Alaska
Fisheries Science
Center

National Marine
Fisheries Service

U.S DEPARTMENT OF COMMERCE

AFSC PROCESSED REPORT 96-05

1992 Bottom Trawl Survey of the Eastern Bering Sea Continental Shelf

June 1996

ERRATA NOTICE

This document is being made available in .PDF format for the convenience of users; however, the accuracy and correctness of the document can only be certified as was presented in the original hard copy format.

Inaccuracies in the OCR scanning process may influence text searches of the .PDF file. Light or faded ink in the original document may also affect the quality of the scanned document.


NATIONAL MARINE FISHERIES SERVICE
1871
125th ANNIVERSARY
1996
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

1992 BOTTOM TRAWL SURVEY OF THE EASTERN BERING SEA CONTINENTAL SHELF

Gary Walters
Compiler

Bering Sea Subtask

Claire Armistead
Pamela Goddard
Daniel Nichol
Terrance Sample

Resource Assessment and Conservation Engineering Division
Alaska Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
7600 Sand Point Way N.E., Bin C15700
Seattle, WA 98115-0070

June 1996

ABSTRACT

The Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center conducts annual bottom trawl surveys to monitor the condition of the demersal fish and crab stocks of the eastern Bering Sea continental shelf. The standard study area, surveyed each year since 1979, encompasses a major portion of the eastern Bering Sea shelf between the 20-m and the 200-m isobaths and from the Alaska Peninsula north to approximately the latitude of St. Matthew Island (lat. 60° 50' N). In 1992, this area was again surveyed by two chartered trawlers, the 30.5 m Alaska and the 30.5 m Tracy Anne.

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

Survey results presented in this report include relative fishing powers of the survey vessels, abundance estimates for fish and invertebrates, geographic distributions of 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.

CONTENTS

INTRODUCTION

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

Since 1971, the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC) has conducted annual bottom trawl surveys of the eastern Bering Sea continental shelf. In 1975, the first large-scale survey of the eastern Bering Sea shelf was conducted under contract 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 latitude. 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 (1979, 1982, 1985, 1988, 1991) an extended survey has been conducted, including hydroacoustic assessment of midwater pollock, bottom trawl sampling of the continental slope, and bottom trawl sampling in the region between St. Matthew and St. Lawrence Islands. The information gathered by the annual surveys serves to: 1) provide the North Pacific Fishery Management Council with annual fishery-independent estimates of abundance and biological condition of commercially exploited stocks, 2) provide distribution and abundance information to commercial fishermen, and 3) develop a time-series data base contributing to our understanding of the population dynamics and interactions of groundfish species.

This report presents information collected by the AFSC in the eastern Bering Sea during the 1992 bottom trawl survey. The groundfish/crab survey and several ancillary projects were conducted from 1 June to 6 August by two U.S. vessels. A cooperative U.S.-Russian survey of portions of the western Bering Sea shelf was performed aboard the Mys Babushkina from June 5 to July 29. The results of that survey will be reported elsewhere. Also, detailed information on principal crab species can be found in a report by Stevens et al. (1992).

METHODS

Survey Area and Sampling Design

The standard station pattern for the eastern Bering Sea survey is based on a systematic 20 x 20 nautical mile grid. In areas surrounding St. Matthew and the Pribilof Islands, grid block corners were also sampled to better assess blue king crab (Paralithodes platypus) concentrations. The survey design pattern called for 356 stations. In 1992, 336 standard stations and 20 additional stations north-west of the standard pattern were successfully sampled (Fig. 1, Appendix A). Due to extreme weather conditions, vessel breakdowns, and a medical emergency, a block of 18 stations on the north-central edge of the pattern was not sampled.

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 1988). The presence of high-density sampling for blue king crab in subareas 3, 4, and 6 necessitated a further division of these subareas into high-density and standard-density

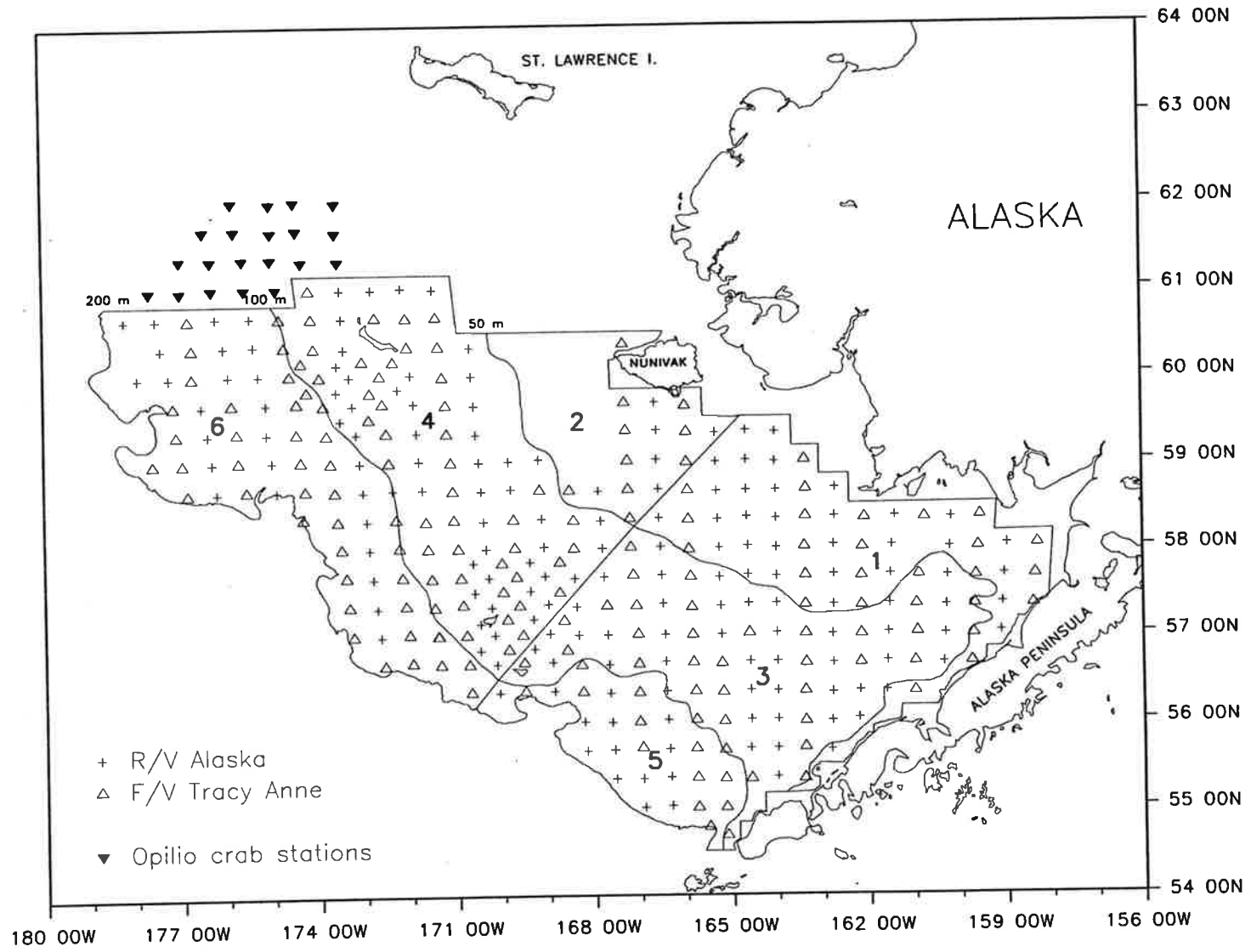

Figure 1.--Standard and special study stations sampled during the 1992 eastern Bering Sea bottom trawl survey, and stratification used for analysis of data.

sample strata, resulting in a total of 10 geographic strata. The overall sampling density for the entire survey area was one station per 1,304 km^2 (Table 1). However, because of the high-density sampling in subareas 3, 4, and 6, and the irregular subarea boundaries, sampling density among the six subareas varied from one station per 1,096 km^2 to one per 1,492 km^2. Subareas 2 and 4, where some designated stations were missed (Fig. 1), were adjusted to include only those grid blocks actually sampled and not the standard area sampled in prior years.

Table 1.--Size of subareas and sampling densities by subarea for the 1992 eastern Bering Sea bottom trawl survey (see also Fig. 1).

Subarea	Area (km^2)	No. stations successfully sampled	Sampling density (km^2/stn)
1	77,871	57	1,366
2	20,740[a]	16	1,296
3	103,300	76	1,359
4	102,966[a]	94	1,096
5	38,792	26	1,492
6	94,562	67	1,411
Subareas combined	438,262	336	1,304

[a] Subareas 2 and 4 are smaller than in previous years. See text for explanation.

Vessels and Fishing Gear

The 1992 eastern Bering Sea bottom trawl survey was conducted aboard the 30.5 m University of Washington research vessel Alaska and the 30.5 m fishing vessel Tracy Anne (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 dandylines. Each lower dandyline had a 0.61 m chain extension connected to the lower wing edge to improve bottom tending characteristics. Steel "V"-doors measuring 1.8 x 2.7 m and weighing 816 kg were used.

Table 2.--Characteristics of vessels used during the 1992 eastern Bering Sea bottom trawl survey.

Vessel	Overall length (m)	Gross tonnage	Horsepower	Survey period Start	Survey period Finish
Alaska	30.5	219	850	1 June	6 August
Tracy Anne	30.5	189	825	1 June	6 August

SCANMAR[1] net mensuration systems were used aboard each vessel to measure net height and width. Net width was measured by the distance between two sensors attached to the upper starboard and port dandylines, 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.

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

83/112 EASTERN

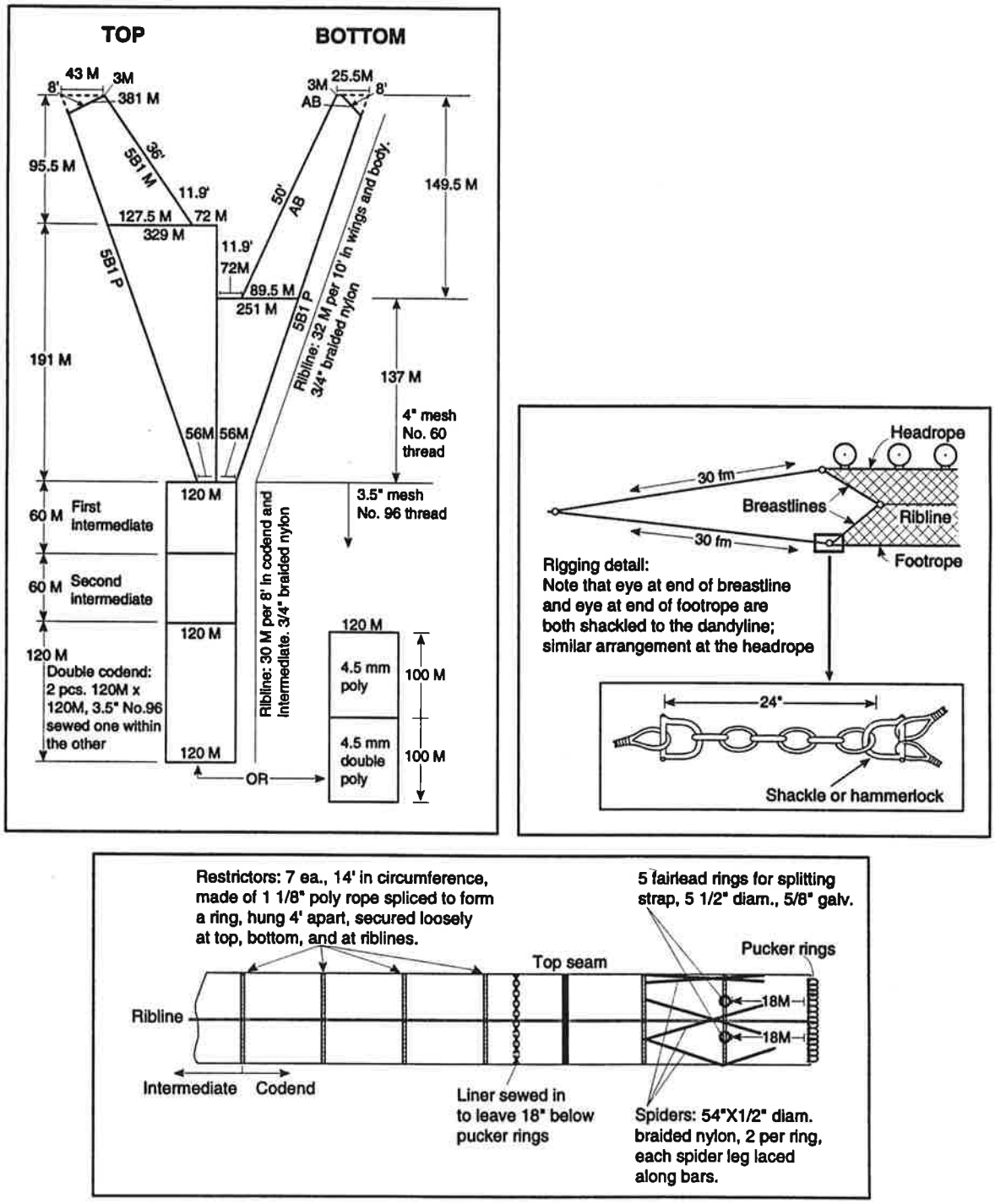

Figure 2.-- Schematic diagram of trawl used during the 1992 eastern Bering Sea bottom trawl survey.

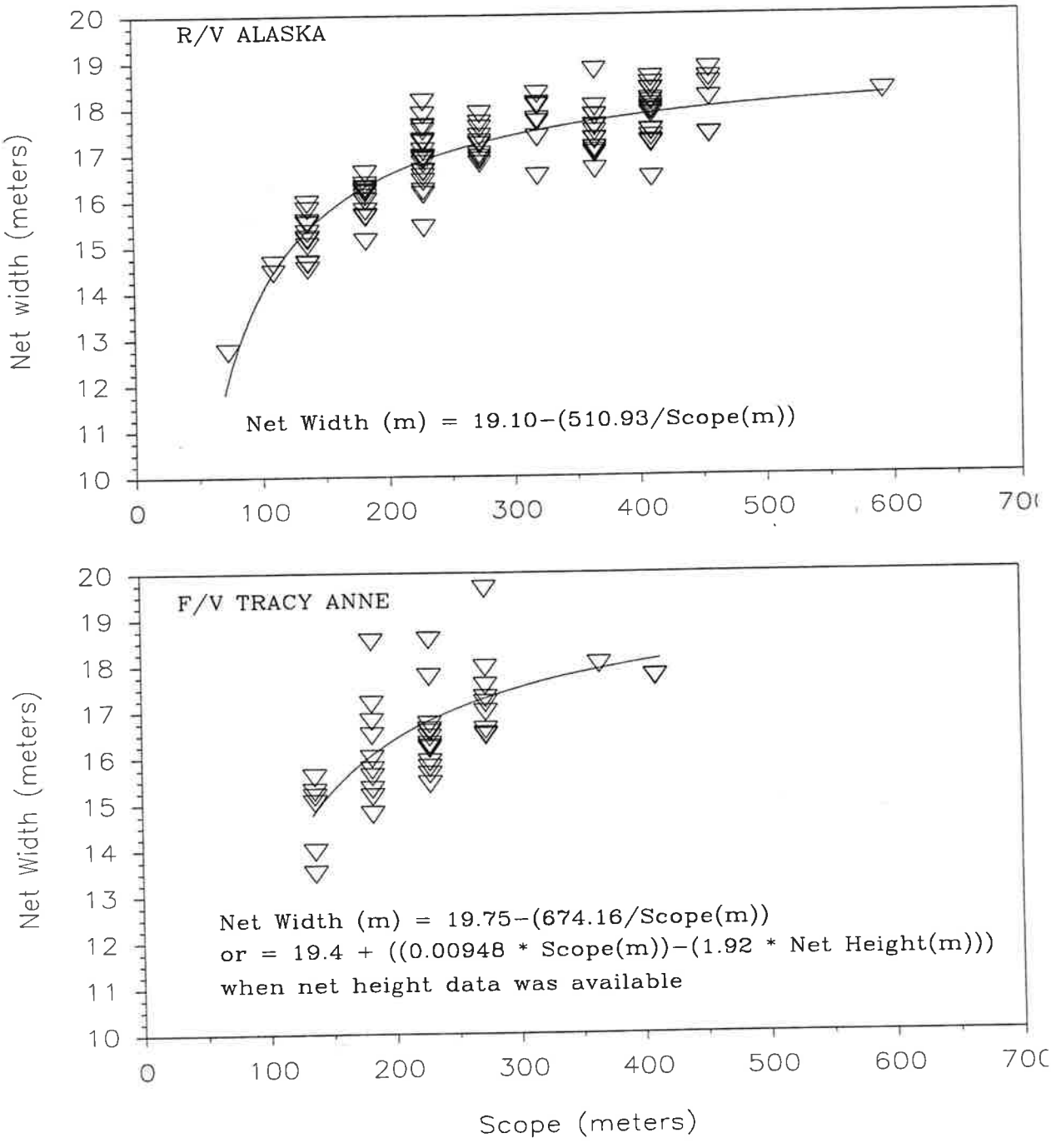

Figure 3.--Relationship between net-width and scope (wire-out) or net-height for vessels participating in the 1992 eastern Bering Sea bottom trawl survey.

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

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

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

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

Table 3.--Number of length measurements taken during the 1992 eastern Bering Sea bottom trawl survey.

Species	Length measurements by subarea						Total
	1	2	3	4	5	6	
Walleye pollock	1,854	909	8,202	8,768	3,860	10,431	34,024
Rock sole	7,988	2,133	8,606	6,662	133	1,572	27,094
Yellowfin sole	8,919	2,509	8,167	4,017	14	--	23,626
Flathead sole	477	2	4,848	1,729	3,777	4,980	15,813
Pacific cod	2,308	411	2,082	2,668	445	1,550	9,464
Alaska plaice	1,710	672	1,599	3,436	2	162	7,581
Arrowtooth flounder	21	--	1,041	342	2,492	1,814	5,710
Bering flounder	--	--	--	1,680	--	414	2,094
Pacific halibut	467	139	304	257	85	137	1,389
Rex sole	3	--	16	--	356	157	532
Greenland turbot	--	--	2	33	1	404	440
Pacific herring	247	--	--	--	--	18	265
Starry flounder	155	8	49	--	--	--	212
Arctic cod	--	--	--	111	--	--	111
Pacific ocean perch	--	--	--	--	--	109	109
Longhead dab	89	--	--	--	--	--	89
Saffron cod	--	42	--	--	--	--	42
Northern rockfish	--	--	--	--	35	--	35
Dover sole	--	--	--	--	4	2	6
Sakhalin sole	--	--	--	1	--	--	1

Table 4.--Number of fish in which age structures were collected, by species and subarea, during the 1992 eastern Bering Sea bottom trawl survey.

Species	Subarea 1	2	3	4	5	6	Total
Walleye pollock	178	0	303	197	162	305	1,279[a]
Pacific cod[b]	146	29	69	205	102	140	731
Yellowfin sole	383	67	45	116	0	0	611
Rock sole	262	0	44	104	0	98	535
Flathead sole	0	0	167	0	92	161	420
Alaska plaice	96	7	65	150	0	0	318
Greenland turbot	0	0	2	1	1	3	7
Arrowtooth flounder	0	0	0	0	84	13	97
Kamchatka flounder	0	0	26	0	110	29	165

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

Data Analysis

A brief description of the procedures used in analysis of 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). Two-hundred-ninety-two stations sampled by the two vessels during the standard survey (Fig. 1) plus 10 stations from special studies 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 the Age and Growth

Determination Unit 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 the Food Habits Program of the AFSC's REFM Division (Table 5).

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

Table 5.--Biological fish samples collected for special studies during the 1992 eastern Bering Sea bottom trawl survey.

Species	Stomach samples collected	Pathobiological samples collected
Walleye pollock	2,747	92
Pacific cod	1,981	102
Yellowfin sole	848	2
Rock sole	449	2
Flathead sole	485	--
Pacific halibut	329	--
Alaska plaice	264	--
Arrowtooth flounder	97	--
Greenland turbot	89	--
Skates	459	--
Pacific herring	--	31

RESULTS

Station Data

Station data from the 1992 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 3.1° to 10.6°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 -2.0° to 7.4°C (Fig. 5). The warmest temperatures (above 4°C) occurred in shallow waters along the Alaska mainland, along portions of the outer shelf, and in the southern portion of the outer shelf just north of Unimak Pass. The coldest bottom temperatures observed were in the northern portion of the mid-shelf at depths between 50 and 100 m.

The mean bottom water temperature for the total survey area in 1992 was 1.76°C (Fig. 6). Historically, this is the lowest average value ever recorded for mean summer bottom water temperatures in the standard survey area (range in annual means 1.8° to 5.1°C, average of annual means 2.8°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

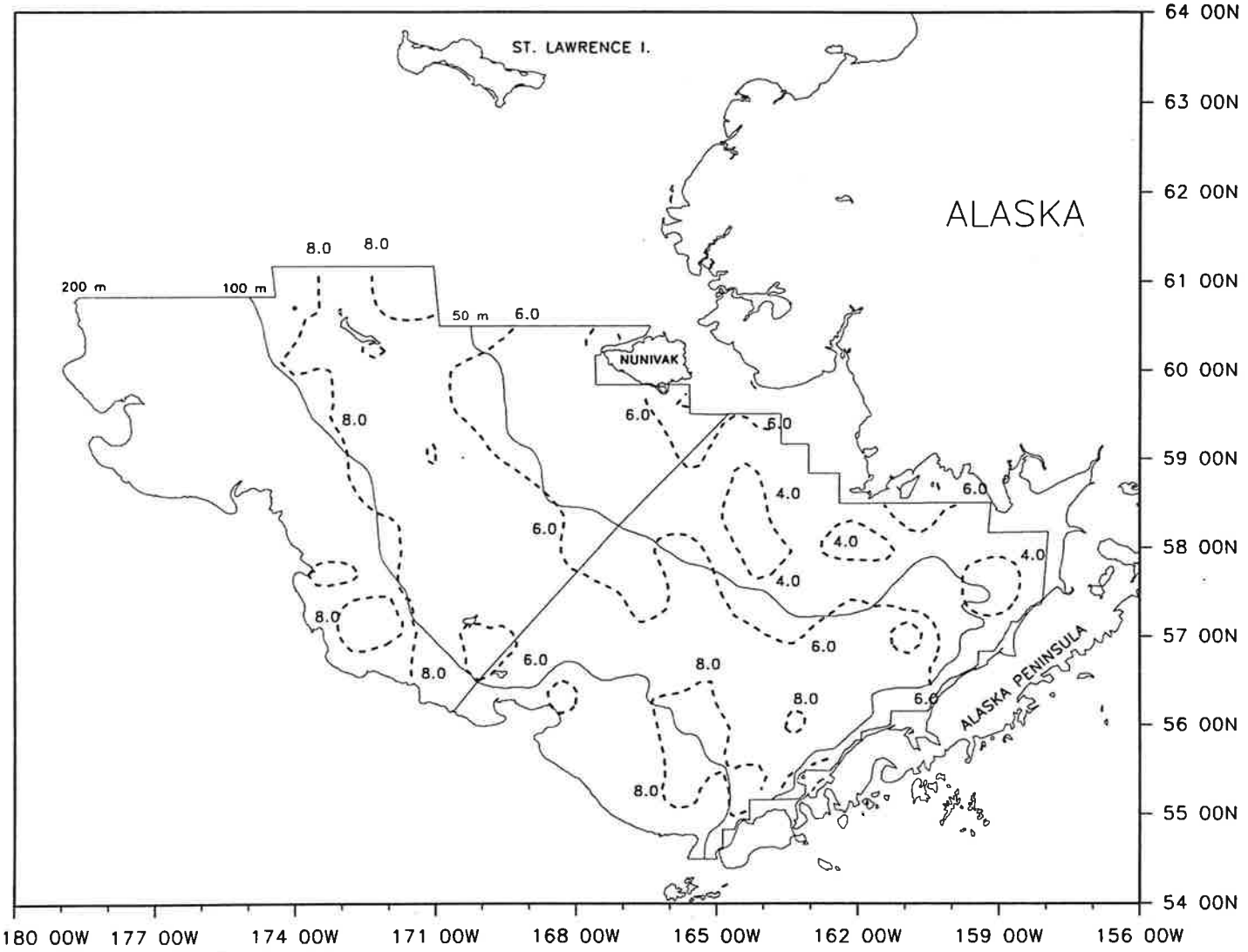

Figure 4.--Distribution of surface water temperatures (C) observed during the 1992 eastern Bering Sea bottom trawl survey.

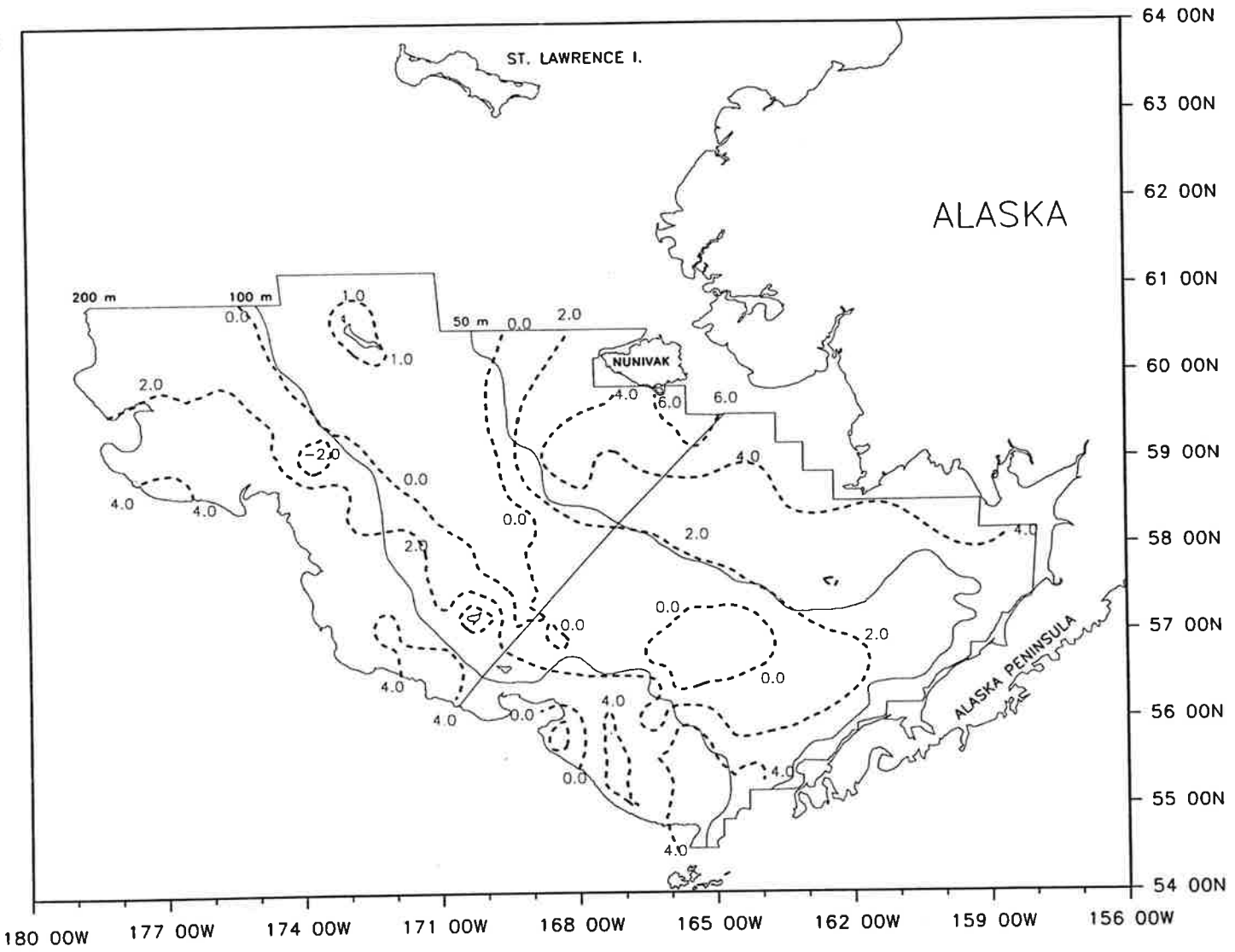

Figure 5.--Distribution of bottom water temperatures (°C) observed during the 1992 eastern Bering Sea bottom trawl survey.

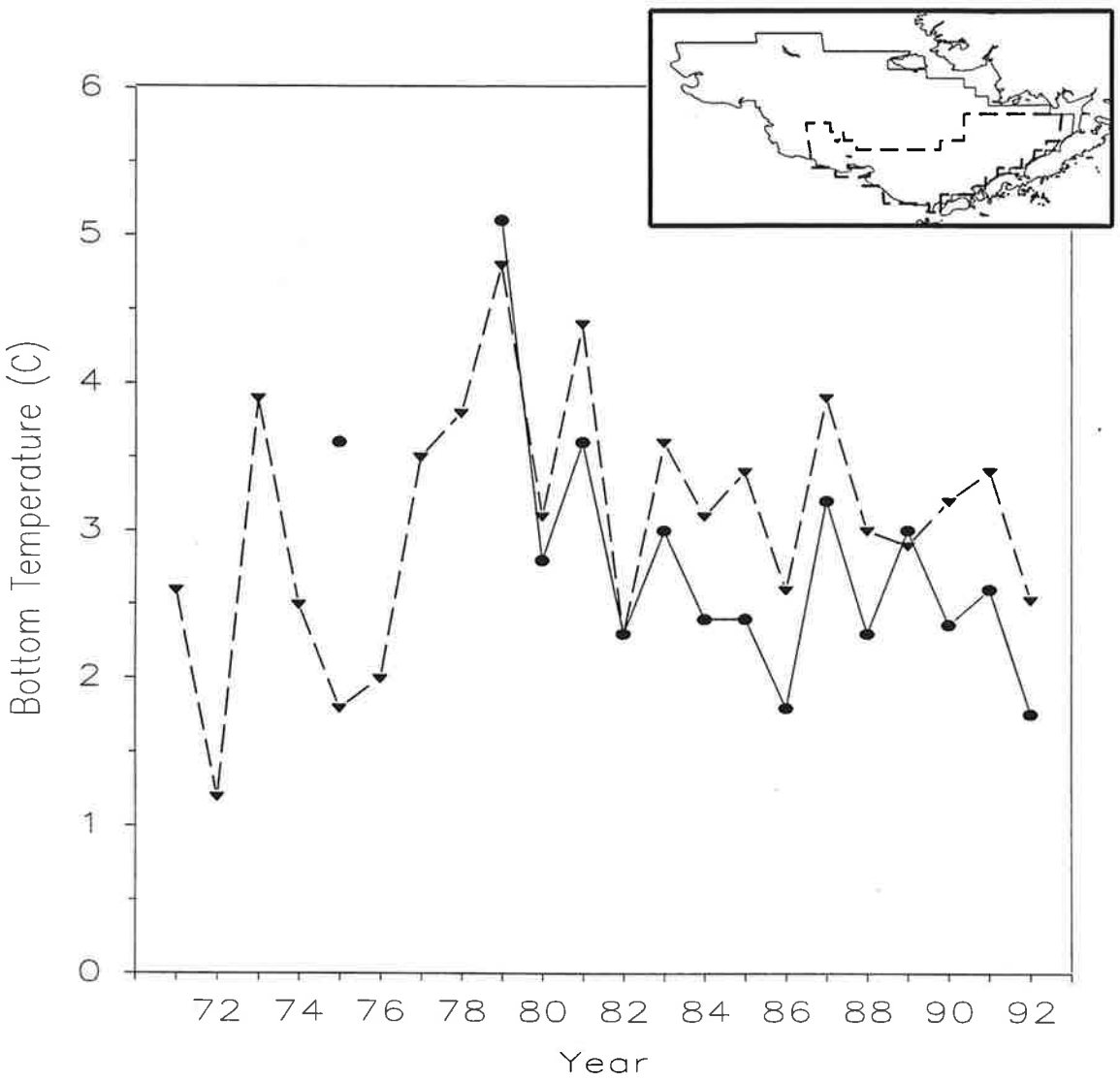

Figure 6.--Mean summer bottom water temperatures based on bathythermograph casts made during Alaska Fisheries Science Center bottom trawl surveys. The 1971-92 means (dashed line) are from the southeast Bering Sea (see inset) and the 1975 and 1979-92 means are from the larger survey area outlined on the 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.

1992 value for this area was 2.5 °C, the lowest value since 1982 and well below the long-term average (3.1°C)(Fig. 6.). The distribution of bottom water temperatures was somewhat unusual in 1992 in that there was a relatively broad distribution of 0°C and colder water on the northern midshelf that extended as far south as the Pribilof Islands. In addition the 2°C isotherm extended farther south and east than normal. A residual pool of 0.0° C or colder water remained as far east as longitude 164°. Overall, 1992 appears to have been the coldest year in the eastern Bering Sea since 1976.

Relative Fishing Powers of Survey Vessels

A total of 302 alternate-row tows (Alaska = 149, Tracy Anne = 153) were used in the comparison of vessel catch rates with the methods developed by Kappenman (1992). There were 292 tows from the standard area and 10 more from the special studies work (Appendix A). Based on this analysis, the Tracy Anne was significantly more efficient than the Alaska at capturing the following species and species groups: walleye pollock, Pacific cod, Hippoglossoides spp., Alaska plaice, Atheresthes spp., Pacific halibut, Myoxocephalus spp., yellowfin sole, rock sole, and snow crab. Fishing power corrections were applied to catches (by species) of the less efficient vessel (Table 6).

Table 6.--Species for which fishing power corrections were applied, and scaling factors determined by the method of Kappenman (1992) based on 302 total hauls.

Species	Hauls with catch		Catch multiplier	
	Alaska	Tracy Anne	Alaska	Tracy Anne
Walleye pollock	144	148	1.03	1.00
Pacific cod	146	145	1.09	1.00
Rock sole	135	139	1.10	1.00
Hippoglossoides spp.	134	134	1.14	1.00
Alaska plaice	106	95	1.06	1.00
Atheresthes spp.	51	59	1.28	1.00
Pacific halibut	110	115	1.18	1.00
Yellowfin sole	108	100	1.11	1.00
Myoxocephalus spp.	106	104	1.03	1.00
Snow crab	108	112	1.19	1.00

Estimated Biomass of Major Fish and Invertebrate Groups

Total demersal animal biomass for the overall survey area was estimated at 13.9 million t, of which fish species accounted for 78% (10.8 million t, Table 7), and invertebrates 22% (3.1 million t, Table 8). Concentrations of fish biomass were located in Bristol Bay and along the Alaska Peninsula, around the Pribilof Islands, and northwest of the Pribilofs (Fig. 7). Although 21 families and 74 species of fish were identified in the catches (Appendix B), the fish biomass was dominated by flatfishes (Pleuronectidae, 5.2 million t) and cods (Gadidae, 4.9 million t) (Table 7). The biomass of invertebrates was comprised primarily of the phyla Echinodermata (1.2 million t), Crustacea (1.1 million t), and Mollusca (0.3 million t). A total of 75 invertebrate species from 10 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 76% (238 kg/ha) of total animal mean CPUE (313 kg/ha) and 97% of total fish mean CPUE (245 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 98 kg/ha. Similarly, Pacific cod were more abundant at depths exceeding 50 m, but their overall mean CPUE was only 12 kg/ha. Yellowfin sole and rock sole, with overall mean catch rates of 45 kg/ha and 36 kg/ha respectively, dominated catches in water less than 50 m. Yellowfin sole and rock sole were also prominent on the mid-shelf in waters between 50 and 100 m along with Alaska plaice and Hippogloissoides spp. The Myoxocephalus sculpins were spread across both the inner and mid-shelf. Conversely, Hippoglossoides spp., Atheresthes spp., and skates were most abundant in water greater than 100 m. Pacific halibut were present at low levels in all depth zones. See Appendix C for a descending rank of all organisms caught.

Table 7.--Biomass estimates (t) for major fish species and fish groups taken during the 1992 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t)[a] and 95% confidence interval	Proportion of total animal biomass[b]	Estimated biomass by subarea (t)					
			1	2[c]	3	4[c]	5	6
Gadidae (cods)								
Walleye pollock	4,324,825 ± 24%	0.314	171,102	24,257	973,834	613,850	248,299	2,293,483
Pacific cod	535,645 ± 16%	0.039	113,963	11,359	134,442	91,496	51,956	132,428
Other cods	2,807 ± 43%	<0.001	47	571	1	2,187	0	1
Total cods	4,863,277 ± 21%	0.353	285,113	36,188	1,108,277	707,533	300,255	2,425,912
Anoplopomatidae								
Sablefish	294 ± 139%	<0.001	0	0	0	0	294	0
Scorpaenidae (rockfish)								
Pacific ocean perch	15,444 ± 198%	0.001	0	0	0	0	101	15,343
Other rockfish	3,835 ± 201%	<0.001	0	0	14	0	3,821	0
Total rockfish	19,279 ± 164%	0.001	0	0	14	0	3,923	15,343
Pleuronectidae (flatfishes)								
Yellowfin sole	1,997,641 ± 16%	0.145	858,189	295,886	652,497	189,897	1,172	0
Rock sole	1,480,775 ± 14%	0.108	677,582	130,242	322,043	292,332	5,707	52,869
Hippoglossoides spp.	649,543 ± 20%	0.047	20,879	32	254,246	51,752	136,596	186,038
Alaska plaice	489,327 ± 21%	0.036	75,645	28,358	117,243	222,134	26	45,920
Atheresthes spp.	420,176 ± 23%	0.031	582	0	83,716	6,836	162,701	166,342
Greenland turbot	23,997 ± 48%	0.002	0	0	617	1,041	214	22,125
Pacific halibut	98,302 ± 17%	0.007	23,406	6,594	24,372	9,822	16,435	17,673
Other flatfish	50,168 ± 31%	0.004	27,657	3,728	6,650	71	8,680	3,382
Total flatfish	5,209,929 ± 10%	0.378	1,683,940	464,840	1,461,385	773,886	331,531	494,347
Clupeidae								
Pacific herring	8,461 ± 91%	0.001	5,886	705	880	721	27	242
Cottidae (sculpins)	223,972 ± 18%	0.016	39,612	15,616	34,591	91,759	7,863	34,530
Zoarcidae (eelpouts)	33,198 ± 21%	0.002	0	0	3,121	7,966	1,902	20,209
Osmeridae (smelts)	8,293 ± 39%	0.001	4,664	386	625	50	2,562	6
Agonidae (poachers)	23,342 ± 19%	0.002	6,618	2,839	5,580	6,590	1,197	518
Cyclopteridae (snailfishes)	4,102 ± 35%	<0.001	3	6	32	2,582	104	1,375
Rajidae (skates)	377,535 ± 18%	0.027	9,362	9,861	68,891	56,210	59,711	173,499
Other fish	21,425 ± 58%	0.002	3,394	1,355	426	559	8,224	7,468
Total fish	10,793,106 ± 11%	0.784	2,038,591	531,795	2,683,824	1,647,855	717,592	3,173,449

[a]Differences in sums of estimates and totals are due to rounding
[b]Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass= 13,923,797
[c]Strata 2 and 4 were not completely surveyed in 1992. See text for details

Table 8.--Biomass estimates (t) for major invertebrate species and invertebrate groups taken during the 1992 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t[a]) and 95% confidence interval	Proportion of total animal biomass[b]	Estimated biomass by subarea (t)					
			1	2[c]	3	4[c]	5	6
Crustacea								
Chionoecetes spp. (snow crab)	651,994 ± 23%	0.045	4,508	33,437	138,135	277,567	30,906	167,441
Lithodes spp. king crab	0 ± 0%	0.000	0	0	0	0	0	0
Paralithodes spp. (king crab)	57,625 ± 39%	0.004	10,600	632	25,210	19,198	0	1,986
Erimacrus isenbeckii (hair crab)	1,727 ± 59%	<0.001	63	7	287	1,259	99	12
Paguridae hermit crab	352,369 ± 22%	0.024	13,091	5,314	126,998	115,591	7,632	83,744
Other crab	43,314 ± 47%	0.003	10,059	6,774	13,276	12,508	238	460
Total crab	1,113,774 ± 16%	0.077	38,320	46,163	307,662	429,112	38,874	253,642
Shrimps	11,161 ± 90%	0.001	14	62	65	429	485	10,107
Other crustaceans	674 ± 199%	<0.001	4	0	16	643	0	10
Total crustaceans	1,125,609 ± 16%	0.078	38,338	46,225	307,743	430,184	39,359	263,760
Mollusca								
Gastropoda (snails)	302,862 ± 23%	0.021	14,009	13,619	108,148	85,399	6,783	74,903
Pelecypoda (bivalves)	5,353 ± 92%	<0.001	1,086	438	2,974	515	197	143
Squids	26 ± 182%	<0.001	0	0	0	0	6	20
Octopuses	5,326 ± 123%	<0.001	254	0	2,854	295	855	1,068
Other mollusks	0 ± 0%	0.000	0	0	0	0	0	0
Total mollusks	313,568 ± 22%	0.022	15,350	14,058	113,977	86,208	7,841	76,135
Echinodermata	1,021,895 ± 30%	0.070	314,123	175,967	357,137	119,246	1,025	54,398
Asteroidea (starfish)	169,600 ± 42%	0.012	1,662	2,743	32,503	22,809	7,266	102,618
Ophiuroidea (brittle stars)	7,322 ± 137%	0.001	7	0	682	560	3,933	2,139
Echinoidea (sea urchin)	7,007 ± 123%	<0.001	2,988	0	2,992	1,022	0	5
Holothuroidea (sea cucumbers)	1,207,396 ± 26%	0.083	320,221	178,709	393,367	143,660	12,224	159,215
Total echinoderms	165,892 ± 54%	0.011	11,239	5,820	62,044	86,337	451	0
Ascidiacea	55,501 ± 118%	0.004	524	394	47,949	5,739	595	301
Porifera (sponges)	167,983 ± 26%	0.012	11,988	980	82,046	55,585	11,381	6,003
Coelenterata	96,314 ± 38%	0.007	9,615	1,967	50,714	26,700	1,172	6,146
Other invertebrates	3,130,691 ± 14%	0.216	405,833	248,154	1,057,787	834,391	73,022	511,504
Total invertebrates								

[a]Differences in sums of estimates and totals are due to rounding
[b]Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass=13,923,797 t.
[c]Strata 2 and 4 were not completely surveyed in 1992. See text for details.

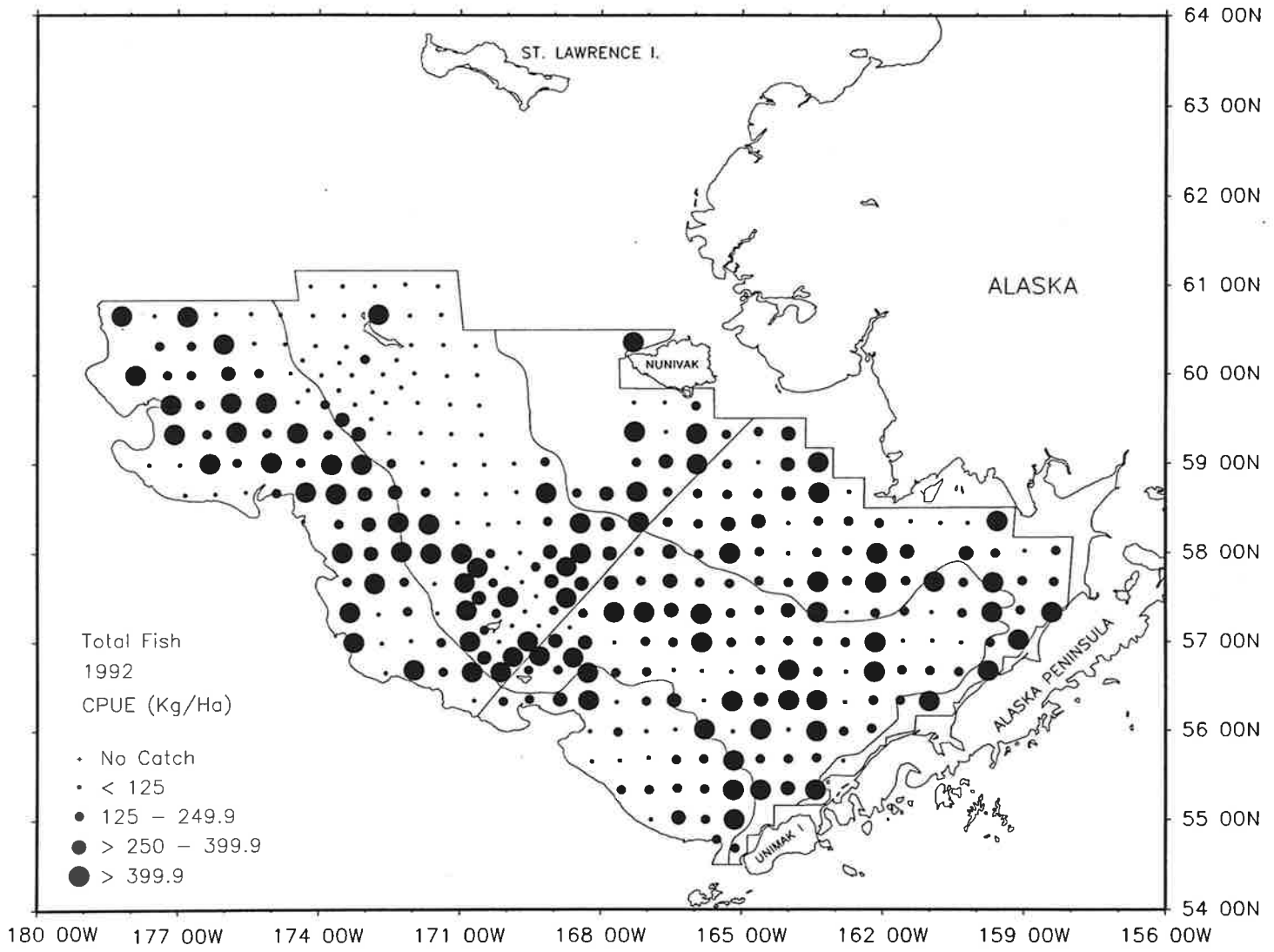

Figure 7.--Distribution and relative abundance of total fish, 1992 eastern Bering Sea bottom trawl survey.

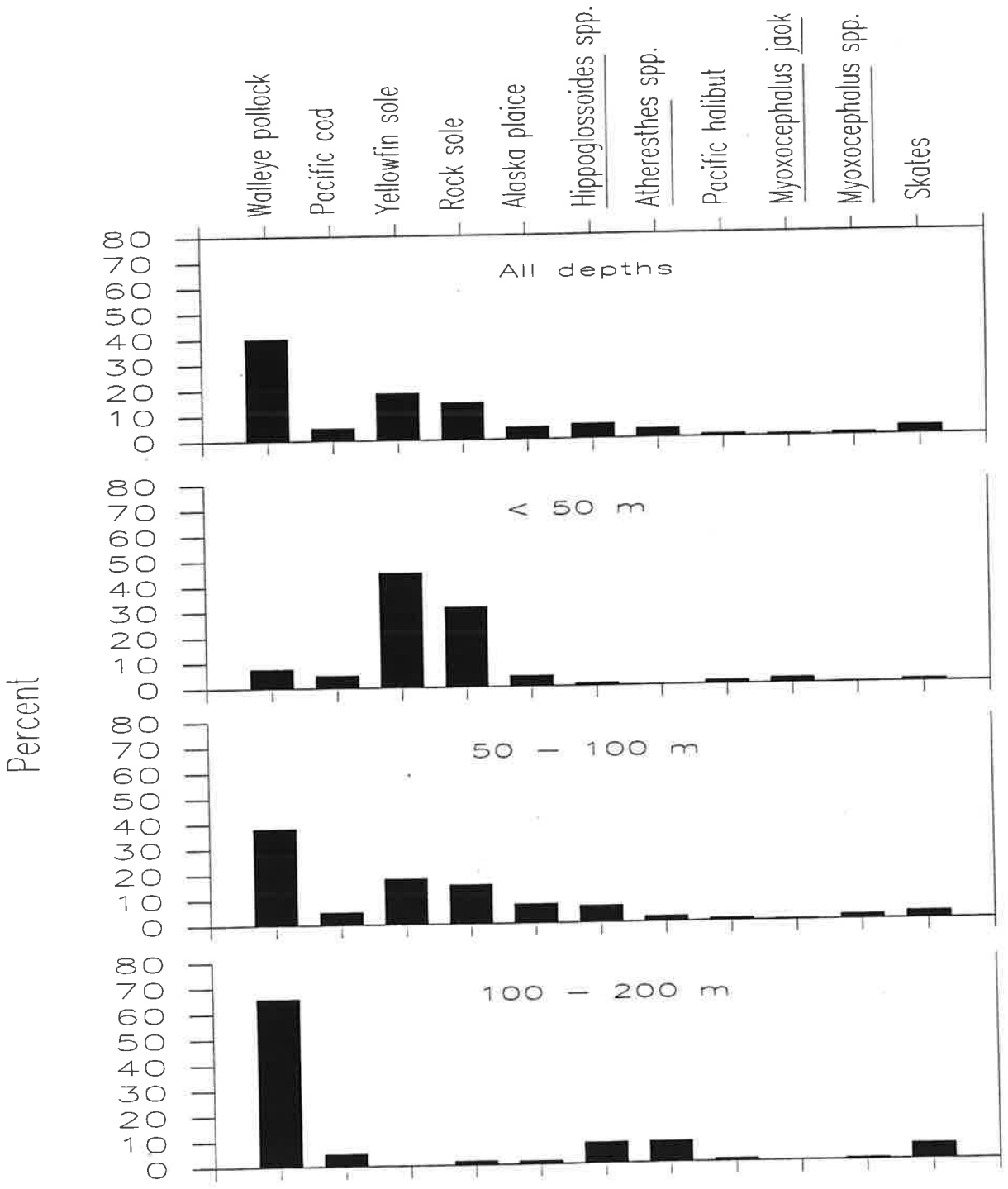

Figure 8.--Relative abundance (%CPUE in kg/ha) of principal groundfish species (top 11 for all depths combined) by depth zone and for all depths combined, 1992 eastern Bering Sea bottom trawl survey.

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), Atheresthes spp., 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, Pacific cod, yellowfin sole, rock sole, Hippoglossoides spp., and Alaska plaice. Geographical distributions for some common, but generally noncommercial fish species are presented. These are total skates, great sculpin, plain sculpin, bigmouth sculpin, wattled eelpout, shortfin eelpout, marbled eelpout, sturgeon poacher, Bering poacher, eulachon, capelin, and Pacific herring. 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 eulachon, capelin, and Pacific herring due to the bottom sampling nature of the survey. We do not feel 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 in are given Appendix D. Population estimates by sex and size class for the total survey area are listed in Appendix E.

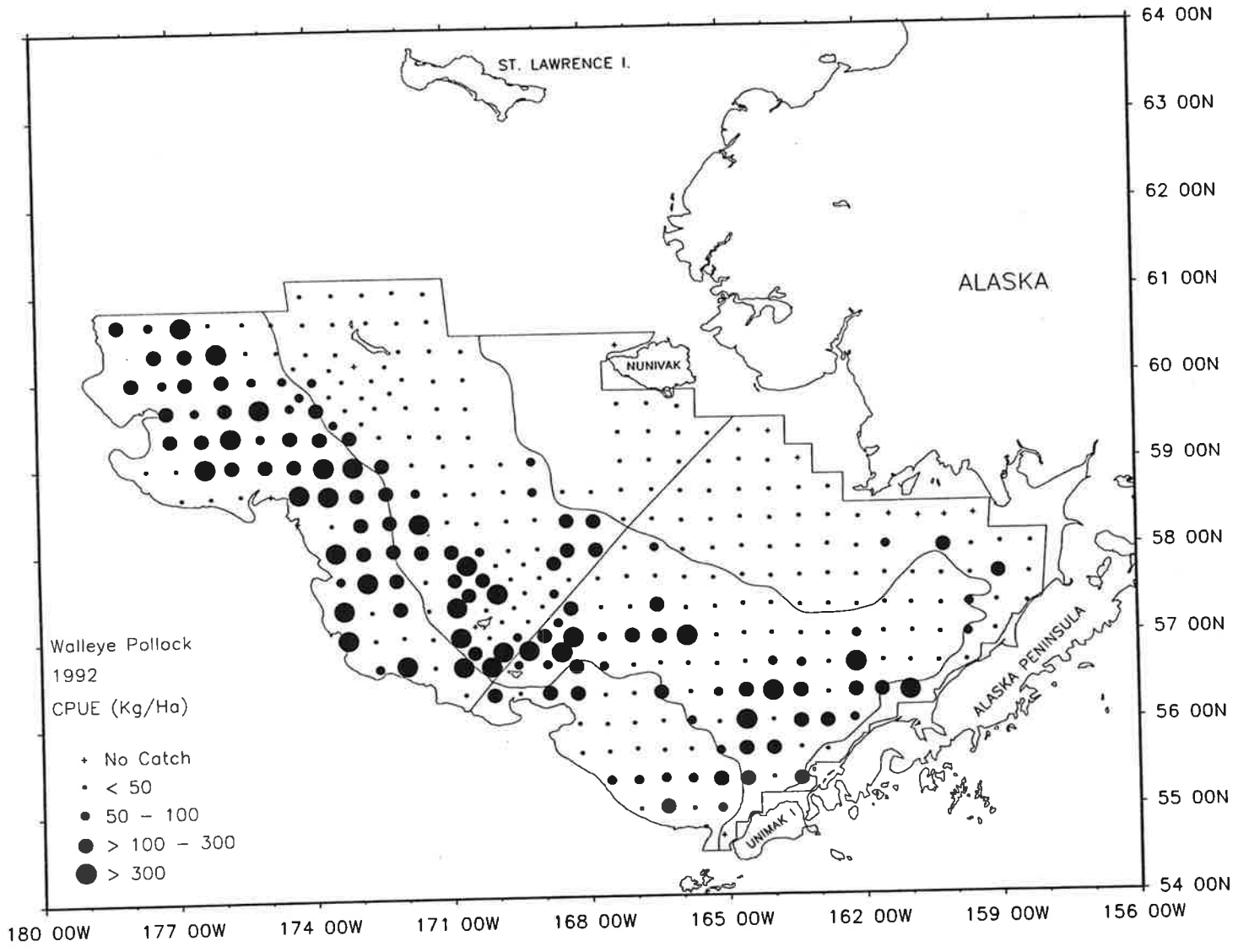

Figure 9.--Distribution and relative abundance in kg/ha of walleye pollock, 1992 eastern Bering Sea bottom trawl survey.

Table 9.--Abundance estimates and mean size of walleye pollock by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size	
						Weight (kg)	Length (cm)
1	21.97	171,102	0.040	128,073,058	0.019	1.336	51.5
2[b]	11.69	24,257	0.006	240,167,259	0.036	0.101	14.5
3	94.27	973,834	0.225	1,439,145,116	0.214	0.677	43.7
4[b]	59.60	613,850	0.142	1,015,236,713	0.151	0.605	36.1
5	64.01	248,299	0.057	309,870,667	0.046	0.801	45.6
6	242.54	2,293,483	0.530	3,603,569,934	0.535	0.636	41.1
All subareas combined[c]	98.68	4,324,825	1.000	6,736,062,747	1.000	0.642	40.3
95% Confidence interval		±1,021,923		±1,544,756,449			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

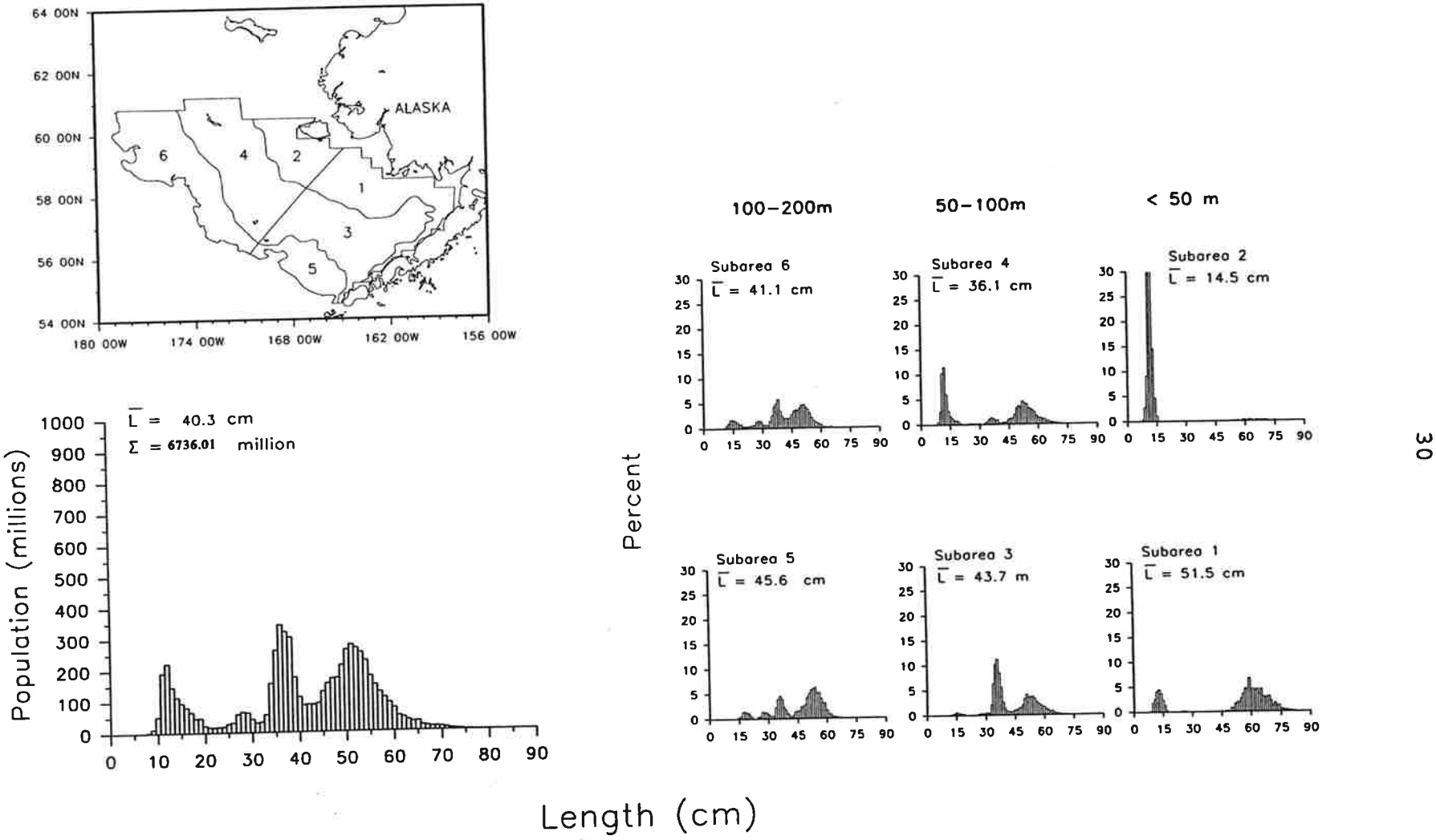

Figure 10.--Estimated relative size distribution (sexes combined) of walleye pollock in terms of population numbers and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 10.--Estimated population numbers (millions of fish) of walleye pollock by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m		50-100 m		<50 m			
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
1	1991	369.13	18.43	389.44	35.22	219.82	25.14	1,057.18	0.1569
2	1990	228.49	16.42	17.83	26.44	0.93	1.08	291.18	0.0432
3	1989	903.36	63.16	65.03	621.50	0.00	0.25	1,653.30	0.2454
4	1988	178.55	8.02	10.53	68.91	0.00	0.00	266.01	0.0395
5	1987	215.58	9.73	20.71	45.07	0.02	0.32	291.44	0.0433
6	1986	353.58	18.87	41.93	62.32	0.03	0.75	477.48	0.0709
7	1985	283.49	24.49	62.83	72.49	0.35	2.81	446.46	0.0663
8	1984	377.75	40.84	96.08	122.33	0.88	7.60	645.48	0.0958
9	1983	155.95	20.27	49.52	63.73	0.69	7.59	297.77	0.0442
10	1982	273.68	41.41	99.95	126.39	1.52	15.14	558.10	0.0829
11	1981	89.21	15.26	43.19	53.37	1.30	9.84	212.15	0.0315
12	1980	89.78	17.32	53.52	67.81	2.82	21.41	252.65	0.0375
13	1979	31.17	6.38	24.62	30.55	2.00	15.30	110.02	0.0163
14	1978	26.38	5.40	18.60	24.49	1.68	10.32	86.87	0.0129
15	1977	21.88	3.21	11.92	14.46	0.67	4.99	57.13	0.0085
16	1976	3.31	0.58	2.26	2.49	0.31	1.76	10.71	0.0016
17	1975	1.26	0.08	0.53	0.57	0.02	0.62	3.08	0.0005
18	1974	0.37	0.01	0.39	0.54	0.16	0.93	2.39	0.0004
Age Unknown		0.65	0.00	6.37	0.46	6.96	2.23	16.66	0.0025
All Ages Combined		3,603.57	309.87	1,015.24	1,439.15	240.17	128.07	6,736.06	1.0000

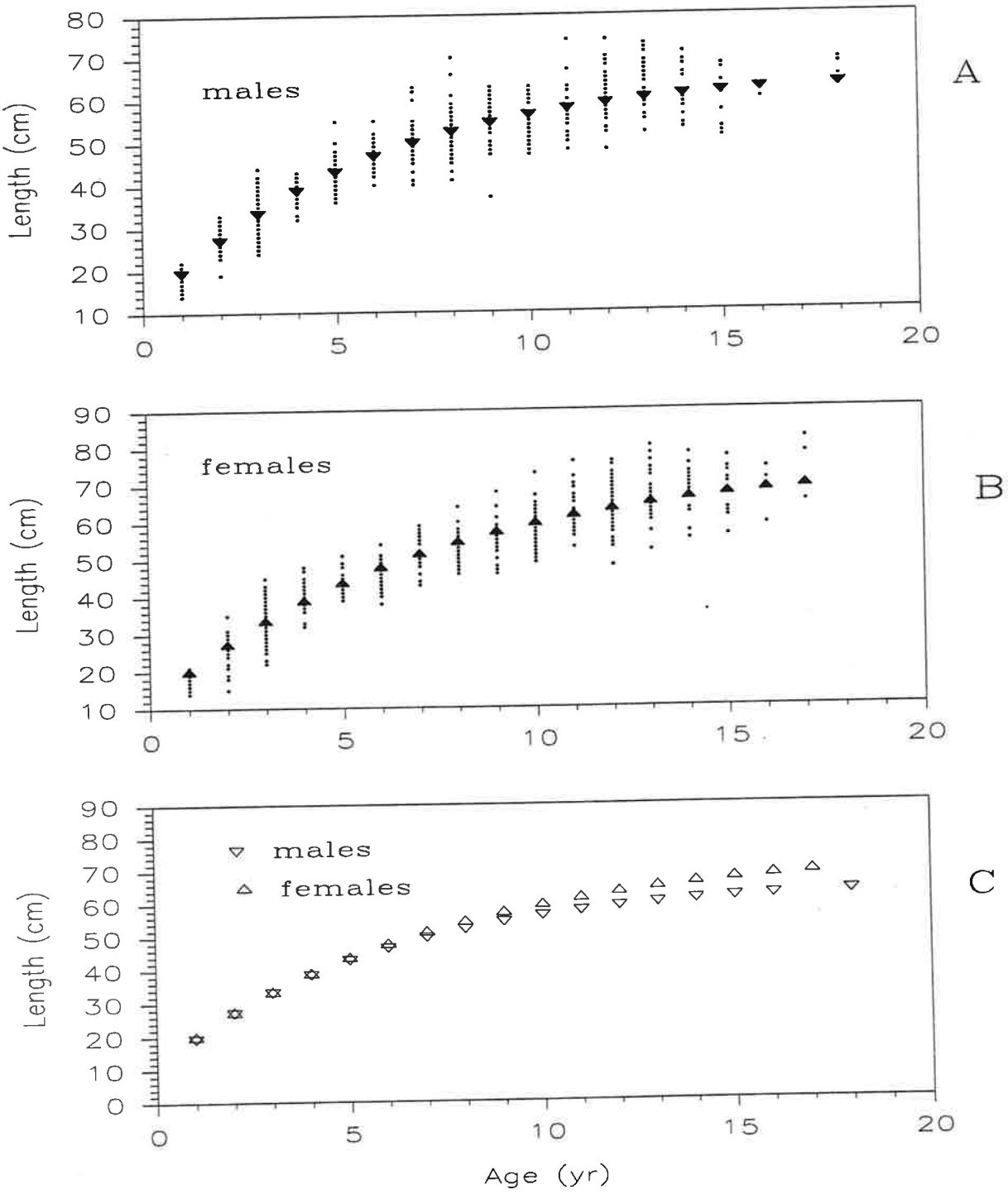

Figure 11.--Distribution of walleye pollock aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 11.--von-Bertalanffy growth parameter estimates for walleye pollock by sex, based on otolith age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Male	599	1-18	14-74	65.5	0.18	-0.97
Female	643	1-17	14-82	75.1	0.14	-1.19

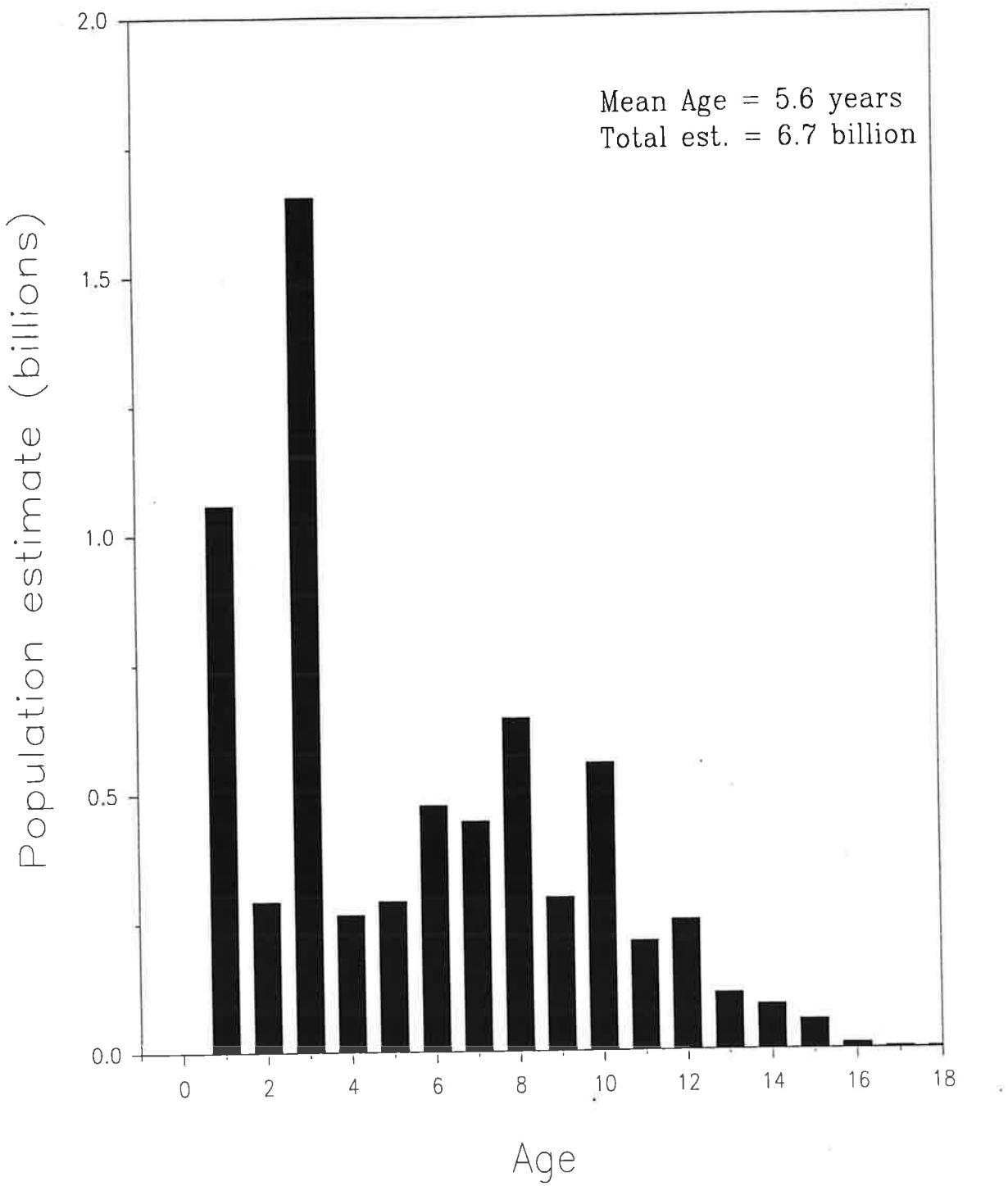

Figure 12.--Population number estimates by age for walleye pollock, 1992 eastern Bering Sea bottom trawl survey.

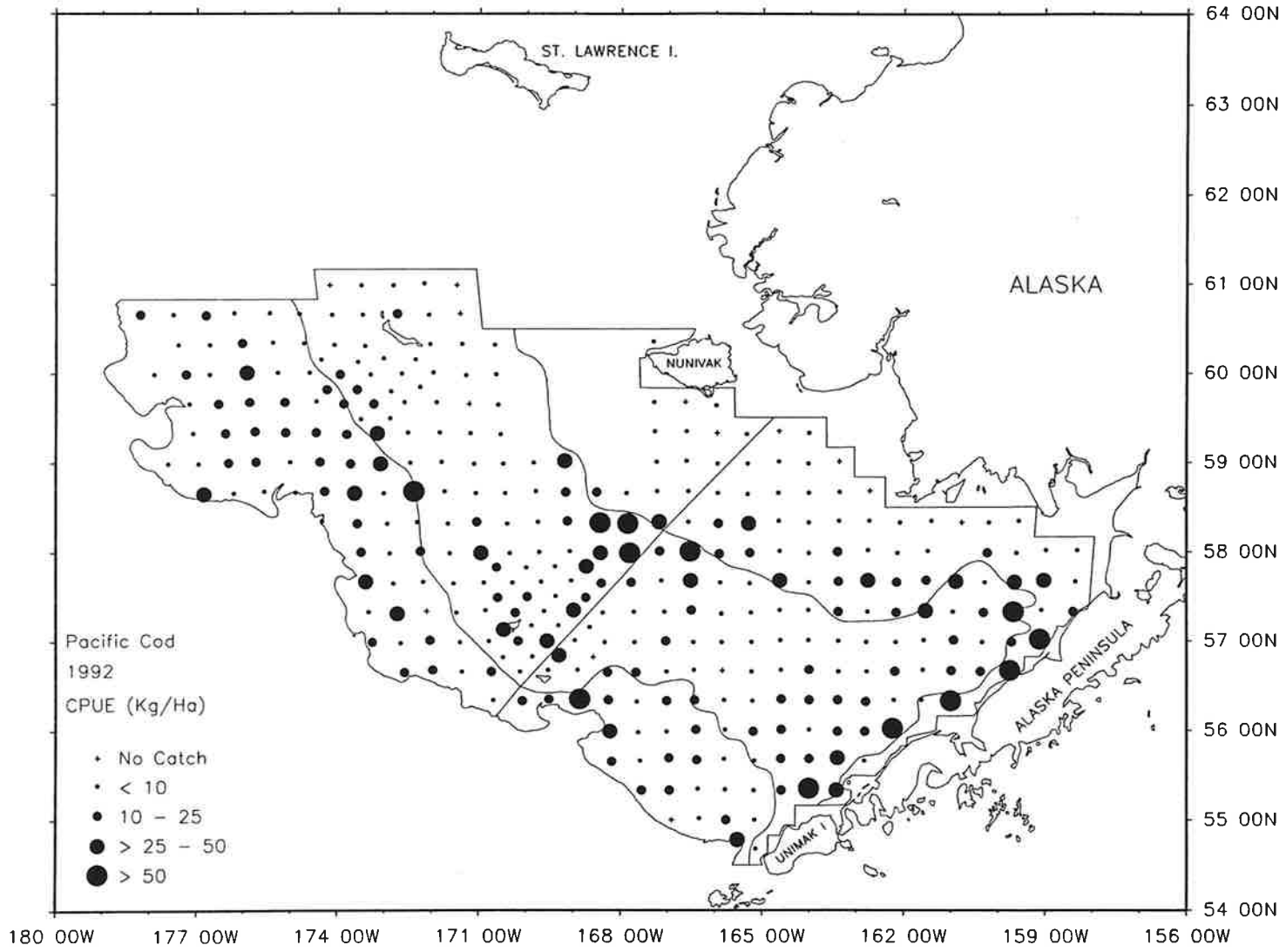

Figure 13.--Distribution and relative abundance in kg/ha of Pacific cod, 1992 eastern Bering Sea bottom trawl survey.

Table 12.--Abundance estimates and mean size of Pacific cod by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size Weight (kg)	Mean Size Length (cm)
1	14.64	113,963	0.213	178,742,320	0.317	0.638	31.7
2[b]	5.48	11,359	0.021	31,619,358	0.056	0.359	26.1
3	13.02	134,442	0.251	137,478,337	0.244	0.978	38.6
4[b]	8.88	91,496	0.171	143,240,482	0.254	0.639	34.5
5	13.39	51,956	0.097	19,807,987	0.035	2.623	56.1
6	14.00	132,428	0.247	53,492,624	0.095	2.476	52.8
All subareas combined[c]	12.22	535,645	1.000	564,381,108	1.000	0.949	36.6
95% Confidence interval		±87,860		±126,011,530			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

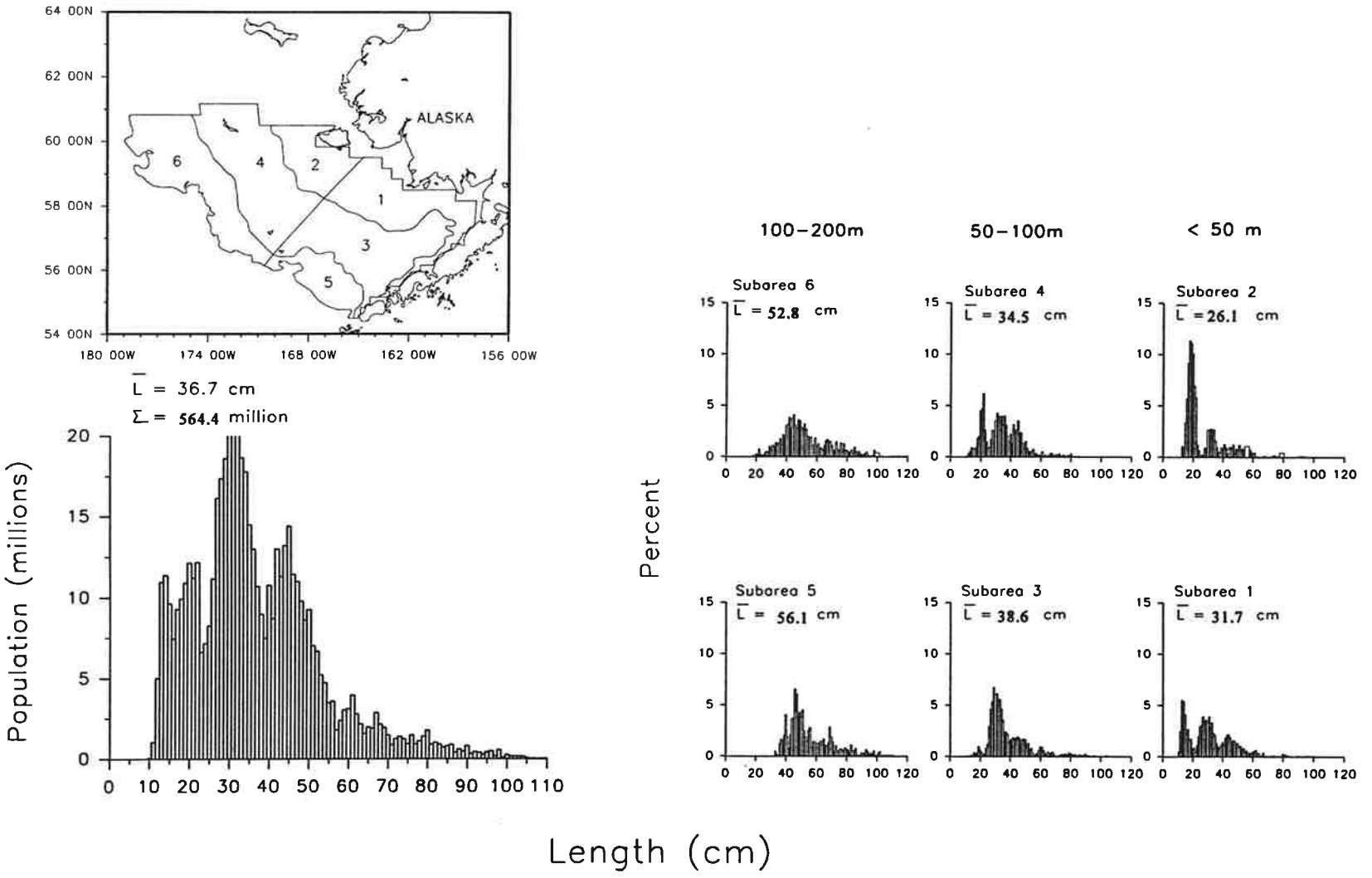

Figure 14.--Estimated relative size distribution (sexes combined) of Pacific cod in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 13.--Estimated population numbers (millions of fish) of Pacific cod by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m		50-100 m		<50 m			
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
1	1991	0.46	0.00	24.11	4.15	16.61	44.94	90.27	0.1599
2	1990	1.78	0.01	28.41	31.73	5.71	36.88	104.52	0.1852
3	1989	7.08	1.33	43.06	54.00	4.45	39.53	149.46	0.2648
4	1988	18.02	7.38	32.71	24.28	2.58	29.96	114.91	0.2036
5	1987	10.63	4.62	7.94	9.81	1.56	12.32	46.88	0.0831
6	1986	5.73	2.52	2.94	5.95	0.33	5.61	23.08	0.0409
7	1985	4.43	1.58	1.91	2.43	0.26	0.81	11.42	0.0202
8	1984	1.96	0.87	0.71	1.75	0.02	0.96	6.27	0.0111
9	1983	1.10	0.47	0.25	1.10	0.08	0.62	3.61	0.0064
10	1982	0.37	0.16	0.04	0.17	0.02	0.01	0.77	0.0014
11	1981	0.27	0.20	0.09	0.37	0.00	0.34	1.28	0.0023
12	1980	0.35	0.19	0.02	0.09	0.00	0.10	0.73	0.0013
13	1979	0.03	0.04	0.02	0.05	0.00	0.00	0.14	0.0002
14	1978	0.08	0.00	0.02	0.18	0.00	0.09	0.37	0.0006
Age Unknown		1.22	0.44	1.01	1.44	0.00	6.57	10.68	0.0189
All Ages Combined		53.49	19.81	143.24	137.48	31.62	178.74	564.38	1.0000

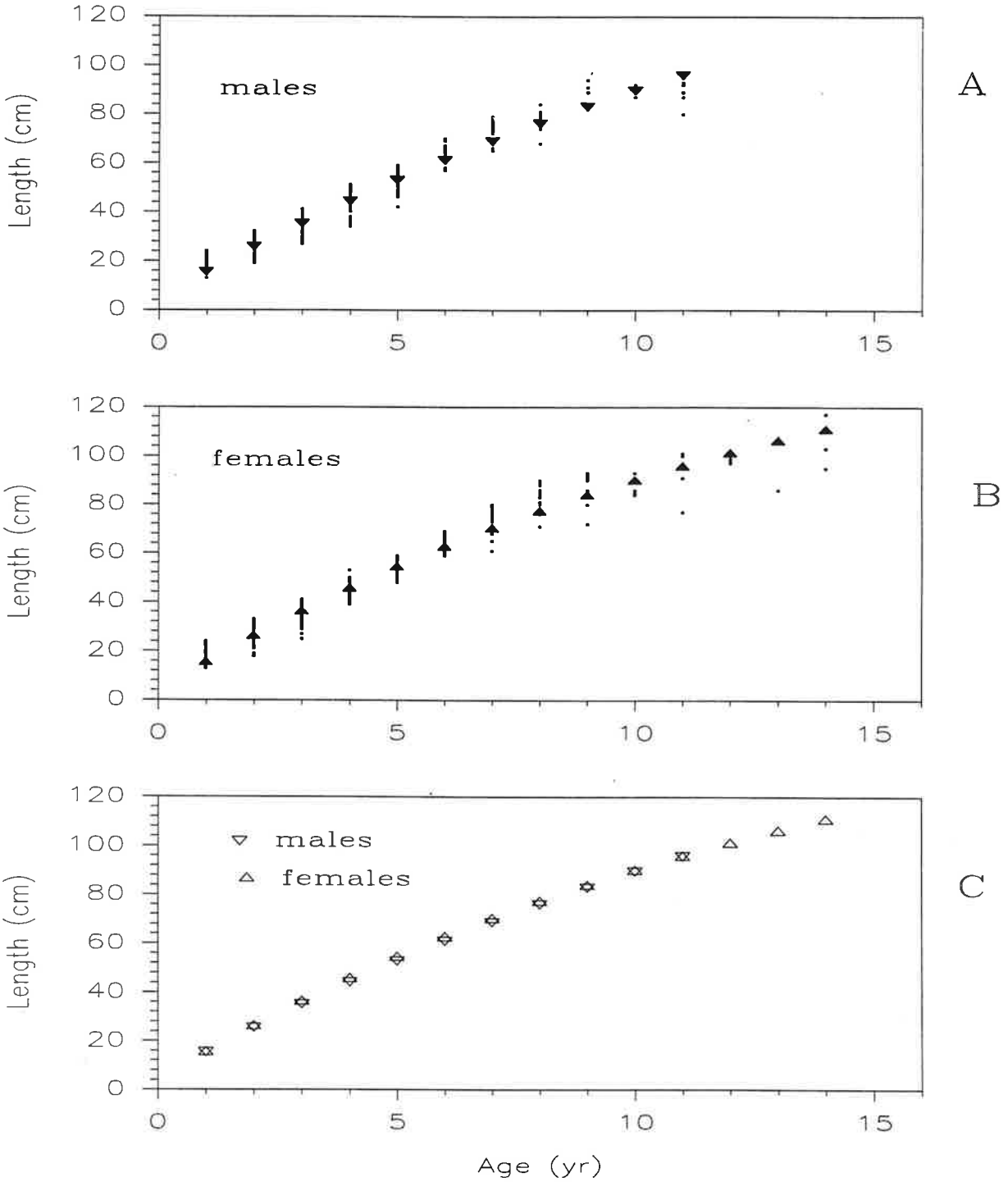

Figure 15.--Distribution of Pacific cod aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 14.--von-Bertalanffy growth parameter estimates for Pacific cod by sex, based on otolith and scale age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Male	368	1-11	13-94	209.6	0.05	-0.46
Female	349	1-14	13-117	175.1	0.07	-0.31

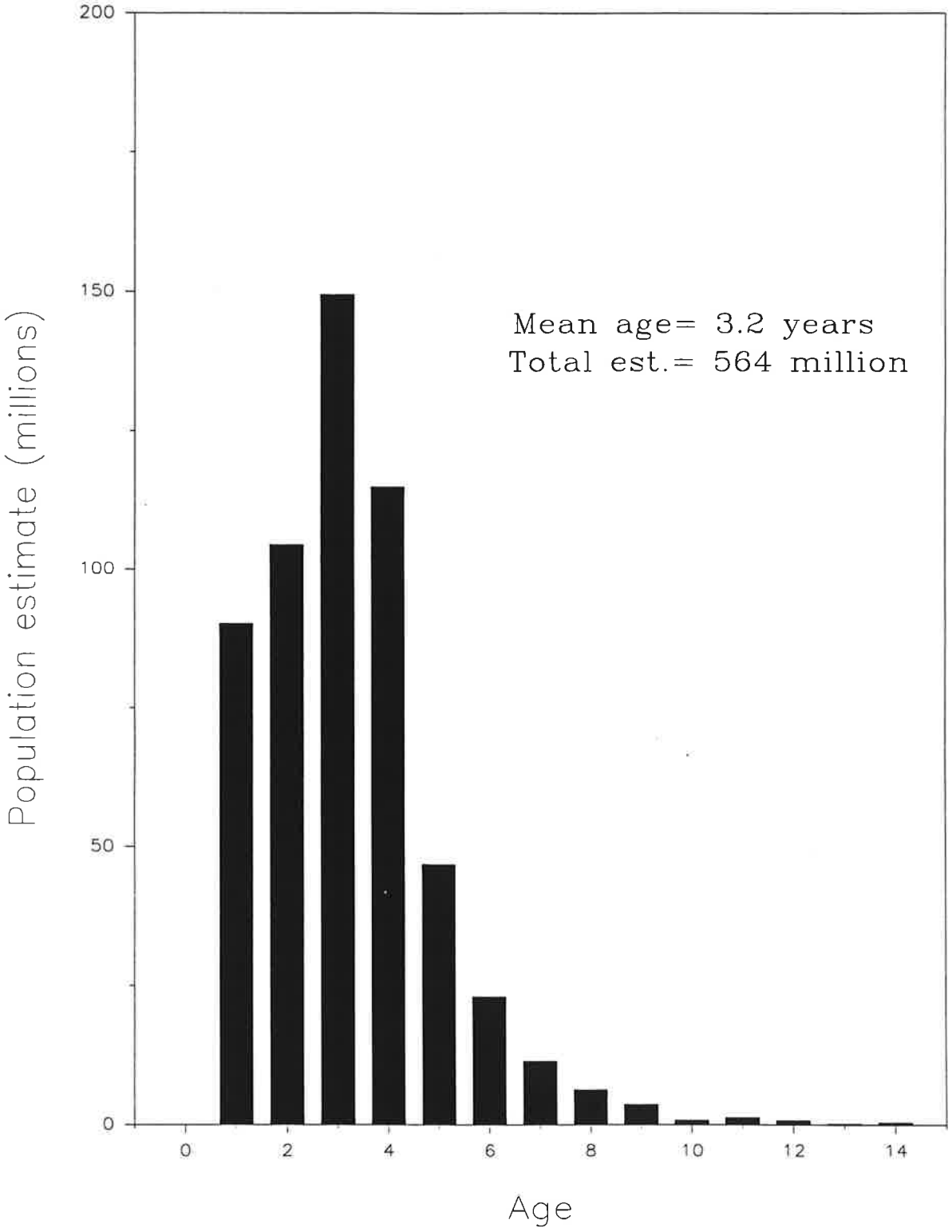

Figure 16.--Population number estimates by age for Pacific cod, 1992 eastern Bering Sea bottom trawl survey.

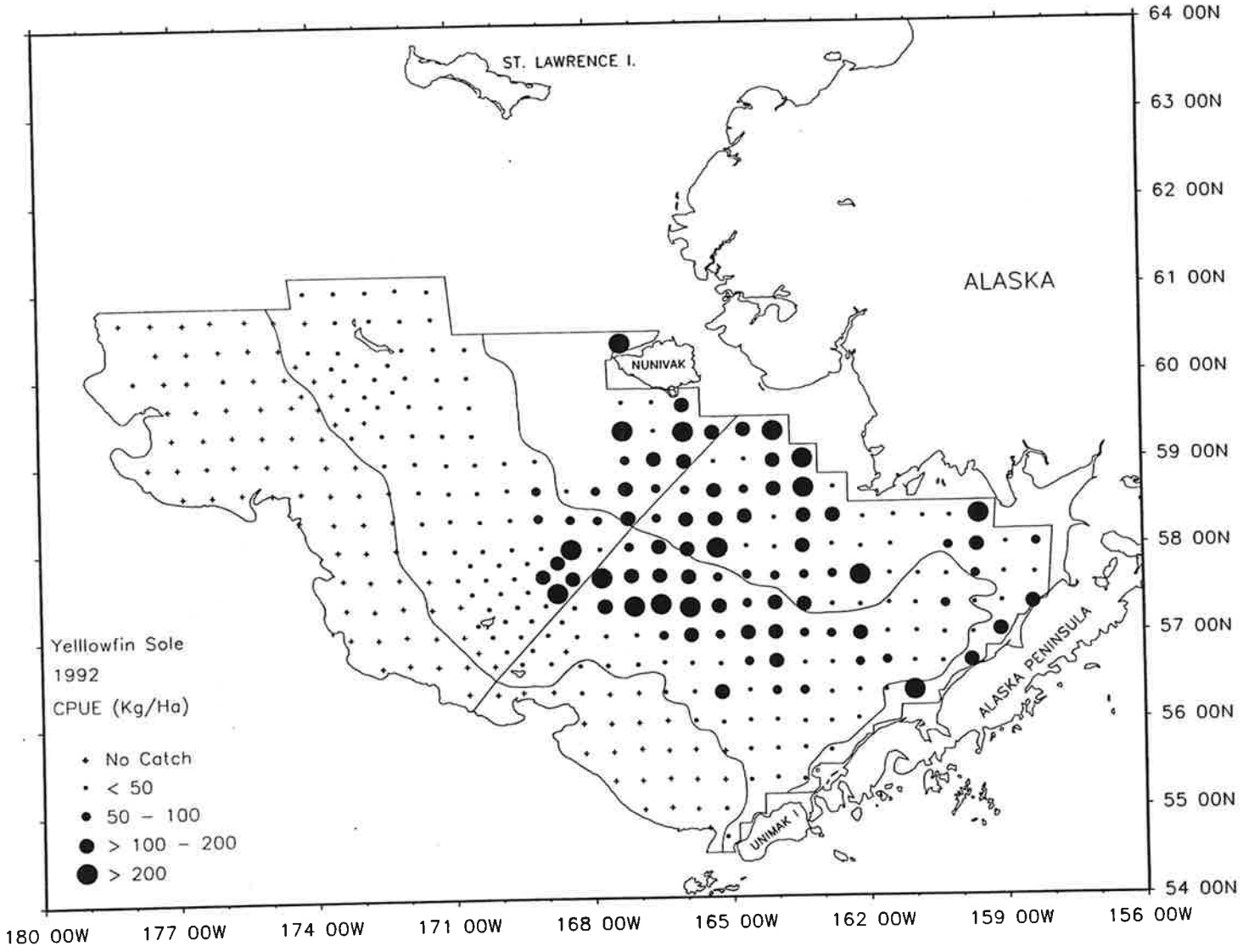

Figure 17.--Distribution and relative abundance in kg/ha of yellowfin sole, 1992 eastern Bering Sea bottom trawl survey.

Table 15.--Abundance estimates and mean size of yellowfin sole by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size: Weight (kg)	Mean Size: Length (cm)
1	110.21	858,189	0.430	3,680,541,997	0.446	0.233	25.7
2[b]	142.66	295,886	0.148	1,554,782,213	0.188	0.190	23.3
3	63.17	652,497	0.327	2,438,828,156	0.295	0.268	27.8
4[b]	18.44	189,897	0.095	582,182,495	0.070	0.326	29.3
5	0.30	1,172	0.001	2,486,019	0.000	0.471	32.2
6	0.00	0	0.000	0	0.000	0.000	0.0
All subareas combined[c]	45.58	1,997,641	1.000	8,258,820,880	1.000	0.242	26.1
95% Confidence interval		±322,186		±1,318,294,863			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

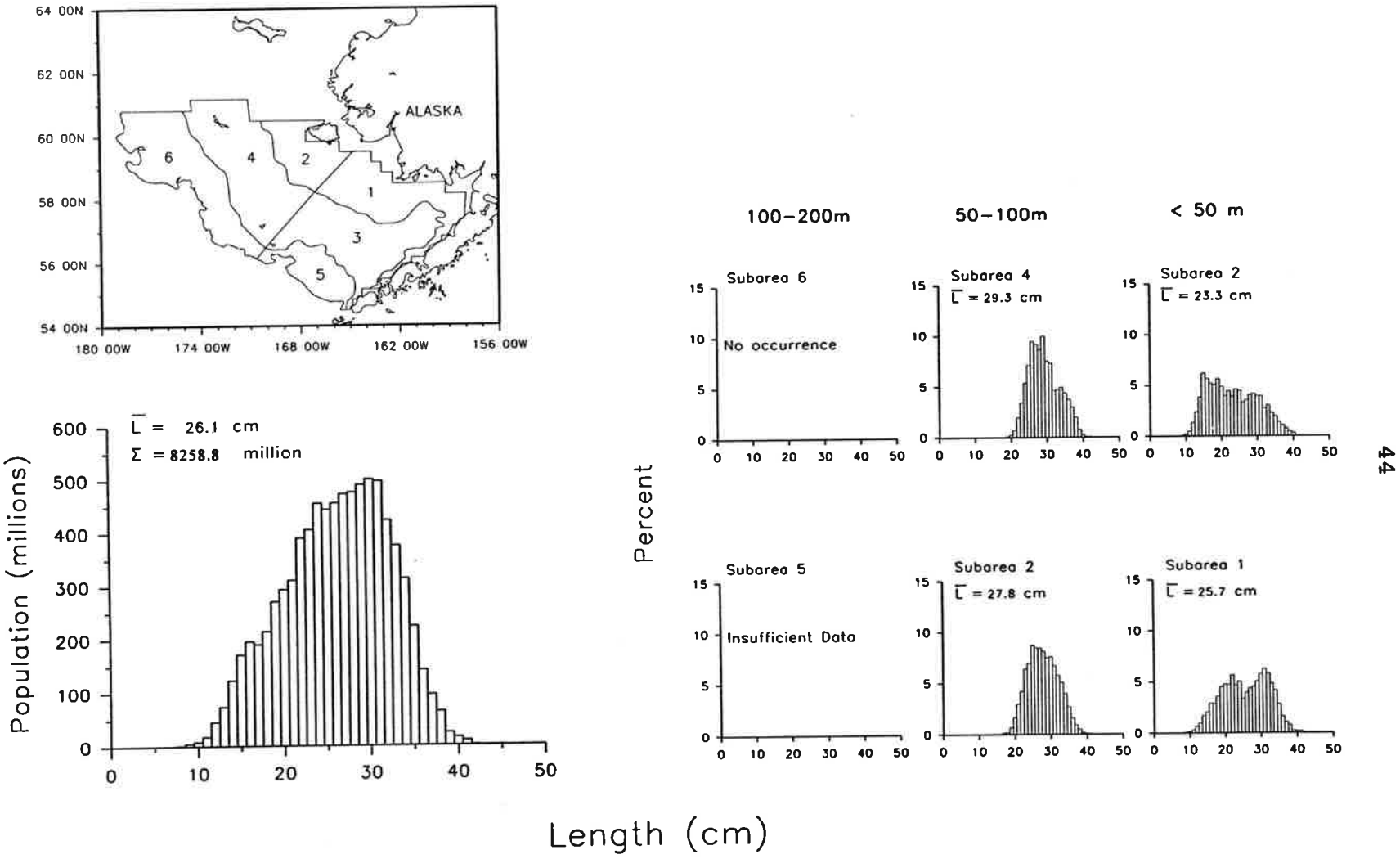

Figure 18.--Estimated relative size distribution (sexes combined) of yellowfin sole in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 16.--Estimated population numbers (millions of fish) of yellowfin sole by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m			50-100 m		<50 m		
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
3	1989	0.00	0.00	0.00	0.00	6.78	5.92	12.70	0.0015
4	1988	0.00	0.00	0.00	1.11	131.40	131.66	264.18	0.0320
5	1987	0.00	0.00	2.85	35.97	263.01	370.07	671.90	0.0814
6	1986	0.00	0.00	16.14	153.73	232.04	456.52	858.42	0.1039
7	1985	0.00	0.02	15.03	99.77	86.82	187.16	388.81	0.0471
8	1984	0.00	0.04	35.42	158.66	71.79	174.04	439.95	0.0533
9	1983	0.00	0.16	133.69	612.05	214.53	572.61	1,533.03	0.1856
10	1982	0.00	0.04	20.03	74.53	23.74	66.31	184.65	0.0224
11	1981	0.00	0.82	141.45	581.12	194.12	619.24	1,536.75	0.1861
12	1980	0.00	0.14	17.92	80.04	34.36	101.33	233.78	0.0283
13	1979	0.00	0.31	44.75	172.85	50.94	201.37	470.22	0.0569
14	1978	0.00	0.08	15.08	47.54	11.82	54.31	128.84	0.0156
15	1977	0.00	0.10	17.15	43.50	14.04	59.87	134.66	0.0163
16	1976	0.00	0.10	23.13	65.17	25.23	91.47	205.09	0.0248
17	1975	0.00	0.03	12.99	42.53	15.49	60.34	131.38	0.0159
18	1974	0.00	0.06	14.56	46.51	29.63	89.88	180.63	0.0219
19	1973	0.00	0.03	13.81	41.47	12.91	52.09	120.32	0.0146
20	1972	0.00	0.06	8.44	30.88	15.99	52.29	107.67	0.0130
21	1971	0.00	0.01	11.08	25.25	13.88	44.85	95.07	0.0115
22	1970	0.00	0.05	12.40	34.80	18.17	57.94	123.37	0.0149
23	1969	0.00	0.05	9.07	29.24	28.15	81.77	148.28	0.0180
24	1968	0.00	0.01	6.94	27.86	17.28	57.16	109.26	0.0132
25	1967	0.00	0.00	3.82	10.47	10.85	24.48	49.62	0.0060
26	1966	0.00	0.03	3.59	9.25	1.73	7.41	22.01	0.0027
27	1965	0.00	0.05	1.00	1.17	0.97	4.29	7.49	0.0009
28	1964	0.00	0.00	0.74	5.34	2.30	8.01	16.39	0.0020
29	1963	0.00	0.00	0.57	7.87	7.28	19.47	35.19	0.0043
Age Unknown		0.00	0.30	0.52	0.15	19.52	28.68	49.16	0.0060
All Ages Combined		0.00	2.49	582.18	2,438.83	1,554.78	3,680.54	8,258.82	1.0000

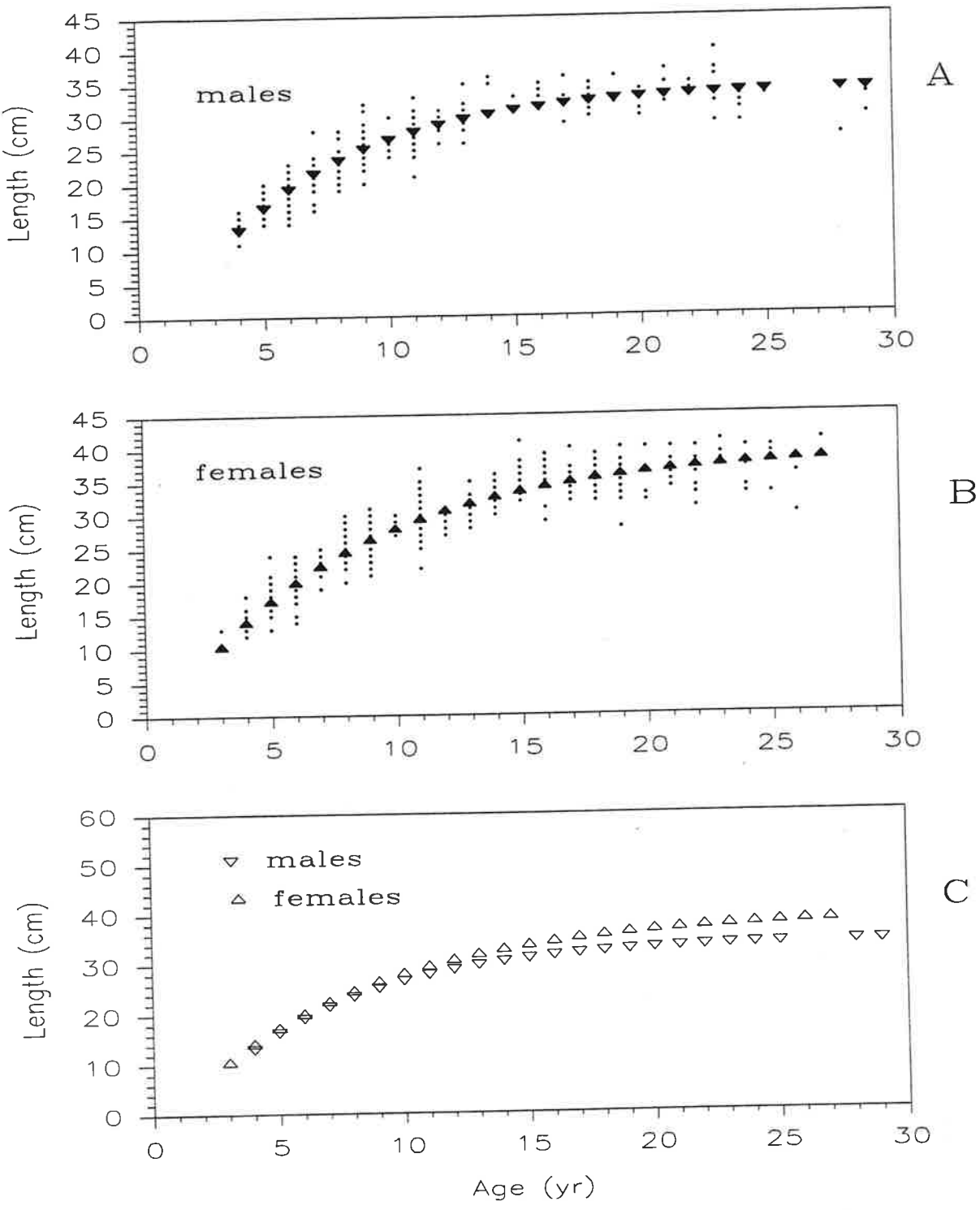

Figure 19.--Distribution of yellowfin sole aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 17.--von-Bertalanffy growth parameter estimates for yellowfin sole by sex, based on otolith age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				L_{inf}	K	t_o
Male	248	4-29	11-40	34.3	0.17	1.16
Female	358	3-27	12-41	39.4	0.13	0.69

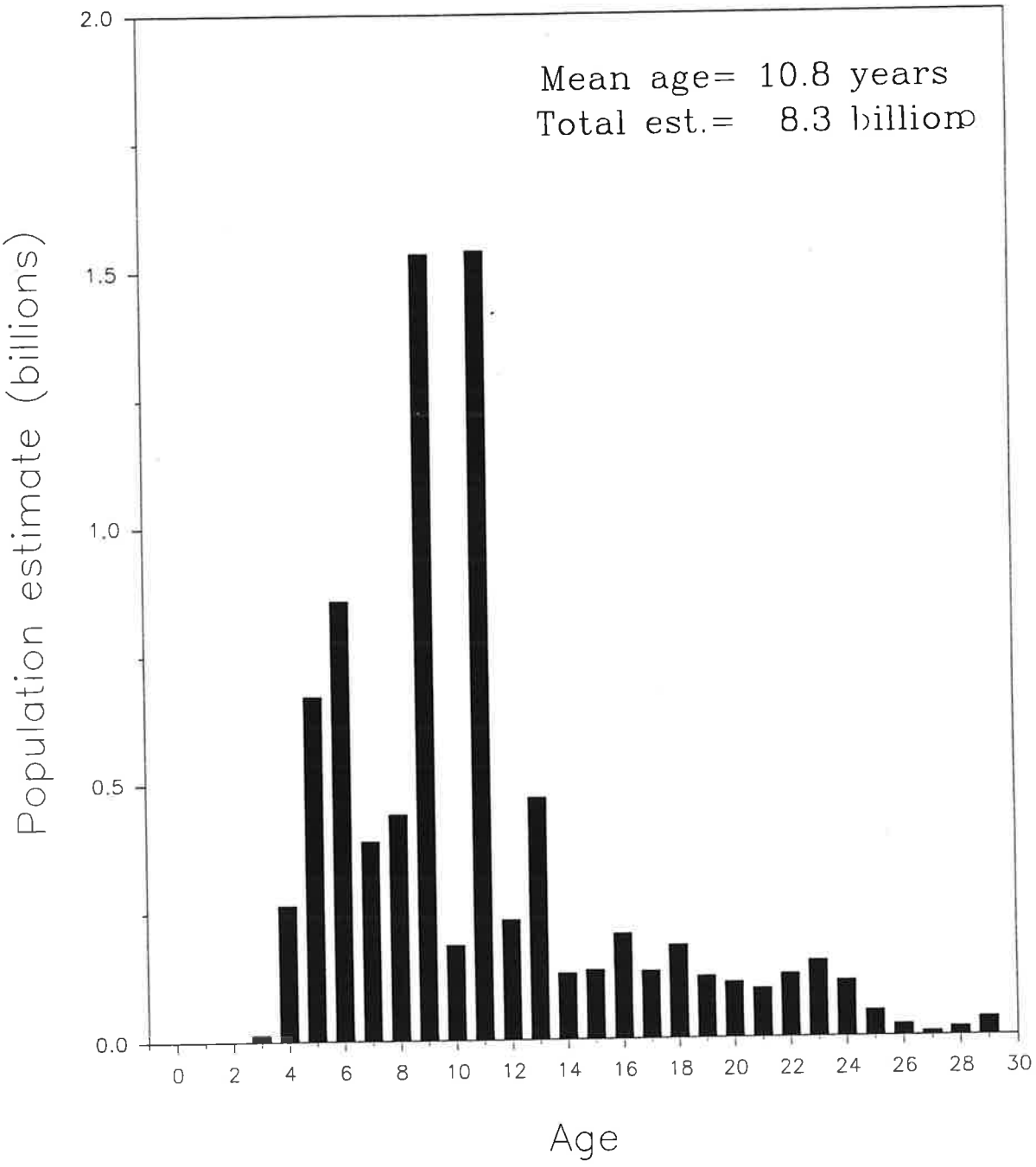

Figure 20.--Population number estimates by age for yellowfin sole, 1992 eastern Bering Sea bottom trawl survey.

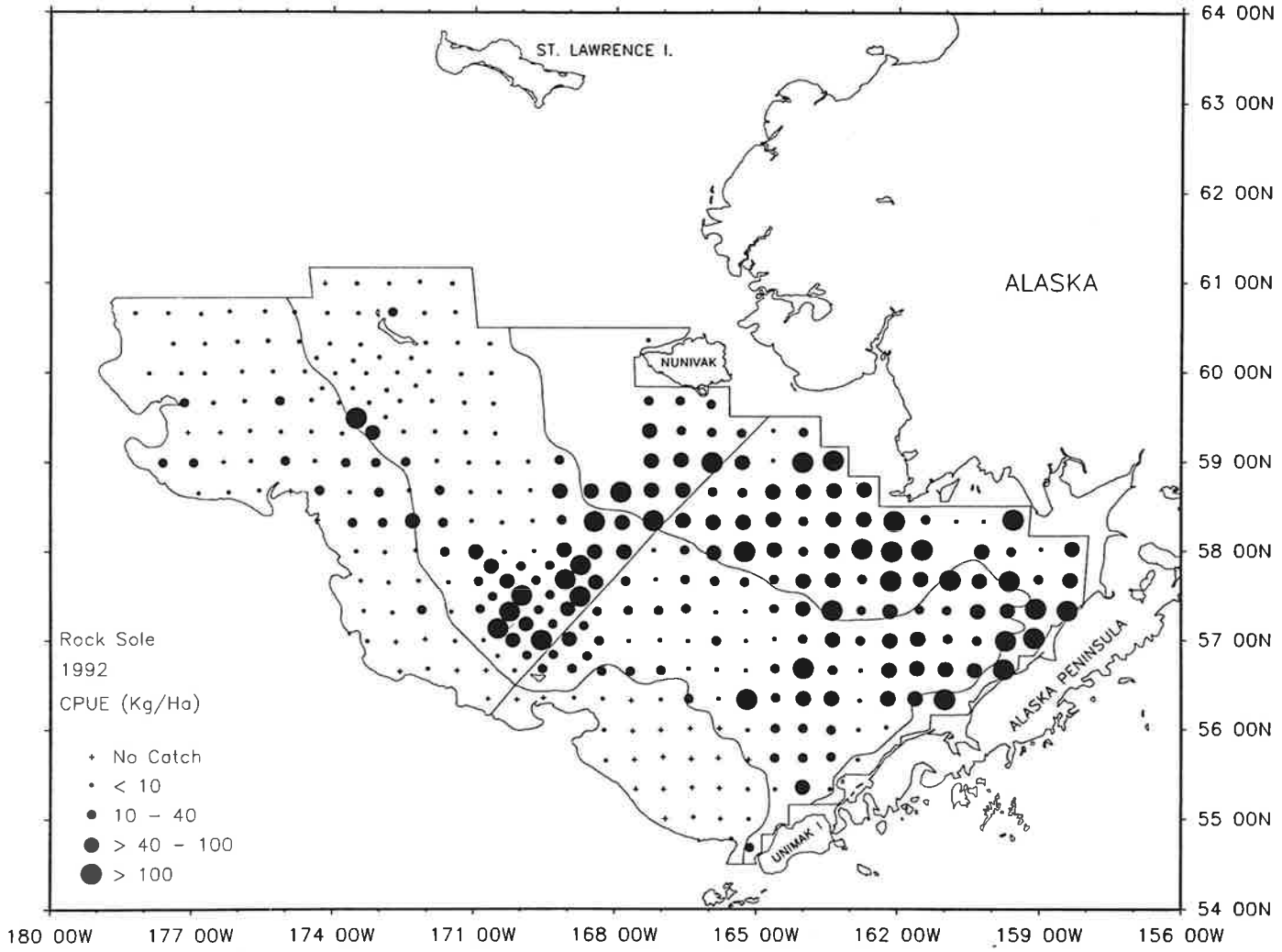

Figure 21.--Distribution and relative abundance in kg/ha of rock sole, 1992 eastern Bering Sea bottom trawl survey.

Table 18.--Abundance estimates and mean size of rock sole by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size: Weight (kg)	Mean Size: Length (cm)
1	87.01	677,582	0.458	4,465,538,111	0.493	0.152	21.7
2[b]	62.80	130,242	0.088	935,278,438	0.103	0.139	20.7
3	31.17	322,043	0.217	2,207,995,498	0.244	0.146	22.5
4[b]	28.38	292,332	0.197	1,313,729,581	0.145	0.223	24.6
5	1.47	5,707	0.004	14,756,593	0.002	0.387	29.4
6	5.59	52,869	0.036	120,561,584	0.013	0.439	31.8
All subareas combined[c]	33.79	1,480,775	1.000	9,057,859,806	1.000	0.163	22.4
95% Confidence interval		±211,750		±1,450,716,534			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

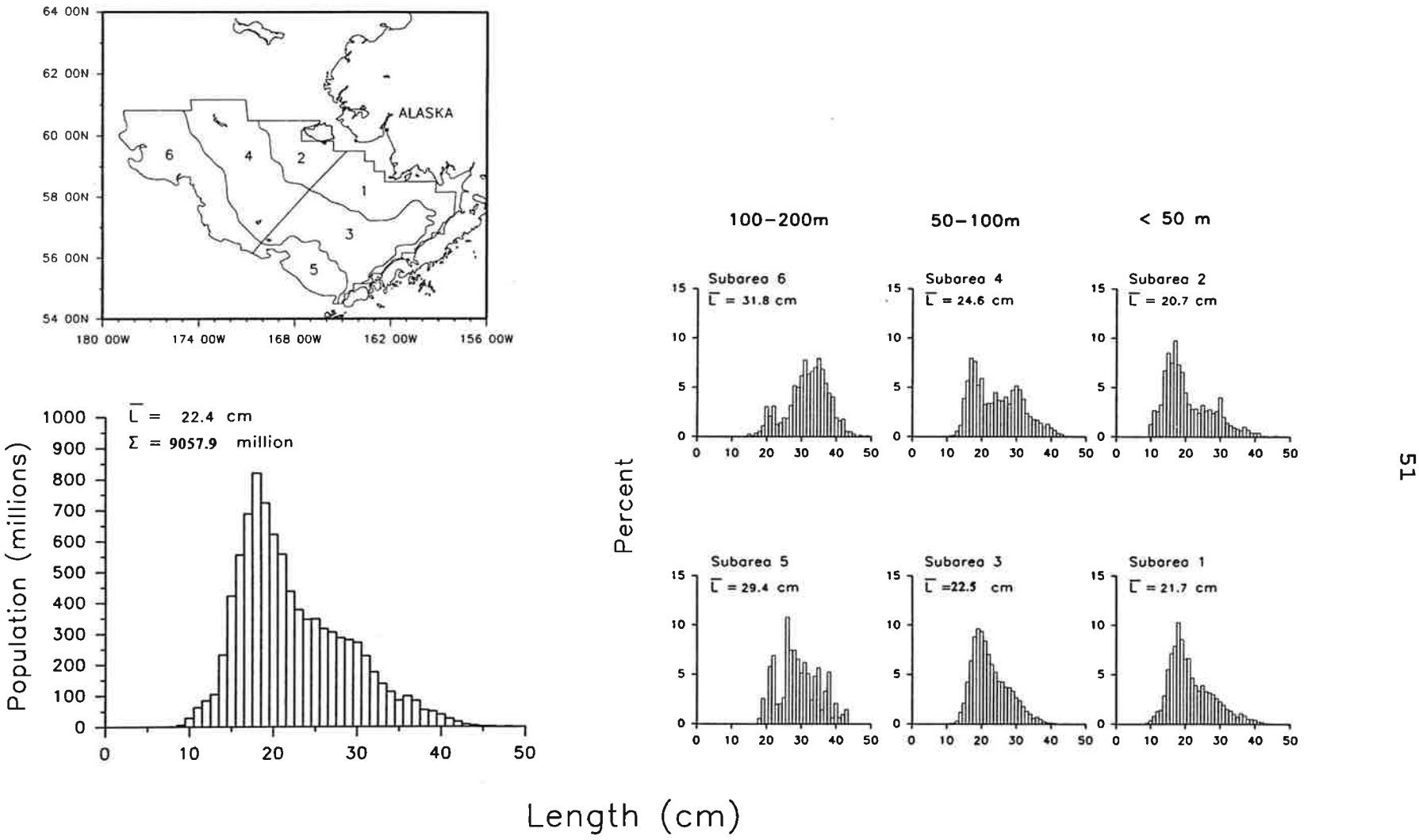

Figure 22.--Estimated relative size distribution (sexes combined) of rock sole in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 19.--Estimated population numbers (millions of fish) of rock sole by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m			50-100 m		<50 m		
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
2	1990	0.00	0.00	0.00	0.45	2.31	4.96	7.71	0.0009
3	1989	0.01	0.00	7.95	7.61	74.43	137.34	227.36	0.0251
4	1988	0.27	0.01	62.96	86.28	121.29	344.12	614.92	0.0679
5	1987	5.14	0.69	339.03	659.20	292.73	1,461.13	2,757.94	0.3045
6	1986	10.02	2.51	244.78	637.29	163.44	1,078.42	2,136.47	0.2359
7	1985	9.22	1.40	123.53	229.42	65.14	382.33	811.04	0.0895
8	1984	17.40	2.97	165.54	278.09	80.31	442.70	987.01	0.1090
9	1983	13.76	1.71	99.05	118.03	42.19	196.82	471.56	0.0521
10	1982	15.47	1.26	63.69	54.97	22.34	122.44	280.17	0.0309
11	1981	15.52	1.28	69.52	55.29	24.58	112.39	278.57	0.0308
12	1980	10.67	0.90	46.57	29.49	16.45	68.79	172.87	0.0191
13	1979	8.25	0.74	35.67	23.22	11.05	42.42	121.35	0.0134
14	1978	5.20	0.51	25.43	15.46	8.87	29.71	85.18	0.0094
15	1977	3.00	0.27	12.12	6.47	3.98	16.54	42.39	0.0047
16	1976	1.60	0.10	7.19	3.67	1.81	8.88	23.26	0.0026
17	1975	1.00	0.06	3.85	1.58	1.42	3.69	11.59	0.0013
19	1973	0.90	0.11	3.44	0.53	1.07	4.22	10.28	0.0011
22	1970	0.60	0.00	0.95	0.53	0.37	2.54	4.98	0.0006
Age Unknown		2.52	0.25	2.45	0.41	1.51	6.09	13.24	0.0015
All Ages Combined		120.56	14.76	1,313.73	2,208.00	935.28	4,465.54	9,057.86	1.0000

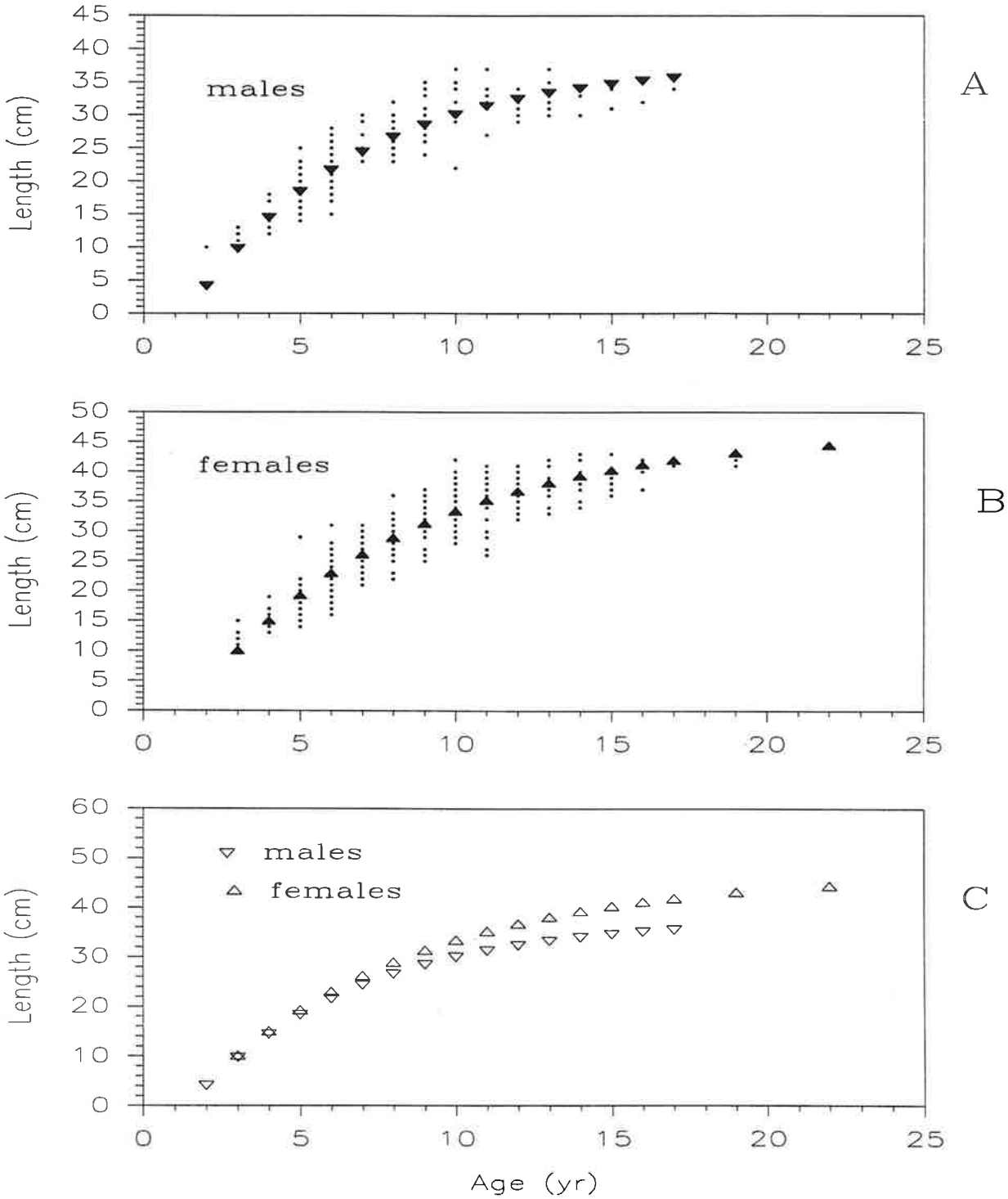

Figure 23.--Distribution of rock sole aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 20.--von-Bertalanffy growth parameter estimates for rock sole by sex, based on otolith age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Male	216	2-17	10-37	37.9	0.18	1.35
Female	306	3-22	10-44	46.7	0.14	1.33

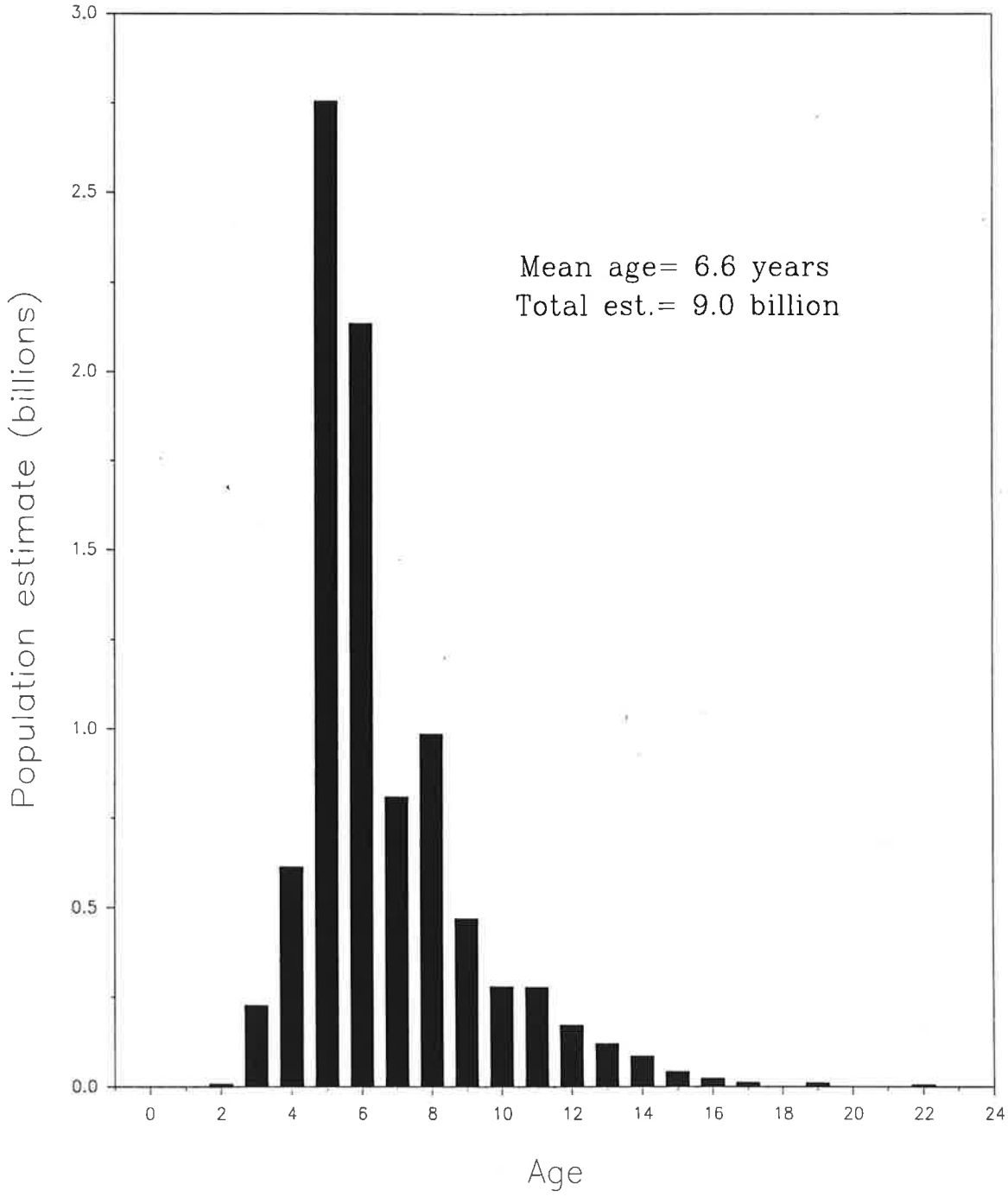

Figure 24.--Population number estimates by age for rock sole, 1992 eastern Bering Sea bottom trawl survey.

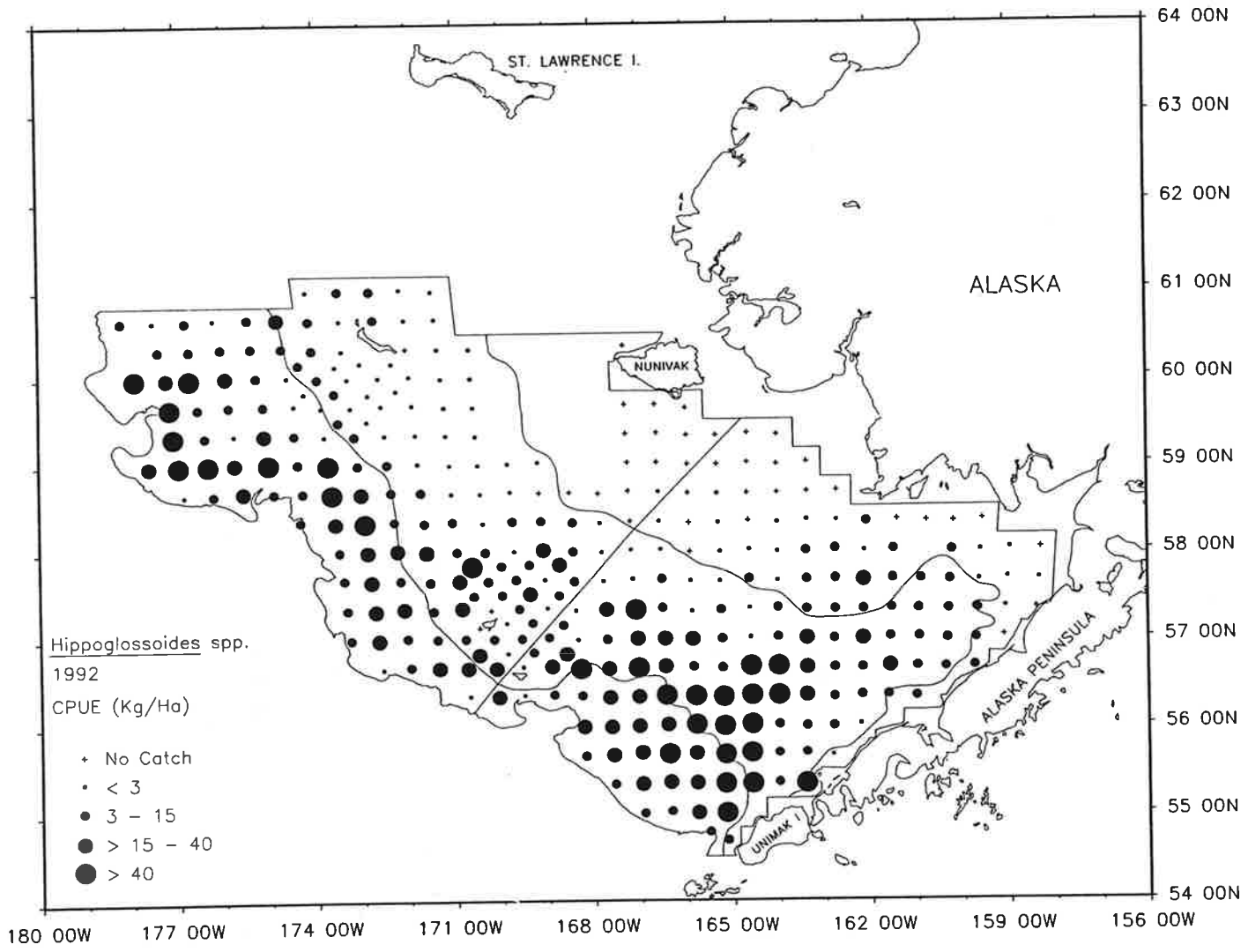

Figure 25.--Distribution and relative abundance in kg/ha of Hippoglossoides spp., 1992 eastern Bering Sea bottom trawl survey.

Table 21.--Abundance estimates and mean size of Hippoglossoides spp. by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size	
						Weight (kg)	Length (cm)
1	2.68	20,879	0.032	45,872,766	0.017	0.455	35.5
2[b]	0.01	32	0.000	61,277	0.000	0.522	33.0
3	24.61	254,246	0.391	830,436,089	0.304	0.306	30.8
4[b]	5.03	51,752	0.080	167,031,472	0.061	0.310	29.4
5	35.21	136,596	0.210	724,713,302	0.265	0.188	26.3
6	19.67	186,038	0.286	962,395,825	0.352	0.193	24.7
All subareas combined[c]	14.82	649,543	1.000	2,730,510,732	1.000	0.238	27.5
95% Confidence interval		±132,378		±541,586,992			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

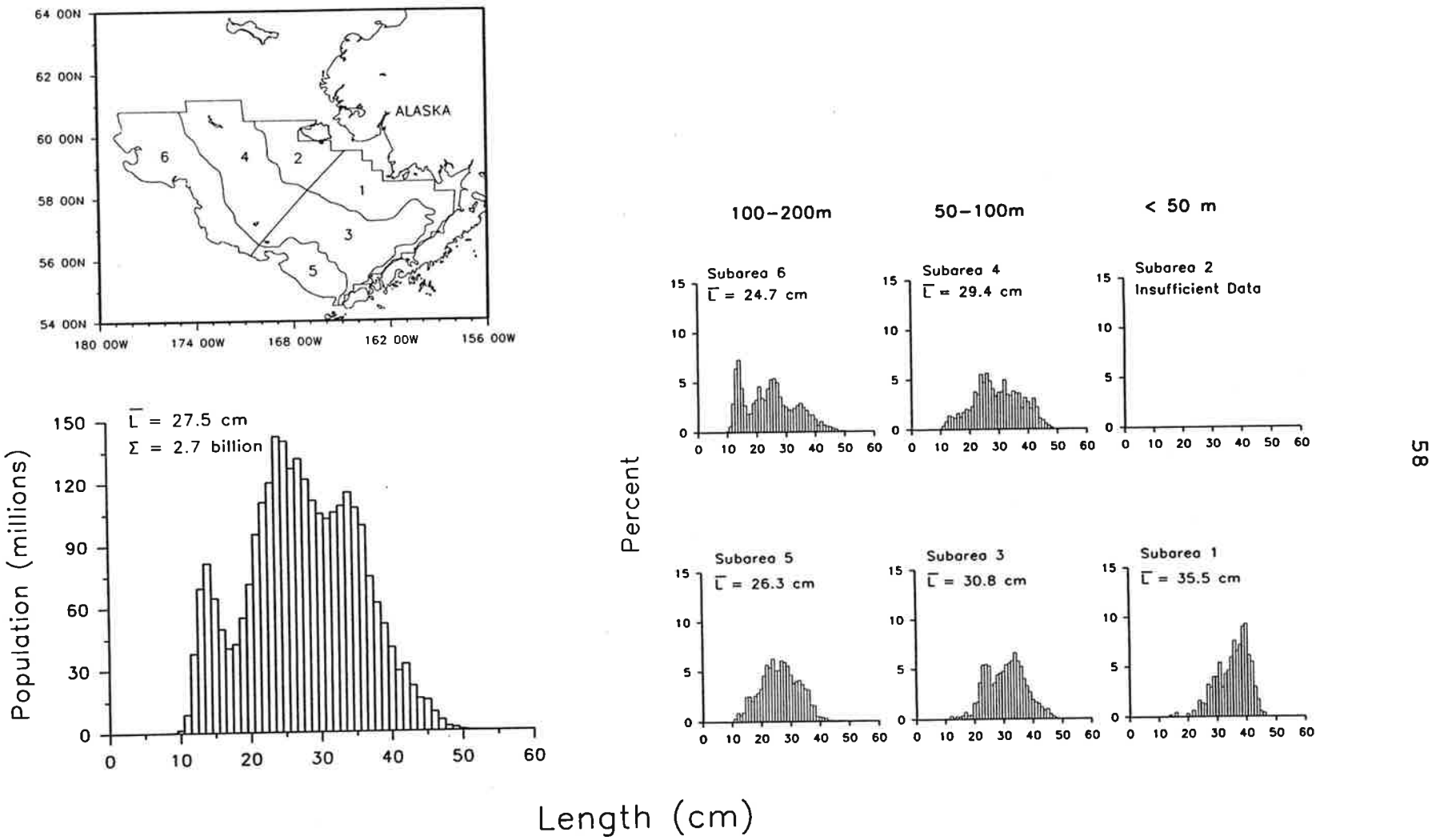

Figure 26.--Estimated relative size distribution (sexes combined) of Hippoglossoides spp. in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 22.--Estimated population numbers (millions of fish) of Hippoglossoides spp. by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m		50-100 m		<50 m			
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
2	1990	63.68	13.14	3.33	3.08	0.00	0.03	83.26	0.0305
3	1989	195.53	65.29	11.16	13.76	0.00	0.25	285.99	0.1047
4	1988	40.93	35.70	5.03	11.85	0.00	0.02	93.52	0.0343
5	1987	151.95	137.36	20.54	102.42	0.00	1.23	413.50	0.1514
6	1986	93.71	96.24	20.00	87.00	0.00	1.84	298.78	0.1094
7	1985	117.27	123.77	22.81	128.48	0.01	4.13	396.46	0.1452
8	1984	47.71	60.48	10.57	71.04	0.01	3.04	192.84	0.0706
9	1983	63.30	68.47	17.70	99.65	0.01	6.82	255.96	0.0937
10	1982	50.00	50.85	12.90	89.97	0.02	3.80	207.54	0.0760
11	1981	32.55	22.80	9.48	55.79	0.00	5.95	126.57	0.0464
12	1980	44.08	25.75	15.47	73.00	0.00	9.66	167.96	0.0615
13	1979	32.04	17.35	9.35	54.91	0.01	5.38	119.04	0.0436
14	1978	11.17	2.57	3.81	15.56	0.00	1.56	34.68	0.0127
15	1977	2.96	1.83	1.21	4.51	0.00	0.87	11.39	0.0042
16	1976	3.44	0.37	1.19	5.72	0.00	0.56	11.28	0.0041
17	1975	4.98	1.66	1.21	8.53	0.00	0.65	17.03	0.0062
18	1974	1.55	0.00	0.31	1.89	0.00	0.05	3.79	0.0014
21	1971	0.56	0.07	0.15	0.70	0.00	0.03	1.51	0.0006
Age Unknown		5.00	1.03	0.84	2.58	0.00	0.00	9.46	0.0035
All Ages Combined		962.40	724.71	167.06	830.44	0.06	45.87	2,730.54	1.0000

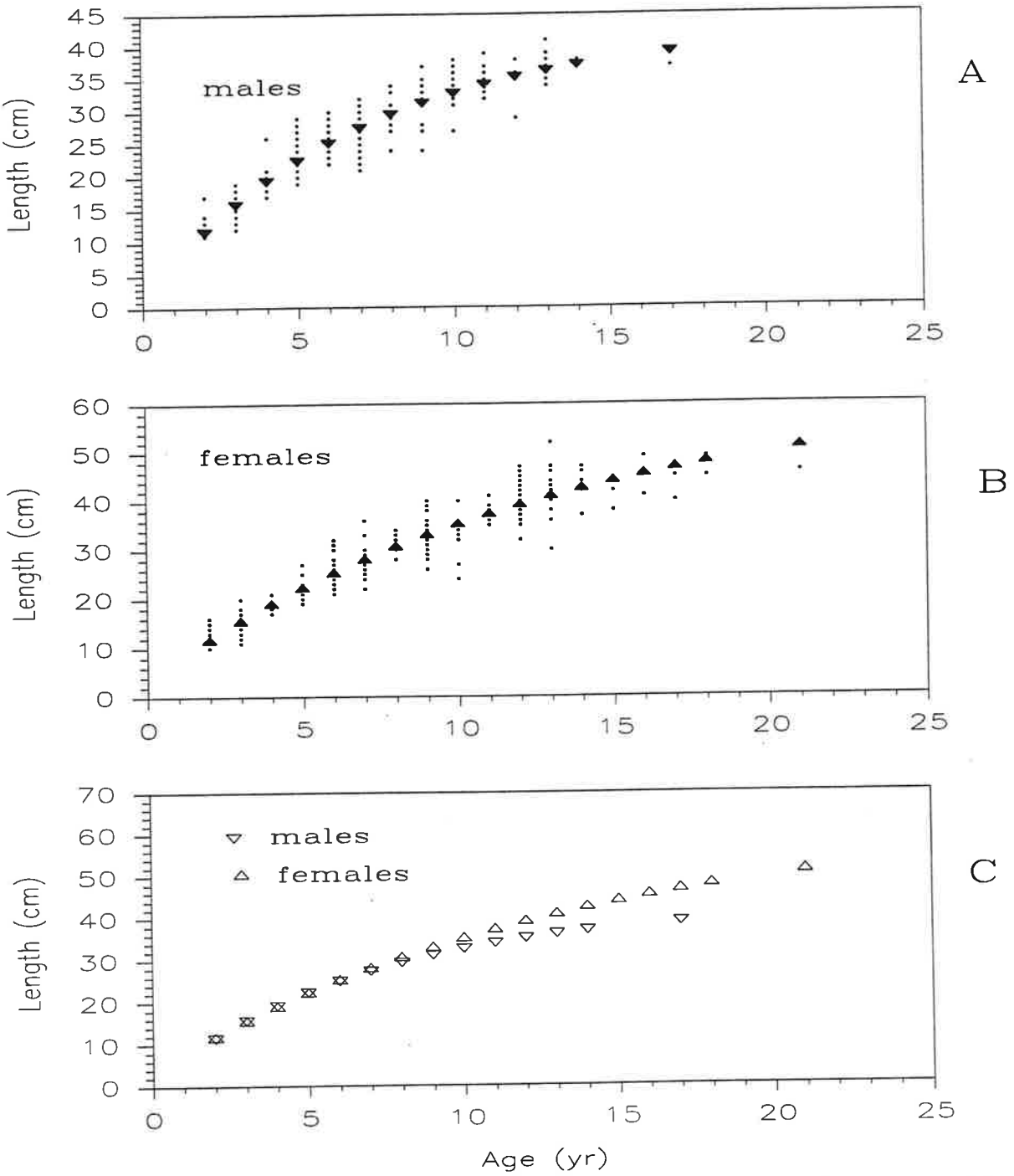

Figure 27.--Distribution of flathead sole aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 23.--von-Bertalanffy growth parameter estimates for flathead sole by sex, based on otolith age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				L_{inf}	K	t_o
Male	191	2-17	11-41	42.9	0.14	-0.24
Female	228	2-21	10-52	62.9	0.08	-0.64

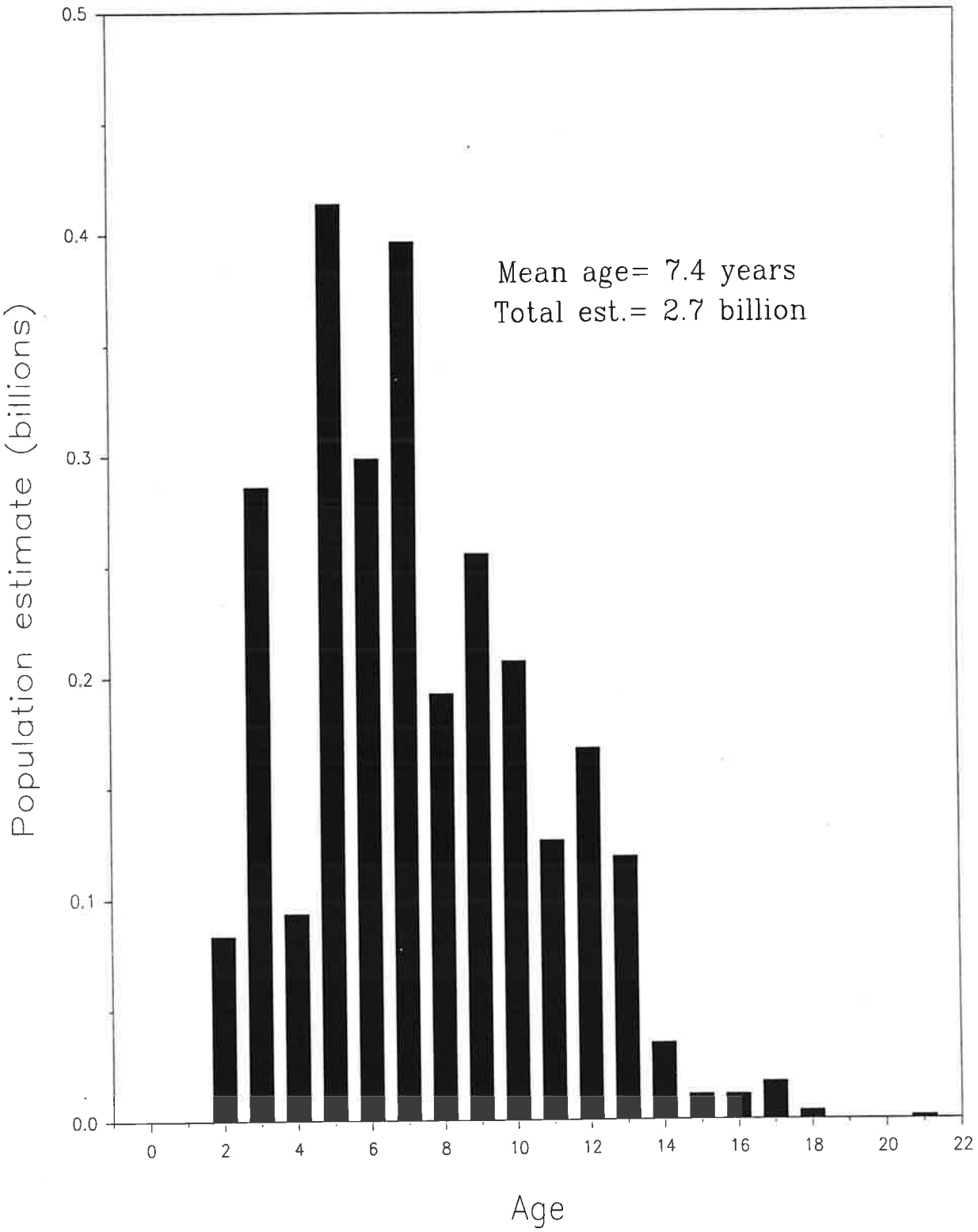

Figure 28.--Population number estimates by age for Hippoglossoides spp., 1992 eastern Bering Sea bottom trawl survey.

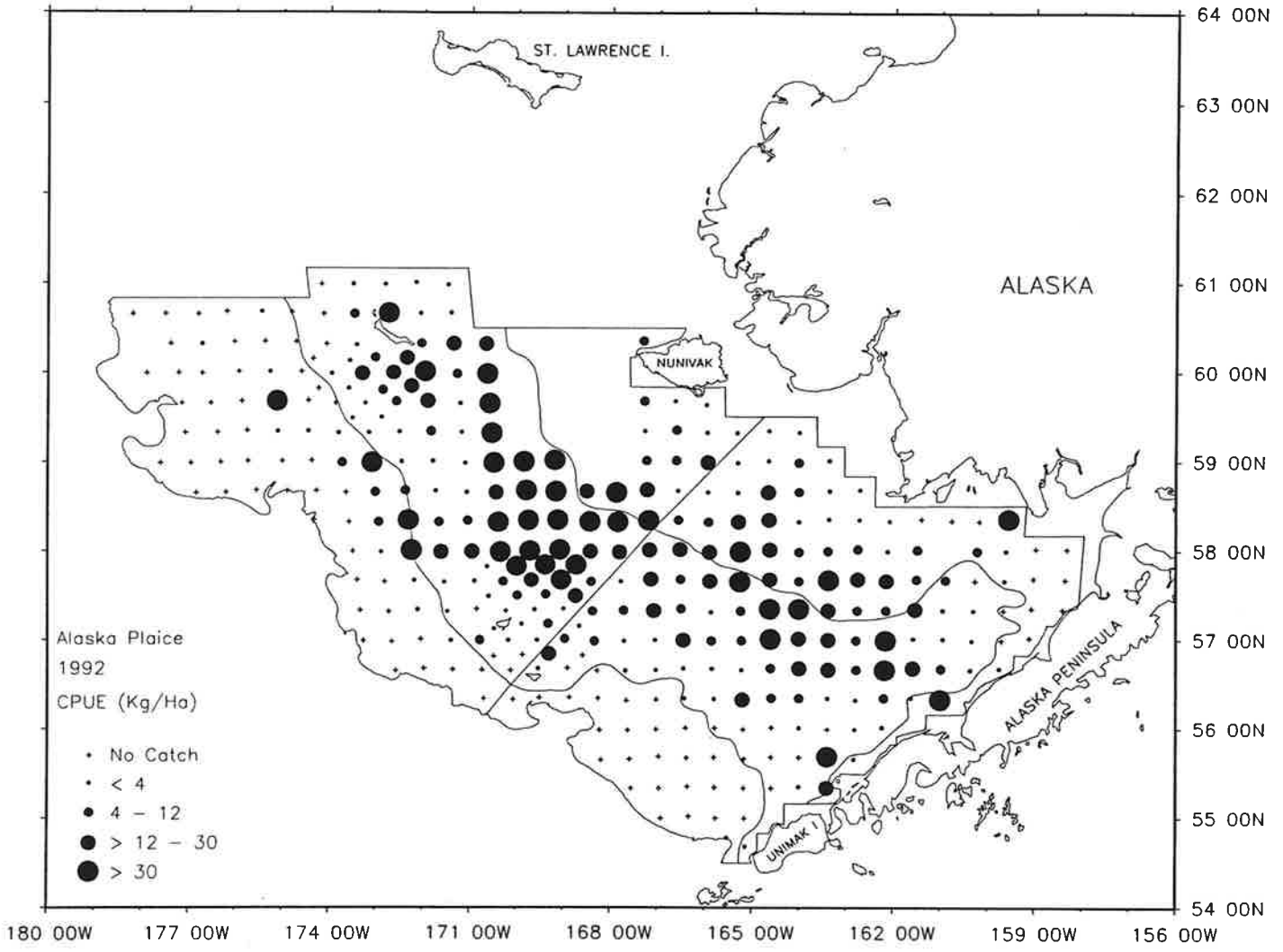

Figure 29.--Distribution and relative abundance in kg/ha of Alaska plaice, 1992 eastern Bering Sea bottom trawl survey.

Table 24.--Abundance estimates and mean size of Alaska plaice by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size	
						Weight (kg)	Length (cm)
1	9.71	75,645	0.155	148,501,734	0.217	0.509	32.7
2[b]	13.67	28,358	0.058	70,294,572	0.103	0.403	30.0
3	11.35	117,243	0.240	156,907,820	0.229	0.747	38.1
4[b]	21.57	222,134	0.454	284,959,909	0.416	0.780	38.1
5	0.01	26	0.000	57,704	0.000	0.451	32.0
6	4.86	45,920	0.094	24,442,465	0.036	1.879	48.6
All subareas combined[c]	11.16	489,327	1.000	685,164,204	1.000	0.714	36.5
95% Confidence interval		±103,687		±149,545,188			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

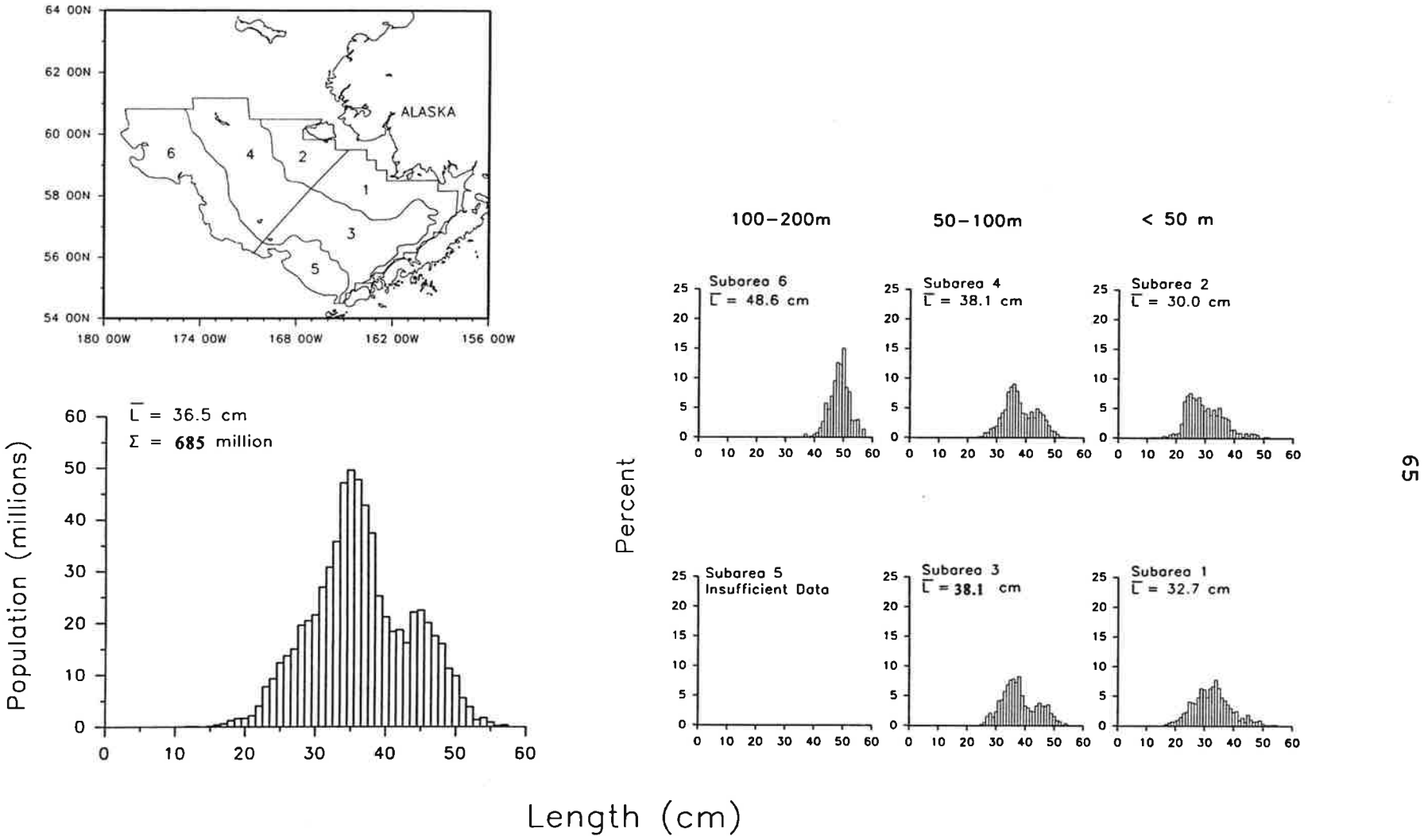

Figure 30.--Estimated relative size distribution (sexes combined) of Alaska plaice in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

Table 25.--Estimated population numbers (millions of fish) of Alaska plaice by age group and subarea, 1992 eastern Bering Sea bottom trawl survey.

		DEPTH AND SUBAREA							
		100-200 m		50-100 m		<50 m			
AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
4	1988	0.00	0.00	0.27	0.07	1.55	1.87	3.77	0.0055
5	1987	0.00	0.00	3.44	1.88	4.57	6.42	16.32	0.0238
6	1986	0.00	0.00	1.51	1.11	0.87	1.74	5.23	0.0076
7	1985	0.00	0.00	5.17	3.98	6.13	8.91	24.20	0.0353
8	1984	0.00	0.00	14.18	8.88	10.19	18.00	51.24	0.0748
9	1983	0.14	0.03	15.58	8.92	5.78	10.77	41.23	0.0602
10	1982	0.00	0.00	15.80	7.51	4.16	10.35	37.82	0.0552
11	1981	0.07	0.00	33.43	16.73	5.60	17.98	73.81	0.1077
12	1980	0.24	0.00	22.24	10.73	2.90	9.61	45.73	0.0667
13	1979	0.30	0.00	18.20	9.27	1.47	5.62	34.85	0.0509
14	1978	1.25	0.01	23.62	11.25	1.54	5.17	42.84	0.0625
15	1977	1.39	0.00	16.95	8.06	0.98	3.94	31.31	0.0457
16	1976	2.01	0.00	15.37	7.90	0.98	3.36	29.61	0.0432
17	1975	2.73	0.00	16.12	9.07	1.58	5.29	34.78	0.0508
18	1974	3.28	0.00	21.46	13.51	1.47	5.40	45.12	0.0659
19	1973	2.87	0.01	14.84	7.99	0.78	2.93	29.42	0.0429
20	1972	1.16	0.00	10.50	6.07	0.77	2.57	21.08	0.0308
21	1971	1.54	0.00	5.75	3.31	0.34	1.78	12.72	0.0186
22	1970	0.19	0.00	3.18	2.28	0.36	1.33	7.35	0.0107
23	1969	1.54	0.00	6.25	4.15	0.25	1.15	13.35	0.0195
24	1968	2.13	0.01	10.92	7.58	0.61	2.45	23.69	0.0346
25	1967	0.00	0.00	1.77	1.87	0.12	0.45	4.21	0.0061
26	1966	0.46	0.00	1.77	1.06	0.07	0.37	3.73	0.0054
27	1965	0.65	0.00	1.27	0.94	0.05	0.30	3.21	0.0047
28	1964	0.70	0.00	0.48	1.03	0.02	0.33	2.56	0.0037
Age Unknown		1.80	0.00	4.88	1.76	17.15	20.40	46.00	0.0671
All Ages Combined		24.44	0.06	284.96	156.91	70.29	148.50	685.16	1.0000

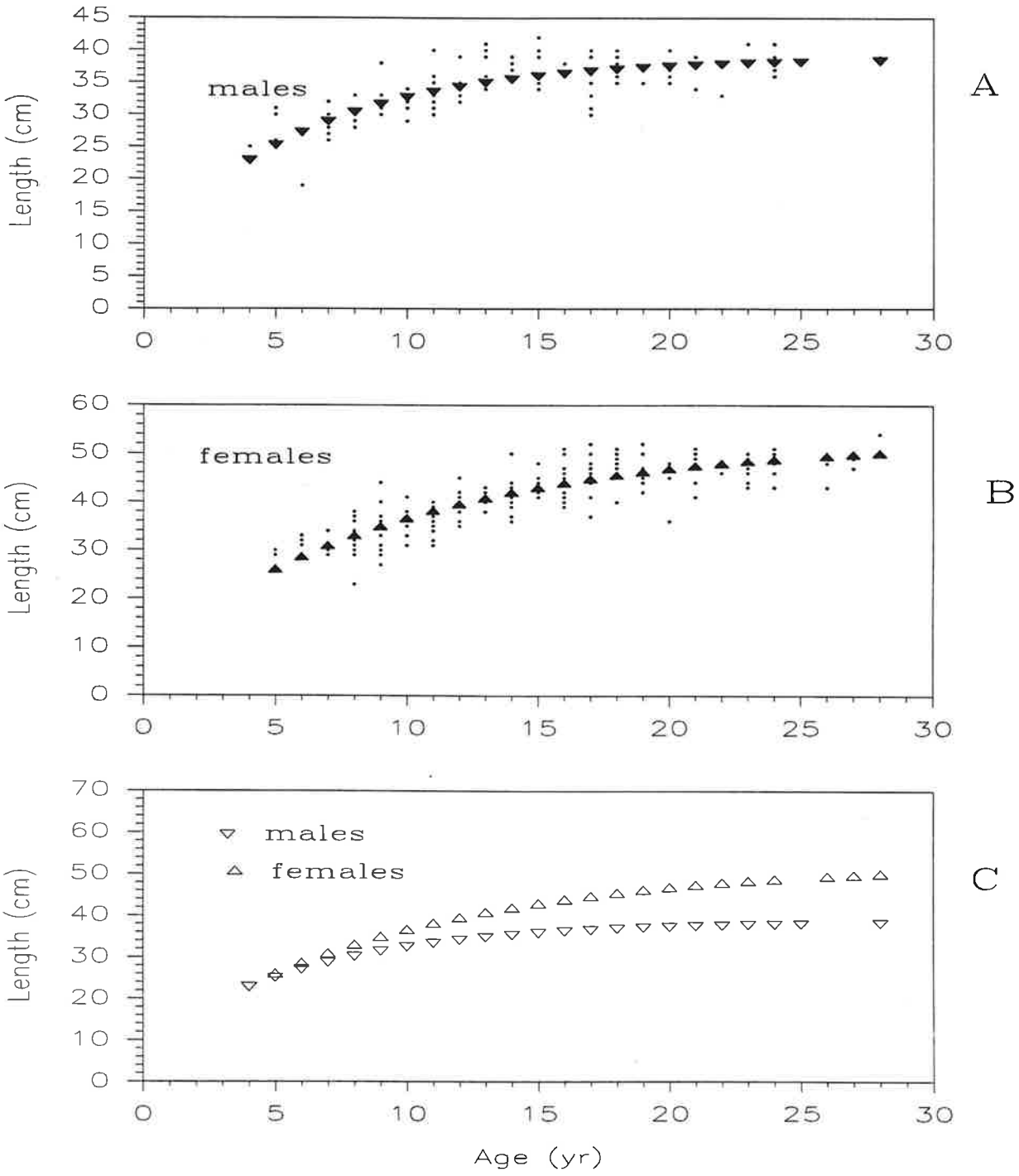

Figure 31.--Distribution of Alaska plaice aged samples from the 1992 eastern Bering Sea bottom trawl survey by length for males (A) and females (B) with symbols showing non-linear von-Bertalanffy estimates. Males and females compared (C).

Table 26.--von-Bertalanffy growth parameter estimates for Alaska plaice by sex, based on otolith age reading and length data from the 1992 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters L_{inf}	K	t_o
Male	127	4-28	19-42	38.9	0.16	-1.62
Female	184	5-28	23-54	52.6	0.10	-1.74

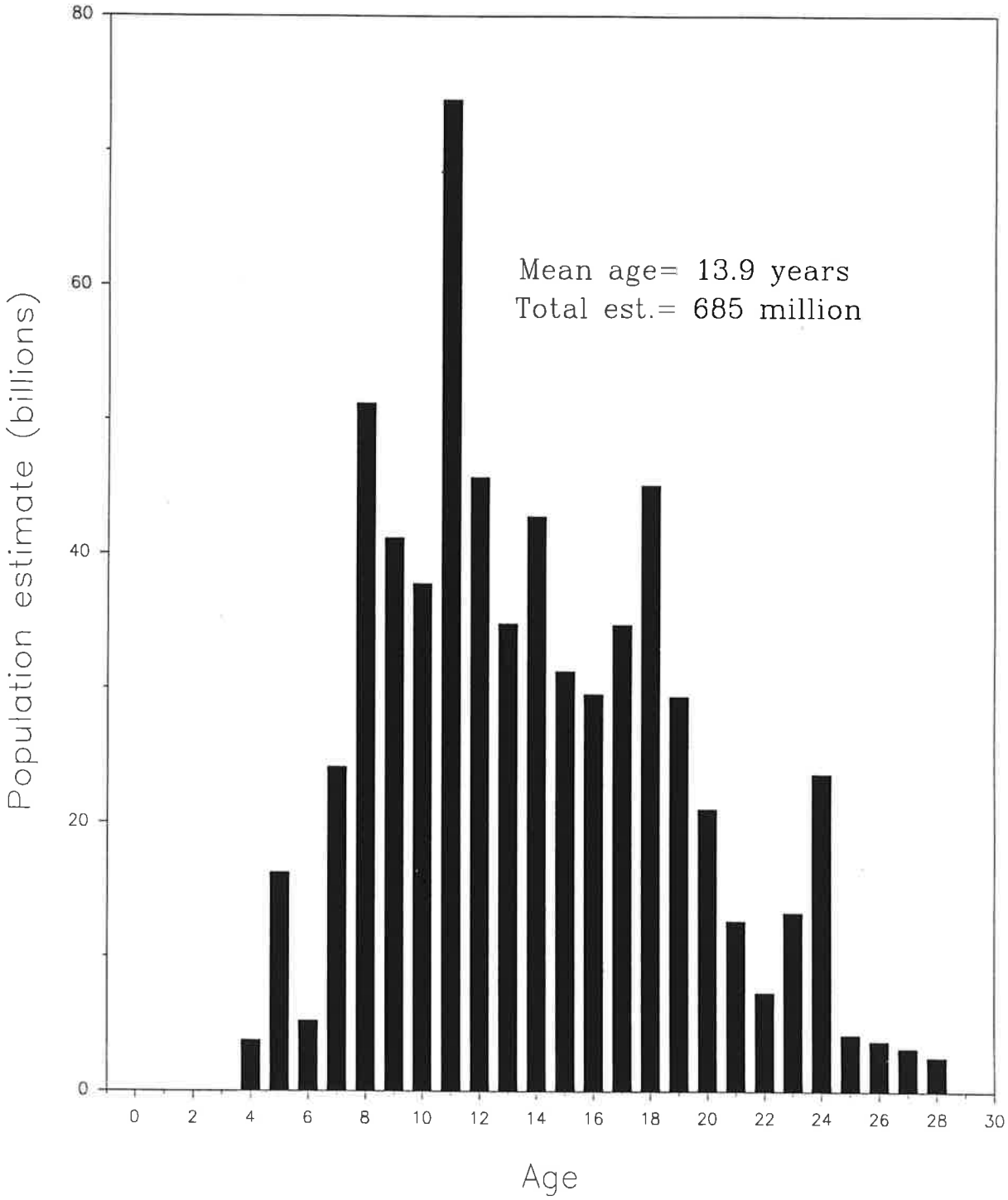

Figure 32.--Population number estimates by age for Alaska plaice, 1992 eastern Bering Sea bottom trawl survey.

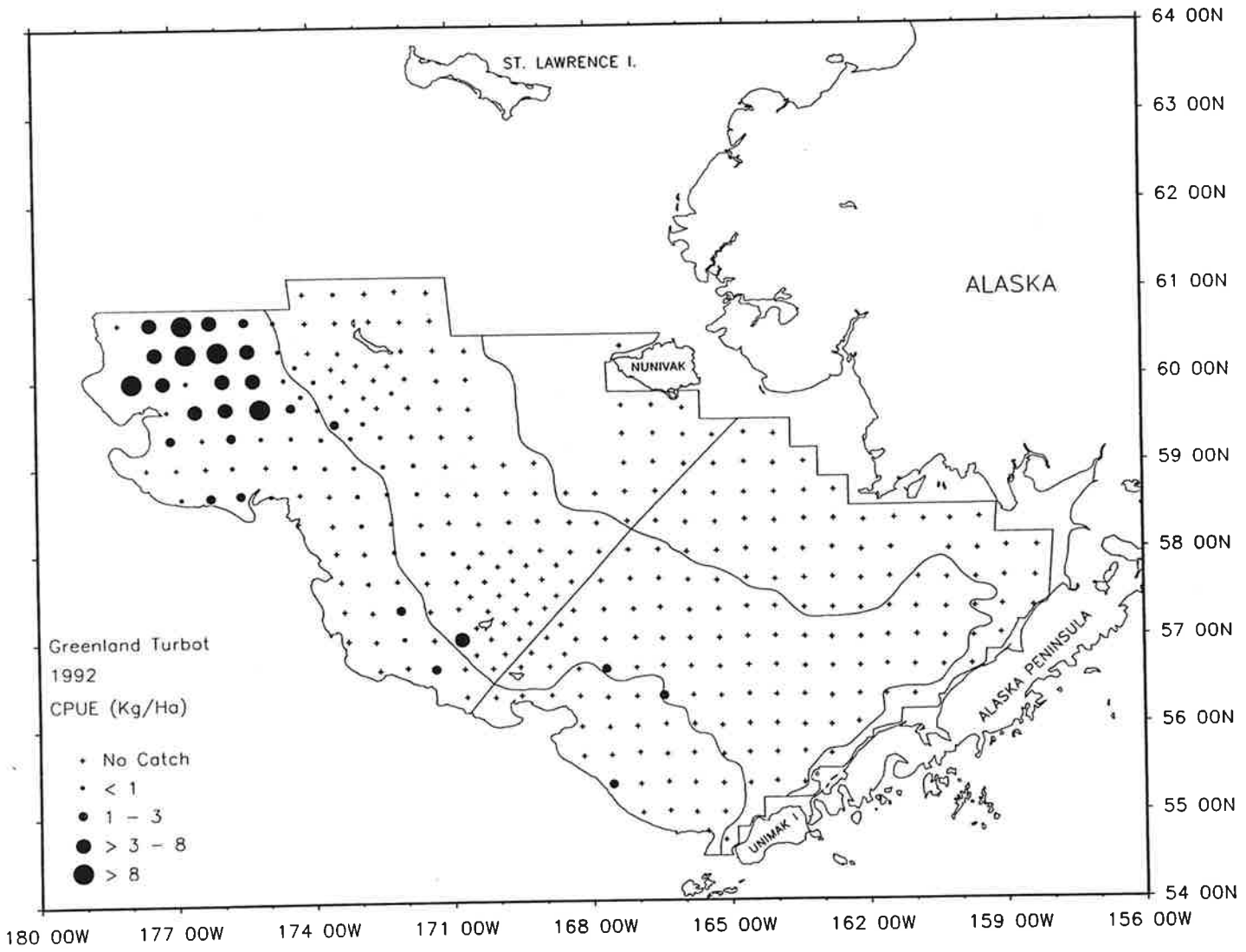

Figure 33.--Distribution and relative abundance in kg/ha of Greenland turbot, 1992 eastern Bering Sea bottom trawl survey.

Table 27.--Abundance estimates and mean size of Greenland turbot by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	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[b]	0.00	0	0.000	0	0.000	0.000	0.0
3	0.06	617	0.026	112,251	0.005	5.497	80.8
4[b]	0.10	1,041	0.043	1,322,196	0.061	0.787	34.8
5	0.05	214	0.009	27,706	0.001	7.724	87.0
6	2.34	22,125	0.922	20,106,857	0.932	1.100	40.3
All subareas combined[c]	0.55	23,997	1.000	21,569,010	1.000	1.113	40.2
95% Confidence interval		±11,473		±8,734,840			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

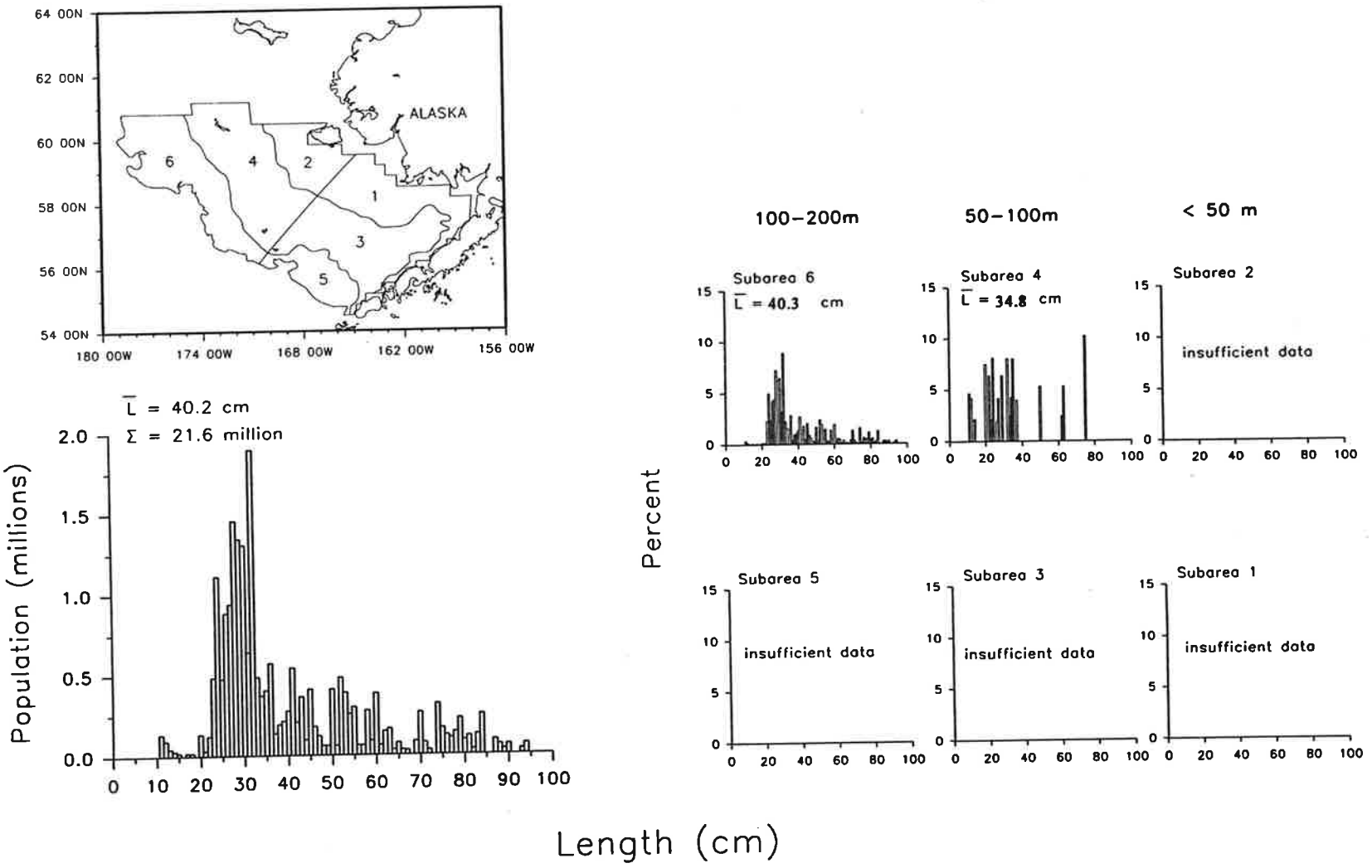

Figure 34.--Estimated relative size distribution (sexes combined) of Greenland turbot in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

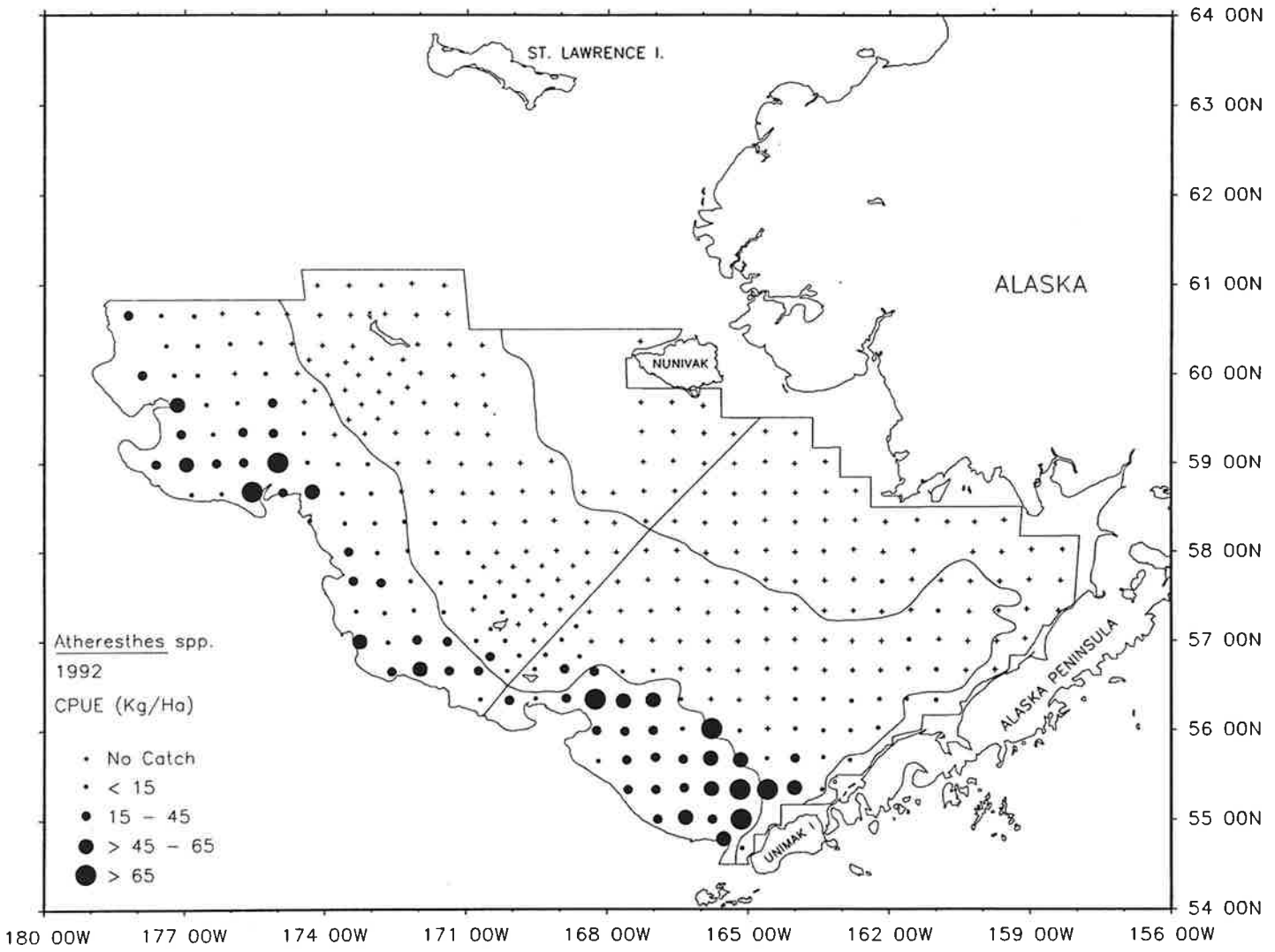

Figure 35.--Distribution and relative abundance in kg/ha of Atheresthes spp., 1992 eastern Bering Sea bottom trawl survey.

Table 28.--Abundance estimates and mean size of Atheresthes spp. by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size: Weight (kg)	Mean Size: Length (cm)
1	0.08	582	0.001	1,888,699	0.003	0.308	33.1
2[b]	0.00	0	0.000	0	0.000	0.000	0.0
3	8.10	83,716	0.199	203,027,314	0.279	0.412	34.5
4[b]	0.66	6,836	0.016	25,297,531	0.035	0.270	28.3
5	41.94	162,701	0.387	286,056,610	0.392	0.569	37.5
6	17.59	166,342	0.396	212,625,355	0.292	0.782	39.7
All subareas combined[c]	9.59	420,176	1.000	728,895,509	1.000	0.576	37.0
95% Confidence interval		±98,250		±195,544,215			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

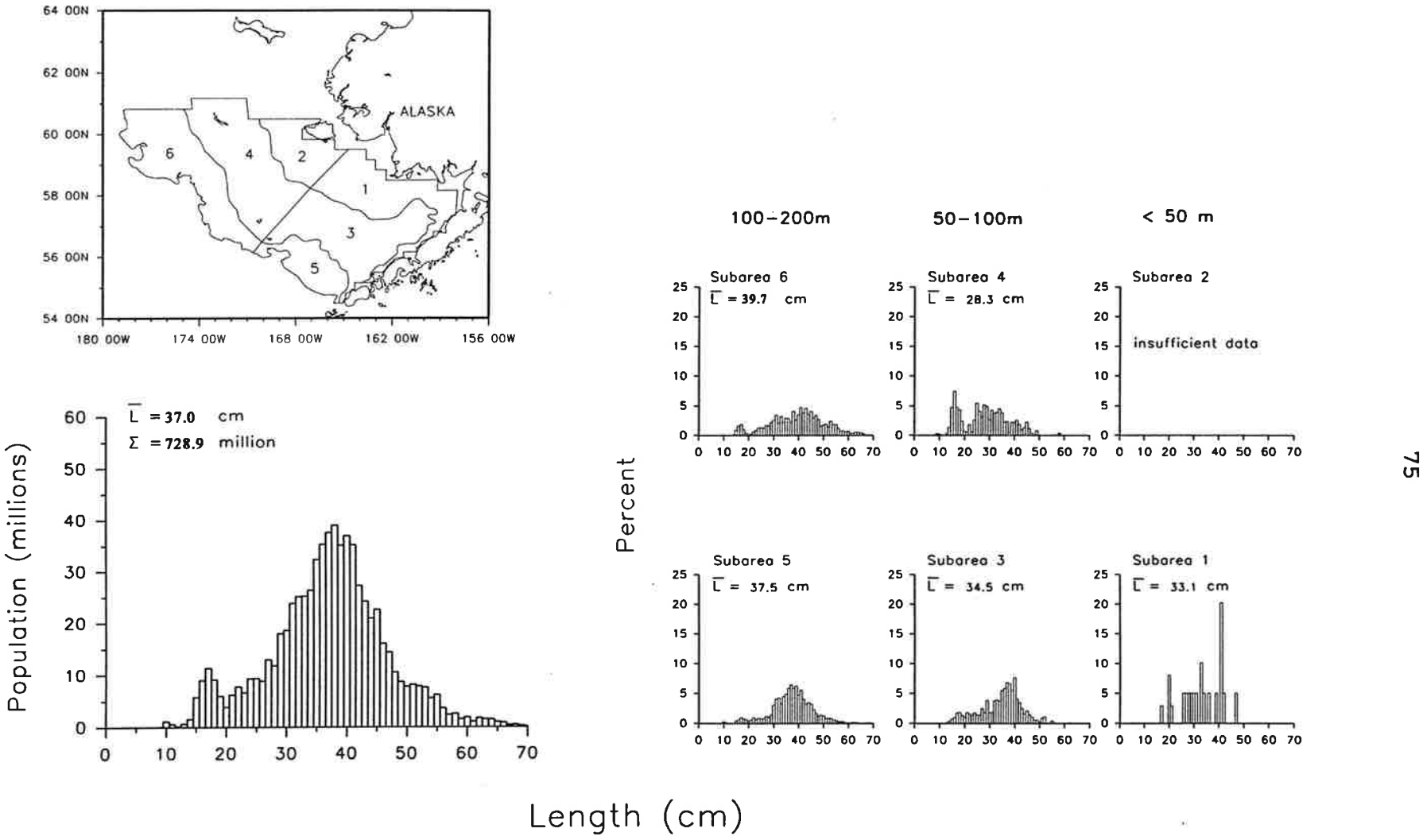

Figure 36.--Estimated relative size distribution (sexes combined) of Atheresthes spp. in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

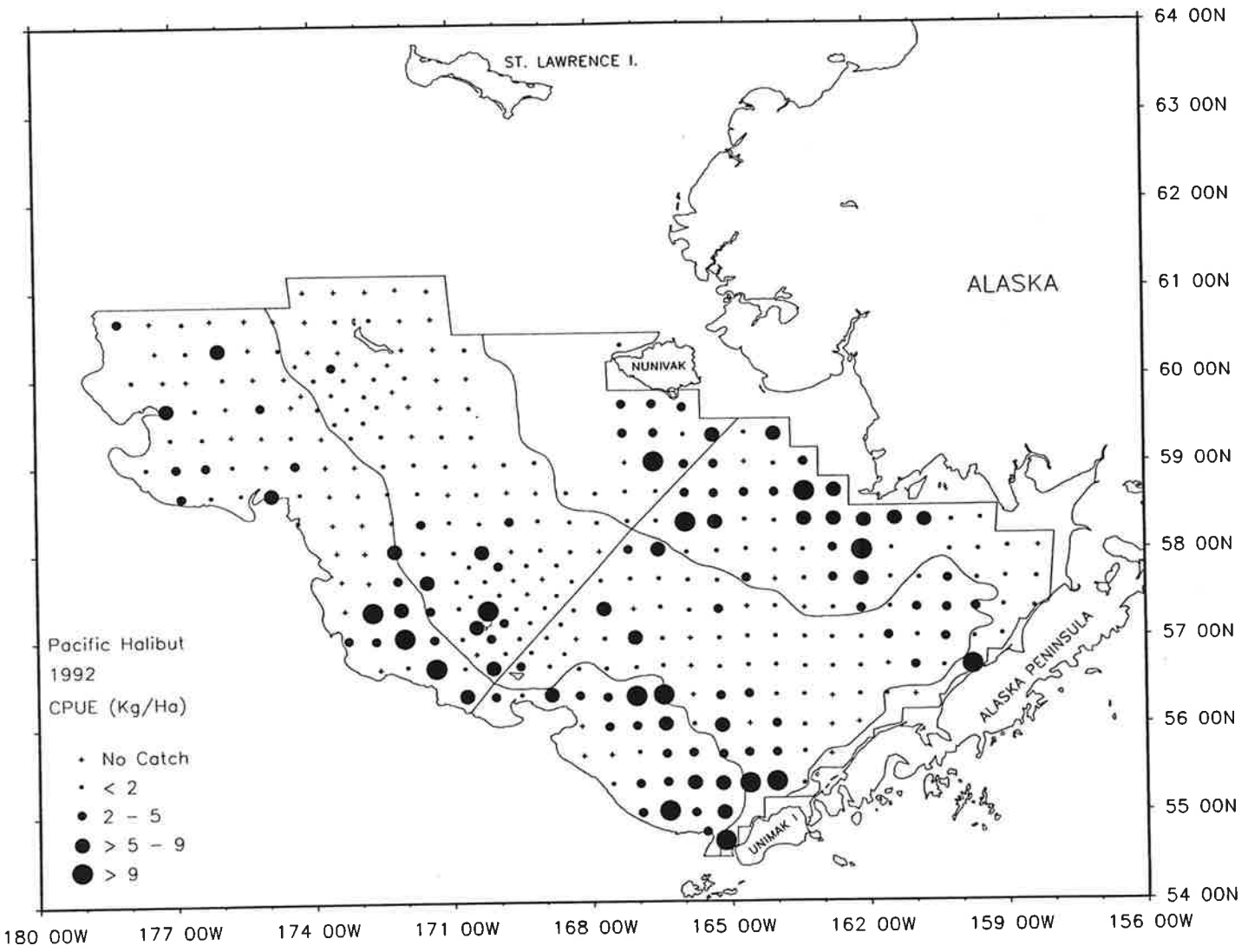

Figure 37.--Distribution and relative abundance in kg/ha of Pacific halibut, 1992 eastern Bering Sea bottom trawl survey.

Table 29.--Abundance estimates and mean size of Pacific halibut by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Size	
						Weight (kg)	Length (cm)
1	3.01	23,406	0.238	16,414,592	0.360	1.426	48.3
2[b]	3.18	6,594	0.067	4,927,824	0.108	1.338	44.9
3	2.36	24,372	0.248	10,214,930	0.224	2.386	54.0
4[b]	0.95	9,822	0.100	6,715,255	0.147	1.463	46.1
5	4.24	16,435	0.167	2,945,414	0.065	5.580	71.4
6	1.87	17,673	0.180	4,354,245	0.096	4.059	63.6
All subareas combined[c]	2.24	98,302	1.000	45,572,261	1.000	2.157	51.8
95% Confidence interval		±17,001		±8,224,033			

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

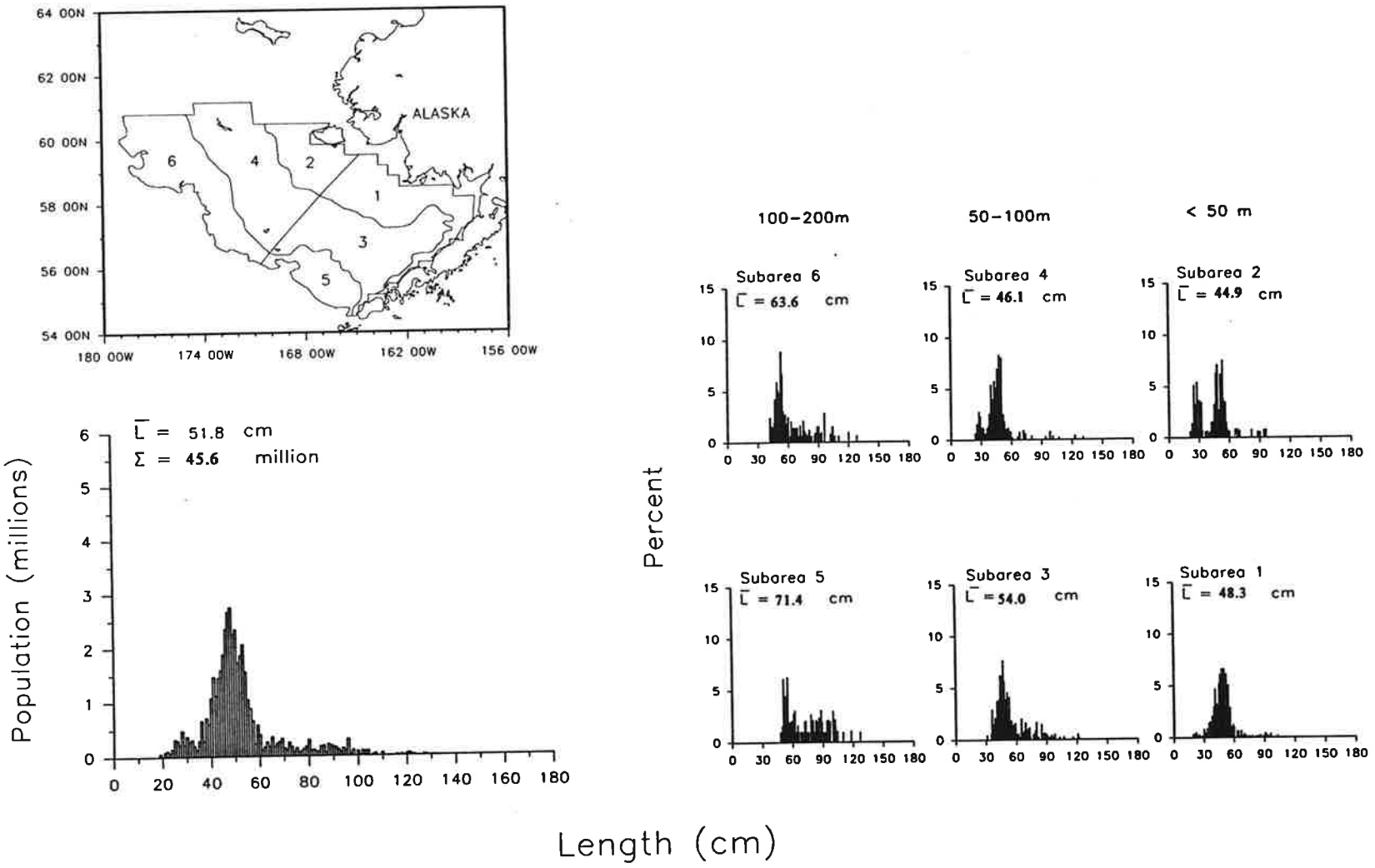

Figure 38.--Estimated relative size distribution (sexes combined) of Pacific halibut in terms of population numbers, and percent for subareas 1-6, 1992 eastern Bering Sea bottom trawl survey.

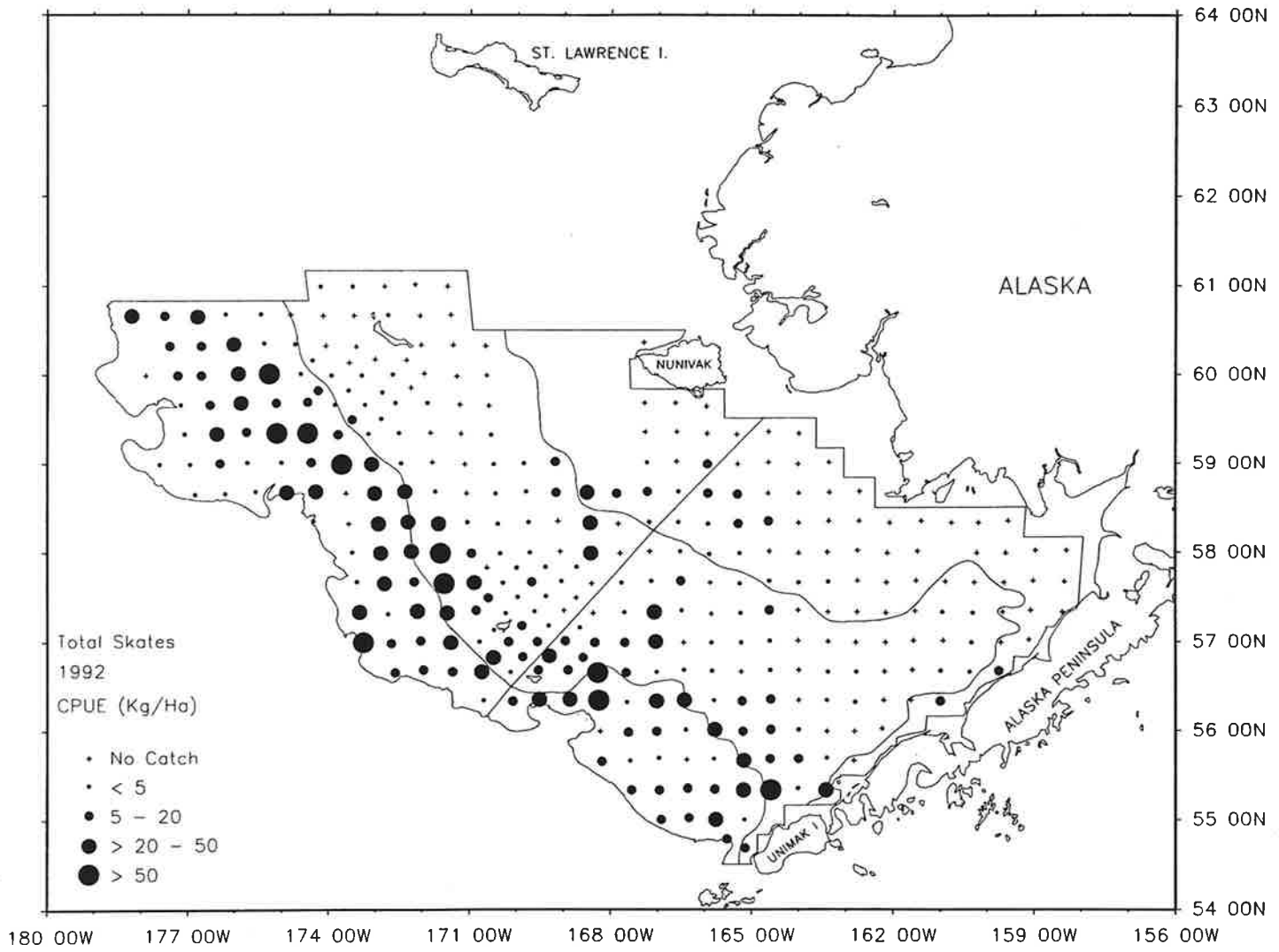

Figure 39.--Distribution and relative abundance in kg/ha of total skates, 1992 eastern Bering Sea bottom trawl survey.

Table 30.--Abundance estimates and mean size of skates by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	1.20	9,362	0.025	1,512,499	0.018	6.190
2[b]	4.76	9,861	0.026	1,417,578	0.017	6.956
3	6.67	68,891	0.182	18,007,863	0.214	3.826
4[b]	5.46	56,210	0.149	11,939,283	0.142	4.708
5	15.39	59,711	0.158	13,818,078	0.165	4.321
6	18.35	173,499	0.460	37,269,098	0.444	4.655
All subareas combined[c]	8.61	377,535	1.000	83,964,399	1.000	4.496
95% Confidence interval		±66,240		±15,868,638		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

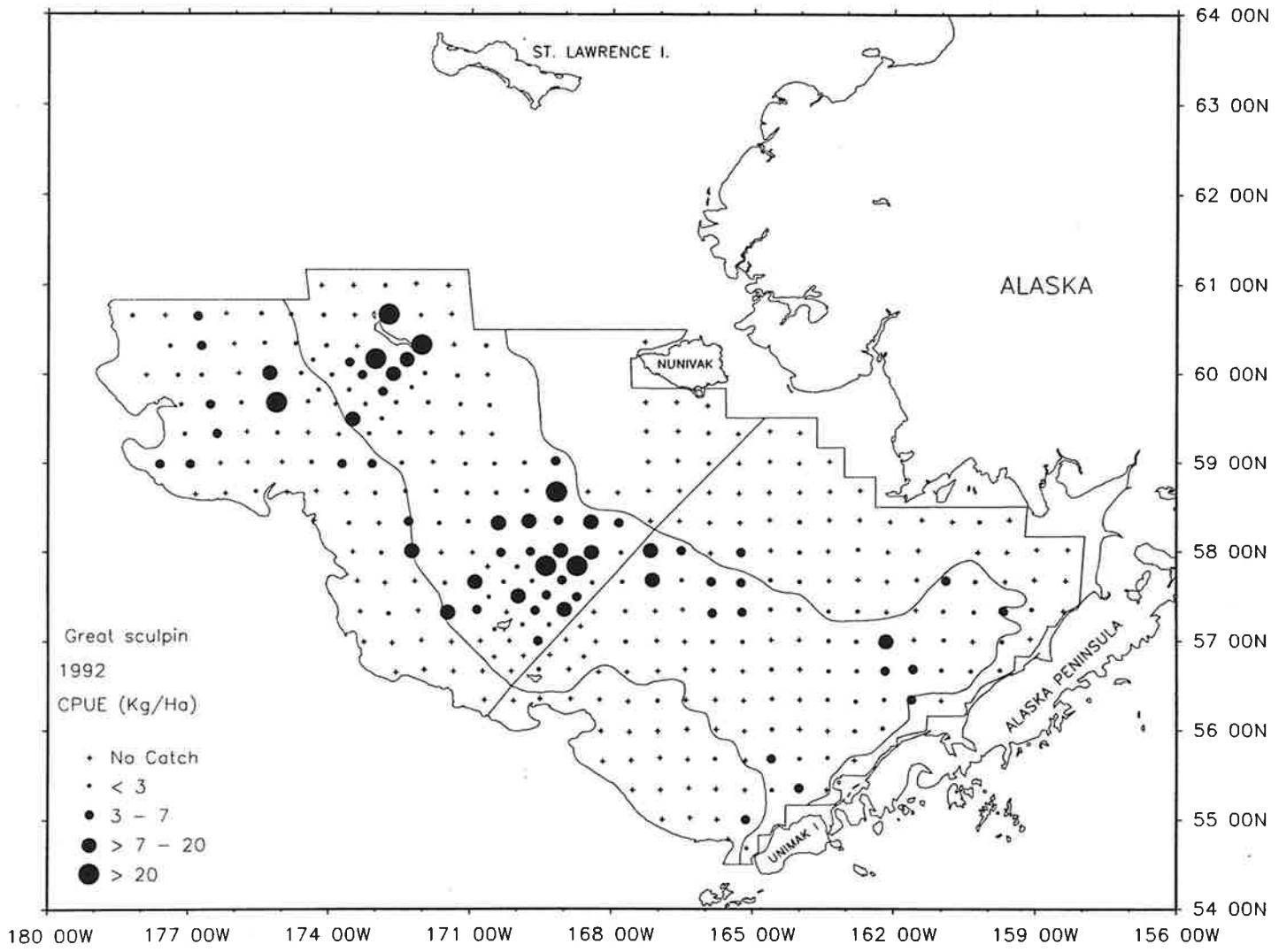

Figure 40.--Distribution and relative abundance in kg/ha of great sculpin, 1992 eastern Bering Sea bottom trawl survey.

Table 31.--Abundance estimates and mean size of great sculpin by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.35	2,707	0.030	1,440,132	0.021	1.880
2[b]	0.00	0	0.000	0	0.000	0.000
3	1.51	15,598	0.173	10,848,285	0.159	1.438
4[b]	5.13	52,810	0.584	49,329,629	0.723	1.071
5	0.22	844	0.009	375,380	0.006	2.248
6	1.95	18,440	0.204	6,210,242	0.091	2.969
All subareas combined[c]	2.06	90,399	1.000	68,203,669	1.000	1.325
95% Confidence interval		±26,358		±23,179,649		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding

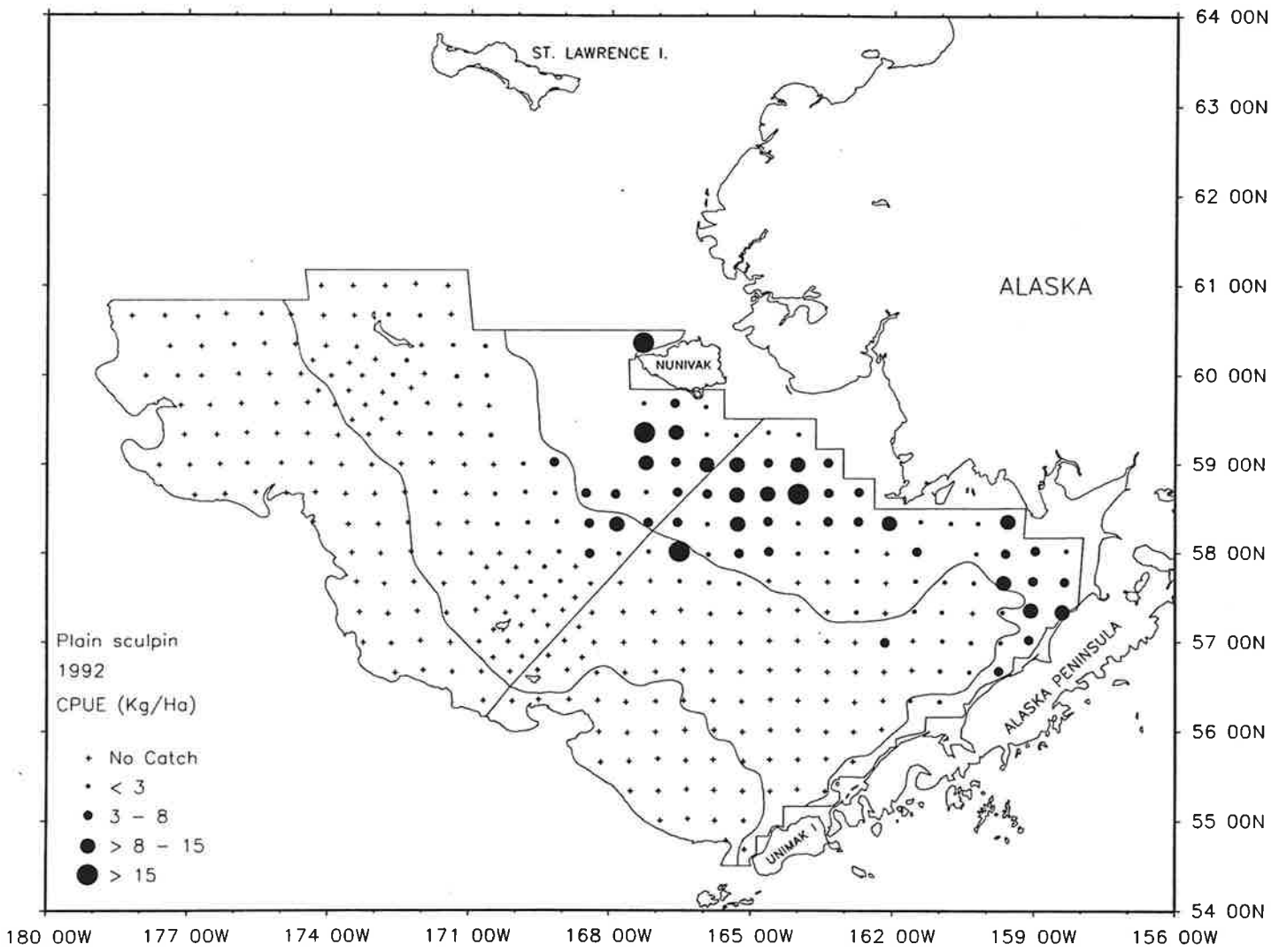

Figure 41.--Distribution and relative abundance in kg/ha of plain sculpin, 1992 eastern Bering Sea bottom trawl survey.

Table 32.--Abundance estimates and mean size of plain sculpin by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	4.41	34,349	0.579	59,573,712	0.646	0.577
2[b]	7.39	15,334	0.258	22,085,210	0.239	0.694
3	0.42	4,353	0.073	4,915,296	0.053	0.886
4[b]	0.51	5,308	0.089	5,674,030	0.062	0.935
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[c]	1.35	59,343	1.000	92,248,248	1.000	0.643
95% Confidence interval		±13,372		±20,351,186		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

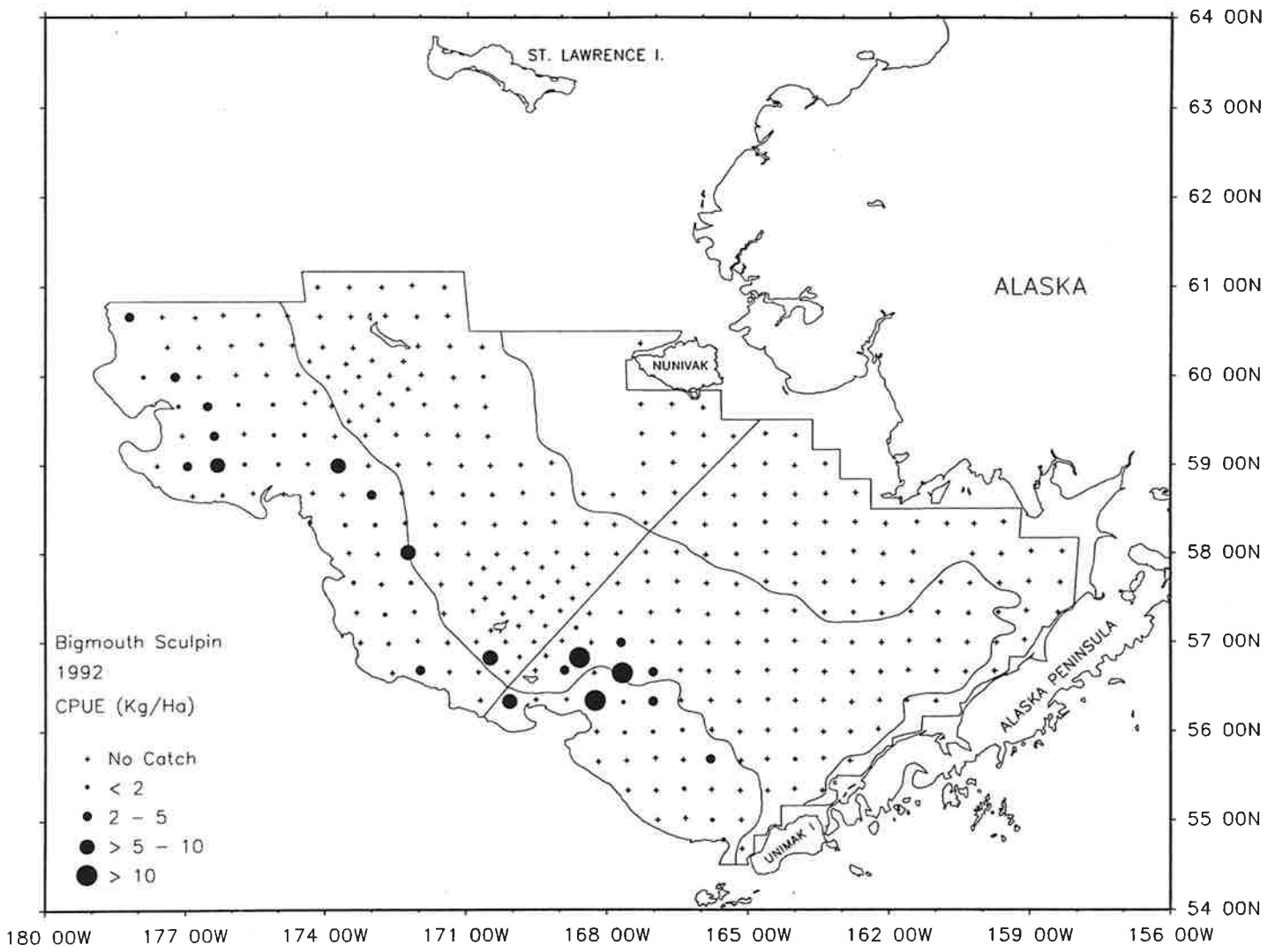

Figure 42.--Distribution and relative abundance in kg/ha of bigmouth sculpin, 1992 eastern Bering Sea bottom trawl survey.

Table 33.--Abundance estimates and mean size of bigmouth sculpin by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2[b]	0.00	0	0.000	0	0.000	0.000
3	0.42	4,324	0.236	1,045,172	0.175	4.137
4[b]	0.07	706	0.039	191,155	0.032	3.693
5	1.31	5,087	0.278	1,317,371	0.220	3.861
6	0.87	8,184	0.447	3,429,178	0.573	2.387
All subareas combined[c]	0.42	18,300	1.000	5,982,876	1.000	3.059
95% Confidence interval		±7,826		±2,149,877		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

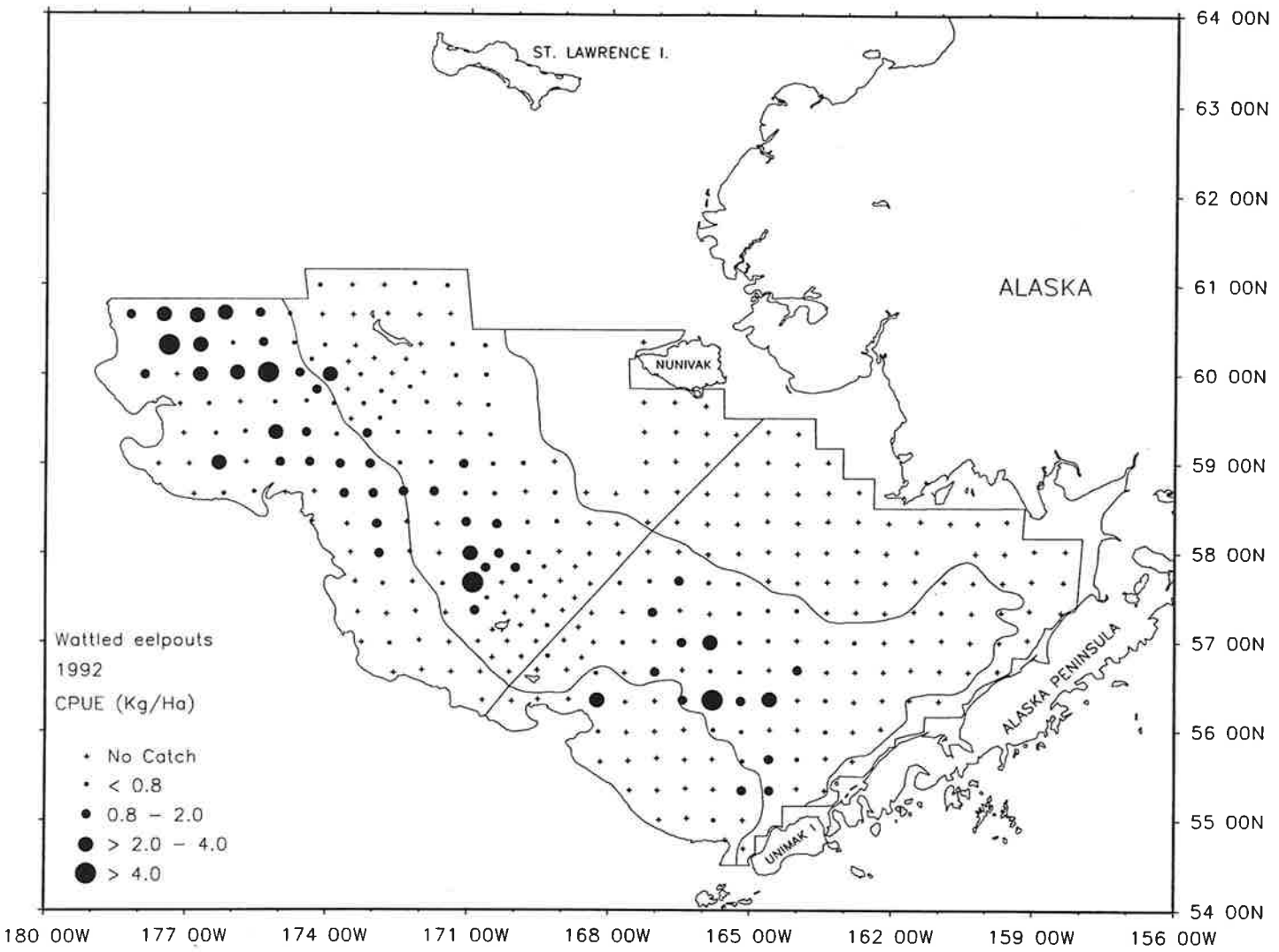

Figure 43.--Distribution and relative abundance in kg/ha of wattled eelpout, 1992 eastern Bering Sea bottom trawl survey.

Table 34.--Abundance estimates and mean size of wattled eelpout by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2[b]	0.00	0	0.000	0	0.000	0.000
3	0.29	2,988	0.238	15,002,057	0.163	0.199
4[b]	0.19	1,938	0.154	13,088,255	0.143	0.148
5	0.21	806	0.064	3,146,914	0.034	0.256
6	0.72	6,824	0.544	60,541,418	0.660	0.113
All subareas combined[c]	0.29	12,555	1.000	91,778,644	1.000	0.137
95% Confidence interval		±3,525		±34,472,050		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

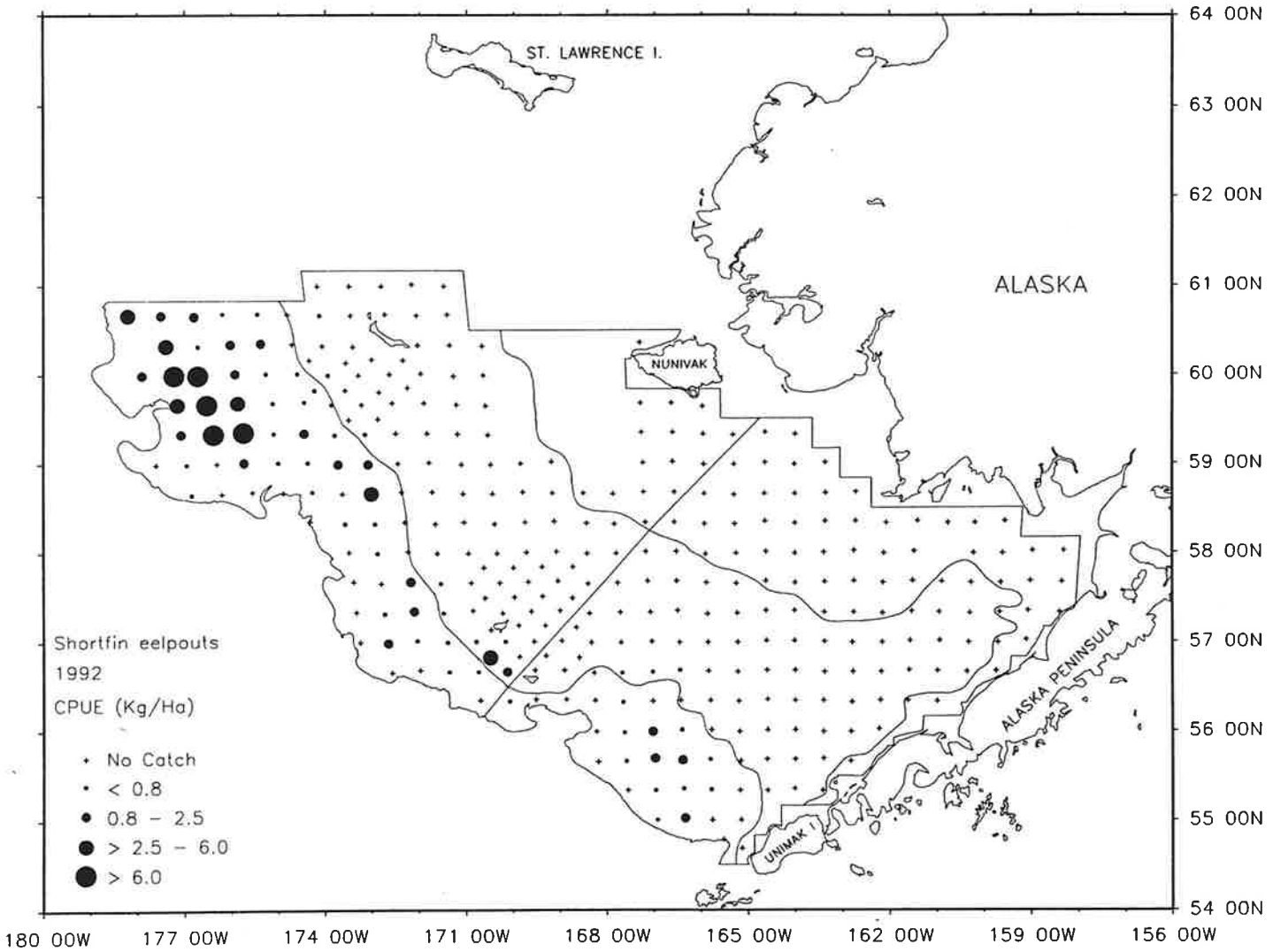

Figure 44.--Distribution and relative abundance in kg/ha of shortfin eelpout, 1992 eastern Bering Sea bottom trawl survey.

Table 35.--Abundance estimates and mean size of shortfin eelpout by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2[b]	0.00	0	0.000	0	0.000	0.000
3	0.01	134	0.009	1,060,971	0.004	0.126
4[b]	0.08	835	0.056	15,133,410	0.059	0.055
5	0.28	1,096	0.073	18,205,217	0.071	0.060
6	1.37	12,906	0.862	220,730,011	0.865	0.058
All subareas combined[c]	0.34	14,970	1.000	255,129,608	1.000	0.059
95% Confidence interval		±5,391		±78,230,654		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

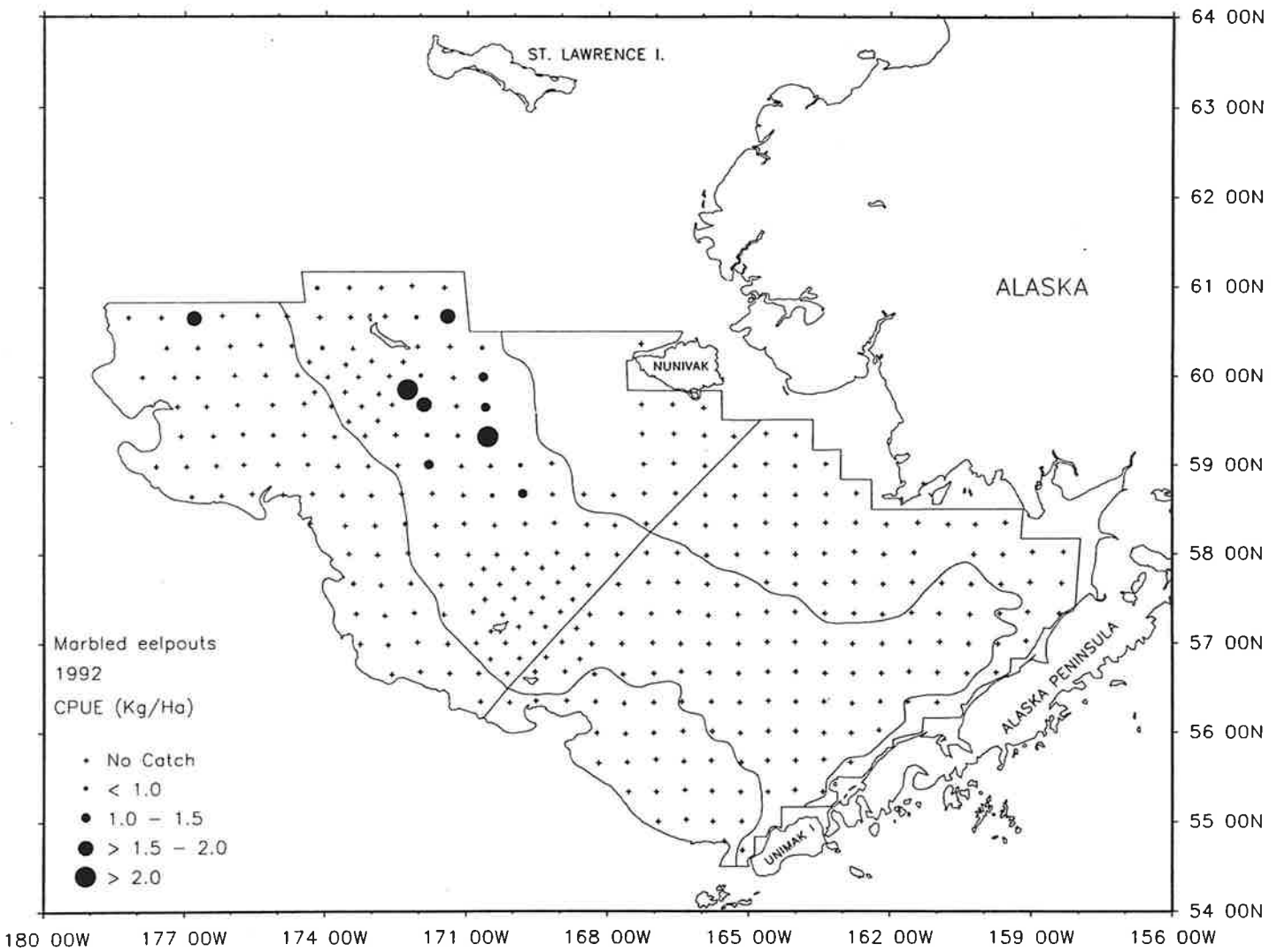

Figure 45.--Distribution and relative abundance in kg/ha of marbled eelpout, 1992 eastern Bering Sea bottom trawl survey.

Table 36.--Abundance estimates and mean size of marbled eelpout by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0:000	0.000
2[b]	0.00	0	0.000	0	0.000	0.000
3	0.00	0	0.000	0	0.000	0.000
4[b]	0.22	2,230	0.895	2,332,712	0.954	0.956
5	0.00	0	0.000	0	0.000	0.000
6	0.03	264	0.106	112,980	0.046	2.337
All subareas combined[c]	0.06	2,493	1.000	2,445,692	1.000	1.019
95% Confidence interval		±1,468		±1,400,573		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

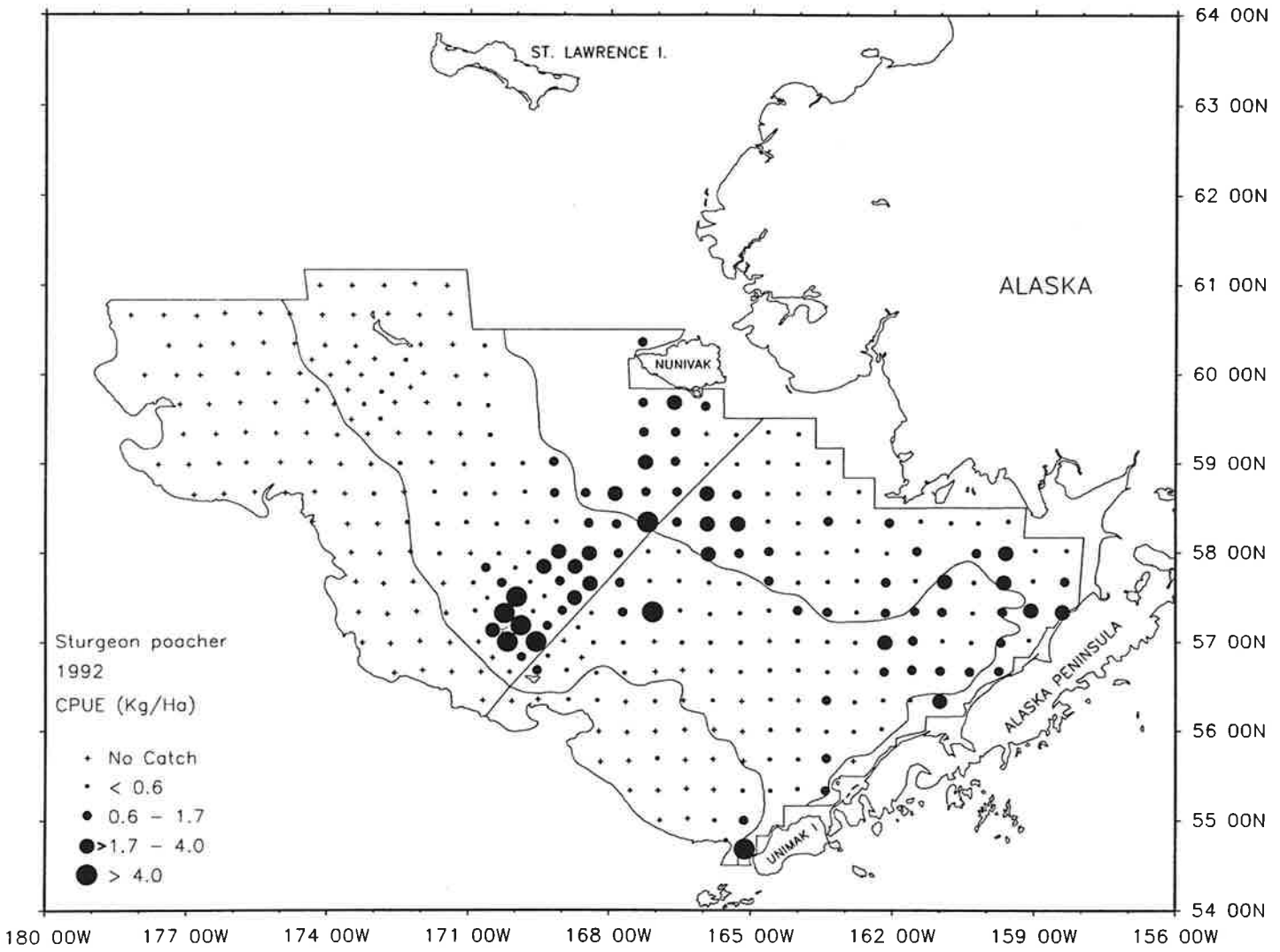

Figure 46.--Distribution and relative abundance in kg/ha of sturgeon poacher, 1992 eastern Bering Sea bottom trawl survey.

Table 37.--Abundance estimates and mean size of sturgeon poacher by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.84	6,519	0.306	74,991,494	0.259	0.087
2[b]	1.35	2,805	0.132	44,514,041	0.154	0.063
3	0.51	5,289	0.248	75,070,356	0.260	0.070
4[b]	0.62	6,383	0.300	89,800,103	0.311	0.071
5	0.07	276	0.013	3,949,995	0.014	0.070
6	0.00	34	0.002	836,251	0.003	0.041
All subareas combined[c]	0.49	21,306	1.000	289,162,239	1.000	0.074
95% Confidence interval		±4,256		±64,448,664		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

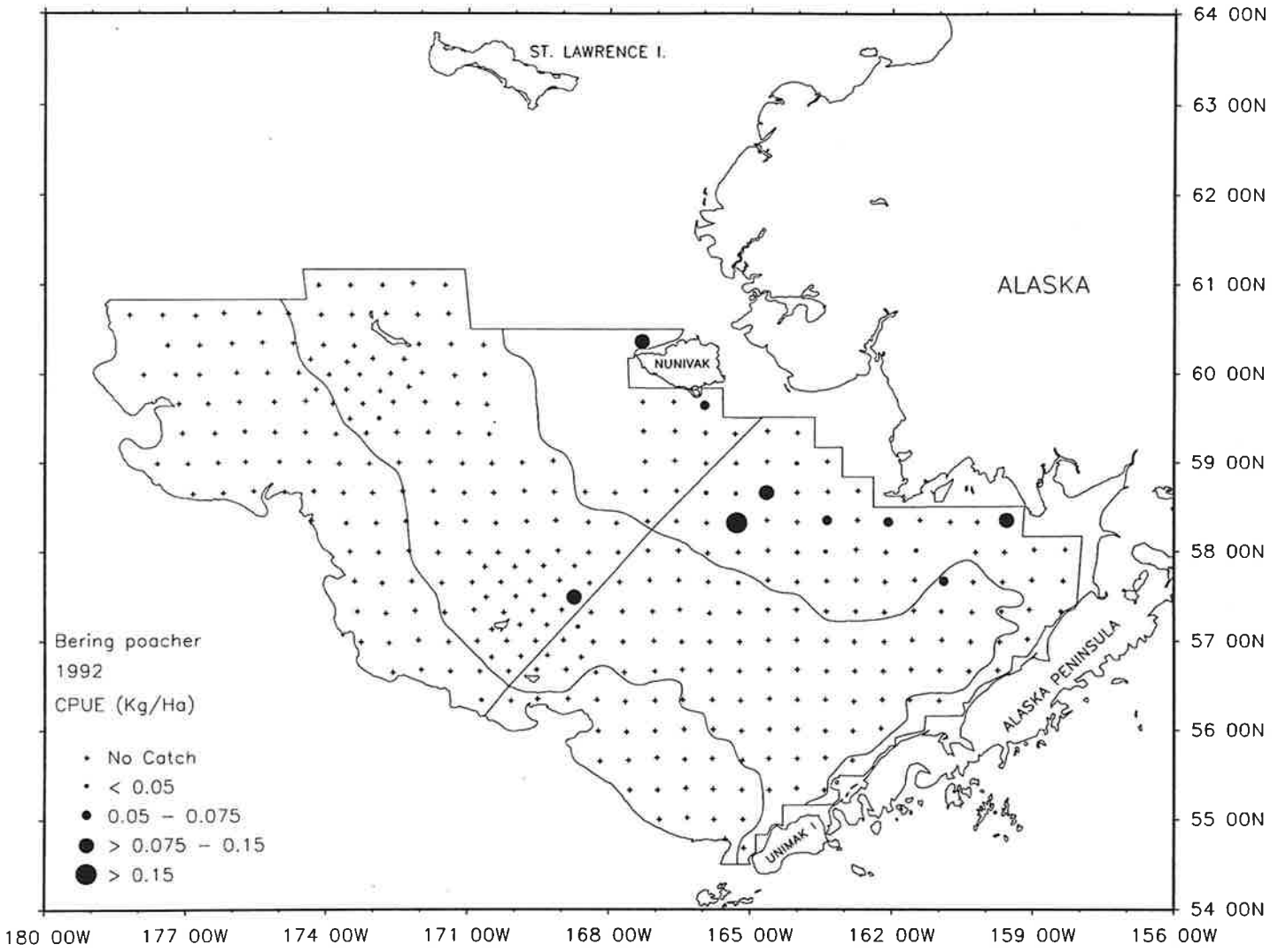

Figure 47.--Distribution and relative abundance in kg/ha of Bering poacher, 1992 eastern Bering Sea bottom trawl survey.

Table 38.--Abundance estimates and mean size of Bering poacher by subarea, 1992 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)[a]	Estimated biomass (t)[a]	Proportion of estimated biomass	Estimated population numbers[a]	Proportion of estimated population	Mean Weight (kg)
1	0.01	93	0.633	1,835,925	0.525	0.051
2[b]	0.01	27	0.184	930,621	0.266	0.029
3	0.00	14	0.095	192,345	0.055	0.073
4[b]	0.00	11	0.075	497,288	0.142	0.022
5	0.00	0	0.000	0	0.000	0.000
6	0.00	2	0.014	40,267	0.012	0.050
All subareas combined[c]	0.00	147	1.000	3,496,447	1.000	0.042
95% Confidence interval		±85		±1,987,071		

[a]Variances of abundance estimates are given in Appendix D.
[b]Subareas 2 and 4 were not completely surveyed in 1992. See text for details.
[c]Differences in sums of estimates and totals are due to rounding.

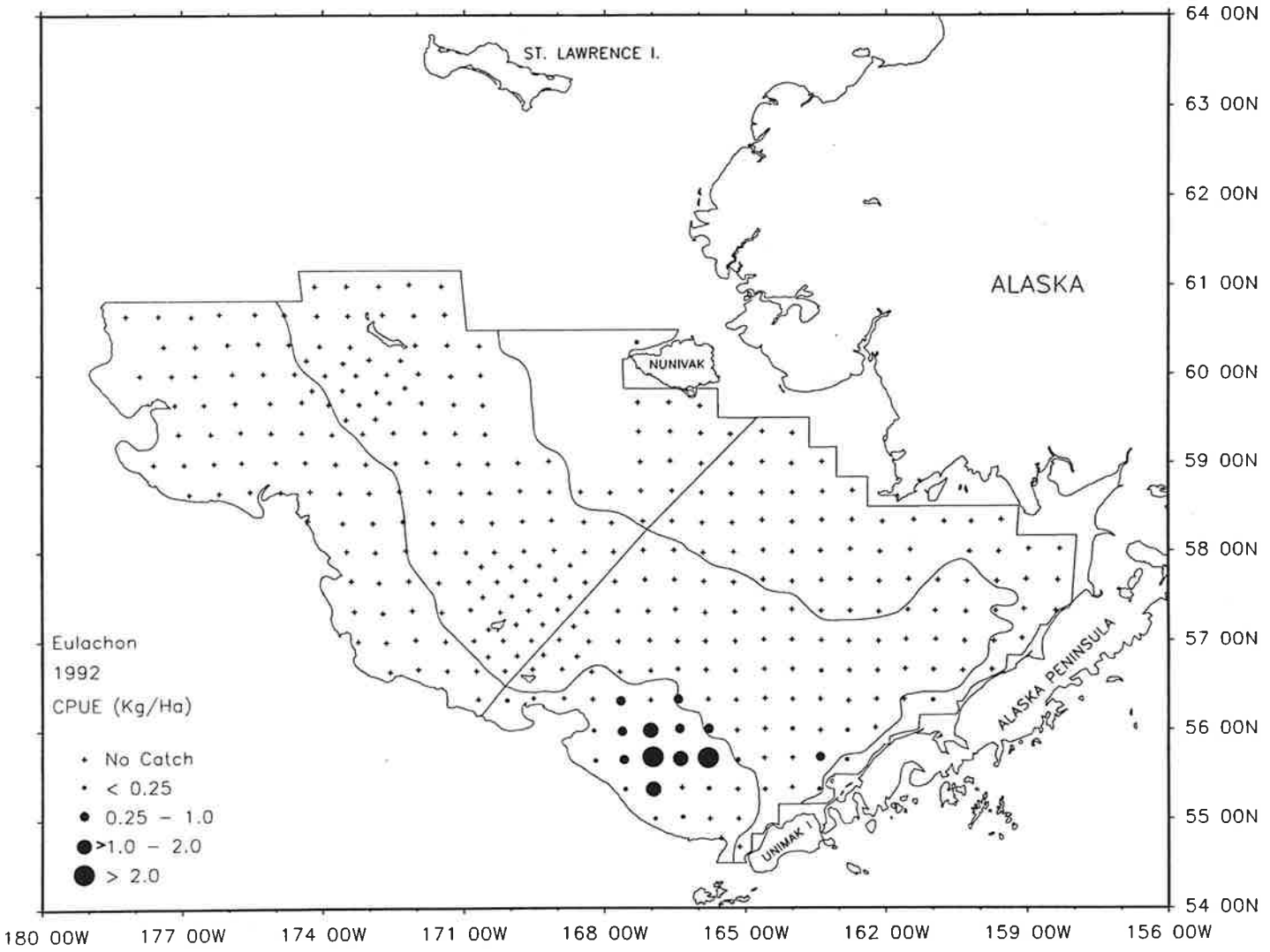

Figure 48.--Distribution and relative abundance in kg/ha of eulachon, 1992 eastern Bering Sea bottom trawl survey.

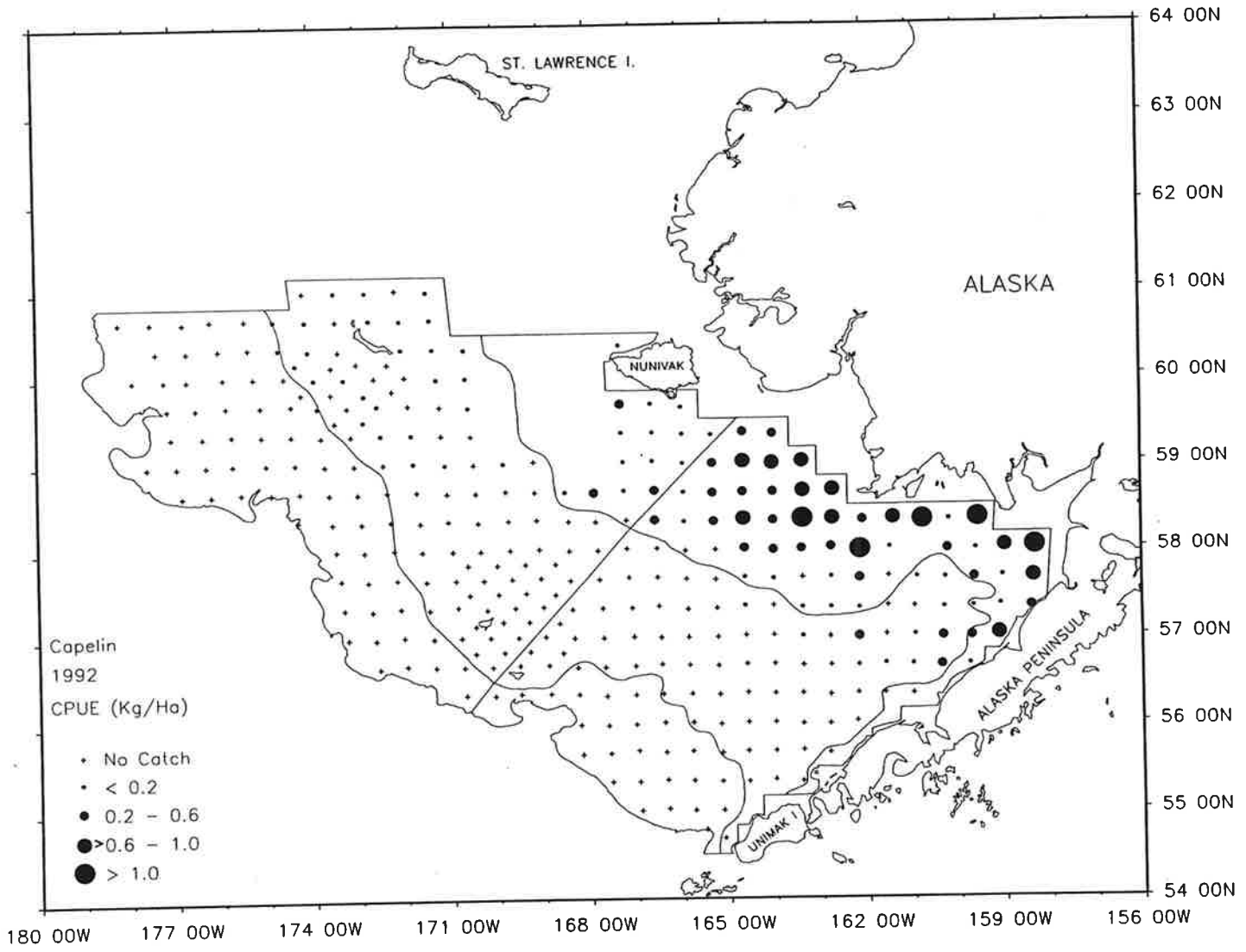

Figure 49.--Distribution and relative abundance in kg/ha of capelin, 1992 eastern Bering Sea bottom trawl survey.

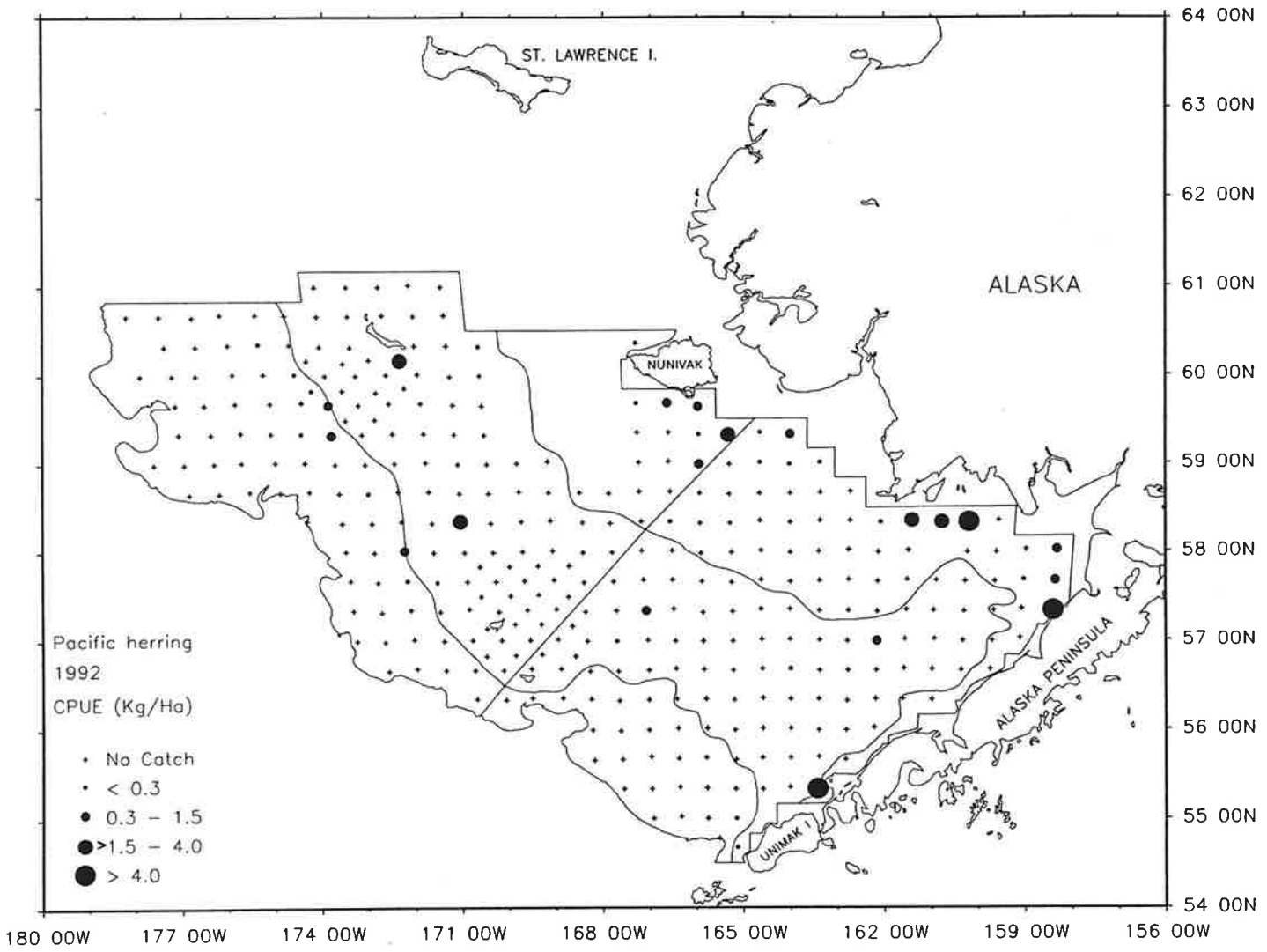

Figure 50.--Distribution and relative abundance in kg/ha of Pacific herring, 1992 eastern Bering Sea bottom trawl survey.

CITATIONS

Alverson, D. L., and W. T. Pereyra. 1969. Demersal fish explorations in the northeast Pacific Ocean--An evaluation of exploratory fishing methods and analytical approaches to stock size and yield forecasts. J. Fish. Res. Board Can. 26:1985-2001.

Bakkala, R. G., and K. Wakabayashi (editors). 1985. Results of cooperative U.S.-Japan groundfish investigations in the Bering Sea during May-August 1979. Int. North Pac. Fish. Comm., Bull. 44, 252 p.

Bakkala, R. G. 1988. Structure and historical changes in the groundfish complex of the eastern Bering Sea. Ph.D. Diss., Hokkaido Univ., Hakodate, Japan, 187 p.

Kappenman, R. F. 1992. Robust estimation of the ratio of scale parameters for positive random variables. AFSC Processed Rep. 92-01, 10 p. Alaska Fish. Sci. Cent., Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, BIN C15700, Seattle, WA 98115.

North Pacific Fishery Management Council. 1990. Stock assessment and fishery evaluation document for groundfish resources in the Bering Sea/Aleutian Islands region as projected for 1991, 281 p. Available from North Pacific Fishery Management Council, P.O. Box 103136, Anchorage, AK 99510.

Pereyra, W. T., J. E. Reeves, and R. G. Bakkala. 1976. Demersal fish and shellfish resources of the eastern Bering Sea in the baseline year 1975. Processed Rep., 619 p. Northwest and Alaska Fish. Cent., Natl. Mar. Fish. Serv., NOAA, 2725 Montlake Blvd. E., Seattle, WA 98112.

Rose, C. S., and G. E. Walters. 1990. Trawl width variation during bottom trawl surveys: causes and consequences. In L. Low (editor), Proceedings of the symposium on application of stock assessment techniques to gadids, p. 57-67. Int. North Pac. Fish. Comm., Bull. 50.

Smith, G. B., and R. G. Bakkala. 1982. Demersal fish resources of the eastern Bering Sea: Spring 1976. U.S. Dep. Commer., NOAA Tech. Rep. NMFS SSRF-754, 129 p.

Stevens, B. G., J. H. Bowerman, R. A. MacIntosh, and J. A. Haaga. 1992. Report to industry on the 1992 eastern Bering Sea crab survey. AFSC Processed Rep. 92-12, 57 p. Kodiak Facility, Alaska Fish. Sci. Cent., Natl. Mar. Fish. Serv., P.O. Box 1638, Kodiak, AK 99615.

von Bertalanffy, L. 1938. A quantitative theory of organic growth. Hum. Biol. 10:181-213.

Wakabayashi, K., R. G. Bakkala, and M. S. Alton. 1985. Methods of the U.S.-Japan demersal trawl surveys. In R. G. Bakkala and K. Wakabayashi (editors), Results of cooperative U.S.-Japan groundfish investigations in the Bering Sea during May-August 1979, p. 7-29. Int. North Pac. Fish. Comm., Bull. 44.

APPENDIX A

Station Data, 1992 Eastern Bering Sea Bottom Trawl Survey

Appendix A contains station data by vessel for the 336 successfuly 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. Negative longitude indicates western hemisphere.
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. Ten additional special study hauls not listed here were also used for that analysis. For reference purposes, these hauls were: Alaska- 153,165,166,167,187- Tracy Anne-15,151,152,153,174.

List of Tables

Table A-1.--Haul data for stations sampled by the RV Alaska during the 1992 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	06/06/92	58.019	-158.969	42	07	0.50	2.83	10	4.5		15.7	F
*	2	06/06/92	57.683	-159.023	46	10	0.50	3.11	10	3.1		16.6	F
*	3	06/06/92	57.348	-159.068	46	12	0.50	2.93	10	3.1		16.0	F
*	4	06/06/92	57.017	-159.113	31	15	0.50	2.82	10	5.5		14.7	F
*	5	06/07/92	56.659	-160.368	60	06	0.50	2.67	31	5.8		16.9	F
*	6	06/07/92	56.988	-160.334	62	09	0.50	2.80	31	5.9		16.9	F
*	7	06/07/92	57.323	-160.300	59	12	0.50	2.80	31	5.1		16.9	F
*	8	06/07/92	57.657	-160.267	53	15	0.50	2.85	31	5.8		15.2	F
*	9	06/07/92	57.992	-160.218	49	17	0.50	2.98	10	3.9		15.7	F
*	10	06/08/92	58.327	-160.177	16	07	0.50	2.87	10	5.5		13.5	F
*	11	06/08/92	58.349	-161.404	29	13	0.50	2.74	10	5.5		15.4	F
*	12	06/08/92	58.008	-161.484	53	16	0.50	2.80	10	3.2		15.8	F
*	13	06/08/92	57.676	-161.506	51	19	0.50	2.87	10	5.2		16.1	F
*	14	06/09/92	57.338	-161.535	55	06	0.50	3.04	31	6.0		15.4	F
*	15	06/09/92	57.011	-161.570	66	09	0.50	2.83	31	6.5		16.9	F
*	16	06/09/92	56.677	-161.585	88	12	0.40	2.50	31	6.5		17.2	F
*	17	06/09/92	56.345	-161.617	64	15	0.30	1.57	10	6.2		16.2	F
	18	06/09/92	56.344	-162.199	77	17	0.33	1.91	31	6.3		17.2	F
	19	06/11/92	56.015	-162.232	68	06	0.50	2.72	31	6.3	2.5	16.9	F
*	20	06/11/92	55.658	-162.834	48	10	0.50	2.89	10	6.3		16.3	F
*	21	06/11/92	55.991	-162.817	77	12	0.50	2.76	31	7.7	2.1	17.2	F
*	22	06/11/92	56.323	-162.801	77	15	0.50	2.91	31	7.5	1.1	17.2	F
*	23	06/11/92	56.662	-162.785	71	18	0.50	2.89	31	6.9		17.2	F
*	24	06/12/92	56.993	-162.789	60	06	0.50	2.82	31	6.8		16.9	F
*	25	06/12/92	57.327	-162.762	48	09	0.50	2.57	10	5.2		16.9	F
*	27	06/14/92	58.683	-162.707	18	15	0.50	2.89	10	5.1	4.7	13.5	F
*	28	06/14/92	58.346	-162.720	27	18	0.50	2.69	10	4.5	4.0	15.6	F
*	29	06/14/92	58.018	-162.752	38	20	0.50	2.78	10	4.1	3.4	15.6	F
*	30	06/15/92	57.678	-162.753	42	06	0.50	2.74	10	4.2	4.0	16.3	F
*	31	06/15/92	57.658	-164.002	49	11	0.50	2.76	10	3.7	3.3	16.3	F
*	32	06/15/92	57.987	-164.002	44	14	0.50	2.72	10	3.9	2.8	16.3	F
*	33	06/15/92	58.326	-164.004	38	17	0.50	2.91	10	3.9	3.2	16.0	F

Table A-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
*	34	06/16/92	58.659	-164.005	31	06	0.50	2.91	10	3.9	3.7	15.4	F
*	35	06/16/92	58.989	-164.011	26	09	0.50	2.98	10	4.4	4.2	15.1	F
*	36	06/16/92	59.327	-164.002	20	11	0.50	2.85	10	6.2	5.9	14.7	F
	37	06/16/92	59.346	-164.643	20	14	0.50	2.83	10	5.2	5.0	15.9	F
	38	06/16/92	59.011	-164.644	24	17	0.50	2.87	10	4.2	4.4	15.5	F
	39	06/17/92	58.657	-164.653	35	06	0.50	2.82	10	3.8	2.9	15.4	F
	40	06/17/92	58.345	-164.636	42	11	0.50	2.65	10	3.4	3.2	16.3	F
	41	06/17/92	58.011	-164.619	42	14	0.50	2.78	10	4.0	3.1	16.2	F
	42	06/17/92	57.677	-164.619	51	16	0.50	2.83	10	4.8	1.9	16.1	F
	43	06/17/92	57.346	-164.620	64	19	0.50	2.69	31	5.8	0.2	16.7	F
*	44	06/18/92	57.346	-164.006	60	06	0.50	2.72	31	5.7	0.8	16.5	F
*	45	06/18/92	57.013	-164.011	68	12	0.50	2.83	31	6.0	-0.4	16.9	F
*	46	06/18/92	56.678	-164.003	73	15	0.50	2.80	31	7.3	-0.4	17.2	F
*	47	06/18/92	56.680	-164.601	73	18	0.50	2.87	31	6.9	-0.7	17.2	F
*	48	06/19/92	56.346	-164.585	90	07	0.50	2.76	31	6.7		17.2	F
*	49	06/19/92	56.344	-164.005	86	10	0.50	2.78	31	7.0	1.2	17.2	F
*	50	06/19/92	56.011	-164.004	90	14	0.50	2.76	31	7.7	1.5	17.5	F
*	51	06/19/92	56.014	-164.587	91	18	0.25	1.52	31	7.8	0.9	17.5	F
*	52	06/20/92	55.682	-164.595	95	07	0.45	2.59	31	7.6	2.5	17.5	F
*	53	06/20/92	55.681	-164.005	93	10	0.50	2.89	31	7.2	2.5	17.5	F
*	54	06/20/92	55.349	-164.007	75	13	0.50	2.87	31	9.0	4.8	17.2	F
*	56	06/27/92	56.991	-165.217	71	06	0.50	2.70	31	6.6	-0.4	17.3	F
*	57	06/27/92	57.322	-165.235	66	10	0.50	2.76	31	6.7	0.1	16.6	F
*	58	06/27/92	57.652	-165.252	59	13	0.50	2.89	31	6.8	0.9	16.9	F
*	59	06/27/92	57.988	-165.248	48	19	0.50	2.80	10	6.0	3.3	16.2	F
*	60	06/28/92	58.321	-165.282	44	06	0.50	2.78	10	5.1	3.4	16.1	F
*	61	06/28/92	58.653	-165.298	38	09	0.50	2.72	10	5.5	3.1	15.2	F
*	62	06/28/92	58.988	-165.303	26	12	0.50	2.96	10	6.1	5.5	14.6	F
*	63	06/28/92	59.322	-165.320	16	15	0.50	2.91	20	7.2	6.7	12.8	F
*	64	06/28/92	59.681	-166.635	26	20	0.50	2.83	20	5.8	4.8	14.5	F
*	65	06/29/92	59.354	-166.601	26	06	0.50	2.82	20	4.7	4.4	14.7	F
*	66	06/29/92	59.015	-166.603	31	09	0.50	2.52	20	4.8	4.5	15.4	F
*	67	06/29/92	58.677	-166.565	38	12	0.50	2.78	20	4.7	3.4	15.2	F

Table A-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
*	68	06/29/92	58.343	-166.557	46	15	0.50	2.65	10	5.4	3.3	16.3	F
*	69	06/29/92	58.015	-166.519	59	18	0.50	2.76	31	5.9	0.8	17.0	F
*	70	06/29/92	57.679	-166.506	66	20	0.50	2.85	31	4.9	0.9	16.9	F
*	71	06/30/92	57.348	-166.493	70	06	0.50	2.89	31	5.1	1.2	16.8	F
*	72	06/30/92	56.994	-166.445	73	10	0.33	1.95	31	6.9		17.2	F
*	73	06/30/92	56.678	-166.442	84	15	0.40	2.19	31	7.6	-0.5	17.2	F
*	74	06/30/92	56.344	-166.425	102	19	0.25	1.24	31	8.0	3.6	17.8	F
*	75	07/02/92	56.009	-166.401	123	08	0.40	2.28	50	7.6	0.0	17.8	F
*	76	07/02/92	55.674	-166.382	126	11	0.50	2.95	50	7.3	3.9	18.4	F
*	77	07/02/92	55.349	-166.355	130	14	0.50	2.80	50	7.3	3.8	18.4	F
*	78	07/02/92	55.018	-166.332	141	16	0.33	1.85	50	7.5	4.0	17.9	F
	79	07/03/92	54.996	-166.919	155	07	0.50	2.83	50	7.3	4.0	18.5	F
	80	07/03/92	55.329	-166.960	139	09	0.50	3.02	50	7.2	3.9	17.5	F
	81	07/04/92	55.329	-167.551	146	09	0.50	2.89	50	7.2	4.0	18.6	F
*	82	07/04/92	55.658	-167.584	135	11	0.50	2.78	50	7.4	3.9	18.1	F
	83	07/04/92	55.650	-168.185	135	14	0.50	2.74	50	7.7	0.0	17.4	F
	84	07/04/92	55.986	-168.218	148	17	0.50	2.89	50	7.1	0.0	18.2	F
*	85	07/04/92	55.984	-167.622	134	20	0.50	2.85	50	7.6	3.8	18.7	F
*	86	07/05/92	56.320	-167.651	128	07	0.50	2.72	50	7.8	3.5	18.2	F
*	87	07/05/92	56.653	-167.671	104	10	0.25	1.50	31	7.6	0.3	18.8	F
*	88	07/05/92	56.988	-167.698	77	12	0.50	2.82	31	6.6	0.9	17.0	F
	89	07/05/92	56.985	-168.329	80	16	0.50	2.72	32	6.3	0.0	17.4	F
	90	07/05/92	57.321	-168.369	73	19	0.50	2.82	32	6.6	1.0	17.6	F
	91	07/06/92	57.654	-168.398	70	07	0.50	2.72	42	6.6	0.7	16.7	F
*	92	07/06/92	57.658	-167.767	68	10	0.50	2.93	31	6.2	0.9	17.0	F
*	93	07/06/92	57.987	-167.802	66	13	0.40	2.32	41	4.7	0.8	16.9	F
*	94	07/06/92	58.323	-167.837	59	16	0.33	1.87	41	5.5	2.5	17.1	F
*	95	07/06/92	58.655	-167.867	44	19	0.50	2.76	20	4.9	4.1	16.3	F
	96	07/07/92	59.019	-169.184	51	06	0.33	1.98	41	5.7	3.0	16.4	F
	97	07/07/92	59.003	-169.841	60	09	0.33	1.89	41	6.1	-0.7	17.3	F
*	98	07/07/92	58.680	-169.788	64	12	0.33	1.85	41	6.7	-0.7	16.6	F
*	99	07/07/92	58.346	-169.118	66	16	0.40	2.28	41	7.0	-0.5	17.3	F
*	100	07/07/92	58.011	-169.072	68	19	0.40	2.43	42	7.4	0.0	17.6	F

Table A-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
*	101	07/08/92	57.844	-169.379	64	06	0.40	2.32	42	6.4	-0.5	17.5	F
*	102	07/08/92	57.678	-169.037	66	09	0.33	1.85	42	7.1	-0.1	17.3	F
*	103	07/08/92	57.512	-169.367	70	11	0.33	1.89	42	6.8	-0.2	16.2	F
*	104	07/08/92	57.347	-168.988	68	14	0.33	1.78	42	7.4	0.2	16.9	F
*	105	07/08/92	57.182	-169.315	71	16	0.33	1.95	42	6.6	-0.4	17.2	F
*	106	07/08/92	57.012	-168.960	79	19	0.33	1.96	32	7.6	0.7	17.2	F
*	107	07/09/92	56.844	-169.300	79	07	0.33	2.00	32	5.7	0.6	17.2	F
*	108	07/09/92	56.681	-168.904	99	09	0.33	1.93	32	7.9	1.4	17.5	F
*	109	07/09/92	56.354	-168.864	124	12	0.33	2.00	50	7.6	3.7	17.7	F
*	110	07/09/92	56.329	-170.067	110	18	0.33	2.19	50	7.0	3.0	17.7	F
*	111	07/10/92	56.658	-170.118	97	07	0.33	2.11	42	5.1	2.4	17.5	F
*	112	07/10/92	56.816	-170.481	101	09	0.33	1.85	42	6.7	2.7	17.5	F
*	113	07/10/92	56.995	-170.164	66	12	0.33	1.87	42	4.9	3.9	16.9	F
*	114	07/10/92	57.126	-170.471	48	14	0.40	2.11	42	5.7	5.0	16.3	F
*	115	07/11/92	57.324	-170.219	53	07	0.50	2.91	42	7.0	4.3	16.3	F
*	116	07/11/92	57.490	-170.588	71	10	0.33	1.85	42	6.5	1.7	17.2	F
*	117	07/11/92	57.657	-170.277	71	14	0.33	1.91	42	6.7	0.5	17.2	F
*	118	07/11/92	57.826	-170.623	75	17	0.25	1.50	42	6.7	1.1	17.2	F
*	119	07/12/92	57.989	-170.338	73	07	0.50	2.67	42	6.7	0.1	17.2	F
*	120	07/12/92	58.321	-170.387	73	10	0.50	2.72	41	6.6	-1.0	17.2	F
*	121	07/12/92	58.657	-170.438	71	13	0.50	2.85	41	6.6	-1.2	17.2	F
*	122	07/12/92	58.989	-170.485	70	16	0.50	2.93	41	6.6	-1.2	16.9	F
*	123	07/12/92	59.322	-170.535	66	19	0.50	2.87	41	6.2	-1.1	16.9	F
*	124	07/13/92	59.654	-170.586	66	07	0.50	2.78	41	5.9	-1.2	16.9	F
*	125	07/13/92	59.988	-170.637	64	10	0.50	2.80	41	5.9	-0.9	16.9	F
*	126	07/13/92	60.322	-170.666	60	13	0.50	2.83	41	6.8	-1.4	16.9	F
*	127	07/13/92	60.013	-171.966	64	18	0.50	2.83	43	6.5	-1.4	16.9	F
*	128	07/13/92	59.848	-172.249	73	20	0.50	2.74	43	6.5	-1.5	17.2	F
*	129	07/14/92	59.683	-171.905	77	07	0.50	2.72	43	6.2	-1.5	17.2	F
*	130	07/14/92	59.343	-171.833	79	09	0.50	2.89	43	6.2	-1.5	17.2	F
*	131	07/14/92	59.011	-171.787	86	12	0.50	2.87	41	6.7	-1.3	17.2	F
*	132	07/14/92	58.676	-171.720	91	15	0.50	2.80	41	7.3	-0.2	17.5	F
	133	07/14/92	58.681	-172.369	101	18	0.50	2.67	61	7.4	0.9	17.5	F

Table A-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
*	134	07/23/92	56.982	-172.650	121	08	0.50	2.98	61	7.5	3.9	17.1	F
*	135	07/23/92	57.314	-172.715	115	10	0.50	2.65	61	6.8		17.7	F
*	136	07/23/92	57.652	-172.802	119	14	0.40	2.20	61	10.6		17.7	F
*	137	07/23/92	57.989	-172.877	108	17	0.33	2.00	61	8.9	2.4	17.1	F
*	138	07/23/92	58.324	-172.933	108	19	0.40	2.30	61	8.8	1.7	17.3	F
*	139	07/24/92	58.661	-173.006	112	07	0.33	1.95	61	8.3	2.0	17.3	F
*	140	07/24/92	58.992	-173.085	106	09	0.33	1.89	61	8.2	1.4	13.5	F
*	141	07/24/92	59.326	-173.151	99	12	0.33	1.98	43	8.2	0.2	18.1	F
*	142	07/24/92	59.490	-173.501	102	14	0.33	1.96	43	8.2	-0.4	18.1	F
*	143	07/24/92	59.658	-173.234	95	17	0.50	2.95	43	8.3	-1.1	18.1	F
*	144	07/24/92	59.824	-173.583	95	19	0.50	2.70	43	8.2	-1.0	18.3	F
*	145	07/25/92	59.988	-173.299	73	07	0.50	2.80	43	8.1		16.9	F
*	146	07/25/92	60.132	-173.567	73	10	0.40	2.28	43	7.8		16.9	F
*	147	07/25/92	60.312	-173.420	60	12	0.50	2.95	43	7.7		16.6	F
*	148	07/25/92	60.656	-173.468	64	15	0.50	2.85	41	8.1		16.9	F
	149	07/26/92	60.986	-171.483	59	07	0.50	2.87	41	8.7	-1.5	17.6	F
	150	07/26/92	61.009	-172.166	62	10	0.50	2.89	41	8.2	-1.4	17.9	F
	151	07/26/92	60.989	-172.817	64	13	0.50	2.85	41	7.6	-0.9	18.2	F
*	152	07/26/92	60.991	-173.500	73	16	0.50	2.85	41	8.0	-1.2	17.9	F
*	168	07/29/92	60.681	-176.199	119	18	0.50	2.78	61	8.7	0.8	17.1	F
*	169	07/30/92	60.681	-175.452	108	07	0.50	2.78	61	8.9	0.2	17.5	F
*	170	07/30/92	60.350	-175.382	110	10	0.50	2.83	61	9.0	0.8	18.0	F
*	171	07/30/92	60.345	-176.033	121	13	0.33	1.89	61	9.0	1.6	17.6	F
*	172	07/30/92	60.010	-175.933	128	16	0.33	1.95	61	9.3	1.6	17.3	F
*	173	07/30/92	60.012	-175.269	117	19	0.33	1.91	61	8.5	1.4	16.7	F
*	174	07/31/92	59.680	-175.120	124	08	0.33	1.91	61	9.1	1.8	17.9	F
*	175	07/31/92	59.342	-175.100	132	11	0.50	2.96	61	9.0	2.4	18.0	F
*	176	07/31/92	59.008	-175.002	128	14	0.33	2.00	61	9.1	2.2	17.9	F
*	177	07/31/92	58.674	-174.892	218	18	0.33	1.98	61	8.8	3.1	18.3	F
*	178	08/01/92	58.656	-176.201	143	07	0.50	2.89	61	8.6	2.9	18.8	F
*	179	08/01/92	58.998	-176.312	134	10	0.33	1.87	61	8.6	2.8	18.5	F
*	180	08/01/92	59.327	-176.384	135	13	0.40	2.24	61	8.9	2.1	17.9	F
*	181	08/01/92	59.658	-176.534	134	16	0.33	1.91	61	8.8	2.0	18.1	F

Table A-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
	182	08/02/92	59.992	-177.900	141	07	0.50	2.87	61	8.8	1.7	17.2	F
*	183	08/02/92	59.995	-177.217	137	11	0.50	2.96	61	9.0	1.9	17.5	F
*	184	08/02/92	60.323	-177.386	144	13	0.50	2.87	61	9.1	1.6	16.5	F
*	185	08/02/92	60.657	-177.503	146	16	0.50	2.87	61	8.8	1.5	17.4	F
	186	08/03/92	60.656	-178.198	161	08	0.50	2.83	61	8.5	2.0	17.4	F

Table A-2.--Haul data for stations sampled by the F/V Tracy Anne during the 1992 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	06/05/92	57.334	-158.405	29	09	0.50	2.67	10	4.7		14.6	F
*	2	06/05/92	57.671	-158.346	33	14	0.50	3.07	10	4.5		14.8	F
*	3	06/05/92	58.015	-158.310	31	17	0.50	3.24	10	4.7		15.6	M
*	4	06/06/92	58.350	-159.553	24	07	0.50	1.82	10	5.6	5.1	14.8	F
*	5	06/06/92	57.994	-159.604	40	10	0.50	3.22	10	4.9		14.8	F
*	6	06/06/92	57.659	-159.637	48	13	0.50	3.11	10	3.5		16.1	F
*	7	06/06/92	57.325	-159.666	55	16	0.50	3.17	10		2.6	16.8	F
*	8	06/06/92	56.989	-159.708	55	19	0.50	3.11	10	5.1	2.3	15.9	M
*	9	06/07/92	56.673	-159.747	37	06	0.50	3.30	10	4.4	3.8	13.5	M
*	10	06/07/92	56.326	-161.005	51	12	0.25	1.19	10	7.0	3.1	14.8	M
*	11	06/07/92	56.671	-160.987	66	15	0.50	3.24	31	6.7	2.6	16.0	F
*	12	06/07/92	57.007	-160.945	62	17	0.50	3.15	31	10.4	2.6	15.7	M
*	13	06/08/92	57.329	-160.947	59	07	0.50	2.89	31	5.4	2.6	16.8	F
*	14	06/08/92	57.669	-160.888	55	09	0.50	3.02	31	5.1	2.1	16.2	M
*	16	06/08/92	58.332	-160.758	18	15	0.50	2.70	10	7.7		14.8	F
*	17	06/09/92	58.330	-162.069	46	07	0.50	2.69	10	4.1	3.8	16.1	F
*	18	06/09/92	57.992	-162.115	37	09	0.50	2.63	10	3.3	2.8	15.1	M
*	19	06/09/92	57.660	-162.139	44	12	0.33	1.74	10	5.4	3.8	15.8	M
*	20	06/09/92	57.325	-162.150	48	15	0.33	1.98	10	6.3	3.9	17.2	M
*	21	06/09/92	56.990	-162.165	60	17	0.33	1.80	31	7.5	2.1	16.8	F
*	22	06/09/92	56.659	-162.181	73	20	0.33	1.80	31	7.4	1.3	17.3	F
*	23	06/11/92	55.334	-163.416	51	07	0.50	2.76	31	4.7	2.1	15.2	M
*	24	06/11/92	55.687	-163.404	80	10	0.50	2.67	31	7.6	2.3	17.3	F
*	25	06/11/92	55.993	-163.402	88	13	0.33	2.15	31	8.1	1.8	17.6	F
*	26	06/11/92	56.344	-163.398	84	16	0.50	2.83	31	7.8		17.3	F
*	27	06/11/92	56.662	-163.384	75	18	0.50	3.09	31	6.9	0.6	17.3	F
*	28	06/12/92	56.998	-163.384	64	07	0.50	2.82	31	5.6	0.7	16.8	F
*	29	06/12/92	57.328	-163.382	53	10	0.50	2.93	10	5.3	2.4	16.8	F
*	30	06/14/92	59.014	-163.356	18	14	0.50	2.80	10	5.3	4.4	14.0	M
*	31	06/14/92	58.673	-163.352	29	17	0.50	2.78	10	5.3	4.4	15.2	M
*	32	06/15/92	58.353	-163.363	35	07	0.50	2.61	10	4.6	3.9	15.2	F
*	34	06/15/92	57.996	-163.388	42	11	0.20	0.89	10	4.0	3.1	18.6	M

Table A-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
*	35	06/15/92	57.670	-163.373	44	13	0.50	3.00	10	4.5	3.5	16.5	M
*	36	06/18/92	57.009	-164.607	70	10	0.50	2.78	31	6.3		16.8	F
	37	06/20/92	54.780	-165.516	210	08	0.50	2.78	50	6.7		18.6	F
	38	06/20/92	54.684	-165.129	80	12	0.50	2.80	31	7.4		17.3	F
	39	06/20/92	54.996	-165.151	110	14	0.50	2.69	50	7.9	4.8	17.9	F
*	40	06/20/92	54.998	-165.760	128	17	0.50	2.72	50	7.8	4.1	18.1	F
*	41	06/21/92	55.332	-164.586	101	07	0.33	1.41	31		3.9	17.6	F
	42	06/21/92	55.332	-165.169	110	09	0.50	2.76	50	7.5	4.5	17.9	F
*	43	06/21/92	55.663	-165.163	108	12	0.50	2.91	31	8.6	4.2	17.9	F
*	44	06/21/92	55.993	-165.184	95	15	0.50	2.78	31	8.8	3.0	17.6	F
*	45	06/21/92	56.326	-165.202	86	17	0.33	1.80	31	8.3	0.5	17.3	F
*	46	06/21/92	56.660	-165.217	75	20	0.50	2.78	31	8.1	-0.9	17.3	F
*	47	06/22/92	56.674	-165.840	77	07	0.50	2.72	31	6.7	-0.3	17.3	F
*	48	06/22/92	56.337	-165.796	91	09	0.50	2.93	31	8.1	-0.7	17.6	F
*	49	06/22/92	56.010	-165.785	104	12	0.50	2.72	31	9.4	4.2	17.6	F
*	50	06/22/92	55.679	-165.799	117	14	0.50	2.80	50	8.9	4.2	17.9	F
*	51	06/22/92	55.340	-165.784	119	17	0.50	2.93	50	9.0	4.1	17.9	F
*	52	06/27/92	56.989	-165.851	71	07	0.50	2.54	31	6.6		17.6	M
*	53	06/27/92	57.309	-165.863	66	11	0.50	2.82	31		0.2	16.5	M
*	54	06/27/92	57.658	-165.883	62	15	0.50	2.91	31	6.4	0.2	17.3	M
*	55	06/27/92	57.985	-165.895	55	18	0.50	2.93	10	6.7	2.1	16.3	M
*	56	06/28/92	58.320	-165.917	42	07	0.50	2.78	10	5.3	3.2	16.1	F
*	57	06/28/92	58.657	-165.933	35	09	0.50	2.98	10	5.5	3.3	15.3	F
*	58	06/28/92	58.991	-165.936	27	12	0.50	2.87	20	5.8	5.0	15.2	F
*	59	06/28/92	59.325	-165.951	22	15	0.50	3.11	20	6.3	5.5	14.8	F
*	60	06/28/92	59.638	-165.972	22	17	0.45	2.41	20	8.0	7.4	14.8	F
	61	06/29/92	60.358	-167.309	27	07	0.50	2.80	20	3.7	3.2	14.8	F
*	62	06/29/92	59.681	-167.289	31	13	0.50	2.72	20	4.8	3.9	14.8	F
*	63	06/29/92	59.345	-167.270	29	16	0.50	2.72	20	5.2	4.5	15.3	M
*	64	06/29/92	59.014	-167.233	38	19	0.50	2.67	20	4.7	3.7	14.8	F
*	65	06/30/92	58.684	-167.219	42	07	0.50	2.95	20	4.0	3.4	16.1	F
*	66	06/30/92	58.341	-167.183	49	10	0.50	3.07	20	5.0	2.7	16.0	M
*	67	06/30/92	58.010	-167.166	62	13	0.50	2.91	31	4.9	1.0	16.8	F

Table A-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
*	68	06/30/92	57.682	-167.132	66	18	0.50	2.65	31		0.6	16.5	M
*	69	07/03/92	55.688	-166.968	134	07	0.50	2.52	50	7.8	3.8	17.8	M
*	70	07/03/92	55.993	-167.019	135	11	0.50	2.80	50	7.7	3.6	18.1	F
*	71	07/03/92	56.328	-167.021	113	15	0.50	2.59	50	7.8	3.2	17.9	F
*	72	07/03/92	56.660	-167.023	93	19	0.50	2.67	31	7.4	0.6	17.6	F
*	73	07/04/92	56.998	-167.039	73	09	0.50	2.56	31	6.2	1.1	17.3	F
*	74	07/04/92	57.327	-167.074	70	13	0.50	2.65	31	6.7	0.7	16.8	F
	75	07/04/92	57.330	-167.709	73	17	0.50	2.87	31	6.7	0.7	17.3	F
*	76	07/05/92	56.343	-168.254	152	07	0.50	2.65	50	3.8	3.8	18.5	F
*	77	07/05/92	56.651	-168.274	108	11	0.50	2.63	50	7.6	0.5	18.0	M
*	78	07/05/92	56.823	-168.583	99	14	0.33	2.30	32	7.3	0.0	17.6	F
*	79	07/05/92	57.155	-168.650	75	18	0.50	2.54	32	7.0	-0.1	19.7	M
*	80	07/06/92	57.493	-168.731	70	07	0.50	2.80	42	6.5	0.1	16.8	M
*	81	07/06/92	57.843	-168.724	70	11	0.50	2.59	42	6.7	0.7	16.6	M
*	82	07/06/92	57.992	-168.424	68	16	0.33	1.69	42		0.2	16.6	M
*	83	07/06/92	58.327	-168.432	64	20	0.33	2.00	41	6.3	1.5	17.8	M
*	84	07/07/92	58.668	-168.498	51	07	0.33	1.83	20		3.5	15.6	M
*	85	07/07/92	58.667	-169.157	60	10	0.25	1.26	41	6.3	1.6	16.3	M
*	86	07/07/92	58.343	-169.743	70	15	0.33	1.87	41		-0.7	18.0	M
*	87	07/07/92	57.999	-169.707	70	18	0.33	1.83	42	7.7	-0.7	18.6	M
*	88	07/08/92	57.832	-169.988	71	07	0.33	1.89	42	6.8	-0.5	17.2	M
*	89	07/08/92	57.675	-169.674	71	09	0.33	2.09	42	6.3	-0.5	16.6	M
*	90	07/08/92	57.501	-169.974	66	11	0.25	1.46	42	6.5	0.7	15.5	M
*	91	07/08/92	57.341	-169.606	62	14	0.33	2.09	42	6.8	0.7	16.8	F
*	92	07/08/92	57.179	-169.882	46	17	0.33	2.02	42	6.8	4.5	15.4	M
*	93	07/09/92	56.999	-169.554	59	06	0.33	1.78	42	5.2	0.7	15.8	M
*	94	07/09/92	56.833	-169.862	71	09	0.33	1.72	42	5.8	2.4	16.5	M
*	95	07/09/92	56.677	-169.532	79	12	0.33	1.76	32		2.8	17.3	F
*	96	07/09/92	56.350	-169.506	137	17	0.33	1.76	50	7.3	3.8	17.8	M
*	97	07/10/92	56.340	-170.690	121	07	0.33	2.04	61	7.3	4.2	17.9	F
*	98	07/10/92	56.660	-170.730	113	09	0.33	1.82	61	7.1	5.3	17.9	F
*	99	07/10/92	56.997	-170.776	95	12	0.33	1.95	42	6.9	2.6	17.6	F
*	100	07/10/92	57.346	-170.847	82	14	0.33	2.07	42	6.4	1.4	17.0	M
*	101	07/11/92	57.663	-170.890	84	07	0.33	1.80	42	7.2	1.5	17.3	F

Table A-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
*	102	07/11/92	57.994	-170.949	86	10	0.33	1.87	42	6.7	1.0	17.3	F
*	103	07/11/92	58.340	-171.039	84	14	0.33	1.70	41	6.8	-0.4	17.3	F
*	104	07/11/92	58.660	-171.060	82	18	0.33	1.82	41	6.7	-1.2	17.3	F
*	105	07/12/92	58.990	-171.099	77	07	0.50	2.69	41	5.9	-1.5	17.3	F
*	106	07/12/92	59.334	-171.176	75	10	0.50	2.82	41	6.1	-1.5	17.3	F
*	107	07/12/92	59.658	-171.210	71	13	0.50	2.83	41	6.6	-1.6	17.3	F
*	108	07/12/92	59.985	-171.281	70	18	0.50	2.65	41	6.7	-1.5	16.7	F
*	109	07/13/92	60.325	-171.358	66	07	0.50	2.82	41	6.8	-1.5	16.8	F
	110	07/13/92	60.329	-172.045	59	10	0.50	2.61	43	6.4	-1.1	16.8	F
	111	07/13/92	60.164	-172.349	57	13	0.50	2.59	43	5.6	1.2	16.8	F
*	112	07/13/92	59.999	-172.636	66	15	0.50	2.70	43	7.2	-1.3	16.8	F
*	113	07/13/92	60.169	-173.023	59	18	0.50	2.70	43	6.5	-0.7	16.8	F
*	114	07/14/92	59.803	-172.860	80	07	0.30	1.63	43	7.2		17.3	F
*	115	07/14/92	59.677	-172.576	86	09	0.50	2.87	43	6.7	-1.4	17.3	F
*	116	07/14/92	59.500	-172.882	93	11	0.50	3.00	43	6.7	-1.3	17.6	F
*	117	07/14/92	59.336	-172.501	86	14	0.50	2.82	43	7.5	-1.1	17.3	F
*	118	07/14/92	59.003	-172.450	99	17	0.50	2.57	41		-0.1	17.6	F
	119	07/20/92	56.664	-171.353	119	07	0.50	2.91	61	7.6		17.9	F
	121	07/20/92	56.994	-171.390	110	12	0.50	2.85	61	8.1	3.3	17.9	F
	122	07/20/92	57.320	-171.467	101	15	0.50	2.89	41	8.1	3.3	17.6	F
	123	07/20/92	57.652	-171.532	99	18	0.50	2.83	41	7.8	2.3	17.6	F
	124	07/21/92	57.989	-171.605	97	07	0.50	2.74	41	7.9	2.7	17.6	F
	125	07/21/92	58.324	-171.649	95	10	0.33	1.83	41	8.0	1.6	17.6	F
*	126	07/21/92	58.345	-172.305	102	13	0.50	2.78	61	8.1	1.1	17.6	F
*	127	07/21/92	58.008	-172.234	106	16	0.50	2.95	61	8.4	3.0	17.9	F
*	128	07/22/92	57.670	-172.171	108	07	0.50	2.98	61	8.3		17.9	F
*	129	07/22/92	57.340	-172.099	108	10	0.33	1.37	61	7.8		17.9	F
*	130	07/22/92	57.008	-172.033	115	12	0.50	2.96	61	7.7	4.1	17.9	F
*	131	07/22/92	56.676	-171.968	124	15	0.50	2.80	61	8.9	3.9	18.1	F
	132	07/22/92	56.653	-172.566	137	18	0.50	3.00	61	8.5	3.8	18.1	F
*	133	07/23/92	56.989	-173.253	141	07	0.50	2.87	61	8.5	3.4	18.1	F
*	134	07/23/92	57.331	-173.325	119	10	0.33	2.04	61	9.2	3.5	17.9	F
*	135	07/23/92	57.674	-173.386	146	13	0.50	3.15	61		3.3	18.3	F

Table A-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
*	136	07/23/92	57.995	-173.486	117	15	0.50	2.87	61	9.6	3.3	17.9	F
*	137	07/23/92	58.321	-173.567	115	18	0.50	2.93	61	9.1	3.3	17.9	F
*	138	07/24/92	58.656	-173.635	126	07	0.16	0.89	61	8.5	3.2	18.1	F
*	139	07/24/92	58.992	-173.717	117	10	0.16	0.91	61	8.3	-2.0	17.9	F
*	140	07/24/92	59.325	-173.798	110	12	0.50	2.95	62	8.3	0.9	17.9	F
*	141	07/24/92	59.658	-173.867	102	14	0.50	2.96	62	8.5	-0.1	17.6	F
*	142	07/24/92	59.822	-174.234	108	17	0.50	2.96	62	8.4	-0.1	17.9	F
*	143	07/25/92	59.988	-173.953	97	07	0.50	2.85	43	7.9	-0.9	17.6	F
*	144	07/25/92	60.156	-174.353	101	09	0.50	2.89	43	7.9	-0.7	17.6	F
*	145	07/25/92	60.321	-174.065	90	12	0.50	3.00	43		-1.3	17.6	F
*	146	07/25/92	60.656	-174.133	86	14	0.50	3.17	41	7.9	-1.2	17.3	F
	147	07/26/92	60.669	-171.414	62	07	0.50	2.72	41	8.5	-1.2	16.8	F
	148	07/26/92	60.664	-172.066	60	10	0.50	3.24	41	8.5	-1.5	16.8	F
*	149	07/26/92	60.667	-172.740	42	12	0.50	3.00	41	6.6	1.6	16.6	F
*	150	07/26/92	60.989	-174.184	84	18	0.50	2.98	41	8.4	-1.5	17.3	F
*	154	07/27/92	60.675	-174.817	97	15	0.50	3.00	41	8.9	-0.2	17.6	F
*	155	07/27/92	60.345	-174.717	102	18	0.50	2.89	62	9.3	-0.2	17.6	F
*	156	07/27/92	60.009	-174.600	110	20	0.50	2.70	62	8.9	0.4	17.9	F
*	157	07/28/92	59.686	-174.450	115	07	0.50	3.11	62	8.8	0.7	17.9	F
*	158	07/28/92	59.344	-174.447	119	10	0.50	3.11	62	8.8	1.8	17.9	F
*	159	07/28/92	59.015	-174.370	126	12	0.50	2.76	61	9.0	1.8	18.1	F
*	160	07/28/92	58.676	-174.266	154	15	0.50	2.69	61	9.3	3.2	18.3	F
	161	07/28/92	58.348	-174.322	183	18	0.50	3.48	61	9.6	3.6	18.5	F
*	162	07/31/92	59.679	-175.867	137	08	0.50	2.82	61	9.2	2.4	18.1	F
*	163	07/31/92	59.347	-175.753	137	11	0.50	2.83	61	9.1	2.3	18.1	F
*	164	07/31/92	59.009	-175.735	134	13	0.50	3.02	61	8.8	2.8	18.1	F
*	165	07/31/92	58.682	-175.554	134	18	0.50	2.69	61		3.3	18.1	F
*	166	08/01/92	58.652	-176.836	141	08	0.50	2.93	61	8.8	6.0	18.1	F
	167	08/01/92	58.986	-177.599	135	11	0.50	3.09	61	9.1	2.9	18.1	F
*	168	08/01/92	58.990	-176.951	135	15	0.50	3.04	61	9.6	3.1	18.1	F
*	169	08/01/92	59.325	-177.068	150	18	0.50	2.98	61	9.0	2.6	18.3	F
*	170	08/02/92	59.657	-177.150	179	08	0.50	2.85	61		2.1	18.4	F
*	171	08/02/92	59.990	-176.715	141	11	0.50	3.11	61	9.0	1.9	18.1	F
*	172	08/02/92	60.323	-176.716	135	14	0.50	2.98	61	9.2	1.8	18.1	F
*	173	08/02/92	60.653	-176.801	128	16	0.50	2.87	61	9.1	1.0	18.1	F

APPENDIX B

List of Species Encountered

Appendix B contains a listing of all fish and invertebrate species taken during the 1992 eastern Bering Sea bottom trawl survey.

List of Tables

Table B-1.--Fish species encountered during the 1992 U.S. eastern Bering Sea bottom trawl survey.

Common name	Scientific name
Family Squalidae	
Pacific sleeper shark	Somniosus pacificus
Family Rajidae	
Bering skate	Bathyraja interrupta
Alaska skate	Bathyraja parmifera
Skate unident.	Rajidae unident.
Family Clupeidae	
Pacific herring	Clupea pallasii
Family Salmonidae	
Sockeye salmon	Onchorynchus nerka
Family Osmeridae	
Capelin	Mallotus villosus
Smelt unident	Osmeridae
Rainbow smelt	Osmerus mordax
Eulachon	Thaleichthys pacificus
Family Oneirodidae	
Oneirodes unident.	Oneirodes sp.
Family Gadidae	
Arctic cod	Boreogadus saida
Saffron cod	Eleginus gracilis
Pacific cod	Gadus macrocephalus
Walleye pollock	Theragra chalcogramma
Family Zoarcidae	
Shortfin eelpout	Lycodes brevipes
Wattled eelpout	Lycodes palearis
Marbled eelpout	Lycodes raridens
Lycodes unident.	Lycodes sp.
Polar eelpout	Lycodes turneri
Family Trichodontidae	
Pacific sandfish	Trichodon trichodon

Table B-1.--Continued.

Common name	Scientific name
Family Stichaeidae	
Pighead prickleback	Acantholumpenus mackayi
Slender eelblenny	Lumpenus fabricii
Daubed shanny	Lumpenus maculatus
Snake prickleback	Lumpenus sagitta
Lumpenus unident.	Lumpenus sp.
Whitebarred prickleback	Poroclinus rothrocki
Prickleback unident.	Stichaeidae
Family Bathymasteridae	
Searcher	Bathymaster signatus
Ronquil unident.	Bathymasteridae
Northern ronquil	Ronquilus jordani
Family Anarhichadidae	
Bering wolffish	Anarhichas orientalis
Family Zaproridae	
Prowfish	Zaprora silenus
Family Ammodytidae	
Pacific sand lance	Ammodytes hexapterus
Family Scorpaenidae	
Pacific ocean perch	Sebastes alutus
Dusky rockfish	Sebastes ciliatus
Northern rockfish	Sebastes polyspinis
Rockfish unident.	Sebastes sp.
Family Anaplopomatidae	
Sablefish	Anoplopoma fimbria
Family Hexagrammidae	
Greenling unident.	Hexagrammidae
Kelp greenling	Hexagrammos decagrammus
Hexagrammos unident.	Hexagrammos sp.
Whitespotted greenling	Hexagrammos stelleri
Atka mackerel	Pleurogrammus monopterygius

Table B-1.--Continued.

Common name	Scientific name
Family Cottidae	
Pacific hookear sculpin	Artediellus pacificus
Artediellus unident.	Artediellus sp.
Sculpin unident.	Cottidae
Spinyhead sculpin	Dasycottus setiger
Antlered sculpin	Enophrys diceraus
Armorhead sculpin	Gymnocanthus galeatus
Threaded sculpin	Gymnocanthus pistilliger
Gymnocanthus unident.	Gymnocanthus sp.
Red Irish Lord	Hemilepidotus hemilepidotus
Yellow Irish Lord	Hemilepidotus jordani
Butterfly sculpin	Hemilepidotus papilio
Bigmouth sculpin	Hemitripterus bolini
Icelus unident.	Icelus sp.
Spatulate sculpin	Icelus spatula
Thorny sculpin	Icelus spiniger
Malacocottus unident.	Malacocottus sp.
Darkfin sculpin	Malacocottus zonurus
Plain Sculpin	Myoxocephalus jaok
Great Sculpin	Myoxocephalus polyacanthocephalus
Myoxocephalus unident.	Myoxocephalus sp.
Eyeshade sculpin	Nautichthys oculofasciatus
Ribbed sculpin	Triglops pingeli
Speckled sculpin	Triglops scepticus
Triglops unident.	Triglops sp.
Family Agonidae	
Poacher unident.	Agonidae
Sturgeon poacher	Agonus acipenserinus
Aleutian alligatorfish	Aspidophoroides bartoni
Arctic alligatorfish	Aspidophoroides olriki
Bering poacher	Occella dodecaedron
Sawback poacher	Sarritor frenatus
Family Cyclopteridae	
Smooth lumpsucker	Aptocyclus ventricosus
Peachskin snailfish	Careproctus scottae
Snailfish unident.	Cyclopteridae (Liparidinae)

Table B-1.--Continued.

Common name	Scientific name
Pacific spiny lumpsucker	Eumicrotremus orbis
Liparis unident.	Liparis sp.
Family Pleuronectidae	
Kamchatka flounder	Atheresthes evermanni
Arrowtooth flounder	Atheresthes stomias
Rex Sole	Glyptocephalus zachirus
Flathead sole	Hippoglossoides elassodon
Bering flounder	Hippoglossoides robustus
Pacific halibut	Hippoglossus stenolepis
Butter sole	Isopsetta isolepis
Rock sole	Lepidopsetta bilineatus
Dover sole	Microstomus pacificus
Starry flounder	Platichthys stellatus
Yellowfin sole	Pleuronectes aspera
Longhead dab	Pleuronectes proboscidea
Alaska plaice	Pleuronectes quadrituberculatus
Sakhalin sole	Pleuronectus sakhalinensis
Greenland turbot	Reinhardtius hippoglossoides

Table B-2.--Invertebrate species encountered during the 1992 U.S. eastern Bering Sea bottom trawl survey.

Common name	Scientific name
Phylum Porifera	
Sponge unident.	Porifera
Phylum Coelenterata	
Sea anemone unident.	Actinaria (order)
Sea raspberry	Eunephthya rubiformis
Hydractinia unident.	Hydractinia sp.
Hydroid unident.	Hydrozoa (class)
Metridium senile	Metridium senile
Sea Pen unident.	Pennatulacea (order)
Jellyfish unident.	Scyphozoa (class)
Phylum Mollusca	
Gastropods	
Keeled aforia	Aforia circinata
Alaska volute	Artomelon stearnsii
Northern beringius	Beringius beringii
Beringius unident.	Beringius sp.
Angled whelk	Buccinum angulosum
Sinuous whelk	Buccinum plectrum
Polar whelk	Buccinum polare
Ladder (silky) whelk	Buccinum scalariforme
Buccinum unident.	Buccinum sp.
Colus unident.	Colus sp.
Thick-ribbed whelk	Colus spitzbergensis
Oregon triton	Fusitriton oregonensis
Fusitriton unident.	Fusitriton sp.
Snail unident.	Gastropoda (phylum)
Natica unident.	Natica sp.
Little neptune	Neptunea borealis
Northern neptune	Neptunea heros
Lyre whelk	Neptunea lyrata
Helmet whelk	Neptunea magma
Pribilof whelk	Neptunea pribiloffensis
Neptunea unident.	Neptunea sp.
Fat whelk	Neptunea ventricosa
Nudibranch unident.	Onchidoridae (family)

Table B-2.--Continued.

Common name	Scientific name
Gastropods (cont'd)	
Kroyer's plicifus	Plicifusus kroyeri
Plicifusus unident.	Plicifusus sp.
Polinices unident.	Polinices sp.
Snail (gastropod) eggs	Snail (gastropod) eggs
Rosy tritonia	Tritonia diomedea
Warped whelk	Volutopsius deformis
Threaded whelk	Volutpsius filosus
Fragile whelk	Volutopsius fragilis
Large melon snail	Volutopsius melonis
Tulip whelk	Volutopsius middendorffii
Volutopsius unident.	Volutopsius sp.
Bivalves	
Bivalve unident.	Bivalvia (class)
Cockle unident.	Cardiidae (family)
Chlamys unident.	Chlamys sp.
Hairy cockle	Clinocardium ciliatum
Clinocardium unident.	Clinocardium sp.
Macoma unident.	Macoma sp.
Artic surfclam	Mactromeris polynyma
Mactromeris unident.	Mactromeris sp.
Mussel unident.	Mytilidae (family)
Blue mussel	Mytilus edulis
Weathervane scallop	Patinopectin caurinus
Scallop unident.	Pectinidae (family)
Pododesmus unident	Pododesmus sp.
Greenland cockle	Serripes groenlandicus
Serripes unident	Serripes sp.
Alaska razor clam	Siliqua alta
Cephalopods	
Octopus unident.	Octopodidae (family)
Squid unident.	Teuthoidea (order)
Phylum Annelida	
Sea mouse unident.	Aphroditidae (family)
Depressed scale worm	Eunoe depressa
Giant scale worm	Eunoe nodosa

Table B-2.--Continued.

Common name	Scientific name
Phylum Annelida (cont'd)	
Eunoe unident.	Eunoe sp.
Scale worm unident.	Polynoidae (family)
Leech unident.	Hirudinea (class)
Phylum Arthropoda	
Giant barnacle	Balanus evermanni
Barnacle unident.	Thoracica (order)
Crab	
Dungeness crab	Cancer magister
Oregon rock crab	Cancer oregonensis
Broad snow crab	Chionoecetes bairdi
Tanner crab	Chionoecetes hybrid
Narrow snow crab	Chionoecetes opilio
Tanner crab unident.	Chionoecetes sp.
Horsehair crab	Erimacrus isenbeckii
Circumboreal toad crab	Hyas coarctatus
North Pacific toad crab	Hyas lyratus
Hyas unident.	Hyas sp.
Longhorned decorator crab	Oregonia gracilis
Hermit crab unident.	Paguridae (family)
Alaskan hermit crab	Pagurus ochotensis
Red king crab	Paralithodes camtschatica
Blue king crab	Paralithodes platypus
Helmet crab	Telmessus cheiragonus
Shrimp	
Artic argid	Argis dentata
Northern argid	Argis lar
Argis unident.	Argis sp.
Crangon unident.	Crangon sp.
Lebbeus unident.	Lebbeus sp.
Sidestripe shrimp	Pandalopsis dispar
Northern (pink) shrimp	Pandalus borealis
Humpy shrimp	Pandalus goniurus
Pandalus unident.	Pandalus sp.
Sclerocrangon unident.	Sclerocrangon sp.
Spirontocaris unident.	Spirontocaris sp.

Table B-2.--Continued.

Common name	Scientific name
Phylum Sipuncula	
Sipunculid worm unident.	Sipuncula (phylum)
Phylum Bryozoa	
Bryozoan unident.	Bryozoa (phylum)
Feathery bryozoan	Eucratea loricata
Leafy bryozoan	Flustra serrulata
Phylum Echinodermata	
Holothuroidea	
Sea football	Cucumaria fallax
Cucumaria unident.	Cucumaria sp.
Sea cucumber unident	Holothuroidea (class)
Redscaled sea cucumber	Psolus sp.
Echinoidea	
Sand dollar unident.	Clypeasteroida (order)
Sea urchin unident.	Sea urchin unident.
Green sea urchin	Strongylocentrotus droebachiensis
Asteroidea	
Purple-orange sea star	Asterias amurensis
Asterias unident.	Asterias sp.
Starfish unident.	Asteroidea (subclass)
Red bat star	Ceramaster japonicus
Orange bat star	Ceramaster patagonicus
Bat star unident.	Ceramaster sp.
Rose sea star	Crossaster papposus
Common mud star	Ctenodiscus crispatus
Ctenodiscus unident.	Ctenodiscus sp.
Northern sea star	Diplopteraster borealis
Pincushion sea star	Diplopteraster multipes
Giant sea star	Evasterias echinosoma
Henricia unident.	Henricia sp.
Tumid sea star	Henricia tumida
Arctic sea star	Leptasterias arctica
Knobby six-rayed sea star	Leptasterias polaris

Table B-2.--Continued.

Common name	Scientific name
Asteroidea (cont'd)	
Leptasterias unident.	Leptasterias sp.
Blackspined sea star	Lethasterias nanimensis
Scarlet sea star	Pseudarchaster parelii
Obscure sea star	Pteraster obscurus
Pteraster unident.	Pteraster sp.
Cushion sea star	Pteraster tesselatus
Solaster unident.	Solaster sp.
Ophiuroidea	
Basket star	Gorgonocephalus caryi
Notched brittlestar	Ophiura sarsi
Brittlestarfish unident.	Ophiuroidea (subclass)
Phylum Chordata	
Aplidium unident.	Aplidium sp.
Tunicate unident.	Ascidian unident.
Sea onion	Boltenia ovifera
Sea onion unident.	Boltenia sp.
Compound ascidian unident.	Compound ascidian unident.
Sea peach	Halocynthia aurantium
Sea grape	Molgula grifithsii
Sea potato	Styela rustica

APPENDIX C

Rank Order of Relative Abundance of Fish and Invertebrates

Appendix C ranks all fish and invertebrates caught during the 1992 eastern Bering Sea bottom trawl survey by descending CPUE (kg/ha).

Table C-1.--Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1992 eastern Bering Sea bottom trawl survey.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	97.86823	134.961	75.09839	120.63806	0.31226999	0.31226999	THERAGRA CHALCOGRAMMA
2	10210	45.16245	19.891	36.42104	53.90386	0.14410099	0.45637101	PLEURONECTES ASPER
3	10260	35.75454	10.345	29.45038	42.05871	0.11408300	0.57045400	PLEURONECTES BILINEATUS
4	81742	17.58892	5.832	12.85545	22.32239	0.05612100	0.62657601	ASTERIAS AMURENSIS
5	10130	13.67243	2.248	10.73354	16.61133	0.04362500	0.67020100	HIPPOGLOSSOIDES ELASSODON
6	21720	11.93847	0.940	10.03832	13.83862	0.03809200	0.70829302	GADUS MACROCEPHALUS
7	10285	11.42392	1.553	8.98127	13.86658	0.03645100	0.74474400	PLEURONECTES QUADRITUBERCULATUS
8	68580	11.01930	1.212	8.86126	13.17733	0.03516000	0.77990299	CHIONOECETES OPILIO
9	69010	8.52568	0.616	6.98741	10.06396	0.02720300	0.80710602	PAGURIDAE
10	400	7.87227	0.655	6.28579	9.45875	0.02511800	0.83222401	RAJIDAE UNIDENT.
11	10110	7.63770	1.381	5.33478	9.94062	0.02437000	0.85659403	ATHERESTHES STOMIAS
12	68560	3.30142	0.341	2.15756	4.44528	0.01053400	0.86712801	CHIONOECETES BAIRDI
13	40500	2.35579	0.063	1.86287	2.84870	0.00751700	0.87464499	SCYPHOZOA (CLASS)
14	21370	2.31676	0.134	1.60011	3.03341	0.00739200	0.88203698	MYOXOCEPHALUS POLYACANTHOCEPHALUS
15	10120	2.17885	0.039	1.78966	2.56804	0.00695200	0.88898897	HIPPOGLOSSUS STENOLEPIS
16	71820	1.95813	0.101	1.33589	2.58038	0.00624800	0.89523703	NEPTUNEA PRIBILOFFENSIS
17	83010	1.91595	0.173	1.10117	2.73074	0.00611300	0.90135002	BASKETSTARFISH UNIDENT.
18	80000	1.79550	0.612	0.26260	3.32839	0.00572900	0.90707898	STARFISH UNIDENT.
19	98000	1.76717	0.281	0.72754	2.80680	0.00563900	0.91271800	ASCIDIAN UNIDENT.
20	43000	1.74019	0.246	0.76823	2.71215	0.00555200	0.91826999	ACTINIARIA (ORDER)
21	98082	1.43754	0.235	0.48759	2.38748	0.00458700	0.92285699	STYELA RUSTICA
22	21371	1.31991	0.034	0.95794	1.68188	0.00421100	0.92706800	MYOXOCEPHALUS JAOK
23	91000	1.25296	0.263	0.24857	2.25735	0.00399800	0.93106598	PORIFERA
24	10112	1.03758	0.019	0.76599	1.30916	0.00331100	0.93437701	ATHERESTHES EVERMANNI
25	71884	1.00459	0.038	0.62077	1.38841	0.00320500	0.93758202	NEPTUNEA HEROS
26	69322	0.99272	0.047	0.56762	1.41782	0.00316700	0.94075000	PARALITHODES CAMTSCHATICA
27	71882	0.96238	0.028	0.63280	1.29197	0.00307100	0.94382000	NEPTUNEA VENTRICOSA
28	83000	0.78886	0.103	0.16059	1.41712	0.00251700	0.94633698	OPHIUROID UNIDENT.
29	71870	0.77194	0.027	0.45236	1.09152	0.00246300	0.94880003	NEPTUNEA LYRATA
30	83020	0.68947	0.015	0.44826	0.93068	0.00220000	0.95099998	GORGONOCEPHALUS CARYI
31	68577	0.68620	0.035	0.31981	1.05260	0.00218900	0.95319003	HYAS COARCTATUS
32	80590	0.64275	0.017	0.38774	0.89775	0.00205100	0.95524102	LEPTASTERIAS POLARIS
33	71800	0.58031	0.042	0.17805	0.98257	0.00185200	0.95709199	NEPTUNEA SP.
34	10220	0.57074	0.020	0.29317	0.84832	0.00182100	0.95891303	PLATICHTHYS STELLATUS
35	20040	0.55753	0.005	0.41298	0.70207	0.00177900	0.96069199	PODOTHECUS ACIPENSERINUS
36	69323	0.52851	0.021	0.24678	0.81024	0.00168600	0.96237898	PARALITHODES PLATYPUS
37	21347	0.51331	0.015	0.27224	0.75438	0.00163800	0.96401602	HEMILEPIDOTUS JORDANI
38	10115	0.50740	0.016	0.25754	0.75726	0.00161900	0.96563500	REINHARDTIUS HIPPOGLOSSOIDES
39	98200	0.45612	0.071	0.00000	0.97952	0.00145500	0.96709102	HALOCYNTHIA SP.
40	21348	0.45417	0.056	0.00000	0.91947	0.00144900	0.96854001	HEMILEPIDOTUS PAPILIO
41	71500	0.40761	0.005	0.26936	0.54587	0.00130100	0.96984100	GASTROPOD UNIDENT.
42	21420	0.39964	0.008	0.22530	0.57398	0.00127500	0.97111601	HEMITRIPTERUS BOLINI
43	81779	0.39895	0.024	0.09449	0.70342	0.00127300	0.97238898	CTENODISCUS SP.
44	81780	0.39419	0.043	0.00000	0.79997	0.00125800	0.97364599	CTENODISCUS CRISPATUS

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
45	471	0.39218	0.008	0.21536	0.56899	0.00125100	0.97489798	BATHYRAJA PARMIFERA
46	10140	0.36443	0.006	0.21810	0.51076	0.00116300	0.97605997	HIPPOGLOSSOIDES ROBUSTUS
47	24191	0.31973	0.004	0.19574	0.44373	0.00102000	0.97708100	LYCODES BREVIPES
48	30060	0.31289	0.096	0.00000	0.92062	0.00099800	0.97807902	SEBASTES ALUTUS
49	10200	0.28345	0.005	0.13892	0.42799	0.00090400	0.97898299	GLYPTOCEPHALUS ZACHIRUS
50	72500	0.28322	0.004	0.15914	0.40731	0.00090400	0.97988701	FUSITRITON OREGONENSIS
51	24185	0.28176	0.002	0.20179	0.36174	0.00089900	0.98078603	LYCODES PALEARIS
52	21313	0.28079	0.027	0.00000	0.60090	0.00089600	0.98168200	GYMNOCANTHUS SP.
53	71753	0.26392	0.021	0.00000	0.54926	0.00084200	0.98252398	PYRULOFUSUS DEFORMIS
54	98100	0.25243	0.004	0.13291	0.37194	0.00080500	0.98333001	BOLTENIA SP.
55	83320	0.23902	0.018	0.00000	0.50305	0.00076300	0.98409200	OPHIURA SARSI
56	20720	0.22669	0.010	0.03357	0.41981	0.00072300	0.98481601	BATHYMASTER SIGNATUS
57	69000	0.21678	0.013	0.00000	0.44049	0.00069200	0.98550701	ANOMURA
58	66031	0.21396	0.005	0.06968	0.35824	0.00068300	0.98619002	PANDALUS BOREALIS
59	21110	0.18884	0.007	0.02278	0.35490	0.00060300	0.98679203	CLUPEA PALLASI
60	10211	0.18868	0.001	0.11651	0.26085	0.00060200	0.98739398	LIMANDA PROBOSCIDEA
61	69520	0.16248	0.002	0.07889	0.24606	0.00051800	0.98791301	HYAS SP.
62	80200	0.13229	0.001	0.06400	0.20058	0.00042200	0.98833501	LETHASTERIAS NANIMENSIS
63	98310	0.12468	0.008	0.00000	0.29992	0.00039800	0.98873299	APLIDIUM SP.
64	68590	0.12394	0.001	0.07816	0.16972	0.00039500	0.98912799	CHIONOECETES HYBRID
65	82500	0.11709	0.005	0.00000	0.25527	0.00037400	0.98950201	SEA URCHIN UNIDENT.
66	78010	0.11666	0.003	0.01757	0.21574	0.00037200	0.98987401	OCTOPUS UNIDENT.
67	68541	0.11291	0.013	0.00000	0.33421	0.00036000	0.99023402	CHIONOECETES SP.
68	23041	0.11235	0.001	0.06107	0.16363	0.00035800	0.99059302	MALLOTUS VILLOSUS
69	72755	0.11162	0.000	0.06973	0.15352	0.00035600	0.99094898	BUCCINUM POLARE
70	72752	0.10563	0.000	0.06971	0.14155	0.00033700	0.99128598	BUCCINUM SCALARIFORME
71	80594	0.10498	0.001	0.03255	0.17740	0.00033500	0.99162102	LEPTASTERIAS ARCTICA
72	41201	0.10193	0.001	0.04693	0.15693	0.00032500	0.99194598	GERSEMIA SP.
73	72751	0.09756	0.004	0.00000	0.22430	0.00031100	0.99225700	BUCCINUM PLECTRUM
74	72743	0.08575	0.000	0.05491	0.11659	0.00027400	0.99253100	BUCCINUM ANGULOSUM
75	85200	0.08532	0.003	0.00000	0.19919	0.00027200	0.99280298	CUCUMARIA SP.
76	21375	0.08206	0.003	0.00000	0.18457	0.00026200	0.99306500	MYOXOCEPHALUS SP.
77	30420	0.07299	0.005	0.00000	0.21605	0.00023300	0.99329799	SEBASTES POLYSPINIS
78	80020	0.07220	0.002	0.00000	0.15990	0.00023000	0.99352801	EVASTERIAS ECHINOSOMA
79	21390	0.06816	0.000	0.03764	0.09867	0.00021700	0.99374598	DASYCOTTUS SETIGER
80	21446	0.06742	0.000	0.04388	0.09095	0.00021500	0.99396098	ICELUS SP.
81	21592	0.06268	0.002	0.00000	0.14696	0.00020000	0.99416101	TRICHODON TRICHODON
82	23010	0.05985	0.001	0.00988	0.10982	0.00019100	0.99435198	THALEICHTHYS PACIFICUS
83	21316	0.05880	0.001	0.00000	0.11818	0.00018800	0.99453998	GYMNOCANTHUS GALEATUS
84	71001	0.05848	0.000	0.03227	0.08470	0.00018700	0.99472600	SNAIL (GASTROPOD) EGGS
85	24184	0.05675	0.000	0.02278	0.09072	0.00018100	0.99490702	LYCODES RARIDENS
86	68578	0.05629	0.000	0.02781	0.08477	0.00018000	0.99508703	HYAS LYRATUS
87	69400	0.05509	0.000	0.02764	0.08254	0.00017600	0.99526298	ERIMACRUS ISENBECKII
88	72740	0.05348	0.000	0.01292	0.09404	0.00017100	0.99543297	BUCCINUM SP.

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
89	320	0.05114	0.001	0.00000	0.12465	0.00016300	0.99559599	SOMNIOSUS PACIFICUS
90	21725	0.05092	0.000	0.02576	0.07609	0.00016200	0.99575901	BOREOGADUS SAIDA
91	22200	0.05086	0.000	0.02757	0.07415	0.00016200	0.99592102	CYCLOPTERIDAE (LIPARIDINAE)
92	71750	0.05038	0.001	0.00509	0.09567	0.00016100	0.99608201	VOLUTOPSIUS SP.
93	22201	0.04902	0.000	0.01594	0.08209	0.00015600	0.99623799	LIPARIS SP.
94	68781	0.04530	0.000	0.02334	0.06725	0.00014500	0.99638301	TELMESSUS CHEIRAGONUS
95	24001	0.04509	0.001	0.00000	0.10454	0.00014400	0.99652702	ZAPRORA SILENUS
96	85201	0.04325	0.001	0.00000	0.10572	0.00013800	0.99666500	CUCUMARIA FALLAX
97	82510	0.04313	0.000	0.01502	0.07123	0.00013800	0.99680197	STRONGYLOCENTROTUS DROEBACHIENSIS
98	20006	0.04045	0.000	0.01842	0.06248	0.00012900	0.99693102	SARRITOR FRENATUS
99	20322	0.03780	0.000	0.00396	0.07165	0.00012100	0.99705201	ANARHICHAS ORIENTALIS
100	81310	0.03706	0.000	0.00000	0.07924	0.00011800	0.99716997	PTERASTER SP.
101	95030	0.03705	0.000	0.00929	0.06481	0.00011800	0.99728799	FLUSTRA SERRULATA
102	24189	0.03644	0.000	0.00360	0.06929	0.00011600	0.99740499	LYCODES TURNERI
103	74120	0.03494	0.001	0.00000	0.10291	0.00011100	0.99751598	PATINOPECTEN CAURINUS
104	82730	0.03418	0.001	0.00000	0.08644	0.00010900	0.99762499	SAND DOLLAR UNIDENT.
105	21438	0.03239	0.001	0.00000	0.08426	0.00010300	0.99772900	ICELUS SPINIGER
106	56311	0.03237	0.000	0.00000	0.06857	0.00010300	0.99783200	EUNOE NODOSA
107	74000	0.03235	0.000	0.00864	0.05606	0.00010300	0.99793500	PELECYPODA UNIDENT.
108	24180	0.03111	0.000	0.00000	0.06906	0.00009900	0.99803400	LYCODES SP.
109	81741	0.03083	0.001	0.00000	0.09125	0.00009800	0.99813300	ASTERIAS SP.
110	85210	0.03023	0.000	0.00000	0.06489	0.00009600	0.99822903	PSOLUS SP.
111	72501	0.02934	0.000	0.00909	0.04959	0.00009400	0.99832302	FUSITRITON SP.
112	95000	0.02676	0.001	0.00000	0.07310	0.00008500	0.99840802	BRYOZOAN UNIDENT.
113	10270	0.02649	0.000	0.00000	0.06256	0.00008500	0.99849302	ISOPSETTA ISOLEPIS
114	50160	0.02592	0.000	0.00000	0.05479	0.00008300	0.99857497	APHRODITIDAE
115	80595	0.02515	0.000	0.00531	0.04499	0.00008000	0.99865597	LEPTASTERIAS SP.
116	81095	0.02098	0.000	0.00000	0.04199	0.00006700	0.99872297	CROSSASTER PAPPOSUS
117	71769	0.01969	0.000	0.00000	0.04313	0.00006300	0.99878502	BERINGIUS SP.
118	75110	0.01865	0.000	0.00216	0.03514	0.00006000	0.99884498	MACTROMERIS SP.
119	404	0.01749	0.000	0.00000	0.04906	0.00005600	0.99890101	RAJA SP.
120	71886	0.01655	0.000	0.00651	0.02659	0.00005300	0.99895400	NEPTUNEA MAGNA
121	81355	0.01396	0.000	0.00325	0.02468	0.00004500	0.99899799	PTERASTER OBSCURUS
122	40020	0.01382	0.000	0.00000	0.04091	0.00004400	0.99904197	HYDRACTINIA SP.
123	65203	0.01375	0.000	0.00000	0.04071	0.00004400	0.99908602	BALANUS EVERMANNI
124	21735	0.01301	0.000	0.00000	0.02736	0.00004200	0.99912798	ELEGINUS GRACILIS
125	71010	0.01151	0.000	0.00178	0.02123	0.00003700	0.99916399	NUDIBRANCH UNIDENT.
126	71835	0.01074	0.000	0.00430	0.01717	0.00003400	0.99919897	NEPTUNEA BOREALIS
127	21932	0.01010	0.000	0.00000	0.02051	0.00003200	0.99923098	HEXAGRAMMOS STELLERI
128	74981	0.01006	0.000	0.00299	0.01714	0.00003200	0.99926299	COCKLE UNIDENT.
129	71772	0.00997	0.000	0.00000	0.01999	0.00003200	0.99929500	BERINGIUS BERINGII
130	21350	0.00987	0.000	0.00000	0.02439	0.00003200	0.99932599	TRIGLOPS SP.
131	81360	0.00980	0.000	0.00000	0.02217	0.00003100	0.99935800	DIPLOPTERASTER MULTIPES
132	68020	0.00969	0.000	0.00000	0.02708	0.00003100	0.99938798	CANCER MAGISTER

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
133	21441	0.00924	0.000	0.00000	0.02618	0.00002900	0.99941802	ICELUS SPATULA
134	71525	0.00920	0.000	0.00163	0.01678	0.00002900	0.99944699	NATICA SP.
135	74100	0.00754	0.000	0.00000	0.01684	0.00002400	0.99947101	PECTINID UNIDENT.
136	71710	0.00732	0.000	0.00000	0.02037	0.00002300	0.99949503	COLUS SP.
137	80728	0.00719	0.000	0.00000	0.01963	0.00002300	0.99951798	CERAMASTER SP.
138	66045	0.00710	0.000	0.00279	0.01140	0.00002300	0.99953997	PANDALUS GONIURUS
139	66570	0.00670	0.000	0.00161	0.01179	0.00002100	0.99956203	ARGIS SP.
140	98105	0.00633	0.000	0.00000	0.01587	0.00002000	0.99958199	BOLTENIA OVIFERA
141	65000	0.00628	0.000	0.00000	0.01840	0.00002000	0.99960202	CIRRIPEDIA (CLASS)
142	20510	0.00586	0.000	0.00000	0.01404	0.00001900	0.99962097	ANOPLOPOMA FIMBRIA
143	99902	0.00559	0.000	0.00000	0.01402	0.00001800	0.99963802	MOLGULA GRIFITHSII
144	21355	0.00544	0.000	0.00000	0.01307	0.00001700	0.99965602	TRIGLOPS PINGELI
145	23240	0.00519	0.000	0.00000	0.01537	0.00001700	0.99967200	ONCORHYNCHUS NERKA
146	21314	0.00490	0.000	0.00046	0.00935	0.00001600	0.99968803	GYMNOCANTHUS PISTILLIGER
147	68510	0.00483	0.000	0.00198	0.00768	0.00001500	0.99970299	OREGONIA GRACILIS
148	75285	0.00434	0.000	0.00108	0.00760	0.00001400	0.99971700	SERRIPES GROENLANDICUS
149	71030	0.00428	0.000	0.00000	0.00954	0.00001400	0.99973100	TRITONIA DIOMEDEA
150	23055	0.00408	0.000	0.00000	0.00895	0.00001300	0.99974400	OSMERUS MORDAX
151	21935	0.00407	0.000	0.00000	0.01171	0.00001300	0.99975699	HEXAGRAMMOS DECAGRAMMUS
152	401	0.00357	0.000	0.00126	0.00587	0.00001100	0.99976802	SKATE EGG CASE UNIDENT.
153	20061	0.00342	0.000	0.00142	0.00541	0.00001100	0.99977899	OCCELLA DODECAEDRON
154	75605	0.00338	0.000	0.00000	0.00999	0.00001100	0.99979001	PODODESMUS SP.
155	30040	0.00324	0.000	0.00000	0.00959	0.00001000	0.99980003	SEBASTES SP.
156	71764	0.00303	0.000	0.00000	0.00897	0.00001000	0.99980998	VOLUTOPSIUS MIDDENDORFFII
157	56310	0.00288	0.000	0.00000	0.00606	0.00000900	0.99981898	EUNOE SP.
158	10180	0.00277	0.000	0.00000	0.00594	0.00000900	0.99982798	MICROSTOMUS PACIFICUS
159	66611	0.00265	0.000	0.00067	0.00464	0.00000800	0.99983603	ARGIS LAR
160	21930	0.00262	0.000	0.00000	0.00564	0.00000800	0.99984503	HEXAGRAMMOS SP.
161	43020	0.00251	0.000	0.00000	0.00743	0.00000800	0.99985301	METRIDIUM SENILE
162	85000	0.00248	0.000	0.00000	0.00607	0.00000800	0.99986100	HOLOTHUROIDEA UNIDENT.
163	94000	0.00228	0.000	0.00000	0.00633	0.00000700	0.99986798	SIPUNCULA (PHYLUM)
164	42000	0.00218	0.000	0.00000	0.00525	0.00000700	0.99987501	PENNATULACEA (ORDER)
165	23808	0.00215	0.000	0.00106	0.00324	0.00000700	0.99988198	LUMPENUS SAGITTA
166	21339	0.00214	0.000	0.00000	0.00468	0.00000700	0.99988902	MALACOCOTTUS SP.
167	10212	0.00198	0.000	0.00000	0.00417	0.00000600	0.99989498	LIMANDA SAKHALINENSIS
168	95020	0.00182	0.000	0.00000	0.00467	0.00000600	0.99990100	EUCRATEA LORICATA
169	80540	0.00174	0.000	0.00050	0.00299	0.00000600	0.99990600	HENRICIA SP.
170	40011	0.00167	0.000	0.00017	0.00317	0.00000500	0.99991202	HYDROID UNIDENT.
171	75240	0.00159	0.000	0.00000	0.00407	0.00000500	0.99991697	MACOMA SP.
172	80660	0.00149	0.000	0.00000	0.00298	0.00000500	0.99992102	PSEUDARCHASTER PARELII
173	74080	0.00135	0.000	0.00000	0.00325	0.00000400	0.99992597	MYTILUS EDULIS
174	22232	0.00124	0.000	0.00000	0.00367	0.00000400	0.99993002	CAREPROCTUS SCOTTAE
175	21921	0.00107	0.000	0.00000	0.00260	0.00000300	0.99993300	PLEUROGRAMMUS MONOPTERYGIUS
176	56312	0.00104	0.000	0.00000	0.00249	0.00000300	0.99993700	EUNOE DEPRESSA

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
177	71575	0.00094	0.000	0.00000	0.00253	0.00000300	0.99993998	POLINICES SP.
178	20050	0.00094	0.000	0.00025	0.00162	0.00000300	0.99994302	ASPIDOPHOROIDES BARTONI
179	74050	0.00088	0.000	0.00000	0.00209	0.00000300	0.99994498	MYTILIDAE
180	66502	0.00088	0.000	0.00018	0.00158	0.00000300	0.99994802	CRANGON SP.
181	20000	0.00085	0.000	0.00000	0.00195	0.00000300	0.99995100	AGONIDAE
182	81060	0.00081	0.000	0.00000	0.00186	0.00000300	0.99995297	SOLASTER SP.
183	20202	0.00079	0.000	0.00000	0.00162	0.00000300	0.99995601	AMMODYTES HEXAPTERUS
184	74104	0.00075	0.000	0.00000	0.00201	0.00000200	0.99995798	CHLAMYS SP.
185	71726	0.00074	0.000	0.00000	0.00219	0.00000200	0.99996102	COLUS SPITZBERGENSIS
186	21354	0.00073	0.000	0.00000	0.00183	0.00000200	0.99996299	TRIGLOPS SCEPTICUS
187	66120	0.00067	0.000	0.00000	0.00198	0.00000200	0.99996501	PANDALOPSIS DISPAR
188	72063	0.00064	0.000	0.00000	0.00162	0.00000200	0.99996698	AFORIA CIRCINATA
189	68040	0.00060	0.000	0.00014	0.00106	0.00000200	0.99996901	CANCER OREGONENSIS
190	21333	0.00057	0.000	0.00000	0.00119	0.00000200	0.99997097	ARTEDIELLUS PACIFICUS
191	79000	0.00053	0.000	0.00000	0.00122	0.00000200	0.99997300	SQUID UNIDENT.
192	71891	0.00050	0.000	0.00000	0.00118	0.00000200	0.99997401	PLICIFUSUS KROYERI
193	66530	0.00044	0.000	0.00003	0.00084	0.00000100	0.99997598	CRANGON DALLI
194	80546	0.00043	0.000	0.00000	0.00095	0.00000100	0.99997699	HENRICIA TUMIDA
195	80729	0.00039	0.000	0.00000	0.00114	0.00000100	0.99997801	CERAMASTER JAPONICUS
196	71761	0.00038	0.000	0.00000	0.00113	0.00000100	0.99997902	PYRULOFUSUS MELONIS
197	98300	0.00038	0.000	0.00000	0.00095	0.00000100	0.99998099	COMPOUND ASCIDIAN UNIDENT.
198	62000	0.00035	0.000	0.00000	0.00103	0.00000100	0.99998200	ISOPODA (ORDER)
199	74980	0.00034	0.000	0.00000	0.00096	0.00000100	0.99998301	CLINOCARDIUM SP.
200	50000	0.00033	0.000	0.00000	0.00098	0.00000100	0.99998403	POLYCHAETA (CLASS)
201	435	0.00033	0.000	0.00000	0.00097	0.00000100	0.99998498	BATHYRAJA INTERRUPTA
202	56300	0.00031	0.000	0.00000	0.00090	0.00000100	0.99998599	POLYNOIDAE
203	23807	0.00030	0.000	0.00000	0.00065	0.00000100	0.99998701	LUMPENUS FABRICII
204	22178	0.00029	0.000	0.00000	0.00067	0.00000100	0.99998802	EUMICROTREMUS ORBIS
205	30150	0.00029	0.000	0.00000	0.00087	0.00000100	0.99998897	SEBASTES CILIATUS
206	21900	0.00028	0.000	0.00000	0.00083	0.00000100	0.99998999	HEXAGRAMMIDAE
207	22175	0.00024	0.000	0.00000	0.00070	0.00000100	0.99998999	APTOCYCLUS VENTRICOSUS
208	81315	0.00022	0.000	0.00000	0.00066	0.00000100	0.99999100	PTERASTER TESSELATUS
209	65100	0.00021	0.000	0.00000	0.00062	0.00000100	0.99999201	THORACICA (ORDER)
210	71890	0.00020	0.000	0.00000	0.00059	0.00000100	0.99999201	PLICIFUSUS SP.
211	66200	0.00018	0.000	0.00000	0.00043	0.00000100	0.99999303	LEBBEUS SP.
212	81870	0.00016	0.000	0.00000	0.00047	0.00000100	0.99999398	DIPSACASTER BOREALIS
213	23805	0.00016	0.000	0.00000	0.00038	0.00000000	0.99999398	LUMPENUS MACULATUS
214	21346	0.00014	0.000	0.00000	0.00041	0.00000000	0.99999398	HEMILEPIDOTUS HEMILEPIDOTUS
215	20051	0.00014	0.000	0.00000	0.00037	0.00000000	0.99999499	ASPIDOPHOROIDES OLRIKI
216	59100	0.00014	0.000	0.00000	0.00041	0.00000000	0.99999499	HIRUDINEA UNIDENT.
217	21388	0.00013	0.000	0.00000	0.00039	0.00000000	0.99999601	ENOPHRYS DICERAUS
218	23801	0.00013	0.000	0.00000	0.00032	0.00000000	0.99999601	LUMPENUS SP.
219	23809	0.00013	0.000	0.00000	0.00038	0.00000000	0.99999702	ACANTHOLUMPENUS MACKAYI
220	21341	0.00013	0.000	0.00000	0.00038	0.00000000	0.99999702	MALACOCOTTUS ZONURUS

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
221	66020	0.00013	0.000	0.00000	0.00037	0.00000000	0.99999702	PANDALUS SP.
222	72790	0.00011	0.000	0.00000	0.00033	0.00000000	0.99999797	ARCTOMELON STEARNSII
223	80730	0.00010	0.000	0.00000	0.00031	0.00000000	0.99999797	CERAMASTER PATAGONICUS
224	20700	0.00010	0.000	0.00000	0.00028	0.00000000	0.99999797	BATHYMASTERIDAE
225	75284	0.00009	0.000	0.00000	0.00026	0.00000000	0.99999899	SERRIPES SP.
226	23800	0.00008	0.000	0.00000	0.00018	0.00000000	0.99999899	STICHAEIDAE
227	21331	0.00007	0.000	0.00000	0.00020	0.00000000	0.99999899	ARTEDIELLUS SP.
228	21300	0.00003	0.000	0.00000	0.00009	0.00000000	0.99999899	COTTIDAE
229	66600	0.00003	0.000	0.00000	0.00009	0.00000000	0.99999899	SCLEROCRANGON SP.
230	71759	0.00003	0.000	0.00000	0.00009	0.00000000	0.99999899	VOLUTOPSIUS FILOSUS
231	75267	0.00003	0.000	0.00000	0.00009	0.00000000	1.00000000	SILIQUA ALTA
232	23850	0.00003	0.000	0.00000	0.00008	0.00000000	1.00000000	POROCLINUS ROTHROCKI
233	69090	0.00003	0.000	0.00000	0.00008	0.00000000	1.00000000	PAGURUS OCHOTENSIS
234	21405	0.00003	0.000	0.00000	0.00008	0.00000000	1.00000000	NAUTICHTHYS PRIBILOVIUS
235	66160	0.00003	0.000	0.00000	0.00008	0.00000000	1.00000000	SPIRONTOCARIS SP.
236	23000	0.00003	0.000	0.00000	0.00007	0.00000000	1.00000000	OSMERIDAE

APPENDIX D

Abundance Estimates for Principal Fish Species

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

Subarea	Stratum
1	10
2	20
3	31
	32 (Pribilof 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)

List of Tables

Table D-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	57	50	50	50	21.97	.39740E+02	16.45	.16110E+02
20	16	15	15	15	11.70	.77020E+01	115.80	.37080E+04
31	68	67	67	67	79.88	.20150E+03	115.13	.12130E+04
32	8	8	8	8	249.32	.57990E+04	399.84	.30880E+05
Subtotal	76	75	75	75	94.27	.21060E+03	139.32	.12390E+04
41	41	41	41	41	40.03	.15260E+03	85.41	.61120E+03
42	31	30	30	30	142.22	.84340E+03	190.76	.22840E+04
43	22	21	21	21	19.29	.57980E+02	29.80	.51610E+02
Subtotal	94	92	92	92	59.60	.96460E+02	98.57	.31930E+03
50	26	26	26	26	64.01	.10840E+03	79.88	.44160E+03
61	60	58	58	58	252.84	.28860E+04	400.56	.52330E+04
62	7	7	7	7	101.30	.33530E+03	113.95	.11040E+04
Subtotal	67	65	65	65	242.54	.25080E+04	381.08	.45510E+04
Total	336	323	323	323	97.87	.13500E+03	151.18	.32220E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	128,073,058	.97703E+15	56.00	64,901,781	191,244,335
20	240,167,259	.15952E+17	15.00	0	509,313,094
31	1,088,317,110	.10840E+18	67.00	429,829,514	1,746,804,707
32	350,828,005	.23775E+17	7.00	0	715,494,088
Subtotal	1,439,145,116	.13218E+18	68.21	712,022,257	2,166,267,974
41	494,308,660	.20475E+17	40.00	205,122,057	783,495,263
42	458,029,916	.13168E+17	30.00	223,708,559	692,351,273
43	62,898,137	.22995E+15	21.00	31,265,728	94,530,546
Subtotal	1,015,236,713	.33873E+17	70.55	647,145,892	1,383,327,534
50	309,870,667	.66448E+16	25.00	141,622,282	478,119,053
61	3,530,318,029	.40649E+18	59.00	2,241,799,822	4,818,836,235
62	73,251,905	.45619E+15	6.00	20,987,211	125,516,599
Subtotal	3,603,569,934	.40694E+18	59.13	2,314,328,892	4,892,810,975
Total	6,736,062,747	.59657E+18	115.11	5,191,306,299	8,280,819,196

Table D-1.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	171,102	.24100E+10	56.00	71,889	270,316
20	24,257	.33129E+08	15.00	11,911	36,603
31	755,080	.18006E+11	67.00	486,709	1,023,451
32	218,754	.44646E+10	7.00	55,250	382,258
Subtotal	973,834	.22470E+11	65.69	674,031	1,273,636
41	231,653	.51119E+10	40.00	87,157	376,150
42	341,475	.48627E+10	30.00	199,081	483,869
43	40,722	.25833E+09	21.00	7,290	74,153
Subtotal	613,850	.10233E+11	72.49	411,535	816,165
50	248,299	.16312E+10	25.00	165,100	331,498
61	2,228,360	.22417E+12	59.00	1,271,495	3,185,225
62	65,123	.13856E+09	6.00	34,859	95,387
Subtotal	2,293,483	.22430E+12	59.07	1,336,322	3,250,644
Total	4,324,825	.26108E+12	79.16	3,302,902	5,346,748

Table D-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	57	53	53	52	14.63	.14330E+02	22.95	.30410E+02
20	16	14	14	14	5.48	.42380E+01	15.25	.60640E+02
31	68	67	67	67	13.60	.30460E+01	14.24	.74760E+01
32	8	7	7	7	6.69	.83480E+01	3.26	.11380E+01
Subtotal	76	74	74	74	13.01	.26110E+01	13.31	.62680E+01
41	41	37	37	35	9.56	.12660E+02	13.44	.28750E+02
42	31	31	31	31	11.53	.41830E+01	20.81	.31290E+02
43	22	22	22	22	4.02	.18070E+01	7.34	.29330E+01
Subtotal	94	90	90	88	8.88	.43000E+01	13.91	.10900E+02
50	26	25	25	25	13.39	.67860E+01	5.11	.16850E+01
61	60	59	59	59	14.37	.31440E+01	5.37	.11870E+01
62	7	7	7	7	8.95	.21790E+01	9.63	.58450E+01
Subtotal	67	66	66	66	14.00	.27410E+01	5.66	.10580E+01
Total	336	322	322	319	11.94	.93990E+00	13.17	.21610E+01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	178,742,320	.18442E+16	56.00	91,951,885	265,532,754
20	31,619,358	.26086E+15	15.00	0	66,263,283
31	134,614,176	.66799E+15	67.00	82,923,200	186,305,152
32	2,864,161	.87574E+12	7.00	650,976	5,077,346
Subtotal	137,478,337	.66886E+15	67.17	85,753,489	189,203,185
41	77,779,296	.96296E+15	40.00	14,412,698	141,145,894
42	49,961,283	.18039E+15	30.00	22,495,100	77,427,466
43	15,499,904	.13069E+14	21.00	7,958,872	23,040,936
Subtotal	143,240,482	.11564E+16	55.08	74,513,999	211,966,966
50	19,807,987	.25361E+14	25.00	9,433,799	30,182,176
61	47,301,062	.92198E+14	59.00	27,895,487	66,706,637
62	6,191,562	.24154E+13	6.00	2,388,550	9,994,574
Subtotal	53,492,624	.94613E+14	61.71	34,038,765	72,946,483
Total	564,381,108	.40503E+16	170.21	438,369,579	690,392,638

Table D-2.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	113,963	.86876E+09	56.00	54,395	173,532
20	11,359	.18229E+08	15.00	2,261	20,458
31	128,569	.27217E+09	67.00	95,574	161,564
32	5,873	.64265E+07	7.00	0	12,076
Subtotal	134,442	.27859E+09	69.83	101,060	167,824
41	55,320	.42402E+09	40.00	13,704	96,936
42	27,685	.24118E+08	30.00	17,642	37,728
43	8,491	.80527E+07	21.00	2,589	14,393
Subtotal	91,496	.45619E+09	46.07	48,330	134,662
50	51,956	.10211E+09	25.00	31,139	72,772
61	126,677	.24422E+09	59.00	95,094	158,261
62	5,751	.90069E+06	6.00	3,428	8,073
Subtotal	132,428	.24512E+09	59.43	100,786	164,070
Total	535,645	.19690E+10	188.60	447,785	623,504

Table D-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	57	57	57	57	110.21	.23160E+03	472.64	.32320E+04
20	16	16	16	16	142.66	.10060E+04	749.64	.29430E+05
31	68	67	66	65	68.75	.71820E+02	257.44	.10740E+04
32	8	7	7	7	3.01	.10190E+01	6.11	.51630E+01
Subtotal	76	74	73	72	63.17	.60140E+02	236.09	.89970E+03
41	41	37	37	37	15.99	.14070E+02	53.54	.17710E+03
42	31	27	27	27	39.03	.21040E+03	107.93	.17220E+04
43	22	17	17	16	1.71	.40820E+00	6.23	.65100E+01
Subtotal	94	81	81	80	18.44	.15900E+02	56.52	.14980E+03
50	26	3	3	3	0.30	.40390E-01	0.64	.19930E+00
61	60	0	0	0	0.00	.00000E+00	0.00	.00000E+00
62	7	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	67	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Total	336	231	230	228	45.16	.19890E+02	184.86	.35010E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	3,680,541,997	.19599E+18	56.00	2,785,837,351	4,575,246,643
20	1,554,782,213	.12659E+18	15.00	796,595,012	2,312,969,414
31	2,433,466,406	.96007E+17	67.00	1,813,767,339	3,053,165,473
32	5,361,750	.39750E+13	7.00	646,568	10,076,933
Subtotal	2,438,828,156	.96011E+17	67.01	1,819,116,260	3,058,540,052
41	309,889,386	.59322E+16	40.00	154,229,994	465,548,777
42	259,153,033	.99275E+16	30.00	55,694,317	462,611,749
43	13,140,076	.29005E+14	21.00	1,937,886	24,342,267
Subtotal	582,182,495	.15889E+17	60.62	330,081,213	834,283,777
50	2,486,019	.29988E+13	25.00	0	6,053,344
61	0	.00000E+00	59.00	0	0
62	0	.00000E+00	6.00	0	0
Subtotal	0	.00000E+00	63.21	0	0
Total	8,258,820,880	.43448E+18	99.57	6,940,526,017	9,577,115,743

Table D-3.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	858,189	.14044E+11	56.00	618,684	1,097,694
20	295,886	.43291E+10	15.00	154,754	437,018
31	649,858	.64169E+10	67.00	489,647	810,070
32	2,639	.78435E+06	7.00	544	4,733
Subtotal	652,497	.64177E+10	67.02	492,275	812,718
41	92,564	.47129E+09	40.00	48,690	136,439
42	93,724	.12131E+10	30.00	22,601	164,847
43	3,609	.18187E+07	21.00	796	6,422
Subtotal	189,897	.16862E+10	52.08	106,907	272,887
50	1,172	.60774E+06	25.00	0	2,781
61	0	.00000E+00	59.00	0	0
62	0	.00000E+00	6.00	0	0
Subtotal	0	.00000E+00	63.21	0	0
Total	1,997,641	.26478E+11	128.87	1,675,455	2,319,827

Table D-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	57	57	57	57	87.01	.10830E+03	573.45	.55120E+04
20	16	16	16	16	62.80	.13180E+03	450.95	.77710E+04
31	68	66	66	66	31.56	.15430E+02	223.15	.10500E+04
32	8	8	8	8	27.05	.91800E+01	112.39	.20210E+03
Subtotal	76	74	74	74	31.18	.12980E+02	213.75	.88040E+03
41	41	40	40	38	12.66	.17960E+02	86.32	.11820E+04
42	31	31	31	31	79.15	.32450E+03	297.45	.57820E+04
43	22	22	22	22	13.75	.73840E+02	47.36	.36620E+03
Subtotal	94	93	93	91	28.38	.26400E+02	127.55	.70280E+03
50	26	9	9	9	1.47	.73250E+00	3.80	.42350E+01
61	60	49	49	38	5.63	.13830E+01	12.77	.73370E+01
62	7	7	7	7	5.10	.51760E+00	12.49	.48310E+01
Subtotal	67	56	56	45	5.59	.12040E+01	12.75	.63960E+01
Total	336	305	305	292	35.75	.10350E+02	210.50	.40400E+03

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	4,465,538,111	.33426E+18	56.00	3,297,092,713	5,633,983,510
20	935,278,438	.33429E+17	15.00	545,652,403	1,324,904,473
31	2,109,383,358	.93789E+17	67.00	1,496,883,086	2,721,883,630
32	98,612,140	.15561E+15	7.00	69,110,504	128,113,776
Subtotal	2,207,995,498	.93945E+17	67.22	1,594,987,332	2,821,003,665
41	499,574,317	.39589E+17	40.00	93,277,232	905,871,403
42	714,199,421	.33337E+17	30.00	340,814,038	1,087,584,804
43	99,955,843	.16316E+16	21.00	15,939,326	183,972,360
Subtotal	1,313,729,581	.74558E+17	72.81	767,624,094	1,859,835,069
50	14,756,593	.63734E+14	25.00	0	31,202,342
61	112,529,910	.56991E+15	59.00	64,283,034	160,776,786
62	8,031,674	.19964E+13	6.00	4,399,016	11,664,332
Subtotal	120,561,584	.57191E+15	59.41	72,230,278	168,892,891
Total	9,057,859,806	.53683E+18	126.54	7,607,143,272	10,508,576,340

Table D-4.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	677,582	.65650E+10	56.00	513,831	841,332
20	130,242	.56696E+09	15.00	79,168	181,317
31	298,307	.13785E+10	67.00	224,052	372,562
32	23,736	.70676E+07	7.00	17,449	30,023
Subtotal	322,043	.13855E+10	67.67	247,598	396,488
41	73,264	.60147E+09	40.00	23,184	123,344
42	190,044	.18706E+10	30.00	101,727	278,361
43	29,024	.32898E+09	21.00	0	66,750
Subtotal	292,332	.28010E+10	59.98	185,371	399,293
50	5,707	.11023E+08	25.00	0	12,546
61	49,591	.10742E+09	59.00	28,645	70,537
62	3,277	.21390E+06	6.00	2,146	4,409
Subtotal	52,869	.10763E+09	59.23	31,901	73,836
Total	1,480,775	.11437E+11	137.62	1,269,024	1,692,525

Table D-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	57	36	36	34	2.68	.27080E+00	5.89	.17300E+01
20	16	1	1	1	0.02	.23340E-03	0.03	.87290E-03
31	68	68	68	68	26.04	.17510E+02	85.46	.38890E+03
32	8	8	8	8	9.19	.14530E+02	25.74	.12030E+03
Subtotal	76	76	76	76	24.61	.14770E+02	80.39	.32650E+03
41	41	40	40	40	3.75	.53710E+00	15.83	.12630E+02
42	31	29	29	29	10.50	.54440E+01	22.35	.27220E+02
43	22	21	21	20	2.29	.21500E+00	10.29	.43700E+01
Subtotal	94	90	90	89	5.02	.47450E+00	16.22	.56510E+01
50	26	26	26	26	35.21	.14560E+03	186.82	.15420E+04
61	60	60	60	60	20.91	.70370E+01	108.06	.20670E+03
62	7	7	7	7	2.72	.14720E+01	15.53	.45740E+02
Subtotal	67	67	67	67	19.67	.61190E+01	101.77	.17970E+03
Total	336	296	296	293	14.04	.22280E+01	57.65	.40800E+02

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	45,872,766	.10490E+15	56.00	25,173,805	66,571,728
20	61,277	.37548E+10	15.00	0	192,715
31	807,855,724	.34746E+17	67.00	435,050,739	1,180,660,708
32	22,580,366	.92588E+14	7.00	0	45,336,972
Subtotal	830,436,089	.34838E+17	67.35	457,134,728	1,203,737,451
41	91,635,978	.42309E+15	40.00	50,065,751	133,206,205
42	53,668,108	.15691E+15	30.00	28,051,662	79,284,554
43	21,727,386	.19471E+14	21.00	12,549,117	30,905,655
Subtotal	167,031,472	.59947E+15	67.62	118,063,282	215,999,661
50	724,713,302	.23204E+17	25.00	410,310,090	1,039,116,515
61	952,412,876	.16053E+17	59.00	696,353,783	1,208,471,970
62	9,982,949	.18901E+14	6.00	0	20,621,475
Subtotal	962,395,825	.16072E+17	59.14	706,186,026	1,218,605,625
Total	2,730,510,732	.74818E+17	127.42	2,188,923,740	3,272,097,724

Table D-5.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	20,879	.16422E+08	56.00	12,690	29,069
20	32	.10040E+04	15.00	0	99
31	246,182	.15645E+10	67.00	167,075	325,289
32	8,064	.11185E+08	7.00	155	15,974
Subtotal	254,246	.15757E+10	67.93	174,857	333,636
41	21,705	.17992E+08	40.00	13,132	30,277
42	25,207	.31385E+08	30.00	13,751	36,664
43	4,841	.95793E+06	21.00	2,805	6,876
Subtotal	51,752	.50334E+08	61.85	37,563	65,942
50	136,596	.21914E+10	25.00	40,162	233,029
61	184,292	.54657E+09	59.00	137,044	231,540
62	1,746	.60833E+06	6.00	0	3,751
Subtotal	186,038	.54717E+09	59.13	138,763	233,313
Total	649,543	.43810E+10	82.11	517,165	781,921

Table D-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	57	45	45	43	9.71	.53940E+01	19.07	.14490E+02
20	16	16	16	15	13.67	.16640E+02	33.89	.81490E+02
31	68	59	58	55	11.78	.37780E+01	16.08	.86160E+01
32	8	6	6	6	6.71	.86330E+01	5.60	.51980E+01
Subtotal	76	65	64	61	11.35	.32260E+01	15.19	.72520E+01
41	41	38	38	37	27.70	.40170E+02	37.27	.93870E+02
42	31	26	26	26	19.38	.28870E+02	21.93	.48780E+02
43	22	20	20	19	7.23	.30800E+01	7.85	.44590E+01
Subtotal	94	84	84	82	21.57	.14380E+02	27.67	.32480E+02
50	26	1	1	1	0.01	.45510E-04	0.01	.22130E-03
61	60	16	16	14	5.13	.60960E+01	2.74	.18280E+01
62	7	2	2	2	1.05	.46320E+00	0.50	.10580E+00
Subtotal	67	18	18	16	4.86	.52980E+01	2.58	.15880E+01
Total	336	229	228	218	11.42	.15530E+01	15.82	.32000E+01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	148,501,734	.87891E+15	56.00	88,586,298	208,417,171
20	70,294,572	.35056E+15	15.00	30,395,406	110,193,738
31	151,994,706	.76989E+15	67.00	96,501,027	207,488,385
32	4,913,114	.40018E+13	7.00	182,060	9,644,168
Subtotal	156,907,820	.77389E+15	67.68	101,270,103	212,545,537
41	215,729,902	.31445E+16	40.00	102,401,352	329,058,453
42	52,660,232	.28122E+15	30.00	18,366,574	86,953,890
43	16,569,775	.19866E+14	21.00	7,298,830	25,840,719
Subtotal	284,959,909	.34455E+16	47.51	166,329,741	403,590,076
50	57,704	.33298E+10	25.00	0	176,575
61	24,119,970	.14199E+15	59.00	37,619	48,202,321
62	322,495	.43722E+11	6.00	0	834,158
Subtotal	24,442,465	.14204E+15	59.04	356,406	48,528,523
Total	685,164,204	.55909E+16	111.22	535,619,016	834,709,392

Table D-6.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	75,645	.32707E+09	56.00	39,095	112,195
20	28,358	.71582E+08	15.00	10,210	46,506
31	111,353	.33759E+09	67.00	74,606	148,101
32	5,890	.66461E+07	7.00	0	11,987
Subtotal	117,243	.34424E+09	69.41	80,136	154,350
41	160,344	.13456E+10	40.00	85,439	235,248
42	46,527	.16645E+09	30.00	20,183	72,872
43	15,263	.13724E+08	21.00	7,558	22,969
Subtotal	222,134	.15257E+10	50.39	143,193	301,076
50	26	.68481E+03	25.00	0	80
61	45,244	.47352E+09	59.00	1,266	89,222
62	676	.19141E+06	6.00	0	1,746
Subtotal	45,920	.47371E+09	59.05	1,933	89,907
Total	489,327	.27423E+10	139.37	385,640	593,014

Table D-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	57	0	0	0	0.00	.00000E+00	0.00	.00000E+00
20	16	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	68	2	2	2	0.07	.21910E-02	0.01	.70540E-04
32	8	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	76	2	2	2	0.06	.18350E-02	0.01	.59070E-04
41	41	6	6	5	0.04	.39820E-03	0.13	.45300E-02
42	31	2	2	2	0.26	.64780E-01	0.09	.39640E-02
43	22	7	7	6	0.10	.77330E-02	0.16	.43820E-02
Subtotal	94	15	15	13	0.10	.39710E-02	0.13	.18300E-02
50	26	1	1	1	0.06	.30330E-02	0.01	.51010E-04
61	60	34	34	28	2.45	.41450E+00	2.08	.24160E+00
62	7	7	7	7	0.89	.11740E+00	2.82	.26320E+00
Subtotal	67	41	41	35	2.34	.36060E+00	2.13	.21110E+00
Total	336	59	59	51	0.51	.16250E-01	0.47	.99690E-02

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	0	.00000E+00	56.00	0	0
20	0	.00000E+00	15.00	0	0
31	112,251	.63030E+10	67.00	0	271,033
32	0	.00000E+00	7.00	0	0
Subtotal	112,251	.63030E+10	7.94	0	300,011
41	773,639	.15174E+12	40.00	0	1,560,896
42	207,258	.22852E+11	30.00	0	516,396
43	341,299	.19524E+11	21.00	49,823	632,775
Subtotal	1,322,196	.19412E+12	61.64	441,024	2,203,368
50	27,706	.76765E+09	25.00	0	84,782
61	18,291,978	.18764E+14	59.00	9,537,437	27,046,518
62	1,814,879	.10879E+12	6.00	966,865	2,662,894
Subtotal	20,106,857	.18873E+14	59.67	11,326,974	28,886,740
Total	21,569,010	.19074E+14	70.10	12,834,170	30,303,850

Table D-7.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	0	.00000E+00	56.00	0	0
20	0	.00000E+00	15.00	0	0
31	617	.19576E+06	67.00	0	1,502
32	0	.00000E+00	7.00	0	0
Subtotal	617	.19576E+06	45.00	0	1,511
41	218	.13338E+05	40.00	0	454
42	614	.37346E+06	30.00	0	1,862
43	209	.34455E+05	21.00	0	595
Subtotal	1,041	.42125E+06	37.68	0	2,367
50	214	.45644E+05	25.00	0	654
61	21,551	.32197E+08	59.00	10,084	33,019
62	573	.48508E+05	6.00	7	1,139
Subtotal	22,125	.32245E+08	59.18	10,648	33,601
Total	23,997	.32908E+08	66.98	12,524	35,470

Table D-8.--CPUE, population, and biomass estimates for Atheresthes 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	57	4	4	2	0.07	.37010E-02	0.24	.27670E-01
20	16	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	68	24	24	23	8.35	.16970E+02	19.37	.72020E+02
32	8	6	6	6	5.42	.80740E+01	22.71	.15440E+03
Subtotal	76	30	30	29	8.10	.14270E+02	19.65	.61420E+02
41	41	4	4	4	0.40	.50700E-01	0.76	.19460E+00
42	31	11	11	10	1.89	.14870E+01	8.70	.24400E+02
43	22	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	94	15	15	14	0.66	.96850E-01	2.46	.13880E+01
50	26	26	26	26	41.94	.27830E+02	73.74	.12100E+03
61	60	55	55	53	18.83	.65650E+01	24.10	.13340E+02
62	7	1	1	1	0.56	.31690E+00	0.38	.14790E+00
Subtotal	67	56	56	54	17.59	.57040E+01	22.49	.11590E+02
Total	336	131	131	125	8.68	.14880E+01	15.42	.54560E+01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	1,888,699	.16780E+13	56.00	0	4,506,666
20	0	.00000E+00	15.00	0	0
31	183,102,883	.64349E+16	67.00	22,667,730	343,538,037
32	19,924,431	.11884E+15	7.00	0	45,706,246
Subtotal	203,027,314	.65537E+16	69.27	41,117,461	364,937,168
41	4,397,734	.65173E+13	40.00	0	9,557,143
42	20,899,797	.14068E+15	30.00	0	45,155,363
43	0	.00000E+00	21.00	0	0
Subtotal	25,297,531	.14720E+15	32.88	522,883	50,072,178
50	286,056,610	.18207E+16	25.00	198,158,028	373,955,191
61	212,378,090	.10361E+16	59.00	147,325,578	277,430,602
62	247,265	.61140E+11	6.00	0	882,985
Subtotal	212,625,355	.10361E+16	59.01	147,570,924	277,679,786
Total	728,895,509	.95594E+16	118.46	533,351,294	924,439,724

Table D-8.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	582	.22441E+06	56.00	0	1,539
20	0	.00000E+00	15.00	0	0
31	78,960	.15167E+10	67.00	1,071	156,849
32	4,756	.62162E+07	7.00	0	10,857
Subtotal	83,716	.15229E+10	67.54	5,668	161,764
41	2,297	.16983E+07	40.00	0	4,931
42	4,539	.85752E+07	30.00	0	10,527
43	0	.00000E+00	21.00	0	0
Subtotal	6,836	.10273E+08	43.47	358	13,313
50	162,701	.41881E+09	25.00	120,543	204,859
61	165,980	.50993E+09	59.00	120,342	211,618
62	362	.13097E+06	6.00	0	1,247
Subtotal	166,342	.51006E+09	59.03	120,698	211,985
Total	420,176	.24623E+10	132.53	321,926	518,426

Table D-9.--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	57	50	50	50	3.01	.22330E+00	2.11	.10680E+00
20	16	15	15	15	3.18	.90590E+00	2.38	.42480E+00
31	68	58	58	58	2.50	.26900E+00	1.00	.50370E-01
32	8	7	7	7	0.82	.12530E+00	0.82	.12670E+00
Subtotal	76	65	65	65	2.36	.22610E+00	0.99	.43090E-01
41	41	23	23	23	0.68	.37670E-01	0.43	.73800E-02
42	31	26	26	26	2.19	.66730E+00	1.56	.45300E+00
43	22	12	12	12	0.30	.17350E-01	0.21	.36930E-02
Subtotal	94	61	61	61	0.95	.48890E-01	0.65	.27100E-01
50	26	23	23	23	4.24	.88740E+00	0.76	.44180E-01
61	60	35	35	35	1.99	.17540E+00	0.48	.10410E-01
62	7	3	3	3	0.15	.52910E-02	0.13	.57750E-02
Subtotal	67	38	38	38	1.87	.15230E+00	0.46	.90690E-02
Total	336	252	252	252	2.18	.39430E-01	1.05	.11900E-01

POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	16,414,592	.64760E+13	56.00	11,271,539	21,557,646
20	4,927,824	.18272E+13	15.00	2,028,344	7,827,304
31	9,497,772	.45004E+13	67.00	5,254,928	13,740,616
32	717,159	.97524E+11	7.00	0	1,455,720
Subtotal	10,214,930	.45980E+13	69.62	5,926,362	14,503,499
41	2,507,735	.24720E+12	40.00	1,502,900	3,512,570
42	3,756,519	.26114E+13	30.00	456,676	7,056,361
43	451,001	.16452E+11	21.00	184,212	717,791
Subtotal	6,715,255	.28751E+13	36.12	3,252,836	10,177,674
50	2,945,414	.66478E+12	25.00	1,262,545	4,628,283
61	4,269,207	.80856E+12	59.00	2,451,921	6,086,493
62	85,039	.23868E+10	6.00	0	204,585
Subtotal	4,354,245	.81095E+12	59.34	2,534,279	6,174,211
Total	45,572,261	.17252E+14	194.18	37,348,229	53,796,294

Table D-9.--Continued.

BIOMASS

Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	23,406	.13538E+08	56.00	15,970	30,842
20	6,594	.38967E+07	15.00	2,360	10,828
31	23,654	.24033E+08	67.00	13,849	33,459
32	718	.96460E+05	7.00	0	1,453
Subtotal	24,372	.24129E+08	67.53	14,548	34,196
41	3,927	.12619E+07	40.00	1,657	6,198
42	5,252	.38471E+07	30.00	1,241	9,263
43	643	.77319E+05	21.00	65	1,221
Subtotal	9,822	.51863E+07	50.44	5,219	14,424
50	16,435	.13354E+08	25.00	8,907	23,963
61	17,576	.13621E+08	59.00	10,117	25,035
62	97	.21865E+04	6.00	0	211
Subtotal	17,673	.13623E+08	59.02	10,214	25,132
Total	98,302	.73727E+08	229.17	81,301	115,303

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.

List of Tables

Table E-1.--Population estimates by sex and size group for walleye pollock from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
70	0	0	92,681	92,681	0.0000	0.0000
80	0	0	1,695,946	1,695,946	0.0003	0.0003
90	0	0	12,486,996	12,486,996	0.0019	0.0021
100	0	251,464	50,824,283	51,075,747	0.0076	0.0097
110	577,892	0	189,922,578	190,500,470	0.0283	0.0380
120	264,356	323,643	220,367,912	220,955,911	0.0328	0.0708
130	744,955	480,423	143,810,377	145,035,755	0.0215	0.0923
140	1,908,551	1,462,523	110,156,505	113,527,578	0.0169	0.1092
150	4,134,946	2,592,059	87,232,357	93,959,362	0.0139	0.1231
160	4,341,426	4,030,207	71,814,220	80,185,853	0.0119	0.1350
170	6,043,003	8,857,204	49,851,307	64,751,514	0.0096	0.1446
180	4,714,145	7,624,778	33,396,309	45,735,233	0.0068	0.1514
190	9,844,274	9,426,973	27,423,739	46,694,985	0.0069	0.1584
200	6,216,028	6,591,401	9,521,504	22,328,933	0.0033	0.1617
210	7,785,514	5,660,978	3,836,972	17,283,463	0.0026	0.1642
220	10,696,501	5,332,084	395,577	16,424,163	0.0024	0.1667
230	6,615,386	11,459,241	50,291	18,124,918	0.0027	0.1694
240	9,737,186	9,345,301	145,941	19,228,429	0.0029	0.1722
250	16,972,007	10,325,805	0	27,297,812	0.0041	0.1763
260	17,909,526	13,081,891	0	30,991,417	0.0046	0.1809
270	32,556,548	24,842,168	25,145	57,423,862	0.0085	0.1894
280	37,191,810	27,748,478	25,145	64,965,434	0.0096	0.1990
290	37,843,441	24,329,928	0	62,173,369	0.0092	0.2083
300	17,625,183	24,876,332	0	42,501,515	0.0063	0.2146
310	17,203,757	13,346,603	0	30,550,360	0.0045	0.2191
320	18,740,723	13,849,748	0	32,590,471	0.0048	0.2240
330	36,178,683	20,339,638	0	56,518,321	0.0084	0.2323
340	93,288,104	62,675,963	0	155,964,067	0.0232	0.2555
350	143,373,551	118,111,085	0	261,484,636	0.0388	0.2943
360	173,527,892	169,552,694	0	343,080,585	0.0509	0.3453
370	158,156,899	163,645,255	0	321,802,154	0.0478	0.3930
380	133,091,607	170,336,760	0	303,428,367	0.0450	0.4381
390	89,737,531	86,395,001	0	176,132,533	0.0261	0.4642
400	53,833,913	59,239,934	0	113,073,847	0.0168	0.4810
410	48,041,979	38,193,338	0	86,235,317	0.0128	0.4938
420	50,142,791	37,346,727	0	87,489,518	0.0130	0.5068
430	52,111,818	34,460,927	0	86,572,745	0.0129	0.5196
440	59,153,273	32,791,276	0	91,944,550	0.0136	0.5333
450	79,392,009	49,641,896	0	129,033,904	0.0192	0.5525
460	97,880,047	56,938,079	0	154,818,126	0.0230	0.5754
470	116,204,999	54,147,029	0	170,352,029	0.0253	0.6007
480	90,709,069	82,226,332	0	172,935,401	0.0257	0.6264
490	132,219,066	80,015,792	0	212,234,858	0.0315	0.6579
500	166,591,997	95,223,970	0	261,815,967	0.0389	0.6968
510	160,074,176	118,041,386	0	278,115,562	0.0413	0.7381
520	146,315,376	121,089,816	0	267,405,192	0.0397	0.7778
530	131,435,258	121,583,273	0	253,018,531	0.0376	0.8153
540	122,852,608	103,824,831	0	226,677,439	0.0337	0.8490
550	82,375,802	95,261,970	0	177,637,771	0.0264	0.8753
560	67,966,658	80,996,163	0	148,962,821	0.0221	0.8975
570	60,011,025	65,930,617	0	125,941,642	0.0187	0.9162
580	42,930,990	64,711,666	0	107,642,656	0.0160	0.9321
590	35,359,289	56,122,352	0	91,481,640	0.0136	0.9457
600	26,021,127	47,751,926	0	73,773,052	0.0110	0.9567
610	17,923,759	31,048,235	0	48,971,994	0.0073	0.9639
620	15,773,539	28,525,931	0	44,299,470	0.0066	0.9705
630	10,219,972	24,713,631	0	34,933,603	0.0052	0.9757
640	10,163,091	19,011,952	0	29,175,044	0.0043	0.9800
650	8,453,400	23,150,683	0	31,604,083	0.0047	0.9847
660	5,533,012	12,478,397	0	18,011,409	0.0027	0.9874

Table E-1.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
670	5,285,563	10,818,304	0	16,103,867	0.0024	0.9898
680	3,132,648	9,568,469	0	12,701,117	0.0019	0.9917
690	3,291,322	10,445,658	0	13,736,981	0.0020	0.9937
700	1,702,357	9,788,444	0	11,490,801	0.0017	0.9954
710	1,290,611	7,718,973	0	9,009,584	0.0013	0.9968
720	990,921	5,256,132	0	6,247,054	0.0009	0.9977
730	756,853	3,429,609	0	4,186,461	0.0006	0.9983
740	332,699	2,935,625	0	3,268,324	0.0005	0.9988
750	296,031	1,853,116	0	2,149,147	0.0003	0.9991
760	0	1,978,503	0	1,978,503	0.0003	0.9994
770	0	983,765	0	983,765	0.0001	0.9995
780	84,369	751,217	0	835,586	0.0001	0.9997
790	0	599,379	0	599,379	0.0001	0.9998
800	0	439,679	0	439,679	0.0001	0.9998
810	31,758	274,855	0	306,613	0.0000	0.9999
820	0	726,215	0	726,215	0.0001	1.0000
830	0	57,017	0	57,017	0.0000	1.0000
840	0	29,537	0	29,537	0.0000	1.0000
860	29,775	0	0	29,775	0.0000	1.0000
900	0	32,333	0	32,333	0.0000	1.0000
TOTAL	3,003,936,376	2,719,050,587	1,013,075,784	6,736,062,747		

Table E-2.--Population estimates by sex and size group for Pacific cod from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
100	0	0	44,033	44,033	0.0001	0.0001
110	0	54,662	1,012,678	1,067,340	0.0019	0.0020
120	269,268	554,707	4,324,788	5,148,764	0.0091	0.0111
130	189,299	1,780,887	9,235,349	11,205,535	0.0199	0.0309
140	531,994	1,587,435	9,456,874	11,576,303	0.0205	0.0515
150	797,505	493,638	8,471,187	9,762,331	0.0173	0.0688
160	1,543,900	1,589,754	4,364,568	7,498,221	0.0133	0.0820
170	2,437,369	2,396,508	4,541,833	9,375,710	0.0166	0.0987
180	2,898,735	3,712,580	3,364,480	9,975,796	0.0177	0.1163
190	4,528,156	3,667,662	2,797,174	10,992,992	0.0195	0.1358
200	5,071,540	5,623,631	1,479,747	12,174,917	0.0216	0.1574
210	6,296,895	4,403,715	533,663	11,234,273	0.0199	0.1773
220	6,205,751	5,652,228	332,856	12,190,835	0.0216	0.1989
230	3,644,340	2,922,774	68,759	6,635,872	0.0118	0.2106
240	3,308,153	3,888,869	0	7,197,022	0.0128	0.2234
250	4,018,942	4,308,053	0	8,326,995	0.0148	0.2381
260	5,739,164	5,542,135	0	11,281,299	0.0200	0.2581
270	7,622,153	8,662,060	0	16,284,213	0.0289	0.2870
280	7,698,801	9,852,353	0	17,551,153	0.0311	0.3181
290	8,815,082	10,055,644	0	18,870,726	0.0334	0.3515
300	9,832,060	10,940,393	0	20,772,453	0.0368	0.3883
310	10,917,068	11,822,913	0	22,739,981	0.0403	0.4286
320	11,273,597	9,555,394	0	20,828,990	0.0369	0.4655
330	10,050,867	8,723,588	0	18,774,454	0.0333	0.4988
340	8,859,247	9,024,151	0	17,883,398	0.0317	0.5305
350	8,394,928	6,144,514	0	14,539,442	0.0258	0.5562
360	7,598,929	5,400,382	0	12,999,311	0.0230	0.5793
370	5,067,999	5,658,085	0	10,726,083	0.0190	0.5983
380	4,408,599	4,620,610	0	9,029,209	0.0160	0.6143
390	3,390,624	4,114,912	0	7,505,536	0.0133	0.6276
400	6,082,843	4,729,715	0	10,812,558	0.0192	0.6467
410	4,750,812	3,990,238	0	8,741,049	0.0155	0.6622
420	7,233,623	5,784,917	0	13,018,540	0.0231	0.6853
430	5,652,226	5,674,174	0	11,326,401	0.0201	0.7054
440	6,258,156	7,000,778	0	13,258,934	0.0235	0.7289
450	7,337,797	7,099,182	0	14,436,979	0.0256	0.7544
460	6,002,301	5,452,929	0	11,455,229	0.0203	0.7747
470	4,761,048	6,259,639	0	11,020,687	0.0195	0.7943
480	5,319,567	4,506,597	0	9,826,164	0.0174	0.8117
490	4,566,173	4,088,659	0	8,654,832	0.0153	0.8270
500	4,755,941	4,524,165	0	9,280,106	0.0164	0.8434
510	3,653,570	3,388,245	0	7,041,815	0.0125	0.8559
520	3,770,681	2,922,998	0	6,693,679	0.0119	0.8678
530	2,754,219	2,488,729	0	5,242,948	0.0093	0.8771
540	2,520,933	2,222,337	0	4,743,270	0.0084	0.8855
550	2,434,834	1,047,334	0	3,482,168	0.0062	0.8916
560	1,725,047	1,858,666	0	3,583,713	0.0063	0.8980
570	1,014,861	789,493	0	1,804,354	0.0032	0.9012
580	1,138,143	1,249,237	0	2,387,380	0.0042	0.9054
590	1,301,245	1,736,486	0	3,037,731	0.0054	0.9108
600	1,808,670	1,319,615	0	3,128,286	0.0055	0.9163
610	3,011,226	949,654	0	3,960,879	0.0070	0.9234
620	1,018,590	1,775,956	0	2,794,546	0.0050	0.9283
630	1,439,055	741,340	0	2,180,395	0.0039	0.9322
640	1,059,014	534,257	0	1,593,271	0.0028	0.9350
650	996,605	980,147	0	1,976,752	0.0035	0.9385
660	932,095	974,781	0	1,906,875	0.0034	0.9419
670	2,055,339	816,378	0	2,871,717	0.0051	0.9470
680	1,087,605	1,073,106	0	2,160,711	0.0038	0.9508
690	930,732	1,013,861	0	1,944,592	0.0034	0.9542

Table E-2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
700	814,519	672,000	0	1,486,519	0.0026	0.9569
710	505,674	363,795	0	869,469	0.0015	0.9584
720	566,161	701,469	0	1,267,630	0.0022	0.9607
730	684,430	713,377	0	1,397,807	0.0025	0.9631
740	666,441	582,994	0	1,249,434	0.0022	0.9654
750	451,809	485,702	0	937,511	0.0017	0.9670
760	695,602	787,818	0	1,483,420	0.0026	0.9696
770	322,440	609,739	0	932,179	0.0017	0.9713
780	355,889	767,305	0	1,123,193	0.0020	0.9733
790	566,487	848,600	0	1,415,087	0.0025	0.9758
800	1,089,707	691,216	0	1,780,923	0.0032	0.9790
810	211,361	691,450	0	902,810	0.0016	0.9806
820	586,248	445,424	0	1,031,672	0.0018	0.9824
830	327,214	586,649	0	913,863	0.0016	0.9840
840	355,168	361,423	0	716,592	0.0013	0.9853
850	165,076	620,734	0	785,810	0.0014	0.9867
860	351,533	547,828	0	899,361	0.0016	0.9883
870	248,281	158,856	0	407,137	0.0007	0.9890
880	252,331	352,844	0	605,175	0.0011	0.9900
890	236,040	234,264	0	470,304	0.0008	0.9909
900	75,020	724,643	0	799,663	0.0014	0.9923
910	112,122	205,329	0	317,451	0.0006	0.9929
920	126,000	311,473	0	437,473	0.0008	0.9936
930	91,250	314,955	0	406,205	0.0007	0.9944
940	104,432	170,644	0	275,076	0.0005	0.9948
950	86,737	337,749	0	424,486	0.0008	0.9956
960	76,275	412,206	0	488,481	0.0009	0.9965
970	28,207	149,470	0	177,677	0.0003	0.9968
980	74,407	496,038	0	570,444	0.0010	0.9978
990	0	88,162	0	88,162	0.0002	0.9979
1000	200,182	64,354	0	264,536	0.0005	0.9984
1010	28,946	145,392	0	174,338	0.0003	0.9987
1020	0	170,270	0	170,270	0.0003	0.9990
1030	0	163,371	0	163,371	0.0003	0.9993
1040	28,946	124,825	0	153,770	0.0003	0.9996
1050	0	74,186	0	74,186	0.0001	0.9997
1060	0	32,666	0	32,666	0.0001	0.9998
1070	0	35,760	0	35,760	0.0001	0.9998
1090	0	30,070	0	30,070	0.0001	0.9999
1110	0	27,683	0	27,683	0.0000	0.9999
1170	0	33,693	0	33,693	0.0001	1.0000
TOTAL	259,268,844	255,084,277	50,027,988	564,381,108		

Table E-3.--Population estimates by sex and size group for yellowfin sole from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	0	1,182,174	0	1,182,174	0.0001	0.0001
90	2,364,348	2,447,398	0	4,811,746	0.0006	0.0007
100	5,806,830	2,447,398	0	8,254,229	0.0010	0.0017
110	7,725,087	10,236,280	0	17,961,367	0.0022	0.0039
120	17,678,735	27,948,533	0	45,627,268	0.0055	0.0094
130	35,681,652	38,087,972	0	73,769,624	0.0089	0.0184
140	54,163,446	69,390,953	0	123,554,399	0.0150	0.0333
150	76,441,065	95,339,508	0	171,780,573	0.0208	0.0541
160	101,255,293	95,412,205	0	196,667,498	0.0238	0.0779
170	103,227,721	87,806,525	0	191,034,246	0.0231	0.1011
180	102,611,279	113,461,809	0	216,073,089	0.0262	0.1272
190	160,072,324	111,943,247	0	272,015,571	0.0329	0.1602
200	153,676,828	141,842,503	0	295,519,330	0.0358	0.1959
210	174,911,069	138,654,216	0	313,565,285	0.0380	0.2339
220	193,805,291	198,991,777	0	392,797,068	0.0476	0.2815
230	201,692,814	207,802,228	0	409,495,042	0.0496	0.3311
240	246,578,149	212,250,741	0	458,828,890	0.0556	0.3866
250	227,624,879	220,056,134	0	447,681,013	0.0542	0.4408
260	232,801,483	226,861,592	0	459,663,075	0.0557	0.4965
270	245,907,052	230,947,329	0	476,854,381	0.0577	0.5542
280	250,678,834	229,417,802	0	480,096,636	0.0581	0.6123
290	254,423,113	239,841,975	0	494,265,087	0.0598	0.6722
300	253,164,272	251,514,893	0	504,679,166	0.0611	0.7333
310	240,069,056	260,903,153	0	500,972,209	0.0607	0.7940
320	176,145,977	250,326,274	0	426,472,252	0.0516	0.8456
330	118,441,846	259,699,416	0	378,141,262	0.0458	0.8914
340	63,002,160	252,796,121	0	315,798,281	0.0382	0.9296
350	38,725,838	186,482,769	0	225,208,607	0.0273	0.9569
360	14,072,976	128,568,151	0	142,641,128	0.0173	0.9742
370	9,309,188	87,074,016	0	96,383,204	0.0117	0.9858
380	2,198,204	62,096,786	0	64,294,990	0.0078	0.9936
390	1,737,065	22,899,363	0	24,636,428	0.0030	0.9966
400	0	15,878,990	0	15,878,990	0.0019	0.9985
410	76,825	9,150,537	0	9,227,362	0.0011	0.9996
420	0	1,227,801	0	1,227,801	0.0001	0.9998
430	0	233,338	0	233,338	0.0000	0.9998
440	0	809,906	0	809,906	0.0001	0.9999
450	0	718,365	0	718,365	0.0001	1.0000
TOTAL	3,766,070,699	4,492,750,181	0	8,258,820,880		

Table E-4.--Population estimates by sex and size group for rock sole from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	321,854	45,389	486,569	853,812	0.0001	0.0001
90	2,922,544	1,312,329	1,975,263	6,210,136	0.0007	0.0008
100	16,490,302	10,932,353	970,269	28,392,924	0.0031	0.0039
110	31,765,840	30,438,193	323,423	62,527,456	0.0069	0.0108
120	40,473,381	44,330,460	0	84,803,841	0.0094	0.0202
130	55,117,505	50,009,523	0	105,127,027	0.0116	0.0318
140	125,435,701	107,994,101	0	233,429,802	0.0258	0.0576
150	233,356,101	190,817,452	0	424,173,553	0.0468	0.1044
160	313,620,159	244,666,698	0	558,286,857	0.0616	0.1660
170	400,278,066	292,180,268	0	692,458,334	0.0764	0.2425
180	436,885,966	388,519,544	0	825,405,510	0.0911	0.3336
190	401,760,851	327,313,795	0	729,074,647	0.0805	0.4141
200	327,506,297	298,654,718	0	626,161,015	0.0691	0.4832
210	281,297,753	279,758,700	0	561,056,453	0.0619	0.5452
220	219,444,386	220,602,215	0	440,046,600	0.0486	0.5937
230	207,875,754	171,204,563	0	379,080,317	0.0419	0.6356
240	193,775,914	154,211,938	0	347,987,852	0.0384	0.6740
250	187,256,521	161,872,650	0	349,129,171	0.0385	0.7126
260	174,386,581	143,169,808	0	317,556,389	0.0351	0.7476
270	162,541,647	143,785,158	0	306,326,805	0.0338	0.7814
280	169,881,832	118,489,424	0	288,371,256	0.0318	0.8133
290	166,695,985	115,188,651	0	281,884,636	0.0311	0.8444
300	158,162,007	114,702,225	0	272,864,233	0.0301	0.8745
310	125,516,363	104,392,546	0	229,908,910	0.0254	0.8999
320	77,659,982	99,619,855	74,128	177,353,964	0.0196	0.9195
330	43,888,837	95,072,512	74,128	139,035,477	0.0153	0.9348
340	23,149,563	89,696,077	74,128	112,919,768	0.0125	0.9473
350	6,047,509	79,608,393	74,128	85,730,031	0.0095	0.9568
360	2,219,917	97,387,852	0	99,607,769	0.0110	0.9678
370	2,602,933	81,852,834	0	84,455,767	0.0093	0.9771
380	691,814	53,649,904	74,128	54,415,846	0.0060	0.9831
390	317,823	50,623,529	74,128	51,015,481	0.0056	0.9887
400	393,116	39,270,450	0	39,663,567	0.0044	0.9931
410	0	26,973,705	74,128	27,047,832	0.0030	0.9961
420	16,484	17,296,281	74,128	17,386,893	0.0019	0.9980
430	0	8,616,241	0	8,616,241	0.0010	0.9990
440	0	4,983,994	0	4,983,994	0.0006	0.9995
450	0	1,826,543	0	1,826,543	0.0002	0.9997
460	0	1,596,453	0	1,596,453	0.0002	0.9999
470	0	206,823	0	206,823	0.0000	0.9999
480	0	748,710	0	748,710	0.0001	1.0000
490	100,604	30,509	0	131,114	0.0000	1.0000
TOTAL	4,589,857,894	4,463,653,366	4,348,546	9,057,859,806		

Table E-5.--Population estimates by sex and size group for Hippoglossoides spp. from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	0	0	76,555	76,555	0.0000	0.0000
90	18,841	0	156,234	175,075	0.0001	0.0001
100	847,407	441,594	122,111	1,411,112	0.0005	0.0006
110	2,586,066	3,543,840	2,655,865	8,785,770	0.0032	0.0038
120	14,492,672	11,585,586	11,858,081	37,936,339	0.0139	0.0177
130	30,240,157	19,082,308	20,044,454	69,366,920	0.0254	0.0431
140	38,030,305	29,656,321	13,809,517	81,496,143	0.0298	0.0730
150	36,671,039	25,072,210	2,992,656	64,735,906	0.0237	0.0967
160	26,285,654	22,529,464	1,018,261	49,833,379	0.0183	0.1149
170	19,442,493	19,950,155	967,959	40,360,607	0.0148	0.1297
180	20,950,204	21,220,069	307,469	42,477,743	0.0156	0.1453
190	28,279,110	27,122,678	0	55,401,788	0.0203	0.1656
200	33,460,168	38,056,575	0	71,516,744	0.0262	0.1917
210	58,067,848	37,479,010	0	95,546,858	0.0350	0.2267
220	57,502,135	53,289,195	31,682	110,823,013	0.0406	0.2673
230	71,065,178	49,230,251	31,682	120,327,111	0.0441	0.3114
240	86,884,102	55,624,775	31,682	142,540,560	0.0522	0.3636
250	73,309,133	66,812,860	31,682	140,153,675	0.0513	0.4149
260	65,744,483	61,239,742	31,682	127,015,907	0.0465	0.4614
270	78,337,896	53,119,173	190,093	131,647,163	0.0482	0.5097
280	56,535,407	64,894,298	380,186	121,809,892	0.0446	0.5543
290	62,362,986	48,899,174	285,140	111,547,300	0.0409	0.5951
300	59,972,338	45,030,038	158,411	105,160,787	0.0385	0.6336
310	64,279,738	38,241,387	190,093	102,711,218	0.0376	0.6713
320	66,209,063	39,405,548	126,729	105,741,340	0.0387	0.7100
330	69,332,761	39,248,025	285,140	108,865,926	0.0399	0.7498
340	71,335,628	43,590,840	316,822	115,243,290	0.0422	0.7921
350	67,043,208	40,582,418	253,458	107,879,083	0.0395	0.8316
360	55,713,558	43,458,761	158,411	99,330,731	0.0364	0.8679
370	33,145,740	41,338,300	63,364	74,547,404	0.0273	0.8952
380	17,946,407	43,798,227	63,364	61,807,999	0.0226	0.9179
390	14,230,000	37,409,681	63,364	51,703,045	0.0189	0.9368
400	3,493,885	36,642,757	31,682	40,168,324	0.0147	0.9515
410	1,725,899	27,065,982	95,047	28,886,927	0.0106	0.9621
420	1,327,509	30,738,016	0	32,065,525	0.0117	0.9738
430	295,961	21,412,801	0	21,708,761	0.0080	0.9818
440	28,895	15,547,905	0	15,576,800	0.0057	0.9875
450	0	14,821,853	0	14,821,853	0.0054	0.9929
460	23,811	9,064,851	0	9,088,663	0.0033	0.9963
470	0	5,241,247	0	5,241,247	0.0019	0.9982
480	0	2,182,097	0	2,182,097	0.0008	0.9990
490	0	1,651,824	0	1,651,824	0.0006	0.9996
500	0	677,990	0	677,990	0.0002	0.9998
510	179,844	151,572	0	331,416	0.0001	1.0000
520	0	132,926	0	132,926	0.0000	1.0000
TOTAL	1,387,397,532	1,286,284,324	56,828,876	2,730,510,732		

Table E-6.--Population estimates by sex and size group for Alaska plaice from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
120	63,655	0	0	63,655	0.0001	0.0001
130	63,655	0	0	63,655	0.0001	0.0002
150	33,707	67,413	0	101,120	0.0001	0.0003
160	190,895	33,707	131,524	356,126	0.0005	0.0009
170	459,918	159,484	0	619,402	0.0009	0.0018
180	497,773	760,188	0	1,257,961	0.0018	0.0036
190	1,001,577	654,252	0	1,655,829	0.0024	0.0060
200	783,891	893,573	0	1,677,464	0.0024	0.0085
210	1,159,227	1,013,655	0	2,172,882	0.0032	0.0116
220	1,985,726	2,067,251	0	4,052,977	0.0059	0.0175
230	3,449,874	4,333,216	0	7,783,090	0.0114	0.0289
240	5,762,118	3,526,487	0	9,288,605	0.0136	0.0425
250	7,534,835	4,882,359	0	12,417,194	0.0181	0.0606
260	8,062,024	5,701,545	0	13,763,569	0.0201	0.0807
270	8,907,272	6,158,608	0	15,065,880	0.0220	0.1027
280	11,870,977	7,768,290	0	19,639,267	0.0287	0.1313
290	11,755,829	8,798,260	0	20,554,089	0.0300	0.1613
300	14,080,939	7,583,987	0	21,664,926	0.0316	0.1929
310	18,458,741	8,564,789	0	27,023,530	0.0394	0.2324
320	23,283,198	7,599,590	0	30,882,788	0.0451	0.2775
330	27,121,550	8,757,794	0	35,879,344	0.0524	0.3298
340	38,304,641	8,962,629	0	47,267,270	0.0690	0.3988
350	39,143,845	10,541,723	0	49,685,568	0.0725	0.4713
360	37,018,482	10,859,007	0	47,877,489	0.0699	0.5412
370	30,074,083	12,889,893	0	42,963,976	0.0627	0.6039
380	21,027,285	16,495,430	0	37,522,715	0.0548	0.6587
390	8,401,211	16,901,622	0	25,302,832	0.0369	0.6956
400	4,135,570	17,157,203	0	21,292,773	0.0311	0.7267
410	3,315,358	15,160,359	0	18,475,717	0.0270	0.7536
420	731,586	18,040,152	0	18,771,738	0.0274	0.7810
430	524,951	15,708,512	0	16,233,463	0.0237	0.8047
440	140,301	22,010,752	0	22,151,053	0.0323	0.8371
450	0	22,558,922	0	22,558,922	0.0329	0.8700
460	49,995	20,059,200	0	20,109,195	0.0293	0.8993
470	24,998	17,581,998	0	17,606,996	0.0257	0.9250
480	216,744	15,883,859	0	16,100,604	0.0235	0.9485
490	24,998	11,257,906	0	11,282,904	0.0165	0.9650
500	0	9,870,456	0	9,870,456	0.0144	0.9794
510	0	5,608,505	0	5,608,505	0.0082	0.9876
520	0	3,867,914	0	3,867,914	0.0056	0.9932
530	0	1,381,328	0	1,381,328	0.0020	0.9953
540	74,010	1,723,314	0	1,797,324	0.0026	0.9979
550	31,392	875,875	0	907,267	0.0013	0.9992
560	0	198,080	0	198,080	0.0003	0.9995
570	0	346,762	0	346,762	0.0005	1.0000
TOTAL	329,766,829	355,265,851	131,524	685,164,204		

Table E-7.--Population estimates by sex and size group for Greenland turbot from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
110	81,441	50,305	0	131,746	0.0061	0.0061
120	0	32,288	59,987	92,275	0.0043	0.0104
130	0	43,877	0	43,877	0.0020	0.0124
140	28,722	0	0	28,722	0.0013	0.0138
150	0	18,018	0	18,018	0.0008	0.0146
170	0	18,018	0	18,018	0.0008	0.0154
180	18,018	0	0	18,018	0.0008	0.0163
200	0	130,543	0	130,543	0.0061	0.0223
210	0	31,011	0	31,011	0.0014	0.0237
220	56,913	63,028	0	119,941	0.0056	0.0293
230	380,888	102,940	0	483,828	0.0224	0.0517
240	701,957	409,132	0	1,111,088	0.0515	0.1033
250	338,415	136,627	0	475,042	0.0220	0.1253
260	532,971	349,018	0	881,990	0.0409	0.1662
270	523,315	415,514	0	938,829	0.0435	0.2097
280	929,654	526,259	0	1,455,913	0.0675	0.2772
290	874,673	469,803	0	1,344,476	0.0623	0.3395
300	450,196	855,736	0	1,305,932	0.0605	0.4001
310	321,442	319,918	0	641,360	0.0297	0.4298
320	1,203,969	691,624	0	1,895,594	0.0879	0.5177
330	330,341	156,920	0	487,261	0.0226	0.5403
340	109,333	261,702	0	371,035	0.0172	0.5575
350	94,372	309,499	0	403,871	0.0187	0.5762
360	335,259	235,420	0	570,679	0.0265	0.6027
370	109,360	24,945	0	134,304	0.0062	0.6089
380	113,667	76,992	0	190,659	0.0088	0.6177
390	92,962	120,143	0	213,105	0.0099	0.6276
400	82,609	192,963	0	275,572	0.0128	0.6404
410	287,819	253,461	0	541,281	0.0251	0.6655
420	90,612	115,584	0	206,195	0.0096	0.6751
430	0	362,817	0	362,817	0.0168	0.6919
440	48,165	45,972	0	94,137	0.0044	0.6962
450	120,091	287,944	0	408,035	0.0189	0.7152
460	59,517	117,024	0	176,541	0.0082	0.7233
470	59,614	58,460	0	118,074	0.0055	0.7288
480	28,972	30,127	0	59,099	0.0027	0.7316
490	0	58,030	0	58,030	0.0027	0.7342
500	408,703	0	0	408,703	0.0189	0.7532
510	28,972	28,972	0	57,945	0.0027	0.7559
520	178,642	301,707	0	480,349	0.0223	0.7781
530	148,869	239,695	0	388,565	0.0180	0.7962
540	211,486	43,557	0	255,043	0.0118	0.8080
550	28,972	268,668	0	297,640	0.0138	0.8218
560	60,817	0	0	60,817	0.0028	0.8246
570	0	60,817	0	60,817	0.0028	0.8274
580	28,972	245,955	0	274,927	0.0127	0.8402
590	28,972	57,945	0	86,917	0.0040	0.8442
600	30,127	350,482	0	380,609	0.0176	0.8618
610	0	60,903	0	60,903	0.0028	0.8647
620	28,972	114,896	0	143,869	0.0067	0.8713
630	31,845	128,676	0	160,521	0.0074	0.8788
640	0	30,459	0	30,459	0.0014	0.8802
650	72,529	0	0	72,529	0.0034	0.8836
660	30,459	0	0	30,459	0.0014	0.8850
670	0	28,428	0	28,428	0.0013	0.8863
690	0	82,609	0	82,609	0.0038	0.8901
700	43,557	218,384	0	261,941	0.0121	0.9023
710	43,557	30,979	0	74,536	0.0035	0.9057
720	0	28,972	0	28,972	0.0013	0.9071
740	0	314,474	0	314,474	0.0146	0.9216

Table E-7.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
750	0	165,555	0	165,555	0.0077	0.9293
760	0	119,358	0	119,358	0.0055	0.9349
770	0	103,073	0	103,073	0.0048	0.9396
780	0	139,626	0	139,626	0.0065	0.9461
790	0	224,059	0	224,059	0.0104	0.9565
800	0	87,936	0	87,936	0.0041	0.9606
810	0	112,735	0	112,735	0.0052	0.9658
820	0	30,459	0	30,459	0.0014	0.9672
830	0	123,621	0	123,621	0.0057	0.9729
840	0	250,065	0	250,065	0.0116	0.9845
870	30,459	58,165	0	88,624	0.0041	0.9886
880	0	59,431	0	59,431	0.0028	0.9914
890	0	30,459	0	30,459	0.0014	0.9928
900	0	60,918	0	60,918	0.0028	0.9956
930	0	30,459	0	30,459	0.0014	0.9970
940	0	63,690	0	63,690	0.0030	1.0000
TOTAL	9,841,175	11,667,848	59,987	21,569,010		

Table E-8.--Population estimates by sex and size group for Atheresthes spp. from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	0	87,696	0	87,696	0.0001	0.0001
100	229,338	0	891,371	1,120,709	0.0015	0.0017
110	0	0	575,868	575,868	0.0008	0.0024
120	0	0	163,480	163,480	0.0002	0.0027
130	313,615	225,709	163,480	702,803	0.0010	0.0036
140	694,552	556,959	326,960	1,578,471	0.0022	0.0058
150	1,904,853	2,888,037	1,042,500	5,835,390	0.0080	0.0138
160	2,698,260	4,880,757	1,476,714	9,055,731	0.0124	0.0262
170	3,044,095	6,895,202	1,476,714	11,416,010	0.0157	0.0419
180	3,640,560	5,450,977	163,480	9,255,017	0.0127	0.0546
190	1,182,973	4,765,572	110,785	6,059,329	0.0083	0.0629
200	1,210,351	2,712,792	0	3,923,143	0.0054	0.0683
210	843,281	5,423,902	0	6,267,184	0.0086	0.0769
220	2,836,812	5,004,390	0	7,841,202	0.0108	0.0876
230	2,265,372	4,473,497	0	6,738,870	0.0092	0.0969
240	4,229,853	5,284,194	0	9,514,048	0.0131	0.1099
250	2,825,310	6,708,708	0	9,534,018	0.0131	0.1230
260	2,866,650	6,133,930	0	9,000,580	0.0123	0.1354
270	4,368,529	8,717,324	0	13,085,853	0.0180	0.1533
280	2,882,907	9,003,669	0	11,886,576	0.0163	0.1696
290	7,317,443	10,776,926	0	18,094,369	0.0248	0.1945
300	5,229,149	13,548,155	0	18,777,304	0.0258	0.2202
310	8,310,240	15,721,236	0	24,031,476	0.0330	0.2532
320	9,043,409	16,329,812	0	25,373,221	0.0348	0.2880
330	8,947,407	16,502,381	0	25,449,788	0.0349	0.3229
340	8,552,497	18,101,723	0	26,654,220	0.0366	0.3595
350	17,043,360	15,521,638	0	32,564,997	0.0447	0.4042
360	17,581,149	17,974,659	0	35,555,808	0.0488	0.4529
370	21,052,607	16,762,449	0	37,815,055	0.0519	0.5048
380	21,989,675	17,412,415	0	39,402,089	0.0541	0.5589
390	12,420,468	22,962,438	0	35,382,906	0.0485	0.6074
400	13,297,559	24,008,153	0	37,305,712	0.0512	0.6586
410	9,591,688	25,921,873	0	35,513,561	0.0487	0.7073
420	8,388,626	19,221,372	0	27,609,998	0.0379	0.7452
430	6,175,892	18,527,216	0	24,703,107	0.0339	0.7791
440	4,806,282	16,456,542	0	21,262,824	0.0292	0.8083
450	6,208,719	16,800,980	0	23,009,698	0.0316	0.8398
460	4,084,966	12,280,012	0	16,364,978	0.0225	0.8623
470	2,950,980	11,769,786	0	14,720,765	0.0202	0.8825
480	2,809,839	7,884,615	0	10,694,454	0.0147	0.8971
490	1,817,253	6,983,840	0	8,801,093	0.0121	0.9092
500	1,414,942	6,612,872	0	8,027,814	0.0110	0.9202
510	1,128,062	7,245,770	0	8,373,833	0.0115	0.9317
520	494,843	7,474,417	0	7,969,260	0.0109	0.9427
530	493,713	7,396,017	0	7,889,730	0.0108	0.9535
540	415,024	5,233,498	0	5,648,521	0.0077	0.9612
550	227,168	6,183,135	0	6,410,303	0.0088	0.9700
560	213,573	3,519,559	0	3,733,132	0.0051	0.9751
570	179,067	2,271,062	0	2,450,130	0.0034	0.9785
580	110,674	2,512,551	0	2,623,225	0.0036	0.9821
590	0	1,653,501	0	1,653,501	0.0023	0.9844
600	0	1,952,448	0	1,952,448	0.0027	0.9871
610	196,134	881,665	0	1,077,799	0.0015	0.9885
620	0	1,792,964	0	1,792,964	0.0025	0.9910
630	102,899	1,506,868	0	1,609,767	0.0022	0.9932
640	60,278	1,482,616	0	1,542,894	0.0021	0.9953
650	0	1,044,274	0	1,044,274	0.0014	0.9968
660	0	885,845	0	885,845	0.0012	0.9980
670	0	451,292	0	451,292	0.0006	0.9986
680	0	537,155	0	537,155	0.0007	0.9993
690	0	308,119	0	308,119	0.0004	0.9997
700	0	184,099	0	184,099	0.0003	1.0000
TOTAL	240,692,896	481,811,261	6,391,351	728,895,509		

Table E-9.--Population estimates by sex and size group for Pacific halibut from the 1992 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
190	0	0	60,263	60,263	0.0013	0.0013
210	0	0	89,301	89,301	0.0020	0.0033
220	0	0	116,276	116,276	0.0026	0.0058
230	39,910	0	32,114	72,024	0.0016	0.0074
240	0	0	151,355	151,355	0.0033	0.0107
250	0	0	324,955	324,955	0.0071	0.0179
260	0	0	306,665	306,665	0.0067	0.0246
270	0	0	219,089	219,089	0.0048	0.0294
280	39,910	0	446,227	486,137	0.0107	0.0401
290	0	0	228,616	228,616	0.0050	0.0451
300	0	0	379,400	379,400	0.0083	0.0534
310	0	0	279,165	279,165	0.0061	0.0595
320	0	0	314,104	314,104	0.0069	0.0664
330	0	0	208,593	208,593	0.0046	0.0710
340	0	0	131,317	131,317	0.0029	0.0739
350	0	0	299,459	299,459	0.0066	0.0805
360	0	0	665,630	665,630	0.0146	0.0951
370	28,264	0	266,154	294,419	0.0065	0.1015
380	28,264	0	691,335	719,600	0.0158	0.1173
390	0	0	605,197	605,197	0.0133	0.1306
400	28,264	0	1,051,766	1,080,031	0.0237	0.1543
410	0	0	1,474,582	1,474,582	0.0324	0.1867
420	109,368	0	1,017,195	1,126,563	0.0247	0.2114
430	0	125,987	1,330,520	1,456,507	0.0320	0.2433
440	28,264	36,586	1,540,237	1,605,087	0.0352	0.2786
450	34,994	49,799	1,811,316	1,896,110	0.0416	0.3202
460	74,365	56,245	2,235,665	2,366,275	0.0519	0.3721
470	129,417	39,910	2,503,457	2,672,785	0.0586	0.4307
480	36,586	103,374	2,625,689	2,765,649	0.0607	0.4914
490	146,345	28,264	2,095,790	2,270,398	0.0498	0.5412
500	27,950	0	2,328,925	2,356,876	0.0517	0.5930
510	174,503	86,385	1,471,823	1,732,711	0.0380	0.6310
520	30,202	73,172	1,771,798	1,875,172	0.0411	0.6721
530	84,794	114,995	1,873,125	2,072,914	0.0455	0.7176
540	79,820	36,586	1,454,989	1,571,395	0.0345	0.7521
550	0	0	1,057,884	1,057,884	0.0232	0.7753
560	36,586	36,586	815,338	888,510	0.0195	0.7948
570	28,051	68,174	573,669	669,894	0.0147	0.8095
580	0	0	240,806	240,806	0.0053	0.8148
590	0	0	584,183	584,183	0.0128	0.8276
600	0	36,586	376,401	412,987	0.0091	0.8367
610	0	49,799	77,453	127,252	0.0028	0.8395
620	0	0	181,489	181,489	0.0040	0.8434
630	0	0	268,021	268,021	0.0059	0.8493
640	0	0	194,146	194,146	0.0043	0.8536
650	0	49,799	311,795	361,595	0.0079	0.8615
660	0	0	188,200	188,200	0.0041	0.8656
670	0	0	247,346	247,346	0.0054	0.8711
680	0	0	273,683	273,683	0.0060	0.8771
690	0	0	329,470	329,470	0.0072	0.8843
700	0	0	160,401	160,401	0.0035	0.8878
710	0	0	134,411	134,411	0.0029	0.8908
720	0	0	258,451	258,451	0.0057	0.8965
730	0	0	182,274	182,274	0.0040	0.9005
740	0	0	98,952	98,952	0.0022	0.9026
750	0	0	160,451	160,451	0.0035	0.9061
760	0	0	84,425	84,425	0.0019	0.9080
770	0	0	97,575	97,575	0.0021	0.9101
780	0	49,799	95,159	144,959	0.0032	0.9133
790	0	0	184,534	184,534	0.0040	0.9174
800	0	27,950	275,204	303,154	0.0067	0.9240
810	0	0	114,328	114,328	0.0025	0.9265

Table E-9.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
820	0	39,910	81,748	121,658	0.0027	0.9292
830	0	0	92,238	92,238	0.0020	0.9312
840	0	0	91,655	91,655	0.0020	0.9332
850	0	0	188,451	188,451	0.0041	0.9374
860	0	0	206,093	206,093	0.0045	0.9419
870	0	0	69,716	69,716	0.0015	0.9434
880	0	0	226,266	226,266	0.0050	0.9484
890	28,051	0	174,076	202,127	0.0044	0.9528
900	0	0	184,680	184,680	0.0041	0.9569
910	0	0	168,988	168,988	0.0037	0.9606
920	0	0	128,515	128,515	0.0028	0.9634
930	0	0	77,577	77,577	0.0017	0.9651
940	0	0	151,705	151,705	0.0033	0.9684
950	0	0	109,063	109,063	0.0024	0.9708
960	0	39,910	277,206	317,115	0.0070	0.9778
970	0	0	60,543	60,543	0.0013	0.9791
980	27,950	0	85,372	113,322	0.0025	0.9816
1000	0	0	89,135	89,135	0.0020	0.9836
1010	0	0	24,969	24,969	0.0005	0.9841
1020	0	0	101,531	101,531	0.0022	0.9863
1030	0	0	93,033	93,033	0.0020	0.9884
1040	0	0	101,345	101,345	0.0022	0.9906
1060	0	0	27,507	27,507	0.0006	0.9912
1070	0	0	50,796	50,796	0.0011	0.9923
1100	0	0	55,940	55,940	0.0012	0.9935
1160	0	0	28,004	28,004	0.0006	0.9942
1180	0	0	32,131	32,131	0.0007	0.9949
1200	0	0	44,132	44,132	0.0010	0.9958
1210	0	0	55,959	55,959	0.0012	0.9971
1220	0	0	29,725	29,725	0.0007	0.9977
1230	0	0	28,232	28,232	0.0006	0.9983
1270	0	0	28,474	28,474	0.0006	0.9990
1280	0	0	27,976	27,976	0.0006	0.9996
1310	0	19,659	0	19,659	0.0004	1.0000
TOTAL	1,241,859	1,169,478	43,160,925	45,572,261		