



**Alaska  
Fisheries Science  
Center**

National Marine  
Fisheries Service

U.S. DEPARTMENT OF COMMERCE

## **AFSC PROCESSED REPORT 2000-02**

# 1997 Bottom Trawl Survey of the Eastern Bering Sea Continental Shelf

March 2000

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1997 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° 50' N). In 1997, 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 × 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 1997 bottom trawl survey. The groundfish/crab survey and several ancillary projects were conducted from 4 June to 10 August by two U.S. vessels. Detailed information on principal crab species can be found in a report by Stevens et al. (1998).

## 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 1997, 356 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

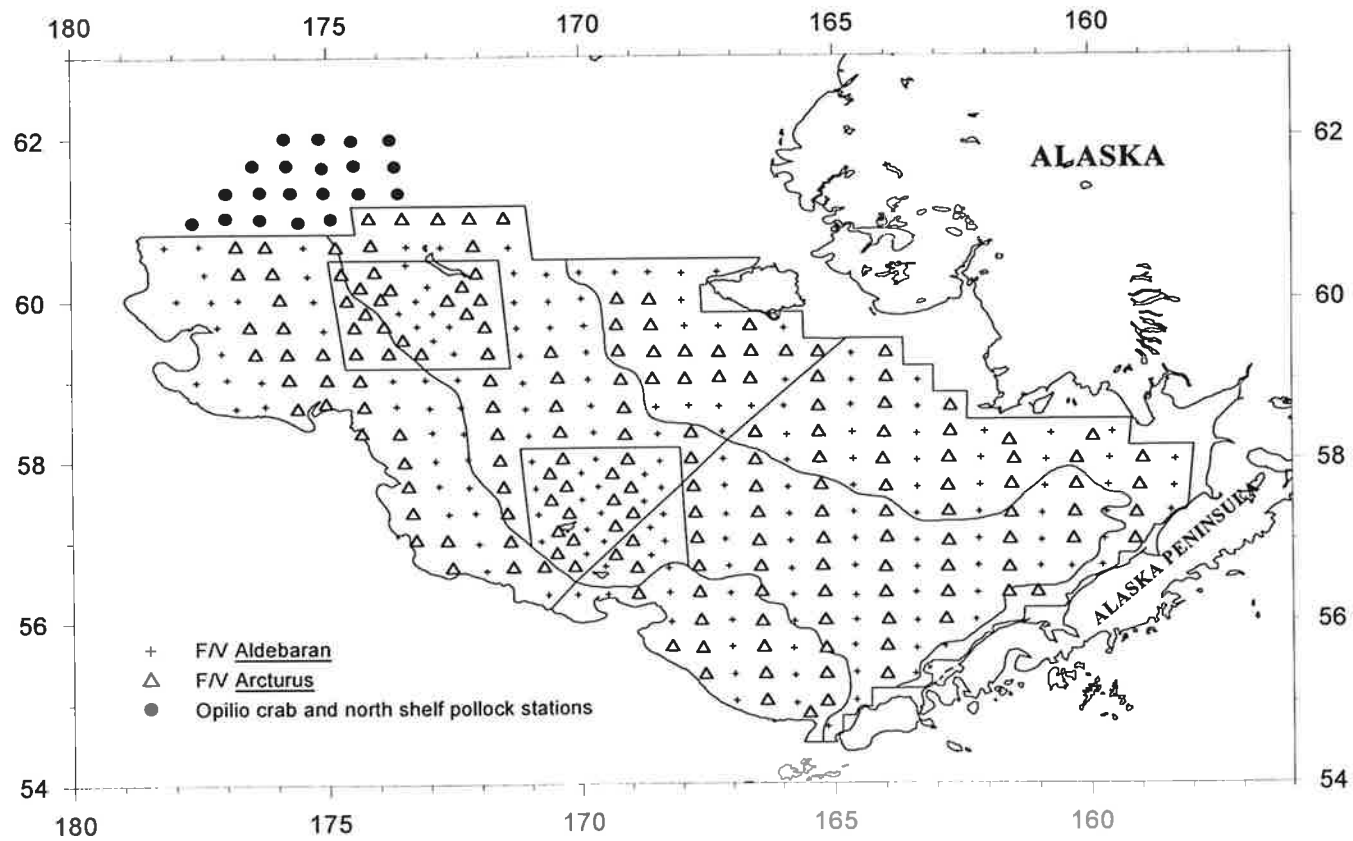


Figure 1.--Standard and special study stations sampled during the 1997 eastern Bering Sea bottom trawl survey, and stratifications used for the analysis of data.

sample strata, resulting in a total of 10 geographic strata. The overall sampling density for the entire survey area was one station per 1,302 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 1,492 km<sup>2</sup>.

Table 1.--Size of subareas and strata, and sampling densities for the 1997 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	58	1,343
2 (20)	41,027	31	1,323
3	103,300	77	1,342
(31)	94,526	69	1,370
(32)	8,774	8	1,097
4	107,822	96	1,123
(41)	62,703	43	1,458
(42)	24,011	31	775
(43)	21,108	22	959
5 (50)	38,792	26	1,492
6	94,562	68	1,391
(61)	88,134	61	1,445
(62)	6,429	7	918
Subareas Combined	463,374	356	1,302

### Vessels and Fishing Gear

The 1997 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 1997 eastern Bering Sea bottom trawl survey.

Vessel	Overall length (m)	Horsepower	Survey period	
			Start	Finish
F/V <i>Arcturus</i>	40	1525	4 June	6 August
F/V <i>Aldebaran</i>	40	1525	4 June	10 August

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

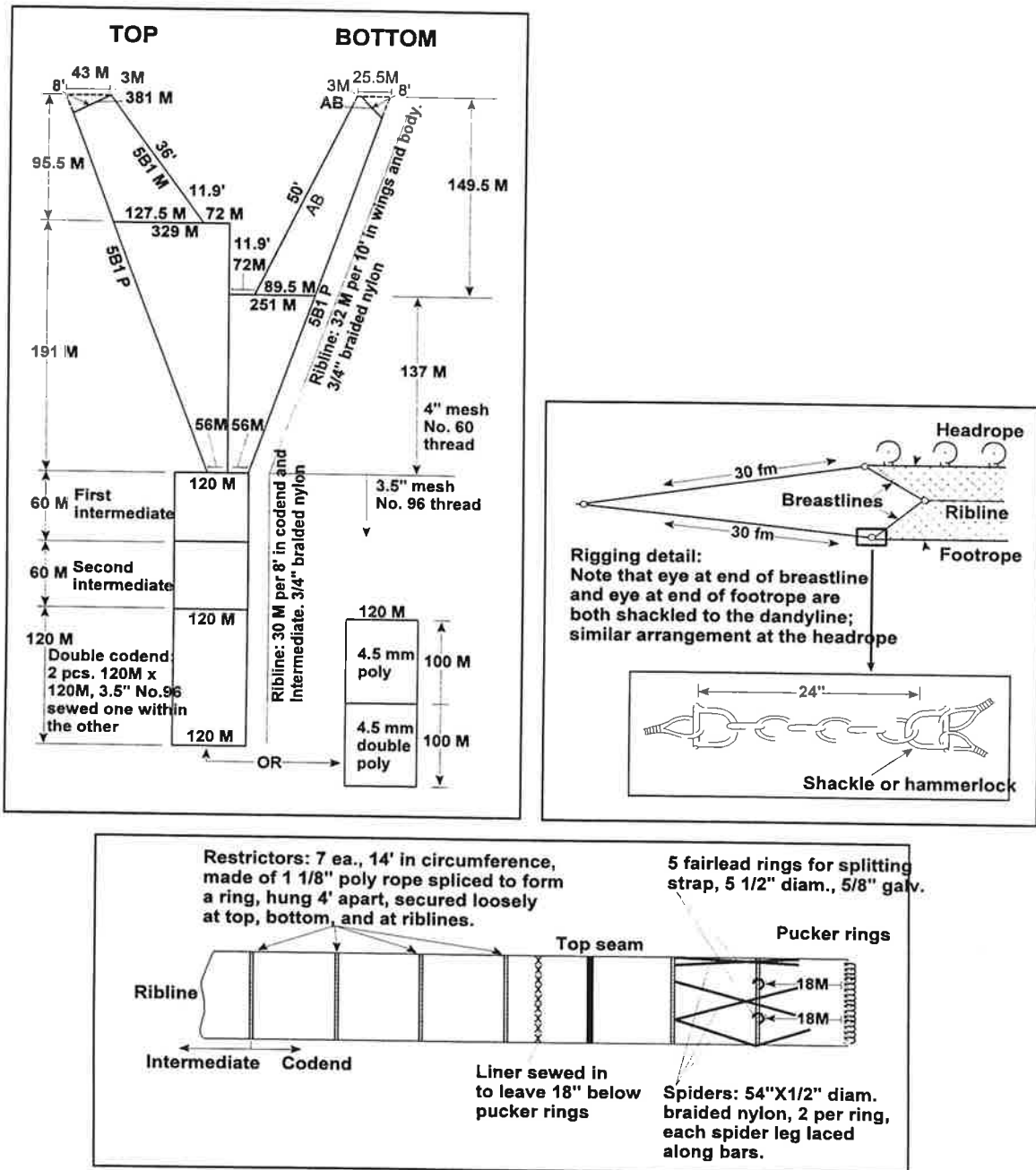


Figure 2.--Schematic diagram of trawl used during the 1997 eastern Bering Sea bottom trawl survey.



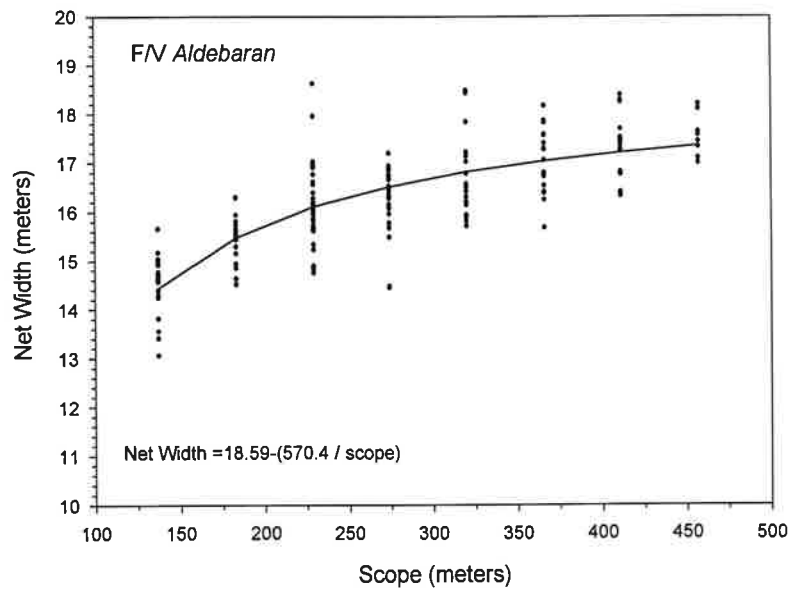
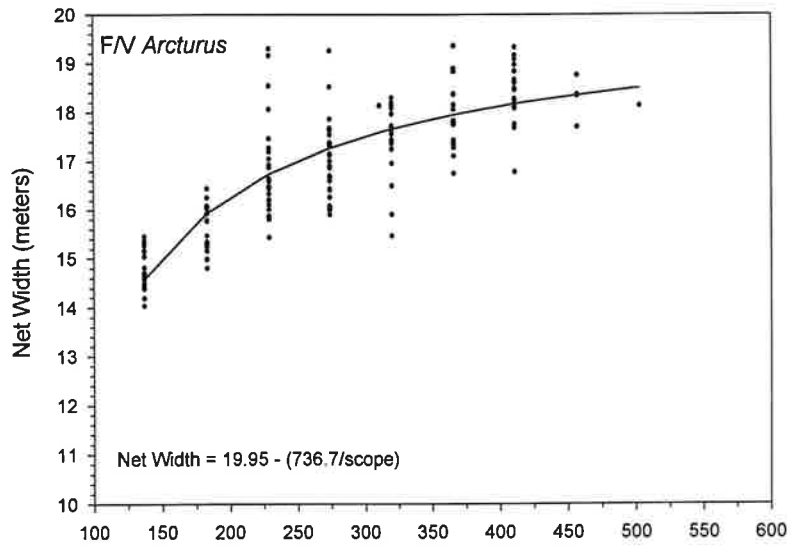


Figure 3.--Relationship between net-width and scope (wire-out) for vessels participating in the 1997 eastern Bering Sea survey.

## 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. All sculpins of the genus *Myoxocephalus* have been grouped (*Myoxocephalus* spp. in text and tables) for the purpose of this report due to growing concerns about correct identification of great sculpin (*Myoxocephalus polycanthocephalus*), plain sculpin (*Myoxocephalus jaok*), and warty sculpin (*Myoxocephalus verrucosus*). 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. Pacific halibut, walleye pollock, Pacific cod, and yellowfin sole were measured whenever caught while other species were measured as time permitted (Table 3). Pacific halibut were measured immediately upon capture and returned to the sea in an effort to reduce sampling mortality for this species. Random samples of the remaining species of up to approximately 200 individuals (300 in the case of walleye pollock) were sexed and measured to the nearest centimeter from the tip of the snout to the end of the middle rays of the caudal fin (fork length).

Sagittal otoliths were collected from 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 (*Lepidopsetta* spp.; two species are now recognized from the Bering Sea, *L. bilineata* and a new species being described by Orr and Matarese (in press)), and five 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 arrowtooth flounder (*Atheresthes stomias*) and Kamchatka flounder (*A. evermanni*) in conjunction with otolith sampling. In the case of the *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 1997 eastern Bering Sea bottom trawl survey.

Species	Length measurements by subarea						Total
	1	2	3	4	5	6	
Alaska plaice	1,901	1,684	2,296	3,929	---	309	10,119
Arctic cod	---	---	---	51	---	---	51
Bering flounder	---	5	---	1,403	---	110	1,518
Greenland turbot	---	---	1	25	---	171	197
Kamchatka flounder	---	---	49	26	278	327	680
Pacific cod	1,100	1,377	1,269	3,813	240	1,637	9,436
Pacific halibut	394	135	265	139	83	161	1,177
Pacific herring	---	8	---	24	---	---	32
Pacific ocean arrowtooth flounder	---	---	---	---	5	199	204
butter sole	26	---	1,157	541	2,692	2,776	7,192
flathead sole	---	---	9	---	---	---	9
longhead dab	678	13	4,165	1,745	3,180	6,558	16,339
rock sole	208	---	---	---	---	---	208
northern rockfish	8,117	4,655	8,823	9,551	69	3,237	34,452
rex sole	---	---	---	---	25	---	25
sablefish	5	---	19	---	261	56	341
saffron cod	---	---	---	---	1	---	1
starry flounder	---	26	---	---	---	---	26
walleye pollock	301	16	18	---	---	---	335
yellowfin sole	2,240	8,121	10,460	30,980	1,735	59,933	113,469
	8,106	4,964	7,678	5,245	1	7	26,001

Table 4.--Number of fish in which age structures (otoliths and/or scales) were collected, by species and subarea, during the 1997 eastern Bering Sea bottom trawl survey.

Species	Subarea						Total <sup>a</sup>
	1	2	3	4	5	6	
walleye pollock	84	0	286	494	0	193	1,241
yellowfin sole	358	48	40	24	--	--	470
Pacific cod <sup>b</sup>	60	37	--	345	--	243	737
rock sole	167	107	50	--	--	--	339
flathead sole	--	--	185	75	--	41	301
Alaska plaice	44	--	38	--	--	--	82
Kamchatka flounder	--	--	--	9	--	22	31
Greenland turbot	--	--	--	--	--	42	79

<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 thirty-eight 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 formalin for later examination by REFM's Food Habits Task (Table 5).

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 1997 eastern Bering Sea bottom trawl survey.

Species	Stomach samples collected	Pathology samples
Walleye pollock	2,862	960
Pacific cod	2,258	
Yellowfin sole	889	
<i>Lepidopsetta</i> spp.	435	
<i>Hippoglossoides</i> spp.	528	
Pacific halibut	294	
Alaska plaice	358	
<i>Atheresthes</i> spp.	402	
Greenland turbot	54	
Sculpin spp.	218	
Skates	319	
<i>Myoxocephalus</i> spp.	253	
Red king crab		98
Blue king crab		88



## RESULTS

### Station Data

Station data from the 1997 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 3.3° to 10.4° 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 -1.4° to 9.8° C (Fig. 5). The warmest temperatures (above 7° C) occurred in shallow waters along the central portion of the inner shelf east of Nunivak 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 1997 was 2.8° C (Fig. 6). Historically, this was close to the value recorded for mean summer bottom water temperatures in the standard survey area since 1981 (annual mean temperatures range from 1.7° to 5.1°C; average of annual means is 2.7° C). Mean bottom temperatures observed over a more limited region of the southeast Bering Sea, which has been sampled annually since 1971, have ranged from 1.2° to 4.8°C; the 1997 value for this area was 3.2°C, just above the long-term average (3.1° C)(Fig. 6).

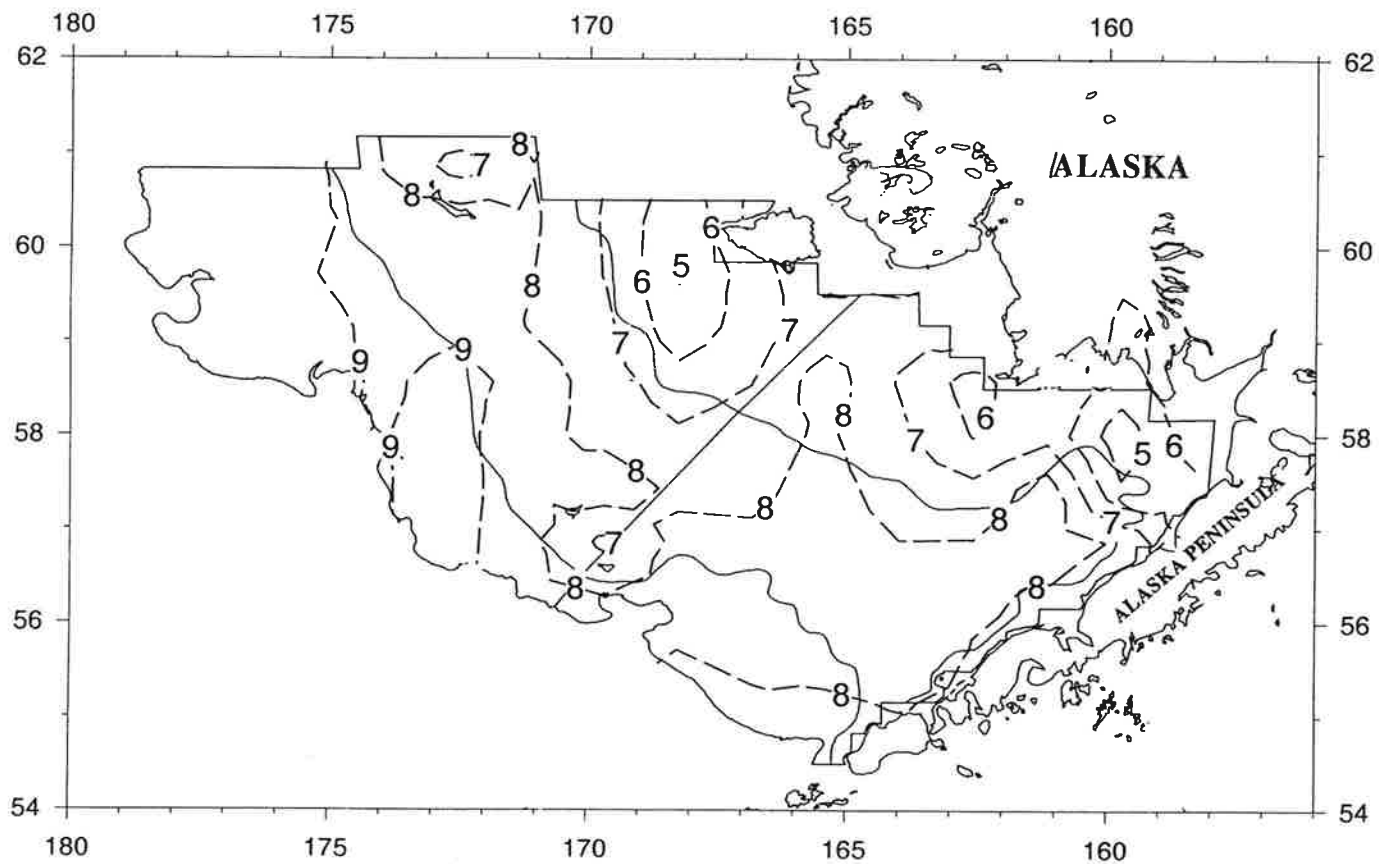


Figure 4.—Distribution of surface water temperatures (°C) observed during the 1997 eastern Bering Sea bottom trawl survey.

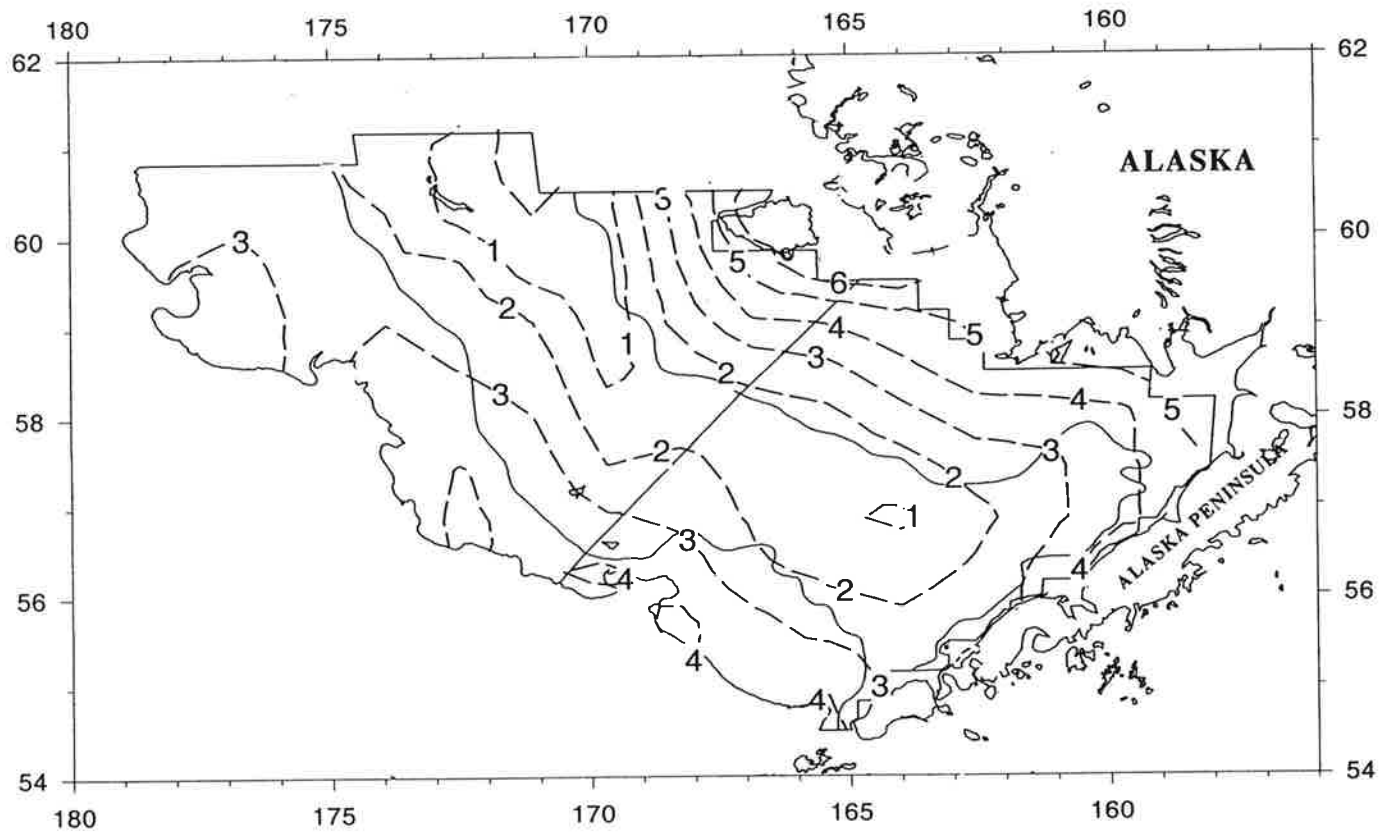


Figure 5.—Distribution of bottom water temperatures (°C) observed during the 1997 eastern Bering Sea bottom trawl survey.

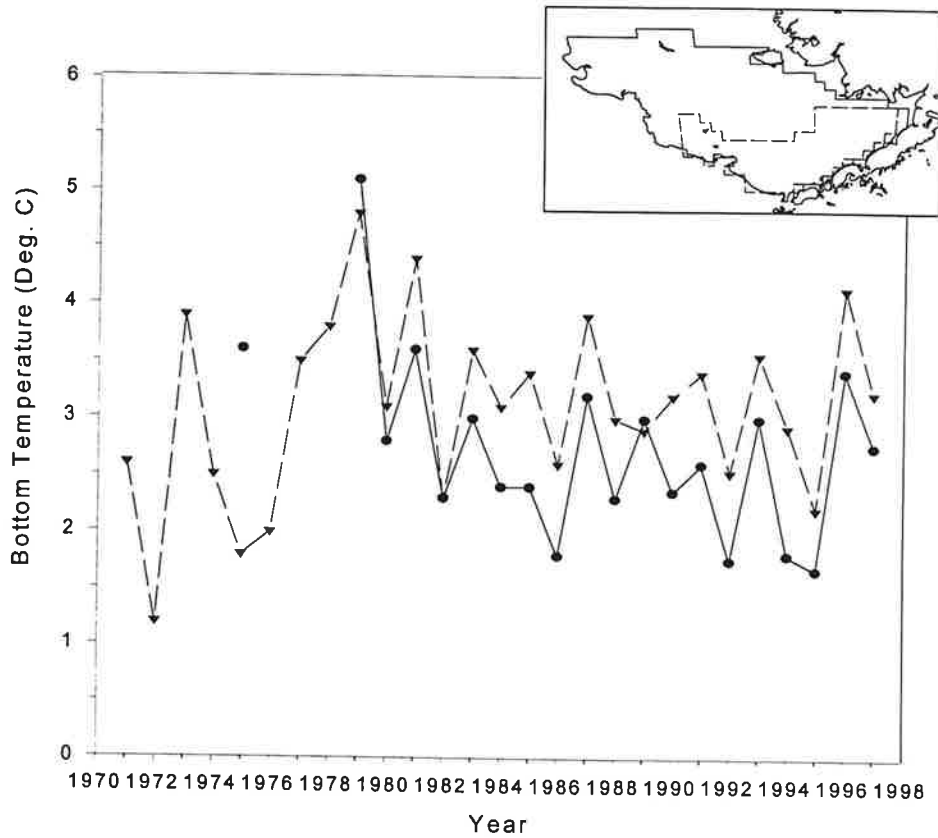


Figure 6.--Mean summer bottom water temperatures based on expendable bathythermograph casts or micro-bathythermographs attached to the net headrope during Alaska Fisheries Science Center bottom trawl surveys. The 1971-95 means (dashed line) are from the southeast Bering Sea (see insert) and the 1975 and 1979-97 means are from the larger survey area outlined on the inset. The 1975 data point for the overall survey area is based on data collected from August through September, while those in all other years and areas were collected from June through early August.

## Relative Fishing Powers of Survey Vessels

A total of 338 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 Pacific halibut, rock sole, Alaska plaice, and walleye pollock, and the F/V *Arcturus* was more efficient at capturing *Myoxocephalus* spp. and skates. 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 1997, and scaling factors determined by the method of Kappenman (1992) based on 338 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.	124	117	1.00	1.02
Pacific halibut	109	105	1.14	1.00
Alaska plaice	109	109	1.03	1.00
rock sole	154	146	1.08	1.00
<i>Myoxocephalus</i> spp.	85	99	1.00	1.10
walleye pollock	158	154	1.14	1.00

### Estimated Biomass of Major Fish and Invertebrate Groups

Total demersal animal biomass for the overall survey area was estimated at 15.6 million t, of which fish species accounted for 73% (11.4 million t, Table 7), and invertebrates 27% (4.5 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 22 families and 87 species of fish were identified in the catches (Appendix B), the fish biomass was dominated by flatfishes (Pleuronectidae, 7.0 million t) and cods (Gadidae, 3.6 million t) (Table 7). The biomass of invertebrates was comprised primarily of the phyla Echinodermata (1.6 million t), Crustacea (0.98 million t), and Mollusca (0.4 million t). A total of 191 invertebrate species from 11 phyla were identified in the survey (Table 8, Appendix B).

### Relative Abundance of Individual Fish Species

Relative abundance of the 11 most abundant species and species groups of fish are shown in Figure 8. These taxa accounted for 72% (249 kg/ha) of total animal mean CPUE (346 kg/ha) and 89% of total fish mean CPUE (280 kg/ha). Overall, but particularly in water deeper than 50 m, walleye pollock were the dominant species in the catch with a mean CPUE of 74.3 kg/ha. Pacific cod were consistently abundant across all depths with an overall mean CPUE of 13.2 kg/ha. Yellowfin sole and rock sole, with overall mean catch rates of 46.2kg/ha and 60.1 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(t) for major fish species and fish groups taken during the 1997 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 by subarea (t)						
			1	2	3	4	5	6	
Gadidae (cods)									
Walleye pollock	3,031,557 ± 20%	0.193	104,645	36,669	642,637	1,259,983	194,041	793,582	
Pacific cod	604,881 ± 23%	0.039	81,065	18,255	131,402	196,541	23,978	153,640	
Other cods	7,030 ± 116%	0.000	1,006	5,892	11	121	0	0	
Total cods	3,643,468 ± 18%	0.232	186,717	60,816	774,050	1,456,645	218,018	947,222	
Anoplopomatidae									
Sablefish	40 ± 198%	0.000	0	0	0	0	40	0	
Scorpaenidae (rockfish)									
Pacific ocean perch	21,374 ± 199%	0.001	0	0	0	0	64	21,310	
Other rockfish	903 ± 173%	0.000	0	0	126	0	777	0	
Total rockfish	22,277 ± 191%	0.001	0	0	126	0	841	21,310	
Pleuronectidae (flatfishes)									
Yellowfin sole	2,163,336 ± 12%	0.138	1,035,133	337,690	609,318	180,912	72	211	
Rock sole	2,710,486 ± 15%	0.173	1,304,239	295,074	455,639	551,864	1,557	102,113	
Hippoglossoides spp.	779,544 ± 42%	0.050	37,486	657	267,939	69,543	65,482	338,437	
Alaska plaice	643,413 ± 23%	0.041	113,591	44,861	194,984	258,294	0	31,684	
Arrowtooth flounder	460,348 ± 26%	0.029	402	0	105,455	14,443	169,143	170,905	
Kamchatka flounder	18,282 ± 20%	0.001	0	0	1,623	1,954	4,069	10,636	
Greenland turbot	29,218 ± 42%	0.002	0	0	988	3,402	0	24,828	
Pacific halibut	149,464 ± 16%	0.010	26,825	12,153	41,508	18,789	20,268	29,921	
Other flatfish	849,834 ± 39%	0.054	89,520	7,027	272,838	69,629	71,067	339,754	
Total flatfish	7,024,382 ± 10%	0.448	2,569,710	696,804	1,682,354	1,099,286	266,176	710,052	
Clupeidae									
Pacific herring	35,959 ± 83%	0.002	22,193	7,303	5,716	673	6	67	
Cottidae (sculpins)	224,425 ± 20%	0.014	53,995	24,818	42,696	46,273	3,554	53,089	
Zoarcidae (eelpouts)	22,525 ± 25%	0.001	0	0	3,048	8,349	160	10,968	
Osmeridae (smelts)	8,979 ± 51%	0.001	1,951	56	2,632	3	4,337	0	
Agonidae (poachers)	22,601 ± 22%	0.001	9,465	3,324	5,154	4,343	117	197	
Cyclopteridae (snailfishes)	3,001 ± 84%	0.000	0	205	191	2,305	22	279	
Rajidae (skates)	393,716 ± 13%	0.025	20,377	31,541	73,202	77,231	40,734	150,632	
Other fish	12,942 ± 105%	0.001	631	226	675	79	2,857	8,474	
<b>Total fish</b>	<b>11,414,316 ± 9%</b>	<b>0.727</b>	<b>2,865,039</b>	<b>825,094</b>	<b>2,589,844</b>	<b>2,695,187</b>	<b>536,862</b>	<b>1,902,290</b>	

<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=15,693,340t.

Table 8.--Biomass estimates(t) for major invertebrate species and invertebrate groups taken during the 1997 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 by subarea (t)						
			1	2	3	4	5	6	
<b>Crustacea</b>									
Chionoecetes sp. (snow crab)	459,183 ± 14%	0.029	545	1,193	94,790	215,270	11,347	136,039	
Lithodes sp. king crab	87 ± 198%	0.000	0	0	0	0	0	87	
Paralithodes sp. (king crab)	94,817 ± 33%	0.006	20,242	592	49,054	23,941	0	989	
Erimacrus isenbeckii (hair crab)	4,626 ± 44%	0.000	196	646	1,015	2,721	48	0	
Paguridae hermit crab	394,777 ± 15%	0.025	22,441	32,064	123,842	145,337	4,947	66,145	
Other crab	23,363 ± 36%	0.001	9,776	1,917	6,511	4,824	170	165	
Total crab	976,853 ± 9%	0.062	53,200	36,411	275,212	392,092	16,513	203,426	
Shrimps	3,168 ± 25%	0.000	50	74	462	407	482	1,693	
Other crustaceans	318 ± 88%	0.000	37	0	99	111	12	58	
Total crustaceans	980,339 ± 9%	0.062	53,287	36,485	275,773	392,610	17,007	205,177	
<b>Mollusca</b>									
Gastropoda (snails)	396,281 ± 15%	0.025	23,836	30,624	129,154	113,569	6,762	92,336	
Pelecypoda (bivalves)	20,443 ± 111%	0.001	1,219	1,108	14,994	2,568	106	448	
Squids	1,297 ± 195%	0.000	0	0	1,276	0	6	16	
Octopuses	211 ± 88%	0.000	0	0	30	138	6	37	
Other mollusks	0 ± 0%	0.000	0	0	0	0	0	0	
Total mollusks	418,233 ± 15%	0.027	25,055	31,732	145,454	116,275	6,880	92,837	
<b>Echinodermata</b>									
Asterozoa (starfish)	1,377,288 ± 15%	0.088	537,510	196,540	411,239	182,830	1,078	48,091	
Ophiurozoa (brittle stars)	220,979 ± 36%	0.014	9,800	1,432	57,533	28,226	700	123,287	
Echinozoa (sea urchin)	5,024 ± 78%	0.000	127	0	1,600	370	1,712	1,215	
Holothurozoa (sea cucumbers)	13,034 ± 125%	0.001	8,512	0	3,497	1,007	0	18	
Total echinoderms	1,616,803 ± 14%	0.103	555,976	197,972	473,983	212,704	3,508	172,659	
Ascidiacea	385,956 ± 37%	0.025	64,698	7,371	195,800	118,012	59	16	
Porifera (sponges)	388,592 ± 88%	0.025	3,053	60	383,575	959	165	781	
Coelenterata	268,390 ± 19%	0.017	28,200	2,512	99,179	84,821	18,696	34,981	
Other invertebrates	221,189 ± 23%	0.014	36,499	16,382	80,329	70,368	1,023	16,589	
<b>Total invertebrates</b>	<b>4,279,024 ± 10%</b>	<b>0.273</b>	<b>766,742</b>	<b>292,514</b>	<b>1,653,980</b>	<b>995,478</b>	<b>47,319</b>	<b>522,992</b>	

<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=15,693,340t.



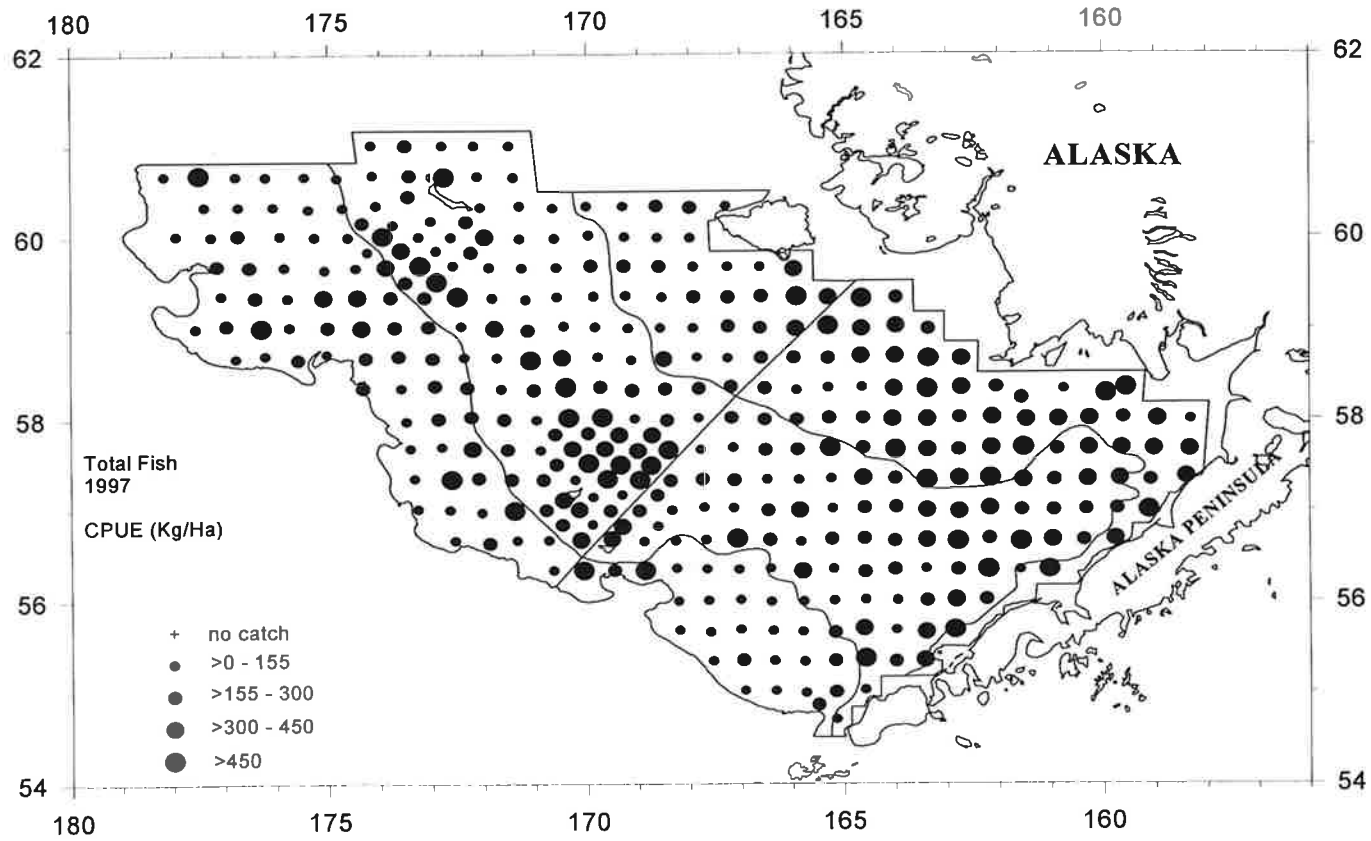


Figure 7.—Distribution and relative abundance of total fish, 1997 eastern Bering Sea bottom trawl survey.

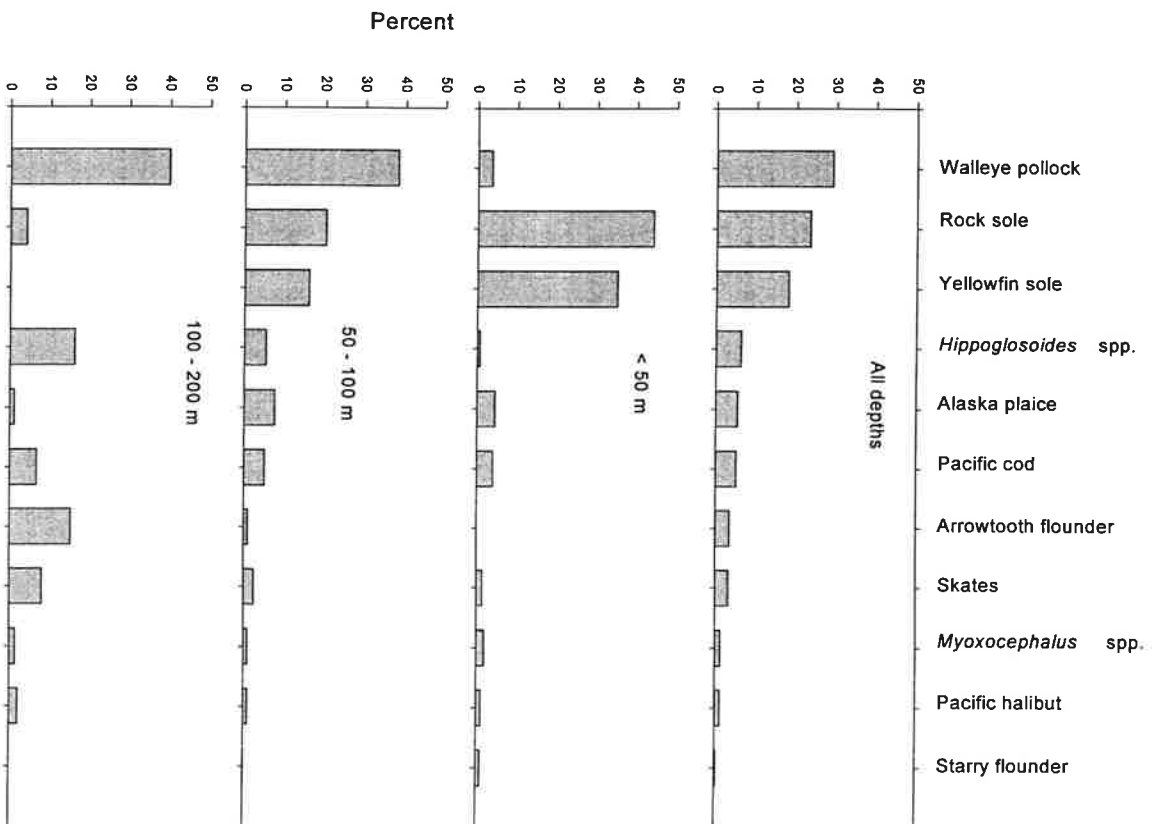


Figure 8.--Relative abundance (% CPUE in kg/ha) of principal groundfish species (top 11 for all depths combined) by depth zones and for all depths combined, 1997 eastern Bering Sea bottom trawl survey.

## 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, rock sole, *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, yellowfin sole, and rock sole. Geographical distributions for some common, but generally noncommercial fish species are presented. These are total skates, *Myoxocephalus* spp., bigmouth sculpin (*Hemitripterus bolini*), wattle 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.

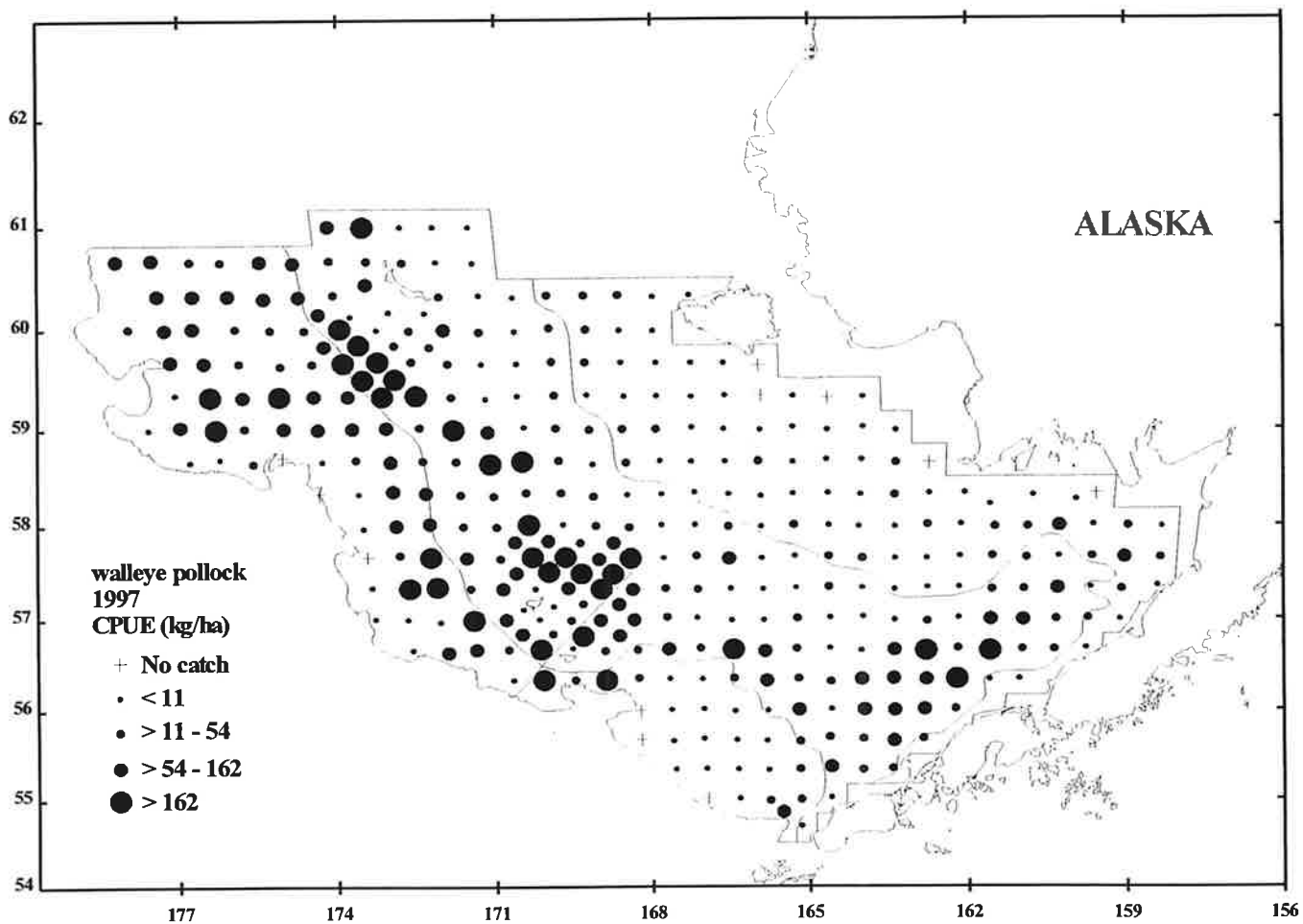


Figure 9--. Distribution and relative abundance in kg/ha of walleye pollock, 1997 eastern Bering Sea bottom trawl survey.

Table 9.--Abundance estimates and mean size of walleye pollock by subarea, 1997 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	13.44	104,645	0.035	152,893,226	0.024	0.684	28.2
2	8.94	36,669	0.012	344,731,619	0.054	0.106	16.4
3	62.21	642,637	0.212	884,999,526	0.139	0.726	43.1
4	116.86	1,259,983	0.416	2,170,499,516	0.340	0.581	41.5
5	50.02	194,041	0.064	197,514,692	0.031	0.982	47.9
6	83.92	793,582	0.262	2,629,670,169	0.412	0.302	27.1
All subareas combined <sup>b</sup>	65.42	3,031,557	1.000	6,380,308,748	1.000	0.475	34.3
95% Confidence interval		±618,775		±1,568,845,708			

<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.

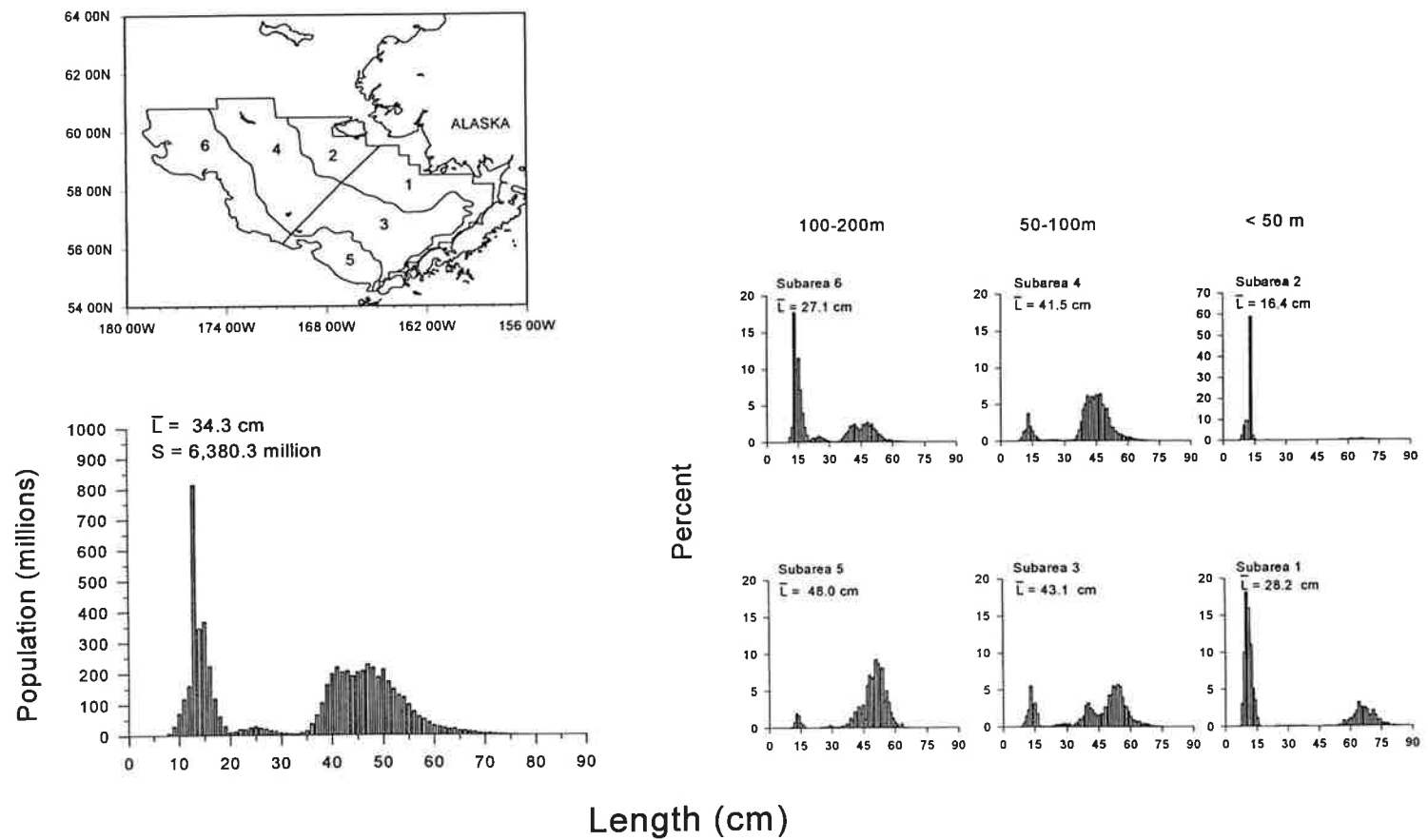


Figure 10.—Estimated relative size distribution (sexes combined) of walleye pollock in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

Table 10.--Estimated population numbers (millions) of walleye pollock by age group and subarea, 1997 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	1996	1,370.73	10.41	244.48	149.04	291.07	97.11	2,162.83	0.3390
2	1995	219.09	1.68	41.14	25.18	24.47	6.80	318.36	0.0499
3	1994	32.54	1.54	19.39	16.00	0.18	0.07	69.72	0.0109
4	1993	21.28	1.14	41.96	13.78	0.00	0.01	78.17	0.0123
5	1992	315.93	23.55	642.69	127.47	0.00	0.00	1,109.65	0.1739
6	1991	214.47	33.84	413.64	97.17	0.28	0.07	759.48	0.1190
7	1990	157.72	34.90	288.88	82.41	0.28	0.36	564.55	0.0885
8	1989	191.08	56.34	305.27	179.77	1.76	1.60	735.80	0.1153
9	1988	30.00	10.98	44.30	43.33	1.36	1.75	131.72	0.0206
10	1987	11.89	5.38	18.72	30.95	0.73	0.86	68.54	0.0107
11	1986	9.65	3.78	16.20	18.35	1.70	1.96	51.63	0.0081
12	1985	7.74	4.02	16.01	21.70	2.59	5.04	57.10	0.0089
13	1984	14.78	5.20	28.91	29.67	5.38	9.87	93.81	0.0147
14	1983	3.31	0.76	8.90	11.29	2.37	4.43	31.07	0.0049
15	1982	5.74	1.92	11.46	16.52	2.74	6.77	45.15	0.0071
16	1981	2.37	0.45	6.19	7.40	2.15	4.18	22.75	0.0036
17	1980	2.45	0.99	6.89	7.99	3.08	6.41	27.80	0.0044
18	1979	0.24	0.01	1.02	1.28	0.45	1.30	4.29	0.0007
19	1978	0.31	0.01	0.69	0.59	0.52	1.00	3.11	0.0005
20	1977	0.24	0.00	0.57	1.54	0.53	1.49	4.36	0.0007
Age unknown		18.10	0.61	13.21	3.58	3.10	1.82	40.42	0.0063
All ages combined		2,629.66	197.51	2,170.52	885.01	344.74	152.90	6,380.31	1.0000



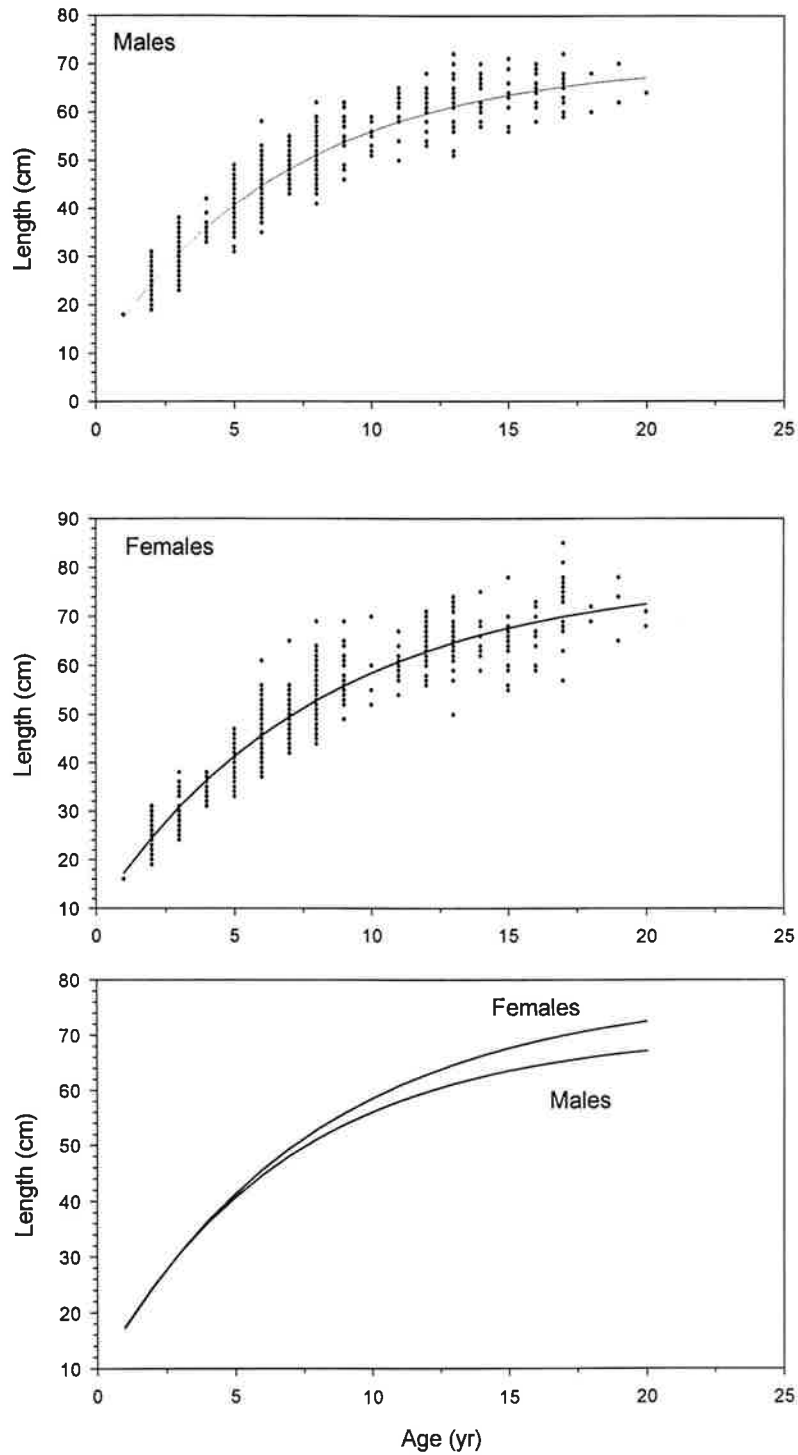


Figure 11.--Distribution of walleye pollock aged samples from the 1997 eastern Bering Sea bottom trawl survey by length for males, females and compared showing non-linear von Bertalanffy estimates.

Table 11.--Von Bertalanffy growth parameter estimates for walleye pollock by sex, based on otolith age reading and length data, from the 1997 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	524	1-20	18-72	70.60	0.14	-0.97
Female	579	1-20	16-85	78.04	0.13	-0.98

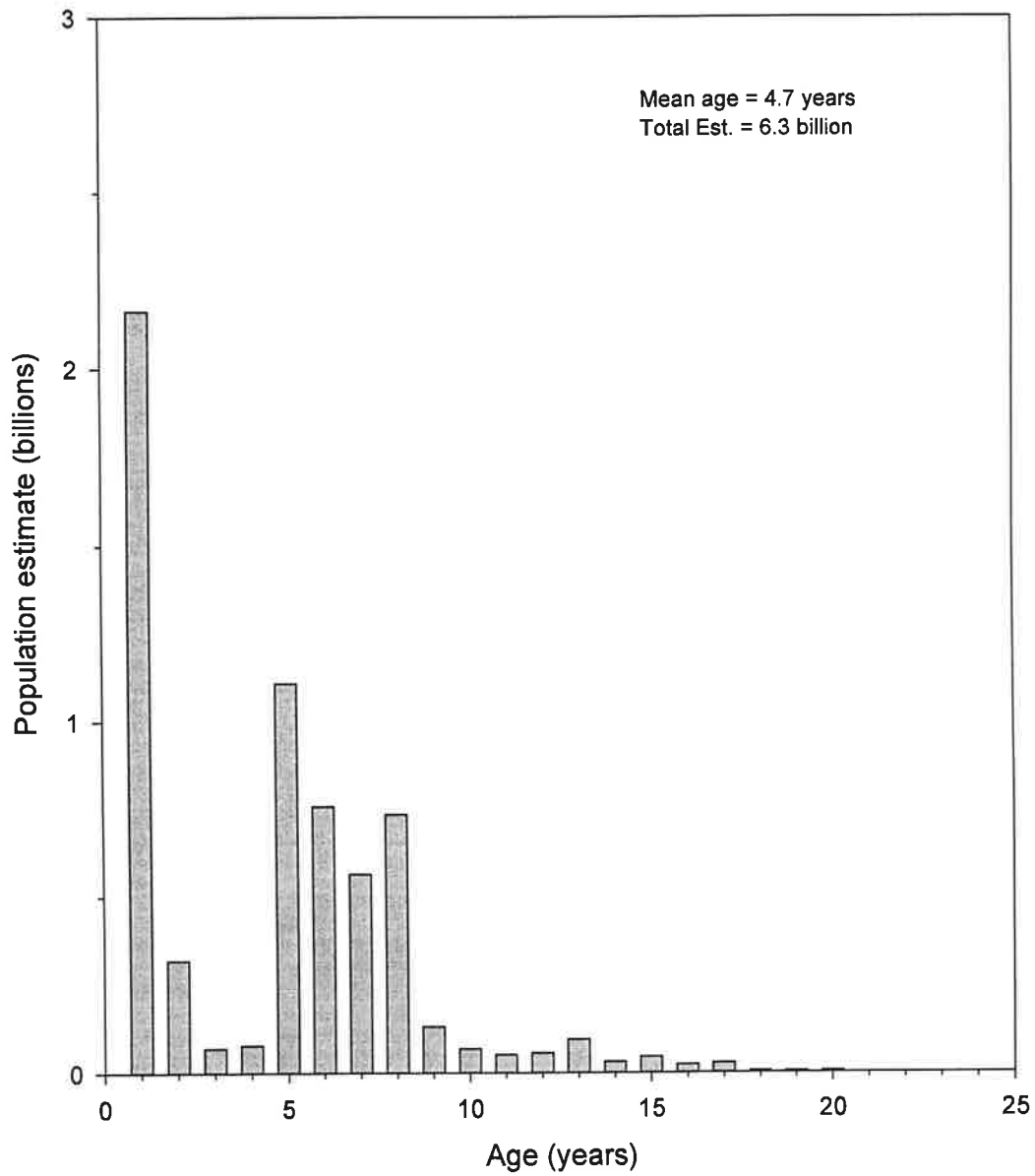


Figure 12.--Population number estimates by age for walleye pollock, 1997 eastern Bering Sea bottom trawl survey.

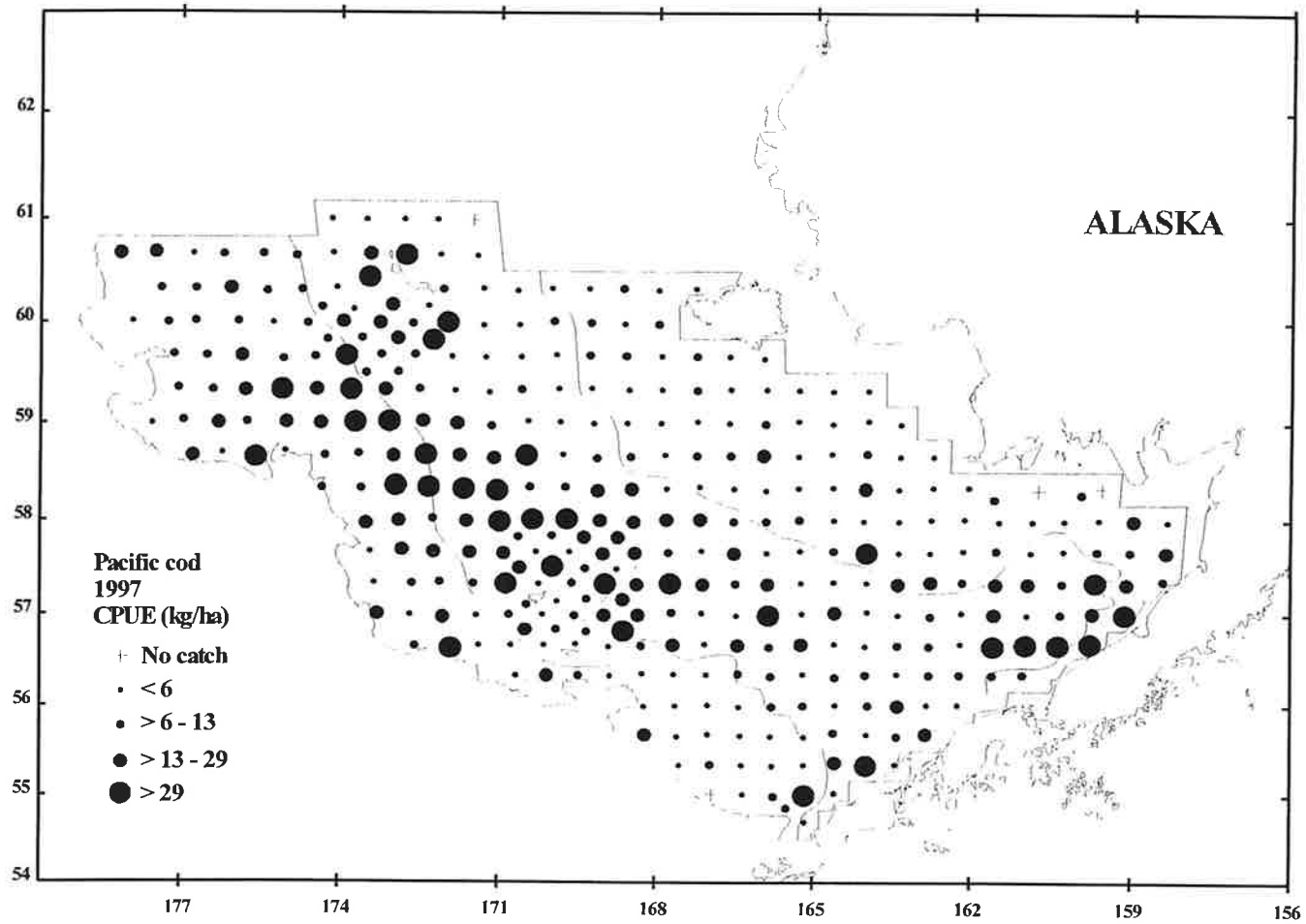


Figure 13--. Distribution and relative abundance in kg/ha of Pacific cod, 1997 eastern Bering Sea bottom trawl survey.

Table 12.--Abundance estimates and mean size of Pacific cod by subarea, 1997 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	10.41	81,065	0.134	99,305,429	0.204	0.816	31.8
2	4.45	18,255	0.030	45,762,965	0.094	0.399	23.8
3	12.72	131,402	0.217	107,395,921	0.220	1.224	42.3
4	18.23	196,541	0.325	173,478,439	0.356	1.133	42.2
5	6.18	23,978	0.040	8,488,567	0.017	2.825	58.5
6	16.25	153,640	0.254	52,998,380	0.109	2.899	59.5
All subareas combined <sup>b</sup>	13.05	604,881	1.000	487,429,700	1.000	1.241	40.6
95% Confidence interval		±138,499		±145,825,619			

<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.

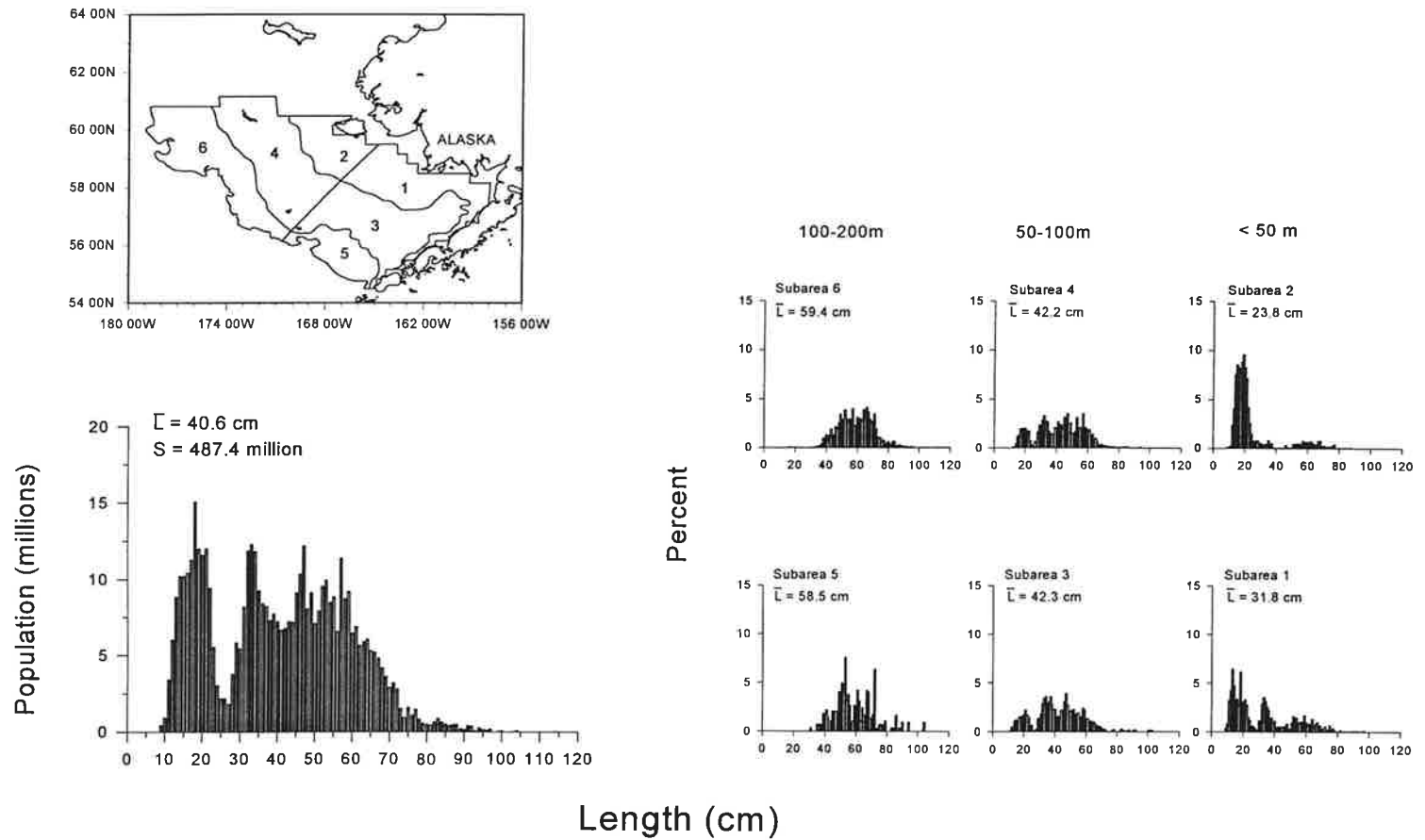


Figure 14.--Estimated relative size distribution (sexes combined) of Pacific cod in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

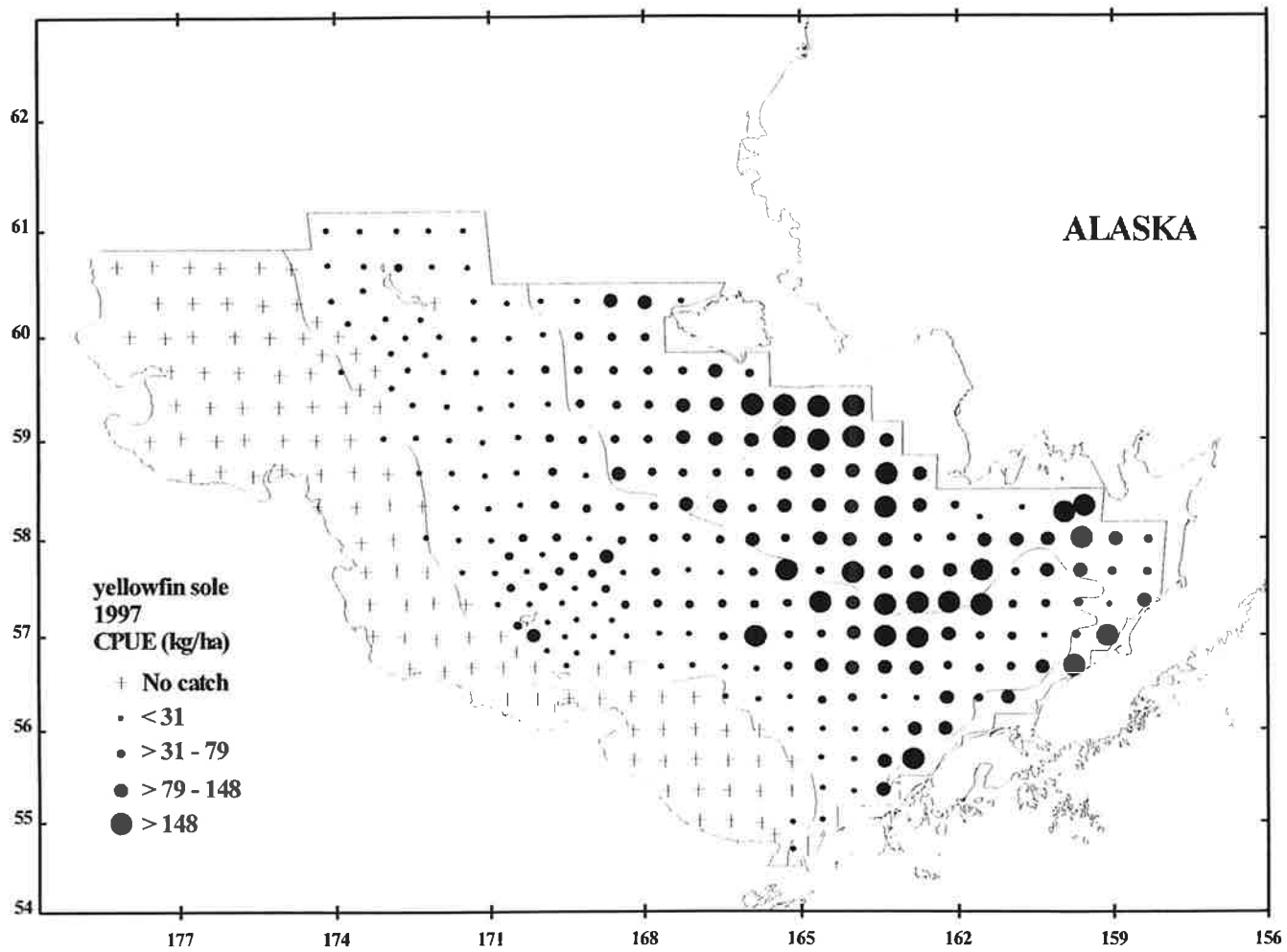


Figure 15--. Distribution and relative abundance in kg/ha of yellowfin sole, 1997 eastern Bering Sea bottom trawl survey.

Table 13.--Abundance estimates and mean size of yellowfin sole by subarea, 1997 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	132.93	1,035,133	0.478	4,635,714,479	0.514	0.223	25.3
2	82.31	337,690	0.156	1,657,824,822	0.184	0.204	23.3
3	58.99	609,318	0.282	2,172,592,135	0.241	0.280	27.8
4	16.78	180,912	0.084	548,961,422	0.061	0.330	29.0
5	0.02	72	0.000	87,148	0.000	0.826	38.0
6	0.02	211	0.000	349,234	0.000	0.604	36.2
All subareas combined <sup>b</sup>	46.69	2,163,336	1.000	9,015,529,240	1.000	0.240	25.7
95% Confidence interval		±255,539		±1,193,162,527			

<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.



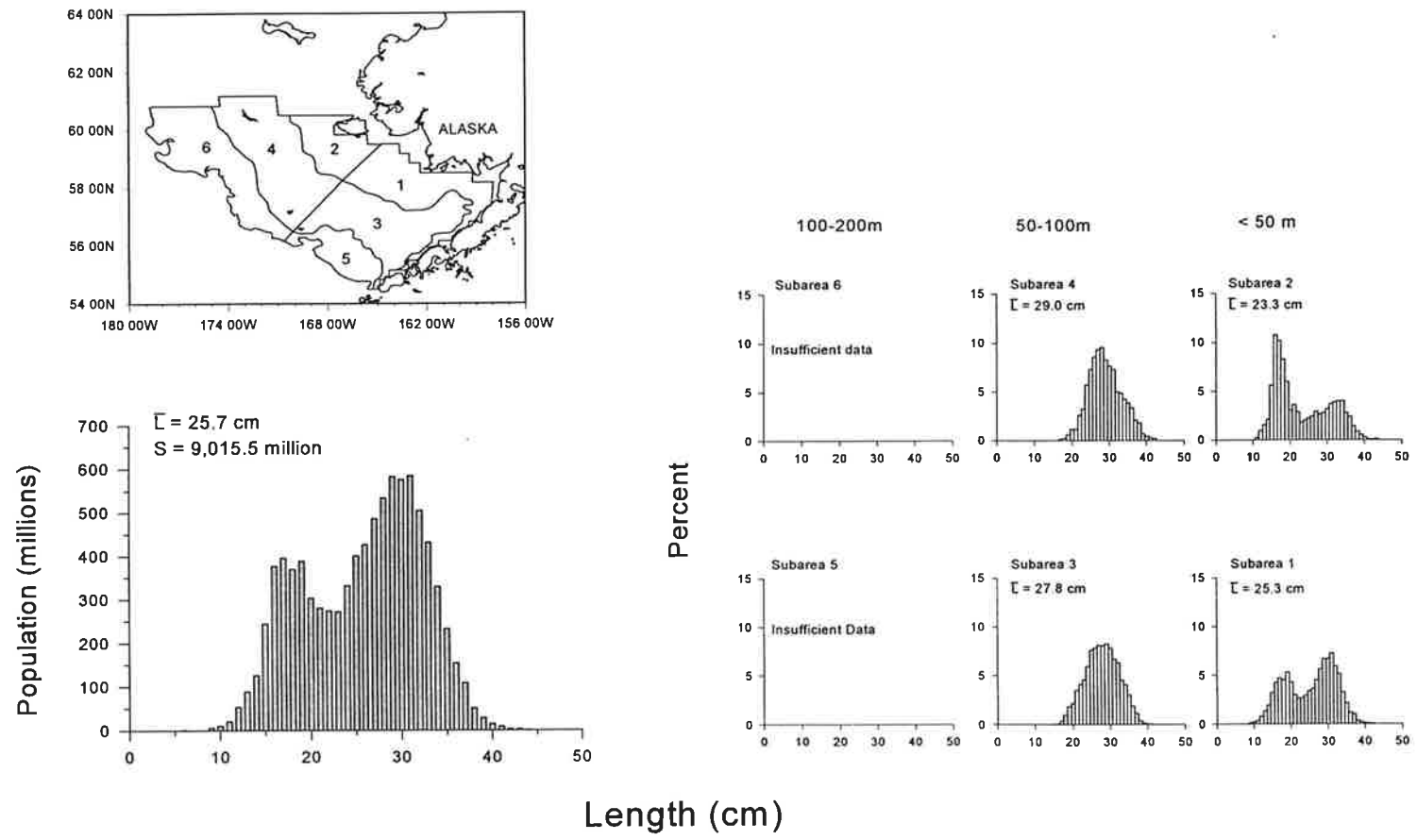


Figure 16.--Estimated size distribution (sexes combined) of yellowfin sole in terms of population numbers, and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

Table 14.--Estimated population numbers (millions) of yellowfin sole by age group and subarea, 1997 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		
3	1994	0.00	0.00	0.00	0.07	9.20	28.41	37.69	0.0042
4	1993	0.00	0.00	0.31	4.18	201.08	336.02	541.59	0.0601
5	1992	0.00	0.00	15.66	107.83	275.64	528.76	927.90	0.1029
6	1991	0.00	0.00	40.83	256.42	414.45	811.13	1,522.84	0.1689
7	1990	0.01	0.00	36.63	144.52	62.07	193.75	436.97	0.0485
8	1989	0.01	0.00	44.96	150.14	45.66	181.91	422.68	0.0469
9	1988	0.01	0.00	107.80	369.49	88.90	385.71	951.91	0.1056
10	1987	0.01	0.00	46.51	164.39	43.28	219.39	473.59	0.0525
11	1986	0.01	0.00	25.76	103.96	27.40	150.75	307.87	0.0341
12	1985	0.02	0.00	30.28	120.05	40.07	199.98	390.41	0.0433
13	1984	0.01	0.00	23.55	91.43	34.77	142.60	292.35	0.0324
14	1983	0.03	0.00	62.42	270.86	118.64	562.12	1,014.07	0.1125
15	1982	0.01	0.00	5.74	26.57	19.88	70.55	122.75	0.0136
16	1981	0.02	0.00	40.42	146.96	82.97	307.97	578.35	0.0642
17	1980	0.00	0.00	7.99	28.56	17.39	52.43	106.38	0.0118
18	1979	0.00	0.00	10.33	50.45	33.02	124.95	218.75	0.0243
19	1978	0.01	0.01	8.48	31.50	24.22	79.33	143.55	0.0159
20	1977	0.00	0.03	3.53	7.77	10.35	25.97	47.66	0.0053
21	1976	0.01	0.00	3.55	15.12	12.25	34.55	65.48	0.0073
22	1975	0.00	0.01	6.05	16.80	12.19	35.68	70.73	0.0078
23	1974	0.05	0.00	8.15	21.90	18.05	40.31	88.46	0.0098
24	1973	0.01	0.00	6.85	16.91	16.48	35.69	75.93	0.0084
25	1972	0.01	0.00	1.92	6.14	9.07	9.46	26.59	0.0029
26	1971	0.05	0.00	2.06	2.40	7.23	11.11	22.84	0.0025
27	1970	0.00	0.00	1.79	6.42	9.02	16.06	33.29	0.0037
28	1969	0.00	0.01	1.68	1.40	2.34	2.92	8.35	0.0009
29	1968	0.00	0.00	2.34	8.34	4.68	16.21	31.56	0.0035
31	1966	0.00	0.01	1.68	1.40	3.39	2.92	9.41	0.0010
99	1898	0.09	0.00	1.68	0.59	14.13	29.08	45.58	0.0051
All Ages Combined		0.37	0.07	548.95	2,172.57	1,657.82	4,635.72	9,015.53	1.0000

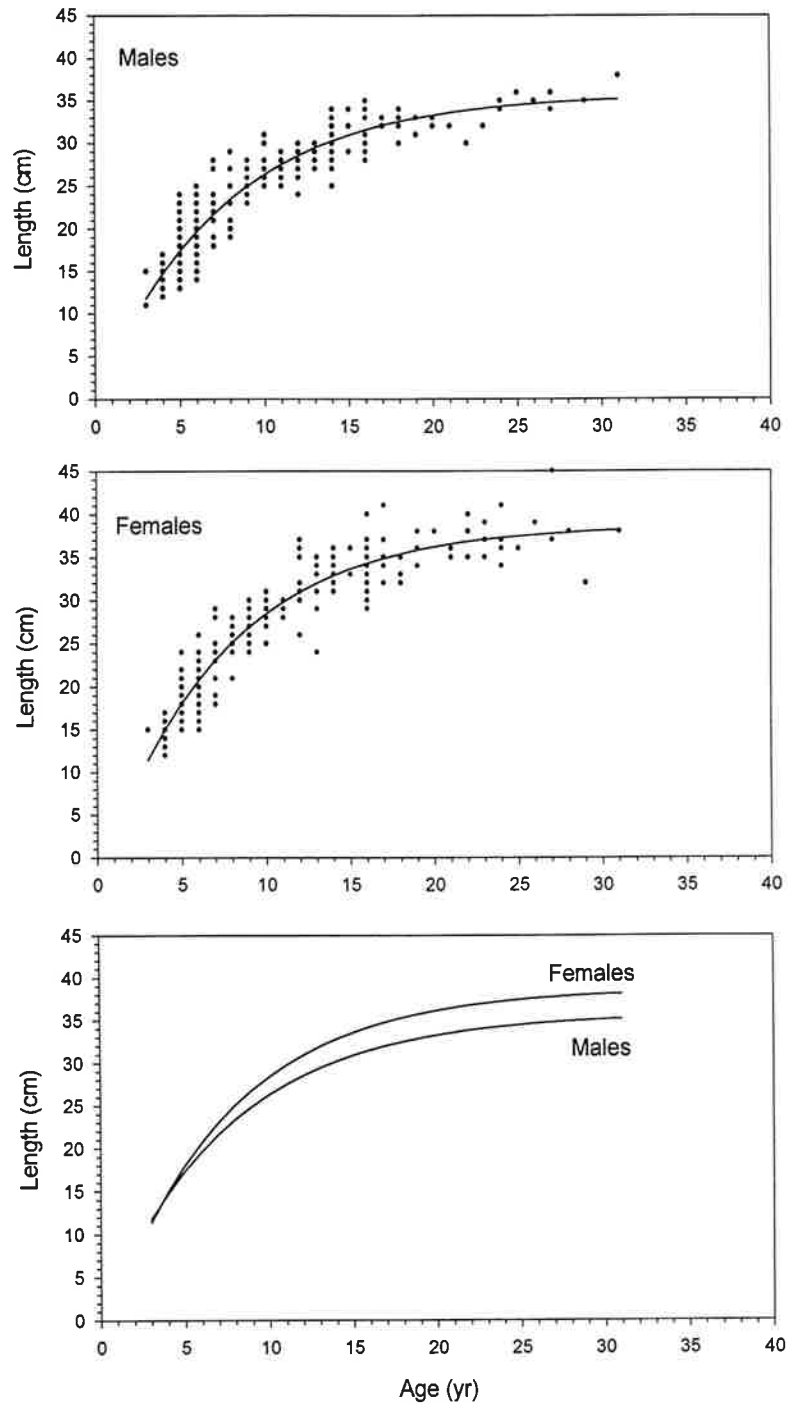


Figure 17.--Distribution of yellowfin sole aged samples from the 1997 eastern Bering Sea bottom trawl survey by length for males, females, and compared showing non-linear von Bertalanffy estimates.

Table 15.--Von Bertalanffy growth parameter estimates for yellowfin sole by sex, based on otolith age reading and length data from the 1997 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	223	3-31	11-38	35.75	0.13	0.01
Female	231	3-31	12-45	38.67	0.14	0.50

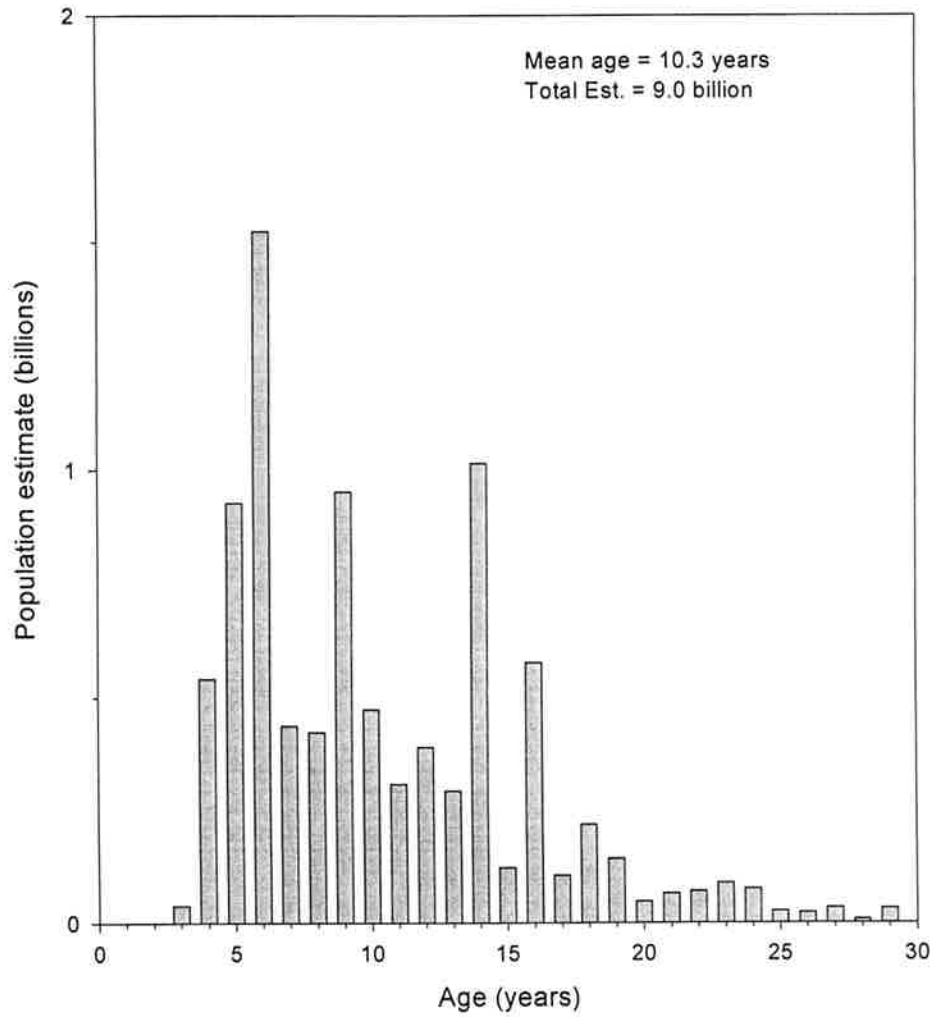


Figure 18.--Population number estimates by age for yellowfin sole, 1997 eastern Bering Sea bottom trawl survey.

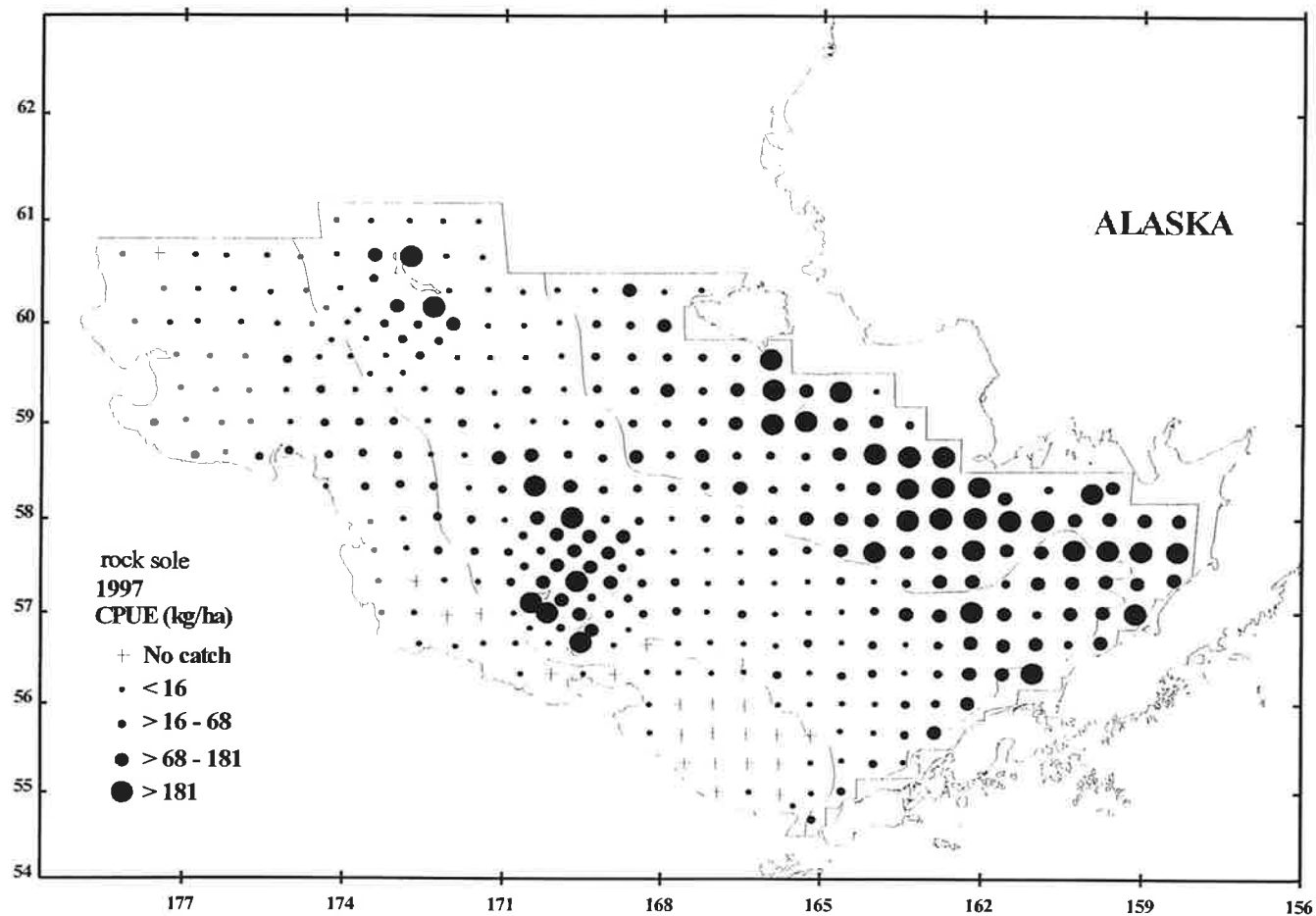


Figure 19--. Distribution and relative abundance in kg/ha of rock sole, 1997 eastern Bering Sea bottom trawl survey.

Table 16.--Abundance estimates and mean size of rock sole by subarea, 1997 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	167.49	1,304,239	0.481	6,804,343,661	0.538	0.192	24.4
2	71.92	295,074	0.109	1,361,685,068	0.108	0.217	24.4
3	44.11	455,639	0.168	2,450,800,098	0.194	0.186	24.7
4	51.18	551,864	0.204	1,789,198,273	0.142	0.308	28.5
5	0.40	1,557	0.001	3,775,857	0.000	0.412	31.7
6	10.80	102,113	0.038	231,088,965	0.018	0.442	32.0
All subareas combined <sup>b</sup>	58.49	2,710,486	1.000	12,640,891,922	1.000	0.214	25.2
95% Confidence interval		±394,732		±1,687,651,153			

<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.

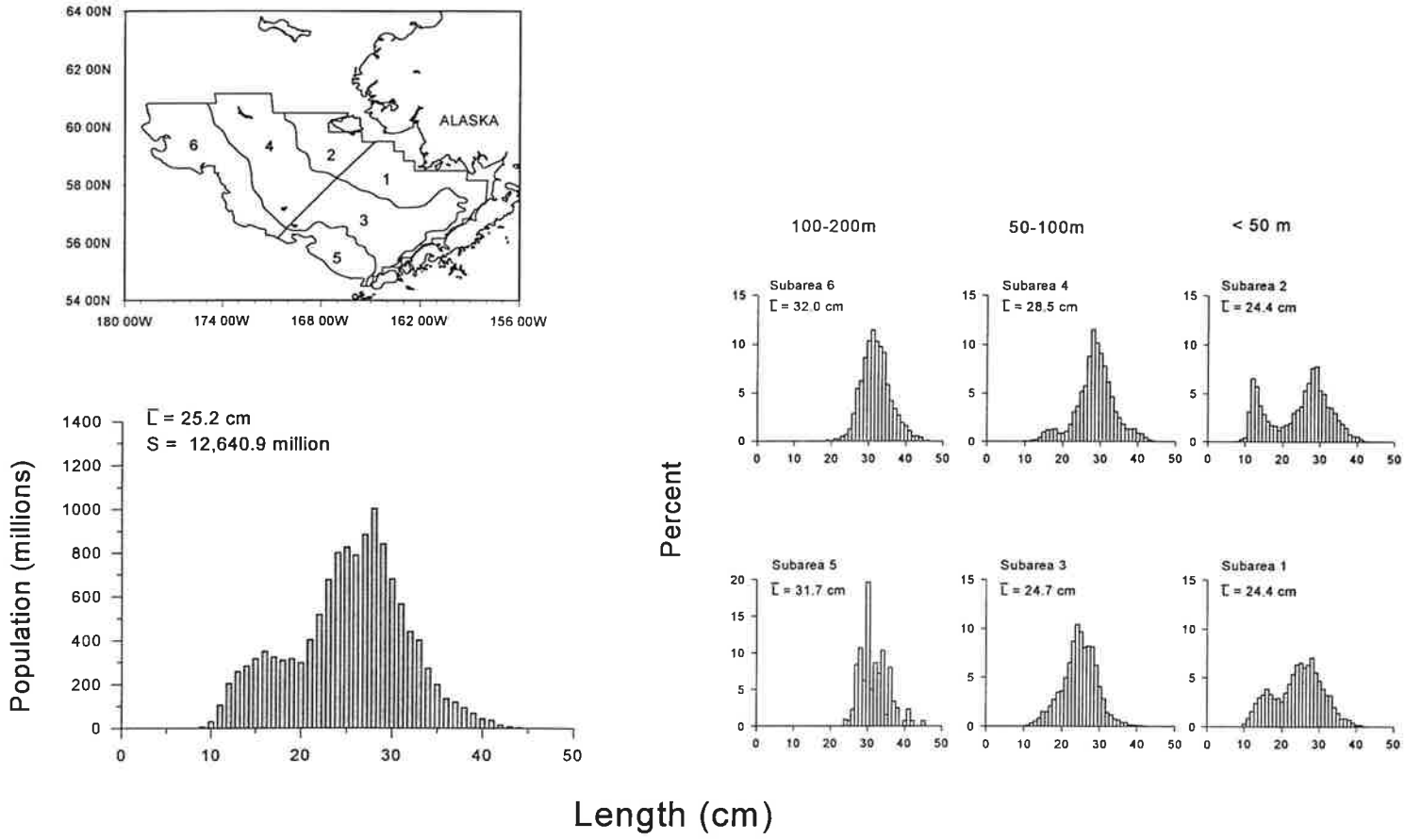


Figure 20.--Estimated relative size distribution (sexes combined) of rock sole in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.



Table 17.--Estimated population numbers (millions) of rock sole by age group and subarea, 1997 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		
2	1995	0.00	0.00	0.00	0.13	2.44	1.85	4.42	0.0003
3	1994	0.00	0.00	10.87	33.62	186.65	369.46	600.59	0.0475
4	1993	0.23	0.00	86.40	227.46	189.76	1,099.01	1,602.87	0.1268
5	1992	0.40	0.00	33.46	170.44	35.11	339.82	579.23	0.0458
6	1991	1.14	0.01	65.36	293.56	52.75	535.00	947.82	0.0750
7	1990	17.71	0.26	288.05	731.07	194.42	1,451.47	2,682.98	0.2122
8	1989	8.73	0.08	69.23	99.39	51.49	319.97	548.89	0.0434
9	1988	16.20	0.26	180.93	218.68	98.07	480.41	994.55	0.0787
10	1987	65.72	0.79	423.07	361.78	226.69	1,062.49	2,140.53	0.1693
11	1986	33.06	0.56	191.64	108.31	100.28	387.82	821.67	0.0650
12	1985	20.31	0.30	140.00	93.23	72.68	279.51	606.04	0.0479
13	1984	21.11	0.37	102.24	38.77	54.34	174.41	391.24	0.0310
14	1983	10.03	0.26	77.66	45.47	35.29	125.80	294.51	0.0233
15	1982	9.28	0.39	36.87	10.01	17.80	50.17	124.52	0.0099
16	1981	8.00	0.08	34.39	8.12	17.08	63.35	131.01	0.0104
17	1980	3.95	0.05	14.04	3.78	9.15	26.70	57.68	0.0046
18	1979	3.13	0.04	12.56	1.16	3.69	9.68	30.26	0.0024
22	1975	0.95	0.00	1.46	0.00	0.58	0.91	3.90	0.0003
23	1974	0.91	0.01	4.00	0.51	1.91	3.34	10.67	0.0008
99	1898	10.23	0.33	16.96	5.30	11.50	23.20	67.51	0.0053
<b>All ages combined</b>		<b>231.09</b>	<b>3.79</b>	<b>1,789.19</b>	<b>2,450.79</b>	<b>1,361.68</b>	<b>6,804.37</b>	<b>12,640.89</b>	<b>1.0000</b>

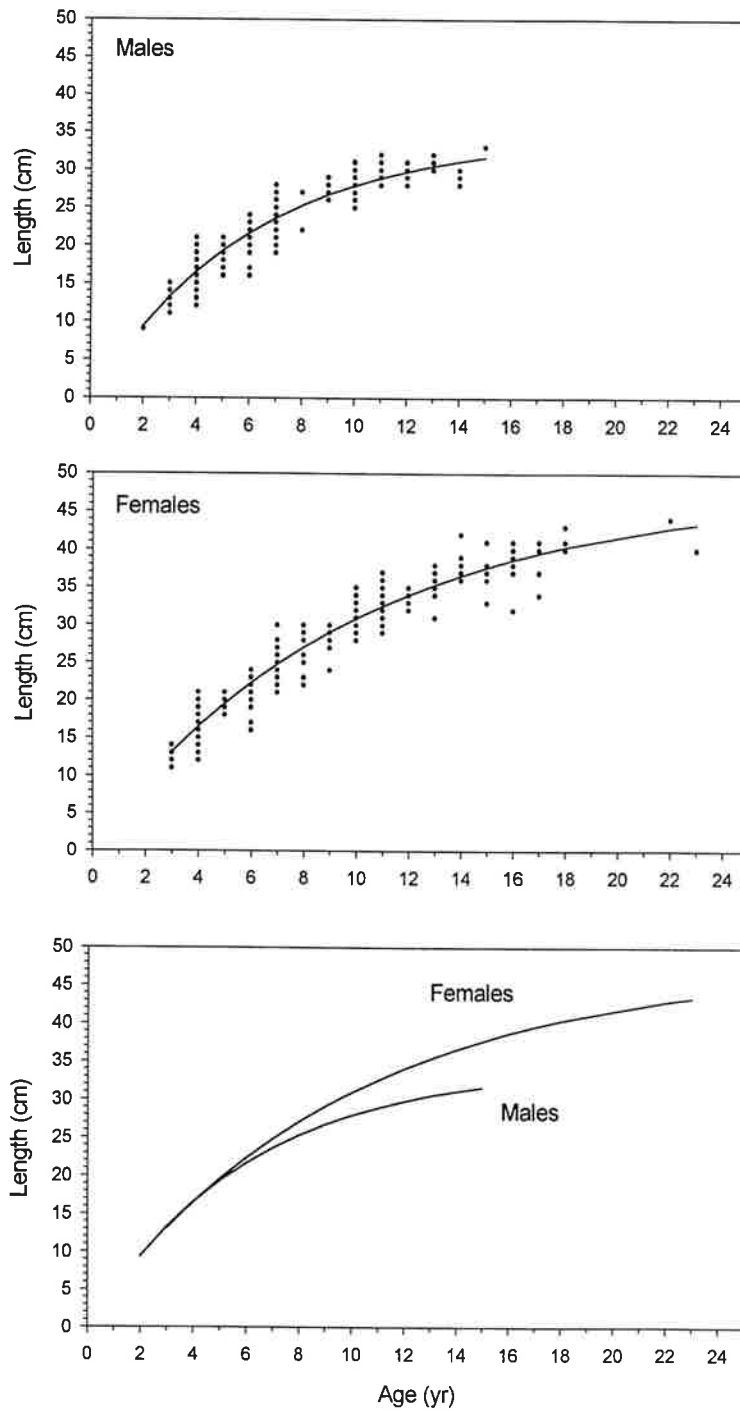


Figure 21.--Distribution of rock sole aged samples from the 1997 eastern Bering Sea bottom trawl survey by length for males, females, and compared showing non-linear von Bertalanffy estimates.

Table 18.--Von Bertalanffy growth parameter estimates for rock sole by sex, based on otolith age reading and length data from the 1997 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	129	2-15	9-33	34.45	0.17	0.11
Female	207	3-23	11-44	47.76	0.10	-0.10

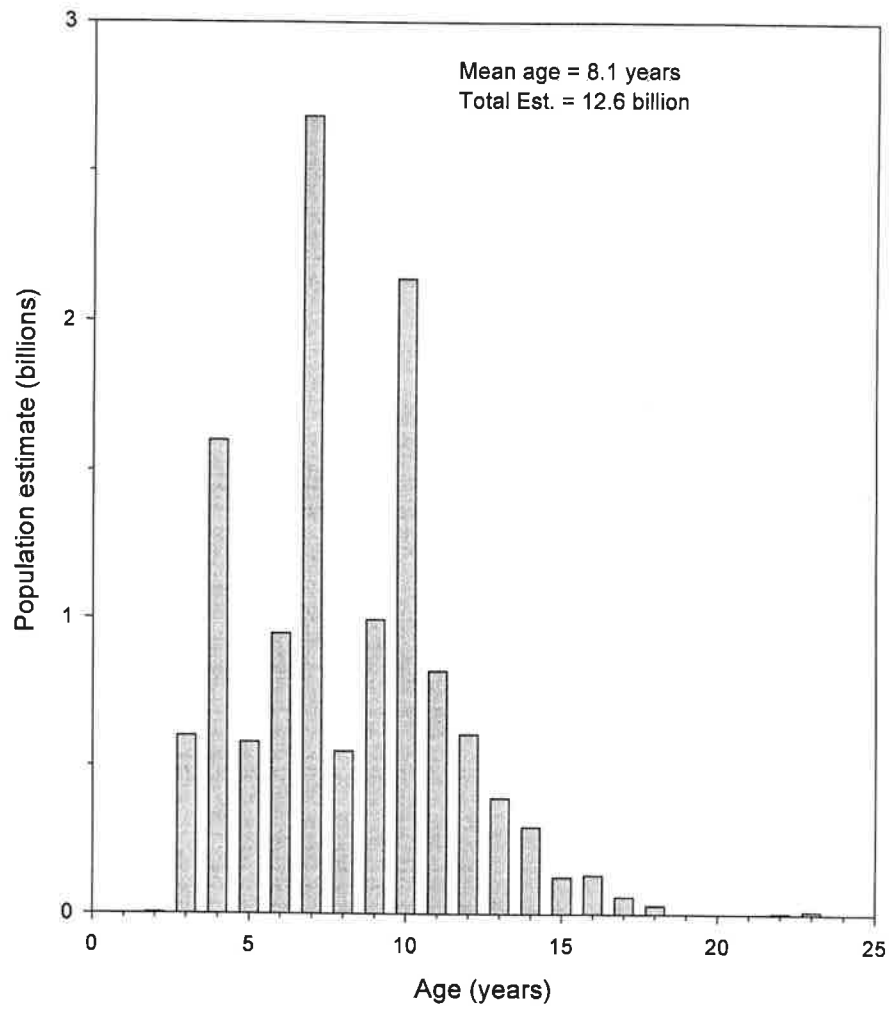


Figure 22.--Population number estimates by age for rock sole, 1997 eastern Bering Sea bottom trawl survey.

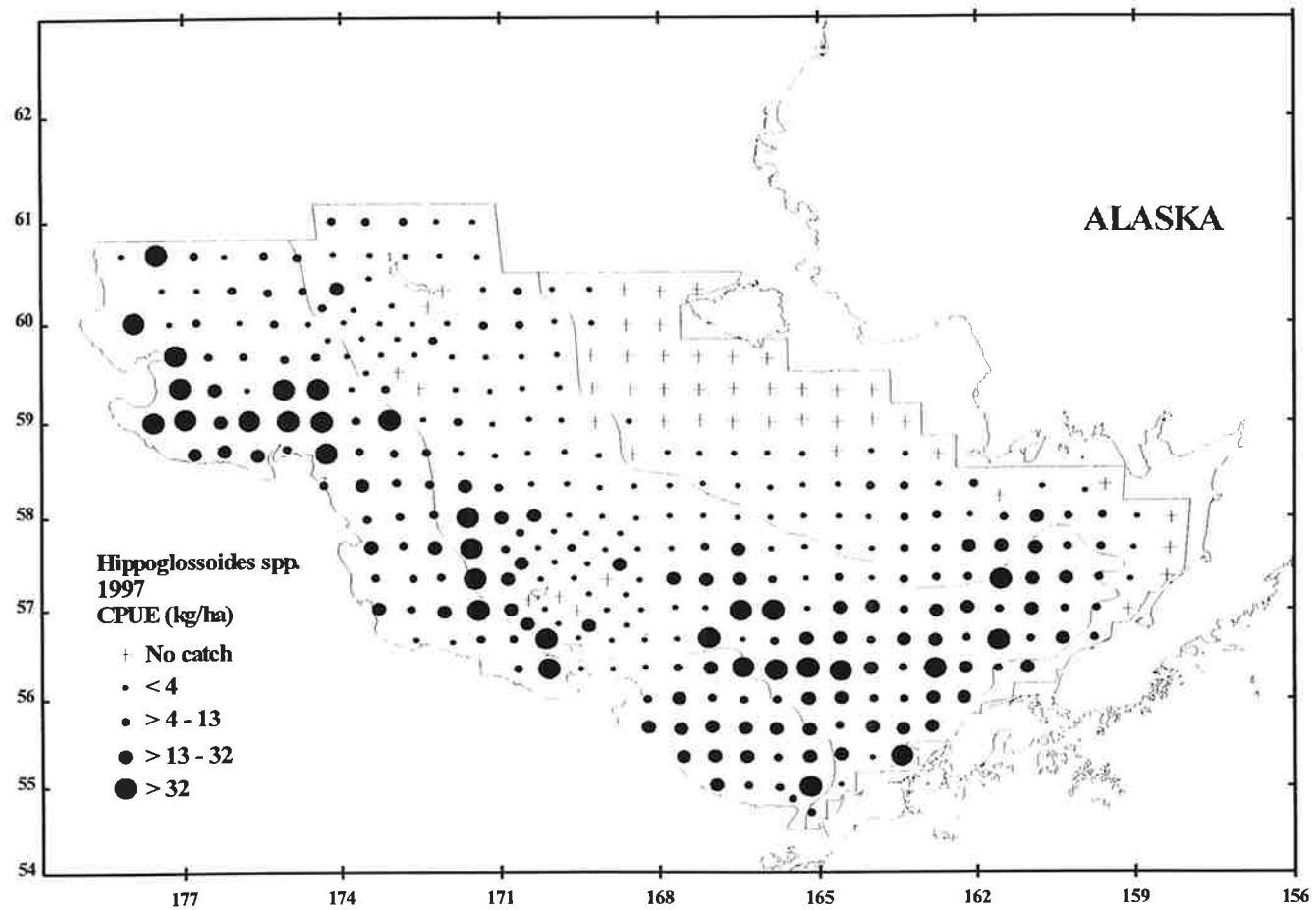


Figure 23--. Distribution and relative abundance in kg/ha of *Hippoglossoides* spp., 1997 eastern Bering Sea bottom trawl survey.

Table 19.--Abundance estimates and mean size of *Hippoglossoides* spp. by subarea, 1997 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	4.81	37,486	0.048	67,357,354	0.032	0.557	36.7
2	0.16	657	0.001	1,159,670	0.001	0.567	35.7
3	25.94	267,939	0.344	616,028,273	0.297	0.435	33.4
4	6.45	69,543	0.089	184,506,562	0.089	0.377	32.3
5	16.88	65,482	0.084	352,445,174	0.170	0.186	25.9
6	35.79	338,437	0.434	853,602,969	0.411	0.396	31.8
All subareas combined <sup>b</sup>	16.82	779,544	1.000	2,075,100,003	1.000	0.376	31.5
95% Confidence interval		±329,805		±558,884,876			

<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.

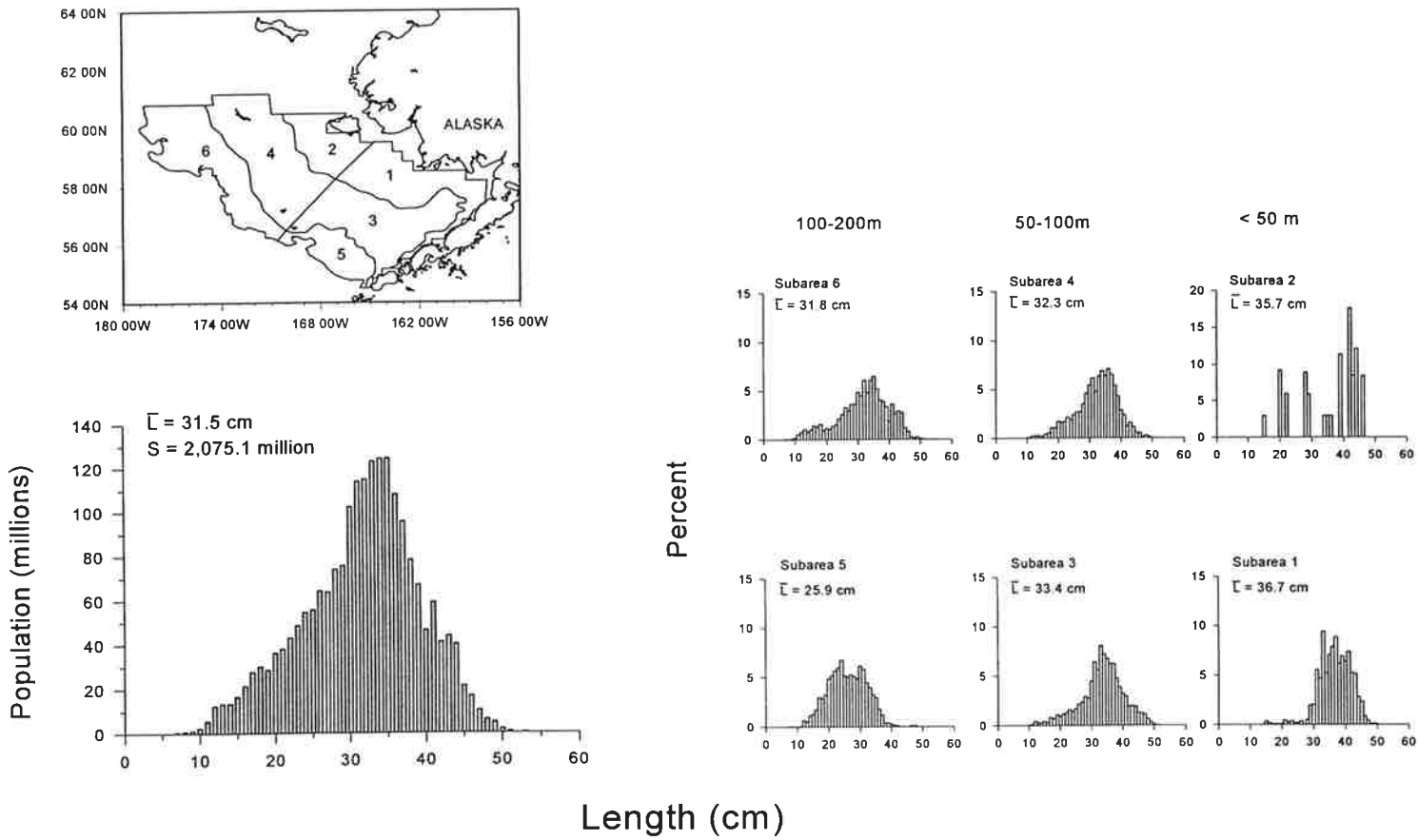


Figure 24.--Estimated relative size distribution (sexes combined) of *Hippoglossoides* spp. in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

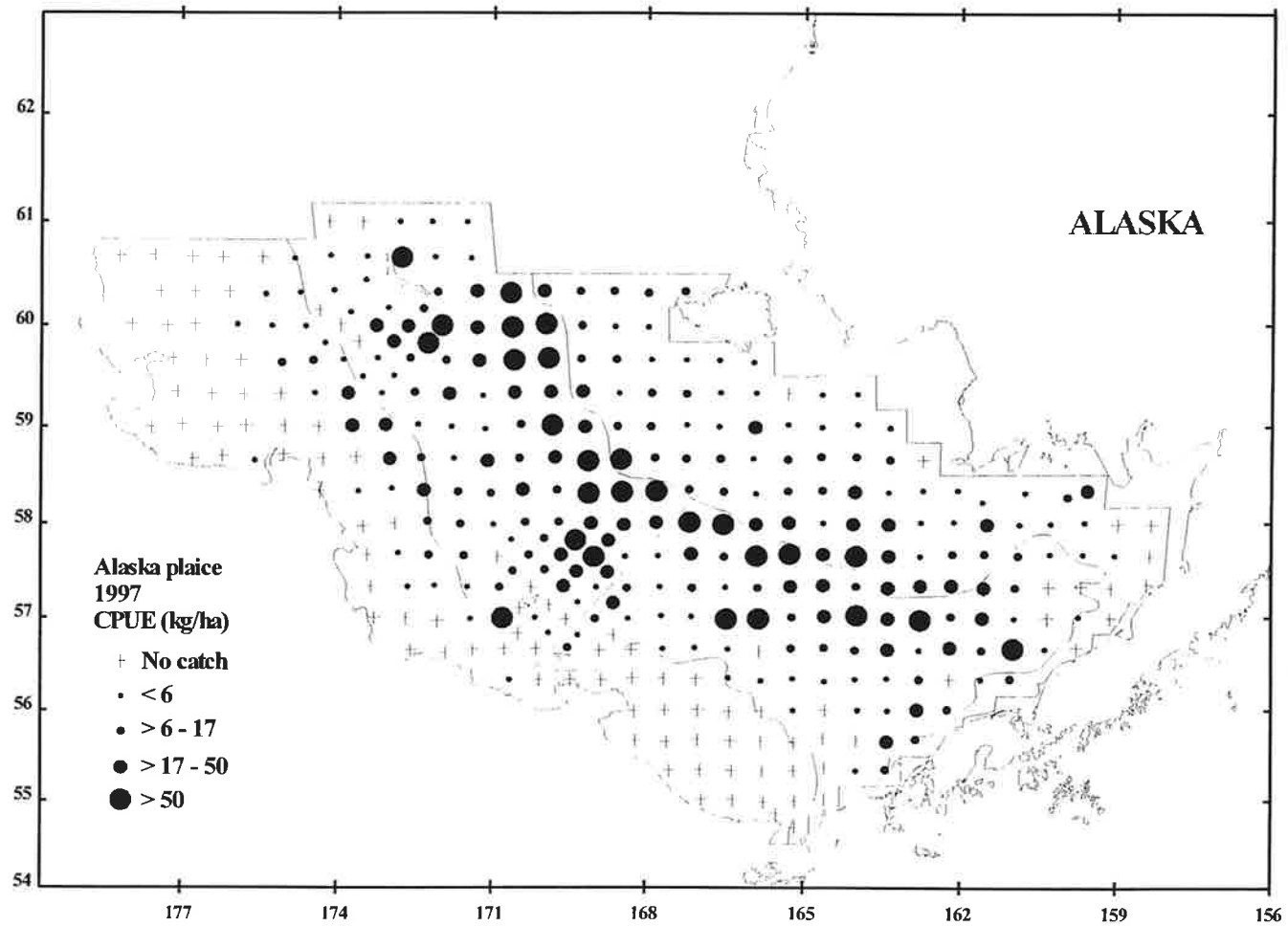


Figure 25--. Distribution and relative abundance in kg/ha of Alaska plaice, 1997 eastern Bering Sea bottom trawl survey.



Table 20.--Abundance estimates and mean size of Alaska plaice by subarea, 1997 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	14.59	113,591	0.177	208,719,415	0.200	0.544	33.4
2	10.93	44,861	0.070	124,068,575	0.119	0.362	29.5
3	18.88	194,984	0.303	301,868,161	0.289	0.646	35.7
4	23.96	258,294	0.401	392,219,944	0.375	0.659	36.2
5	0.00	0	0.000	0	0.000	0.000	0.0
6	3.35	31,684	0.049	18,700,150	0.018	1.694	46.5
All subareas combined <sup>b</sup>	13.89	643,413	1.000	1,045,576,245	1.000	0.615	34.9
95% Confidence interval		±144,925		±218,302,148			

<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.

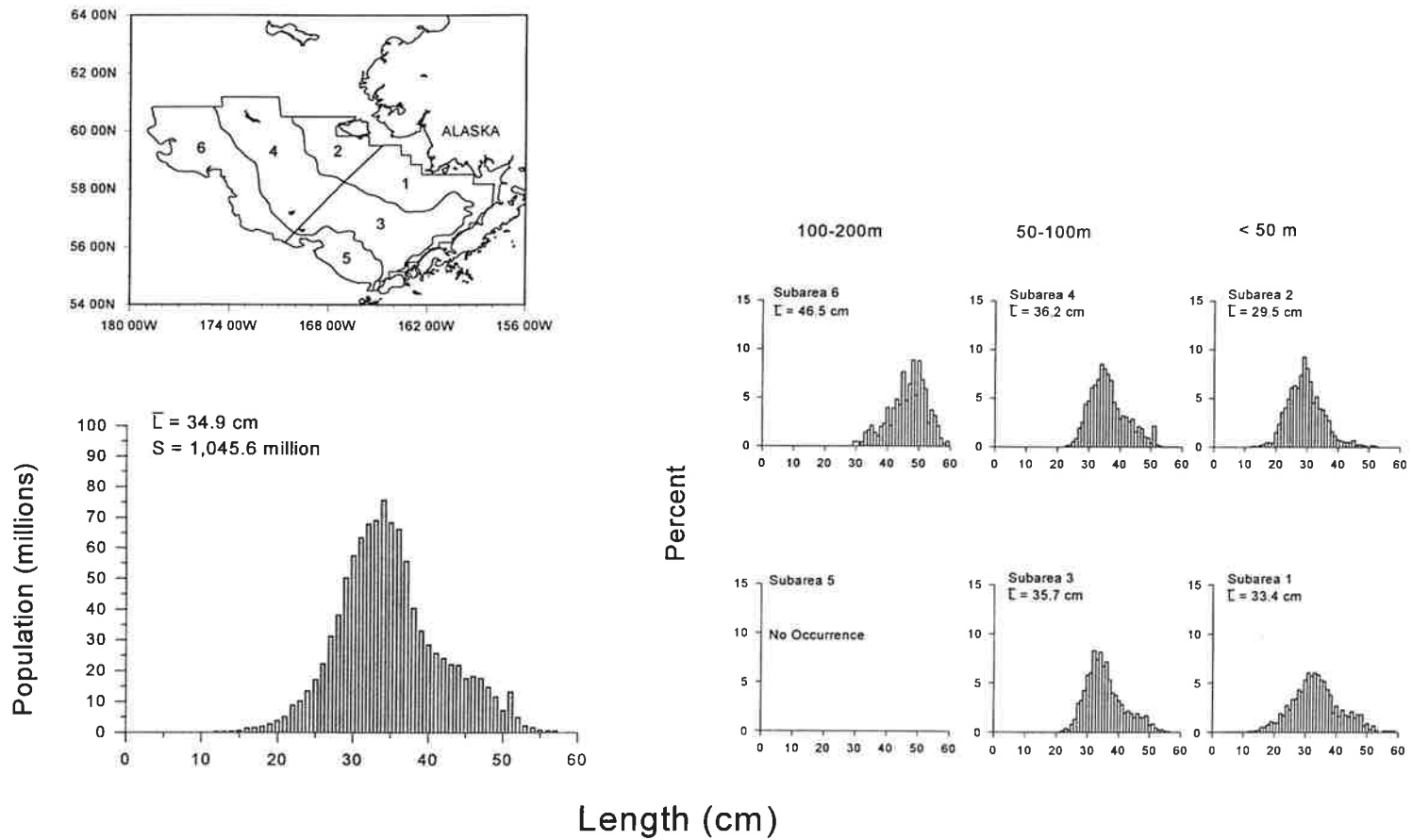


Figure 26.--Estimated relative size distribution (sexes combined) of Alaska plaice in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

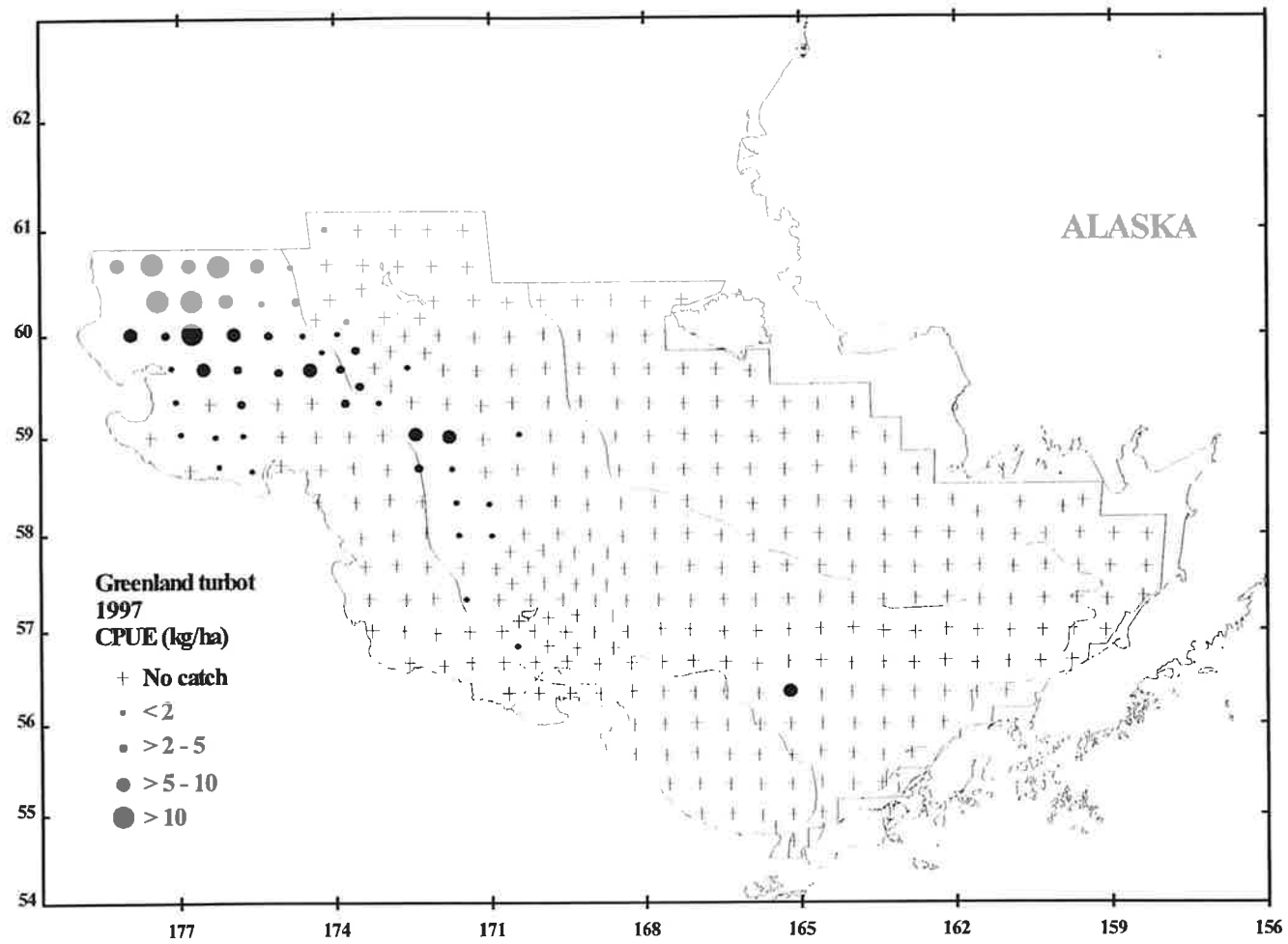


Figure 27--. Distribution and relative abundance in kg/ha of Greenland turbot, 1997 eastern Bering Sea bottom trawl survey.

Table 23.--Abundance estimates and mean size of Greenland turbot by subarea, 1997 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	0.10	988	0.034	116,428	0.014	8.486	93.0
4	0.32	3,402	0.116	681,802	0.082	4.990	68.0
5	0.00	0	0.000	0	0.000	0.000	0.0
6	2.63	24,828	0.850	7,549,530	0.904	3.289	64.5
All subareas combined <sup>b</sup>	0.63	29,218	1.000	8,347,760	1.000	3.500	65.1
95% Confidence interval		±12,150		±4,572,093			

<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.

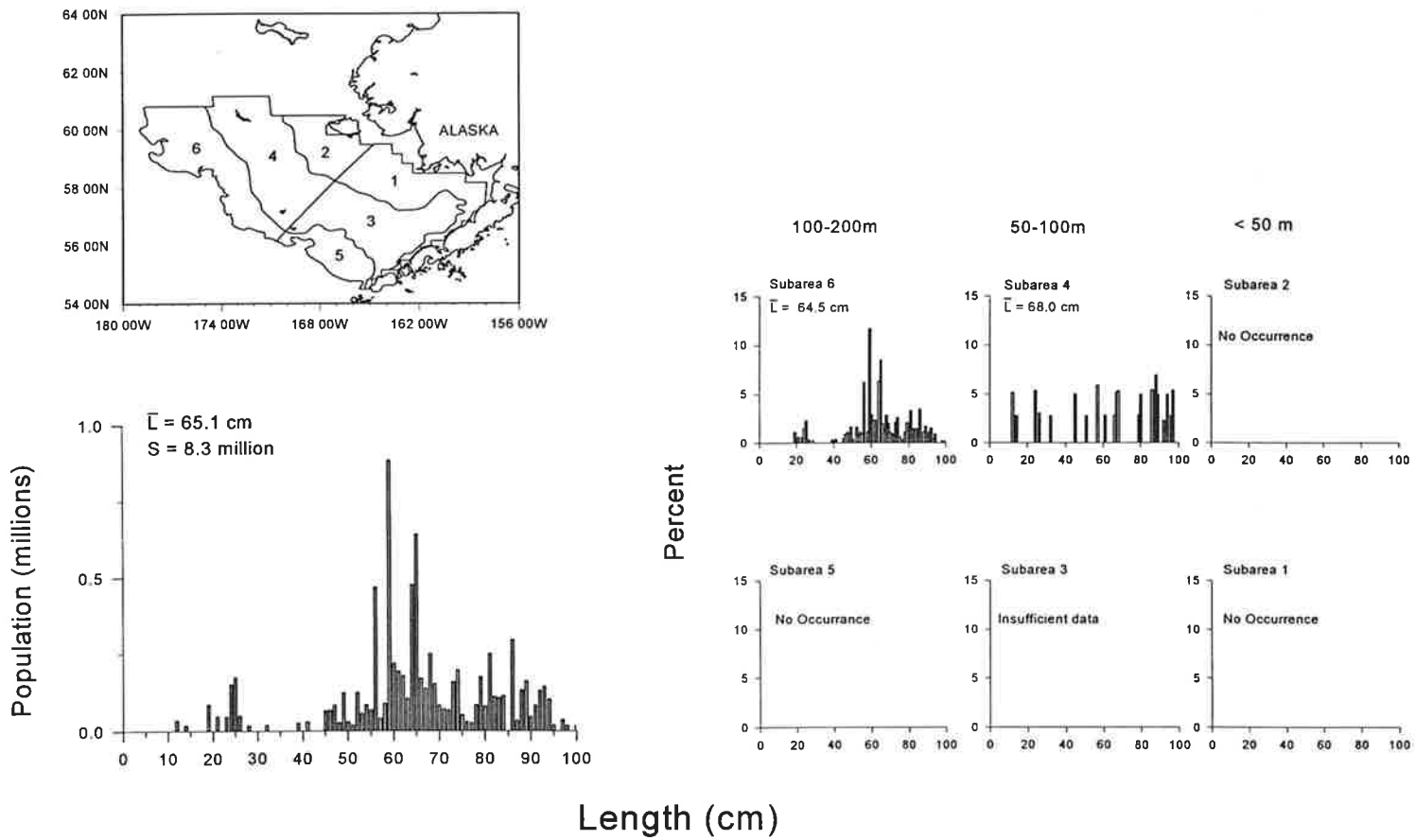


Figure 28.--Estimated relative size distribution (sexes combined) of Greenland turbot in terms of population number and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

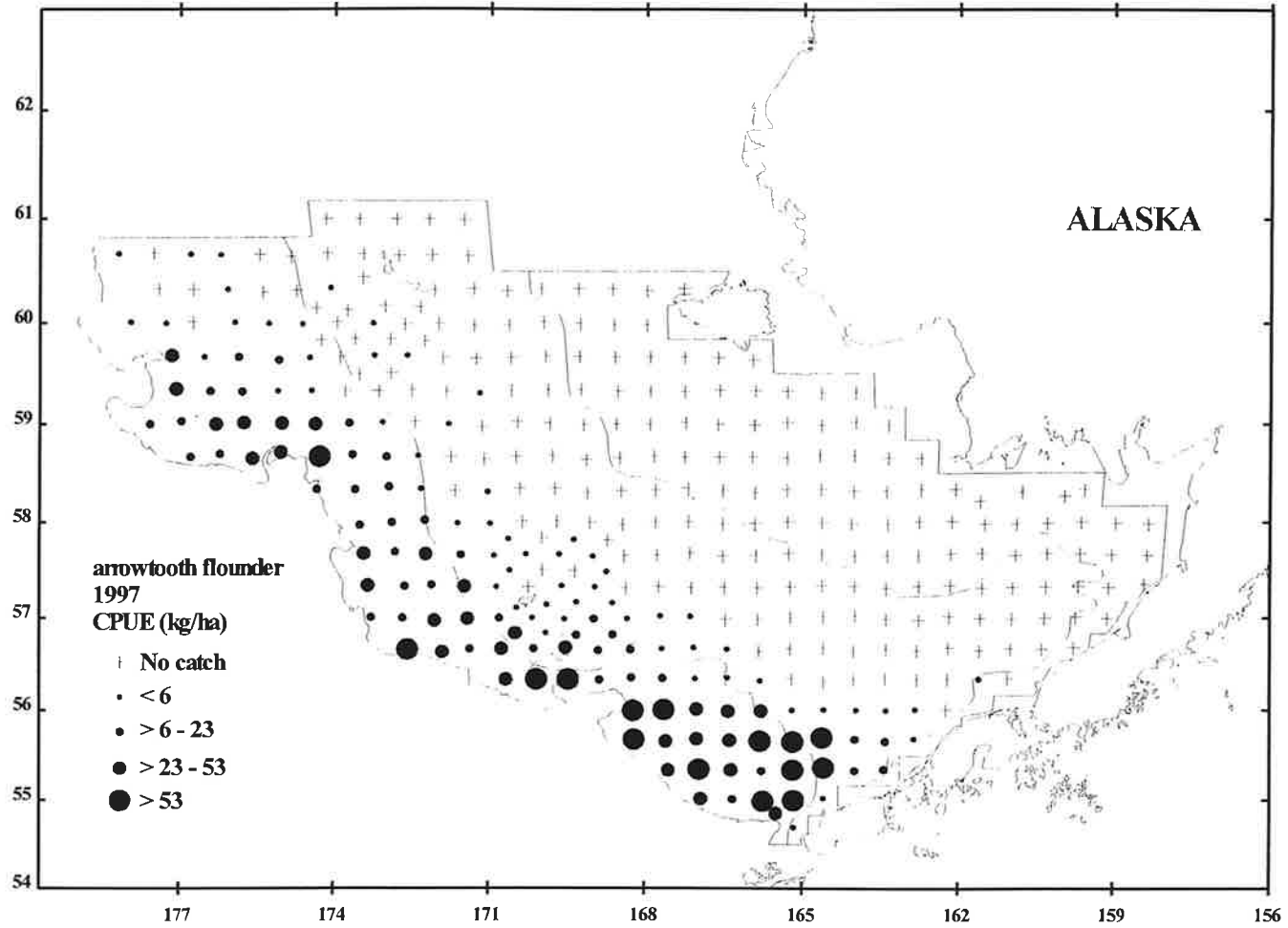


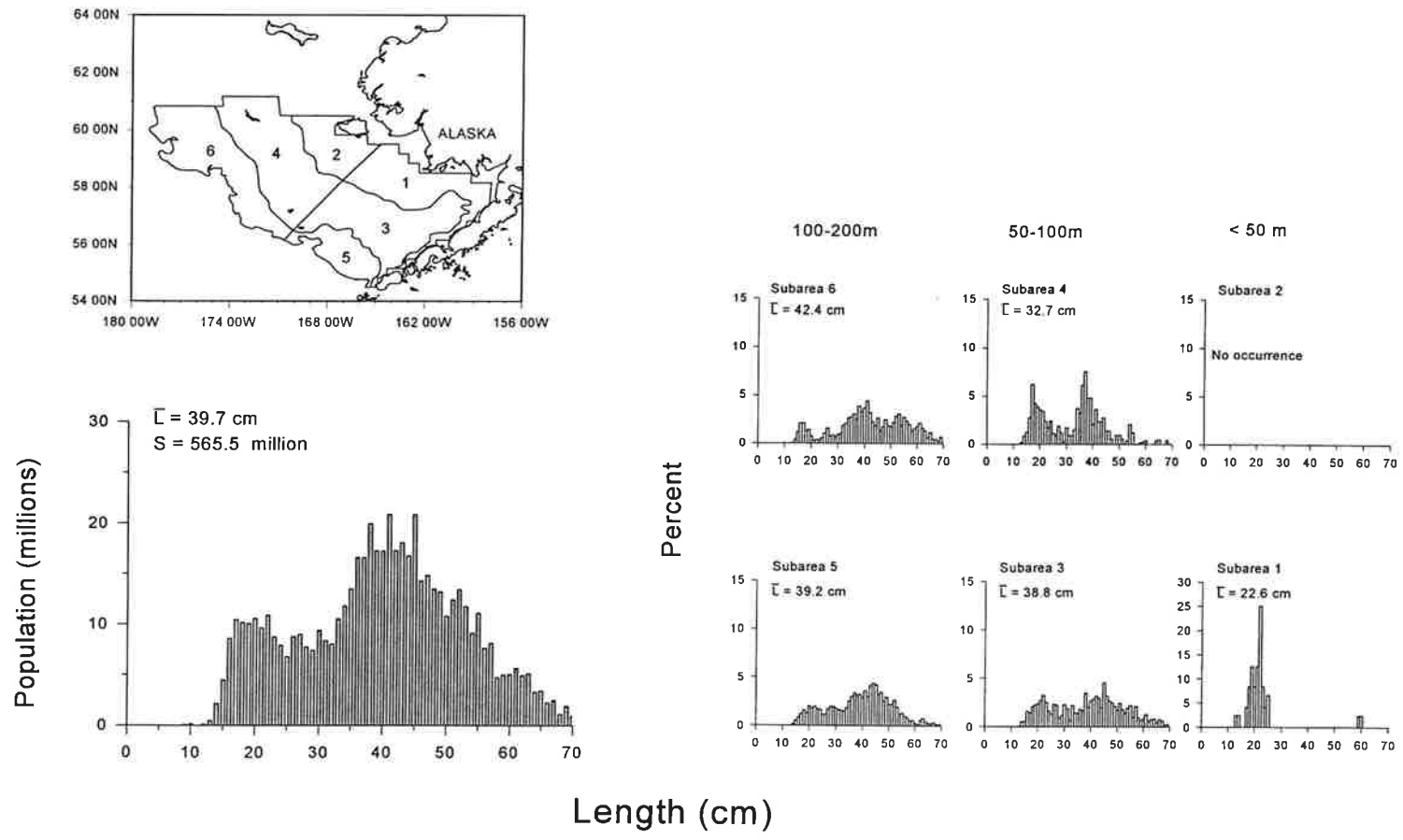
Figure 29--. Distribution and relative abundance in kg/ha of arrowtooth flounder, 1997 eastern Bering Sea bottom trawl survey.

Table 24.--Abundance estimates and mean size of arrowtooth flounder by subarea, 1997 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	0.05	402	0.001	2,223,657	0.004	0.181	22.6
2	0.00	0	0.000	0	0.000	0.000	0.0
3	10.21	105,455	0.229	131,180,333	0.232	0.804	38.8
4	1.34	14,443	0.031	30,326,178	0.054	0.476	32.7
5	43.60	169,143	0.367	233,369,808	0.413	0.725	39.2
6	18.07	170,905	0.371	168,440,761	0.298	1.015	42.4
All subareas combined <sup>b</sup>	9.93	460,348	1.000	565,540,736	1.000	0.814	39.7
95% Confidence interval		±117,444		±134,043,728			

<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 30.--Estimated relative size distribution (sexes combined) of arrowtooth flounder in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.



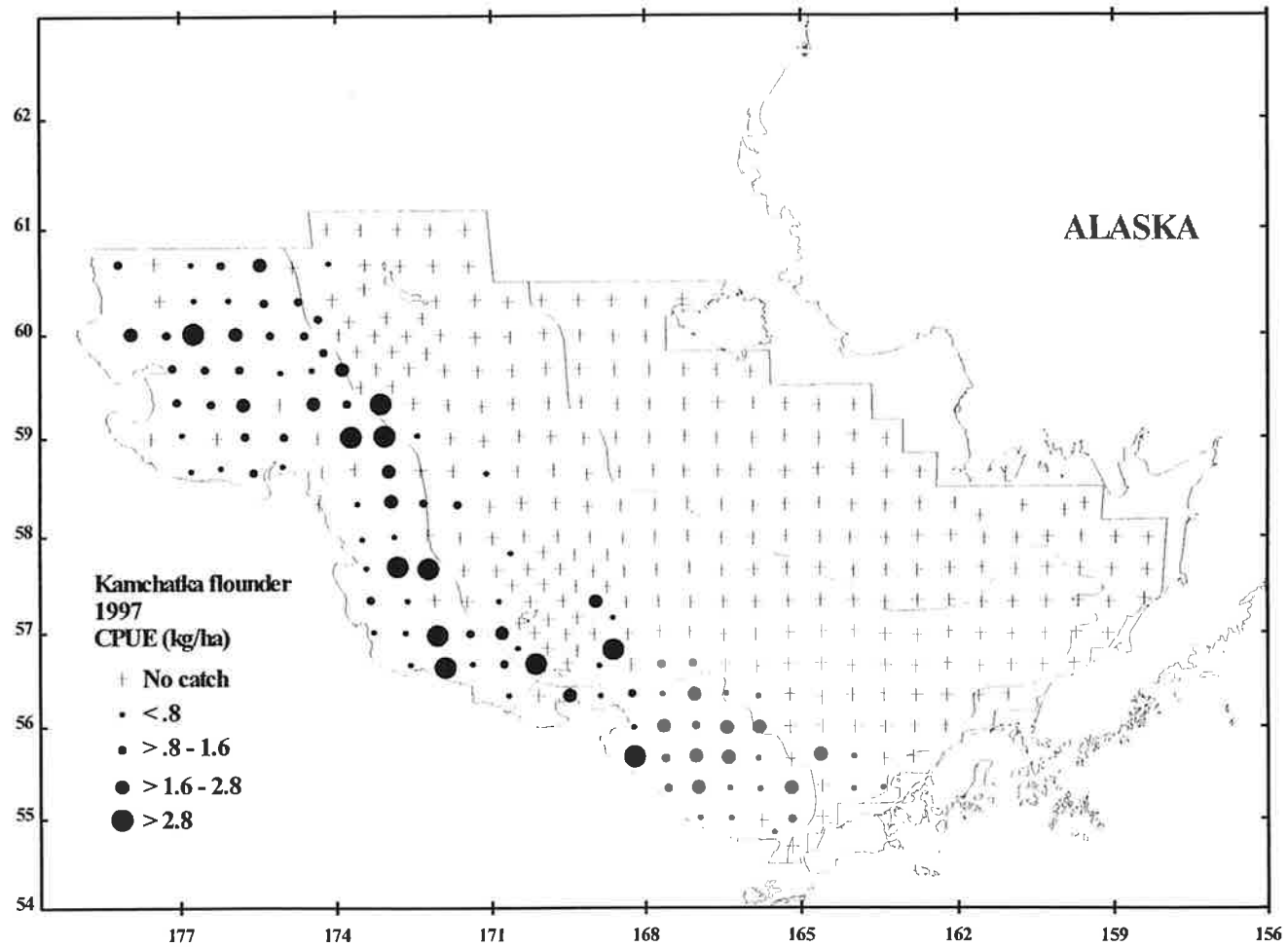


Figure 31--. Distribution and relative abundance in kg/ha of Kamchatka flounder, 1997 eastern Bering Sea bottom trawl survey.

Table 25.--Abundance estimates and mean size of Kamchatka flounder by subarea, 1997 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	0.16	1,623	0.089	1,947,504	0.073	0.833	38.6
4	0.18	1,954	0.107	1,633,389	0.061	1.196	45.4
5	1.05	4,069	0.223	8,508,779	0.318	0.478	31.8
6	1.12	10,636	0.582	14,709,362	0.549	0.723	36.1
All subareas combined <sup>b</sup>	0.39	18,282	1.000	26,799,034	1.000	0.682	35.5
95% Confidence interval		±3,643		±5,987,748			

<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.

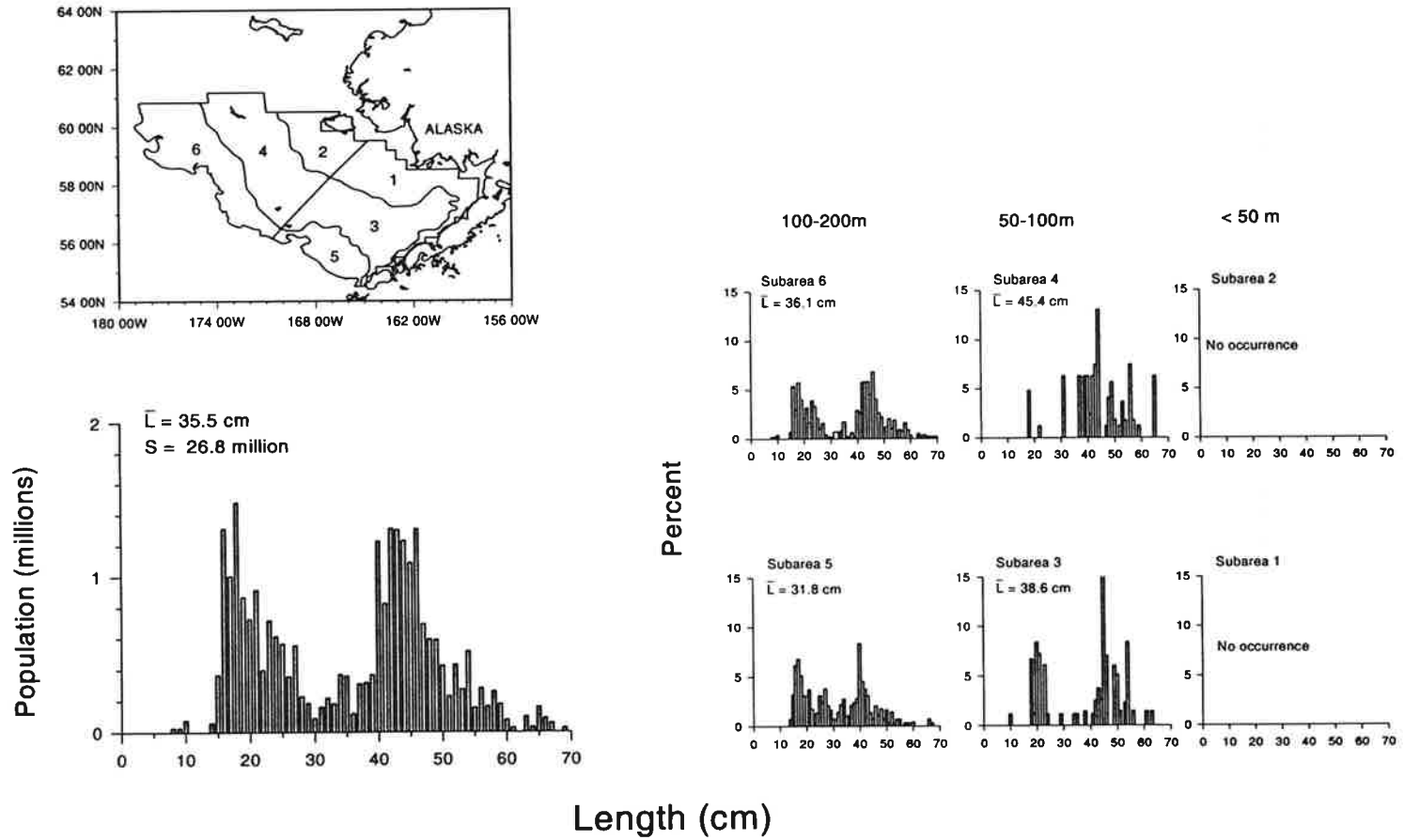


Figure 32.--Estimated relative size distribution (sexes combined) of Kamchatka flounder in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

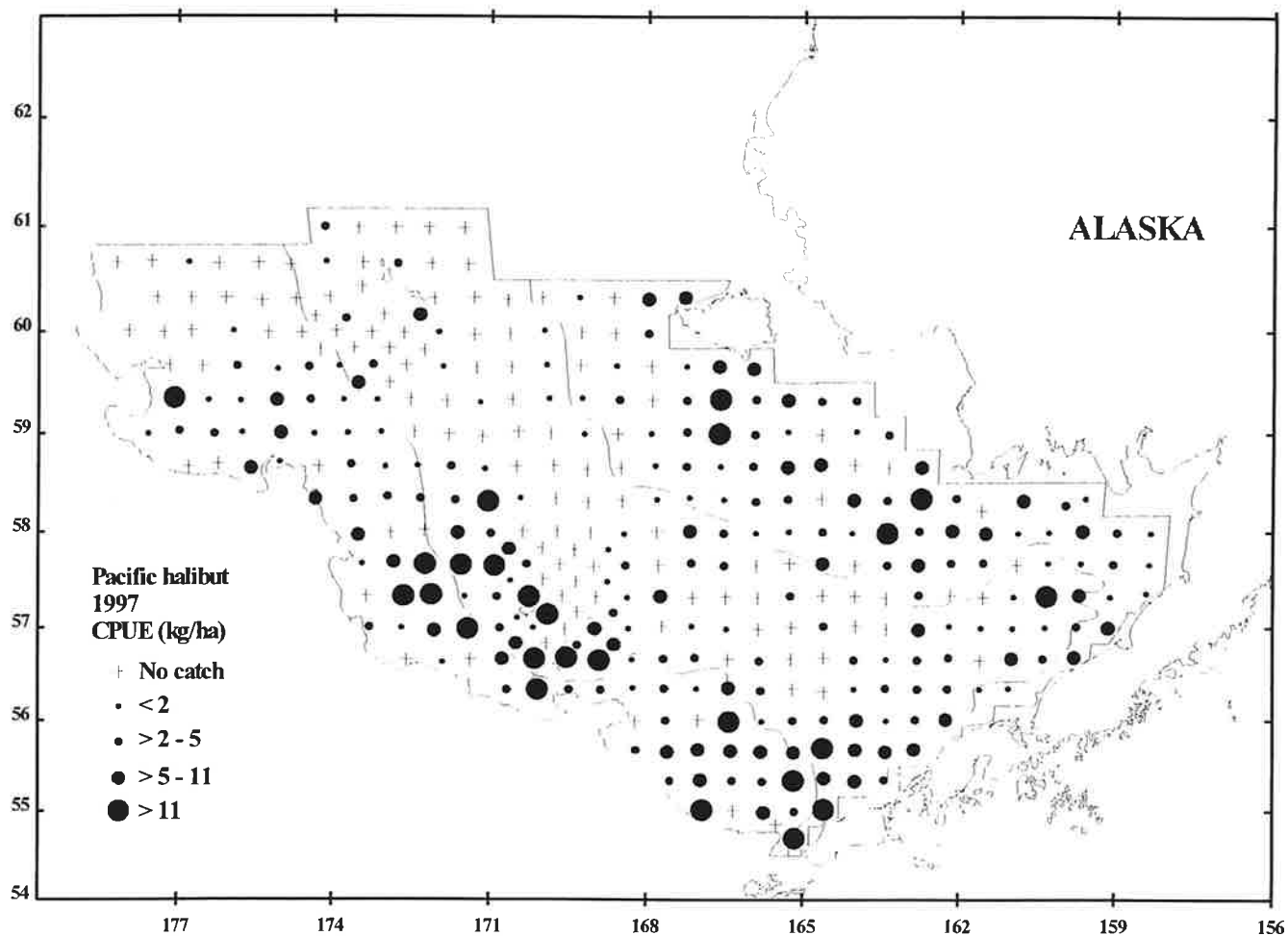


Figure 33--. Distribution and relative abundance in kg/ha of Pacific halibut, 1997 eastern Bering Sea bottom trawl survey.

Table 26.--Abundance estimates and mean size of Pacific halibut by subarea, 1997 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	3.44	26,825	0.179	13,176,505	0.357	2.036	46.7
2	2.96	12,153	0.081	4,639,134	0.126	2.620	55.1
3	4.02	41,508	0.278	8,144,217	0.221	5.097	68.0
4	1.74	18,789	0.126	3,201,778	0.087	5.868	71.5
5	5.22	20,268	0.136	2,546,257	0.069	7.960	84.2
6	3.16	29,921	0.200	5,224,624	0.141	5.727	76.3
All subareas combined <sup>b</sup>	3.23	149,464	1.000	36,932,514	1.000	4.047	61.4
95% Confidence interval		±23,870		±6,839,945			

<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.

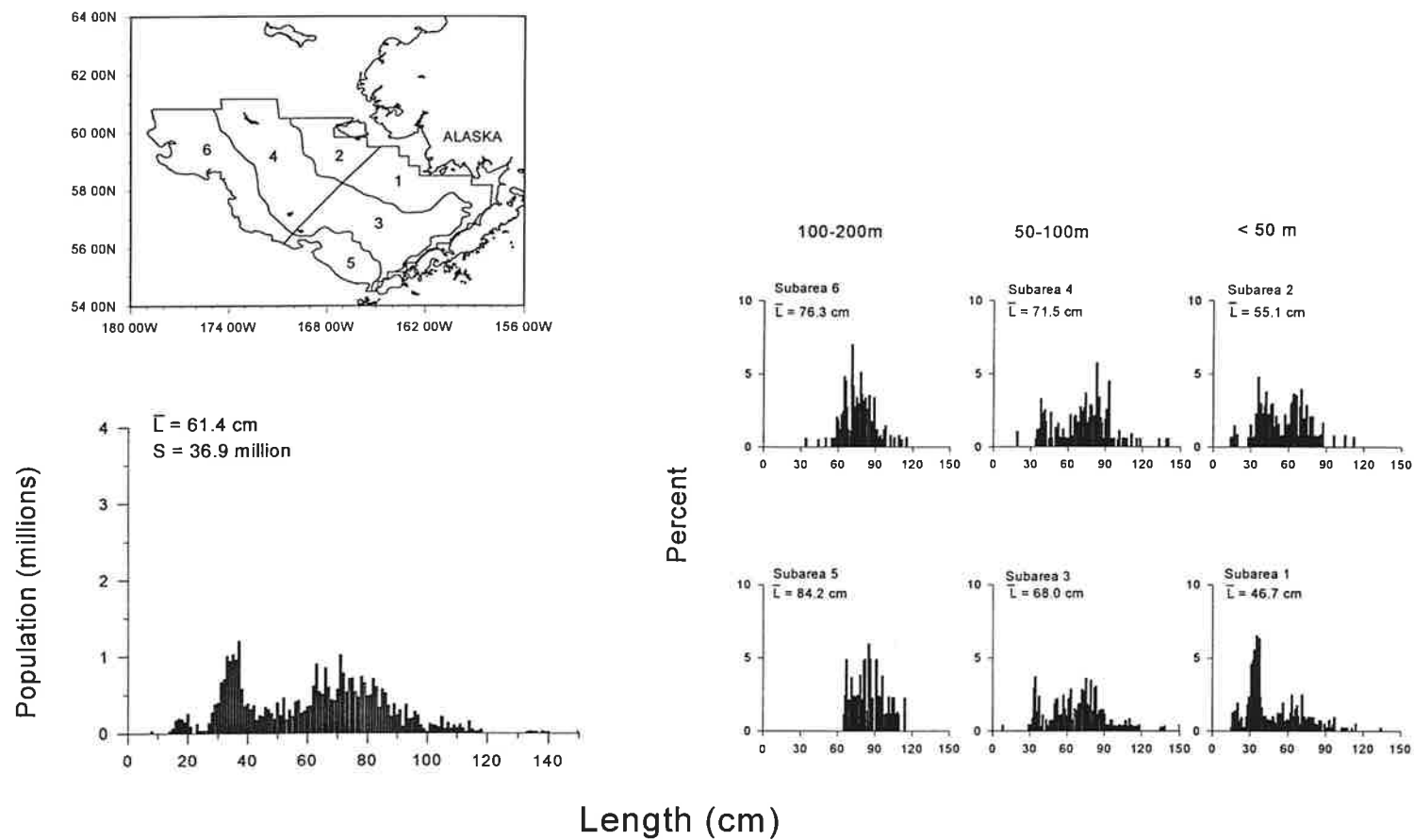


Figure 34.--Estimated relative size distribution (sexes combined) of Pacific halibut in terms of population numbers and percent for subareas 1-6, 1997 eastern Bering Sea bottom trawl survey.

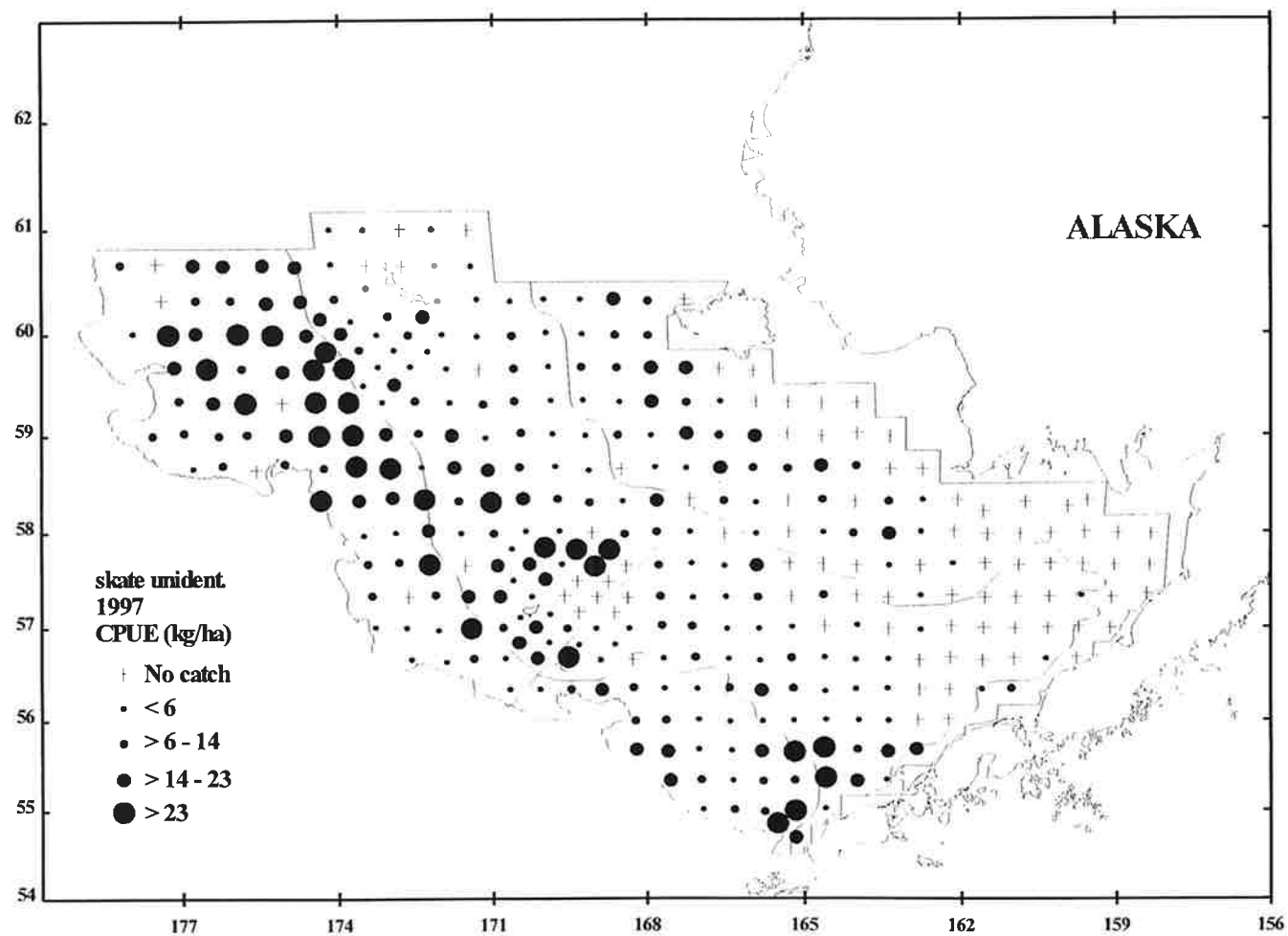


Figure 35--. Distribution and relative abundance in kg/ha of skates, 1997 eastern Bering Sea bottom trawl survey.

Table 27.--Abundance estimates and mean size of skates by subarea, 1997 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	Weight (kg)
1	2.62	20,377	0.052	4,128,010	0.043	4.936
2	7.69	31,541	0.080	6,897,053	0.071	4.573
3	7.09	73,202	0.186	23,447,644	0.242	3.122
4	7.16	77,231	0.196	24,595,048	0.254	3.140
5	10.50	40,734	0.103	8,121,260	0.084	5.016
6	15.93	150,632	0.383	29,589,746	0.306	5.091
All subareas combined <sup>b</sup>	8.50	393,716	1.000	96,778,761	1.000	4.068
95% Confidence interval		±52,800		±14,228,650		

<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.



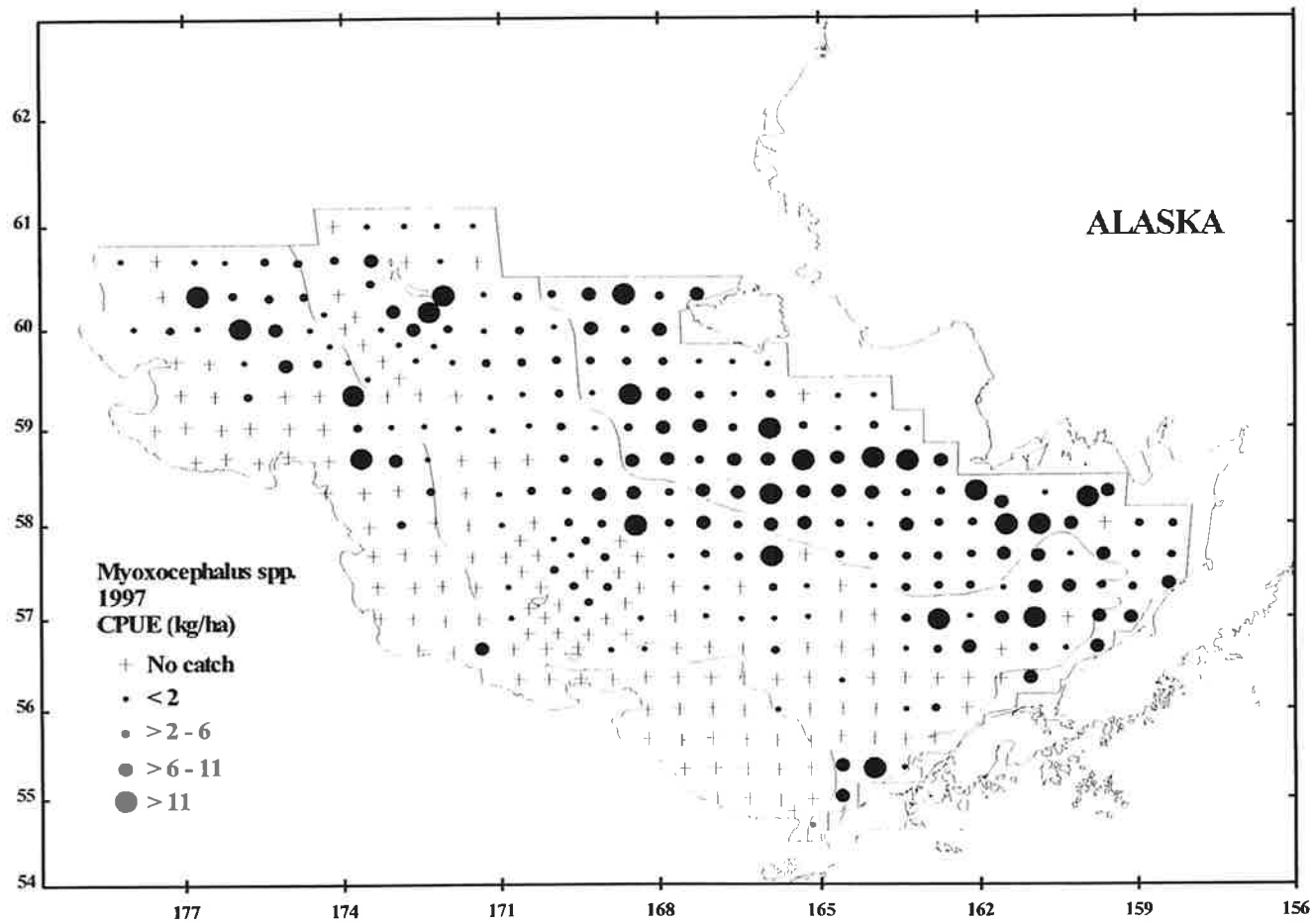


Figure 36--. Distribution and relative abundance in kg/ha of *Myoxocephalus* spp., 1997 eastern Bering Sea bottom trawl survey.

Table 28.--Abundance estimates and mean size of *Myoxocephalus* spp. by subarea, 1997 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	Weight (kg)
1	6.45	50,237	0.313	76,838,834	0.486	0.654
2	5.90	24,207	0.151	34,467,312	0.218	0.702
3	2.51	25,946	0.162	13,715,960	0.087	1.892
4	2.15	23,161	0.144	21,211,400	0.134	1.092
5	0.05	177	0.001	32,115	0.000	5.511
6	3.88	36,693	0.229	11,831,961	0.075	3.101
All subareas combined <sup>b</sup>	3.46	160,420	1.000	158,097,583	1.000	1.015
95% Confidence interval		42,176		24,230,905		

<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.

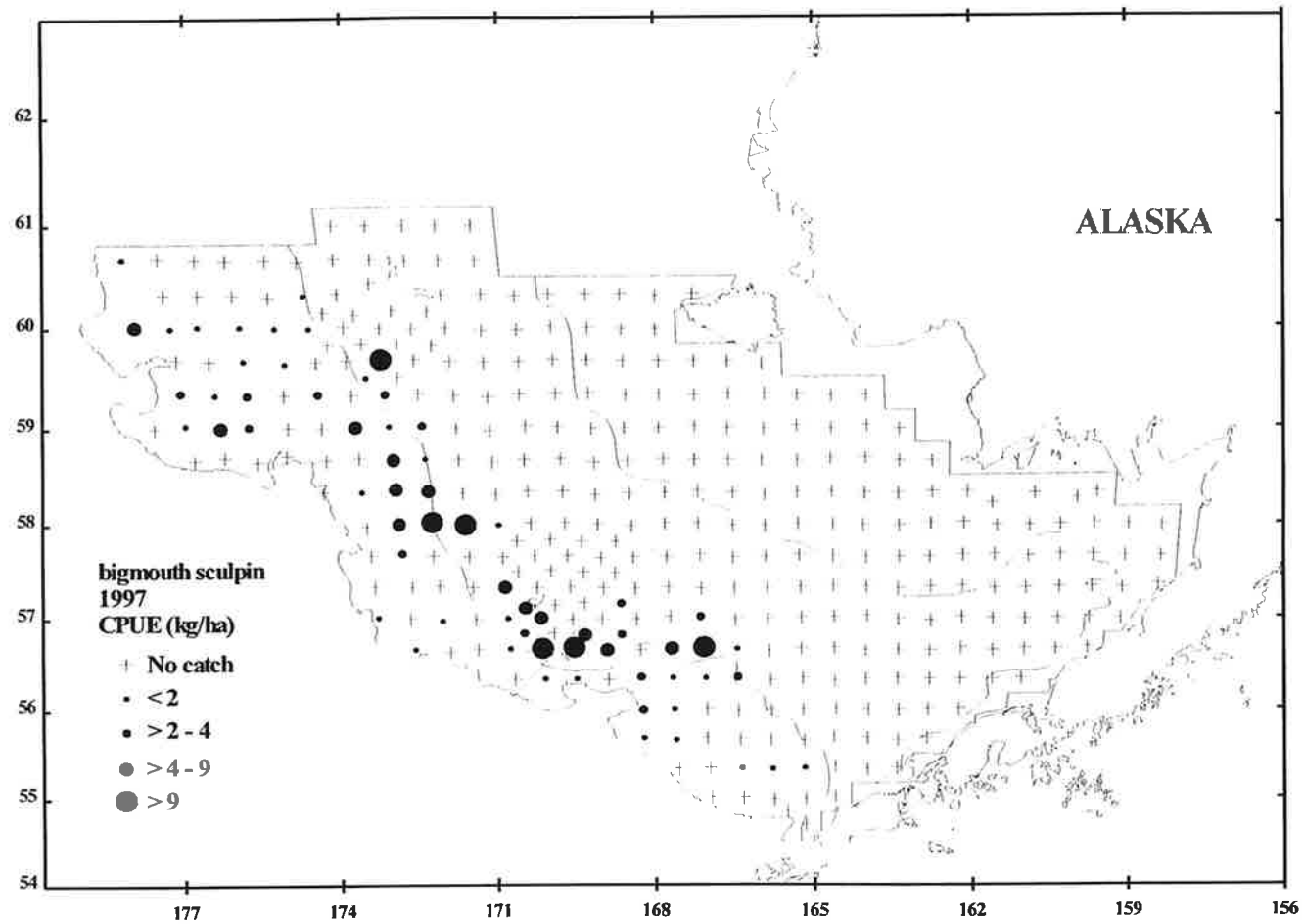


Figure 37--. Distribution and relative abundance in kg/ha of bigmouth sculpin, 1997 eastern Bering Sea bottom trawl survey.

Table 30.--Abundance estimates and mean size of bigmouth sculpin by subarea, 1997 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	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	0.78	8,088	0.275	1,722,690	0.233	4.695
4	0.59	6,357	0.216	1,284,456	0.174	4.949
5	0.71	2,742	0.093	764,194	0.103	3.588
6	1.30	12,248	0.416	3,626,406	0.490	3.377
All subareas combined <sup>b</sup>	0.64	29,434	1.000	7,397,746	1.000	3.979
95% Confidence interval		±10,050		±2,350,487		

<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.

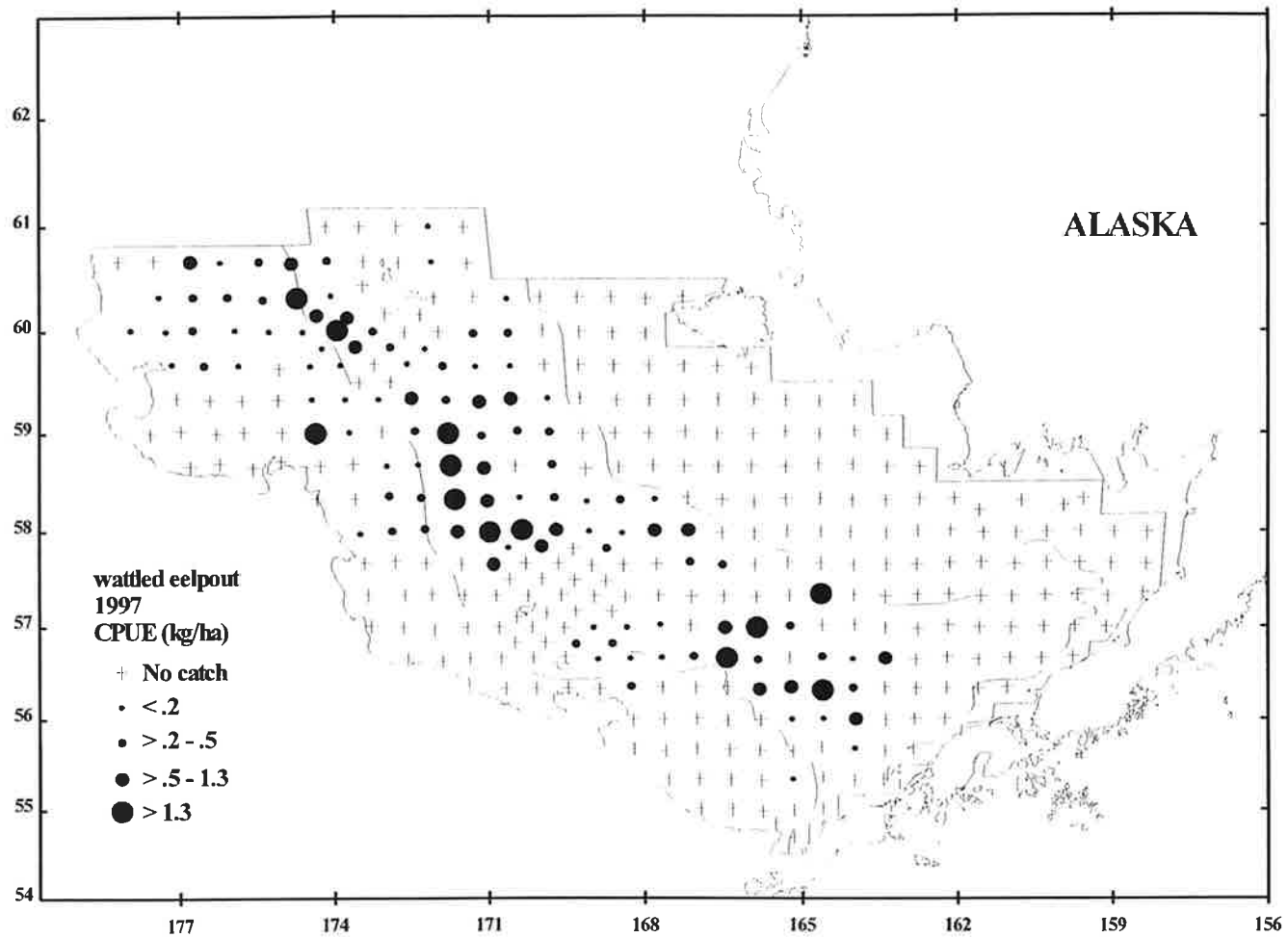


Figure 38---. Distribution and relative abundance in kg/ha of wattle eelpout, 1997 eastern Bering Sea bottom trawl survey.

Table 31.--Abundance estimates and mean size of wattled eelpout by subarea, 1997 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	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	0.26	2,666	0.361	14,306,318	0.367	0.186
4	0.32	3,412	0.463	16,591,224	0.425	0.206
5	0.01	57	0.008	457,708	0.012	0.125
6	0.13	1,241	0.168	7,655,244	0.196	0.162
All subareas combined <sup>b</sup>	0.16	7,376	1.000	39,010,495	1.000	0.189
95% Confidence interval		±2,329		±12,819,725		

<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.

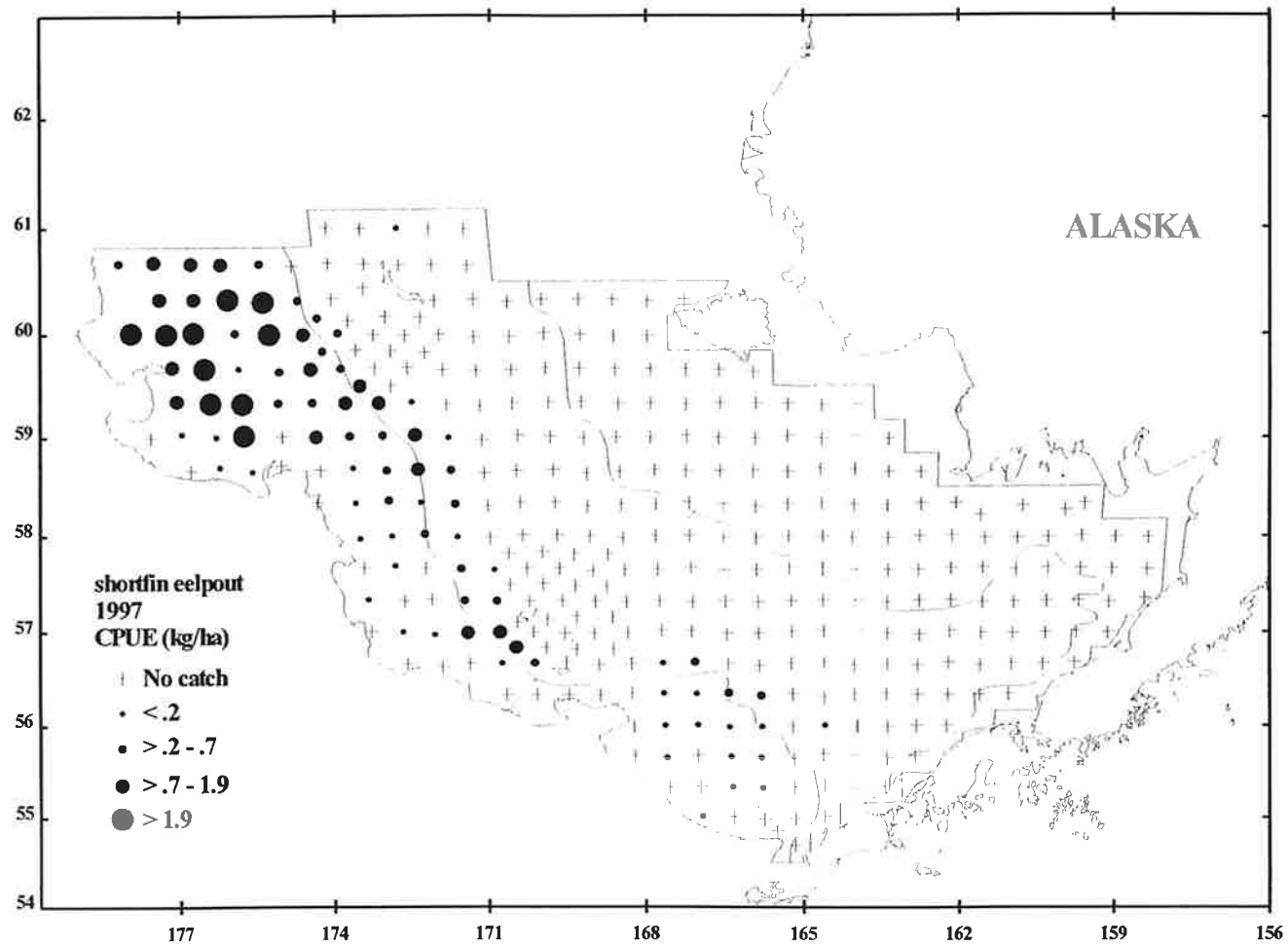


Figure 39--. Distribution and relative abundance in kg/ha of shortfin eelpout, 1997 eastern Bering Sea bottom trawl survey.

Table 32.--Abundance estimates and mean size of shortfin eelpout by subarea, 1997 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	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	0.02	237	0.021	4,043,735	0.021	0.059
4	0.09	971	0.088	24,329,378	0.127	0.040
5	0.03	104	0.009	2,517,469	0.013	0.041
6	1.03	9,728	0.881	160,589,474	0.839	0.061
All subareas combined <sup>b</sup>	0.24	11,039	1.000	191,480,055	1.000	0.058
95% Confidence interval		±4,804		±66,882,267		

<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.



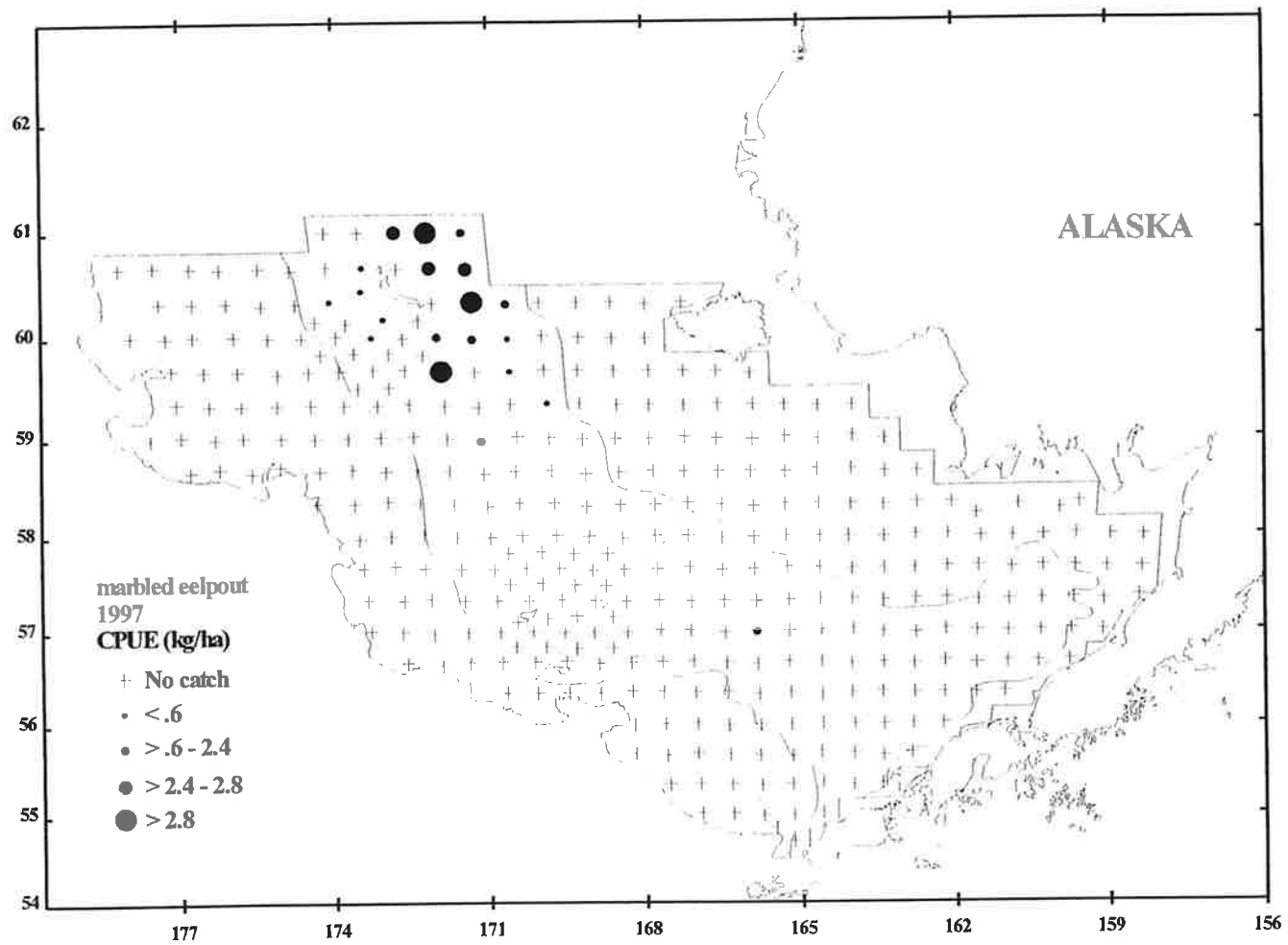


Figure 40--. Distribution and relative abundance in kg/ha of marbled eelpout, 1997 eastern Bering Sea bottom trawl survey.

Table 33.--Abundance estimates and mean size of marbled eelpout by subarea, 1997 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	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	145	0.035	91,662	0.025	1.582
4	0.37	3,966	0.965	3,560,132	0.975	1.114
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 <sup>b</sup>	0.09	4,110	1.000	3,651,794	1.000	1.125
95% Confidence interval		±2,489		±2,177,434		

<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.

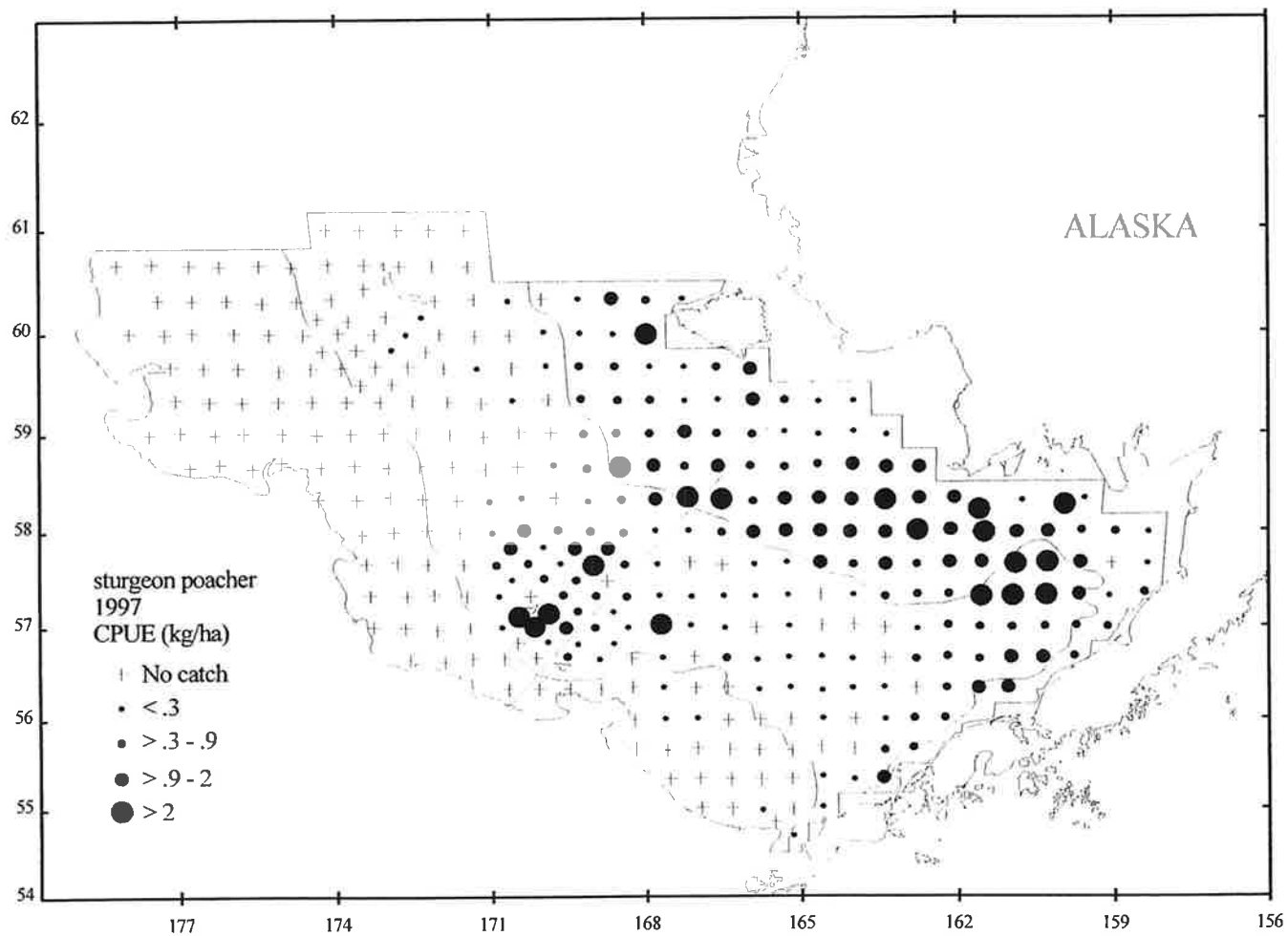


Figure 41--. Distribution and relative abundance in kg/ha of sturgeon poacher, 1997 eastern Bering Sea bottom trawl survey.

Table 34.--Abundance estimates and mean size of sturgeon poacher by subarea, 1997 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	Weight (kg)
1	1.20	9,325	0.431	115,061,656	0.418	0.081
2	0.79	3,229	0.149	52,233,387	0.190	0.062
3	0.48	4,917	0.227	65,068,219	0.237	0.076
4	0.38	4,130	0.191	42,534,264	0.155	0.097
5	0.00	15	0.001	152,570	0.001	0.098
6	0.00	0	0.000	0	0.000	0.000
All subareas combined <sup>b</sup>	0.47	21,617	1.000	275,050,095	1.000	0.079
95% Confidence interval		±5,002		±3,410,690		

<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.

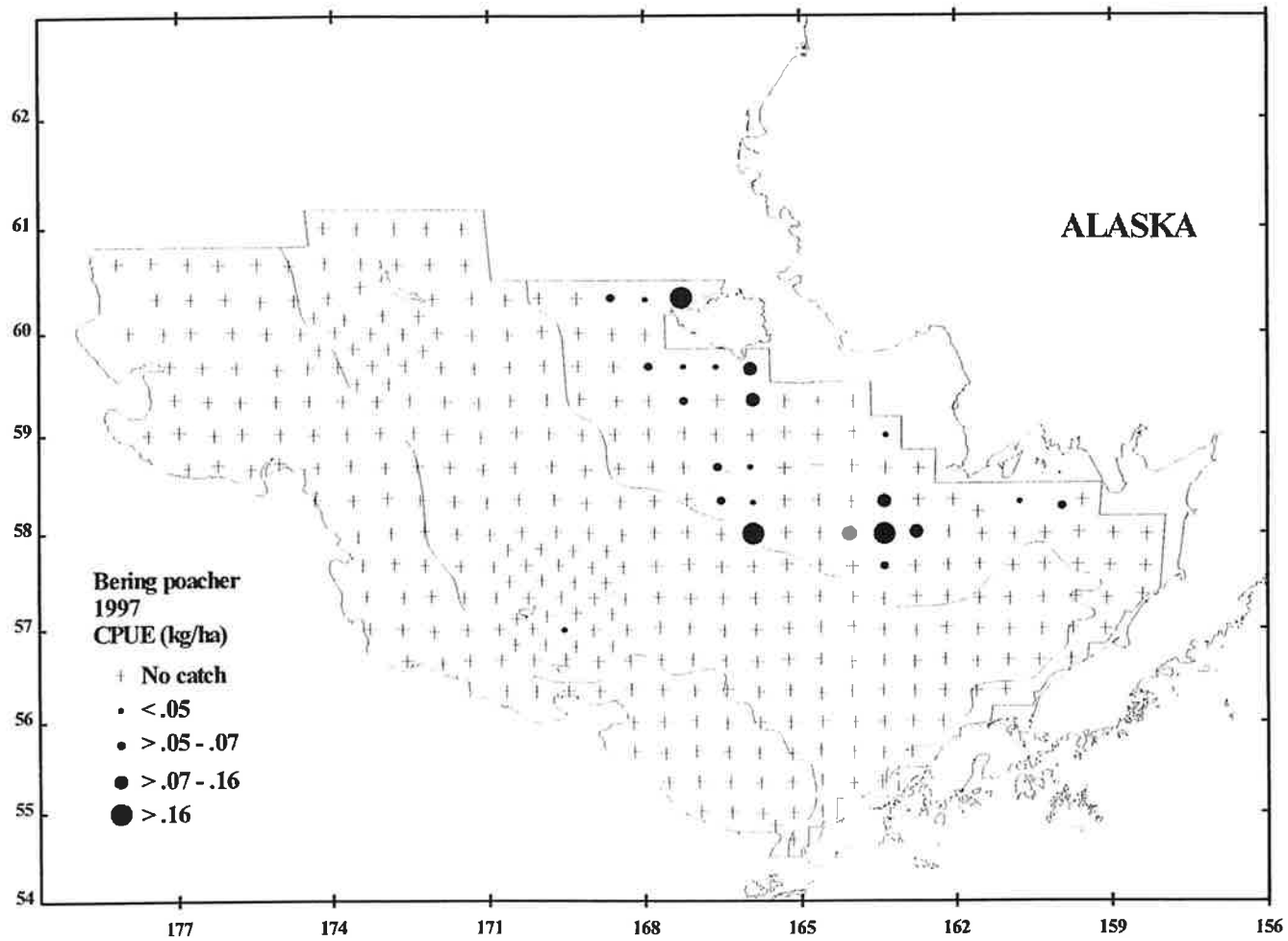


Figure 42--. Distribution and relative abundance in kg/ha of Bering poacher, 1997 eastern Bering Sea bottom trawl survey.

Table 35.--Abundance estimates and mean size of Bering poacher by subarea, 1997 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	Weight (kg)
1	0.02	125	0.561	1,675,251	0.452	0.075
2	0.02	95	0.426	2,001,505	0.539	0.047
3	0.00	0	0.000	0	0.000	0.000
4	0.00	4	0.018	33,458	0.009	0.120
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 <sup>b</sup>	0.00	223	1.000	3,710,214	1.000	0.060
95% Confidence interval		±112		±2,478,732		

<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.

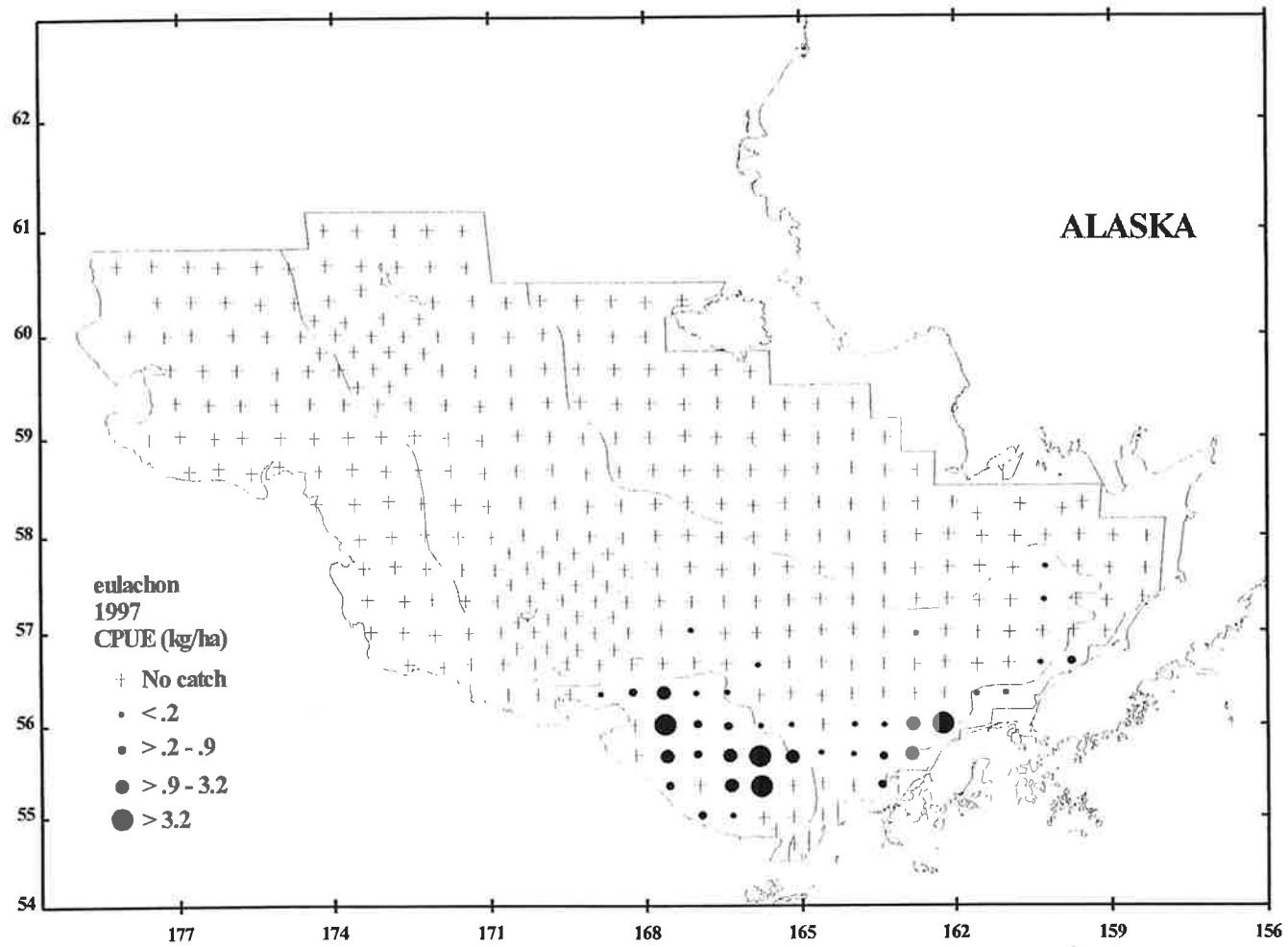


Figure 43--. Distribution and relative abundance in kg/ha of eulachon, 1997 eastern Bering Sea bottom trawl survey.

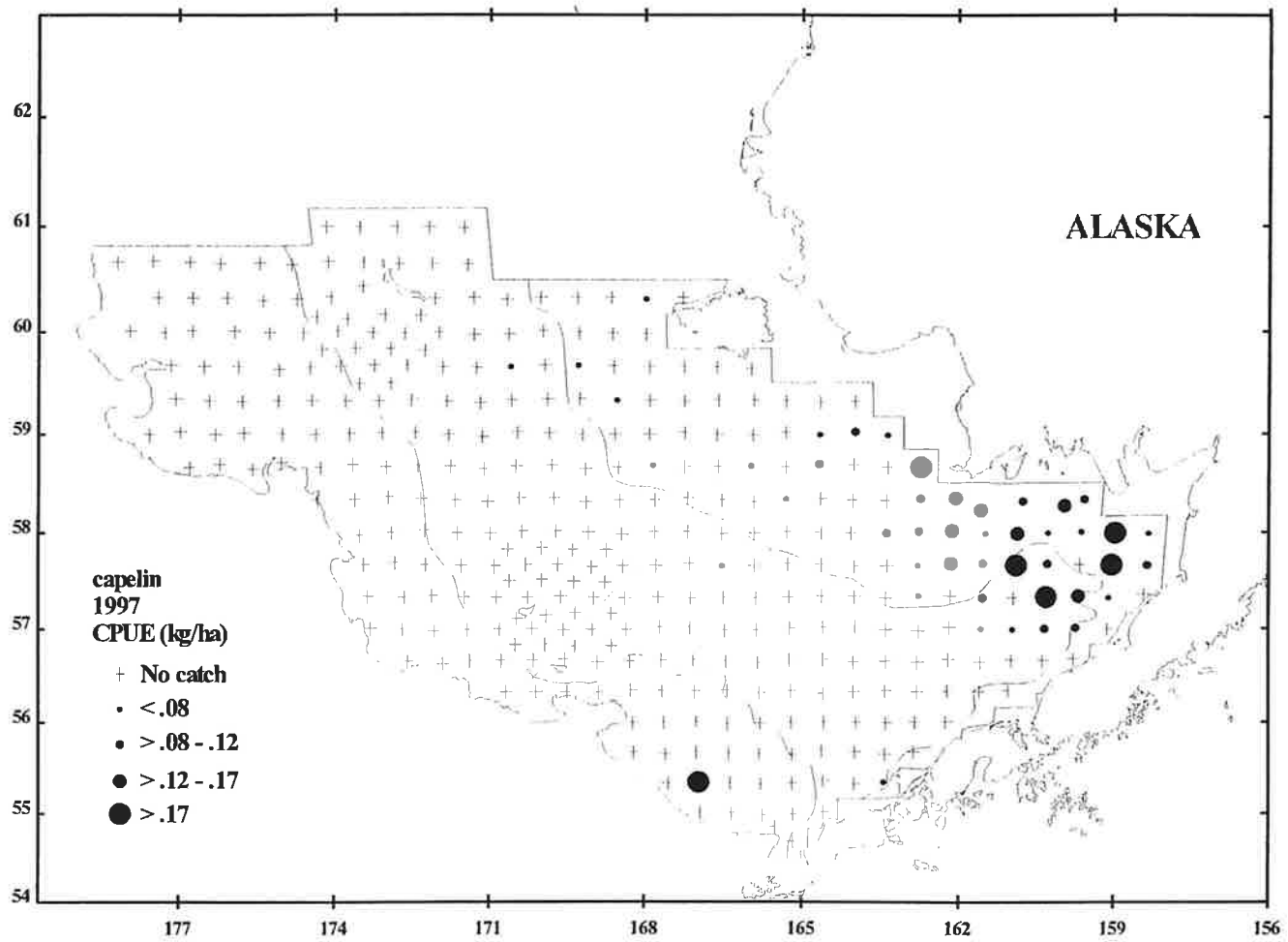


Figure 44--. Distribution and relative abundance in kg/ha of capelin, 1997 eastern Bering Sea bottom trawl survey.



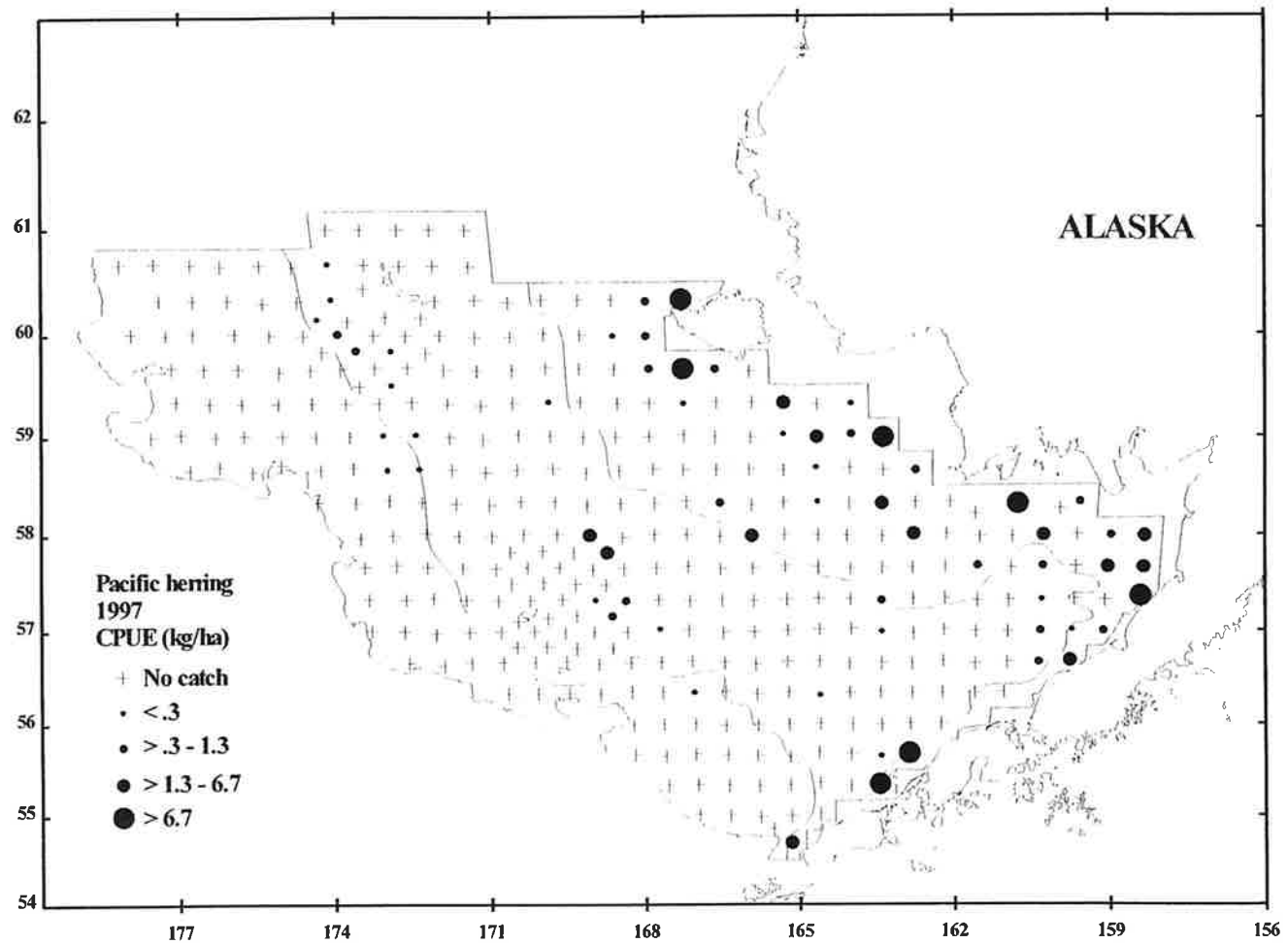


Figure 45--. Distribution and relative abundance in kg/ha of Pacific herring, 1997 eastern Bering Sea bottom trawl survey.

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## APPENDIX A

## Station Data, 1997 Eastern Bering Sea Bottom Trawl Survey

Appendix A contains station data by vessel for the 356 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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A-2. F/V <i>Aldebaran</i> .....	98

Appendix A Table 1--Haul data for stations sampled by the F/V *Arcturus* during the 1997 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	06/07/97	56.996	159.114	32	06	0.49	2.78	10	5.8	5.3	15.4	M
*	2	06/07/97	57.324	159.079	47	09	0.50	2.83	10	4.5	3.6	15.9	F
*	3	06/07/97	57.666	159.020	44	11	0.50	3.43	10	4.2	3.1	15.9	M
*	4	06/07/97	57.997	158.954	40	14	0.48	3.39	10	7.1	4.8	14.6	M
*	5	06/08/97	58.273	159.936	44	06	0.33	1.82	10	5.5	5.0	14.6	F
*	6	06/08/97	57.999	160.256	49	08	0.49	2.83	10	4.0	3.4	16.1	M
*	7	06/08/97	57.677	160.269	53	11	0.49	2.80	31	4.0	3.1	15.8	M
*	8	06/08/97	57.332	160.296	59	13	0.51	3.07	31	6.3	3.3	15.8	M
*	9	06/08/97	56.999	160.324	61	16	0.50	3.09	31	9.9	2.8	16.7	F
*	10	06/09/97	56.343	161.031	51	11	0.50	2.72	10	7.8	3.7	16.7	F
*	11	06/09/97	56.335	161.594	62	14	0.50	3.26	10	7.7	3.2	16.7	F
*	12	06/09/97	56.649	161.579	88	16	0.50	2.90	31	8.3	2.0	15.4	M
*	13	06/09/97	56.994	161.566	68	19	0.49	3.12	31	9.0	---	16.1	M
*	14	06/09/97	57.320	161.537	54	21	0.48	2.65	31	8.9	2.2	15.5	M
*	15	06/10/97	57.679	161.526	51	11	0.49	3.00	10	7.4	3.0	15.0	M
*	16	06/10/97	57.987	161.476	54	13	0.49	3.08	10	5.8	3.6	15.3	M
*	17	06/10/97	58.222	161.568	39	15	0.31	1.70	10	5.5	4.1	14.6	F
*	18	06/10/97	58.657	162.714	23	20	0.51	2.93	10	7.9	5.4	14.0	M
*	19	06/11/97	58.339	162.718	29	11	0.51	3.22	10	5.3	4.9	15.3	M
*	20	06/11/97	58.010	162.752	39	13	0.50	2.80	10	5.1	3.8	15.1	M
*	21	06/11/97	57.655	162.767	43	16	0.50	3.16	10	6.4	3.2	16.1	M
*	22	06/11/97	57.341	162.759	48	18	0.50	3.11	10	7.6	2.1	16.0	M
*	23	06/11/97	56.975	162.763	59	21	0.51	2.87	31	8.2	1.3	16.9	M
*	24	06/12/97	56.650	162.786	70	11	0.52	2.95	31	8.3	2.0	16.4	M
*	25	06/12/97	56.336	162.786	76	14	0.50	3.06	31	8.1	2.2	15.9	M
*	26	06/12/97	56.006	162.824	77	16	0.51	3.31	31	8.1	2.8	16.9	M
*	27	06/12/97	55.331	163.987	70	22	0.50	2.70	31	7.5	3.0	16.0	M
*	28	06/13/97	55.678	163.981	93	11	0.51	2.89	31	8.1	2.4	17.4	M
*	29	06/13/97	56.000	163.956	88	14	0.50	2.84	31	8.8	2.2	16.5	M
*	31	06/13/97	56.338	164.006	84	18	0.50	2.92	31	9.0	1.4	17.6	M
*	32	06/13/97	56.652	164.009	81	20	0.51	2.65	31	9.0	1.5	17.7	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
*	33	06/13/97	57.024	163.976	66	23	0.49	2.73	31	8.0	0.8	17.1	M
*	34	06/14/97	57.336	163.991	59	11	0.50	2.56	31	7.6	1.5	16.2	M
*	35	06/14/97	57.654	163.988	49	13	0.49	2.77	10	7.0	2.0	14.8	M
*	36	06/14/97	57.992	164.048	44	16	0.34	1.98	10	7.3	3.0	15.2	M
*	37	06/14/97	58.325	164.016	39	18	0.48	2.71	10	6.9	3.8	14.7	M
*	38	06/14/97	58.687	163.995	33	21	0.49	3.15	10	7.4	4.9	14.6	M
*	39	06/15/97	59.020	163.975	25	11	0.50	2.75	10	7.1	5.5	14.6	M
*	40	06/15/97	59.326	163.978	20	13	0.51	2.85	10	9.0	8.1	14.8	M
*	41	06/15/97	59.331	165.298	18	17	0.51	2.83	20	8.8	8.0	14.2	M
*	42	06/15/97	59.337	165.912	23	19	0.51	2.70	20	7.3	5.7	14.5	M
*	43	06/17/97	59.019	165.302	26	11	0.51	2.73	10	6.8	6.4	14.4	M
*	44	06/17/97	58.661	165.302	39	13	0.48	2.99	10	7.4	4.1	14.4	M
*	45	06/17/97	58.334	165.296	43	16	0.50	3.14	10	8.7	2.8	15.2	M
*	46	06/17/97	58.006	165.278	48	18	0.49	2.80	10	8.0	2.1	15.3	M
*	47	06/17/97	57.677	165.259	59	21	0.50	2.65	31	8.4	0.9	15.8	M
*	48	06/18/97	57.336	165.240	66	11	0.49	2.89	31	8.4	0.9	17.0	M
*	49	06/18/97	57.006	165.217	69	13	0.49	3.02	31	8.5	0.8	17.3	M
*	50	06/18/97	56.672	165.231	74	16	0.52	2.71	31	8.3	1.5	17.6	M
*	51	06/18/97	56.345	165.200	84	18	0.49	2.75	31	8.8	1.8	17.1	M
*	52	06/18/97	55.998	165.191	94	21	0.48	2.72	31	8.6	2.3	17.2	M
*	53	06/19/97	55.649	165.175	107	11	0.51	3.00	31	7.4	4.2	17.1	M
*	54	06/19/97	55.338	165.174	109	13	0.47	2.89	50	7.4	4.4	17.4	M
*	55	06/19/97	54.995	165.160	108	15	0.48	3.07	50	7.3	4.1	16.7	M
*	56	06/19/97	54.852	165.501	144	17	0.47	2.84	50	6.9	4.5	16.8	M
*	57	06/20/97	55.008	166.331	141	11	0.46	2.60	50	8.4	4.1	18.8	M
*	58	06/20/97	55.337	166.357	124	14	0.46	2.75	50	8.4	3.8	18.3	M
*	59	06/20/97	55.666	166.385	124	16	0.48	2.83	50	8.8	3.5	18.2	M
*	60	06/20/97	55.987	166.414	122	18	0.50	2.91	50	8.4	3.1	18.2	F
*	61	06/20/97	56.351	166.426	100	21	0.47	2.74	31	9.1	2.1	17.6	M
*	62	06/21/97	56.663	166.435	83	11	0.51	2.89	31	8.9	1.7	16.6	M
*	63	06/21/97	56.985	166.468	73	13	0.50	2.87	31	8.8	1.4	16.0	M
*	64	06/21/97	57.328	166.487	68	16	0.49	2.91	31	8.2	1.4	15.4	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	
*	65	06/21/97	57.651	166.515	64	18	0.49	2.91	31	7.9	1.2	15.8	M
*	66	06/21/97	57.990	166.528	59	21	0.50	2.93	31	8.1	0.9	16.1	M
*	67	06/22/97	58.330	166.527	46	11	0.50	2.90	10	6.8	2.4	16.0	M
*	68	06/22/97	58.332	167.810	58	15	0.49	2.91	41	6.4	1.2	16.9	M
*	69	06/22/97	58.009	167.812	65	18	0.50	2.61	41	6.6	0.7	16.6	M
*	70	06/22/97	57.660	167.772	67	20	0.47	2.76	31	7.4	1.0	15.8	M
*	71	06/23/97	57.332	167.736	74	11	0.49	2.88	31	7.4	1.7	16.3	M
*	72	06/23/97	57.021	167.707	75	13	0.49	2.90	31	7.4	2.2	16.0	M
*	73	06/23/97	56.668	167.675	102	16	0.46	2.79	31	8.2	2.4	17.6	M
*	74	06/23/97	56.346	167.660	126	18	0.46	2.79	50	8.4	2.5	18.1	M
*	75	06/23/97	56.002	167.633	129	21	0.50	2.56	50	8.0	4.0	18.1	M
*	76	06/24/97	55.676	168.204	134	11	0.50	2.90	50	7.7	4.1	18.1	M
*	77	06/24/97	55.656	167.598	133	14	0.50	2.87	50	7.9	3.9	18.5	M
*	78	06/24/97	55.336	167.549	146	16	0.47	2.80	50	7.8	4.0	18.4	M
*	79	06/27/97	56.330	168.873	126	14	0.50	3.19	50	8.5	3.6	17.7	M
*	80	06/27/97	56.650	168.897	99	16	0.49	2.81	32	8.4	3.1	17.5	M
*	81	06/28/97	56.814	169.315	78	07	0.50	2.71	32	7.4	2.8	16.7	M
*	82	06/28/97	56.988	168.982	78	09	0.49	2.86	32	7.7	2.5	16.9	M
*	83	06/28/97	57.166	169.315	70	11	0.49	3.00	42	7.2	1.9	15.8	M
*	84	06/28/97	57.328	168.964	69	14	0.49	2.97	42	7.2	2.2	16.0	M
*	85	06/28/97	57.493	169.345	69	17	0.49	2.84	42	6.8	1.5	15.8	M
*	86	06/29/97	57.647	169.008	66	07	0.50	2.77	42	6.9	1.5	16.5	M
*	87	06/29/97	57.823	169.369	64	09	0.51	2.95	42	6.6	0.8	16.7	F
*	88	06/29/97	58.002	169.068	68	13	0.48	2.91	42	6.9	0.7	16.3	M
*	89	06/29/97	58.310	169.116	66	15	0.50	2.82	41	6.5	0.5	16.6	M
*	90	06/29/97	58.643	169.133	61	17	0.50	2.70	41	6.8	0.4	16.4	M
*	91	06/30/97	58.995	169.197	52	07	0.49	2.87	41	5.5	0.9	16.4	M
	92	06/30/97	59.000	168.569	44	09	0.52	2.78	20	3.3	2.6	15.8	M
	93	06/30/97	58.999	167.923	39	12	0.49	2.58	20	3.5	3.3	15.3	M
	94	06/30/97	59.016	167.240	38	14	0.50	2.95	20	5.0	4.1	14.7	M
	95	06/30/97	58.998	166.621	33	17	0.50	2.94	20	5.9	5.1	15.2	M
	96	07/01/97	59.663	166.626	26	06	0.51	3.09	20	7.6	7.4	14.6	F

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
97	07/01/97	59.340	166.599	26	08	0.51	2.96	20	7.0	6.7	14.6	F
98	07/01/97	59.329	167.245	30	11	0.51	3.01	20	6.5	5.7	14.6	F
99	07/01/97	59.336	167.914	37	13	0.50	2.89	20	5.5	3.6	14.4	M
100	07/01/97	59.334	168.536	40	16	0.50	2.96	20	4.9	3.2	15.0	M
101	07/02/97	59.670	168.597	38	06	0.50	2.77	20	3.6	2.8	15.4	M
102	07/02/97	59.989	168.626	37	09	0.50	2.71	20	6.3	2.4	15.2	M
* 103	07/02/97	59.999	169.265	43	11	0.50	2.75	20	6.6	0.7	15.8	M
* 104	07/02/97	59.676	169.281	45	14	0.51	2.74	20	5.9	1.8	16.1	M
* 105	07/02/97	59.351	169.245	48	16	0.49	2.65	20	6.7	1.7	16.2	M
* 106	07/03/97	59.340	170.575	67	06	0.50	2.78	41	6.7	-0.2	17.2	M
* 107	07/03/97	59.021	170.448	69	09	0.49	2.66	41	7.1	-0.1	17.5	M
* 108	07/03/97	58.673	170.473	72	12	0.51	2.91	41	7.1	0.7	17.3	M
* 109	07/03/97	58.349	170.403	72	14	0.50	2.59	41	7.2	1.0	16.9	M
* 110	07/03/97	58.014	170.351	73	17	0.50	2.76	42	7.3	2.3	17.0	M
* 111	07/04/97	57.107	170.454	47	07	0.51	2.84	42	4.9	4.4	15.2	M
* 112	07/04/97	57.001	170.153	67	09	0.49	2.75	42	5.9	3.7	16.6	M
* 113	07/06/97	57.831	170.616	76	07	0.52	2.98	42	7.6	3.2	16.7	M
* 114	07/06/97	57.671	170.279	71	09	0.53	2.86	42	7.6	2.9	16.1	M
* 115	07/06/97	57.499	170.587	72	12	0.54	2.89	42	7.0	3.6	16.4	M
* 116	07/06/97	57.330	170.230	53	15	0.50	3.19	42	6.5	4.1	15.0	M
* 117	07/07/97	56.834	170.477	99	07	0.51	2.67	42	8.0	3.7	17.7	M
* 118	07/07/97	56.669	170.122	96	09	0.52	2.75	42	7.6	3.7	17.4	M
* 119	07/07/97	56.666	170.741	111	12	0.52	2.75	61	8.4	4.1	17.7	M
* 120	07/07/97	56.665	171.353	117	14	0.27	1.46	61	8.4	4.1	17.7	M
* 121	07/08/97	56.989	171.400	106	07	0.53	2.79	61		---	17.4	M
* 122	07/08/97	57.333	171.461	97	10	0.52	2.72	41	8.3	---	17.4	M
* 123	07/08/97	57.663	171.533	95	12	0.52	2.80	41	8.4	---	17.0	M
* 124	07/08/97	57.996	171.602	96	15	0.52	2.69	41	8.4	3.0	17.4	M
* 125	07/08/97	58.328	171.653	94	17	0.52	2.77	41	8.3	2.5	17.2	M
* 126	07/09/97	58.673	171.737	91	07	0.53	2.80	41	7.8	2.1	18.2	M
* 127	07/09/97	58.997	171.788	83	09	0.51	2.74	41	7.7	3.2	17.3	F
* 128	07/09/97	59.329	171.830	76	12	0.51	2.75	43	7.6	---	17.3	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	
*	129	07/09/97	59.663	171.894	76	14	0.52	2.79	43	7.7	-0.1	17.3	M
*	130	07/09/97	59.828	172.246	71	16	0.52	2.83	43	7.7	---	17.4	M
*	131	07/09/97	59.993	172.632	61	19	0.51	2.73	43	6.6	---	16.9	M
*	132	07/10/97	60.164	172.339	52	06	0.52	2.74	43	5.7	---	15.9	M
*	133	07/10/97	59.999	171.978	61	08	0.51	2.71	43	7.4	---	16.5	M
*	134	07/10/97	60.325	172.063	58	11	0.52	2.90	43	7.4	-1.0	16.2	M
*	135	07/10/97	60.662	172.119	60	14	0.51	2.71	41	6.9	-0.9	19.2	M
	136	07/10/97	60.998	172.181	63	16	0.50	2.79	41	9.3	-1.4	19.3	M
	137	07/10/97	60.996	171.506	59	19	0.50	2.72	41	9.4	-1.3	18.5	M
	138	07/11/97	60.999	172.801	64	06	0.51	2.66	41	7.3	-1.2	18.1	M
*	140	07/11/97	60.998	173.512	73	10	0.51	2.73	41	7.2	-0.8	19.3	M
*	141	07/11/97	61.004	174.167	81	13	0.51	2.82	41	7.2	1.1	17.5	M
*	142	07/11/97	60.676	174.140	85	16	0.50	2.72	41	7.3	1.2	18.5	M
*	143	07/11/97	60.343	174.070	88	18	0.53	2.78	43	7.9	1.2	17.7	M
*	145	07/12/97	60.130	173.750	86	09	0.51	2.81	43	7.7	0.9	17.9	M
*	146	07/12/97	60.010	173.942	95	10	0.51	2.78	43	7.9	1.5	18.1	M
*	147	07/12/97	59.834	174.240	106	12	0.53	2.79	62	8.2	2.0	18.4	M
*	148	07/12/97	59.670	173.880	103	14	0.51	2.76	62	8.5	2.0	18.1	M
*	149	07/12/97	59.501	173.509	101	17	0.51	2.77	43	8.7	1.9	18.0	M
*	150	07/13/97	59.335	173.140	99	07	0.52	2.77	43	8.2	1.7	18.3	M
*	151	07/13/97	59.335	173.790	109	09	0.53	2.87	62	8.0	2.1	18.0	M
*	152	07/13/97	59.337	174.432	119	12	0.52	2.73	62	8.4	2.2	17.8	M
*	153	07/13/97	59.334	175.087	131	15	0.53	2.84	61	8.6	2.7	18.3	M
*	154	07/13/97	59.007	175.004	128	18	0.53	2.80	61	8.8	2.8	18.1	M
*	155	07/14/97	58.999	174.355	125	07	0.54	2.88	61	8.7	3.0	17.7	M
*	156	07/14/97	58.671	174.273	154	10	0.51	2.71	61	8.7	3.4	17.7	M
*	157	07/14/97	58.340	174.325	178	13	0.50	2.73	61	8.9	3.8	18.1	M
*	158	07/14/97	58.336	173.587	114	15	0.55	2.90	61	9.0	3.3	17.8	M
*	160	07/14/97	57.973	173.491	117	20	0.52	2.84	61	9.4	3.7	18.4	M
*	161	07/15/97	57.675	173.412	145	07	0.54	2.78	61	8.8	4.0	18.7	M
*	162	07/15/97	57.342	173.330	117	09	0.50	2.51	61	9.1	4.1	17.9	F
*	163	07/15/97	57.006	173.267	139	12	0.53	2.77	61	9.3	4.1	18.2	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	
*	164	07/15/97	56.998	172.655	120	16	0.51	2.78	61	9.4	4.2	19.4	M
*	165	07/20/97	56.659	172.558	134	11	0.54	2.87	61	9.2	4.1	18.2	M
*	166	07/21/97	59.662	174.466	113	07	0.52	2.73	62	9.2	2.3	18.1	M
*	167	07/21/97	59.994	174.611	106	09	0.54	2.94	62	9.2	2.0	17.8	M
*	168	07/21/97	60.153	174.345	98	11	0.51	2.66	43	9.2	1.5	18.1	M
*	169	07/21/97	60.322	174.721	100	13	0.52	2.70	62	9.5	1.6	18.1	M
*	170	07/21/97	60.649	174.829	95	16	0.53	2.79	61	10.2	---	18.1	M
*	181	07/24/97	60.662	176.206	117	07	0.48	2.67	61	9.0	2.1	18.9	M
*	182	07/24/97	60.669	176.785	125	09	0.55	2.95	61	8.8	2.1	19.1	M
*	183	07/24/97	60.333	176.733	125	13	0.54	2.89	61	9.3	2.0	19.2	M
*	184	07/24/97	60.333	176.064	125	16	0.50	2.73	61	9.4	2.0	18.8	M
*	185	07/24/97	60.011	175.925	126	19	0.51	2.67	61	9.2	---	19.0	M
*	186	07/25/97	59.669	175.852	133	07	0.50	2.80	61	9.5	---	19.3	M
*	187	07/25/97	59.670	176.518	133	10	0.53	2.80	61	9.3	---	18.7	M
*	188	07/25/97	59.332	176.400	133	13	0.54	2.83	61	9.3	---	18.8	M
*	189	07/25/97	59.328	175.782	133	15	0.52	2.81	61	9.7	---	18.4	M
*	190	07/25/97	59.012	175.747	129	18	0.54	2.80	61	9.7	---	18.6	M
*	191	07/26/97	58.652	175.580	133	07	0.53	2.69	61	9.7	---	18.6	M
*	192	07/26/97	58.716	175.025	146	11	0.52	2.97	61	9.7	---	18.3	M

Appendix A Table 2--Haul data for stations sampled by the F/V *Aldebaran* during the 1997 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	06/07/97	57.363	158.395	28	09	0.52	2.68	10	5.6	4.7	14.2	M
* 2	06/07/97	57.662	158.337	30	12	0.52	3.18	10	5.9	5.3	15.0	M
* 3	06/07/97	57.992	158.314	32	14	0.52	3.36	10	7.1	5.7	15.7	M
* 4	06/08/97	58.339	159.552	23	06	0.53	2.83	10	5.9	5.8	14.9	M
* 5	06/08/97	58.010	159.608	38	08	0.53	3.23	10	4.4	4.1	15.7	M
* 6	06/08/97	57.675	159.636	46	11	0.52	3.04	10	3.8	3.3	15.6	M
* 7	06/08/97	57.341	159.668	52	13	0.51	2.83	10	5.1	3.8	14.9	M
* 8	06/08/97	57.009	159.721	53	16	0.54	2.95	10	7.9	3.8	15.3	M
* 9	06/09/97	56.681	159.760	35	06	0.50	2.79	10	7.2	5.2	13.6	M
* 10	06/09/97	56.665	160.364	55	08	0.53	2.90	31	7.6	3.6	14.7	M
* 11	06/09/97	56.667	160.972	64	11	0.51	2.77	31	8.0	3.0	14.9	M
* 12	06/09/97	56.990	160.950	60	13	0.51	2.79	31	8.8	2.6	14.8	M
* 13	06/09/97	57.323	160.935	59	16	0.52	2.84	31	9.4	2.6	14.9	M
* 14	06/10/97	57.661	160.880	56	06	0.53	2.97	31	7.2	2.7	15.7	M
* 15	06/10/97	57.989	160.855	44	09	0.53	3.01	10	5.4	3.9	15.7	M
* 16	06/10/97	58.318	160.751	21	11	0.54	2.80	10	10.4	9.8	14.3	M
* 17	06/10/97	58.343	162.046	45	16	0.53	2.99	10	7.4	4.5	15.5	M
* 18	06/11/97	58.014	162.119	35	06	0.51	2.79	10	5.4	4.5	14.4	F
* 19	06/11/97	57.676	162.141	46	08	0.53	3.01	10	4.9	3.3	15.5	M
* 20	06/11/97	57.343	162.159	50	11	0.53	3.01	10	6.4	2.8	15.5	M
* 21	06/11/97	57.012	162.170	59	13	0.53	2.94	31	8.1	1.7	16.4	M
* 22	06/11/97	56.678	162.186	70	16	0.52	2.91	31	8.4	1.3	15.8	M
* 23	06/12/97	56.340	162.205	79	06	0.33	1.76	31	8.2	2.4	14.5	M
* 24	06/12/97	56.009	162.239	69	08	0.51	2.90	31	7.6	3.1	15.6	M
* 25	06/12/97	55.681	162.849	52	11	0.51	2.80	10	7.6	3.3	14.5	M
* 26	06/12/97	55.346	163.425	53	15	0.51	2.83	31	7.4	3.4	14.6	M
* 27	06/13/97	55.655	163.400	80	06	0.53	2.89	31	7.8	2.6	16.3	M
* 28	06/13/97	55.995	163.385	87	08	0.52	2.77	31	8.4	2.4	15.5	M
* 30	06/13/97	56.346	163.402	83	12	0.52	2.83	31	8.7	1.5	16.4	M
* 31	06/13/97	56.659	163.387	74	14	0.53	2.93	31	8.9	1.5	16.3	M
* 32	06/13/97	56.989	163.381	65	17	0.51	2.73	31	8.3	1.0	15.7	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
*	33	06/14/97	57.320	163.380	53	06	0.51	2.77	10	6.8	2.3	15.6	M
*	34	06/14/97	57.655	163.369	46	08	0.52	2.82	10	7.0	2.6	14.8	M
*	35	06/14/97	57.989	163.370	42	11	0.53	2.88	10	6.5	3.2	15.5	M
*	36	06/14/97	58.321	163.372	36	13	0.51	2.81	10	5.5	4.5	15.0	M
*	37	06/14/97	58.657	163.350	30	15	0.52	2.61	10	6.5	4.8	14.9	M
*	38	06/15/97	58.985	163.349	21	06	0.54	2.51	10	8.6	6.6	13.4	M
*	39	06/15/97	58.990	164.650	26	10	0.52	2.53	10	7.5	5.9	14.6	M
*	40	06/15/97	59.319	164.651	15	13	0.54	2.57	10	9.9	8.5	14.6	M
*	41	06/15/97	59.641	165.964	23	17	0.53	3.09	20	7.9	6.3	14.6	M
*	42	06/17/97	58.687	164.664	36	06	0.52	2.83	10	8.0	4.9	14.9	M
*	43	06/17/97	58.341	164.637	43	08	0.53	2.87	10	7.4	3.2	15.5	M
*	44	06/17/97	58.004	164.620	44	11	0.53	2.97	10	8.6	2.7	15.2	M
*	45	06/17/97	57.675	164.620	50	13	0.52	2.90	10	7.9	2.4	15.4	M
*	46	06/17/97	57.346	164.617	65	16	0.52	2.88	31	8.6	1.0	16.2	M
*	47	06/18/97	57.015	164.595	69	06	0.52	2.81	31	8.0	1.0	16.1	M
*	48	06/18/97	56.678	164.599	74	08	0.53	2.98	31	7.9	1.1	16.8	M
*	49	06/18/97	56.312	164.588	86	11	0.49	2.88	31	9.0	2.0	16.3	M
*	50	06/18/97	56.007	164.580	91	13	0.54	3.02	31	8.6	2.3	16.8	M
*	51	06/18/97	55.696	164.613	95	16	0.50	2.67	31	8.2	4.0	15.8	M
*	52	06/19/97	55.364	164.584	101	06	0.50	2.71	31	6.9	5.0	16.2	M
*	53	06/19/97	55.019	164.591	61	08	0.53	3.01	31	7.2	5.0	15.6	M
*	54	06/19/97	54.695	165.154	83	11	0.52	2.88	31	7.6	5.5	15.7	M
*	55	06/20/97	54.984	165.747	129	06	0.48	2.75	50	7.7	4.5	17.3	M
*	56	06/20/97	55.326	165.775	119	08	0.48	2.65	50	8.3	4.0	18.2	M
*	57	06/20/97	55.657	165.805	116	11	0.51	2.72	50	8.7	4.1	17.8	M
*	58	06/20/97	55.989	165.786	106	13	0.52	2.83	31	9.0	2.2	17.9	M
*	59	06/20/97	56.321	165.805	91	16	0.54	2.89	31	9.0	1.8	15.9	M
*	60	06/21/97	56.643	165.835	78	06	0.54	2.94	31	8.7	1.5	16.3	M
*	61	06/21/97	56.988	165.852	72	08	0.53	2.84	31	8.8	0.9	15.8	M
*	62	06/21/97	57.322	165.871	67	11	0.51	2.76	31	8.5	1.0	15.2	M
*	63	06/21/97	57.656	165.894	63	13	0.52	2.82	31	8.5	1.0	15.6	M
*	64	06/21/97	57.990	165.906	55	16	0.54	3.04	10	8.3	1.7	15.8	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	06/22/97	58.310	165.911	43	06	0.53	2.92	10	7.4	3.0	15.5	M
* 66	06/22/97	58.350	167.185	51	10	0.52	2.89	20	6.7	1.8	15.3	M
* 67	06/22/97	58.011	167.172	63	12	0.52	2.89	31	7.3	0.8	16.0	M
* 68	06/22/97	57.679	167.142	66	15	0.52	2.88	31	7.2	1.0	15.7	M
* 69	06/23/97	57.321	167.118	70	06	0.52	2.72	31	7.4	1.5	16.2	M
* 70	06/23/97	57.013	167.134	73	08	0.53	2.94	31	8.0	1.9	16.1	M
* 71	06/23/97	56.679	167.069	95	11	0.53	2.96	31	8.3	1.9	15.9	M
* 72	06/23/97	56.342	167.038	112	13	0.53	3.01	50	8.6	2.1	17.3	M
* 73	06/23/97	56.008	167.011	133	16	0.48	2.74	50	8.1	3.6	18.2	M
* 74	06/24/97	55.681	167.011	134	06	0.52	2.85	50	7.9	3.7	18.3	M
* 75	06/24/97	55.344	166.964	139	09	0.48	2.70	50	7.3	3.9	18.4	M
* 76	06/24/97	55.012	166.929	154	11	0.51	2.85	50	8.0	4.0	18.2	M
* 77	06/27/97	55.993	168.221	149	11	0.53	2.93	50	8.0	4.2	17.0	M
* 78	06/27/97	56.354	168.258	149	15	0.55	3.00	50	8.4	4.0	17.4	M
* 79	06/28/97	56.658	168.276	102	06	0.51	2.70	50	8.6	3.0	17.2	M
* 80	06/28/97	56.819	168.620	92	08	0.54	2.92	32	8.3	3.1	17.0	M
* 81	06/28/97	56.991	168.343	76	10	0.53	2.91	32	8.3	2.8	16.5	M
* 82	06/28/97	57.158	168.630	72	12	0.54	3.11	32	8.2	2.6	14.5	M
* 83	06/28/97	57.319	168.368	70	14	0.54	2.99	32	7.9	2.4	16.3	M
* 84	06/28/97	57.485	168.745	68	16	0.35	1.91	42	7.8	2.1	16.0	M
* 85	06/29/97	57.654	168.406	67	06	0.51	2.78	42	7.2	1.9	14.9	M
* 86	06/29/97	57.820	168.730	66	08	0.51	2.77	42	7.2	1.3	15.7	M
* 87	06/29/97	57.985	168.434	65	10	0.51	2.85	42	7.2	1.0	16.1	M
* 88	06/29/97	58.325	168.471	61	12	0.51	2.70	41	6.3	1.0	16.2	M
* 89	06/29/97	58.658	168.498	50	15	0.51	2.88	20	5.5	2.2	15.8	M
* 90	06/30/97	58.677	167.845	43	06	0.53	2.95	20	4.4	3.5	15.7	M
* 91	06/30/97	58.667	167.245	40	08	0.53	2.91	20	4.9	4.4	15.6	M
* 92	06/30/97	58.668	166.594	38	11	0.53	2.85	20	6.9	4.3	15.4	M
* 93	06/30/97	58.669	165.965	33	13	0.51	2.80	10	6.9	6.2	14.8	M
* 94	06/30/97	58.989	165.931	27	16	0.53	2.87	20	7.0	6.3	13.1	M
* 95	07/01/97	59.665	167.254	29	06	0.53	2.87	20	6.4	5.4	14.7	M
* 96	07/01/97	59.667	167.923	32	08	0.51	2.80	20	4.9	3.6	13.8	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	07/01/97	59.984	167.983	22	11	0.53	2.78	20	5.6	5.6	14.4	M
* 98	07/01/97	60.317	167.986	27	13	0.52	2.92	20	6.8	6.4	15.2	M
* 99	07/01/97	60.333	167.285	26	16	0.52	2.90	20	8.2	6.8	14.7	M
* 100	07/02/97	60.335	168.651	33	06	0.51	2.77	20	4.5	4.1	14.7	M
* 101	07/02/97	60.333	169.302	40	08	0.53	2.89	20	7.1	0.3	15.6	M
* 102	07/02/97	60.336	170.008	48	11	0.51	2.82	20	7.2	-0.3	16.3	M
* 103	07/02/97	60.015	169.968	50	13	0.51	2.82	41	7.3	-0.1	15.9	M
* 104	07/02/97	59.681	169.919	53	16	0.53	2.86	41	7.1	0.5	16.2	M
* 105	07/03/97	59.346	169.869	57	06	0.53	2.88	41	7.0	-0.3	16.9	M
* 106	07/03/97	59.011	169.837	60	08	0.53	2.94	41	7.1	-0.1	16.9	M
* 107	07/03/97	58.682	169.781	63	11	0.52	2.89	41	7.3	0.3	16.9	M
* 108	07/03/97	58.348	169.735	65	13	0.52	2.94	41	7.5	0.7	17.0	M
* 109	07/03/97	58.016	169.698	66	16	0.52	2.72	42	7.7	1.1	16.6	M
* 110	07/04/97	56.988	169.544	57	06	0.53	2.90	42	6.6	2.8	15.9	M
* 111	07/04/97	57.140	169.879	49	08	0.50	2.74	42	5.3	4.7	15.3	M
* 112	07/06/97	57.844	169.979	68	06	0.57	3.25	42	8.1	2.1	16.5	M
* 113	07/06/97	57.670	169.649	67	09	0.55	3.33	42	8.2	1.3	16.1	M
* 114	07/06/97	57.513	169.967	65	11	0.52	2.86	42	7.7	2.5	15.7	M
* 115	07/06/97	57.339	169.600	58	14	0.42	2.43	42	8.8	2.0	15.9	M
* 116	07/07/97	56.838	169.894	69	06	0.53	2.81	42	7.1	4.9	15.7	M
* 117	07/07/97	56.680	169.518	76	09	0.45	2.48	32	7.6	5.1	16.3	M
* 118	07/07/97	56.334	169.469	142	12	0.54	2.91	50	9.2	3.9	17.6	M
* 119	07/07/97	56.334	170.070	105	14	0.54	2.93	50	8.7	4.0	17.3	M
* 120	07/07/97	56.333	170.651	116	17	0.45	2.44	61	8.4	4.3	16.8	M
* 121	07/08/97	56.997	170.785	91	06	0.56	2.97	42	8.4	3.9	17.1	M
* 122	07/08/97	57.330	170.844	79	09	0.36	1.99	42	8.3	3.8	16.7	M
* 123	07/08/97	57.654	170.893	82	11	0.53	2.90	42	8.4	3.6	16.9	M
* 124	07/08/97	57.990	170.969	82	14	0.53	2.89	42	8.3	2.9	17.2	M
* 125	07/08/97	58.314	171.022	80	16	0.53	2.79	41	8.6	2.6	16.9	M
* 126	07/09/97	58.645	171.087	79	06	0.43	2.39	41	7.9	2.0	16.7	M
* 127	07/09/97	58.973	171.137	74	09	0.53	2.96	41	8.0	0.8	16.9	M
* 128	07/09/97	59.310	171.182	72	11	0.53	2.95	41	8.1	0.2	16.9	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
* 129	07/09/97	59.657	171.260	69	14	0.53	2.95	41	8.3	-0.1	16.7	M
* 130	07/09/97	59.976	171.301	65	16	0.52	2.91	41	7.9	-1.0	16.6	M
* 131	07/10/97	59.661	170.586	63	06	0.52	2.80	41	7.5	-0.1	16.8	M
* 132	07/10/97	59.981	170.625	61	09	0.52	2.93	41	7.8	-0.5	17.0	M
* 133	07/10/97	60.314	170.657	58	11	0.52	3.05	41	7.8	-1.1	16.9	M
* 134	07/10/97	60.335	171.306	63	14	0.52	2.80	41	8.2	-1.2	18.0	M
* 135	07/10/97	60.650	171.422	60	16	0.52	2.98	41	9.8	-1.2	18.6	M
* 136	07/11/97	60.657	172.763	40	06	0.53	2.91	41	9.4	3.1	15.2	M
* 137	07/11/97	60.670	173.434	61	09	0.53	2.84	41	7.0	1.0	16.6	M
* 138	07/11/97	60.443	173.454	58	12	0.33	2.03	43	7.5	---	16.1	F
* 139	07/11/97	60.173	173.020	56	14	0.39	2.08	43	7.7	0.5	16.3	M
* 140	07/11/97	59.998	173.252	71	16	0.52	2.96	43	8.2	0.7	16.3	M
* 141	07/12/97	59.850	173.589	90	06	0.44	2.45	43	8.1	1.7	16.6	M
* 143	07/12/97	59.845	172.917	76	10	0.53	2.94	43	8.0	0.9	16.0	M
* 144	07/12/97	59.683	173.225	90	12	0.28	1.54	43	8.2	1.1	16.4	M
* 145	07/12/97	59.509	172.905	90	14	0.16	1.06	43	8.5	1.8	17.8	M
* 146	07/12/97	59.684	172.590	81	16	0.52	2.85	43	8.7	0.6	16.1	M
* 147	07/13/97	59.345	172.500	86	07	0.30	1.66	43	8.3	---	16.3	M
* 148	07/13/97	59.020	172.432	95	09	0.50	2.78	41	8.5	2.2	18.5	M
* 149	07/13/97	59.016	173.064	102	11	0.35	1.94	61	8.9	2.2	16.1	M
* 150	07/13/97	59.007	173.708	113	14	0.53	2.87	61	8.9	2.9	16.4	M
* 151	07/13/97	58.690	173.638	122	16	0.55	2.99	61	8.3	3.1	16.3	M
* 152	07/14/97	58.679	172.372	98	07	0.50	2.77	61	8.9	2.8	18.4	M
* 153	07/14/97	58.667	172.982	108	09	0.54	2.99	61	9.2	2.7	16.4	M
* 154	07/14/97	58.363	172.935	105	12	0.53	3.00	61	9.4	2.8	16.2	M
* 155	07/14/97	58.346	172.314	99	15	0.52	2.81	61	9.6	3.0	15.7	M
* 156	07/14/97	58.025	172.236	100	17	0.52	2.78	61	9.9	3.3	16.5	M
* 157	07/15/97	58.002	172.873	104	07	0.27	1.55	61	9.2	3.2	16.4	M
* 158	07/15/97	57.692	172.806	114	09	0.54	2.92	61	9.3	4.0	17.6	M
* 159	07/15/97	57.670	172.213	104	11	0.30	1.66	61	9.4	3.8	17.1	M
* 160	07/15/97	57.349	172.096	104	14	0.54	2.99	61	9.6	4.0	17.6	M
* 161	07/15/97	57.335	172.616	111	16	0.32	1.98	61	9.5	4.1	17.4	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
*	162	07/20/97	56.632	171.883	123	09	0.51	2.82	61	9.0	4.4	17.4	M
*	163	07/20/97	56.970	172.036	113	12	0.53	2.54	61	9.8	4.3	15.7	M
*	164	07/21/97	59.639	175.068	121	07	0.54	2.93	61	9.5	2.6	16.8	M
*	165	07/21/97	59.998	175.262	113	10	0.52	2.76	61	9.1	2.3	16.8	M
*	166	07/21/97	60.307	175.381	107	12	0.54	3.05	61	9.7	2.2	16.7	M
*	167	07/21/97	60.666	175.457	102	15	0.54	2.89	61	10.0	1.9	16.5	M
*	178	07/23/97	60.683	177.503	141	20	0.49	2.59	61	9.3	2.3	16.4	M
*	179	07/24/97	60.672	178.176	156	07	0.53	2.84	61	9.1	3.2	18.1	M
*	180	07/24/97	60.336	177.396	142	11	0.53	2.85	61	9.3	2.5	17.3	M
*	181	07/24/97	60.012	177.939	137	15	0.52	2.74	61	9.3	2.4	17.5	M
*	182	07/24/97	60.001	177.260	132	17	0.53	2.85	61	9.4	2.8	17.4	M
*	183	07/25/97	60.015	176.738	137	07	0.54	2.77	61	9.4	2.5	17.2	M
*	184	07/25/97	59.683	177.148	165	10	0.48	2.74	61	9.5	3.0	17.6	M
*	185	07/25/97	59.354	177.060	145	12	0.52	2.97	61	9.5	3.3	17.1	M
*	186	07/25/97	59.028	176.961	134	15	0.52	2.89	61	9.5	3.3	16.8	M
*	187	07/25/97	58.998	177.562	130	17	0.51	2.78	61	9.5	3.4	17.5	M



## APPENDIX B

## List of Species Encountered

Appendix B contains a listing of all fish and invertebrate species taken during the 1997 eastern Bering Sea bottom trawl survey.

## List of Tables

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B-1. Fish species encountered.....	106
B-2. Invertebrate species encountered.....	109

Appendix B Table 1.--Fish species encountered during the 1997 U.S. eastern Bering Sea bottom trawl survey.

Family	Scientific name	Common name
Squalidae	<i>Squalus acanthias</i>	spiny dogfish
Rajidae	Rajidae unident.	skate unident.
	<i>Bathyraja interrupta</i>	Bering skate
	<i>Bathyraja parmifera</i>	Alaska skate
	<i>Bathyraja aleutica</i>	Aleutian 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 elassodon</i>	flathead sole
	<i>Hippoglossoides robustus</i>	Bering flounder
	<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</i> sp. cf. <i>bilineata</i>	northern rock sole
	<i>Lepidopsetta bilineata</i>	southern rock sole
	<i>Isopsetta isolepis</i>	butter sole
<i>Pleuronectes quadrituberculatus</i>	Alaska plaice	
Agonidae	Agonidae	poacher unident.
	<i>Sarritor frenatus</i>	sawback poacher
	<i>Bathyagonus infraspinus</i>	spinycheek starsnout
	<i>Podothecus acipenserinus</i>	sturgeon poacher
	<i>Aspidophoroides bartoni</i>	Aleutian alligatorfish
	<i>Ocella dodecaedron</i>	Bering poacher
Ammodytidae	<i>Ammodytes hexapterus</i>	Pacific sand lance

Appendix B Table 1.--Continued.

Family	Scientific name	Common name
Anarhichadidae	<i>Anarhichas orientalis</i>	Bering wolffish
Anoplopomatidae	<i>Anoplopoma fimbria</i>	sablefish
Aulorhynchidae	<i>Aulorhynchus flavidus</i>	tube-snout
Bathymasteridae	<i>Bathymaster signatus</i>	searcher
Clupeidae	<i>Clupea pallasii</i>	Pacific herring
Cottidae	Cottidae	sculpin unident.
	<i>Gymnocanthus</i> sp.	
	<i>Gymnocanthus pistilliger</i>	threaded sculpin
	<i>Gymnocanthus tricuspis</i>	Arctic staghorn sculpin
	<i>Gymnocanthus galeatus</i>	armorhead sculpin
	<i>Malacocottus</i> sp.	
	<i>Malacocottus zonurus</i>	darkfin sculpin
	<i>Hemilepidotus hemilepidotus</i>	red Irish lord
	<i>Hemilepidotus jordani</i>	yellow Irish lord
	<i>Hemilepidotus papilio</i>	butterfly sculpin
	<i>Triglops</i> sp.	
	<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
	<i>Dasycottus setiger</i>	spinyhead sculpin
	<i>Psychrolutes paradoxus</i>	tadpole sculpin
	<i>Nautichthys pribilovius</i>	eyeshade sculpin
	<i>Hemitriperus bolini</i>	bigmouth sculpin
	<i>Icelus spiniger</i>	thorny sculpin
	<i>Icelus</i> sp.	
Trichodontidae	<i>Trichodon trichodon</i>	Pacific sandfish

Family	Scientific name	Common name
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	Hexagrammidae	greenling unident.
	<i>Pleurogrammus monopterygius</i>	Atka mackerel
	<i>Hexagrammos stelleri</i>	whitespotted greenling
	<i>Hexagrammos decagrammus</i>	kelp greenling
Cyclopteridae	Liparidinae	snailfish unident.
	<i>Liparis</i> sp.	
	<i>Liparis dennyi</i>	marbled snailfish
	<i>Liparis gibbus</i>	dusky snailfish
	<i>Elassodiscus</i> sp.	
	<i>Careproctus</i> sp.	
	<i>Careproctus phasma</i>	monster snailfish
Myctophidae	<i>Lampanyctus</i> sp.	
Osmeridae	<i>Thaleichthys pacificus</i>	eulachon
	<i>Mallotus villosus</i>	capelin
	<i>Osmerus mordax</i>	rainbow smelt
Stichaeidae	<i>Lumpenus maculatus</i>	daubed shanny
	<i>Lumpenus fabricii</i>	slender eelblenny
	<i>Lumpenus sagitta</i>	snake prickleback
	<i>Poroclinus rothrocki</i>	whitebarred prickleback
Zaproridae	<i>Zaprora silenus</i>	prowfish
Zoarcidae	<i>Lycodes raridens</i>	marbled eelpout
	<i>Lycodes palearis</i>	wattled eelpout
	<i>Lycodes brevipes</i>	shortfin eelpout
Scorpaenidae	<i>Sebastes aleutianus</i>	rougheye rockfish
	<i>Sebastes alutus</i>	Pacific ocean perch

## Appendix B Table 1.--Continued.

Family	Scientific name	Common name
	<i>Sebastes ciliatus</i>	dusky rockfish
	<i>Sebastes polyspinis</i>	northern rockfish

Appendix B Table 2.--Invertebrate species encountered during the 1997 U.S. eastern Bering Sea bottom trawl survey.

Phylum	Species name	Common name
Cnidaria	Scyphozoa (class)	jellyfish unident.
	<i>Gersemia</i> sp.	sea raspberry
	Pennatulacea (order)	sea pen or sea whip unident.
	<i>Stylatula</i> sp.	slender seawhip
	Actinaria (order)	sea anemone unident.
	<i>Metridium</i> sp.	
	<i>Tealia</i> sp.	
	<i>Tealia crassicornis</i>	
	Annelida	Polychaeta (class)
Aphroditidae		sea mouse unident.
Polynoidae		scale worm unident.
<i>Eunoe</i> sp.		
<i>Eunoe nodosa</i>		giant scale worm
<i>Eunoe depressa</i>		depressed scale worm
Hirudinea unident.		leech unident.
Arthropoda		Thoracica (order)
	<i>Balanus evermanni</i>	giant barnacle
	Pandalidae	pandalid shrimp unident.
	<i>Pandalus</i> sp.	
	<i>Pandalus borealis</i>	northern shrimp
	<i>Pandalus goniurus</i>	humpy shrimp
	<i>Eualus</i> sp.	
	<i>Crangon</i> sp.	
	<i>Crangon communis</i>	twospine crangon
	<i>Crangon septemspinosa</i>	sevenspine bay shrimp
	<i>Argis</i> sp.	
<i>Argis dentata</i>	Arctic argid	

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Argis lar</i>	kuro argid
	<i>Cancer oregonensis</i>	Oregon rock crab
	<i>Oregonia gracilis</i>	graceful decorator crab
	<i>Chionoecetes</i> sp.	tanner crab unident.
	<i>Chionoecetes bairdi</i>	Tanner crab
	<i>Hyas coarctatus</i>	circumboreal toad crab
	<i>Hyas lyratus</i>	Pacific lyre crab
	<i>Chionoecetes opilio</i>	narrow 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>Pagurus rathbuni</i>	longfinger hermit
	<i>Elassochirus tenuimanus</i>	widehand hermit crab
	<i>Pagurus capillatus</i>	hairy hermit crab
	<i>Lithodes aequispina</i>	golden king crab
	<i>Hapalogaster grebnitzkii</i>	
	<i>Paralithodes camtschaticus</i>	red king crab
	<i>Paralithodes platypus</i>	blue king crab
	<i>Erimacrus isenbeckii</i>	horsehair crab
Mollusca	Gastropod unident.	snail unident.
	<i>Natica</i> sp.	
	<i>Natica clausa</i>	Arctic moonsnail

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Natica aleutica</i>	
	<i>Natica russa</i>	rusty moonsnail
	<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 spitzbergensis</i>	thick-ribbed whelk
	<i>Colus halli</i>	
	<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>	
	<i>Volutopsius stefanssoni</i>	shouldered whelk
	<i>Volutopsius middendorffi</i>	tulip whelk
	<i>Beringius</i> sp.	
	<i>Beringius kennicottii</i>	
	<i>Beringius frielei</i>	
	<i>Beringius beringii</i>	
	<i>Beringius stimpsoni</i>	
	<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



## Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Plicifusus</i> sp.	
	<i>Plicifusus kroyeri</i>	
	<i>Aforia</i> sp.	
	<i>Aforia goodei</i>	
	<i>Aforia circinata</i>	keeled aforia
	<i>Boreotrophon</i> sp.	
	<i>Fusitriton oregonensis</i>	Oregon triton
	<i>Buccinum</i> sp.	
	<i>Buccinum angulosum</i>	
	<i>Buccinum plectrum</i>	sinuous whelk
	<i>Buccinum scalariforme</i>	ladder whelk
	<i>Buccinum polare</i>	polar whelk
	<i>Arctomelon stearnsii</i>	Alaska volute
	<i>Cylichna alba</i>	white chalice-bubble
	Pelecypoda unident.	bivalve unident.
	Mytilidae	mussel unident.
	<i>Mytilus</i> sp.	
	<i>Mytilus edulis</i>	blue mussel
	Pectinid unident.	scallop unident.
	<i>Chlamys</i> sp.	
	<i>Chlamys rubida</i>	reddish scallop
	<i>Patinopecten caurinus</i>	weathervane scallop
	<i>Hiatella arctica</i>	Arctic hiatella
	<i>Yoldia</i> sp.	
	<i>Nuculana</i> sp.	
	<i>Musculus</i> sp.	
	<i>Musculus niger</i>	black mussel
	<i>Musculus discors</i>	discordant mussel

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Astarte</i> sp.	
	<i>Cardita</i> sp.	
	<i>Cyclocardia crebricostata</i>	many-rib cyclocardia
	<i>Cyclocardia</i> sp.	
	<i>Kellia laperousii</i>	La Perouse kellyclam
	<i>Clinocardium</i> sp.	
	<i>Clinocardium ciliatum</i>	hairy cockle
	<i>Mactromeris</i> sp.	
	<i>Mactromeris polynyma</i>	Arctic surfclam
	<i>Tellina lutea</i>	Alaska great-tellin
	<i>Macoma</i> sp.	
	<i>Macoma calcarea</i>	chalky macoma
	<i>Siliqua</i> sp.	
	<i>Siliqua patula</i>	Pacific razor
	<i>Siliqua alta</i>	Alaska razor
	<i>Serripes</i> sp.	
	<i>Serripes groenlandicus</i>	Greenland cockle
	<i>Serripes laperousii</i>	broad cockle
	<i>Mya elegans</i>	elegant soft shell
	<i>Pododesmus macroschisma</i>	Alaska falsejingle
	<i>Pododesmus</i> sp.	
	<i>Rossia pacifica</i>	eastern Pacific bobtail
Echinodermata	<i>Evasterias</i> sp.	
	<i>Evasterias troschelii</i>	
	<i>Evasterias echinosoma</i>	
	<i>Leptasterias groenlandica</i>	
	<i>Pycnopodia helianthoides</i>	
	<i>Lethasterias nanimensis</i>	

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Henricia</i> sp.	
	<i>Henricia tumida</i>	
	<i>Leptasterias polaris</i>	
	<i>Leptasterias arctica</i>	
	<i>Leptasterias</i> sp.	
	<i>Hippasteria spinosa</i>	
	<i>Pseudarchaster parelii</i>	
	<i>Ceramaster</i> sp.	
	<i>Ceramaster japonicus</i>	red bat star
	<i>Ceramaster patagonicus</i>	orange bat star
	<i>Dermasterias imbricata</i>	
	<i>Solaster</i> sp.	
	<i>Solaster dawsoni</i>	
	<i>Crossaster</i> sp.	
	<i>Crossaster papposus</i>	rose sea star
	<i>Pteraster</i> sp.	
	<i>Pteraster tessellatus</i>	
	<i>Pteraster obscurus</i>	
	<i>Diplopteraster multipes</i>	
	<i>Asterias amurensis</i>	purple-orange seastar
	<i>Ctenodiscus</i> sp.	
	<i>Ctenodiscus crispatus</i>	common mud star
	<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>	
	<i>Ophiura sarsi</i>	

Appendix B Table 2.--Continued.

Phylum	Species name	Common name
	<i>Ophiopholis</i> sp.	
	<i>Ophiopholis aculeata</i>	
	Holothuroidea unident.	sea cucumber unident.
	<i>Cucumaria</i> sp.	
	<i>Cucumaria fallax</i>	
	<i>Psolus</i> sp.	
Porifera	Porifera	sponge unident.
	<i>Halichondria panicea</i>	barrel sponge
Rhynchocoela	Nemertea (phylum)	nemertean worm unident.
Sipuncula	Sipuncula (phylum)	sipunculid worm unident.
Bryozoa	<i>Eucratea loricata</i>	feathery bryozoan
	<i>Flustra serrulata</i>	leafy bryozoan
	<i>Porella compressa</i>	flattened bryozoan
	<i>Rhaphostomella costata</i>	ribbed bryozoan
Chordata	Ascidian unident.	tunicate unident.
	<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.	
	<i>Synoicum</i> sp.	
	<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 1997 eastern Bering Sea bottom trawl survey by descending CPUE (kg/ha).

Appendix C Table 1.--Rank of fish and invertebrate taxa by unweighted total CPUE (kg/ha) from the 1997 eastern Bering Sea bottom trawl survey.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
1	21740	74.26174	84.609	56.23303	92.29046	0.21441159	0.21441159	Theragra chalcogramma
2	10261	60.13986	25.782	50.18781	70.09191	0.17363830	0.38804989	Lepidopsetta sp.
3	10210	46.22062	13.483	39.02354	53.41770	0.13345008	0.52149997	Limanda aspera
4	81742	27.92363	6.485	22.93246	32.91480	0.08062226	0.60212223	Asterias amurensis
5	10129	15.99649	10.918	9.52011	22.47286	0.04618572	0.64830794	Hippoglossoides sp.
6	10285	14.06669	2.544	10.94059	17.19279	0.04061393	0.68892187	Pleuronectes quadrituberculatus
7	21720	13.24460	1.911	10.53529	15.95392	0.03824037	0.72716224	Gadus macrocephalus
8	68580	10.22726	0.765	8.51342	11.94111	0.02952858	0.75669082	Chionoecetes opilio
9	10110	9.14238	1.805	6.50935	11.77541	0.02639625	0.78308708	Atheresthes stomias
10	400	8.56924	0.372	7.37300	9.76547	0.02474145	0.80782853	Rajidae unident.
11	91000	8.15056	12.919	1.10567	15.19546	0.02353265	0.83136118	Porifera
12	98082	6.29263	2.169	3.40588	9.17938	0.01816834	0.84952952	Styela rustica
13	69010	6.21104	0.509	4.81225	7.60983	0.01793277	0.86746229	Paguridae
14	40500	4.44444	0.231	3.50203	5.38684	0.01283216	0.88029445	Scyphozoa (class)
15	21375	3.41630	0.186	2.57202	4.26058	0.00986368	0.89015813	Myoxocephalus sp.
16	10120	3.20026	0.069	2.68551	3.71502	0.00923993	0.89939806	Hippoglossus stenolepis
17	83020	2.89537	0.150	2.13712	3.65362	0.00835963	0.90775769	Gorgonocephalus eucnemis
18	71884	2.59542	0.124	1.90467	3.28616	0.00749359	0.91525128	Neptunea heros
19	71820	2.50392	0.148	1.75045	3.25738	0.00722941	0.92248069	Neptunea pribiloffensis
20	69322	1.70701	0.123	1.01956	2.39445	0.00492854	0.92740923	Paralithodes camtschaticus
21	69060	1.48053	0.086	0.90463	2.05643	0.00427465	0.93168388	Pagurus aleuticus
22	98205	1.32033	0.227	0.38638	2.25427	0.00381210	0.93549598	Halocynthia aurantium
23	43000	1.25306	0.193	0.39131	2.11480	0.00361788	0.93911386	Actiniaria (order)
24	71882	1.18763	0.025	0.88053	1.49473	0.00342897	0.94254283	Neptunea ventricosa
25	83010	1.17784	0.493	0.00000	2.55363	0.00340071	0.94594354	Basketstarfish unident.
26	80590	0.97995	0.033	0.62630	1.33360	0.00282935	0.94877289	Leptasterias polaris
27	10220	0.85783	0.041	0.45962	1.25605	0.00247677	0.95124966	Platichthys stellatus
28	71870	0.80302	0.027	0.47915	1.12688	0.00231850	0.95356817	Neptunea lyrata
29	21110	0.76185	0.099	0.14543	1.37828	0.00219966	0.95576782	Clupea pallasii
30	21347	0.72026	0.043	0.31389	1.12663	0.00207957	0.95784740	Hemilepidotus jordani
31	69035	0.69506	0.040	0.30117	1.08895	0.00200680	0.95985419	Pagurus sp.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
32	21420	0.66437	0.014	0.43371	0.89502	0.00191818	0.96177238	Hemitripterus bolini
33	10115	0.60112	0.017	0.34552	0.85672	0.00173558	0.96350795	Reinhardtius hippoglossoides
34	81780	0.59602	0.069	0.08192	1.11012	0.00172086	0.96522881	Ctenodiscus crispatus
35	69323	0.52920	0.013	0.30165	0.75675	0.00152792	0.96675673	Paralithodes platypus
36	20040	0.50673	0.006	0.35839	0.65507	0.00146305	0.96821978	Podothecus acipenserinus
37	68560	0.42826	0.002	0.33282	0.52370	0.00123649	0.96945627	Chionoecetes bairdi
38	30060	0.41551	0.172	0.00000	1.22753	0.00119967	0.97065594	Sebastes alutus
39	98105	0.41376	0.018	0.14857	0.67895	0.00119462	0.97185056	Boltenia ovifera
40	10112	0.39091	0.002	0.29291	0.48890	0.00112864	0.97297921	Atheresthes evermanni
41	68577	0.38141	0.012	0.16474	0.59809	0.00110123	0.97408044	Hyas coarctatus
42	10211	0.37774	0.007	0.21200	0.54347	0.00109062	0.97517106	Limanda proboscidea
43	80200	0.34449	0.006	0.18961	0.49937	0.00099463	0.97616568	Lethasterias nanimensis
44	98310	0.33956	0.008	0.16009	0.51904	0.00098040	0.97714608	Aplidium sp.
45	95000	0.32659	0.099	0.00000	0.94464	0.00094295	0.97808903	bryozoan unident.
46	72500	0.31690	0.004	0.19936	0.43443	0.00091496	0.97900399	Fusitriton oregonensis
47	83000	0.31072	0.024	0.00723	0.61422	0.00089713	0.97990112	Ophiuroid unident.
48	41201	0.27550	0.003	0.16424	0.38676	0.00079544	0.98069656	Gersemia sp.
49	74120	0.26600	0.053	0.00000	0.71755	0.00076801	0.98146457	Patinopecten caurinus
50	71001	0.23822	0.002	0.15338	0.32307	0.00068781	0.98215238	snail (gastropod) eggs
51	69070	0.23684	0.008	0.06018	0.41349	0.00068381	0.98283619	Pagurus confragosus
52	24191	0.22668	0.003	0.12662	0.32674	0.00065448	0.98349067	Lycodes brevipes
53	83320	0.22374	0.009	0.03459	0.41290	0.00064601	0.98413668	Ophiura sarsi
54	98100	0.20765	0.008	0.03017	0.38513	0.00059954	0.98473622	Boltenia sp.
55	69090	0.20136	0.001	0.13483	0.26789	0.00058137	0.98531759	Pagurus ochotensis
56	85200	0.19357	0.029	0.00000	0.52452	0.00055888	0.98587647	Cucumaria sp.
57	71753	0.19045	0.005	0.05350	0.32740	0.00054987	0.98642634	Pyrulofusus deformis
58	69120	0.17950	0.002	0.08969	0.26932	0.00051827	0.98694462	Pagurus capillatus
59	71500	0.17554	0.002	0.09477	0.25631	0.00050683	0.98745144	Gastropod unident.
60	98200	0.17297	0.011	0.00000	0.38265	0.00049941	0.98795085	Halocynthia sp.
61	24185	0.16346	0.001	0.11249	0.21443	0.00047194	0.98842279	Lycodes palearis
62	10200	0.15814	0.002	0.06818	0.24810	0.00045658	0.98887937	Glyptocephalus zachirus
63	20720	0.15285	0.006	0.00000	0.30862	0.00044132	0.98932069	Bathymaster signatus

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
64	72755	0.14916	0.001	0.08300	0.21533	0.00043067	0.98975136	Buccinum polare
65	21735	0.14568	0.008	0.00000	0.31581	0.00042061	0.99017196	Eleginus gracilis
66	80020	0.14099	0.004	0.01788	0.26410	0.00040708	0.99057904	Evasterias echinosoma
67	72752	0.13878	0.000	0.10276	0.17479	0.00040068	0.99097972	Buccinum scalariforme
68	69400	0.13683	0.002	0.06078	0.21289	0.00039506	0.99137478	Erimacrus isenbeckii
69	23010	0.13682	0.002	0.04585	0.22780	0.00039504	0.99176982	Thaleichthys pacificus
70	80594	0.12976	0.004	0.00727	0.25226	0.00037466	0.99214448	Leptasterias arctica
71	69095	0.12530	0.016	0.00000	0.37090	0.00036178	0.99250626	Pagurus rathbuni
72	69061	0.12528	0.003	0.02340	0.22716	0.00036172	0.99286798	Labidochirus splendescens
73	43010	0.11432	0.008	0.00000	0.28592	0.00033008	0.99319806	Metridium sp.
74	82510	0.09020	0.001	0.01493	0.16548	0.00026044	0.99345850	Strongylocentrotus droebachiensis
75	72743	0.08428	0.000	0.05283	0.11573	0.00024334	0.99370184	Buccinum angulosum
76	24184	0.08398	0.001	0.03190	0.13606	0.00024247	0.99394430	Lycodes raridens
77	21314	0.08106	0.000	0.03913	0.12300	0.00023405	0.99417836	Gymnocanthus pistilliger
78	71750	0.07800	0.001	0.03294	0.12306	0.00022521	0.99440357	Volutopsius sp.
79	99902	0.06833	0.001	0.00000	0.14267	0.00019727	0.99460084	Molgula grifithsii
80	21348	0.06724	0.001	0.01106	0.12342	0.00019413	0.99479497	Hemilepidotus papilio
81	24001	0.06380	0.003	0.00000	0.17126	0.00018421	0.99497919	Zaprora silenus
82	68781	0.06239	0.000	0.03179	0.09299	0.00018013	0.99515932	Telmessus cheiragonus
83	80595	0.06048	0.001	0.00508	0.11588	0.00017461	0.99533393	Leptasterias sp.
84	10270	0.05998	0.001	0.00895	0.11101	0.00017318	0.99550711	Isopsetta isolepis
85	71772	0.05950	0.002	0.00000	0.14188	0.00017179	0.99567890	Beringius beringii
86	72751	0.05684	0.001	0.00000	0.11654	0.00016410	0.99584301	Buccinum plectrum
87	68578	0.05475	0.000	0.02971	0.07980	0.00015809	0.99600110	Hyas lyratus
88	85201	0.05229	0.000	0.00989	0.09468	0.00015097	0.99615206	Cucumaria fallax
89	72740	0.04317	0.000	0.00021	0.08613	0.00012464	0.99627671	Buccinum sp.
90	22200	0.04254	0.001	0.00000	0.11234	0.00012283	0.99639953	Liparidinae
91	66031	0.04182	0.000	0.02830	0.05534	0.00012075	0.99652028	Pandalus borealis
92	74562	0.04149	0.000	0.00000	0.08494	0.00011980	0.99664009	Musculus discors
93	21316	0.04044	0.000	0.00100	0.07988	0.00011676	0.99675685	Gymnocanthus galeatus
94	71756	0.04006	0.000	0.01226	0.06786	0.00011566	0.99687251	Volutopsius fragilis
95	69042	0.03881	0.001	0.00000	0.08791	0.00011205	0.99698457	Pagurus brandti



Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
96	81779	0.03824	0.001	0.00000	0.08687	0.00011040	0.99709497	Ctenodiscus sp.
97	50160	0.03721	0.000	0.00395	0.07047	0.00010744	0.99720241	Aphroditidae
98	75285	0.03686	0.000	0.01207	0.06165	0.00010643	0.99730884	Serripes groenlandicus
99	56311	0.03518	0.000	0.01533	0.05502	0.00010156	0.99741040	Eunoe nodosa
100	71886	0.03445	0.000	0.01419	0.05471	0.00009946	0.99750986	Neptunea magna
101	56310	0.03243	0.000	0.01376	0.05110	0.00009364	0.99760350	Eunoe sp.
102	23041	0.03100	0.000	0.00331	0.05869	0.00008951	0.99769301	Mallotus villosus
103	71835	0.03002	0.000	0.01712	0.04291	0.00008666	0.99777967	Neptunea borealis
104	71891	0.02942	0.000	0.01250	0.04633	0.00008493	0.99786460	Plicifusus kroyeri
105	81355	0.02779	0.000	0.01587	0.03971	0.00008023	0.99794483	Pteraster obscurus
106	79000	0.02652	0.001	0.00000	0.07779	0.00007657	0.99802140	squid unident.
107	71769	0.02553	0.000	0.00732	0.04374	0.00007372	0.99809511	Beringius sp.
108	85210	0.02215	0.000	0.00000	0.06402	0.00006396	0.99815907	Psolus sp.
109	68510	0.02182	0.000	0.00650	0.03714	0.00006300	0.99822207	Oregonia gracilis
110	22219	0.02173	0.000	0.00255	0.04091	0.00006274	0.99828481	Careproctus sp.
111	71761	0.02080	0.000	0.00000	0.05129	0.00006005	0.99834486	Pyrulofusus melonis
112	20322	0.02077	0.000	0.00012	0.04142	0.00005998	0.99840484	Anarhichas orientalis
113	80160	0.02073	0.000	0.00000	0.05098	0.00005986	0.99846470	Pycnopodia helianthoides
114	21390	0.01819	0.000	0.01086	0.02552	0.00005251	0.99851721	Dasycottus setiger
115	21438	0.01736	0.000	0.01166	0.02306	0.00005012	0.99856733	Icelus spiniger
116	20006	0.01669	0.000	0.01156	0.02183	0.00004820	0.99861553	Sarritor frenatus
117	71010	0.01555	0.000	0.00356	0.02755	0.00004490	0.99866043	nudibranch unident.
118	80910	0.01552	0.000	0.00000	0.04595	0.00004482	0.99870525	Dermasterias imbricata
119	30420	0.01385	0.000	0.00000	0.04100	0.00003999	0.99874524	Sebastes polyspinis
120	81095	0.01371	0.000	0.00564	0.02178	0.00003957	0.99878481	Crossaster papposus
121	75284	0.01369	0.000	0.00000	0.03053	0.00003954	0.99882435	Serripes sp.
122	85000	0.01360	0.000	0.00112	0.02608	0.00003925	0.99886360	Holothuroidea unident.
123	75111	0.01300	0.000	0.00557	0.02043	0.00003754	0.99890114	Mactromeris polynyma
124	21354	0.01245	0.000	0.00000	0.03004	0.00003594	0.99893708	Triglops scepticus
125	74050	0.01232	0.000	0.00000	0.02473	0.00003556	0.99897264	Mytilidae
126	82730	0.01173	0.000	0.00000	0.02452	0.00003386	0.99900650	sand dollar unident.
127	82500	0.01130	0.000	0.00663	0.01597	0.00003263	0.99903913	sea urchin unident.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
128	72060	0.01128	0.000	0.00000	0.03338	0.00003255	0.99907168	Aforia goodei
129	71640	0.01074	0.000	0.00102	0.02046	0.00003100	0.99910268	Crepidula sp.
130	23055	0.00986	0.000	0.00000	0.02663	0.00002847	0.99913115	Osmerus mordax
131	98320	0.00932	0.000	0.00000	0.02008	0.00002692	0.99915807	Synoicum sp.
132	95070	0.00887	0.000	0.00329	0.01445	0.00002562	0.99918369	Rhamphostomella costata
133	42000	0.00865	0.000	0.00000	0.01969	0.00002497	0.99920866	Pennatulacea (order)
134	43040	0.00844	0.000	0.00126	0.01561	0.00002436	0.99923301	Tealia sp.
135	43042	0.00834	0.000	0.00000	0.01747	0.00002407	0.99925708	Tealia crassicornis
136	75600	0.00819	0.000	0.00000	0.02423	0.00002364	0.99928072	Pododesmus macroschisma
137	21313	0.00719	0.000	0.00173	0.01265	0.00002076	0.99930148	Gymnocanthus sp.
138	66502	0.00706	0.000	0.00197	0.01215	0.00002038	0.99932187	Crangon sp.
139	71774	0.00681	0.000	0.00000	0.01673	0.00001966	0.99934152	Beringius stimpsoni
140	75110	0.00680	0.000	0.00014	0.01346	0.00001963	0.99936115	Mactromeris sp.
141	95020	0.00673	0.000	0.00000	0.01520	0.00001942	0.99938057	Eucratea loricata
142	65100	0.00620	0.000	0.00000	0.01307	0.00001789	0.99939846	Thoracica (order)
143	22201	0.00591	0.000	0.00045	0.01137	0.00001707	0.99941554	Liparis sp.
144	78010	0.00577	0.000	0.00039	0.01115	0.00001666	0.99943220	octopus unident.
145	68590	0.00567	0.000	0.00322	0.00813	0.00001638	0.99944858	Chionoecetes hybrid
146	68541	0.00560	0.000	0.00000	0.01659	0.00001618	0.99946476	Chionoecetes sp.
147	95030	0.00550	0.000	0.00024	0.01075	0.00001587	0.99948063	Flustra serrulata
148	20061	0.00476	0.000	0.00228	0.00724	0.00001374	0.99949437	Ocella dodecaedron
149	66570	0.00442	0.000	0.00173	0.00711	0.00001277	0.99950714	Argis sp.
150	74980	0.00412	0.000	0.00034	0.00791	0.00001190	0.99951905	Clinocardium sp.
151	69110	0.00398	0.000	0.00000	0.00982	0.00001148	0.99953053	Elassochirus tenuimanus
152	74803	0.00389	0.000	0.00000	0.00981	0.00001123	0.99954175	Kellia laperousii
153	66020	0.00372	0.000	0.00000	0.01029	0.00001075	0.99955251	Pandalus sp.
154	81360	0.00355	0.000	0.00000	0.00788	0.00001026	0.99956276	Diplopteraster multipes
155	20202	0.00351	0.000	0.00166	0.00535	0.00001012	0.99957288	Ammodytes hexapterus
156	71770	0.00348	0.000	0.00000	0.00938	0.00001005	0.99958293	Beringius kennicottii
157	80110	0.00321	0.000	0.00000	0.00893	0.00000927	0.99959220	Leptasterias groenlandica
158	80546	0.00321	0.000	0.00030	0.00611	0.00000925	0.99960146	Henricia tumida
159	80650	0.00312	0.000	0.00000	0.00923	0.00000900	0.99961046	Hippasteria spinosa

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cummulative Proportion	Name
160	22205	0.00310	0.000	0.00000	0.00742	0.00000896	0.99961941	Liparis gibbus
161	21725	0.00309	0.000	0.00080	0.00539	0.00000893	0.99962835	Boreogadus saida
162	74560	0.00308	0.000	0.00000	0.00911	0.00000890	0.99963724	Musculus sp.
163	71525	0.00303	0.000	0.00000	0.00741	0.00000874	0.99964599	Natica sp.
164	71764	0.00293	0.000	0.00000	0.00852	0.00000847	0.99965446	Volutopsius middendorffii
165	21592	0.00290	0.000	0.00000	0.00647	0.00000838	0.99966283	Trichodon trichodon
166	74065	0.00286	0.000	0.00000	0.00705	0.00000825	0.99967109	Mytilus sp.
167	71890	0.00277	0.000	0.00000	0.00708	0.00000801	0.99967909	Plicifusus sp.
168	74080	0.00265	0.000	0.00000	0.00641	0.00000766	0.99968675	Mytilus edulis
169	98000	0.00265	0.000	0.00000	0.00699	0.00000765	0.99969440	Ascidian unident.
170	30150	0.00259	0.000	0.00000	0.00766	0.00000747	0.99970188	Sebastes ciliatus
171	71721	0.00258	0.000	0.00000	0.00591	0.00000744	0.99970932	Colus herendeenii
172	71710	0.00252	0.000	0.00000	0.00526	0.00000728	0.99971661	Colus sp.
173	66045	0.00250	0.000	0.00017	0.00483	0.00000721	0.99972382	Pandalus goniurus
174	80728	0.00244	0.000	0.00000	0.00710	0.00000704	0.99973086	Ceramaster sp.
175	72790	0.00239	0.000	0.00000	0.00571	0.00000690	0.99973776	Arctomelon stearnsii
176	68040	0.00236	0.000	0.00058	0.00415	0.00000683	0.99974459	Cancer oregonensis
177	94000	0.00236	0.000	0.00000	0.00623	0.00000680	0.99975139	Sipuncula (phylum)
178	21932	0.00232	0.000	0.00000	0.00505	0.00000670	0.99975808	Hexagrammos stelleri
179	75267	0.00230	0.000	0.00080	0.00380	0.00000664	0.99976472	Siliqua alta
180	75205	0.00228	0.000	0.00035	0.00421	0.00000659	0.99977131	Tellina lutea
181	56312	0.00225	0.000	0.00063	0.00388	0.00000651	0.99977782	Eunoe depressa
182	80010	0.00225	0.000	0.00000	0.00537	0.00000650	0.99978432	Evasterias sp.
183	66019	0.00219	0.000	0.00000	0.00488	0.00000631	0.99979063	Pandalidae
184	21921	0.00215	0.000	0.00000	0.00495	0.00000621	0.99979684	Pleurogrammus monopterygius
185	81060	0.00215	0.000	0.00000	0.00636	0.00000621	0.99980305	Solaster sp.
186	74981	0.00209	0.000	0.00000	0.00585	0.00000604	0.99980909	cockle unident.
187	56300	0.00208	0.000	0.00000	0.00446	0.00000599	0.99981508	Polynoidae
188	71537	0.00206	0.000	0.00028	0.00385	0.00000596	0.99982104	Natica russa
189	98300	0.00201	0.000	0.00000	0.00481	0.00000581	0.99982685	compound ascidian unident.
190	72059	0.00201	0.000	0.00000	0.00457	0.00000580	0.99983265	Aforia sp.
191	81310	0.00192	0.000	0.00018	0.00365	0.00000553	0.99983818	Pteraster sp.

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
192	80015	0.00190	0.000	0.00000	0.00563	0.00000549	0.99984367	Evasterias troschelii
193	21350	0.00189	0.000	0.00079	0.00298	0.00000544	0.99984911	Triglops sp.
194	50000	0.00177	0.000	0.00000	0.00439	0.00000510	0.99985421	Polychaeta (class)
195	10212	0.00175	0.000	0.00008	0.00342	0.00000506	0.99985927	Limanda sakhalinensis
196	69310	0.00169	0.000	0.00000	0.00501	0.00000489	0.99986416	Lithodes aequispina
197	23808	0.00162	0.000	0.00067	0.00258	0.00000469	0.99986884	Lumpenus sagitta
198	72420	0.00151	0.000	0.00000	0.00401	0.00000435	0.99987319	Boreotrophon sp.
199	72063	0.00148	0.000	0.00024	0.00272	0.00000427	0.99987745	Aforia circinata
200	71681	0.00142	0.000	0.00000	0.00421	0.00000411	0.99988156	Crepidula grandis
201	95050	0.00141	0.000	0.00000	0.00322	0.00000406	0.99988562	Porella compressa
202	42004	0.00136	0.000	0.00000	0.00315	0.00000392	0.99988954	Stylatula sp.
203	10262	0.00135	0.000	0.00000	0.00400	0.00000390	0.99989345	Lepidopsetta bilineata
204	82526	0.00132	0.000	0.00000	0.00384	0.00000381	0.99989726	Strongylocentrotus pallidus
205	66580	0.00128	0.000	0.00029	0.00227	0.00000369	0.99990095	Argis dentata
206	71760	0.00126	0.000	0.00000	0.00373	0.00000364	0.99990459	Volutopsius castaneus
207	21446	0.00125	0.000	0.00046	0.00205	0.00000362	0.99990821	Icelus sp.
208	75264	0.00121	0.000	0.00000	0.00253	0.00000348	0.99991169	Siliqua sp.
209	65203	0.00117	0.000	0.00000	0.00328	0.00000339	0.99991508	Balanus evermanni
210	80540	0.00117	0.000	0.00051	0.00183	0.00000338	0.99991846	Henricia sp.
211	71726	0.00115	0.000	0.00000	0.00330	0.00000333	0.99992179	Colus spitzbergensis
212	22226	0.00107	0.000	0.00000	0.00236	0.00000310	0.99992489	Careproctus phasma
213	22620	0.00106	0.000	0.00000	0.00314	0.00000306	0.99992795	Lampanyctus sp.
214	75286	0.00104	0.000	0.00000	0.00241	0.00000300	0.99993095	Serripes laperousii
215	66515	0.00102	0.000	0.00000	0.00288	0.00000296	0.99993391	Crangon communis
216	22214	0.00101	0.000	0.00000	0.00299	0.00000292	0.99993683	Elassodiscus sp.
217	74561	0.00096	0.000	0.00000	0.00262	0.00000277	0.99993959	Musculus niger
218	80660	0.00091	0.000	0.00020	0.00161	0.00000262	0.99994221	Pseudarchaster parelii
219	21341	0.00085	0.000	0.00000	0.00203	0.00000246	0.99994467	Malacocottus zonurus
220	20050	0.00084	0.000	0.00000	0.00175	0.00000243	0.99994710	Aspidophoroides bartoni
221	75240	0.00083	0.000	0.00000	0.00216	0.00000238	0.99994949	Macoma sp.
222	74000	0.00081	0.000	0.00000	0.00173	0.00000233	0.99995182	Pelecypoda unident.
223	74983	0.00078	0.000	0.00004	0.00152	0.00000225	0.99995407	Clinocardium ciliatum
224	30050	0.00077	0.000	0.00000	0.00228	0.00000222	0.99995629	Sebastes aleutianus

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cummulative Proportion	Name
225	21355	0.00077	0.000	0.00014	0.00140	0.00000222	0.99995851	Triglops pingeli
226	20510	0.00076	0.000	0.00000	0.00224	0.00000219	0.99996070	Anoplopoma fimbria
227	74655	0.00070	0.000	0.00000	0.00152	0.00000203	0.99996273	Cyclocardia crebricostata
228	310	0.00070	0.000	0.00000	0.00206	0.00000201	0.99996474	Squalus acanthias
229	74656	0.00069	0.000	0.00000	0.00147	0.00000199	0.99996673	Cyclocardia sp.
230	74106	0.00067	0.000	0.00000	0.00189	0.00000193	0.99996866	Chlamys rubida
231	75336	0.00057	0.000	0.00000	0.00170	0.00000166	0.99997032	mya elegans
232	71771	0.00055	0.000	0.00000	0.00163	0.00000159	0.99997190	Beringius frielei
233	73351	0.00054	0.000	0.00000	0.00160	0.00000157	0.99997347	Cylichna alba
234	75605	0.00048	0.000	0.00000	0.00141	0.00000138	0.99997484	Pododesmus sp.
235	21315	0.00047	0.000	0.00000	0.00117	0.00000135	0.99997619	Gymnocanthus tricuspis
236	74100	0.00046	0.000	0.00000	0.00104	0.00000132	0.99997751	Pectinid unident.
237	21900	0.00045	0.000	0.00000	0.00106	0.00000128	0.99997879	Hexagrammidae
238	71535	0.00042	0.000	0.00000	0.00124	0.00000121	0.99998000	Natica aleutica
239	74104	0.00038	0.000	0.00000	0.00094	0.00000111	0.99998111	Chlamys sp.
240	22204	0.00038	0.000	0.00000	0.00113	0.00000111	0.99998222	Liparis dennyi
241	66611	0.00031	0.000	0.00000	0.00066	0.00000091	0.99998312	Argis lar
242	74640	0.00030	0.000	0.00000	0.00089	0.00000086	0.99998399	Astarte sp.
243	80730	0.00028	0.000	0.00000	0.00069	0.00000082	0.99998481	Ceramaster patagonicus
244	82740	0.00028	0.000	0.00000	0.00069	0.00000082	0.99998563	Echinarachnius parma
245	20542	0.00028	0.000	0.00000	0.00083	0.00000081	0.99998644	Aulorhynchus flavidus
246	20000	0.00025	0.000	0.00000	0.00072	0.00000073	0.99998717	Agonidae
247	71763	0.00025	0.000	0.00000	0.00074	0.00000072	0.99998789	Volutopsius stefanssoni
248	81090	0.00025	0.000	0.00000	0.00063	0.00000071	0.99998860	Crossaster sp.
249	74650	0.00024	0.000	0.00000	0.00072	0.00000070	0.99998930	Cardita sp.
250	74311	0.00022	0.000	0.00000	0.00049	0.00000062	0.99998992	Hiatella arctica

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cumulative Proportion	Name
251	80729	0.00019	0.000	0.00000	0.00041	0.00000055	0.99999048	Ceramaster japonicus
252	21346	0.00019	0.000	0.00000	0.00055	0.00000054	0.99999102	Hemilepidotus hemilepidotus
253	71800	0.00019	0.000	0.00000	0.00055	0.00000054	0.99999155	Neptunea sp.
254	91050	0.00018	0.000	0.00000	0.00054	0.00000053	0.99999208	Halichondria panicea
255	74414	0.00018	0.000	0.00000	0.00044	0.00000051	0.99999260	Yoldia sp.
256	50010	0.00017	0.000	0.00000	0.00050	0.00000049	0.99999309	tube worm unident.
257	83360	0.00017	0.000	0.00000	0.00040	0.00000048	0.99999357	Ophiopholis sp.
258	80000	0.00015	0.000	0.00000	0.00038	0.00000045	0.99999402	starfish unident.
259	21405	0.00015	0.000	0.00000	0.00046	0.00000045	0.99999446	Nautichthys pribilovius
260	71530	0.00015	0.000	0.00000	0.00030	0.00000042	0.99999489	Natica clausa
261	66548	0.00014	0.000	0.00000	0.00030	0.00000042	0.99999530	Crangon septemspinosa
262	59100	0.00013	0.000	0.00000	0.00037	0.00000037	0.99999568	Hirudinea unident.
263	71731	0.00013	0.000	0.00000	0.00034	0.00000036	0.99999604	Colus halli
264	75242	0.00013	0.000	0.00000	0.00034	0.00000036	0.99999640	Macoma calcarea
265	21300	0.00012	0.000	0.00000	0.00029	0.00000035	0.99999675	Cottidae
266	23850	0.00011	0.000	0.00000	0.00027	0.00000033	0.99999708	Poroclinus rothrocki
267	21356	0.00011	0.000	0.00000	0.00032	0.00000031	0.99999739	Triglops macellus
268	21935	0.00009	0.000	0.00000	0.00028	0.00000027	0.99999766	Hexagrammos decagrammus
269	75266	0.00009	0.000	0.00000	0.00026	0.00000025	0.99999791	Siliqua patula
270	69316	0.00008	0.000	0.00000	0.00025	0.00000025	0.99999816	Hapalogaster grebnitzkii
271	71580	0.00007	0.000	0.00000	0.00021	0.00000020	0.99999836	Polinices pallidus
272	66000	0.00006	0.000	0.00000	0.00018	0.00000018	0.99999854	shrimp unident.
273	21339	0.00006	0.000	0.00000	0.00017	0.00000017	0.99999871	Malacocottus sp.
274	81315	0.00006	0.000	0.00000	0.00017	0.00000017	0.99999888	Pteraster tessellatus
275	23807	0.00006	0.000	0.00000	0.00017	0.00000017	0.99999904	Lumpenus fabricii
276	79020	0.00006	0.000	0.00000	0.00017	0.00000016	0.99999921	Rossia pacifica

Appendix C Table 1.--Continued.

Rank	Species	Mean CPUE (kg/ha)	Variance	95 Percent Confidence Limits		Proportion	Cummulative Proportion	Name
277	60100	0.00006	0.000	0.00000	0.00016	0.00000016	0.99999937	amphipod unident.
278	21394	0.00005	0.000	0.00000	0.00016	0.00000016	0.99999953	Psychrolutes paradoxus
279	81064	0.00005	0.000	0.00000	0.00016	0.00000016	0.99999968	Solaster dawsoni
280	92500	0.00003	0.000	0.00000	0.00010	0.00000010	0.99999978	Nemertea (phylum)
281	74435	0.00003	0.000	0.00000	0.00009	0.00000008	0.99999987	Nuculana sp.
282	83400	0.00002	0.000	0.00000	0.00006	0.00000006	0.99999993	Ophiopholis aculeata
283	23805	0.00001	0.000	0.00000	0.00003	0.00000003	0.99999996	Lumpenus maculatus
284	66170	0.00001	0.000	0.00000	0.00003	0.00000003	0.99999999	Eualus sp.
285	20036	0.00000	0.000	0.00000	0.00001	0.00000001	1.00000000	Bathyagonus infraspinatus

## 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	58	55	54	53	13.44	.79480E+01	19.63	.22910E+02
20	31	29	28	28	8.94	.26060E+01	84.03	.19300E+04
31	69	69	69	69	58.83	.13830E+03	76.36	.31660E+03
32	8	8	8	8	98.64	.97900E+03	186.04	.56610E+04
Subtotal	77	77	77	77	62.21	.12290E+03	85.67	.30590E+03
41	43	43	43	43	43.86	.13130E+03	82.69	.33970E+03
42	31	31	31	28	223.44	.49850E+04	394.03	.17040E+05
43	22	22	22	22	212.46	.47740E+04	334.42	.13170E+05
Subtotal	96	96	96	93	116.86	.47460E+03	201.30	.14650E+04
50	26	23	23	23	50.02	.67110E+03	50.92	.60380E+03
61	61	58	58	55	82.82	.23670E+03	277.68	.48660E+04
62	7	7	7	7	98.98	.88570E+03	283.69	.94820E+04
Subtotal	68	65	65	62	83.92	.20970E+03	278.09	.42710E+04
Total	356	345	343	336	65.42	.14890E+04	137.69	.85980E+04

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	152,893,226	.13894E+16	57.00	77,561,628	228,224,823
20	344,731,619	.32480E+17	30.00	0	712,746,038
31	721,762,305	.28288E+17	68.00	385,382,992	1,058,141,617
32	163,237,222	.43580E+16	7.00	7,111,023	319,363,421
Subtotal	884,999,526	.32646E+17	73.60	523,636,655	1,246,362,398
41	518,507,036	.13356E+17	42.00	284,948,041	752,066,030
42	946,110,857	.98255E+17	30.00	305,093,327	1,587,128,388
43	705,881,623	.58692E+17	21.00	201,973,179	1,209,790,066
Subtotal	2,170,499,516	.17030E+18	59.18	1,336,480,372	3,004,518,659
50	197,514,692	.90863E+16	25.00	1,151,261	393,878,124
61	2,447,294,324	.37799E+18	60.00	1,217,675,887	3,676,912,762
62	182,375,844	.39188E+16	6.00	29,192,411	335,559,277
Subtotal	2,629,670,169	.38191E+18	61.18	1,393,694,119	3,865,646,218
Total	6,380,308,748	.62781E+18	134.65	4,811,463,040	7,949,154,456

Appendix D Table 1.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	104,645	.48195E+09	57.00	60,278	149,013
20	36,669	.43869E+08	30.00	23,145	50,194
31	556,092	.12360E+11	68.00	333,738	778,447
32	86,544	.75371E+09	7.00	21,616	151,473
Subtotal	642,637	.13114E+11	73.88	413,603	871,670
41	275,030	.51622E+10	42.00	129,824	420,236
42	536,498	.28740E+11	30.00	190,319	882,678
43	448,454	.21268E+11	21.00	145,115	751,794
Subtotal	1,259,983	.55171E+11	61.24	790,214	1,729,751
50	194,041	.10099E+11	25.00	0	401,060
61	729,949	.18388E+11	60.00	458,742	1,001,157
62	63,633	.36605E+09	6.00	14,443	112,822
Subtotal	793,582	.18754E+11	62.17	519,688	1,067,476
Total	3,031,557	.97664E+11	154.44	2,412,781	3,650,332

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	58	56	55	55	10.41	.47510E+01	12.75	.35930E+01
20	31	31	31	31	4.45	.30070E+00	11.15	.39660E+01
31	69	69	69	69	12.49	.44400E+01	10.83	.35590E+01
32	8	8	8	8	15.25	.12150E+02	5.71	.13780E+01
Subtotal	77	77	77	77	12.72	.38060E+01	10.40	.29900E+01
41	43	42	42	42	19.53	.93240E+02	18.06	.11380E+03
42	31	31	31	30	18.07	.79420E+01	13.30	.44620E+01
43	22	22	22	22	14.55	.93610E+01	13.41	.11530E+02
Subtotal	96	95	95	94	18.23	.32280E+02	16.09	.39160E+02
50	26	25	25	25	6.18	.25680E+01	2.19	.27500E+00
61	61	61	61	61	16.12	.37940E+01	5.43	.55700E+00
62	7	7	7	7	17.99	.23350E+02	7.95	.70300E+01
Subtotal	68	68	68	68	16.25	.34040E+01	5.60	.51630E+00
Total	356	352	351	350	13.05	.47110E+02	10.52	.50500E+02

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	99,305,429	.21788E+15	57.00	69,473,653	129,137,205
20	45,762,965	.66756E+14	30.00	29,078,980	62,446,950
31	102,383,170	.31799E+15	68.00	66,718,636	138,047,704
32	5,012,750	.10606E+13	7.00	2,577,147	7,448,354
Subtotal	107,395,921	.31905E+15	68.45	71,671,960	143,119,882
41	113,243,180	.44753E+16	42.00	0	248,443,272
42	31,938,137	.25728E+14	30.00	21,580,647	42,295,628
43	28,297,122	.51355E+14	21.00	13,391,306	43,202,937
Subtotal	173,478,439	.45524E+16	43.45	37,118,971	309,837,908
50	8,488,567	.41387E+13	25.00	4,297,766	12,679,368
61	47,887,126	.43262E+14	60.00	34,732,398	61,041,854
62	5,111,254	.29051E+13	6.00	729,137	9,493,371
Subtotal	52,998,380	.46167E+14	65.38	39,409,144	66,587,616
Total	487,429,700	.52064E+16	56.53	341,604,081	633,255,319

Appendix D Table 2.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	81,065	.28809E+09	57.00	46,763	115,368
20	18,255	.50608E+07	30.00	13,661	22,849
31	118,018	.39674E+09	68.00	78,181	157,855
32	13,384	.93552E+07	7.00	5,899	20,868
Subtotal	131,402	.40610E+09	70.86	91,098	171,705
41	122,457	.36658E+10	42.00	94	244,820
42	43,382	.45790E+08	30.00	29,544	57,221
43	30,702	.41708E+08	21.00	17,269	44,135
Subtotal	196,541	.37533E+10	44.01	72,726	320,355
50	23,978	.38640E+08	25.00	11,173	36,783
61	142,076	.29469E+09	60.00	107,742	176,409
62	11,565	.96510E+07	6.00	3,963	19,166
Subtotal	153,640	.30435E+09	63.31	118,749	188,531
Total	604,881	.47955E+10	70.67	466,382	743,380

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	58	58	58	58	132.93	.14810E+03	595.31	.30490E+04
20	31	31	31	31	82.31	.14420E+03	404.08	.50040E+04
31	69	67	67	67	62.76	.53230E+02	225.45	.98840E+03
32	8	7	7	7	18.36	.41810E+02	47.29	.35640E+03
Subtotal	77	74	74	74	58.99	.44870E+02	210.32	.83020E+03
41	43	42	42	42	15.97	.78560E+01	50.26	.10080E+03
42	31	28	28	28	31.03	.25690E+02	89.25	.25070E+03
43	22	15	15	15	2.98	.74470E+00	9.23	.76680E+01
Subtotal	96	85	85	85	16.78	.39590E+01	50.91	.46810E+02
50	26	1	1	1	0.02	.34770E-03	0.02	.50470E-03
61	61	3	3	3	0.02	.29520E-03	0.03	.49160E-03
62	7	1	1	1	0.03	.68890E-03	0.11	.13050E-01
Subtotal	68	4	4	4	0.02	.25960E-03	0.04	.48730E-03
Total	356	253	253	253	46.69	.34110E+03	194.56	.89300E+04

POPULATION						
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits		
				Lower	Upper	
10	4,635,714,479	.18487E+18	57.00	3,766,758,739	5,504,670,219	
20	1,657,824,822	.84236E+17	30.00	1,065,166,371	2,250,483,274	
31	2,131,095,200	.88315E+17	68.00	1,536,737,697	2,725,452,702	
32	41,496,935	.27437E+15	7.00	964,652	82,029,217	
Subtotal	2,172,592,135	.88590E+17	68.42	1,577,312,104	2,767,872,165	
41	315,175,258	.39619E+16	42.00	187,965,929	442,384,587	
42	214,309,028	.14455E+16	30.00	136,671,691	291,946,364	
43	19,477,137	.34164E+14	21.00	7,319,502	31,634,771	
Subtotal	548,961,422	.54416E+16	66.77	401,426,756	696,496,088	
50	87,148	.75948E+10	25.00	0	267,022	
61	275,792	.38185E+11	60.00	0	666,610	
62	73,441	.53936E+10	6.00	0	253,152	
Subtotal	349,234	.43578E+11	65.15	0	766,742	
Total	9,015,529,240	.36314E+18	138.62	7,822,366,713	10,208,691,767	

Appendix D Table 3.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	1,035,133	.89804E+10	57.00	843,613	1,226,653
20	337,690	.24274E+10	30.00	237,083	438,296
31	593,211	.47562E+10	68.00	455,279	731,142
32	16,108	.32190E+08	7.00	2,689	29,526
Subtotal	609,318	.47884E+10	68.89	470,921	747,715
41	100,123	.30886E+09	42.00	64,605	135,640
42	74,507	.14808E+09	30.00	49,621	99,392
43	6,283	.33177E+07	21.00	2,494	10,071
Subtotal	180,912	.46026E+09	70.54	138,005	223,819
50	72	.52321E+04	25.00	0	221
61	194	.22929E+05	60.00	0	497
62	17	.28470E+03	6.00	0	60
Subtotal	211	.23213E+05	61.40	0	516
Total	2,163,336	.16657E+11	142.49	1,907,797	2,418,876

Appendix D Table 4.--CPUE, population, and biomass estimates for rock 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	58	58	58	58	167.49	.29640E+03	873.79	.78400E+04
20	31	31	31	30	71.92	.14010E+03	331.90	.15340E+04
31	69	68	68	68	42.27	.38390E+02	236.93	.14480E+04
32	8	8	8	8	63.93	.56990E+03	240.71	.77020E+04
Subtotal	77	76	76	76	44.11	.36260E+02	237.25	.12680E+04
41	43	43	43	43	44.35	.33810E+03	126.70	.16660E+04
42	31	31	31	31	88.59	.28440E+03	342.71	.35670E+04
43	22	22	22	22	28.93	.86830E+02	81.42	.64420E+03
Subtotal	96	96	96	96	51.18	.13180E+03	165.94	.76490E+03
50	26	10	10	10	0.40	.62690E-01	0.97	.43250E+00
61	61	57	57	55	10.70	.28030E+01	24.20	.13690E+02
62	7	7	7	7	12.20	.10950E+02	27.63	.31150E+02
Subtotal	68	64	64	62	10.80	.24860E+01	24.44	.12040E+02
Total	356	335	335	332	58.49	.60710E+03	272.80	.11420E+05

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	6,804,343,661	.47539E+18	57.00	5,410,888,837	8,197,798,484
20	1,361,685,068	.25826E+17	30.00	1,033,524,519	1,689,845,616
31	2,239,599,020	.12934E+18	68.00	1,520,320,019	2,958,878,020
32	211,201,078	.59294E+16	7.00	29,090,340	393,311,817
Subtotal	2,450,800,098	.13527E+18	72.89	1,715,218,848	3,186,381,348
41	794,443,239	.65490E+17	42.00	277,247,276	1,311,639,202
42	822,889,740	.20566E+17	30.00	530,049,556	1,115,729,923
43	171,865,295	.28700E+16	21.00	60,434,881	283,295,709
Subtotal	1,789,198,273	.88926E+17	67.80	1,192,787,704	2,385,608,843
50	3,775,857	.65087E+13	25.00	0	9,031,349
61	213,327,406	.10636E+16	60.00	147,418,110	279,236,702
62	17,761,559	.12874E+14	6.00	8,981,776	26,541,343
Subtotal	231,088,965	.10764E+16	61.37	165,470,966	296,706,965
Total	12,640,891,922	.72650E+18	121.20	10,953,240,769	14,328,543,075



Appendix D Table 4.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Lower	Limits Upper
10	1,304,239	.17973E+11	57.00	1,033,299	1,575,179
20	295,074	.23589E+10	30.00	195,751	394,397
31	399,543	.34305E+10	68.00	282,402	516,684
32	56,096	.43874E+09	7.00	4,840	107,351
Subtotal	455,639	.38692E+10	74.65	331,233	580,045
41	278,089	.13294E+11	42.00	45,072	511,106
42	212,703	.16398E+10	30.00	129,892	295,513
43	61,073	.38687E+09	21.00	20,162	101,984
Subtotal	551,864	.15320E+11	54.52	301,715	802,014
50	1,557	.94332E+06	25.00	0	3,561
61	94,271	.21774E+09	60.00	64,449	124,093
62	7,842	.45258E+07	6.00	2,372	13,311
Subtotal	102,113	.22227E+09	62.25	72,295	131,930
Total	2,710,486	.39744E+11	152.49	2,315,753	3,105,218

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	58	44	44	44	4.81	.71700E+00	8.65	.34240E+01
20	31	8	8	6	0.16	.65860E-02	0.28	.12480E-01
31	69	69	69	68	28.05	.50640E+02	64.29	.16690E+03
32	8	8	8	8	3.24	.21510E+01	9.45	.23150E+02
Subtotal	77	77	77	76	25.94	.42420E+02	59.63	.13990E+03
41	43	42	42	38	7.16	.45540E+01	19.87	.33500E+02
42	31	27	27	23	8.04	.54390E+01	18.48	.44350E+02
43	22	18	18	18	2.53	.68850E+00	7.37	.71920E+01
Subtotal	96	87	87	79	6.45	.18360E+01	17.11	.13800E+02
50	26	26	26	26	16.88	.87290E+01	90.85	.19560E+03
61	61	61	60	60	36.81	.28480E+03	94.07	.74800E+03
62	7	7	7	7	21.79	.37350E+03	38.10	.72230E+03
Subtotal	68	68	67	67	35.79	.24910E+03	90.27	.65310E+03
Total	356	310	309	298	16.82	.30280E+03	44.78	.10060E+04

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	95% Confidence Limits Upper
10	67,357,354	.20761E+15	57.00	38,237,357	96,477,351
20	1,159,670	.21008E+12	30.00	223,727	2,095,613
31	607,733,333	.14915E+17	68.00	363,482,965	851,983,700
32	8,294,941	.17820E+14	7.00	0	18,278,501
Subtotal	616,028,273	.14932E+17	68.16	371,632,034	860,424,513
41	124,580,985	.13170E+16	42.00	51,237,792	197,924,178
42	44,377,706	.25566E+15	30.00	11,679,159	77,076,253
43	15,547,872	.32043E+14	21.00	3,773,688	27,322,055
Subtotal	184,506,562	.16047E+16	59.15	103,547,632	265,465,493
50	352,445,174	.29436E+16	25.00	240,679,666	464,210,682
61	829,108,370	.58101E+17	60.00	341,963,420	1,316,253,319
62	24,494,599	.29852E+15	6.00	0	66,773,505
Subtotal	853,602,969	.58400E+17	60.60	370,283,002	1,336,922,935
Total	2,075,100,003	.78088E+17	101.73	1,516,215,127	2,633,984,879

Appendix D Table 5.—Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	37,486	.43480E+08	57.00	24,159	50,812
20	657	.11086E+06	30.00	0	1,337
31	265,100	.45246E+10	68.00	130,570	399,630
32	2,839	.16562E+07	7.00	0	5,988
Subtotal	267,939	.45262E+10	68.05	133,384	402,493
41	44,916	.17904E+09	42.00	17,874	71,958
42	19,295	.31359E+08	30.00	7,860	30,730
43	5,332	.30676E+07	21.00	1,689	8,975
Subtotal	69,543	.21346E+09	57.21	40,016	99,071
50	65,482	.13135E+09	25.00	41,873	89,092
61	324,432	.22124E+11	60.00	26,950	621,913
62	14,005	.15434E+09	6.00	0	45,945
Subtotal	338,437	.22278E+11	60.81	39,919	636,954
Total	779,544	.27193E+11	87.36	449,739	1,109,349

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	58	49	49	48	14.59	.25610E+02	26.80	.36650E+02
20	31	30	29	28	10.93	.60810E+01	30.24	.29180E+02
31	69	57	57	55	20.12	.21400E+02	31.46	.62490E+02
32	8	6	6	4	5.45	.46060E+01	5.14	.42260E+01
Subtotal	77	63	63	59	18.88	.17950E+02	29.22	.52350E+02
41	43	41	41	40	28.34	.35340E+02	44.41	.81040E+02
42	31	24	24	20	16.51	.15610E+02	26.17	.43520E+02
43	22	19	19	18	19.39	.46450E+02	24.14	.86900E+02
Subtotal	96	84	84	78	23.96	.14510E+02	36.38	.32890E+02
50	26	0	0	0	0.00	.00000E+00	0.00	.00000E+00
61	61	20	20	17	3.19	.12570E+01	1.88	.39900E+00
62	7	7	7	7	5.60	.46220E+01	3.26	.12450E+01
Subtotal	68	27	27	24	3.35	.11130E+01	1.98	.35230E+00
Total	356	253	252	237	13.89	.65270E+02	22.56	.15140E+03

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	95% Confidence Limits Upper
10	208,719,415	.22225E+16	57.00	113,443,145	303,995,684
20	124,068,575	.49118E+15	30.00	78,812,727	169,324,422
31	297,360,892	.55833E+16	68.00	147,918,019	446,803,765
32	4,507,269	.32538E+13	7.00	93,326	8,921,212
Subtotal	301,868,161	.55865E+16	68.08	152,381,749	451,354,573
41	278,439,807	.31861E+16	42.00	164,363,583	392,516,030
42	62,825,376	.25088E+15	30.00	30,481,779	95,168,973
43	50,954,762	.38719E+15	21.00	10,026,404	91,883,119
Subtotal	392,219,944	.38242E+16	58.27	267,241,810	517,198,079
50	0	.00000E+00	25.00	0	0
61	16,606,549	.30991E+14	60.00	5,472,673	27,740,425
62	2,093,601	.51446E+12	6.00	338,461	3,848,740
Subtotal	18,700,150	.31505E+14	61.84	7,474,240	29,926,060
Total	1,045,576,245	.12156E+17	183.78	827,274,097	1,263,878,393

Appendix D Table 6.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Lower	Limits Upper
10	113,591	.15533E+10	57.00	33,941	193,241
20	44,861	.10235E+09	30.00	24,172	65,550
31	190,204	.19124E+10	68.00	102,742	277,666
32	4,780	.35459E+07	7.00	172	9,388
Subtotal	194,984	.19159E+10	68.25	107,441	282,527
41	177,727	.13895E+10	42.00	102,393	253,061
42	39,643	.89972E+08	30.00	20,274	59,012
43	40,924	.20697E+09	21.00	11,000	70,848
Subtotal	258,294	.16864E+10	58.90	175,300	341,287
50	0	.00000E+00	25.00	0	0
61	28,082	.97602E+08	60.00	8,116	48,048
62	3,602	.19101E+07	6.00	49	7,156
Subtotal	31,684	.99512E+08	62.13	11,733	51,635
Total	643,413	.53575E+10	198.13	498,488	788,339

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	58	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	1	1	1	0.10	.10940E-01	0.01	.15170E-03
32	8	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	77	1	1	1	0.10	.91560E-02	0.01	.12700E-03
41	43	9	9	7	0.36	.37280E-01	0.06	.51290E-03
42	31	2	2	2	0.08	.35480E-02	0.01	.85730E-04
43	22	6	6	6	0.45	.56070E-01	0.12	.25470E-02
Subtotal	96	17	17	15	0.32	.14930E-01	0.06	.27530E-03
50	26	0	0	0	0.00	.00000E+00	0.00	.00000E+00
61	61	27	27	27	2.61	.43160E+00	0.81	.66420E-01
62	7	6	6	6	2.79	.16250E+01	0.57	.52060E-01
Subtotal	68	33	33	33	2.63	.38240E+00	0.80	.57930E-01
Total	356	51	51	49	0.63	.40650E+00	0.18	.58340E-01

POPULATION						
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits		
				Lower	Upper	
10	0	.00000E+00	57.00	0	0	
20	0	.00000E+00	30.00	0	0	
31	116,428	.13555E+11	68.00	0	349,284	
32	0	.00000E+00	7.00	0	0	
Subtotal	116,428	.13555E+11	9.09	0	379,788	
41	388,291	.20166E+11	42.00	101,297	675,285	
42	31,968	.49424E+09	30.00	0	77,365	
43	261,543	.11348E+11	21.00	39,968	483,118	
Subtotal	681,802	.32008E+11	64.75	323,988	1,039,617	
50	0	.00000E+00	25.00	0	0	
61	7,181,774	.51589E+13	60.00	2,591,420	11,772,129	
62	367,756	.21514E+11	6.00	8,839	726,673	
Subtotal	7,549,530	.51804E+13	60.49	2,997,412	12,101,649	
Total	8,347,760	.52260E+13	115.08	3,775,667	12,919,854	

Appendix D Table 7.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	0	.00000E+00	57.00	0	0
20	0	.00000E+00	30.00	0	0
31	988	.97708E+06	68.00	0	2,965
32	0	.00000E+00	7.00	0	0
Subtotal	988	.97708E+06	74.99	0	2,965
41	2,273	.14656E+07	42.00	0	4,720
42	188	.20455E+05	30.00	0	481
43	940	.24981E+06	21.00	0	1,980
Subtotal	3,402	.17358E+07	55.66	739	6,064
50	0	.00000E+00	25.00	0	0
61	23,034	.33524E+08	60.00	11,454	34,613
62	1,795	.67175E+06	6.00	0	3,902
Subtotal	24,828	.34196E+08	62.18	13,133	36,524
Total	29,218	.36909E+08	81.11	17,068	41,369

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	58	2	2	2	0.05	.13530E-02	0.29	.63800E-01
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	22	22	22	10.19	.24820E+02	11.10	.28030E+02
32	8	7	7	6	10.39	.15350E+02	29.96	.29530E+03
Subtotal	77	29	29	28	10.21	.20890E+02	12.70	.25600E+02
41	43	6	6	5	1.03	.44220E+00	1.62	.11190E+01
42	31	21	21	16	3.32	.18920E+01	8.31	.10430E+02
43	22	4	4	2	0.01	.61490E-04	0.11	.54150E-02
Subtotal	96	31	31	23	1.34	.24340E+00	2.81	.89590E+00
50	26	26	26	26	43.60	.35960E+02	60.16	.58670E+02
61	61	54	54	54	19.35	.92580E+01	19.07	.11070E+02
62	7	3	3	3	0.58	.16990E+00	0.63	.20170E+00
Subtotal	68	57	57	57	18.07	.80430E+01	17.81	.96210E+01
Total	356	145	145	136	9.93	.65140E+02	12.20	.94850E+02

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	2,223,657	.38688E+13	57.00	0	6,198,793
20	0	.00000E+00	30.00	0	0
31	104,889,798	.25046E+16	68.00	4,798,119	204,981,477
32	26,290,535	.22736E+15	7.00	0	63,187,371
Subtotal	131,180,333	.27319E+16	74.91	26,644,328	235,716,338
41	10,145,759	.43988E+14	42.00	0	23,549,705
42	19,948,536	.60147E+14	30.00	4,111,961	35,785,112
43	231,882	.24127E+11	21.00	0	555,899
Subtotal	30,326,178	.10416E+15	65.11	9,914,556	50,737,799
50	233,369,808	.88286E+15	25.00	172,042,393	294,697,222
61	168,032,970	.86022E+15	60.00	109,373,825	226,692,114
62	407,792	.83337E+11	6.00	0	1,114,195
Subtotal	168,440,761	.86031E+15	60.01	109,778,776	227,102,747
Total	565,540,736	.45831E+16	146.60	431,497,008	699,584,465



Appendix D Table 8.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	402	.82025E+05	57.00	0	981
20	0	.00000E+00	30.00	0	0
31	96,339	.22177E+10	68.00	2,154	190,524
32	9,116	.11814E+08	7.00	987	17,245
Subtotal	105,455	.22295E+10	68.71	11,020	199,891
41	6,459	.17388E+08	42.00	0	14,886
42	7,962	.10909E+08	30.00	1,218	14,707
43	22	.27396E+03	21.00	0	56
Subtotal	14,443	.28297E+08	71.71	3,804	25,082
50	169,143	.54120E+09	25.00	121,126	217,159
61	170,531	.71910E+09	60.00	116,899	224,163
62	374	.70234E+05	6.00	0	1,055
Subtotal	170,905	.71917E+09	60.01	117,270	224,540
Total	460,348	.35183E+10	133.58	342,904	577,792

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	58	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	9	9	9	0.11	.21040E-02	0.13	.25550E-02
32	8	3	3	3	0.63	.25160E+00	0.79	.22990E+00
Subtotal	77	12	12	12	0.16	.35770E-02	0.19	.37970E-02
41	43	4	4	4	0.06	.94960E-03	0.04	.53690E-03
42	31	6	6	4	0.45	.10000E+00	0.49	.96750E-01
43	22	2	2	2	0.23	.39090E-01	0.09	.45670E-02
Subtotal	96	12	12	10	0.18	.67790E-02	0.15	.51540E-02
50	26	23	23	23	1.05	.26550E-01	2.19	.17530E+00
61	61	48	48	44	1.10	.22960E-01	1.59	.70530E-01
62	7	7	7	6	1.45	.77710E-01	1.03	.61590E-01
Subtotal	68	55	55	50	1.12	.20300E-01	1.56	.61550E-01
Total	356	102	102	95	0.39	.57210E-01	0.58	.24580E+00

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	0	.00000E+00	57.00	0	0
20	0	.00000E+00	30.00	0	0
31	1,256,633	.22827E+12	68.00	301,088	2,212,178
32	690,870	.17695E+12	7.00	0	1,685,728
Subtotal	1,947,504	.40522E+12	31.34	647,629	3,247,378
41	259,214	.21110E+11	42.00	0	552,852
42	1,182,123	.55777E+12	30.00	0	2,707,171
43	192,052	.20347E+11	21.00	0	489,607
Subtotal	1,633,389	.59923E+12	34.53	52,681	3,214,098
50	8,508,779	.26373E+13	25.00	5,156,894	11,860,665
61	14,049,616	.54781E+13	60.00	9,368,559	18,730,673
62	659,746	.25454E+11	6.00	249,559	1,069,934
Subtotal	14,709,362	.55035E+13	60.55	10,017,443	19,401,282
Total	26,799,034	.91453E+13	139.96	20,811,287	32,786,782

Appendix D Table 9.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	0	.00000E+00	57.00	0	0
20	0	.00000E+00	30.00	0	0
31	1,068	.18798E+06	68.00	201	1,935
32	555	.19369E+06	7.00	0	1,632
<b>Subtotal</b>	<b>1,623</b>	<b>.38167E+06</b>	<b>24.78</b>	<b>348</b>	<b>2,898</b>
41	376	.37335E+05	42.00	0	766
42	1,085	.57660E+06	30.00	0	2,636
43	493	.17414E+06	21.00	0	1,361
<b>Subtotal</b>	<b>1,954</b>	<b>.78808E+06</b>	<b>49.46</b>	<b>160</b>	<b>3,748</b>
50	4,069	.39952E+06	25.00	2,767	5,371
61	9,706	.17833E+07	60.00	7,035	12,376
62	931	.32116E+05	6.00	492	1,369
<b>Subtotal</b>	<b>10,636</b>	<b>.18155E+07</b>	<b>61.98</b>	<b>7,942</b>	<b>13,331</b>
<b>Total</b>	<b>18,282</b>	<b>.33847E+07</b>	<b>231.13</b>	<b>14,639</b>	<b>21,925</b>

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	58	50	50	50	3.44	.17660E+00	1.69	.10430E+00
20	31	22	21	21	2.96	.51950E+00	1.13	.84030E-01
31	69	48	48	48	3.71	.50000E+00	0.78	.27150E-01
32	8	8	8	8	7.29	.34650E+01	0.87	.41400E-01
Subtotal	77	56	56	56	4.02	.44360E+00	0.79	.23030E-01
41	43	17	17	17	1.32	.16450E+00	0.21	.45780E-02
42	31	17	17	17	3.54	.13540E+01	0.69	.54250E-01
43	22	7	7	7	0.94	.15920E+00	0.09	.10900E-02
Subtotal	96	41	41	41	1.74	.12890E+00	0.30	.42810E-02
50	26	22	22	22	5.22	.13970E+01	0.66	.19780E-01
61	61	38	38	38	3.32	.54640E+00	0.58	.12090E-01
62	7	4	4	4	1.08	.22040E+00	0.17	.47920E-02
Subtotal	68	42	42	42	3.16	.47560E+00	0.55	.10530E-01
Total	356	233	232	232	3.23	.31410E+01	0.80	.24600E+00

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	13,176,505	.63252E+13	57.00	8,093,710	18,259,299
20	4,639,134	.14144E+13	30.00	2,207,027	7,071,241
31	7,381,590	.24257E+13	68.00	4,266,664	10,496,515
32	762,627	.31873E+11	7.00	325,766	1,199,489
Subtotal	8,144,217	.24576E+13	69.68	5,008,893	11,279,540
41	1,338,716	.18000E+12	42.00	481,283	2,196,148
42	1,663,071	.31279E+12	30.00	519,352	2,806,789
43	199,991	.48563E+10	21.00	54,623	345,359
Subtotal	3,201,778	.49764E+12	61.41	1,790,901	4,612,654
50	2,546,257	.29769E+12	25.00	1,422,295	3,670,219
61	5,113,634	.93922E+12	60.00	3,155,018	7,072,249
62	110,991	.19805E+10	6.00	2,092	219,889
Subtotal	5,224,624	.94120E+12	60.25	3,284,318	7,164,930
Total	36,932,514	.11934E+14	162.29	30,092,570	43,772,459

Appendix D Table 10.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	26,825	.10709E+08	57.00	20,211	33,438
20	12,153	.87444E+07	30.00	6,106	18,200
31	35,112	.44673E+08	68.00	21,745	48,480
32	6,396	.26679E+07	7.00	2,533	10,259
Subtotal	41,508	.47341E+08	73.81	27,747	55,269
41	8,308	.64658E+07	42.00	3,169	13,447
42	8,496	.78074E+07	30.00	2,791	14,202
43	1,985	.70928E+06	21.00	228	3,742
Subtotal	18,789	.14982E+08	73.58	11,048	26,531
50	20,268	.21024E+08	25.00	10,822	29,713
61	29,225	.42439E+08	60.00	16,196	42,254
62	696	.91070E+05	6.00	0	1,472
Subtotal	29,921	.42530E+08	60.25	16,878	42,964
Total	149,464	.14533E+09	246.51	125,594	173,333

## 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 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
40	0	0	75,972	75,972	0.0000	0.0000
60	0	0	81,312	81,312	0.0000	0.0000
70	0	0	453,071	453,071	0.0001	0.0001
80	266,811	0	6,807,377	7,074,188	0.0011	0.0012
90	35,091	0	29,573,723	29,608,815	0.0046	0.0058
100	926,854	413,731	70,015,549	71,356,134	0.0112	0.0170
110	2,448,518	704,015	116,321,651	119,474,185	0.0187	0.0358
120	3,085,835	1,176,474	157,153,679	161,415,988	0.0253	0.0611
130	4,098,541	3,365,293	807,017,912	814,481,746	0.1277	0.1887
140	4,648,572	2,203,880	339,768,921	346,621,373	0.0543	0.2430
150	4,878,247	3,745,928	360,287,712	368,911,887	0.0578	0.3009
160	3,214,917	2,172,421	219,137,449	224,524,787	0.0352	0.3360
170	1,027,170	352,901	119,035,132	120,415,204	0.0189	0.3549
180	1,271,281	1,227,118	59,644,786	62,143,185	0.0097	0.3647
190	2,362,193	1,964,455	25,685,090	30,011,738	0.0047	0.3694
200	4,307,594	1,318,533	4,949,162	10,575,290	0.0017	0.3710
210	4,064,041	2,552,143	6,318,597	12,934,781	0.0020	0.3730
220	8,829,649	4,802,685	6,021,695	19,654,029	0.0031	0.3761
230	10,296,468	7,796,686	1,111,283	19,204,436	0.0030	0.3791
240	12,914,122	11,256,134	234,427	24,404,683	0.0038	0.3830
250	13,464,351	15,331,573	268,940	29,064,864	0.0046	0.3875
260	12,904,382	10,658,895	63,214	23,626,491	0.0037	0.3912
270	9,655,924	10,801,233	139,418	20,596,575	0.0032	0.3944
280	9,749,883	6,145,692	0	15,895,574	0.0025	0.3969
290	7,276,443	5,917,662	0	13,194,105	0.0021	0.3990
300	4,546,610	3,739,149	0	8,285,758	0.0013	0.4003
310	4,892,292	2,695,622	173,839	7,761,753	0.0012	0.4015
320	3,507,372	2,361,460	0	5,868,832	0.0009	0.4024
330	2,689,513	2,289,083	126,428	5,105,025	0.0008	0.4032
340	5,695,647	4,097,197	197,327	9,990,171	0.0016	0.4048
350	10,687,108	4,356,197	63,214	15,106,519	0.0024	0.4072
360	23,715,978	10,442,192	3,625,450	37,783,619	0.0059	0.4131
370	41,083,948	24,695,251	173,839	65,953,038	0.0103	0.4234
380	71,252,041	33,920,622	63,214	105,235,877	0.0165	0.4399
390	109,751,928	53,697,862	410,891	163,860,682	0.0257	0.4656
400	122,755,352	76,248,648	126,428	199,130,428	0.0312	0.4968
410	130,187,031	90,148,911	173,839	220,509,781	0.0346	0.5314
420	114,237,734	89,675,662	126,428	204,039,824	0.0320	0.5634
430	111,165,931	96,883,156	0	208,049,087	0.0326	0.5960
440	106,508,083	84,263,082	237,053	191,008,217	0.0299	0.6259
450	108,462,270	95,219,014	126,428	203,807,712	0.0319	0.6579
460	113,338,987	94,633,079	601,304	208,573,371	0.0327	0.6905
470	115,614,613	113,827,451	0	229,442,064	0.0360	0.7265

Appendix E Table 1.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
480	113,931,565	103,996,682	70,899	217,999,147	0.0342	0.7607
490	100,021,957	87,989,423	194,972	188,206,353	0.0295	0.7902
500	101,183,207	111,984,779	187,888	213,355,873	0.0334	0.8236
510	85,736,808	87,806,406	368,811	173,912,024	0.0273	0.8509
520	79,361,332	70,448,208	460,843	150,270,383	0.0236	0.8744
530	60,340,690	70,156,427	688,770	131,185,887	0.0206	0.8950
540	60,552,153	62,179,798	319,045	123,050,996	0.0193	0.9143
550	46,955,804	52,306,912	265,871	99,528,586	0.0156	0.9299
560	28,178,069	49,044,514	460,843	77,683,425	0.0122	0.9420
570	25,955,132	34,141,109	648,130	60,744,371	0.0095	0.9516
580	19,350,968	32,592,085	241,062	52,184,115	0.0082	0.9597
590	17,721,597	24,908,946	319,045	42,949,587	0.0067	0.9665
600	11,860,991	19,985,659	265,871	32,112,521	0.0050	0.9715
610	11,977,284	15,174,815	241,062	27,393,161	0.0043	0.9758
620	10,938,872	12,616,652	124,073	23,679,597	0.0037	0.9795
630	7,590,877	12,019,601	0	19,610,478	0.0031	0.9826
640	9,166,443	11,885,480	0	21,051,923	0.0033	0.9859
650	6,010,158	8,747,329	70,899	14,828,386	0.0023	0.9882
660	6,005,987	9,104,912	63,214	15,174,114	0.0024	0.9906
670	4,036,744	8,458,881	63,214	12,558,839	0.0020	0.9926
680	2,791,532	7,560,115	70,899	10,422,546	0.0016	0.9942
690	1,877,450	5,773,493	0	7,650,943	0.0012	0.9954
700	1,468,797	4,194,915	0	5,663,713	0.0009	0.9963
710	1,969,071	4,887,220	0	6,856,291	0.0011	0.9973
720	1,325,274	3,571,634	0	4,896,908	0.0008	0.9981
730	554,947	2,803,006	0	3,357,953	0.0005	0.9986
740	72,386	2,707,125	0	2,779,511	0.0004	0.9991
750	227,329	1,511,579	0	1,738,908	0.0003	0.9993
760	89,024	1,386,207	0	1,475,231	0.0002	0.9996
770	59,341	759,304	0	818,645	0.0001	0.9997
780	35,943	706,267	0	742,211	0.0001	0.9998
790	0	534,881	0	534,881	0.0001	0.9999
800	0	171,584	0	171,584	0.0000	0.9999
810	0	163,284	0	163,284	0.0000	1.0000
830	0	83,410	0	83,410	0.0000	1.0000
840	59,497	34,232	0	93,729	0.0000	1.0000
880	67,070	0	0	67,070	0.0000	1.0000
Total	2,139,293,627	1,899,497,960	2,341,517,162	6,380,308,748	1.0000	1.0000



Appendix E Table 2.--Population estimates by sex and size group for Pacific cod from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	0	0	448,149	448,149	0.0009	0.0009
100	0	89,912	836,248	926,159	0.0019	0.0028
110	593,504	191,152	2,654,909	3,439,565	0.0071	0.0099
120	926,879	875,239	4,245,160	6,047,278	0.0124	0.0223
130	1,358,811	896,936	6,599,290	8,855,037	0.0182	0.0404
140	3,307,473	2,139,879	4,770,382	10,217,734	0.0210	0.0614
150	3,561,101	2,513,899	4,144,264	10,219,263	0.0210	0.0824
160	3,165,605	3,266,501	3,995,923	10,428,030	0.0214	0.1038
170	4,564,294	3,440,061	3,280,204	11,284,560	0.0232	0.1269
180	4,966,436	5,709,847	4,390,320	15,066,603	0.0309	0.1578
190	5,416,359	4,621,390	1,979,222	12,016,971	0.0247	0.1825
200	5,341,818	5,299,395	961,415	11,602,627	0.0238	0.2063
210	5,166,681	5,415,281	1,415,206	11,997,168	0.0246	0.2309
220	4,082,722	3,952,494	1,396,279	9,431,496	0.0193	0.2503
230	2,695,171	2,482,739	369,837	5,547,746	0.0114	0.2616
240	1,420,075	1,487,547	143,717	3,051,338	0.0063	0.2679
250	1,417,929	769,084	0	2,187,013	0.0045	0.2724
260	609,007	1,463,193	110,967	2,183,167	0.0045	0.2769
270	924,701	894,228	0	1,818,929	0.0037	0.2806
280	998,284	2,669,577	110,967	3,778,827	0.0078	0.2883
290	1,953,434	3,890,379	0	5,843,813	0.0120	0.3003
300	2,326,657	3,144,646	0	5,471,303	0.0112	0.3116
310	4,614,945	3,589,922	0	8,204,867	0.0168	0.3284
320	3,944,090	7,934,107	0	11,878,197	0.0244	0.3528
330	6,297,795	6,002,238	0	12,300,033	0.0252	0.3780
340	5,058,507	6,766,797	0	11,825,304	0.0243	0.4023
350	5,009,753	4,257,359	0	9,267,112	0.0190	0.4213
360	3,894,593	4,491,820	29,921	8,416,334	0.0173	0.4385
370	4,598,953	3,635,216	0	8,234,169	0.0169	0.4554
380	3,208,343	4,098,313	0	7,306,656	0.0150	0.4704
390	4,665,117	3,055,234	0	7,720,351	0.0158	0.4863
400	3,481,999	3,747,485	0	7,229,484	0.0148	0.5011
410	3,783,409	2,894,875	0	6,678,284	0.0137	0.5148
420	3,084,147	3,688,952	0	6,773,099	0.0139	0.5287
430	2,969,768	4,261,190	0	7,230,958	0.0148	0.5435
440	3,398,936	3,797,234	0	7,196,170	0.0148	0.5583
450	4,232,661	4,880,694	0	9,113,355	0.0187	0.5770
460	4,924,465	5,414,951	0	10,339,416	0.0212	0.5982
470	5,815,942	6,373,208	0	12,189,150	0.0250	0.6232
480	4,073,286	3,993,785	0	8,067,071	0.0166	0.6397
490	4,602,904	4,521,221	0	9,124,126	0.0187	0.6585
500	3,816,766	3,300,797	0	7,117,563	0.0146	0.6731

Appendix E Table 2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
510	4,172,413	3,758,242	0	7,930,655	0.0163	0.6893
520	4,267,400	5,260,158	0	9,527,559	0.0195	0.7089
530	5,022,083	4,935,636	0	9,957,720	0.0204	0.7293
540	4,263,666	4,221,379	0	8,485,046	0.0174	0.7467
550	3,481,951	5,371,067	0	8,853,018	0.0182	0.7649
560	3,314,333	3,281,573	0	6,595,907	0.0135	0.7784
570	5,267,468	6,112,981	0	11,380,449	0.0233	0.8018
580	3,778,587	4,966,306	0	8,744,893	0.0179	0.8197
590	4,272,258	4,916,067	0	9,188,324	0.0189	0.8386
600	3,144,555	3,340,040	0	6,484,595	0.0133	0.8519
610	3,005,047	3,894,078	0	6,899,124	0.0142	0.8660
620	2,217,513	3,443,978	0	5,661,491	0.0116	0.8776
630	2,840,143	3,054,120	0	5,894,264	0.0121	0.8897
640	2,513,764	3,544,856	0	6,058,621	0.0124	0.9022
650	3,000,313	2,319,693	0	5,320,006	0.0109	0.9131
660	1,919,200	3,303,489	0	5,222,689	0.0107	0.9238
670	2,238,586	2,592,537	0	4,831,123	0.0099	0.9337
680	2,108,791	2,084,199	0	4,192,989	0.0086	0.9423
690	1,498,951	2,126,786	0	3,625,737	0.0074	0.9497
700	1,471,814	1,460,448	0	2,932,262	0.0060	0.9558
710	1,625,960	1,593,858	0	3,219,817	0.0066	0.9624
720	1,012,319	1,799,706	0	2,812,024	0.0058	0.9681
730	773,712	753,034	0	1,526,746	0.0031	0.9713
740	425,256	526,049	0	951,304	0.0020	0.9732
750	537,910	1,078,453	0	1,616,363	0.0033	0.9765
760	365,620	704,675	0	1,070,294	0.0022	0.9787
770	775,696	693,759	0	1,469,455	0.0030	0.9817
780	269,699	564,845	0	834,545	0.0017	0.9834
790	324,903	251,915	0	576,818	0.0012	0.9846
800	152,613	374,080	0	526,693	0.0011	0.9857
810	174,729	277,395	0	452,124	0.0009	0.9866
820	114,279	534,266	0	648,545	0.0013	0.9880
830	449,492	443,963	0	893,455	0.0018	0.9898
840	375,538	269,614	0	645,153	0.0013	0.9911
850	156,821	359,941	0	516,761	0.0011	0.9922
860	309,189	120,562	0	429,751	0.0009	0.9931
870	62,179	415,076	0	477,254	0.0010	0.9940
880	312,697	181,421	0	494,119	0.0010	0.9951
890	77,352	148,588	0	225,940	0.0005	0.9955
900	61,063	96,788	0	157,851	0.0003	0.9958
910	135,981	285,128	0	421,108	0.0009	0.9967
920	121,665	266,591	0	388,256	0.0008	0.9975
930	73,476	30,832	0	104,308	0.0002	0.9977
940	62,442	228,932	0	291,374	0.0006	0.9983
950	113,654	61,600	0	175,253	0.0004	0.9987

Appendix E Table 2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
960	0	124,052	0	124,052	0.0003	0.9989
970	55,336	134,255	0	189,591	0.0004	0.9993
990	56,765	0	0	56,765	0.0001	0.9994
1000	0	94,572	0	94,572	0.0002	0.9996
1030	36,270	0	0	36,270	0.0001	0.9997
1040	0	80,444	0	80,444	0.0002	0.9999
1070	0	16,537	0	16,537	0.0000	0.9999
1120	0	15,728	0	15,728	0.0000	0.9999
1140	0	29,482	0	29,482	0.0001	1.0000
Total	213,084,771	232,462,551	41,882,378	487,429,700	1.0000	1.0000

Appendix E Table 3.--Population estimates by sex and size group for yellowfin sole from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	1,203,126	0	0	1,203,126	0.0001	0.0001
80	0	0	819,968	819,968	0.0001	0.0002
90	1,089,058	2,127,627	3,279,873	6,496,558	0.0007	0.0009
100	2,316,265	2,038,829	6,559,745	10,914,839	0.0012	0.0022
110	9,579,573	9,856,434	1,639,936	21,075,943	0.0023	0.0045
120	21,139,666	30,777,341	1,639,936	53,556,944	0.0059	0.0104
130	45,008,401	42,739,269	819,968	88,567,638	0.0098	0.0203
140	64,967,997	60,460,386	0	125,428,383	0.0139	0.0342
150	118,787,680	125,020,260	0	243,807,940	0.0270	0.0612
160	190,129,063	186,455,381	0	376,584,443	0.0418	0.1030
170	206,987,927	188,711,631	0	395,699,558	0.0439	0.1469
180	182,206,967	188,001,061	0	370,208,028	0.0411	0.1879
190	178,052,116	210,866,250	0	388,918,366	0.0431	0.2311
200	147,771,350	155,806,203	0	303,577,553	0.0337	0.2647
210	144,330,496	136,662,350	0	280,992,846	0.0312	0.2959
220	132,313,131	141,935,644	0	274,248,775	0.0304	0.3263
230	135,998,696	136,187,185	0	272,185,881	0.0302	0.3565
240	168,184,110	163,435,904	0	331,620,013	0.0368	0.3933
250	233,860,682	167,273,028	0	401,133,710	0.0445	0.4378
260	240,284,620	187,060,023	0	427,344,643	0.0474	0.4852
270	271,974,694	214,587,735	0	486,562,428	0.0540	0.5391
280	309,940,821	223,771,019	0	533,711,840	0.0592	0.5983
290	336,167,676	246,508,788	0	582,676,464	0.0646	0.6630
300	315,663,909	260,649,612	0	576,313,521	0.0639	0.7269
310	309,862,744	274,853,883	0	584,716,627	0.0649	0.7917
320	226,567,640	278,633,538	0	505,201,178	0.0560	0.8478
330	156,783,283	274,735,021	0	431,518,304	0.0479	0.8956
340	91,952,231	238,084,332	0	330,036,563	0.0366	0.9322
350	33,417,428	199,585,267	0	233,002,695	0.0258	0.9581
360	19,721,605	134,470,696	0	154,192,301	0.0171	0.9752
370	15,806,495	93,001,866	0	108,808,361	0.0121	0.9872
380	1,056,868	50,120,902	0	51,177,770	0.0057	0.9929
390	267,994	28,968,149	0	29,236,143	0.0032	0.9962
400	475,224	15,126,365	0	15,601,589	0.0017	0.9979
410	237,612	9,093,103	0	9,330,715	0.0010	0.9989
420	0	4,149,977	0	4,149,977	0.0005	0.9994
430	0	3,501,254	0	3,501,254	0.0004	0.9998
440	0	1,427,341	0	1,427,341	0.0002	0.9999
450	0	293,720	0	293,720	0.0000	1.0000
470	0	180,431	0	180,431	0.0000	1.0000
520	0	78,201	0	78,201	0.0000	1.0000
Total	4,314,107,148	4,687,236,005	14,759,427	9,016,102,580	1.0000	1.0000

Appendix E Table 4.--Population estimates by sex and size group for rock sole from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
70	877,174	0	0	877,174	0.0001	0.0001
80	573,824	106,467	701,415	1,381,706	0.0001	0.0002
90	3,511,499	1,411,041	907,687	5,830,227	0.0005	0.0006
100	15,156,013	9,705,177	4,370,152	29,231,342	0.0023	0.0030
110	59,690,506	31,520,233	14,907,641	106,118,380	0.0084	0.0113
120	111,426,046	63,317,954	29,931,996	204,675,996	0.0162	0.0275
130	117,161,138	115,494,959	26,638,618	259,294,715	0.0205	0.0481
140	137,118,177	129,551,732	17,012,720	283,682,630	0.0224	0.0705
150	160,847,649	146,626,982	9,928,438	317,403,069	0.0251	0.0956
160	185,157,377	160,533,083	4,544,111	350,234,571	0.0277	0.1233
170	180,372,892	141,868,088	1,337,114	323,578,094	0.0256	0.1489
180	156,700,298	151,510,870	1,049,300	309,260,468	0.0245	0.1734
190	183,310,360	133,847,045	0	317,157,404	0.0251	0.1985
200	167,571,811	130,956,581	0	298,528,392	0.0236	0.2221
210	231,031,499	172,068,563	0	403,100,062	0.0319	0.2540
220	294,623,724	222,833,369	0	517,457,093	0.0409	0.2949
230	414,931,320	262,608,333	0	677,539,652	0.0536	0.3485
240	488,639,629	312,055,157	0	800,694,786	0.0633	0.4118
250	473,684,812	353,574,345	0	827,259,158	0.0654	0.4773
260	484,473,740	306,361,014	0	790,834,754	0.0626	0.5398
270	615,016,172	269,803,135	0	884,819,308	0.0700	0.6098
280	712,599,159	291,537,373	0	1,004,136,532	0.0794	0.6893
290	536,955,170	304,859,695	0	841,814,865	0.0666	0.7559
300	295,221,407	386,367,620	0	681,589,027	0.0539	0.8098
310	143,856,845	422,768,269	0	566,625,114	0.0448	0.8546
320	73,540,413	368,612,670	0	442,153,083	0.0350	0.8896
330	31,155,990	370,522,515	0	401,678,505	0.0318	0.9214
340	15,532,448	257,236,153	0	272,768,601	0.0216	0.9429
350	6,632,416	193,314,748	0	199,947,164	0.0158	0.9588
360	6,474,601	128,845,575	0	135,320,176	0.0107	0.9695
370	2,853,320	116,570,991	0	119,424,312	0.0094	0.9789
380	2,128,276	91,100,133	0	93,228,409	0.0074	0.9863
390	193,327	67,026,302	0	67,219,629	0.0053	0.9916
400	29,767	42,685,185	0	42,714,952	0.0034	0.9950
410	30,216	36,841,287	0	36,871,503	0.0029	0.9979
420	0	14,500,791	0	14,500,791	0.0011	0.9991
430	0	7,306,330	0	7,306,330	0.0006	0.9996
440	0	3,902,561	0	3,902,561	0.0003	0.9999
450	0	438,059	0	438,059	0.0000	1.0000
460	0	206,456	0	206,456	0.0000	1.0000
580	0	86,872	0	86,872	0.0000	1.0000
Total	6,309,079,017	6,220,483,714	111,329,191	12,640,891,92	1.0000	1.0000

Appendix E Table 5.--Population estimates by sex and size group for *Hippoglossoides* spp. from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
70	58,392	0	450,968	509,360	0.0002	0.0002
80	182,185	230,931	451,148	864,264	0.0004	0.0007
90	274,658	240,525	648,085	1,163,268	0.0006	0.0012
100	827,412	650,683	858,009	2,336,104	0.0011	0.0023
110	2,069,988	874,613	2,694,429	5,639,030	0.0027	0.0051
120	4,305,907	2,856,623	5,327,433	12,489,963	0.0060	0.0111
130	5,695,887	3,453,324	4,276,464	13,425,675	0.0065	0.0176
140	5,024,470	5,607,400	2,927,867	13,559,738	0.0065	0.0241
150	6,998,107	8,102,616	1,473,352	16,574,075	0.0080	0.0321
160	9,586,290	10,016,854	1,887,636	21,490,780	0.0104	0.0424
170	13,824,868	11,154,098	2,772,830	27,751,796	0.0134	0.0558
180	14,585,277	14,876,983	739,456	30,201,716	0.0146	0.0704
190	14,678,135	13,492,570	430,905	28,601,610	0.0138	0.0841
200	18,935,019	17,219,291	143,635	36,297,945	0.0175	0.1016
210	20,132,484	17,986,737	28,024	38,147,245	0.0184	0.1200
220	23,296,640	19,748,065	0	43,044,705	0.0207	0.1408
230	28,446,395	20,189,021	0	48,635,417	0.0234	0.1642
240	30,320,708	24,264,768	0	54,585,475	0.0263	0.1905
250	33,910,774	21,791,801	0	55,702,576	0.0268	0.2173
260	35,568,398	28,896,125	0	64,464,523	0.0311	0.2484
270	35,678,686	28,304,399	0	63,983,085	0.0308	0.2792
280	39,941,167	34,114,866	0	74,056,033	0.0357	0.3149
290	48,391,237	27,303,165	0	75,694,402	0.0365	0.3514
300	65,394,474	36,937,530	0	102,332,003	0.0493	0.4007
310	72,558,170	41,225,001	0	113,783,171	0.0548	0.4556
320	74,311,685	40,441,418	0	114,753,103	0.0553	0.5109
330	72,080,869	50,963,879	0	123,044,748	0.0593	0.5702
340	68,334,684	55,978,506	0	124,313,190	0.0599	0.6301
350	71,691,951	52,760,254	0	124,452,205	0.0600	0.6900
360	51,190,385	56,748,280	0	107,938,665	0.0520	0.7421
370	47,013,035	48,669,453	0	95,682,488	0.0461	0.7882
380	32,991,235	45,381,840	0	78,373,075	0.0378	0.8259
390	18,317,939	48,752,263	0	67,070,202	0.0323	0.8583
400	8,432,477	38,112,411	0	46,544,888	0.0224	0.8807
410	10,562,072	48,555,710	0	59,117,783	0.0285	0.9092
420	3,898,669	37,289,777	0	41,188,446	0.0198	0.9290
430	2,256,285	41,683,005	0	43,939,289	0.0212	0.9502
440	0	40,191,937	0	40,191,937	0.0194	0.9696
450	0	21,394,723	0	21,394,723	0.0103	0.9799
460	1,747,984	15,150,529	0	16,898,513	0.0081	0.9880
470	0	10,435,743	0	10,435,743	0.0050	0.9930
480	0	6,158,774	0	6,158,774	0.0030	0.9960
490	0	5,025,510	0	5,025,510	0.0024	0.9984
500	0	1,892,002	0	1,892,002	0.0009	0.9993

Appendix E Table 5.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
510	0	738,542	0	738,542	0.0004	0.9997
520	0	153,054	0	153,054	0.0001	0.9998
530	0	306,109	0	306,109	0.0001	0.9999
540	0	153,054	0	153,054	0.0001	1.0000
Total	993,515,000	1,056,474,763	25,110,240	2,075,100,003	1.0000	1.0000

Appendix E Table 6.--Population estimates by sex and size group for Alaska plaice from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	0	80,207	0	80,207	0.0001	0.0001
80	0	80,207	0	80,207	0.0001	0.0002
90	80,207	0	0	80,207	0.0001	0.0002
110	86,584	0	0	86,584	0.0001	0.0003
120	216,461	90,837	0	307,298	0.0003	0.0006
130	268,258	90,837	0	359,094	0.0003	0.0010
140	303,045	134,129	0	437,174	0.0004	0.0014
150	457,503	320,054	0	777,557	0.0007	0.0021
160	833,279	662,140	0	1,495,419	0.0014	0.0035
170	1,108,848	588,312	0	1,697,160	0.0016	0.0052
180	1,430,656	724,744	0	2,155,400	0.0021	0.0072
190	1,847,665	1,028,391	0	2,876,057	0.0028	0.0100
200	2,164,480	1,770,741	0	3,935,221	0.0038	0.0137
210	3,422,945	1,802,717	0	5,225,662	0.0050	0.0187
220	6,306,495	2,691,613	0	8,998,108	0.0086	0.0273
230	6,630,101	3,798,091	0	10,428,191	0.0100	0.0373
240	8,298,513	5,301,315	0	13,599,828	0.0130	0.0503
250	10,008,322	7,302,328	0	17,310,649	0.0166	0.0669
260	12,704,265	9,729,381	0	22,433,645	0.0215	0.0883
270	18,815,055	12,568,844	0	31,383,899	0.0300	0.1184
280	22,991,522	15,240,890	0	38,232,412	0.0366	0.1549
290	30,790,077	19,508,402	0	50,298,479	0.0481	0.2030
300	38,373,130	19,084,431	0	57,457,561	0.0550	0.2580
310	41,714,952	21,743,093	0	63,458,046	0.0607	0.3187
320	43,834,271	24,073,708	0	67,907,979	0.0649	0.3836
330	49,525,508	19,669,650	0	69,195,158	0.0662	0.4498
340	52,808,853	22,913,192	0	75,722,045	0.0724	0.5222
350	48,470,025	19,906,972	0	68,376,997	0.0654	0.5876
360	40,723,121	25,577,373	0	66,300,494	0.0634	0.6510
370	33,700,233	21,979,620	0	55,679,853	0.0533	0.7043
380	18,190,471	22,346,065	0	40,536,536	0.0388	0.7430
390	11,949,494	21,194,020	0	33,143,514	0.0317	0.7747
400	4,531,824	24,124,079	0	28,655,903	0.0274	0.8022
410	2,567,395	23,345,823	0	25,913,218	0.0248	0.8269
420	749,064	23,534,845	0	24,283,909	0.0232	0.8502
430	383,497	21,867,417	0	22,250,913	0.0213	0.8714
440	99,811	21,907,480	0	22,007,291	0.0210	0.8925
450	58,137	17,585,439	0	17,643,576	0.0169	0.9094
460	0	18,321,303	0	18,321,303	0.0175	0.9269
470	42,680	17,566,073	0	17,608,753	0.0168	0.9437
480	107,795	14,746,058	0	14,853,853	0.0142	0.9579
490	0	11,718,561	0	11,718,561	0.0112	0.9691
500	0	7,361,639	0	7,361,639	0.0070	0.9762
510	0	13,339,203	0	13,339,203	0.0128	0.9889



Appendix E Table 6.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
520	0	5,059,462	0	5,059,462	0.0048	0.9938
530	0	2,291,236	0	2,291,236	0.0022	0.9960
540	0	1,703,545	0	1,703,545	0.0016	0.9976
550	0	986,112	0	986,112	0.0009	0.9985
560	0	700,522	0	700,522	0.0007	0.9992
570	0	640,621	0	640,621	0.0006	0.9998
580	0	50,009	0	50,009	0.0000	0.9999
590	0	99,811	0	99,811	0.0001	1.0000
620	0	30,163	0	30,163	0.0000	1.0000
Total	516,594,541	528,981,704	0	1,045,576,245	1.0000	1.0000

Appendix E Table 7.--Population estimates by sex and size group for Greenland turbot from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
120	0	0	35,119	35,119	0.0042	0.0042
140	19,066	0	0	19,066	0.0023	0.0065
190	0	85,726	0	85,726	0.0103	0.0168
210	47,232	0	0	47,232	0.0057	0.0224
230	28,666	17,925	0	46,591	0.0056	0.0280
240	151,393	0	0	151,393	0.0181	0.0461
250	105,546	67,951	0	173,498	0.0208	0.0669
260	28,362	20,878	0	49,240	0.0059	0.0728
280	18,566	0	0	18,566	0.0022	0.0750
320	0	19,094	0	19,094	0.0023	0.0773
390	25,673	0	0	25,673	0.0031	0.0804
410	30,244	0	0	30,244	0.0036	0.0840
450	34,152	31,178	0	65,330	0.0078	0.0919
460	67,951	0	0	67,951	0.0081	0.1000
470	55,881	28,362	0	84,243	0.0101	0.1101
480	26,727	0	0	26,727	0.0032	0.1133
490	124,737	0	0	124,737	0.0149	0.1282
500	30,244	0	0	30,244	0.0036	0.1319
510	19,066	0	0	19,066	0.0023	0.1341
520	125,424	0	0	125,424	0.0150	0.1492
530	0	57,028	0	57,028	0.0068	0.1560
540	56,481	28,560	0	85,041	0.0102	0.1662
550	68,396	0	0	68,396	0.0082	0.1744
560	425,467	44,034	0	469,500	0.0562	0.2306
570	20,878	19,298	0	40,177	0.0048	0.2354
580	30,208	58,910	0	89,118	0.0107	0.2461
590	790,445	93,625	0	884,070	0.1059	0.3520
600	140,660	80,013	0	220,673	0.0264	0.3784
610	117,435	77,114	0	194,549	0.0233	0.4018
620	94,864	83,784	0	178,648	0.0214	0.4232
630	0	105,788	0	105,788	0.0127	0.4358
640	0	477,831	0	477,831	0.0572	0.4931
650	58,874	583,170	0	642,044	0.0769	0.5700
660	67,951	102,722	0	170,674	0.0204	0.5904
670	0	137,673	0	137,673	0.0165	0.6069
680	98,604	152,577	0	251,182	0.0301	0.6370
690	68,396	85,141	0	153,537	0.0184	0.6554
700	28,666	54,490	0	83,156	0.0100	0.6654
710	26,727	44,477	0	71,205	0.0085	0.6739
720	67,951	0	0	67,951	0.0081	0.6820
730	68,396	90,667	0	159,063	0.0191	0.7011
740	86,962	110,568	0	197,530	0.0237	0.7247
750	0	52,401	0	52,401	0.0063	0.7310
760	0	30,208	0	30,208	0.0036	0.7346

Appendix E Table 7.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
770	0	25,673	0	25,673	0.0031	0.7377
780	0	85,505	0	85,505	0.0102	0.7480
790	19,298	156,253	0	175,552	0.0210	0.7690
800	0	80,757	0	80,757	0.0097	0.7787
810	0	250,940	0	250,940	0.0301	0.8087
820	0	110,960	0	110,960	0.0133	0.8220
830	0	107,121	0	107,121	0.0128	0.8348
840	0	113,963	0	113,963	0.0137	0.8485
860	0	297,055	0	297,055	0.0356	0.8841
870	0	33,838	0	33,838	0.0041	0.8881
880	0	133,118	0	133,118	0.0159	0.9041
890	0	162,242	0	162,242	0.0194	0.9235
900	0	46,913	0	46,913	0.0056	0.9291
910	0	83,784	0	83,784	0.0100	0.9392
920	0	131,754	0	131,754	0.0158	0.9550
930	0	145,094	0	145,094	0.0174	0.9723
940	0	102,234	0	102,234	0.0122	0.9846
950	0	18,925	0	18,925	0.0023	0.9869
970	0	36,723	0	36,723	0.0044	0.9913
980	0	18,566	0	18,566	0.0022	0.9935
1000	0	17,711	0	17,711	0.0021	0.9956
1090	0	36,723	0	36,723	0.0044	1.0000
Total	3,275,595	5,037,046	35,119	8,347,760	1.0000	1.0000

Appendix E Table 8.--Population estimates by sex and size group for arrowtooth flounder from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	0	65,398	0	65,398	0.0001	0.0001
100	98,654	0	35,374	134,027	0.0002	0.0004
120	69,765	0	35,374	105,139	0.0002	0.0005
130	216,922	188,395	89,514	494,831	0.0009	0.0014
140	471,271	1,494,467	204,408	2,170,147	0.0038	0.0053
150	1,871,192	1,787,359	832,244	4,490,795	0.0079	0.0132
160	2,485,956	5,005,571	1,116,060	8,607,587	0.0152	0.0284
170	4,000,769	5,513,318	948,200	10,462,286	0.0185	0.0469
180	3,671,385	5,489,647	1,019,744	10,180,776	0.0180	0.0649
190	3,372,934	6,147,041	551,445	10,071,420	0.0178	0.0827
200	3,756,865	6,633,114	191,191	10,581,170	0.0187	0.1014
210	2,903,441	6,696,474	30,487	9,630,401	0.0170	0.1185
220	4,217,327	6,657,637	30,487	10,905,450	0.0193	0.1377
230	3,479,553	5,288,221	0	8,767,774	0.0155	0.1532
240	2,339,439	5,608,499	0	7,947,938	0.0141	0.1673
250	1,858,327	4,948,057	0	6,806,384	0.0120	0.1793
260	3,352,687	5,457,088	0	8,809,775	0.0156	0.1949
270	3,053,134	5,940,910	0	8,994,043	0.0159	0.2108
280	2,808,042	4,986,975	0	7,795,017	0.0138	0.2246
290	2,055,663	5,370,012	0	7,425,675	0.0131	0.2377
300	3,746,566	5,667,106	0	9,413,672	0.0166	0.2544
310	3,330,423	5,046,002	0	8,376,425	0.0148	0.2692
320	4,271,976	3,809,213	0	8,081,188	0.0143	0.2835
330	4,801,764	5,754,647	0	10,556,411	0.0187	0.3021
340	5,420,437	6,398,327	0	11,818,764	0.0209	0.3230
350	4,961,774	8,551,591	0	13,513,365	0.0239	0.3469
360	4,912,906	11,707,046	0	16,619,952	0.0294	0.3763
370	5,143,330	11,475,333	0	16,618,663	0.0294	0.4057
380	8,252,419	11,717,994	0	19,970,413	0.0353	0.4410
390	5,912,451	11,357,518	0	17,269,969	0.0305	0.4716
400	5,304,453	11,954,177	0	17,258,630	0.0305	0.5021
410	6,567,385	14,304,593	0	20,871,978	0.0369	0.5390
420	5,822,923	11,493,499	0	17,316,422	0.0306	0.5696
430	6,428,594	11,661,328	0	18,089,921	0.0320	0.6016
440	4,429,888	12,366,288	0	16,796,176	0.0297	0.6313
450	4,976,157	15,883,350	0	20,859,507	0.0369	0.6682
460	3,246,862	11,066,037	0	14,312,899	0.0253	0.6935
470	3,337,402	11,531,264	0	14,868,666	0.0263	0.7198
480	1,913,005	11,578,915	0	13,491,919	0.0239	0.7436
490	2,256,397	10,975,606	0	13,232,003	0.0234	0.7670
500	891,958	9,912,377	0	10,804,334	0.0191	0.7861
510	217,846	12,212,368	0	12,430,214	0.0220	0.8081
520	652,762	12,773,356	0	13,426,118	0.0237	0.8318
530	647,532	11,130,122	0	11,777,654	0.0208	0.8527

Appendix E Table 8.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
540	115,118	9,036,080	0	9,151,197	0.0162	0.8689
550	559,682	10,552,025	0	11,111,707	0.0196	0.8885
560	0	7,676,211	0	7,676,211	0.0136	0.9021
570	1,184,536	6,967,419	0	8,151,955	0.0144	0.9165
580	0	4,750,548	0	4,750,548	0.0084	0.9249
590	0	5,015,744	0	5,015,744	0.0089	0.9338
600	38,590	5,042,434	0	5,081,023	0.0090	0.9427
610	91,939	5,548,661	0	5,640,601	0.0100	0.9527
620	0	4,951,729	0	4,951,729	0.0088	0.9615
630	514,848	4,613,403	0	5,128,251	0.0091	0.9705
640	191,881	3,121,402	0	3,313,283	0.0059	0.9764
650	0	3,430,221	0	3,430,221	0.0061	0.9825
660	429,486	1,844,553	0	2,274,039	0.0040	0.9865
670	0	2,493,671	0	2,493,671	0.0044	0.9909
680	30,487	1,109,564	0	1,140,051	0.0020	0.9929
690	101,132	1,810,443	0	1,911,575	0.0034	0.9963
700	0	954,951	0	954,951	0.0017	0.9980
710	0	556,203	0	556,203	0.0010	0.9990
720	0	185,296	0	185,296	0.0003	0.9993
730	0	371,421	0	371,421	0.0007	0.9999
740	0	29,760	0	29,760	0.0001	1.0000
Total	146,788,232	413,667,978	5,084,526	565,540,736	1.0000	1.0000

Appendix E Table 9.--Population estimates by sex and size group for Kamchatka flounder from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	0	0	28,251	28,251	0.0011	0.0011
90	0	0	28,251	28,251	0.0011	0.0021
100	49,776	0	28,251	78,026	0.0029	0.0050
140	30,025	0	30,487	60,512	0.0023	0.0073
150	28,414	99,587	240,166	368,166	0.0137	0.0210
160	820,627	401,946	89,951	1,312,524	0.0490	0.0700
170	581,559	200,352	223,650	1,005,561	0.0375	0.1075
180	788,580	570,037	124,267	1,482,884	0.0553	0.1628
190	618,886	189,551	60,263	868,700	0.0324	0.1953
200	459,298	239,212	29,776	728,286	0.0272	0.2224
210	577,664	337,787	0	915,452	0.0342	0.2566
220	228,936	171,544	0	400,480	0.0149	0.2715
230	575,813	141,748	0	717,562	0.0268	0.2983
240	308,668	307,936	0	616,604	0.0230	0.3213
250	419,534	148,624	0	568,158	0.0212	0.3425
260	210,682	148,954	0	359,636	0.0134	0.3559
270	313,328	243,260	0	556,588	0.0208	0.3767
280	173,028	57,938	0	230,967	0.0086	0.3853
290	106,359	81,338	0	187,697	0.0070	0.3923
300	31,035	57,545	0	88,580	0.0033	0.3956
310	102,235	58,869	0	161,104	0.0060	0.4017
320	119,681	98,978	0	218,658	0.0082	0.4098
330	123,548	59,826	0	183,374	0.0068	0.4167
340	197,887	173,278	0	371,164	0.0138	0.4305
350	85,787	276,275	0	362,062	0.0135	0.4440
360	60,188	59,234	0	119,423	0.0045	0.4485
370	221,829	88,427	0	310,257	0.0116	0.4601
380	204,294	115,324	0	319,618	0.0119	0.4720
390	308,883	59,078	0	367,961	0.0137	0.4857
400	962,018	267,374	0	1,229,393	0.0459	0.5316
410	415,070	413,195	0	828,265	0.0309	0.5625
420	791,275	521,837	0	1,313,112	0.0490	0.6115
430	831,493	472,945	0	1,304,438	0.0487	0.6602
440	592,272	641,660	0	1,233,933	0.0460	0.7062
450	516,829	574,166	0	1,090,995	0.0407	0.7469
460	702,523	606,968	0	1,309,491	0.0489	0.7958
470	359,805	333,849	0	693,654	0.0259	0.8217
480	388,424	207,890	0	596,314	0.0223	0.8439
490	475,822	116,220	0	592,042	0.0221	0.8660
500	213,789	212,007	0	425,796	0.0159	0.8819
510	169,801	60,523	0	230,324	0.0086	0.8905
520	156,390	275,092	0	431,482	0.0161	0.9066
530	83,374	190,827	0	274,201	0.0102	0.9168
540	114,657	403,739	0	518,395	0.0193	0.9362

Appendix E Table 9.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
550	19,926	135,333	0	155,259	0.0058	0.9420
560	102,235	180,289	0	282,524	0.0105	0.9525
570	0	165,283	0	165,283	0.0062	0.9587
580	28,868	232,394	0	261,262	0.0097	0.9684
590	0	178,879	0	178,879	0.0067	0.9751
600	0	77,147	0	77,147	0.0029	0.9780
610	0	27,136	0	27,136	0.0010	0.9790
630	0	97,778	0	97,778	0.0036	0.9826
640	0	31,954	0	31,954	0.0012	0.9838
650	102,235	57,566	0	159,801	0.0060	0.9898
660	0	89,282	0	89,282	0.0033	0.9931
670	0	57,384	0	57,384	0.0021	0.9953
690	0	28,567	0	28,567	0.0011	0.9963
730	0	66,237	0	66,237	0.0025	0.9988
760	0	32,203	0	32,203	0.0012	1.0000
Total	14,773,349	11,142,373	883,312	26,799,034	1.0000	1.0000

Appendix E Table 10.--Population estimates by sex and size group for Pacific halibut from the 1997 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	0	0	32,435	32,435	0.0009	0.0009
140	0	0	30,913	30,913	0.0008	0.0017
150	0	0	65,503	65,503	0.0018	0.0035
160	0	0	164,697	164,697	0.0045	0.0079
170	0	36,437	151,811	188,249	0.0051	0.0130
180	0	0	181,261	181,261	0.0049	0.0180
190	0	0	144,428	144,428	0.0039	0.0219
200	0	0	254,616	254,616	0.0069	0.0288
210	0	0	87,614	87,614	0.0024	0.0311
230	0	0	121,958	121,958	0.0033	0.0344
240	0	0	36,873	36,873	0.0010	0.0354
250	0	0	36,505	36,505	0.0010	0.0364
260	0	0	36,873	36,873	0.0010	0.0374
270	0	0	131,051	131,051	0.0035	0.0410
280	0	0	270,721	270,721	0.0073	0.0483
290	0	0	378,519	378,519	0.0102	0.0585
300	70,909	0	330,515	401,423	0.0109	0.0694
310	0	0	670,356	670,356	0.0182	0.0876
320	0	0	712,498	712,498	0.0193	0.1069
330	0	35,454	974,446	1,009,901	0.0273	0.1342
340	0	71,892	875,912	947,804	0.0257	0.1599
350	0	0	1,031,511	1,031,511	0.0279	0.1878
360	72,746	131,853	759,626	964,225	0.0261	0.2139
370	67,555	57,061	1,082,822	1,207,438	0.0327	0.2466
380	36,437	89,161	460,805	586,403	0.0159	0.2625
390	0	36,437	320,087	356,525	0.0097	0.2721
400	72,875	19,830	293,532	386,236	0.0105	0.2826
410	36,437	0	276,409	312,846	0.0085	0.2911
420	72,875	36,437	256,356	365,668	0.0099	0.3010
430	0	0	171,805	171,805	0.0047	0.3056
440	72,875	0	157,937	230,812	0.0062	0.3119
450	0	72,875	149,360	222,235	0.0060	0.3179
460	93,284	0	248,470	341,753	0.0093	0.3271
470	54,615	32,100	224,005	310,720	0.0084	0.3355
480	0	35,454	222,837	258,291	0.0070	0.3425
490	0	0	186,681	186,681	0.0051	0.3476
500	0	35,454	363,822	399,276	0.0108	0.3584
510	0	0	231,696	231,696	0.0063	0.3647
520	72,746	0	394,660	467,406	0.0127	0.3773
530	0	21,606	152,075	173,681	0.0047	0.3820
540	0	56,846	247,185	304,031	0.0082	0.3903
550	36,437	0	183,202	219,640	0.0059	0.3962
560	20,409	0	394,526	414,935	0.0112	0.4074
570	35,454	36,437	358,033	429,925	0.0116	0.4191



Appendix E Table 10.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
580	0	74,224	189,383	263,607	0.0071	0.4262
590	0	19,161	269,476	288,637	0.0078	0.4340
600	72,746	33,293	243,878	349,918	0.0095	0.4435
610	28,682	28,682	298,105	355,470	0.0096	0.4531
620	0	53,384	566,706	620,090	0.0168	0.4699
630	70,554	99,503	733,407	903,464	0.0245	0.4944
640	36,437	35,454	476,302	548,193	0.0148	0.5092
650	38,355	65,406	406,277	510,038	0.0138	0.5230
660	53,277	0	801,178	854,455	0.0231	0.5462
670	52,218	0	551,129	603,347	0.0163	0.5625
680	0	54,011	382,977	436,988	0.0118	0.5743
690	26,361	0	400,886	427,247	0.0116	0.5859
700	108,326	65,120	404,849	578,295	0.0157	0.6016
710	34,116	71,892	919,160	1,025,168	0.0278	0.6293
720	33,293	0	749,695	782,988	0.0212	0.6505
730	19,161	30,890	492,998	543,049	0.0147	0.6652
740	69,971	0	644,626	714,597	0.0193	0.6846
750	34,517	19,161	667,285	720,962	0.0195	0.7041
760	0	0	546,615	546,615	0.0148	0.7189
770	33,326	0	443,622	476,948	0.0129	0.7318
780	52,187	69,571	620,220	741,977	0.0201	0.7519
790	69,730	34,517	555,676	659,923	0.0179	0.7698
800	56,927	0	431,863	488,790	0.0132	0.7830
810	0	19,161	480,506	499,666	0.0135	0.7965
820	0	54,011	658,827	712,838	0.0193	0.8158
830	52,454	53,410	501,090	606,954	0.0164	0.8323
840	0	19,161	317,331	336,491	0.0091	0.8414
850	0	38,989	537,141	576,130	0.0156	0.8570
860	0	19,161	506,227	525,388	0.0142	0.8712
870	0	36,437	325,850	362,287	0.0098	0.8810
880	0	34,116	184,247	218,363	0.0059	0.8869
890	19,161	0	359,417	378,578	0.0103	0.8972
900	0	17,711	217,773	235,485	0.0064	0.9036
910	22,038	60,051	220,061	302,150	0.0082	0.9117
920	0	0	89,751	89,751	0.0024	0.9142
930	0	22,038	348,839	370,877	0.0100	0.9242
940	19,094	0	162,782	181,876	0.0049	0.9291
950	0	0	193,466	193,466	0.0052	0.9344
960	0	0	278,368	278,368	0.0075	0.9419
970	0	19,161	213,124	232,284	0.0063	0.9482
980	0	0	105,887	105,887	0.0029	0.9511
990	0	0	59,032	59,032	0.0016	0.9527
1000	0	0	15,854	15,854	0.0004	0.9531
1010	0	19,298	103,264	122,562	0.0033	0.9564
1020	0	0	105,568	105,568	0.0029	0.9593
1030	0	0	91,703	91,703	0.0025	0.9618
1040	0	0	77,516	77,516	0.0021	0.9639

Appendix E Table 10.--Continued

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
1050	0	55,736	154,886	210,622	0.0057	0.9696
1060	0	0	56,101	56,101	0.0015	0.9711
1070	0	0	134,177	134,177	0.0036	0.9747
1080	0	0	62,289	62,289	0.0017	0.9764
1090	0	0	97,732	97,732	0.0026	0.9790
1100	0	0	66,182	66,182	0.0018	0.9808
1110	0	0	112,155	112,155	0.0030	0.9839
1120	0	0	65,056	65,056	0.0018	0.9856
1130	0	0	24,343	24,343	0.0007	0.9863
1140	0	0	153,615	153,615	0.0042	0.9905
1150	34,116	0	18,510	52,627	0.0014	0.9919
1160	0	0	26,665	26,665	0.0007	0.9926
1170	0	0	29,047	29,047	0.0008	0.9934
1180	0	0	51,332	51,332	0.0014	0.9948
1330	0	0	18,510	18,510	0.0005	0.9953
1340	0	0	30,033	30,033	0.0008	0.9961
1350	0	0	22,090	22,090	0.0006	0.9967
1360	0	0	22,747	22,747	0.0006	0.9973
1380	0	0	29,558	29,558	0.0008	0.9981
1390	0	0	18,516	18,516	0.0005	0.9986
1400	0	0	18,516	18,516	0.0005	0.9991
1500	0	0	32,822	32,822	0.0009	1.0000
9999	1,852,701	2,028,045	33,051,768	36,932,514	1.0000	1.0000
1710	0	0	16,374	16,374	0.0005	1.0000
Total	0	0	35,806,751	35,806,751	1.0000	1.0000