



NOAA Technical Memorandum NMFS-AFSC-185

Data Report: 2004 Aleutian Islands Bottom Trawl Survey

by
C. N. Rooper and M. E. Wilkins

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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ABSTRACT

Ninth in a series dating from 1980, the third biennial groundfish assessment survey of the Aleutian Islands region was conducted during the summer of 2004 by the Alaska Fisheries Science Center's (AFSC) Resource Assessment and Conservation Engineering (RACE) Division. The survey area covered the continental shelf and upper continental slope to 500 m in the Aleutian Archipelago from Islands of Four Mountains (170° W long.) to Stalemate Bank (170° E long.), including Petrel Bank and Petrel Spur (180° long.), and the northern side of the Aleutian Islands between Unimak Pass (165° W long.) and Islands of Four Mountains. The survey was conducted aboard two chartered trawlers, the FV *Gladiator*, and FV *Sea Storm*. Samples were collected successfully at 420 survey stations using standard RACE Division Poly Nor'Eastern high-opening bottom trawl nets with rubber bobbin roller gear. The primary survey objectives were to define the distribution and estimate the relative abundance of principal groundfish and commercially or ecologically important invertebrate species that inhabit the Aleutian marine habitat and to collect data to define biological parameters useful to fisheries researchers and managers such as growth rates; length-weight relationships; feeding habits; and size, sex, and age compositions. Atka mackerel (*Pleurogrammus monopterygius*) were the most abundant species in the survey area with an estimated biomass greater than 1,115,000 metric tons (t). Pacific ocean perch (*Sebastes alutus*; POP) were the most abundant species of rockfish and catches of POP were high throughout the survey area at intermediate depths. Arrowtooth flounder (*Atheresthes stomias*) were the dominant flatfish species and were ubiquitous across the entire survey area. The skate assemblage was comprised of predominantly three species: whiteblotched skate (*Bathyraja maculata*), Aleutian skate (*B. aleutica*), and Alaska skate (*B. parmifera*), with a wide diversity of skate species captured in the eastern portion of the survey area. Survey results are presented as estimates of catch per unit of effort and biomass, species distribution and relative abundance, length frequency distribution, and length-weight relationships for commercially important species and for others of biological interest.

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INTRODUCTION

The 2004 biennial bottom trawl survey of the Aleutian Islands region was conducted from 1 June through 9 August by the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), National Marine Fisheries Service (NMFS), Seattle, Washington. It was the ninth comprehensive NMFS bottom trawl survey conducted since 1980. The surveys conducted prior to 1991 were cooperative efforts involving U.S. and Japanese scientists and vessels. From 1991 to 2000 the surveys were planned and conducted on a triennial basis by NMFS, employing chartered U.S. fishing vessels. Biennial surveys began in 2000. The primary focus of these surveys is to build a standardized data time series to assess, describe, and monitor the distribution, abundance, and biological condition of Aleutian groundfish and invertebrate stocks. This report presents 2004 survey results for the principal fish species in each of four North Pacific Fishery Management Council (NPFMC) regulatory areas: Southern Bering Sea, and Eastern, Central, and Western Aleutians. No detailed comparisons to previous surveys are made in this report, however most time-series of principal groundfish and invertebrate species are available through the AFSC Resource Ecology and Ecosystem Modeling website (<http://access.afsc.noaa.gov/reem/ecoweb/Index.cfm>). The specific survey objectives were to: 1) obtain data from which to estimate the abundance of principal groundfish species, 2) define the distribution of principal groundfish and invertebrate species that inhabit the Aleutian region, 3) collect data to define biological parameters including; age, growth rates, length-weight relationships, feeding habits, and size and sex compositions, 4) collect specimens and data as requested by other researchers or research groups. Special collections were made for researchers at the University of Washington, University of Alaska, Fairbanks, California Academy of Sciences, U.S. Fish and Wildlife Service, Auke Bay Laboratories (AFSC), Resource Ecology and Fisheries Management (REFM) Division (AFSC), and RACE Division (AFSC). Projects and special collections included: snailfish species identification, juvenile Pacific ocean perch energetics, harlequin and sharpchin rockfish maturity, northern rockfish and Atka mackerel genetics, marine mammal prey items, non-commercial crabs, crangonid shrimp, hermit crabs, skate species identification, cephalopod species identification, squat lobster collections, collections of ascidians, gorgonian corals and sponges, as well as testing net mensuration equipment, light effects on trawl catches and observations of seabirds.

METHODS

Survey Area

The Aleutian region is an extensive archipelago of volcanic origin typified by a relatively narrow continental shelf and a steep continental slope that drops quickly into the Aleutian Trench on the south side and into the Aleutian Basin and Bowers Basin on the north side (Fig. 1). The islands are separated by numerous deep passes and relatively narrow channels. Strong currents flow through the passes and across the shelf, sometimes making sampling operations difficult. The continental shelf and upper continental slope are typified by hard and sometimes irregular terrain. Extending over 900 nautical miles (nmi) from east to west, the survey area is composed of the continental shelf and upper slope from Islands of Four Mountains (170° W long.) to Stalemate Bank (170° E long.), including Petrel Bank and Petrel Spur (180° long.), and the northern side of the archipelago between Unimak Pass (165° W long.) and Islands of Four

Mountains (Fig. 1). Survey depths range from nearshore waters to 500 m. The total area surveyed is more than 64,415 km² (Table 1). The Western Aleutians area represents 24% of the total survey area, the Central Aleutians area almost 26%, the Eastern Aleutians area 39%, and the Southern Bering Sea area comprises about 11%. In terms of depth, the 1-100 m and 101-200 m depth intervals comprise 33.5% and 30.4%, respectively. Reflecting the fact that the upper continental slope is narrow and steep in many places, the area represented by the 201-300 m and 301-500 m depth intervals are 14.4% and 21.7%, respectively.

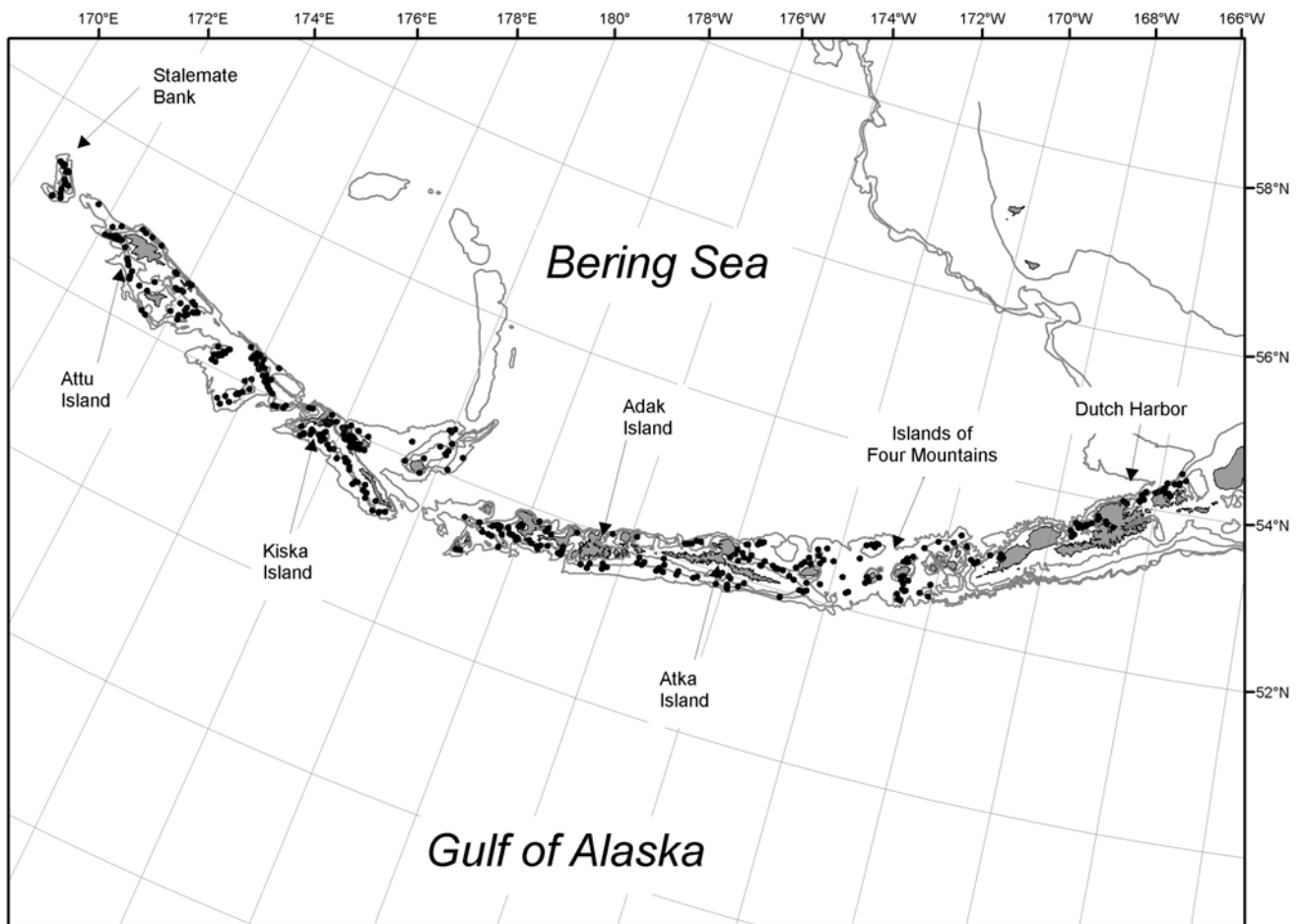


Figure 1. -- Locations of trawl hauls (black dots) performed during the 2004 bottom trawl survey of the Aleutian Islands.

Vessels

Since the inception of the Aleutian Islands bottom trawl survey series in 1980, commercial trawlers and crew have been chartered to conduct the survey operations under the supervision and guidance of RACE Groundfish Assessment Program staff. Two vessels (occasionally three) have been chartered each year the survey has been done. Since these

surveys generate data for a time series to describe trends in abundance, distribution, and population biology characteristics of managed resources, it is essential that the methods employed are standardized. Stringent standards for selecting charter vessels are specified whenever new charters are arranged to ensure that the sampling platforms can adequately collect samples and do so in as similar a manner as possible within and between years. As such, vessels and crews must meet minimum criteria in terms of size, main engine horsepower, fishing machinery, skipper and crew experience, and navigational and safety equipment. Continuity of suitable platforms has been further enhanced in the past decade through the use of multi-year charters, assuring both the government and the contractors a stable planning situation for as much as 4 years at a time.

In 2004 two U.S. commercial fishing vessels, F/V *Sea Storm* and F/V *Gladiator*, were chartered to conduct the Aleutian Islands bottom trawl survey. Both vessels are house-forward stern trawlers with stern ramps; aft net storage reels (mounted over the stern ramp); telescoping deck cranes; propeller nozzles; and paired, controlled-tension hydraulic trawl winches containing between 1,645 and 2,200 m of 2.54 cm diameter steel cable. The *Sea Storm* is 37.5 m in overall length (LOA) and is powered by a single 1,710 continuous horsepower (HP) main engine. The *Gladiator* is 38 m LOA with a 1,725 HP main engine. Aboard both vessels electronic equipment included global positioning system (GPS) receivers and plotters, at least two radars, single sideband and VHF radios, echosounders with color video or paper displays, and auto-pilots. Captain Dan Clark operated the *Gladiator* and Captain Steve Branstiter operated the *Sea Storm*.

Fishing Gear

The fishing gear and protocols for deployment are described in detail in Stauffer (2004). Both vessels used standard RACE Division Poly Nor'Eastern high-opening bottom trawls with 24.2 m roller gear constructed with 36 cm rubber bobbins separated by 10 cm rubber disks. The fishing dimensions of the trawls were measured using Scanmar acoustic net mensuration equipment mounted on the wing-tips and headrope of the trawl. Each trawl was measured and certified as conforming to standard measurements prior to its use in the survey.

Survey Design

For this survey the Aleutian region is divided into four major areas based on geographic features and NPFMC regulatory areas. Those areas are further divided into 45 area-depth strata or subareas (Appendix A). Survey depth intervals are as follows: 1-100, 101-200, 201-300, and 301-500 m. Naming conventions to designate direction and relative geographic locations of subareas in text, figures, and tables use the abbreviations N, S, E, and W (or their combinations; i.e., NW) for the four major points of the compass. Most of the areas suitable to deploy the RACE standard research trawl and to meet trawl duration and performance criteria have been reasonably well defined during past Aleutian Islands surveys. Consistent with recent RACE Division assessment surveys (Martin and Clausen 1995, Stark and Clausen 1995, Munro and Hoff 1995, Martin 1997, Britt and Martin 2001), sample allocations for each stratum were determined using a modified Neyman optimum allocation sampling strategy (Cochran 1977).

A maximum of 420 tows was set as the number of tows that we could expect to perform given survey time and vessel scheduling restrictions, expected weather days, and time lost to gear repairs. The number of stations allocated to each stratum was based on catches of the 20 most important groundfish species captured from the previous five surveys and the ex-vessel values of those species. Most of the 420 allocated tow locations were selected randomly without replacement from a database of previously conducted tows, but to satisfy the sampling requirements in certain strata, it was necessary to add some stations at previously unsampled locations. To avoid duplicate effort at a given geographic site, no two stations could be < 1 km apart. Every stratum was allocated at least two stations.

Assigned sample densities were highest in the 101-200 m and 201-300 m depth intervals at about 5 to 10 tows per 1,000 km² (Table 1). The overall sample density was 6.52 tows per 1,000 km². If an allocated station could not be occupied due to fishing gear conflicts or untrawlable bottom, alternate sites in the same stratum were sought. To locate new or alternate tow sites, search patterns were run within the proper stratum using an echosounder to locate seafloor where a successful tow could be conducted. Search time at a given site was limited to 2 hours.

Table 1. -- Stations allocated, attempted, successfully completed, and sampling density for the 2004 Aleutian Islands bottom trawl survey by NPFMC area and depth interval.

NPFMC area	Depth range (m)	Stations allocated	Stations attempted	Stations successful	Area (km²)	Stations/1,000 km²
Western Aleutians	1 - 100	23	25	23	4,877	4.72
	101 - 200	62	70	62	5,318	11.66
	201 - 300	25	25	25	1,724	14.50
	301 - 500	14	14	14	3,272	4.28
	All depths	124	134	124	15,190	8.16
Central Aleutians	1 - 100	32	34	31	5,847	5.30
	101 - 200	48	52	48	4,606	10.42
	201 - 300	31	34	31	2,109	14.70
	301 - 500	21	23	21	3,981	5.28
	All depths	132	143	131	16,543	7.92
Eastern Aleutians	1 - 100	15	19	15	6,848	2.19
	101 - 200	42	44	42	7,768	5.41
	201 - 300	33	43	33	4,901	6.73
	301 - 500	22	28	22	5,683	3.87
	All depths	112	134	112	25,200	4.44
Southern Bering Sea	1 - 100	32	34	33	4,026	8.20
	101 - 200	8	8	8	1,849	4.33
	201 - 300	4	5	4	564	7.09
	301 - 500	8	13	8	1,043	7.67
	All depths	52	60	53	7,482	7.08
All areas	1 - 100	102	112	102	21,598	4.72
	101 - 200	160	174	160	19,540	8.19
	201 - 300	93	107	93	9,298	10.00
	301 - 500	65	78	65	13,979	4.65
	All depths	420	471	420	64,415	6.52

Trawl Performance Data Collection

Bottom trawl hauls were conducted according to the protocols set out in Stauffer (2004). The goal of each tow was for the net to arrive quickly on bottom in towing configuration at the standard towing speed of 3 knots and to maintain the vessel speed while the net held its fishing configuration with proper bottom contact for 15 minutes. To reduce potential fishing power

differences between the vessels, standard scope ratio tables of trawl warp relative to bottom depth were used. Towing time was abbreviated on some occasions to avoid gear damage or when echosounder or net mensuration data suggested the net configuration deviated from the expected ranges. The date, time, and GPS-generated position were recorded every 6 seconds during each tow. Pressure at depth (transformed as estimated depth), water temperature, and time were recorded every 6 seconds during most tows using a SeaBird Model 39 data logger which was attached near the middle of the trawl headrope. During the tow the vertical and horizontal trawl openings were measured with Scanmar net sonde units. A bottom contact sensor was attached to the midpoint of the roller gear to record the date, time, and tilt angle relative to bottom, indicating the degree of contact with the bottom. Surface water temperatures were collected with a bucket thermometer during the tow retrieval. At the end of each tow, retrieval started with the vessel maintaining or increasing towing speed with the objective of lifting the trawl quickly away from the bottom. All tows were performed during daylight hours within the period between one-half hour after sunrise and one-half hour before sunset. All of the trawl performance data collected during the tow was judged after its completion using computer-generated graphics and data summaries. A trawl sample was considered to be successful if horizontal and vertical net openings remained within a predetermined normal range, the roller gear maintained consistent contact with the bottom, the net suffered little or no damage during the tow, there were no significant encounters with derelict fishing gear, and tow duration was at least 10 minutes.

Catch Processing and Data Collection

Catches were sorted to species (or species group for some invertebrates) then weighed using an electronic motion-compensating scale. Species catches weighing more than about 2 kg were weighed to the nearest 10 g on a Marel Model M1100 electronic digital platform scale, while species catches weighing less than 2 kg were weighed to the nearest 2 g on a Marel Model M60 scale. In some cases where the total catch was > 1,100 kg but could still be lifted safely off the deck using the vessel crane, the entire catch was weighed using a dynamometer. In these cases, all non-dominant species were weighed using the platform scale. The total weight of the dominant species was calculated by subtracting the aggregate non-dominant species weight from the weight of the entire catch. For extremely large catches that could not be safely lifted off the deck, the total catch weight was estimated volumetrically.

A random sample of up to 200 length frequencies were collected for each of the major species. A target tow-by-tow length frequency sample size was pre-assigned for each species. A smaller length frequency sample was collected for some minor catch components such as sculpins. Most individuals were sexed prior to measurement. All skates and Pacific halibut (scientific names for all species are listed in Appendix Tables B1 and B2) were measured. Unsexed length frequencies were collected for forage fish such as herring, capelin, and eulachon. Individual lengths were measured with barcode-reader data loggers and barcoded length boards, and data were downloaded into a catch database after each tow. Pacific halibut were immediately measured and released if not retained for biological samples. Halibut catch weights were estimated by applying a length-weight relationship supplied by the International Pacific Halibut Commission to length frequency data.

Age structures (otoliths) were collected for requested species. Separate collections were made from each of the four major subareas. Samples were stratified by sex and size with a specified number of otoliths collected per centimeter length interval. Limits were placed on the number collected per sex-centimeter per day to distribute the sample evenly over each area. Length was measured to the nearest centimeter and weight to the nearest 2-10 g. Fork length or total lengths were measured for all fish species except grenadiers (snout to insertion of anal fin). Stomach samples were collected for selected species throughout the survey area by biologists from the AFSC's Resource Ecology and Ecosystem Management Program.

Data Analysis

Biomass estimates were calculated using the area-swept method (Alverson and Pereyra 1969). The area swept by the trawl was calculated as the product of the distance towed (km) and the mean net spread (m) for each tow. The distance towed was estimated as the distance traveled derived from smoothed GPS positions from when the net was on-bottom to when the net was off-bottom, as determined by net mensuration data. The mean net spread was estimated from the smoothed Scanmar net spread readings collected between on-bottom and off-bottom.

For each species, a catch-per-unit-of-effort (CPUE) was calculated for each tow by dividing catch weight (kg) by the area swept by the trawl (hectares, ha). The mean CPUE for each stratum was calculated as the mean of the individual tow CPUEs (including zero catches) within the stratum. Mean CPUEs for combined strata were calculated as the weighted average of the individual stratum CPUE means (weighted by stratum area). Biomass estimates (metric tons (t)) were calculated by multiplying each stratum mean CPUE by the stratum area and summing the results to obtain estimates by NPFMC regulatory area and depth interval. The 95% confidence interval was calculated for each species biomass estimate. A detailed description of the analytical procedures is presented in Wakabayashi et al. (1985).

Population length compositions were estimated by expanding the length frequencies to the total catch for each species by length and sex category at each station (Wakabayashi et al. 1985). The stratum population within a sex-length category was calculated by multiplying the stratum population by the proportion of fish in that category from the summed station data. Population size composition estimates were summed over strata to derive estimates by area. Length-weight data collected from individual fish were used to establish length-weight relationships based on a nonlinear least-squares regression algorithm. The length-weight relationship was expressed as:

$$W = a * L^b ,$$

where W is weight in grams, L is length in millimeters and a and b are the fitted parameters. The parameter estimates for major species are given in Appendix C.

Data Limitations

Due to the multi-species nature of this survey, there are some limitations to its ability to estimate fish abundance. Populations whose entire depth range is not covered by the survey are

not fully sampled (e.g., sablefish and shortspine thornyhead). Populations that extend into areas untrawlable with the survey gear or that occupy the water column above the headrope of the trawl are not fully represented (e.g., many rockfish species). Populations of species that exhibit a highly contagious distribution pattern (e.g., Atka mackerel and rockfishes) might be better sampled with a different survey design. The survey trawl exhibits size selectivity (small fish are more likely to escape through the meshes). For these reasons, survey estimates of abundance are considered more reliable for species that are widely and more uniformly distributed and survey biomass estimates should be considered relative measures of abundance.

RESULTS

Out of a total of 471 attempted tows, 420 were successful. All successful tows were included in the biomass and size composition analysis (Table 1). Net height and spread were measured for all but seven survey hauls (for these hauls net dimensions were estimated from other bottom trawl hauls). Temperatures were successfully recorded for all but 16 tows. Average bottom temperatures ranged from 3.1° to 7.0°C, but the vast majority ranged from 3.5° to 5.0°C. Sea surface temperatures ranged from 4.0° to 10.9°C.

Results by Area

Over 150 species of fish from 28 families and 400 invertebrate species or taxa from 10 phyla were captured during the 2004 survey. Appendix B presents lists of fish (Appendix B-1) and invertebrate (Appendix B-2) species encountered during the survey. This report deals largely with the major groundfish species. Relative abundance estimates, reported as CPUE (kg/ha), are presented in Table 2 for the 20 most abundant groundfish species in each of the four NPFMC regulatory areas covered by the survey, the combined Aleutian areas, and the entire survey region. Atka mackerel was the most abundant species captured over the entire survey region (Table 2), followed by Pacific ocean perch (POP), giant grenadier and northern rockfish. Atka mackerel and POP generated the two highest mean CPUEs in the Western and Central Aleutians areas. Atka mackerel and giant grenadier were the most abundant species in the Eastern Aleutians area. In the Southern Bering Sea area Atka mackerel, walleye pollock, and Pacific ocean perch mean CPUEs were exceptionally high compared to all other species in the area. Pacific cod, an important Aleutian groundfish species, was more or less uniformly distributed throughout the survey area, but at levels much lower than Atka mackerel or POP.

Results by Species

More detailed species-specific accounts are provided below. Some minor species of biological interest such as sculpins have been grouped. Generally, the following items are presented for most, but not all species: 1) a short summary of the data collected and data analysis; 2) a table showing the number of hauls, the number of hauls with catch, mean CPUE, estimated biomass and confidence intervals, mean length and mean weight of that species by NPFMC area and depth interval; 3) a table showing mean CPUE and estimated biomass confidence intervals by subarea and depth stratum; 4) figures showing the station distribution and CPUE; and 5) figures showing the estimated size composition of the population by NPFMC area and depth interval. The distribution maps show relative abundance classified as: 1) no

catch, 2) sample CPUE less than mean CPUE, 3) sample CPUE between mean CPUE and two standard deviations (SD) above mean CPUE, 4) sample CPUE between two and four SDs, and 5) sample CPUE greater than four SDs above the mean CPUE.

Table 2. -- Mean CPUE (kg/ha) for the 20 most abundant groundfish and total sampling effort for each NPFMC regulatory area from the 2004 Aleutian Islands bottom trawl survey.

<u>Western Aleutians Area</u>	<u>CPUE</u>	<u>Central Aleutians Area</u>	<u>CPUE</u>	<u>Eastern Aleutians Area</u>	<u>CPUE</u>
Atka mackerel	247.80	Atka mackerel	162.80	Atka mackerel	96.84
Pacific ocean perch	139.98	Pacific ocean perch	92.39	Giant grenadier	71.90
Northern rockfish	96.23	Giant grenadier	34.64	Pacific ocean perch	54.41
Arrowtooth flounder	11.45	Northern rockfish	16.35	Walleye pollock	44.46
Shortraker rockfish	10.75	Northern rock sole	13.51	Pacific cod	20.58
Whiteblotched skate	8.66	Pacific cod	12.52	Arrowtooth flounder	16.77
Shortspine thornyhead	7.90	Kamchatka flounder	11.64	Pacific halibut	8.98
Northern rock sole	6.87	Arrowtooth flounder	11.14	Kamchatka flounder	4.48
Giant grenadier	6.35	Walleye pollock	7.03	Northern rockfish	4.12
Pacific cod	6.34	Shortraker rockfish	5.29	Northern rock sole	4.08
Walleye pollock	4.35	Rougheye rockfish	4.58	Whiteblotched skate	3.80
Alaska skate	4.17	Aleutian skate	3.51	Shortraker rockfish	2.98
Kamchatka flounder	3.67	Pacific halibut	2.82	Rougheye rockfish	2.19
Pacific halibut	2.92	Shortspine thornyhead	2.63	Yellow Irish lord	1.63
flathead sole	2.83	Alaska skate	2.20	Octopus unident.	1.35
Rex sole	1.91	Sablefish	1.88	Aleutian skate	1.10
Greenland turbot	1.70	Greenland turbot	1.78	Rex sole	1.04
Magistrate armhook squid	1.47	Whiteblotched skate	1.77	Alaska skate	1.02
Aleutian skate	1.40	Yellow Irish lord	1.40	Greenland turbot	1.02
Rougheye rockfish	0.78	Rex sole	1.25	Flathead sole	1.00
Number of hauls	124	Number of hauls	131	Number of hauls	112

<u>Combined Aleutian Areas</u>	<u>CPUE</u>	<u>Southern Bering Sea Area</u>	<u>CPUE</u>	<u>All Areas</u>	<u>CPUE</u>
Atka mackerel	156.28	Atka mackerel	357.62	Atka mackerel	179.67
Pacific ocean perch	88.28	Walleye pollock	314.99	Pacific ocean perch	89.54
Giant grenadier	43.58	Pacific ocean perch	99.19	Walleye pollock	56.81
Northern rockfish	32.25	Pacific cod	42.72	Giant grenadier	38.52
Walleye pollock	22.88	Arrowtooth flounder	22.60	Northern rockfish	29.43
Pacific cod	14.44	Southern rock sole	15.16	Pacific cod	17.72
Arrowtooth flounder	13.72	Pacific halibut	12.86	Arrowtooth flounder	14.75
Northern rock sole	7.56	Northern rock sole	11.82	Northern rock sole	8.06
Kamchatka flounder	6.34	Flathead sole	8.28	Pacific halibut	6.42
Shortraker rockfish	5.72	Rex sole	8.19	Kamchatka flounder	6.09
Pacific halibut	5.58	Northern rockfish	7.99	Shortraker rockfish	5.16
Whiteblotched skate	4.50	Harlequin rockfish	5.57	Whiteblotched skate	4.08
Shortspine thornyhead	3.04	Greenland turbot	4.32	Shortspine thornyhead	2.84
Rougheye rockfish	2.51	Kamchatka flounder	4.15	Rougheye rockfish	2.32
Alaska skate	2.20	Sablefish	2.20	Rex sole	2.13
Aleutian skate	1.88	Yellow Irish lord	2.04	Flathead sole	2.06
Greenland turbot	1.42	Dusky rockfish	1.82	Alaska skate	1.98
Rex sole	1.33	Shortspine thornyhead	1.26	Southern rock sole	1.86
Flathead sole	1.25	Aleutian skate	1.10	Aleutian skate	1.79
Yellow Irish lord	1.20	Rougheye rockfish	0.87	Greenland turbot	1.76
Number of hauls	367	Number of hauls	53	Number of hauls	420

Flatfish

Arrowtooth flounder (*Atheresthes stomias*)

Arrowtooth flounder was the most abundant flatfish species in the survey area. Its relative abundance was highest in the Eastern Aleutians area and the Southern Bering Sea area (Table 2), much higher than the mean CPUE in the Western or Central Aleutians areas. This species was distributed throughout the entire survey area and in all depth intervals (Table 3, Fig. 2). Mean CPUE was highest in the 201-300 m depth interval in the combined Aleutian areas and in the 301-500 m interval in the Southern Bering Sea area. The estimated biomass was 94,999 t, 44% of which was found in the Eastern Aleutians area. In the 19 subareas and depth strata where arrowtooth flounder was most abundant, virtually every trawl haul produced arrowtooth flounder (Table 4). The species was not particularly abundant or highly concentrated but was widely distributed. Many stations produced CPUEs within the range of mean CPUE to two standard deviations above the mean (Fig. 2).

Mean length and weight of arrowtooth flounder increased with depth (Table 3) and were slightly larger in the combined Aleutian areas than in the Southern Bering Sea area. Maximum lengths of males were shorter than females (Fig. 3) and females were more abundant in the deeper strata.

Kamchatka flounder (*Atheresthes evermanni*)

Relative abundance of Kamchatka flounder was highest in the Central Aleutian Islands where it was more abundant than all other flatfish except northern rock sole (Table 2). This species was least abundant in the Western Aleutians area. Total estimated biomass was about 39,200 t, almost all of which was found in the 301-500 m depth interval (Table 5). It is possible that this species is also abundant in deeper, unsampled depths, since the results of the 1980 U.S.-Japan cooperative trawl survey showed that 31% of the total Aleutian biomass of arrowtooth and Kamchatka flounder combined was between 500 m and 900 m depths (Ronholt et al. 1986). Relative abundance increased markedly with depth, as did mean individual weight and length. Kamchatka flounder and arrowtooth flounder are physically very similar and probably occupy similar ecological niches, but adults of the former species inhabit the deepest survey strata, whereas the latter is most abundant at depths < 300 m (Tables 3 and 5). Kamchatka flounder mean CPUE was highest in the 301-500 m depth interval in the northern Central Aleutians subarea, and was captured in most trawl hauls conducted at this depth interval (Table 6). Relatively high CPUE was found at a station west of Tanaga Island (Fig. 4).

Like arrowtooth flounder, Kamchatka flounder exhibit sexual dimorphism. Adult females grow larger than males (Fig. 5). Unlike arrowtooth flounder females were generally shallower than males (Fig. 5). Mean length also increased with depth.

Table 3. -- Total effort (number of trawl hauls), number of hauls with arrowtooth flounder, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	8	0.823	401	34	768	0.203	26.3
	101-200	62	41	27.220	14,475	6,973	21,977	1.206	45.7
	201-300	25	19	8.709	1,501	843	2,159	1.356	44.9
	301-500	14	7	3.124	1,022	46	1,998	4.113	66.0
	All depths	124	75	11.454	17,400	9,888	24,912	1.367	46.4
Central Aleutians	1-100	31	12	1.150	672	0	1,351	0.333	31.5
	101-200	48	40	20.701	9,534	0	19,714	1.616	49.4
	201-300	31	27	23.839	5,027	2,529	7,526	1.768	52.3
	301-500	21	18	8.021	3,193	1,209	5,177	2.920	62.0
	All depths	131	97	11.139	18,426	7,935	28,917	1.836	51.7
Eastern Aleutians	1-100	15	7	2.187	1,497	0	3,754	0.416	30.2
	101-200	42	30	19.169	14,891	2,408	27,374	0.716	38.6
	201-300	33	33	42.910	21,032	7,245	34,819	0.934	44.3
	301-500	22	16	8.522	4,843	101	9,585	1.813	55.7
	All depths	112	86	16.771	42,263	23,435	61,091	0.940	43.1
All Aleutian Areas	1-100	69	27	1.46	2,571	356	4,787	0.361	29.9
	101-200	152	111	21.99	38,900	21,464	56,336	1.119	43.9
	201-300	89	79	31.56	27,560	13,877	41,244	1.109	45.8
	301-500	57	41	7.00	9,058	4,038	14,078	2.463	59.1
	All depths	367	258	13.72	78,090	55,428	100,751	1.246	45.9
Southern Bering Sea	1-100	33	26	11.538	4,645	1,853	7,437	0.574	34.5
	101-200	8	7	30.594	5,656	543	10,769	0.648	39.3
	201-300	4	4	18.283	1,031	0	2,497	0.968	45.7
	301-500	8	8	53.461	5,577	0	14,242	1.900	54.0
	All depths	53	45	22.600	16,909	7,891	25,927	1.060	43.2

Table 4. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of arrowtooth flounder by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	71.71	1,118	0	11,017
Central Aleutians	201-300	N Central Aleutians	16	14	64.91	2,850	1,232	4,468
Eastern Aleutians	201-300	SE Eastern Aleutians	10	10	57.52	11,852	997	22,708
Southern Bering Sea	301-500	Combined Southern Bering	8	8	53.46	5,577	0	14,244
Central Aleutians	101-200	N Central Aleutians	9	8	48.64	5,185	0	14,913
Southern Bering Sea	101-200	E Southern Bering	6	6	47.77	5,633	74	11,192
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	39.95	6,369	0	21,763
Central Aleutians	201-300	SE Central Aleutians	3	3	36.17	1,726	0	5,768
Eastern Aleutians	201-300	NE Eastern Aleutians	15	15	34.70	6,831	0	16,924
Western Aleutians	101-200	W Western Aleutians	36	32	32.12	13,059	5,666	20,452
Central Aleutians	101-200	SW Central Aleutians	22	19	29.75	3,130	0	8,716
Eastern Aleutians	101-200	SW Eastern Aleutians	12	12	26.86	6,074	0	17,023
Southern Bering Sea	201-300	Combined Southern Bering	4	4	18.28	1,031	0	2,497
Southern Bering Sea	1-100	E Southern Bering	31	25	18.05	4,404	1,648	7,160
Eastern Aleutians	201-300	SW Eastern Aleutians	6	6	17.18	1,231	733	1,729
Central Aleutians	301-500	N Central Aleutians	12	11	14.93	1,851	386	3,315
Eastern Aleutians	101-200	NE Eastern Aleutians	18	13	12.15	2,445	732	4,158
Western Aleutians	201-300	W Western Aleutians	14	12	11.72	1,102	566	1,638
Western Aleutians	101-200	E Western Aleutians	26	9	11.31	1,416	0	3,434
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	8	9.95	2,658	0	7,012
Central Aleutians	101-200	SE Central Aleutians	15	12	9.63	724	0	2,004
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	8.97	1,137	0	5,472
Eastern Aleutians	301-500	SE Eastern Aleutians	9	6	8.21	2,114	0	4,789
Central Aleutians	301-500	SW Central Aleutians	3	3	7.20	568	0	2,681
Central Aleutians	201-300	SW Central Aleutians	9	7	6.19	264	0	661
Western Aleutians	201-300	E Western Aleutians	11	7	5.10	399	0	845
Central Aleutians	301-500	SE Central Aleutians	3	2	4.24	303	0	1,005
Western Aleutians	301-500	W Western Aleutians	10	6	3.89	666	52	1,281
Central Aleutians	301-500	Petrel Bank	3	2	3.81	472	0	2,368
Central Aleutians	101-200	Petrel Bank	2	1	2.85	495	0	6,781
Central Aleutians	1-100	N Central Aleutians	16	6	2.63	554	0	1,252
Central Aleutians	201-300	Petrel Bank	3	3	2.44	187	0	581
Western Aleutians	301-500	E Western Aleutians	4	1	2.28	356	0	1,489
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	1.69	327	0	3,821
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	1.64	72	0	721
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	1.52	241	0	3,307
Western Aleutians	1-100	W Western Aleutians	10	7	1.08	398	0	798
Central Aleutians	1-100	SW Central Aleutians	4	4	0.48	77	0	195
Central Aleutians	1-100	SE Central Aleutians	5	2	0.36	42	0	152
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	0.34	23	0	315
Eastern Aleutians	1-100	SE Eastern Aleutians	8	2	0.15	26	0	86
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.04	8	0	108
Western Aleutians	1-100	E Western Aleutians	13	1	0.03	3	0	10
Eastern Aleutians	101-200	SE Eastern Aleutians	9	2	0.02	3	0	8

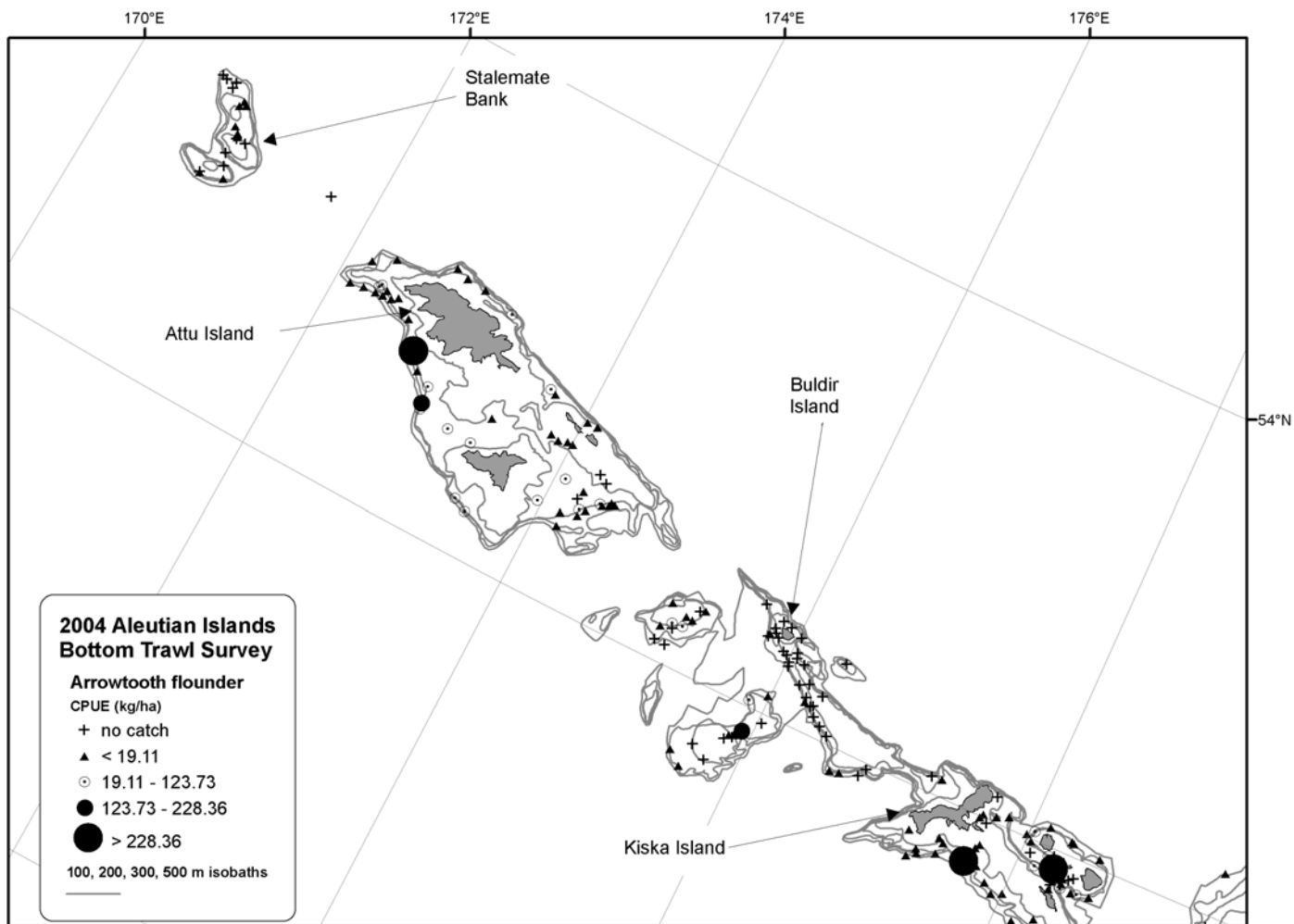


Figure 2. -- Distribution and relative abundance of arrowtooth flounder from the 2004 Aleutian Islands bottom trawl survey

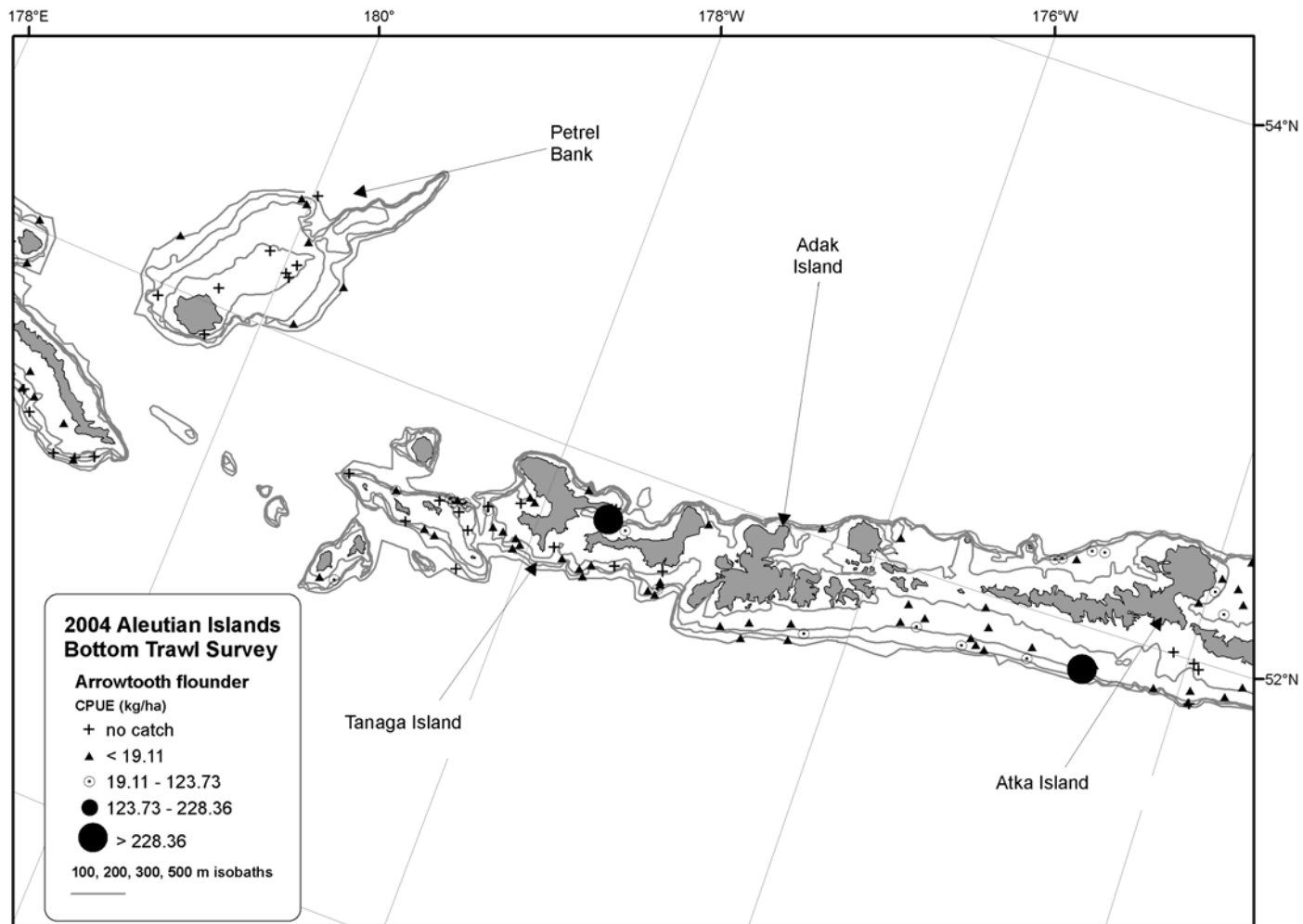


Figure 2. -- (continued).

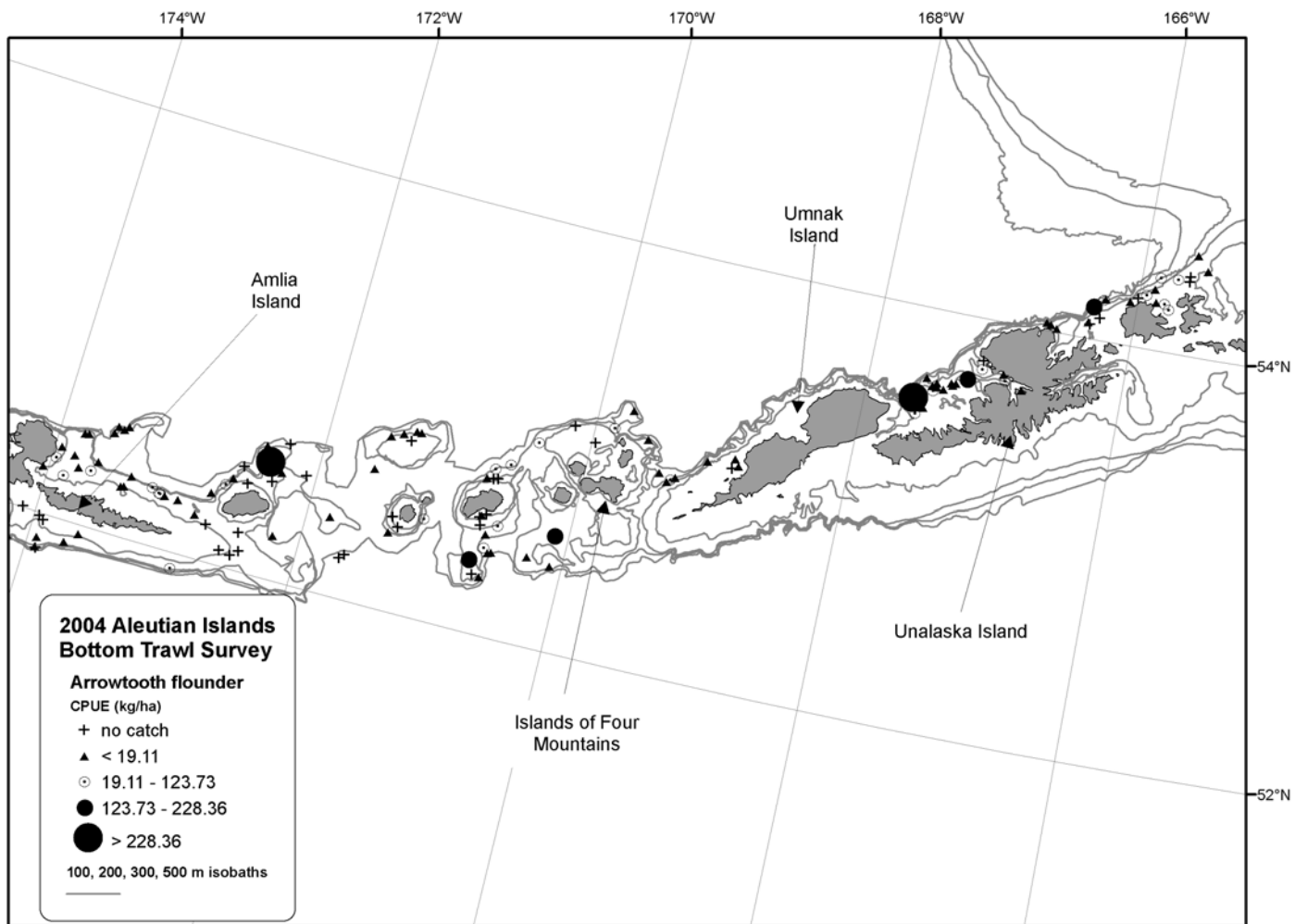


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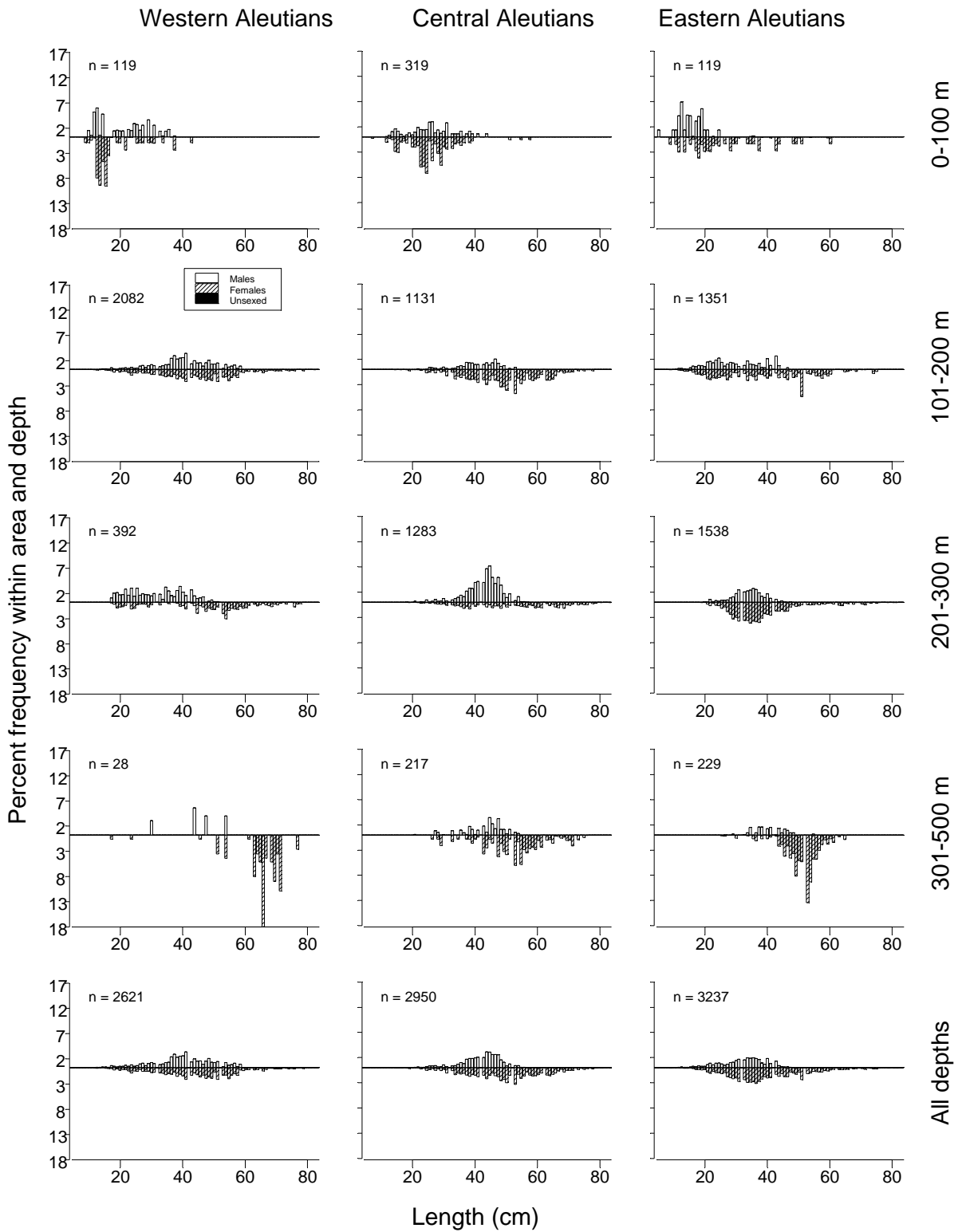


Figure 3. -- Size composition of arrowtooth flounder captured in the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

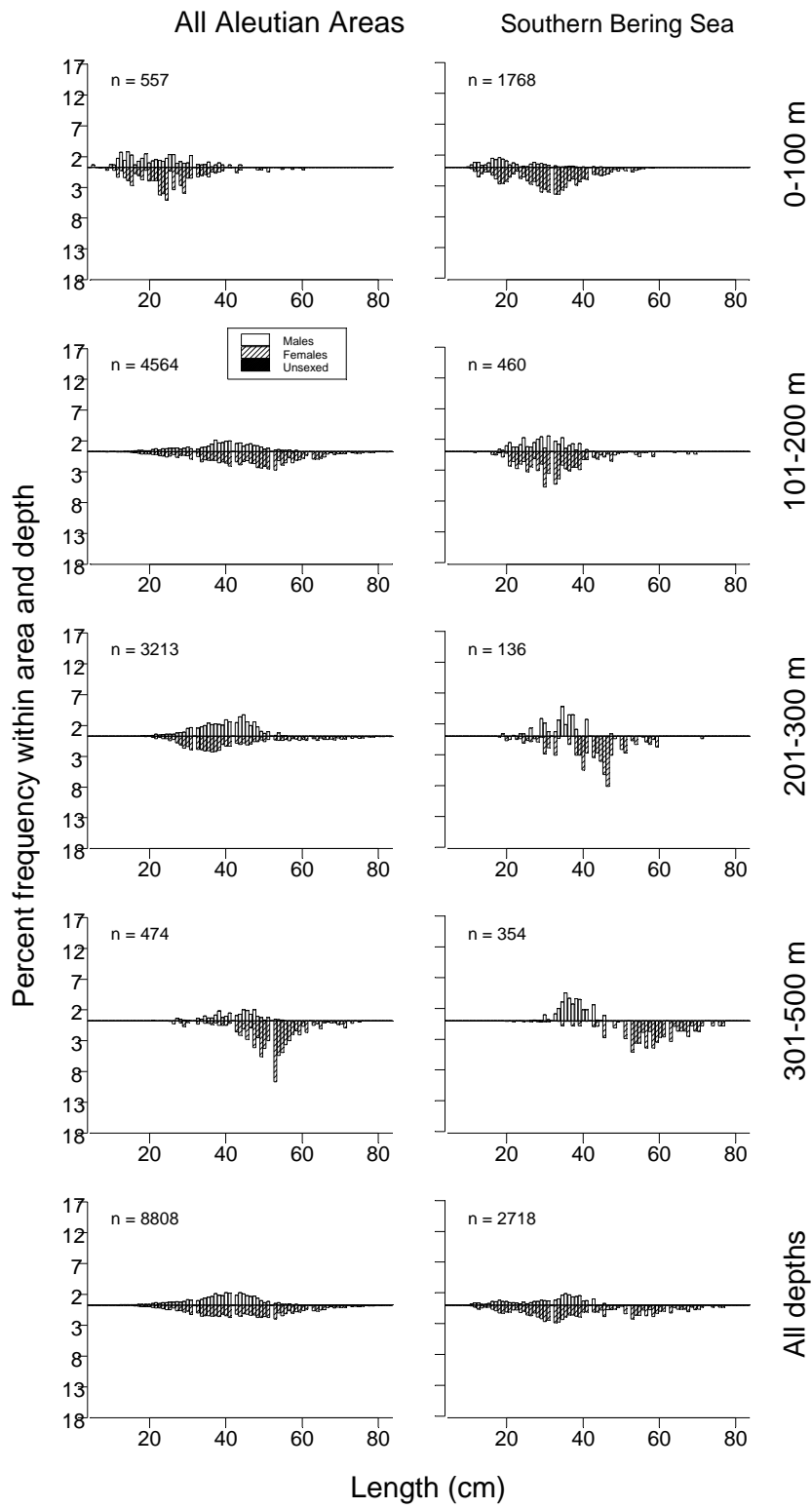


Figure 3. -- (continued).

Table 5. -- Total effort (number of trawl hauls), number of hauls with Kamchatka flounder, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	7	0.053	26	0	53	0.110	22.4
	101-200	62	33	2.333	1,240	757	1,724	0.604	36.0
	201-300	25	18	8.271	1,426	267	2,584	2.314	52.6
	301-500	14	12	8.793	2,878	1,419	4,336	3.879	66.5
	All depths	124	70	3.666	5,569	3,766	7,372	2.732	55.9
Central Aleutians	1-100	31	9	0.090	53	3	102	0.136	23.8
	101-200	48	33	0.931	429	144	714	0.402	30.7
	201-300	31	27	7.049	1,487	0	3,124	2.061	53.5
	301-500	21	18	43.427	17,287	0	34,871	2.349	58.6
	All depths	131	87	11.640	19,255	2,501	36,010	2.277	57.5
Eastern Aleutians	1-100	15	4	0.327	224	0	554	0.107	21.6
	101-200	42	21	1.817	1,411	0	2,956	0.232	27.4
	201-300	33	20	2.241	1,098	214	1,983	0.943	42.5
	301-500	22	18	15.051	8,553	1,973	15,134	2.414	58.3
	All depths	112	63	4.479	11,287	4,772	17,802	1.952	52.1
All Aleutian Areas	1-100	69	20	0.17	302	0	612	0.113	22.0
	101-200	152	87	1.74	3,081	1,471	4,690	0.405	31.3
	201-300	89	65	4.59	4,011	1,882	6,139	1.845	50.2
	301-500	57	48	22.20	28,718	10,630	46,806	2.522	59.3
	All depths	367	220	6.34	36,111	18,157	54,066	2.246	55.6
Southern Bering Sea	1-100	33	2	0.002	1	0	3	0.093	22.6
	101-200	8	2	0.821	152	0	491	0.451	36.0
	201-300	4	1	0.282	16	0	67	0.879	45.0
	301-500	8	7	28.173	2,939	0	5,932	2.736	61.8
	All depths	53	12	4.154	3,108	552	5,663	2.614	60.4

Table 6. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Kamchatka flounder by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	301-500	N Central Aleutians	12	12	109.49	13,574	0	31,547
Central Aleutians	301-500	Petrel Bank	3	3	28.85	3,570	0	12,570
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	11	28.52	7,614	633	14,595
Southern Bering Sea	301-500	Combined Southern Bering	8	7	28.17	2,939	0	5,932
Central Aleutians	201-300	SE Central Aleutians	3	1	16.26	776	0	4,117
Western Aleutians	201-300	E Western Aleutians	11	7	12.31	965	0	2,178
Western Aleutians	301-500	E Western Aleutians	4	4	11.42	1,783	333	3,233
Central Aleutians	201-300	N Central Aleutians	16	16	10.71	470	99	842
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	8.13	127	19	234
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	6.56	1,046	0	4,286
Western Aleutians	301-500	W Western Aleutians	10	8	6.40	1,094	0	2,221
Western Aleutians	201-300	W Western Aleutians	14	11	4.90	461	168	754
Eastern Aleutians	201-300	NE Eastern Aleutians	15	12	4.30	847	0	1,751
Eastern Aleutians	301-500	SE Eastern Aleutians	9	6	3.46	890	0	1,904
Western Aleutians	101-200	W Western Aleutians	36	27	2.85	1,158	679	1,638
Central Aleutians	101-200	N Central Aleutians	9	7	2.77	295	0	598
Central Aleutians	201-300	SW Central Aleutians	9	8	2.28	97	45	149
Central Aleutians	201-300	Petrel Bank	3	2	1.86	143	0	563
Central Aleutians	301-500	SE Central Aleutians	3	2	1.38	99	0	357
Eastern Aleutians	101-200	NE Eastern Aleutians	18	10	1.37	276	1	551
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	1.31	166	0	780
Southern Bering Sea	101-200	E Southern Bering	6	2	1.29	152	0	509
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	1.13	49	0	677
Western Aleutians	101-200	E Western Aleutians	26	6	0.66	82	0	201
Central Aleutians	301-500	SW Central Aleutians	3	1	0.57	45	0	237
Eastern Aleutians	201-300	SE Eastern Aleutians	10	2	0.55	113	0	350
Central Aleutians	101-200	SE Central Aleutians	15	9	0.54	41	0	100
Central Aleutians	101-200	SW Central Aleutians	22	16	0.48	51	20	81
Eastern Aleutians	101-200	SW Eastern Aleutians	12	8	0.40	90	16	164
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	0.30	58	0	751
Southern Bering Sea	201-300	Combined Southern Bering Sea	4	1	0.28	16	0	67
Central Aleutians	101-200	Petrel Bank	2	1	0.25	43	0	587
Central Aleutians	1-100	N Central Aleutians	16	7	0.24	50	0	101
Eastern Aleutians	201-300	SW Eastern Aleutians	6	4	0.17	12	1	23
Western Aleutians	1-100	W Western Aleutians	10	7	0.07	26	0	56
Central Aleutians	1-100	SW Central Aleutians	4	2	0.02	3	0	9
Southern Bering Sea	1-100	E Southern Bering Sea	31	2	0.00	1	0	3
Central Aleutians	1-100	SE Central Aleutians	7	2	0.10	11	0	35
Western Aleutians	1-100	W Western Aleutians	8	1	0.08	30	0	101
Southern Bering Sea	1-100	E Southern Bering Sea	19	6	0.06	16	0	32
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	0.05	10	0	137
Eastern Aleutians	101-200	SE Eastern Aleutians	10	1	0.03	5	0	17
Western Aleutians	1-100	E Western Aleutians	14	1	0.01	1	0	3

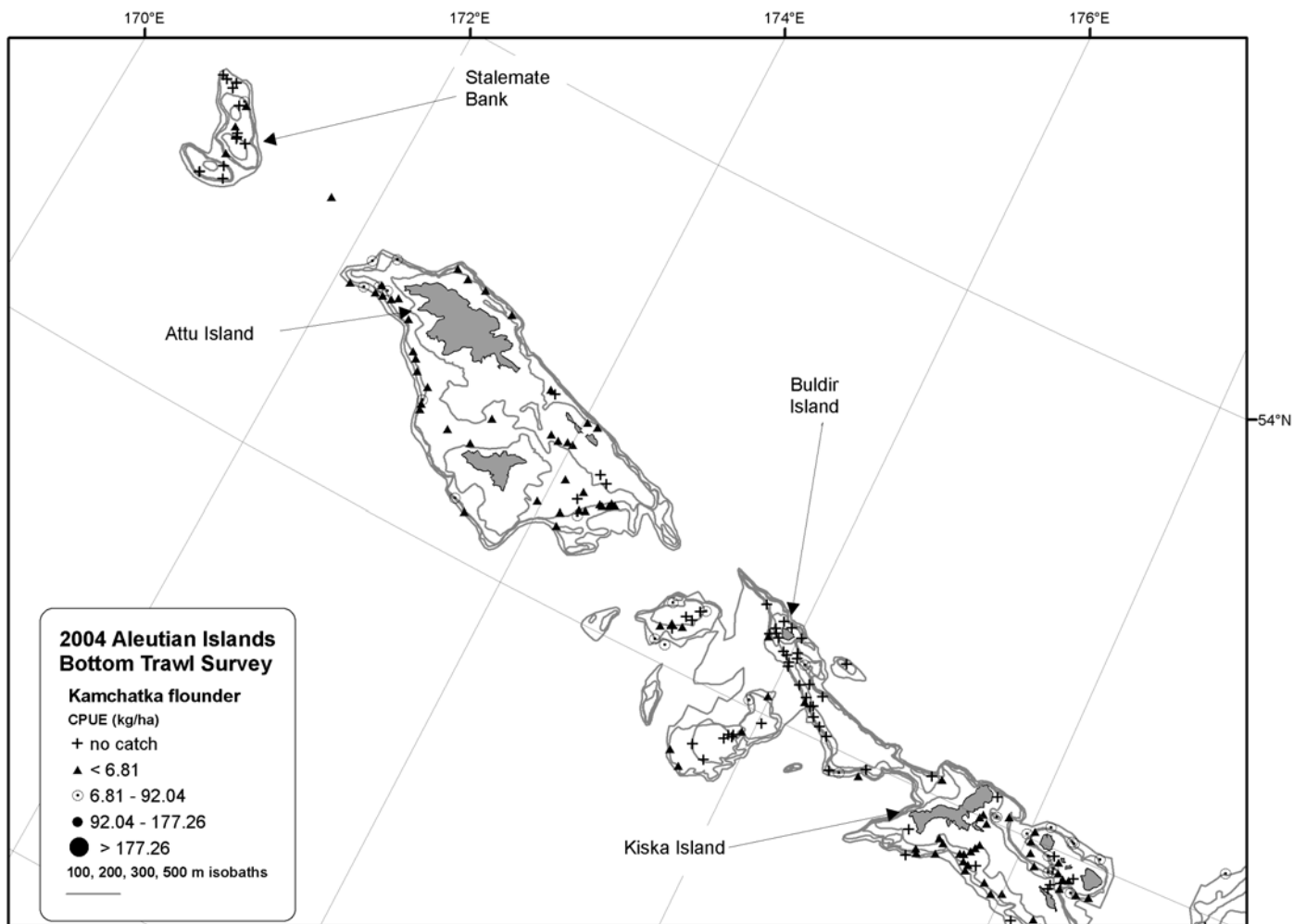


Figure 4. -- Distribution and relative abundance of Kamchatka flounder from the 2004 Aleutian Islands bottom trawl survey.

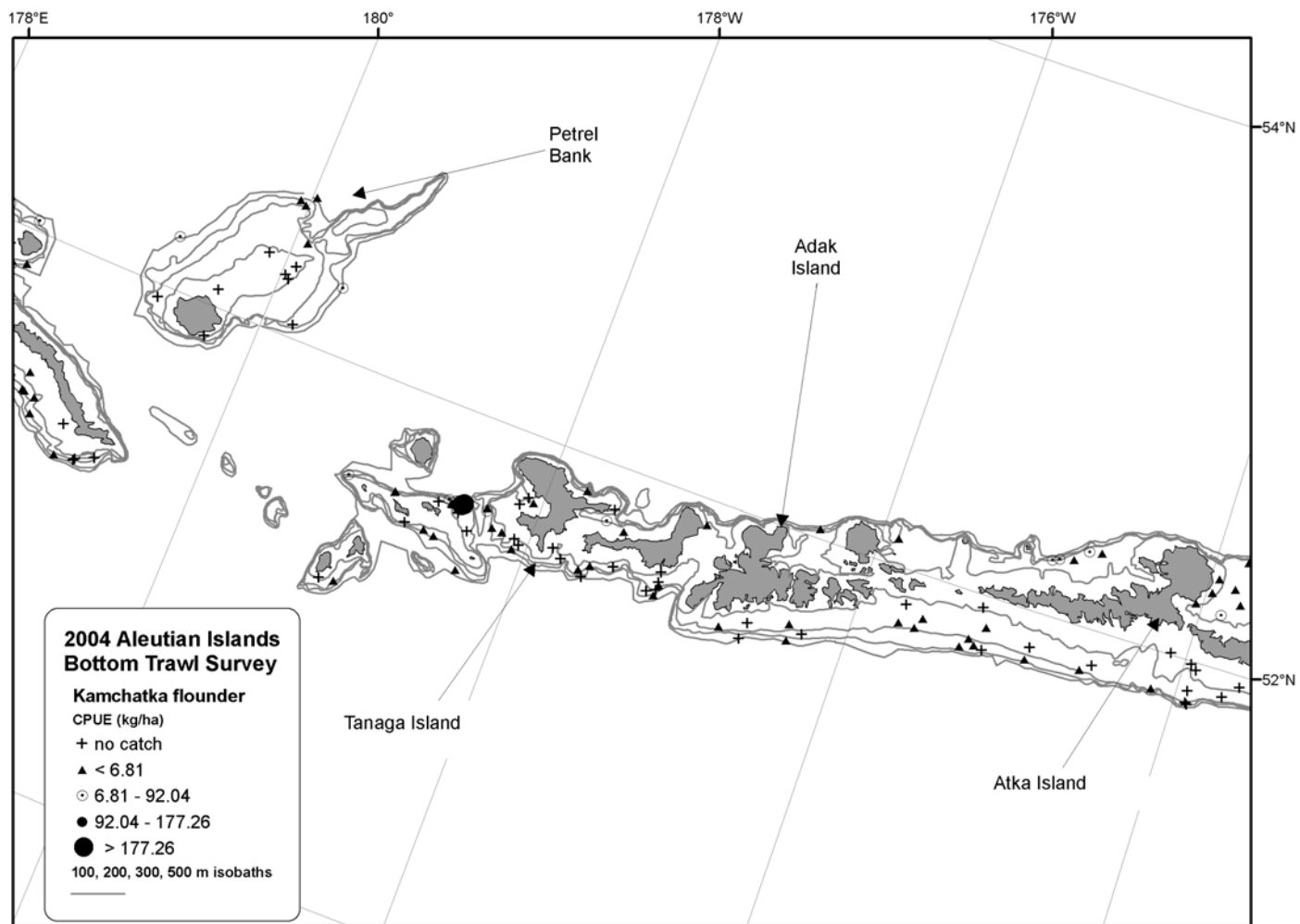


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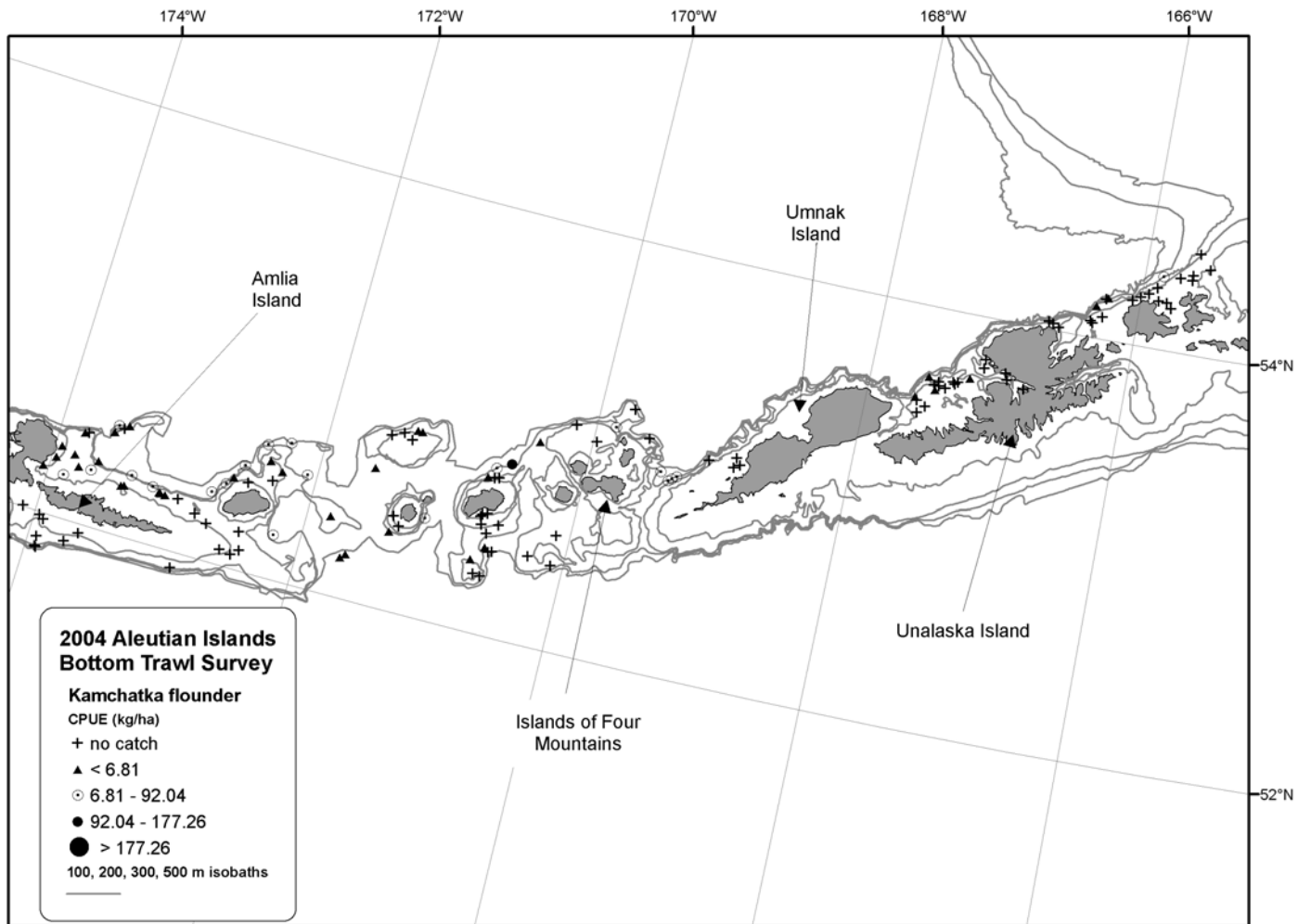


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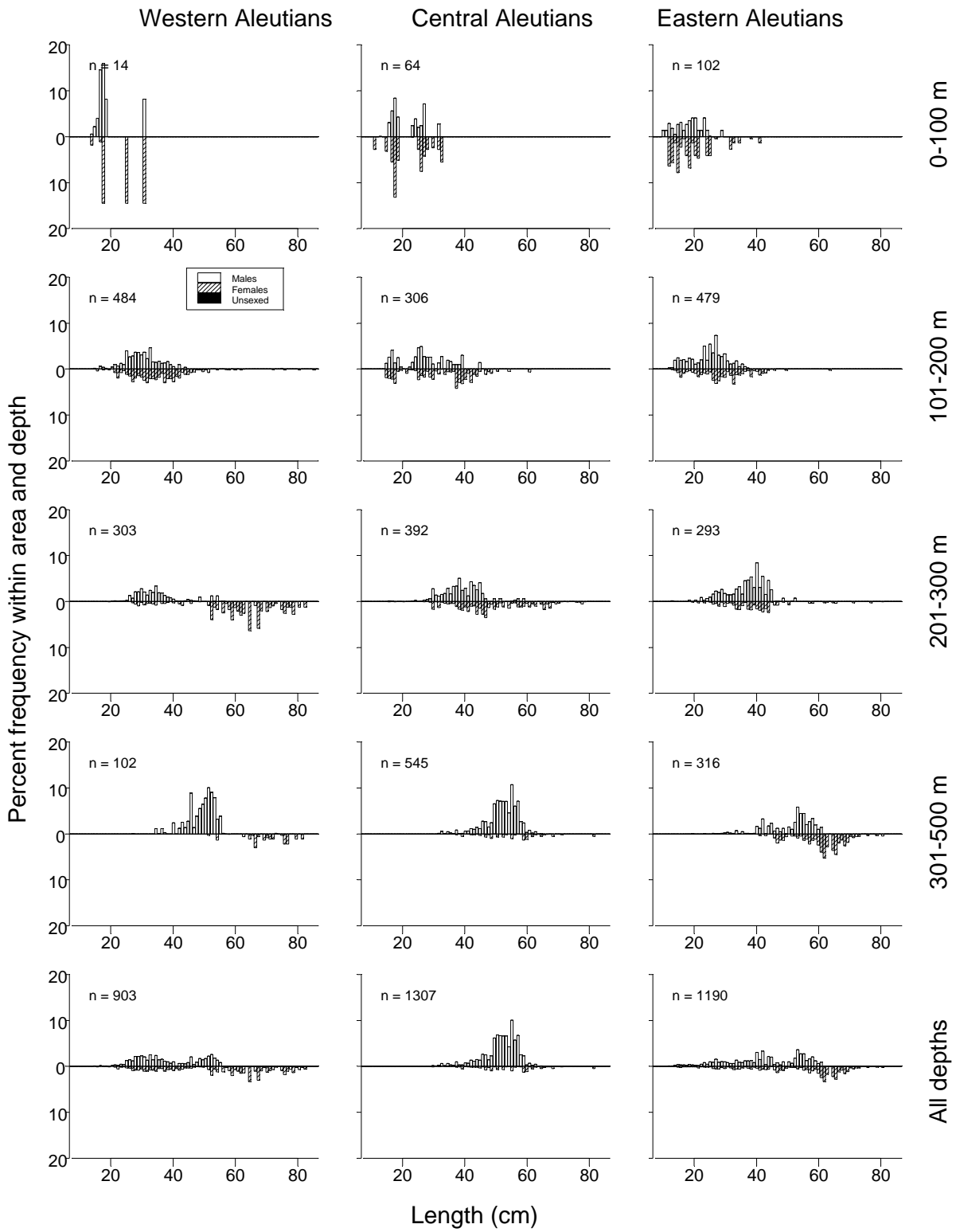


Figure 5. -- Size composition of Kamchatka flounder from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

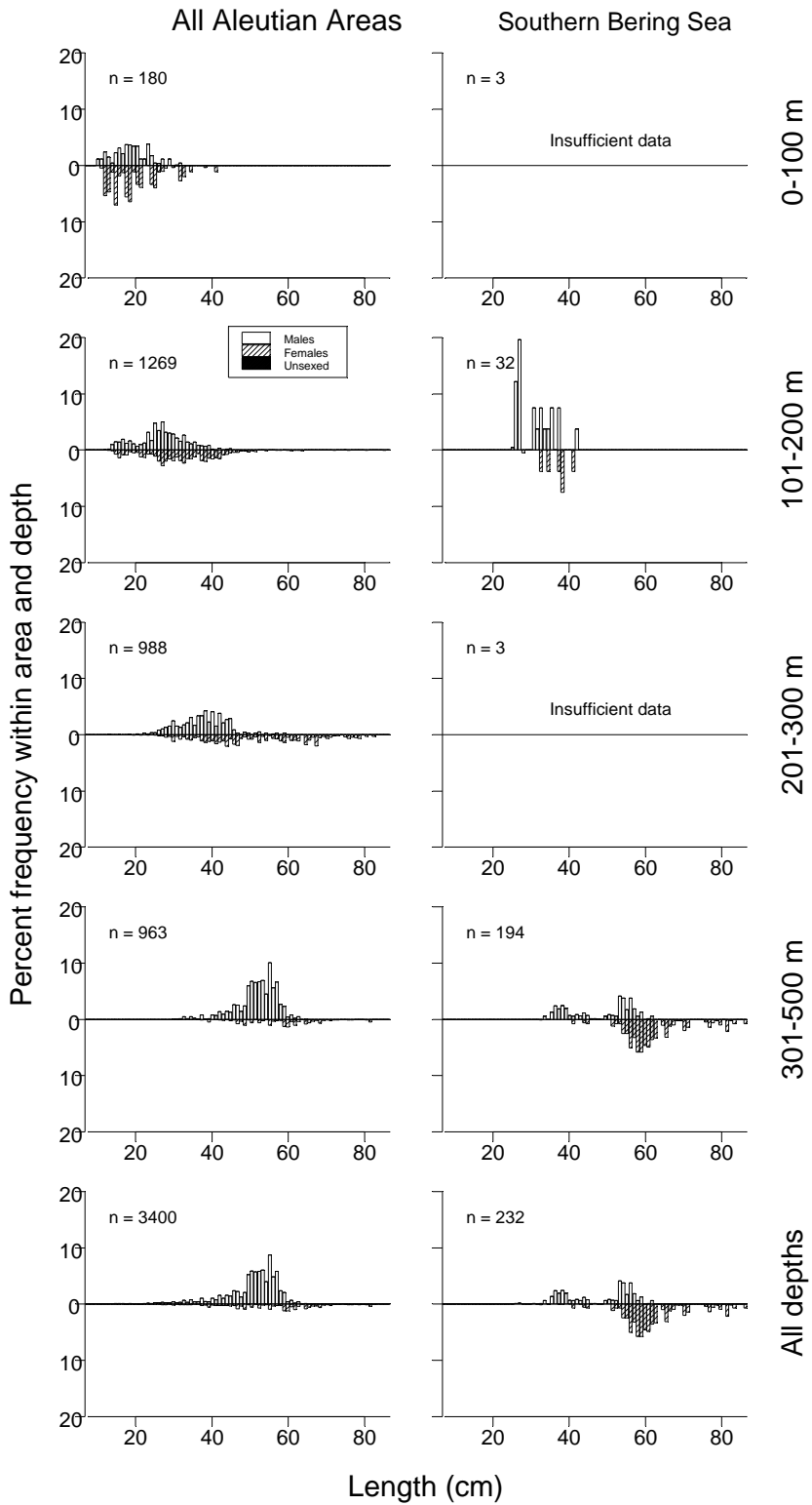


Figure 5. -- (continued).

Northern rock sole (*Lepidopsetta polyxystra*)

Since the 1997 Aleutian Islands bottom trawl survey, two species of rock sole (northern rock sole, *L. polyxystra*, and southern rock sole, *L. bilineata*) have been separated in trawl catches. In the Aleutian areas northern rock sole is the more abundant of the two (Table 2) and in fact was the only species of rock sole found in the Western Aleutians (Fig. 6). The relative abundance of northern rock sole ranked eighth overall in the combined Aleutian areas, much less than that of Atka mackerel and POP (Table 2). The highest mean catch rate was in the Central Aleutians area. In the Southern Bering Sea area, northern rock sole mean CPUE is only slightly lower than southern rock sole. Northern rock sole mean CPUE and estimated biomass was highest in the 1-100 m depth interval in all survey areas (Table 7). Although occurrences were reported in waters deeper than 300 m in some locations, northern rock sole abundance was very low in the deepest depth interval. Most of the estimated biomass in the 201-300 m depth interval was composed of females (Fig. 7). More than 64% of the estimated northern rock sole biomass in the Aleutian areas occurred in 1-100 m and 97% occurred within the shallower two depth intervals. In the Central Aleutians area within the 1-100 m interval, northern rock sole were caught in all but one trawl haul (Table 7). The highest stratum-specific mean CPUE occurred in the 1-100 m depth interval, in the Petrel Bank subarea (Table 8, Fig. 8). However, only six tows were conducted in that subarea (Table 8).

Sexual dimorphism was pronounced. For the combined Aleutian areas the largest female size composition mode was about 7 cm larger than that of the males (Fig. 8). The majority of northern rock sole found deeper than 200 m were females.

Southern rock sole (*L. bilineata*)

Southern rock sole was most abundant in the Southern Bering Sea area (Table 2). Although captured in most shallow tows around Unalaska Island, this species rarely occurred west of Umnak Island and none were reported from catches west of Atka Island (Fig. 9). Thus, the survey defines what appears to be the western margin of the southern rock sole distribution in the Aleutian archipelago. In the Southern Bering Sea area > 90% of the estimated biomass was found in the 1-100 m depth interval where all but two tows reported southern rock sole (Tables 9 and 10). All of the southern rock sole larger than 41 cm in the biomass-weighted size composition were females (Fig. 10).

Table 7. -- Total effort (number of trawl hauls), number of hauls with northern rock sole, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	22	14.303	6,975	4,273	9,678	0.284	27.7
	101-200	62	42	6.319	3,360	2,191	4,530	0.380	30.5
	201-300	25	9	0.570	98	0	197	0.627	37.8
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	73	6.869	10,434	7,605	13,262	0.318	28.7
Central Aleutians	1-100	31	30	28.324	16,562	10,144	22,981	0.405	31.2
	101-200	48	46	11.424	5,261	3,443	7,079	0.439	32.5
	201-300	31	20	2.462	519	243	795	0.587	36.3
	301-500	21	0	0.000	0	--	--	--	--
	All depths	131	96	13.506	22,343	15,868	28,818	0.417	31.6
Eastern Aleutians	1-100	15	11	5.967	4,086	2,876	5,296	0.330	29.4
	101-200	42	33	7.013	5,448	3,650	7,245	0.673	36.9
	201-300	33	15	1.374	673	370	976	0.789	40.0
	301-500	22	1	0.112	64	0	196	0.729	39.4
	All depths	112	60	4.076	10,271	8,158	12,383	0.544	34.1
All Aleutian Areas	1-100	69	63	15.72	27,623	20,742	34,505	0.363	30.1
	101-200	152	121	7.95	14,069	11,309	16,829	0.515	33.7
	201-300	89	44	1.48	1,291	880	1,701	0.695	38.4
	301-500	57	1	0.05	64	0	191	0.729	39.4
	All depths	367	229	7.56	43,047	35,718	50,376	0.423	31.5
Southern Bering Sea	1-100	33	29	16.879	6,795	4,946	8,645	0.438	32.1
	101-200	8	7	10.058	1,859	271	3,448	0.426	32.2
	201-300	4	2	3.369	190	0	751	0.948	42.8
	301-500	8	0	0.000	0	--	--	--	--
	All depths	53	38	11.822	8,845	6,551	11,138	0.446	32.3

Table 8. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of northern rock sole by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	1-100	Petrel Bank	6	6	51.31	4,926	82	9,770
Central Aleutians	1-100	SE Central Aleutians	5	5	32.12	3,739	0	8,773
Central Aleutians	101-200	SW Central Aleutians	22	22	25.83	2,718	1,576	3,860
Southern Bering Sea	1-100	W Southern Bering	2	2	25.53	4,047	427	7,668
Central Aleutians	1-100	N Central Aleutians	16	15	23.50	4,949	1,837	8,060
Central Aleutians	1-100	SW Central Aleutians	4	4	18.23	2,948	0	5,978
Western Aleutians	1-100	W Western Aleutians	10	10	16.08	5,940	3,060	8,821
Central Aleutians	101-200	SE Central Aleutians	15	14	13.19	992	189	1,795
Southern Bering Sea	101-200	E Southern Bering	6	5	12.49	1,473	0	3,126
Southern Bering Sea	1-100	E Southern Bering	31	27	11.26	2,748	990	4,506
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	11.13	1,775	1,226	2,324
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	9.27	1,176	437	1,915
Central Aleutians	101-200	N Central Aleutians	9	8	9.08	968	151	1,786
Western Aleutians	1-100	E Western Aleutians	13	12	8.75	1,035	433	1,637
Central Aleutians	201-300	N Central Aleutians	16	15	8.16	358	132	584
Western Aleutians	101-200	W Western Aleutians	36	29	7.90	3,213	2,025	4,400
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	6.92	1,336	341	2,332
Eastern Aleutians	101-200	NE Eastern Aleutians	18	14	6.91	1,391	0	2,907
Eastern Aleutians	101-200	SW Eastern Aleutians	12	10	6.75	1,527	618	2,436
Southern Bering Sea	101-200	W Southern Bering	2	2	5.77	386	0	2,871
Eastern Aleutians	201-300	SW Eastern Aleutians	6	6	5.39	386	157	615
Eastern Aleutians	1-100	SE Eastern Aleutians	8	4	4.78	832	0	2,085
Eastern Aleutians	101-200	SE Eastern Aleutians	9	6	3.97	755	66	1,444
Eastern Aleutians	1-100	SW Eastern Aleutians	2	2	3.89	741	154	1,329
Southern Bering Sea	201-300	Combined Southern Bering	4	2	3.37	190	0	750
Central Aleutians	101-200	Petrel Bank	2	2	3.36	583	0	6,925
Central Aleutians	201-300	SW Central Aleutians	9	4	3.27	140	0	326
Western Aleutians	101-200	E Western Aleutians	26	13	1.18	148	21	274
Eastern Aleutians	201-300	NE Eastern Aleutians	15	3	0.95	187	0	417
Western Aleutians	201-300	W Western Aleutians	14	4	0.78	73	0	174
Eastern Aleutians	201-300	SE Eastern Aleutians	10	4	0.46	94	0	210
Central Aleutians	201-300	SE Central Aleutians	3	1	0.45	22	0	114
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	0.43	7	0	34
Western Aleutians	201-300	E Western Aleutians	11	5	0.32	25	0	51
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.25	64	0	210

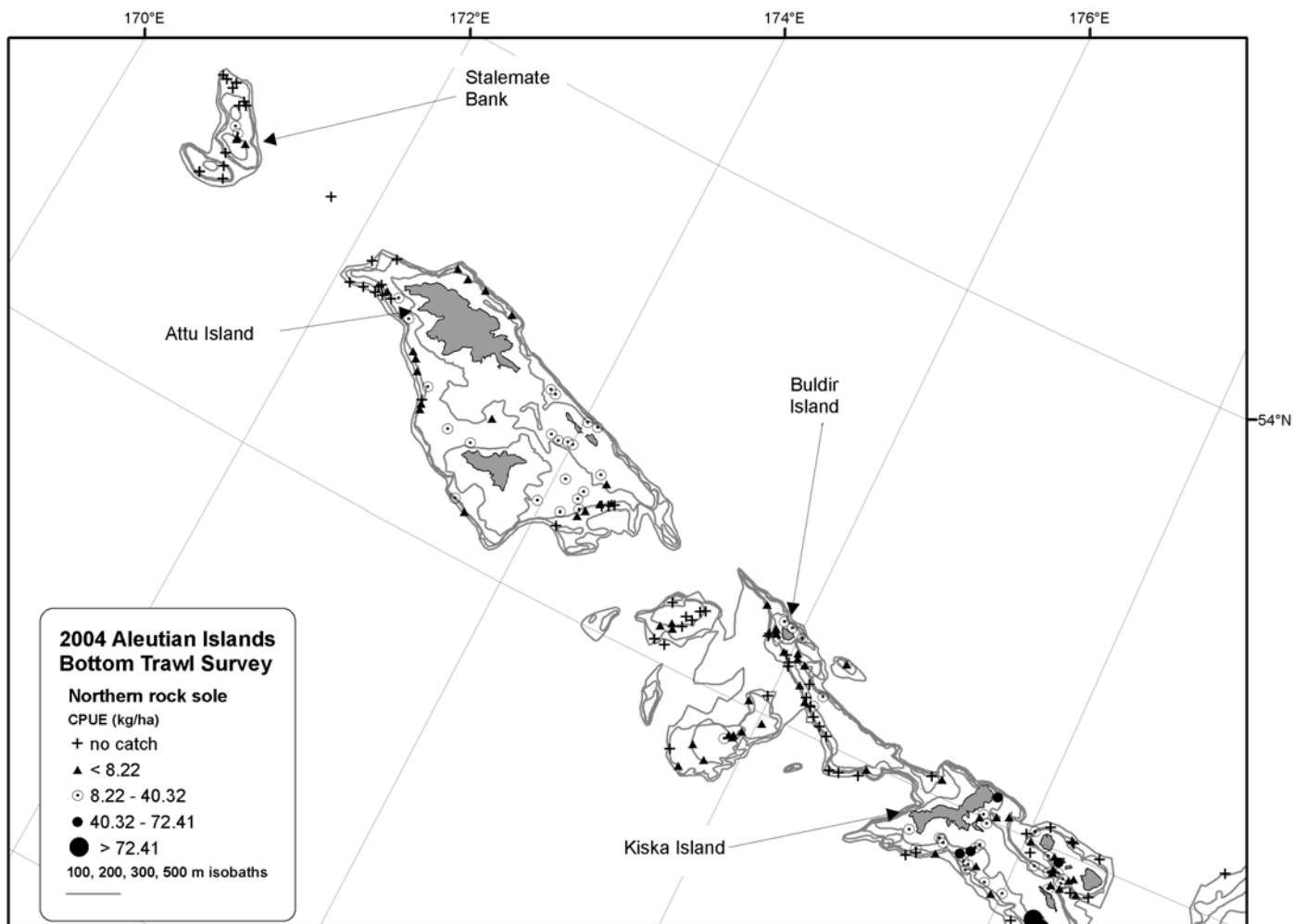


Figure 7. -- Distribution and relative abundance of northern rock sole from the 2004 Aleutian Islands bottom trawl survey.

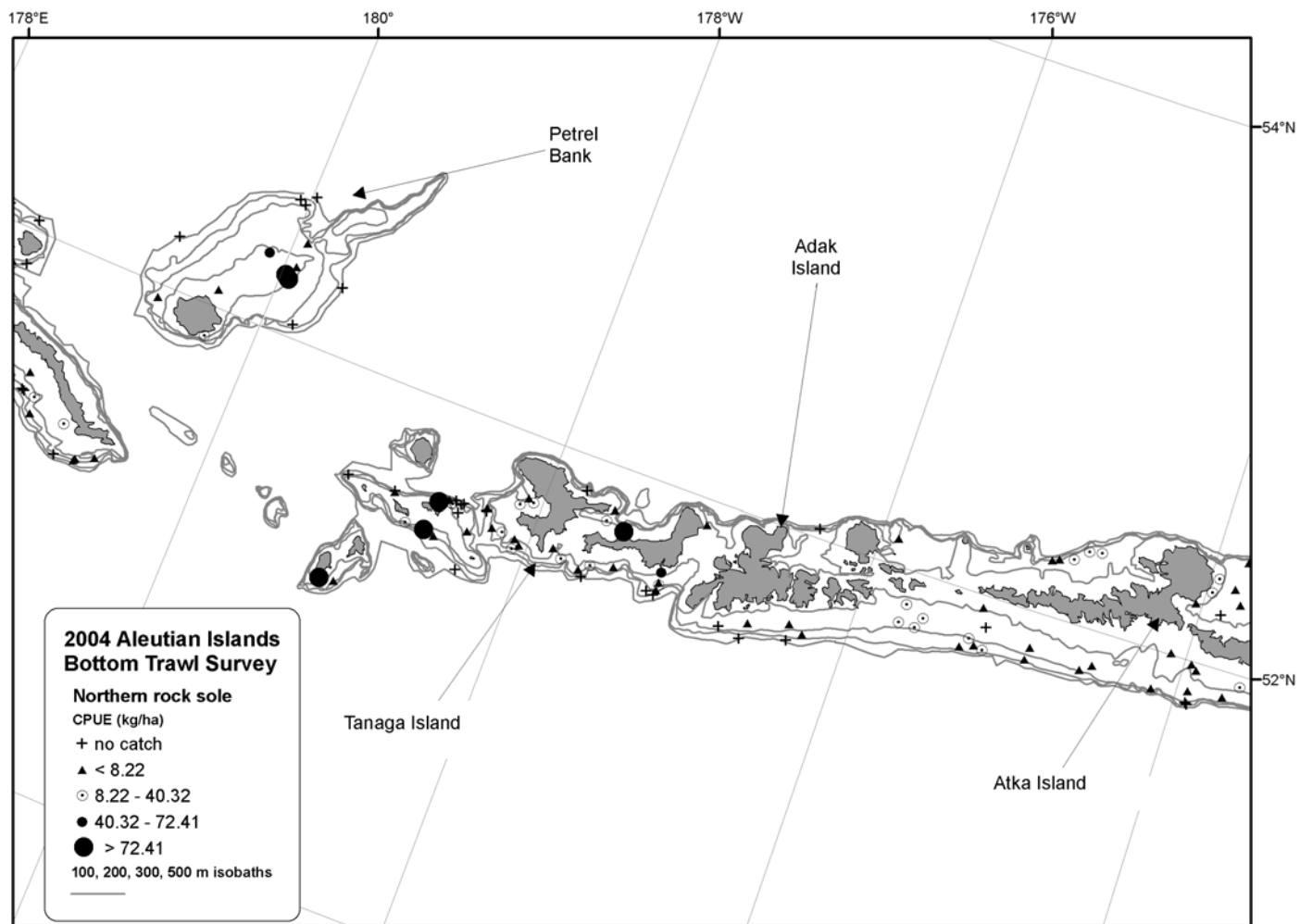


Figure 7. -- (continued).

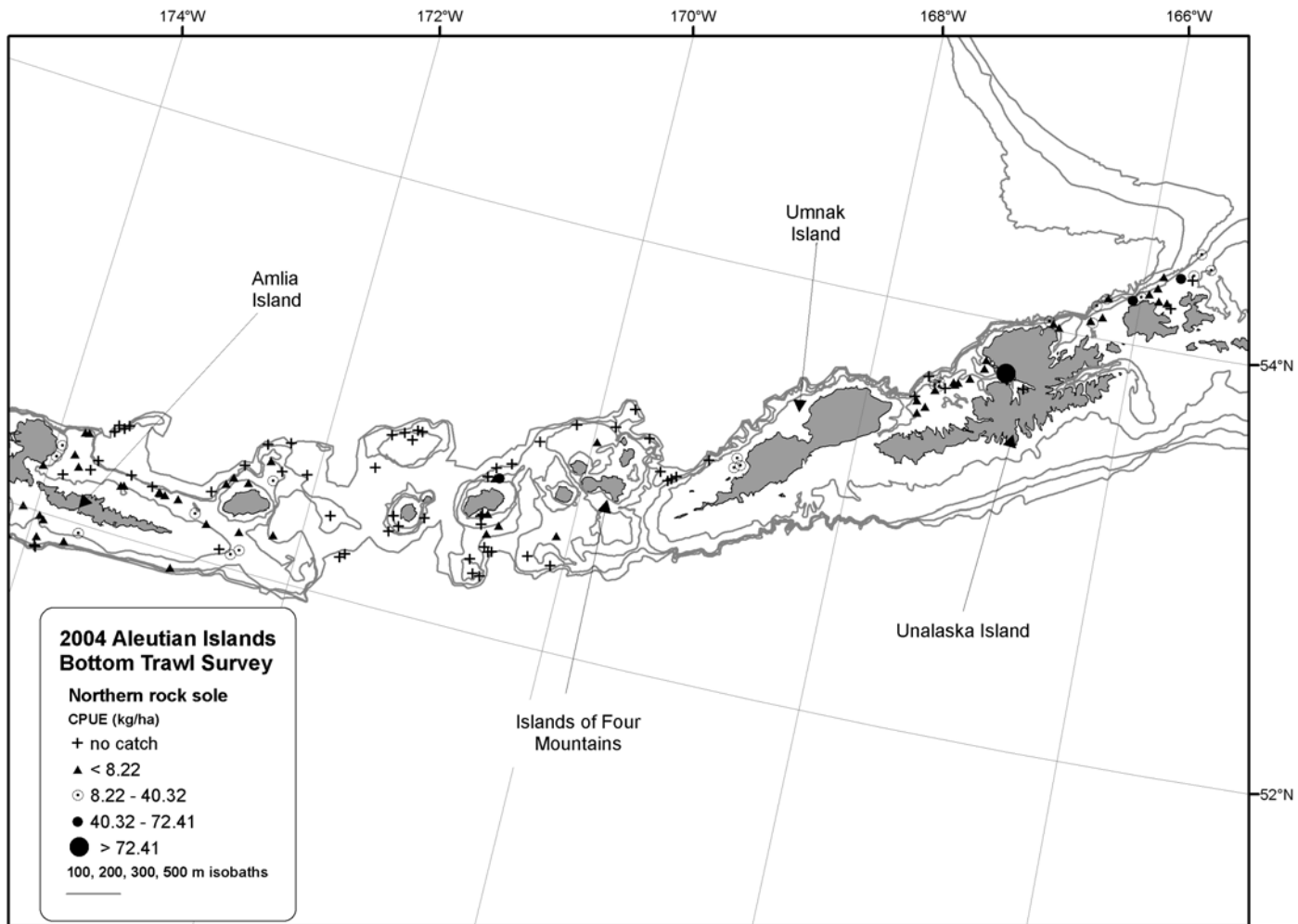


Figure 7. -- (continued).

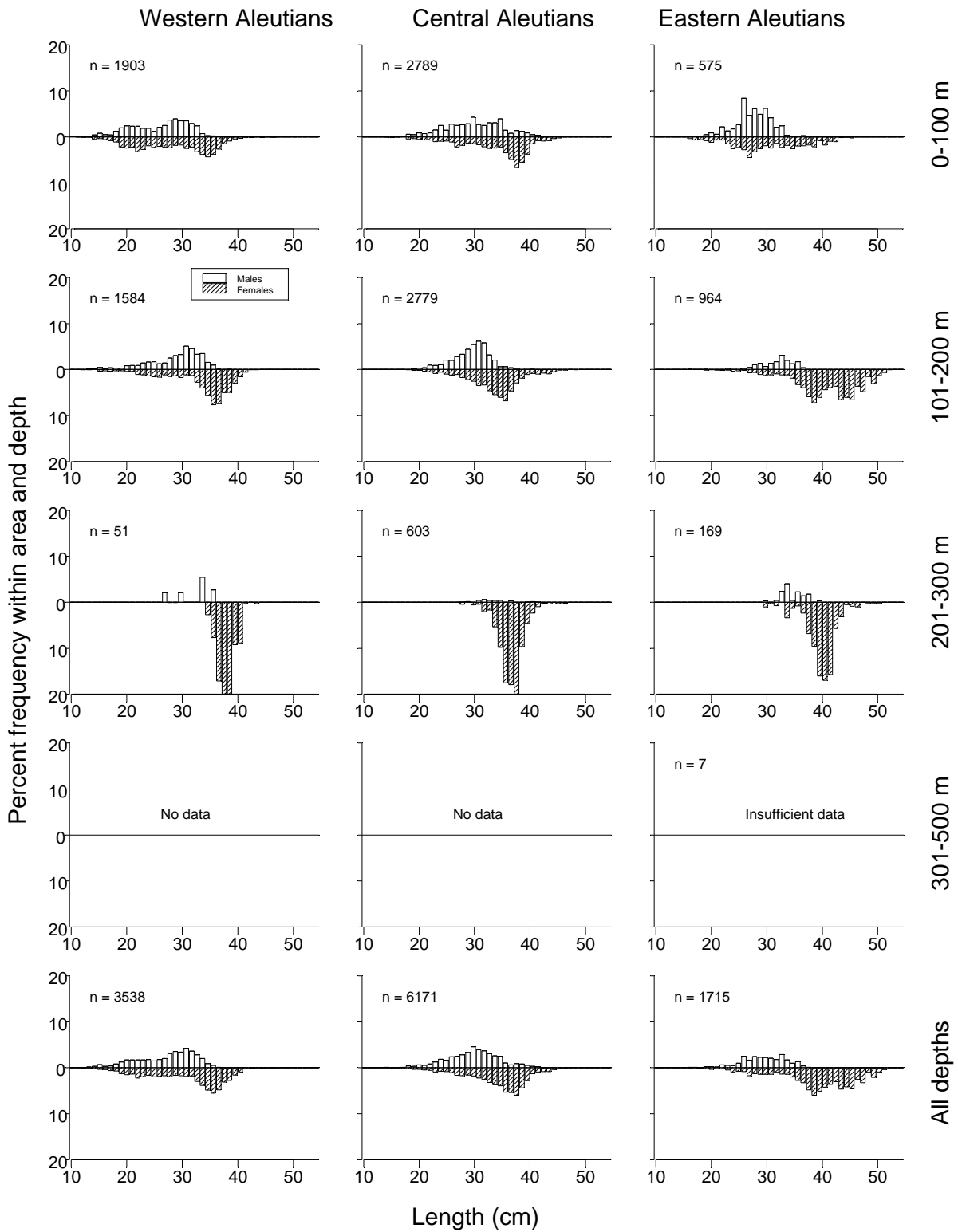


Figure 8. -- Size composition of northern rock sole from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

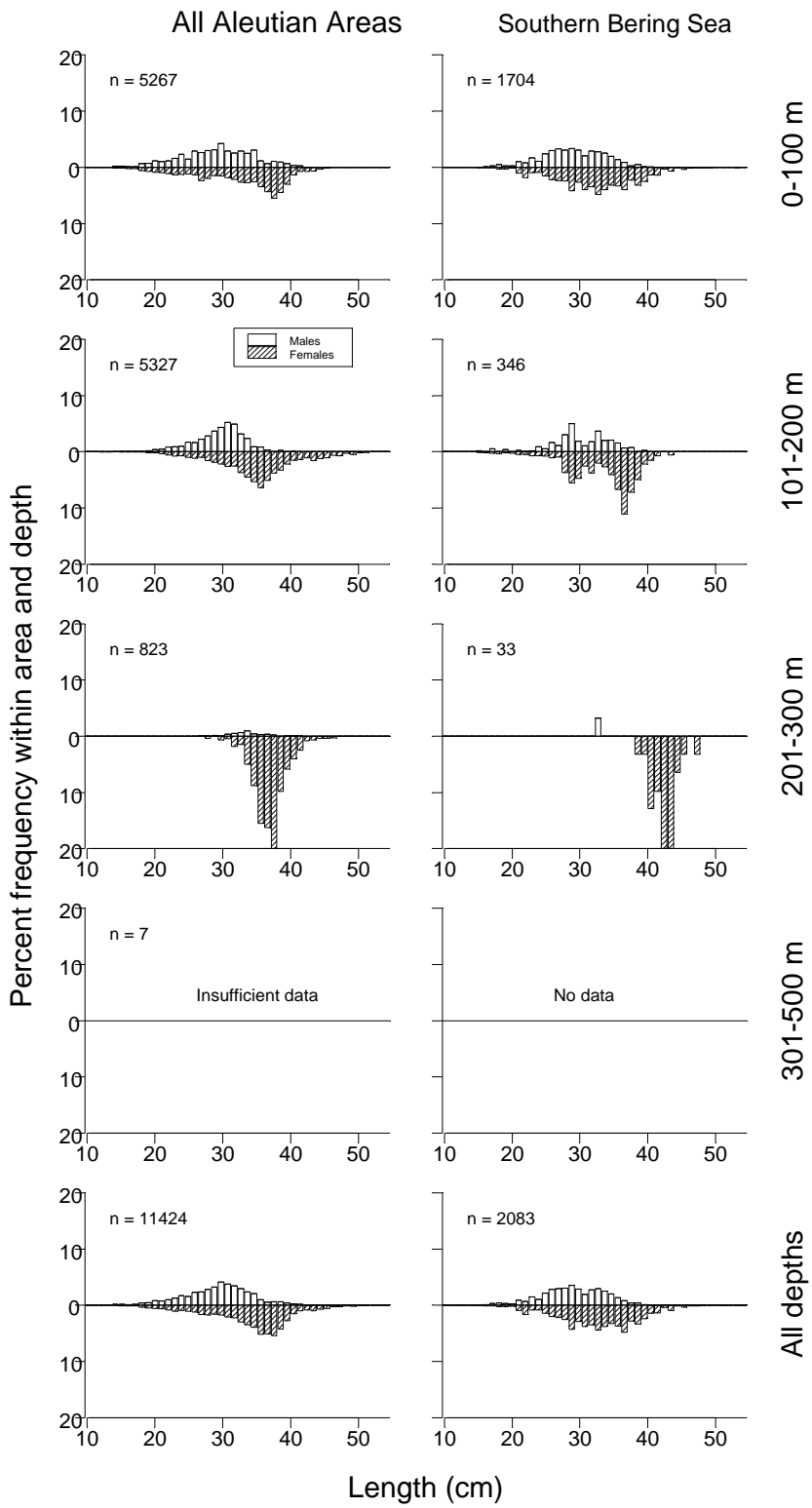


Figure 8. -- (continued).

Table 9. -- Total effort (number of trawl hauls), number of hauls with southern rock sole, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	0	0.000	0	--	--	--	--
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	0	0.000	0	--	--	--	--
Central Aleutians	1-100	31	1	0.034	20	0	60	0.704	38.5
	101-200	48	1	0.009	4	0	12	0.964	40.0
	201-300	31	0	0.000	0	--	--	--	--
	301-500	21	0	0.000	0	--	--	--	--
	All depths	131	2	0.014	24	0	63	0.748	38.8
Eastern Aleutians	1-100	15	6	0.841	576	0	1,210	0.800	38.8
	101-200	42	2	0.026	21	0	54	0.989	44.1
	201-300	33	0	0.000	0	--	--	--	--
	301-500	22	0	0.000	0	--	--	--	--
	All depths	112	8	0.237	597	10	1,184	0.806	39.0
All Aleutian Areas	1-100	69	7	0.34	596	4	1,187	0.797	38.8
	101-200	152	3	0.01	25	0	58	0.985	43.5
	201-300	89	0	0.00	0	--	--	--	--
	301-500	57	0	0.00	0	--	--	--	--
	All depths	367	10	0.11	620	36	1,204	0.804	39.0
Southern Bering Sea	1-100	33	31	25.089	10,100	8,074	12,127	0.636	35.6
	101-200	8	4	6.708	1,240	0	2,792	0.526	35.0
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	1	0.009	1	0	3	0.153	24.0
	All depths	53	36	15.159	11,342	8,950	13,733	0.624	35.5

Table 10. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of southern rock sole by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	1-100	W Southern Bering	2	2	27.67	4,387	2,758	6,016
Southern Bering Sea	1-100	E Southern Bering	31	29	23.41	5,713	3,698	7,728
Southern Bering Sea	101-200	E Southern Bering	6	3	8.76	1,033	0	2,633
Southern Bering Sea	101-200	W Southern Bering	2	1	3.10	207	0	2,840
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	1.30	165	0	873
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	1.19	231	0	3,164
Eastern Aleutians	1-100	SE Eastern Aleutians	8	3	0.70	122	0	266
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.31	59	0	805
Central Aleutians	1-100	SE Central Aleutians	5	1	0.17	20	0	74
Eastern Aleutians	101-200	SW Eastern Aleutians	12	1	0.07	16	0	50
Central Aleutians	101-200	SE Central Aleutians	15	1	0.05	4	0	13
Eastern Aleutians	101-200	NE Eastern Aleutians	18	1	0.02	5	0	15
Southern Bering Sea	301-500	Combined Southern Bering	8	1	0.01	1	0	3

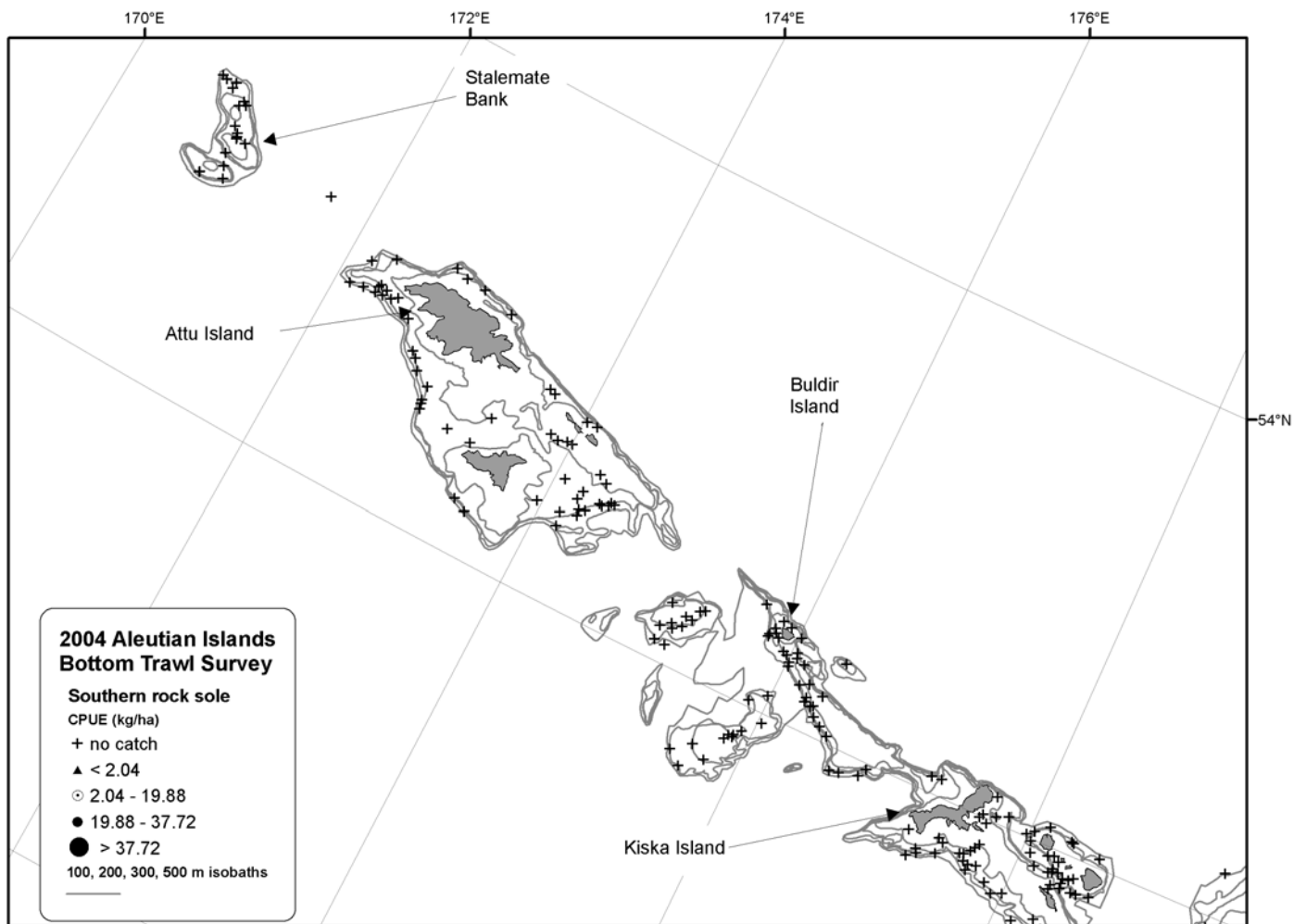


Figure 9. -- Distribution and relative abundance of southern rock sole from the 2004 Aleutian Islands bottom trawl survey.

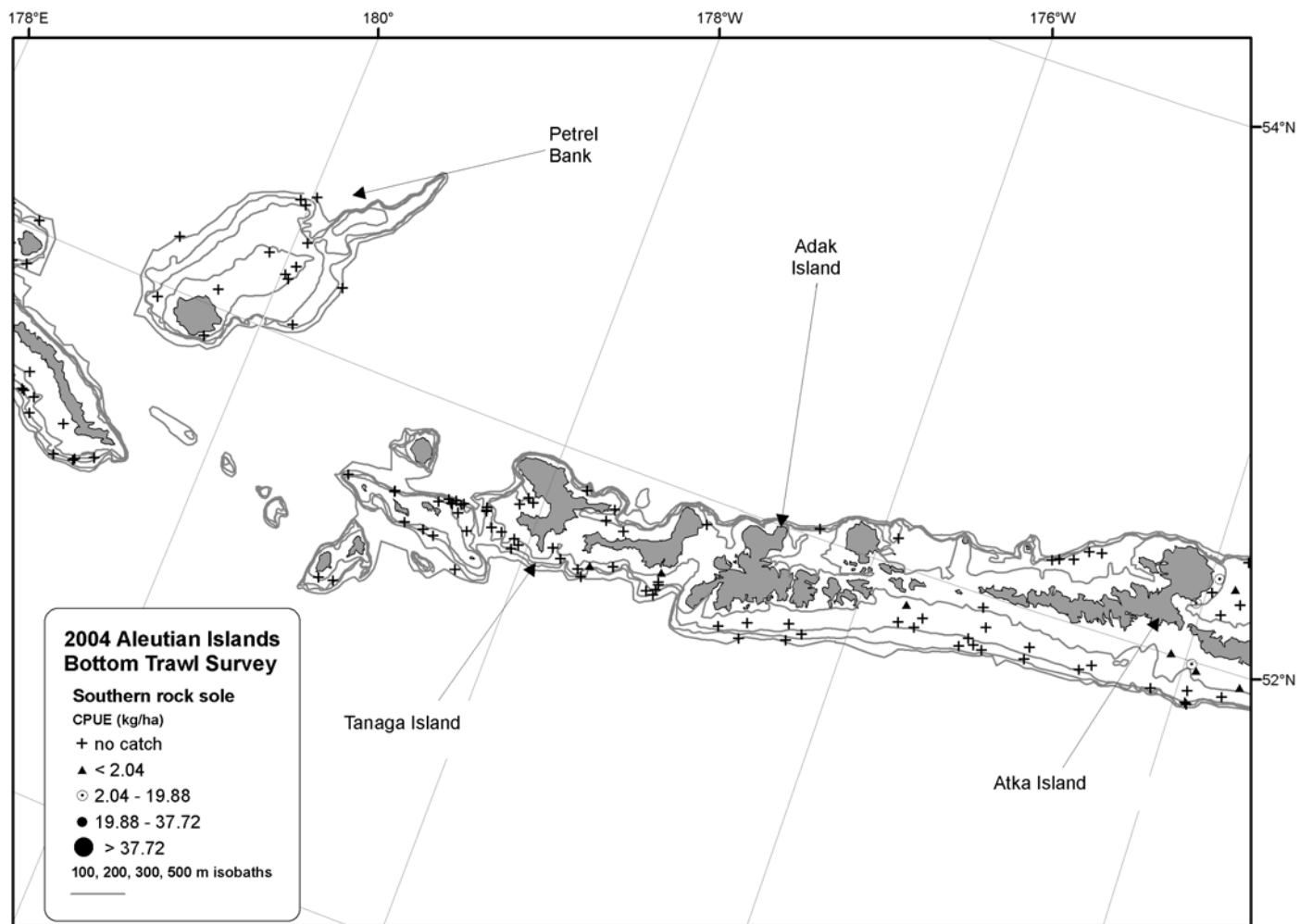


Figure 9. -- (continued).

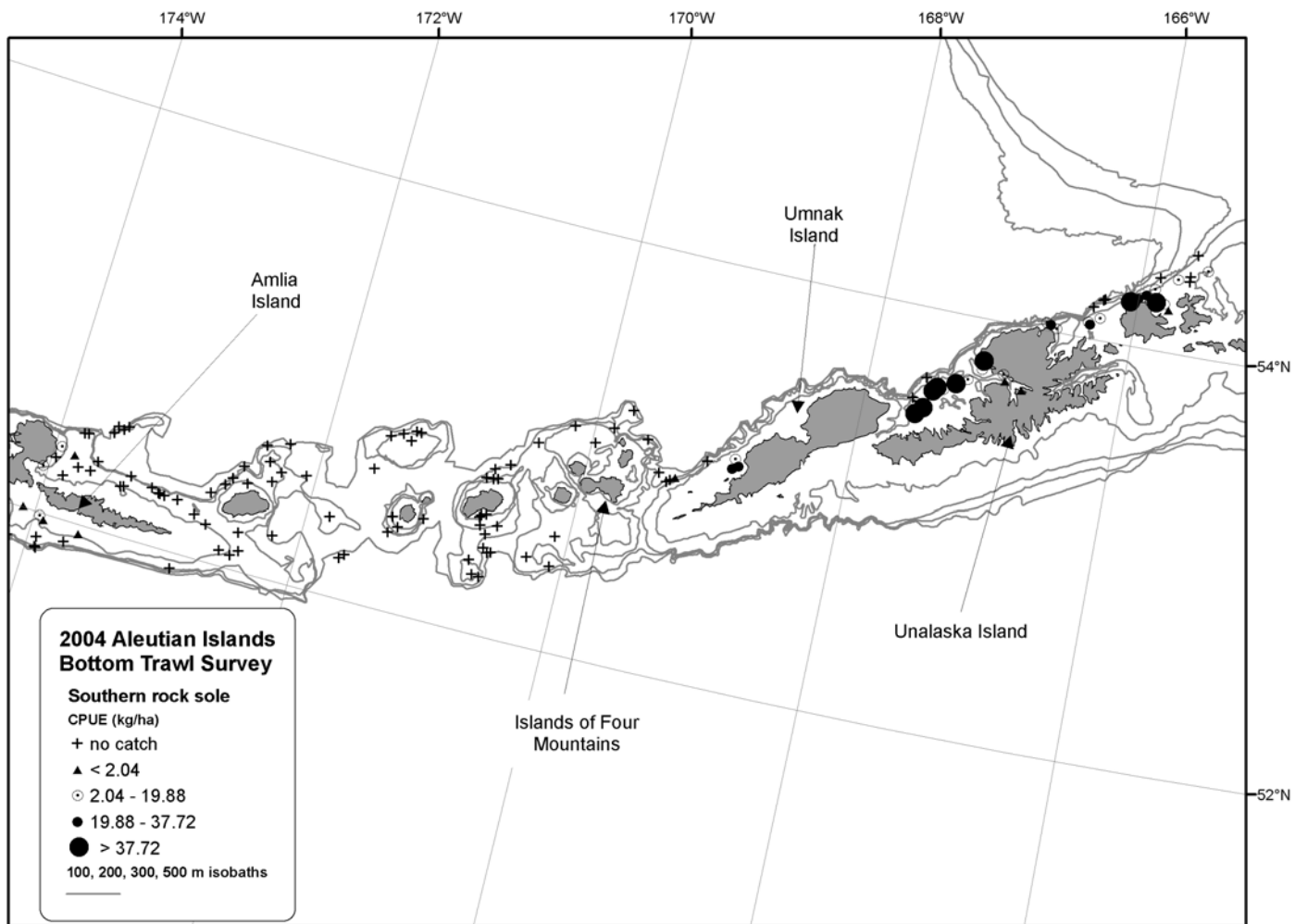


Figure 9. -- (continued).

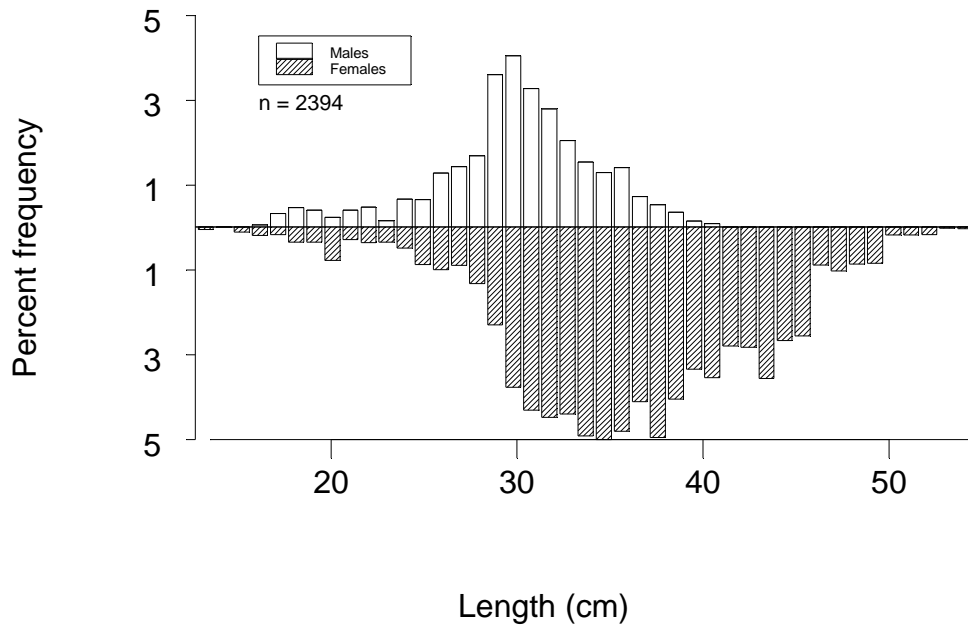


Figure 10. -- Size composition of southern rock sole from the 2004 Aleutian Islands bottom trawl survey.

Pacific halibut (*Hippoglossus stenolepis*)

Pacific halibut was distributed throughout the survey area with the exception of the extreme western end, on Stalemate Bank (Fig. 11). It was not particularly abundant in the Western and Central NPFMC Aleutian regulatory areas, although its mean CPUE was relatively high (9-13 kg/ha) in the Eastern Aleutians and Southern Bering Sea areas (Table 2). Halibut were predominantly distributed at shallow depths in all NPFMC areas (Table 11). Estimated biomass totaled slightly above 40,000 t, with almost half found in the Eastern Aleutians area and 82% of the estimated total Aleutian biomass in the 1-100 m and 101-200 m depth intervals. Whereas abundance generally decreased with increasing depth, mean individual weight and length increased (Table 10 and Fig. 12). The two highest individual subarea mean CPUEs were from the 1-100 m and 101- 200 m depth intervals in the NW Eastern Aleutians and SE Eastern Aleutians subareas (Table 12).

Greenland turbot (*Reinhardtius hippoglossoides*)

This commercially important species is probably under-sampled by this trawl survey since the maximum depth sampled is only 500 m, resulting in an underestimate of total biomass for the species. Aleutian area relative abundance and estimated biomass were invariably highest in the 301-500 m depth interval (Table 13). In 1980 the U.S.- Japan cooperative trawl survey sampled to 900 m with a much larger, stronger trawl with a very heavy footrope. In that year, more than 80% of the total estimated Aleutian biomass was found in the 501-900 m depth interval (Ronholt et al. 1986). During the 2004 survey, the most notable incidence of Greenland turbot was found in 301-500 m in the Southern Bering Sea area (Table 14) around Samalga Pass (Fig. 13). Catches of female Greenland turbot were relatively small compared to males (Fig. 14). Although females were not well represented in the catches, they were generally larger than the males. It is possible that females primarily inhabit greater depths. The results of the 1980 U.S.- Japan cooperative trawl survey showed that virtually all Greenland turbot larger than 75 cm fork length were females. Greenland turbot larger than 75 cm were found most frequently in the 501-900 m depth interval, outside the scope of the present survey.

Table 11. -- Total effort (number of trawl hauls), number of hauls with Pacific halibut, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	12	5.189	2,530	403	4,657	11.288	88.5
	101-200	62	14	1.773	943	362	1,523	10.712	93.0
	201-300	25	4	5.600	965	0	2,013	46.510	143.5
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	30	2.922	4,438	2,101	6,775	18.826	101.4
Central Aleutians	1-100	31	19	3.709	2,169	828	3,509	3.557	56.5
	101-200	48	24	3.885	1,789	231	3,348	7.372	80.5
	201-300	31	11	1.547	326	77	575	16.225	102.5
	301-500	21	3	0.971	387	0	967	18.684	111.5
	All depths	131	57	2.823	4,671	2,576	6,766	7.155	73.5
Eastern Aleutians	1-100	15	13	13.782	9,438	868	18,007	10.370	77.3
	101-200	42	33	11.614	9,022	5,972	12,072	7.335	77.1
	201-300	33	15	4.286	2,101	895	3,306	9.703	86.9
	301-500	22	3	3.658	2,079	0	5,452	18.919	107.8
	All depths	112	64	8.984	22,639	13,509	31,768	9.884	80.9
All Aleutian Areas	1-100	69	44	8.05	14,137	5,802	22,471	9.489	76.1
	101-200	152	71	6.64	11,754	8,352	15,155	7.612	78.9
	201-300	89	30	3.88	3,392	1,824	4,960	20.804	104.5
	301-500	57	6	1.91	2,465	0	5,762	18.882	108.4
	All depths	367	151	5.58	31,748	22,166	41,329	10.732	82.7
Southern Bering Sea	1-100	33	33	14.876	5,989	3,822	8,156	1.779	50.1
	101-200	8	7	13.835	2,558	1,270	3,845	3.301	63.7
	201-300	4	2	3.556	201	0	611	10.189	93.0
	301-500	8	5	8.352	871	0	1,959	18.478	109.0
	All depths	53	47	12.856	9,618	7,046	12,190	3.872	60.0

Table 12. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Pacific halibut by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	23.09	4,463	0	43,561
Eastern Aleutians	101-200	SE Eastern Aleutians	9	8	21.06	4,002	1,206	6,797
Southern Bering Sea	101-200	W Southern Bering	2	2	20.79	1,392	0	3,512
Southern Bering Sea	1-100	E Southern Bering	31	31	19.02	4,640	2,753	6,528
Eastern Aleutians	1-100	SE Eastern Aleutians	8	7	14.70	2,558	0	5,491
Eastern Aleutians	101-200	NE Eastern Aleutians	18	14	13.39	2,694	1,342	4,047
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	11.66	2,223	0	30,474
Western Aleutians	201-300	E Western Aleutians	11	3	10.56	827	0	1,916
Southern Bering Sea	101-200	E Southern Bering	6	5	9.88	1,165	0	2,498
Southern Bering Sea	1-100	W Southern Bering	2	2	8.50	1,348	0	8,039
Southern Bering Sea	301-500	Combined Southern Bering	8	5	8.35	871	0	1,923
Central Aleutians	201-300	N Central Aleutians	16	11	7.43	326	67	585
Eastern Aleutians	101-200	SW Eastern Aleutians	12	8	6.96	1,573	185	2,961
Central Aleutians	1-100	N Central Aleutians	16	12	6.69	1,408	220	2,597
Western Aleutians	1-100	W Western Aleutians	10	4	6.37	2,352	37	4,668
Central Aleutians	101-200	SE Central Aleutians	15	12	6.21	467	198	735
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	6.15	1,584	0	5,237
Eastern Aleutians	201-300	NE Eastern Aleutians	15	8	6.02	1,186	181	2,190
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	4.72	753	551	955
Central Aleutians	101-200	Petrel Bank	2	1	4.27	740	0	10,148
Central Aleutians	101-200	N Central Aleutians	9	5	3.60	384	21	747
Central Aleutians	1-100	SE Central Aleutians	5	4	3.56	414	0	1,145
Southern Bering Sea	201-300	Combined Southern Bering	4	2	3.56	201	0	611
Eastern Aleutians	201-300	SW Eastern Aleutians	6	2	3.51	252	0	738
Central Aleutians	301-500	SW Central Aleutians	3	1	3.31	261	0	1,384
Eastern Aleutians	201-300	SE Eastern Aleutians	10	4	3.15	649	0	1,347
Central Aleutians	1-100	Petrel Bank	6	1	2.13	205	0	731
Western Aleutians	101-200	W Western Aleutians	36	10	1.96	795	220	1,369
Central Aleutians	101-200	SW Central Aleutians	22	6	1.89	198	0	416
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	2	1.85	495	0	1,275
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	1.53	193	0	708
Western Aleutians	1-100	E Western Aleutians	13	8	1.51	178	34	322
Western Aleutians	201-300	W Western Aleutians	14	1	1.47	138	0	436
Central Aleutians	301-500	SE Central Aleutians	3	1	1.24	89	0	470
Western Aleutians	101-200	E Western Aleutians	26	4	1.18	148	2	294
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.92	14	0	197
Central Aleutians	1-100	SW Central Aleutians	4	2	0.87	141	0	419
Central Aleutians	301-500	N Central Aleutians	12	1	0.30	37	0	118

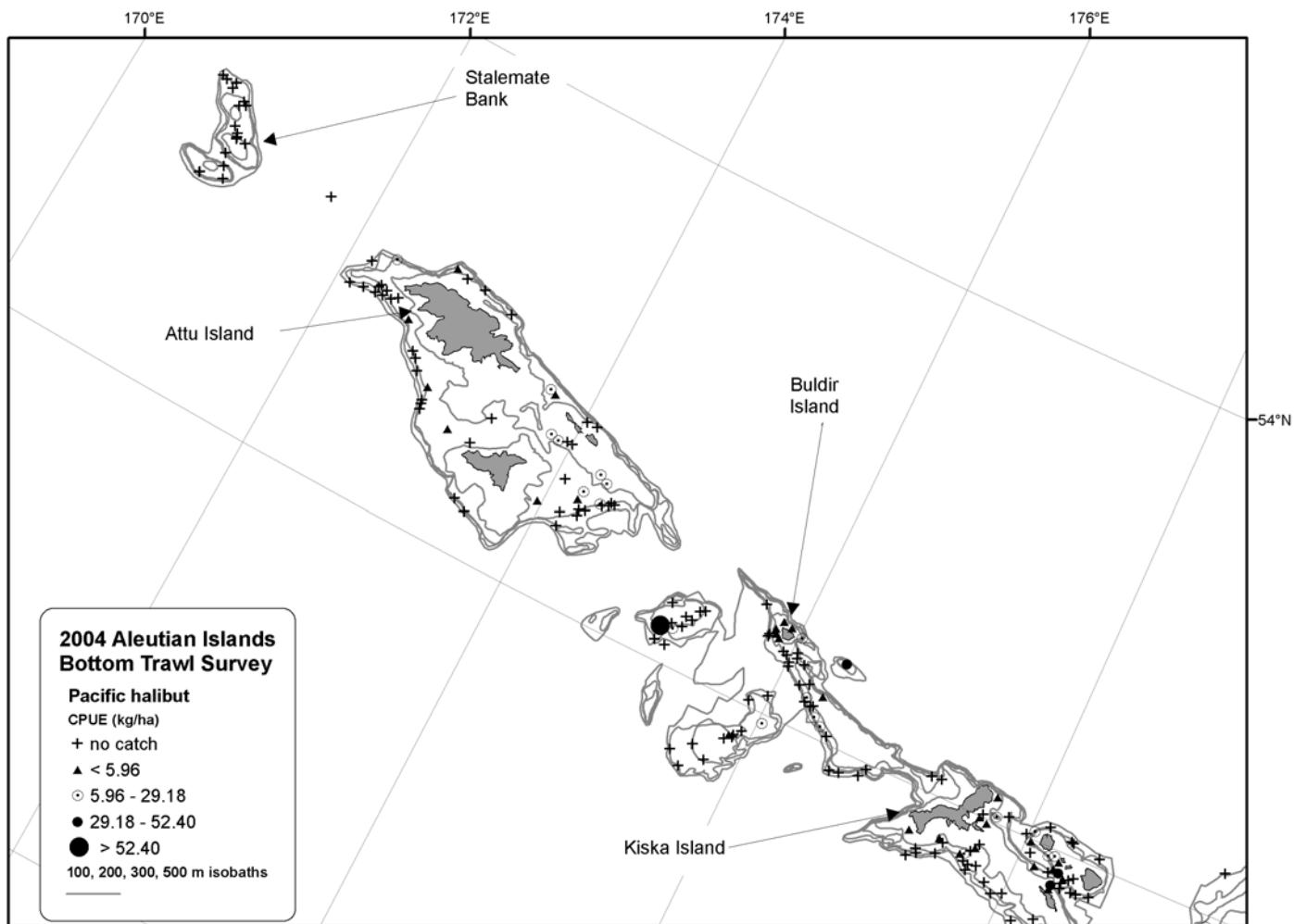


Figure 11. -- Distribution and relative abundance of Pacific halibut from the 2004 Aleutian Islands bottom trawl survey.

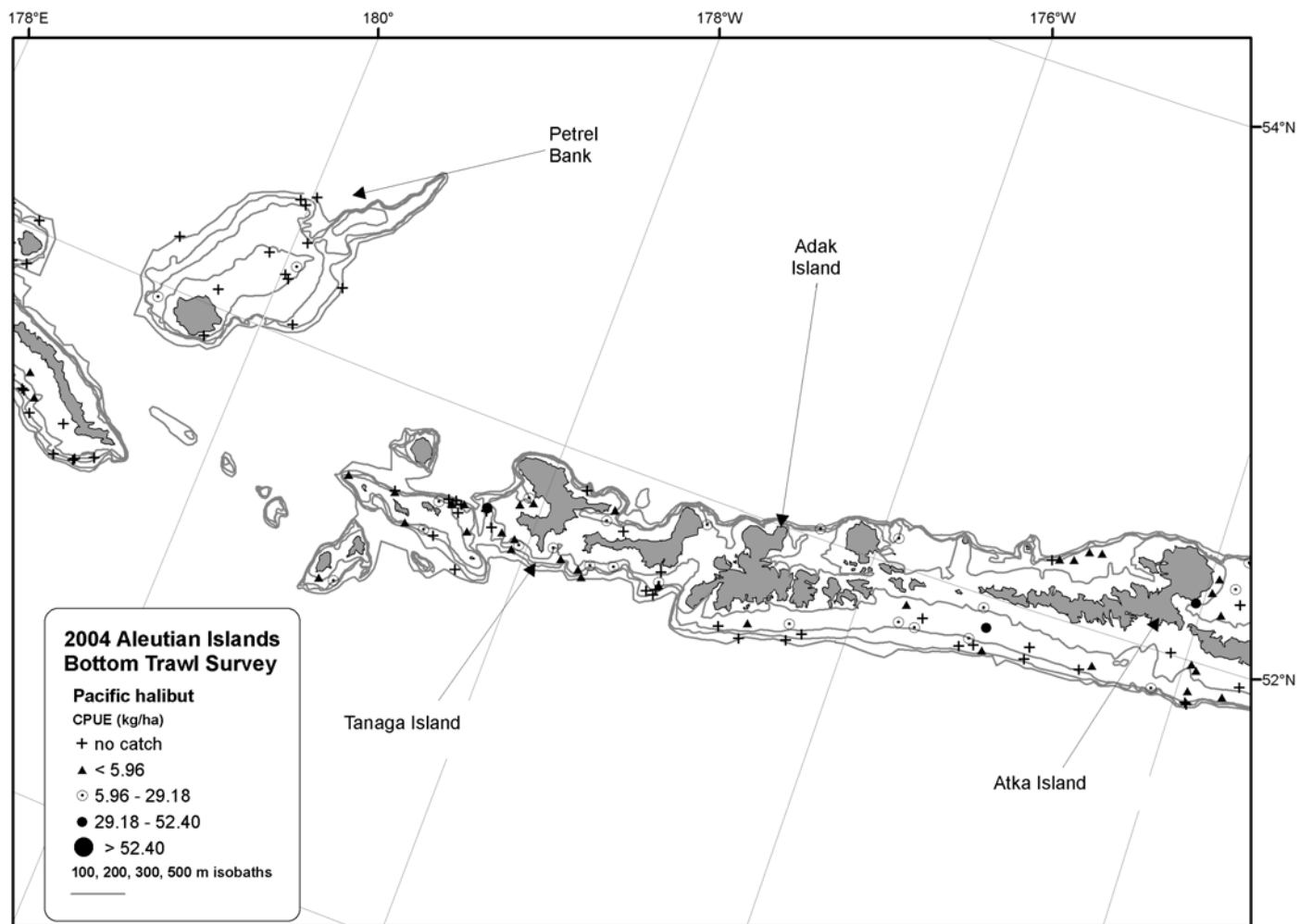


Figure 11. -- (continued).

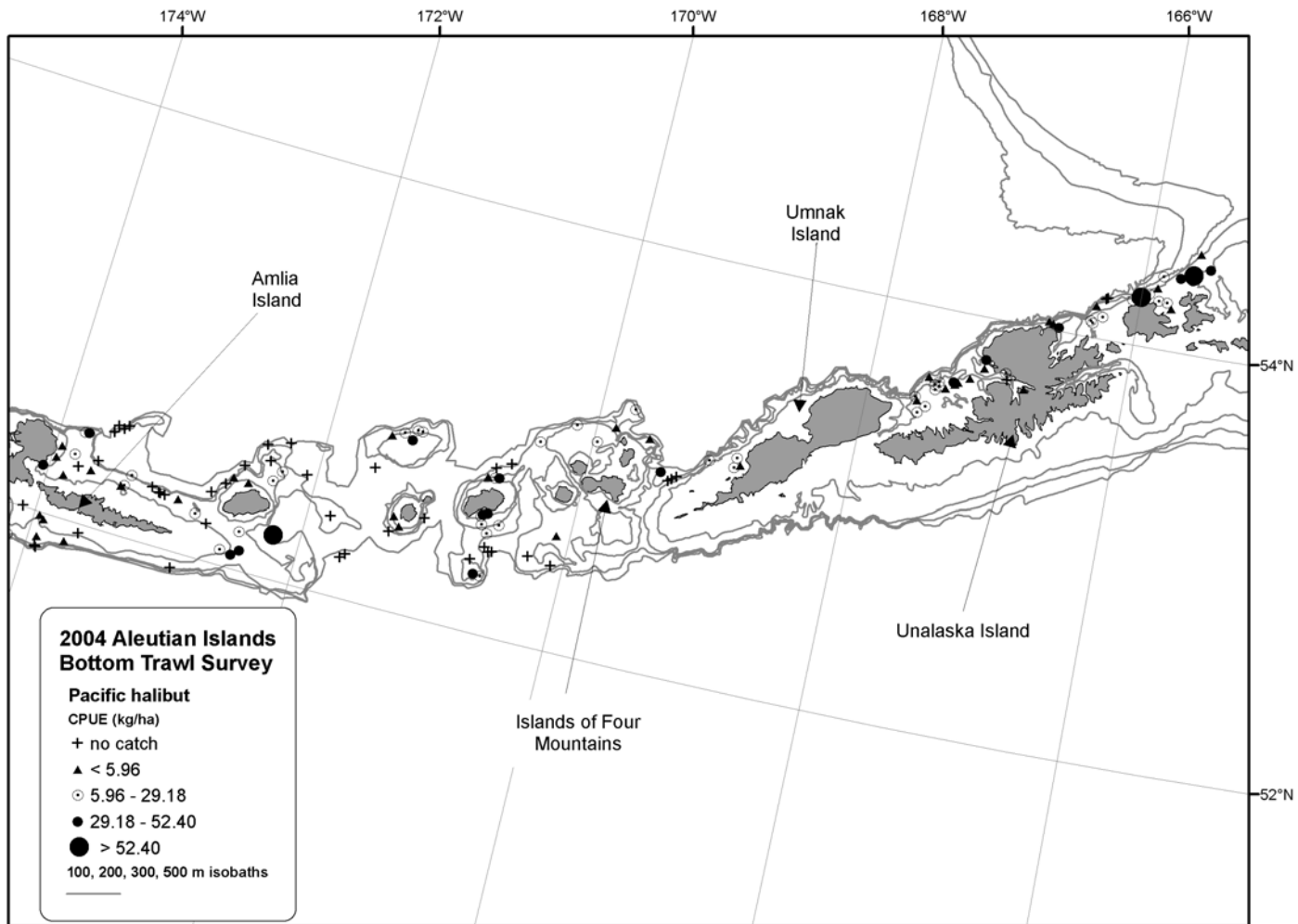


Figure 11. -- (continued).

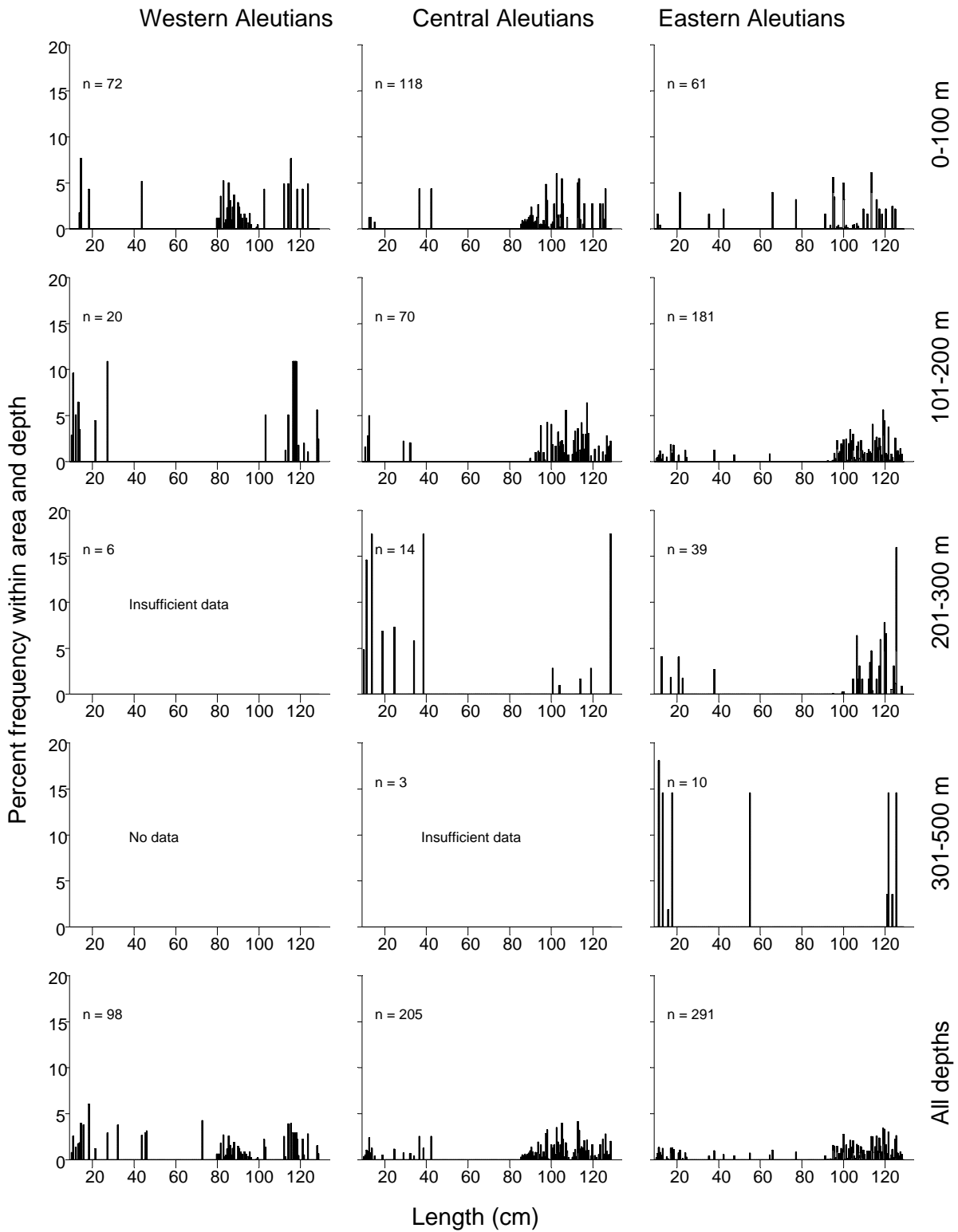


Figure 12. -- Size composition of Pacific halibut from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

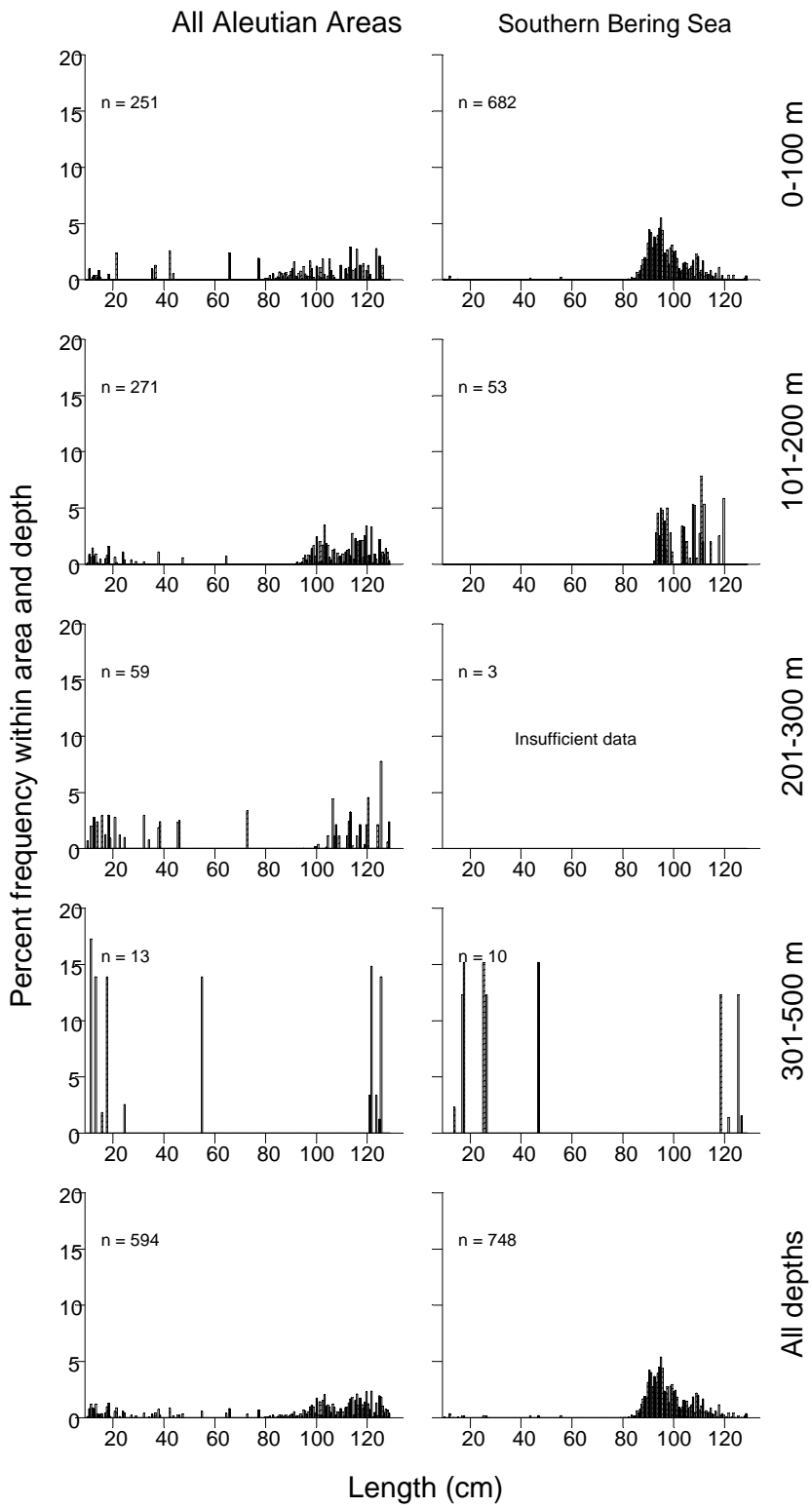


Figure 12. -- (continued).

Table 13. -- Total effort (number of trawl hauls), number of hauls with Greenland turbot, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	0	0.000	0	--	--	--	--
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	9	7.909	2,588	386	4,791	5.906	80.3
	All depths	124	9	1.704	2,588	588	4,589	5.906	80.3
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	0	0.000	0	--	--	--	--
	201-300	31	3	0.428	90	0	236	5.075	82.9
	301-500	21	12	7.176	2,856	524	5,189	4.565	76.0
	All depths	131	15	1.781	2,947	730	5,163	4.581	76.2
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	1	0.051	40	0	121	7.615	89.0
	201-300	33	1	0.101	50	0	151	4.421	77.5
	301-500	22	11	4.355	2,475	778	4,172	3.508	72.1
	All depths	112	13	1.018	2,564	942	4,186	3.590	72.4
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	1	0.02	40	0	119	7.615	89.0
	201-300	89	4	0.16	140	0	312	4.843	81.0
	301-500	57	32	6.12	7,919	4,486	11,353	4.673	76.2
	All depths	367	37	1.42	8,099	4,723	11,475	4.691	76.3
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	1	0.915	52	0	216	4.276	72.5
	301-500	8	5	30.505	3,182	0	7,731	3.253	71.8
	All depths	53	6	4.322	3,234	0	6,968	3.269	71.9

Table 14. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Greenland turbot by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	301-500	Combined Southern Bering	8	5	30.51	3,182	0	7,579
Western Aleutians	301-500	W Western Aleutians	10	7	10.44	1,787	0	3,686
Central Aleutians	301-500	N Central Aleutians	12	5	10.40	1,289	0	3,302
Central Aleutians	301-500	SE Central Aleutians	3	2	8.83	631	0	2,614
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	8	7.39	1,974	297	3,651
Western Aleutians	301-500	E Western Aleutians	4	2	5.13	802	0	2,592
Central Aleutians	301-500	Petrel Bank	3	2	4.86	601	0	2,461
Central Aleutians	301-500	SW Central Aleutians	3	3	4.26	336	0	855
Eastern Aleutians	301-500	SE Eastern Aleutians	9	3	1.94	500	0	1,228
Central Aleutians	201-300	SE Central Aleutians	3	1	1.46	69	0	368
Southern Bering Sea	201-300	Combined Southern Bering	4	1	0.92	52	0	216
Central Aleutians	201-300	N Central Aleutians	16	2	0.47	21	0	53
Eastern Aleutians	201-300	NE Eastern Aleutians	15	1	0.25	50	0	156
Eastern Aleutians	101-200	NE Eastern Aleutians	18	1	0.20	40	0	124

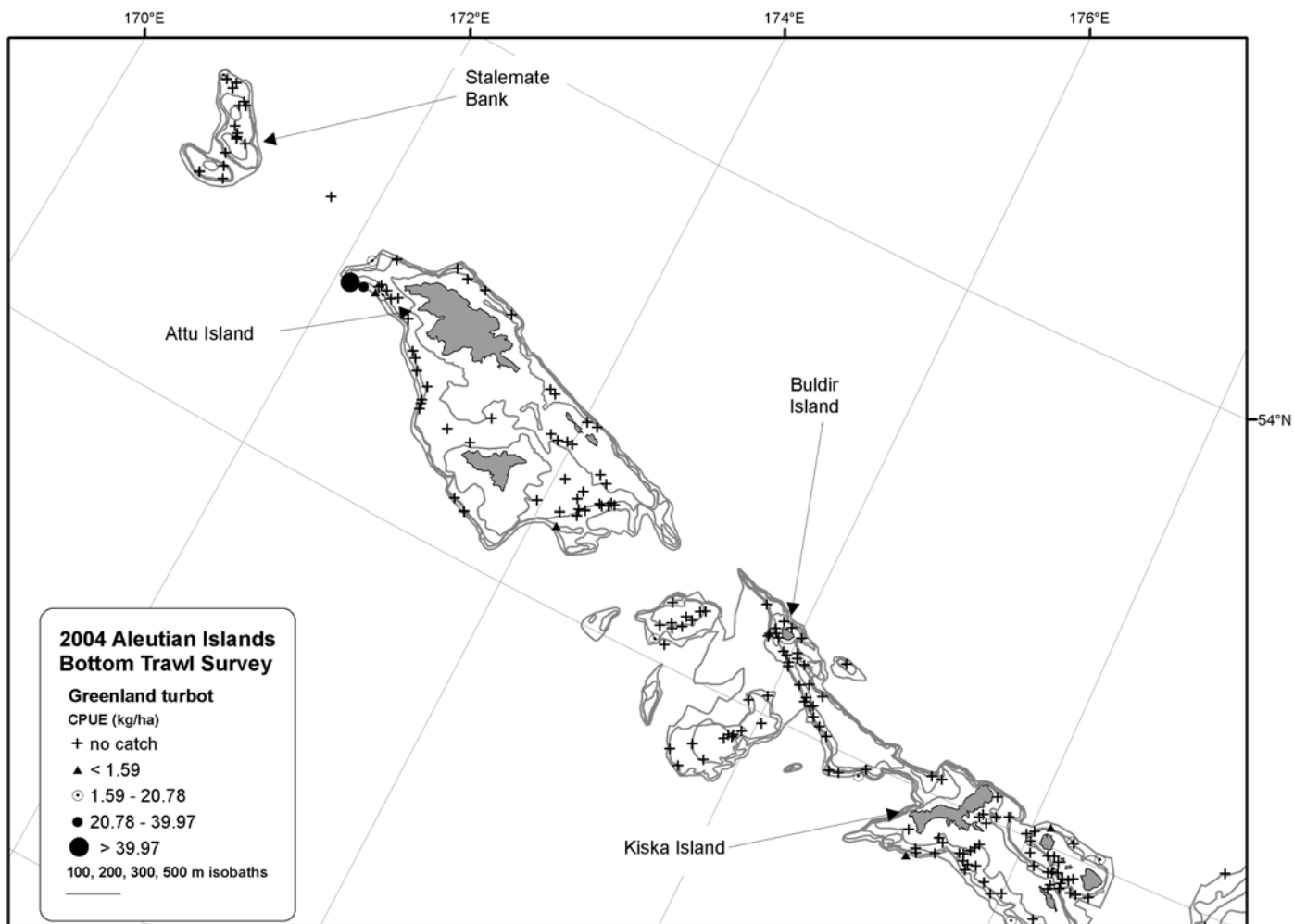


Figure 13. -- Distribution and relative abundance of Greenland turbot from the 2004 Aleutian Islands bottom trawl survey.

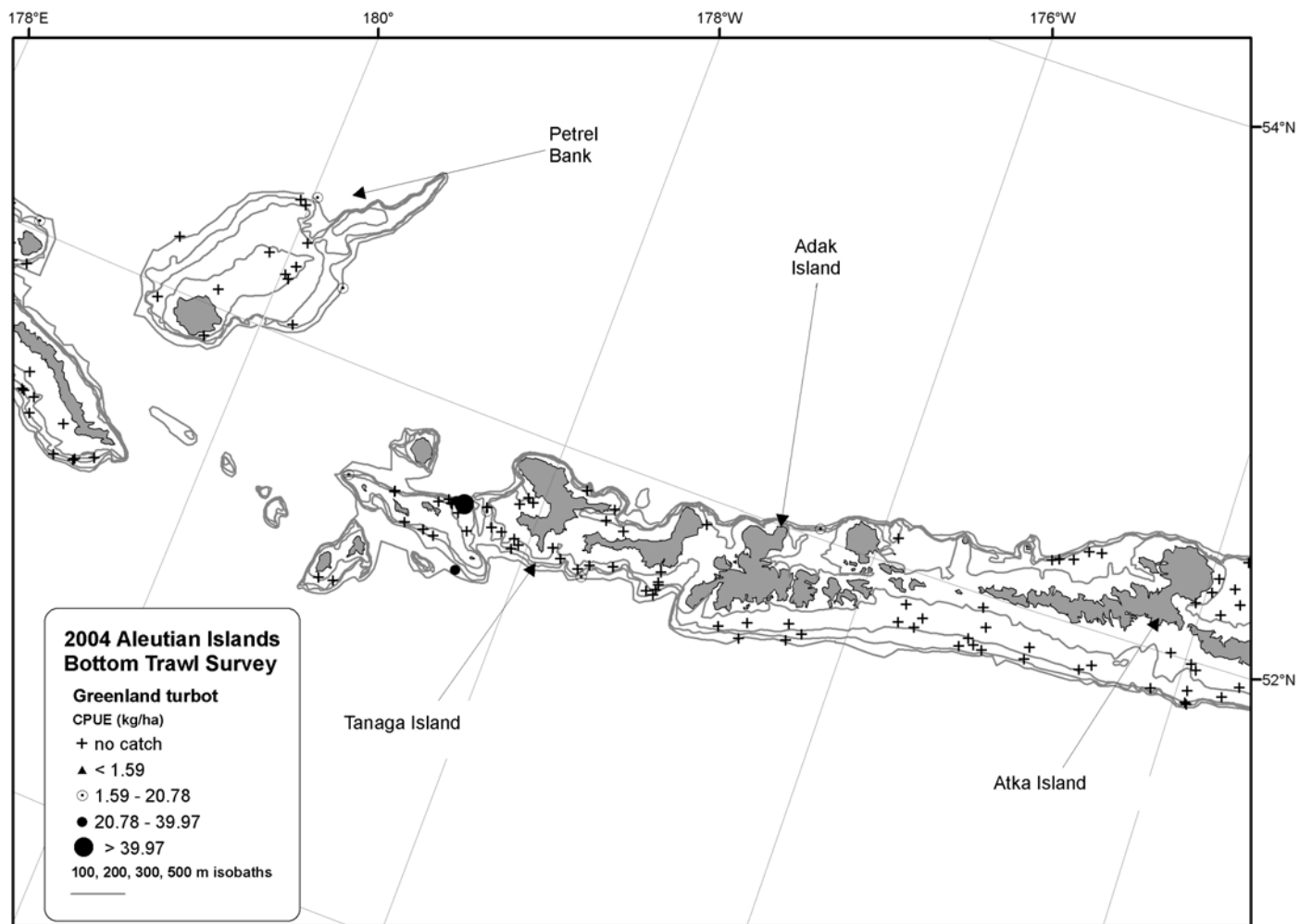


Figure 13. -- (continued).

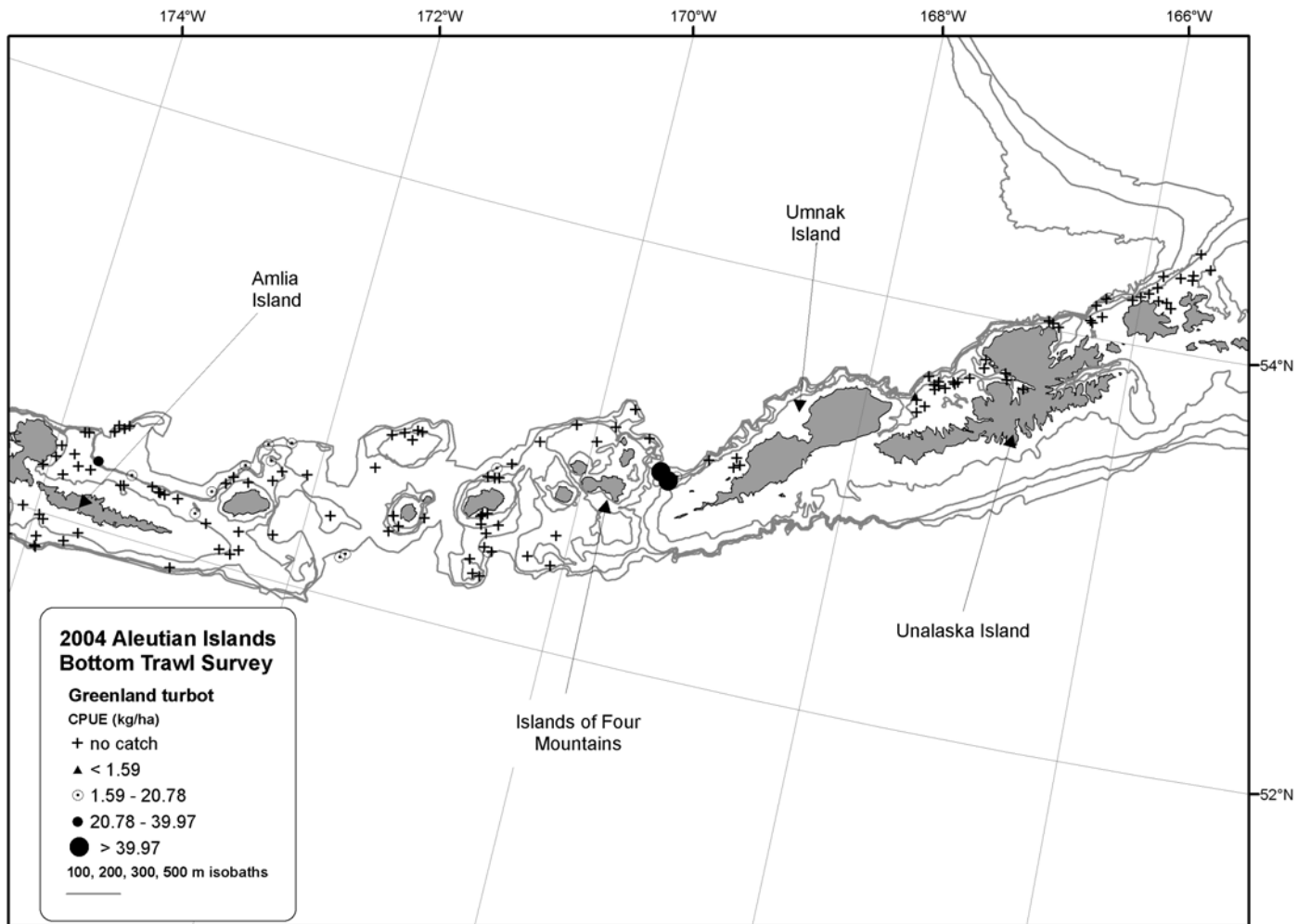


Figure 13. -- (continued).

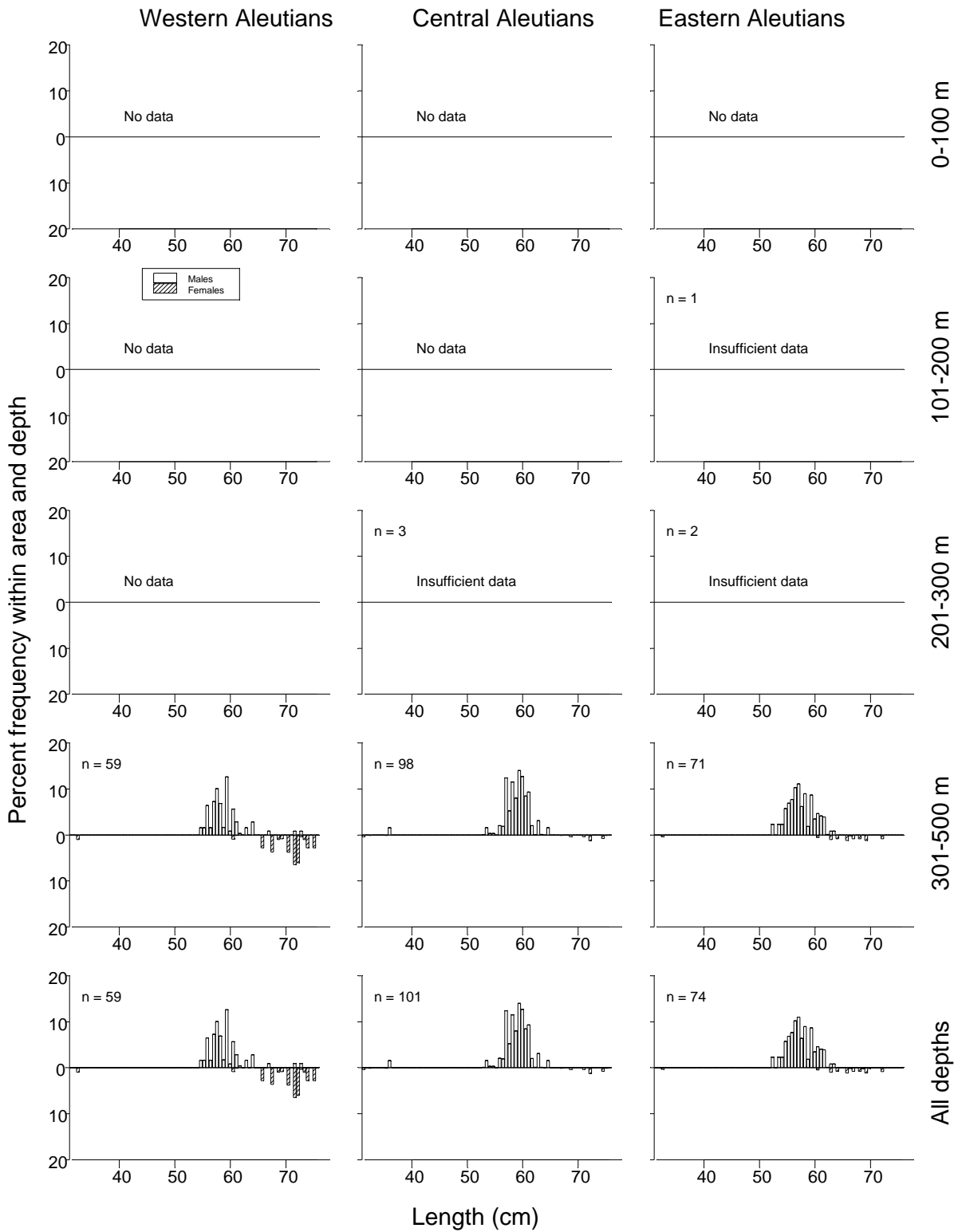


Figure 14. -- Size composition of Greenland turbot from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

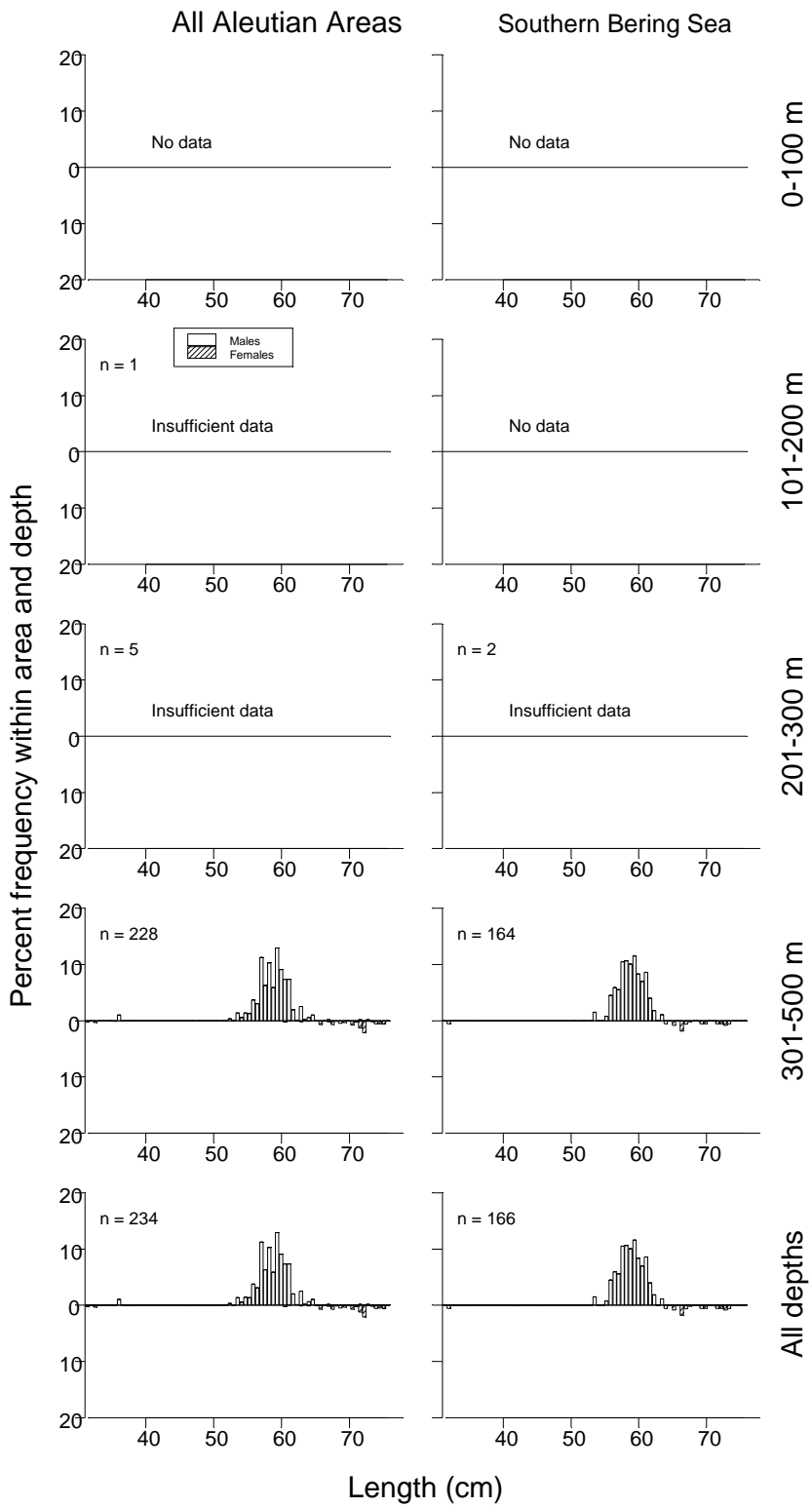


Figure 14. -- (continued).

Flathead sole (*Hippoglossoides elassodon*)

Flathead sole is widely distributed in the Aleutian region, although at low relative abundance levels (Table 2), especially in the Central Aleutians area where CPUE ranked lower than the top 20 species. Total estimated biomass was 13,299 t, with 47% found in the Southern Bering Sea area (Table 15). The highest mean CPUE was found in the Southern Bering Sea area in the 101-200 m depth interval where flathead sole individual mean length and weight was the smallest. The highest stratum mean CPUEs were in the E Southern Bering Sea in 1-100 m and 101-200 m (Table 16). The four largest station-specific CPUEs were concentrated near Unalaska Island, especially in Makushin Bay (Fig. 15). Size compositions did not increase with depth, although females appear to reach greater size than males in most areas (Fig. 16).

Rex sole (*Glyptocephalus zachirus*)

Rex sole are ubiquitous over the entire survey area, although at relatively low levels of abundance (Table 2). Mean CPUE was highest in the 201-300 m depth interval in the Aleutian areas and in the 301-500 m depth interval in the Southern Bering Sea area (Table 17). The top two ranked subarea mean CPUEs were in the Southern Bering Sea area (Table 18). The highest catches were centered around Unalaska Island (Fig. 17). Males were smaller than females in all areas. At the shallower depths females dominated in terms of catch, while both sexes were equally common at deeper depths (Fig. 18).

Dover sole (*Microstomus pacificus*)

Dover sole appeared at low abundance levels throughout the survey area, mostly at depths greater than 100 m. Abundance most likely does not approach commercially exploitable levels, so it is mostly of biological interest as part of the Aleutian ecosystem. The biomass was highest in the 301-500 m depth interval in the Southern Bering Sea and all Aleutian Islands areas (Table 19). Most of the biomass originated from four tows in the 301-500 m depth interval in the Southern Bering Sea and from three tows at 201-300 m depth on Petrel Bank (Table 20). Males outnumbered females in length frequency collections (Fig. 19).

Table 15. -- Total effort (number of trawl hauls), number of hauls with flathead sole, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	8	2.844	1,387	162	2,612	0.333	30.0
	101-200	62	32	4.993	2,655	1,494	3,817	0.234	28.0
	201-300	25	10	1.476	254	51	458	0.208	27.3
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	50	2.829	4,296	2,647	5,946	0.264	28.6
Central Aleutians	1-100	31	5	0.223	131	0	286	0.363	29.9
	101-200	48	12	0.261	120	38	202	0.592	36.9
	201-300	31	9	0.149	31	5	58	0.593	37.4
	301-500	21	0	0.000	0	--	--	--	--
	All depths	131	26	0.171	282	109	455	0.486	33.7
Eastern Aleutians	1-100	15	3	1.332	912	0	2,585	0.157	25.0
	101-200	42	12	1.840	1,429	163	2,696	0.256	27.3
	201-300	33	7	0.383	188	0	380	0.572	36.8
	301-500	22	0	0.000	0	--	--	--	--
	All depths	112	22	1.004	2,529	546	4,513	0.243	27.2
All Aleutian Areas	1-100	69	16	1.38	2,430	482	4,377	0.268	28.2
	101-200	152	56	2.38	4,205	2,514	5,895	0.252	28.0
	201-300	89	26	0.54	474	201	746	0.378	31.7
	301-500	57	0	0.00	0	--	--	--	--
	All depths	367	98	1.25	7,108	4,541	9,675	0.266	28.3
Southern Bering Sea	1-100	33	28	10.305	4,149	1,976	6,321	0.319	29.6
	101-200	8	6	10.373	1,918	0	4,166	0.275	28.4
	201-300	4	2	0.244	14	0	49	0.567	37.3
	301-500	8	2	1.063	111	0	330	0.651	39.8
	All depths	53	38	8.275	6,191	3,362	9,020	0.312	29.4

Table 16. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of flathead sole by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	1-100	E Southern Bering	31	27	16.77	4,093	1,921	6,266
Southern Bering Sea	101-200	E Southern Bering	6.00	6	16.26	1,918	0	4,280
Western Aleutians	101-200	W Western Aleutians	36.00	29	6.36	2,585	1,403	3,767
Eastern Aleutians	1-100	NE Eastern Aleutians	3.00	1	6.03	764	0	4,053
Western Aleutians	1-100	W Western Aleutians	10.00	8	3.76	1,387	54	2,720
Eastern Aleutians	101-200	NE Eastern Aleutians	18.00	5	3.55	714	0	1,752
Eastern Aleutians	101-200	NW Eastern Aleutians	3.00	3	3.39	540	0	2,116
Western Aleutians	201-300	W Western Aleutians	14.00	7	2.63	247	35	460
Eastern Aleutians	201-300	NW Eastern Aleutians	2.00	2	1.84	29	0	377
Eastern Aleutians	201-300	SW Eastern Aleutians	6.00	4	1.77	126	0	343
Southern Bering Sea	301-500	Combined Southern Bering	8.00	2	1.06	111	0	322
Eastern Aleutians	101-200	SW Eastern Aleutians	12.00	4	0.77	175	0	465
Eastern Aleutians	1-100	NW Eastern Aleutians	2.00	2	0.77	148	0	1,719
Central Aleutians	1-100	N Central Aleutians	16.00	5	0.62	131	0	293
Central Aleutians	201-300	N Central Aleutians	16.00	5	0.57	25	0	52
Western Aleutians	101-200	E Western Aleutians	26.00	3	0.56	70	0	168
Central Aleutians	101-200	SW Central Aleutians	22.00	7	0.54	57	12	101
Central Aleutians	101-200	N Central Aleutians	9.00	3	0.48	52	0	128
Southern Bering Sea	1-100	W Southern Bering	2.00	1	0.35	56	0	762
Southern Bering Sea	201-300	Combined Southern Bering	4.00	2	0.24	14	0	49
Eastern Aleutians	201-300	NE Eastern Aleutians	15.00	1	0.17	33	0	103
Central Aleutians	101-200	SE Central Aleutians	15.00	2	0.16	12	0	35
Central Aleutians	201-300	SW Central Aleutians	9.00	3	0.09	4	0	9
Western Aleutians	201-300	E Western Aleutians	11.00	3	0.09	7	0	19
Central Aleutians	201-300	SE Central Aleutians	3.00	1	0.06	3	0	14

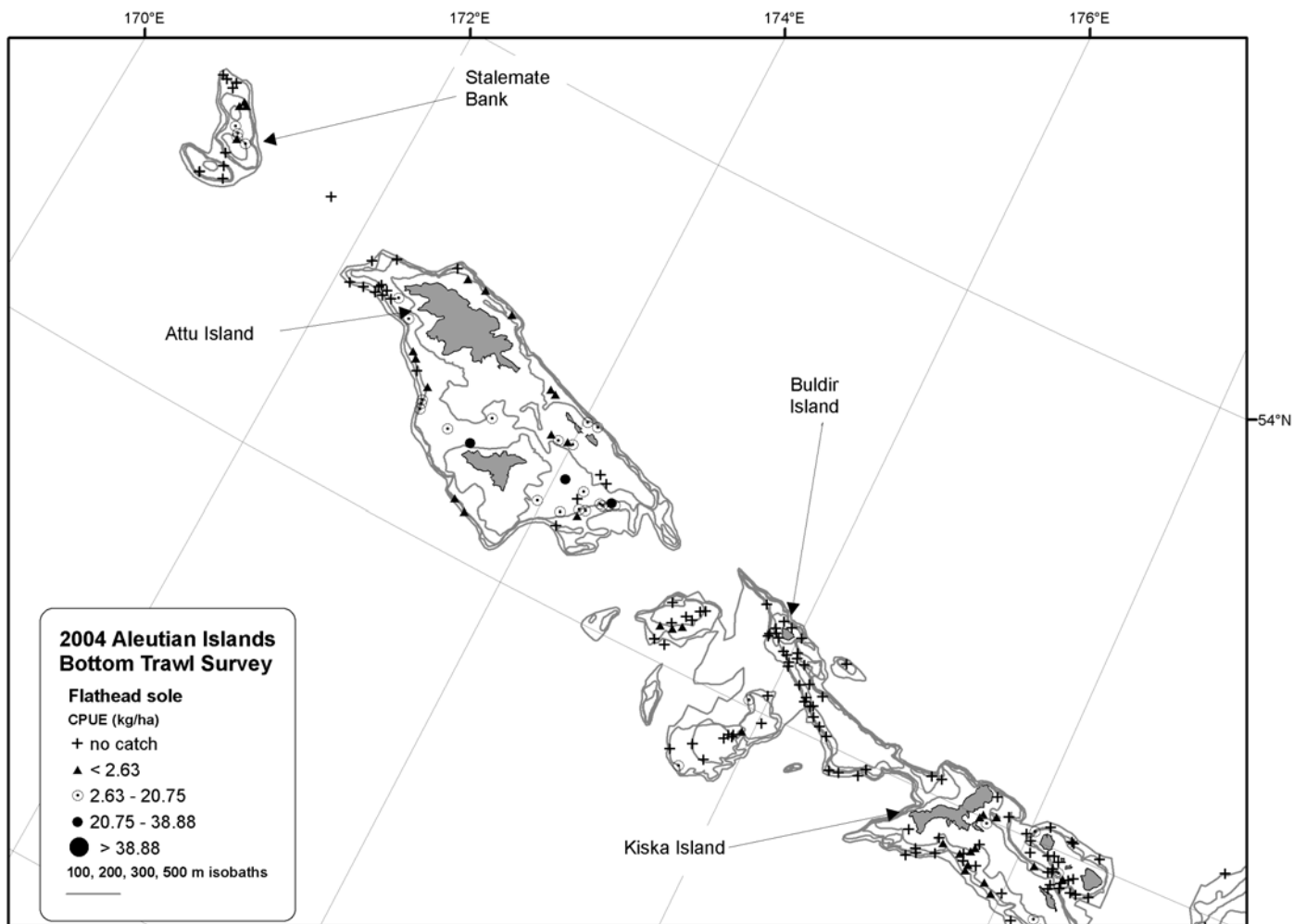


Figure 15. -- Distribution and relative abundance of flathead sole from the 2004 Aleutian Islands bottom trawl survey.

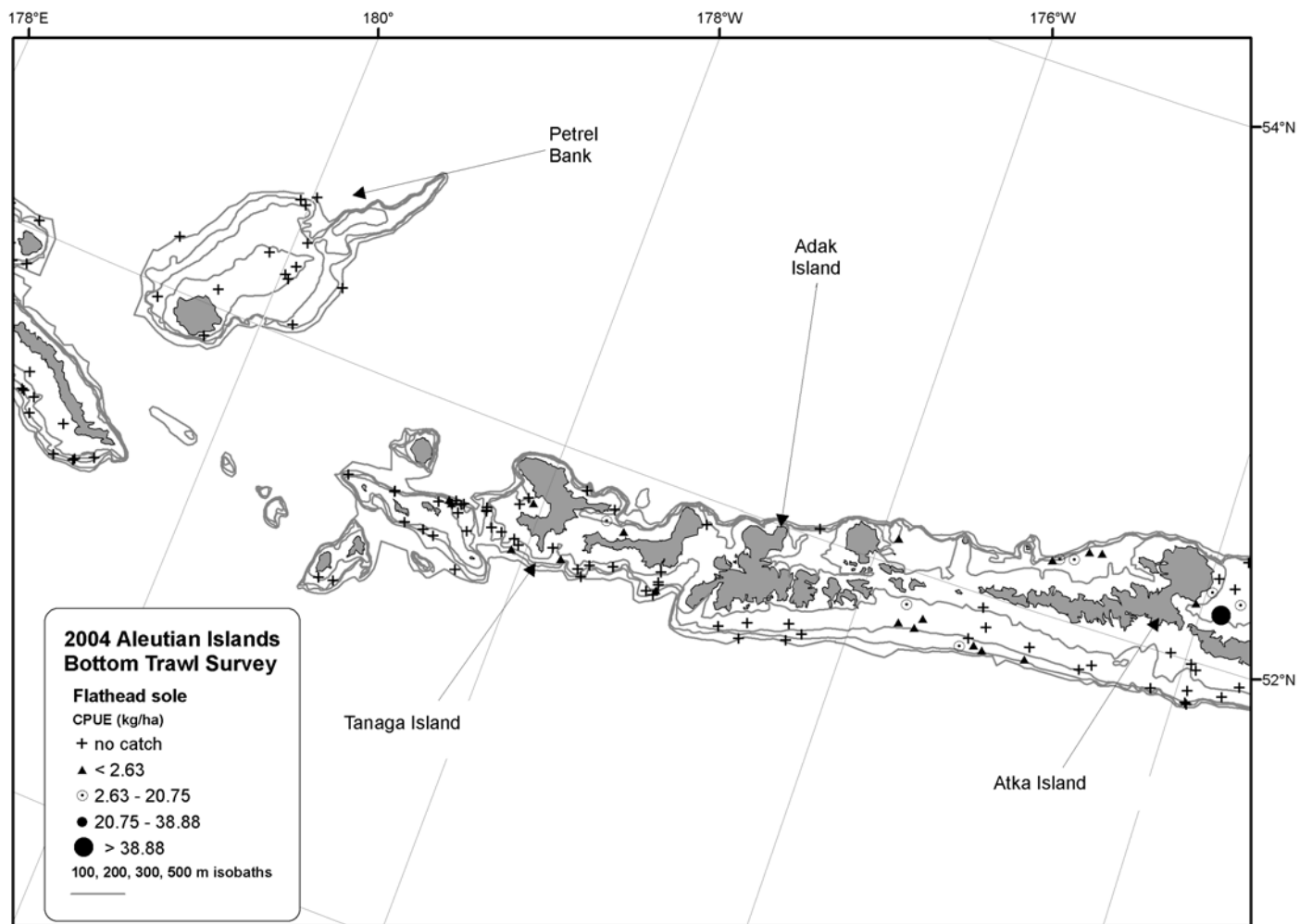


Figure 15. -- (continued).

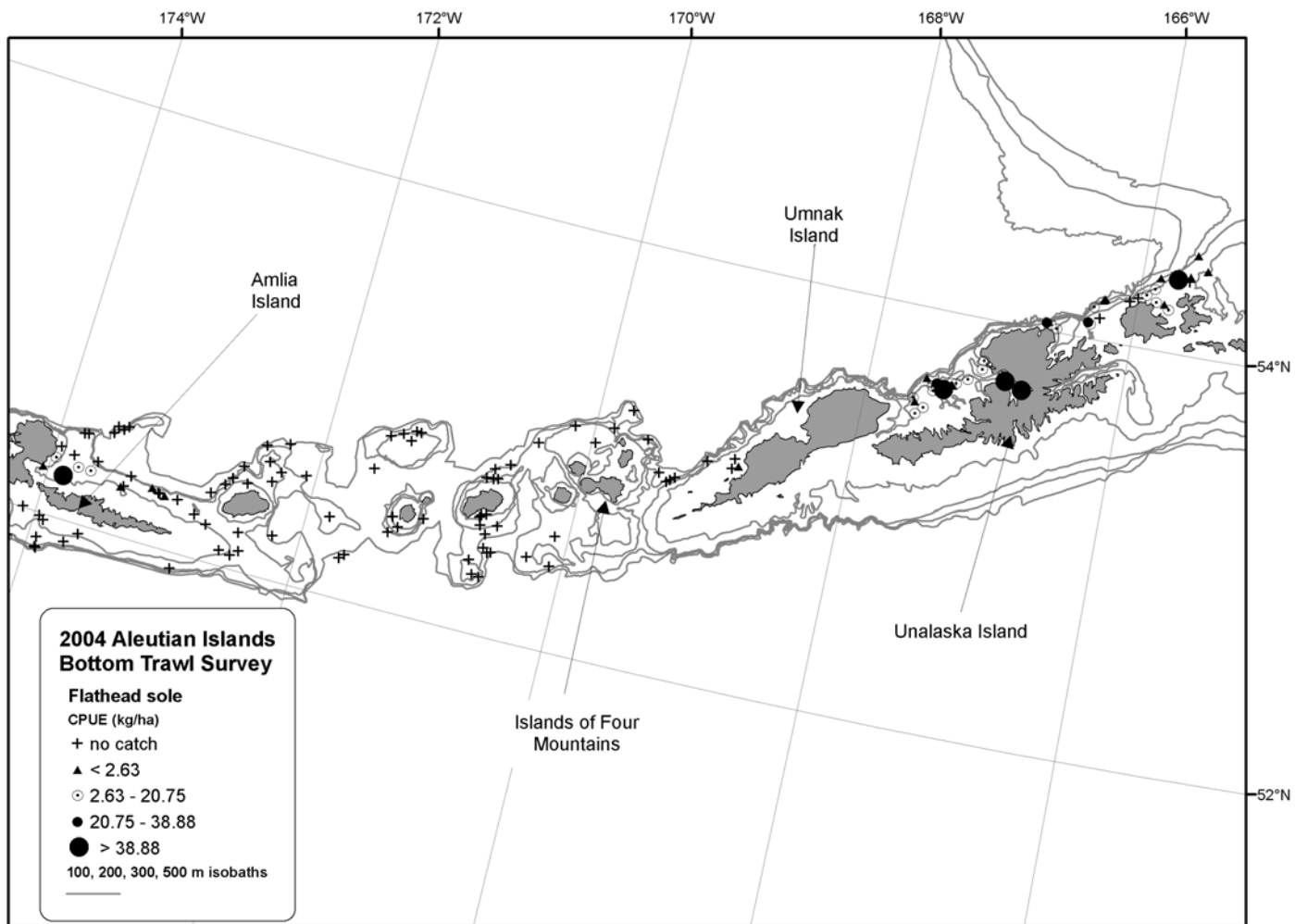


Figure 15. -- (continued).

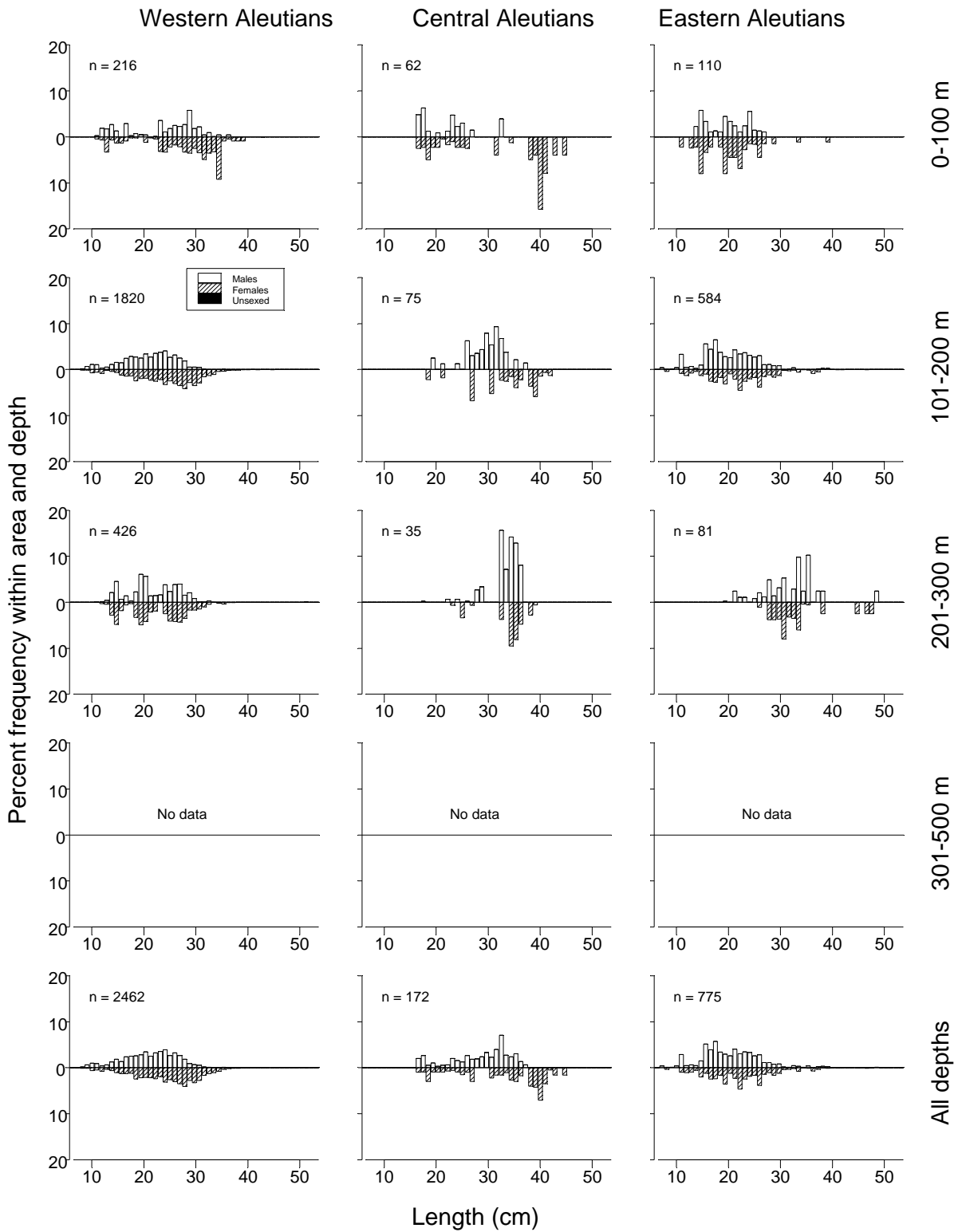


Figure 16. -- Size composition of flathead sole from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

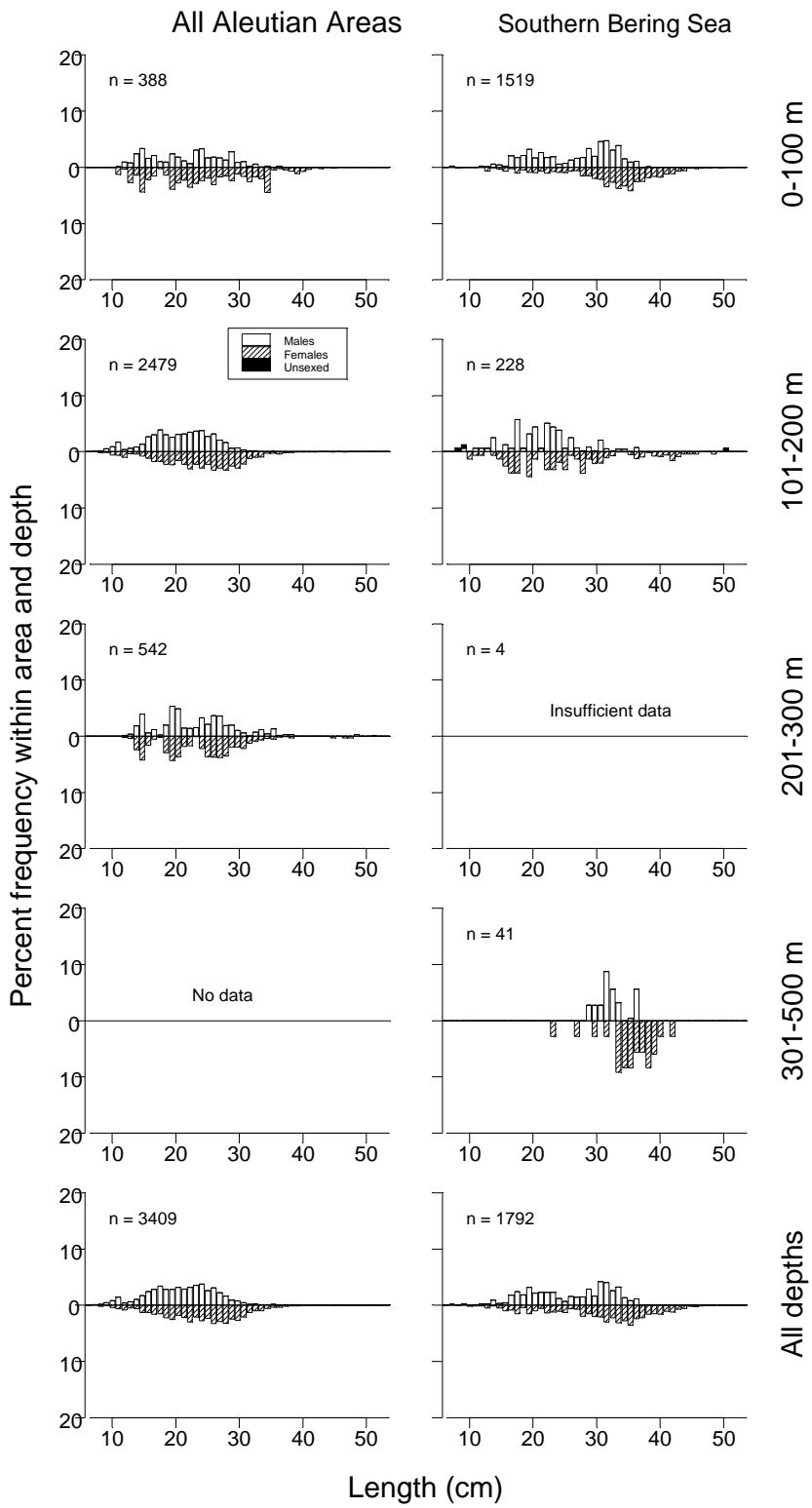


Figure 16. -- (continued).

Table 17. -- Total effort (number of trawl hauls), number of hauls with rex sole, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	6	0.981	478	0	1,128	0.668	44.6
	101-200	62	28	3.645	1,939	560	3,317	0.581	42.0
	201-300	25	12	1.686	291	30	552	0.432	38.5
	301-500	14	6	0.578	189	0	416	0.464	39.5
	All depths	124	52	1.907	2,897	1,364	4,429	0.572	41.9
Central Aleutians	1-100	31	2	0.006	3	0	8	0.193	29.3
	101-200	48	13	0.709	326	3	649	0.605	41.8
	201-300	31	19	4.582	966	274	1,658	0.583	42.7
	301-500	21	15	1.938	772	273	1,270	0.713	44.9
	All depths	131	49	1.250	2,067	1,188	2,947	0.634	43.4
Eastern Aleutians	1-100	15	2	0.520	356	0	1,092	0.390	36.5
	101-200	42	9	0.650	505	22	988	0.655	42.4
	201-300	33	12	2.222	1,089	191	1,987	0.721	44.6
	301-500	22	6	1.166	663	0	1,400	0.512	40.6
	All depths	112	29	1.037	2,612	1,218	4,007	0.610	42.1
All Aleutian Areas	1-100	69	10	0.48	837	0	1,763	0.548	41.1
	101-200	152	50	1.57	2,770	1,294	4,245	0.597	42.0
	201-300	89	43	2.69	2,346	1,213	3,479	0.629	43.1
	301-500	57	27	1.26	1,623	741	2,506	0.602	42.5
	All depths	367	130	1.33	7,576	5,341	9,812	0.602	42.4
Southern Bering Sea	1-100	33	16	1.336	538	80	995	0.475	39.3
	101-200	8	5	17.391	3,215	0	7,424	0.486	39.9
	201-300	4	2	7.509	423	0	1,228	0.630	43.7
	301-500	8	7	18.671	1,948	0	4,858	0.616	44.0
	All depths	53	30	8.185	6,124	1,728	10,519	0.536	41.4

Table 18. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of rex sole by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	101-200	E Southern Bering	6	5	27.27	3,215	0	7,791
Southern Bering Sea	301-500	Combined Southern Bering	8	7	18.67	1,948	0	4,859
Eastern Aleutians	201-300	SW Eastern Aleutians	6	6	12.39	887	0	1,970
Southern Bering Sea	201-300	Combined Southern Bering	4	2	7.51	423	0	1,228
Central Aleutians	201-300	N Central Aleutians	16	12	7.06	310	66	554
Central Aleutians	201-300	Petrel Bank	3	2	5.95	456	0	1,764
Central Aleutians	201-300	SW Central Aleutians	9	4	4.50	192	0	413
Western Aleutians	101-200	W Western Aleutians	36	22	3.86	1,568	283	2,853
Western Aleutians	101-200	E Western Aleutians	26	6	2.96	371	0	948
Central Aleutians	301-500	SE Central Aleutians	3	2	2.84	203	0	761
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	2.70	343	0	1,818
Western Aleutians	201-300	W Western Aleutians	14	8	2.68	252	0	521
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	4	2.42	645	0	1,436
Southern Bering Sea	1-100	E Southern Bering	31	16	2.20	538	79	997
Central Aleutians	301-500	N Central Aleutians	12	9	2.19	272	33	510
Eastern Aleutians	101-200	NE Eastern Aleutians	18	5	2.15	433	0	923
Central Aleutians	301-500	SW Central Aleutians	3	2	1.94	153	0	689
Central Aleutians	101-200	SE Central Aleutians	15	1	1.24	93	0	293
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	1.19	19	0	254
Central Aleutians	101-200	N Central Aleutians	9	2	1.18	126	0	406
Central Aleutians	301-500	Petrel Bank	3	2	1.16	144	0	637
Western Aleutians	1-100	W Western Aleutians	10	3	1.13	418	0	1,120
Central Aleutians	101-200	SW Central Aleutians	22	9	0.98	103	3	203
Western Aleutians	301-500	W Western Aleutians	10	4	0.97	166	0	402
Eastern Aleutians	201-300	SE Eastern Aleutians	10	1	0.55	114	0	371
Western Aleutians	1-100	E Western Aleutians	13	3	0.51	60	0	141
Western Aleutians	201-300	E Western Aleutians	11	4	0.50	39	0	82
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	0.40	17	0	53
Eastern Aleutians	201-300	NE Eastern Aleutians	15	4	0.35	70	0	204
Eastern Aleutians	101-200	SW Eastern Aleutians	12	4	0.32	72	0	195
Central Aleutians	201-300	SE Central Aleutians	3	1	0.18	9	0	46
Western Aleutians	301-500	E Western Aleutians	4	2	0.15	23	0	67
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	0.07	13	0	180
Central Aleutians	101-200	Petrel Bank	2	1	0.03	4	0	60
Central Aleutians	1-100	N Central Aleutians	16	2	0.02	3	0	8

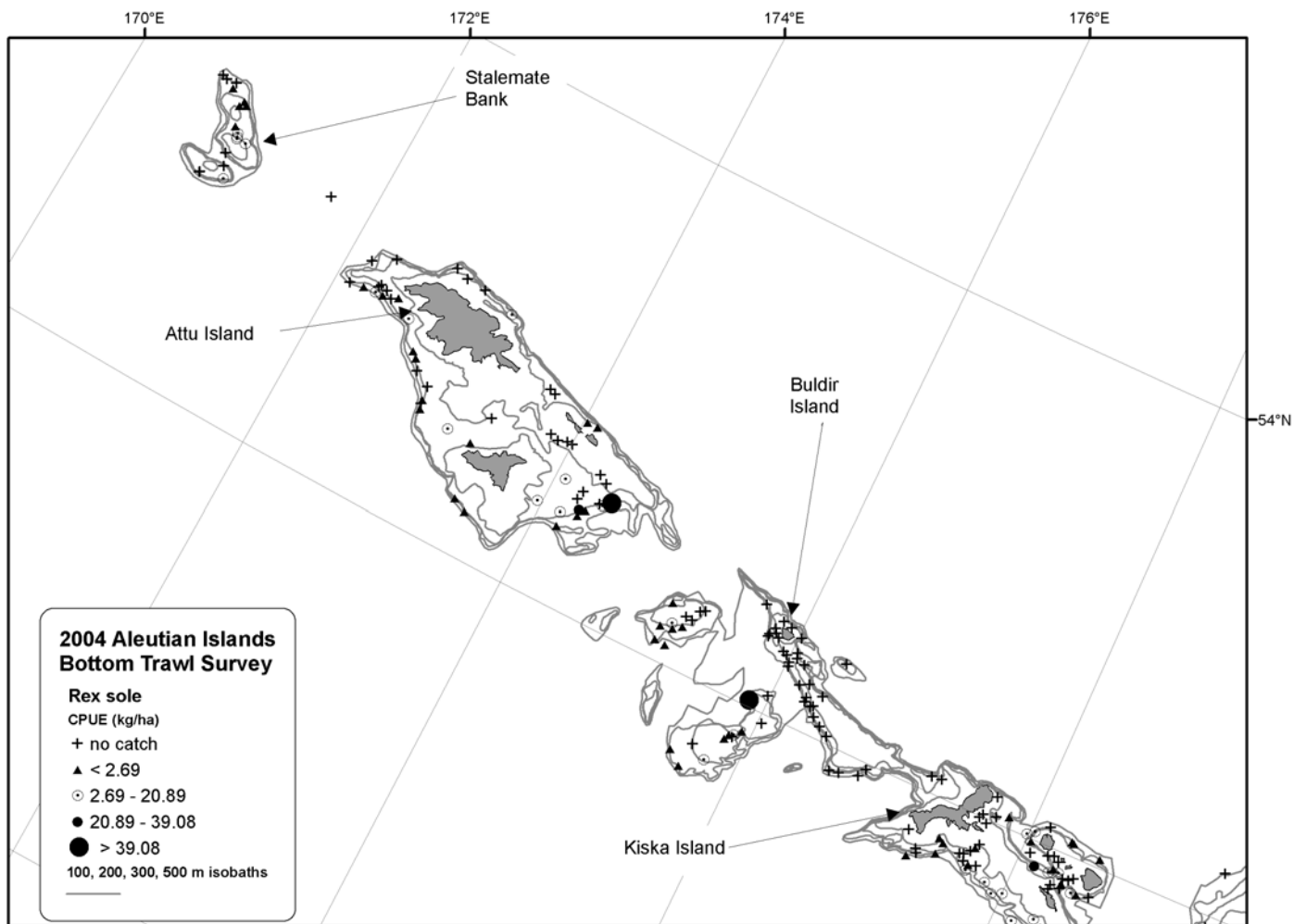


Figure 17. -- Distribution and relative abundance of rex sole from the 2004 Aleutian Islands bottom trawl survey.

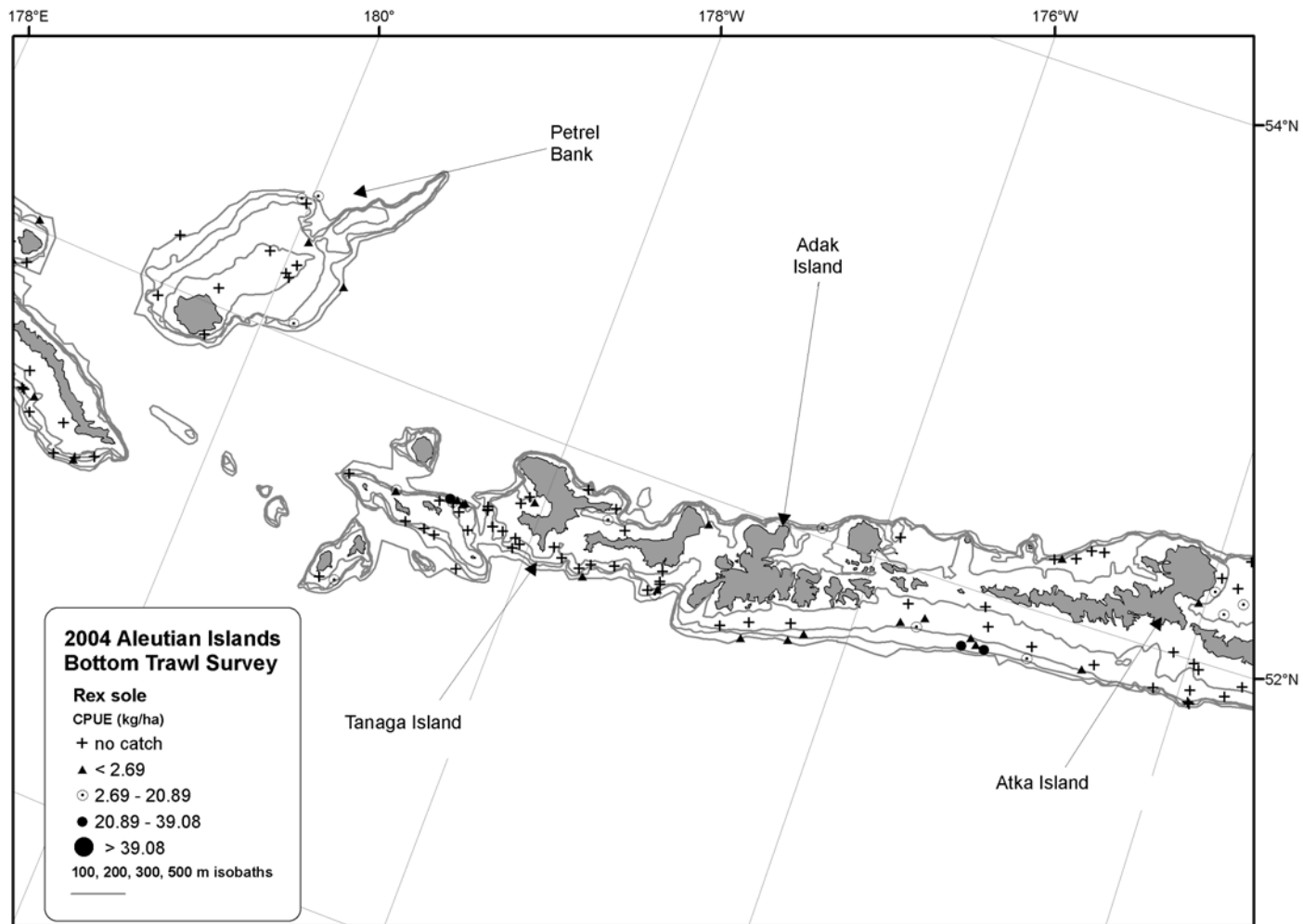


Figure 17. -- (continued).

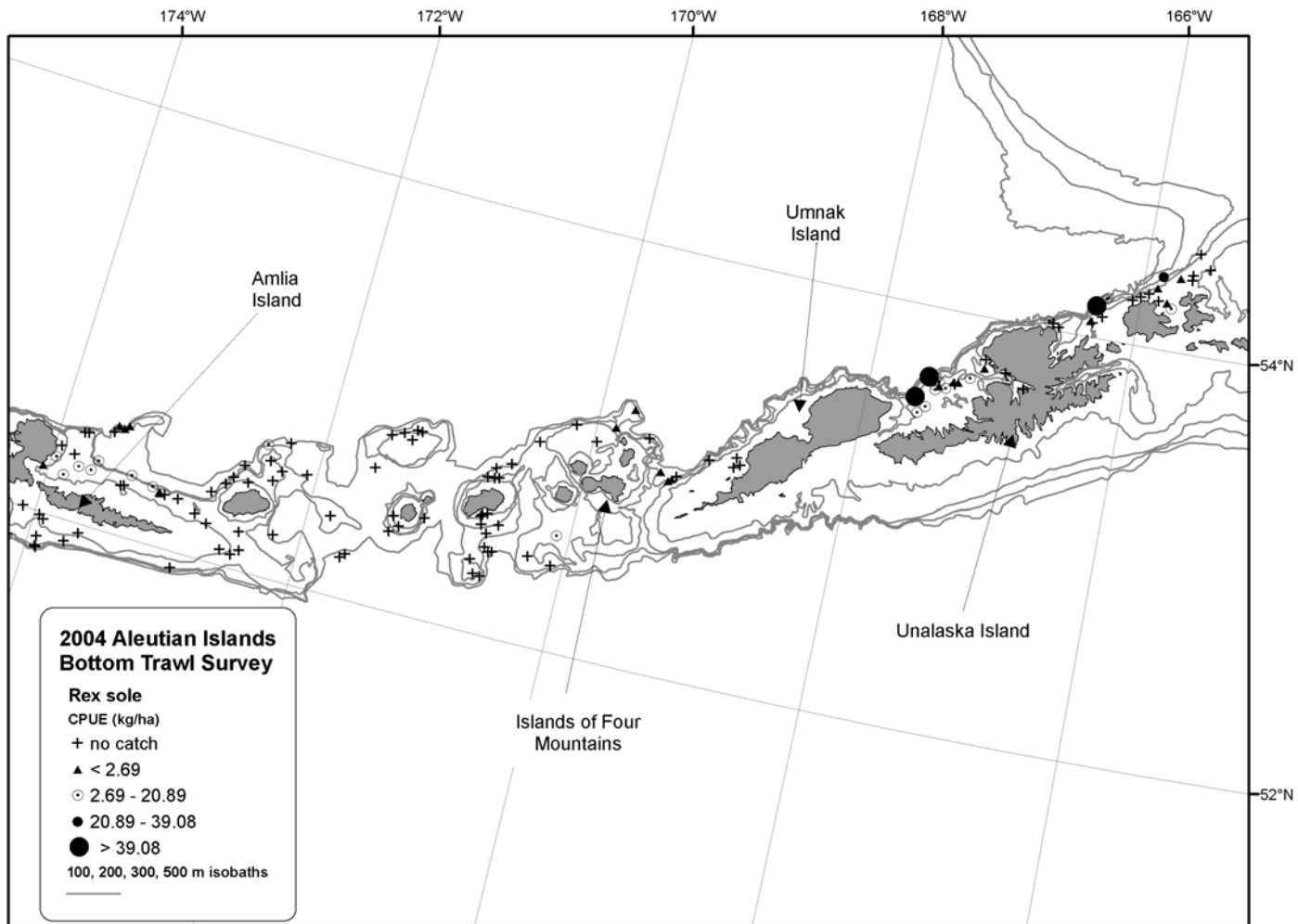


Figure 17. -- (continued).

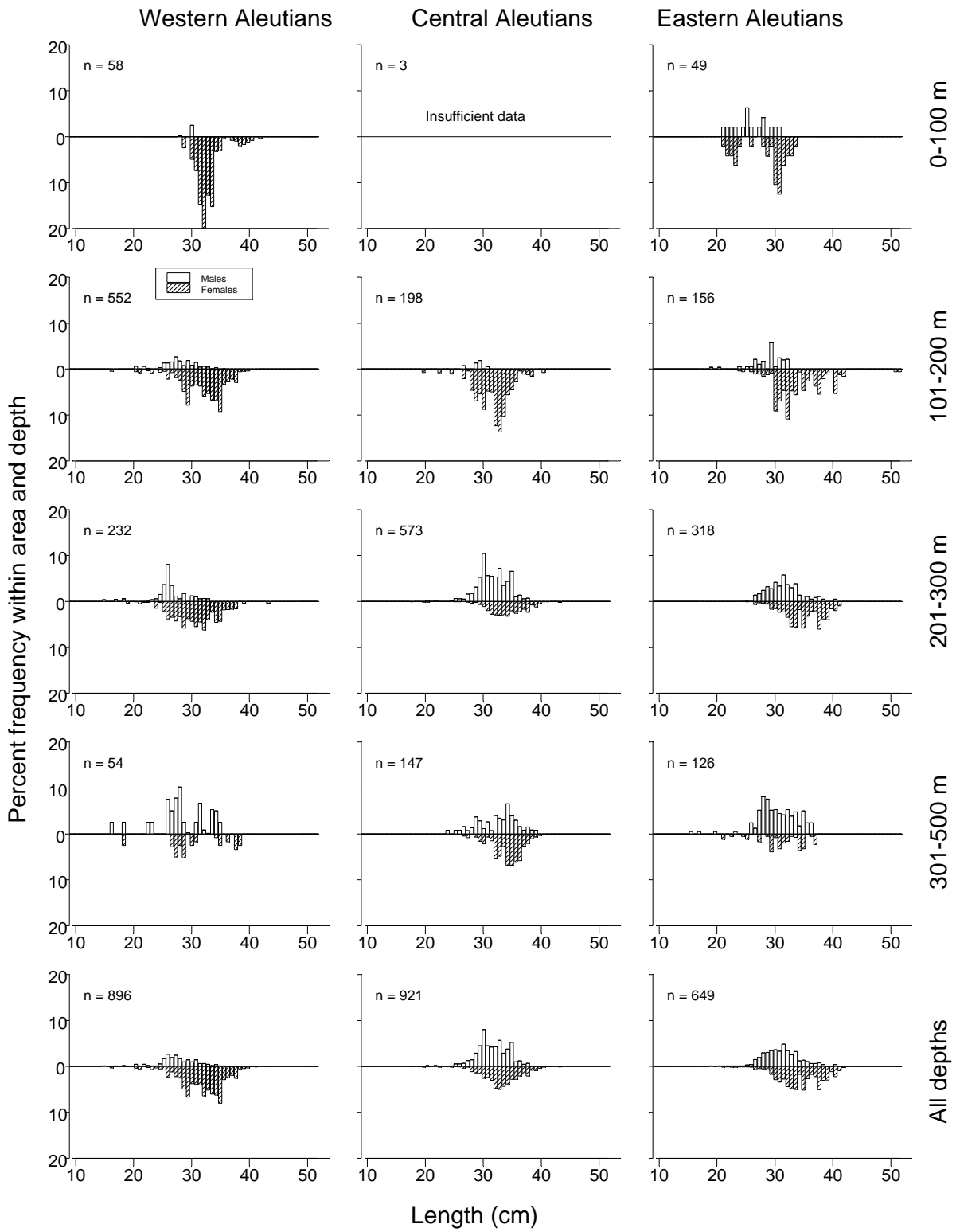


Figure 18. -- Size composition of rex sole from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

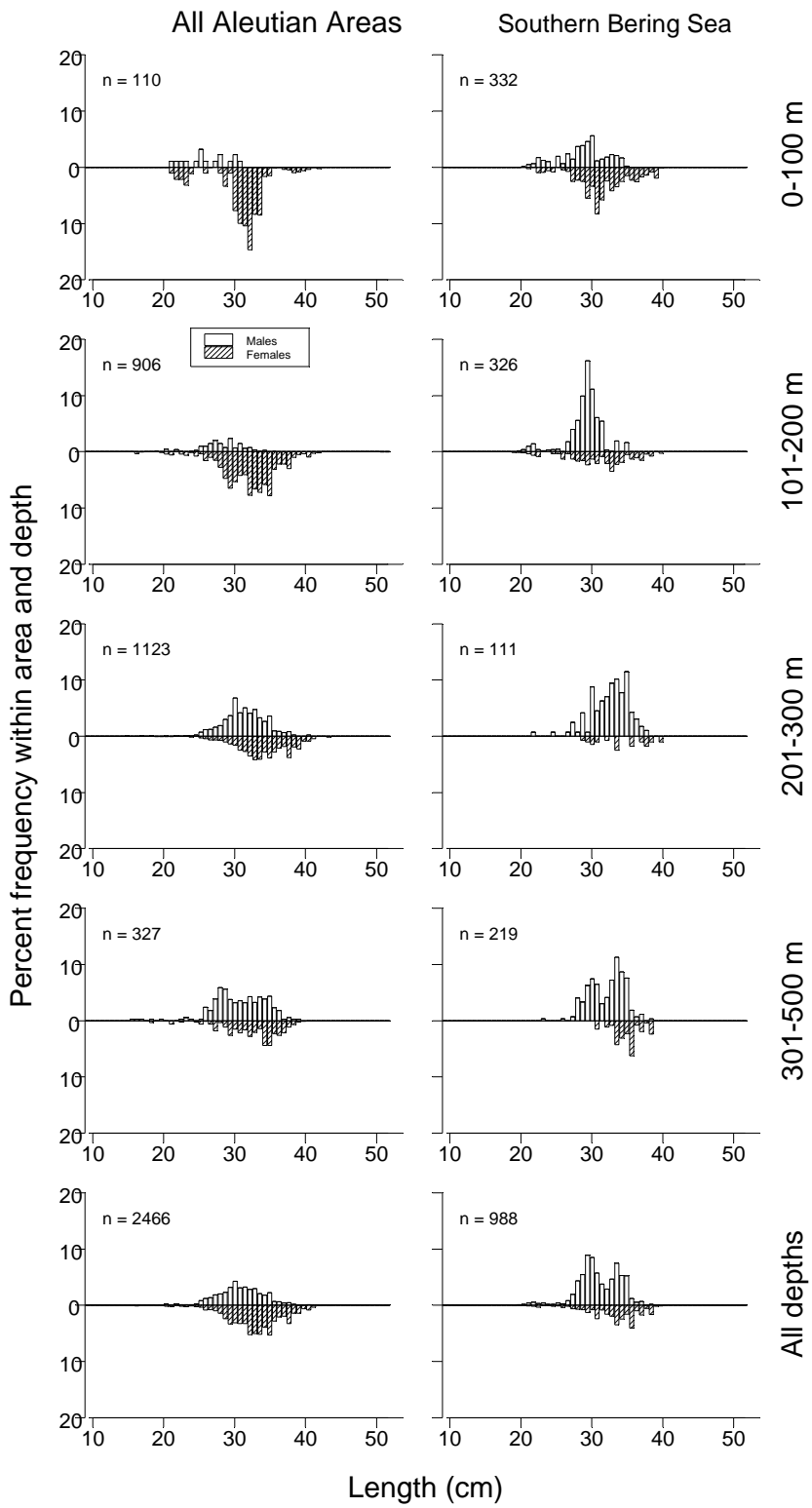


Figure 18. -- (continued).

Table 19. -- Total effort (number of trawl hauls), number of hauls with Dover sole, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	2	0.054	26	0	74	0.476	0.0
	101-200	62	12	0.294	156	49	264	0.704	0.0
	201-300	25	5	0.087	15	0	31	1.240	0.0
	301-500	14	1	0.039	13	0	41	1.596	0.0
	All depths	124	20	0.138	210	91	330	0.768	0.0
Central Aleutians	1-100	31	1	0.005	3	0	8	0.245	0.0
	101-200	48	2	0.009	4	0	10	0.901	0.0
	201-300	31	5	0.706	149	0	312	0.807	0.0
	301-500	21	4	0.361	144	0	384	1.161	0.0
	All depths	131	12	0.181	300	22	577	0.973	0.0
Eastern Aleutians	1-100	15	1	0.008	6	0	18	0.310	0.0
	101-200	42	3	0.013	10	0	22	0.393	0.0
	201-300	33	2	0.031	15	0	44	0.565	0.0
	301-500	22	4	0.189	107	0	223	0.929	0.0
	All depths	112	10	0.055	138	24	253	0.824	0.0
All Aleutian Areas	1-100	69	4	0.02	35	0	83	0.431	0.0
	101-200	152	17	0.10	171	64	277	0.690	0.0
	201-300	89	12	0.20	179	17	341	0.822	0.0
	301-500	57	9	0.20	264	7	521	1.088	0.0
	All depths	367	42	0.11	648	327	969	0.875	0.0
Southern Bering Sea	1-100	33	2	0.004	2	0	4	0.259	0.0
	101-200	8	1	0.069	13	0	43	0.320	0.0
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	4	1.971	206	0	633	1.166	0.0
	All depths	53	7	0.294	220	0	572	1.111	0.0

Table 20. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Dover sole by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	301-500	Combined Southern Bering	8	4	1.97	206	0	619
Central Aleutians	201-300	Petrel Bank	3	3	1.92	147	0	491
Central Aleutians	301-500	Petrel Bank	3	1	0.92	114	0	603
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.90	14	0	192
Western Aleutians	101-200	E Western Aleutians	26	4	0.32	40	0	87
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	3	0.32	85	0	198
Western Aleutians	101-200	W Western Aleutians	36	8	0.29	116	16	215
Central Aleutians	301-500	N Central Aleutians	12	3	0.24	30	0	69
Western Aleutians	1-100	E Western Aleutians	13	2	0.22	26	0	77
Southern Bering Sea	101-200	E Southern Bering	6	1	0.11	13	0	46
Western Aleutians	201-300	W Western Aleutians	14	2	0.11	10	0	26
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.09	22	0	74
Western Aleutians	301-500	W Western Aleutians	10	1	0.08	13	0	42
Western Aleutians	201-300	E Western Aleutians	11	3	0.06	5	0	11
Central Aleutians	201-300	N Central Aleutians	16	2	0.05	2	0	5
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	0.05	6	0	30
Eastern Aleutians	101-200	NE Eastern Aleutians	18	2	0.04	8	0	20
Central Aleutians	101-200	SW Central Aleutians	22	1	0.03	3	0	8
Central Aleutians	101-200	N Central Aleutians	9	1	0.02	2	0	5
Central Aleutians	1-100	N Central Aleutians	16	1	0.01	3	0	8
Eastern Aleutians	101-200	SW Eastern Aleutians	12	1	0.01	2	0	6
Southern Bering Sea	1-100	E Southern Bering	31	2	0.01	2	0	4
Eastern Aleutians	201-300	NE Eastern Aleutians	15	1	0.01	1	0	4

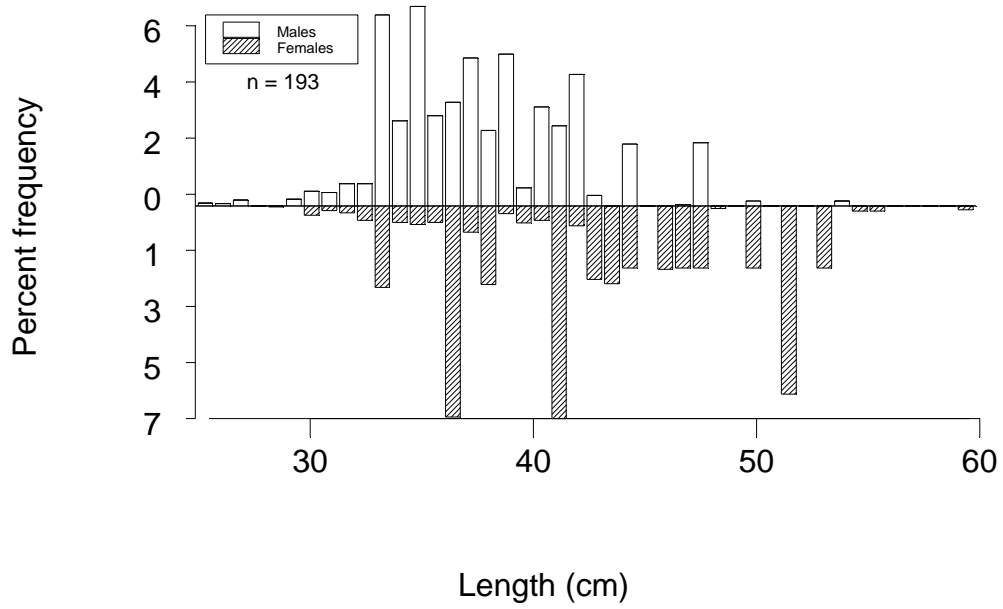


Figure 19. -- Size composition of Dover sole from the 2004 Aleutian Islands bottom trawl survey.

Roundfish

Atka mackerel (*Pleurogrammus monopterygius*)

Atka mackerel had the highest mean CPUE and estimated biomass of all species in the 2004 survey (Table 2) and were distributed throughout the entire survey area (Fig. 20). Estimated biomass for the entire survey area surpassed 1.15 million t. Atka mackerel mean CPUE was notably highest in the Southern Bering Sea and Western Aleutians areas, although estimated biomass was high throughout the survey area (Table 21). The highest Atka mackerel abundance in the Central area was found in the 1-100 m depth interval, while CPUE was highest in the 101-200 m depth interval in the other NPFMC areas. Atka mackerel was captured in 76% of all successful survey tows conducted shallower than 200 m. The highest two stratum-specific mean CPUEs were found in the E Southern Bering Sea and E Western Aleutians subareas in depth intervals of 101-200 m (Table 22 and Fig. 20).

The largest mean size fish were found in the Eastern Aleutians and Southern Bering Sea areas. Over 16,000 Atka mackerel were measured during the survey. One major mode dominated the Aleutian size composition distributions for males and females at 37 cm (Fig. 21). The primary mode in the Southern Bering Sea was at 43 cm, although these fish represented only a small part of the Atka mackerel population.

Table 21. -- Total effort (number of trawl hauls), number of hauls with Atka mackerel, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	21	288.455	140,669	54,953	226,385	0.430	32.1
	101-200	62	53	431.913	229,675	70,658	388,693	0.413	31.7
	201-300	25	12	35.004	6,033	0	16,685	0.479	33.2
	301-500	14	5	0.111	36	4	69	0.373	30.4
	All depths	124	91	247.798	376,414	198,717	554,111	0.420	31.9
Central Aleutians	1-100	31	24	339.472	198,501	18,574	378,429	0.402	31.6
	101-200	48	41	152.565	70,267	10,741	129,793	0.546	35.4
	201-300	31	11	1.698	358	0	932	0.522	34.3
	301-500	21	4	0.487	194	0	527	0.485	33.1
	All depths	131	80	162.804	269,320	85,453	453,187	0.440	32.6
Eastern Aleutians	1-100	15	10	79.475	54,424	0	148,414	0.528	33.8
	101-200	42	27	242.777	188,592	53,442	323,741	0.679	37.5
	201-300	33	12	1.980	971	0	1,977	0.703	37.4
	301-500	22	2	0.101	57	0	142	0.783	40.9
	All depths	112	51	96.841	244,043	85,529	402,557	0.645	36.7
All Aleutian Areas	1-100	69	55	223.99	393,594	180,624	606,564	0.430	32.1
	101-200	152	121	276.14	488,534	275,020	702,047	0.535	34.5
	201-300	89	35	8.43	7,362	0	17,680	0.510	33.8
	301-500	57	11	0.22	288	0	619	0.530	34.3
	All depths	367	222	156.28	889,778	590,929	1,188,626	0.488	33.4
Southern Bering Sea	1-100	33	17	310.233	124,896	0	266,658	1.080	41.0
	101-200	8	4	771.468	142,616	0	362,101	1.270	42.6
	201-300	4	2	0.697	39	0	140	0.651	40.7
	301-500	8	1	0.036	4	0	13	0.667	37.0
	All depths	53	24	357.620	267,556	34,758	500,354	1.181	41.8

Table 22. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Atka mackerel by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	101-200	E Southern Bering	6	4	1209.51	142,616	0	381,257
Western Aleutians	101-200	E Western Aleutians	26	26	1020.82	127,853	70,183	185,523
Western Aleutians	1-100	E Western Aleutians	13	13	851.66	100,780	41,010	160,550
Central Aleutians	1-100	SE Central Aleutians	5	3	849.76	98,915	0	323,361
Central Aleutians	101-200	SE Central Aleutians	15	12	633.51	47,626	0	105,398
Eastern Aleutians	101-200	NE Eastern Aleutians	18	12	531.36	106,939	6,532	207,347
Southern Bering Sea	1-100	E Southern Bering	31	17	511.82	124,896	0	267,010
Central Aleutians	1-100	Petrel Bank	6	5	466.42	44,778	0	108,075
Eastern Aleutians	101-200	SE Eastern Aleutians	9	7	362.99	68,976	0	174,635
Eastern Aleutians	1-100	SE Eastern Aleutians	8	5	250.80	43,655	0	146,406
Western Aleutians	101-200	W Western Aleutians	36	27	250.48	101,822	0	253,815
Central Aleutians	1-100	N Central Aleutians	16	12	242.66	51,095	0	103,835
Central Aleutians	101-200	SW Central Aleutians	22	22	129.30	13,606	0	32,583
Western Aleutians	1-100	W Western Aleutians	10	8	108.01	39,890	0	109,824
Central Aleutians	101-200	N Central Aleutians	9	6	83.90	8,945	0	27,803
Western Aleutians	201-300	E Western Aleutians	11	7	74.56	5,841	0	17,334
Eastern Aleutians	101-200	SW Eastern Aleutians	12	8	56.07	12,677	0	36,231
Eastern Aleutians	1-100	SW Eastern Aleutians	2	2	46.59	8,883	0	77,863
Central Aleutians	1-100	SW Central Aleutians	4	4	22.96	3,713	0	11,637
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	14.41	1,827	0	9,690
Central Aleutians	201-300	N Central Aleutians	16	5	6.73	295	0	886
Eastern Aleutians	201-300	NE Eastern Aleutians	15	7	4.45	877	0	1,929
Western Aleutians	201-300	W Western Aleutians	14	5	2.05	192	0	533
Central Aleutians	301-500	Petrel Bank	3	2	1.52	189	0	874
Southern Bering Sea	201-300	Combined Southern Bering	4	2	0.70	39	0	140
Central Aleutians	201-300	Petrel Bank	3	1	0.58	45	0	237
Central Aleutians	101-200	Petrel Bank	2	1	0.52	90	0	1,233
Eastern Aleutians	201-300	SE Eastern Aleutians	10	3	0.43	89	0	220
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	0.31	59	57	61
Central Aleutians	201-300	SW Central Aleutians	9	4	0.21	9	0	22
Central Aleutians	201-300	SE Central Aleutians	3	1	0.20	9	0	49
Western Aleutians	301-500	W Western Aleutians	10	4	0.17	29	0	59
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	1	0.12	33	0	106
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.10	24	0	81
Eastern Aleutians	201-300	SW Eastern Aleutians	6	2	0.07	5	0	14
Western Aleutians	301-500	E Western Aleutians	4	1	0.05	7	0	30
Central Aleutians	301-500	N Central Aleutians	12	2	0.05	6	0	14
Southern Bering Sea	301-500	Combined Southern Bering Sea	8	1	0.04	4	0	13

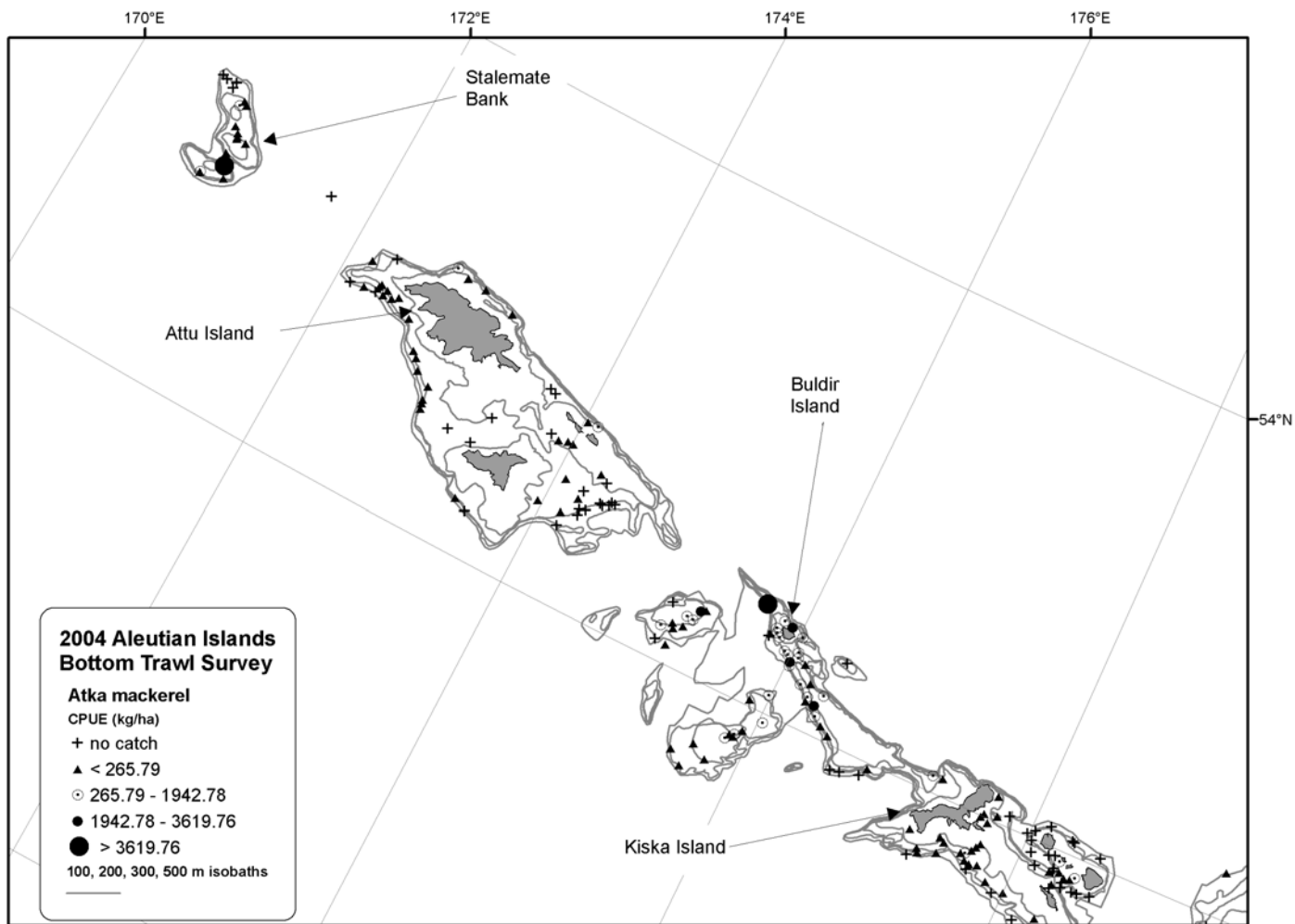


Figure 20. -- Distribution and relative abundance of Atka mackerel from the 2004 Aleutian Islands bottom trawl survey.

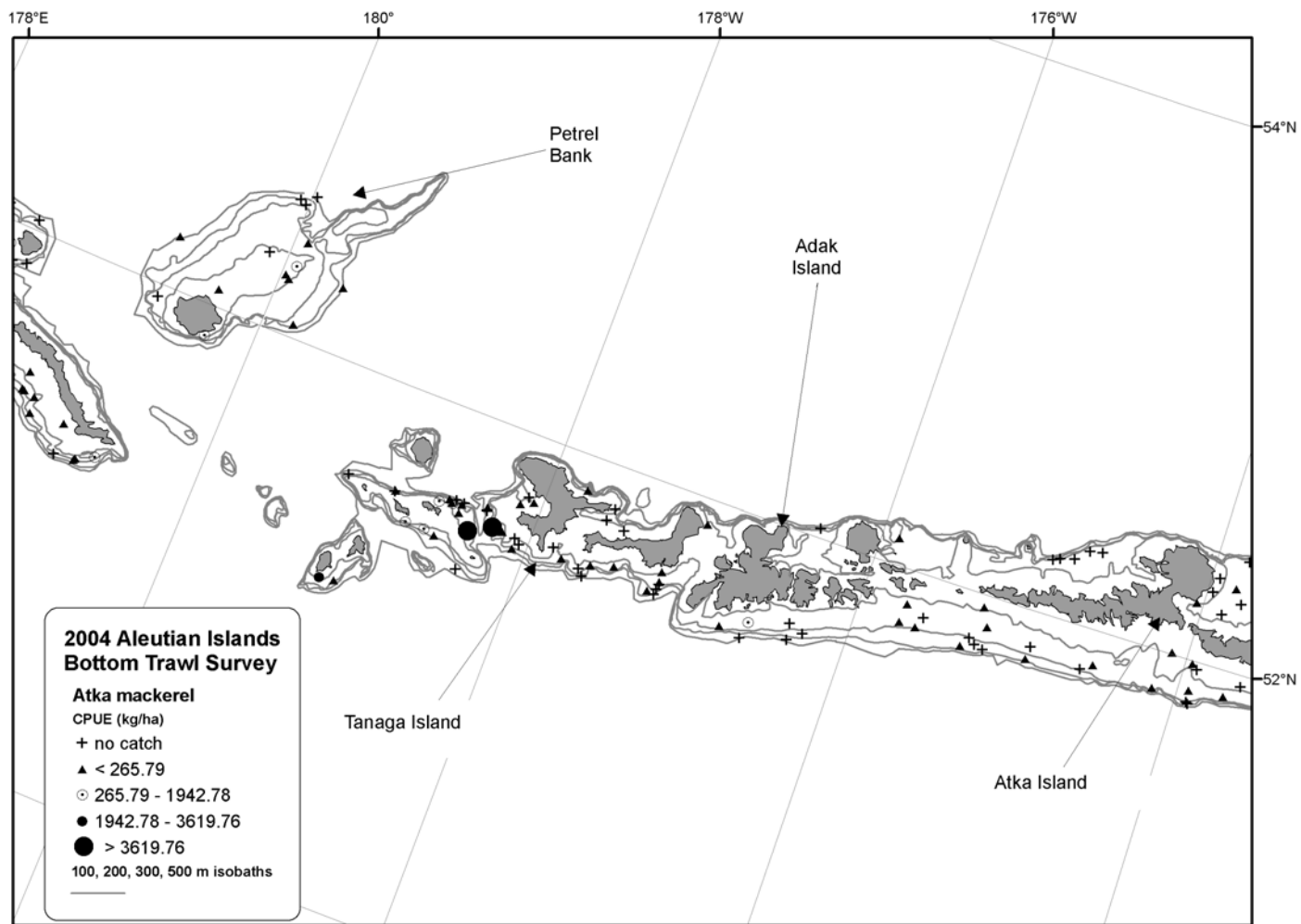


Figure 20. -- (continued).

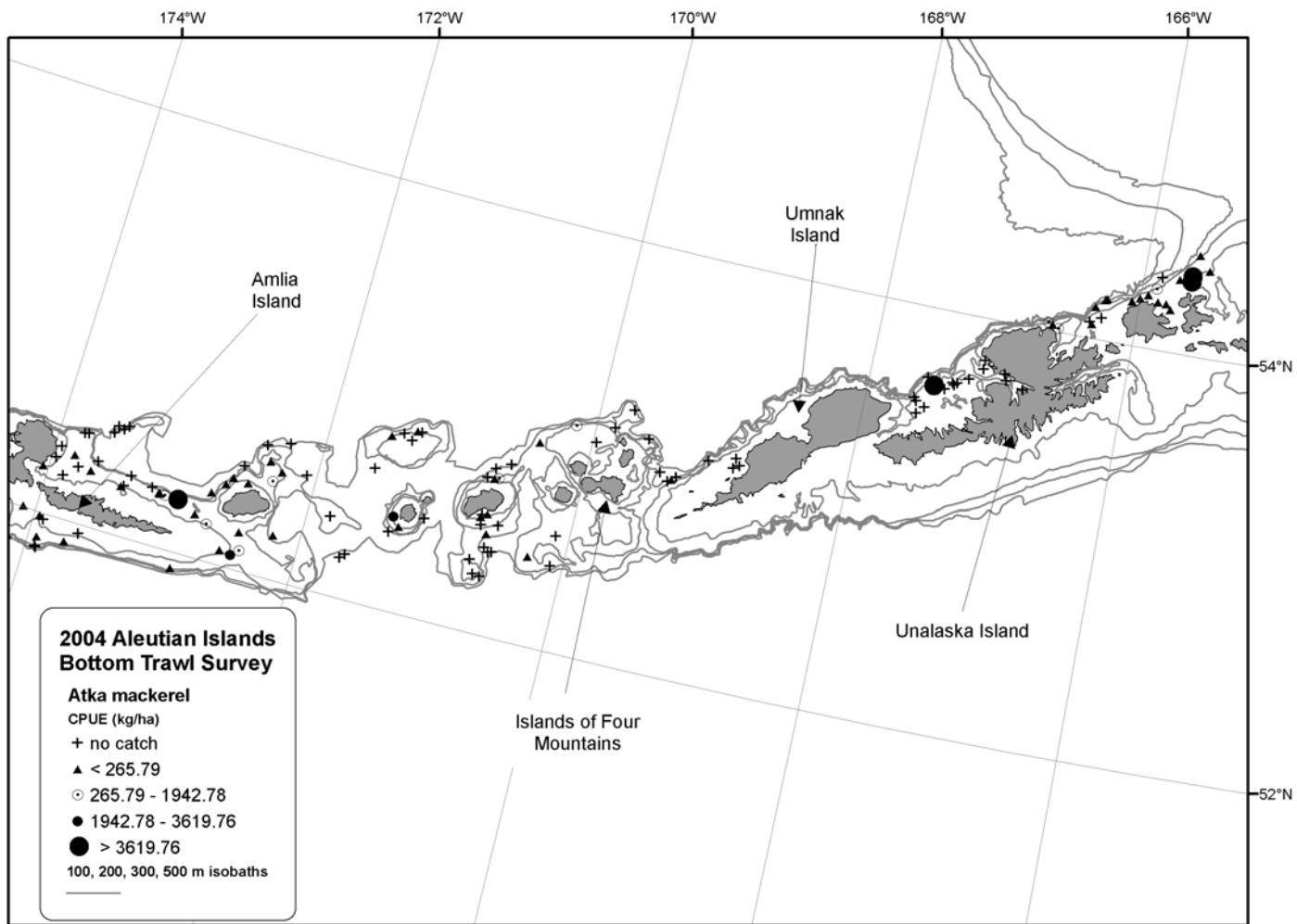


Figure 20. -- (continued).

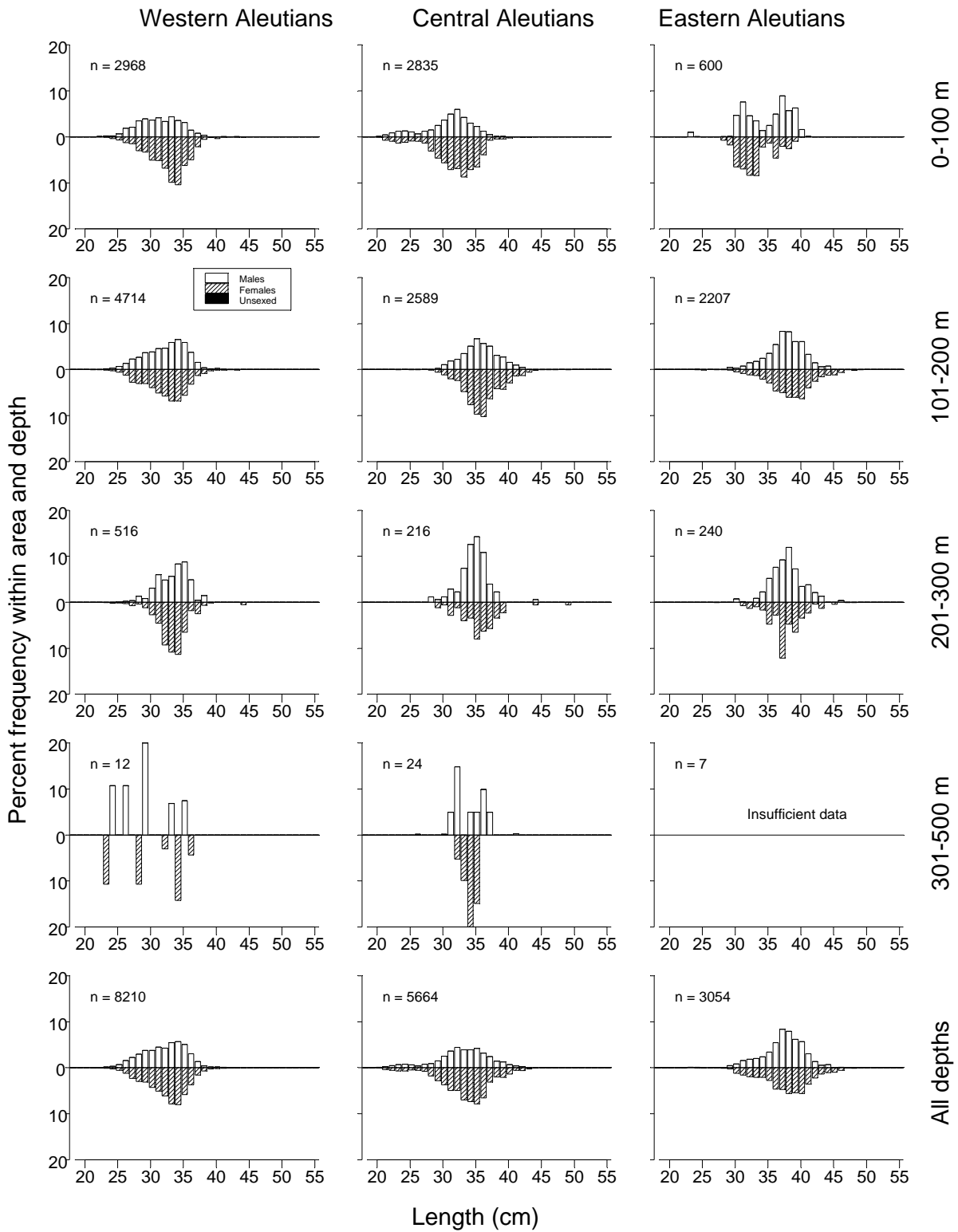


Figure 21. -- Size composition of Atka mackerel from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

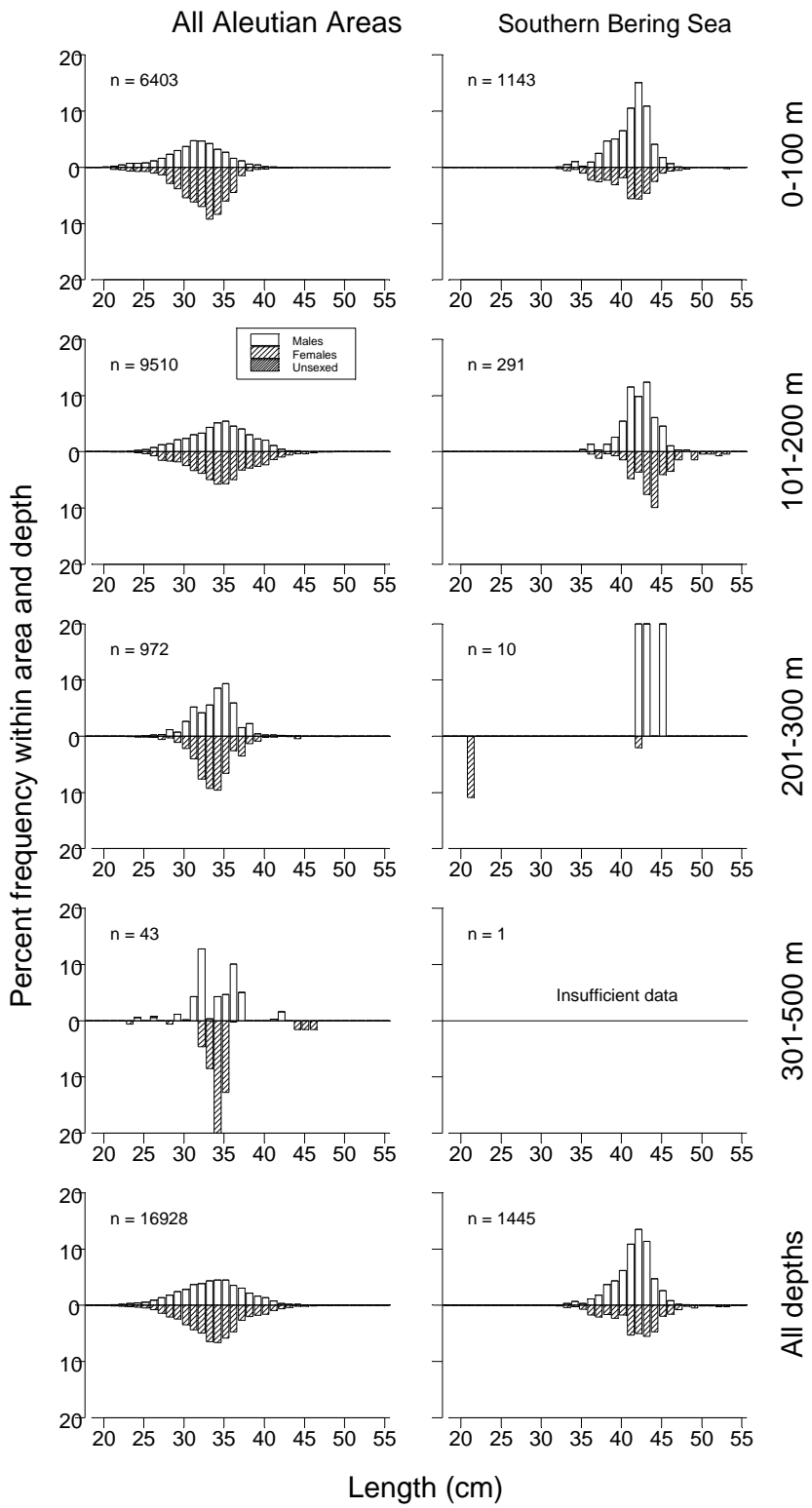


Figure 21. -- (continued).

Pacific cod (*Gadus macrocephalus*)

Pacific cod were more or less evenly distributed throughout the survey area to depths of about 300 m (Table 23). Cod mean CPUE was highest in the Southern Bering Sea and Eastern Aleutians areas (Table 2). Estimated biomass for the entire survey area was 114,161 t. The Eastern Aleutians area biomass was about double that of the other Aleutian areas. Although the mean CPUE in the Southern Bering Sea was higher than the Aleutian areas, the relatively small geographic area only produced an estimated biomass of 31,964 t (Table 23). The 101-200 m depth interval produced 61% of the overall Aleutian biomass. The 1-100 m interval produced 43% of the estimated biomass in the Southern Bering Sea area. Pacific cod was captured in 68% of all successful survey tows conducted shallower than 300 m. There were no outstandingly large catches of Pacific cod, only four catches exceeded four times the standard deviation of the mean CPUE. Two of these catches occurred in Seguam Pass at 101-200 m depth interval (Fig. 22). The highest three CPUEs were observed in the NE Eastern Aleutian Islands, the Southern Bering Sea and the SE Central Aleutian Islands subareas, all in the 101-200 m depth interval (Table 24). Almost 5,000 cod were measured representing a very broad size range. In the Aleutian areas there was a broad distribution of lengths from 50 to 115 cm (Fig. 23).

Walleye pollock (*Theragra chalcogramma*)

Walleye pollock mean CPUE was the fifth highest in the combined Aleutian areas and second highest in the Southern Bering Sea area (Table 2). Pollock was captured in all areas and depth intervals. Estimated total pollock biomass reached almost 366,000 t and 51% of the total was found in the 101-200 m depth interval in the Southern Bering Sea area (Table 25). In the areas where pollock was most abundant, a large proportion of trawl hauls caught that species (Table 25). The three highest subarea mean CPUEs were in the E Southern Bering Sea (101-200 m depth interval), SE Eastern Aleutians (101-200 m), and Southern Bering Sea (201-300 m depth interval) subareas (Table 26). The high mean CPUE in the Southern Bering Sea area resulted from four large catches that occurred west of Unimak Pass. The high mean CPUE from the Eastern Aleutians area resulted from a one large catches near Amlia Island (Fig. 24). The majority of pollock caught in the Aleutian Islands areas and the Southern Bering Sea were adults (Fig. 25).

Table 23. -- Total effort (number of trawl hauls), number of hauls with Pacific cod, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	12	6.232	3,039	1,056	5,023	6.051	69.9
	101-200	62	37	12.084	6,426	3,797	9,054	3.576	60.2
	201-300	25	7	0.998	172	31	313	1.539	51.2
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	56	6.344	9,637	6,420	12,854	4.320	63.1
Central Aleutians	1-100	31	23	17.906	10,471	3,418	17,523	3.920	61.4
	101-200	48	43	19.771	9,106	4,017	14,194	3.637	63.1
	201-300	31	19	4.622	975	190	1,759	2.467	59.1
	301-500	21	2	0.396	158	0	455	2.602	61.8
	All depths	131	87	12.519	20,709	12,202	29,216	3.717	62.0
Eastern Aleutians	1-100	15	10	9.902	6,781	0	16,381	2.030	53.7
	101-200	42	31	49.947	38,799	8,438	69,161	5.509	73.4
	201-300	33	24	12.019	5,891	2,291	9,490	3.007	62.9
	301-500	22	3	0.670	381	0	898	3.064	64.9
	All depths	112	68	20.576	51,851	20,568	83,134	4.752	69.6
All Aleutian Areas	1-100	69	45	11.55	20,290	8,850	31,731	3.607	60.1
	101-200	152	111	30.71	54,331	24,097	84,564	4.967	70.1
	201-300	89	50	8.06	7,037	3,445	10,630	2.897	62.1
	301-500	57	5	0.42	539	0	1,113	2.929	64.0
	All depths	367	211	14.44	82,197	49,863	114,531	4.440	66.9
Southern Bering Sea	1-100	33	25	34.932	14,063	0	31,180	4.537	66.6
	101-200	8	8	82.804	15,308	0	32,860	4.682	70.7
	201-300	4	4	41.313	2,330	0	7,533	3.120	62.4
	301-500	8	3	2.531	264	0	696	2.863	63.2
	All depths	53	40	42.724	31,964	9,213	54,715	4.489	68.2

Table 24. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Pacific cod by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Eastern Aleutians	101-200	NE Eastern Aleutians	18	12	171.61	34,536	2,914	66,159
Southern Bering Sea	101-200	E Southern Bering	6	6	95.03	11,205	0	27,183
Central Aleutians	101-200	SE Central Aleutians	15	14	65.82	4,949	0	9,947
Southern Bering Sea	101-200	W Southern Bering	2	2	61.28	4,103	0	55,683
Southern Bering Sea	1-100	E Southern Bering	31	25	57.63	14,063	0	31,223
Southern Bering Sea	201-300	Combined Southern Bering	4	4	41.31	2,330	0	7,532
Central Aleutians	1-100	N Central Aleutians	16	12	36.38	7,661	654	14,668
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	35.70	557	0	2,644
Central Aleutians	101-200	SW Central Aleutians	22	22	26.24	2,761	1,033	4,489
Western Aleutians	101-200	E Western Aleutians	26	16	22.93	2,872	926	4,818
Eastern Aleutians	1-100	SE Eastern Aleutians	8	5	18.89	3,289	0	10,605
Eastern Aleutians	201-300	NE Eastern Aleutians	15	8	17.89	3,521	0	7,121
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	16.73	3,233	0	44,304
Western Aleutians	1-100	E Western Aleutians	13	6	13.63	1,612	0	3,284
Central Aleutians	101-200	N Central Aleutians	9	6	12.02	1,281	95	2,467
Eastern Aleutians	101-200	SE Eastern Aleutians	9	8	11.45	2,176	138	4,215
Central Aleutians	1-100	SE Central Aleutians	5	4	10.56	1,230	0	3,375
Central Aleutians	1-100	Petrel Bank	6	3	10.28	987	0	2,687
Central Aleutians	201-300	SE Central Aleutians	3	3	9.18	438	0	1,899
Western Aleutians	101-200	W Western Aleutians	36	21	8.74	3,553	1,687	5,420
Central Aleutians	201-300	N Central Aleutians	16	10	7.84	344	14	675
Eastern Aleutians	201-300	SE Eastern Aleutians	10	9	7.43	1,531	374	2,689
Eastern Aleutians	101-200	SW Eastern Aleutians	12	10	6.35	1,436	436	2,437
Central Aleutians	201-300	SW Central Aleutians	9	6	4.52	192	0	402
Eastern Aleutians	101-200	NW Eastern Aleutians	3	1	4.08	650	0	3,448
Eastern Aleutians	201-300	SW Eastern Aleutians	6	5	3.93	281	21	542
Western Aleutians	1-100	W Western Aleutians	10	6	3.86	1,427	144	2,709
Central Aleutians	1-100	SW Central Aleutians	4	4	3.67	593	0	1,488
Southern Bering Sea	301-500	Combined Southern Bering Sea	8	3	2.53	264	0	697
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	2.04	258	0	823
Central Aleutians	301-500	SE Central Aleutians	3	1	1.98	142	0	751
Western Aleutians	201-300	W Western Aleutians	14	6	1.75	164	18	310
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	2	1.29	345	0	893
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.83	36	0	498
Central Aleutians	101-200	Petrel Bank	2	1	0.67	116	0	1,585
Central Aleutians	301-500	N Central Aleutians	12	1	0.13	16	0	52
Western Aleutians	201-300	E Western Aleutians	11	1	0.10	8	0	26

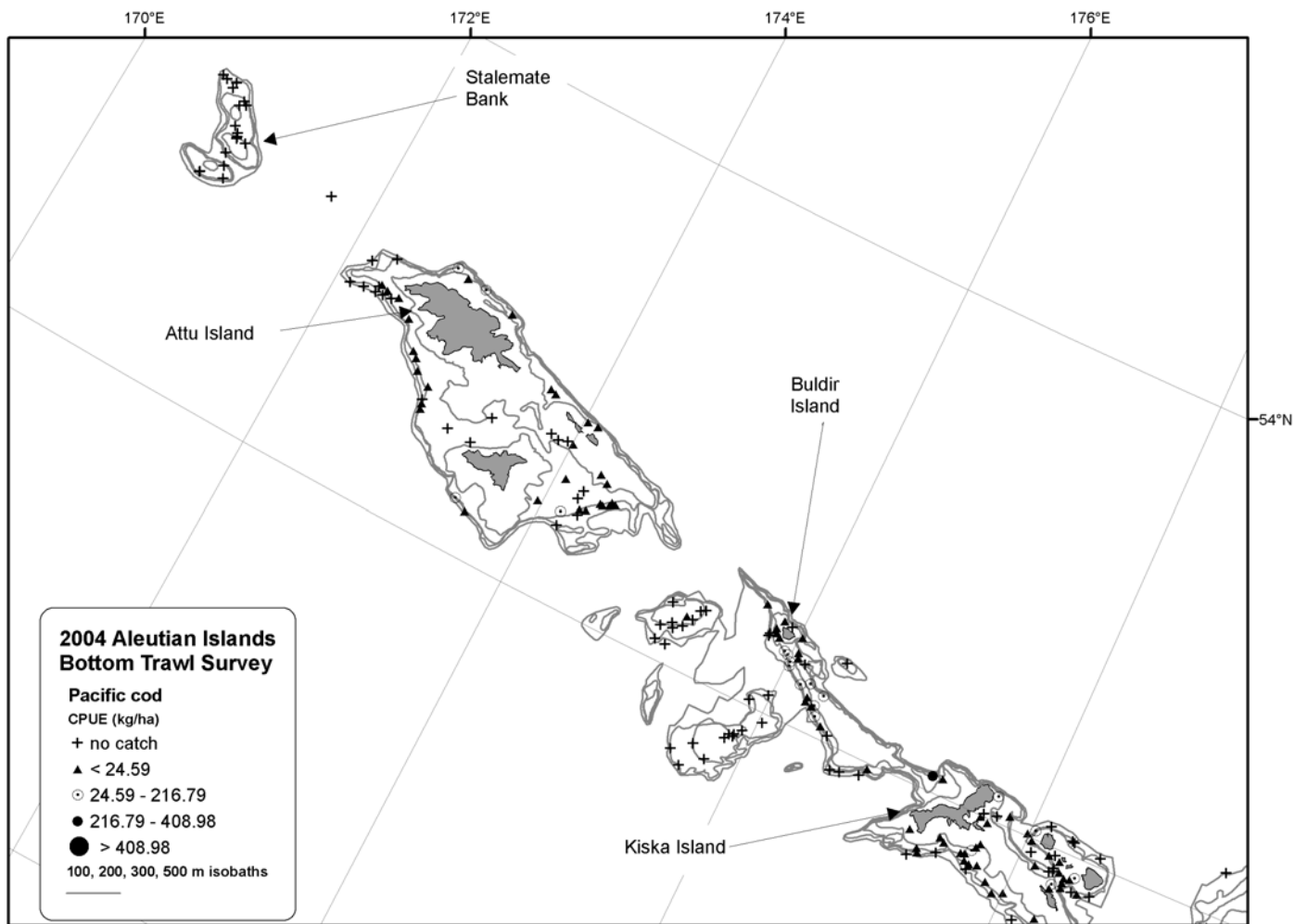


Figure 22. -- Distribution and relative abundance of Pacific cod from the 2004 Aleutian Islands bottom trawl survey.

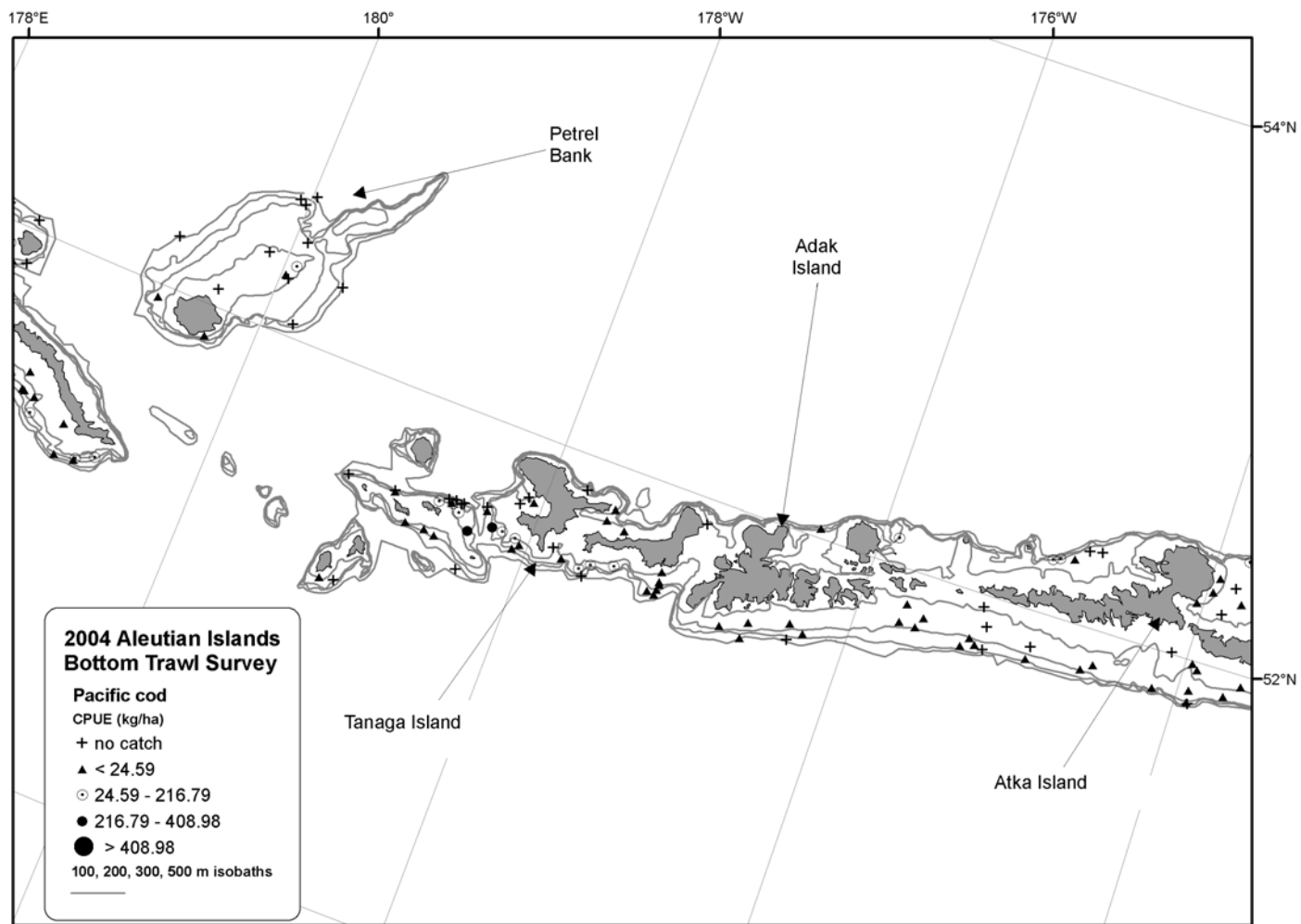


Figure 22. -- (continued).

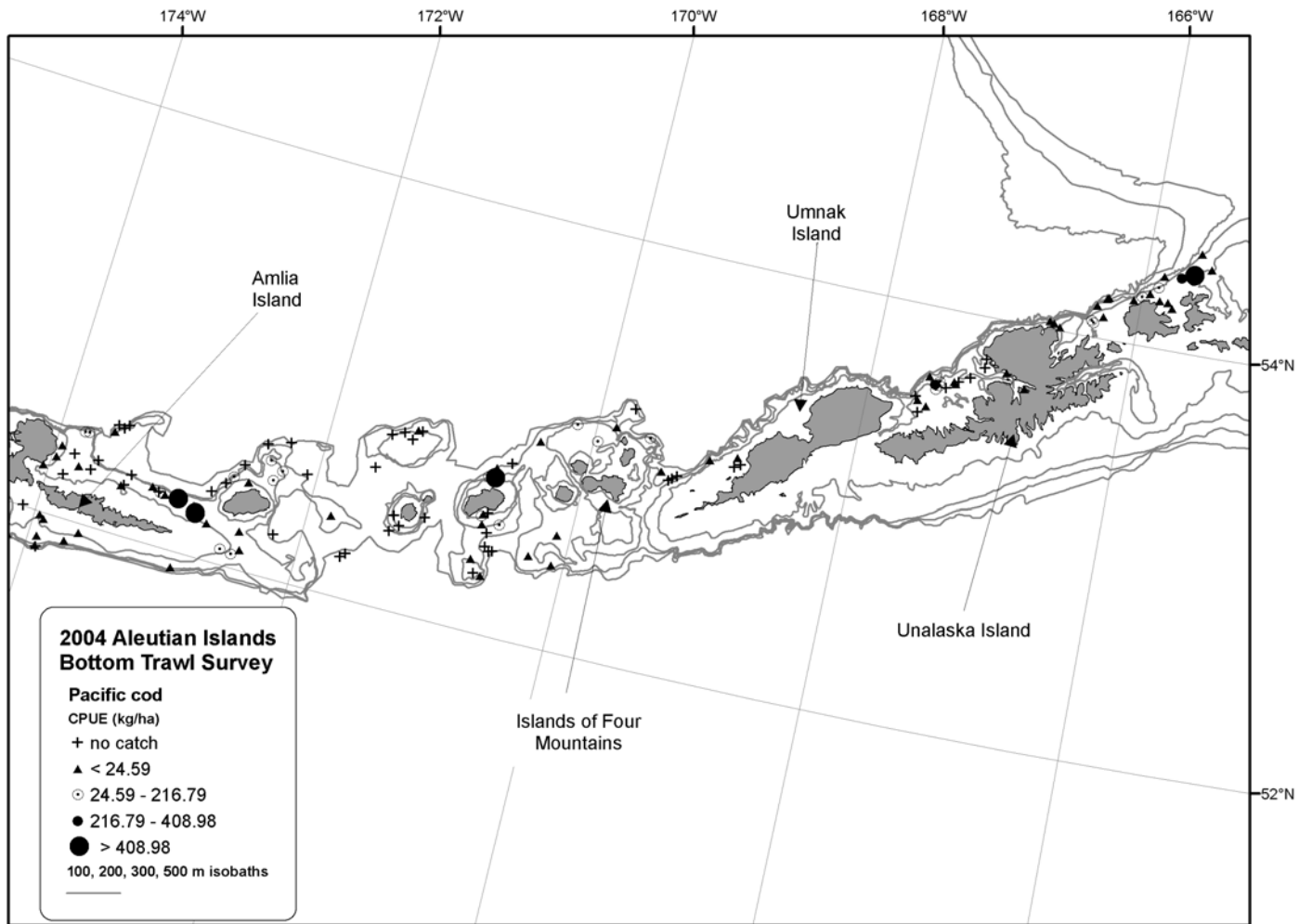


Figure 22. -- (continued).

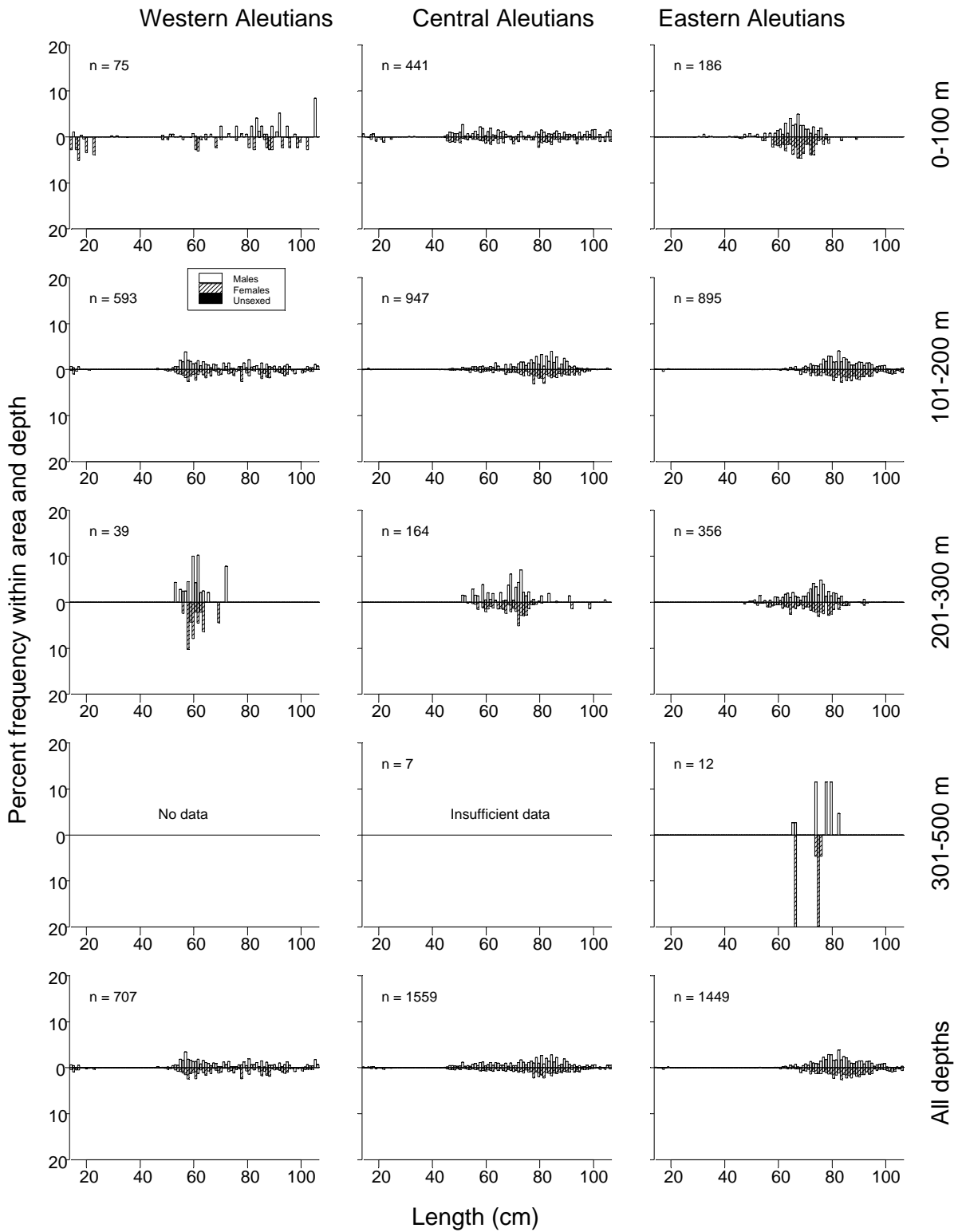


Figure 23. -- Size composition of Pacific cod from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

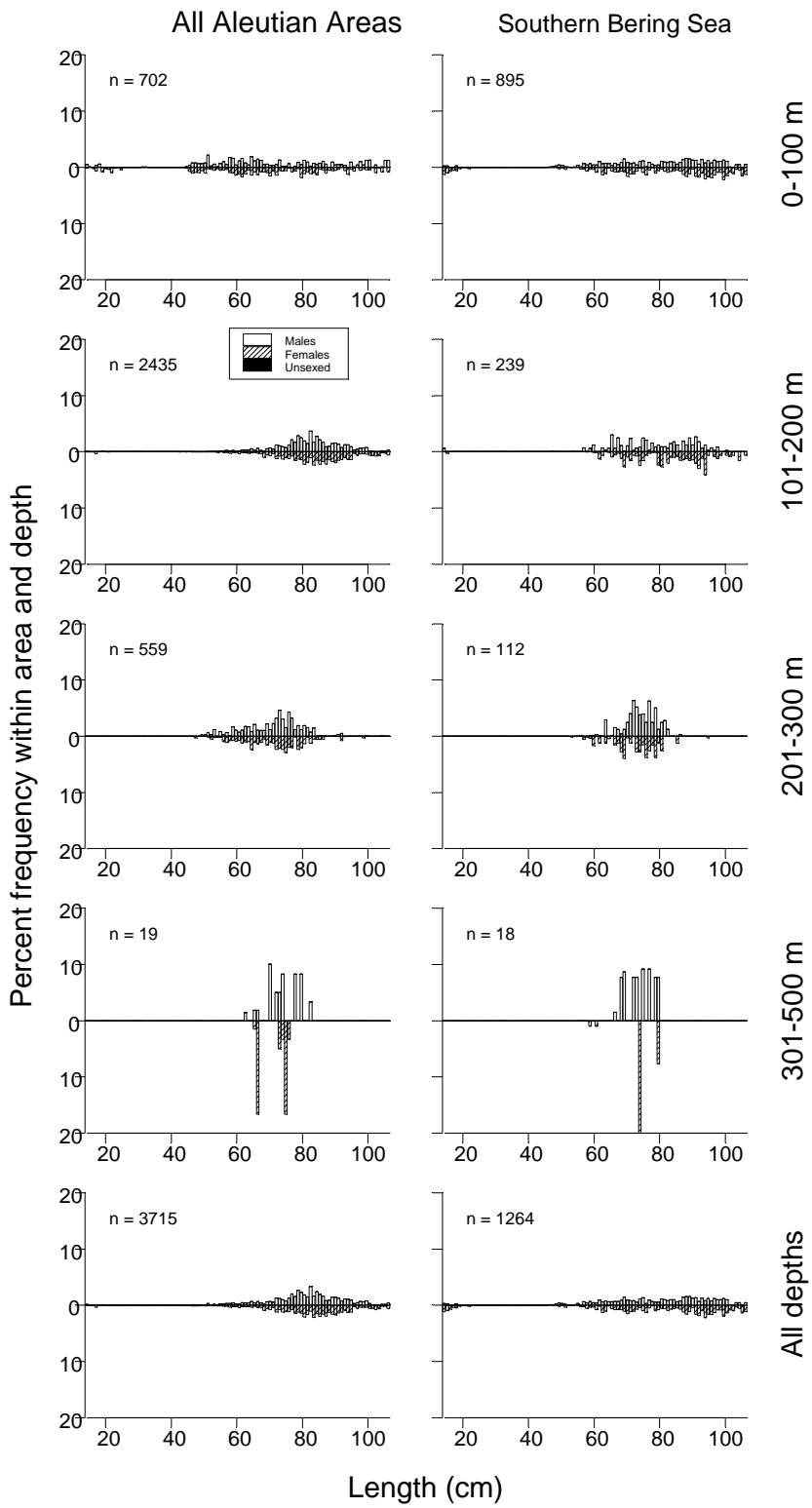


Figure 23. -- (continued).

Table 25. -- Total effort (number of trawl hauls), number of hauls with walleye pollock, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	7	0.659	321	0	717	1.694	52.9
	101-200	62	41	9.190	4,887	2,353	7,422	1.017	49.0
	201-300	25	21	7.644	1,318	509	2,126	1.146	51.5
	301-500	14	3	0.240	79	0	179	1.605	60.5
	All depths	124	72	4.348	6,605	3,951	9,259	1.083	49.8
Central Aleutians	1-100	31	8	0.139	82	0	193	0.581	39.7
	101-200	48	23	13.716	6,317	0	13,706	1.102	51.0
	201-300	31	30	20.717	4,369	721	8,017	1.408	56.7
	301-500	21	10	2.157	859	245	1,473	1.635	58.9
	All depths	131	71	7.028	11,627	3,525	19,728	1.253	53.6
Eastern Aleutians	1-100	15	4	0.321	220	0	451	0.055	17.4
	101-200	42	24	132.405	102,853	0	306,865	1.682	58.1
	201-300	33	22	15.377	7,537	269	14,804	1.163	54.2
	301-500	22	13	2.517	1,431	0	3,424	1.463	57.6
	All depths	112	63	44.460	112,040	0	312,350	1.641	57.7
All Aleutian Areas	1-100	69	19	0.35	623	174	1,071	0.970	38.7
	101-200	152	88	64.47	114,058	0	313,798	1.622	57.3
	201-300	89	73	15.14	13,223	5,256	21,190	1.242	54.7
	301-500	57	26	1.83	2,368	357	4,379	1.530	58.2
	All depths	367	206	22.88	130,272	0	329,236	1.578	57.0
Southern Bering Sea	1-100	33	14	92.281	37,152	0	77,930	1.001	50.9
	101-200	8	7	1,007.051	186,167	5,501	366,833	1.044	50.7
	201-300	4	4	165.145	9,312	0	22,472	1.159	53.2
	301-500	8	8	29.023	3,028	0	8,356	1.112	53.7
	All depths	53	33	314.985	235,658	76,886	394,431	1.043	50.9

Table 26. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of walleye pollock by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	101-200	E Southern Bering	6	6	1578.84	186,165	0	382,599
Eastern Aleutians	101-200	SE Eastern Aleutians	9	5	534.93	101,647	0	334,589
Southern Bering Sea	201-300	Combined Southern Bering	4	4	165.15	9,312	0	22,470
Southern Bering Sea	1-100	E Southern Bering	31	14	152.24	37,152	0	78,031
Central Aleutians	201-300	N Central Aleutians	16	15	47.12	2,069	0	4,414
Southern Bering Sea	301-500	Combined Southern Bering	8	8	29.02	3,028	0	8,357
Eastern Aleutians	201-300	SE Eastern Aleutians	10	6	26.02	5,362	0	13,226
Central Aleutians	201-300	Petrel Bank	3	3	21.31	1,633	0	7,650
Central Aleutians	101-200	Petrel Bank	2	1	20.43	3,545	0	48,589
Central Aleutians	101-200	SW Central Aleutians	22	11	15.73	1,655	386	2,923
Central Aleutians	201-300	SW Central Aleutians	9	9	12.91	550	210	891
Central Aleutians	101-200	N Central Aleutians	9	5	9.78	1,043	0	2,749
Western Aleutians	101-200	W Western Aleutians	36	25	9.51	3,867	1,805	5,928
Eastern Aleutians	201-300	NE Eastern Aleutians	15	9	8.82	1,736	79	3,392
Western Aleutians	201-300	W Western Aleutians	14	13	8.27	778	192	1,364
Western Aleutians	101-200	E Western Aleutians	26	16	8.15	1,021	0	2,599
Western Aleutians	201-300	E Western Aleutians	11	8	6.89	540	0	1,167
Eastern Aleutians	201-300	SW Eastern Aleutians	6	5	5.74	411	0	960
Eastern Aleutians	101-200	NE Eastern Aleutians	18	11	5.17	1,041	0	2,814
Central Aleutians	301-500	N Central Aleutians	12	7	4.88	605	104	1,106
Eastern Aleutians	301-500	SE Eastern Aleutians	9	5	4.46	1,149	0	3,346
Central Aleutians	301-500	SE Central Aleutians	3	1	2.49	178	0	943
Central Aleutians	201-300	SE Central Aleutians	3	3	2.45	117	0	294
Western Aleutians	1-100	E Western Aleutians	13	4	1.78	211	0	569
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	1.78	28	0	198
Central Aleutians	101-200	SE Central Aleutians	15	6	0.99	75	0	199
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	7	0.98	262	32	492
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	0.86	165	0	1,472
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	0.72	114	0	326
Central Aleutians	1-100	Petrel Bank	6	2	0.66	64	0	202
Central Aleutians	301-500	SW Central Aleutians	3	1	0.62	49	0	260
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.46	20	0	277
Western Aleutians	301-500	W Western Aleutians	10	3	0.46	79	0	183
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	0.43	55	0	183
Western Aleutians	1-100	W Western Aleutians	10	3	0.30	110	0	326
Eastern Aleutians	101-200	SW Eastern Aleutians	12	5	0.23	51	0	104
Central Aleutians	301-500	Petrel Bank	3	1	0.22	27	0	142
Central Aleutians	1-100	N Central Aleutians	16	6	0.09	18	2	35
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	0.04	2	0	32
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	0.02	1	0	8
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.01	2	0	21
Central Aleutians	1-100	N Central Aleutians	11	2	0.00	1	0	2

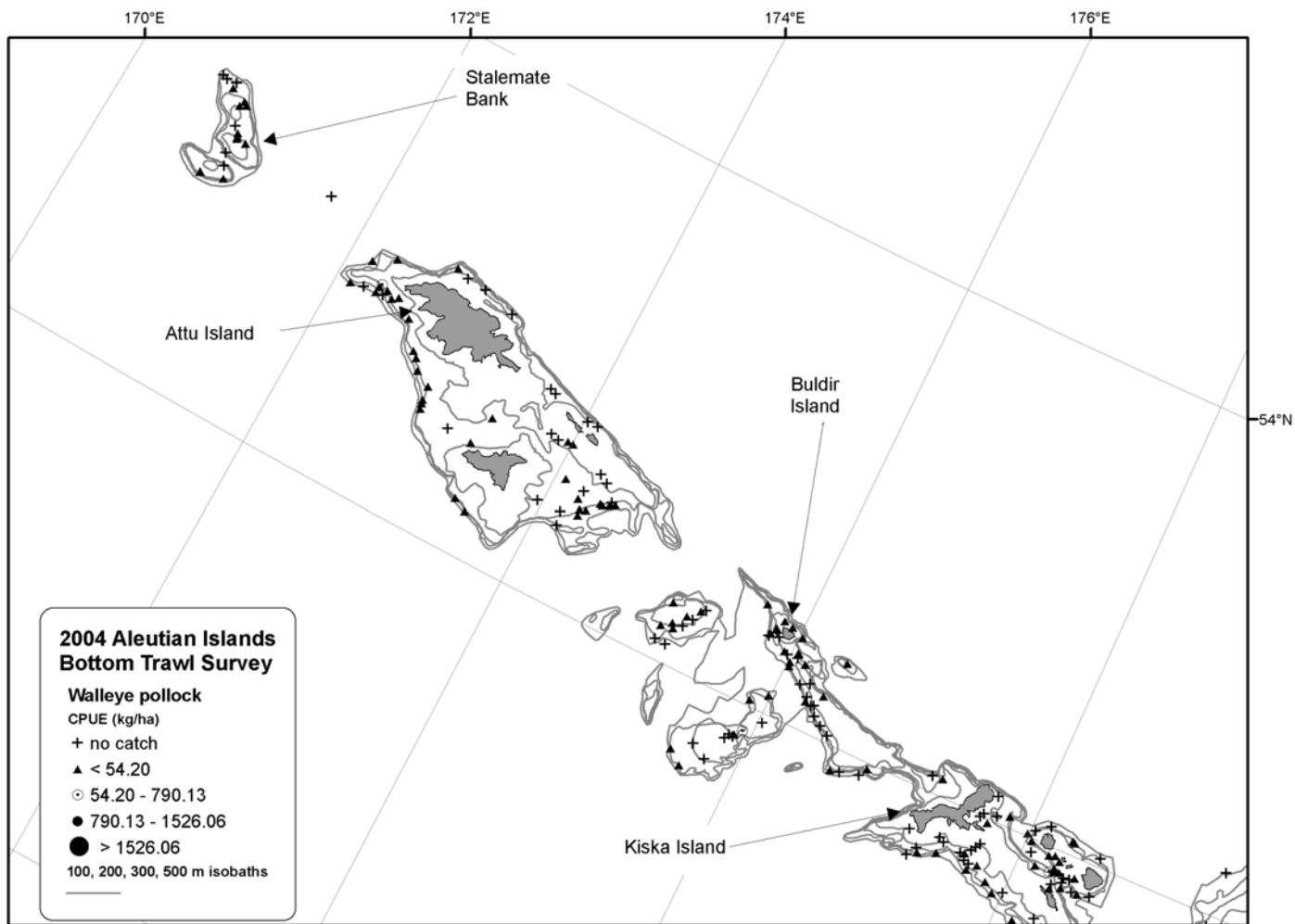


Figure 24. -- Distribution and relative abundance of walleye pollock from the 2004 Aleutian Islands bottom trawl survey.

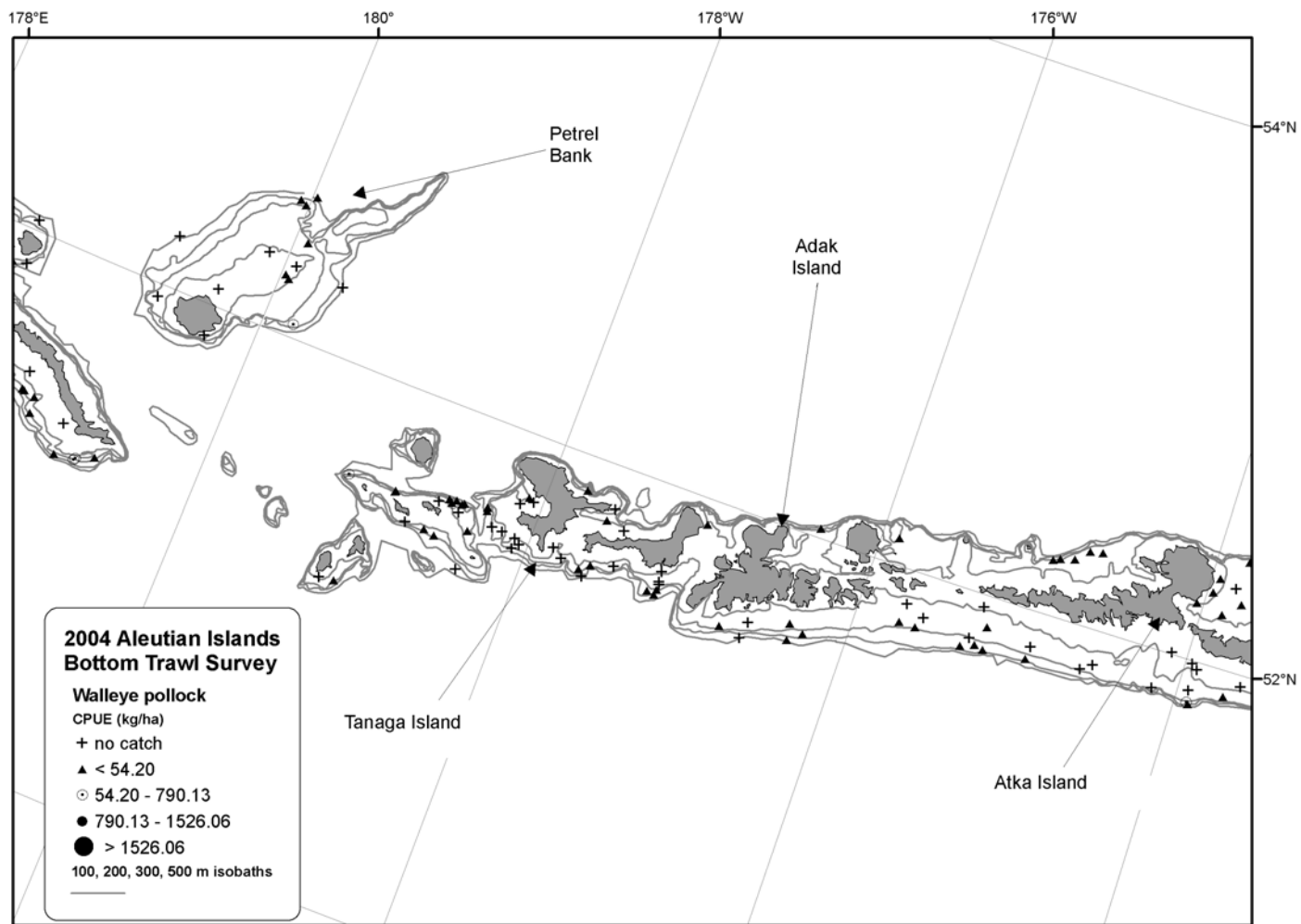


Figure 24. -- (continued).

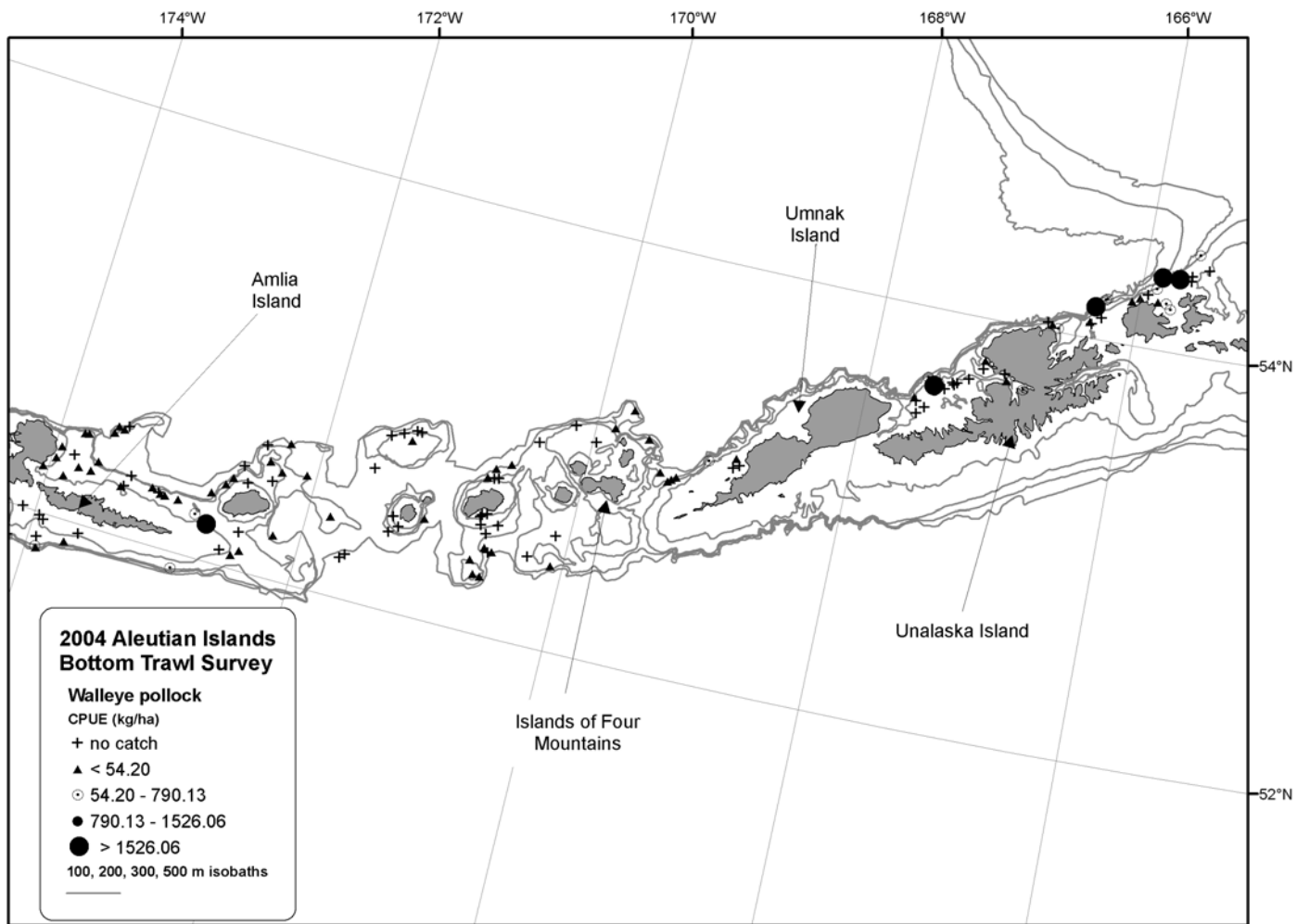


Figure 24. -- (continued).

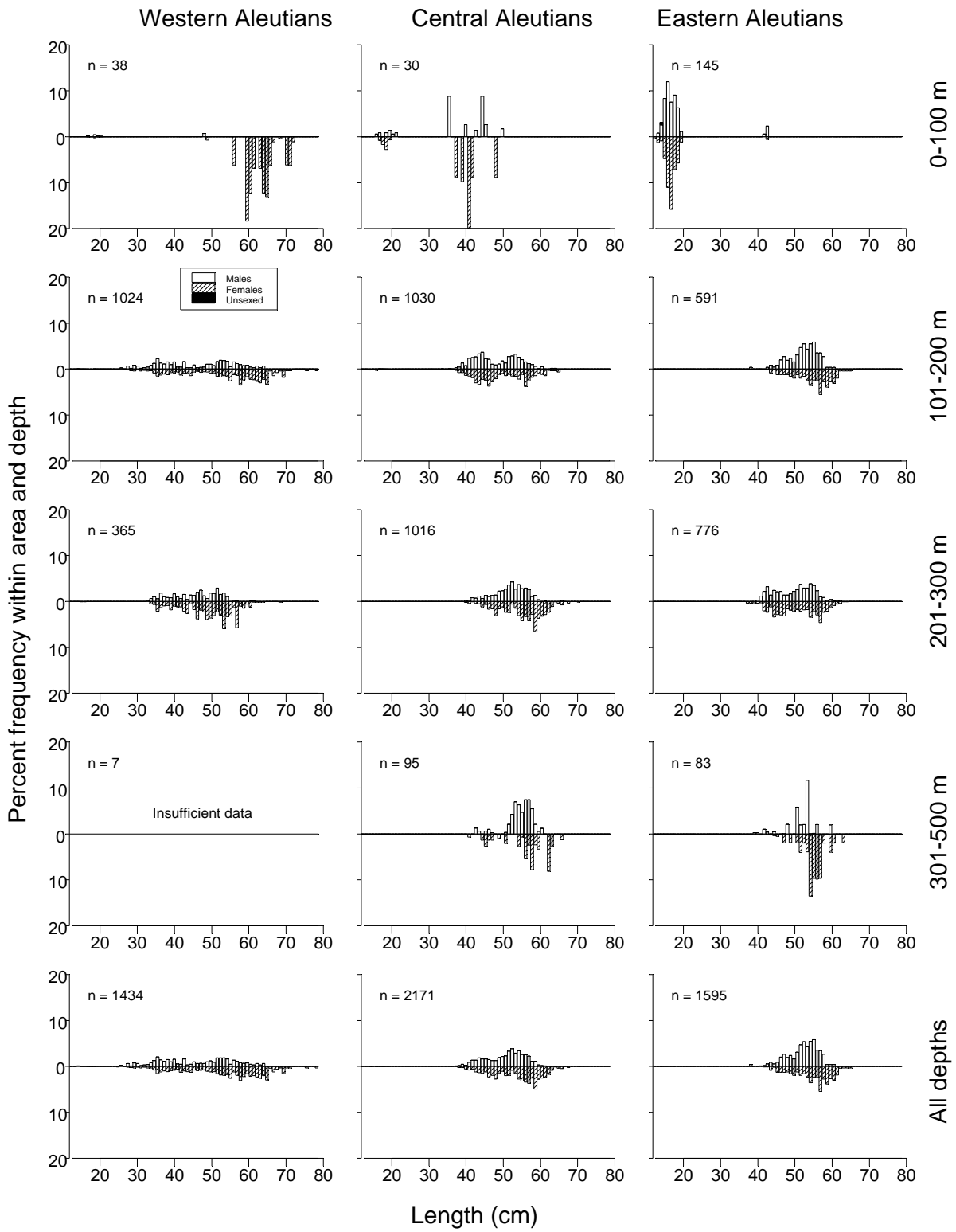


Figure 25. -- Size composition of walleye pollock from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

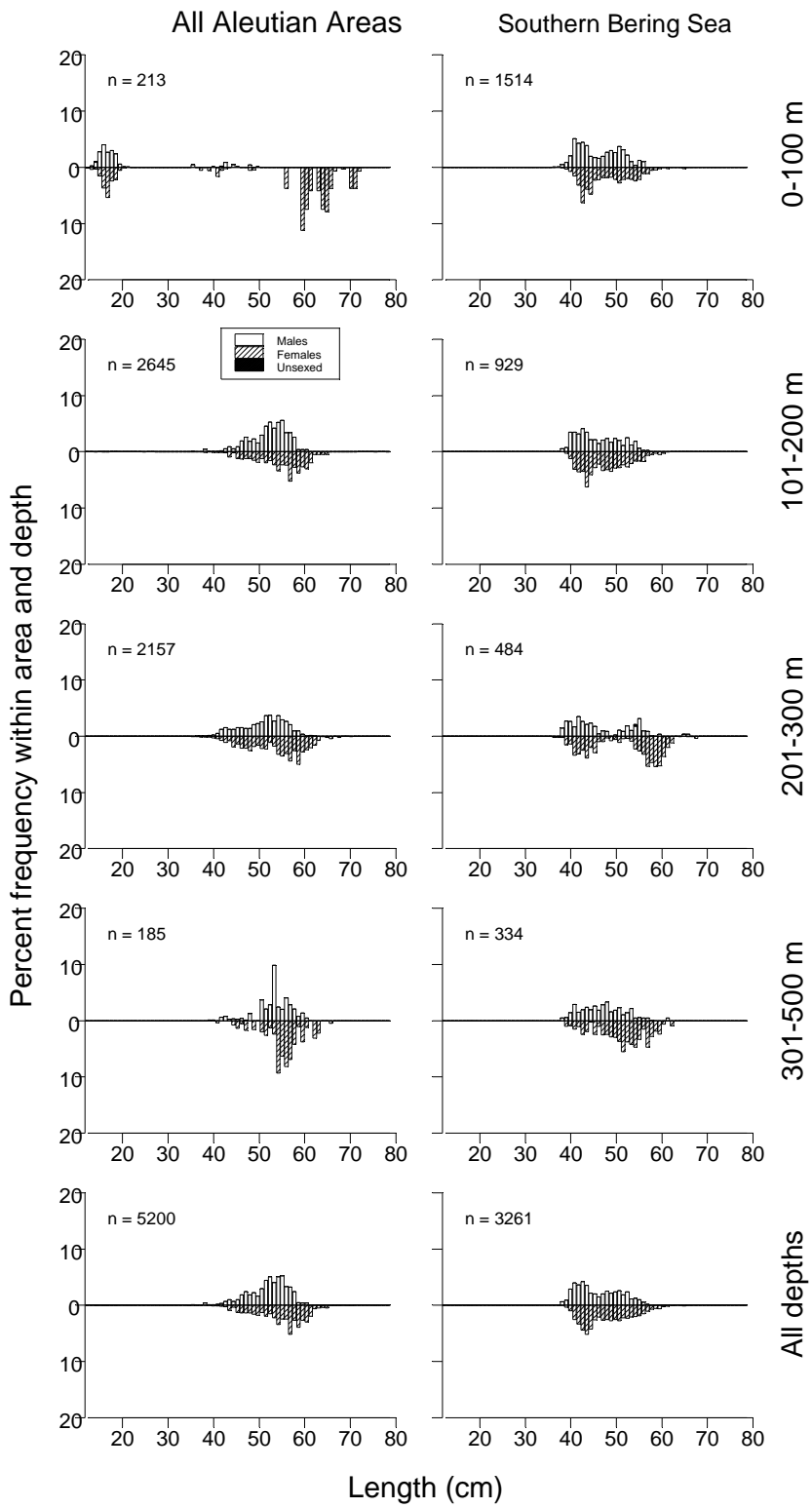


Figure 25. -- (continued).

Sablefish (*Anoplopoma fimbria*)

Sablefish habitat customarily extends deeper than is sampled by this survey. Mean CPUE was highest in the Southern Bering Sea area (Table 2). Throughout the entire survey area, mean CPUE was always highest at depths deeper than 200 m (Table 27). The total biomass estimate of 7,204 t is undoubtedly an underestimate of true biomass. Mean individual weight and length generally increased with increasing depth (Table 27). The two highest mean CPUEs were reported for the Central Aleutians subareas in the 201-300 and 301-500 m depth intervals (Table 28). The largest individual catches were reported west of Tanaga Island (Fig. 26). Figure 27 summarizes sablefish size composition data. Generally sablefish captured during the survey were in the middle of their normal adult size range.

Giant grenadier (*Albatrossia pectoralis*)

Catches of giant grenadier were restricted to the 301-500 m depth interval, primarily in the Eastern Aleutians area (Tables 29 and 30). The high mean CPUE in that area resulted from three large catches north of Seguam Island (Fig. 28). While those few large catches contributed unusually heavy influence, giant grenadier abundance is probably very high along the Aleutian Archipelago. The survey does not sample deeper waters adequately to measure grenadier abundance, nor does it capture a significant number of male grenadiers (Fig. 29). This species was found to be most abundant in the 501-900 m depth range during the 1980 U.S.- Japan cooperative trawl survey (Ronholt et al. 1986). Ronholt also reported that the larger grenadiers were found in the 301-500 m depth interval and the smaller sizes were found in the 501-900 m interval. Coincidentally, the mean vent length of males was about 29 cm and the mean vent length of females was approximately 31 cm (the vent length measurement is the distance from anterior tip of the head to the origin of the anal fin). Thus, it might be expected that males are more likely to be found in depths outside the survey range.

Table 27. -- Total effort (number of trawl hauls), number of hauls with sablefish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	0	0.000	0	--	--	--	--
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	4	2.122	694	0	1,608	4.664	72.1
	All depths	124	4	0.457	694	0	1,532	4.664	72.1
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	1	0.334	154	0	463	1.896	56.7
	201-300	31	6	4.444	937	0	2,116	2.187	58.2
	301-500	21	9	5.053	2,012	411	3,613	2.868	62.6
	All depths	131	16	1.875	3,102	1,183	5,022	2.614	60.9
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	0	0.000	0	--	--	--	--
	201-300	33	4	1.520	745	0	2,001	1.906	56.4
	301-500	22	14	1.788	1,016	408	1,624	1.940	57.0
	All depths	112	18	0.699	1,762	409	3,114	1.926	56.7
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	1	0.09	154	0	457	1.896	56.7
	201-300	89	10	1.93	1,682	4	3,360	2.062	57.4
	301-500	57	27	2.88	3,722	1,876	5,569	2.950	62.8
	All depths	367	38	0.98	5,558	3,082	8,035	2.652	61.0
Southern Bering Sea	1-100	33	3	0.016	7	0	16	0.225	30.2
	101-200	8	1	0.053	10	0	33	0.494	36.7
	201-300	4	2	3.388	191	0	667	2.429	60.8
	301-500	8	8	13.785	1,438	97	2,779	2.654	62.0
	All depths	53	14	2.199	1,646	486	2,805	2.605	61.6

Table 28. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of sablefish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	201-300	N Central Aleutians	16	4	19.72	866	0	2,092
Central Aleutians	301-500	N Central Aleutians	12	6	14.59	1,809	152	3,466
Southern Bering Sea	301-500	Combined Southern Bering	8	8	13.79	1,438	97	2,779
Southern Bering Sea	201-300	Combined Southern Bering	4	2	3.39	191	0	543
Eastern Aleutians	201-300	NE Eastern Aleutians	15	1	3.08	607	0	1,909
Western Aleutians	301-500	W Western Aleutians	10	2	2.32	398	0	1,232
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	8	2.28	608	76	1,140
Central Aleutians	301-500	SE Central Aleutians	3	2	2.08	148	0	678
Western Aleutians	301-500	E Western Aleutians	4	2	1.90	297	0	956
Eastern Aleutians	301-500	SE Eastern Aleutians	9	5	1.51	390	3	777
Central Aleutians	201-300	SE Central Aleutians	3	2	1.50	72	0	240
Central Aleutians	101-200	N Central Aleutians	9	1	1.44	154	0	508
Central Aleutians	301-500	SW Central Aleutians	3	1	0.69	55	0	290
Eastern Aleutians	201-300	SE Eastern Aleutians	10	3	0.67	138	0	383
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.42	18	0	251
Southern Bering Sea	101-200	E Southern Bering	6	1	0.08	10	0	35
Southern Bering Sea	1-100	E Southern Bering	31	3	0.03	7	0	16

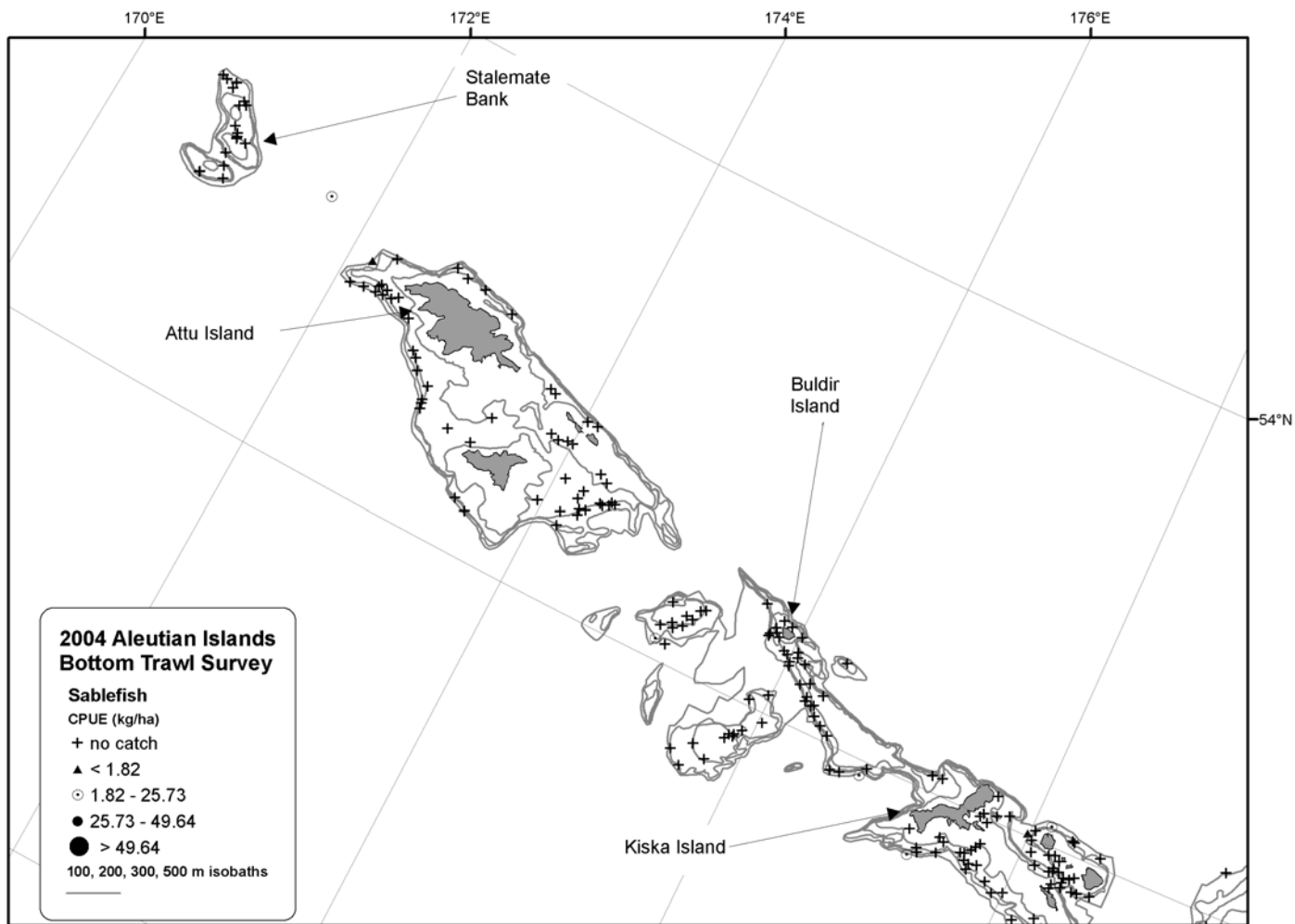


Figure 26. -- Distribution and relative abundance of sablefish from the 2004 Aleutian Islands bottom trawl survey.

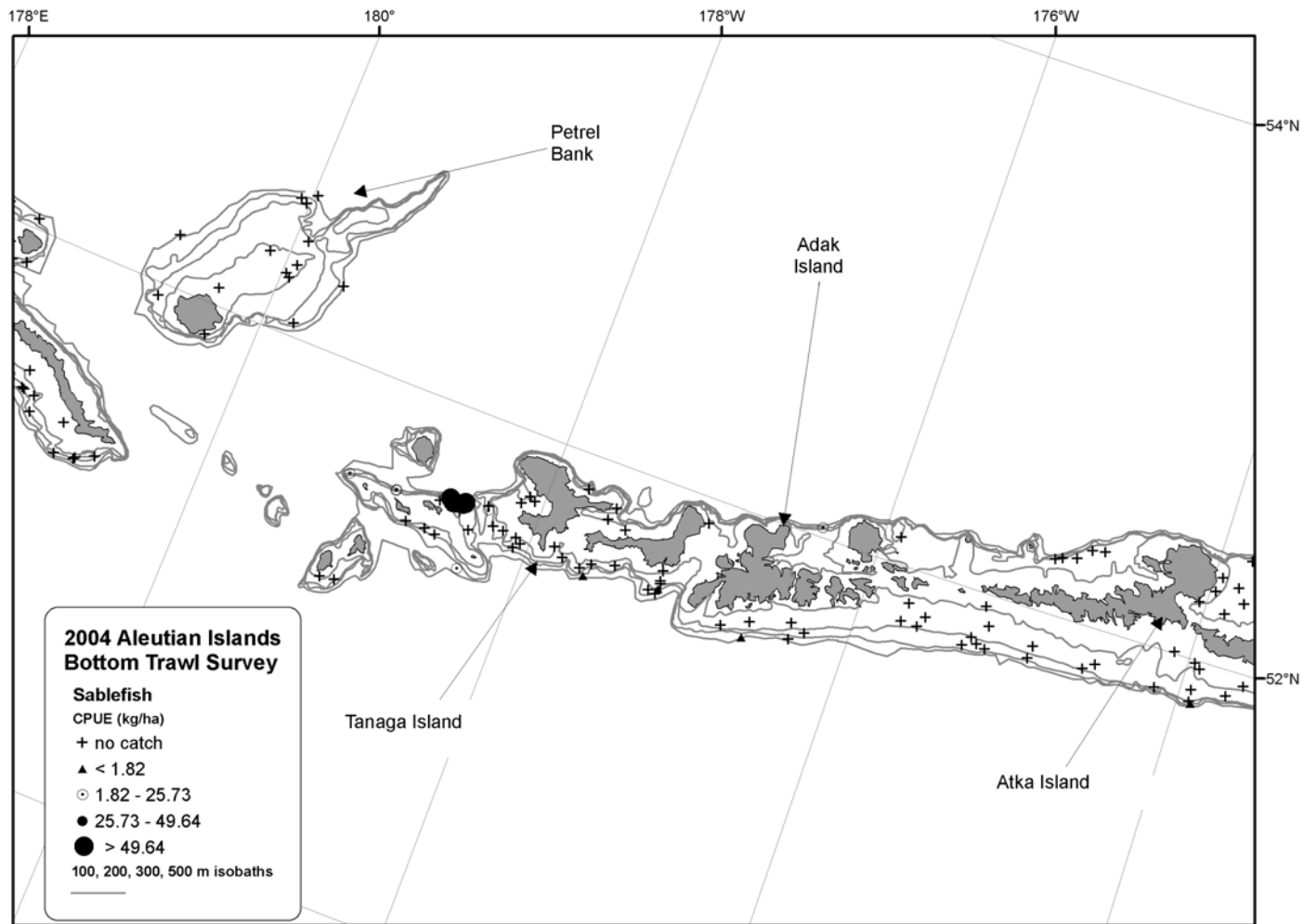


Figure 26. -- (continued).

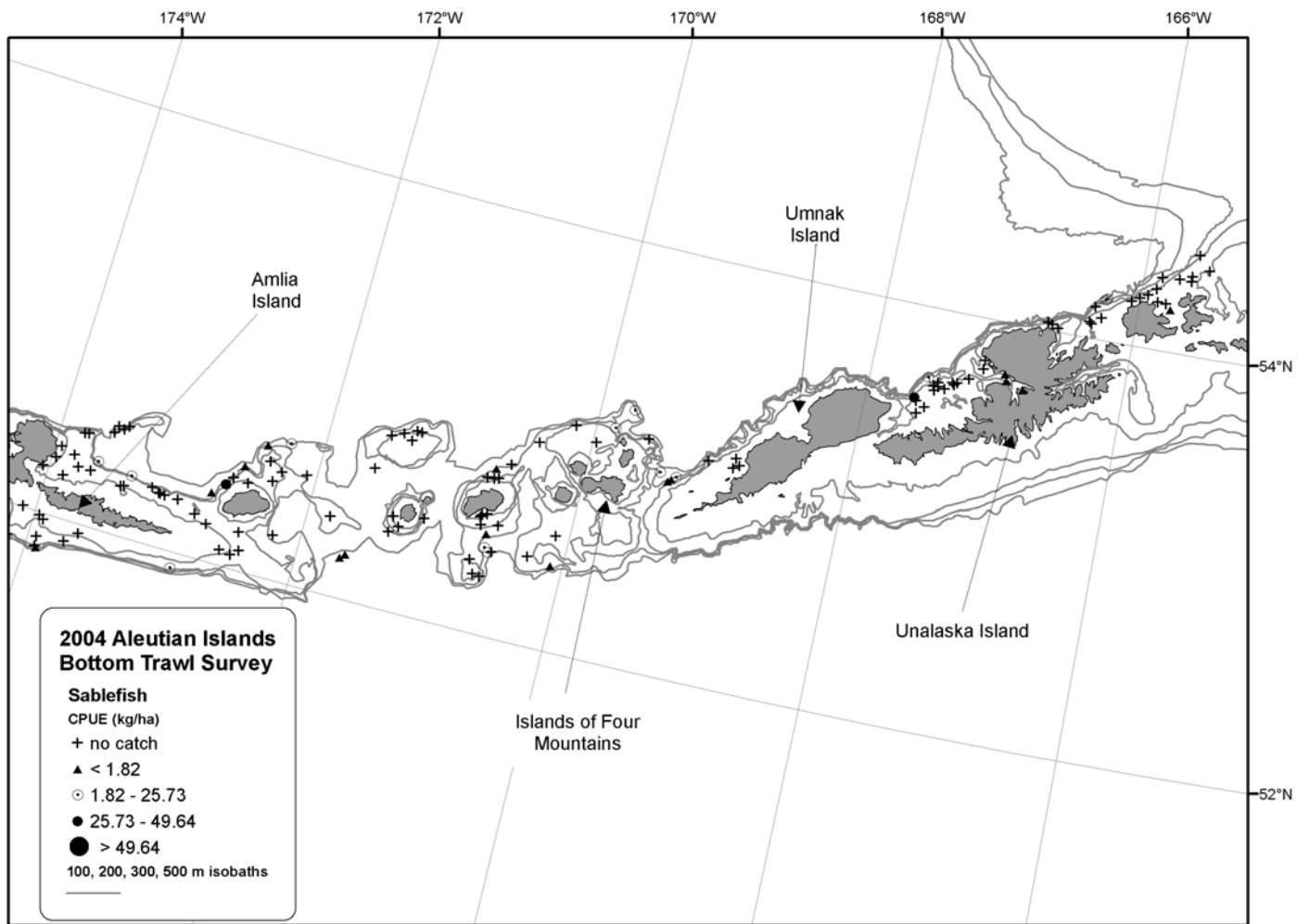


Figure 26. -- (continued).

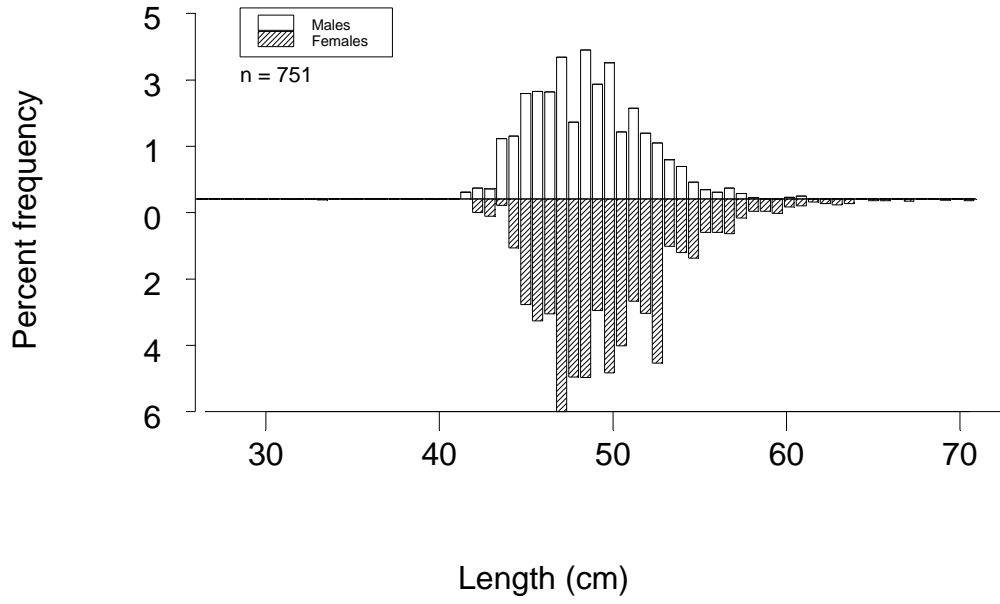


Figure 27. -- Size composition of sablefish from the 2004 Aleutian Islands bottom trawl survey.

Table 29. -- Total effort (number of trawl hauls), number of hauls with giant grenadier, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	0	0.000	0	--	--	--	--
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	10	29.472	9,645	282	19,008	4.207	31.0
	All depths	124	10	6.349	9,645	1,138	18,152	4.207	31.0
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	0	0.000	0	--	--	--	--
	201-300	31	0	0.000	0	--	--	--	--
	301-500	21	13	143.952	57,304	0	121,445	4.426	30.8
	All depths	131	13	34.640	57,304	0	118,137	4.426	30.8
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	0	0.000	0	--	--	--	--
	201-300	33	1	0.316	155	0	470	5.503	34.8
	301-500	22	10	318.555	181,033	0	367,565	4.313	31.3
	All depths	112	11	71.899	181,188	3,433	358,944	4.314	31.3
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	0	0.00	0	--	--	--	--
	201-300	89	1	0.18	155	0	463	5.503	34.8
	301-500	57	33	191.70	247,981	57,763	438,199	4.335	31.2
	All depths	367	34	43.58	248,136	61,483	434,789	4.336	31.2
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	1	0.214	22	0	75	5.632	33.0
	All depths	53	1	0.030	22	0	67	5.632	33.0

Table 30. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of giant grenadier by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	6	605.79	161,745	0	357,590
Central Aleutians	301-500	N Central Aleutians	12	7	259.53	32,175	0	87,081
Central Aleutians	301-500	Petrel Bank	3	2	164.71	20,383	0	97,233
Eastern Aleutians	301-500	SE Eastern Aleutians	9	4	74.91	19,288	0	60,446
Western Aleutians	301-500	W Western Aleutians	10	8	50.94	8,716	0	18,276
Central Aleutians	301-500	SE Central Aleutians	3	2	50.59	3,614	0	12,133
Central Aleutians	301-500	SW Central Aleutians	3	2	14.35	1,133	0	3,569
Western Aleutians	301-500	E Western Aleutians	4	2	5.95	928	0	3,405
Eastern Aleutians	201-300	NE Eastern Aleutians	15	1	0.79	155	0	487
Southern Bering Sea	301-500	Combined Southern Bering	8	1	0.21	22	0	75

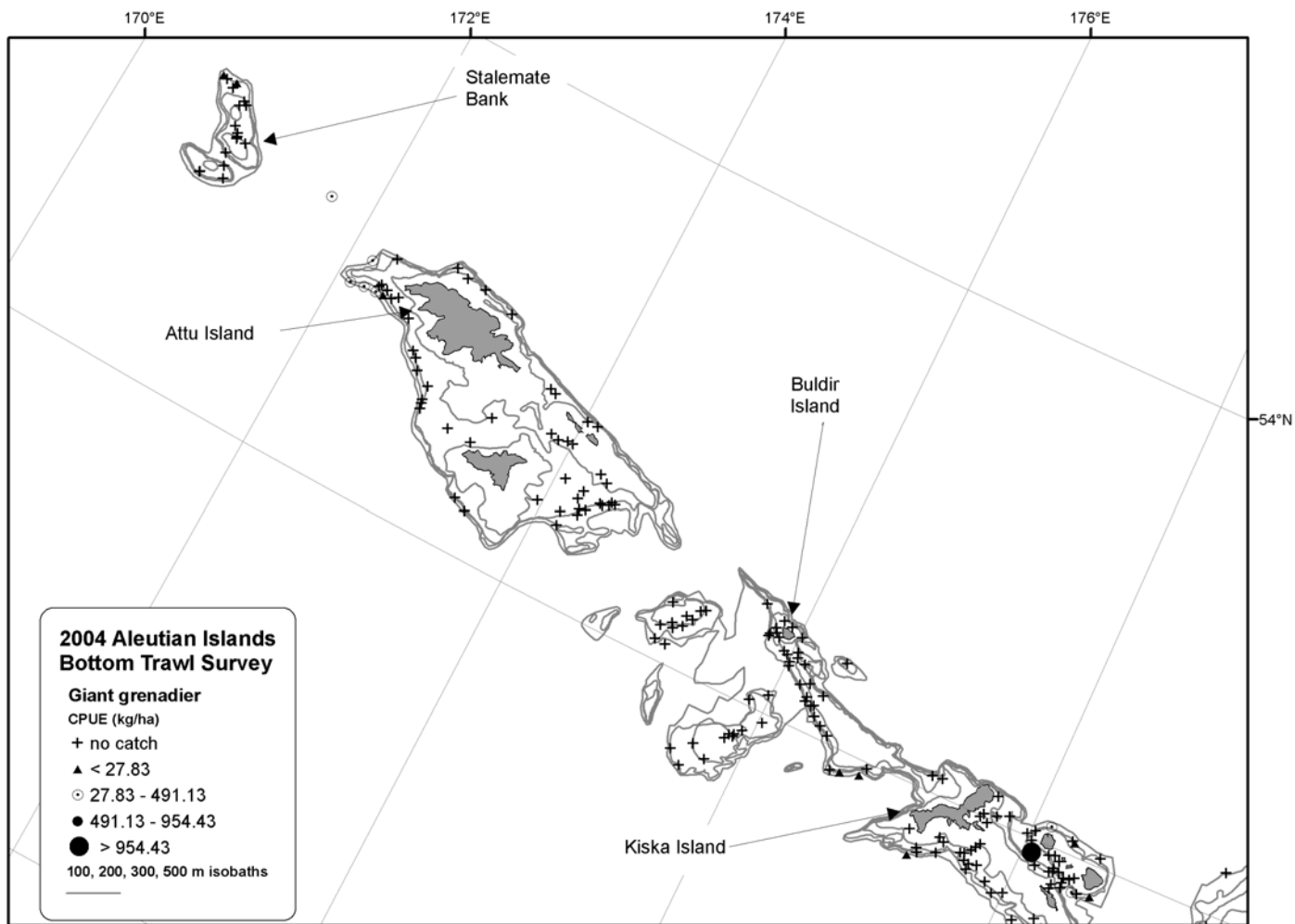


Figure 28. -- Distribution and relative abundance of giant grenadier from the 2004 Aleutian Islands bottom trawl survey.

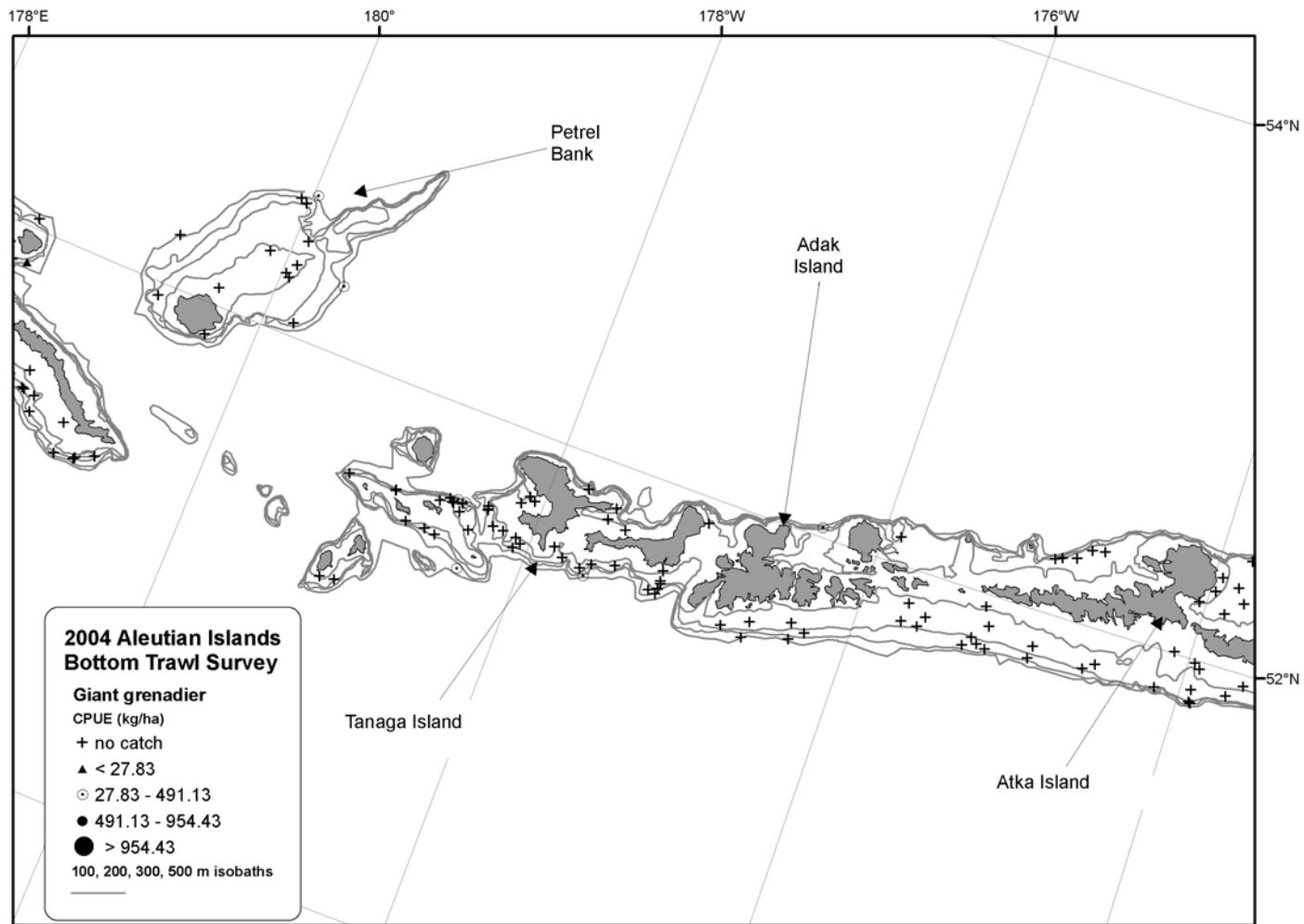


Figure 28. -- (continued).

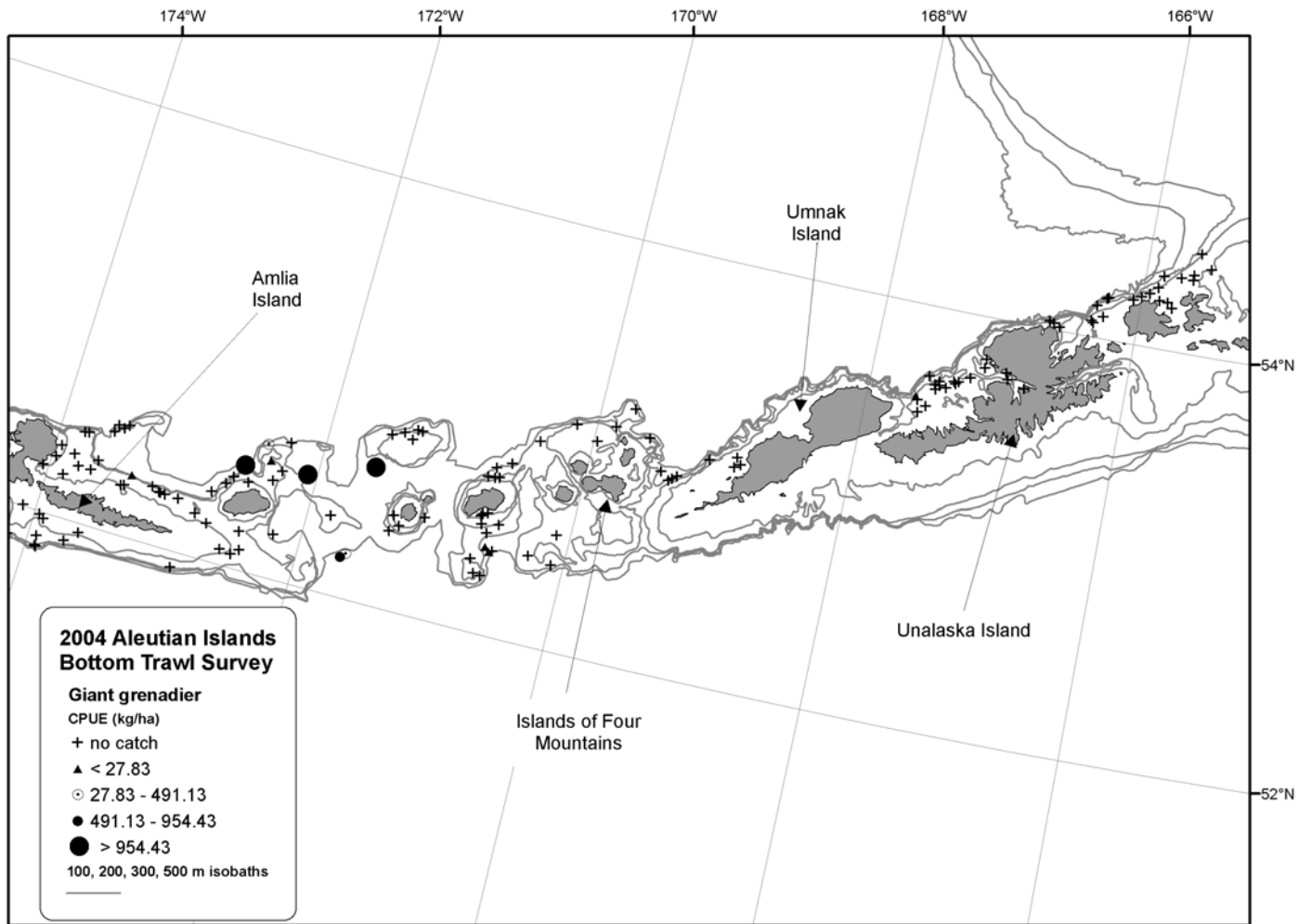


Figure 28. -- (continued).

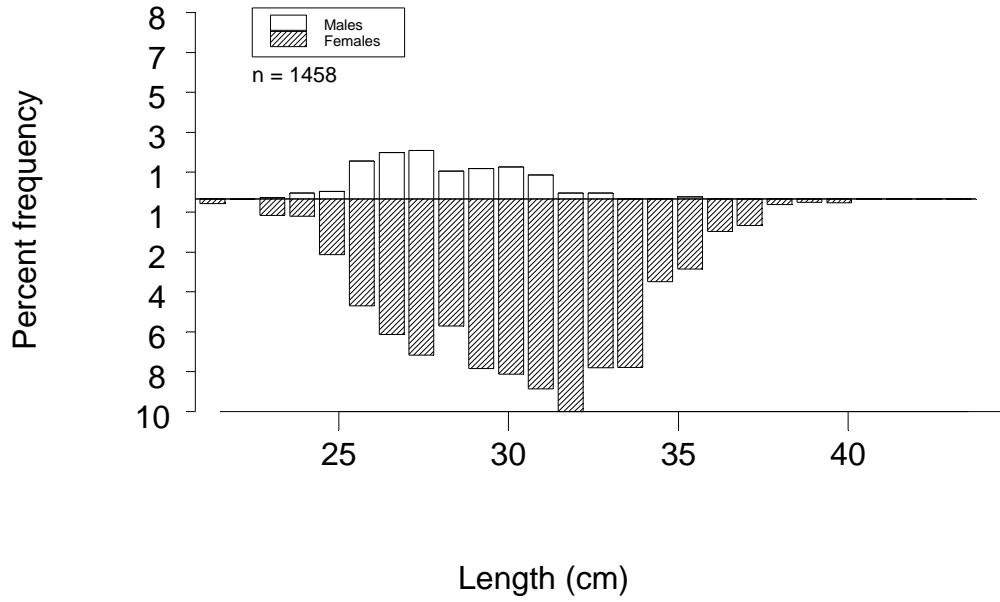


Figure 29. -- Size composition of giant grenadier from the 2004 Aleutian Islands bottom trawl survey.

Sculpins (Cottidae)

Sculpins are probably not sampled well by the survey trawl. The small size of many of the species and their demersal orientation may help them to escape under the footrope. They are no doubt biologically important. In this report, sculpin catch rates and biomass estimates are treated as a grouped whole. Twenty-eight species of sculpins were identified from trawl catches and are summarized by total catch in Table 31. Yellow Irish lord represented the largest total catch in terms of weight, but darkfin sculpin were much more numerous.

Sculpins were captured throughout the survey area (Table 2) and in all depth intervals (Table 32). They were captured in 89% of all trawl hauls. Sculpin mean CPUE was lowest in the Western Aleutians area and highest in the Central Aleutians area. The 1-100 m depth interval on Petrel Bank was the most productive subarea (Table 33 and Fig. 30).

Table 31. -- Sculpin species catch (weight and numbers) in the 2004 Aleutian Islands bottom trawl survey. Data are combined across areas and are only shown for species that were identified in the catch.

Species name	Common name	Weight (kg)	Number
<i>Hemilepidotus jordani</i>	yellow Irish lord	1,142	1,698
<i>Malacocottus zonurus</i>	darkfin sculpin	840	7,965
<i>Myoxocephalus polyacanthocephalus</i>	great sculpin	196	72
<i>Triglops szepticus</i>	spectacled sculpin	161	2,439
<i>Hemitripterus bolini</i>	bigmouth sculpin	105	30
<i>Gymnocanthus galeatus</i>	armorhead sculpin	83	418
<i>Triglops forficata</i>	scissortail sculpin	75	767
<i>Dasycottus setiger</i>	spinyhead sculpin	16	120
<i>Hemilepidotus zapus</i>	longfin Irish lord	12	240
<i>Thyriscus anoplus</i>	sponge sculpin	6	167
<i>Triglops metopias</i>	crescent-tail sculpin	3	37
<i>Triglops macellus</i>	roughspine sculpin	2	18
<i>Enophrys diceraus</i>	antlered sculpin	1	5
<i>Enophrys lucasi</i>	leister sculpin	<1	1
<i>Hemilepidotus hemilepidotus</i>	red Irish lord	<1	2
<i>Icelus euryops</i>	wide-eye sculpin	<1	35
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	<1	2
<i>Bolinia euryptera</i>	broadfin sculpin	<1	6
<i>Rastrinus scutiger</i>	roughskin sculpin	<1	28
<i>Icelus uncinialis</i>	uncinate sculpin	<1	4
<i>Icelus spiniger</i>	thorny sculpin	<1	5
<i>Icelus canaliculatus</i>	blacknose sculpin	<1	5
<i>Archistes biseriatus</i>	scaled sculpin	<1	3
<i>Icelus spatula</i>	spatulate sculpin	<1	1
<i>Nautichthys pribilovius</i>	eyeshade sculpin	<1	1
<i>Myoxocephalus quadricornis</i>	fourhorn sculpin	<1	1
<i>Triglops xenostethus</i>	scalybreasted sculpin	<1	2
<i>Icelus spiniger</i>	thorny sculpin	<1	5

Table 32. -- Total effort (number of trawl hauls), number of hauls with sculpin species, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)
Western Aleutians	1-100	23	17	0.009	448	0	1,699	0.445
	101-200	62	60	0.016	864	0	2,731	0.199
	201-300	25	23	0.024	411	0	1,117	0.061
	301-500	14	11	0.005	165	0	433	0.033
	All depths	124	111	0.012	1,888	0	4,202	0.213
Central Aleutians	1-100	31	26	0.045	2,607	0	5,599	0.806
	101-200	48	42	0.066	3,027	0	6,128	0.157
	201-300	31	31	0.038	803	83	1,523	0.139
	301-500	21	17	0.009	343	0	894	0.105
	All depths	131	116	0.041	6,779	2,482	11,076	0.402
Eastern Aleutians	1-100	15	14	0.050	3,432	0	9,786	0.737
	101-200	42	39	0.020	1,563	0	4,630	0.607
	201-300	33	28	0.031	1,522	0	4,681	0.148
	301-500	22	19	0.024	1,341	0	3,649	0.082
	All depths	112	100	0.031	7,858	288	15,427	0.485
All Aleutian Areas	1-100	90	76	0.04	7,078	77	14,080	0.787
	101-200	148	138	0.04	6,371	1,160	11,583	0.419
	201-300	87	83	0.03	2,767	0	5,999	0.135
	301-500	49	40	0.02	2,025	0	4,474	0.084
	All depths	374	337	0.03	18,242	8,712	27,772	0.481
Southern Bering Sea	1-100	33	26	0.024	949	0	3,424	1.014
	101-200	8	6	0.063	1,166	0	4,162	1.001
	201-300	4	4	0.012	70	0	167	0.260
	301-500	8	8	0.038	393	0	1,517	0.073
	All depths	53	44	0.034	2,578	0	6,161	0.844

Table 33. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of sculpin species by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	1-100	Petrel Bank	6	6	18.29	1,756	1,660	1,852
Central Aleutians	101-200	Petrel Bank	2	2	13.16	2,285	1,709	2,861
Eastern Aleutians	1-100	SE Eastern Aleutians	8	8	10.35	1,801	1,594	2,009
Southern Bering Sea	101-200	E Southern Bering	6	5	9.69	1,143	1,043	1,242
Central Aleutians	201-300	SW Central Aleutians	9	9	7.80	332	310	354
Eastern Aleutians	1-100	NW Eastern Aleutians	2	2	6.06	1,170	788	1,553
Eastern Aleutians	101-200	SE Eastern Aleutians	9	9	4.94	939	835	1,043
Eastern Aleutians	201-300	SE Eastern Aleutians	10	8	4.67	961	855	1,067
Central Aleutians	101-200	SE Central Aleutians	15	13	4.14	312	282	341
Southern Bering Sea	301-500	Combined Southern Bering	8	8	3.77	393	359	428
Southern Bering Sea	1-100	E Southern Bering	31	25	3.45	843	765	921
Western Aleutians	201-300	E Western Aleutians	11	11	3.18	249	230	268
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	3.11	394	369	419
Central Aleutians	201-300	SE Central Aleutians	3	3	2.96	141	130	152
Central Aleutians	201-300	N Central Aleutians	16	16	2.74	120	112	128
Central Aleutians	201-300	Petrel Bank	3	3	2.74	210	195	224
Eastern Aleutians	201-300	NE Eastern Aleutians	15	15	2.62	516	486	547
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	10	2.61	697	649	745
Central Aleutians	301-500	SE Central Aleutians	3	2	2.53	181	157	205
Eastern Aleutians	301-500	SE Eastern Aleutians	9	7	2.50	644	579	708
Central Aleutians	1-100	SW Central Aleutians	4	2	2.49	404	325	482
Western Aleutians	101-200	E Western Aleutians	26	26	2.26	283	245	322
Central Aleutians	101-200	N Central Aleutians	9	8	2.24	239	221	257
Eastern Aleutians	101-200	NE Eastern Aleutians	18	18	1.83	369	341	397
Central Aleutians	101-200	SW Central Aleutians	22	19	1.82	192	174	209
Western Aleutians	201-300	W Western Aleutians	14	12	1.72	162	148	176
Western Aleutians	1-100	E Western Aleutians	13	11	1.67	197	170	225
Central Aleutians	1-100	SE Central Aleutians	5	4	1.52	177	156	198
Western Aleutians	101-200	W Western Aleutians	36	34	1.43	581	534	627
Central Aleutians	1-100	N Central Aleutians	16	14	1.28	270	251	289
Southern Bering Sea	201-300	Combined Southern Bering	4	4	1.24	70	67	73
Eastern Aleutians	101-200	SW Eastern Aleutians	12	9	1.10	248	227	270
Central Aleutians	301-500	N Central Aleutians	12	11	0.83	102	89	116
Western Aleutians	301-500	E Western Aleutians	4	4	0.73	115	105	124
Western Aleutians	1-100	W Western Aleutians	10	6	0.68	250	218	282
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.67	106	46	166
Eastern Aleutians	201-300	SW Eastern Aleutians	6	3	0.54	39	33	45
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	0.35	23	10	37
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.35	66	29	104
Central Aleutians	301-500	SW Central Aleutians	3	1	0.30	24	18	30
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	0.30	5	2	7
Western Aleutians	301-500	W Western Aleutians	10	7	0.30	51	45	56
Central Aleutians	301-500	Petrel Bank	3	3	0.29	35	32	39
Eastern Aleutians	101-200	NW Eastern Aleutians	3	3	0.04	7	7	7
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	0.02	1	1	1

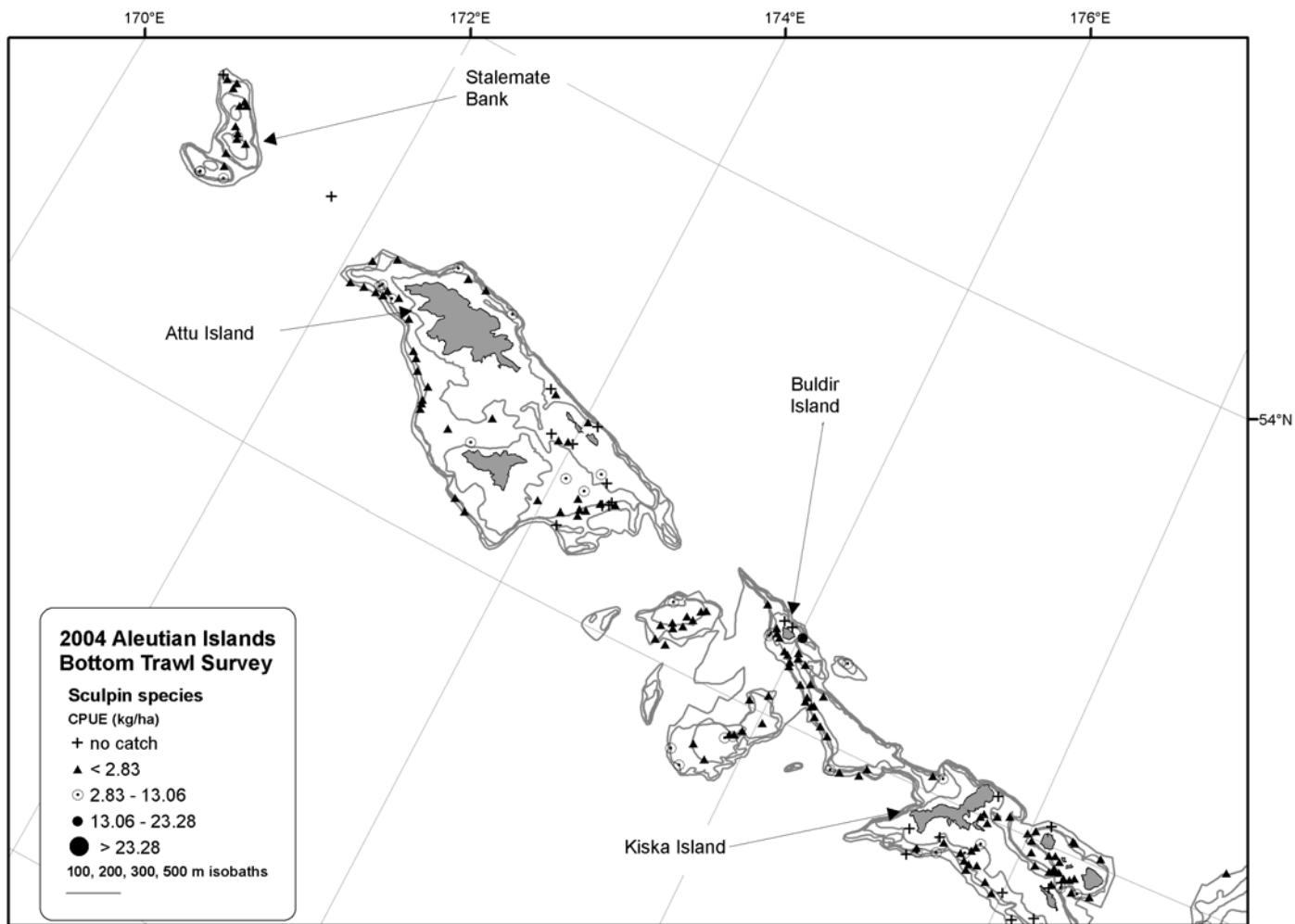


Figure 30. -- Distribution and relative abundance of sculpin species from the 2004 Aleutian Islands bottom trawl survey.

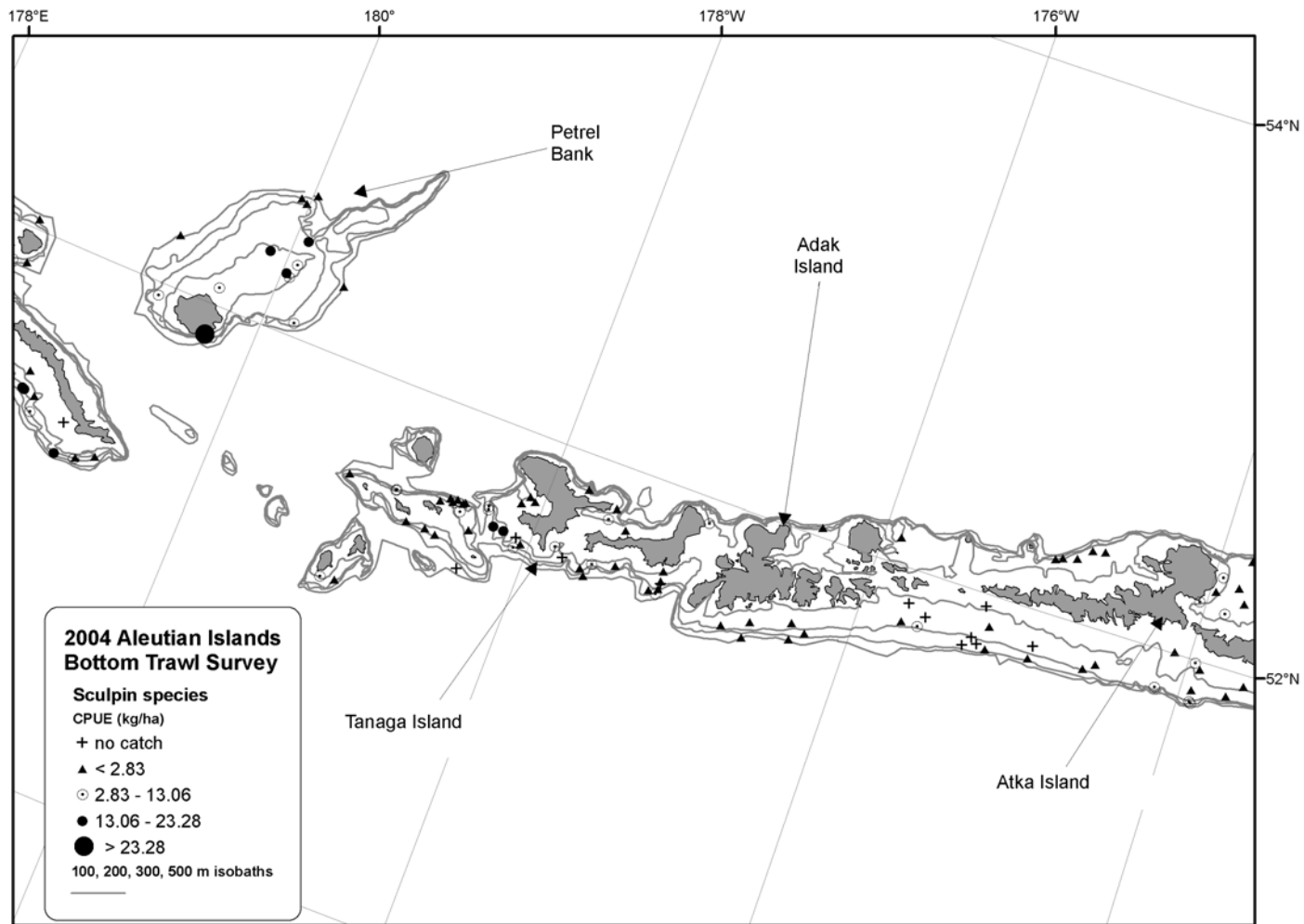


Figure 30. -- (continued).

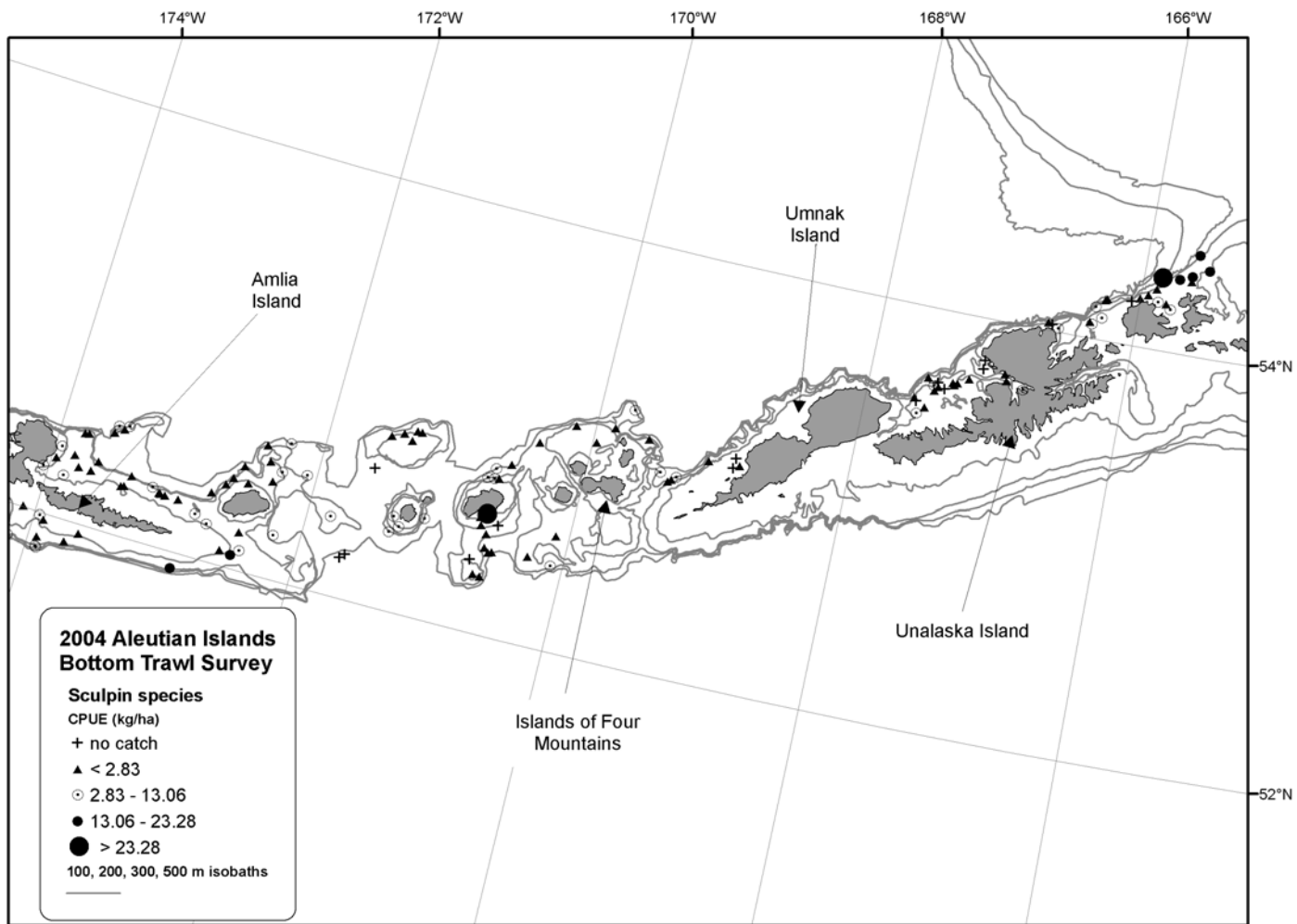


Figure 30. -- (continued).

Rockfishes

Pacific ocean perch (*Sebastes alutus*)

The highest area-specific catch rate for Pacific ocean perch (POP) was in the Western Aleutians area (Table 2). The overall mean CPUE of POP by area diminished in an easterly direction (Fig. 31). Estimated biomass for the entire survey area surpassed 576,000 t (Table 34) and more than 87% of the total estimated biomass was found in the Aleutian areas. Mean CPUE increased with depth to about 300 m. Whereas Atka mackerel abundance was highest in the 101-200 m depth interval, the highest concentrations of POP were found in 201-300 m. The highest nine stratum-specific mean CPUEs were all found in the 201-300 m depth interval (Table 37). Mean lengths and weights increased with depth in both the Aleutian and Southern Bering Sea areas (Table 34). Size composition data show matching male and female frequency modes (25 cm) for juvenile POP, but the primary adult frequency mode (Fig. 32) for males (35 cm) differs from that of females (38 cm). Size compositions by depth interval showed that in 1-100 m small POP predominated, in 101-200 m there was a mix of adult and juvenile sizes, and the two deeper strata contained adults exclusively.

Northern rockfish (*Sebastes polyspinus*)

Northern rockfish relative abundance was highest in the Western Aleutians area (Table 2). Figure 33 shows that the largest catches of northern rockfish were between Kiska Island and Buldir Island, although there were many positive catches west of 180° longitude. Estimated total survey biomass was slightly less than 200,000 t, with about 77% found in the Western Aleutians area (Table 36), and in depths less than 200 m (Table 37). Northern rockfish were encountered in relatively small numbers in the 201-300 m depth interval and rarely in trawl hauls deeper than 300 m. The distribution by depth is more similar to that of Atka mackerel than POP. Northern rockfish were captured in 53% of all successful tows shallower than 200 m. The highest catch rate of northern rockfish occurred in 1-100 m and 101-200 m depth intervals in the E Western Aleutian subarea. All tows except seven in that subarea caught northern rockfish (Table 37). Mean individual length and weight increased with depth to 300 m. The size composition modes for both sexes occurred between 30 and 35 cm in Aleutian Island Areas, while slightly larger fish were observed in the Southern Bering Sea (Fig. 34). The primary modes in the size compositions of both males and females in all Aleutian areas combined were at 32 cm, but larger females represented a greater proportion of the population than larger males.

Table 34. -- Total effort (number of trawl hauls), number of hauls with Pacific ocean perch, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	3	2.075	1,012	0	3,043	0.136	22.0
	101-200	62	48	237.201	126,135	56,965	195,305	0.496	32.4
	201-300	25	25	489.241	84,327	26,305	142,349	0.587	34.4
	301-500	14	5	3.560	1,165	0	2,543	0.697	36.6
	All depths	124	81	139.983	212,639	124,369	300,910	0.532	33.2
Central Aleutians	1-100	31	3	0.099	58	0	141	0.328	26.1
	101-200	48	35	66.907	30,815	12,817	48,813	0.597	33.6
	201-300	31	31	533.139	112,430	66,633	158,227	0.765	37.4
	301-500	21	13	23.957	9,537	0	26,865	0.781	37.7
	All depths	131	82	92.391	152,840	102,327	203,353	0.732	36.7
Eastern Aleutians	1-100	15	9	0.324	222	17	426	0.373	27.7
	101-200	42	18	13.229	10,276	1,184	19,368	0.418	30.1
	201-300	33	32	239.925	117,599	39,612	195,586	0.675	34.9
	301-500	22	10	15.864	9,015	0	23,785	0.625	36.6
	All depths	112	69	54.409	137,112	59,437	214,787	0.652	34.7
All Aleutian Areas	1-100	69	15	0.74	1,292	0	3,251	0.185	23.2
	101-200	152	101	94.52	167,226	96,074	238,378	0.510	32.5
	201-300	89	88	359.92	314,356	209,970	418,742	0.684	35.7
	301-500	57	28	15.24	19,717	0	41,648	0.705	37.1
	All depths	367	232	88.28	502,591	375,503	629,679	0.626	34.6
Southern Bering Sea	1-100	33	5	1.810	729	0	2,170	0.340	27.9
	101-200	8	5	25.148	4,649	0	13,626	0.526	31.9
	201-300	4	4	1,128.080	63,608	0	168,295	0.787	37.6
	301-500	8	8	50.062	5,222	0	15,342	0.854	38.8
	All depths	53	22	99.187	74,208	7,193	141,223	0.771	37.2

Table 35. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Pacific ocean perch by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	201-300	Combined Southern Bering	4	4	1128.08	63,608	0	168,281
Central Aleutians	201-300	N Central Aleutians	16	16	924.38	40,581	22,880	58,282
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	843.67	13,155	6,685	19,625
Western Aleutians	201-300	W Western Aleutians	14	14	607.37	57,107	0	116,041
Central Aleutians	201-300	SE Central Aleutians	3	3	558.60	26,665	0	66,908
Central Aleutians	201-300	SW Central Aleutians	9	9	416.61	17,749	0	38,723
Central Aleutians	201-300	Petrel Bank	3	3	357.96	27,435	0	97,308
Western Aleutians	201-300	E Western Aleutians	11	11	347.46	27,220	12,124	42,317
Eastern Aleutians	201-300	SE Eastern Aleutians	10	10	284.37	58,597	0	141,677
Western Aleutians	101-200	W Western Aleutians	36	24	247.07	100,437	30,906	169,969
Western Aleutians	101-200	E Western Aleutians	26	24	205.18	25,698	13,148	38,248
Eastern Aleutians	201-300	NE Eastern Aleutians	15	14	170.82	33,628	13,150	54,106
Eastern Aleutians	201-300	SW Eastern Aleutians	6	6	170.56	12,219	0	25,202
Central Aleutians	101-200	SW Central Aleutians	22	18	153.73	16,177	2,474	29,879
Central Aleutians	301-500	SE Central Aleutians	3	3	116.82	8,344	0	43,893
Central Aleutians	101-200	N Central Aleutians	9	6	99.49	10,606	0	22,460
Southern Bering Sea	301-500	Combined Southern Bering	8	8	50.06	5,222	0	15,343
Southern Bering Sea	101-200	E Southern Bering	6	5	39.43	4,649	0	14,410
Eastern Aleutians	101-200	SW Eastern Aleutians	12	8	39.01	8,821	0	18,507
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	5	26.41	7,053	0	22,366
Central Aleutians	101-200	Petrel Bank	2	2	18.17	3,154	0	43,188
Central Aleutians	101-200	SE Central Aleutians	15	9	11.69	879	0	2,019
Central Aleutians	301-500	N Central Aleutians	12	7	9.22	1,144	0	3,054
Western Aleutians	1-100	E Western Aleutians	13	3	8.55	1,012	0	3,140
Eastern Aleutians	301-500	SE Eastern Aleutians	9	4	7.30	1,880	0	6,003
Western Aleutians	301-500	W Western Aleutians	10	3	5.29	904	0	2,240
Eastern Aleutians	101-200	NE Eastern Aleutians	18	6	3.77	758	0	2,141
Eastern Aleutians	101-200	SE Eastern Aleutians	9	4	3.67	697	0	2,224
Southern Bering Sea	1-100	E Southern Bering Sea	31	5	2.99	729	0	2,173
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	1.88	83	0	1,131
Western Aleutians	301-500	E Western Aleutians	4	2	1.67	261	0	1,026
Eastern Aleutians	1-100	SE Eastern Aleutians	8	7	0.72	126	0	259
Eastern Aleutians	1-100	SW Eastern Aleutians	2	2	0.50	96	0	1,076
Central Aleutians	1-100	N Central Aleutians	16	3	0.28	58	0	145
Central Aleutians	301-500	SW Central Aleutians	3	2	0.25	20	0	66
Central Aleutians	301-500	Petrel Bank	3	1	0.24	29	0	156

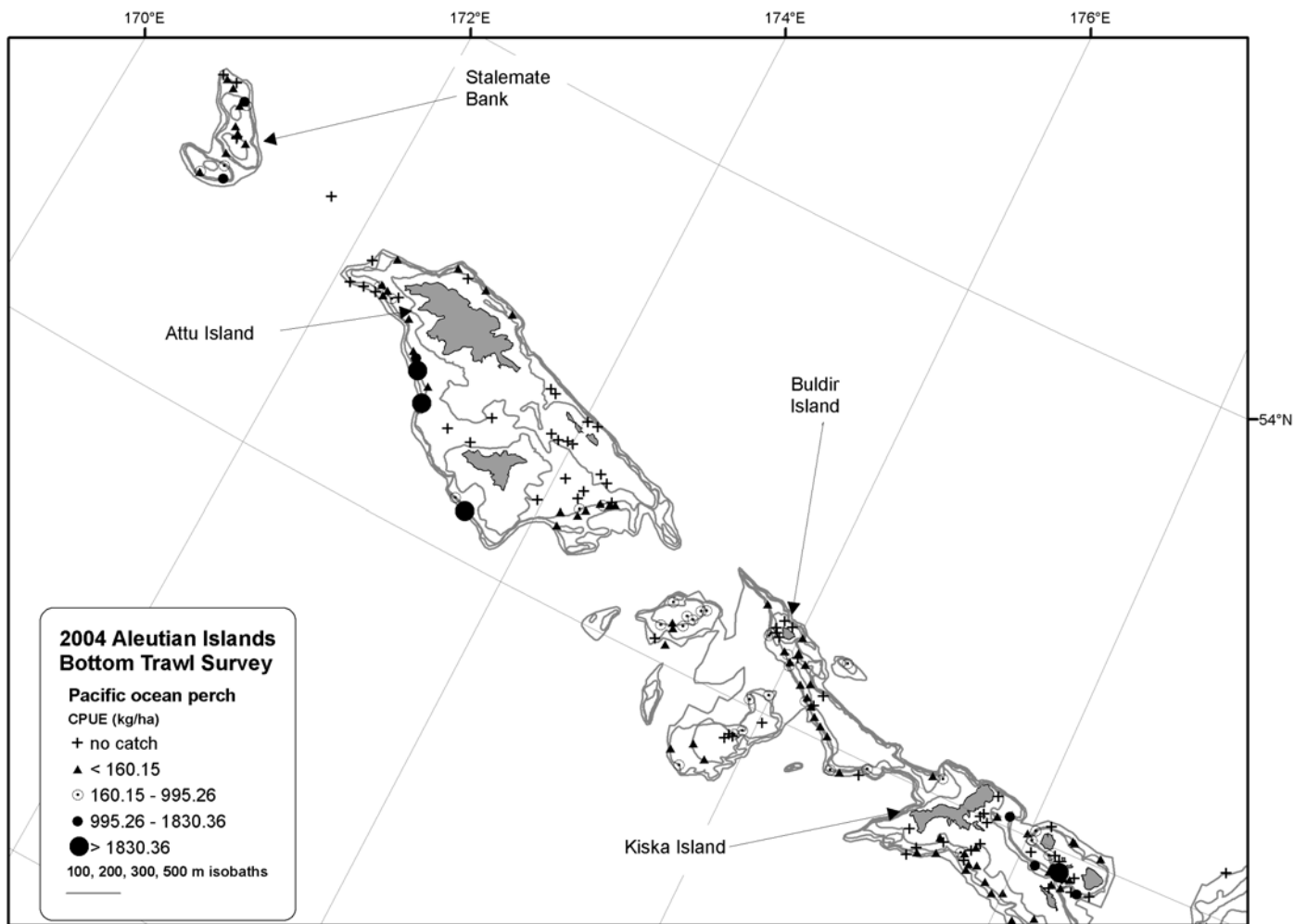


Figure 31. -- Distribution and relative abundance of Pacific ocean perch from the 2004 Aleutian Islands bottom trawl survey.

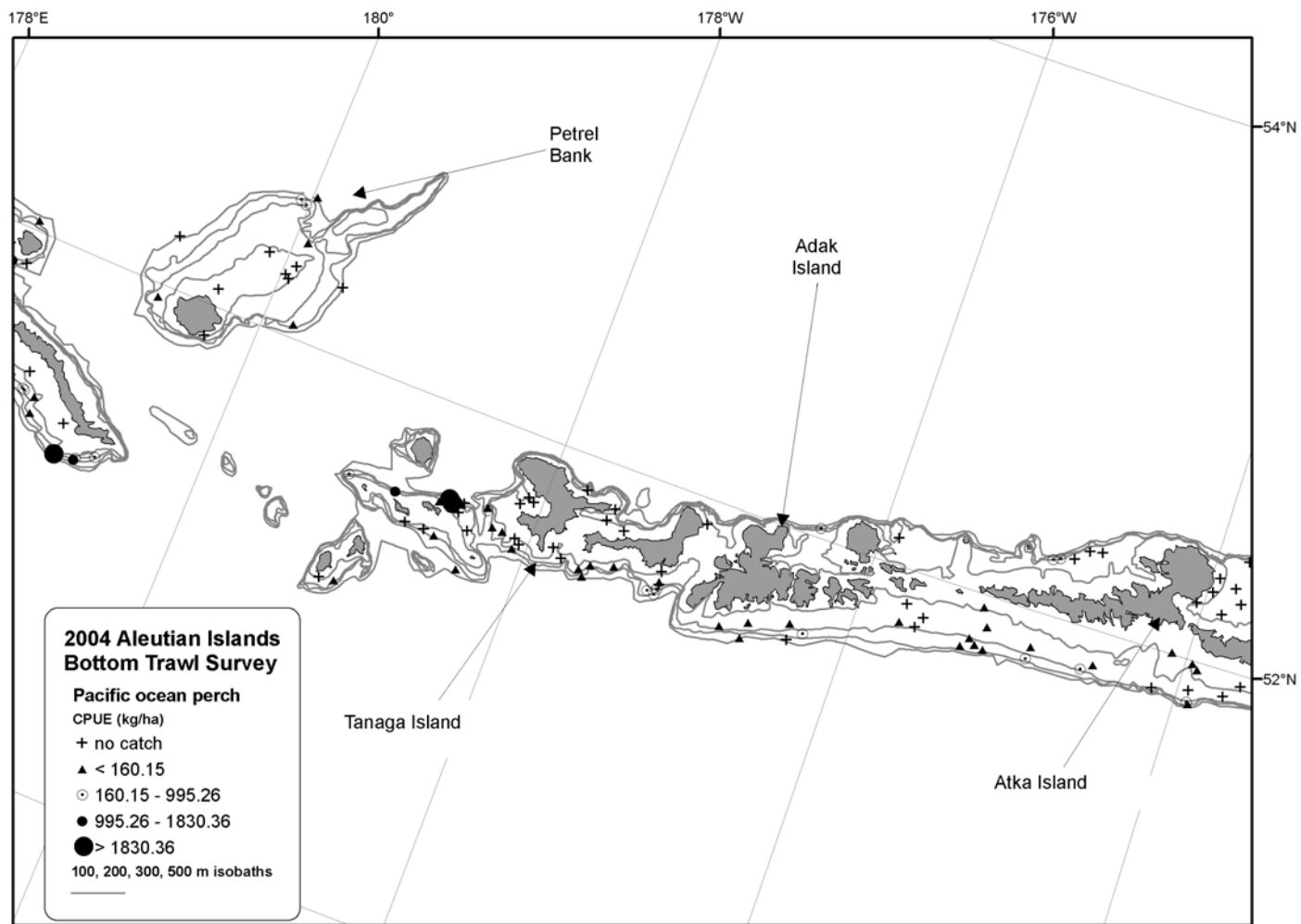


Figure 31. -- (continued)

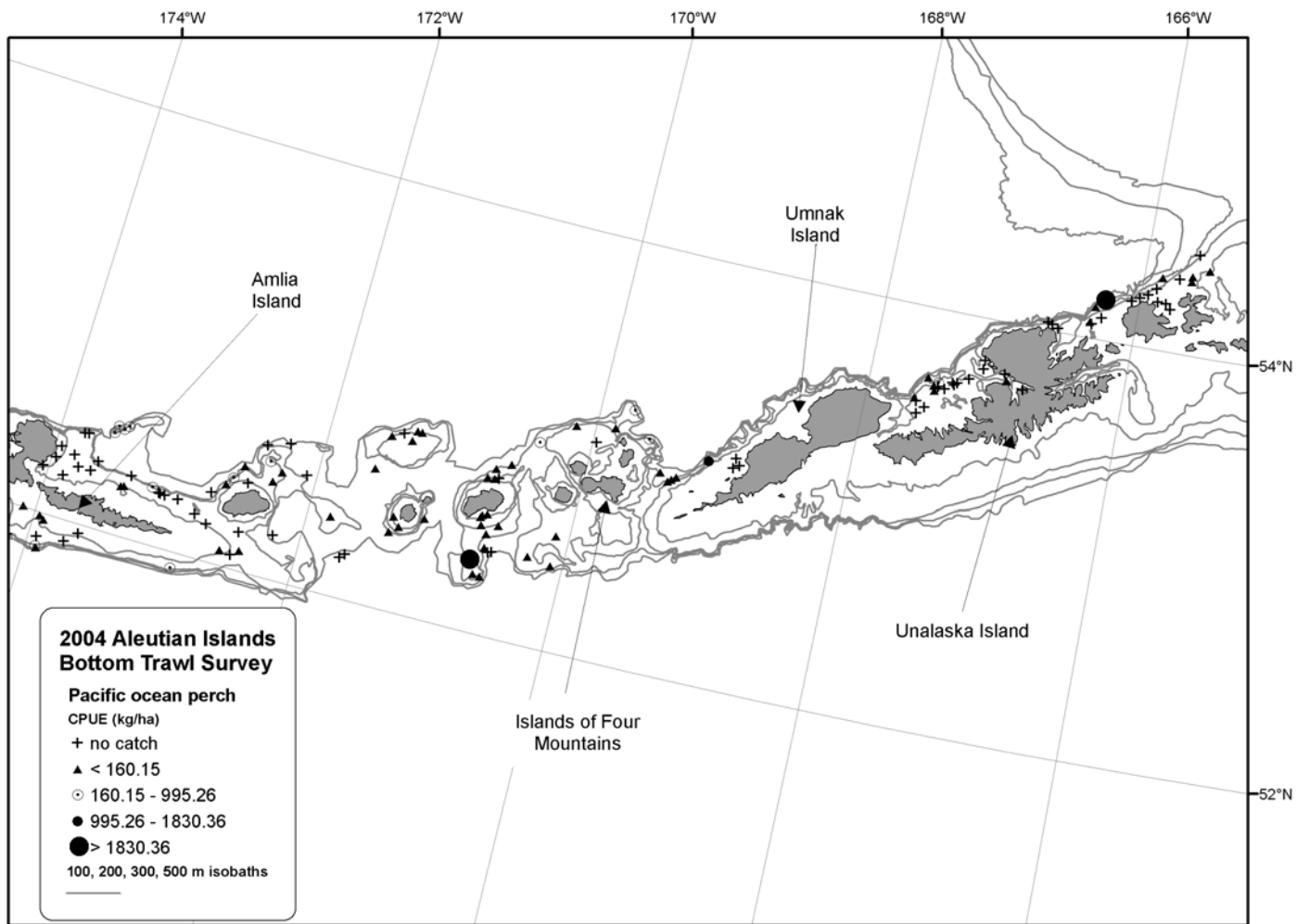


Figure 31. -- (continued)

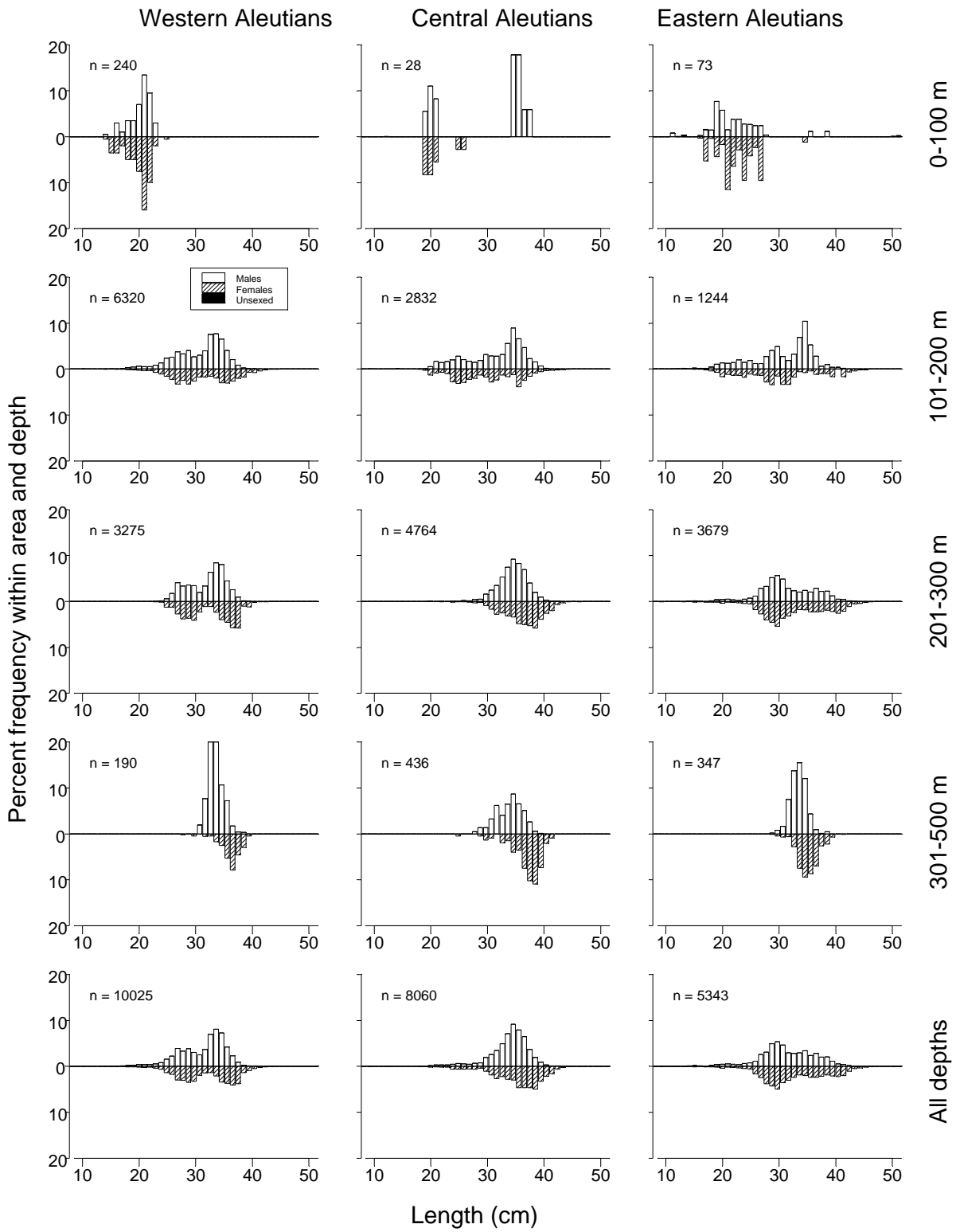


Figure 32. -- Size composition of Pacific ocean perch from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

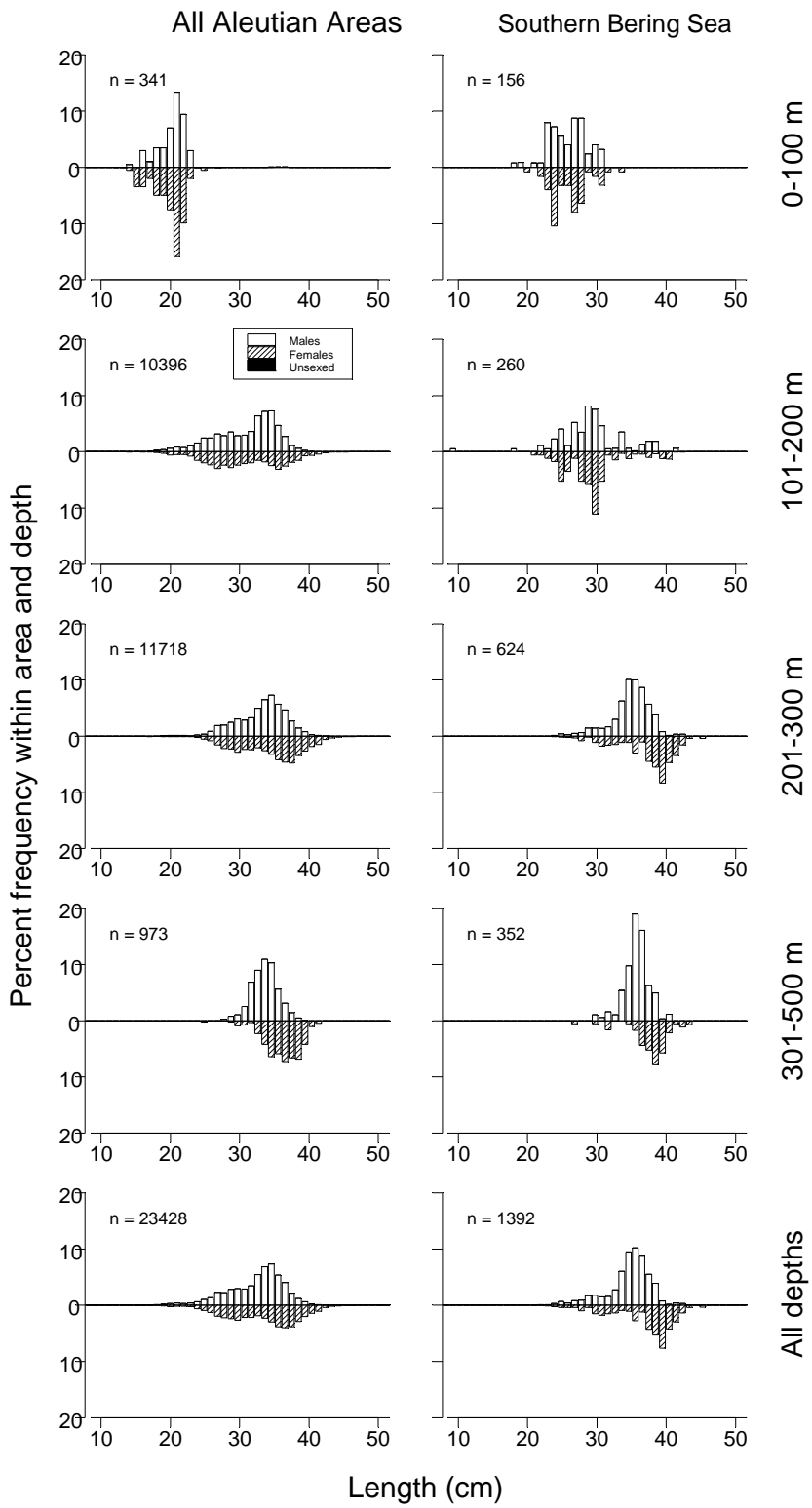


Figure 32. -- (continued).

Table 36. -- Total effort (number of trawl hauls), number of hauls with northern rockfish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	14	96.949	47,279	0	103,741	0.375	29.8
	101-200	62	52	185.488	98,636	39,925	157,346	0.448	31.4
	201-300	25	17	1.533	264	83	446	0.479	32.1
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	83	96.231	146,179	67,015	225,343	0.425	30.9
Central Aleutians	1-100	31	8	17.097	9,997	0	28,831	0.305	27.2
	101-200	48	35	36.587	16,851	6,393	27,308	0.517	32.7
	201-300	31	19	0.840	177	38	317	0.509	32.3
	301-500	21	2	0.063	25	0	72	0.536	33.2
	All depths	131	64	16.352	27,050	6,128	47,971	0.438	30.7
Eastern Aleutians	1-100	15	9	8.088	5,539	0	11,184	0.524	32.6
	101-200	42	14	3.859	2,998	0	7,402	0.560	34.2
	201-300	33	18	3.738	1,832	0	5,282	0.843	37.6
	301-500	22	1	0.011	6	0	19	0.561	34.0
	All depths	112	42	4.117	10,375	2,816	17,934	0.591	33.9
All Aleutian Areas	1-100	69	31	35.75	62,815	5,349	120,280	0.377	29.6
	101-200	152	101	66.97	118,484	59,413	177,554	0.461	31.7
	201-300	89	54	2.60	2,274	0	5,646	0.775	36.6
	301-500	57	3	0.02	31	0	78	0.541	33.4
	All depths	367	189	32.25	183,603	101,916	265,290	0.436	31.0
Southern Bering Sea	1-100	33	6	0.825	332	0	954	0.679	34.8
	101-200	8	2	30.066	5,558	0	18,680	0.744	36.7
	201-300	4	3	1.547	87	0	260	0.682	35.6
	301-500	8	1	0.023	2	0	8	0.411	31.0
	All depths	53	12	7.993	5,980	0	17,132	0.740	36.6

Table 37. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of northern rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	101-200	E Western Aleutians	26	26	576.53	72,208	14,448	129,967
Western Aleutians	1-100	E Western Aleutians	13	10	167.18	19,782	2,535	37,030
Central Aleutians	101-200	SW Central Aleutians	22	22	120.80	12,712	4,225	21,200
Western Aleutians	1-100	W Western Aleutians	10	4	74.45	27,497	0	86,243
Western Aleutians	101-200	W Western Aleutians	36	26	65.01	26,428	8,640	44,216
Southern Bering Sea	101-200	E Southern Bering	6	2	47.14	5,558	0	19,825
Central Aleutians	101-200	SE Central Aleutians	15	6	46.11	3,466	0	10,266
Central Aleutians	1-100	N Central Aleutians	16	4	45.15	9,508	0	29,123
Eastern Aleutians	1-100	SE Eastern Aleutians	8	7	28.73	5,001	0	11,160
Eastern Aleutians	101-200	SW Eastern Aleutians	12	5	11.17	2,525	0	7,227
Eastern Aleutians	201-300	NE Eastern Aleutians	15	9	8.83	1,738	0	5,370
Central Aleutians	101-200	N Central Aleutians	9	7	6.31	672	0	1,979
Eastern Aleutians	101-200	NE Eastern Aleutians	18	7	2.29	462	0	1,390
Western Aleutians	201-300	E Western Aleutians	11	7	2.27	178	0	362
Central Aleutians	201-300	SW Central Aleutians	9	6	1.99	85	0	177
Central Aleutians	1-100	SE Central Aleutians	5	2	1.96	229	0	675
Central Aleutians	201-300	N Central Aleutians	16	10	1.72	76	0	191
Central Aleutians	1-100	SW Central Aleutians	4	2	1.61	261	0	996
Southern Bering Sea	201-300	Combined Southern Bering	4	3	1.55	87	0	260
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	1.51	288	0	3,945
Southern Bering Sea	1-100	E Southern Bering	31	6	1.36	332	0	955
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	1.29	250	0	3,427
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	1.00	16	0	48
Western Aleutians	201-300	W Western Aleutians	14	10	0.92	86	20	152
Eastern Aleutians	201-300	SW Eastern Aleutians	6	4	0.34	24	0	65
Central Aleutians	301-500	SE Central Aleutians	3	1	0.32	23	0	121
Eastern Aleutians	201-300	SE Eastern Aleutians	10	3	0.26	54	0	127
Central Aleutians	201-300	SE Central Aleutians	3	2	0.15	7	0	23
Central Aleutians	201-300	Petrel Bank	3	1	0.13	10	0	52
Eastern Aleutians	101-200	SE Eastern Aleutians	9	2	0.06	11	0	27
Southern Bering Sea	301-500	Combined Southern Bering Sea	8	1	0.02	2	0	8
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	1	0.02	6	0	19
Central Aleutians	301-500	N Central Aleutians	12	1	0.02	2	0	7

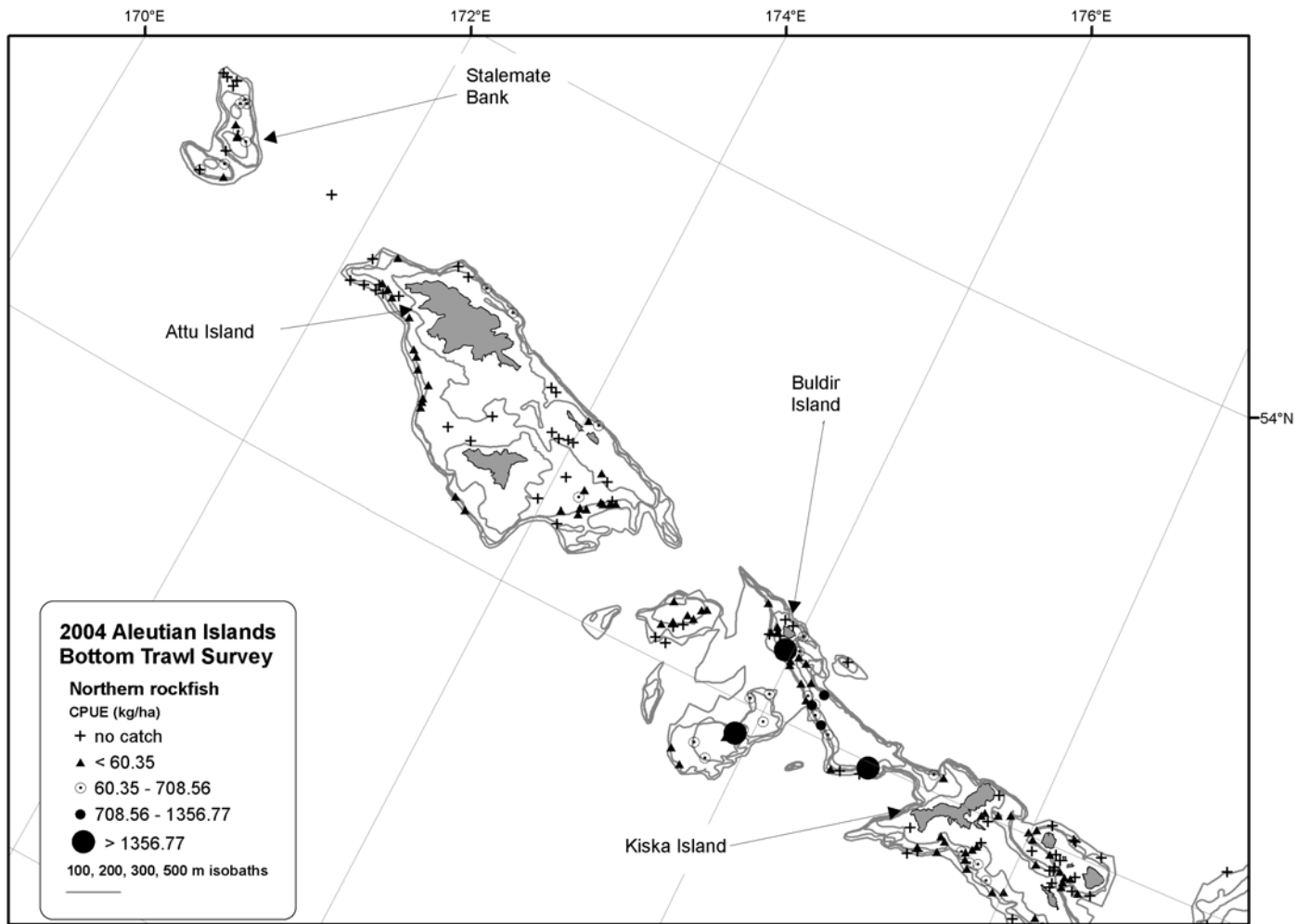


Figure 33. -- Distribution and relative abundance of northern rockfish from the 2004 Aleutian Islands bottom trawl survey.

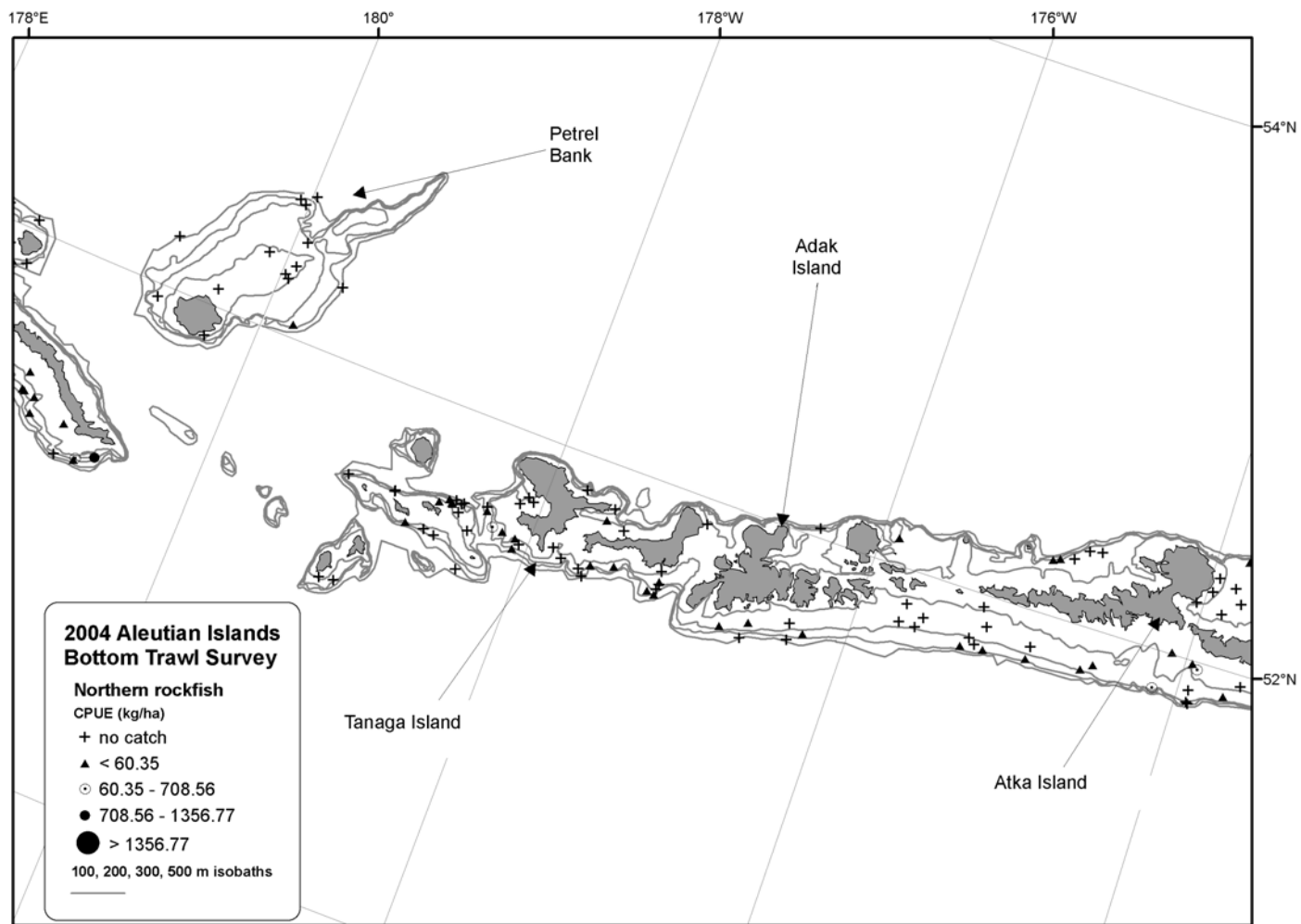


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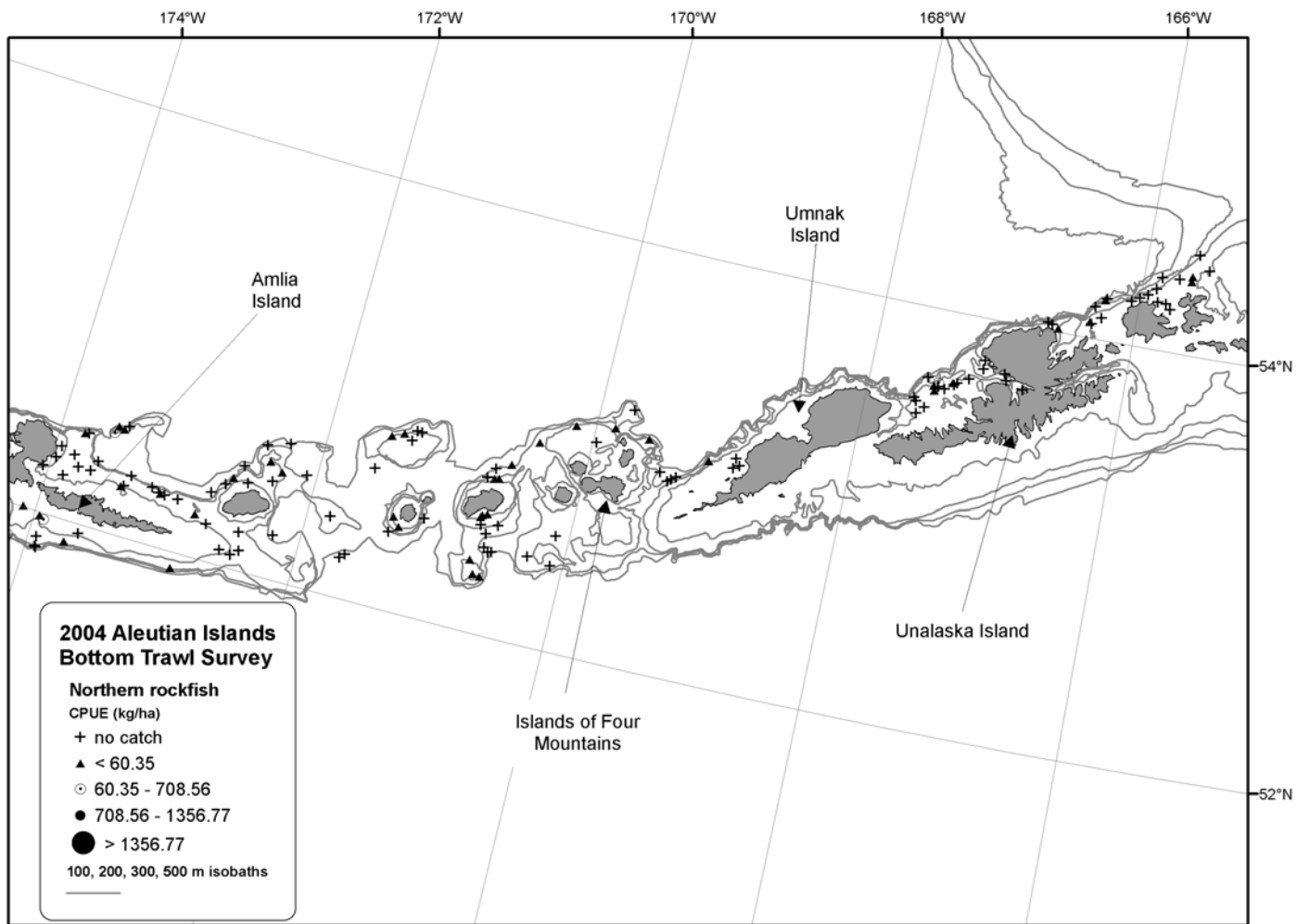


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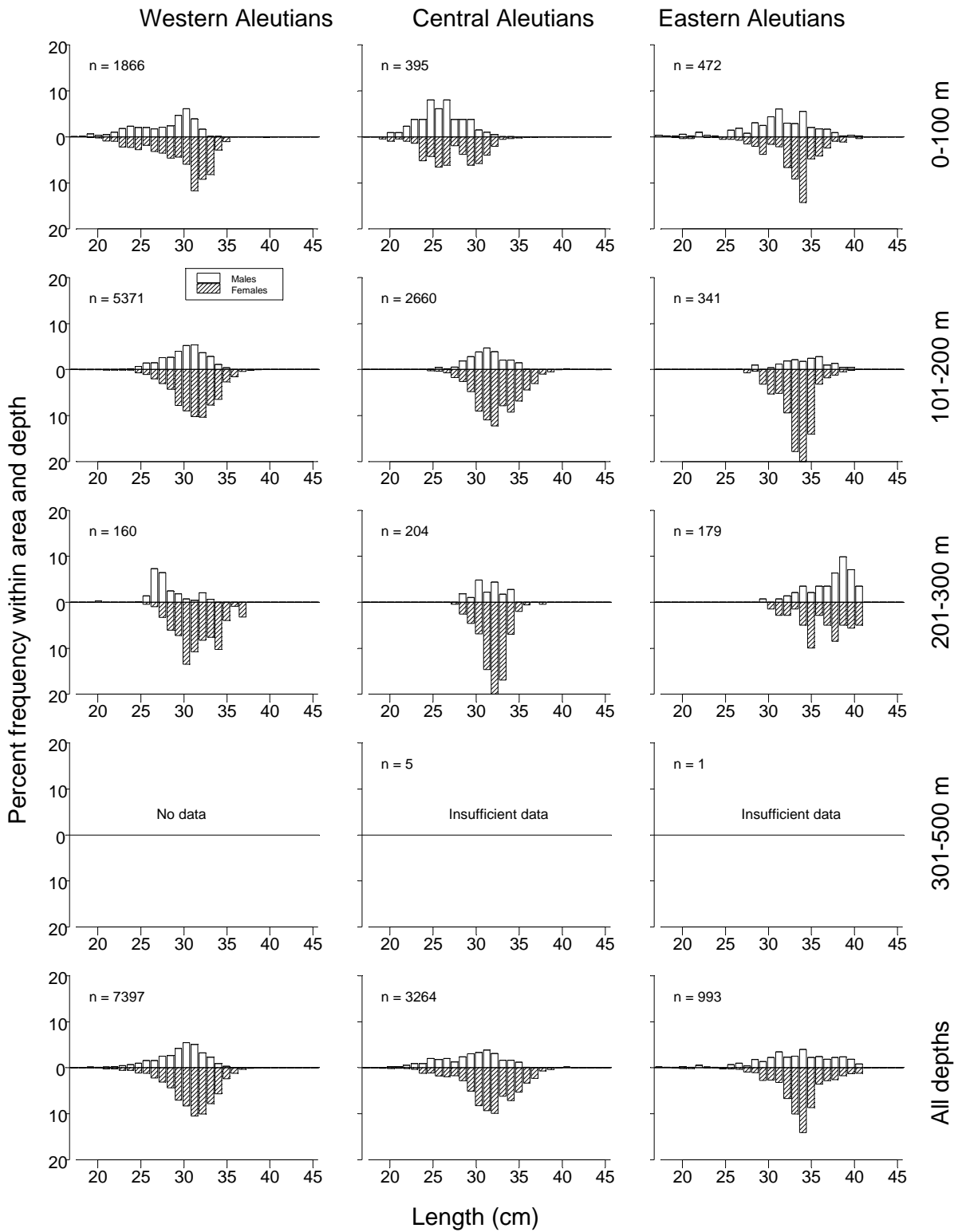


Figure 34. -- Size composition of northern rockfish from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

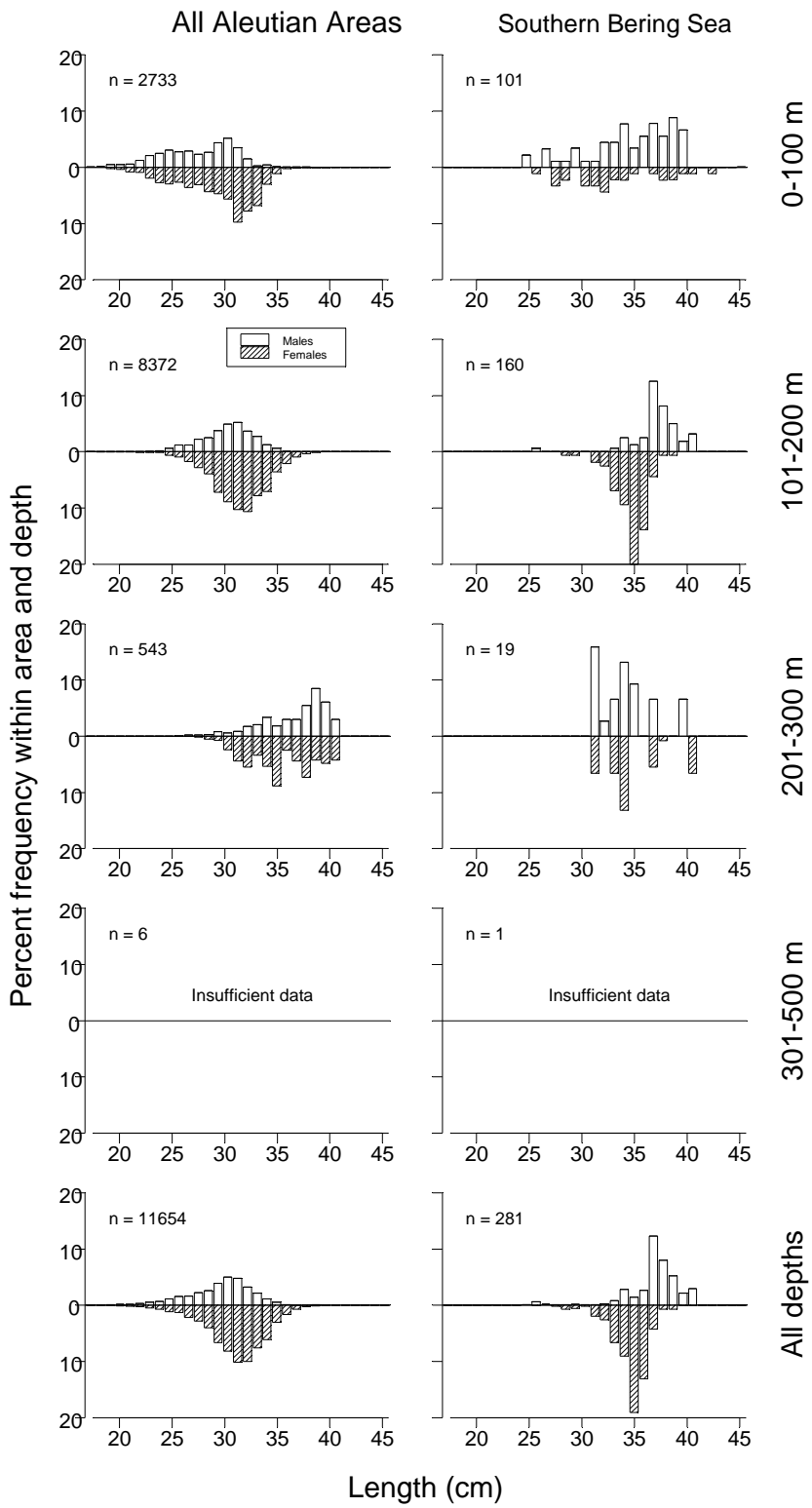


Figure 34. -- (continued).

Shortraker rockfish (*Sebastes borealis*)

Shortraker rockfish mean CPUE was higher than that of rougheye rockfish in all Aleutian Island survey areas (Table 2). The estimated biomass for this species was higher at the deepest depth intervals across all NPFMC areas (Table 38). A significant proportion, about 16%, of the total shortraker rockfish biomass estimated from the 1980 U.S.-Japan cooperative Aleutian trawl survey was found in the 501-900 m depth interval (Ronholt et al. 1986). Thus, estimates from the 2004 AFSC survey are likely to have excluded some part of the shortraker rockfish population. The highest five area-specific mean CPUEs were the 301-500 m depth interval (Table 39), with the highest CPUE estimate from the W Western Aleutians subarea. Nine of 10 trawl hauls in this subarea produced catches of shortraker rockfish. Three catches accounted for the entire biomass estimate in the Southern Bering Sea area (Table 39). Notable individual catches of shortraker rockfish occurred at Stalemate Bank, north of Amlia Island, and west of Tanaga Island (Fig. 35). Size compositions of males and females from the combined Aleutian areas were similar (Fig. 36).

Rougheye rockfish (*Sebastes aleutianus*)

The total estimated biomass of rougheye rockfish was 14,929 t across all areas (Table 40). Rougheye rockfish were generally only found in the deepest depth stratum (301-500 m) and were only found in 26 survey subareas (Table 41). The largest catches were found in the Central Aleutians Islands near Kiska Island (Fig. 37). The size composition for rougheye rockfish is shown in Figure 38.

Table 38. -- Total effort (number of trawl hauls), number of hauls with shortraker rockfish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	0	0.000	0	--	--	--	--
	201-300	25	1	0.059	10	0	31	3.176	56.0
	301-500	14	13	49.879	16,323	0	41,603	2.799	52.3
	All depths	124	14	10.752	16,333	0	39,302	2.800	52.3
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	0	0.000	0	--	--	--	--
	201-300	31	13	3.382	713	145	1,281	4.222	58.2
	301-500	21	21	20.195	8,039	4,928	11,151	2.072	47.8
	All depths	131	34	5.291	8,752	5,760	11,744	2.247	48.7
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	0	0.000	0	--	--	--	--
	201-300	33	2	0.515	253	0	711	2.267	49.8
	301-500	22	14	12.752	7,247	28	14,465	1.702	45.2
	All depths	112	16	2.976	7,499	607	14,392	1.721	45.3
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	0	0.00	0	--	--	--	--
	201-300	89	16	1.12	976	265	1,687	3.705	56.0
	301-500	57	48	24.43	31,609	7,155	56,062	2.363	49.5
	All depths	367	64	5.72	32,585	8,579	56,590	2.403	49.7
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	1	3.758	212	0	886	17.561	98.5
	301-500	8	2	4.011	418	0	1,165	1.837	45.5
	All depths	53	3	0.842	630	0	1,393	7.123	63.3

Table 39. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of shorttraker rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	301-500	W Western Aleutians	10	9	84.09	14,388	0	40,549
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	41.95	1,838	1,265	2,412
Central Aleutians	301-500	SE Central Aleutians	3	3	36.70	2,622	37	5,206
Central Aleutians	301-500	N Central Aleutians	12	12	25.86	3,206	659	5,753
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	7	16.83	4,494	0	12,017
Central Aleutians	201-300	N Central Aleutians	16	9	14.85	652	62	1,242
Western Aleutians	301-500	E Western Aleutians	4	4	12.39	1,935	0	4,908
Central Aleutians	301-500	Petrel Bank	3	3	12.13	1,501	0	4,250
Central Aleutians	301-500	SW Central Aleutians	3	3	9.01	711	0	2,089
Southern Bering Sea	301-500	Combined Southern Bering	8	2	4.01	418	0	1,165
Southern Bering Sea	201-300	Combined Southern Bering	4	1	3.76	212	0	886
Eastern Aleutians	301-500	SE Eastern Aleutians	9	5	3.55	914	0	2,770
Eastern Aleutians	201-300	SE Eastern Aleutians	10	1	1.08	223	0	728
Central Aleutians	201-300	SE Central Aleutians	3	2	0.95	45	0	149
Eastern Aleutians	201-300	SW Eastern Aleutians	6	1	0.41	30	0	106
Central Aleutians	201-300	SW Central Aleutians	9	2	0.38	16	0	44
Western Aleutians	201-300	W Western Aleutians	14	1	0.11	10	0	32

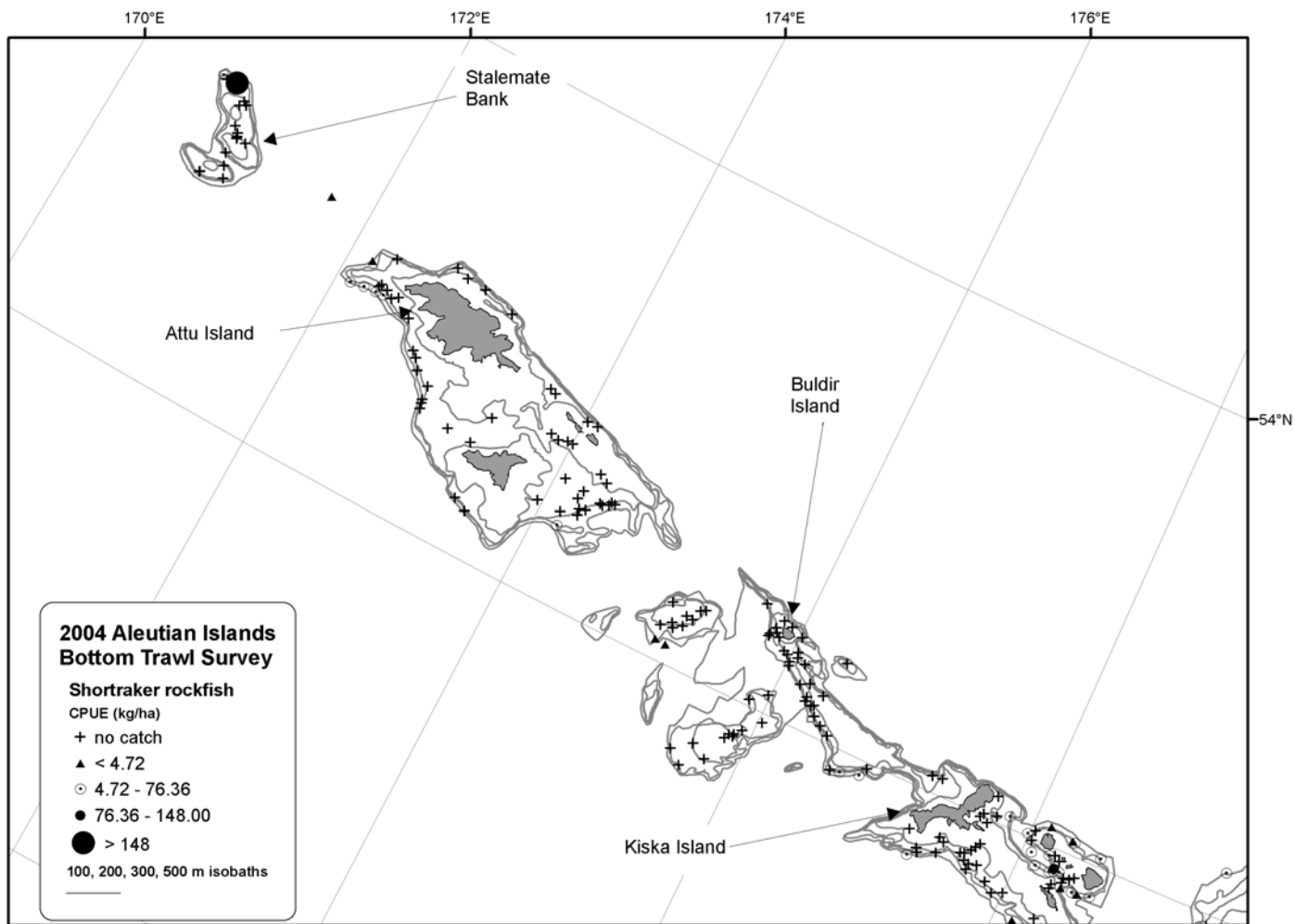


Figure 35. -- Distribution and relative abundance of shorttraker rockfish from the 2004 Aleutian Islands bottom trawl survey.

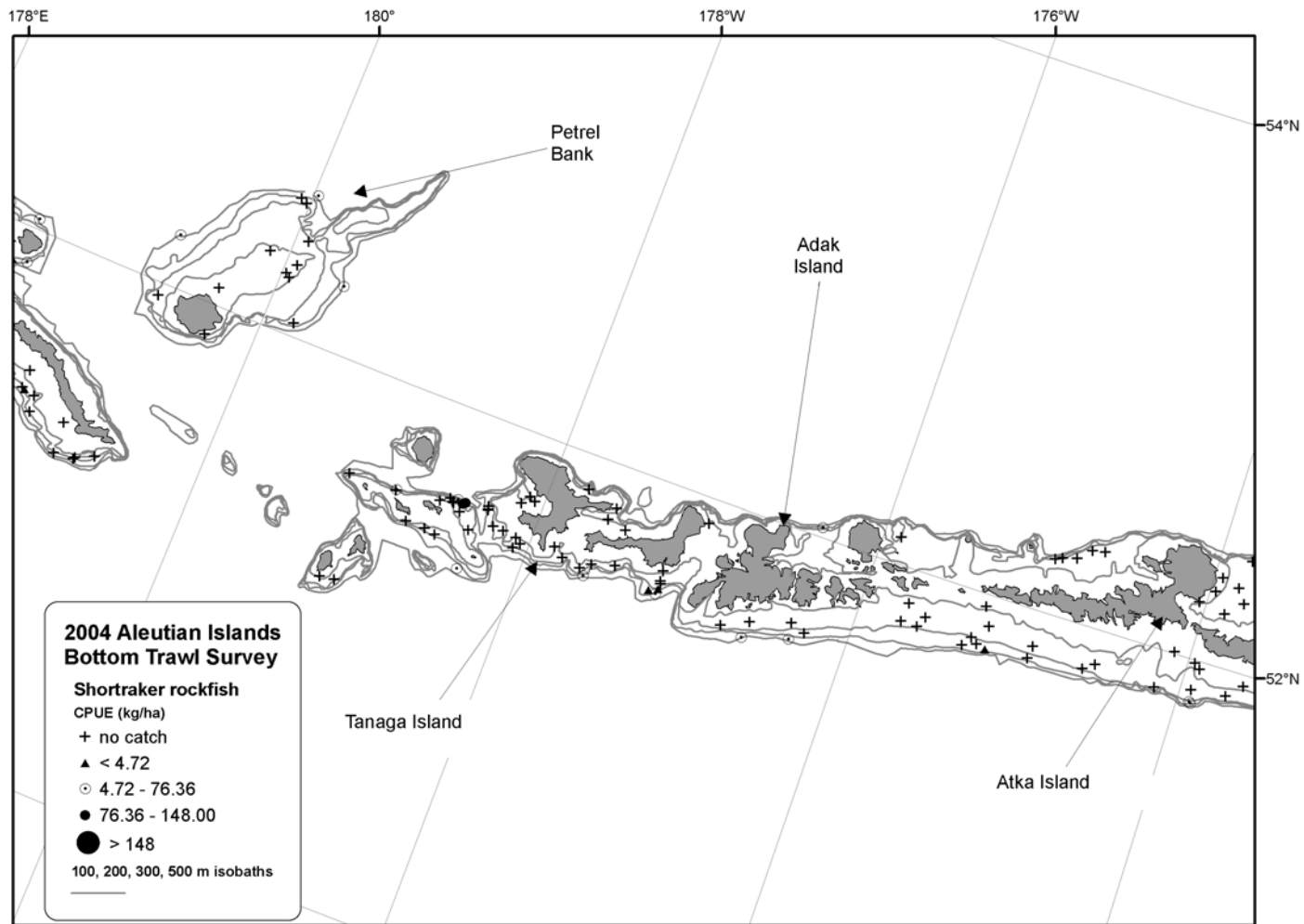


Figure 35. -- (continued).

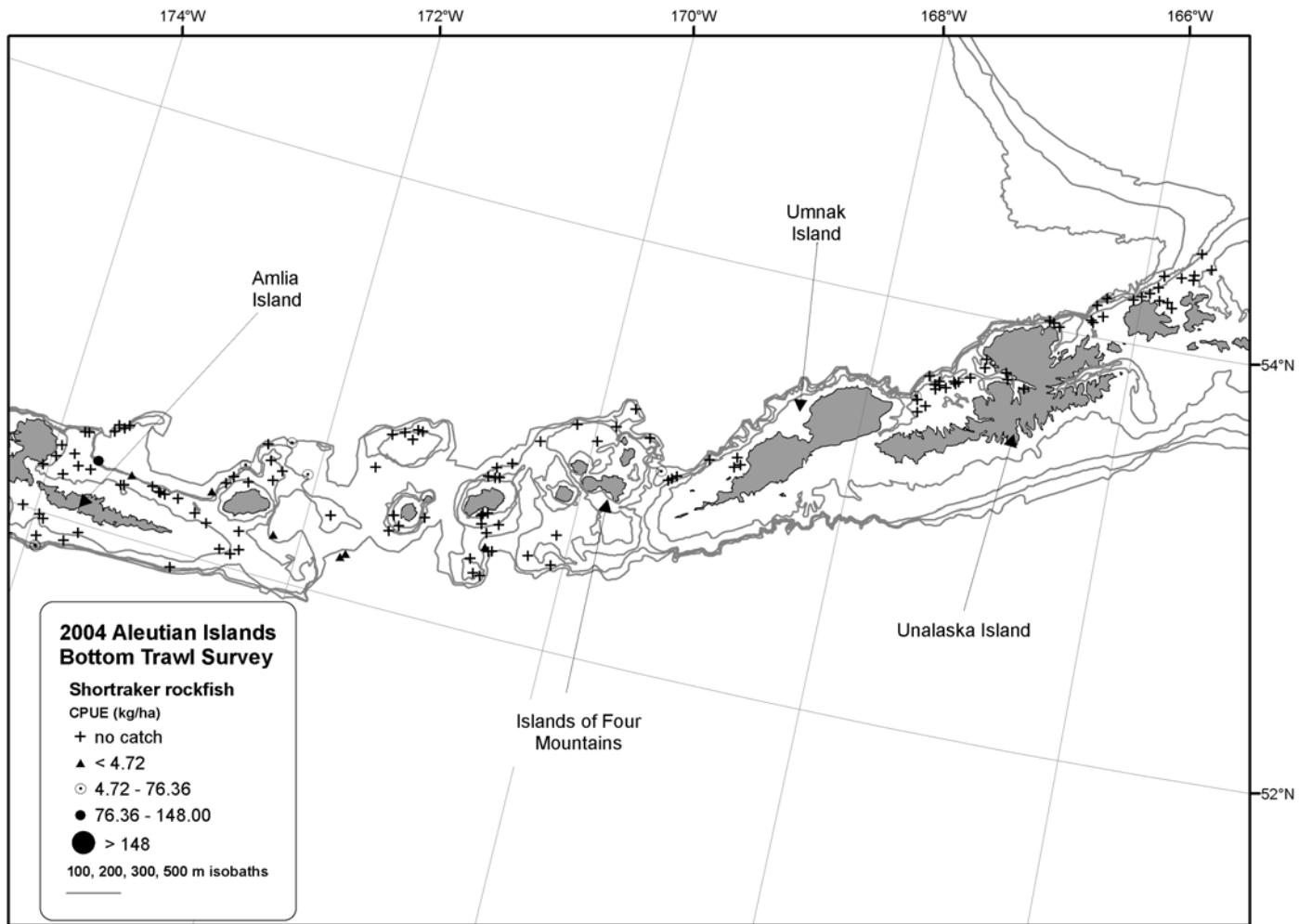


Figure 35. -- (continued).

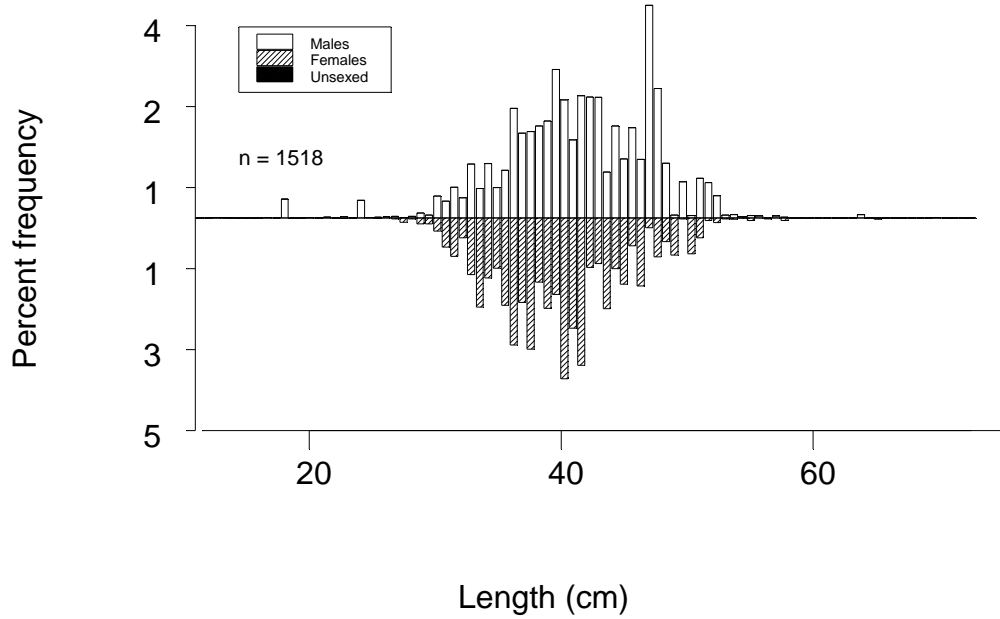


Figure 36. -- Size composition of shorttraker rockfish from the 2004 Aleutian Islands bottom trawl survey.

Table 40. -- Total effort (number of trawl hauls), number of hauls with rougheye rockfish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	5	0.115	61	0	129	1.284	39.5
	201-300	25	6	0.578	100	0	226	0.355	22.6
	301-500	14	10	3.129	1,024	0	2,387	1.662	45.9
	All depths	124	21	0.780	1,185	0	2,441	1.533	43.6
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	6	0.107	49	2	96	1.285	41.3
	201-300	31	22	9.146	1,929	0	4,611	1.720	44.8
	301-500	21	21	14.048	5,592	404	10,781	1.512	44.5
	All depths	131	49	4.576	7,570	2,020	13,121	1.563	44.6
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	2	0.069	54	0	130	2.043	48.1
	201-300	33	8	0.521	255	0	593	1.014	38.6
	301-500	22	21	9.170	5,212	217	10,206	1.322	43.1
	All depths	112	31	2.191	5,520	749	10,291	1.315	43.0
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	13	0.09	164	53	274	1.533	42.9
	201-300	89	36	2.61	2,284	0	4,917	1.581	43.1
	301-500	57	52	9.14	11,828	4,799	18,857	1.441	44.0
	All depths	367	101	2.51	14,275	6,899	21,651	1.465	43.9
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	1	0.379	70	0	241	0.481	31.0
	201-300	4	2	2.928	165	0	521	1.219	39.9
	301-500	8	7	4.010	418	33	804	1.731	46.0
	All depths	53	10	0.873	654	241	1,066	1.468	42.8

Table 41. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of rougheye rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	201-300	N Central Aleutians	16	11	39.07	1,715	0	4,507
Central Aleutians	301-500	N Central Aleutians	12	12	32.11	3,980	0	9,327
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	20.65	905	0	4,618
Eastern Aleutians	301-500	SE Eastern Aleutians	9	8	10.70	2,754	0	8,065
Central Aleutians	301-500	SE Central Aleutians	3	3	10.31	737	0	2,058
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	11	5.82	1,553	181	2,925
Western Aleutians	301-500	E Western Aleutians	4	3	4.82	753	0	2,747
Central Aleutians	301-500	Petrel Bank	3	3	4.62	571	0	2,061
Southern Bering Sea	301-500	Combined Southern Bering	8	7	4.01	418	46	791
Central Aleutians	301-500	SW Central Aleutians	3	3	3.86	304	0	1,057
Southern Bering Sea	201-300	Combined Southern Bering	4	2	2.93	165	0	521
Central Aleutians	201-300	SW Central Aleutians	9	7	1.77	75	8	143
Western Aleutians	301-500	W Western Aleutians	10	7	1.58	271	106	436
Western Aleutians	201-300	E Western Aleutians	11	6	1.27	100	0	236
Central Aleutians	201-300	SE Central Aleutians	3	3	1.25	60	0	216
Central Aleutians	201-300	Petrel Bank	3	1	1.03	79	0	417
Eastern Aleutians	201-300	SE Eastern Aleutians	10	3	0.93	191	0	554
Southern Bering Sea	101-200	E Southern Bering	6	1	0.59	70	0	250
Western Aleutians	101-200	E Western Aleutians	26	5	0.49	61	0	131
Central Aleutians	101-200	SW Central Aleutians	22	4	0.29	30	0	68
Eastern Aleutians	201-300	SW Eastern Aleutians	6	2	0.25	18	0	53
Eastern Aleutians	201-300	NE Eastern Aleutians	15	3	0.24	47	0	129
Eastern Aleutians	101-200	SE Eastern Aleutians	9	1	0.15	28	0	92
Eastern Aleutians	101-200	NE Eastern Aleutians	18	1	0.13	26	0	80
Central Aleutians	101-200	N Central Aleutians	9	1	0.12	13	0	43
Central Aleutians	101-200	SE Central Aleutians	15	1	0.08	6	0	19

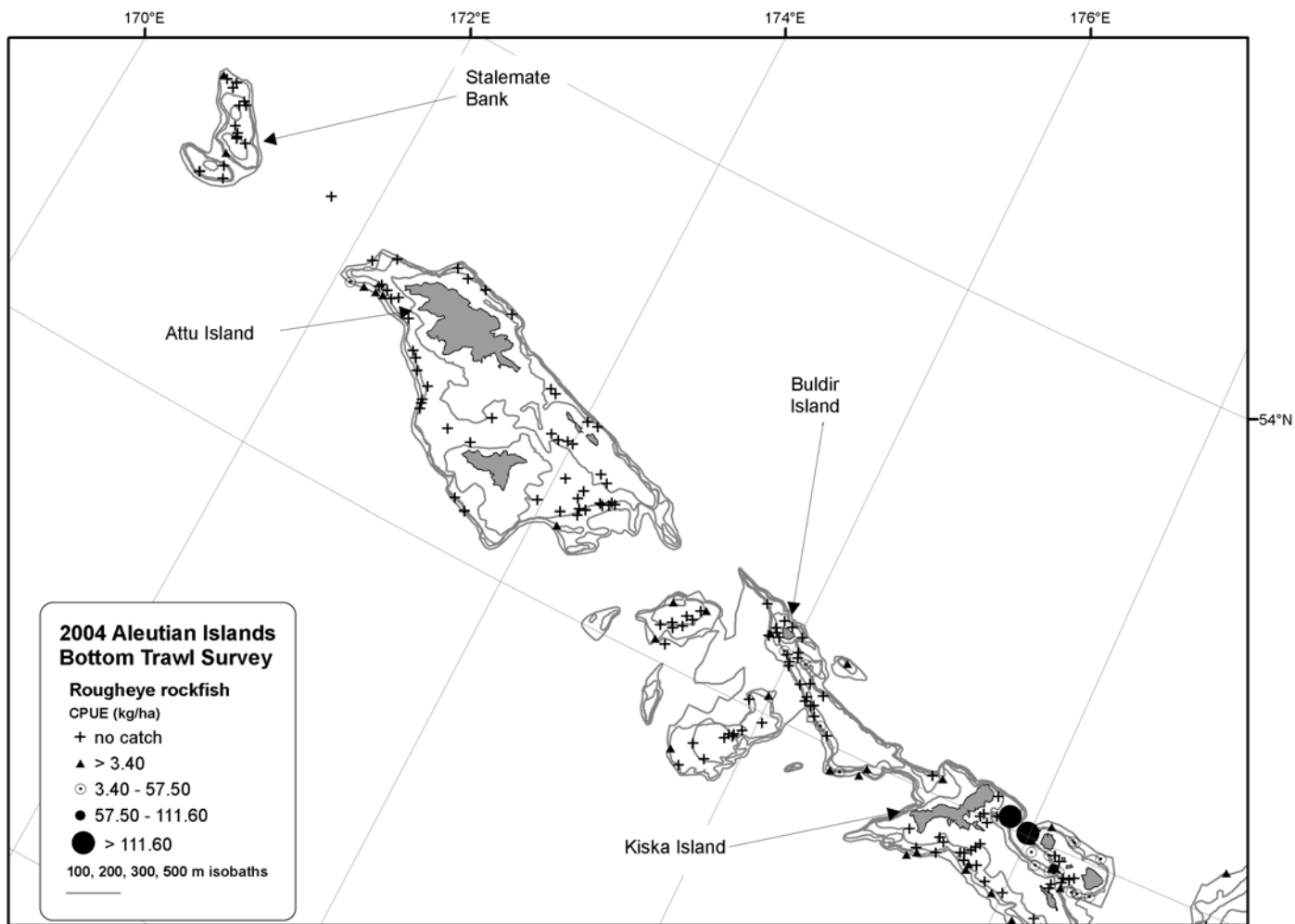


Figure 37. -- Distribution and relative abundance of rougheye rockfish from the 2004 Aleutian Islands bottom trawl survey.

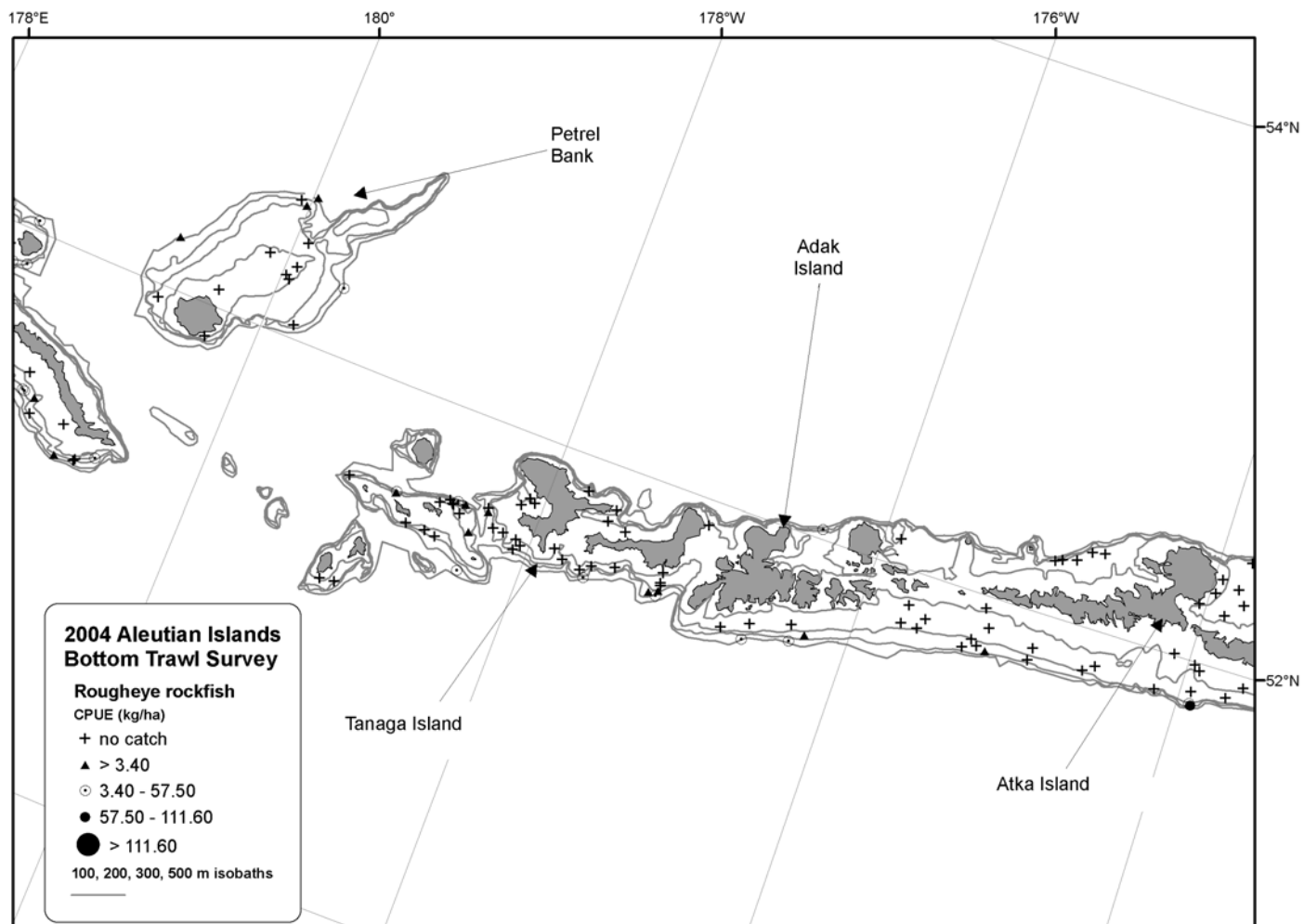


Figure 37. -- (continued).

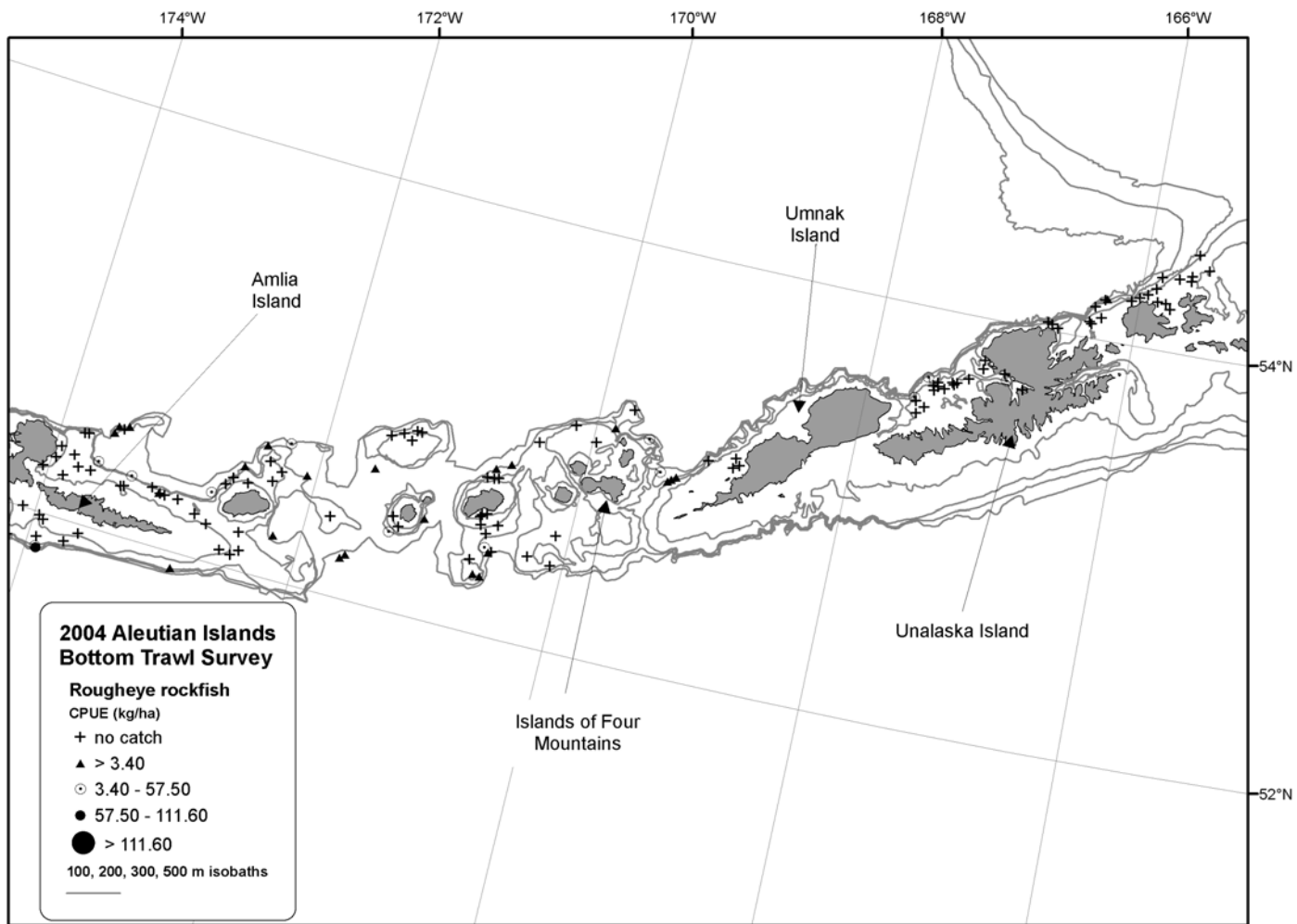


Figure 37. -- (continued).

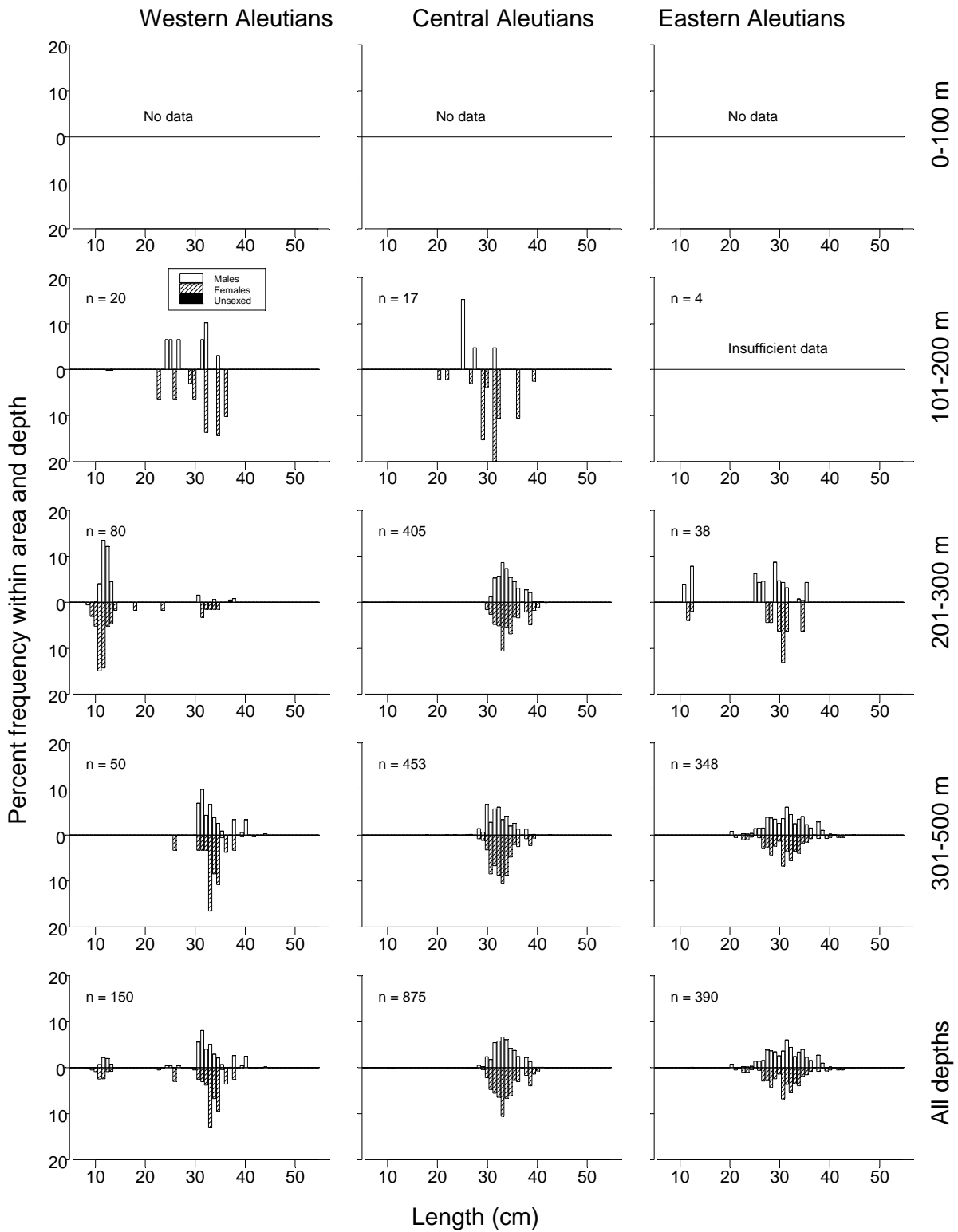


Figure 38. -- Size composition of roughey rockfish from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

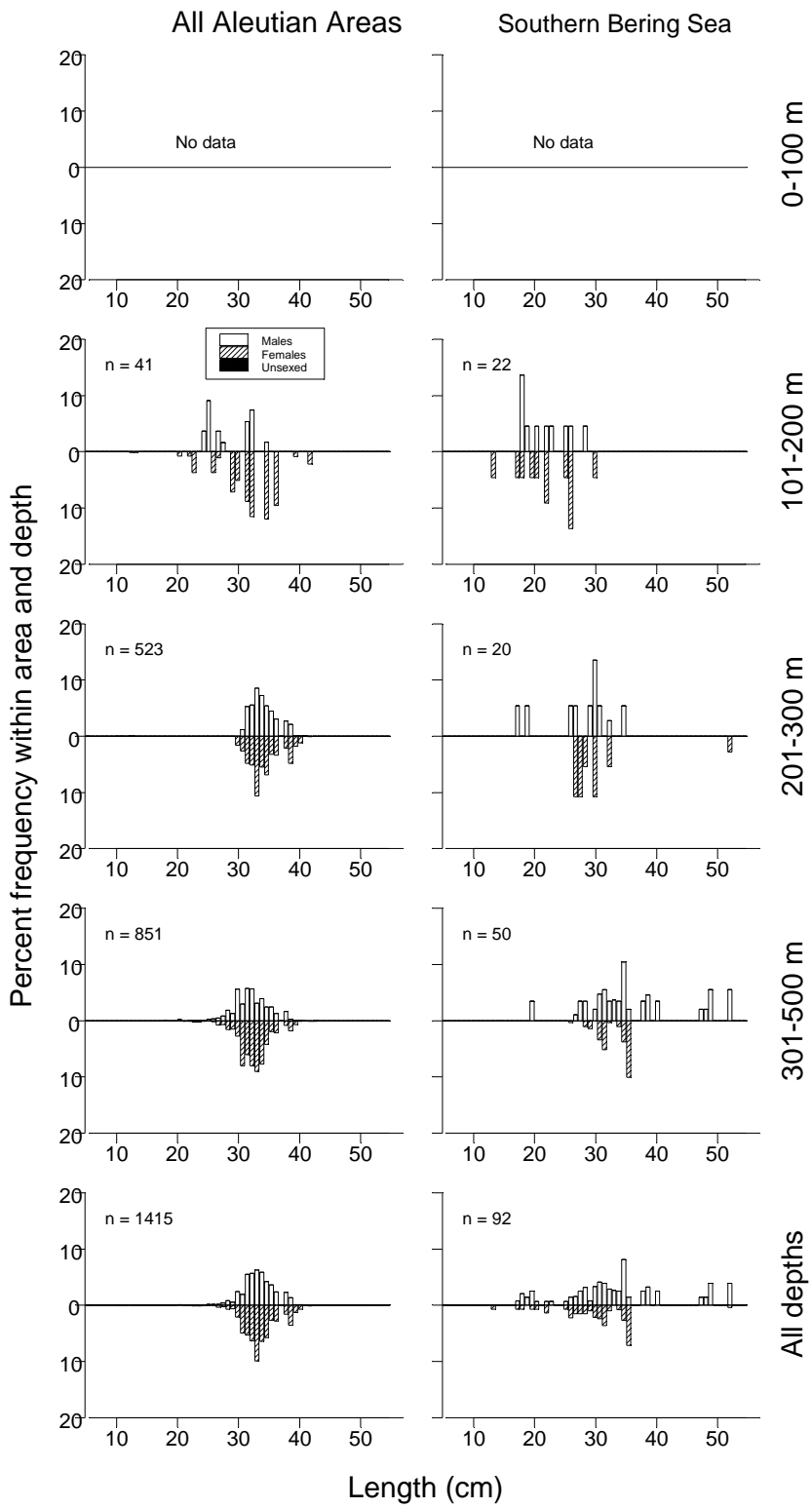


Figure 38. -- (continued).

Shortspine thornyhead (*Sebastolobus alascanus*)

Thornyheads were most abundant in the Western and Central Aleutians areas at depths greater than 200 m (Table 42) and catch rates were highest in the 301- 500 m depth interval. They were captured in all trawl hauls in the 301-500 m depth interval in the Western Aleutians area, and the two subareas in this depth interval in the Western Aleutians (W and E Western Aleutians) exhibited the highest CPUEs of all subareas in the survey (Table 43). Notable individual catches were made on the small plateau north of the Islands of Four Mountains, on Stalemate Bank, south of Kiska Island and SW of Attu Island (Fig. 39). Biomass estimates from this survey are very likely underestimates of thornyhead abundance; Ronholt et al. (1986) reported that 68% of the total Aleutian thornyhead biomass was found in the 501-900 m depth interval, a depth zone unsampled by the present survey. Male and female size compositions share similar ranges in fork lengths, with females comprising the majority of the catch (Fig. 40).

Dusky rockfish (*Sebastes variabilis*)

Dusky rockfish were distributed in the three shallowest depth strata (< 300 m) at very low abundances throughout most of the Aleutian Islands bottom trawl survey area. Dusky rockfish were most abundant at 101-200 m in the Southern Bering Sea, although this was based on only two hauls with catch (Table 44). Two bottom trawl hauls produced 2,089 t of dusky rockfish in the E Southern Bering Sea subarea in the 101-200 m depth interval (Table 45). Both female and male dusky rockfish had similar length frequency distributions (Fig. 41).

Dark rockfish (*Sebastes ciliatus*)

Similar to dusky rockfishes, dark rockfish were found in very low abundance throughout the survey area. Dark rockfish only occurred in the shallowest tows, all except two occurring in the 1-100 m strata (Table 46). The total biomass was low and 96% of the biomass was found in the Western Aleutians area. The species only occurred in five Aleutian Island subareas and was most commonly captured in the E Western Aleutians subarea near Attu Island (Table 47). Length-frequencies for dark rockfish are shown in Figure 42.

Table 42. -- Total effort (number of trawl hauls), number of hauls with shortspine thornyhead, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	6	0.318	169	0	347	0.850	36.4
	201-300	25	12	5.102	879	324	1,434	0.529	32.9
	301-500	14	14	33.471	10,953	4,226	17,681	0.501	30.7
	All depths	124	32	7.901	12,002	5,812	18,191	0.508	30.9
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	2	0.005	2	0	5	0.367	35.0
	201-300	31	9	5.073	1,070	0	2,318	0.585	32.6
	301-500	21	19	8.245	3,282	1,651	4,913	0.487	31.6
	All depths	131	30	2.632	4,354	2,390	6,318	0.511	31.8
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	0	0.000	0	--	--	--	--
	201-300	33	3	0.263	129	0	345	0.821	37.1
	301-500	22	6	1.496	850	0	1,744	0.815	36.2
	All depths	112	9	0.388	979	101	1,856	0.816	36.3
All Aleutian Areas	1-100	69	0	0.00	0	--	--	--	--
	101-200	152	8	0.10	172	0	347	0.843	36.4
	201-300	89	24	2.38	2,078	734	3,422	0.576	33.0
	301-500	57	39	11.66	15,085	8,596	21,574	0.515	31.2
	All depths	367	71	3.04	17,335	10,825	23,844	0.526	31.5
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	1	0.300	17	0	71	0.562	34.8
	301-500	8	5	8.901	929	0	2,170	0.439	30.3
	All depths	53	6	1.264	945	0	2,000	0.441	30.4

Table 43. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of shortspine thornyhead by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	301-500	W Western Aleutians	10	10	45.75	7,828	861	14,796
Western Aleutians	301-500	E Western Aleutians	4	4	20.02	3,125	1,671	4,579
Central Aleutians	201-300	SW Central Aleutians	9	6	12.16	518	0	1,194
Central Aleutians	301-500	SW Central Aleutians	3	3	11.80	932	0	2,853
Central Aleutians	301-500	Petrel Bank	3	3	10.99	1,360	0	3,938
Southern Bering Sea	301-500	Combined Southern Bering	8	5	8.90	929	0	2,170
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	8.85	388	0	3,972
Western Aleutians	201-300	W Western Aleutians	14	8	8.32	782	219	1,345
Central Aleutians	201-300	Petrel Bank	3	3	7.20	552	0	2,860
Central Aleutians	301-500	SE Central Aleutians	3	3	5.13	366	29	703
Central Aleutians	301-500	N Central Aleutians	12	10	5.04	625	148	1,102
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	3	1.37	366	0	1,057
Western Aleutians	201-300	E Western Aleutians	11	4	1.25	98	0	243
Eastern Aleutians	201-300	SE Eastern Aleutians	10	1	0.51	105	0	342
Western Aleutians	101-200	W Western Aleutians	36	5	0.39	157	0	337
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.37	96	0	318
Eastern Aleutians	201-300	SW Eastern Aleutians	6	2	0.33	24	0	63
Southern Bering Sea	201-300	Combined Southern Bering	4	1	0.30	17	0	71
Western Aleutians	101-200	E Western Aleutians	26	1	0.10	13	0	39
Central Aleutians	101-200	SW Central Aleutians	22	2	0.02	2	0	6

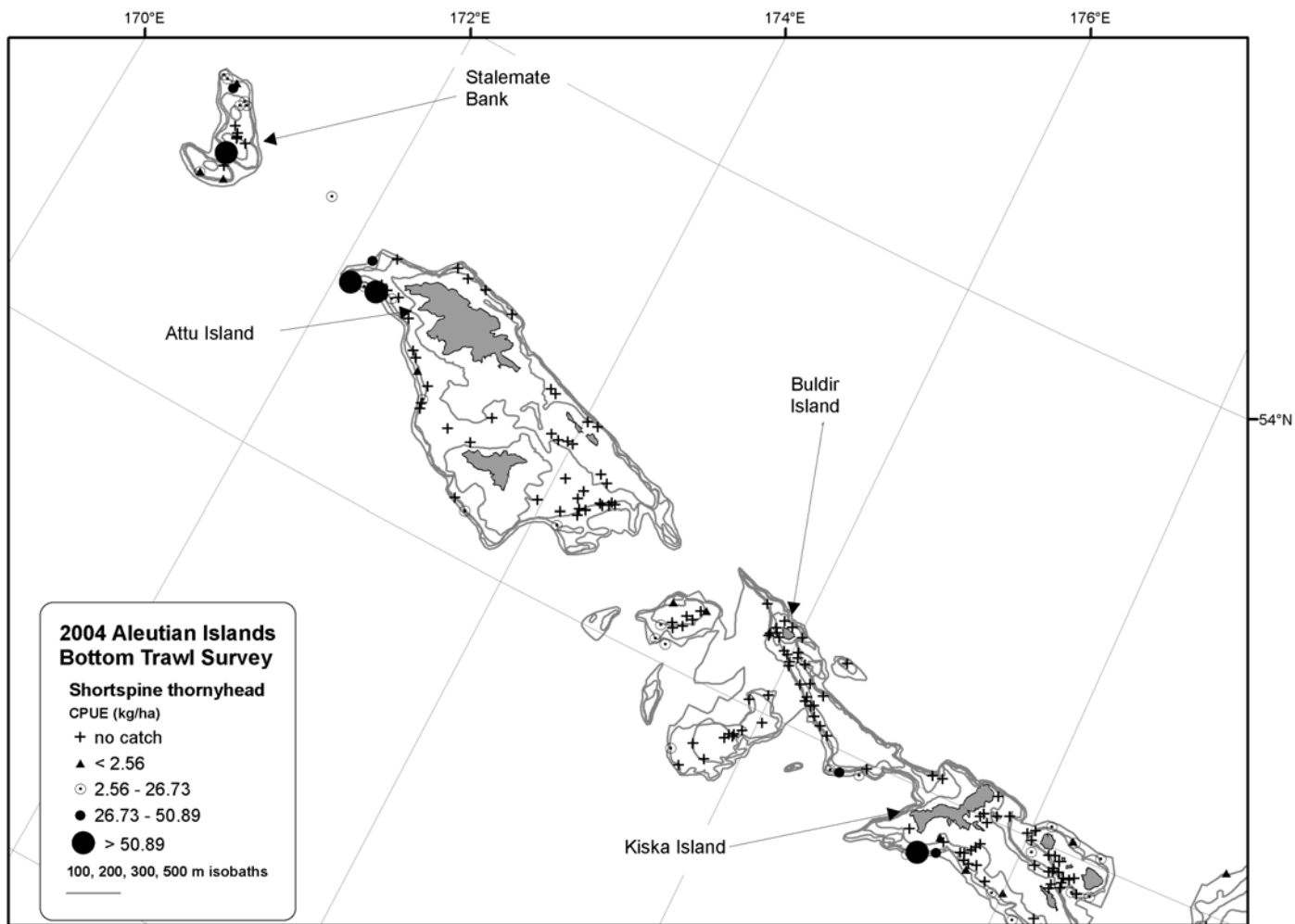


Figure 39. -- Distribution and relative abundance of shortspine thornyhead from the 2004 Aleutian Islands bottom trawl survey.

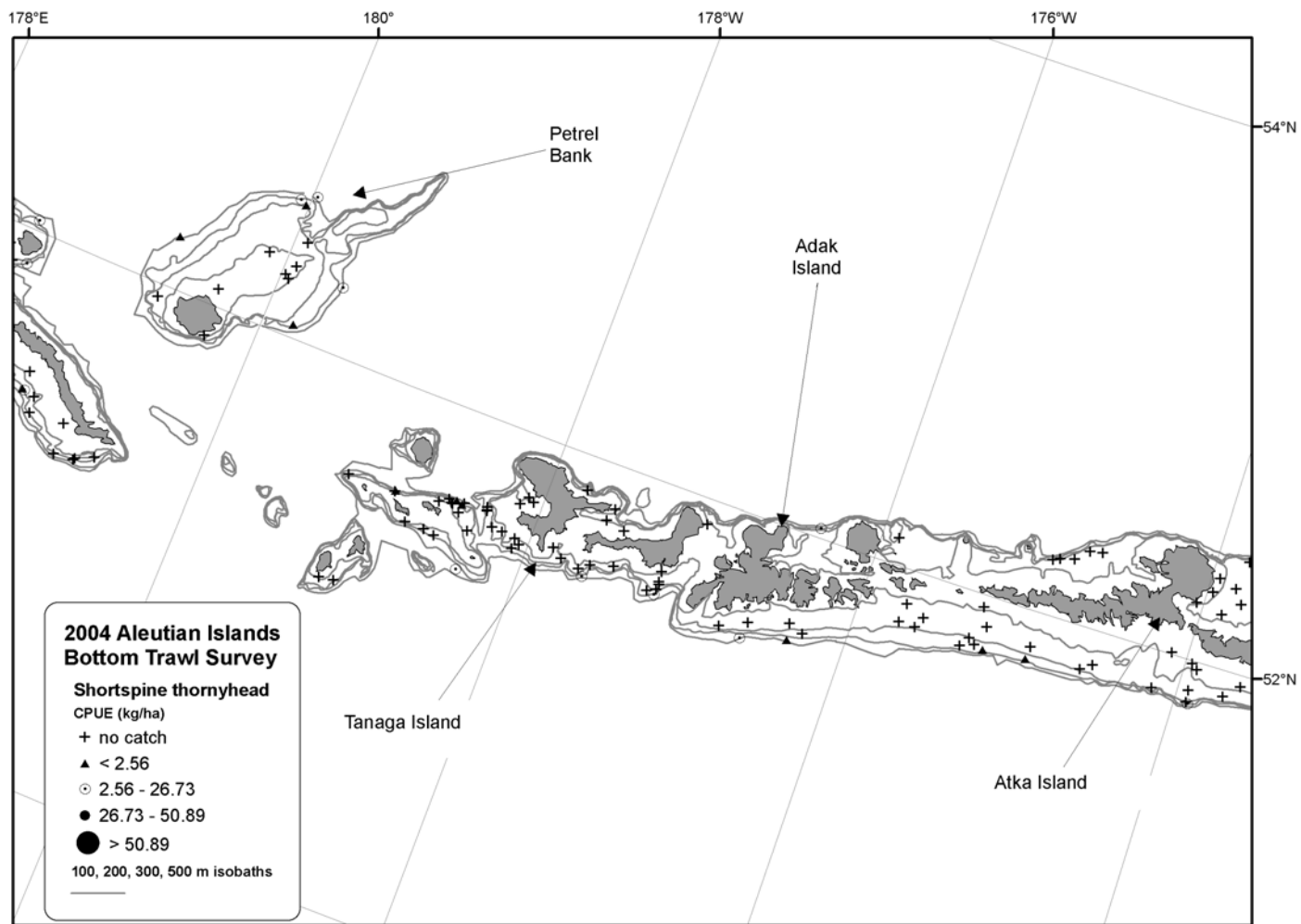


Figure 39. -- (continued).

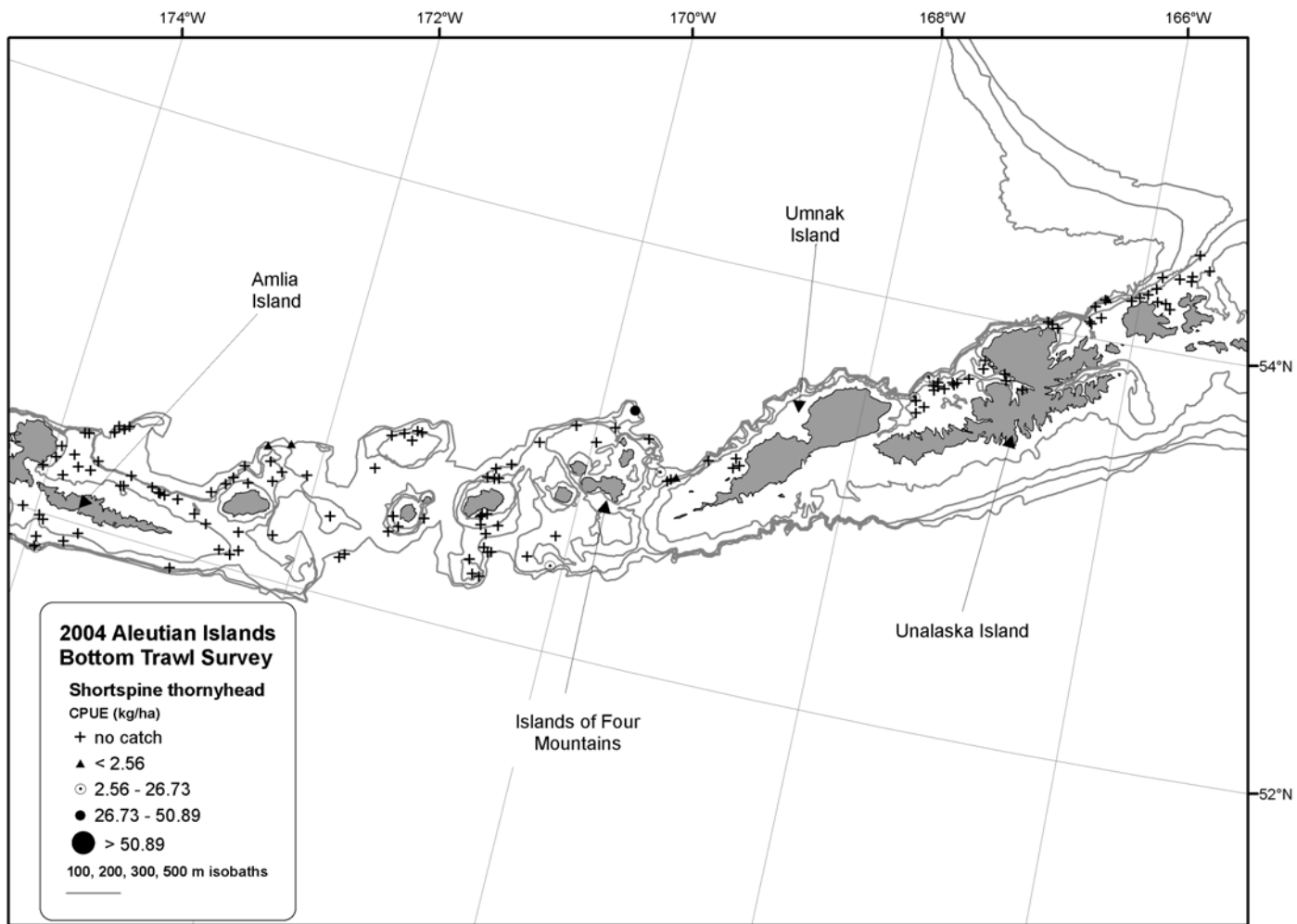


Figure 39. -- (continued).

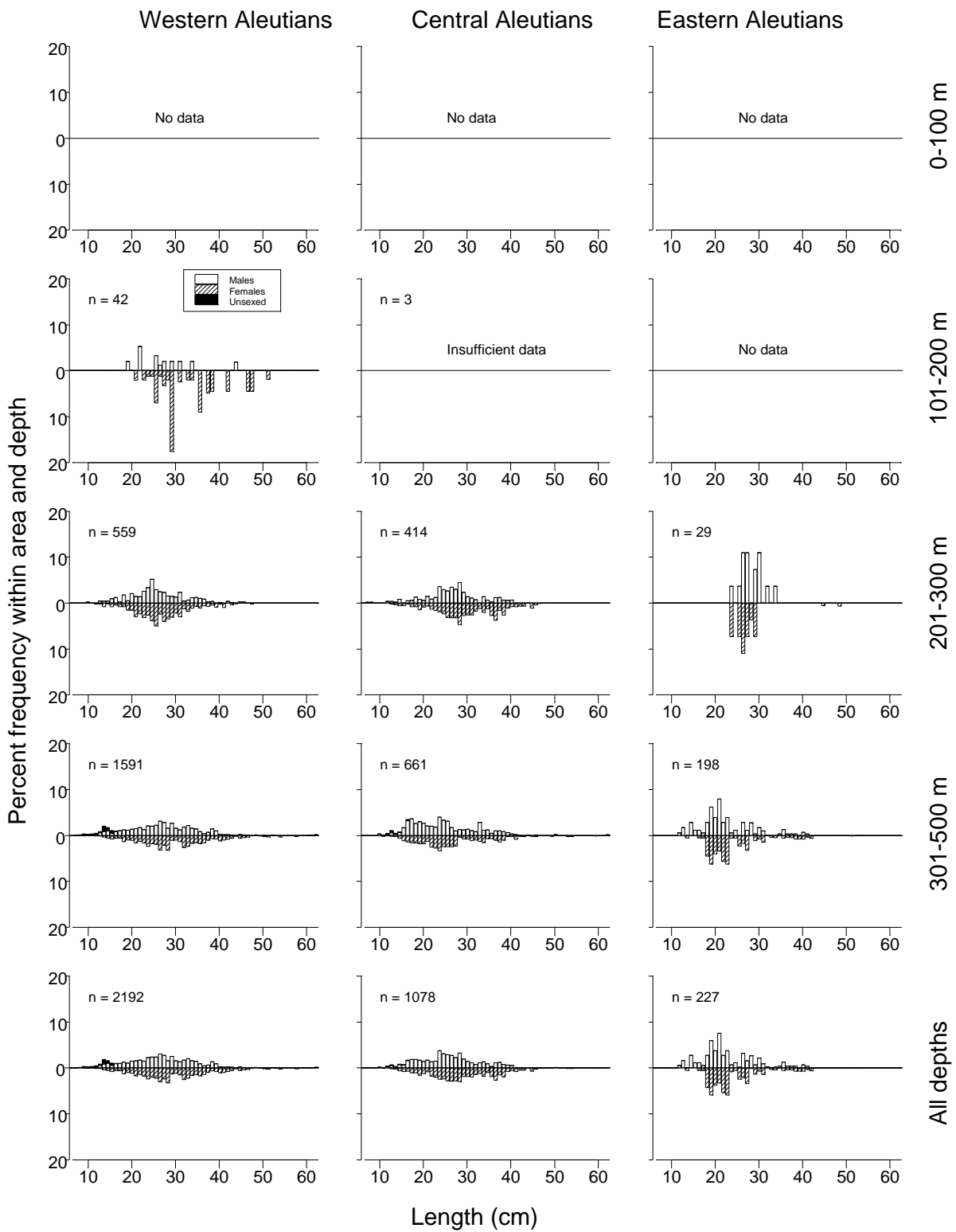


Figure 40. -- Size composition of shortspine thornyhead from the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

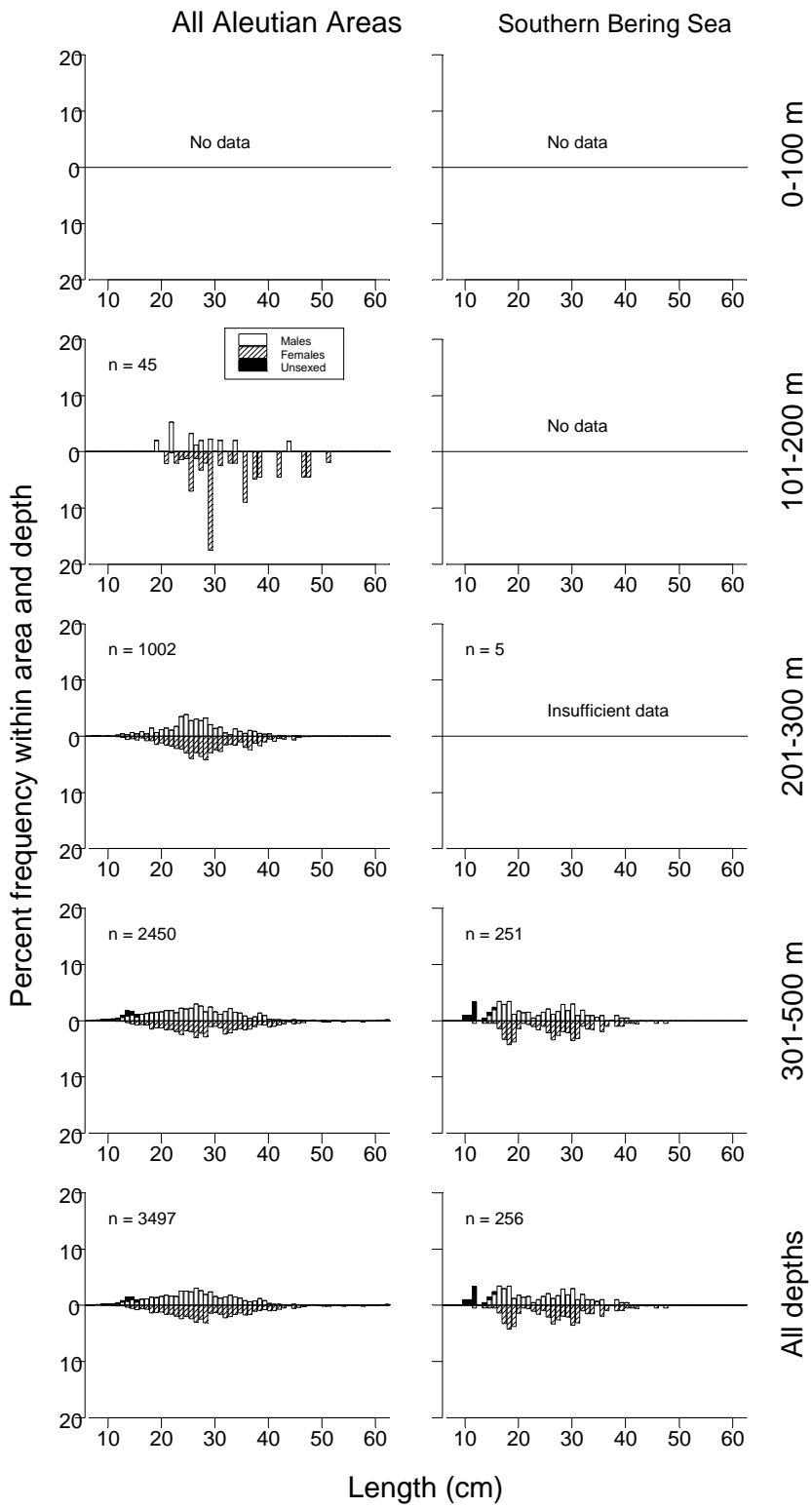


Figure 40. -- (continued).

Table 44. -- Total effort (number of trawl hauls), number of hauls with dusky rockfish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	1	0.006	3	0	9	0.743	0.0
	101-200	62	6	0.461	245	0	669	1.430	0.0
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	7	0.163	248	0	668	1.422	0.0
Central Aleutians	1-100	31	2	0.042	25	0	60	0.940	0.0
	101-200	48	6	0.752	346	0	831	1.114	0.0
	201-300	31	4	0.057	12	0	25	1.251	0.0
	301-500	21	1	0.016	6	0	19	1.457	0.0
	All depths	131	13	0.235	389	0	867	1.113	0.0
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	2	0.034	26	0	64	1.347	0.0
	201-300	33	4	0.090	44	0	88	1.618	0.0
	301-500	22	1	0.039	22	0	69	1.381	0.0
	All depths	112	7	0.037	93	21	164	1.485	0.0
All Aleutian Areas	1-100	69	3	0.02	28	0	63	0.918	0.0
	101-200	152	14	0.35	617	0	1,253	1.249	0.0
	201-300	89	8	0.06	56	12	101	1.540	0.0
	301-500	57	2	0.02	29	0	75	1.398	0.0
	All depths	367	27	0.13	730	94	1,366	1.265	0.0
Southern Bering Sea	1-100	33	4	0.270	109	0	287	0.985	0.0
	101-200	8	2	6.761	1,250	0	4,155	1.277	0.0
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	0	0.000	0	--	--	--	--
	All depths	53	6	1.816	1,359	0	3,830	1.254	0.0

Table 45. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of dusky rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Southern Bering Sea	101-200	E Southern Bering	6	2	10.60	1,250	0	4,409
Central Aleutians	101-200	SW Central Aleutians	22	4	2.98	314	0	812
Western Aleutians	101-200	W Western Aleutians	36	1	0.52	211	0	642
Southern Bering Sea	1-100	E Southern Bering	31	4	0.45	109	0	288
Central Aleutians	101-200	SE Central Aleutians	15	2	0.44	33	0	81
Western Aleutians	101-200	E Western Aleutians	26	5	0.27	34	0	80
Central Aleutians	201-300	SW Central Aleutians	9	3	0.24	10	0	24
Eastern Aleutians	201-300	SW Eastern Aleutians	6	1	0.19	14	0	49
Eastern Aleutians	201-300	NE Eastern Aleutians	15	3	0.16	31	0	67
Central Aleutians	1-100	SE Central Aleutians	5	1	0.11	13	0	49
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.09	22	0	74
Eastern Aleutians	101-200	SE Eastern Aleutians	9	1	0.08	15	0	48
Central Aleutians	1-100	SW Central Aleutians	4	1	0.07	11	0	48
Eastern Aleutians	101-200	NE Eastern Aleutians	18	1	0.06	12	0	36
Central Aleutians	301-500	N Central Aleutians	12	1	0.05	6	0	20
Central Aleutians	201-300	N Central Aleutians	16	1	0.04	2	0	5
Western Aleutians	1-100	E Western Aleutians	13	1	0.03	3	0	10

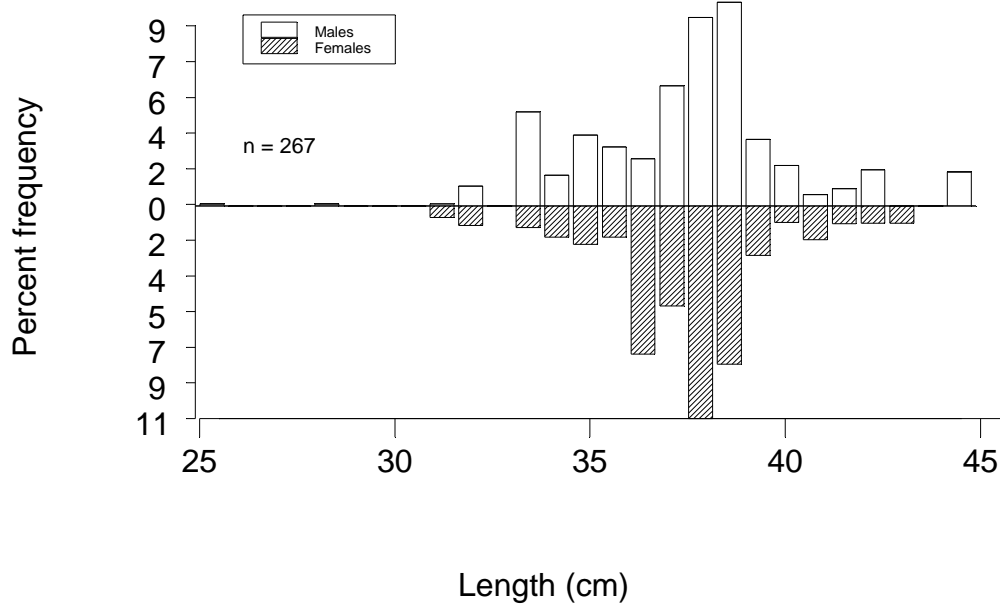


Figure 41. -- Size composition of dusky rockfish from the 2004 Aleutian Islands bottom trawl survey.

Table 46. -- Total effort (number of trawl hauls), number of hauls with dark rockfish, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	7	0.632	308	0	696	0.853	0.0
	101-200	62	1	0.004	2	0	6	0.789	0.0
	201-300	25	0	0.000	0	--	--	--	--
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	8	0.204	310	0	680	0.852	0.0
Central Aleutians	1-100	31	0	0.000	0	--	--	--	--
	101-200	48	1	0.005	2	0	7	1.158	0.0
	201-300	31	0	0.000	0	--	--	--	--
	301-500	21	0	0.000	0	--	--	--	--
	All depths	131	1	0.001	2	0	7	1.158	0.0
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--	--
	101-200	42	0	0.000	0	--	--	--	--
	201-300	33	0	0.000	0	--	--	--	--
	301-500	22	0	0.000	0	--	--	--	--
	All depths	112	0	0.000	0	--	--	--	--
All Aleutian Areas	1-100	69	7	0.18	308	0	681	0.853	0.0
	101-200	152	2	0.00	4	0	10	0.991	0.0
	201-300	89	0	0.00	0	--	--	--	--
	301-500	57	0	0.00	0	--	--	--	--
	All depths	367	9	0.05	312	0	680	0.855	0.0
Southern Bering Sea	1-100	33	1	0.020	8	0	24	1.138	0.0
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	0	0.000	0	--	--	--	--
	All depths	53	1	0.011	8	0	24	1.138	0.0

Table 47. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of dark rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	1-100	E Western Aleutians	13	6	2.46	291	0	697
Western Aleutians	1-100	W Western Aleutians	10	1	0.05	17	0	55
Southern Bering Sea	1-100	E Southern Bering	31	1	0.03	8	0	24
Central Aleutians	101-200	SW Central Aleutians	22	1	0.02	2	0	7
Western Aleutians	101-200	E Western Aleutians	26	1	0.02	2	0	6

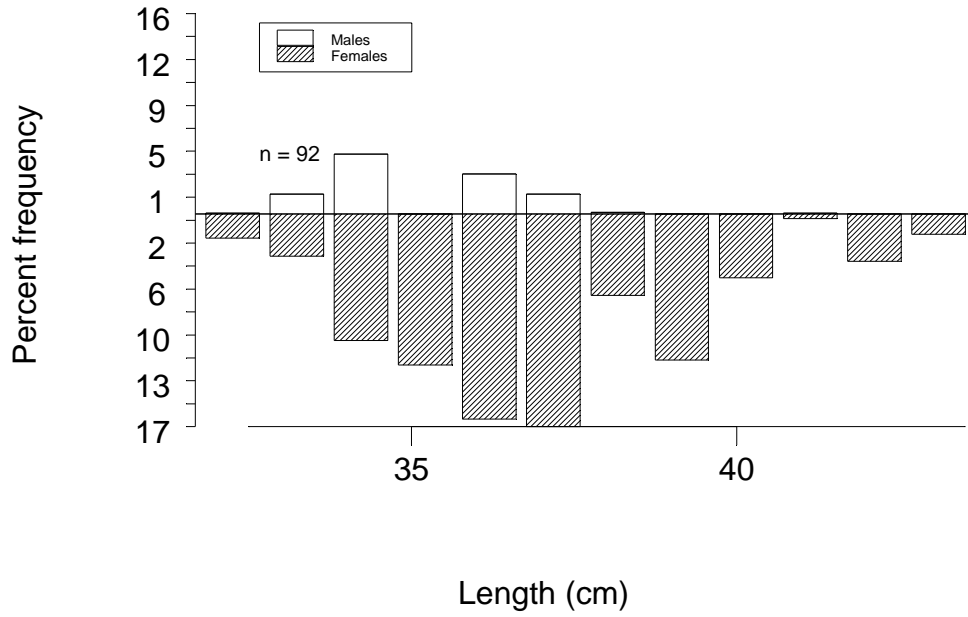


Figure 42. -- Size composition of dark rockfish from the 2004 Aleutian Islands bottom trawl survey.

Skates

Whiteblotched skate (*Bathyraja maculata*)

Whiteblotched skate was the most abundant species of skate captured in Aleutian NPFMC areas and the second most abundant skate in the Southern Bering Sea area (Table 2). The total biomass of whiteblotched skate was over 26,000 t with the majority occurring in the Aleutian Islands region (Table 48). The highest subarea-specific mean CPUEs occurred in the W Western Aleutians subarea in 101-200 m and 1-100 m depth intervals (Table 49). High catches were observed east of Adia Island and on Stalemate Bank (Fig. 43). A wide size range of both males and females were captured and their respective length frequencies were similar (Fig. 44).

Alaska skate (*Bathyraja parmifera*)

Alaska skate was the second most abundant species of skate captured during in the Aleutian Islands, but was less abundant than the Alaska skate in the the Southern Bering Sea (Table 2). The estimated biomass of 12,687 t, was highest in the 1-100 m and 101-200 m depth intervals and was fairly equally distributed across these depths (Table 50). Mean sizes decreased from west to east. The smallest mean sizes were found in the shallower depths. The highest three subarea-specific mean CPUEs and estimated biomasses were found in the Western and Central Aleutians area (Table 51). Notable catches were observed at Stalemate Bank, Buldir Island and west of Tanaga Island (Fig. 45). Figure 46 shows the length-frequencies of Alaska skate.

Aleutian skate (*Bathyraja aleutica*)

Aleutian skate was relatively evenly distributed across the Aleutian areas with the highest overall CPUE in the Central Aleutians (Table 52). The estimated biomass was greater than 11,000 t and was highest at mid-depths (101-200 m and 201-300 m depth intervals). The top two subareas in terms of mean CPUE were the Petrel Bank and the E Western Aleutians subareas at depth intervals of 101-200 and 201-300 m depth intervals, respectively (Table 53). Notable catches were found at Stalemate Bank, Buldir Island, Petrel Bank and north of Unalaska Island (Fig. 47). Figure 48 shows the length-frequency for Aleutian skate. This was the most abundant skate species in the Southern Bering Sea.

Table 48. -- Total effort (number of trawl hauls), number of hauls with whiteblotched skate, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	1	11.369	5,544	0	17,041	7.169	91.1
	101-200	62	9	14.079	7,487	2,442	12,531	6.139	84.5
	201-300	25	2	0.595	103	0	259	7.207	97.3
	301-500	14	2	0.048	16	0	49	1.022	45.7
	All depths	124	14	8.656	13,149	1,091	25,207	6.575	87.4
Central Aleutians	1-100	31	1	0.086	51	0	154	8.889	110.0
	101-200	48	7	4.731	2,179	578	3,780	9.397	107.8
	201-300	31	9	1.707	360	37	683	8.601	103.7
	301-500	21	7	0.836	333	0	794	3.145	71.6
	All depths	131	24	1.767	2,922	1,256	4,589	8.578	103.2
Eastern Aleutians	1-100	15	3	0.594	407	0	835	8.624	107.2
	101-200	42	17	5.351	4,157	1,580	6,734	7.722	100.0
	201-300	33	14	5.199	2,548	1,040	4,056	7.403	101.1
	301-500	22	13	4.327	2,459	0	5,066	1.935	62.8
	All depths	112	47	3.798	9,571	5,714	13,428	6.188	91.0
All Aleutian Areas	1-100	69	5	3.42	6,001	0	17,072	7.282	92.4
	101-200	152	33	7.81	13,822	8,019	19,625	7.129	92.8
	201-300	89	25	3.45	3,011	1,499	4,523	7.539	101.3
	301-500	57	22	2.17	2,808	258	5,358	2.073	63.7
	All depths	367	85	4.50	25,643	12,959	38,326	6.659	90.5
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	2	1.670	309	0	883	7.487	101.7
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	6	3.162	330	0	665	2.796	73.7
	All depths	53	8	0.854	639	75	1,203	5.064	87.2

Table 49. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of whiteblotched skate by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	101-200	W Western Aleutians	36	9	18.42	7,487	2,335	12,638
Western Aleutians	1-100	W Western Aleutians	10	1	15.01	5,544	0	18,084
Eastern Aleutians	101-200	NE Eastern Aleutians	18	9	12.12	2,439	250	4,627
Central Aleutians	101-200	Petrel Bank	2	2	11.44	1,985	0	12,040
Eastern Aleutians	201-300	NE Eastern Aleutians	15	9	9.45	1,860	423	3,297
Eastern Aleutians	101-200	SE Eastern Aleutians	9	7	8.68	1,650	0	3,357
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	6	5.50	1,468	0	3,968
Eastern Aleutians	301-500	SE Eastern Aleutians	9	7	3.85	992	0	2,278
Southern Bering Sea	101-200	W Southern Bering	2	1	3.43	230	0	3,145
Eastern Aleutians	201-300	SE Eastern Aleutians	10	5	3.34	689	0	1,401
Central Aleutians	201-300	N Central Aleutians	16	6	3.25	143	0	288
Southern Bering Sea	301-500	Combined Southern Bering	8	6	3.16	330	0	665
Eastern Aleutians	1-100	SE Eastern Aleutians	8	3	2.34	407	0	879
Central Aleutians	201-300	SE Central Aleutians	3	1	2.04	97	0	515
Central Aleutians	301-500	Petrel Bank	3	1	1.71	212	0	1,122
Central Aleutians	201-300	Petrel Bank	3	1	1.35	103	0	548
Central Aleutians	101-200	N Central Aleutians	9	3	1.10	117	0	266
Central Aleutians	101-200	SE Central Aleutians	15	2	1.02	77	0	192
Central Aleutians	301-500	N Central Aleutians	12	6	0.98	121	0	260
Western Aleutians	201-300	W Western Aleutians	14	1	0.71	67	0	212
Southern Bering Sea	101-200	E Southern Bering	6	1	0.67	79	0	283
Western Aleutians	201-300	E Western Aleutians	11	1	0.45	36	0	115
Central Aleutians	201-300	SW Central Aleutians	9	1	0.39	17	0	55
Eastern Aleutians	101-200	SW Eastern Aleutians	12	1	0.30	68	0	218
Central Aleutians	1-100	N Central Aleutians	16	1	0.24	51	0	158
Western Aleutians	301-500	W Western Aleutians	10	2	0.09	16	0	51

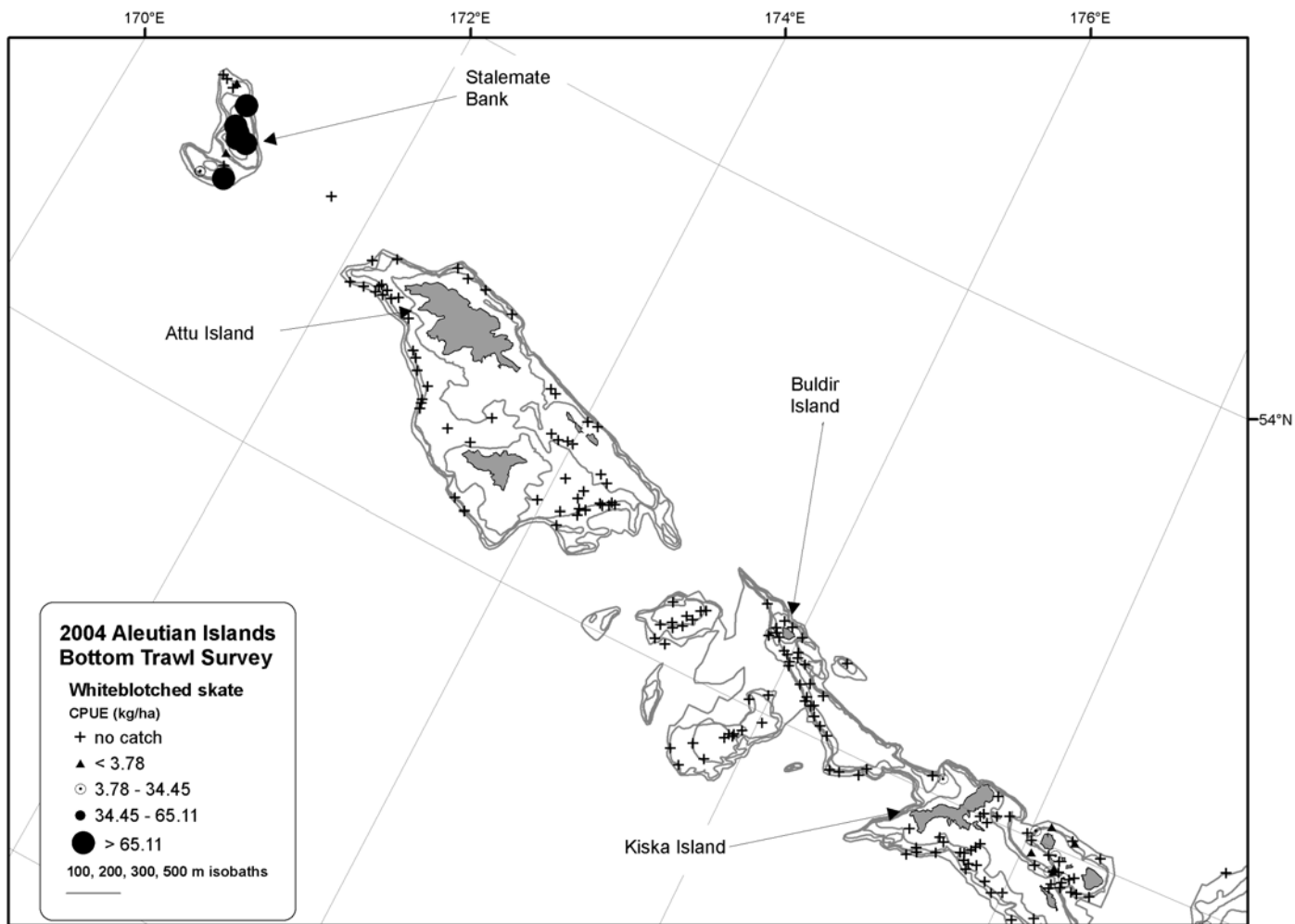


Figure 43. -- Distribution and relative abundance of whiteblotched skate from the 2004 Aleutian Islands bottom trawl survey.

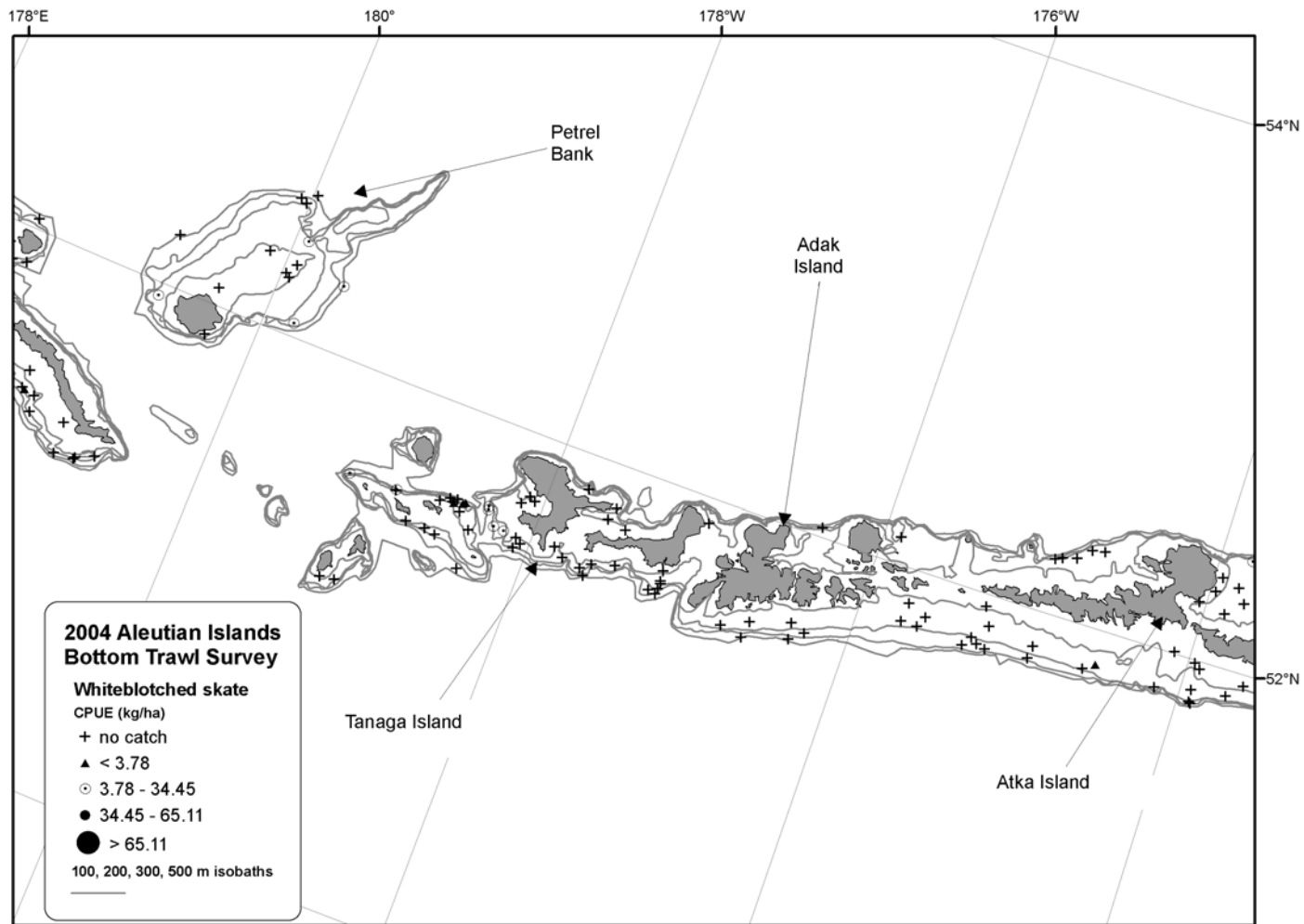


Figure 43. -- (continued).

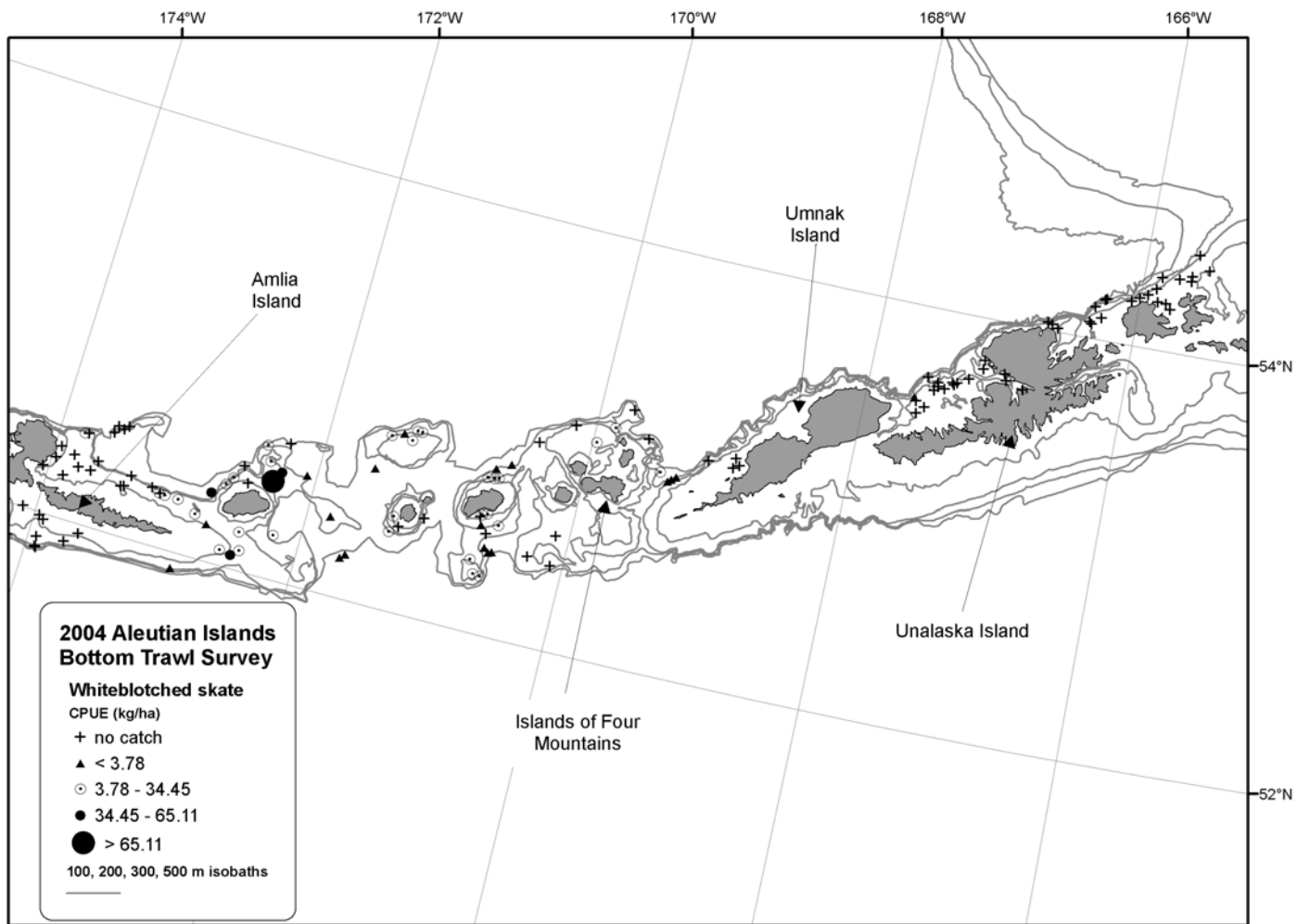


Figure 43. -- (continued).

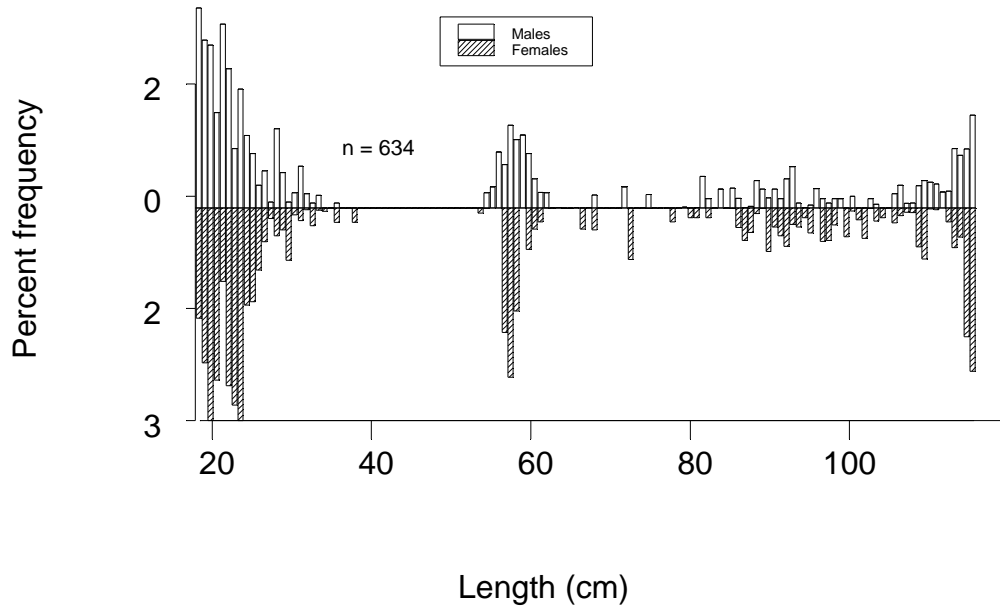


Figure 44. -- Size composition of whiteblotched skate from the 2004 Aleutian Islands bottom trawl survey.

Table 50. -- Total effort (number of trawl hauls), number of hauls with Alaska skate, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	8	3.976	1,939	0	5,385	9.323	106.7
	101-200	62	23	6.778	3,604	1,285	5,923	8.683	102.7
	201-300	25	3	4.594	792	0	2,046	9.001	102.7
	301-500	14	0	0.000	0	--	--	--	--
	All depths	124	34	4.170	6,335	2,155	10,515	8.919	103.9
Central Aleutians	1-100	31	10	3.081	1,802	0	3,631	5.973	81.0
	101-200	48	16	3.931	1,810	0	4,141	9.495	103.8
	201-300	31	2	0.140	29	0	85	12.454	111.2
	301-500	21	0	0.000	0	--	--	--	--
	All depths	131	28	2.201	3,642	744	6,539	7.776	92.6
Eastern Aleutians	1-100	15	3	2.452	1,679	0	4,188	5.757	87.3
	101-200	42	13	1.140	885	346	1,425	8.545	100.3
	201-300	33	0	0.000	0	--	--	--	--
	301-500	22	0	0.000	0	--	--	--	--
	All depths	112	16	1.018	2,565	187	4,942	6.719	91.8
All Aleutian Areas	1-100	69	21	3.08	5,420	995	9,846	7.104	92.2
	101-200	152	52	3.56	6,300	3,019	9,580	8.897	102.7
	201-300	89	5	0.94	821	0	2,030	9.125	103.0
	301-500	57	0	0.00	0	--	--	--	--
	All depths	367	78	2.20	12,541	6,964	18,118	8.137	98.1
Southern Bering Sea	1-100	33	7	0.363	146	33	259	6.441	90.8
	101-200	8	1	0.211	39	0	132	4.534	85.0
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	0	0.000	0	--	--	--	--
	All depths	53	8	0.248	185	49	322	6.039	89.6

Table 51. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Alaska skate by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Western Aleutians	201-300	E Western Aleutians	11	2	9.74	763	0	2,116
Central Aleutians	1-100	SE Central Aleutians	5	2	8.45	984	0	3,284
Western Aleutians	101-200	W Western Aleutians	36	18	8.44	3,432	1,075	5,788
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	7.91	1,003	0	5,318
Central Aleutians	101-200	Petrel Bank	2	1	6.48	1,125	0	15,417
Central Aleutians	1-100	Petrel Bank	6	3	5.09	488	0	1,278
Western Aleutians	1-100	W Western Aleutians	10	2	4.96	1,833	0	5,578
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	3.09	597	0	8,177
Central Aleutians	101-200	N Central Aleutians	9	4	3.03	323	0	871
Central Aleutians	101-200	SW Central Aleutians	22	6	2.15	226	0	485
Central Aleutians	101-200	SE Central Aleutians	15	5	1.82	136	4	269
Eastern Aleutians	101-200	NE Eastern Aleutians	18	7	1.63	328	114	543
Central Aleutians	1-100	N Central Aleutians	16	5	1.57	330	17	642
Western Aleutians	101-200	E Western Aleutians	26	5	1.38	172	0	401
Eastern Aleutians	101-200	SE Eastern Aleutians	9	2	1.15	218	0	552
Eastern Aleutians	101-200	NW Eastern Aleutians	3	2	1.06	168	0	875
Western Aleutians	1-100	E Western Aleutians	13	6	0.90	107	0	243
Eastern Aleutians	101-200	SW Eastern Aleutians	12	2	0.75	170	0	423
Central Aleutians	201-300	SW Central Aleutians	9	1	0.63	27	0	89
Southern Bering Sea	1-100	E Southern Bering	31	7	0.60	146	33	260
Eastern Aleutians	1-100	SE Eastern Aleutians	8	1	0.46	80	0	269
Southern Bering Sea	101-200	E Southern Bering	6	1	0.33	39	0	140
Western Aleutians	201-300	W Western Aleutians	14	1	0.31	29	0	91
Central Aleutians	201-300	N Central Aleutians	16	1	0.06	3	0	8

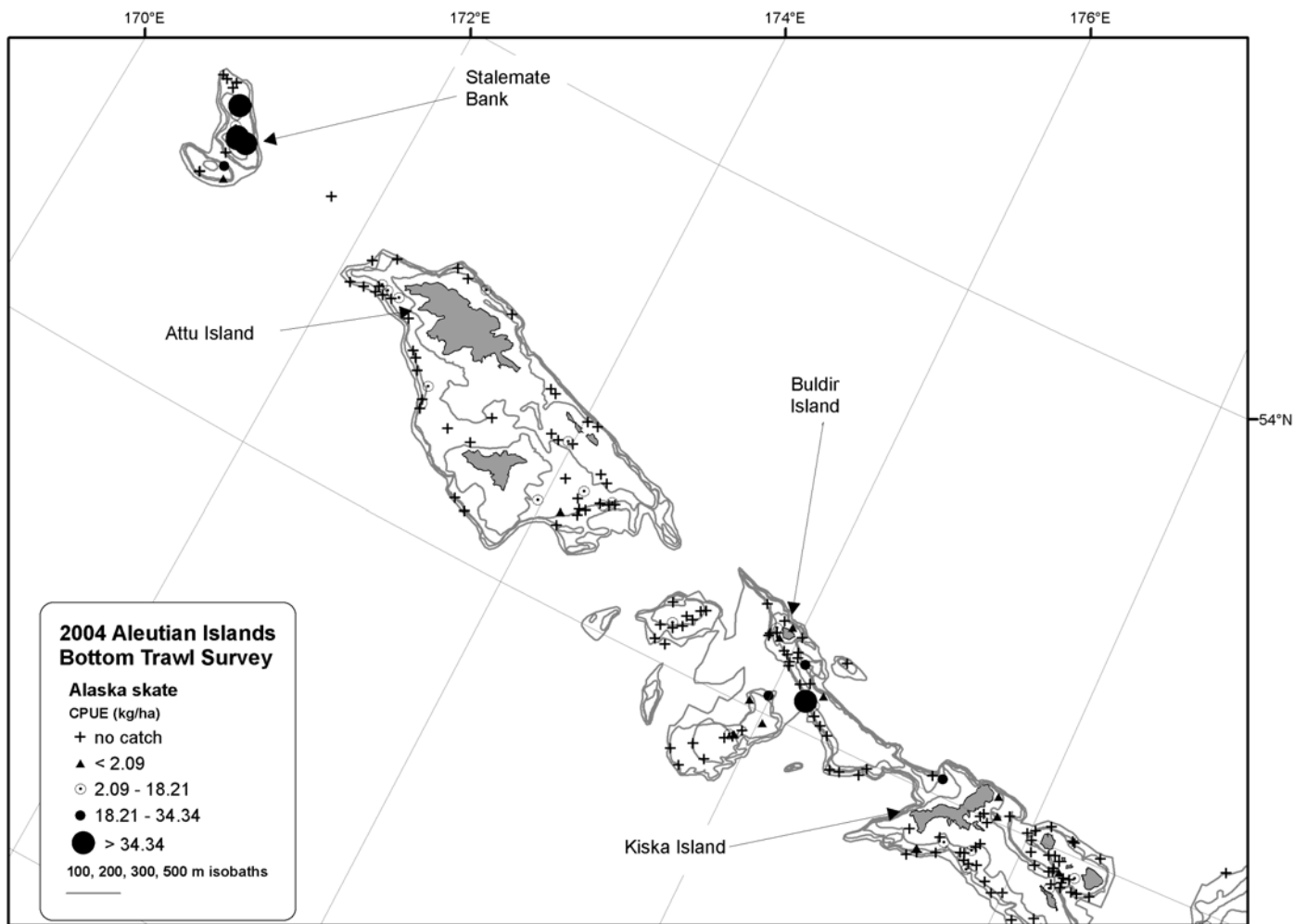


Figure 45. -- Distribution and relative abundance of Alaska skate from the 2004 Aleutian Islands bottom trawl survey.

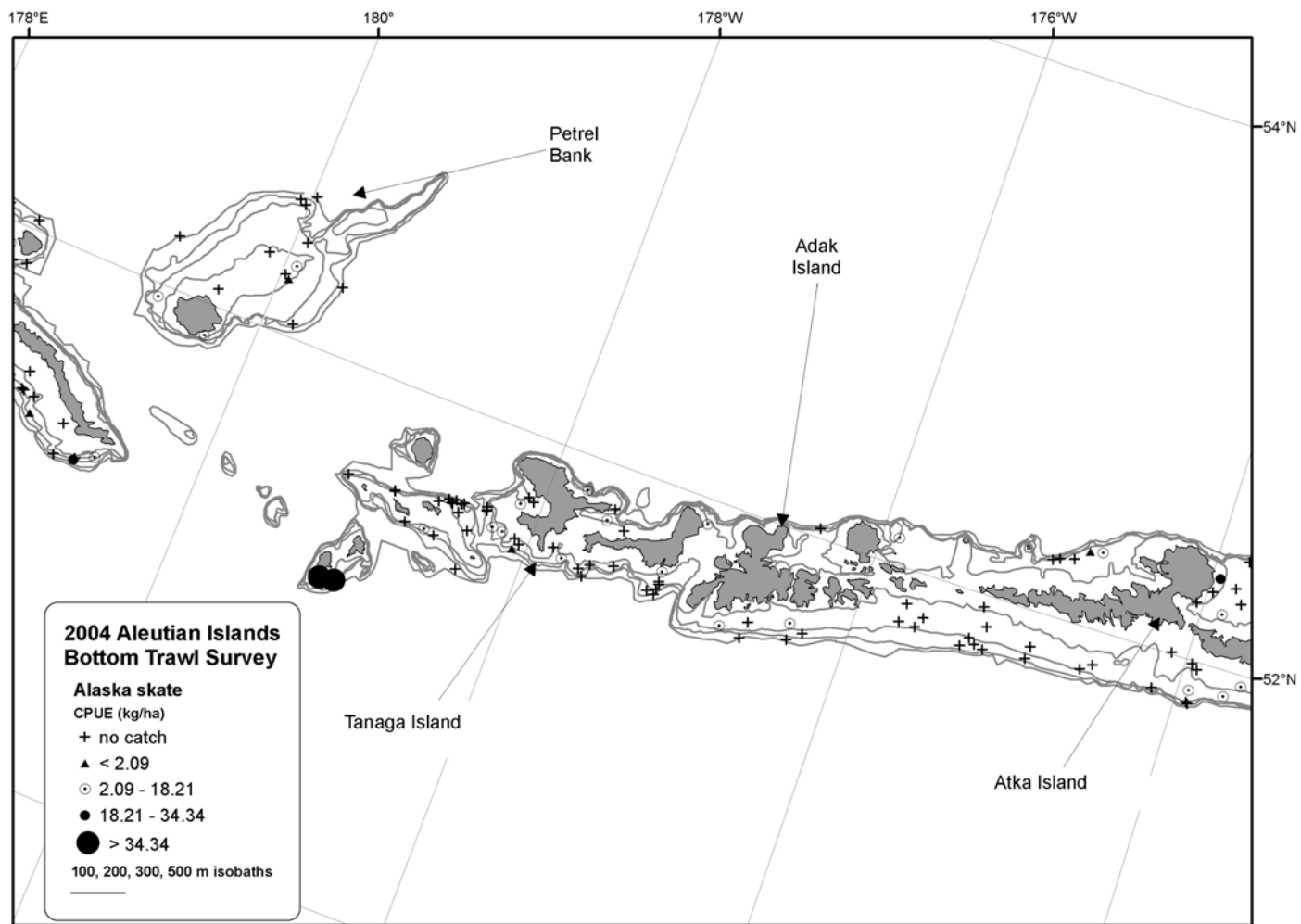


Figure 45. -- (continued).

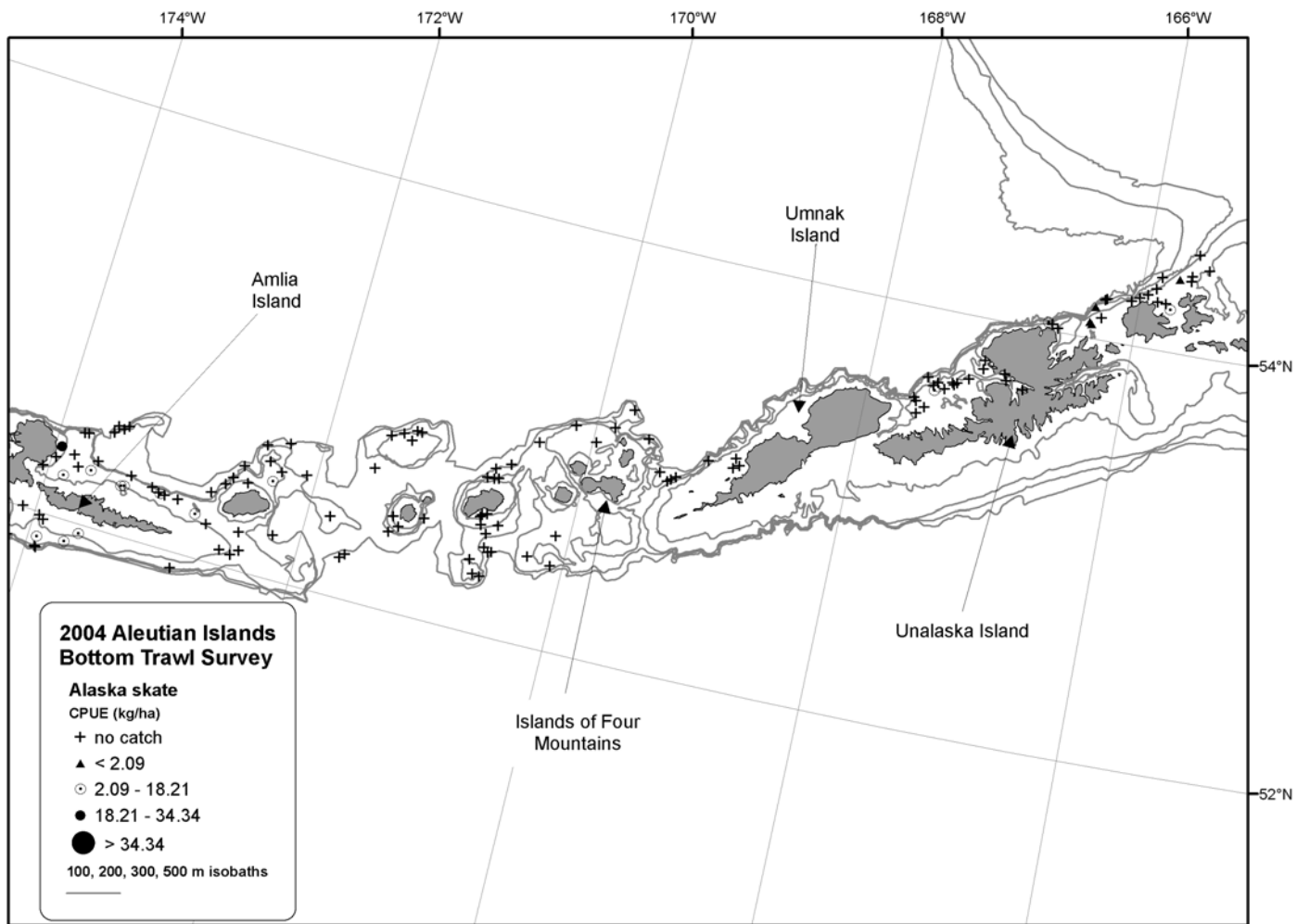


Figure 45. -- (continued).

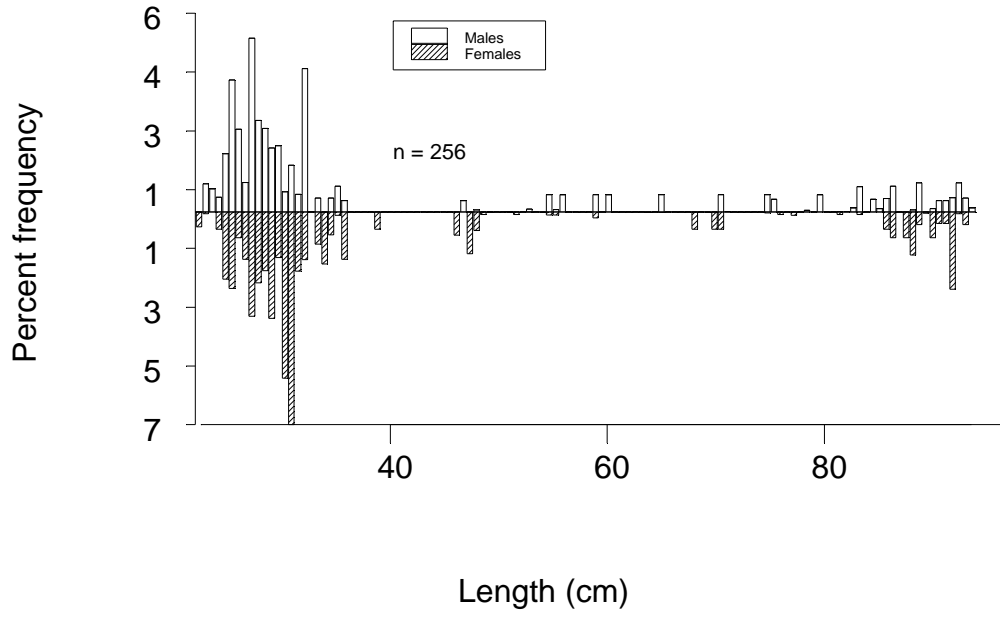


Figure 46. -- Size composition of Alaska skate from the 2004 Aleutian Islands bottom trawl survey.

Table 52. -- Total effort (number of trawl hauls), number of hauls with Aleutian skate, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	11	2.134	1,135	70	2,199	11.316	118.8
	201-300	25	6	5.266	908	0	2,068	11.007	117.1
	301-500	14	2	0.249	82	0	224	5.420	112.0
	All depths	124	19	1.398	2,124	585	3,662	10.958	117.8
Central Aleutians	1-100	31	1	0.196	114	0	348	19.393	140.0
	101-200	48	6	11.175	5,147	0	15,110	11.487	125.2
	201-300	31	10	2.395	505	0	1,012	15.050	131.5
	301-500	21	3	0.108	43	0	115	3.612	77.4
	All depths	131	20	3.512	5,809	0	15,617	11.895	125.7
Eastern Aleutians	1-100	15	3	1.646	1,127	0	2,720	15.667	134.8
	101-200	42	4	0.852	662	0	1,555	16.478	132.2
	201-300	33	8	1.850	907	145	1,669	14.046	124.8
	301-500	22	3	0.122	69	0	168	2.852	80.1
	All depths	112	18	1.097	2,765	896	4,634	15.008	129.5
All Aleutian Areas	1-100	69	4	0.71	1,241	0	2,741	16.010	135.2
	101-200	152	21	3.92	6,943	0	16,817	11.935	124.8
	201-300	89	24	2.66	2,320	890	3,749	13.076	123.3
	301-500	57	8	0.15	194	17	371	4.101	92.9
	All depths	367	57	1.88	10,698	658	20,738	12.513	125.1
Southern Bering Sea	1-100	33	1	0.121	49	0	148	14.214	137.0
	101-200	8	1	3.835	709	0	2,385	11.744	123.7
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	1	0.595	62	0	209	5.174	95.3
	All depths	53	3	1.096	820	0	2,251	11.393	122.4

Table 53. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of Aleutian skate by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Central Aleutians	101-200	Petrel Bank	2	1	28.51	4,949	0	67,827
Western Aleutians	201-300	E Western Aleutians	11	4	10.34	810	0	2,052
Southern Bering Sea	101-200	E Southern Bering	6	1	6.01	709	0	2,532
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	3.46	660	0	9,041
Central Aleutians	201-300	SE Central Aleutians	3	1	3.26	155	0	824
Eastern Aleutians	201-300	SW Eastern Aleutians	6	3	3.23	232	0	519
Western Aleutians	101-200	W Western Aleutians	36	9	2.64	1,073	0	2,156
Central Aleutians	201-300	SW Central Aleutians	9	3	2.54	108	0	275
Central Aleutians	201-300	Petrel Bank	3	1	2.31	177	0	937
Eastern Aleutians	101-200	SE Eastern Aleutians	9	1	2.19	416	0	1,375
Eastern Aleutians	201-300	SE Eastern Aleutians	10	2	1.93	398	0	1,036
Eastern Aleutians	1-100	NW Eastern Aleutians	2	1	1.53	295	0	4,043
Central Aleutians	201-300	N Central Aleutians	16	5	1.48	65	0	131
Eastern Aleutians	201-300	NE Eastern Aleutians	15	2	1.39	273	0	743
Eastern Aleutians	101-200	SW Eastern Aleutians	12	3	1.09	246	0	577
Western Aleutians	201-300	W Western Aleutians	14	2	1.04	98	0	250
Eastern Aleutians	1-100	SE Eastern Aleutians	8	1	0.99	172	0	580
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.98	43	0	590
Central Aleutians	101-200	SE Central Aleutians	15	2	0.86	64	0	159
Central Aleutians	101-200	SW Central Aleutians	22	2	0.82	87	0	214
Southern Bering Sea	301-500	Combined Southern Bering	8	1	0.60	62	0	209
Central Aleutians	1-100	N Central Aleutians	16	1	0.54	114	0	358
Western Aleutians	101-200	E Western Aleutians	26	2	0.49	61	0	163
Western Aleutians	301-500	W Western Aleutians	10	2	0.48	82	0	231
Central Aleutians	101-200	N Central Aleutians	9	1	0.44	47	0	155
Central Aleutians	301-500	N Central Aleutians	12	2	0.29	36	0	110
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.28	4	0	59
Southern Bering Sea	1-100	E Southern Bering Sea	31	1	0.20	49	0	148
Central Aleutians	301-500	SW Central Aleutians	3	1	0.09	7	0	38
Eastern Aleutians	301-500	Combined Eastern Aleutian Islands	11	1	0.07	19	0	60
Eastern Aleutians	301-500	SE Eastern Aleutians	9	1	0.03	8	0	26

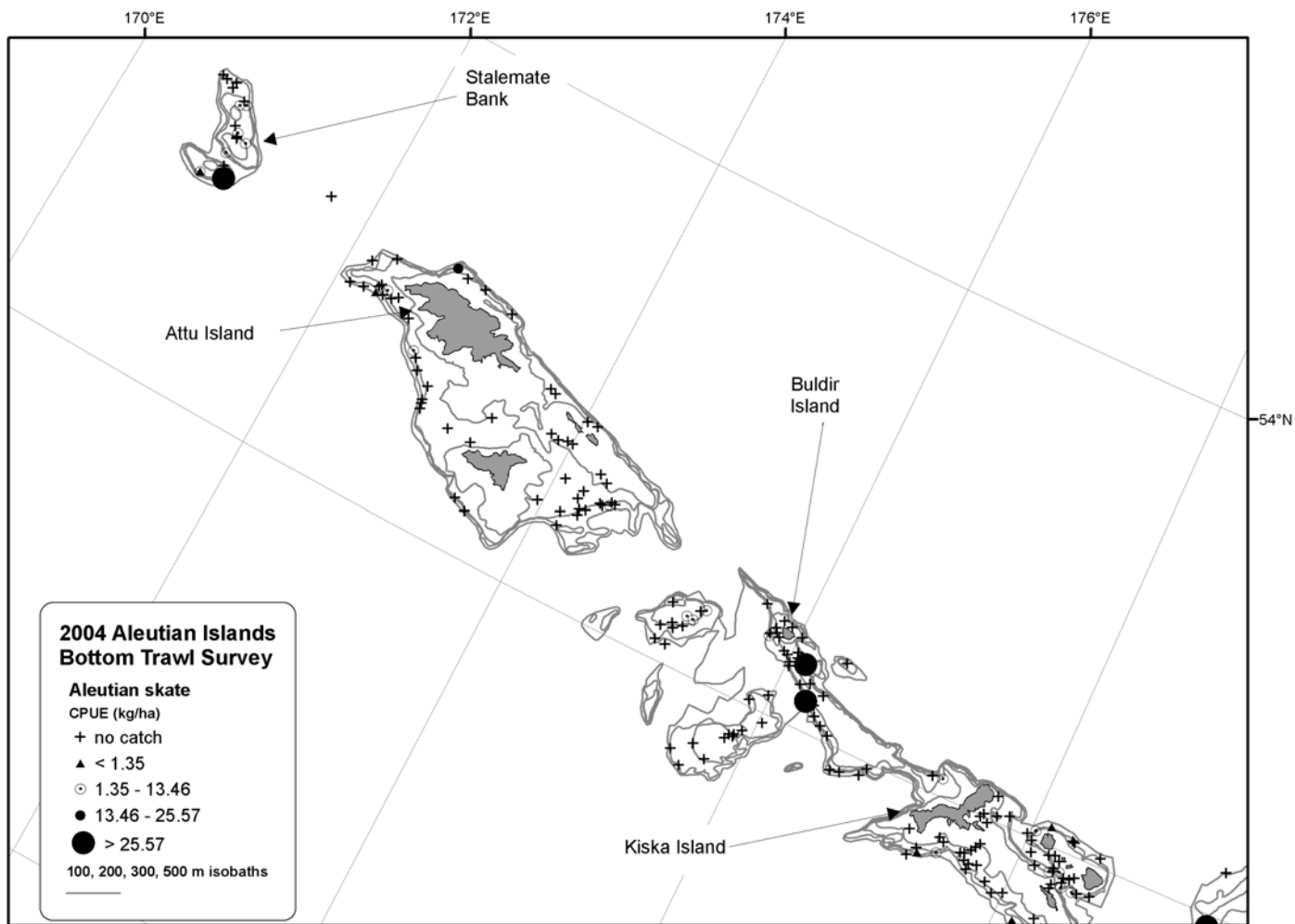


Figure 47. -- Distribution and relative abundance of Aleutian skate from the 2004 Aleutian Islands bottom trawl survey.

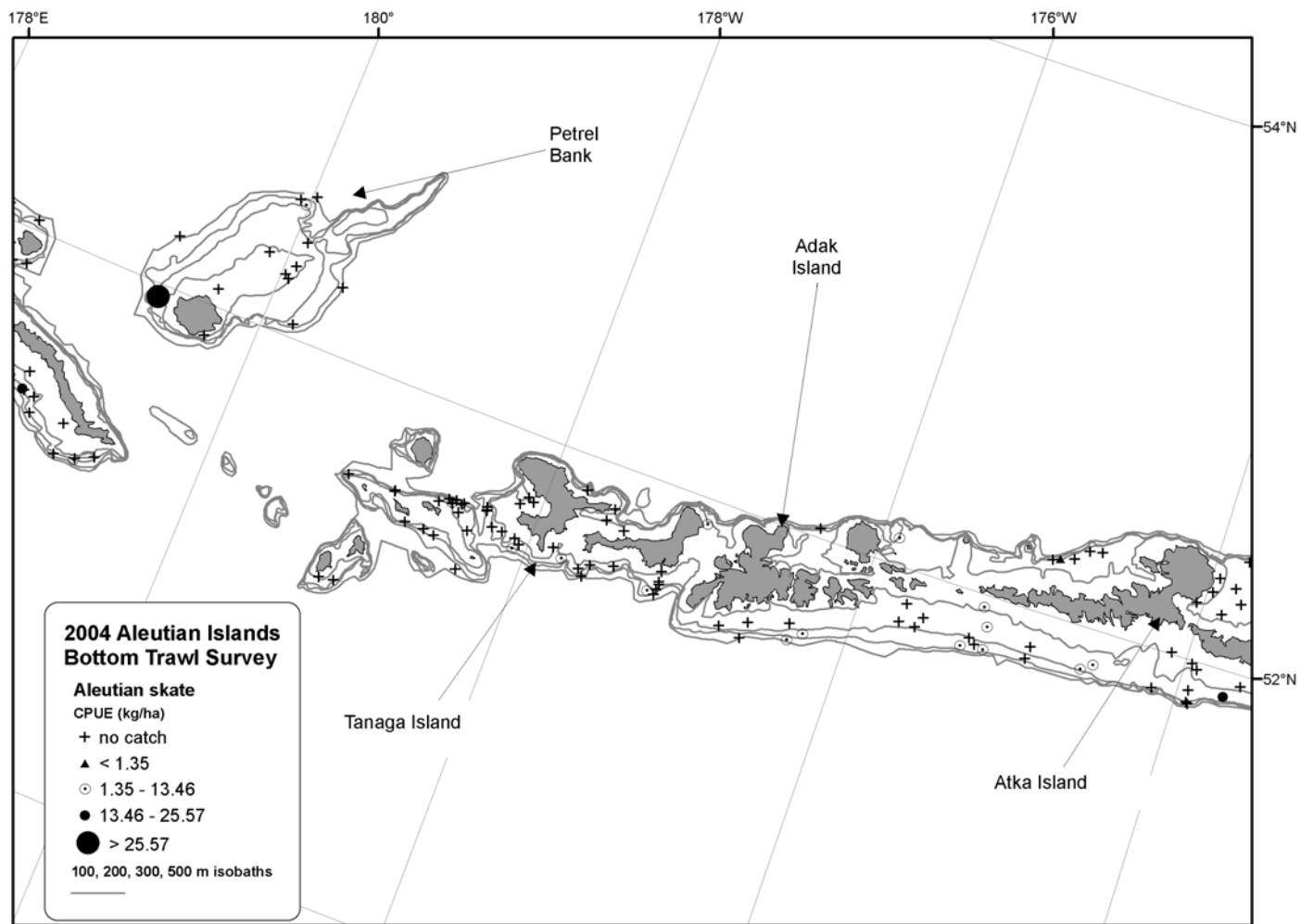


Figure 47. -- (continued).

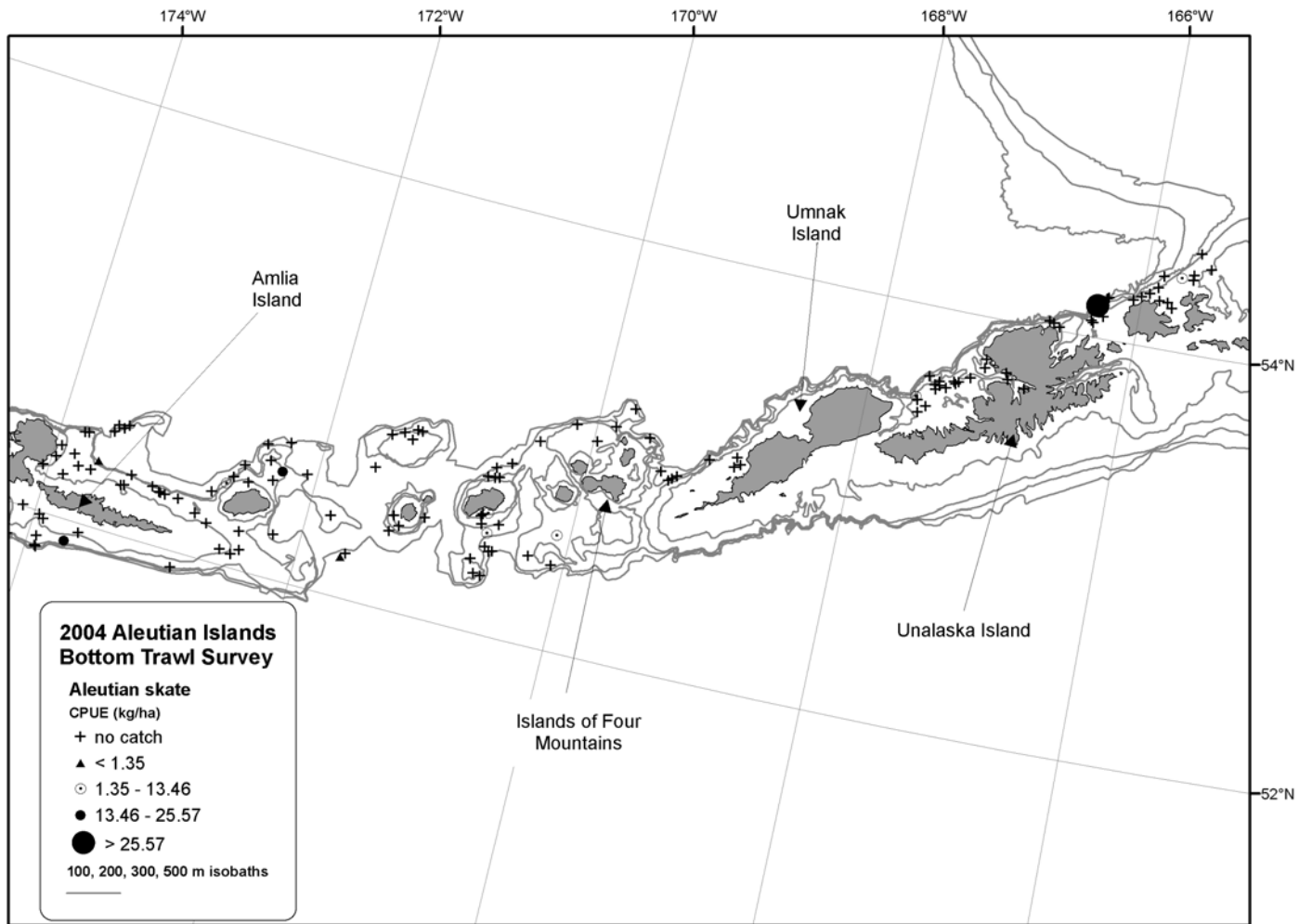


Figure 47. -- (continued).

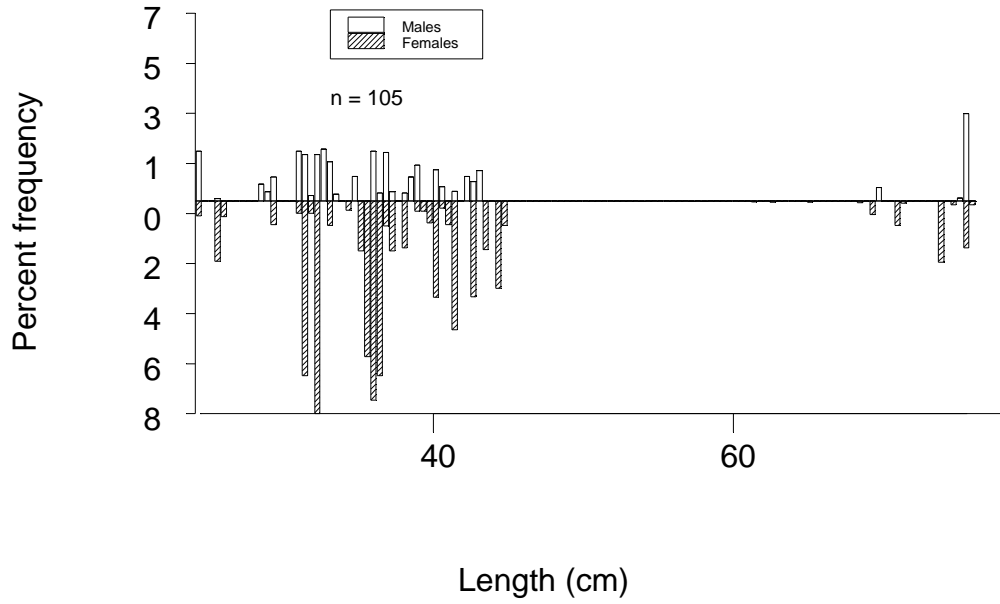


Figure 48. -- Size composition of Aleutian skate from the 2004 Aleutian Islands bottom trawl survey.

Mud skate (*Bathyraja taranetzi*)

Mud skates were found throughout the survey area in most depth intervals, except in the Southern Bering Sea (Table 54). Mean CPUE was very modest, increasing somewhat with depth. With an estimated biomass of under 2,000 t, it represents a small part of the general skate population in the Aleutian region. Subarea-specific mean CPUEs were small but catches were scattered across the entire survey area (Table 55). Figure 49 summarizes catch locations and CPUE. Note that the CPUE values cited in the figure legend are very small. Figure 50 presents length-frequency data for mud skate during the 2004 Aleutian Islands bottom trawl survey.

Miscellaneous skates

Miscellaneous skate species captured during the Aleutian Islands bottom trawl survey in 2004 included the deepsea skate (*Bathyraja abyssicola*), big skate (*Raja binoculata*), Bering skate (*Bathyraja interrupta*), commander skate (*Bathyraja lindbergi*), and butterfly skate (*Bathyraja mariposa*). Most of these skates were captured at shallow depths in the Southern Bering Sea subareas and reflect the area's position as a transition area between species dominant on the Bering Sea shelf and those dominant in the Aleutian Islands (Tables 56 and 57).

Table 54. -- Total effort (number of trawl hauls), number of hauls with mud skate, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)	Mean length (cm)
Western Aleutians	1-100	23	0	0.000	0	--	--	--	--
	101-200	62	5	0.059	31	3	59	1.335	61.2
	201-300	25	4	0.081	14	0	29	1.164	59.2
	301-500	14	5	0.133	44	0	91	0.838	53.2
	All depths	124	14	0.059	89	36	142	1.064	57.0
Central Aleutians	1-100	31	4	0.317	186	0	508	11.919	60.1
	101-200	48	4	0.042	19	0	41	1.494	60.9
	201-300	31	12	0.729	154	0	353	0.942	54.6
	301-500	21	15	0.485	193	69	318	0.718	50.4
	All depths	131	35	0.333	552	166	938	4.575	55.2
Eastern Aleutians	1-100	15	1	0.047	33	0	102	1.910	67.0
	101-200	42	5	0.125	97	0	212	1.323	60.5
	201-300	33	4	0.073	36	0	74	0.772	48.3
	301-500	22	17	1.658	942	460	1,424	0.559	45.7
	All depths	112	27	0.439	1,107	630	1,585	0.673	47.7
All Aleutian Areas	1-100	69	5	0.12	218	0	540	10.428	61.1
	101-200	152	14	0.08	148	31	265	1.348	60.7
	201-300	89	20	0.23	203	5	401	0.928	53.8
	301-500	57	37	0.91	1,179	698	1,659	0.596	46.7
	All depths	367	76	0.31	1,748	1,136	2,360	1.925	50.5
Southern Bering Sea	1-100	33	0	0.000	0	--	--	--	--
	101-200	8	0	0.000	0	--	--	--	--
	201-300	4	0	0.000	0	--	--	--	--
	301-500	8	4	0.501	52	0	110	0.885	53.4
	All depths	53	4	0.070	52	3	102	0.885	53.4

Table 55. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of mud skate by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Biomass (t)	Lower CI biomass (t)	Upper CI biomass (t)
Eastern Aleutians	301-500	SE Eastern Aleutians	9	6	1.94	499	32	965
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	1.80	79	0	507
Central Aleutians	201-300	Petrel Bank	3	3	1.52	117	0	532
Eastern Aleutians	301-500	Combined Eastern Aleutian	11	9	1.37	364	127	602
Central Aleutians	1-100	SE Central Aleutians	5	1	1.35	157	0	593
Central Aleutians	301-500	N Central Aleutians	12	10	0.65	80	7	154
Central Aleutians	301-500	SE Central Aleutians	3	2	0.57	41	0	140
Central Aleutians	201-300	SW Central Aleutians	9	4	0.56	24	0	52
Central Aleutians	301-500	SW Central Aleutians	3	2	0.51	40	0	168
Southern Bering Sea	301-500	Combined Southern Bering	8	4	0.50	52	0	110
Central Aleutians	201-300	N Central Aleutians	16	5	0.30	13	0	27
Eastern Aleutians	101-200	SW Eastern Aleutians	12	2	0.29	65	0	177
Central Aleutians	301-500	Petrel Bank	3	1	0.26	32	0	169
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	0.26	33	0	172
Eastern Aleutians	201-300	SW Eastern Aleutians	6	2	0.17	12	0	34
Western Aleutians	301-500	W Western Aleutians	10	4	0.15	26	0	52
Western Aleutians	201-300	W Western Aleutians	14	4	0.15	14	0	30
Central Aleutians	101-200	N Central Aleutians	9	2	0.14	15	0	39
Eastern Aleutians	101-200	SE Eastern Aleutians	9	1	0.12	23	0	77
Eastern Aleutians	201-300	NE Eastern Aleutians	15	2	0.12	23	0	59
Western Aleutians	301-500	E Western Aleutians	4	1	0.12	18	0	76
Central Aleutians	1-100	N Central Aleutians	16	2	0.10	20	0	51
Western Aleutians	101-200	W Western Aleutians	36	4	0.06	26	0	52
Central Aleutians	1-100	SW Central Aleutians	4	1	0.05	9	0	36
Eastern Aleutians	101-200	NE Eastern Aleutians	18	2	0.05	10	0	23
Western Aleutians	101-200	E Western Aleutians	26	1	0.04	5	0	16
Central Aleutians	101-200	SE Central Aleutians	15	1	0.03	3	0	8
Central Aleutians	101-200	SW Central Aleutians	22	1	0.01	2	0	5

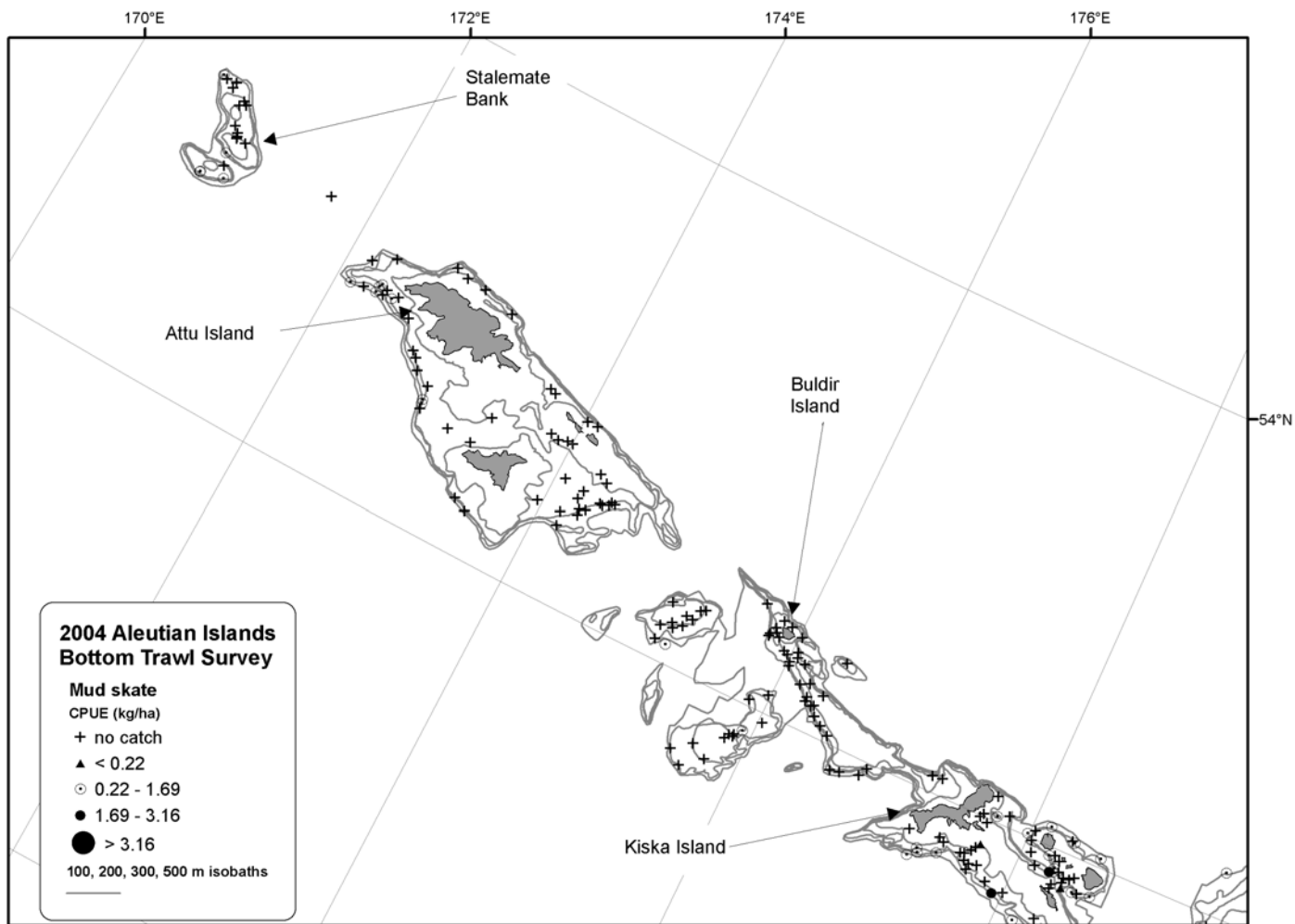


Figure 49. -- Distribution and relative abundance of mud skate from the 2004 Aleutian Islands bottom trawl survey.

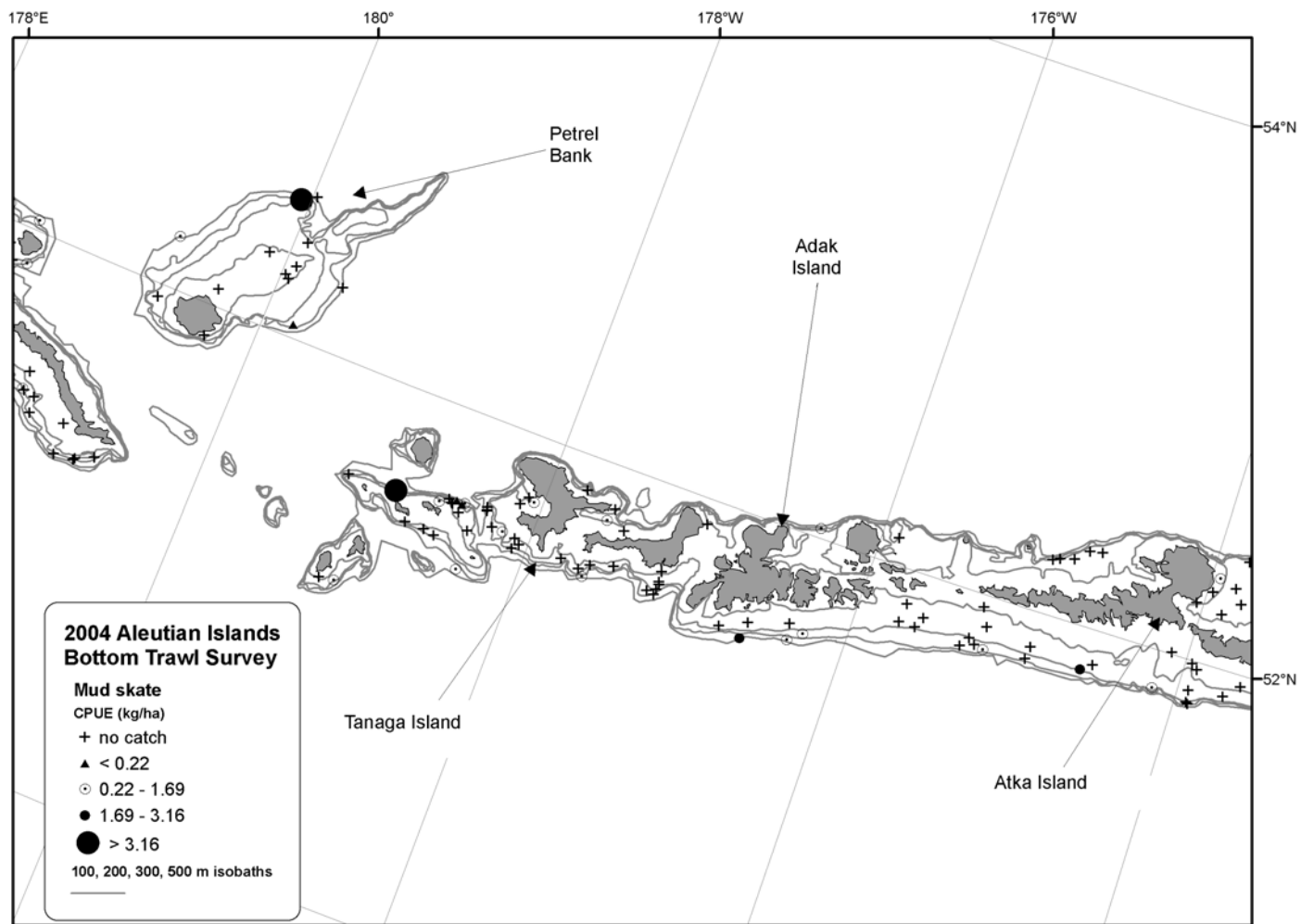


Figure 49. -- (continued).

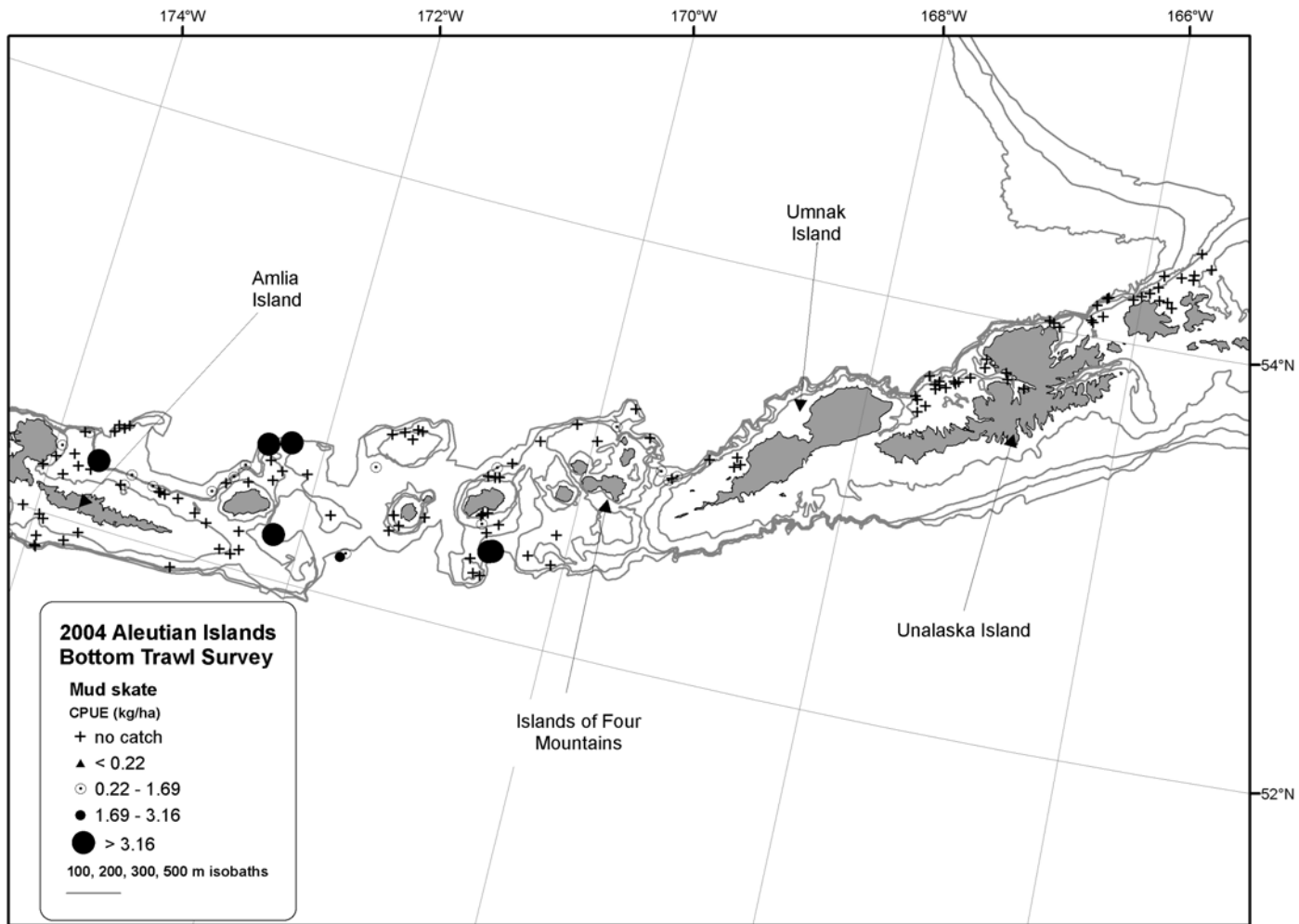


Figure 49. -- (continued).

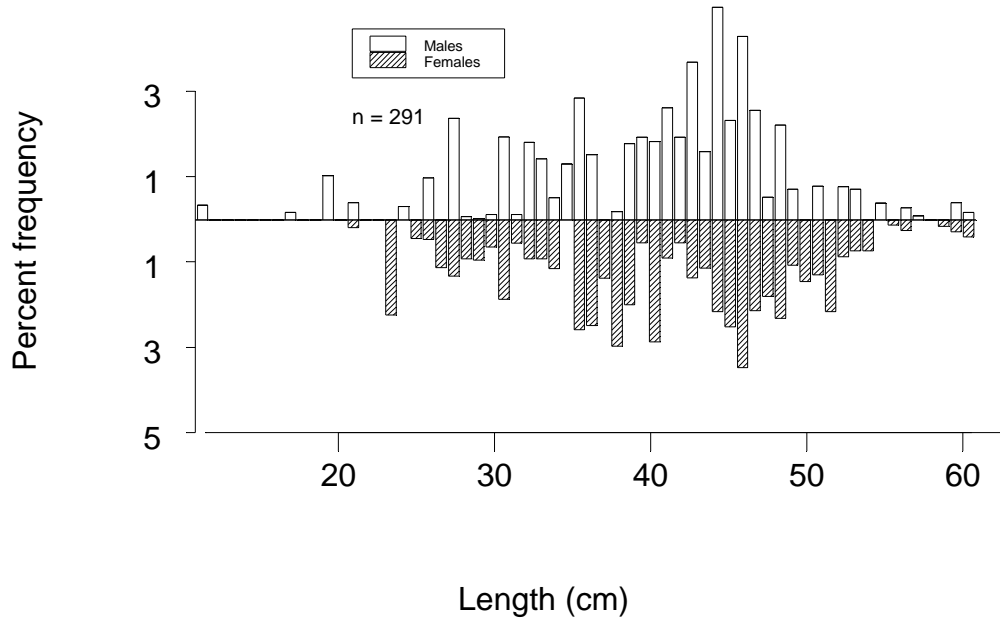


Figure 50. -- Size composition of mud skate from the 2004 Aleutian Islands bottom trawl survey.

Table 56. -- Total effort (number of trawl hauls), number of hauls with miscellaneous skates, mean CPUE, biomass estimates with confidence intervals, mean weight, and mean length based on the 2004 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of trawl hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)	Mean weight (kg)
Western Aleutians	1-100	23	0	0.000	0	--	--	--
	101-200	62	2	0.000	0	0	2	0.053
	201-300	25	0	0.000	0	--	--	--
	301-500	14	1	0.001	34	0	268	4.828
	All depths	124	3	0.000	34	0	249	4.801
Central Aleutians	1-100	31	1	0.000	1	0	3	0.044
	101-200	48	2	0.002	109	0	957	23.445
	201-300	31	2	0.000	1	0	8	0.403
	301-500	21	2	0.000	8	0	61	0.453
	All depths	131	7	0.001	119	0	955	21.508
Eastern Aleutians	1-100	15	0	0.000	0	--	--	--
	101-200	42	1	0.000	0	0	3	0.062
	201-300	33	1	0.000	2	0	11	0.209
	301-500	22	0	0.000	0	--	--	--
	All depths	112	2	0.000	2	0	11	0.187
All Aleutian Areas	1-100	84	6	0.00	422	0	2,904	18.281
	101-200	139	7	0.00	138	0	976	18.861
	201-300	90	3	0.00	3	0	14	0.280
	301-500	54	3	0.00	43	0	265	3.964
	All depths	367	19	0.00	606	0	3,207	17.322
Southern Bering Sea	1-100	33	5	0.010	422	0	2,964	18.307
	101-200	8	2	0.002	28	0	136	1.329
	201-300	4	0	0.000	0	--	--	--
	301-500	8	0	0.000	0	--	--	--
	All depths	53	7	0.006	450	0	2,956	17.248

Table 57. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of miscellaneous skates by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2004 Aleutian Islands bottom trawl survey.

NPFMC area	Depth range (m)	Stratum name	Number of hauls	Hauls		Mean CPUE (kg/ha)	Biomass (t)	Lower CI	Upper CI
				with catch				biomass (t)	biomass (t)
Southern Bering Sea	1-100	E Southern Bering	31	5	1.73	422	341	502	
Central Aleutians	101-200	SE Central Aleutians	15	1	1.45	109	80	137	
Southern Bering Sea	101-200	E Southern Bering	6	2	0.24	28	25	32	
Western Aleutians	301-500	W Western Aleutians	10	1	0.20	34	27	42	
Central Aleutians	301-500	N Central Aleutians	12	2	0.07	8	7	10	
Eastern Aleutians	201-300	SW Eastern Aleutians	6	1	0.02	2	1	2	
Central Aleutians	201-300	N Central Aleutians	16	2	0.02	1	1	1	
Central Aleutians	101-200	N Central Aleutians	9	1	0.01	1	0	1	
Central Aleutians	1-100	SE Central Aleutians	5	1	0.01	1	1	1	
Eastern Aleutians	101-200	NE Eastern Aleutians	18	1	0.00	0	0	0	
Western Aleutians	101-200	E Western Aleutians	26	1	0.00	0	0	0	
Western Aleutians	101-200	W Western Aleutians	36	1	0.00	0	0	0	

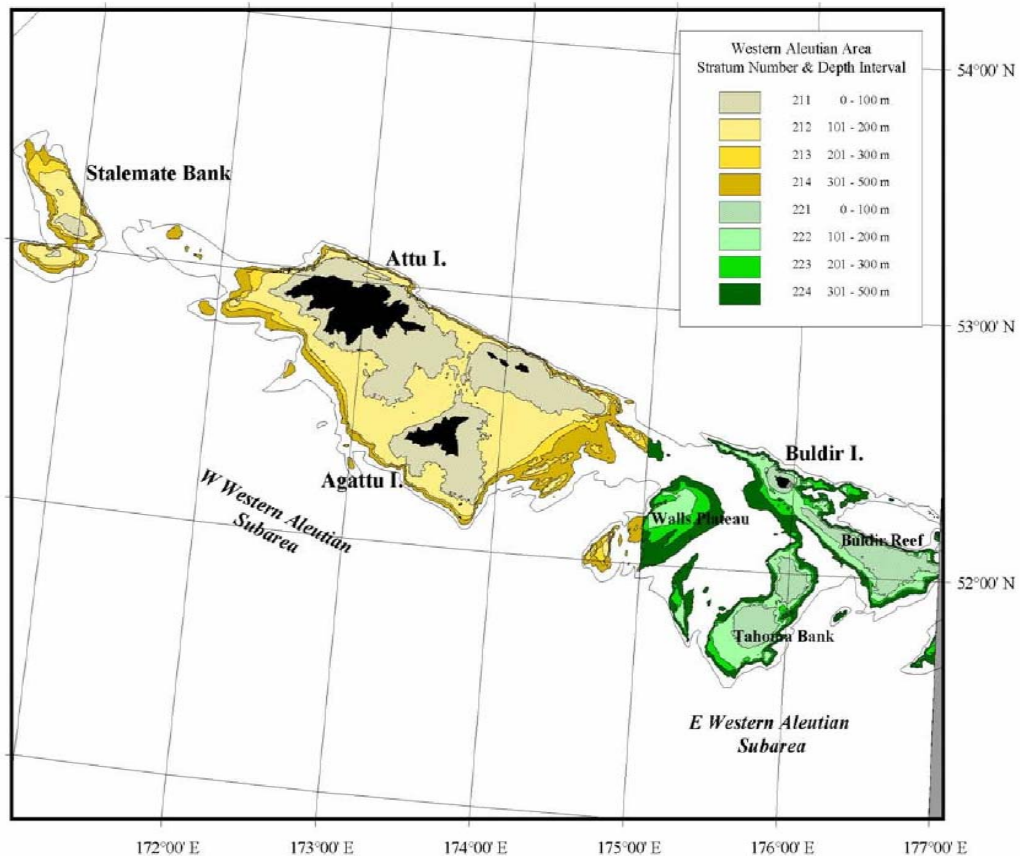
CITATIONS

- Alverson, D.L., and W.T. Pereyra. 1969. Demersal fish explorations in the northeastern 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.
- Britt, L.L., and M.H. Martin. 2001. Data report: 1999 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-121, 249 p.
- Cochran, W.G. 1977. *Sampling Techniques*. 3rd ed. Wiley Series in Probability and Mathematical Statistics – Applied. John Wiley & Sons. NY. 428 p.
- Martin, M.H. 1997. Data report: 1996 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-82, 235 p.
- Martin, M.H., and D.M. Clausen. 1995. Data report: 1993 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-59, 217 p.
- Munro, P.T., and R.Z. Hoff. 1995. Two demersal trawl surveys in the Gulf of Alaska: Implications of survey design and methods. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-50, 139 p.
- Ronholt, L.L., K. Wakabayashi, T.K. Wilderbuer, H. Yamaguchi, and K. Okada. 1986. Groundfish resource of the Aleutian Island waters based on the U.S.-Japan trawl survey, June – November 1980. *Int. North Pac. Fish. Comm. Bull.* 48.
- Stark, J.W., and D.M. Clausen. 1995. Data report: 1990 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-49, 221 p.
- Stauffer, G. 2004. NOAA protocols for groundfish bottom trawl surveys of the nation's fishery resources. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-65, 205 p. Available online at <http://spo.nmfs.noaa.gov/tm/tm65.pdf>
- Wakabayashi, K., R.G. Bakkala, and M.S. Alton. 1985. Methods of the U.S.-Japan demersal trawl surveys, 7-29. *In* R.G. Bakkala and K. Wakabayashi (editors), *Results of cooperative U.S.-Japan groundfish investigations in the Bering Sea during May-August 1979*. *Int. North Pac. Fish. Comm. Bull.* 44.

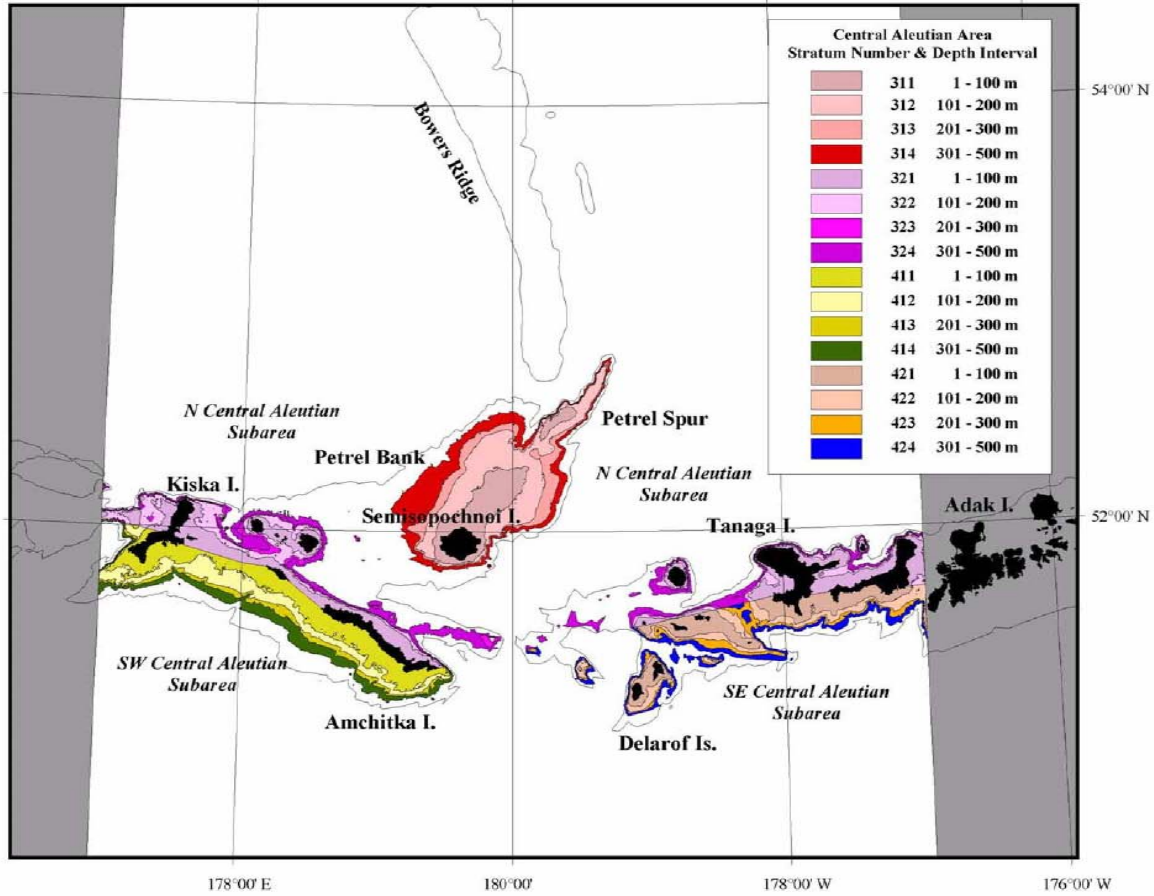
APPENDIX A

Appendix Table A-1. -- Survey sampling areas, subareas, stratum codes, depth ranges, and areas in square kilometers.

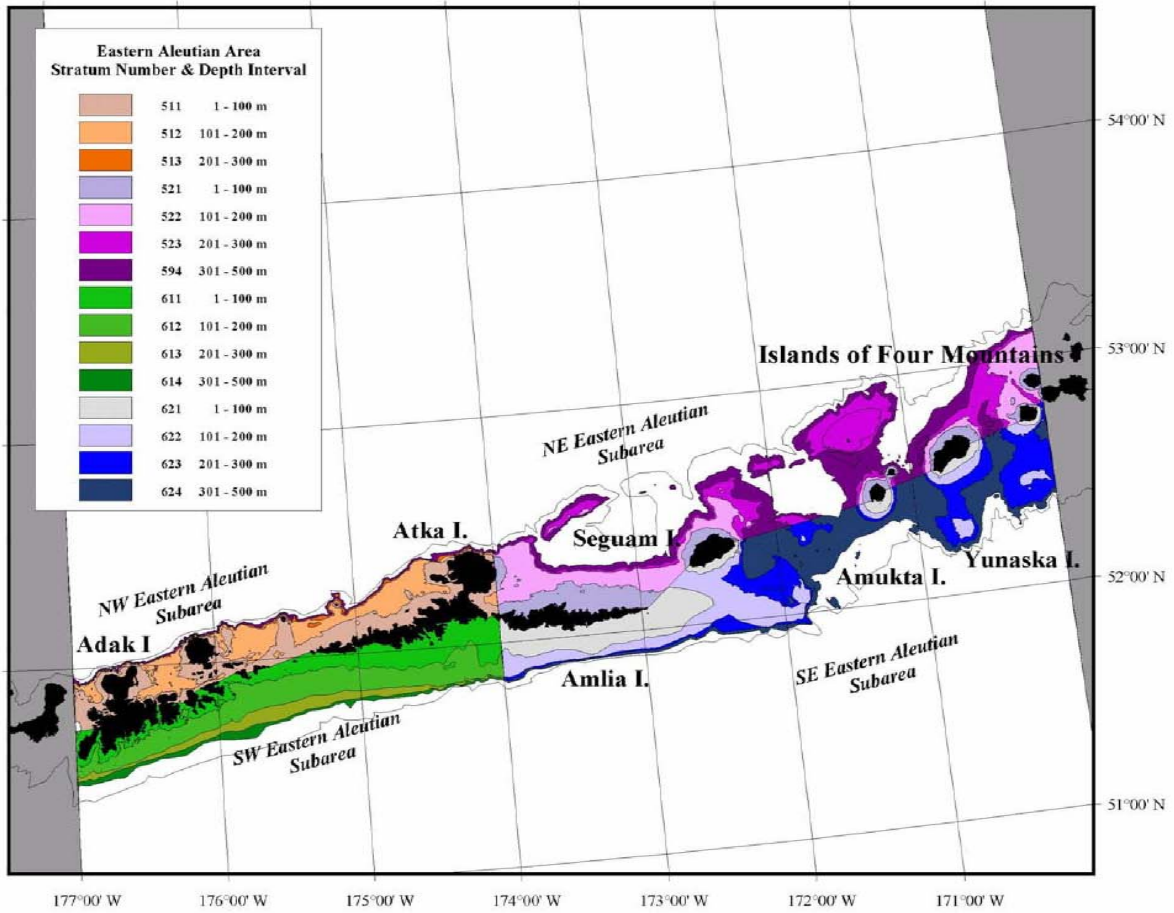
NPFMC Area	Subarea Description	Stratum Code	Depth Interval (m)	Area (km ²)
Western Aleutians	W Western Aleutians	211	1-100	3,693
	W Western Aleutians	212	101-200	4,065
	W Western Aleutians	213	201-300	940
	W Western Aleutians	214	301-500	1,711
	E Western Aleutians	221	1-100	1,183
	E Western Aleutians	222	101-200	1,252
	E Western Aleutians	223	201-300	783
	E Western Aleutians	224	301-500	1,561
Central Aleutians	Petrel Bank	311	1-100	960
	Petrel Bank	312	101-200	1,736
	Petrel Bank	313	201-300	766
	Petrel Bank	314	301-500	1,237
	N Central Aleutians	321	1-100	2,106
	N Central Aleutians	322	101-200	1,066
	N Central Aleutians	323	201-300	439
	N Central Aleutians	324	301-500	1,240
	SW Central Aleutians	411	1-100	1,618
	SW Central Aleutians	412	101-200	1,052
	SW Central Aleutians	413	201-300	426
	SW Central Aleutians	414	301-500	789
	SE Central Aleutians	421	1-100	1,164
	SE Central Aleutians	422	101-200	752
	SE Central Aleutians	423	201-300	477
	SE Central Aleutians	424	301-500	714
Eastern Aleutians	NW Eastern Aleutians	511	1-100	1,932
	NW Eastern Aleutians	512	101-200	1,594
	NW Eastern Aleutians	513	201-300	156
	NE Eastern Aleutians	521	1-100	1,268
	NE Eastern Aleutians	522	101-200	2,013
	NE Eastern Aleutians	523	201-300	1,969
	Combined Eastern Aleutian Islands	594	301-500	2,670
	SW Eastern Aleutians	611	1-100	1,907
	SW Eastern Aleutians	612	101-200	2,261
	SW Eastern Aleutians	613	201-300	716
	SW Eastern Aleutians	614	301-500	438
	SE Eastern Aleutians	621	1-100	1,741
	SE Eastern Aleutians	622	101-200	1,900
	SE Eastern Aleutians	623	201-300	2,061
SE Eastern Aleutians	624	301-500	2,575	
Southern Bering Sea	W Southern Bering Sea	711	1-100	1,586
	W Southern Bering Sea	712	101-200	670
	E Southern Bering Sea	721	1-100	2,440
	E Southern Bering Sea	722	101-200	1,179
	Combined Southern Bering Sea	793	201-300	564
	Combined Southern Bering Sea	794	301-500	1,043



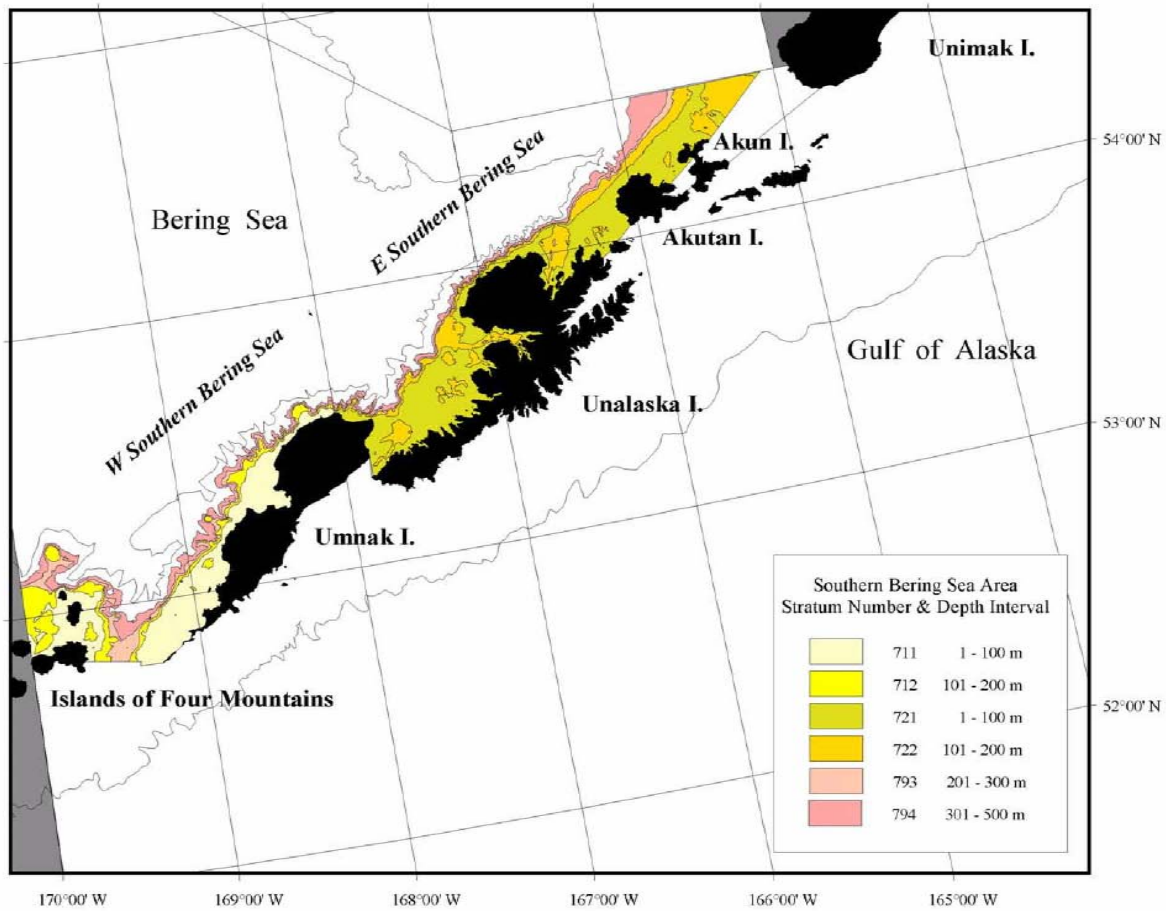
Appendix Figure A-1. -- Strata sampled during the Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-2. -- Strata sampled during the Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-3. -- Strata sampled during the Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-4. -- Strata sampled during the Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.

APPENDIX B

Appendix Table B-1. -- Fish species encountered and identified during the 2004 Aleutian Islands bottom trawl survey.

Family	Scientific name	Common name
Petromyzontidae	<i>Lampetra tridentata</i>	Pacific lamprey
	<i>Somniosus pacificus</i>	Pacific sleeper shark
Rajidae	<i>Rajidae</i> unident.	skate unident.
	<i>Raja binocularata</i>	big skate
	<i>Bathyrāja interrupta</i>	Bering skate
	<i>Bathyrāja taranetzi</i>	mud skate
	<i>Bathyrāja trachura</i>	rougthead skate
	<i>Bathyrāja parmifera</i>	Alaska skate
	<i>Bathyrāja aleutica</i>	Aleutian skate
	<i>Bathyrāja minispinosa</i>	whitebrow skate
	<i>Bathyrāja maculata</i>	whiteblotched skate
	<i>Bathyrāja mariposa</i>	butterfly skate
	Pleuronectidae	<i>Atheresthes stomias</i>
<i>Atheresthes evermanni</i>		Kamchatka flounder
<i>Reinhardtius hippoglossoides</i>		Greenland turbot
<i>Hippoglossus stenolepis</i>		Pacific halibut
<i>Hippoglossoides elassodon</i>		flathead sole
<i>Parophrys vetulus</i>		English sole
<i>Microstomus pacificus</i>		Dover sole
<i>Glyptocephalus zachirus</i>		rex sole
<i>Limanda aspera</i>		yellowfin sole
<i>Platichthys stellatus</i>		starry flounder
<i>Lepidopsetta polyxystra</i>		northern rock sole
<i>Lepidopsetta bilineata</i>		southern rock sole
<i>Isopsetta isolepis</i>		butter sole
<i>Pleuronectes quadrituberculatus</i>		Alaska plaice
Agonidae		<i>Leptagonus frenatus</i>
	<i>Leptagonus leptorhynchus</i>	longnose poacher
	<i>Bathyrāgonus alascanus</i>	gray starsnout
	<i>Bathyrāgonus infraspinatus</i>	spinycheek starsnout
	<i>Aspidophoroides bartoni</i>	Aleutian alligatorfish
	<i>Odontopyxis trispinosa</i>	pygmy poacher
	<i>Bathyrāgonus nigripinnis</i>	blackfin poacher
	<i>Podothecus accipenserinus</i>	sturgeon poacher
Ammodytidae	<i>Hypsagonus quadricornis</i>	fourhorn poacher
Ammodytidae	<i>Ammodytes hexapterus</i>	Pacific sand lance
Anoplopomatidae	<i>Anoplopoma fimbria</i>	sablefish
Bathylagidae	<i>Bathylagus pacificus</i>	Pacific blacksmelt
	<i>Leuroglossus schmidti</i>	northern smoothtongue
	<i>Bathylagus</i> sp.	blacksmelt unident.
	<i>Bathylagus milleri</i>	robust blacksmelt

Appendix Table B-1. -- (continued).

Family	Scientific name	Common name
Bathymasteridae	<i>Bathymaster caeruleofasciatus</i>	Alaskan ronquil
	<i>Bathymaster leurolepis</i>	smallmouth ronquil
	<i>Bathymaster signatus</i>	searcher
Clupeidae	<i>Clupea pallasii</i>	Pacific herring
Ophidiidae	<i>Ophidiidae</i> unident.	cusks-eel unident.
Ceratiidae	<i>Ceratiidae</i> unident.	seadevils unident.
Chauliodontidae	<i>Chauliodontidae</i>	viperfish unident.
	<i>Chauliodus macouni</i>	Pacific viperfish
Macrouridae	<i>Albatrossia pectoralis</i>	giant grenadier
	<i>Coryphaenoides cinereus</i>	popeye grenadier
Cottidae	<i>Thyriscus anoplus</i>	sponge sculpin
	<i>Gymnocanthus galeatus</i>	armorhead sculpin
	<i>Bolinia euryptera</i>	broadfin sculpin
	<i>Malacocottus zonurus</i>	darkfin sculpin
	<i>Hemilepidotus zapus</i>	longfin Irish lord
	<i>Hemilepidotus hemilepidotus</i>	red Irish lord
	<i>Hemilepidotus jordani</i>	yellow Irish lord
	<i>Triglops forficata</i>	scissortail sculpin
	<i>Triglops scepticus</i>	spectacled sculpin
	<i>Triglops metopias</i>	crescent-tail sculpin
	<i>Triglops macellus</i>	roughspine sculpin
	<i>Leptocottus armatus</i>	Pacific staghorn sculpin
	<i>Archistes biseriatus</i>	scaled sculpin
	<i>Myoxocephalus polyacanthocephalus</i>	great sculpin
	<i>Myoxocephalus quadricornis</i>	fourhorn sculpin
	<i>Enophrys lucasi</i>	leister sculpin
	<i>Enophrys diceraus</i>	antlered sculpin
	<i>Nautichthys pribilovius</i>	eyeshade sculpin
	<i>Triglops xenostethus</i>	scalybreasted sculpin
	<i>Icelus canaliculatus</i>	blacknose sculpin
	<i>Icelus spatula</i>	spatulate sculpin
	<i>Dasycottus setiger</i>	spinyhead sculpin
	<i>Hemitripterus bolini</i>	bigmouth sculpin
<i>Icelus spiniger</i>	thorny sculpin	
<i>Icelus euryops</i>	wide-eye sculpin	
<i>Icelus uncinatis</i>	uncinate sculpin	
<i>Rastrinus scutigera</i>	roughskin sculpin	
Gadidae	<i>Gadus macrocephalus</i>	Pacific cod
	<i>Theragra chalcogramma</i>	walleye pollock
	<i>Antimora microlepis</i>	Pacific flatnose
	<i>Sigmops gracilis</i>	slender fangjaw
Hexagrammidae	<i>Pleurogrammus monopterygius</i>	Atka mackerel
	<i>Hexagrammos lagocephalus</i>	rock greenling
	<i>Hexagrammos decagrammus</i>	kelp greenling
Cyclopteridae	<i>Aptocyclus ventricosus</i>	smooth lumpsucker
	<i>Lethotremus muticus</i>	docked snailfish

Appendix Table B-1. -- (continued).

Family	Scientific name	Common name
Cyclopteridae (cont.)	<i>Eumicrotremus orbis</i>	Pacific spiny lump sucker
	<i>Eumicrotremus</i> sp.	spiny lump suckers
	<i>Cyclopteropsis phrynooides</i>	toad lump sucker
	<i>Liparidinae</i>	snailfish unident.
	<i>Crystallichthys cyclospilus</i>	blotched snailfish
	<i>Liparis ochotensis</i>	Okhotsk snailfish
	<i>Allocareproctus jordani</i>	cherry snailfish
	<i>Careproctus melanurus</i>	blacktail snailfish
	<i>Careproctus simis</i>	long snouted pink snailfish
	<i>Careproctus ectenes</i>	shovelhead snailfish
	<i>Careproctus furcellus</i>	emarginate snailfish
	<i>Careproctus gilberti</i>	small disk snailfish
	<i>Careproctus rastrinus</i>	salmon snailfish
	<i>Careproctus zachirus</i>	paintbrush snailfish
	<i>Allocareproctus tanix</i>	peach snailfish
	<i>Careproctus cypselurus</i>	blackfin snailfish
	<i>Careproctus candidus</i>	big eye snailfish
	<i>Paraliparis</i> sp.	
	<i>Careproctus</i> sp. B (Orr)	
	Melamphaeidae	<i>Poromitra crassiceps</i>
<i>Melamphaes lugubris</i>		high snout big scale
Myctophidae	<i>Stenobranchius leucopsarus</i>	northern lampfish
	<i>Stenobranchius nannochir</i>	garnet lampfish
	<i>Tactostoma macropus</i>	longfin dragonfish
	<i>Diaphus theta</i>	California headlightfish
	<i>Nannobranchium regale</i>	pinpoint lampfish
	<i>Lampanyctus jordani</i>	brokenline lampfish
	<i>Protomyctophum thompsoni</i>	northern flashlightfish
	<i>Oneirodes</i> sp.	
	<i>Oneirodes bulbosus</i>	hairy-lure dreamer
	<i>Thaleichthys pacificus</i>	eulachon
Osmeridae	<i>Mallotus villosus</i>	capelin
	<i>Oncorhynchus keta</i>	chum salmon
Salmonidae		
Alepisauridae	<i>Alepisaurus ferox</i>	longnose lancetfish
Stichaeidae	<i>Lumpenella longirostris</i>	longsnout prickleback
	<i>Chirolophis decoratus</i>	decorated warbonnet
	<i>Poroclinus rothrocki</i>	whitebarred prickleback
	<i>Chirolophis nugator</i>	mosshead warbonnet
	<i>Bryzoichthys marjorius</i>	pearly prickleback
	<i>Opisthoproctidae</i> unid.	spookfish unident.
Opisthoproctidae		
Zaproridae	<i>Zaprora silenus</i>	prowfish
Zoarcidae	<i>Bothrocara brunneum</i>	twoline eelpout
	<i>Lycodes akuugun</i>	bicolor eelpout
	<i>Lycodes palearis</i>	wattled eelpout
	<i>Lycodes concolor</i>	ebony eelpout
	<i>Lycodes diapterus</i>	black eelpout

Appendix Table B-1. -- (continued).

Family	Scientific name	Common name
Zoarcidae (cont.)	<i>Lycodes brevipes</i>	shortfin eelpout
	<i>Lycodapus</i> sp.	
	<i>Nalbantichthys elongatus</i>	
Scorpaenidae	<i>Sebastobus alascanus</i>	shortspine thornyhead
	<i>Sebastobus macrochir</i>	broadfin thornyhead
	<i>Sebastes</i> sp.	rockfish unident.
	<i>Sebastes aleutianus</i>	roughey rockfish
	<i>Sebastes alutus</i>	Pacific ocean perch
	<i>Sebastes ciliatus</i>	dark rockfish
	<i>Sebastes variabilis</i>	dusky rockfish
	<i>Sebastes polyspinis</i>	northern rockfish
	<i>Sebastes babcocki</i>	redbanded rockfish
	<i>Sebastes variegatus</i>	harlequin rockfish
	<i>Sebastes borealis</i>	shortraker rockfish
	<i>Sebastes zacentrus</i>	sharpchin rockfish

Appendix Table B-2.—Invertebrate species encountered and identified during the 2004 Aleutian Islands bottom trawl survey.

Phylum	Scientific name	Common name
Cnidaria	Hydrozoa (class)	unidentified hydroid
	<i>Hydroid</i> sp. A	champagne flute hydroid
		pussywillow hydroid
	<i>Aglaophenia</i> sp.	
	Scyphozoa	jellyfish unident.
	<i>Chrysaora</i> sp.	chrysaora jellyfish
	<i>Periphylla periphylla</i>	
	<i>Chrysaora melanaster</i>	
	<i>Phacellophora camtschatica</i>	egg yolk jelly
	<i>Aequorea</i> sp.	
	<i>Atolla</i> sp.	
	<i>Aurelia</i> sp.	
	<i>Aurelia labiata</i>	
	<i>Aurelia aurita</i>	
	<i>Cyanea</i> sp.	
	<i>Cyanea capillata</i>	lion's mane
	Alcyonacea	soft coral unident.
	<i>Alyconaria unident.</i>	octocoral unident.
	<i>Alcyonium</i> sp.	
	<i>Gersemia</i> sp.	sea raspberry
	<i>Anthomastus</i> sp.	
	<i>Anthomastus</i> sp. A	red anthomastus
	<i>Anthomastus</i> sp. B	gray anthomastus
	Gorgonacea	gorgonian coral unident.
	<i>Primnoa pacifica</i>	
	<i>Primnoa willeyi</i>	red tree coral
	<i>Swiftia</i> sp.	
	<i>Paragorgia</i> sp.	
	<i>Paragorgia arborea</i>	Kamchatka coral
	<i>Euplexaura</i> sp.	
	<i>Alaskagorgia aleutiana</i>	
	<i>Callogorgia</i> sp.	
	<i>Calcigorgia</i> sp.	
	<i>Calcigorgia spiculifera</i>	
	<i>Clavularia</i> sp.	
	Pennatulacea	sea pen or sea whip unident.
	Virgularidae	sea whip unident.
	<i>Stylatula</i> sp.	slender seawhips
	<i>Ptilosarcus</i> sp.	
	<i>Ptilosarcus gurneyi</i>	orange sea pen
	Actiniaria	sea anemone unident.
<i>Actinauge verrillii</i>	reticulate anemone	
	purple striated sea anemone	

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Cnidaria (cont.)	<i>Corallimorphus</i> sp.	
	<i>Metridium farcimen</i> (= <i>Metridium giganteum</i>)	gigantic anemone
	<i>Stomphia</i> sp.	
	<i>Stomphia coccinea</i>	swimming anemone
	<i>Urticina crassicornis</i>	mottled anemone
	<i>Bathypheilia australis</i>	hot dog sea anemone
	<i>Cribrinopsis fernaldi</i>	chevron-tentacled anemone
	<i>Liponema brevicornis</i>	tentacle-shedding anemone
	Actinostolidae	
	Hormathiidae	
	<i>Zoanthus</i> sp.	
	Scleractinia unident.	stony coral unident.
	<i>Javania borealis</i>	
	<i>Javania</i> sp.	
	<i>Caryophyllia</i> sp.	
	<i>Caryophyllia</i> sp. A	
	<i>Caryophyllia alaskensis</i>	Alaska cup coral
	Stylasterina unident.	hydrocoral unident.
	<i>Stylaster</i> sp.	
	<i>Stylaster brochi</i>	
	<i>Stylaster cancellatus</i>	
	<i>Stylaster elassotomus</i>	
	<i>Stylaster polyorchis</i>	
	<i>Crypthelia trophostega</i>	
	<i>Stylaster campylecus</i>	
	<i>Stylaster moseleyana</i>	
	<i>Cyclohelia lamellata</i>	
	<i>Cyclohelia</i> sp.	
	<i>Cyclohelia</i> sp. A (Clark 1997)	
	<i>Stylaster stejnegeri</i>	
	<i>Distichopora</i> sp.	
	<i>Distichopora borealis</i>	
	<i>Errinopora pourtalesi</i>	
	<i>Errinopora</i> sp.	
	<i>Errinopora nanneca</i>	
	<i>Plumarella</i> sp.	
	<i>Plumarella</i> sp. 1 (Bayer)	
	<i>Thouarella</i> sp.	
	<i>Fanellia</i> sp.	
	<i>Fanellia compressa</i>	
<i>Fanellia fraseri</i>		
<i>Muriceides nigra</i>		
<i>Muriceides</i> sp.		
<i>Amphilaphis</i> sp.		
<i>Amphilaphis</i> sp. 1		
<i>Amphilaphis</i> sp. 3		

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Cnidaria (cont.)	<i>Arthrogorgia</i> sp.	
Ctenophora	various unidentified species	
	<i>Beroe</i> sp.	
Annelida	Polychaeta (class)	polychaete worm unidentified
	<i>Aphrodita</i> sp.	
	<i>Aphrodita negligens</i>	
	Polynoidae	scale worm unident.
	<i>Eunoe</i> sp.	
	<i>Eunoe nodosa</i>	giant scale worm
	<i>Eunoe depressa</i>	depressed scale worm
		bristle worm unident.
	<i>Hirudinea</i> unident.	leech unident.
	<i>Carcinobdella</i> sp.	
	<i>Notostombdella</i> (= <i>Carcinobdella</i>) <i>cyclostomum</i>	striped sea leech
Arthropoda	Amphipoda	amphipod unidentified
	Gammaridae	gammarid amphipod unidentified
	Isopoda	isopod unidentified
	Arcturidae	
	Mysidacea	mysid unident.
	<i>Gnathophausia gigas</i>	
	<i>Gnathophausia ingens</i>	
	Thoracica	barnacle unident.
	<i>Balanus</i> sp.	
	<i>Balanus evermanni</i>	giant barnacle
	<i>Balanus hesperius</i>	crab barnacle
	<i>Balanus rostratus</i>	beaked barnacle
	<i>Scalpellum cornutum</i>	eared barnacle
		shrimp unident.
	Sergestidae	sergestid shrimp unident.
	<i>Pandalus borealis</i>	northern shrimp
	<i>Pandalus tridens</i>	yellowleg pandalid
	<i>Pandalus goniurus</i>	humpy shrimp
	<i>Pandalopsis aleutica</i>	
	<i>Pandalopsis dispar</i>	sidestripe shrimp
	<i>Pandalopsis ampla</i>	
	<i>Eualus</i> sp.	
	<i>Lebbeus groenlandicus</i>	spiny lebbeid
	<i>Lebbeus polaris</i>	
	Crangonidae	crangonid shrimp unident.
	<i>Crangon communis</i>	twospine crangon
	<i>Crangon dalli</i>	ridged crangon
	<i>Metacrangon variabilis</i>	deepsea spinyhead
	<i>Argis</i> sp.	
	<i>Argis dentata</i>	Arctic argid
	<i>Sclerocrangon boreas</i>	sculptured shrimp
	<i>Rhynocrangon sharpi</i>	

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Arthropoda (cont.)	<i>Argis lar</i>	kuro argid
	<i>Argis ovifer</i>	split-eye argid
	<i>Pasiphaea pacifica</i>	Pacific glass shrimp
	<i>Pasiphaea tarda</i>	crimson pasiphaeid
	<i>Cancer oregonensis</i>	Oregon rock crab
	<i>Oregonia bifurca</i>	
	<i>Oregonia gracilis</i>	graceful decorator crab
	<i>Chorilia longipes</i>	Longhorned decorator crab
	<i>Chionoecetes tanneri</i>	grooved Tanner crab
	<i>Chionoecetes bairdi</i>	Tanner crab
	<i>Hyas coarctatus</i>	circumboreal toad crab
	<i>Hyas lyratus</i>	Pacific lyre crab
	<i>Pagurus</i> sp.	
	<i>Pagurus brandti</i>	sponge hermit
	<i>Pagurus aleuticus</i>	Aleutian hermit
	<i>Labidochirus splendescens</i>	splendid hermit
	<i>Pagurus confragosus</i>	knobbyhand hermit
	<i>Pagurus cornutus</i>	
	<i>Pagurus dalli</i>	whiteknee hermit
	<i>Pagurus kennerlyi</i>	bluespine hermit
	<i>Pagurus trigonocheirus</i>	fuzzy hermit crab
	<i>Pagurus ochotensis</i>	Alaskan hermit
	<i>Pagurus rathbuni</i>	longfinger hermit
	<i>Pagurus tanneri</i>	longhand hermit
	<i>Elassochirus tenuimanus</i>	widehand hermit crab
	<i>Pagurus capillatus</i>	hairy hermit crab
	<i>Elassochirus cavimanus</i>	purple hermit
	Lithodidae unident.	stone crab unident.
	<i>Acantholithodes hispidus</i>	fuzzy crab
	<i>Lithodes couesi</i>	scarlet king crab
	<i>Lithodes aequispina</i>	golden king crab
	<i>Hapalogaster grebnitzkii</i>	
	<i>Rhinolithodes wosnessenskii</i>	rhinoceros crab
	<i>Paralithodes camtschaticus</i>	red king crab
	<i>Placetron wosnessenskii</i>	scaled crab
	<i>Erimacrus isenbeckii</i>	horsehair crab
	<i>Pugettia</i> sp.	kelp crab
	<i>Munida quadrispina</i>	pinchbug
	Pycnogonida	sea spider unident.
	<i>Colossendeis</i> sp.	
	<i>Colossendeis microsetosa</i>	
<i>Neomenia</i> sp.		
Mollusca	Polyplacophora unident.	chiton unident.
	<i>Cryptochiton stelleri</i>	giant Pacific chiton
	<i>Lepidozona beringiana</i>	
	<i>Lepidozona abyssicola</i>	

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Mollusca (cont.)	<i>Lepidozona</i> sp.	
	<i>Amicula vestita</i>	
	<i>Placiphorella pacifica</i>	
	<i>Leptochiton belknapi</i>	
	Nudibranchia unident.	nudibranch unident.
	<i>Tochuina tetraquetra</i>	giant orange tochui
	<i>Cadlina luteomarginata</i>	yellow-edged cadlina
	<i>Dendronotus</i> sp.	
	<i>Dendronotus dalli</i>	Dall's dendronotid
	<i>Tritonia</i> sp.	
	<i>Tritonia diomedea</i>	rosy tritonia
		dorid nudibranch unident.
	<i>Archidoris odhneri</i>	white night doris
	<i>Cranopsis major</i>	great puncturella
	Gastropod unident.	snail unident.
	<i>Bulbus fragilis</i>	fragile moonsnail
	<i>Cryptonatica (=Natica) aleutica</i>	Aleutian moonsnail
	Muricidae	
	<i>Lamellaria</i> sp.	
	<i>Colus periscelidus</i>	garter whelk
	<i>Colus spitzbergensis</i>	thick-ribbed whelk
	<i>Colus halli</i>	shrew whelk
	<i>Japelion aleutica</i>	
	<i>Japelion</i> sp.	
	<i>Pyrulofusus dexius</i>	
	<i>Volutopsius</i> sp.	
	<i>Pyrulofusus deformis</i>	warped whelk
	<i>Pyrulofusus harpa</i>	left-hand whelk
	<i>Volutopsius regularis</i>	regular whelk
	<i>Volutopsius</i> sp. A (McLean & Clark)	
	<i>Beringius</i> sp.	
	<i>Beringius kennicottii</i>	
	<i>Beringius undatus</i>	
	<i>Beringius</i> sp. A	
	<i>Beringius</i> sp. B	
	<i>Beringius</i> sp. D (McLean & Clark)	
	<i>Neptunea</i> sp.	
	<i>Neptunea amianta</i>	
	<i>Neptunea pribiloffensis</i>	Pribilof whelk
	<i>Neptunea middendorffii</i>	
<i>Neptunea lyrata</i>	lyre whelk	
<i>Neptunea ventricosa</i>	fat whelk	
<i>Plicifusus kroyeri</i>		
<i>Torellia ammonia</i>	rams-horn hairsnail	
<i>Boreotrophon elegantulus</i>		
<i>Fusitriton oregonensis</i>	Oregon triton	

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Mollusca (cont.)	<i>Margarites</i> sp.	
	<i>Buccinum picturatum</i>	
	<i>Buccinum</i> sp.	
	<i>Buccinum sigmatopleura</i>	
	<i>Buccinum eugrammatum</i>	lirate whelk
	<i>Buccinum plectrum</i>	sinuous whelk
	<i>Buccinum scalariforme</i>	ladder whelk
	<i>Buccinum castaneum</i>	chestnut whelk
	<i>Bathybuccinum clarki</i>	Roger's buccinid
	<i>Arctomelon stearnsii</i>	Alaska volute
	<i>Arctomelon tamikoe</i>	
	<i>Bivalvia</i> unident.	bivalve unident.
	Mytilidae	mussel unident.
	<i>Modiolus modiolus</i>	northern horse mussel
	<i>Chlamys albida</i>	white scallop
	<i>Chlamys</i> sp.	
	<i>Chlamys behringiana</i>	Iceland scallop
	<i>Chlamys rubida</i>	reddish scallop
	<i>Chlamys erythocomata</i>	
	<i>Patinopecten caurinus</i>	weathervane scallop
	<i>Hiatella arctica</i>	Arctic hiatella
	<i>Yoldia</i> sp.	
	<i>Limopsis akutanica</i>	Akutan limops
	<i>Empleconia vaginata</i>	vaginated limops
	<i>Musculus</i> sp.	
	<i>Musculus discors</i>	discordant mussel
	<i>Astarte crenata</i>	crenulate astarte
	<i>Clinocardium</i> sp.	
	<i>Clinocardium ciliatum</i>	hairy cockle
	<i>Serripes groenlandicus</i>	Greenland cockle
	<i>Pododesmus macroschisma</i>	Alaska falsejingle
	<i>Octopus</i> sp.	
	<i>Japatella diaphana</i>	
	<i>Opisthoteuthis californiana</i>	flapjack devilfish
	<i>Octopus dofleini</i>	giant octopus
	<i>Octopus rubescens</i>	
	<i>Benthoctopus</i> sp.	
	Teuthoidea	squid unident.
		squid eggs unident.
	<i>Rossia pacifica</i>	eastern Pacific bobtail
<i>Rossia pacifica</i> eggs		
<i>Gonatus</i> sp.		
<i>Gonatus madokai</i>		
<i>Berryteuthis magister</i>	magistrate armhook squid	
<i>Gonatopsis borealis</i>	boreopacific armhook squid	
<i>Chiroteuthis calyx</i>		

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Mollusca (cont.)	<i>Taonius pavo</i>	
	<i>Histioteuthis hoylei</i>	
Echinodermata	Asteroidea unident.	starfish unident.
	<i>Evasterias troschelii</i>	mottled sea star
	<i>Evasterias echinosoma</i>	giant sea star
	<i>Orthasterias koehleri</i>	redbanded sea star
	<i>Leptasterias hylodes</i>	Aleutian sea star
	<i>Leptasterias coei</i>	
	<i>Pycnopodia helianthoides</i>	sunflower sea star
	<i>Lethasterias nanimensis</i>	blackspined sea star
	<i>Pedicellaster magister</i>	majestic sea star
	<i>Stephanasterias albula</i>	
	<i>Henricia</i> sp.	
	<i>Henricia sanguinolenta</i>	sanguine sea star
	<i>Henricia aspera</i>	ridged blood star
	<i>Henricia leviuscula</i>	blood sea star
	<i>Henricia tumida</i>	tumid sea star
	<i>Henricia asthenactis</i>	
	<i>Henricia longispina</i>	
	<i>Henricia multispina</i>	
	<i>Odontohenricia</i> sp.	
	<i>Odontohenricia</i> sp. A (Clark)	
	<i>Odontohenricia</i> sp. B (Clark)	
	<i>Odontohenricia</i> sp. C (Clark)	
	<i>Leptasterias polaris</i>	
	<i>Leptasterias arctica</i>	
	<i>Leptasterias</i> sp.	
	<i>Gephyreaster swifti</i>	Swift's sea star
	<i>Pseudarchaster alascensis</i>	
	<i>Odontaster</i> sp. B (Clark)	
	<i>Hippasteria</i> sp.	
	<i>Hippasteria kurilensis</i>	
	<i>Hippasteria armata</i>	
	<i>Hippasteria</i> sp. A (Clark, 1999)	
	<i>Hippasteria</i> sp. B (Clark)	
	<i>Hippasteria heathi</i>	
	<i>Hippasteria leiopelta</i>	
	<i>Hippasteria spinosa</i>	spiny red sea star
	<i>Pseudarchaster parelii</i>	scarlet sea star
	<i>Mediaster tenellus</i>	
	<i>Mediaster aequalis</i>	vermillion sea star
	<i>Ceramaster</i> sp.	
	<i>Ceramaster japonicus</i>	red bat star
	<i>Ceramaster patagonicus</i>	orange bat sea star
	<i>Ceramaster arcticus</i>	Arctic bat sea star
	<i>Luidia foliolata</i>	sand sea star

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Echinodermata (cont.)	<i>Solaster</i> sp.	
	<i>Solaster endeca</i>	northern sun sea star
	<i>Solaster hypothrissus</i>	
	<i>Solaster</i> sp. B	
	<i>Solaster dawsoni</i>	morning sun sea star
	<i>Solaster stimpsoni</i>	striped sun sea star
	<i>Solaster</i> sp. A (Clark 1997)	
	<i>Solaster</i> sp. C	
	<i>Solaster</i> sp. D (Clark)	
	<i>Solaster</i> sp. E (Clark)	
	<i>Solaster</i> sp. F (Clark)	
	<i>Solaster paxillatus</i>	evening sun sea star
	<i>Crossaster</i> sp.	
	<i>Crossaster borealis</i>	grooved sea star
	<i>Crossaster</i> sp. A (Clark)	
	<i>Crossaster</i> sp. B (Clark)	
	<i>Crossaster papposus</i>	rose sea star
	<i>Lophaster vexator</i>	
	<i>Lophaster furcilliger</i>	crested sea star
	<i>Pteraster</i> sp.	
	<i>Pteraster</i> sp. cf. <i>temnochiton</i> (Clark, 1999)	
	<i>Pteraster temnochiton</i>	cushion sea star
	<i>Pteraster</i> sp. A (Clark, 1999)	
	<i>Pteraster</i> sp. B (Clark, 1997)	
	<i>Pteraster tessellatus</i>	
	<i>Pteraster</i> sp. C (Clark)	
	<i>Pteraster militaris</i>	wrinkled star
	<i>Pteraster marssipus</i>	
	<i>Pteraster pulvillus</i>	
	<i>Diplopteraster multipes</i>	pincushion sea star
	<i>Ctenodiscus crispatus</i>	common mud star
	<i>Leptychaster anomalus</i>	
	<i>Leptychaster arcticus</i>	North Pacific sea star
	<i>Cladaster validus</i>	
	<i>Dipsacaster borealis</i>	northern sea star
	<i>Cheiraster</i> sp.	
	<i>Cheiraster</i> (=Luidiaster) <i>dawsoni</i>	fragile sea star
	<i>Nearchaster variabilis</i>	
	<i>Anteliaster</i> sp.	
	<i>Strongylocentrotus droebachiensis</i>	green sea urchin
	<i>Strongylocentrotus</i> sp.	
	<i>Strongylocentrotus polyacanthus</i>	
	<i>Strongylocentrotus pallidus</i>	white sea urchin
	<i>Allocentrotus fragilis</i>	orange-pink sea urchin
	<i>Echinarachnius parma</i>	parma sand dollar crinoid unident.

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Echinodermata (cont.)	<i>Retiometra alascana</i>	Alaskan crinoid
	<i>Florometra</i> sp.	
	<i>Ophiuroid</i> unident.	brittlestarfish unident.
	<i>Gorgonocephalus eucnemis</i>	basketstar
	<i>Asteronyx</i> sp.	
	<i>Asteronyx loveni</i>	serpent sea star
	<i>Astrochele laevis</i>	
	<i>Astrochele</i> sp.	
	<i>Ophiura</i> sp.	
	<i>Ophiura sarsi</i>	notched brittlestar
	<i>Stegophiura ponderosa</i>	
	<i>Ophiopholis</i> sp.	
	<i>Ophiopholis longispina</i>	
	<i>Ophiopholis aculeata</i>	ubiquitous brittle star
	<i>Ophiolebes</i> sp.	
	<i>Holothuroidea</i> unident.	sea cucumber unident.
	<i>Cucumaria japonica</i>	
	<i>Chiridota</i> sp.	
	<i>Bathyplores</i> sp.	
	<i>Cucumaria</i> sp.	
	<i>Cucumaria fallax</i>	sea football
	Psolidae	
	<i>Psolus</i> sp.	
	<i>Psolus fabricii</i>	brownscaled sea cucumber
	<i>Psolus squamatus</i>	whitescaled sea cucumber
	<i>Psolus japonicus</i>	
	<i>Pannychia moseleyi</i>	
	<i>Synallactes</i> sp.	
	<i>Synallactes challengerii</i>	
	Porifera	Porifera
<i>Suberites</i> sp.		
<i>Suberites ficus</i>		hermit sponge
<i>Aphrocallistes vastus</i>		clay pipe sponge
<i>Mycale</i> sp.		
<i>Mycale loveni</i>		tree sponge ginseng sponge
<i>Geodia mesotriaena</i>		
<i>Geodia</i> sp.		
<i>Acanthascus</i> sp.		
<i>Halichondria</i> sp.		
<i>Halichondria panicea</i>		barrel sponge
<i>Leucandra heathi</i>		spiny vase sponge
<i>Rhabdocalyptus</i> sp.		cloud sponge
<i>Mycale bellabellensis</i>		lampshade sponge scapula sponge

Appendix Table B-2. -- (continued).

Phylum	Scientific name	Common name
Porifera (cont.)	<i>Phakellia dalli</i>	cat-o-nine-tails sponge
	<i>Myxilla incrustans</i>	scallop sponge
		soft green sponge
	<i>Plicatellopsis amphispicula</i>	firm finger sponge
	<i>Histodermella</i> sp. A (Clark 2006)	spud sponge
		club sponge
	<i>Leucosolenia blanca</i>	yellow leafy sponge
	<i>Tethya</i> sp.	ball sponge
	<i>Halichondria sitiens</i>	black papillate sponge
	<i>Halichondria cf. sitiens</i>	yellow green papillate sponge
		Yellow papillate sponge
		orange encrusting sponge
		stone sponge
	<i>Neoesperiopsis rigida</i>	soft finger sponge
	<i>Neoesperiopsis infundibula</i>	
		orange papillate sponge
		cheesestick sponge
		pita sponge
		glass sponge unident.
	<i>Hexactinellida</i>	
	<i>Staurocalyptus</i> sp.	
	<i>Craniella</i> sp.	
		puffball sponges
		calcareous finger sponge
Sipuncula	Platyhelminthes	flatworm unident.
	Nemertea	nemertean worm unident.
	Sipuncula	peanut worm unid.
	Echiura	echiuroid worm unident.
Bryozoa	Bryozoa unident.	bryozoan unident.
	<i>Eucratea loricata</i>	feathery bryozoan
	<i>Flustra serrulata</i>	leafy bryozoan
	<i>Flustrellidra corniculata</i>	
	<i>Myriozooum subgracile</i>	
	<i>Porella compressa</i>	flattened bryozoan
	<i>Rhamphostomella costata</i>	ribbed bryozoan
	<i>Terebratulina unguicula</i>	snakeshead brachiopod
	<i>Laqueus californianus</i>	California lamp shell
Chordata	Ascidian unident.	tunicate unident.
	<i>Thaliacea</i> unident.	salp unident.
	<i>Styela</i> sp.	
	<i>Styela rustica</i>	sea potato
	<i>Boltenia ovifera</i>	
	<i>Halocynthia aurantium</i>	sea peach
	<i>Cnemidocarpa finsmarkiensis</i>	
	<i>Aplidium</i> sp.	sea glob
<i>Molgula griffithsii</i>	sea grape	

APPENDIX C

Appendix Table C-1. -- Length-weight parameters (a and b) for species where individual length and weight data were collected. The number of individuals measured and weighed (n) is also provided.

Species	Sex	a	b	n	Species	Sex	a	b	n
<i>Atheresthes stomais</i>	Male	2.223E-06	3.22	302	<i>Sebastes aleutianus</i>	Male	4.181E-06	3.224	229
	Female	1.123E-06	3.347	463		Female	5.008E-06	3.194	245
	Both	1.213E-06	3.331	765		Both	4.622E-06	3.208	474
<i>Atheresthes evermanni</i>	Male	3.304E-06	3.183	10	<i>Sebastes alutus</i>	Male	9.158E-06	3.075	465
	Female	2.054E-06	3.26	43		Female	1.168E-05	3.029	547
	Both	9.721E-07	3.375	95		Both	1.074E-05	3.045	1012
<i>Reinhardtius hippoglossoides</i>	Male	6.584E-06	3.035	169	<i>Sebastes ciliatus</i>	Male	3.060E-06	3.301	12
	Female	4.959E-07	3.448	76		Female	1.316E-05	3.038	45
	Both	7.023E-08	3.731	245		Both	1.616E-05	3.006	57
<i>Lepidopsetta polyxystra</i>	Male	4.264E-06	3.167	268	<i>Sebastes variabilis</i>	Male	2.650E-05	2.931	105
	Female	3.529E-06	3.202	380		Female	3.875E-06	3.25	94
	Both	3.720E-06	3.192	648		Both	1.416E-05	3.035	199
<i>Lepidopsetta bilineata</i>	Male	9.052E-06	3.044	109	<i>Sebastes polyspinis</i>	Male	6.277E-06	3.14	228
	Female	3.297E-06	3.229	190		Female	1.617E-05	2.979	288
	Both	3.913E-06	3.197	299		Both	1.093E-05	3.045	516
<i>Albatrossia pectoralis</i>	Male	2.014E-03	2.52	18	<i>Sebastes borealis</i>	Male	4.788E-06	3.209	322
	Female	1.253E-03	2.606	170		Female	2.252E-06	3.335	310
	Both	1.243E-03	2.608	188		Both	3.728E-06	3.251	633
<i>Gadus macrocephalus</i>	Male	2.612E-06	3.228	376	<i>Bathyraja taranetzi</i>	Male	6.240E-06	2.968	132
	Female	2.444E-06	3.242	401		Female	1.846E-06	3.171	122
	Both	2.496E-06	3.237	777		Both	3.696E-06	3.056	254
<i>Theragra chalcogramma</i>	Male	4.964E-06	3.063	240	<i>Bathyraja parmifera</i>	Male	2.663E-06	3.149	119
	Female	7.067E-06	3.003	353		Female	1.609E-06	3.228	102
	Both	6.259E-06	3.024	593		Both	2.011E-06	3.192	221
<i>Pleurogrammus monopterygius</i>	Male	1.769E-06	3.337	290	<i>Bathyraja aleutica</i>	Male	1.583E-06	3.184	36
	Female	5.363E-06	3.198	319		Female	1.041E-06	3.245	57
	Both	3.380E-06	3.221	609		Both	1.101E-06	3.236	93
<i>Sebastolobus alascanus</i>	Male	2.734E-06	3.256	378	<i>Bathyraja maculata</i>	Male	1.501E-06	3.219	211
	Female	1.821E-06	3.328	422		Female	9.262E-07	3.298	245
	Both	2.274E-06	3.289	818		Both	1.163E-06	3.261	456