



**Alaska  
Fisheries Science  
Center**

National Marine  
Fisheries Service

U.S. DEPARTMENT OF COMMERCE

## **AFSC PROCESSED REPORT 2000-05**

### **1999 Bottom Trawl Survey of the Eastern Bering Sea Continental Shelf**

October 2000

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1999 BOTTOM TRAWL SURVEY OF THE EASTERN BERING SEA  
CONTINENTAL SHELF

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## ABSTRACT

The Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center conducts annual bottom trawl surveys to monitor the condition of the demersal fish and crab stocks of the eastern Bering Sea continental shelf. The standard study area, surveyed each year since 1979, encompasses a major portion of the eastern Bering Sea shelf between the 20-m and the 200-m isobaths and from the Alaska Peninsula north to approximately the latitude of St. Matthew Island ( $60^{\circ} 50' N$ ). In 1999, this area was again surveyed by two chartered trawlers, the 40-m F/V *Arcturus* and the 40-m F/V *Aldebaran*.

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

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

Appendices provide station data, species listings, and detailed results of analyses of abundance and biological data of the sampled populations.



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## INTRODUCTION

The eastern Bering Sea continental shelf supports one of the most productive groundfish fisheries in the world (Bakkala 1993). Since 1970, annual commercial catches of groundfish have ranged from 1.2 to 2.2 million metric tons (t) (North Pacific Fishery Management Council 1998). Although many species are caught commercially, the most abundant has been walleye pollock (*Theragra chalcogramma*), which, since 1970, has comprised more than 70% of the total landings. The next most abundant species have been yellowfin sole (*Limanda asper*) and Pacific cod (*Gadus macrocephalus*) which have comprised 8% and 5%, respectively, of the commercial landings.

Since 1971, the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC) has conducted annual bottom trawl surveys of the eastern Bering Sea continental shelf. In 1975, the first large-scale survey of the eastern Bering Sea shelf was conducted under contract from the Bureau of Land Management in response to a need for baseline data to assess the potential impact of proposed offshore oil exploration and development on fishery resources (Pereyra et al. 1976). During this baseline survey, sampling was conducted over the eastern Bering Sea shelf between the 20-m and 200-m isobaths and from the Alaska Peninsula north to approximately 62°N. In subsequent years, the areal coverage of the annual surveys was reduced, until 1979 when the most comprehensive survey of the Bering Sea shelf was undertaken in cooperation with the Japan Fisheries Agency (Bakkala and Wakabayashi 1985). The 1979 survey encompassed the entire region sampled in the 1975 baseline study, and in addition, the continental slope waters between the Aleutian Islands and the U.S.-U.S.S.R. Convention Line, and the shelf region between St. Matthew and St. Lawrence Islands. A

hydroacoustic survey was also conducted in 1979 to assess the midwater component of the walleye pollock population. Subsequent annual bottom trawl surveys have essentially resampled the stations established during the 1975 survey, with slight modifications each year. This region encompasses the major portion of economically important eastern Bering Sea groundfish populations, except those primarily located in continental slope waters. Every third year, through 1991 (1979, 1982, 1985, 1988, 1991) an extended survey was conducted, including hydroacoustic assessment of midwater pollock, bottom trawl sampling of the continental slope (the continental slope was not surveyed in 1994 or 1997), and bottom trawl sampling in the region between St. Matthew and St. Lawrence Islands. The information gathered by the annual surveys serves to: 1) provide the North Pacific Fishery Management Council with annual fishery-independent estimates of abundance and biological condition of commercially exploited stocks, 2) provide distribution and abundance information to commercial fishermen, and 3) develop a time-series database contributing to our understanding of the population dynamics and interactions of groundfish species.

This report presents information collected by the AFSC in the eastern Bering Sea during the 1999 bottom trawl survey. The groundfish/crab survey and several ancillary projects were conducted from 19 May to 24 July by two U.S. vessels. Detailed information on principal crab species can be found in a report by Stevens et al. (2000).

## METHODS

### Survey Area and Sampling Design

The standard station pattern for the eastern Bering Sea survey is based on a systematic 20 × 20 nautical mile grid. In areas surrounding St. Matthew and the Pribilof Islands, grid block corners were also sampled to better assess blue king crab (*Paralithodes platypus*) concentrations. The survey design pattern called for 356 stations. In 1999, 353 standard stations and 20 additional stations northwest of the standard pattern were successfully sampled (Fig. 1 and Appendix A).

Starting with the eastern stations, the two vessels fished alternate north/south lines of stations such that coverage of the survey area was similar for each vessel. This sampling design facilitated the computation of relative fishing powers (or catch efficiencies) of the two vessels. The progression from east to west was established to prevent multiple encounters of yellowfin sole, Alaska plaice (*Pleuronectes quadrituberculatus*), and perhaps other species which may be migrating eastward during the course of the survey (Smith and Bakkala 1982). Tows were usually 30 minutes in duration and fishing was limited to daylight hours. For data analysis, the survey region was divided into six subareas bounded by the 50-m, 100-m, and 200-m isobaths and by a line separating the northwest and southeast portions of the study area (Fig. 1). This stratification scheme was designed to reduce the variances of population and biomass estimates by conforming to oceanographic domains which seem related to distributions of Bering Sea fishes (Bakkala 1993). The presence of high-density sampling for blue king crab in subareas 3, 4, and 6 necessitated a further division of these subareas into high-density and standard-density

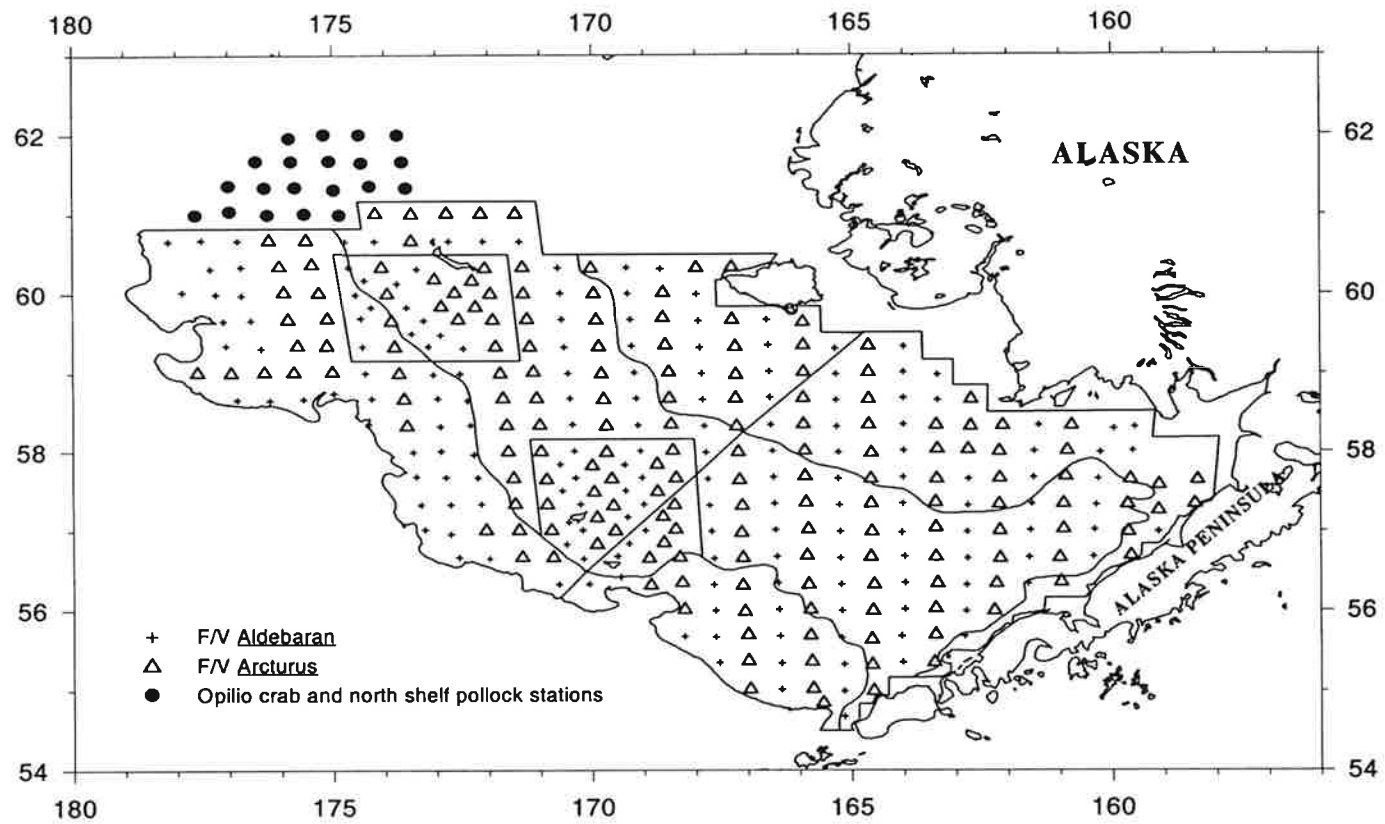


Figure 1.--Standard and special study stations sampled during the 1999 eastern Bering Sea bottom trawl survey, and stratifications used for the analysis of data.

sample strata, resulting in a total of 10 geographic strata. The overall sampling density for the entire survey area was one station per 1,313 km<sup>2</sup> (Table 1). However, because of the high-density sampling in subareas 3, 4, and 6, and the irregular subarea boundaries, sampling density among the six subareas varied from one station per 1,123 km<sup>2</sup> to one per 1,552 km<sup>2</sup>.

Table 1.--Size of subareas and strata, and sampling densities for the 1999 eastern Bering Sea bottom trawl survey (See also Fig. 1).

Subarea	Area (km <sup>2</sup> )	No. Stations successfully sampled	Sampling density (km <sup>2</sup> /stn)
1 (10)	77,871	56	1,391
2 (20)	41,027	31	1,323
3	103,300	78	1,324
(31)	94,526	69	1,370
(32)	8,774	9	975
4	107,822	96	1,123
(41)	62,703	44	1,425
(42)	24,011	31	775
(43)	21,108	21	1,005
5 (50)	38,792	25	1,552
6	94,562	67	1,411
(61)	88,134	60	1,469
(62)	6,429	7	918
Subareas Combined	463,374	353	1,313

### Vessels and Fishing Gear

The 1999 eastern Bering Sea bottom trawl survey was conducted aboard the 40-m fishing vessels F/V *Arcturus* and F/V *Aldebaran* (Table 2). As in previous years, both vessels were equipped with 83-112 eastern otter trawls which have 25.3-m (83 ft) headropes and 34.1-m (112 ft) footropes (Fig. 2). These nets were attached to tail chains with 54.9-m (30 fathoms) paired dandyline. Each lower dandyline had a 0.61-m chain extension connected to the lower wing edge to improve bottom tending characteristics. Steel "V"-doors measuring 1.8 × 2.7 m and weighing 816 kg were used.

Table 2.--Characteristics of vessels used during the 1999 eastern Bering Sea bottom trawl survey.

Vessel	Overall length (m)	Horsepower	Survey period	
			Start	Finish
F/V <i>Arcturus</i>	40	1,525	19 May	24 July
F/V <i>Aldebaran</i>	40	1,525	19 May	24 July

SCANMAR<sup>1</sup> net mensuration systems were used aboard each vessel to measure net height and width. Net width was measured by the distance between two sensors attached to the upper starboard and port dandyline, about 0.61 m in front of the net. Mean net widths were calculated from observations recorded within each tow. These data were then used to establish a net width-scope (wire-out) relationship for each vessel to enable prediction of net width for tows where net width data were not available (Fig. 3) as described by Rose and Walters (1990). Estimates of net width were used in area-swept calculations.

<sup>1</sup> Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

83/112 EASTERN

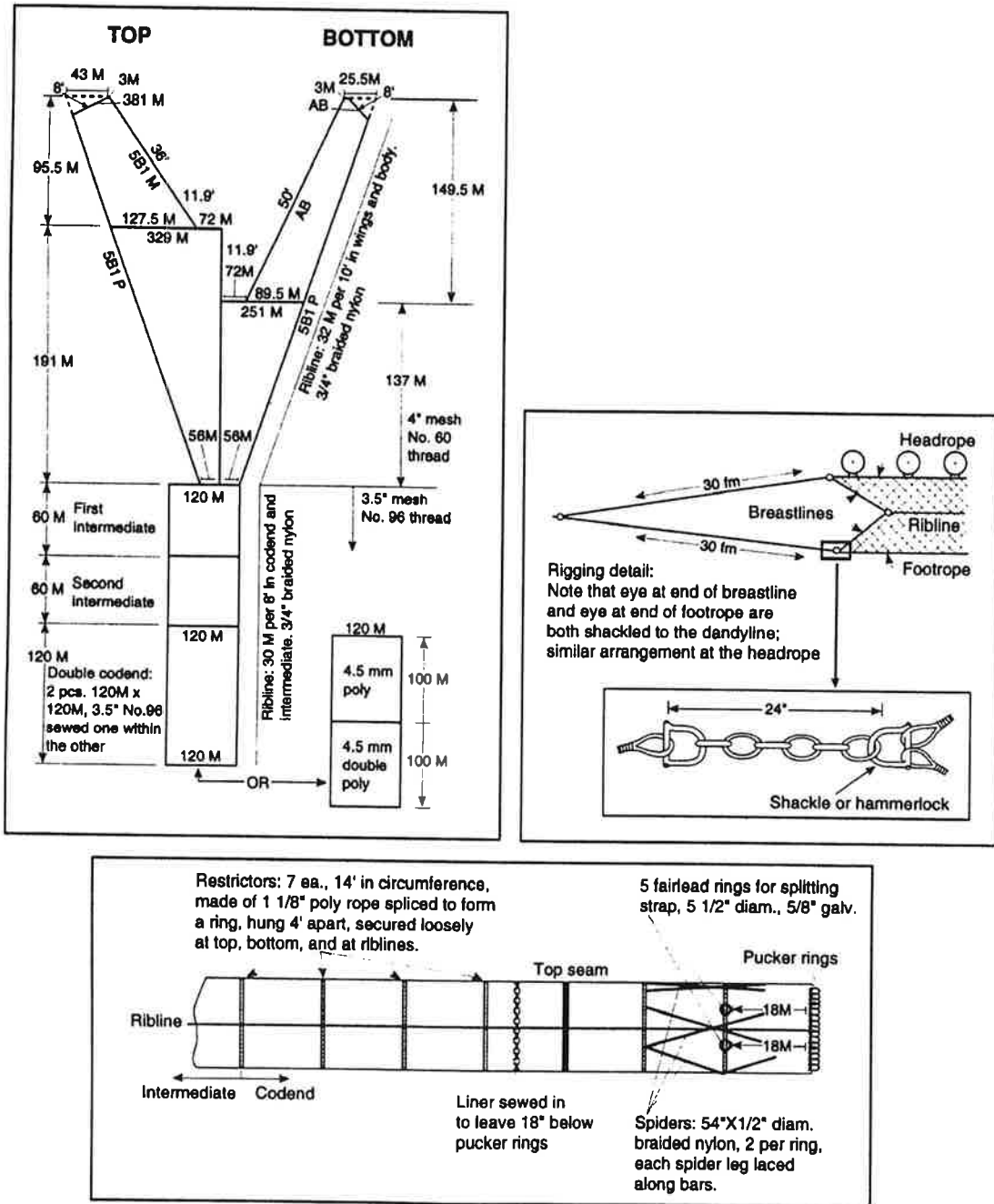


Figure 2.--Schematic diagram of trawl used during the 1999 eastern Bering Sea bottom trawl survey.

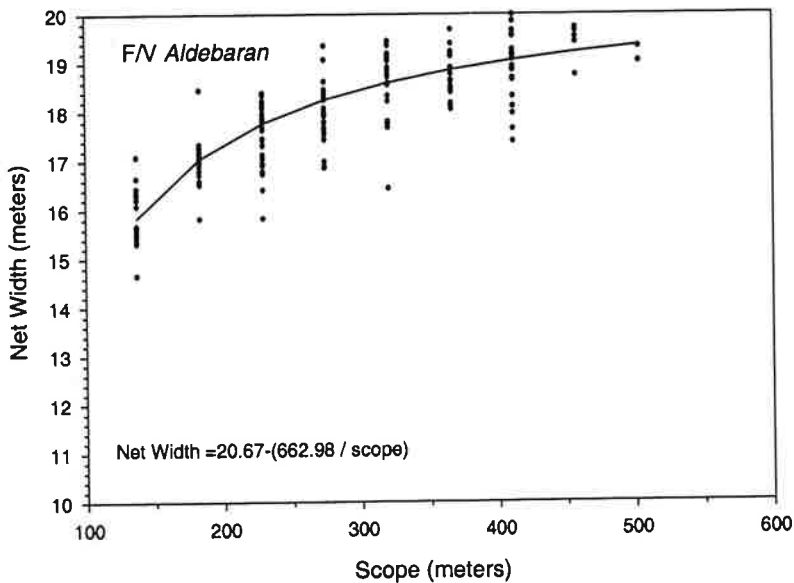
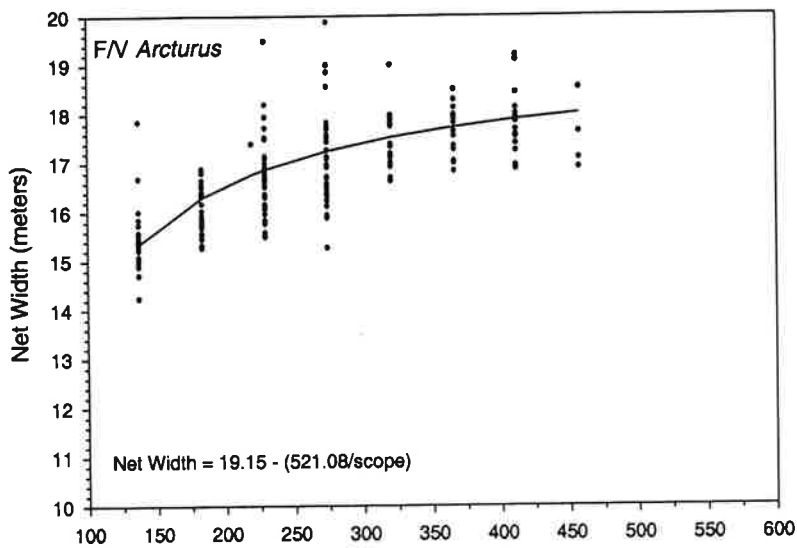


Figure 3.--Relationship between net-width and scope (wire-out) for vessels participating in the 1999 eastern Bering Sea survey.



## Data Collection

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

Samples were collected by trawling at the center of each 20 × 20 nautical mile grid block (or corner station, in the case of high-density strata) for 30 minutes (timed after the net had settled on the bottom), towing at a speed of 1.54 m/sec (3 knots). If the bottom appeared to be untrawlable at the specified location, the nearest trawlable site within the same grid square was used. If the net was ripped or "hung up" on some object on the bottom during the tow, the catch was discarded and a new sample obtained.

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

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

Sagittal otoliths were collected from nine fish species (Table 4). In both the northwestern and southeastern divisions of the survey area, three otolith pairs per sex/centimeter interval were collected for Pacific cod and rock sole spp. (*Lepidopsetta* spp.; two species are now recognized from the Bering Sea: *L. bilineata* and *L. polyxystra* Orr and Matarese (2000)), and five otolith pairs per sex/centimeter interval for all other species. Scales as well as otoliths were taken from Pacific cod to aid in age determination of young fish. Individual fish weight data were collected for all species for which otoliths were taken. In the case of *Hippoglossoides* spp., otoliths were collected only from individuals that were identified with certainty as flathead sole. Age structures for roundfish were preserved in 50% ethanol; flatfish otoliths were preserved in 50% glycerol.

Temperature profiles were taken at each station using a micro-bathythermograph (MBT) attached to the head rope of the net; surface temperatures were taken by bucket thermometer.

Table 3.--Number of length measurements taken during the 1999 eastern Bering Sea bottom trawl survey.

Species	Length measurements by subarea						Total <sup>a</sup>
	1	2	3	4	5	6	
Alaska plaice	4,051	3,035	1,903	3,754	---	226	13,024
Atka mackerel	---	---	---	---	---	1	1
Bering flounder	---	15	1	951	---	120	2,208
Dover sole	---	---	1	---	1	---	2
Greenland turbot	---	---	3	5	---	76	128
Kamchatka flounder	---	---	156	14	255	379	804
Pacific cod	715	175	3,753	3,907	233	1,670	11,183
Pacific halibut	189	103	742	301	57	198	1,612
Pacific herring	516	326	---	---	---	---	842
Pacific ocean perch	---	---	2	---	---	91	93
Sakhalin sole	---	---	---	9	---	---	244
arrowtooth flounder	14	---	1,505	539	2,845	1,488	6,391
butter sole	164	---	14	---	---	---	178
flathead sole	238	5	4,168	1,593	3,604	4,564	14,239
light dusky rockfish	---	---	6	---	2	---	8
longhead dab	1,966	608	1	1	---	---	2,576
northern rock sole	9,108	2,811	10,937	7,222	80	3,006	34,086
northern rockfish	---	---	14	---	3	---	17
prowfish	---	---	---	---	---	1	1
rex sole	1	---	164	12	462	165	804
roughey rockfish	---	---	---	1	---	---	1
sablefish	---	---	4	---	5	---	9
southern rock sole	---	---	4	---	---	---	4
starry flounder	492	39	142	---	---	---	673
walleye pollock	1,867	2,110	7,784	9,318	1,128	11,954	36,130
yellowfin sole	10,734	4,203	7,500	5,718	4	44	28,431

<sup>a</sup>Some length measurements were collected outside the standard survey area.

Table 4.--Number of fish in which age structures (otoliths and/or scales) were collected, by species and subarea, during the 1999 eastern Bering Sea bottom trawl survey.

Species	Subarea						Total <sup>a</sup>
	1	2	3	4	5	6	
walleye pollock	165	46	425	275	77	380	1,385
Pacific cod <sup>b</sup>	71	---	305	312	14	168	878
yellowfin sole	351	207	55	164	---	---	777
northern rock sole	212	130	47	76	---	25	490
longhead dab	254	234	---	1	---	---	489
flathead sole	9	---	139	89	43	140	420
rex sole	1	---	67	1	271	18	358
Alaska plaice	136	39	59	63	---	---	297
Greenland turbot	---	---	3	1	---	7	11

<sup>a</sup>Some age structures were collected outside the standard survey area.

<sup>b</sup>Scales were also taken.

## Data Analysis

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

Relative fishing powers between the two vessels were determined using the methods of Kappenman (1992). Three hundred twelve stations sampled by the two vessels during the standard survey (Fig. 1) were used in that analysis (see Appendix A).

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

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

Otolith and scale samples collected during the survey were read by staff of the Age and Growth Program of the AFSC's Resource Ecology and Fisheries Management (REFM) Division. From these age samples, stratified by sex and length, an age-length key was produced that

showed the distribution of ages by sex at each centimeter interval. Population age composition was estimated by apportioning ages to the estimated population number at each length interval. Only species whose age samples have been read by the time of writing of this publication have been included in the age analyses. Species completed at a later date will be presented in subsequent publications.

Growth characteristics of principal species were described with von Bertalanffy (1938) growth curves fitted to age-length data collected in this survey.

#### Special Studies

Stomach samples from several of the most prevalent commercial species in each haul were collected and preserved in 10% formalin for later examination by REFM's Food Habits Task (Table 5).

Additional biological information including age and growth, sex ratio, feeding ecology/morphology, and habitat preference were collected for rex sole (*Errex zachirus*).

Specimens of bigmouth sculpin (*Hemitriptus bolini*) egg masses and ovaries were collected to further describe the species' development and life history.

Additional activities included collecting specimens for observer training programs, collecting samples for fish and crab pathology studies (Table 5), and fulfilling collection requests from academic institutions.

Table 5.--Biological fish samples collected for special studies during the 1999 eastern Bering Sea bottom trawl survey.

Species	Stomach samples collected	Pathology samples
Walleye pollock	2,855	830
Pacific cod	2,243	
Yellowfin sole	1,028	
<i>Lepidopsetta</i> spp.	799	
<i>Hippoglossoides</i> spp.	603	
Pacific halibut	439	
Alaska plaice	478	
<i>Atheresthes</i> spp.	331	
Greenland turbot	67	
Plain sculpin	116	
Great sculpin	99	
Warty sculpin	51	
Alaska skate	296	
Bering skate	15	
<i>Bathyraja</i> spp.	320	
Red king crab		88
Blue king crab		40

## RESULTS

### Station Data

Station data from the 1999 survey are listed in Appendix A. Relevant information such as position, tow parameters, time, and environmental measurements are listed for each vessel for all standard bottom trawl stations used in the analyses.

### Environmental Conditions

Sea surface temperatures recorded during the survey ranged from  $-0.3^{\circ}$  to  $7.7^{\circ}$  C (Fig. 4). As in most previous years, surface temperature increased from east to west across the shelf, probably reflecting the progression of summer warming as the survey proceeded from east to west.

Bottom temperatures ranged from  $-1.7^{\circ}$  to  $3.6^{\circ}$  C (Fig. 5). The warmest temperatures (above  $3^{\circ}$  C) occurred in shallow waters along the northern portion of Bristol Bay, the southern central shelf, and north of St. George's Island. The coldest bottom temperatures observed were in the northern portion of the mid-shelf at depths between 50 and 100 m.

The mean bottom water temperature for the total survey area in 1999 was  $0.8^{\circ}$  C (Fig. 6). Historically, this was well below the values recorded for mean summer bottom water temperatures in the standard survey area since 1981 (annual mean temperatures range from  $1.7^{\circ}$  to  $5.1^{\circ}$  C; average of annual means is  $2.7^{\circ}$  C). Mean bottom temperatures observed over a more limited region of the southeast Bering Sea, which has been sampled annually since 1971, have ranged from  $1.2^{\circ}$  to  $4.8^{\circ}$  C; the 1999 value for this area was  $1.5^{\circ}$  C, one and a half degrees below the long-term average ( $3.1^{\circ}$  C) (Fig. 6).



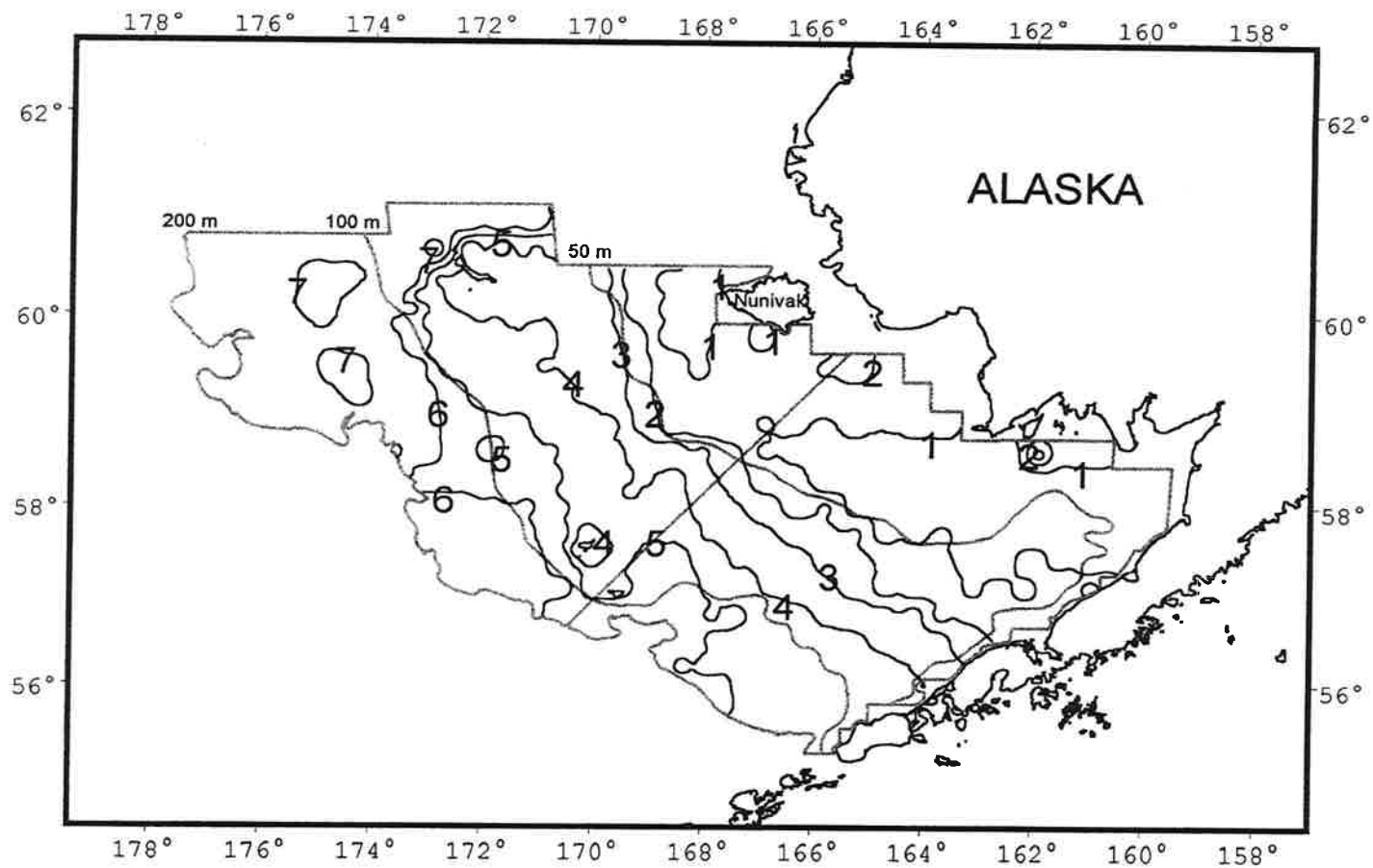


Figure 4.--Distribution of surface water temperatures ( $^{\circ}\text{C}$ ) observed during the 1999 eastern Bering Sea bottom trawl survey.

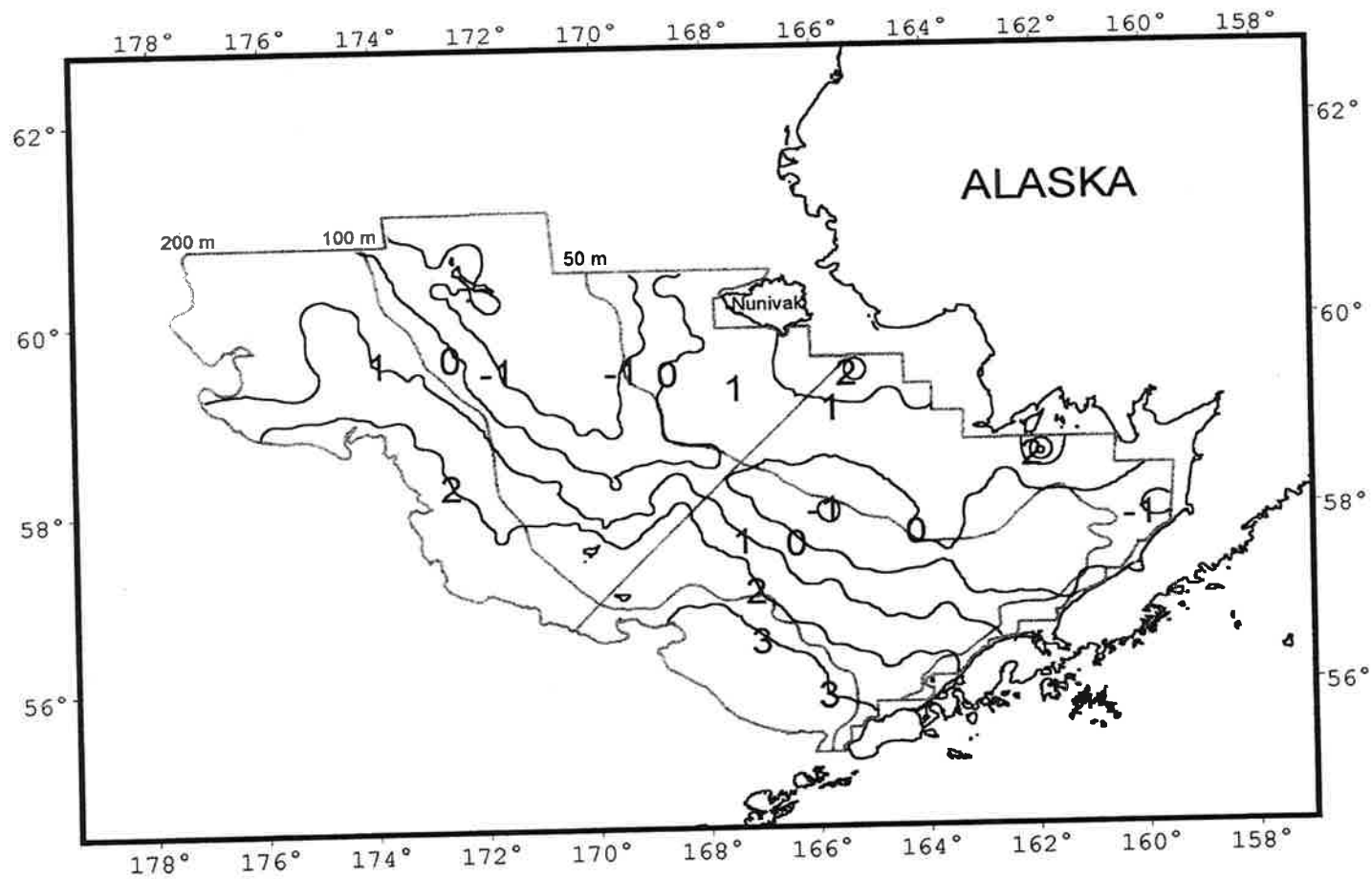


Figure 5.--Distribution of bottom water temperatures ( $^{\circ}\text{C}$ ) observed during the 1999 eastern Bering Sea bottom trawl survey.

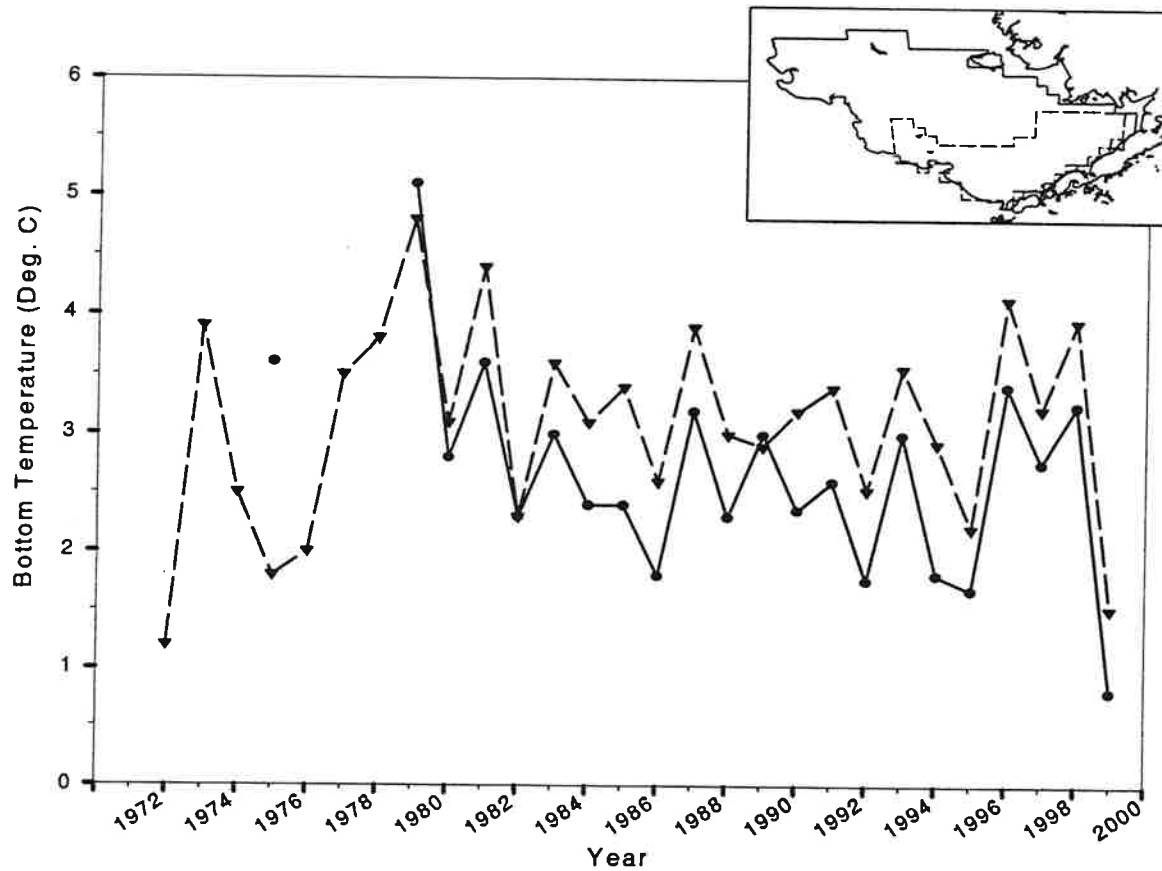


Figure 6.--Mean summer bottom water temperatures based on expendable bathythermograph casts or micro-bathythermographs attached to the net headrope during Alaska Fisheries Science Center bottom trawl surveys. The 1971-99 means (dashed line) are from the southeast Bering Sea (see insert) and the 1975 and 1979-99 means are from the larger survey area outlined on the inset. The 1975 data point for the overall survey area is based on data collected from August through September, while those in all other years and areas were collected from May through early August.

## Relative Fishing Powers of Survey Vessels

A total of 312 alternate-row tows were used in the comparison of vessel catch rates with the methods developed by Kappenman (1992). Based on this analysis, the F/V *Aldebaran* was more efficient than the F/V *Arcturus* at capturing skates, yellowfin sole, *Lepidopsetta* spp., Alaska plaice, *Myoxocephalus* spp., and Pacific cod. Fishing power corrections were applied to catches (by species) of the less efficient vessel (Table 6).

Table 6.--Species for which fishing power corrections were applied in 1999, and scaling factors determined by the method of Kappenman (1992) based on 312 total hauls.

Species	Hauls with catch		Catch multiplier	
	F/V <i>Arcturus</i>	F/V <i>Aldebaran</i>	F/V <i>Arcturus</i>	F/V <i>Aldebaran</i>
skate unident.	161	166	1.24	1.00
yellowfin sole	118	117	1.09	1.00
<i>Lepidopsetta</i> spp.	134	135	1.09	1.00
Alaska plaice	118	114	1.30	1.00
<i>Myoxocephalus</i> spp.	180	145	1.08	1.00
Pacific cod	138	131	1.06	1.00

### Estimated Biomass of Major Fish and Invertebrate Groups

Total demersal animal biomass for the overall survey area was estimated at 11.8 million t, of which fish species accounted for 78% (9.2 million t, Table 7), and invertebrates 22% (2.6 million t, Table 8). Concentrations of fish biomass were located in Bristol Bay and along the Alaska Peninsula, around the Pribilof Islands, and northwest of the Pribilofs (Fig. 7). Although 21 families and 102 species of fish were identified in the catches (Appendix B), the fish biomass was dominated by flatfishes (Pleuronectidae, 4.4 million t) and cods (Gadidae, 4.2 million t) (Table 7). The biomass of invertebrates was comprised primarily of the phyla Echinodermata (0.95 million t), Crustacea (0.50 million t), and Mollusca (0.26 million t). A total of 204 invertebrate species from 9 phyla were identified in the survey (Table 8, Appendix B).

### Relative Abundance of Individual Fish Species

Relative abundance (not weighted by area) of the 11 most abundant species and species groups of fish are shown in Figure 8. These taxa accounted for 76% (190.5 kg/ha) of total animal mean CPUE (251.1 kg/ha) and 97% of total fish mean CPUE (196.3 kg/ha). Overall, but particularly in water deeper than 50 m, walleye pollock was the dominant species in the catch with a mean CPUE of 76.4 kg/ha. Pacific cod were consistently abundant in the 50-100m depth zone with an overall mean CPUE of 13.2 kg/ha. Yellowfin sole and *Lepidopsetta* spp., with overall mean catch rates of 27.8kg/ha and 36.6 kg/ha, respectively, dominated catches in water less than 50 m. Yellowfin sole and rock sole were also prominent on the mid-shelf waters between the 50-m and the 100-m isobaths along with Alaska plaice and *Hippoglossoides* spp. See Appendix C for a descending rank of all organisms caught.

Table 7.--Biomass estimates in metric tons (t) for major fish species and fish groups taken during the 1999 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t) <sup>a</sup> and 95% confidence interval		Proportion of total animal biomass <sup>b</sup>	Estimated biomass (t) by subarea						
				1	2	3	4	5	6	
Gadidae (cods)										
Walleye pollock	3,567,083	± 25%	0.303	104,337	32,757	448,211	584,662	63,615	2,333,502	
Pacific cod	583,259	± 17%	0.049	24,338	7,504	204,095	186,851	21,435	139,036	
Other cods	539	± 44%	0.000	7	142	0	391	0	0	
Total cods	4,150,881	± 22%	0.352	128,681	40,403	652,306	771,904	85,050	2,472,538	
Anoplopomatidae										
Sablefish	188	± 115%	0.000	0	0	47	0	142	0	
Scorpaenidae (rockfish)										
Pacific ocean perch	3,428	± 199%	0.000	0	0	6	0	8	3,414	
Other rockfish	778	± 125%	0.000	0	0	421	51	306	0	
Total rockfish	4,206	± 164%	0.000	0	0	427	51	314	3,414	
Pleuronectidae (flatfishes)										
Yellowfin sole	1,306,475	± 14%	0.111	686,444	156,412	357,324	104,896	155	1,243	
Lepidopsetta spp.	1,689,245	± 20%	0.143	563,128	53,583	750,010	235,669	1,567	85,287	
Hippoglossoides spp.	393,388	± 17%	0.033	9,331	286	139,624	46,735	42,131	155,281	
Alaska plaice	546,522	± 17%	0.046	119,338	103,731	124,217	173,730	0	25,505	
Arrowtooth flounder	243,811	± 54%	0.021	129	0	57,655	2,662	126,381	56,985	
Kamchatka flounder	18,276	± 28%	0.002	0	0	1,845	497	2,887	13,047	
Greenland turbot	19,797	± 43%	0.002	0	0	473	614	0	18,710	
Pacific halibut	128,608	± 17%	0.011	11,347	5,183	41,089	21,708	9,127	40,155	
Other flatfish	69,713	± 33%	0.006	43,861	3,160	16,280	115	4,445	1,852	
Total flatfish	4,416,262	± 11%	0.375	1,433,578	322,355	1,488,515	587,055	186,693	398,067	
Clupeidae										
Pacific herring	22,966	± 65%	0.002	8,597	11,430	1,646	1,293	0	0	
Cottidae (sculpins)	150,170	± 14%	0.013	43,384	13,846	34,119	29,795	3,116	25,909	
Zoarcidae (eelpouts)	18,618	± 23%	0.002	0	61	4,016	6,709	322	7,510	
Osmeridae (smelts)	3,582	± 25%	0.000	781	372	902	100	1,427	0	
Agonidae (poachers)	15,017	± 16%	0.001	7,017	1,320	5,205	1,321	52	103	
Cyclopteridae (snailfishes)	1,193	± 56%	0.000	3	41	0	682	13	453	
Rajidae (skates)	370,543	± 35%	0.031	6,876	12,550	78,836	63,498	94,343	114,440	
Other fish	6,643	± 63%	0.001	339	1,149	1,462	9	345	3,339	
Total fish	9,160,269	± 11%	0.777	1,629,256	403,527	2,267,481	1,462,415	371,817	3,025,774	

<sup>a</sup>Differences in sums of estimates and totals are due to rounding.

<sup>b</sup>Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass=12,911,100t.

Table 8.--Biomass estimates in metric tons (t) for major invertebrate species and invertebrate groups taken during the 1999 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t) and 95% confidence interval		Proportion of total animal biomass	Estimated biomass (t) by subarea					
				1	2	3	4	5	6
Crustacea									
<i>Chionoecetes</i> spp. (snow crab)	149,349	± 16%	0.013	2,058	5,077	35,208	48,052	9,264	49,690
<i>Lithodes</i> spp. king crab	0	± 0%	0.000	0	0	0	0	0	0
<i>Paralithodes</i> spp. (king crab)	83,631	± 40%	0.007	16,986	881	47,130	18,463	0	172
<i>Erimacrus isenbeckii</i> (hair crab)	2,344	± 26%	0.000	175	678	560	931	0	0
Paguridae hermit crab	247,016	± 13%	0.021	19,113	16,477	93,043	69,362	3,575	45,446
Other crab	15,090	± 26%	0.001	5,471	1,762	5,138	2,438	146	135
Total crab	497,430	± 11%	0.042	43,803	24,875	181,079	139,245	12,985	95,444
Shrimps	1,443	± 37%	0.000	89	10	37	122	209	976
Other crustaceans	1,102	± 68%	0.000	510	0	175	131	2	283
Total crustaceans	499,974	± 11%	0.042	44,401	24,884	181,291	139,498	13,196	96,703
Mollusca									
Gastropoda (snails)	251,933	± 16%	0.021	26,188	12,907	78,020	56,210	4,312	74,296
Pelecypoda (bivalves)	3,965	± 36%	0.000	1,781	267	1,065	511	64	277
Squids	86	± 139%	0.000	0	0	1	0	68	17
Octopuses	832	± 102%	0.000	0	0	431	174	1	225
Other mollusks	10	± 174%	0.000	0	9	0	0	0	1
Total mollusks	256,825	± 16%	0.022	27,969	13,182	79,517	56,895	4,446	74,817
Echinodermata									
Asterozoa (starfish)	670,501	± 13%	0.057	320,872	76,568	129,168	86,996	1,388	55,509
Ophiurozoa (brittle stars)	263,249	± 47%	0.022	8,774	1,881	43,003	25,353	1,903	182,334
Echinozoa (sea urchin)	4,021	± 58%	0.000	104	0	751	219	1,529	1,418
Holothurozoa (sea cucumbers)	8,690	± 58%	0.001	2,745	0	4,754	1,158	0	33
Total echinoderms	947,946	± 16%	0.080	333,109	78,448	177,953	114,317	4,825	239,294
Ascidiacea	163,281	± 33%	0.014	23,724	14,610	59,004	65,902	32	9
Porifera (sponges)	387,320	± 94%	0.033	405	0	385,204	801	90	820
Coelenterata	209,731	± 14%	0.018	8,804	1,661	57,641	99,230	11,694	30,700
Other invertebrates	163,271	± 21%	0.014	28,234	10,050	77,454	35,251	906	11,376
Total invertebrates	2,626,863	± 16%	0.223	466,033	142,836	1,017,787	511,302	35,184	453,720

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

\*Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass=12,911,100t.

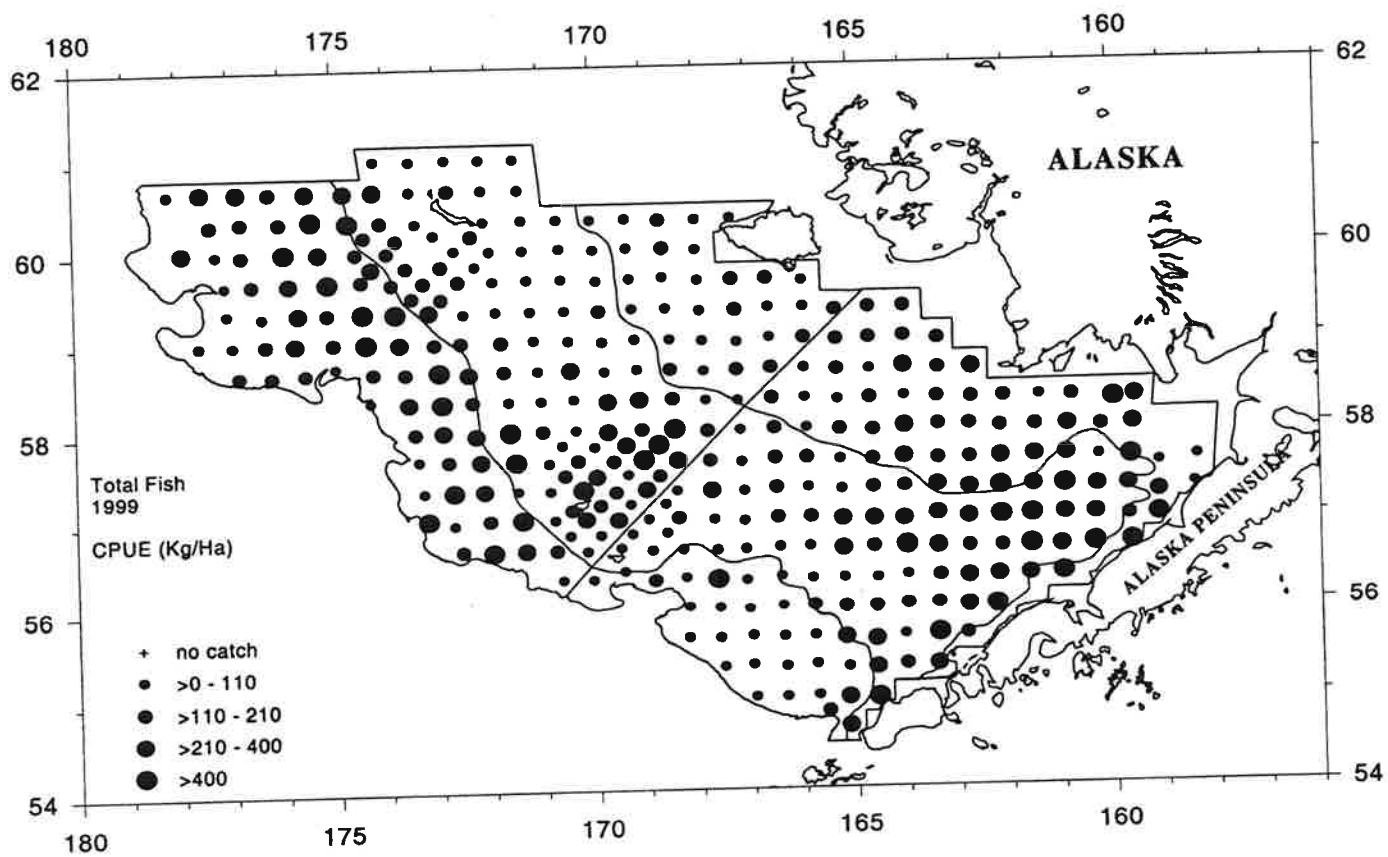


Figure 7.--Distribution and relative abundance of total fish, 1999 eastern Bering Sea bottom trawl survey.



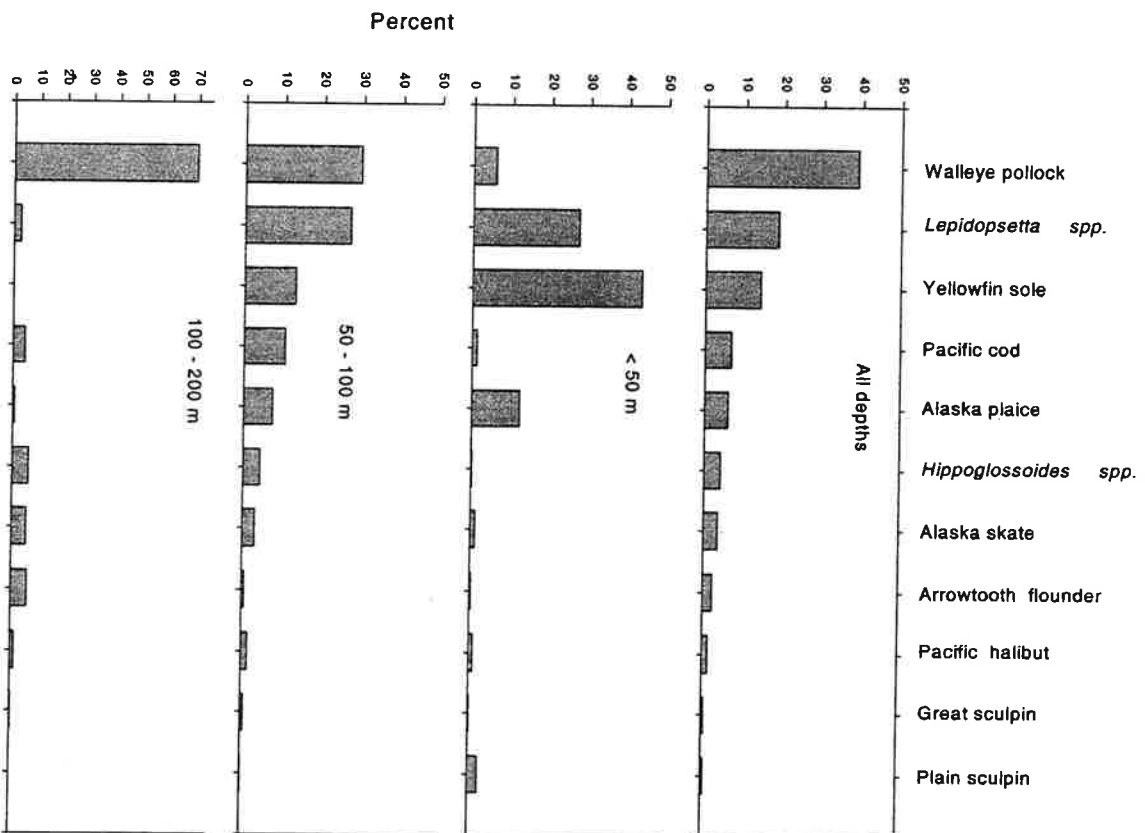


Figure 8.--Relative abundance (% CPUE in kg/ha) of principal groundfish species (top 11 for all depths combined) by depth zones and for all depths combined, 1999 eastern Bering Sea bottom trawl survey.

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

Geographical distributions, population numbers, biomass estimates, and size composition are presented for each of the following commercially important eastern Bering Sea groundfish: walleye pollock, Pacific cod, yellowfin sole, *Lepidopsetta* spp., *Hippoglossoides* spp., Alaska plaice, Greenland turbot (*Reinhardtius hippoglossoides*), arrowtooth flounder, Kamchatka flounder, and Pacific halibut. Estimated biomass, population numbers, and mean size (by length and weight) are summarized by subarea and for the entire survey area. Size composition data are illustrated in histograms relating the population percentage of length by centimeter interval for each subarea and in population numbers for the total survey area. Age composition and von Bertalanffy growth parameters are given for walleye pollock. Age data and growth parameters for Pacific cod, yellowfin sole, and *Lepidopsetta* spp. will be presented in a separate report.

Geographical distributions for some common, but generally noncommercial fish species are presented. These are Bering skate (*Bathyraja interrupta*), Alaska skate (*B. parmifera*), warty sculpin (*Myoxocephalus verrucosus*), great sculpin (*M. polyacanthocephalus*), plain sculpin (*M. jaok*), bigmouth sculpin (*Hemitripterus bolini*), wattled eelpout (*Lycodes palearis*), shortfin eelpout (*L. brevipes*), marbled eelpout (*L. raridens*), sturgeon poacher (*Podothecus acipenserinus*), Bering poacher (*Ocella dodecaedron*), eulachon (*Thaleichthys pacificus*), capelin (*Mallotus villosus*), and Pacific herring (*Clupea pallasii*). Biomass and population estimates as well as mean weight are given by subarea and total area. These tables are not given for the pelagic species such as eulachon, capelin, and Pacific herring due to the bottom sampling

nature of the survey. We do not believe these species are adequately represented in the samples; however, plots are shown to give some idea of geographic distribution.

Appendices to the report contain detailed results of the analysis. CPUE, population, and biomass estimates as well as the variances and confidence limits for each species by stratum are given in Appendix D. Population estimates by sex and size class for the total survey area are listed in Appendix E.

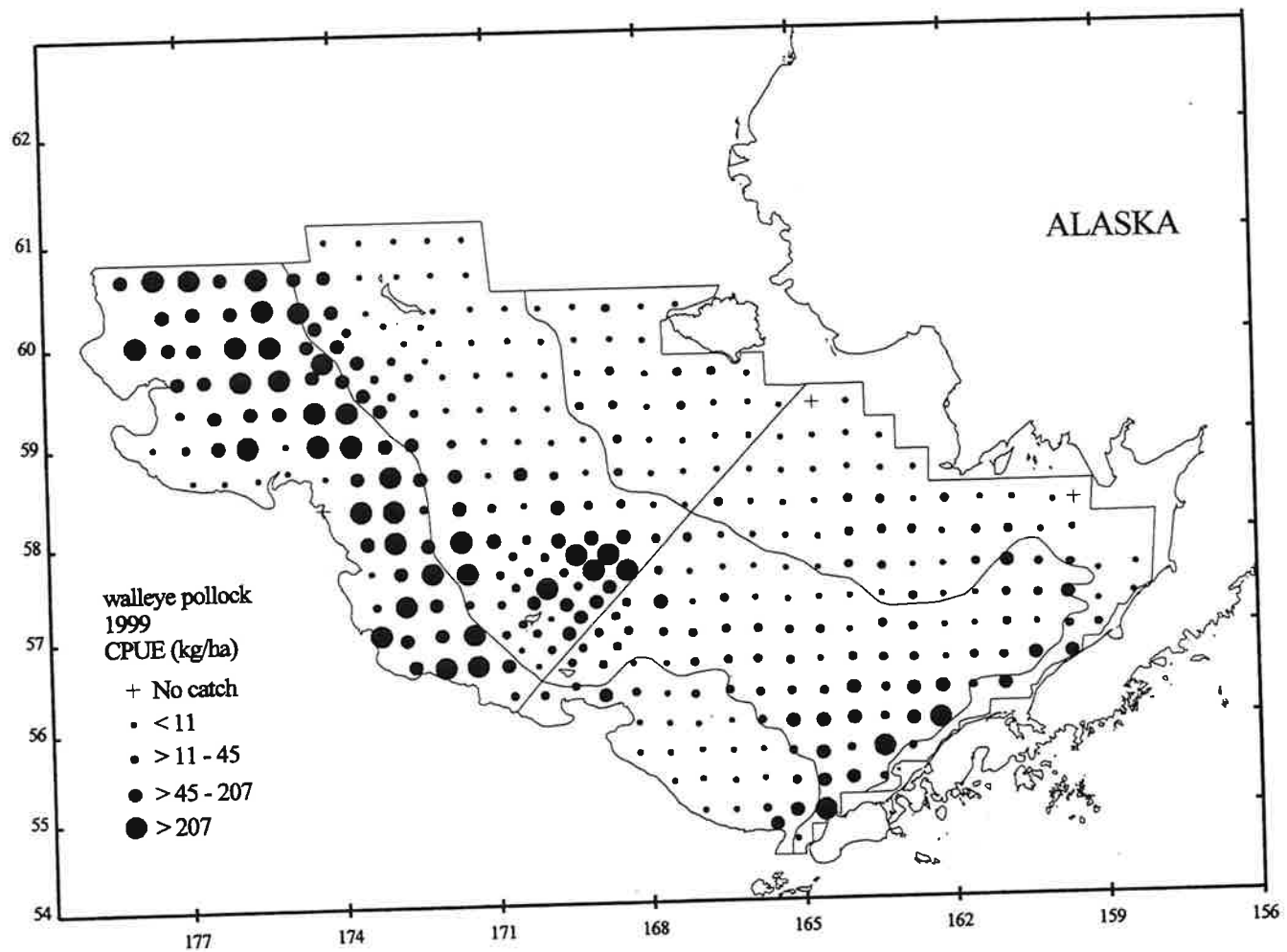


Figure 9.-- Distribution and relative abundance in kg/ha of walleye pollock, 1999 eastern Bering Sea bottom trawl survey.

Table 9.--Abundance estimates and mean size of walleye pollock by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	13.40	104,337	0.029	81,465,574	0.012	1.281	48.0
2	7.98	32,757	0.009	98,114,272	0.015	0.334	19.3
3	43.39	448,211	0.126	557,769,626	0.083	0.804	45.1
4	54.22	584,662	0.164	1,002,145,339	0.149	0.583	40.2
5	16.40	63,615	0.018	83,621,276	0.012	0.761	46.5
6	246.77	2,333,502	0.654	4,898,642,581	0.729	0.476	38.4
All subareas combined <sup>b</sup>	76.98	3,567,083	1.000	6,721,758,669	1.000	0.531	39.2
95% Confidence interval		±891,362		±1,654,094,060			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

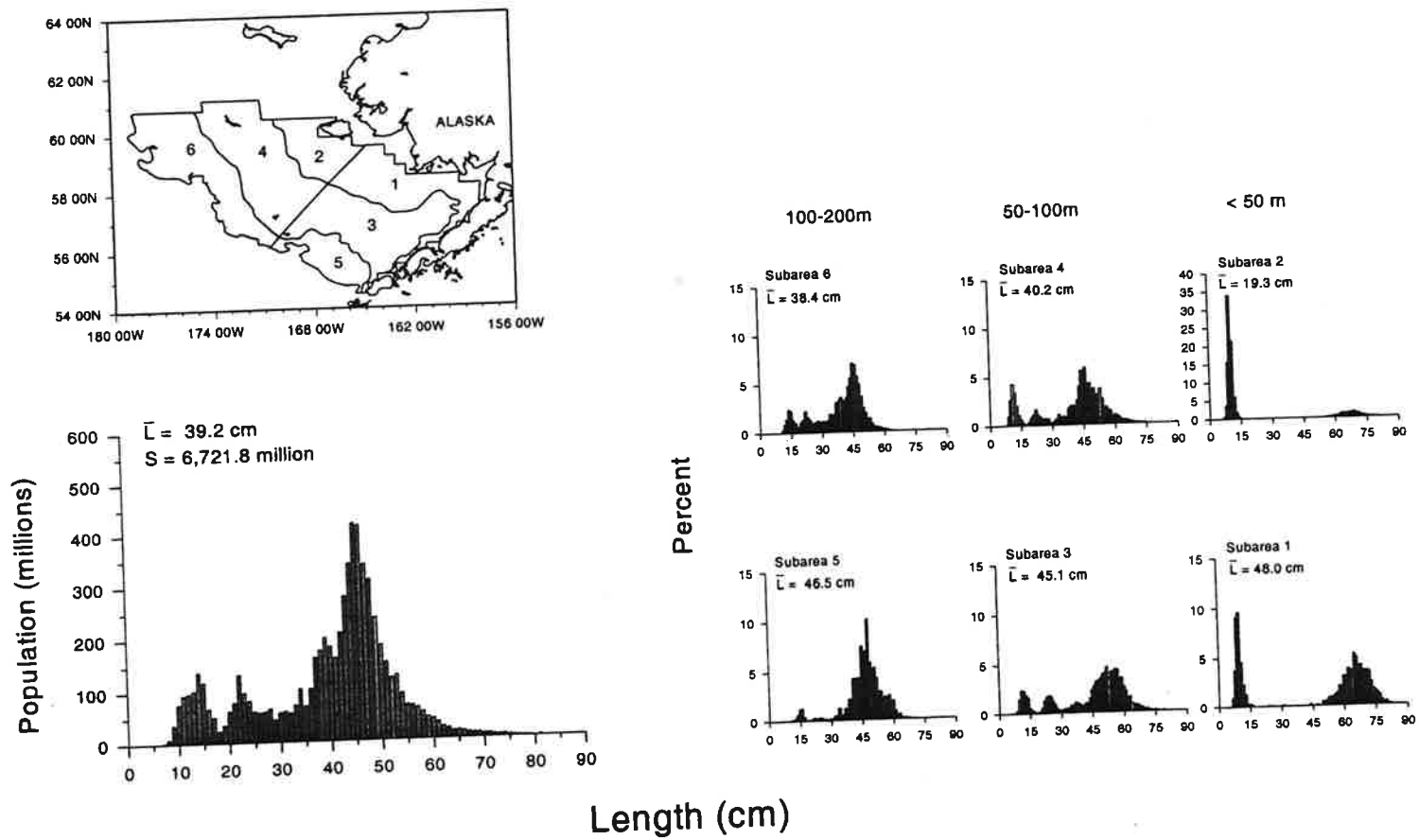


Figure 10.--Estimated relative size distribution (sexes combined) of walleye pollock in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

Table 10.--Estimated population numbers (millions) of walleye pollock by age group and subarea, 1999 eastern Bering Sea bottom trawl survey.

Age	Year class	Depth and Subarea						All subareas combined	Proportion
		100 - 200 m		50 - 100 m		< 50 m			
		6	5	4	3	2	1		
1	1998	464.91	3.08	155.64	61.44	81.26	25.24	791.57	0.1178
2	1997	520.26	1.12	71.56	48.05	0.04	0.11	641.14	0.0954
3	1996	530.89	2.82	57.69	25.95	0	0.08	617.43	0.0919
4	1995	591.91	5.87	66.84	19.87	0	0.01	684.49	0.1018
5	1994	330.24	4.66	44.05	11.24	0	0.01	390.2	0.058
6	1993	554.59	9.29	97.07	30.38	0	0.18	691.5	0.1029
7	1992	1326.12	32.27	256.38	109.28	0.33	1.97	1726.36	0.2568
8	1991	300.56	9.75	92.8	67.12	0.79	3.76	474.78	0.0706
9	1990	109.26	5.71	54.76	58.54	1.46	5.91	235.64	0.0351
10	1989	99.43	4.97	50.47	57.62	1.66	6.97	221.13	0.0329
11	1988	31.97	2.28	19.43	24.41	1.01	3.53	82.63	0.0123
12	1987	11.68	0.71	9.08	11.18	0.61	2.23	35.48	0.0053
13	1986	2.5	0.27	3.53	5.03	0.77	2.69	14.79	0.0022
14	1985	2.88	0.29	5.2	6.28	1.65	5.81	22.12	0.0033
15	1984	1.73	0.14	3.72	5.02	1.52	4.5	16.62	0.0025
16	1983	3.32	0.26	4.2	5.59	1.47	4.06	18.9	0.0028
17	1982	1	0.05	2.63	3.54	1.45	4.07	12.75	0.0019
18	1981	2.16	0.04	2.06	2.33	0.83	2.43	9.84	0.0015
19	1980	1.14	0.03	2.73	2.54	1.18	3.87	11.49	0.0017
20	1979	0.56	0.01	0.91	1.64	0.46	1.7	5.28	0.0008
21	1978	0.06	0	0.28	0.31	0.16	0.53	1.34	0.0002
Age Unknown		11.48	0	1.13	0.4	1.45	1.82	16.3	0.0024
All ages combined		4,898.65	83.62	1,002.16	557.76	98.10	81.48	6,721.78	1.0000

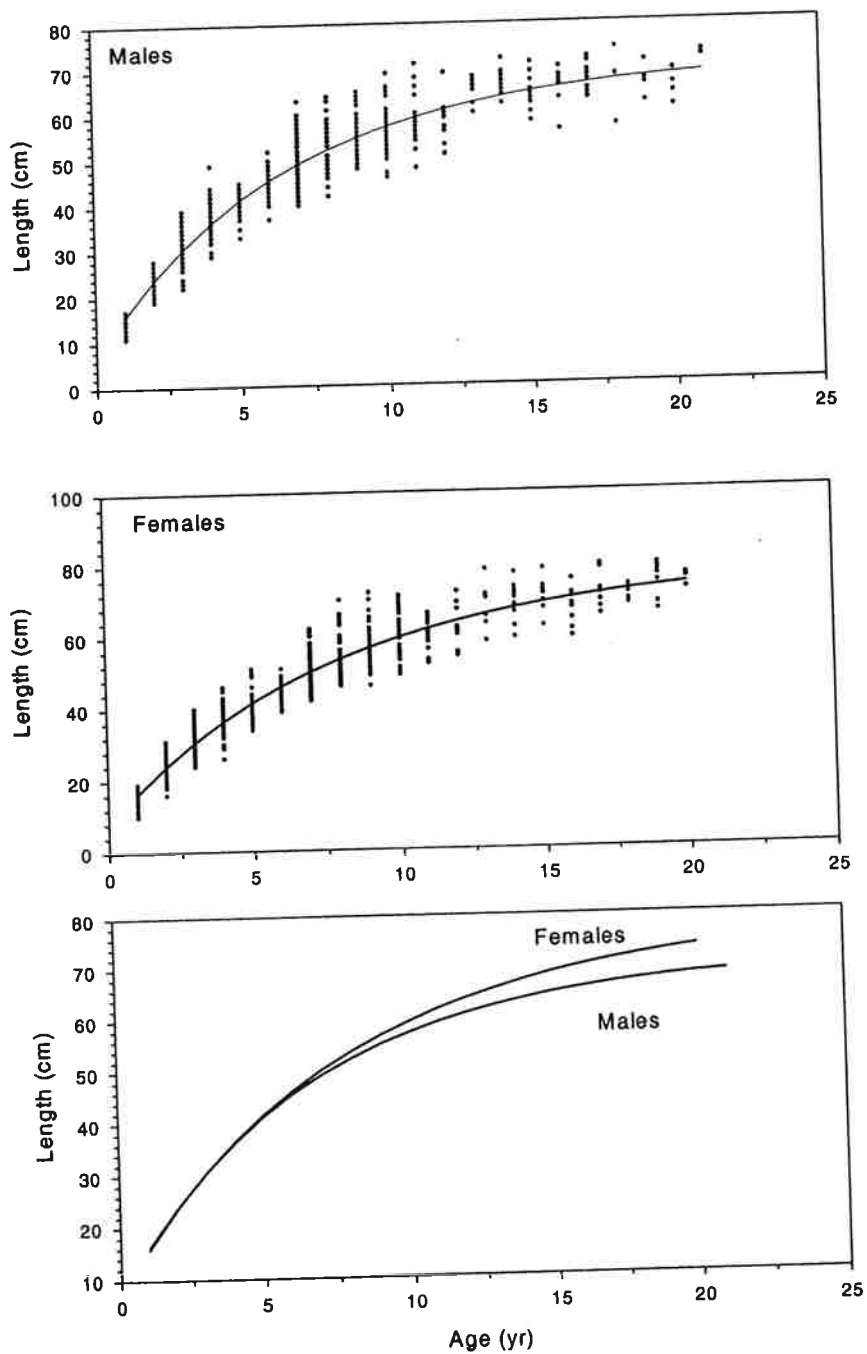


Figure 11.--Distribution of walleye pollock aged samples from the 1999 eastern Bering Sea bottom trawl survey by length for males, females and compared showing non-linear von Bertalanffy estimates.



Table 11.--Von Bertalanffy growth parameter estimates for walleye pollock by sex, based on otolith age reading and length data, from the 1999 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	627	1-21	11-76	71.01	-0.65	0.15
Female	656	1-20	10-79	78.87	-0.79	0.13

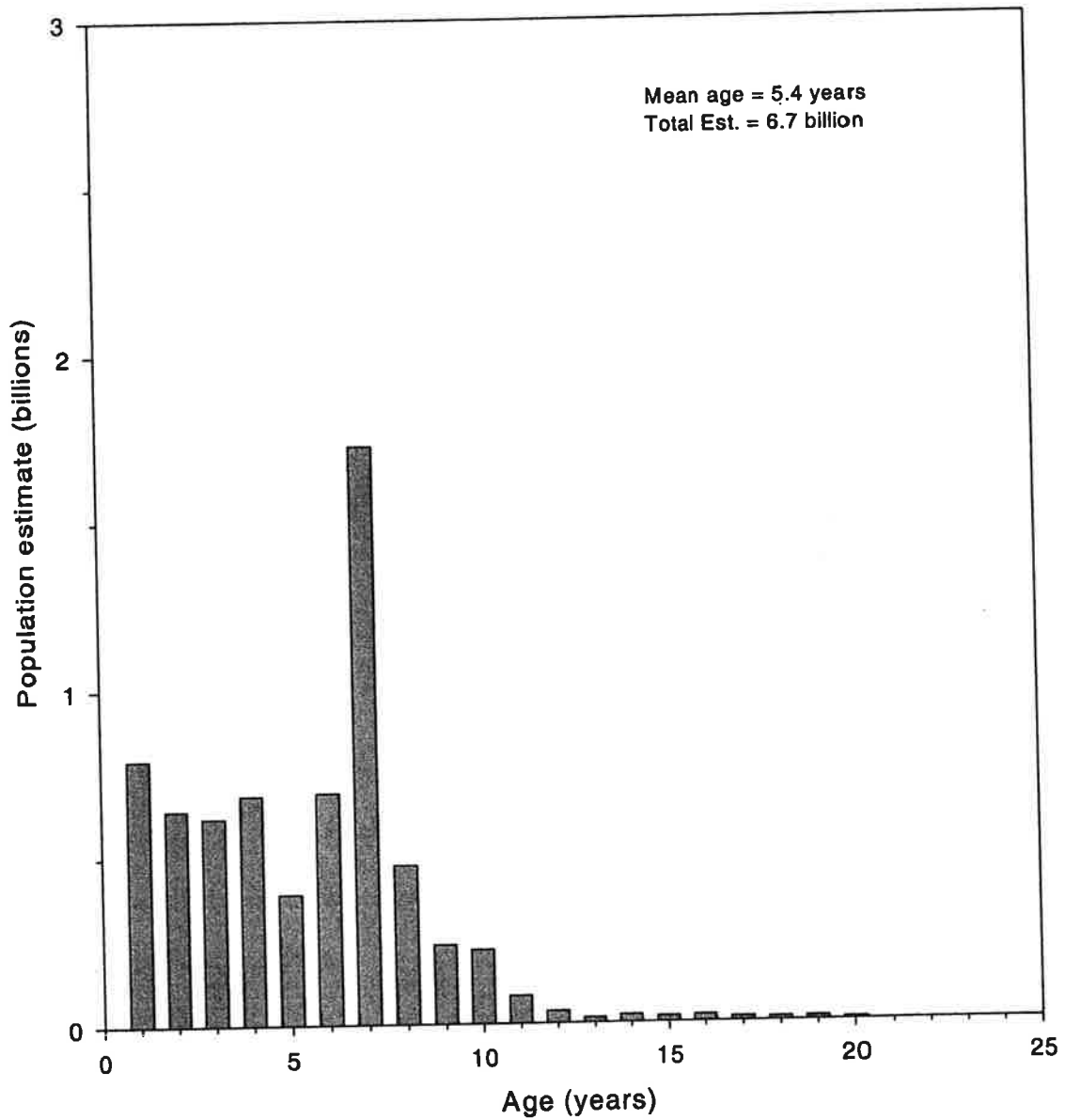


Figure 12.--Population number estimates by age for walleye pollock, 1999 eastern Bering Sea bottom trawl survey.

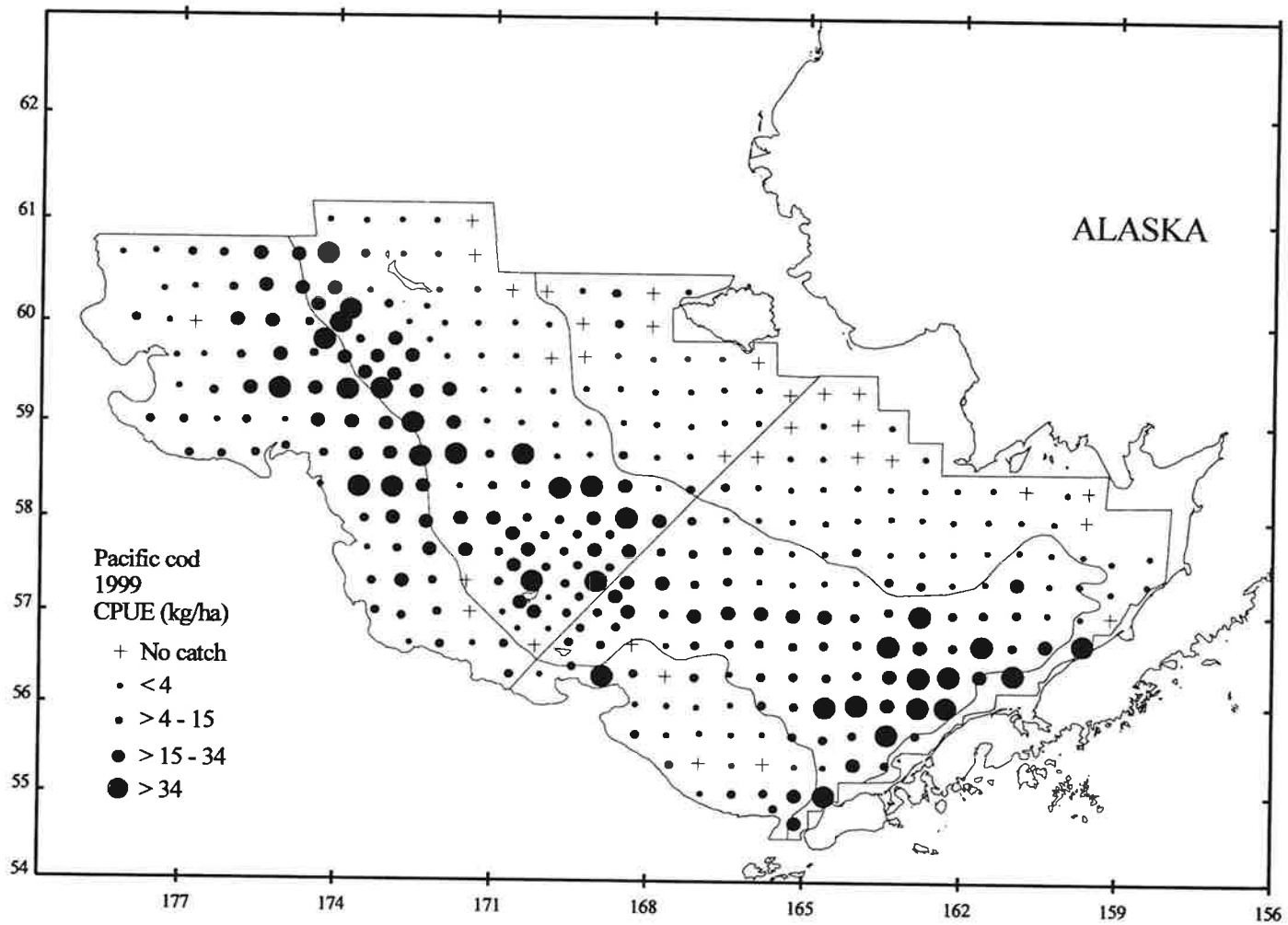


Figure 13.-- Distribution and relative abundance in kg/ha of Pacific cod, 1999 eastern Bering Sea bottom trawl survey.

Table 12.--Abundance estimates and mean size of Pacific cod by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	3.13	24,338	0.042	30,401,989	0.061	0.801	29.0
2	1.83	7,504	0.013	5,334,672	0.011	1.407	39.7
3	19.76	204,095	0.350	208,664,947	0.417	0.978	41.0
4	17.33	186,851	0.320	175,936,379	0.351	1.062	41.5
5	5.53	21,435	0.037	8,179,718	0.016	2.621	57.4
6	14.70	139,036	0.238	72,175,168	0.144	1.926	50.8
All subareas combined <sup>b</sup>	12.59	583,259	1.000	500,692,872	1.000	1.165	42.1
95% Confidence interval		±100,231		±92,120,830			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

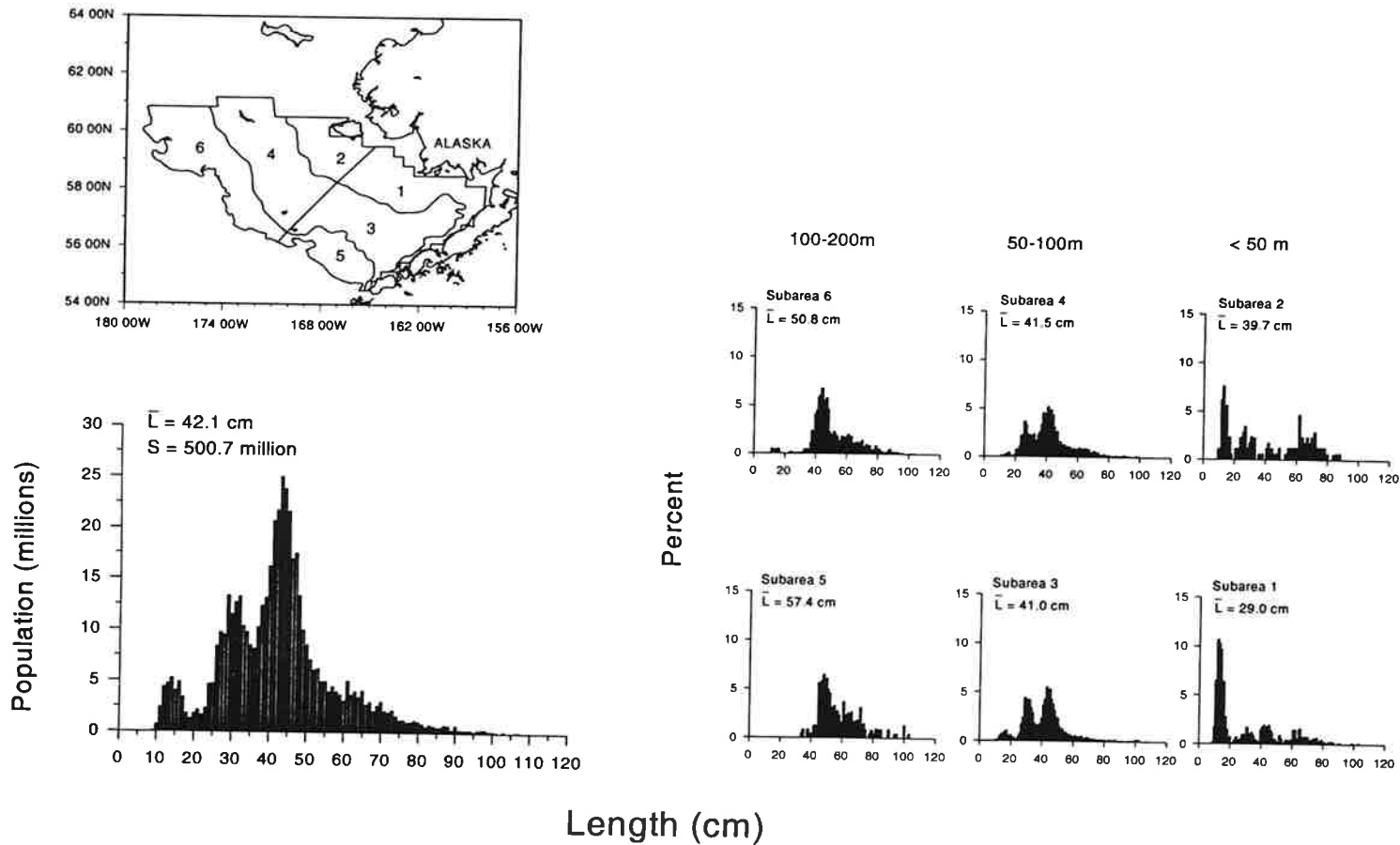


Figure 14.--Estimated relative size distribution (sexes combined) of Pacific cod in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

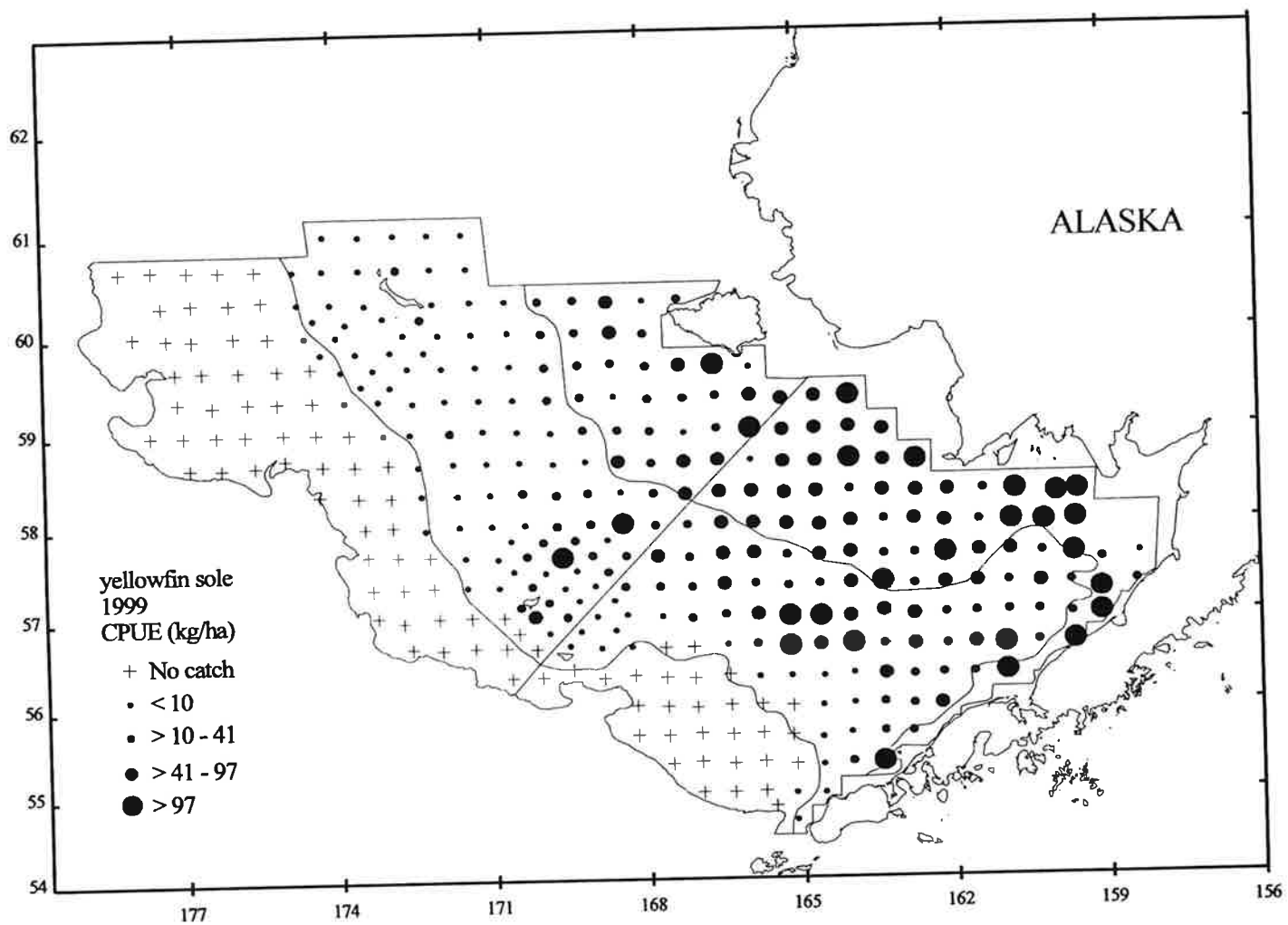


Figure 15.-- Distribution and relative abundance in kg/ha of yellowfin sole, 1999 eastern Bering Sea bottom trawl survey.

Table 13.--Abundance estimates and mean size of yellowfin sole by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size	
						Weight (kg)	Length (cm)
1	88.15	686,444	0.525	3,470,186,655	0.597	0.198	24.6
2	38.12	156,412	0.120	712,341,701	0.123	0.220	24.5
3	34.59	357,324	0.274	1,272,557,364	0.219	0.281	28.5
4	9.73	104,896	0.080	354,538,830	0.061	0.296	28.5
5	0.04	155	0.000	248,759	0.000	0.623	36.1
6	0.13	1,243	0.001	3,534,269	0.001	0.352	30.8
All subareas combined <sup>b</sup>	28.19	1,306,475	1.000	5,813,407,578	1.000	0.225	25.7
95% Confidence interval		±187,677		±799,187,957			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

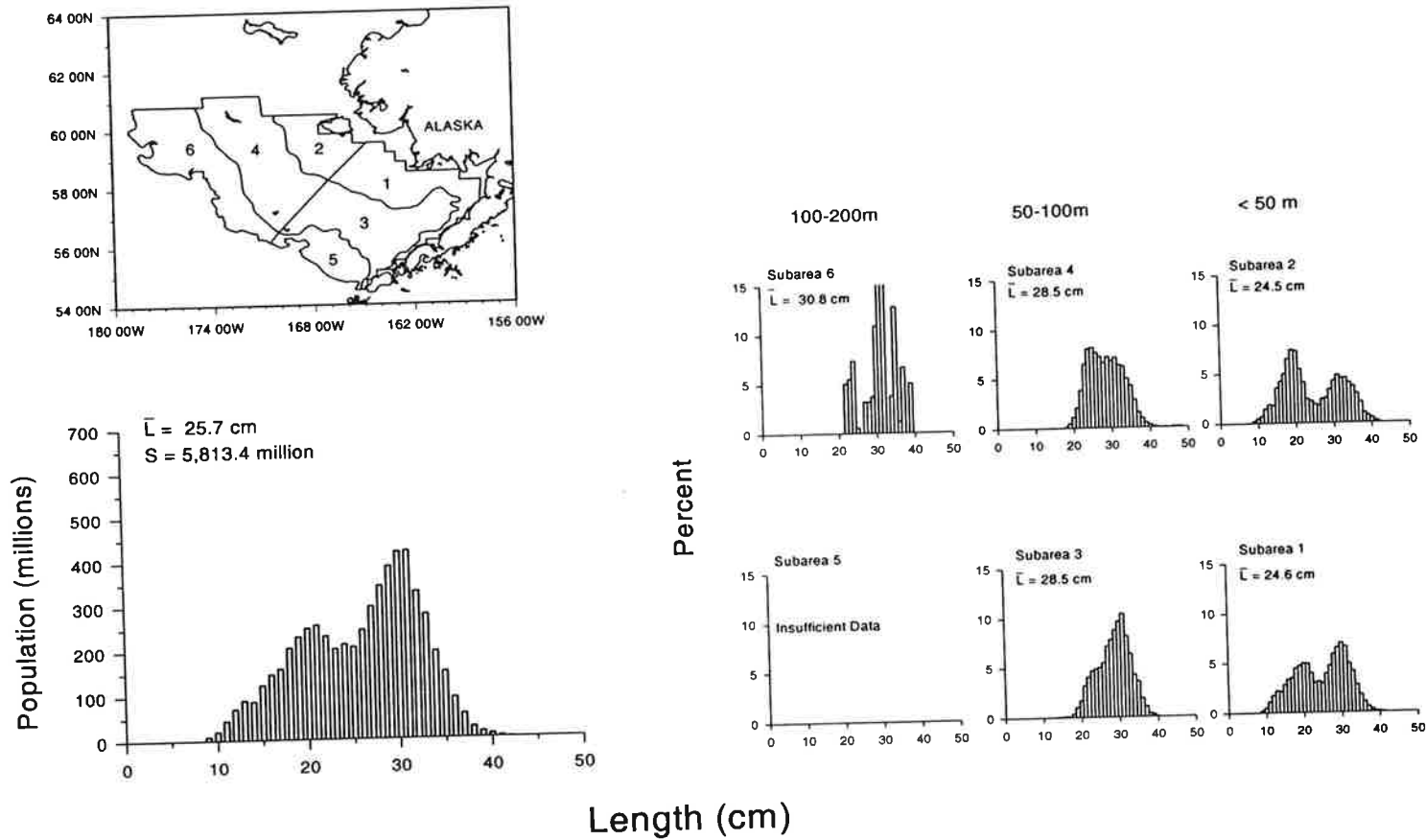


Figure 16.--Estimated size distribution (sexes combined) of yellowfin sole in terms of population numbers, and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.



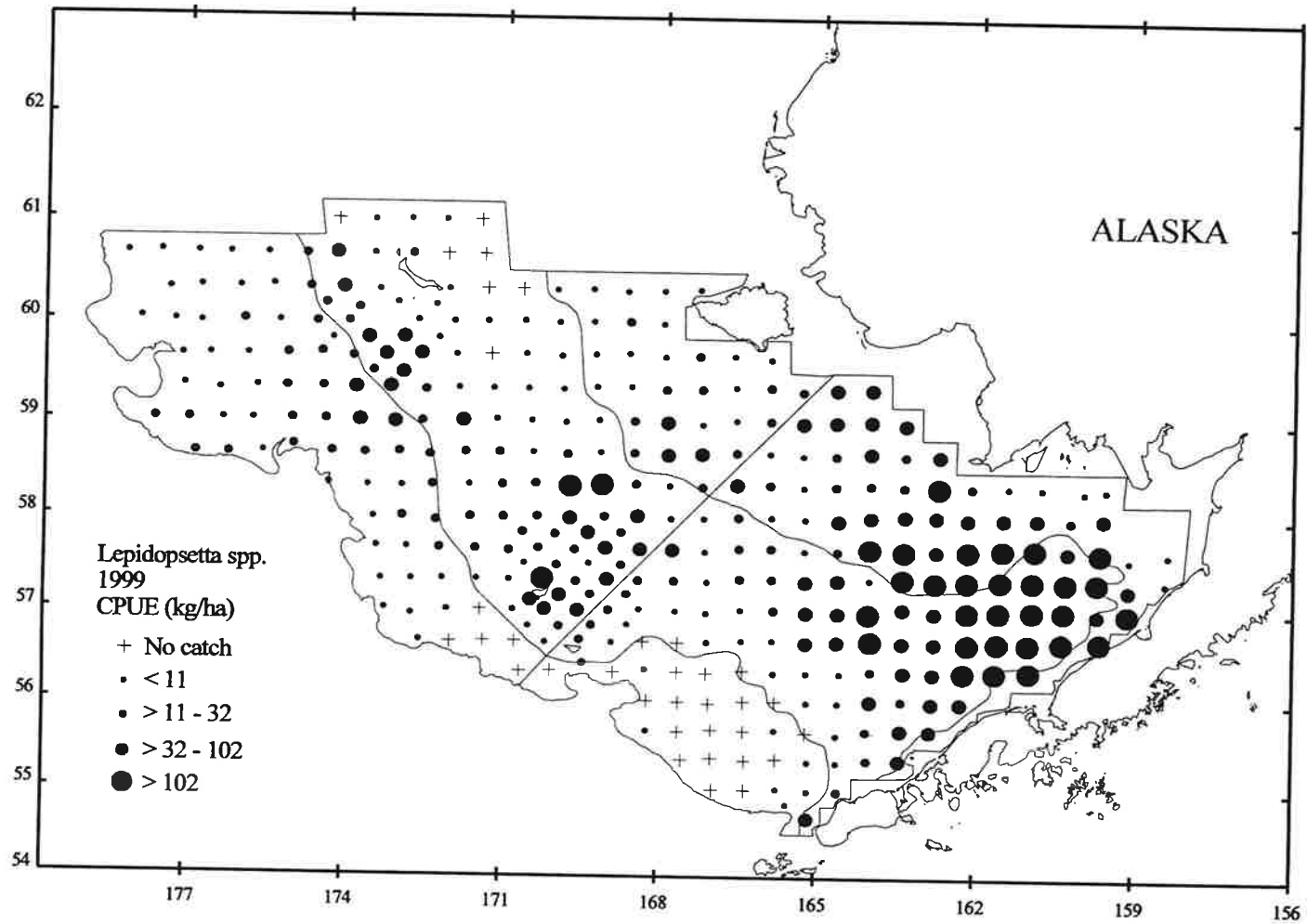


Figure 17.-- Distribution and relative abundance in kg/ha of *Lepidopsetta* spp., 1999 eastern Bering Sea bottom trawl survey.

Table 14.--Abundance estimates and mean size of *Lepidopsetta* spp. by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	72.32	563,128	0.333	2,461,669,869	0.334	0.229	26.8
2	13.06	53,583	0.032	257,232,066	0.035	0.208	25.0
3	72.60	750,010	0.444	3,548,866,626	0.481	0.211	26.5
4	21.86	235,669	0.140	893,649,732	0.121	0.264	28.2
5	0.40	1,567	0.001	5,214,476	0.001	0.301	29.8
6	9.02	85,287	0.050	212,179,161	0.029	0.402	31.6
All subareas combined <sup>b</sup>	36.46	1,689,245	1.000	7,378,811,929	1.000	0.229	26.9
95% Confidence interval		±342,120		±1,579,126,133			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

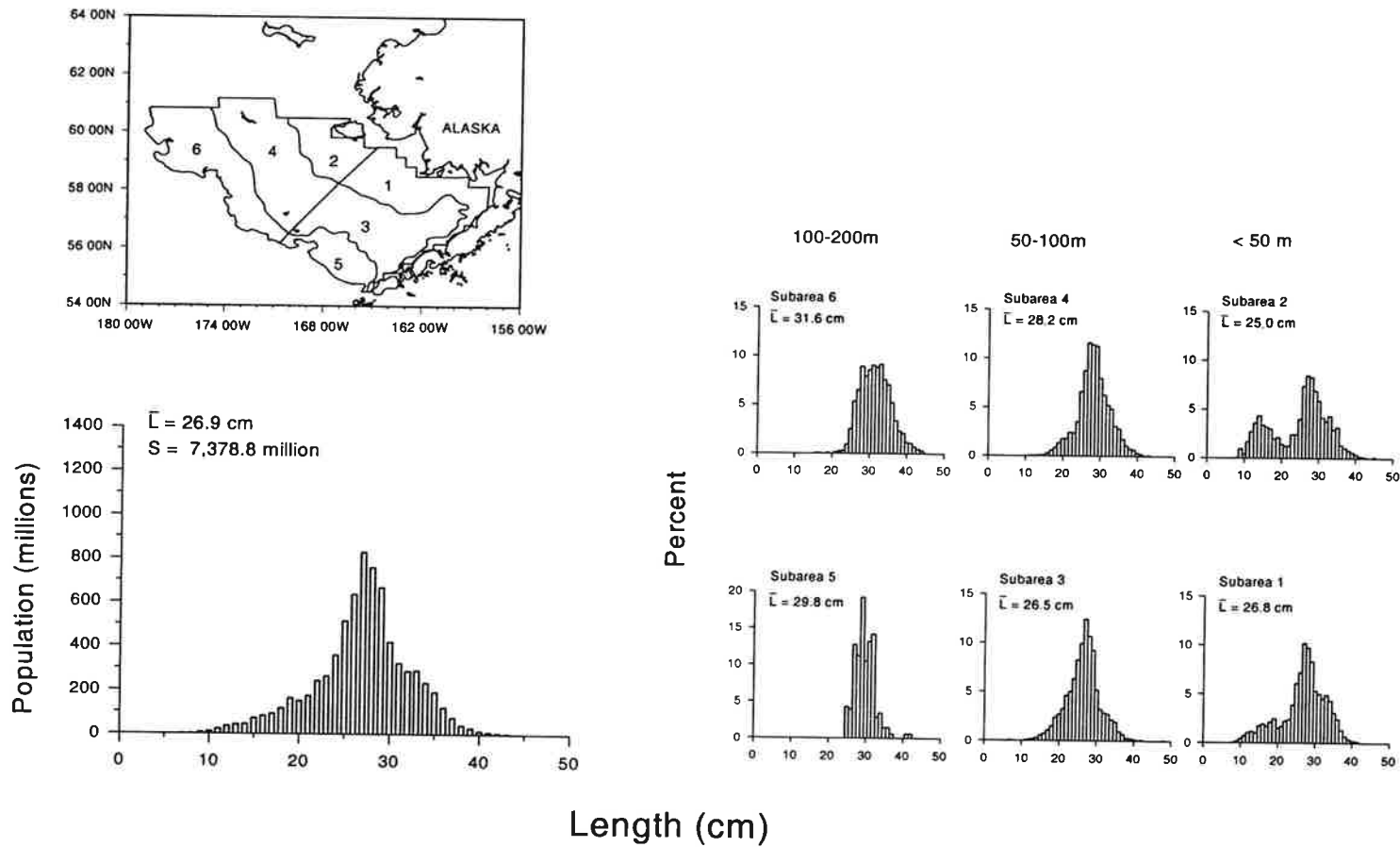


Figure 18.--Estimated relative size distribution (sexes combined) of *Lepidopsetta* spp. in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

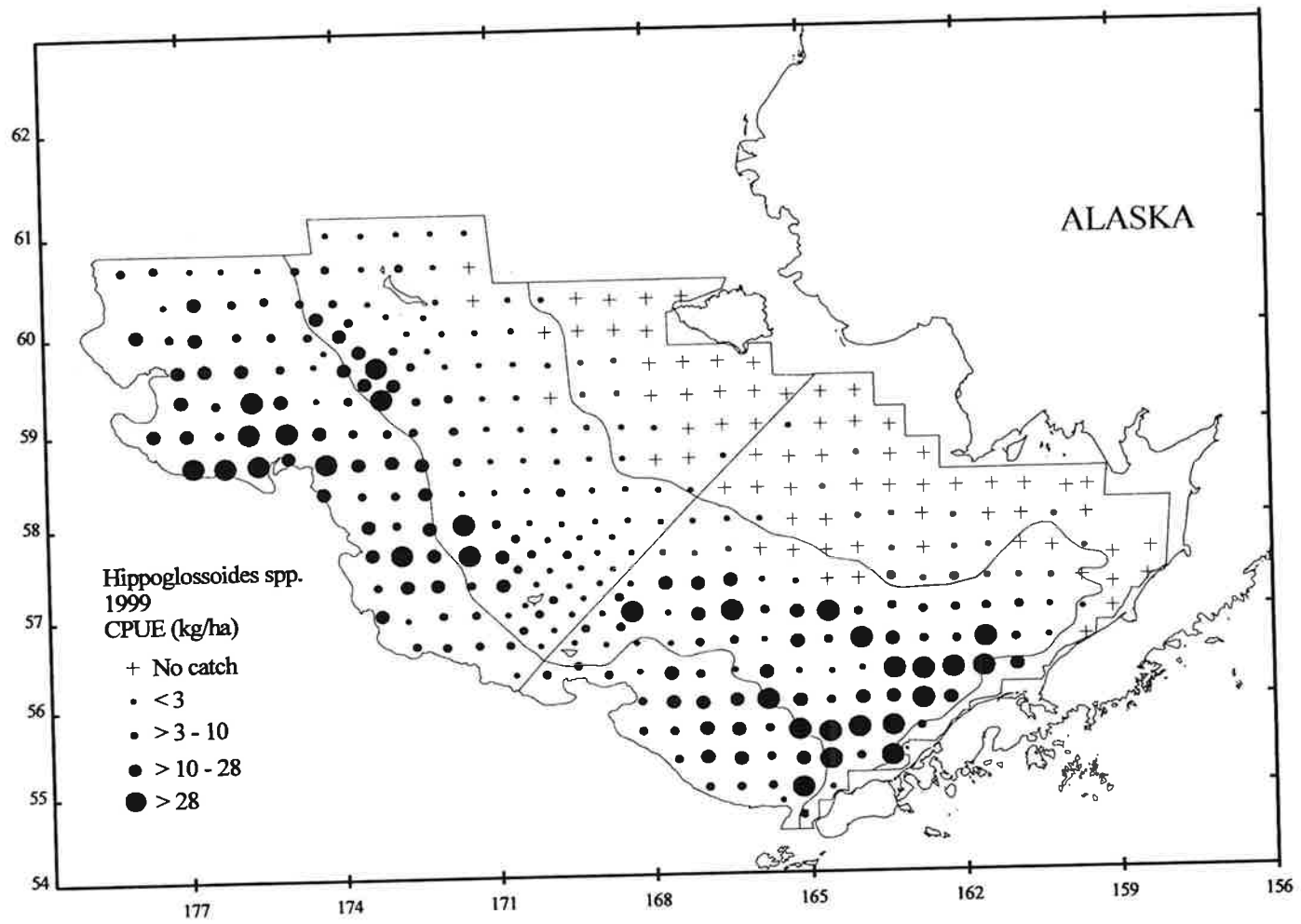


Figure 19.-- Distribution and relative abundance in kg/ha of *Hippoglossoides* spp., 1999 eastern Bering Sea bottom trawl survey.

Table 15.--Abundance estimates and mean size of *Hippoglossoides* spp. by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	1.20	9,331	0.024	23,262,165	0.019	0.401	33.1
2	0.07	286	0.001	682,550	0.001	0.419	33.2
3	13.52	139,624	0.355	384,484,413	0.317	0.363	32.3
4	4.33	46,735	0.119	109,200,203	0.090	0.428	32.8
5	10.86	42,131	0.107	223,436,154	0.184	0.189	27.0
6	16.42	155,281	0.395	472,482,447	0.389	0.329	29.0
All subareas combined <sup>b</sup>	8.49	393,388	1.000	1,213,547,932	1.000	0.324	30.1
95% Confidence interval		±67,753		±191,783,957			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

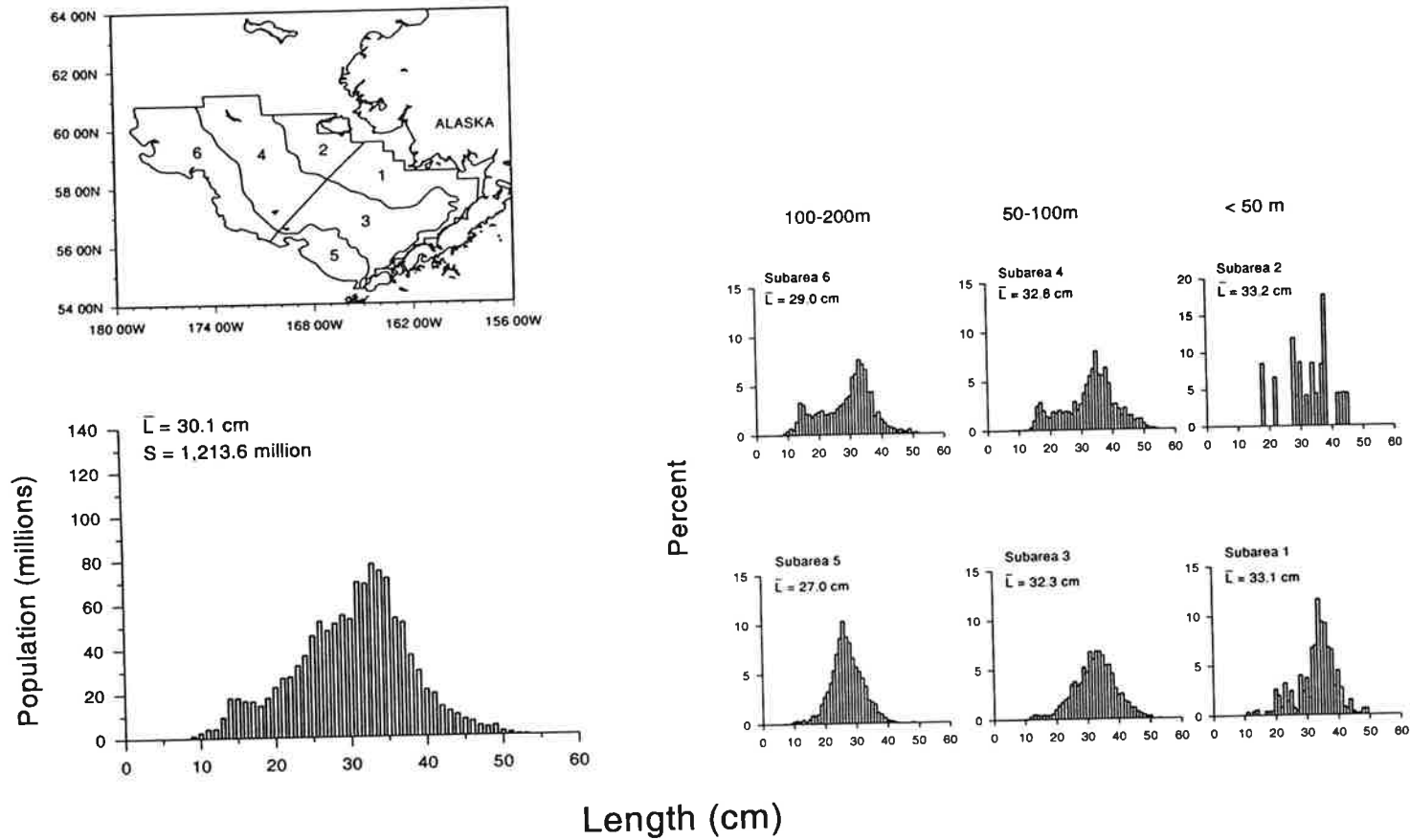


Figure 20.--Estimated relative size distribution (sexes combined) of *Hippoglossoides* spp. in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

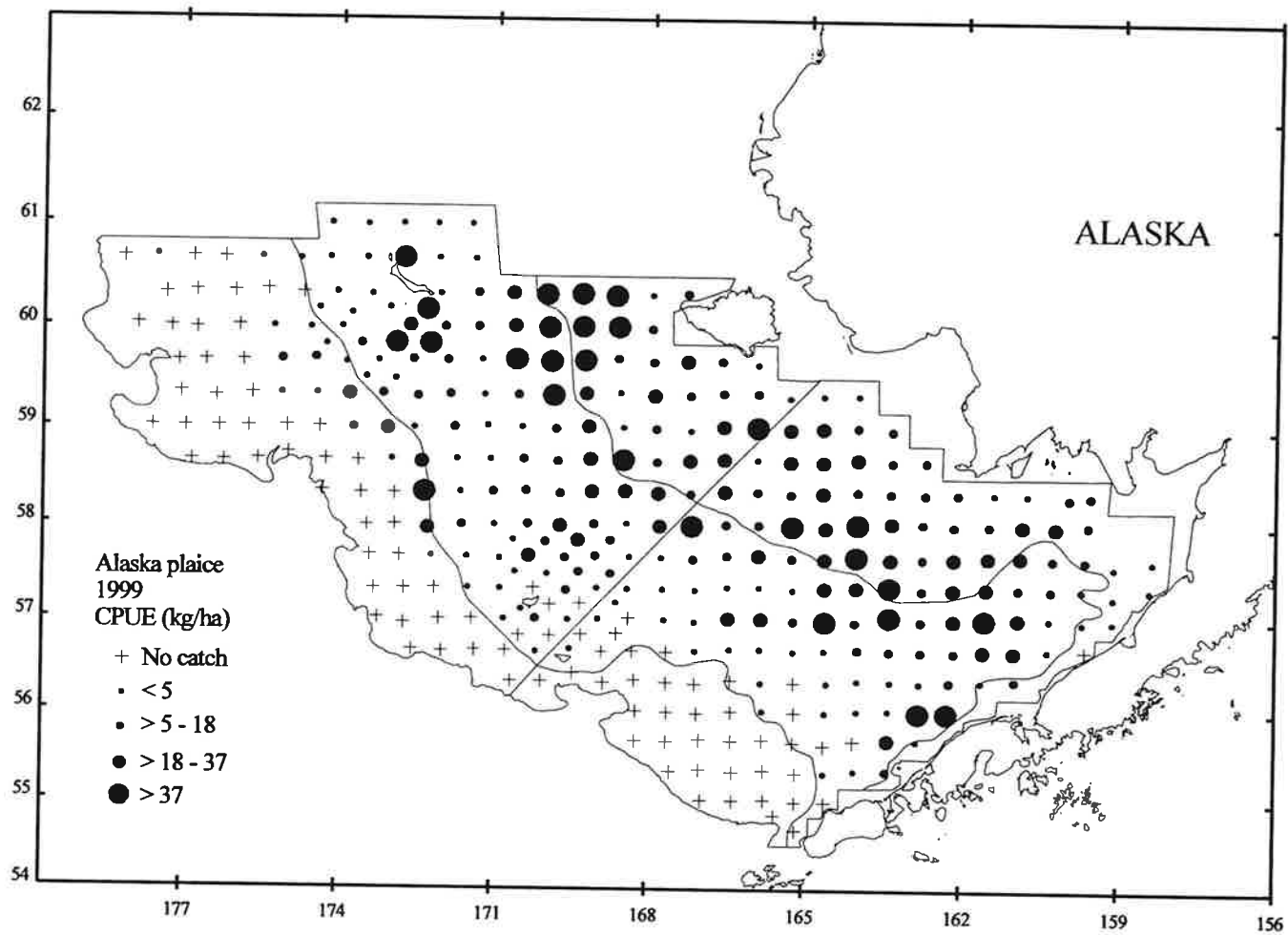


Figure 21.-- Distribution and relative abundance in kg/ha of Alaska plaice, 1999 eastern Bering Sea bottom trawl survey.

Table 16.--Abundance estimates and mean size of Alaska plaice by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	15.33	119,338	0.218	253,125,085	0.266	0.471	32.8
2	25.28	103,731	0.190	223,553,923	0.235	0.464	33.2
3	12.02	124,217	0.227	197,860,619	0.208	0.628	36.4
4	16.11	173,730	0.318	256,813,414	0.270	0.676	36.8
5	0.00	0	0.000	0	0.000	0.000	0.0
6	2.70	25,505	0.047	20,414,597	0.021	1.249	43.3
All subareas combined <sup>b</sup>	11.79	546,522	1.000	951,767,638	1.000	0.574	34.9
95% Confidence interval		±93,120		±143,420,915			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.



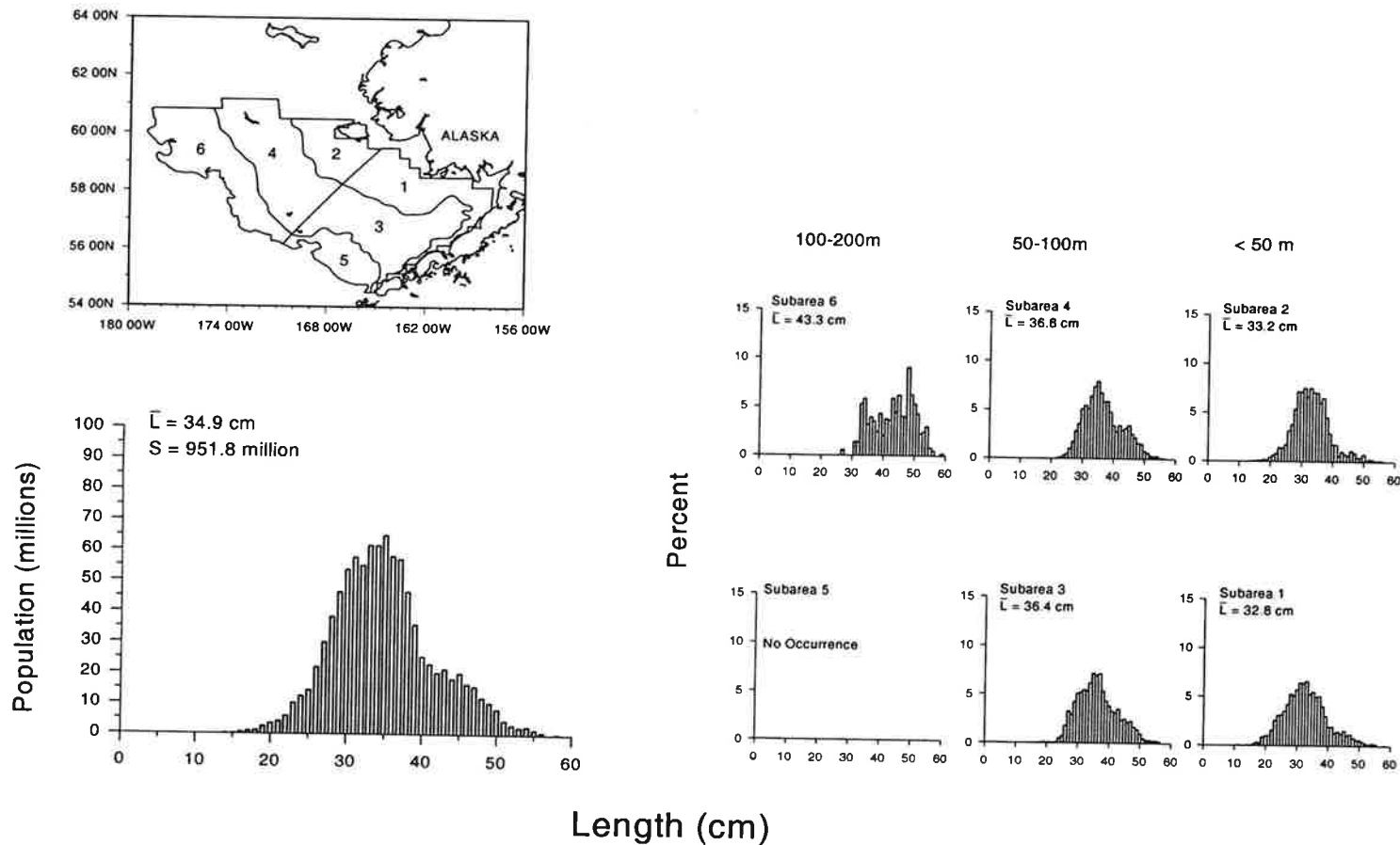


Figure 22.--Estimated relative size distribution (sexes combined) of Alaska plaice in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

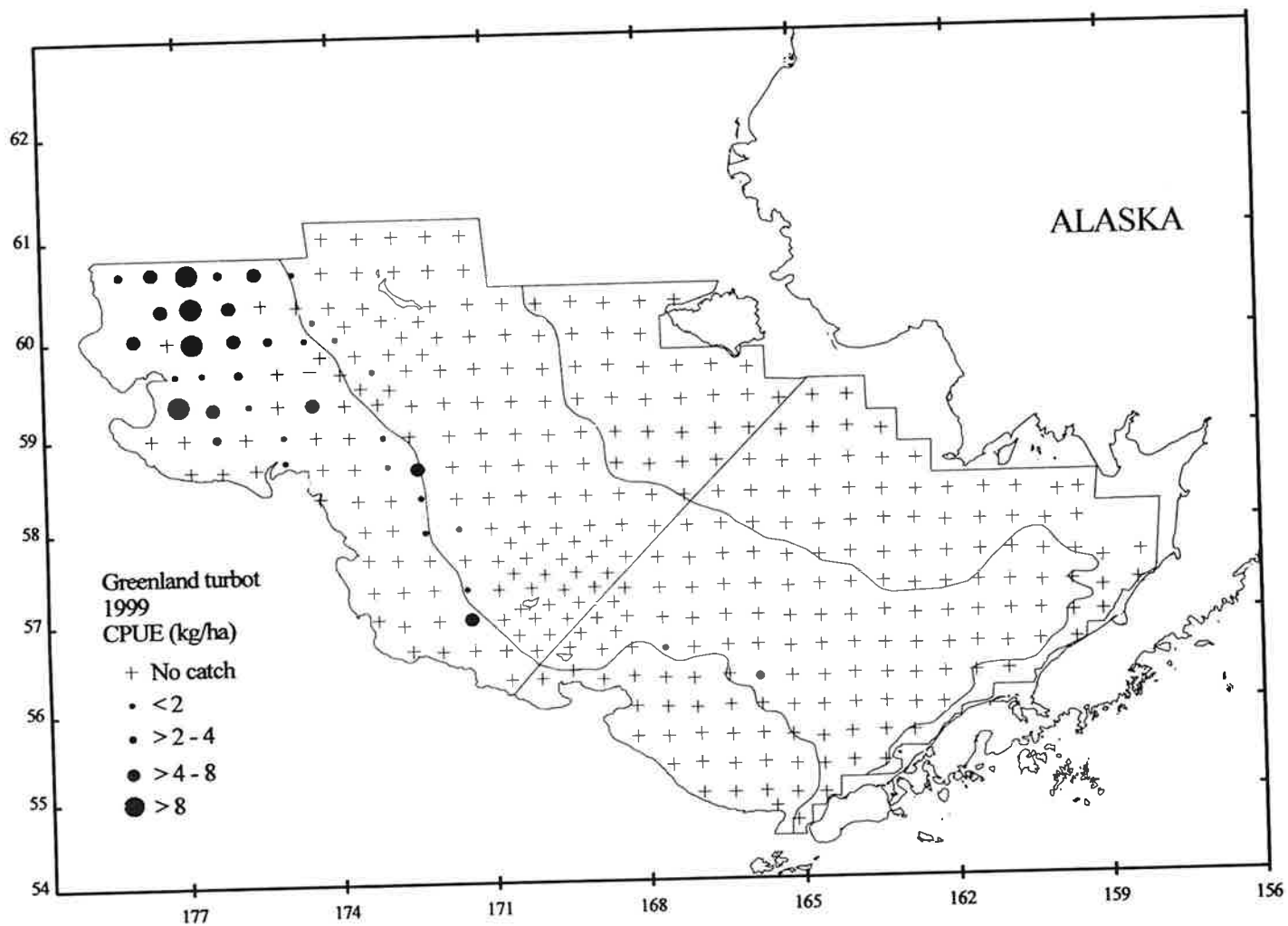


Figure 23.-- Distribution and relative abundance in kg/ha of Greenland turbot, 1999 eastern Bering Sea bottom trawl survey.

Table 17.--Abundance estimates and mean size of Greenland turbot by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	0.00	0	0.000	0	0.000	0.000	0.0
2	0.00	0	0.000	0	0.000	0.000	0.0
3	0.05	473	0.024	78,287	0.016	6.042	82.0
4	0.06	614	0.031	240,175	0.050	2.556	57.8
5	0.00	0	0.000	0	0.000	0.000	0.0
6	1.98	18,710	0.945	4,470,394	0.933	4.185	64.8
All subareas combined <sup>b</sup>	0.43	19,797	1.000	4,788,856	1.000	4.134	64.7
95% Confidence interval		±8,419		±2,407,451			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

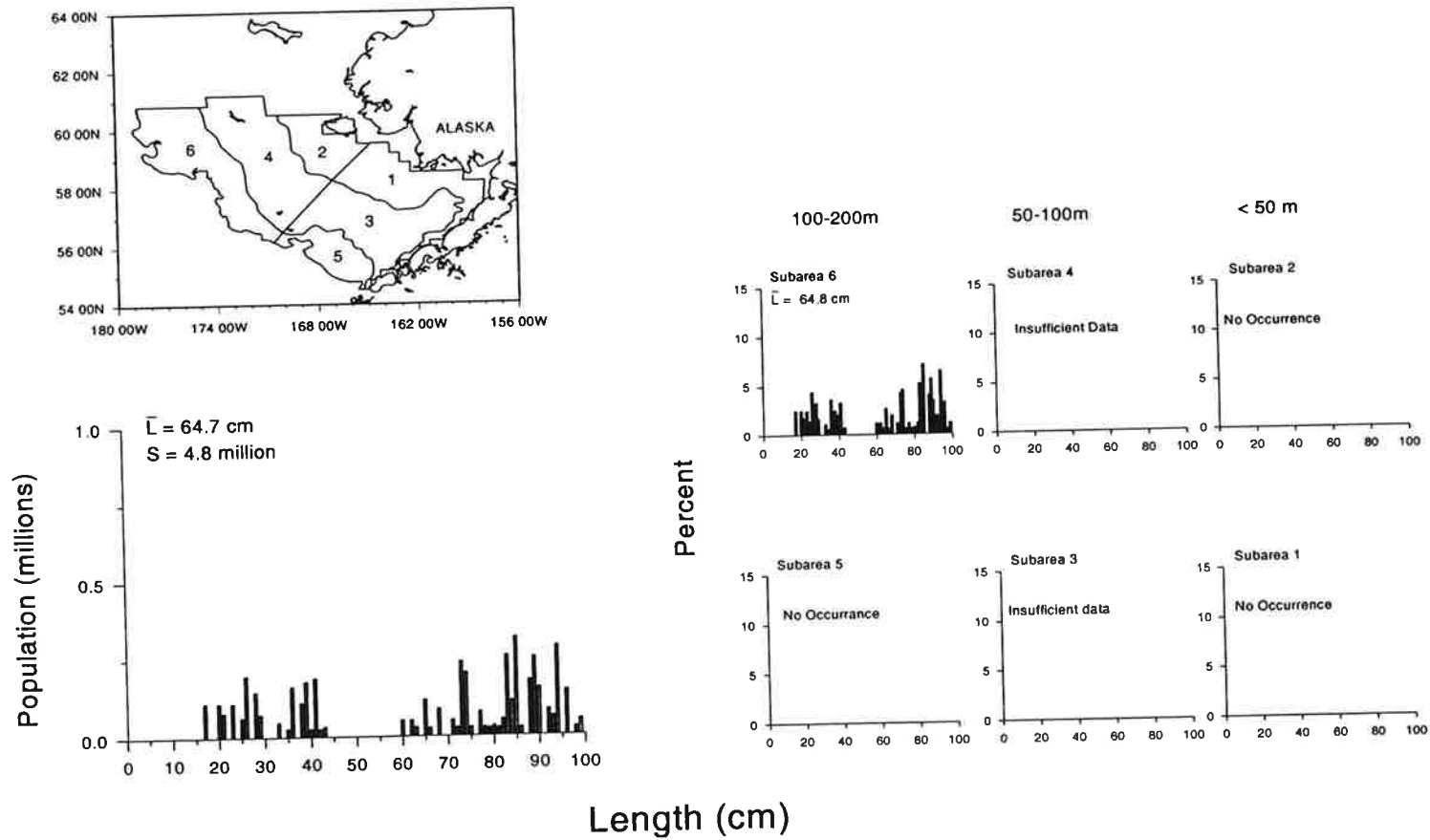


Figure 24.--Estimated relative size distribution (sexes combined) of Greenland turbot in terms of population number and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

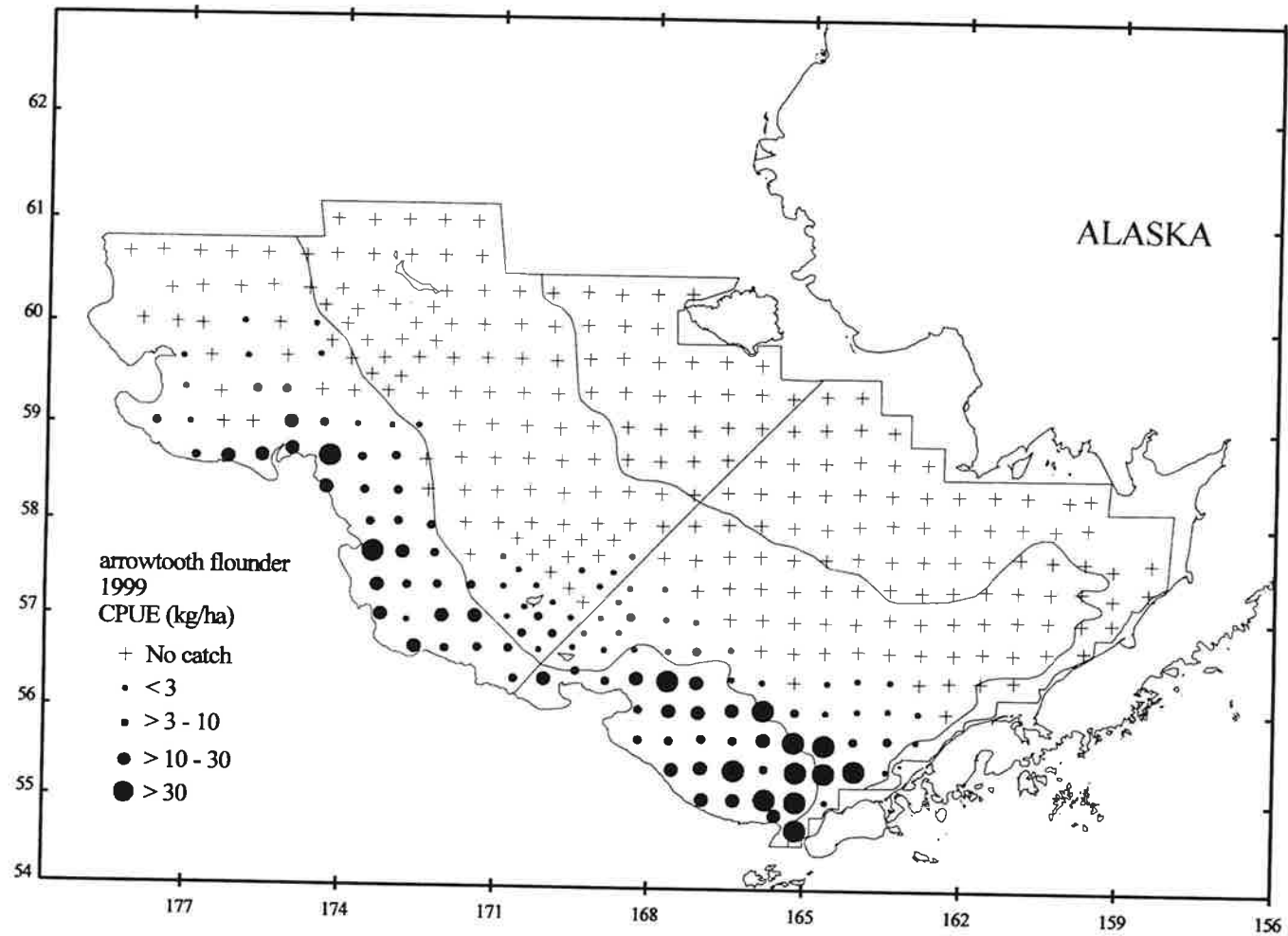


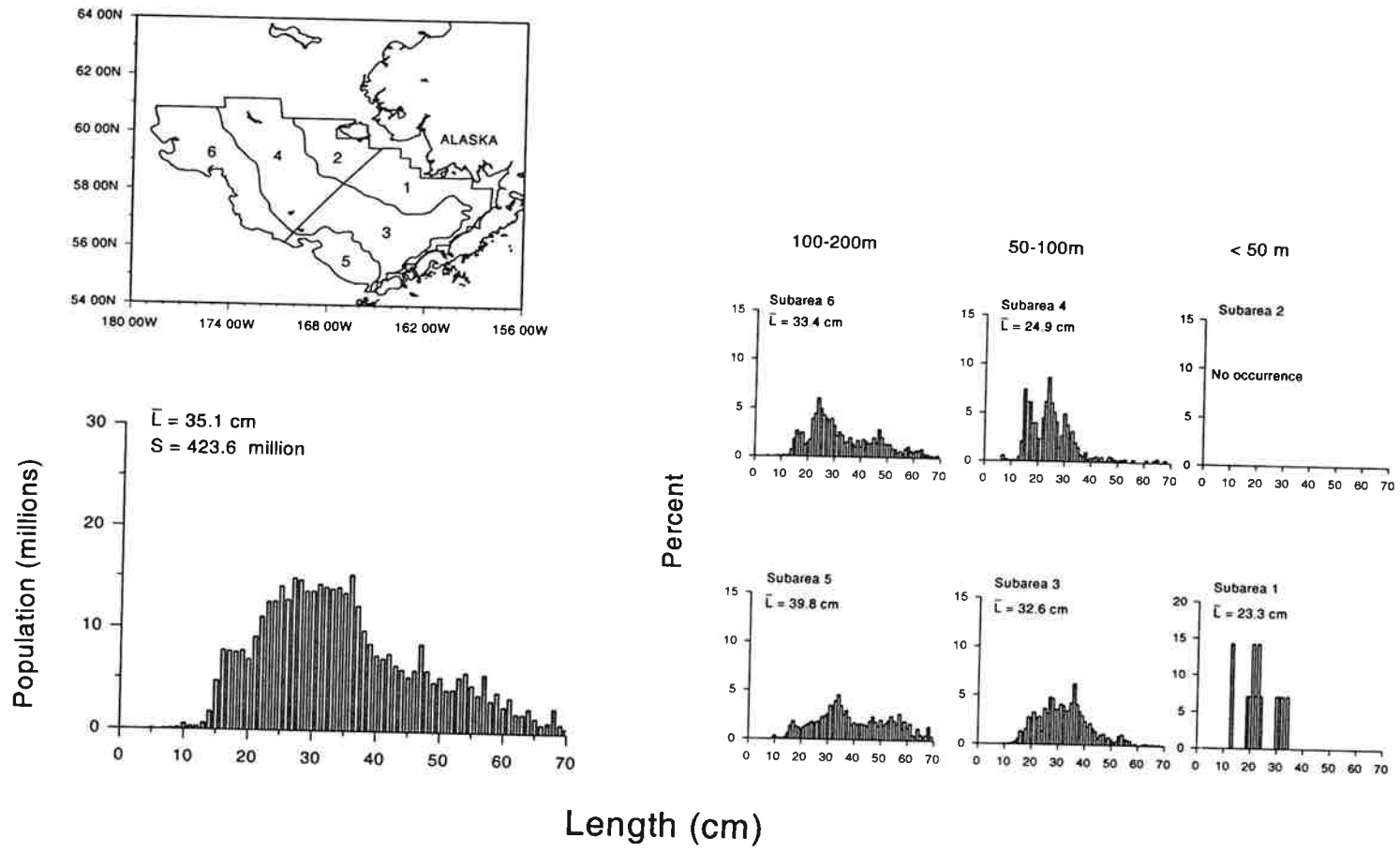
Figure 25.-- Distribution and relative abundance in kg/ha of arrowtooth flounder, 1999 eastern Bering Sea bottom trawl survey.

Table 18.--Abundance estimates and mean size of arrowtooth flounder by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	0.02	129	0.001	1,056,198	0.002	0.122	23.3
2	0.00	0	0.000	0	0.000	0.000	0.0
3	5.58	57,655	0.236	147,606,519	0.348	0.391	32.6
4	0.25	2,662	0.011	13,532,353	0.032	0.197	24.9
5	32.58	126,381	0.518	149,879,072	0.354	0.843	39.8
6	6.03	56,985	0.234	111,506,174	0.263	0.511	33.4
All subareas combined <sup>b</sup>	5.26	243,811	1.000	423,580,316	1.000	0.576	35.1
95% Confidence interval		±131,595		±138,219,236			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.



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Figure 26.--Estimated relative size distribution (sexes combined) of arrowtooth flounder in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

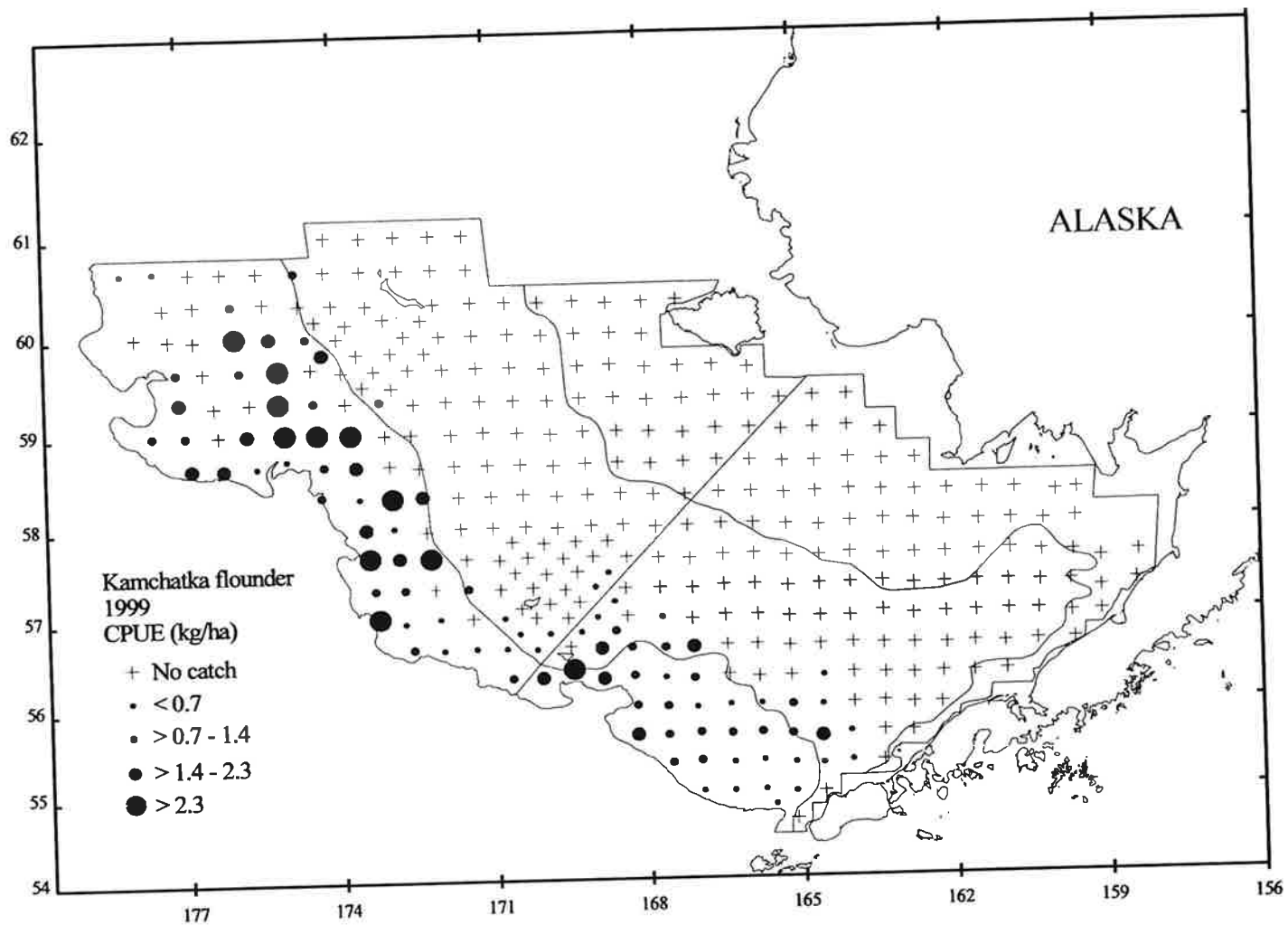


Figure 27.-- Distribution and relative abundance in kg/ha of Kamchatka flounder, 1999 eastern Bering Sea bottom trawl survey.



Table 19.--Abundance estimates and mean size of Kamchatka flounder by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	0.00	0	0.000	0	0.000	0.000	0.0
2	0.00	0	0.000	0	0.000	0.000	0.0
3	0.18	1,845	0.101	3,919,217	0.111	0.471	33.4
4	0.05	497	0.027	417,635	0.012	1.190	46.2
5	0.74	2,887	0.158	8,288,266	0.235	0.348	31.5
6	1.38	13,047	0.714	22,597,457	0.642	0.577	32.4
All subareas combined <sup>b</sup>	0.39	18,276	1.000	35,222,575	1.000	0.519	32.5
95% Confidence interval		±5,064		±16,194,112			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

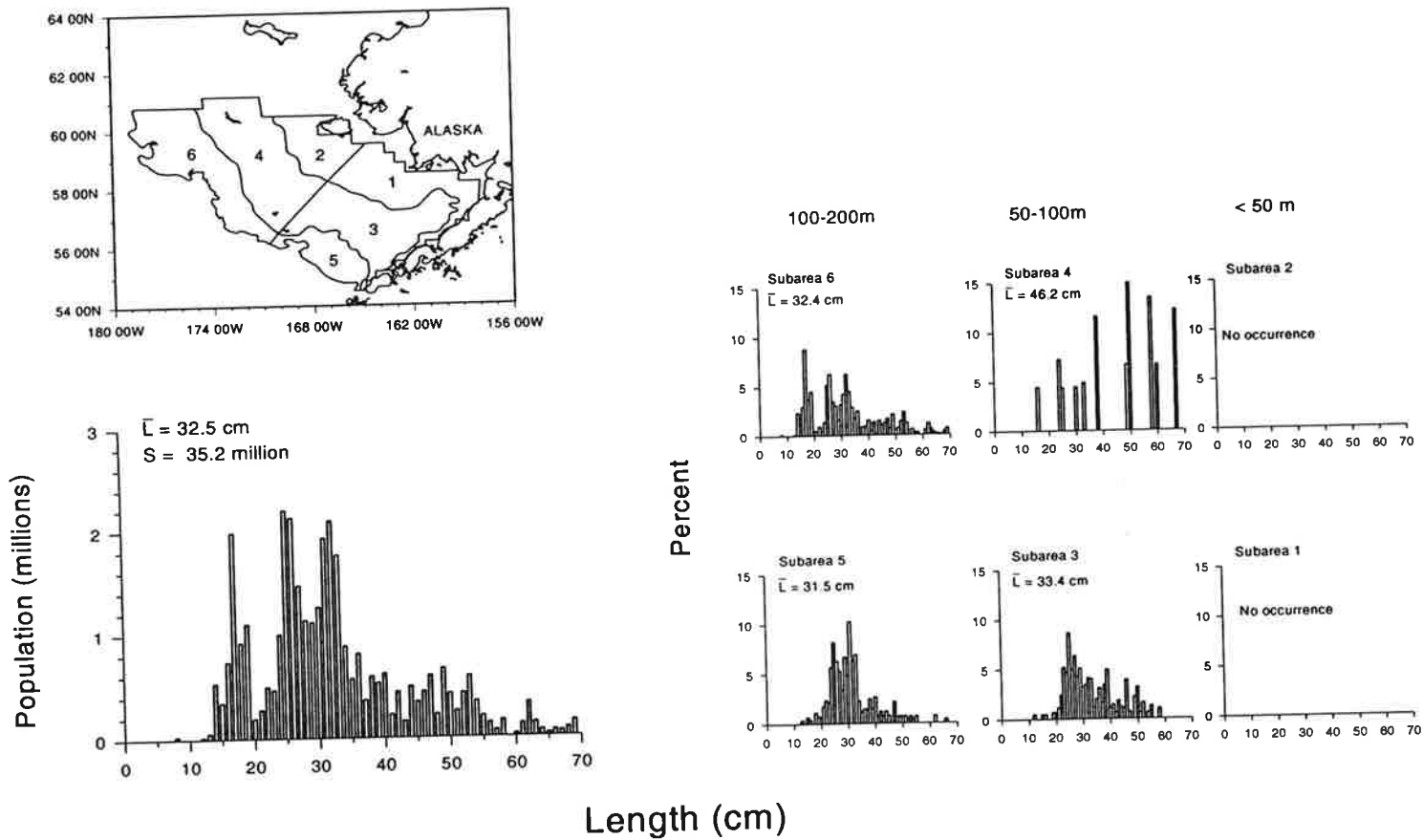


Figure 28.--Estimated relative size distribution (sexes combined) of Kamchatka flounder in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

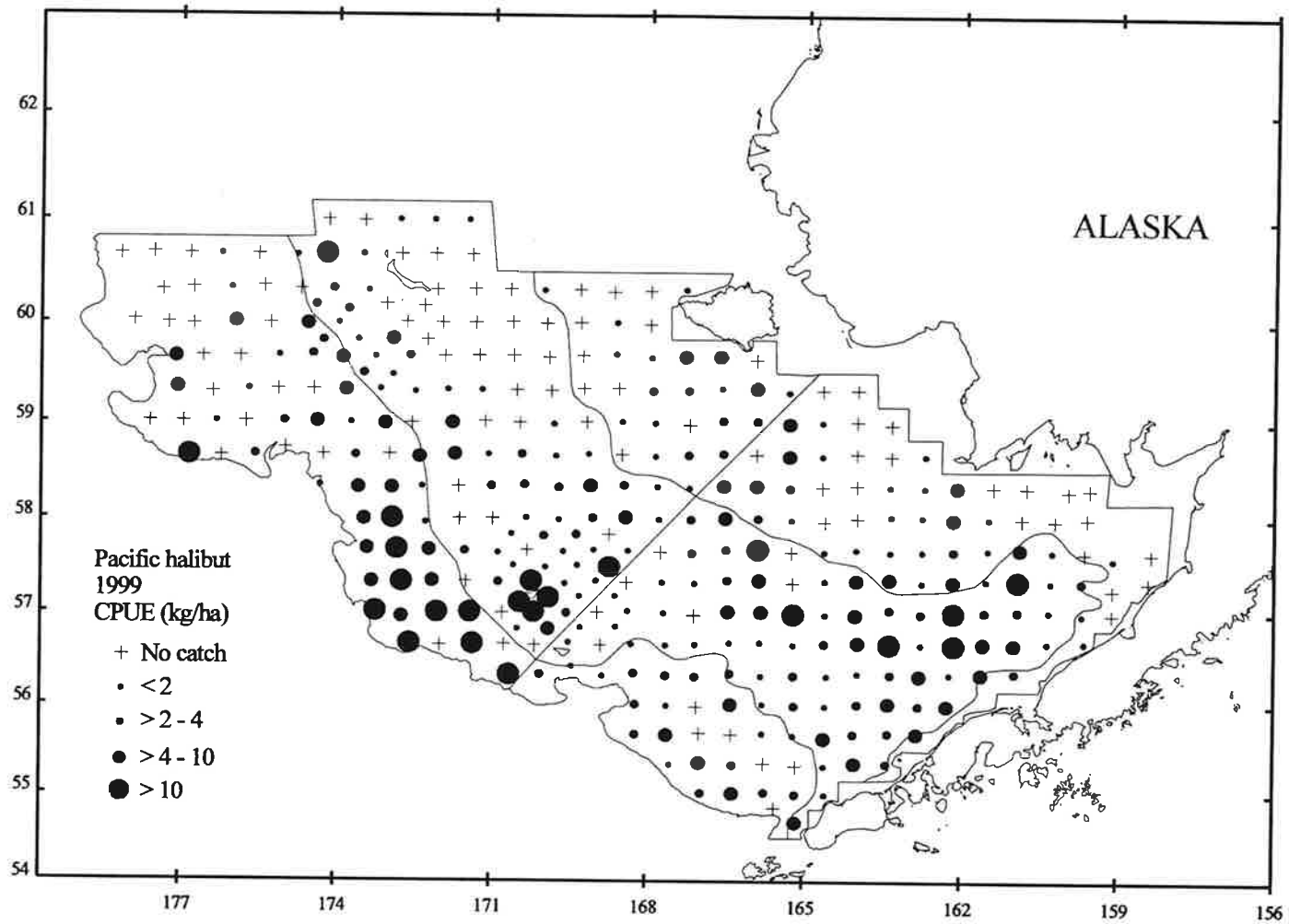


Figure 29.-- Distribution and relative abundance in kg/ha of Pacific halibut, 1999 eastern Bering Sea bottom trawl survey.

Table 20.--Abundance estimates and mean size of Pacific halibut by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean size Weight (kg)	Mean size Length (cm)
1	1.46	11,347	0.088	5,676,743	0.123	1.999	48.5
2	1.26	5,183	0.040	3,138,457	0.068	1.651	45.5
3	3.98	41,089	0.319	23,274,508	0.504	1.765	49.5
4	2.01	21,708	0.169	6,280,369	0.136	3.456	58.8
5	2.35	9,127	0.071	1,764,939	0.038	5.171	73.9
6	4.25	40,155	0.312	6,040,625	0.131	6.647	79.0
All subareas combined <sup>b</sup>	2.78	128,608	1.000	46,175,640	1.000	2.785	55.2
95% Confidence interval		±21,422		±10,547,085			

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

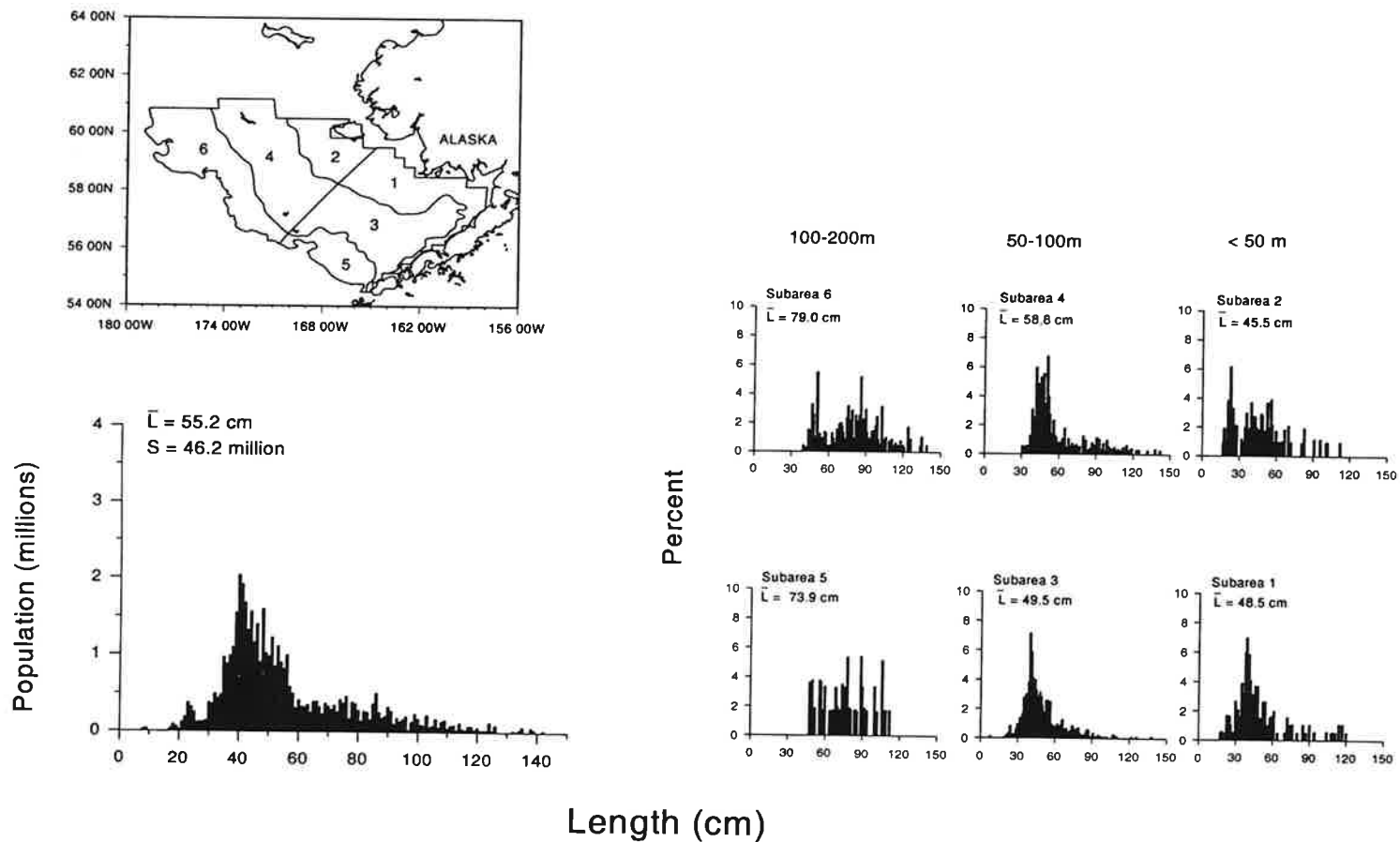


Figure 30.--Estimated relative size distribution (sexes combined) of Pacific halibut in terms of population numbers and percent for subareas 1-6, 1999 eastern Bering Sea bottom trawl survey.

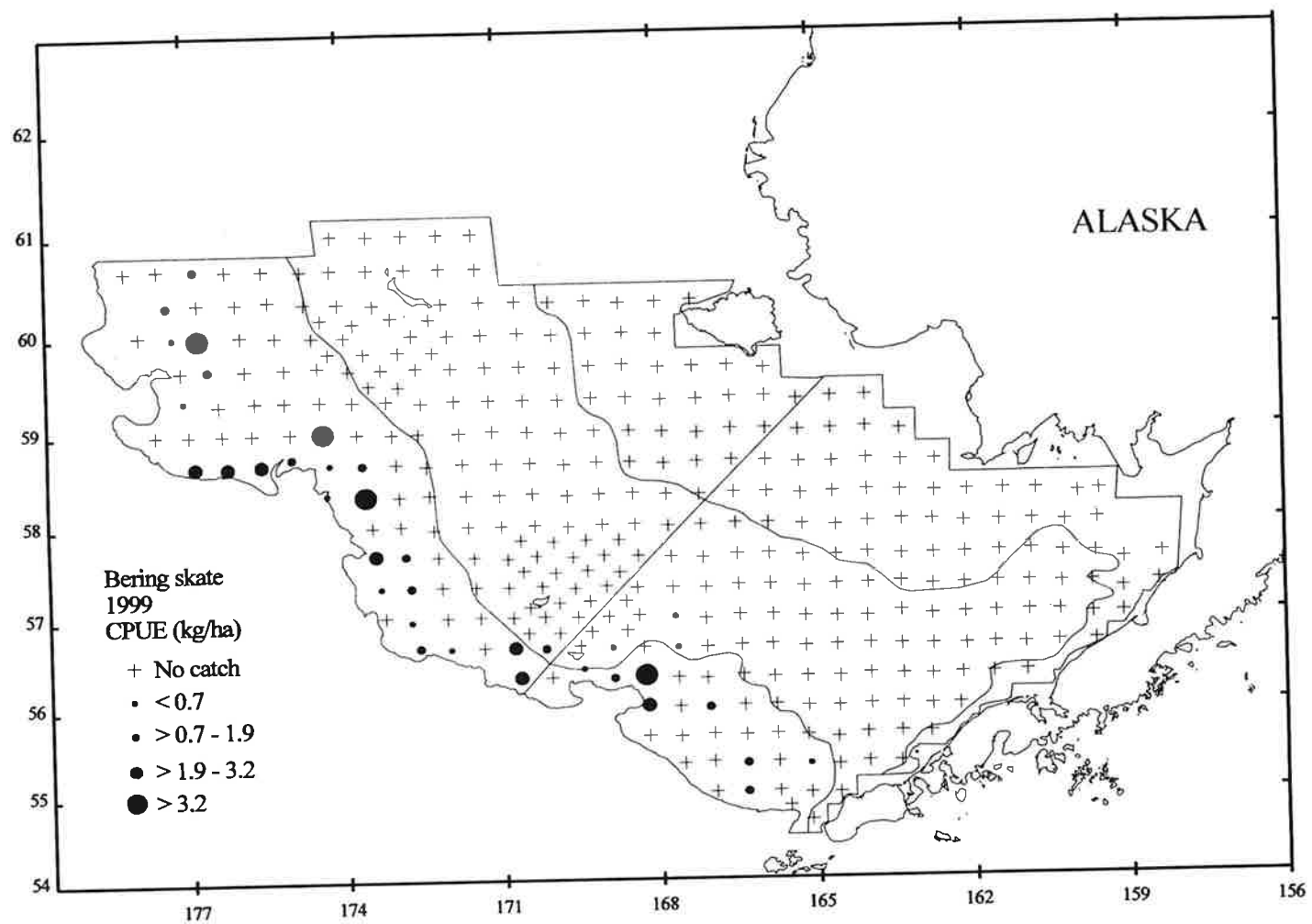


Figure 31.-- Distribution and relative abundance in kg/ha of Bering skate, 1999 eastern Bering Sea bottom trawl survey.

Table 21.--Abundance estimates and mean weight of Bering skate by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.01	154	0.017	92,718	0.025	1.661
4	0.01	56	0.006	45,998	0.012	1.217
5	0.49	1,914	0.210	1,079,369	0.293	1.773
6	0.74	6,977	0.767	2,464,577	0.669	2.831
All subareas combined <sup>b</sup>	0.20	9,100	1.000	3,682,661	1.000	2.471
95% Confidence interval		±3,908		±1,455,776		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

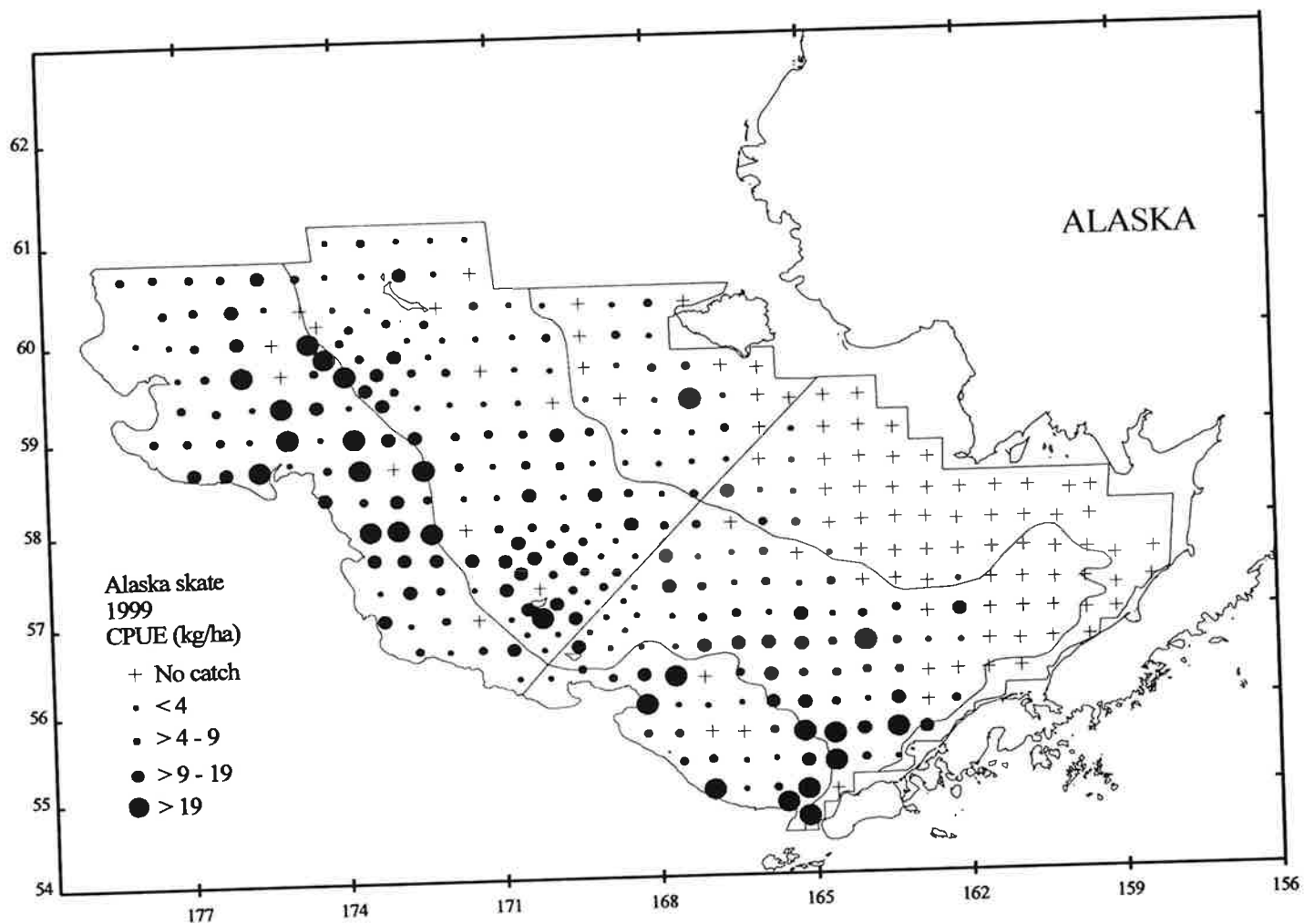


Figure 32.-- Distribution and relative abundance in kg/ha of Alaska skate, 1999 eastern Bering Sea bottom trawl survey.



Table 22.--Abundance estimates and mean weight of Alaska skate by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.88	6,876	0.020	1,401,330	0.015	4.907
2	3.06	12,550	0.037	2,428,039	0.025	5.169
3	6.90	71,283	0.211	31,585,966	0.328	2.257
4	5.51	59,447	0.176	21,678,127	0.225	2.742
5	21.64	83,938	0.248	13,496,685	0.140	6.219
6	10.99	103,893	0.307	25,753,777	0.267	4.034
All subareas combined <sup>b</sup>	7.29	337,988	1.000	96,343,924	1.000	3.508
95% Confidence interval		±116,185		±20,314,854		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

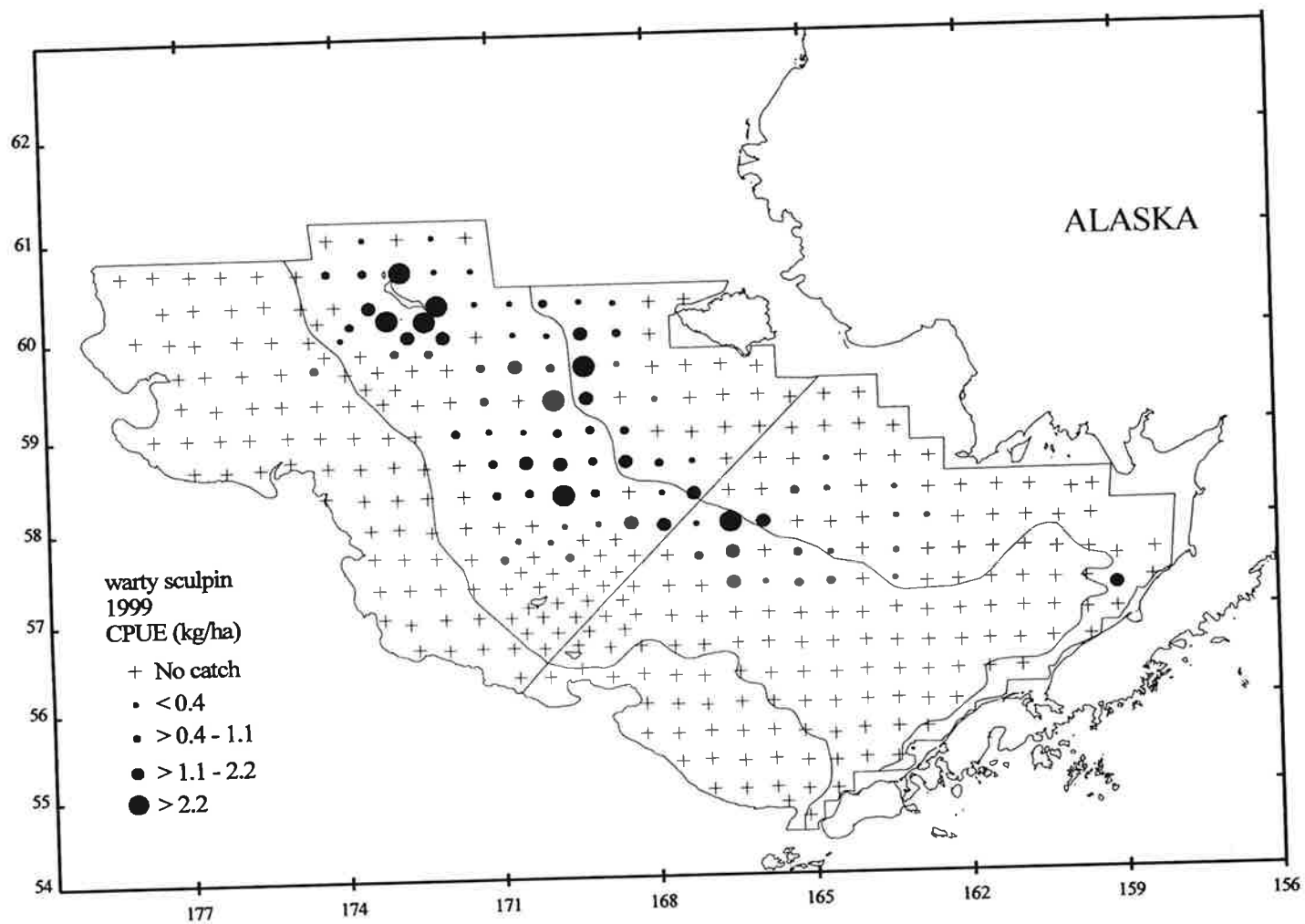


Figure 33.-- Distribution and relative abundance in kg/ha of warty sculpin, 1999 eastern Bering Sea bottom trawl survey.

Table 23.--Abundance estimates and mean weight of warty sculpin by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.08	640	0.058	907,423	0.072	0.705
2	0.55	2,248	0.205	2,944,826	0.235	0.763
3	0.12	1,242	0.113	1,394,666	0.111	0.891
4	0.63	6,817	0.620	7,225,008	0.577	0.944
5	0.00	0	0.000	0	0.000	0.000
6	0.00	45	0.004	47,381	0.004	0.950
All subareas combined <sup>b</sup>	0.24	10,992	1.000	12,519,304	1.000	0.878
95% Confidence interval		±4,151		±4,664,758		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

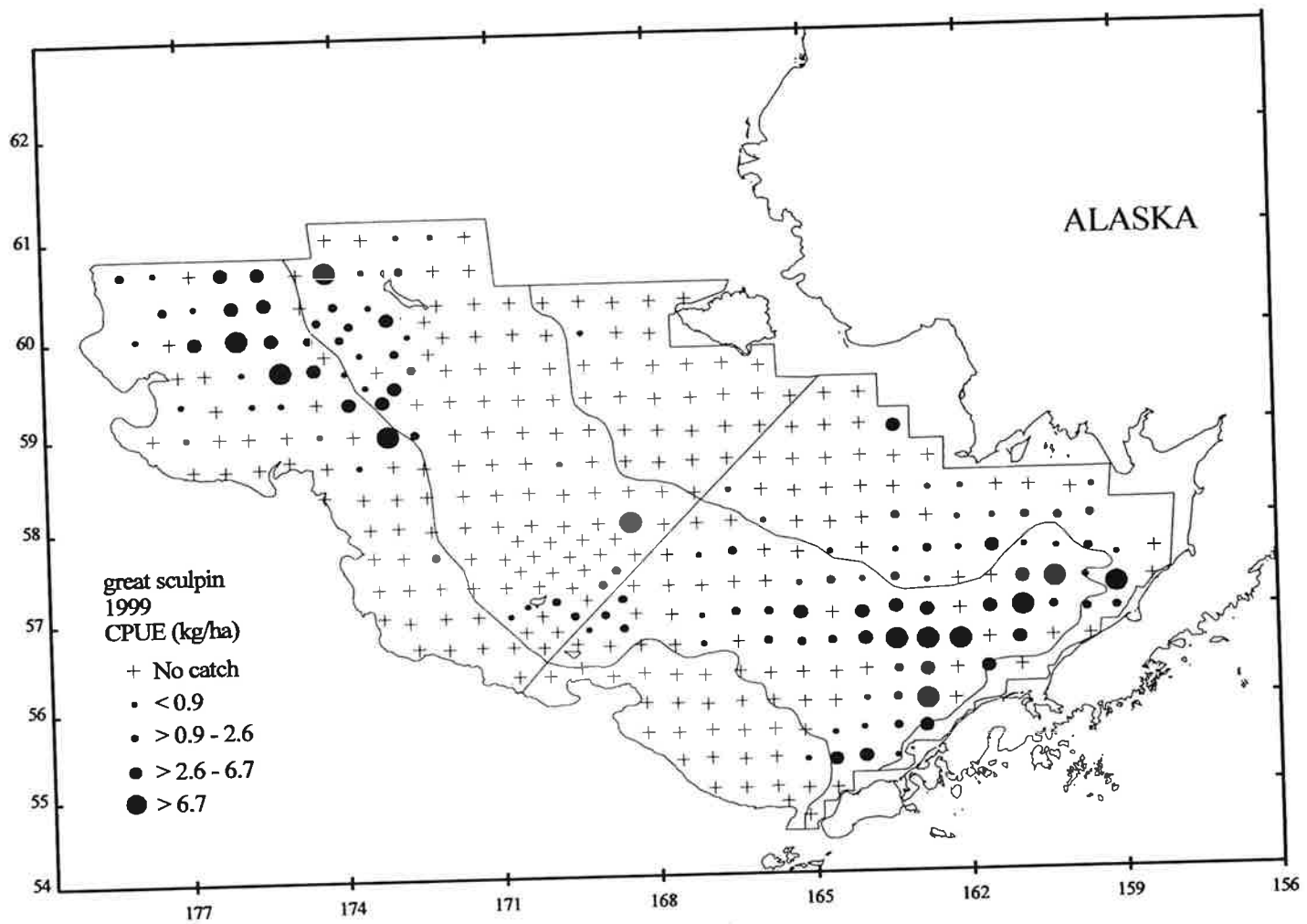


Figure 34.-- Distribution and relative abundance in kg/ha of great sculpin, 1999 eastern Bering Sea bottom trawl survey.

Table 24.--Abundance estimates and mean weight of great sculpin by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.76	5,917	0.131	9,115,316	0.350	0.649
2	0.00	9	0.000	83,001	0.003	0.108
3	2.14	22,065	0.490	9,702,526	0.373	2.274
4	0.61	6,527	0.145	2,197,656	0.084	2.970
5	0.00	14	0.000	27,992	0.001	0.500
6	1.11	10,540	0.234	4,883,353	0.188	2.158
All subareas combined <sup>b</sup>	0.97	45,073	1.000	26,009,844	1.000	1.733
95% Confidence interval		±12,891		±8,390,189		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

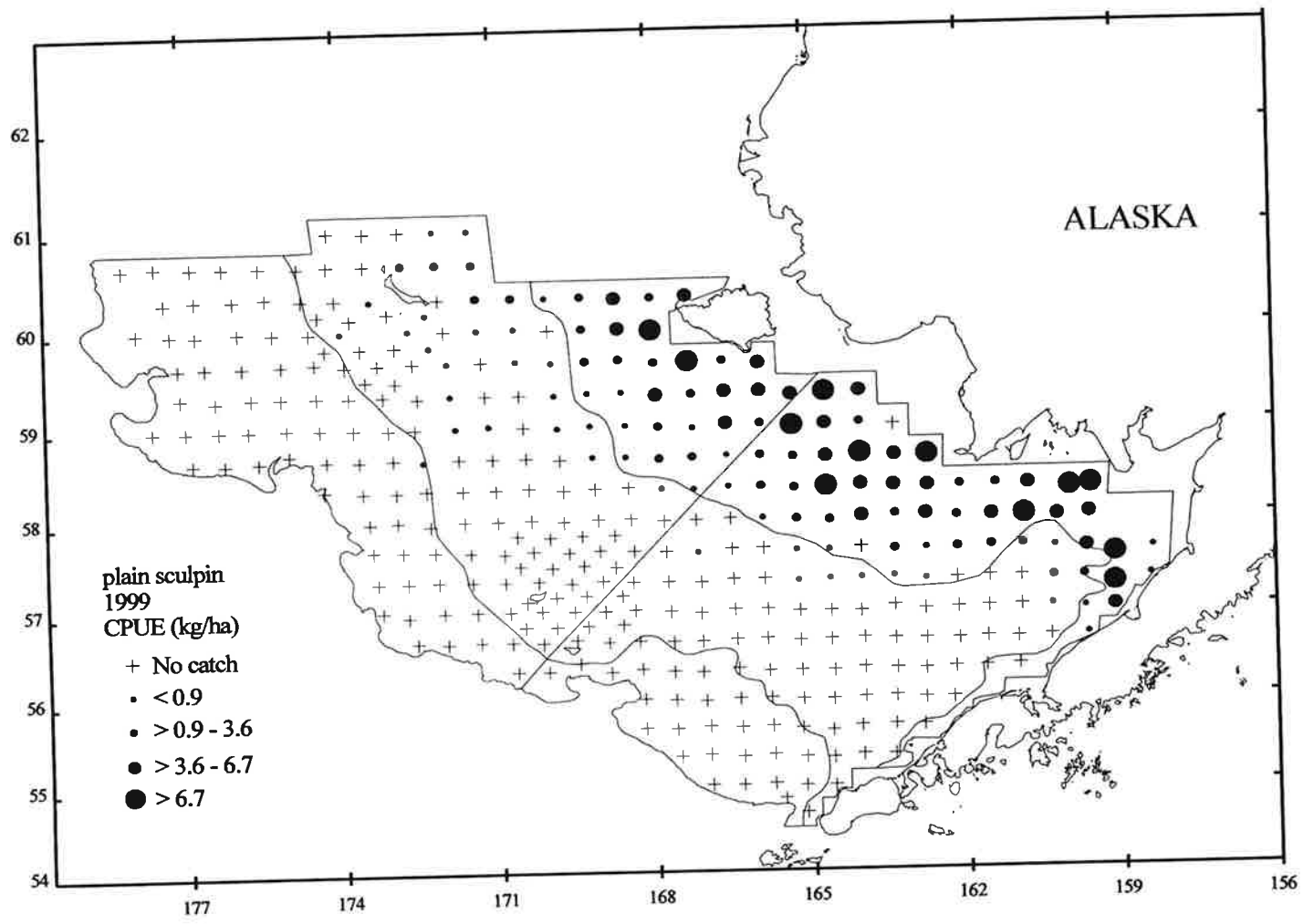


Figure 35.-- Distribution and relative abundance in kg/ha of plain sculpin, 1999 eastern Bering Sea bottom trawl survey.

Table 25.--Abundance estimates and mean weight of plain sculpin by subarea, 1999  
eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	4.27	33,277	0.704	76,321,756	0.752	0.436
2	2.78	11,422	0.242	21,437,245	0.211	0.533
3	0.06	645	0.014	1,232,848	0.012	0.523
4	0.17	1,798	0.038	2,431,693	0.024	0.739
5	0.00	0	0.000	0	0.000	0.000
6	0.01	123	0.003	113,416	0.001	1.085
All subareas combined <sup>b</sup>	1.02	47,264	1.000	101,536,957	1.000	0.465
95% Confidence interval		±11,299		±22,975,586		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

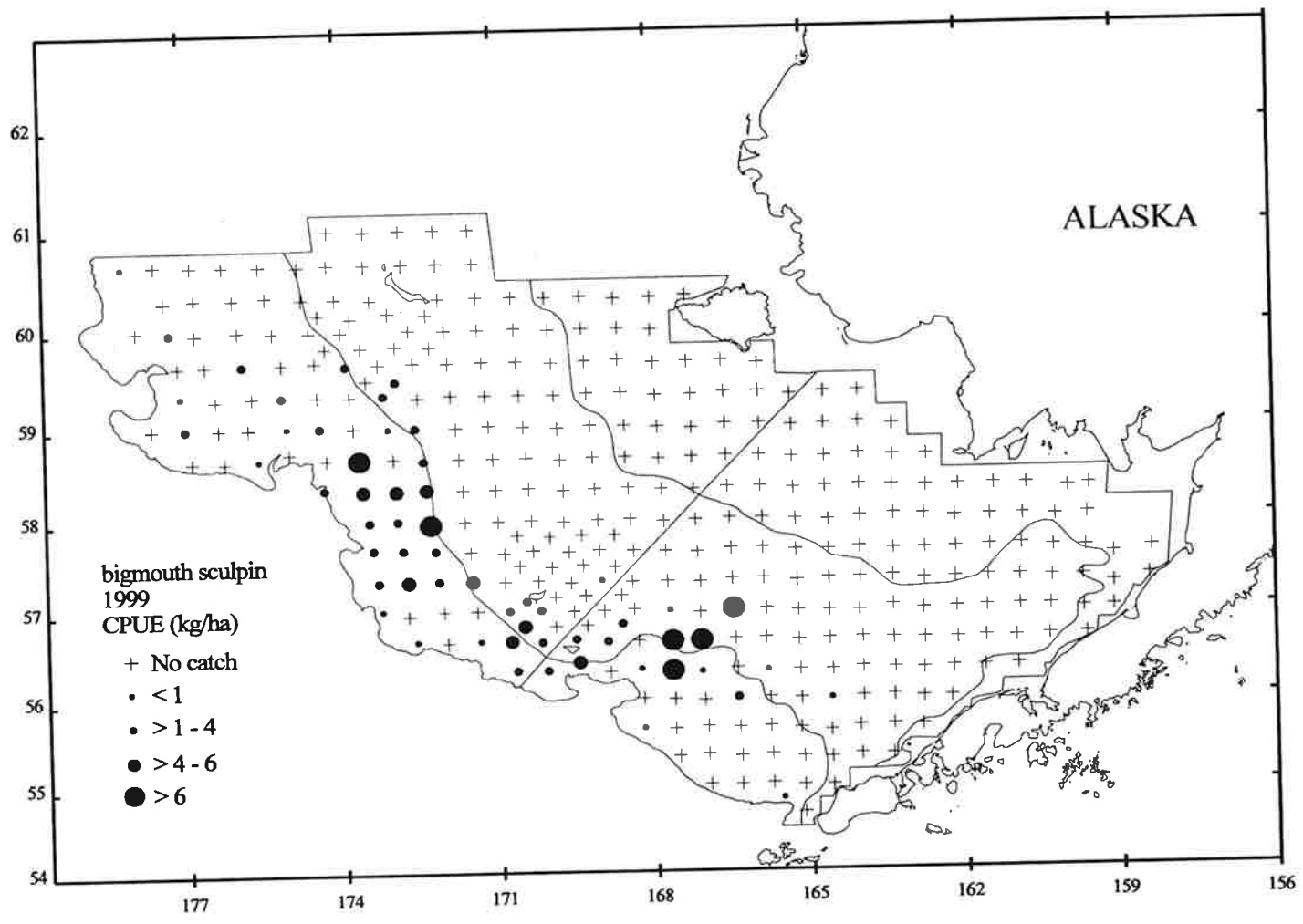


Figure 36.-- Distribution and relative abundance in kg/ha of bigmouth sculpin, 1999 eastern Bering Sea bottom trawl survey.



Table 26.--Abundance estimates and mean weight of bigmouth sculpin by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.64	6,649	0.272	1,137,177	0.232	5.847
4	0.26	2,798	0.115	619,089	0.126	4.520
5	0.68	2,621	0.107	559,635	0.114	4.683
6	1.31	12,368	0.506	2,593,468	0.528	4.769
All subareas combined <sup>b</sup>	0.53	24,436	1.000	4,909,369	1.000	4.977
95% Confidence interval		±8,525		±1,526,900		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

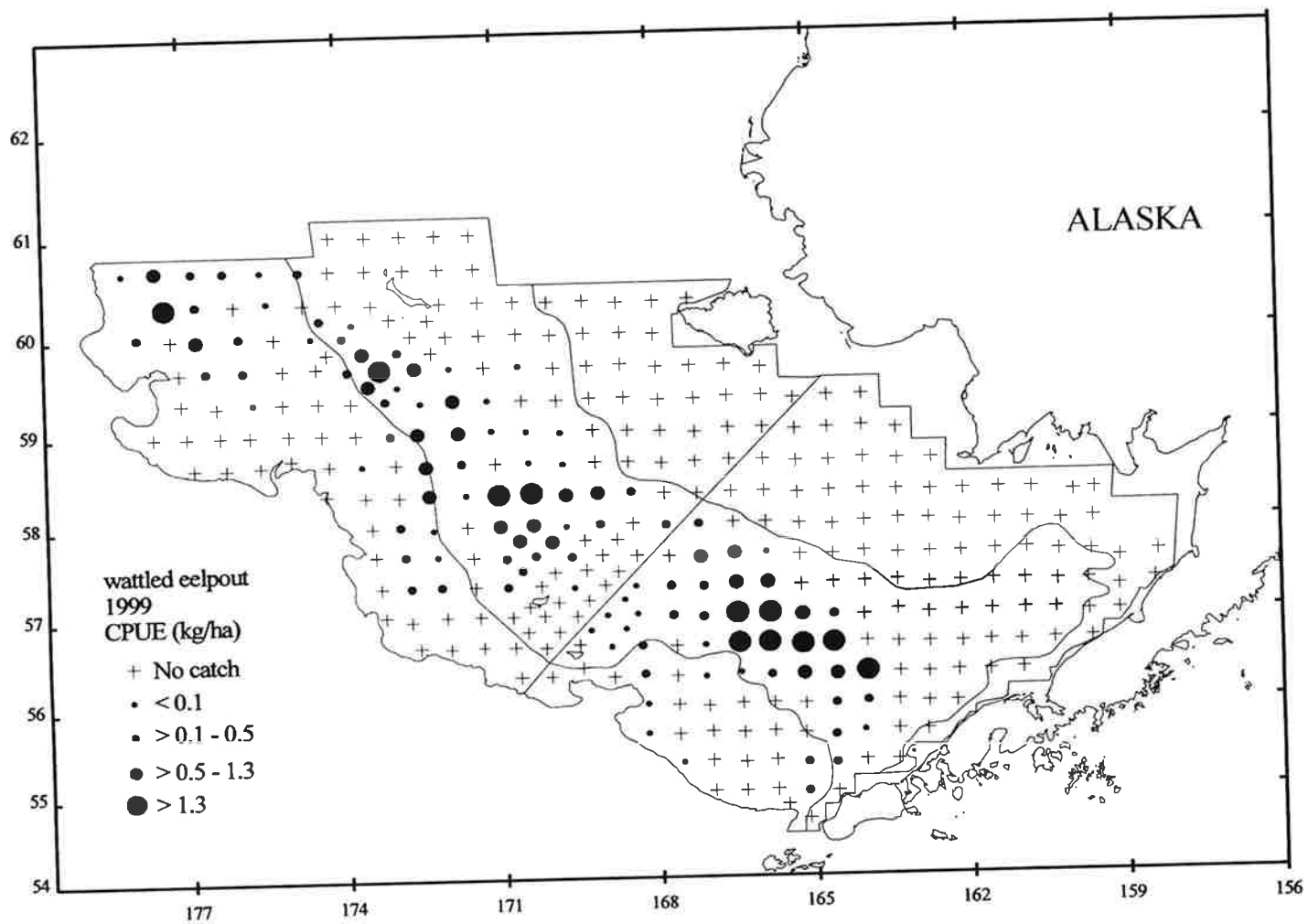


Figure 37.-- Distribution and relative abundance in kg/ha of wattle eelpout, 1999 eastern Bering Sea bottom trawl survey.

Table 27.--Abundance estimates and mean weight of wattled eelpout by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.38	3,901	0.518	18,646,398	0.486	0.209
4	0.22	2,329	0.309	11,027,302	0.287	0.211
5	0.04	145	0.019	702,979	0.018	0.206
6	0.12	1,154	0.153	7,981,831	0.208	0.145
All subareas combined <sup>b</sup>	0.16	7,529	1.000	38,358,510	1.000	0.196
95% Confidence interval		±2,421		±11,678,892		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

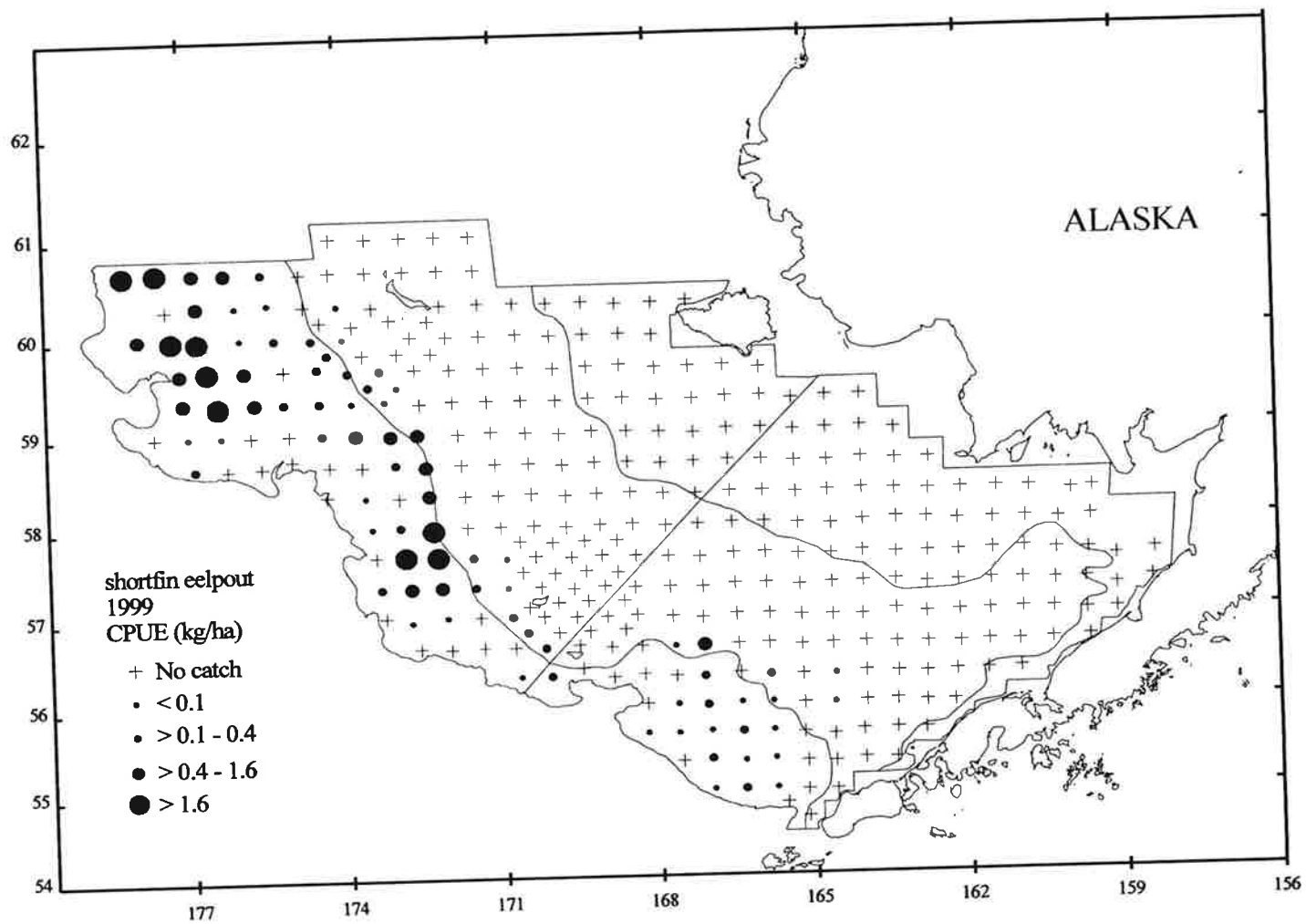


Figure 38.-- Distribution and relative abundance in kg/ha of shortfin eelpout, 1999 eastern Bering Sea bottom trawl survey.

Table 28.--Abundance estimates and mean weight of shortfin eelpout by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.01	115	0.018	2,559,648	0.021	0.045
4	0.04	415	0.064	11,070,397	0.091	0.037
5	0.05	177	0.027	4,238,486	0.035	0.042
6	0.61	5,739	0.890	103,619,757	0.853	0.055
All subareas combined <sup>b</sup>	0.14	6,447	1.000	121,488,288	1.000	0.053
95% Confidence interval		±2,592		±41,553,959		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

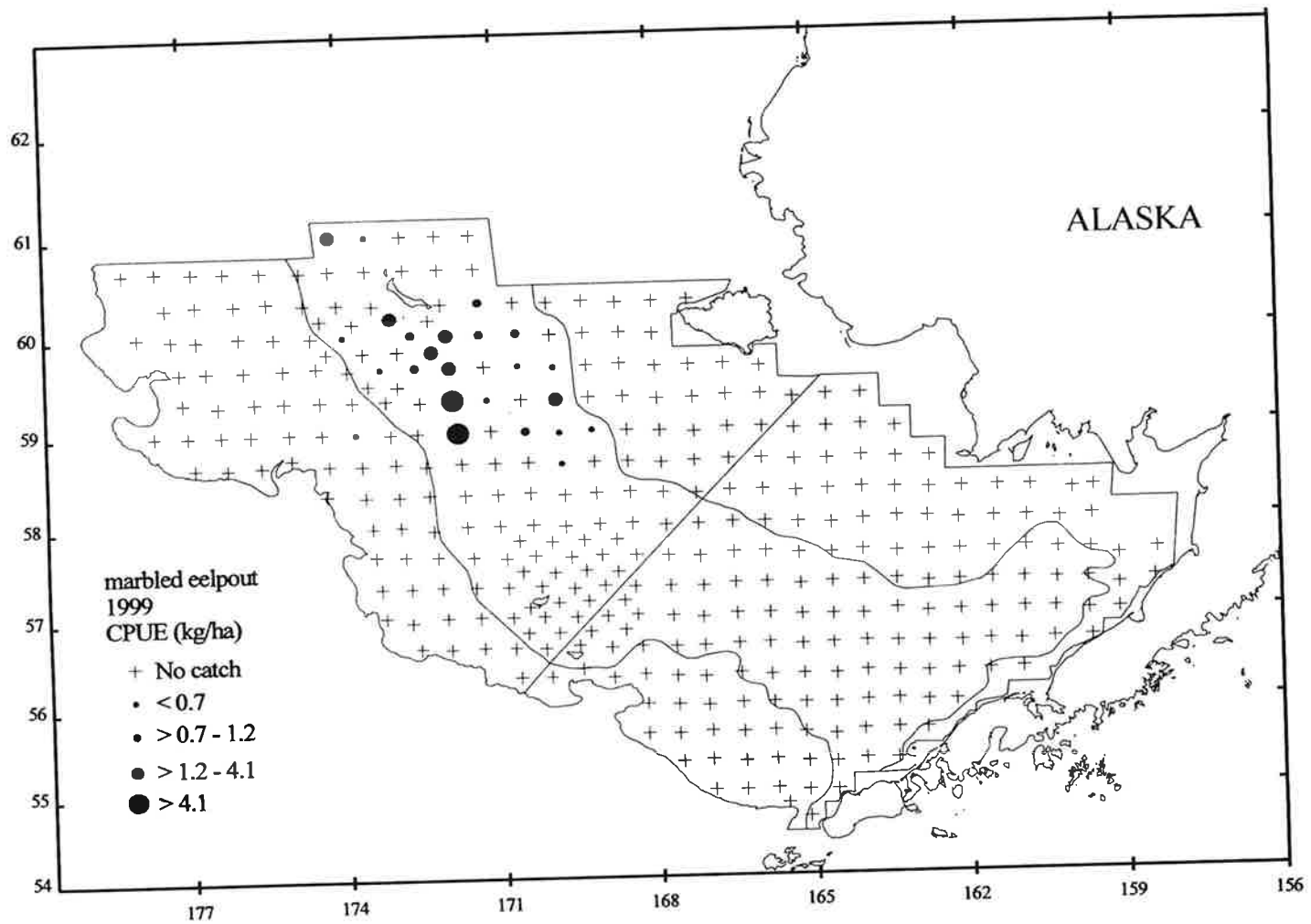


Figure 39.-- Distribution and relative abundance in kg/ha of marbled eelpout, 1999 eastern Bering Sea bottom trawl survey.

Table 29.--Abundance estimates and mean weight of marbled eelpout by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.00	0	0.000	0	0.000	0.000
4	0.37	3,958	0.978	3,215,157	0.973	1.231
5	0.00	0	0.000	0	0.000	0.000
6	0.01	89	0.022	90,429	0.027	0.984
All subareas combined <sup>b</sup>	0.09	4,048	1.000	3,305,586	1.000	1.225
95% Confidence interval		±2,062		±1,724,550		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

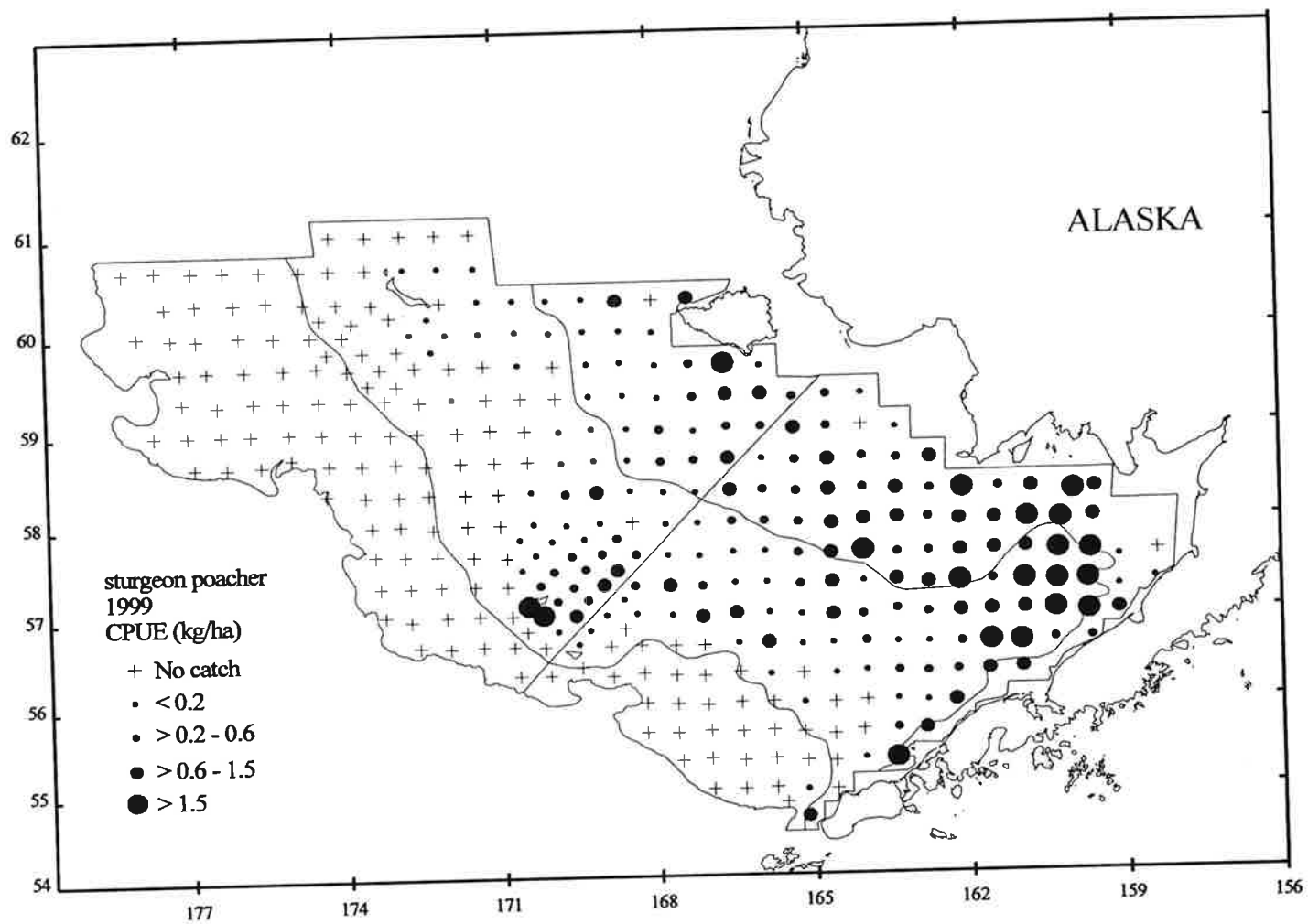


Figure 40.-- Distribution and relative abundance in kg/ha of sturgeon poacher, 1999 eastern Bering Sea bottom trawl survey.



Table 30.--Abundance estimates and mean weight of sturgeon poacher by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.88	6,848	0.481	102,240,842	0.432	0.067
2	0.32	1,310	0.092	26,432,152	0.112	0.050
3	0.47	4,897	0.344	85,681,732	0.362	0.057
4	0.11	1,174	0.082	22,456,354	0.095	0.052
5	0.00	6	0.000	61,568	0.000	0.097
6	0.00	0	0.000	0	0.000	0.000
All subareas combined <sup>b</sup>	0.31	14,235	1.000	236,872,647	1.000	0.060
95% Confidence interval		±2,422		±36,176,978		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

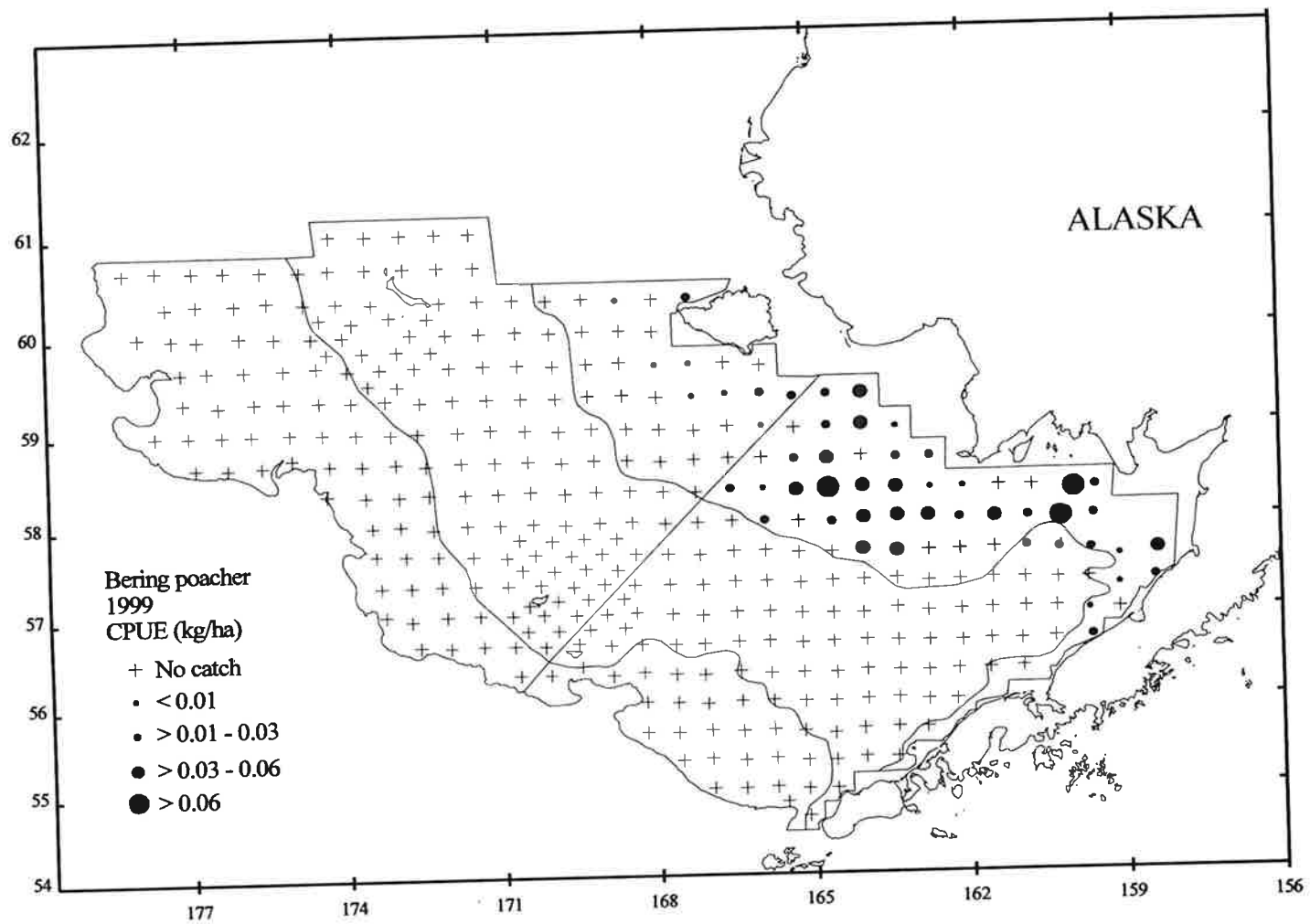


Figure 41.-- Distribution and relative abundance in kg/ha of Bering poacher, 1999 eastern Bering Sea bottom trawl survey.

Table 31.--Abundance estimates and mean weight of Bering poacher by subarea, 1999 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean weight (kg)
1	0.02	168	0.923	6,578,845	0.914	0.026
2	0.00	9	0.049	503,580	0.070	0.018
3	0.00	4	0.022	111,969	0.016	0.036
4	0.00	0	0.000	0	0.000	0.000
5	0.00	0	0.000	0	0.000	0.000
6	0.00	0	0.000	0	0.000	0.000
All subareas combined	0.00	182	1.000	7,194,394	1.000	0.025
95% Confidence interval		±53		±2,155,693		

<sup>a</sup>Variances of abundance estimates are given in Appendix D.

<sup>b</sup>Differences in sums of estimates and totals are due to rounding.

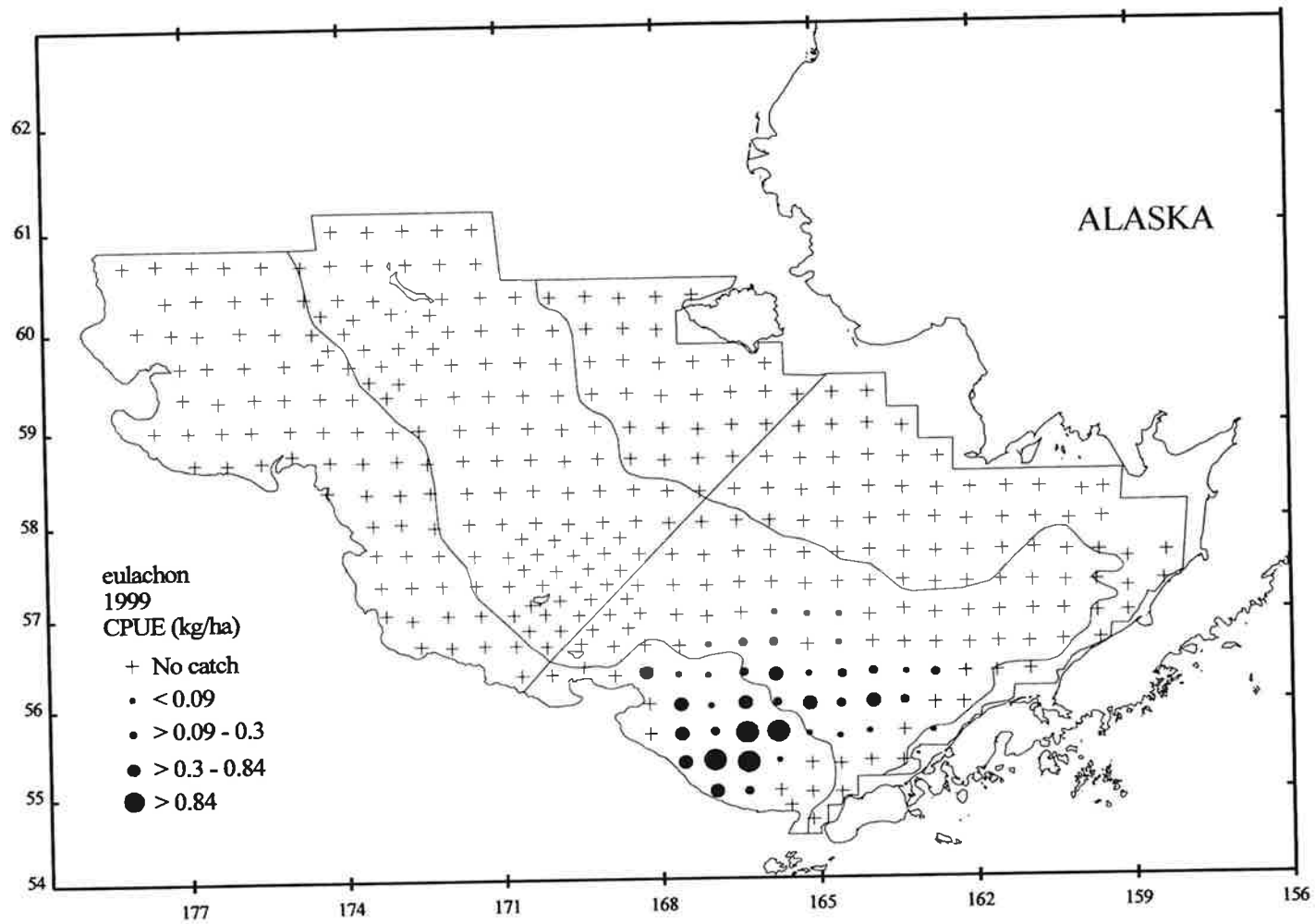


Figure 42.-- Distribution and relative abundance in kg/ha of eulachon, 1999 eastern Bering Sea bottom trawl survey.

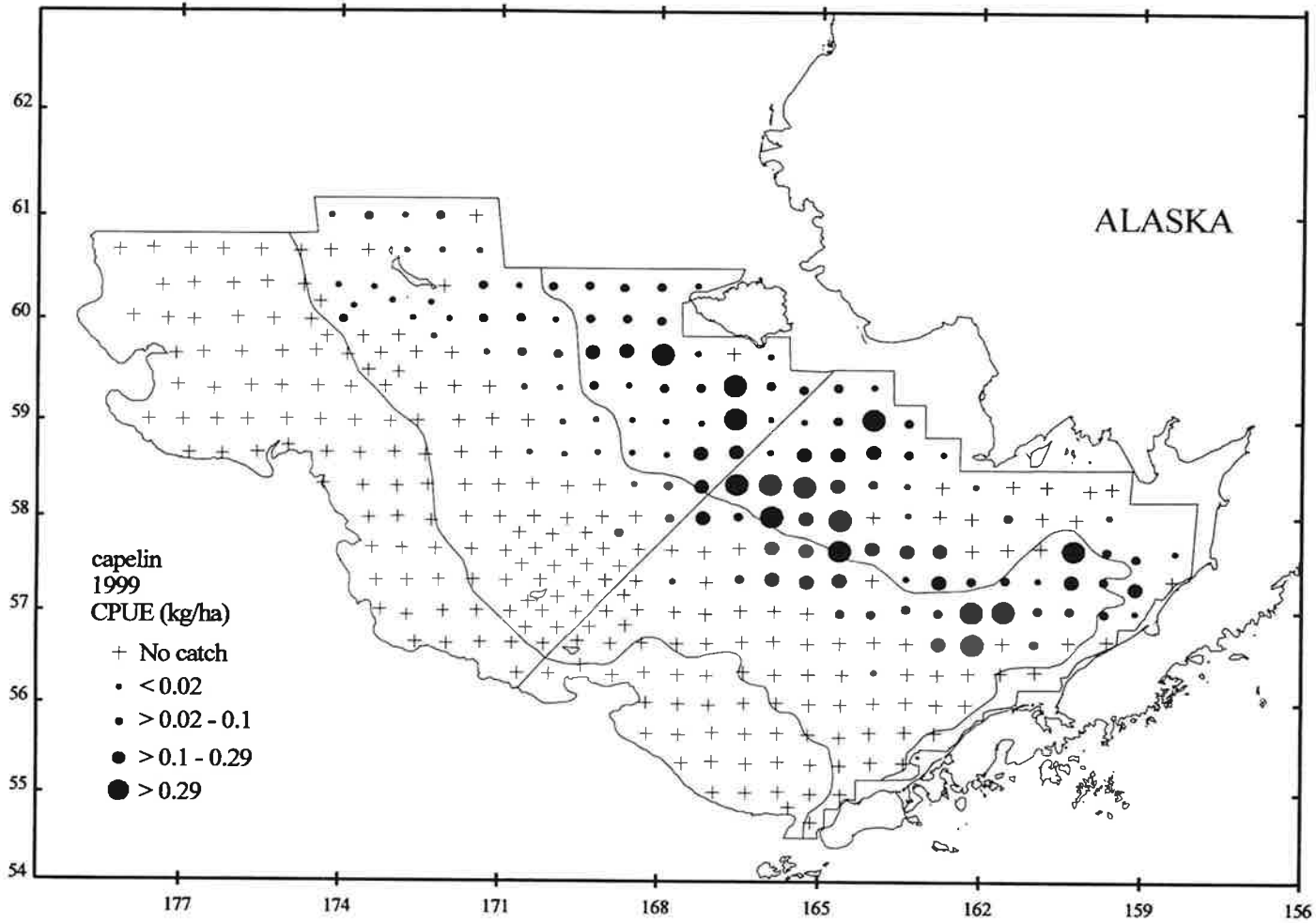


Figure 43.-- Distribution and relative abundance in kg/ha of capelin, 1999 eastern Bering Sea bottom trawl survey.

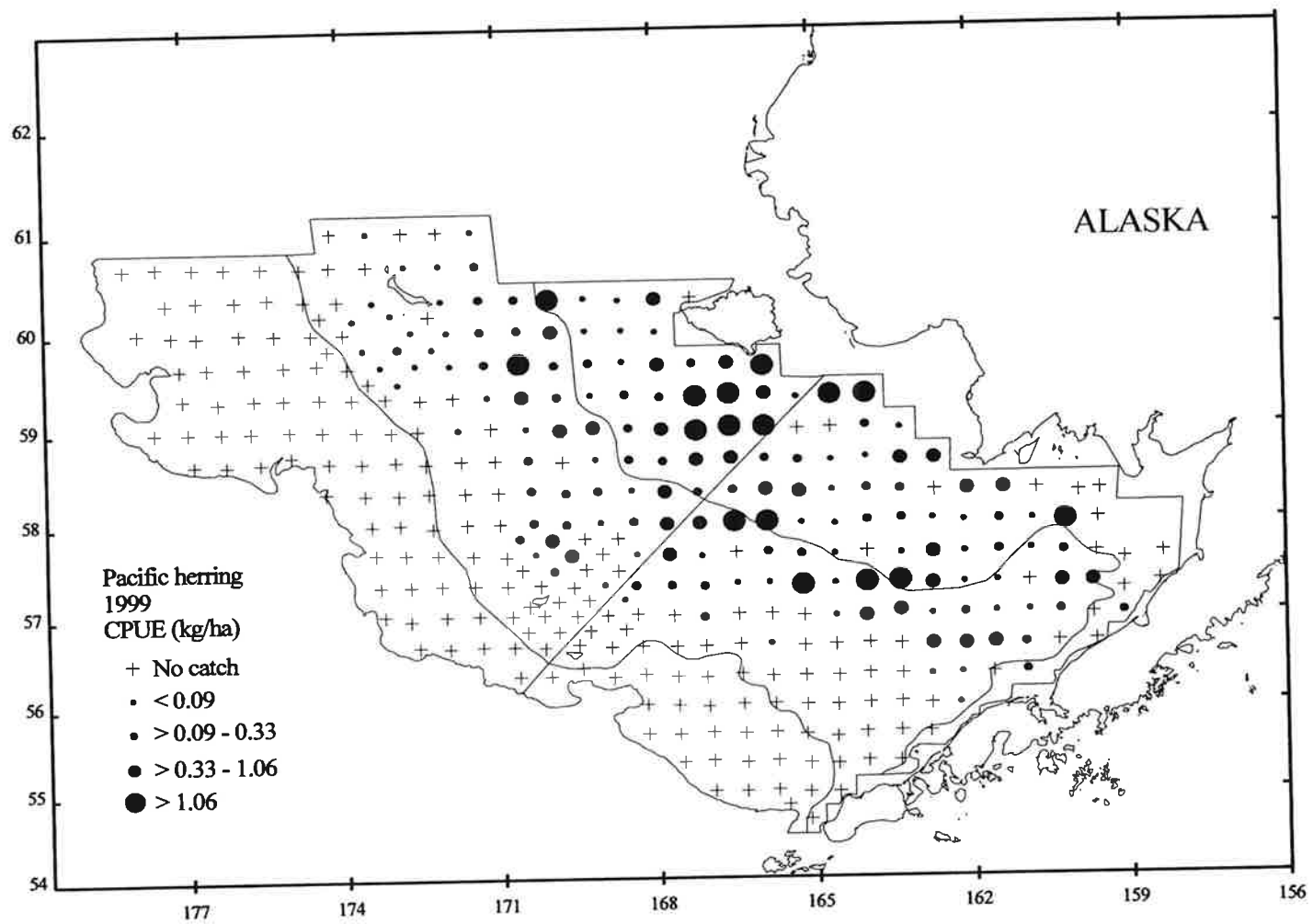


Figure 44.-- Distribution and relative abundance in kg/ha of Pacific herring, 1999 eastern Bering Sea bottom trawl survey.

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## APPENDIX A

## Station Data, 1999 Eastern Bering Sea Bottom Trawl Survey

Appendix A contains station data by vessel for the 353 successfully completed standard survey stations. In using the tables, the following should be noted:

1. Time represents the nearest hour at the start of the tow.
2. Haul numbers are not always sequential because special study and unsatisfactory hauls were omitted.
3. All longitudes are in Western Hemisphere, latitudes in Northern Hemisphere.

Geodetic positions are displayed as degrees and decimal minutes.

4. Width codes are as follows:

M = Net width was measured by mensuration gear.

F = Net width was estimated from a function of wire out or wire out and net height.

5. Hauls marked with an "\*" were used for the FPC analysis.

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Appendix A Table 1--Haul data for stations sampled by the F/V *Arcturus* during the 1999 eastern Bering Sea bottom trawl survey.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
1	05/23/99	57.333	158.418	30	06	0.50	3.10	10	0.4	-0.3	15.0	M
2	05/23/99	57.635	158.364	36	09	0.49	2.82	10	0.6	-1.5	14.7	M
3	05/23/99	57.252	159.112	45	13	0.49	2.90	10	1.0	-1.1	15.4	M
4	05/23/99	56.686	159.645	30	17	0.50	2.69	10	2.3	0.9	14.2	M
* 5	05/24/99	56.983	159.694	53	06	0.51	2.99	10	0.3	-0.4	15.5	M
6	05/24/99	57.331	159.703	54	09	0.49	2.76	10	0.0	---	15.6	M
7	05/24/99	57.575	159.100	45	12	0.48	2.94	10	-0.3	---	15.8	M
8	05/24/99	57.646	159.648	46	15	0.43	2.25	10	0.4	-0.2	15.3	M
* 10	05/25/99	58.329	160.772	20	08	0.35	2.21	10	3.4	3.3	15.7	M
* 11	05/25/99	58.004	160.856	42	11	0.49	2.69	10	0.6	0.2	16.5	M
* 12	05/25/99	57.683	160.886	53	13	0.51	2.89	31	0.2	-0.4	16.6	M
* 13	05/25/99	57.340	160.928	59	16	0.49	2.83	31	0.0	-0.6	16.7	M
* 14	05/25/99	57.018	160.930	64	18	0.49	2.77	31	2.3	-0.7	17.0	M
* 15	05/26/99	56.660	161.004	65	06	0.50	2.88	31	0.3	-0.2	16.7	M
* 16	05/26/99	56.355	160.976	52	09	0.52	2.86	10	1.6	0.9	16.2	M
* 17	05/26/99	55.994	162.270	67	14	0.50	2.81	31	2.6	1.8	16.1	M
* 18	05/26/99	56.337	162.223	81	17	0.51	2.79	31	1.8	0.4	15.3	M
* 19	05/27/99	56.653	162.149	72	06	0.51	2.84	31	0.7	-0.3	16.6	M
* 20	05/27/99	57.001	162.158	58	09	0.18	1.01	31	0.6	-0.3	16.8	M
* 21	05/27/99	57.331	162.169	48	11	0.50	2.82	10	0.6	0.0	15.7	M
* 22	05/27/99	57.660	162.156	44	14	0.51	2.85	10	0.7	-0.1	15.9	M
* 23	05/27/99	57.998	162.165	35	16	0.49	3.16	10	0.9	0.2	15.4	M
* 24	05/27/99	57.998	162.165	35	16	0.49	3.16	10	0.9	0.2	15.4	M
* 25	05/28/99	58.329	162.094	45	06	0.51	2.76	10	0.4	0.1	15.5	M
* 26	05/28/99	58.658	162.703	21	10	0.52	2.90	10	1.2	---	14.9	M
27	05/28/99	58.324	162.715	32	12	0.50	3.11	10	0.9	0.3	15.3	M
28	05/28/99	58.023	162.759	40	15	0.50	2.96	10	0.3	0.1	15.6	M
29	05/29/99	58.334	163.372	38	06	0.49	2.84	10	0.9	0.5	15.8	M
30	05/29/99	58.028	163.353	44	09	0.51	2.89	10	1.0	0.2	16.8	M
* 31	05/29/99	57.651	163.365	44	12	0.50	3.12	10	1.2	---	16.8	M
* 32	05/29/99	57.357	163.386	52	14	0.49	2.77	10	0.9	0.3	16.2	M
* 33	05/29/99	57.033	163.383	64	17	0.51	2.92	31	1.0	-0.3	16.8	M

Appendix A Table 1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 33	05/30/99	56.664	163.384	75	06	0.52	2.84	31	1.5	0.5	16.5	M
* 34	05/30/99	56.336	163.355	84	09	0.18	1.04	31	3.4	0.7	17.6	M
* 35	05/30/99	56.018	163.388	87	12	0.50	2.89	31	3.8	1.5	16.4	M
* 36	05/30/99	55.688	163.393	80	14	0.50	2.97	31	4.0	2.2	16.9	M
* 37	05/30/99	55.347	163.419	53	17	0.49	2.87	31	4.4	2.5	16.9	M
* 39	06/01/99	54.992	164.584	61	08	0.27	1.53	31	4.4	3.2	16.9	M
* 40	06/01/99	55.317	164.607	100	10	0.47	2.85	31	4.8	2.8	17.3	M
* 41	06/01/99	55.628	164.612	95	13	0.49	2.07	31	4.7	2.6	17.0	M
* 42	06/01/99	55.990	164.592	91	15	0.48	2.70	31	4.2	1.4	17.9	M
* 43	06/01/99	56.317	164.565	85	18	0.49	2.93	31	3.9	1.2	17.5	M
* 44	06/02/99	56.667	164.625	72	06	0.51	3.07	31	2.6	0.6	17.1	M
* 45	06/02/99	56.981	164.610	68	09	0.50	2.72	31	2.6	-0.2	17.5	M
* 46	06/02/99	57.337	164.621	63	12	0.50	2.97	31	2.2	-1.3	16.9	M
* 47	06/02/99	57.651	164.626	51	14	0.50	2.67	10	0.7	-0.3	15.6	M
* 48	06/02/99	57.974	164.613	42	16	0.51	2.80	10	0.7	-0.2	16.0	M
* 49	06/03/99	58.334	164.666	41	07	0.51	2.87	10	0.8	0.1	15.8	M
* 50	06/03/99	58.654	164.669	32	09	0.50	2.91	10	1.2	---	15.2	M
* 51	06/03/99	59.001	164.671	23	12	0.51	2.90	10	1.7	---	15.2	M
* 52	06/03/99	59.333	164.669	23	15	0.52	3.09	10	3.0	2.5	15.1	M
* 53	06/04/99	59.635	165.938	27	06	0.52	2.99	20	1.8	1.5	16.0	M
* 54	06/04/99	59.347	165.928	25	08	0.51	2.82	20	1.9	1.5	15.0	M
* 55	06/04/99	59.010	165.925	31	11	0.51	2.76	20	1.5	1.0	15.5	M
* 56	06/04/99	58.676	165.929	38	13	0.49	2.97	10	1.1	0.5	16.7	M
* 57	06/04/99	58.345	165.921	44	16	0.51	2.84	10	0.9	0.2	16.3	M
* 58	06/04/99	58.008	165.894	55	18	0.50	2.83	10	1.2	-0.2	16.6	M
* 59	06/05/99	57.681	165.891	64	06	0.50	2.75	31	1.2	-0.7	17.1	M
* 60	06/05/99	57.349	165.873	66	09	0.50	2.69	31	2.8	---	18.2	M
* 61	06/05/99	57.011	165.833	72	12	0.52	2.83	31	3.4	0.0	19.0	M
* 62	06/05/99	56.681	165.855	77	15	0.50	2.86	31	3.4	1.0	17.8	M
* 63	06/06/99	56.319	165.823	91	06	0.52	2.91	31	4.4	1.6	18.0	M
* 64	06/06/99	56.009	165.793	106	09	0.51	2.65	31	4.5	3.1	18.0	M
* 65	06/06/99	55.683	165.789	116	12	0.48	2.85	50	4.7	3.2	18.5	M

Appendix A Table 1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code	
							2.96	50	4.6	3.4	21.0	M	
*	66	06/06/99	55.361	165.767	118	15	0.48	2.96	50	4.6	3.4	21.0	M
*	67	06/06/99	55.019	165.743	126	17	0.51	2.88	50	4.8	3.4	17.9	M
*	68	06/06/99	54.845	165.548	149	19	0.49	2.78	50	4.7	3.4	17.6	M
*	69	06/07/99	55.689	166.993	132	06	0.48	2.74	50	4.9	3.4	19.2	M
*	70	06/07/99	55.365	166.990	136	08	0.47	2.77	50	4.9	3.3	18.4	M
*	71	06/07/99	55.013	166.957	153	11	0.48	2.72	50	5.0	3.4	18.5	M
*	72	06/11/99	55.980	167.053	132	11	0.48	2.64	50	4.9	3.4	19.1	M
*	73	06/11/99	56.308	167.094	113	14	0.49	2.70	50	5.3	3.0	18.3	M
*	74	06/11/99	56.659	167.095	95	17	0.50	3.04	31	5.0	2.3	17.8	M
*	75	06/12/99	56.975	167.117	74	06	0.52	2.87	31	3.9	2.1	16.7	M
*	76	06/12/99	57.314	167.109	70	09	0.53	2.83	31	3.6	---	16.1	M
*	77	06/12/99	57.640	167.153	64	12	0.49	2.82	31	3.1	0.2	16.3	M
*	78	06/12/99	57.995	167.180	60	14	0.50	2.98	31	2.9	-0.3	16.5	M
*	79	06/12/99	58.323	167.211	49	16	0.50	2.84	20	2.3	0.5	15.7	M
*	80	06/13/99	58.667	167.230	41	06	0.51	2.97	20	1.2	0.7	15.8	M
*	81	06/13/99	58.972	167.222	37	08	0.52	2.88	20	1.5	0.9	16.6	M
*	82	06/13/99	59.324	167.237	29	11	0.50	2.92	20	1.9	1.3	15.3	M
*	83	06/13/99	59.662	167.296	28	14	0.51	2.93	20	1.8	0.9	15.0	M
*	84	06/14/99	60.331	167.307	28	07	0.42	2.22	20	1.1	0.7	15.4	M
*	85	06/14/99	60.317	167.985	28	09	0.50	2.75	20	0.8	0.2	15.4	M
*	86	06/14/99	60.007	168.625	35	12	0.50	2.80	20	0.8	-0.1	15.4	M
*	87	06/14/99	59.688	168.630	35	15	0.49	2.86	20	0.6	-0.2	15.0	M
*	88	06/14/99	59.349	168.584	38	17	0.50	2.75	20	0.9	0.2	15.8	M
*	89	06/15/99	59.005	168.515	42	06	0.50	2.90	20	1.1	0.6	15.9	M
*	90	06/15/99	58.674	168.512	50	10	0.49	2.73	20	1.0	0.4	16.4	M
*	91	06/15/99	58.349	168.474	61	12	0.49	2.81	41	3.6	-0.5	16.5	M
*	92	06/15/99	58.014	168.438	65	14	0.40	2.37	42	4.5	1.6	16.1	M
*	93	06/15/99	57.840	168.745	66	16	0.49	2.83	42	4.3	1.5	15.8	M
*	94	06/16/99	57.665	168.382	67	06	0.49	2.83	42	4.4	2.5	15.5	M
*	95	06/16/99	57.493	168.739	68	09	0.49	2.74	42	4.7	2.5	16.3	M
*	96	06/16/99	57.326	168.412	70	11	0.49	2.74	32	5.0	2.7	16.2	M
*	97	06/16/99	57.179	168.632	72	13	0.50	2.79	32	5.0	2.7	15.9	M

Appendix A Table 1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code	
*	98	06/16/99	57.018	168.387	75	15	0.48	2.83	32	5.5	2.5	15.9	M
*	99	06/16/99	56.850	168.615	91	17	0.48	2.69	32	5.6	2.2	17.1	M
*	100	06/17/99	56.664	168.308	103	06	0.49	2.72	50	5.6	2.4	17.1	M
*	101	06/17/99	56.347	168.265	148	08	0.48	2.57	50	5.9	3.2	17.1	M
*	102	06/17/99	56.009	168.222	145	11	0.48	2.75	50	6.0	3.3	16.9	M
*	103	06/17/99	56.318	168.865	124	15	0.46	2.67	50	6.0	3.0	17.5	M
*	104	06/17/99	56.656	168.901	96	17	0.50	2.85	32	5.9	---	17.4	M
*	105	06/19/99	56.829	169.900	68	07	0.49	2.82	42	4.8	3.4	16.1	M
*	106	06/19/99	57.001	169.552	58	09	0.50	2.90	42	4.8	2.2	15.8	M
*	107	06/19/99	57.165	169.901	47	11	0.49	2.68	42	3.1	2.3	15.3	M
*	108	06/19/99	57.315	169.590	59	14	0.49	2.76	42	5.3	1.5	15.8	M
*	109	06/19/99	57.489	169.960	64	16	0.49	2.78	42	5.0	0.9	16.1	M
*	110	06/20/99	57.657	169.622	67	07	0.49	2.71	42	4.9	0.8	16.0	M
*	111	06/20/99	57.822	169.995	68	09	0.51	2.80	42	4.8	0.2	16.4	M
*	112	06/20/99	57.990	169.717	66	11	0.50	2.74	42	4.5	-0.1	16.4	M
*	113	06/20/99	58.324	169.721	66	13	0.49	2.80	41	4.4	-0.3	16.6	M
*	114	06/20/99	58.655	169.775	64	16	0.49	2.80	41	4.3	-1.2	16.6	M
*	115	06/21/99	58.984	169.815	60	06	0.50	2.81	41	4.0	-1.3	17.1	M
*	116	06/21/99	59.327	169.867	57	09	0.49	2.67	41	4.1	-1.2	16.7	M
*	117	06/21/99	59.658	169.913	53	12	0.49	2.78	41	3.6	-1.3	16.7	M
*	118	06/21/99	59.994	169.965	51	14	0.48	2.78	41	3.5	-1.4	16.4	M
*	119	06/21/99	60.323	170.019	49	16	0.49	2.79	20	3.5	-1.5	16.4	M
*	120	06/22/99	60.333	171.337	63	07	0.49	2.76	41	3.6	-1.6	17.4	M
	121	06/22/99	60.322	172.067	56	09	0.53	2.98	43	3.7	-1.5	17.9	M
	122	06/23/99	60.165	172.314	55	07	0.49	2.77	43	1.5	-0.3	16.7	M
*	123	06/23/99	60.184	173.038	57	12	0.52	2.92	43	3.2	-1.1	17.7	M
	124	06/23/99	60.009	172.644	63	14	0.52	2.92	43	3.1	-1.4	16.7	M
*	125	06/23/99	59.838	172.905	77	16	0.50	2.83	43	4.7	-1.0	16.7	M
*	126	06/23/99	59.673	172.576	81	18	0.51	2.89	43	4.6	-0.9	17.1	M
	127	06/24/99	59.668	171.911	74	07	0.49	2.74	43	4.0	-1.6	17.3	M
	128	06/24/99	59.832	172.248	72	09	0.49	2.74	43	4.2	-1.6	16.6	M
	129	06/24/99	59.999	171.963	62	11	0.48	2.61	43	3.9	-1.4	16.4	M

Appendix A Table 1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code	
*	130	06/24/99	60.002	171.322	66	13	0.49	2.78	41	4.0	-1.6	17.5	M
*	131	06/24/99	59.677	171.251	69	16	0.49	2.78	41	4.5	-1.6	17.7	M
*	132	06/25/99	59.336	171.857	77	07	0.49	2.64	43	4.4	-1.2	17.8	M
*	133	06/25/99	59.333	171.198	72	09	0.51	2.91	41	3.9	-1.6	17.7	M
*	134	06/25/99	59.016	171.131	73	12	0.49	3.05	41	4.7	-1.5	17.5	M
*	135	06/25/99	58.998	171.767	83	14	0.48	2.73	41	4.7	-0.6	17.4	M
*	136	06/25/99	58.675	171.716	89	17	0.48	2.70	41	5.2	0.1	17.8	M
*	137	06/26/99	58.674	171.068	80	07	0.49	2.79	41	4.9	-0.5	19.9	M
*	138	06/26/99	58.339	171.009	80	09	0.48	2.74	41	5.1	0.2	17.0	M
*	139	06/26/99	58.337	171.641	92	12	0.49	2.80	41	5.3	0.7	18.0	M
*	140	06/26/99	58.000	171.615	93	14	0.47	2.63	41	5.4	1.2	16.9	M
*	141	06/26/99	58.002	170.985	83	17	0.48	2.72	42	5.3	1.1	17.1	M
*	142	06/27/99	57.647	170.876	81	07	0.43	2.34	42	5.8	2.0	16.7	M
*	143	06/27/99	57.664	171.512	95	09	0.49	2.72	41	6.2	1.7	16.6	M
*	144	06/27/99	57.339	171.483	97	12	0.49	2.69	41	6.1	2.5	19.0	M
*	145	06/27/99	57.333	170.864	79	14	0.50	2.79	42	6.1	2.6	16.5	M
*	146	06/27/99	57.007	170.782	91	17	0.48	2.64	42	6.1	2.8	17.0	M
*	147	06/28/99	57.007	172.040	113	06	0.24	1.29	61	6.5	2.9	17.0	M
*	148	06/28/99	57.009	171.404	105	09	0.24	1.39	61	6.5	2.7	16.8	M
*	149	06/28/99	56.669	171.348	115	11	0.49	2.72	61	6.6	2.7	17.0	M
*	150	06/28/99	56.665	170.752	109	14	0.38	2.06	61	7.0	2.6	17.0	M
*	151	07/04/99	58.328	173.569	111	07	0.48	2.68	61	6.4	2.2	17.6	M
*	152	07/04/99	58.663	173.627	122	09	0.53	2.93	61	6.6	1.9	16.9	M
*	153	07/04/99	58.993	173.722	114	12	0.49	2.81	61	7.0	1.7	17.3	M
*	154	07/04/99	59.329	173.801	106	15	0.49	2.78	62	6.6	1.1	17.5	M
*	155	07/05/99	59.650	173.869	93	07	0.65	2.74	62	6.2	0.9	16.7	M
*	156	07/05/99	59.996	173.949	93	09	0.49	2.76	43	6.4	0.2	17.2	M
*	157	07/05/99	60.330	174.058	87	11	0.49	2.68	43	7.0	-0.3	17.9	M
*	158	07/05/99	60.665	173.486	62	14	0.48	2.68	41	7.7	-1.1	17.1	M
*	159	07/06/99	61.000	171.477	57	07	0.49	2.73	41	7.3	-1.6	19.5	M
	160	07/06/99	61.000	172.140	60	09	0.49	2.70	41	7.1	-1.6	20.7	M
	161	07/06/99	61.001	172.799	63	11	0.48	2.73	41	6.9	-1.3	20.7	M



Appendix A Table 1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 162	07/06/99	60.992	173.482	72	13	0.43	2.46	41	6.8	-1.7	18.8	M
* 163	07/06/99	61.002	174.175	79	16	0.51	2.93	41	7.0	-1.6	18.6	M
* 174	07/09/99	60.669	176.217	115	06	0.50	2.67	61	6.9	0.5	18.1	M
* 175	07/09/99	60.667	175.503	103	09	0.49	2.69	61	6.7	0.6	17.9	M
* 176	07/09/99	60.361	175.394	107	12	0.48	2.72	61	7.3	0.7	17.8	M
* 177	07/09/99	60.338	176.021	117	14	0.47	2.65	61	7.3	1.0	17.9	M
* 178	07/09/99	60.011	175.936	125	17	0.24	1.23	61	7.3	1.6	17.7	M
* 179	07/10/99	60.001	175.267	117	06	0.50	2.81	61	7.0	1.2	17.3	M
* 180	07/10/99	59.675	175.103	121	09	0.49	2.83	61	6.7	1.3	16.9	M
* 181	07/10/99	59.666	175.859	132	12	0.24	1.33	61	7.0	1.9	17.2	M
* 182	07/10/99	59.338	175.670	135	14	0.24	1.31	61	7.2	---	18.0	M
* 183	07/10/99	59.336	175.109	134	17	0.49	2.76	61	7.3	---	16.9	M
184	07/11/99	59.004	177.597	135	07	0.47	2.72	61		---	17.6	M
185	07/11/99	59.000	176.952	135	09	0.48	2.79	61	7.0	---	17.8	M
186	07/11/99	59.002	176.314	135	12	0.48	2.59	61	7.0	---	18.1	M
187	07/11/99	59.003	175.743	132	14	0.24	1.32	61		---	17.9	M
188	07/11/99	59.006	175.004	130	16	0.50	2.79	61	7.4	---	17.4	M

Appendix A Table 2--Haul data for stations sampled by the F/V *Aldebaran* during the 1999 eastern Bering Sea bottom trawl survey.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 1	05/23/99	56.993	159.118	32	06	0.50	3.05	10	1.0	-0.2	15.4	M
* 2	05/23/99	57.327	160.305	59	12	0.52	2.97	31	1.3	-0.7	16.9	M
* 3	05/23/99	57.015	160.338	61	15	0.52	3.15	31	0.5	-0.6	16.8	M
* 4	05/23/99	56.678	160.363	57	17	0.51	2.89	31	3.1	-0.2	16.7	M
* 5	05/24/99	57.658	160.265	52	06	0.50	2.93	31	-0.1	-0.4	17.0	M
* 6	05/24/99	57.989	160.221	49	08	0.51	3.00	10	0.3	0.0	17.1	M
* 7	05/24/99	58.293	159.967	42	11	0.26	1.42	10	1.2	0.7	17.0	M
8	05/24/99	58.315	159.559	23	13	0.51	2.78	10	1.4	1.0	16.3	M
9	05/24/99	58.011	159.603	38	16	0.50	2.78	10	0.7	0.2	16.6	M
* 10	05/25/99	58.335	161.402	31	06	0.49	2.69	10	0.5	0.6	17.1	M
* 11	05/25/99	58.004	161.490	53	08	0.53	2.97	10	-0.1	-0.4	17.8	M
* 12	05/25/99	57.676	161.501	51	11	0.50	2.83	10	-0.2	-0.4	17.2	M
* 13	05/25/99	57.341	161.538	53	13	0.50	2.82	31	0.1	-0.3	17.3	M
* 14	05/25/99	57.009	161.568	66	16	0.50	2.81	31	-0.1	-0.3	17.7	M
* 15	05/26/99	56.669	161.590	88	06	0.52	2.74	31	1.4	-0.5	16.4	M
* 16	05/26/99	56.340	161.620	62	09	0.48	2.70	10	1.5	1.0	15.8	M
* 17	05/26/99	55.681	162.845	50	15	0.50	2.82	10	3.4	2.2	17.3	M
* 18	05/26/99	55.993	162.811	76	17	0.49	2.78	31	3.4	1.8	18.0	M
* 19	05/26/99	55.993	162.811	76	06	0.48	2.71	31	1.7	1.3	18.0	M
* 20	05/27/99	56.322	162.798	76	06	0.48	2.71	31	1.7	1.3	18.0	M
* 21	05/27/99	56.658	162.781	70	08	0.52	2.87	31	1.7	0.1	18.4	M
* 22	05/27/99	56.989	162.785	58	11	0.51	2.79	31	1.2	0.0	17.4	M
* 23	05/27/99	57.321	162.770	46	13	0.51	2.80	10	1.2	0.1	16.9	M
* 24	05/27/99	57.321	162.770	46	13	0.51	2.80	10	1.2	0.1	16.9	M
* 25	05/27/99	57.656	162.756	41	16	0.52	3.09	10	0.5	0.2	17.0	M
* 26	05/28/99	58.655	163.347	29	06	0.51	2.80	10	1.1	0.7	15.4	M
27	05/28/99	58.979	163.350	20	08	0.52	2.84	10	1.5	1.3	14.7	M
* 28	05/28/99	59.337	163.999	20	11	0.52	2.89	10	1.8	1.5	15.6	M
* 29	05/28/99	59.013	164.005	25	14	0.52	2.90	10	1.4	0.8	15.7	M
* 30	05/28/99	58.682	164.005	31	16	0.51	2.83	10	1.0	0.5	15.3	M
* 31	05/29/99	58.349	164.006	38	06	0.49	2.77	10	0.7	0.3	16.4	M
* 32	05/29/99	58.013	164.000	45	08	0.50	2.76	10	0.3	0.0	17.3	M
* 33	05/29/99	57.677	164.014	49	11	0.51	2.80	10	0.3	-0.2	17.3	M

Appendix A Table 2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 32	05/29/99	57.345	164.016	59	14	0.51	3.20	31	0.5	-0.9	18.0	M
* 34	05/29/99	56.976	164.034	66	18	0.50	2.79	31	2.0	-0.8	18.2	M
* 35	05/30/99	56.679	163.985	73	06	0.51	2.79	31	1.3	0.6	18.3	M
* 36	05/30/99	56.346	163.978	84	08	0.50	2.86	31	3.2	0.9	18.5	M
* 37	05/30/99	56.012	163.980	88	11	0.53	2.88	31	3.6	1.5	17.8	M
* 38	05/30/99	55.677	164.050	90	14	0.52	2.86	31	4.2	1.9	17.7	M
* 39	05/30/99	55.348	164.027	77	16	0.51	2.85	31	4.6	2.3	18.6	M
* 40	06/01/99	54.679	165.144	44	06	0.49	2.83	31	3.8	--	17.9	M
* 41	06/01/99	54.995	165.150	107	09	0.49	2.71	50	4.2	3.6	18.6	M
* 42	06/01/99	55.328	165.151	107	11	0.52	2.86	50	4.4	2.8	19.4	M
* 43	06/01/99	55.660	165.199	104	14	0.49	2.76	31	4.5	3.0	19.2	M
* 44	06/01/99	55.993	165.186	92	17	0.48	2.68	31	4.2	1.8	19.1	M
* 45	06/02/99	56.324	165.201	83	06	0.48	2.70	31	3.8	1.1	19.1	M
* 46	06/02/99	56.656	165.215	73	09	0.51	2.92	31	3.1	1.3	18.3	M
* 47	06/02/99	56.987	165.216	68	11	0.48	2.68	31	2.8	0.7	18.1	M
* 48	06/02/99	57.321	165.233	64	14	0.49	2.71	31	2.2	-1.2	18.3	M
* 49	06/02/99	57.654	165.255	57	16	0.49	2.74	31	2.2	-1.5	17.8	M
* 50	06/03/99	57.990	165.252	47	06	0.50	2.76	10	0.4	-0.2	17.1	M
* 51	06/03/99	58.321	165.284	42	08	0.51	2.77	10	0.6	0.0	17.0	M
* 52	06/03/99	58.654	165.298	37	11	0.49	2.80	10	0.8	0.2	16.2	M
* 53	06/03/99	58.987	165.301	25	13	0.51	2.86	10	1.4	1.0	16.1	M
* 54	06/03/99	59.310	165.315	18	15	0.52	2.80	20	2.1	1.5	15.5	M
* 55	06/04/99	59.665	166.631	24	06	0.51	2.84	20	0.4	0.5	15.6	M
* 56	06/04/99	59.348	166.599	24	08	0.52	2.81	20	1.2	0.9	15.7	M
* 57	06/04/99	59.014	166.582	31	11	0.50	2.79	20	1.0	0.6	16.3	M
* 58	06/04/99	58.682	166.567	39	13	0.52	2.85	20	0.9	0.2	17.1	M
* 59	06/04/99	58.345	166.552	44	16	0.51	2.81	10	0.8	0.0	17.3	M
* 60	06/05/99	58.010	166.519	58	06	0.52	2.83	31	0.8	-0.3	18.4	M
* 61	06/05/99	57.679	166.502	63	08	0.50	2.72	31	2.8	-0.4	18.4	M
* 62	06/05/99	57.348	166.484	66	11	0.50	2.77	31	3.1	0.4	18.1	M
* 63	06/05/99	57.012	166.464	70	14	0.49	2.76	31	3.6	1.5	18.4	M
* 64	06/05/99	56.678	166.436	80	17	0.50	2.82	31	3.8	1.7	18.6	M

Appendix A Table 2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 65	06/06/99	56.348	166.416	99	06	0.49	2.68	31	4.3	2.1	19.4	M
* 66	06/06/99	56.007	166.398	65	09	0.48	2.59	50	4.7	---	19.7	M
* 67	06/06/99	55.675	166.382	124	12	0.48	2.73	50	4.7	3.2	20.1	M
* 68	06/06/99	55.340	166.350	130	14	0.47	2.61	50	4.9	3.3	20.0	M
* 69	06/06/99	55.010	166.352	140	17	0.50	2.74	50	4.8	3.3	19.6	M
70	06/07/99	55.674	168.223	133	06	0.51	2.80	50	4.9	3.3	19.2	M
71	06/07/99	55.666	167.621	132	09	0.50	2.84	50	4.7	3.4	18.9	M
72	06/07/99	55.345	167.551	145	11	0.53	2.89	50	5.6	3.4	19.5	M
* 73	06/11/99	55.995	167.622	129	11	0.54	2.81	50	4.9	3.2	19.5	M
* 74	06/11/99	56.322	167.654	125	13	0.48	2.71	50	4.9	3.5	18.3	M
* 75	06/11/99	56.655	167.651	101	16	0.50	2.76	31	4.8	2.5	19.1	M
* 76	06/12/99	56.997	167.699	77	06	0.51	2.80	31	4.4	2.2	17.6	M
* 77	06/12/99	57.324	167.734	72	08	0.49	2.71	31	3.9	1.8	17.8	M
* 78	06/12/99	57.658	167.768	68	11	0.48	2.67	31	3.2	1.4	17.1	M
* 79	06/12/99	57.990	167.802	66	13	0.50	2.78	41	3.2	0.3	17.5	M
* 80	06/12/99	58.331	167.834	59	16	0.51	2.89	41	3.2	-0.8	17.6	M
* 81	06/13/99	58.653	167.867	47	06	0.51	2.83	20	1.3	0.6	16.6	M
* 82	06/13/99	58.989	167.884	42	08	0.51	2.87	20	1.1	0.6	16.7	M
* 83	06/13/99	59.319	167.919	40	11	0.49	2.71	20	0.8	0.0	15.3	M
* 84	06/13/99	59.653	167.949	35	13	0.51	2.82	20	0.7	-0.1	15.6	M
* 85	06/13/99	59.988	167.985	26	15	0.52	3.09	20	0.7	0.1	15.5	M
* 86	06/14/99	60.311	168.682	37	06	0.50	2.78	20	0.8	0.3	15.6	M
* 87	06/14/99	60.331	169.334	45	08	0.50	2.80	20	1.4	-1.1	18.5	M
* 88	06/14/99	60.008	169.316	46	11	0.51	2.81	20	1.5	-1.4	17.0	M
* 89	06/14/99	59.675	169.266	47	13	0.51	2.84	20	2.4	-1.3	17.3	M
* 90	06/14/99	59.346	169.237	50	15	0.49	2.80	20	2.8	-0.7	16.8	M
* 91	06/15/99	59.009	169.185	54	06	0.50	2.77	41	2.2	-0.3	16.5	M
* 92	06/15/99	58.677	169.148	63	08	0.50	2.81	41	2.8	-1.1	17.8	M
* 93	06/15/99	58.342	169.112	67	11	0.50	2.80	41	3.2	-0.2	18.1	M
* 94	06/15/99	58.010	169.067	69	13	0.50	2.83	42	3.8	0.7	17.9	M
* 95	06/15/99	57.839	169.374	65	15	0.51	2.86	42	3.6	0.0	17.3	M
* 96	06/16/99	57.675	169.038	68	06	0.50	2.72	42	4.2	0.7	17.3	M

Appendix A Table 2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 97	06/16/99	57.510	169.352	70	08	0.49	2.70	42	4.1	1.4	16.9	M
* 98	06/16/99	57.340	169.000	70	10	0.52	2.87	42	4.9	2.4	17.4	M
* 99	06/16/99	57.176	169.315	71	12	0.52	2.88	42	5.0	2.3	16.9	M
* 100	06/16/99	57.006	168.971	78	14	0.51	2.89	32	5.2	2.5	17.6	M
* 101	06/16/99	56.841	169.288	78	16	0.52	2.94	32	5.3	2.3	17.7	M
* 102	06/17/99	56.684	169.510	79	06	0.51	2.85	32	4.4	3.2	16.9	M
103	06/17/99	56.425	169.449	105	08	0.53	2.79	32	5.2	2.7	18.1	M
104	06/17/99	56.333	170.059	108	11	0.51	2.78	50	5.4	2.7	18.5	M
105	06/17/99	56.333	170.645	118	14	0.51	2.78	61	5.6	2.9	18.4	M
* 106	06/17/99	56.653	170.164	98	17	0.51	2.77	42	4.5	2.7	18.2	M
* 107	06/19/99	56.831	170.491	100	07	0.52	2.64	42	5.3	2.7	18.7	M
* 108	06/19/99	57.011	170.179	65	09	0.50	2.91	42	3.0	2.0	16.4	M
* 110	06/19/99	57.113	170.451	55	13	0.49	2.84	42	3.3	2.6	15.8	M
* 111	06/19/99	57.342	170.226	58	15	0.53	2.80	42	2.8	2.7	17.1	M
* 112	06/19/99	57.508	170.576	73	18	0.53	2.95	42	4.8	2.1	17.0	M
* 113	06/20/99	57.673	170.315	72	06	0.53	2.92	42	4.5	0.5	17.5	M
* 114	06/20/99	57.844	170.614	76	08	0.53	3.03	42	4.2	0.6	17.8	M
* 115	06/20/99	58.010	170.342	74	10	0.53	2.93	42	4.6	0.2	17.7	M
* 116	06/20/99	58.353	170.378	74	12	0.52	3.12	41	4.0	-0.4	18.1	M
* 117	06/20/99	58.677	170.428	73	15	0.54	3.05	41	4.1	-1.1	18.3	M
* 118	06/21/99	59.003	170.465	70	06	0.51	2.84	41	3.9	-1.5	17.0	M
* 119	06/21/99	59.332	170.538	67	09	0.52	2.86	41	3.7	-1.5	17.9	M
* 120	06/21/99	59.678	170.589	66	11	0.51	2.90	41	3.6	-1.6	17.9	M
* 121	06/21/99	60.011	170.617	64	13	0.52	2.92	41	3.6	-1.6	18.0	M
* 122	06/21/99	60.329	170.660	62	16	0.50	2.82	41	3.7	-1.6	20.1	M
123	06/22/99	60.662	171.398	60	06	0.50	2.68	41	3.9	---	20.3	M
124	06/22/99	60.667	172.100	61	09	0.50	2.86	41	3.4	-1.7	21.1	M
125	06/22/99	60.664	172.762	44	11	0.52	2.91	41	3.2	-0.1	17.1	M
* 126	06/23/99	60.313	173.383	62	06	0.53	2.92	43	3.8	-1.3	18.2	M
* 128	06/23/99	60.129	173.764	86	11	0.53	2.89	43	4.3	-0.1	19.4	M
* 130	06/23/99	59.830	173.576	94	17	0.54	2.95	43	4.5	0.2	19.1	M
* 131	06/24/99	59.663	173.245	95	06	0.53	2.97	43	4.3	0.1	18.9	M

Appendix A Table 2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
							3.08	43	4.5	0.4	19.0	M
* 132	06/24/99	59.499	173.477	101	09	0.55	3.08	43	4.5	0.4	19.0	M
* 133	06/24/99	59.482	172.919	93	11	0.54	3.10	43	4.4	0.1	19.2	M
* 134	06/24/99	59.340	173.155	98	13	0.51	2.80	43	4.5	0.4	19.1	M
* 135	06/24/99	59.315	172.483	87	16	0.52	2.98	43	4.4	-0.5	19.4	M
* 136	06/25/99	58.995	172.547	96	06	0.49	2.78	41	4.6	---	18.6	M
* 137	06/25/99	58.984	173.061	103	08	0.55	3.02	61	5.4	---	19.1	M
* 138	06/25/99	58.677	172.978	110	11	0.37	1.97	61	5.5	1.4	18.8	M
* 139	06/25/99	58.647	172.397	98	13	0.49	2.76	61	5.2	---	18.8	M
* 140	06/25/99	58.339	172.342	100	15	0.52	2.93	61	4.3	1.1	18.3	M
* 141	06/26/99	58.325	172.926	106	06	0.38	2.14	61	5.6	1.6	18.4	M
				106	08	0.54	3.04	61	5.9	1.9	18.5	M
				106	08	0.54	3.04	61	5.9	1.9	18.5	M
				114	11	0.53	2.95	61	5.7	2.2	19.2	M
				114	11	0.53	2.95	61	5.7	2.2	19.2	M
				141	13	0.53	2.90	61	6.2	2.7	18.3	M
				141	13	0.53	2.90	61	6.2	2.2	18.6	M
				116	16	0.54	2.98	61	6.2	2.2	18.6	M
				116	16	0.54	2.98	61	6.2	2.2	18.6	M
				103	06	0.53	2.88	61	5.7	1.7	17.8	M
* 146	06/27/99	57.965	172.274	103	06	0.53	2.88	61	5.7	1.7	17.8	M
* 147	06/27/99	57.675	172.200	105	08	0.55	3.00	61	6.1	1.5	18.4	M
* 148	06/27/99	57.342	172.137	105	11	0.52	2.92	61	6.1	1.9	18.1	M
* 149	06/27/99	57.335	172.723	114	13	0.52	3.13	61	6.3	2.3	18.9	M
				114	13	0.52	3.13	61	6.3	2.3	18.9	M
				118	16	0.53	3.05	61	6.3	2.5	18.2	M
				118	16	0.53	3.05	61	6.3	2.5	18.2	M
				135	18	0.53	2.94	61	6.4	2.8	17.4	M
				135	18	0.53	2.94	61	6.4	2.8	17.4	M
* 152	06/28/99	56.961	172.723	123	06	0.54	3.05	61	6.4	2.6	18.1	M
				123	06	0.54	3.05	61	6.4	2.6	18.1	M
				134	09	0.52	2.89	61	6.5	2.8	18.0	M
				134	09	0.52	2.89	61	6.5	2.8	18.0	M
* 154	06/28/99	56.656	171.978	124	11	0.29	1.68	61	6.6	2.7	17.7	M
				124	11	0.29	1.68	61	6.6	2.7	17.7	M
* 155	07/04/99	58.352	174.311	188	06	0.51	2.92	61	5.9	---	19.0	M
				188	06	0.51	2.92	61	5.9	---	19.0	M
* 156	07/04/99	58.673	174.250	148	09	0.53	3.09	61	6.3	2.4	18.7	M
				148	09	0.53	3.09	61	6.3	2.4	18.7	M
* 157	07/04/99	59.002	174.369	124	12	0.37	2.20	61	6.2	1.6	19.2	M
				124	12	0.37	2.20	61	6.2	1.6	19.2	M
* 158	07/04/99	59.337	174.425	117	15	0.53	2.93	62	6.8	1.1	18.8	M
				117	15	0.53	2.93	62	6.8	1.1	18.8	M
* 159	07/05/99	59.691	174.457	112	06	0.54	3.03	62	6.1	0.7	19.2	M
				112	06	0.54	3.03	62	6.1	0.7	19.2	M
* 160	07/05/99	59.829	174.258	104	08	0.54	3.04	62	5.9	0.5	18.4	M
				104	08	0.54	3.04	62	5.9	0.5	18.4	M
* 161	07/05/99	59.992	174.558	105	11	0.51	2.80	62	6.3	0.5	18.6	M
				105	11	0.51	2.80	62	6.3	0.5	18.6	M
* 162	07/05/99	60.175	174.389	98	13	0.54	2.95	43	6.5	0.3	18.9	M
				98	13	0.54	2.95	43	6.5	0.3	18.9	M
* 163	07/05/99	60.335	174.696	99	15	0.54	3.03	62	7.1	0.5	18.6	M
				99	15	0.54	3.03	62	7.1	0.5	18.6	M

Appendix A Table 2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear Temp.	Net Width (m)	Width Code
* 164	07/06/99	60.661	174.772	94	06	0.53	2.88	41	6.9	0.1	19.4	M
* 165	07/06/99	60.667	174.193	85	09	0.54	3.00	41	6.9	-0.1	20.3	M
177	07/08/99	60.683	177.523	143	14	0.55	2.66	61	6.9	0.7	19.2	F
178	07/08/99	60.667	178.157	157	17	0.54	2.90	61	6.9	0.2	19.7	M
* 179	07/09/99	60.674	176.823	127	06	0.55	2.97	61	6.7	0.4	19.7	M
* 180	07/09/99	60.343	176.759	134	09	0.53	2.87	61	6.6	0.2	19.1	M
181	07/09/99	60.319	177.351	142	11	0.51	2.89	61	6.9	0.5	19.6	M
182	07/09/99	60.023	177.889	139	14	0.50	2.93	61	6.5	0.2	19.1	M
183	07/09/99	59.998	177.247	134	17	0.54	3.00	61	6.9	0.5	19.3	M
* 184	07/10/99	59.984	176.752	138	06	0.54	2.96	61	7.0	0.3	19.2	M
* 185	07/10/99	59.666	176.572	132	09	0.54	2.93	61	6.5	-0.3	18.8	M
186	07/10/99	59.658	177.098	167	11	0.55	3.08	61	6.6	1.4	19.3	M
187	07/10/99	59.348	177.049	145	13	0.53	2.91	61	6.7	0.9	19.4	M
* 188	07/10/99	59.307	176.377	134	16	0.53	2.88	61	6.4	0.2	19.9	M
189	07/11/99	58.660	176.838	135	06	0.53	2.92	61	6.7	2.2	18.7	M
190	07/11/99	58.653	176.215	140	09	0.53	2.88	61	6.7	2.3	18.9	M
191	07/11/99	58.672	175.563	131	11	0.55	2.97	61	6.6	2.3	19.2	M
192	07/11/99	58.742	174.982	139	14	0.53	2.97	61	6.9	2.1	18.7	M

APPENDIX B

List of Species Encountered

Appendix B contains a listing of all fish and invertebrate species taken during the 1999 eastern Bering Sea bottom trawl survey.

List of Tables

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Appendix B Table 1.--Fish species encountered during the 1999 eastern Bering Sea bottom trawl survey.

Family	Scientific name	Common name
Petromyzontidae	Petromyzontidae	lamprey unident.
Squalidae	<i>Somniosus pacificus</i>	Pacific sleeper shark
Rajidae	<i>Rajidae</i> unident.	skate unident.
	<i>Bathyraja</i> sp.	
	<i>Raja binoculata</i>	big skate
	<i>Bathyraja interrupta</i>	Bering skate
	<i>Bathyraja parmifera</i>	Alaska skate
	<i>Bathyraja violacea</i>	Okhotsk skate
Pleuronectidae	<i>Atheresthes stomias</i>	arrowtooth flounder
	<i>Atheresthes evermanni</i>	Kamchatka flounder
	<i>Reinhardtius hippoglossoides</i>	Greenland turbot
	<i>Hippoglossus stenolepis</i>	Pacific halibut
	<i>Hippoglossoides</i> sp.	
	<i>Hippoglossoides elassodon</i>	flathead sole
	<i>Hippoglossoides robustus</i>	Bering flounder
	<i>Microstomus pacificus</i>	Dover sole
	<i>Glyptocephalus zachirus</i>	rex sole
	<i>Limanda asper</i>	yellowfin sole
	<i>Limanda proboscidea</i>	longhead dab
	<i>Limanda sakhalinensis</i>	Sakhalin sole
	<i>Platichthys stellatus</i>	starry flounder
	<i>Lepidopsetta polyxystra</i>	northern rock sole
	<i>Lepidopsetta bilineata</i>	southern rock sole
	<i>Isopsetta isolepis</i>	butter sole
	<i>Pleuronectes quadrituberculatus</i>	Alaska plaice
Agonidae	<i>Pallasina barbata</i>	tubenose poacher
	<i>Sarritor leptorhynchus</i>	longnose poacher

Appendix B Table 1.--Continued.

Family	Scientific name	Common name
	<i>Sarritor frenatus</i>	sawback poacher
	<i>Bathyagonus alascanus</i>	gray starsnout
	<i>Bathyagonus infraspinus</i>	spinycheek starsnout
	<i>Podothecus acipenserinus</i>	sturgeon poacher
	<i>Podothecus veterus</i>	vetrans poacher
	<i>Aspidophoroides bartoni</i>	Aleutian alligatorfish
	<i>Occella dodecaedron</i>	Bering poacher
Ammodytidae	<i>Ammodytes hexapterus</i>	Pacific sand lance
Anarhichadidae	<i>Anarhichas orientalis</i>	Bering wolffish
Anoplopomatidae	<i>Anoplopoma fimbria</i>	sablefish
Bathymasteridae	<i>Bathymaster signatus</i>	searcher
Clupeidae	<i>Clupea pallasii</i>	Pacific herring
Cottidae	Cottidae	sculpin unident.
	<i>Gymnocanthus pistilliger</i>	threaded sculpin
	<i>Gymnocanthus galeatus</i>	armorhead sculpin
	<i>Artediellus pacificus</i>	Pacific hookear sculpin
	<i>Malacocottus</i> sp.	
	<i>Malacocottus zonurus</i>	darkfin sculpin
	<i>Hemilepidotus</i> sp.	Irish lord
	<i>Hemilepidotus hemilepidotus</i>	red Irish lord
	<i>Hemilepidotus jordani</i>	yellow Irish lord
	<i>Hemilepidotus papilio</i>	butterfly sculpin
	<i>Triglops forficata</i>	scissortail sculpin
	<i>Triglops szepticus</i>	spectacled sculpin
	<i>Triglops pingeli</i>	ribbed sculpin
	<i>Triglops macellus</i>	roughspine sculpin
	<i>Myoxocephalus verrucosus</i>	warty sculpin
	<i>Myoxocephalus polyacanthocephalus</i>	great sculpin
	<i>Myoxocephalus jaok</i>	plain sculpin

Family	Scientific name	Common name
	<i>Myoxocephalus</i> sp.	
	<i>Leptocottus armatus</i>	Pacific staghorn sculpin
	<i>Enophrys diceraus</i>	antlered sculpin
	<i>Dasycottus setiger</i>	spinyhead sculpin
	<i>Blepsias bilobus</i>	crested sculpin
	<i>Nautichthys pribilovius</i>	eyeshade sculpin
	<i>Nautichthys oculoasciatus</i>	sailfin sculpin
	<i>Hemitripterus bolini</i>	bigmouth sculpin
	<i>Icelus spiniger</i>	thorny sculpin
	<i>Icelus spatula</i>	spatulate sculpin
Trichodontidae	<i>Trichodon trichodon</i>	Pacific sandfish
Gadidae	<i>Gadus macrocephalus</i>	Pacific cod
	<i>Boreogadus saida</i>	Arctic cod
	<i>Eleginus gracilis</i>	saffron cod
	<i>Theragra chalcogramma</i>	walleye pollock
Hexagrammidae	<i>Pleurogrammus monoptygius</i>	Atka mackerel
	<i>Hexagrammos stelleri</i>	whitespotted greenling
	<i>Hexagrammos decagrammus</i>	kelp greenling
Cyclopteridae	<i>Aptocyclus ventricosus</i>	smooth lumpsucker
	Liparidinae	snailfish unident.
	<i>Liparis</i> sp.	
	<i>Liparis gibbus</i>	dusky snailfish
	<i>Crystallichthys cyclospilus</i>	blotched snailfish
	<i>Careproctus</i> sp.	
	<i>Careproctus cypselurus</i>	blackfin snailfish
	<i>Careproctus rastrinus</i>	salmon snailfish
Osmeridae	<i>Thaleichthys pacificus</i>	eulachon
	<i>Mallotus villosus</i>	capelin
	<i>Osmerus mordax</i>	rainbow smelt

Appendix B Table 1.--Continued.

Family	Scientific name	Common name
Salmonidae	<i>Oncorhynchus tshawytscha</i>	chinook salmon
Stichaeidae	<i>Lumpenus maculatus</i>	daubed shanny
	<i>Lumpenus medius</i>	stout eelblenny
	<i>Lumpenus sagitta</i>	snake prickleback
	<i>Poroclinus rothrocki</i>	whitebarred prickleback
Zaproridae	<i>Zaprora silenus</i>	prowfish
Zoarcidae	Zoarcidae	eelpout unident.
	<i>Lycodes raridens</i>	marbled eelpout
	<i>Lycodes palearis</i>	wattled eelpout
	<i>Lycodes polaris</i>	Canadian eelpout
	<i>Lycodes turneri</i>	polar eelpout
	<i>Lycodes brevipes</i>	shortfin eelpout
	<i>Gymnelus viridis</i>	fish doctor
Scorpaenidae	<i>Sebastes aleutianus</i>	rougheye rockfish
	<i>Sebastes alutus</i>	Pacific ocean perch
	<i>Sebastes ciliatus</i>	light dusky rockfish

Appendix B Table 2.--Invertebrate species encountered during the 1999 eastern Bering Sea bottom trawl survey.

Phylum	Species name	Common name
Cnidaria	Scyphozoa (class)	jellyfish unident.
	<i>Gersemia</i> sp.	sea raspberry
	<i>Gersemia rubiformis</i>	
	Gorgonacea (order)	gorgonian coral unident.
	<i>Paragorgia arborea</i>	Kamchatka coral
	Pennatulacea (order)	sea pen or sea whip unident.
	<i>Virgularia</i> sp.	smoothstem seawhip
	Actiniaria (order)	sea anemone unident.
	<i>Metridium</i> sp.	
	<i>Urticina</i> sp.	
	<i>Liponema brevicorne</i>	tentacle-shedding anemone
Annelida	Polychaeta (class)	polychaete worm unident.
	Aphroditidae	sea mouse unident.
	<i>Aphrodita negligens</i>	
	<i>Nereis</i> sp.	
	<i>Cheilonereis cyclurus</i>	
	Polynoidae	scale worm unident.
	<i>Eunoe nodosa</i>	giant scale worm
	<i>Eunoe depressa</i>	depressed scale worm
	Hirudinea unident.	leech unident.
	<i>Carcinobdella cyclostomum</i>	striped sea leech
Arthropoda	Isopoda (order)	isopod unident.
	Thoracica (order)	barnacle unident.
	<i>Balanus evermanni</i>	giant barnacle
	<i>Balanus rostratus</i>	beaked barnacle
	<i>Pandalus borealis</i>	northern shrimp
	<i>Pandalus goniurus</i>	humpy shrimp

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Pandalus hypsinotus</i>	coonstripe shrimp
	<i>Eualus</i> sp.	
	<i>Lebbeus</i> sp.	
	Crangonidae	crangonid shrimp unident.
	<i>Crangon</i> sp.	
	<i>Crangon communis</i>	twospine crangon
	<i>Crangon dalli</i>	ridged crangon
	<i>Argis</i> sp.	
	<i>Argis dentata</i>	Arctic argid
	<i>Sclerocrangon boreas</i>	sculptured shrimp
	<i>Argis lar</i>	kuro argid
	<i>Cancer oregonensis</i>	Oregon rock crab
	<i>Oregonia gracilis</i>	graceful decorator crab
	<i>Chionoecetes bairdi</i>	Tanner crab
	<i>Hyas coarctatus</i>	circumboreal toad crab
	<i>Hyas lyratus</i>	Pacific lyre crab
	<i>Chionoecetes opilio</i>	snow crab
	<i>Chionoecetes hybrid</i>	tanner crab
	<i>Telmessus cheiragonus</i>	helmet crab
	Paguridae	hermit crab unident.
	<i>Pagurus</i> sp.	
	<i>Pagurus brandti</i>	sponge hermit
	<i>Pagurus aleuticus</i>	Aleutian hermit
	<i>Labidochirus splendescens</i>	splendid hermit
	<i>Pagurus confragosus</i>	knobbyhand hermit
	<i>Pagurus ochotensis</i>	Alaskan hermit
	<i>Elassochirus tenuimanus</i>	widehand hermit crab
	<i>Pagurus capillatus</i>	hairy hermit crab

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Elassochirus cavimanus</i>	purple hermit
	<i>Hapalogaster grebnitzkii</i>	
	<i>Paralithodes camtschaticus</i>	red king crab
	<i>Paralithodes platypus</i>	blue king crab
	<i>Placetron wosnessenskii</i>	scaled crab
	<i>Erimacrus isenbeckii</i>	horsehair crab
Mollusca	Mollusca (phylum)	mollusk unident.
	Nudibranchia unident.	nudibranch unident.
	<i>Tritonia</i> sp.	
	<i>Tritonia diomedea</i>	rosy tritonia
	Gastropod unident.	snail unident.
	<i>Natica</i> sp.	
	<i>Natica clausa</i>	Arctic moonsnail
	<i>Natica aleutica</i>	Aleutian moonsnail
	<i>Polinices</i> sp.	
	<i>Polinices pallidus</i>	pale moonsnail
	<i>Crepidula</i> sp.	slipper shell
	<i>Crepidula grandis</i>	great slippersnail
	<i>Colus</i> sp.	
	<i>Colus herendeenii</i>	thin-ribbed whelk
	<i>Colus roseus</i>	rosy whelk
	<i>Colus spitzbergensis</i>	thick-ribbed whelk
	<i>Colus halli</i>	shrew whelk
	<i>Volutopsius</i> sp.	
	<i>Pyrulofusus deformis</i>	warped whelk
	<i>Volutopsius fragilis</i>	fragile whelk
	<i>Volutopsius castaneus</i>	volute whelk
	<i>Pyrulofusus melonis</i>	

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Volutopsius middendorffii</i>	tulip whelk
	<i>Beringius</i> sp.	
	<i>Beringius kennicottii</i>	
	<i>Beringius frielei</i>	
	<i>Beringius beringii</i>	
	<i>Beringius stimpsoni</i>	
	<i>Beringius crebricostatus</i>	thick-cord whelk
	<i>Neptunea</i> sp.	
	<i>Neptunea pribiloffensis</i>	Pribilof whelk
	<i>Neptunea borealis</i>	
	<i>Neptunea lyrata</i>	lyre whelk
	<i>Neptunea ventricosa</i>	fat whelk
	<i>Neptunea heros</i>	
	<i>Neptunea magna</i>	helmet whelk
	<i>Plicifusus</i> sp.	
	<i>Plicifusus kroyeri</i>	
	<i>Aforia circinata</i>	keeled aforia
	<i>Oenopota</i> sp.	
	<i>Boreotrophon muriciformis</i>	
	<i>Boreotrophon</i> sp.	
	<i>Fusitriton oregonensis</i>	Oregon triton
	<i>Fusitriton</i> sp.	
	<i>Buccinum</i> sp.	
	<i>Buccinum angulosum</i>	angular whelk
	<i>Buccinum plectrum</i>	sinuous whelk
	<i>Buccinum scalariforme</i>	ladder whelk
	<i>Buccinum polare</i>	polar whelk
	<i>Buccinum solenum</i>	



Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Arctomelon stearnsii</i>	Alaska volute
	Bivalvia unident.	bivalve unident.
	Mytilidae	mussel unident.
	<i>Modiolus modiolus</i>	northern horsemussel
	<i>Mytilus edulis</i>	blue mussel
	Pectinid unident.	scallop unident.
	<i>Chlamys</i> sp.	
	<i>Patinopecten caurinus</i>	weathervane scallop
	<i>Hiatella arctica</i>	Arctic hiatella
	<i>Yoldia</i> sp.	
	<i>Yoldia scissurata</i>	crisscrossed yoldia
	<i>Nuculana</i> sp.	
	<i>Musculus discors</i>	discordant mussel
	<i>Cyclocardia crebricostata</i>	many-rib cyclocardia
	<i>Cyclocardia</i> sp.	
	<i>Clinocardium</i> sp.	
	<i>Clinocardium nuttallii</i>	Nuttall cockle
	<i>Clinocardium ciliatum</i>	hairy cockle
	<i>Mactromeris</i> sp.	
	<i>Mactromeris polynyma</i>	Arctic surfclam
	<i>Tellina</i> sp.	
	<i>Tellina lutea</i>	Alaska great-tellin
	<i>Macoma</i> sp.	
	<i>Macoma nasuta</i>	bent-nose macoma
	<i>Siliqua</i> sp.	
	<i>Siliqua alta</i>	Alaska razor
	<i>Serripes</i> sp.	
	<i>Serripes groenlandicus</i>	Greenland cockle

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Serripes laperousii</i>	broad cockle
	<i>Pododesmus macroschisma</i>	Alaska falsejingle
	Cephalopoda unident.	cephalopod unident.
	<i>Rossia pacifica</i>	eastern Pacific bobtail
Echinodermata	Asteroidea unident.	starfish unident.
	<i>Evasterias</i> sp.	
	<i>Evasterias troschelii</i>	
	<i>Evasterias echinosoma</i>	
	<i>Leptasterias hylodes</i>	
	<i>Pycnopodia helianthoides</i>	
	<i>Lethasterias nanimensis</i>	
	<i>Pedicellaster magister</i>	
	<i>Henricia</i> sp.	
	<i>Henricia leviuscula</i>	
	<i>Henricia tumida</i>	
	<i>Leptasterias polaris</i>	
	<i>Leptasterias arctica</i>	
	<i>Leptasterias</i> sp.	
	<i>Gephyreaster swifti</i>	
	<i>Pseudarchaster parelii</i>	
	<i>Ceramaster</i> sp.	
	<i>Ceramaster patagonicus</i>	orange bat star
	<i>Solaster</i> sp.	
	<i>Crossaster borealis</i>	
	<i>Crossaster papposus</i>	rose sea star
	<i>Pteraster</i> sp.	
	<i>Pteraster tessellatus</i>	
	<i>Pteraster obscurus</i>	

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Diplopteraster multipes</i>	
	<i>Asterias</i> sp.	
	<i>Asterias amurensis</i>	purple-orange seastar
	<i>Ctenodiscus crispatus</i>	common mud star
	<i>Dipsacaster borealis</i>	
	Echinacea unident.	sea urchin unident.
	<i>Strongylocentrotus droebachiensis</i>	green sea urchin
	<i>Strongylocentrotus pallidus</i>	white sea urchin
	<i>Echinarachnius parma</i>	Parma sand dollar
	Ophiuroid unident.	brittlestarfish unident.
	<i>Gorgonocephalus eucnemis</i>	basketstarfish
	<i>Ophiura</i> sp.	
	<i>Ophiura sarsi</i>	
	Holothuroidea unident.	sea cucumber unident.
	<i>Cucumaria fallax</i>	
	<i>Psolus</i> sp.	
Porifera	Porifera	sponge unident.
	<i>Suberites ficus</i>	hermit sponge
	<i>Mycale loveni</i>	tree sponge
	<i>Halichondria panicea</i>	barrel sponge
Sipuncula	Sipuncula (phylum)	sipunculid worm unident.
Bryozoa	Bryozoa unident.	bryozoan unident.
	<i>Flustra serrulata</i>	leafy bryozoan
	<i>Porella compressa</i>	flattened bryozoan
	<i>Escharopsis sarsi</i>	
	<i>Rhaphostomella costata</i>	ribbed bryozoan
	<i>Cellepora ventricosa</i>	coral bryozoan
Chordata	Ascidian unident.	tunicate unident.

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	Thaliacea unident.	salps unident.
	<i>Styela</i> sp.	
	<i>Styela rustica</i>	sea potato
	<i>Boltenia</i> sp.	
	<i>Boltenia ovifera</i>	
	<i>Halocynthia</i> sp.	sea peach unident.
	<i>Halocynthia aurantium</i>	sea peach
	<i>Aplidium</i> sp.	sea glob
	<i>Molgula griffithsii</i>	sea grape

APPENDIX C

Rank Order of Relative Abundance of Fish and Invertebrates

Appendix C ranks all fish and invertebrates caught during the 1999 eastern Bering Sea bottom trawl survey by descending unweighted CPUE (kg/ha).

Appendix C Table 1.--Rank of fish and invertebrate taxa by unweighted total CPUE (kg/ha) from the 1999 eastern Bering Sea bottom trawl survey.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
1	21740	76.37074	98.415	56.92672	95.81477	0.30418989	0.30418989	<i>Theragra chalcogramma</i>
2	10260	36.63349	15.037	29.03297	44.23401	0.14591371	0.45010360	<i>Lepidopsetta</i> sp.
3	10210	27.75057	6.358	22.80835	32.69279	0.11053240	0.56063600	<i>Limanda aspera</i>
4	21720	13.20646	1.513	10.79596	15.61696	0.05260224	0.61323824	<i>Gadus macrocephalus</i>
5	81742	12.45704	1.230	10.28296	14.63112	0.04961723	0.66285547	<i>Asterias amurensis</i>
6	10285	11.73525	1.119	9.66225	13.80825	0.04674230	0.70959777	<i>Pleuronectes quadrituberculatus</i>
7	10129	8.19615	0.618	6.65552	9.73677	0.03264582	0.74224358	<i>Hippoglossoides</i> sp.
8	91000	8.06786	14.856	0.51339	15.62233	0.03213483	0.77437841	Porifera
9	471	7.17241	1.154	5.06672	9.27810	0.02856820	0.80294662	<i>Bathyraja parmitifera</i>
10	83020	5.13633	1.565	2.68429	7.58837	0.02045836	0.82340497	<i>Gorgonocephalus eucnemis</i>
11	10110	4.70835	1.579	2.24524	7.17146	0.01875366	0.84215864	<i>Atheresthes stomias</i>
12	69010	4.36185	0.151	3.59941	5.12430	0.01737356	0.85953220	Paguridae
13	40500	4.21273	0.129	3.50960	4.91587	0.01677960	0.87631180	Scyphozoa (class)
14	10120	2.79355	0.063	2.30041	3.28669	0.01112690	0.88743869	<i>Hippoglossus stenolepis</i>
15	68580	2.73716	0.064	2.23979	3.23452	0.01090228	0.89834098	<i>Chionoecetes opilio</i>
16	98082	2.31205	0.245	1.34127	3.28284	0.00920906	0.90755004	<i>Styela rustica</i>
17	69322	1.77858	0.190	0.92464	2.63251	0.00708420	0.91463425	<i>Paralithodes camtschaticus</i>
18	71820	1.53187	0.052	1.08455	1.97919	0.00610156	0.92073580	<i>Neptunea pribiloffensis</i>
19	71884	1.45788	0.042	1.05836	1.85741	0.00580685	0.92654265	<i>Neptunea heros</i>
20	98205	1.30761	0.194	0.44383	2.17138	0.00520828	0.93175093	<i>Halocynthia aurantium</i>
21	81780	1.00044	0.142	0.26074	1.74014	0.00398483	0.93573576	<i>Ctenodiscus crispatus</i>
22	21370	0.98182	0.022	0.69246	1.27118	0.00391066	0.93964642	<i>Myoxocephalus polyacanthocephalus</i>
23	21371	0.97557	0.021	0.69405	1.25708	0.00388575	0.94353217	<i>Myoxocephalus jaok</i>
24	10220	0.93055	0.052	0.48262	1.37849	0.00370646	0.94723863	<i>Platichthys stellatus</i>
25	69060	0.84721	0.016	0.59549	1.09894	0.00337451	0.95061314	<i>Pagurus aleuticus</i>
26	71882	0.71225	0.009	0.52152	0.90299	0.00283696	0.95345010	<i>Neptunea ventricosa</i>
27	80590	0.61894	0.011	0.41418	0.82370	0.00246529	0.95591539	<i>Leptasterias polaris</i>
28	68560	0.57977	0.016	0.33358	0.82596	0.00230927	0.95822466	<i>Chionoecetes bairdi</i>
29	21420	0.51343	0.008	0.33469	0.69218	0.00204504	0.96026969	<i>Hemitripterus bolini</i>
30	71870	0.48655	0.009	0.30573	0.66737	0.00193795	0.96220764	<i>Neptunea lyrata</i>

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
31	21110	0.48284	0.026	0.16819	0.79748	0.00192317	0.96413081	<i>Clupea pallasii</i>
32	21347	0.41668	0.010	0.21981	0.61354	0.00165965	0.96579047	<i>Hemilepidotus jordani</i>
33	10115	0.38973	0.008	0.21106	0.56839	0.00155231	0.96734278	<i>Reinhardtius hippoglossoides</i>
34	10112	0.36630	0.003	0.25477	0.47784	0.00145900	0.96880178	<i>Atheresthes evermanni</i>
35	98105	0.34060	0.006	0.19187	0.48932	0.00135662	0.97015840	<i>Boltenia ovifera</i>
36	20040	0.30802	0.001	0.24732	0.36871	0.00122686	0.97138526	<i>Podothecus acipenserinus</i>
37	43000	0.30702	0.010	0.11486	0.49919	0.00122289	0.97260815	Actiniaria (order)
38	72500	0.30685	0.005	0.17524	0.43846	0.00122222	0.97383036	<i>Fusitriton oregonensis</i>
39	69090	0.30039	0.002	0.21003	0.39075	0.00119648	0.97502685	<i>Pagurus ochotensis</i>
40	405	0.29472	0.022	0.00373	0.58572	0.00117391	0.97620076	<i>Bathyraja</i> sp.
41	50010	0.27100	0.035	0.00000	0.63778	0.00107942	0.97728018	tube worm unident.
42	68577	0.26977	0.002	0.18296	0.35659	0.00107452	0.97835470	<i>Hyas coarctatus</i>
43	10211	0.24813	0.003	0.13423	0.36202	0.00098830	0.97934300	<i>Limanda proboscidea</i>
44	21368	0.24166	0.002	0.15131	0.33201	0.00096253	0.98030554	<i>Myoxocephalus verrucosus</i>
45	69323	0.23314	0.006	0.08245	0.38383	0.00092861	0.98123414	<i>Paralithodes platypus</i>
46	71753	0.21851	0.009	0.03386	0.40316	0.00087033	0.98210448	<i>Pyrulofusus deformis</i>
47	80200	0.20739	0.002	0.12800	0.28677	0.00082604	0.98293052	<i>Lethasterias nanimensis</i>
48	71500	0.18906	0.007	0.03088	0.34725	0.00075305	0.98368357	Gastropod unident.
49	85201	0.18154	0.003	0.07352	0.28956	0.00072308	0.98440666	<i>Cucumaria fallax</i>
50	83320	0.18126	0.004	0.06011	0.30242	0.00072199	0.98512865	<i>Ophiura sarsi</i>
51	435	0.17488	0.002	0.09496	0.25480	0.00069655	0.98582519	<i>Bathyraja interrupta</i>
52	24185	0.16531	0.001	0.11305	0.21757	0.00065845	0.98648364	<i>Lycodes palearis</i>
53	10200	0.15579	0.002	0.06767	0.24391	0.00062052	0.98710416	<i>Glyptocephalus zachirus</i>
54	420	0.13424	0.018	0.00000	0.39735	0.00053469	0.98763885	<i>Raja binoculata</i>
55	43010	0.13162	0.002	0.04336	0.21987	0.00052424	0.98816309	<i>Metridium</i> sp.
56	24191	0.12741	0.001	0.07244	0.18238	0.00050749	0.98867058	<i>Lycodes brevipes</i>
57	71001	0.11517	0.000	0.07200	0.15835	0.00045875	0.98912932	gastropod eggs
58	71756	0.10171	0.001	0.03124	0.17217	0.00040510	0.98953442	<i>Volutopsius fragilis</i>
59	43090	0.10024	0.001	0.02855	0.17193	0.00039925	0.98993368	<i>Liponema brevicorne</i>
60	80020	0.09752	0.001	0.04558	0.14945	0.00038843	0.99032210	<i>Evasterias echinosoma</i>
61	24184	0.09591	0.001	0.04249	0.14933	0.00038201	0.99070411	<i>Lycodes raridens</i>
62	91050	0.08670	0.002	0.00000	0.17939	0.00034535	0.99104946	<i>Halichondria panicea</i>

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
63	10270	0.08474	0.003	0.00000	0.18801	0.00033751	0.99138697	Isopsetta isolepis
64	72740	0.08014	0.000	0.04529	0.11500	0.00031922	0.99170619	Buccinum sp.
65	21314	0.07291	0.000	0.03972	0.10610	0.00029041	0.99199660	Gymnocanthus pistilliger
66	41201	0.07165	0.000	0.04541	0.09789	0.00028539	0.99228200	Gersemia sp.
67	80594	0.07137	0.001	0.01022	0.13253	0.00028428	0.99256627	Leptasterias arctica
68	30060	0.06616	0.004	0.00000	0.19490	0.00026352	0.99282980	Sebastes alutus
69	98310	0.06483	0.000	0.02384	0.10582	0.00025822	0.99308801	Aplidium sp.
70	69400	0.06155	0.000	0.04181	0.08129	0.00024517	0.99333319	Erimacrus isenbeckii
71	21348	0.06005	0.001	0.01156	0.10854	0.00023919	0.99357237	Hemilepidotus papilio
72	82510	0.05424	0.000	0.02970	0.07879	0.00021606	0.99378843	Strongylocentrotus droebachiensis
73	69035	0.05103	0.001	0.00000	0.10347	0.00020324	0.99399167	Pagurus sp.
74	83000	0.04939	0.001	0.00000	0.10280	0.00019672	0.99418839	Ophiuroid unident.
75	71886	0.04735	0.000	0.01135	0.08334	0.00018860	0.99437699	Neptunea magna
76	91016	0.04530	0.001	0.00000	0.09204	0.00018042	0.99455741	Suberites ficus
77	400	0.04521	0.001	0.00000	0.09417	0.00018009	0.99473750	Rajidae unident.
78	69061	0.04171	0.000	0.02641	0.05701	0.00016612	0.99490362	Labidochirus splendescens
79	320	0.04010	0.001	0.00000	0.09616	0.00015974	0.99506336	Somniosus pacificus
80	68578	0.03812	0.000	0.02379	0.05246	0.00015184	0.99521520	Hyas lyratus
81	72743	0.03686	0.000	0.01891	0.05481	0.00014682	0.99536202	Buccinum angulosum
82	20322	0.03596	0.001	0.00000	0.08121	0.00014322	0.99550524	Anarhichas orientalis
83	23041	0.03578	0.000	0.02547	0.04609	0.00014252	0.99564776	Mallotus villosus
84	23010	0.03481	0.000	0.01763	0.05198	0.00013863	0.99578639	Thaleichthys pacificus
85	69121	0.03444	0.000	0.00599	0.06288	0.00013717	0.99592355	Elassochirus cavimanus
86	71750	0.03344	0.000	0.00847	0.05840	0.00013317	0.99605673	Volutopsius sp.
87	20720	0.03047	0.000	0.01002	0.05091	0.00012135	0.99617808	Bathymaster signatus
88	21390	0.02982	0.000	0.01419	0.04545	0.00011878	0.99629685	Dasycottus setiger
89	81355	0.02935	0.000	0.00664	0.05206	0.00011691	0.99641376	Pteraster obscurus
90	82500	0.02836	0.000	0.00000	0.06548	0.00011297	0.99652673	Echinacea unident.
91	42001	0.02813	0.000	0.00000	0.05897	0.00011203	0.99663875	Virgularia sp.
92	72752	0.02803	0.000	0.01503	0.04103	0.00011164	0.99675039	Buccinum scalariforme
93	69070	0.02693	0.001	0.00000	0.07971	0.00010726	0.99685765	Pagurus confragosus
94	71010	0.02660	0.000	0.00305	0.05015	0.00010595	0.99696360	Nudibranchia unident.



Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
95	66031	0.02590	0.000	0.01511	0.03669	0.00010317	0.99706677	<i>Pandalus borealis</i>
96	81315	0.02429	0.001	0.00000	0.06869	0.00009676	0.99716353	<i>Pteraster tessellatus</i>
97	72755	0.02263	0.000	0.01057	0.03469	0.00009014	0.99725367	<i>Buccinum polare</i>
98	71772	0.02216	0.000	0.00000	0.04460	0.00008825	0.99734192	<i>Beringius beringii</i>
99	80010	0.02042	0.000	0.00000	0.05475	0.00008133	0.99742325	<i>Evasterias</i> sp.
100	21438	0.01999	0.000	0.00993	0.03005	0.00007961	0.99750286	<i>Icelus spiniger</i>
101	78010	0.01967	0.000	0.00094	0.03839	0.00007833	0.99758119	octopus unident.
102	71769	0.01928	0.000	0.00000	0.04007	0.00007679	0.99765799	<i>Beringius</i> sp.
103	71764	0.01783	0.000	0.00259	0.03306	0.00007101	0.99772899	<i>Volutopsius middendorffii</i>
104	82730	0.01752	0.000	0.00000	0.04295	0.00006980	0.99779879	sand dollar unident.
105	82740	0.01685	0.000	0.00000	0.03843	0.00006713	0.99786592	<i>Echinarachnius parma</i>
106	98200	0.01521	0.000	0.00000	0.04504	0.00006060	0.99792652	<i>Halocynthia</i> sp.
107	74562	0.01507	0.000	0.00029	0.02985	0.00006003	0.99798655	<i>Musculus discors</i>
108	71891	0.01488	0.000	0.00258	0.02719	0.00005928	0.99804583	<i>Plicifusus (=Colus)</i>
109	68781	0.01460	0.000	0.00713	0.02207	0.00005816	0.99810400	<i>Telmessus cheiragonus</i>
110	65100	0.01417	0.000	0.00163	0.02671	0.00005644	0.99816043	<i>Thoracica</i> (order)
111	56311	0.01403	0.000	0.00759	0.02047	0.00005588	0.99821631	<i>Eunoe nodosa</i>
112	20006	0.01314	0.000	0.00794	0.01835	0.00005236	0.99826867	<i>Sarritor frenatus</i>
113	85000	0.01310	0.000	0.00000	0.03333	0.00005218	0.99832085	<i>Holothuroidea</i> unident.
114	95000	0.01299	0.000	0.00515	0.02083	0.00005174	0.99837258	<i>Bryozoa</i> unident.
115	69042	0.01290	0.000	0.00000	0.03806	0.00005136	0.99842395	<i>Pagurus brandti</i>
116	22205	0.01262	0.000	0.00328	0.02196	0.00005027	0.99847421	<i>Liparis gibbus</i>
117	74311	0.01204	0.000	0.00000	0.02802	0.00004795	0.99852217	<i>Hiatella arctica</i>
118	72751	0.01174	0.000	0.00120	0.02228	0.00004677	0.99856894	<i>Buccinum plectrum</i>
119	21725	0.01120	0.000	0.00604	0.01636	0.00004461	0.99861355	<i>Boreogadus saida</i>
120	23220	0.01101	0.000	0.00000	0.02659	0.00004385	0.99865739	<i>Oncorhynchus tshawytscha</i>
121	81095	0.01053	0.000	0.00182	0.01923	0.00004192	0.99869932	<i>Crossaster papposus</i>
122	24188	0.01018	0.000	0.00213	0.01822	0.00004053	0.99873985	<i>Lycodes polaris</i>
123	75111	0.01016	0.000	0.00431	0.01602	0.00004048	0.99878033	<i>Mactromeris polynyma</i>
124	30420	0.01009	0.000	0.00000	0.02443	0.00004018	0.99882051	<i>Sebastes polyspinis</i>
125	71835	0.00957	0.000	0.00594	0.01320	0.00003811	0.99885862	<i>Neptunea borealis</i>
126	71025	0.00894	0.000	0.00000	0.01948	0.00003563	0.99889424	<i>Tritonia</i> sp.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
127	21316	0.00876	0.000	0.00108	0.01645	0.00003491	0.99892916	Gymnocanthus galeatus
128	99902	0.00862	0.000	0.00000	0.02541	0.00003435	0.99896350	Molgula griffithsii
129	75286	0.00796	0.000	0.00180	0.01412	0.00003171	0.99899521	Serripes laperousii
130	22236	0.00777	0.000	0.00073	0.01481	0.00003095	0.99902616	Careproctus rastrinus
131	65203	0.00756	0.000	0.00000	0.01655	0.00003013	0.99905629	Balanus evermanni
132	30152	0.00755	0.000	0.00000	0.01880	0.00003007	0.99908636	Sebastes new
133	74100	0.00719	0.000	0.00000	0.02097	0.00002862	0.99911498	Pectinid unident.
134	74120	0.00707	0.000	0.00117	0.01296	0.00002814	0.99914312	Patinopecten caurinus
135	80595	0.00698	0.000	0.00000	0.01824	0.00002781	0.99917093	Leptasterias sp.
136	83310	0.00691	0.000	0.00000	0.02045	0.00002751	0.99919844	Ophiura sp.
137	81360	0.00690	0.000	0.00000	0.01487	0.00002749	0.99922593	Diplopteraster multipes
138	68510	0.00642	0.000	0.00202	0.01082	0.00002556	0.99925149	Oregonia gracilis
139	21355	0.00609	0.000	0.00000	0.01330	0.00002425	0.99927574	Triglops pingeli
140	71761	0.00608	0.000	0.00000	0.01398	0.00002420	0.99929994	Pyrulofusus melonis
141	50192	0.00586	0.000	0.00000	0.01293	0.00002336	0.99932330	Aphrodita negligens
142	401	0.00543	0.000	0.00172	0.00914	0.00002163	0.99934493	skate egg case unident.
143	91040	0.00537	0.000	0.00000	0.01532	0.00002140	0.99936633	Mycale loveni
144	71890	0.00507	0.000	0.00000	0.01501	0.00002020	0.99938653	Plicifusus (=Colus)
145	74060	0.00464	0.000	0.00000	0.01191	0.00001848	0.99940501	Modiolus modiolus
146	21932	0.00439	0.000	0.00000	0.00894	0.00001750	0.99942252	Hexagrammos stelleri
147	74080	0.00438	0.000	0.00000	0.01201	0.00001744	0.99943996	Mytilus edulis
148	71721	0.00410	0.000	0.00000	0.00884	0.00001632	0.99945628	Colus herendeenii
149	75285	0.00405	0.000	0.00043	0.00766	0.00001611	0.99947239	Serripes groenlandicus
150	72501	0.00397	0.000	0.00000	0.01093	0.00001582	0.99948821	Fusitriton sp.
151	21354	0.00385	0.000	0.00000	0.01019	0.00001533	0.99950354	Triglops scepticus
152	75600	0.00372	0.000	0.00000	0.00857	0.00001481	0.99951835	Pododesmus macroschisma
153	20061	0.00371	0.000	0.00236	0.00506	0.00001478	0.99953313	Ocella dodecaedron
154	98070	0.00368	0.000	0.00000	0.00771	0.00001465	0.99954777	Thaliacea unident.
155	20510	0.00355	0.000	0.00000	0.00762	0.00001414	0.99956191	Anoplopoma fimbria
156	68590	0.00353	0.000	0.00161	0.00545	0.00001407	0.99957599	Chionoecetes hybrid
157	22228	0.00350	0.000	0.00000	0.01035	0.00001393	0.99958991	Careproctus cypselurus
158	50160	0.00330	0.000	0.00046	0.00613	0.00001314	0.99960305	Aphroditidae

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
159	75110	0.00318	0.000	0.00000	0.00702	0.00001266	0.99961571	Mactromeris sp.
160	65205	0.00314	0.000	0.00000	0.00814	0.00001250	0.99962821	Balanus rostratus
161	80160	0.00299	0.000	0.00000	0.00886	0.00001193	0.99964014	Pycnopodia helianthoides
162	24001	0.00299	0.000	0.00000	0.00886	0.00001192	0.99965206	Zaprora silenus
163	98000	0.00261	0.000	0.00000	0.00530	0.00001040	0.99966246	Ascidian unident.
164	1	0.00260	0.000	0.00000	0.00615	0.00001034	0.99967281	fish eggs unident.
165	21341	0.00237	0.000	0.00000	0.00684	0.00000945	0.99968225	Malacocottus zonurus
166	21592	0.00235	0.000	0.00028	0.00441	0.00000935	0.99969160	Trichodon trichodon
167	81741	0.00235	0.000	0.00000	0.00695	0.00000935	0.99970095	Asterias sp.
168	20050	0.00231	0.000	0.00000	0.00627	0.00000922	0.99971017	Aspidophoroides bartoni
169	21921	0.00223	0.000	0.00000	0.00550	0.00000888	0.99971905	Pleurogrammus monopterygius
170	98300	0.00214	0.000	0.00000	0.00454	0.00000851	0.99972757	compound ascidian unident.
171	71770	0.00209	0.000	0.00000	0.00455	0.00000834	0.99973590	Beringius kennicottii
172	74980	0.00209	0.000	0.00000	0.00453	0.00000831	0.99974421	Clinocardium sp.
173	85210	0.00206	0.000	0.00000	0.00495	0.00000820	0.99975241	Psolus sp.
174	495	0.00206	0.000	0.00000	0.00609	0.00000819	0.99976060	Bathyraja violacea
175	30050	0.00204	0.000	0.00000	0.00500	0.00000812	0.99976872	Sebastes aleutianus
176	80112	0.00192	0.000	0.00000	0.00568	0.00000764	0.99977636	Leptasterias hylodes
177	41582	0.00183	0.000	0.00000	0.00541	0.00000728	0.99978364	Paragorgia arborea
178	80540	0.00180	0.000	0.00094	0.00266	0.00000717	0.99979081	Henricia sp.
179	71800	0.00178	0.000	0.00000	0.00375	0.00000711	0.99979792	Neptunea sp.
180	69120	0.00175	0.000	0.00000	0.00421	0.00000695	0.99980487	Pagurus capillatus
181	71681	0.00165	0.000	0.00000	0.00403	0.00000657	0.99981144	Crepidula grandis
182	66502	0.00151	0.000	0.00000	0.00314	0.00000601	0.99981745	Crangon sp.
183	75284	0.00151	0.000	0.00003	0.00298	0.00000600	0.99982345	Serripes sp.
184	80000	0.00150	0.000	0.00011	0.00289	0.00000597	0.99982943	Asteroidea unident.
185	75240	0.00148	0.000	0.00014	0.00282	0.00000590	0.99983532	Macoma sp.
186	72063	0.00145	0.000	0.00040	0.00250	0.00000577	0.99984109	Aforia circinata
187	10212	0.00142	0.000	0.00058	0.00227	0.00000567	0.99984676	Limanda sakhalinensis
188	81060	0.00142	0.000	0.00000	0.00419	0.00000564	0.99985239	Solaster sp.
189	21935	0.00135	0.000	0.00000	0.00399	0.00000537	0.99985776	Hexagrammos decagrammus
190	56312	0.00135	0.000	0.00048	0.00221	0.00000536	0.99986312	Eunoe depressa

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
191	95030	0.00132	0.000	0.00000	0.00321	0.00000526	0.99986838	Flustra serrulata
192	24189	0.00130	0.000	0.00000	0.00384	0.00000517	0.99987355	Lycodes turneri
193	72790	0.00129	0.000	0.00000	0.00327	0.00000514	0.99987869	Arctomelon stearnsii
194	79000	0.00123	0.000	0.00000	0.00335	0.00000490	0.99988359	squid unident.
195	72403	0.00114	0.000	0.00000	0.00311	0.00000456	0.99988815	Boreotrophon muriciformis
196	80602	0.00109	0.000	0.00000	0.00283	0.00000436	0.99989251	Gephyreaster swifti
197	66570	0.00103	0.000	0.00059	0.00147	0.00000409	0.99989660	Argis sp.
198	71774	0.00101	0.000	0.00000	0.00244	0.00000404	0.99990064	Beringius stimpsoni
199	81092	0.00101	0.000	0.00000	0.00299	0.00000403	0.99990467	Crossaster borealis
200	69110	0.00098	0.000	0.00000	0.00221	0.00000392	0.99990858	Elassochirus tenuimanus
201	21380	0.00093	0.000	0.00000	0.00274	0.00000369	0.99991227	Leptocottus armatus
202	21346	0.00087	0.000	0.00000	0.00256	0.00000345	0.99991572	Hemilepidotus hemilepidotus
203	71726	0.00079	0.000	0.00001	0.00156	0.00000313	0.99991885	Colus spitzbergensis
204	71775	0.00075	0.000	0.00000	0.00209	0.00000297	0.99992182	Beringius crebricostatus
205	22175	0.00073	0.000	0.00000	0.00215	0.00000289	0.99992471	Aptocyclus ventricosus
206	71030	0.00070	0.000	0.00000	0.00202	0.00000280	0.99992751	Tritonia diomedea
207	42000	0.00069	0.000	0.00000	0.00176	0.00000275	0.99993026	Pennatulacea (order)
208	94000	0.00069	0.000	0.00000	0.00139	0.00000274	0.99993300	Sipuncula (phylum)
209	43040	0.00068	0.000	0.00000	0.00166	0.00000271	0.99993571	Urticina (=Tealia)
210	98100	0.00067	0.000	0.00000	0.00161	0.00000267	0.99993838	Boltenia sp.
211	75267	0.00066	0.000	0.00026	0.00106	0.00000263	0.99994101	Siliqua alta
212	75205	0.00061	0.000	0.00008	0.00115	0.00000244	0.99994345	Tellina lutea
213	74104	0.00059	0.000	0.00000	0.00135	0.00000234	0.99994579	Chlamys sp.
214	66601	0.00055	0.000	0.00000	0.00159	0.00000220	0.99994799	Sclerocrangon boreas
215	71760	0.00055	0.000	0.00000	0.00163	0.00000219	0.99995018	Volutopsius castaneus
216	72756	0.00054	0.000	0.00000	0.00123	0.00000215	0.99995233	Buccinum solenum
217	50000	0.00051	0.000	0.00000	0.00113	0.00000204	0.99995436	Polychaeta (class)
218	74655	0.00048	0.000	0.00000	0.00109	0.00000191	0.99995627	Cyclocardia crebricostata
219	66045	0.00045	0.000	0.00000	0.00097	0.00000179	0.99995806	Pandalus goniurus
220	56300	0.00045	0.000	0.00000	0.00096	0.00000178	0.99995984	Polynoidae
221	95080	0.00045	0.000	0.00000	0.00101	0.00000178	0.99996162	Cellepora ventricosa
222	22219	0.00044	0.000	0.00000	0.00105	0.00000175	0.99996338	Careproctus sp.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
223	80728	0.00037	0.000	0.00003	0.00072	0.00000149	0.99996487	Ceramaster sp.
224	79020	0.00037	0.000	0.00002	0.00073	0.00000148	0.99996634	Rossia pacifica
225	82526	0.00035	0.000	0.00000	0.00104	0.00000139	0.99996774	Strongylocentrotus pallidus
226	71580	0.00034	0.000	0.00000	0.00068	0.00000136	0.99996910	Polinices pallidus
227	21375	0.00034	0.000	0.00000	0.00101	0.00000136	0.99997046	Myoxocephalus sp.
228	10180	0.00031	0.000	0.00000	0.00072	0.00000123	0.99997169	Microstomus pacificus
229	22200	0.00031	0.000	0.00000	0.00089	0.00000123	0.99997292	Liparidinae
230	21441	0.00030	0.000	0.00009	0.00052	0.00000121	0.99997413	Icelus spatula
231	68040	0.00030	0.000	0.00000	0.00059	0.00000118	0.99997531	Cancer oregonensis
232	71575	0.00028	0.000	0.00000	0.00071	0.00000113	0.99997644	Polinices sp.
233	80230	0.00027	0.000	0.00000	0.00080	0.00000108	0.99997752	Pedicellaster magister
234	41221	0.00026	0.000	0.00000	0.00059	0.00000103	0.99997855	Gersemia rubiformis
235	95050	0.00024	0.000	0.00000	0.00072	0.00000097	0.99997952	Porella compressa
236	80660	0.00023	0.000	0.00000	0.00052	0.00000091	0.99998044	Pseudarchaster parelii
237	74050	0.00023	0.000	0.00000	0.00058	0.00000091	0.99998134	Mytilidae
238	21356	0.00022	0.000	0.00000	0.00067	0.00000089	0.99998224	Triglops macellus
239	81310	0.00022	0.000	0.00000	0.00066	0.00000088	0.99998312	Pteraster sp.
240	74000	0.00021	0.000	0.00000	0.00063	0.00000085	0.99998397	Bivalvia unident.
241	81870	0.00021	0.000	0.00000	0.00062	0.00000084	0.99998481	Dipsacaster borealis
242	80015	0.00021	0.000	0.00000	0.00061	0.00000082	0.99998563	Evasterias troschelii
243	80546	0.00019	0.000	0.00000	0.00047	0.00000076	0.99998638	Henricia tumida
244	24100	0.00019	0.000	0.00000	0.00056	0.00000075	0.99998714	Zoarcidae
245	70000	0.00018	0.000	0.00000	0.00055	0.00000073	0.99998787	Mollusca (phylum)
246	71530	0.00016	0.000	0.00000	0.00040	0.00000063	0.99998850	Natica clausa
247	80730	0.00015	0.000	0.00000	0.00037	0.00000061	0.99998910	Ceramaster patagonicus
248	22206	0.00015	0.000	0.00000	0.00043	0.00000058	0.99998968	Crystallichthys cyclospilus
249	20202	0.00014	0.000	0.00001	0.00026	0.00000055	0.99999024	Ammodytes hexapterus
250	75201	0.00014	0.000	0.00000	0.00033	0.00000055	0.99999079	Tellina sp.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
251	10	0.00014	0.000	0.00000	0.00040	0.00000054	0.99999133	Petromyzontidae
252	21339	0.00013	0.000	0.00000	0.00034	0.00000052	0.99999185	Malacocottus sp.
253	95060	0.00012	0.000	0.00000	0.00035	0.00000047	0.99999232	Escharopsis sarsi
254	21735	0.00009	0.000	0.00000	0.00021	0.00000036	0.99999267	Eleginus gracilis
255	23055	0.00009	0.000	0.00000	0.00024	0.00000034	0.99999302	Osmerus mordax
256	71640	0.00008	0.000	0.00000	0.00025	0.00000033	0.99999335	Crepidula sp.
257	66611	0.00008	0.000	0.00003	0.00013	0.00000033	0.99999368	Argis lar
258	72100	0.00008	0.000	0.00000	0.00024	0.00000032	0.99999400	Oenopota sp.
259	21397	0.00008	0.000	0.00000	0.00023	0.00000031	0.99999431	Blepsias bilobus
260	71710	0.00007	0.000	0.00000	0.00016	0.00000029	0.99999460	Colus sp.
261	69336	0.00007	0.000	0.00000	0.00017	0.00000028	0.99999488	Placetron wosnessenskii
262	71525	0.00007	0.000	0.00000	0.00016	0.00000027	0.99999514	Natica sp.
263	71535	0.00007	0.000	0.00000	0.00020	0.00000026	0.99999541	Natica aleutica
264	75264	0.00007	0.000	0.00000	0.00015	0.00000026	0.99999567	Siliqua sp.
265	74656	0.00006	0.000	0.00000	0.00015	0.00000026	0.99999592	Cyclocardia sp.
266	71771	0.00006	0.000	0.00000	0.00018	0.00000025	0.99999617	Beringius frielei
267	21388	0.00006	0.000	0.00000	0.00018	0.00000024	0.99999641	Enophrys diceraus
268	21342	0.00006	0.000	0.00000	0.00018	0.00000024	0.99999665	Hemilepidotus sp.
269	75241	0.00006	0.000	0.00000	0.00015	0.00000024	0.99999689	Macoma nasuta
270	41500	0.00006	0.000	0.00000	0.00017	0.00000023	0.99999712	Gorgonacea (order)
271	21352	0.00006	0.000	0.00000	0.00017	0.00000022	0.99999734	Triglops forficata
272	72420	0.00006	0.000	0.00000	0.00016	0.00000022	0.99999757	Boreotrophon sp.
273	21405	0.00004	0.000	0.00000	0.00011	0.00000018	0.99999774	Nautichthys pribilovius
274	21333	0.00004	0.000	0.00000	0.00010	0.00000018	0.99999792	Artediellus pacificus
275	98080	0.00004	0.000	0.00000	0.00013	0.00000017	0.99999809	Styela sp.
276	22201	0.00004	0.000	0.00000	0.00011	0.00000015	0.99999824	Liparis sp.
277	74414	0.00004	0.000	0.00000	0.00010	0.00000015	0.99999839	Yoldia sp.
278	95070	0.00004	0.000	0.00000	0.00011	0.00000015	0.99999854	Rhamphostomella costata

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
279	66200	0.00004	0.000	0.00000	0.00009	0.00000014	0.99999868	Lebbeus sp.
280	74983	0.00003	0.000	0.00000	0.00010	0.00000014	0.99999882	Clinocardium ciliatum
281	80544	0.00003	0.000	0.00000	0.00008	0.00000012	0.99999894	Henricia leviuscula
282	23805	0.00003	0.000	0.00000	0.00006	0.00000011	0.99999905	Lumpenus maculatus
283	78000	0.00003	0.000	0.00000	0.00008	0.00000010	0.99999915	Cephalopoda unident.
284	23808	0.00002	0.000	0.00000	0.00005	0.00000008	0.99999923	Lumpenus sagitta
285	69316	0.00002	0.000	0.00000	0.00005	0.00000007	0.99999931	Hapalogaster grebnitzkii
286	74416	0.00001	0.000	0.00000	0.00004	0.00000005	0.99999936	Yoldia scissurata
287	54010	0.00001	0.000	0.00000	0.00003	0.00000005	0.99999941	Nereis sp.
288	20005	0.00001	0.000	0.00000	0.00003	0.00000005	0.99999946	Sarritor leptorhynchus
289	71724	0.00001	0.000	0.00000	0.00003	0.00000005	0.99999951	Colus roseus
290	20041	0.00001	0.000	0.00000	0.00003	0.00000005	0.99999955	Podothecus veterinus
291	74982	0.00001	0.000	0.00000	0.00003	0.00000004	0.99999960	Clinocardium nuttallii
292	2	0.00001	0.000	0.00000	0.00002	0.00000004	0.99999964	fish larvae unident.
293	71731	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999967	Colus halli
294	59100	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999971	Hirudinea unident.
295	66170	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999973	Eualus sp.
296	20001	0.00001	0.000	0.00000	0.00002	0.00000003	0.99999976	Pallasina barbata
297	21300	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999978	Cottidae
298	68000	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999981	crab unident.
299	66530	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999983	Crangon dalli
300	66515	0.00001	0.000	0.00000	0.00001	0.00000002	0.99999985	Crangon communis
301	23850	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999988	Poroclinus rothrocki
302	54030	0.00001	0.000	0.00000	0.00002	0.00000002	0.99999990	Cheilonereis cyclurus
303	23806	0.00000	0.000	0.00000	0.00001	0.00000002	0.99999992	Lumpenus medius
304	59111	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999993	Carcinobdella cyclostomum
305	66050	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999994	Pandalus hypsinotus
306	66580	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999996	Argis dentata

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
307	20036	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999997	Bathyagonus infraspinus
308	24192	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999997	Gymnelus viridis
309	62000	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999998	Isopoda (order)
310	66500	0.00000	0.000	0.00000	0.00001	0.00000001	0.99999999	Crangonidae (family)
311	74435	0.00000	0.000	0.00000	0.00000	0.00000000	0.99999999	Nuculana sp.
312	20035	0.00000	0.000	0.00000	0.00000	0.00000000	1.00000000	Bathyagonus alascanus
313	21406	0.00000	0.000	0.00000	0.00000	0.00000000	1.00000000	Nautichthys oculofasciatus



## APPENDIX D

## Abundance Estimates for Principal Fish Species

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

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

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

CPUE								
Stratum	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	56	54	54	54	13.40	.75180E+01	10.46	.27490E+01
20	31	31	31	30	7.98	.13440E+01	23.91	.29560E+02
31	69	69	69	69	45.10	.69520E+02	54.08	.82680E+02
32	9	9	9	9	24.93	.93080E+01	53.07	.42280E+02
Subtotal	78	78	78	78	43.39	.58280E+02	54.00	.69540E+02
41	44	44	44	44	45.88	.33100E+03	84.87	.15490E+04
42	31	31	31	31	99.37	.62330E+03	155.31	.94910E+03
43	21	21	21	21	27.66	.44930E+02	45.99	.17270E+03
Subtotal	96	96	96	96	54.22	.14460E+03	92.94	.57760E+03
50	25	25	25	25	16.40	.41070E+02	21.56	.68760E+02
61	60	59	59	59	246.74	.22300E+04	514.06	.76560E+04
62	7	7	7	7	247.17	.31830E+04	572.47	.31650E+05
Subtotal	67	66	66	66	246.77	.19520E+04	518.03	.67960E+04
Total	353	350	350	349	76.98	.22040E+04	145.06	.75450E+04

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Lower	95% Confidence Upper
10	81,465,574	.16671E+15	55.00	55,370,988	107,560,161
20	98,114,272	.49761E+15	30.00	52,496,208	143,732,336
31	511,207,199	.73876E+16	68.00	339,304,481	683,109,917
32	46,562,427	.32546E+14	8.00	33,406,893	59,717,962
Subtotal	557,769,626	.74202E+16	68.59	385,488,667	730,050,585
41	532,154,854	.60908E+17	43.00	33,381,773	1,030,927,935
42	372,912,262	.54721E+16	30.00	221,636,304	524,188,220
43	97,078,223	.76928E+15	20.00	39,220,992	154,935,453
Subtotal	1,002,145,339	.67149E+17	51.64	478,440,165	1,525,850,512
50	83,621,276	.10347E+16	24.00	17,066,948	150,175,605
61	4,530,621,337	.59466E+18	59.00	2,972,145,224	6,089,097,450
62	368,021,244	.13080E+17	6.00	88,165,852	647,876,637
Subtotal	4,898,642,581	.60774E+18	61.33	3,339,491,137	6,457,794,026
Total	6,721,758,669	.68401E+18	76.57	5,067,664,608	8,375,852,729

Appendix D Table 1.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	104,337	.45587E+09	55.00	61,186	147,487
20	32,757	.22625E+08	30.00	23,030	42,484
31	426,332	.62116E+10	68.00	268,705	583,959
32	21,878	.71655E+07	8.00	15,548	28,209
Subtotal	448,211	.62187E+10	68.16	290,493	605,928
41	287,681	.13012E+11	43.00	57,142	518,219
42	238,607	.35935E+10	30.00	116,018	361,197
43	58,374	.20019E+09	20.00	28,760	87,987
Subtotal	584,662	.16806E+11	64.62	325,386	843,938
50	63,615	.61800E+09	24.00	12,304	114,925
61	2,174,604	.17320E+12	59.00	1,333,531	3,015,678
62	158,898	.13153E+10	6.00	70,152	247,644
Subtotal	2,333,502	.17451E+12	59.87	1,489,241	3,177,764
Total	3,567,083	.19863E+12	76.81	2,675,721	4,458,445

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

CPUE								
Stratum	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	56	45	45	43	3.13	.11420E+01	3.90	.59520E+00
20	31	23	23	22	1.83	.26650E+00	1.30	.13000E+00
31	69	69	69	68	20.41	.10230E+02	21.42	.12960E+02
32	9	9	9	9	12.68	.12540E+02	7.02	.69430E+01
Subtotal	78	78	78	77	19.76	.86560E+01	20.20	.10900E+02
41	44	39	39	39	15.21	.20970E+02	13.60	.14130E+02
42	31	30	30	30	21.81	.53100E+02	16.90	.27920E+02
43	21	21	20	20	18.55	.14980E+02	23.72	.23240E+02
Subtotal	96	90	89	89	17.33	.10300E+02	16.32	.70540E+01
50	25	21	21	21	5.53	.47580E+01	2.11	.51520E+00
61	60	58	57	57	13.32	.31660E+01	6.24	.95670E+00
62	7	7	7	7	33.63	.12150E+03	26.66	.14700E+03
Subtotal	67	65	64	64	14.70	.33120E+01	7.63	.15100E+01
Total	353	322	320	316	12.59	.28430E+02	10.81	.20710E+02

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	30,401,989	.36093E+14	55.00	18,260,315	42,543,662
20	5,334,672	.21889E+13	30.00	2,309,133	8,360,211
31	202,502,074	.11582E+16	68.00	134,437,882	270,566,267
32	6,162,873	.53450E+13	8.00	831,557	11,494,189
Subtotal	208,664,947	.11635E+16	68.62	140,443,878	276,886,017
41	85,281,228	.55552E+15	43.00	37,647,389	132,915,067
42	40,577,496	.16096E+15	30.00	14,670,661	66,484,330
43	50,077,655	.10355E+15	20.00	28,779,218	71,376,091
Subtotal	175,936,379	.82003E+15	78.39	118,664,051	233,208,706
50	8,179,718	.77535E+13	24.00	2,432,486	13,926,949
61	55,038,070	.74312E+14	59.00	37,616,129	72,460,011
62	17,137,098	.60732E+14	6.00	0	37,173,072
Subtotal	72,175,168	.13504E+15	25.76	48,236,218	96,114,118
Total	500,692,872	.21646E+16	161.34	408,572,043	592,813,702

Appendix D Table 2.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	24,338	.69270E+08	55.00	7,517	41,158
20	7,504	.44860E+07	30.00	3,173	11,835
31	192,966	.91402E+09	68.00	132,501	253,432
32	11,129	.96524E+07	8.00	3,965	18,294
Subtotal	204,095	.92367E+09	69.38	143,312	264,879
41	95,341	.82447E+09	43.00	37,311	153,371
42	52,360	.30616E+09	30.00	16,578	88,143
43	39,150	.66750E+08	20.00	22,107	56,192
Subtotal	186,851	.11974E+10	74.84	117,644	256,057
50	21,435	.71597E+08	24.00	3,970	38,900
61	117,417	.24592E+09	59.00	85,724	149,110
62	21,619	.50229E+08	6.00	4,277	38,962
Subtotal	139,036	.29614E+09	60.68	104,618	173,454
Total	583,259	.25626E+10	197.78	483,028	683,490

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

CPUE								
Stratum	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	56	56	55	55	88.15	.10210E+03	445.63	.19830E+04
20	31	31	31	30	38.12	.27920E+02	173.63	.76530E+03
31	69	63	63	63	37.48	.21390E+02	133.75	.26620E+03
32	9	8	8	8	3.50	.17320E+01	9.39	.14160E+02
Subtotal	78	71	71	71	34.59	.17920E+02	123.19	.22300E+03
41	44	44	44	44	7.44	.19050E+01	27.34	.28980E+02
42	31	28	28	28	20.13	.25530E+02	60.65	.25420E+03
43	21	21	21	21	4.69	.22180E+01	17.76	.37310E+02
Subtotal	96	93	93	93	9.73	.19960E+01	32.88	.23840E+02
50	25	2	2	2	0.04	.12030E-02	0.06	.31200E-02
61	60	4	4	4	0.12	.73700E-02	0.32	.56240E-01
62	7	5	5	5	0.33	.12870E-01	1.06	.12210E+00
Subtotal	67	9	9	9	0.13	.64620E-02	0.37	.49410E-01
Total	353	262	261	260	28.19	.14990E+03	125.46	.29950E+04

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	3,470,186,655	.12022E+18	55.00	2,769,444,117	4,170,929,194
20	712,341,701	.12882E+17	30.00	480,234,807	944,448,595
31	1,264,322,444	.23784E+17	68.00	955,878,740	1,572,766,147
32	8,234,920	.10898E+14	8.00	622,325	15,847,514
Subtotal	1,272,557,364	.23795E+17	68.06	964,043,004	1,581,071,723
41	171,407,754	.11394E+16	43.00	103,187,509	239,627,999
42	145,637,271	.14656E+16	30.00	67,461,788	223,812,754
43	37,493,804	.16622E+15	20.00	10,599,778	64,387,830
Subtotal	354,538,830	.27713E+16	74.45	249,252,281	459,825,378
50	248,759	.46944E+11	24.00	0	695,957
61	2,851,751	.43682E+13	59.00	0	7,075,680
62	682,518	.50461E+11	6.00	132,837	1,232,198
Subtotal	3,534,269	.44186E+13	60.29	0	7,738,382
Total	5,813,407,578	.15968E+18	92.13	5,014,219,621	6,612,595,535

Appendix D Table 3.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	686,444	.61907E+10	55.00	527,430	845,458
20	156,412	.46990E+09	30.00	112,147	200,677
31	354,257	.19111E+10	68.00	266,825	441,689
32	3,067	.13334E+07	8.00	404	5,730
Subtotal	357,324	.19124E+10	68.09	269,861	444,787
41	46,666	.74916E+08	43.00	29,173	64,158
42	48,323	.14720E+09	30.00	23,511	73,134
43	9,908	.98823E+07	20.00	3,351	16,466
Subtotal	104,896	.23200E+09	62.77	74,433	135,360
50	155	.18107E+05	24.00	0	433
61	1,029	.57250E+06	59.00	0	2,558
62	214	.53175E+04	6.00	36	393
Subtotal	1,243	.57782E+06	60.05	0	2,764
Total	1,306,475	.88056E+10	102.19	1,118,798	1,494,151



Appendix D Table 4.--CPUE, population, and biomass estimates for *Lepidopsetta* spp.

CPUE								
Stratum	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	56	56	56	56	72.32	.10620E+03	316.12	.22600E+04
20	31	31	31	30	13.06	.54690E+01	62.70	.20780E+03
31	69	65	65	65	78.16	.23500E+03	369.94	.51010E+04
32	9	9	9	9	12.72	.55590E+01	59.25	.17650E+03
Subtotal	78	74	74	74	72.60	.19680E+03	343.55	.42730E+04
41	44	37	37	37	14.75	.31260E+02	58.56	.54510E+03
42	31	31	31	31	36.05	.34970E+02	152.68	.55230E+03
43	21	21	20	20	26.83	.40860E+02	75.73	.37400E+03
Subtotal	96	89	88	88	21.86	.13870E+02	82.88	.22610E+03
50	25	7	7	7	0.40	.12610E+00	1.34	.14450E+01
61	60	55	55	55	8.32	.14140E+01	20.27	.75190E+01
62	7	7	7	7	18.58	.11900E+02	52.18	.68870E+02
Subtotal	67	62	62	62	9.02	.12830E+01	22.44	.68490E+01
Total	353	319	318	317	36.46	.32380E+03	159.24	.69750E+04

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	2,461,669,869	.13704E+18	55.00	1,713,507,503	3,209,832,235
20	257,232,066	.34985E+16	30.00	136,450,749	378,013,384
31	3,496,880,507	.45582E+18	68.00	2,146,597,242	4,847,163,771
32	51,986,119	.13589E+15	8.00	25,104,914	78,867,325
Subtotal	3,548,866,626	.45595E+18	68.04	2,198,382,104	4,899,351,147
41	367,196,527	.21431E+17	43.00	71,337,433	663,055,621
42	366,600,139	.31843E+16	30.00	251,370,491	481,829,788
43	159,853,066	.16662E+16	20.00	74,704,731	245,001,400
Subtotal	893,649,732	.26281E+17	61.90	569,419,865	1,217,879,598
50	5,214,476	.21747E+14	24.00	0	14,839,613
61	178,632,067	.58401E+15	59.00	129,792,007	227,472,127
62	33,547,094	.28464E+14	6.00	20,491,968	46,602,220
Subtotal	212,179,161	.61247E+15	63.41	162,682,771	261,675,551
Total	7,378,811,929	.62341E+18	114.02	5,799,685,796	8,957,938,063

Appendix D Table 4.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	563,128	.64404E+10	55.00	400,939	725,318
20	53,583	.92056E+08	30.00	33,962	73,203
31	738,851	.20995E+11	68.00	449,055	1,028,646
32	11,160	.42798E+07	8.00	6,389	15,930
Subtotal	750,010	.21000E+11	68.03	460,185	1,039,836
41	92,486	.12291E+10	43.00	21,633	163,338
42	86,553	.20163E+09	30.00	57,558	115,549
43	56,630	.18206E+09	20.00	28,484	84,777
Subtotal	235,669	.16128E+10	68.18	155,350	315,988
50	1,567	.18972E+07	24.00	0	4,410
61	73,343	.10985E+09	59.00	52,161	94,524
62	11,945	.49179E+07	6.00	6,243	17,646
Subtotal	85,287	.11476E+09	63.16	63,862	106,713
Total	1,689,245	.29262E+11	117.69	1,347,124	2,031,365

Appendix D Table 5.--CPUE, population, and biomass estimates for *Hippoglossoides* spp.

CPUE								
Stratum	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	56	19	19	16	1.20	.31570E+00	2.99	.23000E+01
20	31	10	10	10	0.07	.67030E-03	0.17	.28820E-02
31	69	63	63	62	13.52	.43350E+01	38.03	.45080E+02
32	9	9	9	9	13.48	.11310E+03	28.51	.43170E+03
Subtotal	78	72	72	71	13.52	.44450E+01	37.22	.40860E+02
41	44	41	41	39	3.01	.13360E+01	8.86	.78300E+01
42	31	31	31	31	3.01	.31810E+00	6.65	.15540E+01
43	21	21	21	21	9.77	.10040E+02	17.86	.15390E+02
Subtotal	96	93	93	91	4.33	.85230E+00	10.13	.33150E+01
50	25	25	25	25	10.86	.28770E+01	57.60	.79490E+02
61	60	60	59	59	17.19	.68640E+01	52.30	.42460E+02
62	7	7	7	7	5.83	.45030E+01	17.92	.53250E+01
Subtotal	67	67	66	66	16.42	.59830E+01	49.97	.36910E+02
Total	353	286	285	279	8.49	.14470E+02	26.19	.16290E+03

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	23,262,165	.13946E+15	55.00	0	47,128,511
20	682,550	.48515E+11	30.00	232,775	1,132,324
31	359,465,081	.40279E+16	68.00	232,533,027	486,397,134
32	25,019,332	.33233E+15	8.00	0	67,057,656
Subtotal	384,484,413	.43603E+16	75.32	252,419,753	516,549,072
41	55,541,578	.30784E+15	43.00	20,082,498	91,000,657
42	15,965,215	.89612E+13	30.00	9,852,446	22,077,983
43	37,693,411	.68580E+14	20.00	20,360,605	55,026,217
Subtotal	109,200,203	.38538E+15	60.54	69,938,034	148,462,373
50	223,436,154	.11962E+16	24.00	152,049,646	294,822,662
61	460,959,339	.32984E+16	59.00	344,889,985	577,028,694
62	11,523,108	.22006E+13	6.00	7,709,162	15,337,053
Subtotal	472,482,447	.33006E+16	59.08	356,374,379	588,590,515
Total	1,213,547,932	.93820E+16	176.55	1,021,763,976	1,405,331,889

Appendix D Table 5.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	9,331	.19144E+08	55.00	488	18,173
20	286	.11282E+05	30.00	69	503
31	127,796	.38732E+09	68.00	88,435	167,157
32	11,828	.87056E+08	8.00	0	33,894
Subtotal	139,624	.47438E+09	71.37	96,063	183,184
41	18,873	.52517E+08	43.00	4,227	33,519
42	7,234	.18342E+07	30.00	4,469	10,000
43	20,628	.44732E+08	20.00	6,676	34,579
Subtotal	46,735	.99084E+08	60.13	26,827	66,643
50	42,131	.43289E+08	24.00	28,551	55,711
61	151,536	.53314E+09	59.00	104,871	198,200
62	3,745	.18611E+07	6.00	407	7,083
Subtotal	155,281	.53500E+09	59.41	108,535	202,027
Total	393,388	.11709E+10	167.06	325,635	461,140

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

CPUE								
Stratum	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	56	55	55	56	15.33	.31980E+01	32.51	.10370E+02
20	31	31	31	30	25.28	.19370E+02	54.49	.69230E+02
31	69	60	59	65	13.02	.51920E+01	20.82	.13230E+02
32	9	4	4	9	1.25	.38490E+00	1.22	.41370E+00
Subtotal	78	64	63	74	12.02	.43500E+01	19.15	.11080E+02
41	44	44	44	37	20.33	.25510E+02	30.98	.49440E+02
42	31	26	26	31	6.70	.23050E+01	10.37	.60430E+01
43	21	21	20	20	14.30	.27170E+02	17.85	.50020E+02
Subtotal	96	91	90	88	16.11	.97830E+01	23.82	.18940E+02
50	25	0	0	7	0.00	.00000E+00	0.00	.00000E+00
61	60	12	12	55	2.49	.10980E+01	2.07	.86490E+00
62	7	6	6	7	5.51	.12120E+02	3.34	.34190E+01
Subtotal	67	18	18	62	2.70	.10100E+01	2.16	.76710E+00
Total	353	259	257	317	11.79	.37710E+02	20.54	.11040E+03

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	253,125,085	.62878E+15	55.00	202,447,465	303,802,705
20	223,553,923	.11653E+16	30.00	153,846,036	293,261,811
31	196,787,471	.11823E+16	68.00	128,018,378	265,556,565
32	1,073,148	.31853E+12	8.00	0	2,374,610
Subtotal	197,860,619	.11826E+16	68.04	129,082,263	266,638,976
41	194,231,835	.19438E+16	43.00	105,129,600	283,334,070
42	24,903,535	.34839E+14	30.00	12,850,756	36,956,313
43	37,678,045	.22286E+15	20.00	6,432,702	68,923,387
Subtotal	256,813,414	.22015E+16	53.61	161,988,503	351,638,325
50	0	.00000E+00	24.00	0	0
61	18,269,024	.67185E+14	59.00	1,703,660	34,834,387
62	2,145,573	.14128E+13	6.00	0	5,201,469
Subtotal	20,414,597	.68597E+14	61.24	3,849,898	36,979,295
Total	951,767,638	.52468E+16	168.43	808,346,723	1,095,188,554

Appendix D Table 6.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	119,338	.19393E+09	55.00	91,194	147,482
20	103,731	.32607E+09	30.00	66,858	140,604
31	123,117	.46389E+09	68.00	80,041	166,193
32	1,100	.29633E+06	8.00	0	2,388
Subtotal	124,217	.46418E+09	68.09	81,127	167,307
41	127,448	.10030E+10	43.00	63,442	191,454
42	16,098	.13289E+08	30.00	8,654	23,542
43	30,184	.12107E+09	20.00	7,155	53,213
Subtotal	173,730	.11374E+10	53.60	105,572	241,888
50	0	.00000E+00	24.00	0	0
61	21,960	.85280E+08	59.00	3,297	40,624
62	3,545	.50084E+07	6.00	0	9,021
Subtotal	25,505	.90288E+08	63.96	6,501	44,509
Total	546,522	.22118E+10	154.63	453,402	639,641

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

CPUE								
Stratum	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	56	0	0	0	0.00	.00000E+00	0.00	.00000E+00
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	2	2	2	0.05	.15300E-02	0.01	.37770E-04
32	9	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	78	2	2	2	0.05	.12810E-02	0.01	.31630E-04
41	44	3	3	3	0.09	.27100E-02	0.02	.10720E-03
42	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
43	21	3	3	2	0.02	.27530E-03	0.06	.14530E-02
Subtotal	96	6	6	5	0.06	.92700E-03	0.02	.91950E-04
50	25	0	0	0	0.00	.00000E+00	0.00	.00000E+00
61	60	27	26	26	2.06	.22110E+00	0.49	.18770E-01
62	7	2	2	1	0.87	.73430E+00	0.19	.14680E-01
Subtotal	67	29	28	27	1.98	.19540E+00	0.47	.16380E-01
Total	353	37	36	34	0.43	.19760E+00	0.10	.16500E-01

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	0	.00000E+00	55.00	0	0
20	0	.00000E+00	30.00	0	0
31	78,287	.33748E+10	68.00	0	194,473
32	0	.00000E+00	8.00	0	0
Subtotal	78,287	.33748E+10	8.64	0	212,250
41	110,838	.42151E+10	43.00	0	242,050
42	0	.00000E+00	30.00	0	0
43	129,337	.64747E+10	20.00	0	297,751
Subtotal	240,175	.10690E+11	33.48	29,050	451,301
50	0	.00000E+00	24.00	0	0
61	4,350,860	.14582E+13	59.00	1,910,346	6,791,373
62	119,534	.60674E+10	6.00	0	310,139
Subtotal	4,470,394	.14643E+13	59.48	2,024,808	6,915,979
Total	4,788,856	.14784E+13	187.54	2,381,405	7,196,307

Appendix D Table 7.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	0	.00000E+00	55.00	0	0
20	0	.00000E+00	30.00	0	0
31	473	.13672E+06	68.00	0	1,212
32	0	.00000E+00	8.00	0	0
Subtotal	473	.13672E+06	41.54	0	1,220
41	563	.10654E+06	43.00	0	1,223
42	0	.00000E+00	30.00	0	0
43	51	.12264E+04	20.00	0	124
Subtotal	614	.10777E+06	60.91	0	1,270
50	0	.00000E+00	24.00	0	0
61	18,149	.17171E+08	59.00	9,775	26,524
62	561	.30345E+06	6.00	0	1,977
Subtotal	18,710	.17474E+08	60.92	10,350	27,071
Total	19,797	.17719E+08	80.76	11,378	28,216



Appendix D Table 8.--CPUE, population, and biomass estimates for arrowtooth flounder.

CPUE								
Stratum	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	56	1	1	1	0.02	.27270E-03	0.14	.18400E-01
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	26	26	26	5.91	.56430E+01	14.96	.32940E+02
32	9	9	9	9	2.00	.31050E+00	7.11	.35710E+01
Subtotal	78	35	35	35	5.58	.47270E+01	14.29	.27610E+02
41	44	2	2	2	0.07	.54480E-02	0.08	.51100E-02
42	31	16	16	16	0.92	.10120E+00	5.43	.60670E+01
43	21	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	96	18	18	18	0.25	.68600E-02	1.26	.30260E+00
50	25	25	25	25	32.58	.23640E+03	38.64	.54430E+02
61	60	40	40	40	6.44	.11600E+01	12.64	.13800E+02
62	7	2	2	2	0.40	.11750E+00	0.21	.20790E-01
Subtotal	67	42	42	42	6.03	.10080E+01	11.79	.11980E+02
Total	353	121	121	121	5.26	.24220E+03	9.14	.94350E+02

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	1,056,198	.11156E+13	55.00	0	3,190,775
20	0	.00000E+00	30.00	0	0
31	141,366,041	.29433E+16	68.00	32,860,893	249,871,190
32	6,240,478	.27495E+13	8.00	2,318,939	10,162,017
Subtotal	147,606,519	.29461E+16	68.13	39,050,703	256,162,335
41	501,318	.20092E+12	43.00	0	1,407,223
42	13,031,035	.34978E+14	30.00	936,517	25,125,552
43	0	.00000E+00	20.00	0	0
Subtotal	13,532,353	.35179E+14	30.71	1,420,941	25,643,765
50	149,879,072	.81915E+15	24.00	90,662,761	209,095,384
61	111,370,828	.10716E+16	59.00	45,213,601	177,528,055
62	135,346	.85935E+10	6.00	0	362,186
Subtotal	111,506,174	.10716E+16	59.00	45,348,682	177,663,666
Total	423,580,316	.48731E+16	135.85	285,361,080	561,799,552

Appendix D Table 8.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	129	.16538E+05	55.00	0	388
20	0	.00000E+00	30.00	0	0
31	55,903	.50421E+09	68.00	10,994	100,812
32	1,752	.23906E+06	8.00	624	2,879
Subtotal	57,655	.50445E+09	68.06	12,735	102,575
41	464	.21420E+06	43.00	0	1,399
42	2,198	.58332E+06	30.00	639	3,758
43	0	.00000E+00	20.00	0	0
Subtotal	2,662	.79752E+06	69.56	876	4,448
50	126,381	.35576E+10	24.00	3,272	249,490
61	56,730	.90103E+08	59.00	37,546	75,914
62	255	.48554E+05	6.00	0	821
Subtotal	56,985	.90152E+08	59.06	37,796	76,174
Total	243,811	.41530E+10	32.48	112,216	375,406

Appendix D Table 9.--CPUE, population, and biomass estimates for Kamchatka flounder.

CPUE								
Stratum	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	56	0	0	0	0.00	.00000E+00	0.00	.00000E+00
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	12	12	12	0.12	.19260E-02	0.21	.72190E-02
32	9	6	6	6	0.86	.16570E+00	2.23	.17350E+01
Subtotal	78	18	18	18	0.18	.28090E-02	0.38	.18560E-01
41	44	2	2	2	0.04	.83940E-03	0.02	.23900E-03
42	31	6	6	5	0.06	.88320E-03	0.09	.13820E-02
43	21	1	1	1	0.04	.19470E-02	0.03	.70790E-03
Subtotal	96	9	9	8	0.05	.40230E-03	0.04	.17650E-03
50	25	25	25	25	0.74	.91850E-02	2.14	.84950E-01
61	60	41	40	39	1.44	.75840E-01	2.54	.80170E+00
62	7	3	3	3	0.59	.83750E-01	0.29	.18740E-01
Subtotal	67	44	43	42	1.38	.66260E-01	2.39	.69650E+00
Total	353	96	95	93	0.39	.78660E-01	0.76	.80020E+00

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	0	.00000E+00	55.00	0	0
20	0	.00000E+00	30.00	0	0
31	1,962,540	.64501E+12	68.00	356,289	3,568,791
32	1,956,677	.13359E+13	8.00	0	4,690,185
Subtotal	3,919,217	.19809E+13	17.12	949,492	6,888,943
41	134,620	.93968E+10	43.00	0	330,529
42	226,856	.79670E+10	30.00	44,591	409,122
43	56,159	.31538E+10	20.00	0	173,306
Subtotal	417,635	.20518E+11	90.21	131,156	704,114
50	8,288,266	.12784E+13	24.00	5,948,929	10,627,603
61	22,412,446	.62275E+14	59.00	6,463,858	38,361,035
62	185,011	.77457E+10	6.00	0	411,284
Subtotal	22,597,457	.62282E+14	59.01	6,647,877	38,547,037
Total	35,222,575	.65562E+14	68.33	19,028,464	51,416,687

Appendix D Table 9.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	0	.00000E+00	55.00	0	0
20	0	.00000E+00	30.00	0	0
31	1,089	.17210E+06	68.00	260	1,919
32	755	.12760E+06	8.00	0	1,579
Subtotal	1,845	.29971E+06	36.36	727	2,963
41	258	.33002E+05	43.00	0	625
42	145	.50921E+04	30.00	0	291
43	93	.86767E+04	20.00	0	287
Subtotal	497	.46771E+05	73.01	64	929
50	2,887	.13822E+06	24.00	2,118	3,656
61	12,665	.58908E+07	59.00	7,760	17,570
62	382	.34610E+05	6.00	0	838
Subtotal	13,047	.59254E+07	59.67	8,128	17,967
Total	18,276	.64101E+07	103.68	13,212	23,339

Appendix D Table 10.--CPUE, population, and biomass estimates for Pacific halibut.

CPUE								
Stratum	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	56	33	33	33	1.46	.89910E-01	0.73	.22800E-01
20	31	20	20	20	1.26	.96580E-01	0.76	.28450E-01
31	69	65	65	65	4.30	.41090E+00	2.44	.26580E+00
32	9	6	6	6	0.54	.43150E-01	0.25	.90400E-02
Subtotal	78	71	71	71	3.98	.34430E+00	2.25	.22260E+00
41	44	22	22	22	1.34	.22460E+00	0.36	.10150E-01
42	31	26	26	26	4.47	.21440E+01	1.20	.10090E+00
43	21	14	14	14	1.23	.10090E+00	0.54	.15720E-01
Subtotal	96	62	62	62	2.01	.18610E+00	0.58	.90360E-02
50	25	19	19	19	2.35	.20520E+00	0.45	.57450E-02
61	60	36	36	36	4.32	.61930E+00	0.66	.13450E-01
62	7	5	5	5	3.30	.96160E+00	0.39	.21110E-01
Subtotal	67	41	41	41	4.25	.54240E+00	0.64	.11780E-01
Total	353	246	246	246	2.78	.14650E+01	1.00	.30050E+00

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	5,676,743	.13825E+13	55.00	3,300,430	8,053,056
20	3,138,457	.47893E+12	30.00	1,725,301	4,551,613
31	23,051,738	.23751E+14	68.00	13,304,723	32,798,752
32	222,770	.69597E+10	8.00	30,393	415,147
Subtotal	23,274,508	.23758E+14	68.04	13,526,065	33,022,950
41	2,261,821	.39892E+12	43.00	985,355	3,538,286
42	2,889,179	.58152E+12	30.00	1,332,004	4,446,355
43	1,129,369	.70053E+11	20.00	575,401	1,683,336
Subtotal	6,280,369	.10505E+13	72.53	4,230,498	8,330,239
50	1,764,939	.86461E+11	24.00	1,156,566	2,373,311
61	5,792,883	.10451E+13	59.00	3,726,825	7,858,942
62	247,741	.87241E+10	6.00	7,602	487,881
Subtotal	6,040,625	.10538E+13	59.95	3,965,961	8,115,288
Total	46,175,640	.27810E+14	92.38	35,628,554	56,722,725

Appendix D Table 10.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	11,347	.54522E+07	55.00	6,628	16,066
20	5,183	.16256E+07	30.00	2,580	7,787
31	40,613	.36711E+08	68.00	28,495	52,731
32	475	.33216E+05	8.00	55	896
Subtotal	41,089	.36745E+08	68.12	28,965	53,212
41	8,374	.88316E+07	43.00	2,368	14,380
42	10,728	.12359E+08	30.00	3,549	17,907
43	2,605	.44955E+06	20.00	1,207	4,004
Subtotal	21,708	.21640E+08	67.73	12,404	31,011
50	9,127	.30885E+07	24.00	5,499	12,754
61	38,037	.48104E+08	59.00	24,020	52,054
62	2,119	.39741E+06	6.00	576	3,661
Subtotal	40,155	.48501E+08	59.94	26,080	54,230
Total	128,608	.11705E+09	204.46	107,186	150,030

## APPENDIX E

Population Estimates by Sex and Size  
Groups for Principal Fish Species

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

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Appendix E Table 1.--Population estimates by sex and size group for walleye pollock from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	173,699	0	46,085	219,784	0.0000	0.0000
70	0	0	1,267,767	1,267,767	0.0002	0.0002
80	184,117	0	7,633,848	7,817,965	0.0012	0.0014
90	277,822	1,327,456	33,509,007	35,114,285	0.0052	0.0066
100	227,336	186,317	75,604,650	76,018,304	0.0113	0.0179
110	2,404,569	3,130,180	88,055,733	93,590,482	0.0139	0.0318
120	7,199,120	3,068,266	86,569,935	96,837,321	0.0144	0.0462
130	11,425,616	5,324,554	85,551,315	102,301,485	0.0152	0.0615
140	17,205,372	11,996,116	108,471,924	137,673,412	0.0205	0.0819
150	20,866,312	10,850,317	86,612,273	118,328,902	0.0176	0.0996
160	9,548,010	5,230,165	52,369,247	67,147,422	0.0100	0.1095
170	8,455,426	6,081,783	36,072,375	50,609,584	0.0075	0.1171
180	9,342,544	3,835,172	9,691,780	22,869,497	0.0034	0.1205
190	11,806,639	11,845,948	10,441,490	34,094,077	0.0051	0.1255
200	24,653,627	27,237,071	10,422,603	62,313,301	0.0093	0.1348
210	37,370,454	40,197,059	1,167,132	78,734,645	0.0117	0.1465
220	69,213,889	62,731,444	125,765	132,071,098	0.0196	0.1662
230	49,100,960	47,914,647	107,136	97,122,743	0.0144	0.1806
240	36,552,800	44,719,985	0	81,272,786	0.0121	0.1927
250	25,440,221	34,897,395	0	60,337,616	0.0090	0.2017
260	27,943,918	29,508,744	0	57,452,662	0.0085	0.2102
270	24,628,351	35,581,313	0	60,209,663	0.0090	0.2192
280	34,881,921	30,464,738	0	65,346,659	0.0097	0.2289
290	22,608,973	20,721,690	0	43,330,663	0.0064	0.2354
300	29,307,197	27,519,830	0	56,827,026	0.0085	0.2438
310	28,520,578	31,364,138	0	59,884,715	0.0089	0.2527
320	27,936,300	28,538,387	0	56,474,687	0.0084	0.2611
330	40,487,252	31,012,097	0	71,499,349	0.0106	0.2718
340	46,611,984	56,170,443	0	102,782,428	0.0153	0.2871
350	35,901,357	33,782,563	0	69,683,920	0.0104	0.2974
360	67,840,437	35,056,114	0	102,896,550	0.0153	0.3127
370	74,092,288	86,319,141	0	160,411,429	0.0239	0.3366
380	87,714,913	87,227,918	0	174,942,830	0.0260	0.3626
390	96,572,488	102,573,151	0	199,145,639	0.0296	0.3923
400	101,121,170	80,729,649	0	181,850,819	0.0271	0.4193
410	87,796,801	71,890,202	0	159,687,003	0.0238	0.4431
420	134,653,791	73,911,695	0	208,565,486	0.0310	0.4741
430	172,374,855	103,705,982	0	276,080,838	0.0411	0.5152
440	194,709,287	144,951,797	0	339,661,083	0.0505	0.5657
450	204,187,897	213,952,019	0	418,139,916	0.0622	0.6279
460	181,937,504	231,677,934	0	413,615,438	0.0615	0.6894
470	132,659,552	205,904,320	0	338,563,872	0.0504	0.7398
480	132,357,266	176,241,007	0	308,598,273	0.0459	0.7857
490	90,919,402	145,342,555	0	236,261,957	0.0351	0.8209



Appendix E Table 1.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
500	78,661,248	104,739,345	0	183,400,593	0.0273	0.8481
510	59,452,080	92,280,673	0	151,732,753	0.0226	0.8707
520	54,805,302	66,901,210	0	121,706,512	0.0181	0.8888
530	54,531,751	71,634,949	0	126,166,701	0.0188	0.9076
540	36,170,927	54,581,419	0	90,752,345	0.0135	0.9211
550	29,290,686	39,158,220	0	68,448,905	0.0102	0.9313
560	31,901,290	35,798,448	0	67,699,737	0.0101	0.9414
570	28,212,734	34,802,912	0	63,015,646	0.0094	0.9507
580	16,929,809	37,245,914	0	54,175,723	0.0081	0.9588
590	16,197,482	27,229,730	0	43,427,212	0.0065	0.9653
600	13,992,414	26,244,632	0	40,237,046	0.0060	0.9712
610	11,794,551	21,286,521	0	33,081,072	0.0049	0.9762
620	9,091,195	14,449,414	0	23,540,610	0.0035	0.9797
630	7,704,055	12,817,475	0	20,521,529	0.0031	0.9827
640	5,388,329	9,220,179	0	14,608,509	0.0022	0.9849
650	5,336,346	9,851,727	0	15,188,072	0.0023	0.9871
660	5,543,398	8,205,364	0	13,748,762	0.0020	0.9892
670	4,152,072	7,255,323	0	11,407,394	0.0017	0.9909
680	4,131,214	5,770,993	0	9,902,207	0.0015	0.9924
690	2,623,070	6,905,405	0	9,528,475	0.0014	0.9938
700	3,149,670	4,092,259	0	7,241,928	0.0011	0.9949
710	2,401,494	4,852,480	0	7,253,974	0.0011	0.9959
720	1,065,389	4,392,218	0	5,457,607	0.0008	0.9967
730	1,073,759	3,920,768	0	4,994,527	0.0007	0.9975
740	2,262,663	3,250,659	0	5,513,322	0.0008	0.9983
750	659,042	2,588,937	0	3,247,979	0.0005	0.9988
760	264,891	1,742,730	0	2,007,621	0.0003	0.9991
770	156,347	1,371,649	0	1,527,996	0.0002	0.9993
780	28,644	805,483	0	834,127	0.0001	0.9994
790	0	1,129,722	0	1,129,722	0.0002	0.9996
800	0	462,723	0	462,723	0.0001	0.9997
810	0	1,708,698	0	1,708,698	0.0003	0.9999
820	28,644	71,007	0	99,651	0.0000	1.0000
830	0	273,999	0	273,999	0.0000	1.0000
850	0	59,611	0	59,611	0.0000	1.0000
Total	2,906,214,509	3,121,824,095	693,720,064	6,721,758,669	1.0000	1.0000

Appendix E Table 2.--Population estimates by sex and size group for Pacific cod from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	0	0	34,272	34,272	0.0001	0.0001
100	28,387	0	626,923	655,310	0.0013	0.0014
110	257,855	61,674	2,014,589	2,334,118	0.0047	0.0060
120	152,946	613,692	3,583,348	4,349,986	0.0087	0.0147
130	650,318	831,002	3,244,754	4,726,074	0.0094	0.0242
140	1,118,680	1,120,072	3,004,278	5,243,029	0.0105	0.0346
150	893,368	1,252,390	1,877,876	4,023,634	0.0080	0.0427
160	1,904,376	1,610,563	1,334,698	4,849,637	0.0097	0.0524
170	1,333,859	1,212,506	821,578	3,367,943	0.0067	0.0591
180	759,641	714,608	326,968	1,801,217	0.0036	0.0627
190	371,271	685,565	212,722	1,269,557	0.0025	0.0652
200	504,212	1,238,435	24,372	1,767,019	0.0035	0.0687
210	1,038,413	1,064,724	0	2,103,136	0.0042	0.0729
220	1,241,895	423,792	0	1,665,687	0.0033	0.0763
230	1,338,138	945,268	0	2,283,406	0.0046	0.0808
240	2,331,813	2,323,750	0	4,655,563	0.0093	0.0901
250	2,574,596	2,135,513	0	4,710,109	0.0094	0.0995
260	3,718,803	4,675,848	0	8,394,651	0.0168	0.1163
270	4,105,911	5,632,414	0	9,738,325	0.0194	0.1358
280	4,114,659	5,378,923	0	9,493,582	0.0190	0.1547
290	6,894,970	6,413,734	0	13,308,704	0.0266	0.1813
300	5,406,465	6,114,217	0	11,520,681	0.0230	0.2043
310	6,518,505	6,149,519	0	12,668,024	0.0253	0.2296
320	6,977,338	6,238,195	0	13,215,533	0.0264	0.2560
330	4,826,247	5,506,193	0	10,332,440	0.0206	0.2766
340	5,187,788	4,567,251	0	9,755,039	0.0195	0.2961
350	4,620,549	3,851,350	0	8,471,899	0.0169	0.3130
360	4,036,618	4,122,373	0	8,158,991	0.0163	0.3293
370	5,163,287	5,081,911	0	10,245,198	0.0205	0.3498
380	6,387,683	5,960,715	0	12,348,398	0.0247	0.3745
390	6,749,839	6,392,368	0	13,142,207	0.0262	0.4007
400	8,238,404	7,957,852	0	16,196,255	0.0323	0.4331
410	10,337,271	10,366,583	0	20,703,853	0.0414	0.4744
420	10,208,697	11,508,831	0	21,717,527	0.0434	0.5178
430	12,653,257	12,349,622	0	25,002,880	0.0499	0.5677
440	12,075,953	11,737,559	0	23,813,512	0.0476	0.6153
450	10,678,053	10,943,629	0	21,621,682	0.0432	0.6585
460	8,860,846	8,051,634	0	16,912,480	0.0338	0.6922
470	8,740,209	8,742,148	0	17,482,357	0.0349	0.7272
480	7,020,597	6,319,694	0	13,340,291	0.0266	0.7538
490	5,029,633	4,962,219	0	9,991,853	0.0200	0.7738
500	4,183,378	4,336,196	0	8,519,574	0.0170	0.7908
510	3,119,234	3,942,494	0	7,061,727	0.0141	0.8049
520	3,098,489	2,991,945	0	6,090,434	0.0122	0.8170

Appendix E Table 2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
530	4,269,105	1,943,428	0	6,212,533	0.0124	0.8295
540	2,309,569	2,679,088	0	4,988,657	0.0100	0.8394
550	2,861,388	2,131,642	0	4,993,030	0.0100	0.8494
560	1,771,092	2,212,291	0	3,983,383	0.0080	0.8573
570	2,760,069	1,711,916	0	4,471,985	0.0089	0.8663
580	2,620,587	1,346,472	0	3,967,059	0.0079	0.8742
590	2,277,605	1,420,662	0	3,698,268	0.0074	0.8816
600	1,451,424	1,620,585	0	3,072,009	0.0061	0.8877
610	2,329,462	2,664,155	0	4,993,616	0.0100	0.8977
620	1,963,780	1,701,125	0	3,664,905	0.0073	0.9050
630	1,809,899	2,168,616	0	3,978,514	0.0079	0.9130
640	1,768,741	1,647,673	0	3,416,414	0.0068	0.9198
650	1,980,545	2,078,246	0	4,058,792	0.0081	0.9279
660	1,317,351	1,387,922	0	2,705,274	0.0054	0.9333
670	1,489,304	1,471,203	0	2,960,507	0.0059	0.9392
680	1,207,829	865,981	0	2,073,809	0.0041	0.9433
690	1,703,963	920,031	0	2,623,994	0.0052	0.9486
700	1,244,983	1,752,295	0	2,997,278	0.0060	0.9546
710	951,868	1,131,645	0	2,083,513	0.0042	0.9587
720	1,049,538	885,941	0	1,935,479	0.0039	0.9626
730	891,183	1,280,617	0	2,171,800	0.0043	0.9669
740	516,990	1,070,156	0	1,587,146	0.0032	0.9701
750	525,742	651,912	0	1,177,654	0.0024	0.9725
760	434,411	783,726	0	1,218,137	0.0024	0.9749
770	509,379	467,328	0	976,706	0.0020	0.9768
780	408,077	612,957	0	1,021,034	0.0020	0.9789
790	538,129	623,014	0	1,161,144	0.0023	0.9812
800	390,101	660,509	0	1,050,610	0.0021	0.9833
810	275,156	548,488	0	823,644	0.0016	0.9849
820	237,681	314,338	0	552,019	0.0011	0.9860
830	260,108	479,087	0	739,195	0.0015	0.9875
840	286,226	345,032	0	631,258	0.0013	0.9888
850	51,622	463,301	0	514,923	0.0010	0.9898
860	272,679	211,430	0	484,109	0.0010	0.9908
870	282,041	436,642	0	718,683	0.0014	0.9922
880	317,872	346,473	0	664,345	0.0013	0.9935
890	62,568	193,559	0	256,127	0.0005	0.9941
900	431,098	243,689	0	674,787	0.0013	0.9954
910	172,498	84,897	0	257,396	0.0005	0.9959
920	49,379	162,574	0	211,952	0.0004	0.9963
930	31,819	188,151	0	219,970	0.0004	0.9968
940	59,604	173,157	0	232,761	0.0005	0.9972
950	68,117	31,353	0	99,469	0.0002	0.9974
960	29,529	201,960	0	231,490	0.0005	0.9979
970	0	270,762	0	270,762	0.0005	0.9984
980	0	268,836	0	268,836	0.0005	0.9990
990	83,146	56,124	0	139,269	0.0003	0.9993

Appendix E Table 2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
1000	109,326	0	0	109,326	0.0002	0.9995
1010	27,086	30,703	0	57,789	0.0001	0.9996
1030	0	93,462	0	93,462	0.0002	0.9998
1040	0	22,949	0	22,949	0.0000	0.9998
1060	0	27,700	0	27,700	0.0001	0.9999
1070	0	59,604	0	59,604	0.0001	1.0000
Total	241,912,119	241,674,375	17,106,379	500,692,872	1.0000	1.0000

Appendix E Table 3.--Population estimates by sex and size group for yellowfin sole from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
50	0	88,789	0	88,789	0.0000	0.0000
70	0	346,222	0	346,222	0.0001	0.0001
80	187,167	0	0	187,167	0.0000	0.0001
90	5,445,755	3,205,826	0	8,651,581	0.0015	0.0016
100	12,642,733	6,921,346	297,938	19,862,016	0.0034	0.0050
110	22,431,936	19,291,020	1,787,625	43,510,582	0.0075	0.0125
120	38,920,792	29,879,716	1,489,688	70,290,196	0.0121	0.0246
130	48,298,334	40,424,378	595,875	89,318,587	0.0154	0.0400
140	46,215,817	39,208,493	1,191,750	86,616,060	0.0149	0.0549
150	63,685,768	57,691,197	1,489,688	122,866,653	0.0211	0.0760
160	80,742,167	63,812,366	1,787,625	146,342,158	0.0252	0.1012
170	77,688,852	80,588,043	893,813	159,170,707	0.0274	0.1285
180	108,121,845	95,666,305	2,085,563	205,873,713	0.0354	0.1640
190	117,041,056	113,293,367	595,875	230,930,298	0.0397	0.2037
200	135,223,214	111,718,222	2,979,375	249,920,811	0.0430	0.2467
210	134,022,608	121,938,701	595,875	256,557,184	0.0441	0.2908
220	111,936,800	118,765,009	1,489,688	232,191,496	0.0399	0.3307
230	104,694,599	98,237,628	297,938	203,230,165	0.0350	0.3657
240	110,987,265	102,105,245	297,938	213,390,448	0.0367	0.4024
250	97,950,268	108,787,306	297,938	207,035,512	0.0356	0.4380
260	147,552,603	97,554,136	0	245,106,739	0.0422	0.4802
270	177,610,101	119,066,583	0	296,676,684	0.0510	0.5312
280	205,113,415	137,391,196	1,191,750	343,696,361	0.0591	0.5903
290	214,160,378	171,852,857	1,787,625	387,800,860	0.0667	0.6570
300	212,842,269	205,475,695	893,813	419,211,776	0.0721	0.7292
310	188,777,520	231,819,140	1,191,750	421,788,411	0.0726	0.8017
320	139,147,536	189,161,153	1,191,750	329,500,439	0.0567	0.8584
330	109,798,905	167,540,348	1,489,688	278,828,941	0.0480	0.9064
340	52,975,474	139,183,789	3,277,313	195,436,576	0.0336	0.9400
350	28,648,687	118,752,479	1,787,625	149,188,791	0.0257	0.9656
360	13,721,379	76,763,125	893,813	91,378,317	0.0157	0.9814
370	3,444,557	48,912,662	2,383,500	54,740,720	0.0094	0.9908
380	1,046,851	22,910,243	893,813	24,850,907	0.0043	0.9950
390	390,608	13,477,542	297,938	14,166,088	0.0024	0.9975
400	48,631	8,454,408	0	8,503,038	0.0015	0.9989
410	1,114,176	2,515,214	0	3,629,390	0.0006	0.9996
420	0	1,450,418	0	1,450,418	0.0002	0.9998
430	0	500,015	0	500,015	0.0001	0.9999
440	0	267,309	0	267,309	0.0000	0.9999
450	0	152,674	0	152,674	0.0000	1.0000
470	0	152,781	0	152,781	0.0000	1.0000
Total	2,812,630,065	2,965,322,946	35,454,568	5,813,407,578	1.0000	1.0000

Appendix E Table 4.--Population estimates by sex and size group for *Lepidopsetta* spp. from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	59,420	94,937	0	154,357	0.0000	0.0000
70	2,885,572	0	0	2,885,572	0.0004	0.0004
80	1,192,284	839,315	34,245	2,065,844	0.0003	0.0007
90	4,525,603	2,217,811	796,777	7,540,191	0.0010	0.0017
100	7,572,190	3,939,817	620,069	12,132,077	0.0016	0.0034
110	15,507,176	7,912,684	582,170	24,002,030	0.0033	0.0066
120	21,138,126	15,746,243	210,953	37,095,322	0.0050	0.0116
130	26,658,545	17,936,436	243,371	44,838,352	0.0061	0.0177
140	28,236,282	17,853,947	36,072	46,126,301	0.0063	0.0240
150	40,842,472	31,660,873	0	72,503,345	0.0098	0.0338
160	54,739,820	29,643,587	0	84,383,407	0.0114	0.0452
170	56,495,029	36,444,435	0	92,939,464	0.0126	0.0578
180	68,354,948	49,149,123	0	117,504,071	0.0159	0.0737
190	96,917,399	67,499,504	0	164,416,903	0.0223	0.0960
200	98,013,365	54,378,907	0	152,392,273	0.0207	0.1167
210	104,418,517	71,101,390	0	175,519,907	0.0238	0.1405
220	147,768,840	96,407,554	0	244,176,394	0.0331	0.1736
230	163,196,244	102,068,091	0	265,264,335	0.0359	0.2095
240	229,934,898	130,288,908	0	360,223,806	0.0488	0.2583
250	345,216,699	171,691,915	0	516,908,614	0.0701	0.3284
260	446,047,844	191,762,822	0	637,810,666	0.0864	0.4148
270	595,915,958	235,761,477	0	831,677,435	0.1127	0.5275
280	569,095,715	190,738,917	0	759,834,632	0.1030	0.6305
290	450,831,795	218,371,543	0	669,203,338	0.0907	0.7212
300	201,748,404	217,613,684	0	419,362,088	0.0568	0.7780
310	97,369,473	225,412,283	0	322,781,756	0.0437	0.8218
320	41,826,923	245,759,619	0	287,586,541	0.0390	0.8608
330	23,271,110	267,680,680	0	290,951,790	0.0394	0.9002
340	7,580,953	227,092,051	0	234,673,004	0.0318	0.9320
350	8,102,443	184,172,565	0	192,275,008	0.0261	0.9580
360	6,561,936	117,192,004	0	123,753,940	0.0168	0.9748
370	3,433,767	72,841,846	0	76,275,613	0.0103	0.9852
380	1,194,249	39,860,095	0	41,054,344	0.0056	0.9907
390	1,721,892	27,322,255	0	29,044,148	0.0039	0.9947
400	675,219	15,737,121	0	16,412,340	0.0022	0.9969
410	0	10,150,603	0	10,150,603	0.0014	0.9983
420	95,439	6,529,903	0	6,625,342	0.0009	0.9992
430	636,497	2,623,789	0	3,260,286	0.0004	0.9996
440	152,177	832,113	0	984,290	0.0001	0.9997
450	0	463,651	0	463,651	0.0001	0.9998
470	140,290	257,620	0	397,911	0.0001	0.9998
480	0	1,160,639	0	1,160,639	0.0002	1.0000
Total	3,970,075,514	3,406,212,757	2,523,658	7,378,811,929	1.0000	1.0000

Appendix E Table 5.--Population estimates by sex and size group for *Hippoglossoides* spp. from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
50	0	0	18,799	18,799	0.0000	0.0000
60	0	0	159,910	159,910	0.0001	0.0001
70	0	0	113,520	113,520	0.0001	0.0002
80	40,070	0	0	40,070	0.0000	0.0003
90	420,693	141,717	535,297	1,097,707	0.0009	0.0012
100	1,208,180	300,996	1,073,011	2,582,187	0.0021	0.0033
110	1,390,113	1,822,903	979,175	4,192,191	0.0035	0.0068
120	2,474,111	1,309,738	560,361	4,344,211	0.0036	0.0103
130	4,841,188	4,489,469	217,784	9,548,441	0.0079	0.0182
140	11,110,634	6,334,938	647,302	18,092,873	0.0149	0.0331
150	9,022,908	8,057,939	910,857	17,991,704	0.0148	0.0479
160	8,135,203	7,718,415	768,848	16,622,466	0.0137	0.0616
170	7,846,866	7,963,245	597,438	16,407,549	0.0135	0.0752
180	7,637,537	6,637,078	156,710	14,431,325	0.0119	0.0871
190	10,024,179	7,978,228	78,355	18,080,763	0.0149	0.1020
200	13,882,888	8,606,629	235,065	22,724,581	0.0187	0.1207
210	15,284,174	11,221,291	235,065	26,740,529	0.0220	0.1427
220	14,719,438	12,382,346	156,710	27,258,493	0.0225	0.1652
230	16,350,494	15,939,718	0	32,290,212	0.0266	0.1918
240	21,457,434	15,381,916	0	36,839,350	0.0304	0.2221
250	26,469,422	19,279,239	0	45,748,661	0.0377	0.2598
260	29,979,431	22,105,781	0	52,085,211	0.0429	0.3028
270	29,294,202	18,710,595	0	48,004,798	0.0396	0.3423
280	30,356,920	20,808,027	0	51,164,947	0.0422	0.3845
290	34,894,819	19,814,049	0	54,708,869	0.0451	0.4296
300	32,032,505	20,997,268	0	53,029,772	0.0437	0.4733
310	47,164,754	22,383,285	0	69,548,039	0.0573	0.5306
320	44,696,050	24,214,681	0	68,910,732	0.0568	0.5874
330	52,984,609	24,866,378	0	77,850,987	0.0642	0.6515
340	46,462,440	28,166,602	0	74,629,042	0.0615	0.7130
350	35,624,812	35,739,718	0	71,364,531	0.0588	0.7718
360	24,683,412	28,613,529	0	53,296,942	0.0439	0.8157
370	20,500,364	30,947,796	0	51,448,161	0.0424	0.8581
380	13,496,359	23,063,626	0	36,559,986	0.0301	0.8882
390	7,441,987	22,100,470	0	29,542,457	0.0243	0.9126
400	6,168,237	14,682,564	0	20,850,802	0.0172	0.9298
410	3,221,996	16,020,473	0	19,242,469	0.0159	0.9456
420	1,426,742	11,943,601	0	13,370,343	0.0110	0.9566
430	423,579	10,985,193	0	11,408,773	0.0094	0.9660
440	386,310	9,389,311	0	9,775,621	0.0081	0.9741
450	229,404	7,311,382	0	7,540,787	0.0062	0.9803
460	0	6,593,039	0	6,593,039	0.0054	0.9857
470	0	4,579,815	0	4,579,815	0.0038	0.9895
480	101,944	3,814,420	0	3,916,363	0.0032	0.9927
490	0	4,570,521	0	4,570,521	0.0038	0.9965
500	0	1,831,916	0	1,831,916	0.0015	0.9980

Appendix E Table 5.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
510	0	1,272,633	0	1,272,633	0.0010	0.9991
520	0	448,033	0	448,033	0.0004	0.9994
530	0	424,432	0	424,432	0.0003	0.9998
540	0	77,926	0	77,926	0.0001	0.9999
650	0	174,445	0	174,445	0.0001	1.0000
Total	633,886,409	572,217,317	7,444,207	1,213,547,932	1.0000	1.0000



Appendix E Table 6.--Population estimates by sex and size group for Alaska plaice from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
110	72,710	0	0	72,710	0.0001	0.0001
120	33,364	28,368	0	61,731	0.0001	0.0001
140	137,291	36,412	0	173,703	0.0002	0.0003
150	51,457	51,457	0	102,913	0.0001	0.0004
160	281,696	240,811	0	522,507	0.0005	0.0010
170	504,254	437,708	0	941,962	0.0010	0.0020
180	639,891	530,677	0	1,170,568	0.0012	0.0032
190	1,576,915	937,017	0	2,513,932	0.0026	0.0058
200	2,220,458	1,220,666	0	3,441,124	0.0036	0.0095
210	2,581,446	1,549,993	0	4,131,440	0.0043	0.0138
220	3,700,486	2,248,126	0	5,948,612	0.0063	0.0200
230	6,373,636	3,753,784	0	10,127,420	0.0106	0.0307
240	7,813,105	4,733,398	0	12,546,503	0.0132	0.0439
250	8,683,787	5,708,333	0	14,392,120	0.0151	0.0590
260	13,438,920	8,620,387	0	22,059,308	0.0232	0.0822
270	18,246,125	11,842,335	0	30,088,460	0.0316	0.1138
280	25,592,370	12,816,506	0	38,408,877	0.0404	0.1541
290	32,525,640	13,912,949	0	46,438,589	0.0488	0.2029
300	39,067,927	14,641,995	0	53,709,921	0.0564	0.2594
310	42,242,290	15,552,940	0	57,795,230	0.0607	0.3201
320	38,751,630	16,297,550	0	55,049,180	0.0578	0.3779
330	44,916,506	16,766,839	0	61,683,345	0.0648	0.4427
340	43,349,696	18,195,417	0	61,545,113	0.0647	0.5074
350	48,055,881	16,874,764	0	64,930,645	0.0682	0.5756
360	41,208,401	16,924,221	0	58,132,622	0.0611	0.6367
370	38,235,916	18,898,390	0	57,134,305	0.0600	0.6967
380	26,078,311	20,458,318	0	46,536,629	0.0489	0.7456
390	14,113,667	21,708,250	0	35,821,917	0.0376	0.7833
400	8,002,530	17,408,086	0	25,410,615	0.0267	0.8100
410	2,770,826	20,190,856	0	22,961,682	0.0241	0.8341
420	2,058,129	18,145,786	0	20,203,915	0.0212	0.8553
430	656,546	20,763,727	0	21,420,273	0.0225	0.8778
440	360,875	17,845,251	0	18,206,126	0.0191	0.8969
450	440,937	19,630,683	0	20,071,620	0.0211	0.9180
460	14,936	16,556,995	0	16,571,930	0.0174	0.9354
470	0	15,674,075	0	15,674,075	0.0165	0.9519
480	114,741	11,960,448	0	12,075,189	0.0127	0.9646
490	109,013	10,219,233	0	10,328,246	0.0109	0.9755
500	28,368	8,146,553	0	8,174,921	0.0086	0.9840
510	89,717	4,454,533	0	4,544,250	0.0048	0.9888
520	0	3,059,414	0	3,059,414	0.0032	0.9920
530	0	2,290,394	0	2,290,394	0.0024	0.9944
540	73,860	2,489,940	0	2,563,800	0.0027	0.9971
550	0	1,544,879	0	1,544,879	0.0016	0.9988
560	0	733,744	0	733,744	0.0008	0.9995
570	0	56,654	0	56,654	0.0001	0.9996

Appendix E Table 6.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
580	0	110,896	0	110,896	0.0001	0.9997
590	0	44,749	0	44,749	0.0000	0.9997
610	0	62,330	0	62,330	0.0001	0.9998
670	0	54,497	0	54,497	0.0001	0.9999
690	0	122,054	0	122,054	0.0001	1.0000
Total	515,214,251	436,553,387	0	951,767,638	1.0000	1.0000

Appendix E Table 7.--Population estimates by sex and size group for Greenland turbot from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
170	109,063	0	0	109,063	0.0228	0.0228
200	109,063	0	0	109,063	0.0228	0.0455
210	46,394	31,461	0	77,855	0.0163	0.0618
230	108,118	0	0	108,118	0.0226	0.0844
250	63,375	0	0	63,375	0.0132	0.0976
260	195,652	0	0	195,652	0.0409	0.1385
280	144,342	0	0	144,342	0.0301	0.1686
290	46,394	26,276	0	72,670	0.0152	0.1838
330	0	46,394	0	46,394	0.0097	0.1935
350	0	26,141	0	26,141	0.0055	0.1989
360	160,229	0	0	160,229	0.0335	0.2324
380	109,063	0	0	109,063	0.0228	0.2552
390	63,375	112,681	0	176,055	0.0368	0.2919
400	0	26,411	0	26,411	0.0055	0.2974
410	144,342	42,798	0	187,140	0.0391	0.3365
420	25,090	0	0	25,090	0.0052	0.3418
430	0	31,461	0	31,461	0.0066	0.3483
600	0	51,166	0	51,166	0.0107	0.3590
620	51,166	0	0	51,166	0.0107	0.3697
630	0	29,114	0	29,114	0.0061	0.3758
650	29,114	86,588	0	115,703	0.0242	0.3999
660	26,411	0	0	26,411	0.0055	0.4055
680	0	86,588	0	86,588	0.0181	0.4235
710	51,166	0	0	51,166	0.0107	0.4342
720	0	26,958	0	26,958	0.0056	0.4399
730	160,229	77,383	0	237,612	0.0496	0.4895
740	0	202,289	0	202,289	0.0422	0.5317
750	0	27,811	0	27,811	0.0058	0.5375
770	0	77,076	0	77,076	0.0161	0.5536
780	0	27,811	0	27,811	0.0058	0.5594
790	0	25,090	0	25,090	0.0052	0.5647
800	0	31,461	0	31,461	0.0066	0.5712
810	0	26,276	0	26,276	0.0055	0.5767
820	0	52,822	0	52,822	0.0110	0.5877
830	0	257,642	0	257,642	0.0538	0.6415
840	0	112,418	0	112,418	0.0235	0.6650
850	109,063	206,804	0	315,867	0.0660	0.7310
860	0	26,189	0	26,189	0.0055	0.7365
880	0	177,339	0	177,339	0.0370	0.7735
890	109,063	142,409	0	251,472	0.0525	0.8260
900	0	152,681	0	152,681	0.0319	0.8579
920	0	83,730	0	83,730	0.0175	0.8754
930	0	62,001	0	62,001	0.0129	0.8883
940	109,063	177,750	0	286,813	0.0599	0.9482
960	0	144,342	0	144,342	0.0301	0.9783
980	0	26,411	0	26,411	0.0055	0.9839

Appendix E Table 7.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
990	0	51,166	0	51,166	0.0107	0.9945
1020	0	26,141	0	26,141	0.0055	1.0000
Total	1,969,775	2,819,081	0	4,788,856	1.0000	1.0000

Appendix E Table 8.--Population estimates by sex and size group for arrowtooth flounder from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
50	75,063	0	0	75,063	0.0002	0.0002
70	17,302	0	62,335	79,636	0.0002	0.0004
80	49,423	28,824	31,000	109,246	0.0003	0.0006
90	117,959	0	43,608	161,567	0.0004	0.0010
100	394,293	55,758	73,334	523,385	0.0012	0.0022
110	31,409	146,398	134,911	312,718	0.0007	0.0030
120	134,951	188,152	0	323,103	0.0008	0.0037
130	199,556	395,343	30,261	625,160	0.0015	0.0052
140	526,901	1,006,755	256,750	1,790,405	0.0042	0.0094
150	1,615,272	3,078,535	77,263	4,771,071	0.0113	0.0207
160	1,833,326	5,847,430	124,265	7,805,021	0.0184	0.0391
170	1,812,197	5,887,504	31,335	7,731,036	0.0183	0.0574
180	2,512,782	5,095,609	15,667	7,624,058	0.0180	0.0754
190	2,714,376	5,096,991	0	7,811,367	0.0184	0.0938
200	1,723,653	5,205,285	0	6,928,938	0.0164	0.1102
210	2,340,372	6,794,397	0	9,134,769	0.0216	0.1317
220	3,062,708	8,022,827	0	11,085,535	0.0262	0.1579
230	3,929,936	8,640,373	0	12,570,309	0.0297	0.1876
240	3,813,028	8,841,808	0	12,654,837	0.0299	0.2175
250	3,215,228	10,924,226	0	14,139,454	0.0334	0.2509
260	3,891,170	8,905,241	0	12,796,411	0.0302	0.2811
270	4,485,772	10,454,088	0	14,939,860	0.0353	0.3163
280	3,940,227	10,818,388	0	14,758,615	0.0348	0.3512
290	4,252,587	9,412,053	0	13,664,640	0.0323	0.3834
300	4,507,908	9,160,489	0	13,668,396	0.0323	0.4157
310	5,715,014	8,661,356	0	14,376,370	0.0339	0.4496
320	3,853,683	10,210,425	0	14,064,108	0.0332	0.4828
330	3,527,302	10,366,369	0	13,893,671	0.0328	0.5156
340	5,284,389	8,780,956	0	14,065,344	0.0332	0.5489
350	5,089,366	8,429,444	0	13,518,810	0.0319	0.5808
360	5,730,497	9,595,364	0	15,325,861	0.0362	0.6170
370	3,700,848	8,559,020	0	12,259,868	0.0289	0.6459
380	2,269,114	7,593,995	0	9,863,109	0.0233	0.6692
390	2,200,818	6,355,176	0	8,555,994	0.0202	0.6894
400	1,644,249	5,762,226	0	7,406,475	0.0175	0.7069
410	1,743,314	5,380,995	0	7,124,309	0.0168	0.7237
420	2,432,412	5,162,021	0	7,594,434	0.0179	0.7416
430	2,282,349	4,140,559	0	6,422,908	0.0152	0.7568
440	1,533,091	4,506,761	0	6,039,852	0.0143	0.7710
450	2,004,637	3,310,187	0	5,314,824	0.0125	0.7836
460	957,822	5,048,415	0	6,006,237	0.0142	0.7978
470	761,382	7,820,338	0	8,581,720	0.0203	0.8180
480	543,167	5,402,626	0	5,945,793	0.0140	0.8321
490	440,558	4,391,241	0	4,831,799	0.0114	0.8435
500	270,971	5,035,901	0	5,306,872	0.0125	0.8560
510	282,247	3,847,947	0	4,130,194	0.0098	0.8657

Appendix E Table 8.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
520	27,882	4,141,631	0	4,169,514	0.0098	0.8756
530	243,653	5,123,035	0	5,366,688	0.0127	0.8883
540	213,409	5,603,883	0	5,817,291	0.0137	0.9020
550	170,371	4,432,690	0	4,603,061	0.0109	0.9129
560	227,062	3,439,003	0	3,666,065	0.0087	0.9215
570	76,280	5,570,827	0	5,647,107	0.0133	0.9348
580	0	3,139,049	0	3,139,049	0.0074	0.9423
590	100,760	3,837,519	0	3,938,279	0.0093	0.9516
600	42,872	2,514,879	0	2,557,751	0.0060	0.9576
610	289,627	3,132,045	0	3,421,672	0.0081	0.9657
620	0	1,890,240	0	1,890,240	0.0045	0.9701
630	0	1,822,482	0	1,822,482	0.0043	0.9744
640	0	2,404,559	0	2,404,559	0.0057	0.9801
650	0	1,478,064	0	1,478,064	0.0035	0.9836
660	28,276	844,828	0	873,103	0.0021	0.9857
670	0	1,060,654	0	1,060,654	0.0025	0.9882
680	0	2,468,423	0	2,468,423	0.0058	0.9940
690	0	922,129	0	922,129	0.0022	0.9962
700	0	531,122	0	531,122	0.0013	0.9974
710	0	649,722	0	649,722	0.0015	0.9990
720	0	205,044	0	205,044	0.0005	0.9994
750	0	108,210	0	108,210	0.0003	0.9997
760	0	24,996	0	24,996	0.0001	0.9998
770	0	33,266	0	33,266	0.0001	0.9998
820	0	68,672	0	68,672	0.0002	1.0000
Total	104,884,821	317,814,766	880,729	423,580,316	1.0000	1.0000

Appendix E Table 9.--Population estimates by sex and size group for Kamchatka flounder from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	0	0	27,295	27,295	0.0008	0.0008
120	19,331	0	0	19,331	0.0005	0.0013
130	0	27,206	30,261	57,467	0.0016	0.0030
140	476,402	54,500	0	530,902	0.0151	0.0180
150	151,181	194,827	0	346,007	0.0098	0.0279
160	500,435	219,564	18,489	738,488	0.0210	0.0488
170	1,716,523	272,923	0	1,989,446	0.0565	0.1053
180	732,212	191,738	0	923,949	0.0262	0.1315
190	954,589	146,124	0	1,100,713	0.0313	0.1628
200	57,901	110,484	26,389	194,775	0.0055	0.1683
210	133,585	144,800	0	278,385	0.0079	0.1762
220	333,065	162,758	0	495,823	0.0141	0.1903
230	300,361	167,010	0	467,370	0.0133	0.2036
240	595,953	405,345	0	1,001,298	0.0284	0.2320
250	1,565,950	635,772	0	2,201,722	0.0625	0.2945
260	1,224,345	903,793	0	2,128,138	0.0604	0.3549
270	792,952	674,072	0	1,467,024	0.0417	0.3966
280	614,700	518,569	0	1,133,269	0.0322	0.4287
290	406,719	705,450	0	1,112,170	0.0316	0.4603
300	945,488	312,275	0	1,257,763	0.0357	0.4960
310	766,936	1,163,884	0	1,930,821	0.0548	0.5508
320	1,441,591	653,310	0	2,094,901	0.0595	0.6103
330	1,061,002	701,182	0	1,762,184	0.0500	0.6604
340	441,157	442,448	0	883,605	0.0251	0.6854
350	397,826	173,384	0	571,210	0.0162	0.7017
360	225,595	583,496	0	809,092	0.0230	0.7246
370	140,490	226,509	0	366,999	0.0104	0.7350
380	264,133	327,044	0	591,177	0.0168	0.7518
390	123,949	405,850	0	529,799	0.0150	0.7669
400	203,462	412,602	0	616,064	0.0175	0.7844
410	46,876	180,029	0	226,905	0.0064	0.7908
420	249,723	192,349	0	442,072	0.0126	0.8034
430	80,031	79,837	0	159,868	0.0045	0.8079
440	148,923	343,331	0	492,254	0.0140	0.8219
450	260,392	85,116	0	345,508	0.0098	0.8317
460	313,567	128,428	0	441,995	0.0125	0.8442
470	466,224	126,016	0	592,240	0.0168	0.8610
480	113,099	114,431	0	227,530	0.0065	0.8675
490	340,344	320,325	0	660,669	0.0188	0.8863
500	238,633	181,959	0	420,591	0.0119	0.8982
510	0	256,864	0	256,864	0.0073	0.9055
520	213,460	213,326	0	426,785	0.0121	0.9176
530	180,679	408,224	0	588,902	0.0167	0.9343
540	56,171	288,482	0	344,653	0.0098	0.9441
550	92,644	114,126	0	206,770	0.0059	0.9500
560	0	139,110	0	139,110	0.0039	0.9539

Appendix E Table 9.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
570	0	66,755	0	66,755	0.0019	0.9558
580	63,820	97,069	0	160,889	0.0046	0.9604
600	27,882	0	0	27,882	0.0008	0.9612
610	0	128,257	0	128,257	0.0036	0.9648
620	0	327,931	0	327,931	0.0093	0.9741
630	0	137,117	0	137,117	0.0039	0.9780
640	0	62,227	0	62,227	0.0018	0.9798
650	0	31,767	0	31,767	0.0009	0.9807
660	26,389	33,408	0	59,798	0.0017	0.9824
670	50,972	0	0	50,972	0.0014	0.9838
680	0	84,243	0	84,243	0.0024	0.9862
690	0	150,418	0	150,418	0.0043	0.9905
710	0	315,083	0	315,083	0.0089	0.9995
760	0	19,331	0	19,331	0.0005	1.0000
Total	19,557,662	15,562,479	102,434	35,222,575	1.0000	1.0000



Appendix E Table 10.--Population estimates by sex and size group for Pacific halibut from the 1999 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	0	0	25,910	25,910	0.0006	0.0006
90	0	0	31,303	31,303	0.0007	0.0012
170	0	0	30,070	30,070	0.0007	0.0019
180	30,092	60,169	0	90,261	0.0020	0.0038
190	0	62,290	0	62,290	0.0013	0.0052
200	0	0	25,876	25,876	0.0006	0.0058
210	0	61,013	60,140	121,153	0.0026	0.0084
220	60,183	95,079	30,409	185,671	0.0040	0.0124
230	96,070	72,863	201,476	370,409	0.0080	0.0204
240	87,167	88,638	140,506	316,311	0.0069	0.0273
250	95,156	130,036	28,276	253,468	0.0055	0.0328
260	28,518	59,334	29,157	117,009	0.0025	0.0353
270	65,725	30,309	30,019	126,053	0.0027	0.0380
280	124,664	0	0	124,664	0.0027	0.0407
290	30,309	0	110,728	141,037	0.0031	0.0438
300	256,797	90,130	28,546	375,473	0.0081	0.0519
310	166,873	91,202	101,398	359,473	0.0078	0.0597
320	230,281	177,616	85,382	493,280	0.0107	0.0704
330	138,428	294,023	0	432,451	0.0094	0.0797
340	219,821	76,370	186,263	482,454	0.0104	0.0902
350	518,637	246,809	203,990	969,436	0.0210	0.1112
360	381,748	321,610	182,678	886,036	0.0192	0.1304
370	450,842	314,085	223,579	988,506	0.0214	0.1518
380	497,890	356,158	248,394	1,102,442	0.0239	0.1757
390	610,638	568,014	367,778	1,546,430	0.0335	0.2091
400	1,029,662	465,715	540,246	2,035,623	0.0441	0.2532
410	658,365	769,299	486,621	1,914,285	0.0415	0.2947
420	535,418	497,767	645,722	1,678,908	0.0364	0.3310
430	326,166	651,686	345,235	1,323,086	0.0287	0.3597
440	572,496	494,593	495,036	1,562,124	0.0338	0.3935
450	400,296	294,386	470,943	1,165,625	0.0252	0.4188
460	323,113	598,941	479,834	1,401,889	0.0304	0.4491
470	220,656	401,226	285,466	907,349	0.0196	0.4688
480	565,740	447,034	582,219	1,594,993	0.0345	0.5033
490	289,340	237,827	499,865	1,027,032	0.0222	0.5256
500	504,901	274,487	203,894	983,282	0.0213	0.5469
510	386,193	334,470	506,000	1,226,663	0.0266	0.5734
520	294,330	134,332	426,008	854,670	0.0185	0.5919
530	308,307	252,511	553,519	1,114,337	0.0241	0.6161
540	296,333	254,166	353,223	903,722	0.0196	0.6356
550	202,348	247,696	371,695	821,739	0.0178	0.6534
560	137,477	372,714	490,607	1,000,799	0.0217	0.6751
570	129,019	318,978	142,190	590,186	0.0128	0.6879
580	55,359	221,549	223,473	500,382	0.0108	0.6987
590	0	208,511	99,152	307,663	0.0067	0.7054
600	48,568	87,531	272,745	408,843	0.0089	0.7142

Appendix E Table 10.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
610	78,168	173,405	78,178	329,751	0.0071	0.7214
620	83,906	113,843	117,148	314,897	0.0068	0.7282
630	46,020	88,744	212,767	347,531	0.0075	0.7357
640	28,949	57,669	166,396	253,013	0.0055	0.7412
650	50,590	165,635	176,306	392,531	0.0085	0.7497
660	134,794	82,114	179,292	396,200	0.0086	0.7583
670	96,333	0	228,281	324,615	0.0070	0.7653
680	51,508	40,118	140,894	232,520	0.0050	0.7704
690	25,471	105,237	235,031	365,739	0.0079	0.7783
700	89,959	133,937	107,943	331,839	0.0072	0.7855
710	19,830	29,060	241,124	290,014	0.0063	0.7917
720	60,962	127,742	155,850	344,554	0.0075	0.7992
730	115,714	0	142,606	258,320	0.0056	0.8048
740	87,809	129,857	200,217	417,884	0.0090	0.8139
750	86,635	205,773	81,007	373,415	0.0081	0.8219
760	151,121	31,293	277,822	460,236	0.0100	0.8319
770	54,987	17,224	99,718	171,928	0.0037	0.8356
780	61,494	118,451	209,189	389,134	0.0084	0.8441
790	111,357	58,559	199,386	369,302	0.0080	0.8521
800	85,408	110,740	83,358	279,506	0.0061	0.8581
810	58,930	55,201	27,667	141,798	0.0031	0.8612
820	46,834	96,256	127,588	270,678	0.0059	0.8670
830	31,078	61,013	164,527	256,618	0.0056	0.8726
840	47,819	56,799	52,991	157,609	0.0034	0.8760
850	128,126	121,124	112,619	361,869	0.0078	0.8838
860	62,952	67,115	373,123	503,190	0.0109	0.8947
870	38,862	74,296	143,427	256,585	0.0056	0.9003
880	0	43,974	135,652	179,626	0.0039	0.9042
890	0	52,423	153,009	205,433	0.0044	0.9086
900	67,115	59,115	199,130	325,361	0.0070	0.9157
910	0	79,413	190,188	269,601	0.0058	0.9215
920	0	61,149	43,682	104,832	0.0023	0.9238
930	0	72,511	107,169	179,680	0.0039	0.9277
940	0	0	134,213	134,213	0.0029	0.9306
950	0	55,431	106,284	161,714	0.0035	0.9341
960	31,772	97,056	72,585	201,413	0.0044	0.9385
970	0	0	27,789	27,789	0.0006	0.9391
980	31,772	30,244	66,812	128,828	0.0028	0.9418
990	67,115	95,202	75,076	237,393	0.0051	0.9470
1000	30,444	0	140,683	171,127	0.0037	0.9507
1010	0	91,795	0	91,795	0.0020	0.9527
1020	0	0	84,984	84,984	0.0018	0.9545
1030	31,772	50,634	131,643	214,049	0.0046	0.9592
1040	0	32,300	28,276	60,576	0.0013	0.9605
1050	0	30,659	50,772	81,431	0.0018	0.9622
1060	0	80,306	88,047	168,352	0.0036	0.9659
1070	0	25,471	30,409	55,879	0.0012	0.9671
1080	0	78,270	56,316	134,586	0.0029	0.9700

Appendix E Table 10.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
1090	0	80,385	70,917	151,302	0.0033	0.9733
1100	0	0	46,559	46,559	0.0010	0.9743
1110	0	26,142	55,193	81,335	0.0018	0.9761
1120	0	60,143	30,019	90,162	0.0020	0.9780
1130	0	0	26,480	26,480	0.0006	0.9786
1140	0	49,629	65,855	115,484	0.0025	0.9811
1150	0	0	38,972	38,972	0.0008	0.9819
1160	0	0	26,634	26,634	0.0006	0.9825
1170	0	31,293	46,396	77,689	0.0017	0.9842
1180	0	20,067	50,301	70,368	0.0015	0.9857
1190	0	0	25,562	25,562	0.0006	0.9863
1200	0	0	57,254	57,254	0.0012	0.9875
1210	0	0	17,593	17,593	0.0004	0.9879
1220	0	0	23,790	23,790	0.0005	0.9884
1230	0	18,899	0	18,899	0.0004	0.9888
1240	0	62,952	59,304	122,257	0.0026	0.9915
1250	0	18,899	0	18,899	0.0004	0.9919
1260	0	56,683	25,426	82,109	0.0018	0.9936
1320	0	0	16,210	16,210	0.0004	0.9940
1340	0	26,142	0	26,142	0.0006	0.9946
1350	0	0	63,412	63,412	0.0014	0.9959
1380	0	29,058	23,363	52,421	0.0011	0.9971
1390	0	27,741	0	27,741	0.0006	0.9977
1420	0	0	16,151	16,151	0.0003	0.9980
1510	0	58,150	0	58,150	0.0013	0.9993
1520	0	0	16,151	16,151	0.0003	0.9996
1830	0	0	17,313	17,313	0.0004	1.0000
Total	13,569,532	14,684,513	17,921,595	46,175,640	1.0000	1.0000