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1990 Bottom Trawl Survey of the Eastern Bering Sea Continental Shelf

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U.S. DEPARTMENT OF COMMERCE
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ABSTRACT

The Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center conducts annual bottom trawl surveys to monitor the condition of the demersal fish and crab stocks of the eastern Bering Sea continental shelf. The standard study area, surveyed each year since 1979, encompasses a major portion of the eastern Bering Sea shelf between the 20-m and the 200-m isobaths and from the Alaska Peninsula north to approximately the latitude of St. Matthew Island (lat. 60° 50' N). In 1990, this area of 463,000 km^2 was again surveyed by two chartered trawlers, the 30.5 m Alaska and the 33.5 m Ocean Hope 3.

Demersal populations were sampled by trawling for 30 minutes at stations centered in 20 x 20 nautical mile grids covering the survey area. At each station, species composition of the catch was determined and commercially important species were sampled to obtain length distributions and age structure samples.

Survey results presented in this report include relative fishing powers of the survey vessels, abundance estimates for fish and invertebrates, geographic distributions of economically important fish species and major fish families, size composition of principal fish species, and age and growth information for selected species. Surface and bottom temperatures recorded at each sampling station are also presented.

Appendices provide detailed station data and computer listings of the analyses of abundance and biological data of the sampled populations.

CONTENTS

INTRODUCTION

The eastern Bering Sea continental shelf supports one of the most productive groundfish fisheries in the world (Bakkala 1988). Since 1970, annual commercial catches of groundfish have ranged from 1.2 to 2.2 million metric tons (t) (North Pacific Fishery Management Council 1990). Although many species are caught commercially, the most abundant has been walleye pollock (Theragra chalcogramma) which, since 1970, has comprised more than 70% of the total landings. The next most abundant species have been yellowfin sole (Pleuronectes asper) and Pacific cod (Gadus macrocephalus) which have comprised 8 and 5%, respectively, of the commercial landings.

Since 1971, the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC) has conducted annual bottom trawl surveys of the eastern Bering Sea continental shelf. In 1975, the first large-scale survey of the eastern Bering Sea shelf was conducted under contract to the Bureau of Land Management in response to a need for baseline data to assess the potential impact of proposed offshore oil exploration and development on fishery resources (Pereyra et al. 1976). During this baseline survey, sampling was conducted over the Bering Sea shelf between the 20 m and 200 m isobaths and from the Alaska Peninsula north to approximately 62°N lat. (Fig. 1). Following 1975, the areal coverage of the annual surveys was reduced until 1979 when an even more comprehensive survey of the Bering Sea shelf than in 1975 was undertaken in cooperation with the Japan Fisheries Agency (Fig.

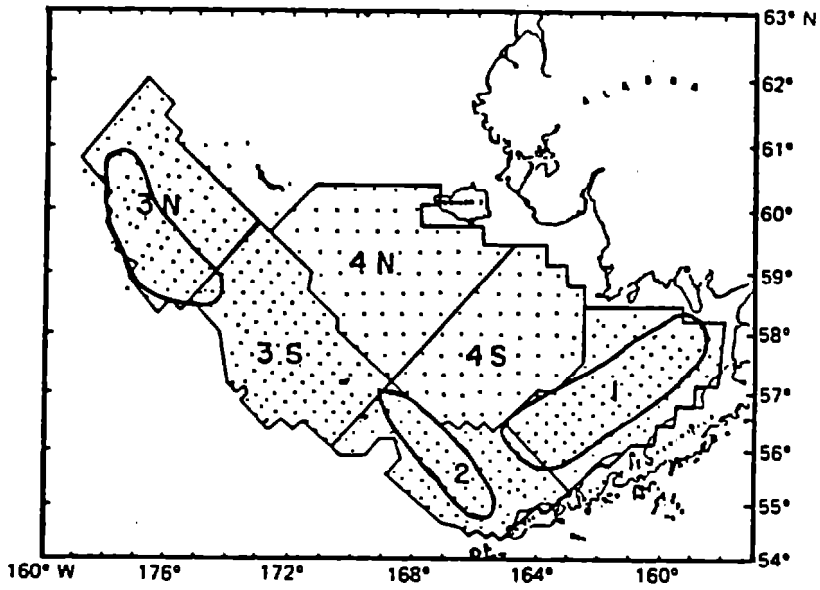

Figure l.--Sampling stations and survey stratificationused for analyses **of** data from the 1975 baseline survey on the eastern Bering Sea shelf, with approximate locations of oil lease areas (from Pereyra et al. 1976).

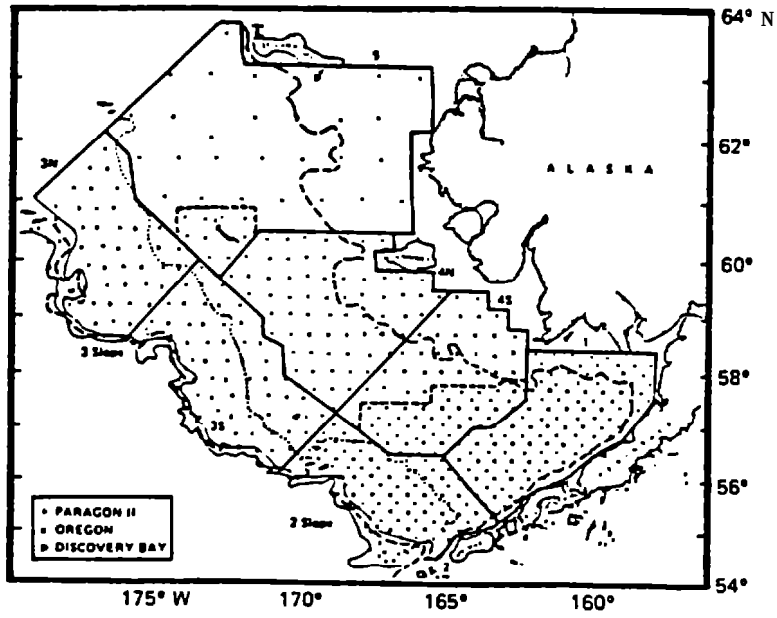

Figure 2. --Sampling stations and survey stratification used for analyses of data from the 1979 expanded triennial survey on the eastern Bering Sea shelf and slope (from Bakkala and Wakabayashi 1985).

2, Bakkala and Wakabayashi 1985). The 1979 survey encompassed the entire region sampled in the 1975 baseline study, and in addition, the continental slope waters between the Aleutian Islands and the U.S.-U.S.S.R. convention line, and the region between St. Matthew and St. Lawrence Islands. A hydroacoustic survey was also conducted in 1979 to assess the midwater component of the walleye pollock population. Subsequent annual bottom trawl surveys have essentially resampled the stations established during the 1975 survey, with slight modifications each year. This region has been found to encompass the major portion of economically important eastern Bering Sea groundfish populations, except those primarily located in continental slope waters. Every third year (1979, 1982, 1985, 1988) an extended survey has been conducted, including hydroacoustic assessment of midwater pollock, bottom trawl sampling of the continental slope, and bottom trawl sampling in the region between St. Matthew and St. Lawrence Islands. The information gathered by the annual surveys serves to: 1) provide the North Pacific Fishery Management Council with annual fishery-independent estimates of abundance and biological condition of commercially exploited stocks, 2) provide distribution and abundance information to commercial fishermen, and 3) develop a time-series data base contributing to our understanding of the population dynamics and interactions of groundfish species.

This report presents information collected by the AFSC in the eastern Bering Sea during the 1990 bottom trawl survey. The

groundfish/crab survey and several ancillary projects were conducted from 1 June to 8 August by two U.S. vessels. The survey area was also sampled by the Soviet research vessel Novokotovsk from 18 May to 17 July 1990. The survey data collected by the Soviet and the U.S. vessels have not been combined due to differences in survey timing and sampling gear. Results of the Soviet survey will be presented in a future report. Also, detailed information on principal crab species is not included here but can be found in a report by Stevens and Macintosh (1990).

METHODS

Survey Area and Sampling Design

A total of 352 standard and 28 special study stations were successfully sampled during the 1990 survey (Fig. 3). The standard station pattern was based on a systematic 20 x 20 nautical mile grid. In areas surrounding St. Matthew and the Pribilof Islands, grid block corners were also sampled to better assess blue king crab (Paralithodes platupus) concentrations. Starting with the eastern stations, the two vessels fished alternate north/south lines of stations such that coverage of the survey area was similar for each vessel. This sampling design facilitated the computation of relative fishing powers (or catch efficiencies) of the two vessels., The progression from east to west was established to prevent multiple encounters of yellowfin sole, Alaska plaice (Pleuronectes quadrituberculatus), and

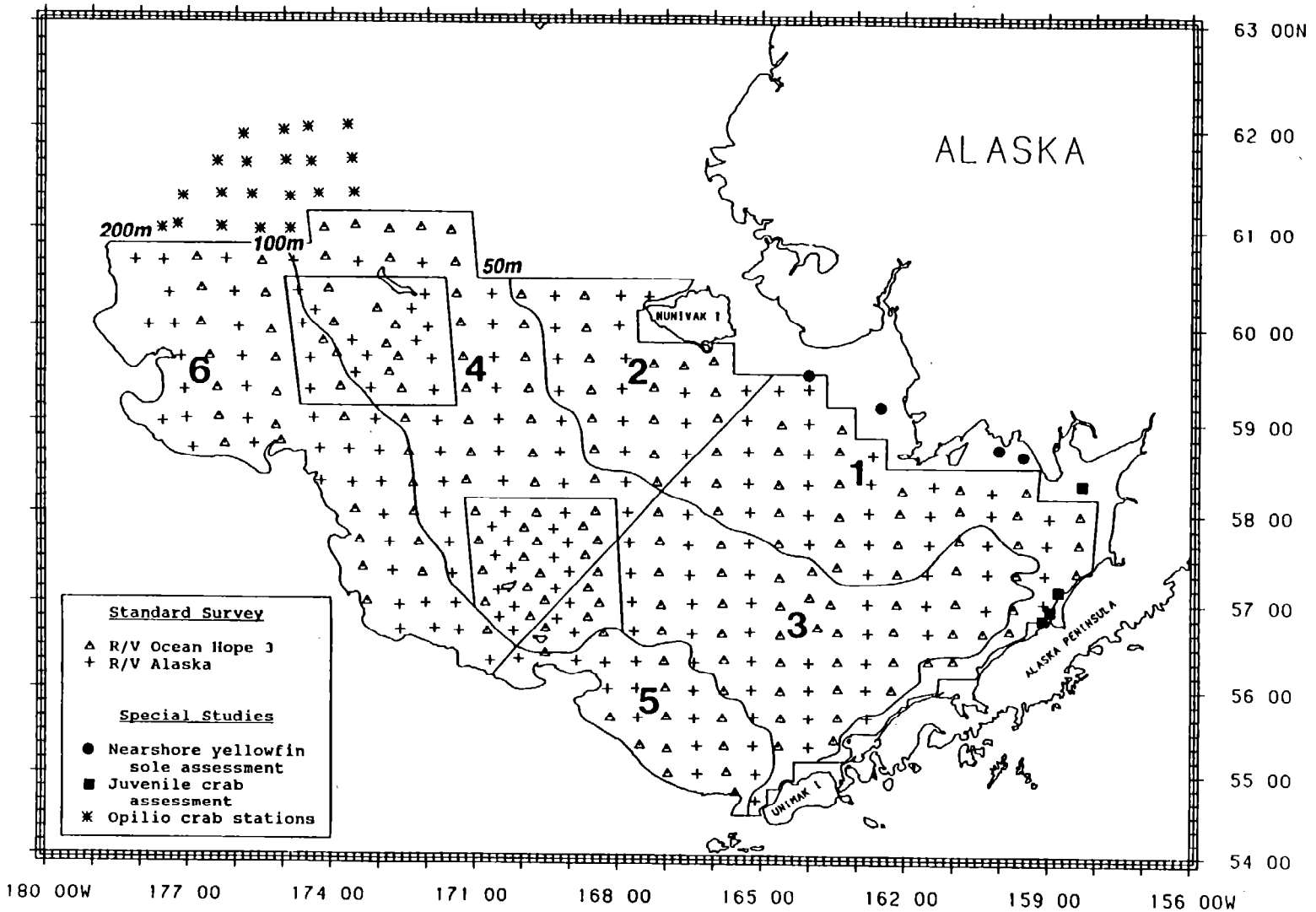

Figure 3.--Standard and special study stations sampled during the 1990 eastern Bering Sea bottom trawl survey, and stratification used for analyses of the data. Boxed areas s&rounding the Pribilof Islands and St. Matthew Island indicate locations of high-density sampling.

perhaps other species which may be migrating eastward during the course of the survey (Smith and Bakkala 1982). Tows were usually 30 minutes in duration and fishing was limited to daylight hours.

For data analysis, the survey region was divided into six subareas bounded by the 50 m, 100 m, and 200 m isobaths and by a line separating the northwest and southeast portions of the study area (Fig. 3). This stratification scheme was designed to reduce the variances of population and biomass estimates by conforming to oceanographic domains which seem to relate to distributions of fishes (Bakkala 1988). The presence of high-density sampling for blue king crab in subareas 3, 4, and 6 necessitated a further division of these subareas into high-density and standard-density sampling strata, resulting in a total of 10 geographic strata.

Of the 356 total standard survey stations, 352 were successfully sampled in 1990 (Appendix A). The overall sampling density for the entire survey area was one station per 1,316 km^2 (Table 1). However, because of the high-density sampling in subareas 3, 4, and 6, and the irregular subarea boundaries, sampling density among the six subareas varied from one station per 1,147 km^2 to one per 1,492 km^2.

Table l.--Size of subareas and sampling densities by subarea for the 1990 eastern Bering Sea bottom trawl survey (see also Fig. 3).

Subarea	Area (km^2)	No. stations allocated	No. stations successfully sampled	Sampling density (km^2/stn)
1	77,872	58	58	1,343
2	41,028	31	31	1,323
3	103,302	76	76	1,359
4	107,822	98	94	1,147
5	38,792	26	26	1,492
6	94,562	67	67	1,411
Subareas combined	463,376	356	352	1,316

Vessels and Fishing Gear

For the third consecutive year, the annual eastern Bering Sea bottom trawl survey was conducted aboard the 30.5 m University of Washington research vessel Alaska and the 33.5 m fishing vessel Ocean Hope 3 (Table 2). As in previous years, both vessels were equipped with 83-112 eastern otter trawls which have 25.3 m (83 ft) headropes and 34.1 m (112 ft) footropes (Appendix B). These nets were attached to tail chains with 54.9 m (30 fathoms) paired dandylines. Each lower dandyline had a 0.61 m chain extension connected to the lower wing edge to improve bottom tending characteristics. Steel "V"-doors measuring 1.8 x 2.7 m and weighing 816 kg were used.

Table 2. --Characteristics of vessels used during the 1990 eastern Bering Sea bottom trawl survey.

Vessel	Overall length(m)	Gross tonnage	Horsepower	Survey period Start	Finish
Alaska	30.5	219	600	1 June	8 August
Ocean Hope 3	33.5	197	850	1 June	8 August

SCANMAR[1] net mensuration systems were used aboard each vessel to measure net height and width. Net width was measured by the distance between two sensors attached to the upper dandyline, about 0.61 m in front of the net. For most tows, a mean net width was calculated from observations recorded during the tow. These data were also used to establish a net width-scope (wire-out) relationship for each vessel to enable prediction of net width for tows where net width data were not available (Fig. 4) as described by Rose and Walters (1990). Estimates of net width were used in area-swept calculations.

Data Collection

Sampling procedures used in RACE eastern Bering Sea assessment surveys are described in detail by Wakabayashi et al. (1985). A brief summary follows.

Samples were collected by trawling at the center of each 20 x 20 nautical mile grid block (or corner station, in the case of high-density strata) for 30 minutes (timed after the net had

[1] Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

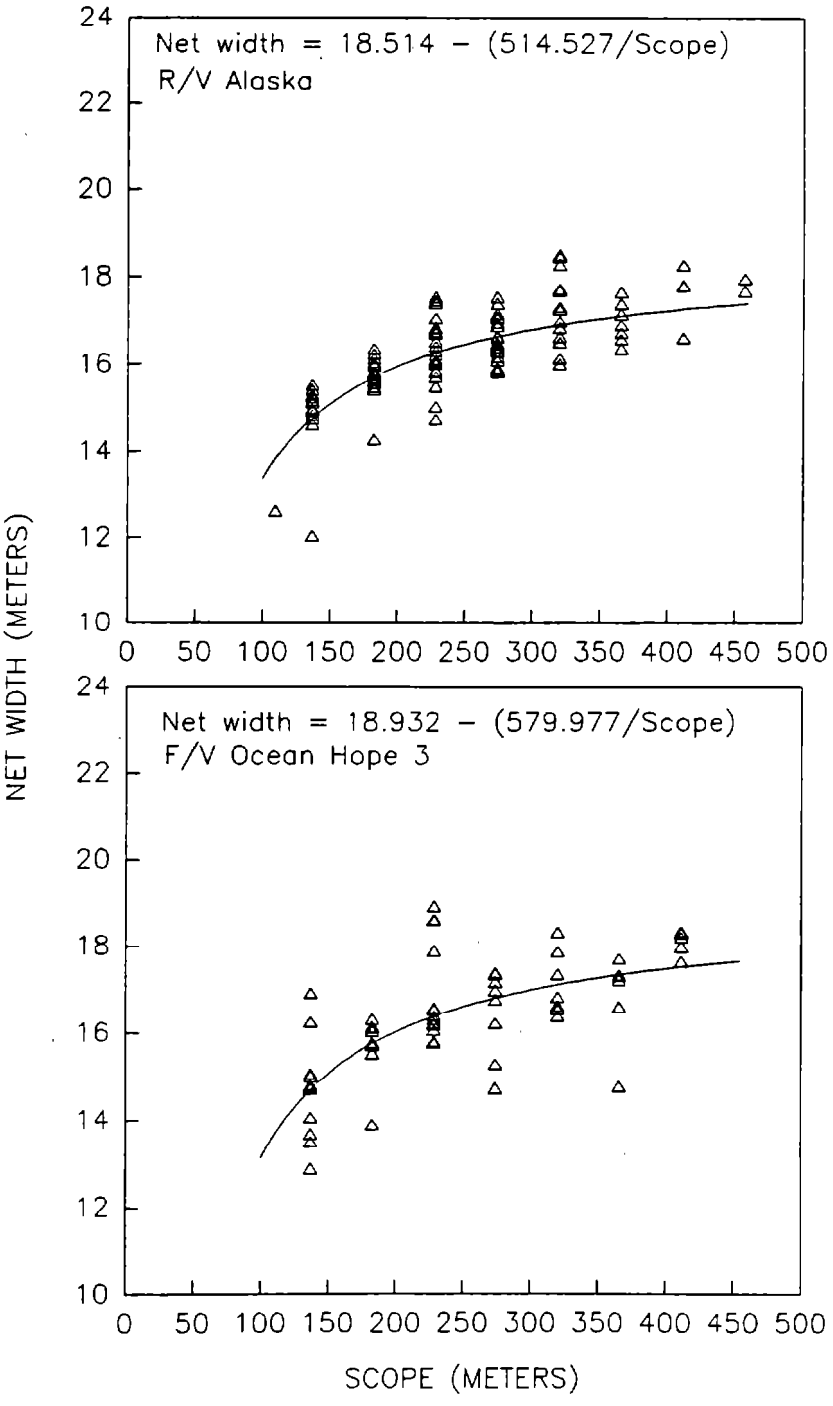

Figure 4. --Relationship between net-width and scope (wire-out) for the two vessels participating in the 1990 eastern Bering Sea bottom trawl survey.

settled on the bottom), towing at a speed of 1.54 m/sec (3 knots). If the bottom appeared to be untrawlable at the specified location, the nearest trawlable site within the same grid square was used. If the net was ripped or "hung up" on some object on the bottom during the tow, the catch was discarded and a new sample obtained.

Catches of less than approximately 1,150 kg (2,500 lb) were processed entirely while larger catches were subsampled. Economically important fish and invertebrates were sorted to species with the exception of four species of flatfish. Similar features between arrowtooth (Atheresthes stomias) and Kamchatka flounder (Atheresthes evermanni), and flathead sole (Hippoglossoides elassodon) and Bering flounder (Hippoglossoides robustus) made identification of these species difficult within the time constraints of the survey; thus, these species were grouped by genus for purposes of this report. Minor species of fish and invertebrates were sorted to the lowest taxonomic level practicable. Catch weights and numbers by species or species group were estimated directly or, when subsampled, estimated by extrapolating the proportion in the subsample to that of the entire catch weight. Pacific halibut (Hippoglossus stenolepis) and crab species of the genera Paralithodes (red and blue king crabs, camtschatica and platypus, respectively), Chionoecetes (snow and Tanner crabs, opilio and bairdi, respectively), and Erimacrus (hair crabs, isenbeckii) were usually weighed and enumerated from the entire catch.

Size composition data were collected for each commercially important species. Pacific halibut, walleye pollock, Pacific cod, and yellowfin sole were measured whenever caught while other species were measured as time permitted (Table 3). Pacific halibut were measured immediately upon capture and returned to the sea in an effort to reduce sampling mortality for this species. Random samples of the remaining species of up to approximately 200 individuals (300 in the case of walleye pollock) were sexed and measured to the nearest centimeter from the tip of the snout to the end of- the middle rays of the caudal fin (fork length).

Sagittal otoliths were collected from seven commercially important species (Table 4). In both the northwestern and southeastern divisions of the survey area, three otolith pairs per sex/centimeter interval were collected for Pacific cod and rock sole (Pleuronectes bilineatus), and five pairs per sex/centimeter interval for all other species. Scales as well as otoliths were taken from Pacific cod to aid in ageing young fish. Individual weight data were collected from Alaska plaice in conjunction with otolith sampling. In the case of the Hippoglossoides, otoliths were collected only from individuals that were identified with certainty as flathead sole. Age structures for roundfish were preserved in 50% ethanol/water; flatfish otoliths were preserved in 50% glycerol/water.

Temperature profiles were taken at each station with an expendable bathythermograph cast; surface temperatures were taken by bucket thermometer.

Table 3.--Number of length measurements taken during the 1990 eastern Bering Sea bottom trawl survey.

Species	Length measurements by subarea 1	2	3	4	5	6	Total
Walleye pollock	2,219	792	5,809	7,821	2,429	12,991	34,814[a]
Rock sole	11,798	4,392	8,658	6,130	66	1179	32,921[a]
Yellowfin sole	11,973	4,457	9,825	4,871	9	4	32,312[a]
Hippoglossoides spp.	760	17	5,078	2,999	3,501	4,756	19,383[a]
Alaska plaice	1,984	1,404	1,737	2,679	--	43	7,955[a]
Atheresthes spp.	73	--	2,061	692	2,435	1,971	7,232
Pacific cod	1,175	345	1,115	1,597	219	826	5,693[a]
Pacific halibut	1,069	220	256	151	45	54	1,819[a]
Greenland turbot	--	--	--	64	--	168	544[a]
Arctic cod	--	--	--	--	--	--	404[a]
Starry flounder	234	4	13	--	--	--	324[a]
Rex sole	1	--	9	--	218	1	229
Longhead dab	75	32	--	--	--	--	122[a]
Sakhalin sole	--	--	--	23	--	--	100[a]
Saffron cod	3	--	--	--	--	--	92[a]
Northern rockfish	--	--	--	--	--	13	13
Pacific ocean perch	--	--	--	--	--	16	16
Rockfish unident.	--	--	--	--	--	4	4
Sablefish	--	--	1	--	1	--	2
Rougheye rockfish	--	--	--	--	--	1	1

[a]Some length measurements were made in hauls that fell outside the standa survey area, thus, the numbers taken in the six subareas of the standard survey area do not add to the total.

Table 4. --Number of fish in which age structures were collected, by species and subarea, during the 1990 eastern Bering Sea bottom trawl survey.

Species	Subarea 1	2	3	4	5	6	Total
Walleye pollock	28	63	394	264	83	374	1,358[a]
Pacific cod[b]	131	57	207	280	45	176	929[a]
Yellowfin sole	232	283	191	98	0	0	804
Rock sole	235	146	102	128	0	36	647
Flathead sole	0	0	186	41	28	255	510
Alaska plaice	54	61	58	55	0	0	228
Greenland turbot	0	0	0	6	0	49	146[a]

[a]Some age structures were collected outside the standard survey area, therefore, the numbers collected for the six subareas do not add to the total.

[b]Scales were also taken.

Data Analysis

A brief description of the procedures used in analysis of PACE Bering Sea survey data follows (for a detailed description see Wakabayashi et al. 1985). Many of the species collected were grouped by family for data analysis because of their insignificant commercial value or questionable identification.

Since 1979, the Bayesian technique of Geisser and Eddy (1979) was used to compare the relative fishing powers of the two survey vessels. If the distribution of catch-per-unit-effort (CPUE) values for any one species were statistically different between vessels, catch rates of the less efficient vessel were expanded by the ratio of the mean CPUEs (more efficient divided

by less efficient) of the two vessels. Recent work at the AFSC determined that the ratio of means was extremely unstable and too sensitive to abnormally large values of CPUE. Consequently, a new method developed by Kappenman (1992) was used to compare CPUE 'distributions and determine a scaling factor for correction. All stations sampled by the two vessels during the standard survey (Fig. 3) were used in the analysis.

Mean CPUE values for each species were calculated in kilograms per hectare and number per hectare for each of the 10 strata; area swept (hectares) was computed as the distance towed multiplied by the mean net width (Alverson and Pereyra 1969). Mean CPUE values, weighted by strata areas, were calculated for individual subareas and for the overall survey area. Biomass and population estimates were derived for each stratum by multiplying the stratum mean CPUE by the stratum area. Stratum totals were then added together to produce estimates for each subarea and for the total survey area.

In estimating the size composition of populations of principal commercial species, length-frequency data obtained at each station were expanded to the station catch by proportion and then extrapolated to the stratum population by the weighted CPUE. Stratum estimates were summed to derive the estimated size composition by subarea and for the overall survey area.

Otolith and scale samples collected during the survey were read by the Age and Growth Determination Unit of the AFSC's Resource Ecology and Fisheries Management (REFM) Division. From

each centimeter interval. Population age composition was estimated by apportioning ages to the estimated population at each length interval. Age composition in terms of biomass was estimated by first calculating biomass at length using the equation:

$$B_L = P_L * [A * (L^B)]$$

where B_L = biomass at length L in grams,
P_L = population number at length L,
L = fork length in mm, and
A and B = constants based on the regression of previous species-specific length-weight data obtained from the RACE eastern Bering Sea database.

Values used for the constants A and B are as follows:

		A	B
1)	Walleye pollock		
	Male	0.0000081670	2.963988
	Female	0.0000063161	3.010031
	Unsexed	0.0000029701	3.167916
2)	Pacific cod		
	Male	0.0000044268	3.162674
	Female	0.0000043510	3.165096
	Unsexed	0.0000043973	3.163560
3)	Yellowfin sole		
	Male	0.0000135820	2.960426
	Female	0.0000111310	3.003173
	Unsexed	0.0000119530	2.987584
4)	Rock sole		
	All	0.0000047050	3.169881

After converting weight in grams into metric tons, B_L was then apportioned to biomass at age using the age-length key for each species.

Growth characteristics of principal species were described with von Bertalanffy (1938) growth curves fitted to age-length

data collected in this survey.

Special Studies

In addition to the 352 standard survey tows, 28 tows were made for special studies (Fig. 3). Nearshore sampling for juvenile crab and fish was conducted at three stations in Port Heiden, and at one station in Kvichak Bay. In addition, 2 tows each were made in Togiak and Kuskokwim Bays to assess the abundance and spawning condition of yellowfin sole inshore of the standard survey area, and 20 tows were made to assess the abundance of snow crab northwest of St. Matthew Island. Catches from these 28 tows were used to define geographic distributions of fish groups but were not used to estimate population parameters in order to maintain comparability with estimates from previous standard annual survey areas.

Stomach samples from several of the most prevalent commercial species in each haul were collected and preserved in formalin for later examination by the Food Habits Program of the AFSC's REFM Division (Table 5).

Additional activities included tagging Pacific cod (Table 5), collecting specimens or tissue samples for observer training programs and crab pathology studies, and fulfilling requests from academic institutions.

Table 5. --Biological samples collected for special studies and number of Pacific cod tagged during the 1990 eastern Bering Sea bottom trawl survey.

Species	Stomach samples collected	Number tagged
Walleye pollock	2,706	--
Pacific cod	1,470	51
Yellowfin sole	1,139	--
Flathead sole	958	--
Rock sole	613	--
Alaska plaice	393	--
Atheresthes spp.	281	--
Pacific halibut	270	--
Greenland turbot	27	--

RESULTS

Environmental Conditions

Sea surface temperatures recorded during the survey ranged from 2.3° to 10.8°C (Fig. 5). As in most previous years, surface temperature increased from east to west across the shelf, probably reflecting the progression of summer warming as the survey proceeded from east to west.

Bottom temperatures ranged from -1.5° to 6.8°C (Fig. 5). The warmest temperatures (above 4°C) occurred in shallow waters along the Alaska mainland, in the vicinity of the Pribilof Islands, and in the southern portion of the outer shelf just

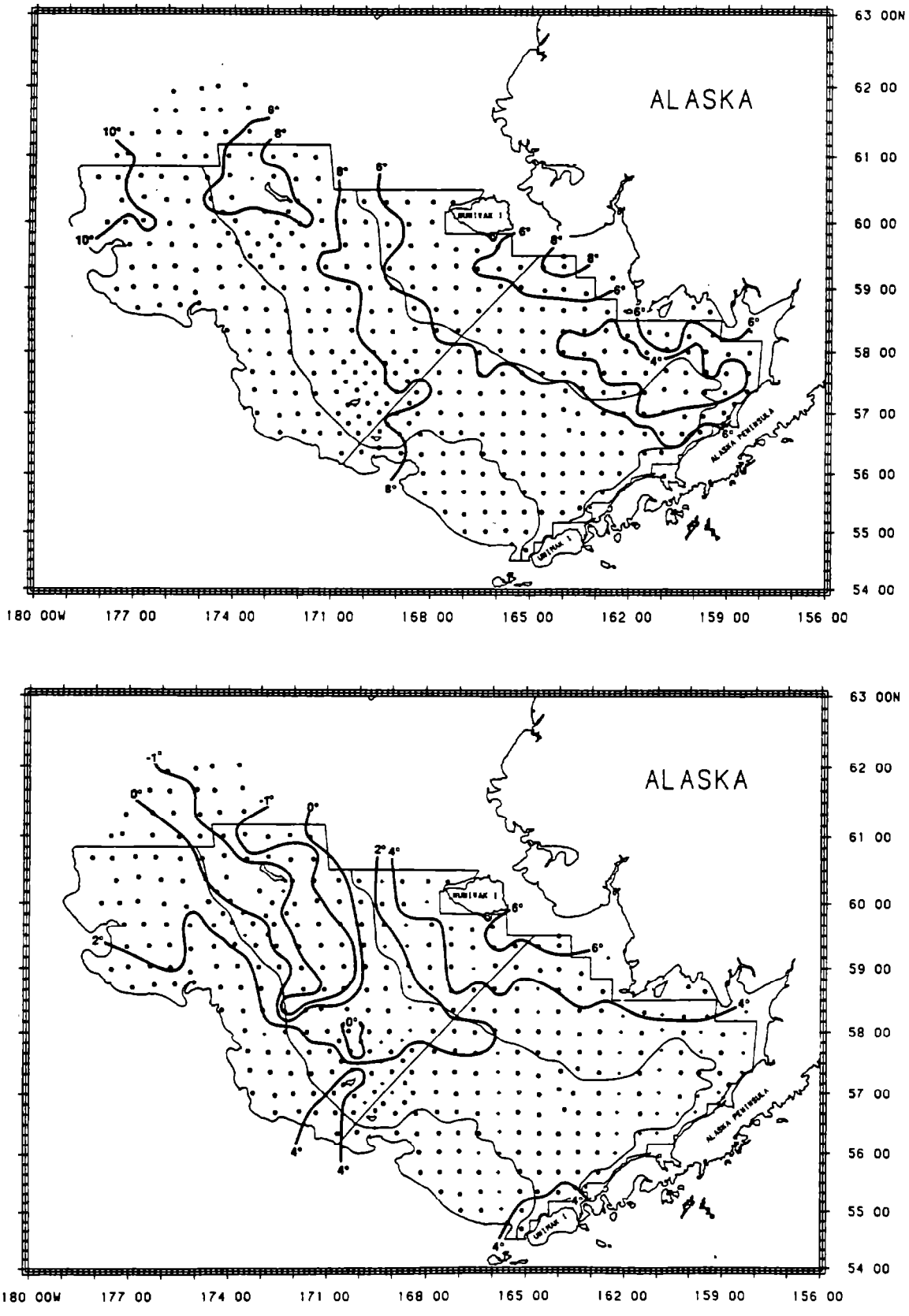

Figure 5.--Distribution of surface water (top panel) and bottom water (lower panel) temperatures ("C) observed during the 1990 eastern Bering Sea bottom trawl survey.

north of Unimak Pass. The coldest bottom temperatures observed were in the northern portion of the mid-shelf at depths between 50 and 100 m.

The mean bottom water temperature for the total survey area in 1990 was 2.3°C (Fig. 6). Historically, this is below average for mean summer bottom water temperatures in the standard survey area (range in annual means 1.8° to 5.1°C, average of annual means 2.9°C). Mean bottom temperatures observed over a more limited region of the southeast Bering Sea, which has been sampled annually since 1971, have ranged from 1.2° to 4.8°C; the 1990 value for this area was 3.2°C, near the long-term average (3.1°C). The distribution of bottom water temperatures was somewhat unusual in 1990 in that there was a relatively broad distribution of O°C and colder water on the northern midshelf, but the 2°C isotherm did not extend as far south as it normally does when the O°C and colder water is as extensive as it was in 1990. This would account for the total survey area mean in 1990 falling below average while the mean for the southeast Bering Sea was near average.

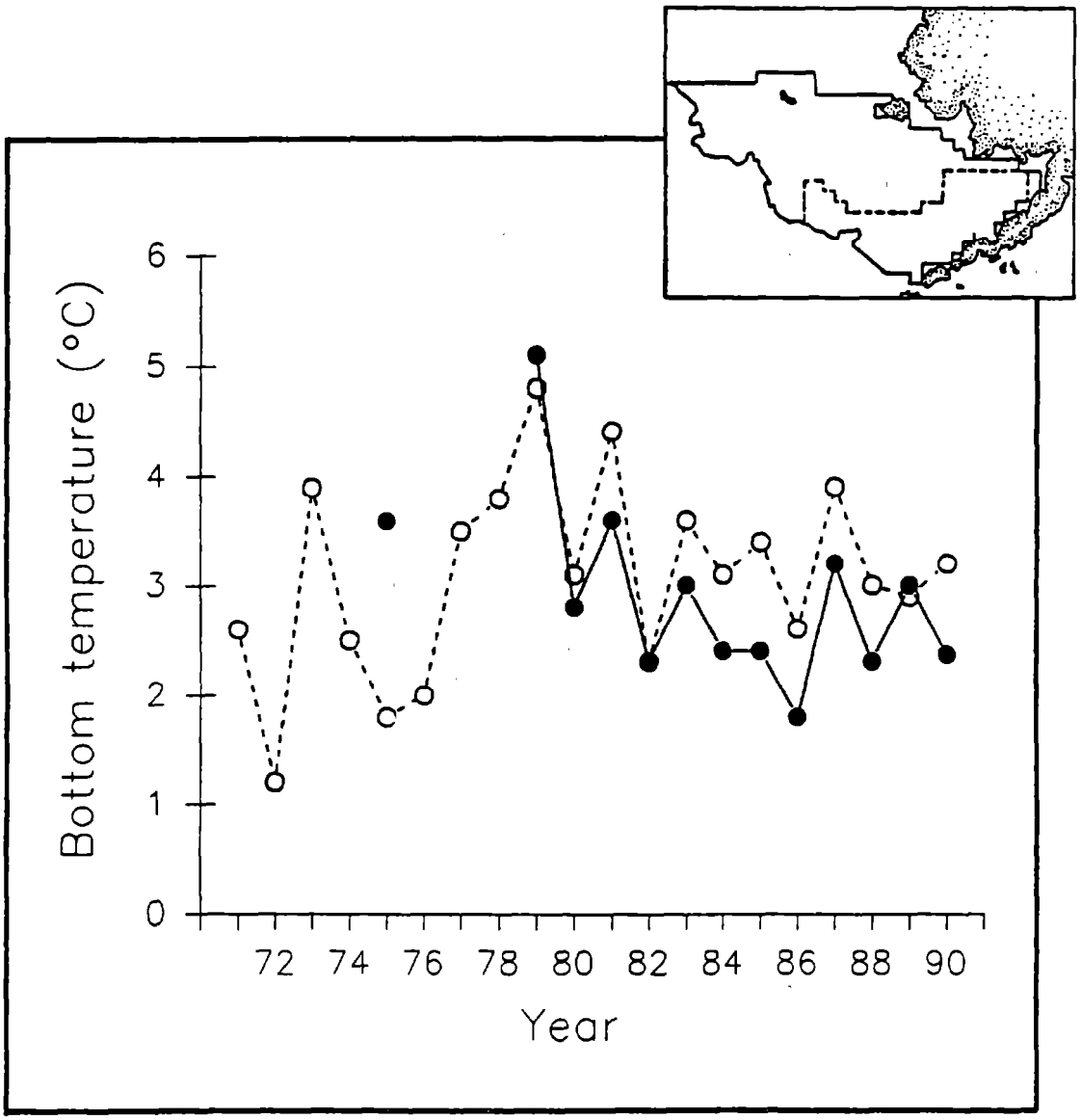

Figure 6.--Mean summer bottom water temperatures based on bathythermograph casts made during Alaska Fisheries Science Center bottom trawl surveys. The 1971-90 means (dashed line) are from the southeast Bering Sea (see inset) and the 1975 and 1979-90 means are from the larger survey area outlined on the inset. The 1975 data point for the overall survey area is based on data collected from August through September, while those in all other years and areas were collected from June through early August.

Relative Fishing Powers of Survey Vessels

A total of 352 alternate-row tows were used in the statistical comparison of vessel catch rates developed by Kappenman (1992). Based on this analysis, the Alaska was significantly more efficient than the Ocean Hope 3 at capturing the following species and species groups: walleye pollock, Pacific cod, Hippoglossoides spp., Alaska plaice, Atheresthes spp., Pacific halibut, Myoxocephalus spp., skates (Rajidae), Tanner crab, and snow crab. The Ocean Hope 3 was more efficient at catching rock sole. Fishing power corrections were applied to catches (by species) of the less efficient vessel (Table 6).

Table 6.--Species for which fishing power corrections were applied, and scaling factors determined by the method of Kappenman (1992).

	Hauls with catch		Catch multiplier	
Species	Alaska	Ocean Hope 3	Alaska	Ocean Hope 3
Walleye pollock	172	169	1.00	1.17
Pacific cod	166	163	1.00	1.05
Rock sole	155	159	1.04	1.00
Hippoglossoides spp.	155	151	1.00	1.24
Alaska plaice	110	127	1.00	1.12
Atheresthes spp.	88	74	1.00	1.11
Pacific halibut	104	93	1.00	1.14
Myoxocephalus spp.	113	104	1.00	1.09
Skates	118	104	1.00	1.49
Tanner crab	129	130	1.00	1.22
Snow crab	132	129	1.00	1.21

Estimated Biomass of Major Fish and Invertebrate Groups

Total demersal animal biomass for the overall survey area was estimated at 18.2 million t, of which fish species accounted for 80% (14.6 million t), and invertebrates 20% (3.6 million t). Concentrations of fish biomass were located in Bristol Bay and along the Alaska Peninsula, around the Pribilof Islands, and northwest of the Pribilofs (Fig. 7). Although 18 families and 70 species of fish were identified in the catches (Appendix C), the fish biomass was dominated by cods (Gadidae, 8.4 million t) and flatfishes (Pleuronectidae, 5.4 million t) (Table 7).

The biomass of invertebrates was comprised primarily of the phyla Crustacea (1.6 million t), Mollusca (0.4 million t), and Echinodermata (1.2 million t). A total of 96 invertebrate species were identified in the survey (Table 8, Appendix C).

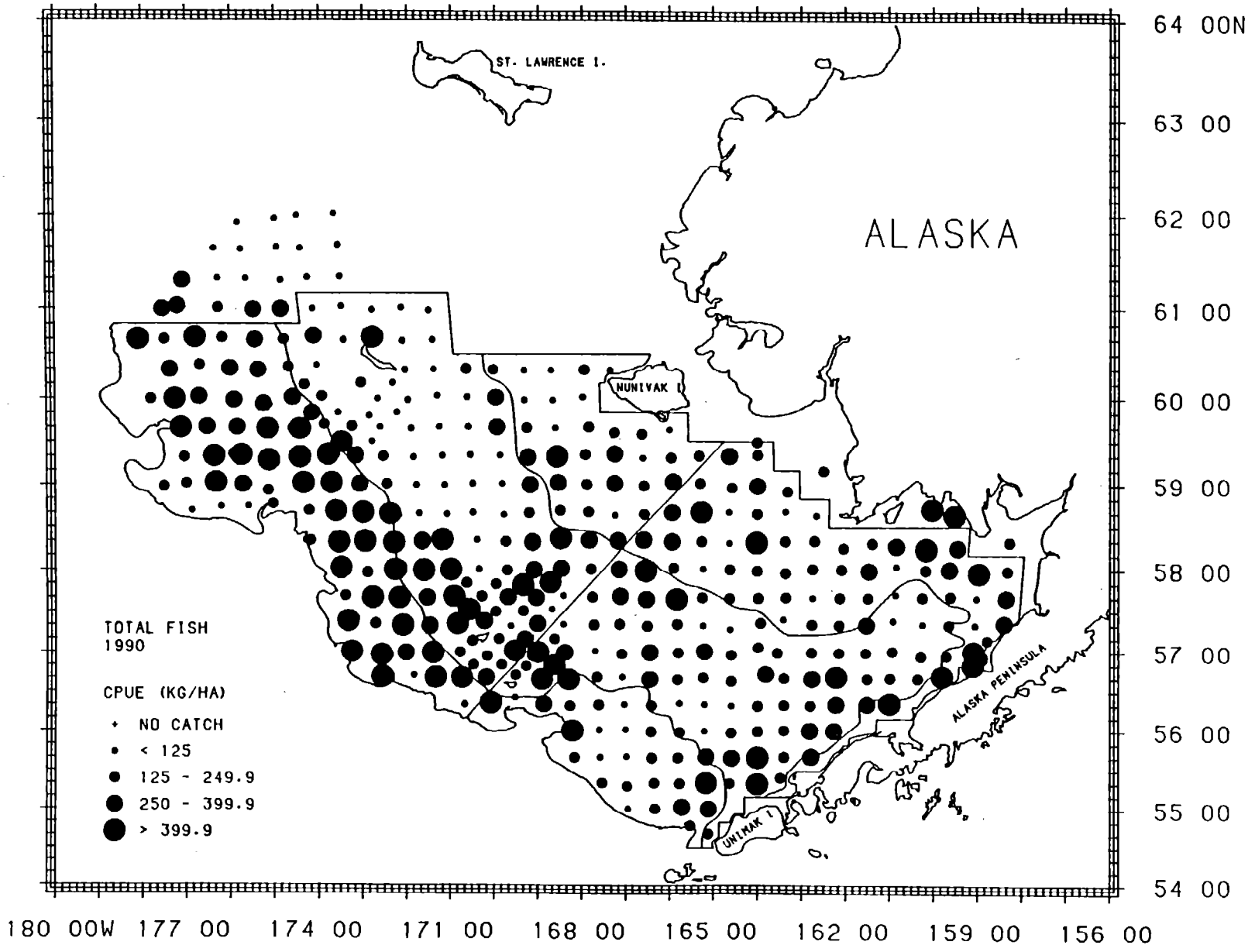

Figure 7.--Distribution and relative abundance in kg/ha of total fish, 1990 eastern Bering Sea bottom trawl survey.

Table 7.--Biomass estimates (metric tons) for major fish species and fish groups taken during the 1990 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t)[a] and 95% confidence interval	Proportion of total animal biomass[b]	Estimated biomass by subarea (t)					
			1	2	3	4	5	6
Gadidae (cods)								
Walleye pollock	7,653,433 ± 27%	0.421	122,938	25,667	1,026,680	920,826	569,943	4,987,378
Pacific cod	708,551 ± 15%	0.039	41,425	17,802	151,480	123,846	62,871	311,127
Other cods	6,943 ± 60%	<0.001	1,316	4,379	0	1,247	0	0
Total cods	8,368,926 ± 25%	0.460	165,679	47,848	1,178,160	1,045,920	632,814	5,298,505
Anoplopomatidae								
Sablefish	308 ± 96%	<0.001	0	0	85	0	135	88
Scorpaenidae (rockfish)								
Pacific ocean perch	222 ± 166%	<0.001	0	0	0	0	43	180
Other rockfish	866 ± 161%	<0.001	0	0	0	0	134	732
Total rockfish	1,088 ± 161%	<0.001	0	0	0	0	177	912
Pleuronectidae (flatfishes)								
Yellowfin sole	2,183,777 ± 14%	0.120	866,296	368,047	673,564	275,220	621	28
Rock sole	1,408,988 ± 13%	0.077	619,275	190,773	255,074	287,730	2,271	53,863
Hippoglossoides spp.	645,990 ± 17%	0.035	23,154	991	187,108	63,354	92,438	278,944
Alaska plaice	525,767 ± 19%	0.029	71,609	55,939	138,885	231,990	0	27,344
Atheresthes spp.	454,136 ± 17%	0.025	931	0	78,284	14,897	152,131	207,894
Greenland turbot	14,093 ± 61%	0.001	0	0	0	498	0	13,596
Pacific halibut	89,535 ± 17%	0.005	25,201	5,587	19,607	9,203	10,620	19,318
Other flatfish	46,648 ± 27%	0.003	25,634	5,673	4,372	122	8,463	2,385
Total flatfish	5,368,934 ± 8%	0.295	1,632,100	627,012	1,356,894	883,014	266,543	603,371
Clupeidae								
Pacific herring	3,512 ± 46%	<0.001	172	1,199	945	849	0	348
Cottidae (sculpins)	224,145 ± 19%	0.012	60,149	16,443	21,333	82,541	4,753	38,926
Zoarcidae (eelpouts)	41,215 ± 18%	0.002	300	70	4,447	20,910	575	14,912
Osmeridae (smelts)	6,713 ± 48%	<0.001	3,571	936	223	61	1,921	0
Agonidae (poachers)	35,284 ± 19%	0.002	8,516	8,957	10,120	6,759	343	589
Cyclopteridae (snailfishes)	9,027 ± 30%	<0.001	56	76	137	7,072	172	1,514
Rajidae (skates)	573,905 ± 23%	0.032	15,098	5,085	65,963	88,000	87,559	312,201
Other fish	14,494 ± 69%	0.001	2,292	1,719	1,428	640	630	7,785
Total fish	14,647,551 ± 14%	0.805	1,887,933	709,344	2,639,734	2,135,765	995,623	6,279,151

[a]Differences in sums of estimates and totals are due to rounding.

[b]Proportion of total estimated biomass of fish and invertebrates combined, for the total survey area. Total estimated biomass = 18,199,154 t.

Table 8.--Biomass estimates (metric tons) for major invertebrate species and invertebrate groups taken during the 1990 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t)[a] and 95% confidence interval		Proportion of total animal biomass[b]	Estimated biomass by subarea (t)					
				1	2	3	4	5	6
Crustacea									
Chionoecetes sp. (snow crab)	947,795	± 16%	0.052	11,721	445	240,933	450,515	43,757	200,424
Lithodes sp. (king crab)	0	0	0.000	0	0	0	0	0	0
Paralithodes sp. (king crab)	83,995	± 39%	0.005	9,314	502	49,453	24,291	0	436
Erimacrus isenbeckii (hair crab)	3,381	± 101%	<0.001	197	70	556	2,558	0	0
Paguridae (hermit crabs)	474,474	± 15%	0.026	31,489	37,779	170,471	160,128	7,472	67,135
Other crabs	49,749	± 29%	0.003	17,052	11,022	10,884	8,854	511	1,426
Total crabs	1,559,394	± 11%	0.086	69,772	49,817	472,298	646,346	51,740	269,422
Shrimps	4,295	± 31%	<0.001	295	278	303	467	542	2,410
Other crustaceans	4,635	± 115%	<0.001	2,243	58	580	1,673	21	61
Total crustaceans	1,568,324	± 11%	0.086	72,310	50,153	473,181	648,485	52,303	271,893
Mollusca									
Gastropoda (snails)	409,898	± 18%	0.023	23,143	37,546	107,754	99,214	6,215	136,026
Pelecypoda (bivalves)	6,507	± 83%	<0.001	928	783	4,043	57	276	421
Squids	5,751	± 196%	<0.001	5,632	0	48	0	21	50
Octopuses	11,566	± 96%	0.001	0	0	2,959	323	581	7,703
Other mollusks	0	0	0.000	0	0	0	0	0	0
Total mollusks	433,722	± 17%	0.024	29,703	38,328	114,803	99,594	7,094	144,200
Echinodermata									
Asteroidea (starfishes)	974,100	± 13%	0.054	380,933	158,021	218,406	166,478	3,016	47,246
Ophiuroidea (brittle stars)	216,949	± 34%	0.012	3,132	2,492	53,996	21,533	22,462	113,334
Echinoidea (sea urchins)	9,710	± 49%	0.001	304	0	3,515	1,190	2,082	2,618
Holothuroidea (sea cucumbers)	10,775	± 96%	0.001	5,209	99	4,520	929	0	18
Total echinoderms	1,211,534	± 12%	0.068	389,578	160,612	280,438	190,130	27,561	163,216
Ascidiacea	171,219	± 30%	0.009	29,026	25,135	60,167	56,854	3	35
Porifera (sponges)	32,198	± 61%	0.002	2,729	334	27,646	341	104	1,045
Coelenterata	104,568	± 22%	0.006	7,674	1,487	37,137	22,858	28,854	6,558
Other invertebrates	30,037	± 93%	0.002	24,967	1,423	1,262	78	18	2,289
Total invertebrates	3,551,603	± 7%	0.195	555,988	277,471	994,633	1,018,340	115,936	589,235

[a]Differences in sums of estimates and totals are due to rounding.

[b]Proportion of total estimated biomass (fish and invertebrates combined, for the total survey area. Total estimated biomass = 18,199,154 t.

Relative Abundance of Individual Fish Species

The 11 most abundant species and species groups of fish are shown in Figure 8. These taxa accounted for 79% (309 kg/ha) of total animal mean CPUE (393 kg/ha) and 98% of total fish mean CPUE (316 kg/ha). Overall, but particularly in water deeper than 50 m, walleye pollock were the most dominant species in the catch with a mean CPUE of 165 kg/ha. Similarly, Pacific cod were more abundant at depths exceeding 50 m, but their overall mean CPUE was only 15 kg/ha. Yellowfin sole and rock sole, with overall mean catch rates of 47 kg/ha and 30 kg/ha respectively, dominated catches in water less than 50 m. Alaska plaice, butterfly sculpins (Hemilepidotus papilio) and Myoxocephalus sculpins were most prominent at depths less than 100 m. Conversely, Hippoglossoides spp., Atheresthes spp., and skates were most abundant in water greater than 100 m. Pacific halibut were present at low levels in all depth zones. See Appendix D for a descending rank of all organisms caught.

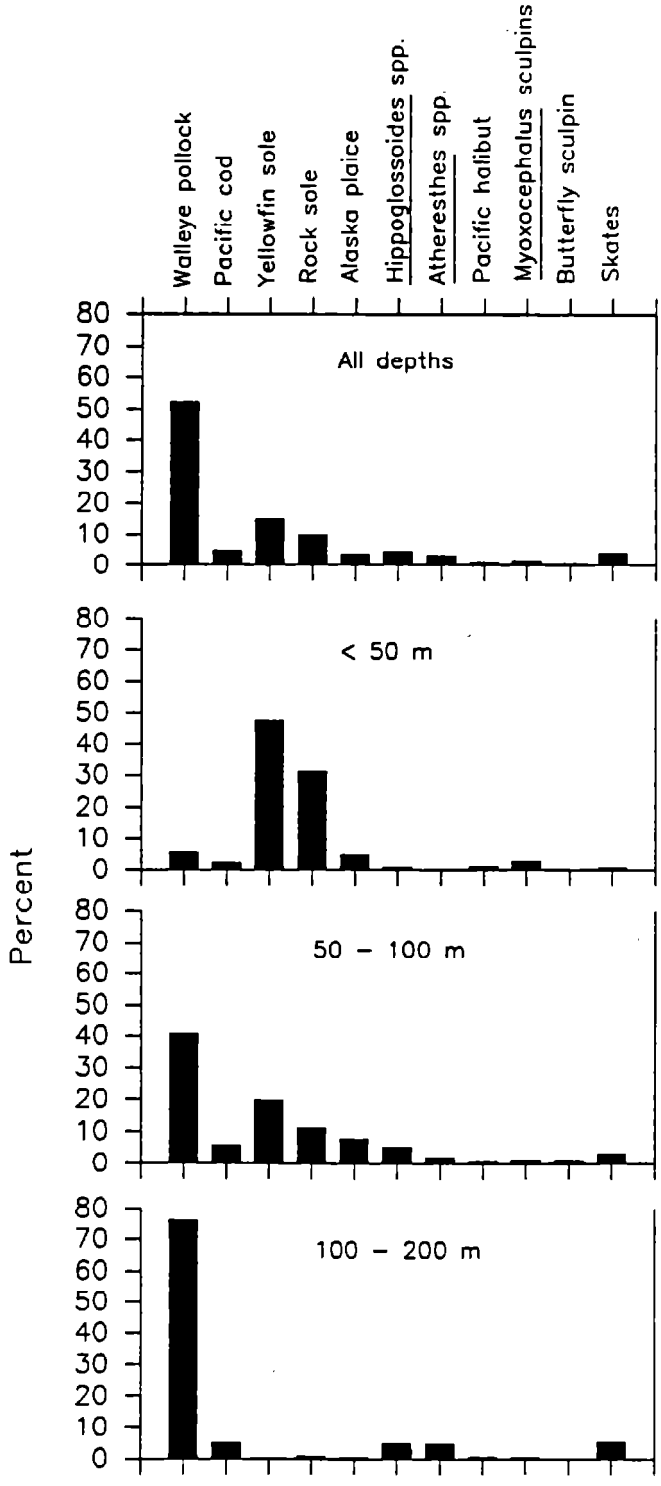

Figure 8. --Relative abundance (%CPUE in kg/ha) of principal groundfish species by depth zone and for all depths combined, 1990 eastern Bering Sea bottom trawl survey.

Abundance, Distribution, and Size and Age Composition of Principal Species and Species Groups

Geographical distributions, population numbers and biomass estimates, and size composition are presented for each of the following commercially important eastern Bering Sea groundfish: walleye pollock, Pacific cod, yellowfin sole, rock sole, Hippoglossoides spp., Alaska plaice, Greenland turbot, Atheresthes spp., and Pacific halibut (Tables 9-29 and Figs. 9-43). Estimated biomass, population number, and mean size (by length and weight) are summarized by subarea and for the entire survey area. Size composition data are illustrated in histograms relating the population percentage of length by centimeter interval for each subarea and in population numbers for the total survey area. Age composition and von Bertalanffy growth parameters are given for walleye pollock, Pacific cod, yellowfin sole, and rock sole. Geographical distributions for noncommercial fish groups are presented in Figures 44 to 49; biomass estimates for these groups are found in Table 7.

Appendices to the report contain detailed results of the analysis. CPUE, population, and biomass estimates are given for each species by stratum in Appendix E. Population estimates by sex and size class are listed for the total survey area in Appendix F. Age-length keys and population estimates by age are given in Appendices G and H, respectively.

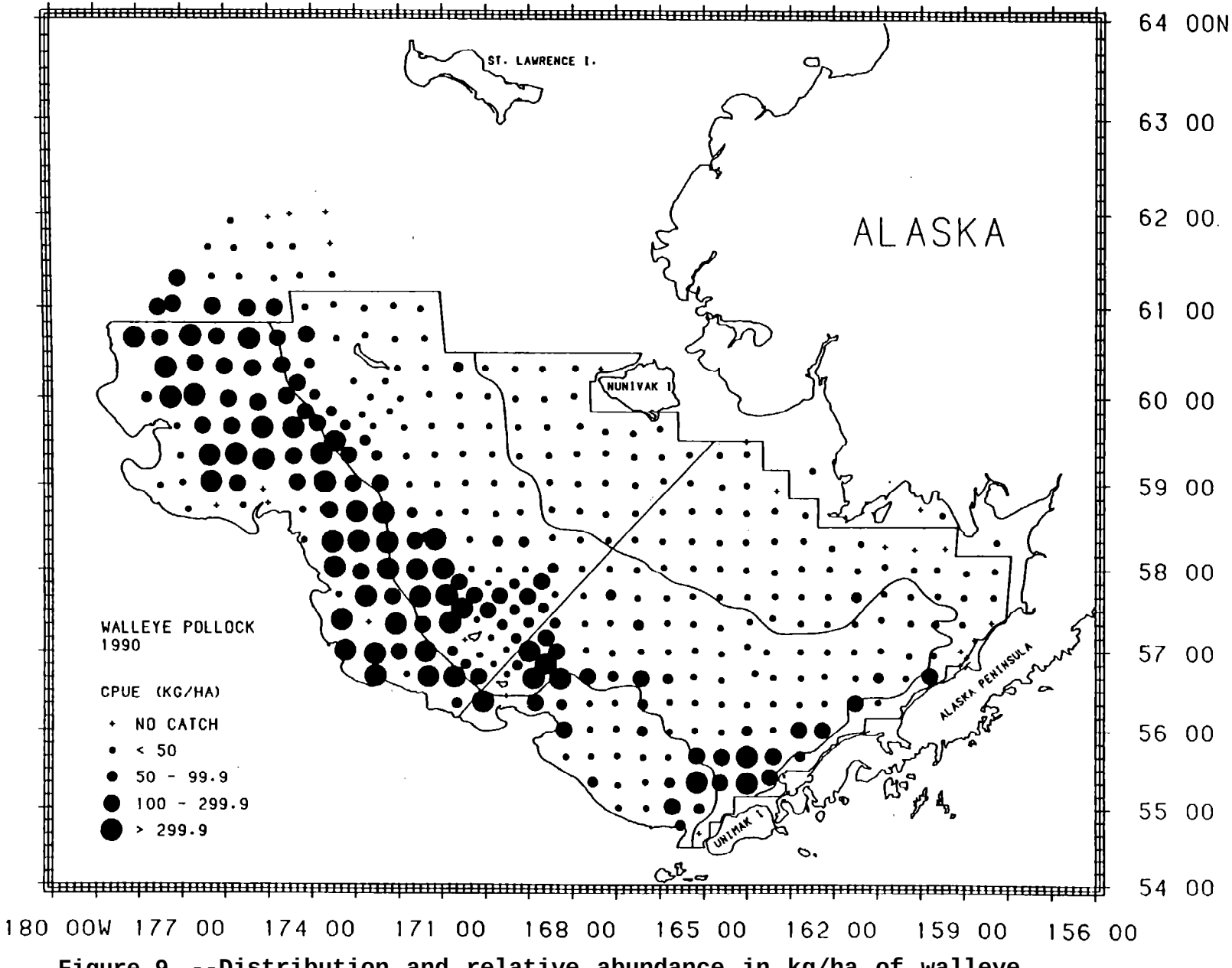

Figure 9. --Distribution and relative abundance in kg/ha of walleye pollock, 1990 eastern Bering Sea bottom trawl survey.

Table 9. --Abundance estimates and mean size of walleye pollock by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	15.79	122,938	0.016	386,666,332	0.033	0.318	24.5
2	6.26	25,667	0.003	74,758,265	0.006	0.343	21.6
3	99.39	1,026,680	0.134	1,297,195,014	0.111	0.791	43.5
4	85.40	920,826	0.120	1,338,283,460	0.115	0.688	40.0
5	146.92	569,943	0.074	649,720,531	0.056	0.877	47.8
6	527.42	4,987,378	0.652	7,939,576,760	0.679	0.628	42.5
All subareas combined[b]	165.17	7,653,433	1.000	11,686,200,362	1.000	0.655	41.9
95% confidence interval		± 2,033,294		± 2,913,351,448			

Variances of abundance estimates are given in Appendix E.
differences in sums of estimates and totals are due to rounding.

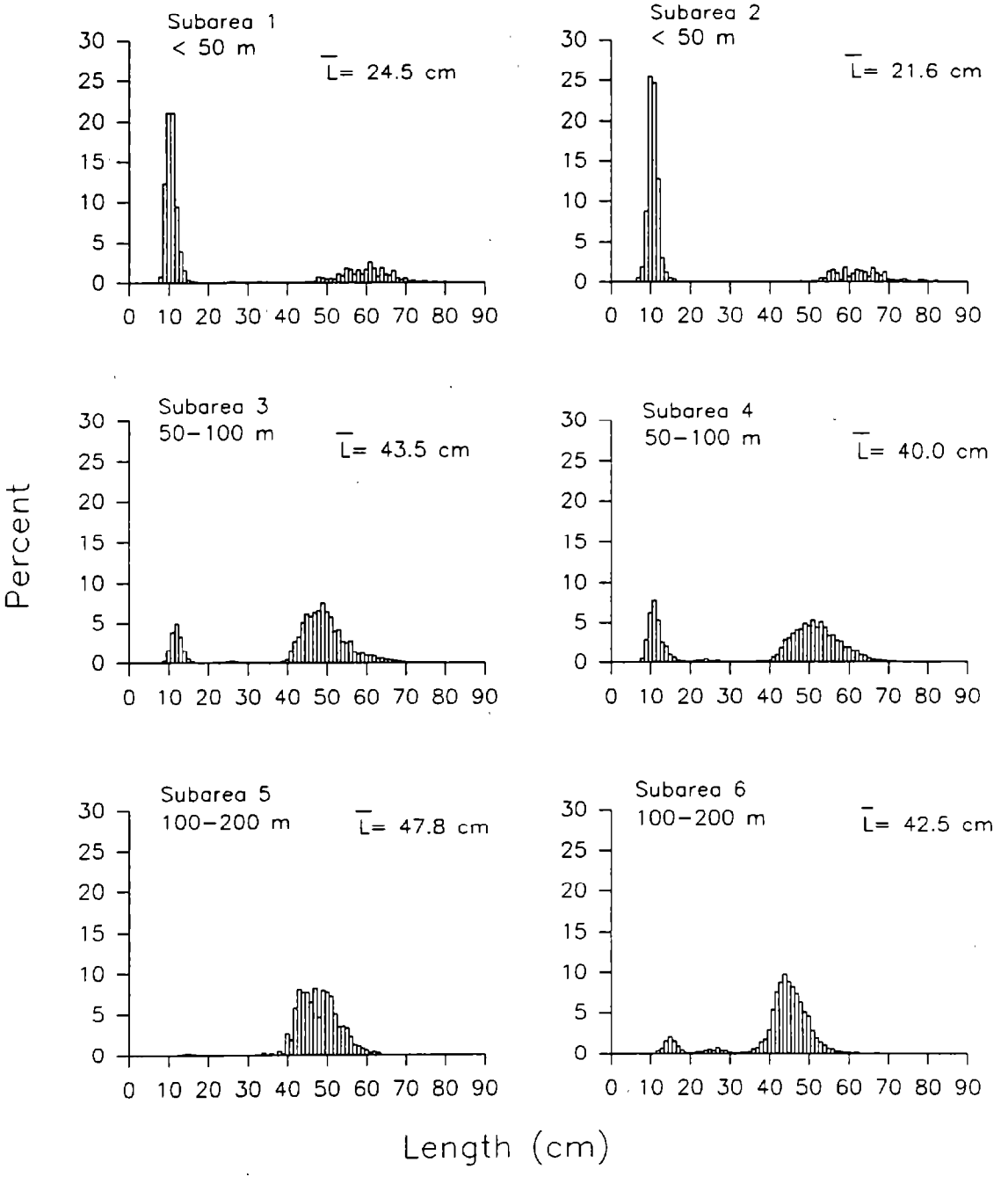

Figure 10.--Estimated relative size composition of walleye pollock (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

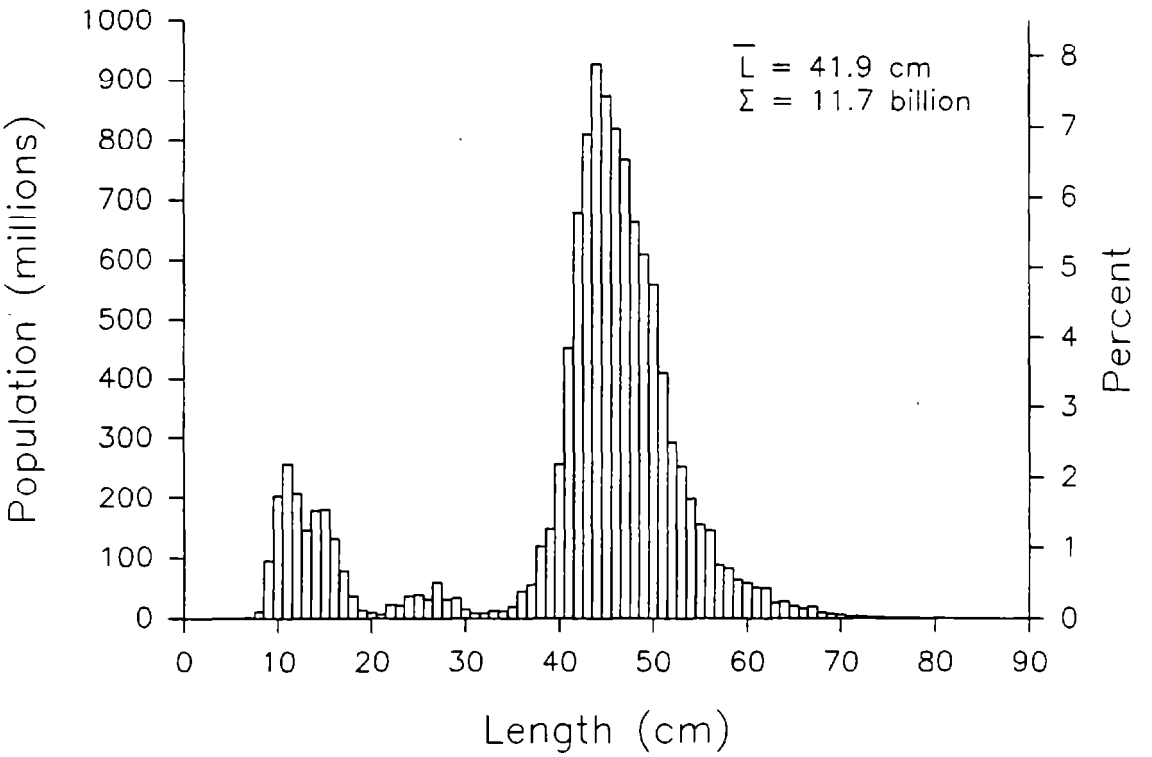

Figure 11. --Estimated size composition of walleye pollock (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

Table l0.--Estimated population numbers (millions of fish of walleye pollock by age group and subarea, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Depth and subarea: 100-200 m, 6	100-200 m, 5	50-100 m, 4	50-100 m, 3	<50 m, 2	<50 m, 1	All subareas combined	Proportion of total
1	1989	600.12	3.61	370.08	204.19	58.74	272.20	1,508.93	0.129
2	1988	223.87	0.15	16.56	9.40	0.00	1.61	251.60	0.022
3	1987	71.51	0.64	2.58	2.18	0.00	0.85	77.77	0.007
4	1986	525.62	21.07	9.41	14.69	0.00	1.24	572.04	0.049
5	1985	983.56	63.56	42.25	74.38	0.00	0.52	1,164.27	0.100
6	1984	3,124.51	238.99	220.24	347.18	0.11	4.41	3,935.44	0.337
7	1983	596.64	48.90	57.45	90.61	0.08	2.03	795.72	0.068
8	1982	1,314.01	158.76	243.97	270.43	1.12	12.17	2,000.46	0.171
9	1981	118.29	17.42	34.86	32.25	0.41	3.51	206.74	0.018
10	1980	134.61	36.29	112.40	82.85	2.58	19.67	388.40	0.033
11	1979	18.70	5.46	17.25	14.58	0.49	3.69	60.17	0.005
12	1978	180.44	45.73	164.92	122.09	7.71	45.23	566.13	0.048
13	1977	18.81	3.22	11.59	9.48	0.54	4.41	48.04	0.004
14	1976	10.22	2.87	10.57	8.76	1.07	3.94	37.43	0.003
15	1975	11.08	1.71	6.45	5.86	0.79	2.96	28.86	0.003
16	1974	2.33	0.10	0.46	0.88	0.29	1.69	5.74	0.001
18	1972	1.83	0.58	3.26	1.78	0.17	1.34	8.94	0.001
>18		1.76	0.59	1.32	1.22	0.03	0.14	5.07	<.001
Age unknown		1.67	0.07	12.66	4.38	0.64	5.04	24.45	0.002
All ages combined		7,939.58	649.72	1,338.28	1,297.20	74.76	386.67	11,686.20	1.000

'Differences in sums of estimates and totals are due to rounding.

Table 11. --Estimated biomass (metric tons) of walleye pollock by age group, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Biomass (t)	Proportion of total
1	1989	26,287	0.0034
2	1988	30,491	0.0040
3	1987	15,224	0.0020
4	1986	256,242	0.0335
5	1985	686,866	0.0897
6	1984	2,641,918	0.3452
7	1983	572,957	0.0749
8	1982	1,702,448	0.2224
9	1981	194,656	0.0254
10	1980	478,147	0.0625
11	1979	75,614	0.0099
12	1978	770,760	0.1007
13	1977	61,639	0.0081
14	1976	57,741	0.0075
15	1975	42,509	0.0056
16	1974	13,390	0.0017
18	1972	15,708	0.0021
>18		6,469	0.0008
Age unknown		4,367	0.0006
All ages combined[1]		7,653,433	1.0000

[1]Differences in totals are due to rounding.

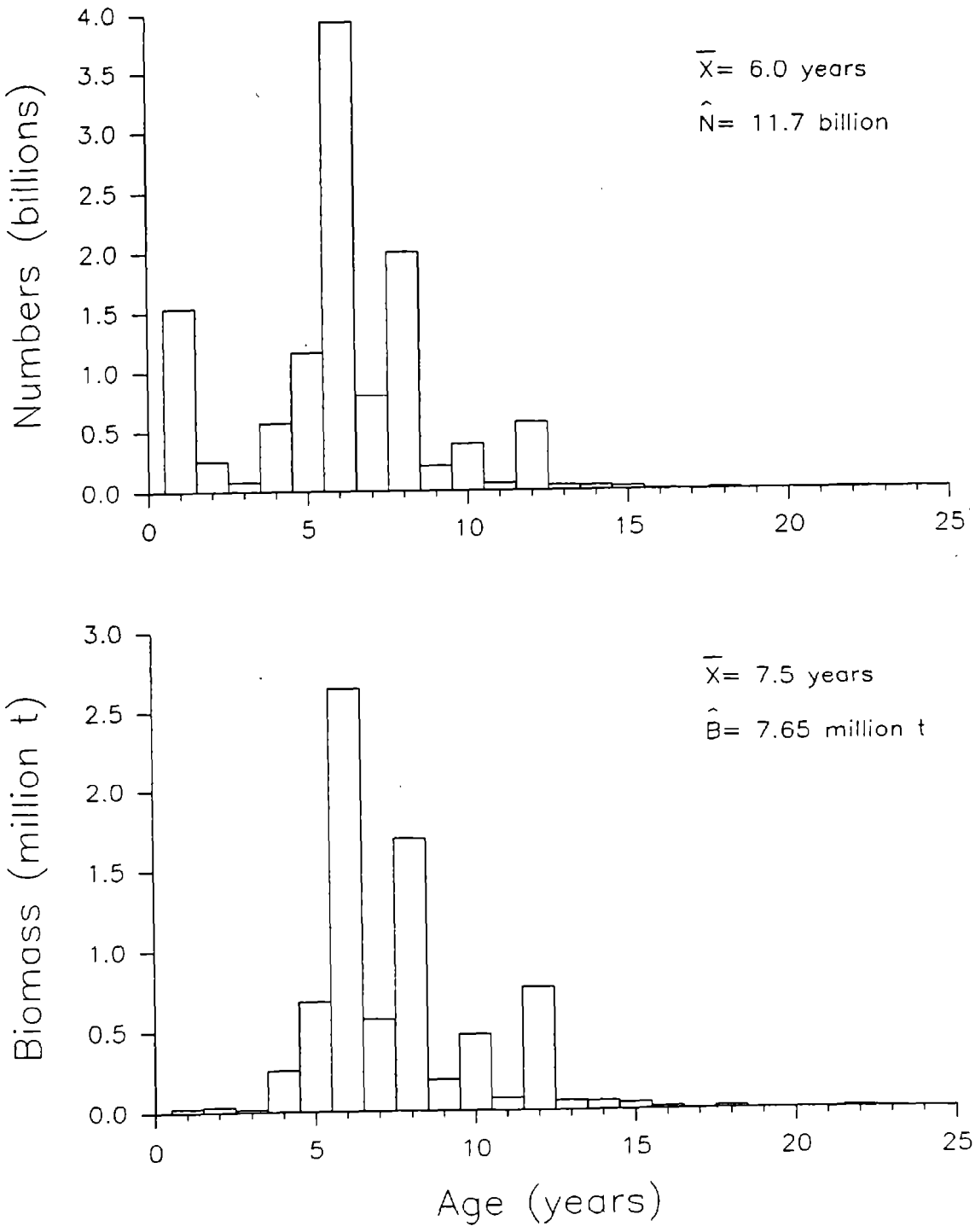

Figure 12.--Population number and biomass (metric tons) estimates by age for walleye pollock, 1990 eastern Bering Sea bottom trawl survey.

Table 12. --Von Bertalanffy growth parameter estimates for walleye pollock by sex, based on otolith age readings and length data from the 1990 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				L_{inf}	K	t_o
Male	573	1-18	15-78	70.0	0.14	-1.04
Female	623	1-22	16-79	74.9	0.14	-0.86

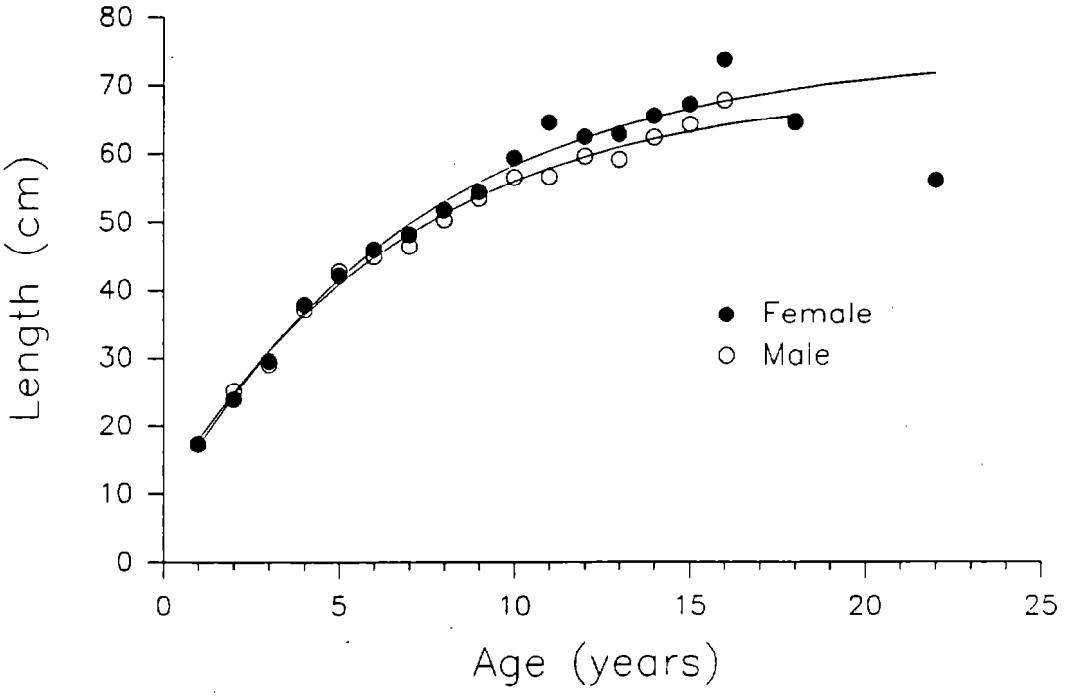

Figure 13. --Von Bertalanffy growth curves and mean lengths at age (symbols) for male and female walleye pollock, 1990 eastern Bering Sea bottom trawl survey.

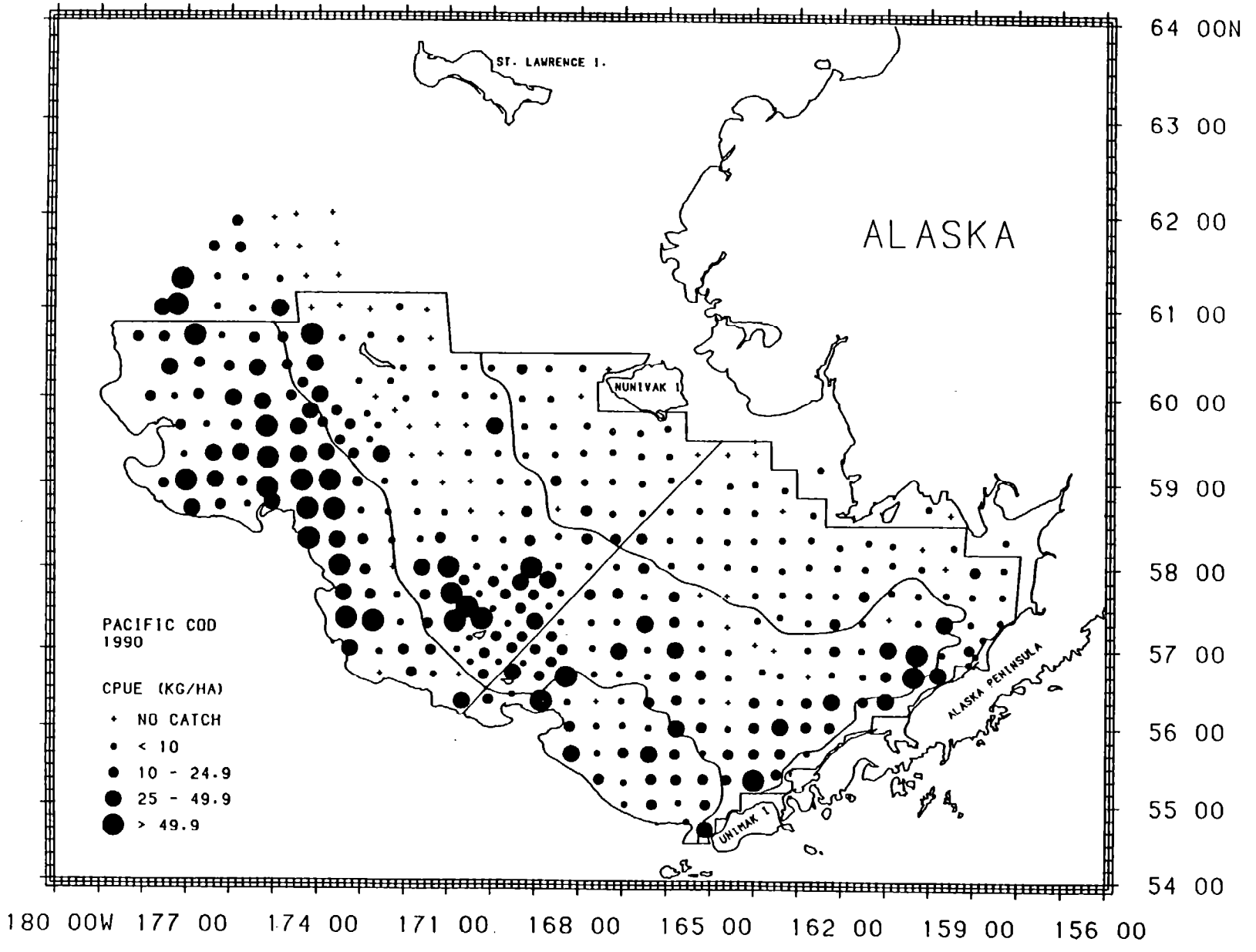

Figure 14. --Distribution and relative abundance in kg/ha of Pacific cod, 1990 eastern Bering Sea bottom trawl survey.

Table 13.--Abundance estimates and mean size of Pacific cod by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	5.32	41,425	0.058	100,308,812	0.231	0.413	22.8
2	4.34	17,802	0.025	30,343,358	0.070	0.587	23.7
3	14.66	151,480	0.214	85,213,945	0.196	1.778	44.7
4	11.49	123,846	0.175	126,767,083	0.292	0.977	36.1
5	16.21	62,871	0.089	15,648,630	0.036	4.018	66.4
6	32.90	311,127	0.439	76,374,068	0.176	4.074	64.2
All subareas combined[b]	15.29	708,551	1.000	434,655,895	1.000	1.630	39.9
95% confidence interval		± 105,306		± 74,838,809			

[a]Variances of abundance estimates are given in Appendix E.

[b]differences in suns of estimates and totals are due to rounding.

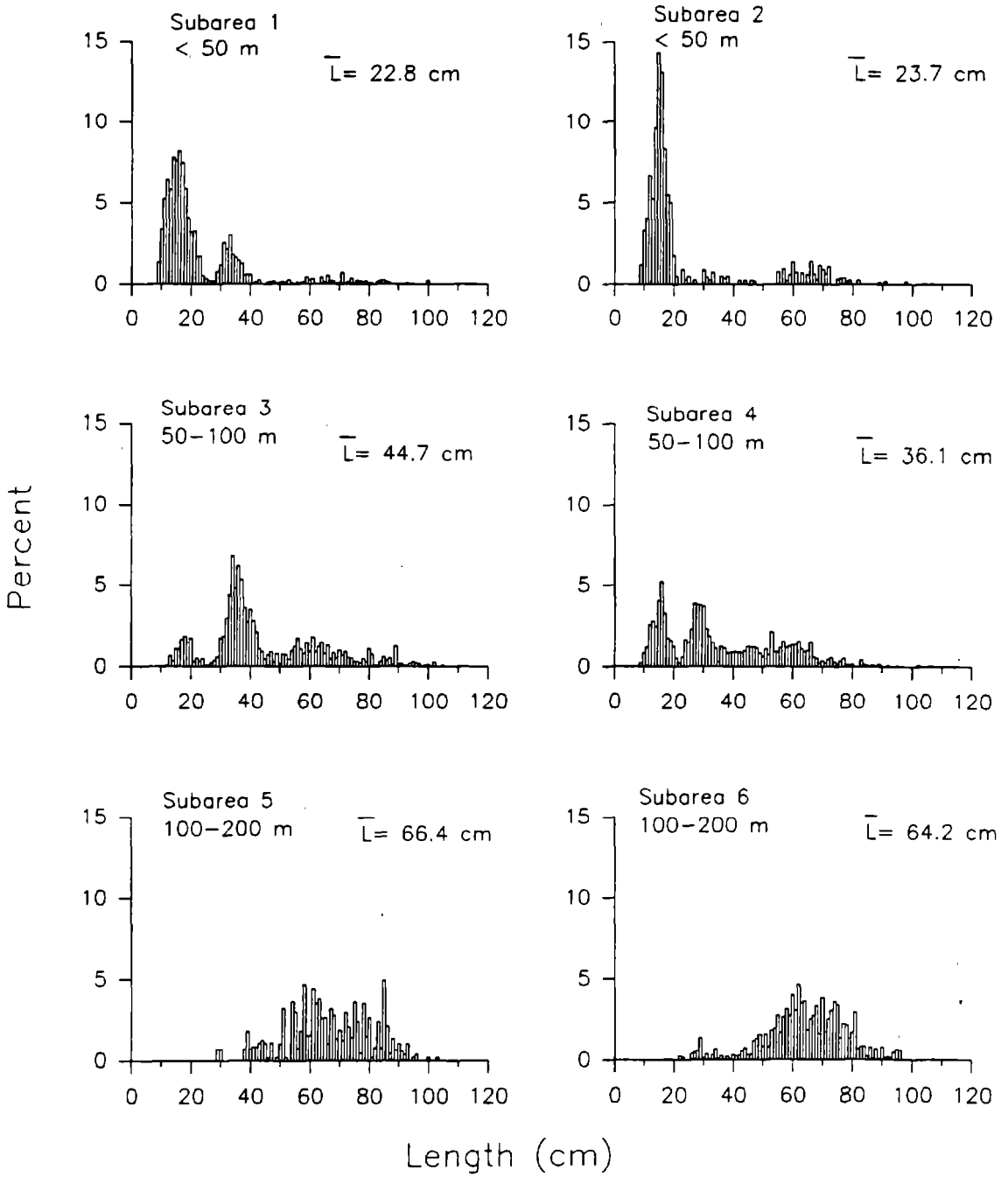

Figure 15. --Estimated relative size composition of Pacific cod (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

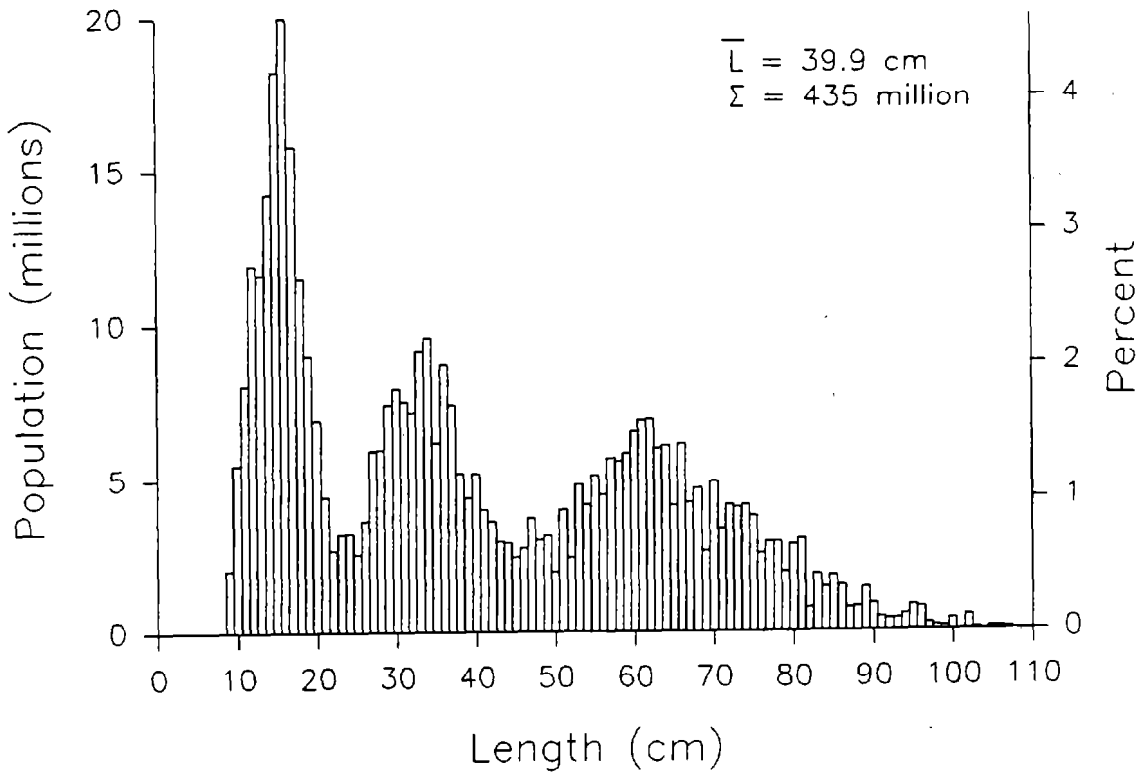

Figure 16.--Estimated size composition of Pacific cod (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

Table 14.--Estimated population numbers (millions of fish) of Pacific cod by age group and subarea, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Depth and subarea: 100-200 m, 6	100-200 m, 5	50-100 m, 4	50-100 m, 3	<50 m, 2	<50 m, 1	All subareas combined	Proportion of total
1	1989	0.12	0.00	32.60	7.14	20.91	58.09	118.87	0.274
2	1988	2.75	0.12	27.97	10.15	2.42	15.39	58.79	0.135
3	1987	1.69	0.71	18.80	32.19	0.90	13.43	67.73	0.156
4	1986	7.46	1.64	14.64	9.54	0.34	1.63	35.24	0.081
5	1985	15.24	2.82	13.54	7.46	0.92	1.11	41.09	0.095
6	1984	21.67	3.79	11.42	8.10	1.96	2.10	49.04	0.113
7	1983	17.65	3.06	4.11	4.43	1.19	1.82	32.26	0.074
8	1982	7.16	2.72	1.69	3.85	0.13	1.00	16.55	0.038
9	1981	1.14	0.37	0.10	0.56	0.03	0.10	2.29	0.005
10	1980	0.33	0.05	0.05	0.20	0.00	0.00	0.63	0.001
12	1978	0.02	0.05	0.00	0.36	0.00	0.00	0.43	0.001
13	1977	0.00	0.03	0.00	0.00	0.00	0.00	0.03	<0.001
14	1976	0.32	0.03	0.04	0.14	0.00	0.00	0.51	0.001
Age unknown		0.83	0.26	1.81	1.11	1.54	5.64	11.20	0.026
All ages, combined		76.37	15.65	126.77	85.21	30.34	100.31	434.66	1.000

*Differences in sums of estimates and totals are due to rounding.

Table 15. --Estimated biomass (metric tons) of Pacific cod by age group, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Biomass (t)	Proportion of total
1	1989	4,595	0.0065
2	1988	12,951	0.0183
3	1987	33,504	0.0473
4	1986	42,799	0.0604
5	1985	92,556	0.1306
6	1984	163,450	0.2307
7	1983	163,251	0.2304
8	1982	122,255	0.1725
9	1981	21,507	0.0304
10	1980	5,535	0.0078
12	1978	3,923	0.0055
13	1977	459	0.0006
14	1976	5,495	0.0078
Age unknown		36,272	0.0512
All ages combined		708,551	1.0000

Differences in totals are due to rounding.

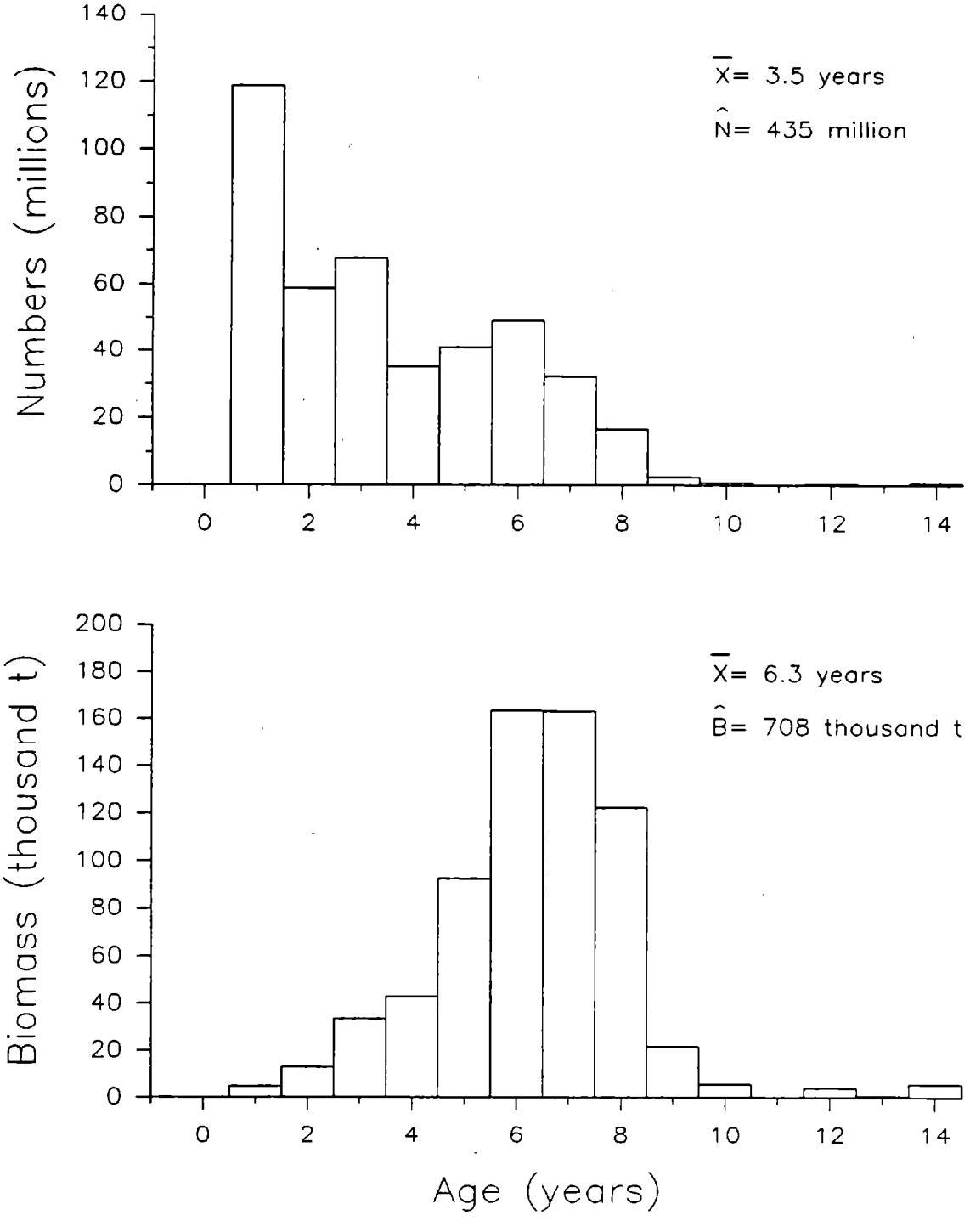

Figure 17.--Population number and biomass (metric tons) estimates by age for Pacific cod, 1990 eastern Bering Sea bottom trawl survey.

Tab1e 16. --Von Bertalanffy growth parameter estimates for Pacific cod by sex, based on otolith age readings and length data from the 1990 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Male	400	1-14	12-97	142.6	0.10	-0.08
Female	393	1-14	11-103	165.5	0.08	-0.10

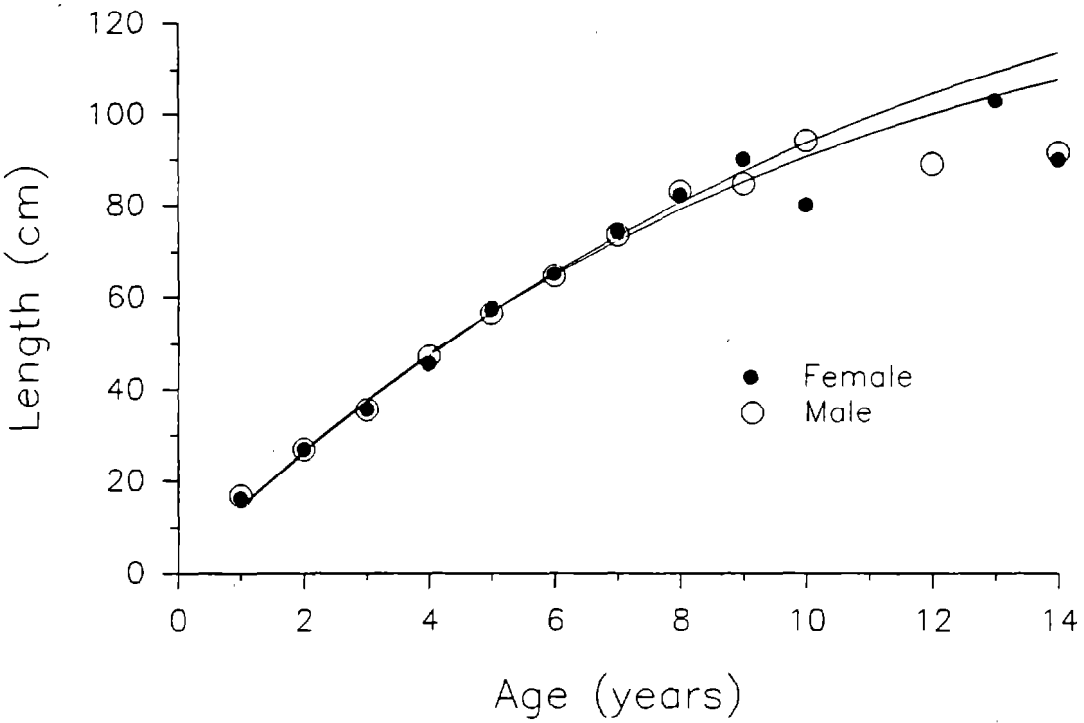

Figure 18.--Von Bertalanffy growth curves and mean lengths at age (symbols) for male and female Pacific cod, 1990 eastern Bering Sea bottom trawl survey.

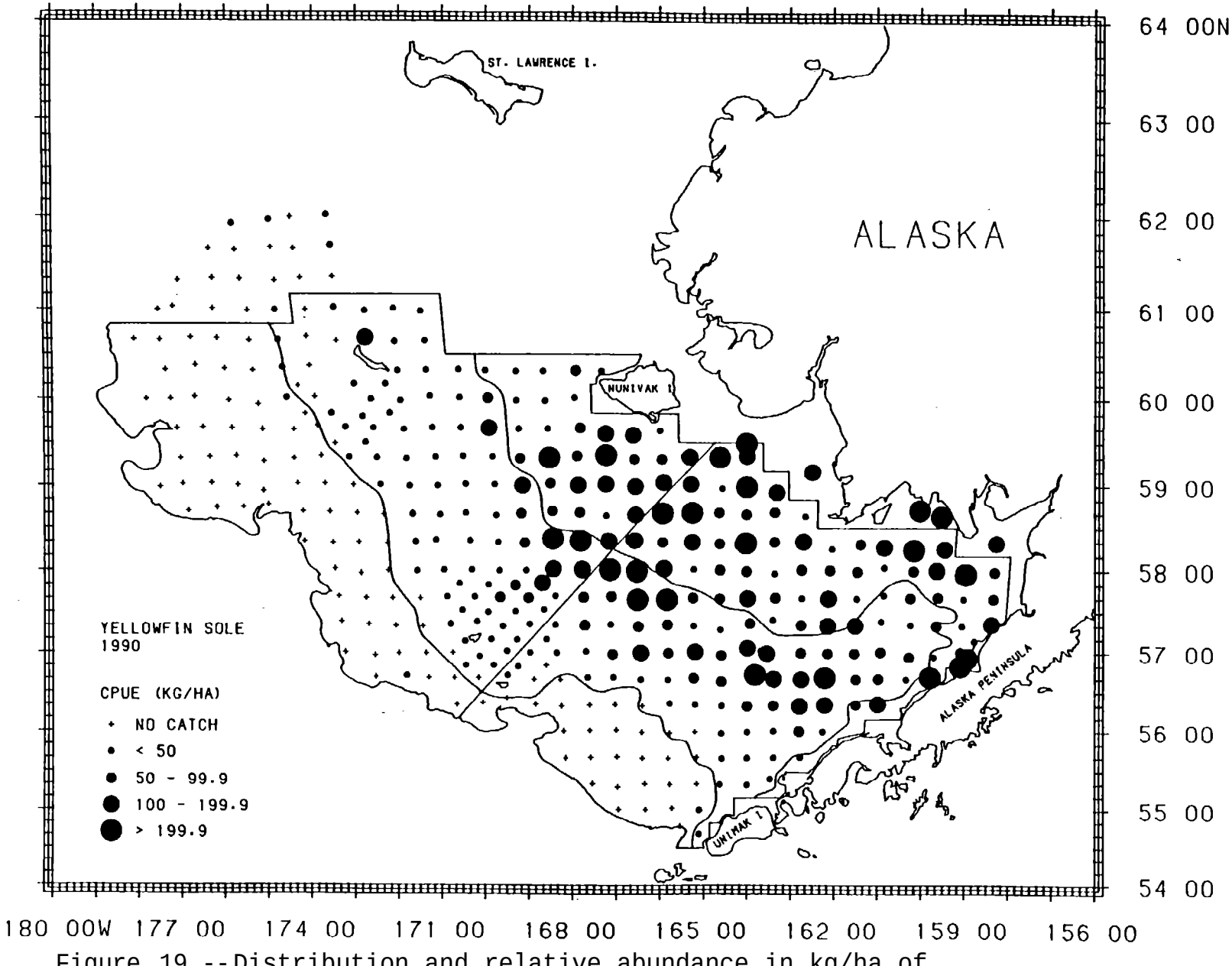

Figure 19.--Distribution and relative abundance in kg/ha of yellowfin sole, 1990 eastern Bering Sea bottom trawl survey.

Table 17. --Abundance estimates and mean size of yellowfin sole by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	111.25	866,296	0.397	3,984,184,493	0.440	0.217	24.6
2	89.71	368,047	0.169	1,997,283,772	0.220	0.184	22.8
3	65.20	673,564	0.308	2,177,907,028	0.240	0.309	28.6
4	25.53	275,220	0.126	899,506,626	0.099	0.306	27.5
5	0.16	621	< 0.001	960,302	< 0.001	0.646	35.0
6	0.00	28	< 0.001	147,422	< 0.001	0.191	26.4
All subareas combined[b]	47.13	2,183,777	1.000	9,059,989,643	1.000	0.241	25.4
95% confidence interval		± 296,843		± 1,407,515,110			

variances of abundance estimates are given in Appendix E.

differences in sues of estimates and totals are due to rounding.

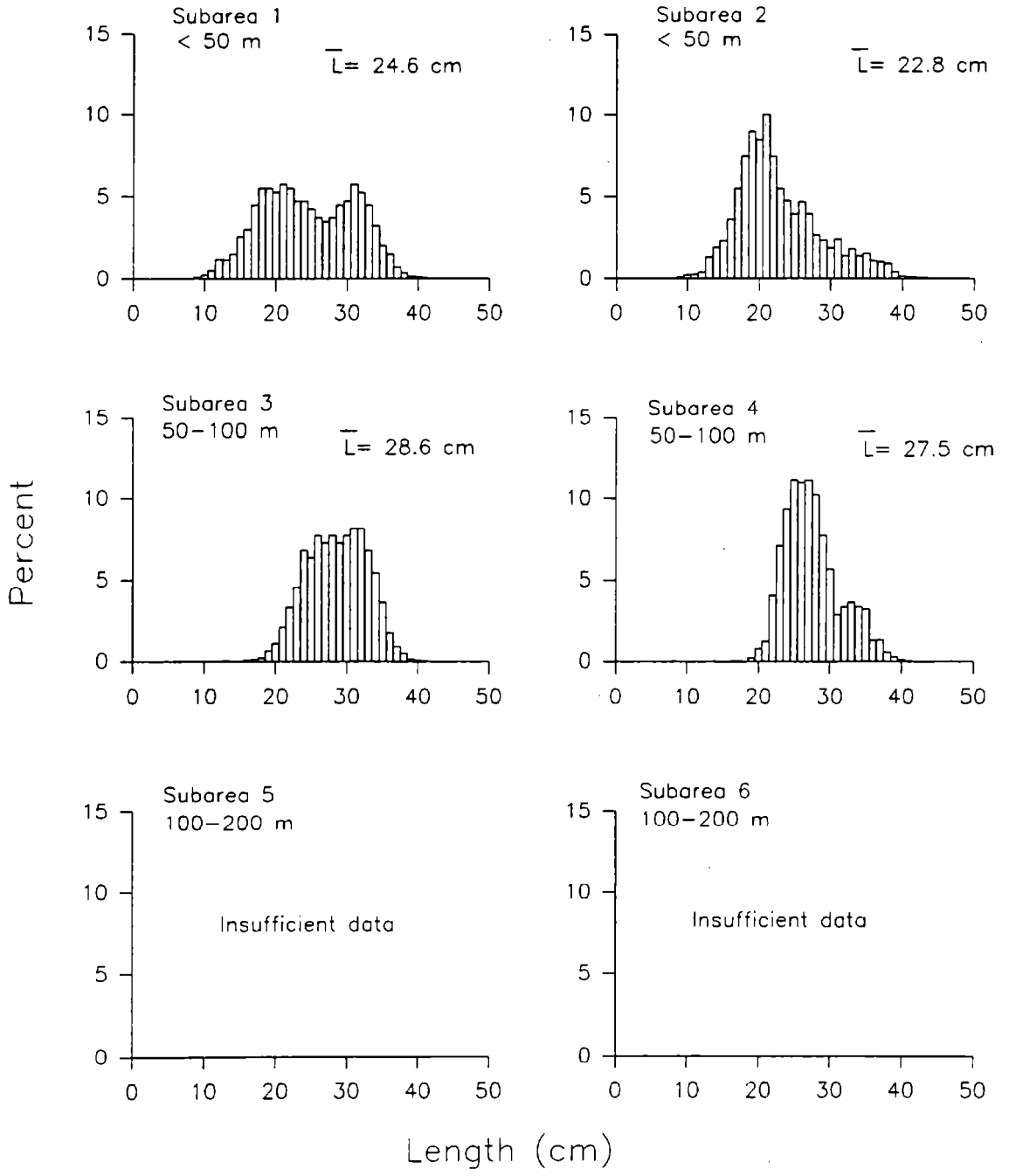

Figure 20.--Estimated relative size composition of yellowfin sole (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

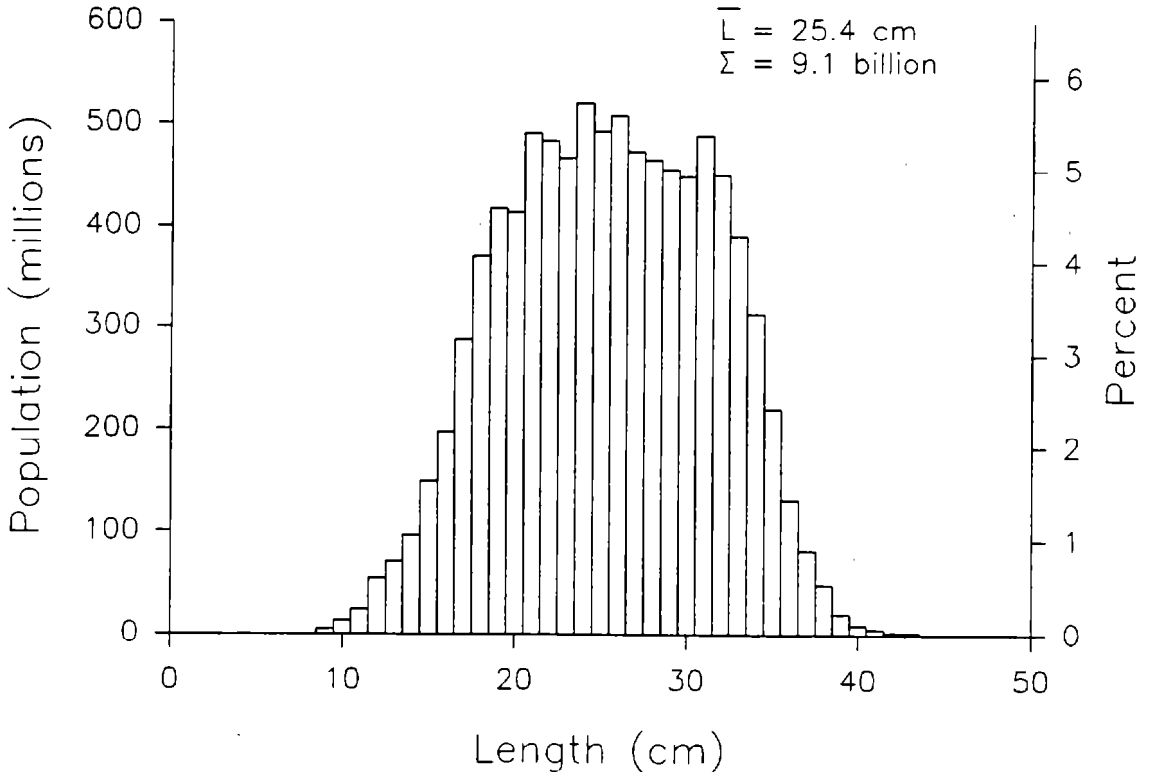

Figure 21.--Estimated size composition of yellowfin sole (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

Table 18.--Estimated population numbers (millions of fish) of yellowfin sole by age group and subarea, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Depth and subarea: 100-200 m, 6	100-200 m, 5	50-100 m, 4	50-100 m, 3	<50 m, 2	<50 m, 1	All subareas combined	Proportion of total
3	1987	0.00	0.00	0.00	0.00	1.32	9.37	10.69	0.001
4	1986	0.00	0.00	0.00	0.26	31.87	84.42	116.55	0.013
5	1985	0.00	0.00	1.63	4.95	79.93	134.35	220.86	0.024
6	1984	<.01	0.01	18.55	36.37	221.64	361.15	637.72	0.070
7	1983	0.02	0.00	126.90	240.86	646.21	933.62	1,947.61	0.215
8	1982	0.01	0.01	37.61	66.22	111.50	171.30	386.65	0.043
9	1981	0.08	0.11	358.13	684.39	474.14	884.55	2,401.38	0.265
10	1980	0.02	0.05	106.78	232.37	120.12	267.34	726.59	0.080
11	1979	0.01	0.09	95.83	277.09	85.00	288.65	746.66	0.082
12	1978	<.01	0.03	15.27	51.75	13.80	60.83	141.69	0.016
13	1977	0.00	0.02	9.06	48.64	12.58	67.38	137.66	0.015
14	1976	<.01	0.02	14.60	59.58	20.16	80.59	174.94	0.019
15	1975	0.00	0.02	8.99	39.31	10.12	44.01	102.45	0.011
16	1974	0.00	0.10	29.70	109.73	32.94	113.74	286.22	0.032
17	1973	0.00	0.07	14.75	70.07	22.12	93.26	200.28	0.022
18	1972	0.00	0.02	5.72	45.32	13.31	80.24	144.61	0.016
19	1971	0.00	0.07	8.90	41.25	15.39	63.55	129.15	0.014
20	1970	<.01	0.06	17.57	54.09	22.39	67.39	161.50	0.018
21	1969	0.00	0.06	13.32	54.75	22.64	74.47	165.24	0.018
22	1968	0.00	0.05	4.14	12.05	6.97	12.99	36.20	0.004
23	1967	0.00	0.11	9.19	36.17	17.36	52.62	115.45	0.013
24	1966	0.00	0.00	0.62	2.49	1.96	5.39	10.45	0.001
25	1965	0.00	0.05	0.83	4.19	3.83	9.01	17.91	0.002
>25		0.00	0.03	1.41	6.07	4.14	11.38	23.03	0.003
Age unknown		0.00	0.00	0.00	0.03	5.86	12.61	18.50	0.002
All ages combined*		0.15	0.96	899.51	2,177.91	1,997.28	3,984.18	9,059.99	1.000

*Differences in sums of estimates and totals are due to rounding.

Table lg.--Estimated biomass (metric tons) of yellowfin sole by age group, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Biomass (t)	Proportion of total
3	1987	209	0.0001
4	1986	3,549	0.0016
5	1985	12,216	0.0056
6	1984	53,372	0.0244
7	1983	237,340	0.1087
8	1982	58,580	0.0268
9	1981	522,945	0.2395
10	1980	188,547	0.0863
11	1979	253,990	0.1163
12	1978	63,435	0.0290
13	1977	59,122	0.0271
14	1976	73,870	0.0338
15	1975	46,370	0.0212
16	1974	132,393	0.0606
17	1973	89,957	0.0412
18	1972	61,049	0.0280
19	1971	60,455	0.0277
20	1970	76,427	0.0350
21	1969	80,858	0.0370
22	1968	21,003	0.0096
23	1967	59,322	0.0272
24	1966	6,106	0.0028
25	1965	9,871	0.0045
26	1964	6,208	0.0028
>26		6,266	0.0029
Age unknown		316	0.0001
All ages combined[1]		2,183,777	1.0000

[1]Differences in totals are due to rounding.

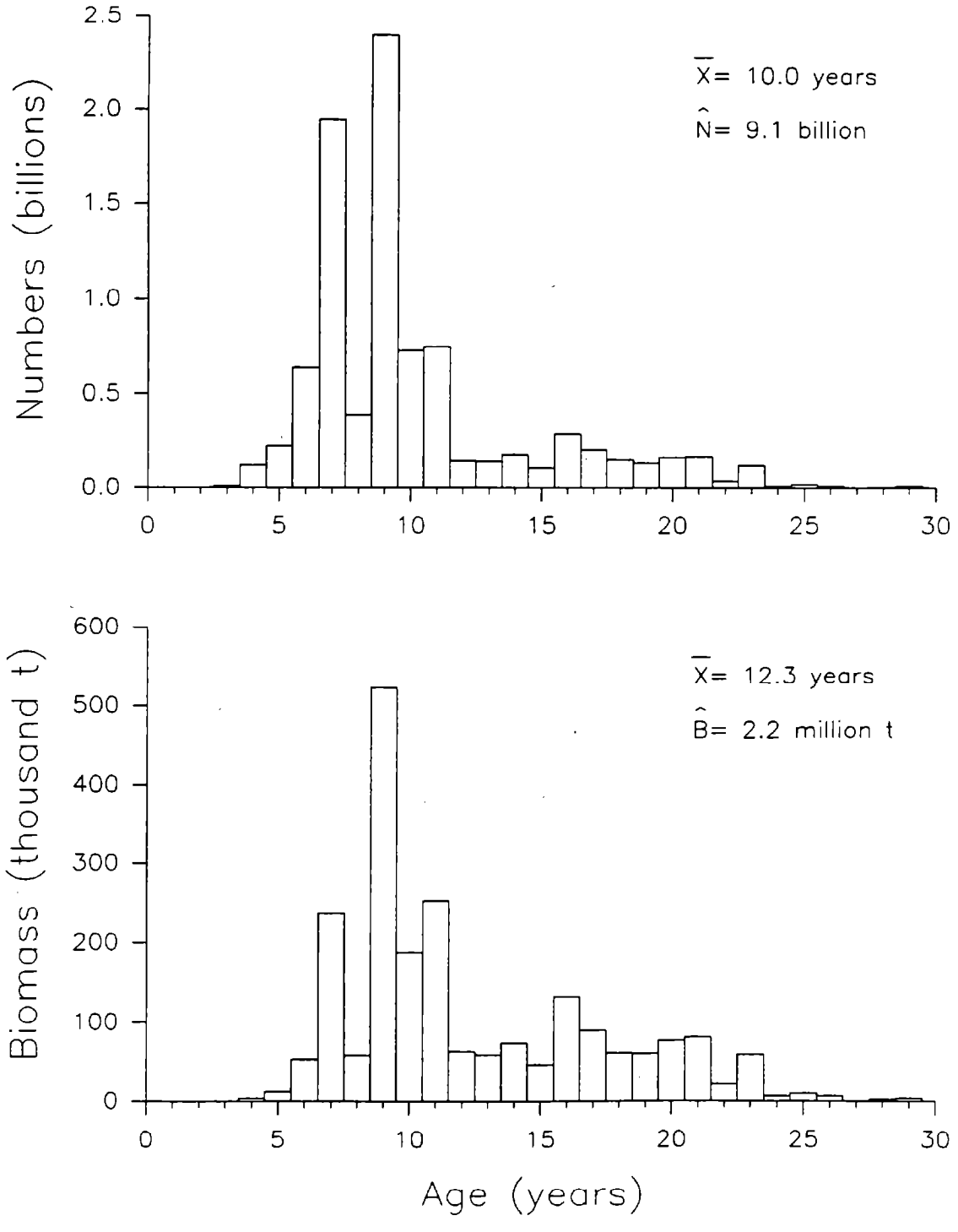

Figure 22. --Population number and biomass (metric tons) estimates by age for yellowfin sole, 1990 eastern Bering Sea bottom trawl survey.

Table 20. --Von Bertalanffy growth parameter estimates for yellowfin sole by sex, based on otolith age readings and length data from the 1990 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				L_{inf}	K	t_o
Male	357	3-29	11-39	34.4	0.17	1.64
Female	435	4-28	11-44	38.9	0.16	1.94

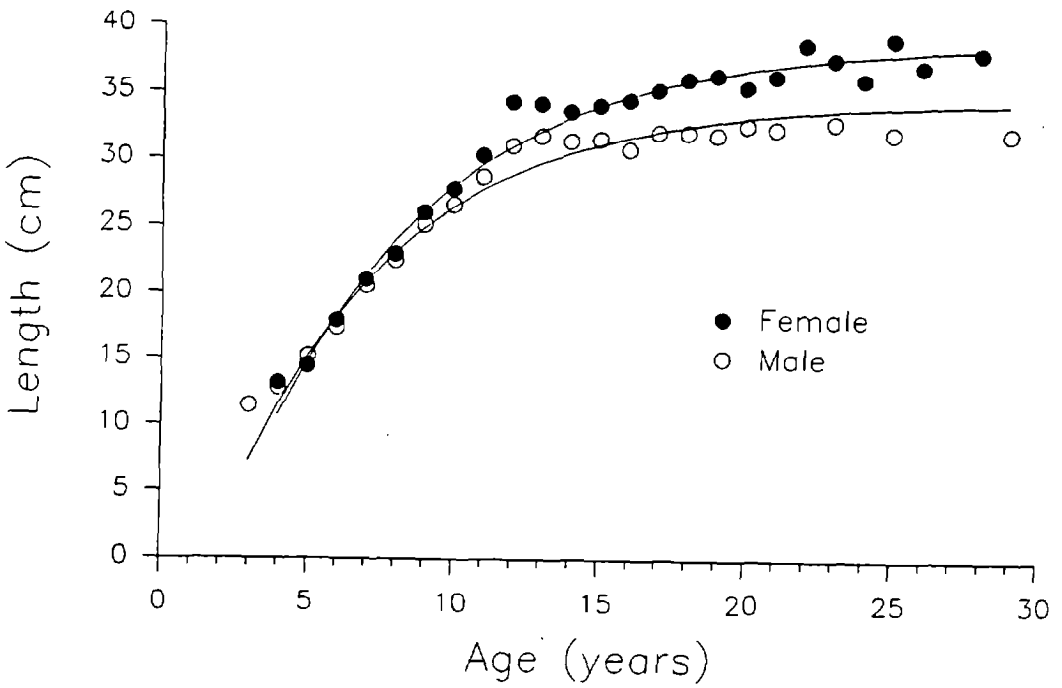

Figure 23.--Von Bertalanffy growth curves and mean lengths at age (symbols) for male and female yellowfin sole, 1990 eastern Bering Sea bottom trawl survey.

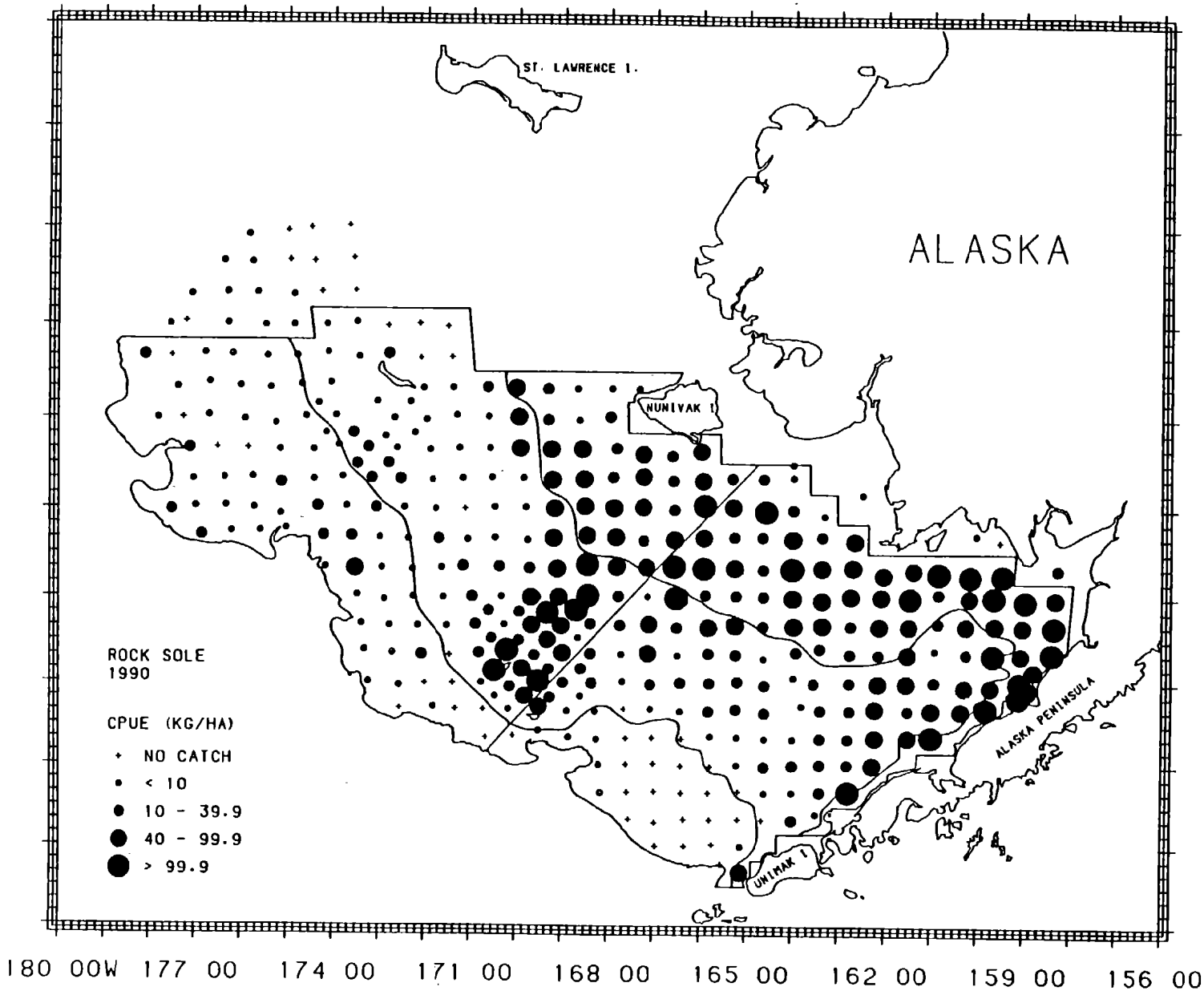

Figure 24.--Distribution and relative abundance in kg/ha of rock sole, 1990 eastern Bering Sea bottom trawl survey.

Table 21. --Abundance estimates and mean size of rock sole by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	79.53	619,275	0.440	5,859,090,863	0.554	0.106	18.2
2	46.50	190,773	0.135	1,574,987,566	0.149	0.121	17.5
3	24.69	255,074	0.181	1,892,988,308	0.179	0.135	20.5
4	26.69	287,730	0.204	1,126,613,922	0.107	0.255	25.5
5	0.59	2,271	0.002	5,272,267	< 0.001	0.431	32.9
6	5.70	53,863	0.038	115,669,665	0.011	0.466	32.3
All subareas combined[b]	30.41	1,408,988	1.000	10,574,622,592	1.000	0.133	19.5
95% confidence interval		± 178,693		± 1,663,697,057			

[a]Variances of abundance estimates are given in Appendix E.

differences in sues of estimates and totals are due to rounding.

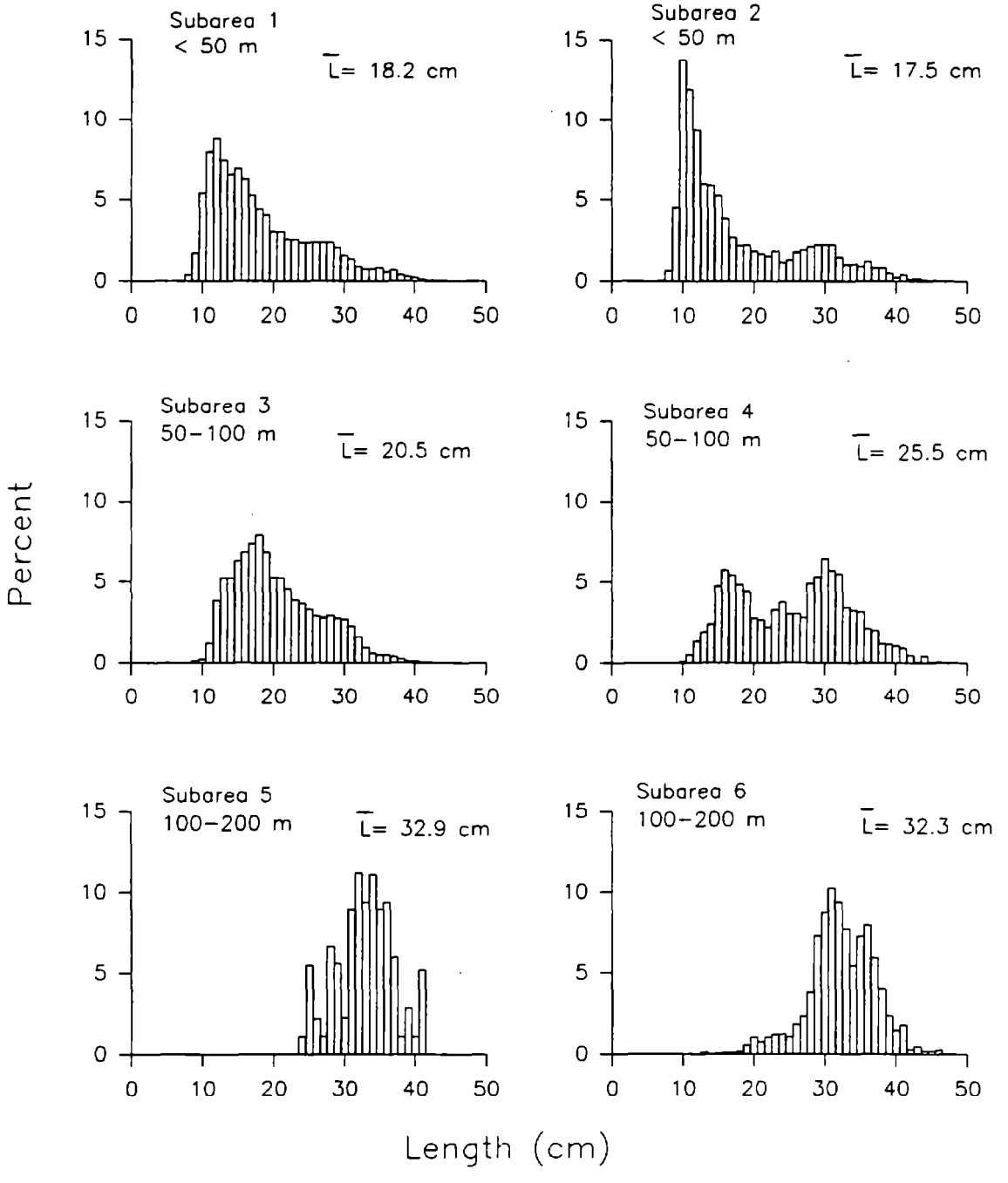

Figure 25. --Estimated relative size composition of rock sole (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

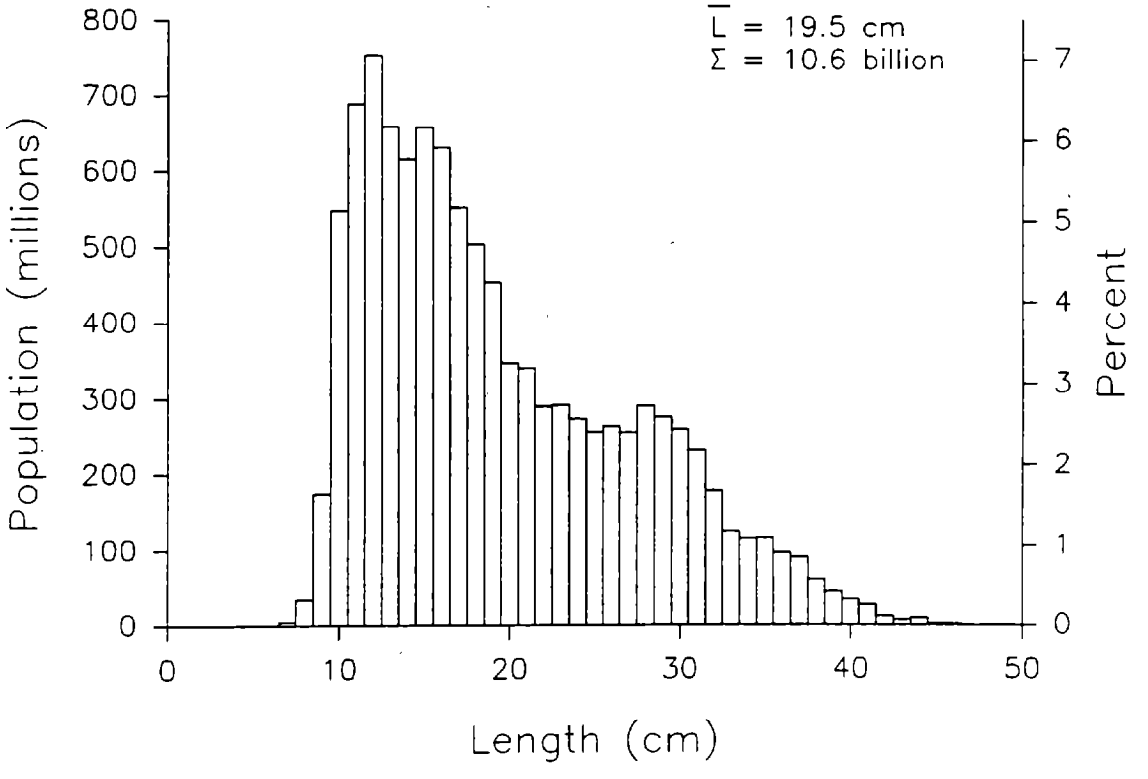

Figure 26. --Estimated size composition of rock sole (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

Table 22. --Estimated population numbers millions of fish) of rock sole by age group and 1990 eastern Bering sea bottom trawl survey.

Age	Year class	Depth and subarea: 100-200 m 6	100-200 m 5	50-100 m 4	50-100 m 3	<50 m 2	<50 m 1	All subareas combined	Proportion of total
2	1988	0.00	0.00	0.17	1.09	47.31	61.44	110.01	0.010
3	1987	0.08	0.00	27.74	119.78	558.76	1,326.42	2,032.78	0.192
4	1986	0.91	0.00	223.07	622.46	406.26	1,970.16	3,222.88	0.305
5	1985	3.64	0.07	172.97	460.02	142.05	921.38	1,700.14	0.161
6	1984	6.01	0.26	111.09	231.78	82.11	489.05	920.30	0.087
7	1983	22.65	1.01	195.29	245.31	128.14	531.08	1,123.49	0.106
8	1982	13.79	0.64	77.94	49.12	44.66	147.44	333.59	0.032
9	1981	24.51	1.24	124.35	69.32	62.92	173.47	455.79	0.043
10	1980	19.86	0.80	82.11	48.83	45.37	114.32	311.28	0.029
11	1979	9.11	0.40	36.22	16.64	20.92	47.10	130.39	0.012
12	1978	3.67	0.24	18.99	6.62	8.36	19.05	56.93	0.005
13	1977	4.06	0.19	20.34	8.83	9.29	22.20	64.90	0.006
14	1976	1.56	0.10	5.94	2.42	2.47	5.23	17.71	0.002
15	1975	3.02	0.21	13.21	5.39	6.89	11.44	40.17	0.004
16	1974	0.09	0.00	0.07	0.09	0.38	0.45	1.10	<.001
17	1973	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
18	1972	0.42	0.03	3.05	0.25	1.56	2.31	7.63	0.001
19	1971	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
20	1970	1.33	0.05	7.15	3.80	4.26	8.66	25.25	0.002
21	1969	0.37	0.00	1.57	0.20	0.79	0.97	3.90	<.001
>21		0.51	0.04	3.38	0.55	1.49	2.92	8.89	0.001
Age unknown		0.07	0.00	1.94	0.49	1.00	4.01	7.50	0.001
All ages combined*		115.67	5.27	1,126.61	1,892.99	1,574.99	5,859.09	10,574.62	1.000

*Differences in sums of estimates and totals are due to rounding.

Table 23. --Estimated biomass (metric tons) of rock sole by age grop, 1990 eastern Bering Sea bottom trawl survey.

Age	Year class	Biomass (t)	Proportion of total
2	1988	910	0.0006
3	1987	30,748	0.0218
4	1986	129,753	0.0921
5	1985	146,959	0.1043
6	1984	143,763	0.1020
7	1983	279,346	0.1983
8	1982	120,738	0.0857
9	1981	194,102	0.1378
10	1980	144,816	0.1028
11	1979	73,390	0.0521
12	1978	34,673	0.0246
13	1977	36,741	0.0261
14	1976	10,600	0.0075
15	1975	25,797	0.0183
16	1974	1,123	0.0008
18	1972	7,682	0.0055
20	1970	13,837	0.0098
21	1969	4,244	0.0030
>21		7,746	0.0055
Age unknown		2,019	0.0014
All ages combined*		1,408,988	1.0000

*Differences in totals are due to rounding.

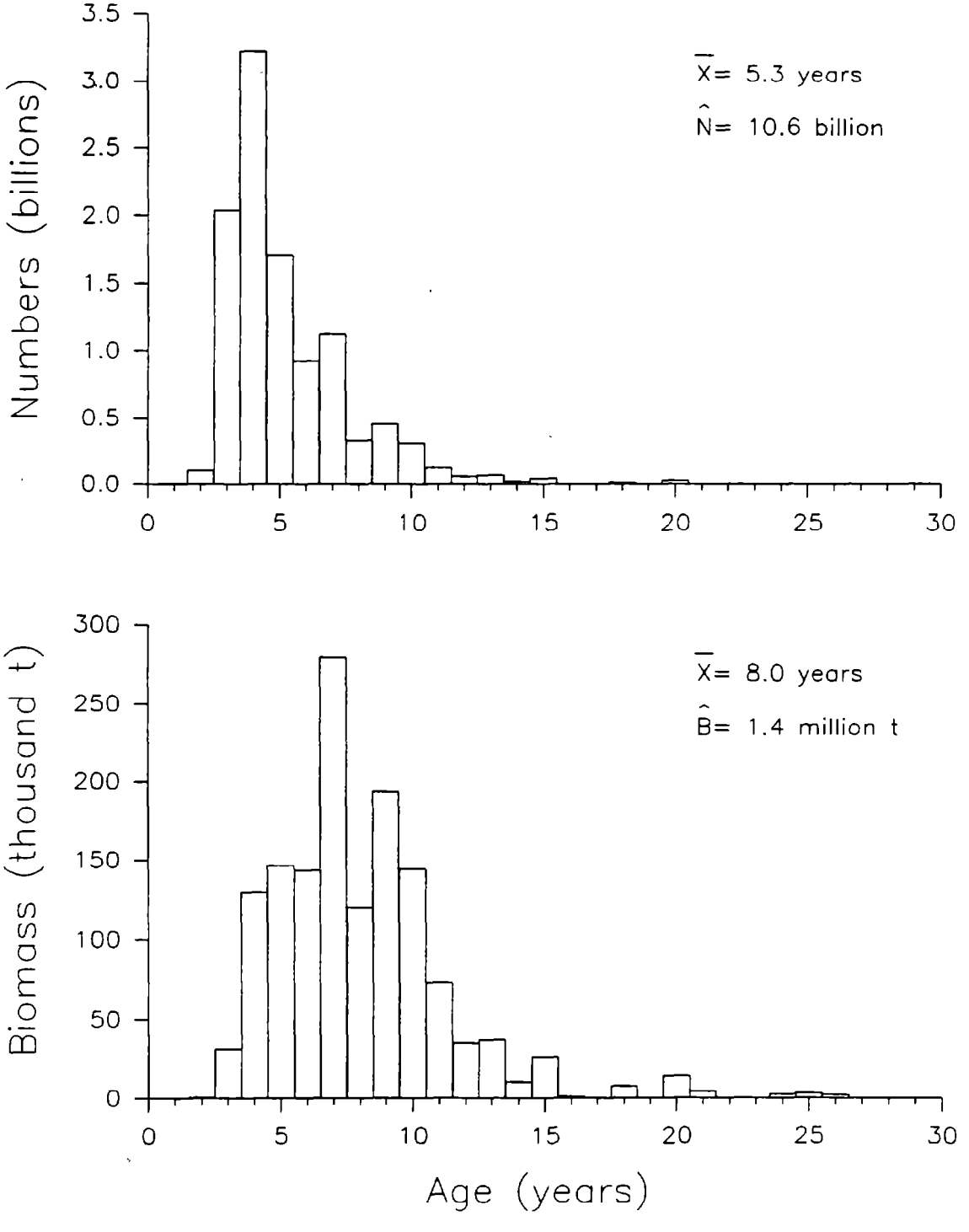

Figure 27. --Population number and biomass (metric tons) estimates by age for rock sole, 1990 eastern Bering Sea bottom trawl survey.

Table 24. --Von Bertalanffy growth parameter estimates for rock sole by sex, based on otolith age readings and length data from the 1990 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				L_{inf}	K	t_o
Male	260	2-21	8-38	36.1	0.24	1.56
Female	358	2-26	9-48	46.3	0.17	1.51

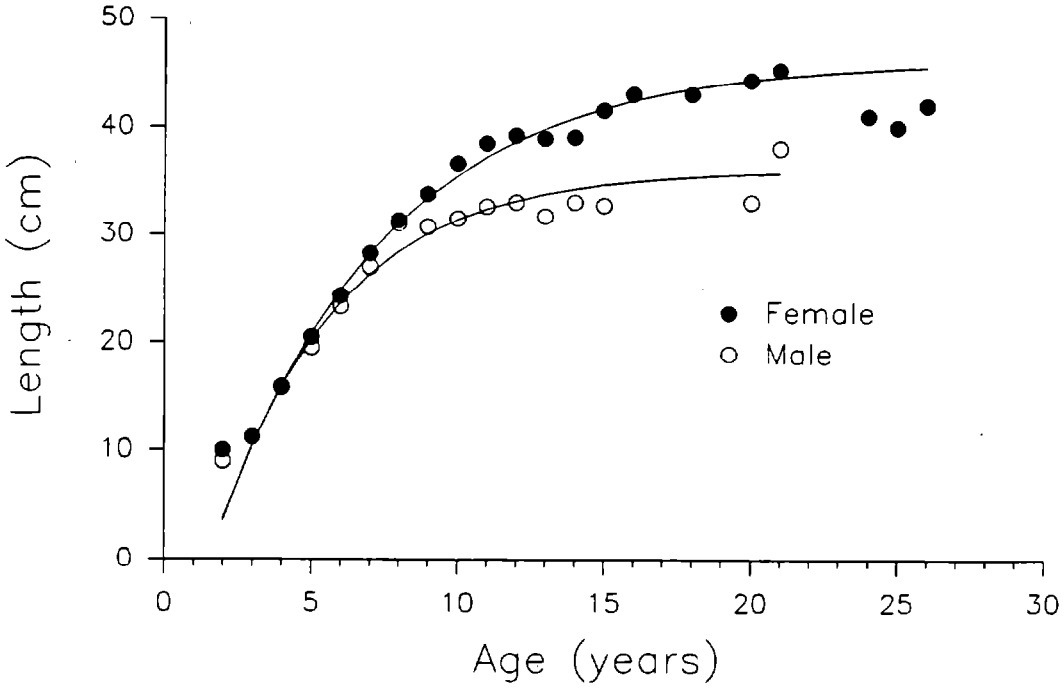

Figure 28.--Von Bertalanffy growth curves and mean lengths at age (symbols) for male and female rock sole, 1990 eastern Bering Sea bottom trawl survey.

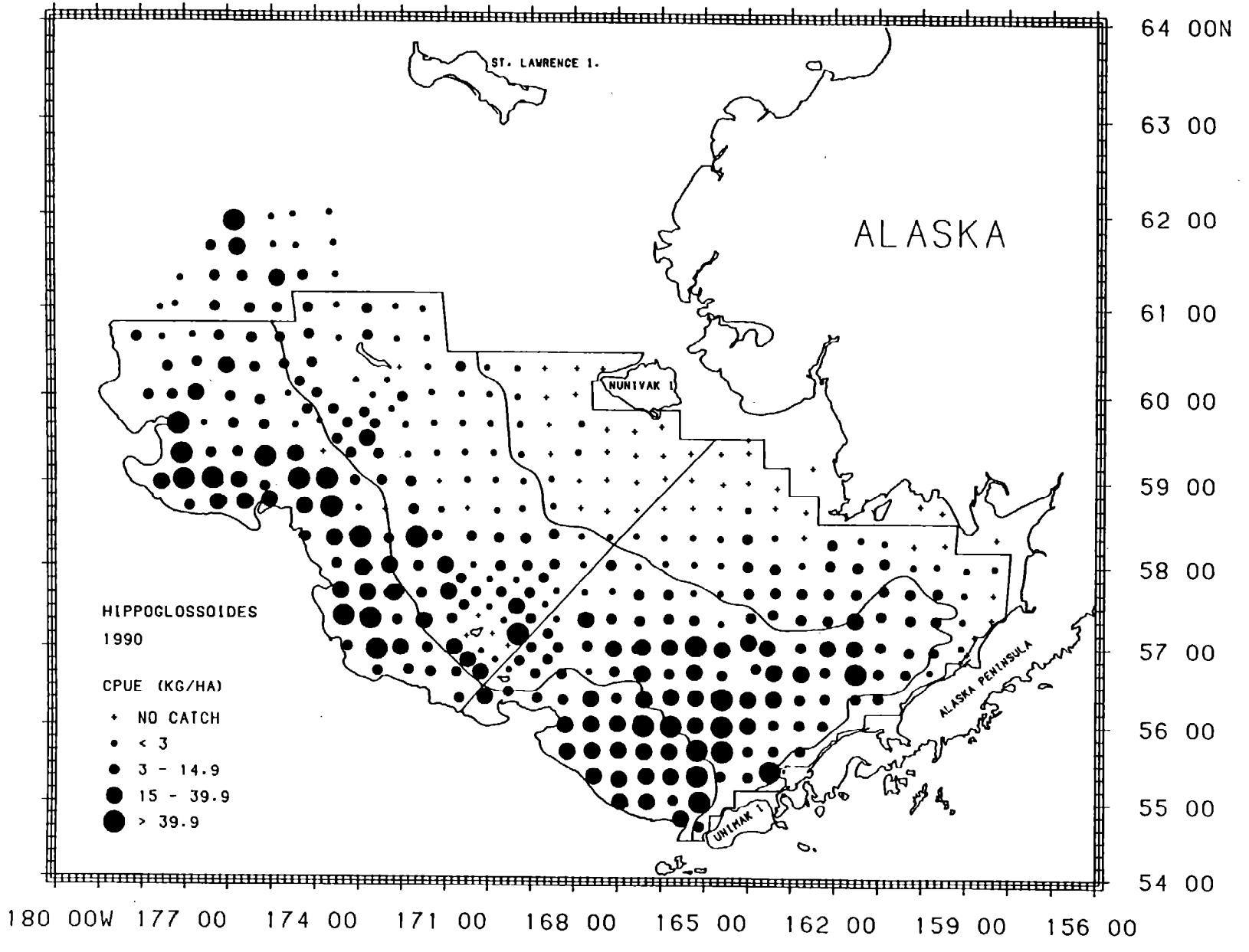

Figure 29.--Distribution and relative abundance in kg/ha of Hippoglossoides spp., 1990 eastern Bering Sea bottom trawl survey.

Table 25. --Abundance estimates and mean size of Hippoglossoides spp. by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	2.97	23,154	0.036	71,708,388	0.030	0.323	28.5
2	0.24	991	0.002	2,227,843	0.001	0.445	32.1
3	18.11	187,108	0.290	616,573,195	0.254	0.303	29.5
4	5.88	63,354	0.098	219,553,611	0.091	0.289	28.2
5	23.83	92,438	0.143	565,727,480	0.233	0.163	24.2
6	29.50	278,944	0.432	950,119,228	0.392	0.294	28.0
All subareas combined[b]	13.94	645,990	1.000	2,425,909,745	1.000	0.266	27.5
95% confidence interval		± 111,710		± 352,142,682			

[a]Variances of abundance estimates are given in Appendix E.

[b]differences in sum of estimates and totals are due to rounding.

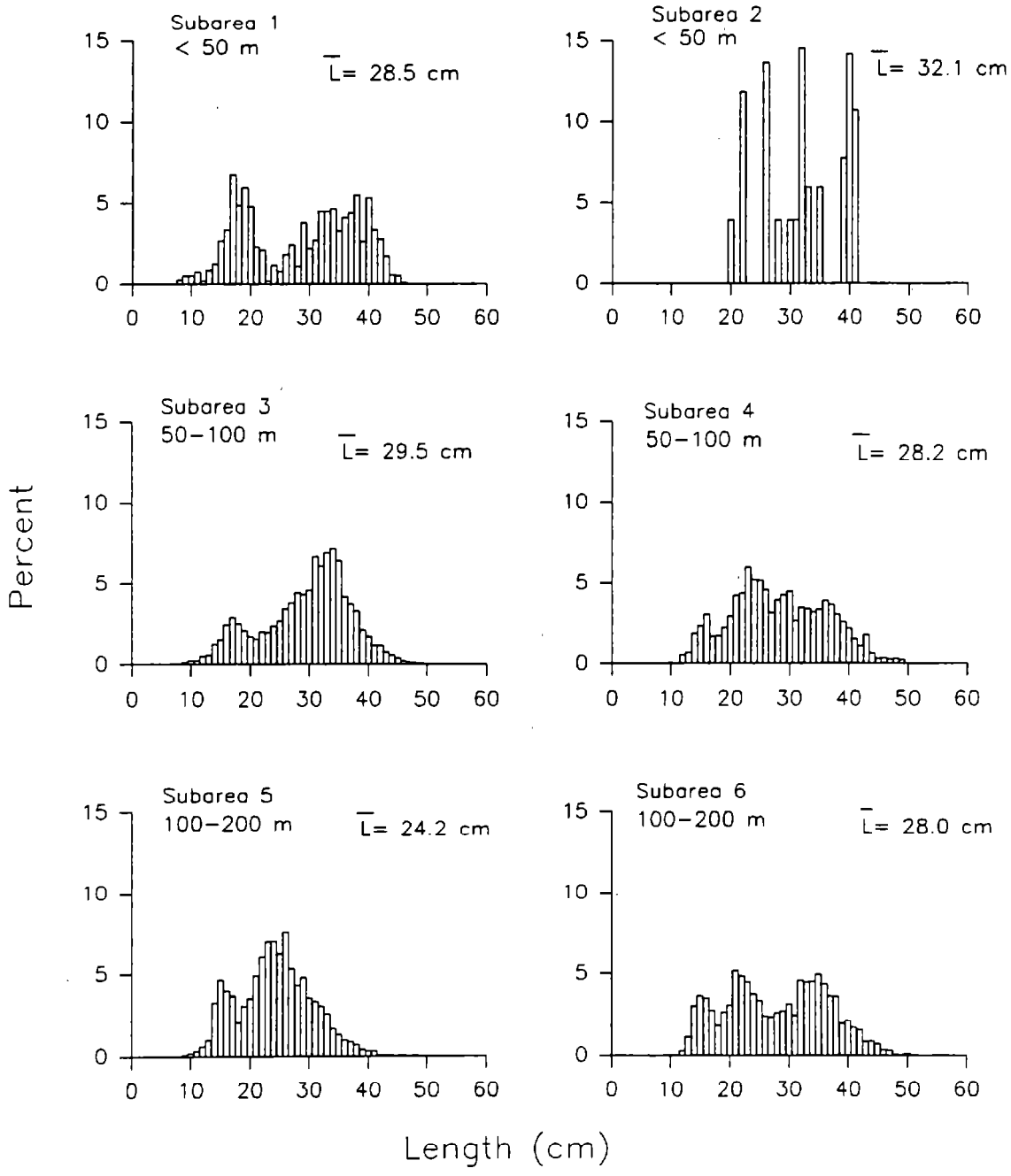

Figure 30. --Estimated relative size composition of Hippoglossoides Spp. (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

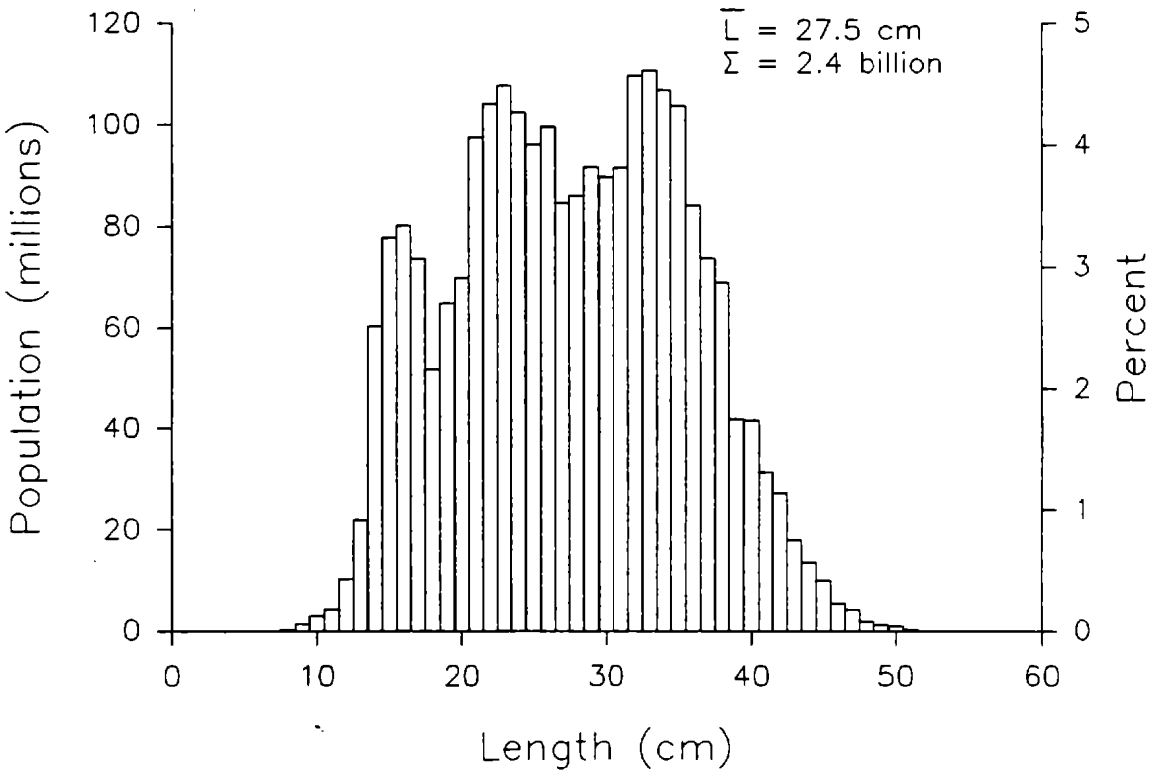

Figure 31.--Estimated size composition of Hippoglossoides spp. (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

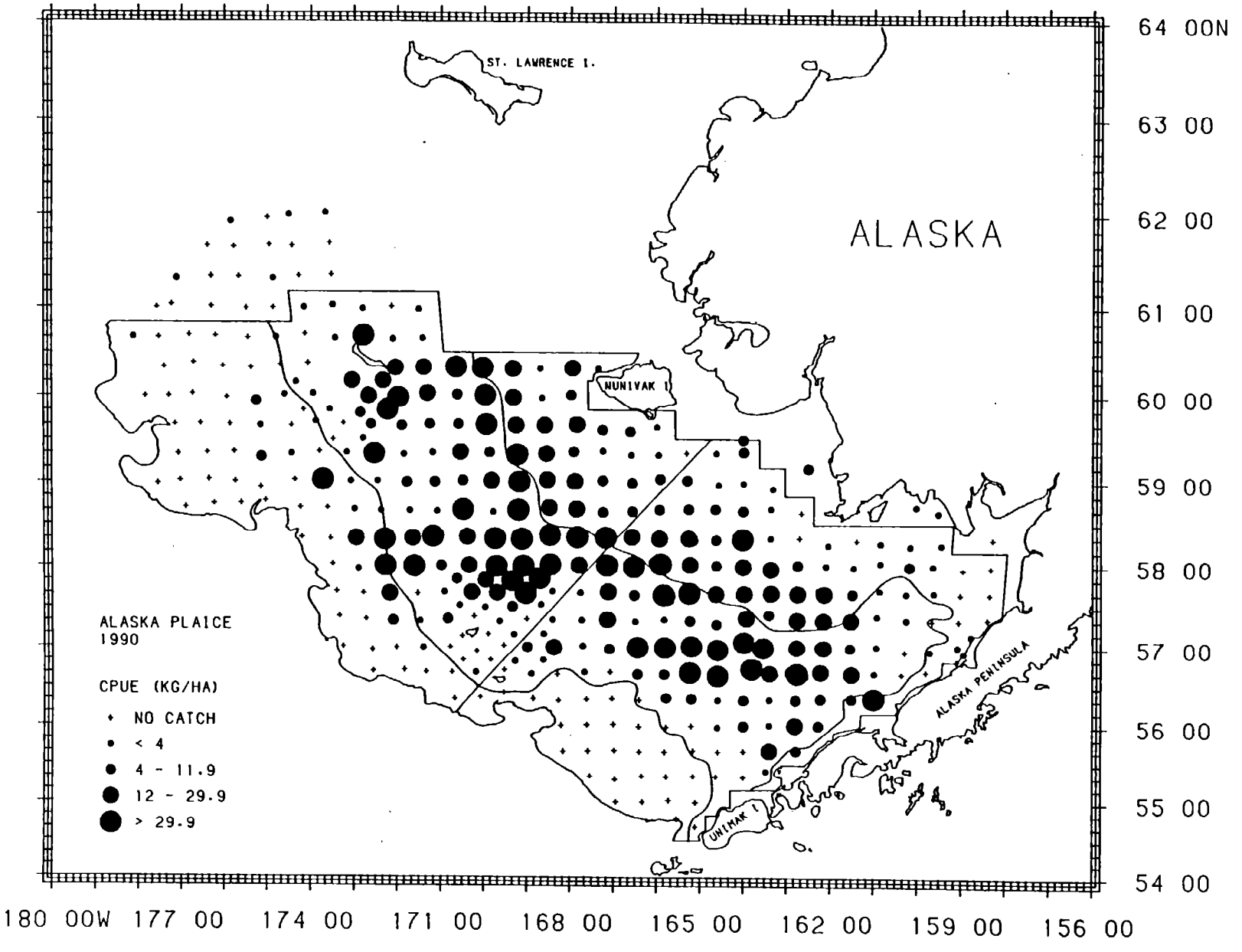

Figure 32.--Distribution and relative abundance in kg/ha of Alaska plaice, 1990 eastern Bering Sea bottom trawl survey.

Table 26. --Abundance estimates and mean size of Alaska plaice by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	9.20	71,609	0.136	157,693,212	0.212	0.454	31.0
2	13.63	55,939	0.106	116,389,397	0.156	0.481	31.3
3	13.44	138,885	0.264	180,050,945	0.242	0.771	38.0
4	21.52	231,990	0.441	274,973,855	0.370	0.844	38.5
5	0.00	0	0.000	0	0.000	0.000	0.0
6	2.89	27,344	0.052	15,040,715	0.020	1.818	48.8
All subareas combined[b]	11.35	525,767	1.000	744,148,125	1.000	0.707	35.9
95% confidence interval		± 99,872		± 134,335,659			

[a]Variances of abundance estimates are given in Appendix E.

[b]differences in sums of estimates and totals are due to rounding.

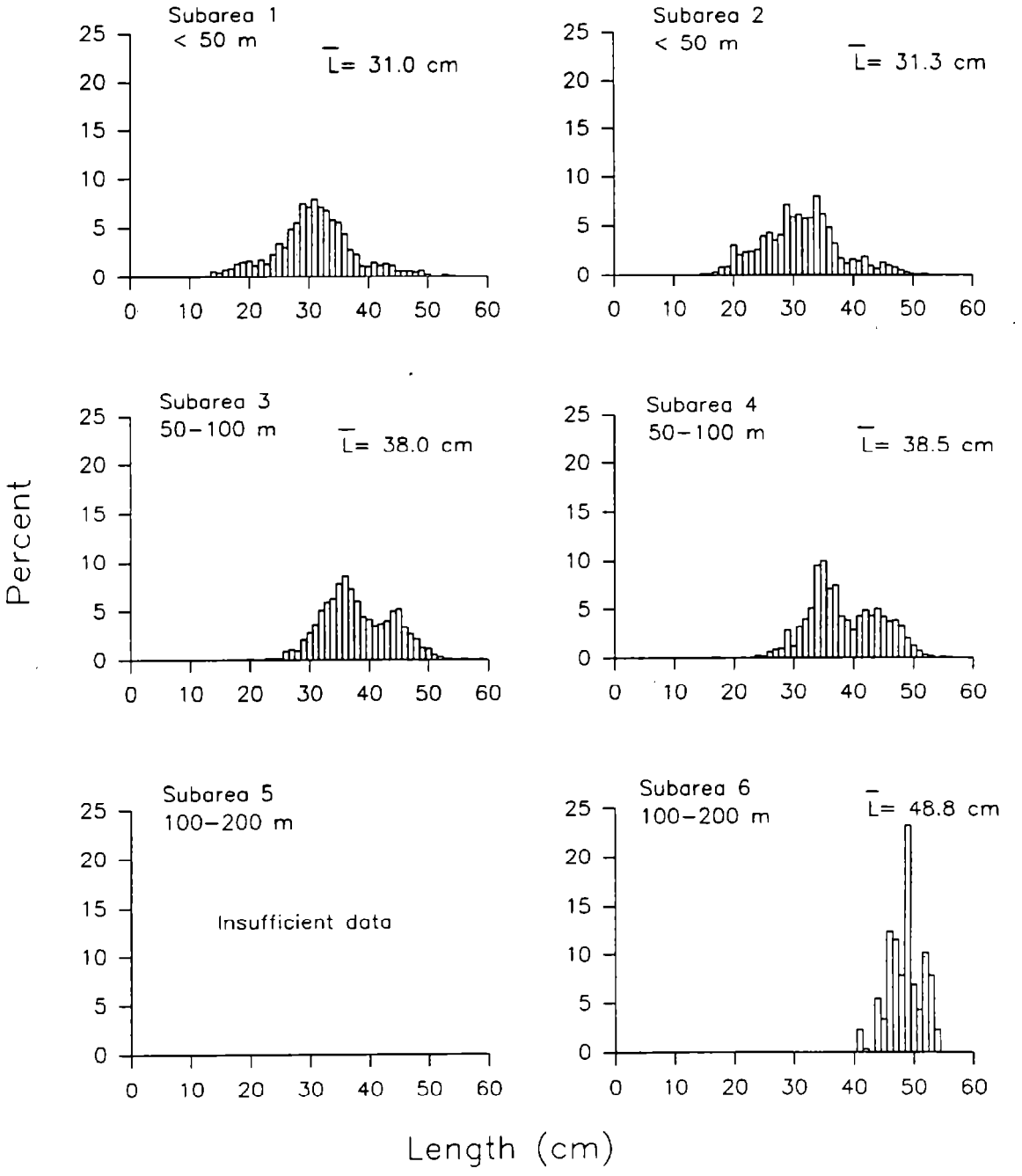

Figure 33. --Estimated relative size composition of Alaska plaice (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

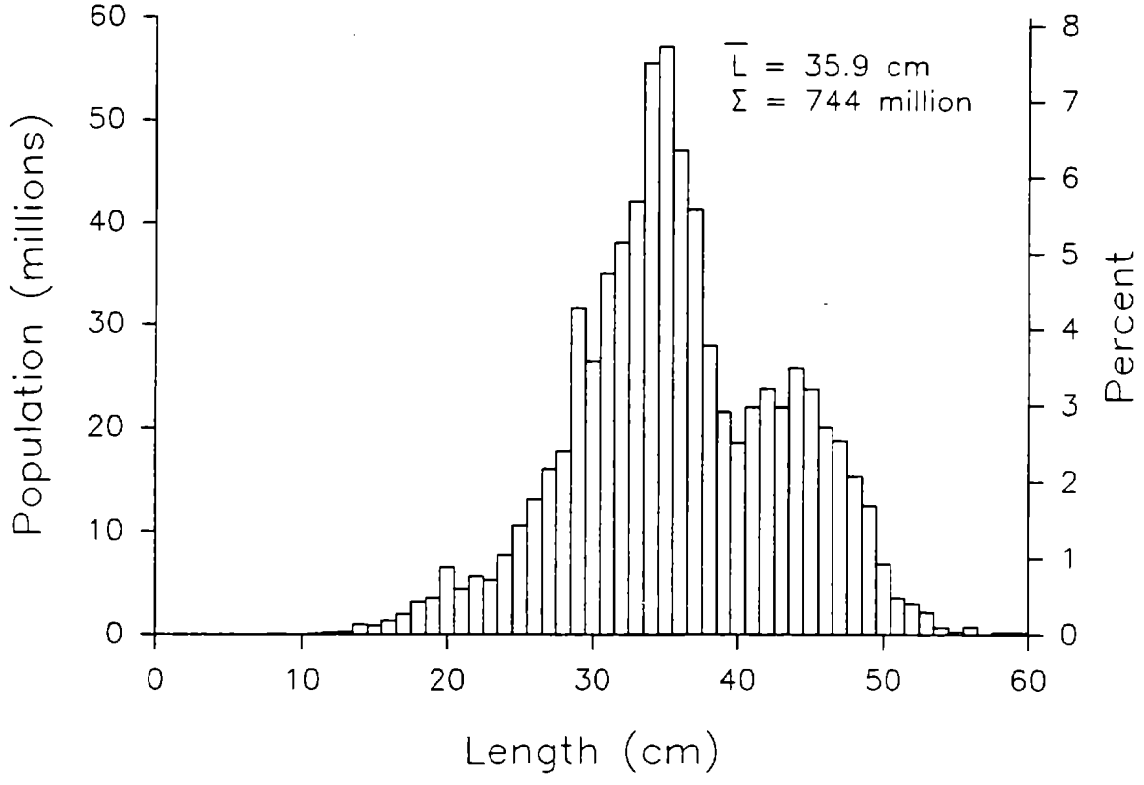

Figure 34.--Estimated size composition of Alaska plaice (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

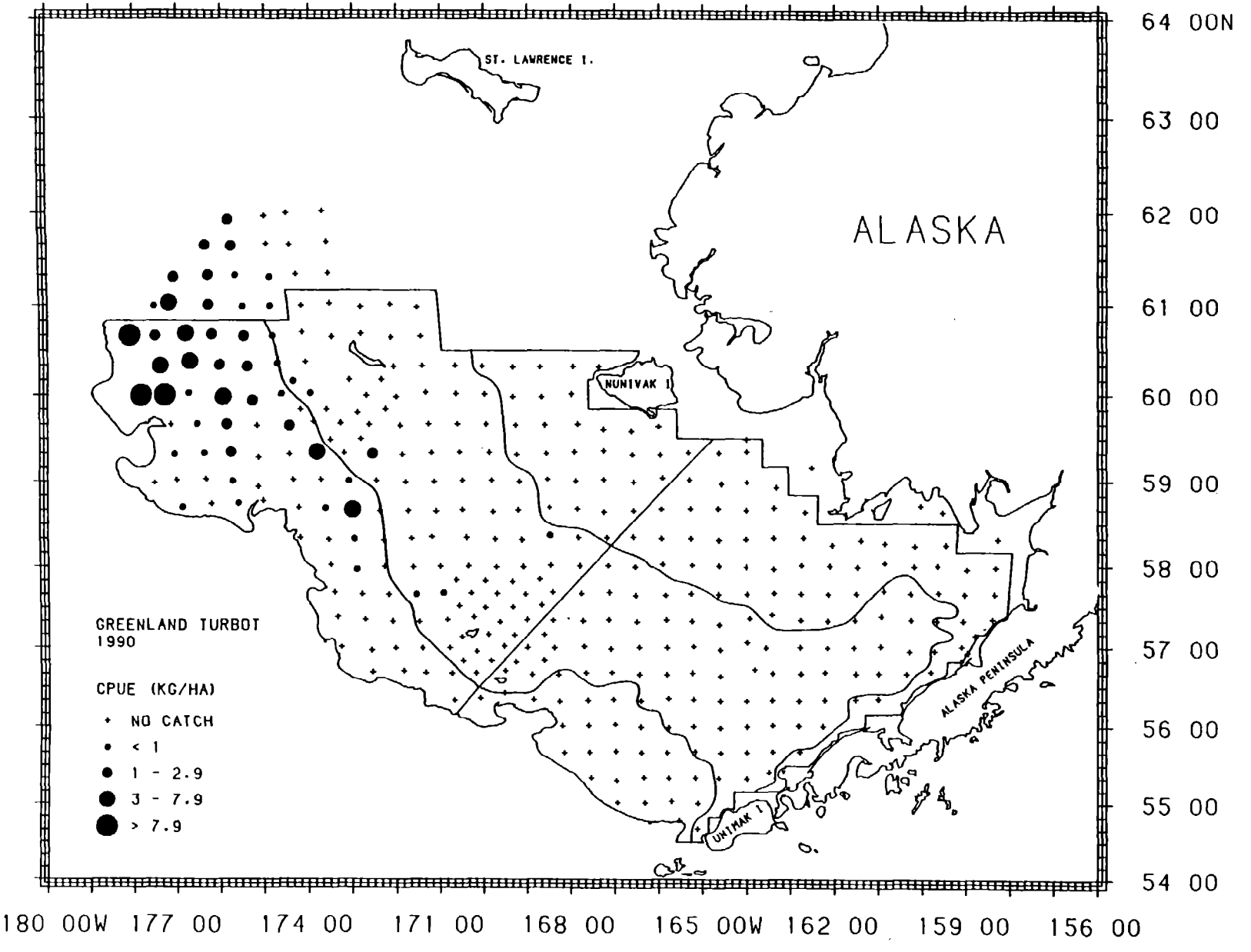

Figure 35. --Distribution and relative abundance in kg/ha of Greenland turbot, 1990 eastern Bering Sea bottom trawl survey.

Table 27. --Abundance estimates and mean size of Greenland turbot by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	0.00	0	0.000	0	0.000	0.000	0.0
2	0.00	0	0.000	0	0.000	0.000	0.0
3	0.00	0	0.000	0	0.000	0.000	0.0
4	0.05	498	0.035	3,751,606	0.213	0.133	16.2
5	0.00	0	0.000	0	0.000	0.000	0.0
6	1.44	13,596	0.965	13,883,838	0.787	0.979	35.4
All subareas combined[b]	0.30	14,093	1.000	17,635,444	1.000	0.799	31.3
95% confidence interval		± 8,637		± 6,304,701			

Variances of abundance estimates are given in Appendix E.

Differences in suns of estimates and totals are due to rounding.

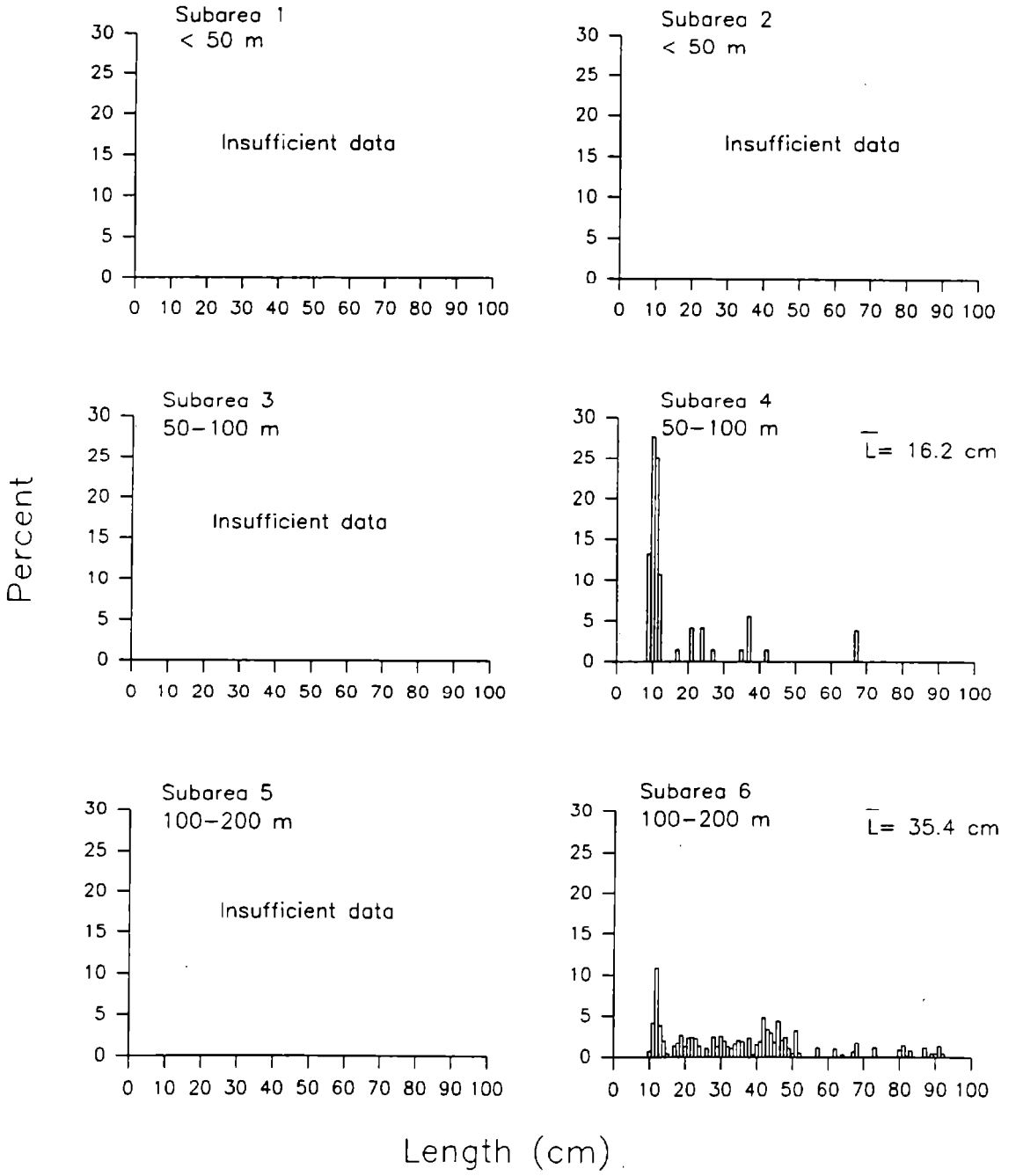

Figure 36.--Estimated relative size composition of Greenland turbot (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

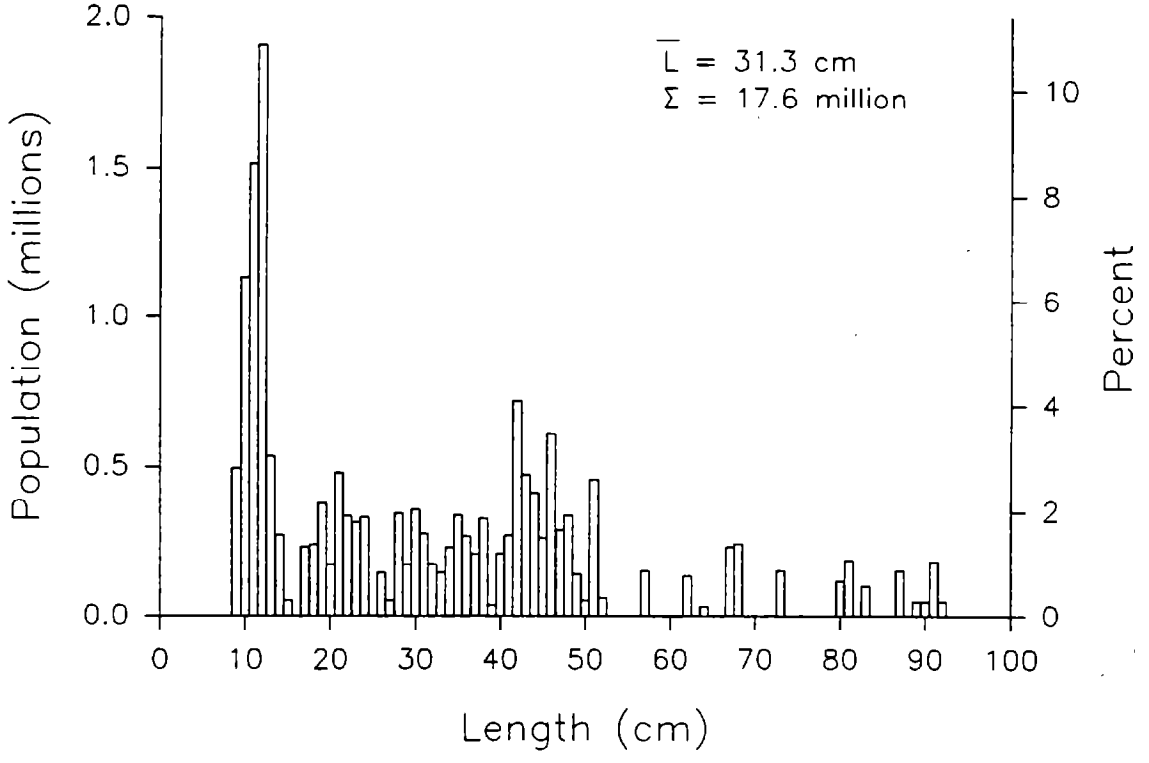

Figure 37. --Estimated size composition of Greenland turbot (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

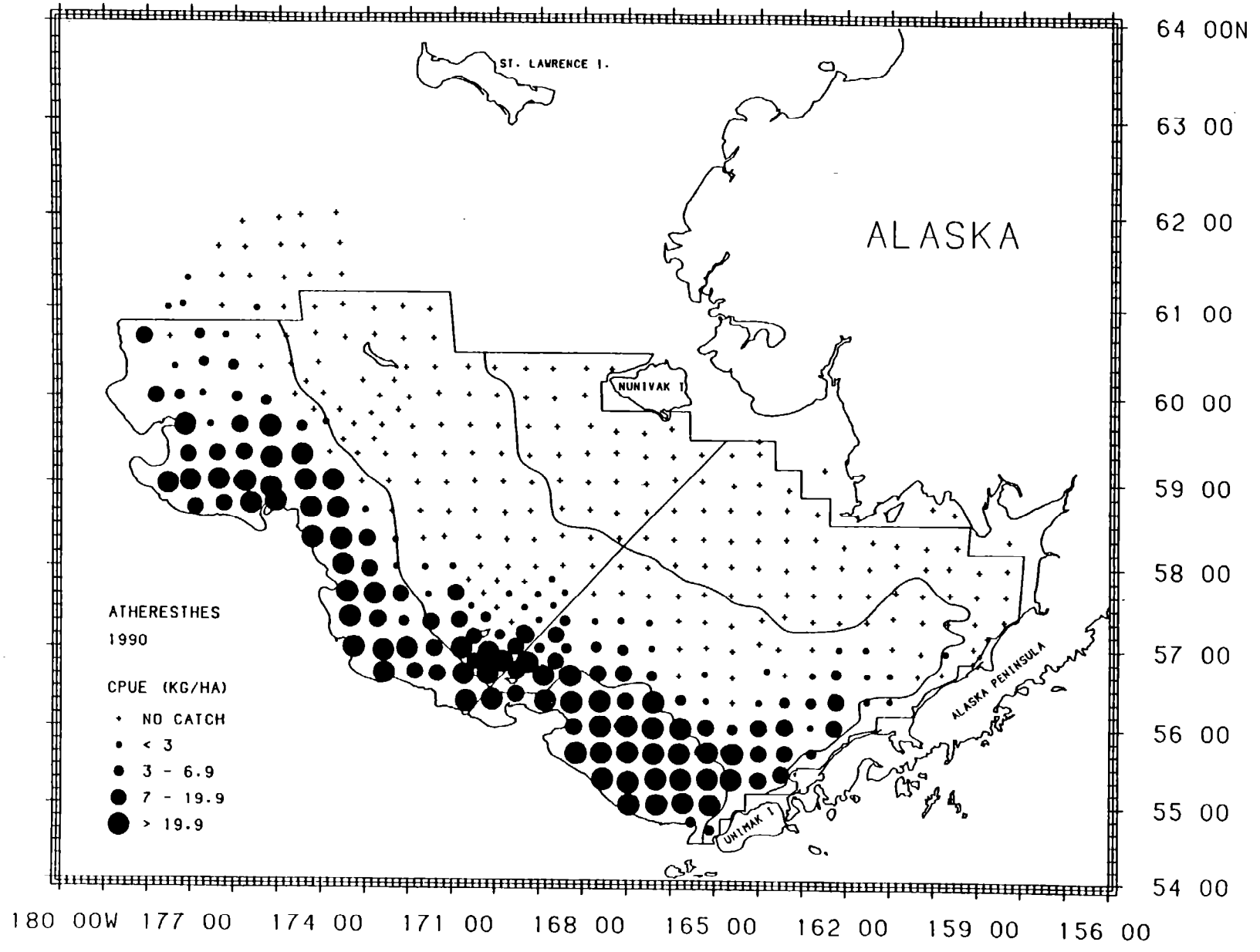

Figure 38.--Distribution and relative abundance in kg/ha of Atheresthes spp., 1990 eastern Bering Sea bottom trawl survey.

Table 28.--Abundance estimates and mean size of Atheresthes spp. by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	0.12	931	0.002	8,910,330	0.010	0.104	21.7
2	0.00	0	0.000	0	0.000	0.000	0.0
3	7.58	78,284	0.172	241,468,136	0.259	0.324	30.5
4	1.38	14,897	0.033	58,019,570	0.062	0.257	27.8
5	39.22	152,131	0.335	316,539,755	0.340	0.481	34.5
6	21.98	207,894	0.458	306,695,919	0.329	0.678	39.0
All subareas combined[b]	9.80	454,136	1.000	931,633,711	1.000	0.487	34.4
95% confidence interval		± 78,745		± 160,151,726			

Variances of abundance estimates are given in Appendix E.

Differences in suns of estimates and totals are due to rounding.

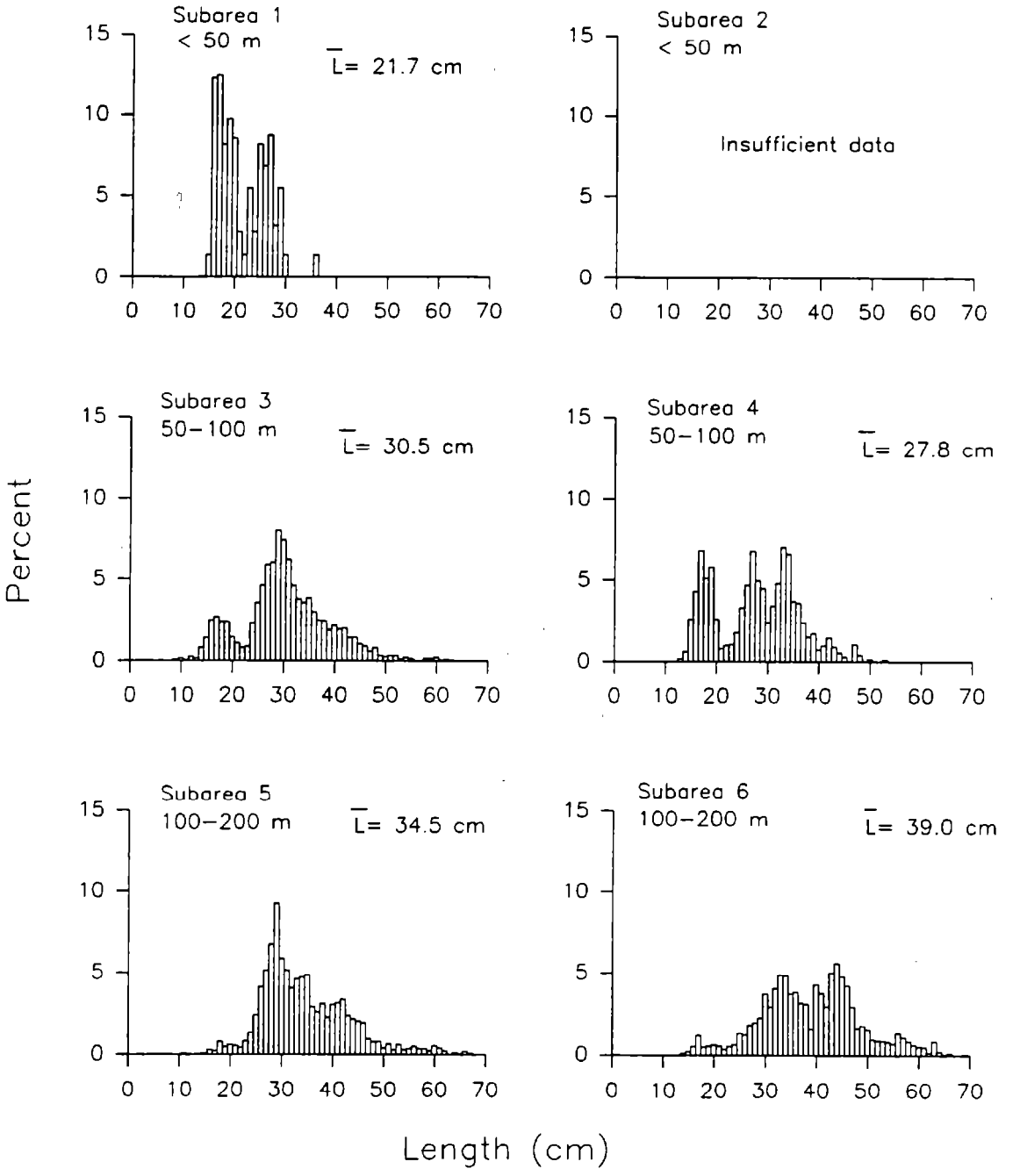

Figure 39.--Estimated relative size composition of Atheresthes spp. (sexes combined) by subarea, 1990 eastern Bering Sea bottom trawl survey.

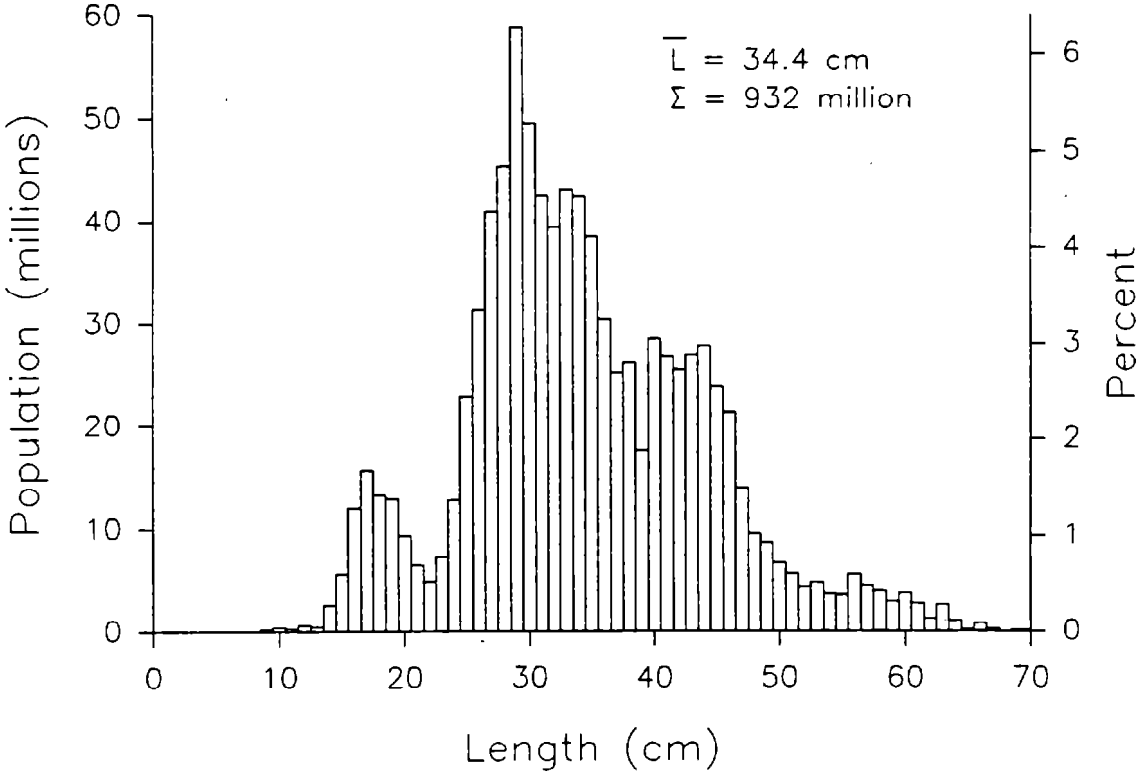

Figure 40. --Estimated size composition of Atheresthes spp. (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

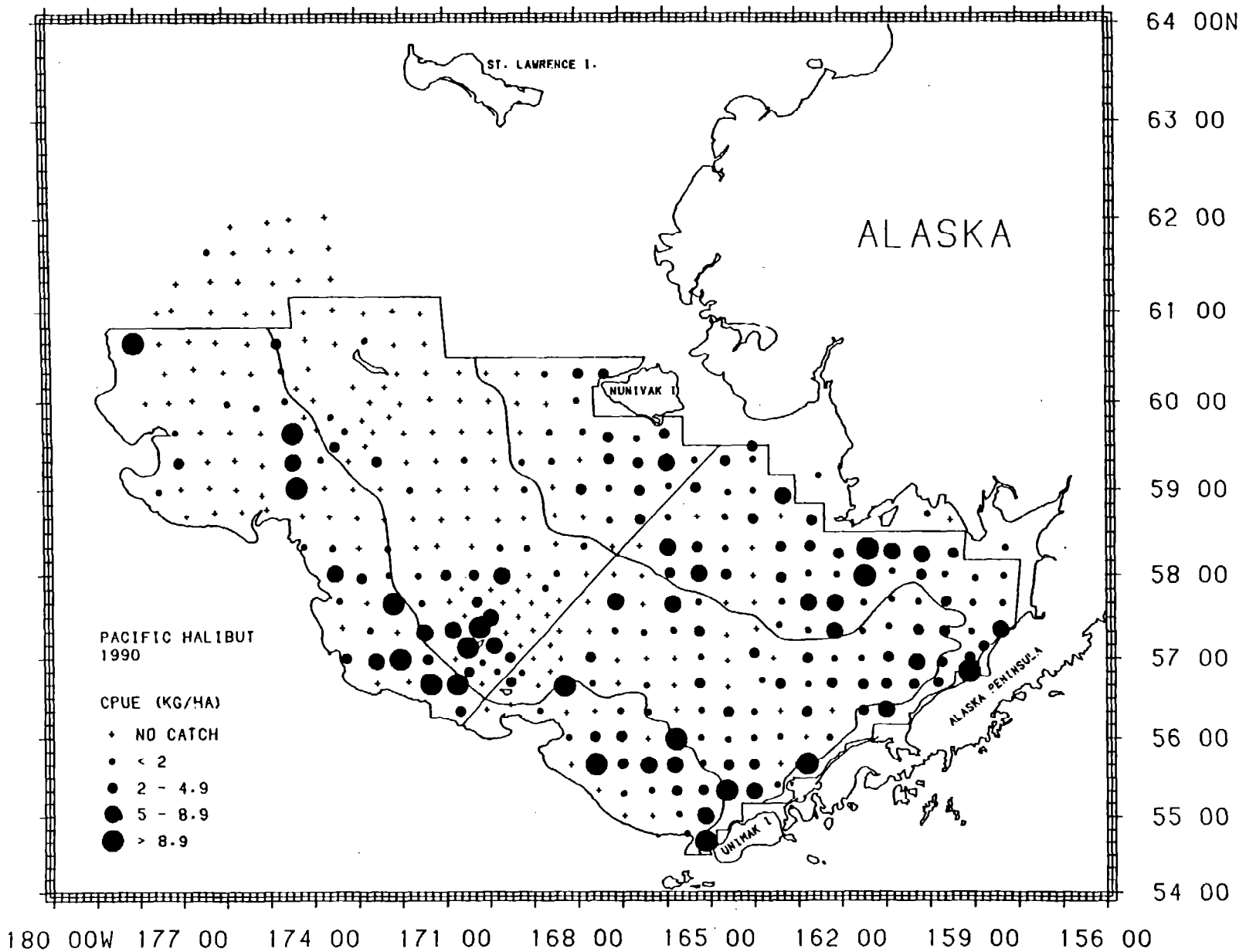

Figure 41. --Distribution and relative abundance in kg/ha of Pacific halibut, 1990 eastern Bering Sea bottom trawl survey.

Table 29. --Abundance estimates and mean size of Pacific halibut by subarea, 1990 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE[a] (kg/ha)	Estimated biomass[a] (t)	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	3.24	25,201	0.281	36,484,138	0.607	0.691	33.0
2	1.36	5,587	0.062	7,830,950	0.130	0.714	34.4
3	1.90	19,607	0.219	8,936,426	0.149	2.194	48.5
4	0.85	9,203	0.103	2,977,745	0.050	3.091	55.0
5	2.74	10,620	0.119	1,540,402	0.026	6.894	78.6
6	2.04	19,318	0.216	2,305,750	0.038	8.378	79.9
All subareas combined[b]	1.93	89,535	1.000	60,075,410	1.000	1.490	39.6
95% confidence interval		± 15,190		± 14,890,902			

[a]Variances of abundance estimates are given in Appendix E.

[b]differences in suns of estimates and totals are due to rounding.

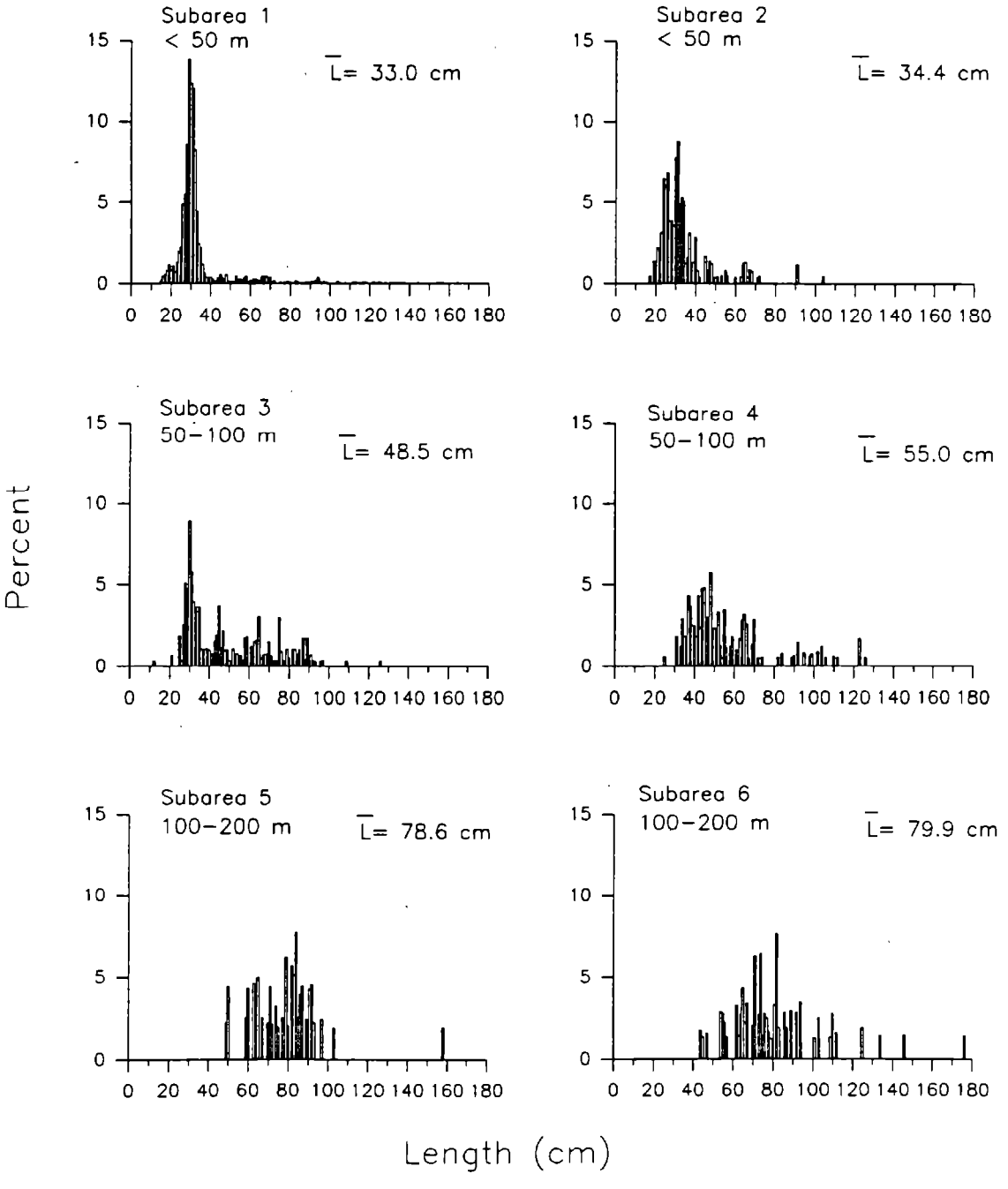

Figure 42. --Estimated relative size composition of Pacific halibut (sexes combined), by subarea, 1990 eastern Bering Sea bottom trawl survey.

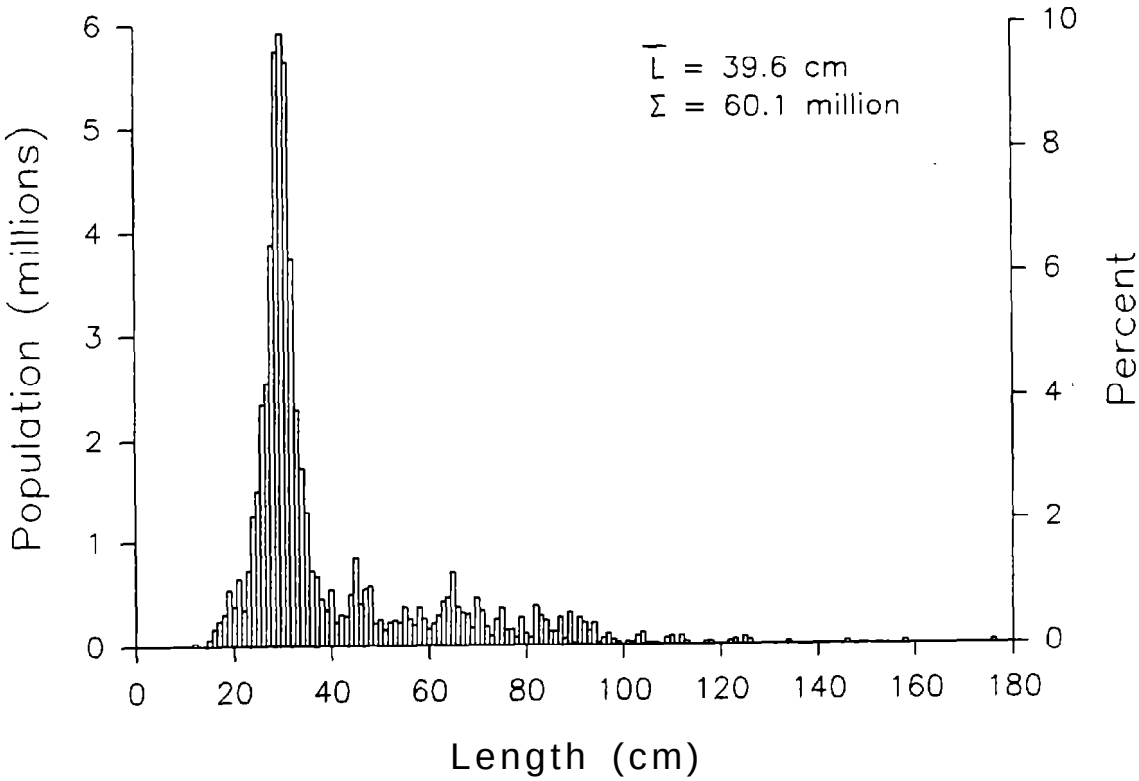

Figure 43. --Estimated size composition of Pacific halibut (sexes combined), all subareas combined, 1990 eastern Bering Sea bottom trawl survey.

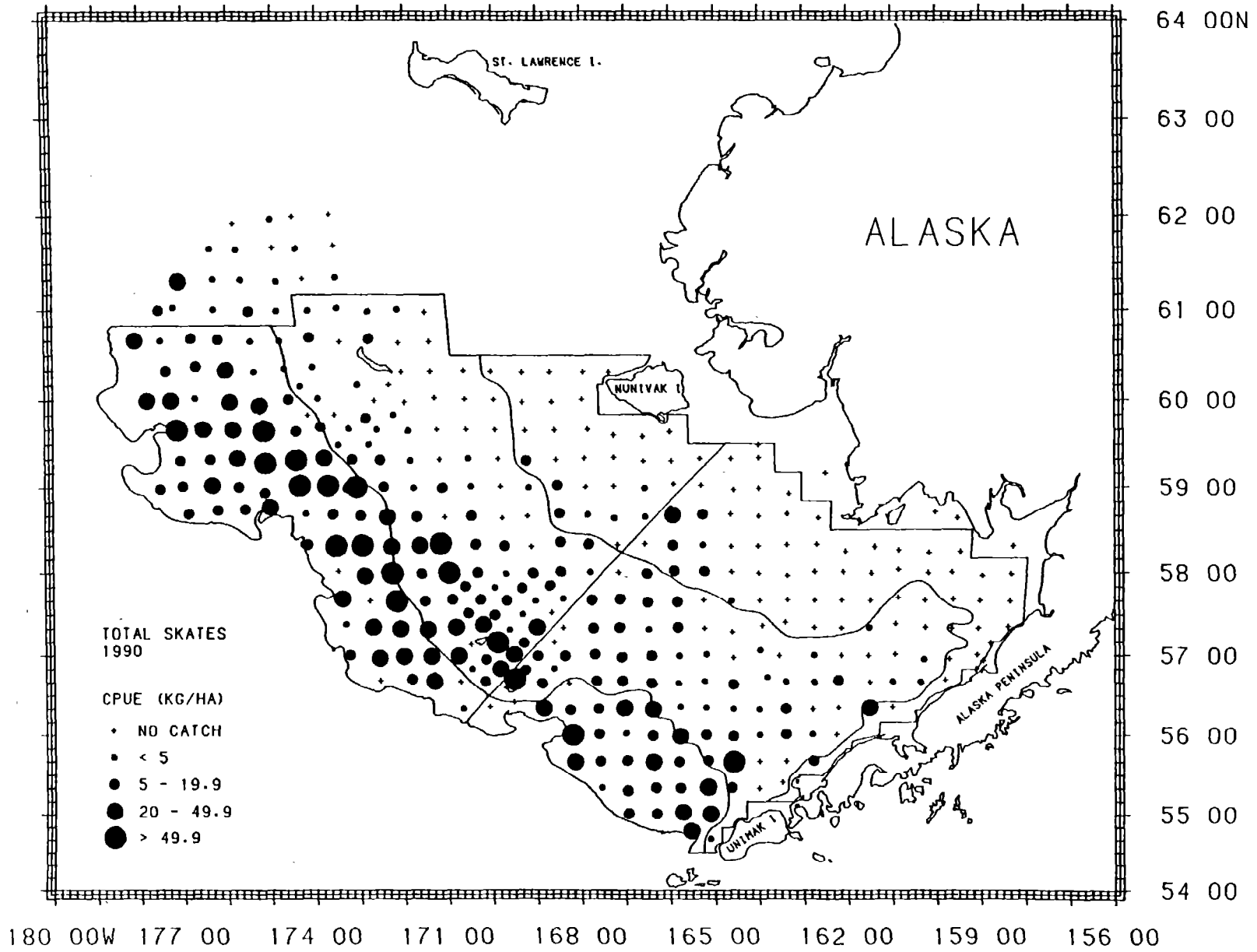

Figure 44. --Distribution and relative abundance in kg/ha of skates, 1990 eastern Bering Sea bottom trawl survey.

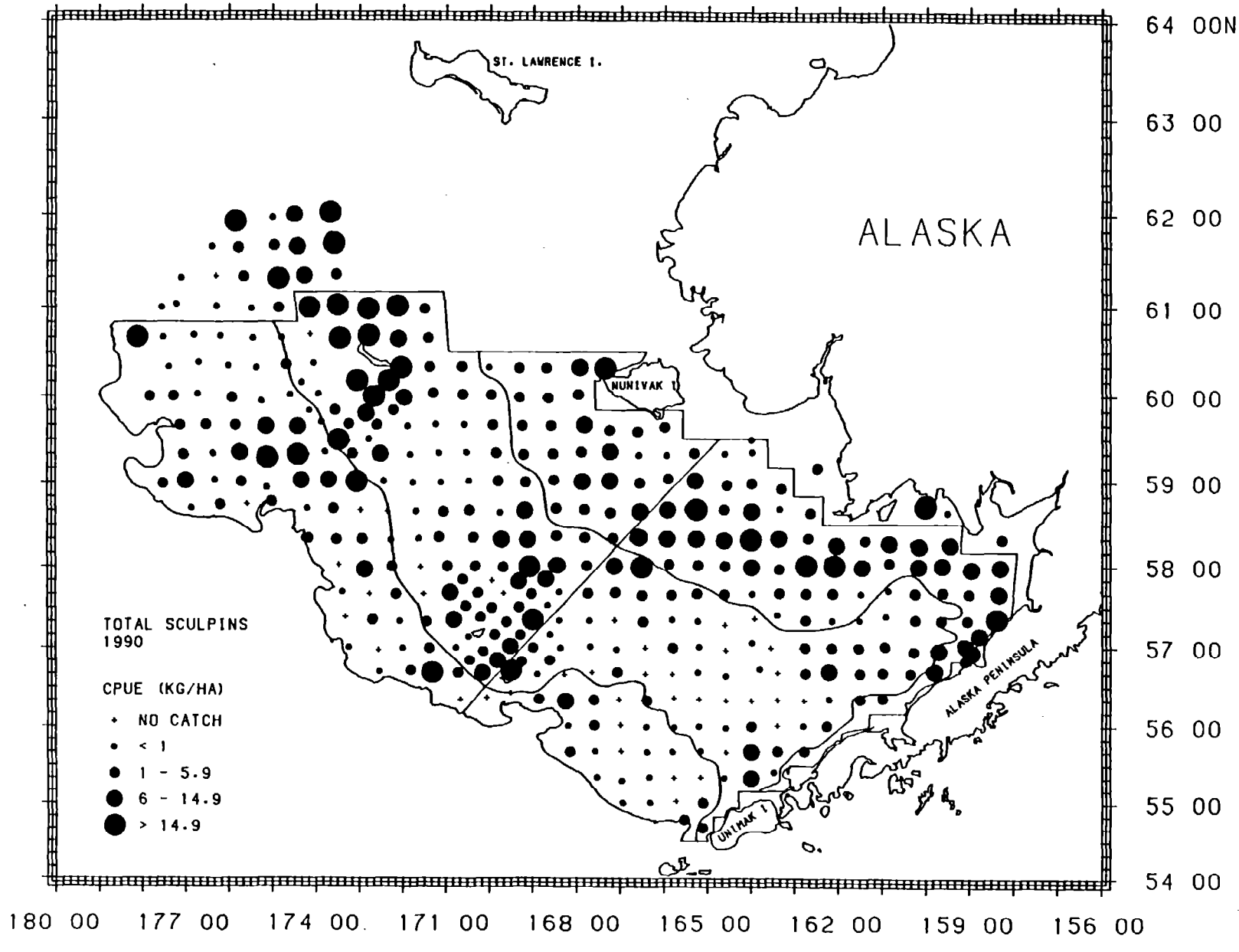

Figure 45. --Distribution and relative abundance in kg/ha of sculpins, 1990 eastern Bering Sea bottom trawl survey.

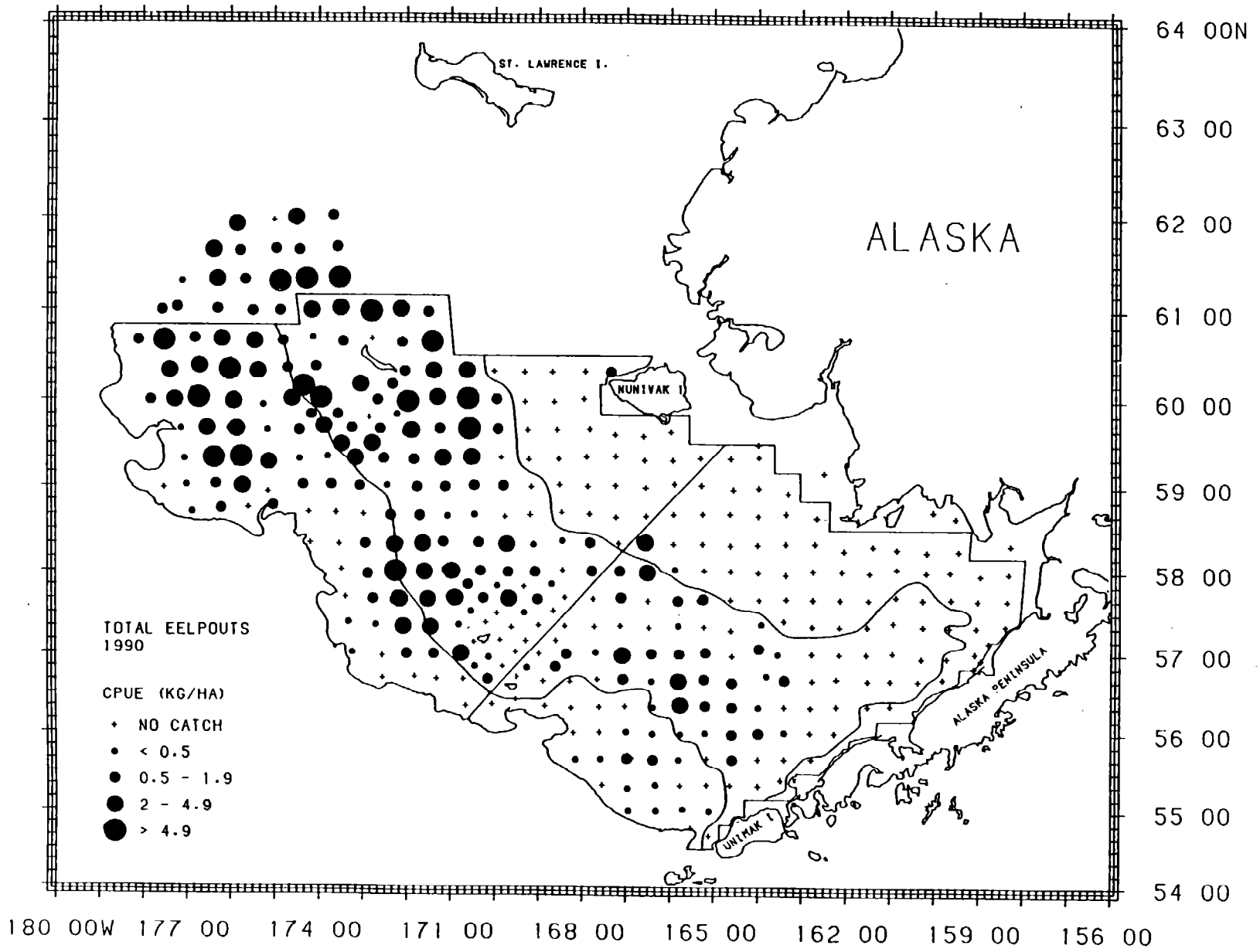

Figure 46.--Distribution and relative abundance in kg/ha of eelpouts, 1990 eastern Bering Sea bottom trawl survey.

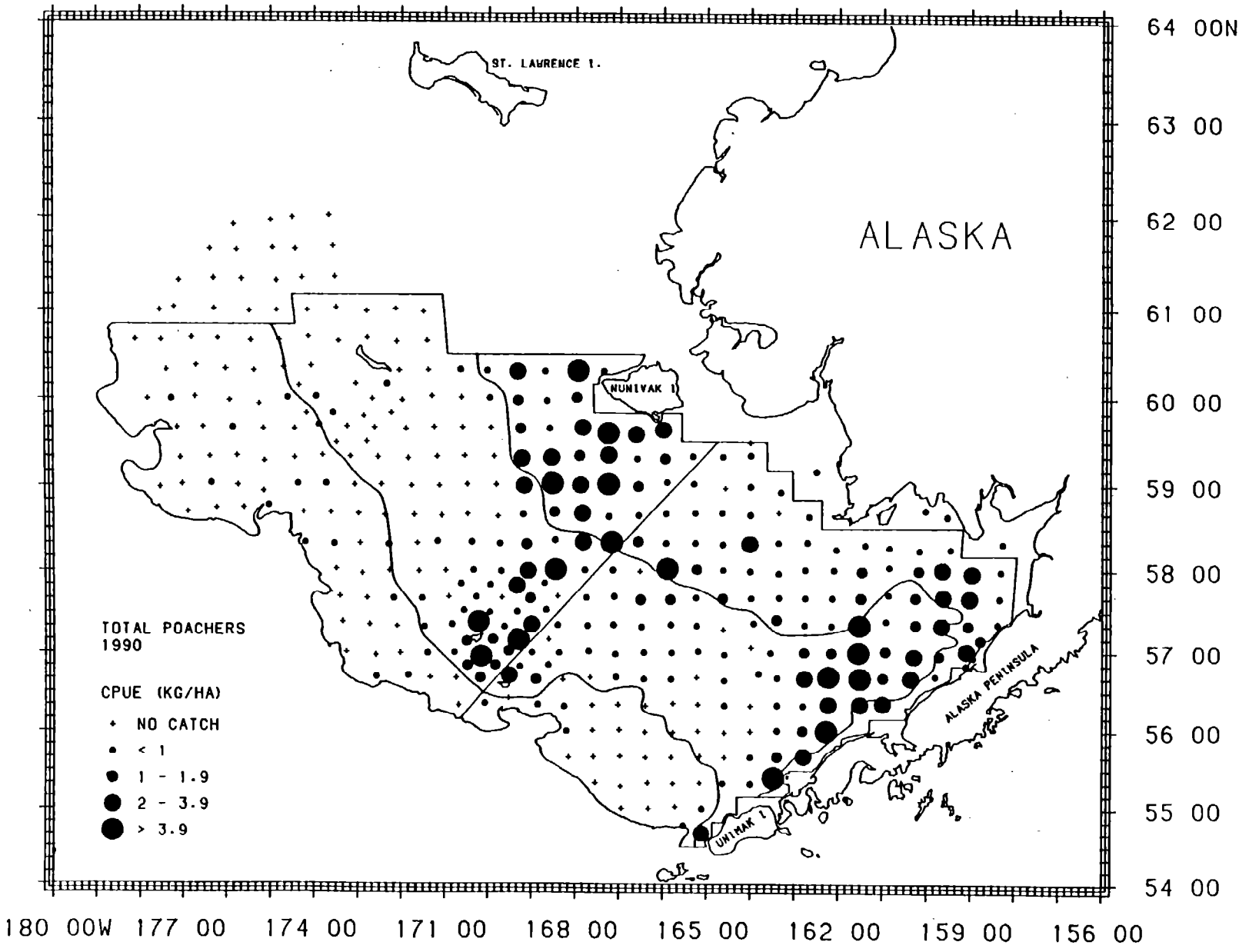

Figure 47.--Distribution and relative abundance in kg/ha of poachers, 1990 eastern Bering Sea bottom trawl survey.

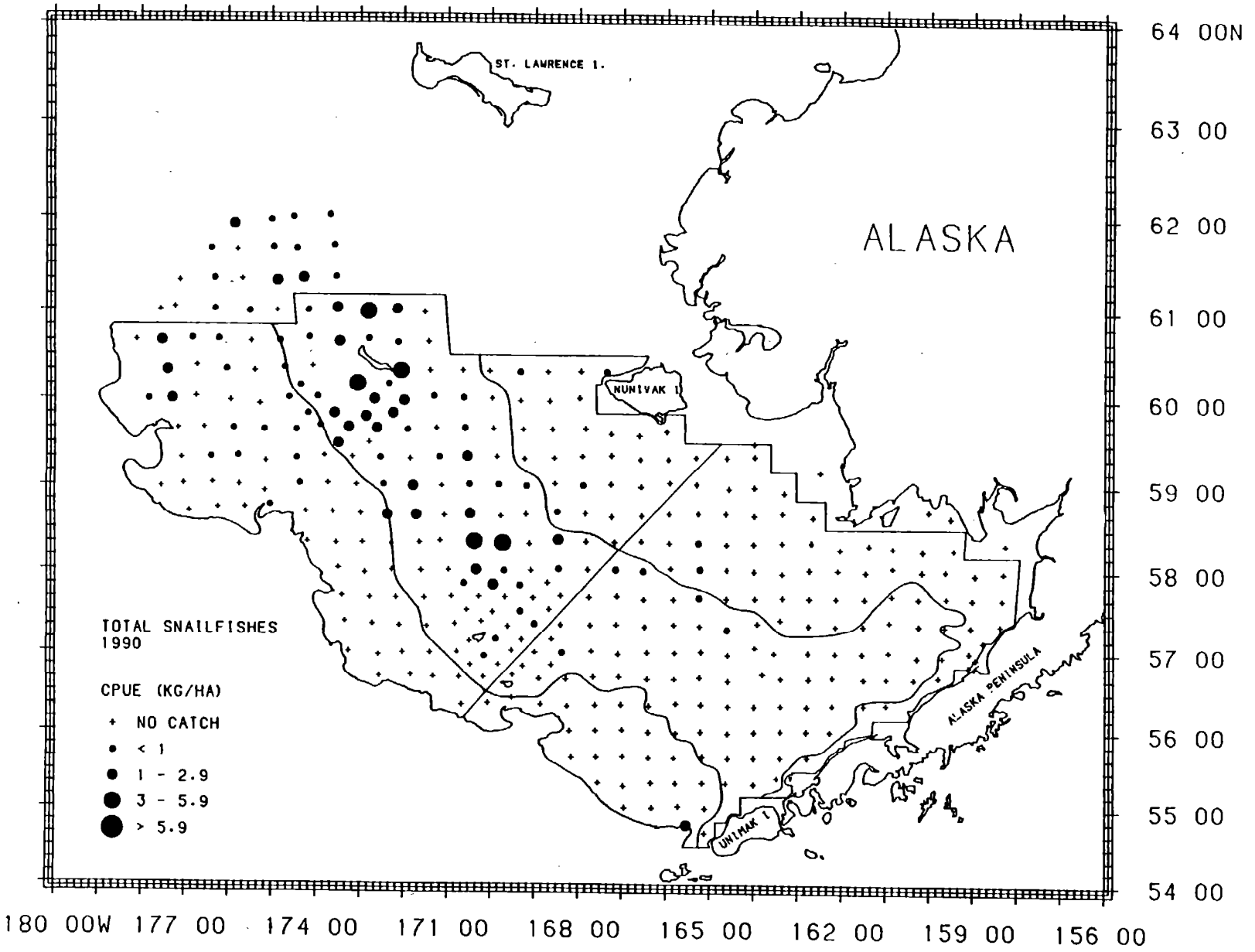

Figure 48.--Distribution and relative abundance in kg/ha of snailfish and lumpsuckers, 1990 eastern Bering Sea bottom trawl survey.

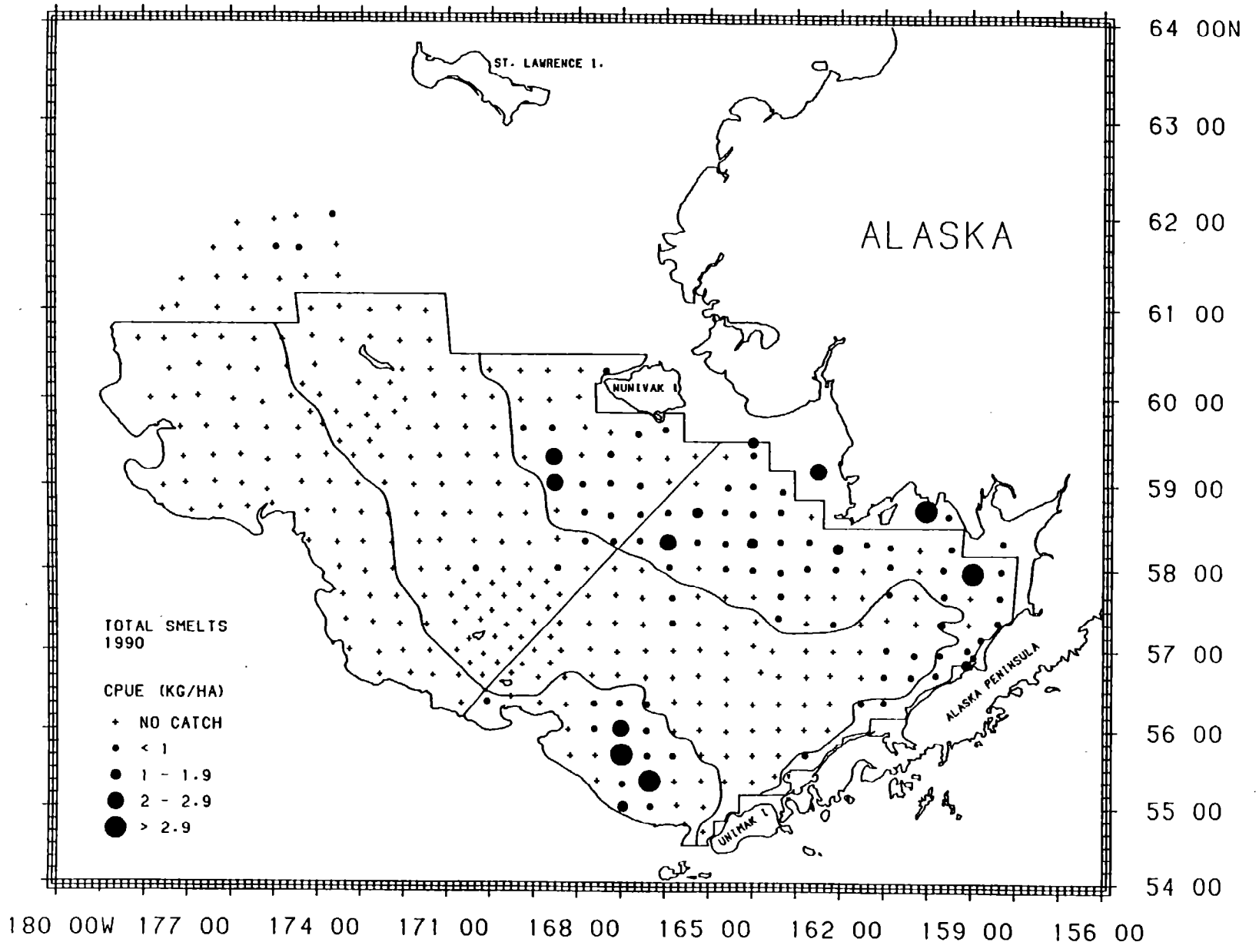

Figure 49. --Distribution and relative abundance in kg/ha of smelts, 1990 eastern Bering Sea bottom trawl survey.

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APPENDIX A

Station Data, 1990 Eastern Bering Sea Bottom Trawl Survey

Appendix A contains station data by vessel for the 352 successfully completed standard survey stations. In using the tables the following should be noted:

1. Time represents the nearest hour at the start of the tow.
2. Haul numbers are not always sequential because special study and unsatisfactory hauls were omitted.

List of Tables

Table A-1. --Haul data for stations sampled by the RV Alaska during the 1990 eastern Bering Sea bottom trawl survey.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nmi)	Stratum	Temperature °C Surface	Temperature °C Bottom
5	6/ 5/90	57	21	159	04	48	7	0.50	1.49	10	3.3	3.3
6	6/ 5/90	57	40	159	02	48	9	0.50	1.48	10	2.8	2.6
7	6/ 5/90	57	58	158	59	37	12	0.50	1.07	10	5.5	3.3
10	6/ 6/90	58	15	160	11	29	11	0.33	0.90	10	5.1	4.3
11	6/ 6/90	57	60	160	12	48	13	0.50	1.48	10	3.7	2.4
12	6/ 6/90	57	41	160	16	49	16	0.50	1.52	31	3.0	2.6
13	6/ 7/90	57	21	160	16	59	6	0.50	1.49	31	3.6	2.9
15	6/ 7/90	56	57	160	18	66	10	0.50	1.49	31	4.4	3.4
16	6/ 7/90	56	41	161	31	86	16	0.50	1.48	31	6.3	2.7
17	6/ 7/90	56	60	161	33	66	19	0.50	1.51	31	3.1	2.6
18	6/ 8/90	57	21	161	32	55	6	0.50	1.56	31	4.1	2.9
19	6/ 8/90	57	41	161	30	51	9	0.50	1.47	10	3.1	2.4
20	6/ 8/90	57	60	161	29	53	12	0.50	1.42	10	5.4	3.1
21	6/ 8/90	58	19	161	24	31	15	0.33	0.99	10	7.0	5.0
22	6/ 9/90	58	39	162	40	24	6	0.50	1.48	10	4.3	4.2
23	6/ 9/90	58	21	162	43	31	9	0.50	1.45	10	3.8	3.2
24	6/ 9/90	58	01	162	46	40	12	0.50	1.54	10	2.3	1.9
25	6/ 9/90	57	41	162	46	42	15	0.50	1.56	10	3.0	2.3
26	6/ 9/90	57	21	162	47	46	17	0.50	1.50	10	4.3	3.1
27	6/10/90	57	01	162	47	59	6	0.50	1.50	31	6.0	3.0
28	6/10/90	56	41	162	46	71	9	0.50	1.45	31	6.9	2.3
30	6/10/90	56	20	162	49	79	13	0.50	1.54	31	7.0	2.1
31	6/10/90	56	01	162	49	77	16	0.50	1.53	31	7.2	2.7
32	6/10/90	55	41	162	48	46	19	0.50	1.50	10	7.1	4.3
33	6/17/90	55	20	164	01	75	7	0.50	1.34	31	6.5	4.9
34	6/17/90	55	41	164	01	93	11	0.33	0.94	31	6.9	3.1
35	6/17/90	56	01	164	01	90	13	0.50	1.50	31	7.0	2.9
36	6/17/90	56	20	164	01	86	16	0.50	1.42	31	10.6	2.9
37	6/18/90	57	41	163	60	49	6	0.50	1.53	10	4.8	2.4
38	6/18/90	57	60	164	01	44	9	0.50	1.46	10	3.9	2.6
39	6/18/90	58	20	164	02	38	12	0.50	1.55	10	4.0	2.7
40	6/18/90	58	40	164	01	31	14	0.50	1.58	10	4.6	3.9
41	6/18/90	58	60	164	01	24	17	0.50	1.40	10	6.8	5.4
42	6/19/90	59	21	163	60	18	6	0.50	1.50	10	9.4	6.6
44	6/19/90	59	21	164	38	18	11	0.50	1.55	10	8.6	6.3
45	6/19/90	59	21	165	20	16	13	0.33	0.97	20	6.2	5.7
46	6/19/90	59	02	165	19	24	16	0.50	1.45	10	6.8	4.8
47	6/19/90	58	41	165	17	37	19	0.50	1.49	10	4.6	3.7
48	6/20/90	58	20	165	16	44	6	0.50	1.41	10	4.0	2.9
49	6/20/90	58	01	165	14	37	9	0.50	1.57	10	4.6	2.2
50	6/20/90	57	41	165	16	59	11	0.50	1.47	31	5.8	2.1
51	6/20/90	57	20	165	15	64	14	0.50	1.44	31	6.5	1.9
52	6/20/90	57	01	165	13	70	17	0.50	1.52	31	6.7	2.0
53	6/22/90	56	41	165	14	75	6	0.50	1.41	31	6.6	2.1
54	6/22/90	56	21	165	13	86	9	0.50	1.62	31	7.0	2.4

Table A-1. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nmi)	Stratum	Temperature °C Surface	Temperature °C Bottom
55	6/22/90	56	01	165	13	93	12	0.50	1.41	31	6.9	3.2
56	6/22/90	55	41	165	10	106	15	0.50	1.52	31	6.6	3.9
57	6/22/90	55	21	165	10	110	18	0.33	0.91	50	7.1	3.9
58	6/22/90	55	01	165	07	126	21	0.50	1.42	50	6.5	4.4
59	6/23/90	54	41	165	07	80	8	0.50	1.41	31	5.7	5.3
60	6/25/90	55	01	166	20	143	8	0.50	1.53	50	6.8	3.4
61	6/25/90	55	21	166	21	132	11	0.50	1.45	50	7.5	3.5
62	6/25/90	55	40	166	24	124	14	0.50	1.29	50	7.4	3.8
63	6/25/90	55	60	166	25	123	17	0.50	1.46	50	6.5	--
64	6/26/90	56	20	166	24	102	6	0.50	1.50	31	7.0	3.3
65	6/26/90	56	40	166	27	84	9	0.33	1.01	31	7.0	1.9
66	6/26/90	56	60	166	27	73	12	0.50	1.51	31	8.2	2.1
67	6/26/90	57	20	166	30	68	15	0.50	1.43	31	6.9	2.6
68	6/26/90	57	39	166	31	64	17	0.50	1.52	31	6.0	2.0
69	6/27/90	57	60	166	32	59	6	0.50	1.42	31	5.6	1.9
70	6/27/90	58	21	166	35	44	9	0.50	1.43	10	4.4	3.2
71	6/27/90	58	40	166	34	40	12	0.50	1.51	20	4.1	3.6
72	6/27/90	58	60	166	35	31	14	0.50	1.50	20	4.9	--
73	6/27/90	59	19	166	36	26	17	0.50	1.53	20	6.2	5.8
74	6/28/90	60	19	167	22	29	6	0.33	0.92	20	5.2	5.5
75	6/28/90	60	20	167	57	27	9	0.50	1.49	20	5.4	5.1
76	6/28/90	60	01	167	59	22	12	0.50	1.34	20	4.4	--
77	6/28/90	59	41	167	51	31	15	0.50	1.51	20	4.3	3.8
78	6/28/90	59	21	167	55	37	17	0.50	1.52	20	4.4	3.5
79	6/29/90	59	01	167	54	38	6	0.50	1.49	20	4.0	3.6
80	6/29/90	58	41	167	51	44	9	0.50	1.43	20	3.9	2.8
81	6/29/90	58	21	167	50	59	12	0.50	1.40	41	5.7	1.2
82	6/29/90	58	01	167	48	66	15	0.50	1.49	41	6.2	1.5
83	6/29/90	57	41	167	46	68	18	0.50	1.47	31	5.9	2.0
84	6/30/90	57	21	167	44	71	6	0.50	1.48	31	7.4	2.3
85	6/30/90	57	01	167	42	75	9	0.50	1.43	31	7.5	2.1
86	6/30/90	56	41	167	40	101	12	0.33	0.98	31	7.7	3.2
87	6/30/90	56	20	167	37	130	15	0.50	1.35	50	7.8	3.5
88	6/30/90	56	01	167	37	132	17	0.50	1.59	50	7.8	3.6
89	7/ 1/90	55	41	167	35	135	6	0.50	1.52	50	7.5	3.7
90	7/ 1/90	56	01	168	13	150	10	0.50	1.56	50	7.3	3.6
91	7/ 1/90	56	20	168	16	155	14	0.50	1.42	50	7.9	3.6
92	7/ 1/90	56	21	168	52	37	17	0.50	1.47	50	8.0	3.7
93	7/ 2/90	56	40	168	54	101	6	0.50	1.44	32	7.9	3.0
94	7/ 2/90	56	50	169	16	80	8	0.50	1.44	32	7.3	2.7
95	7/ 2/90	56	60	168	60	79	11	0.50	1.36	32	8.0	--
96	7/ 2/90	57	10	169	18	71	13	0.50	1.56	42	7.8	--
97	7/ 2/90	57	21	169	01	70	15	0.33	1.00	42	8.0	2.2
98	7/ 2/90	57	31	169	20	68	18	0.33	0.99	42	7.8	--
99	7/ 3/90	57	41	169	02	68	6	0.50	1.56	42	7.3	1.7
100	7/ 3/90	57	50	169	21	64	8	0.50	1.31	42	7.3	--
101	7/ 3/90	57	60	169	06	68	11	0.33	1.05	42	7.1	1.4
102	7/ 3/90	58	20	169	08	66	13	0.50	1.59	41	6.6	0.7

Table A-l. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nmi)	Stratum	Temperature °C Surface	Temperature °C Bottom
103	7/ 3/90	58	40	169	13	62	16	0.50	1.55	41	6.6	0.8
104	7/ 4/90	59	01	169	11	51	6	0.50	1.49	41	--	1.3
105	7/ 4/90	59	20	169	14	37	9	0.50	1.49	20	5.8	--
106	7/ 4/90	59	40	169	16	44	11	0.50	1.51	20	6.8	2.0
107	7/ 4/90	59	59	169	20	44	14	0.50	1.52	20	6.8	2.7
108	7/ 4/90	60	19	169	20	42	17	0.50	1.57	20	5.2	--
109	7/ 5/90	60	21	170	39	60	6	0.50	1.56	41	7.6	0.0
110	7/ 5/90	60	01	170	38	62	9	0.50	1.52	41	7.4	--
111	7/ 5/90	59	41	170	36	66	12	0.50	1.58	41	7.5	-0.9
112	7/ 5/90	59	21	170	33	66	14	0.50	1.51	41	7.6	-1.1
113	7/ 5/90	59	01	170	30	70	17	0.50	1.47	41	8.1	-1.3
114	7/ 6/90	58	41	170	29	73	6	0.50	1.40	41	8.1	-1.0
115	7/ 6/90	58	21	170	23	73	9	0.50	1.45	41	8.0	2.5
116	7/ 6/90	58	01	170	21	73	12	0.50	1.48	42	8.4	-0.4
117	7/ 6/90	57	51	170	38	77	14	0.50	1.47	42	9.1	0.2
118	7/ 6/90	57	41	170	17	71	16	0.50	1.43	42	8.8	-0.5
119	7/ 6/90	57	32	170	34	71	18	0.33	0.92	42	9.8	1.9
120	7/ 7/90	57	23	170	13	59	6	0.50	1.58	42	8.0	4.9
121	7/ 7/90	57	09	170	30	48	9	0.50	1.62	42	8.0	4.2
122	7/ 8/90	56	57	170	10	77	8	0.50	1.47	42	9.0	3.6
123	7/ 8/90	56	51	170	29	101	9	0.33	1.12	42	9.0	--
124	7/ 8/90	56	41	170	11	97	12	0.33	0.97	42	7.0	3.5
125	7/ 8/90	56	22	170	05	106	14	0.33	1.01	50	8.8	3.6
126	7/ 8/90	56	21	170	41	119	17	0.50	1.53	61	8.9	4.0
127	7/ 9/90	56	41	171	20	126	6	0.50	1.47	61	8.8	4.7
128	7/ 9/90	56	60	171	24	110	9	0.33	1.00	61	8.9	3.2
129	7/ 9/90	57	20	171	29	101	12	0.33	0.98	41	8.9	2.4
130	7/ 9/90	57	40	171	32	99	15	0.33	1.05	41	9.3	2.2
131	7/ 9/90	57	60	171	37	97	17	0.33	1.09	41	9.5	1.6
132	7/10/90	58	20	171	39	95	6	0.50	1.53	41	9.1	0.6
133	7/10/90	58	40	171	43	93	9	0.50	1.53	41	8.6	-0.4
134	7/10/90	58	60	171	47	86	12	0.50	1.48	41	8.6	-1.0
135	7/10/90	59	20	171	51	79	15	0.50	1.49	43	8.7	-1.5
136	7/10/90	59	40	171	55	77	17	0.50	1.68	43	8.6	-1.5
137	7/11/90	59	51	172	14	75	6	0.50	1.33	43	8.7	-1.5
138	7/11/90	59	59	171	59	66	8	0.33	0.98	43	7.8	-1.4
139	7/11/90	60	11	172	20	57	10	0.33	1.00	43	4.2	--
140	7/11/90	60	20	172	04	59	12	0.33	1.00	43	8.7	-1.1
141	7/11/90	60	39	172	07	60	15	0.50	1.50	41	8.8	-1.2
142	7/12/90	60	40	173	27	64	6	0.33	0.98	41	--	-1.0
147	7/12/90	59	51	173	35	93	17	0.50	1.48	43	8.6	--
148	7/12/90	59	41	173	16	93	20	0.50	1.46	43	8.7	--
149	7/13/90	59	30	173	30	102	7	0.50	1.47	43	8.6	--
150	7/13/90	59	21	173	11	104	9	0.33	0.97	43	8.2	0.3
151	7/13/90	59	01	173	05	106	12	0.33	0.99	61	8.8	1.1
152	7/13/90	58	41	172	60	112	15	0.25	0.70	61	8.6	1.9
153	7/13/90	58	20	172	57	108	19	0.25	0.69	61	8.6	1.8
154	7/14/90	57	58	172	54	110	6	0.50	1.52	61	9.0	--

Table A-l. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nmi)	Stratum	Temperature °C Surface	Temperature °C Bottom
155	7/14/90	57	41	172	47	117	9	0.25	0.72	61	8.9	2.5
156	7/14/90	57	21	172	43	117	12	0.28	0.90	61	8.8	2.7
157	7/14/90	56	58	172	35	123	15	0.25	0.78	61	8.9	3.3
158	7/14/90	56	42	172	34	134	17	0.17	0.52	61	9.2	3.8
160	7/22/90	56	43	171	50	121	18	0.50	1.48	61	7.5	3.8
161	7/22/90	56	60	172	01	117	21	0.33	1.00	61	7.1	3.7
162	7/23/90	58	20	173	33	115	8	0.33	0.93	61	8.4	2.9
163	7/23/90	58	21	174	12	139	11	0.33	1.16	61	8.4	3.4
164	7/23/90	58	42	174	14	144	14	0.50	1.21	61	8.0	2.7
165	7/23/90	58	42	173	37	126	17	0.33	1.05	61	8.3	2.6
166	7/24/90	59	02	174	22	126	7	0.40	1.27	61	8.3	2.4
167	7/24/90	59	20	174	27	121	9	0.25	0.79	62	8.2	2.2
168	7/24/90	59	40	174	27	115	12	0.30	0.90	62	8.6	1.5
169	7/24/90	60	01	174	37	106	15	0.33	1.07	62	8.7	0.4
170	7/24/90	60	10	174	21	101	16	0.50	1.58	43	7.7	-0.3
171	7/25/90	60	22	174	43	102	7	0.33	0.97	62	7.4	-0.1
172	7/25/90	60	40	174	49	97	9	0.33	1.04	41	8.1	-0.4
182	7/29/90	60	41	176	12	117	14	0.50	1.42	61	9.4	0.9
183	7/29/90	60	21	176	02	121	17	0.50	1.52	61	9.6	1.4
184	7/30/90	59	59	175	56	130	7	0.50	1.48	61	9.1	1.7
185	7/30/90	59	40	175	52	135	9	0.50	1.57	61	9.1	1.7
186	7/30/90	59	21	175	46	137	12	0.33	1.00	61	9.0	1.7
187	7/30/90	59	01	175	45	134	15	0.33	0.98	61	8.9	1.8
188	7/30/90	58	45	175	37	132	17	0.50	1.53	61	9.1	3.0
189	7/31/90	58	42	176	53	132	7	0.50	1.58	61	8.7	2.4
190	7/31/90	58	59	177	32	134	10	0.50	1.45	61	9.2	2.5
191	7/31/90	59	01	177	01	137	13	0.50	1.49	61	9.3	2.1
192	7/31/90	59	20	177	04	150	15	0.50	1.58	61	9.2	1.7
193	7/31/90	59	40	177	09	170	18	0.50	1.50	61	9.2	2.4
194	8/ 1/90	59	60	177	50	141	7	0.33	1.04	61	10.0	1.1
195	8/ 1/90	59	60	177	17	135	9	0.33	1.01	61	9.9	1.1
196	8/ 1/90	60	20	177	24	146	12	0.40	1.27	61	10.0	0.8
197	8/ 1/90	60	40	177	31	146	14	0.58	1.82	61	10.0	0.7
198	8/ 1/90	60	41	178	06	161	17	0.50	1.48	61	10.8	1.6

Table A-2. --Haul data for stations sampled by the FV Ocean Hope 3 during the 1990 eastern Bering Sea bottom trawl survey.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nm)	Stratum	Temperature °C Surface	Temperature °C Bottom
1	6/ 4/90	57	22	158	25	33	11	0.50	1.61	10	4.9	--
2	6/ 4/90	57	40	158	22	35	14	0.50	1.48	10	4.4	--
3	6/ 4/90	57	60	158	20	35	16	0.50	1.47	10	4.4	--
4	6/ 5/90	58	20	158	17	22	7	0.40	1.10	--	--	--
5	6/ 5/90	58	16	159	28	29	14	0.50	1.55	10	--	--
6	6/ 5/90	58	01	159	39	42	16	0.50	1.51	10	7.3	--
7	6/ 6/90	57	41	159	38	49	7	0.50	1.53	10	4.5	--
8	6/ 6/90	57	21	159	41	57	9	0.50	1.52	10	3.3	--
9	6/ 6/90	56	58	159	44	55	13	0.50	1.52	10	4.4	--
10	6/ 6/90	56	42	159	49	37	15	0.50	1.52	10	6.1	--
11	6/ 6/90	56	41	160	23	59	17	0.50	1.58	31	4.8	--
12	6/ 7/90	56	22	161	01	57	7	0.50	1.48	10	6.0	--
13	6/ 7/90	56	21	161	31	66	10	0.50	1.44	10	6.2	--
14	6/ 7/90	56	41	160	60	68	16	0.50	1.51	31	5.1	--
15	6/ 8/90	57	01	160	57	64	7	0.50	1.52	31	4.0	--
16	6/ 8/90	57	24	160	56	62	10	0.50	1.54	31	4.0	--
17	6/ 8/90	57	43	160	53	57	12	0.50	1.52	31	2.6	--
18	6/ 8/90	58	03	160	52	44	15	0.50	1.58	10	6.5	--
19	6/ 8/90	58	17	160	52	31	17	0.50	1.47	10	7.7	--
20	6/ 9/90	58	16	162	04	48	6	0.50	1.45	10	5.5	--
21	6/ 9/90	58	01	162	07	38	9	0.50	1.53	10	2.6	--
22	6/ 9/90	57	41	162	09	48	11	0.50	1.53	10	2.9	--
23	6/ 9/90	57	21	162	10	51	14	0.50	1.56	10	4.9	--
24	6/ 9/90	56	60	162	10	60	16	0.50	1.55	31	5.9	--
25	6/10/90	56	42	162	14	71	9	0.50	1.26	31	6.4	--
27	6/10/90	56	21	162	14	82	13	0.50	1.52	31	9.5	--
28	6/10/90	56	01	162	17	73	16	0.50	1.64	31	7.5	--
29	6/11/90	55	25	163	29	64	7	0.50	1.36	31	6.9	3.9
30	6/14/90	55	41	163	25	86	12	0.50	1.32	31	6.5	3.0
31	6/14/90	56	01	163	25	90	14	0.50	1.45	31	6.6	3.0
32	6/14/90	56	21	163	25	84	17	0.50	1.56	31	6.8	2.6
33	6/15/90	56	41	163	25	75	7	0.50	1.46	31	6.4	2.0
35	6/17/90	56	44	163	50	75	6	0.50	1.58	31	6.9	2.2
36	6/17/90	56	60	163	34	68	10	0.50	1.57	31	7.0	2.5
37	6/17/90	57	04	163	60	68	12	0.50	1.50	31	6.9	2.2
38	6/17/90	57	22	163	56	60	14	0.50	1.65	31	6.6	2.8
39	6/17/90	57	25	163	25	53	17	0.50	1.64	10	5.7	2.8
40	6/18/90	57	41	163	22	48	7	0.50	1.44	10	5.0	3.0
41	6/18/90	57	58	163	23	44	9	0.50	1.70	10	3.6	3.0
42	6/18/90	58	21	163	23	37	12	0.50	1.62	10	4.1	4.0
43	6/18/90	58	42	163	23	31	14	0.50	1.50	10	5.9	5.5
44	6/18/90	58	56	163	20	26	16	0.50	1.45	10	7.0	5.5
46	6/19/90	58	59	164	35	27	15	0.50	1.55	10	6.5	5.2
47	6/19/90	58	41	164	39	37	18	0.50	1.65	10	4.5	--
48	6/20/90	58	19	164	38	46	6	0.50	1.53	10	4.5	--
49	6/20/90	58	01	164	38	46	9	0.50	1.54	10	4.5	3.5

Table A-2. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nm)	Stratum	Temperature °C Surface	Temperature °C Bottom
50	6/20/90	57	40	164	38	53	11	0.50	1.69	10	5.2	2.8
51	6/20/90	57	18	164	38	66	14	0.50	1.54	31	6.7	2.1
52	6/20/90	56	59	164	36	71	17	0.50	1.54	31	6.8	4.0
53	6/22/90	56	39	164	36	77	6	0.50	1.45	31	6.8	2.2
54	6/22/90	56	20	164	36	90	9	0.50	1.46	31	7.0	2.7
55	6/22/90	55	59	164	36	95	12	0.50	1.51	31	7.1	2.6
56	6/22/90	55	40	164	36	97	14	0.50	1.52	31	7.1	3.4
57	6/22/90	55	21	164	38	104	17	0.50	1.54	31	7.2	3.6
58	6/23/90	54	48	165	33	210	6	0.50	1.43	50	6.0	4.0
59	6/25/90	55	02	165	44	130	10	0.50	1.51	50	7.2	--
60	6/25/90	55	21	165	47	123	12	0.50	1.50	50	7.1	--
61	6/25/90	55	40	165	49	119	15	0.50	1.50	50	7.1	--
62	6/25/90	55	60	165	47	110	18	0.50	1.56	31	7.1	--
63	6/26/90	56	22	165	47	93	6	0.50	1.48	31	7.0	--
64	6/26/90	56	40	165	50	79	9	0.50	1.55	31	7.1	--
65	6/26/90	56	60	165	49	73	11	0.50	1.36	31	6.9	--
66	6/26/90	57	21	165	50	68	14	0.50	1.66	31	7.0	--
67	6/26/90	57	40	165	51	64	17	0.50	1.61	31	7.8	--
68	6/27/90	58	02	165	55	55	6	0.50	1.53	10	5.2	--
69	6/27/90	58	20	165	57	44	9	0.50	1.63	10	4.6	3.8
70	6/27/90	58	41	165	57	37	12	0.50	1.63	10	4.6	4.4
71	6/27/90	59	03	165	56	29	14	0.50	1.70	20	5.9	5.2
72	6/27/90	59	19	165	58	24	17	0.50	1.53	20	7.4	6.2
73	6/28/90	59	39	166	01	26	6	0.50	1.53	20	6.1	6.8
74	6/28/90	59	36	166	38	29	9	0.50	1.54	20	5.8	5.8
75	6/28/90	59	37	167	16	29	12	0.50	1.43	20	4.9	5.8
76	6/28/90	59	22	167	16	31	14	0.50	1.52	20	5.2	4.8
77	6/28/90	59	02	167	16	40	17	0.50	1.55	20	4.9	4.2
78	6/29/90	58	39	167	15	44	6	0.50	1.53	20	4.3	4.3
79	6/29/90	58	21	167	11	51	9	0.50	1.50	20	4.8	3.2
80	6/29/90	58	01	167	10	64	11	0.50	1.46	31	6.4	1.4
81	6/29/90	57	42	167	08	68	14	0.50	1.48	31	6.8	1.9
82	6/29/90	57	21	167	09	71	17	0.50	1.59	31	6.8	2.5
83	6/30/90	56	59	167	06	75	6	0.50	1.52	31	7.6	2.5
84	6/30/90	56	42	167	05	97	9	0.50	1.57	31	7.6	2.9
85	6/30/90	56	21	167	02	115	11	0.50	1.54	50	7.6	3.6
86	6/30/90	56	02	167	01	137	14	0.50	1.44	50	7.7	3.7
87	6/30/90	55	41	166	59	137	17	0.50	1.50	50	7.9	3.6
88	7/ 1/90	55	18	166	59	144	7	0.50	1.61	50	7.4	3.5
89	7/ 1/90	55	01	166	57	159	9	0.50	1.47	50	7.3	3.5
90	7/ 1/90	55	21	167	33	152	13	0.50	1.50	50	8.6	3.5
91	7/ 1/90	55	40	168	10	139	16	0.50	1.58	50	7.2	3.8
92	7/ 2/90	56	40	168	18	108	7	0.50	1.53	50	7.7	3.4
93	7/ 2/90	56	51	168	38	97	10	0.30	0.93	32	7.9	2.7
94	7/ 2/90	56	60	168	23	82	12	0.30	1.03	32	7.9	2.5
95	7/ 2/90	57	10	168	37	77	13	0.30	1.09	32	8.1	2.6
96	7/ 2/90	57	21	168	25	75	15	0.30	1.08	32	8.3	3.7
97	7/ 2/90	57	32	168	41	73	17	0.50	1.62	42	8.0	2.5

Table A-2. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nm)	Stratum	Temperature °C Surface	Temperature °C Bottom
98	7/ 3/90	57	42	168	25	71	7	0.50	1.59	42	7.8	2.4
99	7/ 3/90	57	51	168	43	71	9	0.50	1.61	42	7.8	--
100	7/ 3/90	58	01	168	28	70	12	0.50	1.69	42	7.1	--
101	7/ 3/90	58	23	168	29	64	15	0.50	1.60	41	6.8	--
102	7/ 3/90	58	42	168	30	53	17	0.50	1.56	20	6.5	--
103	7/ 4/90	59	02	168	33	46	6	0.50	1.53	20	4.8	--
104	7/ 4/90	59	20	168	34	40	9	0.50	1.59	20	4.3	--
105	7/ 4/90	59	40	168	36	38	11	0.50	1.65	20	5.0	--
106	7/ 4/90	59	59	168	40	38	14	0.50	1.65	20	4.8	4.8
107	7/ 4/90	60	20	168	43	37	16	0.50	1.70	20	6.4	5.5
108	7/ 5/90	60	20	170	02	53	6	0.50	1.64	20	7.2	1.3
109	7/ 5/90	60	01	169	59	55	9	0.50	1.52	41	7.0	1.2
110	7/ 5/90	59	41	169	57	57	11	0.50	1.51	41	6.8	1.1
111	7/ 5/90	59	21	169	52	60	14	0.50	1.61	41	7.6	1.1
112	7/ 5/90	59	01	169	49	64	16	0.50	1.54	41	6.8	0.6
113	7/ 6/90	58	39	169	47	68	6	0.50	1.58	41	7.6	0.5
114	7/ 6/90	58	20	169	44	70	9	0.50	1.57	41	7.5	0.7
115	7/ 6/90	57	60	169	43	71	11	0.50	1.58	42	7.8	1.1
116	7/ 6/90	57	50	169	58	73	14	0.50	1.62	42	8.5	1.0
117	7/ 6/90	57	41	169	41	71	16	0.50	1.49	42	9.8	1.5
118	7/ 7/90	57	30	169	58	70	6	0.50	1.59	42	8.8	--
119	7/ 7/90	57	20	169	38	62	8	0.50	1.60	42	8.6	2.6
120	7/ 8/90	57	10	169	54	55	7	0.50	1.56	42	8.1	--
121	7/ 8/90	57	02	169	32	62	10	0.50	1.43	42	8.5	2.5
122	7/ 8/90	56	51	169	50	73	12	0.50	1.44	42	8.9	--
123	7/ 8/90	56	43	169	31	77	14	0.30	0.94	32	8.6	4.5
125	7/ 8/90	56	26	169	32	112	19	0.25	0.84	50	9.8	--
126	7/ 9/90	56	41	170	44	115	6	0.30	0.87	61	8.6	4.0
127	7/ 9/90	56	60	170	47	99	9	0.50	1.55	42	8.8	4.3
128	7/ 9/90	57	22	170	50	82	12	0.30	0.94	42	9.0	3.4
129	7/ 9/90	57	41	170	55	86	14	0.30	0.80	42	8.1	2.5
130	7/ 9/90	58	01	170	59	88	17	0.50	1.46	42	8.8	1.5
131	7/10/90	58	22	171	11	90	7	0.50	1.40	41	9.0	0.2
132	7/10/90	58	40	171	05	86	9	0.30	0.96	41	8.8	-1.2
133	7/10/90	58	60	171	08	79	12	0.50	1.52	41	8.9	-1.1
134	7/10/90	59	21	171	12	77	14	0.50	1.40	41	6.9	-1.1
135	7/10/90	59	41	171	16	73	17	0.50	1.56	41	9.0	-1.1
136	7/11/90	60	02	171	19	71	6	0.50	1.46	41	8.7	-1.0
137	7/11/90	60	20	171	24	64	9	0.50	1.44	41	9.0	-0.8
138	7/11/90	60	40	171	26	64	11	0.50	1.47	41	8.9	-1.0
139	7/11/90	60	59	171	31	62	14	0.50	1.53	41	9.0	0.6
140	7/11/90	61	01	172	09	66	16	0.50	1.41	41	8.8	-0.5
141	7/12/90	60	60	172	49	68	6	0.50	1.55	41	8.4	-0.1
142	7/12/90	60	42	172	48	48	10	0.50	1.62	41	7.6	2.5
143	7/12/90	60	11	173	04	60	13	0.50	1.40	43	7.9	0.4
144	7/12/90	59	60	172	41	68	16	0.50	1.50	43	8.7	-0.6
145	7/13/90	59	48	172	52	82	7	0.50	1.52	43	8.5	-0.9
146	7/13/90	59	41	172	37	86	9	0.50	1.43	43	8.4	-1.0

Table A-2. --Continued.

Haul	M/ D/Yr	Latitude Deg.	Latitude Min.	Longitude Deg.	Longitude Min.	Depth (m)	Time	Duration (hr)	Distance fished (nm)	Stratum	Temperature °C Surface	Temperature °C Bottom
147	7/13/90	59	31	172	48	95	12	0.50	1.41	43	8.8	-0.3
148	7/13/90	59	20	172	32	91	14	0.50	1.45	43	8.5	-0.3
149	7/13/90	59	01	172	28	101	17	0.30	0.96	41	8.7	0.3
150	7/14/90	58	40	172	23	104	6	0.50	1.48	61	8.8	-9.0
151	7/14/90	58	19	172	17	104	9	0.25	0.74	61	9.0	-1.5
152	7/14/90	57	60	172	16	106	12	0.25	0.69	61	9.5	2.4
153	7/14/90	57	40	172	10	110	14	0.25	0.72	61	9.0	2.7
154	7/14/90	57	20	172	06	110	17	0.25	0.57	61	9.5	3.0
158	7/23/90	57	01	173	16	144	8	0.33	0.90	61	7.6	3.6
159	7/23/90	57	24	173	21	124	10	0.50	1.40	61	8.2	3.2
160	7/23/90	57	42	173	25	148	13	0.50	1.40	61	8.5	3.6
161	7/23/90	58	02	173	30	117	15	0.25	0.70	61	--	3.9
162	7/24/90	59	02	173	44	119	7	0.25	0.60	61	8.2	2.4
163	7/24/90	59	22	173	49	113	10	0.25	0.80	62	--	1.5
164	7/24/90	59	43	173	54	106	12	0.33	0.80	62	8.0	0.7
165	7/24/90	59	51	174	11	108	14	0.50	1.40	62	8.1	0.7
166	7/24/90	60	02	173	58	99	16	0.50	1.50	43	8.8	-0.5
167	7/25/90	60	23	174	05	91	7	0.50	1.50	43	7.5	-0.7
168	7/25/90	60	43	174	09	90	10	0.50	1.50	41	7.9	-0.9
169	7/25/90	60	60	174	10	84	12	0.50	1.60	41	7.5	-1.2
170	7/28/90	61	02	173	31	77	7	0.50	1.30	41	7.8	-0.2
179	7/29/90	60	40	175	28	110	14	0.50	1.50	61	9.4	0.4
180	7/29/90	60	20	175	23	113	19	0.50	1.50	61	9.4	1.3
181	7/30/90	59	57	175	16	123	7	0.50	1.50	61	9.4	1.9
182	7/30/90	59	40	175	10	130	10	0.50	0.90	61	9.0	2.2
183	7/30/90	59	18	175	09	137	12	0.25	0.60	61	9.0	2.3
185	7/30/90	58	57	175	09	135	16	0.50	1.50	61	9.0	2.6
186	7/30/90	58	47	175	03	174	18	0.50	1.50	61	9.0	3.2
187	7/31/90	58	45	176	14	134	7	0.50	1.50	61	9.0	2.3
188	7/31/90	59	02	176	21	139	10	0.25	0.80	61	9.1	2.0
189	7/31/90	59	21	176	23	139	12	0.50	1.50	61	9.2	1.7
190	7/31/90	59	41	176	33	139	14	0.50	1.70	61	9.6	1.4
191	7/31/90	60	02	176	44	144	17	0.50	1.50	61	10.1	1.3
192	8/ 1/90	60	23	176	43	137	7	0.50	1.40	61	9.8	1.7

APPENDIX B

Schematic Diagram of Trawl Gear

List of Figures

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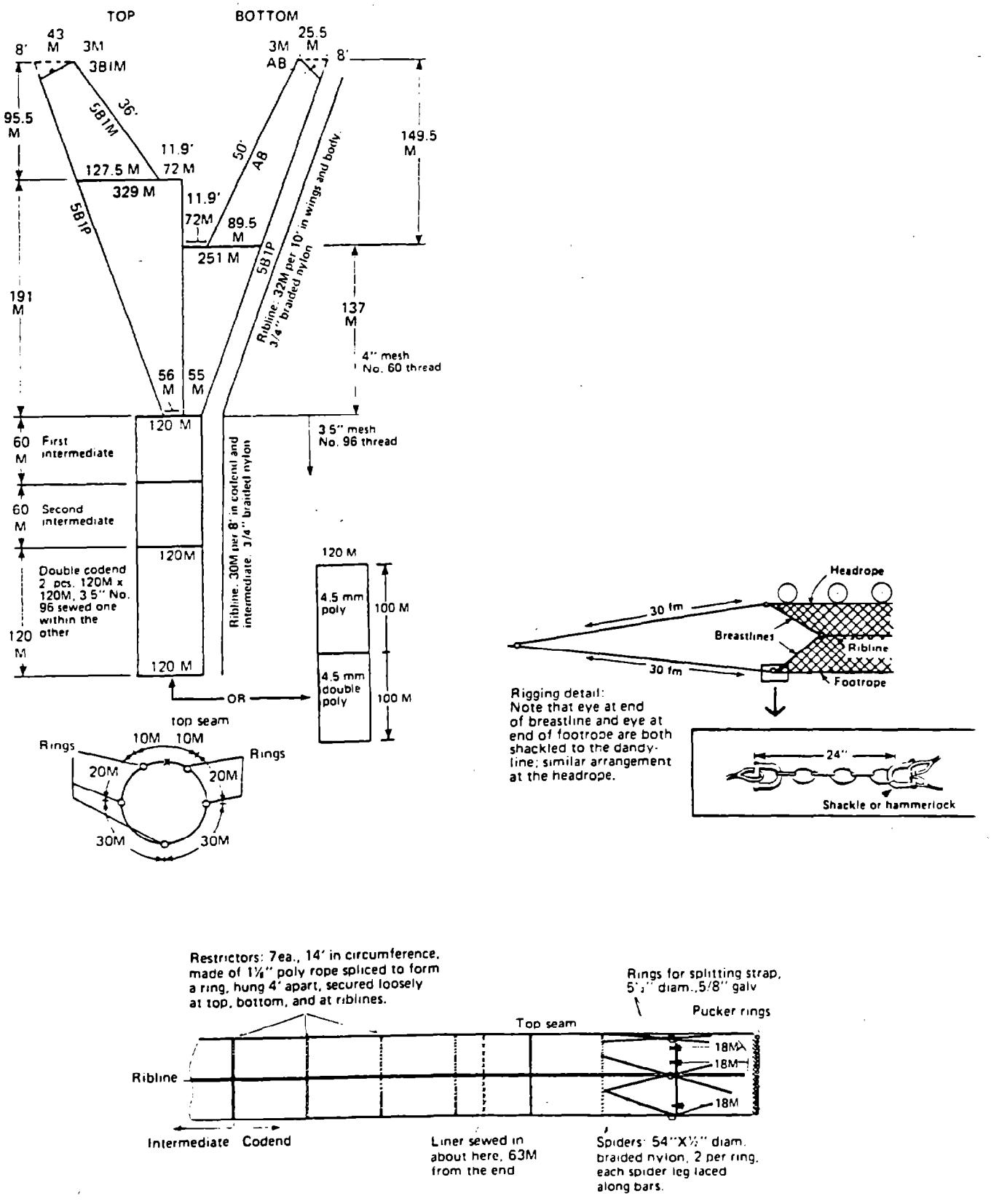

Figure B-l.--Schematic diagram of trawl used during the 1990 eastern Bering Sea bottom trawl survey.

APPENDIX C

List of Species Encountered

Appendix C contains a computer listing of all fish and invertebrate species taken during the 1990 eastern Bering Sea bottom trawl survey.

List of Tables

Table C-l.--Fish species encountered during the 1990 eastern Bering Sea bottom trawl survey.

Common name	Scientific name
Family Rajidae	
Skate unident.	Rajidae unident.
Family Clupeidae	
Pacific herring	Clupea pallasii
Family Osmeridae	
Capelin	Mallotus villosus
Smelt unident.	Osmeridae
Rainbow smelt	Osmerus mordax
Eulachon	Thaleichthys pacificus
Family Gadidae	
Arctic cod	Boreogadus saida
Saffron cod	Eleginus gracilis
Pacific cod	Gadus macrocephalus
Walleye pollock	Theragra chalcogramma
Family Scorpaenidae	
Rougheye rockfish	Sebastes aleutianus
Pacific ocean perch	Sebastes alutus
Northern rockfish	Sebastes polyspinis
Rockfish unident.	Sebastes sp.
Family Anaplopomatidae	
Sablefish	Anoplopoma fimbria
Family Hexagrammidae	
Kelp greenling	Hexagrammos decagrammus
Whitespotted greenling	Hexagrammos stelleri
Atka mackerel	Pleurogrammus monopterygius
Family Cottidae	
Artediellus unident.	Artediellus sp.
Crested sculpin	Blepsias bilobus
Spinyhead sculpin	Dasycottus setiger
Antlered sculpin	Enophrys diceraus
Leister sculpin	Enophrys lucasi
Enophrys unident.	Enophrys sp.
Armorhead sculpin	Gymnocanthus galeatus
Gymnocanthus unident.	Gymnocanthus sp.
Arctic staghorn sculpin	Gymnocanthus tricuspis
Red Irish lord	Hemilepidotus hemilepidotus
Yellow Irish lord	Hemilepidotus jordani

Table C-1. --Continued.

Common name	Scientific name
Family Cottidae (cont'd)	
Butterfly sculpin	Hemilepidotus papilio
Irish lord unident.	Hemilepidotus sp.
Bigmouth sculpin	Hemitripterus bolini
Icelus unident.	Icelus sp.
Spatulate sculpin	Icelus spatula
Thorny sculpin	Icelus spiniger
Pacific staghorn sculpin	Leptocottus armatus
Blackfin sculpin	Malacocottus kincaidi
Malacocottus unident.	Malacocottus sp.
Darkfin sculpin	Malacocottus zonurus
Plain sculpin	Myoxocephalus jaok
Great sculpin	Myoxocephalus polyacanthocephalus
Myoxocephalus unident.	Myoxocephalus sp.
Tadpole sculpin	Psychrolutes paradoxus
Ribbed sculpin	Triglops pingeli
Speckled sculpin	Triglops scepticus
Triglops unident.	Triglops sp.
Family Agonidae	
Poacher unident.	Agonidae
Aleutian alligatorfish	Aspidophoroides bartoni
Bering poacher	Occella dodecaedron
Tubenose poacher	Pallasina barbata
Dragon poacher	Percis japonica
Sturgeon poacher	Podothecus acipenserinus
Sawback poacher	Sarritor frenatus
Family Cyclopteridae	
Careproctus unident.	Careproctus sp.
Snailfish unident.	Cyclopteridae (Liparidinae)
Liparis unident.	Liparis sp.
Family Bathymasteridae	
Searcher	Bathymaster signatus
Northern ronquil	Ronquilus jordani
Family Zoarcidae	
Shortfin eelpout	Lycodes brevipes
Wattled eelpout	Lycodes palearis
Marbled eelpout	Lycodes raridens
Family Stichaeidae	
Decorated warbonnet	Chirolophis decoratus
Bearded warbonnet	Chirolophis snyderi
Daubed shanny	Lumpenus maculatus

Table C-1. --Continued.

Common name	Scientific name
Family Stichaeidae (cont'd)	
Snake prickleback	Lumpenus sagitta
Whitebarred prickleback	Poroclinus rothrocki
Prickleback unident.	Stichaeidae
Family Anarhichadidae	
Bering wolffish	Anarhichas orientalis
Family Zaproridae	
Prowfish	Zaprora silenus
Family Trichodontidae	
Pacific sandfish	Trichodon trichodon
Family Ammodytidae	
Pacific sand lance	Ammodytes hexapterus
Family Pleuronectidae	
Kamchatka flounder	Atheresthes evermanni
Arrowtooth flounder	Atheresthes stomias
Rex sole	Errex zachirus
Flathead sole	Hippoglossoides elassodon
Bering flounder	Hippoglossoides robustus
Pacific halibut	Hippoglossus stenolepis
Dover sole	Microstomus pacificus
Starry flounder	Platichthys stellatus
Yellowfin sole	Pleuronectes asper
Rock sole	Pleuronectes bilineatus
Butter sole	Pleuronectes isolepis
Longhead dab	Pleuronectes proboscideus
Alaska plaice	Pleuronectes quadrituberculatus
Sakhalin sole	Pleuronectes sakhalinensis
Greenland turbot	Reinhardtius hippoglossoides

Table C-2.--Invertebrate species encountered during the 1990 eastern Bering Sea bottom trawl survey.

Common name	Scientific name
Phylum Porifera	
Sponge unident.	Porifera
Phylum Coelenterata	
Sea anemone unident.	Actinaria (order)
Sea raspberry	Eunephthya rubiformis
Sea raspberry unident.	Eunephthya sp.
Hydroid unident.	Hydrozoa (class)
Kamchatka coral	Paragorgia arborea
Sea pen unident.	Pennatulacea (order)
Jellyfish unident.	Scyphozoa (class)
Tealia unident.	Tealia sp.
Phylum Ctenophora	
Comb jelly unident.	Ctenophora
Phylum Mollusca	
Gastropods	
Keeled aforia	Aforia circinata
Alaska volute	Artomelon stearnsii
Northern beringius	Beringius beringii
Kennicott's beringius	Beringius kennicottii
Beringius unident.	Beringius sp.
Stimpson's beringius	Beringius stimpsoni
Boreotrophon unident.	Boreotrophon sp.
Angled whelk	Buccinum angulosum
Sinuous whelk	Buccinum plectrum
Polar whelk	Buccinum polare
Ladder (silky) whelk	Buccinum scalariforme
Buccinum solenum	Buccinum solenum
Buccinum unident.	Buccinum sp.
Thin-ribbed whelk	Colus herendeeni
Colus unident.	Colus sp.
Thick-ribbed whelk	Colus spitzbergensis
Great slippersnail	Crepidula grandis
Slipper shell	Crepidula sp.
Oregon triton	Fusitriton oregonensis
Fusitriton unident.	Fusitriton sp.
Snail unident.	Gastropoda unident.
Aleutian moonsnail	Natica aleutica
Artic moonsnail	Natica clausa
Rusty moonsnail	Natica russa
Nautica unident.	Nautica sp.

Table C-2. --Continued.

Common name	Scientific name
Phylum Mollusca (cont'd)	
Gastropods (cont'd)	
Little neptune	Neptunea borealis
Northern neptune	Neptunea heros
Lyre whelk	Neptunea lyrata
Helmet whelk	Neptunea magma
Pribilof whelk	Neptunea pribiloffensis
Neptunea unident.	Neptunea sp.
Fat whelk	Neptunea ventricosa
Nudibranch unident.	Onchidoridae (family)
Kroyer's plicifus	Plicifusus kroyeri
Plicifusus unident.	Plicifusus sp.
Pale moonsnail	Polinices pallidus
Polinices unident.	Polinices sp.
Snail (gastropod) eggs	Snail (gastropod) eggs
Rosy tritonia	Tritonia diomedea
Volute whelk	Volutopsius castaneus
Warped whelk	Volutopsius deformis
Fragile whelk	Volutopsius fragilis
Tulip whelk	Volutopsius middendorffii
Volutopsius unident.	Volutopsius sp.
Shouldered whelk	Volutopsius stefanssoni
Bivalves	
Bivalve unident.	Bivalvia (class)
Cockle unident.	Cardiidae (family)
Chlamys unident.	Chlamys sp.
Hairy cockle	Clinocardium ciliatum
Nuttal cockle	Clinocardium nuttalii
Clinocardium unident.	Clinocardium sp.
Many-rib cyclocardia	Cyclocardia crebricostata
Arctic hiatella	Hiatella arctica
Macoma unident.	Macoma sp.
Artic surfclam	Macromeris polynyma
Macromeris unident.	Macromeris sp.
Northern horsemussel	Modiolus modiolus
Discordant mussel	Musculus discors
Mussel unident.	Mytilidae (family)
Nuculana unident.	Nuculana sp.
Weathervane scallop	Patinopectin caurinus
Scallop unident.	Pectinidae (family)
Alaska falsejingle	Pododesmus macroschisma
Greenland cockle	Serripes groenlandicus
Broad cockle	Serripes laperousii

Table C-2. --Continued.

Common name	Scientific name
Phylum Mollusca (cont'd)	
Bivalves (cont'd)	
Serripes unident.	Serripes sp.
Northern razor clam	Siliqua alta
Pacific razor clam	Siliqua patula
Siliqua unident.	Siliqua sp.
Tellin unident.	Tellina sp.
Boreal tridonta	Tridonta borealis
Cephalopods	
Gonatus unident.	Gonatus sp.
Octopus unident.	Octopodidae (family)
Pacific bobtail squid	Rossia pacifica
Squid unident.	Teuthoidea (order)
Phylum Annelida	
Sea mouse unident.	Aphroditidae (family)
Depressed scale worm	Eunoe depressa
Giant scale worm	Eunoe nodosa
Eunoe unident.	Eunoe sp.
Scale worm unident.	Polynoidae (family)
Tube worm unident.	Tube worm unident.
Phylum Arthropoda	
Giant barnacle	Balanus evermanni
Balanus unident.	Balanus sp.
Cirripedia unident.	Cirripedia (class)
Barnacle unident.	Thoracica (order)
Crab	
Dungeness crab	Cancer magister
Oregon rock crab	Cancer oregonensis
Broad snow crab	Chionoecetes bairdi
Hybrid snow crab	Chionoecetes hybrid
Narrow snow crab	Chionoecetes opilio
Horsehair crab	Erimacrus isenbeckii
Soft crab	Hapalogaster grebnitzkii
Circumboreal toad crab	Hyas coarctatus
North Pacific toad crab	Hyas lyratus
Hyas unident.	Hyas sp.
Longhorned decorator crab	Oregonia gracilis
Hermit crab unident.	Paguridae (family)
Alaskan hermit crab	Pagurus ochotensis
Fuzzy hermit crab	Pagurus trigonocheirus
Red king crab	Paralithodes camtschatica

Table C-2. --Continued.

Common name	Scientific name
Phylum Arthropoda (cont'd)	
Crab (cont'd)	
Blue king crab	Paralithodes platypus
Helmet crab	Telmessus cheiragonus
Shrimp	
Artic argid	Argis dentata
Northern argid	Argis lar
Argis unident.	Argis sp.
Common crangon	Crangon communis
Ridged crangon	Crangon dalli
Crangon unident.	Crangon sp.
Crangonid shrimp unident.	Crangonidae (family)
Eualus unident.	Eualus sp.
Short-scaled eualid	Eualus suckleyi
Hippolytid shrimp unident.	Hippolytidae (family)
Northern (pink) shrimp	Pandalus borealis
Humpy shrimp	Pandalus goniurus
Tank shrimp	Sclerocrangon boreas
Phylum Sipuncula	
Sipunculid worm unident.	Sipuncula (phylum)
Phylum Bryozoa	
Bryozoan unident.	Bryozoa (phylum)
Leafy bryozoan	Flustra serrulata
Phylum Echinodermata	
Holothuroidea	
Cucumaria unident.	Cucumaria sp.
Sea cucumber unident.	Holothuroidea (class)
Redscaled sea cucumber	Psolus sp.
Echinoidea	
Sand dollar unident.	Clypeasteroida (order)
Parma sand dollar	Echinarachnius parma
Sea urchin unident.	Sea urchin unident.
Green sea urchin	Strongylocentrotus droebachiensis
Asteroidea	
Purple-orange sea star	Asterias amurensis
Asterias unident.	Asterias sp.
Starfish unident.	Asteroidea (subclass)
Red bat star	Ceramaster japonicus
Orange bat star	Ceramaster patagonicus

Table C-2. --Continued.

Common name	Scientific name
Phylum Echinodermata (cont'd)	
Asteroidea (cont'd)	
Rose sea star	Crossaster papposus
Crossaster unident.	Crossaster sp.
Common mud star	Ctenodiscus crispatus
Ctenodiscus unident.	Ctenodiscus sp.
Pincushion sea star	Diplopteridae multipes
Giant sea star	Evasterias echinosoma
Mottled sea star	Evasterias troschelii
Henricia unident.	Henricia sp.
Tumid sea star	Henricia tumida
Arctic sea star	Leptasterias arctica
Knobby six-rayed sea star	Leptasterias polaris
Leptasterias unident.	Leptasterias sp.
Blackspined sea star	Lethasterias nanimensis
Obscure sea star	Pteraster obscurus
Pteraster unident.	Pteraster sp.
Cushion sea star	Pteraster tesselatus
Ophiuroidea	
Basket star	Gorgonocephalus caryi
Notched brittlestar	Ophiura sarsi
Brittlestarfish unident.	Ophiuroidea (subclass)
Phylum Chordata	
Aplidium unident.	Aplidium sp.
Tunicate unident.	Ascidian unident.
Sea onion	Boltenia ovifera
Sea onion unident.	Boltenia sp.
Compound ascidian unident.	Compound ascidian unident.
Sea peach	Halocynthia aurantium
Sea peach unident.	Halocynthis sp.
Sea potato	Styela rustica
Salps unident.	Thaliacea (class)

APPENDIX D

Rank Order of Relative Abundance of Fish and Invertebrates

Appendix D ranks all fish and invertebrates caught during the 1990 eastern Bering Sea bottom trawl survey by descending CPUE.

List of Tables

Table D-l. --Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1990 eastern Bering Sea bottom trawl survey.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	165.16666	487.355	128.56650	201.76682	0.42053784	0.42053784	WALLEYE POLLOCK
2	10210	47.12750	10.468	41.76340	52.49161	0.11999334	0.54053118	YELLOWFIN SOLE
3	10260	30.40698	3.793	27.17795	33.63602	0.07742051	0.61795169	ROCK SOLE
4	68580	16.46350	2.630	13.77497	19.15202	0.04191841	0.65987010	NARROW SNOW CRAB(=TANNER CRAB(OPILIO))
5	21720	15.29105	1.317	13.38814	17.19395	0.03893318	0.69880328	PACIFIC COD
6	81742	14.85911	1.590	12.76847	16.94975	0.03783341	0.73663669	PURPLE-ORANGE SEASTAR
7	10130	13.52395	1.479	11.50760	15.54029	0.03443389	0.77107058	FLATHEAD SOLE
8	00400	12.36692	2.079	9.97634	14.75751	0.03148795	0.80255853	SKATE UNIDENT.
9	10285	11.34643	1.182	9.54415	13.14870	0.02888962	0.83144814	ALASKA PLAICE
10	69010	10.21797	0.593	8.94090	11.49504	0.02601641	0.85746456	HERMIT CRAB UNIDENT.
11	10110	9.09279	0.663	7.74294	10.44264	0.02315154	0.88061610	ARROWTOOTH FLOUNDER
12	68560	3.92219	0.163	3.25274	4.59165	0.00998646	0.89060255	BROAD SNOW CRAB (=TANNER CRAB(BAIRDI))
13	80000	3.62545	0.466	2.49375	4.75715	0.00923090	0.89983346	STARFISH UNIDENT.
14	83020	3.58651	0.561	2.34422	4.82879	0.00913175	0.90896521	GORGONOCEPHALUS CARYI
15	71820	2.59325	0.361	1.59755	3.58895	0.00660278	0.91556799	PRIBILOF WHELK
16	98082	2.45468	0.264	1.60296	3.30639	0.00624996	0.92181794	SEA POTATO
17	71884	2.37441	0.107	1.83309	2.91572	0.00604558	0.92786352	NEPTUNEA HEROS
18	10120	1.93224	0.027	1.65775	2.20672	0.00491975	0.93278327	PACIFIC HALIBUT
19	21375	1.58458	0.048	1.22278	1.94637	0.00403456	0.93681783	MYOXOCEPHALUS SP.
20	69322	1.49251	0.120	0.91829	2.06673	0.00380015	0.94061798	RED KING CRAB
21	43000	1.03177	0.034	0.72661	1.33693	0.00262703	0.94324501	SEA ANEMONE UNIDENT.
22	71870	0.88523	0.021	0.64453	1.12592	0.00225391	0.94549892	LYRE WHELK
23	81741	0.85503	0.127	0.26494	1.44511	0.00217702	0.94767594	ASTERIAS SP.
24	40500	0.82772	0.020	0.59373	1.06171	0.00210749	0.94978343	JELLYFISH UNIDENT.
25	21348	0.82498	0.079	0.35810	1.29187	0.00210053	0.95188395	BUTTERFLY SCULPIN
26	21371	0.80007	0.043	0.45562	1.14451	0.00203708	0.95392104	PLAIN SCULPIN
27	21370	0.77186	0.045	0.42119	1.12253	0.00196527	0.95588630	GREAT SCULPIN
28	80590	0.76281	0.028	0.48768	1.03794	0.00194223	0.95782853	LEPTASTERIAS POLARIS
29	83000	0.73816	0.063	0.32074	1.15557	0.00187945	0.95970798	BRITTLESTARFISH UNIDENT.
30	20040	0.71636	0.005	0.59584	0.83688	0.00182396	0.96153194	STURGEON POACHER
31	10112	0.70780	0.010	0.54252	0.87309	0.00180217	0.96333411	KAMCHATKA FLOUNDER
32	91000	0.69486	0.045	0.34245	1.04726	0.00176920	0.96510331	SPONGE UNIDENT.
33	71882	0.64302	0.012	0.45994	0.82611	0.00163723	0.96674054	FAT WHELK
34	98100	0.50946	0.017	0.29453	0.72439	0.00129716	0.96803769	SEA ONION UNIDENT.
35	69520	0.46249	0.014	0.26321	0.66177	0.00117756	0.96921526	HYAS SP.
36	10140	0.41699	0.004	0.31548	0.51849	0.00106171	0.97027696	BERING FLOUNDER
37	50000	0.41292	0.087	0.00000	0.90119	0.00105136	0.97132833	POLYCHAETE WORM UNIDENT.
38	71500	0.40367	0.011	0.23040	0.57693	0.00102780	0.97235612	SNAIL UNIDENT.
39	10211	0.40139	0.004	0.30167	0.50111	0.00102200	0.97337812	LONGHEAD DAB
40	24185	0.38704	0.002	0.31536	0.45871	0.00098545	0.97436357	WATTLED EELPOUT
41	71800	0.37290	0.032	0.07549	0.67031	0.00094946	0.97531303	NEPTUNEA SP.
42	83320	0.35726	0.030	0.07157	0.64296	0.00090964	0.97622267	OPHIURA SARSI
43	21420	0.34790	0.007	0.21112	0.48469	0.00088581	0.97710848	BIGMOUTH SCULPIN
44	68577	0.33035	0.007	0.19214	0.46856	0.00084112	0.97794960	CIRCUMBOREAL TOAD CRAB (=HYAS CRAB (ROUND SPINED))

Table D-l. --Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
45	10220	0.32474	0.007	0.18745	0.46203	0.00082684	0.97877643	STARRY FLOUNDER
46	69323	0.32017	0.009	0.16044	0.47990	0.00081520	0.97959163	BLUE KING CRAB
47	10115	0.30414	0.009	0.14962	0.45867	0.00077440	0.98036603	GREENLAND TURBOT (=GREENLAND HALIBUT)
48	24184	0.29330	0.004	0.18863	0.39798	0.00074679	0.98111282	MARBLED EELPOUT (PREV. SPARSE TOOTHED LYCOD)
49	81780	0.29067	0.019	0.06176	0.51959	0.00074009	0.98185291	COMMON MUD STAR
50	98000	0.27282	0.022	0.02877	0.51687	0.00069465	0.98254756	TUNICATE UNIDENT.
51	71001	0.26695	0.019	0.03545	0.49845	0.00067969	0.98322725	SNAIL (GASTROPOD) EGGS
52	10200	0.25591	0.003	0.16698	0.34485	0.00065159	0.98387884	REX SOLE
53	81779	0.25427	0.017	0.03587	0.47268	0.00064742	0.98452626	CTENODISCUS SP.
54	78010	0.24960	0.015	0.04876	0.45044	0.00063552	0.98516178	OCTOPUS UNIDENT.
55	72740	0.24715	0.003	0.15287	0.34144	0.00062929	0.98579107	BUCCINUM SP.
56	72500	0.24420	0.002	0.16829	0.32012	0.00062178	0.98641285	OREGON TRITON
57	98200	0.24239	0.008	0.09214	0.39264	0.00061716	0.98703001	SEA PEACH UNIDENT.
58	21347	0.22037	0.002	0.15539	0.28536	0.00056110	0.98759111	YELLOW IRISH LORD
59	24191	0.20910	0.001	0.14860	0.26960	0.00053240	0.98812351	SHORTFIN EELPOUT
60	72752	0.19683	0.001	0.14001	0.25364	0.00050115	0.98862466	LADDER WHELK (PREV. SILKY WHELK)
61	43020	0.19513	0.006	0.06736	0.32291	0.00049684	0.98912150	METRIDIUM SENILE
62	80020	0.18152	0.003	0.08896	0.27408	0.00046218	0.98958367	EVASTERIAS ECHINOSOMA
63	68578	0.16762	0.002	0.08751	0.24773	0.00042678	0.99001046	NORTH PACIFIC TOAD CRAB(=HYAS CRAB (SHARP SPINED))
64	41201	0.16682	0.002	0.09327	0.24036	0.00042474	0.99043520	SEA RASPBERRY
65	20720	0.15543	0.009	0.00000	0.31146	0.00039574	0.99083093	SEARCHER
66	22200	0.15392	0.001	0.10989	0.19794	0.00039190	0.99122283	SNAILFISH UNIDENT.
67	85201	0.14893	0.012	0.00000	0.32860	0.00037919	0.99160202	CUCUMARIA FALLAX
68	21735	0.12309	0.001	0.05892	0.18726	0.00031341	0.99191542	SAFFRON COD
69	79020	0.12258	0.015	0.00000	0.32411	0.00031210	0.99222753	ROSSIA PACIFICA
70	82510	0.11527	0.001	0.05143	0.17911	0.00029349	0.99252102	GREEN SEA URCHIN
71	80200	0.10756	0.001	0.06211	0.15301	0.00027385	0.99279487	LETHASTERIAS NANIMENSIS
72	95000	0.10680	0.003	0.02038	0.19322	0.00027192	0.99306679	BRYOZOAN UNIDENT.
73	98105	0.10440	0.004	0.00123	0.20756	0.00026581	0.99333260	BOLTENIA OVIFERA
74	23041	0.09438	0.001	0.04250	0.14626	0.00024031	0.99357291	CAPELIN
75	21313	0.08945	0.000	0.05281	0.12609	0.00022775	0.99380066	GYMNOCANTHUS SP.
76	71753	0.08921	0.002	0.01986	0.15856	0.00022714	0.99402780	WARPED WHELK
77	71750	0.08524	0.002	0.01474	0.15573	0.00021703	0.99424483	VOLUTOPSIUS SP. (=PYRULOFUSUS SP.)
78	68781	0.08433	0.003	0.00000	0.17350	0.00021472	0.99445955	TELMESSUS CRAB
79	72743	0.07837	0.000	0.04794	0.10880	0.00019954	0.99465909	BUCCINUM ANGULOSUM
80	21316	0.07754	0.003	0.00000	0.16730	0.00019743	0.99485652	ARMORHEAD SCULPIN
81	21110	0.07580	0.000	0.04632	0.10528	0.00019300	0.99504952	PACIFIC HERRING
82	82500	0.07500	0.001	0.02815	0.12184	0.00019096	0.99524048	SEA URCHIN UNIDENT.
83	69400	0.07297	0.001	0.01293	0.13300	0.00018578	0.99542626	HORSEHAIR CRAB
84	68590	0.06841	0.000	0.04972	0.08711	0.00017419	0.99560046	TANNER CRAB (HYBRID)
85	66031	0.06811	0.000	0.04493	0.09129	0.00017343	0.99577388	NORTHERN SHRIMP (=PINK SHRIMP=NORTHERN PINK SHRIMP)
86	98205	0.06382	0.003	0.00000	0.15215	0.00016249	0.99593637	SEA PEACH
87	75285	0.06307	0.003	0.00000	0.15149	0.00016059	0.99609696	GREENLAND COCKLE
88	72501	0.06115	0.001	0.02312	0.09918	0.00015570	0.99625266	FUSITRITON SP.
89	50010	0.05915	0.003	0.00000	0.15721	0.00015060	0.99640326	TUBE WORM UNIDENT.

Table D-l. --Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
90	85200	0.05798	0.001	0.01574	0.10023	0.00014763	0.99655088	CUCUMARIA SP.
91	71756	0.05493	0.002	0.00000	0.12856	0.00013985	0.99669074	FRAGILE WHELK
92	20322	0.05199	0.001	0.00258	0.10140	0.00013237	0.99682311	BERING WOLFFISH
93	71764	0.04685	0.000	0.02078	0.07291	0.00011928	0.99694239	TULIP WHELK
94	65203	0.04666	0.002	0.00000	0.12211	0.00011879	0.99706118	GIANT BARNACLE
95	23010	0.04611	0.000	0.01976	0.07246	0.00011740	0.99717858	EULACHON
96	72755	0.04538	0.000	0.02661	0.06414	0.00011553	0.99729411	POLAR WHELK
97	98310	0.04272	0.000	0.02743	0.05801	0.00010877	0.99740288	APLIDIUM SP.
98	72751	0.04191	0.000	0.00913	0.07470	0.00010671	0.99750960	SINUOUS WHELK (PREV. LYRE WHELK)
99	21932	0.03905	0.000	0.01604	0.06206	0.00009943	0.99760903	WHITESPOTTED GREENLING
100	50160	0.03851	0.000	0.00596	0.07106	0.00009805	0.99770708	SEA MOUSE UNIDENT.
101	24001	0.03721	0.001	0.00000	0.09890	0.00009474	0.99780182	PROWFISH
102	65100	0.03654	0.001	0.00000	0.09412	0.00009305	0.99789487	BARNACLE UNIDENT.
103	21438	0.03334	0.000	0.01761	0.04907	0.00008489	0.99797976	THORNY SCULPIN
104	22201	0.03292	0.000	0.00769	0.05814	0.00008381	0.99806357	LIPARIS SP.
105	20006	0.03114	0.000	0.02098	0.04129	0.00007927	0.99814284	SAWBACK POACHER
106	21390	0.02942	0.000	0.01736	0.04148	0.00007491	0.99821775	SPINYHEAD SCULPIN
107	80594	0.02764	0.000	0.00464	0.05065	0.00007039	0.99828814	LEPTASTERIAS ARCTICA
108	71835	0.02694	0.000	0.01359	0.04030	0.00006860	0.99835674	NEPTUNEA BOREALIS
109	21446	0.02689	0.000	0.01822	0.03555	0.00006846	0.99842519	ICELUS SP.
110	21725	0.02673	0.001	0.00000	0.06632	0.00006807	0.99849326	ARCTIC COD
111	68510	0.02392	0.000	0.01266	0.03517	0.00006090	0.99855416	LONGHORNED DECORATOR CRAB (=DECORATOR CRAB)
112	10270	0.02127	0.000	0.00013	0.04241	0.00005415	0.99860831	BUTTER SOLE
113	43040	0.02125	0.000	0.00812	0.03438	0.00005410	0.99866241	TEALIA SP.
114	56311	0.02090	0.000	0.00704	0.03477	0.00005322	0.99871563	GIANT SCALE WORM
115	21592	0.02077	0.000	0.00153	0.04000	0.00005288	0.99876851	PACIFIC SANDFISH
116	69090	0.02026	0.000	0.00623	0.03429	0.00005158	0.99882009	PAGURUS OCHOTENSIS
117	81355	0.01976	0.000	0.00747	0.03205	0.00005032	0.99887041	PTERASTER OBSCURUS
118	71769	0.01973	0.000	0.00671	0.03275	0.00005023	0.99892064	BERINGIUS SP.
119	82730	0.01921	0.000	0.00000	0.04553	0.00004892	0.99896956	SAND DOLLAR UNIDENT.
120	71772	0.01898	0.000	0.00684	0.03113	0.00004833	0.99901790	BERINGIUS BERINGII
121	00401	0.01835	0.000	0.00000	0.03821	0.00004673	0.99906463	SKATE EGG CASE UNIDENT.
122	74120	0.01749	0.000	0.00367	0.03130	0.00004452	0.99910915	WEATHERVANE SCALLOP
123	71886	0.01741	0.000	0.00910	0.02572	0.00004433	0.99915349	HELMET WHELK
124	85210	0.01632	0.000	0.00000	0.04139	0.00004156	0.99919504	PSOLUS SP.
125	74000	0.01577	0.000	0.00000	0.04011	0.00004016	0.99923520	BIVALVE UNIDENT.
126	81310	0.01162	0.000	0.00184	0.02141	0.00002960	0.99926480	PTERASTER SP.
127	65201	0.01095	0.000	0.00000	0.02715	0.00002787	0.99929267	BALANUS SP.
128	21350	0.01062	0.000	0.00578	0.01547	0.00002705	0.99931972	TRIGLOPS SP.
129	75110	0.01034	0.000	0.00550	0.01517	0.00002632	0.99934604	MACTROMERIS SP. (=SPISULA SP.)
130	30420	0.01007	0.000	0.00000	0.02366	0.00002563	0.99937167	NORTHERN ROCKFISH
131	21355	0.00945	0.000	0.00632	0.01258	0.00002405	0.99939572	RIBBED SCULPIN
132	85000	0.00931	0.000	0.00039	0.01822	0.00002369	0.99941942	SEA CUCUMBER UNIDENT.
133	20061	0.00928	0.000	0.00400	0.01456	0.00002363	0.99944305	BERING POACHER
134	66570	0.00928	0.000	0.00603	0.01253	0.00002362	0.99946667	ARGIS SP.
135	30040	0.00804	0.000	0.00000	0.01857	0.00002048	0.99948715	ROCKFISH UNIDENT.

Table D-l. --Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
136	22219	0.00797	0.000	0.00000	0.01851	0.00002029	0.99950745	CAREPROCTUS SP.
137	80595	0.00794	0.000	0.00000	0.01814	0.00002023	0.99952767	LEPTASTERIAS SP.
138	81315	0.00768	0.000	0.00170	0.01365	0.00001954	0.99954722	PTERASTER TESSELATUS
139	71010	0.00685	0.000	0.00306	0.01064	0.00001744	0.99956466	NUDIBRANCH UNIDENT.
140	66045	0.00677	0.000	0.00384	0.00969	0.00001723	0.99958188	HUMPY SHRIMP
141	20510	0.00664	0.000	0.00127	0.01202	0.00001692	0.99959880	SABLEFISH
142	42000	0.00658	0.000	0.00000	0.01534	0.00001676	0.99961556	SEA PEN UNIDENT.
143	21341	0.00658	0.000	0.00000	0.01598	0.00001675	0.99963232	DARKFIN SCULPIN
144	75111	0.00651	0.000	0.00250	0.01053	0.00001659	0.99964890	ARCTIC SURFCLAM (PREV. ALASKA SURF CLAM)
145	81095	0.00634	0.000	0.00006	0.01262	0.00001615	0.99966506	ROSE SEA STAR
146	65000	0.00589	0.000	0.00000	0.01204	0.00001499	0.99968004	CIRRIPEDIA (CLASS)
147	40011	0.00557	0.000	0.00000	0.01164	0.00001418	0.99969422	HYDROID UNIDENT.
148	95030	0.00534	0.000	0.00080	0.00989	0.00001361	0.99970783	LEAFY BRYOZOAN
149	72063	0.00495	0.000	0.00237	0.00752	0.00001259	0.99972042	KEELED AFORIA
150	30060	0.00480	0.000	0.00000	0.01140	0.00001221	0.99973263	PACIFIC OCEAN PERCH
151	98300	0.00460	0.000	0.00028	0.00891	0.00001170	0.99974434	COMPOUND ASCIDIAN UNIDENT.
152	71575	0.00457	0.000	0.00136	0.00778	0.00001164	0.99975598	POLINICES SP.
153	74562	0.00453	0.000	0.00000	0.01024	0.00001152	0.99976750	DISCORDANT MUSSEL
154	74050	0.00439	0.000	0.00000	0.01080	0.00001118	0.99977868	MUSSEL UNIDENT.
155	23000	0.00424	0.000	0.00055	0.00793	0.00001080	0.99978948	SMELT UNIDENT.
156	71891	0.00393	0.000	0.00170	0.00615	0.00001000	0.99979948	PLICIFUSUS KROYERI
157	74655	0.00321	0.000	0.00000	0.00705	0.00000817	0.99980765	MANY-RIB CYCLOCARDIA
158	23808	0.00273	0.000	0.00185	0.00360	0.00000695	0.99981460	SNAKE PRICKLEBACK
159	68040	0.00272	0.000	0.00092	0.00453	0.00000694	0.99982154	OREGON ROCK CRAB
160	66611	0.00270	0.000	0.00127	0.00412	0.00000687	0.99982840	NORTHERN ARGID
161	81360	0.00265	0.000	0.00000	0.00703	0.00000674	0.99983514	DIPLOPTERASTER MULTIPES
162	20000	0.00255	0.000	0.00000	0.00591	0.00000648	0.99984162	POACHER UNIDENT.
163	75284	0.00245	0.000	0.00024	0.00466	0.00000623	0.99984786	SERRIPES SP.
164	10212	0.00238	0.000	0.00035	0.00440	0.00000605	0.99985391	SAKHALIN SOLE
165	71525	0.00211	0.000	0.00000	0.00458	0.00000538	0.99985929	NATICA SP.
166	66502	0.00204	0.000	0.00092	0.00316	0.00000520	0.99986449	CRANGON SP.
167	66530	0.00203	0.000	0.00061	0.00345	0.00000517	0.99986966	RIDGED CRANGON
168	68020	0.00200	0.000	0.00000	0.00439	0.00000510	0.99987476	DUNGENESS CRAB
169	74100	0.00183	0.000	0.00000	0.00487	0.00000466	0.99987942	SCALLOP UNIDENT.
170	56300	0.00174	0.000	0.00007	0.00341	0.00000443	0.99988385	SCALE WORM UNIDENT.
171	20050	0.00171	0.000	0.00088	0.00253	0.00000435	0.99988820	ALEUTIAN ALLIGATORFISH
172	74981	0.00165	0.000	0.00000	0.00419	0.00000421	0.99989241	COCKLE UNIDENT.
173	74980	0.00159	0.000	0.00000	0.00406	0.00000404	0.99989645	CLINOCARDIUM SP.
174	71710	0.00154	0.000	0.00000	0.00356	0.00000393	0.99990038	COLUS SP.
175	75201	0.00149	0.000	0.00000	0.00396	0.00000380	0.99990418	TELLINA SP.
176	21921	0.00149	0.000	0.00000	0.00365	0.00000378	0.99990796	ATKA MACKEREL
177	71760	0.00145	0.000	0.00000	0.00385	0.00000369	0.99991165	VOLUTE WHELK
178	71030	0.00130	0.000	0.00013	0.00248	0.00000332	0.99991497	ROSY TRITONIA (PREV.DIOMEDES' TRITON)
179	21441	0.00127	0.000	0.00066	0.00187	0.00000322	0.99991819	SPATULATE SCULPIN
180	69086	0.00126	0.000	0.00000	0.00320	0.00000321	0.99992141	FUZZY HERMIT CRAB

Table D-l. --Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
181	71890	0.00119	0.000	0.00000	0.00315	0.00000302	0.99992443	PLICIFUSUS SP.
182	94000	0.00115	0.000	0.00000	0.00241	0.00000292	0.99992735	SIPUNCULID WORM UNIDENT.
183	75240	0.00111	0.000	0.00000	0.00229	0.00000283	0.99993018	MACOMA SP.
184	23805	0.00110	0.000	0.00050	0.00171	0.00000281	0.99993300	DAUBED SHANNY
185	71726	0.00108	0.000	0.00000	0.00272	0.00000274	0.99993574	THICK-RIBBED WHELK
186	56312	0.00105	0.000	0.00001	0.00209	0.00000266	0.99993840	DEPRESSED SCALE WORM
187	74982	0.00103	0.000	0.00000	0.00261	0.00000263	0.99994103	NUTTAL COCKLE
188	66515	0.00102	0.000	0.00043	0.00161	0.00000260	0.99994363	COMMON CRANGON
189	10180	0.00101	0.000	0.00001	0.00201	0.00000257	0.99994620	DOVER SOLE
190	21339	0.00099	0.000	0.00000	0.00217	0.00000252	0.99994872	MALACOCOTTUS SP.
191	41582	0.00097	0.000	0.00000	0.00258	0.00000247	0.99995119	PARAGORGIA ARBOREA
192	23800	0.00094	0.000	0.00033	0.00156	0.00000240	0.99995359	PRICKLEBACK UNIDENT.
193	71580	0.00087	0.000	0.00004	0.00171	0.00000223	0.99995582	PALE MOONSNAIL
194	20202	0.00085	0.000	0.00027	0.00143	0.00000217	0.99995798	PACIFIC SAND LANCE
195	74983	0.00080	0.000	0.00000	0.00174	0.00000205	0.99996003	HAIRY COCKLE
196	79000	0.00077	0.000	0.00000	0.00163	0.00000196	0.99996199	SQUID UNIDENT.
197	79200	0.00077	0.000	0.00001	0.00152	0.00000196	0.99996395	GONATUS SP.
198	75286	0.00073	0.000	0.00000	0.00160	0.00000187	0.99996581	BROAD COCKLE
199	45000	0.00068	0.000	0.00000	0.00151	0.00000174	0.99996755	COMB JELLY UNIDENT.
200	66580	0.00068	0.000	0.00021	0.00114	0.00000172	0.99996928	ARCTIC ARGID
201	56310	0.00065	0.000	0.00000	0.00141	0.00000166	0.99997094	EUNOE SP.
202	74060	0.00064	0.000	0.00000	0.00133	0.00000163	0.99997257	NORTHERN HORSEMUSSEL (PREV. HORSE MUSSEL)
203	81090	0.00058	0.000	0.00000	0.00155	0.00000148	0.99997405	CROSSASTER SP.
204	30050	0.00058	0.000	0.00000	0.00155	0.00000148	0.99997553	ROUGHEYE ROCKFISH
205	75600	0.00058	0.000	0.00000	0.00134	0.00000148	0.99997701	ALASKA FALSEJINGLE (PREV. ROCK JINGLE)
206	71640	0.00055	0.000	0.00000	0.00145	0.00000139	0.99997840	SLIPPER SHELL
207	21346	0.00054	0.000	0.00000	0.00123	0.00000137	0.99997977	RED IRISH LORD
208	21935	0.00052	0.000	0.00000	0.00138	0.00000133	0.99998109	KELP GREENLING
209	23841	0.00045	0.000	0.00000	0.00120	0.00000115	0.99998224	DECORATED WARBONNET
210	21387	0.00043	0.000	0.00000	0.00115	0.00000110	0.99998334	LEISTER SCULPIN
211	72756	0.00042	0.000	0.00000	0.00112	0.00000107	0.99998441	BUCCINUM SOLENUM
212	80540	0.00042	0.000	0.00002	0.00082	0.00000107	0.99998548	HENRICIA SP.
213	71774	0.00041	0.000	0.00000	0.00108	0.00000104	0.99998651	BERINGIUS STIMPSONI
214	71537	0.00040	0.000	0.00005	0.00075	0.00000102	0.99998753	RUSTY MOONSNAIL
215	80729	0.00039	0.000	0.00000	0.00090	0.00000099	0.99998852	RED BAT STAR
216	20002	0.00032	0.000	0.00000	0.00085	0.00000081	0.99998934	DRAGON POACHER
217	74104	0.00030	0.000	0.00000	0.00080	0.00000077	0.99999011	CHLAMYS SP.
218	71681	0.00027	0.000	0.00000	0.00071	0.00000068	0.99999078	GREAT SLIPPERSNAIL
219	21388	0.00026	0.000	0.00000	0.00056	0.00000065	0.99999144	ANTLERED SCULPIN
220	74641	0.00024	0.000	0.00000	0.00062	0.00000061	0.99999205	BOREAL TRIDONTA
221	74311	0.00024	0.000	0.00000	0.00064	0.00000061	0.99999266	ARCTIC HIATELLA
222	75266	0.00019	0.000	0.00001	0.00037	0.00000049	0.99999315	PACIFIC RAZOR (PREV. PACIFIC RAZOR CLAM)
223	80546	0.00019	0.000	0.00000	0.00044	0.00000048	0.99999363	HENRICIA TUMIDA
224	69316	0.00019	0.000	0.00000	0.00045	0.00000047	0.99999410	HAPALOGASTER GREBNITZKII
225	43082	0.00017	0.000	0.00000	0.00045	0.00000044	0.99999454	CRIBRINOPSIS FERNALDI

Table D-l. --Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90% CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
226	72790	0.00015	0.000	0.00000	0.00041	0.00000039	0.99999493	ALASKA VOLUTE
227	98070	0.00015	0.000	0.00000	0.00039	0.00000038	0.99999531	SALPS UNIDENT.
228	21340	0.00015	0.000	0.00000	0.00039	0.00000037	0.99999568	BLACKFIN SCULPIN
229	23850	0.00015	0.000	0.00000	0.00032	0.00000037	0.99999605	WHITEBARRED PRICKLEBACK
230	23055	0.00014	0.000	0.00000	0.00038	0.00000037	0.99999642	RAINBOW SMELT
231	71770	0.00014	0.000	0.00000	0.00036	0.00000035	0.99999677	BERINGIUS KENNICOTTII
232	21354	0.00012	0.000	0.00000	0.00033	0.00000031	0.99999708	SPECTACLED SCULPIN
233	80730	0.00012	0.000	0.00000	0.00026	0.00000030	0.99999738	ORANGE BAT STAR
234	74435	0.00010	0.000	0.00000	0.00027	0.00000026	0.99999765	NUCULANA SP.
235	21397	0.00009	0.000	0.00000	0.00025	0.00000024	0.99999789	CRESTED SCULPIN
236	20001	0.00009	0.000	0.00000	0.00021	0.00000024	0.99999813	TUBENOSE POACHER
237	21394	0.00009	0.000	0.00000	0.00024	0.00000023	0.99999836	TADPOLE SCULPIN
238	20702	0.00009	0.000	0.00000	0.00023	0.00000022	0.99999858	NORTHERN RONQUIL
239	21342	0.00009	0.000	0.00000	0.00023	0.00000022	0.99999881	IRISH LORD
240	82740	0.00006	0.000	0.00000	0.00017	0.00000016	0.99999897	PARMA SAND DOLLAR
241	21331	0.00006	0.000	0.00000	0.00013	0.00000016	0.99999913	ARTEDIELLUS SP.
242	75267	0.00006	0.000	0.00000	0.00016	0.00000016	0.99999929	ALASKA RAZOR (PREV. NORTHERN RAZOR CLAM)
243	75264	0.00006	0.000	0.00000	0.00016	0.00000015	0.99999944	SILIQUA SP.
244	21315	0.00005	0.000	0.00000	0.00014	0.00000014	0.99999957	ARCTIC STAGHORN SCULPIN
245	72420	0.00003	0.000	0.00000	0.00009	0.00000008	0.99999965	BOREOTROPHON SP. (FORMERLY TROPHONOPSIS SP.)
246	23843	0.00003	0.000	0.00000	0.00008	0.00000008	0.99999973	BEARDED WARBONNET
247	80015	0.00003	0.000	0.00000	0.00008	0.00000008	0.99999981	EVASTERIAS TROSCHELII
248	66170	0.00003	0.000	0.00000	0.00008	0.00000008	0.99999989	EUALUS SP.
249	66150	0.00003	0.000	0.00000	0.00008	0.00000008	0.99999996	HIPPOLYTID SHRIMP UNIDENT.
250	21384	0.00002	0.000	0.00000	0.00004	0.00000004	1.00000000	ENOPHRYS SP.
	TOTAL	392.75101						

APPENDIX E

Abundance Estimates for Principal Fish Species

Appendix E presents estimates of catch-per-unit-effort (CPUE), population numbers and biomass for the principal fish species. Estimates of variance and confidence intervals do not incorporate variation associated with fishing power corrections or measurements of effort. CPUE is measured in kilograms (kg) and numbers (no.) per hectare. Estimates are given separately for each of the 10 geographic strata used in the analysis; estimates for each of the six standard subareas are presented as subtotals of the component strata. Stratum codes correspond to subareas as follows:

Subarea	Stratum
1	10
2	20
3	31
	32 (Pribilof Island high density)
4	41
	42 (Pribilof Island high density)
	43 (St. Matthew Island high density)
5	50
6	61
	62 (St. Matthew Island high density)

List of Tables

Table E-1 --CPUE, population, and biomass estimates for walleye pollock.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	53	53	53	15.79	0.131767E+02	49.65	0.216912E+03
20	31	31	31	30	6.26	0.104807E+01	18.22	0.195147E+02
31	68	67	67	67	86.27	0.171878E+04	108.30	0.231213E+04
32	8	8	8	8	240.75	0.552755E+04	311.69	0.109112E+05
Subtotal	76	75	75	75	99.39	0.147907E+04	125.58	0.201475E+04
41	44	44	44	44	66.37	0.417925E+03	122.40	0.862000E+03
42	31	30	30	30	150.23	0.189892E+04	163.76	0.160389E+04
43	19	19	19	18	68.20	0.554308E+03	84.13	0.688982E+03
Subtotal	94	93	93	92	85.40	0.256753E+03	124.12	0.397467E+03
50	26	25	25	25	146.92	0.319642E+04	167.49	0.519061E+04
61	60	57	57	56	532.92	0.103018E+05	848.68	0.227058E+05
62	7	7	7	7	451.95	0.233371E+05	715.33	0.561743E+05
Subtotal	67	64	64	63	527.42	0.905653E+04	839.61	0.199832E+05
Total	352	341	341	338	165.17	0.487357E+03	252.20	0.996521E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	Upper
10	386,666,332	0.131533942E+17	57.00	156,928,568	616,404,096
20	74,758,265	0.328475593E+15	30.00	37,749,270	111,767,260
31	1,023,712,307	0.206592849E+18	67.00	115,723,144	1,931,701,471
32	273,482,707	0.840012646E+16	7.00	56,725,245	490,240,169
Subtotal	1,297,195,014	0.214992976E+18	71.43	371,548,450	2,222,841,579
41	767,497,348	0.338914727E+17	43.00	396,018,492	1,138,976,204
42	393,209,404	0.924696393E+16	30.00	196,848,366	589,570,443
43	177,576,708	0.306965615E+16	18.00	61,171,900	293,981,515
Subtotal	1,338,283,460	0.462080928E+17	70.97	909,150,294	1,767,416,625
50	649,720,531	0.781111257E+17	25.00	73,984,156	1,225,456,905
61	7,479,718,041	0.176368858E+19	59.00	4,822,244,854	10,137,191,227
62	459,858,720	0.232151932E+17	6.00	87,020,762	832,696,677
Subtotal	7,939,576,760	0.178690377E+19	60.46	5,266,074,362	10,613,079,159
Total	11,686,200,362	0.213969783E+19	85.20	8,772,848,914	14,599,551,810

Table E-l .--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	Upper
10	122,938	0.799026694E+09	57.00	66,315	179,561
20	25,667	0.176413683E+08	30.00	17,090	34,243
31	815,440	0.153575568E+12	67.00	32,580	1,598,300
32	211,240	0.425544151E+10	7.00	56,963	365,518
Subtotal	1,026,680	0.157831010E+12	70.25	233,446	1,819,915
41	416,146	0.164316581E+11	43.00	157,486	674,806
42	360,729	0.109478898E+11	30.00	147,070	574,388
43	143,952	0.246963666E+10	18.00	39,542	248,362
Subtotal	920,826	0.298491846E+11	83.95	576,670	1,264,983
50	569,943	0.481014537E+11	25.00	118,143	1,021,744
61	4,696,839	0.800193864E+12	59.00	2,906,828	6,486,849
62	290,540	0.964455172E+10	6.00	50,228	530,851
Subtotal	4,987,378	0.809838416E+12	60.34	3,187,558	6,787,199
Total	7,653,433	0.104643673E+13	96.68	5,620,139	9,686,726

CONFIDENCE LIMITS

	Total biomass (t) Lower	Upper	Total population Lower	Upper
80 Percent	6,332,099	8,974,767	9,794,716,077	13,577,684,647
90 Percent	5,952,276	9,354,590	9,249,834,028	14,122,566,696
95 Percent	5,620,139	9,686,726	8,772,848,914	14,599,551,810

Table E-2.--CPUE, population, and biomass estimates for Pacific cod.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	54	54	52	5.32	0.133752E+01	12.88	0.128472E+02
20	31	29	29	27	4.34	0.879200E+00	7.40	0.541607E+01
31	68	61	61	60	14.70	0.486997E+01	8.24	0.233344E+01
32	8	8	8	8	14.24	0.117976E+02	8.39	0.162994E+02
Subtotal	76	69	69	68	14.66	0.416293E+01	8.25	0.207147E+01
41	44	40	40	39	7.66	0.502785E+01	6.46	0.229620E+01
42	31	31	31	31	22.93	0.198436E+02	19.18	0.126773E+02
43	19	17	17	17	9.83	0.724557E+01	19.04	0.171167E+02
Subtotal	94	88	88	87	11.49	0.296214E+01	11.76	0.206122E+01
50	26	25	25	24	16.21	0.149846E+02	4.03	0.111187E+01
61	60	57	57	54	33.50	0.220430E+02	7.91	0.103617E+01
62	7	7	7	7	24.76	0.156262E+02	10.31	0.139891E+01
Subtotal	67	64	64	61	32.90	0.192200E+02	8.08	0.906537E+00
Total	352	329	329	319	15.29	0.131739E+01	9.38	0.665379E+00

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	100,308,812	0.779046789E+15	57.00	44,398,072	156,219,553
20	30,343,358	0.911643169E+14	30.00	10,846,340	49,840,375
31	77,855,954	0.208497356E+15	67.00	49,010,771	106,701,137
32	7,357,990	0.125482828E+14	7.00	0	15,735,661
Subtotal	85,213,945	0.221045638E+15	72.78	55,543,164	114,884,726
41	40,516,653	0.902803562E+14	43.00	21,343,854	59,689,452
42	46,064,934	0.730886520E+14	30.00	28,607,488	63,522,380
43	40,185,496	0.762609351E+14	18.00	21,837,987	58,533,005
Subtotal	126,767,083	0.239629943E+15	83.14	95,925,792	157,608,374
50	15,648,630	0.167320697E+14	25.00	7,222,230	24,075,029
61	69,745,951	0.804846785E+14	59.00	51,793,880	87,698,022
62	6,628,117	0.578130646E+12	6.00	4,767,543	8,488,691
Subtotal	76,374,068	0.810628091E+14	59.82	58,367,091	94,381,045
Total	434,655,895	0.142868157E+16	164.50	359,817,087	509,494,704

Table E-2--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	Upper
10	41,425	0.811058859E+08	57.00	23,385	59,465
20	17,802	0.147988719E+08	30.00	9,947	25,658
31	138,987	0.435140753E+09	67.00	97,316	180,658
32	12,493	0.908254505E+07	7.00	5,365	19,620
Subtotal	151,480	0.444223298E+09	69.54	109,397	193,562
41	48,036	0.197681242E+09	43.00	19,665	76,407
42	55,063	0.114404996E+09	30.00	33,222	76,904
43	20,747	0.322815194E+08	18.00	8,810	32,685
Subtotal	123,846	0.344367758E+09	84.53	86,887	160,806
50	62,871	0.225496076E+09	25.00	31,937	93,805
61	295,213	0.171220297E+10	59.00	212,412	378,014
62	15,914	0.645784673E+07	6.00	9,696	22,133
Subtotal	311,127	0.171866081E+10	59.44	228,170	394,084
Total	708,551	0.282865270E+10	142.64	603,245	813,857

CONFIDENCE LIMITS

	Total biomass (t) Lower	Upper	Total population Lower	Upper
80 Percent	639,996	777,106	385,934,761	483,377,029
90 Percent	620,371	796,731	371,987,647	497,324,143
95 Percent	603,245	813,857	359,817,087	509,494,704

Table. E-3.--CPUE, population and biomass estimates for yellowfin sole.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	58	58	58	111.25	0.138846E+03	511.64	0.375403E+04
20	31	31	31	31	89.71	0.247145E+03	486.82	0.951600E+04
31	68	65	65	65	70.30	0.673105E+02	227.90	0.832533E+03
32	8	6	6	6	10.30	0.912915E+01	26.92	0.719022E+02
Subtotal	76	71	71	71	65.20	0.564275E+02	210.83	0.697630E+03
41	44	39	39	39	32.85	0.902053E+02	106.75	0.994016E+03
42	31	29	29	29	25.43	0.545215E+02	81.12	0.643224E+03
43	19	15	15	15	3.88	0.336130E+01	16.75	0.638080E+02
Subtotal	94	83	83	83	25.53	0.333395E+02	83.42	0.370514E+03
50	26	1	1	1	0.16	0.256023E-01	0.25	0.612804E-01
61	60	1	1	1	0.00	0.275343E-05	0.01	0.995411E-04
62	7	2	2	1	0.02	0.183909E-03	0.09	0.357548E-02
Subtotal	67	3	3	2	0.00	0.324175E-05	0.02	0.102992E-03
Total	352	247	247	246	47.13	0.104683E+02	195.52	0.235350E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	3,984,184,493	0.227641257E+18	57.00	3,028,446,262	4,939,922,725
20	1,997,283,772	0.160175266E+18	30.00	1,180,036,527	2,814,531,016
31	2,154,290,058	0.743883245E+17	67.00	1,609,441,995	2,699,138,121
32	23,616,970	0.553546618E+14	7.00	6,021,201	41,212,739
Subtotal	2,177,907,028	0.744436791E+17	67.10	1,632,856,284	2,722,957,773
41	669,377,986	0.390819654E+17	43.00	270,466,008	1,068,289,964
42	194,779,896	0.370839520E+16	30.00	70,429,051	319,130,742
43	35,348,744	0.284287103E+15	18.00	0	70,773,317
Subtotal	899,506,626	0.430746477E+17	51.56	482,674,600	1,316,338,653
50	960,302	0.922179533E+12	25.00	0	2,938,523
61	87,931	0.773190678E+10	59.00	0	263,886
62	59,491	0.147764030E+10	6.00	0	153,554
Subtotal	147,422	0.920954708E+10	61.59	0	339,291
Total	9,059,989,643	0.505335781E+18	135.62	7,652,474,534	10,467,504,753

Table E-3.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	866,296	0.841948704E+10	57.00	682,492	1,050,101
20	368,047	0.415999797E+10	30.00	236,342	499,752
31	664,526	0.601431320E+10	67.00	509,603	819,449
32	9,038	0.702817673E+07	7.00	2,768	15,308
Subtotal	673,564	0.602134138E+10	67.16	518,551	828,578
41	205,966	0.354662176E+10	43.00	85,796	326,136
42	61,068	0.314334274E+09	30.00	24,865	97,272
43	8,186	0.149757610E+08	18.00	55	16,317
Subtotal	275,220	0.387593179E+10	50.78	150,118	400,323
50	621	0.385277620E+06	25.00	0	1,899
61	15	0.213874026E+03	59.00	0	44
62	13	0.760041506E+02	6.00	0	35
Subtotal	28	0.289878176E+03	48.35	0	62
Total	2,183,777	0.224771437E+11	190.20	1,886,934	2,480,620

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	1,990,528	2,377,027	8,143,680,993	9,976,298,294
90 Percent	1,935,208	2,432,347	7,881,372,150	10,238,607,137
95 Percent	1,886,934	2,480,620	7,652,474,534	10,467,504,753

Table E-4.--CPUE, population, and biomass estimates for rock sole.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	58	58	58	79.53	0.579277E+02	752.41	0.872273E+04
20	31	31	31	31	46.50	0.270243E+02	383.89	0.441627E+04
31	68	63	63	62	24.97	0.961021E+01	192.09	0.712193E+03
32	8	8	8	8	21.68	0.247854E+02	88.02	0.637345E+03
Subtotal	76	71	71	70	24.69	0.822581E+01	183.25	0.600944E+03
41	44	40	40	39	15.41	0.177476E+02	74.99	0.519814E+03
42	31	31	31	31	73.51	0.432284E+03	252.18	0.203252E+04
43	19	19	19	19	6.91	0.329355E+01	24.11	0.126990E+02
Subtotal	94	90	90	89	26.69	0.275660E+02	104.49	0.277080E+03
50	26	7	7	5	0.59	0.116373E+00	1.36	0.578537E+00
61	60	50	50	40	5.77	0.119255E+01	12.23	0.630293E+01
62	7	7	7	6	4.62	0.138539E+01	12.28	0.916941E+01
Subtotal	67	57	57	46	5.70	0.104232E+01	12.23	0.551746E+01
Total	352	314	314	299	30.41	0.379338E+01	228.21	0.326065E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	5,859,090,863	0.528939693E+18	57.00	4,402,235,119	7,315,946,607
20	1,574,987,566	0.743356374E+17	30.00	1,018,245,198	2,131,729,935
31	1,815,762,091	0.636357285E+17	67.00	1,311,828,239	2,319,695,943
32	77,226,217	0.490667025E+15	7.00	24,839,090	129,613,344
Subtotal	1,892,988,308	0.641263955E+17	68.00	1,387,199,792	2,398,776,824
41	470,204,613	0.204376657E+17	43.00	181,732,042	758,677,183
42	605,512,345	0.117181249E+17	30.00	384,465,257	826,559,434
43	50,896,964	0.565782968E+14	18.00	35,093,547	66,700,380
Subtotal	1,126,613,922	0.322123688E+17	72.61	768,435,569	1,484,792,275
50	5,272,267	0.870612511E+13	25.00	0	11,350,533
61	107,773,097	0.489583251E+15	59.00	63,496,808	152,049,386
62	7,896,568	0.378944886E+13	6.00	3,133,113	12,660,022
Subtotal	115,669,665	0.493372700E+15	59.88	71,245,676	160,093,654
Total	10,574,622,592	0.700116173E+18	94.86	8,910,925,534	12,238,319,649

Table E-4.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	619,275	0.351269063E+10	57.00	500,553	737,998
20	190,773	0.454877817E+09	30.00	147,222	234,325
31	236,055	0.858689246E+09	67.00	177,517	294,594
32	19,019	0.190813304E+08	7.00	8,688	29,350
Subtotal	255,074	0.877770577E+09	69.68	195,919	314,230
41	96,641	0.697787753E+09	43.00	43,338	149,943
42	176,504	0.249225987E+10	30.00	74,562	278,446
43	14,586	0.146739039E+08	18.00	6,537	22,634
Subtotal	287,730	0.320472153E+10	47.03	173,737	401,723
50	2,271	0.175124368E+07	25.00	0	4,997
61	50,896	0.926321114E+08	59.00	31,637	70,155
62	2,968	0.572541844E+06	6.00	1,116	4,819
Subtotal	53,863	0.932046532E+08	59.71	34,555	73,172
Total	1,408,988	0.814501645E+10	146.46	1,230,295	1,587,681

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	1,292,656	1,525,319	9,493,637,869	11,655,607,314
90 Percent	1,259,355	1,558,621	9,182,792,878	11,966,452,305
95 Percent	1,230,295	1,587,681	8,910,925,534	12,238,319,649

Table E-5.--CPUE, population, and biomass estimates for Hippoglossoides spp.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	42	42	40	2.97	0.246815E+00	9.21	0.602582E+01
20	31	10	10	5	0.24	0.762953E-02	0.54	0.390908E-01
31	68	68	68	66	19.36	0.614399E+01	63.92	0.951202E+02
32	8	8	8	8	4.64	0.110633E+01	14.11	0.205665E+02
Subtotal	76	76	76	74	18.11	0.515257E+01	59.69	0.797960E+02
41	44	42	42	40	4.30	0.113359E+01	16.39	0.114315E+02
42	31	27	27	25	11.20	0.150360E+02	26.84	0.589567E+02
43	19	18	18	18	4.48	0.115582E+01	24.79	0.333112E+02
Subtotal	94	87	87	83	5.88	0.117333E+01	20.36	0.806642E+01
50	26	26	26	26	23.83	0.583520E+01	145.83	0.384940E+03
61	60	59	59	56	31.28	0.304964E+02	106.61	0.206125E+03
62	7	6	6	6	5.12	0.930028E+01	16.42	0.208966E+02
Subtotal	67	65	65	62	29.50	0.265338E+02	100.48	0.179148E+03
Total	352	306	306	290	13.94	0.147255E+01	52.35	0.147315E+02

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	71,708,388	0.365400882E+15	57.00	33,417,251	109,999,525
20	2,227,843	0.657983970E+12	30.00	571,450	3,884,236
31	604,193,043	0.849915246E+16	67.00	420,026,459	788,359,627
32	12,380,152	0.158333054E+14	7.00	2,969,560	21,790,744
Subtotal	616,573,195	0.851498577E+16	67.25	432,235,146	800,911,244
41	102,793,852	0.449454927E+15	43.00	60,014,722	145,572,983
42	64,436,054	0.339904421E+15	30.00	26,788,727	102,083,380
43	52,323,705	0.148412964E+15	18.00	26,728,302	77,919,108
Subtotal	219,553,611	0.937772311E+15	89.99	158,613,705	280,493,517
50	565,727,480	0.579278846E+16	25.00	408,940,117	722,514,843
61	939,563,873	0.160108721E+17	59.00	686,362,863	1,192,764,884
62	10,555,354	0.863597144E+13	6.00	3,364,350	17,746,359
Subtotal	950,119,228	0.160195081E+17	59.06	696,849,940	1,203,388,515
Total	2,425,909,745	0.316311135E+17	147.63	2,073,767,063	2,778,052,427

Table E-5.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	23,154	0.149666532E+08	57.00	15,405	30,904
20	991	0.128421885E+06	30.00	259	1,723
31	183,040	0.548975936E+09	67.00	136,235	229,846
32	4,068	0.851722111E+06	7.00	1,885	6,250
Subtotal	187,108	0.549827658E+09	67.21	140,266	233,950
41	26,989	0.445696704E+08	43.00	13,518	40,460
42	26,902	0.866873563E+08	30.00	7,889	45,914
43	9,464	0.514957237E+07	18.00	4,696	14,232
Subtotal	63,354	0.136406599E+09	62.41	40,004	86,705
50	92,438	0.878112233E+08	25.00	73,134	111,742
61	275,650	0.236882078E+10	59.00	178,258	373,042
62	3,294	0.384353441E+07	6.00	0	8,091
Subtotal	278,944	0.237266432E+10	59.19	181,473	376,415
Total	645,990	0.316180487E+10	99.75	534,280	757,700

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	573,378	718,601	2,196,660,384	2,655,159,107
90 Percent	552,517	739,463	2,131,034,139	2,720,785,351
95 Percent	534,280	757,700	2,073,767,063	2,778,052,427

Table E-6.--CPUE, population, and biomass estimates for Alaska plaice.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	47	47	46	9.20	0.357791E+01	20.25	0.125338E+02
20	31	30	30	30	13.63	0.542920E+01	28.37	0.169577E+02
31	68	56	56	51	14.30	0.524479E+01	18.72	0.937865E+01
32	8	7	7	6	4.28	0.451909E+01	3.49	0.292044E+01
Subtotal	76	63	63	57	13.44	0.442427E+01	17.43	0.787417E+01
41	44	41	41	39	27.31	0.381415E+02	33.24	0.639228E+02
42	31	22	22	19	13.74	0.143738E+02	16.32	0.192976E+02
43	19	16	16	13	13.15	0.154873E+02	12.94	0.137755E+02
Subtotal	94	79	79	71	21.52	0.142056E+02	25.50	0.231033E+02
50	26	0	0	0	0.00	0.	0.00	0.
61	60	15	15	8	3.05	0.135669E+01	1.68	0.405439E+00
62	7	3	3	2	0.66	0.187445E+00	0.33	0.343715E-01
Subtotal	67	18	18	10	2.89	0.117937E+01	1.59	0.352346E+00
Total	352	237	237	214	11.35	0.118174E+01	16.06	0.214381E+01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	Upper
10	157,693,212	0.760040671E+15	57.00	102,468,700	212,917,724
20	116,389,397	0.285434975E+15	30.00	81,890,172	150,888,621
31	176,988,630	0.837998896E+15	67.00	119,159,755	234,817,505
32	3,062,315	0.224833068E+13	7.00	0	6,608,499
Subtotal	180,050,945	0.840247227E+15	67.36	122,144,545	237,957,345
41	208,455,203	0.251326943E+16	43.00	107,295,301	309,615,106
42	39,196,597	0.111257025E+15	30.00	17,657,898	60,735,295
43	27,322,055	0.613746153E+14	18.00	10,862,411	43,781,699
Subtotal	274,973,855	0.268590107E+16	48.90	170,723,910	379,223,801
50	0	0.	0.00	0	0
61	14,825,520	0.314926876E+14	59.00	3,595,959	26,055,082
62	215,194	0.142047217E+11	6.00	0	506,837
Subtotal	15,040,715	0.315068923E+14	59.05	3,808,621	26,272,809
Total	744,148,125	0.460313083E+16	124.01	609,812,465	878,483,784

Table E-6.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	71,609	0.216961758E+09	57.00	42,103	101,115
20	55,939	0.913854198E+08	30.00	36,419	75,460
31	135,131	0.468631582E+09	67.00	91,886	178,376
32	3,753	0.347907306E+07	7.00	0	8,165
Subtotal	138,885	0.472110655E+09	67.96	95,486	182,283
41	171,251	0.149961724E+10	43.00	93,110	249,392
42	32,990	0.828693153E+08	30.00	14,401	51,579
43	27,748	0.690012775E+08	18.00	10,296	45,201
Subtotal	231,990	0.165148783E+10	51.66	150,371	313,608
50	0	0.	0.00	0	0
61	26,923	0.105381771E+09	59.00	6,381	47,465
62	421	0.774654710E+05	6.00	0	1,102
Subtotal	27,344	0.105459237E+09	59.09	6,795	47,894
Total	525,767	0.253740490E+10	112.24	425,894	625,639

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	460,789	590,744	656,694,203	831,602,046
90 Percent	442,161	609,372	631,658,940	856,637,309
95 Percent	425,894	625,639	609,812,465	878,483,784

Table E-7.--CPUE, population, and biomass estimates for Greenland turbot.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	0	0	0	0.00	0.	0.00	0.
20	31	0	0	0	0.00	0.	0.00	0.
31	68	0	0	0	0.00	0.	0.00	0.
32	8	0	0	0	0.00	0.	0.00	0.
Subtotal	76	0	0	0	0.00	0.	0.00	0.
41	44	20	20	16	0.04	0.428549E-03	0.44	0.835945E-02
42	31	1	1	1	0.01	0.345047E-04	0.06	0.419266E-02
43	19	7	7	6	0.12	0.112305E-01	0.40	0.377334E-01
Subtotal	94	28	28	23	0.05	0.577034E-03	0.35	0.448112E-02
50	26	0	0	0	0.00	0.	0.00	0.
61	60	28	28	22	1.45	0.235557E+00	1.43	0.119629E+00
62	7	6	6	3	1.26	0.697248E+00	2.01	0.356464E+00
Subtotal	67	34	34	25	1.44	0.207840E+00	1.47	0.105564E+00
Total	352	62	62	48	0.30	0.868689E-02	0.38	0.463892E-02

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
31	0	0.	0.00	0	0
32	0	0.	0.00	0	0
Subtotal	0	0.	0.00	0	0
41	2,756,152	0.328670719E+12	43.00	1,599,322	3,912,981
42	155,474	0.241720648E+11	30.00	0	472,951
43	839,981	0.168115459E+12	18.00	0	1,701,430
Subtotal	3,751,606	0.520958243E+12	66.17	2,309,501	5,193,711
50	0	0.	0.00	0	0
61	12,593,049	0.929226918E+13	59.00	6,493,204	18,692,895
62	1,290,789	0.147316046E+12	6.00	351,587	2,229,991
Subtotal	13,883,838	0.943958522E+13	60.74	7,740,080	20,027,595
Total	17,635,444	0.996054347E+13	67.44	11,330,742	23,940,145

Table E-7.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
31	0	0.	0.00	0	0
32	0	0.	0.00	0	0
Subtotal	0	0.	0.00	0	0
41	234	0.168493553E+05	43.00	0	496
42	14	0.198930931E+03	30.00	0	43
43	250	0.500356309E+05	18.00	0	720
Subtotal	498	0.670839171E+05	30.89	0	1,026
50	0	0.	0.00	0	0
61	12,785	0.182969821E+08	59.00	4,226	21,345
62	810	0.288152222E+06	6.00	0	2,124
Subtotal	13,596	0.185851343E+08	60.72	4,975	22,216
Total	14,093	0.186522182E+08	61.16	5,457	22,730

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	8,497	19,690	13,547,803	21,723,085
90 Percent	6,878	21,309	12,366,499	22,904,388
95 Percent	5,457	22,730	11,330,742	23,940,145

Table E-8.--CPUE, population, and biomass estimates for Atheresthes spp.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	5	5	3	0.12	0.835756E-02	1.14	0.861564E+00
20	31	0	0	0	0.00	0.	0.00	0.
31	68	40	40	36	7.02	0.374538E+01	20.69	0.310358E+02
32	8	8	8	8	13.55	0.314358E+02	52.36	0.262383E+03
Subtotal	76	48	48	44	7.58	0.336294E+01	23.38	0.278804E+02
41	44	3	3	3	0.45	0.123985E+00	1.24	0.943169E+00
42	31	22	22	18	5.04	0.169740E+01	20.94	0.449931E+02
43	19	0	0	0	0.00	0.	0.00	0.
Subtotal	94	25	25	21	1.38	0.126107E+00	5.38	0.255025E+01
50	26	26	26	24	39.22	0.208965E+02	81.60	0.824240E+02
61	60	55	55	47	23.24	0.114120E+02	34.41	0.253778E+02
62	7	3	3	2	4.84	0.163740E+02	5.30	0.172258E+02
Subtotal	67	58	58	49	21.98	0.998875E+01	32.43	0.221242E+02
Total	352	162	162	141	9.80	0.736637E+00	20.11	0.304706E+01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	8,910,330	0.522445580E+14	57.00	0	23,389,178
20	0	0.	0.00	0	0
31	195,530,283	0.277310144E+16	67.00	90,332,666	300,727,900
32	45,937,853	0.201998462E+15	7.00	12,325,016	79,550,691
Subtotal	241,468,136	0.297509990E+16	73.39	132,615,543	350,320,730
41	7,751,533	0.370827898E+14	43.00	0	20,039,360
42	50,268,037	0.259399597E+15	30.00	17,379,816	83,156,258
43	0	0.	0.00	0	0
Subtotal	58,019,570	0.296482387E+15	38.64	23,184,491	92,854,649
50	316,539,755	0.124035968E+16	25.00	243,989,150	389,090,361
61	303,291,495	0.197123743E+16	59.00	214,447,637	392,135,353
62	3,404,424	0.711890963E+13	6.00	0	9,933,335
Subtotal	306,695,919	0.197835634E+16	59.42	217,691,781	395,700,057
Total	931,633,711	0.654254287E+16	170.99	771,481,984	1,091,785,437

Table E-8.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	931	0.506795966E+06	57.00	0	2,357
20	0	0.	0.00	0	0
31	66,400	0.334656334E+09	67.00	29,855	102,944
32	11,885	0.242011887E+08	7.00	250	23,519
Subtotal	78,284	0.358857523E+09	73.37	40,479	116,089
41	2,803	0.487474390E+07	43.00	0	7,258
42	12,094	0.978605546E+07	30.00	5,706	18,482
43	0	0.	0.00	0	0
Subtotal	14,897	0.146607994E+08	57.40	7,227	22,567
50	152,131	0.314462096E+09	25.00	115,601	188,661
61	204,784	0.886430658E+09	59.00	145,207	264,361
62	3,110	0.676688449E+07	6.00	0	9,475
Subtotal	207,894	0.893197542E+09	59.87	148,121	267,666
Total	454,136	0.158168476E+10	131.39	375,391	532,881

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	402,872	505,400	827,372,558	1,035,894,863
90 Percent	388,197	520,075	797,526,387	1,065,741,034
95 Percent	375,391	532,881	771,481,984	1,091,785,437

Table E-9.--CPUE, population and biomass estimates for Pacific halibut.

CPUE

Stratum	Total hauls	Hauls with catch	Hauls with no.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no./ha)	Variance mean CPUE (no./ha)
10	58	51	51	51	3.24	0.147830E+00	4.69	0.731293E+00
20	31	21	21	21	1.36	0.922767E-01	1.91	0.310640E+00
31	68	48	48	48	2.04	0.117389E+00	0.93	0.458803E-01
32	8	2	2	2	0.35	0.103039E+00	0.16	0.170020E-01
Subtotal	76	50	50	50	1.90	0.990373E-01	0.87	0.385400E-01
41	44	11	11	11	0.41	0.427079E-01	0.08	0.480427E-03
42	31	15	15	15	2.39	0.633375E+00	0.97	0.315121E+00
43	19	4	4	4	0.43	0.642814E-01	0.08	0.165802E-02
Subtotal	94	30	30	30	0.85	0.483170E-01	0.28	0.158533E-01
50	26	17	17	17	2.74	0.498761E+00	0.40	0.123443E-01
61	60	23	23	23	1.97	0.302118E+00	0.24	0.307323E-02
62	7	5	5	5	3.10	0.285602E+01	0.26	0.447332E-02
Subtotal	67	28	28	28	2.04	0.275636E+00	0.24	0.269026E-02
Total	352	197	197	197	1.93	0.274110E-01	1.30	0.260603E-01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	36,484,138	0.443450694E+14	57.00	23,144,743	49,823,533
20	7,830,950	0.522875142E+13	30.00	3,161,618	12,500,281
31	8,796,388	0.409948504E+13	67.00	4,751,675	12,841,101
32	140,038	0.130891638E+11	7.00	0	410,613
Subtotal	8,936,426	0.411257421E+13	67.42	4,885,261	12,987,591
41	474,237	0.188890564E+11	43.00	196,908	751,565
42	2,340,187	0.181677303E+13	30.00	0	5,092,553
43	163,321	0.738704219E+10	18.00	0	343,898
Subtotal	2,977,745	0.184304913E+13	30.87	208,398	5,747,092
50	1,540,402	0.185763207E+12	25.00	652,536	2,428,267
61	2,141,628	0.238714897E+12	59.00	1,163,945	3,119,310
62	164,122	0.184869336E+10	6.00	58,910	269,334
Subtotal	2,305,750	0.240563591E+12	59.88	1,324,804	3,286,696
Total	60,075,410	0.559557710E+14	87.52	45,184,509	74,966,312

Table E-9.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence limits Lower	95% Confidence limits Upper
10	25,201	0.896431811E+07	57.00	19,203	31,198
20	5,587	0.155321997E+07	30.00	3,042	8,132
31	19,295	0.104888844E+08	67.00	12,826	25,765
32	311	0.793258791E+05	7.00	0	977
Subtotal	19,607	0.105682103E+08	67.98	13,114	26,100
41	2,547	0.167915801E+07	43.00	0	5,162
42	5,748	0.365160873E+07	30.00	1,845	9,650
43	908	0.286395984E+06	18.00	0	2,032
Subtotal	9,203	0.561716272E+07	61.31	4,463	13,942
50	10,620	0.750562762E+07	25.00	4,977	16,264
61	17,327	0.234671981E+08	59.00	7,633	27,021
62	1,991	0.118031096E+07	6.00	0	4,649
Subtotal	19,318	0.246475091E+08	63.50	9,395	29,240
Total	89,535	0.588560478E+08	223.96	74,346	104,725

CONFIDENCE LIMITS

	Total biomass (t) Lower	Total biomass (t) Upper	Total population Lower	Total population Upper
80 Percent	79,647	99,424	50,405,301	69,745,520
90 Percent	76,816	102,255	47,621,111	72,529,710
95 Percent	74,346	104,725	45,184,509	74,966,312

APPENDIX F

Population Estimates by Sex and Size Groups for Principal Fish Species

Appendix F presents estimates of the numbers of individuals within the overall survey area by sex and size group for principal fish species.

List of Tables

Table F-1.--Population estimates by sex and size group for walleye pollock.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
50	0	0	38,859	38,859	0.0000	0.0000
70	0	0	747,211	747,211	0.0001	0.0001
80	0	306,635	10,351,803	10,658,438	0.0009	0.0010
90	86,030	102,212	94,015,654	94,203,896	0.0081	0.0090
100	351,460	102,212	201,635,914	202,089,585	0.0173	0.0263
110	3,189,908	1,042,036	252,526,929	256,758,873	0.0220	0.0483
120	2,457,713	1,854,793	202,427,659	206,740,165	0.0177	0.0660
130	1,163,299	2,115,954	142,051,526	145,330,779	0.0124	0.0784
140	1,616,511	6,076,688	169,610,553	177,303,751	0.0152	0.0936
150	1,129,670	2,144,938	176,574,897	179,849,505	0.0154	0.1090
160	1,030,828	5,682,451	125,069,675	131,782,954	0.0113	0.1203
170	2,135,951	1,324,505	74,684,925	78,145,381	0.0067	0.1270
180	1,357,380	6,414,436	29,261,537	37,033,353	0.0032	0.1301
190	918,130	3,371,453	9,971,686	14,261,270	0.0012	0.1313
200	2,591,951	3,520,227	3,724,559	9,836,737	0.0008	0.1322
210	1,450,622	2,644,691	2,197,647	6,292,960	0.0005	0.1327
220	5,088,832	13,098,750	3,971,988	22,159,571	0.0019	0.1346
230	8,848,913	11,111,347	1,336,205	21,296,465	0.0018	0.1364
240	14,466,691	22,133,031	547,241	37,146,964	0.0032	0.1396
250	20,627,341	18,516,648	233,498	39,377,488	0.0034	0.1430
260	14,009,873	17,397,072	0	31,406,945	0.0027	0.1457
270	23,809,667	35,427,442	393,273	59,630,382	0.0051	0.1508
280	18,782,247	12,731,790	0	31,514,037	0.0027	0.1535
290	25,746,054	7,526,768	0	33,272,822	0.0028	0.1563
300	13,721,945	1,444,581	0	15,166,526	0.0013	0.1576
310	4,790,342	3,973,894	0	8,764,235	0.0007	0.1584
320	6,337,988	2,867,528	0	9,205,516	0.0008	0.1592
330	8,589,368	4,440,089	0	13,029,456	0.0011	0.1603
340	4,190,914	7,197,010	0	11,387,924	0.0010	0.1613
350	9,322,677	9,974,685	0	19,297,362	0.0017	0.1629
360	26,661,770	17,880,261	0	44,542,031	0.0038	0.1667
370	32,188,286	22,546,836	0	54,735,122	0.0047	0.1714
380	70,245,168	48,130,492	0	118,375,660	0.0101	0.1815
390	89,967,674	58,145,673	0	148,113,347	0.0127	0.1942
400	173,254,303	83,563,383	0	256,817,686	0.0220	0.2162
410	295,791,348	158,346,441	0	454,137,789	0.0389	0.2550
420	434,092,543	245,253,604	0	679,346,148	0.0581	0.3132
430	499,334,173	310,692,147	0	810,026,320	0.0693	0.3825
440	556,919,758	369,534,109	0	926,453,867	0.0793	0.4618
450	483,907,504	388,879,797	0	872,787,301	0.0747	0.5365
460	454,963,458	363,978,633	0	818,942,091	0.0701	0.6065
470	429,421,885	336,758,721	0	766,180,606	0.0656	0.6721
480	365,223,431	298,010,485	0	663,233,915	0.0568	0.7288
490	305,770,520	304,434,895	0	610,205,415	0.0522	0.7811
500	268,317,069	290,365,956	0	558,683,025	0.0478	0.8289
510	197,878,394	212,596,295	0	410,474,690	0.0351	0.8640
520	139,656,914	153,252,171	0	292,909,086	0.0251	0.8891
530	113,634,696	139,927,303	0	253,561,999	0.0217	0.9108
540	75,854,644	122,391,002	0	198,245,646	0.0170	0.9277
550	62,889,506	92,834,879	0	155,724,385	0.0133	0.9410
560	49,453,924	96,300,261	0	145,754,185	0.0125	0.9535
570	29,062,706	57,853,969	0	86,916,675	0.0074	0.9610
580	29,602,287	52,608,106	0	82,210,392	0.0070	0.9680
590	20,937,607	42,390,742	0	63,328,349	0.0054	0.9734
600	21,812,802	36,434,454	0	58,247,256	0.0050	0.9784
610	17,260,442	33,357,735	0	50,618,177	0.0043	0.9827
620	11,205,873	38,472,155	0	49,678,028	0.0043	0.9870
630	7,917,123	18,463,342	0	26,380,466	0.0023	0.9892
640	7,825,731	20,531,301	0	28,357,032	0.0024	0.9917
650	5,529,960	15,206,880	0	20,736,840	0.0018	0.9934
660	4,511,794	11,429,295	0	15,941,090	0.0014	0.9948

Table F-l. --Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
670	8,558,140	11,161,214	0	19,719,353	0.0017	0.9965
680	944,438	9,435,465	0	10,379,903	0.0009	0.9974
690	1,371,405	5,984,515	0	7,355,920	0.0006	0.9980
700	524,745	6,015,767	0	6,540,512	0.0006	0.9986
710	377,172	3,169,420	0	3,546,593	0.0003	0.9989
720	337,031	3,507,318	0	3,844,350	0.0003	0.9992
730	305,114	1,543,550	0	1,848,664	0.0002	0.9994
740	150,908	1,788,227	0	1,939,135	0.0002	0.9995
750	199,427	1,420,562	0	1,619,989	0.0001	0.9997
760	272,270	815,174	0	1,087,444	0.0001	0.9997
770	82,977	721,238	0	804,214	0.0001	0.9998
780	99,605	659,039	0	758,643	0.0001	0.9999
790	32,612	311,783	0	344,395	0.0000	0.9999
800	92,357	424,893	0	517,250	0.0000	1.0000
810	0	269,196	0	269,196	0.0000	1.0000
820	0	199,960	0	199,960	0.0000	1.0000
840	0	30,810	0	30,810	0.0000	1.0000
Total	5,492,253,800	4,692,573,321	1,501,373,241	11,686,200,362		

Table F-2. --Population estimates by sex and size group for Pacific cod.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
90	54,154	85,352	1,856,198	1,995,704	0.0046	0.0046
100	147,588	291,946	5,023,815	5,463,349	0.0126	0.0172
110	785,352	610,634	6,648,556	8,044,541	0.0185	0.0357
120	2,733,614	1,755,840	7,445,902	11,935,357	0.0275	0.0631
130	2,123,832	2,346,600	7,169,603	11,640,035	0.0268	0.0899
140	5,034,956	3,965,038	5,230,394	14,230,387	0.0327	0.1226
150	5,859,852	7,099,550	5,261,312	18,220,714	0.0419	0.1646
160	7,609,491	7,221,584	5,168,199	19,999,275	0.0460	0.2106
170	7,089,406	5,726,337	2,988,654	15,804,397	0.0364	0.2469
180	5,906,946	4,462,376	1,154,137	11,523,460	0.0265	0.2735
190	4,206,338	3,838,355	956,977	9,001,670	0.0207	0.2942
200	4,441,461	2,074,000	364,733	6,880,193	0.0158	0.3100
210	2,567,656	1,775,442	75,377	4,418,475	0.0102	0.3202
220	1,386,991	1,261,443	0	2,648,434	0.0061	0.3262
230	1,915,677	1,278,405	0	3,194,082	0.0073	0.3336
240	1,933,172	1,226,878	64,716	3,224,766	0.0074	0.3410
250	983,149	1,537,732	0	2,520,880	0.0058	0.3468
260	1,930,191	1,679,300	0	3,609,491	0.0083	0.3551
270	2,755,638	3,094,944	64,716	5,915,298	0.0136	0.3687
280	3,233,691	2,715,282	0	5,948,972	0.0137	0.3824
290	3,599,679	3,806,099	0	7,405,778	0.0170	0.3995
300	4,465,848	3,470,338	0	7,936,186	0.0183	0.4177
310	3,749,849	3,769,566	0	7,519,415	0.0173	0.4350
320	4,006,009	3,151,594	0	7,157,603	0.0165	0.4515
330	4,292,182	4,831,665	0	9,123,847	0.0210	0.4725
340	4,302,583	5,261,477	0	9,564,060	0.0220	0.4945
350	2,849,031	3,320,624	0	6,169,655	0.0142	0.5087
360	4,931,043	3,768,473	0	8,699,516	0.0200	0.5287
370	3,638,769	3,776,904	0	7,415,673	0.0171	0.5457
380	2,472,028	2,730,575	0	5,202,604	0.0120	0.5577
390	1,620,338	2,768,752	0	4,389,091	0.0101	0.5678
400	2,228,254	2,941,638	0	5,169,892	0.0119	0.5797
410	2,156,819	1,823,646	0	3,980,465	0.0092	0.5889
420	1,977,969	1,618,400	0	3,596,369	0.0083	0.5971
430	1,923,394	1,029,301	0	2,952,696	0.0068	0.6039
440	1,154,142	1,764,606	0	2,918,747	0.0067	0.6106
450	1,075,234	1,326,528	0	2,401,762	0.0055	0.6162
460	1,542,740	1,160,951	0	2,703,690	0.0062	0.6224
470	2,523,558	1,169,808	0	3,693,366	0.0085	0.6309
480	1,668,928	1,323,970	0	2,992,898	0.0069	0.6378
490	1,665,867	1,468,098	0	3,133,965	0.0072	0.6450
500	1,137,530	786,676	0	1,924,206	0.0044	0.6494
510	1,300,436	2,701,328	0	4,001,763	0.0092	0.6586
520	1,353,969	1,037,136	0	2,391,105	0.0055	0.6641
530	2,549,143	2,271,894	0	4,821,037	0.0111	0.6752
540	1,782,491	2,370,311	0	4,152,803	0.0096	0.6848
550	2,719,087	2,392,956	0	5,112,043	0.0118	0.6965
560	2,619,036	1,875,218	0	4,494,254	0.0103	0.7069
570	2,720,176	2,939,384	0	5,659,560	0.0130	0.7199
580	3,105,133	2,448,697	0	5,553,831	0.0128	0.7327
590	3,163,886	2,641,220	0	5,805,105	0.0134	0.7460
600	2,672,571	3,847,867	0	6,520,438	0.0150	0.7610
610	3,365,659	3,503,470	0	6,869,129	0.0158	0.7768
620	3,817,305	3,086,946	0	6,904,251	0.0159	0.7927
630	2,067,194	3,908,379	0	5,975,573	0.0137	0.8065
640	3,183,651	2,869,298	0	6,052,949	0.0139	0.8204
650	2,099,683	2,013,705	0	4,113,389	0.0095	0.8298
660	3,853,344	2,271,176	0	6,124,520	0.0141	0.8439
670	2,228,405	1,997,880	0	4,226,285	0.0097	0.8537
680	2,067,624	2,631,769	0	4,699,392	0.0108	0.8645
690	1,317,527	1,280,878	0	2,598,405	0.0060	0.8705

Table F-2. --Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
700	2,389,115	2,522,393	0	4,911,508	0.0113	0.8818
710	1,892,085	1,423,906	0	3,315,991	0.0076	0.8894
720	724,435	3,414,604	0	4,139,039	0.0095	0.8989
730	1,557,104	2,493,258	0	4,050,362	0.0093	0.9082
740	2,175,677	1,961,462	0	4,137,140	0.0095	0.9177
750	885,488	2,877,996	0	3,763,485	0.0087	0.9264
760	592,788	1,931,830	0	2,524,618	0.0058	0.9322
770	891,406	2,029,504	0	2,920,910	0.0067	0.9389
780	1,327,758	1,591,321	0	2,919,079	0.0067	0.9456
790	943,758	957,414	0	1,901,172	0.0044	0.9500
800	550,522	2,282,278	0	2,832,800	0.0065	0.9565
810	825,990	2,185,211	0	3,011,201	0.0069	0.9635
820	326,842	448,090	0	774,933	0.0018	0.9652
830	237,783	1,581,682	0	1,819,465	0.0042	0.9694
840	485,917	950,195	0	1,436,112	0.0033	0.9727
850	834,310	957,524	0	1,791,834	0.0041	0.9769
860	368,867	1,125,405	0	1,494,272	0.0034	0.9803
870	349,989	412,577	0	762,566	0.0018	0.9820
880	119,442	691,869	0	811,311	0.0019	0.9839
890	852,675	554,923	0	1,407,599	0.0032	0.9872
900	131,142	750,093	0	881,235	0.0020	0.9892
910	246,594	174,044	0	420,639	0.0010	0.9901
920	86,240	268,463	0	354,703	0.0008	0.9910
930	162,962	202,811	0	365,773	0.0008	0.9918
940	88,585	426,657	0	515,242	0.0012	0.9930
950	204,123	633,983	0	838,106	0.0019	0.9949
960	227,701	535,897	0	763,597	0.0018	0.9967
970	91,612	102,905	0	194,517	0.0004	0.9971
980	17,501	94,300	0	111,800	0.0003	0.9974
990	0	95,308	0	95,308	0.0002	0.9976
1000	0	360,766	0	360,766	0.0008	0.9984
1020	0	455,195	0	455,195	0.0010	0.9995
1030	0	31,418	0	31,418	0.0001	0.9996
1050	0	77,592	0	77,592	0.0002	0.9997
1060	0	85,317	0	85,317	0.0002	0.9999
1070	0	32,492	0	32,492	0.0001	1.0000
Total	189,255,684	195,926,922	49,473,289	434,655,895		

Table F-3. --Population estimates by sex and size group for yellowfin sole.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
80	0	303,861	0	303,861	0.0000	0.0000
90	2,467,209	2,473,322	0	4,940,532	0.0005	0.0006
100	7,575,998	5,315,848	275,425	13,167,272	0.0015	0.0020
110	9,406,130	14,098,368	826,275	24,330,774	0.0027	0.0047
120	28,817,449	24,906,170	137,713	53,861,331	0.0059	0.0107
130	43,045,555	28,187,582	0	71,233,137	0.0079	0.0185
140	46,909,351	49,842,089	0	96,751,440	0.0107	0.0292
150	71,578,518	78,234,353	0	149,812,871	0.0165	0.0457
160	89,405,941	107,913,735	0	197,319,676	0.0218	0.0675
170	152,429,544	135,620,171	0	288,049,715	0.0318	0.0993
180	165,160,888	204,901,264	0	370,062,153	0.0408	0.1402
190	208,596,262	208,707,264	0	417,303,526	0.0461	0.1862
200	201,302,108	212,426,523	0	413,728,631	0.0457	0.2319
210	264,205,831	226,183,402	0	490,389,232	0.0541	0.2860
220	232,875,357	249,916,781	0	482,792,138	0.0533	0.3393
230	223,496,463	243,163,278	0	466,659,742	0.0515	0.3908
240	256,137,078	264,798,766	0	520,935,844	0.0575	0.4483
250	234,197,123	258,260,374	0	492,457,497	0.0544	0.5027
260	246,896,338	260,790,896	0	507,687,234	0.0560	0.5587
270	225,566,631	247,256,335	0	472,822,966	0.0522	0.6109
280	222,856,500	241,953,843	0	464,810,343	0.0513	0.6622
290	236,363,263	218,669,312	0	455,032,576	0.0502	0.7124
300	223,506,094	224,772,367	0	448,278,461	0.0495	0.7619
310	244,870,675	243,519,687	0	488,390,361	0.0539	0.8158
320	167,596,017	281,658,902	0	449,254,919	0.0496	0.8654
330	91,510,264	298,888,973	0	390,399,236	0.0431	0.9085
340	38,881,908	273,153,188	0	312,035,095	0.0344	0.9429
350	15,265,583	204,604,423	0	219,870,007	0.0243	0.9672
360	7,903,488	123,542,098	0	131,445,586	0.0145	0.9817
370	2,944,901	78,107,488	0	81,052,389	0.0089	0.9906
380	951,874	46,656,677	0	47,608,551	0.0053	0.9959
390	286,252	19,147,238	0	19,433,489	0.0021	0.9980
400	0	8,797,907	0	8,797,907	0.0010	0.9990
410	0	5,289,536	0	5,289,536	0.0006	0.9996
420	0	2,004,269	0	2,004,269	0.0002	0.9998
430	0	1,591,028	0	1,591,028	0.0002	1.0000
450	0	86,317	0	86,317	0.0000	1.0000
Total	3,963,006,597	5,095,743,634	1,239,413	9,059,989,643		

Table F-4. --Population estimates by sex and size group for rock sole.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
50	0	0	270,912	270,912	0.0000	0.0000
60	0	0	131,100	131,100	0.0000	0.0000
70	1,195,758	0	2,759,398	3,955,156	0.0004	0.0004
80	7,091,480	1,146,245	25,946,520	34,184,246	0.0032	0.0036
90	23,086,114	14,608,026	136,985,689	174,679,829	0.0165	0.0202
100	96,493,562	44,075,345	406,813,010	547,381,917	0.0518	0.0719
110	203,470,447	95,877,640	389,789,401	689,137,489	0.0652	0.1371
120	287,214,085	185,826,832	280,026,931	753,067,848	0.0712	0.2083
130	306,810,882	175,233,577	176,346,059	658,390,518	0.0623	0.2706
140	293,426,621	202,167,459	119,860,729	615,454,809	0.0582	0.3288
150	322,572,768	256,599,710	78,113,602	657,286,080	0.0622	0.3909
160	310,894,494	282,125,400	37,408,226	630,428,120	0.0596	0.4505
170	309,816,258	225,536,152	16,399,637	551,752,047	0.0522	0.5027
180	274,601,417	219,475,059	10,369,140	504,445,617	0.0477	0.5504
190	234,149,457	218,414,806	645,409	453,209,673	0.0429	0.5933
200	172,901,219	174,285,326	0	347,186,545	0.0328	0.6261
210	176,519,840	163,726,639	0	340,246,479	0.0322	0.6583
220	144,888,866	145,587,293	0	290,476,159	0.0275	0.6858
230	148,338,664	143,611,110	0	291,949,774	0.0276	0.7134
240	130,061,658	144,746,442	0	274,808,100	0.0260	0.7394
250	125,827,364	130,487,693	0	256,315,057	0.0242	0.7636
260	140,037,657	124,235,824	0	264,273,481	0.0250	0.7886
270	137,835,531	118,035,238	0	255,870,769	0.0242	0.8128
280	163,054,277	128,172,236	0	291,226,514	0.0275	0.8403
290	164,636,102	112,562,832	0	277,198,935	0.0262	0.8665
300	166,633,949	93,050,347	0	259,684,296	0.0246	0.8911
310	127,699,430	105,519,277	0	233,218,706	0.0221	0.9132
320	86,485,717	91,928,314	0	178,414,031	0.0169	0.9300
330	38,224,266	86,742,886	0	124,967,152	0.0118	0.9418
340	18,083,990	97,556,251	0	115,640,241	0.0109	0.9528
350	6,698,676	108,986,083	0	115,684,759	0.0109	0.9637
360	1,951,999	94,936,731	0	96,888,731	0.0092	0.9729
370	3,588,226	87,184,348	0	90,772,573	0.0086	0.9815
380	607,157	60,305,656	0	60,912,813	0.0058	0.9872
390	324,497	43,324,331	0	43,648,828	0.0041	0.9914
400	119,798	33,576,117	0	33,695,914	0.0032	0.9945
410	759,173	26,043,980	0	26,803,153	0.0025	0.9971
420	402,425	11,336,832	0	11,739,258	0.0011	0.9982
430	0	6,574,943	0	6,574,943	0.0006	0.9988
440	0	9,094,158	0	9,094,158	0.0009	0.9997
450	0	1,313,114	0	1,313,114	0.0001	0.9998
460	0	1,640,532	0	1,640,532	0.0002	0.9999
470	0	84,463	0	84,463	0.0000	1.0000
480	0	126,695	0	126,695	0.0000	1.0000
490	0	391,057	0	391,057	0.0000	1.0000
Total	4,626,503,826	4,266,253,001	1,681,865,764	10,574,622,592		

Table F-5. --Population estimates by sex and size group for Hippoglossoides spp.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
80	0	203,734	0	203,734	0.0001	0.0001
90	1,374,866	0	0	1,374,866	0.0006	0.0007
100	1,807,996	1,049,185	0	2,857,181	0.0012	0.0018
110	3,215,245	962,973	0	4,178,218	0.0017	0.0036
120	5,460,038	4,545,865	301,262	10,307,165	0.0042	0.0078
130	12,561,280	9,051,992	328,705	21,941,977	0.0090	0.0168
140	34,567,940	25,333,436	493,058	60,394,434	0.0249	0.0417
150	41,718,239	35,595,342	465,615	77,779,196	0.0321	0.0738
160	42,578,043	37,451,886	136,909	80,166,839	0.0330	0.1068
170	38,566,835	35,030,475	0	73,597,310	0.0303	0.1372
180	28,688,164	23,170,214	0	51,858,377	0.0214	0.1586
190	37,990,749	26,809,682	0	64,800,431	0.0267	0.1853
200	39,540,633	30,290,925	0	69,831,557	0.0288	0.2141
210	58,299,102	39,244,013	0	97,543,115	0.0402	0.2543
220	54,928,146	49,136,929	0	104,065,075	0.0429	0.2972
230	63,259,399	44,455,553	0	107,714,952	0.0444	0.3416
240	51,917,081	50,526,362	0	102,443,443	0.0422	0.3838
250	51,385,793	44,727,136	0	96,112,929	0.0396	0.4234
260	50,732,148	48,812,268	0	99,544,416	0.0410	0.4645
270	49,803,622	34,855,741	0	84,659,363	0.0349	0.4993
280	49,278,206	36,722,766	0	86,000,973	0.0355	0.5348
290	51,839,818	39,789,560	0	91,629,378	0.0378	0.5726
300	54,500,996	35,277,298	0	89,778,294	0.0370	0.6096
310	58,533,930	32,941,609	0	91,475,539	0.0377	0.6473
320	67,226,822	42,361,944	0	109,588,766	0.0452	0.6925
330	72,914,824	37,602,949	0	110,517,773	0.0456	0.7380
340	69,670,244	37,108,330	0	106,778,573	0.0440	0.7820
350	66,530,306	37,201,550	0	103,731,856	0.0428	0.8248
360	45,930,244	38,163,391	0	84,093,636	0.0347	0.8595
370	25,961,551	47,821,416	0	73,782,968	0.0304	0.8899
380	22,914,627	46,007,786	0	68,922,414	0.0284	0.9183
390	5,082,653	36,909,039	0	41,991,693	0.0173	0.9356
400	2,495,425	39,207,960	0	41,703,384	0.0172	0.9528
410	3,011,672	28,438,195	0	31,449,867	0.0130	0.9657
420	130,535	27,152,546	0	27,283,081	0.0112	0.9770
430	409,836	17,687,708	0	18,097,544	0.0075	0.9845
440	0	13,569,432	0	13,569,432	0.0056	0.9900
450	85,129	9,954,863	0	10,039,993	0.0041	0.9942
460	0	5,477,335	0	5,477,335	0.0023	0.9964
470	0	4,213,706	0	4,213,706	0.0017	0.9982
480	0	1,901,058	0	1,901,058	0.0008	0.9990
490	0	1,200,383	0	1,200,383	0.0005	0.9995
500	0	1,006,516	0	1,006,516	0.0004	0.9999
510	0	301,005	0	301,005	0.0001	1.0000
Total	1,264,912,136	1,159,272,060	1,725,549	2,425,909,745		

Table F-6.--Population estimates by sex and size group for Alaska plaice.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
110	79,916	0	0	79,916	0.0001	0.0001
120	79,916	79,916	0	159,832	0.0002	0.0003
130	79,916	159,832	0	239,749	0.0003	0.0006
140	655,834	355,573	0	1,011,407	0.0014	0.0020
150	643,996	241,167	0	885,163	0.0012	0.0032
160	780,831	611,826	0	1,392,657	0.0019	0.0051
170	1,434,345	562,650	0	1,996,996	0.0027	0.0077
180	1,891,381	1,286,577	0	3,177,958	0.0043	0.0120
190	2,641,362	908,713	0	3,550,074	0.0048	0.0168
200	3,641,705	2,916,187	0	6,557,892	0.0088	0.0256
210	2,353,566	2,061,420	0	4,414,987	0.0059	0.0315
220	2,477,853	3,190,017	0	5,667,870	0.0076	0.0392
230	2,353,768	2,971,529	0	5,325,297	0.0072	0.0463
240	4,074,099	3,654,784	0	7,728,882	0.0104	0.0567
250	6,614,432	3,994,745	0	10,609,177	0.0143	0.0710
260	7,593,343	5,526,499	0	13,119,842	0.0176	0.0886
270	10,684,914	5,371,924	0	16,056,837	0.0216	0.1102
280	11,586,420	6,183,305	0	17,769,724	0.0239	0.1340
290	24,136,852	7,445,405	0	31,582,257	0.0424	0.1765
300	17,429,564	9,024,145	0	26,453,709	0.0355	0.2120
310	25,173,850	9,830,267	0	35,004,118	0.0470	0.2591
320	26,285,895	11,812,773	0	38,098,668	0.0512	0.3103
330	31,767,948	10,347,234	0	42,115,182	0.0566	0.3669
340	45,087,324	10,499,608	0	55,586,932	0.0747	0.4416
350	45,102,115	12,075,005	0	57,177,121	0.0768	0.5184
360	34,759,592	12,338,576	0	47,098,168	0.0633	0.5817
370	27,815,420	13,523,954	0	41,339,373	0.0556	0.6372
380	16,051,907	11,976,501	0	28,028,408	0.0377	0.6749
390	7,442,619	14,123,375	0	21,565,994	0.0290	0.7039
400	3,292,985	15,309,036	0	18,602,020	0.0250	0.7289
410	1,559,750	20,483,604	0	22,043,354	0.0296	0.7585
420	1,323,470	22,550,541	0	23,874,012	0.0321	0.7906
430	55,606	21,972,916	0	22,028,522	0.0296	0.8202
440	57,228	25,804,264	0	25,861,492	0.0348	0.8549
450	0	23,802,375	0	23,802,375	0.0320	0.8869
460	314,156	19,785,405	0	20,099,561	0.0270	0.9139
470	130,941	18,647,936	0	18,778,877	0.0252	0.9392
480	272,067	15,102,298	0	15,374,365	0.0207	0.9598
490	0	12,502,783	0	12,502,783	0.0168	0.9766
500	0	6,881,864	0	6,881,864	0.0092	0.9859
510	55,606	3,475,079	0	3,530,684	0.0047	0.9906
520	0	2,985,426	0	2,985,426	0.0040	0.9946
530	0	2,167,104	0	2,167,104	0.0029	0.9976
540	0	657,631	0	657,631	0.0009	0.9984
550	0	245,411	0	245,411	0.0003	0.9988
560	0	758,854	0	758,854	0.0010	0.9998
590	0	159,601	0	159,601	0.0002	1.0000
Total	367,782,490	376,365,635	0	744,148,125		

Table F-7. --Population estimates by sex and size group for Greenland turbot.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
90	0	0	494,926	494,926	0.0281	0.0281
100	182,217	36,234	915,479	1,133,930	0.0643	0.0924
110	187,359	36,234	1,291,774	1,515,368	0.0859	0.1783
120	909,674	137,056	858,029	1,904,759	0.1080	0.2863
130	283,205	108,703	144,513	536,421	0.0304	0.3167
140	100,822	100,822	72,257	273,901	0.0155	0.3322
150	0	53,899	0	53,899	0.0031	0.3353
170	144,513	88,641	0	233,154	0.0132	0.3485
180	108,491	133,453	0	241,944	0.0137	0.3622
190	198,412	180,873	0	379,285	0.0215	0.3837
200	173,291	0	0	173,291	0.0098	0.3936
210	100,822	378,805	0	479,627	0.0272	0.4208
220	337,173	0	0	337,173	0.0191	0.4399
230	198,412	118,023	0	316,436	0.0179	0.4578
240	0	332,848	0	332,848	0.0189	0.4767
260	144,639	0	0	144,639	0.0082	0.4849
270	0	52,407	0	52,407	0.0030	0.4879
280	144,725	201,644	0	346,369	0.0196	0.5075
290	86,438	86,930	0	173,368	0.0098	0.5174
300	185,344	173,291	0	358,635	0.0203	0.5377
310	154,258	123,164	0	277,422	0.0157	0.5534
320	174,735	0	0	174,735	0.0099	0.5633
330	146,137	0	0	146,137	0.0083	0.5716
340	144,639	86,438	0	231,076	0.0131	0.5847
350	0	339,592	0	339,592	0.0193	0.6040
360	118,023	151,026	0	269,049	0.0153	0.6192
370	0	208,917	0	208,917	0.0118	0.6311
380	0	328,459	0	328,459	0.0186	0.6497
390	36,234	0	0	36,234	0.0021	0.6518
400	100,822	108,491	0	209,313	0.0119	0.6636
410	36,234	235,234	0	271,468	0.0154	0.6790
420	255,157	465,325	0	720,482	0.0409	0.7199
430	246,970	225,796	0	472,766	0.0268	0.7467
440	324,021	90,134	0	414,154	0.0235	0.7702
450	208,157	53,899	0	262,056	0.0149	0.7850
460	186,888	424,242	0	611,130	0.0347	0.8197
470	146,612	144,639	0	291,251	0.0165	0.8362
480	86,930	251,475	0	338,405	0.0192	0.8554
490	53,899	86,930	0	140,829	0.0080	0.8634
500	53,899	0	0	53,899	0.0031	0.8664
510	458,811	0	0	458,811	0.0260	0.8924
520	0	61,196	0	61,196	0.0035	0.8959
570	0	150,653	0	150,653	0.0085	0.9045
620	0	135,659	0	135,659	0.0077	0.9121
640	32,630	0	0	32,630	0.0019	0.9140
670	145,042	86,930	0	231,971	0.0132	0.9271
680	0	243,366	0	243,366	0.0138	0.9409
730	0	150,653	0	150,653	0.0085	0.9495
800	0	117,210	0	117,210	0.0066	0.9561
810	0	187,337	0	187,337	0.0106	0.9668
830	0	100,407	0	100,407	0.0057	0.9725
870	0	150,653	0	150,653	0.0085	0.9810
890	0	50,203	0	50,203	0.0028	0.9838
900	0	50,203	0	50,203	0.0028	0.9867
910	0	184,531	0	184,531	0.0105	0.9972
920	0	50,203	0	50,203	0.0028	1.0000
Total	6,595,636	7,262,830	3,776,977	17,635,444		

Table F-8. --Population estimates by sex and size group for Atheresthes spp.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
90	0	0	157,135	157,135	0.0002	0.0002
100	365,064	0	0	365,064	0.0004	0.0006
110	234,838	0	0	234,838	0.0003	0.0008
120	251,444	362,881	0	614,325	0.0007	0.0015
130	298,918	149,876	0	448,793	0.0005	0.0020
140	1,746,683	845,382	0	2,592,065	0.0028	0.0047
150	2,912,124	2,706,758	0	5,618,882	0.0060	0.0108
160	4,759,394	7,210,837	0	11,970,231	0.0128	0.0236
170	6,249,788	9,469,084	0	15,718,872	0.0169	0.0405
180	5,587,571	7,686,198	0	13,273,768	0.0142	0.0547
190	3,950,315	8,958,381	0	12,908,696	0.0139	0.0686
200	2,634,682	6,708,358	0	9,343,040	0.0100	0.0786
210	2,581,052	3,924,893	0	6,505,945	0.0070	0.0856
220	1,892,207	2,989,645	0	4,881,852	0.0052	0.0908
230	4,274,580	3,028,979	0	7,303,559	0.0078	0.0987
240	6,691,972	6,118,145	0	12,810,117	0.0138	0.1124
250	11,512,332	11,428,742	0	22,941,074	0.0246	0.1371
260	15,922,106	15,455,736	0	31,377,842	0.0337	0.1707
270	19,502,646	21,451,791	0	40,954,438	0.0440	0.2147
280	20,603,431	24,705,311	0	45,308,743	0.0486	0.2633
290	23,492,676	35,329,337	0	58,822,013	0.0631	0.3265
300	16,986,114	32,564,831	0	49,550,945	0.0532	0.3797
310	14,577,515	27,927,125	0	42,504,640	0.0456	0.4253
320	14,727,456	24,748,843	0	39,476,299	0.0424	0.4677
330	16,872,692	26,200,104	0	43,072,796	0.0462	0.5139
340	12,277,596	30,166,691	0	42,444,287	0.0456	0.5594
350	8,747,974	29,775,839	0	38,523,813	0.0414	0.6008
360	7,875,024	22,604,471	0	30,479,495	0.0327	0.6335
370	8,192,065	17,059,290	0	25,251,355	0.0271	0.6606
380	9,761,928	16,469,357	0	26,231,285	0.0282	0.6888
390	6,576,498	11,013,910	0	17,590,408	0.0189	0.7077
400	12,930,921	15,667,377	0	28,598,298	0.0307	0.7384
410	11,943,801	14,991,110	0	26,934,910	0.0289	0.7673
420	9,086,609	16,442,658	0	25,529,267	0.0274	0.7947
430	5,965,134	21,084,814	0	27,049,948	0.0290	0.8237
440	4,991,850	22,945,766	0	27,937,616	0.0300	0.8537
450	2,543,778	21,310,084	0	23,853,863	0.0256	0.8793
460	3,047,865	18,310,146	0	21,358,011	0.0229	0.9022
470	2,839,692	11,127,479	0	13,967,171	0.0150	0.9172
480	1,114,846	8,410,459	0	9,525,305	0.0102	0.9274
490	1,033,473	7,675,191	0	8,708,664	0.0093	0.9368
500	2,059,880	4,688,433	0	6,748,313	0.0072	0.9440
510	227,949	5,459,040	0	5,686,989	0.0061	0.9501
520	95,676	4,291,035	0	4,386,711	0.0047	0.9548
530	667,008	4,133,657	0	4,800,665	0.0052	0.9600
540	362,038	3,389,722	0	3,751,760	0.0040	0.9640
550	346,524	3,261,528	0	3,608,052	0.0039	0.9679
560	1,340,790	4,253,902	0	5,594,692	0.0060	0.9739
570	31,197	4,452,869	0	4,484,066	0.0048	0.9787
580	295,410	3,676,462	0	3,971,872	0.0043	0.9830
590	0	2,967,658	0	2,967,658	0.0032	0.9862
600	554,455	3,210,282	0	3,764,737	0.0040	0.9902
610	0	2,775,608	0	2,775,608	0.0030	0.9932
620	0	1,208,665	0	1,208,665	0.0013	0.9945
630	0	2,680,824	0	2,680,824	0.0029	0.9974
640	0	1,023,154	0	1,023,154	0.0011	0.9985
650	0	194,937	0	194,937	0.0002	0.9987
660	295,410	520,896	0	816,306	0.0009	0.9995
670	0	209,918	0	209,918	0.0002	0.9998
690	0	129,528	0	129,528	0.0001	0.9999
700	0	89,587	0	89,587	0.0001	1.0000
Total	313,832,990	617,643,586	157,135	931,633,711		

Table F-9. --Population estimates by sex and size group for Pacific halibut.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
120	0	0	29,562	29,562	0.0005	0.0005
150	0	0	64,901	64,901	0.0011	0.0016
160	0	0	169,587	169,587	0.0028	0.0044
170	0	0	245,269	245,269	0.0041	0.0085
180	0	0	297,786	297,786	0.0050	0.0134
190	0	0	533,169	533,169	0.0089	0.0223
200	0	0	374,527	374,527	0.0062	0.0285
210	0	0	638,683	638,683	0.0106	0.0392
220	0	0	344,805	344,805	0.0057	0.0449
230	0	0	726,053	726,053	0.0121	0.0570
240	0	0	1,248,668	1,248,668	0.0208	0.0778
250	0	0	1,505,669	1,505,669	0.0251	0.1028
260	0	0	2,341,794	2,341,794	0.0390	0.1418
270	0	0	2,545,553	2,545,553	0.0424	0.1842
280	0	0	3,876,273	3,876,273	0.0645	0.2487
290	0	0	5,747,848	5,747,848	0.0957	0.3444
300	0	0	5,918,593	5,918,593	0.0985	0.4429
310	0	0	5,647,974	5,647,974	0.0940	0.5369
320	0	0	3,740,160	3,740,160	0.0623	0.5992
330	0	32,660	2,261,665	2,294,325	0.0382	0.6374
340	0	32,660	1,692,180	1,724,841	0.0287	0.6661
350	0	0	1,295,544	1,295,544	0.0216	0.6877
360	0	0	725,318	725,318	0.0121	0.6997
370	0	0	670,719	670,719	0.0112	0.7109
380	0	32,660	412,692	445,352	0.0074	0.7183
390	0	0	339,310	339,310	0.0056	0.7240
400	0	0	530,221	530,221	0.0088	0.7328
410	32,660	0	191,292	223,952	0.0037	0.7365
420	0	32,660	258,849	291,509	0.0049	0.7414
430	0	0	280,009	280,009	0.0047	0.7460
440	0	0	490,390	490,390	0.0082	0.7542
450	0	0	846,245	846,245	0.0141	0.7683
460	0	0	397,195	397,195	0.0066	0.7749
470	0	0	535,791	535,791	0.0089	0.7838
480	0	0	561,255	561,255	0.0093	0.7932
490	0	0	208,883	208,883	0.0035	0.7966
500	0	0	245,782	245,782	0.0041	0.8007
510	0	0	147,763	147,763	0.0025	0.8032
520	41,752	0	183,548	225,300	0.0038	0.8069
530	0	0	245,303	245,303	0.0041	0.8110
540	0	0	221,393	221,393	0.0037	0.8147
550	0	0	367,873	367,873	0.0061	0.8208
560	0	0	252,852	252,852	0.0042	0.8250
570	0	0	198,869	198,869	0.0033	0.8283
580	0	0	361,776	361,776	0.0060	0.8344
590	0	0	253,673	253,673	0.0042	0.8386
600	0	0	163,139	163,139	0.0027	0.8413
610	0	0	210,698	210,698	0.0035	0.8448
620	0	0	284,810	284,810	0.0047	0.8495
630	0	0	420,998	420,998	0.0070	0.8566
640	0	32,660	421,076	453,736	0.0076	0.8641
650	32,660	0	674,685	707,345	0.0118	0.8759
660	0	0	365,878	365,878	0.0061	0.8820
670	0	0	310,808	310,808	0.0052	0.8871
680	0	0	297,484	297,484	0.0050	0.8921
690	0	0	168,079	168,079	0.0028	0.8949
700	41,752	0	411,355	453,106	0.0075	0.9024
710	0	0	334,383	334,383	0.0056	0.9080
720	0	0	182,678	182,678	0.0030	0.9110
730	0	0	95,233	95,233	0.0016	0.9126
740	0	0	246,804	246,804	0.0041	0.9167
750	0	0	353,829	353,829	0.0059	0.9226
760	0	0	146,570	146,570	0.0024	0.9251
770	0	0	156,971	156,971	0.0026	0.9277

Table F-9. --Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative proportion
780	0	0	71,773	71,773	0.0012	0.9289
790	0	0	262,059	262,059	0.0044	0.9332
800	0	0	112,226	112,226	0.0019	0.9351
810	0	0	76,079	76,079	0.0013	0.9364
820	0	0	373,787	373,787	0.0062	0.9426
830	0	0	279,082	279,082	0.0046	0.9472
840	0	0	236,572	236,572	0.0039	0.9512
850	0	0	130,185	130,185	0.0022	0.9533
860	0	0	127,012	127,012	0.0021	0.9555
870	0	0	267,091	267,091	0.0044	0.9599
880	0	0	63,522	63,522	0.0011	0.9610
890	0	0	307,922	307,922	0.0051	0.9661
900	0	0	19,624	19,624	0.0003	0.9664
910	0	0	262,459	262,459	0.0044	0.9708
920	0	0	214,144	214,144	0.0036	0.9743
930	0	0	135,472	135,472	0.0023	0.9766
940	0	0	210,309	210,309	0.0035	0.9801
950	0	0	24,168	24,168	0.0004	0.9805
960	0	0	65,418	65,418	0.0011	0.9816
970	0	0	109,061	109,061	0.0018	0.9834
980	0	0	50,322	50,322	0.0008	0.9842
990	0	0	22,358	22,358	0.0004	0.9846
1010	0	0	28,831	28,831	0.0005	0.9851
1020	0	0	26,453	26,453	0.0004	0.9855
1030	0	0	85,510	85,510	0.0014	0.9870
1040	0	0	119,828	119,828	0.0020	0.9890
1060	0	0	16,524	16,524	0.0003	0.9892
1090	0	0	59,279	59,279	0.0010	0.9902
1100	0	0	81,638	81,638	0.0014	0.9916
1120	0	0	88,019	88,019	0.0015	0.9930
1130	0	0	32,390	32,390	0.0005	0.9936
1170	0	0	30,358	30,358	0.0005	0.9941
1180	0	0	29,410	29,410	0.0005	0.9946
1220	0	0	28,219	28,219	0.0005	0.9950
1230	0	0	49,168	49,168	0.0008	0.9959
1250	0	0	77,103	77,103	0.0013	0.9972
1260	0	0	44,104	44,104	0.0007	0.9979
1340	0	0	32,200	32,200	0.0005	0.9984
1460	0	0	33,020	33,020	0.0005	0.9990
1580	0	0	29,827	29,827	0.0005	0.9995
1760	0	0	32,020	32,020	0.0005	1.0000
Total	148,824	163,302	59,763,285	60,075,410		

APPENDIX G

Age-Length Keys for Principal Fish Species

Appendix G presents age-length keys for principal species of fish by sex and sexes combined. Lengths are expressed in millimeters. Asterisks indicate ages affected by the linear interpolation used to assign age distributions to length classes (in the age-length key) not represented by collected age data.

List of Tables

Table G-1.--Age-length keys for walleye pollock sampled during the 1990 eastern Bering Sea bottom trawl survey.

MALE KEY

LEN GTH	AVG AGE	STD. DEV.	FREQ- UENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
150	1.00	0.00	2	0	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	0
160	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.00	0.00	2	0	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	0
190	1.25	0.50	4	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	2.00	0.00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	1.00	0.00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	2.33	0.58	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	2.17	0.41	6	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.00	0.00	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.00	0.00	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	2.40	0.89	5	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	2.00	0.00	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	2.86	0.69	7	0	0	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	2.50	0.71	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	2.50	0.71	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	3.00	0.00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	3.20	0.45	5	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	3.50	1.00	4	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	4.00	0.00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	4.00	0.00	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	4.00	0.00	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	4.29	0.49	7	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	4.60	0.84	10	0	0	0	0	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	5.08	1.08	12	0	0	0	0	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	5.88	1.20	16	0	0	0	0	2	4	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	5.78	1.06	18	0	0	0	0	2	5	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	6.16	0.90	19	0	0	0	0	1	2	10	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	5.70	1.17	20	0	0	0	0	2	7	9	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	5.79	0.85	19	0	0	0	0	1	5	11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	6.20	0.77	20	0	0	0	0	0	2	14	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.52	1.12	21	0	0	0	0	0	3	11	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.75	1.12	20	0	0	0	0	0	1	11	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	6.74	1.10	19	0	0	0	0	0	2	8	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	6.90	0.91	20	0	0	0	0	0	0	9	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8.70	2.47	20	0	0	0	0	0	1	2	3	7	1	2	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0
510	8.15	1.46	20	0	0	0	0	0	0	1	4	12	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	9.39	2.12	18	0	0	0	0	0	0	2	1	4	1	6	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
530	9.47	1.87	17	0	0	0	0	0	0	1	2	3	1	5	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	10.00	1.69	20	0	0	0	0	0	0	0	0	6	1	7	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
550	10.47	1.81	17	0	0	0	0	0	0	1	0	1	2	5	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0
560	10.83	1.79	18	0	0	0	0	0	0	0	0	3	1	4	1	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0
570	11.40	1.50	20	0	0	0	0	0	0	0	0	1	1	3	4	8	1	2	0	0	0	0	0	0	0	0	0	0	0	0
580	10.00	1.60	15	0	0	0	0	0	0	0	0	4	2	3	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	10.79	1.37	14	0	0	0	0	0	0	0	0	1	1	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-1.--Continued.

MALE KEY

LEN GTH	AVG AGE	STD. DEV.	FREQ- UENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
600	11.62	1.04	13	0	0	0	0	0	0	0	0	0	0	3	1	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0
610	11.36	1.34	14	0	0	0	0	0	0	0	0	1	0	3	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0
620	12.46	1.51	13	0	0	0	0	0	0	0	0	0	0	1	1	7	1	2	0	1	0	0	0	0	0	0	0	0	0	0
630	11.11	1.05	9	0	0	0	0	0	0	0	0	0	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	12.86	2.54	7	0	0	0	0	0	0	0	0	0	0	1	0	4	0	1	0	0	0	1	0	0	0	0	0	0	0	0
650	12.57	2.99	7	0	0	0	0	0	0	0	0	1	0	0	0	4	0	1	0	0	0	1	0	0	0	0	0	0	0	0
660	12.83	1.33	6	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0
670	14.33	1.63	6	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0
680	12.00	0.00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	12.00	0.00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	13.33	1.15	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
* 710	13.00	1.41	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
720	12.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 730	13.50	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
740	15.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
750	16.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
* 760	14.67	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3333	0.0	0.0	0.0	.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
* 770	13.33	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6667	0.0	0.0	0.0	.3333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
780	12.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7.67	3.57	578.0	0.0 18.0	40.0	14.0	39.0	38.0	109.0	31.0	79.0	14.0	52.0	13.0	97.5	9.0	13.0	4.5	5.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table G-1.--Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
160	1.00	0.00	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.00	0.63	6	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	2.00	0.00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	2.00	1.41	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	2.00	0.00	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	2.00	0.00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.10	0.32	10	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.25	0.46	8	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	2.14	0.38	7	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 270	2.13	0.38	4.0	0.0	0.0	3.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
280	2.00	0.00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	3.00	1.41	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 300	3.00	1.00	2.0	0.0	0.0	0.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
310	3.00	0.00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	5.00	0.00	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	3.50	0.71	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	4.00	0.00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	4.00	0.53	8	0	0	0	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	3.75	0.50	4	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	4.00	0.00	7	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	4.22	0.83	9	0	0	0	1	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	4.88	1.36	8	0	0	0	0	4	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	4.58	0.67	12	0	0	0	0	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	5.38	0.96	16	0	0	0	0	4	3	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	5.65	1.00	17	0	0	0	0	2	5	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	5.60	0.68	20	0	0	0	0	2	4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	6.10	0.94	21	0	0	0	0	0	5	12	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	5.90	0.45	20	0	0	0	0	0	3	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.75	1.52	20	0	0	0	0	0	1	12	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.72	1.02	18	0	0	0	0	0	1	8	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	7.85	1.53	20	0	0	0	0	0	0	4	2	11	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
490	6.81	1.11	16	0	0	0	0	0	1	8	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	6.90	1.02	20	0	0	0	0	0	1	8	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	7.75	1.71	20	0	0	0	0	0	0	6	1	11	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	8.47	1.68	19	0	0	0	0	0	0	2	2	9	1	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	7.95	1.57	20	0	0	0	0	0	0	5	1	9	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.75	2.00	20	0	0	0	0	0	0	1	0	7	0	6	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0
550	9.95	2.01	19	0	0	0	0	0	0	1	1	4	1	4	2	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-1.--Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
560	10.79	3.22	19	0	0	0	0	0	0	0	0	5	3	2	0	8	0	0	0	0	0	0	0	0	0	1	0	0	0	0
570	10.00	1.73	17	0	0	0	0	0	0	0	0	6	0	5	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	10.35	2.55	17	0	0	0	0	0	0	0	0	5	2	4	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0
590	10.70	1.84	20	0	0	0	0	0	0	0	0	4	1	5	0	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0
600	11.50	2.25	16	0	0	0	0	0	0	0	0	1	0	6	0	7	0	1	0	0	0	1	0	0	0	0	0	0	0	0
610	11.47	1.46	15	0	0	0	0	0	0	0	0	0	0	6	0	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0
620	11.93	1.64	14	0	0	0	0	0	0	0	0	0	1	2	0	9	0	0	2	0	0	0	0	0	0	0	0	0	0	0
630	11.82	1.08	11	0	0	0	0	0	0	0	0	0	0	2	0	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0
640	12.10	1.20	10	0	0	0	0	0	0	0	0	0	0	1	0	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0
650	11.54	1.51	13	0	0	0	0	0	0	0	0	0	0	5	0	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0
660	12.25	2.05	12	0	0	0	0	0	0	0	0	0	0	2	1	6	2	0	0	0	0	1	0	0	0	0	0	0	0	0
670	12.11	1.05	9	0	0	0	0	0	0	0	0	0	0	1	0	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0
680	12.11	1.27	9	0	0	0	0	0	0	0	0	0	0	1	1	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0
690	11.67	0.50	9	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	12.50	1.57	12	0	0	0	0	0	0	0	0	0	0	1	0	8	1	0	1	1	0	0	0	0	0	0	0	0	0	0
710	11.83	0.98	6	0	0	0	0	0	0	0	0	0	0	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
720	12.67	1.15	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
* 730	13.00	1.63	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
740	13.50	2.12	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
750	17.00	1.41	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
760	13.50	3.54	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
770	12.00	0.00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	14.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
790	15.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7.93	3.64	631.5	0.0	18.0	40.0	12.5	44.5	35.0	115.0	21.0	99.0	14.0	59.0	9.0	128.5	10.0	9.5	8.5	3.0	0.0	4.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0

Table G-1.--Continued.

SEXES COMBINED

LEN GTH	AVG AGE	STD. DEV.	FREQ- UENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
80	1.00	0.00	2	0	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	0
90	1.00	0.00	2	0	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	0
100	1.00	0.00	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	1.00	0.00	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	1.00	0.00	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	1.00	0.00	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1.00	0.00	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.07	0.26	15	0	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.00	0.00	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	1.14	0.38	7	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	2.00	0.00	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	1.67	1.15	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	2.08	0.28	13	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	2.08	0.29	12	0	0	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.05	0.22	20	0	0	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.15	0.38	13	0	0	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	2.25	0.62	12	0	0	10	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	2.00	0.00	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	2.75	0.71	8	0	0	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	2.75	0.96	4	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	2.50	0.71	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	3.00	0.00	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	3.50	0.84	6	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	3.50	0.84	6	0	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	4.00	0.00	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	4.00	0.50	9	0	0	0	1	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	3.90	0.32	10	0	0	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	4.14	0.36	14	0	0	0	0	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	4.42	0.84	19	0	0	0	1	12	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	5.00	1.17	20	0	0	0	0	9	5	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	5.32	1.19	28	0	0	0	0	8	9	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	5.59	1.02	34	0	0	0	0	6	8	15	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	5.92	0.97	36	0	0	0	0	3	7	18	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	5.65	0.95	40	0	0	0	0	4	11	23	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	5.95	0.90	40	0	0	0	0	1	10	23	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	6.05	0.64	40	0	0	0	0	0	5	30	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.63	1.32	41	0	0	0	0	0	4	23	2	11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.74	1.06	38	0	0	0	0	0	2	19	6	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	7.31	1.44	39	0	0	0	0	0	2	12	4	18	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
490	6.86	0.99	36	0	0	0	0	0	1	17	4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	7.80	2.08	40	0	0	0	0	0	2	10	6	15	1	2	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0
510	7.95	1.58	40	0	0	0	0	0	0	7	5	23	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	8.92	1.93	37	0	0	0	0	0	0	4	3	13	2	9	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0
530	8.65	1.86	37	0	0	0	0	0	0	6	3	12	3	7	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-1.--Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
540	9.88	1.83	40	0	0	0	0	0	0	1	0	13	1	13	1	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0
550	10.19	1.91	36	0	0	0	0	0	0	2	1	5	3	9	3	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0
560	10.81	2.59	37	0	0	0	0	0	0	0	0	8	4	6	1	15	1	1	0	0	0	0	0	0	0	1	0	0	0	0
570	10.76	1.74	37	0	0	0	0	0	0	0	0	7	1	8	4	14	1	2	0	0	0	0	0	0	0	0	0	0	0	0
580	10.19	2.13	32	0	0	0	0	0	0	0	0	9	4	7	2	9	0	0	0	0	0	1	0	0	0	0	0	0	0	0
590	10.74	1.64	34	0	0	0	0	0	0	0	0	5	2	10	0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0
600	11.55	1.78	29	0	0	0	0	0	0	0	0	1	0	9	1	14	2	1	0	0	0	1	0	0	0	0	0	0	0	0
610	11.41	1.38	29	0	0	0	0	0	0	0	0	1	0	9	0	16	2	0	1	0	0	0	0	0	0	0	0	0	0	0
620	12.19	1.57	27	0	0	0	0	0	0	0	0	0	1	3	1	16	1	2	2	1	0	0	0	0	0	0	0	0	0	0
630	11.50	1.10	20	0	0	0	0	0	0	0	0	0	0	6	0	13	0	1	0	0	0	0	0	0	0	0	0	0	0	0
640	12.41	1.84	17	0	0	0	0	0	0	0	0	0	0	2	0	12	0	1	1	0	0	1	0	0	0	0	0	0	0	0
650	11.90	2.13	20	0	0	0	0	0	0	0	0	1	0	5	0	10	1	1	1	0	0	1	0	0	0	0	0	0	0	0
660	12.44	1.82	18	0	0	0	0	0	0	0	0	0	0	2	1	10	2	1	1	0	0	1	0	0	0	0	0	0	0	0
670	13.00	1.69	15	0	0	0	0	0	0	0	0	0	0	1	0	7	2	2	1	2	0	0	0	0	0	0	0	0	0	0
680	12.09	1.14	11	0	0	0	0	0	0	0	0	0	0	1	1	7	0	2	0	0	0	0	0	0	0	0	0	0	0	0
690	11.73	0.47	11	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	12.67	1.50	15	0	0	0	0	0	0	0	0	0	0	1	0	9	1	2	1	1	0	0	0	0	0	0	0	0	0	0
710	11.83	0.98	6	0	0	0	0	0	0	0	0	0	0	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
720	12.50	1.00	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0
* 730	13.14	1.60		0.0		0.0		0.0		0.0		0.0		0.0		2.0		0.5		0.0		0.0		0.0		0.0		0.0		0.0
			3.5		0.0		0.0		0.0		0.0		0.0		0.0		0.0		1.0		0.0		0.0		0.0		0.0		0.0	
740	14.00	1.73	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
750	16.67	1.15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0
760	13.50	3.54	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
770	12.00	0.00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	13.00	1.41	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
790	15.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7.49	3.78		0.0		86.0		83.0		224.0		178.0		111.0		224.0		21.5		7.0		6.0		0.0		1.0		0.0		0.0
			1260.5		87.0		25.0		73.0		52.0		28.0		22.0		19.0		13.0		0.0		0.0		0.0		0.0		0.0	

Table G-2.--Age-length keys for Pacific cod sampled during the 1990 eastern Bering Sea bottom trawl survey.

MALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
120	1.00	0.00	2	0	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	0
130	1.00	0.00	2	0	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	0
140	1.00	0.00	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	1.00	0.00	2	0	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	0
160	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.00	0.00	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.40	0.55	5	0	3	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
190	1.50	0.58	4	0	2	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
200	1.43	0.53	7	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	1.60	0.55	5	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	2.00	0.00	2	0	0	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
230	1.50	0.71	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.00	0.00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.00	0.00	2	0	0	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
260	2.00	0.00	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	2.00	0.00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	2.00	0.00	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	2.20	0.45	5	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	2.67	0.50	9	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	2.75	0.46	8	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	3.00	0.00	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	2.56	0.53	9	0	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	2.86	0.38	7	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	2.75	0.46	8	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	2.75	0.50	4	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	2.67	0.52	6	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	3.00	0.00	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	3.00	0.00	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	3.60	0.55	5	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	3.20	0.42	10	0	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	3.50	0.55	6	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	3.80	0.45	5	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	4.00	0.00	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	4.00	0.00	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	4.00	0.00	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	4.00	0.00	7	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	4.00	0.00	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	4.00	0.00	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	4.33	0.58	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	4.00	0.00	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	5.00	0.00	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	4.43	0.53	7	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	4.63	0.52	8	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	4.71	0.49	7	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	5.00	0.00	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	5.00	0.00	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-2.--Continued.

MALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
580	5.18	0.40	11	0	0	0	0	0	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	5.00	0.00	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.67	0.50	9	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	6.00	0.00	7	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	5.63	0.52	8	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	6.00	0.00	6	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	6.00	0.00	11	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650	6.13	0.35	8	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	6.13	0.35	8	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	6.29	0.49	7	0	0	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.00	0.00	7	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	6.13	0.35	8	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	6.75	0.50	4	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
710	6.88	0.35	8	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	7.00	0.00	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	7.00	0.00	6	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	7.00	0.00	7	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	6.80	0.45	5	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
760	7.17	0.41	6	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	7.00	0.00	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	7.40	0.55	5	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
790	7.20	0.45	5	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	8.00	0.82	4	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	8.33	0.58	3	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	8.00	0.00	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	8.00	0.00	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
850	8.00	0.00	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	9.20	2.68	5	0	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
870	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
890	10.00	2.83	2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
930	9.00	0.00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	10.00	0.00	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 950	11.33	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6667	0.0	0.0	0.0	.3333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
* 960	12.67	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3333	0.0	0.0	0.0	.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
970	14.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4.56	2.27	402.0	0.0 33.0	50.0 66.0	53.0 48.0	73.0 48.0	22.0 3.0	2.0 0.0	1.0 0.0	3.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0

Table G-2.--Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
110	1.00	0.00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	1.00	0.00	2	0	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	0
130	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.50	0.71	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.00	0.00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	1.00	0.00	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	1.25	0.50	4	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	1.50	0.71	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 220	1.80	0.52	2.5	0.0	0.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230	2.00	0.00	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.00	0.00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.00	0.00	2	0	0	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
260	2.00	0.00	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	2.00	0.00	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	2.40	0.55	5	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	2.00	0.00	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	2.50	0.58	4	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	3.00	0.00	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	2.80	0.45	5	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	2.71	0.49	7	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	2.67	0.52	6	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	2.86	0.38	7	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	3.00	0.00	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	3.17	0.41	6	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	3.00	0.00	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	3.00	0.00	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	3.43	0.53	7	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	3.57	0.53	7	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	3.60	0.55	5	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	4.00	0.00	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	3.80	0.45	5	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	4.00	0.00	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	4.00	0.00	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	4.00	0.00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	4.00	0.00	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	4.00	0.00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	4.25	0.50	4	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	4.33	0.58	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	4.25	0.50	4	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	5.00	0.00	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	4.83	0.41	6	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-2.--Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
550	5.00	0.00	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	5.00	0.00	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	5.00	0.00	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	5.00	0.00	6	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	5.00	0.00	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.75	0.46	8	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	5.86	0.38	7	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	5.83	0.41	6	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	5.70	0.48	10	0	0	0	0	0	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	6.14	0.38	7	0	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650	5.75	0.46	8	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	6.20	0.45	5	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	5.86	0.38	7	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.00	0.00	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	6.00	0.00	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	6.50	0.53	8	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
710	6.67	0.58	3	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	7.00	0.00	7	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	6.88	0.35	8	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	7.13	0.35	8	0	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	7.13	0.35	8	0	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	7.00	0.00	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	7.11	0.33	9	0	0	0	0	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	7.20	0.45	5	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
790	7.50	0.58	4	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	8.14	0.90	7	0	0	0	0	0	0	0	1	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	7.86	0.38	7	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	8.33	0.58	3	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	8.00	0.00	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
850	8.00	0.00	5	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
870	8.00	0.00	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 880	8.00	0.00	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
890	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	9.57	1.99	7	0	0	0	0	0	0	0	0	1	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
* 910	9.50	2.00	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table G-2. --Continued.

FEMALE KEY

LEN GTH	AVG AGE	STD. DEV.	FREQ- UENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
920	9.00	0.00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 930	9.00	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
940	9.00	0.00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1030	13.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4.89	2.30	402.5	0.0	27.5	43.0	59.0	48.0	51.0	66.0	56.0	36.5	12.0	1.0	0.0	0.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table G-2 . . - Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
110	1.00	0.00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	1.00	0.00	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	1.00	0.00	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	1.00	0.00	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1.00	0.00	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	1.13	0.35	8	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	1.25	0.46	8	0	6	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
190	1.25	0.46	8	0	6	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
200	1.36	0.50	11	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	1.57	0.53	7	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	2.00	0.00	2	0	0	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
230	1.80	0.45	5	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	2.00	0.00	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	2.00	0.00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	2.00	0.00	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	2.00	0.00	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	2.20	0.42	10	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	2.10	0.32	10	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	2.62	0.51	13	0	0	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	2.83	0.39	12	0	0	2	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	2.90	0.32	10	0	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	2.63	0.50	16	0	0	6	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	2.77	0.44	13	0	0	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	2.80	0.41	15	0	0	3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	2.92	0.29	12	0	0	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	2.92	0.51	12	0	0	2	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	3.00	0.00	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	3.00	0.00	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	3.50	0.52	12	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	3.35	0.49	17	0	0	0	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	3.55	0.52	11	0	0	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	3.89	0.33	9	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	3.83	0.41	6	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	4.00	0.00	11	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	4.00	0.00	8	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	4.00	0.00	9	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	4.00	0.00	9	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	4.00	0.00	7	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	4.29	0.49	7	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	4.13	0.35	8	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	4.63	0.52	8	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	4.60	0.52	10	0	0	0	0	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	4.71	0.47	14	0	0	0	0	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	4.82	0.40	11	0	0	0	0	2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table G-2.--Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
560	5.00	0.00	9	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	5.00	0.00	11	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	5.12	0.33	17	0	0	0	0	0	15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	5.00	0.00	15	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.71	0.47	17	0	0	0	0	0	5	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	5.93	0.27	14	0	0	0	0	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	5.71	0.47	14	0	0	0	0	0	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	5.81	0.40	16	0	0	0	0	0	3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	6.06	0.24	18	0	0	0	0	0	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650	5.94	0.44	16	0	0	0	0	0	2	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	6.15	0.38	13	0	0	0	0	0	0	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	6.07	0.47	14	0	0	0	0	0	1	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.00	0.00	12	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	6.06	0.24	17	0	0	0	0	0	0	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	6.58	0.51	12	0	0	0	0	0	0	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
710	6.82	0.40	11	0	0	0	0	0	0	2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	7.00	0.00	8	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	6.93	0.27	14	0	0	0	0	0	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	7.07	0.26	15	0	0	0	0	0	0	0	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	7.00	0.41	13	0	0	0	0	0	0	1	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	7.10	0.32	10	0	0	0	0	0	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	7.09	0.30	11	0	0	0	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	7.30	0.48	10	0	0	0	0	0	0	0	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
790	7.33	0.50	9	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	8.09	0.83	11	0	0	0	0	0	0	0	2	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	8.00	0.47	10	0	0	0	0	0	0	0	1	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	8.20	0.45	5	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830	8.00	0.00	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	8.00	0.00	5	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
850	8.00	0.00	7	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	9.00	2.45	6	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
870	8.00	0.00	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	8.00	0.00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
890	9.33	2.31	3	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	9.57	1.99	7	0	0	0	0	0	0	0	0	1	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
* 910	9.50	2.00	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
920	9.00	0.00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
930	9.00	0.00	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	9.50	0.71	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 950	10.40	2.93	1.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6667	0.0	0.0	0.0	.3333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table G-2.--Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
* 960	11.75	4.56		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3333	0.0	.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			1.3333		0.0		0.0		0.0		0.0	.3333		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
970	14.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1030	13.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4.73	2.29		0.0	91.0		101.0		139.0		56.5		3.0		1.0		4.5		0.0		0.0		0.0		0.0		0.0		0.0	
			800.0		60.0		125.0		99.0		104.0		15.0		0.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0	

Table G-3.--Age-length keys for yellowfin sole sampled during the 1990 eastern Bering Sea bottom trawl survey.

MALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
110	3.50	0.71	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	4.00	0.71	5	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	4.71	0.49	7	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	5.36	1.12	11	0	0	0	0	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	6.40	0.70	10	0	0	0	0	0	0	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	5.83	0.58	12	0	0	0	0	0	3	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.58	0.90	12	0	0	0	0	0	2	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.00	1.14	18	0	0	0	0	0	0	5	11	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	7.84	1.30	19	0	0	0	0	0	0	2	8	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	7.06	1.03	17	0	0	0	0	0	1	3	9	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.68	1.20	19	0	0	0	0	0	0	2	10	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	8.05	1.32	21	0	0	0	0	0	1	0	8	2	9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	8.11	1.20	19	0	0	0	0	0	0	2	5	2	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	8.25	1.21	20	0	0	0	0	0	0	1	7	0	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	8.70	0.86	20	0	0	0	0	0	0	0	3	2	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	9.35	1.81	20	0	0	0	0	0	0	0	2	1	12	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
270	9.58	1.87	19	0	0	0	0	0	0	0	2	0	10	4	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
280	9.32	1.00	19	0	0	0	0	0	0	0	1	2	8	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	12.22	3.86	18	0	0	0	0	0	0	0	0	0	7	1	4	0	0	1	0	1	2	0	1	1	0	0	0	0	0	0
300	12.07	2.89	14	0	0	0	0	0	0	0	0	0	4	1	1	2	2	2	1	0	0	0	1	0	0	0	0	0	0	0
310	15.64	4.86	11	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	3	0	1	1	0	1	0	0	0	0
320	17.53	4.96	17	0	0	0	0	0	0	0	0	0	0	0	2	0	3	1	0	0	3	2	2	0	1	0	1	0	1	1
330	16.73	3.47	11	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	2	0	0	0	0	0
340	15.78	5.19	9	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	0	2	0	0	0
350	17.33	1.53	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0
360	16.50	10.61	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
370	20.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
* 380	15.00	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
390	10.00	0.00	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9.48	4.17	358.0	0.0	0.0	2.0	9.0	16.0	35.0	78.0	18.0	94.0	27.5	19.0	3.0	6.0	6.0	2.0	6.0	8.0	7.0	6.0	4.5	4.0	0.0	4.0	1.0	1.0	1.0	1.0

Table G-3 .--Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
110	4.50	0.71	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	4.25	0.50	4	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	4.50	0.58	4	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	5.50	0.84	6	0	0	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	5.60	0.97	10	0	0	0	0	2	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	5.88	0.83	8	0	0	0	0	1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.64	0.50	14	0	0	0	0	0	0	5	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.00	0.50	9	0	0	0	0	0	0	1	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	7.15	1.28	13	0	0	0	0	0	1	2	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	7.69	0.95	13	0	0	0	0	0	0	0	8	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.36	1.28	14	0	0	0	0	0	1	2	6	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	7.89	1.08	18	0	0	0	0	0	0	0	10	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	8.42	1.71	19	0	0	0	0	0	0	0	7	4	5	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
240	8.52	1.47	21	0	0	0	0	0	0	2	5	0	10	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	8.22	1.22	18	0	0	0	0	0	0	1	6	1	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	8.90	0.79	20	0	0	0	0	0	0	0	2	1	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	9.72	1.02	18	0	0	0	0	0	0	0	0	1	9	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	9.82	2.90	17	0	0	0	0	0	0	0	2	1	8	3	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
290	9.60	1.19	20	0	0	0	0	0	0	1	0	0	9	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	9.41	1.00	17	0	0	0	0	0	0	0	1	0	10	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	12.85	3.69	20	0	0	0	0	0	0	0	0	0	2	4	6	0	1	1	1	2	1	0	0	0	2	0	0	0	0	0
320	12.95	3.34	19	0	0	0	0	0	0	0	0	0	2	1	8	0	1	1	1	2	1	1	0	0	1	0	0	0	0	0
330	15.80	4.07	20	0	0	0	0	0	0	0	0	0	0	1	4	1	1	1	1	1	4	1	0	2	1	1	1	0	0	0
340	15.53	3.66	17	0	0	0	0	0	0	0	0	0	1	1	0	3	0	0	1	6	1	0	2	1	0	0	1	0	0	0
350	16.81	3.66	21	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	1	5	0	0	2	2	1	1	2	0	0	0
360	18.05	3.87	19	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	1	2	1	1	2	4	0	0	1	0	1
370	18.05	3.93	20	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	0	2	0	4	4	1	2	0	0	0
380	21.21	3.93	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	1	1	2	0	2	0	2	2
390	20.43	2.30	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	2	0	0	0
400	21.00	2.10	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2	1	0	0	0
410	22.00	2.37	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	0	1	0
* 420	22.00	2.37	4.3333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6667	0.0	0.0	.6667	1.0	1.333	0.0	.6667	0.0	0.0
* 430	22.00	2.37	2.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3333	0.0	0.0	.3333	1.0	.6667	0.0	.3333	0.0	0.0
440	22.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL	11.64	5.45	442.0	0.0	0.0	0.0	9.0	11.0	27.0	73.0	13.0	93.0	31.0	37.0	9.0	7.0	11.0	7.0	20.0	13.0	7.0	8.0	14.0	19.0	10.0	15.0	1.0	4.0	3.0	

Table G-3.--Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
110	4.00	0.82	4	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	4.11	0.60	9	0	0	0	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	4.64	0.50	11	0	0	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	5.41	1.00	17	0	0	0	0	3	7	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	6.00	0.92	20	0	0	0	0	2	1	13	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	5.85	0.67	20	0	0	0	0	1	3	14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.62	0.70	26	0	0	0	0	0	2	7	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.00	0.96	27	0	0	0	0	0	0	6	18	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	7.56	1.32	32	0	0	0	0	0	1	4	15	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	7.33	1.03	30	0	0	0	0	0	1	3	17	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.55	1.23	33	0	0	0	0	0	1	4	16	1	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	7.97	1.20	39	0	0	0	0	0	1	0	18	3	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	8.26	1.46	38	0	0	0	0	0	0	2	12	6	14	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
240	8.39	1.34	41	0	0	0	0	0	0	3	12	0	20	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	8.47	1.06	38	0	0	0	0	0	0	1	9	3	21	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	9.13	1.40	40	0	0	0	0	0	0	0	4	2	26	6	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
270	9.65	1.49	37	0	0	0	0	0	0	0	2	1	19	6	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
280	9.56	2.10	36	0	0	0	0	0	0	0	3	3	16	9	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
290	10.84	3.05	38	0	0	0	0	0	0	1	0	0	16	6	9	0	0	1	0	1	2	0	1	1	0	0	0	0	0	0
300	10.61	2.45	31	0	0	0	0	0	0	0	1	0	14	4	4	2	2	2	1	0	0	0	1	0	0	0	0	0	0	0
310	13.84	4.28	31	0	0	0	0	0	0	0	0	0	2	5	10	0	1	1	1	2	1	3	0	1	3	0	1	0	0	0
320	15.11	4.73	36	0	0	0	0	0	0	0	0	0	2	1	10	0	4	2	1	2	4	3	2	0	2	0	1	0	1	1
330	16.13	3.84	31	0	0	0	0	0	0	0	0	0	0	1	5	2	1	2	2	2	5	2	1	3	3	1	1	0	0	0
340	15.62	4.15	26	0	0	0	0	0	0	0	0	1	1	2	0	3	1	1	1	7	2	1	2	1	0	0	3	0	0	0
350	16.88	3.44	24	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	1	6	1	0	3	2	1	1	2	0	0	0
360	17.90	4.39	21	0	0	0	0	0	0	0	0	0	1	0	0	1	1	3	1	1	2	1	1	2	4	0	0	2	0	1
370	18.14	3.85	21	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	0	2	0	5	4	1	2	0	0	0
380	21.21	3.93	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	1	1	2	0	2	0	2	2
390	19.13	4.26	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2	1	0	1	2	0	0	0
400	21.00	2.10	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2	1	0	0	0
410	22.00	2.37	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	0	1	0
* 420	22.00	2.37	4.3333	0.0 / 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6667	0.0	0.0	0.0	1.0	.6667	1.333	0.0	.6667	0.0
* 430	22.00	2.37	2.6667	0.0 / 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3333	0.0	0.0	0.0	1.0	.3333	.6667	0.0	.3333	0.0
440	22.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL	10.67	5.03	799.0	0.0 / 0.0	0.0	2.0	18.0	27.0	62.0	151.0	31.0	187.0	58.0	56.0	12.0	13.0	17.0	9.0	26.0	21.0	14.0	14.0	18.0	23.0	10.0	19.0	2.0	5.0	4.0

Table G-4.--Age-length keys for rock sole sampled during the 1990 eastern Bering Sea bottom trawl survey.

MALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
80	3.00	0.00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	2.67	0.58	3	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	3.00	0.00	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	3.13	0.35	8	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	3.44	0.53	9	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	3.71	0.49	7	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	4.00	0.00	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3.91	0.30	11	0	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	4.33	0.50	9	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	4.46	0.66	13	0	0	0	1	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	4.50	0.52	12	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	4.73	0.65	11	0	0	0	0	4	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	4.75	0.62	12	0	0	0	0	4	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	5.55	0.82	11	0	0	0	0	1	4	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	5.73	0.79	11	0	0	0	0	0	5	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	5.83	0.58	12	0	0	0	0	0	3	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	6.20	0.79	10	0	0	0	0	0	2	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	6.64	0.50	11	0	0	0	0	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	6.69	0.48	13	0	0	0	0	0	0	4	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	6.82	0.40	11	0	0	0	0	0	0	2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	7.90	1.29	10	0	0	0	0	0	0	0	6	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	9.25	3.65	12	0	0	0	0	0	0	0	5	1	3	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
300	9.27	1.19	11	0	0	0	0	0	0	0	1	2	2	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	9.58	2.71	12	0	0	0	0	0	0	0	4	0	4	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
320	9.57	1.62	7	0	0	0	0	0	0	0	1	0	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	10.78	3.15	9	0	0	0	0	0	0	0	1	2	2	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0
340	10.40	3.21	5	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
350	10.20	0.45	5	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 360	11.71	4.04		0.0		0.0		0.0		0.0		0.0		2.0		0.0		0.0		0.0		0.0		0.5		0.0		0.0		0.0
			3.5		0.0		0.0		0.0		0.0		0.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
370	15.50	6.36	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
380	21.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TOTAL	6.43	3.01		0.0		1.0		52.0		33.0		7.0		17.0		2.0		2.0		0.0		0.0		2.5		0.0		0.0		0.0
			263.5		0.0		24.0		43.0		52.0		15.0		6.0		3.0		3.0		0.0		0.0		1.0		0.0		0.0	

Table G-4. --Continued.

FEMALE KEY

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
90	3.00	0.00	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	2.75	0.50	4	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	3.00	0.00	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	3.17	0.41	6	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	3.60	0.52	10	0	0	0	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	4.13	0.35	8	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	4.00	0.00	11	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	4.27	0.47	11	0	0	0	0	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	4.27	0.47	11	0	0	0	0	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	4.42	0.51	12	0	0	0	0	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	4.92	0.67	12	0	0	0	0	3	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	5.27	0.79	11	0	0	0	0	1	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	5.25	0.45	12	0	0	0	0	0	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	5.50	0.71	10	0	0	0	0	0	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	5.60	0.84	10	0	0	0	0	1	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	5.92	0.64	13	0	0	0	0	0	3	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	5.91	0.83	11	0	0	0	0	0	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	6.50	0.71	10	0	0	0	0	0	1	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	7.00	0.94	10	0	0	0	0	0	0	3	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	7.33	0.89	12	0	0	0	0	0	0	2	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	7.55	0.82	11	0	0	0	0	0	0	1	4	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	7.77	1.92	13	0	0	0	0	0	0	3	5	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
310	7.45	0.69	11	0	0	0	0	0	0	0	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	7.91	0.83	11	0	0	0	0	0	0	0	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	8.64	1.21	11	0	0	0	0	0	0	0	1	6	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	9.09	0.70	11	0	0	0	0	0	0	0	0	2	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	9.36	1.45	14	0	0	0	0	0	0	0	1	2	7	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	10.00	1.29	13	0	0	0	0	0	0	0	0	0	6	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
370	9.90	0.74	10	0	0	0	0	0	0	0	0	0	3	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	10.91	2.02	11	0	0	0	0	0	0	0	0	1	1	3	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
390	12.22	3.15	9	0	0	0	0	0	0	0	0	0	0	3	2	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0
400	14.22	4.21	9	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	1	0	0	0	0	0	0	0	0	0	1	0
410	14.67	4.27	9	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	0	1	0	0	0	0	0	1	0	0
420	16.80	6.30	5	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1
430	15.33	3.44	6	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0
440	16.40	3.78	5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	1	0	0	0	0	0
450	20.50	0.71	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
460	19.25	2.87	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0
470	20.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
480	20.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL	7.77	4.14	358	0	0	1	19	53	52	39	46	29	34	22	16	9	9	2	8	1	0	4	0	7	4	0	0	1	1	1

Table G-4.--Continued.

SEXES COMBINED

LENGTH	AVG AGE	STD. DEV.	FREQUENCY	AGE (IN YEARS) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26+
80	2.67	0.58	3	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	2.67	0.50	9	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	2.91	0.30	11	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	3.07	0.26	15	0	0	0	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	3.41	0.51	17	0	0	0	10	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	3.68	0.48	19	0	0	0	6	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	4.06	0.25	16	0	0	0	0	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3.95	0.21	22	0	0	0	1	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	4.30	0.47	20	0	0	0	0	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	4.38	0.58	24	0	0	0	1	13	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	4.46	0.51	24	0	0	0	0	13	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	4.83	0.65	23	0	0	0	0	7	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	5.00	0.74	23	0	0	0	0	5	14	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	5.39	0.66	23	0	0	0	0	1	13	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	5.62	0.74	21	0	0	0	0	0	11	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	5.73	0.70	22	0	0	0	0	1	6	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	6.04	0.71	23	0	0	0	0	0	5	12	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	6.27	0.77	22	0	0	0	0	0	4	8	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	6.61	0.58	23	0	0	0	0	0	1	7	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	6.90	0.70	21	0	0	0	0	0	0	5	14	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	7.59	1.10	22	0	0	0	0	0	0	2	11	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	8.43	2.78	23	0	0	0	0	0	0	1	9	6	4	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
300	8.46	1.77	24	0	0	0	0	0	0	3	6	3	5	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
310	8.57	2.25	23	0	0	0	0	0	0	0	11	3	5	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
320	8.56	1.42	18	0	0	0	0	0	0	0	5	4	6	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	9.60	2.48	20	0	0	0	0	0	0	0	2	8	3	2	1	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0
340	9.50	1.86	16	0	0	0	0	0	0	0	1	3	6	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
350	9.58	1.30	19	0	0	0	0	0	0	0	1	2	7	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	10.00	1.29	13	0	0	0	0	0	0	0	0	0	6	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
370	10.83	2.98	12	0	0	0	0	0	0	0	0	0	3	5	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
380	11.75	3.49	12	0	0	0	0	0	0	0	0	1	1	3	4	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0
390	12.22	3.15	9	0	0	0	0	0	0	0	0	0	0	3	2	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0
400	14.22	4.21	9	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	1	0	0	0	0	0	0	0	0	0	1	0
410	14.67	4.27	9	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	0	1	0	0	0	0	0	1	0	0
420	16.80	6.30	5	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1
430	15.33	3.44	6	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0
440	16.40	3.78	5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	1	0	0	0	0	0
450	20.50	0.71	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
460	19.25	2.87	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0
470	20.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
480	20.00	0.00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL	7.07	3.75	634	0	0	5	50	111	95	72	98	36	49	37	21	11	12	4	11	1	0	4	0	9	5	0	0	1	1	1

APPENDIX H

Population Estimates by Age for Principal Fish Species

Appendix H presents population estimates and mean lengths at age by sex and for sexes combined. Population estimates listed as "below minimum key length" and "above maximum key length" refer to fish lengths that lack age observations. Asterisks indicate ages affected by the linear interpolation used to assign age distributions to length classes (in the age-length key) not represented by collected age data.

List of Tables

Table H-1.--Population estimates of walleye pollock by age (years), derived from data collected during the 1990 eastern Bering Sea bottom trawl survey. Mean lengths are presented in millimeters.

MALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	8,864,921	0.0016	8,864,921	0.0016	120.28	12.11
1	7,793,048	0.0014	16,657,968	0.0030	176.73	19.40
2	110,947,429	0.0202	127,605,397	0.0232	261.19	24.73
3	43,498,540	0.0079	171,103,937	0.0312	290.05	22.42
4	312,609,855	0.0569	483,713,792	0.0881	395.19	33.59
5	717,453,931	0.1306	1,201,167,723	0.2187	433.97	24.93
6	2,166,869,297	0.3945	3,368,037,020	0.6132	448.13	26.99
7	492,410,363	0.0897	3,860,447,383	0.7029	455.69	39.22
8	996,952,039	0.1815	4,857,399,422	0.8844	479.97	33.03
9	105,025,275	0.0191	4,962,424,697	0.9035	493.35	46.40
10	194,830,424	0.0355	5,157,255,121	0.9390	539.31	30.78
11	39,873,739	0.0073	5,197,128,860	0.9463	547.65	25.87
* 12	234,740,226	0.0427	5,431,869,086	0.9890	554.17	46.73
13	18,569,742	0.0034	5,450,438,828	0.9924	576.49	37.27
* 14	19,761,103	0.0036	5,470,199,931	0.9960	574.78	56.92
* 15	15,897,641	0.0029	5,486,097,572	0.9989	527.31	64.13
* 16	4,123,303	0.0008	5,490,220,875	0.9996	668.05	35.38
18	1,907,956	0.0003	5,492,128,830	1.0000	644.14	4.93
ABOVE MAXIMUM KEY LENGTH	124,969	0.0000	5,492,253,800	1.0000	797.39	4.39
TOTAL	5,492,253,800	1.0000	5,492,253,800	1.0000	454.50	59.79

Table H-1 .--Continued.

FEMALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	13,745,468	0.0029	13,745,468	0.0029	133.04	14.68
1	17,894,440	0.0038	31,639,908	0.0067	177.13	14.50
* 2	124,525,396	0.0265	156,165,304	0.0333	252.50	21.94
* 3	33,059,499	0.0070	189,224,803	0.0403	304.51	53.14
* 4	259,430,341	0.0553	448,655,145	0.0956	393.63	27.42
5	446,816,209	0.0952	895,471,354	0.1908	433.55	28.14
6	1,768,570,586	0.3769	2,664,041,939	0.5677	457.83	29.83
7	303,306,115	0.0646	2,967,348,055	0.6323	473.47	28.78
8	1,003,508,989	0.2139	3,970,857,044	0.8462	498.06	34.71
9	101,716,588	0.0217	4,072,573,632	0.8679	515.69	42.40
10	193,564,624	0.0412	4,266,138,256	0.9091	567.69	39.07
11	20,294,895	0.0043	4,286,433,151	0.9135	576.84	59.69
* 12	331,391,773	0.0706	4,617,824,923	0.9841	579.90	58.05
13	29,474,285	0.0063	4,647,299,208	0.9904	543.56	73.81
* 14	17,668,486	0.0038	4,664,967,694	0.9941	612.20	68.96
* 15	12,958,682	0.0028	4,677,926,375	0.9969	642.25	43.49
16	1,619,182	0.0003	4,679,545,558	0.9972	737.04	25.12
18	7,034,470	0.0015	4,686,580,028	0.9987	614.47	52.21
22	5,068,435	0.0011	4,691,648,463	0.9998	560.00	0.00
ABOVE MAXIMUM KEY LENGTH	924,859	0.0002	4,692,573,321	1.0000	808.57	9.77
TOTAL	4,692,573,321	1.0000	4,692,573,321	1.0000	470.09	74.95

Table H-1 .--Continued.

UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	786,070	0.0005	786,070	0.0005	69.01	4.34
1	1,483,244,336	0.9879	1,484,030,405	0.9884	127.61	24.57
2	16,130,114	0.0107	1,500,160,519	0.9992	200.29	25.45
3	1,212,722	0.0008	1,501,373,241	1.0000	216.22	9.54
TOTAL	1,501,373,241	1.0000	1,501,373,241	1.0000	128.43	25.84

Table H-1 .--Continued.

MALES, FEMALES, AND UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	23,396,458	0.0020	23,396,458	0.0020	126.05	18.26
1	1,508,931,824	0.1291	1,532,328,282	0.1311	128.45	25.27
* 2	251,602,938	0.0215	1,783,931,220	0.1527	252.99	27.52
* 3	77,770,761	0.0067	1,861,701,981	0.1593	295.04	40.40
* 4	572,040,196	0.0490	2,433,742,178	0.2083	394.49	30.95
5	1,164,270,140	0.0996	3,598,012,318	0.3079	433.81	26.21
6	3,935,439,882	0.3368	7,533,452,200	0.6446	452.49	28.71
7	795,716,478	0.0681	8,329,168,678	0.7127	462.47	36.64
8	2,000,461,028	0.1712	10,329,629,707	0.8839	489.04	35.07
9	206,741,864	0.0177	10,536,371,570	0.9016	504.34	45.85
10	388,395,048	0.0332	10,924,766,618	0.9348	553.46	37.91
11	60,168,634	0.0051	10,984,935,252	0.9400	557.50	42.84
* 12	566,131,998	0.0484	11,551,067,250	0.9884	569.23	55.12
13	48,044,026	0.0041	11,599,111,277	0.9925	556.29	64.32
* 14	37,429,589	0.0032	11,636,540,865	0.9958	592.44	65.61
* 15	28,856,323	0.0025	11,665,397,188	0.9982	578.92	79.90
* 16	5,742,485	0.0005	11,671,139,673	0.9987	687.50	45.17
18	8,942,426	0.0008	11,680,082,099	0.9995	620.80	47.93
22	5,068,435	0.0004	11,685,150,534	0.9999	560.00	0.00
ABOVE MAXIMUM KEY LENGTH	1,049,828	0.0001	11,686,200,362	1.0000	807.24	9.98
TOTAL	11,686,200,362	1.0000	11,686,200,362	1.0000	418.87	128.49

Table H-2.--Population estimates of Pacific cod by age (years), derived from data collected during the 1990 eastern Bering Sea bottom trawl survey. Mean lengths are presented in millimeters.

MALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	987,093	0.0052	987,093	0.0052	107.41	5.49
1	40,621,366	0.2146	41,608,460	0.2199	162.28	24.32
2	32,076,749	0.1695	73,685,209	0.3893	264.00	54.28
3	32,931,725	0.1740	106,616,934	0.5633	348.88	35.43
4	18,887,244	0.0998	125,504,178	0.6631	471.01	40.99
5	19,247,905	0.1017	144,752,083	0.7648	567.43	27.73
6	24,380,566	0.1288	169,132,649	0.8937	642.92	31.03
7	13,233,212	0.0699	182,365,861	0.9636	729.06	35.51
8	4,720,290	0.0249	187,086,150	0.9885	832.62	34.52
9	575,923	0.0030	187,662,073	0.9916	841.57	55.70
* 10	300,568	0.0016	187,962,641	0.9932	949.58	7.39
12	426,338	0.0023	188,388,979	0.9954	890.00	0.00
* 14	385,228	0.0020	188,774,207	0.9975	941.46	40.16
BETWEEN KEY LENGTHS	463,976	0.0025	189,238,183	0.9999	909.03	6.78
ABOVE MAXIMUM KEY LENGTH	17,501	0.0001	189,255,684	1.0000	980.00	0.00
TOTAL	189,255,684	1.0000	189,255,684	1.0000	410.44	208.51

Table H-2.--Continued.

FEMALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	377,299	0.0019	377,299	0.0019	97.74	4.18
* 1	36,858,654	0.1881	37,235,953	0.1901	160.90	23.21
* 2	25,505,235	0.1302	62,741,189	0.3202	264.42	49.09
3	34,795,213	0.1776	97,536,402	0.4978	350.23	34.44
4	16,357,446	0.0835	113,893,847	0.5813	458.69	41.47
5	21,839,330	0.1115	135,733,177	0.6928	569.71	34.48
6	24,656,418	0.1258	160,389,595	0.8186	645.06	33.22
7	19,031,143	0.0971	179,420,737	0.9158	739.36	32.45
* 8	11,832,454	0.0604	191,253,191	0.9761	827.23	36.03
* 9	1,713,608	0.0087	192,966,799	0.9849	910.43	32.00
10	326,040	0.0017	193,292,839	0.9866	800.00	0.00
13	31,418	0.0002	193,324,257	0.9867	1030.00	0.00
* 14	128,912	0.0007	193,453,169	0.9874	901.69	3.75
BETWEEN KEY LENGTHS	2,278,353	0.0116	195,731,521	0.9990	978.07	27.06
ABOVE MAXIMUM KEY LENGTH	195,401	0.0010	195,926,922	1.0000	1057.69	7.14
TOTAL	195,926,922	1.0000	195,926,922	1.0000	454.31	228.93

Table H-2.--Continued.

UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	6,880,013	0.1391	6,880,013	0.1391	97.30	4.44
1	41,386,781	0.8365	48,266,794	0.9756	137.61	21.18
2	1,206,495	0.0244	49,473,289	1.0000	190.20	25.50
TOTAL	49,473,289	1.0000	49,473,289	1.0000	133.29	25.86

Table H-2. --Continued.

MALES, FEMALES, AND UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	8,244,405	0.0190	8,244,405	0.0190	98.53	5.62
* 1	118,866,802	0.2735	127,111,207	0.2924	153.26	25.62
* 2	58,788,479	0.1353	185,899,686	0.4277	262.67	52.69
3	67,726,938	0.1558	253,626,625	0.5835	349.58	34.93
4	35,244,690	0.0811	288,871,315	0.6646	465.29	41.67
5	41,087,235	0.0945	329,958,549	0.7591	568.64	31.52
6	49,036,984	0.1128	378,995,533	0.8719	644.00	32.17
7	32,264,355	0.0742	411,259,888	0.9462	735.14	34.12
* 8	16,552,744	0.0381	427,812,631	0.9843	828.77	35.69
* 9	2,289,531	0.0053	430,102,162	0.9895	893.11	49.39
* 10	626,608	0.0014	430,728,770	0.9910	871.75	74.90
12	426,338	0.0010	431,155,108	0.9919	890.00	0.00
13	31,418	0.0001	431,186,526	0.9920	1030.00	0.00
* 14	514,139	0.0012	431,700,665	0.9932	931.49	38.85
BETWEEN KEY LENGTHS	2,742,329	0.0063	434,442,994	0.9995	966.39	35.87
ABOVE MAXIMUM KEY LENGTH	212,901	0.0005	434,655,895	1.0000	1051.31	22.41
TOTAL	434,655,895	1.0000	434,655,895	1.0000	398.67	228.26

Table H-3.--Population estimates of yellowfin sole by age (years), derived from data collected during the 1990 eastern Bering Sea bottom trawl survey. Mean lengths are presented in millimeters.

MALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	10,043,208	0.0025	10,043,208	0.0025	97.54	4.30
3	10,466,555	0.0026	20,509,762	0.0052	115.51	4.97
4	47,085,724	0.0119	67,595,486	0.0171	127.05	9.75
5	119,990,787	0.0303	187,586,273	0.0473	159.87	29.36
6	315,410,671	0.0796	502,996,944	0.1269	180.79	27.48
7	886,071,075	0.2236	1,389,068,020	0.3505	208.20	29.32
8	194,902,641	0.0492	1,583,970,660	0.3997	222.01	39.86
9	1,146,440,486	0.2893	2,730,411,147	0.6890	250.95	28.88
* 10	318,975,498	0.0805	3,049,386,645	0.7695	261.15	34.70
11	265,382,225	0.0670	3,314,768,870	0.8364	290.00	31.09
12	40,248,557	0.0102	3,355,017,427	0.8466	306.20	12.15
13	65,825,422	0.0166	3,420,842,848	0.8632	311.61	12.24
14	67,558,650	0.0170	3,488,401,499	0.8802	307.23	15.45
15	24,283,836	0.0061	3,512,685,335	0.8864	310.28	14.24
16	55,075,892	0.0139	3,567,761,226	0.9003	294.47	32.22
17	73,566,207	0.0186	3,641,327,434	0.9188	313.67	19.45
18	99,139,417	0.0250	3,740,466,850	0.9438	314.97	8.24
19	62,220,835	0.0157	3,802,687,685	0.9595	312.33	17.91
* 20	47,132,216	0.0119	3,849,819,901	0.9714	312.41	21.23
21	48,757,789	0.0123	3,898,577,690	0.9837	318.85	8.86
23	40,759,984	0.0103	3,939,337,674	0.9940	318.78	11.74
24	3,951,744	0.0010	3,943,289,418	0.9950	360.00	0.00
25	9,858,589	0.0025	3,953,148,007	0.9975	320.00	0.00
29	9,858,589	0.0025	3,963,006,597	1.0000	320.00	0.00
TOTAL	3,963,006,597	1.0000	3,963,006,597	1.0000	242.78	53.35

Table H-3 .--Continued.

FEMALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	8,093,031	0.0016	8,093,031	0.0016	96.19	5.58
4	68,958,690	0.0135	77,051,721	0.0151	135.65	17.40
5	100,631,374	0.0197	177,683,095	0.0349	155.25	32.60
6	322,306,429	0.0633	499,989,524	0.0981	183.62	35.85
7	1,061,541,700	0.2083	1,561,531,224	0.3064	209.48	30.68
8	191,750,591	0.0376	1,753,281,815	0.3441	225.86	30.37
9	1,254,943,975	0.2463	3,008,225,790	0.5903	259.07	32.87
10	407,612,043	0.0800	3,415,837,833	0.6703	276.62	35.30
11	481,278,692	0.0944	3,897,116,525	0.7648	301.74	26.05
12	101,436,564	0.0199	3,998,553,088	0.7847	334.66	24.41
13	71,838,311	0.0141	4,070,391,400	0.7988	334.86	18.49
14	107,383,878	0.0211	4,177,775,277	0.8199	326.78	39.64
15	78,163,078	0.0153	4,255,938,355	0.8352	334.03	17.04
16	231,139,899	0.0454	4,487,078,254	0.8806	337.96	15.56
17	126,717,075	0.0249	4,613,795,329	0.9054	335.99	19.63
* 18	45,470,383	0.0089	4,659,265,712	0.9143	340.50	23.42
19	66,927,279	0.0131	4,726,192,991	0.9275	350.93	15.25
20	114,369,315	0.0224	4,840,562,306	0.9499	340.36	27.67
* 21	116,480,690	0.0229	4,957,042,996	0.9728	343.92	26.55
* 22	36,201,595	0.0071	4,993,244,591	0.9799	354.65	27.67
* 23	74,688,998	0.0147	5,067,933,589	0.9945	354.95	22.91
24	6,502,216	0.0013	5,074,435,805	0.9958	360.00	0.00
* 25	8,054,057	0.0016	5,082,489,861	0.9974	386.05	13.60
26	9,834,835	0.0019	5,092,324,697	0.9993	366.78	9.47
28	3,332,620	0.0007	5,095,657,317	1.0000	380.00	0.00
ABOVE MAXIMUM KEY LENGTH	86,317	0.0000	5,095,743,634	1.0000	450.00	0.00
TOTAL	5,095,743,634	1.0000	5,095,743,634	1.0000	263.22	63.34

Table H-3.--Continued.

UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	275,425	0.2222	275,425	0.2222	100.00	0.00
3	221,870	0.1790	497,295	0.4012	110.69	2.53
4	504,946	0.4074	1,002,242	0.8086	111.82	3.86
5	237,172	0.1914	1,239,413	1.0000	111.29	3.35
TOTAL	1,239,413	1.0000	1,239,413	1.0000	108.89	5.67

Table H-3.--Continued.

MALES, FEMALES, AND UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	18,411,664	0.0020	18,411,664	0.0020	96.99	4.94
3	10,688,425	0.0012	29,100,089	0.0032	115.41	4.98
4	116,549,360	0.0129	145,649,448	0.0161	132.07	15.40
5	220,859,333	0.0244	366,508,781	0.0405	157.71	30.98
6	637,717,101	0.0704	1,004,225,882	0.1108	182.22	32.01
7	1,947,612,775	0.2150	2,951,838,657	0.3258	208.90	30.08
8	386,653,232	0.0427	3,338,491,889	0.3685	223.92	35.53
9	2,401,384,461	0.2651	5,739,876,350	0.6335	255.19	31.29
* 10	726,587,541	0.0802	6,466,463,891	0.7137	269.83	35.87
11	746,660,917	0.0824	7,213,124,808	0.7962	297.57	28.51
12	141,685,120	0.0156	7,354,809,928	0.8118	326.58	25.16
13	137,663,733	0.0152	7,492,473,661	0.8270	323.74	19.62
14	174,942,528	0.0193	7,667,416,189	0.8463	319.23	33.87
15	102,446,914	0.0113	7,769,863,103	0.8576	328.40	19.28
16	286,215,791	0.0316	8,056,078,894	0.8892	329.59	26.25
17	200,283,282	0.0221	8,256,362,176	0.9113	327.79	22.33
* 18	144,609,799	0.0160	8,400,971,975	0.9273	323.00	18.96
19	129,148,114	0.0143	8,530,120,089	0.9415	332.33	25.44
* 20	161,501,531	0.0178	8,691,621,620	0.9593	332.20	28.90
* 21	165,238,480	0.0182	8,856,860,100	0.9776	336.52	25.51
* 22	36,201,595	0.0040	8,893,061,694	0.9816	354.65	27.67
* 23	115,448,982	0.0127	9,008,510,676	0.9943	342.18	26.21
24	10,453,960	0.0012	9,018,964,636	0.9955	360.00	0.00
* 25	17,912,646	0.0020	9,036,877,282	0.9974	349.70	34.10
26	9,834,835	0.0011	9,046,712,118	0.9985	366.78	9.47
28	3,332,620	0.0004	9,050,044,737	0.9989	380.00	0.00
29	9,858,589	0.0011	9,059,903,327	1.0000	320.00	0.00
ABOVE MAXIMUM KEY LENGTH	86,317	0.0000	9,059,989,643	1.0000	450.00	0.00
TOTAL	9,059,989,643	1.0000	9,059,989,643	1.0000	254.26	60.06

Table H-4.--Population estimates of rock sole by age (years), derived from data collected during the 1990 eastern Bering Sea bottom trawl survey. Mean lengths are presented in millimeters.

MALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	1,195,758	0.0003	1,195,758	0.0003	70.00	0.00
2	7,695,371	0.0017	8,891,129	0.0019	90.00	0.00
3	597,392,876	0.1291	606,284,005	0.1310	117.48	16.99
4	1,581,459,792	0.3418	2,187,743,796	0.4729	152.31	22.41
5	829,477,882	0.1793	3,017,221,678	0.6522	189.08	21.75
6	433,439,927	0.0937	3,450,661,605	0.7458	230.73	20.75
7	640,937,539	0.1385	4,091,599,144	0.8844	268.01	25.36
8	72,433,264	0.0157	4,164,032,408	0.9000	299.12	17.14
9	175,887,600	0.0380	4,339,920,008	0.9381	303.89	14.05
* 10	155,161,123	0.0335	4,495,081,131	0.9716	300.28	16.76
* 11	44,914,881	0.0097	4,539,996,012	0.9813	307.48	19.99
12	15,971,900	0.0035	4,555,967,912	0.9848	324.53	8.37
13	25,530,379	0.0055	4,581,498,291	0.9903	313.33	7.45
14	8,494,281	0.0018	4,589,992,573	0.9921	330.00	0.00
15	18,505,558	0.0040	4,608,498,130	0.9961	320.45	12.59
* 20	15,792,645	0.0034	4,624,290,775	0.9995	300.32	26.59
21	607,157	0.0001	4,624,897,933	0.9997	380.00	0.00
ABOVE MAXIMUM KEY LENGTH	1,605,893	0.0003	4,626,503,826	1.0000	407.72	10.40
TOTAL	4,626,503,826	1.0000	4,626,503,826	1.0000	195.29	64.36

Table H-4. --Continued.

FEMALES

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	1,146,245	0.0003	1,146,245	0.0003	80.00	0.00
2	11,018,836	0.0026	12,165,081	0.0029	100.00	0.00
3	368,491,300	0.0864	380,656,381	0.0892	116.32	10.15
4	1,151,651,974	0.2699	1,532,308,355	0.3592	157.38	19.66
5	839,996,871	0.1969	2,372,305,225	0.5561	199.02	27.18
6	486,778,415	0.1141	2,859,083,640	0.6702	238.01	28.30
7	482,552,488	0.1131	3,341,636,129	0.7833	276.93	31.50
8	261,160,282	0.0612	3,602,796,411	0.8445	309.89	25.40
9	279,900,554	0.0656	3,882,696,965	0.9101	335.43	28.36
10	156,121,688	0.0366	4,038,818,653	0.9467	361.61	19.16
11	85,474,921	0.0200	4,124,293,573	0.9667	374.59	22.14
12	40,955,871	0.0096	4,165,249,444	0.9763	375.97	27.79
13	39,366,411	0.0092	4,204,615,855	0.9856	374.95	40.11
14	9,213,012	0.0022	4,213,828,867	0.9877	388.10	9.82
15	21,667,662	0.0051	4,235,496,529	0.9928	403.69	16.83
16	1,095,824	0.0003	4,236,592,352	0.9930	430.00	0.00
18	7,627,262	0.0018	4,244,219,615	0.9948	427.18	13.84
20	9,454,853	0.0022	4,253,674,468	0.9971	410.95	24.30
21	3,295,654	0.0008	4,256,970,122	0.9978	446.97	8.42
24	2,893,776	0.0007	4,259,863,898	0.9985	410.00	0.00
25	3,730,680	0.0009	4,263,594,577	0.9994	400.00	0.00
26	2,267,366	0.0005	4,265,861,944	0.9999	420.00	0.00
ABOVE MAXIMUM KEY LENGTH	391,057	0.0001	4,266,253,001	1.0000	490.00	0.00
TOTAL	4,266,253,001	1.0000	4,266,253,001	1.0000	225.17	81.58

Table H-4.--Continued.

UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	3,161,410	0.0019	3,161,410	0.0019	67.87	5.82
2	91,293,737	0.0543	94,455,147	0.0562	93.10	6.35
3	1,066,898,813	0.6344	1,161,353,960	0.6905	107.09	10.91
4	489,763,356	0.2912	1,651,117,316	0.9817	134.85	14.57
5	30,664,265	0.0182	1,681,781,580	0.9999	160.80	13.86
6	84,184	0.0001	1,681,865,764	1.0000	190.00	0.00
TOTAL	1,681,865,764	1.0000	1,681,865,764	1.0000	115.33	19.13

Table H-4.--Continued.

MALES, FEMALES, AND UNSEXED

AGE CLASS	NUMBER	PROPORTION	CUMULATIVE NUMBER	CUMULATIVE PROPORTION	MEAN LENGTH	STD. DEV. OF LENGTH
BELOW MINIMUM KEY LENGTH	5,503,413	0.0005	5,503,413	0.0005	70.86	6.49
2	110,007,945	0.0104	115,511,358	0.0109	93.58	6.22
3	2,032,782,988	0.1922	2,148,294,346	0.2032	111.82	13.81
4	3,222,875,121	0.3048	5,371,169,467	0.5079	151.47	21.72
5	1,700,139,017	0.1608	7,071,308,484	0.6687	193.48	25.36
6	920,302,526	0.0870	7,991,611,009	0.7557	234.57	25.29
7	1,123,490,028	0.1062	9,115,101,037	0.8620	271.84	28.51
8	333,593,546	0.0315	9,448,694,583	0.8935	307.55	24.26
9	455,788,154	0.0431	9,904,482,737	0.9366	323.26	28.38
* 10	311,282,811	0.0294	10,215,765,548	0.9661	331.04	35.56
* 11	130,389,801	0.0123	10,346,155,350	0.9784	351.47	38.42
12	56,927,771	0.0054	10,403,083,121	0.9838	361.54	33.31
13	64,896,790	0.0061	10,467,979,910	0.9899	350.71	43.64
14	17,707,293	0.0017	10,485,687,204	0.9916	360.23	29.88
15	40,173,220	0.0038	10,525,860,423	0.9954	365.35	44.13
16	1,095,824	0.0001	10,526,956,247	0.9955	430.00	0.00
18	7,627,262	0.0007	10,534,583,509	0.9962	427.18	13.84
* 20	25,247,498	0.0024	10,559,831,007	0.9986	341.75	59.42
21	3,902,812	0.0004	10,563,733,819	0.9990	436.55	25.48
24	2,893,776	0.0003	10,566,627,595	0.9992	410.00	0.00
25	3,730,680	0.0004	10,570,358,274	0.9996	400.00	0.00
26	2,267,366	0.0002	10,572,625,641	0.9998	420.00	0.00
ABOVE MAXIMUM KEY LENGTH	1,996,951	0.0002	10,574,622,591	1.0000	423.83	33.96
TOTAL	10,574,622,591	1.0000	10,574,622,591	1.0000	194.63	77.02

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