DISTRIBUTION, ABUNDANCE, AND BIOLOGICAL CHARACTERISTICS OF GROUNDFISH IN THE EASTERN BERING SEA BASED ON RESULTS OF U.S.-JAPAN BOTTOM TRAWL AND MIDWATER SURVEYS DURING JUNE-SEPTEMBER 1988

by

Richard G. Bakkala, William A. Karp[1] Gary F. Walters[1], Takashi Sasaki[2], Matthew T. Wilson[1], Terrance M. Sample[1], Allen M. Shimada', Denise Adams', and Claire E. Armistead[1]

[1]Alaska Fisheries Science Center
National Marine Fisheries Service, NOAA
7600 Sand Point Way NE.
BIN Cl5700 Building 4
Seattle, WA 98115-0070

[2]National Research Institute of Far Seas Fisheries
7-1, Orido 5 Chome
Shimizu, 424 Japan

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ABSTRACT

The Alaska Fisheries Science Center and the National Research Institute of Far Seas Fisheries of Japan initiated a series of comprehensive triennial surveys of the groundfish and invertebrate resources of the eastern Bering Sea in 1979. The fourth in this series of triennial surveys was carried out from June to September 1988. The primary sampling gear used during these surveys has been bottom trawls, but echo integration-midwater trawl methods have also been used to assess midwater concentrations of walleye pollock (*Theragra chalcogramma*). Results of the 1988 triennial survey are presented here in the form of a data report. Methods are described in some detail, but results are mainly presented through tables and figures without a narrative description of findings. Biomass estimates for principal species and species groups of groundfish from the 4 years of triennial surveys are compared and major trends are described.

For results of the 1988 survey, geographic distributions and estimates of relative and absolute abundance for each of the principal species and species groups of groundfish and invertebrates are described. In addition, size composition, and where available, age composition and growth characteristics are presented for principal species. Appendices to the report contain diagrams of the trawl used during the survey and listings of individual station data and results of data analyses.

Species referred to in text portion of this paper.

Common name	Scientific name
Alaska plaice	Pleuronectes quadrituberculatus
Arctic staghorn sculpin	Gymnocanthus tricuspis
Armorhead sculpin	Gymnocanthus galeatus
Arrowtooth flounder	Atheresthes stomias
Bigmouth sculpin	Hemitripterus bolini
Blue king crab	Paralithodes platypus
Butterfly sculpin	Melletes papilio
Grenadier	Macrouridae spp.
Eelpouts	Zoarcidae
Flathead sole	Hippoglossoides elassodon
Greenland turbot	Reinhardtius hippoglossoides
Grenadiers	Macrouridae
Kamchatka flounder	Atheresthes evermanni
Longhead dab	Limanda proboscidea
Longnose lancetfish	Alepisaurus ferox
Longsnout prickleback	Lumpenella longirostris
Marbled eelpout	Lycodes raridens
Pacific cod	Gadus macrocephalus
Pacific halibut	Hippoglossus stenolepis
Pacific herring	Clupea harengus pallasi
Pacific ocean perch	Sebastes alutus
Plain sculpin	Myoxocephalus jaok
Poachers	Agonidae
Rex sole	Glyptocephalus zachirus
Rock sole	Lepidopsetta bilineata
Rougheye rockfish	Sebastes aleutianus
Sablefish	Anoplopoma fimbria
Sculpins	Cottidae
Shortfin eelpout	Lycodes brevipes
Shortraker rockfish	Sebastes borealis
Skates	Rajidae
Smelts	Osmeridae
Snailfishes	Cyclopteridae
Snow crab	Chionoecetes opilio
Spinyhead sculpin	Dasycottus setiger
Starry flounder	Platichthys stellatus
Thornyhead rockfish	Sebastolobus spp.
Walleye pollock	Theragra chalcogramma
Wattled eelpout	Lycodes palearis
Yellowfin sole	Limanda aspera
Yellow Irish lord	Hemilepidotus jordani
Yellowtail rockfish	Sebastes flavidus

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INTRODUCTION

The eastern Bering Sea supports one of the most productive groundfish fisheries in the world with annual commercial catches since 1970 ranging from 1.2 to 2.2 million metric tons (t). The Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC) has conducted annual bottom trawl surveys to monitor the abundance, distribution, and biological condition of eastern Bering Sea demersal fish and crab stocks. The information gathered is used to provide the North Pacific Fishery Management Council with annual fishery-independent estimates of abundance and biological assessments of commercially exploited stocks, to provide distribution and abundance information to commercial fishermen, and to develop a time-series data base contributing to our understanding of the population dynamics and interactions of groundfish species.

The standard sampling area established for these surveys was first sampled in 1975. Annual surveys have been performed since 1979. This area of about 465,000 km (Fig. 1) encompasses a major portion of the eastern Bering Sea continental shelf and the distributions of the principal species of crab and groundfish that inhabit shelf waters. Every third year, starting in 1979, the AFSC has expanded survey effort to provide an even more comprehensive assessment of eastern Bering Sea groundfish. During the larger triennial surveys, sampling with bottom trawls is extended beyond the standard survey area to the northern continental shelf region including Norton Sound and to waters of the continental slope. In addition, an echo integration-midwater trawl (EIMWT) survey is conducted to assess the midwater portion of the walleye pollock (*Theragra chalcogramma*) population and, when combined with results from the bottom trawl surveys, to provide an overall assessment of this species.

During June-September 1988, the AFSC completed the fourth in this series of expanded triennial surveys. Results of previous triennial surveys are reported by Bakkala and Wakabayashi (1985), Bakkala et al. (1985) and Walters et al. (1988). The 1988 survey involved four U.S. vessels as well as vessels from the U.S.S.R. and Japan. During previous triennial surveys, the Far Seas Fisheries Research Laboratory of the Fisheries Agency of Japan has cooperated by providing one or two chartered landbased (Hokuten) trawlers to extensively sample continental slope waters; in 1979, these vessels also sampled the continental shelf. Because of other research commitments, the Japanese were unable to provide a vessel for a full-scale survey of the continental slope in 1988. However, they did provide a chartered landbased trawler for a period of 18 days to conduct comparative fishing experiments and to supplement the sampling of the slope by the U.S. survey vessel. Data from the comparative fishing experiment will be used to relate abundance estimates from the

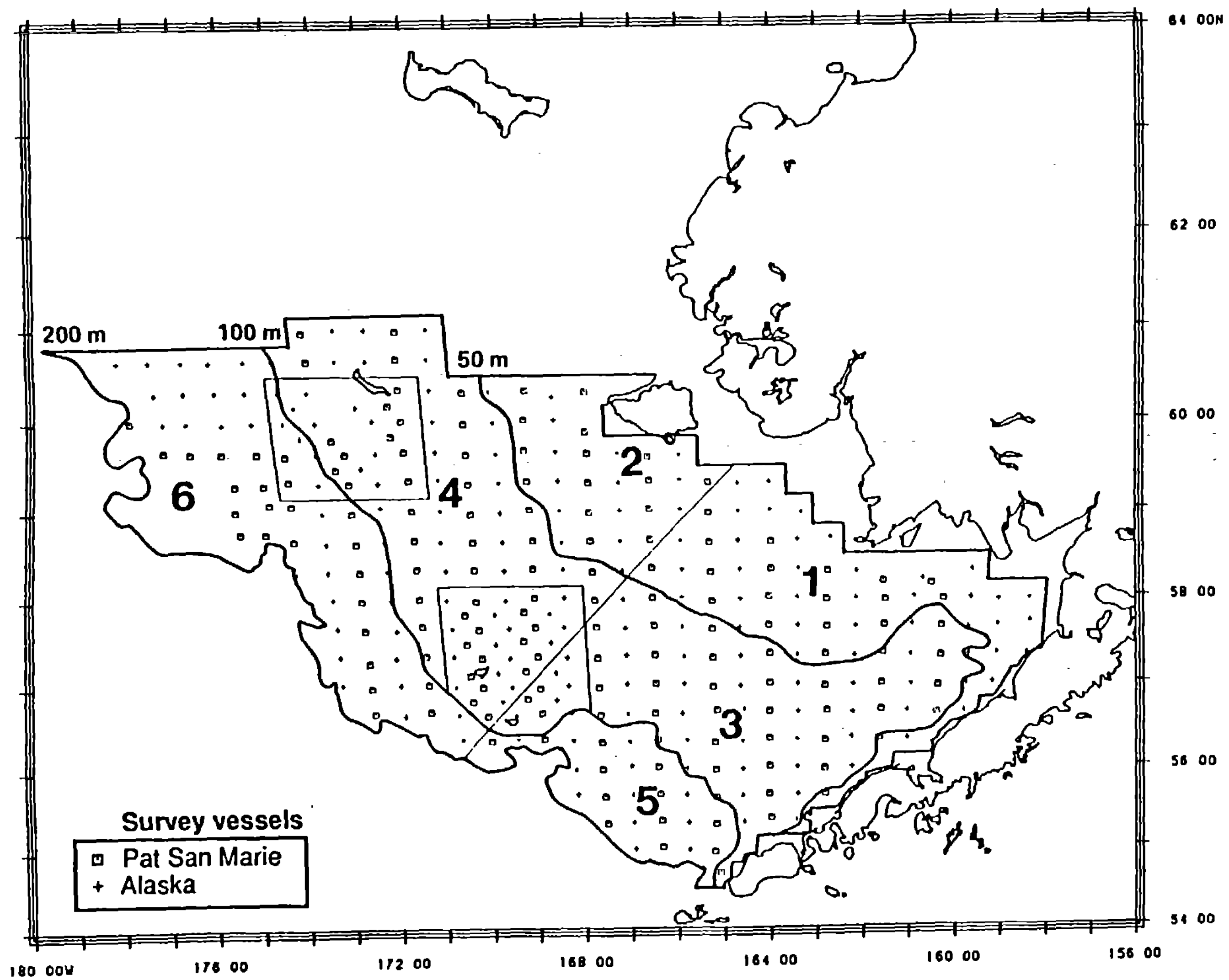

Figure 1.--Standard sampling area for the Alaska Fisheries Science Center's annual bottom trawl surveys in the eastern Bering Sea. Shown is the sampling pattern of survey vessels during the 1987 survey. Boxed areas in Subareas 3, 4, and 6 indicate high-density sampling areas.

U.S. vessel in 1988 to those from Japanese vessels that sampled the slope in previous years. The Soviet research vessel Darwin also sampled continental shelf waters from 17 May to 21 June 1988. The Darwin further conducted 18 side-by-side tows with one of the U.S. survey vessels to compare relative fishing powers. Because of the largely independent nature and different timing of the Darwin survey and differences between trawls and methods of handling catches, the U.S. and Soviet survey data were not compatible. The results of the Darwin survey are, therefore, not included in this report.

This report summarizes information from the survey on the abundance, distribution, and biological characteristics of principal groundfish species. Biomass estimates of principal species and species groups of groundfish from the four triennial surveys are also compared. Appendices contain diagrams of trawls used, basic station data, and results of data analyses of the data.

Preliminary results from the 1988 survey for principal species of crabs are reported by Stevens et al. (1988). Results of the studies in Norton Sound will be issued in a future report.

METHODS

Survey Area and Sampling Design

Bottom Trawl Survey

The stratification of the sampling area for analysis of the 1988 survey data was changed from that used for analyzing previous triennial survey data. The previous stratification originated from the sampling scheme used by U.S. and Japanese vessels during the 1979 survey (Bakkala and Wakabayashi 1985). In 1979, there was considerable overlap of sampling on both the continental shelf and slope by U.S. and Japanese vessels. In order to combine the data from all survey vessels, it was necessary to adopt the stratification scheme shown in Figure 2. In addition, at the time of the 1979 cooperative survey, nautical charts in meters were not available for all areas of the eastern Bering Sea, and it was therefore necessary to stratify the survey area by depth in terms of fathoms.

Following the 1979 survey, the AFSC developed a standard survey area on the continental shelf that has been sampled each year since 1979 (Fig. 1). Stratification of this standard survey area is based on depth contours (<50 m, 50-100 m, 100-200 m) that correspond to oceanographic domains on the shelf which may more accurately reflect differences in fish distributions and thereby minimize variances of abundance estimates. A lo-year consecutive time series of assessment data now exists for this area which has been used to examine long-term trends in abundance and to assess the current condition of the various principal species of

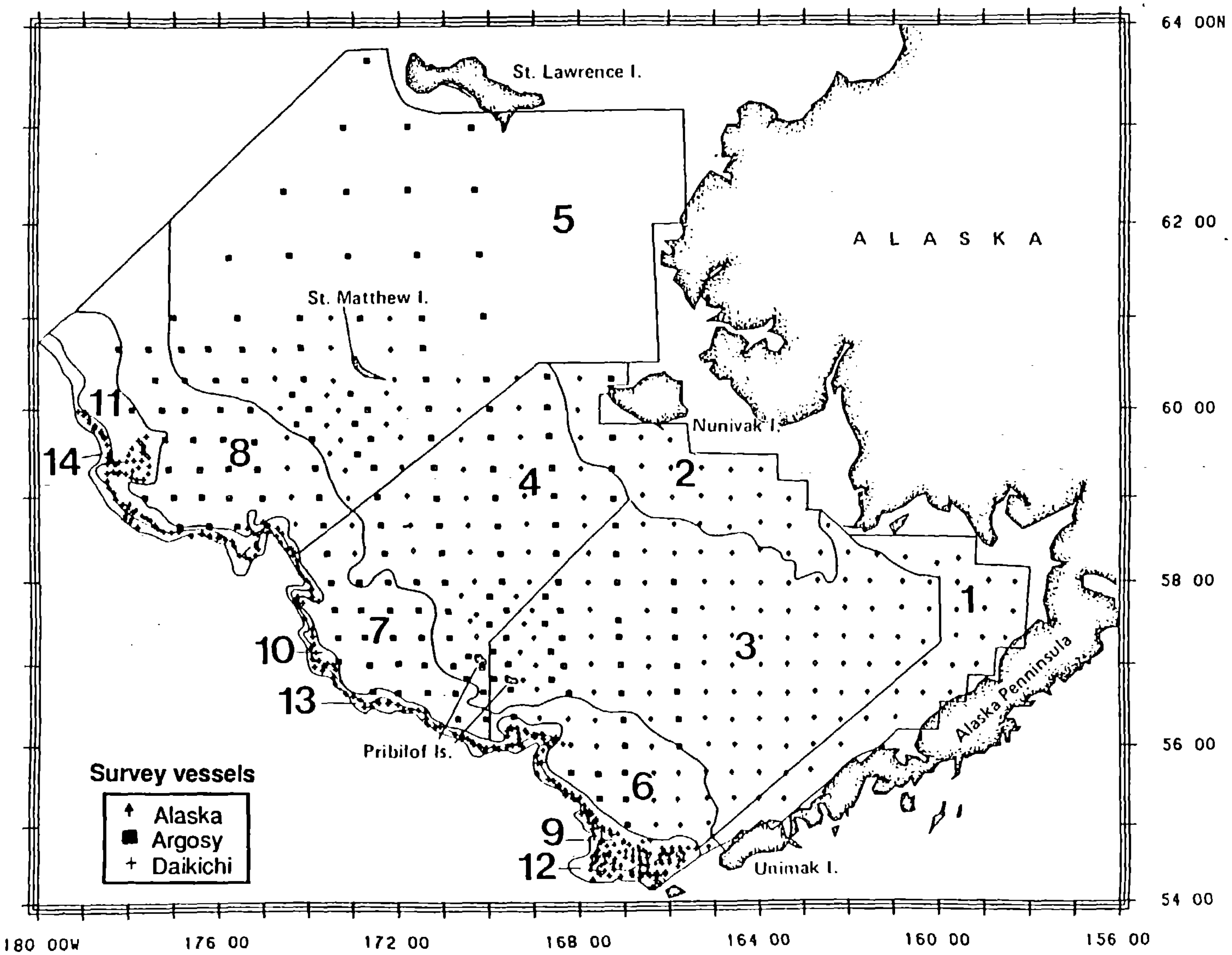

Figure 2.--Stratification scheme used in analyses of the 1979, 1982, and 1985 U.S.-Japan triennial survey data. Shown is the sampling pattern of survey vessels during the 1985 triennial survey.

groundfish for management purposes. Because of the importance of this standard survey area, it has been used as the foundation for a new stratification scheme for the 1988 triennial survey data (Fig. 3). This new stratification facilitates a comparison of the triennial survey data with those from the standard series. Furthermore, it simplifies the supplementation of the standard survey area data with those from the expanded areas sampled during the triennial surveys. The availability of new nautical charts also allowed us to develop new depth stratification in meters on the continental slope to correspond with the units used on the continental shelf.

In the standard survey area on the shelf (subareas 1-6, Fig. 3), a systematic sampling scheme is used based on a 20 x 20 nautical mile (nmi) grid. Samples of demersal fish and invertebrates are obtained by trawling at or near the center of each grid block. In the Pribilof and St. Matthew Islands regions, however, sampling density is doubled by adding stations at the grid block corners; this is done in order to increase coverage of blue king crab (Paralithodes platypus) stocks present in these areas. In 1988, the survey vessels fished alternate north-south lines of the station grid, proceeding from Bristol Bay westward to the shelf break (Fig. 3). The alternate-line fishing pattern facilitates comparison of fishing powers of the two vessels, while the progression from east to west prevents multiple encounters of species which may be migrating to inshore feeding or spawning grounds (from west to east) during the course of the survey.

The presence of high-density sampling in subareas 3, 4, and 6 necessitated a further division of these subareas into high-density and standard-density strata, resulting in a total of 10 geographic strata for statistical calculations. The overall sampling density in the standard survey area was 1,309 km^2 per station (Table 1). However, because of the high-density sampling in subareas 3, 4, and 6, and the irregular boundaries of the survey area, sampling density varied among subareas from 1,123 to 1,436 km^2 per station.

In the north shelf region (subareas 7 and 8, Fig. 3), sampling density was reduced to an average of 2,581 km^2 per station because of the lower abundance of groundfish in this region than in the standard survey area. Standard density sampling was performed in the southwest portion of subarea 8 to improve sampling of snow crab (Chionoecetes opilio) in these waters; this necessitated the division of this subarea into low-density and standard-density strata for statistical calculations.

As noted earlier, the availability of new navigational charts made it possible to restratify the continental slope region in terms of meters. The interval sampled (200-800 m) was divided equally into two depth subdivisions (200-500 m and 500-800 m). In addition, the diagonal line separating the shelf

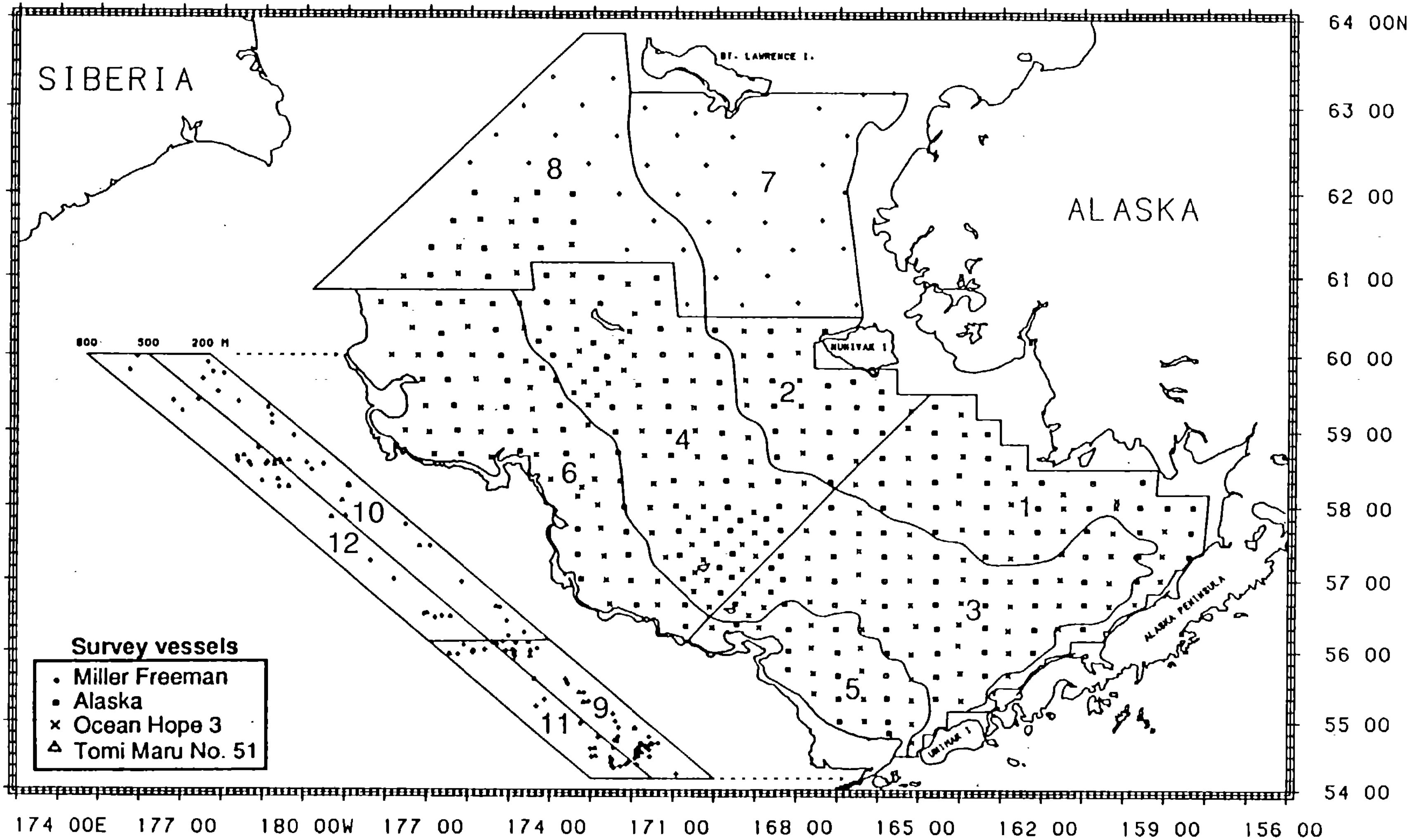

Figure 3.--Station pattern of the U.S. and Japanese vessels during the 1988 bottom trawl survey and stratification used in the analyses of the survey data.

Table 1. --Size of subareas and sampling densities by subarea during the 1988 bottom trawl survey and areas of each strata surveyed during the 1988 midwater survey (see also Figs. 3 and 4).

Subarea	Bottom trawl survey			Midwater survey area
	Area (km^2)	No. stations successfully sampled	Sampling density (km^2/station)	(km^2)
Eastern Bering Sea Shelf				
1	77,871	58	1,343	0
2	41,027	31	1,323	0
3	103,300	75	1,377	67,260
4	107,822	96	1,123	66,475
5	38,792	27	1,436	38,792
6	94,590	67	1,412	94,590
North Shelf				
7	72,827	25	2,913	0
8	82,011	35	2,343	7,851
Slope				
9	7,785	47	166	7,785
10	5,646	28	202	5,646
11	4,392	31	142	0
12	3,311	27	123	0
Total survey area	639,374	547	1,169	288,399

region into southeast and northwest portions was extended to the slope to create four subareas on the slope (subareas 9-12, Fig. 3).

The number of vessel days available to sample the continental slope region in 1988 was much less than the effort provided by Japanese vessels during previous triennial surveys. In order to representatively sample the slope with this reduced effort, the 1988 station pattern was derived by selecting every other station sampled by the Japanese vessel in 1985. The distribution of the stations on the slope is not systematic such as that on the shelf, but instead station locations were governed by the steepness of the slope and the extent of trawlable bottom. Density of sampling, therefore, varied by subarea from 123 to 202 km^2 per station (Table 1).

Echo Integration-Midwater Trawl Survey

The 1988 EIMWT survey of midwater walleye pollock was conducted between 17 June and 15 August. The continental shelf and upper slope areas over bottom depths of 90 to 460 m were surveyed by transecting a series of adjacent parallel tracklines with 20 nmi spacing (Fig. 4). Data were collected from approximately 15 m below the surface to within 3 m of the bottom. If pollock sign was present at a transect endpoint, then that transect was extended for several miles past the sign and the next transect was initiated at the same depth. Abundance estimates for pelagic pollock (age 1 and older) were determined for each geographical stratum surveyed (Fig. 4). The areas surveyed in each stratum are indicated in Table 1. Midwater trawl hauls were made throughout the survey to identify echo sign and to provide information on pollock biological characteristics.

Vessels and Sampling Gear

Vessels

The chartered vessels R/V *Alaska* and the F/V *Ocean Hope* 3 conducted the bottom trawl survey on the continental shelf. The chartered vessel F/V *Pelagos* conducted the EIMWT survey. The NOAA vessel *Miller Freeman* sampled the northern shelf, Norton Sound, and the continental slope. The Japanese chartered vessel *Tomi Maru* No. 5l, a land-based (Hokuten) trawler, also participated in the bottom trawl survey of the continental slope. Characteristics of these vessels are given in Table 2.

Fishing Gear

Trawl--Characteristics of the trawls used during the survey are given in Table 3 and Appendix A. The 83-112 eastern otter trawl used by all U.S. vessels during the survey on the shelf has

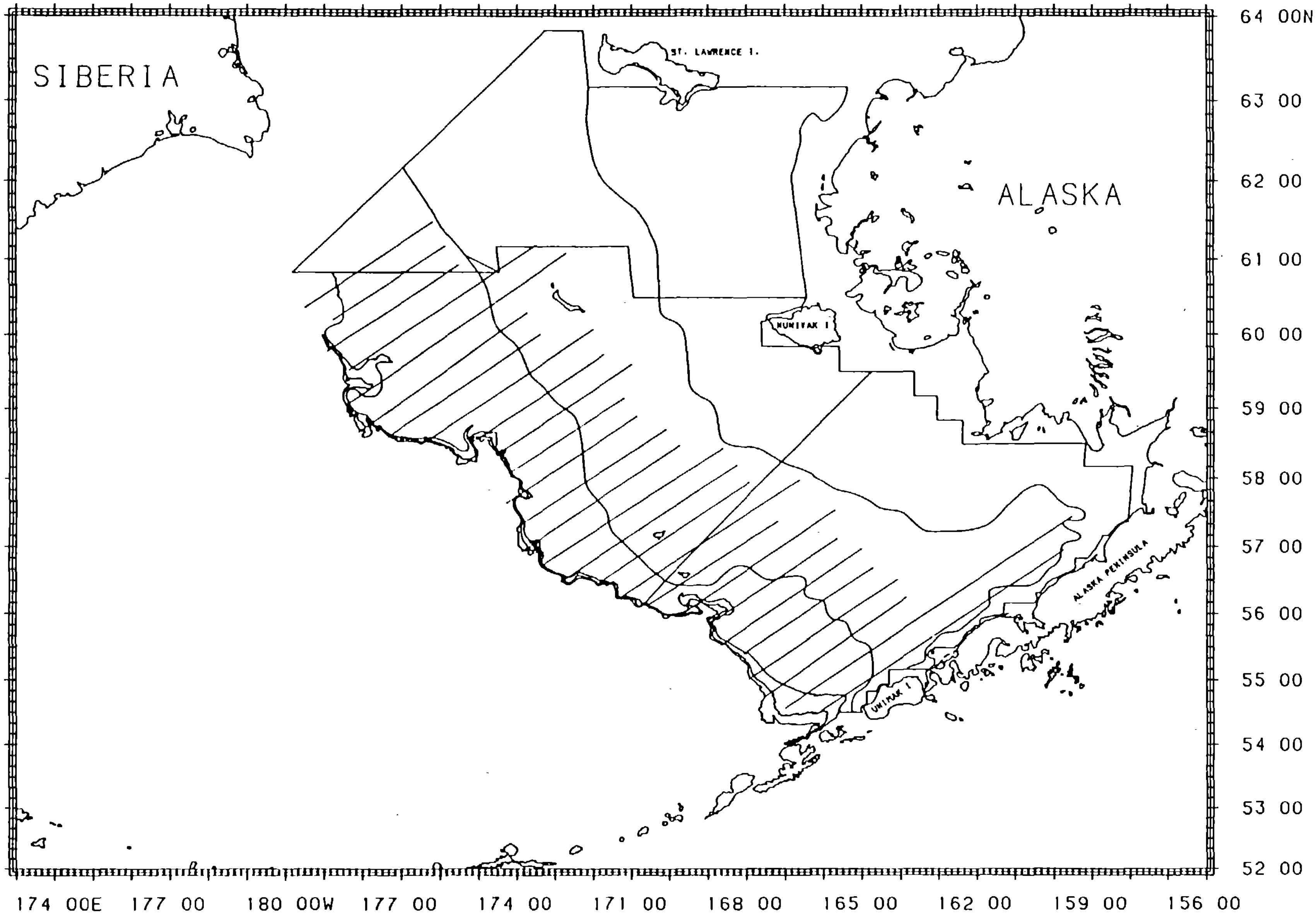

Figure 4.--Transects by the charter vessel Pelagos during the 1988 midwater survey.

Table 2.--Characteristics of vessels used during the 1988 eastern Bering Sea survey.

Vessel	Nation	Overall length (m)	Gross tonnage (tons)	Shaft horse-power	Survey methods	Survey period	
						Start	Finish
Alaska	U.S.	30.5	219	600	Bottom trawl	4 June	6 August[a]
Ocean Hope 3	U.S.	31.4	192	850	Bottom trawl	4 June	6 August[a]
Pelagos	U.S.	39.9	186	1700	EIMWT[b]	17 June	15 August[c]
Miller Freeman	U.S.	65.5	1515	2150	Bottom trawl	13 August	23 Sept.[d]
Tomi Maru No. 51	Japan	51.0	279	2600	Bottom trawl	5 Sept.	16 Sept.

[a] The *Alaska* and *Ocean Hope 3* performed gear comparison experiments from 1 Aug. to 6 Aug.

[b] Echo integration-midwater trawl survey.

[c] Includes time for target calibration and vessel intercalibration.

[d] Includes time for the Norton Sound survey.

Table 3.--Trawls used during the 1988 eastern Bering Sea survey. (also see appendix A)

Characteristic	Tomi Maru No. 51 trawl	83-112 trawl	Nor'eastern trawl	Northern Gold trawl	Marinovich trawl
Horizontal opening while fishing (m)	35.0	-[a]	16.23	40-50	6.10[b]
Vertical opening while fishing (m)	3.9	2	6	30-40	4.0
Headrope length (m)	69.0	25.3	27.4	89.6	9.1
Footrope length (m)	83.0	34.1	32.0	84.9	9.1
Mesh sizes (mm)					
Wing	180-240	102	127	rope	76
Body	120-150	102	127	1630-76	70-38
Intermediate	90-120	89	89	96-89	-[c]
Codend	100	89	89	89	38
Codend liner	-[d]	32	32	32	3.2
Door (m)					
Length	4.0	2.7	2.1	1.8	1.8
Height	2.6	1.8	1.5	2.7	2.7
Dandyline Length (m)	-	54.9	54.9	82.3	9.1

[a]Net width measured for each tow or calculated from a functional relationship with scope if no measurement exists.
[b]Based on net design considerations only.
[c]Trawl has no intermediate.
[d]Codend consists of three layers of 100-mm mesh.

been the standard trawl for this survey since 1982. This trawl is believed to be more efficient at fishing for bottom-dwelling species, such as the flatfishes, than trawls used prior to 1982--based on large increases in abundance estimates between 1981 and 1982 (Bakkala et al. 1985). This gear effect will be discussed further in the section dealing with between-year comparisons.

The Nor'eastern bottom trawl used by the NOAA vessel Miller Freeman on the continental slope was essentially the same as that used by the U.S. vessel sampling slope waters during the 1979 triennial survey (Bakkala and Wakabayashi 1985) except that it is now constructed of polyethylene rather than nylon.

The bottom trawl used by the Tomi Maru No. 51 was essentially the same as that used by the Japanese in previous cooperative surveys (Table 3 and Appendix A). A Northern Gold 1200 rope trawl was used aboard the Pelagos for sampling age-l and older walleye pollock in midwater. A Marinovich midwater trawl was used to sample age-0 pollock.

Wins spread measurements--Wing spread measurements for all the bottom trawls were made using acoustic mensuration equipment (Scanmar'). These measurements were used to derive the area swept by the trawl for calculating abundance estimates. Measurements were made for the majority of the tows aboard the Alaska and Ocean Hope 2 as well as the NOAA vessel Miller Freeman when operating on the north shelf. This was the first triennial survey where measurements were made routinely on almost every tow. During past surveys, measurements were either made for only a small selected sample of tows or values based on previous measurements were used. In the analyses of these earlier survey data, a mean value was used for all tows of a particular vessel in the survey. During 1988, when reliable data was obtained, the mean value for each tow (usually from over 100 readings at l0-second intervals) was used to determine the area swept by the net during that tow. For all tows with reliable data the functional relationship between scope (trawl wire paid out) and net-width was also determined (Fig. 5) from which net-width values could be estimated for tows lacking mensuration data.

Net-width data were collected on only eight tows aboard the Tomi Maru No. 51. These measurements indicated a mean value near 35.0 m over all depths sampled on the slope. This value is identical to the value obtained in 1985 (Walters et al. 1988). Because of equipment malfunctions there were no measurements made of the Nor'eastern trawl during the NOAA Vessel Miller Freeman's slope survey. However, measurements were made approximately 3 months later at similar depths during eight tows. There was little variation over depth, and the mean value of 16.23 m determined from these tows was used to calculate area swept

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

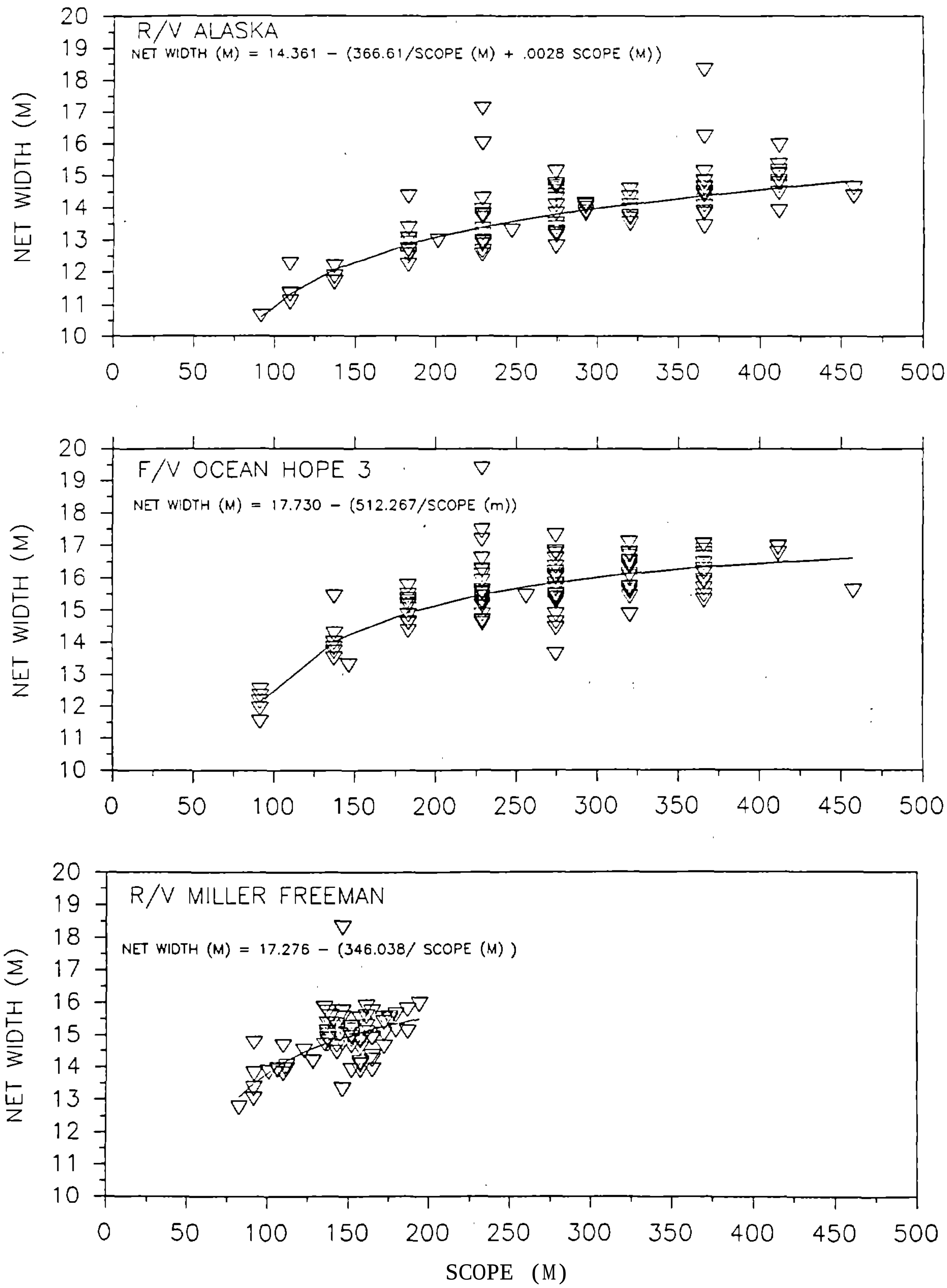

Figure 5.--Relationship between net width and scope (trawl warp paid out) for the three vessels participating in the 1988 demersal trawl survey on the Bering Sea shelf.

during the eastern Bering Sea slope survey. At the depths on the slope where these two vessels worked, it appears that both nets were operating in the asymptotic portion of the relationship between scope and net width where additional wire paid out had no effect on width. Therefore single values were used for all tows.

Relative Fishing Powers

Relative fishing powers of survey vessels were estimated during the eastern Bering Sea surveys to account for differences in the efficiencies of the vessels at capturing various species; by compensating for these differences abundance estimates are assumed to be improved.

Two methods were used to measure the relative fishing powers of survey vessels during the 1988 survey: alternate-row fishing and side-by-side fishing. The U.S. vessels Alaska and Ocean Hope 2 fished alternate north-south lines of stations throughout the survey area on the shelf (Fig. 6). This has become the preferred method of measuring the fishing powers for the standard annual shelf surveys. It produces a large number of observations over the entire range of all species within the survey area and appears to produce good results without sacrificing vessel time for side-by-side trawling. The relative fishing powers of the two vessels are determined for each species or species group by comparing the distribution of catch per unit effort (CPUE) values obtained by each vessel from sets of stations on alternate lines throughout the survey area. The need for a fishing-power correction factor is assessed for each species by determining whether the distributions of CPUE values from the two vessels were statistically equivalent based on the method of Geisser and Eddy (1979). If the analysis indicates that the CPUE distributions are the same, or if there are insufficient data to test for differences, the vessels were assumed to have equal fishing powers for that species. If the CPUE distributions are statistically different for a given species, the vessel with the higher catch rate is assigned a fishing power of 1.0, and catch weights and numbers taken by the less efficient vessel were adjusted to those of the more efficient vessel by using the ratio of the mean catch rates from the two vessels. The rationale for this adjustment is based on the assumption that CPUE values of the more efficient vessel provide the best estimate of the true abundance of the species.

Analysis of the alternate-row fishing data (Table 4) revealed that the Alaska was more efficient than the Ocean Hope 2 for almost all species and significantly more efficient for an unusually high number of species relative to results from previous years. Between-vessel fishing power corrections have usually only been required for 1 to 4 species in past years, while in 1988 the analysis indicates that 13 species required fishing power corrections. The consistency of the results for the large majority of species shows that the trawls were

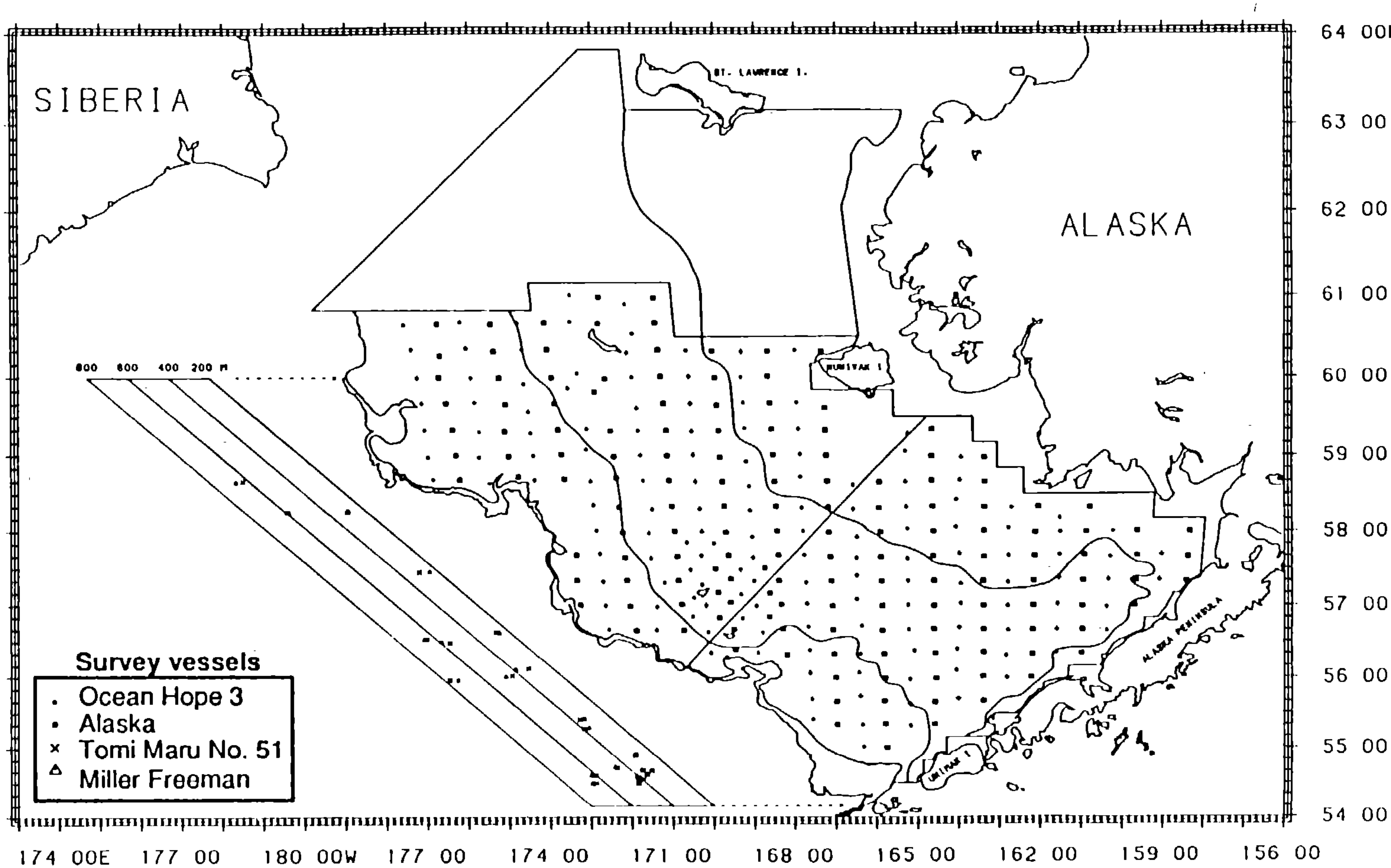

Figure 6. --Stations used to determine relative fishing powers of the *Alaska* and *Ocean Hope* 3 on the continental shelf and the NOAA vessel *Miller Freeman* and *Tomi Maru* No. 51 on the continental slope during the 1988 survey.

Table 4.--Relative fishing powers of the Alaska and Ocean Hope 3 based on comparision of mean catch rates from fishing alternate rows of stations over the area shown in Figure 6.

Species[a]	Number of stations at which species was taken[b]		Mean catch rates (kg/ha)		Ratio of catch rates
	Alaska	Ocean Hope 3	Alaska	Ocean Hope 3	Alaska/Ocean Hope 3
Walleye pollock	150	154	165.45	141.85	1.166
Pacific cod	150	145	22.61	18.05	1.253
Pacific herring	51	38	7.67	0.21	35.860
Yellowfin sole	114	107	59.11	32.57	1.815[c]
Rock sole	145	136	42.87	25.27	1.697[c]
Flathead sole	113	116	12.03	10.40	1.157
Alaska plaice	113	106	21.72	9.78	2.221[c]
Greenland turbot	21	17	0.25	0.22	1.124
Arrowtooth flounder	82	75	7.35	5.03	1.462
Pacific halibut	94	76	2.94	1.57	1.876[c]
Starry flounder	15	8	0.19	0.08	2.416[c]
Longhead dab	34	24	0.40	0.16	2.458[c]
Rex sole	30	22	0.31	0.20	1.537
Bering flounder	38	33	0.37	0.43	0.845
Butter sole	6	2	0.04	0.03	1.098
Gymnocanthus sp.	26	20	0.27	0.06	4.520[c]
Yellow Irish lord	28	29	1.01	0.60	1.680
Butterfly sculpin	10	12	0.39	0.31	1.283
Triglops sp.	20	12	0.03	0.01	3.095
Myoxocephalus sp.	94	91	3.40	2.59	1.316
Spinyhead sculpin	11	13	0.02	0.02	0.995
Bigmouth sculpin	19	19	0.43	0.60	0.713
Icelus sp.	28	35	0.06	0.03	2.056[c]
Arctic cod	16	11	0.02	0.01	1.860
Saffron cod	6	6	0.04	0.02	1.841
Eulachon	5	8	0.05	0.02	3.202
Capelin	45	41	0.06	0.06	0.859
Marbled eelpout	18	16	0.36	0.14	2.524[c]
Wattled eelpout	61	56	0.57	0.23	2.530[c]
Shortfin eelpout	35	29	0.21	0.10	2.070[c]
Sturgeon poacher	105	80	0.63	0.36	1.772[c]
Snailfish	37	38	0.19	0.14	1.326
Skates	91	90	9.25	5.33	1.736[c]
Octopus	10	11	0.23	0.10	2.326

[a]For species not listed, observations were lacking or too few for meaningful comparisons. Vessels were assumed to have equal fishing powers for the species not listed.

[b]A total of 156 stations trawled by the Alaska and Ocean Hope 3 were used in the analysis.

[c]The Geisser and Eddy (1979) procedure indicates that the two vessels sampled distinct populations.

operating differently on the two vessels. One major difference was noted in the performance of the trawls. Wing spread on the Alaska trawl averaged almost 2 m less than that of the Ocean Hope 3 trawl based on a large number of observations with Scanmar trawl mensuration systems during the 1988 survey. Because of this large difference in wing-spread measurements, the two trawls were fished in Puget Sound, Washington, during February 1989 and remeasured with different sets of Scanmar gear. Results of these special studies confirmed the measurements obtained during the 1988 survey. It was also discovered that slightly smaller than normal otter doors were inadvertently used by the Alaska during the 1988 survey which may have caused the trawl to fish narrower than usual. Although the wing-spread measurements were shown to be accurate and the narrower trawl width of the Alaska's trawl was accounted for, application of some of the higher fishing-power correction factors appear to produce unreasonable increases in abundance for certain species.. For example, when compared to estimates in 1987, the magnitude of the increases seem high for yellowfin sole (*Limanda aspera*), rock sole (*Lepidopsetta bilineata*), and Alaska plaice (*Pleuronectes quadrituberculatus*) in the standard annual survey area on the shelf as shown below:

	Mean biomass estimate		95% confidence intervals	
Species	1987	1988	1987	1988
Yellowfin sole	2,469,087	2,853,671	2,094,300-2,843,900	2,393,500-3,314,900
Rock sole	1,249,361	1,904,271	1,072,800-1,425,900	1,656,500-2,152,000
Alaska plaice	522,470	936,049	411,100-663,800	628,900-1,243,200

Nevertheless, the fishing power correction factors were applied, lacking any valid justification for not using them.

No comparative fishing experiments were conducted between the NOAA vessel Miller Freeman, which sampled north shelf waters, and the Alaska and Ocean Hope 3. Therefore, no attempt was made to standardize the abundance data from the Miller Freeman to that of the other U.S. vessels engaged in sampling shelf waters.

Side-by-side fishing experiments were conducted on the continental slope by the Miller Freeman and the Tomi Maru No. 51 to relate the abundance estimates from the Miller Freeman which conducted the slope survey for the first time in 1988, to those of Japanese landbased trawlers that have sampled slope waters during previous triennial surveys. Although 34 paired tows were completed by the two vessels, 12 of these pairs were eliminated from the analysis because the depth of trawling differed by more than 50 m. However, as mentioned earlier, data from all 34 of the Tomi Maru No 51 tows were used to supplement the *Miller Freeman* data in the regular analysis of the slope data. The results of the comparative fishing show that the Japanese trawl was more efficient for the larger flatfish, and fishing-power correction factors were required for Greenland turbot (*Reinhardtius hippoglossoides*) and Pacific halibut (*Hippoglossus stenolepis*) (Table 5). However, the application of the fishing-power correction factor for Greenland turbot would imply that the abundance of this species on the slope increased by a factor of 1.65 between 1985 and 1988. Assessments of the Greenland turbot population based on the time series of eastern Bering Sea survey data show that recruitment of juveniles has been extremely low since the early 1980s, and it seems unlikely that the abundance of the older juvenile and adult populations would have increased between 1985 and 1988 (Bakkala 1989). In addition, size composition data clearly shows an absence of juvenile recruitment to the slope since the early 1980s. The application of the fishing-power correction factor derived during the 1988 slope survey was therefore assumed to produce erroneous results and was not used in calculating abundance estimates for this report. The reason for the apparent erroneous fishing power value may be that the number of replications were insufficient or the difficulty of two vessels fishing the same or similar depths on the slope may have produced faulty results. The only other species that was sampled on the slope and required correction for fishing power was the longsnout prickleback (*Lumpenella longirostris*).

Species Groupings

Appendix C contains a ranking by relative abundance based on the mean CPUE, of all fish and invertebrates identified during the 1988 bottom trawl survey. Because midwater trawl hauls were directed to sample specific echo sign, the use of CPUE rankings of abundance would be misleading. For these midwater collections, summaries of overall catch composition are provided. The listing in Appendix C may include some species of uncertain identification. In presenting information in the main body of this report, fish species with difficult or uncertain identifications were grouped into broader taxonomic categories as shown in Table 6. In addition, in some of the tables summarizing abundance data for the overall survey, noncommercially important species were grouped by family. In these latter tables, infrequently occurring species were grouped as "other fish."

Data Collection and Station Sampling Procedure

Bottom Trawl Survey

Detailed methods of data collection and sampling are described by Wakabayashi et al. (1985). Data collected at each

Table 5.--Relative fishing powers of the Miller Freeman and Tomi Maru No.51 based on comparison of mean catch rates from 22 side-by-side tows on the continental slope.

Species[a]	Number of stations at which species was taken[b]		Mean catch rates (Kg/ha)		Ratio of catch rates
	Tomi Maru	Miller Freeman	Tomi Maru	Miller Freeman	Tomi Maru/ Miller Freeman
Walleye pollock	17	17	62.66	109.45	0.573
Pacific cod	10	10	4.94	8.30	0.594
Sablefish	22	22	14.78	11.09	1.333
Pacific ocean perch	13	13	27.53	6.13	4.494
Other rockfish	12	7	0.94	1.28	0.738
Shortspine thornyhead	15	15	1.34	1.15	1.167
Flathead sole	13	13	6.58	7.17	0.918
Arrowtooth flounder	21	19	20.64	11.99	1.722
Greenland turbot	22	20	28.64	10.94	2.618[c]
Pacific halibut	13	3	1.66	0.33	5.066[c]
Rex sole	15	12	1.30	0.69	1.892
Darkfin sculpin	17	16	0.91	1.69	0.537
Bigmouth sculpin	9	7	1.41	1.58	0.889
Marbled eelpout	2	2	0.13	0.04	3.179
Black eelpout	13	13	0.10	0.05	1.915
Twoline eelpout	13	10	0.64	0.33	1.921
Pacific flatnose	2	3	0.02	0.02	1.200
Smooth lumpsucker	3	3	0.04	0.09	0.501
Longsnout prickleback	6	5	0.10	0.02	4.132[c]
Prowfish	4	3	0.34	0.57	0.602
Skates	18	8	1.03	1.14	0.909
Grenadiers	12	11	57.05	26.58	2.146
Snailfish	14	10	0.33	0.16	2.054

[a]For species not listed, observations were lacking or too few for meaningful comparison. Vessels were assumed to have equal fishing powers for the species not listed.

[b]Data for this analysis are from 22 side-by-side tows by the two vessels.

[c]The Geisser and Eddy (1979) procedure indicates that the two vessels sampled distinct populations.

Table 6.--Species groupings used in presenting information on the distribution and abundance of principal species and species groups of fish.

Group name	Species included
Skates	All Rajidae
Smelts	All Osmeridae
Other eelpouts	All Zoarcidae except *Lycodes raridens*, *L. palearis*, *L. brevipes*, *L. diapterus*, *L. concolor*, and *Bothrocara brunneum*
Rattails	All Macrouridae
Other rockfish	All *Sebastes* except *S. alutus*
Thornyhead rockfish	All *Sebastolobus*
Irish lords	All *Hemilepidotus* except *H. papilio*
Other *Myoxocephalus*	All *Myoxocephalus* sculpins except *M. jaok*
Gymnocanthus	All *Gymnocanthus* sculpins
Malacocottus	All *Malacocottus* sculpins
Other sculpins	All Cottidae except species and species groups of sculpins listed above and *Dasycottus setiger* and *Hemitripterus bolini*
Poachers	All Agonidae
Snailfishes	All Cyclopteridae
Arrowtooth flounder	All Atheresthes
Flathead sole	All Hippoglossoides

station included haul position information, species composition by weight and number, and water temperature profiles. Random samples of principal species were measured for length at most stations where they appeared in catches. Age-structure samples, stratified by sex and length class, was also collected from commercially important species. Approximate numbers of length measurements and age structures collected are given in Table 7.

The 1988 sampling and data collection procedures were identical to those used in 1979 (Wakabayashi et al. 1985) with the following modifications: 1) All vessels used Loran C to determine positions at the beginning and end of each tow, and 2) shipboard computers were used on the Japanese vessel as well as all U.S. vessels for recording data on disks.

Echo Integration-Midwater Trawl Survey

Techniques for the Bering Sea EIMWT surveys are described by Traynor and Nelson (1985), and additional details are reported by Bakkala and Wakabayashi (1985) and Walters et al. (1988). The echo integration system consists of a 38 kHz transmitter and receiver, a towed transducer, and a computer-based echo integration and target-strength measurement system. The acoustic system was installed in a portable container that was located on the deck of the survey vessel. The transducer was mounted in a dead-weight towed body that was towed behind the vessel at an approximate depth of 11 m at vessel speeds of 9 to 11 knots. While transecting, echo integrals (which are proportional to fish density) were computed for up to 400 l-m surface-locked depth intervals and 40 l-m bottom-locked intervals every minute.

Estimates of walleye pollock target-strength distributions were obtained when conditions suitable for single-target recognition were encountered. In these situations, the transducer was lowered to bring it as close as possible to the targets. In situ target-strength measurements were obtained by means of dual-beam and split-beam techniques (Ehrenberg 1983).

Midwater trawling was conducted on an opportunistic basis throughout the survey to identify sign and to obtain biological information. Extra trawls were conducted before and after the collection of target-strength data. For each sample collected with the Northern Gold midwater trawl, total weight was determined for each species (or higher taxon) caught, and total number was estimated for each species of finfish. The entire catch was sorted and weighed by species unless it exceeded approximately 1,100 kg. Larger catches were subsampled and the total catch composition was estimated by extrapolation. Sex and length data were collected for each catch of walleye pollock. Random samples of pollock otoliths were taken at most trawl stations. Data on weight and maturity of pollock were collected from selected hauls.

Table 7.--Numbers of length measurements and age structures collected by species during the 1988 U.S.-Japan survey in the eastern Bering Sea.

Species	Bottom trawl survey: Length frequencies[a] U.S.	Bottom trawl survey: Length frequencies[a] Japan	Bottom trawl survey: Age structures[b]	Midwater survey: Length frequencies	Midwater survey: Age structures
Walleye pollock	47,927	3,026	1,125	6,617	1,519
Pacific cod	8,432	308	649	---	---
Arctic cod	949	---	---	---	---
Saffron cod	1,573	---	---	---	---
Sablefish	1,324	2,682	---	---	---
Eulachon	---	---	---	20	---
Pacific Ocean perch	1,713	1,724	---	---	---
Northern rockfish	121	---	---	---	---
Rougheye rockfish	221	---	---	---	---
Shortraker rockfish	112	---	---	---	---
Shortspine thornyhead	1,156	573	---	---	---
Yellowfin sole	33,757	---	598	---	---
Limanda sakhalinensis	275	---	---	---	---
Rock sole	30,848	4	471[c]	---	---
Flathead sole	17,739	2,440	375	---	---
Alaska plaice	8,920	---	348	---	---
Rex sole	499	22	---	---	---
Arrowtooth flounder[d]	9,472	3,430	263	---	---
Greenland turbot	1,584	2,742	105	---	---
Pacific halibut	1,028	64	---	---	---
Longhead dab	275	---	---	---	---
Bering flounder	5,082	---	---	---	---
Starry flounder	16	---	---	---	---
Dover sole	---	3	---	---	---
Coryphaenoides sp.[e]	2,973	1,348	---	---	---
Berryteuthis magister[f]	675	1,293	---	---	---
Pandalus sp.[g]	---	75	---	---	---
Northern pink shrimp[g]	---	294	---	---	---
Pandalus tridens[g]	---	25	---	---	---
Sidestripe shrimp[g]	---	397	---	---	---

[a] Fork lengths (anterior tip of the head to the middle portion of the posterior edge of the caudal fin) were measured for all species of fish except grenadiers.

[b] Otoliths except scales also collected for Pacific cod.

[c] Individual length-weight data also collected for rock sole.

[d] Includes Kamchatka flounder (Atheresthes evermanni Jordan and Starks).

[e] Anus lengths were measured for grenadiers (anterior tip of the head to the middle of the anus).

[f] Mantle lengths were measured for squids (anterior tip to the posterior tip of the mantle).

[g] Body lengths were measured for shrimp (posterior-most part of the orbit to the posterior tip of the telson).

The Marinovich midwater trawl was used to sample age-0 pollock when they were detected acoustically. In almost all cases, catches of age-0 pollock occurred with large quantities of jellyfish. When age-0 pollock were caught, a sample was measured to obtain an estimate of size composition.

Vertical salinity and temperature profiles were obtained at each trawl location with a Seabird Model SBE CTD probe.

Data Analyses

Bottom Trawl Survey

The methods of data analysis used for the bottom trawl survey were the same as those used in 1979, which were described in detail by Wakabayashi et al. (1985). In general terms, catches at each station were standardized to a basic sampling unit (kg/ha = kilogram per hectare or 10,000 m^2) trawled. Mean CPUE values for each species and stratum, adjusted by fishing power coefficients where appropriate, were then computed from the standardized catch rates. The overall mean CPUE for the entire survey area was determined as the sum of the mean CPUE values of individual strata weighted by the size of each strata. Standing stock biomass estimates were derived using the "area swept" method of Alverson and Pereyra (1969). Vulnerability (the proportion of the population available to the fishing gear that is caught when encountered by the gear) of all species to the most efficient vessel-trawl combination was assumed to be 1.0.

In estimating the length composition of the sampled populations, the number of individuals within sex and size classes for each station was derived by expanding the length-frequency subsample to the total catch per standard sampling unit. The length composition data from individual station data were then extrapolated to the total strata area and summed over all strata to obtain estimates for the total survey area. W e composition was estimated by proportioning the computed population length-frequency distributions to ages using age-length keys that were stratified by sex and size categories.

Problems in ageing walleye pollock from midwater trawl samples are described in the following section. This problem was not as severe in ageing pollock from the bottom trawl samples, and all age readings were used in developing an age-length key for estimating the age composition of near-bottom pollock.

Echo Integration-Midwater Trawl Survey

Size-specific biomass estimates and population estimates for each stratum were obtained by combining echo integration data with midwater trawl catch information. In situations where insufficient trawl samples had been taken within a stratum, data from catches in adjacent strata were also used.. Because the availability of in situ target-strength data is limited, mean target strength for each stratum was computed from the size composition data by means of the regression relationship presented by Foote and Traynor (1988). The computed mean target strength estimates were then used to scale the echo integration results to provide estimates of mean fish density (Traynor and Nelson 1985).

For each stratum, pelagic walleye pollock biomass was calculated as the product of mean density and area. Age-and size-specific biomass and population estimates were calculated using midwater trawl length-frequency data, a length-weight relationship, and an age-length key.

As a quality control procedure during age reading at the AFSC, 20% of the pollock otoliths were read a second time by an independent test reader. In cases where the original and tested age estimates did not agree, the original reader and the test reader review the reading and agree on a resolved age. A comparison between original and resolved ages for the tested sample from this survey revealed a systematic difference: an unusually high proportion of resolved ages were lower than the originally estimated age (for originally estimated ages of 2- 8 years). Because it was not feasible to reread the whole sample, it was not possible to produce corrected age-length keys. Therefore, it was assumed that rereading of the entire sample would result in an overall change in age composition equivalent to that observed in the tested portion and the initial age-specific biomass so population estimates were adjusted accordingly.

As a result of this procedure, inconsistencies will be observed in the results, particularly with regard to the relationships between numbers, biomass, and mean weight. Also, it was considered inappropriate to present the original age-length keys for EIMWT pollock samples in this report.

ASSUMPTIONS AND LIMITATIONS

Bottom Trawl Survey

The assumptions and limitations that apply to most trawl surveys also apply to the 1988 cooperative survey. The estimates of abundance and size composition, as well as the distribution of the species, are limited by the area and timing of the surveys, and the sampling gear used. The survey is designed as a multispecies survey, and therefore has some limitations for almost any individual species. For example, during the summer period when the survey was performed, many species have juvenile distributions close inshore 'in shallow waters where the trawl cannot be operated effectively. These include many of the flatfish and herring as well as some of the cods and smelts. On the continental slope the bottom terrain is such that trawlable bottom is difficult to find. Some species, such as the rockfishes, are known to congregate in areas where trawling is impossible. In addition, there are a number of species that have distributions extending beyond the depth and geographic boundaries of these surveys.

The trawl used in the bottom trawl survey is designed primarily for demersal species. The head rope height is limited to a few meters, and species that display primarily pelagic behavior may not be well represented in the trawl catches. In some cases this phenomenon may be limited to specific age groups within a species. The catchability coefficient is assumed to be 1.0 in this analysis. The actual value may be less than that because of. escapement by some species. Then again, for some other species, the herding effects of the doors and dandylines may result in catchabilities exceeding 1.0.

The bottom trawl survey on the major portions of the continental shelf is designed to progress from east to west. It is believed that most of the target species migrate from west to east during the summer period and would therefore be sampled only once, rather than following the same group of fish. Some of the species may have opposite or near-random movement. In those cases there may have been unknown errors caused by such movements. For most species, these various factors are believed to result in an underestimation of abundance rather than an overestimation. The difference between the estimates and the true value may vary considerably between species.

Echo Integration-Midwater Trawl Survey

Many of the sources of bias associated with bottom trawl assessment of demersal stocks are also of concern when using EIMWT techniques for pelagic stock assessment. In general, these aspects relate to fish availability and are discussed in detail above. Because our survey covered most of the shelf and slope area within a relatively short period of time, we believe that immigration, emigration, or migration of walleye pollock within the survey area were insignificant. However, because the EIMWT survey was conducted during both daylight and darkness, changes in vertical distribution, particularly die1 vertical migrations between midwater and the bottom may have produced bias in the pollock biomass estimates.

During analysis of the EIMWT data, it was assumed that the effective height of the bottom trawl was 3 m. Acoustic data collected within 3 m of the bottom were not included in the analysis. Total pollock abundance is assumed, then, to be the sum of abundance estimates from the two surveys. It has been observed that pollock frequently dive as they become aware of an approaching net; this may result in a much greater effective height for the bottom trawl. If this occurred frequently it could have caused overestimation, especially of larger pollock which are generally found close to the bottom. We are planning experiments to address this problem during the next triennial survey.

Several sources of bias are of specific concern when using acoustic techniques to survey pelagic stocks. These include echo sign identification, determination of fish target strength, measurement of equipment performance during calibration, and selection of the density threshold during data collection.

The principal source of information for identification of echo sign is obtained by midwater trawling. The data obtained during midwater trawling are also used to apportion the biomass and population estimates by size and age. Consequently, inadequate trawl sampling may contribute to errors in species identification and in the estimation of stock size and age composition. Because AFSC scientists have conducted EIMWT surveys of walleye pollock for a number of years, and have developed extensive expertise in echo sign identification and allocation of midwater trawl effort, we do not believe that echo sign misinterpretation or inadequate trawl sampling were substantial sources of bias during this survey.

Fish target-strength estimation is a serious concern in all acoustic stock-assessment work. Fish target strength is the factor used when converting the relative biomass estimates obtained during echo integration into absolute abundance estimates; it is influenced by fish size and behavior. In previous surveys, we have used length-specific target-strength estimates based on published information. Recent work on walleye pollock swimbladder morphology and target strength by Foote and Traynor (1988) now provides us with a regression relationship for calculating target strength which should reduce the bias associated with this factor. In the future, we plan to collect sufficient in situ target-strength data to provide time-and area-specific information.

Complete system calibration was conducted before and after the survey, and field calibrations were conducted three times during the season. We believe that unbiased instrument performance measurements were obtained during these occasions.

The normal practice of setting the density threshold high enough to exclude all extraneous returns (from noise and small scatterers) will result in the exclusion of some fish targets, especially when the fish are sparsely distributed;. low densities of walleye pollock may not have been detected, particularly at depths greater that 200 m. However, because most pollock were observed in relatively dense schools shallower than 200 m, this source of bias is not thought to have been serious. In some areas, pollock may have been obscured by dense aggregations of zooplankton and jellyfish; data from these aggregations were not used to estimate pollock abundance.

RESULTS OF 1988 TRIENNIAL SURVEY

Station Data

Station data from the 1988 survey are listed in Appendix B. The data are organized by area of survey activity and vessel. Appendix Tables Bl-B4 contain standard bottom trawl stations used in the analyses; Tables B5-B6 contain the station data from the acoustic survey.

Environmental Conditions

Sea surface temperatures recorded during the 1988 survey ranged from 2.8 to 12.9°C (Fig. 7). Two cells of cold 2.8-4.0°C water were observed within the 50 m isobath off northern Bristol Bay. Most of the remaining inner shelf water ranged from 4 to 6°C Midshelf surface water mainly ranged from 6 to 8°C as did the outer shelf water south of the Pribilof Islands. Surface waters over the outer shelf north of the Pribilofs and over much of the slope ranged from 8 to 10°C. There was some colder 7-8°C surface water over the extreme northern and southern slope areas that also extended onto the shelf in these regions. The warmest temperatures observed were near shore on the north shelf where surface temperatures exceeded 10°C.

Bottom temperature conditions during summer 1988 were some of the coldest observed since 1975 (Fig. 7). Water of less than O°C covered extensive areas of the midshelf to as far south as the vicinity of the Pribilof Islands. Such an extensive tongue of subzero water has only been observed previously in 1975 and 1986. The large mass of 0-2°C water extending over the majority of the central shelf and portions of the inner and outer shelves is also typical of colder years. Somewhat warmer 2-4°C bottom water was found over most of the outer shelf and the slope. Bottom temperatures on the slope were quite uniform with almost all the observations ranging from 3.1 to 3.9°C. Some much warmer bottom temperatures (7-10°C and higher) were recorded on the more inshore areas of the north shelf.

The mean bottom temperature for the standard annual survey area (excluding the north shelf) was 2.3°C (Fig. 8). This value falls at the lower end of the range of mean summer bottom water temperatures (1.8-5.1°C) for years in which the total standard area has been surveyed. 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 1988 value for this area was 3.0°C, near the middle of 'the range for this area.

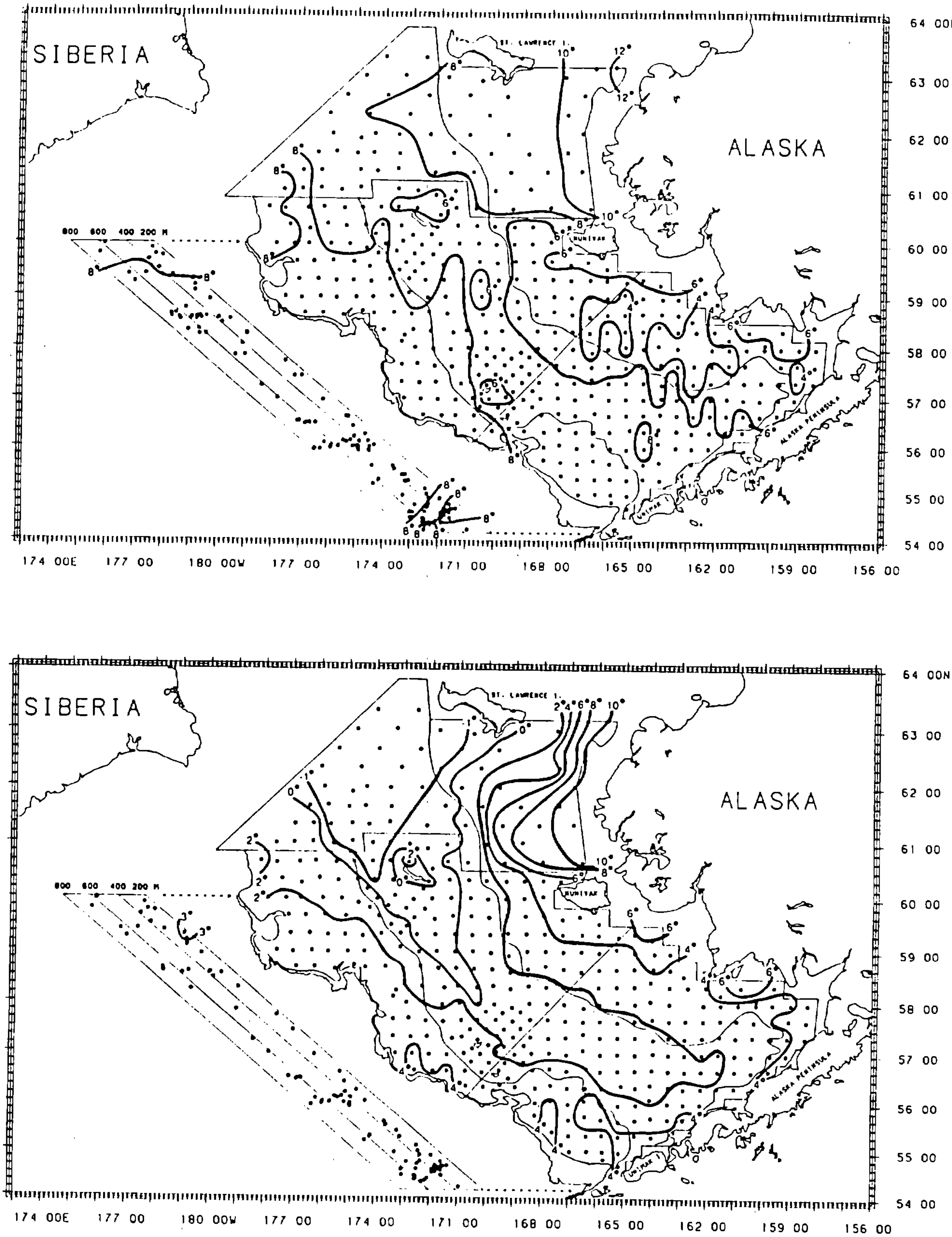

Figure 7.--Distribution of surface water (top panel) and bottom water (lower panel) temperatures (°C) observed during the 1988 survey.

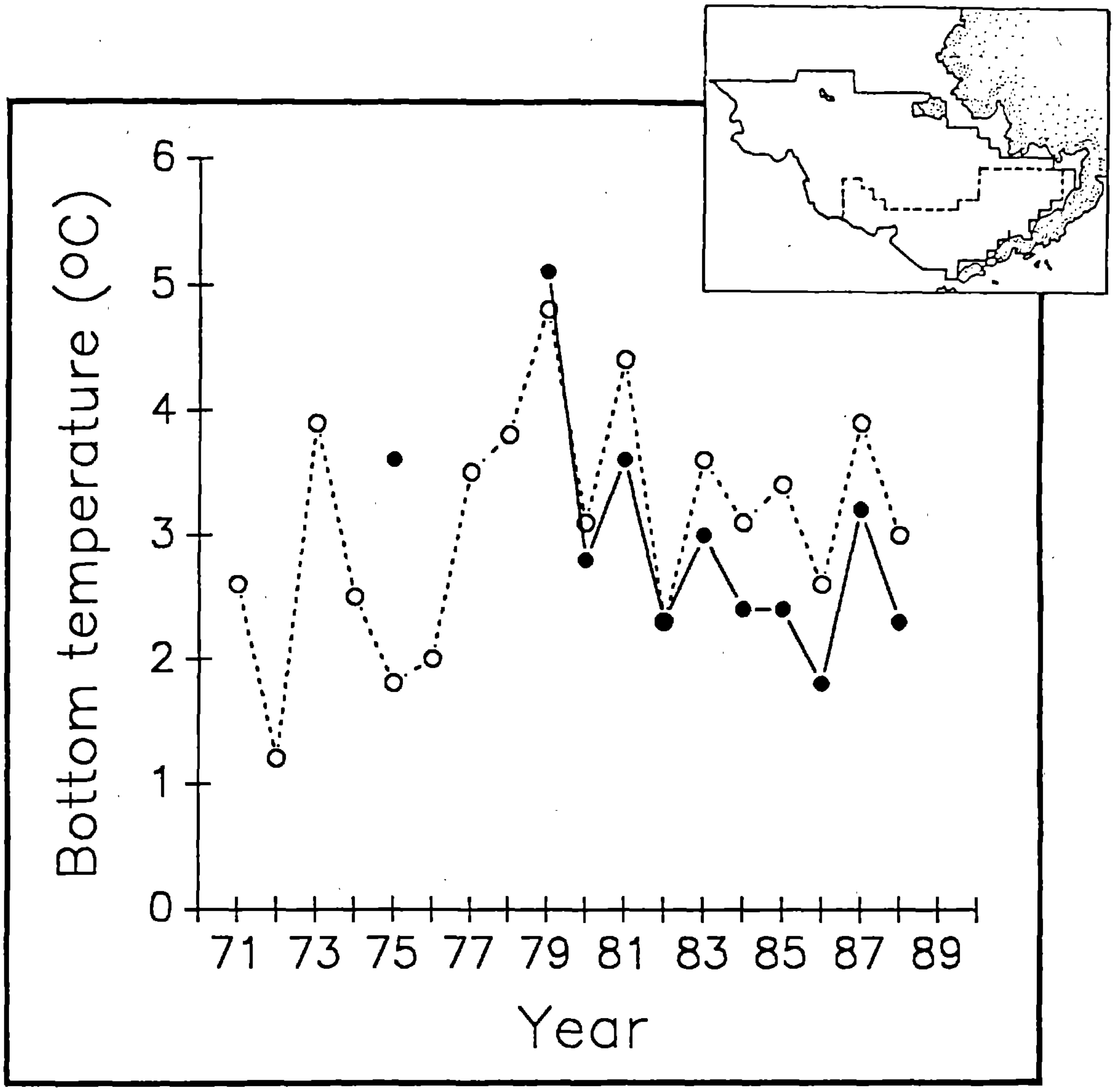

Figure 8. --Mean bottom temperatures in the eastern Bering Sea based on bathythermograph casts during the Alaska Fisheries Science Center's groundfish surveys. The 1971-88 means (dashed line) are from the southeast Bering Sea (see inset) and the 1975 and 1979-88 means (solid line) are from the larger survey area outlined on the inset.

Species Encountered

All species of fish and invertebrates taken during the 1988 survey are ranked by relative abundance (CPUE) in Appendix Table C-3. There were 106 species of fish identified among 34 families, similar in number to the 108 species among 33 families identified during the 1982 triennial survey (Bakkala et al. 1985).

Two species not taken during earlier surveys were identified during the 1988 survey: longnose lancetfish (Alepisaurus ferox) and yellowtail rockfish (Sebastes flavidus).

Overall Abundance of Major Fish and Invertebrate Families

The total animal biomass for the overall survey area was estimated at 26.1 million t, of which fish species accounted for 84% (21.8 million t) and invertebrates 16% (4.2 million t) (Tables 8 and 9). Within the groundfish complex, the most abundant families were the cods which represented 61% (13.3 million t) of the total fish biomass and the flatfish (7.3 million t), which represented 33% of the total biomass; these families combined represented 94% of the total fish biomass. The next most abundant families were the skates and sculpins representing 2 and 1% of the total, respectively.

The most abundant invertebrate groups were the crabs (43% of the total sampled invertebrate biomass), starfish (22%), and snails (12%). The majority of the fish biomass (92%) was located on the eastern Bering Sea shelf (subareas l-6, Fig. 9; see Fig. 3 for location of subareas). The north shelf (subareas 7-8) accounted for 6% of the total fish biomass and the continental slope (subareas 9-12) for 2%. The majority of the fish biomass (44%) was located on the outer shelf (subareas 5-6), but they were also abundant (35%) in the middle shelf subareas (Fig. 9). Over a third of the total fish biomass (8.1 million t, or 37%) was located in the outer shelf subarea north of the Pribilof Islands (subarea 6) with most of this (7.4 million t) consisting of walleye pollock. Most (7.5 million t or 62%) of the total biomass of pollock derived from the combined bottom trawl and acoustic survey data were sampled by bottom trawls.

Relative Importance of Individual Species of Fish

Listings of all species of fish and invertebrates in order of relative abundance (CPUE) taken on the continental shelf and slope and in the overall survey area are presented in Appendix C.

Bottom Trawl Survey

Figure 10 illustrates the relative importance of major species and species groups taken during the 1988 bottom trawl

Table 8.--Biomass estimates (metric tons, t) for major fish species and fish groups taken during the 1988 bottom trawl and midwater hydroacoustic survey.

Taxon	Estimated total biomass (t) and 95% confidence interval	Proportion of total animal biomass[A]	Estimated biomass by subarea (t)											
			Eastern Bering Sea shelf						North shelf		Slope			
			1	2	3	4	5	6	7	8	9	10	11	12
Gadidae (cods)														
Walleye pollock														
Demersal	7,511,167 ± 19%	0.288	146,232	45,193	1,188,969	1,164,403	420,077	3,957,156	90,886	367,399	62,943	67,394	461	54
Midwater[B]	4,675,436 ± 17%	0.179	--	--	500,493	195,864	586,962	3,159,824	0	147,087	67,040	18,166	--	--
Pacific cod	1,046,476 ± 15%	0.040	112,330	37,913	244,407	165,431	101,393	298,069	42,520	35,011	1,777	7,410	214	0
Other cods	83,640 ± 65%	0.003	2,052	858	0	621	0	0	38,724	41,384	0	0	0	0
Total cods	13,316,719	0.511	260,614	83,964	1,933,870	1,526,319	1,108,432	7,415,049	172,130	590,881	131,760	92,970	675	54
Anoplopomatidae														
Sablefish	30,786 ± 40%	0.001	0	0	0	0	199	130	0	0	15,367	4,286	6,622	4,182
Scorpaenidae (rockfish)														
Pacific ocean perch	29,433 ± 66%	0.001	0	0	0	0	548	3	0	0	2,577	26,090	139	76
Thornyheads	5,250 ± 85%	<.001	0	0	0	0	0	0	0	0	841	97	3,616	696
Other rockfish	9,688 ± 147%	<.001	0	0	41	0	6,907	143	0	0	1,025	725	756	91
Total rockfish	44,370 ± 55%	0.002	0	0	41	0	7,455	145	0	0	4,443	26,912	4,511	863
Pleuronectidae (flatfishes)														
Yellowfin sole	3,069,387 ± 15%	0.118	1,303,331	353,022	944,667	253,421	0	121	174,027	40,798	0	0	0	0
Rock sole	1,914,741 ± 13%	0.073	878,172	114,095	590,458	265,793	3,633	51,393	5,941	5,240	1	16	0	0
Flathead sole	618,884 ± 15%	0.024	13,667	628	201,515	46,884	98,571	196,218	4,726	45,946	8,842	1,769	116	1
Alaska plaice	1,060,644 ± 30%	0.041	173,502	70,373	366,305	295,049	175	31,379	85,702	38,158	0	0	0	0
Arrowtooth flounder	337,053 ± 20%	0.013	1,018	0	77,555	13,442	91,999	122,348	0	132	16,908	12,162	1,210	279
Greenland turbot	57,562 ± 24%	0.002	0	0	0	209	286	11,071	0	3,259	16,015	12,942	11,348	2,432
Pacific halibut	142,507 ± 17%	0.005	30,973	10,915	24,761	15,137	28,306	28,061	2,712	304	915	357	48	17
Other flatfish	59,395 ± 19%	0.002	24,088	5,743	8,970	259	8,764	3,984	4,516	1,222	1,538	153	136	20
Total flatfish	7,260,174 ± 11%	0.278	2,424,752	554,776	2,214,233	890,194	231,734	444,574	277,624	135,060	44,220	27,400	12,857	2,751
Clupeidae														
Pacific herring	164,956 ± 176%	0.006	153,848	1,721	758	4,694	0	3,421	51	460	2	0	0	0
Cottidae (sculpins)	314,666 ± 25%	0.012	46,295	16,479	19,936	119,765	8,363	25,017	44,782	30,134	1,179	2,075	577	62
Macrouridae (rattails)	61,377 ± 28%	0.002	0	0	0	0	0	0	0	0	3,144	11,334	9,659	37,240
Zoarcidae (eelpouts)	95,331 ± 20%	0.004	313	22	5,414	25,024	937	19,673	5,480	34,475	687	217	2,864	225
Osmeridae (smelts)	9,686 ± 30%	<0.001	2,166	590	359	117	2,368	0	1,691	2,378	16	0	0	0
Agonidae (poachers)	26,579 ± 21%	0.001	6,795	3,902	7,778	6,963	191	157	650	37	68	26	9	2
Cyclopteridae (snailfish)	13,358 ± 19%	0.001	240	62	395	3,387	27	3,164	251	5,271	220	200	54	87
Rajidae (skates)	470,488 ± 19%	0.018	9,310	2,540	66,017	77,832	107,472	187,254	7,540	10,001	870	1,388	112	151
Other fish	23,184 ± 70%	0.001	413	788	1,107	918	7,391	8,249	296	175	506	1,553	1,527	259
Total fish	21,831,672	0.837	2,904,747	664,845	4,249,910	2,655,214	1,474,569	8,106,835	510,498	808,872	202,482	168,359	39,466	45,876

[A]Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area (Total estimated biomass = 26,069,413 t).
[B]Subareas 1, 2, 11, and 12 were not sampled during the midwater acoustic survey.
Note: Differences in sums of estimates and totals are due to rounding.

Table 9.--Biomass estimates (in metric tons, t) for major invertebrate species and invertebrate groups taken during the 1988 bottom trawl survey.

Taxon	Estimated total biomass (t) and 95% confidence interval	Proportion of total animal biomass[1]	Estimated biomass by subarea (t): Eastern Bering Sea shelf 1	2	3	4	5	6	North shelf 7	8	Slope 9	10	11	12
Crustacea														
Chionoecetes sp. (snow crab)	1,252,038 ± 13%	0.048	24,777	10,557	183,092	442,540	9,616	132,629	60,166	388,061	59	40	440	62
Lithodes sp. (king crab)	177 ± 95%	<.001	0	0	0	0	0	106	0	0	17	13	37	3
Paralithodes sp. (king crab)	60,646 ± 38%	0.002	10,884	497	42,287	6,627	0	136	76	138	0	0	0	0
Erimacrus isenbeckii (hair crab)	1,420 ± 65%	<.001	55	228	324	766	47	0	0	0	0	0	0	0
Paguridae (hermit crab)	482,010 ± 15%	0.018	51,280	34,207	128,222	146,707	4,412	58,009	44,714	14,444	3	8	3	1
Other crab	41,261 ± 24%	0.002	15,385	6,826	7,525	6,118	330	1,457	2,686	929	1	1	6	0
Total crab	1,837,551 ± 11%	0.070	102,380	52,314	361,449	602,757	14,405	192,338	107,643	403,573	78	62	486	66
Shrimps	9,328 ± 23%	<.001	376	299	502	191	145	2,859	2,099	2,249	347	209	29	22
Other crustaceans	8,752 ± 88%	<.001	560	0	1,017	452	2,016	15	4,692	0	0	0	0	0
Total crustaceans	1,855,630 ± 10%	0.071	103,316	52,613	362,968	603,401	16,566	195,211	114,433	405,822	426	271	516	88
Mollusca														
Gastropoda (snails)	506,614 ± 14%	0.019	42,039	48,757	135,342	102,695	6,153	87,790	47,014	36,723	12	18	68	3
Pelecypoda (bivalves)	9,886 ± 42%	<.001	988	796	1,037	1,226	84	1,781	3,632	342	0	1	0	0
Squids	2,274 ± 25%	<.001	0	0	4	0	2	98	0	0	1,157	579	391	42
Octopuses	10,647 ± 53%	<.001	0	0	943	301	1,987	7,136	30	141	29	48	12	19
Other mollusks	5 ± 200%	<.001	0	0	0	5	0	0	0	0	0	0	0	0
Total mollusks	529,425 ± 14%	0.020	43,027	49,552	137,326	104,227	8,227	96,805	50,676	37,206	1,199	646	471	64
Echinodermata														
Asteroidea (starfish)	995,381 ± 16%	0.038	314,438	153,968	217,243	124,999	1,283	75,080	84,944	23,179	77	12	151	6
Ophiuroidea (brittlestars)	203,417 ± 29%	0.008	3,321	937	44,448	18,726	28,773	84,499	5,471	16,667	0	2	573	0
Echinoidea (sea urchin)	14,741 ± 59%	0.001	99	124	3,501	7,280	1,987	1,282	381	84	1	1	0	0
Holothuroidea (sea cucumbers)	15,432 ± 113%	0.001	8,890	0	5,872	42	0	65	9	54	361	7	122	10
Total echinoderms	1,228,972 ± 14%	0.047	326,748	155,029	271,063	151,047	32,043	160,926	90,805	39,985	440	23	847	16
Ascidiacea	337,010 ± 31%	0.013	60,392	29,746	80,103	92,513	0	42	70,710	3,505	0	0	0	0
Porifera (sponges)	132,244 ± 133%	0.005	2,588	235	116,389	10,441	667	541	204	71	4	28	1,076	0
Coelenterata (coelenterates)	142,131 ± 32%	0.005	13,293	1,905	37,845	41,612	31,845	4,133	7,490	2,581	817	219	313	79
Other invertebrates	12,329 ± 50%	0.001	3,890	183	1,700	841	6	4,097	843	757	1	6	3	1
Total invertebrates	4,237,741 ± 9%	0.163	553,253	289,265	1,007,394	1,004,081	89,355	461,755	335,161	489,926	2,886	1,193	3,225	248

[1]Proportion of total estimated biomass, fish and Invertebrates combined, for the total survey area (Total estimated biomass = 26,069,413 t).
Note: Differences in sums of estimates and totals ore due to rounding.

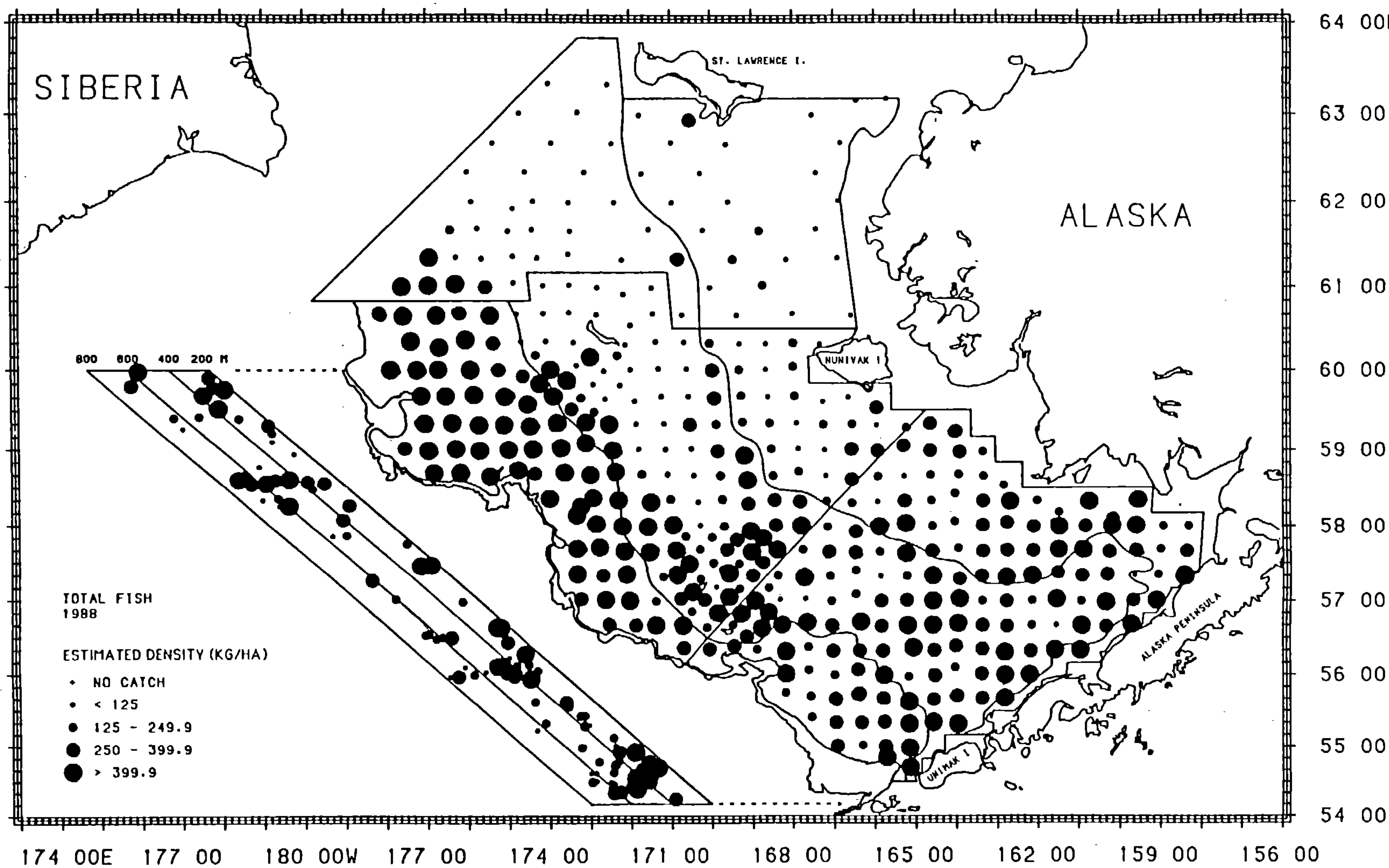

Figure 9.--Distribution and relative abundance of total fish in the eastern Bering Sea, including midwater walleye pollock, as shown by the 1988 bottom trawl and midwater surveys.

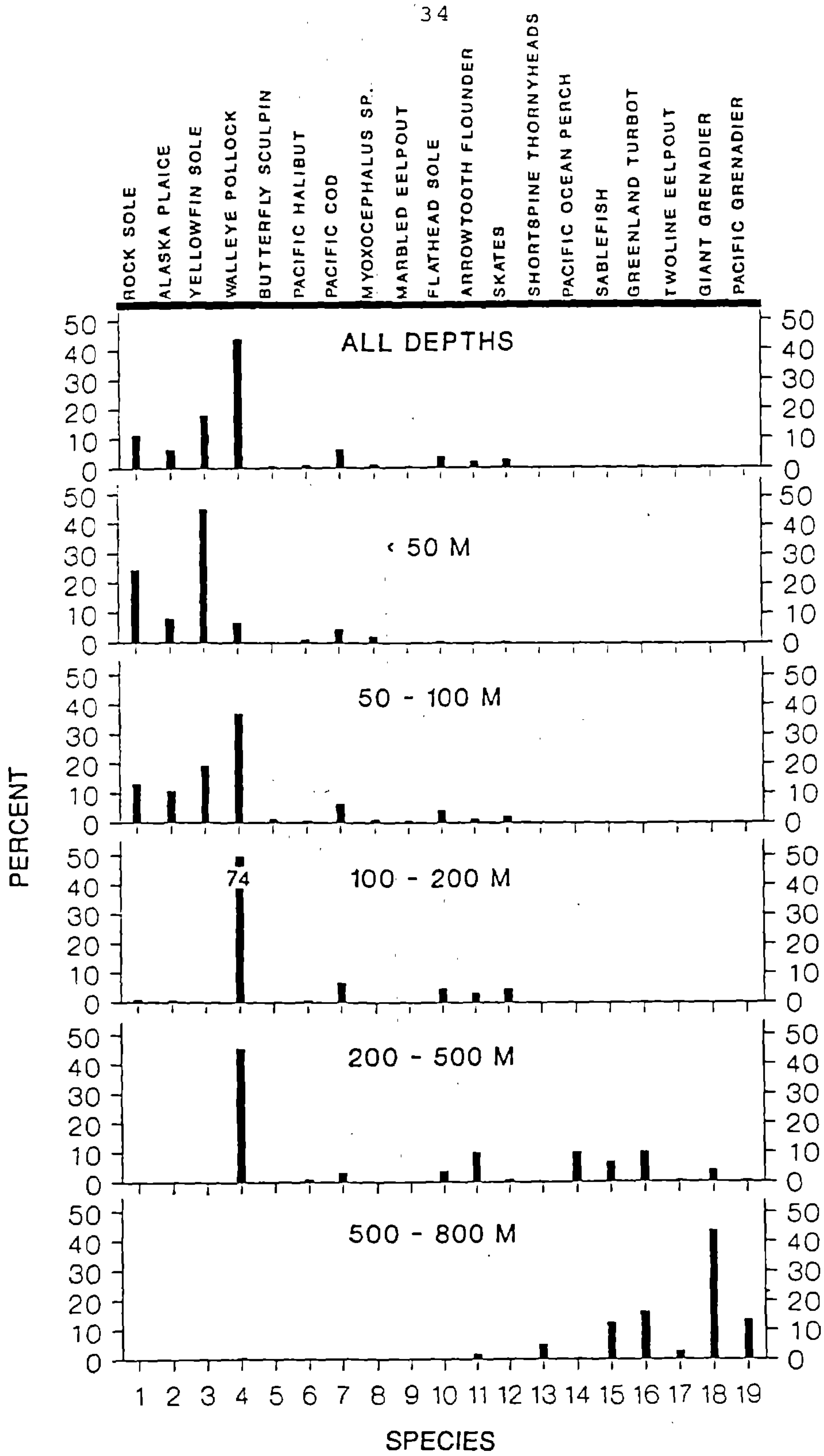

Figure 10.--The relative importance of selected species by depth interval as shown by proportion of biomass from the 1988 eastern Bering Sea bottom trawl survey.

survey. Table 8 presents biomass estimates for all principal species and species groups of fish from the bottom trawl data and includes the walleye pollock data from the EIMWT survey.

Over all depths, walleye pollock was the most prominent species representing nearly 44% of the total fish biomass estimate from the bottom trawl survey (Fig. 10). Including the EIMWT survey estimate, walleye pollock made up 56%. Flatfish represented an important component of the bottom trawl estimates. Yellowfin sole was the second most abundant species representing 18% of the total fish biomass, and rock sole was third with 11%.

The relative proportion of each species in the bottom trawl survey varied considerably with depth. In the inshore waters less than 50 m in depth, yellowfin sole was the predominant species, representing 45% of the total fish biomass estimate. Rock sole was second with 25% and Alaska plaice was third with 8%. In these waters, walleye pollock made up only 7% of the estimated fish.

Across the rest of the shelf, from 50 m to the shelf edge near 200 m, walleye pollock made up 56% of the bottom trawl biomass estimate for fish. Yellowfin sole was second with 10% and rock sole was third with 7%. Pacific cod (Gadus macrocephalus) was also near 7%.

On the continental slope, walleye pollock was still the predominate species with 32% of the biomass. Greenland turbot was second with 20%, and the rattails were third with 15%. Sablefish (Anoplopoma fimbria), arrowtooth flounder (Atheresthes stomias), and Pacific ocean perch (Sebastes alutus) each accounted for nearly 7%.

Echo Integration-Midwater Trawl Survey

As described under methods, two types of midwater trawls were used to sample midwater walleye pollock. The smaller Marinovich trawl, with a 3.2 mm codend liner, was directed at juvenile fish sign while the Northern Gold rope trawl, a commercial midwater pollock trawl, was directed at adult pollock sign. As would be expected, catch compositions differed between the two trawls. Age-l and older walleye pollock dominated rope trawl catches over all depths and comprised 99.8% by weight of the total catch of fish (Table 10). This proportion was similar from the three hauls over bottom depths of 50-100 m and from the 22 hauls over bottom depths of 100-200 m. Other species, mainly Pacific cod, were taken in very small quantities.

Pollock also dominated catches from the Marinovich midwater trawl (Table 11). Adult flatfish dominated the aggregated catch composition by weight from the six hauls over bottom depths of 50-100 m because two adult flatfish were caught in one of the hauls. Overall, juvenile pollock dominated the fish catches; pollock was the only species taken in the four Marinovich tows

Table 10.--Rank order of abundance of all fish taxa taken by the Northern Gold 1200 Rope trawl during the 1988 midwater survey.

Taxon	Proportion of total catch	Cumulative proportion
Over bottom depths of 50-100 m		
Walleye pollock	0.9908	0.9908
Pacific cod	0.0082	0.9991
Flatfish (unident.)	0.0007	0.9998
Pacific herring	0.0002	1.0000
Over bottom depths of 100-200 m		
Walleye pollock	0.9976	0.9976
Pacific cod	0.0013	0.9990
Pacific herring	0.0005	0.9995
Coho salmon	0.0004	0.9998
Eulachon	0.0001	1.0000
Rock sole	<0.0001	1.0000
Smooth lumpsucker	<0.0001	1.0000
Over all bottom depths		
Walleye pollock	0.9975	0.9975
Pacific cod	0.0015	0.9990
Pacific herring	0.0005	0.9995
Coho salmon	0.0004	0.9998
Eulachon	0.0001	0.9999
Rock sole	<0.0001	1.0000
Flatfish (unident.)	<0.0001	1.0000
Smooth lumpsucker	<0.0001	1.0000

Table 11. --Rank order of abundance of all fish taxa in surface layers taken by the Marinovich trawl during the 1988 midwater survey.

Taxon	Proportion of total catch	Cumulative proportion
Over bottom depths of 50-100 m		
Flatfish (unident.)	0.5517	0.5517
Walleye pollock	0.3103	0.8621
Pacific sand lance	0.0345	0.8966
Poacher (unident.)	0.0345	0.9310
Roundfish (unident.)	0.0345	0.9655
Flatfish larvae	0.0345	1.0000
Over bottom depths of 100-200 m		
Walleye pollock	1.0000	1.0000
Over all bottom depths		
Walleye pollock	0.9612	0.9612
Flatfish (unident.)	0.0311	0.9922
Pacific sand lance	0.0019	0.9942
Flatfish larvae	0.0019	0.9961
Roundfish (unident.)	0.0019	0.9981
Poacher (unident.)	0.0019	1.0000

over depths of 100-200 m. For fish and invertebrates combined, jellyfish comprised 90.9% by weight of the Marinovich trawl catches over all depths.

Results of 1988 Studies on Age-O Walleye Pollock

In previous years, attempts have been made to assess the distribution and abundance of age-0 walleye pollock. However, practical difficulties were encountered because age-0 pollock were often found in close association with substantial quantities of jellyfish. In addition interpretation of survey results was confounded by within- and between-year differences in gear characteristics, survey area coverage, and survey timing. Therefore, a directed survey of age-0 pollock was not conducted in 1988 although hauls were made in areas where possible age-0 sign was encountered; when young-of-the-year pollock were caught, length frequency samples were collected. Because of the limited effort in 1988, it was not considered appropriate to compare these results with the age-0 observations from previous years.

Age-O pollock were taken in nine of the Marinovich tows. Most of these juveniles were encountered southeast of the Pribilof Islands and in water depths between 50 and 100 m, a known area of high abundance of age-0 pollock determined from previous triennial surveys (Walters et al. 1988). Overall, length measurements were taken from 268 fish having a mean length of 33.1 mm (Figure 11).

Abundance, Distribution, and Size and Age Composition of Principa1 Species of Fish, Shrimps, Squids, and Octopuses

Tables 15-45 and Figures 14-87 summarize findings from the 1988 U.S.-Japan survey for each of the principal commercially important species of demersal fish and the more abundant species groups such as the sculpins, eelpouts, and skates, and the shrimps, squids, and octopuses. (Note that the final section of the report comparing results of the four triennial surveys, which contains Tables 12-14 and Figures 12-13, precedes the above tables and figures. This arrangement allows all of the text to precede the large numbers of tables and figures in the remainder of the report as a convenience for the reader.) Tables summarize mean CPUE and biomass estimates, population numbers and mean size by subarea. Figures illustrate the geographic distributions and length compositions of each species. Where data are available, the age distribution and growth characteristics of the populations are also shown. Results of the hydroacoustic survey are also summarized in the walleye pollock section (except for results on age-0 pollock described above) along with combined results from the bottom trawl and hydroacoustic survey on pollock.

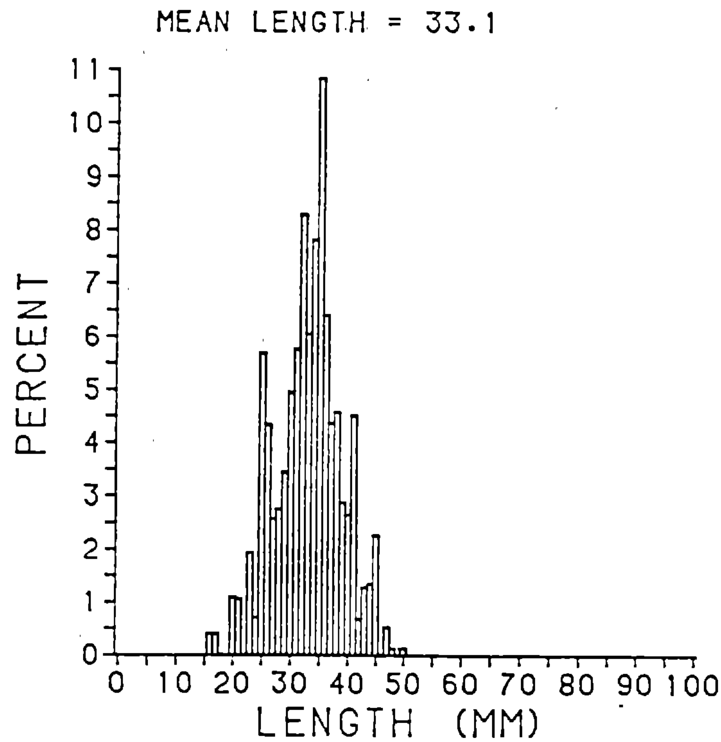

Figure 11. --Length distribution of age-0 walleye pollock as shown by sampling during the 1988 midwater survey.

COMPARISON OF RESULTS FROM THE FOUR TRIENNIAL SURVEYS

Results from the 1979, 1982, and 1985 triennial surveys were compared by Walters et al. (1988). This previous comparison did not include results of the EIMWT surveys of midwater walleye pollock, but did include results of the 1981 survey when both the continental shelf and slope waters of the eastern Bering Sea were also sampled with bottom trawls by U.S and Japanese vessels. In this previous comparison, a portion of the shelf was excluded in the vicinity of Nunivak Island because it was not sampled in 1981 (see Fig. 17 of Walters et al. 1988). In the present report only the results of the triennial surveys (1979, 1982, 1985, and 1988) are compared so that the results are compatible with the way the shelf data are normally analyzed and used. Abundance estimates from the EIMWT assessments of midwater pollock are also included. The comparison is limited to subareas l-6 on the shelf and the continental slope. North shelf data (subareas 7 and 8) are not included because sampling of this region has not been uniform during the four triennial years.

Trends in the abundance of major species and species groups of fish, as well as the overall groundfish complex from the 4 years of triennial survey data, are given in Table 12 and illustrated in Figure 12. These data indicate that the biomass of the total groundfish complex was remarkably stable at 15 million t from 1979 to 1985 but increased to about 20 million t in 1988. Despite the stability in the total biomass estimates between 1979 and 1985, major changes were occurring among species components. For example, between 1979 and 1982, the survey data showed a substantial decline in the biomass of walleye pollock of about 2.6 million t. This was offset by an apparent 2.27 million t increase in biomass of flatfish, a 290,000 t increase in biomass of Pacific cod, and a 116,000 t increase in other fish to maintain the total fish biomass at approximately 15 million t. Between 1982 and 1985, the survey data indicated that the biomass of walleye pollock increased by 1.5 million t while the apparent biomass of flatfish decreased by about 858,000 t and other fish by 483,000 t to again maintain the biomass of the overall groundfish complex at about 15 million t. The increase in total fish biomass from 15 million to 20 million t between 1985 and 1988 was the result of increases in mean estimates for all species categories; the biomass of pollock increased nearly 2.2 million t, flatfish 2.5 million t, and other fish 511,000 t.

Some of these fluctuations may be an artifact of the availability or vulnerability of certain species to the surveys or to sampling error. The marked decline in pollock biomass estimates between 1979 and 1982 is questionable based on what is now known about the population at that time. The extremely large 1978 year class was recruiting to the population in that period (Bakkala 1989), and it seems unlikely that biomass would decline substantially between 1979 and 1982. It is possible that the abundance was overestimated by the 1979 survey, or that pollock

Table 12.--Biomass estimates for principal species and species groups of groundfish in the eastern Bering Sea as shown by the 4 years of triennial triennial bottom trawl and hydroacoustic (midwater) surveys.

Species	Continental shelf				Continental slope				Shelf and slope combined			
	1979	1982	1985	1988	1979	1982	1985	1988[a]	1979	1982	1985	1988
Walleye pollock Demersal	2,939,029	2,908,130	4,524,947	6,922,030	87,842	204,541	79,741	130,851	3,026,871	3,112,671	4,604,688	7,052,881
Midwater	7,457,500	4,513,290	4,528,449	4,443,143	b	265,006	270,114	85,206	7,457,500	4,778,296	4,798,563	4,528,349
Demersal and midwater	10,396,529	7,421,420	9,053,396	11,365,173	87,842	469,547	349,855	216,057	10,484,371	7,890,967	9,403,251	11,581,230
Pacific cod	754,314	1,020,550	961,049	959,544	11,133	34,708	22,143	9,400	765,447	1,055,258	983,192	968,944
Other codfishes	29,951	2,170	146	3,532	105	49	22	0	30,056	2,219	168	3,532
Sablefish	42,508	7,497	18,485	329	12,818	42,944	34,720	30,457	55,326	50,441	53,205	30,786
Pacific ocean perch	5,247	162	844	551	4,459	5,948	32,392	28,882	9,706	6,110	33,236	29,433
Other Sebastes rockfishes	388	5,758	42	7,091	2,456	5,833	5,735	2,597	2,844	11,591	5,777	9,688
Thornyheads	0	0	0	0	3,190	4,353	5,119	5,250	3,190	4,353	5,119	5,250
Yellowfin sole	1,866,523	3,275,351	2,277,423	2,854,562	<1	0	0	0	1,866,523	3,275,351	2,277,423	2,854,562
Rock sole	194,734	572,233	720,309	1,903,544	61	55	36	16	194,795	572,288	720,345	1,903,560
Flathead sole	104,894	197,450	329,919	557,484	2,936	6,212	10,474	10,728	107,830	203,662	340,393	568,212
Alaska plaice	277,198	700,245	553,294	936,783	<1	0	0	0	277,198	700,245	553,294	936,783
Greenland turbot	146,123	31,443	7,533	11,565	127,525	90,601	79,247	42,737	273,648	122,044	86,780	54,302
Arrowtooth flounder	42,109	73,178	163,562	306,361	33,815	24,749	74,392	30,560	75,924	97,927	237,954	336,921
Pacific halibut	66,862	61,562	69,109	138,153	2,541	1,835	7,105	1,338	69,403	63,397	76,214	139,491
Other flatfish	50,916	147,770	33,044	51,810	392	1,709	987	1,847	51,308	149,479	34,031	53,657
Pacific herring	12,648	3,643	32,111	164,443	8	0	<1	2	12,656	3,643	32,111	164,445
Smelts	10,386	10,658	2,626	5,601	29	3	60	16	10,415	10,661	2,686	5,617
Sculpins	328,291	331,481	171,805	235,856	7,847	4,622	2,939	3,894	336,138	336,103	174,744	239,750
Snailfishes	19,204	2,410	2,875	7,276	637	905	606	560	19,841	3,315	3,481	7,836
Poachers	26,988	13,908	3,176	25,787	51	23	20	105	27,039	13,931	3,196	25,892
Eelpouts	382,185	109,265	12,127	51,382	2,593	4,681	4,713	3,994	384,778	113,946	16,840	55,376
Skates	70,006	169,322	148,309	450,426	4,301	3,927	5,658	2,520	74,307	173,249	153,967	452,946
Grenadiers	0	0	0	0	91,470	104,724	107,624	61,377	91,470	104,724	107,624	61,377
Other fish	18,522	11,059	7,125	18,868	1,546	2,174	3,465	3,844	20,068	13,233	10,590	22,712
Total fish	14,846,526	14,168,535	14,568,306	20,056,119	397,758	809,606	747,311	456,183	15,244,284	14,978,141	15,315,617	20,512,302

[a] Depths sampled on the slope were 200-800 m in 1988 and 200-1,000 in earlier years.
[b] Included in shelf estimate.
Note: Differences in sums of estimates and totals are due to rounding. Estimates for the north shelf area are not included here.

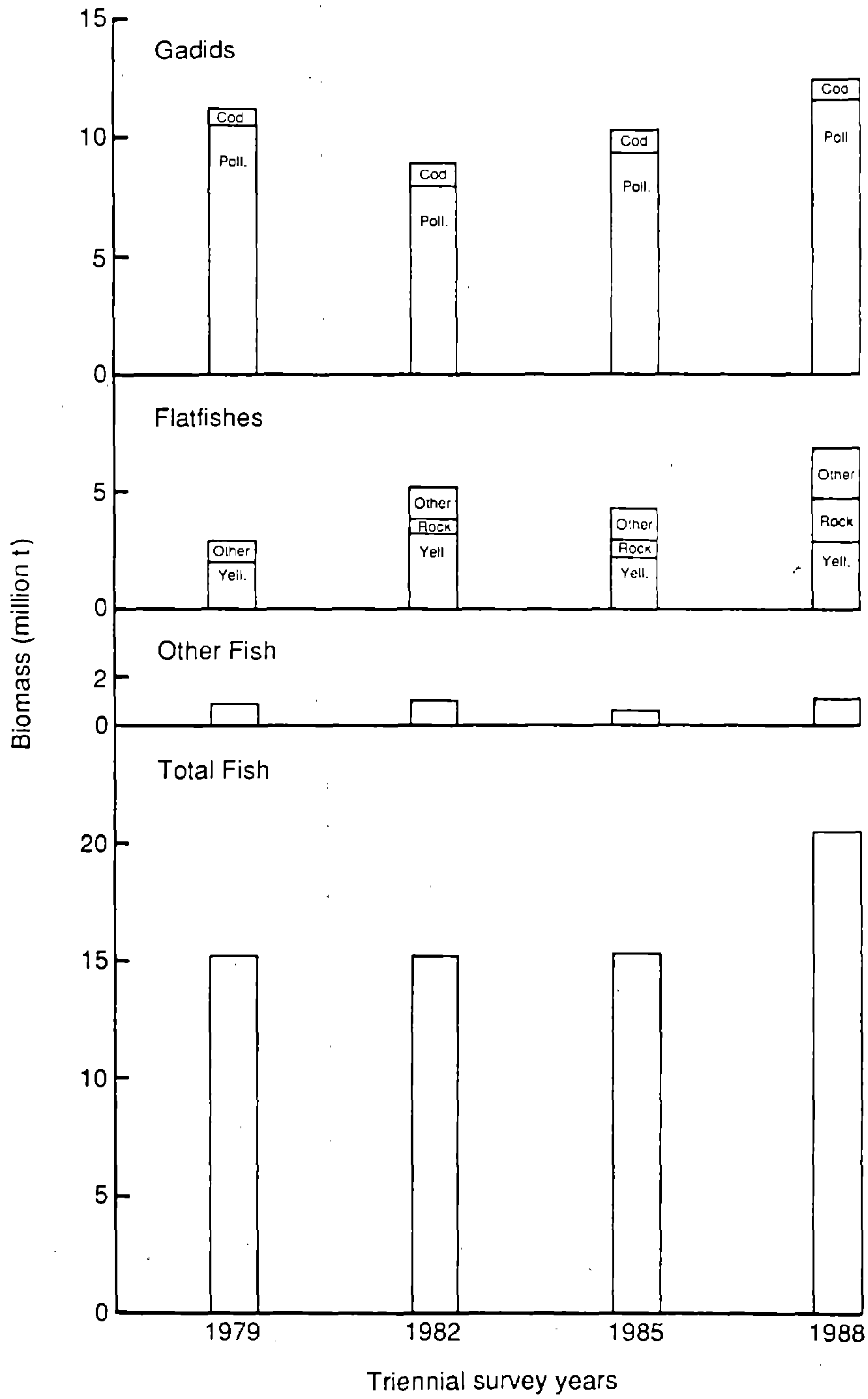

Figure 12.--Biomass estimates for principal species and species groups of fish and for all fish combined based on the 4 years of U.S.-Japan triennial bottom trawl and midwater survey data. Species abbreviations are Cod = Pacific cod, Poll. = walleye pollock, Yell. = yellowfin sole, Rock = rock sole.

were less available in the survey area in 1982 than in the other triennial survey years.

In 1979, population estimates of pollock were dominated by l- and 2- year-old fish. As a result of this good recruitment, population estimates were much higher in 1979 (134 billion) than during later triennial surveys when estimates ranged between 27 and 31 billion (Table 13). The time series of triennial survey age data for pollock now makes it apparent that recruitment in 1979, particularly for the 1978 year class was extraordinarily large. The 1978 year class has since dominated or contributed significantly to the biomass of the population, even at the advanced age of 10 years in 1988 (Table 14, Fig. 13). The time series also shows that there was moderately good recruitment from the 1982 and 1984 year classes. The 1985 survey data suggests that the 1979 and 1980 year classes were also moderately strong although this was not evident in other years.

Another phenomenon revealed by the series of triennial survey data is an increase in the average age of the pollock population during the 1980s (Fig. 13). In 1979 a high proportion of the biomass (78%) was made up of age groups 1 to 3 with relatively few fish older than age 4 or 5. This was typical of the eastern Bering Sea pollock population throughout the late 1970s (Bakkala 1989). During the 1980s there has been a shift to a dominance of older age groups in the sampled population which started with the progression of the strong 1978 year class through the population. Subsequent year classes, even though they have been weak to moderately strong, have remained abundant to advanced ages. By 1988, 68% of the overall estimated biomass consisted of age groups older than age 4.

An interesting aspect of pollock behavior, revealed by the series of triennial survey data, is that older pollock tend to occupy near-bottom water to a greater degree than younger pollock. In 1979, only 29% of the combined bottom trawl and acoustic biomass estimates were sampled by bottom trawls, but this proportion increased to 39% in 1982, 49% in 1985, and 61% in 1988. The younger pollock, age-2 and age-3, appear to be consistently more abundant at midwater depths (Table 14). However, the vertical distribution of age-l fish has been more variable. In 1979, when the very large 1978 year class was age 1, a high proportion of their biomass was found in midwater. In subsequent triennial survey years when the new year classes were less abundant, the majority of the age-l biomass was found near the bottom. The results from the 1979 survey may have been anomalous because of the extraordinary large size of the 1978 year class.

The species group showing the greatest increase in abundance during the period of the triennial surveys was the flatfishes. Collectively, the biomass of the flatfish complex more than doubled between 1979 and 1988. However, this increase may be exaggerated by a change in survey bottom trawls between 1979 and

Table 13.--Estimated population numbers (billions) of walleye pollock from demersal and midwater surveys in 1979, 1982, 1985, and 1988*.

Age	Year Class	1979 Midwater	1979 Demersal	1979 Total	Year Class	1982 Midwater	1982 Demersal	1982 Total
1	1978	69.110	7.752	76.862	1981	0.108	0.952	1.060
2	1977	41.132	5.759	46.891	1980	3.401	2.099	5.500
3	1976	3.884	2.389	6.273	1979	4.108	2.043	6.151
4	1975	0.413	1.187	1.600	1978	7.637	4.381	12.018
5	1974	0.534	0.780	1.314	1977	1.790	1.700	3.490
6	1973	0.128	0.379	0.507	1976	0.286	0.283	0.569
7	1972	0.030	0.196	0.226	1975	0.141	0.158	0.299
8	1971	0.004	0.091	0.095	1974	0.178	0.102	0.280
9	1970	0.028	0.097	0.125	1973	0.090	0.046	0.136
10	1969	0.060	0.064	0.124	1972	0.055	0.028	0.083
11+	--	0.102	0.056	0.158	--	0.122	0.038	0.160
Total		115.425	18.749	134.175		17.920	11.830	29.750

Age	Year Class	1985 Midwater	1985 Demersal	1985 Total	Year Class	1988 Midwater	1988 Demersal	1988 Total
1	1984	2.076	4.950	7.026	1987	0.011	2.010	2.021
2	1983	0.929	0.479	1.408	1986	1.112	0.593	1.705
3	1982	8.149	1.717	9.866	1985	3.586	1.224	4.810
4	1981	0.898	0.676	1.574	1984	3.864	2.318	6.182
5	1980	2.186	2.505	4.691	1983	0.739	1.026	1.765
6	1979	1.510	1.751	3.261	1982	1.882	3.398	5.280
7	1978	1.127	1.291	2.418	1981	0.403	1.013	1.416
8	1977	0.130	0.268	0.398	1980	0.151	0.798	0.949
9	1976	0.021	0.080	0.101	1979	0.130	0.478	0.608
10	1975	0.007	0.060	0.067	1978	0.255	1.201	1.456
11+	--	0.008	0.048	0.056	--	0.159	0.257	0.416
Total		17.041	13.825	30.866		12.292	14.316	26.608

*Population number estimates for 1982 have been revised from those given in tables of this kind in previous triennial reports (Bakkala et al. 1985, Walters et al. 1988) so that they are derived from the bottom trawl survey area stratification system used in the analyses of the 1985 and 1988 age data.

Table 14.--Estimated biomass (thousands of metric tons) of walleye pollock from demersal and midwater surveys in 1979, 1982, 1985, and 1988.*

		1979				1982		
Age	Year Class	Midwater	Demersal	Total	Year Class	Midwater	Demersal	Total
1	1978	1,901.0	222.7	2,123.7	1981	3.4	35.1	38.5
2	1977	3,895.0	679.3	4,574.3	1980	226.8	172.1	398.1
3	1976	996.9	612.6	1,609.5	1979	698.8	387.2	1,086.0
4	1975	168.5	518.1	686.6	1978	2,617.0	1,891.5	4,508.5
5	1974	229.2	388.2	617.4	1977	740.1	895.2	1,635.3
6	1973	73.1	250.2	323.3	1976	143.2	210.4	353.6
7	1972	22.6	179.1	201.7	1975	114.6	165.3	279.9
8	1971	3.7	100.1	103.8	1974	124.4	108.6	233.0
9	1970	25.3	107.7	133.0	1973	67.7	69.3	137.0
10	1969	51.3	74.1	125.4	1972	37.1	41.8	78.9
11+	--	90.9	72.2	163.1	--	128.2	63.1	191.3
Total		7,457.5	3,204.3	10,661.8		4,900.5	4,039.6	8,940.1

		1985				1988		
Age	Year Class	Midwater	Demersal	Total	Year Class	Midwater	Demersal	Total
1	1984	42.6	79.8	122.4	1987	0.3	39.5	39.8
2	1983	92.7	53.3	146.0	1986	126.1	60.5	186.6
3	1982	1,379.6	520.8	1,900.4	1985	1,045.5	420.5	1,466.0
4	1981	329.4	318.4	647.8	1984	1,279.5	935.0	2,214.5
5	1980	1,124.2	1,468.6	2,592.8	1983	300.6	529.7	830.3
6	1979	869.4	1,304.7	2,174.1	1982	1,059.4	1,990.0	3,049.4
7	1978	811.8	1,167.9	1,979.7	1981	248.7	683.6	932.3
8	1977	116.0	310.7	426.7	1980	108.8	675.4	784.2
9	1976	18.2	141.9	160.1	1979	118.3	453.0	571.3
10	1975	8.5	83.4	91.9	1978	233.4	1,375.5	1,608.9
11+	--	6.1	72.7	78.8	--	155.1	348.2	503.3
Total		4,798.5	5,522.2	10,320.7		4,675.4	7,511.2	12,186.6

*Biomass estimates in this table exceed those in Table 12 because estimates from the north shelf are included here but not in Table 12. In addition, in some years the totals are not equal to those in Table 12 because different strata were used to estimate the midwater biomass.

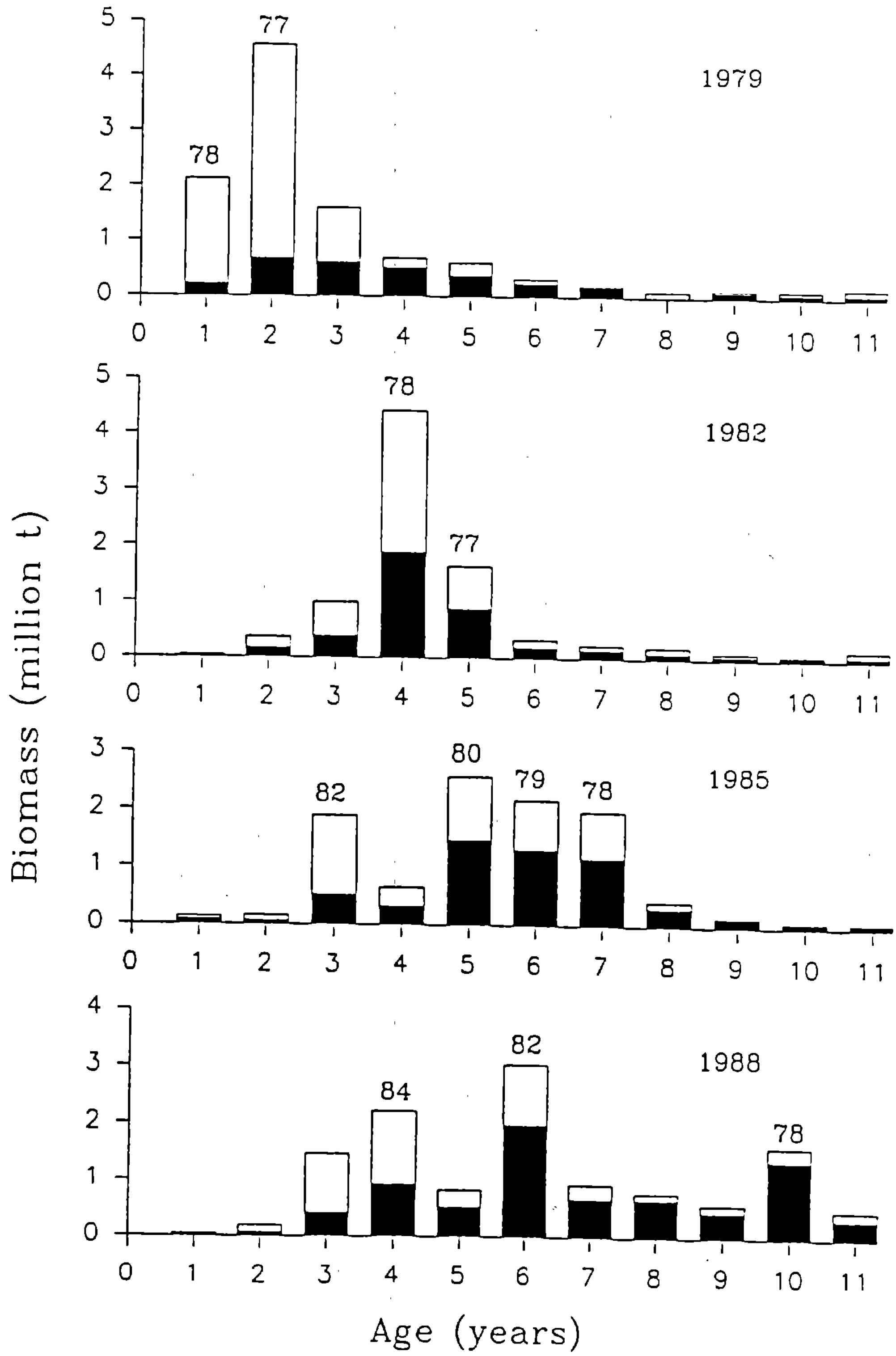

Figure 13.--Biomass estimates (in metric tons t) by age of walleye pollock as shown by combined data from the 1988 bottom trawl and midwater surveys. Filled bars indicate the bottom trawl component and open bars indicate the midwater trawl component.

1982 and the unusually high fishing power coefficients used in 1988. As larger survey vessels came into use during the 1980s, it became necessary to employ a bottom trawl larger than the 400-mesh eastern trawl which had been used as the standard trawl. The new trawl, adopted in 1982 and used since then, is the 83-112 Eastern otter trawl. Substantial apparent increases in abundance for most species of flatfish between the 1981 and 1982 surveys suggested that the 83-112 trawl was more effective in capturing flatfish than the 400-mesh eastern trawl (Bakkala et al. 1985).

As pointed out in the section on "Relative Fishing Powers", the 1988 data indicated the need to apply relatively high fishing power coefficients to an unusually large number of species, particularly in the case of the flatfish (Table 4). The application of these coefficients appeared to produce unreasonable increases in abundance of at least some of the flatfish. This may be another factor that exaggerated the increase in abundance of the flatfish complex between 1979 and 1988. Nevertheless, the abundance of most of the flatfishes has increased during the 1980s, and the abundance of the complex was at its highest observed level in 1988.

Despite the use of the same standard trawl since 1982, the survey data have shown what seems to be unreasonable fluctuations in abundance of some flatfish, particularly yellowfin sole. For example, the triennial survey biomass estimates for yellowfin sole, which increased from 1.9 million t in 1979 to 3.3 million t in 1982, decreased to 2.3 million t in 1985, and then increased again to 2.9 million t in 1988. The decrease between 1982 and 1985 was statistically significant based on nonoverlapping 95% confidence intervals although the increase between 1985 and 1988 was not. Fluctuations in biomass of this magnitude are biologically untenable for a long-lived and slow-growing species like yellowfin sole. These fluctuations appear to be the result of year-to-year changes in the availability or vulnerability of yellowfin sole to the survey trawls. Although of lower magnitude and, thus, not as apparent, fluctuations in abundance of some of the other species of flatfish may also be an artifact of sampling error.

The triennial and earlier survey data have also documented increased abundance of other commercially important stocks such as Pacific cod, sablefish, and Pacific ocean perch. Most of the increase for Pacific cod occurred prior to the first triennial survey in 1979 as a result of the recruitment of a strong year class spawned in 1977. The biomass of Pacific cod has been relatively stable at about 1.0 million t since 1982 and has been maintained at that level by recruitment of moderately strong year classes in 1982 and 1984. Juvenile sablefish of the 1977 year class were abundant on the eastern Bering Sea continental shelf during the 1979 triennial survey as well as in 1978 and 1980 (Table 12), the only such occurrence since survey activity was initiated in the early 1970s. The decline in abundance of juvenile sablefish on the shelf and the increase in abundance on the slope in subsequent years indicate a movement of these juveniles to continental slope waters.

During the 9-year period of the triennial surveys, there have also been some large changes in abundance of some of the noncommercially important species groups, most notably for eelpouts and skates. The survey data indicate that the biomass of eelpouts declined in 1985 to about 5% of their abundance in 1979. The higher biomass in 1988 suggests that this species complex may be beginning to recover. In contrast, the survey data indicate that the biomass of skates increased about sixfold from less than 100,000 t in 1979 to about 450,000 t in 1988. As in the case of flatfish, the change in trawls in 1982 may have also overemphasized the increase in abundance of this species complex.

This comparison of results from the triennial surveys demonstrate the dynamic nature of the groundfish complex in the eastern Bering Sea. Over the relatively brief 9-year period of these surveys, major changes in abundance of several species or species groups took place. These changes often involved increases or declines in abundance on the order of four-to five-fold or greater. Although the magnitude of these fluctuations may have been exaggerated to some degree by factors such as the change in the standard survey trawls in 1982, it is clear that the abundance of many species has increased, and that the condition of the groundfish complex in the eastern Bering Sea has generally improved over the 9-year period of the triennial surveys.

NOTE TO READERS

As explained on page 38, the following Tables 15-45 and Figures 14-87 summarize findings from the 1988 triennial survey for the principal species and species groups of groundfish, shrimps, octopuses, and squids. The citations section follows these figures and tables.

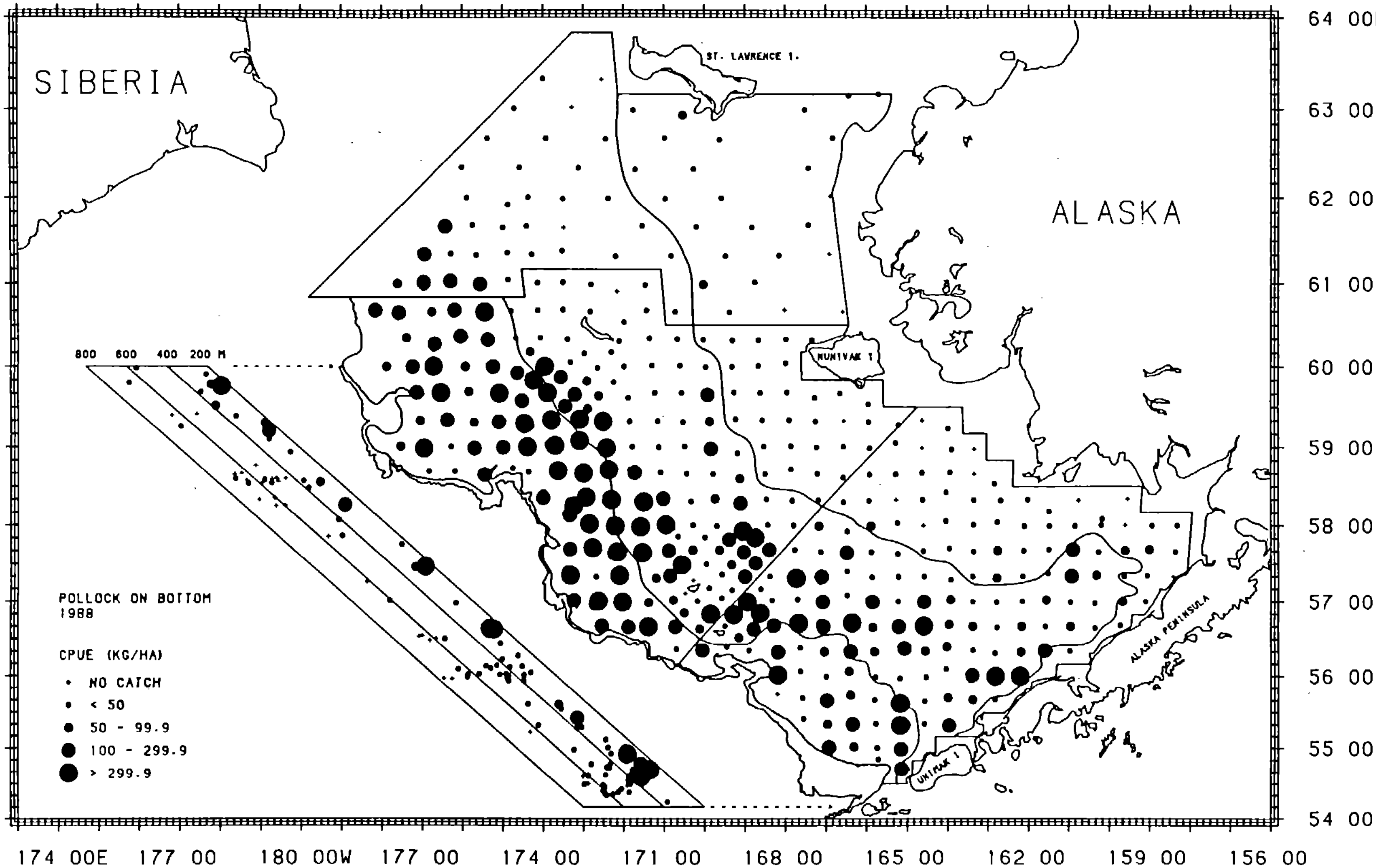

Figure 14. --Distribution and relative abundance of age-1 and older walleye pollock near bottom in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 15.--Abundance estimates and mean size of walleye pollock by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	18.78	146,232	0.019	135,637,235	0.009	1.078	51.3
2	< 50	11.02	45,193	0.006	107,132,456	0.007	0.422	24.5
3	50 - 100	115.10	1,188,969	0.158	1,583,657,456	0.111	0.751	47.0
4	50 - 100	107.99	1,164,403	0.155	1,590,275,906	0.111	0.732	45.7
5	100 - 200	108.29	420,077	0.056	554,609,882	0.039	0.757	47.0
6	100 - 200	418.35	3,957,156	0.527	8,150,190,914	0.569	0.486	38.6
Subareas combined		149.37	6,922,030	0.922	12,121,503,849	0.847	0.571	41.0
North Shelf								
7	< 50	12.48	90,886	0.012	240,808,579	0.017	0.377	26.3
8	50 - 200	44.80	367,399	0.049	1,778,417,064	0.124	0.207	26.8
Subareas combined		29.60	458,285	0.061	2,019,225,643	0.141	0.227	26.7
Slope								
9	200 - 500	80.85	62,943	0.008	73,369,875	0.005	0.858	48.5
10	200 - 500	119.36	67,394	0.009	100,311,382	0.007	0.672	45.3
11	500 - 800	1.05	461	<0.001	530,556	<0.001	0.869	49.2
12	500 - 800	0.16	54	<0.001	98,053	<0.001	0.548	41.1
Subareas combined		61.91	130,851	0.017	174,309,865	0.012	0.751	46.7
All subareas combined		117.48	7,511,167	1.000	14,315,039,358	1.000	0.525	39.1

Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

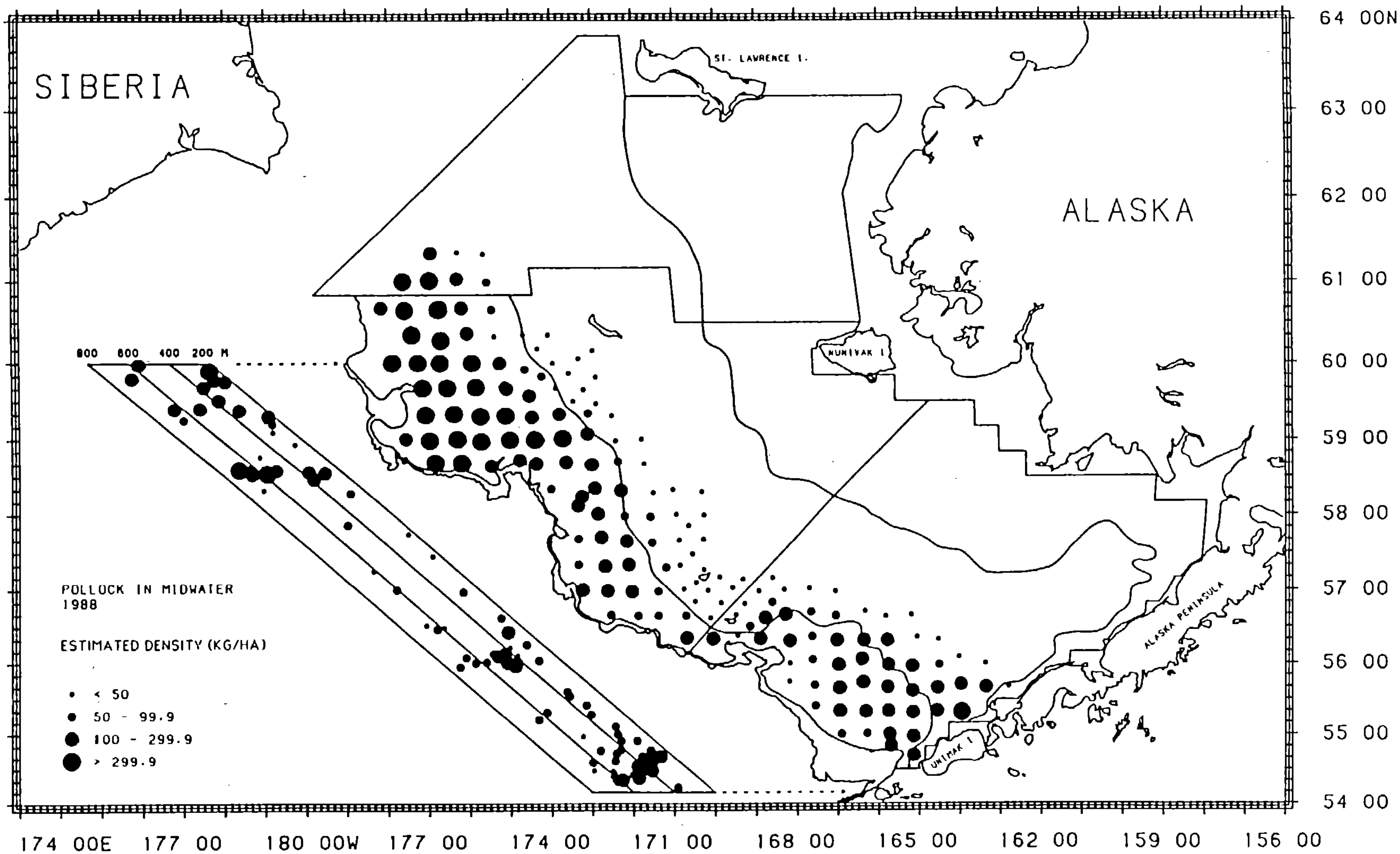

Figure 15.--Distribution and relative abundance of age-1 and older walleye pollock in midwater of the eastern Bering Sea as shown by the 1988 midwater survey.

Table 16.--Abundance estimates and mean size of walleye pollock by subarea from U.S. midwater data collected during the 1988 Bering Sea survey.

Subarea	Depth interval (m)	Mean density (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	-[a]	-	-	-	-	-	-
2	< 50	-	-	-	-	-	-	-
3	50 - 100	74	500,493	0.107	851,396,672	0.069	0.603[b]	43.4[b]
4	50 - 100	29	195,864	0.042	428,579,797	0.035	0.474	40.0
5	100 - 200	151	586,962	0.126	1,076,931,565	0.088	0.556	42.3
6	100 - 200	334	3,159,824	0.676	9,129,602,641	0.743	0.361	35.5
Subareas combined		166	4,443,143	0.950	11,486,510,675	0.934	0.401	36.9
North Shelf								
7	< 50	-	-	-	-	-	-	-
8	50 - 200	187	147,087	0.031	636,359,804	0.052	0.237	30.9
Subareas combined		187	147,087	0.031	636,359,804	0.052	0.237	30.9
Slope								
9	200 - 500	86	67,040	0.014	123,573,219	0.010	0.553[b]	42.4[b]
10	200 - 500	32	18,166	0.004	45,361,746	0.004	0.414[b]	37.3[b]
11	500 - 800	-	-	-	-	-	-	-
12	500 - 800	-	-	-	-	-	-	-
Subareas combined		63	85,206	0.018	168,934,965	0.014	0.516	41.0
All subareas combined		162	4,675,436	1.000	12,291,805,444	1.000	0.394	36.7

[a] indicates no fishing or no sample.
[b] Trawl samples were not taken in these areas. Biological information is based on closest samples taken in adjacent areas.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

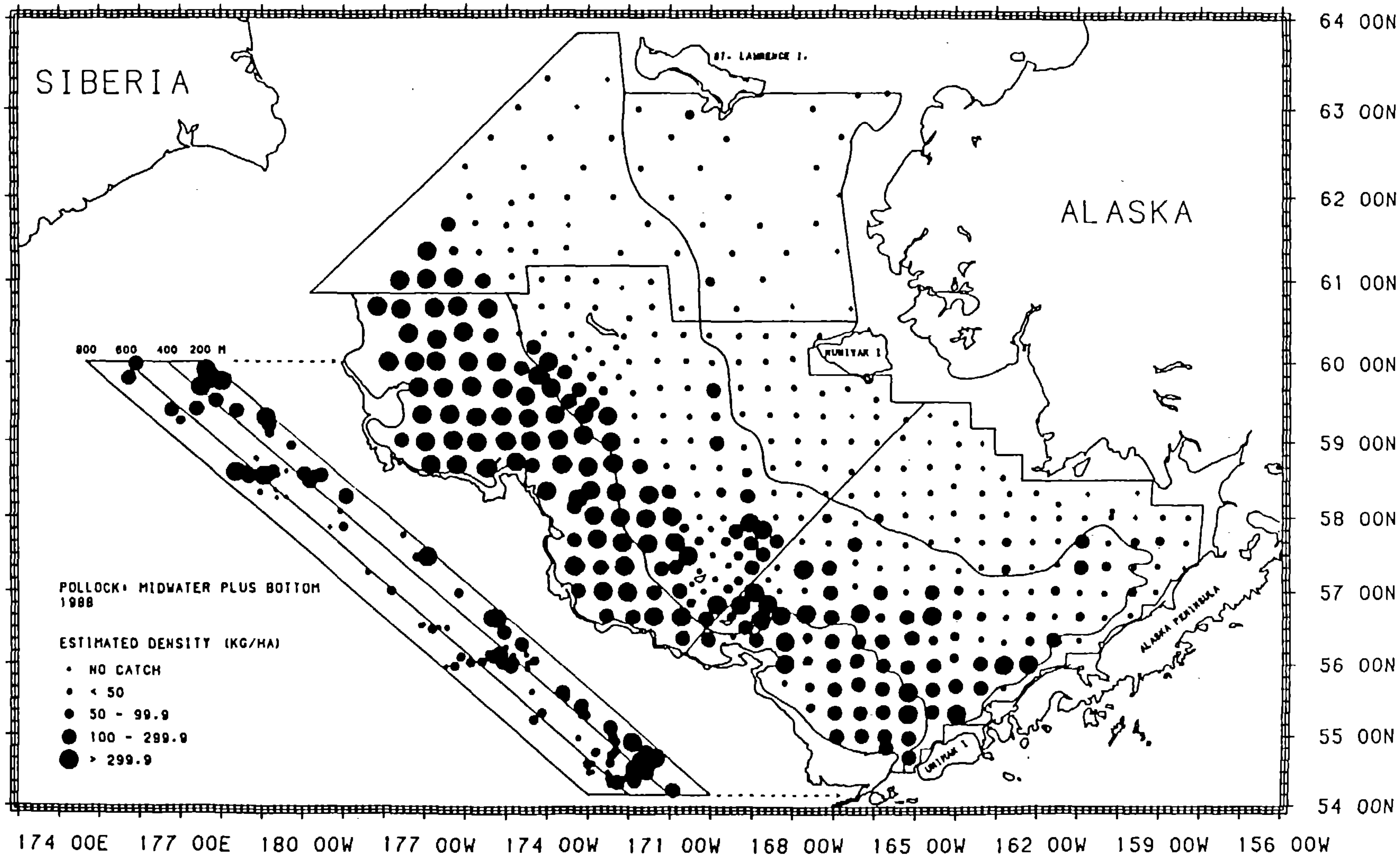

Figure 16.--Distribution and relative abundance of age-1 and older walleye pollock in midwater and near bottom as shown by combined data from the 1988 bottom trawl and midwater surveys.

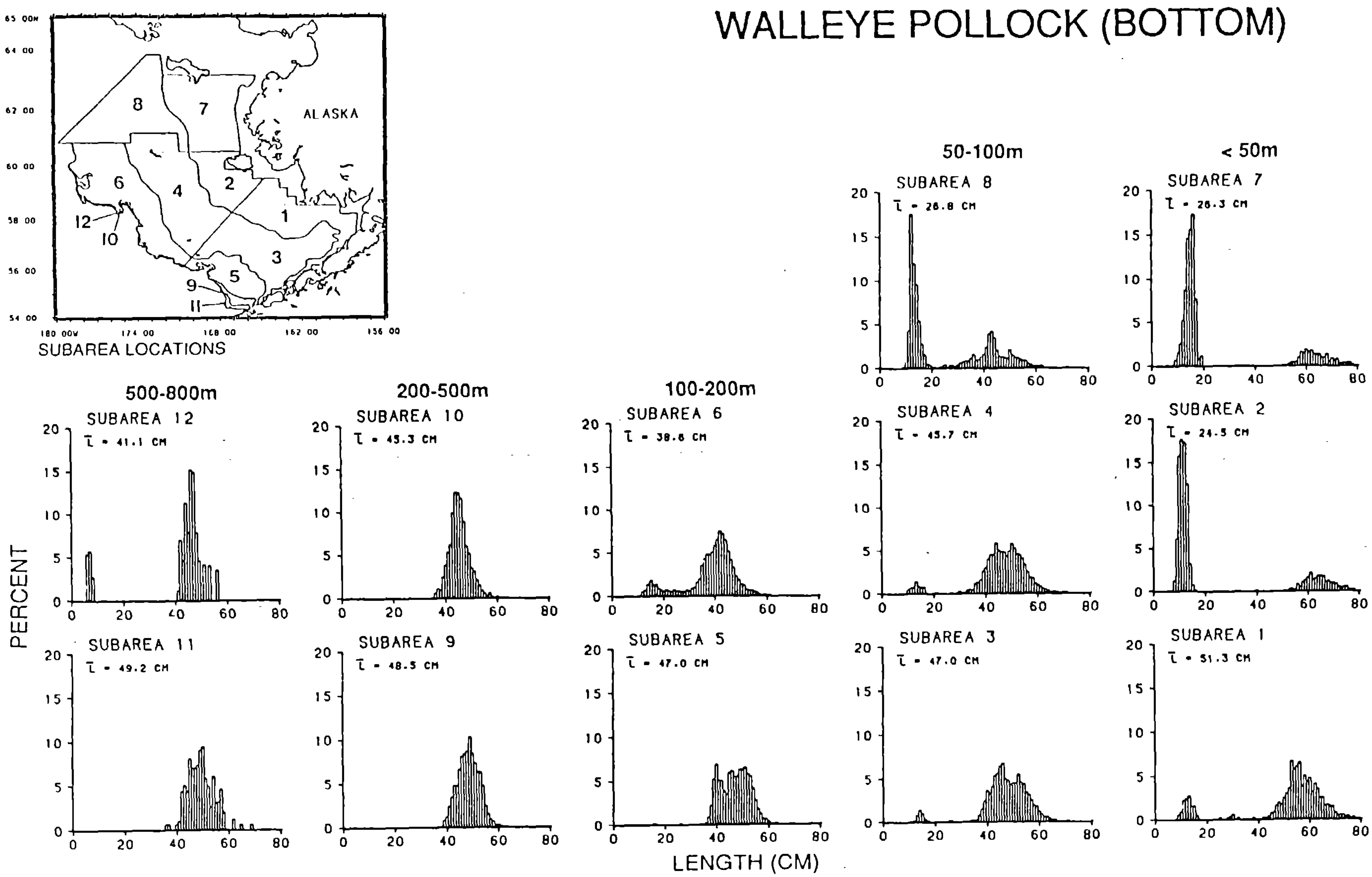

Figure 17. --Length composition of walleye pollock near bottom by subarea and depth zone as shown by data from the 1988 U.S-Japan bottom trawl survey.

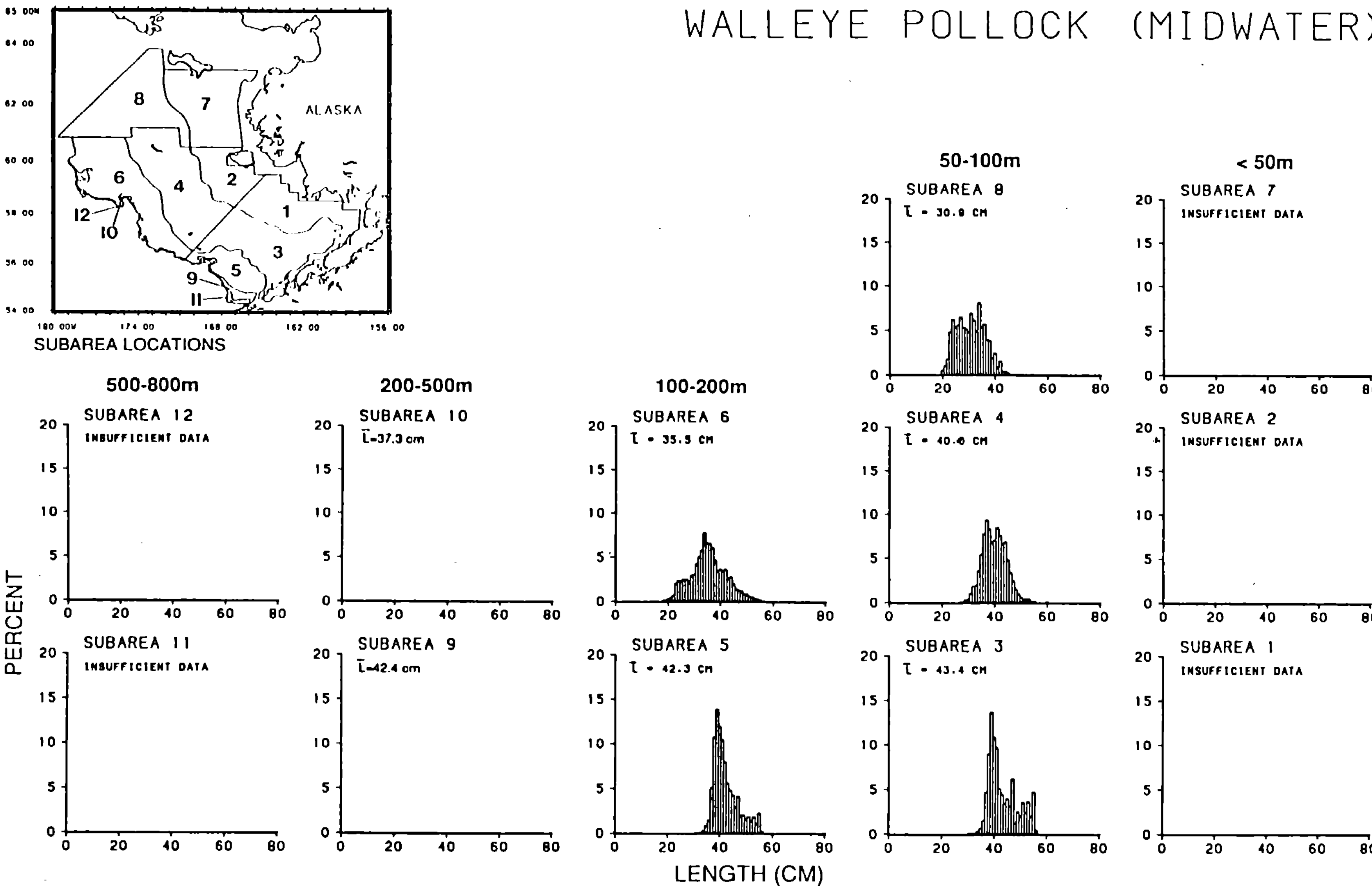

Figure 18.--Length composition of walleye pollock in midwater by subarea and bottom depth zone as shown by data from the 1988 midwater survey.

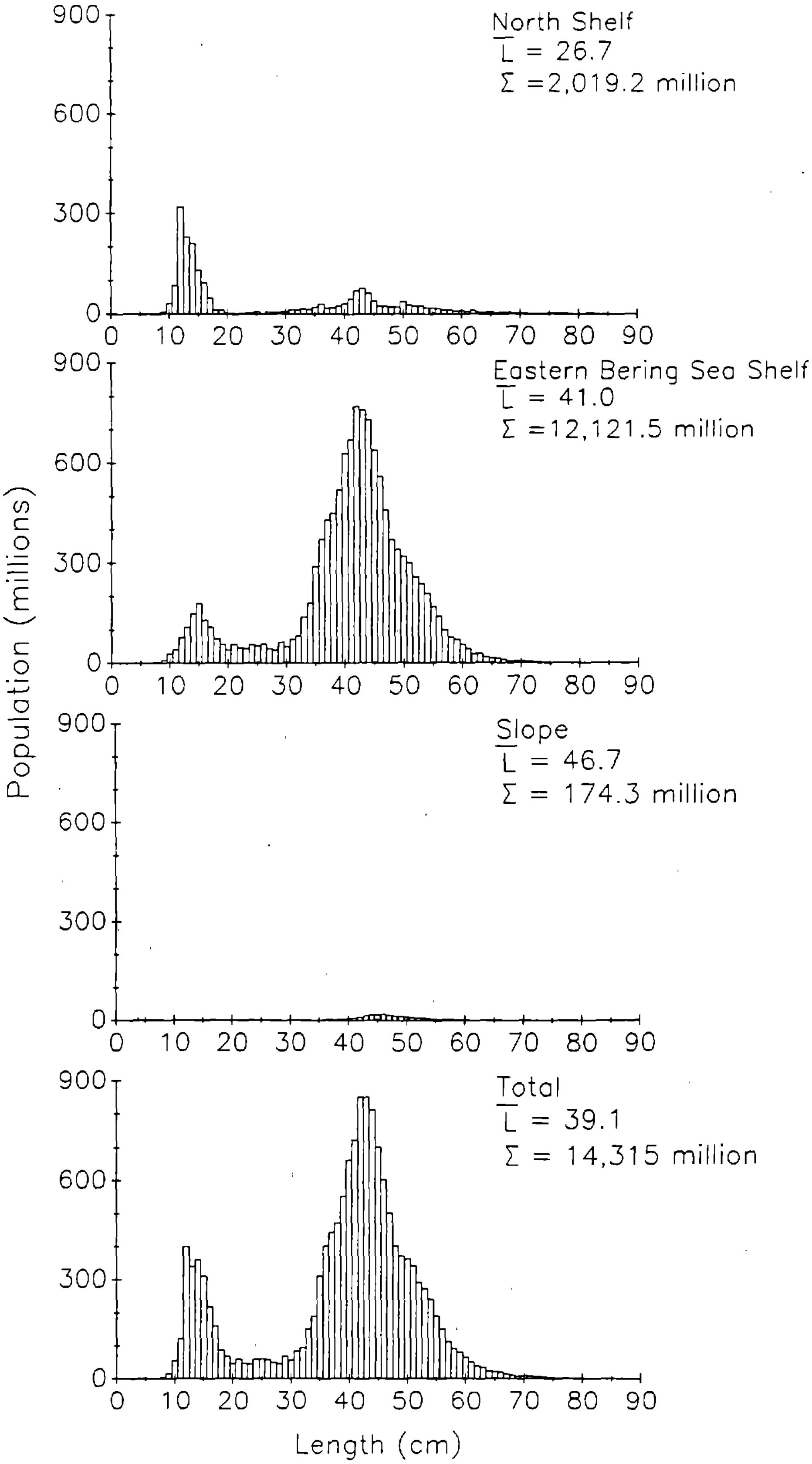

Figure 19. --Population number estimates by centimeter length interval for walleye pollock near bottom in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

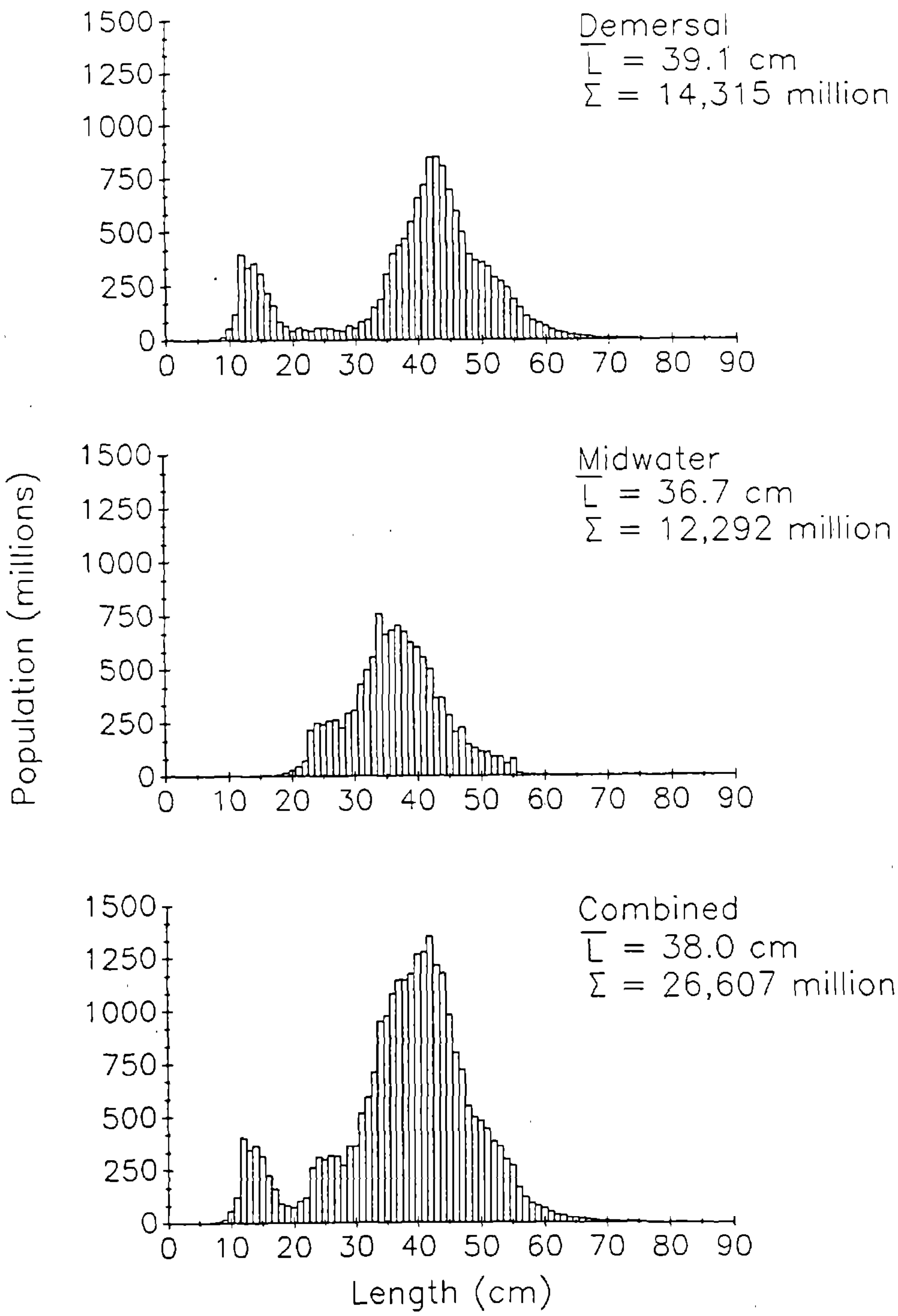

Figure 20.--Population estimates by centimeter length interval for walleye pollock in the eastern Bering Sea from the 1988 bottom trawl and midwater surveys and from combined data.

Table 17.--Estimated population numbers (millions of fish) of walleye pollock near bottom by age group and subarea as shown by combined age and length data from the 1988 bottom trawl survey.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	<50 m	100-200 m		50-100 m		<50 m			
Age	Year class	12	11	10	9	8	7	6	5	4	3	2	1	All subareas combined	Proportion of total
1	1987	0.00	0.00	0.00	0.00	969.90	173.54	617.77	1.17	95.45	63.68	72.30	16.22	2,010.04	0.140
2	1986	0.00	0.00	0.00	0.00	46.90	7.94	520.03	0.74	9.24	6.74	0.02	1.21	592.82	0.041
3	1985	0.01	0.03	15.41	4.39	72.07	0.00	990.77	26.01	63.77	51.10	0.03	0.84	1,224.43	0.085
4	1984	0.04	0.03	14.69	4.75	148.63	0.00	1,814.16	56.31	148.58	129.62	0.03	0.92	2,317.73	0.162
5	1983	0.01	0.03	9.56	3.89	59.35	0.00	712.32	44.15	98.31	97.08	0.03	1.22	1,025.95	0.072
6	1982	0.04	0.18	42.10	27.20	220.71	0.24	2,156.34	158.43	386.98	398.47	0.20	6.72	3,397.62	0.237
7	1981	0.01	0.03	4.12	5.51	64.40	0.50	562.99	61.50	152.44	156.87	0.20	4.77	1,013.33	0.071
8	1980	<0.01	0.02	1.93	4.42	50.98	2.27	316.28	60.45	166.29	179.85	0.91	14.65	798.05	0.055
9	1979	<0.01	0.03	2.41	3.39	37.41	2.81	143.88	42.59	113.55	118.44	1.18	11.93	477.63	0.033
10	1978	0.01	0.14	8.76	17.21	88.58	32.89	271.82	91.13	296.74	320.92	14.87	57.44	1,200.52	0.084
11	1977	<0.01	0.01	0.29	0.77	8.49	8.55	22.20	7.51	29.95	30.08	4.31	8.40	120.54	0.008
12	1976	0.00	0.01	0.00	0.02	4.80	4.52	11.88	3.40	16.86	21.04	2.43	5.82	70.77	0.005
13	1975	<0.01	0.01	0.34	0.71	0.63	2.45	2.81	0.21	2.83	3.45	1.01	1.93	16.38	0.001
14	1974	0.00	<0.01	0.03	0.11	0.94	0.50	5.00	0.99	4.12	3.96	0.50	0.98	17.13	0.001
15	1973	0.00	0.01	0.40	0.90	0.22	0.43	0.33	0.00	0.48	0.62	0.20	0.37	3.95	<0.001
16	1972	0.00	0.00	0.00	0.00	0.68	0.65	0.28	0.03	0.99	1.01	0.17	0.61	4.43	<0.001
17	1971	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
18	1970	0.00	0.00	0.00	0.00	0.22	0.36	0.37	0.00	0.42	0.29	0.15	0.31	2.13	<0.001
Age unknown		0.01	0.00	0.27	0.11	0.00	3.15	0.97	0.00	3.28	0.45	8.59	1.29	21.59	0.001
All ages combined		0.10	0.53	100.31	73.37	1,778.42	240.81	8,150.19	554.61	1,590.28	1,583.66	107.13	135.64	14,315.04	1.000

Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

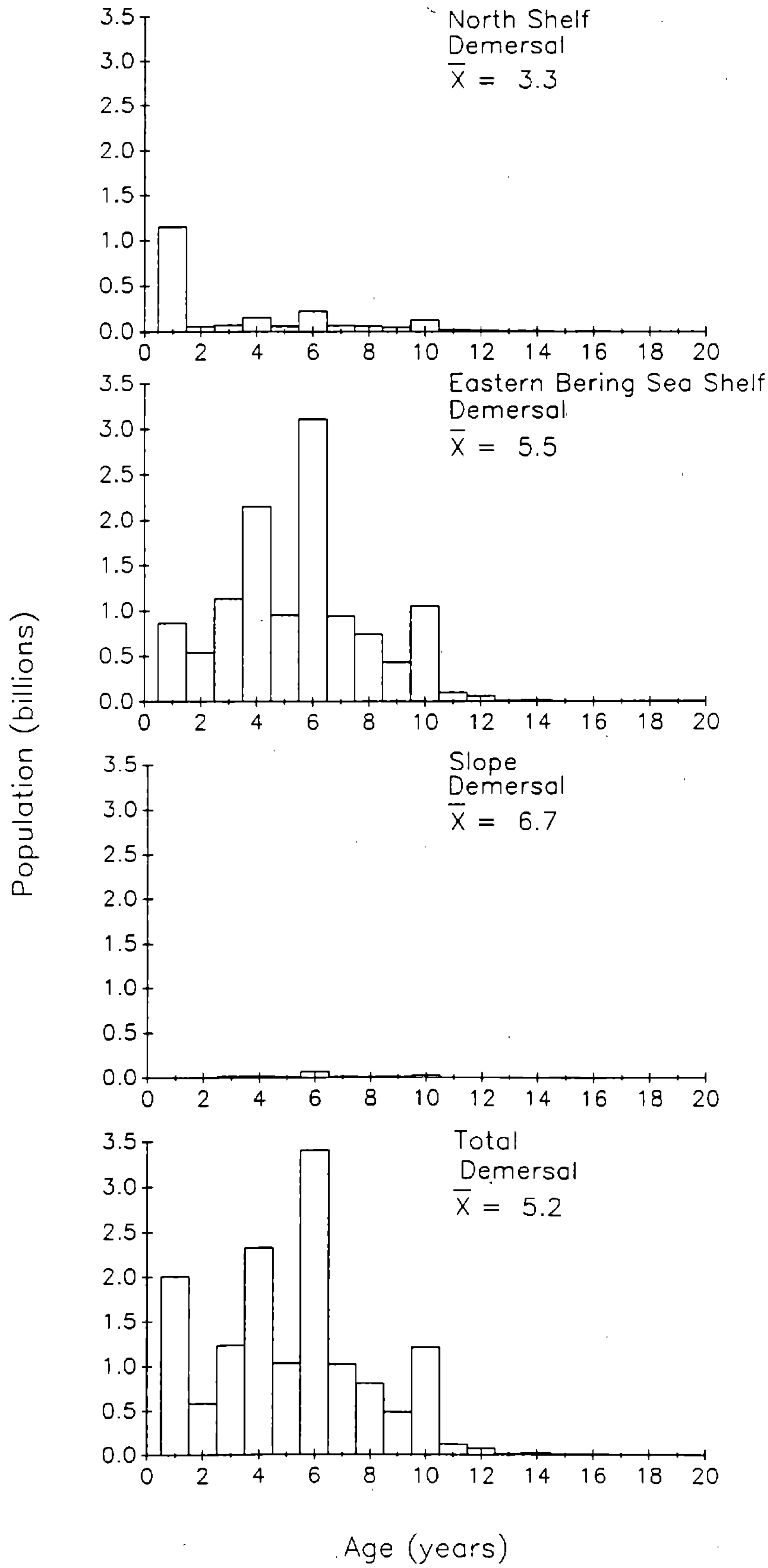

Figure 21.--Population estimates by age for walleye pollock near bottom as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

Table 1&I.--Estimated population numbers (millions of fish) of walleye pollock in midwater by age group and subarea as shown by age and length data from the 1988 midwater survey.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	< 50 m	100-200 m		50-100 m		< 50 m			
Age	Year class	12[a]	11[a]	10[b]	9[b]	8	7[a]	6	5	4	3[b]	2[a]	1[a]	All subareas combined	Proportion of total
1	1987			0.00	0.00	0.00		10.85	0.00	0.00	0.00			10.85	0.001
2	1986			0.98	0.00	154.17		956.50	0.00	0.27	0.00			1111.93	0.090
3	1985			12.50	53.76	229.86		2423.19	470.43	60.58	335.37			3585.69	0.292
4	1984			19.07	23.10	191.70		3143.49	196.55	149.18	141.23			3864.34	0.314
5	1983			2.70	5.39	26.38		584.28	46.17	41.19	33.30			739.41	0.060
6	1982			4.08	25.45	27.90		1315.91	213.23	125.40	169.70			1881.68	0.153
7	1981			1.19	5.68	3.98		278.21	46.28	25.87	42.16			403.36	0.033
8	1980			0.44	2.40	1.58		101.29	18.90	9.71	17.03			151.35	0.012
9	1979			0.70	2.92	0.15		64.26	24.89	3.98	32.63			129.53	0.011
10	1978			1.85	3.58	0.50		147.73	40.04	8.79	52.04			254.52	0.021
11	1977			0.40	1.11	0.05		24.49	10.27	0.89	12.82			50.04	0.004
12	1976			0.62	0.00	0.05		34.04	0.00	1.08	0.00			35.79	0.003
13	1975			0.12	0.00	0.00		6.69	0.00	0.21	0.00			7.01	0.001
14	1974			0.38	0.00	0.00		19.67	0.00	0.83	0.00			20.88	0.002
15	1973			0.24	0.00	0.03		14.60	0.00	0.45	0.00			15.32	0.001
16	1972			0.05	0.19	0.00		2.46	10.16	0.12	15.12			28.10	0.002
17	1971			0.05	0.00	0.00		1.93	0.00	0.03	0.00			2.00	<0.001
All ages combined				45.36	123.57	636.36		9129.60	1076.93	428.58	851.40			12291.81	1.00

[a] Subarea not sampled during the 1988 midwater survey.
[b] Trawl samples were not taken in these areas. Biological information is based on the closest samples taken in adjacent areas.
Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

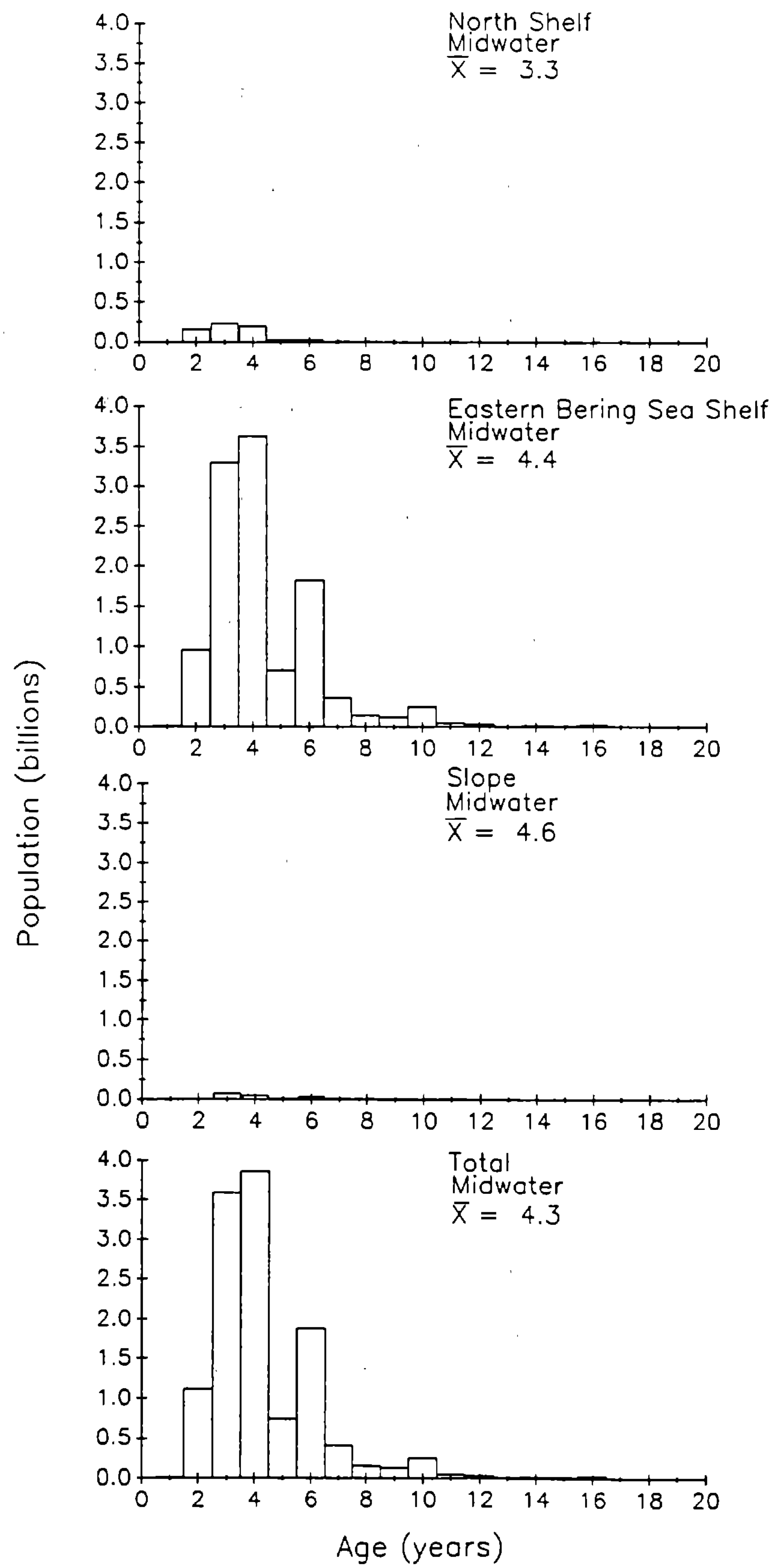

Figure 22.--Population estimates by age for walleye pollock in midwater as shown by age and length data from the 1988 midwater survey in the eastern Bering Sea.

Table 1g.--Estimated population numbers (millions of fish) of walleye pollock near bottom and in midwater by age group and subarea as shown by combined age and length data from the 1988 bottom trawl and midwater survey.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	< 50 m	100-200 m		50-100 m		< 50 m			
Age	Year class	12	11	10	9	8	7	6	5	4	3	2	1	All subareas combined	Proportion of total
1	1987	0.00	0.00	0.00	0.00	969.90	173.54	628.62	1.17	95.45	63.68	72.30	16.22	2,020.89	0.076
2	1986	0.00	0.00	0.98	0.00	201.08	7.94	1,476.53	0.74	9.51	6.74	0.02	1.21	1,704.75	0.064
3	1985	0.01	0.03	27.91	58.15	301.94	0.00	3,413.96	496.44	124.35	386.46	0.03	0.84	4,810.12	0.181
4	1984	0.01	0.03	33.77	27.85	340.34	0.00	4,957.66	254.86	297.76	270.84	0.03	0.92	6,182.06	0.023
5	1983	0.01	0.03	12.26	9.27	85.73	0.00	1,296.61	90.32	139.50	130.37	0.03	1.22	1,765.36	0.066
6	1982	0.04	0.18	46.19	52.66	248.66	0.24	3,472.24	371.66	512.38	568.17	0.20	6.72	5,279.30	0.198
7	1981	0.01	0.03	5.30	11.19	68.38	0.50	841.20	107.77	178.31	199.03	0.20	4.77	1,416.70	0.053
8	1980	<0.01	0.02	2.37	6.82	52.56	2.27	417.56	79.35	176.00	196.88	0.91	14.65	949.40	0.036
9	1979	<0.01	0.03	3.11	6.31	37.56	2.81	208.14	67.48	117.53	151.08	1.18	11.93	607.16	0.023
10	1978	0.09	0.14	10.61	20.78	89.08	32.89	419.55	131.17	305.53	372.95	14.87	57.44	1,455.03	0.055
11	1977	0.00	0.01	0.68	1.88	8.54	8.55	46.69	17.78	30.84	42.90	4.31	8.40	170.58	0.006
12	1976	0.00	0.01	0.62	0.02	4.86	4.52	45.92	3.40	17.93	21.04	2.43	5.82	106.56	0.004
13	1975	<0.01	0.01	0.45	0.71	0.63	2.45	9.50	0.21	3.04	3.45	1.01	1.93	23.40	0.001
14	1974	0.00	<0.01	0.41	0.11	0.94	0.50	24.67	0.99	4.95	3.96	0.50	0.98	38.02	0.001
15	1973	0.00	<0.01	0.64	0.90	0.25	0.43	14.93	0.00	0.93	0.62	0.20	0.37	19.27	0.001
16	1972	0.00	0.00	0.05	0.19	0.68	0.65	2.74	10.20	1.11	16.14	0.17	0.61	32.53	0.001
17	1971	0.00	0.00	0.05	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	2.00	<0.001
18	1970	0.00	0.00	0.00	0.00	0.22	0.36	0.37	0.00	0.03	0.29	0.15	0.31	2.13	<0.001
Age unknown		0.01	0.00	0.27	0.11	3.47	3.15	0.97	0.00	3.28	0.45	8.59	1.29	21.59	0.001
All ages combined		0.10	0.53	145.67	196.94	2,414.78	240.81	17,279.79	1,631.54	2,018.86	2,435.05	107.13	135.64	26,606.86	1.000

Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

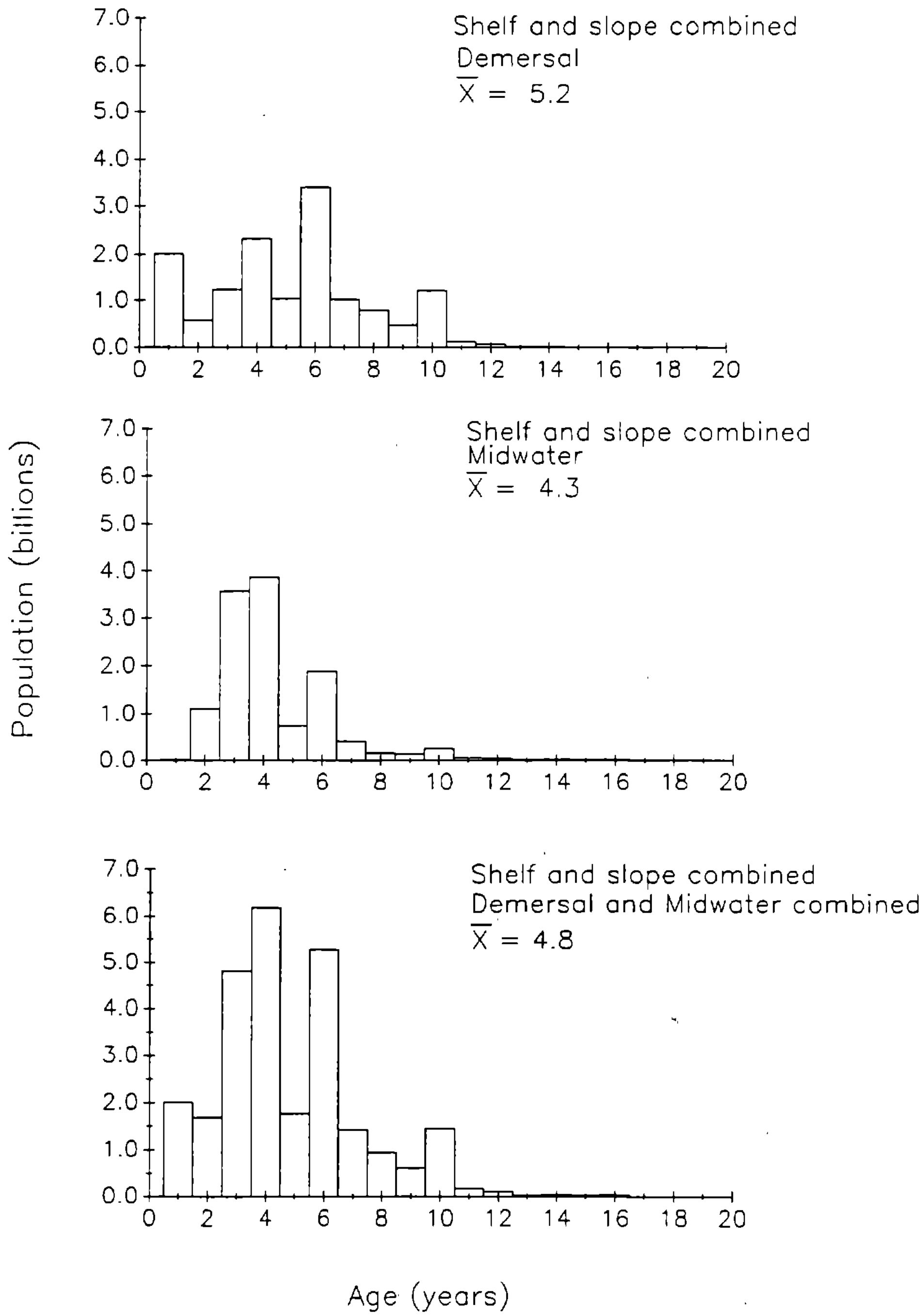

Figure 23.--Population estimates by age for walleye pollock near bottom, in midwater, and for the overall sampled population as shown by age and length data from the 1988 bottom trawl and midwater surveys.

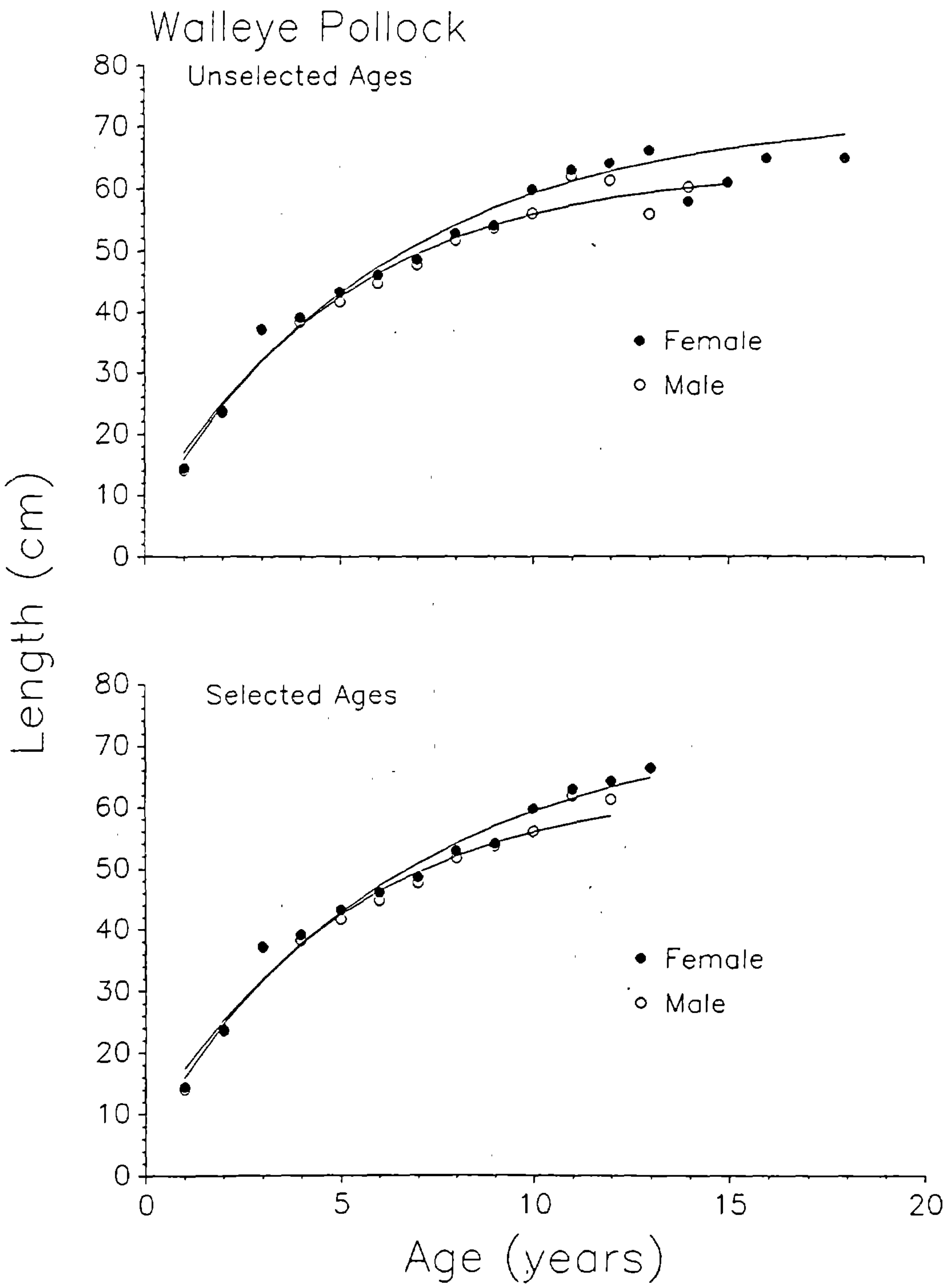

Figure 24.--Von Bertalanffy growth curves for male and female walleye pollock as shown by age data from the 1988 U.S. bottom trawl survey.

Table 20. --Parameters of the von Bertalanffy growth curves for walleye pollock by sex based on age readings from otoliths and length data from the 1988 U.S. bottom trawl survey. Parameters for unselected ages were derived from all age readings and those for selected ages from ages with five or more observations.

Data	Sex	Number of age readings	Age range	Length range (cm)	Parameters L_{inf}	K	t_o
Unselected	Male	665	1-15	10-72	63.5	0.20	-0.42
	Female	706	1-18	10-79	72.6	0.16	-0.69
Selected	Male	659	1-12	10-72	63.6	0.20	-0.42
	Female	699	1-13	10-79	74.5	0.15	-0.81

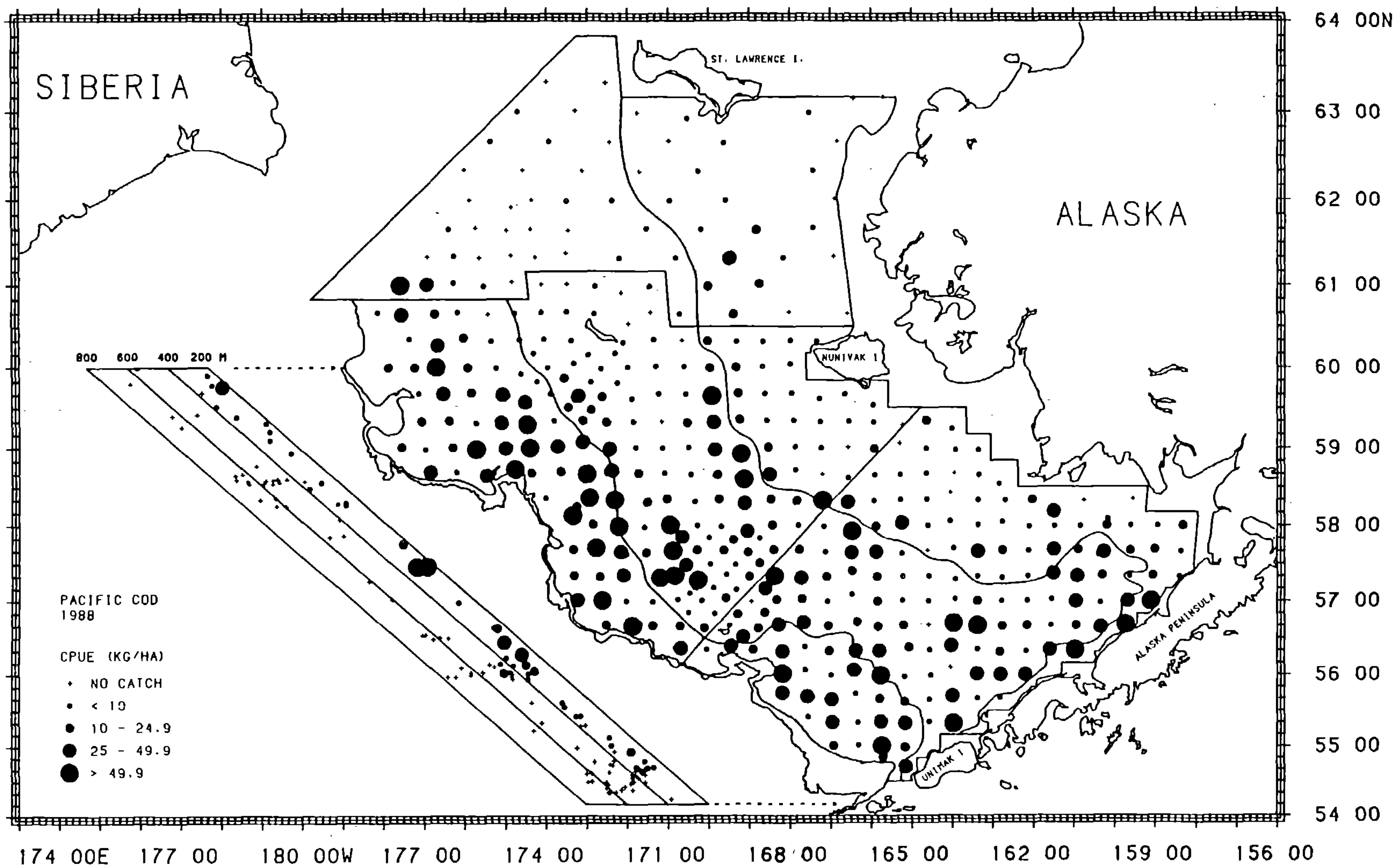

Figure 25.--Distribution and relative abundance of Pacific cod in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 21.--Abundance estimates and mean size of Pacific cod by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size	
							Weight (kg)	Length (cm)
Eastern Bering Sea Shelf								
1	< 50	14.43	112,330	0.107	68,618,090	0.126	1.637	47.2
2	< 50	9.24	37,913	0.036	21,783,388	0.040	1.740	51.0
3	50 - 100	23.66	244,407	0.234	137,293,328	0.252	1.780	49.8
4	50 - 100	15.34	165,431	0.158	149,240,229	0.274	1.108	42.4
5	100 - 200	26.14	101,393	0.097	26,403,835	0.048	3.840	64.6
6	100 - 200	31.51	298,069	0.285	105,997,613	0.194	2.812	57.9
Subareas combined		20.71	959,544	0.917	509,336,483	0.934	1.884	49.8
North Shelf								
7	< 50	5.84	42,520	0.041	21,714,107	0.040	1.958	48.0
8	50 - 200	4.27	35,011	0.033	11,926,801	0.022	2.936	55.3
Subareas combined		5.01	77,532	0.074	33,640,908	0.062	2.305	50.6
Slope								
9	200 - 500	2.28	1,777	0.002	617,436	0.001	2.878	59.8
10	200 - 500	13.12	7,410	0.007	1,556,324	0.003	4.761	70.9
11	500 - 800	0.49	214	<0.001	65,595	<0.001	3.259	65.1
12	500 - 800	0[a]	0	0	0	0	-[b]	-
Subareas combined		4.45	9,400	0.009	2,239,355	0.004	4.198	67.7
All subareas combined		16.37	1,046,476	1.000	545,216,747	1.000	1.919	49.9

[a]0 indicates fishing but no catch.
indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

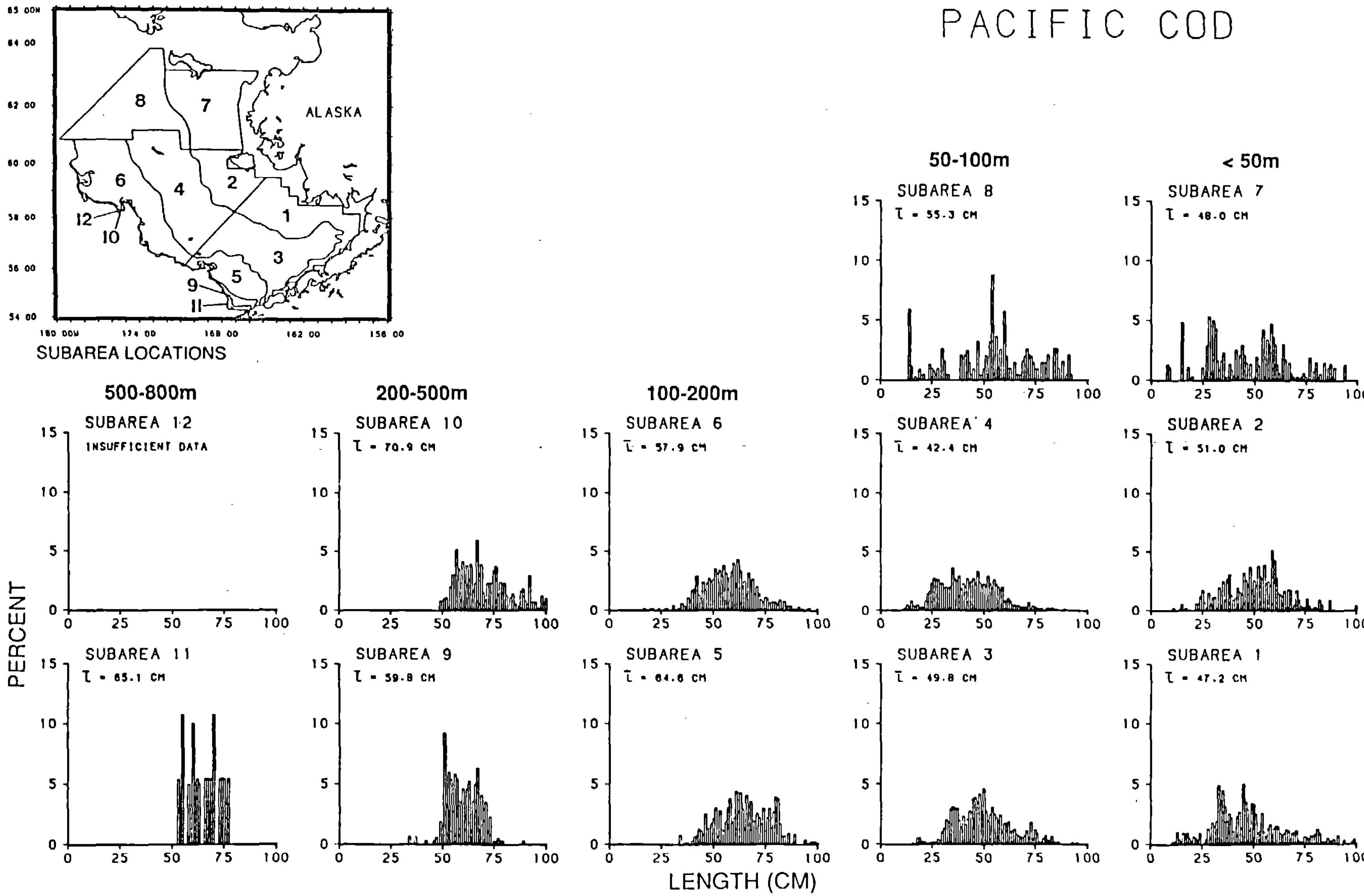

Figure 26.--Length composition of Pacific cod by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

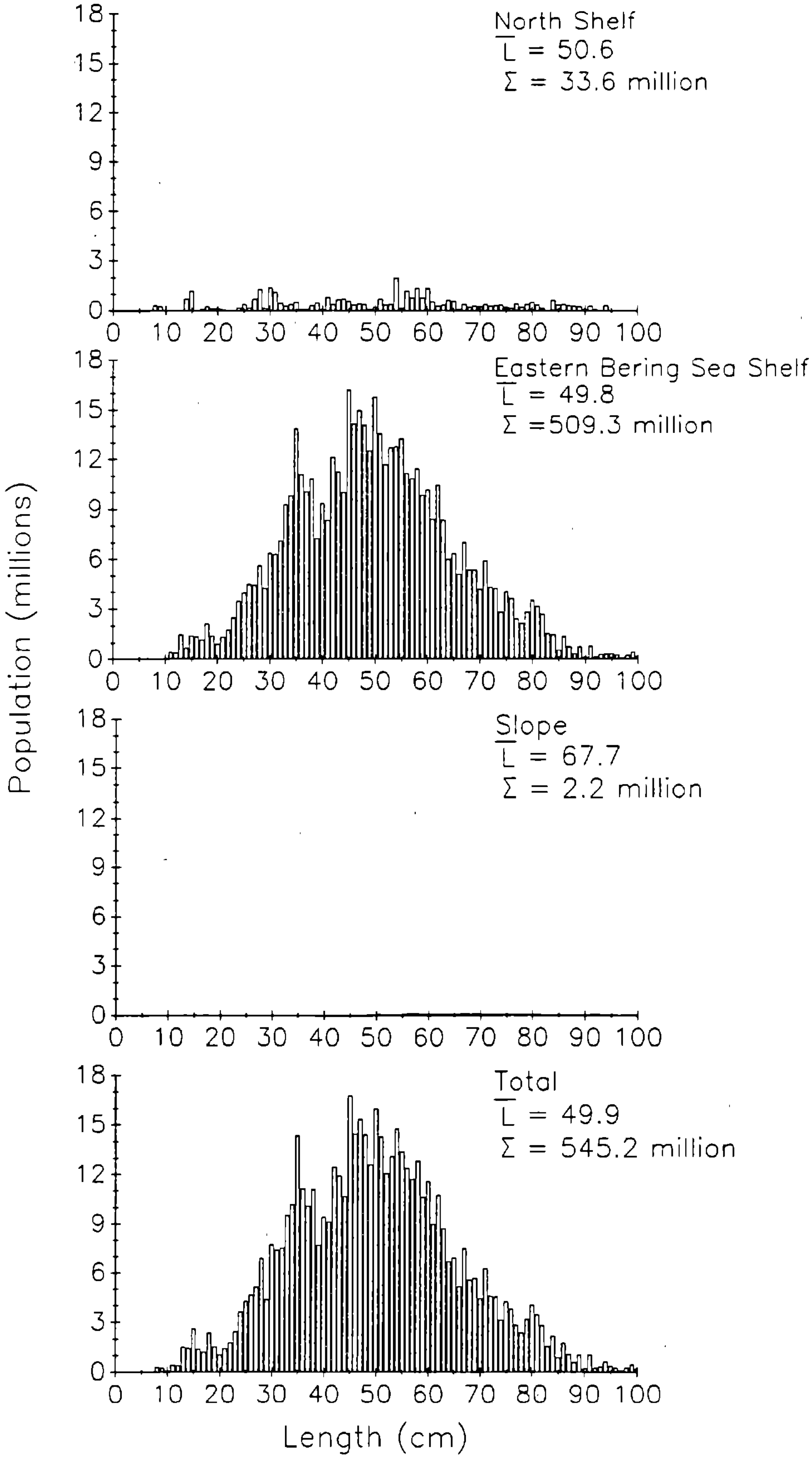

Figure 27.--Population number estimates by centimeter length interval for Pacific cod in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

Table 22.--Estimated population numbers (millions of fish) of Pacific cod by age group and subarea as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	< 50 m	100-200 m		50-100 m		< 50 m			
Age	Year class	12	11	10	9	8	7	6	5	4	3	2	1	All subareas combined	Pro-portion of total
1	1987	0.00	0.00	0.00	0.00	0.91	1.47	0.60	0.00	21.08	2.65	1.53	4.65	32.89	0.060
2	1986	0.00	0.00	0.00	<0.01	0.67	3.62	3.24	0.33	27.56	16.91	1.78	10.37	64.48	0.118
3	1985	0.00	<0.01	0.01	0.02	1.01	3.27	12.90	1.57	35.44	33.52	3.81	18.07	109.60	0.201
4	1984	0.00	0.01	0.13	0.16	2.13	2.70	25.80	3.95	32.44	37.92	5.42	14.49	125.16	0.230
5	1983	0.00	0.02	0.39	0.23	2.23	4.38	29.65	6.35	19.76	22.89	5.12	7.40	98.41	0.180
6	1982	0.00	0.01	0.23	0.10	0.61	1.49	13.07	3.63	4.51	6.84	1.62	3.18	35.31	0.065
7	1981	0.00	0.02	0.20	0.08	0.78	0.59	7.89	2.78	2.48	5.19	0.80	2.12	22.91	0.042
8	1980	0.00	<0.01	0.12	0.02	0.57	0.48	4.33	2.44	1.28	3.59	0.55	1.49	14.88	0.027
9	1979	0.00	0.01	0.09	0.01	0.41	0.36	2.31	1.74	0.95	2.51	0.27	1.08	9.71	0.018
10	1978	0.00	<0.01	0.04	<0.01	0.23	0.08	1.00	1.02	0.27	0.98	0.16	0.76	4.56	0.008
11	1977	0.00	0.00	0.07	<0.01	0.63	0.16	1.52	1.32	0.51	1.66	0.23	0.92	7.01	0.013
12	1976	0.00	0.00	0.02	<0.01	0.20	0.11	0.37	0.32	0.14	0.24	0.03	0.18	1.62	0.003
13	1975	0.00	0.00	0.01	<0.01	0.02	0.00	0.08	0.04	0.05	0.05	0.00	0.07	0.32	0.001
14	1974	0.00	0.00	0.00	0.00	0.00	0.04	0.27	0.08	0.01	0.09	0.07	0.17	0.73	0.001
Age unknown		0.00	0.00	0.26	<0.01	1.55	2.96	2.96	0.84	2.77	2.25	0.39	3.66	17.64	0.032
All ages Combined		0.00	0.07	1.56	0.62	11.93	21.71	106.00	26.40	149.24	137.29	21.78	68.62	545.22	1.000

Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

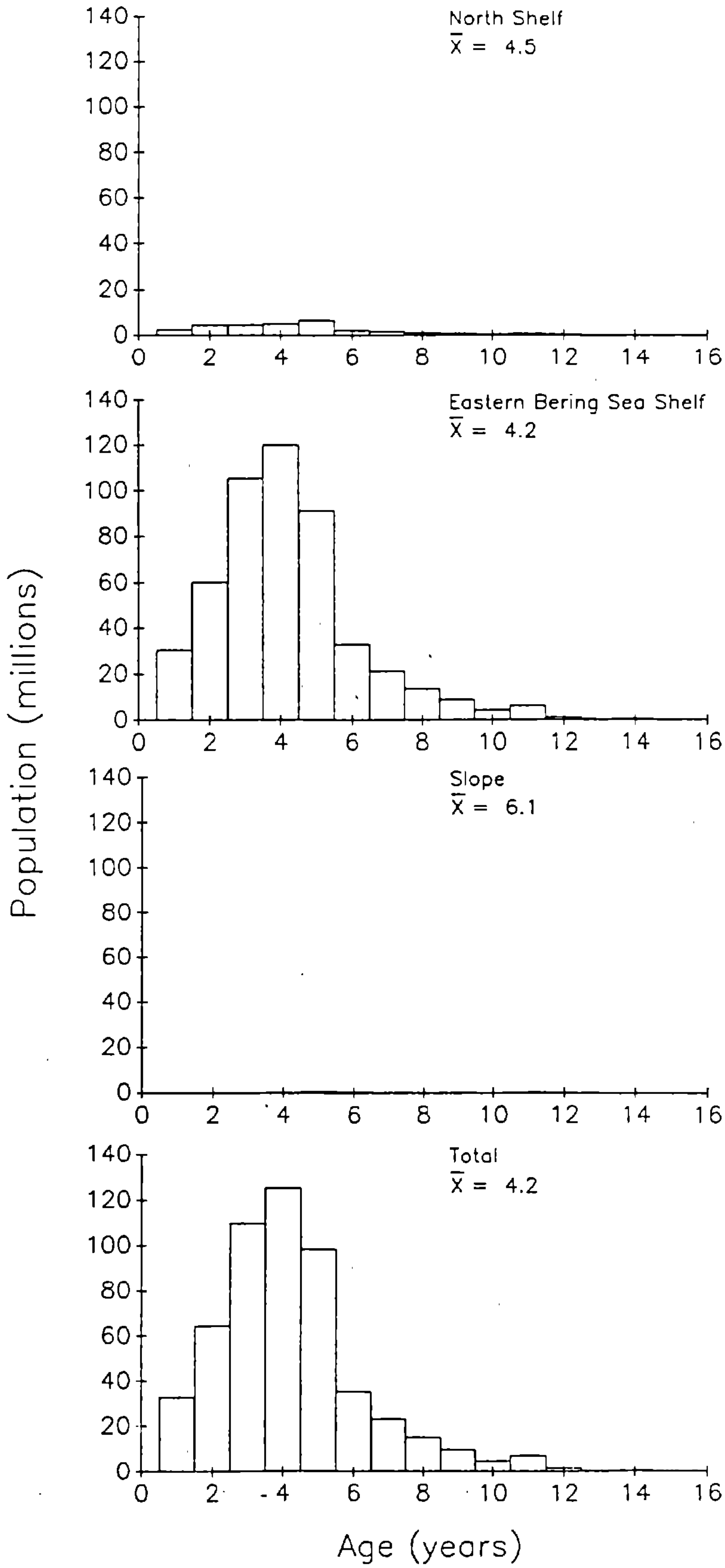

Figure 28.--Population estimates by age for Pacific cod as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

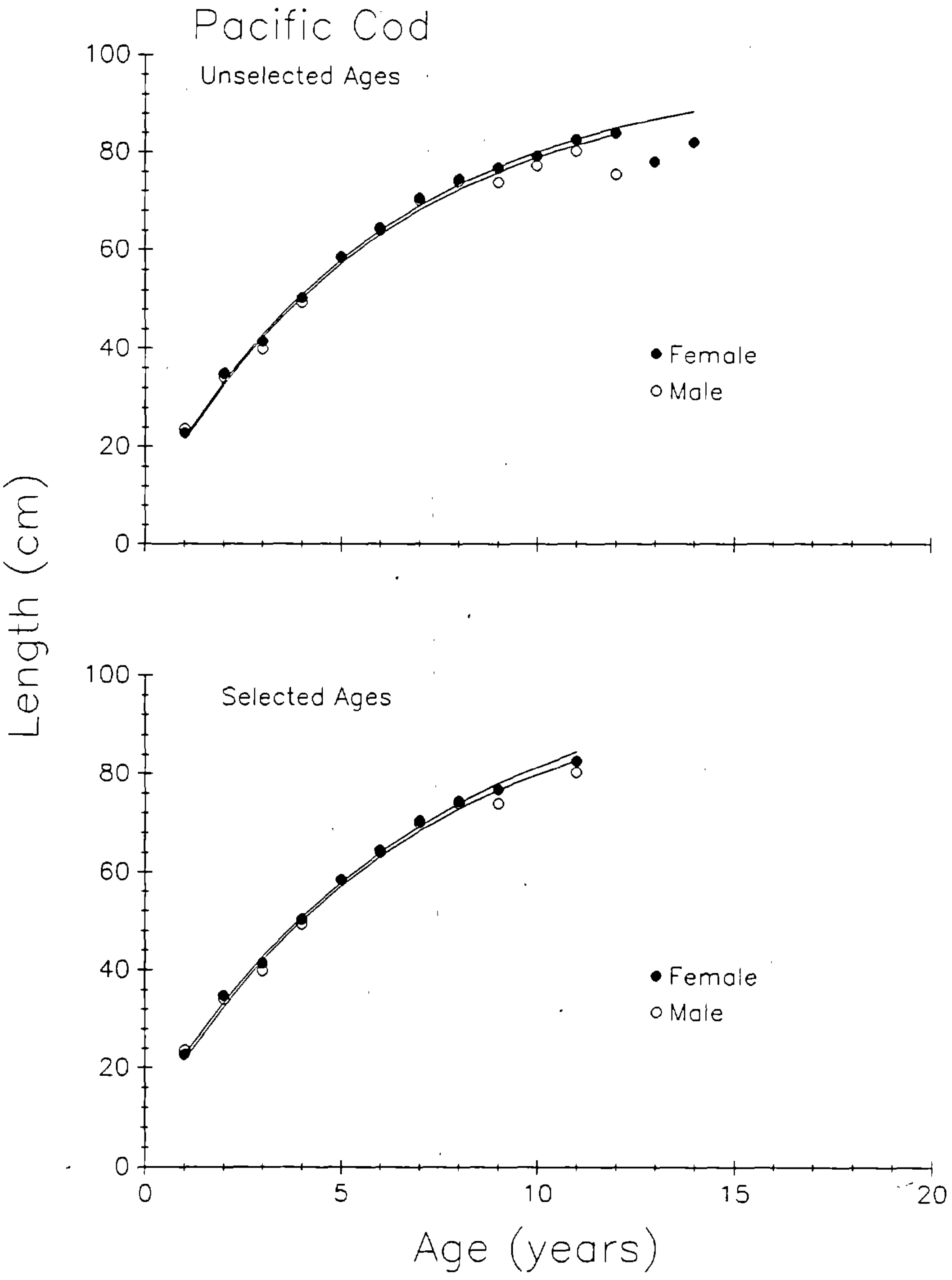

Figure 29. --Von Bertalanffy growth curves for male and female Pacific cod as shown by age data from the 1988 U.S. bottom trawl survey.

Table 23.--Parameters of the von Bertalanffy growth curves for Pacific cod by sex based on age readings from otoliths and length data from the 1988 U.S. bottom trawl survey. Parameters for unselected ages were derived from all age readings and those for selected ages from ages with five or more observations.

Data	Sex	Number of age readings	Age range	Length range (cm)	Parameters L_{inf}	K	t_o
Unselected	Male	316	1-12	16-93	95.9	0.16	-0.54
	Female	323	1-14	14-90	97.7	0.16	-0.57
Selected	Male	310	1-11	16-93	100.1	0.15	-0.60
	Female	316	1-11	14-90	104.5	0.14	-0.74

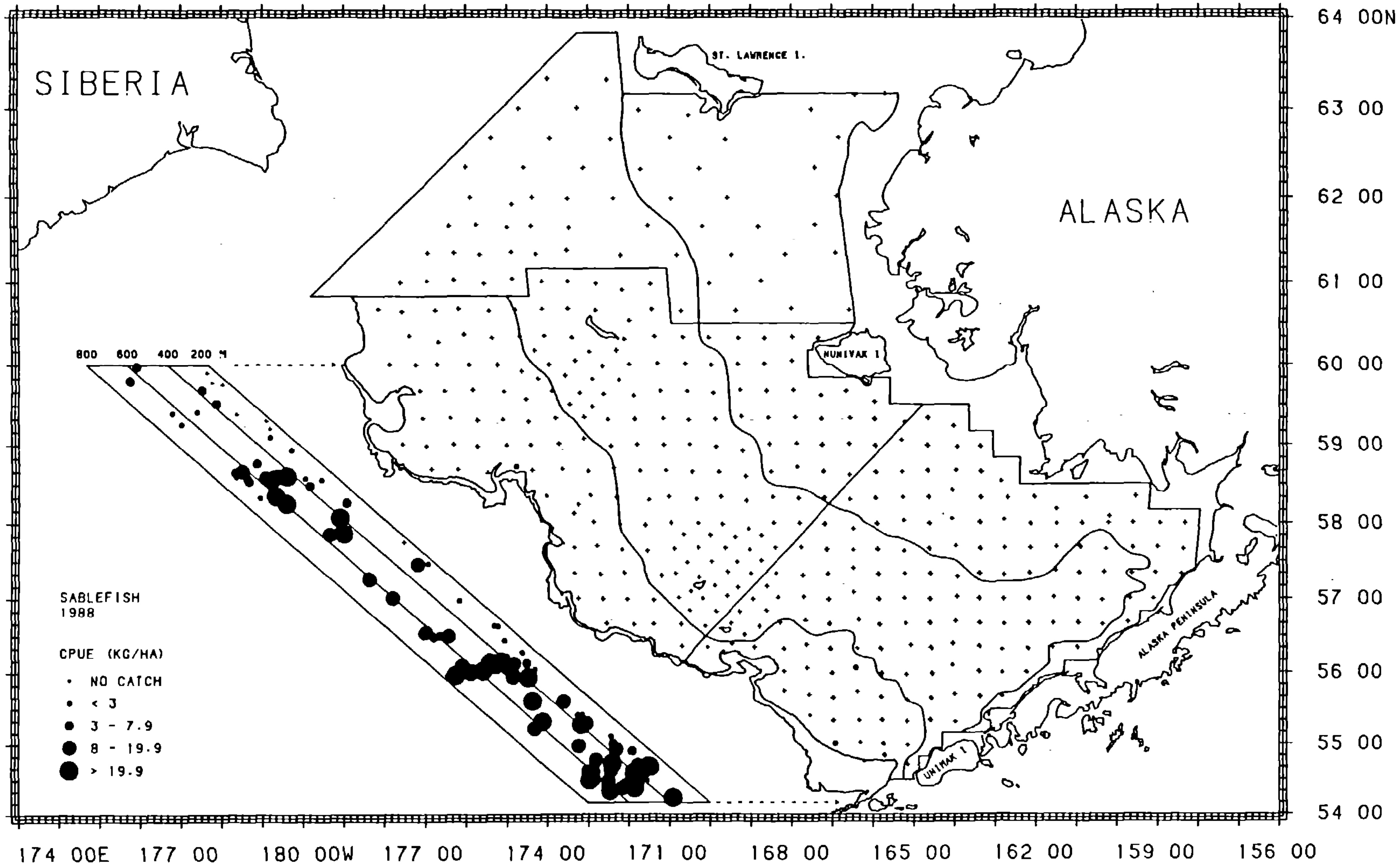

Figure 30.--Distribution and relative abundance of sablefish in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 24.--Abundance estimates and mean size of sablefish by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	0	0	0	0	0	-	-
4	50 - 100	0	0	0	0	0	-	-
5	100 - 200	0.05	199	0.006	123,774	0.011	1.605	58.5
6	100 - 200	0.01	130	0.004	52,197	0.005	2.495	61.0
Subareas combined		0.01	329	0.011	175,971	0.016	1.869	59.2
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
Slope								
9	200 - 500	19.74	15,367	0.499	5,531,189	0.508	2.778	62.6
10	200 - 500	7.59	4,286	0.139	1,300,669	0.119	3.295	66.5
11	500 - 800	15.08	6,622	0.215	2,499,749	0.230	2.649	62.6
12	500 - 800	12.63	4,182	0.136	1,381,202	0.127	3.028	65.0
Subareas combined		14.41	30,457	0.989	10,712,810	0.984	2.843	63.4
All subareas combined		0.48	30,786	1.000	10,888,781	1.000	2.827	63.3

[a]0 indicates fishing but no catch.
indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

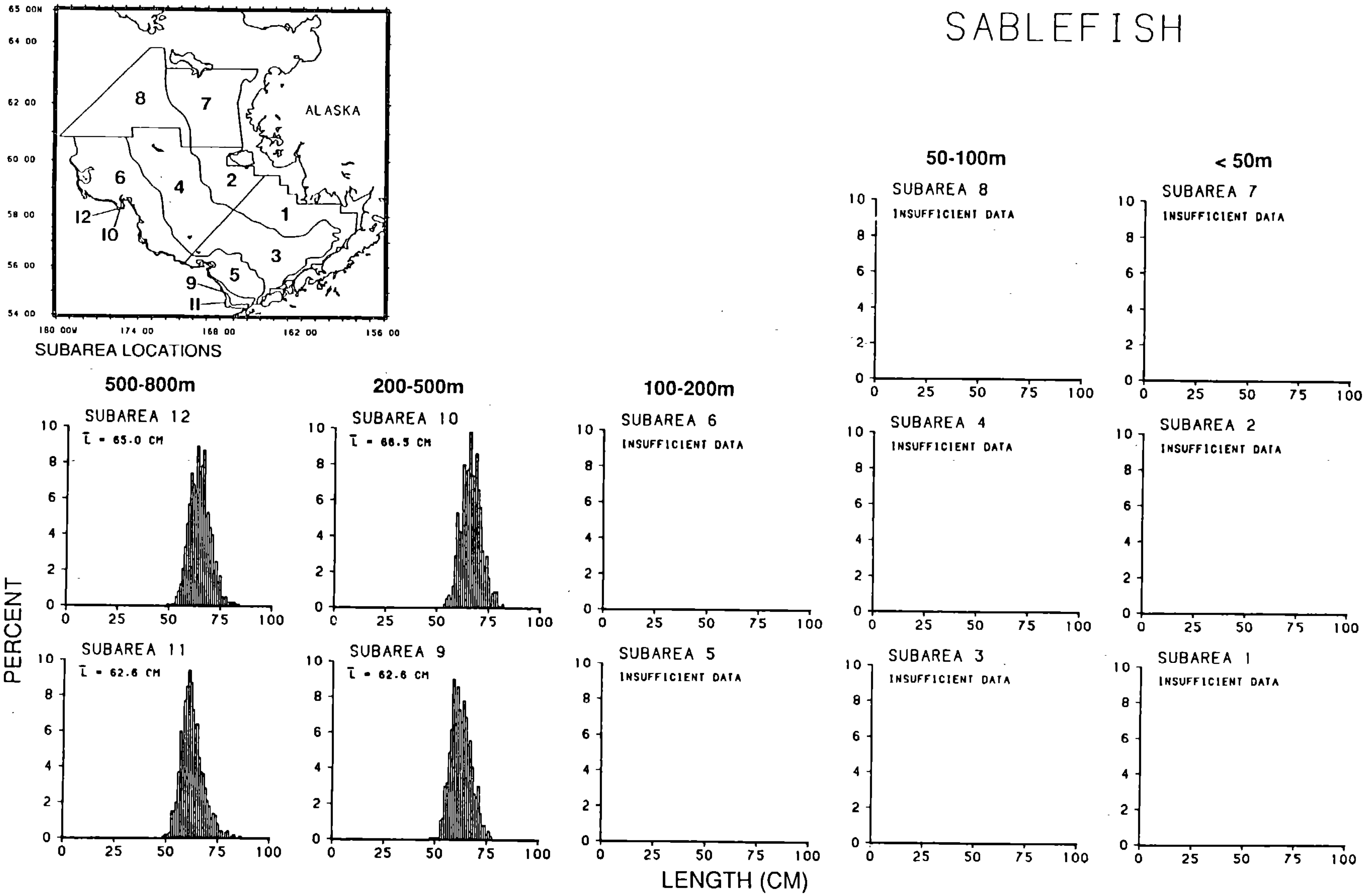

Figure 31.--Length composition of sablefish by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

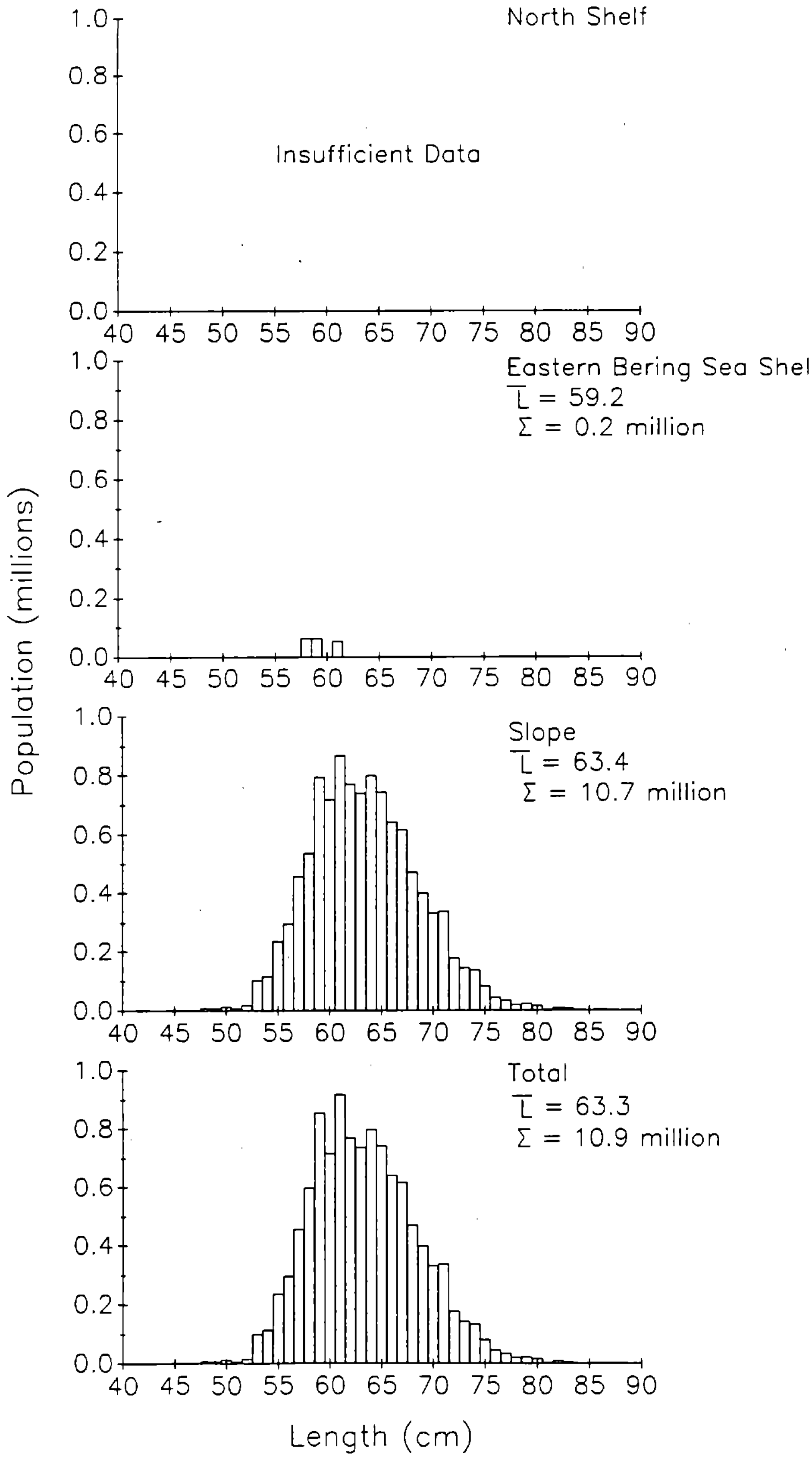

Figure 32.--Population number estimates by centimeter length interval for sablefish in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

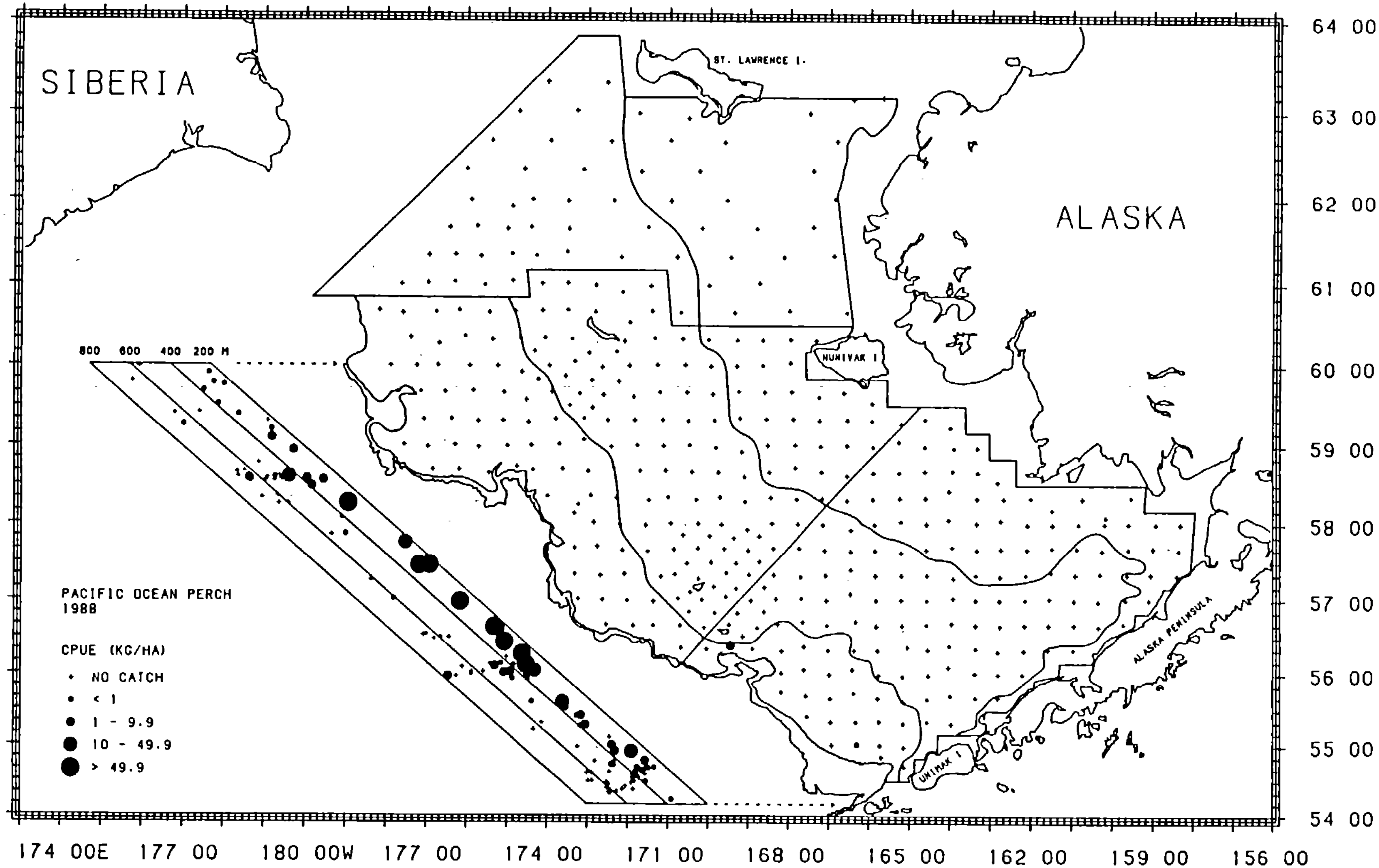

Figure 33.--Distribution and relative abundance of Pacific ocean perch in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 25.--Abundance estimates and mean size of Pacific ocean perch by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size: Weight (kg)	Mean size: Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	0	0	0	0	0	-	-
4	50 - 100	0	0	0	0	0	-	-
5	100 - 200	0.14	548	0.019	1,530,074	0.033	0.358	28.9
6	100 - 200	<0.01	3	<0.001	30,992	0.001	0.091	-
Subareas combined		0.01	551	0.019	1,561,066	0.034	0.353	28.9
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
Slope								
9	200 - 500	3.31	2,577	0.088	3,039,183	0.066	0.848	37.7
10	200 - 500	46.21	26,090	0.886	41,193,247	0.894	0.633	34.6
11	500 - 800	0.32	139	0.005	167,079	0.004	0.833	38.1
12	500 - 800	0.23	76	0.003	133,489	0.003	0.571	34.4
Subareas combined		13.67	28,882	0.981	44,532,998	0.966	0.649	34.8
All subareas combined		0.46	29,433	1.000	46,094,064	1.000	0.639	34.6

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

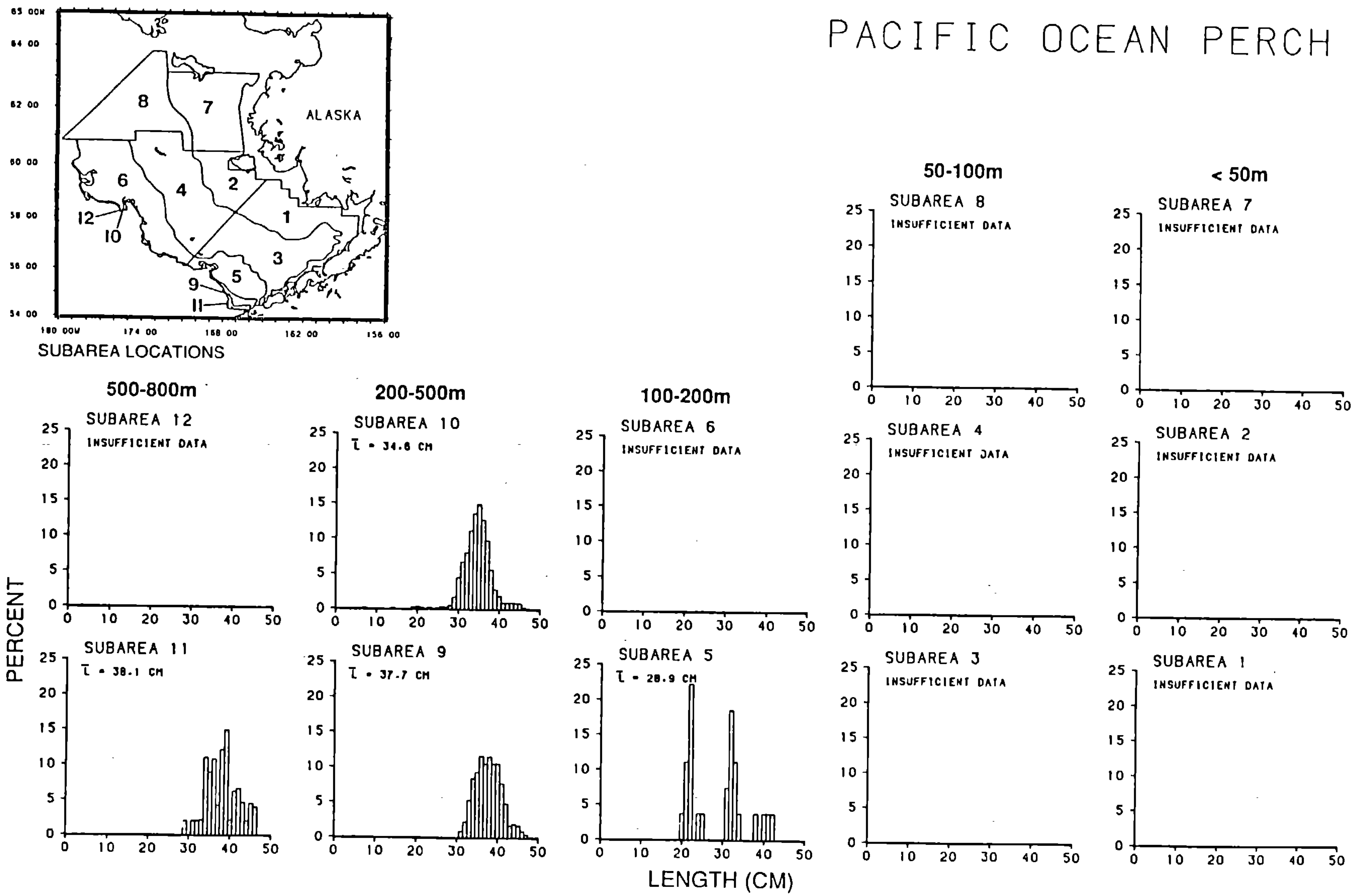

Figure 34.--Length composition of Pacific Ocean perch by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

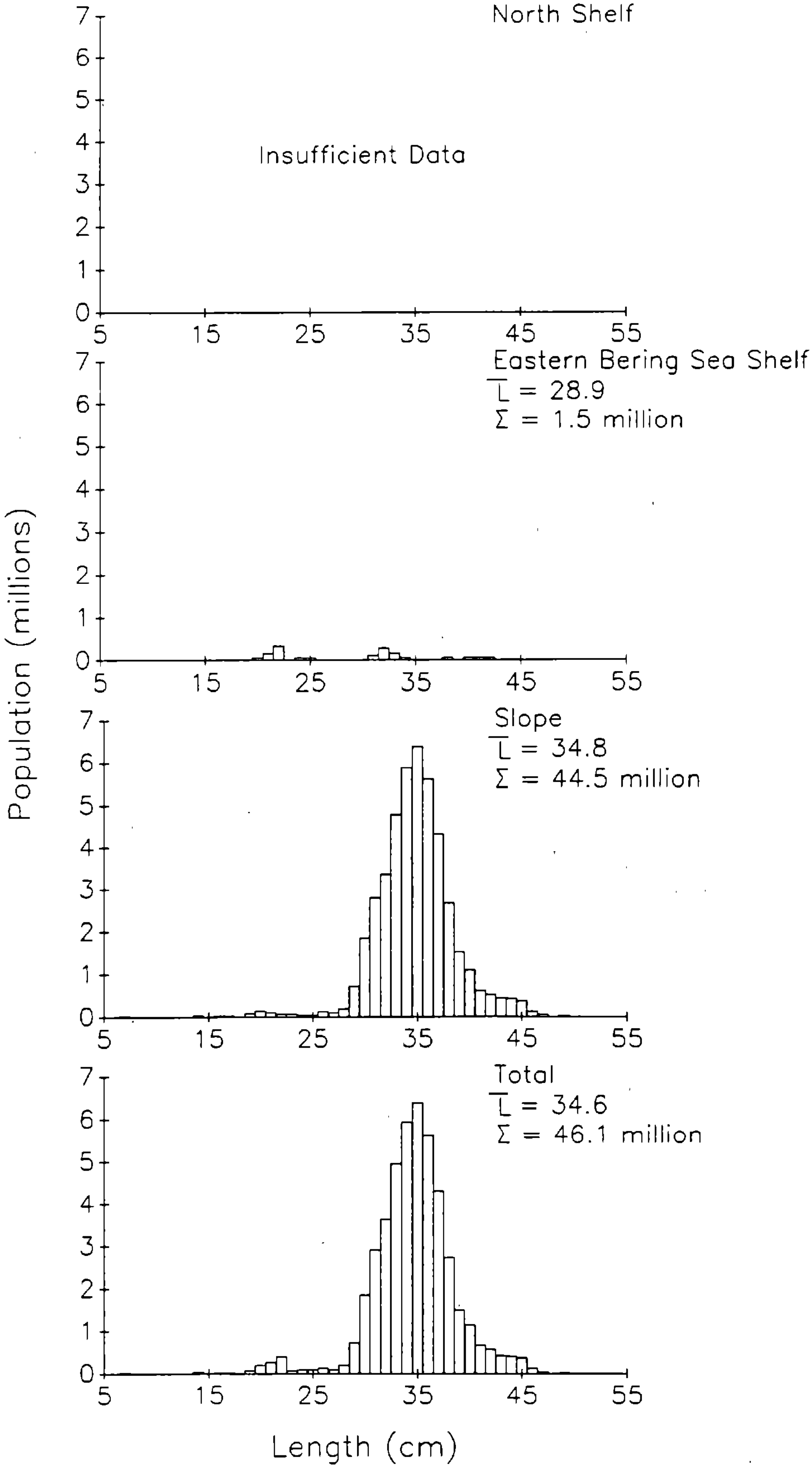

Figure 35. --Population number estimates by centimeter length interval for Pacific Ocean perch in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

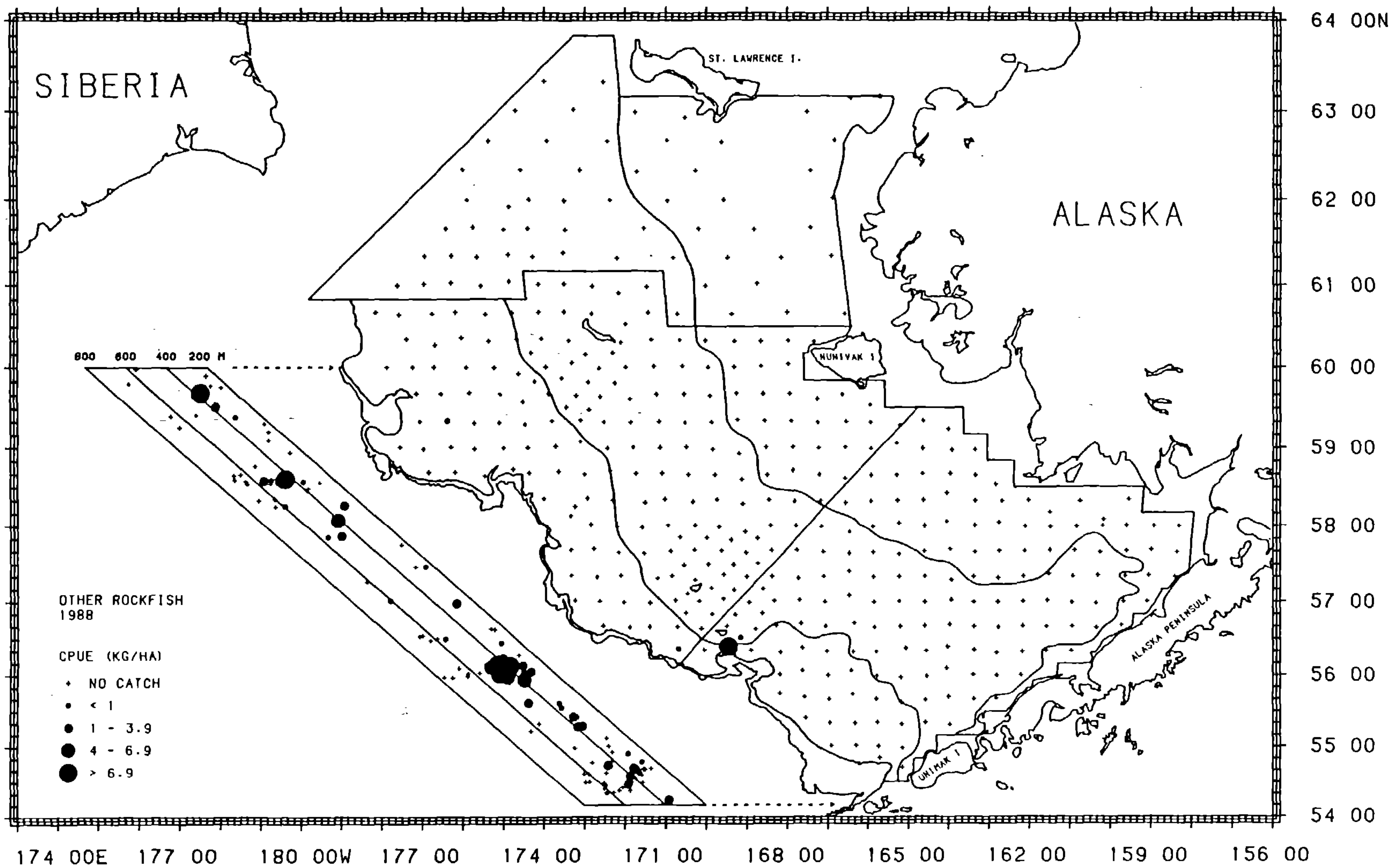

Figure 36.--Distribution and relative abundance of other rockfish in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 26.--Abundance estimates and mean size of rougheye, shortraker, and northern rockfish by subarea from the 1988 U.S. bottom trawl surveys of the Bering Sea slope.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size	
							Weight (kg)	Length (cm)
Rougheye rockfish								
9	200 - 500	0.37	288	0.329	361,135	0.380	0.797	32.9
10	200 - 500	0.61	345	0.394	240,139	0.253	1.437	43.7
11	500 - 800	0.52	230	0.263	299,959	0.316	0.766	33.7
12	500 - 800	0.04	13	0.015	49,418	0.052	0.272	30.3
Subareas combined		0.41	876	1.000	950,652	1.000	0.922	35.8
Shortraker rockfish								
9	200 - 500	0.73	566	0.449	263,433	0.538	2.148	42.6
10	200 - 500	0.08	43	0.034	11,427	0.023	3.742	60.5
11	500 - 800	1.32	579	0.460	138,101	0.282	4.193	57.8
12	500 - 800	0.22	72	0.057	76,681	0.157	0.940	34.1
Subareas combined		0.60	1,260	1.000	489,642	1.000	2.573	46.0
Northern rockfish								
Shelf subareas		0.11	7,009	0.999	10,366,235	0.999	0.676	34.1
Slope subareas		<0.01	4	0.001	10,973	0.001	0.408	-
All subareas combined		0.11	7,014	1.000	10,377,209	1.000	0.676	34.1

Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

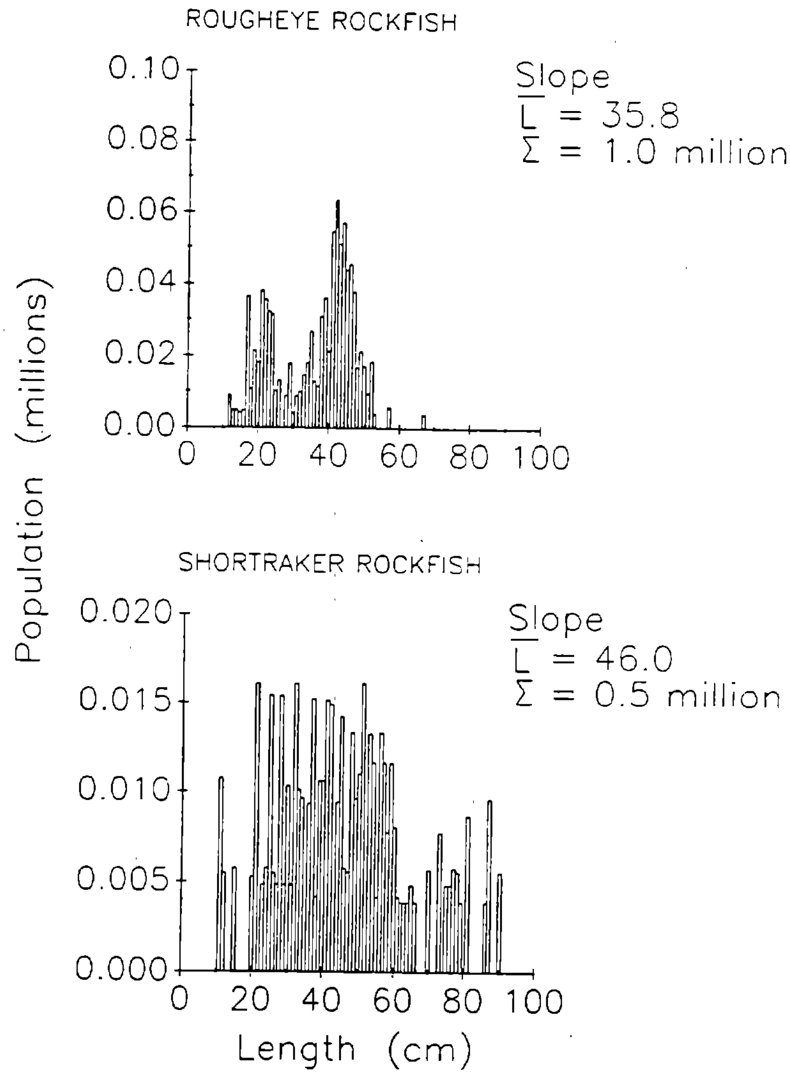

Figure 37.--Population number estimates by centimeter length interval for rougheye rockfish and shortraker rockfish in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

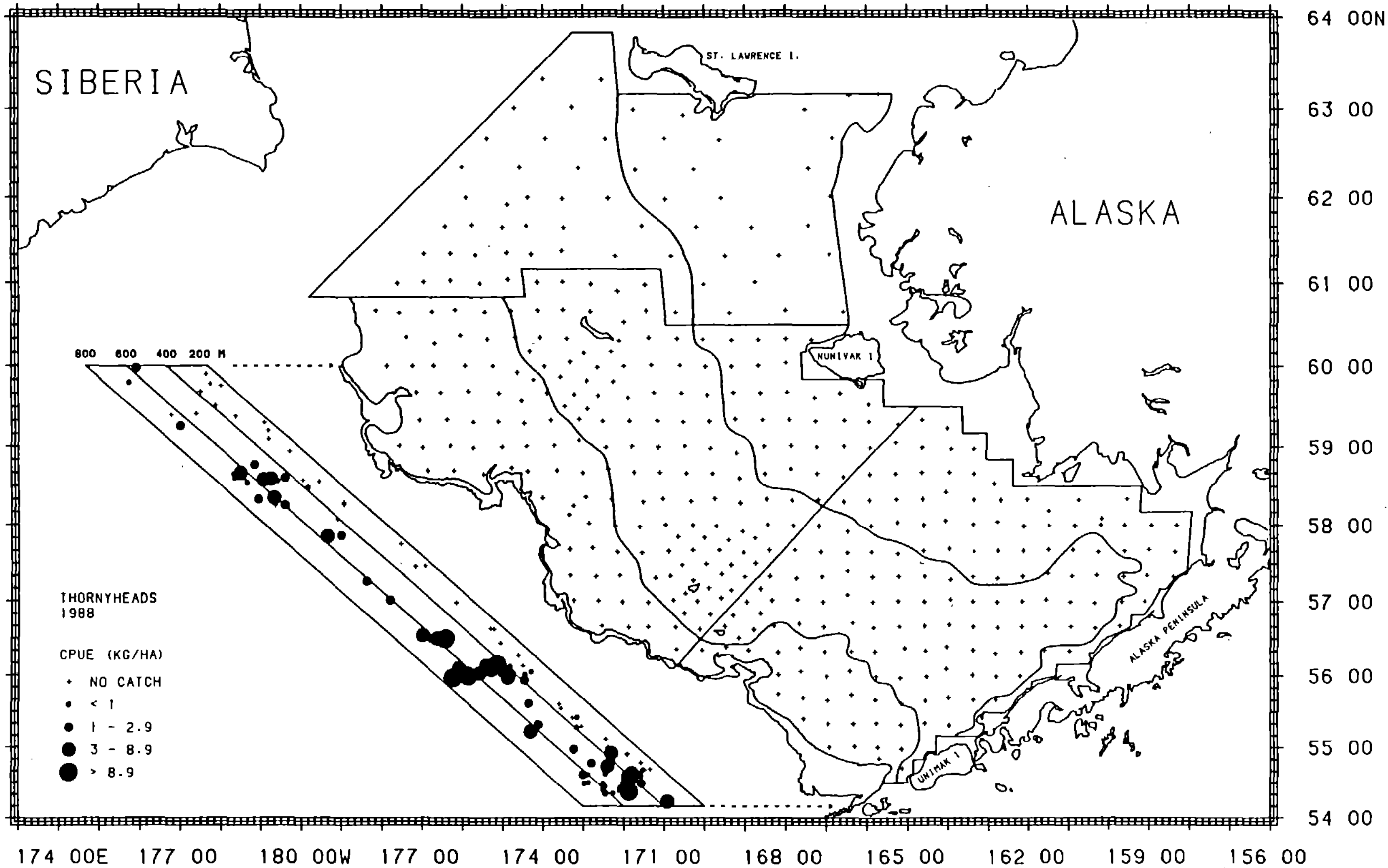

Figure 38.--Distribution and relative abundance of thornyhead rockfish in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 27.--Abundance estimates and mean size of shortspine thornyhead rockfish by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	0	0	0	0	0	-	-
4	50 - 100	0	0	0	0	0	-	-
5	100 - 200	0	0	0	0	0	-	-
6	100 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
Slope								
9	200 - 500	1.08	841	0.162	2,424,739	0.365	0.347	26.3
10	200 - 500	0.17	97	0.019	89,462	0.013	1.082	38.6
11	500 - 800	8.12	3,565	0.686	3,699,095	0.556	0.964	39.3
12	500 - 800	2.10	696	0.134	437,941	0.066	1.589	45.3
Subareas combined		2.46	5,199	1.000	6,651,237	1.000	0.782	35.0
All subareas combined		0.08	5,199	1.000	6,651,237	1.000	0.782	35.0

[a] 0 indicates fishing but no catch.
[b] - indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

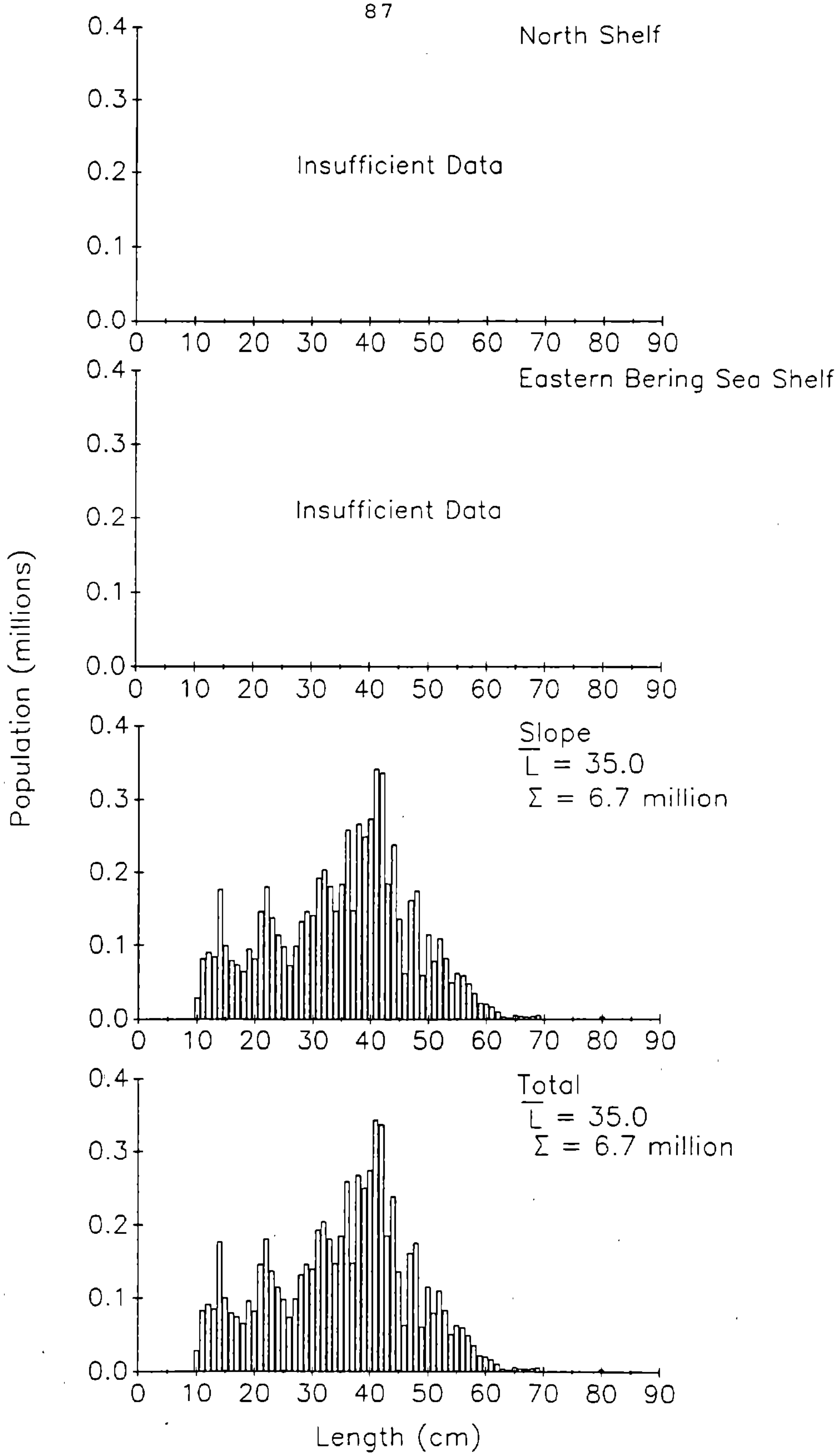

Figure 39. --Population number estimates by centimeter length interval for thornyhead rockfish in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

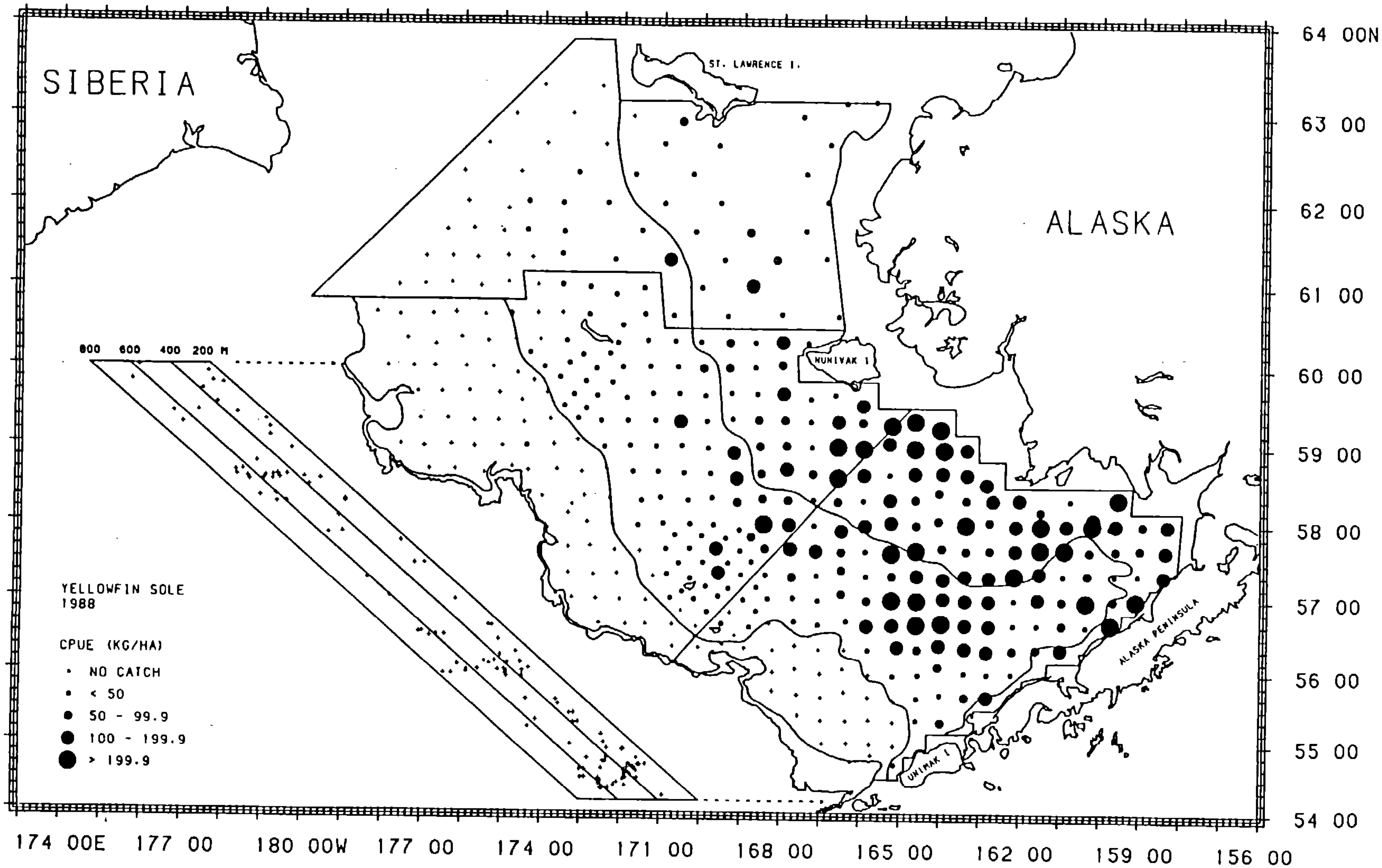

Figure 40.--Distribution and relative abundance of yellowfin sole in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 28. --Abundance estimates and mean size of yellowfin sole by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size	
							Weight (kg)	Length (cm)
Eastern Bering Sea Shelf								
1	< 50	167.37	1,303,331	0.425	5,780,577,311	0.444	0.225	25.1
2	< 50	86.05	353,022	0.115	2,347,495,628	0.180	0.150	21.2
3	50 - 100	91.45	944,667	0.308	2,979,211,558	0.229	0.317	29.2
4	50 - 100	23.50	253,421	0.083	785,672,874	0.060	0.323	28.7
5	100 - 200	0[a]	0	0	0	0	-[b]	-
6	100 - 200	0.01	121	<0.001	550,964	<0.001	0.220	27.0
Subareas combined		61.60	2,854,562	0.930	11,893,508,335	0.913	0.240	25.6
North Shelf								
7	< 50	23.90	174,027	0.057	1,005,405,108	0.077	0.173	22.3
8	50 - 200	4.97	40,798	0.013	130,814,577	0.010	0.312	27.9
Subareas combined		13.87	214,825	0.070	1,136,219,685	0.087	0.189	22.9
Slope								
9	200 - 500	0	0	0	0	0	-	-
10	200 - 500	0	0	0	0	0	-	-
11	500 - 800	0	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
All subareas combined		48.01	3,069,387	1.000	13,029,728,020	1.000	0.236	25.4

[a] 0 indicates fishing but no catch.
[b] - indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

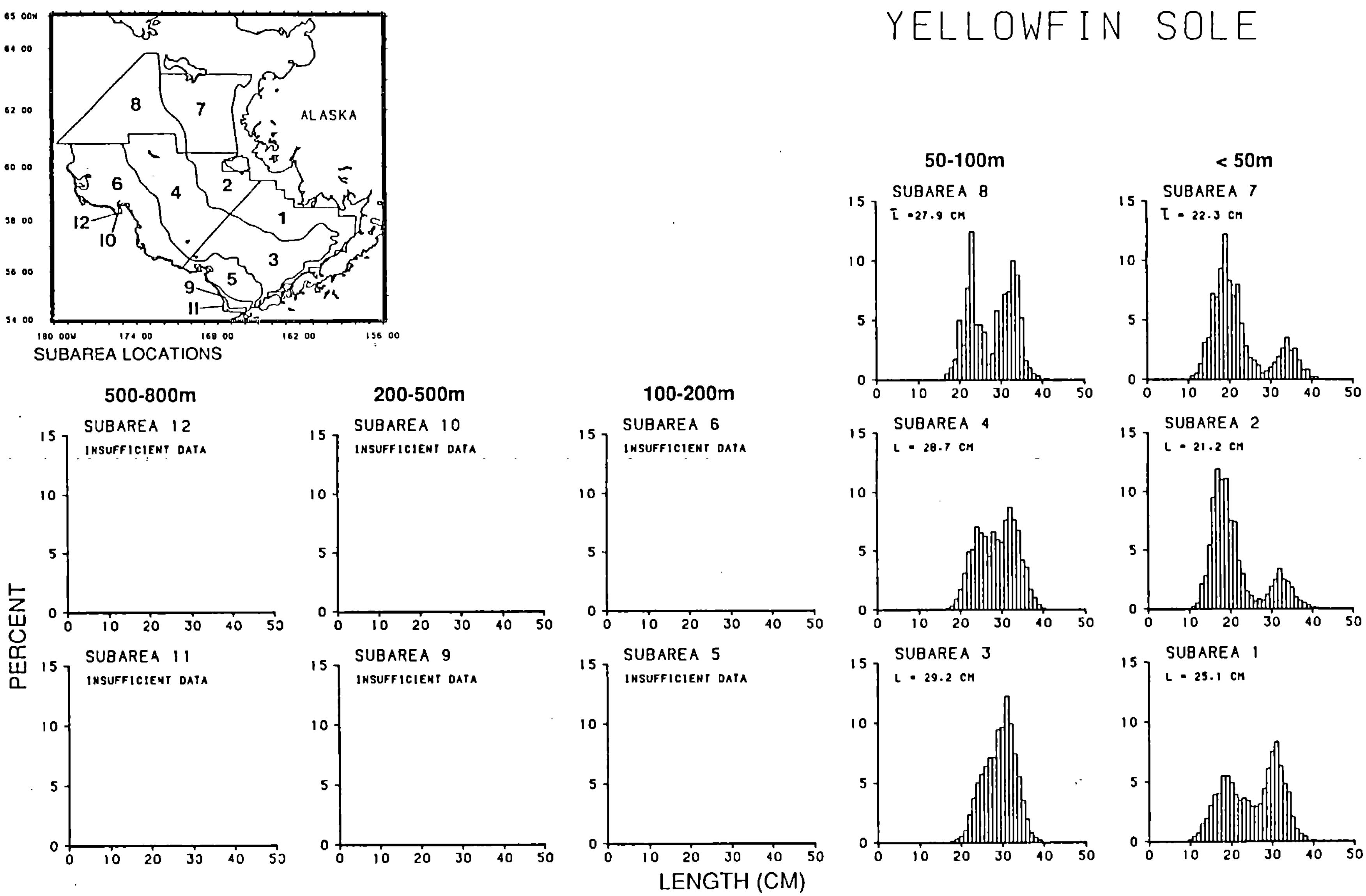

Figure 41.--Length composition of yellowfin sole by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

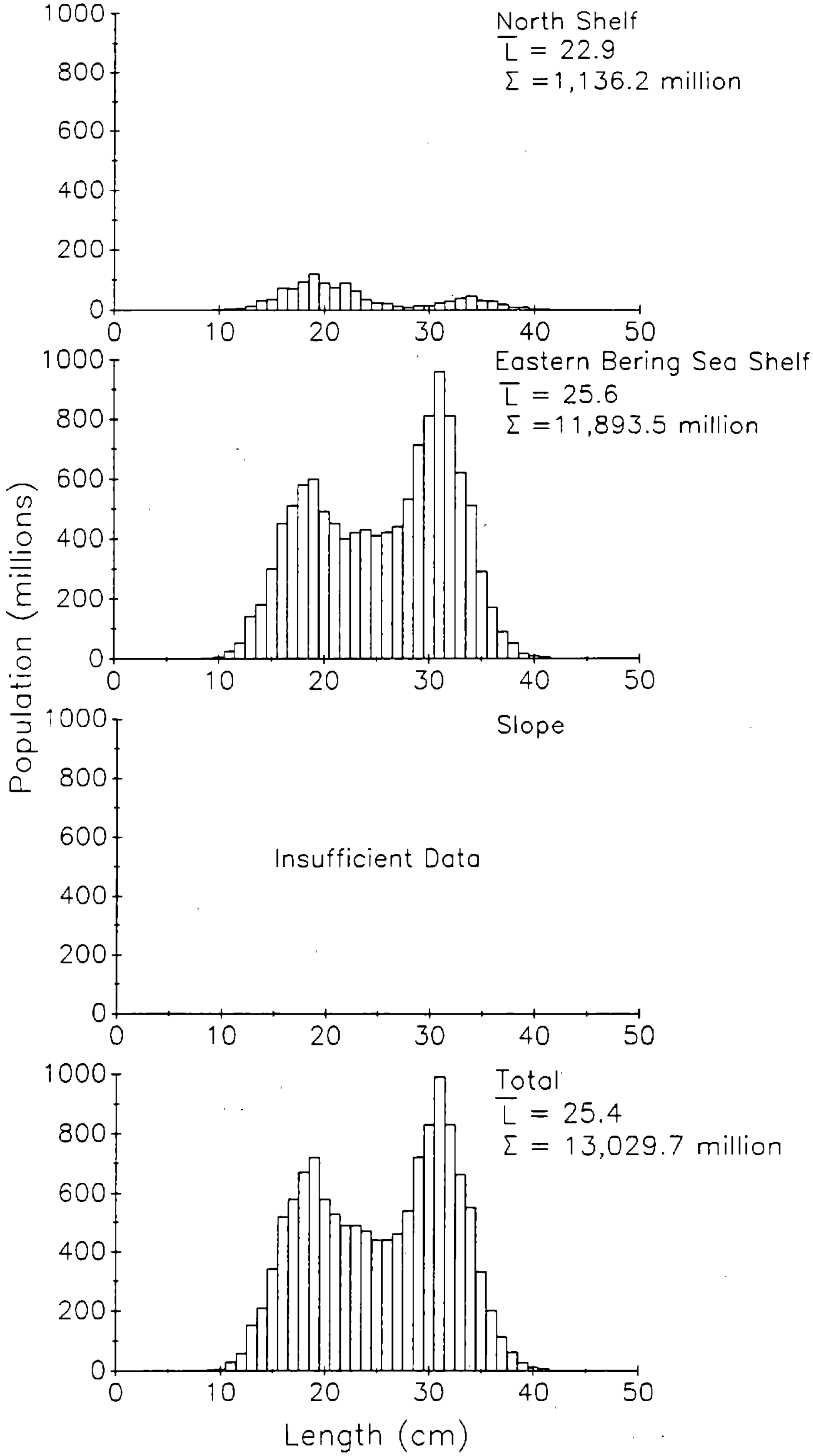

Figure 42. --Population number estimates by centimeter length interval for yellowfin sole in the eastern Bering Sea as -shown by data from the 1988 U.S.-Japan bottom trawl survey.

Table 29.--Estimated population numbers (millions of fish) of yellowfin sole by age groups and subarea as shown by age and length data from the 1988 bottom trawl survey in the eastern Bering Sea.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	<50 m	100-200 m		50-100 m		<50 m			
Age	Year class	12	11	10	9	8	7	6	5	4	3	2	1	All subareas combined	Proportion of total
1	1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
2	1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.84	<0.001
3	1985	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.42	3.59	4.29	<0.001
4	1984	0.00	0.00	0.00	0.00	0.00	3.25	0.00	0.00	0.00	0.00	6.78	25.24	35.27	0.003
5	1983	0.00	0.00	0.00	0.00	1.54	115.18	0.00	0.00	4.27	6.23	324.31	447.78	899.31	0.069
6	1982	0.00	0.00	0.00	0.00	0.97	22.50	0.00	0.00	3.00	4.25	55.38	71.10	157.20	0.012
7	1981	0.00	0.00	0.00	0.00	27.06	440.92	0.00	0.00	114.51	268.12	1,106.66	1,507.73	3,465.00	0.266
8	1980	0.00	0.00	0.00	0.00	19.46	158.87	0.28	0.00	115.51	381.77	306.36	720.34	1,702.59	0.131
9	1979	0.00	0.00	0.00	0.00	14.12	55.39	0.11	0.00	121.08	486.80	108.89	554.91	1,341.30	0.103
10	1978	0.00	0.00	0.00	0.00	2.79	5.58	0.11	0.00	29.46	141.44	16.32	131.66	327.36	0.025
11	1977	0.00	0.00	0.00	0.00	6.03	15.11	0.00	0.00	42.65	186.87	36.12	235.14	521.92	0.040
12	1976	0.00	0.00	0.00	0.00	6.62	9.53	0.06	0.00	50.94	189.82	30.64	175.27	462.88	0.036
13	1975	0.00	0.00	0.00	0.00	5.34	15.38	0.00	0.00	33.72	160.19	35.57	235.13	485.33	0.037
14	1974	0.00	0.00	0.00	0.00	9.47	31.02	0.00	0.00	60.33	281.63	65.13	414.44	862.03	0.066
15	1973	0.00	0.00	0.00	0.00	6.92	17.33	0.00	0.00	40.85	192.63	47.07	267.05	571.85	0.044
16	1972	0.00	0.00	0.00	0.00	4.60	7.41	0.00	0.00	29.57	113.53	22.92	124.78	302.81	0.023
17	1971	0.00	0.00	0.00	0.00	4.53	10.77	0.00	0.00	24.96	110.94	28.82	170.96	350.97	0.027
18	1970	0.00	0.00	0.00	0.00	2.93	10.48	0.00	0.00	18.73	87.02	23.09	128.07	270.33	0.021
19	1969	0.00	0.00	0.00	0.00	4.15	22.80	0.00	0.00	24.02	93.71	34.42	143.21	322.31	0.025
20	1968	0.00	0.00	0.00	0.00	4.40	15.33	0.00	0.00	18.17	88.93	26.16	144.30	297.29	0.023
21	1967	0.00	0.00	0.00	0.00	3.87	12.98	0.00	0.00	10.87	60.86	22.26	123.53	234.37	0.018
22	1966	0.00	0.00	0.00	0.00	4.19	16.71	0.00	0.00	29.31	95.97	28.89	112.34	287.41	0.022
23	1965	0.00	0.00	0.00	0.00	1.28	9.62	0.00	0.00	5.54	15.15	10.65	22.73	64.97	0.005
24	1964	0.00	0.00	0.00	0.00	0.34	4.94	0.00	0.00	5.51	8.69	7.34	14.56	41.37	0.003
25	1963	0.00	0.00	0.00	0.00	0.14	1.37	0.00	0.00	1.87	3.69	1.58	3.78	12.42	0.001
>25	1962	0.00	0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.82	0.98	1.48	2.07	6.25	0.001
Age unknown		0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.21	0.00	2.03	<0.001
All ages combined		0.00	0.00	0.00	0.00	130.81	1,005.41	0.55	0.00	785.67	2,979.21	2,347.50	5,780.58	13,029.73	1.00

Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

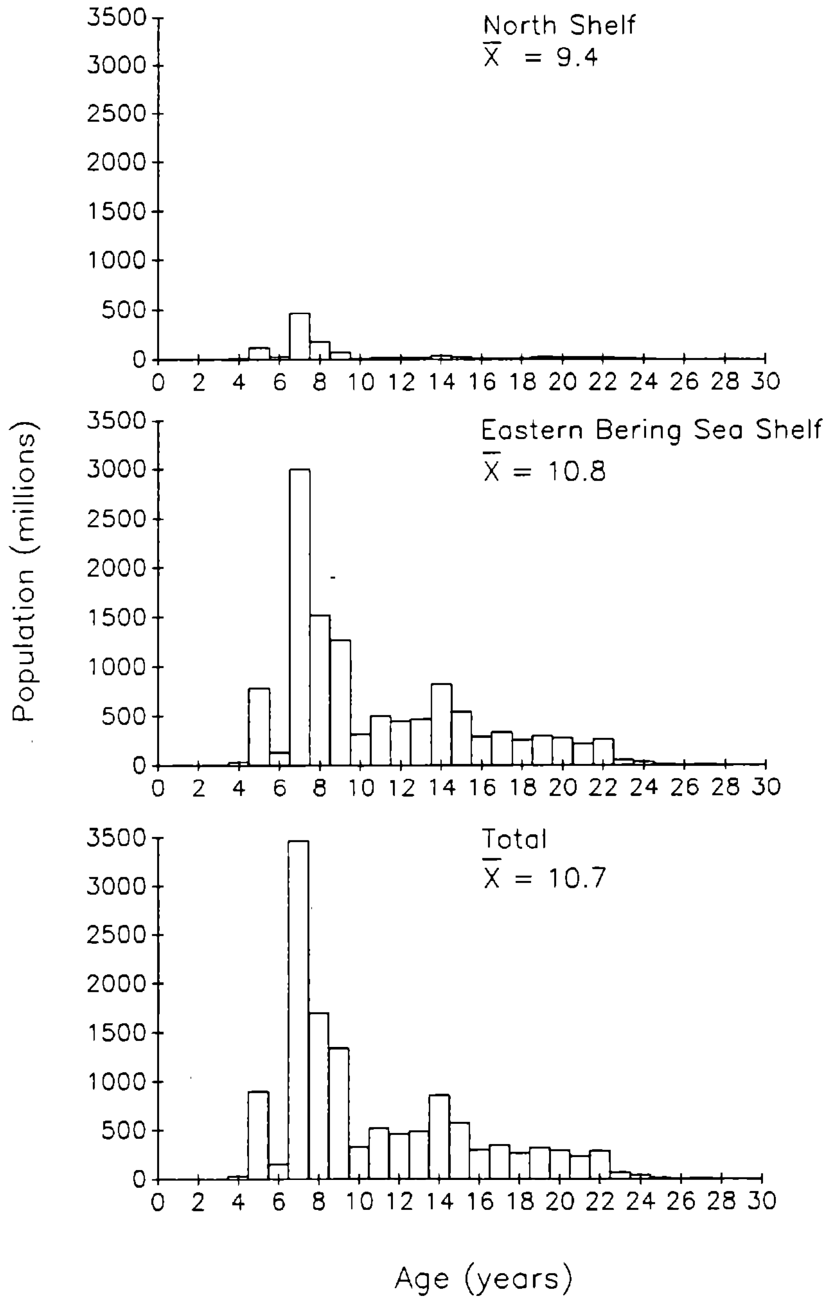

Figure 43.--Population estimates by age for yellowfin sole as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

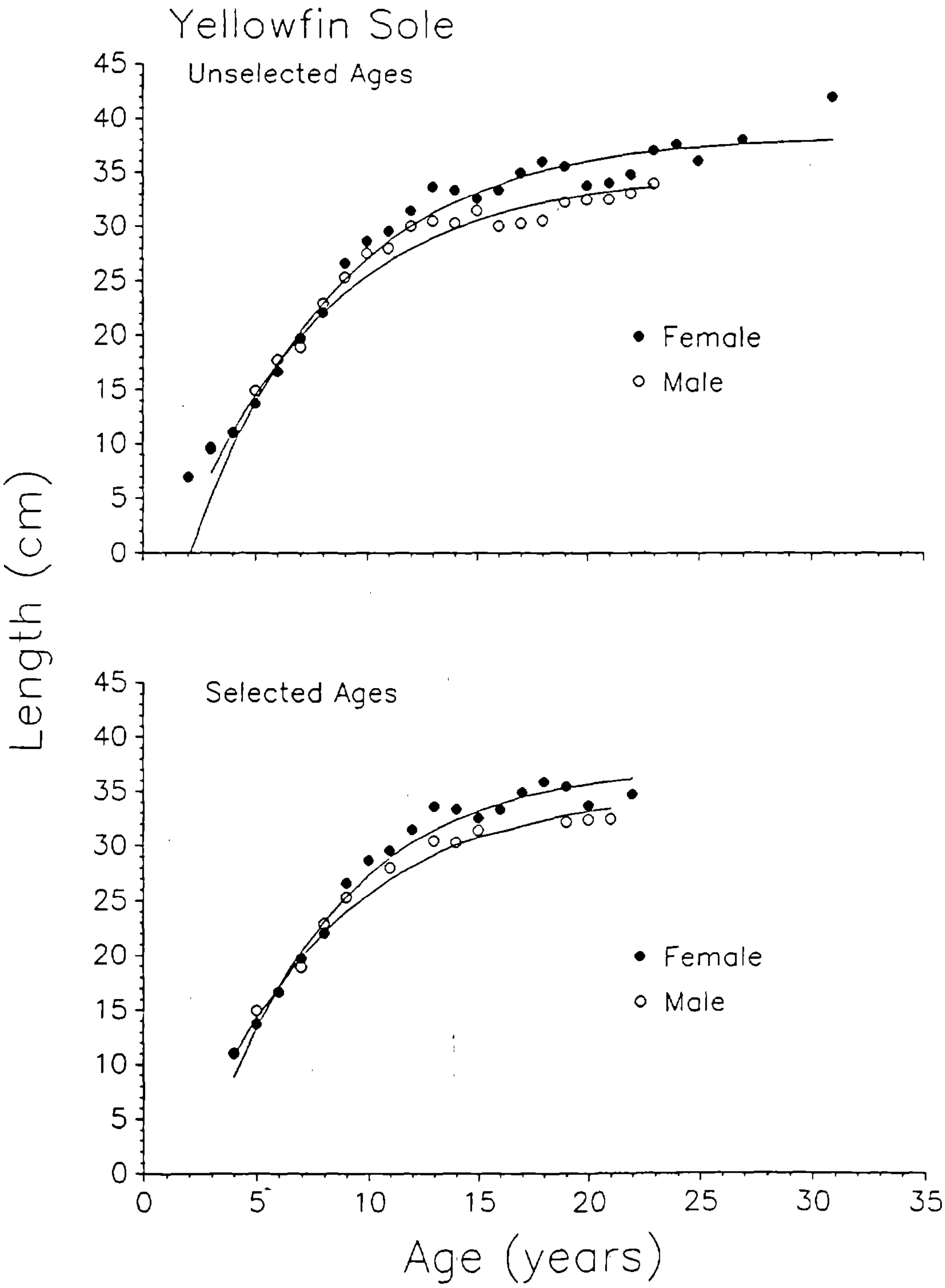

Figure 44.--Von Bertalanffy growth curves for male and female yellowfin sole as shown by age data from the 1988 U.S. bottom trawl survey.

Table 30.--Parameters of the von Bertalanffy growth curves for yellowfin sole by sex based on age readings from otoliths and length data from the 1988 U.S. bottom trawl survey. Parameters for unselected ages were derived from all age readings and those for selected ages from ages with five or more observations.

Data	Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Unselected	Male	275	3-23	9-37	35.0	0.15	1.46
	Female	369	2-31	7-44	38.4	0.15	2.07
Selected	Male	251	4-21	10-37	35.2	0.16	1.63
	Female	352	4-22	10-44	37.6	0.17	2.44

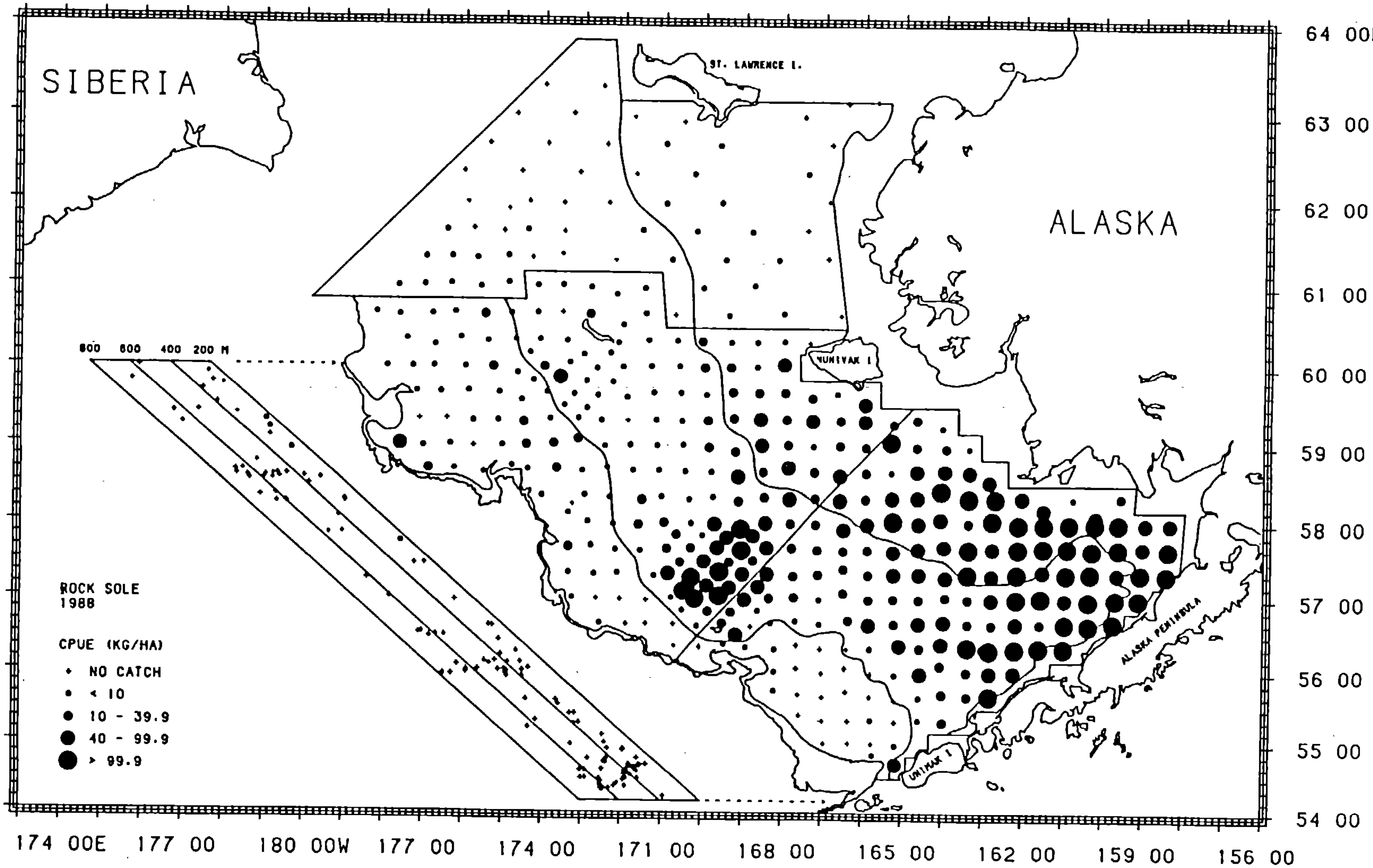

Figure 45.--Distribution and relative abundance of rock sole in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 31.--Abundance estimates and mean size of rock sole by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	112.77	878,172	0.459	5,452,373,675	0.525	0.161	21.6
2	< 50	27.81	114,095	0.060	669,611,088	0.064	0.170	20.4
3	50 - 100	57.16	590,458	0.308	3,003,752,677	0.289	0.197	24.4
4	50 - 100	24.65	265,793	0.139	979,954,357	0.094	0.271	27.1
5	100 - 200	0.94	3,633	0.002	6,107,244	0.001	0.595	36.0
6	100 - 200	5.43	51,393	0.027	113,432,031	0.011	0.453	32.0
Subareas combined		41.08	1,903,544	0.994	10,225,231,072	0.984	0.186	23.0
North Shelf								
7	< 50	0.82	5,941	0.003	142,958,716	0.014	0.042	12.7
8	50 - 200	0.64	5,240	0.003	23,230,064	0.002	0.226	22.9
Subareas combined		0.72	11,181	0.006	166,188,780	0.016	0.067	14.1
Slope								
9	200 - 500	<0.01	1	<0.001	4,235	<0.001	0.181	-[b]
10	200 - 500	0.03	16	<0.001	27,070	<0.001	0.580	-
11	500 - 800	0[a]	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		0.01	16	<0.001	31,305	<0.001	0.526	-
All subareas combined		29.95	1,914,741	1.000	10,391,451,157	1.000	0.184	22.9

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

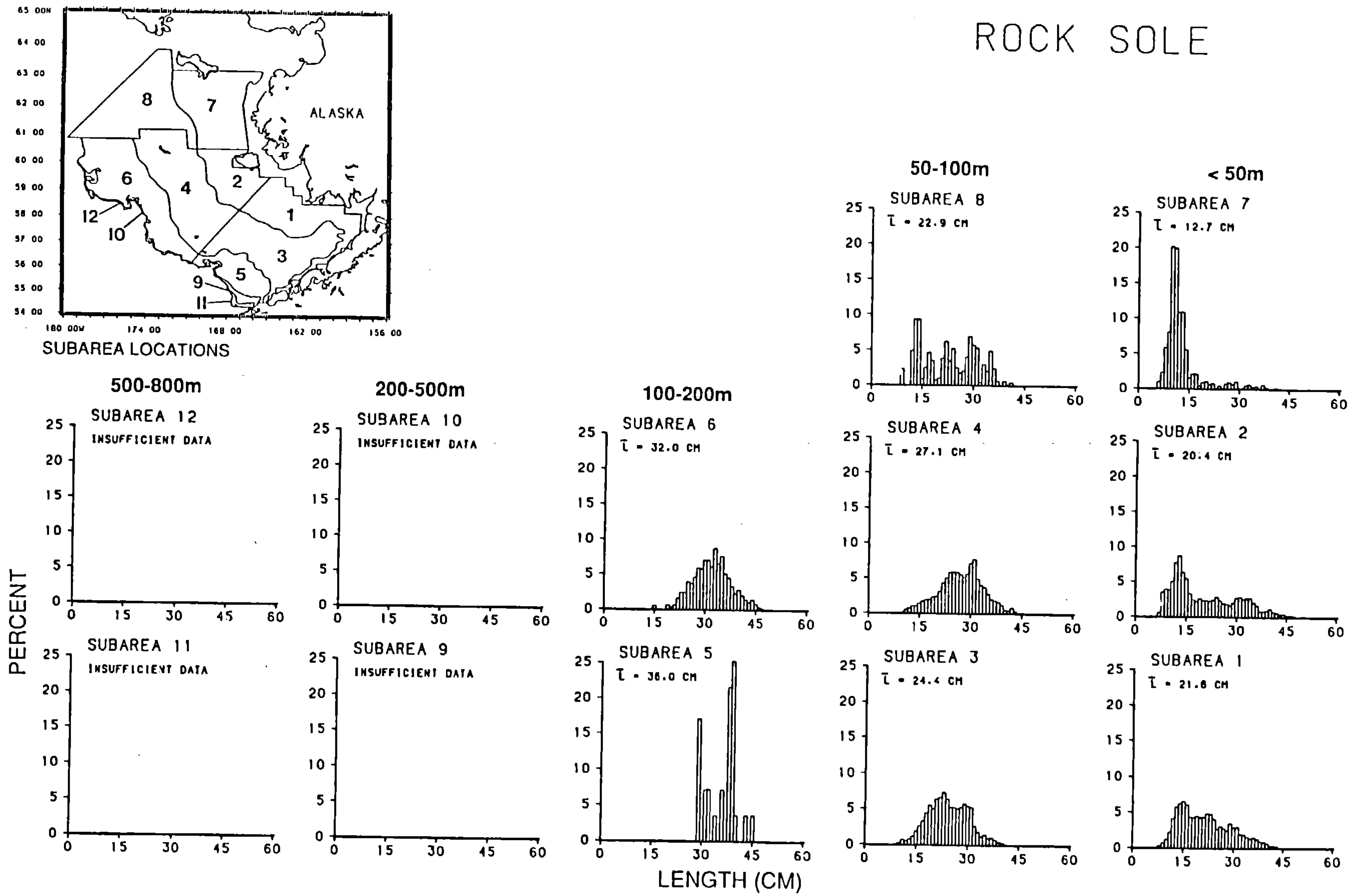

Figure 46.--Length composition of rock sole by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

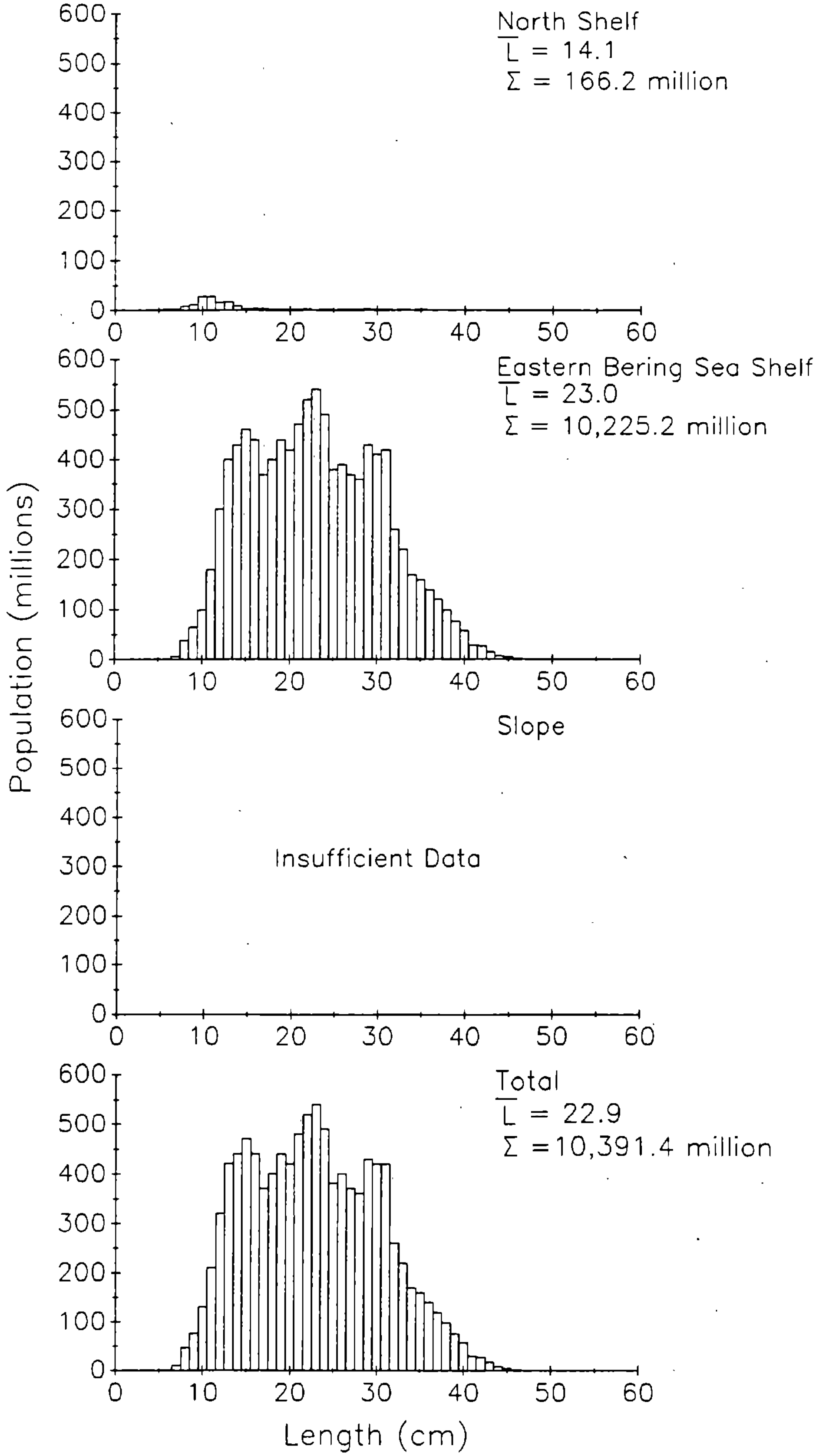

Figure 47.--Population number estimates by centimeter length interval for rock sole in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

Table 32.--Estimated population numbers (millions of fish) of rock sole by age group and subarea as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

		Depth and subarea													
		500-800 m		200-500 m		50-200 m	< 50 m	100-200 m		50-100 m		< 50 m			
Age	Year class	12	11	10	9	8	7	6	5	4	3	2	1	All subareas combined	Proportion of total
1	1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
2	1986	0.00	0.00	0.00	0.00	1.49	41.04	0.00	0.00	6.85	25.06	91.99	262.65	429.08	0.041
3	1985	0.00	0.00	0.00	0.00	3.52	72.23	0.47	0.00	38.05	139.13	167.92	990.55	1,411.85	0.136
4	1984	0.00	0.00	0.00	0.00	3.89	14.09	0.66	0.00	79.86	513.89	97.36	1,168.62	1,878.37	0.181
5	1983	0.00	0.00	0.00	0.00	4.35	6.03	11.73	0.22	228.71	868.05	96.76	1,254.09	2,469.94	0.238
6	1982	0.00	0.00	0.00	0.00	2.48	1.58	14.92	0.47	155.39	522.50	39.56	510.46	1,247.35	0.120
7	1981	0.00	0.00	0.00	0.00	3.00	2.16	21.69	0.43	180.40	454.39	49.50	468.75	1,180.33	0.114
8	1980	0.00	0.00	0.00	0.00	1.70	1.74	19.02	0.63	107.09	187.23	39.61	288.74	645.76	0.062
9	1979	0.00	0.00	0.00	0.00	1.11	0.88	12.08	0.70	65.41	121.71	21.73	169.86	393.49	0.038
10	1978	0.00	0.00	0.00	0.00	0.27	0.18	3.05	0.23	14.05	20.34	5.32	41.53	84.96	0.008
11	1977	0.00	0.00	0.00	0.00	0.54	0.56	7.21	1.15	32.88	56.94	13.84	96.30	209.41	0.020
12	1976	0.00	0.00	0.00	0.00	0.26	0.27	4.00	0.40	17.27	34.22	8.06	48.93	113.42	0.011
13	1975	0.00	0.00	0.00	0.00	0.27	0.29	4.17	0.27	13.81	15.12	8.73	46.31	88.96	0.009
14	1974	0.00	0.00	0.00	0.00	0.09	0.15	4.18	0.40	12.09	14.48	6.34	36.21	73.94	0.007
15	1973	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
16	1972	0.00	0.00	0.00	0.00	0.00	0.03	0.28	0.11	1.27	1.83	0.42	4.24	8.18	0.001
17	1971	0.00	0.00	0.00	0.00	0.02	0.00	0.57	0.19	2.70	1.55	1.39	7.63	14.05	0.001
18	1970	0.00	0.00	0.00	0.00	0.22	0.10	4.61	0.44	13.71	16.20	8.84	30.96	75.09	0.007
19	1969	0.00	0.00	0.00	0.00	0.02	0.04	0.81	0.25	5.13	8.54	2.40	12.64	29.83	0.003
20	1968	0.00	0.00	0.00	0.00	0.00	0.03	0.71	0.22	1.81	1.98	0.98	4.64	10.36	0.001
> 20		0.00	0.00	0.00	0.00	0.01	0.02	0.52	0.00	1.67	0.20	1.13	4.16	7.71	0.001
Age unknown		0.00	0.00	0.03	<0.01	0.00	1.53	2.76	0.00	1.79	0.42	3.94	5.09	19.33	0.002
All ages Combined		0.00	0.00	0.03	<0.00	23.23	142.96	113.43	6.11	979.95	3,003.75	669.61	5,452.37	10,391.42	1.000

Note: Differences in sums of estimates by subarea or age and totals are due to rounding.

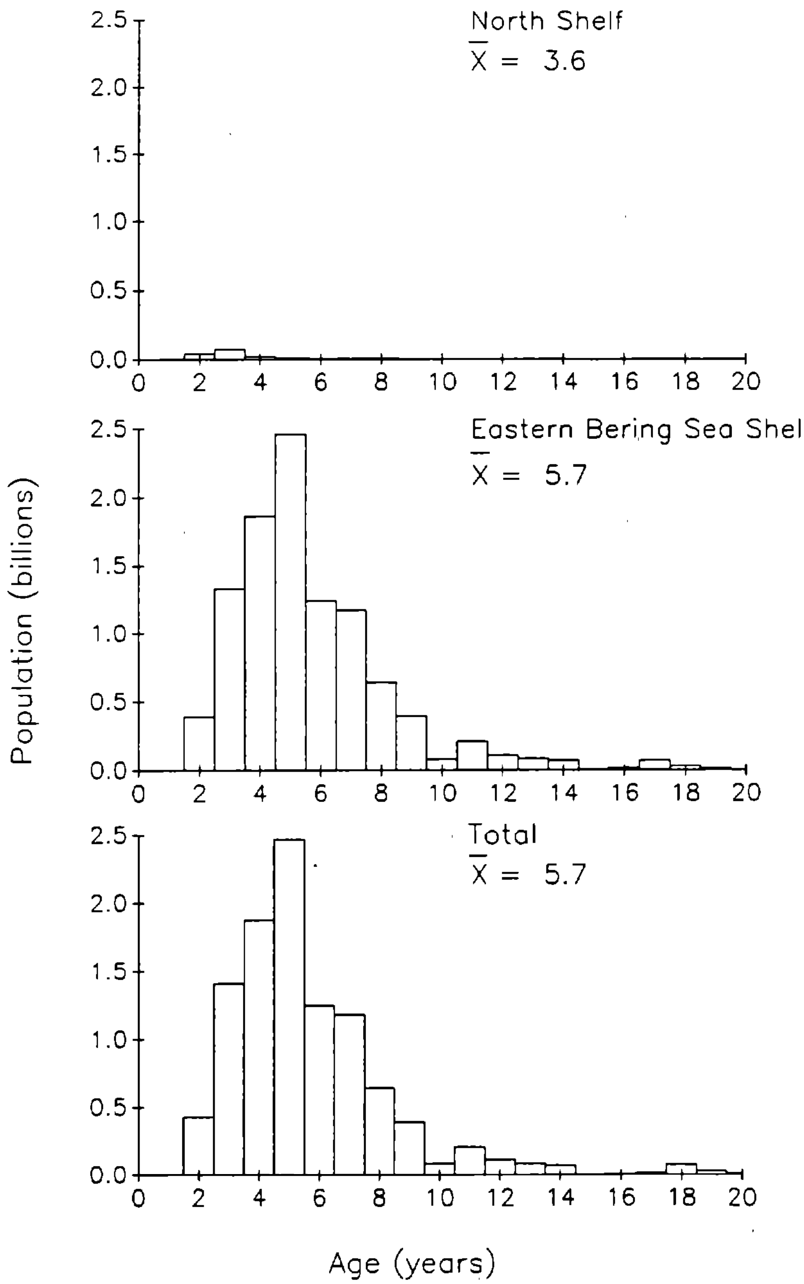

Figure 48.--Population estimates by age for rock sole as shown by age and length data from the 1988 bottom trawl survey of the eastern Bering Sea.

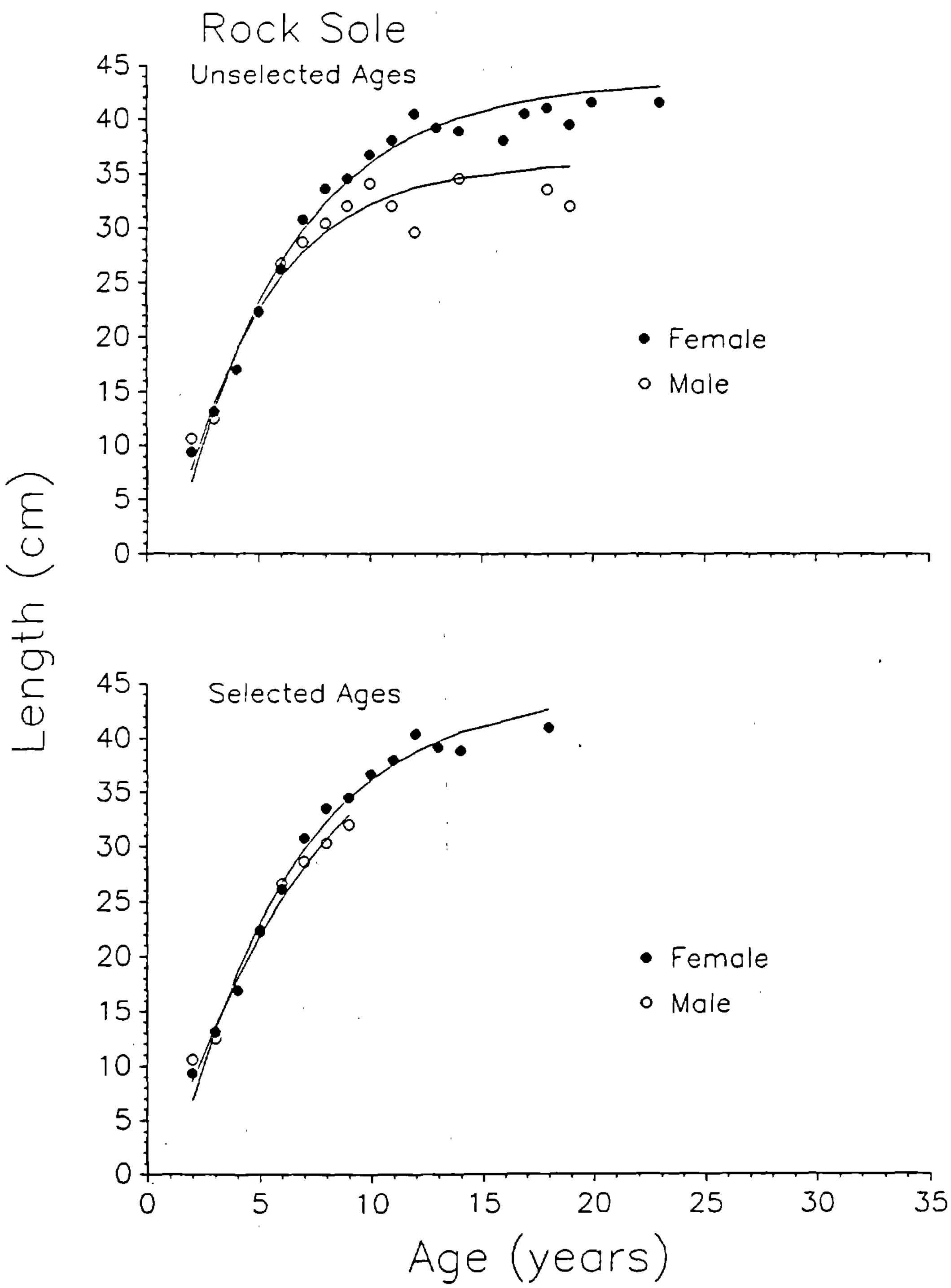

Figure 49.--Von Bertalanffy growth curves for male and female rock sole as shown by age data from the 1988 U.S. bottom trawl survey.

Table 33.--Parameters of the von Bertalanffy growth curves for rock sole by sex based on age readings from otoliths and length data from the 1988 U.S. bottom trawl survey. Parameters for unselected ages were derived from all age readings and those for selected ages from ages with five or more observations.

Data	Sex	Number of age readings	Age range	Length range (cm)	Parameters		
					L_{inf}	K	t_o
Unselected	Male	122	2-19	8-35	36.1	0.24	1.01
	Female	228	2-23	7-45	43.5	0.20	1.16
Selected	Male	111	2- 9	8-35	48.0	0.14	0.57
	Female	219	2-18	7-45	44.5	0.19	1.10

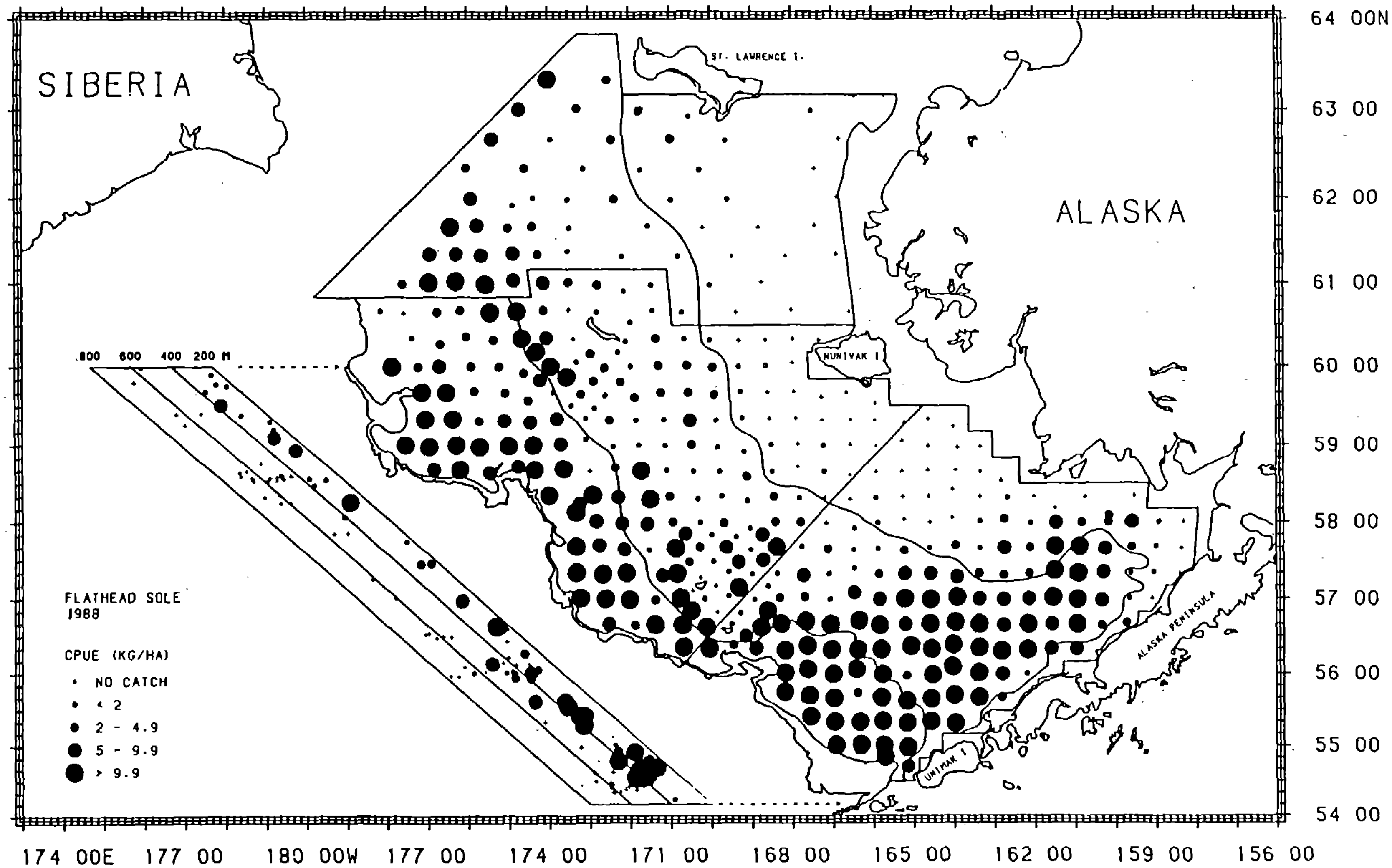

Figure 50.--Distribution and relative abundance of flathead sole in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 34.--Abundance estimates and mean size of flathead sole by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	1.76	13,667	0.022	41,555,947	0.014	0.329	29.5
2	< 50	0.15	628	0.001	2,213,876	0.001	0.284	-
3	50 - 100	19.51	201,515	0.326	608,533,572	0.202	0.331	31.2
4	50 - 100	4.35	46,884	0.076	297,505,250	0.099	0.158	24.0
5	100 - 200	25.41	98,571	0.159	672,676,607	0.224	0.147	22.9
6	100 - 200	20.74	196,218	0.317	784,856,722	0.261	0.250	25.9
Subareas combined		12.03	557,484	0.901	2,407,341,974	0.801	0.232	26.2
North Shelf								
7	< 50	0.65	4,726	0.008	37,168,971	0.012	0.127	19.2
8	50 - 200	5.60	45,946	0.074	539,126,939	0.179	0.085	18.7
Subareas combined		3.27	50,672	0.082	576,295,910	0.192	0.088	18.7
Slope								
9	200 - 500	11.36	8,842	0.014	17,491,007	0.006	0.506	35.8
10	200 - 500	3.13	1,769	0.003	5,689,147	0.002	0.311	32.9
11	500 - 800	0.26	116	<0.001	166,965	<0.001	0.692	38.9
12	500 - 800	<0.01	1	<0.001	1,467	<0.001	0.907	41.0
Subareas combined		5.08	10,728	0.017	23,348,587	0.008	0.459	35.1
All subareas combined		9.68	618,884	1.000	3,006,986,471	1.000	0.206	24.8

• indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

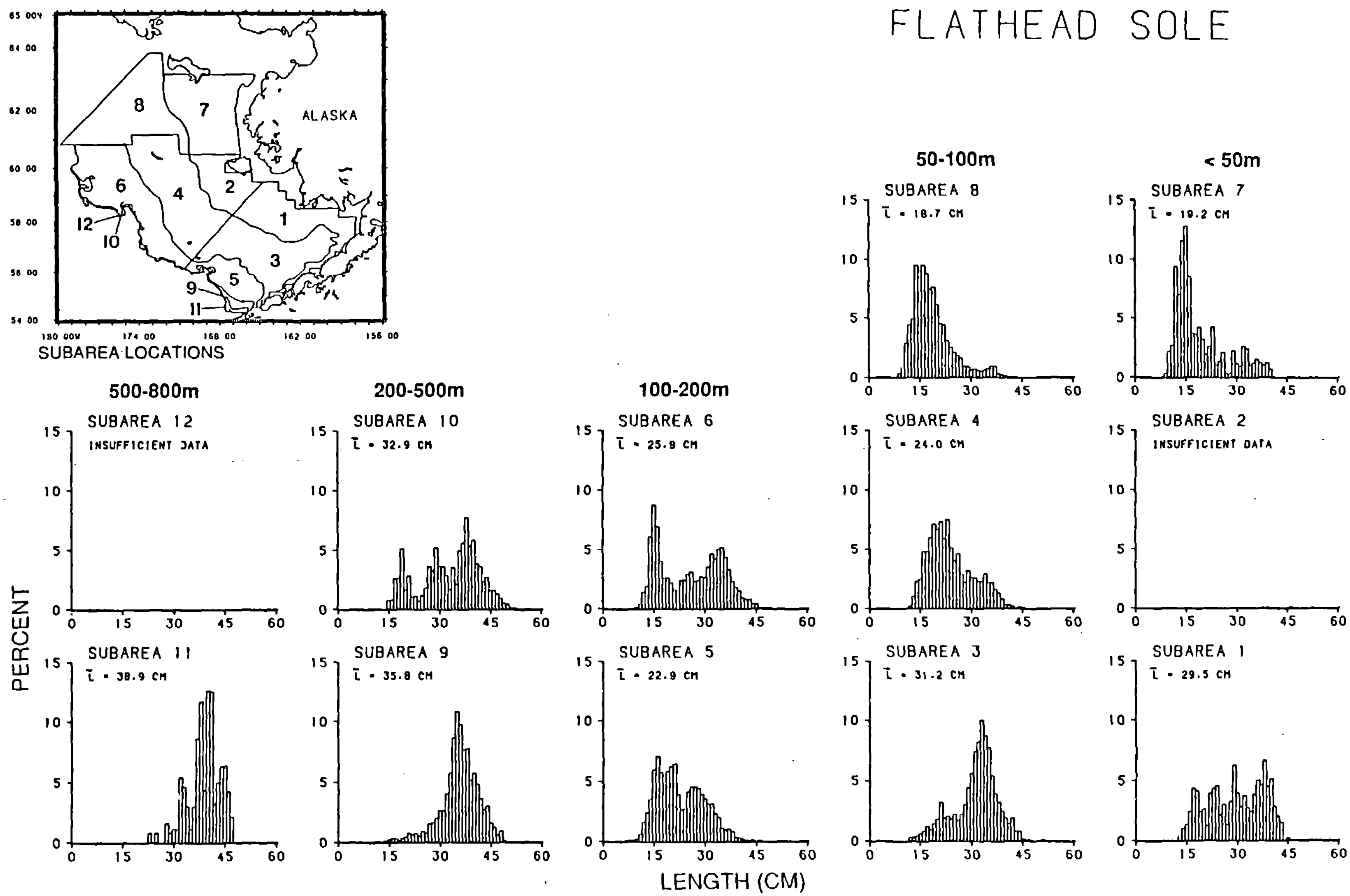

Figure 51.--Length composition of flathead sole by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

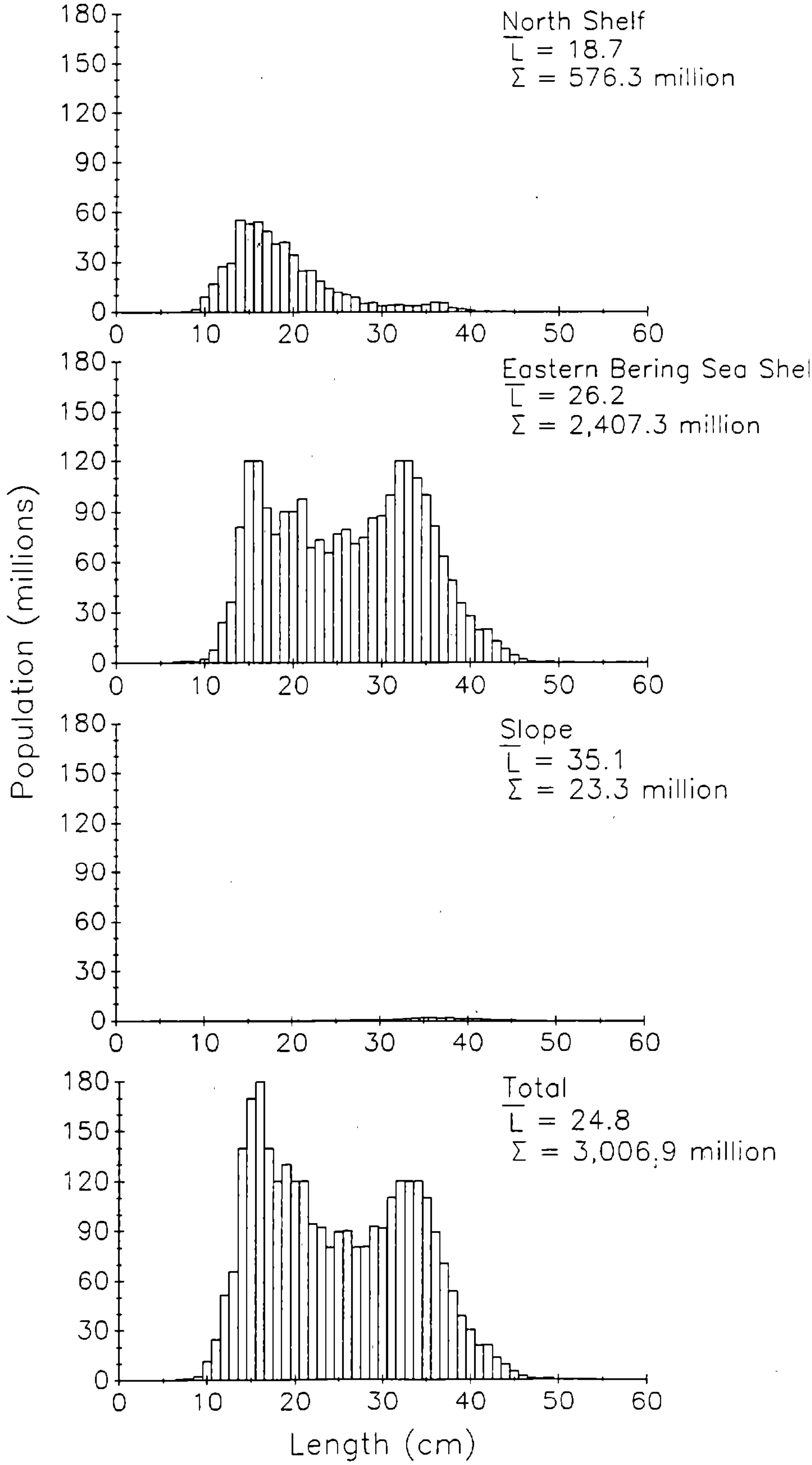

Figure 52. --Population number estimates by centimeter length interval for flathead sole in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

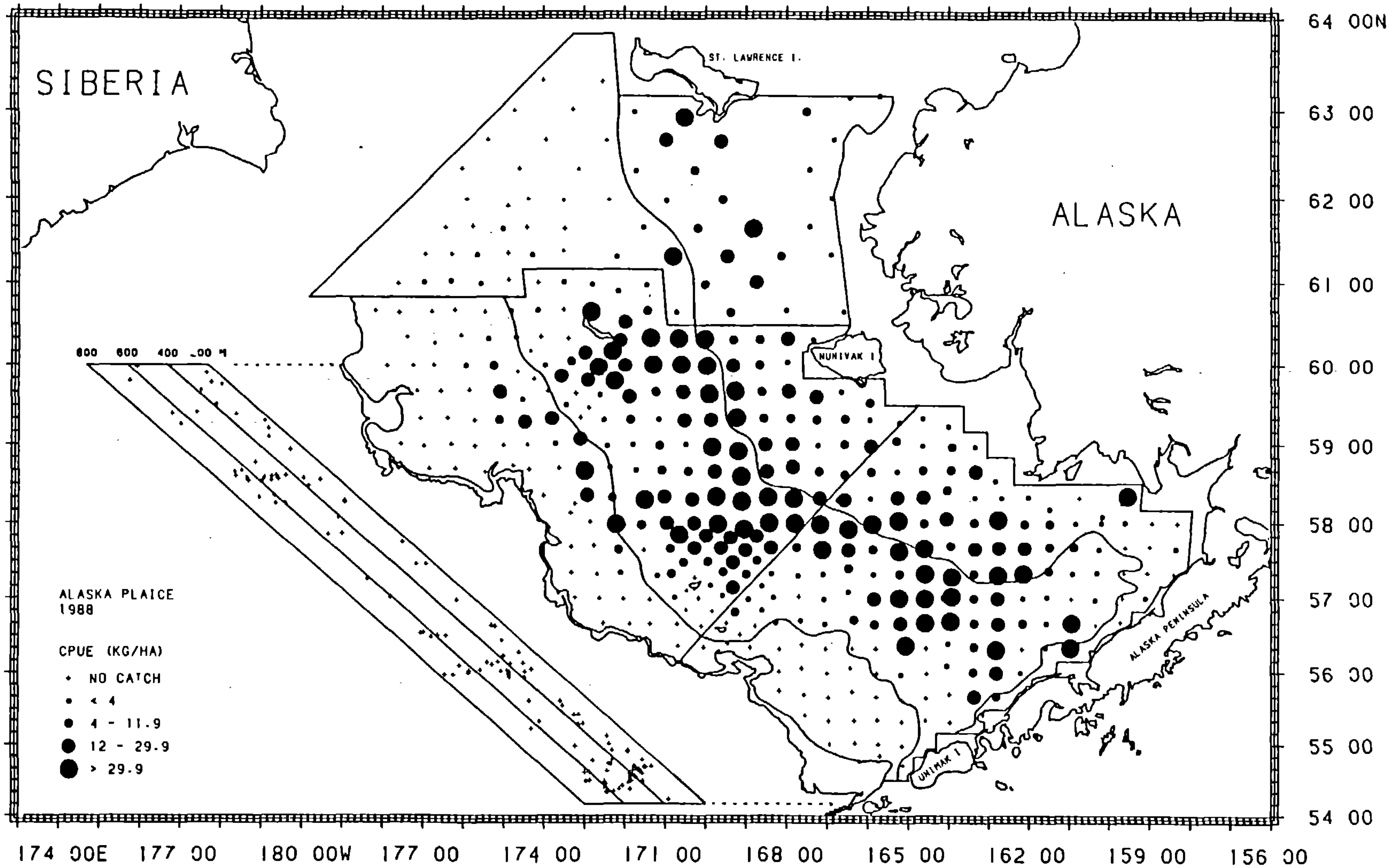

Figure 53.--Distribution and relative abundance of Alaska plaice in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 35.--Abundance estimates and mean size of Alaska plaice by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size	
							Weight (kg)	Length (cm)
Eastern Bering Sea Shelf								
1	< 50	22.28	173,502	0.164	346,591,257	0.218	0.501	33.2
2	< 50	17.15	70,373	0.066	155,109,270	0.097	0.454	32.1
3	50 - 100	35.46	366,305	0.345	467,457,957	0.293	0.784	38.5
4	50 - 100	27.36	295,049	0.278	399,354,847	0.251	0.739	37.0
5	100 - 200	0.05	175	<0.001	118,260	<0.001	1.482	-[b]
6	100 - 200	3.32	31,379	0.030	18,242,031	0.011	1.720	47.5
Subareas combined		20.22	936,783	0.883	1,386,873,622	0.871	0.675	36.2
North Shelf								
7	< 50	11.77	85,702	0.081	146,370,573	0.092	0.586	31.8
8	50 - 200	4.65	38,158	0.036	59,580,143	0.037	0.640	35.3
Subareas combined		8.00	123,861	0.117	205,950,715	0.129	0.601	32.8
Slope								
9	200 - 500	0[a]	0	0	0	0	-	-
10	200 - 500	0	0	0	0	0	-	-
11	500 - 800	0	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
All subareas combined		16.59	1,060,644	1.000	1,592,824,337	1.000	0.666	35.7

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

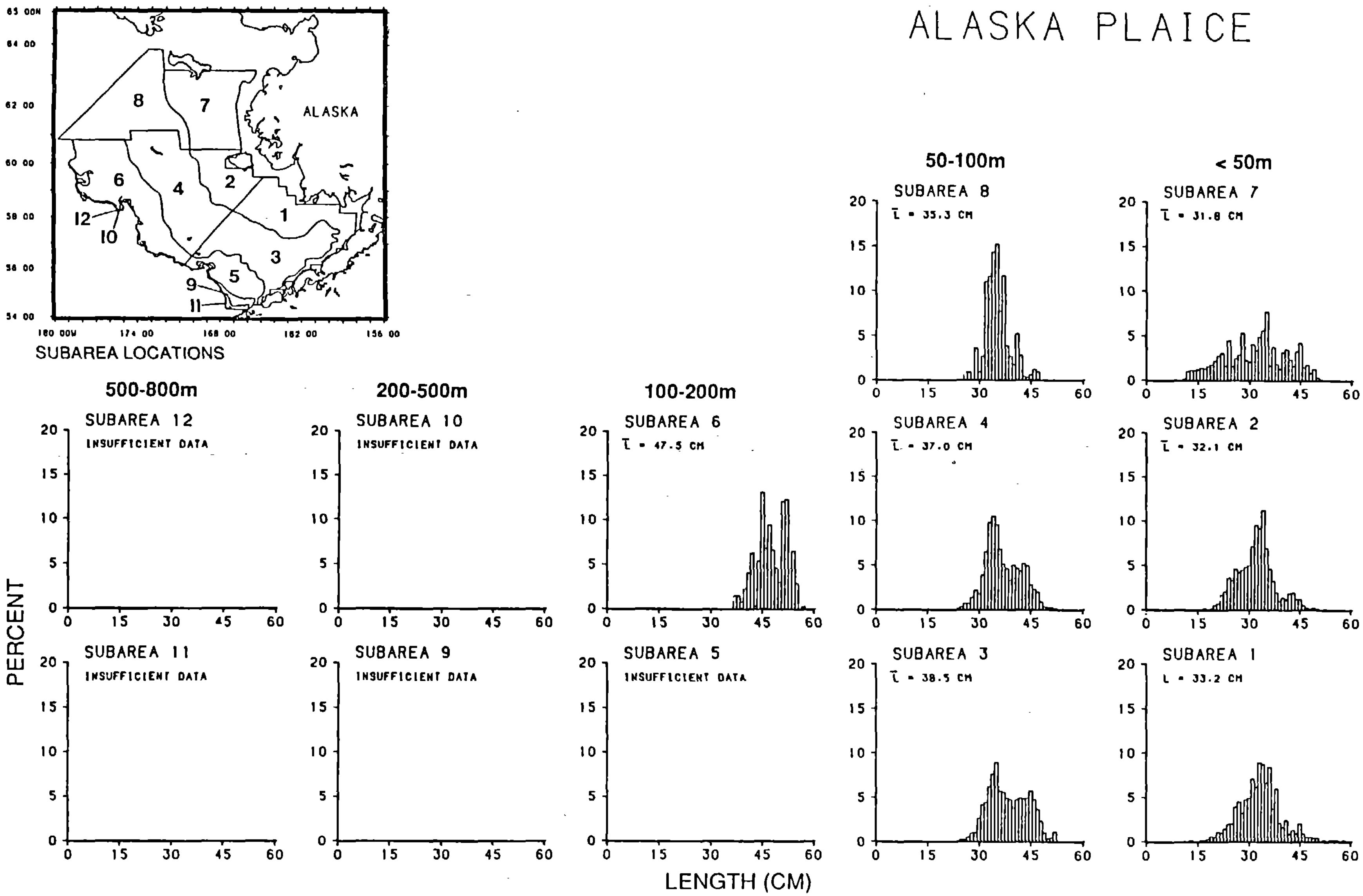

Figure 54.--Length composition of Alaska plaice by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

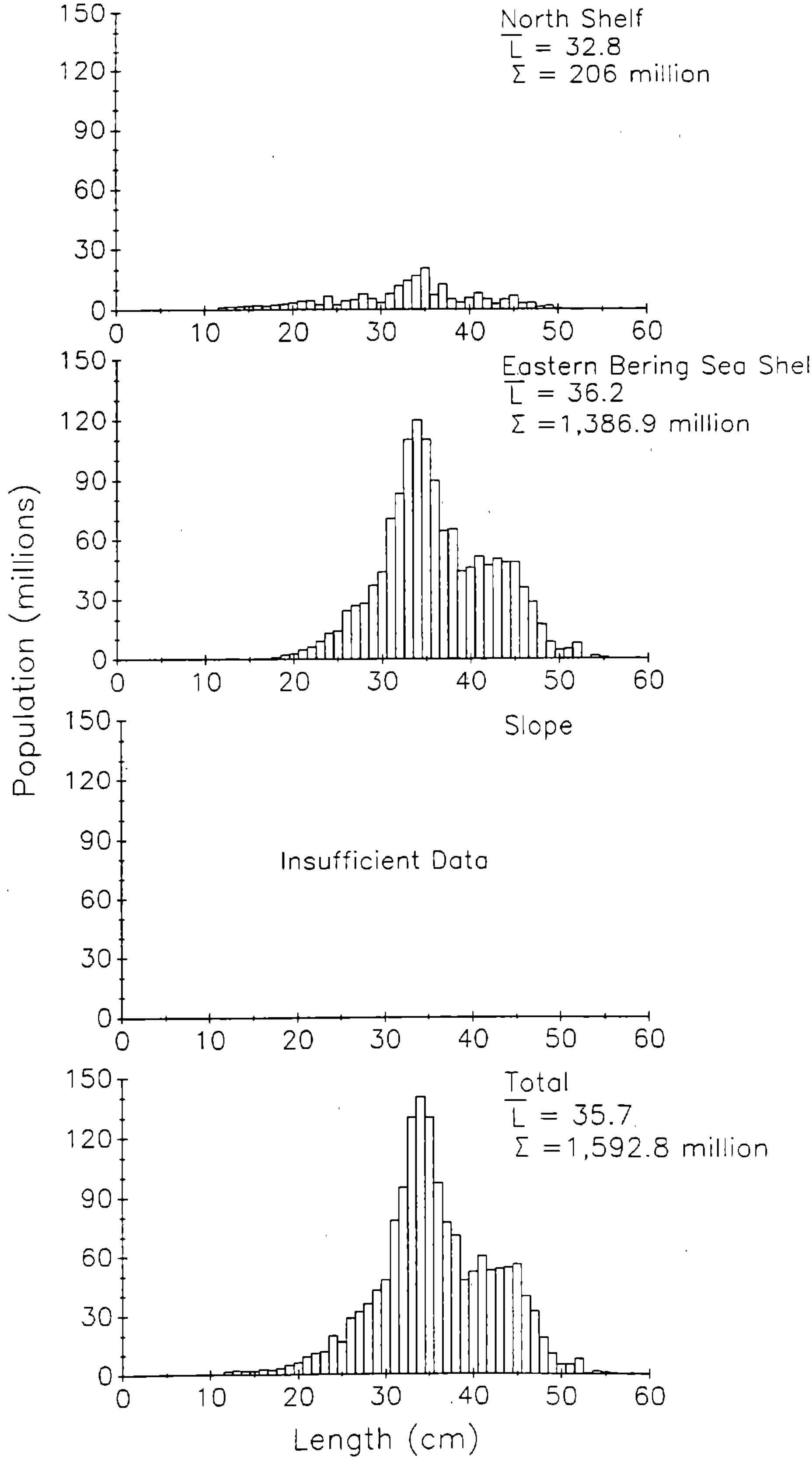

Figure 55. --Population number estimates by centimeter length interval for Alaska plaice in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

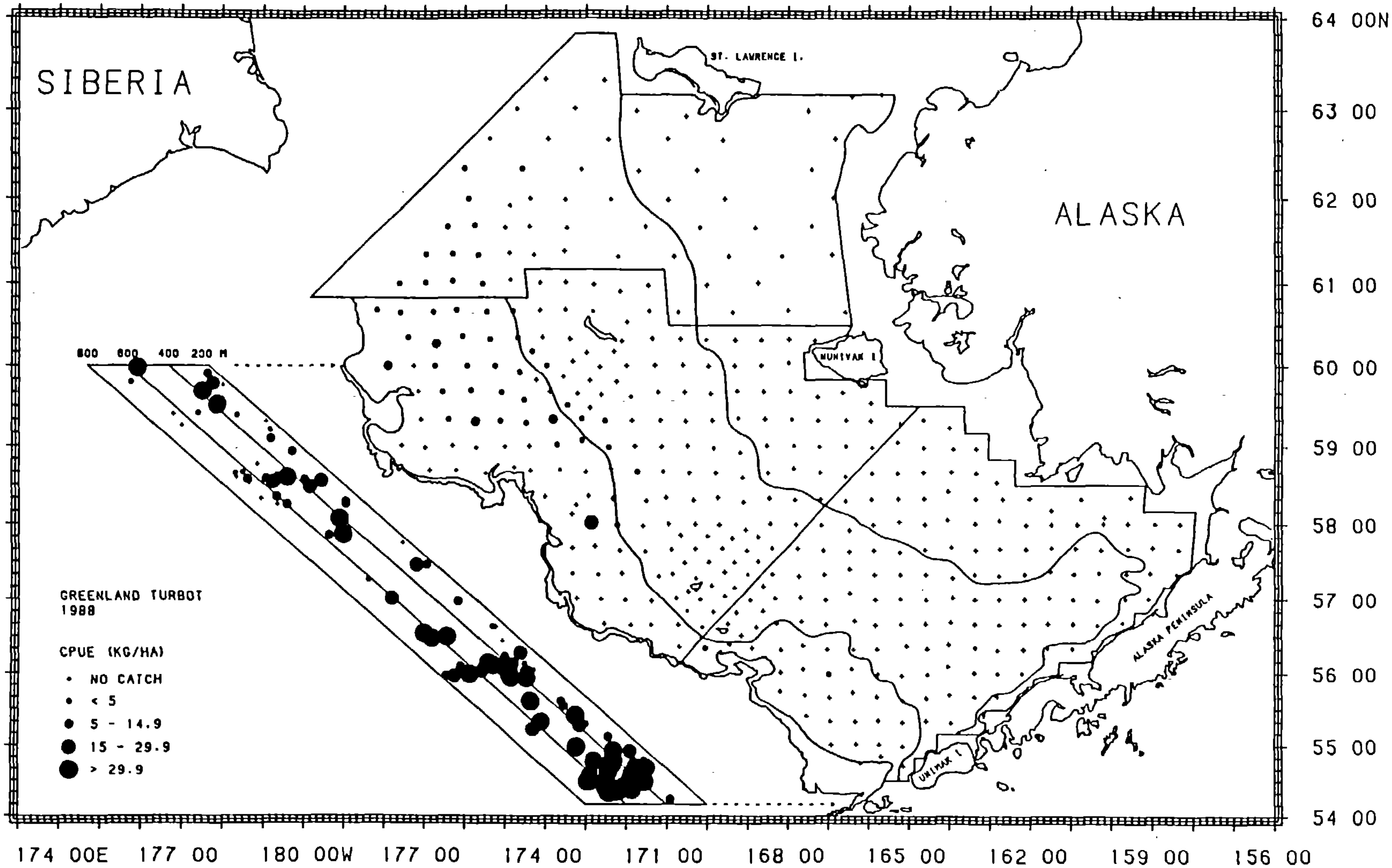

Figure 56.--Distribution and relative abundance of Greenland turbot in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 36.--Abundance estimates and mean size of Greenland turbot by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	0	0	0	0	0	-	-
4	50 - 100	0.02	209	0.004	1,440,918	0.029	0.145	24.4
5	100 - 200	0.07	286	0.005	60,934	0.001	4.688	-
6	100 - 200	1.17	11,071	0.192	16,332,302	0.324	0.678	34.5
Subareas combined		0.25	11,565	0.201	17,834,153	0.353	0.648	33.9
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0.40	3,259	0.057	22,215,169	0.440	0.147	23.8
Subareas combined		0.21	3,259	0.057	22,215,169	0.440	0.147	23.8
Slope								
9	200 - 500	20.57	16,015	0.278	4,686,766	0.093	3.417	68.8
10	200 - 500	22.92	12,942	0.225	2,967,727	0.059	4.361	71.8
11	500 - 800	25.84	11,348	0.197	2,178,282	0.043	5.209	75.6
12	500 - 800	7.35	2,432	0.042	598,876	0.012	4.061	70.2
Subareas combined		20.22	42,737	0.742	10,431,651	0.207	4.097	71.1
All subareas combined		0.90	57,562	1.000	50,480,973	1.000	1.140	37.2

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

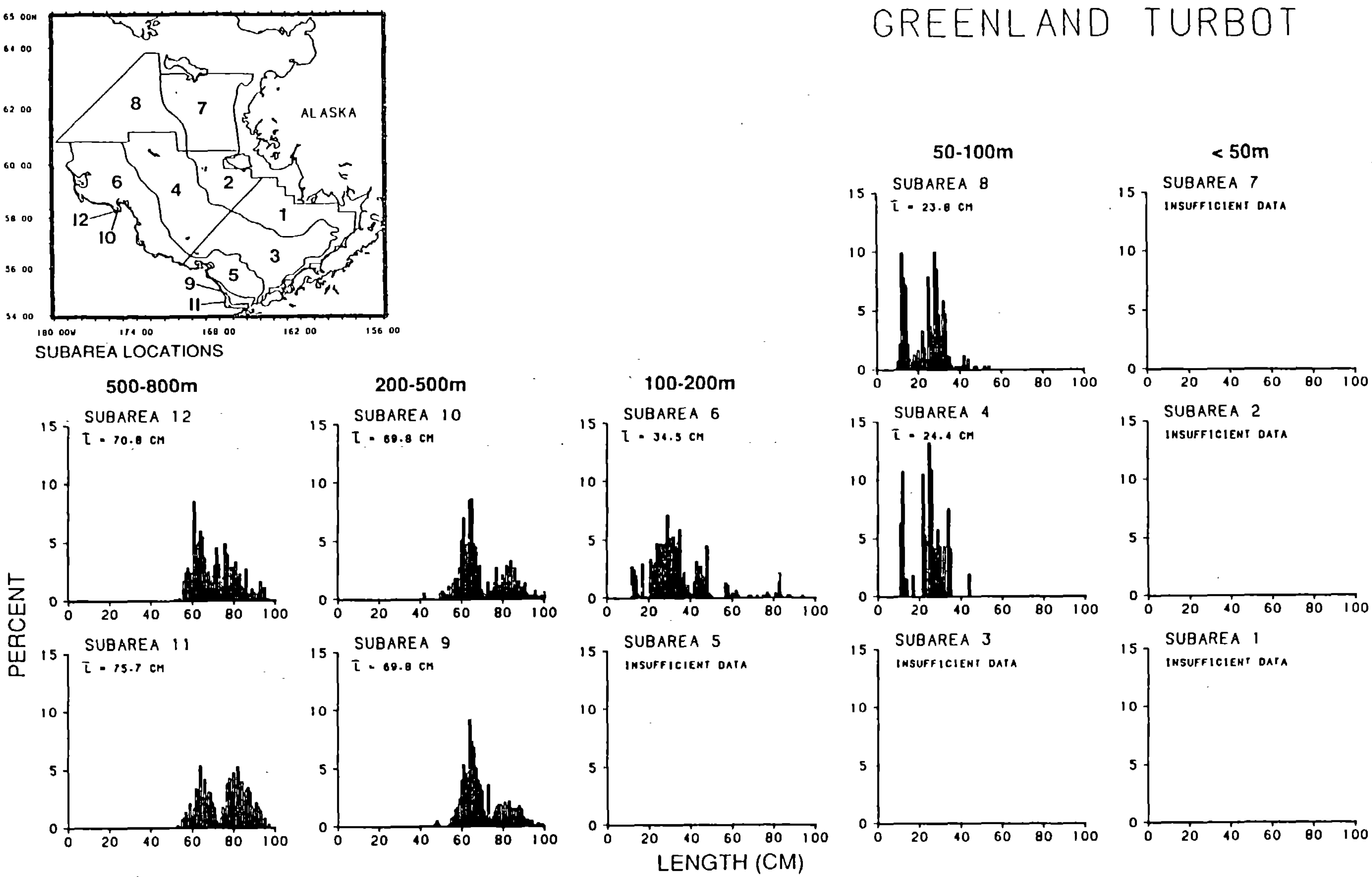

Figure 57.--Length composition of Greenland turbot by subarea and depth zone as shown by data from the 1988 U,S. -Japan bottom trawl survey.

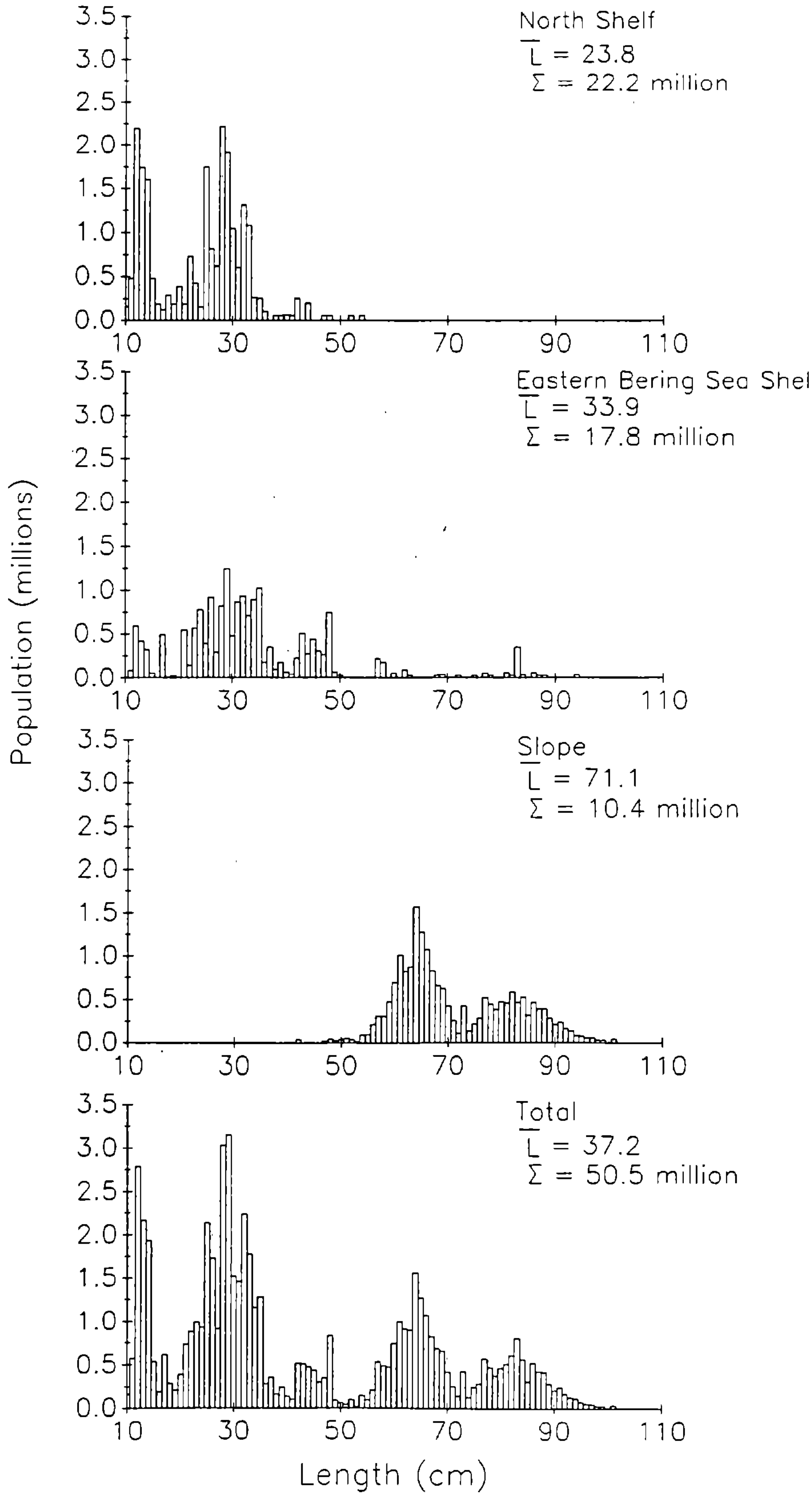

Figure 58. --Population number estimates by centimeter length interval for Greenland turbot in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

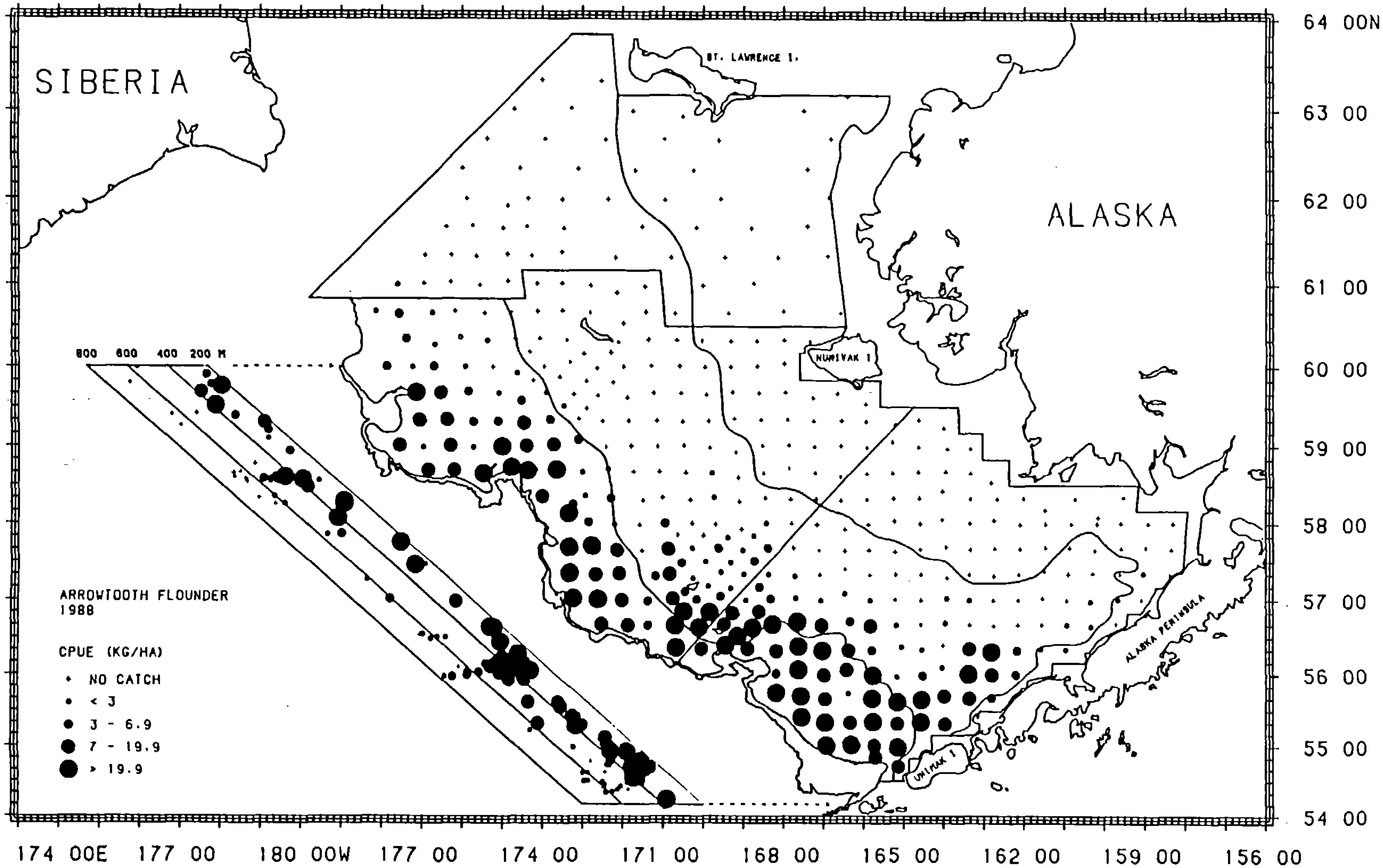

Figure 59.--Distribution and relative abundance of arrowtooth flounder in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 37.--Abundance estimates and mean size of arrowtooth flounder by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.13	1,018	0.003	7,456,772	0.009	0.136	22.4
2	< 50	0[a]	0	0	0	0	-[b]	-
3	50 - 100	7.51	77,555	0.230	231,436,632	0.291	0.335	31.4
4	50 - 100	1.25	13,442	0.040	78,517,137	0.099	0.171	23.2
5	100 - 200	23.72	91,999	0.273	231,792,695	0.291	0.397	32.9
6	100 - 200	12.93	122,348	0.363	228,986,714	0.287	0.534	36.0
Subareas combined		6.61	306,361	0.909	778,189,950	0.977	0.394	32.3
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0.02	132	<0.001	116,468	<0.001	1.134	-
Subareas combined		0.01	132	<0.001	116,468	<0.001	1.134	-
Slope								
9	200 - 500	21.72	16,908	0.050	9,514,617	0.012	1.777	53.3
10	200 - 500	21.54	12,162	0.036	7,876,929	0.010	1.544	51.9
11	500 - 800	2.76	1,210	0.004	668,059	0.001	1.811	54.4
12	500 - 800	0.84	279	0.001	171,198	<0.001	1.632	52.0
Subareas combined		14.46	30,560	0.091	18,230,804	0.023	1.676	52.7
All subareas combined		5.27	337,053	1.000	796,537,221	1.000	0.423	32.8

[a] 0 indicates fishing but no catch.
[b] - indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

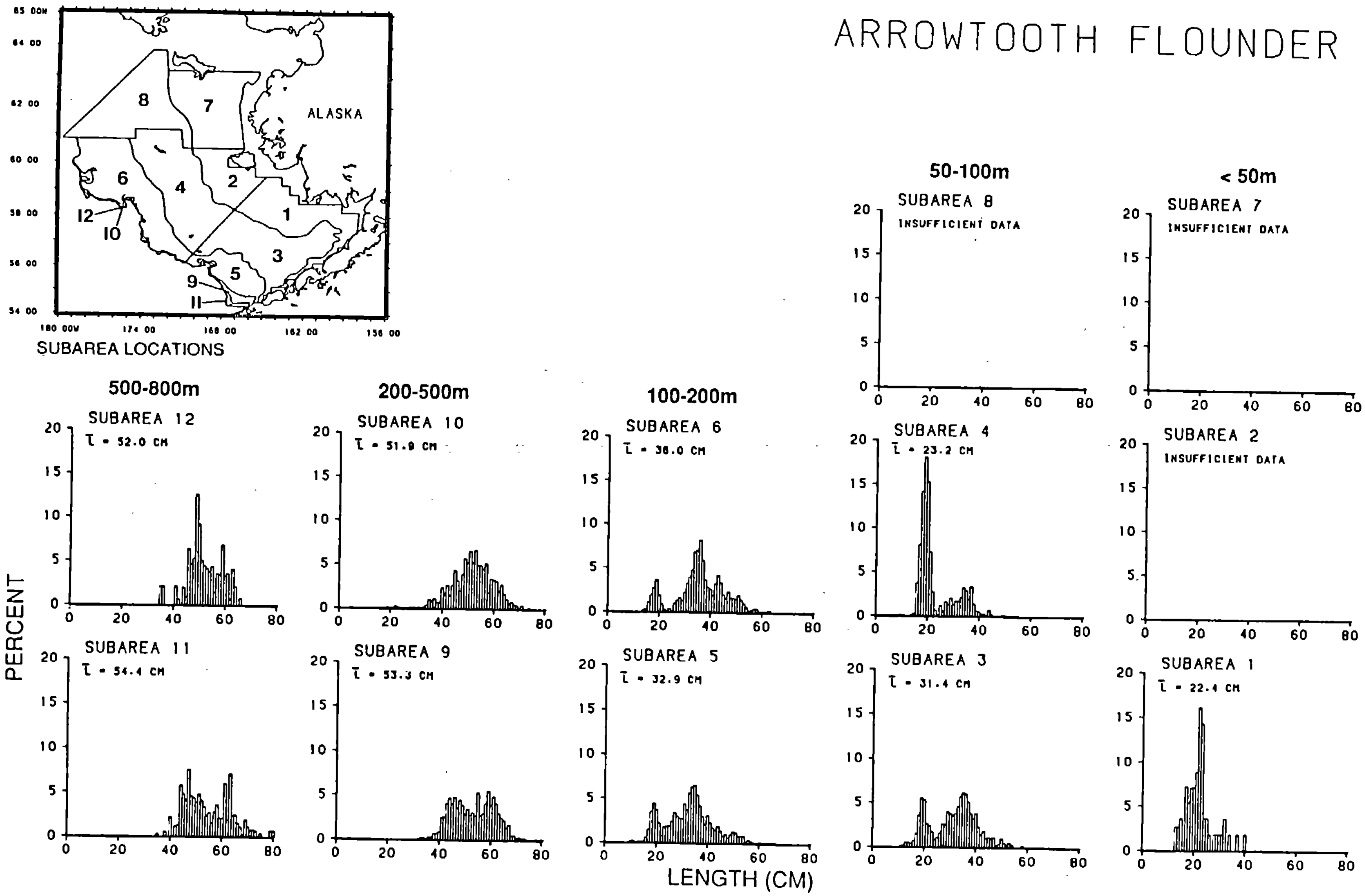

Figure 60.--Length composition of arrowtooth flounder by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

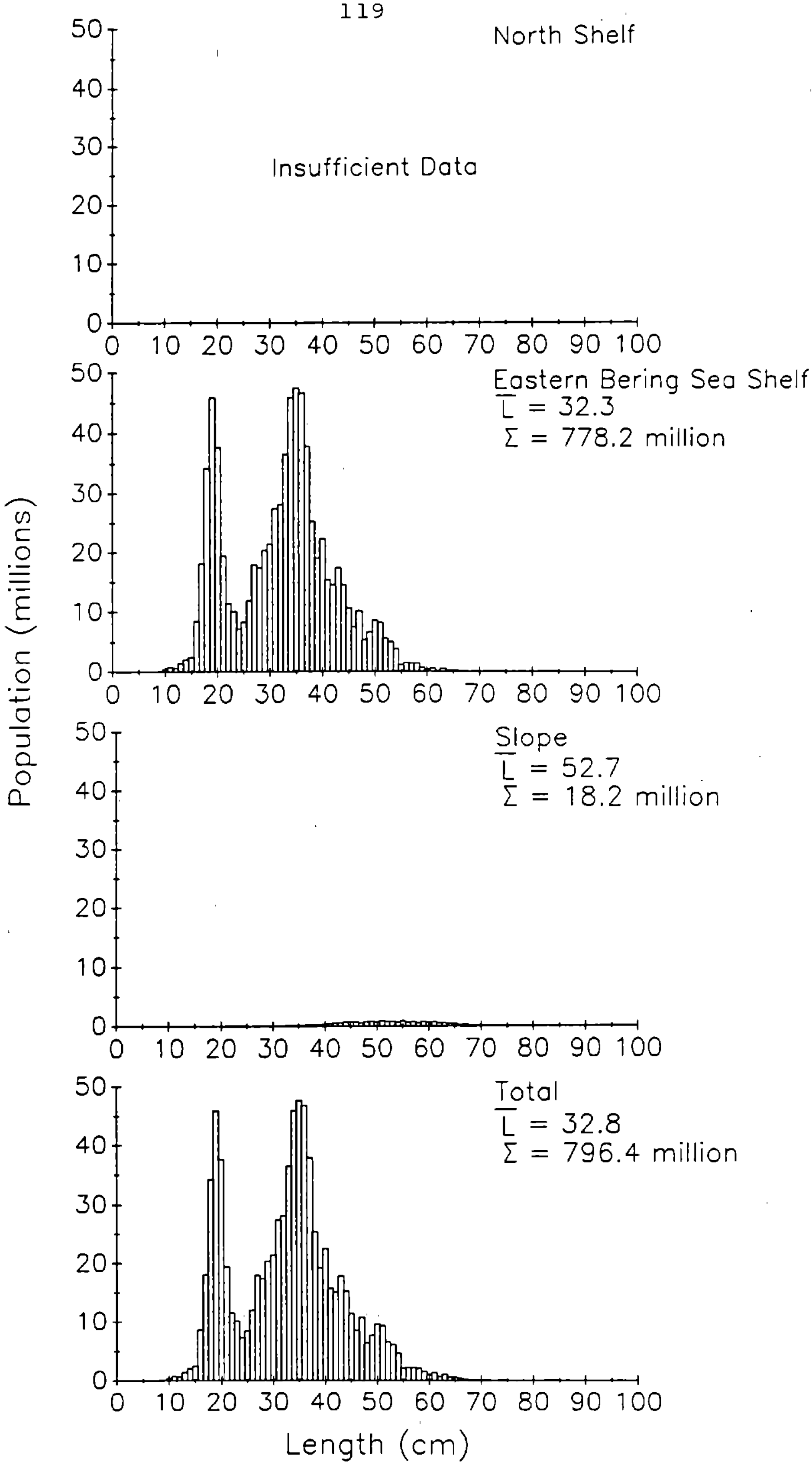

Figure 61.--Population number estimates by centimeter length interval for arrowtooth flounder in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

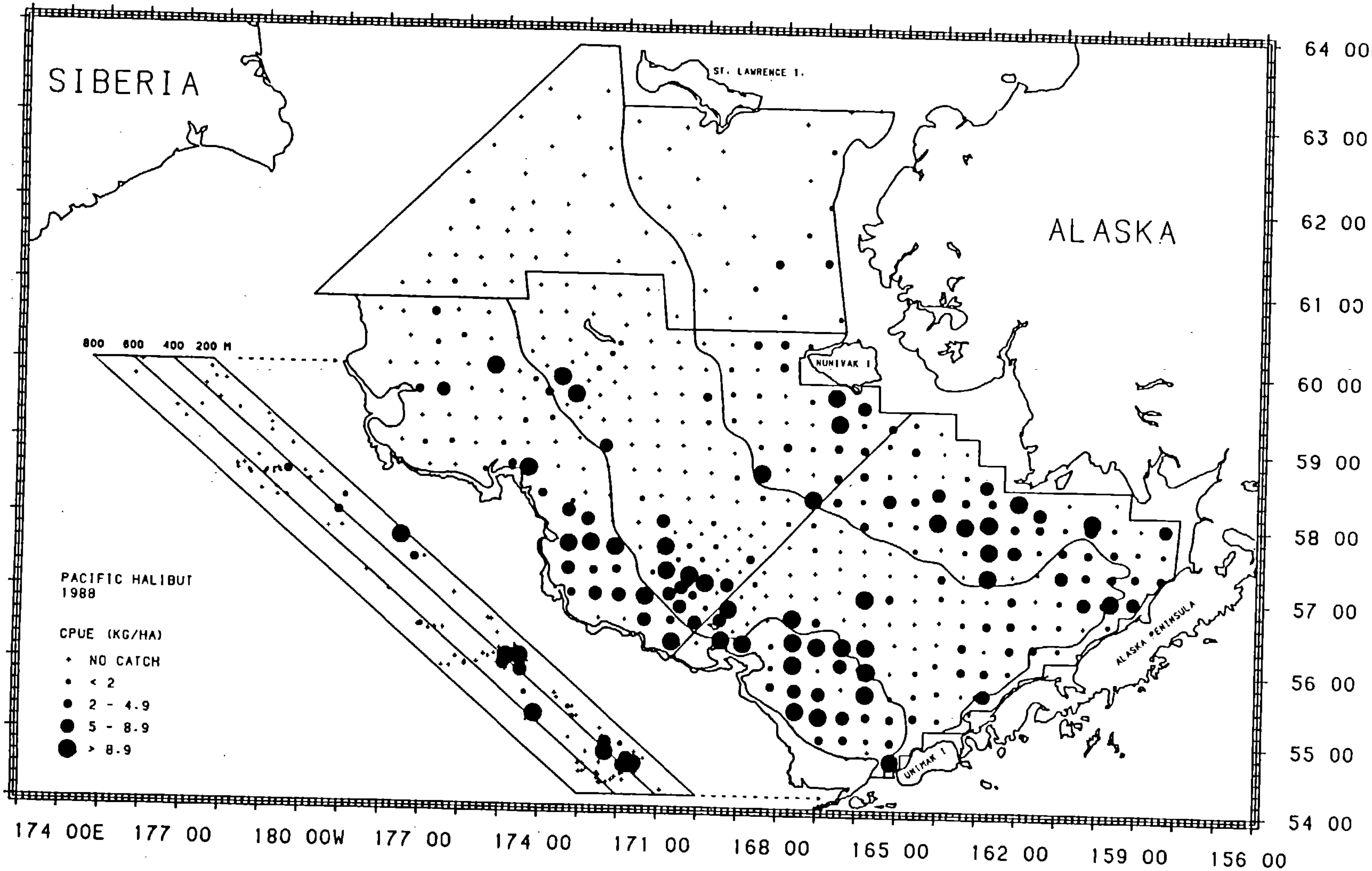

Figure 62.--Distribution and relative abundance of Pacific halibut in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 38.--Abundance estimates and mean size of Pacific halibut by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	3.98	30,973	0.217	11,768,277	0.305	2.632	50.1
2	< 50	2.66	10,915	0.077	5,844,231	0.152	1.868	49.6
3	50 - 100	2.40	24,761	0.174	5,608,216	0.146	4.415	63.8
4	50 - 100	1.40	15,137	0.106	4,825,237	0.125	3.137	53.0
5	100 - 200	7.30	28,306	0.199	4,507,879	0.117	6.279	77.6
6	100 - 200	2.97	28,061	0.197	4,284,503	0.111	6.549	76.6
Subareas combined		2.98	138,153	0.969	36,838,344	0.956	3.750	58.9
North Shelf								
7	< 50	0.37	2,712	0.019	1,400,763	0.036	1.936	52.5
8	50 - 200	0.04	304	0.002	156,662	0.004	1.939	56.5
Subareas combined		0.19	3,016	0.021	1,557,425	0.040	1.936	52.9
Slope								
9	200 - 500	1.18	915	0.006	79,408	0.002	11.529	86.8
10	200 - 500	0.63	357	0.003	41,629	0.001	8.578	82.2
11	500 - 800	0.11	48	<0.001	4,939	<0.001	9.705	93.1
12	500 - 800	0.05	17	<0.001	1,305	<0.001	13.381	102.0
Subareas combined		0.19	1,338	0.009	127,281	0.003	10.512	85.4
All subareas combined		2.23	142,507	1.000	38,523,049	1.000	3.699	58.9

Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

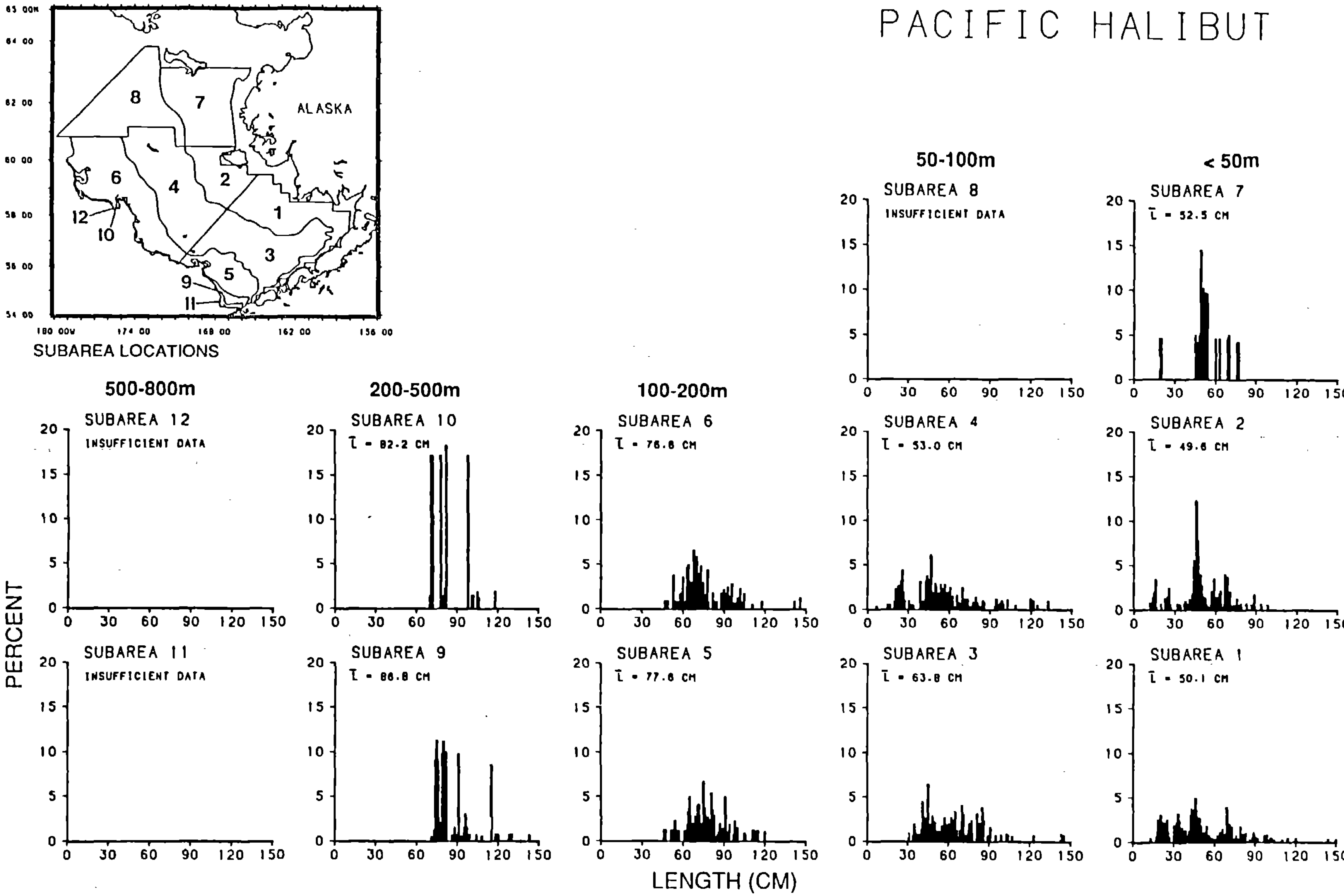

Figure 63.--Length composition of Pacific halibut by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

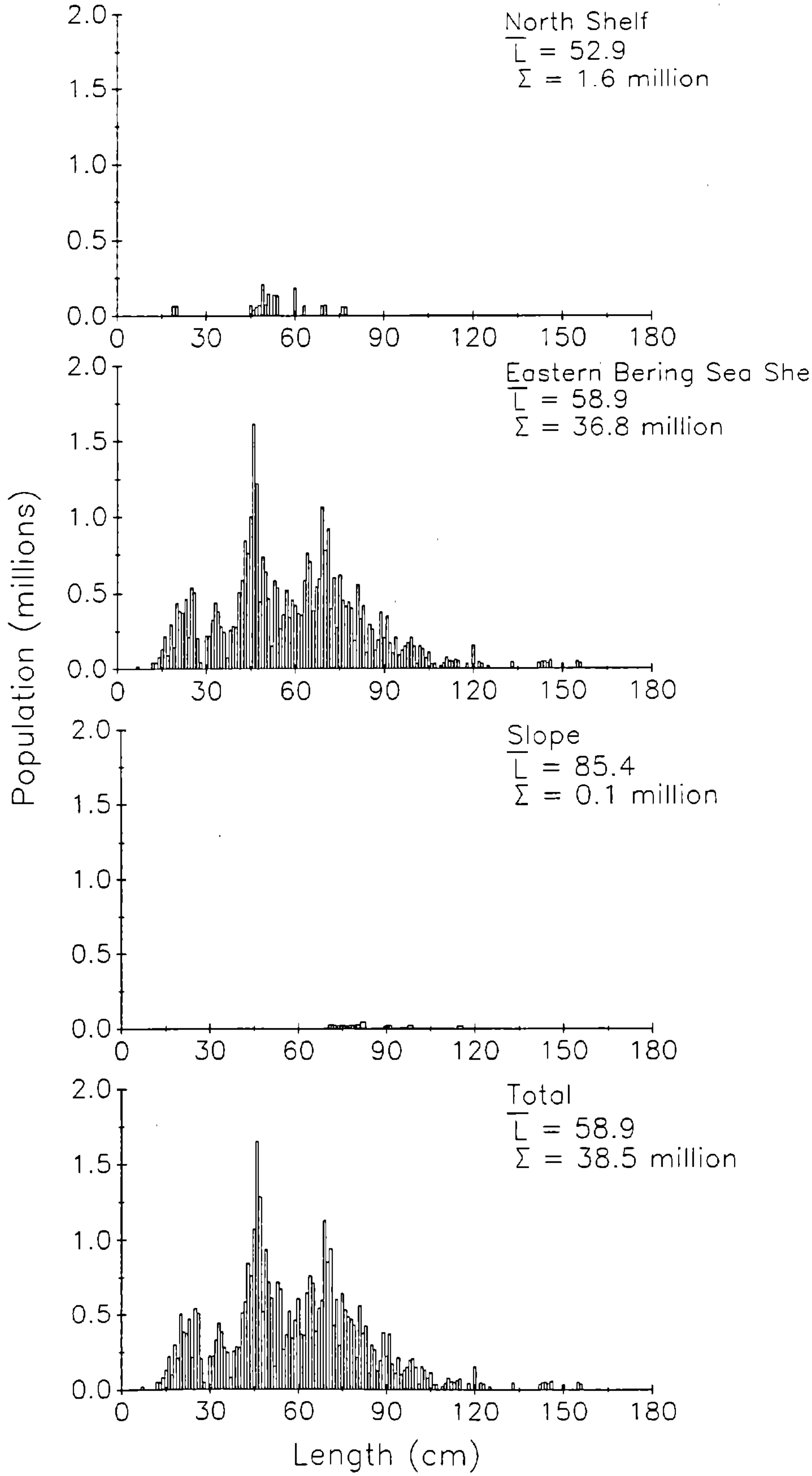

Figure 64. --Population number estimates by centimeter length interval for Pacific halibut in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

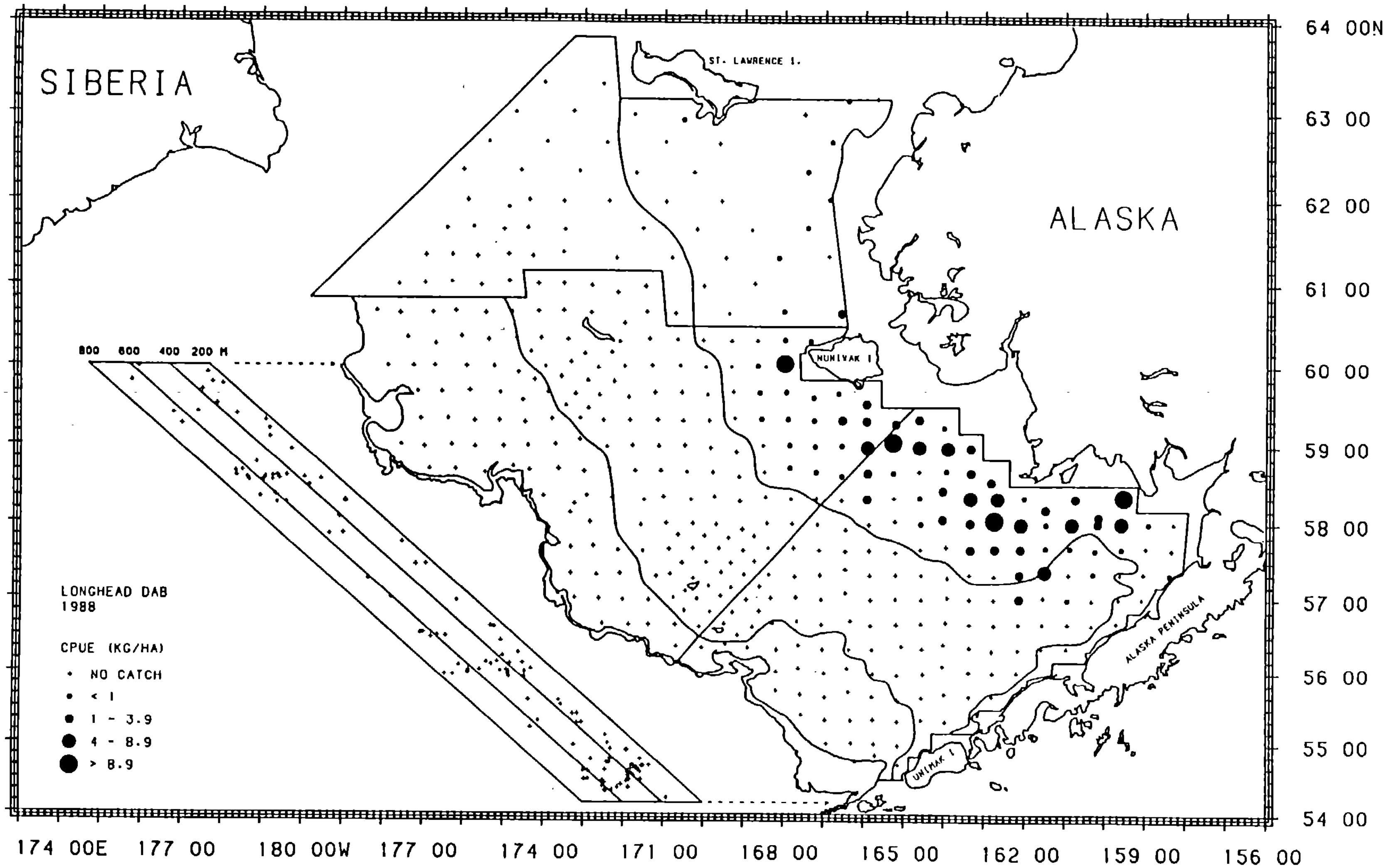

Figure 65.--Distribution and relative abundance of longhead dab in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 39.--Abundance estimates and mean size of longhead dab by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	2.15	16,762	0.684	151,642,869	0.566	0.111	23.6
2	< 50	1.23	5,042	0.206	90,364,694	0.337	0.056	-[b]
3	50 - 100	0.16	1,655	0.068	5,423,911	0.020	0.305	-
4	50 - 100	<0.01	2	<0.001	36,434	<0.001	0.045	-
5	100 - 200	0[a]	0	0	0	0	-	-
6	100 - 200	0	0	0	0	0	-	-
Subareas combined		0.51	23,460	0.958	247,467,907	0.924	0.095	23.6
North Slope								
7	< 50	0.14	1,028	0.042	20,412,411	0.076	0.050	16.4
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0.07	1,028	0.042	20,412,411	0.076	0.050	16.4
Slope								
9	200 - 500	0	0	0	0	0	-	-
10	200 - 500	0	0	0	0	0	-	-
11	500 - 800	0	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
All subareas combined		0.38	24,489	1.000	267,880,318	1.000	0.091	22.8

[a] 0 indicates fishing but no catch.
[b] - indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

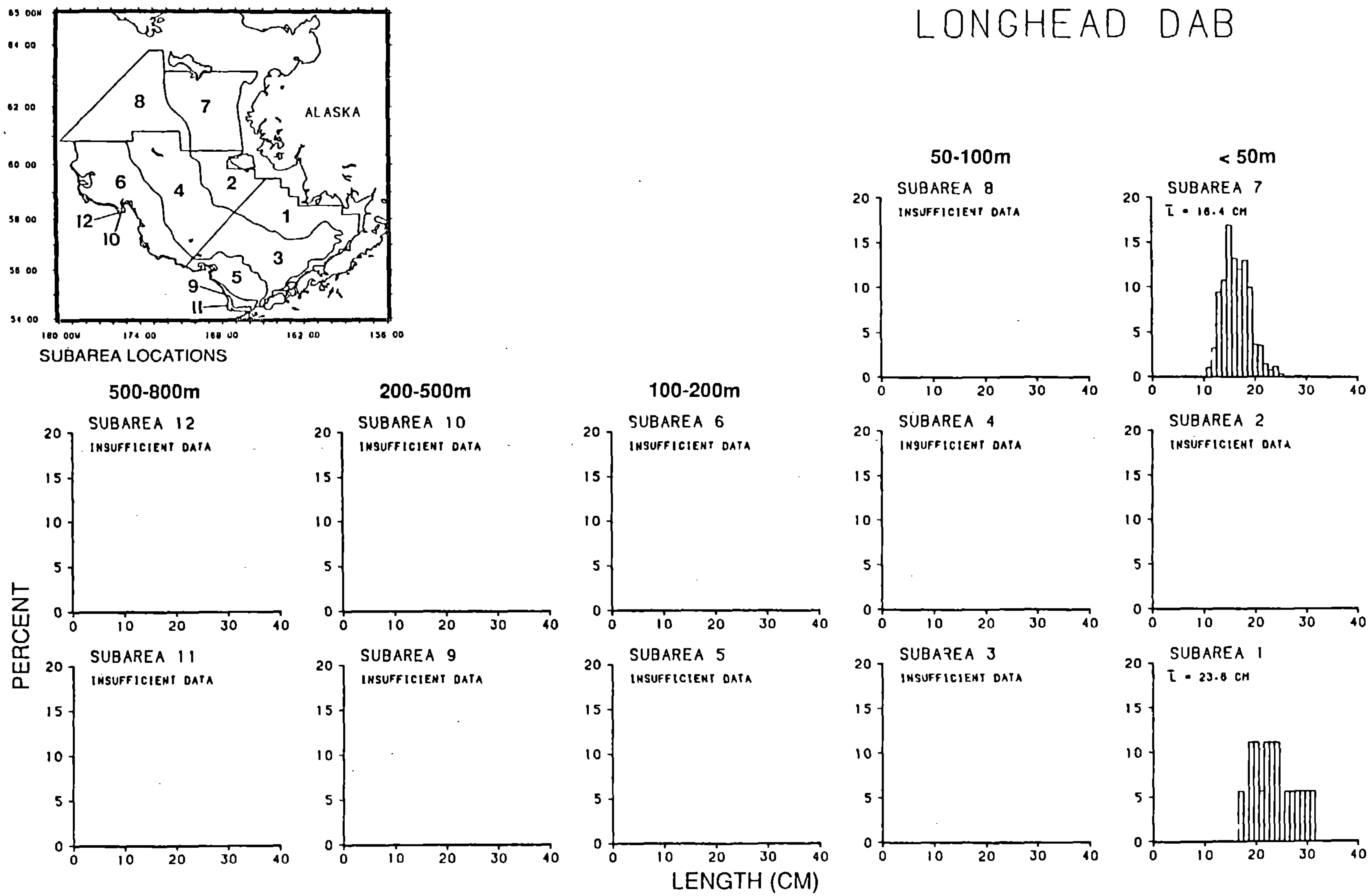

Figure 66.--Length composition of longhead dab by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

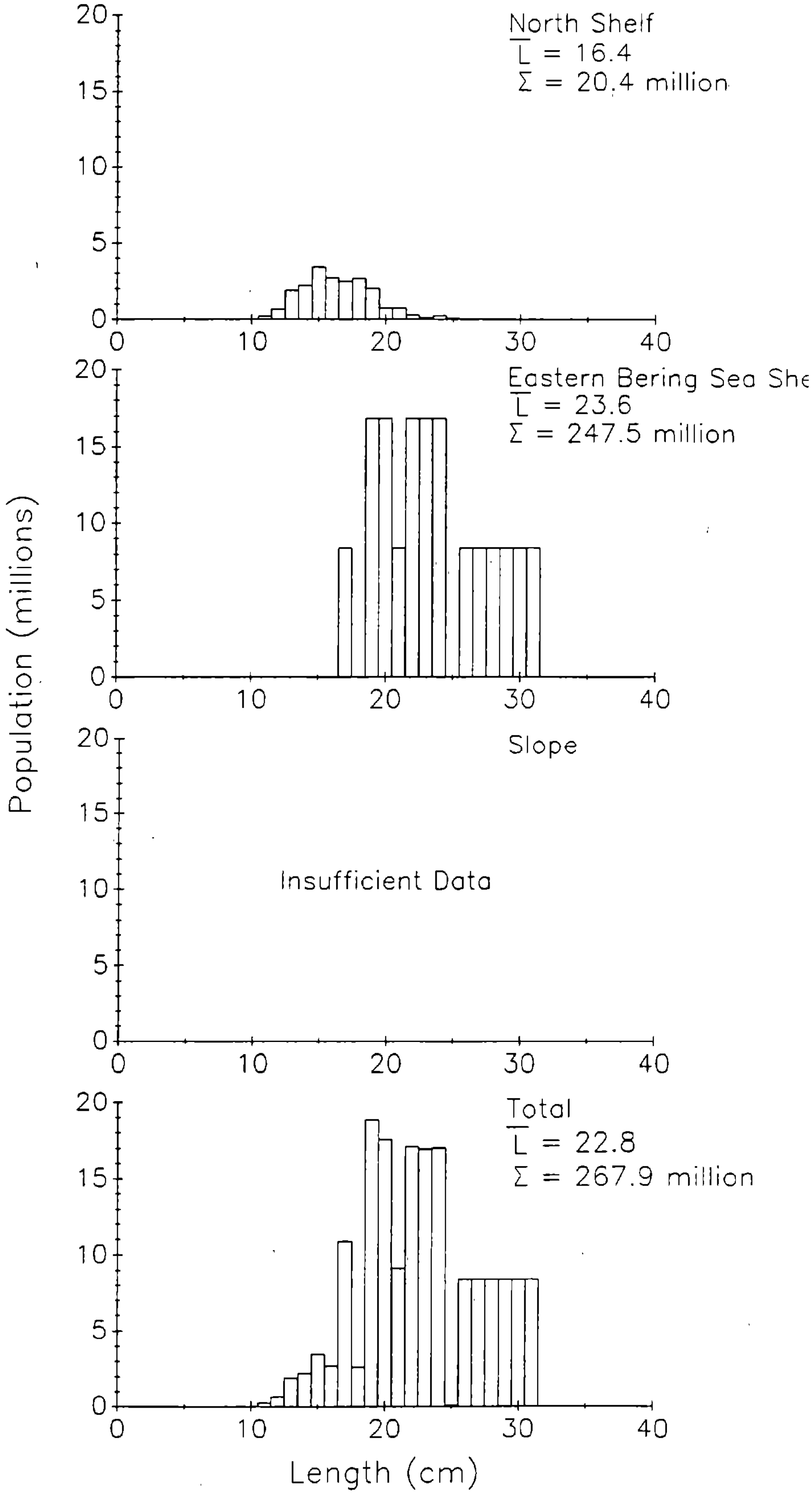

Figure 67. --Population number estimates by centimeter length interval for longhead dab in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

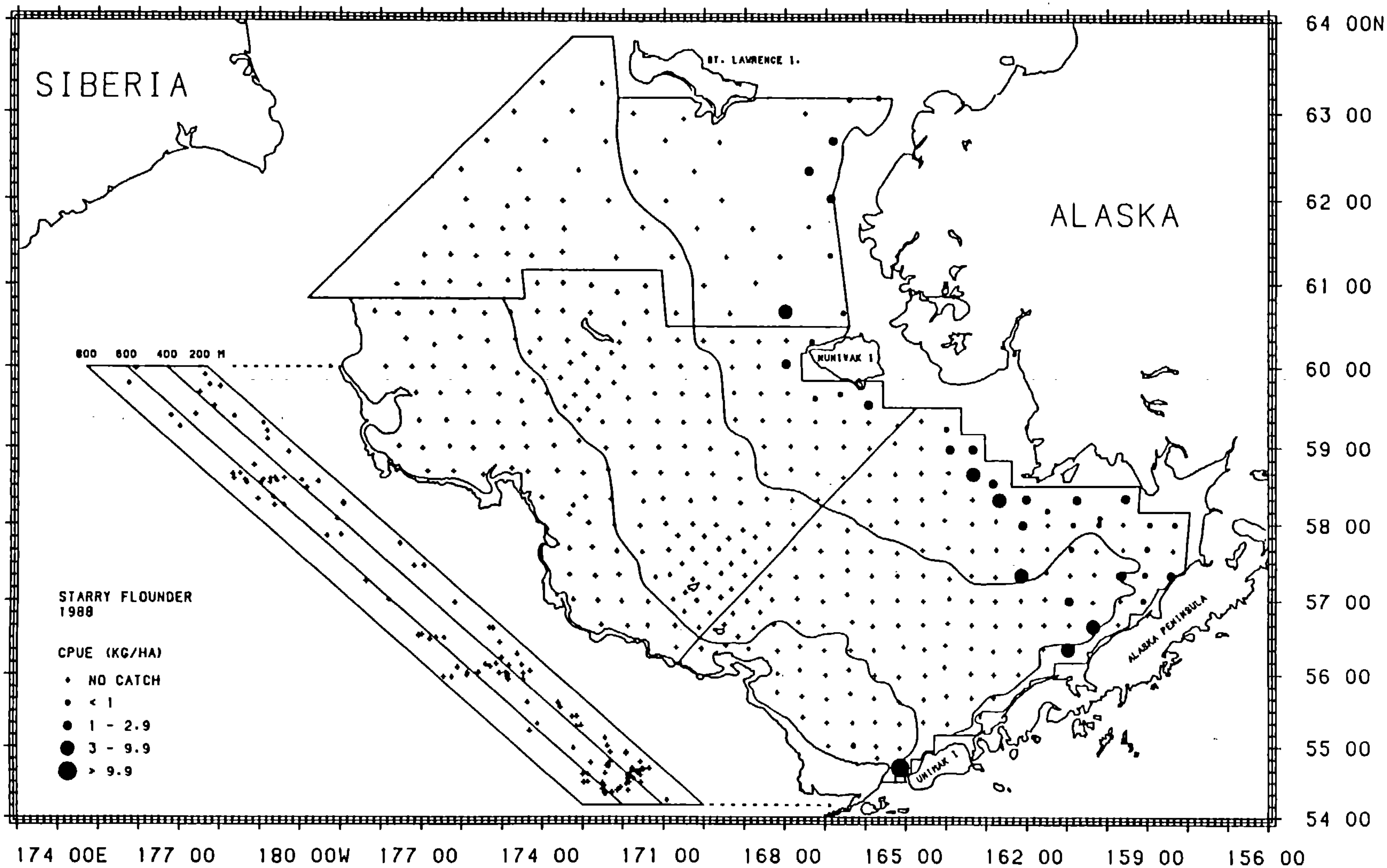

Figure 68.--Distribution and relative abundance of starry flounder in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 40.--Abundance estimates and mean size of starry flounder by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.71	5,540	0.454	4,399,871	0.444	1.259	-[b]
2	< 50	0.17	679	0.056	678,433	0.068	1.001	-
3	50 - 100	0.30	3,148	0.258	1,722,595	0.174	1.827	-
4	50 - 100	0[a]	0	0	0	0	-	-
5	100 - 200	0.02	94	0.008	59,130	0.006	1.588	-
6	100 - 200	0	0	0	0	0	-	-
Subareas combined		0.20	9,461	0.776	6,860,029	0.692	1.379	-
North Shelf								
7	< 50	0.38	2,735	0.224	3,055,710	0.308	0.895	38.7
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0.18	2,735	0.224	3,055,710	0.308	0.895	38.7
Slope								
9	200 - 500	0	0	0	0	0	-	-
10	200 - 500	0	0	0	0	0	-	-
11	500 - 800	0	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
All subareas combined		0.19	12,196	1.000	9,915,739	1.000	1.230	38.7

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

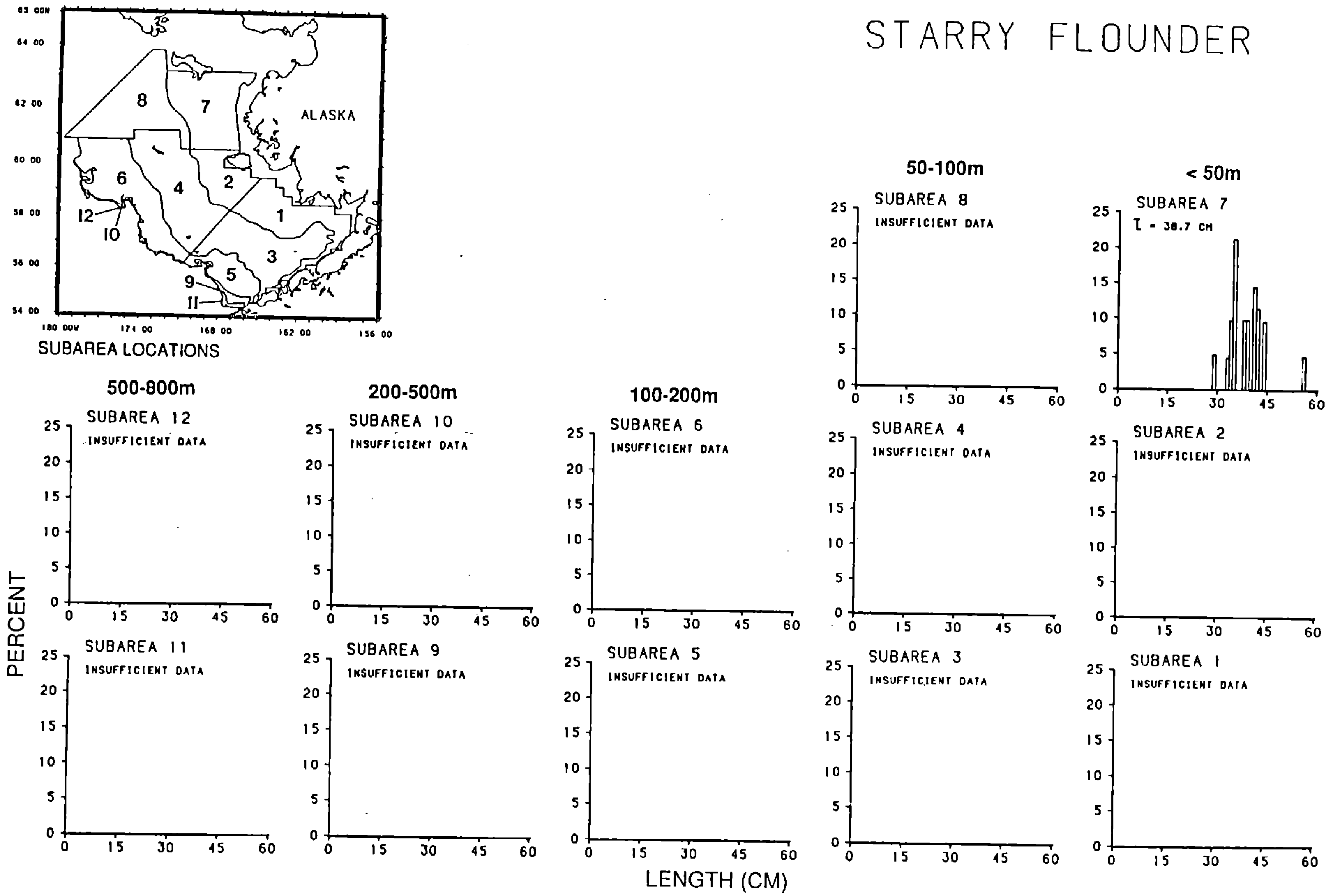

Figure 69.--Length composition of starry flounder by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

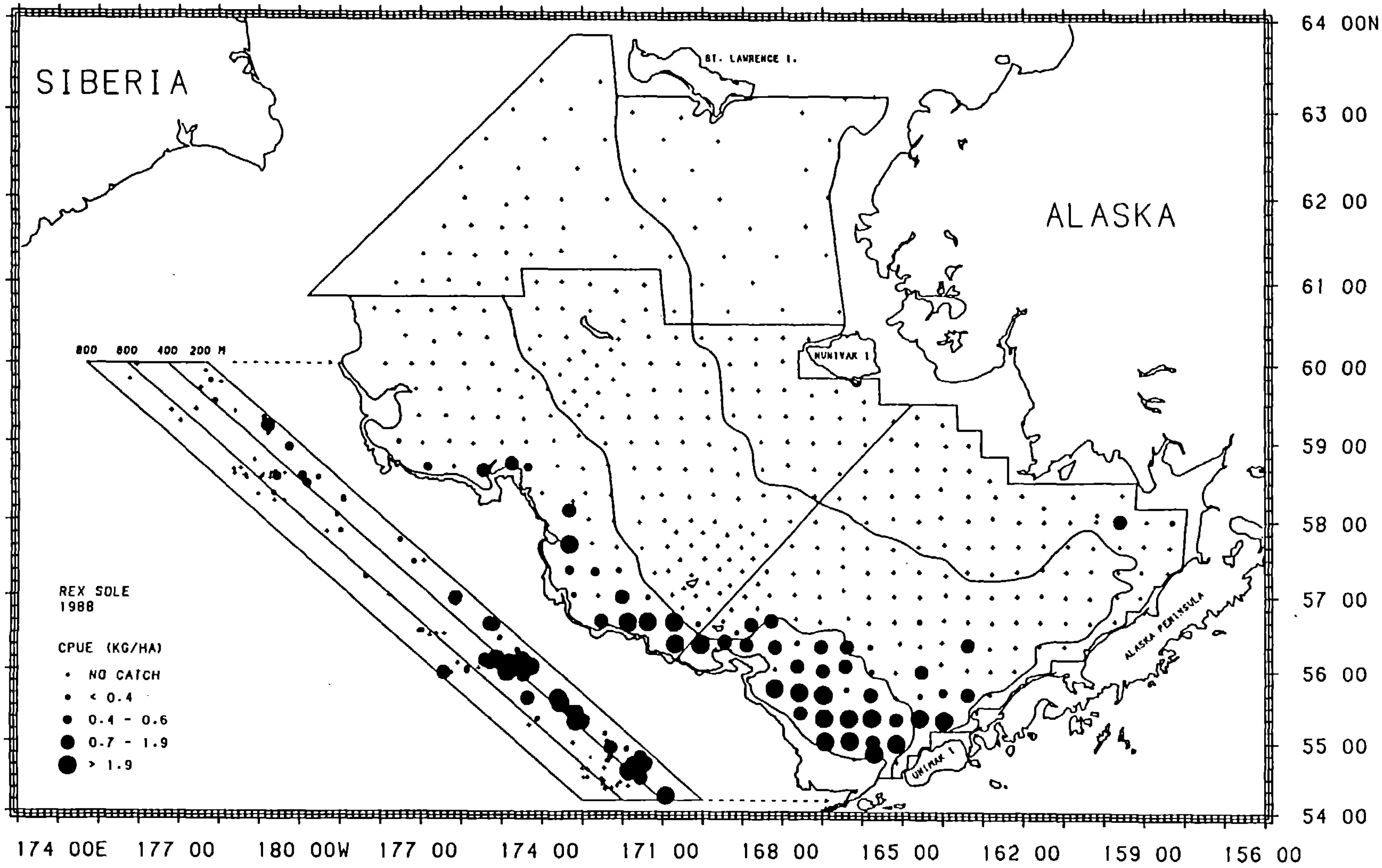

Figure 70.--Distribution and relative abundance of rex sole in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 41.--Abundance estimates and mean size of rex sole by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.02	168	0.010	392,665	0.007	0.428	41.0
2	< 50	0[a]	0	0	0	0	-[b]	-
3	50 - 100	0.24	2,509	0.147	5,443,752	0.103	0.461	-
4	50 - 100	<.01	24	0.001	90,656	0.002	0.265	-
5	100 - 200	2.23	8,634	0.505	31,757,889	0.601	0.272	31.2
6	100 - 200	0.42	3,984	0.233	10,583,457	0.200	0.376	-
Subareas combined		0.33	15,320	0.895	48,268,418	0.913	0.317	31.3
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
Slope								
9	200 - 500	1.92	1,494	0.087	3,496,467	0.066	0.427	42.7
10	200 - 500	0.27	153	0.009	595,835	0.011	0.258	-
11	500 - 800	0.29	128	0.007	434,489	0.008	0.295	-
12	500 - 800	0.04	14	0.001	74,763	0.001	0.187	-
Subareas combined		0.85	1,789	0.105	4,601,554	0.087	0.389	42.7
All subareas combined		0.27	17,109	1.000	52,869,972	1.000	0.324	32.5

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

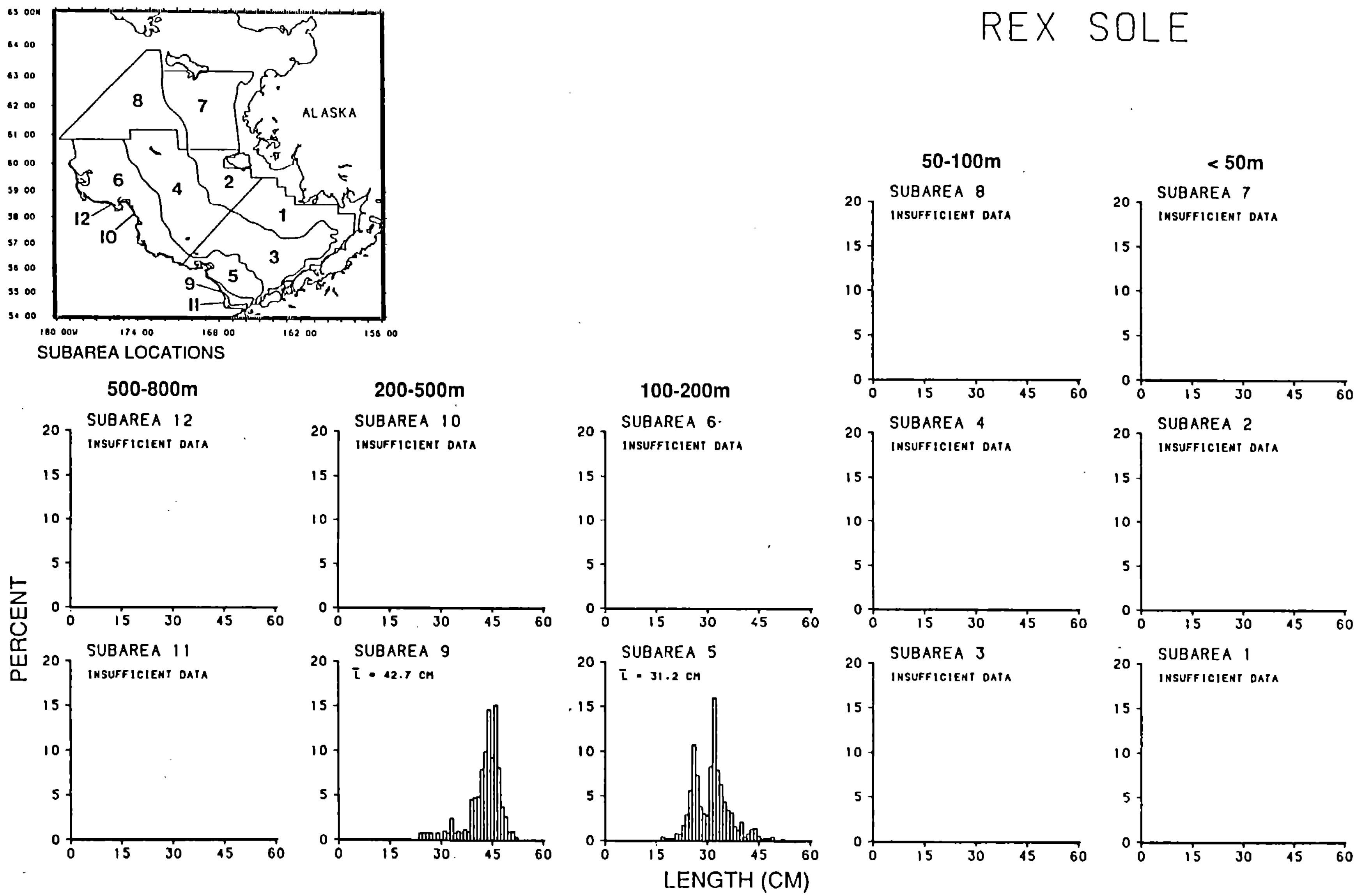

Figure 71 .--Length composition of rex sole by subarea and depth zone as shown by data from the 1988 U.S.-Japan bottom trawl survey.

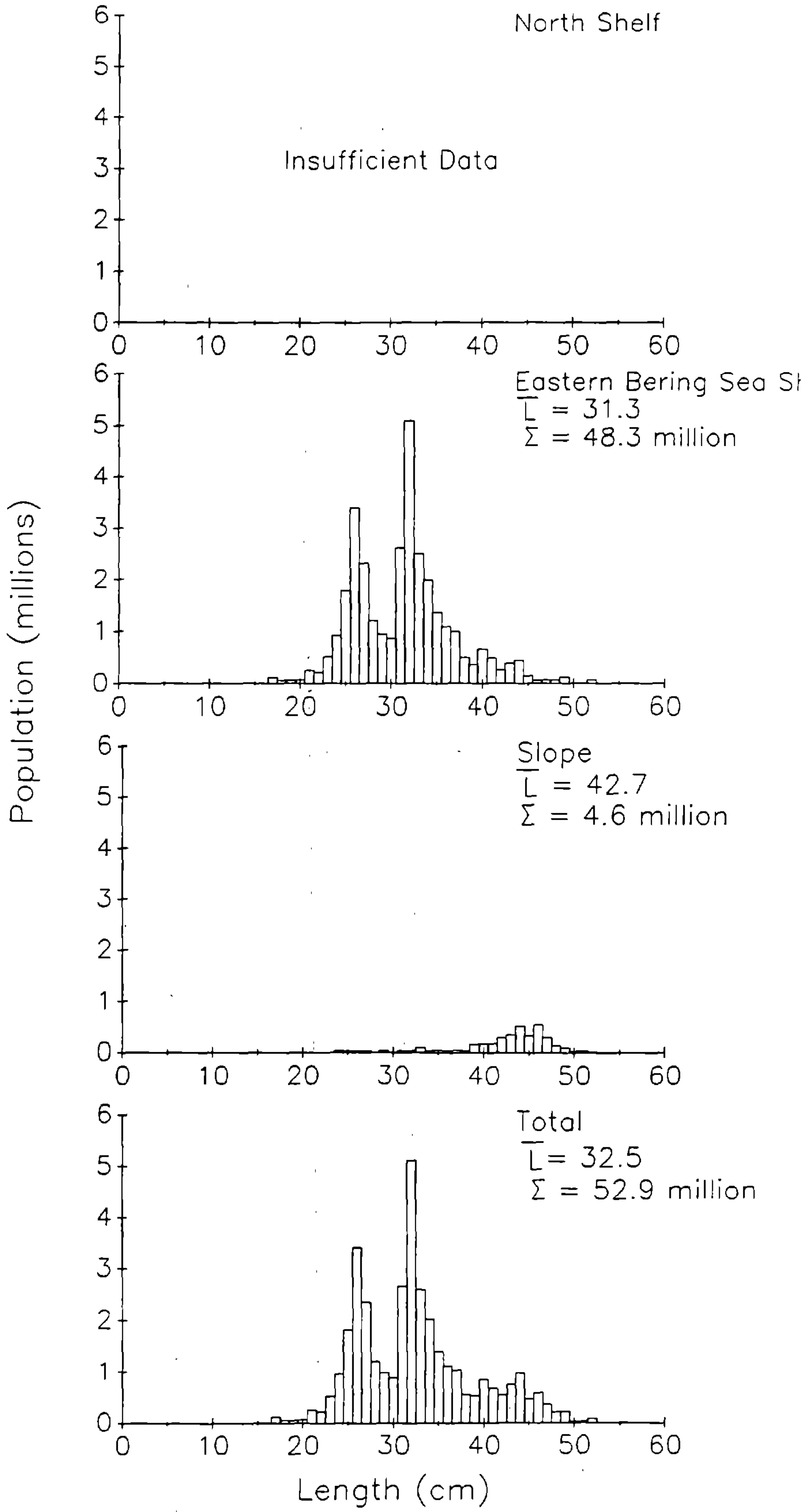

Figure 72.--Population number estimates by centimeter length interval for rex sole in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey.

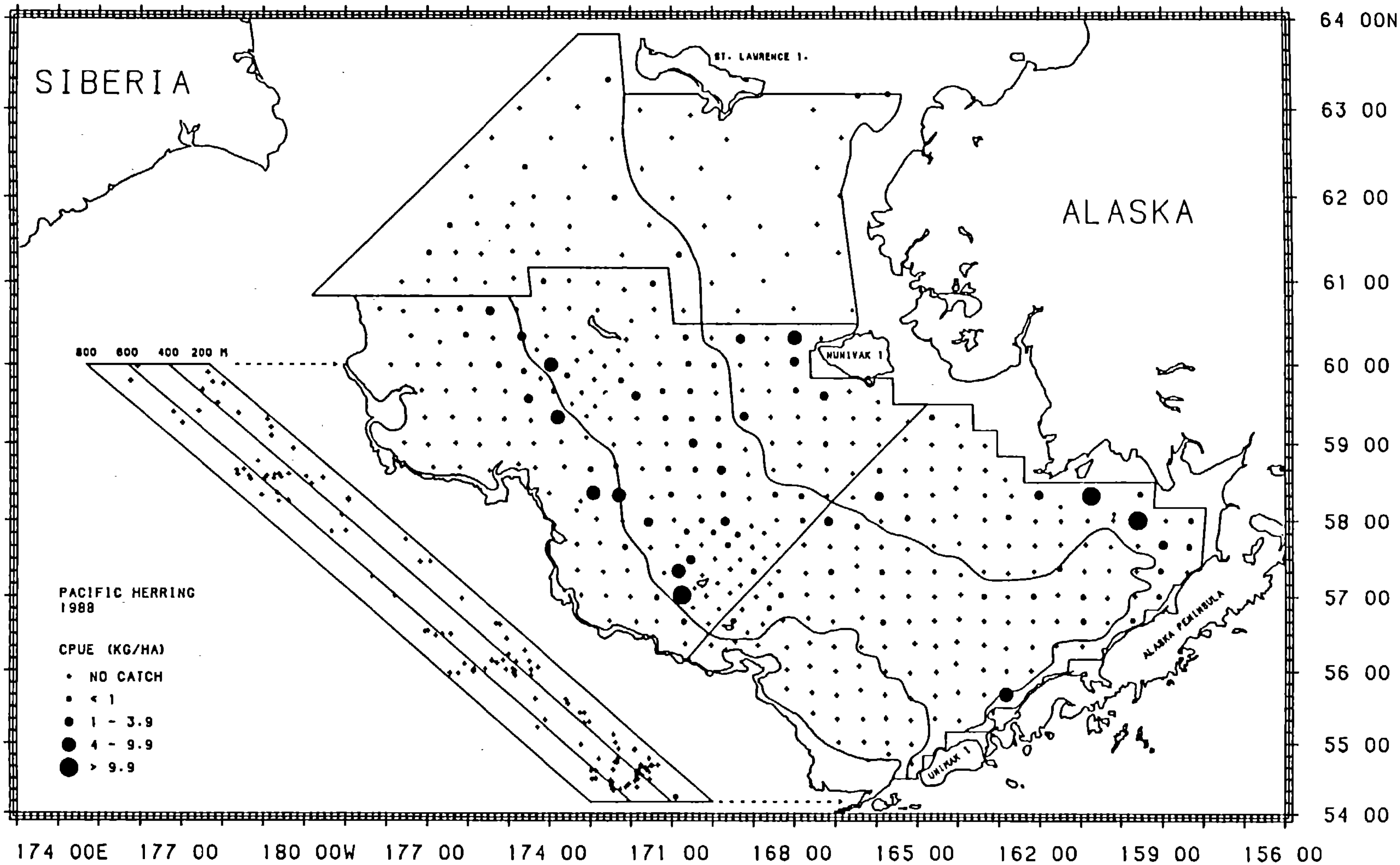

Figure 73.--Distribution and relative abundance of Pacific herring in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 42.--Abundance estimates and mean size of Pacific herring by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	19.76	153,848	0.933	559,746,529	0.922	0.275	-
2	< 50	0.42	1,721	0.010	7,503,144	0.012	0.229	-
3	50 - 100	0.07	758	0.005	3,642,339	0.006	0.208	-
4	50 - 100	0.44	4,694	0.028	19,090,328	0.031	0.246	-
5	100 - 200	0[a]	0	0	0	0	-[b]	-
6	100 - 200	0.36	3,421	0.021	12,949,172	0.021	0.264	-
Subareas combined		3.55	164,443	0.997	602,931,512	0.993	0.273	-
North Shelf								
7	< 50	0.01	51	<0.001	998,020	0.002	0.051	-
8	50 - 200	0.06	460	0.003	3,031,610	0.005	0.152	-
Subareas combined		0.03	511	0.003	4,029,630	0.007	0.127	-
Slope								
9	200 - 500	<0.01	2	<0.001	4,472	<0.001	0.454	-
10	200 - 500	0	0	0	0	0	-	-
11	500 - 800	0	0	0	0	0	-	-
12	500 - 800	0	0	0	0	0	-	-
Subareas combined		<0.01	2	<0.001	4,472	<0.001	0.454	-
All subareas combined		2.58	164,956	1.000	606,965,614	1.000	0.272	-

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

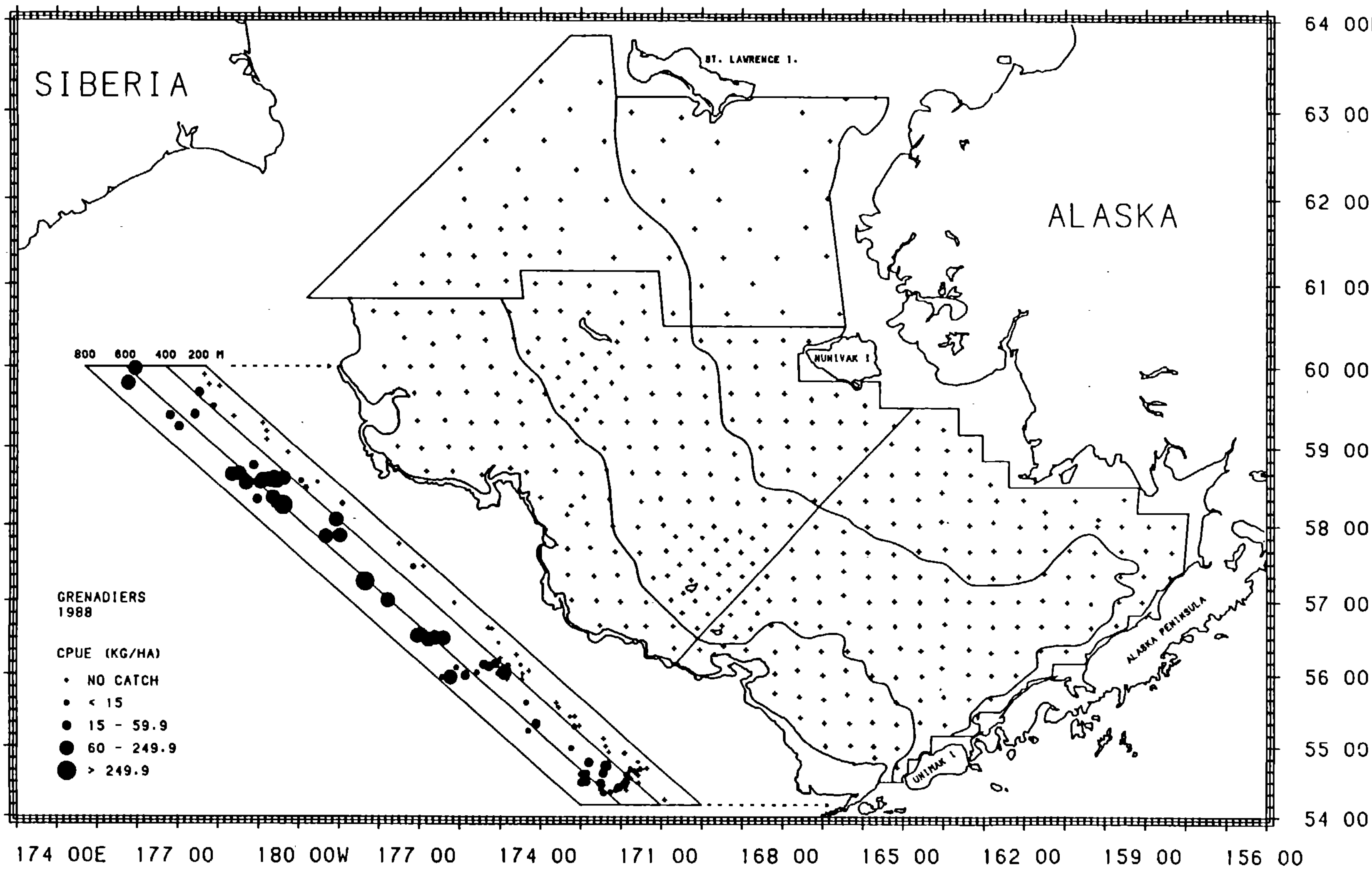

Figure 74.--Distribution and relative abundance of grenadiers in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 43.--Abundance estimates and mean size of *Coryphaenoides* spp. and giant grenadiers by subarea from the 1988 U.S. bottom trawl survey of the Bering Sea slope.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Coryphaenoides spp.								
9	200 - 500	0.02	13	0.001	55,689	0.001	-*	-
10	200 - 500	1.54	872	0.088	7,819,505	0.128	-	-
11	500 - 800	7.42	3,260	0.331	11,429,295	0.187	-	-
12	500 - 800	17.24	5,707	0.579	41,714,945	0.684	-	-
Subareas combined		4.66	9,852	1.000	61,019,434	1.000	-	-
Giant grenadier								
9	200 - 500	1.23	959	0.025	178,776	0.017	5.365	31.7
10	200 - 500	13.80	7,790	0.206	1,719,689	0.159	4.530	27.7
11	500 - 800	14.48	6,359	0.168	2,852,368	0.263	2.229	23.3
12	500 - 800	68.50	22,679	0.600	6,078,073	0.562	3.731	27.5
Subareas combined		17.88	37,787	1.000	10,828,906	1.000	3.489	26.5

*- indicates no catch or no sample.

Note: Differences in totals and sums of biomass and poulation numbers by subarea are due to rounding. The sum of the biomass estimates for *Coryphaenoides* spp . and giant grenadier in this table, based on U.S. survey vessel data, do not equal the estimate For all grenadiers in Table 8. The estimate in Table 8 includes data from the Japanese survey vessel which did not always identify giant grenadiers in their catches.

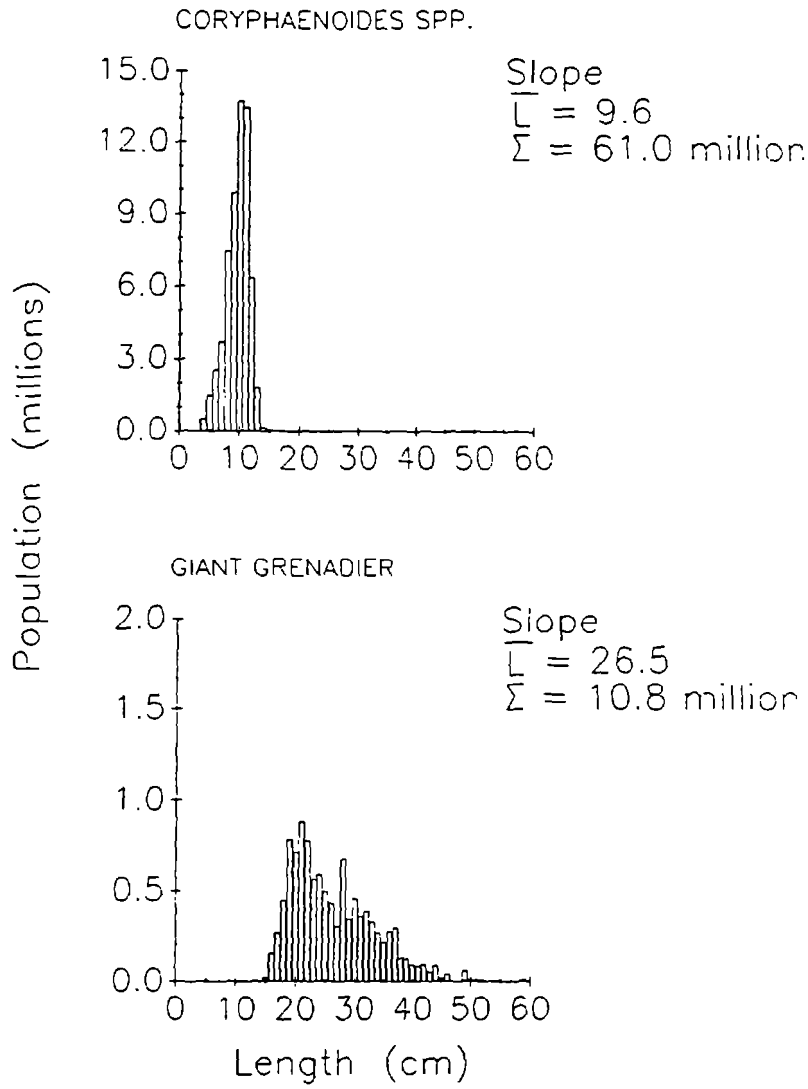

Figure 75.--Population number estimates by centimeter length interval for _Coryphaenoides_ spp. and giant grenadier in the eastern Bering Sea as shown by data from the 1988 U.S.-Japan bottom trawl survey. Length measurements are from the anterior tip of the head to the middle of the anus.

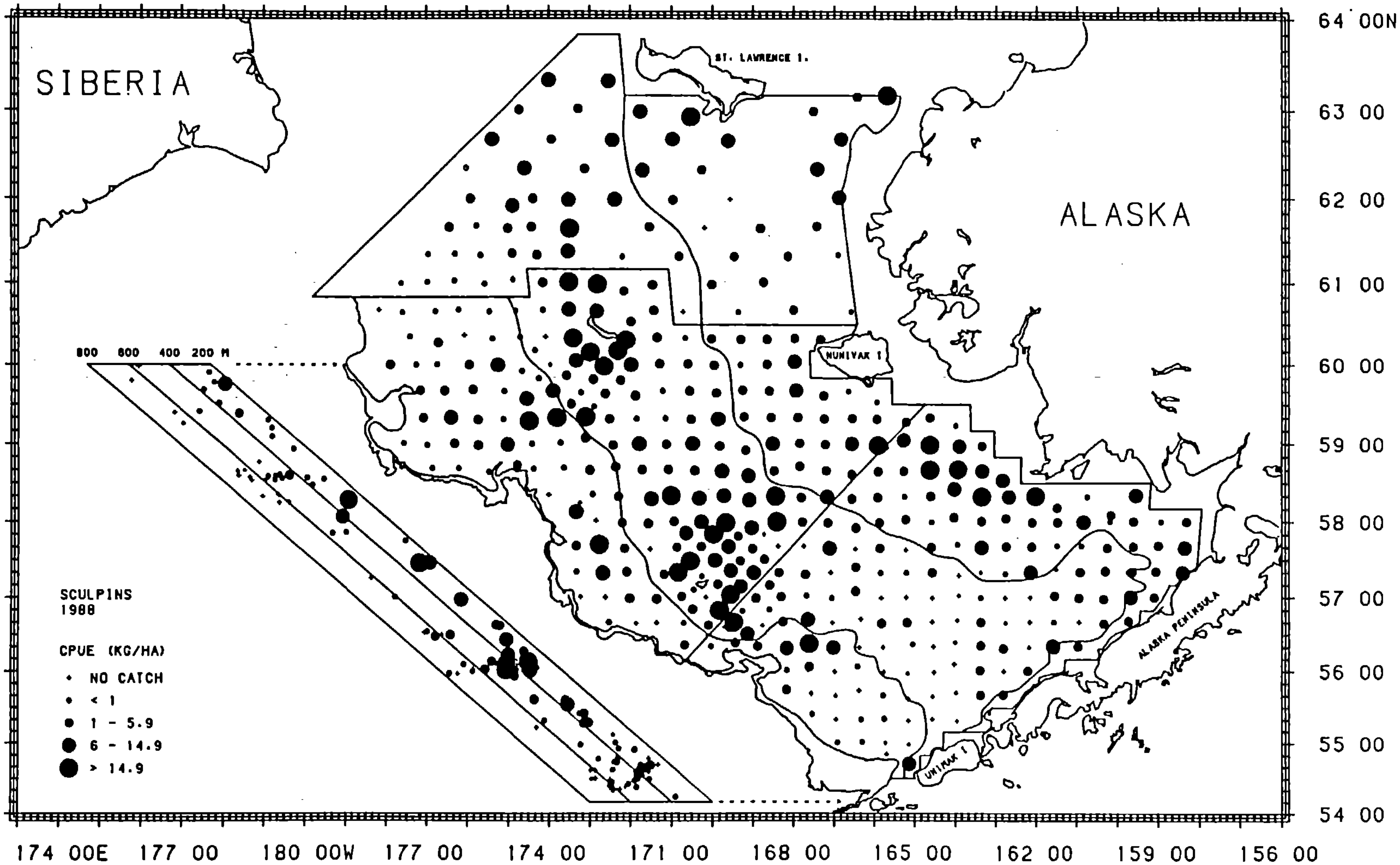

Figure 76.--Distribution and relative abundance of sculpins in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 44.--Estimates of biomass (t) and population numbers in millions (below) by depth (m) and subareas for sculpins from the 1988 U.S.-Japan bottom trawl surveys in the Bering Sea.

	Eastern Bering Sea Shelf						North Shelf		Slope					
	<50		50-100		100-200		<50	50-200	200-500		500-800		All subareas combined	Proportion of total population
Species	1	2	3	4	5	6	7	8	9	10	11	12		
Gymnocanthus	2,000	212	452	2,669	0	0	1,057	522	0	0	0	0	6,913	0.022
spp.	55.4	2.5	1.0	7.4	0.0	0.0	31.3	12.1	0.0	0.0	0.0	0.0	109.8	0.145
Butterfly	0	0	0	50,965	0	26	15,264	26,680	0	0	0	0	92,935	0.295
sculpin	0.0	0.0	0.0	183.4	0.0	0.2	29.1	70.5	0.0	0.0	0.0	0.0	283.2	0.375
Malacocottus	0	0	0	0	43	30	0	0	570	590	456	11	1,700	0.005
spp.	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	3.8	4.1	2.9	0.1	11.4	0.015
Yellow Irish	319	0	7,508	13,374	667	2,932	24	0	0	3	0	3	24,830	0.079
lords	1.1	0.0	11.7	26.5	0.8	5.3	0.2	0.0	0.0	<0.1	0.0	<0.1	45.6	0.060
Plain	25,932	15,567	2,547	5,477	0	63	20,201	144	0	0	0	0	69,930	0.222
sculpin	44.3	21.8	1.4	5.8	0.0	<0.1	28.0	0.2	0.0	0.0	0.0	0.0	101.6	0.135
Other	17,841	669	8,359	44,022	0	7,165	8,096	2,383	0	17	0	0	88,553	0.281
Myoxocephalus	27.3	1.2	5.6	40.2	0.0	2.8	11.0	5.1	0.0	<0.1	0.0	0.0	93.1	0.123
Spinyhead	0	0	36	55	225	638	0	0	28	10	4	<0.1	996	0.003
sculpin	0.0	0.0	0.2	0.4	1.1	1.6	0.0	0.0	0.3	0.2	0.1	<0.1	3.9	0.005
Bigmouth	0	0	876	1,587	7,207	11,993	0	14	565	1,414	109	12	23,776	0.076
sculpin	0.0	0.0	0.1	0.3	1.5	4.5	0.0	0.1	0.2	0.4	0.1	<0.1	7.1	0.009
Other	204	30	158	1,617	220	2,170	140	391	16	41	8	37	5,033	0.016
sculpins	9.5	1.5	2.6	5.3	5.2	60.5	4.6	8.6	0.2	1.3	0.3	0.2	99.8	0.132
Total	46,295	16,479	19,936	119,765	8,363	25,017	44,782	30,134	1,179	2,075	577	62	314,666	1.000
sculpins	137.6	26.9	22.7	269.3	8.9	75.2	104.1	96.6	4.5	6.0	3.2	0.3	755.3	1.000

Note: Differences in totals and sums are due to rounding.

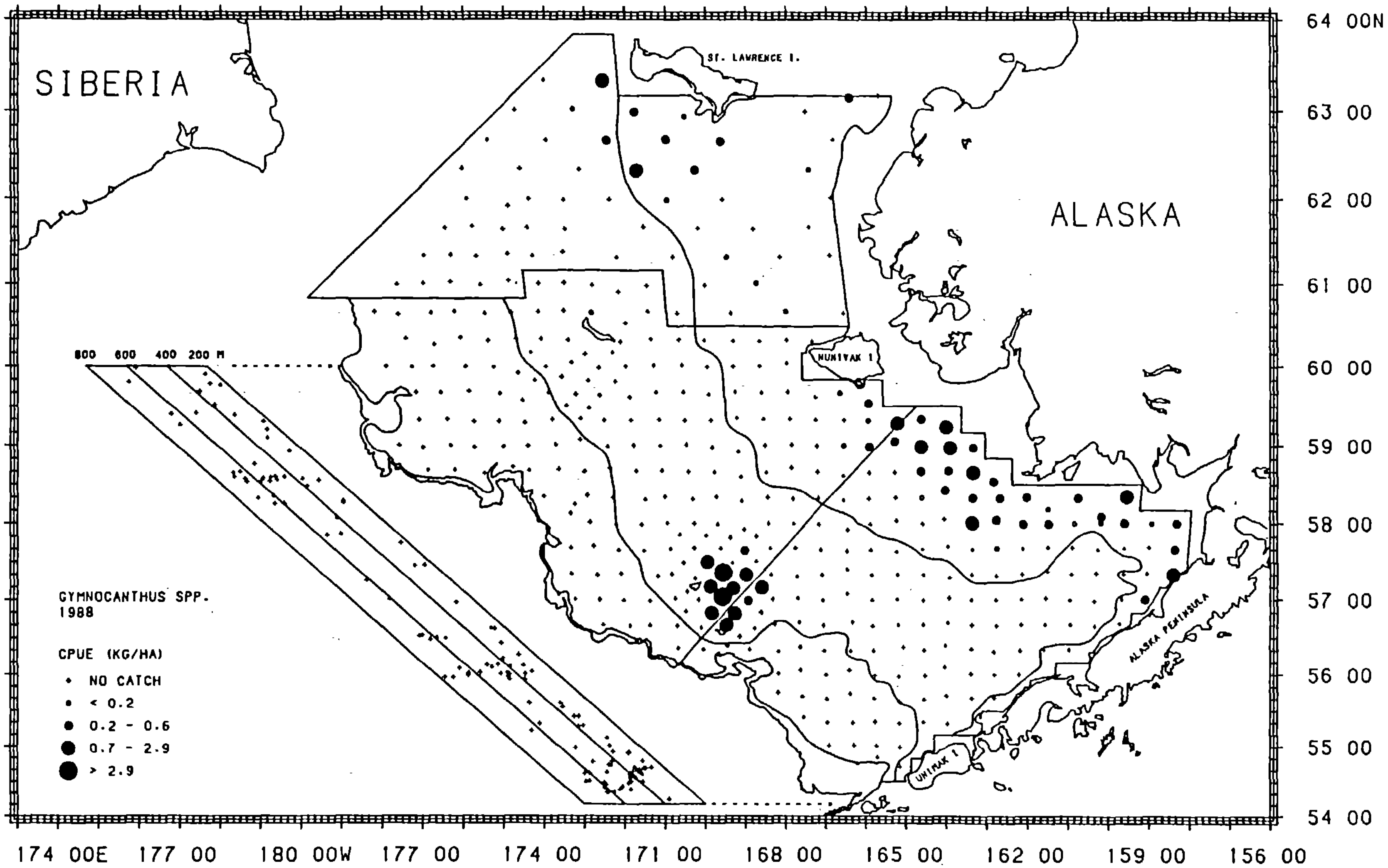

Figure 77.--Distribution and relative abundance of Gymnocanthus spp. in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

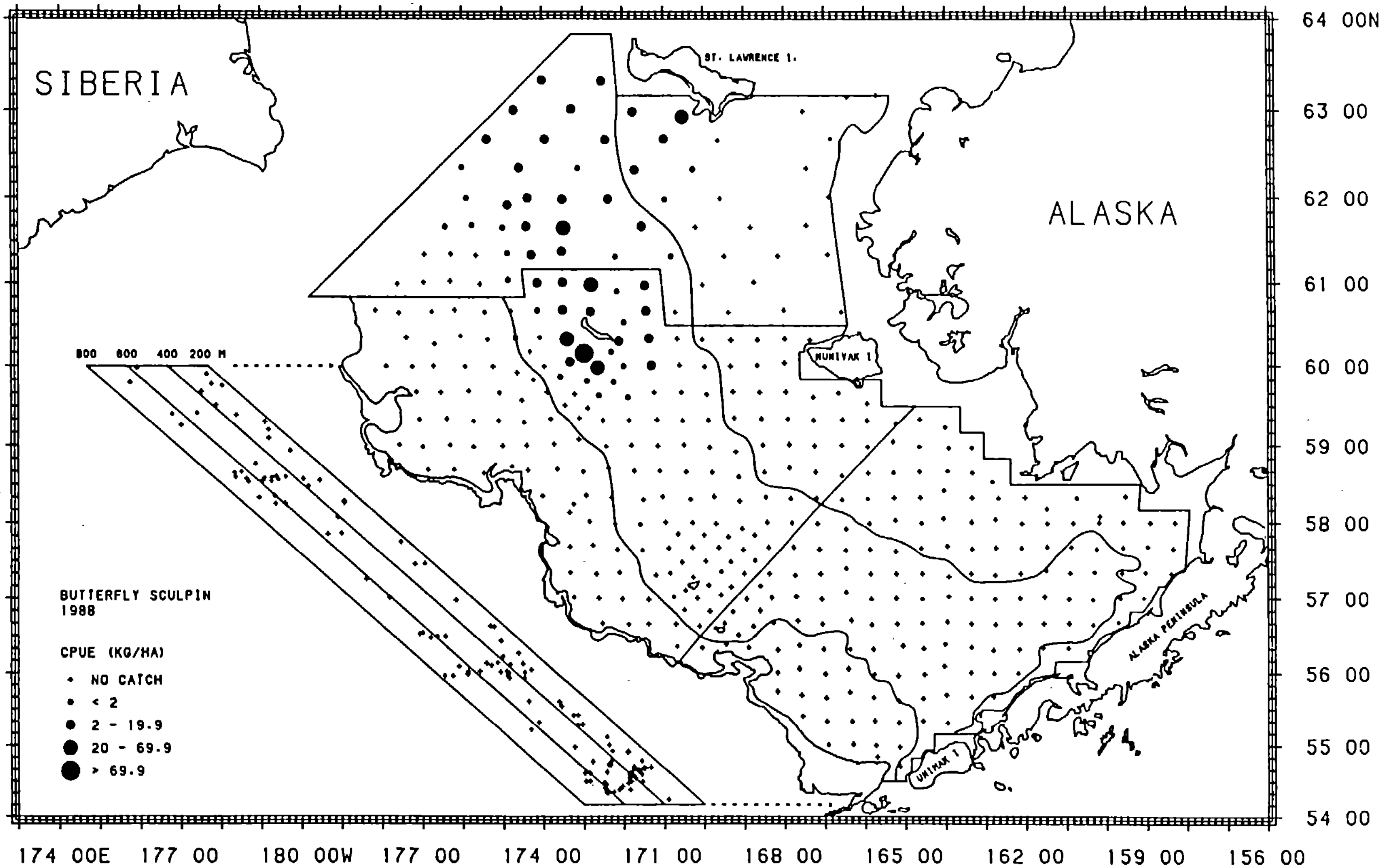

Figure 78.--Distribution and relative abundance of butterfly sculpin in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

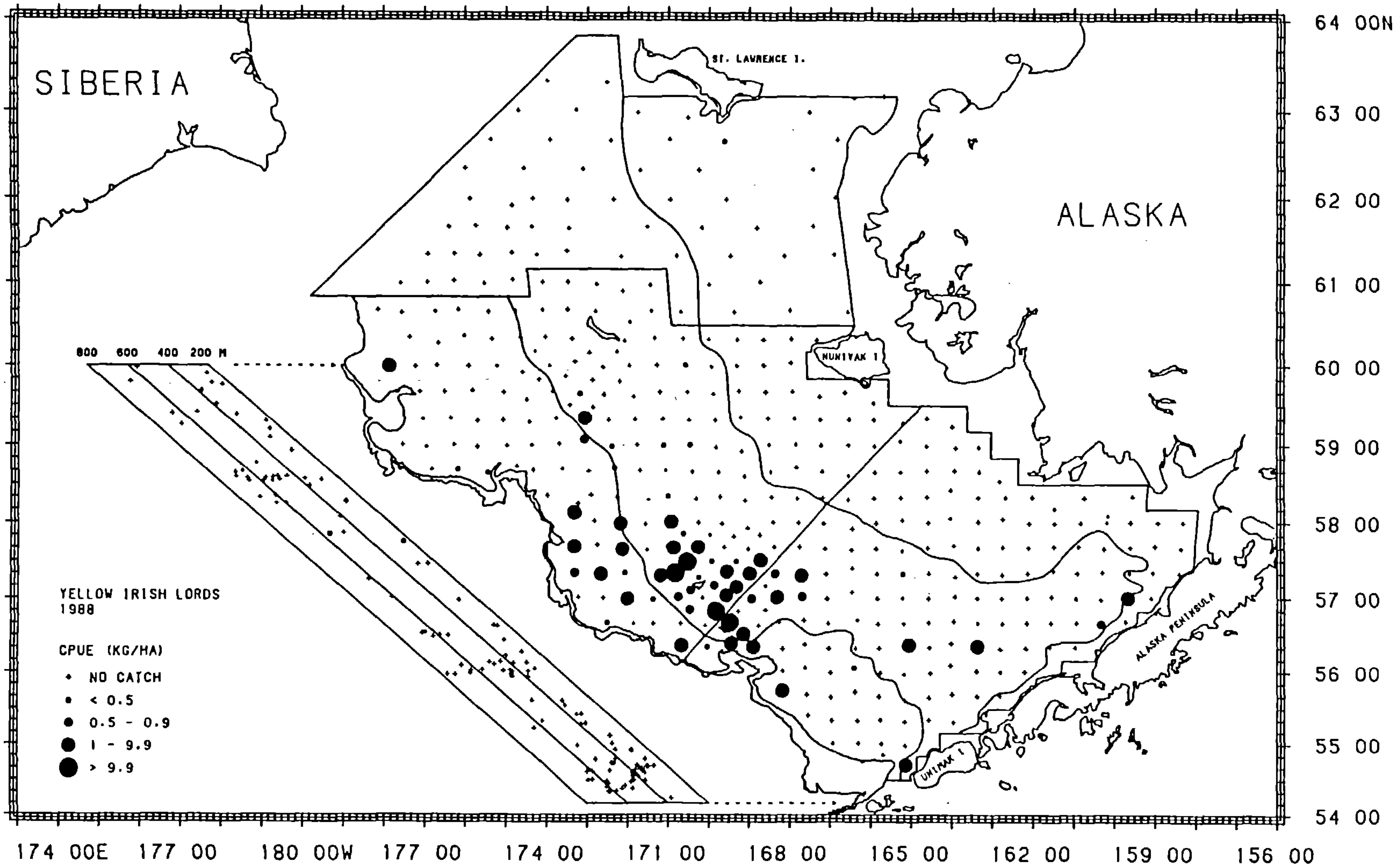

Figure 79.--Distribution and relative abundance of yellow Irish lords in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

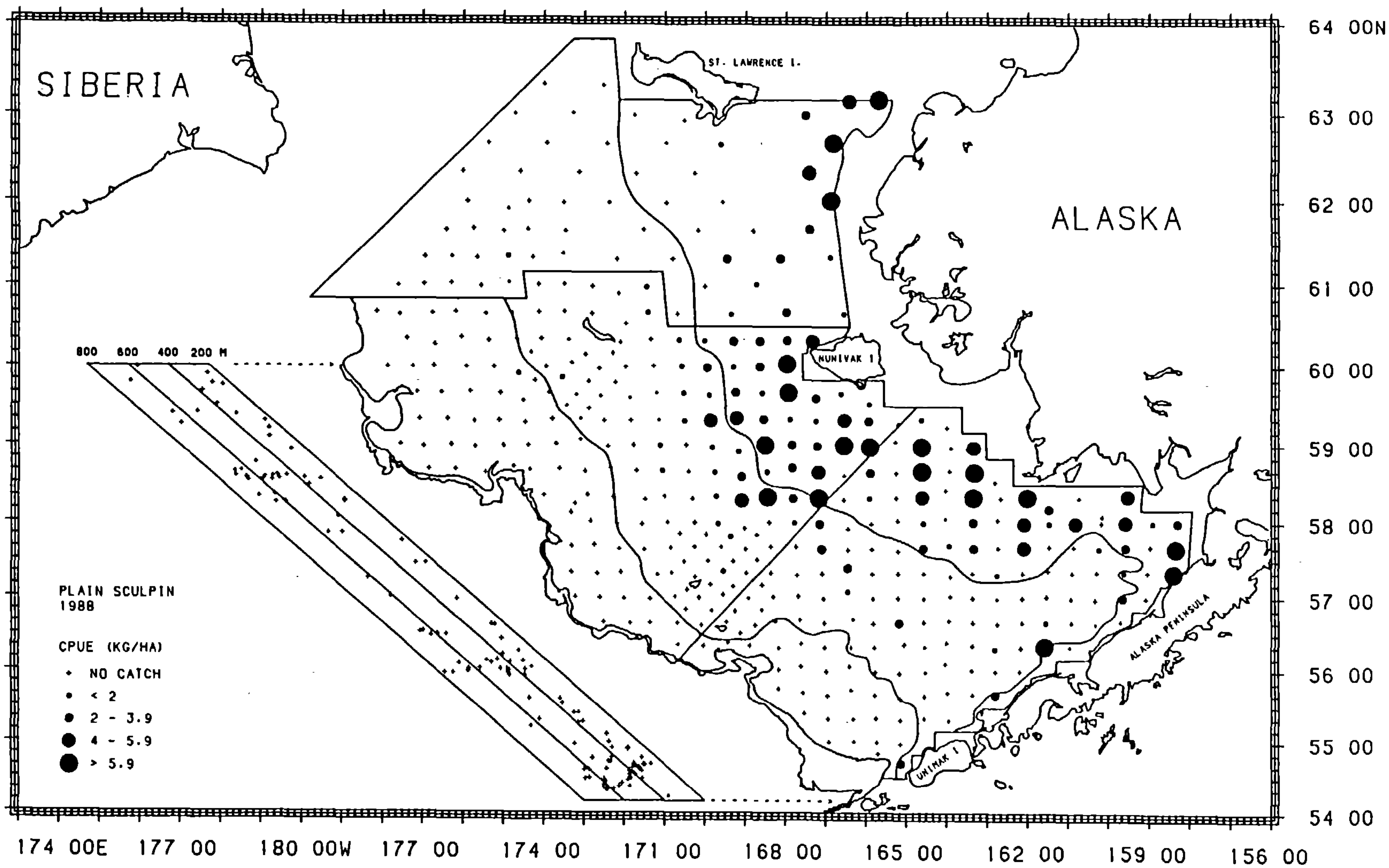

Figure 80.--Distribution and relative abundance of plain sculpin in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

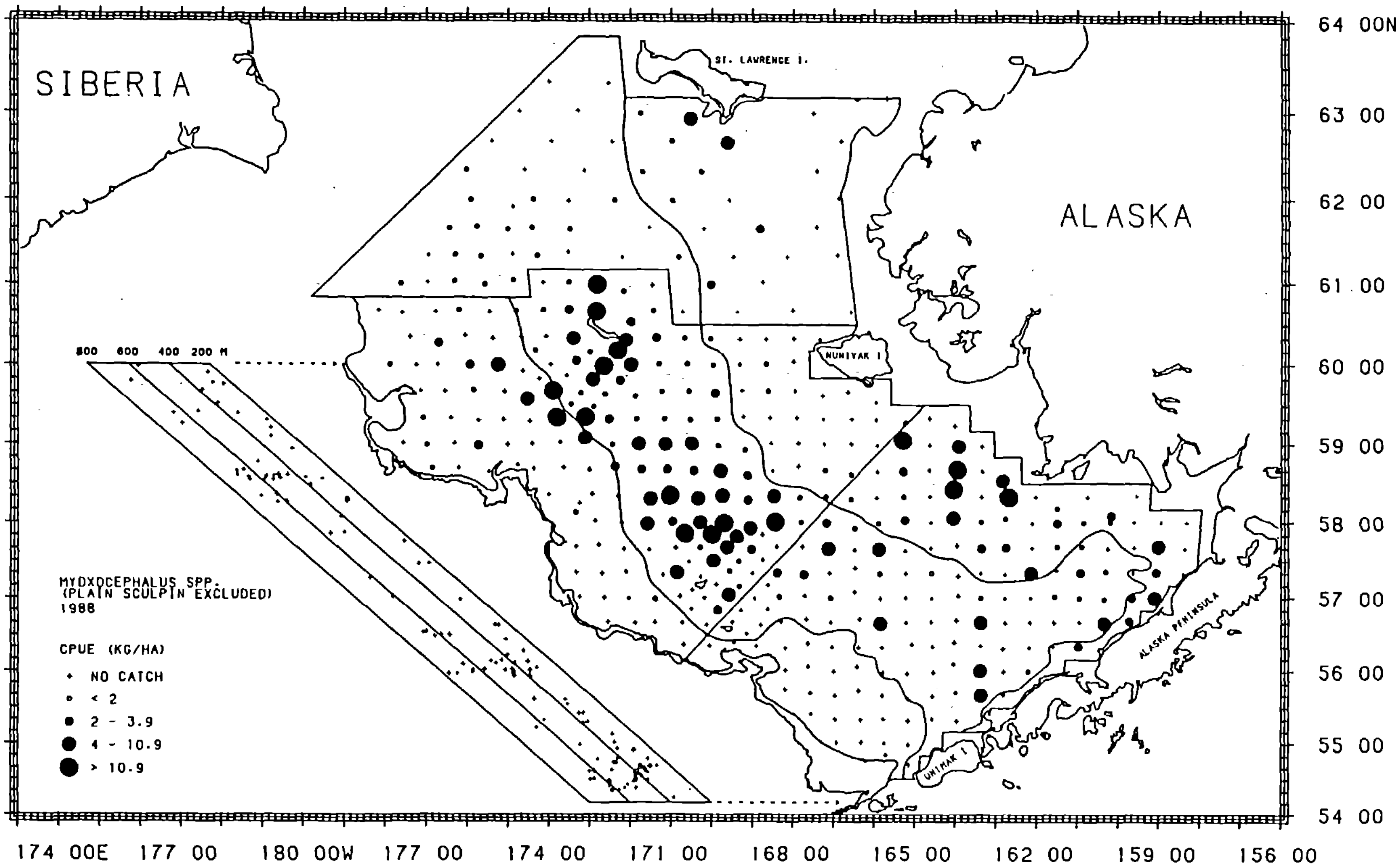

Figure 81.--Distribution and relative abundance of Myoxocephalus spp. in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

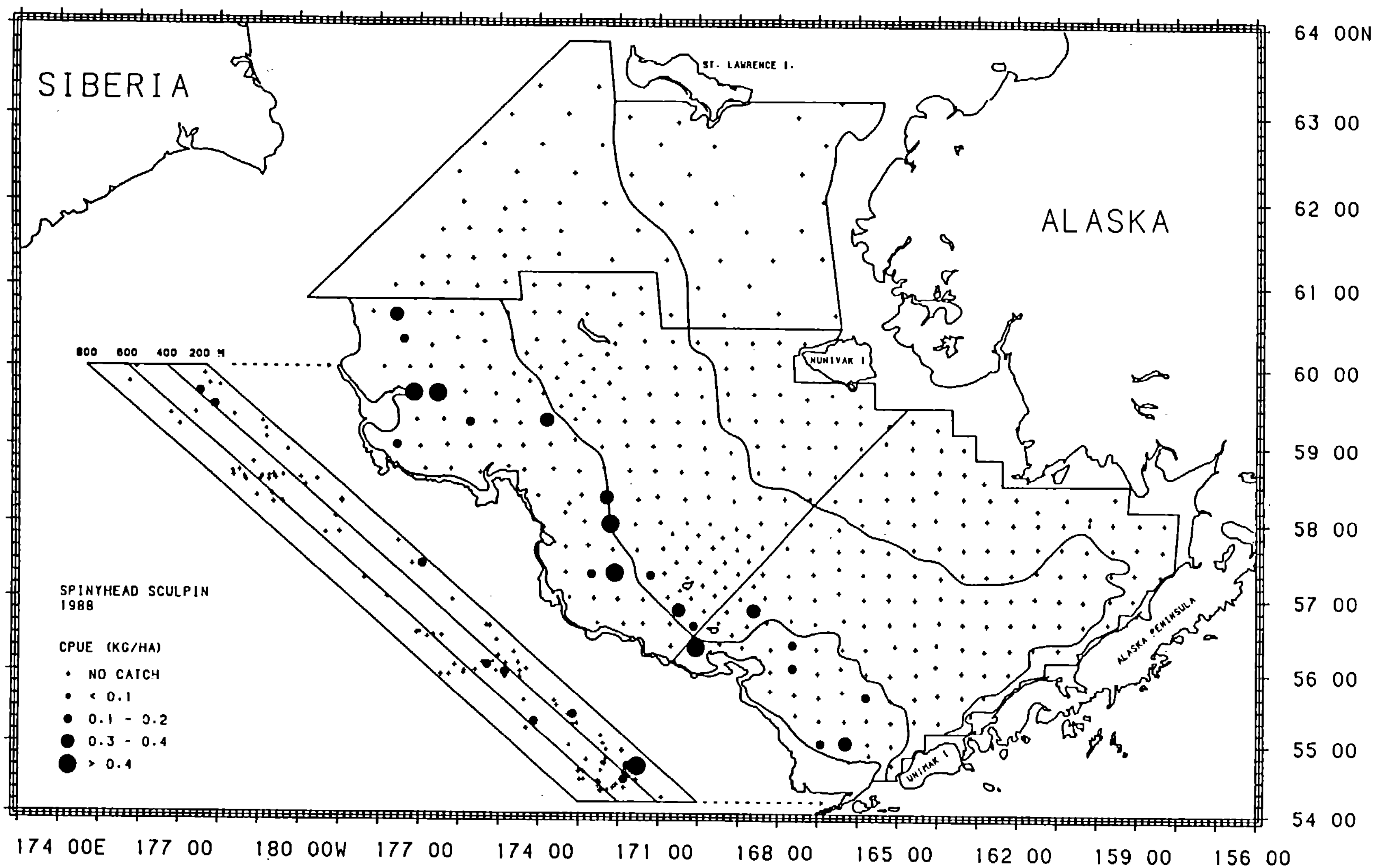

Figure 82.--Distribution and relative abundance of spinyhead sculpin in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

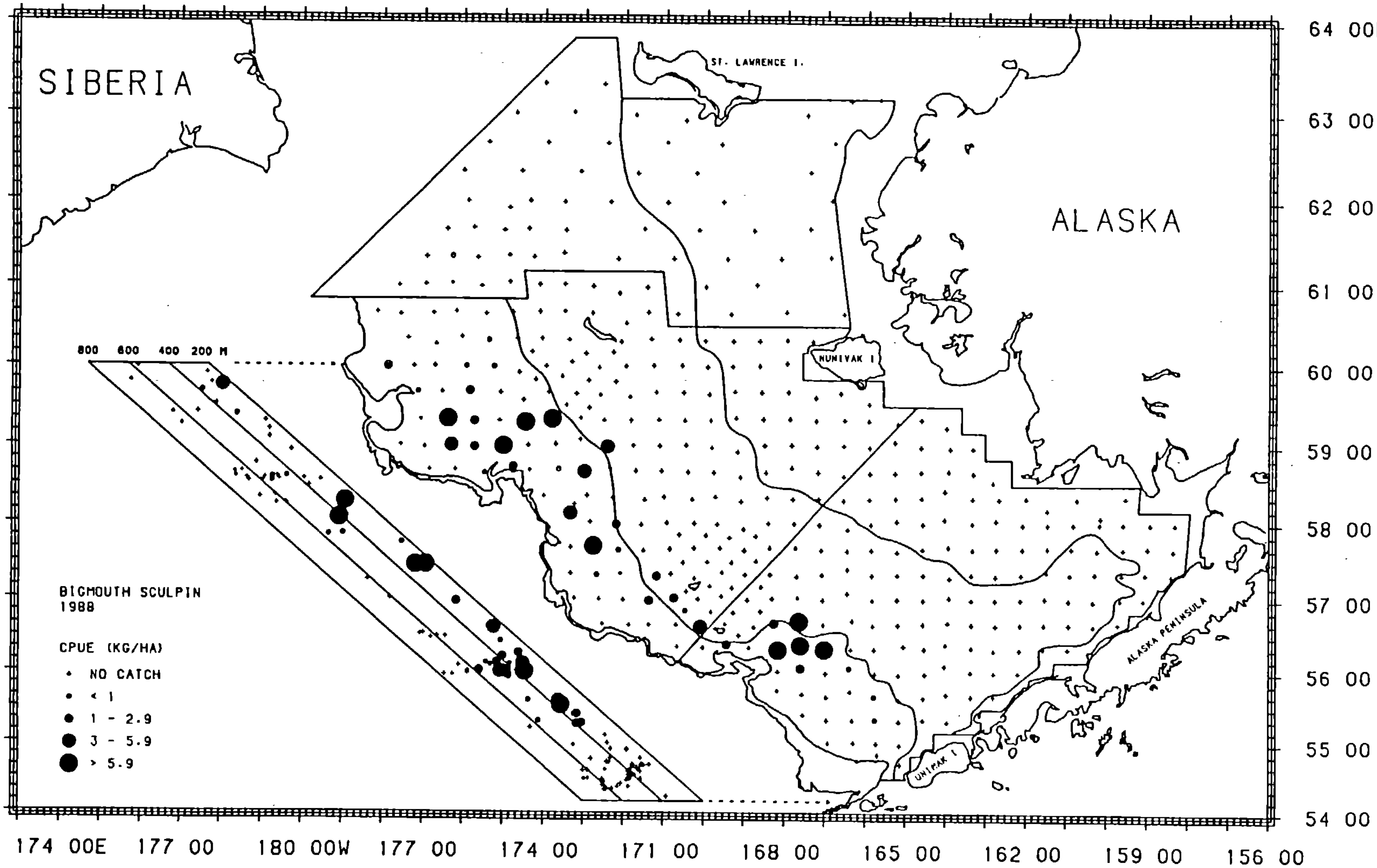

Figure 83.--Distribution and relative abundance of bigmouth sculpin in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

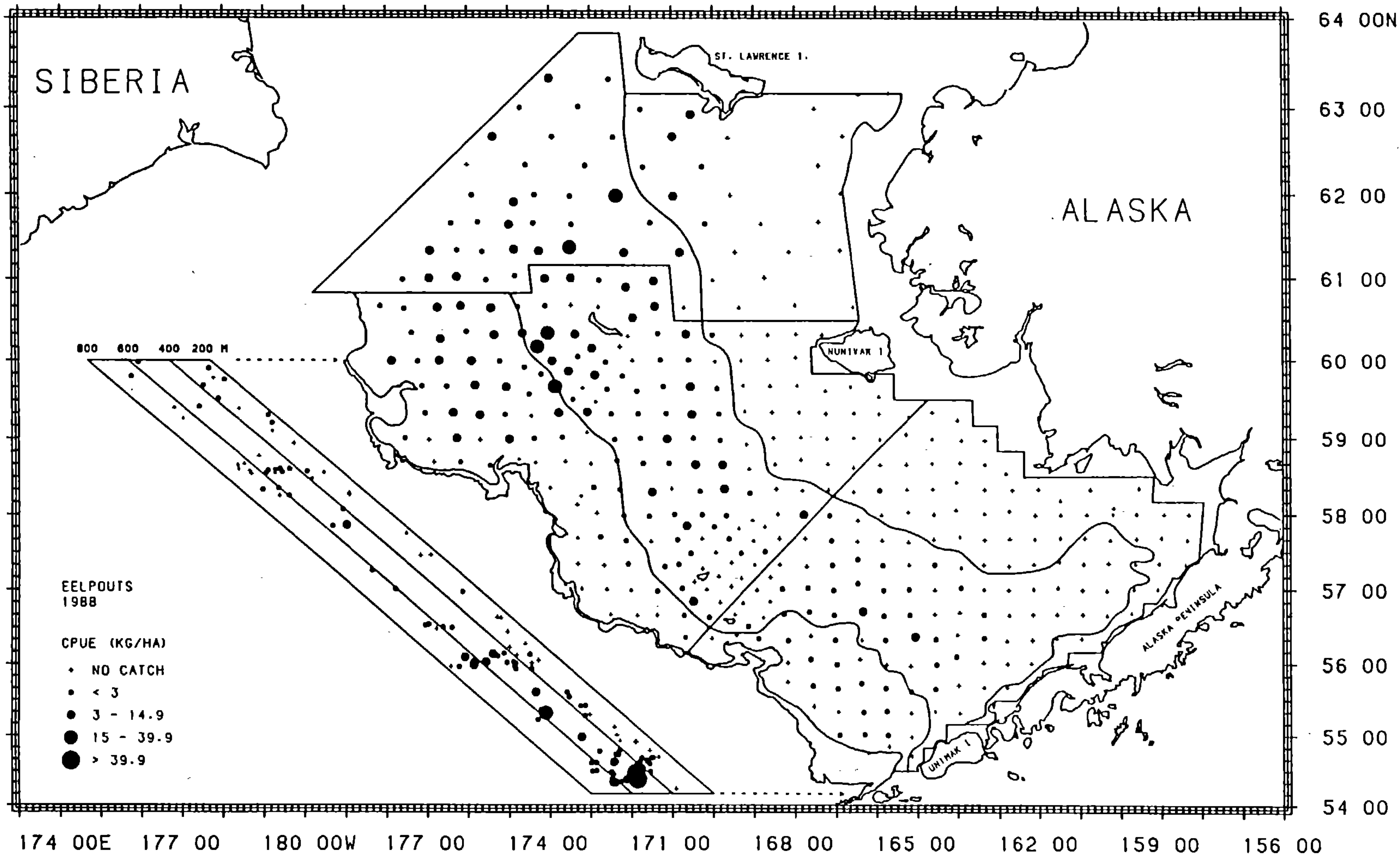

Figure 84.--Distribution and relative abundance of eelpouts in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 45.--Estimates of biomass (in metric tons) and population numbers in millions (below) by depth (m) and subareas for eelpouts from the 1988 U.S.-Japan bottom trawl surveys in the Bering Sea.

	Eastern Bering Sea Shelf						North Shelf		Slope					
	<50		50-100		100-200		<50	50-200	200-500		500-800			
Species	1	2	3	4	5	6	7	8	9	10	11	12	All subareas combined	Proportion of total population
Marbled eelpout	0	0	0	19,011	0	109	5,480	26,425	0	0	0	0	51,025	0.535
	0.0	0.0	0.0	21.0	0.0	0.1	5.0	51.3	0.0	0.0	0.0	0.0	77.4	0.187
Two-line eelpout	0	0	0	0	0	0	0	0	353	109	2,323	79	2,864	0.030
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	4.9	0.1	5.7	0.014
Wattled eelpout	0	22	5,214	5,249	560	13,350	0	7,229	8	36	0	0	31,669	0.332
	0.0	0.1	25.3	34.2	2.2	75.4	0.0	54.6	<0.1	0.1	0.0	0.0	192.0	0.463
Ebony eelpout	0	0	0	0	0	0	0	0	218	50	271	66	606	0.006
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4	0.1	0.9	0.002
Shortfin eelpout	0	0	200	264	376	6,214	0	473	2	1	0	0	7,529	0.079
	0.0	0.0	1.5	3.5	7.2	112.1	0.0	8.7	<0.1	<0.1	0.0	0.0	133.0	0.321
Black eelpout	0	0	0	0	0	0	0	0	106	21	183	79	388	0.004
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.3	1.7	0.2	3.3	0.008
Other eelpouts	313	0	0	500	0	0	0	348	0	0	87	2	1,250	0.013
	0.1	0.0	0.0	0.7	0.0	0.0	0.0	1.7	0.0	0.0	0.1	<0.1	2.6	0.006
Total eelpouts	313	22	5,414	25,024	937	19,673	5,480	34,475	687	217	2,864	225	95,331	1.000
	0.1	0.1	26.8	59.4	9.4	187.6	5.0	116.3	2.3	0.5	7.0	0.4	414.8	1.000

Note: Differences in totals and sums are due to rounding.

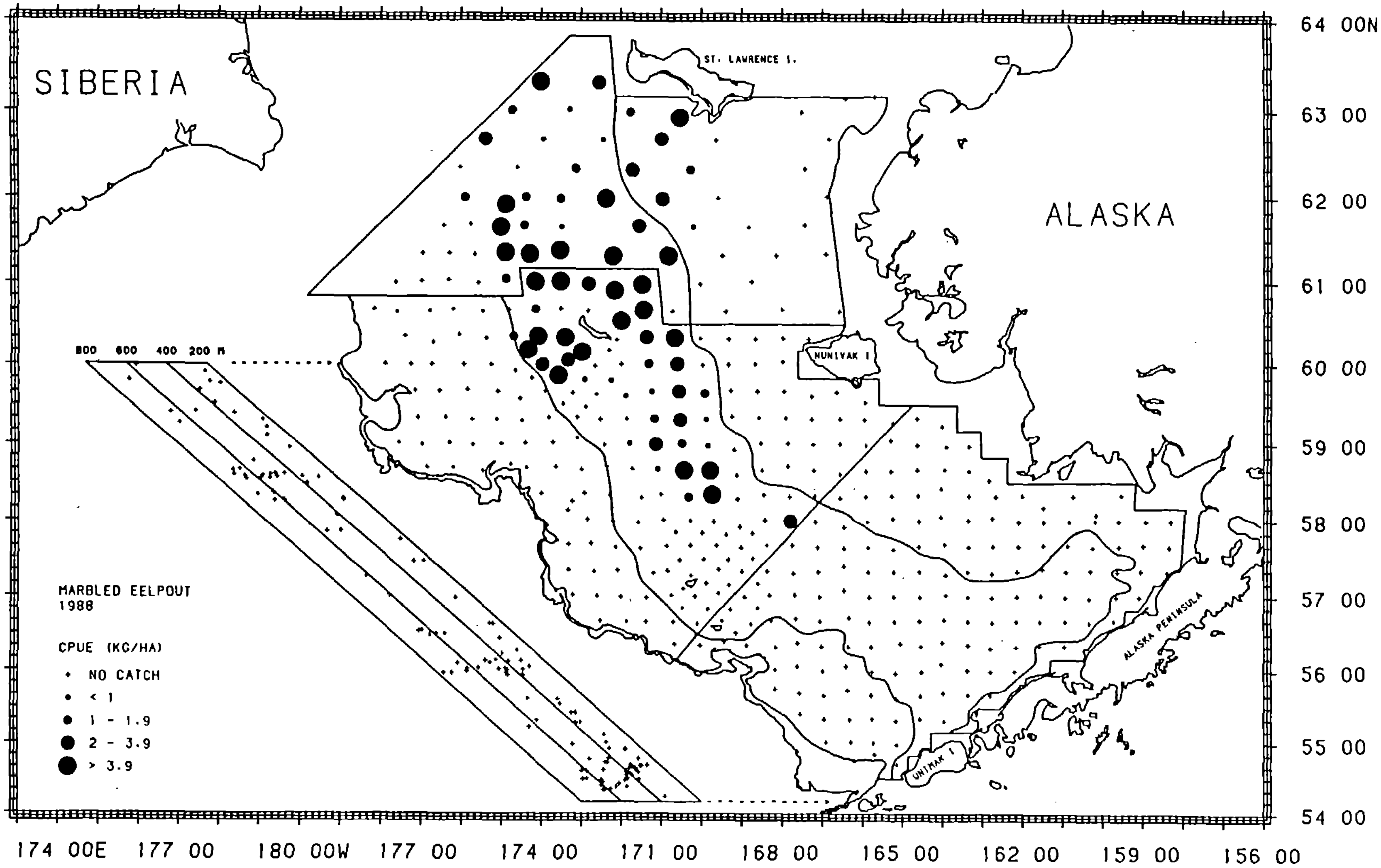

Figure 85.--Distribution and relative abundance of marbled eelpouts in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

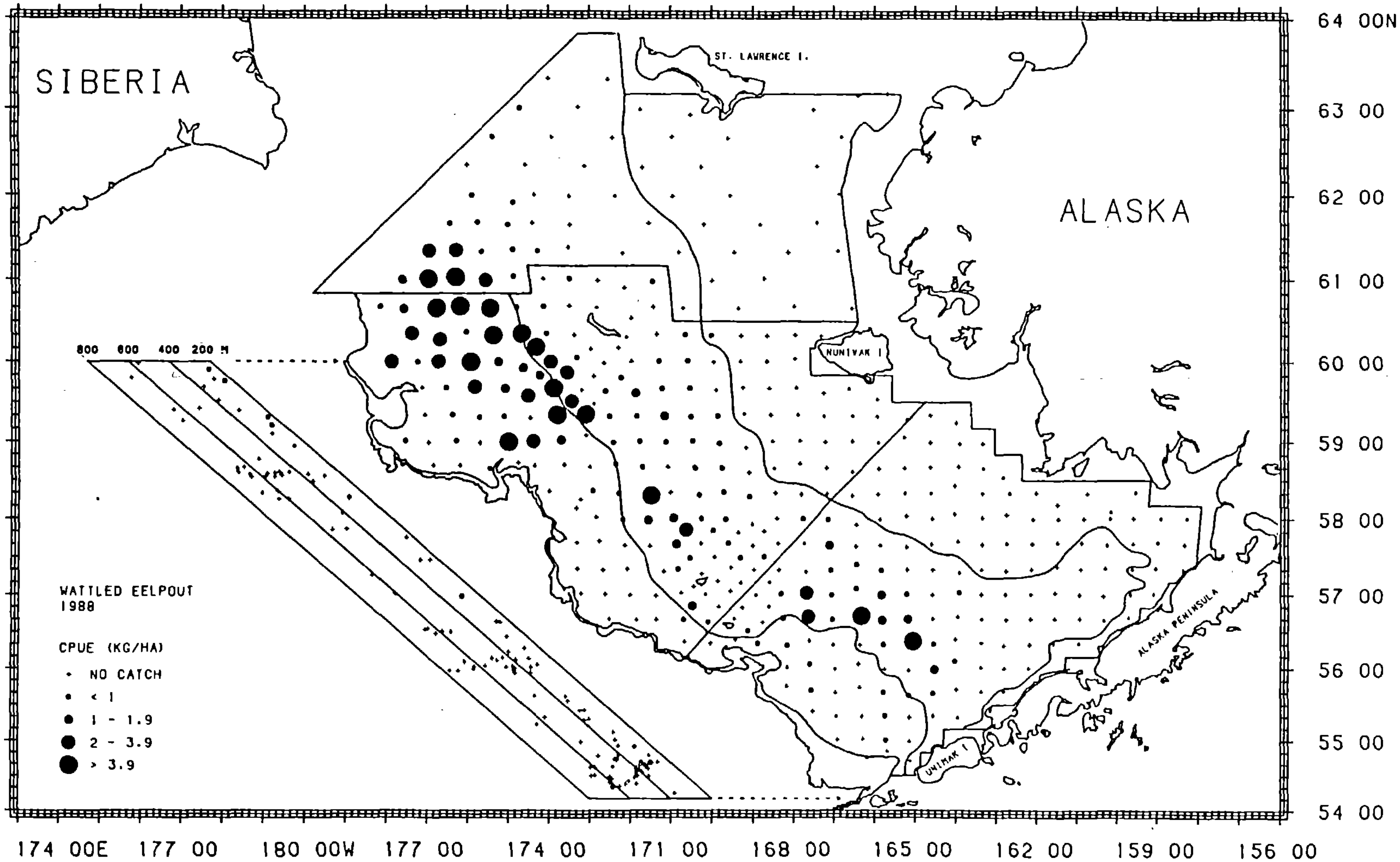

Figure 86.--Distribution and relative abundance of wattled eelpout in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

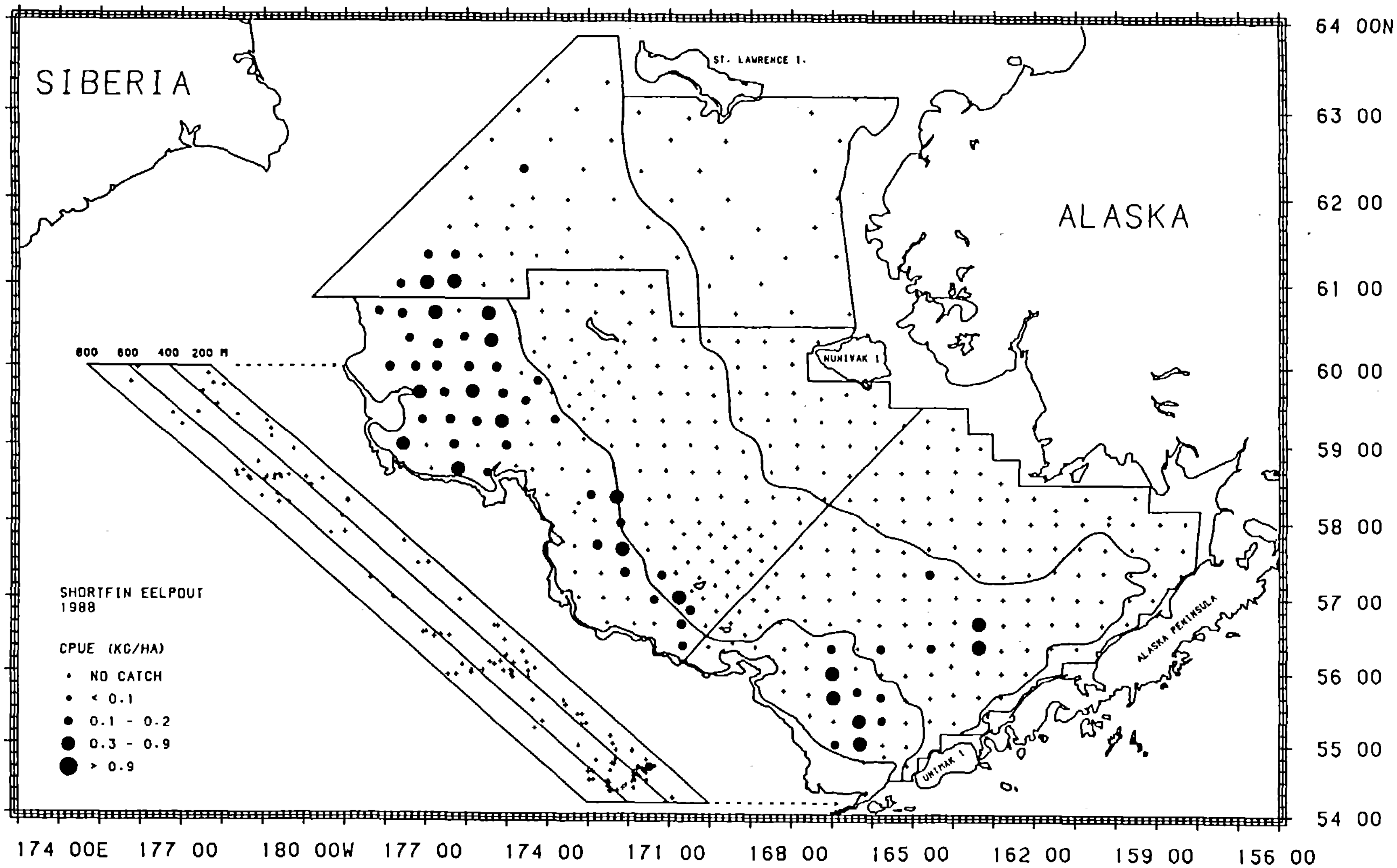

Figure 87.--Distribution and relative abundance of shortfin eelpout in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

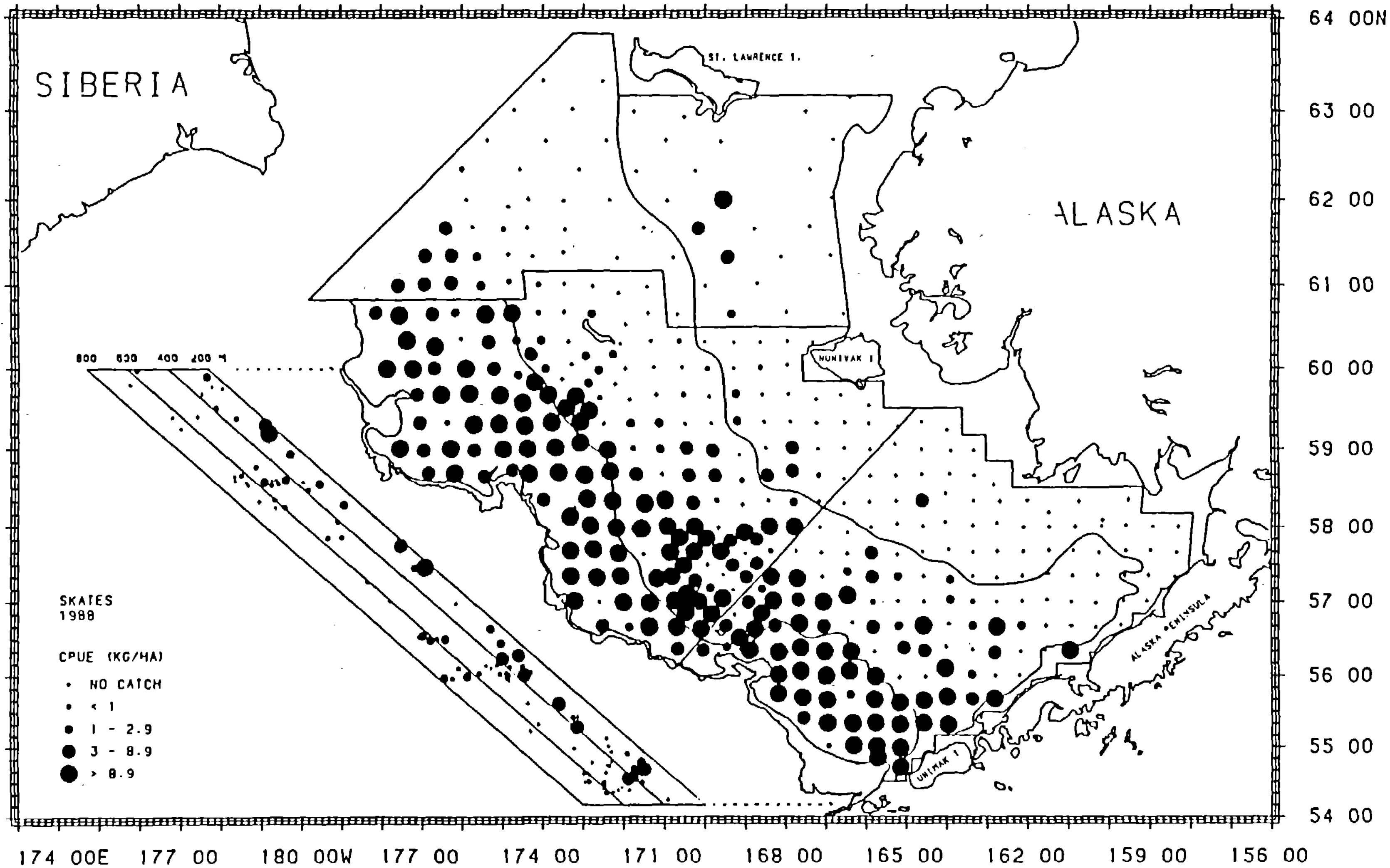

Figure 88.--Distribution and relative abundance of skates in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 46. --Abundance estimates and mean size of skates by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	1.20	9,310	0.020	1,077,017	0.010	8.644	-*
2	< 50	0.62	2,540	0.005	870,028	0.008	2.919	-
3	50 - 100	6.39	66,017	0.140	17,679,375	0.158	3.734	-
4	50 - 100	7.22	77,832	0.165	20,201,809	0.181	3.853	-
5	100 - 200	27.70	107,472	0.228	15,668,373	0.140	6.859	-
6	100 - 200	19.80	187,254	0.398	47,707,380	0.427	3.925	-
Subareas combined		9.72	450,426	0.957	103,203,982	0.924	4.364	-
North Shelf								
7	< 50	1.04	7,540	0.016	1,784,233	0.016	4.226	-
8	50 - 200	1.22	10,001	0.021	6,092,742	0.055	1.642	-
Subareas combined		1.13	17,542	0.037	7,876,975	0.070	2.227	-
Slope								
9	200 - 500	1.12	870	0.002	211,817	0.002	4.109	-
10	200 - 500	2.46	1,387	0.003	240,249	0.002	5.775	-
11	500 - 800	0.25	112	<0.001	98,997	0.001	1.127	-
12	500 - 800	0.46	151	<0.001	112,200	0.001	1.343	-
Subareas combined		1.19	2,520	0.005	663,263	0.006	3.800	-
All subareas combined		7.57	470,488	1.000	111,744,220	1.000	4.210	-

* indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

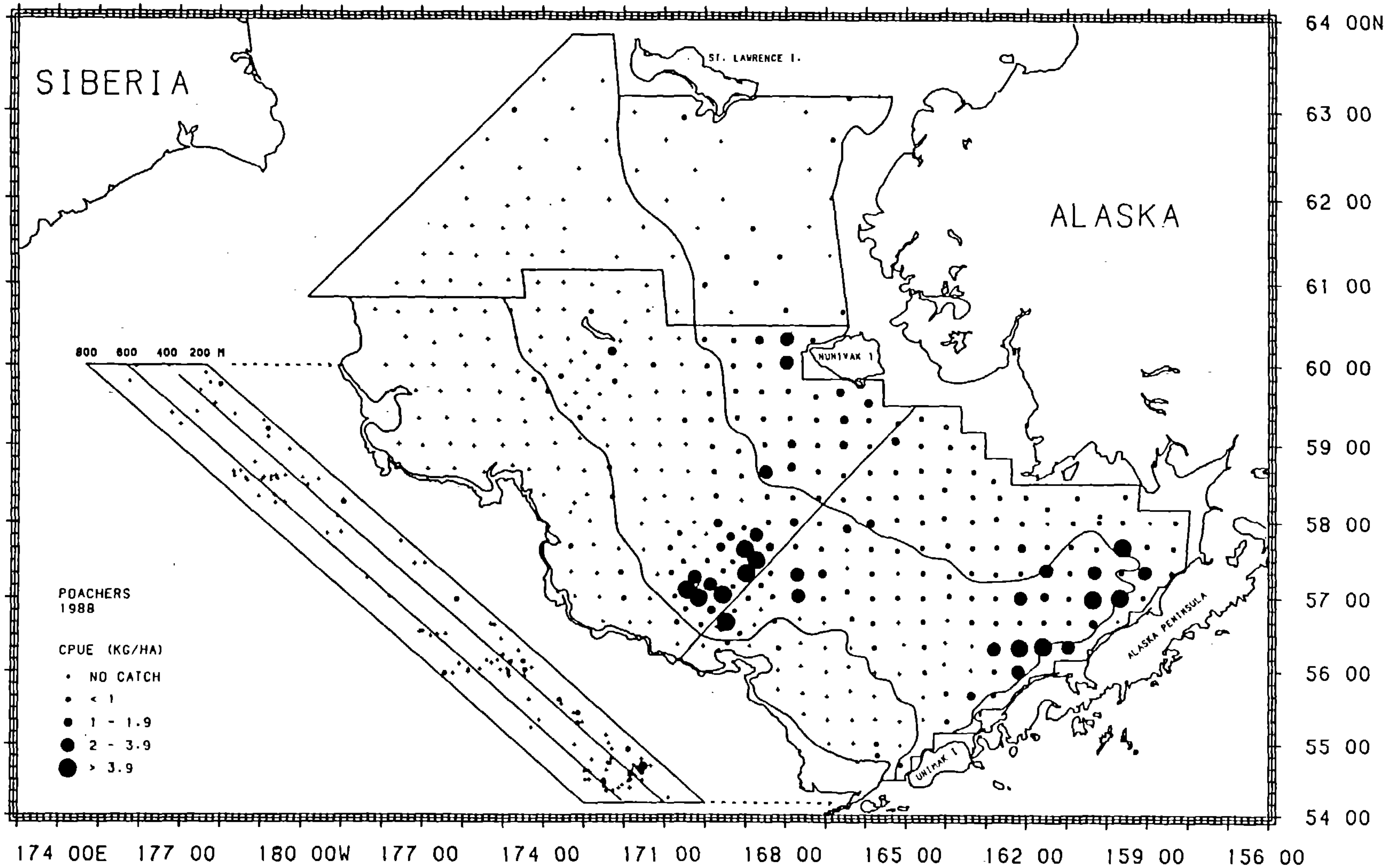

Figure 89.--Distribution and relative abundance of poachers in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 47.--Abundance estimates and mean size of poachers by subarea Erom the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.87	6,795	0.256	127,404,018	0.248	0.053	-*
2	< 50	0.95	3,902	0.147	82,468,631	0.161	0.047	-
3	50 - 100	0.75	7,778	0.293	143,731,056	0.280	0.054	-
4	50 - 100	0.65	6,963	0.262	134,167,518	0.261	0.052	-
5	100 - 200	0.05	191	0.007	2,713,150	0.005	0.070	-
6	100 - 200	0.02	157	0.006	3,225,019	0.006	0.049	-
Subareas combined		0.56	25,787	0.970	493,709,391	0.962	0.052	-
North Shelf								
7	< 50	0.09	650	0.024	16,348,957	0.032	0.040	-
8	50 - 200	<0.01	37	0.001	966,766	0.002	0.038	-
Subareas combined		0.04	687	0.026	17,315,723	0.034	0.040	-
Slope								
9	200 - 500	0.09	68	0.003	1,269,578	0.002	0.054	-
10	200 - 500	0.05	26	0.001	457,815	0.001	0.056	-
11	500 - 800	0.02	9	<0.001	330,595	0.001	0.028	-
12	500 - 800	<0.01	2	<0.001	65,559	<0.001	0.025	-
Subareas combined		0.05	105	0.004	2,123,546	0.004	0.049	-
All subareas combined		0.42	26,579	1.000	513,148,660	1.000	0.052	-

*

Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

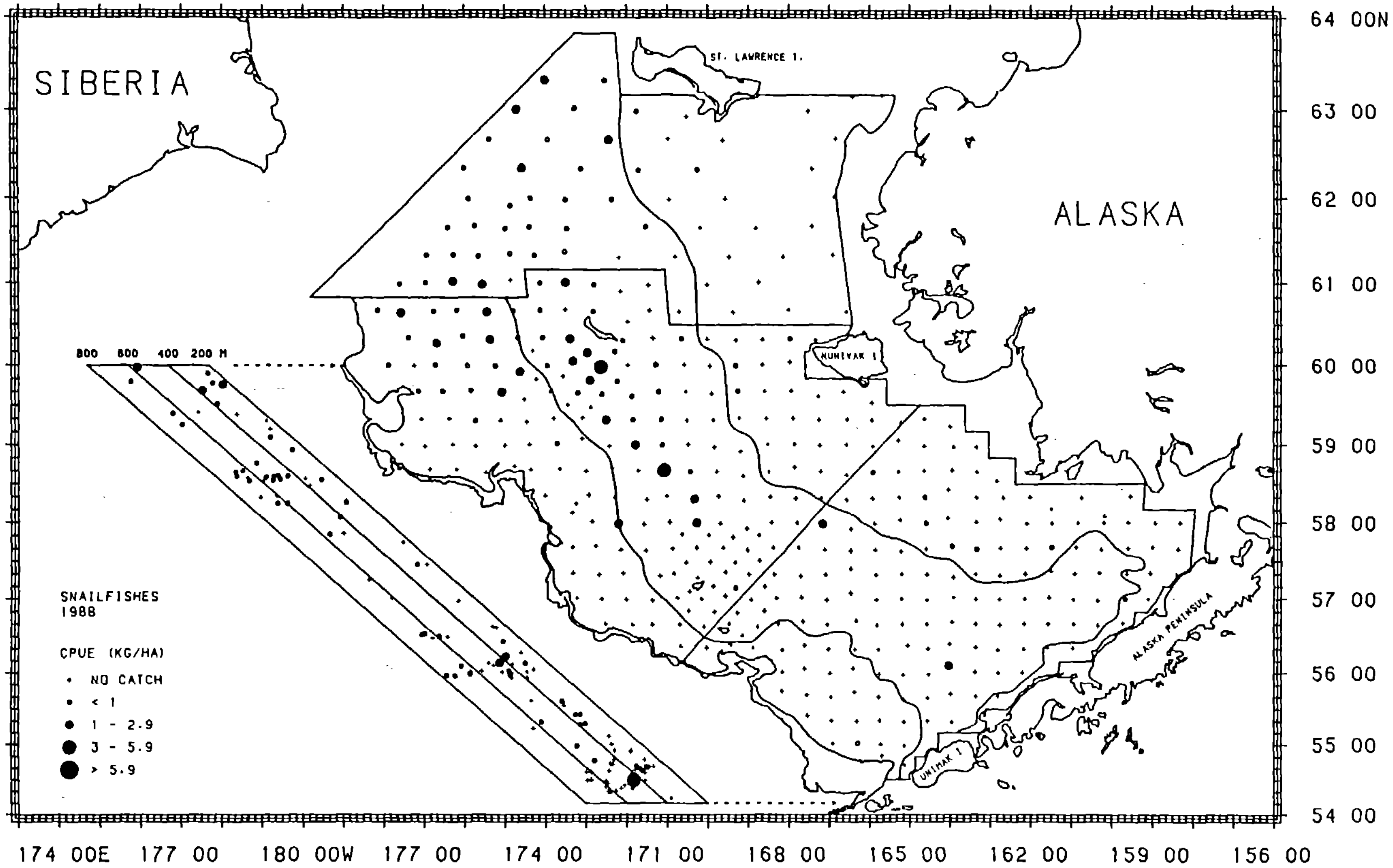

Figure 90.--Distribution and relative abundance of snailfishes in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 48.--Abundance estimates and mean size of snailfish by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.03	240	0.018	1,586,145	0.018	0.151	-*
2	< 50	0.02	62	0.005	521,541	0.006	0.120	-
3	50 - 100	0.04	395	0.030	498,514	0.006	0.793	-
4	50 - 100	0.31	3,387	0.254	5,620,880	0.062	0.603	-
5	100 - 200	0.01	27	0.002	118,260	0.001	0.227	-
6	100 - 200	0.33	3,164	0.237	10,532,413	0.117	0.300	-
Subareas combined		0.16	7,276	0.545	18,877,753	0.210	0.385	-
North Shelf								
7	< 50	0.03	251	0.019	3,300,185	0.037	0.076	-
8	50 - 200	0.64	5,271	0.395	66,851,502	0.743	0.079	-
Subareas combined		0.36	5,522	0.413	70,151,687	0.779	0.079	-
Slope								
9	200 - 500	0.28	220	0.016	210,408	0.002	1.043	-
10	200 - 500	0.35	200	0.015	393,443	0.004	0.508	-
11	500 - 800	0.12	54	0.004	150,823	0.002	0.356	-
12	500 - 800	0.26	87	0.007	247,316	0.003	0.354	-
Subareas combined		0.27	560	0.042	1,001,991	0.011	0.559	-
All subareas combined		0.21	13,358	1.000	90,031,431	1.000	0.148	-

* - indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

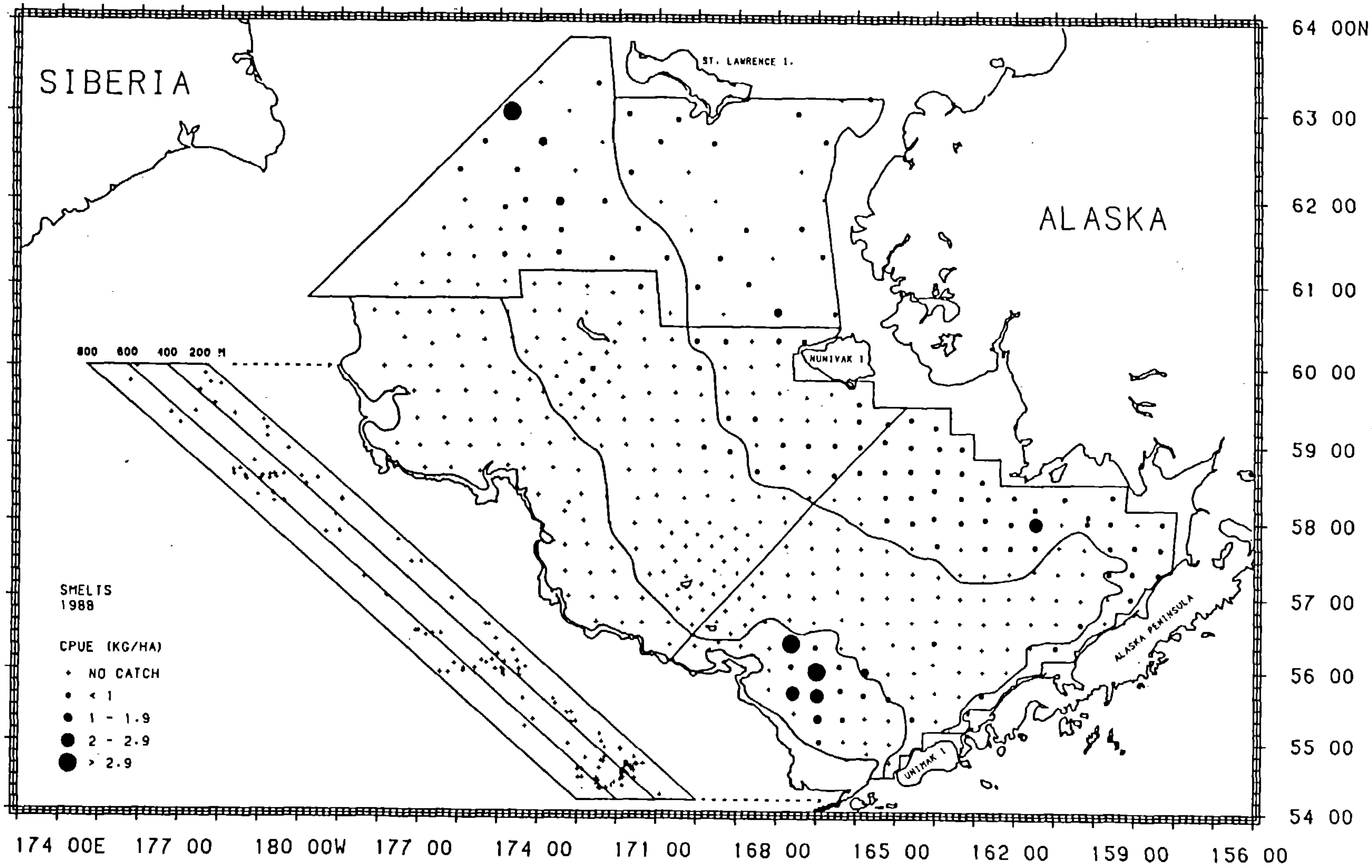

Figure 91 .--Distribution and relative abundance of smelts in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 49.--Abundance estimates and mean size of smelts by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.28	2,166	0.224	126,422,035	0.316	0.017	-[b]
2	< 50	0.14	590	0.061	33,507,114	0.084	0.018	-
3	50 - 100	0.03	359	0.037	5,128,161	0.013	0.070	-
4	50 - 100	0.01	117	0.012	4,893,916	0.012	0.024	-
5	100 - 200	0.61	2,368	0.244	47,812,355	0.119	0.050	-
6	100 - 200	0.00	0[a]	0.000	0	0.000	0.000	-
Subareas combined		0.12	5,601	0.578	217,763,580	0.544	0.026	-
North Shelf								
7	< 50	0.23	1,691	0.175	51,249,375	0.128	0.033	-
8	50 - 200	0.29	2,378	0.246	131,190,144	0.328	0.018	-
Subareas combined		0.26	4,069	0.420	182,439,519	0.456	0.022	-
Slope								
9	200 - 500	0.02	16	0.002	220,322	0.001	0.075	-
10	200 - 500	0.00	0	0.000	0	0.000	0.000	-
11	500 - 800	0.00	0	0.000	0	0.000	0.000	-
12	500 - 800	0.00	0	0.000	0	0.000	0.000	-
Subareas combined		0.01	16	0.002	220,322	0.001	0.075	-
All subareas combined		0.15	9,686	1.000	400,423,421	1.000	0.024	-

[a]0 indicates fishing but no catch.
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

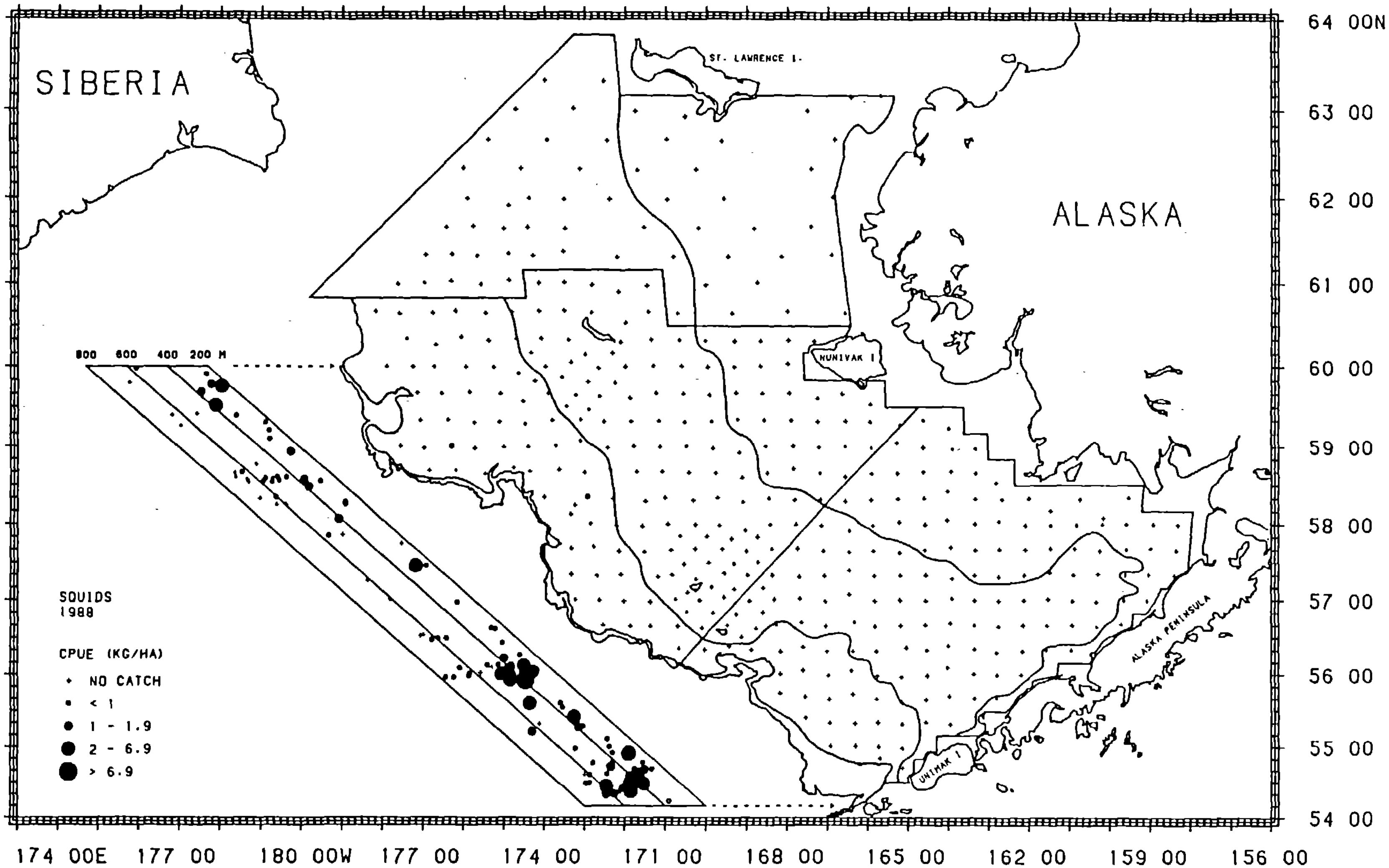

Figure 92.--Distribution and relative abundance of squids in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 50. --Abundance estimates and mean size of squids by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	<0.01	4	0.002	45,695	0.007	0.091	-
4	50 - 100	0	0	0	0	0	-	-
5	100 - 200	<0.01	2	0.001	54,479	0.008	0.045	-
6	100 - 200	0.01	98	0.043	1,101,485	0.158	0.089	-
Subareas combined		<0.01	104	0.046	1,201,659	0.173	0.087	-
North Shelf								
7	< 50	0	0	0	0	0	-	-
8	50 - 200	0	0	0	0	0	-	-
Subareas combined		0	0	0	0	0	-	-
Slope								
9	200 - 500	1.49	1,157	0.509	3,105,623	0.446	0.373	-
10	200 - 500	1.03	579	0.255	1,547,535	0.222	0.374	-
11	500 - 800	0.89	391	0.172	984,125	0.141	0.398	-
12	500 - 800	0.13	42	0.018	123,639	0.018	0.336	-
Subareas combined		1.03	2,169	0.954	5,760,923	0.827	0.377	-
All subareas combined		0.04	2,274	1.000	6,962,582	1.000	0.327	-

[a]0 indicates fishing but no catch;
[b]- indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

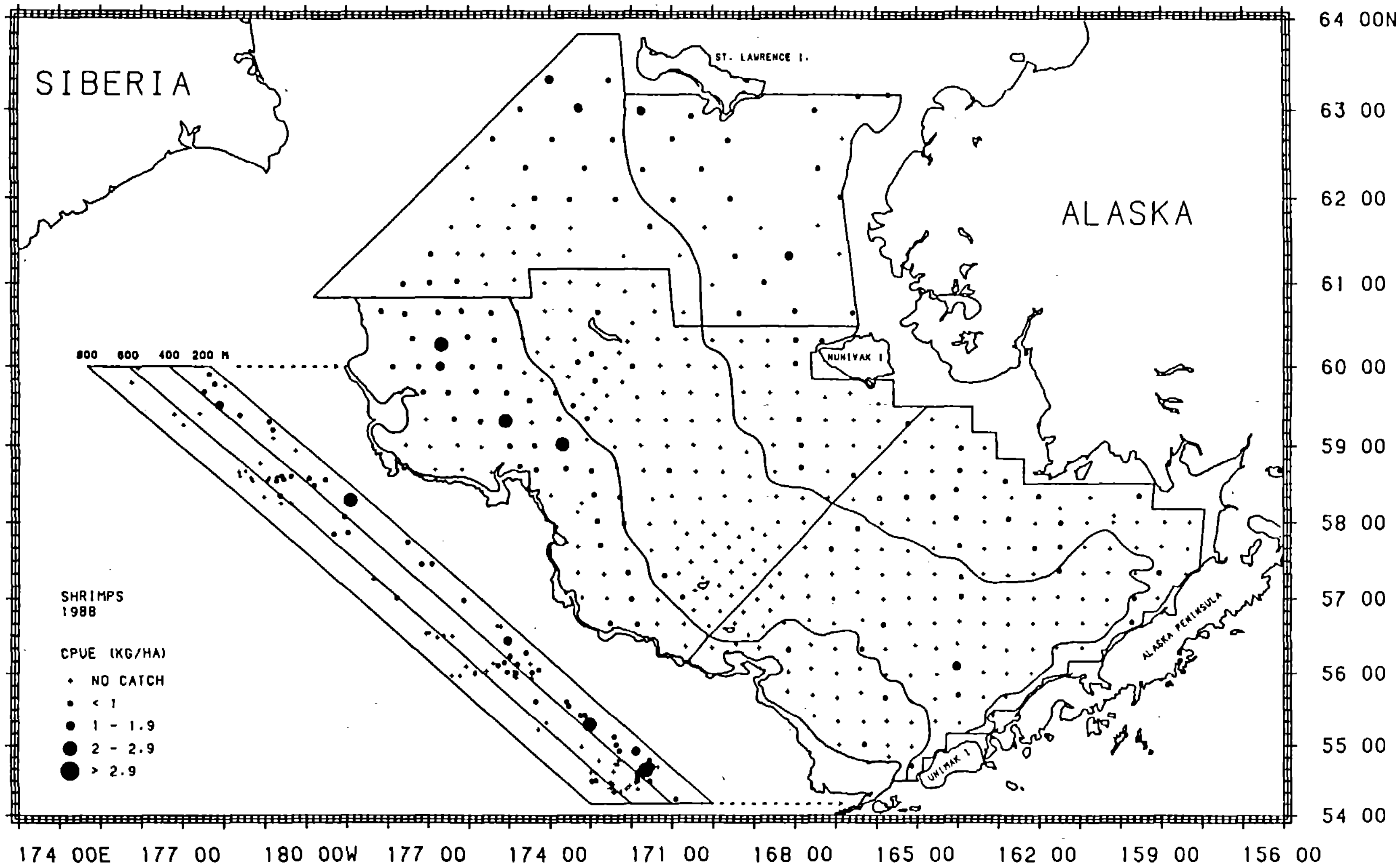

Figure 93.--Distribution and relative abundance of shrimps in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 51.--Abundance estimates and mean size of shrimps by subarea from the 1988 U.S.- Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0.05	376	0.040	53,333,007	0.086	0.007	-*
2	< 50	0.07	299	0.032	79,664,962	0.128	0.004	-
3	50 - 100	0.05	502	0.054	10,992,095	0.018	0.046	-
4	50 - 100	0.02	191	0.020	16,458,805	0.027	0.012	-
5	100 - 200	0.04	145	0.016	15,789,367	0.025	0.009	-
6	100 - 200	0.30	2,859	0.307	168,824,755	0.272	0.017	-
Subareas combined		0.09	4,372	0.469	345,062,991	0.556	0.013	-
North Shelf								
7	< 50	0.29	2,099	0.225	109,888,126	0.177	0.019	-
8	50 - 200	0.27	2,249	0.241	130,943,335	0.211	0.017	-
Subareas combined		0.28	4,348	0.467	240,831,461	0.388	0.018	-
Slope								
9	200 - 500	0.45	347	0.037	22,314,143	0.036	0.016	-
10	200 - 500	0.37	209	0.022	10,342,601	0.017	0.020	-
11	500 - 800	0.07	29	0.003	1,353,315	0.002	0.022	-
12	500 - 800	0.07	22	0.002	920,073	0.001	0.024	-
Subareas combined		0.29	608	0.065	34,930,132	0.056	0.017	-
All subareas combined		0.15	9,328	1.000	620,824,583	1.000	0.015	-

*indicates no catch or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

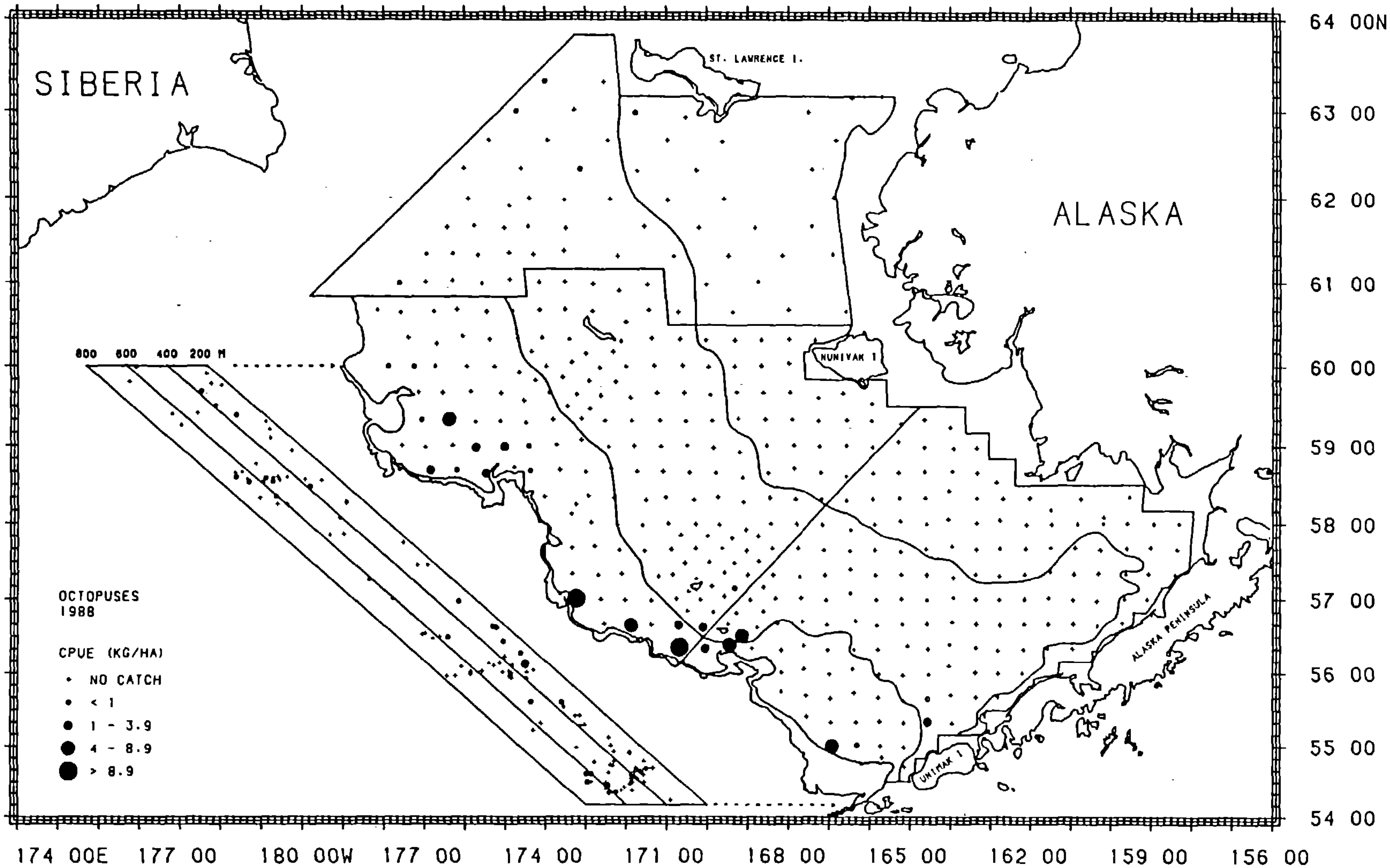

Figure 94.--Distribution and relative abundance of octopuses in the eastern Bering Sea as shown by the 1988 U.S.-Japan bottom trawl survey.

Table 52.--Abundance estimates and mean size of octopuses by subarea from the 1988 U.S.-Japan bottom trawl surveys in the eastern Bering Sea.

Subarea	Depth interval (m)	Mean CPUE (kg/ha)	Estimated biomass (t)	Proportion of estimated biomass	Estimated population numbers	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
Eastern Bering Sea Shelf								
1	< 50	0[a]	0	0	0	0	-[b]	-
2	< 50	0	0	0	0	0	-	-
3	50 - 100	0.09	943	0.089	297,700	0.048	3.169	-
4	50 - 100	0.03	301	0.028	126,436	0.020	2.383	-
5	100 - 200	0.51	1,987	0.187	250,384	0.040	7.936	-
6	100 - 200	0.75	7,136	0.670	4,112,625	0.662	1.735	-
Subareas combined		0.22	10,368	0.974	4,787,145	0.770	2.166	-
North Shelf								
7	< 50	0.00	30	0.003	195,315	0.031	0.151	-
8	50 - 200	0.02	141	0.013	1,088,307	0.175	0.130	-
Subareas combined		0.01	171	0.016	1,283,621	0.207	0.133	-
Slope								
9	200 - 500	0.04	29	0.003	17,614	0.003	1.655	-
10	200 - 500	0.09	48	0.005	66,194	0.011	0.729	-
11	500 - 800	0.03	12	0.001	42,000	0.007	0.283	-
12	500 - 800	0.06	19	0.002	19,188	0.003	0.995	-
Subareas combined		0.05	108	0.010	144,995	0.023	0.748	-
All subareas combined		0.17	10,647	1.000	6,215,762	1.000	1.713	-

[a]0 indicates fishing but no catch; [b]- indicates no fishing or no sample.
Note: Differences in totals and sums of biomass and population numbers by subarea are due to rounding.

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APPENDIX A

Schematic Diagrams of Trawls Used During the 1988 U.S.-Japan Eastern Bering Sea Surveys

List of Figures

83-112 EASTERN BOTTOM TRAWL

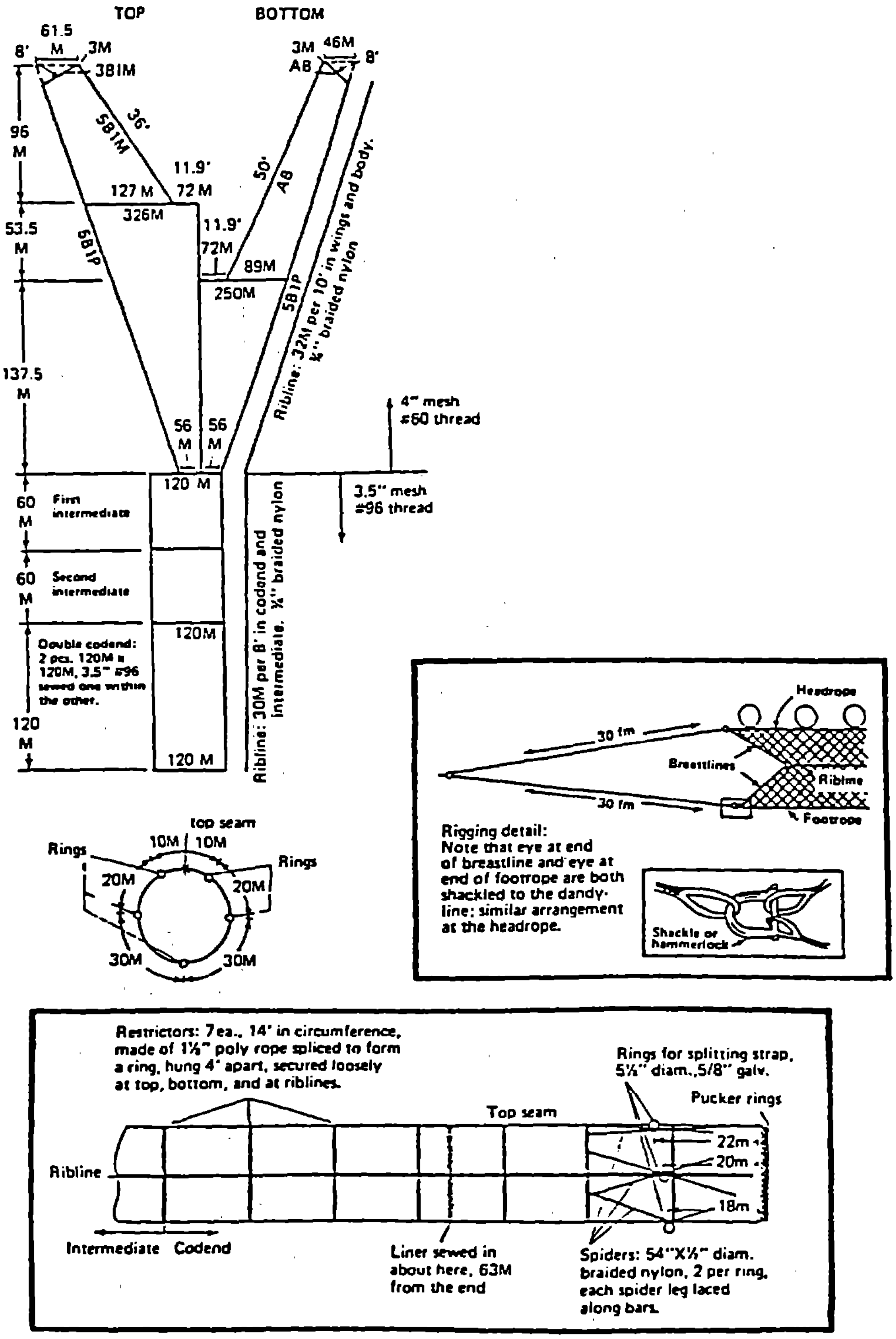

Figure A-1.--Schematic diagram of the 83-112 Eastern bottom trawl used by U.S. vessels on the continental shelf during the 1988 survey.

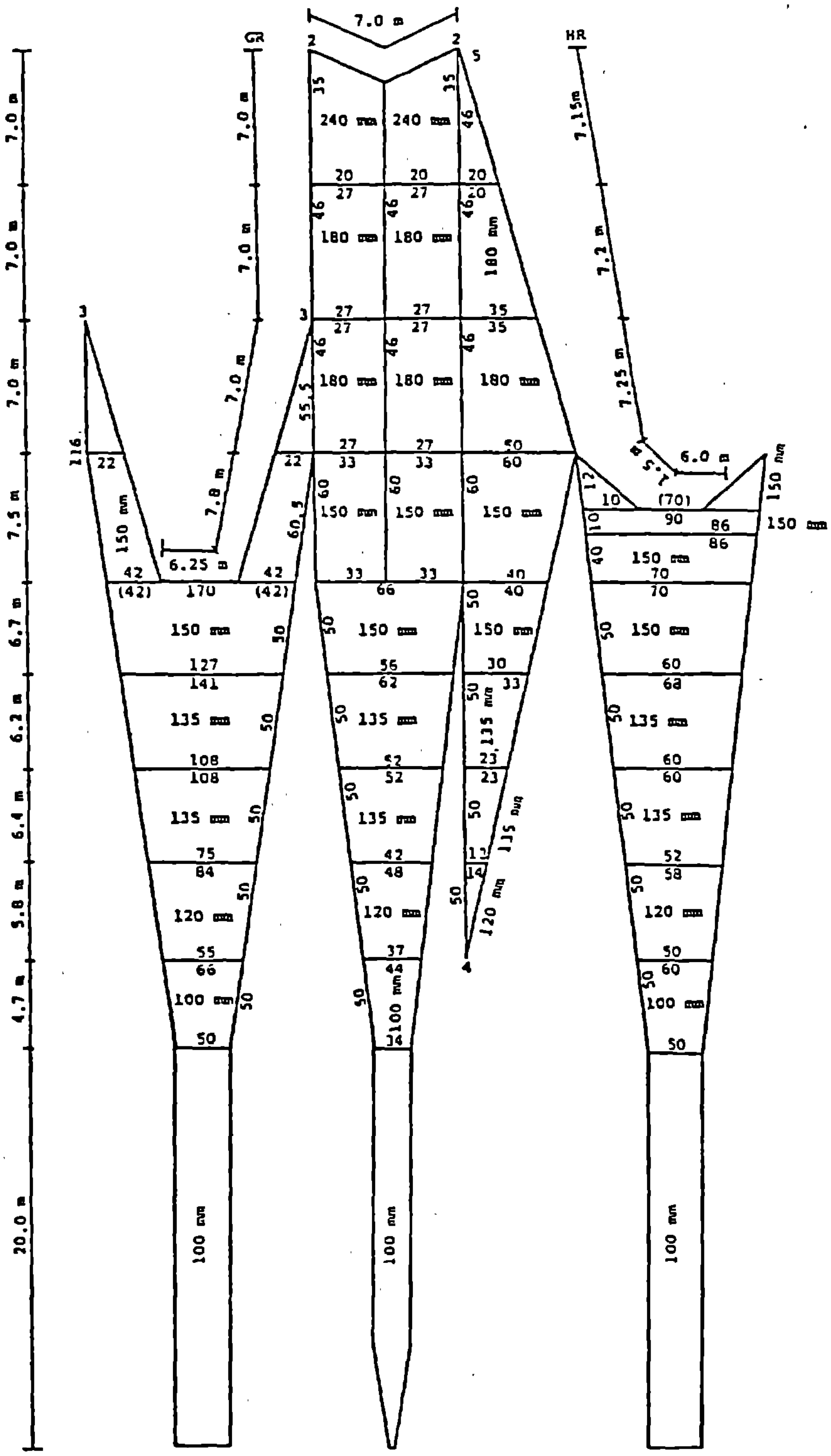

Figure A-2a.--Schematic diagram of the bottom trawl used on the Japanese vessel Tomi Maru No. 51 during the 1988 survey.

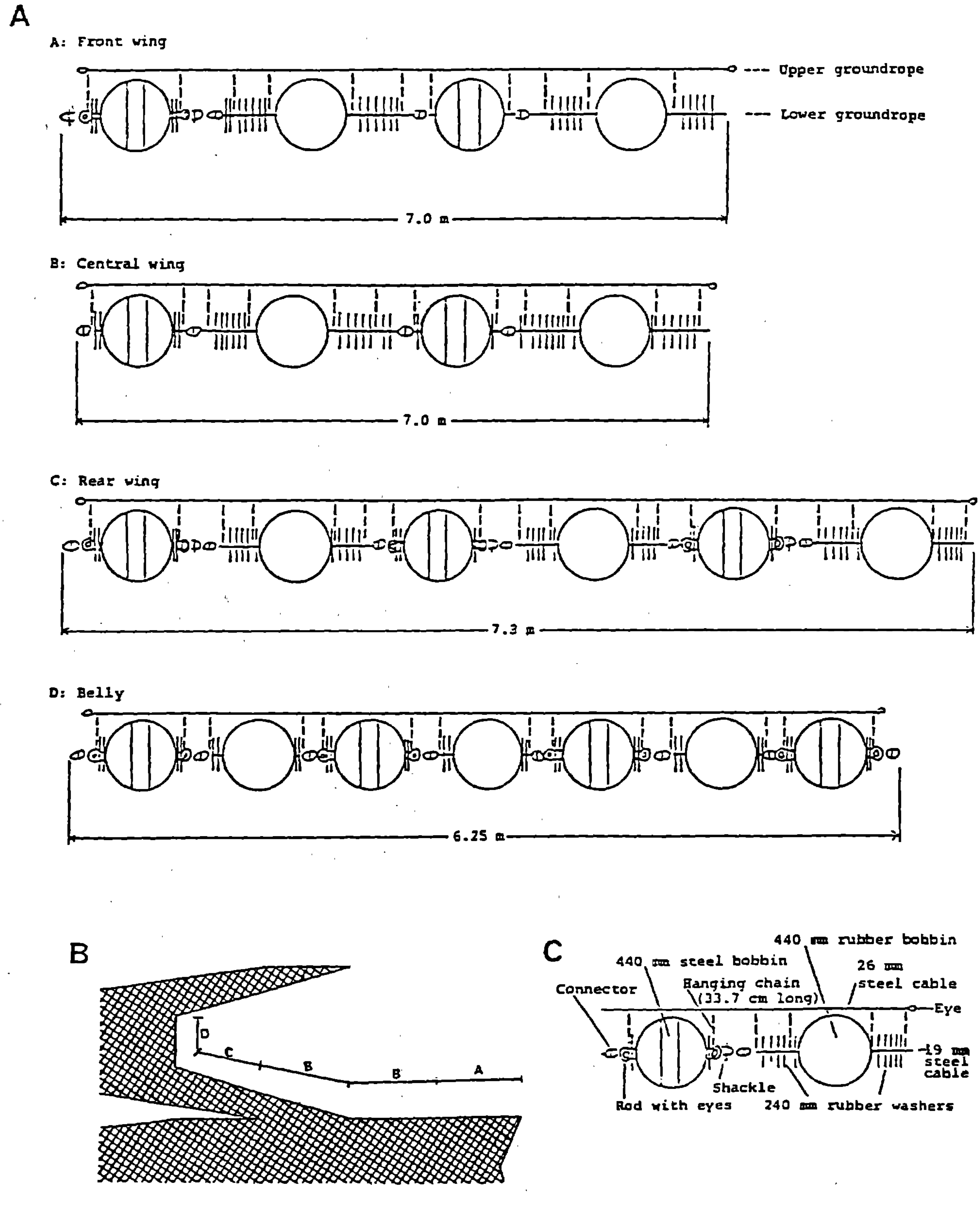

Figure A-2b.--Schematic diagram of the lower and upper ground-rope used on the bottom trawl of the Japanese vessel Tomi Maru No. 51.

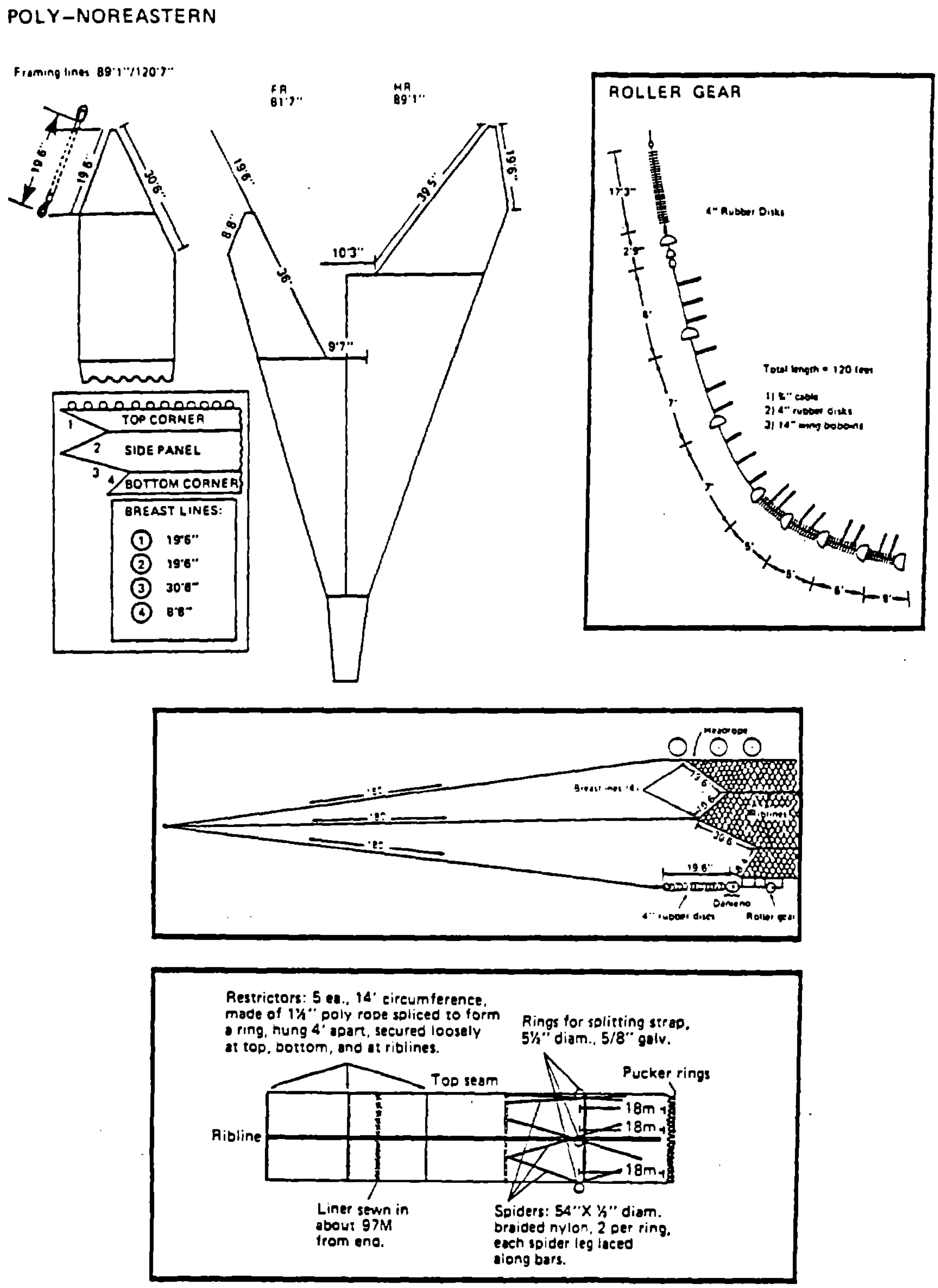

Figure A-3.--Schematic diagram of the Nor'eastern trawl used by the NOAA vessel Miller Freeman on the continental slope during the 1988 survey.

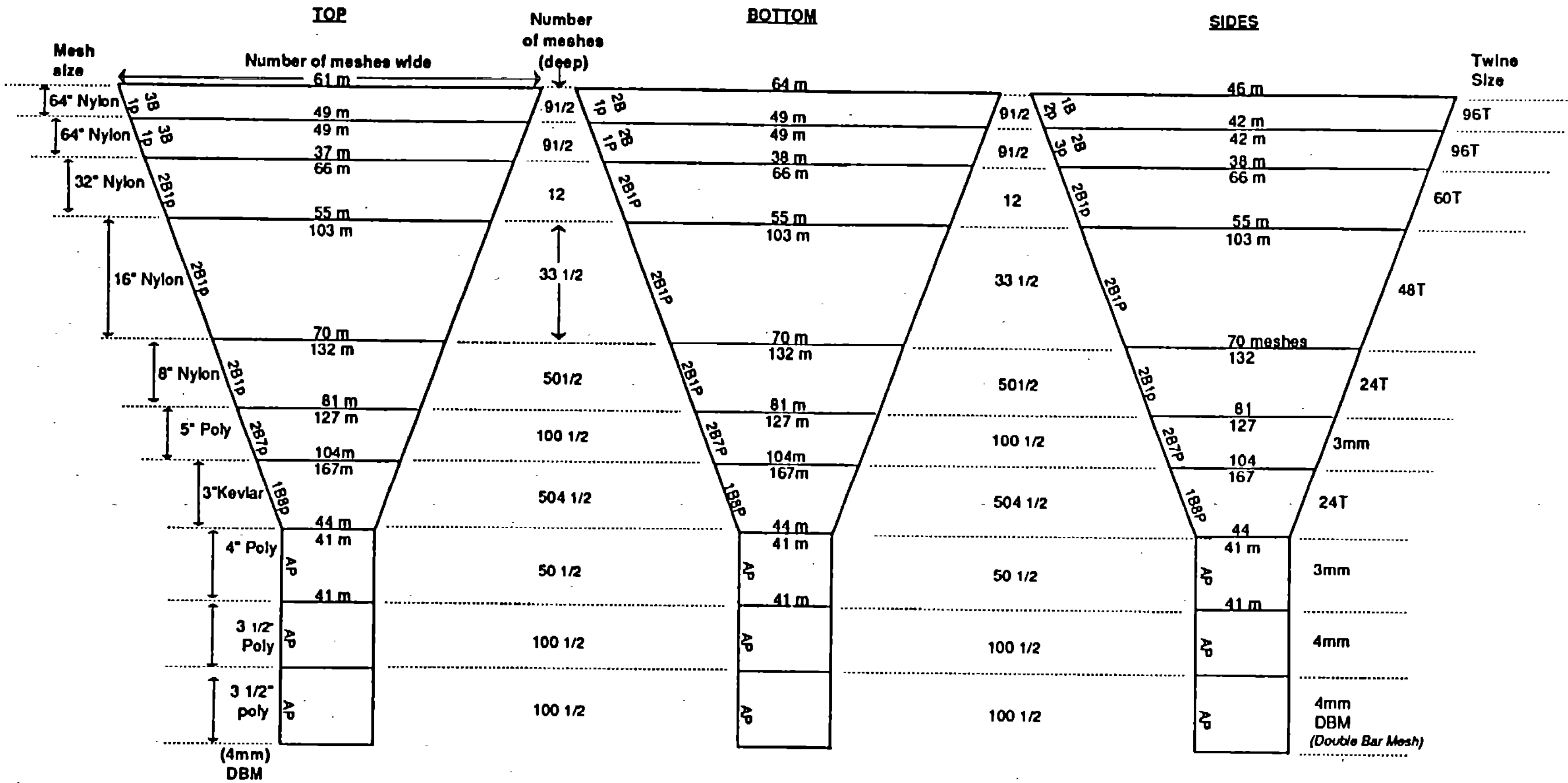

Figure A-4a.--Schematic diagram of the Northern Gold trawl used to sample age-l and older walleye pollock during the 1988 midwater survey aboard the <u>Pelagos</u>.

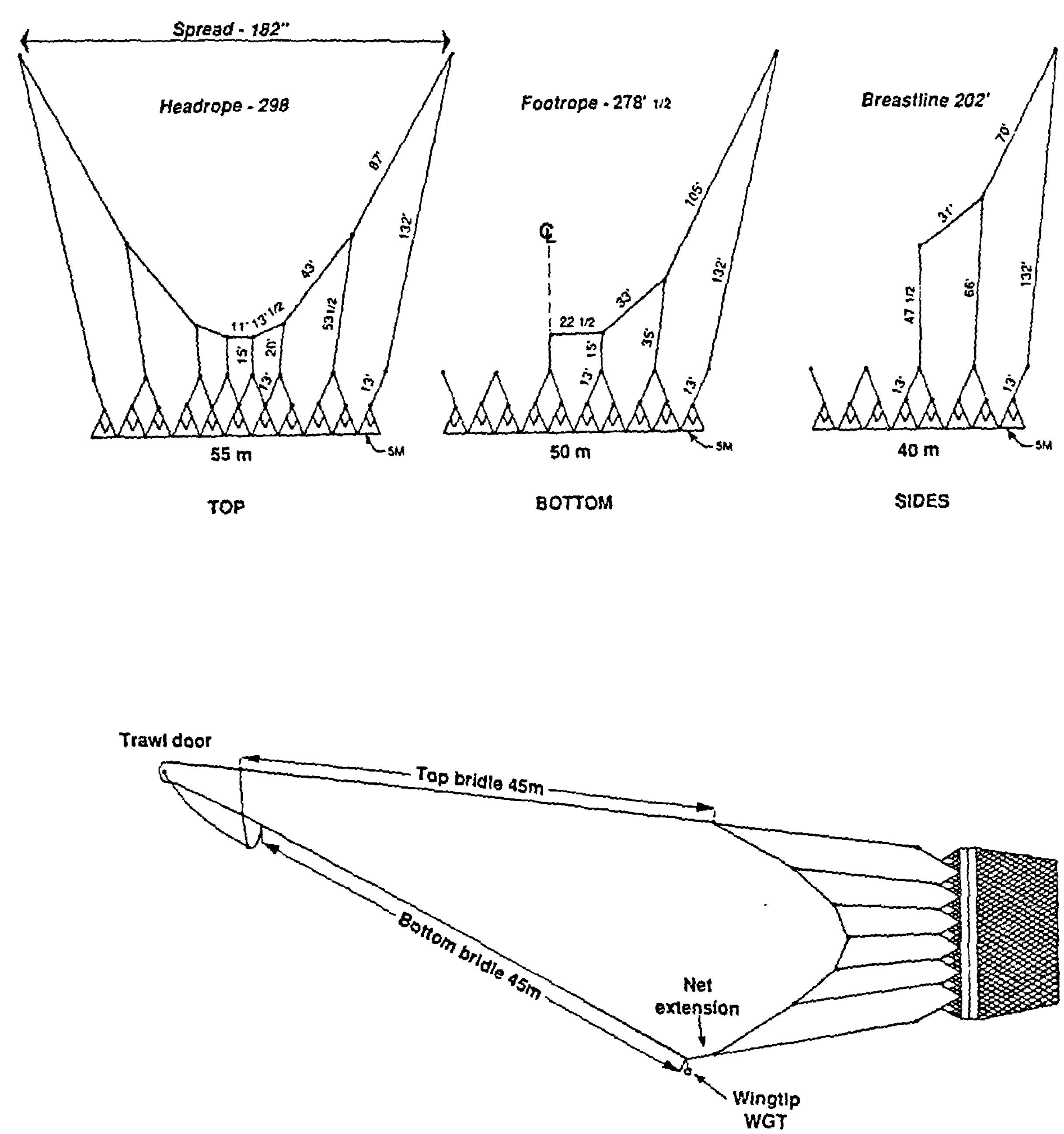

Figure A-4b. --Schematic diagram of the rigging for the headrope, footrope, and breastlines (above} and the bridles (below) for the Northern fold trawl used during the midwater survey on the Pelagos.

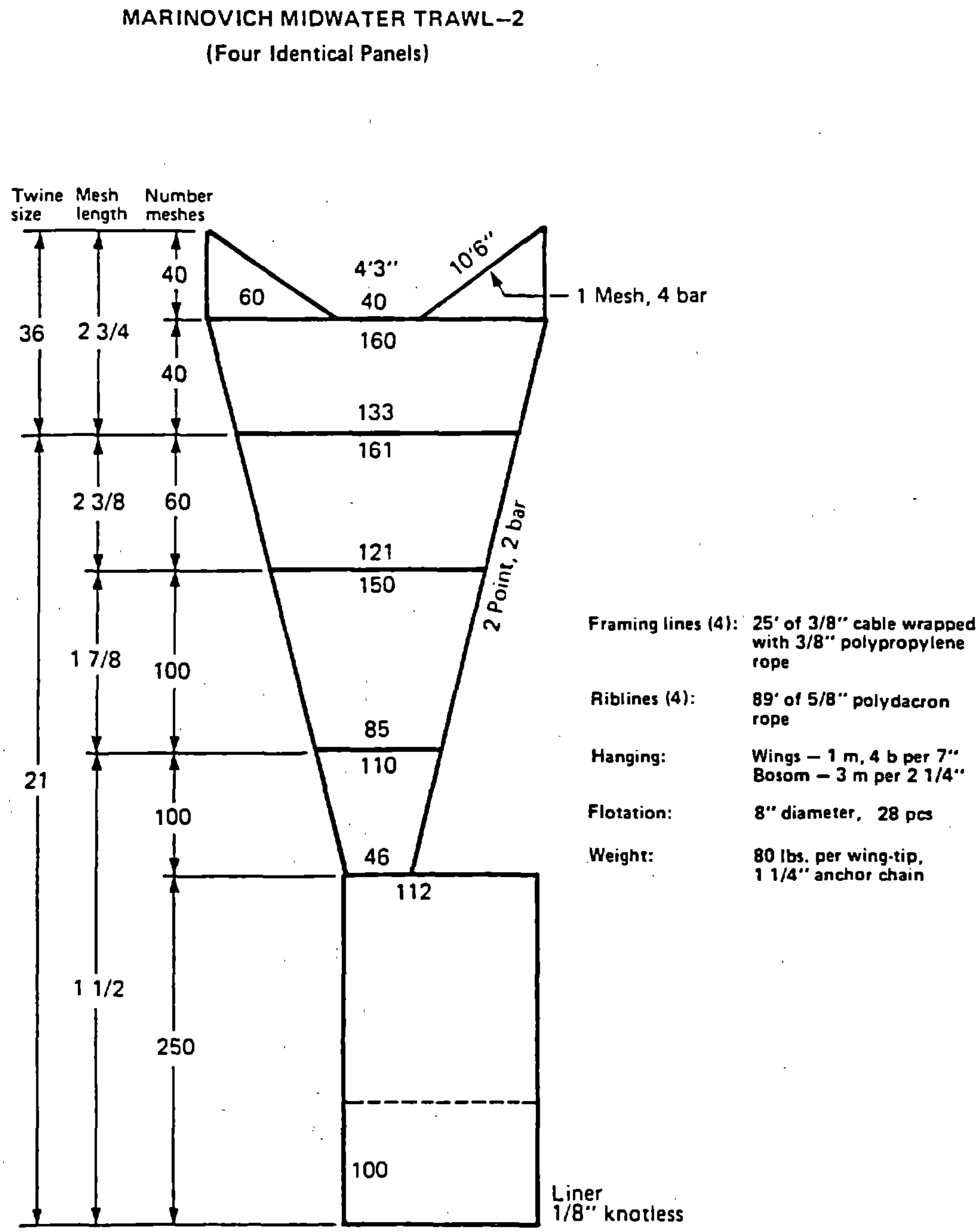

Figure A-5.--Schematic diagram of the Marinovich midwater trawl used during the 1988 midwater survey to sample age-0 walleye pollock aboard the Pelagos.

APPENDIX B

Station Data from the 1988 U.S.-Japan Eastern Bering Sea Surveys

Appendix B contains listings of station data for all trawl stations completed during the 1988 surveys.

In using the tables the following should be noted:

Time represents the nearest hour at the start of the tow.

List of Tables

Table B-1.--Station data for the chartered vessel Alaska during the 1988 bottom trawl survey.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
1	6/ 4/88	57	20	158	26	17	7	0.50	1.36	10	4.6	4.6
2	6/ 4/88	57	40	158	23	19	10	0.50	1.34	10	4.6	3.6
3	6/ 4/88	58	1	158	20	17	13	0.50	1.48	10	5.7	4.5
4	6/ 4/88	58	1	158	57	21	16	0.50	1.44	10	7.2	3.2
5	6/ 5/88	58	41	159	52	11	16	0.33	0.95	-9	8.2	-9.0
6	6/ 5/88	58	40	159	33	7	18	0.33	1.09	-9	8.7	8.4
7	6/ 6/88	58	31	159	53	13	6	0.33	0.88	-9	5.1	4.4
8	6/ 6/88	58	31	159	35	11	8	0.33	1.02	-9	5.6	4.9
9	6/ 6/88	58	21	159	34	12	10	0.50	1.49	10	6.2	5.7
10	6/ 6/88	58	1	159	37	22	12	0.50	1.43	10	6.8	3.3
11	6/ 6/88	57	41	159	38	26	15	0.50	1.49	10	5.2	4.0
12	6/ 6/88	57	21	159	39	30	18	0.50	1.52	10	5.6	3.6
13	6/ 7/88	57	1	159	42	30	7	0.50	1.53	10	4.4	3.5
14	6/ 7/88	56	41	160	58	37	12	0.50	1.45	30	6.9	2.2
15	6/ 7/88	56	21	160	59	28	16	0.50	1.41	10	6.6	3.5
16	6/ 8/88	56	60	160	58	33	15	0.50	1.45	30	5.4	2.5
17	6/ 8/88	57	21	160	56	33	18	0.50	1.50	30	6.0	2.7
18	6/ 9/88	57	42	160	55	30	6	0.50	1.52	30	5.0	2.2
19	6/ 9/88	57	60	160	52	23	9	0.50	1.54	10	4.3	3.4
20	6/ 9/88	58	20	160	46	10	11	0.50	1.61	10	7.7	7.1
21	6/ 9/88	58	21	162	3	25	16	0.50	1.44	10	4.9	3.8
22	6/10/88	57	60	162	8	20	6	0.50	1.43	10	3.9	3.1
23	6/10/88	57	41	162	8	25	9	0.50	1.48	10	4.2	3.3
24	6/10/88	57	21	162	10	27	12	0.50	1.51	10	5.2	2.4
25	6/10/88	57	1	162	10	33	15	0.50	1.48	30	6.3	2.1
26	6/10/88	56	41	162	11	40	18	0.50	1.42	30	7.4	1.2
27	6/11/88	56	20	162	12	41	6	0.50	1.54	30	7.0	2.2
28	6/11/88	56	1	162	14	34	9	0.50	1.50	30	7.8	3.4
29	6/11/88	55	41	163	24	43	14	0.50	1.54	30	-9.0	2.8
30	6/11/88	56	1	163	24	48	17	0.50	1.53	30	9.2	2.4
31	6/12/88	56	22	163	24	46	6	0.50	1.45	30	7.3	1.8
32	6/12/88	56	41	163	23	40	9	0.50	1.48	30	7.2	1.4
33	6/12/88	57	1	163	24	35	12	0.50	1.52	30	7.1	0.5
34	6/12/88	57	21	163	24	27	14	0.50	1.55	10	6.4	1.8
35	6/12/88	57	40	163	22	24	17	0.50	1.61	10	5.8	2.4
36	6/13/88	58	1	163	23	23	6	0.50	1.60	10	3.8	3.0
37	6/13/88	58	20	163	22	19	9	0.50	1.56	10	4.3	3.5
38	6/13/88	58	40	163	21	16	11	0.50	1.45	10	4.9	3.7
39	6/13/88	58	59	163	22	11	14	0.50	1.49	10	5.9	4.4
40	6/15/88	59	11	163	22	8	11	0.50	1.60	-9	7.6	-9.0
41	6/15/88	59	20	163	40	7	12	0.50	1.53	-9	8.1	7.1
42	6/15/88	59	30	164	1	8	14	0.50	1.57	-9	8.1	8.1
43	6/15/88	59	21	164	39	11	17	0.50	1.58	10	7.1	6.1
44	6/16/88	58	60	164	39	14	6	0.50	1.45	10	4.8	4.0
45	6/16/88	58	41	164	39	19	9	0.50	1.49	10	4.3	3.2

Table B-1.--Station data Alaska Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
46	6/16/88	58	21	164	38	23	12	0.50	1.47	10	4.3	2.7
47	6/16/88	58	1	164	37	24	15	0.50	1.63	10	4.5	2.8
48	6/16/88	57	41	164	37	28	17	0.50	1.53	10	6.1	1.7
49	6/17/88	57	21	164	36	35	6	0.50	1.44	30	6.1	0.5
50	6/17/88	56	60	164	36	38	10	0.50	1.45	30	6.5	0.5
51	6/17/88	56	41	164	36	40	13	0.50	1.58	30	7.5	1.5
52	6/17/88	56	21	164	34	47	15	0.50	1.57	30	8.7	1.3
53	6/17/88	55	60	164	33	50	18	0.50	1.48	30	8.7	2.6
54	6/18/88	55	40	164	35	52	6	0.50	1.50	30	7.0	2.9
55	6/18/88	55	21	164	36	56	9	0.50	1.56	30	6.9	4.2
56	6/18/88	54	51	165	43	84	16	0.50	1.55	50	7.0	3.8
57	6/18/88	55	1	165	45	70	19	0.50	1.65	50	7.1	3.9
58	6/19/88	55	21	165	47	65	8	0.50	1.50	50	6.6	3.7
59	6/19/88	55	41	165	49	64	10	0.50	1.56	50	7.1	4.0
60	6/19/88	55	60	165	47	57	13	0.50	1.48	30	7.1	4.0
61	6/19/88	56	20	165	49	50	16	0.50	1.53	30	7.2	2.1
62	6/19/88	56	40	165	51	42	18	0.50	1.47	30	7.2	1.8
63	6/20/88	56	60	165	52	38	6	0.50	1.43	30	6.1	0.6
64	6/20/88	57	20	165	53	36	9	0.50	1.54	30	6.1	0.9
65	6/20/88	57	40	165	54	34	12	0.50	1.58	30	5.9	1.6
66	6/20/88	57	60	165	54	30	16	0.50	1.46	10	6.3	2.2
67	6/20/88	58	20	165	57	23	18	0.57	1.66	10	6.2	2.4
68	6/21/88	58	40	165	56	19	6	0.52	1.44	10	4.0	2.9
69	6/21/88	58	60	165	56	15	9	0.50	1.46	20	4.2	3.7
70	6/21/88	59	20	165	58	12	12	0.50	1.63	20	5.6	4.8
71	6/21/88	59	33	165	58	12	14	0.50	1.65	20	6.9	5.6
72	6/21/88	59	41	166	40	14	17	0.50	1.52	20	7.1	5.7
73	6/22/88	59	20	166	34	14	7	0.50	1.45	20	4.6	4.5
74	6/22/88	59	1	166	35	17	9	0.50	1.49	20	4.0	3.5
75	6/25/88	55	1	166	56	85	14	0.50	1.45	50	6.6	3.7
76	6/25/88	55	21	166	59	76	18	0.50	1.46	50	7.6	3.5
77	6/26/88	55	40	166	59	74	6	0.50	1.39	50	7.1	3.4
78	6/26/88	55	60	167	1	73	9	0.50	1.52	50	7.0	3.4
79	6/26/88	56	20	167	3	61	12	0.50	1.56	50	6.9	3.3
80	6/26/88	56	40	167	5	51	15	0.50	1.60	30	8.0	2.9
81	6/26/88	56	60	167	5	40	17	0.50	1.53	30	7.7	1.6
82	6/27/88	57	20	167	7	38	6	0.50	1.49	30	7.1	0.4
83	6/27/88	57	40	167	8	36	9	0.50	1.56	30	5.8	0.4
84	6/27/88	57	60	167	11	34	12	0.50	1.49	30	5.2	0.9
85	6/27/88	58	20	167	12	27	15	0.50	1.58	20	5.8	2.0
86	6/27/88	58	40	167	13	23	17	0.50	1.62	20	5.7	2.6
87	6/28/88	58	60	167	15	20	6	0.50	1.56	20	5.2	3.2
88	6/28/88	59	20	167	16	16	9	0.50	1.53	20	5.5	4.9
89	6/28/88	59	37	167	17	15	11	0.50	1.50	20	6.0	4.5
90	6/28/88	60	20	167	22	16	16	0.50	1.46	20	7.5	5.7
91	6/29/88	60	20	168	41	18	6	0.50	1.56	20	5.2	3.6

Table B-l .--Station data Alaska Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
92	6/29/88	60	1	168	41	20	9	0.50	1.55	20	5.9	3.2
93	6/29/88	59	41	168	38	20	11	0.50	1.56	20	5.1	3.2
94	6/29/88	59	21	168	35	21	14	0.50	1.50	20	5.4	3.3
95	6/29/88	59	1	168	33	24	17	0.50	1.47	20	5.6	2.3
96	6/30/88	58	40	168	31	29	6	0.50	1.48	20	5.0	2.4
97	6/30/88	58	21	168	29	35	9	0.50	1.52	40	5.7	1.1
98	6/30/88	58	1	168	27	37	12	0.50	1.53	41	5.7	0.6
99	6/30/88	57	51	168	45	38	15	0.50	1.43	41	6.7	0.7
100	6/30/88	57	41	168	25	38	18	0.50	1.49	41	7.0	1.8
101	7/ 1/88	57	31	168	45	38	6	0.50	1.43	41	6.9	2.2
102	7/ 1/88	57	21	168	24	40	9	0.50	1.46	31	6.9	2.4
103	7/ 1/88	57	11	168	37	41	11	0.50	1.53	31	7.4	2.2
104	7/ 1/88	57	1	168	21	43	13	0.50	1.50	31	7.8	1.6
105	7/ 1/88	56	51	168	38	52	15	0.50	1.47	31	8.0	1.9
106	7/ 1/88	56	41	168	18	58	18	0.50	1.43	50	8.0	2.6
107	7/ 2/88	56	20	168	12	82	11	0.50	1.53	50	7.8	3.7
108	7/ 2/88	56	1	168	12	80	14	0.50	1.43	50	8.0	3.9
109	7/ 2/88	55	45	168	12	73	17	0.50	1.42	50	8.0	3.9
110	7/ 3/88	56	24	169	28	69	7	0.33	0.99	50	7.6	3.7
111	7/ 3/88	56	41	169	30	43	9	0.33	1.00	31	5.7	4.2
112	7/ 3/88	56	50	169	52	39	11	0.50	1.28	41	6.9	3.5
113	7/ 5/88	57	11	169	54	27	7	0.50	1.47	41	4.4	4.1
114	7/ 5/88	57	3	169	36	33	9	0.50	1.53	41	5.1	1.8
115	7/ 5/88	57	22	169	35	35	15	0.50	1.38	41	7.2	1.8
116	7/ 5/88	57	30	169	58	37	18	0.50	1.42	41	7.2	1.1
117	7/ 6/88	57	41	169	38	37	6	0.50	1.52	41	7.0	1.9
118	7/ 6/88	57	50	169	24	34	8	0.50	1.53	41	7.5	2.0
119	7/ 6/88	57	60	169	42	37	11	0.50	1.63	41	7.4	0.9
120	7/ 6/88	58	21	169	45	37	13	0.50	1.54	40	6.8	0.9
121	7/ 6/88	58	40	169	48	36	16	0.50	1.46	40	6.4	1.2
122	7/ 6/88	58	59	169	51	34	18	0.50	1.47	40	6.5	1.7
123	7/ 7/88	59	20	169	53	32	6	0.50	1.50	40	6.5	1.6
124	7/ 7/88	59	39	169	56	30	9	0.50	1.54	40	6.2	1.5
125	7/ 7/88	59	60	169	59	28	12	0.50	1.52	40	6.5	1.6
126	7/ 7/88	60	20	170	3	27	14	0.50	1.59	20	6.7	1.2
127	7/ 8/88	60	59	171	29	32	7	0.50	1.52	40	6.7	-0.5
128	7/ 8/88	60	41	171	27	33	9	0.50	1.48	40	6.4	0.2
129	7/ 8/88	60	21	171	22	35	12	0.50	1.44	40	6.5	-0.7
130	7/ 8/88	60	1	171	19	37	14	0.50	1.37	40	6.8	-0.4
131	7/ 8/88	59	41	171	14	39	17	0.50	1.72	40	8.0	-0.3
132	7/ 9/88	59	20	171	11	40	6	0.50	1.53	40	8.0	-0.2
133	7/ 9/88	58	60	171	9	41	9	0.50	1.48	40	8.0	-0.5
134	7/ 9/88	58	41	171	6	44	12	0.50	1.48	40	8.0	-1.1
135	7/ 9/88	58	21	171	2	45	14	0.50	1.51	40	8.5	-0.3
136	7/ 9/88	58	1	170	58	46	17	0.50	1.64	41	9.1	2.1
137	7/10/88	57	41	170	54	46	6	0.50	1.53	41	8.5	2.7

Table B-l .--Station data Alaska Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
138	7/10/88	57	21	170	52	44	9	0.50	1.52	41	8.4	3.4
139	7/10/88	57	2	170	47	51	17	0.50	1.59	41	9.7	3.2
140	7/11/88	56	40	170	44	62	6	0.50	1.57	60	8.3	3.4
141	7/11/88	56	22	170	42	64	9	0.50	1.59	60	8.2	3.9
142	7/11/88	56	40	171	54	68	14	0.58	1.63	60	8.1	3.8
143	7/11/88	56	60	172	2	64	17	0.50	1.45	60	8.4	3.7
144	7/12/88	57	21	172	7	59	7	0.50	1.62	60	8.4	3.1
145	7/12/88	57	40	172	10	58	10	0.50	1.41	60	8.3	2.5
146	7/12/88	57	60	172	13	56	18	0.33	1.04	60	8.6	2.0
147	7/13/88	58	21	172	19	56	7	0.50	1.43	60	8.5	1.8
148	7/13/88	58	43	172	23	55	10	0.50	1.49	60	8.1	1.0
149	7/13/88	58	60	172	26	53	13	0.50	1.45	40	7.6	0.5
150	7/13/88	59	20	172	32	47	15	0.50	1.46	42	7.4	-0.9
151	7/14/88	57	42	173	21	77	6	0.50	1.40	60	8.5	3.6
152	7/14/88	57	21	173	21	66	9	0.33	0.95	60	8.3	3.5
153	7/14/88	57	1	173	15	76	12	0.50	1.45	60	8.1	3.5
154	7/20/88	59	50	172	55	43	7	0.50	1.45	42	7.2	-1.0
155	7/20/88	59	60	172	40	36	9	0.50	1.48	42	7.2	-0.1
156	7/20/88	60	10	172	59	31	12	0.50	1.51	42	7.4	-9.0
157	7/20/88	60	40	172	50	23	16	0.50	1.42	40	5.2	2.9
158	7/20/88	60	60	172	49	36	19	0.50	1.61	40	7.4	-0.5
159	7/21/88	61	40	173	30	37	7	0.50	1.50	74	7.2	-1.6
160	7/21/88	61	60	173	31	32	10	0.50	1.58	74	7.3	-1.6
161	7/21/88	62	1	174	23	39	13	0.50	1.46	74	7.5	-1.6
162	7/21/88	61	41	174	25	42	16	0.50	1.48	74	7.6	-1.6
163	7/21/88	61	21	174	17	42	18	0.50	1.50	74	9.1	-1.6
164	7/22/88	61	1	174	9	45	7	0.50	1.51	40	-9.0	-1.5
165	7/22/88	60	41	174	9	47	10	0.50	1.47	40	7.8	-1.2
166	7/22/88	60	21	174	5	49	12	0.50	1.50	42	8.2	-1.3
167	7/22/88	60	11	174	20	55	14	0.50	1.49	42	9.0	0.3
168	7/22/88	60	1	173	58	53	17	0.50	1.50	42	9.5	0.1
169	7/22/88	59	50	174	14	58	19	0.50	1.49	61	9.9	1.2
170	7/23/88	59	41	173	54	57	7	0.50	1.51	61	8.1	1.4
171	7/23/88	59	21	173	49	60	9	0.50	1.49	61	8.2	1.3
172	7/23/88	59	2	173	43	64	12	0.50	1.55	60	8.7	1.9
173	7/23/88	58	42	173	39	69	15	0.33	1.00	60	8.7	2.8
174	7/23/88	58	44	174	47	86	20	0.33	1.02	60	8.7	3.5
175	7/24/88	58	60	175	1	71	7	0.50	1.52	60	7.9	2.8
176	7/24/88	59	20	175	7	72	10	0.33	0.97	60	8.2	2.2
177	7/24/88	59	41	175	6	68	13	0.33	1.06	60	8.5	1.8
178	7/27/88	59	60	175	15	64	7	0.50	1.49	60	7.8	1.2
179	7/27/88	60	20	175	23	61	10	0.50	1.49	60	8.0	0.8
180	7/27/88	60	40	175	28	58	12	0.50	1.48	60	7.8	0.7
181	7/27/88	60	60	175	35	56	15	0.50	1.57	73	8.5	-1.0
182	7/27/88	61	20	175	40	53	18	0.50	1.57	74	-9.0	-1.1
183	7/28/88	61	60	175	55	51	7	0.50	1.51	74	7.1	-1.5

Table B-l .--Station data Alaska Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
184	7/28/88	61	41	175	46	52	10	0.50	1.42	74	7.2	-1.5
185	7/28/88	61	40	176	26	57	12	0.50	1.53	73	7.7	-0.4
186	7/28/88	61	21	176	57	63	16	0.50	1.51	73	9.1	1.5
187	7/28/88	61	1	176	58	66	19	0.50	1.34	73	8.5	0.5
188	7/29/88	60	40	176	46	71	7	0.50	1.45	60	8.2	1.5
189	7/29/88	60	17	176	42	75	11	0.50	1.40	60	8.6	1.4
190	7/29/88	60	1	176	44	77	14	0.50	1.55	60	9.6	2.0
191	7/29/88	59	41	176	33	74	17	0.50	1.54	60	9.8	2.1
192	7/29/88	59	21	176	24	74	20	0.50	1.51	60	9.9	2.9
193	7/30/88	59	1	176	18	75	8	0.50	1.48	60	9.2	2.5
194	7/30/88	58	42	176	13	75	11	0.50	1.52	60	9.3	2.9
195	8/ 1/88	56	2	163	27	48	12	0.25	0.75	-9	-9.0	-9.0
196	8/ 1/88	55	60	163	26	47	15	0.50	1.51	-9	-9.0	-9.0
197	8/ 1/88	55	60	163	21	47	16	0.50	1.48	-9	-9.0	-9.0
198	8/ 2/88	55	44	163	19	45	12	0.50	1.54	-9	-9.0	-9.0
199	8/ 2/88	55	44	163	14	44	14	0.50	1.56	-9	-9.0	-9.0
200	8/ 2/88	55	47	163	13	45	16	0.50	1.54	-9	-9.0	-9.0
201	8/ 4/88	55	46	163	18	46	12	0.50	1.53	-9	-9.0	-9.0
202	8/ 4/88	55	49	163	13	46	14	0.50	1.56	-9	-9.0	-9.0
203	8/ 4/88	55	48	163	10	46	16	0.50	1.29	-9	-9.0	-9.0
204	8/ 4/88	55	49	163	14	46	17	0.50	1.46	-9	-9.0	-9.0
205	8/ 4/88	55	48	163	18	46	18	0.50	1.66	-9	-9.0	-9.0
206	8/ 5/88	55	43	163	19	43	9	0.50	1.40	-9	-9.0	-9.0
207	8/ 5/88	55	43	163	18	43	11	0.50	1.51	-9	-9.0	-9.0
208	8/ 5/88	55	43	163	18	44	12	0.50	1.56	-9	-9.0	-9.0
209	8/ 5/88	55	44	163	18	44	14	0.50	1.57	-9	-9.0	-9.0
210	8/ 5/88	55	42	163	15	42	16	0.50	1.59	-9	-9.0	-9.0
211	8/ 5/88	55	42	163	13	41	17	0.50	1.52	-9	-9.0	-9.0
212	8/ 6/88	55	45	163	19	44	9	0.50	1.40	-9	10.6	-9.0
213	8/ 6/88	55	44	163	21	44	11	0.50	1.48	-9	-9.0	-9.0
214	8/ 6/88	55	45	163	22	45	12	0.50	1.58	-9	-9.0	-9.0
215	8/ 6/88	55	45	163	19	45	14	0.50	1.48	-9	-9.0	-9.0
216	8/ 6/88	55	45	163	18	46	15	0.50	1.62	-9	-9.0	-9.0
217	8/ 6/88	55	46	163	17	46	16	0.50	1.55	-9	-9.0	-9.0

[a] Hauls with a stratum designator of -9 were not used in the analysis due to bad performance, being outside the standard area, or part of another experiment.
[b] A value of -9.0 indicates no temperature was taken.

Table B-2.--Station data for the chartered vessel Ocean Hope 3 during the 1988 bottom trawl survey.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
1	6/ 3/88	55	60	161	59	28	15	0.50	1.64	-9	4.6	4.2
2	6/ 3/88	56	4	161	41	26	17	0.50	1.14	-9	4.0	4.2
3	6/ 3/88	56	13	161	29	30	20	0.50	1.57	-9	5.3	-9.0
4	6/ 4/88	56	22	160	55	30	7	0.50	1.57	-9	5.1	3.2
5	6/ 4/88	56	28	160	38	29	9	0.50	1.50	-9	5.3	-9.0
6	6/ 4/88	56	33	160	25	26	10	0.50	1.42	-9	5.1	-9.0
7	6/ 4/88	56	40	160	15	30	12	0.50	1.68	-9	4.5	3.6
8	6/ 4/88	56	42	159	45	21	16	0.50	1.67	10	4.9	4.2
9	6/ 5/88	57	1	159	7	20	6	0.50	1.60	10	4.2	4.4
10	6/ 5/88	57	21	159	5	28	9	0.50	1.45	10	3.1	3.4
11	6/ 5/88	57	42	159	1	25	13	0.50	1.79	10	3.7	4.4
12	6/ 6/88	58	43	160	3	16	7	0.33	0.93	-9	6.4	-9.0
13	6/ 6/88	58	6	160	12	26	15	0.50	1.93	10	3.4	3.2
14	6/ 6/88	58	1	160	13	28	17	0.50	1.58	10	4.1	2.9
15	6/ 6/88	57	40	160	17	31	20	0.50	1.85	30	-9.0	3.2
16	6/ 7/88	57	22	160	20	34	7	0.50	1.59	30	3.5	3.1
17	6/ 7/88	56	59	160	22	35	10	0.50	1.74	30	4.5	2.6
18	6/ 7/88	56	40	160	22	32	13	0.50	2.02	30	5.5	2.5
19	6/ 8/88	56	21	161	37	37	12	0.50	1.62	10	5.0	2.9
20	6/ 8/88	56	41	161	36	50	15	0.50	1.96	30	4.0	1.9
21	6/ 8/88	57	2	161	34	38	18	0.50	1.86	30	5.4	1.9
22	6/ 9/88	57	23	161	32	32	7	0.50	2.03	30	4.6	2.3
23	6/ 9/88	57	42	161	31	29	9	0.50	1.82	10	3.8	3.0
24	6/ 9/88	57	60	161	30	30	12	0.50	1.65	10	3.3	2.7
25	6/ 9/88	58	18	161	26	20	14	0.50	1.69	-9	5.7	5.2
26	6/ 9/88	58	12	161	31	25	19	0.30	1.21	10	5.2	5.2
27	6/10/88	58	56	162	43	15	7	0.25	0.68	-9	-9.0	-9.0
28	6/10/88	59	18	162	43	14	11	0.33	1.33	-9	6.9	6.3
29	6/10/88	58	33	162	52	17	17	0.33	1.06	10	3.5	3.4
30	6/10/88	58	20	162	42	18	19	0.50	1.99	10	3.4	3.2
31	6/11/88	58	3	162	47	23	6	0.50	1.59	10	-9.0	-9.0
32	6/11/88	57	41	162	47	25	10	0.50	1.88	10	3.2	3.0
33	6/11/88	57	19	162	48	27	12	0.50	1.90	10	2.8	2.2
34	6/11/88	56	60	162	48	34	15	0.50	1.75	30	4.1	1.1
35	6/11/88	56	40	162	48	41	18	0.50	1.60	30	5.3	1.2
36	6/12/88	56	19	162	51	45	6	0.50	1.57	30	6.5	3.0
37	6/12/88	55	60	162	50	44	9	0.50	1.69	30	6.6	2.6
38	6/12/88	55	41	162	50	27	12	0.50	1.88	10	6.6	4.7
39	6/12/88	55	19	163	59	71	17	0.50	2.27	30	6.3	4.5
40	6/15/88	55	43	164	1	53	7	0.50	1.61	30	6.1	2.3
41	6/15/88	56	7	164	4	51	10	0.50	1.86	30	6.2	1.9
42	6/15/88	56	24	164	2	48	12	0.50	1.46	30	7.1	2.3
43	6/15/88	56	42	163	59	42	15	0.50	1.51	30	6.2	2.0
44	6/15/88	57	2	163	57	38	18	0.50	1.87	30	5.5	1.1
45	6/16/88	57	18	163	57	36	7	0.50	1.82	30	5.0	1.0

Table B-2.--Station data Ocean Hope 3 Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
46	6/16/88	57	43	163	59	41	10	0.50	1.80	10	3.5	2.2
47	6/16/88	58	4	164	4	26	13	0.50	1.76	10	2.8	2.6
48	6/16/88	58	26	164	4	22	15	0.50	1.63	10	3.6	3.5
49	6/16/88	58	41	163	58	19	18	0.50	1.57	10	5.0	4.8
50	6/17/88	58	59	163	56	15	7	0.50	1.91	10	5.5	5.0
51	6/17/88	59	15	164	2	13	9	0.50	2.09	10	6.4	6.0
52	6/17/88	59	18	165	14	13	13	0.33	1.02	20	4.3	4.2
53	6/17/88	59	4	165	18	15	15	0.50	1.69	10	3.5	3.5
54	6/17/88	58	40	165	18	22	18	0.50	2.18	10	4.0	3.0
55	6/18/88	58	20	165	17	25	6	0.50	1.68	10	4.0	3.0
56	6/18/88	58	3	165	15	28	9	0.50	1.57	10	3.6	3.2
57	6/18/88	57	38	165	15	35	12	0.50	1.00	30	5.2	0.7
58	6/18/88	57	20	165	14	38	14	0.50	1.74	30	6.0	0.9
59	6/18/88	57	1	165	14	40	17	0.50	1.69	30	6.0	1.3
60	6/18/88	56	40	165	13	43	19	0.50	1.64	30	6.2	1.0
61	6/19/88	56	23	165	5	48	7	0.50	1.58	30	6.4	1.6
62	6/19/88	55	59	165	12	55	10	0.50	1.75	30	6.8	3.4
63	6/19/88	55	38	165	11	62	12	0.50	1.72	50	6.5	3.5
64	6/19/88	55	20	165	11	62	15	0.50	1.98	50	7.0	4.2
65	6/19/88	54	59	165	10	62	18	0.50	1.67	50	6.5	4.2
66	6/19/88	54	43	165	9	47	20	0.50	1.47	30	6.5	4.1
67	6/20/88	55	2	166	19	80	7	0.50	1.68	50	6.0	3.9
68	6/20/88	55	21	166	21	75	9	0.50	1.98	50	7.2	3.7
69	6/20/88	55	45	166	24	73	12	0.50	1.70	50	6.7	5.0
70	6/20/88	56	3	166	25	69	15	0.50	1.59	-9	7.0	5.5
71	6/20/88	56	4	166	26	68	16	0.50	1.91	50	6.8	4.1
72	6/20/88	56	20	166	24	58	19	0.50	2.25	30	7.0	3.9
73	6/21/88	56	43	166	22	45	7	0.50	1.67	30	6.7	2.0
74	6/21/88	57	6	166	30	41	10	0.50	1.66	30	6.5	1.1
75	6/21/88	57	25	166	29	38	12	0.50	2.03	30	5.8	1.1
76	6/21/88	57	39	166	30	37	15	0.50	1.35	30	5.0	1.7
77	6/21/88	57	56	166	29	32	18	0.50	1.71	30	3.8	1.8
78	6/22/88	58	37	166	35	24	6	0.50	1.99	20	3.2	2.4
79	6/22/88	58	19	166	35	27	9	0.50	1.79	10	3.0	2.0
80	6/26/88	55	25	167	34	79	7	0.50	1.75	50	6.7	4.3
81	6/26/88	55	42	167	36	75	10	0.50	1.89	50	6.8	-9.0
82	6/26/88	56	4	167	39	76	13	0.50	2.12	50	6.8	4.0
83	6/26/88	56	23	167	39	70	15	0.50	1.71	50	8.1	3.5
84	6/26/88	56	43	167	41	53	18	0.50	1.82	30	9.9	2.6
85	6/27/88	57	2	167	43	43	7	0.50	1.65	30	6.8	1.8
86	6/27/88	57	19	167	44	41	9	0.50	1.62	30	6.5	1.0
87	6/27/88	57	42	167	47	35	12	0.50	1.68	30	5.7	1.5
88	6/27/88	58	1	167	49	37	15	0.58	1.75	40	5.0	0.7
89	6/27/88	58	20	167	50	34	17	0.50	2.13	40	5.6	1.6
90	6/28/88	58	44	167	52	25	7	0.50	1.61	20	4.8	2.9
91	6/28/88	59	1	167	53	23	9	0.50	1.70	20	4.8	3.0

Table B-2.--Station data Ocean Hope 3 Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
92	6/28/88	59	21	167	55	21	11	0.50	1.92	20	5.6	3.2
93	6/28/88	59	41	167	58	19	14	0.50	1.76	20	6.4	4.0
94	6/28/88	60	3	167	60	14	17	0.50	1.49	20	5.7	5.3
95	6/29/88	60	20	167	60	17	7	0.50	1.37	20	5.6	5.6
96	6/29/88	60	20	169	20	24	12	0.50	1.70	20	5.0	2.4
97	6/29/88	60	1	169	20	26	14	0.50	1.64	20	5.6	1.8
98	6/29/88	59	42	169	17	26	16	0.50	1.53	20	5.6	2.0
99	6/29/88	59	22	169	15	28	19	0.50	1.57	20	5.5	2.3
100	6/30/88	58	56	169	12	33	7	0.50	1.55	40	4.8	2.2
101	6/30/88	58	36	169	8	36	9	0.50	1.51	40	5.2	2.0
102	6/30/88	58	18	169	7	38	11	0.50	1.55	40	6.0	1.2
103	6/30/88	57	56	169	4	38	14	0.50	1.73	41	6.4	1.0
104	6/30/88	57	40	169	2	38	16	0.50	1.54	41	6.8	2.2
105	7/ 1/88	57	30	169	21	40	7	0.50	1.49	41	7.0	1.7
106	7/ 1/88	57	20	169	1	40	9	0.50	1.54	41	7.0	1.8
107	7/ 1/88	57	10	169	20	40	11	0.50	1.81	41	7.3	1.7
108	7/ 1/88	56	60	168	58	45	14	0.50	1.66	31	7.4	1.8
109	7/ 1/88	56	50	169	18	45	16	0.50	1.39	31	7.6	2.2
110	7/ 2/88	56	38	168	48	61	7	0.50	1.26	31	-9.0	-9.0
111	7/ 2/88	56	31	169	10	54	9	0.25	0.75	31	7.6	2.9
112	7/ 2/88	56	21	168	55	73	11	0.50	1.64	50	7.8	4.0
113	7/ 2/88	56	21	170	4	61	16	0.50	1.82	50	8.2	3.5
114	7/ 2/88	56	38	170	8	56	18	0.50	1.68	41	8.0	3.5
115	7/ 3/88	56	51	170	31	57	7	0.50	1.69	41	6.9	3.5
116	7/ 3/88	57	1	170	11	37	10	0.50	1.54	41	5.7	3.9
117	7/ 4/88	57	7	170	29	32	15	0.50	1.28	41	7.1	4.1
118	7/ 4/88	57	17	170	17	30	17	0.50	1.14	41	4.8	4.4
119	7/ 5/88	57	30	170	34	42	7	0.50	1.59	41	6.5	2.7
120	7/ 5/88	57	41	170	18	41	10	0.50	1.82	41	6.8	1.5
121	7/ 5/88	57	52	170	40	45	12	0.50	1.62	41	7.0	1.5
122	7/ 5/88	57	51	169	60	41	14	0.50	1.39	41	6.8	0.6
123	7/ 5/88	58	1	170	17	42	16	0.50	1.35	41	6.7	-0.2
124	7/ 6/88	58	19	170	21	42	7	0.50	1.44	40	6.5	-0.1
125	7/ 6/88	58	40	170	27	42	10	0.50	1.96	40	6.2	0.4
126	7/ 6/88	59	1	170	30	40	12	0.50	1.67	40	5.4	1.0
127	7/ 6/88	59	20	170	32	39	15	0.50	1.54	40	5.4	1.2
128	7/ 6/88	59	41	170	34	38	18	0.50	1.47	40	6.1	0.5
129	7/ 7/88	60	1	170	37	36	7	0.50	1.37	40	5.8	0.4
130	7/ 7/88	60	21	170	41	35	9	0.50	1.54	40	6.2	0.4
131	7/ 7/88	60	33	171	60	35	15	0.50	1.79	40	5.9	-0.8
132	7/ 7/88	60	55	172	10	36	18	0.50	1.58	40	5.8	-0.9
133	7/ 8/88	60	19	172	7	27	14	0.37	1.32	42	6.4	-0.5
134	7/ 8/88	60	11	172	19	32	16	0.50	1.22	42	5.9	1.9
135	7/ 8/88	60	1	171	60	37	18	0.50	1.31	42	7.3	-0.2
136	7/ 9/88	59	49	172	15	43	7	0.50	1.47	42	7.1	-1.0
137	7/ 9/88	59	37	171	54	44	9	0.50	1.65	42	7.6	-0.7

Table B-2.--Station data Ocean Hope 3 Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
138	7/ 9/88	59	20	171	52	45	11	0.50	1.46	42	8.1	-1.0
139	7/ 9/88	59	1	171	48	49	14	0.50	1.38	40	8.2	-0.7
140	7/ 9/88	58	41	171	44	53	17	0.50	1.48	40	9.4	0.3
141	7/10/88	58	19	171	31	54	6	0.50	1.46	40	8.7	1.8
142	7/10/88	57	59	171	36	55	9	0.50	1.53	40	8.3	1.8
143	7/10/88	57	39	171	33	57	12	0.50	1.54	40	8.4	2.5
144	7/10/88	57	19	171	13	57	14	0.50	1.51	40	8.6	3.5
145	7/10/88	56	60	171	24	62	17	0.50	1.78	60	8.9	3.9
146	7/11/88	56	40	171	24	67	7	0.50	1.42	60	7.8	4.0
147	7/11/88	56	41	172	33	74	11	0.50	1.46	60	7.8	4.0
148	7/11/88	57	1	172	38	68	14	0.50	1.49	60	8.1	4.0
149	7/11/88	57	20	172	42	65	17	0.50	1.65	60	8.1	3.4
150	7/12/88	57	43	172	47	67	7	0.50	1.51	60	7.9	3.7
151	7/12/88	58	2	172	52	61	9	0.50	1.43	60	7.9	2.2
152	7/12/88	58	22	172	57	62	12	0.50	1.63	60	8.0	2.0
153	7/12/88	58	41	173	1	63	15	0.50	1.79	60	8.0	2.0
154	7/12/88	59	5	173	7	60	18	0.50	1.62	60	7.3	1.5
155	7/13/88	59	21	173	7	56	6	0.50	1.39	42	7.3	1.1
156	7/13/88	59	31	173	28	58	9	0.50	1.59	42	7.2	1.0
157	7/13/88	59	40	173	13	54	11	0.50	1.46	42	6.9	0.0
158	7/13/88	59	39	172	38	48	13	0.50	1.71	42	7.2	-0.8
159	7/13/88	59	29	172	54	53	15	0.50	1.52	42	7.1	0.3
160	7/14/88	58	22	174	1	68	6	0.50	1.56	60	8.2	-9.0
161	7/14/88	58	16	173	15	70	8	0.50	1.50	60	8.2	3.5
162	7/14/88	58	9	173	21	70	11	0.50	1.37	60	8.1	3.5
163	7/20/88	59	53	173	35	53	7	0.50	1.45	42	7.1	-0.9
164	7/20/88	60	4	173	20	41	9	0.40	1.29	42	7.2	-0.4
165	7/20/88	60	11	173	40	44	12	0.10	0.41	-9	7.2	-0.8
166	7/20/88	60	13	173	41	43	13	0.25	0.62	-9	7.2	-0.8
167	7/20/88	60	10	173	49	50	15	0.25	0.65	-9	7.2	-0.8
168	7/20/88	60	21	173	25	34	18	0.25	0.67	42	6.5	0.4
169	7/21/88	60	42	173	31	38	7	0.25	0.66	40	5.8	-0.8
170	7/21/88	61	1	173	31	43	10	0.50	1.46	40	6.5	-1.1
171	7/21/88	61	23	173	32	41	13	0.50	1.43	74	6.8	-1.3
172	7/21/88	61	56	174	53	44	19	0.50	1.64	74	6.6	-1.5
173	7/22/88	61	40	175	1	48	7	0.50	1.49	74	6.0	-1.5
174	7/22/88	61	22	174	54	48	9	0.50	1.56	74	6.4	-1.4
175	7/22/88	61	3	174	53	51	12	0.50	1.49	74	6.6	-1.3
176	7/22/88	60	41	174	48	55	14	0.50	1.38	40	6.5	-0.4
177	7/22/88	60	21	174	41	57	17	0.50	1.62	61	6.9	0.6
178	7/23/88	59	56	174	39	62	7	0.50	1.53	61	7.8	1.6
179	7/23/88	59	35	174	32	66	9	0.50	1.59	61	8.0	2.0
180	7/23/88	59	18	174	29	68	11	0.50	1.45	61	7.8	2.1
181	7/23/88	59	1	174	25	71	14	0.50	1.57	60	8.5	2.9
182	7/23/88	58	42	174	23	97	17	0.50	1.54	60	8.5	3.5
183	7/24/88	58	39	175	29	76	7	0.50	1.38	60	8.0	2.8

Table B-2.--Station data Ocean Hope 3 Continued.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata[a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
184	7/24/88	58	60	175	44	75	10	0.50	1.45	60	8.4	2.4
185	7/24/88	59	19	175	44	77	13	0.50	1.56	60	7.7	2.2
186	7/27/88	59	42	175	51	77	8	0.50	1.39	60	8.0	2.0
187	7/27/88	60	1	175	56	73	11	0.50	1.73	60	7.8	1.8
188	7/27/88	60	23	176	4	68	14	0.50	1.96	60	7.5	1.3
189	7/27/88	60	41	176	12	67	16	0.50	1.71	60	7.7	0.8
190	7/27/88	61	2	176	18	63	19	0.50	1.54	73	7.1	0.3
191	7/28/88	61	21	176	18	60	7	0.50	1.48	73	7.1	0.9
192	7/28/88	60	60	177	37	76	13	0.50	1.51	73	7.4	1.4
193	7/28/88	60	41	178	10	91	16	0.50	1.59	60	7.3	2.3
194	7/28/88	60	39	177	36	86	18	0.50	1.38	60	8.2	1.7
195	7/29/88	60	22	177	24	84	7	0.50	1.48	60	7.0	1.8
196	7/29/88	60	1	177	54	80	10	0.50	1.62	60	7.8	2.0
197	7/29/88	59	60	177	15	76	13	0.50	1.52	60	7.5	2.1
198	7/29/88	59	41	177	9	96	16	0.50	1.52	60	8.9	2.6
199	7/29/88	59	21	177	5	84	18	0.50	1.32	60	8.0	2.5
200	7/30/88	59	1	177	34	76	7	0.50	1.43	60	8.5	3.0
201	7/30/88	58	60	176	59	76	9	0.50	1.56	60	9.0	2.6
202	7/30/88	58	42	176	52	75	11	0.50	1.46	60	9.2	3.2
203	8/ 1/88	55	60	163	26	50	14	0.50	1.48	-9	11.2	3.2
204	8/ 1/88	55	59	163	19	49	16	0.50	1.45	-9	-9.0	-9.0
205	8/ 2/88	55	44	163	19	47	12	0.50	1.57	-9	-9.0	-9.0
206	8/ 2/88	55	44	163	14	46	14	0.50	1.47	-9	-9.0	-9.0
207	8/ 2/88	55	47	163	13	47	16	0.50	1.50	-9	-9.0	-9.0
208	8/ 4/88	55	46	163	18	47	12	0.50	1.53	-9	-9.0	-9.0
209	8/ 4/88	55	49	163	13	49	14	0.50	1.78	-9	-9.0	-9.0
210	8/ 4/88	55	48	163	10	47	15	0.50	1.28	-9	-9.0	-9.0
211	8/ 4/88	55	49	163	14	49	17	0.50	1.33	-9	10.2	-9.0
212	8/ 4/88	55	48	163	17	49	18	0.50	1.47	-9	-9.0	-9.0
213	8/ 5/88	55	42	163	19	44	9	0.50	1.56	-9	10.3	-9.0
214	8/ 5/88	55	43	163	18	45	11	0.50	1.43	-9	10.5	-9.0
215	8/ 5/88	55	43	163	18	46	12	0.50	1.50	-9	-9.0	-9.0
216	8/ 5/88	55	43	163	18	46	14	0.50	1.58	-9	10.5	-9.0
217	8/ 5/88	55	42	163	15	44	15	0.50	1.67	-9	10.3	-9.0
218	8/ 5/88	55	42	163	12	43	17	0.50	1.70	-9	10.3	-9.0
219	8/ 6/88	55	45	163	18	46	9	0.50	1.28	-9	10.5	-9.0
220	8/ 6/88	55	44	163	20	46	10	0.50	1.32	-9	10.6	-9.0
221	8/ 6/88	55	44	163	22	46	12	0.50	1.80	-9	10.6	-9.0
222	8/ 6/88	55	46	163	18	48	14	0.50	1.46	-9	10.8	-9.0
223	8/ 6/88	55	46	163	18	48	15	0.50	1.58	-9	-9.0	-9.0
224	8/ 6/88	55	46	163	17	48	16	0.50	1.56	-9	-9.0	-9.0

[a] Hauls with a stratum designator of -9 were not used in the analysis due to bad performance, being outside the standard area, or part of another experiment.
[b] A value of -9.0 indicates no temperature was taken.

Table B-3.--Station data for the NOAA vessel Miller Freeman during the 1988 bottom trawl survey.

Haul	Date	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata	Surf. Temp. (°C)	Gear Temp. (°C)
49	8/20/88	63	10	165	43	13	17	0.30	0.95	71	12.9	10.3
86	8/23/88	62	60	167	32	19	17	0.50	1.61	71	10.1	1.7
87	8/23/88	62	41	166	51	16	21	0.50	1.53	71	11.1	10.0
88	8/24/88	62	21	167	26	15	1	0.50	1.52	71	10.2	3.9
89	8/24/88	62	1	166	54	14	4	0.50	1.54	71	11.5	10.9
90	8/24/88	61	41	167	27	14	7	0.50	1.58	71	10.7	10.4
91	8/24/88	61	21	166	55	11	11	0.50	1.46	71	11.6	11.6
92	8/25/88	60	40	166	36	11	10	0.50	1.66	71	11.2	11.0
93	8/25/88	60	41	168	1	16	14	0.50	1.55	71	9.7	9.5
94	8/25/88	61	1	168	46	21	18	0.50	1.55	71	8.7	8.5
95	8/25/88	61	20	169	29	23	21	0.50	1.57	71	8.6	7.2
96	8/25/88	61	40	170	12	26	24	0.50	1.52	71	8.8	2.1
97	8/26/88	61	60	169	35	24	3	0.50	1.54	71	8.6	4.5
98	8/26/88	62	20	170	16	23	6	0.50	1.63	71	8.9	0.7
99	8/26/88	62	40	169	38	23	9	0.50	1.71	71	9.1	0.7
100	8/26/88	62	56	170	32	24	13	0.50	1.57	71	8.1	-0.9
101	8/26/88	62	41	170	60	26	16	0.50	1.62	71	8.6	-1.0
102	8/26/88	62	60	171	46	31	19	0.50	1.56	71	8.3	-1.3
103	8/26/88	63	20	172	33	36	22	0.50	1.61	72	7.7	-1.4
104	8/27/88	63	2	173	18	39	2	0.50	1.50	72	7.7	-1.5
105	8/27/88	63	21	174	1	43	5	0.50	1.58	72	7.6	-1.6
106	8/27/88	63	1	174	44	45	9	0.50	1.44	72	7.2	-1.4
107	8/27/88	62	41	175	24	45	12	0.50	1.54	72	7.4	-1.5
108	8/27/88	62	21	176	1	51	15	0.50	1.56	72	7.4	-1.5
109	8/27/88	62	21	174	36	41	19	0.50	1.55	72	8.1	-1.6
110	8/27/88	62	41	173	57	40	21	0.50	1.51	72	7.8	-1.5
111	8/28/88	62	40	172	27	31	2	0.50	1.77	72	8.6	-1.6
112	8/28/88	62	21	173	8	34	5	0.50	1.68	72	8.7	-1.6
117	8/28/88	61	60	172	23	32	20	0.50	1.59	72	8.9	-1.3
118	8/28/88	62	20	171	43	27	23	0.50	1.63	71	9.0	-1.1
119	8/29/88	61	60	170	59	28	2	0.50	1.52	71	9.1	1.4
120	8/29/88	61	41	171	33	32	5	0.50	1.74	72	8.9	-0.6
121	8/29/88	61	20	172	12	36	8	0.50	1.58	72	8.7	-0.2
122	8/29/88	61	20	170	50	28	13	0.50	1.55	72	8.1	0.6
123	8/29/88	60	60	170	2	27	16	0.50	1.58	71	8.7	2.5
124	8/29/88	61	40	168	50	20	21	0.50	1.58	71	9.1	7.0
125	8/30/88	61	20	168	10	17	1	0.50	1.76	71	9.2	9.5
126	8/30/88	60	40	169	23	24	6	0.50	1.52	71	8.2	5.0
127	8/30/88	60	40	170	44	33	10	0.50	1.43	72	8.5	1.0
128	9/ 3/88	54	15	166	13	218	22	0.50	1.23	81	7.7	3.7
129	9/ 4/88	54	23	166	2	310	4	0.50	1.28	83	7.6	-9.0
130	9/ 4/88	54	30	165	49	233	7	0.50	1.30	81	9.0	4.4
131	9/ 4/88	54	36	165	42	203	10	0.50	0.96	81	8.3	3.6
132	9/ 4/88	54	42	165	29	143	12	0.50	1.47	81	8.5	3.8
133	9/ 4/88	54	42	165	50	170	14	0.50	1.30	81	8.7	3.7

Table B-3.--Station data Miller Freeman Continued.

Haul	Date	Latitude Deg	Min	Longitude Deg	Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata	Surf. Temp. (°C)	Gear Temp. (°C)
134	9/ 4/88	54	40	165	52	198	16	0.50	1.42	81	8.8	3.8
135	9/ 4/88	54	33	165	60	262	24	0.50	1.33	81	8.5	3.6
136	9/ 5/88	54	21	166	13	376	3	0.50	1.27	83	8.5	3.7
137	9/ 5/88	54	20	166	31	402	7	0.50	1.42	83	8.3	-9.0
138	9/ 5/88	54	30	166	14	274	11	0.50	1.37	81	8.4	-9.0
139	9/ 5/88	54	42	166	4	169	14	0.50	1.11	81	8.2	3.8
140	9/ 5/88	54	40	165	50	196	16	0.50	1.42	81	8.5	3.8
141	9/ 5/88	54	38	166	17	202	22	0.50	1.37	81	8.8	3.8
142	9/ 5/88	54	42	166	16	166	24	0.50	1.35	81	9.1	4.1
143	9/ 6/88	54	29	166	34	290	3	0.33	0.57	83	8.1	-9.0
144	9/ 6/88	54	21	166	34	406	6	0.50	1.12	83	8.1	-9.0
145	9/ 6/88	54	35	166	38	240	9	0.50	1.59	81	7.9	3.8
146	9/ 6/88	54	39	166	36	202	12	0.50	1.48	81	8.7	3.6
147	9/ 6/88	54	48	166	41	147	14	0.50	1.67	81	9.0	3.8
148	9/ 6/88	54	42	166	53	201	17	0.50	1.47	81	8.3	3.8
149	9/ 6/88	54	36	167	3	246	20	0.50	1.35	81	7.9	3.7
150	9/ 7/88	54	24	167	28	395	1	0.50	1.29	83	7.7	3.8
151	9/ 7/88	54	29	167	27	370	3	0.50	1.68	83	8.2	3.6
152	9/ 7/88	54	39	166	56	223	6	0.50	1.17	81	8.1	3.8
153	9/ 7/88	54	56	167	14	155	9	0.50	0.84	81	7.4	3.8
154	9/ 7/88	54	45	167	22	280	12	0.50	1.34	83	9.0	3.4
155	9/ 7/88	54	30	167	38	432	16	1.00	2.17	83	9.2	3.5
156	9/ 7/88	54	37	167	37	400	19	0.50	1.29	83	9.0	3.4
157	9/ 7/88	54	47	167	30	323	22	0.50	1.24	83	8.6	3.4
158	9/ 7/88	54	56	167	25	210	24	0.50	1.26	81	9.1	3.7
159	9/ 8/88	55	1	167	34	196	2	0.50	1.24	81	8.7	3.7
160	9/ 8/88	55	8	167	41	171	4	0.50	1.61	81	8.7	3.8
161	9/ 8/88	55	14	168	1	404	8	0.50	1.46	83	8.3	3.7
162	9/ 8/88	55	18	167	57	203	9	0.50	1.59	81	9.7	3.8
163	9/ 8/88	55	26	168	13	181	11	0.50	1.60	81	9.9	3.8
164	9/ 8/88	55	37	168	44	190	15	0.50	1.59	81	8.9	3.7
165	9/ 8/88	55	57	168	58	268	19	0.50	1.42	83	9.3	3.5
166	9/ 8/88	56	2	168	40	343	22	0.50	1.36	83	9.6	3.6
167	9/ 9/88	56	3	168	27	157	1	0.50	1.37	81	9.6	3.9
168	9/ 9/88	56	6	168	51	396	4	0.50	1.25	83	9.5	3.7
169	9/ 9/88	56	14	169	37	203	8	0.50	1.28	81	9.7	3.8
170	9/11/88	56	8	169	29	209	11	0.50	1.57	81	8.4	3.5
171	9/11/88	55	58	169	46	456	15	0.50	1.25	83	8.3	3.8
172	9/11/88	56	1	170	14	247	19	0.50	1.37	81	8.4	3.8
173	9/11/88	56	2	170	19	274	22	0.50	1.34	83	8.4	3.7
174	9/12/88	56	9	170	37	247	1	0.50	1.44	83	8.5	3.7
175	9/12/88	56	17	171	20	134	4	0.50	1.52	82	8.6	3.5
176	9/12/88	56	29	171	58	380	8	0.50	1.27	84	8.6	3.6
177	9/12/88	56	32	172	27	403	12	0.50	1.36	84	8.5	3.6
178	9/12/88	56	31	172	48	351	16	0.50	1.24	84	8.9	3.5
179	9/12/88	56	38	173	3	114	19	0.50	1.34	82	8.7	3.5

Table B-3.--Station data Miller Freeman Continued.

Haul	Date	Latitude Deg	Min	Longitude Deg	Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata	Surf. Temp. (°C)	Gear Temp. (°C)
180	9/12/88	56	59	173	25	142	23	0.50	1.53	82	8.8	3.4
181	9/13/88	57	1	173	35	363	2	0.50	1.39	82	8.8	4.0
182	9/13/88	57	16	173	59	369	6	0.50	1.20	84	8.3	3.7
183	9/13/88	57	28	173	57	105	9	0.50	1.68	82	8.2	3.8
184	9/13/88	57	46	174	8	102	12	0.50	1.47	82	8.4	3.6
185	9/13/88	57	52	173	57	276	15	0.50	1.18	84	8.7	3.7
187	9/14/88	58	18	174	18	141	4	0.50	1.61	82	8.6	3.7
188	9/14/88	58	36	174	44	305	9	0.50	1.31	84	8.5	3.7
189	9/14/88	58	35	175	1	399	12	0.50	1.37	84	8.5	-9.0
190	9/14/88	58	16	175	23	392	16	0.50	1.55	84	8.6	3.7
191	9/14/88	58	20	175	33	427	19	0.50	1.36	84	8.3	-9.0
193	9/15/88	58	29	175	44	210	2	0.50	1.65	82	8.6	3.8
194	9/15/88	58	34	176	5	148	4	0.50	1.57	82	8.4	3.3
195	9/15/88	58	35	176	20	200	7	0.50	1.58	82	8.3	3.7
196	9/15/88	58	33	176	13	404	10	0.50	1.25	84	8.4	-9.0
197	9/15/88	58	34	176	38	349	13	0.50	1.34	84	8.3	3.7
198	9/15/88	58	36	177	17	431	17	0.43	1.30	84	8.5	3.7
199	9/15/88	58	40	177	52	418	20	0.50	1.24	84	8.6	3.6
200	9/15/88	58	47	177	59	309	24	0.50	1.62	84	8.4	-9.0
201	9/16/88	58	57	178	8	137	6	0.50	1.52	82	8.1	3.5
202	9/16/88	59	6	178	24	164	10	0.50	1.53	82	8.0	3.2
203	9/16/88	59	16	178	29	423	15	0.50	1.37	84	8.0	3.5
204	9/16/88	59	25	178	27	413	19	0.50	1.57	84	8.3	3.5
205	9/16/88	59	25	178	15	322	22	0.50	1.44	82	8.6	3.5
206	9/17/88	59	13	177	42	133	1	0.50	1.39	82	8.1	2.8
207	9/17/88	59	19	177	32	116	5	0.50	1.52	82	8.0	2.0
208	9/17/88	59	24	177	41	193	7	0.50	1.64	82	7.9	3.5
209	9/17/88	59	32	178	24	224	12	0.50	1.43	82	7.7	3.6
210	9/17/88	59	42	178	31	225	15	0.50	1.43	82	7.6	3.7
211	9/17/88	59	46	178	38	132	18	0.50	1.55	82	7.6	3.2
212	9/17/88	59	49	178	46	441	22	0.50	1.37	84	7.7	3.7
213	9/18/88	59	47	178	42	162	1	0.50	1.60	82	7.7	3.4
214	9/18/88	59	55	178	52	143	4	0.50	1.57	82	7.3	3.1
215	9/18/88	59	59	178	59	364	7	0.50	1.33	82	7.6	3.7
216	9/20/88	56	27	171	25	147	12	0.50	1.49	82	8.1	3.8
217	9/20/88	56	7	170	36	279	18	0.50	1.44	83	8.1	3.7
218	9/20/88	55	59	170	11	262	23	0.50	1.32	81	8.1	3.6
219	9/21/88	55	60	169	34	396	3	0.50	1.35	83	8.2	3.6
220	9/21/88	56	2	169	24	384	7	0.50	1.09	81	8.1	3.6
222	9/21/88	56	9	168	55	287	14	0.50	1.44	81	8.5	3.6
223	9/21/88	55	33	168	30	200	18	0.50	1.57	81	8.1	3.7
224	9/21/88	55	20	168	7	347	22	0.50	1.48	83	7.7	3.6
225	9/22/88	54	59	167	45	324	2	0.50	1.43	83	7.8	3.4
226	9/22/88	54	48	167	18	251	6	0.50	1.48	81	7.4	3.7
227	9/22/88	54	38	167	25	318	9	0.50	1.46	83	7.8	3.6
228	9/22/88	54	27	167	18	373	12	0.50	1.29	83	7.4	3.8

Table B-3.--Station data Miller Freeman Continued.

Haul	Date	Latitude Deg Min	Longitude Deg Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata	Surf. Temp. (°C)	Gear Temp. (°C)
229	9/22/88	54 26	166 48	323	16	0.50	1.24	83	6.9	4.0
230	9/22/88	54 23	166 30	348	19	0.50	1.41	83	7.0	3.6

A value of -9.0 indicates no temperature was taken.

Table B-4.--Station data for the chartered vessel Tomi Maru No. 51 during the 1988 bottom trawl survey.

Haul	Date	Latitude Deg Min	Longitude Deg Min	Depth (M)	Time	Duration (Hr)	Distance (nmi)	Strata	Surf. Temp. (°C)	Gear Temp. (°C)[a]
1	9/ 5/88	54 30	166 12	271	11	0.50	1.79	81	8.0	-9.0
2	9/ 5/88	54 41	166 5	172	14	0.50	2.09	81	7.5	-9.0
3	9/ 6/88	54 33	166 38	241	9	0.50	1.59	81	7.4	-9.0
4	9/ 6/88	54 38	166 35	203	12	0.50	1.73	81	7.8	-9.0
5	9/ 6/88	54 41	166 53	201	17	0.50	1.74	81	7.8	-9.0
6	9/ 6/88	54 36	167 7	247	19	0.50	1.67	81	7.8	-9.0
7	9/ 7/88	54 55	167 14	161	9	0.50	2.11	81	7.4	-9.0
8	9/ 7/88	54 44	167 22	275	12	0.50	1.64	83	8.6	-9.0
9	9/ 7/88	54 31	167 37	416	16	0.50	1.81	83	8.5	-9.0
10	9/ 7/88	54 37	167 36	383	19	0.50	1.75	83	8.8	-9.0
11	9/ 8/88	55 17	167 58	224	9	0.50	2.00	81	9.0	-9.0
12	9/ 8/88	55 26	168 15	198	11	0.50	1.78	81	9.1	-9.0
13	9/ 8/88	55 37	168 45	296	15	0.50	1.25	83	8.6	-9.0
14	9/ 8/88	55 57	168 56	215	18	0.50	1.61	81	9.0	-9.0
15	9/11/88	56 8	169 28	162	11	0.50	1.68	81	7.9	-9.0
16	9/11/88	55 59	169 44	484	15	0.50	0.54	83	7.6	-9.0
17	9/11/88	56 1	170 14	190	19	0.50	1.68	81	8.0	-9.0
18	9/11/88	56 2	170 20	249	21	0.50	1.70	81	8.0	-9.0
19	9/12/88	56 33	172 30	389	12	0.50	1.45	84	8.0	-9.0
20	9/12/88	56 30	172 47	323	15	0.50	0.97	84	8.5	-9.0
21	9/12/88	56 39	173 6	124	19	0.50	1.71	82	8.5	-9.0
22	9/13/88	57 28	173 57	142	9	0.50	1.60	82	7.6	-9.0
23	9/13/88	57 46	174 9	67	12	0.50	1.86	-9[b]	8.1	-9.0
24	9/13/88	57 52	173 56	328	15	0.50	1.76	84	8.3	-9.0
25	9/13/88	58 5	174 8	227	17	0.50	2.02	82	8.1	-9.0
26	9/13/88	58 16	174 17	148	20	0.50	1.63	82	8.4	-9.0
27	9/14/88	58 37	174 45	253	11	0.50	1.26	82	8.1	-9.0
28	9/14/88	58 36	174 60	333	12	0.50	1.69	84	8.1	-9.0
29	9/14/88	58 16	175 23	358	16	0.50	1.68	84	8.0	-9.0
30	9/14/88	58 22	175 34	366	19	0.50	1.52	84	8.1	-9.0
31	9/15/88	58 33	176 12	321	10	0.50	1.76	84	8.1	-9.0
32	9/15/88	58 34	176 40	291	13	0.50	1.63	84	7.8	-9.0
33	9/15/88	58 37	177 18	285	17	0.50	1.29	84	8.2	-9.0
34	9/15/88	58 40	177 52	390	20	0.50	1.67	84	8.3	-9.0

[a] A value of -9.0 indicates no temperature was taken.
[b] This haul was not within an established strata.

Table B-5.--Station data for the chartered vessel Pelagos during the 1988 midwater survey while fishing the Northern Gold 1200 rope trawl.

Haul	Date	Latitude Deg Min	Longitude Deg Min	Depth (m)	Time	Duration (hr)	Distance (nm)	Strata [a]	Surf. Temp. (°C)	Gear Temp. (°C)[b]
1	6/23/88	55 6	164 45	30	20	1.33	3.89	5	6.8	5.3
4	6/26/88	54 57	166 2	65	11	0.82	2.11	5	7.0	-9.0
5	6/27/88	55 52	165 48	55	24	0.50	1.57	5	7.4	4.2
7	6/29/88	56 11	167 9	65	22	0.28	0.93	5	7.3	-9.0
8	6/30/88	56 12	167 7	61	5	0.08	0.26	5	7.3	-9.0
9	6/30/88	55 55	168 50	90	17	0.40	0.99	-9	7.5	3.7
10	7/ 1/88	56 33	168 20	52	23	0.05	0.18	5	7.8	3.5
11	7/ 2/88	56 41	168 1	40	16	0.18	0.77	5	7.6	2.8
14	7/ 4/88	57 44	167 22	25	18	0.18	0.49	-9	6.9	0.7
16	7/ 5/88	56 40	171 22	63	16	0.58	1.77	6	7.3	3.9
17	7/ 6/88	57 1	171 35	56	15	0.08	0.25	6	7.8	3.6
18	7/ 6/88	57 1	171 35	25	16	0.53	1.94	-9	7.8	4.8
19	7/ 7/88	57 15	171 60	57	23	0.07	0.20	6	7.5	3.4
20	7/ 8/88	57 15	173 3	61	13	0.93	2.90	6	7.8	3.2
21	7/ 8/88	57 47	171 32	51	22	0.12	0.50	4	8.3	1.9
23	7/10/88	58 5	173 11	57	9	1.00	3.53	6	8.2	2.3
25	7/11/88	58 34	172 57	57	7	0.17	0.59	6	8.0	1.8
26	7/20/88	59 4	173 43	61	10	0.12	0.32	6	7.5	-9.0
28	7/21/88	59 17	174 18	59	9	0.08	0.14	6	7.8	-9.0
29	7/21/88	58 51	175 30	61	16	0.72	2.83	6	8.4	-9.0
30	7/23/88	59 30	176 2	65	9	0.05	0.08	6	8.4	-9.0
32	7/26/88	60 14	176 18	65	8	0.13	0.43	6	7.5	-9.0
33	7/27/88	60 39	176 18	54	8	0.37	1.27	6	7.1	-9.0
34	7/27/88	60 44	177 17	64	21	0.03	0.10	6	7.5	-9.0
35	7/28/88	61 1	177 38	68	15	0.18	0.75	8	8.4	-9.0

[a]Hauls with a stratum of -9 were not used in the analysis due to bad performance, being outside the standard area, or part of another experiment.
[b]A value of -9.0 indicates no temperature taken.

Table B-6.---Station data for the chartered vessel Pelagos during the 1988 midwater survey while fishing the Marinovich trawl.

Haul	Date	Latitude Deg Min	Longitude Deg Min	Depth (m)	Time	Duration (hr)	Distance (nm)	Strata [a]	Surf. Temp. (°C)	Gear Temp. (°C) [b]
2	6/25/88	56 7	163 8	11	16	0.42	2.35	3	7.6	7.1
3	6/25/88	56 6	163 6	22	19	0.58	1.88	3	7.6	2.8
6	6/29/88	56 57	165 6	23	11	0.42	0.93	3	7.1	1.3
12	7/ 2/88	56 42	168 3	37	17	0.27	0.91	5	7.6	2.6
13	7/ 2/88	56 41	168 1	20	18	0.50	1.79	5	7.6	4.1
15	7/ 4/88	57 43	167 25	18	19	0.32	1.25	3	6.9	0.9
22	7/ 8/88	57 47	171 33	35	23	0.37	1.30	4	8.3	2.3
24	7/10/88	58 55	170 51	15	20	0.57	2.04	-9	7.3	2.6
27	7/20/88	59 5	173 39	12	11	0.30	0.66	6	7.5	-9.0
31	7/23/88	59 29	176 3	5	10	0.42	1.10	-9	8.4	-9.0

[a] Hauls with a stratum of -9 were not used in the analysis due to bad performance, being outside the standard area, or part of another experiment.
[b] A value of -9 indicates no temperature taken.

APPENDIX C

Rank Order of Relative Abundance for Fish and Invertebrate Species

Appendix C contains listings of all fish and invertebrate species caught during the 1988 U.S.-Japan bottom trawl survey in the eastern Bering Sea ranked in order of relative abundance. Invertebrates other than squids, octopuses, and shrimps were not identified during the Japanese survey of continental slope waters. The rank order lists are based on at-sea identifications, and the species groupings shown in Table 6 were not used in producing the lists.

List of Tables

Table C-1.--Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1988 U.S. bottom trawl survey on the continental shelf.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	119.37578	139.356	99.80462	138.94695	0.34716295	0.34716295	WALLEYE POLLOCK
2	10210	49.64700	15.037	43.21819	56.07581	0.14438104	0.49154399	YELLOWFIN SOLE
3	10260	30.97046	4.091	27.61705	34.32387	0.09006682	0.58161081	ROCK SOLE
4	68580	18.14637	1.725	15.96881	20.32392	0.05277240	0.63438321	NARROW SNOW CRAB(=TANNER CRAB(OPILIO))
5	10285	17.15580	6.871	12.81013	21.50147	0.04989168	0.68427489	ALASKA PLAICE
6	21720	16.77458	1.607	14.67261	18.87656	0.04878304	0.73305793	PACIFIC COD
7	81742	13.39586	1.597	11.30093	15.49079	0.03895721	0.77201514	PURPLE-ORANGE SEASTAR
8	10130	8.79387	0.589	7.52098	10.06677	0.02557392	0.79758906	FLATHEAD SOLE
9	10110	4.73741	0.300	3.82948	5.64534	0.01377711	0.81136617	ARROWTOOTH FLOUNDER
10	69086	4.15198	0.248	3.32614	4.97782	0.01207459	0.82344077	FUZZY HERMIT CRAB
11	98082	3.95581	0.639	2.63044	5.28118	0.01150410	0.83494486	SEA POTATO
12	00400	3.42911	0.175	2.73650	4.12172	0.00997237	0.84491724	SKATE UNIDENT.
13	99994	3.33287	0.134	2.72640	3.93934	0.00969248	0.85460972	EMPTY GASTROPOD SHELLS
14	71884	2.90835	0.126	2.32043	3.49627	0.00845792	0.86306764	NEPTUNEA HEROS
15	21110	2.66811	5.488	0.00000	6.55208	0.00775927	0.87082691	PACIFIC HERRING
16	10120	2.28339	0.041	1.94806	2.61872	0.00664046	0.87746737	PACIFIC HALIBUT
17	00404	2.06944	0.382	1.04500	3.09388	0.00601824	0.88348561	RAJA SP.
18	68560	1.91743	0.114	1.35856	2.47630	0.00557618	0.88906179	BROAD SNOW CRAB (=TANNER CRAB(BAIRDI))
19	00471	1.79631	0.126	1.20798	2.38465	0.00522395	0.89428574	ALASKA SKATE (=FLATHEAD SKATE)
20	83020	1.51156	0.116	0.94736	2.07575	0.00439584	0.89868158	GORGONOCEPHALUS CARYI
21	21348	1.50321	0.332	0.54853	2.45789	0.00437157	0.90305315	BUTTERFLY SCULPIN
22	71882	1.25433	0.039	0.92659	1.58207	0.00364778	0.90670093	FAT WHELK
23	91050	1.20117	1.443	0.00000	3.19258	0.00349319	0.91019412	BARREL SPONGE
24	21371	1.13227	0.024	0.87299	1.39156	0.00329282	0.91348694	PLAIN SCULPIN
25	71820	1.11403	0.027	0.83916	1.38889	0.00323976	0.91672671	PRIBILOF WHELK
26	81780	1.07433	0.109	0.52632	1.62235	0.00312433	0.91985103	COMMON MUD STAR
27	10140	1.04298	0.017	0.82680	1.25915	0.00303314	0.92288417	BERING FLOUNDER
28	83010	1.00270	0.090	0.50664	1.49875	0.00291599	0.92580016	BASKETSTARFISH UNIDENT.
29	91000	0.90976	0.137	0.29552	1.52399	0.00264571	0.92844587	SPONGE UNIDENT.
30	80590	0.90616	0.015	0.70549	1.10682	0.00263524	0.93108111	LEPTASTERIAS POLARIS
31	69322	0.89146	0.035	0.57960	1.20331	0.00259249	0.93367360	RED KING CRAB
32	43000	0.85694	0.029	0.57470	1.13919	0.00249212	0.93616572	SEA ANEMONE UNIDENT.
33	24184	0.82532	0.018	0.60084	1.04980	0.00240015	0.93856587	MARBLED EELPOUT (PREV. SPARSE TOOTHED LYCOD)
34	98205	0.78474	0.058	0.38587	1.18362	0.00228215	0.94084802	SEA PEACH
35	69060	0.74156	0.015	0.54075	0.94237	0.00215656	0.94300458	ALEUTIAN HERMIT
36	71870	0.71515	0.016	0.50351	0.92680	0.00207977	0.94508436	LYRE WHELK
37	21375	0.70275	0.020	0.46971	0.93579	0.00204371	0.94712806	MYOXOCEPHALUS SP.
38	21725	0.68394	0.128	0.09168	1.27620	0.00198901	0.94911707	ARCTIC COD
39	21735	0.66893	0.061	0.25832	1.07954	0.00194536	0.95106243	SAFFRON COD
40	21370	0.65715	0.007	0.52070	0.79361	0.00191110	0.95297353	GREAT SCULPIN
41	69120	0.64945	0.016	0.43929	0.85960	0.00188869	0.95486222	HAIRY HERMIT CRAB
42	69095	0.64402	0.008	0.49929	0.78875	0.00187291	0.95673514	LONGFINGER HERMIT
43	43020	0.64021	0.098	0.12090	1.15952	0.00186184	0.95859698	METRIDIUM SENILE
44	99993	0.58872	0.019	0.35933	0.81810	0.00171208	0.96030906	EMPTY BIVALVE SHELLS
45	69010	0.53714	0.055	0.14701	0.92726	0.00156208	0.96187113	HERMIT CRAB UNIDENT.
46	24185	0.51153	0.005	0.39213	0.63093	0.00148762	0.96335875	WATTLED EELPOUT
47	69090	0.49558	0.004	0.39058	0.60058	0.00144122	0.96479997	PAGURUS OCHOTENSIS

Table C-1.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
48	83320	0.47527	0.021	0.23694	0.71361	0.00138216	0.96618213	OPHIURA SARSI
49	40500	0.42841	0.005	0.30552	0.55130	0.00124588	0.96742800	JELLYFISH UNIDENT.
50	20040	0.41241	0.002	0.33816	0.48665	0.00119934	0.96862734	STURGEON POACHER
51	21347	0.40153	0.016	0.19269	0.61038	0.00116772	0.96979506	YELLOW IRISH LORD
52	68577	0.39678	0.005	0.27576	0.51780	0.00115389	0.97094895	CIRCUMBOREAL TOAD CRAB (=HYAS CRAB)
53	10211	0.39610	0.004	0.28579	0.50642	0.00115193	0.97210088	LONGHEAD DAB
54	21420	0.35061	0.008	0.20527	0.49595	0.00101962	0.97312050	BIGMOUTH SCULPIN
55	69070	0.32111	0.003	0.23732	0.40490	0.00093385	0.97405435	KNOBBYHAND HERMIT CRAB
56	83000	0.29142	0.019	0.06528	0.51755	0.00084748	0.97490184	BRITTLESTARFISH UNIDENT.
57	72500	0.26778	0.002	0.18990	0.34566	0.00077874	0.97568058	OREGON TRITON
58	72752	0.26297	0.003	0.17851	0.34743	0.00076476	0.97644533	LADDER WHELK (PREV. SILKY WHELK)
59	80020	0.25770	0.016	0.04803	0.46736	0.00074942	0.97719475	EVASTERIAS ECHINOSOMA
60	71001	0.25151	0.002	0.18016	0.32286	0.00073144	0.97792619	SNAIL (GASTROPOD) EGGS
61	10200	0.24779	0.001	0.18831	0.30728	0.00072062	0.97864681	REX SOLE
62	10115	0.23979	0.003	0.15526	0.32431	0.00069733	0.97934414	GREENLAND TURBOT (=GREENLAND HALIBUT)
63	41201	0.23497	0.008	0.09051	0.37943	0.00068333	0.98002747	SEA RASPBERRY
64	98310	0.23346	0.004	0.13118	0.33573	0.00067892	0.98070640	APLIDIUM SP.
65	80200	0.22231	0.002	0.15412	0.29050	0.00064651	0.98135291	LETHASTERIAS NANIMENSIS
66	10112	0.22008	0.002	0.13821	0.30195	0.00064003	0.98199294	KAMCHATKA FLOUNDER
67	85201	0.21839	0.020	0.00000	0.45244	0.00063512	0.98262806	CUCUMARIA FALLAX
68	98105	0.20275	0.005	0.08515	0.32034	0.00058962	0.98321768	BOLTENIA OVIFERA
69	10220	0.19726	0.002	0.11728	0.27724	0.00057367	0.98379135	STARRY FLOUNDER
70	20720	0.18606	0.010	0.02210	0.35002	0.00054109	0.98433244	SEARCHER
71	71753	0.18268	0.010	0.01708	0.34829	0.00053127	0.98486371	WARPED WHELK
72	98100	0.17896	0.003	0.08492	0.27300	0.00052045	0.98538416	SEA ONION UNIDENT.
73	68590	0.17806	0.002	0.10320	0.25292	0.00051783	0.98590199	TANNER CRAB (HYBRID)
74	69061	0.17126	0.000	0.13470	0.20782	0.00049806	0.98640005	LABIDOCHIRUS SPLENDESCENS (=PAGURUS SP.)
75	22200	0.15457	0.000	0.12289	0.18625	0.00044952	0.98684956	SNAILFISH UNIDENT.
76	72743	0.15322	0.001	0.11429	0.19215	0.00044559	0.98729515	BUCCINUM ANGULOSUM
77	72755	0.14353	0.000	0.10892	0.17813	0.00041739	0.98771255	POLAR WHELK
78	71756	0.13751	0.003	0.05206	0.22296	0.00039991	0.98811245	FRAGILE WHELK
79	72751	0.12522	0.001	0.07950	0.17095	0.00036417	0.98847662	SINUOUS WHELK (PREV. LYRE WHELK)
80	24191	0.12175	0.001	0.08223	0.16128	0.00035407	0.98883070	SHORTFIN EELPOUT
81	71835	0.12107	0.003	0.02744	0.21470	0.00035209	0.98918279	NEPTUNEA BOREALIS
82	30420	0.11338	0.012	0.00000	0.29860	0.00032971	0.98951250	NORTHERN ROCKFISH
83	00472	0.11005	0.005	0.00000	0.22924	0.00032005	0.98983255	ALEUTIAN SKATE
84	00435	0.09988	0.002	0.03483	0.16493	0.00029047	0.99012302	BERING SKATE (=SANDPAPER SKATE)
85	68578	0.09316	0.000	0.05768	0.12865	0.00027094	0.99039396	NORTH PACIFIC TOAD CRAB (=HYAS CRAB)
86	78403	0.09242	0.002	0.02744	0.15740	0.00026877	0.99066273	GIANT OCTOPUS
87	80594	0.09140	0.001	0.04248	0.14033	0.00026581	0.99092854	LEPTASTERIAS ARCTICA
88	23041	0.09128	0.000	0.06182	0.12075	0.00026547	0.99119401	CAPELIN
89	82730	0.09006	0.002	0.01335	0.16677	0.00026192	0.99145593	SAND DOLLAR UNIDENT.
90	69323	0.08948	0.000	0.06059	0.11838	0.00026023	0.99171616	BLUE KING CRAB
91	69520	0.07849	0.000	0.04323	0.11375	0.00022826	0.99194442	HYAS SP.
92	78010	0.07804	0.001	0.03488	0.12119	0.00022694	0.99217136	OCTOPUS UNIDENT.
93	69121	0.06777	0.000	0.03751	0.09802	0.00019708	0.99236844	ELASSOCHIRUS CAVIMANUS
94	65201	0.06721	0.002	0.00000	0.14911	0.00019546	0.99256390	BALANUS SP.

Table C-1.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
95	66000	0.06489	0.000	0.04238	0.08741	0.00018872	0.99275262	SHRIMP UNIDENT.
96	21316	0.06283	0.001	0.01940	0.10626	0.00018272	0.99293534	ARMORHEAD SCULPIN
97	72740	0.06230	0.000	0.02527	0.09933	0.00018118	0.99311652	BUCCINUM SP.
98	00232	0.06172	0.004	0.00000	0.16404	0.00017948	0.99329601	SALMON SHARK
99	21368	0.06148	0.000	0.03334	0.08961	0.00017878	0.99347479	WARTY SCULPIN (=SHORTHORNED SCULPIN)
100	71750	0.06093	0.001	0.00000	0.12197	0.00017718	0.99365197	VOLUTOPSIUS SP. (=PYRULOFUSUS SP.)
101	74562	0.05877	0.000	0.03011	0.08743	0.00017092	0.99382289	DISCORDANT MUSSEL
102	98300	0.05635	0.000	0.02265	0.09005	0.00016387	0.99398675	COMPOUND ASCIDIAN UNIDENT.
103	65203	0.05615	0.001	0.00000	0.11765	0.00016328	0.99415003	GIANT BARNACLE
104	68781	0.05544	0.000	0.02935	0.08153	0.00016122	0.99431126	TELMESSUS CRAB
105	82740	0.05495	0.002	0.00000	0.13113	0.00015980	0.99447106	PARMA SAND DOLLAR
106	95000	0.05386	0.001	0.01372	0.09400	0.00015664	0.99462770	BRYOZOAN UNIDENT.
107	82510	0.05286	0.000	0.02940	0.07633	0.00015374	0.99478143	GREEN SEA URCHIN
108	66031	0.05120	0.000	0.03445	0.06795	0.00014891	0.99493034	NORTHERN SHRIMP (=PINK SHRIMP)
109	71759	0.04548	0.001	0.00000	0.09228	0.00013226	0.99506260	THREADED WHELK
110	43010	0.04486	0.000	0.00831	0.08140	0.00013045	0.99519305	METRIDIUM SP.
111	71500	0.04460	0.000	0.02304	0.06617	0.00012971	0.99532276	SNAIL UNIDENT.
112	22201	0.04206	0.000	0.02534	0.05879	0.00012232	0.99544508	LIPARIS SP.
113	81355	0.04077	0.001	0.00312	0.07842	0.00011856	0.99556365	PTERASTER OBSCURUS
114	71721	0.03984	0.001	0.00000	0.08320	0.00011586	0.99567950	THIN-RIBBED WHELK
115	00420	0.03941	0.001	0.00000	0.08562	0.00011461	0.99579411	BIG SKATE
116	21313	0.03912	0.000	0.02104	0.05719	0.00011375	0.99590786	GYMNOCANTHUS SP.
117	71772	0.03856	0.000	0.02536	0.05177	0.00011214	0.99602000	BERINGIUS BERINGII
118	68510	0.03840	0.000	0.00925	0.06755	0.00011167	0.99613167	LONGHORNED DECORATOR CRAB (=DECORATOR CRAB)
119	23055	0.03795	0.000	0.01784	0.05805	0.00011035	0.99624202	RAINBOW SMELT
120	71961	0.03791	0.000	0.02356	0.05226	0.00011025	0.99635228	CLINOPEGMA MAGMA
121	56311	0.03599	0.001	0.00000	0.08162	0.00010466	0.99645693	GIANT SCALE WORM
122	10212	0.03598	0.000	0.01826	0.05370	0.00010464	0.99656157	SAKHALIN SOLE
123	98000	0.03450	0.000	0.00764	0.06136	0.00010033	0.99666190	TUNICATE UNIDENT.
124	41221	0.03404	0.000	0.00737	0.06070	0.00009898	0.99676088	GERSEMIA RUBIFORMIS (=EUNEPHTHYA RUBIFORMIS)
125	10270	0.03359	0.000	0.00724	0.05994	0.00009768	0.99685857	BUTTER SOLE
126	81779	0.03325	0.001	0.00000	0.08575	0.00009671	0.99695527	CTENODISCUS SP.
127	50160	0.03313	0.000	0.01153	0.05474	0.00009635	0.99705162	SEA MOUSE UNIDENT.
128	21438	0.03010	0.000	0.02031	0.03989	0.00008753	0.99713916	THORNY SCULPIN
129	71764	0.02923	0.000	0.00804	0.05043	0.00008501	0.99722417	TULIP WHELK
130	99999	0.02867	0.000	0.00488	0.05247	0.00008338	0.99730755	UNSORTED SHAB
131	75610	0.02845	0.001	0.00000	0.06951	0.00008275	0.99739030	FALSEJINGLES UNIDENT. (PREV. ROCK JINGLES)
132	23010	0.02715	0.000	0.00748	0.04682	0.00007896	0.99746926	EULACHON
133	50000	0.02715	0.001	0.00000	0.06630	0.00007894	0.99754820	POLYCHAETE WORM UNIDENT.
134	99990	0.02582	0.000	0.00000	0.06271	0.00007507	0.99762328	INVERTEBRATE UNIDENT.
135	82526	0.02525	0.000	0.00000	0.06227	0.00007343	0.99769671	WHITE SEA URCHIN
136	80110	0.02487	0.000	0.00559	0.04414	0.00007232	0.99776903	LEPTASTERIAS GROENLANDICA
137	24001	0.02465	0.000	0.00000	0.05349	0.00007167	0.99784070	PROWFISH
138	21360	0.02383	0.000	0.00000	0.05134	0.00006929	0.99790999	BRIGHTBELLY SCULPIN
139	69400	0.02297	0.000	0.01060	0.03533	0.00006680	0.99797679	HORSEHAIR CRAB
140	71763	0.02235	0.000	0.00000	0.04492	0.00006500	0.99804179	SHOULDERED WHELK
141	72063	0.02010	0.000	0.01121	0.02899	0.00005846	0.99810025	KEELED AFORIA

Table C-1.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
142	71010	0.01990	0.000	0.01161	0.02819	0.00005788	0.99815813	NUDIBRANCH UNIDENT.
143	10250	0.01952	0.000	0.00000	0.05188	0.00005676	0.99821489	SAND SOLE
144	71891	0.01893	0.000	0.01325	0.02460	0.00005505	0.99826994	PLICIFUSUS KROYERI
145	71580	0.01890	0.000	0.01208	0.02571	0.00005496	0.99832490	PALE MOONSNAIL
146	71525	0.01774	0.000	0.00899	0.02649	0.00005159	0.99837649	NATICA SP.
147	75285	0.01688	0.000	0.00395	0.02981	0.00004909	0.99842557	GREENLAND COCKLE
148	65100	0.01669	0.000	0.00094	0.03244	0.00004853	0.99847411	BARNACLE UNIDENT.
149	85200	0.01582	0.000	0.00160	0.03005	0.00004602	0.99852012	CUCUMARIA SP.
150	21390	0.01543	0.000	0.00843	0.02242	0.00004486	0.99856498	SPINYHEAD SCULPIN
151	41100	0.01529	0.000	0.00506	0.02552	0.00004446	0.99860945	SOFT CORAL UNIDENT.
152	82500	0.01519	0.000	0.00000	0.03291	0.00004417	0.99865362	SEA URCHIN UNIDENT.
153	43040	0.01321	0.000	0.00670	0.01972	0.00003843	0.99869205	TEALIA SP.
154	24189	0.01260	0.000	0.00032	0.02488	0.00003664	0.99872868	POLAR EELPOUT
155	71760	0.01234	0.000	0.00000	0.02852	0.00003588	0.99876456	VOLUTE WHELK
156	20322	0.01228	0.000	0.00000	0.02589	0.00003572	0.99880028	BERING WOLFFISH
157	80000	0.01131	0.000	0.00112	0.02150	0.00003289	0.99883317	STARFISH UNIDENT.
158	00450	0.01119	0.000	0.00000	0.02975	0.00003256	0.99886573	STARRY SKATE
159	91040	0.01019	0.000	0.00000	0.02709	0.00002964	0.99889537	TREE SPONGE
160	21355	0.01017	0.000	0.00400	0.01634	0.00002958	0.99892495	RIBBED SCULPIN
161	75111	0.01002	0.000	0.00352	0.01652	0.00002913	0.99895408	ARCTIC SURFCLAM (PREV. ALASKA SURF CLAM)
162	21377	0.00999	0.000	0.00000	0.02225	0.00002905	0.99898313	FOURHORN SCULPIN
163	94000	0.00975	0.000	0.00149	0.01801	0.00002836	0.99901150	SIPUNCULID WORM UNIDENT.
164	81310	0.00902	0.000	0.00412	0.01392	0.00002624	0.99903774	PTERASTER SP.
165	21446	0.00897	0.000	0.00463	0.01330	0.00002608	0.99906382	ICELUS SP.
166	30060	0.00891	0.000	0.00000	0.02218	0.00002590	0.99908972	PACIFIC OCEAN PERCH
167	69110	0.00877	0.000	0.00060	0.01695	0.00002551	0.99911524	WIDEHAND HERMIT CRAB
168	71800	0.00833	0.000	0.00000	0.02155	0.00002423	0.99913947	NEPTUNEA SP.
169	42000	0.00780	0.000	0.00043	0.01517	0.00002269	0.99916216	SEA PEN UNIDENT.
170	20061	0.00768	0.000	0.00420	0.01115	0.00002232	0.99918448	BERING POACHER
171	21932	0.00730	0.000	0.00281	0.01178	0.00002122	0.99920570	WHITESPOTTED GREENLING
172	71769	0.00722	0.000	0.00000	0.01547	0.00002101	0.99922671	BERINGIUS SP.
173	74311	0.00676	0.000	0.00185	0.01168	0.00001966	0.99924637	ARCTIC HIATELLA
174	22219	0.00674	0.000	0.00000	0.01792	0.00001961	0.99926598	CAREPROCTUS SP.
175	71537	0.00665	0.000	0.00205	0.01125	0.00001934	0.99928531	RUSTY MOONSNAIL
176	81360	0.00639	0.000	0.00000	0.01280	0.00001859	0.99930390	DIPLOPTERASTER MULTIPES
177	69035	0.00637	0.000	0.00000	0.01694	0.00001853	0.99932243	PAGURUS SP.
178	21314	0.00617	0.000	0.00000	0.01258	0.00001794	0.99934038	THREADED SCULPIN
179	66611	0.00610	0.000	0.00402	0.00819	0.00001775	0.99935813	NORTHERN ARGID
180	66045	0.00600	0.000	0.00304	0.00896	0.00001744	0.99937557	HUMPY SHRIMP
181	85000	0.00597	0.000	0.00000	0.01244	0.00001736	0.99939293	SEA CUCUMBER UNIDENT.
182	72501	0.00565	0.000	0.00000	0.01368	0.00001642	0.99940935	FUSITRITON SP.
183	80015	0.00552	0.000	0.00000	0.01449	0.00001606	0.99942541	EVASTERIAS TROSCHELII
184	81095	0.00548	0.000	0.00216	0.00880	0.00001594	0.99944135	ROSE SEA STAR
185	75110	0.00533	0.000	0.00128	0.00939	0.00001551	0.99945686	MACTROMERIS SP. (=SPISULA SP.)
186	20510	0.00532	0.000	0.00000	0.01106	0.00001547	0.99947233	SABLEFISH
187	24186	0.00510	0.000	0.00000	0.01350	0.00001484	0.99948717	SADDLED EELPOUT
188	66530	0.00499	0.000	0.00323	0.00676	0.00001452	0.99950170	RIDGED CRANGON

Table C-1 .--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
189	98200	0.00454	0.000	0.00000	0.01071	0.00001319	0.99951489	SEA PEACH UNIDENT.
190	68040	0.00436	0.000	0.00180	0.00692	0.00001268	0.99952756	OREGON ROCK CRAB
191	71681	0.00436	0.000	0.00060	0.00811	0.00001267	0.99954023	GREAT SLIPPERSNAIL
192	95030	0.00434	0.000	0.00000	0.00910	0.00001263	0.99955286	LEAFY BRYOZOAN
193	75600	0.00419	0.000	0.00000	0.01114	0.00001219	0.99956505	ALASKA FALSEJINGLE (PREV. ROCK JINGLE)
194	00310	0.00403	0.000	0.00000	0.01071	0.00001172	0.99957677	SPINY DOGFISH
195	71761	0.00383	0.000	0.00056	0.00709	0.00001113	0.99958789	VOLUTOPSIUS MELONIS (=PYRULOFUSUS MELONIS)
196	23235	0.00372	0.000	0.00000	0.00818	0.00001081	0.99959870	CHUM SALMON
197	75281	0.00370	0.000	0.00112	0.00629	0.00001077	0.99960947	CLINOCARDIUM SP.
198	21315	0.00370	0.000	0.00000	0.00808	0.00001075	0.99962022	ARCTIC STAGHORN SCULPIN
199	20006	0.00358	0.000	0.00172	0.00544	0.00001042	0.99963064	SAWBACK POACHER
200	71530	0.00355	0.000	0.00040	0.00671	0.00001033	0.99964097	ARCTIC MOONSNAIL
201	71726	0.00347	0.000	0.00128	0.00567	0.00001011	0.99965108	THICK-RIBBED WHELK
202	80010	0.00342	0.000	0.00000	0.00908	0.00000994	0.99966101	EVASTERIAS SP.
203	66502	0.00339	0.000	0.00214	0.00464	0.00000986	0.99967088	CRANGON SP.
204	23808	0.00325	0.000	0.00159	0.00490	0.00000944	0.99968032	SNAKE PRICKLEBACK
205	75241	0.00324	0.000	0.00095	0.00552	0.00000941	0.99968973	BENT-NOSE MACOMA (PREV. COMMON MACOMA)
206	20035	0.00318	0.000	0.00131	0.00505	0.00000925	0.99969898	GRAY STARSNOUT
207	74120	0.00316	0.000	0.00000	0.00726	0.00000920	0.99970818	WEATHERVANE SCALLOP
208	22226	0.00312	0.000	0.00000	0.00664	0.00000908	0.99971726	MONSTER SNAILFISH
209	56312	0.00303	0.000	0.00004	0.00602	0.00000881	0.99972607	DEPRESSED SCALE WORM
210	99904	0.00282	0.000	0.00000	0.00729	0.00000821	0.99973427	SEA CLOD
211	80595	0.00274	0.000	0.00011	0.00536	0.00000796	0.99974224	LEPTASTERIAS SP.
212	71640	0.00235	0.000	0.00000	0.00614	0.00000682	0.99974906	SLIPPER SHELL
213	10001	0.00231	0.000	0.00000	0.00472	0.00000670	0.99975576	FLATFISH UNIDENT.
214	74561	0.00230	0.000	0.00000	0.00517	0.00000670	0.99976246	BLACK MUSSEL
215	21354	0.00228	0.000	0.00000	0.00566	0.00000663	0.99976909	SPECTACLED SCULPIN
216	72420	0.00223	0.000	0.00000	0.00545	0.00000650	0.99977559	BOREOTROPHON SP. (FORMERLY TROPHONOPSIS SP.)
217	71722	0.00216	0.000	0.00074	0.00358	0.00000629	0.99978187	OBLIQUE WHELK
218	74439	0.00216	0.000	0.00000	0.00463	0.00000627	0.99978815	TRENCHED NUTCLAM
219	74104	0.00215	0.000	0.00000	0.00518	0.00000627	0.99979441	CHLAMYS SP.
220	74655	0.00212	0.000	0.00000	0.00466	0.00000616	0.99980057	MANY-RIB CYCLOCARDIA
221	00001	0.00206	0.000	0.00000	0.00533	0.00000599	0.99980657	FISH EGGS UNIDENT.
222	56310	0.00202	0.000	0.00097	0.00306	0.00000587	0.99981243	EUNOE SP.
223	81315	0.00198	0.000	0.00000	0.00408	0.00000576	0.99981819	PTERASTER TESSELATUS
224	71710	0.00193	0.000	0.00000	0.00399	0.00000562	0.99982381	COLUS SP.
225	71731	0.00191	0.000	0.00070	0.00313	0.00000557	0.99982938	COLUS HALLI
226	21350	0.00184	0.000	0.00003	0.00364	0.00000534	0.99983472	TRIGLOPS SP.
227	21592	0.00180	0.000	0.00007	0.00353	0.00000524	0.99983995	PACIFIC SANDFISH
228	69310	0.00172	0.000	0.00000	0.00385	0.00000501	0.99984496	GOLDEN KING CRAB
229	23805	0.00168	0.000	0.00087	0.00249	0.00000488	0.99984984	DAUBED SHANNY
230	75286	0.00165	0.000	0.00000	0.00425	0.00000480	0.99985464	BROAD COCKLE
231	80660	0.00163	0.000	0.00000	0.00354	0.00000475	0.99985939	PSEUDARCHASTER PARELII
232	79020	0.00162	0.000	0.00000	0.00324	0.00000470	0.99986409	ROSSIA PACIFICA
233	71892	0.00156	0.000	0.00000	0.00317	0.00000454	0.99986864	PLICIFUSUS INCISUS
234	66580	0.00155	0.000	0.00066	0.00244	0.00000451	0.99987315	ARCTIC ARGID
235	65205	0.00151	0.000	0.00000	0.00373	0.00000439	0.99987754	BEAKED BARNACLE

Table C-1.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
236	71260	0.00144	0.000	0.00000	0.00382	0.00000418	0.99988172	WHITE NIGHT DORIS (PREV. SNOW WHITE DORIS)
237	75284	0.00143	0.000	0.00026	0.00261	0.00000417	0.99988589	SERRIPES SP.
238	72805	0.00142	0.000	0.00000	0.00348	0.00000414	0.99989003	SMOOTH LAMELLARIA
239	66570	0.00139	0.000	0.00065	0.00214	0.00000405	0.99989409	ARGIS SP.
240	74106	0.00136	0.000	0.00000	0.00278	0.00000394	0.99989803	CHLAMYS RUBIDA
241	21935	0.00134	0.000	0.00000	0.00356	0.00000390	0.99990193	KELP GREENLING
242	85210	0.00133	0.000	0.00000	0.00313	0.00000388	0.99990580	PSOLUS SP.
243	30240	0.00132	0.000	0.00000	0.00350	0.00000383	0.99990964	YELLOWTAIL ROCKFISH
244	21352	0.00129	0.000	0.00000	0.00340	0.00000376	0.99991340	SCISSORTAIL SCULPIN
245	69042	0.00120	0.000	0.00000	0.00319	0.00000349	0.99991689	SPONGE HERMIT CRAB
246	21340	0.00114	0.000	0.00034	0.00194	0.00000331	0.99992020	BLACKFIN SCULPIN
247	72758	0.00111	0.000	0.00000	0.00244	0.00000324	0.99992344	GLACIAL WHELK
248	80540	0.00109	0.000	0.00055	0.00163	0.00000318	0.99992662	HENRICIA SP.
249	24180	0.00107	0.000	0.00000	0.00284	0.00000310	0.99992972	LYCODES SP.
250	23809	0.00101	0.000	0.00000	0.00220	0.00000293	0.99993266	PIGHEAD PRICKLEBACK
251	74983	0.00099	0.000	0.00014	0.00184	0.00000287	0.99993553	HAIRY COCKLE
252	75267	0.00092	0.000	0.00022	0.00162	0.00000268	0.99993820	ALASKA RAZOR (PREV. NORTHERN RAZOR CLAM)
253	71012	0.00091	0.000	0.00000	0.00199	0.00000264	0.99994084	GIANT ORANGE TOCHUI (PREV.ORANGE-PEEL NUDI.)
254	20050	0.00091	0.000	0.00042	0.00139	0.00000263	0.99994348	ALEUTIAN ALLIGATORFISH
255	72756	0.00090	0.000	0.00017	0.00163	0.00000262	0.99994610	BUCCINUM SOLENUM
256	71535	0.00088	0.000	0.00000	0.00191	0.00000255	0.99994865	NATICA ALEUTICA
257	21921	0.00087	0.000	0.00000	0.00230	0.00000252	0.99995117	ATKA MACKEREL
258	72403	0.00082	0.000	0.00000	0.00180	0.00000239	0.99995356	BOREOTROPHON MURICIFORMIS (=TROPHON)
259	21378	0.00070	0.000	0.00000	0.00185	0.00000203	0.99995558	ARCTIC SCULPIN
260	20202	0.00070	0.000	0.00019	0.00120	0.00000202	0.99995760	PACIFIC SAND LANCE
261	71774	0.00063	0.000	0.00000	0.00168	0.00000184	0.99995944	BERINGIUS STIMPSONI
262	10180	0.00059	0.000	0.00003	0.00115	0.00000171	0.99996116	DOVER SOLE
263	21388	0.00058	0.000	0.00000	0.00129	0.00000170	0.99996285	ANTLERED SCULPIN
264	68020	0.00057	0.000	0.00000	0.00151	0.00000165	0.99996450	DUNGENESS CRAB
265	74416	0.00055	0.000	0.00000	0.00146	0.00000159	0.99996609	CRISSCROSSED YOLDIA
266	75240	0.00054	0.000	0.00000	0.00133	0.00000157	0.99996766	MACOMA SP.
267	92500	0.00049	0.000	0.00000	0.00130	0.00000143	0.99996909	NEMERTEAN WORM UNIDENT.
268	95060	0.00049	0.000	0.00000	0.00130	0.00000142	0.99997051	ESCHAROPSIS SARSI
269	80729	0.00048	0.000	0.00000	0.00106	0.00000139	0.99997190	RED BAT STAR
270	71575	0.00047	0.000	0.00004	0.00090	0.00000136	0.99997326	POLINICES SP.
271	71030	0.00045	0.000	0.00000	0.00103	0.00000132	0.99997458	ROSY TRITONIA (PREV.DIOMEDES' TRITON)
272	22175	0.00044	0.000	0.00000	0.00116	0.00000129	0.99997587	SMOOTH LUMPSUCKER
273	66601	0.00041	0.000	0.00000	0.00087	0.00000120	0.99997707	TANK SHRIMP (SCULPTURED SHRIMP)
274	75264	0.00041	0.000	0.00000	0.00086	0.00000120	0.99997827	SILIQUA SP.
275	72790	0.00041	0.000	0.00000	0.00109	0.00000119	0.99997946	ALASKA VOLUTE
276	74050	0.00037	0.000	0.00005	0.00070	0.00000109	0.99998055	MUSSEL UNIDENT.
277	74100	0.00037	0.000	0.00000	0.00093	0.00000109	0.99998164	SCALLOP UNIDENT.
278	74981	0.00037	0.000	0.00000	0.00098	0.00000107	0.99998271	COCKLE UNIDENT.
279	72531	0.00035	0.000	0.00000	0.00090	0.00000102	0.99998372	MARGARITES SP.
280	80546	0.00029	0.000	0.00005	0.00053	0.00000084	0.99998457	HENRICIA TUMIDA
281	21300	0.00029	0.000	0.00000	0.00065	0.00000083	0.99998540	SCULPIN UNIDENT.
282	75247	0.00029	0.000	0.00000	0.00076	0.00000083	0.99998623	HEAVY MACOMA

Table C-1.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
283	75242	0.00029	0.000	0.00000	0.00076	0.00000083	0.99998707	CHALKY MACOMA
284	66020	0.00027	0.000	0.00000	0.00058	0.00000079	0.99998786	PANDALUS SP.
285	20000	0.00027	0.000	0.00000	0.00058	0.00000079	0.99998865	POACHER UNIDENT.
286	75201	0.00026	0.000	0.00003	0.00048	0.00000075	0.99998939	TELLINA SP.
287	21405	0.00025	0.000	0.00000	0.00052	0.00000072	0.99999012	EYESHADE SCULPIN
288	66175	0.00024	0.000	0.00003	0.00046	0.00000071	0.99999082	EUALUS GAIMARDII BELCHERI
289	66033	0.00022	0.000	0.00000	0.00053	0.00000065	0.99999147	YELLOWLEG PANDALID
290	95080	0.00021	0.000	0.00000	0.00048	0.00000061	0.99999208	CORAL BRYOZOAN
291	74080	0.00020	0.000	0.00000	0.00048	0.00000059	0.99999268	BLUE MUSSEL (PREV. BAY MUSSEL)
292	74414	0.00018	0.000	0.00000	0.00047	0.00000052	0.99999319	YOLDIA SP.
293	74060	0.00017	0.000	0.00000	0.00044	0.00000048	0.99999367	NORTHERN HORSEMUSSEL (PREV. HORSE MUSSEL)
294	66050	0.00016	0.000	0.00000	0.00042	0.00000046	0.99999413	COONSTRIPE SHRIMP
295	66548	0.00016	0.000	0.00000	0.00042	0.00000046	0.99999459	SAND SHRIMP
296	74435	0.00015	0.000	0.00000	0.00035	0.00000043	0.99999502	NUCULANA SP.
297	40011	0.00013	0.000	0.00000	0.00035	0.00000038	0.99999540	HYDROID UNIDENT.
298	81060	0.00011	0.000	0.00000	0.00031	0.00000033	0.99999573	SOLASTER SP.
299	94500	0.00011	0.000	0.00000	0.00030	0.00000033	0.99999606	ECHIUROID WORM UNIDENT.
300	74982	0.00010	0.000	0.00000	0.00023	0.00000029	0.99999635	NUTTAL COCKLE
301	21441	0.00009	0.000	0.00000	0.00025	0.00000027	0.99999662	SPATULATE SCULPIN
302	82530	0.00008	0.000	0.00000	0.00022	0.00000024	0.99999686	ORANGE-PINK SEA URCHIN
303	20055	0.00008	0.000	0.00000	0.00021	0.00000023	0.99999709	SMOOTH ALLIGATORFISH
304	70100	0.00008	0.000	0.00000	0.00021	0.00000023	0.99999732	CHITON UNIDENT.
305	69336	0.00007	0.000	0.00000	0.00016	0.00000022	0.99999754	SCALED CRAB
306	79000	0.00007	0.000	0.00000	0.00019	0.00000021	0.99999775	SQUID UNIDENT.
307	74440	0.00007	0.000	0.00000	0.00017	0.00000019	0.99999794	STOUT NUTCLAM
308	72304	0.00006	0.000	0.00000	0.00016	0.00000018	0.99999812	CROWNED HAIRYSNAIL
309	21345	0.00006	0.000	0.00000	0.00016	0.00000017	0.99999829	LONGFIN IRISH LORD
310	71890	0.00006	0.000	0.00000	0.00015	0.00000017	0.99999846	PLICIFUSUS SP.
311	22178	0.00006	0.000	0.00000	0.00013	0.00000016	0.99999862	PACIFIC SPINY LUMPSUCKER
312	81090	0.00005	0.000	0.00000	0.00014	0.00000015	0.99999878	CROSSASTER SP.
313	20002	0.00005	0.000	0.00000	0.00012	0.00000014	0.99999892	DRAGON POACHER
314	21339	0.00005	0.000	0.00000	0.00012	0.00000013	0.99999905	MALACOCOTTUS SP.
315	20038	0.00004	0.000	0.00000	0.00010	0.00000011	0.99999916	BLACKFIN POACHER
316	23843	0.00003	0.000	0.00000	0.00009	0.00000010	0.99999926	BEARDED WARBONNET
317	71724	0.00003	0.000	0.00000	0.00009	0.00000009	0.99999935	ROSY WHELK
318	20001	0.00003	0.000	0.00000	0.00008	0.00000009	0.99999944	TUBENOSE POACHER
319	23806	0.00003	0.000	0.00000	0.00008	0.00000008	0.99999953	STOUT EELBLENNY
320	66150	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999961	HIPPOLYTID SHRIMP UNIDENT.
321	23850	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999969	WHITEBARRED PRICKLEBACK
322	23800	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999976	PRICKLEBACK UNIDENT.
323	93100	0.00002	0.000	0.00000	0.00006	0.00000007	0.99999983	PRIAPULID WORM UNIDENT.
324	66030	0.00002	0.000	0.00000	0.00005	0.00000006	0.99999989	OCEAN SHRIMP (PREV. OCEAN PINK SHRIMP)
325	69316	0.00002	0.000	0.00000	0.00005	0.00000006	0.99999995	HAPALOGASTER GREBNITZKII
326	23000	0.00002	0.000	0.00000	0.00005	0.00000005	1.00000000	SMELT UNIDENT.
	TOTAL	343.86096						

Teble C-2.--Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1988 U.S.-Japan bottom trawl survey on the continental slope.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	61.91444	180.789	39.62138	84.20750	0.33610923	0.33610923	WALLEYE POLLOCK
2	21230	25.70420	14.994	19.28412	32.12428	0.13953802	0.47564725	GIANT GRENADIER
3	10115	20.22181	8.308	15.44289	25.00074	0.10977630	0.58542355	GREENLAND TURBOT (=GREENLAND HALIBUT)
4	10110	14.46002	2.539	11.81831	17.10172	0.07849777	0.66392132	ARROWTOOTH FLOUNDER
5	20510	14.41113	8.669	9.52935	19.29291	0.07823240	0.74215372	SABLEFISH
6	30060	13.66598	20.198	6.21460	21.11736	0.07418724	0.81634095	PACIFIC OCEAN PERCH
7	10120	5.49450	4.919	1.81712	9.17189	0.02982751	0.84616846	PACIFIC HALIBUT
8	10130	5.07635	0.409	4.01665	6.13606	0.02755752	0.87372598	FLATHEAD SOLE
9	21720	4.44798	1.755	2.25123	6.64473	0.02414634	0.89787232	PACIFIC COD
10	21220	2.95511	0.984	1.31081	4.59941	0.01604213	0.91391445	PACIFIC GRENADIER
11	30020	2.46000	1.079	0.73737	4.18264	0.01335439	0.92726884	SHORTSPINE THORNYHEAD
12	24110	1.35516	0.193	0.62666	2.08366	0.00735665	0.93462548	TWOLINE EELPOUT
13	21420	0.99355	0.064	0.57441	1.41269	0.00539359	0.94001907	BIGMOUTH SCULPIN
14	00320	0.87614	0.095	0.36508	1.38720	0.00475620	0.94477527	PACIFIC SLEEPER SHARK
15	79210	0.85155	0.016	0.63973	1.06338	0.00462274	0.94939800	MAGISTRATE ARMHOOK SQUID (PREV. RED SQUID)
16	10200	0.84668	0.020	0.61024	1.08311	0.00459628	0.95399429	REX SOLE
17	21341	0.76490	0.049	0.39693	1.13288	0.00415237	0.95814666	DARKFIN SCULPIN
18	24001	0.70362	0.083	0.22592	1.18132	0.00381968	0.96196633	PROWFISH
19	40500	0.54027	0.003	0.45438	0.62615	0.00293289	0.96489923	JELLYFISH UNIDENT.
20	91700	0.47696	0.214	0.00000	1.24467	0.00258925	0.96748848	GLASS SPONGE UNIDENT.
21	30576	0.46156	0.042	0.12000	0.80313	0.00250564	0.96999412	SHORTRAKER ROCKFISH
22	30040	0.43492	0.021	0.19250	0.67734	0.00236100	0.97235512	ROCKFISH UNIDENT.
23	00471	0.41981	0.040	0.08874	0.75089	0.00227899	0.97463412	ALASKA SKATE (=FLATHEAD SKATE)
24	21210	0.38206	0.083	0.00000	0.85874	0.00207405	0.97670817	CORYPHAENOIDES SP.
25	30050	0.32781	0.012	0.14696	0.50866	0.00177957	0.97848774	ROUGHEYE ROCKFISH
26	24187	0.28655	0.009	0.13214	0.44095	0.00155555	0.98004329	EBONY EELPOUT (PREV. MARBLED EELPOUT)
27	23836	0.27714	0.006	0.15006	0.40422	0.00150446	0.98154775	LONGSNOUT PRICKLEBACK
28	83000	0.27049	0.073	0.00000	0.71843	0.00146840	0.98301615	BRITTLESTARFISH UNIDENT.
29	00400	0.27036	0.006	0.14395	0.39678	0.00146769	0.98448384	SKATE UNIDENT.
30	00472	0.25213	0.011	0.07558	0.42868	0.00136872	0.98585256	ALEUTIAN SKATE
31	85000	0.23672	0.009	0.08085	0.39258	0.00128503	0.98713760	SEA CUCUMBER UNIDENT.
32	24190	0.18376	0.003	0.09618	0.27134	0.00099756	0.98813516	BLACK EELPOUT
33	68550	0.17834	0.005	0.06360	0.29309	0.00096816	0.98910332	TRUE TANNER CRAB
34	66031	0.17089	0.001	0.11592	0.22585	0.00092768	0.99003100	NORTHERN SHRIMP (=PINK SHRIMP)
35	79200	0.16677	0.004	0.06590	0.26765	0.00090536	0.99093636	GONATUS SP.
36	43000	0.13420	0.002	0.06362	0.20479	0.00072854	0.99166489	SEA ANEMONE UNIDENT.
37	22219	0.10412	0.001	0.04721	0.16103	0.00056523	0.99223012	CAREPROCTUS SP.
38	68570	0.09919	0.001	0.04867	0.14972	0.00053847	0.99276859	CHIONOECETES ANGULATUS
39	00435	0.09688	0.002	0.02494	0.16883	0.00052593	0.99329452	BERING SKATE (=SANDPAPER SKATE)
40	00480	0.07117	0.002	0.00038	0.14196	0.00038635	0.99368087	WHITEBLOTCHED SKATE
41	66120	0.07080	0.000	0.04489	0.09670	0.00038433	0.99406520	SIDESTRIPE SHRIMP
42	22232	0.06872	0.001	0.01098	0.12646	0.00037304	0.99443824	PEACHSKIN SNAILFISH (=SCOTT'S SNAILFISH)
43	23657	0.06139	0.003	0.00000	0.15052	0.00033325	0.99477149	LONGNOSE LANCETFISH
44	22175	0.05533	0.000	0.02929	0.08137	0.00030036	0.99507185	SMOOTH LUMPSUCKER
45	80729	0.05468	0.001	0.00000	0.11301	0.00029684	0.99536869	RED BAT STAR
46	91000	0.04697	0.001	0.00000	0.10180	0.00025497	0.99562366	SPONGE UNIDENT.
47	00460	0.04197	0.000	0.01095	0.07298	0.00022783	0.99585149	BLACK SKATE (PREV. ROUGHTAIL SKATE)

Table C-2.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
48	24100	0.04129	0.001	0.00000	0.09347	0.00022417	0.99607566	EELPOUT UNIDENT.
49	22200	0.03700	0.000	0.01177	0.06224	0.00020088	0.99627654	SNAILFISH UNIDENT.
50	66000	0.03369	0.000	0.00000	0.06803	0.00018292	0.99645946	SHRIMP UNIDENT.
51	80000	0.03297	0.000	0.01435	0.05159	0.00017900	0.99663846	STARFISH UNIDENT.
52	69310	0.03181	0.000	0.00911	0.05451	0.00017269	0.99681115	GOLDEN KING CRAB
53	23240	0.03145	0.000	0.00021	0.06269	0.00017072	0.99698187	SOCKEYE SALMON
54	00450	0.02750	0.001	0.00000	0.07311	0.00014931	0.99713118	STARRY SKATE
55	22600	0.02722	0.000	0.01113	0.04332	0.00014779	0.99727897	LANTERNFISH UNIDENT.
56	21731	0.02677	0.000	0.01685	0.03669	0.00014533	0.99742430	PACIFIC FLATNOSE
57	78010	0.02607	0.000	0.00648	0.04567	0.00014154	0.99756585	OCTOPUS UNIDENT.
58	20720	0.02529	0.000	0.00088	0.04971	0.00013731	0.99770315	SEARCHER
59	78012	0.02522	0.000	0.01018	0.04025	0.00013689	0.99784005	SMOOTHSKIN OCTOPUS
60	30010	0.02389	0.001	0.00000	0.06349	0.00012967	0.99796971	THORNYHEAD UNIDENT.
61	10180	0.02300	0.000	0.01012	0.03588	0.00012486	0.99809457	DOVER SOLE
62	20035	0.02237	0.000	0.00000	0.04488	0.00012142	0.99821599	GRAY STARSNOUT
63	24185	0.02098	0.000	0.00540	0.03655	0.00011388	0.99832987	WATTLED EELPOUT
64	21390	0.01988	0.000	0.01102	0.02874	0.00010792	0.99843779	SPINYHEAD SCULPIN
65	20038	0.01919	0.000	0.01047	0.02792	0.00010419	0.99854198	BLACKFIN POACHER
66	71820	0.01914	0.000	0.00000	0.03917	0.00010388	0.99864585	PRIBILOF WHELK
67	21355	0.01614	0.000	0.00959	0.02268	0.00008760	0.99873345	RIBBED SCULPIN
68	21300	0.01054	0.000	0.00000	0.02313	0.00005722	0.99879068	SCULPIN UNIDENT.
69	00410	0.00974	0.000	0.00000	0.02178	0.00005288	0.99884356	DEEPSEA SKATE
70	21395	0.00964	0.000	0.00000	0.02562	0.00005233	0.99889589	BLOB SCULPIN
71	81092	0.00888	0.000	0.00448	0.01327	0.00004818	0.99894407	CROSSASTER BOREALIS
72	21439	0.00848	0.000	0.00349	0.01347	0.00004603	0.99899010	POREHEAD SCULPIN
73	21370	0.00798	0.000	0.00000	0.02120	0.00004329	0.99903339	GREAT SCULPIN
74	20006	0.00796	0.000	0.00072	0.01520	0.00004321	0.99907660	SAWBACK POACHER
75	10260	0.00779	0.000	0.00120	0.01438	0.00004230	0.99911890	ROCK SOLE
76	23235	0.00723	0.000	0.00000	0.01533	0.00003924	0.99915814	CHUM SALMON
77	81060	0.00722	0.000	0.00112	0.01332	0.00003919	0.99919733	SOLASTER SP.
78	00021	0.00633	0.000	0.00348	0.00918	0.00003436	0.99923169	PACIFIC LAMPREY
79	20622	0.00614	0.000	0.00370	0.00858	0.00003334	0.99926503	NORTHERN SMOOTHTONGUE
80	71500	0.00612	0.000	0.00115	0.01108	0.00003321	0.99929823	SNAIL UNIDENT.
81	68560	0.00576	0.000	0.00119	0.01032	0.00003126	0.99932949	BROAD SNOW CRAB (=TANNER CRAB(BAIRDI))
82	23010	0.00567	0.000	0.00000	0.01198	0.00003076	0.99936025	EULACHON
83	72500	0.00554	0.000	0.00168	0.00939	0.00003006	0.99939032	OREGON TRITON
84	81870	0.00508	0.000	0.00000	0.01131	0.00002759	0.99941790	DIPSACASTER BOREALIS
85	20100	0.00485	0.000	0.00121	0.00848	0.00002631	0.99944421	SLICKHEAD UNIDENT.
86	21340	0.00479	0.000	0.00000	0.01007	0.00002600	0.99947021	BLACKFIN SCULPIN
87	72752	0.00458	0.000	0.00251	0.00664	0.00002484	0.99949505	LADDER WHELK (PREV. SILKY WHELK)
88	79000	0.00443	0.000	0.00116	0.00771	0.00002407	0.99951912	SQUID UNIDENT.
89	10190	0.00406	0.000	0.00000	0.00821	0.00002202	0.99954114	DEEPSEA SOLE
90	79020	0.00377	0.000	0.00151	0.00604	0.00002048	0.99956162	ROSSIA PACIFICA
91	21010	0.00312	0.000	0.00133	0.00490	0.00001691	0.99957854	PACIFIC VIPERFISH
92	22610	0.00309	0.000	0.00000	0.00680	0.00001678	0.99959531	CALIFORNIA HEADLIGHTFISH
93	71800	0.00307	0.000	0.00000	0.00803	0.00001665	0.99961197	NEPTUNEA SP.
94	72740	0.00284	0.000	0.00081	0.00488	0.00001544	0.99962741	BUCCINUM SP.

Table C-2.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
95	30150	0.00284	0.000	0.00000	0.00754	0.00001539	0.99964280	DUSKY ROCKFISH
96	21347	0.00279	0.000	0.00000	0.00606	0.00001512	0.99965792	YELLOW IRISH LORD
97	69335	0.00254	0.000	0.00000	0.00598	0.00001381	0.99967173	PARALOMIS MULTISPINA
98	81910	0.00248	0.000	0.00096	0.00401	0.00001348	0.99968522	LUIDIASTER DAWSONI
99	21438	0.00232	0.000	0.00000	0.00572	0.00001258	0.99969779	THORNY SCULPIN
100	56311	0.00218	0.000	0.00000	0.00454	0.00001184	0.99970964	GIANT SCALE WORM
101	23055	0.00212	0.000	0.00000	0.00484	0.00001149	0.99972113	RAINBOW SMELT
102	72790	0.00183	0.000	0.00000	0.00420	0.00000993	0.99973106	ALASKA VOLUTE
103	30420	0.00174	0.000	0.00000	0.00463	0.00000945	0.99974051	NORTHERN ROCKFISH
104	50160	0.00165	0.000	0.00090	0.00240	0.00000896	0.99974947	SEA MOUSE UNIDENT.
105	80730	0.00165	0.000	0.00061	0.00269	0.00000895	0.99975841	ORANGE BAT STAR
106	69070	0.00159	0.000	0.00033	0.00284	0.00000861	0.99976702	KNOBBYHAND HERMIT CRAB
107	22912	0.00155	0.000	0.00070	0.00240	0.00000841	0.99977543	ONEIRODES SP.
108	66060	0.00147	0.000	0.00000	0.00311	0.00000799	0.99978342	PANDALOPSIS ALEUTICA
109	00485	0.00143	0.000	0.00000	0.00379	0.00000774	0.99979116	WHITEBROW SKATE
110	71764	0.00142	0.000	0.00000	0.00376	0.00000768	0.99979884	TULIP WHELK
111	66570	0.00139	0.000	0.00073	0.00205	0.00000754	0.99980638	ARGIS SP.
112	69300	0.00138	0.000	0.00000	0.00281	0.00000747	0.99981386	LITHODES COUESI
113	66770	0.00132	0.000	0.00021	0.00244	0.00000717	0.99982103	GLASS SHRIMP
114	69086	0.00128	0.000	0.00018	0.00237	0.00000692	0.99982795	FUZZY HERMIT CRAB
115	00495	0.00127	0.000	0.00000	0.00285	0.00000688	0.99983483	OKHOTSK SKATE
116	81360	0.00121	0.000	0.00000	0.00287	0.00000659	0.99984142	DIPLOPTERASTER MULTIPES
117	83020	0.00121	0.000	0.00000	0.00298	0.00000656	0.99984799	GORGONOCEPHALUS CARYI
118	21446	0.00110	0.000	0.00000	0.00237	0.00000595	0.99985393	ICELUS SP.
119	69100	0.00108	0.000	0.00000	0.00231	0.00000585	0.99985978	PAGURUS TANNERI
120	24191	0.00105	0.000	0.00000	0.00219	0.00000569	0.99986547	SHORTFIN EELPOUT
121	69095	0.00104	0.000	0.00000	0.00233	0.00000564	0.99987111	LONGFINGER HERMIT
122	21110	0.00096	0.000	0.00000	0.00255	0.00000521	0.99987632	PACIFIC HERRING
123	69010	0.00094	0.000	0.00028	0.00160	0.00000510	0.99988142	HERMIT CRAB UNIDENT.
124	24152	0.00091	0.000	0.00013	0.00169	0.00000494	0.99988636	KAMCHATKA EELPOUT
125	66020	0.00091	0.000	0.00000	0.00241	0.00000492	0.99989128	PANDALUS SP.
126	68580	0.00091	0.000	0.00000	0.00201	0.00000492	0.99989620	NARROW SNOW CRAB(=TANNER CRAB(OPILIO))
127	71835	0.00090	0.000	0.00000	0.00184	0.00000486	0.99990106	NEPTUNEA BOREALIS
128	66033	0.00089	0.000	0.00016	0.00163	0.00000486	0.99990592	YELLOWLEG PANDALID
129	81355	0.00086	0.000	0.00000	0.00188	0.00000467	0.99991059	PTERASTER OBSCURUS
130	99994	0.00081	0.000	0.00000	0.00216	0.00000441	0.99991500	EMPTY GASTROPOD SHELLS
131	69060	0.00080	0.000	0.00000	0.00169	0.00000432	0.99991932	ALEUTIAN HERMIT
132	56312	0.00079	0.000	0.00018	0.00139	0.00000426	0.99992358	DEPRESSED SCALE WORM
133	66772	0.00076	0.000	0.00026	0.00126	0.00000413	0.99992771	CRIMSON PASIPHAEID
134	43040	0.00074	0.000	0.00000	0.00154	0.00000403	0.99993173	TEALIA SP.
135	83400	0.00062	0.000	0.00000	0.00138	0.00000338	0.99993511	OPHIOPHOLIS ACULEATA
136	66580	0.00062	0.000	0.00000	0.00164	0.00000336	0.99993847	ARCTIC ARGID
137	68578	0.00060	0.000	0.00002	0.00118	0.00000326	0.99994173	NORTH PACIFIC TOAD CRAB(=HYAS CRAB)
138	71001	0.00051	0.000	0.00007	0.00095	0.00000279	0.99994452	SNAIL (GASTROPOD) EGGS
139	22900	0.00051	0.000	0.00000	0.00119	0.00000275	0.99994727	DREAMER UNIDENT.
140	20614	0.00048	0.000	0.00000	0.00102	0.00000261	0.99994988	DEEPSEA SMELT UNIDENT.
141	71870	0.00043	0.000	0.00000	0.00093	0.00000234	0.99995222	LYRE WHELK

Table C-2.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
142	71756	0.00040	0.000	0.00000	0.00106	0.00000217	0.99995439	FRAGILE WHELK
143	81095	0.00039	0.000	0.00000	0.00094	0.00000214	0.99995653	ROSE SEA STAR
144	82526	0.00039	0.000	0.00005	0.00073	0.00000212	0.99995865	WHITE SEA URCHIN
145	80540	0.00039	0.000	0.00006	0.00072	0.00000212	0.99996077	HENRICIA SP.
146	80650	0.00038	0.000	0.00000	0.00100	0.00000205	0.99996282	HIPPASTERIA SPINOSA
147	97000	0.00036	0.000	0.00000	0.00074	0.00000194	0.99996476	BRACHIOPOD UNIDENT.
148	82510	0.00036	0.000	0.00000	0.00073	0.00000194	0.99996670	GREEN SEA URCHIN
149	22300	0.00035	0.000	0.00004	0.00066	0.00000193	0.99996863	BIGSCALE UNIDENT.
150	74106	0.00035	0.000	0.00000	0.00081	0.00000192	0.99997055	CHLAMYS RUBIDA
151	80595	0.00035	0.000	0.00000	0.00071	0.00000190	0.99997246	LEPTASTERIAS SP.
152	71761	0.00032	0.000	0.00000	0.00086	0.00000175	0.99997420	VOLUTOPSIUS MELONIS (=PYRULOFUSUS MELONIS)
153	66150	0.00032	0.000	0.00000	0.00065	0.00000172	0.99997593	HIPPOLYTID SHRIMP UNIDENT.
154	71710	0.00029	0.000	0.00000	0.00066	0.00000155	0.99997748	COLUS SP.
155	66004	0.00026	0.000	0.00001	0.00051	0.00000141	0.99997888	SERGESTES SP.
156	81315	0.00024	0.000	0.00000	0.00053	0.00000131	0.99998019	PTERASTER TESSELATUS
157	21350	0.00024	0.000	0.00001	0.00046	0.00000129	0.99998148	TRIGLOPS SP.
158	23603	0.00024	0.000	0.00000	0.00062	0.00000128	0.99998276	NORTHERN PEARLEYE
159	71759	0.00021	0.000	0.00000	0.00056	0.00000115	0.99998391	THREADED WHELK
160	71010	0.00019	0.000	0.00000	0.00041	0.00000104	0.99998494	NUDIBRANCH UNIDENT.
161	85210	0.00019	0.000	0.00000	0.00041	0.00000104	0.99998598	PSOLUS SP.
162	69121	0.00018	0.000	0.00000	0.00040	0.00000100	0.99998698	ELASSOCHIRUS CAVIMANUS
163	66515	0.00016	0.000	0.00000	0.00034	0.00000085	0.99998784	COMMON CRANGON
164	41100	0.00014	0.000	0.00000	0.00038	0.00000078	0.99998862	SOFT CORAL UNIDENT.
165	56300	0.00014	0.000	0.00000	0.00037	0.00000076	0.99998938	SCALE WORM UNIDENT.
166	23962	0.00014	0.000	0.00000	0.00030	0.00000075	0.99999013	BARRELEYE
167	21000	0.00012	0.000	0.00000	0.00032	0.00000066	0.99999078	VIPERFISH UNIDENT.
168	45000	0.00011	0.000	0.00000	0.00030	0.00000061	0.99999140	COMB JELLY UNIDENT.
169	69042	0.00010	0.000	0.00000	0.00028	0.00000056	0.99999196	SPONGE HERMIT CRAB
170	82675	0.00010	0.000	0.00000	0.00027	0.00000055	0.99999251	BRISASTER LATIFRONS
171	71726	0.00010	0.000	0.00000	0.00027	0.00000055	0.99999305	THICK-RIBBED WHELK
172	20050	0.00010	0.000	0.00000	0.00026	0.00000053	0.99999359	ALEUTIAN ALLIGATORFISH
173	72063	0.00009	0.000	0.00000	0.00025	0.00000051	0.99999410	KEELED AFORIA
174	23620	0.00009	0.000	0.00000	0.00025	0.00000051	0.99999461	SCALY PAPERBONE (PREV. SCALY WEARYFISH)
175	82500	0.00009	0.000	0.00000	0.00024	0.00000050	0.99999511	SEA URCHIN UNIDENT.
176	81780	0.00009	0.000	0.00000	0.00024	0.00000049	0.99999560	COMMON MUD STAR
177	66171	0.00009	0.000	0.00000	0.00024	0.00000049	0.99999608	EUALUS BARBATUS
178	82530	0.00009	0.000	0.00000	0.00024	0.00000049	0.99999657	ORANGE-PINK SEA URCHIN
179	80594	0.00009	0.000	0.00000	0.00023	0.00000047	0.99999704	LEPTASTERIAS ARCTICA
180	69520	0.00008	0.000	0.00000	0.00022	0.00000045	0.99999749	HYAS SP.
181	81130	0.00008	0.000	0.00000	0.00022	0.00000044	0.99999794	LOPHASTER FURCILLIGER
182	21800	0.00008	0.000	0.00000	0.00022	0.00000044	0.99999838	BRISTLEMOUTH UNIDENT. (PREV. ANGLEMOUTH)
183	66530	0.00008	0.000	0.00000	0.00021	0.00000044	0.99999882	RIDGED CRANGON
184	99904	0.00008	0.000	0.00000	0.00021	0.00000043	0.99999924	SEA CLOD
185	98000	0.00008	0.000	0.00000	0.00020	0.00000041	0.99999965	TUNICATE UNIDENT.
186	50000	0.00006	0.000	0.00000	0.00017	0.00000035	1.00000000	POLYCHAETE WORM UNIDENT.
	TOTAL	184.20927						

Table C-3.--Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1988 U.S. bottom trawl survey of the continental shelf and the 1988 U.S.-Japan bottom trawl survey of the continental slope combined.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	117.47643	130.493	98.53844	136.41442	0.34696416	0.34696416	WALLEYE POLLOCK
2	10210	48.00595	14.059	41.78984	54.22206	0.14178456	0.48874872	YELLOWFIN SOLE
3	10260	29.94701	3.825	26.70455	33.18947	0.08844786	0.57719658	ROCK SOLE
4	68580	17.54658	1.613	15.44107	19.65209	0.05182346	0.62902003	NARROW SNOW CRAB(=TANNER CRAB(OPILIO))
5	10285	16.58872	6.424	12.38683	20.79062	0.04899445	0.67801448	ALASKA PLAICE
6	21720	16.36713	1.505	14.33341	18.40086	0.04833998	0.72635447	PACIFIC COD
7	81742	12.95307	1.493	10.92745	14.97869	0.03825662	0.76461109	PURPLE-ORANGE SEASTAR
8	10130	8.67099	0.552	7.43971	9.90227	0.02560960	0.79022068	FLATHEAD SOLE
9	10110	5.05879	0.283	4.17657	5.94100	0.01494102	0.80516170	ARROWTOOTH FLOUNDER
10	69086	4.01478	0.232	3.21626	4.81330	0.01185757	0.81701928	FUZZY HERMIT CRAB
11	98082	3.82505	0.598	2.54354	5.10657	0.01129721	0.82831649	SEA POTATO
12	00400	3.32470	0.163	2.65499	3.99441	0.00981943	0.83813592	SKATE UNIDENT.
13	99994	3.22273	0.125	2.63632	3.80913	0.00951825	0.84765417	EMPTY GASTROPOD SHELLS
14	71884	2.81222	0.118	2.24375	3.38068	0.00830582	0.85595999	NEPTUNEA HEROS
15	21110	2.57995	5.132	0.00000	6.33542	0.00761982	0.86357981	PACIFIC HERRING
16	10120	2.38954	0.044	2.04327	2.73580	0.00705744	0.87063726	PACIFIC HALIBUT
17	00404	2.00103	0.357	1.01049	2.99158	0.00591001	0.87654727	RAJA SP.
18	68560	1.85424	0.106	1.31386	2.39462	0.00547646	0.88202373	BROAD SNOW CRAB (=TANNER CRAB(BAIRDI))
19	00471	1.75081	0.118	1.18184	2.31979	0.00517099	0.88719472	ALASKA SKATE (=FLATHEAD SKATE)
20	83020	1.46163	0.108	0.91611	2.00716	0.00431691	0.89151162	GORGONOCEPHALUS CARYI
21	21348	1.45352	0.310	0.53043	2.37662	0.00429295	0.89580458	BUTTERFLY SCULPIN
22	71882	1.21287	0.037	0.89597	1.52977	0.00358218	0.89938676	FAT WHELK
23	91050	1.16147	1.349	0.00000	3.08698	0.00343037	0.90281713	BARREL SPONGE
24	21371	1.09485	0.023	0.84414	1.34555	0.00323361	0.90605074	PLAIN SCULPIN
25	71820	1.07784	0.026	0.81206	1.34361	0.00318337	0.90923411	PRIBILOF WHELK
26	81780	1.03883	0.102	0.50894	1.56871	0.00306815	0.91230226	COMMON MUD STAR
27	10140	1.00850	0.016	0.79948	1.21752	0.00297859	0.91528085	BERING FLOUNDER
28	83010	0.96955	0.084	0.48991	1.44919	0.00286355	0.91814440	BASKETSTARFISH UNIDENT.
29	10115	0.90028	0.012	0.72244	1.07812	0.00265896	0.92080336	GREENLAND TURBOT (=GREENLAND HALIBUT)
30	91000	0.88124	0.128	0.28732	1.47515	0.00260272	0.92340608	SPONGE UNIDENT.
31	80590	0.87620	0.014	0.68217	1.07023	0.00258785	0.92599392	LEPTASTERIAS POLARIS
32	69322	0.86199	0.033	0.56045	1.16353	0.00254587	0.92853979	RED KING CRAB
33	21230	0.84964	0.016	0.63745	1.06183	0.00250939	0.93104918	GIANT GRENADIER
34	43000	0.83305	0.027	0.56013	1.10597	0.00246040	0.93350958	SEA ANEMONE UNIDENT.
35	24184	0.79804	0.017	0.58099	1.01509	0.00235699	0.93586657	MARBLED EELPOUT (PREV. SPARSE TOOTHED LYCOD)
36	98205	0.75880	0.054	0.37313	1.14448	0.00224111	0.93810768	SEA PEACH
37	69060	0.71707	0.014	0.52291	0.91124	0.00211786	0.94022554	ALEUTIAN HERMIT
38	71870	0.69153	0.015	0.48688	0.89617	0.00204241	0.94226795	LYRE WHELK
39	21375	0.67952	0.018	0.45419	0.90485	0.00200695	0.94427491	MYOXOCEPHALUS SP.
40	21725	0.66133	0.119	0.08867	1.23400	0.00195324	0.94622814	ARCTIC COD
41	21735	0.64682	0.057	0.24980	1.04385	0.00191038	0.94813852	SAFFRON COD
42	21370	0.63570	0.006	0.50375	0.76764	0.00187751	0.95001603	GREAT SCULPIN
43	69120	0.62798	0.015	0.42478	0.83118	0.00185473	0.95187076	HAIRY HERMIT CRAB
44	69095	0.62277	0.007	0.48282	0.76271	0.00183933	0.95371009	LONGFINGER HERMIT
45	43020	0.61905	0.092	0.11692	1.12118	0.00182836	0.95553845	METRIDIUM SENILE
46	99993	0.56926	0.018	0.34746	0.79105	0.00168129	0.95721974	EMPTY BIVALVE SHELLS
47	69010	0.51941	0.052	0.14219	0.89663	0.00153408	0.95875381	HERMIT CRAB UNIDENT.

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
48	24185	0.49532	0.005	0.37987	0.61077	0.00146291	0.96021673	WATTLED EELPOUT
49	20510	0.48150	0.009	0.32005	0.64294	0.00142209	0.96163881	SABLEFISH
50	69090	0.47920	0.004	0.37767	0.58072	0.00141530	0.96305411	PAGURUS OCHOTENSIS
51	30060	0.46033	0.022	0.21372	0.70695	0.00135959	0.96441370	PACIFIC OCEAN PERCH
52	83320	0.45956	0.019	0.22911	0.69001	0.00135731	0.96577100	OPHIURA SARSI
53	40500	0.43211	0.005	0.31325	0.55096	0.00127622	0.96704722	JELLYFISH UNIDENT.
54	20040	0.39877	0.002	0.32699	0.47056	0.00117777	0.96822499	STURGEON POACHER
55	21347	0.38835	0.015	0.18642	0.59029	0.00114699	0.96937198	YELLOW IRISH LORD
56	68577	0.38366	0.005	0.26665	0.50068	0.00113314	0.97050512	CIRCUMBOREAL TOAD CRAB (=HYAS CRAB)
57	10211	0.38301	0.004	0.27634	0.48968	0.00113122	0.97163633	LONGHEAD DAB
58	21420	0.37186	0.007	0.23065	0.51307	0.00109828	0.97273461	BIGMOUTH SCULPIN
59	69070	0.31055	0.002	0.22953	0.39157	0.00091721	0.97365182	KNOBBYHAND HERMIT CRAB
60	83000	0.29073	0.017	0.07157	0.50988	0.00085865	0.97451047	BRITTLESTARFISH UNIDENT.
61	10200	0.26759	0.001	0.20954	0.32563	0.00079032	0.97530079	REX SOLE
62	72500	0.25911	0.002	0.18381	0.33441	0.00076528	0.97606607	OREGON TRITON
63	72752	0.25443	0.002	0.17276	0.33610	0.00075145	0.97681752	LADDER WHELK (PREV. SILKY WHELK)
64	80020	0.24918	0.015	0.04645	0.45191	0.00073594	0.97755346	EVASTERIAS ECHINOSOMA
65	71001	0.24322	0.002	0.17423	0.31221	0.00071833	0.97827180	SNAIL (GASTROPOD) EGGS
66	41201	0.22720	0.007	0.08753	0.36688	0.00067104	0.97894283	SEA RASPBERRY
67	98310	0.22574	0.004	0.12685	0.32463	0.00066671	0.97960955	APLIDIUM SP.
68	80200	0.21496	0.002	0.14903	0.28089	0.00063488	0.98024443	LETHASTERIAS NANIMENSIS
69	10112	0.21281	0.002	0.13365	0.29197	0.00062852	0.98087296	KAMCHATKA FLOUNDER
70	85201	0.21117	0.019	0.00000	0.43748	0.00062370	0.98149666	CUCUMARIA FALLAX
71	98105	0.19604	0.005	0.08234	0.30975	0.00057901	0.98207567	BOLTENIA OVIFERA
72	10220	0.19074	0.002	0.11340	0.26808	0.00056335	0.98263902	STARRY FLOUNDER
73	20720	0.18075	0.009	0.02221	0.33928	0.00053383	0.98317285	SEARCHER
74	71753	0.17664	0.009	0.01652	0.33677	0.00052172	0.98369456	WARPED WHELK
75	98100	0.17305	0.003	0.08212	0.26398	0.00051110	0.98420566	SEA ONION UNIDENT.
76	68590	0.17218	0.002	0.09979	0.24456	0.00050852	0.98471418	TANNER CRAB (HYBRID)
77	69061	0.16560	0.000	0.13025	0.20095	0.00048910	0.98520328	LABIDOCHIRUS SPLENDESCENS (=PAGURUS SP.)
78	22200	0.15069	0.000	0.12004	0.18133	0.00044505	0.98564832	SNAILFISH UNIDENT.
79	72743	0.14816	0.001	0.11051	0.18580	0.00043758	0.98608590	BUCCINUM ANGULOSUM
80	72755	0.13878	0.000	0.10532	0.17224	0.00040989	0.98649579	POLAR WHELK
81	71756	0.13298	0.002	0.05036	0.21560	0.00039275	0.98688854	FRAGILE WHELK
82	72751	0.12108	0.001	0.07687	0.16529	0.00035762	0.98724616	SINUOUS WHELK (PREV. LYRE WHELK)
83	24191	0.11776	0.001	0.07955	0.15598	0.00034781	0.98759397	SHORTFIN EELPOUT
84	71835	0.11710	0.003	0.02657	0.20763	0.00034585	0.98793982	NEPTUNEA BOREALIS
85	00472	0.11475	0.005	0.00000	0.23014	0.00033891	0.98827873	ALEUTIAN SKATE
86	30420	0.10969	0.012	0.00000	0.28878	0.00032395	0.98860268	NORTHERN ROCKFISH
87	00435	0.09978	0.001	0.03684	0.16272	0.00029470	0.98889738	BERING SKATE (=SANDPAPER SKATE)
88	21220	0.09768	0.001	0.04333	0.15203	0.00028849	0.98918588	PACIFIC GRENADIER
89	68578	0.09011	0.000	0.05579	0.12442	0.00026612	0.98945200	NORTH PACIFIC TOAD CRAB(=HYAS CRAB)
90	78403	0.08936	0.001	0.02654	0.15219	0.00026394	0.98971594	GIANT OCTOPUS
91	80594	0.08838	0.001	0.04108	0.13569	0.00026104	0.98997698	LEPTASTERIAS ARCTICA
92	23041	0.08827	0.000	0.05978	0.11676	0.00026069	0.99023767	CAPELIN
93	82730	0.08709	0.002	0.01291	0.16126	0.00025721	0.99049488	SAND DOLLAR UNIDENT.
94	69323	0.08653	0.000	0.05858	0.11447	0.00025555	0.99075043	BLUE KING CRAB

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
95	30020	0.08131	0.001	0.02438	0.13825	0.00024016	0.99099059	SHORTSPINE THORNYHEAD
96	78010	0.07632	0.001	0.03458	0.11805	0.00022541	0.99121600	OCTOPUS UNIDENT.
97	69520	0.07590	0.000	0.04181	0.10999	0.00022416	0.99144016	HYAS SP.
98	69121	0.06553	0.000	0.03628	0.09479	0.00019355	0.99163372	ELASSOCHIRUS CAVIMANUS
99	65201	0.06499	0.002	0.00000	0.14418	0.00019194	0.99182566	BALANUS SP.
100	66000	0.06386	0.000	0.04206	0.08566	0.00018862	0.99201427	SHRIMP UNIDENT.
101	21316	0.06075	0.001	0.01876	0.10275	0.00017944	0.99219371	ARMORHEAD SCULPIN
102	72740	0.06033	0.000	0.02453	0.09614	0.00017820	0.99237191	BUCCINUM SP.
103	00232	0.05968	0.004	0.00000	0.15861	0.00017626	0.99254817	SALMON SHARK
104	21368	0.05944	0.000	0.03224	0.08665	0.00017557	0.99272373	WARTY SCULPIN (=SHORTHORNED SCULPIN)
105	71750	0.05891	0.001	0.00000	0.11794	0.00017400	0.99289773	VOLUTOPSIUS SP. (=PYRULOFUSUS SP.)
106	74562	0.05683	0.000	0.02912	0.08454	0.00016784	0.99306557	DISCORDANT MUSSEL
107	66031	0.05516	0.000	0.03886	0.07146	0.00016292	0.99322849	NORTHERN SHRIMP (=PINK SHRIMP)
108	98300	0.05449	0.000	0.02190	0.08707	0.00016092	0.99338941	COMPOUND ASCIDIAN UNIDENT.
109	65203	0.05429	0.001	0.00000	0.11376	0.00016034	0.99354975	GIANT BARNACLE
110	68781	0.05361	0.000	0.02838	0.07883	0.00015832	0.99370808	TELMESSUS CRAB
111	82740	0.05313	0.002	0.00000	0.12679	0.00015692	0.99386500	PARMA SAND DOLLAR
112	95000	0.05208	0.001	0.01327	0.09089	0.00015382	0.99401882	BRYOZOAN UNIDENT.
113	82510	0.05113	0.000	0.02844	0.07382	0.00015101	0.99416983	GREEN SEA URCHIN
114	24001	0.04709	0.000	0.01504	0.07914	0.00013908	0.99430891	PROWFISH
115	24110	0.04479	0.000	0.02072	0.06887	0.00013230	0.99444120	TWOLINE EELPOUT
116	71759	0.04398	0.001	0.00000	0.08923	0.00012990	0.99457110	THREADED WHELK
117	43010	0.04337	0.000	0.00804	0.07871	0.00012810	0.99469921	METRIDIUM SP.
118	71500	0.04333	0.000	0.02248	0.06418	0.00012797	0.99482718	SNAIL UNIDENT.
119	22201	0.04067	0.000	0.02450	0.05684	0.00012012	0.99494730	LIPARIS SP.
120	81355	0.03945	0.000	0.00305	0.07585	0.00011652	0.99506382	PTERASTER OBSCURUS
121	71721	0.03852	0.001	0.00000	0.08045	0.00011377	0.99517759	THIN-RIBBED WHELK
122	00420	0.03811	0.001	0.00000	0.08279	0.00011255	0.99529014	BIG SKATE
123	21313	0.03782	0.000	0.02034	0.05530	0.00011171	0.99540185	GYMNOCANTHUS SP.
124	71772	0.03729	0.000	0.02452	0.05005	0.00011012	0.99551197	BERINGIUS BERINGII
125	68510	0.03713	0.000	0.00894	0.06532	0.00010966	0.99562163	LONGHORNED DECORATOR CRAB (=DECORATOR CRAB)
126	23055	0.03676	0.000	0.01732	0.05620	0.00010857	0.99573021	RAINBOW SMELT
127	71961	0.03666	0.000	0.02278	0.05054	0.00010827	0.99583848	CLINOPEGMA MAGMA
128	56311	0.03487	0.001	0.00000	0.07900	0.00010299	0.99594146	GIANT SCALE WORM
129	10212	0.03479	0.000	0.01766	0.05192	0.00010275	0.99604422	SAKHALIN SOLE
130	98000	0.03336	0.000	0.00739	0.05933	0.00009854	0.99614275	TUNICATE UNIDENT.
131	41221	0.03291	0.000	0.00713	0.05869	0.00009720	0.99623995	GERSEMIA RUBIFORMIS (=EUNEPHTHYA RUBIFORMIS)
132	10270	0.03248	0.000	0.00700	0.05796	0.00009593	0.99633588	BUTTER SOLE
133	81779	0.03215	0.001	0.00000	0.08291	0.00009497	0.99643085	CTENODISCUS SP.
134	50160	0.03209	0.000	0.01120	0.05298	0.00009478	0.99652563	SEA MOUSE UNIDENT.
135	21438	0.02918	0.000	0.01971	0.03865	0.00008619	0.99661181	THORNY SCULPIN
136	00320	0.02896	0.000	0.01207	0.04585	0.00008553	0.99669735	PACIFIC SLEEPER SHARK
137	71764	0.02831	0.000	0.00782	0.04880	0.00008362	0.99678097	TULIP WHELK
138	79210	0.02815	0.000	0.02115	0.03515	0.00008313	0.99686410	MAGISTRATE ARMHOOK SQUID (PREV. RED SQUID)
139	99999	0.02772	0.000	0.00472	0.05073	0.00008189	0.99694598	UNSORTED SHAB
140	75610	0.02751	0.001	0.00000	0.06721	0.00008126	0.99702724	FALSEJINGLES UNIDENT. (PREV. ROCK JINGLES)
141	23010	0.02644	0.000	0.00742	0.04546	0.00007809	0.99710534	EULACHON

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
142	50000	0.02625	0.001	0.00000	0.06411	0.00007753	0.99718287	POLYCHAETE WORM UNIDENT.
143	21341	0.02528	0.000	0.01312	0.03745	0.00007467	0.99725754	DARKFIN SCULPIN
144	99990	0.02496	0.000	0.00000	0.06064	0.00007372	0.99733127	INVERTEBRATE UNIDENT.
145	82526	0.02443	0.000	0.00000	0.06022	0.00007215	0.99740341	WHITE SEA URCHIN
146	80110	0.02404	0.000	0.00541	0.04268	0.00007102	0.99747443	LEPTASTERIAS GROENLANDICA
147	21360	0.02304	0.000	0.00000	0.04965	0.00006805	0.99754248	BRIGHTBELLY SCULPIN
148	69400	0.02221	0.000	0.01025	0.03416	0.00006560	0.99760807	HORSEHAIR CRAB
149	71763	0.02161	0.000	0.00000	0.04343	0.00006383	0.99767191	SHOULDERED WHELK
150	72063	0.01944	0.000	0.01084	0.02804	0.00005742	0.99772932	KEELED AFORIA
151	71010	0.01925	0.000	0.01124	0.02727	0.00005686	0.99778618	NUDIBRANCH UNIDENT.
152	10250	0.01887	0.000	0.00000	0.05016	0.00005574	0.99784192	SAND SOLE
153	71891	0.01830	0.000	0.01282	0.02379	0.00005406	0.99789598	PLICIFUSUS KROYERI
154	71580	0.01827	0.000	0.01168	0.02486	0.00005397	0.99794995	PALE MOONSNAIL
155	71525	0.01715	0.000	0.00870	0.02561	0.00005066	0.99800061	NATICA SP.
156	75285	0.01632	0.000	0.00382	0.02882	0.00004820	0.99804882	GREENLAND COCKLE
157	65100	0.01614	0.000	0.00091	0.03137	0.00004766	0.99809648	BARNACLE UNIDENT.
158	91700	0.01577	0.000	0.00000	0.04114	0.00004656	0.99814304	GLASS SPONGE UNIDENT.
159	21390	0.01557	0.000	0.00880	0.02235	0.00004599	0.99818903	SPINYHEAD SCULPIN
160	85200	0.01530	0.000	0.00155	0.02905	0.00004519	0.99823422	CUCUMARIA SP.
161	30576	0.01526	0.000	0.00397	0.02655	0.00004506	0.99827928	SHORTRAKER ROCKFISH
162	41100	0.01479	0.000	0.00489	0.02468	0.00004368	0.99832296	SOFT CORAL UNIDENT.
163	82500	0.01469	0.000	0.00000	0.03183	0.00004339	0.99836635	SEA URCHIN UNIDENT.
164	30040	0.01438	0.000	0.00636	0.02239	0.00004246	0.99840881	ROCKFISH UNIDENT.
165	85000	0.01360	0.000	0.00549	0.02170	0.00004016	0.99844896	SEA CUCUMBER UNIDENT.
166	43040	0.01280	0.000	0.00651	0.01909	0.00003781	0.99848677	TEALIA SP.
167	21210	0.01263	0.000	0.00000	0.02838	0.00003730	0.99852407	CORYPHAENOIDES SP.
168	24189	0.01218	0.000	0.00031	0.02405	0.00003598	0.99856005	POLAR EELPOUT
169	80000	0.01203	0.000	0.00215	0.02190	0.00003552	0.99859556	STARFISH UNIDENT.
170	71760	0.01193	0.000	0.00000	0.02757	0.00003523	0.99863080	VOLUTE WHELK
171	20322	0.01188	0.000	0.00000	0.02503	0.00003508	0.99866588	BERING WOLFFISH
172	00450	0.01173	0.000	0.00000	0.02974	0.00003465	0.99870053	STARRY SKATE
173	30050	0.01084	0.000	0.00486	0.01681	0.00003200	0.99873253	ROUGHEYE ROCKFISH
174	21355	0.01037	0.000	0.00440	0.01634	0.00003062	0.99876316	RIBBED SCULPIN
175	22219	0.00996	0.000	0.00000	0.02093	0.00002942	0.99879257	CAREPROCTUS SP.
176	91040	0.00986	0.000	0.00000	0.02619	0.00002911	0.99882168	TREE SPONGE
177	75111	0.00969	0.000	0.00340	0.01597	0.00002861	0.99885029	ARCTIC SURFCLAM (PREV. ALASKA SURF CLAM)
178	21377	0.00966	0.000	0.00000	0.02152	0.00002853	0.99887882	FOURHORN SCULPIN
179	24187	0.00947	0.000	0.00437	0.01457	0.00002797	0.99890680	EBONY EELPOUT (PREV. MARBLED EELPOUT)
180	94000	0.00943	0.000	0.00144	0.01742	0.00002785	0.99893465	SIPUNCULID WORM UNIDENT.
181	23836	0.00916	0.000	0.00496	0.01336	0.00002706	0.99896171	LONGSNOUT PRICKLEBACK
182	81310	0.00873	0.000	0.00399	0.01346	0.00002577	0.99898748	PTERASTER SP.
183	21446	0.00871	0.000	0.00452	0.01290	0.00002572	0.99901320	ICELUS SP.
184	69110	0.00848	0.000	0.00058	0.01639	0.00002506	0.99903825	WIDEHAND HERMIT CRAB
185	71800	0.00816	0.000	0.00000	0.02094	0.00002409	0.99906234	NEPTUNEA SP.
186	42000	0.00754	0.000	0.00042	0.01467	0.00002228	0.99908462	SEA PEN UNIDENT.
187	20061	0.00742	0.000	0.00406	0.01078	0.00002192	0.99910654	BERING POACHER
188	21932	0.00706	0.000	0.00272	0.01139	0.00002084	0.99912738	WHITESPOTTED GREENLING

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
189	71769	0.00699	0.000	0.00000	0.01496	0.00002063	0.99914801	BERINGIUS SP.
190	74311	0.00654	0.000	0.00179	0.01129	0.00001931	0.99916732	ARCTIC HIATELLA
191	71537	0.00643	0.000	0.00198	0.01088	0.00001899	0.99918631	RUSTY MOONSNAIL
192	81360	0.00622	0.000	0.00003	0.01241	0.00001837	0.99920468	DIPLOPTERASTER MULTIPES
193	69035	0.00616	0.000	0.00000	0.01638	0.00001820	0.99922288	PAGURUS SP.
194	24190	0.00607	0.000	0.00318	0.00897	0.00001794	0.99924082	BLACK EELPOUT
195	21314	0.00597	0.000	0.00000	0.01216	0.00001762	0.99925844	THREADED SCULPIN
196	66611	0.00590	0.000	0.00389	0.00792	0.00001743	0.99927588	NORTHERN ARGID
197	68550	0.00590	0.000	0.00210	0.00969	0.00001741	0.99929329	TRUE TANNER CRAB
198	66045	0.00580	0.000	0.00294	0.00866	0.00001712	0.99931041	HUMPY SHRIMP
199	79200	0.00551	0.000	0.00218	0.00885	0.00001628	0.99932670	GONATUS SP.
200	72501	0.00546	0.000	0.00000	0.01323	0.00001613	0.99934282	FUSITRITON SP.
201	80015	0.00534	0.000	0.00000	0.01401	0.00001577	0.99935860	EVASTERIAS TROSCHELII
202	81095	0.00531	0.000	0.00210	0.00852	0.00001569	0.99937429	ROSE SEA STAR
203	75110	0.00516	0.000	0.00124	0.00908	0.00001523	0.99938952	MACTROMERIS SP. (=SPISULA SP.)
204	24186	0.00493	0.000	0.00000	0.01305	0.00001457	0.99940409	SADDLED EELPOUT
205	66530	0.00483	0.000	0.00312	0.00654	0.00001427	0.99941837	RIDGED CRANGON
206	98200	0.00439	0.000	0.00000	0.01036	0.00001295	0.99943132	SEA PEACH UNIDENT.
207	68040	0.00421	0.000	0.00174	0.00669	0.00001245	0.99944377	OREGON ROCK CRAB
208	71681	0.00421	0.000	0.00058	0.00784	0.00001244	0.99945621	GREAT SLIPPERSNAIL
209	95030	0.00420	0.000	0.00000	0.00880	0.00001240	0.99946861	LEAFY BRYOZOAN
210	75600	0.00405	0.000	0.00000	0.01077	0.00001197	0.99948058	ALASKA FALSEJINGLE (PREV. ROCK JINGLE)
211	00310	0.00390	0.000	0.00000	0.01036	0.00001151	0.99949209	SPINY DOGFISH
212	23235	0.00383	0.000	0.00000	0.00816	0.00001132	0.99950341	CHUM SALMON
213	20035	0.00382	0.000	0.00186	0.00577	0.00001127	0.99951468	GRAY STARSNOUT
214	20006	0.00373	0.000	0.00191	0.00554	0.00001101	0.99952569	SAWBACK POACHER
215	71761	0.00371	0.000	0.00055	0.00687	0.00001096	0.99953665	VOLUTOPSIUS MELONIS (=PYRULOFUSUS MELONIS)
216	75281	0.00358	0.000	0.00108	0.00608	0.00001058	0.99954723	CLINOCARDIUM SP.
217	21315	0.00357	0.000	0.00000	0.00781	0.00001056	0.99955778	ARCTIC STAGHORN SCULPIN
218	71530	0.00343	0.000	0.00038	0.00648	0.00001014	0.99956792	ARCTIC MOONSNAIL
219	71726	0.00336	0.000	0.00124	0.00549	0.00000993	0.99957786	THICK-RIBBED WHELK
220	80010	0.00330	0.000	0.00000	0.00878	0.00000976	0.99958761	EVASTERIAS SP.
221	66502	0.00328	0.000	0.00207	0.00449	0.00000969	0.99959730	CRANGON SP.
222	68570	0.00328	0.000	0.00161	0.00495	0.00000968	0.99960698	CHIONOECETES ANGULATUS
223	23808	0.00314	0.000	0.00154	0.00474	0.00000927	0.99961626	SNAKE PRICKLEBACK
224	75241	0.00313	0.000	0.00092	0.00534	0.00000924	0.99962550	BENT-NOSE MACOMA (PREV. COMMON MACOMA)
225	74120	0.00306	0.000	0.00000	0.00702	0.00000903	0.99963453	WEATHERVANE SCALLOP
226	22226	0.00302	0.000	0.00000	0.00642	0.00000892	0.99964344	MONSTER SNAILFISH
227	56312	0.00296	0.000	0.00007	0.00584	0.00000873	0.99965217	DEPRESSED SCALE WORM
228	99904	0.00273	0.000	0.00000	0.00705	0.00000807	0.99966024	SEA CLOD
229	69310	0.00272	0.000	0.00052	0.00491	0.00000802	0.99966826	GOLDEN KING CRAB
230	80595	0.00266	0.000	0.00012	0.00520	0.00000785	0.99967611	LEPTASTERIAS SP.
231	00480	0.00235	0.000	0.00001	0.00469	0.00000695	0.99968306	WHITEBLOTCHED SKATE
232	66120	0.00234	0.000	0.00148	0.00320	0.00000691	0.99968997	SIDESTRIPE SHRIMP
233	22232	0.00227	0.000	0.00036	0.00418	0.00000671	0.99969668	PEACHSKIN SNAILFISH (=SCOTT'S SNAILFISH)
234	80729	0.00227	0.000	0.00026	0.00428	0.00000670	0.99970338	RED BAT STAR
235	71640	0.00227	0.000	0.00000	0.00594	0.00000670	0.99971008	SLIPPER SHELL

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
236	22175	0.00226	0.000	0.00115	0.00336	0.00000667	0.99971675	SMOOTH LUMPSUCKER
237	10001	0.00223	0.000	0.00000	0.00456	0.00000658	0.99972333	FLATFISH UNIDENT.
238	74561	0.00223	0.000	0.00000	0.00500	0.00000658	0.99972991	BLACK MUSSEL
239	21354	0.00220	0.000	0.00000	0.00547	0.00000651	0.99973642	SPECTACLED SCULPIN
240	72420	0.00216	0.000	0.00000	0.00527	0.00000638	0.99974280	BOREOTROPHON SP. (FORMERLY TROPHONOPSIS SP.)
241	71722	0.00209	0.000	0.00072	0.00347	0.00000618	0.99974898	OBLIQUE WHELK
242	74439	0.00209	0.000	0.00000	0.00447	0.00000616	0.99975514	TRENCHED NUTCLAM
243	74104	0.00208	0.000	0.00000	0.00501	0.00000615	0.99976129	CHLAMYS SP.
244	74655	0.00205	0.000	0.00000	0.00451	0.00000605	0.99976734	MANY-RIB CYCLOCARDIA
245	23657	0.00203	0.000	0.00000	0.00498	0.00000599	0.99977334	LONGNOSE LANCETFISH
246	00001	0.00199	0.000	0.00000	0.00516	0.00000588	0.99977922	FISH EGGS UNIDENT.
247	56310	0.00195	0.000	0.00094	0.00296	0.00000576	0.99978498	EUNOE SP.
248	81315	0.00192	0.000	0.00000	0.00396	0.00000568	0.99979066	PTERASTER TESSELATUS
249	71710	0.00188	0.000	0.00000	0.00387	0.00000554	0.99979621	COLUS SP.
250	71731	0.00185	0.000	0.00068	0.00302	0.00000547	0.99980167	COLUS HALLI
251	21350	0.00178	0.000	0.00004	0.00352	0.00000527	0.99980694	TRIGLOPS SP.
252	21592	0.00174	0.000	0.00007	0.00341	0.00000514	0.99981208	PACIFIC SANDFISH
253	79020	0.00169	0.000	0.00012	0.00326	0.00000498	0.99981706	ROSSIA PACIFICA
254	23805	0.00162	0.000	0.00084	0.00241	0.00000480	0.99982186	DAUBED SHANNY
255	75286	0.00160	0.000	0.00000	0.00411	0.00000471	0.99982657	BROAD COCKLE
256	80660	0.00158	0.000	0.00000	0.00342	0.00000467	0.99983124	PSEUDARCHASTER PARELII
257	66580	0.00152	0.000	0.00066	0.00238	0.00000449	0.99983573	ARCTIC ARGID
258	71892	0.00151	0.000	0.00000	0.00307	0.00000446	0.99984019	PLICIFUSUS INCISUS
259	65205	0.00146	0.000	0.00000	0.00360	0.00000431	0.99984450	BEAKED BARNACLE
260	66570	0.00139	0.000	0.00067	0.00211	0.00000412	0.99984862	ARGIS SP.
261	71260	0.00139	0.000	0.00000	0.00369	0.00000410	0.99985272	WHITE NIGHT DORIS (PREV. SNOW WHITE DORIS)
262	75284	0.00139	0.000	0.00025	0.00253	0.00000410	0.99985682	SERRIPES SP.
263	00460	0.00139	0.000	0.00036	0.00241	0.00000410	0.99986092	BLACK SKATE (PREV. ROUGHTAIL SKATE)
264	72805	0.00138	0.000	0.00000	0.00337	0.00000407	0.99986499	SMOOTH LAMELLARIA
265	24100	0.00136	0.000	0.00000	0.00309	0.00000403	0.99986902	EELPOUT UNIDENT.
266	10180	0.00133	0.000	0.00064	0.00202	0.00000393	0.99987295	DOVER SOLE
267	74106	0.00132	0.000	0.00000	0.00270	0.00000391	0.99987685	CHLAMYS RUBIDA
268	21935	0.00130	0.000	0.00000	0.00345	0.00000383	0.99988068	KELP GREENLING
269	85210	0.00130	0.000	0.00000	0.00303	0.00000383	0.99988451	PSOLUS SP.
270	30240	0.00127	0.000	0.00000	0.00339	0.00000376	0.99988827	YELLOWTAIL ROCKFISH
271	21340	0.00126	0.000	0.00047	0.00205	0.00000372	0.99989199	BLACKFIN SCULPIN
272	21352	0.00125	0.000	0.00000	0.00329	0.00000369	0.99989568	SCISSORTAIL SCULPIN
273	69042	0.00116	0.000	0.00000	0.00309	0.00000344	0.99989912	SPONGE HERMIT CRAB
274	72758	0.00108	0.000	0.00000	0.00236	0.00000318	0.99990230	GLACIAL WHELK
275	80540	0.00107	0.000	0.00055	0.00159	0.00000316	0.99990546	HENRICIA SP.
276	23240	0.00104	0.000	0.00001	0.00207	0.00000307	0.99990853	SOCKEYE SALMON
277	24180	0.00103	0.000	0.00000	0.00274	0.00000305	0.99991158	LYCODES SP.
278	23809	0.00098	0.000	0.00000	0.00212	0.00000288	0.99991446	PIGHEAD PRICKLEBACK
279	74983	0.00095	0.000	0.00013	0.00178	0.00000282	0.99991728	HAIRY COCKLE
280	22600	0.00090	0.000	0.00037	0.00143	0.00000266	0.99991994	LANTERNFISH UNIDENT.
281	75267	0.00089	0.000	0.00021	0.00157	0.00000263	0.99992257	ALASKA RAZOR (PREV. NORTHERN RAZOR CLAM)
282	21731	0.00088	0.000	0.00056	0.00121	0.00000261	0.99992518	PACIFIC FLATNOSE

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
283	20050	0.00088	0.000	0.00041	0.00135	0.00000260	0.99992778	ALEUTIAN ALLIGATORFISH
284	71012	0.00088	0.000	0.00000	0.00193	0.00000259	0.99993037	GIANT ORANGE TOCHUI (PREV.ORANGE-PEEL NUDI.)
285	72756	0.00087	0.000	0.00016	0.00158	0.00000258	0.99993294	BUCCINUM SOLENUM
286	71535	0.00085	0.000	0.00000	0.00185	0.00000251	0.99993545	NATICA ALEUTICA
287	21921	0.00084	0.000	0.00000	0.00222	0.00000247	0.99993792	ATKA MACKEREL
288	78012	0.00083	0.000	0.00034	0.00133	0.00000246	0.99994038	SMOOTHSKIN OCTOPUS
289	72403	0.00079	0.000	0.00000	0.00174	0.00000234	0.99994273	BOREOTROPHON MURICIFORMIS (=TROPHON)
290	30010	0.00079	0.000	0.00000	0.00210	0.00000233	0.99994506	THORNYHEAD UNIDENT.
291	21378	0.00067	0.000	0.00000	0.00179	0.00000199	0.99994705	ARCTIC SCULPIN
292	20202	0.00067	0.000	0.00018	0.00116	0.00000199	0.99994904	PACIFIC SAND LANCE
293	20038	0.00067	0.000	0.00038	0.00097	0.00000199	0.99995102	BLACKFIN POACHER
294	21300	0.00063	0.000	0.00008	0.00117	0.00000185	0.99995287	SCULPIN UNIDENT.
295	71774	0.00061	0.000	0.00000	0.00163	0.00000181	0.99995468	BERINGIUS STIMPSONI
296	21388	0.00056	0.000	0.00000	0.00125	0.00000167	0.99995634	ANTLERED SCULPIN
297	68020	0.00055	0.000	0.00000	0.00146	0.00000162	0.99995796	DUNGENESS CRAB
298	74416	0.00053	0.000	0.00000	0.00141	0.00000156	0.99995952	CRISSCROSSED YOLDIA
299	75240	0.00052	0.000	0.00000	0.00129	0.00000154	0.99996106	MACOMA SP.
300	92500	0.00047	0.000	0.00000	0.00126	0.00000140	0.99996246	NEMERTEAN WORM UNIDENT.
301	95060	0.00047	0.000	0.00000	0.00126	0.00000140	0.99996386	ESCHAROPSIS SARSI
302	72790	0.00046	0.000	0.00000	0.00112	0.00000135	0.99996521	ALASKA VOLUTE
303	71575	0.00045	0.000	0.00004	0.00087	0.00000133	0.99996654	POLINICES SP.
304	71030	0.00044	0.000	0.00000	0.00099	0.00000130	0.99996784	ROSY TRITONIA (PREV. DIOMEDES' TRITON)
305	66601	0.00040	0.000	0.00000	0.00084	0.00000118	0.99996902	TANK SHRIMP (SCULPTURED SHRIMP)
306	75264	0.00040	0.000	0.00000	0.00083	0.00000118	0.99997019	SILIQUA SP.
307	74050	0.00036	0.000	0.00005	0.00067	0.00000107	0.99997126	MUSSEL UNIDENT.
308	74100	0.00036	0.000	0.00000	0.00090	0.00000107	0.99997233	SCALLOP UNIDENT.
309	74981	0.00036	0.000	0.00000	0.00094	0.00000105	0.99997338	COCKLE UNIDENT.
310	81060	0.00035	0.000	0.00008	0.00062	0.00000103	0.99997441	SOLASTER SP.
311	72531	0.00034	0.000	0.00000	0.00087	0.00000100	0.99997541	MARGARITES SP.
312	00410	0.00032	0.000	0.00000	0.00072	0.00000095	0.99997636	DEEPSEA SKATE
313	21395	0.00032	0.000	0.00000	0.00085	0.00000094	0.99997731	BLOB SCULPIN
314	81092	0.00029	0.000	0.00015	0.00044	0.00000087	0.99997817	CROSSASTER BOREALIS
315	66020	0.00029	0.000	0.00000	0.00059	0.00000086	0.99997904	PANDALUS SP.
316	21439	0.00028	0.000	0.00012	0.00045	0.00000083	0.99997986	POREHEAD SCULPIN
317	80546	0.00028	0.000	0.00004	0.00052	0.00000083	0.99998069	HENRICIA TUMIDA
318	75247	0.00028	0.000	0.00000	0.00074	0.00000082	0.99998151	HEAVY MACOMA
319	75242	0.00028	0.000	0.00000	0.00074	0.00000082	0.99998233	CHALKY MACOMA
320	20000	0.00026	0.000	0.00000	0.00056	0.00000078	0.99998310	POACHER UNIDENT.
321	75201	0.00025	0.000	0.00003	0.00047	0.00000074	0.99998384	TELLINA SP.
322	66033	0.00024	0.000	0.00000	0.00054	0.00000072	0.99998456	YELLOWLEG PANDALID
323	21405	0.00024	0.000	0.00000	0.00050	0.00000071	0.99998527	EYESHADE SCULPIN
324	66175	0.00024	0.000	0.00003	0.00044	0.00000070	0.99998596	EUALUS GAIMARDII BELCHERI
325	79000	0.00022	0.000	0.00006	0.00038	0.00000064	0.99998660	SQUID UNIDENT.
326	00021	0.00021	0.000	0.00011	0.00030	0.00000062	0.99998722	PACIFIC LAMPREY
327	95080	0.00020	0.000	0.00000	0.00047	0.00000060	0.99998782	CORAL BRYOZOAN
328	20622	0.00020	0.000	0.00012	0.00028	0.00000060	0.99998842	NORTHERN SMOOTHTONGUE
329	74080	0.00020	0.000	0.00000	0.00046	0.00000058	0.99998901	BLUE MUSSEL (PREV. BAY MUSSEL)

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
330	74414	0.00017	0.000	0.00000	0.00046	0.00000051	0.99998951	YOLDIA SP.
331	81870	0.00017	0.000	0.00000	0.00037	0.00000050	0.99999001	DIPSACASTER BOREALIS
332	20100	0.00016	0.000	0.00004	0.00028	0.00000047	0.99999048	SLICKHEAD UNIDENT.
333	74060	0.00016	0.000	0.00000	0.00042	0.00000047	0.99999095	NORTHERN HORSEMUSSEL (PREV. HORSE MUSSEL)
334	66050	0.00015	0.000	0.00000	0.00041	0.00000045	0.99999141	COONSTRIPE SHRIMP
335	66548	0.00015	0.000	0.00000	0.00040	0.00000045	0.99999185	SAND SHRIMP
336	74435	0.00014	0.000	0.00000	0.00034	0.00000042	0.99999227	NUCULANA SP.
337	10190	0.00013	0.000	0.00000	0.00027	0.00000040	0.99999267	DEEPSEA SOLE
338	40011	0.00013	0.000	0.00000	0.00033	0.00000037	0.99999304	HYDROID UNIDENT.
339	94500	0.00011	0.000	0.00000	0.00029	0.00000032	0.99999337	ECHIUROID WORM UNIDENT.
340	21010	0.00010	0.000	0.00004	0.00016	0.00000030	0.99999367	PACIFIC VIPERFISH
341	22610	0.00010	0.000	0.00000	0.00022	0.00000030	0.99999397	CALIFORNIA HEADLIGHTFISH
342	74982	0.00010	0.000	0.00000	0.00022	0.00000029	0.99999426	NUTTAL COCKLE
343	30150	0.00009	0.000	0.00000	0.00025	0.00000028	0.99999453	DUSKY ROCKFISH
344	21441	0.00009	0.000	0.00000	0.00024	0.00000027	0.99999480	SPATULATE SCULPIN
345	69335	0.00008	0.000	0.00000	0.00020	0.00000025	0.99999505	PARALOMIS MULTISPINA
346	82530	0.00008	0.000	0.00000	0.00021	0.00000024	0.99999529	ORANGE-PINK SEA URCHIN
347	81910	0.00008	0.000	0.00003	0.00013	0.00000024	0.99999554	LUIDIASTER DAWSONI
348	20055	0.00008	0.000	0.00000	0.00020	0.00000023	0.99999576	SMOOTH ALLIGATORFISH
349	70100	0.00008	0.000	0.00000	0.00020	0.00000022	0.99999599	CHITON UNIDENT.
350	69336	0.00007	0.000	0.00000	0.00016	0.00000021	0.99999620	SCALED CRAB
351	74440	0.00006	0.000	0.00000	0.00017	0.00000019	0.99999639	STOUT NUTCLAM
352	72304	0.00006	0.000	0.00000	0.00016	0.00000017	0.99999656	CROWNED HAIRYSNAIL
353	21345	0.00006	0.000	0.00000	0.00015	0.00000017	0.99999673	LONGFIN IRISH LORD
354	71890	0.00006	0.000	0.00000	0.00015	0.00000016	0.99999690	PLICIFUSUS SP.
355	22178	0.00005	0.000	0.00000	0.00012	0.00000016	0.99999706	PACIFIC SPINY LUMPSUCKER
356	80730	0.00005	0.000	0.00002	0.00009	0.00000016	0.99999722	ORANGE BAT STAR
357	81090	0.00005	0.000	0.00000	0.00014	0.00000015	0.99999737	CROSSASTER SP.
358	22912	0.00005	0.000	0.00002	0.00008	0.00000015	0.99999752	ONEIRODES SP.
359	66060	0.00005	0.000	0.00000	0.00010	0.00000014	0.99999767	PANDALOPSIS ALEUTICA
360	00485	0.00005	0.000	0.00000	0.00013	0.00000014	0.99999781	WHITEBROW SKATE
361	69300	0.00005	0.000	0.00000	0.00009	0.00000013	0.99999794	LITHODES COUESI
362	20002	0.00005	0.000	0.00000	0.00012	0.00000013	0.99999807	DRAGON POACHER
363	21339	0.00004	0.000	0.00000	0.00012	0.00000013	0.99999820	MALACOCOTTUS SP.
364	66770	0.00004	0.000	0.00001	0.00008	0.00000013	0.99999833	GLASS SHRIMP
365	00495	0.00004	0.000	0.00000	0.00009	0.00000012	0.99999846	OKHOTSK SKATE
366	66150	0.00004	0.000	0.00000	0.00008	0.00000011	0.99999857	HIPPOLYTID SHRIMP UNIDENT.
367	69100	0.00004	0.000	0.00000	0.00008	0.00000011	0.99999867	PAGURUS TANNERI
368	23843	0.00003	0.000	0.00000	0.00009	0.00000010	0.99999877	BEARDED WARBONNET
369	71724	0.00003	0.000	0.00000	0.00008	0.00000009	0.99999886	ROSY WHELK
370	20001	0.00003	0.000	0.00000	0.00008	0.00000009	0.99999895	TUBENOSE POACHER
371	24152	0.00003	0.000	0.00000	0.00006	0.00000009	0.99999904	KAMCHATKA EELPOUT
372	23806	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999912	STOUT EELBLENNY
373	23850	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999920	WHITEBARRED PRICKLEBACK
374	23800	0.00003	0.000	0.00000	0.00007	0.00000008	0.99999927	PRICKLEBACK UNIDENT.
375	66772	0.00003	0.000	0.00001	0.00004	0.00000007	0.99999935	CRIMSON PASIPHAEID
376	93100	0.00002	0.000	0.00000	0.00006	0.00000007	0.99999942	PRIAPULID WORM UNIDENT.
377	83400	0.00002	0.000	0.00000	0.00005	0.00000006	0.99999948	OPHIOPHOLIS ACULEATA

Table C-3.--(Cont.).

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	90 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
378	66030	0.00002	0.000	0.00000	0.00005	0.00000006	0.99999953	OCEAN SHRIMP (PREV. OCEAN PINK SHRIMP)
379	69316	0.00002	0.000	0.00000	0.00005	0.00000005	0.99999959	HAPALOGASTER GREBNITZKII
380	23000	0.00002	0.000	0.00000	0.00005	0.00000005	0.99999964	SMELT UNIDENT.
381	22900	0.00002	0.000	0.00000	0.00004	0.00000005	0.99999969	DREAMER UNIDENT.
382	20614	0.00002	0.000	0.00000	0.00003	0.00000005	0.99999974	DEEPSEA SMELT UNIDENT.
383	80650	0.00001	0.000	0.00000	0.00003	0.00000004	0.99999977	HIPPASTERIA SPINOSA
384	97000	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999981	BRACHIOPOD UNIDENT.
385	22300	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999984	BIGSCALE UNIDENT.
386	66004	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999987	SERGESTES SP.
387	23603	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999989	NORTHERN PEARLEYE
388	66515	0.00001	0.000	0.00000	0.00001	0.00000002	0.99999991	COMMON CRANGON
389	56300	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999992	SCALE WORM UNIDENT.
390	23962	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999993	BARRELEYE
391	21000	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999995	VIPERFISH UNIDENT.
392	45000	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999996	COMB JELLY UNIDENT.
393	82675	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999997	BRISASTER LATIFRONS
394	23620	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999998	SCALY PAPERBONE (PREV. SCALY WEARYFISH)
395	66171	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999998	EUALUS BARBATUS
396	81130	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999999	LOPHASTER FURCILLIGER
397	21800	0.00000	0.000	0.00000	0.00001	0.00000001	1.00000000	BRISTLEMOUTH UNIDENT. (PREV. ANGLEMOUTH)
	TOTAL	338.58376						

APPENDIX D

Abundance and Size Composition Estimates for Principal Species of Fish, Shrimps, Squids, and Octopuses

Appendix D presents estimates of catch per unit effort (CPUE), biomass, and population numbers and variances and confidence intervals for the sampled population of principal species. Confidence intervals include only sampling error and do not incorporate effects of biases from other causes. The appendix also contains population estimates by sex and centimeter length interval for these species.

Definitions of headings that are not readily apparent are as follows:

Stratum--Subareas l-12 (see Fig. 3) were divided into standard and high-density sampling stratum for analytical purposes. Stratum included in each subarea were as follows:

Subarea	Stratum	Sampling density	Subarea	Stratum	Sampling density
1	10	Standard	7	71	Standard
2	20	"	8	72,73,74	High
3	30	"	9	81	Standard
	31	High	10	82	"
4	40	Standard	11	83	"
	41,42	High	12	84	"
5	50	Standard			
6	60	"			
	61	High			

Subtotals show estimates for the overall subarea derived from the sum of the estimates from the individual stratum.

Abundance estimates are also summarized regionally as shown by the following stratum codes: l00--North shelf, 200--standard annual survey area, 300--North shelf and standard survey area combined, 400--slope.

Area--Measured in square nautical miles.

Samples--Number of sampling units in the stratum. A sampling unit is the mean path width of the trawl times a distance of one nautical mile.

Mean WT KG--Mean weight of individual fish or invertebrates in kilograms.

Method used--Code 1 indicates that all catch records had weights and numbers for species, and code 3 indicates that the weights and numbers available were used to calculate mean weight per fish.

Biomass MT--Biomass estimates in metric tons.

L-F--Length frequency measurements.

List of Tables

Tables D-l to D-24 present abundance estimtes from computer analyses of the survey data for the species listed below. For each species having complete data available, the tables are subdivided into the following sections by strata, (b) biomass by strata, (c) population numbers by strata, and (d) population numbers by sex and centimeter length intervals for the overall survey area.

Section d of Table D-2 contains combined population number estimates by centimeter length interval for walleye pollock from both the bottom trawl and midwater survey.

Table D-1 .--Walleye pollock (from bottom trawl survey). Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	50	50	49	18.78	.315689E+02	17.42	.370885E+02
20	11,962.	1,384,553	31	31	31	31	11.02	.469956E+01	26.11	.446314E+02
30	27,559.	3,189,999	66	66	66	65	96.20	.203057E+03	121.66	.375678E+03
31	2,558.	296,105	9	9	9	9	318.69	.205782E+05	494.27	.515484E+05
SUBTOTAL	30,118.	3,486,104	75	75	75	74	115.10	.318490E+03	153.31	.686468E+03
40	18,281.	2,116,073	44	44	44	44	99.15	.119399E+04	143.82	.348448E+04
41	7,001.	810,309	31	31	31	31	138.03	.899465E+03	173.25	.150738E+04
42	6,154.	712,328	21	21	21	21	100.10	.841615E+03	129.08	.149458E+04
SUBTOTAL	31,436.	3,638,710	96	96	96	96	107.99	.480661E+03	147.49	.131046E+04
50	11,310.	1,309,140	27	26	26	26	108.29	.873446E+03	142.97	.169299E+04
60	25,704.	2,975,204	60	60	60	59	418.89	.535122E+04	865.48	.216970E+05
61	1,874.	216,948	7	7	7	7	410.89	.153074E+05	808.92	.868214E+05
SUBTOTAL	27,578.	3,192,153	67	67	67	66	418.35	.471927E+04	861.63	.192490E+05
71	21,233.	2,457,710	25	23	23	22	12.48	.911576E+01	33.07	.298029E+03
72	12,215.	1,413,893	15	14	14	13	6.83	.808930E+01	183.91	.305063E+05
73	5,494.	635,915	7	7	7	7	179.11	.134540E+04	503.27	.382090E+05
74	6,202.	717,847	13	13	13	13	0.59	.116511E+00	28.00	.648463E+02
SUBTOTAL	23,911.	2,767,656	35	34	34	33	44.80	.731465E+02	216.85	.998308E+04
81	2,270.	262,712	47	47	47	47	80.85	.506323E+03	94.25	.672631E+03
82	1,646.	190,552	28	26	26	26	119.36	.157028E+04	177.65	.376285E+04
83	1,281.	148,224	31	24	24	24	1.05	.143377E+00	1.21	.192194E+00
84	965.	111,735	27	10	10	10	0.16	.574158E-02	0.30	.180216E-01
100	45,144.	5,225,365	60	57	57	55	29.60	.225369E+02	130.41	.286656E+04
200	135,107.	15,638,602	354	345	345	342	149.37	.245526E+03	261.58	.920330E+03
300	180,250.	20,863,967	414	402	402	397	119.38	.139356E+03	228.73	.696870E+03
400	6,162.	713,222	133	107	107	107	61.91	.180790E+03	82.48	.359862E+03
TOTAL	186,412.	21,577,189	547	509	509	504	117.48	.130494E+03	223.89	.651955E+03

Table D-1.--Walleye pollock (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	146,232	.191431682E+10	57.00	58,588	233,875
20	45,193	.791039340E+08	30.00	27,031	63,354
30	909,349	.181435395E+11	65.00	640,178	1,178,521
31	279,620	.158423721E+11	8.00	0	569,868
SUBTOTAL	1,188,969	.339859116E+11	31.70	813,296	1,564,643
40	621,686	.469445208E+11	43.00	184,485	1,058,887
41	331,425	.518570589E+10	30.00	184,377	478,473
42	211,292	.374968640E+10	20.00	83,556	339,027
SUBTOTAL	1,164,403	.558799131E+11	59.08	691,376	1,637,430
50	420,077	.131440719E+11	26.00	184,362	655,793
60	3,693,009	.415918623E+12	59.00	2,402,497	4,983,521
61	264,147	.632608995E+10	6.00	69,521	458,774
SUBTOTAL	3,957,156	.422244713E+12	60.67	2,657,766	5,256,547
71	90,886	.483477108E+09	24.00	45,503	136,270
72	28,631	.141992778E+09	14.00	3,071	54,191
73	337,506	.477719205E+10	6.00	168,376	506,636
74	1,262	.527173079E+06	12.00	0	2,844
SUBTOTAL	367,399	.491971200E+10	6.36	195,765	539,033
81	62,943	.306838073E+09	46.00	27,652	98,234
82	67,394	.500640738E+09	27.00	21,481	113,308
83	461	.276589130E+05	30.00	121	801
84	54	.629406145E+03	26.00	2	105
100	458,285	.540318911E+10	7.65	288,780	627,791
200	6,922,030	.527248030E+12	91.60	5,477,538	8,366,522
300	7,380,315	.532651220E+12	93.37	5,928,684	8,831,946
400	130,851	.807507099E+09	57.55	73,958	187,745
TOTAL	7,511,167	.533458727E+12	93.66	6,058,679	8,963,654

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	6,567,488	8,454,845	12,206,500,764	16,423,577,951
90.000 PERCENT	6,296,078	8,726,255	11,600,500,666	17,029,578,049
95.000 PERCENT	6,058,679	8,963,654	11,070,631,508	17,559,447,208

Table D-1.--Walleye pollock (Cont). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	1.078	135,637,235	.224901723E+16	1	57.00	40,640,241	230,634,229
20	0.422	107,132,456	.751245384E+15	1	30.00	51,163,572	163,101,339
30	0.791	1,149,974,445	.335674826E+17	1	65.00	783,851,186	1,516,097,703
31	0.645	433,683,012	.396850799E+17	1	8.00	0	893,063,910
SUBTOTAL	0.751	1,583,657,456	.732525625E+17		25.05	1,026,114,118	2,141,200,795
40	0.689	901,824,538	.137000260E+18	1	43.00	154,946,697	1,648,702,379
41	0.797	416,001,129	.869052894E+16	1	30.00	225,639,749	606,362,508
42	0.776	272,450,239	.665888992E+16	1	20.00	102,228,422	442,672,056
SUBTOTAL	0.732	1,590,275,906	.152349679E+18		52.60	806,767,115	2,373,784,697
50	0.757	554,609,882	.254770254E+17	1	26.00	226,440,945	882,778,819
60	0.484	7,630,169,657	.168637797E+19	1	59.00	5,031,593,790	10,228,745,524
61	0.508	520,021,257	.358807554E+17	1	6.00	56,505,227	983,537,288
SUBTOTAL	0.486	8,150,190,914	.172225873E+19		61.26	5,525,931,255	10,774,450,574
71	0.377	240,808,579	.158067023E+17	1	24.00	0	500,304,377
72	0.037	770,535,899	.535481493E+18	1	14.00	0	2,340,173,990
73	0.356	948,326,128	.135670642E+18	1	6.00	47,010,484	1,849,641,772
74	0.021	59,555,037	.293407257E+15	1	12.00	22,230,653	96,879,422
SUBTOTAL	0.207	1,778,417,064	.671445542E+18		19.14	63,375,594	3,493,458,534
81	0.858	73,369,875	.407622577E+15	1	46.00	32,693,757	114,045,993
82	0.672	100,311,382	.119967968E+16	1	27.00	29,237,505	171,385,259
83	0.869	530,556	.370764121E+11	1	30.00	137,364	923,747
84	0.548	98,053	.197557767E+10	1	26.00	6,669	189,437
100	0.227	2,019,225,643	.687252244E+18	1	20.05	289,917,496	3,748,533,791
200	0.571	12,121,503,849	.197633826E+19	1	79.56	9,319,230,038	14,923,777,660
300	0.522	14,140,729,492	.266359050E+19	1	97.65	10,897,300,117	17,384,158,868
400	0.751	174,309,865	.160734131E+16	1	45.39	93,495,099	255,124,632
TOTAL	0.525	14,315,039,358	.266519784E+19		97.77	11,070,631,508	17,559,447,208

Table D-1.--Walleye pollock (Cont.). Section d, population number estimates by sex and centimeter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
60.0	66,021	0	126,899	192,920	0.00001	0.00001
70.0	0	0	111,954	111,954	0.00001	0.00002
80.0	351,009	182,045	2,815,764	3,348,818	0.00023	0.00026
90.0	522,450	407,960	13,612,185	14,542,595	0.00102	0.00127
100.0	1,184,257	670,287	53,821,968	55,676,513	0.00389	0.00516
110.0	3,469,622	1,734,178	118,674,107	123,877,907	0.00865	0.01381
120.0	9,707,609	7,883,826	383,952,817	401,544,252	0.02805	0.04186
130.0	15,970,331	10,048,657	315,561,775	341,580,763	0.02386	0.06573
140.0	22,649,731	12,277,824	323,045,053	357,972,608	0.02501	0.09073
150.0	19,474,303	16,498,293	278,149,893	314,122,488	0.02194	0.11268
160.0	19,161,574	15,200,465	185,346,743	219,708,783	0.01535	0.12802
170.0	16,750,285	12,540,539	130,946,812	160,237,637	0.01119	0.13922
180.0	8,117,248	17,052,408	60,559,733	85,729,389	0.00599	0.14521
190.0	21,174,134	18,490,672	26,700,486	66,365,292	0.00464	0.14984
200.0	16,839,497	11,912,891	15,020,270	43,772,658	0.00306	0.15290
210.0	20,352,751	16,218,205	20,873,356	57,444,312	0.00401	0.15691
220.0	17,179,121	17,662,798	11,825,507	46,667,426	0.00326	0.16017
230.0	15,744,312	22,254,527	7,198,465	45,197,304	0.00316	0.16333
240.0	30,183,381	24,822,943	3,601,419	58,607,742	0.00409	0.16743
250.0	35,730,536	21,605,565	456,293	57,792,395	0.00404	0.17146
260.0	25,358,334	30,925,111	0	56,283,445	0.00393	0.17539
270.0	29,383,072	18,137,606	0	47,520,678	0.00332	0.17871
280.0	25,988,096	18,691,094	0	44,679,190	0.00312	0.18184
290.0	37,647,037	29,083,139	0	66,730,176	0.00466	0.18650
300.0	28,255,082	26,253,455	0	54,508,538	0.00381	0.19030
310.0	55,880,669	27,166,373	0	83,047,041	0.00580	0.19611
320.0	50,854,202	42,538,294	0	93,392,495	0.00652	0.20263
330.0	91,037,990	61,986,201	0	153,024,190	0.01069	0.21332
340.0	110,231,351	79,929,113	0	190,160,464	0.01328	0.22660
350.0	212,658,085	100,942,112	0	313,600,197	0.02191	0.24851
360.0	236,568,479	163,309,160	0	399,877,639	0.02793	0.27644
370.0	269,138,537	174,629,646	0	443,768,183	0.03100	0.30744
380.0	269,067,394	202,664,540	0	471,731,935	0.03295	0.34040
390.0	314,292,757	234,148,933	0	548,441,691	0.03831	0.37871
400.0	407,429,604	252,621,639	0	660,051,242	0.04611	0.42482
410.0	418,024,429	302,136,556	0	720,160,985	0.05031	0.47513
420.0	461,878,831	388,185,117	0	850,063,948	0.05938	0.53451
430.0	463,993,783	387,127,400	0	851,121,184	0.05946	0.59397
440.0	438,524,415	373,213,201	0	811,737,616	0.05671	0.65067
450.0	359,935,879	336,264,788	0	696,200,667	0.04863	0.69931
460.0	301,049,614	296,216,034	0	597,265,648	0.04172	0.74103
470.0	249,720,894	248,037,269	0	497,758,163	0.03477	0.77580
480.0	207,321,073	192,865,333	0	400,186,405	0.02796	0.80376
490.0	189,469,930	179,050,213	0	368,520,142	0.02574	0.82950
500.0	187,744,071	176,916,208	0	364,660,278	0.02547	0.85497
510.0	180,326,864	156,913,197	0	337,240,061	0.02356	0.87853
520.0	136,782,241	156,281,543	0	293,063,784	0.02047	0.89900

Table D-1 .--Walleye pollock (Cont.). Section d, population number estimates by sex and centimeter Length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
530.0	117,648,556	151,835,830	0	269,484,386	0.01883	0.91783
540.0	105,907,172	131,847,113	0	237,754,285	0.01661	0.93444
550.0	72,887,120	115,390,197	0	188,277,317	0.01315	0.94759
560.0	56,484,830	97,060,605	0	153,545,434	0.01073	0.95832
570.0	33,305,815	79,927,575	0	113,233,390	0.00791	0.96623
580.0	27,206,872	62,279,086	0	89,485,958	0.00625	0.97248
590.0	18,892,614	59,486,957	0	78,379,570	0.00548	0.97795
600.0	18,077,866	45,297,411	0	63,375,277	0.00443	0.98238
610.0	13,324,042	36,995,695	0	50,319,737	0.00352	0.98590
620.0	7,518,339	30,265,582	0	37,783,921	0.00264	0.98854
630.0	6,023,977	27,905,481	0	33,929,458	0.00237	0.99091
640.0	6,006,369	16,852,141	0	22,858,510	0.00160	0.99250
650.0	3,990,990	17,084,043	0	21,075,033	0.00147	0.99398
660.0	3,128,779	15,183,856	0	18,312,635	0.00128	0.99525
670.0	2,862,146	11,541,136	0	14,403,282	0.00101	0.99626
680.0	1,677,948	8,447,561	0	10,125,509	0.00071	0.99697
690.0	1,468,941	6,031,241	0	7,500,182	0.00052	0.99749
700.0	1,391,028	7,468,396	0	8,859,424	0.00062	0.99811
710.0	818,277	5,704,723	0	6,523,001	0.00046	0.99857
720.0	495,601	4,779,338	0	5,274,940	0.00037	0.99893
730.0	1,403,149	3,006,684	0	4,409,832	0.00031	0.99924
740.0	218,483	3,030,459	0	3,248,942	0.00023	0.99947
750.0	175,558	2,326,653	0	2,502,212	0.00017	0.99964
760.0	42,536	1,289,140	0	1,331,676	0.00009	0.99974
770.0	0	1,353,902	0	1,353,902	0.00009	0.99983
780.0	0	882,272	0	882,272	0.00006	0.99989
790.0	0	342,555	0	342,555	0.00002	0.99992
800.0	0	135,365	0	135,365	0.00001	0.99993
810.0	39,420	55,262	0	94,682	0.00001	0.99993
820.0	0	550,902	0	550,902	0.00004	0.99997
830.0	0	314,072	0	314,072	0.00002	0.99999
840.0	0	81,956	0	81,956	0.00001	1.00000
TOTAL	6,534,187,311	5,828,450,548	1,952,401,499	14,315,039,358		

Table D-2.--Walleye pollock (from midwater survey). Section a, mean density estimates by stratum.

STRATUM	AREA[a] SQ. NM.	AREA[a] SQ. KM.	N[b]	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN DENSITY[a] KG/HA	VARIANCE MEAN DENSITY[c] KG/HA
1	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-
3	19,610	67,260	6,239	-	-	-	-	74.4	2.24E+02
4	19,381	66,475	8,537	1	1	1	1	29.5	3.18E+01
5	11,310	38,792	3,001	7	7	7	7	151.3	3.86E+02
6	27,578	94,590	7,638	13	13	13	13	334.0	1.61E+03
7	-	-	-	-	-	-	-	-	-
8	2,289	7,851	710	1	1	1	1	187.3	2.12E+03
9	2,270	7,785	829	-	-	-	-	86.1	1.43E+03
10	1,646	5,646	714	-	-	-	-	32.2	4.63E+01
11	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-
TOTAL	84,084	288,399	27,668	22	22	22	22	162.1	1.97E+02

Table D-2.--Walleye pollock (Cont.). Section b, biomass and population estimates by stratum.

SUBAREA	BIOMASS MT	VARIANCE BIOMASS[c]	BIOMASS 95% CONFIDENCE LIMITS[c] LOWER	UPPER	POPULATION	VARIANCE POPULATION[c]	POPULATION 95% CONFIDENCE INTERVAL[c] LOWER	UPPER
1	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-
3	500,493	1.014317E+10	303,095	697,891	851,396,672	2.935225E+16	515,599,711	1,187,193,633
4	195,864	1.403458E+09	122,437	269,291	428,579,797	6.719756E+15	267,910,523	589,249,071
5	586,962	5.806674E+09	437,607	736,317	1,076,931,565	1.954716E+16	802,901,690	1,350,961,439
6	3,159,824	1.442727E+11	2,415,352	3,904,296	9,129,602,641	1.204376E+18	6,978,618,798	11,280,586,483
7	-	-	-	-	-	-	-	-
8	147,087	1.307594E+09	76,212	217,962	636,359,804	2.447541E+16	329,725,291	942,994,317
9	67,040	8.685665E+08	9,276	124,804	123,573,219	2.951099E+15	17,098,142	230,048,296
10	18,166	1.476182E+07	10,636	25,697	45,361,746	9.204512E+13	26,557,477	64,166,015
11	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-
TOTAL	4,675,436	1.638169E+11	3,882,140	5,468,732	12,291,805,444	1.287514E+18	10,067,819,529	14,515,791,358

[a]These areas represent the portion of the subarea in which pollock concentrations (> age 0) were observed in midwater. Density estimates (kg/ha) represent density occurring within these areas.

[b]Number of 1 minute echo integrator density outputs.

[c]Includes only sampling error. Abundance estimates may be biased due to errors in target strength or calibration constant measurements.

Table D-2. --Walleye pollock (Cont.). Section c, population number estimates by centimeter length interval for the overall midwater survey area.

LENGTH(CM)	TOTAL	PROPORTION	CUMULATIVE PROPORTION
13.0	1,842,415	0.0002	0.0002
14.0	4,506,163	0.0004	0.0005
15.0	0000	0.0000	0.0005
16.0	4,506,163	0.0004	0.0009
17.0	0000	0.0000	0.0009
18.0	6,348,578	0.0005	0.0015
19.0	15,360,910	0.0013	0.0027
20.0	30,503,056	0.0026	0.0053
21.0	45,641,822	0.0039	0.0092
22.0	73,175,380	0.0062	0.0154
23.0	215,237,019	0.0182	0.0335
24.0	250,529,158	0.0212	0.0547
25.0	240,807,448	0.0203	0.0750
26.0	261,587,988	0.0221	0.0971
27.0	267,460,652	0.0226	0.1197
28.0	226,637,575	0.0191	0.1388
29.0	296,207,488	0.0250	0.1638
30.0	308,363,475	0.0260	0.1899
31.0	431,770,949	0.0365	0.2263
32.0	498,029,862	0.0421	0.2684
33.0	557,955,925	0.0471	0.3155
34.0	761,384,812	0.0643	0.3798
35.0	663,409,847	0.0560	0.4358
36.0	683,600,759	0.0577	0.4935
37.0	703,885,768	0.0594	0.5529
38.0	675,010,915	0.0570	0.6099
39.0	627,899,831	0.0530	0.6630
40.0	606,560,009	0.0512	0.7142
41.0	557,387,950	0.0471	0.7612
42.0	502,283,389	0.0424	0.8036
43.0	364,937,144	0.0308	0.8345
44.0	365,053,617	0.0308	0.8653
45.0	287,140,368	0.0242	0.8895
46.0	206,387,618	0.0174	0.9069
47.0	228,220,487	0.0193	0.9262
48.0	152,365,772	0.0129	0.9391
49.0	133,177,310	0.0112	0.9503
50.0	118,143,060	0.0100	0.9603
51.0	110,307,709	0.0093	0.9696
52.0	89,153,712	0.0075	0.9771
53.0	90,358,439	0.0076	0.9848
54.0	58,775,689	0.0050	0.9897
55.0	83,716,850	0.0071	0.9968
56.0	15,978,830	0.0013	0.9982
57.0	8,231,200	0.0007	0.9988
58.0	5,080,722	0.0004	0.9993
59.0	2,345,467	0.0002	0.9995
60.0	3,682,772	0.0003	0.9998

Table D-2. --Walleye pollock (Cont.). Section c, population number estimates by centimeter length interval for the overall midwater survey area.

LENGTH(CM)	TOTAL	PROPORTION	CUMULATIVE PROPORTION
61.0	1,119,290	0.0001	0.9999
62.0	0000	0.0000	0.9999
63.0	0000	0.0000	0.9999
64.0	0000	0.0000	0.9999
65.0	1,421,071	0.0001	1.0000
TOTALS	11,843,492,433*	1.0000	1.0000

*Age-specific population estimates were corrected to account for age reading errors (see methods section); therefore, the total population estimate differs from those given in tables showing population estimates by age.

Table D-2.--Walleye pollock (Cont.). Section d, population number estimates by centimeter length interval for the overall midwater and bottom trawl survey area.

LENGTH(CM)	TOTAL	PROPORTION	CUMULATIVE PROPORTION
6.0	192,920	0.0000	0.0000
7.0	111,954	0.0000	0.0000
8.0	3,348,818	0.0001	0.0001
9.0	14,542,595	0.0006	0.0007
10.0	55,676,513	0.0021	0.0028
11.0	123,877,907	0.0047	0.0076
12.0	401,544,252	0.0154	0.0229
13.0	343,423,178	0.0131	0.0360
14.0	362,478,771	0.0139	0.0499
15.0	314,122,488	0.0120	0.0619
16.0	224,214,946	0.0086	0.0705
17.0	160,237,637	0.0061	0.0766
18.0	92,077,967	0.0035	0.0801
19.0	81,726,202	0.0031	0.0832
20.0	74,275,714	0.0028	0.0861
21.0	103,086,134	0.0039	0.0900
22.0	119,842,806	0.0046	0.0946
23.0	260,434,323	0.0100	0.1046
24.0	309,136,900	0.0118	0.1164
25.0	298,599,843	0.0114	0.1278
26.0	317,871,433	0.0122	0.1399
27.0	314,981,330	0.0120	0.1520
28.0	271,316,765	0.0104	0.1624
29.0	362,937,664	0.0139	0.1762
30.0	362,872,013	0.0139	0.1901
31.0	514,817,990	0.0197	0.2098
32.0	591,422,357	0.0226	0.2324
33.0	710,980,115	0.0272	0.2596
34.0	951,545,276	0.0364	0.2960
35.0	977,010,044	0.0373	0.3333
36.0	1,083,478,398	0.0414	0.3747
37.0	1,147,653,951	0.0439	0.4186
38.0	1,146,742,850	0.0438	0.4624
39.0	1,176,341,522	0.0450	0.5074
40.0	1,266,611,251	0.0484	0.5558
41.0	1,277,548,935	0.0488	0.6047
42.0	1,352,347,337	0.0517	0.6564
43.0	1,216,058,328	0.0465	0.7028
44.0	1,176,791,233	0.0450	0.7478
45.0	983,341,035	0.0376	0.7854
46.0	803,653,266	0.0307	0.8161
47.0	725,978,650	0.0278	0.8439
48.0	552,552,177	0.0211	0.8650
49.0	501,697,452	0.0192	0.8842
50.0	482,803,338	0.0185	0.9027
51.0	447,547,770	0.0171	0.9198
52.0	382,217,496	0.0146	0.9344
53.0	359,842,825	0.0138	0.9481

Table D-2.--Walleye pollock (Cont.) Section d, population number estimates by centimeter length interval for the overall midwater and bottom trawl survey area.

LENGTH(CM)	TOTAL	PROPORTION	CUMULATIVE PROPORTION
54.0	296,529,974	0.0113	0.9595
55.0	271,994,167	0.0104	0.9699
56.0	169,524,264	0.0065	0.9764
57.0	121,464,590	0.0046	0.9810
58.0	94,566,680	0.0036	0.9846
59.0	80,725,037	0.0031	0.9877
60.0	67,058,049	0.0026	0.9903
61.0	51,439,027	0.0020	0.9922
62.0	37,783,921	0.0014	0.9937
63.0	33,929,458	0.0013	0.9950
64.0	22,858,510	0.0009	0.9958
65.0	22,496,104	0.0009	0.9967
66.0	18,312,635	0.0007	0.9974
67.0	14,403,282	0.0006	0.9980
68.0	10,125,509	0.0004	0.9983
69.0	7,500,182	0.0003	0.9986
70.0	8,859,424	0.0003	0.9990
71.0	6,523,001	0.0002	0.9992
72.0	5,274,940	0.0002	0.9994
73.0	4,409,832	0.0002	0.9996
74.0	3,248,942	0.0001	0.9997
75.0	2,502,212	0.0001	0.9998
76.0	1,331,676	0.0001	0.9999
77.0	1,353,902	0.0001	0.9999
78.0	882,272	0.0000	0.9999
79.0	342,555	0.0000	1.0000
80.0	135,365	0.0000	1.0000
81.0	94,682	0.0000	1.0000
82.0	550,902	0.0000	1.0000
83.0	314,072	0.0000	1.0000
84.0	81,956	0.0000	1.0000
TOTALS	26,158,531,791*	1.0000	1.0000

*Age-specific population estimates for the midwater data were corrected to account for age reading errors (see methods section); therefore, the total population estimate differs from those given in tables showing population estimates by age.

Table D-3.--Pacific cod. Section a, CPUE estimates by subarea.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	52	52	50	14.43	.847219E+01	8.81	.416807E+01
20	11,962.	1,384,553	31	28	28	27	9.24	.103580E+02	5.31	.679265E+01
30	27,559.	3,189,999	66	64	64	62	23.79	.245748E+02	13.70	.273203E+01
31	2,558.	296,105	9	8	8	8	22.21	.263411E+02	8.83	.580819E+01
SUBTOTAL	30,118.	3,486,104	75	72	72	70	23.66	.207675E+02	13.29	.232954E+01
40	18,281.	2,116,073	44	38	38	38	15.79	.117980E+02	12.07	.762111E+01
41	7,001.	810,309	31	31	31	31	20.94	.171301E+02	19.39	.166026E+02
42	6,154.	712,328	21	21	21	20	7.65	.298655E+01	12.80	.952275E+01
SUBTOTAL	31,436.	3,638,710	96	90	90	89	15.34	.495398E+01	13.84	.376571E+01
50	11,310.	1,309,140	27	27	27	27	26.14	.363859E+02	6.81	.154521E+01
60	25,704.	2,975,204	60	59	59	59	31.81	.198938E+02	11.29	.249887E+01
61	1,874.	216,948	7	7	7	7	27.43	.311483E+03	10.04	.276349E+02
SUBTOTAL	27,578.	3,192,153	67	66	66	66	31.51	.187204E+02	11.21	.229840E+01
71	21,233.	2,457,710	25	16	16	15	5.84	.282109E+01	2.98	.740852E+00
72	12,215.	1,413,893	15	8	8	7	1.49	.442408E+00	0.86	.974580E-01
73	5,494.	635,915	7	6	6	6	15.24	.800341E+02	4.21	.355434E+01
74	6,202.	717,847	13	6	6	5	0.02	.674523E-04	0.18	.481729E-02
SUBTOTAL	23,911.	2,767,656	35	20	20	18	4.27	.434069E+01	1.45	.213402E+00
81	2,270.	262,712	47	25	25	20	2.28	.429013E+00	0.79	.509074E-01
82	1,646.	190,552	28	21	21	21	13.12	.236816E+02	2.76	.703082E+00
83	1,281.	148,224	31	2	2	2	0.49	.159126E+00	0.15	.136697E-01
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	36	36	33	5.01	.184181E+01	2.17	.223760E+00
200	135,107.	15,638,602	354	335	335	329	20.71	.265556E+01	10.99	.597158E+00
300	180,250.	20,863,967	414	371	371	362	16.77	.160749E+01	8.78	.349534E+00
400	6,162.	713,222	133	48	48	43	4.45	.175548E+01	1.06	.576835E-01
TOTAL	186,412.	21,577,189	547	419	419	405	16.37	.150490E+01	8.53	.326872E+00

Table D-3.--Pacific cod (Cont). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	112,330	.513746819E+09	57.00	66,927	157,734
20	37,913	.174347921E+09	30.00	10,950	64,876
30	224,917	.219580446E+10	65.00	131,276	318,558
31	19,490	.202789602E+08	8.00	9,106	29,875
SUBTOTAL	244,407	.221608342E+10	66.16	150,351	338,464
40	99,015	.463865006E+09	43.00	55,555	142,474
41	50,272	.987605210E+08	30.00	29,978	70,565
42	16,145	.133061420E+08	20.00	8,536	23,754
SUBTOTAL	165,431	.575931669E+09	62.14	117,450	213,412
50	101,393	.547554309E+09	26.00	53,283	149,504
60	280,439	.154623038E+10	59.00	201,753	359,124
61	17,631	.128726854E+09	6.00	0	45,394
SUBTOTAL	298,069	.167495723E+10	64.82	216,285	379,853
71	42,520	.149623579E+09	24.00	17,273	67,767
72	6,252	.776566563E+07	14.00	275	12,230
73	28,710	.284181263E+09	6.00	0	69,960
74	50	.305198324E+03	12.00	11	88
SUBTOTAL	35,011	.291947234E+09	6.33	0	76,822
81	1,777	.259987040E+06	46.00	750	2,804
82	7,410	.755023779E+07	27.00	1,771	13,048
83	214	.306971440E+05	30.00	0	572
84	0	0.	0.00	0	0
100	77,532	.441570813E+09	13.54	32,457	122,606
200	959,544	.570262137E+10	232.24	810,028	1,109,060
300	1,037,076	.614419219E+10	244.46	881,879	1,192,272
400	9,400	.784092197E+07	29.10	3,674	15,127
TOTAL	1,046,476	.615203311E+10	245.09	891,181	1,201,771

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	945,376	1,147,576	498,099,097	592,334,397
90.000 PERCENT	916,435	1,176,517	484,611,661	605,821,833
95.000 PERCENT	891,181	1,201,771	472,842,515	617,590,978

Table D-3.--Pacific cod (Cont). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	1.637	68,618,090	.252748794E+15	1	57.00	36,771,861	100,464,319
20	1.740	21,783,388	.114335209E+15	1	30.00	0	43,618,013
30	1.736	129,544,520	.244111724E+15	1	65.00	98,322,410	160,766,630
31	2.515	7,748,808	.447149624E+13	1	8.00	2,872,560	12,625,055
SUBTOTAL	1.780	137,293,328	.248583220E+15		67.22	105,797,072	168,789,583
40	1.309	75,658,815	.299640888E+15	1	43.00	40,729,552	110,588,077
41	1.080	46,559,841	.957191942E+14	1	30.00	26,581,691	66,537,990
42	0.597	27,021,574	.424271590E+14	1	20.00	13,434,177	40,608,972
SUBTOTAL	1.108	149,240,229	.437787241E+15		77.17	107,512,063	190,968,396
50	3.840	26,403,835	.232531287E+14	1	26.00	16,489,495	36,318,175
60	2.817	99,541,849	.194222457E+15	1	59.00	71,654,473	127,429,226
61	2.731	6,455,764	.114207124E+14	1	6.00	0	14,725,289
SUBTOTAL	2.812	105,997,613	.205643169E+15		63.97	77,336,205	134,659,020
71	1.958	21,714,107	.392929265E+14	1	24.00	8,776,115	34,652,099
72	1.736	3,601,915	.171069526E+13	1	14.00	796,393	6,407,436
73	3.619	7,932,127	.126205721E+14	1	6.00	0	16,625,203
74	0.126	392,759	.217965841E+11	1	12.00	71,059	714,460
SUBTOTAL	2.936	11,926,801	.143530639E+14		7.70	3,190,419	20,663,183
81	2.878	617,436	.308505185E+11	1	46.00	263,568	971,304
82	4.761	1,556,324	.224158395E+12	1	27.00	584,797	2,527,851
83	3.259	65,595	.263704552E+10	1	30.00	0	170,456
84	0.000	0	0.	1	0.00	0	0
100	2.305	33,640,908	.536459904E+14	1	31.60	18,715,363	48,566,453
200	1.884	509,336,483	.128235076E+16	1	291.51	438,436,604	580,236,362
300	1.910	542,977,392	.133599675E+16	1	311.38	470,610,115	615,344,668
400	4.198	2,239,355	.257645959E+12	1	35.27	1,208,189	3,270,521
TOTAL	1.919	545,216,747	.133625440E+16		311.50	472,842,515	617,590,978

Table D-3. --Pacific cod (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
80.0	0	0	277,491	277,491	0.00051	0.00051
90.0	0	0	237,927	237,927	0.00044	0.00095
100.0	0	28,774	0	28,774	0.00005	0.00100
110.0	28,774	0	376,305	405,079	0.00074	0.00174
120.0	107,175	0	284,692	391,867	0.00072	0.00246
130.0	448,599	200,612	815,285	1,464,496	0.00269	0.00515
140.0	894,823	329,752	189,795	1,414,369	0.00259	0.00774
150.0	1,292,845	361,846	946,671	2,601,362	0.00477	0.01251
160.0	568,658	431,971	379,589	1,380,218	0.00253	0.01504
170.0	719,397	398,873	94,897	1,213,168	0.00223	0.01727
180.0	1,861,455	487,549	0	2,349,004	0.00431	0.02158
190.0	657,111	866,159	0	1,523,270	0.00279	0.02437
200.0	832,497	213,678	0	1,046,175	0.00192	0.02629
210.0	956,635	458,562	0	1,415,197	0.00260	0.02888
220.0	752,123	1,016,083	0	1,768,207	0.00324	0.03213
230.0	1,297,453	1,145,890	0	2,443,343	0.00448	0.03661
240.0	1,364,875	2,268,494	0	3,633,368	0.00666	0.04327
250.0	1,895,899	2,402,134	0	4,298,033	0.00788	0.05116
260.0	1,885,441	2,765,824	0	4,651,265	0.00853	0.05969
270.0	3,272,901	1,871,707	0	5,144,608	0.00944	0.06912
280.0	3,650,571	3,241,506	0	6,892,077	0.01264	0.08176
290.0	2,516,044	1,883,328	0	4,399,371	0.00807	0.08983
300.0	3,932,124	3,791,443	0	7,723,567	0.01417	0.10400
310.0	3,270,290	3,994,174	127,653	7,392,116	0.01356	0.11756
320.0	4,143,701	3,371,627	0	7,515,328	0.01378	0.13134
330.0	3,642,617	5,886,358	0	9,528,975	0.01748	0.14882
340.0	5,549,128	4,628,150	0	10,177,278	0.01867	0.16749
350.0	6,436,728	7,924,765	0	14,361,493	0.02634	0.19383
360.0	5,953,711	5,066,717	127,653	11,148,081	0.02045	0.21427
370.0	5,753,399	4,359,982	0	10,113,381	0.01855	0.23282
380.0	4,589,503	6,523,885	0	11,113,388	0.02038	0.25321
390.0	3,707,593	3,982,459	0	7,690,052	0.01410	0.26731
400.0	5,291,694	4,118,938	0	9,410,632	0.01726	0.28457
410.0	4,373,328	4,786,155	0	9,159,483	0.01680	0.30137
420.0	7,728,659	4,633,739	127,653	12,490,050	0.02291	0.32428
430.0	5,947,088	5,853,681	127,653	11,928,422	0.02188	0.34616
440.0	4,960,259	5,750,706	0	10,710,965	0.01965	0.36580
450.0	8,393,451	8,407,944	0	16,801,396	0.03082	0.39662
460.0	6,656,624	7,820,883	0	14,477,508	0.02655	0.42317
470.0	7,970,692	7,354,523	28,774	15,353,989	0.02816	0.45133
480.0	8,690,616	5,753,544	0	14,444,161	0.02649	0.47783
490.0	5,962,672	6,652,268	0	12,614,940	0.02314	0.50096
500.0	8,990,003	7,012,149	0	16,002,152	0.02935	0.53031
510.0	5,761,018	8,530,735	0	14,291,753	0.02621	0.55653
520.0	6,801,840	5,252,300	0	12,054,140	0.02211	0.57864
530.0	7,087,220	6,037,934	0	13,125,154	0.02407	0.60271
540.0	7,436,858	7,338,959	0	14,775,818	0.02710	0.62981

Table D-3. --Pacific cod (Cont.). Section d, population number estimates by sex and centimeter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
550.0	7,906,497	5,481,156	28,663	13,416,316	0.02461	0.65442
560.0	5,950,028	6,442,216	28,774	12,421,018	0.02278	0.67720
570.0	5,676,487	6,003,740	28,663	11,708,890	0.02148	0.69867
580.0	6,060,011	6,782,790	0	12,842,801	0.02356	0.72223
590.0	5,681,330	4,937,762	28,663	10,647,755	0.01953	0.74176
600.0	6,202,981	5,361,539	28,663	11,593,183	0.02126	0.76302
610.0	4,367,560	4,656,901	0	9,024,462	0.01655	0.77957
620.0	4,592,387	6,189,203	0	10,781,591	0.01977	0.79935
630.0	3,634,327	5,105,957	0	8,740,284	0.01603	0.81538
640.0	3,387,664	3,243,424	57,634	6,688,723	0.01227	0.82765
650.0	2,366,983	4,561,649	0	6,928,631	0.01271	0.84036
660.0	2,972,579	2,213,887	0	5,186,466	0.00951	0.84987
670.0	3,202,647	4,288,590	0	7,491,237	0.01374	0.86361
680.0	2,548,051	3,029,798	0	5,577,849	0.01023	0.87384
690.0	2,935,729	2,764,753	0	5,700,481	0.01046	0.88430
700.0	1,788,283	2,646,668	28,663	4,463,613	0.00819	0.89248
710.0	4,501,762	1,781,482	0	6,283,244	0.01152	0.90401
720.0	1,767,079	2,810,506	0	4,577,585	0.00840	0.91240
730.0	2,574,455	1,939,906	57,326	4,571,687	0.00839	0.92079
740.0	1,779,294	1,382,148	0	3,161,443	0.00580	0.92659
750.0	2,137,825	2,104,766	0	4,242,591	0.00778	0.93437
760.0	1,752,744	2,036,933	0	3,789,677	0.00695	0.94132
770.0	1,399,147	1,437,240	0	2,836,387	0.00520	0.94652
780.0	753,350	1,604,343	0	2,357,693	0.00432	0.95084
790.0	802,306	2,380,997	0	3,183,303	0.00584	0.95668
800.0	1,980,364	2,059,001	0	4,039,366	0.00741	0.96409
810.0	1,692,712	1,770,489	0	3,463,201	0.00635	0.97044
820.0	597,428	2,175,280	28,774	2,801,482	0.00514	0.97558
830.0	689,731	870,604	0	1,560,335	0.00286	0.97844
840.0	1,101,697	1,046,631	0	2,148,328	0.00394	0.98238
850.0	389,863	479,358	0	869,221	0.00159	0.98398
860.0	635,485	1,104,589	0	1,740,074	0.00319	0.98717
870.0	459,832	597,526	0	1,057,357	0.00194	0.98911
880.0	485,577	109,298	0	594,875	0.00109	0.99020
890.0	523,970	504,796	0	1,028,766	0.00189	0.99209
900.0	0	190,145	0	190,145	0.00035	0.99244
910.0	363,410	682,018	0	1,045,429	0.00192	0.99435
920.0	50,744	182,471	0	233,215	0.00043	0.99478
930.0	37,572	264,349	0	301,922	0.00055	0.99534
940.0	1,944	609,917	0	611,861	0.00112	0.99646
950.0	44,267	295,962	0	340,230	0.00062	0.99708
960.0	28,440	225,195	0	253,634	0.00047	0.99755
970.0	26,809	28,440	0	55,249	0.00010	0.99765
980.0	33,866	204,187	0	238,053	0.00044	0.99808
990.0	1,944	444,331	0	446,276	0.00082	0.99890
1000.0	0	176,142	0	176,142	0.00032	0.99923
1010.0	35,392	8,573	0	43,965	0.00008	0.99931

Table D-3.--Pacific cod (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
1020.0	0	152,242	0	152,242	0.00028	0.99959
1030.0	0	1,944	0	1,944	0.00000	0.99959
1050.0	0	17,054	0	17,054	0.00003	0.99962
1070.0	0	13,301	0	13,301	0.00002	0.99965
1080.0	0	1,944	0	1,944	0.00000	0.99965
1100.0	0	191,339	0	191,339	0.00035	1.00000
TOTAL	269,956,648	270,802,242	4,457,857	545,216,747		

Table D-4.--Sablefish. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	0	0	0	0.00	0.	0.00	0.
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	0	0	0	0.00	0.	0.00	0.
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	0	0	0	0.00	0.	0.00	0.
50	11,310.	1,309,140	27	2	2	1	0.05	.192216E-02	0.03	.500368E-03
60	25,704.	2,975,204	60	1	1	1	0.01	.218164E-03	0.01	.350533E-04
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	1	1	1	0.01	.189517E-03	0.01	.304505E-04
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	44	44	39	19.74	.545826E+02	7.11	.532391E+01
82	1,646.	190,552	28	21	21	19	7.59	.112997E+02	2.30	.985030E+00
83	1,281.	148,224	31	31	31	28	15.08	.220945E+01	5.69	.326868E+00
84	965.	111,735	27	26	26	25	12.63	.147414E+02	4.17	.151353E+01
100	45,144.	5,225,365	60	0	0	0	0.00	0.	0.00	0.
200	135,107.	15,638,602	354	3	3	2	0.01	.213662E-04	0.00	.477516E-05
300	180,250.	20,863,967	414	3	3	2	0.01	.120041E-04	0.00	.268281E-05
400	6,162.	713,222	133	122	122	111	14.41	.866945E+01	5.07	.843913E+00
TOTAL	186,412.	21,577,189	547	125	125	113	0.48	.948345E-02	0.17	.924566E-03

Table D-4. --Sablefish (Cont.). Section b, biomass estimated by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	0	0.	0.00	0	0
31	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
40	0	0.	0.00	0	0
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
50	199	.289257253E+05	26.00	0	548
60	130	.169565623E+05	59.00	0	391
61	0	0.	0.00	0	0
SUBTOTAL	130	.169565623E+05	59.00	0	391
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	15,367	.330777108E+08	46.00	3,780	26,954
82	4,286	.360258883E+07	27.00	391	8,180
83	6,622	.426226539E+06	30.00	5,289	7,955
84	4,182	.161599024E+07	26.00	1,569	6,796
100	0	0.	0.00	0	0
200	329	.458822876E+05	56.81	0	758
300	329	.458822876E+05	56.81	0	758
400	30,457	.387225164E+08	61.52	18,016	42,898
TOTAL	30,786	.387683987E+08	61.67	18,337	43,234

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	22,718	38,854	8,369,645	13,407,916
90.000 PERCENT	20,384	41,187	7,640,986	14,136,575
95.000 PERCENT	18,337	43,234	7,001,822	14,775,739

Table D-4.--Sablefish (Cont). Section c, population number estimates by subarea.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.000	0	0.	1	0.00	0	0
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
40	0.000	0	0.	1	0.00	0	0
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
50	1.605	123,774	.752980300E+10	1	26.00	0	302,183
60	2.495	52,197	.272448146E+10	1	59.00	0	156,645
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	2.495	52,197	.272448146E+10		59.00	0	156,645
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	2.778	5,531,189	.322635351E+13	1	46.00	1,912,374	9,150,004
82	3.295	1,300,669	.314049728E+12	1	27.00	150,725	2,450,613
83	2.649	2,499,749	.630564944E+11	1	30.00	1,986,982	3,012,517
84	3.028	1,381,202	.165917124E+12	1	26.00	543,733	2,218,671
100	0.000	0	0.	1	0.00	0	0
200	1.869	175,971	.102542845E+11	1	45.59	0	379,986
300	1.869	175,971	.102542845E+11	1	45.59	0	379,986
400	2.843	10,712,810	.376937686E+13	1	61.47	6,830,480	14,595,139
TOTAL	2.827	10,888,781	.377963114E+13		61.81	7,001,822	14,775,739

Table D-4.--Sablefish (Cont.). Section d, population number estimates by sex and centimeter Length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
420.0	1,448	0	0	1,448	0.00013	0.00013
450.0	1,448	0	0	1,448	0.00013	0.00027
460.0	0	1,631	0	1,631	0.00015	0.00042
480.0	7,086	0	0	7,086	0.00065	0.00107
490.0	4,265	1,631	0	5,896	0.00054	0.00161
500.0	9,385	2,319	0	11,704	0.00107	0.00268
510.0	3,003	3,854	0	6,857	0.00063	0.00331
520.0	14,017	2,739	0	16,756	0.00154	0.00485
530.0	61,662	39,097	0	100,758	0.00925	0.01410
540.0	73,732	41,462	0	115,194	0.01058	0.02468
550.0	149,818	84,403	0	234,221	0.02151	0.04619
560.0	182,755	112,855	0	295,610	0.02715	0.07334
570.0	325,210	129,866	0	455,077	0.04179	0.11514
580.0	303,566	294,710	0	598,276	0.05494	0.17008
590.0	455,181	399,956	0	855,137	0.07853	0.24861
600.0	425,737	291,392	0	717,129	0.06586	0.31447
610.0	504,563	414,862	0	919,425	0.08444	0.39891
620.0	422,621	347,508	0	770,129	0.07073	0.46964
630.0	438,469	300,353	0	738,822	0.06785	0.53749
640.0	355,811	442,281	0	798,092	0.07329	0.61078
650.0	352,041	391,786	0	743,827	0.06831	0.67910
660.0	254,559	387,372	0	641,931	0.05895	0.73805
670.0	288,276	329,429	0	617,705	0.05673	0.79478
680.0	178,722	292,604	0	471,326	0.04329	0.83806
690.0	169,458	228,584	0	398,042	0.03656	0.87462
700.0	124,540	208,110	0	332,650	0.03055	0.90517
710.0	91,669	245,858	0	337,527	0.03100	0.93617
720.0	32,437	143,856	0	176,293	0.01619	0.95236
730.0	33,298	110,030	0	143,328	0.01316	0.96552
740.0	22,731	112,505	0	135,235	0.01242	0.97794
750.0	3,519	78,342	0	81,861	0.00752	0.98546
760.0	0	44,770	0	44,770	0.00411	0.98957
770.0	0	33,888	0	33,888	0.00311	0.99268
780.0	0	19,922	0	19,922	0.00183	0.99451
790.0	2,207	20,261	0	22,468	0.00206	0.99657
800.0	1,308	13,895	0	15,204	0.00140	0.99797
810.0	0	2,155	0	2,155	0.00020	0.99817
820.0	0	8,129	0	8,129	0.00075	0.99891
830.0	0	5,505	0	5,505	0.00051	0.99942
840.0	0	1,136	0	1,136	0.00010	0.99952
860.0	0	3,659	0	3,659	0.00034	0.99986
870.0	0	1,526	0	1,526	0.00014	1.00000
TOTAL	5,294,540	5,594,241	0	10,888,781		

Table D-5.--Pacific Ocean perch. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	0	0	0	0.00	0.	0.00	0.
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	0	0	0	0.00	0.	0.00	0.
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	0	0	0	0.00	0.	0.00	0.
50	11,310.	1,309,140	27	2	2	1	0.14	.162872E-01	0.39	.143568E+00
60	25,704.	2,975,204	60	1	1	0	0.00	.101701E-06	0.00	.123576E-04
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	1	1	0	0.00	.883467E-07	0.00	.107350E-04
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	32	32	29	3.31	.271208E+01	3.90	.371678E+01
82	1,646.	190,552	28	24	24	23	46.21	.277782E+03	72.95	.625269E+03
83	1,281.	148,224	31	8	8	7	0.32	.266876E-01	0.38	.365625E-01
84	965.	111,735	27	4	4	2	0.23	.325214E-01	0.40	.950662E-01
100	45,144.	5,225,365	60	0	0	0	0.00	0.	0.00	0.
200	135,107.	15,638,602	354	3	3	1	0.01	.114140E-03	0.03	.100653E-02
300	180,250.	20,863,967	414	3	3	1	0.01	.641267E-04	0.03	.565494E-03
400	6,162.	713,222	133	68	68	61	13.67	.201980E+02	21.07	.451400E+02
TOTAL	186,412.	21,577,189	547	71	71	62	0.46	.221282E-01	0.72	.498485E-01

Table D-5.--Pacific Ocean perch (Cont). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	0	0.	0.00	0	0
31	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
40	0	0.	0.00	0	0
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
50	548	.245098591E+06	26.00	0	1,566
60	3	.790459580E+01	59.00	0	8
61	0	0.	0.00	0	0
SUBTOTAL	3	.790459580E+01	59.00	0	8
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	2,577	.164355450E+07	46.00	0	5,160
82	26,090	.885630607E+08	27.00	6,779	45,400
83	139	.514833033E+04	30.00	0	286
84	76	.356508073E+04	26.00	0	199
100	0	0.	0.00	0	0
200	551	.245106496E+06	26.00	0	1,569
300	551	.245106496E+06	26.00	0	1,569
400	28,882	.902153286E+08	28.01	9,430	48,334
TOTAL	29,433	.904604351E+08	28.16	9,954	48,911

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	16,945	41,921	27,350,732	64,837,396
90.000 PERCENT	13,254	45,611	21,811,956	70,376,172
95.000 PERCENT	9,954	48,911	16,858,463	75,329,665

Table D-5 .=-Pacific Ocean perch (Cont). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.000	0	0.	1	0.00	0	0
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
40	0.000	0	0.	1	0.00	0	0
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
50	0.358	1,530,074	.216048153E+13	1	26.00	0	4,552,101
60	0.091	30,992	.960486138E+09	1	59.00	0	93,008
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.091	30,992	.960486138E+09		59.00	0	93,008
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	0.848	3,039,183	.225241245E+13	1	46.00	15,513	6,062,853
82	0.633	41,193,247	.199349888E+15	1	27.00	12,220,788	70,165,706
83	0.833	167,079	.705330889E+10	1	30.00	0	338,575
84	0.571	133,489	.104214019E+11	1	26.00	0	343,376
100	0.000	0	0.	1	0.00	0	0
200	0.353	1,561,066	.216144201E+13	1	26.02	0	4,583,765
300	0.353	1,561,066	.216144201E+13	1	26.02	0	4,583,765
400	0.649	44,532,998	.201619775E+15	1	27.62	15,452,857	73,613,140
TOTAL	0.639	46,094,064	.203781217E+15		28.21	16,858,463	75,329,665

Table D-5.--Pacfic ocean perch (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
70.0	23,843	0	0	23,843	0.00052	0.00052
140.0	39,611	0	0	39,611	0.00086	0.00138
160.0	15,767	0	0	15,767	0.00034	0.00172
170.0	15,767	0	0	15,767	0.00034	0.00206
190.0	47,301	31,534	0	78,836	0.00171	0.00377
200.0	134,496	58,088	0	192,583	0.00418	0.00795
210.0	142,282	129,106	0	271,388	0.00589	0.01384
220.0	36,206	361,898	0	398,104	0.00864	0.02247
230.0	47,301	15,767	0	63,068	0.00137	0.02384
240.0	0	92,876	0	92,876	0.00201	0.02586
250.0	23,843	72,827	0	96,671	0.00210	0.02795
260.0	40,028	93,544	0	133,572	0.00290	0.03085
270.0	21,881	76,334	0	98,215	0.00213	0.03298
280.0	76,707	122,133	0	198,841	0.00431	0.03730
290.0	394,796	322,776	0	717,571	0.01557	0.05286
300.0	1,103,611	751,456	0	1,855,066	0.04025	0.09311
310.0	1,803,854	1,099,569	0	2,903,423	0.06299	0.15610
320.0	2,436,546	1,204,694	0	3,641,240	0.07900	0.23509
330.0	3,349,668	1,599,760	0	4,949,428	0.10738	0.34247
340.0	3,986,706	1,949,388	0	5,936,094	0.12878	0.47125
350.0	4,046,823	2,331,444	0	6,378,267	0.13838	0.60963
360.0	2,741,821	2,869,872	0	5,611,693	0.12174	0.73137
370.0	1,812,470	2,499,206	0	4,311,676	0.09354	0.82491
380.0	892,867	1,836,725	0	2,729,592	0.05922	0.88413
390.0	700,498	809,366	0	1,509,865	0.03276	0.91689
400.0	580,723	566,199	0	1,146,922	0.02488	0.94177
410.0	226,548	445,123	0	671,672	0.01457	0.95634
420.0	126,379	445,666	0	572,044	0.01241	0.96875
430.0	35,455	396,719	0	432,175	0.00938	0.97813
440.0	53,761	362,998	0	416,758	0.00904	0.98717
450.0	49,376	322,510	0	371,886	0.00807	0.99524
460.0	11,560	117,494	0	129,055	0.00280	0.99804
470.0	0	43,736	0	43,736	0.00095	0.99899
490.0	0	15,767	0	15,767	0.00034	0.99933
TOTAL	25,018,498	21,044,575	0	46,063,072		

Table D-6. --Shortraker rockfish. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
81	2,270.	262,712	34	6	6	6	0.73	.129693E+00	0.34	.301730E-01
82	1,646.	190,552	23	1	1	1	0.08	.573565E-02	0.02	.409587E-03
83	1,281.	148,224	26	4	4	4	1.32	.105746E+01	0.31	.545366E-01
84	965.	111,735	17	1	1	1	0.22	.473524E-01	0.23	.536382E-01
TOTAL	6,162.	713,222	100	12	12	12	0.60	.648402E-01	0.23	.779493E-02

Table D-6.--Shortraker rockfish (Cont.). Section b, biomass estimate by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
81	566	.785957372E+05	33.00	0	1,137
82	43	.182865444E+04	22.00	0	131
83	579	.203996572E+06	25.00	0	1,509
84	72	.519089319E+04	16.00	0	225
TOTAL	1,260	.289611857E+06	45.25	175	2,344

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	559	1,960	248,081	731,203
90.000 PERCENT	355	2,164	178,333	800,951
95.000 PERCENT	175	2,344	117,205	861,079

Table D-6.--Shortraker rockfish (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
81	2.148	263,433	.182851747E+11	1	33.00	0	538,705
82	3.742	11,427	.130585565E+09	1	22.00	0	35,128
83	4.193	138,101	.105207066E+11	1	25.00	0	349,396
84	0.940	76,681	.587994948E+10	1	16.00	0	239,244
TOTAL	2.573	489,642	.348164164E+11		72.50	117,205	862,079

Table D-6.--Shortraker rockfish (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
110.0	10,770	0	0	10,770	0.02202	0.02202
120.0	5,477	0	0	5,477	0.01121	0.03323
150.0	5,766	0	0	5,766	0.01178	0.04502
200.0	0	5,292	0	5,292	0.01080	0.05582
210.0	5,766	10,337	0	16,103	0.03291	0.08873
230.0	0	4,860	0	4,860	0.00991	0.09863
240.0	5,766	0	0	5,766	0.01178	0.11042
250.0	9,669	5,766	0	15,435	0.03156	0.14198
260.0	5,477	0	0	5,477	0.01121	0.15320
270.0	4,860	0	0	4,860	0.00991	0.16311
280.0	10,152	5,292	0	15,444	0.03151	0.19462
290.0	4,860	0	0	4,860	0.00991	0.20453
300.0	4,860	5,477	0	10,337	0.02112	0.22565
310.0	0	4,860	0	4,860	0.00991	0.23556
320.0	0	16,103	0	16,103	0.03291	0.26847
330.0	0	10,152	0	10,152	0.02071	0.28918
340.0	4,860	4,860	0	9,719	0.01982	0.30899
360.0	9,382	0	0	9,382	0.01918	0.32818
370.0	0	15,278	0	15,278	0.03117	0.35935
380.0	4,192	0	0	4,192	0.00857	0.36792
390.0	0	10,626	0	10,626	0.02169	0.38961
400.0	10,626	0	0	10,626	0.02169	0.41130
410.0	5,477	9,719	0	15,196	0.03103	0.44233
420.0	5,477	9,464	0	14,941	0.03054	0.47287
440.0	3,905	5,559	0	9,464	0.01933	0.49220
450.0	14,242	0	0	14,242	0.02909	0.52129
460.0	5,766	0	0	5,766	0.01178	0.53307
470.0	5,559	0	0	5,559	0.01135	0.54443
480.0	5,559	7,809	0	13,368	0.02730	0.57173
490.0	9,671	0	0	9,671	0.01976	0.59148
500.0	5,477	5,559	0	11,036	0.02257	0.61405
510.0	11,273	4,860	0	16,132	0.03293	0.64698
530.0	3,905	9,382	0	13,287	0.02715	0.67413
540.0	6,181	5,477	0	11,659	0.02386	0.69799
550.0	0	4,192	0	4,192	0.00857	0.70656
560.0	9,464	3,905	0	13,368	0.02730	0.73385
570.0	7,809	3,905	0	11,714	0.02391	0.75777
580.0	0	7,809	0	7,809	0.01594	0.77371
590.0	11,714	0	0	11,714	0.02391	0.79762
600.0	4,192	3,905	0	8,097	0.01654	0.81415
610.0	0	4,192	0	4,192	0.00857	0.82272
620.0	3,905	0	0	3,905	0.00797	0.83069
630.0	0	3,905	0	3,905	0.00797	0.83866

Table D-6.--Shortraker rockfish (Cont.). Section d, population estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
640.0	3,905	0	0	3,905	0.00797	0.84663
650.0	4,860	0	0	4,860	0.00991	0.85654
660.0	3,905	0	0	3,905	0.00797	0.86451
700.0	0	5,714	0	5,714	0.01166	0.87617
730.0	3,905	3,905	0	7,809	0.01594	0.89211
750.0	4,860	0	0	4,860	0.00991	0.90202
760.0	4,852	0	0	4,860	0.00991	0.91193
770.0	0	5,766	0	5,766	0.01178	0.92372
780.0	0	5,559	0	5,559	0.01135	0.93507
790.0	3,905	0	0	3,905	0.00797	0.94304
810.0	8,764	0	0	8,764	0.01788	0.96092
860.0	0	3,905	0	3,905	0.00797	0.96889
870.0	5,766	3,905	0	9,671	0.01976	0.98865
900.0	0	5,559	0	5,559	0.01135	1.00000
TOTAL	266,786	222,856	0	489,642		

Table D-7. --Rougheye rockfish. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
81	2,270.	262,712	34	10	10	9	0.37	.213862E-01	0.46	.576970E-01
82	1,646.	190,552	23	7	7	7	0.61	.128596E+00	0.43	.488573E-01
83	1,281.	148,224	26	4	4	4	0.52	.130966E+00	0.68	.244130E+00
84	965.	111,735	17	1	1	1	0.04	.165009E-02	0.15	.222780E-01
TOTAL	6,162.	713,222	100	22	22	21	0.41	.177777E-01	0.45	.224065E-01

Table D-7.--Rougheye rockfish (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
81	288	.129603060E+05	33.00	56	520
82	345	.409991830E+05	22.00	0	765
83	230	.252647331E+05	25.00	0	557
84	13	.180887188E+03	16.00	0	42
TOTAL	876	.794051093E+05	58.91	312	1,440

	CONFIDENCE LIMITS TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	511	1,241	541,137	1,360,166
90.000 PERCENT	405	1,347	422,916	1,478,387
95.000 PERCENT	312	1,440	319,315	1,581,988

Table D-7.--Rougheye rockfish (Cont.). Section c, population number estimates by stratum

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
81	0.797	361,135	.349650768E+11	1	33.00	0	741,789
82	1.437	240,139	.155768131E+11	1	22.00	0	498,989
83	0.766	299,959	.470954671E+11	1	25.00	0	747,010
84	0.272	49,418	.244217473E+10	1	16.00	0	154,185
TOTAL	0.922	950,652	.100079532E+12		73.02	319,315	1,581,988

Table D-7.--Rougheye rockfish (Cont). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
120.0	4,933	4,192	0	9,125	0.00960	0.00960
130.0	0	4,933	0	4,933	0.00519	0.01478
140.0	4,933	0	0	4,933	0.00519	0.01996
150.0	4,192	0	0	4,192	0.00441	0.02437
160.0	4,933	0	0	4,933	0.00519	0.02956
170.0	26,865	9,866	0	36,731	0.03864	0.06818
180.0	6,033	4,933	0	10,966	0.01154	0.07972
190.0	8,151	13,317	0	21,467	0.02258	0.10230
200.0	4,192	14,058	0	18,250	0.01920	0.12150
210.0	23,182	15,158	0	38,341	0.04033	0.16182
220.0	22,441	13,317	0	35,758	0.03761	0.19943
230.0	23,932	8,384	0	32,316	0.03399	0.23342
240.0	13,326	18,267	0	31,593	0.03323	0.26669
250.0	10,225	0	0	10,225	0.01076	0.27746
260.0	8,151	4,942	0	13,093	0.01377	0.29124
280.0	0	8,847	0	8,847	0.00931	0.30055
290.0	9,805	8,097	0	17,901	0.01883	0.31937
300.0	4,192	0	0	4,192	0.00441	0.32379
310.0	4,872	3,959	0	8,831	0.00929	0.33307
320.0	10,068	0	0	10,068	0.01059	0.34366
330.0	4,933	9,781	0	14,713	0.01548	0.35914
340.0	8,833	9,296	0	18,137	0.01908	0.37820
350.0	4,641	15,971	6,275	26,887	0.02828	0.40651
360.0	8,097	4,942	0	13,038	0.01372	0.42023
370.0	5,345	0	6,275	11,620	0.01222	0.43246
380.0	15,632	15,283	0	30,915	0.03252	0.46498
390.0	24,526	11,768	0	36,294	0.03818	0.50317
400.0	9,063	12,288	0	21,352	0.02246	0.52563
410.0	25,897	22,450	6,275	54,622	0.05746	0.58311
420.0	36,402	27,127	0	63,528	0.06683	0.64992
430.0	19,030	32,100	0	51,130	0.05378	0.70372
440.0	37,477	19,662	0	57,139	0.06011	0.76381
450.0	16,237	21,489	6,275	44,001	0.04628	0.81009
460.0	18,868	26,638	0	45,506	0.04787	0.85792
470.0	17,141	20,872	0	38,013	0.03999	0.89791
480.0	0	10,705	6,275	16,979	0.01786	0.91578
490.0	4,933	16,360	0	21,293	0.02240	0.93816
500.0	5,714	5,264	6,275	17,252	0.01815	0.95632
510.0	5,714	3,905	0	9,618	0.01012	0.96644
520.0	5,714	12,681	0	18,395	0.01935	0.98578
530.0	0	3,905	0	3,905	0.00411	0.98988
570.0	5,714	0	0	5,714	0.00601	0.99589
670.0	0	3,905	0	3,905	0.00411	1.00000
TOTAL	474,336	438,668	37,648	950,652		

Table D-8.--Shortspine thornyhead. Section a, CPUE estimated by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	0	0	0	0.00	0.	0.00	0.
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	0	0	0	0.00	0.	0.00	0.
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	0	0	0	0.00	0.	0.00	0.
50	11,310.	1,309,140	27	0	0	0	0.00	0.	0.00	0.
60	25,704.	2,975,204	60	0	0	0	0.00	0.	0.00	0.
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	0	0	0	0.00	0.	0.00	0.
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	28	28	25	1.08	.684641E-01	3.11	.973960E+00
82	1,646.	190,552	28	6	6	6	0.17	.717281E-02	0.16	.611633E-02
83	1,281.	148,224	31	27	27	26	8.12	.246502E+02	8.42	.180191E+02
84	965.	111,735	27	24	24	24	2.10	.205648E+00	1.32	.619183E-01
100	45,144.	5,225,365	60	0	0	0	0.00	0.	0.00	0.
200	135,107.	15,638,602	354	0	0	0	0.00	0.	0.00	0.
300	180,250.	20,863,967	414	0	0	0	0.00	0.	0.00	0.
400	6,162.	713,222	133	85	85	81	2.46	.107950E+01	3.15	.912349E+00
TOTAL	186,412.	21,577,189	547	85	85	81	0.08	.117946E-02	0.10	.996830E-03

Table D-8.--Shortspine thornyhead (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	0	0.	0.00	0	0
31	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
40	0	0.	0.00	0	0
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
50	0	0.	0.00	0	0
60	0	0.	0.00	0	0
61	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	841	.414901025E+05	46.00	430	1,251
82	97	.228685281E+04	27.00	0	195
83	3,565	.475530129E+07	30.00	0	8,018
84	696	.225436874E+05	26.00	387	1,005
100	0	0.	0.00	0	0
200	0	0.	0.00	0	0
300	0	0.	0.00	0	0
400	5,199	.482162193E+07	30.84	720	9,678
TOTAL	5,199	.482162193E+07	30.84	720	9,678

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	2,324	8,074	4,020,904	9,281,571
90.000 PERCENT	1,476	8,922	3,251,789	10,050,686
95.000 PERCENT	720	9,678	2,571,495	10,730,979

Table D-8.--Shortspine thornyhead (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.000	0	0.	1	0.00	0	0
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.	1	0.00	0	0
40	0.000	0	0.	1	0.00	0	0
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.	1	0.00	0	0
50	0.000	0	0.	1	0.00	0	0
60	0.000	0	0.	1	0.00	0	0
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.	1	0.00	0	0
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.	1	0.00	0	0
81	0.347	2,424,739	.590231618E+12	1	46.00	876,915	3,972,563
82	1.082	89,462	.195002175E+10	1	27.00	0	180,076
83	0.964	3,699,095	.347607935E+13	1	30.00	0	7,506,250
84	1.589	437,941	.678764031E+10	1	26.00	268,554	607,329
100	0.000	0	0.	1	0.00	0	0
200	0.000	0	0.	1	0.00	0	0
300	0.000	0	0.	1	0.00	0	0
400	0.782	6,651,237	.407504863E+13	1	40.47	2,571,495	10,730,979
TOTAL	0.782	6,651,237	.407504863E+13		40.47	2,571,495	10,730,979

Table D-8.--Shortspine thornyhead (Cont.). Section d, population number estimates by sex and centimeter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
100.0	0	0	28,229	28,229	0.00424	0.00424
110.0	0	0	82,143	82,143	0.01235	0.01659
120.0	13,037	0	77,223	90,260	0.01357	0.03016
130.0	6,716	6,943	70,176	83,835	0.01260	0.04277
140.0	37,402	3,782	134,464	175,648	0.02641	0.06918
150.0	13,366	3,281	82,538	99,185	0.01491	0.08409
160.0	33,310	14,589	30,802	78,701	0.01183	0.09592
170.0	29,003	14,127	29,836	72,965	0.01097	0.10689
180.0	18,627	11,554	34,238	64,418	0.00969	0.11658
190.0	58,618	14,589	21,673	94,881	0.01427	0.13084
200.0	53,424	8,550	19,030	81,004	0.01218	0.14302
210.0	92,753	27,031	24,698	144,482	0.02172	0.16474
220.0	100,041	51,218	27,479	178,738	0.02687	0.19162
230.0	74,687	39,508	21,850	136,044	0.02045	0.21207
240.0	63,793	38,695	10,736	113,224	0.01702	0.22909
250.0	52,479	30,330	13,605	96,414	0.01450	0.24359
260.0	45,068	24,647	2,669	72,384	0.01088	0.25447
270.0	68,344	19,072	10,037	97,453	0.01465	0.26912
280.0	75,735	47,286	7,923	130,945	0.01969	0.28881
290.0	86,250	50,930	7,923	145,104	0.02182	0.31063
300.0	72,519	63,240	3,109	138,868	0.02088	0.33151
310.0	104,615	84,441	1,554	190,611	0.02866	0.36016
320.0	101,007	100,584	0	201,591	0.03031	0.39047
330.0	105,661	71,373	1,554	178,588	0.02685	0.41732
340.0	56,608	87,387	0	143,995	0.02165	0.43897
350.0	96,481	84,589	0	181,070	0.02722	0.46620
360.0	126,972	127,098	0	254,069	0.03820	0.50439
370.0	61,710	83,192	0	144,902	0.02179	0.52618
380.0	165,748	95,072	0	260,820	0.03921	0.56539
390.0	146,975	96,943	0	243,918	0.03667	0.60207
400.0	158,913	108,046	0	266,958	0.04014	0.64220
410.0	141,857	192,057	0	333,913	0.05020	0.69241
420.0	193,138	135,347	0	328,485	0.04939	0.74179
430.0	37,723	142,240	0	179,963	0.02706	0.76885
440.0	126,112	106,497	0	232,609	0.03497	0.80382
450.0	82,839	50,181	0	133,020	0.02000	0.82382
460.0	36,924	24,574	0	61,499	0.00925	0.83307
470.0	109,060	48,706	0	157,766	0.02372	0.85679
480.0	139,338	31,759	0	171,096	0.02572	0.88251
490.0	38,010	20,568	0	58,577	0.00881	0.89132
500.0	47,712	64,845	0	112,557	0.01692	0.90824
510.0	50,350	26,842	0	77,192	0.01161	0.91985
520.0	84,530	22,490	0	107,020	0.01609	0.93594
530.0	59,438	21,820	0	81,258	0.01222	0.94815
540.0	2,977	46,187	0	49,164	0.00739	0.95555
550.0	35,188	25,889	0	61,077	0.00918	0.96473
560.0	9,799	48,221	0	58,020	0.00872	0.97345
570.0	35,116	12,486	0	47,602	0.00716	0.98061
580.0	0	34,028	0	34,028	0.00512	0.98573
590.0	6,884	14,324	0	21,208	0.00319	0.98891
600.0	3,772	16,178	0	19,950	0.00300	0.99191

Table D-8.--Shortspine thornyhead (Cont.). Section d, population number estimates by sex and centimeter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
610.0	0	15,982	0	15,982	0.00240	0.99432
620.0	0	9,748	0	9,748	0.00147	0.99578
630.0	0	2,977	0	2,977	0.00045	0.99623
640.0	0	1,243	0	1,243	0.00019	0.99642
650.0	0	5,015	0	5,015	0.00075	0.99717
660.0	0	3,772	0	3,772	0.00057	0.99774
670.0	1,075	1,952	0	3,027	0.00046	0.99819
680.0	0	3,886	0	3,886	0.00058	0.99878
690.0	0	5,023	0	5,023	0.00076	0.99953
800.0	0	3,112	0	3,112	0.00047	1.00000
TOTAL	3,361,705	2,546,043	743,489	6,651,237		

Table D-9.--Yellowfin sole. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	58	58	57	167.37	.561959E+03	742.33	.683023E+04
20	11,962.	1,384,553	31	31	31	31	86.05	.157598E+03	572.18	.123337E+05
30	27,559.	3,189,999	66	64	64	64	99.38	.170085E+03	313.80	.198671E+04
31	2,558.	296,105	9	7	7	7	6.04	.589582E+01	14.81	.462933E+02
SUBTOTAL	30,118.	3,486,104	75	71	71	71	91.45	.142461E+03	288.40	.166388E+04
40	18,281.	2,116,073	44	39	39	39	26.57	.455229E+02	81.99	.479146E+03
41	7,001.	810,309	31	29	29	29	32.17	.675678E+02	99.88	.777542E+03
42	6,154.	712,328	21	20	20	20	4.53	.366252E+01	15.04	.493604E+02
SUBTOTAL	31,436.	3,638,710	96	88	88	88	23.50	.188867E+02	72.87	.202496E+03
50	11,310.	1,309,140	27	0	0	0	0.00	0.	0.00	0.
60	25,704.	2,975,204	60	1	1	1	0.01	.188269E-03	0.06	.390563E-02
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	1	1	1	0.01	.163548E-03	0.06	.339279E-02
71	21,233.	2,457,710	25	25	25	23	23.90	.419113E+02	138.05	.215829E+04
72	12,215.	1,413,893	15	6	6	6	9.70	.640269E+02	31.03	.749495E+03
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	6	6	6	0.08	.778809E-03	0.37	.184252E-01
SUBTOTAL	23,911.	2,767,656	35	12	12	12	4.97	.167099E+02	15.95	.195605E+03
81	2,270.	262,712	47	0	0	0	0.00	0.	0.00	0.
82	1,646.	190,552	28	0	0	0	0.00	0.	0.00	0.
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	37	37	35	13.87	.139594E+02	73.38	.532335E+03
200	135,107.	15,638,602	354	249	249	248	61.60	.252056E+02	256.66	.383193E+03
300	180,250.	20,863,967	414	286	286	283	49.65	.150368E+02	210.75	.248678E+03
400	6,162.	713,222	133	0	0	0	0.00	0.	0.00	0.
TOTAL	186,412.	21,577,189	547	286	286	283	48.01	.140591E+02	203.79	.232510E+03

Table D-9.--Yellowfin sole (Cont.). Section b, biomass estimates by strewn.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	1,303,331	.340767425E+11	57.00	933,552	1,673,110
20	353,022	.265271735E+10	30.00	247,850	458,194
30	939,368	.151974314E+11	65.00	693,018	1,185,718
31	5,299	.453895752E+07	8.00	386	10,212
SUBTOTAL	944,667	.152019703E+11	65.04	698,280	1,191,054
40	166,629	.178983541E+10	43.00	81,261	251,997
41	77,241	.389550089E+09	30.00	36,938	117,544
42	9,552	.163178106E+08	20.00	1,125	17,978
SUBTOTAL	253,421	.219570331E+10	60.59	159,720	347,122
50	0	0.	0.00	0	0
60	121	.146330551E+05	59.00	0	363
61	0	0.	0.00	0	0
SUBTOTAL	121	.146330551E+05	59.00	0	363
71	174,027	.222286986E+10	24.00	76,715	271,339
72	40,634	.112387363E+10	14.00	0	112,543
73	0	0.	0.00	0	0
74	165	.352384413E+04	12.00	35	294
SUBTOTAL	40,798	.112387716E+10	14.00	0	112,708
81	0	0.	0.00	0	0
82	0	0.	0.00	0	0
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	214,825	.334674702E+10	37.83	97,665	331,985
200	2,854,562	.541271481E+11	120.87	2,393,911	3,315,214
300	3,069,387	.574738952E+11	134.63	2,594,710	3,544,065
400	0	0.	0.00	0	0
TOTAL	3,069,387	.574738952E+11	134.63	2,594,710	3,544,065

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	2,760,367	3,378,408	11,773,042,837	14,286,413,203
90.000 PERCENT	2,671,905	3,466,870	11,413,298,799	14,646,157,240
95.000 PERCENT	2,594,710	3,544,065	11,099,378,136	14,960,077,903

Table D-9.--Yelloufin sole (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.225	5,780,577,311	.414179683E+18	1	57.00	4,491,414,208	7,069,740,414
20	0.150	2,347,495,628	.207603684E+18	1	30.00	1,417,087,993	3,277,903,264
30	0.317	2,966,217,642	.177516021E+18	1	65.00	2,124,266,850	3,808,168,434
31	0.408	12,993,916	.356393931E+14	1	8.00	0	26,760,445
SUBTOTAL	0.317	2,979,211,558	.177551660E+18		65.03	2,137,176,253	3,821,246,864
40	0.324	514,115,866	.188386949E+17	1	43.00	237,157,630	791,074,103
41	0.322	239,814,559	.448278269E+16	1	30.00	103,095,336	376,533,781
42	0.301	31,742,448	.219917732E+15	1	20.00	807,854	62,677,043
SUBTOTAL	0.323	785,672,874	.235413953E+17		62.09	478,911,053	1,092,434,694
50	0.000	0	0.	1	0.00	0	0
60	0.220	550,964	.303561051E+12	1	59.00	0	1,653,470
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.220	550,964	.303561051E+12		59.00	0	1,653,470
71	0.173	1,005,405,108	.114470231E+18	1	24.00	307,082,710	1,703,727,506
72	0.313	130,024,855	.131560028E+17	1	14.00	0	376,055,541
73	0.000	0	0.	1	0.00	0	0
74	0.208	789,722	.833678741E+11	1	12.00	160,568	1,418,875
SUBTOTAL	0.312	130,814,577	.131560862E+17		14.00	0	376,846,042
81	0.000	0	0.	1	0.00	0	0
82	0.000	0	0.	1	0.00	0	0
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.189	1,136,219,685	.127626317E+18	1	29.17	405,647,000	1,866,792,370
200	0.240	11,893,508,335	.822876726E+18	1	137.07	10,097,409,233	13,689,607,436
300	0.236	13,029,728,020	.950503043E+18	1	164.32	11,099,378,136	14,960,077,903
400	0.000	0	0.	1	0.00	0	0
TOTAL	0.236	13,029,728,020	.950503043E+18		164.32	11,099,378,136	14,960,077,903

Table D-9.--Yellowfin sole (Cont.) Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
70.0	0	0	843,893	843,893	0.00006	0.00006
80.0	381,613	0	0	381,613	0.00003	0.00009
90.0	1,663,312	1,014,561	0	2,677,873	0.00021	0.00030
100.0	1,831,946	4,398,798	0	6,230,744	0.00048	0.00078
110.0	14,577,508	14,174,166	0	28,751,674	0.00221	0.00298
120.0	31,950,246	25,353,261	0	57,303,507	0.00440	0.00738
130.0	66,266,062	81,615,727	0	147,881,788	0.01135	0.01873
140.0	97,703,936	110,692,681	0	208,396,617	0.01599	0.03473
150.0	168,574,118	169,684,569	0	338,258,686	0.02596	0.06069
160.0	253,490,722	265,849,483	0	519,340,205	0.03986	0.10054
170.0	269,478,598	314,148,535	0	583,627,133	0.04479	0.14534
180.0	318,293,279	354,138,414	479,998	672,911,690	0.05164	0.19698
190.0	334,565,976	387,445,283	479,998	722,491,257	0.05545	0.25243
200.0	279,509,571	298,052,756	959,995	578,522,323	0.04440	0.29683
210.0	246,586,009	280,303,299	1,439,993	528,329,300	0.04055	0.33738
220.0	237,461,778	249,121,219	479,998	487,062,995	0.03738	0.37476
230.0	242,857,426	245,354,969	479,998	488,692,393	0.03751	0.41227
240.0	232,608,170	234,672,861	0	467,281,030	0.03586	0.44813
250.0	209,459,101	227,710,222	0	437,169,322	0.03355	0.48168
260.0	207,309,334	231,804,505	719,997	439,833,836	0.03376	0.51544
270.0	228,201,102	229,528,779	479,998	458,209,878	0.03517	0.55060
280.0	299,028,064	241,789,926	239,999	541,057,989	0.04152	0.59213
290.0	418,177,962	303,087,154	479,998	721,745,115	0.05539	0.64752
300.0	431,841,910	395,001,656	719,997	827,563,563	0.06351	0.71103
310.0	402,667,551	581,670,492	719,997	985,058,039	0.07560	0.78663
320.0	253,437,918	580,353,650	719,997	834,511,564	0.06405	0.85068
330.0	136,749,531	519,704,785	479,998	656,934,314	0.05042	0.90110
340.0	94,165,532	457,771,511	0	551,937,043	0.04236	0.94346
350.0	33,777,574	291,132,285	959,995	325,869,855	0.02501	0.96847
360.0	10,349,570	185,804,889	479,998	196,634,456	0.01509	0.98356
370.0	6,653,307	100,201,720	719,997	107,575,024	0.00826	0.99182
380.0	1,118,780	58,700,887	239,999	60,059,666	0.00461	0.99642
390.0	235,595	25,551,136	479,998	26,266,728	0.00202	0.99844
400.0	293,402	11,169,310	0	11,462,712	0.00088	0.99932
410.0	0	7,553,728	0	7,553,728	0.00058	0.99990
420.0	0	594,000	0	594,000	0.00005	0.99995
430.0	0	604,512	0	604,512	0.00005	0.99999
440.0	0	101,953	0	101,953	0.00001	1.00000
TOTAL	5,531,266,501	7,485,857,682	12,603,837	13,029,728,020		

Table D-10. --Rock sole. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	58	58	57	112.77	.136499E+03	700.18	.644758E+04
20	11,962.	1,384,553	31	30	30	30	27.81	.129059E+02	163.21	.375755E+03
30	27,559.	3,189,999	66	64	64	62	58.75	.580923E+02	303.24	.165684E+04
31	2,558.	296,105	9	8	8	5	39.97	.103011E+03	156.54	.184019E+04
SUBTOTAL	30,118.	3,486,104	75	72	72	67	57.16	.493861E+02	290.78	.140061E+04
40	18,281.	2,116,073	44	43	43	33	8.28	.331962E+01	32.89	.623471E+02
41	7,001.	810,309	31	31	31	29	81.65	.279026E+03	293.09	.290396E+04
42	6,154.	712,328	21	21	21	21	8.43	.142916E+02	33.16	.146268E+03
SUBTOTAL	31,436.	3,638,710	96	95	95	83	24.65	.155077E+02	90.89	.170703E+03
50	11,310.	1,309,140	27	10	10	3	0.94	.956347E-01	1.57	.253464E+00
60	25,704.	2,975,204	60	49	49	38	5.50	.804378E+00	11.91	.291046E+01
61	1,874.	216,948	7	7	7	7	4.53	.156196E+01	13.14	.118120E+02
SUBTOTAL	27,578.	3,192,153	67	56	56	45	5.43	.705972E+00	11.99	.258286E+01
71	21,233.	2,457,710	25	14	14	14	0.82	.621493E-01	19.63	.104040E+03
72	12,215.	1,413,893	15	4	4	2	0.31	.826271E-01	2.77	.709421E+01
73	5,494.	635,915	7	7	7	7	2.02	.402974E+00	5.60	.154227E+01
74	6,202.	717,847	13	5	5	4	0.07	.114345E-02	0.49	.558271E-01
SUBTOTAL	23,911.	2,767,656	35	16	16	13	0.64	.429152E-01	2.83	.193663E+01
81	2,270.	262,712	47	1	1	0	0.00	.974054E-06	0.01	.295893E-04
82	1,646.	190,552	28	4	4	0	0.03	.219431E-03	0.05	.693707E-03
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	30	30	27	0.72	.257881E-01	10.73	.235591E+02
200	135,107.	15,638,602	354	321	321	285	41.08	.727935E+01	220.66	.263962E+03
300	180,250.	20,863,967	414	351	351	312	30.97	.409135E+01	168.08	.149779E+03
400	6,162.	713,222	133	5	5	0	0.01	.157952E-04	0.01	.535314E-04
TOTAL	186,412.	21,577,189	547	356	356	312	29.95	.382534E+01	162.53	.140041E+03

Table D-10. --Rock sole (Cont.). Section b, biomass estimate by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	878,172	.827718486E+10	57.00	695,928	1,060,417
20	114,095	.217234980E+09	30.00	83,998	144,192
30	555,387	.519065088E+10	65.00	411,414	699,359
31	35,072	.793039733E+08	8.00	14,536	55,607
SUBTOTAL	590,458	.526995485E+10	66.87	445,439	735,478
40	51,941	.130518118E+09	43.00	28,888	74,994
41	196,053	.160867433E+10	30.00	114,152	277,954
42	17,799	.636739084E+08	20.00	1,153	34,444
SUBTOTAL	265,793	.180286636E+10	37.42	179,713	351,872
50	3,633	.143916224E+07	26.00	1,166	6,099
60	48,479	.625194979E+08	59.00	32,657	64,301
61	2,914	.645512738E+06	6.00	948	4,880
SUBTOTAL	51,393	.631650106E+08	60.16	35,498	67,288
71	5,941	.329624320E+07	24.00	2,193	9,688
72	1,299	.145036588E+07	14.00	0	3,882
73	3,799	.143086183E+07	6.00	872	6,726
74	143	.517372937E+04	12.00	0	300
SUBTOTAL	5,240	.288640144E+07	16.95	1,656	8,825
81	1	.590288523E+00	46.00	0	2
82	16	.699596370E+02	27.00	0	33
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	11,181	.618264464E+07	40.48	6,156	16,206
200	1,903,544	.156318452E+11	143.25	1,655,991	2,151,096
300	1,914,725	.156380279E+11	143.37	1,667,123	2,162,326
400	16	.705499255E+02	27.46	0	34
TOTAL	1,914,741	.156380279E+11	143.37	1,667,140	2,162,343

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	1,753,550	2,075,933	9,415,097,114	11,367,805,200
90.000 PERCENT	1,707,406	2,122,076	9,134,993,063	11,647,909,250
95.000 PERCENT	1,667,140	2,162,343	8,890,299,249	11,892,603,064

Table D-10. --Rock sole (Cont.). Section C, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.161	5,452,373,675	.390976333E+18	1	57.00	4,199,842,034	6,704,905,317
20	0.170	669,611,088	.632479195E+16	1	30.00	507,213,767	832,008,409
30	0.194	2,866,405,329	.148041163E+18	1	65.00	2,097,524,245	3,635,286,412
31	0.255	137,347,348	.141668839E+16	1	8.00	50,551,996	224,142,701
SUBTOTAL	0.197	3,003,752,677	.149457851E+18		66.20	2,231,330,293	3,776,175,061
40	0.252	206,218,830	.245131646E+16	1	43.00	106,313,520	306,124,139
41	0.279	703,737,088	.167422901E+17	1	30.00	439,518,620	967,955,555
42	0.254	69,998,440	.651674177E+15	1	20.00	16,747,220	123,249,659
SUBTOTAL	0.271	979,954,357	.198452808E+17		41.44	695,397,377	1,264,511,337
50	0.595	6,107,244	.381426042E+13	1	26.00	2,091,849	10,122,639
60	0.462	104,982,019	.226213018E+15	1	59.00	74,885,468	135,078,571
61	0.345	8,450,012	.488153751E+13	1	6.00	3,043,561	13,856,463
SUBTOTAL	0.453	113,432,031	.231094556E+15		61.29	83,033,509	143,830,553
71	0.042	142,958,716	.551800146E+16	1	24.00	0	296,279,348
72	0.112	11,623,410	.124525740E+15	1	14.00	0	35,559,701
73	0.360	10,558,906	.547620421E+13	1	6.00	4,832,610	16,285,202
74	0.137	1,047,748	.252598582E+12	1	12.00	0	2,142,895
SUBTOTAL	0.226	23,230,064	.130254543E+15		15.25	0	47,550,978
81	0.181	4,235	.179314654E+08	1	46.00	0	12,766
82	0.580	27,070	.221169165E+09	1	27.00	0	57,587
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.067	166,188,780	.564825600E+16	1	25.12	11,369,727	321,007,833
200	0.186	10,225,231,072	.566839166E+18	1	106.04	8,731,000,903	11,719,461,240
300	0.184	10,391,419,852	.572487422E+18	1	108.12	8,890,267,945	11,892,571,759
400	0.526	31,305	.239100630E+09	1	31.43	0	62,848
TOTAL	0.184	10,391,451,157	.572487422E+18		108.12	8,890,299,249	11,892,603,064

Table D-10.--Rock sole (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
40.0	0	214,592	0	214,592	0.00002	0.00002
50.0	65,485	214,592	0	280,076	0.00003	0.00005
60.0	438,688	0	1,209,713	1,648,402	0.00016	0.00021
70.0	4,260,603	1,783,388	3,714,937	9,758,928	0.00094	0.00115
80.0	20,913,782	15,811,431	10,548,580	47,273,793	0.00455	0.00569
90.0	30,419,440	19,041,527	27,681,086	77,142,053	0.00742	0.01312
100.0	42,572,068	36,926,250	47,368,718	126,867,036	0.01221	0.02533
110.0	95,558,999	73,884,749	39,235,933	208,679,681	0.02008	0.04541
120.0	156,946,234	133,330,527	25,338,605	315,615,367	0.03037	0.07578
130.0	174,702,880	228,574,004	18,467,808	421,744,692	0.04059	0.11637
140.0	214,102,137	215,667,630	8,572,560	438,342,327	0.04218	0.15855
150.0	238,031,542	227,084,744	1,303,450	466,419,736	0.04488	0.20344
160.0	221,601,209	221,815,290	63,131	443,479,629	0.04268	0.24611
170.0	199,641,254	171,332,445	0	370,973,699	0.03570	0.28181
180.0	208,389,288	190,993,526	0	399,382,814	0.03843	0.32025
190.0	234,843,295	210,148,811	0	444,992,106	0.04282	0.36307
200.0	221,219,363	196,152,432	0	417,371,795	0.04016	0.40323
210.0	253,721,879	222,321,878	0	476,043,757	0.04581	0.44905
220.0	285,364,853	233,468,957	0	518,833,810	0.04993	0.49897
230.0	311,023,047	232,977,635	0	544,000,682	0.05235	0.55132
240.0	273,626,888	219,170,149	0	492,797,036	0.04742	0.59875
250.0	202,437,926	173,272,207	0	375,710,133	0.03616	0.63490
260.0	200,550,250	194,533,360	0	395,083,610	0.03802	0.67292
270.0	192,236,108	177,611,337	0	369,847,445	0.03559	0.70852
280.0	204,808,524	154,083,543	0	358,892,067	0.03454	0.74305
290.0	268,254,723	166,680,074	0	434,934,797	0.04186	0.78491
300.0	257,788,556	157,305,257	0	415,093,814	0.03995	0.82485
310.0	213,526,343	204,993,174	0	418,519,517	0.04028	0.86513
320.0	97,019,748	160,307,686	0	257,327,434	0.02476	0.88989
330.0	50,944,764	170,637,723	0	221,582,488	0.02132	0.91122
340.0	22,827,852	150,931,734	0	173,759,585	0.01672	0.92794
350.0	9,156,942	153,601,203	0	162,758,145	0.01566	0.94360
360.0	4,318,441	137,179,161	0	141,497,602	0.01362	0.95722
370.0	3,021,849	119,618,416	0	122,640,265	0.01180	0.96902
380.0	1,235,625	98,160,455	0	99,396,080	0.00957	0.97858
390.0	329,101	76,263,211	0	76,592,312	0.00737	0.98595
400.0	256,613	57,971,567	0	58,228,179	0.00560	0.99156
410.0	438,663	28,723,020	0	29,161,684	0.00281	0.99436
420.0	360,864	27,130,686	0	27,491,549	0.00265	0.99701
430.0	438,663	16,155,670	0	16,594,334	0.00160	0.99861
440.0	0	7,570,197	0	7,570,197	0.00073	0.99934
450.0	0	4,352,662	0	4,352,662	0.00042	0.99975
460.0	214,592	1,158,450	0	1,373,041	0.00013	0.99989
470.0	0	512,798	0	512,798	0.00005	0.99994
480.0	0	199,760	0	199,760	0.00002	0.99995
490.0	0	65,485	0	65,485	0.00001	0.99996
500.0	233,067	139,791	0	372,858	0.00004	1.00000
TOTAL	4,917,842,146	5,290,073,184	183,504,521	10,391,419,852		

Table D-11.--Flathead sole. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	30	30	23	1.76	.134075E+00	5.34	.189833E+01
20	11,962.	1,384,553	31	11	11	0	0.15	.331196E-02	0.54	.477845E-01
30	27,559.	3,189,999	66	65	65	55	19.07	.773188E+01	59.06	.631176E+02
31	2,558.	296,105	9	9	9	4	24.21	.409769E+03	57.29	.219252E+04
SUBTOTAL	30,118.	3,486,104	75	74	74	59	19.51	.943050E+01	58.91	.686688E+02
40	18,281.	2,116,073	44	43	43	27	3.21	.372646E+00	19.58	.256076E+02
41	7,001.	810,309	31	27	27	15	5.92	.200514E+01	22.00	.302008E+02
42	6,154.	712,328	21	20	20	16	5.94	.495687E+01	57.75	.730686E+03
SUBTOTAL	31,436.	3,638,710	96	90	90	58	4.35	.415429E+00	27.59	.381605E+02
50	11,310.	1,309,140	27	27	27	25	25.41	.899887E+01	173.40	.670712E+03
60	25,704.	2,975,204	60	58	58	55	21.79	.134902E+02	85.85	.136854E+03
61	1,874.	216,948	7	7	7	7	6.44	.235206E+01	43.57	.197648E+03
SUBTOTAL	27,578.	3,192,153	67	65	65	62	20.74	.117297E+02	82.97	.119797E+03
71	21,233.	2,457,710	25	11	11	9	0.65	.564259E-01	5.10	.442069E+01
72	12,215.	1,413,893	15	15	15	15	3.76	.909697E+00	52.64	.118689E+03
73	5,494.	635,915	7	7	7	7	11.55	.566986E+01	120.59	.713829E+03
74	6,202.	717,847	13	13	13	12	3.95	.666881E+00	42.94	.860881E+02
SUBTOTAL	23,911.	2,767,656	35	35	35	34	5.60	.581604E+00	65.74	.744521E+02
81	2,270.	262,712	47	40	40	29	11.36	.270537E+01	22.47	.982525E+01
82	1,646.	190,552	28	23	23	10	3.13	.559527E+00	10.08	.970665E+01
83	1,281.	148,224	31	4	4	3	0.26	.350311E-01	0.38	.738791E-01
84	965.	111,735	27	1	1	1	0.00	.161674E-04	0.00	.196450E-04
100	45,144.	5,225,365	60	46	46	43	3.27	.175644E+00	37.22	.218645E+02
200	135,107.	15,638,602	354	297	297	227	12.03	.104670E+01	51.95	.152237E+02
300	180,250.	20,863,967	414	343	343	270	9.84	.599081E+00	48.26	.992451E+01
400	6,162.	713,222	133	68	68	43	5.08	.408512E+00	11.05	.202912E+01
TOTAL	186,412.	21,577,189	547	411	411	313	9.68	.560577E+00	47.03	.928147E+01

Table D-11.--Flathead sole (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	13,667	.813019464E+07	57.00	7,955	19,379
20	628	.557476705E+05	30.00	146	1,110
30	180,272	.690856966E+09	65.00	127,748	232,797
31	21,243	.315465279E+09	8.00	0	62,201
SUBTOTAL	201,515	.100632225E+10	51.19	137,770	265,260
40	20,140	.146513983E+08	43.00	12,416	27,864
41	14,215	.115602902E+08	30.00	7,273	21,158
42	12,529	.220845909E+08	20.00	2,726	22,332
SUBTOTAL	46,884	.482962795E+08	68.94	33,006	60,763
50	98,571	.135419751E+09	26.00	74,646	122,497
60	192,077	.104851220E+10	59.00	127,281	256,872
61	4,141	.972038669E+06	6.00	1,729	6,554
SUBTOTAL	196,218	.104948424E+10	59.11	131,392	261,043
71	4,726	.299269076E+07	24.00	1,156	8,297
72	15,773	.159680582E+08	14.00	7,202	24,345
73	21,767	.201322530E+08	6.00	10,788	32,746
74	8,405	.301740754E+07	12.00	4,620	12,190
SUBTOTAL	45,946	.391177187E+08	17.69	32,805	59,086
81	8,842	.163948902E+07	46.00	6,263	11,422
82	1,769	.178389820E+06	27.00	903	2,636
83	116	.675788043E+04	30.00	0	283
84	1	.177231404E+01	26.00	0	4
100	50,672	.421104095E+08	20.41	37,135	64,209
200	557,484	.224770846E+10	129.03	463,612	651,355
300	608,156	.228981887E+10	133.61	513,409	702,902
400	10,728	.182463849E+07	55.85	8,021	13,436
TOTAL	618,884	.229164350E+10	133.82	524,100	713,669

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	557,178	680,590	2,755,905,471	3,258,067,470
90.000 PERCENT	539,514	698,254	2,684,030,030	3,329,942,912
95.000 PERCENT	524,100	713,669	2,621,309,949	3,392,662,992

Table D-11 .--Flathead sole (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.329	41,555,947	.115113421E+15	1	57.00	20,063,966	63,047,928
20	0.284	2,213,876	.804319061E+12	1	30.00	382,532	4,045,220
30	0.323	558,266,497	.563966837E+16	1	65.00	408,196,209	708,336,785
31	0.423	50,267,075	.168793326E+16	1	8.00	0	145,007,851
SUBTOTAL	0.331	608,533,572	.732760163E+16		63.51	437,444,884	779,622,259
40	0.164	122,770,465	.100682086E+16	1	43.00	58,743,195	186,797,735
41	0.269	52,833,593	.174117578E+15	1	30.00	25,888,664	79,778,522
42	0.103	121,901,192	.325545945E+16	1	20.00	2,881,054	240,921,330
SUBTOTAL	0.158	297,505,250	.443639789E+16		35.50	162,194,571	432,815,928
50	0.147	672,676,607	.100932302E+17	1	26.00	466,120,425	879,232,790
60	0.254	756,847,216	.106368605E+17	1	59.00	550,468,612	963,225,821
61	0.148	28,009,505	.816823008E+14	1	6.00	5,893,945	50,125,066
SUBTOTAL	0.250	784,856,722	.107185428E+17		59.87	577,795,931	991,917,513
71	0.127	37,168,971	.234462615E+15	1	24.00	5,564,648	68,773,295
72	0.072	220,547,670	.208337285E+16	1	14.00	122,641,334	318,454,006
73	0.096	227,233,121	.253462897E+16	1	6.00	104,038,664	350,427,578
74	0.092	91,346,148	.389518998E+15	1	12.00	48,340,890	134,351,405
SUBTOTAL	0.085	539,126,939	.500752082E+16		18.00	390,452,114	687,801,763
81	0.506	17,491,007	.595422011E+13	1	46.00	12,574,883	22,407,131
82	0.311	5,689,147	.309469685E+13	1	27.00	2,079,320	9,298,975
83	0.692	166,965	.142520848E+11	1	30.00	0	410,743
84	0.907	1,467	.215353588E+07	1	26.00	0	4,485
100	0.088	576,295,910	.524198344E+16	1	19.69	425,266,291	727,325,529
200	0.232	2,407,341,974	.326916902E+17	1	147.67	2,049,344,374	2,765,339,574
300	0.204	2,983,637,884	.379336737E+17	1	166.68	2,598,007,427	3,369,268,340
400	0.459	23,348,587	.906317120E+13	1	72.99	17,340,612	29,356,562
TOTAL	0.206	3,006,986,471	.379427368E+17		166.76	2,621,309,949	3,392,662,992

Table D-11.--Flathead sole (Cont.). Section d, population number estimates by sex and centimeter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
70.0	537,642	0	254,842	792,484	0.00026	0.00026
80.0	958,628	0	182,831	1,141,459	0.00038	0.00064
90.0	2,147,811	189,403	0	2,337,214	0.00078	0.00142
100.0	7,291,982	3,583,196	420,988	11,296,166	0.00376	0.00518
110.0	15,302,955	7,302,009	1,628,627	24,233,591	0.00806	0.01324
120.0	30,843,164	18,113,301	2,376,508	51,332,973	0.01707	0.03031
130.0	31,297,107	25,627,459	8,726,640	65,651,206	0.02183	0.05214
140.0	53,748,315	54,781,470	27,742,743	136,272,528	0.04532	0.09746
150.0	75,510,276	72,327,368	24,992,806	172,830,451	0.05748	0.15494
160.0	78,637,520	83,733,107	13,144,260	175,514,886	0.05837	0.21330
170.0	59,391,007	78,948,622	3,353,756	141,693,384	0.04712	0.26043
180.0	48,548,894	67,260,008	2,495,732	118,304,634	0.03934	0.29977
190.0	48,151,229	83,571,993	1,192,394	132,915,616	0.04420	0.34397
200.0	46,675,475	78,081,819	0	124,757,294	0.04149	0.38546
210.0	42,718,944	79,584,594	397,465	122,701,003	0.04081	0.42627
220.0	35,606,505	58,185,017	0	93,791,521	0.03119	0.45746
230.0	37,063,499	54,764,504	0	91,828,004	0.03054	0.48800
240.0	35,079,767	44,681,874	0	79,761,641	0.02653	0.51452
250.0	41,085,668	47,862,504	0	88,948,173	0.02958	0.54410
260.0	42,730,358	47,115,228	0	89,845,586	0.02988	0.57398
270.0	36,368,897	43,549,798	0	79,918,696	0.02658	0.60056
280.0	36,397,968	43,877,946	0	80,275,914	0.02670	0.62725
290.0	49,527,331	42,912,522	0	92,439,853	0.03074	0.65800
300.0	48,185,551	43,399,810	0	91,585,362	0.03046	0.68845
310.0	65,208,257	41,552,239	0	106,760,497	0.03550	0.72396
320.0	66,121,359	54,265,749	0	120,387,107	0.04004	0.76399
330.0	68,969,517	52,666,842	0	121,636,359	0.04045	0.80444
340.0	67,436,140	52,640,005	0	120,076,145	0.03993	0.84438
350.0	52,406,108	57,256,265	0	109,662,373	0.03647	0.88085
360.0	31,939,684	57,147,217	0	89,086,901	0.02963	0.91047
370.0	20,018,446	50,233,396	0	70,251,843	0.02336	0.93384
380.0	13,196,200	40,251,742	0	53,447,942	0.01777	0.95161
390.0	5,162,276	33,295,394	0	38,457,670	0.01279	0.96440
400.0	3,160,514	27,027,047	0	30,187,561	0.01004	0.97444
410.0	2,341,667	18,324,481	0	20,666,148	0.00687	0.98131
420.0	185,189	20,660,224	0	20,845,413	0.00693	0.98824
430.0	227,016	13,029,946	0	13,256,962	0.00441	0.99265
440.0	86,825	9,143,747	0	9,230,572	0.00307	0.99572
450.0	47,428	4,971,476	0	5,018,905	0.00167	0.99739
460.0	23,429	2,396,643	0	2,420,072	0.00080	0.99820
470.0	8,928	1,040,191	0	1,049,119	0.00035	0.99854
480.0	35,359	681,350	0	716,710	0.00024	0.99878
490.0	17,680	924,798	0	942,477	0.00031	0.99910
500.0	0	27,486	0	27,486	0.00001	0.99911
510.0	0	471,003	0	471,003	0.00016	0.99926
520.0	0	3,691	0	3,691	0.00000	0.99926
TOTAL	1,300,398,517	1,617,464,487	86,909,591	3,004,772,595		

Table D-12.--Alaska plaice. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	50	50	37	22.28	.104928E+03	44.51	.248918E+03
20	11,962.	1,384,553	31	31	31	24	17.15	.196807E+02	37.81	.778217E+02
30	27,559.	3,189,999	66	52	52	37	38.50	.168909E+03	49.26	.197723E+03
31	2,558.	296,105	9	6	6	0	2.68	.516178E+00	2.13	.388486E+00
SUBTOTAL	30,118.	3,486,104	75	58	58	37	35.46	.141438E+03	45.25	.165564E+03
40	18,281.	2,116,073	44	41	41	30	34.91	.488853E+02	49.30	.132027E+03
41	7,001.	810,309	31	25	25	12	18.36	.219045E+02	22.28	.325409E+02
42	6,154.	712,328	21	15	15	13	15.19	.254497E+02	17.40	.420458E+02
SUBTOTAL	31,436.	3,638,710	96	81	81	55	27.36	.185943E+02	37.04	.478760E+02
50	11,310.	1,309,140	27	1	1	0	0.05	.204043E-02	0.03	.929358E-03
60	25,704.	2,975,204	60	14	14	10	3.05	.151257E+01	1.76	.492431E+00
61	1,874.	216,948	7	4	4	2	6.93	.165725E+02	4.23	.641905E+01
SUBTOTAL	27,578.	3,192,153	67	18	18	12	3.32	.139051E+01	1.93	.457421E+00
71	21,233.	2,457,710	25	25	25	25	11.77	.179568E+02	20.10	.217013E+02
72	12,215.	1,413,893	15	4	4	4	8.84	.704239E+02	13.98	.184390E+03
73	5,494.	635,915	7	3	3	2	0.45	.755630E-01	0.37	.499121E-01
74	6,202.	717,847	13	3	3	3	0.13	.703463E-02	0.15	.102924E-01
SUBTOTAL	23,911.	2,767,656	35	10	10	9	4.65	.183838E+02	7.26	.481257E+02
81	2,270.	262,712	47	0	0	0	0.00	0.	0.00	0.
82	1,646.	190,552	28	0	0	0	0.00	0.	0.00	0.
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	35	35	34	8.00	.912978E+01	13.30	.183019E+02
200	135,107.	15,638,602	354	239	239	165	20.22	.112101E+02	29.93	.184771E+02
300	180,250.	20,863,967	414	274	274	199	17.16	.687081E+01	25.76	.115289E+02
400	6,162.	713,222	133	0	0	0	0.00	0.	0.00	0.
TOTAL	186,412.	21,577,189	547	274	274	199	16.59	.642409E+01	24.91	.107793E+02

Table D-12.--Alaska plaice (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	173,502	.636274641E+10	57.00	13,717	333,287
20	70,373	.331269975E+09	30.00	33,207	107,539
30	363,949	.150923224E+11	65.00	118,452	609,446
31	2,356	.397385506E+06	8.00	902	3,809
SUBTOTAL	366,305	.150927198E+11	65.00	120,805	611,805
40	218,910	.192203571E+10	43.00	130,445	307,374
41	44,078	.126286382E+09	30.00	21,131	67,025
42	32,061	.113387298E+09	20.00	9,849	54,274
SUBTOTAL	295,049	.216170939E+10	53.66	201,768	388,330
50	175	.307054280E+05	26.00	0	536
60	26,922	.117563111E+09	59.00	5,225	48,618
61	4,457	.684891258E+07	6.00	0	10,861
SUBTOTAL	31,379	.124412024E+09	63.94	9,086	53,672
71	85,702	.952385623E+09	24.00	22,006	149,399
72	37,036	.123616199E+10	14.00	0	112,452
73	842	.268305575E+06	6.00	0	2,109
74	280	.318292977E+05	12.00	0	669
SUBTOTAL	38,158	.123646212E+10	14.01	0	113,584
81	0	0.	0.00	0	0
82	0	0.	0.00	0	0
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	123,861	.218884775E+10	32.60	28,620	219,101
200	936,783	.240728883E+11	134.60	629,579	1,243,988
300	1,060,644	.262617361E+11	154.90	739,779	1,381,509
400	0	0.	0.00	0	0
TOTAL	1,060,644	.262617361E+11	154.90	739,779	1,381,509

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	851,757	1,269,531	1,322,241,928	1,863,406,746
90.000 PERCENT	791,960	1,329,329	1,244,784,501	1,940,864,173
95.000 PERCENT	739,779	1,381,509	1,177,193,708	2,008,454,966

Table D-12. --Alaska plaice (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.501	346,591,257	.150942022E+17	1	57.00	100,487,324	592,695,189
20	0.454	155,109,270	.130991130E+16	1	30.00	81,203,783	229,014,757
30	0.782	465,589,854	.176668787E+17	1	65.00	199,977,759	731,201,948
31	1.261	1,868,103	.299080004E+12	1	8.00	606,993	3,129,213
SUBTOTAL	0.784	467,457,957	.176671778E+17		65.00	201,843,614	733,072,299
40	0.708	309,132,056	.519095224E+16	1	43.00	163,749,468	454,514,644
41	0.824	53,504,896	.187608632E+15	1	30.00	25,535,561	81,474,231
42	0.873	36,717,894	.187328478E+15	1	20.00	8,167,231	65,268,558
SUBTOTAL	0.739	399,354,847	.556588935E+16		49.21	249,283,384	549,426,310
50	1.482	118,260	.139854659E+11	1	26.00	0	361,403
60	1.735	15,519,541	.382737707E+14	1	59.00	3,139,886	27,899,197
61	1.637	2,722,490	.265280420E+13	1	6.00	0	6,708,024
SUBTOTAL	1.720	18,242,031	.409265749E+14		64.42	5,455,785	31,028,278
71	0.586	146,370,573	.115098442E+16	1	24.00	76,346,976	216,394,169
72	0.632	58,564,992	.323663221E+16	1	14.00	0	180,597,060
73	1.213	694,030	.177225535E+12	1	6.00	0	1,724,172
74	0.873	321,121	.465696426E+11	1	12.00	0	791,349
SUBTOTAL	0.640	59,580,143	.323685600E+16		14.00	0	181,616,430
81	0.000	0	0.	1	0.00	0	0
82	0.000	0	0.	1	0.00	0	0
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.601	205,950,715	.438784042E+16	1	23.96	69,229,754	342,671,677
200	0.675	1,386,873,622	.396781212E+17	1	165.97	992,475,753	1,781,271,490
300	0.666	1,592,824,337	.440659617E+17	1	188.72	1,177,193,708	2,008,454,966
400	0.000	0	0.	1	0.00	0	0
TOTAL	0.666	1,592,824,337	.440659617E+17		188.72	1,177,193,708	2,008,454,966

Table D-12.--Alaska plaice (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
110.0	0	135,402	0	135,402	0.00009	0.00009
120.0	659,374	736,148	0	1,395,522	0.00088	0.00096
130.0	277,532	1,674,093	0	1,951,626	0.00123	0.00219
140.0	814,796	834,305	0	1,649,101	0.00104	0.00322
150.0	648,888	1,096,134	0	1,745,021	0.00110	0.00432
160.0	1,503,944	953,874	0	2,457,818	0.00154	0.00586
170.0	790,326	1,527,821	0	2,318,147	0.00146	0.00732
180.0	1,387,939	1,886,666	0	3,274,605	0.00206	0.00937
190.0	2,235,947	2,646,889	0	4,882,836	0.00307	0.01244
200.0	2,596,962	3,268,565	0	5,865,527	0.00368	0.01612
210.0	3,774,939	5,059,531	0	8,834,470	0.00555	0.02167
220.0	5,863,873	4,711,394	0	10,575,267	0.00664	0.02831
230.0	6,043,357	5,363,025	0	11,406,382	0.00716	0.03547
240.0	11,505,970	8,058,460	0	19,564,430	0.01228	0.04775
250.0	8,738,565	7,820,119	0	16,558,684	0.01040	0.05815
260.0	15,180,193	13,499,451	0	28,679,644	0.01801	0.07615
270.0	18,595,982	13,168,942	0	31,764,924	0.01994	0.09609
280.0	21,179,240	14,595,797	0	35,775,037	0.02246	0.11855
290.0	24,866,498	17,784,439	0	42,650,937	0.02678	0.14533
300.0	27,468,475	20,206,923	0	47,675,398	0.02993	0.17526
310.0	55,501,573	22,481,625	0	77,983,197	0.04896	0.22422
320.0	75,075,996	19,398,740	0	94,474,736	0.05931	0.28353
330.0	101,959,581	24,959,104	0	126,918,685	0.07968	0.36321
340.0	120,019,556	21,525,952	0	141,545,508	0.08886	0.45208
350.0	105,895,441	27,408,984	0	133,304,425	0.08369	0.53577
360.0	70,340,542	26,556,941	0	96,897,482	0.06083	0.59660
370.0	45,365,056	31,545,912	0	76,910,968	0.04829	0.64489
380.0	34,131,482	36,116,714	0	70,248,196	0.04410	0.68899
390.0	7,661,576	39,869,501	0	47,531,076	0.02984	0.71883
400.0	6,273,877	45,447,108	0	51,720,985	0.03247	0.75130
410.0	1,443,088	58,245,326	0	59,688,415	0.03747	0.78878
420.0	227,052	52,056,510	0	52,283,562	0.03282	0.82160
430.0	240,339	52,940,352	0	53,180,691	0.03339	0.85499
440.0	335,131	53,300,035	0	53,635,166	0.03367	0.88866
450.0	0	55,288,687	0	55,288,687	0.03471	0.92337
460.0	0	39,031,913	0	39,031,913	0.02450	0.94788
470.0	0	31,815,922	0	31,815,922	0.01997	0.96785
480.0	0	18,410,630	0	18,410,630	0.01156	0.97941
490.0	0	10,236,406	0	10,236,406	0.00643	0.98584
500.0	0	4,830,928	0	4,830,928	0.00303	0.98887
510.0	0	5,001,717	0	5,001,717	0.00314	0.99201
520.0	0	7,777,911	0	7,777,911	0.00488	0.99689
530.0	0	164,980	0	164,980	0.00010	0.99700
540.0	0	1,440,214	0	1,440,214	0.00090	0.99790
550.0	0	786,809	0	786,809	0.00049	0.99840
560.0	0	252,489	0	252,489	0.00016	0.99855
570.0	0	63,011	0	63,011	0.00004	0.99859
580.0	0	252,489	0	252,489	0.00016	0.99875
TOTAL	778,603,088	812,234,885	0	1,590,837,974		

Table D-13.--Greenland turbot. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	0	0	0	0.00	0.	0.00	0.
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
Subtotal	30,118.	3,486,104	75	0	0	0	0.00	0.	0.00	0.
40	18,281.	2,116,073	44	6	6	4	0.01	.104991E-03	0.11	.527238E-02
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	8	8	8	0.06	.541153E-03	0.37	.199774E-01
Subtotal	31,436.	3,638,710	96	14	14	12	0.02	.562463E-04	0.13	.254869E-02
50	11,310.	1,309,140	27	2	2	1	0.07	.306600E-02	0.02	.120488E-03
60	25,704.	2,975,204	60	24	24	23	1.15	.114657E+00	1.68	.294672E+00
61	1,874.	216,948	7	5	5	4	1.40	.733363E+00	2.41	.770093E+00
Subtotal	27,578.	3,192,153	67	29	29	27	1.17	.102989E+00	1.73	.259537E+00
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	5	5	3	0.04	.591905E-03	0.62	.144368E+00
73	5,494.	635,915	7	7	7	7	1.55	.182710E+00	9.20	.786241E+01
74	6,202.	717,847	13	11	11	11	0.08	.204830E-02	1.06	.927264E-01
Subtotal	23,911.	2,767,656	35	23	23	21	0.40	.993806E-02	2.71	.458994E+00
81	2,270.	262,712	47	45	45	45	20.57	.125045E+02	6.02	.170117E+01
82	1,646.	190,552	28	23	23	22	22.92	.833328E+02	5.26	.415446E+01
83	1,281.	148,224	31	31	31	30	25.84	.132320E+02	4.96	.552432E+00
84	965.	111,735	27	19	19	18	7.35	.373284E+01	1.81	.254376E+00
100	45,144.	5,225,365	60	23	23	21	0.21	.278800E-02	1.43	.128765E+00
200	135,107.	15,638,602	354	45	45	40	0.25	.431558E-02	0.38	.109524E-01
300	180,250.	20,863,967	414	68	68	61	0.24	.259948E-02	0.65	.142301E-01
400	6,162.	713,222	133	118	118	115	20.22	.830799E+01	4.94	.557460E+00
TOTAL	186,412.	21,577,189	547	186	186	176	0.90	.115078E-01	0.79	.139140E-01

Table D-13.--Greenland turbot (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	0	0.	0.00	0	0
31	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
40	90	.412796083E+04	43.00	0	220
41	0	0.	0.00	0	0
42	119	.241102666E+04	20.00	16	221
SUBTOTAL	209	.653898749E+04	62.25	47	371
50	286	.461387756E+05	26.00	0	727
60	10,170	.891162141E+07	59.00	4,197	16,144
61	900	.303077621E+06	6.00	0	2,248
SUBTOTAL	11,071	.921469903E+07	62.37	5,001	17,140
71	0	0.	0.00	0	0
72	153	.103898005E+05	14.00	0	372
73	2,929	.648759345E+06	6.00	958	4,900
74	177	.926783615E+04	12.00	0	387
SUBTOTAL	3,259	.668416981E+06	6.37	1,259	5,260
81	16,015	.757786246E+07	46.00	10,469	21,561
82	12,942	.265683582E+08	27.00	2,365	23,519
83	11,348	.255259344E+07	30.00	8,085	14,610
84	2,432	.409203348E+06	26.00	1,117	3,748
100	3,259	.668416981E+06	6.37	1,259	5,260
200	11,565	.926737679E+07	63.08	5,480	17,651
300	14,825	.993579377E+07	68.96	8,530	21,119
400	42,737	.371080174E+08	49.86	30,490	54,985
TOTAL	57,562	.470438112E+08	76.19	43,881	71,243

Table D-13. --Greenland turbot (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.000	0	0.	1	0.00	0	0
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.	1	0.00	0	0
40	0.136	664,134	.207295270E+12	1	43.00	0	1,582,855
41	0.000	0	0.	1	0.00	0	0
42	0.153	776,784	.890064185E+11	1	20.00	154,448	1,399,120
SUBTOTAL	0.145	1,440,918	.296301689E+12	1	62.92	352,790	2,529,045
50	4.688	60,934	.181316488E+10	1	26.00	0	148,481
60	0.688	14,783,282	.229031286E+14	1	59.00	5,206,814	24,359,750
61	0.581	1,549,020	.318256992E+12	1	6.00	168,563	2,929,477
SUBTOTAL	0.678	16,332,302	.232213856E+14	1	60.54	6,696,194	25,968,410
71	0.000	0	0.	1	0.00	0	0
72	0.059	2,610,419	.253412216E+13	1	14.00	0	6,025,028
73	0.169	17,344,007	.279174648E+14	1	6.00	4,414,798	30,273,216
74	0.078	2,260,744	.419554993E+12	1	12.00	849,339	3,672,149
SUBTOTAL	0.147	22,215,169	.308711420E+14	1	7.31	9,074,803	35,355,536
81	3.417	4,686,766	.103093155E+13	1	46.00	2,641,144	6,732,387
82	4.361	2,967,727	.132453423E+13	1	27.00	606,113	5,329,341
83	5.209	2,178,282	.106570310E+12	1	30.00	1,511,668	2,844,895
84	4.061	598,876	.278853806E+11	1	26.00	255,547	942,206
100	0.147	22,215,169	.308711420E+14	1	7.31	9,074,803	35,355,536
200	0.648	17,834,153	.235195004E+14	1	62.09	8,138,005	27,530,302
300	0.370	40,049,323	.543906424E+14	1	21.24	24,709,320	55,389,325
400	4.097	10,431,651	.248992148E+13	1	70.06	7,281,013	13,582,288
TOTAL	1.140	50,480,973	.568805639E+14		23.21	34,876,740	66,085,207

Table D-13.--Greenland turbot (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
100.0	35,171	0	126,136	161,308	0.00320	0.00320
110.0	152,463	0	417,400	569,863	0.01129	0.01448
120.0	1,674,141	533,975	578,024	2,786,141	0.05519	0.06968
130.0	786,680	1,089,446	287,708	2,163,834	0.04286	0.11254
140.0	1,489,005	361,044	84,304	1,934,352	0.03832	0.15086
150.0	182,267	351,925	0	534,192	0.01058	0.16144
160.0	124,138	64,889	0	189,027	0.00374	0.16519
170.0	491,890	123,336	0	615,226	0.01219	0.17737
180.0	160,801	126,347	0	287,148	0.00569	0.18306
190.0	57,461	151,243	0	208,704	0.00413	0.18720
200.0	120,325	264,218	0	384,543	0.00762	0.19481
210.0	671,112	63,174	0	734,285	0.01455	0.20936
220.0	542,941	335,077	0	878,018	0.01739	0.22675
230.0	592,243	400,316	0	992,558	0.01966	0.24641
240.0	199,123	733,568	0	932,691	0.01848	0.26489
250.0	1,274,586	866,381	0	2,140,967	0.04241	0.30730
260.0	1,014,234	721,302	0	1,735,536	0.03438	0.34168
270.0	489,438	426,172	0	915,610	0.01814	0.35982
280.0	1,314,483	1,724,886	0	3,039,369	0.06021	0.42003
290.0	1,523,659	1,634,755	0	3,158,414	0.06257	0.48259
300.0	808,720	712,144	0	1,520,864	0.03013	0.51272
310.0	854,061	606,409	0	1,460,470	0.02893	0.54165
320.0	1,010,013	1,231,782	0	2,241,794	0.04441	0.58606
330.0	1,249,635	526,573	0	1,776,208	0.03519	0.62125
340.0	708,575	450,744	0	1,159,318	0.02297	0.64421
350.0	860,326	420,205	0	1,280,531	0.02537	0.66958
360.0	258,020	23,180	0	281,200	0.00557	0.67515
370.0	353,930	0	0	353,930	0.00701	0.68216
380.0	58,234	102,740	0	160,974	0.00319	0.68535
390.0	95,654	142,853	0	238,507	0.00472	0.69007
400.0	0	131,933	0	131,933	0.00261	0.69269
410.0	41,454	58,234	0	99,688	0.00197	0.69466
420.0	69,808	427,744	0	497,552	0.00986	0.70452
430.0	65,608	438,908	0	504,516	0.00999	0.71451
440.0	178,885	294,279	0	473,164	0.00937	0.72389
450.0	380,572	55,919	0	436,492	0.00865	0.73253
460.0	32,317	270,717	0	303,034	0.00600	0.73853
470.0	7,166	324,081	0	331,247	0.00656	0.74510
480.0	72,566	739,645	0	812,212	0.01609	0.76119
490.0	0	74,748	0	74,748	0.00148	0.76267
500.0	41,737	0	0	41,737	0.00083	0.76349
510.0	17,558	0	0	17,558	0.00035	0.76384
520.0	72,479	0	0	72,479	0.00144	0.76528
530.0	7,888	0	0	7,888	0.00016	0.76543
540.0	103,444	0	0	103,444	0.00205	0.76748
550.0	36,404	7,166	0	43,570	0.00086	0.76835
560.0	100,261	4,021	0	104,282	0.00207	0.77041
570.0	215,375	189,011	0	404,386	0.00801	0.77842
580.0	187,253	181,845	0	369,098	0.00731	0.78573

Table D-13.--Greenland turbot (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
590.0	285,928	0	0	285,928	0.00566	0.79140
600.0	365,228	65,171	0	430,399	0.00853	0.79992
610.0	557,271	4,021	0	561,293	0.01112	0.81104
620.0	461,359	103,423	0	564,781	0.01119	0.82223
630.0	506,131	32,317	0	538,448	0.01067	0.83290
640.0	748,193	44,670	0	792,863	0.01571	0.84860
650.0	655,938	19,931	0	675,868	0.01339	0.86199
660.0	491,582	60,686	0	552,268	0.01094	0.87293
670.0	403,623	30,658	0	434,281	0.00860	0.88153
680.0	336,738	39,741	0	376,479	0.00746	0.88899
690.0	291,749	69,724	0	361,473	0.00716	0.89615
700.0	169,813	31,672	0	201,485	0.00399	0.90014
710.0	106,252	40,079	0	146,332	0.00290	0.90304
720.0	28,325	73,420	0	101,745	0.00202	0.90506
730.0	147,585	43,560	0	191,145	0.00379	0.90885
740.0	24,191	46,244	0	70,434	0.00140	0.91024
750.0	12,987	127,910	0	140,897	0.00279	0.91303
760.0	9,199	142,501	0	151,700	0.00301	0.91604
770.0	15,499	285,829	0	301,328	0.00597	0.92201
780.0	16,819	241,627	0	258,446	0.00512	0.92713
790.0	5,382	201,363	0	206,745	0.00410	0.93122
800.0	4,952	237,083	0	242,035	0.00479	0.93602
810.0	0	305,395	0	305,395	0.00605	0.94207
820.0	0	328,163	0	328,163	0.00650	0.94857
830.0	323,960	265,481	0	589,441	0.01168	0.96024
840.0	0	284,133	0	284,133	0.00563	0.96587
850.0	6,699	174,311	0	181,010	0.00359	0.96946
860.0	6,059	290,499	0	296,558	0.00587	0.97533
870.0	1,516	228,594	0	230,110	0.00456	0.97989
880.0	0	222,934	0	222,934	0.00442	0.98431
890.0	0	174,819	0	174,819	0.00346	0.98777
900.0	0	109,161	0	109,161	0.00216	0.98993
910.0	0	123,429	0	123,429	0.00245	0.99238
920.0	0	88,052	0	88,052	0.00174	0.99412
930.0	0	68,070	0	68,070	0.00135	0.99547
940.0	0	83,305	0	83,305	0.00165	0.99712
950.0	0	35,479	0	35,479	0.00070	0.99782
960.0	0	25,238	0	25,238	0.00050	0.99832
970.0	0	30,701	0	30,701	0.00061	0.99893
980.0	0	19,124	0	19,124	0.00038	0.99931
990.0	0	21,146	0	21,146	0.00042	0.99973
1010.0	0	13,722	0	13,722	0.00027	1.00000
TOTAL	26,767,080	22,220,322	1,493,572	50,480,973		

Table D-14.--Arrowtooth flounder. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	6	6	3	0.13	.101778E-01	0.96	.586952E+00
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	40	40	30	6.36	.472232E+01	18.17	.269251E+02
31	2,558.	296,105	9	9	9	7	19.85	.125829E+03	67.98	.900785E+03
SUBTOTAL	30,118.	3,486,104	75	49	49	37	7.51	.486198E+01	22.40	.290442E+02
40	18,281.	2,116,073	44	5	5	1	0.14	.151813E-01	0.51	.205869E+00
41	7,001.	810,309	31	26	26	13	5.20	.183529E+01	31.35	.187552E+03
42	6,154.	712,328	21	1	1	1	0.03	.677723E-03	0.03	.980033E-03
SUBTOTAL	31,436.	3,638,710	96	32	32	15	1.25	.961750E-01	7.28	.937062E+01
50	11,310.	1,309,140	27	27	27	26	23.72	.576611E+01	59.75	.469351E+02
60	25,704.	2,975,204	60	57	57	47	13.64	.676149E+01	25.67	.297182E+02
61	1,874.	216,948	7	5	5	3	3.20	.173815E+01	4.20	.512110E+01
SUBTOTAL	27,578.	3,192,153	67	62	62	50	12.93	.588169E+01	24.21	.258397E+02
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	1	1	0	0.07	.491249E-02	0.06	.382026E-02
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	1	1	0	0.02	.259344E-03	0.01	.201682E-03
81	2,270.	262,712	47	47	47	32	21.72	.999308E+01	12.22	.278825E+01
82	1,646.	190,552	28	26	26	12	21.54	.163201E+02	13.95	.685882E+01
83	1,281.	148,224	31	24	24	14	2.76	.384969E+00	1.52	.107110E+00
84	965.	111,735	27	14	14	12	0.84	.511323E-01	0.52	.231955E-01
100	45,144.	5,225,365	60	1	1	0	0.01	.727556E-04	0.01	.565793E-04
200	135,107.	15,638,602	354	176	176	131	6.61	.532563E+00	16.79	.337265E+01
300	180,250.	20,863,967	414	177	177	131	4.96	.299212E+00	12.59	.189485E+01
400	6,162.	713,222	133	111	111	70	14.46	.253866E+01	8.63	.873083E+00
TOTAL	186,412.	21,577,189	547	288	288	201	5.27	.282532E+00	12.46	.177261E+01

Table D-14.--Arrowtooth flounder (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	1,018	.617171467E+06	57.00	0	2,591
20	0	0.	0.00	0	0
30	60,137	.421947891E+09	65.00	19,089	101,186
31	17,418	.968711130E+08	8.00	0	40,114
SUBTOTAL	77,555	.518819004E+09	68.81	32,069	123,042
40	892	.596888421E+06	43.00	0	2,451
41	12,495	.105810536E+08	30.00	5,852	19,137
42	55	.301949066E+04	20.00	0	170
SUBTOTAL	13,442	.111809615E+08	33.42	6,635	20,249
50	91,999	.867714746E+08	26.00	72,847	111,150
60	120,289	.525530491E+09	59.00	74,416	166,162
61	2,059	.718327395E+06	6.00	0	4,133
SUBTOTAL	122,348	.526248818E+09	59.16	76,443	168,252
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	132	.174430211E+05	6.00	0	455
74	0	0.	0.00	0	0
SUBTOTAL	132	.174430211E+05	6.00	0	455
81	16,908	.605592969E+07	46.00	11,950	21,866
82	12,162	.520322303E+07	27.00	7,482	16,843
83	1,210	.742648186E+05	30.00	654	1,767
84	279	.560524982E+04	26.00	125	433
100	132	.174430211E+05	6.00	0	455
200	306,361	.114363743E+10	147.18	239,403	373,320
300	306,493	.114365487E+10	147.18	239,534	373,452
400	30,560	.113390228E+08	71.42	23,838	37,283
TOTAL	337,053	.115499390E+10	150.09	269,763	404,343

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	293,247	380,860	686,810,888	906,263,555
90.000 PERCENT	280,706	393,400	655,400,287	937,674,156
95.000 PERCENT	269,763	404,343	627,990,751	965,083,691

Table D-14 .--Arrowtooth flounder (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.136	7,456,772	.355923108E+14	1	57.00	0	19,407,423
20	0.000	0	0.	1	0.00	0	0
30	0.350	171,791,413	.240580733E+16	1	65.00	73,775,101	269,807,724
31	0.292	59,645,219	.693479165E+15	1	8.00	0	120,371,406
SUBTOTAL	0.335	231,436,632	.309928650E+16		64.40	120,168,388	342,704,875
40	0.280	3,183,206	.809422074E+13	1	43.00	0	8,924,058
41	0.166	75,267,853	.108129594E+16	1	30.00	8,120,635	142,415,071
42	0.832	66,079	.436638722E+10	1	20.00	0	203,919
SUBTOTAL	0.171	78,517,137	.108939452E+16		30.45	11,118,932	145,915,343
50	0.397	231,792,695	.706304911E+15	1	26.00	177,151,621	286,433,768
60	0.532	226,284,793	.230982030E+16	1	59.00	130,113,150	322,456,436
61	0.762	2,701,921	.211639928E+13	1	6.00	0	6,261,780
SUBTOTAL	0.534	228,986,714	.231193670E+16		59.11	132,771,021	325,202,406
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	1.134	116,468	.135647913E+11	1	6.00	0	401,465
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	1.134	116,468	.135647913E+11		6.00	0	401,465
81	1.777	9,514,617	.168971526E+13	1	46.00	6,895,728	12,133,506
82	1.544	7,876,929	.218674613E+13	1	27.00	4,842,503	10,911,355
83	1.811	668,059	.206626251E+11	1	30.00	374,532	961,587
84	1.632	171,198	.254275120E+10	1	26.00	67,523	274,874
100	1.134	116,468	.135647913E+11	1	6.00	0	401,465
200	0.394	778,189,950	.724251494E+16	1	176.15	609,688,995	946,690,904
300	0.394	778,306,418	.724252851E+16	1	176.16	609,805,305	946,807,530
400	1.676	18,230,804	.389966677E+13	1	63.58	14,283,922	22,177,685
TOTAL	0.423	796,537,221	.724642817E+16		176.35	627,990,751	965,083,691

Table D-14. --Arrowtooth flounder (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
90.0	0	52,608	0	52,608	0.00007	0.00007
100.0	301,664	115,761	0	417,425	0.00052	0.00059
110.0	637,967	139,958	0	777,925	0.00098	0.00157
120.0	372,209	271,703	0	643,913	0.00081	0.00238
130.0	771,916	391,595	288,632	1,452,143	0.00182	0.00420
140.0	1,336,018	741,284	0	2,077,302	0.00261	0.00681
150.0	813,164	1,653,028	0	2,466,193	0.00310	0.00990
160.0	5,682,813	2,846,964	0	8,529,777	0.01071	0.02061
170.0	9,548,088	8,209,106	340,629	18,097,823	0.02272	0.04333
180.0	13,066,673	21,176,464	0	34,243,137	0.04299	0.08632
190.0	14,357,039	31,580,851	0	45,937,889	0.05767	0.14399
200.0	10,938,887	26,693,991	0	37,632,878	0.04725	0.19124
210.0	5,398,428	14,049,455	0	19,447,884	0.02442	0.21565
220.0	3,070,076	8,421,550	0	11,491,626	0.01443	0.23008
230.0	4,164,476	5,934,952	0	10,099,428	0.01268	0.24276
240.0	3,498,343	3,749,863	0	7,248,206	0.00910	0.25186
250.0	4,794,626	3,609,093	0	8,403,719	0.01055	0.26241
260.0	6,371,460	5,600,018	0	11,971,478	0.01503	0.27744
270.0	9,281,241	8,672,340	0	17,953,581	0.02254	0.29998
280.0	4,980,384	12,480,807	0	17,461,191	0.02192	0.32190
290.0	7,880,539	12,521,572	0	20,402,111	0.02561	0.34751
300.0	9,406,691	12,016,285	0	21,422,976	0.02690	0.37441
310.0	12,503,816	14,890,835	0	27,394,650	0.03439	0.40880
320.0	12,584,044	15,531,261	0	28,115,305	0.03530	0.44410
330.0	16,058,481	20,433,571	0	36,492,052	0.04581	0.48991
340.0	19,358,641	26,543,737	0	45,902,378	0.05763	0.54754
350.0	16,750,431	30,875,344	0	47,625,775	0.05979	0.60733
360.0	13,236,611	33,548,054	0	46,784,665	0.05874	0.66607
370.0	7,989,546	29,933,723	0	37,923,268	0.04761	0.71368
380.0	7,742,837	17,665,560	0	25,408,397	0.03190	0.74557
390.0	6,079,154	13,102,982	0	19,182,136	0.02408	0.76966
400.0	7,911,502	14,679,342	0	22,590,844	0.02836	0.79802
410.0	4,038,273	11,773,990	0	15,812,263	0.01985	0.81787
420.0	4,804,056	10,329,267	0	15,133,323	0.01900	0.83687
430.0	4,247,843	13,687,401	0	17,935,244	0.02252	0.85938
440.0	3,725,220	11,589,456	0	15,314,676	0.01923	0.87861
450.0	3,767,472	7,678,667	0	11,446,139	0.01437	0.89298
460.0	3,027,565	5,395,935	0	8,423,500	0.01058	0.90356
470.0	1,623,080	9,128,001	0	10,751,080	0.01350	0.91705
480.0	1,035,957	5,255,409	0	6,291,366	0.00790	0.92495
490.0	1,187,176	6,438,784	0	7,625,961	0.00957	0.93453
500.0	1,591,558	7,881,154	0	9,472,712	0.01189	0.94642
510.0	824,433	8,386,799	0	9,211,232	0.01156	0.95798
520.0	508,170	5,932,151	0	6,440,321	0.00809	0.96607
530.0	701,491	5,315,685	0	6,017,176	0.00755	0.97362
540.0	425,158	4,179,747	0	4,604,905	0.00578	0.97940
550.0	80,570	1,977,118	0	2,057,688	0.00258	0.98199

Table D-14.--Arrowtooth flounder (Cont.). Section d, population number estimates by sex and centimerter Length inverval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
560.0	134,874	2,044,435	0	2,179,309	0.00274	0.98472
570.0	30,292	2,161,733	0	2,192,026	0.00275	0.98747
580.0	24,852	2,028,851	0	2,053,702	0.00258	0.99005
590.0	20,795	1,516,952	0	1,537,748	0.00193	0.99198
600.0	63,271	935,313	0	998,584	0.00125	0.99324
610.0	188,613	1,156,080	0	1,344,693	0.00169	0.99492
620.0	57,572	618,213	0	675,784	0.00085	0.99577
630.0	43,079	1,054,854	0	1,097,933	0.00138	0.99715
640.0	18,035	533,889	0	551,924	0.00069	0.99784
650.0	76,275	457,407	0	533,682	0.00067	0.99851
660.0	4,976	344,319	0	349,295	0.00044	0.99895
670.0	10,164	218,258	0	228,421	0.00029	0.99924
680.0	11,777	75,235	0	87,012	0.00011	0.99935
690.0	12,938	110,544	0	123,482	0.00016	0.99950
700.0	5,329	27,829	0	33,157	0.00004	0.99955
710.0	0	69,038	0	69,038	0.00009	0.99963
720.0	5,329	19,346	0	24,675	0.00003	0.99966
730.0	0	25,799	0	25,799	0.00003	0.99970
740.0	0	64,310	0	64,310	0.00008	0.99978
750.0	0	9,629	0	9,629	0.00001	0.99979
760.0	0	3,908	0	3,908	0.00000	0.99979
770.0	0	1,954	0	1,954	0.00000	0.99980
780.0	0	6,518	0	6,518	0.00001	0.99980
790.0	0	4,512	0	4,512	0.00001	0.99981
800.0	0	9,415	0	9,415	0.00001	0.99982
810.0	0	8,608	0	8,608	0.00001	0.99983
830.0	0	6,526	0	6,526	0.00001	0.99984
860.0	0	1,954	0	1,954	0.00000	0.99984
870.0	0	1,954	0	1,954	0.00000	0.99985
880.0	0	1,954	0	1,954	0.00000	0.99985
930.0	0	4,979	0	4,979	0.00001	0.99985
TOTAL	269,183,956	526,607,536	629,261	796,420,753		

Table D-15.--Pacific halibut. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	47	47	47	3.98	.353044E+00	1.51	.597456E-01
20	11,962.	1,384,553	31	24	24	24	2.66	.469182E+00	1.42	.119023E+00
30	27,559.	3,189,999	66	35	35	35	2.31	.278572E+00	0.57	.134120E-01
31	2,558.	296,105	9	3	3	3	3.34	.739478E+01	0.23	.166108E-01
SUBTOTAL	30,118.	3,486,104	75	38	38	38	2.40	.286609E+00	0.54	.113502E-01
40	18,281.	2,116,073	44	8	8	8	0.30	.240927E-01	0.07	.661681E-03
41	7,001.	810,309	31	18	18	18	4.47	.181601E+01	1.72	.444572E+00
42	6,154.	712,328	21	5	5	5	1.19	.617041E+00	0.11	.200093E-02
SUBTOTAL	31,436.	3,638,710	96	31	31	31	1.40	.121854E+00	0.45	.223474E-01
50	11,310.	1,309,140	27	22	22	22	7.30	.293612E+01	1.16	.840271E-01
60	25,704.	2,975,204	60	29	29	28	3.10	.472760E+00	0.47	.100577E-01
61	1,874.	216,948	7	4	4	4	1.07	.429233E+00	0.21	.648188E-02
SUBTOTAL	27,578.	3,192,153	67	33	33	32	2.97	.412666E+00	0.45	.876701E-02
71	21,233.	2,457,710	25	8	8	8	0.37	.214411E-01	0.19	.566718E-02
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	1	1	1	0.14	.196864E-01	0.06	.386971E-02
74	6,202.	717,847	13	1	1	1	0.02	.342381E-03	0.02	.343823E-03
SUBTOTAL	23,911.	2,767,656	35	2	2	2	0.04	.106233E-02	0.02	.227423E-03
81	2,270.	262,712	47	18	18	18	1.18	.107513E+00	0.10	.542528E-03
82	1,646.	190,552	28	5	5	5	0.63	.989953E-01	0.07	.179403E-02
83	1,281.	148,224	31	2	2	2	0.11	.598930E-02	0.01	.666429E-04
84	965.	111,735	27	1	1	1	0.05	.278359E-02	0.00	.155465E-04
100	45,144.	5,225,365	60	10	10	10	0.19	.504126E-02	0.10	.131750E-02
200	135,107.	15,638,602	354	195	195	194	2.98	.722551E-01	0.79	.534801E-02
300	180,250.	20,863,967	414	205	205	204	2.28	.409111E-01	0.62	.308729E-02
400	6,162.	713,222	133	26	26	26	0.63	.219805E-01	0.06	.204926E-03
TOTAL	186,412.	21,577,189	547	231	231	230	2.23	.382752E-01	0.60	.288679E-02

Table D-15.--Pacific halibut (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	30,973	.214083335E+08	57.00	21,705	40,242
20	10,915	.789737016E+07	30.00	5,177	16,654
30	21,830	.248909095E+08	65.00	11,860	31,800
31	2,931	.569295135E+07	8.00	0	8,433
SUBTOTAL	24,761	.305838609E+08	68.86	13,718	35,805
40	1,902	.947256740E+06	43.00	0	3,866
41	10,730	.104699100E+08	30.00	4,123	17,337
42	2,505	.274913210E+07	20.00	0	5,964
SUBTOTAL	15,137	.141662989E+08	49.52	7,570	22,704
50	28,306	.441843579E+08	26.00	14,639	41,972
60	27,371	.367447993E+08	59.00	15,241	39,500
61	690	.177389469E+06	6.00	0	1,721
SUBTOTAL	28,061	.369221887E+08	59.56	15,908	40,213
71	2,712	.113718120E+07	24.00	511	4,913
72	0	0.	0.00	0	0
73	264	.699015893E+05	6.00	0	911
74	39	.154915504E+04	12.00	0	125
SUBTOTAL	304	.714507443E+05	6.27	0	958
81	915	.651544203E+05	46.00	401	1,430
82	357	.315619025E+05	27.00	0	722
83	48	.115540278E+04	30.00	0	117
84	17	.305143702E+03	26.00	0	53
100	3,016	.120863195E+07	26.71	760	5,272
200	138,153	.155162410E+09	191.48	113,490	162,816
300	141,169	.156371042E+09	194.39	116,410	165,928
400	1,338	.981768693E+05	74.59	713	1,963
TOTAL	142,507	.156469219E+09	194.64	117,740	167,274

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	126,383	158,631	34,095,021	42,951,078
90.000 PERCENT	121,768	163,246	32,827,452	44,218,647
95.000 PERCENT	117,740	167,274	31,721,350	45,324,749

Table D-15. --Pacific halibut (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	2.632	11,768,277	.362292454E+13	1	57.00	7,955,485	15,581,069
20	1.868	5,844,231	.200342714E+13	1	30.00	2,953,934	8,734,528
30	4.035	5,410,467	.119838673E+13	1	65.00	3,222,874	7,598,059
31	14.824	197,749	.127880068E+11	1	8.00	0	458,521
SUBTOTAL	4.415	5,608,216	.121117474E+13		66.33	3,409,350	7,807,083
40	4.114	462,268	.260154588E+11	1	43.00	136,803	787,733
41	2.595	4,134,243	.256309917E+13	1	30.00	865,066	7,403,420
42	10.952	228,726	.891485528E+10	1	20.00	31,769	425,683
SUBTOTAL	3.137	4,825,237	.259802948E+13		30.82	1,537,244	8,113,230
50	6.279	4,507,879	.126448459E+13	1	26.00	2,195,922	6,819,837
60	6.593	4,151,730	.781726898E+12	1	59.00	2,382,495	5,920,965
61	5.197	132,773	.267877156E+10	1	6.00	6,124	259,422
SUBTOTAL	6.549	4,284,503	.784405670E+12		59.40	2,512,240	6,056,767
71	1.936	1,400,763	.300573280E+12	1	24.00	269,184	2,532,342
72	0.000	0	0.	1	0.00	0	0
73	2.256	117,219	.137403854E+11	1	6.00	0	404,055
74	0.998	39,442	.155568244E+10	1	12.00	0	125,387
SUBTOTAL	1.939	156,662	.152960679E+11		7.39	0	449,158
81	11.529	79,408	.328778510E+09	1	46.00	42,877	115,939
82	8.578	41,629	.571973861E+09	1	27.00	0	90,704
83	9.705	4,939	.128561533E+08	1	30.00	0	12,261
84	13.381	1,305	.170424412E+07	1	26.00	0	3,990
100	1.936	1,557,425	.315869348E+12	1	26.28	401,906	2,712,943
200	3.750	36,838,344	.114844462E+14	1	194.81	30,128,535	43,548,152
300	3.677	38,395,768	.118003155E+14	1	204.53	31,594,333	45,197,203
400	10.512	127,281	.915312769E+09	1	57.89	66,709	187,853
TOTAL	3.699	38,523,049	.118012308E+14		204.56	31,721,350	45,324,749

Table D-15. --Pacific halibut (Cont.). Section d, population number estimates by sex and centimeter Length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
70.0	0	0	19,362	19,362	0.00050	0.00050
120.0	0	0	48,284	48,284	0.00125	0.00175
130.0	0	0	43,990	43,990	0.00114	0.00288
140.0	0	0	80,274	80,274	0.00207	0.00495
150.0	0	0	134,907	134,907	0.00348	0.00843
160.0	0	0	220,690	220,690	0.00569	0.01413
170.0	0	0	97,826	97,826	0.00252	0.01665
180.0	0	0	297,022	297,022	0.00766	0.02432
190.0	0	0	209,442	209,442	0.00540	0.02972
200.0	0	0	497,864	497,864	0.01285	0.04257
210.0	0	0	380,738	380,738	0.00982	0.05239
220.0	0	0	370,643	370,643	0.00956	0.06196
230.0	0	0	465,082	465,082	0.01200	0.07396
240.0	0	0	212,153	212,153	0.00547	0.07944
250.0	0	0	536,760	536,760	0.01385	0.09329
260.0	0	0	506,561	506,561	0.01307	0.10636
270.0	0	0	203,774	203,774	0.00526	0.11162
280.0	0	0	45,956	45,956	0.00119	0.11280
300.0	0	0	220,254	220,254	0.00568	0.11849
310.0	0	0	221,239	221,239	0.00571	0.12420
320.0	0	0	327,240	327,240	0.00844	0.13264
330.0	0	0	438,211	438,211	0.01131	0.14395
340.0	0	0	379,969	379,969	0.00981	0.15375
350.0	0	0	278,563	278,563	0.00719	0.16094
360.0	0	0	246,941	246,941	0.00637	0.16731
370.0	0	0	75,931	75,931	0.00196	0.16927
380.0	0	0	256,975	256,975	0.00663	0.17590
390.0	0	0	283,589	283,589	0.00732	0.18322
400.0	0	0	277,972	277,972	0.00717	0.19040
410.0	0	0	507,701	507,701	0.01310	0.20350
420.0	0	0	583,952	583,952	0.01507	0.21857
430.0	0	0	842,245	842,245	0.02173	0.24030
440.0	0	0	760,014	760,014	0.01961	0.25991
450.0	0	0	1,071,233	1,071,233	0.02764	0.28756
460.0	0	0	1,653,440	1,653,440	0.04267	0.33022
470.0	0	0	1,279,130	1,279,130	0.03301	0.36323
480.0	0	0	517,425	517,425	0.01335	0.37658
490.0	0	0	938,015	938,015	0.02421	0.40079
500.0	0	0	714,724	714,724	0.01844	0.41923
510.0	0	0	609,955	609,955	0.01574	0.43497
520.0	0	0	157,676	157,676	0.00407	0.43904
530.0	0	0	715,826	715,826	0.01847	0.45751
540.0	0	0	670,615	670,615	0.01731	0.47482
550.0	0	0	267,951	267,951	0.00691	0.48173
560.0	0	0	361,227	361,227	0.00932	0.49105
570.0	0	0	522,090	522,090	0.01347	0.50453
580.0	0	0	339,548	339,548	0.00876	0.51329

Table D-15.--Pacific halibut (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
590.0	0	0	457,624	457,624	0.01181	0.52510
600.0	0	0	607,030	607,030	0.01566	0.54076
610.0	0	0	366,153	366,153	0.00945	0.55021
620.0	0	0	357,629	357,629	0.00923	0.55944
630.0	0	0	645,195	645,195	0.01665	0.57609
640.0	0	0	757,844	757,844	0.01956	0.59565
650.0	0	0	707,385	707,385	0.01825	0.61390
660.0	0	0	385,860	385,860	0.00996	0.62386
670.0	0	0	541,703	541,703	0.01398	0.63784
680.0	0	0	592,875	592,875	0.01530	0.65313
690.0	0	0	1,126,907	1,126,907	0.02908	0.68221
700.0	0	0	854,672	854,672	0.02205	0.70427
710.0	0	0	925,364	925,364	0.02435	0.72862
720.0	0	0	406,162	406,162	0.01095	0.73957
730.0	0	0	602,852	602,852	0.01556	0.75513
740.0	0	0	276,853	276,853	0.00753	0.76266
750.0	0	0	620,967	620,967	0.01647	0.77913
760.0	0	0	514,079	514,079	0.01365	0.79278
770.0	0	0	480,045	480,045	0.01239	0.80517
780.0	0	0	447,900	447,900	0.01203	0.81720
790.0	0	0	409,880	409,880	0.01099	0.82819
800.0	0	0	197,981	212,987	0.00550	0.83369
810.0	0	0	559,031	559,031	0.01443	0.84812
820.0	0	0	339,136	339,136	0.00964	0.85776
830.0	0	0	418,152	418,152	0.01079	0.86855
840.0	0	0	109,353	109,353	0.00282	0.87137
850.0	0	0	295,578	295,578	0.00763	0.87900
860.0	0	0	265,287	265,287	0.00685	0.88584
870.0	0	0	125,953	125,953	0.00325	0.88910
880.0	0	0	194,889	194,889	0.00503	0.89412
890.0	0	0	376,486	376,486	0.00972	0.90384
900.0	0	0	212,894	212,894	0.00582	0.90966
910.0	0	0	352,635	352,635	0.00951	0.91918
920.0	0	0	176,354	176,354	0.00455	0.92373
930.0	0	0	109,655	109,655	0.00283	0.92656
940.0	0	0	211,482	211,482	0.00546	0.93201
950.0	0	0	100,875	100,875	0.00260	0.93462
960.0	0	0	132,077	132,077	0.00341	0.93803
970.0	0	0	153,829	153,829	0.00397	0.94200
980.0	0	0	180,337	180,337	0.00513	0.94712
990.0	0	0	209,253	209,253	0.00540	0.95252
1000.0	0	0	153,946	153,946	0.00397	0.95649
1010.0	0	0	39,390	39,390	0.00102	0.95751
1020.0	0	0	157,376	157,376	0.00406	0.96157
1030.0	0	0	134,897	134,897	0.00348	0.96505
1040.0	0	0	75,873	75,873	0.00196	0.96701
1050.0	0	0	115,147	115,147	0.00297	0.96998

Table D-15.--Pacific halibut (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
1060.0	0	0	34,524	34,524	0.00089	0.97087
1070.0	0	0	35,280	35,280	0.00091	0.97178
1080.0	0	0	1,210	1,210	0.00003	0.97181
1090.0	0	0	21,783	21,783	0.00056	0.97238
1100.0	0	0	40,455	40,455	0.00104	0.973[illegible]
1110.0	0	0	77,437	77,437	0.00200	0.975[illegible]
1120.0	0	0	52,991	52,991	0.00137	0.97679
1130.0	0	0	50,988	50,988	0.00132	0.97810
1140.0	0	0	61,645	61,645	0.00159	0.97969
1150.0	0	0	56,789	56,789	0.00183	0.98152
1180.0	0	0	40,546	40,546	0.00105	0.98257
1200.0	0	0	157,332	157,332	0.00406	0.98663
1210.0	0	0	1,751	1,751	0.00005	0.98667
1220.0	0	0	46,466	46,466	0.00120	0.98787
1230.0	0	0	36,896	36,896	0.00095	0.98882
1250.0	0	0	21,783	21,783	0.00056	0.98939
1280.0	0	0	1,519	1,519	0.00004	0.98942
1300.0	0	0	1,588	1,588	0.00004	0.98947
1330.0	0	0	45,227	45,227	0.00117	0.99063
1420.0	0	0	39,633	39,633	0.00102	0.99166
1430.0	0	0	48,841	48,841	0.00126	0.99292
1440.0	0	0	50,344	50,344	0.00130	0.99421
1450.0	0	0	40,278	40,278	0.00104	0.99525
1460.0	0	0	56,874	56,874	0.00147	0.99672
1500.0	0	0	35,677	35,677	0.00092	0.99764
1550.0	0	0	51,418	51,418	0.00133	0.99897
1560.0	0	0	38,423	38,423	0.00099	0.99996
1630.0	0	0	1,519	1,519	0.00004	1.00000
TOTAL	0	0	38,523,049	38,523,049		

Table D-16.--Longhead dab. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	38	38	1	2.15	.197353E+00	19.47	.208313E+02
20	11,962.	1,384,553	31	25	25	0	1.23	.208098E+00	22.03	.799004E+02
30	27,559.	3,189,999	66	6	6	0	0.18	.138672E-01	0.57	.131933E+00
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	6	6	0	0.16	.116115E-01	0.53	.110473E+00
40	18,281.	2,116,073	44	1	1	0	0.00	.694630E-07	0.01	.337617E-04
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	1	1	0	0.00	.234920E-07	0.00	.114180E-04
50	11,310.	1,309,140	27	0	0	0	0.00	0.	0.00	0.
60	25,704.	2,975,204	60	0	0	0	0.00	0.	0.00	0.
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	0	0	0	0.00	0.	0.00	0.
71	21,233.	2,457,710	25	10	10	7	0.14	.404275E-02	2.80	.203221E+01
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	0	0	0	0.00	0.	0.00	0.
82	1,646.	190,552	28	0	0	0	0.00	0.	0.00	0.
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	10	10	7	0.07	.894345E-03	1.32	.449568E+00
200	135,107.	15,638,602	354	70	70	1	0.51	.778103E-02	5.34	.122001E+01
300	180,250.	20,863,967	414	80	80	8	0.40	.442769E-02	4.33	.713634E+00
400	6,162.	713,222	133	0	0	0	0.00	0.	0.00	0.
TOTAL	186,412.	21,577,189	547	80	80	8	0.38	.413981E-02	4.19	.667237E+00

Table D-16.--Longhead dab (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	16,762	.119673596E+08	57.00	9,833	23,692
20	5,042	.350275434E+07	30.00	1,220	8,864
30	1,655	.123905890E+07	65.00	0	3,879
31	0	0.	0.00	0	0
SUBTOTAL	1,655	.123905890E+07	65.00	0	3,879
40	2	.273109295E+01	43.00	0	5
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	2	.273109295E+01	43.00	0	5
50	0	0.	0.00	0	0
60	0	0.	0.00	0	0
61	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
71	1,028	.214417626E+06	24.00	73	1,984
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	0	0.	0.00	0	0
82	0	0.	0.00	0	0
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	1,028	.214417626E+06	24.00	73	1,984
200	23,460	.167091756E+08	94.80	15,333	31,588
300	24,489	.169235932E+08	97.18	16,312	32,666
400	0	0.	0.00	0	0
TOTAL	24,489	.169235932E+08	97.18	16,312	32,666

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	19,175	29,803	200,340,256	335,420,379
90.000 PERCENT	17,648	31,330	180,880,445	354,880,190
95.000 PERCENT	16,312	32,666	163,843,971	371,916,664

Table D-16.--Longhead dab (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.111	151,642,869	.126319525E+16	1	57.00	80,447,997	222,837,741
20	0.056	90,364,694	.134489988E+16	1	30.00	15,478,680	165,250,708
30	0.305	5,423,911	.117884708E+14	1	65.00	0	12,285,057
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.305	5,423,911	.117884708E+14		65.00	0	12,285,057
40	0.045	36,434	.132741862E+10	1	43.00	0	109,952
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.045	36,434	.132741862E+10		43.00	0	109,952
50	0.000	0	0.	1	0.00	0	0
60	0.000	0	0.	1	0.00	0	0
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
71	0.050	20,412,411	.107783118E+15	1	24.00	0	41,840,580
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	0.000	0	0.	1	0.00	0	0
82	0.000	0	0.	1	0.00	0	0
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.050	20,412,411	.107783118E+15	1	24.00	0	41,840,580
200	0.095	247,467,907	.261988493E+16	1	77.74	145,405,393	349,530,421
300	0.091	267,880,318	.272766805E+16	1	83.81	163,843,971	371,916,664
400	0.000	0	0.	1	0.00	0	0
TOTAL	0.091	267,880,318	.272766805E+16		83.81	163,843,971	371,916,664

Table D-16.--Longhead dab (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
110.0	213,127	0	0	213,127	0.00080	0.00080
120.0	653,828	0	0	653,828	0.00244	0.00324
130.0	1,526,104	389,428	0	1,915,531	0.00715	0.01039
140.0	2,050,152	142,085	0	2,192,236	0.00818	0.01857
150.0	2,944,892	514,012	0	3,458,903	0.01291	0.03148
160.0	1,641,866	1,045,524	0	2,687,389	0.01003	0.04151
170.0	9,674,896	1,204,324	0	10,879,221	0.04061	0.08213
180.0	645,470	2,003,631	0	2,649,100	0.00989	0.09202
190.0	16,920,250	1,947,162	0	18,867,411	0.07043	0.16245
200.0	16,920,250	656,096	0	17,576,346	0.06561	0.22806
210.0	8,617,433	522,370	0	9,139,802	0.03412	0.26218
220.0	16,849,208	292,527	0	17,141,735	0.06399	0.32617
230.0	8,424,604	8,566,688	0	16,991,292	0.06343	0.38960
240.0	8,424,604	8,646,089	0	17,070,692	0.06373	0.45332
250.0	0	71,042	0	71,042	0.00027	0.45359
260.0	0	8,424,604	0	8,424,604	0.03145	0.48504
270.0	0	8,424,604	0	8,424,604	0.03145	0.51649
280.0	0	8,424,604	0	8,424,604	0.03145	0.54794
290.0	8,424,604	0	0	8,424,604	0.03145	0.57939
300.0	0	8,424,604	0	8,424,604	0.03145	0.61084
310.0	0	8,424,604	0	8,424,604	0.03145	0.64228
TOTAL	103,931,285	68,123,995	0	172,055,279		

Table D-17.--Starry flounder. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	23	23	0	0.71	.280815E-01	0.57	.167572E-01
20	11,962.	1,384,553	31	5	5	0	0.17	.792627E-02	0.17	.627209E-02
30	27,559.	3,189,999	66	4	4	0	0.33	.647242E-01	0.18	.154358E-01
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	4	4	0	0.30	.541960E-01	0.17	.129250E-01
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	0	0	0	0.00	0.	0.00	0.
50	11,310.	1,309,140	27	1	1	0	0.02	.585582E-03	0.02	.232339E-03
60	25,704.	2,975,204	60	0	0	0	0.00	0.	0.00	0.
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	0	0	0	0.00	0.	0.00	0.
71	21,233.	2,457,710	25	8	8	5	0.38	.239031E-01	0.42	.265385E-01
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	0	0	0	0.00	0.	0.00	0.
82	1,646.	190,552	28	0	0	0	0.00	0.	0.00	0.
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	8	8	5	0.18	.528789E-02	0.20	.587090E-02
200	135,107.	15,638,602	354	33	33	0	0.20	.355230E-02	0.15	.116625E-02
300	180,250.	20,863,967	414	41	41	5	0.20	.232746E-02	0.16	.102348E-02
400	6,162.	713,222	133	0	0	0	0.00	0.	0.00	0.
TOTAL	186,412.	21,577,189	547	41	41	5	0.19	.217613E-02	0.16	.956937E-03

Table D-17.--Starry flounder (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	5,540	.170283978E+07	57.00	2,926	8,154
20	679	.133416660E+06	30.00	0	1,425
30	3,148	.578321644E+07	65.00	0	7,953
31	0	0.	0.00	0	0
SUBTOTAL	3,148	.578321644E+07	65.00	0	7,953
40	0	0.	0.00	0	0
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
50	94	.881214451E+04	26.00	0	287
60	0	0.	0.00	0	0
61	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
71	2,735	.126776106E+07	24.00	411	5,059
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	0	0.	0.00	0	0
82	0	0.	0.00	0	0
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	2,735	.126776106E+07	24.00	411	5,059
200	9,461	.762828502E+07	102.81	3,976	14,945
300	12,196	.889604608E+07	125.03	6,290	18,101
400	0	0.	0.00	0	0
TOTAL	12,196	.889604608E+07	125.03	6,290	18,101

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	8,351	16,040	7,365,574	12,465,905
90.000 PERCENT	7,250	17,141	6,635,146	13,196,332
95.000 PERCENT	6,290	18,101	5,997,580	13,833,898

Table D-17: Starry flounder (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	1.259	4,399,871	.101614317E+13	1	57.00	2,380,617	6,419,125
20	1.001	678,433	.105573111E+12	1	30.00	14,946	1,341,920
30	1.827	1,722,595	.137921634E+13	1	65.00	0	4,069,438
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	1.827	1,722,595	.137921634E+13		65.00	0	4,069,438
40	0.000	0	0.	1	0.00	0	0
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
50	1.588	59,130	.349636648E+10	1	26.00	0	180,702
60	0.000	0	0.	1	0.00	0	0
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
71	0.895	3,055,710	.140753752E+13	1	24.00	606,987	5,504,433
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	0.000	0	0.	1	0.00	0	0
82	0.000	0	0.	1	0.00	0	0
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.895	3,055,710	.140753752E+13	1	24.00	606,987	5,504,433
200	1.379	6,860,029	.250442899E+13	1	131.35	3,726,613	9,993,445
300	1.230	9,915,739	.391196651E+13	1	117.45	5,997,580	13,833,898
400	0.000	0	0.	1	0.00	0	0
TOTAL	1.230	9,915,739	.391196651E+13		117.45	5,997,580	13,833,898

Table D-17.--Starry flounder (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
290.0	150,768	0	0	150,768	0.01520	0.01520
330.0	134,898	0	0	134,898	0.01360	0.02881
340.0	295,029	0	0	295,029	0.02975	0.05856
350.0	301,537	348,716	0	650,252	0.06558	0.12414
380.0	147,514	150,768	0	298,283	0.03008	0.15422
390.0	298,283	0	0	298,283	0.03008	0.18430
410.0	0	443,929	0	443,929	0.04477	0.22907
420.0	0	348,716	0	348,716	0.03517	0.26424
440.0	0	293,161	0	293,161	0.02957	0.29381
560.0	0	142,392	0	142,392	0.01436	0.30817
TOTAL	1,328,028	1,727,682	0	3,055,710		

Table D-18.--Rex sole. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	3	3	1	0.02	.382684E-03	0.05	.136331E-02
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	11	11	0	0.25	.151566E-01	0.55	.578850E-01
31	2,558.	296,105	9	3	3	0	0.16	.187017E-01	0.25	.200616E-01
SUBTOTAL	30,118.	3,486,104	75	14	14	0	0.24	.128261E-01	0.53	.486140E-01
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	1	1	0	0.01	.997992E-04	0.04	.142549E-02
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	1	1	0	0.00	.494919E-05	0.01	.706923E-04
50	11,310.	1,309,140	27	25	25	6	2.23	.122389E+00	8.19	.281044E+01
60	25,704.	2,975,204	60	18	18	0	0.45	.216979E-01	1.20	.155015E+00
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	18	18	0	0.42	.188488E-01	1.12	.134661E+00
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	42	42	4	1.92	.136472E+00	4.49	.590150E+00
82	1,646.	190,552	28	21	21	0	0.27	.560065E-02	1.06	.599560E-01
83	1,281.	148,224	31	8	8	0	0.29	.326754E-01	0.99	.362681E+00
84	965.	111,735	27	7	7	0	0.04	.346235E-03	0.23	.117269E-01
100	45,144.	5,225,365	60	0	0	0	0.00	0.	0.00	0.
200	135,107.	15,638,602	354	61	61	7	0.33	.229143E-02	1.04	.277635E-01
300	180,250.	20,863,967	414	61	61	7	0.25	.128739E-02	0.78	.155982E-01
400	6,162.	713,222	133	78	78	4	0.85	.203358E-01	2.18	.100302E+00
TOTAL	186,412.	21,577,189	547	139	139	11	0.27	.122590E-02	0.83	.146937E-01

Table D-18. --Rex sole (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	168	.232056376E+05	57.00	0	473
20	0	0.	0.00	0	0
30	2,366	.135426718E+07	65.00	40	4,692
31	143	.143976788E+05	8.00	0	420
SUBTOTAL	2,509	.136866486E+07	66.33	171	4,846
40	0	0.	0.00	0	0
41	24	.575374752E+03	30.00	0	73
42	0	0.	0.00	0	0
SUBTOTAL	24	.575374752E+03	30.00	0	73
50	8,634	.184177659E+07	26.00	5,844	11,424
60	3,984	.168644752E+07	59.00	1,386	6,583
61	0	0.	0.00	0	0
SUBTOTAL	3,984	.168644752E+07	59.00	1,386	6,583
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	1,494	.827037218E+05	46.00	914	2,073
82	153	.178561309E+04	27.00	67	240
83	128	.630344516E+04	30.00	0	290
84	14	.379551001E+02	26.00	1	27
100	0	0.	0.00	0	0
200	15,320	.492066998E+07	117.01	10,925	19,714
300	15,320	.492066998E+07	117.01	10,925	19,714
400	1,789	.908307351E+05	54.95	1,185	2,394
TOTAL	17,109	.501150071E+07	121.29	12,677	21,542

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	14,223	19,995	42,798,393	62,941,551
90.000 PERCENT	13,397	20,821	39,868,761	65,871,183
95.000 PERCENT	12,677	21,542	37,287,894	68,452,050

Table D-18.--Rex sole (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.428	392,665	.826699008E+11	1	57.00	0	968,619
20	0.000	0	0.	1	0.00	0	0
30	0.453	5,227,739	.517212662E+13	1	65.00	683,067	9,772,410
31	0.661	216,013	.154446431E+11	1	8.00	0	502,595
SUBTOTAL	0.461	5,443,752	.518757126E+13		65.38	892,300	9,995,204
40	0.000	0	0.	1	0.00	0	0
41	0.265	90,656	.821842580E+10	1	30.00	0	275,774
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.265	90,656	.821842580E+10		30.00	0	275,774
50	0.272	31,757,889	.422930398E+14	1	26.00	18,387,083	45,128,694
60	0.376	10,583,457	.120484142E+14	1	59.00	3,637,647	17,529,266
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.376	10,583,457	.120484142E+14		59.00	3,637,647	17,529,266
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	0.427	3,496,467	.357638325E+12	1	46.00	2,291,619	4,701,316
82	0.258	595,835	.191152990E+11	1	27.00	312,129	879,540
83	0.295	434,489	.699652455E+11	1	30.00	0	974,618
84	0.187	74,763	.128553045E+10	1	26.00	1,046	148,479
100	0.000	0	0.	1	0.00	0	0
200	0.317	48,268,418	.596199135E+14	1	49.60	32,744,557	63,792,279
300	0.317	48,268,418	.596199135E+14	1	49.60	32,744,557	63,792,279
400	0.389	4,601,554	.448004400E+12	1	67.87	3,264,676	5,938,431
TOTAL	0.324	52,869,972	.600679179E+14		50.34	37,287,894	68,452,050

Table D-18. --Rex Sole (Cont.). Section d, population number estimates by sex and centimter interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
170.0	0	112,019	0	112,019	0.00212	0.00212
180.0	56,009	0	0	56,009	0.00106	0.00318
190.0	0	56,009	0	56,009	0.00106	0.00424
200.0	71,392	0	0	71,392	0.00135	0.00559
210.0	123,630	130,775	0	254,406	0.00481	0.01040
220.0	71,392	147,996	0	219,388	0.00415	0.01455
230.0	377,268	147,996	0	525,264	0.00994	0.02448
240.0	798,823	156,579	0	955,403	0.01807	0.04256
250.0	1,021,585	793,862	0	1,815,447	0.03434	0.07689
260.0	2,561,208	857,016	0	3,418,224	0.06465	0.14155
270.0	1,503,608	844,843	0	2,348,451	0.04442	0.18597
280.0	923,405	280,047	0	1,203,452	0.02276	0.20873
290.0	591,022	387,416	0	978,438	0.01851	0.22723
300.0	532,408	345,624	0	878,032	0.01661	0.24384
310.0	1,331,454	1,327,628	0	2,659,081	0.05029	0.29414
320.0	2,410,961	2,705,417	0	5,116,377	0.09677	0.39091
330.0	1,565,545	1,023,422	0	2,588,967	0.04897	0.43988
340.0	1,140,254	877,264	0	2,017,518	0.03816	0.47804
350.0	688,665	711,280	0	1,399,945	0.02648	0.50452
360.0	650,405	464,787	0	1,115,193	0.02109	0.52561
370.0	536,352	504,909	0	1,041,261	0.01969	0.54531
380.0	348,799	197,628	0	546,428	0.01034	0.55564
390.0	204,398	324,797	0	529,196	0.01001	0.56565
400.0	211,626	628,992	0	840,618	0.01590	0.58155
410.0	541,054	133,079	0	674,134	0.01275	0.59430
420.0	281,796	255,271	0	537,067	0.01016	0.60446
430.0	345,113	399,184	0	744,297	0.01408	0.61854
440.0	547,417	415,210	0	962,626	0.01821	0.63674
450.0	238,599	229,763	0	468,362	0.00886	0.64560
460.0	257,016	328,633	0	585,649	0.01108	0.65668
470.0	138,992	215,912	0	354,904	0.00671	0.66339
480.0	0	203,820	0	203,820	0.00386	0.66725
490.0	0	220,594	0	220,594	0.00417	0.67142
500.0	32,007	0	0	32,007	0.00061	0.67203
510.0	0	33,800	0	33,800	0.00064	0.67266
520.0	0	83,243	0	83,243	0.00157	0.67424
TOTAL	20,102,208	15,544,813	0	35,647,021		

Table D-19.--Pacific herring. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	17	17	0	19.76	.345870E+03	71.88	.457140E+04
20	11,962.	1,384,553	31	13	13	0	0.42	.330972E-01	1.83	.553107E+00
30	27,559.	3,189,999	66	10	10	0	0.06	.848208E-03	0.33	.183040E-01
31	2,558.	296,105	9	3	3	0	0.19	.105112E-01	0.61	.956443E-01
SUBTOTAL	30,118.	3,486,104	75	13	13	0	0.07	.786070E-03	0.35	.160166E-01
40	18,281.	2,116,073	44	24	24	0	0.30	.655492E-02	1.24	.100071E+00
41	7,001.	810,309	31	11	11	0	0.89	.306312E+00	3.43	.424647E+01
42	6,154.	712,328	21	5	5	0	0.31	.420858E-01	1.46	.925684E+00
SUBTOTAL	31,436.	3,638,710	96	40	40	0	0.44	.190202E-01	1.77	.279907E+00
50	11,310.	1,309,140	27	0	0	0	0.00	0.	0.00	0.
60	25,704.	2,975,204	60	11	11	0	0.26	.169713E-01	0.95	.218539E+00
61	1,874.	216,948	7	5	5	0	1.78	.101905E+01	7.08	.165121E+02
SUBTOTAL	27,578.	3,192,153	67	16	16	0	0.36	.194498E-01	1.37	.266113E+00
71	21,233.	2,457,710	25	3	3	0	0.01	.167034E-04	0.14	.734862E-02
72	12,215.	1,413,893	15	4	4	0	0.09	.231503E-02	0.66	.104433E+00
73	5,494.	635,915	7	2	2	0	0.05	.144299E-02	0.14	.103907E-01
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	6	6	0	0.06	.680360E-03	0.37	.278036E-01
81	2,270.	262,712	47	1	1	0	0.00	.678877E-05	0.01	.329961E-04
82	1,646.	190,552	28	0	0	0	0.00	0.	0.00	0.
83	1,281.	148,224	31	0	0	0	0.00	0.	0.00	0.
84	965.	111,735	27	0	0	0	0.00	0.	0.00	0.
100	45,144.	5,225,365	60	9	9	0	0.03	.194562E-03	0.26	.942562E-02
200	135,107.	15,638,602	354	99	99	0	3.55	.976885E+01	13.01	.129119E+03
300	180,250.	20,863,967	414	108	108	0	2.67	.548841E+01	9.82	.725431E+02
400	6,162.	713,222	133	1	1	0	0.00	.921086E-06	0.00	.447684E-05
TOTAL	186,412.	21,577,189	547	109	109	0	2.58	.513158E+01	9.49	.678266E+02

Table O-19. --Pacific herring (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	153,848	.209732777E+11	57.00	0	443,947
20	1,721	.557099307E+06	30.00	197	3,245
30	594	.757888693E+05	65.00	44	1,144
31	164	.809214680E+04	8.00	0	372
SUBTOTAL	758	.838810161E+05	72.87	180	1,336
40	1,896	.257721569E+06	43.00	871	2,920
41	2,135	.176598783E+07	30.00	0	4,848
42	664	.187507000E+06	20.00	0	1,567
SUBTOTAL	4,694	.221121640E+07	45.59	1,698	7,690
50	0	0.	0.00	0	0
60	2,275	.131908187E+07	59.00	0	4,573
61	1,146	.421142675E+06	6.00	0	2,734
SUBTOTAL	3,421	.174022455E+07	51.28	770	6,072
71	51	.885906063E+03	24.00	0	113
72	373	.406361601E+05	14.00	0	805
73	87	.512370884E+04	6.00	0	262
74	0	0.	0.00	0	0
SUBTOTAL	460	.457598689E+05	17.12	9	911
81	2	.411407489E+01	46.00	0	6
82	0	0.	0.00	0	0
83	0	0.	0.00	0	0
84	0	0.	0.00	0	0
100	511	.466457750E+05	17.78	57	965
200	164,443	.209778701E+11	57.02	0	454,574
300	164,954	.209779167E+11	57.03	0	455,085
400	2	.411407489E+01	46.00	0	6
TOTAL	164,956	.209779168E+11	57.03	0	455,087

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	0	352,817	0	1,289,952,755
90.000 PERCENT	0	407,262	0	1,487,890,280
95.000 PERCENT	0	455,087	0	1,661,763,573

Table D-19.--Pacific herring (Cont.). Section c, population number estimates by subarea.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.275	559,746,529	.277205948E+18	1	57.00	0	1,614,412,038
20	0.229	7,503,144	.931000448E+13	1	30.00	1,272,533	13,733,756
30	0.191	3,103,492	.163549364E+13	1	65.00	547,895	5,659,089
31	0.305	538,847	.736327895E+11	1	8.00	0	1,164,588
SUBTOTAL	0.208	3,642,339	.170912643E+13		69.83	1,032,025	6,252,652
40	0.244	7,754,842	.393450085E+13	1	43.00	3,752,321	11,757,364
41	0.259	8,246,967	.244822463E+14	1	30.00	0	18,350,689
42	0.215	3,088,518	.412424608E+13	1	20.00	0	7,324,817
SUBTOTAL	0.246	19,090,328	.325409932E+14		49.97	7,621,489	30,559,168
50	0.000	0	0.	1	0.00	0	0
60	0.271	8,394,628	.169857587E+14	1	59.00	147,544	16,641,712
61	0.252	4,554,544	.682397686E+13	1	6.00	0	10,946,779
SUBTOTAL	0.264	12,949,172	.238097355E+14		44.81	3,113,275	22,785,069
71	0.051	998,020	.389752228E+12	1	24.00	0	2,286,578
72	0.134	2,774,794	.183312798E+13	1	14.00	0	5,678,975
73	0.340	256,815	.368949379E+11	1	6.00	0	726,837
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.152	3,031,610	.187002292E+13		14.56	117,493	5,945,726
81	0.454	4,472	.199960226E+08	1	46.00	0	13,481
82	0.000	0	0.	1	0.00	0	0
83	0.000	0	0.	1	0.00	0	0
84	0.000	0	0.	1	0.00	0	0
100	0.127	4,029,630	.225977515E+13	1	20.71	902,860	7,156,400
200	0.273	602,931,512	.277273318E+18	1	57.03	0	1,657,725,173
300	0.272	606,961,142	.277275577E+18	1	57.03	0	1,661,759,101
400	0.454	4,472	.199960226E+08	1	46.00	0	13,481
TOTAL	0.272	606,965,614	.277275577E+18		57.03	0	1,661,763,573

Table D-20.--Giant grenadier. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
81	2,270.	262,712	34	6	6	5	1.23	.435431E+00	0.23	.117671E-01
82	1,646.	190,552	23	7	7	5	13.80	.473122E+02	3.05	.351036E+01
83	1,281.	148,224	26	20	20	10	14.48	.766085E+01	6.49	.136525E+01
84	965.	111,735	17	17	17	17	68.50	.268822E+03	18.38	.199576E+02
TOTAL	6,162.	713,222	100	50	50	37	17.88	.103648E+02	5.12	.800952E+00

Table D-20.--Giant grenadier. Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
81	959	.263876670E+06	33.00	0	2,005
82	7,790	.150841768E+08	22.00	0	15,845
83	6,359	.147786243E+07	25.00	3,854	8,863
84	22,679	.294689532E+08	16.00	11,170	34,187
TOTAL	37,787	.462948691E+08	33.12	23,936	51,638

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	28,888	46,686	8,359,083	13,298,729
90.000 PERCENT	26,267	49,307	7,633,911	14,023,901
95.000 PERCENT	23,936	51,638	6,990,448	14,667,364

Table D-20.--Giant grenadier. Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
81	5.365	178,776	.713099692E+10	1	33.00	6,870	350,681
82	4.530	1,719,689	.111917972E+13	1	22.00	0	3,913,801
83	2.229	2,852,368	.263371062E+12	1	25.00	1,795,182	3,909,554
84	3.731	6,078,073	.218780751E+13	1	16.00	2,942,330	9,213,816
TOTAL	3.489	10,838,906	.357748929E+13		35.66	6,990,448	14,667,364

Table D-20.--Giant grenadier (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	MALES	FEMALES	UNSEXED	TOTAL	PROPORTION	CUMULATIVE PROPORTION
150.0	17,479	4,134	0	21,613	0.00199	0.00199
160.0	104,080	50,308	0	154,388	0.01425	0.01625
170.0	129,627	149,999	0	269,626	0.02489	0.04114
180.0	249,967	198,918	0	448,885	0.04144	0.08258
190.0	434,342	346,826	0	781,168	0.07213	0.15471
200.0	384,073	324,650	0	708,723	0.06544	0.22015
210.0	320,883	560,966	0	881,849	0.08146	0.30161
220.0	330,410	446,647	0	777,057	0.07177	0.37338
230.0	170,379	388,427	0	558,806	0.05161	0.42499
240.0	123,316	463,403	0	586,718	0.05418	0.47917
250.0	96,889	398,973	0	495,862	0.04579	0.52496
260.0	53,353	380,399	0	433,752	0.04005	0.56502
270.0	17,343	291,161	0	308,504	0.02849	0.59350
280.0	8,859	661,959	0	670,818	0.06198	0.65548
290.0	0	345,262	0	345,262	0.03187	0.68735
300.0	15,323	441,554	0	456,877	0.04219	0.72954
310.0	0	362,864	0	362,864	0.03351	0.76305
320.0	16,496	371,558	0	388,053	0.03583	0.79888
330.0	0	326,787	0	326,787	0.03018	0.82906
340.0	0	266,070	0	266,070	0.02456	0.85362
350.0	0	214,811	0	214,811	0.01984	0.87346
360.0	0	277,893	0	277,893	0.02566	0.89912
370.0	0	298,087	0	298,087	0.02753	0.92665
380.0	0	125,203	0	125,203	0.01156	0.93821
390.0	0	124,151	0	124,151	0.01146	0.94967
400.0	0	90,669	0	90,669	0.00837	0.95804
410.0	0	81,779	0	81,779	0.00755	0.96559
420.0	0	93,049	0	93,049	0.00859	0.97418
430.0	0	52,023	0	52,023	0.00480	0.97898
440.0	0	84,535	0	84,535	0.00781	0.98679
450.0	0	16,158	0	16,158	0.00149	0.98828
460.0	6,149	30,779	0	36,9928	0.00341	0.99169
490.0	5,182	52,252	0	57,433	0.00531	0.99700
500.0	0	7,635	0	7,635	0.00071	0.99770
510.0	0	5,643	0	5,643	0.00052	0.99823
520.0	0	5,643	0	5,643	0.00052	0.99875
590.0	0	5,216	0	5,216	0.00048	0.99923
620.0	0	8,366	0	8,366	0.00077	1.00000
TOTAL	2,484,149	8,344,757	0	10,828,906		

Table D-21 .--Coryphaenoides spp. Section a, CPUE by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
81	2,270.	262,712	34	1	1	0	0.02	.263222E-03	0.07	.511746E-02
82	1,646.	190,552	23	2	2	1	1.54	.117635E+01	13.85	.117769E+03
83	1,281.	148,224	26	15	15	1	7.42	.230016E+02	26.02	.418197E+03
84	965.	111,735	17	17	17	12	17.24	.227051E+02	125.99	.112336E+04
TOTAL	6,162.	713,222	100	35	35	14	4.66	.163470E+01	28.87	.540397E+02

Table D-21.--Coryphaenoides spp. (Cont). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
81	13	.159515954E+03	33.00	0	38
82	872	.375046571E+06	22.00	0	2,142
83	3,260	.443725346E+07	25.00	0	7,599
84	5,707	.248898565E+07	16.00	2,363	9,052
TOTAL	9,852	.730144520E+07	45.13	4,405	15,298

	CONFIDENCE LIMITS TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	6,336	13,368	40,808,495	81,230,373
90.000 PERCENT	5,310	14,393	34,917,198	87,121,670
95.000 PERCENT	4,405	15,298	29,718,812	92,320,056

Table D-21.--Coryphaenoides spp. (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
81	0.227	55,689	.310124119E+10	1	33.00	0	169,054
82	0.112	7,819,505	.375473186E+14	1	22.00	0	20,528,120
83	0.285	11,429,295	.806747712E+14	1	25.00	0	29,932,037
84	0.137	41,714,945	.123145847E+15	1	16.00	18,189,072	65,240,818
TOTAL	0.161	61,019,434	.241371038E+15		45.79	29,718.812	92,320,056

Table D-21--Coryphaenoides spp. (Cont.). Section d, population number estimates by sex and centimeter length interval for the overall survey area.

LENGTH(MM)	*** MALES ***	** FEMALES **	** UNSEXED **	*** TOTAL ***	PROPORTION	CUMULATIVE PROPORTION
40.0	371,986	120,980	0	492,967	0.00807	0.00807
50.0	1,036,260	422,944	0	1,459,204	0.02389	0.03196
60.0	2,153,080	393,469	0	2,546,549	0.04169	0.07364
70.0	2,905,376	789,939	0	3,695,316	0.06049	0.13413
80.0	5,678,367	1,783,332	0	7,461,698	0.12214	0.25628
90.0	7,630,309	2,231,626	0	9,861,935	0.16144	0.41771
100.0	9,169,072	4,582,512	0	13,751,584	0.22511	0.64282
110.0	7,290,934	6,161,582	0	13,452,517	0.22021	0.86303
120.0	1,690,229	4,658,106	0	6,348,335	0.10392	0.96695
130.0	64,673	1,740,559	0	1,805,232	0.02955	0.99650
140.0	0	126,108	0	126,108	0.00206	0.99857
150.0	0	31,661	0	31,661	0.00052	0.99908
TOTAL	37,990,286	23,042,819	0	61,033,105		

Table D-22.--Total shrimps. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	33	19	0	0.05	.817618E-04	0.00	0.
20	11,962.	1,384,553	31	25	22	0	0.07	.363909E-03	0.00	0.
30	27,559.	3,189,999	66	17	13	0	0.05	.474959E-03	0.00	0.
31	2,558.	296,105	9	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	30,118.	3,486,104	75	17	13	0	0.05	.397701E-03	0.00	0.
40	18,281.	2,116,073	44	13	10	0	0.01	.104071E-04	0.00	0.
41	7,001.	810,309	31	3	3	0	0.00	.532328E-05	0.34	.694465E-01
42	6,154.	712,328	21	12	10	0	0.06	.696407E-03	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	28	23	0	0.02	.304723E-04	0.08	.344396E-02
50	11,310.	1,309,140	27	19	16	0	0.04	.449538E-03	0.00	0.
60	25,704.	2,975,204	60	43	25	0	0.32	.460487E-02	0.00	0.
61	1,874.	216,948	7	3	2	0	0.08	.254398E-02	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	46	27	0	0.30	.401197E-02	0.00	0.
71	21,233.	2,457,710	25	23	2	0	0.29	.770191E-02	0.00	0.
72	12,215.	1,413,893	15	14	2	0	0.47	.164680E-01	0.00	0.
73	5,494.	635,915	7	7	4	0	0.07	.442631E-03	0.00	0.
74	6,202.	717,847	13	12	8	0	0.07	.992015E-03	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	33	14	0	0.27	.438795E-02	0.00	0.
81	2,270.	262,712	47	40	24	0	0.45	.827502E-02	0.00	0.
82	1,646.	190,552	28	23	8	0	0.37	.698841E-02	0.00	0.
83	1,281.	148,224	31	15	14	0	0.07	.100471E-02	0.00	0.
84	965.	111,735	27	18	18	0	0.07	.667577E-03	2.78	.109266E+01
100	45,144.	5,225,365	60	56	16	0	0.28	.293482E-02	0.00	0.
200	135,107.	15,638,602	354	168	120	0	0.09	.196882E-03	0.02	.186447E-03
300	180,250.	20,863,967	414	224	136	0	0.14	.294699E-03	0.01	.104751E-03
400	6,162.	713,222	133	96	64	0	0.29	.168135E-02	0.44	.268172E-01
TOTAL	186,412.	21,577,189	547	320	200	0	0.15	.277378E-03	0.03	.127241E-03

Table D-22.--Total shrimps (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	376	.495797289E+04	57.00	235	517
20	299	.612538370E+04	30.00	139	459
30	502	.424383911E+05	65.00	90	914
31	0	0.	0.00	0	0
SUBTOTAL	502	.424383911E+05	65.00	90	914
40	57	.409179254E+03	43.00	16	98
41	8	.306904408E+02	30.00	0	19
42	126	.310273461E+04	20.00	10	242
SUBTOTAL	191	.354260430E+04	25.86	69	313
50	145	.676489343E+04	26.00	0	314
60	2,806	.357908985E+06	59.00	1,609	4,003
61	53	.105135365E+04	6.00	0	132
SUBTOTAL	2,859	.358960339E+06	59.34	1,660	4,058
71	2,099	.408490331E+06	24.00	780	3,418
72	1,954	.289066070E+06	14.00	800	3,107
73	137	.157167341E+04	6.00	40	234
74	159	.448852730E+04	12.00	13	305
SUBTOTAL	2,249	.295126271E+06	14.59	1,091	3,407
81	347	.501476246E+04	46.00	205	490
82	209	.222806147E+04	27.00	112	306
83	29	.193820182E+03	30.00	1	58
84	22	.731815033E+02	26.00	4	40
100	4,348	.703616602E+06	38.31	2,649	6,047
200	4,372	.422789584E+06	81.14	3,076	5,668
300	8,720	.112640619E+07	83.88	6,606	10,834
400	608	.750982562E+04	77.04	435	780
TOTAL	9,328	.113391601E+07	85.00	7,207	11,448

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	7,951	10,704	619,886,345	621,762,822
90.000 PERCENT	7,554	11,101	619,612,857	622,036,310
95.000 PERCENT	7,207	11,448	619,371,536	622,277,631

Table D-22.--Total shrimps (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.007	53,333,007	0.	3	0.00	0	0
20	0.004	79,664,962	0.	3	0.00	0	0
30	0.046	10,992,095	0.	3	0.00	0	0
31	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.046	10,992,095	0.		0.00	0	0
40	0.018	3,200,015	0.	3	0.00	0	0
41	0.010	826,101	.400381786E+12	1	30.00	0	2,118,191
42	0.010	12,432,689	0.	3	0.00	0	0
SUBTOTAL	0.012	16,458,805	.400381786E+12		30.00	15,166,714	17,750,895
50	0.009	15,789,367	0.	3	0.00	0	0
60	0.017	164,380,218	0.	3	0.00	0	0
61	0.012	4,444,537	0.	3	0.00	0	0
SUBTOTAL	0.017	168,824,755	0.		0.00	0	0
71	0.019	109,888,126	0.	3	0.00	0	0
72	0.019	100,495,342	0.	3	0.00	0	0
73	0.007	18,712,416	0.	3	0.00	0	0
74	0.014	11,735,576	0.	3	0.00	0	0
SUBTOTAL	0.017	130,943,335	0.		0.00	0	0
81	0.016	22,314,143	0.	3	0.00	0	0
82	0.020	10,342,601	0.	3	0.00	0	0
83	0.022	1,353,315	0.	3	0.00	0	0
84	0.024	920,073	.119780291E+12	1	26.00	208,506	1,631,640
100	0.018	240,831,461	0.	3	0.00	0	0
200	0.013	345,062,991	.400381786E+12	3	30.00	343,770,900	346,355,081
300	0.015	585,894,452	.400381786E+12	3	30.00	584,602,361	587,186,542
400	0.017	34,930,132	.119780291E+12	1	26.00	34,218,565	35,641,699
TOTAL	0.015	620,824,583	.520162078E+12		45.90	619,371,536	622,277,631

Table D-23.--Squids. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	0	0	0	0.00	0.	0.00	0.
31	2,558.	296,105	9	1	1	0	0.00	.223212E-04	0.05	.271224E-02
SUBTOTAL	30,118.	3,486,104	75	1	1	0	0.00	.161037E-06	0.00	.195676E-04
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	0	0	0	0.00	0.	0.00	0.
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	0	0	0	0.00	0.	0.00	0.
50	11,310.	1,309,140	27	1	1	0	0.00	.405788E-06	0.01	.197229E-03
60	25,704.	2,975,204	60	9	9	0	0.01	.468605E-04	0.12	.216031E-02
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	9	9	0	0.01	.407074E-04	0.12	.187665E-02
71	21,233.	2,457,710	25	0	0	0	0.00	0.	0.00	0.
72	12,215.	1,413,893	15	0	0	0	0.00	0.	0.00	0.
73	5,494.	635,915	7	0	0	0	0.00	0.	0.00	0.
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	0	0	0	0.00	0.	0.00	0.
81	2,270.	262,712	47	43	43	0	1.49	.957321E-01	3.99	.401608E+00
82	1,646.	190,552	28	28	28	0	1.03	.469675E-01	2.74	.237667E+00
83	1,281.	148,224	31	29	29	0	0.89	.221052E-01	2.24	.150438E+00
84	965.	111,735	27	18	18	0	0.13	.133967E-02	0.37	.865363E-02
100	45,144.	5,225,365	60	0	0	0	0.00	0.	0.00	0.
200	135,107.	15,638,602	354	11	11	0	0.00	.170692E-05	0.03	.805449E-04
300	180,250.	20,863,967	414	11	11	0	0.00	.958992E-06	0.02	.452523E-04
400	6,162.	713,222	133	118	118	0	1.03	.173289E-01	2.73	.781639E-01
TOTAL	186,412.	21,577,189	547	129	129	0	0.04	.198301E-04	0.11	.127712E-03

Table D-23.--Squids (Cont.). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	0	0.	0.00	0	0
31	4	.171841786E+02	8.00	0	14
SUBTOTAL	4	.171841786E+02	8.00	0	14
40	0	0.	0.00	0	0
41	0	0.	0.00	0	0
42	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
50	2	.610651198E+01	26.00	0	8
60	98	.364218720E+04	59.00	0	219
61	0	0.	0.00	0	0
SUBTOTAL	98	.364218720E+04	59.00	0	219
71	0	0.	0.00	0	0
72	0	0.	0.00	0	0
73	0	0.	0.00	0	0
74	0	0.	0.00	0	0
SUBTOTAL	0	0.	0.00	0	0
81	1,157	.580148391E+05	46.00	672	1,643
82	579	.149742800E+05	27.00	328	831
83	391	.426433812E+04	30.00	258	525
84	42	.146857601E+03	26.00	17	66
100	0	0.	0.00	0	0
200	104	.366547789E+04	59.75	0	225
300	104	.366547789E+04	59.75	0	225
400	2,169	.774003148E+05	72.99	1,614	2,725
TOTAL	2,274	.810657927E+05	79.85	1,706	2,841

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	1,906	2,642	6,031,210	7,893,954
90.000 PERCENT	1,799	2,748	5,764,589	8,160,575
95.000 PERCENT	1,706	2,841	5,531,929	8,393,236

Table D-23.--Squids (Cont.). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.000	0	0.	1	0.00	0	0
31	0.091	45,695	.208804672E+10	1	8.00	0	151,068
SUBTOTAL	0.091	45,695	.208804672E+10		8.00	0	151,068
40	0.000	0	0.	1	0.00	0	0
41	0.000	0	0.	1	0.00	0	0
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
50	0.045	54,479	.296800508E+10	1	26.00	0	166,489
60	0.089	1,101,485	.167908051E+12	1	59.00	281,523	1,921,447
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.089	1,101,485	.167908051E+12		59.00	281,523	1,921,447
71	0.000	0	0.	1	0.00	0	0
72	0.000	0	0.	1	0.00	0	0
73	0.000	0	0.	1	0.00	0	0
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.000	0	0.		0.00	0	0
81	0.373	3,105,623	.243379351E+12	1	46.00	2,111,701	4,099,545
82	0.374	1,547,535	.757736655E+11	1	27.00	982,681	2,112,390
83	0.398	984,125	.290210961E+11	1	30.00	636,259	1,331,992
84	0.336	123,639	.948632243E+09	1	26.00	60,315	186,964
100	0.000	0	0.	1	0.00	0	0
200	0.087	1,201,659	.172964103E+12	1	62.49	370,157	2,033,161
300	0.087	1,201,659	.172964103E+12	1	62.49	370,157	2,033,161
400	0.377	5,760,923	.349122745E+12	1	79.75	4,583,130	6,938,716
TOTAL	0.327	6,962,582	.522086848E+12		135.80	5,531,929	8,393,236

Table D-24.--Octopus. Section a, CPUE estimates by stratum.

STRATUM	AREA SQ. MI.	SAMPLES	TOTAL HAULS	HAULS WITH CATCH	HAULS WITH NUMS.	HAULS WITH L-F	MEAN CPUE KG/HA	VARIANCE MEAN CPUE KG/HA	MEAN CPUE NO/HA	VARIANCE MEAN CPUE NO/HA
10	22,704.	2,627,943	58	0	0	0	0.00	0.	0.00	0.
20	11,962.	1,384,553	31	0	0	0	0.00	0.	0.00	0.
30	27,559.	3,189,999	66	2	2	0	0.02	.366873E-03	0.03	.355838E-03
31	2,558.	296,105	9	1	1	0	0.85	.723205E+00	0.05	.271224E-02
SUBTOTAL	30,118.	3,486,104	75	3	3	0	0.09	.552480E-02	0.03	.317524E-03
40	18,281.	2,116,073	44	0	0	0	0.00	0.	0.00	0.
41	7,001.	810,309	31	2	2	0	0.13	.150487E-01	0.05	.173053E-02
42	6,154.	712,328	21	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	31,436.	3,638,710	96	2	2	0	0.03	.746287E-03	0.01	.858196E-04
50	11,310.	1,309,140	27	5	5	0	0.51	.848050E-01	0.06	.805801E-03
60	25,704.	2,975,204	60	16	16	0	0.81	.776027E-01	0.47	.320119E-01
61	1,874.	216,948	7	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	27,578.	3,192,153	67	16	16	0	0.75	.674129E-01	0.43	.278085E-01
71	21,233.	2,457,710	25	1	1	0	0.00	.164427E-04	0.03	.719261E-03
72	12,215.	1,413,893	15	3	3	0	0.03	.236675E-03	0.25	.207507E-01
73	5,494.	635,915	7	1	1	0	0.01	.125760E-03	0.03	.955065E-03
74	6,202.	717,847	13	0	0	0	0.00	0.	0.00	0.
SUBTOTAL	23,911.	2,767,656	35	4	4	0	0.02	.684069E-04	0.13	.546596E-02
81	2,270.	262,712	47	6	6	0	0.04	.891064E-03	0.02	.891362E-04
82	1,646.	190,552	28	11	11	0	0.09	.964007E-03	0.12	.120819E-02
83	1,281.	148,224	31	10	10	0	0.03	.112385E-03	0.10	.870114E-03
84	965.	111,735	27	8	8	0	0.06	.630964E-03	0.06	.521817E-03
100	45,144.	5,225,365	60	5	5	0	0.01	.228282E-04	0.08	.169252E-02
200	135,107.	15,638,602	354	26	26	0	0.22	.371799E-02	0.10	.118471E-02
300	180,250.	20,863,967	414	31	31	0	0.17	.209030E-02	0.10	.771767E-03
400	6,162.	713,222	133	35	35	0	0.05	.210048E-03	0.07	.148722E-03
TOTAL	186,412.	21,577,189	547	66	66	0	0.17	.195462E-02	0.10	.721752E-03

Table D-24.--Octopus (Cont). Section b, biomass estimates by stratum.

STRATUM	BIOMASS MT	VARIANCE BIOMASS	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - BIOMASS LOWER	UPPER
10	0	0.	0.00	0	0
20	0	0.	0.00	0	0
30	197	.327807682E+05	65.00	0	559
31	746	.556767387E+06	8.00	0	2,467
SUBTOTAL	943	.589548155E+06	8.97	0	2,680
40	0	0.	0.00	0	0
41	301	.867606016E+05	30.00	0	903
42	0	0.	0.00	0	0
SUBTOTAL	301	.867606016E+05	30.00	0	903
50	1,987	.127619063E+07	26.00	0	4,310
60	7,136	.603159654E+07	59.00	2,222	12,051
61	0	0.	0.00	0	0
SUBTOTAL	7,136	.603159654E+07	59.00	2,222	12,051
71	30	.872079020E+03	24.00	0	90
72	120	.415439434E+04	14.00	0	258
73	21	.446541341E+03	6.00	0	73
74	0	0.	0.00	0	0
SUBTOTAL	141	.460093568E+04	16.72	0	284
81	29	.539995504E+03	46.00	0	76
82	48	.307346853E+03	27.00	12	84
83	12	.216802974E+02	30.00	2	21
84	19	.691678728E+02	26.00	2	36
100	171	.547301470E+04	23.08	18	324
200	10,368	.798409593E+07	88.75	4,744	15,992
300	10,538	.798956894E+07	88.87	4,912	16,164
400	108	.938190527E+03	87.69	47	169
TOTAL	10,647	.799050713E+07	88.89	5,021	16,273

CONFIDENCE LIMITS

	TOTAL BIOMASS MT LOWER	UPPER	TOTAL POPULATION LOWER	UPPER
80.000 PERCENT	6,993	14,301	3,992,816	8,438,708
90.000 PERCENT	5,941	15,352	3,351,423	9,080,100
95.000 PERCENT	5,021	16,273	2,789,503	9,642,021

Table D-24.--Octopus (Cont). Section c, population number estimates by stratum.

STRATUM	MEAN WT KG	POPULATION	VARIANCE POPULATION	METHOD USED	EFF. DEG. FREEDOM	95% CONFIDENCE LIMITS - POPULATION LOWER	UPPER
10	0.000	0	0.	1	0.00	0	0
20	0.000	0	0.	1	0.00	0	0
30	0.782	252,005	.317947640E+11	1	65.00	0	608,330
31	16.329	45,695	.208804672E+10	1	8.00	0	151,068
SUBTOTAL	3.169	297,700	.338828108E+11		71.32	0	665,171
40	0.000	0	0.	1	0.00	0	0
41	2.383	126,436	.997707633E+10	1	30.00	0	330,402
42	0.000	0	0.	1	0.00	0	0
SUBTOTAL	2.383	126,436	.997707633E+10		30.00	0	330,402
50	7.936	250,384	.121261282E+11	1	26.00	23,980	476,788
60	1.735	4,112,625	.248809773E+13	1	59.00	956,227	7,269,022
61	0.000	0	0.	1	0.00	0	0
SUBTOTAL	1.735	4,112,625	.248809773E+13		59.00	956,227	7,269,022
71	0.151	195,315	.381478243E+11	1	24.00	0	598,444
72	0.116	1,030,073	.364240178E+12	1	14.00	0	2,324,630
73	0.363	58,234	.339119782E+10	1	6.00	0	200,733
74	0.000	0	0.	1	0.00	0	0
SUBTOTAL	0.130	1,088,307	.367631376E+12		14.26	0	2,388,876
81	1.655	17,614	.540175885E+08	1	46.00	2,806	32,421
82	0.729	66,194	.385198440E+09	1	27.00	25,921	106,468
83	0.283	42,000	.167854528E+09	1	30.00	15,544	68,456
84	0.995	19,188	.572028887E+08	1	26.00	3,638	34,738
100	0.133	1,283,621	.405779200E+12	1	17.26	0	2,627,708
200	2.166	4,787,145	.254408375E+13	1	61.67	1,598,172	7,976,119
300	1.736	6,070,766	.294986295E+13	1	76.00	2,644,894	9,496,639
400	0.748	144,995	.664273445E+09	1	66.62	93,509	196,482
TOTAL	1.713	6,215,762	.295052722E+13		76.04	2,789,503	9,642,021

APPENDIX E

Age-Length Keys for Principal Species of Fish

Appendix E presents age-length keys for principal species of fish by sex and sexes combined for which age samples collected during the 1988 bottom trawl survey have been read. Asterisks denote fish lengths for which ages have been interpolated.

List of Tables

Table E-1.--Age-length keys for walleye pollock from age data collected on the continental shelf during the 1988 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+
100	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
110	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
120	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
130	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
140	1.00	0.00	10	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	0
150	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
160	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
170	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
180	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
190	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
200	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
210	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
220	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
230	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
240	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
250	2.25	0.50	4	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	0	0
260	3.00	0.00	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
270	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
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	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	2.50	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	1.00	3	0	0	1	1	1	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	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
330	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
340	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
350	3.75	0.46	8	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	0	0
360	3.46	0.66	13	0	0	0	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	4.00	0.93	15	0	0	0	5	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	4.13	0.99	15	0	0	0	4	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	4.50	1.32	16	0	0	0	5	4	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	5.06	1.34	17	0	0	0	3	3	3	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	5.06	1.11	18	0	0	0	1	5	6	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	5.13	1.09	16	0	0	0	1	5	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table E-1.--(Cont.).

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+
430	5.69	0.95	16	0	0	0	0	3	1	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	6.50	0.86	18	0	0	0	0	0	1	10	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	6.19	1.52	16	0	0	0	0	2	2	8	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.35	1.46	17	0	0	0	0	2	1	8	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.43	1.16	14	0	0	0	0	0	3	5	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	7.40	2.21	20	0	0	0	0	1	1	7	2	5	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
490	8.37	1.34	19	0	0	0	0	0	0	1	5	5	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8.81	1.47	16	0	0	0	0	0	0	2	1	3	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	8.06	1.39	16	0	0	0	0	0	0	2	5	2	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	9.10	1.21	20	0	0	0	0	0	0	0	1	7	3	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	9.11	0.88	19	0	0	0	0	0	0	0	0	5	8	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.50	1.38	18	0	0	0	0	0	0	0	1	4	3	7	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	8.53	1.37	17	0	0	0	0	0	0	2	1	6	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	9.84	1.07	19	0	0	0	0	0	0	0	0	3	0	15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
570	9.88	1.05	17	0	0	0	0	0	0	0	0	2	2	11	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	9.64	1.01	14	0	0	0	0	0	0	0	0	2	3	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	10.13	0.35	8	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	10.29	0.99	14	0	0	0	0	0	0	0	0	1	0	9	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	10.86	1.95	7	0	0	0	0	0	0	0	0	0	1	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
620	10.00	1.29	7	0	0	0	0	0	0	0	0	1	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	10.71	1.50	7	0	0	0	0	0	0	0	0	0	0	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
640	10.38	0.74	8	0	0	0	0	0	0	0	0	0	0	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
650	12.50	1.91	4	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
660	10.83	1.17	6	0	0	0	0	0	0	0	0	0	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	10.50	1.05	6	0	0	0	0	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	10.67	1.15	3	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	0	0
* 690	11.00	1.15	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	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	0.0	0.0	0.0
700	11.50	0.71	2	0	0	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
* 710	11.00	1.41	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	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	0.0	0.0	0.0
720	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	6.57	3.27	576.0	0.0	53.0	29.0	36.0	63.0	27.0	83.0	34.0	54.0	35.0	122.5	16.0	17.5	1.0	4.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table E-1.--(Cont.).

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+
100	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
110	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
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	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
140	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
150	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
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	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
180	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
* 190	1.67	0.58	3.0	0.0	1.0	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	0.0	0.0	0.0	0.0	0.0	0.0
200	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
210	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
220	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
230	3.00	0.00	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
240	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
250	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
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	2.67	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
280	3.00	0.00	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
290	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
300	3.00	0.00	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
310	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
320	3.00	1.00	3	0	0	1	1	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	0.58	4	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	0
340	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
350	3.67	0.52	6	0	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
360	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
370	3.90	0.57	10	0	0	0	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	3.73	0.80	15	0	0	0	6	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	5.13	0.99	8	0	0	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	4.77	1.24	13	0	0	0	2	4	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	4.93	1.22	15	0	0	0	3	2	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	5.21	1.19	14	0	0	0	0	6	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	5.59	1.06	17	0	0	0	1	2	2	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	5.92	1.12	13	0	0	0	0	2	1	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	6.06	1.73	16	0	0	0	1	2	1	8	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	5.67	1.18	15	0	0	0	1	1	3	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.64	1.01	14	0	0	0	0	0	1	7	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	6.75	1.36	12	0	0	0	0	0	2	4	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	6.64	0.93	14	0	0	0	0	0	1	5	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table E-1.--(Cont.).

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+
500	7.08	1.44	13	0	0	0	0	0	1	6	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	7.94	1.92	17	0	0	0	0	0	1	5	2	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	9.00	1.46	18	0	0	0	0	0	0	2	1	2	4	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	9.16	1.07	19	0	0	0	0	0	0	0	1	6	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.10	1.41	21	0	0	0	0	0	0	1	2	5	1	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	9.39	1.09	18	0	0	0	0	0	0	0	1	2	6	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	9.25	1.41	20	0	0	0	0	0	0	2	0	3	3	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	9.79	1.51	19	0	0	0	0	0	0	1	0	3	1	10	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	10.13	1.51	15	0	0	0	0	0	0	0	1	1	0	9	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
590	9.82	0.88	17	0	0	0	0	0	0	0	1	0	2	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	9.95	1.00	20	0	0	0	0	0	0	0	0	2	2	13	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	10.27	0.96	15	0	0	0	0	0	0	0	0	1	0	10	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	10.75	2.12	8	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
630	10.46	1.05	13	0	0	0	0	0	0	0	0	0	1	8	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
640	10.50	1.07	8	0	0	0	0	0	0	0	0	0	0	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
650	11.38	2.77	8	0	0	0	0	0	0	0	0	0	0	5	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
660	10.90	1.37	10	0	0	0	0	0	0	0	0	0	1	4	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
670	10.00	0.00	8	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	11.23	1.79	13	0	0	0	0	0	0	0	0	0	0	7	1	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0
690	10.56	1.01	9	0	0	0	0	0	0	0	0	0	0	6	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
700	10.80	1.62	10	0	0	0	0	0	0	0	0	0	0	7	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
710	11.38	1.41	8	0	0	0	0	0	0	0	0	0	0	3	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
720	10.80	1.30	5	0	0	0	0	0	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
730	10.60	0.89	5	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	11.00	0.00	1	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
* 750	10.50	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	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
760	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
770	12.00	1.41	2	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	0
780	11.00	0.00	1	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
790	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	7.34	3.30	591.0	0.0	36.0	23.0	32.0	52.0	23.0	86.0	31.0	36.0	32.0	174.5	32.5	17.0	11.0	1.0	1.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table E-1.--(Cont.).

Sexes combined 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+
100	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
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	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
130	1.00	0.00	17	0	17	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	19	0	19	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	18	0	18	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	16	0	16	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	1.27	0.47	11	0	8	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
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	1.60	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
200	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
210	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
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	2.33	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
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	2.33	0.52	6	0	0	4	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	0.50	4	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	0	0
270	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
280	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
290	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
300	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
310	3.00	0.63	6	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	3.29	0.95	7	0	0	2	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	3.70	0.48	10	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	0	0
340	3.93	0.47	14	0	0	0	2	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	3.71	0.47	14	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	0
360	3.61	0.70	18	0	0	0	9	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	3.96	0.79	25	0	0	0	7	13	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	3.93	0.91	30	0	0	0	10	15	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	4.71	1.23	24	0	0	0	5	7	2	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	4.93	1.28	30	0	0	0	5	7	6	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	5.00	1.15	33	0	0	0	4	7	9	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	5.17	1.12	30	0	0	0	1	11	2	14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	5.64	0.99	33	0	0	0	1	5	3	20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	6.26	1.00	31	0	0	0	0	2	2	17	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	6.13	1.60	32	0	0	0	1	4	3	16	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.03	1.36	32	0	0	0	1	3	4	16	4	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.54	1.07	28	0	0	0	0	0	4	12	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	7.16	1.94	32	0	0	0	0	1	3	11	5	6	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
490	7.64	1.45	33	0	0	0	0	0	1	6	12	5	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8.03	1.68	29	0	0	0	0	0	1	8	1	6	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	8.00	1.66	33	0	0	0	0	0	1	7	7	3	7	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	9.05	1.31	38	0	0	0	0	0	0	2	2	9	7	16	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table E-1.--(Cont.).

Sexes combined 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+
530	9.13	0.96	38	0	0	0	0	0	0	0	1	11	9	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.28	1.39	39	0	0	0	0	0	0	1	3	9	4	17	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	8.97	1.29	35	0	0	0	0	0	0	2	2	8	8	14	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	9.54	1.27	39	0	0	0	0	0	0	2	0	6	3	25	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
570	9.83	1.30	36	0	0	0	0	0	0	1	0	5	3	21	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	9.90	1.29	29	0	0	0	0	0	0	0	1	3	3	17	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
590	9.92	0.76	25	0	0	0	0	0	0	0	1	0	2	19	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	10.09	1.00	34	0	0	0	0	0	0	0	0	3	2	22	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	10.45	1.34	22	0	0	0	0	0	0	0	0	1	1	13	4	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0
620	10.40	1.76	15	0	0	0	0	0	0	0	0	1	1	10	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
630	10.55	1.19	20	0	0	0	0	0	0	0	0	0	1	13	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
640	10.44	0.89	16	0	0	0	0	0	0	0	0	0	0	12	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
650	11.75	2.49	12	0	0	0	0	0	0	0	0	0	0	6	1	2	0	2	0	0	0	1	0	0	0	0	0	0	0	0
660	10.88	1.26	16	0	0	0	0	0	0	0	0	0	2	5	4	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
670	10.21	0.70	14	0	0	0	0	0	0	0	0	0	1	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	11.13	1.67	16	0	0	0	0	0	0	0	0	0	0	9	1	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0
690	10.56	1.01	9	0	0	0	0	0	0	0	0	0	0	6	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
700	10.92	1.51	12	0	0	0	0	0	0	0	0	0	0	7	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0
710	11.38	1.41	8	0	0	0	0	0	0	0	0	0	0	3	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
720	10.67	1.21	6	0	0	0	0	0	0	0	0	0	0	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
730	10.60	0.89	5	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	11.00	0.00	1	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
* 750	10.50	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	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
760	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
770	12.00	1.41	2	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	0
780	11.00	0.00	1	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
790	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	6.89	3.34	1174.0	0.0	102.0	50.0	68.0	115.0	50.0	169.0	65.0	90.0	67.0	295.5	47.5	33.0	12.0	5.0	2.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table E-2.--Age-length keys for walleye pollock from age data collected on the continental slope during the 1988 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+
240	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
340	3.00	0.00	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
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	3.00	0.00	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
370	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
380	3.67	1.15	3	0	0	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
390	3.33	0.58	3	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	0
400	3.40	0.55	5	0	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
410	4.60	1.52	5	0	0	0	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	4.40	1.52	5	0	0	0	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	4.80	1.30	5	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	5.17	1.17	6	0	0	0	0	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	4.80	1.30	5	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.50	1.22	6	0	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.60	1.95	5	0	0	0	0	0	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	6.40	0.55	5	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	0
490	10.00	0.00	4	0	0	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
500	8.00	1.87	5	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	6.60	0.89	5	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	8.40	1.82	5	0	0	0	0	0	0	1	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	8.80	1.79	5	0	0	0	0	0	0	1	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.00	1.41	5	0	0	0	0	0	0	0	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	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
560	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
570	8.50	2.12	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	11.00	0.00	1	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
TOTAL	6.19	2.47	93	0	0	1	17	9	7	27	7	3	4	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table E-2.--(Cont.).

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+
360	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
370	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
* 380	4.00	1.41	1.5	0.0	0.0	0.0	0.5	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
390	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
400	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
410	3.83	0.75	6	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	3.75	1.04	8	0	0	0	4	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	4.00	1.22	5	0	0	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	4.83	1.33	6	0	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	5.60	0.55	5	0	0	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
460	5.60	0.89	5	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	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
480	6.00	0.00	4	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	0
490	7.80	2.05	5	0	0	0	0	0	0	2	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8.00	1.83	4	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	8.67	1.63	6	0	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	10.00	4.36	3	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
530	9.17	2.40	6	0	0	0	0	0	0	1	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.00	2.00	5	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	9.29	1.50	7	0	0	0	0	0	0	1	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	10.00	0.00	5	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
570	10.40	1.52	5	0	0	0	0	0	0	0	0	0	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
580	11.25	1.89	4	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
590	10.25	0.50	4	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	10.00	0.00	2	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
610	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
620	11.67	1.53	3	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
630	11.00	0.00	1	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
* 640	12.33	1.63	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	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
650	13.00	0.00	2	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
690	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	7.35	3.11	122.0	0.0	0.0	0.0	15.5	14.5	5.5	28.0	3.0	6.0	3.0	32.0	4.5	2.0	6.0	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

Table E-2.--(Cont.).

Sexes combined 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+
240	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
340	3.00	0.00	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
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	3.33	0.58	3	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	0
370	3.67	1.15	3	0	0	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
380	3.67	1.15	3	0	0	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
390	3.40	0.55	5	0	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
400	3.45	0.69	11	0	0	0	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
410	4.18	1.17	11	0	0	0	4	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	4.00	1.22	13	0	0	0	6	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	4.40	1.26	10	0	0	0	3	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	5.00	1.21	12	0	0	0	1	4	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
450	5.20	1.03	10	0	0	0	1	1	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	6.09	1.14	11	0	0	0	0	1	0	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	6.30	1.34	10	0	0	0	0	0	1	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	6.22	0.44	9	0	0	0	0	0	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	8.78	1.86	9	0	0	0	0	0	0	2	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8.00	1.73	9	0	0	0	0	0	0	3	1	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
510	7.73	1.68	11	0	0	0	0	0	0	4	1	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	9.00	2.83	8	0	0	0	0	0	0	1	2	1	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
530	9.00	2.05	11	0	0	0	0	0	0	2	0	3	0	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
540	9.00	1.63	10	0	0	0	0	0	0	1	1	2	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	9.38	1.41	8	0	0	0	0	0	0	1	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	10.00	0.00	6	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	9.86	1.77	7	0	0	0	0	0	0	0	1	0	1	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
580	11.20	1.64	5	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
590	10.25	0.50	4	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	10.00	0.00	2	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
610	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
620	11.67	1.53	3	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
630	11.00	0.00	1	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
* 640	12.33	1.63	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	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
650	13.00	0.00	2	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
690	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	6.87	2.90	213.5	0.0	0.0	1.0	32.0	23.0	12.0	55.0	10.0	9.0	7.0	49.0	5.5	2.0	6.0	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

Table E-3.--Age-length keys for Pacific cod from age data collected during the 1988 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+
160	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
* 170	1.00	0.00	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	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
180	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
* 190	1.00	0.00	1.6667	0.0	1.667	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
* 200	1.00	0.00	2.3333	0.0	2.333	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
210	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
220	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
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	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
250	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
260	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
270	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
* 280	1.50	0.00	1.0	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	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
290	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
300	1.75	0.50	4	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	0
310	2.50	1.00	4	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	0
320	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
330	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
340	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
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	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	0.58	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
380	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
390	2.67	0.82	6	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	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
410	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
420	3.20	0.84	5	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	3.25	0.46	8	0	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
440	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
450	3.56	0.53	9	0	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
460	3.63	0.52	8	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	0
470	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

Table E-3.--(Cont.).

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+
480	3.78	0.44	9	0	0	0	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	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
500	4.17	0.41	6	0	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
510	4.11	0.33	9	0	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	4.22	0.44	9	0	0	0	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	4.44	0.53	9	0	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
540	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
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	0.87	9	0	0	0	0	2	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	4.78	0.67	9	0	0	0	0	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	5.00	0.50	9	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	0	0
590	5.10	0.57	10	0	0	0	0	1	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.14	0.38	7	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	0
610	5.17	0.41	6	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	0	0
620	5.29	0.49	7	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	0
630	5.63	0.74	8	0	0	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	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
650	5.40	0.55	5	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	0	0
660	5.67	0.52	6	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	6.50	0.55	6	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.50	0.71	2	0	0	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
690	6.00	0.00	2	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
700	7.80	1.10	5	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
710	7.30	0.67	10	0	0	0	0	0	0	1	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	8.63	1.41	8	0	0	0	0	0	0	0	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	7.50	1.00	4	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	9.67	2.08	3	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	9.00	1.67	6	0	0	0	0	0	0	0	1	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	9.67	1.53	3	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	9.25	1.89	4	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* 780	8.80	2.22	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	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	0.0	0.0	0.0
790	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
800	9.67	1.53	3	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	10.50	0.71	2	0	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
820	10.00	1.41	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	11.00	0.00	1	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
930	11.00	0.00	1	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
TOTAL	4.75	2.30	324.5	0.0	20.5	19.5	54.0	75.0	66.0	29.0	21.5	14.0	9.5	4.0	9.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table E-3.--(Cont.).

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+
140	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
* 150	1.00	0.00	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	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
160	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
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	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
230	1.67	0.58	3	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	0
240	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
250	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
260	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
270	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
280	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
290	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
300	2.25	0.50	4	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	0	0
310	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
320	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
330	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
340	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
350	2.25	0.50	4	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	0	0
360	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
370	2.50	0.55	6	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	0
380	2.50	0.55	6	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	0
390	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
400	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
410	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
420	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
430	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
440	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
450	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
460	3.33	0.71	9	0	0	1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	3.64	0.50	11	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	0
480	3.71	1.25	7	0	0	1	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	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
500	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
510	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
520	4.22	0.67	9	0	0	0	1	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	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
540	4.44	0.53	9	0	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
550	4.44	0.53	9	0	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
560	4.80	0.42	10	0	0	0	0	2	8	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	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

Table E-3.--(Cont.).

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+
580	5.11	0.78	9	0	0	0	0	1	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	5.00	0.63	6	0	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.00	0.63	6	0	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	5.00	0.53	8	0	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
620	4.75	0.50	4	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	0	0
630	5.14	0.38	7	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	0
640	6.00	0.00	3	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	0	0
650	5.50	0.58	4	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	0	0
660	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
670	6.33	0.82	6	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.63	0.74	8	0	0	0	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	6.83	0.75	6	0	0	0	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	7.00	0.00	3	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	0
710	7.75	0.50	4	0	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
720	7.50	1.05	6	0	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	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
740	8.00	1.00	3	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	8.25	1.50	4	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	8.25	1.28	8	0	0	0	0	0	0	0	2	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	8.50	0.71	2	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	0
780	9.40	2.07	5	0	0	0	0	0	0	0	0	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
790	8.50	1.05	6	0	0	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	8.50	0.71	2	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	0
810	10.00	1.00	3	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	11.67	2.08	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
830	11.00	0.00	1	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
840	11.50	0.71	2	0	0	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
900	11.00	0.00	1	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
TOTAL	4.77	2.34	324.0	0.0	12.0	34.0	57.0	69.0	60.0	25.0	22.0	20.0	12.0	4.0	6.0	1.0	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	0.0

Table E-3.--(Cont.).

Sexes combined 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+
140	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
* 150	1.00	0.00	1.5	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	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
160	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
* 170	1.00	0.00	1.5	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	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
180	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
* 190	1.00	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	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
* 200	1.00	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	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
210	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
220	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
230	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
240	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
250	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
260	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
270	1.67	0.58	3	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	0
280	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
290	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
300	2.00	0.53	8	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	0	0
310	2.50	0.84	6	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	0
320	2.44	0.53	9	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	0
330	2.57	0.53	7	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	0
340	2.50	0.55	6	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	0
350	2.64	0.50	11	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	0	0
360	2.63	0.52	8	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	0	0
370	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
380	2.69	0.48	13	0	0	4	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
390	2.60	0.70	10	0	0	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	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
410	2.88	0.35	8	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	3.00	0.74	12	0	0	3	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	3.23	0.44	13	0	0	0	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	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

Table E-3.--(Cont.).

Sexes combined 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+
450	3.63	0.50	16	0	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
460	3.47	0.62	17	0	0	1	7	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
470	3.76	0.44	17	0	0	0	4	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	3.75	0.86	16	0	0	1	4	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
490	3.67	0.49	18	0	0	0	6	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	4.07	0.26	15	0	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
510	4.17	0.62	18	0	0	0	1	14	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	4.22	0.55	18	0	0	0	1	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	4.21	0.58	14	0	0	0	1	9	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	4.44	0.51	16	0	0	0	0	9	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
550	4.62	0.51	13	0	0	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
560	4.89	0.66	19	0	0	0	0	4	14	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570	4.87	0.52	15	0	0	0	0	3	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	5.06	0.64	18	0	0	0	0	2	14	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
590	5.06	0.57	16	0	0	0	0	2	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	5.08	0.49	13	0	0	0	0	1	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
610	5.07	0.47	14	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	0
620	5.09	0.54	11	0	0	0	0	1	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	5.40	0.63	15	0	0	0	0	0	10	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	5.89	0.33	9	0	0	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
650	5.44	0.53	9	0	0	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
660	5.75	0.45	12	0	0	0	0	0	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
670	6.42	0.67	12	0	0	0	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6.60	0.70	10	0	0	0	0	0	0	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
690	6.63	0.74	8	0	0	0	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	7.50	0.93	8	0	0	0	0	0	0	0	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
710	7.43	0.65	14	0	0	0	0	0	0	1	6	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	8.14	1.35	14	0	0	0	0	0	0	1	4	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	7.86	0.90	7	0	0	0	0	0	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	8.83	1.72	6	0	0	0	0	0	0	0	1	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
750	8.70	1.57	10	0	0	0	0	0	0	0	3	2	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	8.64	1.43	11	0	0	0	0	0	0	0	2	5	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
770	9.00	1.55	6	0	0	0	0	0	0	0	0	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	9.40	2.07	5	0	0	0	0	0	0	0	0	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
790	8.29	1.11	7	0	0	0	0	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	9.20	1.30	5	0	0	0	0	0	0	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
810	10.20	0.84	5	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	11.00	1.87	5	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
830	11.00	0.00	1	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
840	11.50	0.71	2	0	0	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
880	11.00	0.00	1	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

Table E-3.--(Cont.).

Sexes combined 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+
* 890	11.00	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
900	11.00	0.00	1	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
* 910	11.00	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
* 920	11.00	0.00	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
930	11.00	0.00	1	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
TOTAL	4.77	2.35	650.0	0.0	34.0	53.0	111.0	144.0	126.0	54.0	43.0	33.0	21.0	8.0	18.0	3.0	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	0.0

Table E-4.--Age-Length keys for yellowfin sole from age data collected during the 1988 bottom trawl survey.

Hale 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	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
100	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
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	4.90	0.88	10	0	0	0	0	3	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	5.10	0.32	10	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	0	0
140	5.73	1.01	11	0	0	0	0	0	7	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	5.67	0.98	12	0	0	0	0	0	8	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	6.62	0.96	13	0	0	0	0	0	3	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.69	1.01	16	0	0	0	0	0	3	1	11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.00	0.00	13	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	6.86	1.23	14	0	0	0	0	0	3	1	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	6.92	0.95	13	0	0	0	0	0	2	0	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.27	0.88	15	0	0	0	0	0	1	0	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	7.21	0.97	14	0	0	0	0	0	1	1	7	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	7.67	0.78	12	0	0	0	0	0	0	0	6	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	8.00	0.41	13	0	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
250	9.09	1.22	11	0	0	0	0	0	0	0	1	2	5	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	8.33	0.71	9	0	0	0	0	0	0	0	1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	10.89	3.26	9	0	0	0	0	0	0	0	0	2	2	1	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
280	11.17	2.69	12	0	0	0	0	0	0	0	1	0	4	1	1	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0
290	14.00	3.80	10	0	0	0	0	0	0	0	0	0	2	0	1	0	1	3	0	0	1	0	1	1	0	0	0	0	0	0
300	14.46	3.28	13	0	0	0	0	0	0	0	0	0	1	1	0	1	3	1	1	1	2	0	1	1	0	0	0	0	0	0
310	16.00	3.37	10	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2	0	0	2	0	0	2	0	0	0	0	0
320	16.63	3.58	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	1	0	1	1	0	1	0	0	0	0
330	18.89	2.67	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	3	3	0	0	0	0	0
340	19.00	4.18	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0
350	16.25	3.20	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0
* 360	17.00	3.74	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	0.0	0.5	0.5	0.0	0.0	0.0	0.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	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
TOTAL	9.22	4.55	277.5	0.0	0.0	0.0	3.0	7.0	44.0	4.0	82.0	38.0	25.0	4.0	8.0	1.0	7.5	14.5	8.0	1.0	4.0	4.0	6.0	7.5	6.0	2.0	1.0	0.0	0.0	0.0

Table E-4.--(Cont.).

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+
70	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
* 80	2.50	0.00	1.0	0.0	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	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	3.00	0.00	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
100	4.20	0.84	5	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	4.63	0.74	8	0	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	4.67	0.50	9	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	0
130	5.00	0.00	10	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	5.50	1.07	8	0	0	0	0	0	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	6.67	1.30	12	0	0	0	0	0	4	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	6.57	0.94	14	0	0	0	0	0	3	1	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.87	0.83	15	0	0	0	0	0	2	0	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.06	0.43	17	0	0	0	0	0	0	1	14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	7.21	0.43	14	0	0	0	0	0	0	0	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	7.13	1.15	16	0	0	0	0	0	2	1	8	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.27	0.70	15	0	0	0	0	0	0	1	10	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	7.67	0.72	15	0	0	0	0	0	0	0	7	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	7.80	1.08	15	0	0	0	0	0	0	0	7	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	7.82	1.25	11	0	0	0	0	0	0	0	6	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	8.80	1.14	10	0	0	0	0	0	0	0	1	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	8.38	1.41	8	0	0	0	0	0	0	0	3	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	9.00	1.33	10	0	0	0	0	0	0	0	0	5	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	10.75	3.91	12	0	0	0	0	0	0	0	0	1	7	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
290	13.23	3.72	13	0	0	0	0	0	0	0	0	1	2	0	0	3	2	1	2	0	0	0	0	2	0	0	0	0	0	0
300	11.67	3.54	15	0	0	0	0	0	0	0	0	1	5	2	2	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0
310	12.86	4.11	14	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	1	2	1	0	0	0	0	1	0	0	0	0
320	14.00	2.29	14	0	0	0	0	0	0	0	0	0	1	0	1	1	1	4	4	0	1	1	0	0	0	0	0	0	0	0
330	15.93	3.97	14	0	0	0	0	0	0	0	0	0	0	0	1	4	0	1	1	1	1	1	1	0	1	2	0	0	0	0
340	16.36	3.23	14	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	3	2	0	1	1	1	1	0	0	0	0
350	16.53	3.72	15	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	2	1	0	1	2	2	1	0	1	0	0	0
360	18.67	4.48	15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	1	1	1	1	0	3	0	2	1	0
370	19.30	3.50	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	4	0	0	2	2	0	0	0
380	18.82	4.58	11	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	1	1	0	1	0	2	0	1	0	1
390	18.50	3.70	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
400	24.00	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	0	0	1	0	0
410	17.00	0.00	1	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
420	31.00	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	0	0	0	0	1
* 430	24.50	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	0.0	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	0.5
440	18.00	0.00	1	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
TOTAL	10.50	5.34	371.0	0.0	0.0	1.5	2.5	9.0	38.0	6.0	92.0	47.0	32.0	8.0	11.0	14.0	12.0	17.0	11.0	9.0	8.0	8.5	11.0	7.0	3.0	12.0	4.0	4.0	1.0	2.5

Table E-4.--(Cont.).

Sexes combined 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+
70	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
* 80	2.67	0.82	1.5	0.0	0.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
90	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
100	3.90	0.74	10	0	0	0	3	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	4.60	0.70	10	0	0	0	0	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	4.79	0.71	19	0	0	0	0	6	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	5.05	0.22	20	0	0	0	0	0	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	5.63	1.01	19	0	0	0	0	0	13	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	6.17	1.24	24	0	0	0	0	0	12	0	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	6.59	0.93	27	0	0	0	0	0	6	1	18	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	6.77	0.92	31	0	0	0	0	0	5	1	22	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	7.03	0.32	30	0	0	0	0	0	0	1	27	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	7.04	0.92	28	0	0	0	0	0	3	1	17	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	7.03	1.05	29	0	0	0	0	0	4	1	16	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	7.27	0.78	30	0	0	0	0	0	1	1	19	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	7.45	0.87	29	0	0	0	0	0	1	1	14	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	7.74	0.94	27	0	0	0	0	0	0	0	13	10	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	7.92	0.88	24	0	0	0	0	0	0	0	7	14	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	8.95	1.16	21	0	0	0	0	0	0	0	2	5	9	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	8.35	1.06	17	0	0	0	0	0	0	0	4	5	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	9.89	2.56	19	0	0	0	0	0	0	0	0	7	4	3	2	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0
280	10.96	3.29	24	0	0	0	0	0	0	0	1	1	11	2	1	1	1	4	1	0	0	0	0	0	0	1	0	0	0	0
290	13.57	3.69	23	0	0	0	0	0	0	0	0	1	4	0	1	3	3	4	2	0	1	0	1	3	0	0	0	0	0	0
300	12.96	3.65	28	0	0	0	0	0	0	0	0	1	6	3	2	1	4	2	1	2	2	1	2	1	0	0	0	0	0	0
310	14.17	4.06	24	0	0	0	0	0	0	0	1	1	1	2	2	1	2	3	3	2	1	2	0	0	2	1	0	0	0	0
320	14.95	3.03	22	0	0	0	0	0	0	0	0	0	1	0	2	1	1	5	6	0	2	1	1	1	0	1	0	0	0	0
330	17.09	3.75	23	0	0	0	0	0	0	0	0	0	0	0	1	4	0	2	2	1	1	2	1	3	4	2	0	0	0	0
340	17.05	3.58	19	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	3	2	0	1	1	2	2	1	0	0	0
350	16.47	3.53	19	0	0	0	0	0	0	0	0	0	0	0	1	1	4	1	2	1	0	1	4	2	1	0	1	0	0	0
360	18.67	4.48	15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	1	1	1	1	0	3	0	2	1	0
370	19.36	3.32	11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	4	1	0	2	2	0	0	0
380	18.82	4.58	11	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	1	1	0	1	0	2	0	1	0	1
390	18.50	3.70	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
400	24.00	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	0	0	1	0	0
410	17.00	0.00	1	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
420	31.00	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	0	0	0	0	1
* 430	24.50	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	0.0	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	0.5
440	18.00	0.00	1	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
TOTAL	9.92	5.04	646.5	0.0	0.0	1.5	6.0	16.0	82.0	10.0	174.0	85.0	57.0	12.0	19.0	15.0	19.0	31.0	19.0	10.0	12.0	12.5	16.0	14.0	9.0	14.0	5.0	4.0	1.0	2.5

Table E-5.--Age-length keys for rock sole from age data collected during the 1988 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+
80	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
90	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
100	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
110	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
120	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
130	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
140	3.50	0.58	4	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	0
150	4.00	0.63	6	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	3.33	0.58	3	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	0
170	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
180	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
190	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
200	4.60	0.55	5	0	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
210	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
220	5.00	0.71	5	0	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
230	5.67	0.58	3	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	0
240	6.00	1.00	3	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	5.71	0.76	7	0	0	0	0	0	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	6.00	0.82	4	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	0	0
270	6.25	0.50	4	0	0	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
280	6.40	0.89	5	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	7.80	1.55	10	0	0	0	0	0	0	0	6	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	8.13	2.30	8	0	0	0	0	0	0	2	3	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	8.00	0.76	8	0	0	0	0	0	0	0	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	9.86	4.34	7	0	0	0	0	0	0	1	1	1	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
330	11.00	6.24	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
340	13.25	3.59	4	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
350	11.50	3.54	2	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	0	0
TOTAL	6.07	3.16	122	0	0	8	13	21	18	17	19	8	7	1	3	2	0	2	0	0	0	2	1	0	0	0	0	0	0	0

Table E-5.--(Cont.).

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+
70	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
80	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
90	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
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	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
120	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
130	3.40	0.55	5	0	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
140	3.00	0.71	5	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	0
150	3.40	0.89	5	0	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
160	4.00	0.63	6	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	4.20	0.45	5	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	0	0
180	4.17	0.75	6	0	0	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	4.40	0.55	5	0	0	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
200	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
210	4.50	1.00	4	0	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
220	5.33	0.52	6	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	5.20	0.45	5	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	0
240	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
250	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
260	5.29	0.49	7	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	0
270	5.80	0.84	5	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	7.25	1.26	4	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	6.50	1.73	4	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	6.86	0.38	7	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	0
310	7.67	1.00	9	0	0	0	0	0	0	0	5	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	7.89	0.60	9	0	0	0	0	0	0	0	2	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	8.11	0.60	9	0	0	0	0	0	0	0	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	8.33	1.87	9	0	0	0	0	0	0	0	3	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
350	10.63	3.58	8	0	0	0	0	0	0	0	1	2	1	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
360	10.11	1.96	9	0	0	0	0	0	0	0	0	2	2	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
370	10.44	2.01	9	0	0	0	0	0	0	0	0	1	3	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
380	12.17	3.16	12	0	0	0	0	0	0	0	0	0	2	1	4	2	0	1	0	1	0	0	0	1	0	0	0	0	0	0
390	14.25	3.33	8	0	0	0	0	0	0	0	0	0	0	0	3	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0
400	13.44	3.43	9	0	0	0	0	0	0	0	0	1	0	0	2	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0
410	14.22	3.83	9	0	0	0	0	0	0	0	0	0	0	0	1	2	4	0	0	0	0	1	0	0	0	0	1	0	0	0
420	14.83	4.62	6	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0
430	15.00	4.24	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
440	15.00	4.24	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
450	19.00	1.41	2	0	0	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
TOTAL	7.79	4.41	228	0	0	10	24	19	39	12	22	25	14	6	15	8	11	7	0	1	2	7	2	2	0	0	2	0	0	0

Table E-5.--(Cont.).

Sexes combined 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+
70	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
80	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
90	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
100	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
110	2.89	0.33	9	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	0
120	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
130	3.11	0.78	9	0	0	2	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	3.22	0.67	9	0	0	1	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	3.73	0.79	11	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	0	0
160	3.78	0.67	9	0	0	0	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	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
180	4.08	0.51	12	0	0	0	1	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	4.33	0.52	6	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	4.67	0.49	12	0	0	0	0	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	4.75	0.71	8	0	0	0	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	5.18	0.60	11	0	0	0	0	1	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	5.38	0.52	8	0	0	0	0	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	5.43	0.79	7	0	0	0	0	0	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	5.62	0.77	13	0	0	0	0	0	7	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	5.55	0.69	11	0	0	0	0	0	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	6.00	0.71	9	0	0	0	0	0	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	6.78	1.09	9	0	0	0	0	0	1	2	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	7.43	1.65	14	0	0	0	0	0	1	2	6	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	7.53	1.77	15	0	0	0	0	0	0	3	9	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	7.82	0.88	17	0	0	0	0	0	0	0	7	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	8.75	2.96	16	0	0	0	0	0	0	1	3	7	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
330	8.83	3.01	12	0	0	0	0	0	0	1	1	6	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
340	9.85	3.34	13	0	0	0	0	0	0	0	3	4	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
350	10.80	3.39	10	0	0	0	0	0	0	0	1	2	2	0	2	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
360	10.11	1.96	9	0	0	0	0	0	0	0	0	2	2	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
370	10.44	2.01	9	0	0	0	0	0	0	0	0	1	3	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
380	12.17	3.16	12	0	0	0	0	0	0	0	0	0	2	1	4	2	0	1	0	1	0	0	0	1	0	0	0	0	0	0
390	14.25	3.33	8	0	0	0	0	0	0	0	0	0	0	0	3	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0
400	13.44	3.43	9	0	0	0	0	0	0	0	0	1	0	0	2	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0
410	14.22	3.83	9	0	0	0	0	0	0	0	0	0	0	0	1	2	4	0	0	0	0	1	0	0	0	0	1	0	0	0
420	14.83	4.62	6	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0
430	15.00	4.24	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
440	15.00	4.24	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
450	19.00	1.41	2	0	0	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
TOTAL	7.19	4.10	350	0	0	18	37	40	57	29	41	33	21	7	18	10	11	9	0	1	2	9	3	2	0	0	2	0	0	0

APPENDIX F

Population Estimates by Age for Principal Species of Fish

Appendix F presents population estimates and mean lengths at age by sex and for combined sexes of fish having age data available from the 1988 bottom trawl and midwater acoustic trawl surveys.

Population estimates listed as "below minimum key length", "above maximum key length", and "between key length" are for fish lengths lacking age observations. Asterisks denote population estimates for which interpolation was used to assign numbers to an age for a fish length lacking age observations.

List of Tables

Table F-1.--Population number estimates by age for walleye pollock derived from age (years) and length data collected on the continental shelf during the 1988 bottom trawl survey.

Males

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	939,480	0.0001	939,480	0.0001	84.16	8.15
1	117,775,920	0.0183	118,715,400	0.0184	149.41	21.11
2	277,936,916	0.0431	396,652,316	0.0615	254.18	39.53
3	683,794,400	0.1061	1,080,446,717	0.1676	365.69	36.25
4	1,261,186,288	0.1956	2,341,633,005	0.3632	383.54	38.14
5	554,163,219	0.0860	2,895,796,224	0.4492	413.25	33.58
6	1,719,060,629	0.2666	4,614,856,853	0.7158	433.32	29.10
7	540,248,255	0.0838	5,155,105,108	0.7996	456.31	35.51
8	466,792,755	0.0724	5,621,897,863	0.8720	490.98	38.12
9	222,056,274	0.0344	5,843,954,137	0.9064	516.91	28.88
* 10	523,823,226	0.0812	6,367,777,363	0.9877	525.94	43.06
* 11	26,582,509	0.0041	6,394,359,873	0.9918	583.89	50.56
* 12	33,179,715	0.0051	6,427,539,588	0.9970	570.04	51.49
13	2,959,924	0.0005	6,430,499,512	0.9974	560.00	0.00
14	12,878,456	0.0020	6,443,377,968	0.9994	516.36	68.25
15	1,901,989	0.0003	6,445,279,956	0.9997	610.00	0.00
Above Maximum Key Length	1,879,146	0.0003	6,447,159,102	1.0000	735.39	13.21
Total	6,447,159,102	1.0000	6,447,159,102	1.0000	419.92	80.09

Table F-1.--(Cont.).

Females

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	590,005	0.0001	590,005	0.0001	86.91	4.62
* 1	91,543,831	0.0159	92,133,837	0.0160	152.64	20.96
* 2	182,504,923	0.0318	274,638,759	0.0478	245.76	39.06
3	518,239,567	0.0903	792,878,326	0.1381	360.27	56.61
4	1,037,053,163	0.1806	1,829,931,489	0.3187	389.62	34.42
5	458,296,901	0.0798	2,288,228,390	0.3986	428.58	38.57
6	1,609,033,656	0.2803	3,897,262,045	0.6788	444.55	34.59
7	463,421,308	0.0807	4,360,683,353	0.7595	464.48	38.18
8	324,884,608	0.0566	4,685,567,962	0.8161	505.02	40.61
9	249,742,562	0.0435	4,935,310,523	0.8596	517.18	38.35
* 10	650,580,198	0.1133	5,585,890,721	0.9729	565.77	51.79
* 11	92,893,197	0.0162	5,678,783,918	0.9891	589.00	66.07
12	37,566,268	0.0065	5,716,350,186	0.9957	599.92	46.89
13	12,366,949	0.0022	5,728,717,135	0.9978	673.38	38.57
14	4,114,226	0.0007	5,732,831,362	0.9985	580.00	0.00
15	746,679	0.0001	5,733,578,040	0.9987	700.00	0.00
16	4,426,407	0.0008	5,738,004,447	0.9994	628.79	21.22
18	2,129,205	0.0004	5,740,133,652	0.9998	650.00	0.00
Above Maximum Key Length	1,137,557	0.0002	5,741,271,209	1.0000	821.34	10.35
Total	5,741,271,208	1.0000	5,741,271,209	1.0000	440.93	91.30

Table F-l.--(Cont.).

Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	16,653,281	0.0085	16,653,281	0.0085	87.96	4.68
1	1,800,716,164	0.9224	1,817,369,445	0.9309	137.10	18.79
2	132,378,151	0.0678	1,949,747,596	0.9987	192.69	20.20
3	2,551,586	0.0013	1,952,299,182	1.0000	231.19	4.74
Total	1,952,299,182	1.0000	1,952,299,182	1.0000	140.58	24.15

Table F-1.--(Cont.).

Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	18,182,766	0.0013	18,182,766	0.0013	87.73	4.99
* 1	2,010,035,915	0.1421	2,028,218,681	0.1434	138.53	19.50
* 2	592,819,990	0.0419	2,621,038,671	0.1854	237.86	43.51
3	1,204,585,553	0.0852	3,825,624,224	0.2705	363.07	46.57
4	2,298,239,451	0.1625	6,123,863,675	0.4331	386.28	36.64
5	1,012,460,120	0.0716	7,136,323,795	0.5047	420.19	36.73
6	3,328,094,285	0.2354	10,464,418,080	0.7400	438.75	32.36
7	1,003,669,563	0.0710	11,468,087,643	0.8110	460.09	36.99
8	791,677,363	0.0560	12,259,765,006	0.8670	496.74	39.77
9	471,798,836	0.0334	12,731,563,843	0.9003	517.05	34.22
* 10	1,174,403,424	0.0831	13,905,967,266	0.9834	548.00	52.01
* 11	119,475,706	0.0084	14,025,442,973	0.9918	587.86	62.99
* 12	70,745,983	0.0050	14,096,188,956	0.9969	585.90	51.31
13	15,326,873	0.0011	14,111,515,829	0.9979	651.49	56.60
14	16,992,682	0.0012	14,128,508,511	0.9991	531.77	65.38
15	2,648,667	0.0002	14,131,157,178	0.9993	635.37	40.49
16	4,426,407	0.0003	14,135,583,585	0.9996	628.79	21.22
18	2,129,205	0.0002	14,137,712,790	0.9998	650.00	0.00
Above Maximum Key Length	3,016,703	0.0002	14,140,729,492	1.0000	767.80	43.41
Total	14,140,729,492	1.0000	14,140,729,492	1.0000	389.88	128.22

Table F-2.--Population number estimates by age for walleye pollock derived from age (years) and length data collected during the slope portion of the 1988 bottom trawl survey.

Males

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
3	11,194,004	0.1286	11,194,004	0.1286	412.78	23.77
4	9,055,154	0.1040	20,249,158	0.2327	429.52	19.38
5	8,880,503	0.1020	29,129,661	0.3347	441.24	18.75
6	33,346,784	0.3832	62,476,445	0.7179	461.54	27.76
7	5,886,480	0.0676	68,362,925	0.7855	480.95	30.23
8	1,371,323	0.0158	69,734,248	0.8013	521.24	12.52
9	4,048,810	0.0465	73,783,059	0.8478	487.43	22.73
10	12,954,616	0.1489	86,737,675	0.9967	501.33	23.22
11	179,682	0.0021	86,917,357	0.9987	580.00	0.00
Above Maximum Key Length	110,852	0.0013	87,028,209	1.0000	612.34	16.40
Total	87,028,209	1.0000	87,028,209	1.0000	459.68	38.33

Table F-2.--(Cont.).

Females

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	125,927	0.0014	125,927	0.0014	334.86	33.21
* 3	8,649,176	0.0992	8,775,102	0.1007	417.56	17.53
* 4	10,432,166	0.1197	19,207,268	0.2203	427.98	21.48
* 5	4,607,536	0.0529	23,814,804	0.2732	431.90	28.95
6	36,182,572	0.4150	59,997,376	0.6882	468.55	23.69
7	3,777,704	0.0433	63,775,079	0.7315	503.64	12.54
8	5,005,991	0.0574	68,781,070	0.7890	522.13	10.33
9	1,779,086	0.0204	70,560,156	0.8094	517.76	27.65
10	13,157,814	0.1509	83,717,970	0.9603	528.51	31.10
* 11	887,612	0.0102	84,605,582	0.9705	556.03	27.15
12	21,454	0.0002	84,627,036	0.9707	641.19	32.16
* 13	1,055,391	0.0121	85,682,427	0.9828	548.48	32.80
14	141,423	0.0016	85,823,850	0.9845	580.00	0.00
15	1,303,267	0.0149	87,127,117	0.9994	520.00	0.00
Between Key Length	50,613	0.0006	87,177,730	1.0000	667.10	8.46
Above Maximum Key Length	1,610	0.0000	87,179,340	1.0000	700.00	0.00
Total	87,179,340	1.0000	87,179,340	1.0000	474.13	46.23

Table F-2.--(Cont.).

Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	102,317	1.0000	102,317	1.0000	141.43	30.43
Total	102,317	1.0000	102,317	1.0000	141.43	30.43

Table F-2.--(Cont.).

Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	228,244	0.0013	228,244	0.0013	248.15	101.38
* 3	19,843,180	0.1138	20,071,424	0.1151	414.86	21.41
* 4	19,487,320	0.1118	39,558,744	0.2269	428.70	20.54
* 5	13,488,038	0.0774	53,046,782	0.3043	438.05	23.18
6	69,529,356	0.3989	122,576,138	0.7032	465.19	25.96
7	9,664,184	0.0554	132,240,322	0.7587	489.82	27.22
8	6,377,314	0.0366	138,617,636	0.7952	521.94	10.85
9	5,827,896	0.0334	144,445,532	0.8287	496.69	28.06
10	26,112,430	0.1498	170,557,962	0.9785	515.02	30.65
* 11	1,067,293	0.0061	171,625,255	0.9846	560.07	26.33
12	21,454	0.0001	171,646,710	0.9847	641.19	32.16
* 13	1,055,391	0.0061	172,702,101	0.9908	548.48	32.80
14	141,423	0.0008	172,843,524	0.9916	580.00	0.00
15	1,303,267	0.0075	174,146,791	0.9991	520.00	0.00
Between Key Lengths	50,613	0.0003	174,197,404	0.9994	667.10	8.46
Above Maximum Key Length	112,462	0.0006	174,309,865	1.0000	613.59	19.32
Total	174,309,865	1.0000	174,309,865	1.0000	466.72	43.79

Table F-3. --Population number estimates by age for walleye pollock from age and length data collected during the 1988 midwater trawl survey'.

Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion
1	10,854,740	0.0009	10,854,740	0.0009
2	1,111,930,892	0.0905	1,122,785,632	0.0913
3	3,585,686,686	0.2917	4,708,472,318	0.3831
4	3,864,336,402	0.3144	8,572,808,719	0.6974
5	739,410,446	0.0602	9,312,219,165	0.7576
6	1,881,677,044	0.1531	11,193,896,209	0.9107
7	403,364,650	0.0328	11,597,260,859	0.9435
8	151,347,569	0.0123	11,748,608,427	0.9558
9	129,528,647	0.0105	11,878,137,074	0.9663
10	254,519,025	0.0207	12,132,656,099	0.9871
11	50,039,069	0.0041	12,182,695,168	0.9911
12	35,789,670	0.0029	12,218,484,838	0.9940
13	7,014,044	0.0006	12,225,498,882	0.9946
14	20,881,103	0.0017	12,246,379,985	0.9963
15	15,318,066	0.0012	12,261,698,051	0.9976
16	28,104,529	0.0023	12,289,802,580	0.9998
17	2,002,864	0.0002	12,291,805,444	1.0000
TOTAL	12,291,805,444	1.0000	12,291,805,444	1.0000

'Mean length by age are not presented in this table because of ageing problems discussed in the methods section of this report.

Table F-4.--Population number estimates by age for Pacific cod from age (years) and length data collected during the 1988 bottom trawl survey.

Males

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	2,772,216	0.0103	2,772,216	0.0103	141.96	9.15
* 1	18,284,750	0.0677	21,056,965	0.0780	242.61	44.15
* 2	27,549,162	0.1021	48,606,128	0.1801	332.62	45.35
3	53,175,399	0.1970	101,781,527	0.3770	395.21	45.67
4	66,721,356	0.2472	168,502,883	0.6242	490.83	38.95
5	50,733,701	0.1879	219,236,585	0.8121	576.09	37.23
6	18,742,191	0.0694	237,978,776	0.8815	644.69	36.22
* 7	10,996,497	0.0407	248,975,273	0.9223	699.41	50.12
* 8	5,793,464	0.0215	254,768,737	0.9437	744.94	30.67
* 9	3,549,270	0.0131	258,318,007	0.9569	740.03	33.10
10	2,311,610	0.0086	260,629,617	0.9654	785.91	29.22
11	3,846,082	0.0142	264,475,699	0.9797	795.19	45.57
* 12	1,093,555	0.0041	265,569,254	0.9837	755.11	16.74
Between Key Length	4,214,731	0.0156	269,783,985	0.9994	858.79	25.32
Above Maximum Key Length	172,663	0.0006	269,956,648	1.0000	973.27	21.69
Total	269,956,648	1.0000	269,956,648	1.0000	493.37	151.76

Table F-4.--(Cont.).

Females

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	229,386	0.0008	229,386	0.0008	126.24	9.94
* 1	12,973,236	0.0479	13,202,622	0.0488	242.64	33.48
2	36,827,494	0.1360	50,030,116	0.1847	348.30	49.35
3	56,088,142	0.2071	106,118,259	0.3919	407.88	59.01
4	58,325,198	0.2154	164,443,456	0.6072	502.15	45.89
5	47,571,355	0.1757	212,014,812	0.7829	586.92	35.91
6	16,501,465	0.0609	228,516,277	0.8438	633.36	55.26
7	11,864,527	0.0438	240,380,804	0.8877	697.40	43.19
8	9,068,441	0.0335	249,449,245	0.9211	745.68	35.92
9	6,130,264	0.0226	255,579,509	0.9438	770.10	28.87
10	2,238,281	0.0083	257,817,790	0.9521	795.59	27.24
11	3,153,938	0.0116	260,971,727	0.9637	824.19	27.78
12	523,315	0.0019	261,495,043	0.9656	840.00	0.00
13	320,869	0.0012	261,815,912	0.9668	780.00	0.00
14	725,093	0.0027	262,541,005	0.9695	820.00	0.00
Between Key Length	4,761,826	0.0176	267,302,831	0.9871	584.98	336.03
Above Maximum Key Length	3,499,410	0.0129	270,802,242	1.0000	959.99	47.61
Total	270,802,242	1.0000	270,802,242	1.0000	510.00	159.42

Table F-4.--(Cont.).

Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	1,991,699	0.4468	1,991,699	0.4468	113.05	18.49
* 1	1,632,228	0.3661	3,623,927	0.8129	154.41	19.30
2	101,058	0.0227	3,724,985	0.8356	368.42	39.90
3	333,675	0.0749	4,058,660	0.9105	381.56	50.49
4	111,977	0.0251	4,170,637	0.9356	469.49	59.22
5	108,018	0.0242	4,278,655	0.9598	578.69	23.59
6	62,925	0.0141	4,341,580	0.9739	630.80	19.74
7	47,580	0.0107	4,389,160	0.9846	711.03	31.09
8	16,379	0.0037	4,405,539	0.9883	730.00	0.00
9	29,299	0.0066	4,434,838	0.9948	740.34	41.28
10	5,755	0.0013	4,440,593	0.9961	820.00	0.00
11	11,510	0.0026	4,452,102	0.9987	820.00	0.00
14	5,755	0.0013	4,457,857	1.0000	820.00	0.00
Total	4,457,857	1.0000	4,457,857	1.0000	198.05	153.40

Table F-4.--(Cont.).

Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	4,993,301	0.0092	4,993,301	0.0092	129.71	19.55
* 1	32,890,213	0.0603	37,883,514	0.0695	238.25	43.72
* 2	64,477,715	0.1183	102,361,229	0.1877	341.63	48.31
3	109,597,217	0.2010	211,958,446	0.3888	401.65	53.32
4	125,158,531	0.2296	337,116,977	0.6183	496.09	42.73
5	98,413,074	0.1805	435,530,051	0.7988	581.33	36.98
6	35,306,582	0.0648	470,836,633	0.8636	639.37	46.44
* 7	22,908,604	0.0420	493,745,237	0.9056	698.39	46.64
* 8	14,878,284	0.0273	508,623,520	0.9329	745.38	33.96
* 9	9,708,833	0.0178	518,332,354	0.9507	759.02	33.80
10	4,555,646	0.0084	522,888,000	0.9590	790.71	28.68
11	7,011,529	0.0129	529,899,529	0.9719	808.27	41.16
* 12	1,616,870	0.0030	531,516,399	0.9749	782.58	42.04
13	320,869	0.0006	531,837,268	0.9755	780.00	0.00
14	730,848	0.0013	532,568,116	0.9768	820.00	0.00
Between Key Length	8,976,557	0.0165	541,544,673	0.9933	713.54	280.84
Above Maximum Key Length	3,672,074	0.0067	545,216,747	1.0000	960.62	46.80
Total	545,216,747	1.0000	545,216,747	1.0000	499.21	158.23

Table F-5.--Population number estimates by age for yellowfin sole from age (years) and length data collected during the 1988 bottom trawl survey.

Males

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	381,613	0.0001	381,613	0.0001	80.00	0.00
3	2,396,090	0.0004	2,777,703	0.0005	93.06	4.61
4	17,972,996	0.0032	20,750,699	0.0038	114.72	6.10
5	517,776,235	0.0936	538,526,934	0.0974	161.79	27.00
6	64,328,144	0.0116	602,855,078	0.1090	186.49	26.47
7	1,562,359,057	0.2825	2,165,214,135	0.3914	191.66	28.39
8	748,003,779	0.1352	2,913,217,913	0.5267	229.15	25.85
9	587,097,521	0.1061	3,500,315,434	0.6328	258.51	30.52
10	102,535,028	0.0185	3,602,850,462	0.6514	278.44	17.86
11	227,478,125	0.0411	3,830,328,588	0.6925	285.47	23.32
12	33,218,608	0.0060	3,863,547,196	0.6985	300.00	0.00
* 13	217,173,690	0.0393	4,080,720,886	0.7378	300.15	14.67
* 14	415,539,747	0.0751	4,496,260,633	0.8129	299.24	19.51
15	236,058,102	0.0427	4,732,318,735	0.8556	311.79	15.17
16	33,218,608	0.0060	4,765,537,344	0.8616	300.00	0.00
17	139,934,753	0.0253	4,905,472,097	0.8869	301.54	10.87
18	121,083,580	0.0219	5,026,555,677	0.9088	304.13	18.73
* 19	127,744,759	0.0231	5,154,300,436	0.9318	310.24	21.78
* 20	161,022,543	0.0291	5,315,322,979	0.9610	313.49	20.64
21	144,949,794	0.0262	5,460,272,773	0.9872	320.19	11.79
22	50,512,846	0.0091	5,510,785,619	0.9963	327.46	9.67
23	18,833,106	0.0034	5,529,618,725	0.9997	340.00	0.00
Above Maximum Key Length	1,647,776	0.0003	5,531,266,501	1.0000	384.99	7.79
Total	5,531,266,501	1.0000	5,531,266,501	1.0000	241.60	59.18

Table F-5 .--(Cont.).

Females

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
3	1,894,321	0.0003	1,894,321	0.0003	94.64	4.99
4	17,297,689	0.0023	19,192,010	0.0026	113.87	6.64
5	381,284,578	0.0509	400,476,589	0.0535	150.00	22.01
6	92,744,460	0.0124	493,221,048	0.0659	178.66	25.96
7	1,899,804,828	0.2538	2,393,025,877	0.3197	199.06	32.55
8	953,096,788	0.1273	3,346,122,665	0.4470	226.04	43.40
9	753,108,932	0.1006	4,099,231,597	0.5476	270.87	31.43
10	224,588,611	0.0300	4,323,820,208	0.5776	290.70	20.59
11	294,023,674	0.0393	4,617,843,881	0.6169	297.79	37.16
12	429,338,783	0.0574	5,047,182,664	0.6742	317.46	22.24
13	267,581,444	0.0357	5,314,764,108	0.7100	324.49	25.95
14	445,633,848	0.0595	5,760,397,956	0.7695	324.85	22.37
15	335,267,867	0.0448	6,095,665,823	0.8143	320.12	17.61
16	269,390,157	0.0360	6,365,055,980	0.8503	326.97	17.80
17	210,796,590	0.0282	6,575,852,570	0.8784	333.09	21.58
* 18	148,833,294	0.0199	6,724,685,864	0.8983	331.66	24.17
19	193,826,282	0.0259	6,918,512,146	0.9242	343.78	23.16
20	135,867,833	0.0181	7,054,379,979	0.9424	329.09	29.44
21	89,228,554	0.0119	7,143,608,533	0.9543	338.01	7.71
22	236,512,769	0.0316	7,380,121,302	0.9859	333.97	25.91
23	45,836,947	0.0061	7,425,958,249	0.9920	364.32	13.89
24	41,279,740	0.0055	7,467,237,989	0.9975	373.41	17.46
25	12,386,993	0.0017	7,479,624,982	0.9992	360.00	0.00
27	5,336,444	0.0007	7,484,961,426	0.9999	380.00	0.00
* 31	896,256	0.0001	7,485,857,682	1.0000	423.37	4.73
Total	7,485,857,682	1.0000	7,485,857,682	1.0000	262.99	68.35

Table F-5.--(Cont.).

Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
2	843,893	0.0670	843,893	0.0670	70.00	0.00
5	248,393	0.0197	1,092,286	0.0867	201.19	8.08
6	130,797	0.0104	1,223,083	0.0970	202.44	11.97
7	2,837,317	0.2251	4,060,400	0.3222	208.25	22.51
8	1,487,956	0.1181	5,548,357	0.4402	229.55	31.38
9	1,090,348	0.0865	6,638,704	0.5267	261.64	33.94
10	232,931	0.0185	6,871,635	0.5452	291.10	16.54
11	421,804	0.0335	7,293,439	0.5787	305.02	34.02
12	320,316	0.0254	7,613,755	0.6041	313.74	24.36
13	579,387	0.0460	8,193,142	0.6501	332.11	30.45
14	859,522	0.0682	9,052,664	0.7182	333.30	35.54
15	528,424	0.0419	9,581,089	0.7602	323.20	21.36
16	204,642	0.0162	9,785,730	0.7764	326.87	26.44
17	242,439	0.0192	10,028,170	0.7956	323.48	26.58
18	409,786	0.0325	10,437,956	0.8282	345.73	37.47
19	741,815	0.0589	11,179,771	0.8870	356.92	26.11
20	403,982	0.0321	11,583,753	0.9191	337.64	28.65
21	194,004	0.0154	11,777,757	0.9345	329.02	15.06
22	385,010	0.0305	12,162,767	0.9650	353.04	25.01
23	301,434	0.0239	12,464,201	0.9889	374.61	14.32
24	85,818	0.0068	12,550,019	0.9957	365.08	8.71
25	32,000	0.0025	12,582,018	0.9983	360.00	0.00
27	21,818	0.0017	12,603,836	1.0000	380.00	0.00
Total	12,603,837	1.0000	12,603,836	1.0000	265.94	82.14

Table F-5.--(Cont.).
Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	381,613	0.0000	381,613	0.0000	80.00	0.00
2	843,893	0.0001	1,225,506	0.0001	70.00	0.00
3	4,290,411	0.0003	5,515,917	0.0004	93.76	4.84
4	35,270,685	0.0027	40,786,602	0.0031	114.30	6.38
5	899,309,206	0.0690	940,095,808	0.0722	156.80	25.68
6	157,203,401	0.0121	1,097,299,209	0.0842	181.89	26.45
7	3,465,001,202	0.2659	4,562,300,412	0.3501	195.73	30.96
8	1,702,588,524	0.1307	6,264,888,935	0.4808	227.41	36.76
9	1,341,296,800	0.1029	7,606,185,735	0.5838	265.45	31.64
10	327,356,570	0.0251	7,933,542,305	0.6089	286.86	20.57
11	521,923,602	0.0401	8,455,465,908	0.6489	292.42	32.45
12	462,877,708	0.0355	8,918,343,616	0.6845	316.20	21.90
* 13	485,334,520	0.0372	9,403,678,136	0.7217	313.61	24.81
* 14	862,033,118	0.0662	10,265,711,254	0.7879	312.51	24.64
15	571,854,393	0.0439	10,837,565,647	0.8318	316.69	17.15
16	302,813,407	0.0232	11,140,379,054	0.8550	324.01	18.80
17	350,973,782	0.0269	11,491,352,836	0.8819	320.50	23.78
* 18	270,326,661	0.0207	11,761,679,497	0.9027	319.35	25.87
* 19	322,312,856	0.0247	12,083,992,353	0.9274	330.52	27.97
* 20	297,294,358	0.0228	12,381,286,711	0.9502	320.66	26.24
21	234,372,352	0.0180	12,615,659,063	0.9682	326.98	13.55
22	287,410,625	0.0221	12,903,069,688	0.9903	332.85	24.00
23	64,971,487	0.0050	12,968,041,175	0.9953	357.32	16.12
24	41,365,557	0.0032	13,009,406,733	0.9984	373.39	17.45
25	12,418,992	0.0010	13,021,825,725	0.9994	360.00	0.00
27	5,358,262	0.0004	13,027,183,988	0.9998	380.00	0.00
* 31	896,256	0.0001	13,028,080,243	0.9999	423.37	4.73
Above Maximum Key Length	1,647,776	0.0001	13,029,728,020	1.0000	384.99	7.79
Total	13,029,728,020	1.0000	13,029,728,020	1.0000	253.91	65.49

Table F-6.--Population number estimates by age for rock sole from age (years) and length data collected during the 1988 bottom trawl survey.

Males

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	4,764,776	0.0010	4,764,776	0.0010	68.80	3.64
2	226,903,949	0.0461	231,668,725	0.0471	114.83	16.69
3	544,990,865	0.1108	776,659,590	0.1579	134.99	20.26
4	1,171,716,105	0.2383	1,948,375,695	0.3962	172.92	21.94
5	970,086,022	0.1973	2,918,461,717	0.5934	222.02	25.31
6	823,092,344	0.1674	3,741,554,061	0.7608	254.73	26.25
7	666,075,462	0.1354	4,407,629,523	0.8963	279.55	21.98
8	201,099,552	0.0409	4,608,729,076	0.9371	302.69	10.65
9	134,885,143	0.0274	4,743,614,218	0.9646	313.54	11.69
10	5,706,963	0.0012	4,749,321,181	0.9657	340.00	0.00
11	51,790,496	0.0105	4,801,111,678	0.9763	309.76	13.71
12	59,049,042	0.0120	4,860,160,719	0.9883	295.46	4.98
14	10,285,434	0.0021	4,870,446,154	0.9904	344.45	4.97
18	22,688,551	0.0046	4,893,134,705	0.9950	332.52	4.34
19	13,859,964	0.0028	4,906,994,669	0.9978	320.00	0.00
Above Maximum Key Length	10,847,478	0.0022	4,917,842,146	1.0000	378.76	28.72
Total	4,917,842,146	1.0000	4,917,842,146	1.0000	217.99	62.43

Table F-6.--(Cont.).

Females

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	429,183	0.0001	429,183	0.0001	45.00	5.00
2	133,444,943	0.0252	133,874,127	0.0253	115.39	22.07
3	763,061,169	0.1442	896,935,296	0.1696	141.63	25.96
4	697,135,546	0.1318	1,594,070,842	0.3013	168.18	21.02
5	1,499,606,961	0.2835	3,093,677,803	0.5848	223.40	31.51
6	424,255,811	0.0802	3,517,933,614	0.6650	260.19	26.72
7	514,255,320	0.0972	4,032,188,934	0.7622	302.61	24.26
8	444,658,880	0.0841	4,476,847,814	0.8463	332.03	17.65
9	258,609,846	0.0489	4,735,457,660	0.8952	330.42	34.41
10	79,254,031	0.0150	4,814,711,691	0.9101	352.79	30.50
11	157,617,173	0.0298	4,972,328,864	0.9399	373.13	17.22
12	54,369,813	0.0103	5,026,698,677	0.9502	392.85	28.42
13	88,964,318	0.0168	5,115,662,995	0.9670	374.80	27.62
14	63,650,355	0.0120	5,179,313,350	0.9791	381.51	18.00
16	8,180,038	0.0015	5,187,493,387	0.9806	380.00	0.00
17	14,054,682	0.0027	5,201,548,070	0.9833	399.65	14.01
18	52,405,048	0.0099	5,253,953,118	0.9932	390.06	34.63
19	15,974,187	0.0030	5,269,927,305	0.9962	394.03	4.91
20	10,356,369	0.0020	5,280,283,674	0.9981	394.71	28.52
23	7,713,228	0.0015	5,287,996,901	0.9996	415.86	4.93
Above Maximum Key Length	2,076,283	0.0004	5,290,073,184	1.0000	468.03	11.61
Total	5,290,073,184	1.0000	5,290,073,184	1.0000	242.78	82.38

Table F-6.--(Cont.).

Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	1,209,713	0.0066	1,209,713	0.0066	60.00	0.00
2	68,727,222	0.3745	69,936,935	0.3811	97.39	16.38
3	103,801,070	0.5657	173,738,005	0.9468	110.68	12.20
4	9,522,510	0.0519	183,260,516	0.9987	134.11	6.03
5	244,005	0.0013	183,504,521	1.0000	150.29	1.67
Total	183,504,521	1.0000	183,504,521	1.0000	106.63	16.85

Table F-6.--(Cont.).

Males, Females, and Unsexed

Age Class	Number	Proportion	Cumulative Number	Cumulative Proportion	Mean Length	Std. Dev. of Length
Below Minimum Key Length	6,403,673	0.0006	6,403,673	0.0006	65.55	7.32
2	429,076,114	0.0413	435,479,787	0.0419	112.21	19.59
3	1,411,853,104	0.1359	1,847,332,891	0.1778	136.79	24.45
4	1,878,374,161	0.1808	3,725,707,052	0.3585	170.96	21.83
5	2,469,936,989	0.2377	6,195,644,041	0.5962	222.85	29.25
6	1,247,348,155	0.1200	7,442,992,196	0.7163	256.59	26.54
7	1,180,330,782	0.1136	8,623,322,978	0.8299	289.60	25.68
8	645,758,433	0.0621	9,269,081,411	0.8920	322.89	20.84
9	393,494,988	0.0379	9,662,576,399	0.9299	324.63	29.82
10	84,960,994	0.0082	9,747,537,394	0.9380	351.94	29.63
11	209,407,669	0.0202	9,956,945,063	0.9582	357.46	31.89
12	113,418,855	0.0109	10,070,363,918	0.9691	342.14	52.61
13	88,964,318	0.0086	10,159,328,235	0.9777	374.80	27.62
14	73,935,789	0.0071	10,233,264,024	0.9848	376.35	21.14
16	8,180,038	0.0008	10,241,444,062	0.9856	380.00	0.00
17	14,054,682	0.0014	10,255,498,745	0.9869	399.65	14.01
18	75,093,599	0.0072	10,330,592,344	0.9941	372.67	39.26
19	29,834,151	0.0029	10,360,426,494	0.9970	359.64	37.10
20	10,356,369	0.0010	10,370,782,863	0.9980	394.71	28.52
23	7,713,228	0.0007	10,378,496,091	0.9988	415.86	4.93
Above Maximum Key Length	12,923,761	0.0012	10,391,419,852	1.0000	393.10	42.29
Total	10,391,419,852	1.0000	10,391,419,852	1.0000	228.64	75.65