Samples Combined		362	247	104	713	100.0	257	106.9	712	264	39.2	713
Sex Composition		59.4	40.6									
Unaged		72	53	23	148	20.8	281	98.8	148	271	28.6	148
Sex Composition		57.6	42.4									

Appendix A.17. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Cape Denbigh Subdistrict,Norton Sound District, 3-23 June, 2000.

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	0	1	0	1	0.4	64		1	200		1
	4	26	21	0	47	20.2	127	16.8	47	217	7.5	47
	5	7	7	0	14	6.0	172	28.0	14	235	7.5	14
	6	2	0	0	2	0.9	286	33.9	2	264	10.6	2
	7	43	29	0	72	30.9	274	37.3	72	261	8.7	72
	8	2	1	0	3	1.3	293	31.1	3	262	1.2	3
3- 9 June	9	24	12	0	36	15.5	328	39.2	36	275	8.0	36
	10	9	5	0	14	6.0	340	26.1	14	276	8.5	14
	11	2	3	0	5	2.1	402	32.6	5	291	12.0	5
	12	16	12	0	28	12.0	389	30.8	28	290	5.2	28
	13	4	0	0	4	1.7	432	32.5	4	296	7.5	4
	14	3	1	0	4	1.7	395	60.5	4	293	12.5	4
	15	2	0	0	2	0.9	422	36.8	2	302	11.3	2
	16											
	17	0	1	0	1	0.4	478		1	312		1
Sample Total		140	93	0	233	100.0	274	99.7	233	259	27.1	233
	2											
	3	13	4	0	17	4.2	80	11.2	17	186	7.6	17
	4	95	65	0	160	39.9	119	16.9	160	212	8.7	160
	5	21	11	0	32	8.0	157	19.0	32	229	8.0	32
	6	4	1	0	5	1.2	214	14.3	5	248	6.5	5
	7	60	39	0	99	24.7	267	41.6	99	260	10.2	99
	8	1	2	0	3	0.7	337	27.3	3	271	11.0	3
10-16 June	9	14	11	0	25	6.2	319	45.7	25	273	7.6	25
	10	6	4	0	10	2.5	354	32.5	10	282	7.1	10
	11	3	3	0	6	1.5	363	31.6	6	287	7.2	6
	12	18	18	0	36	9.0	383	40.8	36	289	9.1	36
	13	1	1	0	2	0.5	439	35.4	2	298	3.5	2
	14	1	2	0	3	0.7	439	78.1	3	305	13.8	3
	15	0	1	0	1	0.2	532		1	313		1
	16	0	1	0	1	0.2	438		1	312		1
	17	1	0	0	1	0.2	224		1	250		1
Sample Total		238	163	0	401	100.0	212	106.9	401	240	32.8	401
	1											
	2											
	3	9	2	0	11	8.1	68	7.3	11	179	5.3	11
	4	8	11	0	19	14.1	116	16.5	19	209	9.1	19
	5	9	6	0	15	11.1	142	19.6	15	222	8.8	15
	6	4	1	0	5	3.7	204	17.7	5	249	8.1	5
	7	19	17	0	36	26.7	243	28.0	36	258	9.4	36
	8											
17-23 June	9	9	7	0	16	11.9	277	25.4	16	266	7.3	16
	10	3	4	0	7	5.2	295	28.1	7	274	13.6	7
	11	5	3	0	8	5.9	327	27.4	8	284	7.9	8
	12	5	12	0	17	12.6	341	38.4	17	290	9.0	17
	13											
	14	1	0	0	1	0.7	332		1	287		1
	15											
	16											
	17											
Sample Total		72	63	0	135	100.0	223	90.6	135	248	34.0	135

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Appendix A.17. (p. 2 of 2)

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	22	7	0	29	3.8	75	11.5	29	184	7.9	29
	4	129	97	0	226	29.4	121	17.1	226	213	8.8	226
	5	37	24	0	61	7.9	157	23.7	61	229	9.1	61
	6	10	2	0	12	1.6	222	34.8	12	251	9.2	12
	7	122	85	0	207	26.9	266	39.4	207	260	9.6	207
All Weeks Combined	8	3	3	0	6	0.8	315	35.3	6	267	8.8	6
3-23 June	9	47	30	0	77	10.0	315	43.3	77	272	8.3	77
	10	18	13	0	31	4.0	334	35.8	31	277	9.8	31
	11	10	9	0	19	2.5	358	42.3	19	287	8.8	19
	12	39	42	0	81	10.5	376	41.1	81	290	7.8	81
	13	5	1	0	6	0.8	434	30.0	6	296	6.1	6
	14	5	3	0	8	1.0	404	67.9	8	297	13.2	8
	15	2	1	0	3	0.4	459	68.6	3	306	10.2	3
	16	0	1	0	1	0.1	438		1	312		1
	17	1	1	0	2	0.3	351	179.6	2	281	43.8	2
All Samples Combined		450	319	0	769	100.0	232	105.6	769	247	32.5	769
Sex Composition		58.5	41.5									
Unaged		36	10	0	46	6.0	293	84.9	46	268	23.5	46
Sex Composition		78.3	21.7									

Appendix A.18. Age, sex, and size composition of herring sampled from the variable-mesh gillnet catch, Norton Sound District combined, 27 May - 23 June, 2000.

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3											
	4	19	15	0	34	63.0	134	14.3	34	218	8.5	34
	5	7	4	0	11	20.4	161	27.2	11	229	9.6	11
	6	1	1	0	2	3.7	286	65.8	2	271	17.0	2
	7	3	3	0	6	11.1	276	26.5	6	266	6.2	6
	8											
27 May- 2 June	9											
	10	1	0	0	1	1.9	355		1	286		1
	11											
	12											
	13											
	14											
	15											
	16											
	17											
Sample Total		31	23	0	54	100.0	165	60.3	54	229	20.8	54
	2											
	3	1	1	0	2	0.3	83	26.2	2	204	4.9	2
	4	101	75	1	177	23.7	132	18.0	177	220	9.7	177
	5	24	18	0	42	5.6	183	26.6	42	240	9.1	42
	6	4	3	0	7	0.9	253	35.0	7	255	12.3	7
	7	122	73	0	195	26.1	280	44.2	195	267	12.7	195
	8	5	2	0	7	0.9	274	36.9	7	266	16.0	7
3- 9 June	9	58	40	0	98	13.1	337	41.5	98	281	11.9	98
	10	29	19	0	48	6.4	348	42.2	48	285	13.4	48
	11	14	10	0	24	3.2	396	47.6	24	295	12.3	24
	12	72	52	0	124	16.6	399	46.3	124	296	11.4	124
	13	11	0	0	11	1.5	422	46.4	11	305	13.9	11
	14	5	1	0	6	0.8	415	55.4	6	301	15.9	6
	15	4	1	0	5	0.7	457	56.9	5	314	16.6	5
	16											
	17	0	1	0	1	0.1	478		1	312		1
Sample Total		450	296	1	747	100.0	279	107.5	747	264	31.0	747
	2											
	3	25	17	0	42	3.8	83	13.7	42	187	7.0	42
	4	184	134	11	329	29.9	122	16.6	329	213	9.6	329
	5	53	42	7	102	9.3	162	31.4	102	231	11.7	102
	6	10	6	3	19	1.7	208	24.0	18	249	9.5	19
	7	151	105	29	285	25.9	263	42.1	285	263	11.5	285
	8	6	3	2	11	1.0	281	55.1	11	267	11.8	11
10-16 June	9	49	34	22	105	9.5	310	40.0	105	279	10.6	105
	10	23	22	10	55	5.0	330	38.7	55	284	10.3	55
	11	14	9	4	27	2.5	360	37.8	27	290	10.5	27
	12	49	40	13	102	9.3	379	50.1	102	294	11.3	102
	13	4	5	1	10	0.9	405	44.3	10	304	14.5	10
	14	1	3	0	4	0.4	432	65.3	4	306	11.4	4
	15	1	2	0	3	0.3	444	89.0	3	307	6.6	3
	16	3	2	1	6	0.5	455	58.9	6	313	7.4	6
	17	1	0	0	1	0.1	224		1	250		1
Sample Total		574	424	103	1101	100.0	228	103.3	1100	249	34.3	1101

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Appendix A.18. (p. 2 of 2)

Sample Week	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	2											
	3	9	2	0	11	8.1	68	7.3	11	179	5.3	11
	4	8	11	0	19	14.1	116	16.5	19	209	9.1	19
	5	9	6	0	15	11.1	142	19.6	15	222	8.8	15
	6	4	1	0	5	3.7	204	17.7	5	249	8.1	5
	7	19	17	0	36	26.7	243	28.0	36	258	9.4	36
	8											
17-23 June	9	9	7	0	16	11.9	277	25.4	16	266	7.3	16
	10	3	4	0	7	5.2	295	28.1	7	274	13.6	7
	11	5	3	0	8	5.9	327	27.4	8	284	7.9	8
	12	5	12	0	17	12.6	341	38.4	17	290	9.0	17
	13											
	14	1	0	0	1	0.7	332		1	287		1
	15											
	16											
	17											
Sample Total		72	63	0	135	100.0	223	90.6	135	248	34.0	135
	2											
	3	35	20	0	55	2.7	80	14.3	55	186	8.1	55
	4	312	235	12	559	27.4	126	17.6	559	216	10.2	559
	5	93	70	7	170	8.3	165	31.1	170	232	11.7	170
	6	19	11	3	33	1.6	222	37.0	32	252	11.3	33
	7	295	198	29	522	25.6	268	43.2	522	264	12.0	522
All Weeks Combined	8	11	5	2	18	0.9	278	47.8	18	267	13.1	18
27 May- 23 June	9	116	81	22	219	10.8	319	43.4	219	279	11.7	219
	10	56	45	10	111	5.4	336	41.7	111	284	12.1	111
	11	33	22	4	59	2.9	370	47.1	59	292	11.4	59
	12	126	104	13	243	11.9	386	49.8	243	295	11.3	243
	13	15	5	1	21	1.0	414	45.1	21	304	13.8	21
	14	7	4	0	11	0.5	413	60.6	11	302	14.0	11
	15	5	3	0	8	0.4	453	64.5	8	311	13.5	8
	16	3	2	1	6	0.3	455	58.9	6	313	7.4	6
	17	1	1	0	2	0.1	351	179.6	2	281	43.8	2
All Samples Combined		1127	806	104	2037	100.0	245	106.8	2036	254	33.8	2037
Sex Composition		58.3	41.7									
Unaged		177	112	23	312	15.3	284	98.1	312	267	28.2	312
Sex Composition		61.2	38.8									