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Data Report: 2010 Aleutian Islands Bottom Trawl Survey

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P.G. von Szalay, C.N. Rooper, N.W. Raring, and M.H. Martin

U.S. DEPARTMENT OF COMMERCE
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ABSTRACT

The fifth biennial groundfish assessment survey of the Aleutian Islands region was conducted during the summer of 2010 by the Alaska Fisheries Science Center's (AFSC) Resource Assessment and Conservation Engineering (RACE) Division. This effort constitutes the eleventh in the full series dating from 1980. 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 the Islands of Four Mountains. The survey was conducted aboard two chartered trawlers, the FV *Ocean Explorer* and FV *Sea Storm*. Samples were collected successfully at 418 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. Pacific ocean perch, or POP (*Sebastes alutus*), and Atka mackerel (*Pleurogrammus monopterygius*) were by far the most abundant species in the survey area with estimated biomasses greater than 976,000 and 930,000 metric tons (t), respectively. Catches of POP were large throughout the survey area at intermediate depths. Arrowtooth flounder (*Atheresthes stomias*) were the dominant flatfish species and were ubiquitous. The skate assemblage was made up of predominantly two species, whiteblotched skate (*Bathyraja maculata*) and Aleutian skate (*B. aleutica*), with a wide diversity of 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, population size composition, and length-weight relationships for commercially important species and for others of biological interest.

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INTRODUCTION

The 2010 biennial bottom trawl survey of the Aleutian Islands region was conducted from 6 June through 14 August by the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), National Marine Fisheries Service (NMFS), Seattle, Washington, marking the eleventh comprehensive NMFS bottom trawl survey of this area 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, although the survey scheduled for 2008 was cancelled. The primary focus of these surveys is to build a standardized time series of data to assess, describe, and monitor the distribution, abundance, and biological condition of Aleutian groundfish and invertebrate stocks. This report presents 2010 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) define the distribution and relative abundance of the principal groundfish and important invertebrate species that inhabit the Aleutian region; 2) obtain data from which to estimate the abundance of principal groundfish species; 3) collect data to define biological parameters including age, growth rates, length-weight relationships, feeding habits, and size and sex compositions; 4) collect accurate net mensuration data describing the performance of standard research trawls used by all of the vessels during the survey; 5) conduct special collections as requested by other researchers or research groups. Special collections were made for projects addressing genetics of three species of rockfish, two species of flatfish, Pacific hake, sculpins, and zoarcoid fishes; Atka mackerel growth and maturity; biological or life history characteristics of sharks, myctophids, mollusks, nudibranchs, octopus, sculpins, greenlings, eelpouts, pricklebacks, wrymouths, poachers, and snailfish; coral diversity and habitat; crabs with associated snailfish eggs; skate egg case distributions; trophic level assessment of Pacific cod, pollock, and giant grenadier; ambient light effects on trawl catches; acoustic profiling; and observations of short-tailed albatross.

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 necessitating the use of bobbin-style roller gear on the research trawls (Stauffer 2004). Extending over 1,670 km 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 the Islands of Four Mountains (Fig. 1). Survey depths range from nearshore waters to 500 m. The total survey area is about 64,415 km^2 (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 the sampled depths, the 1-100 m and 101-200 m depth intervals make up 33.5% and 30.4% of the area, respectively. Reflecting the fact that the upper continental slope is relatively 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.

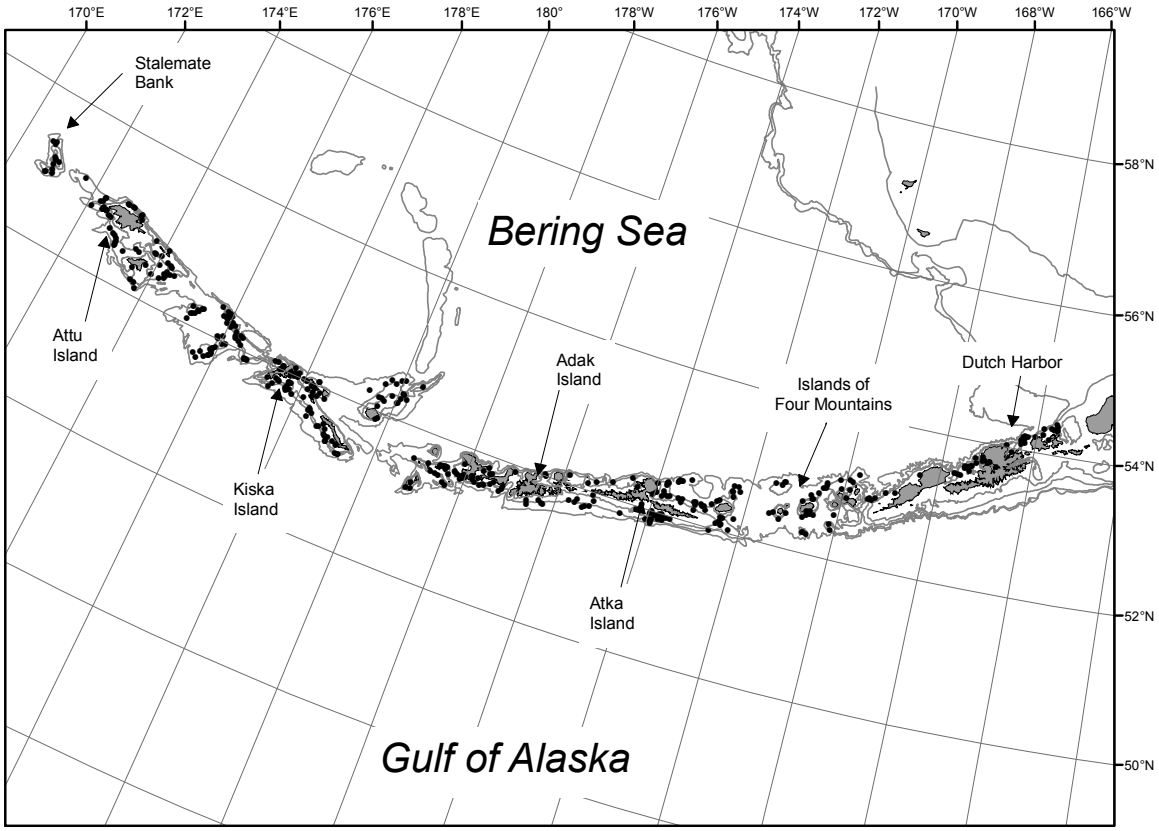

Figure 1. -- Locations of trawl hauls (black dots) performed during the 2010 bottom trawl survey of the Aleutian Islands.

Vessels

Both chartered vessels were house-forward stern trawlers with stern ramps and two net storage reels mounted either over the stern ramp (*Sea Storm*) or directly behind the house (*Ocean Explorer*), telescoping deck cranes, propeller nozzles, and paired, controlled-tension hydraulic trawl winches containing between 1,280 and 1,460 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 *Ocean Explorer* is 47.2 m LOA with an 1,800 HP main engine. Aboard both vessels electronic equipment included global positioning system (GPS)

with video position plotters, at least two radars, single sideband and VHF transmitter-receivers, color video fishfinders (echosounders), paper recorder echosounders, and auto-pilots. Captains Rick Loan and Darin Vanderpol operated the *Ocean Explorer* for one and two legs, respectively. The *Sea Storm* was operated by Captain Steve Branstiter for all three legs.

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 certified as conforming to standard measurements and dimensions prior to its use in the survey.

Survey Design

For this survey the Aleutian region is divided geographically into four NPFMC regulatory areas. Those areas are further divided into 45 area-depth strata or subareas based on bathymetry (Appendix A). Survey depth strata 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 standard research trawl and to meet trawl duration and performance criteria have been reasonably well defined during past surveys. Thus, the vast majority of allocated stations for the 2010 survey were placed at or near locations sampled during previous 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, Rooper and Wilkins 2008, von Szalay et al. 2008, von Szalay et al. 2010), sampling effort for each stratum was determined using a modified Neyman optimum allocation sampling strategy (Cochran 1977) which considers relative abundances of commercially important groundfish species from the previous five surveys of the area and the current ex-vessel value of each species. A maximum 420 stations was estimated as the number of trawls that we could expect to complete given survey time and vessel scheduling restrictions, expected weather days, and other logistics such as time lost to gear repairs. The allocation model drew random stations within each stratum from a 5 by 5 km grid imposed on the entire survey area. A minimum of two stations was allocated to any given stratum. Most of the 420 allocated tow locations were selected randomly without replacement from a database of previously conducted tows, but to satisfy the minimal sampling requirements in certain strata, some previously unsampled stations were required in some strata. Assigned sample densities were highest in the 101-200 m and 201-300 m depth intervals at about 9 tows per 1,000 km^2 (Table 1). Surveywide, the projected overall sample density was 6.5 tows per 1,000 km^2. If fishing gear conflicts or rough or otherwise untrawlable bottom prevented us from sampling a particular pre-selected station, we used an alternate station in the same stratum as a replacement. To locate new or alternate tow sites, search patterns were run within the proper stratum using an echosounder to locate trawlable bottom where a successful 15-minute tow could be conducted. Search time to find an alternate station was limited to 2 hours duration.

Table 1. -- Number of stations allocated, attempted, successfully completed, and sampling density for the 2010 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	32	33	32	4,877	6.56
	101 - 200	55	57	55	5,318	10.34
	201 - 300	22	22	22	1,724	12.76
	301 - 500	9	9	9	3,272	2.75
	All depths	**118**	**121**	**118**	**15,190**	**7.77**
Central Aleutians	1 - 100	48	49	48	5,847	8.21
	101 - 200	47	47	47	4,606	10.20
	201 - 300	22	23	21	2,109	9.96
	301 - 500	12	12	12	3,981	3.01
	All depths	**129**	**131**	**128**	**16,543**	**7.74**
Eastern Aleutians	1 - 100	21	21	21	6,848	3.07
	101 - 200	55	57	55	7,768	7.08
	201 - 300	34	37	33	4,901	6.73
	301 - 500	12	13	12	5,683	2.11
	All depths	**122**	**128**	**121**	**25,200**	**4.80**
Southern Bering Sea	1 - 100	27	29	27	4,026	6.71
	101 - 200	14	15	14	1,849	7.57
	201 - 300	5	5	5	564	8.87
	301 - 500	5	7	5	1,043	4.79
	All depths	**51**	**56**	**51**	**7,482**	**6.82**
All areas	1 - 100	128	132	128	21,598	5.93
	101 - 200	171	176	171	19,540	8.75
	201 - 300	83	87	81	9,298	8.71
	301 - 500	38	41	38	13,979	2.72
	All depths	**420**	**436**	**418**	**64,415**	**6.49**

Trawl Performance Data Collection

A concerted effort was made to standardize towing procedures. The operational 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. Standard scope tables of trawl warp relative to bottom depth were used (Stauffer 2004). Towing time was abbreviated on some occasions to avoid potential gear damage or when the echosounder indicated upcoming obstacles or the net mensuration measurements suggested the net configuration was abnormal. The date, time, and GPS-generated position were recorded every 2 seconds during each tow. Pressure at depth (transformed as estimated depth), water temperature, and time were recorded every 2 seconds during most tows using a SeaBird Model SBE-39 data logger which was attached near the middle of the trawl headrope. During the tow the vertical and horizontal trawl openings were monitored with Scanmar net sonde units, however, on occasion, the units were not deployed on the net to avoid the likelihood of loss or damage due to extremely rough bottom conditions. A bottom contact sensor was attached to the midpoint of the roller gear to record the date, time, and acceleration in three dimensions relative to bottom, indicating the degree of contact with the bottom. 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 measurements collected during each 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, and there were no significant encounters with other fishing gear. The minimum accepted duration for satisfactory tows was about 10 minutes except when the net mensuration data indicated that a large catch had occurred and the codend was full.

Catch Processing and Data Collection

Catches weighing up to approximately 1,100 kg were emptied directly onto a sorting table, sorted to species (or species group for some invertebrates), and weighed to the nearest 10 g using a Marel Model M1100 electronic digital platform scale. Species catches weighing less than about 2 kg were generally weighed to the nearest 2 g on a smaller capacity, electronic Marel Model M60 digital scale. Larger catches that contained more than about 1,100 kg were often processed completely by splitting the total catch onto the table in two or more portions. Very large catches that could be lifted off the deck in the codend were weighed with a dynamometer (load cell) when the sea state was not too rough, and the weights of the largest catches (exceeding approximately 6 t) were estimated volumetrically. For catches whose total weight was determined with a load cell, those less abundant species were separated from the catch and their weights were determined and subtracted from the load cell weight to obtain the total weight of the abundant species. For very large catches with more than one abundant species, a subsample of the dominant species was taken to estimate their relative weights, which was then extrapolated to obtain their separate total weight. A similar procedure was used for volumetrically estimated catches except the total catch weight was estimated by multiplying the density of a representative

sample of the total catch (containing both the abundant and less abundant species) by the catch volume. Pacific halibut (scientific names for all species encountered during the survey are listed in Appendix Tables B1 and B2) were immediately measured and released if not retained for biological samples. Halibut catch weights were estimated during data entry using length-weight parameters supplied by the International Pacific Halibut Commission and length frequency data. A random sample of up to 200 specimens of each of the major species was collected and measured to generate length frequencies. 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 were measured. Unsexed length frequencies were collected for forage fish such as Pacfific herring, capelin, and eulachon. Length measurements were collected with barcode-reader data loggers and barcoded length boards and downloaded to a computer and appended to a database after each tow.

Age structures (otoliths) were collected for most major species. Separate collections were made from each of the four major subareas. Samples were either randomly selected (for walleye pollock) or stratified by sex and size with a specified number of otoliths collected per centimeter length interval on a per area or per trawl haul basis. For species from which otoliths were collected on a per area basis, limits were placed on the number collected per sex-centimeter per day to distribute the sample evenly over the area. Length was measured to the nearest centimeter and weight was estimated to the nearest 2-10 g (scale accuracy depends on the weight of the specimen) with the digital scales. Fork length was measured for all fish species except grenadiers (snout to origin of anal fin) and skates and sharks (total length). 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 an area-swept method (Alverson and Pereyra 1969). The area swept by the trawl was estimated by multiplying the estimated distance towed (km) by the estimated mean net spread (m) for each tow. The distance towed was estimated by computing the distance traveled over ground by the vessel between the estimated time when the footrope came into contact with the bottom (on-bottom) and the estimated time when the center of the footrope left the bottom (off-bottom). The distance traveled by the vessel was estimated by smoothing the GPS position data and measuring the distance along this line. The mean net spread was estimated by averaging the Scanmar net spread readings collected during the on-bottom to off-bottom time period. For each species, a catch-per-unit-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 (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 frequency data 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. Lengths and weights collected from individual fish were used to estimate 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 (Appendix C).

Data Limitations

The primary purpose of this survey is to support management of a large number of fish and benthic invertebrate species, including various functional groups of fish: flatfish, roundfish, and rockfish. The different functional groups have expected differences in both haul level and survey level catchabilities, which, in turn, are generally unknown and may not be consistent even within each group. Survey catch rates and derived abundance estimates, which are used to tune stock assessment models, are used to monitor fish trends and status. Gear deployment is standardized and intentionally not modified over time to ensure scientific consistency and statistical continuity of the time series necessary to reliably monitor the status of fish stocks and forecast trends.

RESULTS

Of a total of 436 trawl tows that were attempted, 418 successful tows were completed at 420 allocated stations. All successful tows were included in the biomass and size composition analysis (Table 1). Scanmar net spread measurements were successfully recorded for all but 15 successful tows. Headrope depth and temperature measurements were successfully recorded for all but 4 tows. Average bottom temperatures ranged from 3.1° to 6.1°C, but the vast majority of bottom temperatures ranged between 3.5° and 5.4°C. Sea surface temperatures ranged from 3.2° to 10.5°C.

Results by Area

Over 135 species of fish from 29 families and 412 invertebrate species or taxa from 13 phyla were captured during the 2010 survey. Appendix B presents lists of fish (Appendix Table B-1) and invertebrate (Appendix Table B-2) species encountered during the survey. This report deals primarily with the groundfish species results. Relative abundance estimates, reported as catch-per-unit-effort (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, combined Aleutian areas, and

the entire survey region. Pacific ocean perch (POP) was the most abundant species captured over the entire survey region (Table 2), followed by Atka mackerel and, to a much lesser extent, walleye pollock. Atka mackerel and POP generated the two highest mean CPUEs in the Eastern, Central, and Western Aleutian areas. In the Southern Bering Sea area, walleye pollock , Atka mackerel, 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. The first species group includes the flatfishes, followed by roundfish, rockfish, and skates, respectively. Some minor species of biological interest such as sculpins have been grouped for convenience sake, but when data such as species-specific length frequency or length weight information are available, these are presented separately for each species.

Generally, the following information is presented for most, but not all species: 1) a short summary of the data collected and data analyses, 2) a table showing the number of hauls, the number of hauls with catch, mean CPUE, estimated biomass and confidence intervals, and mean weight of that species by NPFMC area and depth interval, 3) a table showing mean CPUE and estimated biomass with confidence intervals by subarea and depth stratum, 4) figures showing the station distribution and CPUE, and 5) figures showing the size composition of the population. The distribution maps show relative abundance in five categories: 1) no catch, 2) sample CPUE less than mean CPUE, 3) between mean CPUE and two standard deviations (SD) above mean CPUE, 4) between two and four SDs, and 5) greater than four SDs above the mean CPUE. The species nomenclature used in the following sections generally follows Robins et al. (1991), Mecklenburg et al. (2002) or Kessler (1985).

Table 2. -- Mean CPUE (kg/ha) for the 20 most abundant species of groundfish and total sampling effort for each NPFMC regulatory area from the 2010 Aleutian Islands bottom trawl survey.

Western Aleutians Area	CPUE	Central Aleutians Area	CPUE	Eastern Aleutians Area	CPUE
Pacific ocean perch	260.65	Pacific ocean perch	134.02	Atka mackerel	147.79
Atka mackerel	168.15	Atka mackerel	120.22	Pacific ocean perch	107.51
Northern rockfish	94.77	Northern rockfish	31.03	Walleye pollock	40.95
Pacific cod	14.05	Walleye pollock	17.33	Arrowtooth flounder	17.19
Arrowtooth flounder	11.88	Giant grenadier	13.61	Giant grenadier	12.11
Giant grenadier	11.67	Northern rock sole	12.55	Kamchatka flounder	11.01
Northern rock sole	9.20	Kamchatka flounder	10.65	Pacific cod	9.24
Shortspine thornyhead	7.97	Pacific cod	6.77	Northern rockfish	8.67
Whiteblotched skate	6.36	Arrowtooth flounder	5.58	Pacific halibut	8.12
Bathyraja sp.	6.10	Shortraker rockfish	4.49	Northern rock sole	5.73
Walleye pollock	5.23	Shortspine thornyhead	3.09	Whiteblotched skate	5.20
Shortraker rockfish	4.43	Bathyraja sp.	2.10	Yellow Irish lord	2.13
Yellow Irish lord	3.13	Pacific halibut	2.07	Flathead sole	2.03
Pacific halibut	2.86	Yellow Irish lord	1.92	Black-spotted rockfish	1.72
Flathead sole	2.75	Sablefish	1.66	Shortraker rockfish	1.62
Kamchatka flounder	2.24	Aleutian skate	1.55	Greenland turbot	1.47
Aleutian skate	1.53	Dover sole	1.50	Darkfin sculpin	1.29
Rex sole	1.46	Black-spotted rockfish	1.34	Rex sole	0.93
Prowfish	1.15	Rex sole	1.29	Aleutian skate	0.81
Black-spotted rockfish	1.01	Alaska skate	1.17	Octopus unidentified	0.69
Number of hauls	118	Number of hauls	128	Number of hauls	121

Combined Aleutian Areas	CPUE	Southern Bering Sea Area	CPUE	All Areas	CPUE
Pacific ocean perch	156.07	Walleye pollock	148.47	Pacific ocean perch	151.57
Atka mackerel	145.21	Atka mackerel	138.38	Atka mackerel	144.42
Northern rockfish	38.14	Pacific ocean perch	117.35	Walleye pollock	38.95
Walleye pollock	24.56	Pacific cod	17.04	Northern rockfish	33.74
Giant grenadier	12.43	Arrowtooth flounder	12.62	Arrowtooth flounder	12.43
Arrowtooth flounder	12.40	Pacific halibut	11.52	Giant grenadier	10.98
Pacific cod	9.81	Southern rock sole	8.48	Pacific cod	10.65
Northern rock sole	8.64	Northern rock sole	8.16	Northern rock sole	8.58
Kamchatka flounder	8.56	Kamchatka flounder	6.96	Kamchatka flounder	8.38
Pacific halibut	4.96	Rex sole	4.02	Pacific halibut	5.72
Whiteblotched skate	4.13	Flathead sole	3.25	Whiteblotched skate	3.75
Shortraker rockfish	3.20	Yellow Irish lord	2.83	Shortspine thornyhead	2.97
Shortspine thornyhead	3.17	Aleutian skate	2.40	Shortraker rockfish	2.83
Yellow Irish lord	2.34	Shortspine thornyhead	1.41	Yellow Irish lord	2.39
Bathyraja sp.	2.31	Whiteblotched skate	0.85	Bathyraja sp.	2.05
Flathead sole	1.65	Darkfin sculpin	0.76	Flathead sole	1.83
Black-spotted rockfish	1.42	Big skate	0.75	Rex sole	1.51
Aleutian skate	1.22	Greenland turbot	0.65	Aleutian skate	1.35
Rex sole	1.18	Magistrate armhook squid	0.60	Black-spotted rockfish	1.28
Greenland turbot	1.10	Alaska skate	0.54	Southern rock sole	1.18
Number of hauls	367	Number of hauls	51	Number of hauls	418

Flatfish

Arrowtooth flounder (*Atheresthes stomias*)

Arrowtooth flounder was the fifth most abundant species and the most abundant flatfish species caught in the 2010 survey. Its relative abundance was highest in the Eastern Aleutians (Table 2), where the mean CPUE was more than three times as high as in the Central Aleutian area (by far the least abundant area). Arrowtooth flounder was distributed throughout the survey area and were found 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 80,060 t, 54% of which was found in the Eastern Aleutians area. In the 12 subareas and depth strata where arrowtooth flounder was most abundant, almost every trawl catch contained arrowtooth flounder (Table 4). Arrowtooth flounder 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 weight of arrowtooth flounder increased with depth (Table 3) as larger fish generally were captured at deeper depths, and fish were somewhat larger in the combined Aleutian areas than in the Southern Bering Sea area. Maximum lengths of males were substantially shorter than females (Fig. 3). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of arrowtooth flounder.

Kamchatka flounder (*Atheresthes evermanni*)

Kamchatka flounder was the ninth most abundant species and the third most abundant flatfish species caught in the 2010 survey. Relative abundance of Kamchatka flounder was highest in the Eastern Aleutian Islands NPFMC regulatory area where it was more abundant than all other flatfish except arrowtooth flounder (Table 2). This species was least abundant in the Western Aleutians area. Total estimated biomass was approximately 54,000 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). The highest four stratum-specific mean CPUEs were all found in the 301-500 m depth interval (Table 6). Relatively high CPUEs were found at five stations; one west of Amlia Island, one west of Tanaga Island, two north of Seguam Island, and one to the west of Umnak Island (Fig. 4).

Like arrowtooth flounder, Kamchatka flounder exhibit sexual dimorphism as adult females grow larger than males (Fig. 5). Mean length also increased with depth. Appendix C lists the weight-length relationship parameters for male, female, and combined sexes of Kamchatka flounder.

Table 3. -- Total effort (number of trawl hauls), number of hauls with arrowtooth flounder, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	19	9.45	4,610	959	8,261	0.686
	101 - 200	55	40	18.61	9,898	4,930	14,866	1.138
	201 - 300	22	20	10.48	1,807	731	2,882	3.063
	301 - 500	9	7	5.31	1,739	0	3,497	3.236
	All depths	118	86	11.88	18,053	11,711	24,396	1.091
Central Aleutians	1 - 100	48	16	0.95	555	74	1,035	0.700
	101 - 200	47	32	4.82	2,221	534	3,908	0.883
	201 - 300	21	19	21.02	4,434	509	8,358	1.401
	301 - 500	12	9	5.09	2,028	431	3,624	2.280
	All depths	128	76	5.58	9,237	5,564	12,910	1.255
Eastern Aleutians	1 - 100	21	12	3.58	2,453	0	6,867	0.218
	101 - 200	55	40	28.51	22,150	0	59,683	0.568
	201 - 300	33	32	24.72	12,116	2,568	21,665	1.156
	301 - 500	12	11	11.62	6,606	0	16,888	1.200
	All depths	121	95	17.19	43,325	8,039	78,611	0.654
All Aleutian Areas	1 - 100	101	47	4.34	7,618	2,511	12,725	0.406
	101 - 200	157	112	19.37	34,269	0	69,646	0.682
	201 - 300	76	71	21.02	18,356	8,260	28,452	1.290
	301 - 500	33	27	8.02	10,372	0	20,959	1.497
	All depths	367	257	12.40	70,615	34,331	106,899	0.783
Southern Bering Sea	1 - 100	27	26	6.05	2,435	1,327	3,543	0.429
	101 - 200	14	14	17.30	3,198	1,264	5,133	0.605
	201 - 300	5	5	21.35	1,204	0	3,250	1.154
	301 - 500	5	5	25.00	2,608	413	4,802	1.022
	All depths	51	50	12.62	9,445	6,194	12,695	0.649

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 2010 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	NW Eastern Aleutians	4	4	91.71	14,621	0	56,320
Central Aleutians	201-300	N Central Aleutians	9	8	45.06	1,978	0	4,004
Central Aleutians	201-300	SE Central Aleutians	3	3	41.11	1,963	0	6,708
Eastern Aleutians	201-300	SE Eastern Aleutians	8	8	28.35	5,841	0	14,061
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	26.11	407	0	3,910
Eastern Aleutians	201-300	NE Eastern Aleutians	19	19	26.02	5,122	0	10,642
Southern Bering Sea	101-200	E Southern Bering	12	12	25.69	3,030	1,076	4,983
Southern Bering Sea	301-500	Combined Southern Bering	5	5	25.00	2,608	238	4,977
Eastern Aleutians	101-200	SW Eastern Aleutians	9	9	22.69	5,130	0	12,561
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	5	21.96	5,864	0	16,641
Southern Bering Sea	201-300	Combined Southern Bering	5	5	21.35	1,204	0	3,413
Western Aleutians	101-200	W Western Aleutians	33	29	19.11	7,770	3,665	11,876
Western Aleutians	101-200	E Western Aleutians	22	11	16.99	2,128	0	4,977
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	12.74	1,615	0	8,544
Western Aleutians	1-100	W Western Aleutians	13	13	12.43	4,589	906	8,272
Western Aleutians	201-300	E Western Aleutians	9	9	10.96	858	0	1,761
Eastern Aleutians	201-300	SW Eastern Aleutians	4	3	10.41	746	0	1,957
Western Aleutians	201-300	W Western Aleutians	13	11	10.09	948	213	1,684
Southern Bering Sea	1-100	E Southern Bering	25	25	9.67	2,360	1,256	3,464
Central Aleutians	101-200	N Central Aleutians	9	7	9.46	1,009	0	2,531
Central Aleutians	301-500	N Central Aleutians	6	5	8.96	1,111	0	2,315
Western Aleutians	301-500	W Western Aleutians	7	6	8.62	1,475	0	3,263
Central Aleutians	201-300	SW Central Aleutians	6	5	7.71	329	73	584
Eastern Aleutians	101-200	NE Eastern Aleutians	24	18	6.65	1,338	628	2,048
Central Aleutians	301-500	SW Central Aleutians	2	2	6.14	485	0	6,197
Central Aleutians	301-500	SE Central Aleutians	2	2	6.05	432	0	2,774
Eastern Aleutians	101-200	SE Eastern Aleutians	18	9	5.59	1,061	0	2,665
Central Aleutians	101-200	Petrel Bank	6	4	4.25	738	0	1,785
Eastern Aleutians	1-100	SW Eastern Aleutians	2	2	3.43	654	0	8,053
Central Aleutians	101-200	SW Central Aleutians	18	14	3.30	347	210	485
Eastern Aleutians	301-500	SE Eastern Aleutians	4	4	2.58	664	0	1,583
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	2.52	169	0	382
Central Aleutians	1-100	SE Central Aleutians	12	4	2.35	273	0	742
Central Aleutians	201-300	Petrel Bank	3	3	2.14	164	24	304
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	1.76	77	0	725
Western Aleutians	301-500	E Western Aleutians	2	1	1.69	264	0	3,624
Central Aleutians	101-200	SE Central Aleutians	14	7	1.68	127	0	277
Central Aleutians	1-100	SW Central Aleutians	11	6	1.12	181	0	361
Eastern Aleutians	1-100	SE Eastern Aleutians	13	7	1.04	181	0	450
Central Aleutians	1-100	N Central Aleutians	16	6	0.48	101	12	189
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.47	75	0	1,027
Western Aleutians	1-100	E Western Aleutians	19	6	0.18	21	0	48
Eastern Aleutians	1-100	NW Eastern Aleutians	3	1	0.02	3	0	16

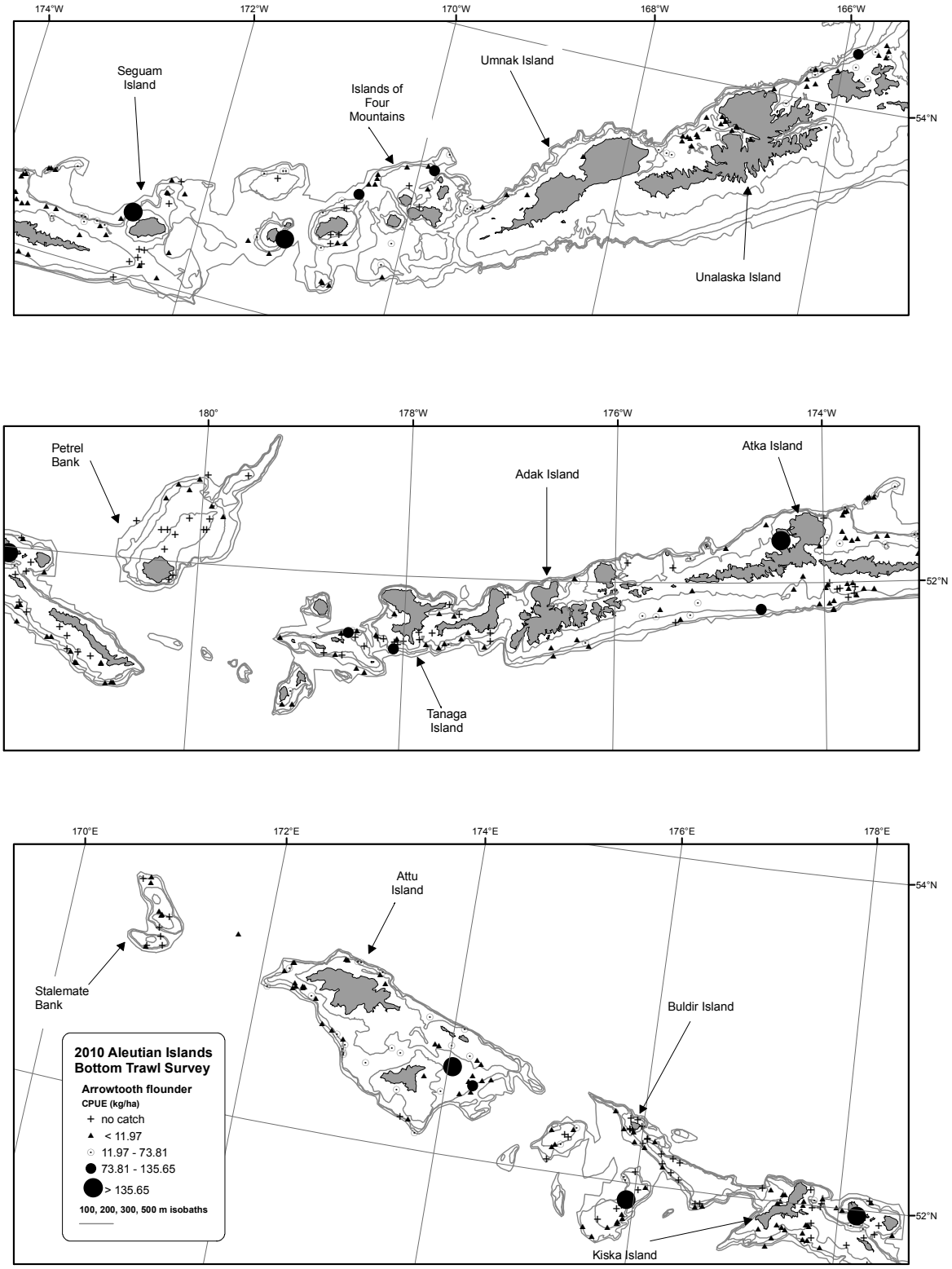

Figure 2. -- Distribution and relative abundance of arrowtooth flounder from the 2010 Aleutian Islands bottom trawl survey.

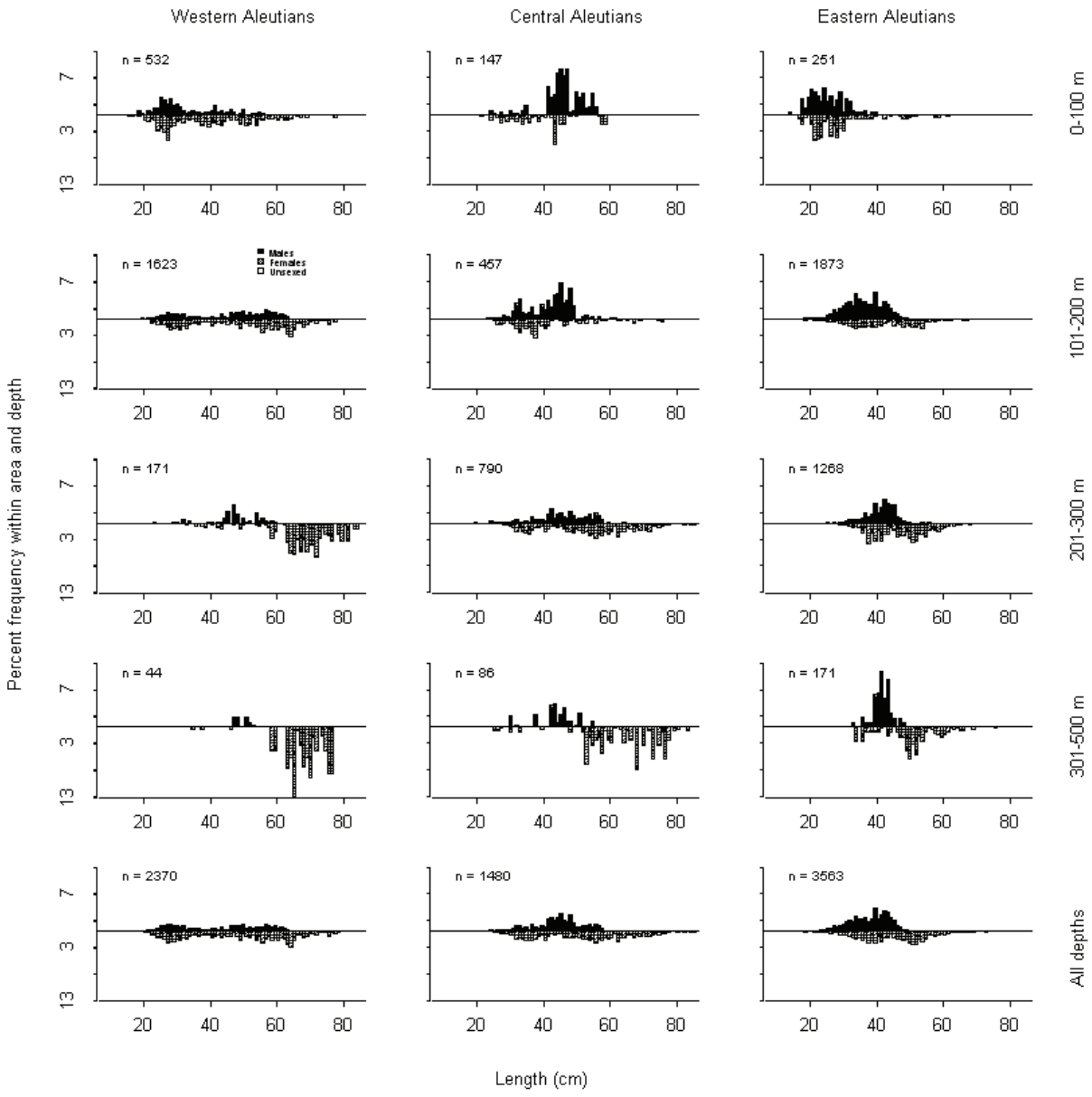

Figure 3. -- Size composition of arrowtooth flounder captured in the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

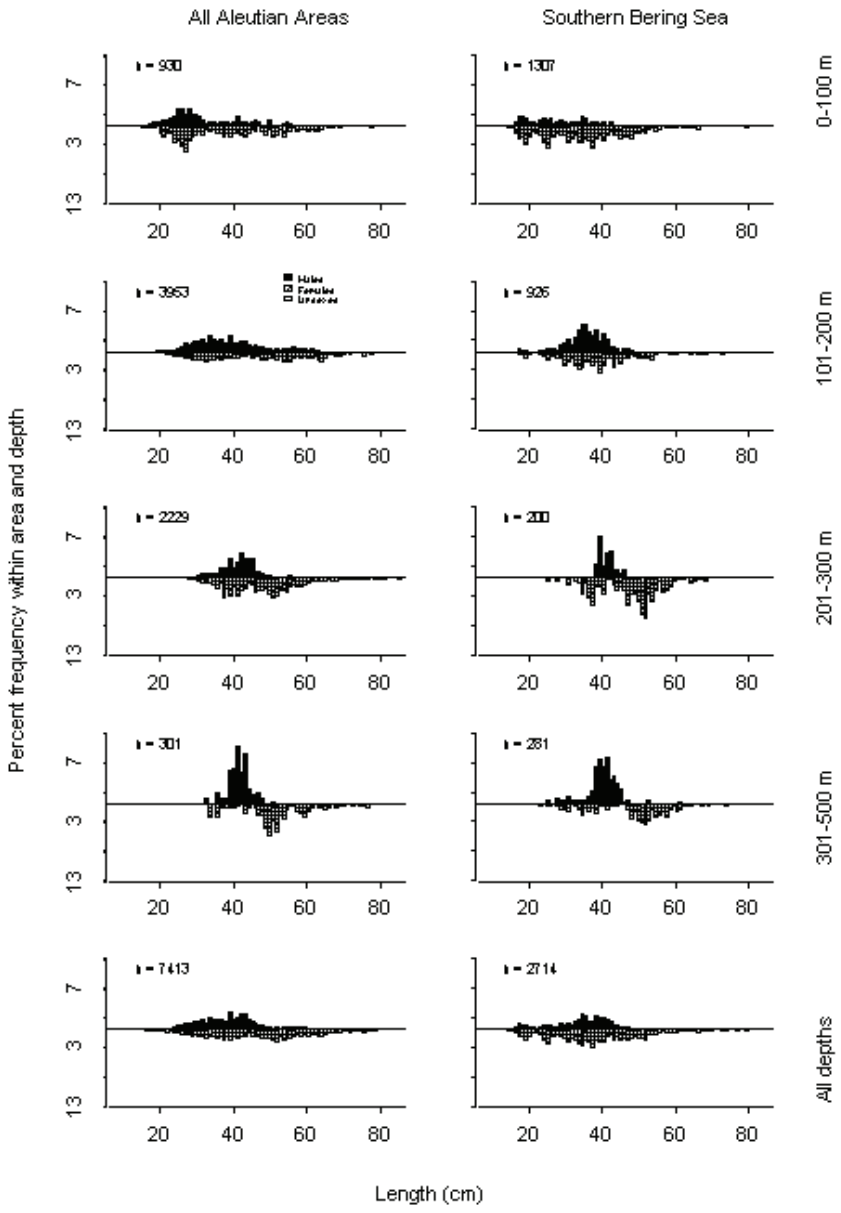

Figure 3. -- (continued).

Table 5. -- Total effort (number of trawl hauls), number of hauls with Kamchatka flounder, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	13	0.22	107	40	175	0.138
	101 - 200	55	33	1.79	954	642	1,267	0.510
	201 - 300	22	18	6.09	1,050	219	1,880	1.920
	301 - 500	9	7	3.94	1,289	122	2,456	3.730
	All depths	118	71	2.24	3,400	1,980	4,821	0.959
Central Aleutians	1 - 100	48	11	0.10	60	0	127	0.120
	101 - 200	47	24	0.46	214	71	357	0.378
	201 - 300	21	15	3.59	758	251	1,266	0.787
	301 - 500	12	10	41.65	16,578	0	39,532	2.746
	All depths	128	60	10.65	17,610	0	40,572	2.184
Eastern Aleutians	1 - 100	21	7	0.13	87	0	326	0.089
	101 - 200	55	23	1.21	940	0	2,292	0.427
	201 - 300	33	23	8.33	4,081	0	9,611	0.783
	301 - 500	12	10	39.83	22,638	0	66,064	2.170
	All depths	121	63	11.01	27,745	0	71,682	1.474
All Aleutian Areas	1 - 100	101	31	0.14	253	39	468	0.113
	101 - 200	157	80	1.19	2,108	783	3,433	0.454
	201 - 300	76	56	6.74	5,889	286	11,491	0.876
	301 - 500	33	27	31.31	40,505	0	87,995	2.409
	All depths	367	194	8.56	48,755	816	96,694	1.602
Southern Bering Sea	1 - 100	27	7	0.03	11	0	25	0.162
	101 - 200	14	10	0.64	118	0	382	0.598
	201 - 300	5	3	0.24	14	0	28	0.916
	301 - 500	5	5	48.54	5,064	0	14,009	2.491
	All depths	51	25	6.96	5,207	0	14,153	2.252

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 2010 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	SW Central Aleutians	2	2	88.27	6,966	0	91,827
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	6	82.99	22,158	0	67,779
Central Aleutians	301-500	N Central Aleutians	6	6	64.11	7,948	0	24,340
Southern Bering Sea	301-500	Combined Southern Bering	5	5	48.54	5,064	0	14,722
Eastern Aleutians	201-300	NE Eastern Aleutians	19	13	16.03	3,155	0	8,598
Central Aleutians	301-500	Petrel Bank	2	1	13.37	1,654	0	22,673
Central Aleutians	201-300	N Central Aleutians	9	7	12.34	542	16	1,067
Western Aleutians	201-300	E Western Aleutians	9	6	10.28	805	0	1,644
Western Aleutians	301-500	W Western Aleutians	7	5	4.68	800	0	2,024
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	4.14	65	0	674
Eastern Aleutians	201-300	SE Eastern Aleutians	8	4	3.96	816	0	2,477
Western Aleutians	301-500	E Western Aleutians	2	2	3.13	489	0	2,089
Eastern Aleutians	101-200	NW Eastern Aleutians	4	2	2.98	476	0	1,962
Western Aleutians	201-300	W Western Aleutians	13	12	2.60	245	137	352
Western Aleutians	101-200	W Western Aleutians	33	28	2.03	824	575	1,073
Central Aleutians	201-300	SE Central Aleutians	3	2	1.85	88	0	281
Eastern Aleutians	301-500	SE Eastern Aleutians	4	2	1.75	452	0	1,306
Eastern Aleutians	101-200	NE Eastern Aleutians	24	13	1.51	305	44	565
Central Aleutians	201-300	Petrel Bank	3	3	1.35	104	0	289
Western Aleutians	101-200	E Western Aleutians	22	5	1.04	130	0	322
Central Aleutians	101-200	SW Central Aleutians	18	14	0.94	99	37	162
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	0.82	55	0	751
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	0.66	29	0	298
Eastern Aleutians	201-300	SW Eastern Aleutians	4	4	0.63	45	3	87
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	0.63	80	0	403
Central Aleutians	101-200	N Central Aleutians	9	4	0.61	65	0	193
Central Aleutians	201-300	SW Central Aleutians	6	3	0.57	24	0	56
Eastern Aleutians	101-200	SW Eastern Aleutians	9	6	0.57	128	4	251
Southern Bering Sea	101-200	E Southern Bering Sea	12	9	0.54	63	3	124
Central Aleutians	101-200	SE Central Aleutians	14	5	0.46	34	0	77
Western Aleutians	1-100	W Western Aleutians	13	11	0.28	104	37	172
Southern Bering Sea	201-300	Combined Southern Bering	5	3	0.24	14	0	30
Central Aleutians	1-100	SW Central Aleutians	11	3	0.19	30	0	90
Eastern Aleutians	101-200	SE Eastern Aleutians	18	2	0.17	32	0	90
Central Aleutians	301-500	SE Central Aleutians	2	1	0.14	10	0	138
Central Aleutians	1-100	N Central Aleutians	16	6	0.13	28	0	66
Central Aleutians	101-200	Petrel Bank	6	1	0.09	15	0	55
Southern Bering Sea	1-100	E Southern Bering Sea	25	7	0.04	11	0	25
Western Aleutians	1-100	E Western Aleutians	19	2	0.03	3	0	10
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.03	5	0	68
Central Aleutians	1-100	SE Central Aleutians	12	2	0.01	2	0	4
Eastern Aleutians	1-100	SE Eastern Aleutians	13	3	0.01	2	0	4

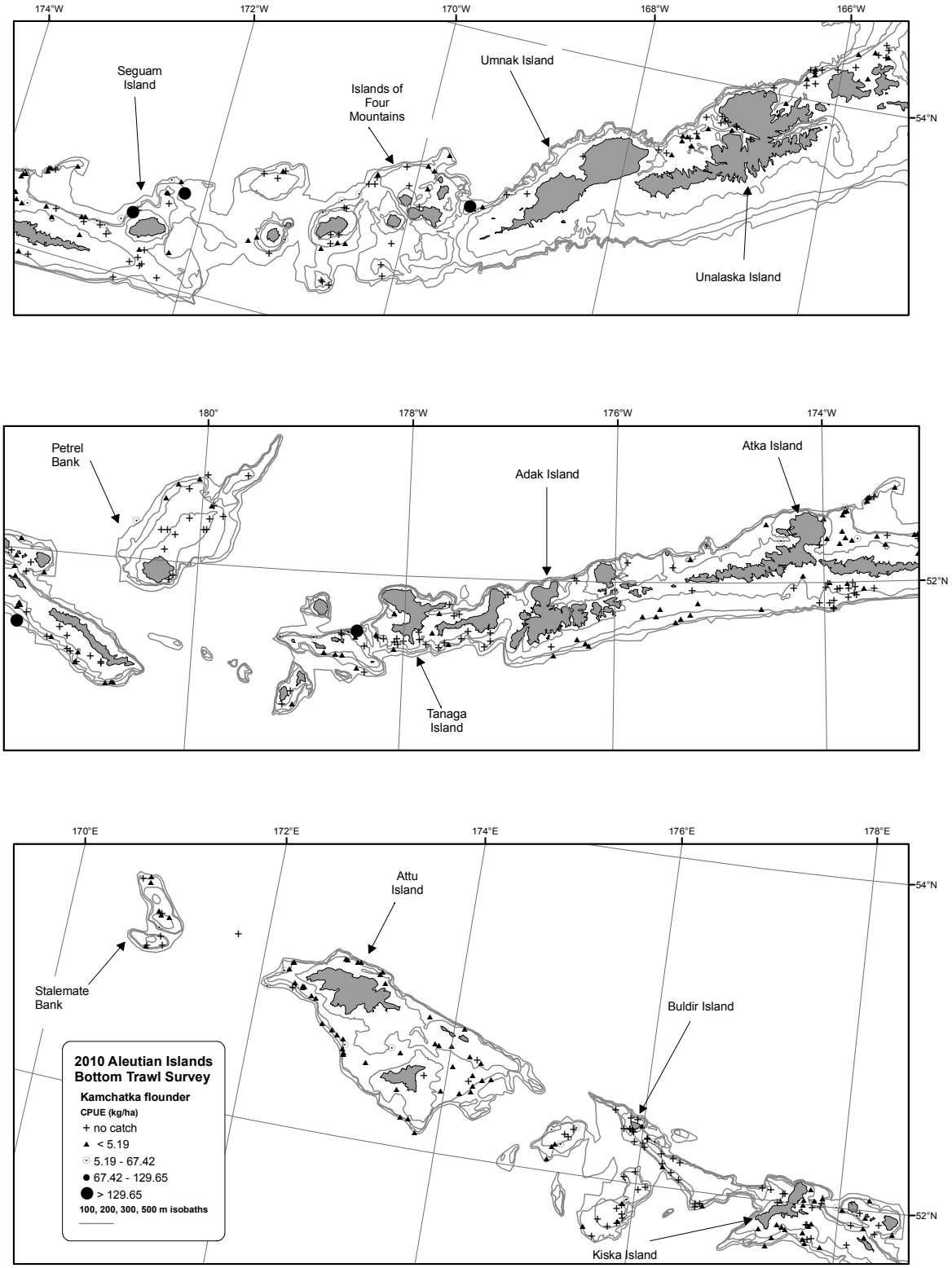

Figure 4. -- Distribution and relative abundance of Kamchatka flounder from the 2010 Aleutian Islands bottom trawl survey.

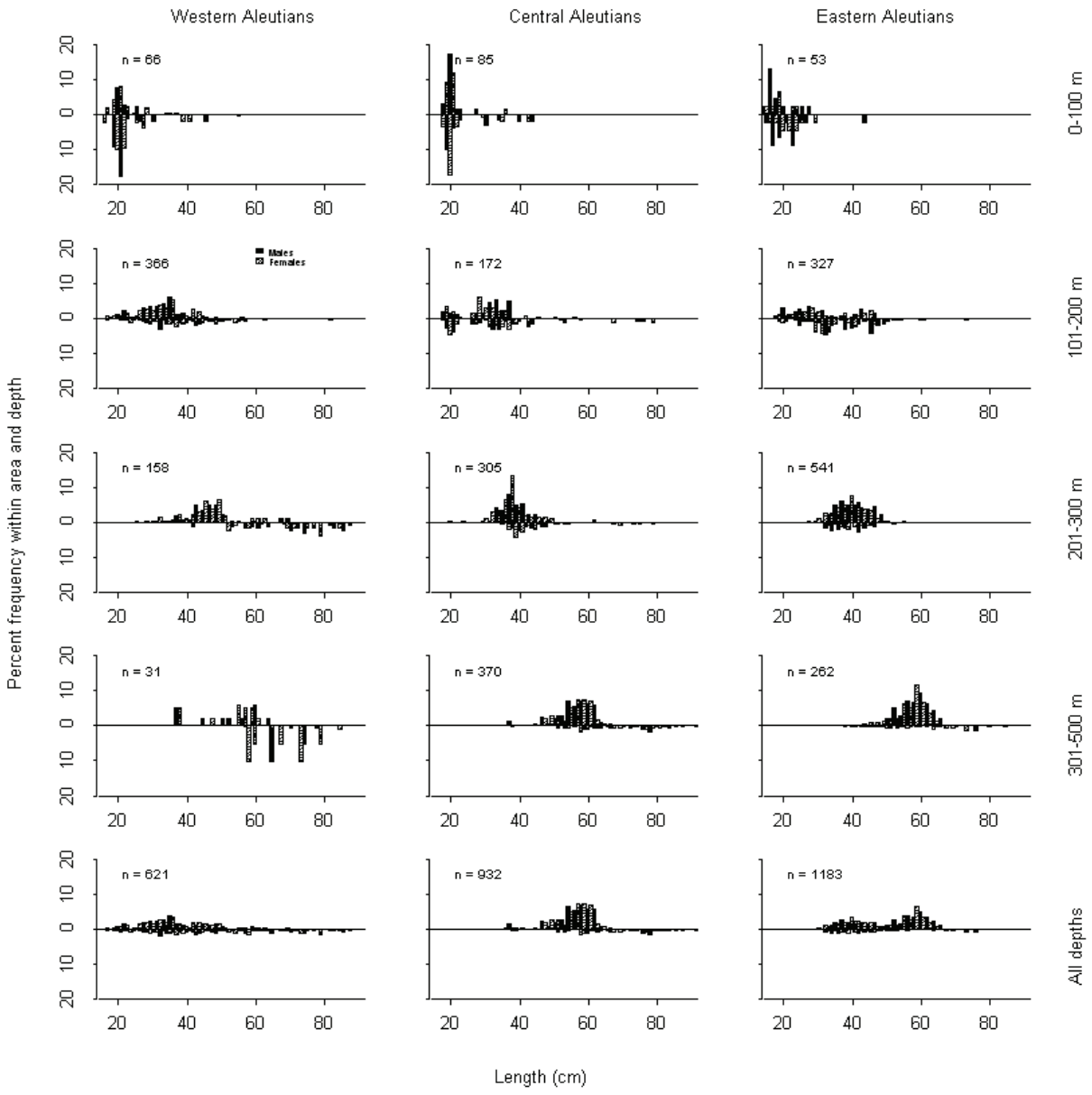

Figure 5. -- Size composition of Kamchatka flounder from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

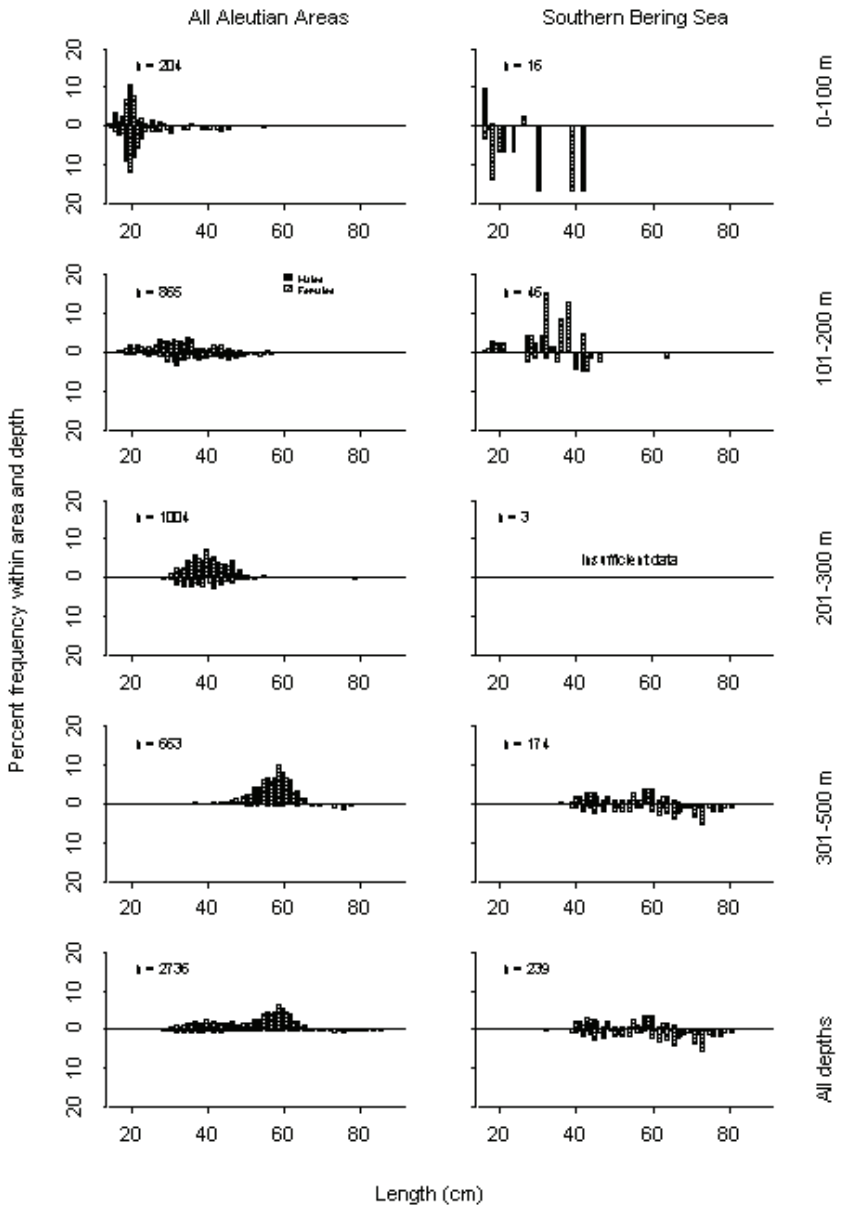

Figure 5. -- (continued).

Northern rock sole (*Lepidopsetta polyxystra*)

Northern rock sole is the more abundant of the two rock soles encountered in the Aleutian Islands and was captured in the majority of survey tows throughout the region (Table 7). 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 was slightly lower than that of 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. The highest stratum-specific mean CPUE occurred in the 1-100 m depth interval of the SE Central Aleutians subarea (Table 8, Fig. 6). Most of the estimated biomass deeper than 200 m was composed of females (Fig. 7). 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. 7). More than 60% of the estimated northern rock sole biomass in the Aleutian areas occurred in the 1-100 m interval and 95% occurred within the shallower two depth intervals. The W Western Aleutians subarea produced the highest estimated individual subarea biomass, based on 13 tows. Appendix C lists the length-weight relationship parameters for male, female and combined sexes of northern rock sole.

Southern rock sole (*Lepidopsetta bilineata*)

Southern rock sole was by far 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 (Fig. 8). 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 91% of the estimated biomass was found in the 1-100 m depth interval where all but four tows reported southern rock sole (Tables 9 and 10). Virtually all of the southern rock sole larger than 41 cm in the estimated population size composition were females (Fig. 9). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of southern rock sole.

Table 7. -- Total effort (number of trawl hauls), number of hauls with northern rock sole, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	31	18.84	9,188	5,877	12,498	0.302
	101 - 200	55	39	8.81	4,684	3,150	6,218	0.407
	201 - 300	22	7	0.57	98	0	260	0.679
	301 - 500	9	0	---	---	---	---	---
	All depths	118	77	9.20	13,969	10,365	17,573	0.332
Central Aleutians	1 - 100	48	46	24.49	14,322	8,858	19,785	0.386
	101 - 200	47	40	10.71	4,934	3,375	6,493	0.455
	201 - 300	21	14	6.87	1,448	0	3,630	0.671
	301 - 500	12	3	0.14	55	0	156	0.280
	All depths	128	103	12.55	20,758	14,968	26,548	0.412
Eastern Aleutians	1 - 100	21	21	10.18	6,973	3,270	10,676	0.408
	101 - 200	55	44	8.58	6,667	3,406	9,929	0.634
	201 - 300	33	11	1.64	806	0	2,294	0.798
	301 - 500	12	1	0.01	4	0	20	0.422
	All depths	121	77	5.73	14,450	9,583	19,317	0.505
All Aleutian Areas	1 - 100	101	98	17.35	30,482	23,312	37,652	0.360
	101 - 200	157	123	9.20	16,285	12,426	20,144	0.496
	201 - 300	76	32	2.69	2,351	286	4,417	0.710
	301 - 500	33	4	0.05	59	0	160	0.286
	All depths	367	257	8.64	49,177	40,986	57,368	0.406
Southern Bering Sea	1 - 100	27	24	11.07	4,459	0	11,751	0.496
	101 - 200	14	13	8.68	1,605	0	5,524	0.435
	201 - 300	5	2	0.80	45	0	150	0.625
	301 - 500	5	0	---	---	---	---	---
	All depths	51	39	8.16	6,108	0	12,232	0.479

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 2010 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	SE Central Aleutians	12	12	25.61	2,981	0	6,109
Central Aleutians	101-200	SW Central Aleutians	18	18	25.29	2,661	1,459	3,863
Central Aleutians	1-100	SW Central Aleutians	11	11	24.44	3,953	1,501	6,404
Central Aleutians	1-100	Petrel Bank	9	7	24.13	2,316	0	4,814
Central Aleutians	1-100	N Central Aleutians	16	16	24.08	5,071	1,534	8,609
Western Aleutians	1-100	W Western Aleutians	13	13	20.17	7,451	4,326	10,575
Eastern Aleutians	1-100	SE Eastern Aleutians	13	13	18.52	3,223	0	6,935
Central Aleutians	201-300	SE Central Aleutians	3	3	17.75	847	0	3,664
Eastern Aleutians	101-200	SW Eastern Aleutians	9	9	15.02	3,397	369	6,424
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	14.82	992	0	12,112
Western Aleutians	1-100	E Western Aleutians	19	18	14.68	1,737	601	2,873
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	13.44	1,705	206	3,204
Central Aleutians	101-200	SE Central Aleutians	14	12	12.97	975	343	1,608
Central Aleutians	101-200	N Central Aleutians	9	9	11.87	1,266	326	2,206
Southern Bering Sea	1-100	E Southern Bering Sea	25	22	11.60	2,830	765	4,896
Western Aleutians	101-200	W Western Aleutians	33	28	10.87	4,420	2,915	5,924
Southern Bering Sea	1-100	W Southern Bering Sea	2	2	10.27	1,628	0	19,007
Eastern Aleutians	201-300	SW Eastern Aleutians	4	4	9.84	705	0	2,404
Central Aleutians	201-300	N Central Aleutians	9	7	7.48	329	0	703
Eastern Aleutians	101-200	NE Eastern Aleutians	24	18	6.98	1,405	536	2,274
Eastern Aleutians	101-200	SE Eastern Aleutians	18	14	6.75	1,283	339	2,228
Central Aleutians	201-300	SW Central Aleutians	6	4	6.39	272	0	590
Eastern Aleutians	1-100	NW Eastern Aleutians	3	3	5.76	1,112	971	1,253
Southern Bering Sea	101-200	E Southern Bering Sea	12	11	5.20	613	56	1,169
Eastern Aleutians	1-100	SW Eastern Aleutians	2	2	4.90	934	0	3,947
Eastern Aleutians	101-200	NW Eastern Aleutians	4	3	3.66	583	0	1,931
Western Aleutians	101-200	E Western Aleutians	22	11	2.11	264	0	568
Western Aleutians	201-300	E Western Aleutians	9	3	1.04	82	0	246
Southern Bering Sea	201-300	Combined Southern Bering	5	2	0.80	45	0	158
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.58	9	0	124
Central Aleutians	301-500	N Central Aleutians	6	3	0.44	55	0	161
Eastern Aleutians	201-300	NE Eastern Aleutians	19	5	0.37	72	0	159
Central Aleutians	101-200	Petrel Bank	6	1	0.19	32	0	115
Western Aleutians	201-300	W Western Aleutians	13	4	0.17	16	0	33
Eastern Aleutians	201-300	SE Eastern Aleutians	8	1	0.10	20	0	66
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.09	4	0	51

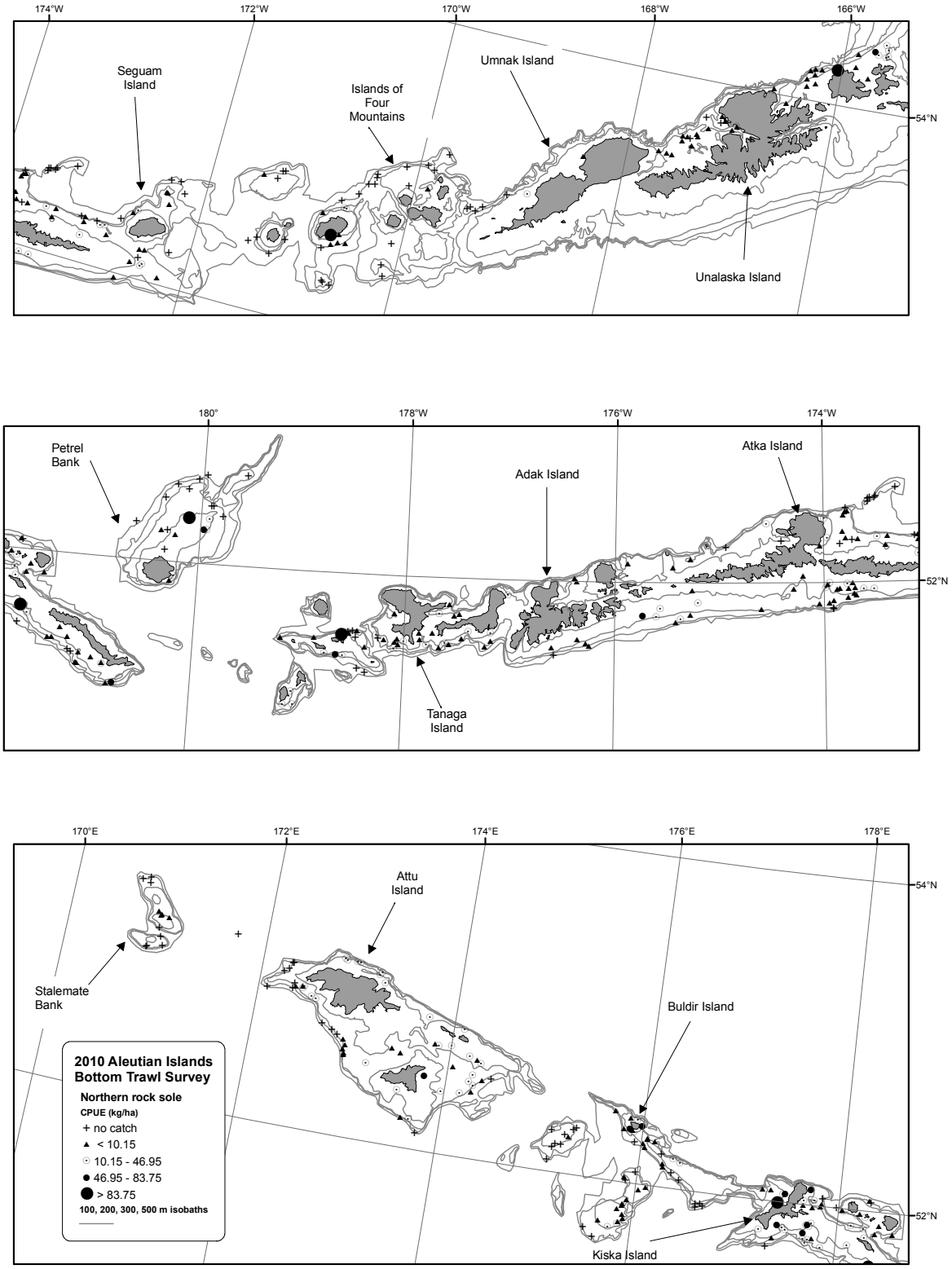

Figure 6. -- Distribution and relative abundance of northern rock sole from the 2010 Aleutian Islands bottom trawl survey.

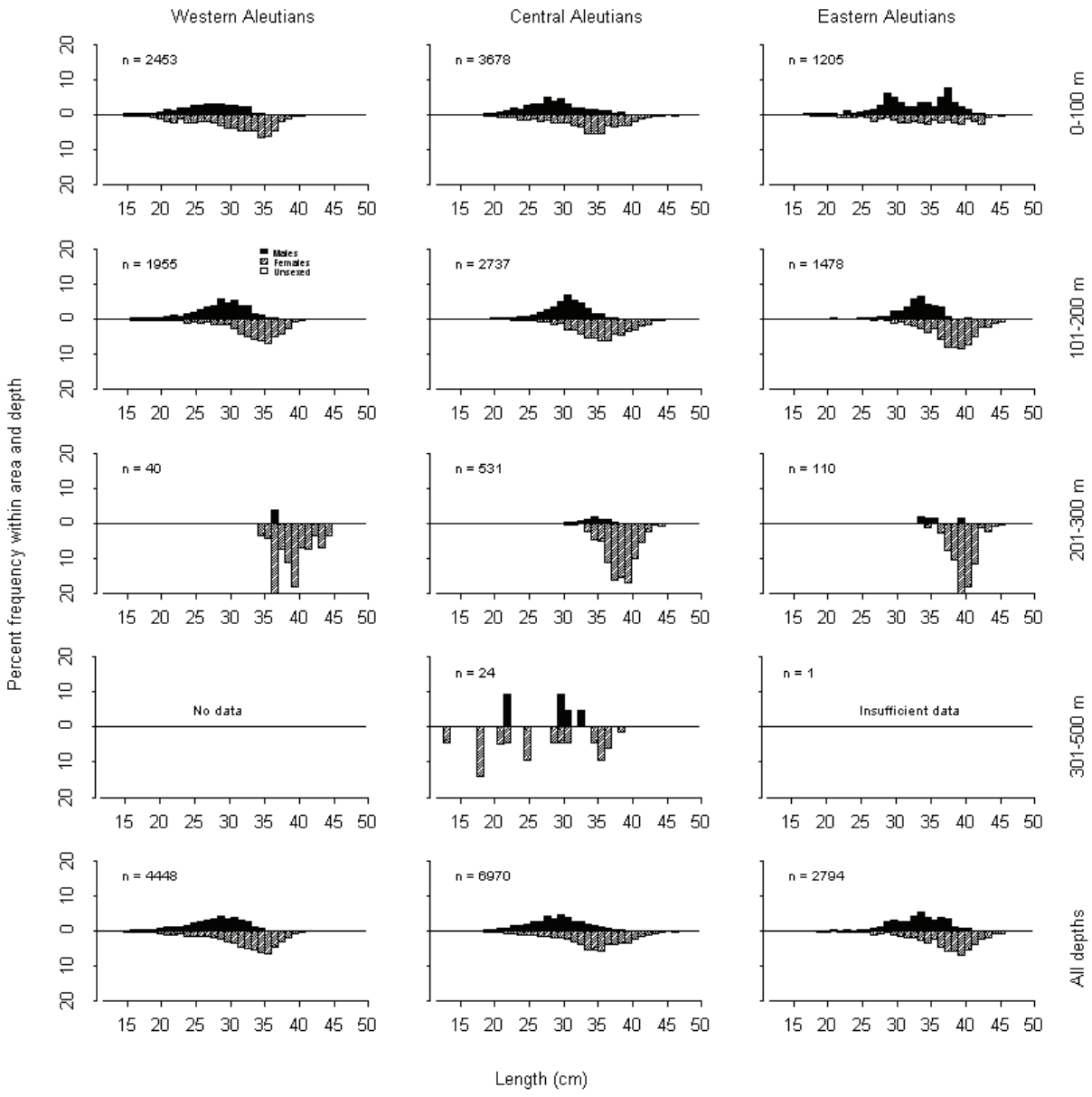

Figure 7. -- Size composition of northern rock sole from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

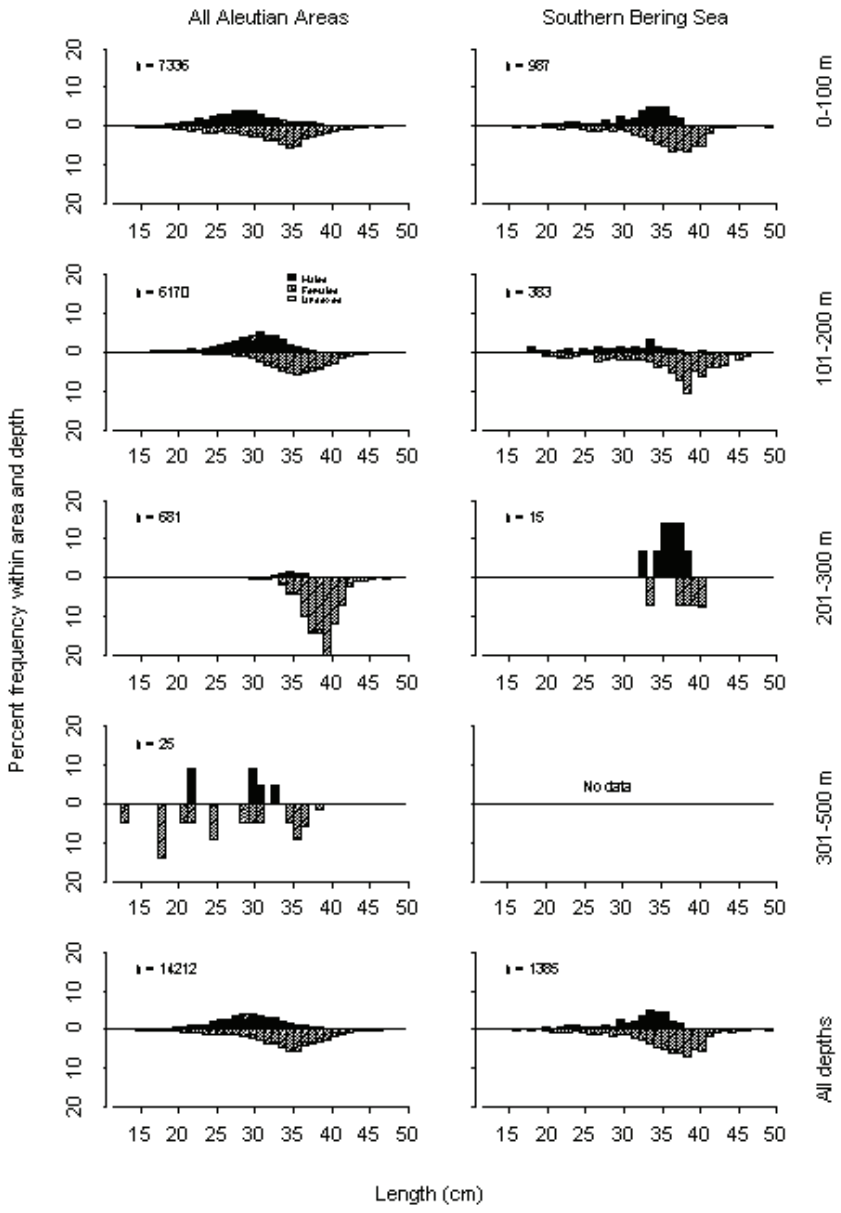

Figure 7. -- (continued).

Table 9. -- Total effort (number of trawl hauls), number of hauls with southern rock sole, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	4	0.04	20	0	47	0.604
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	0	---	---	---	---	---
	301 - 500	9	0	---	---	---	---	---
	All depths	118	4	0.01	20	0	47	0.604
Central Aleutians	1 - 100	48	6	0.07	39	5	73	0.761
	101 - 200	47	3	0.04	19	0	46	0.584
	201 - 300	21	0	---	---	---	---	---
	301 - 500	12	0	---	---	---	---	---
	All depths	128	9	0.04	58	16	101	0.691
Eastern Aleutians	1 - 100	21	15	1.67	1,142	444	1,839	0.591
	101 - 200	55	4	0.04	31	0	75	0.768
	201 - 300	33	0	---	---	---	---	---
	301 - 500	12	0	---	---	---	---	---
	All depths	121	19	0.47	1,173	474	1,872	0.595
All Aleutian Areas	1 - 100	101	25	0.68	1,200	501	1,899	0.596
	101 - 200	157	7	0.03	51	0	103	0.685
	201 - 300	76	0	---	---	---	---	---
	301 - 500	33	0	---	---	---	---	---
	All depths	367	32	0.22	1,251	550	1,952	0.599
Southern Bering Sea	1 - 100	27	23	14.31	5,761	0	13,238	0.505
	101 - 200	14	8	3.08	569	0	1,584	0.602
	201 - 300	5	1	0.22	12	0	44	0.633
	301 - 500	5	0	---	---	---	---	---
	All depths	51	32	8.48	6,342	0	13,944	0.513

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 2010 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 Sea	25	22	17.73	4,326	2,305	6,346
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	9.05	1,436	0	19,678
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	4.09	274	0	3,755
Eastern Aleutians	1-100	SE Eastern Aleutians	13	11	3.78	658	228	1,088
Southern Bering Sea	101-200	E Southern Bering Sea	12	7	2.50	295	0	654
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	1.63	207	0	1,097
Eastern Aleutians	1-100	NW Eastern Aleutians	3	2	1.02	197	0	674
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.42	80	0	1,094
Southern Bering Sea	201-300	Combined Southern Bering	5	1	0.22	12	0	46
Central Aleutians	1-100	SE Central Aleutians	12	3	0.20	23	0	53
Western Aleutians	1-100	E Western Aleutians	19	4	0.17	20	0	47
Central Aleutians	101-200	SW Central Aleutians	18	1	0.11	12	0	37
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	0.08	13	0	55
Eastern Aleutians	101-200	SE Eastern Aleutians	18	2	0.07	14	0	41
Central Aleutians	1-100	SW Central Aleutians	11	2	0.06	9	0	25
Central Aleutians	101-200	SE Central Aleutians	14	1	0.04	3	0	10
Central Aleutians	101-200	N Central Aleutians	9	1	0.04	4	0	14
Central Aleutians	1-100	N Central Aleutians	16	1	0.03	7	0	21
Eastern Aleutians	101-200	NE Eastern Aleutians	24	1	0.02	4	0	13

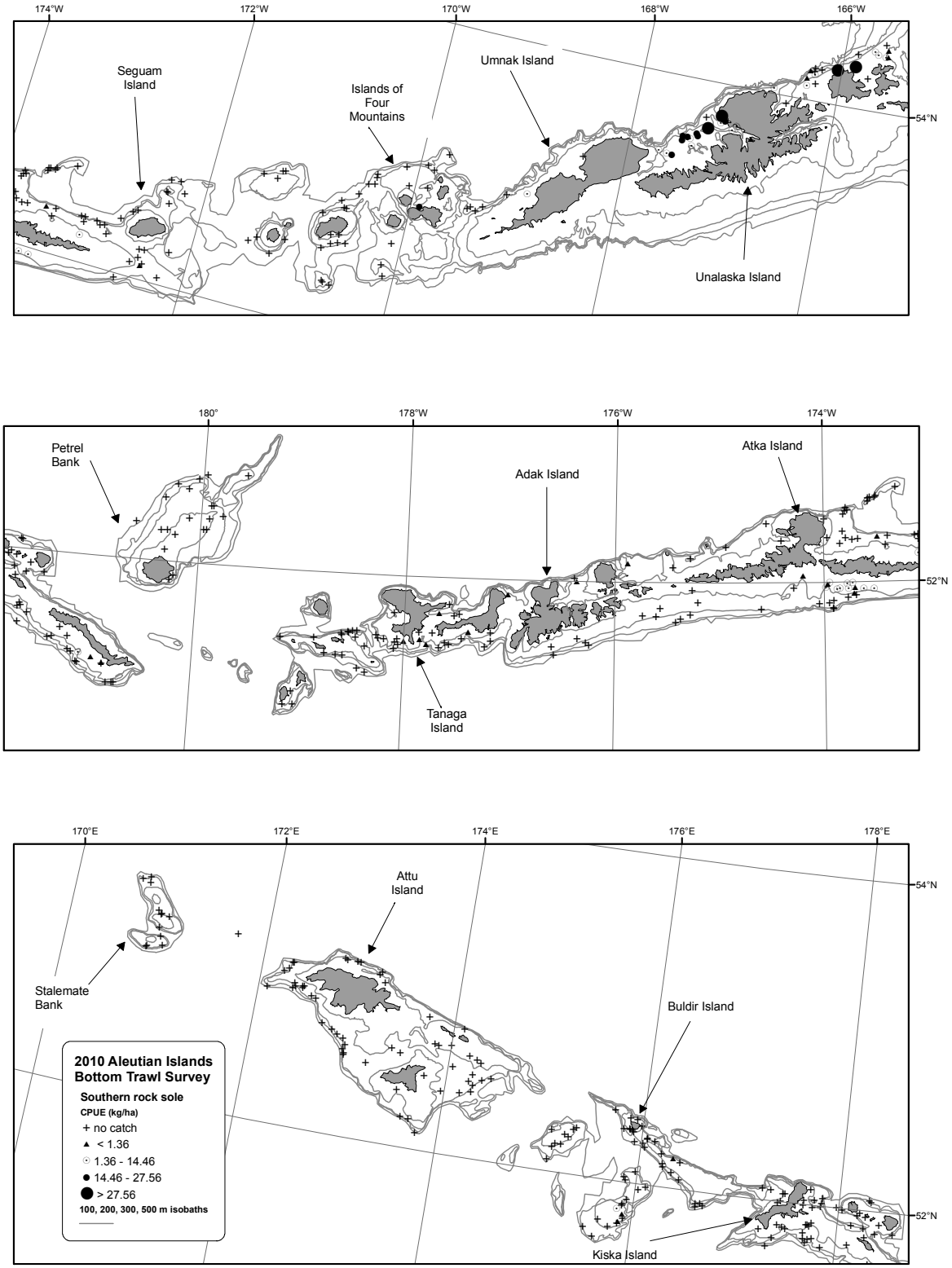

Figure 8. -- Distribution and relative abundance of southern rock sole from the 2010 Aleutian Islands bottom trawl survey.

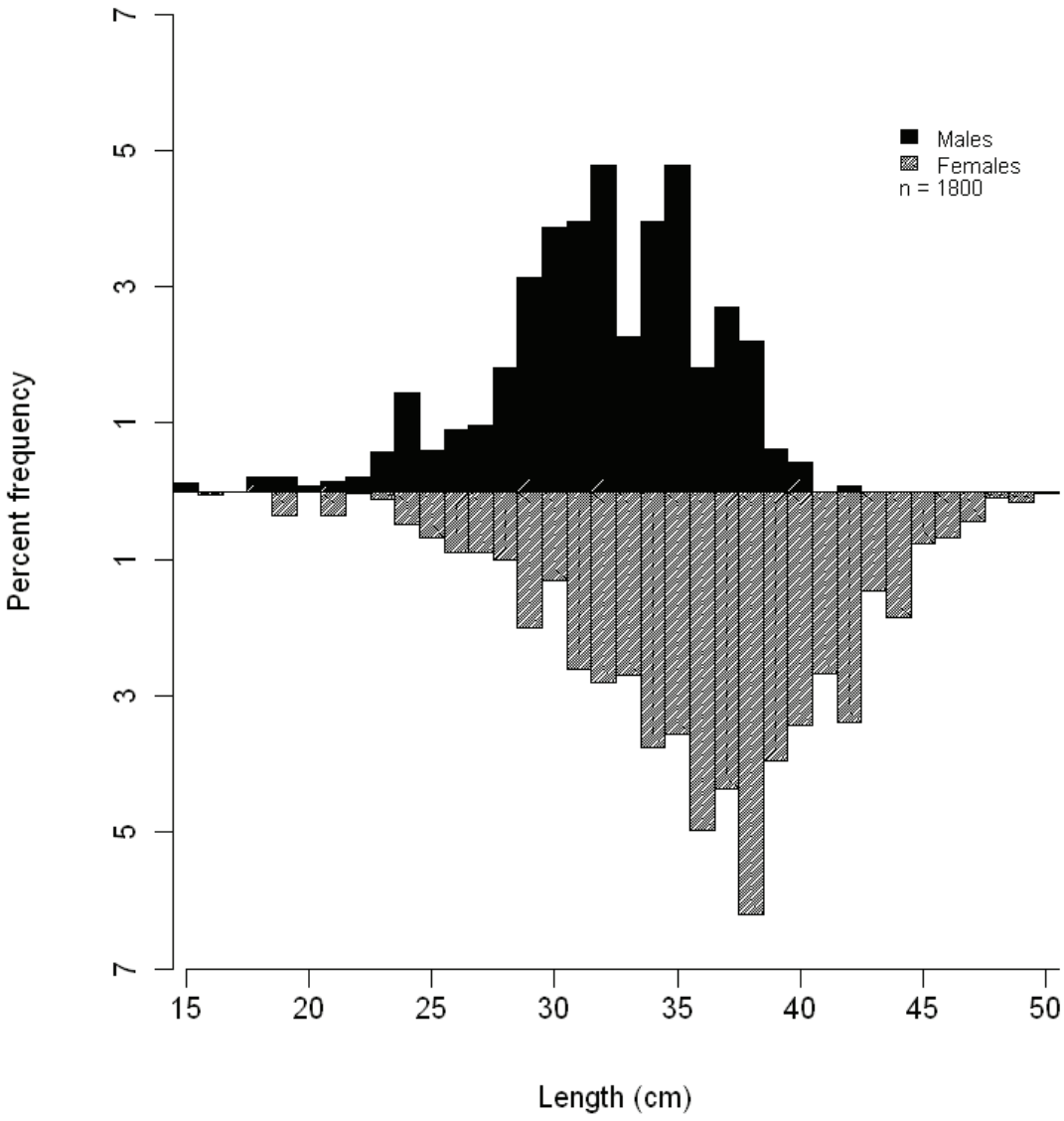

Figure 9. -- Size composition of southern rock sole from the 2010 Aleutian Islands bottom trawl survey.

Pacific halibut (*Hippoglossus stenolepis*)

Pacific halibut was the tenth most abundant species and the fourth most abundant flatfish species caught in the 2010 survey (Table 2). Pacific halibut was distributed throughout the survey area with the exception of Stalemate Bank on the extreme western end (Fig. 10). This species was not particularly abundant in the Western and Central NPFMC Aleutian regulatory areas, although its mean CPUE was relatively high in the Eastern Aleutian and Southern Bering Sea areas (Table 2). In addition to being more common in the eastern portion of the survey area, halibut were most common in depths less than 200 m in all areas except the Central Aleutians area where the highest concentration was in the 201-300 m depth interval. Estimated biomass was 36,854 t, with over half found in the Eastern Aleutians area and 76% of the estimated total Aleutian biomass in the 1-100 m and 101-200 m depth intervals (Table 11). Whereas abundance generally decreased with increasing depth, mean individual weight and length tended to increase with depth (Table 11 and Fig. 11). The two highest individual subarea mean CPUEs were from the 1-100 m depth interval of the NW Eastern Aleutians subarea and the 201- 300 m depth interval of the NW Eastern Aleutians and SE Central Aleutian subarea (Table 12). Individual length and weight data for halibut were not collected during this survey.

Greenland turbot (*Reinhardtius hippoglossoides*)

The population in the Aleutian Islands of this commercially important species is probably under-estimated by the survey since the maximum depth sampled by the survey is only 500 m, considerably less than its maximum depth. In 1980 the U.S.-Japan cooperative trawl survey sampled to 900 m and found that more than 80% of the total estimated Aleutian biomass was found in the 501-900 m depth interval (Ronholt et al. 1986). Relative abundance and estimated biomass were invariably highest in the 301-500 m depth interval in the Aleutians area, particularly in the Eastern and Central Aleutians areas (Tables 13 and 14) around Seguam and Amchitka Islands (Fig. 12). Catches of female Greenland turbot were relatively small compared to males (Fig. 13). 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. Appendix C lists the length-weight relationship parameters for male, female and combined sexes of Greenland turbot.

Table 11. -- Total effort (number of trawl hauls), number of hauls with Pacific halibut, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	14	5.93	2,892	325	5,460	10.707
	101 - 200	55	10	2.23	1,188	330	2,045	12.381
	201 - 300	22	2	1.08	186	0	463	16.302
	301 - 500	9	1	0.24	80	0	268	7.924
	All depths	118	27	2.86	4,345	1,639	7,051	11.214
Central Aleutians	1 - 100	48	22	1.81	1,056	542	1,569	3.378
	101 - 200	47	21	3.25	1,499	674	2,324	6.835
	201 - 300	21	4	4.15	875	0	3,017	22.031
	301 - 500	12	0	---	---	---	---	---
	All depths	128	47	2.07	3,429	1,673	5,185	6.000
Eastern Aleutians	1 - 100	21	18	11.41	7,813	0	18,573	4.709
	101 - 200	55	49	9.08	7,054	4,840	9,268	4.047
	201 - 300	33	20	7.10	3,480	1,512	5,449	11.522
	301 - 500	12	4	3.72	2,112	0	5,960	11.829
	All depths	121	91	8.12	20,460	10,414	30,505	5.269
All Aleutian Areas	1 - 100	101	54	6.69	11,761	1,786	21,736	5.246
	101 - 200	157	80	5.51	9,741	7,308	12,173	4.732
	201 - 300	76	26	5.20	4,541	2,107	6,975	12.857
	301 - 500	33	5	1.69	2,192	0	6,047	11.621
	All depths	367	165	4.96	28,234	17,989	38,479	5.831
Southern Bering Sea	1 - 100	27	26	12.75	5,132	0	10,622	1.556
	101 - 200	14	13	13.24	2,447	862	4,032	2.515
	201 - 300	5	3	0.99	56	0	138	2.274
	301 - 500	5	4	9.44	985	236	1,734	9.855
	All depths	51	46	11.52	8,620	2,292	14,948	1.961

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 2010 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	3	3	27.74	5,360	0	19,584
Central Aleutians	201-300	SE Central Aleutians	3	2	15.75	752	0	3,628
Southern Bering Sea	1-100	E Southern Bering Sea	25	24	14.85	3,625	2,343	4,907
Southern Bering Sea	101-200	E Southern Bering Sea	12	11	14.77	1,741	507	2,975
Eastern Aleutians	101-200	SE Eastern Aleutians	18	15	14.07	2,674	1,150	4,198
Eastern Aleutians	101-200	NE Eastern Aleutians	24	22	11.01	2,217	1,132	3,301
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	10.55	706	0	5,367
Southern Bering Sea	1-100	W Southern Bering Sea	2	2	9.51	1,507	0	15,668
Southern Bering Sea	301-500	Combined Southern Bering	5	4	9.44	985	176	1,794
Eastern Aleutians	201-300	SE Eastern Aleutians	8	6	8.62	1,776	61	3,492
Eastern Aleutians	101-200	NW Eastern Aleutians	4	4	7.95	1,267	0	2,798
Eastern Aleutians	301-500	SE Eastern Aleutians	4	3	7.89	2,032	0	6,436
Western Aleutians	1-100	W Western Aleutians	13	8	7.46	2,756	169	5,343
Eastern Aleutians	201-300	NE Eastern Aleutians	19	11	6.65	1,308	399	2,217
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	6.58	834	0	2,219
Central Aleutians	101-200	SE Central Aleutians	14	11	6.39	481	105	856
Eastern Aleutians	1-100	SE Eastern Aleutians	13	11	6.12	1,065	382	1,748
Eastern Aleutians	201-300	SW Eastern Aleutians	4	2	5.41	388	0	1,323
Central Aleutians	101-200	N Central Aleutians	9	6	5.37	572	119	1,026
Central Aleutians	1-100	SE Central Aleutians	12	9	4.16	484	79	889
Eastern Aleutians	101-200	SW Eastern Aleutians	9	8	3.96	896	237	1,556
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	2.91	554	0	7,591
Central Aleutians	201-300	N Central Aleutians	9	2	2.79	123	0	311
Western Aleutians	101-200	W Western Aleutians	33	9	2.73	1,109	267	1,951
Central Aleutians	1-100	N Central Aleutians	16	10	2.28	480	140	821
Central Aleutians	101-200	Petrel Bank	6	2	2.16	376	0	1,003
Western Aleutians	201-300	W Western Aleutians	13	2	1.98	186	0	466
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	1.83	80	0	1,101
Western Aleutians	1-100	E Western Aleutians	19	6	1.15	136	8	265
Southern Bering Sea	201-300	Combined Southern Bering	5	3	0.99	56	0	145
Central Aleutians	101-200	SW Central Aleutians	18	2	0.67	71	0	211
Western Aleutians	101-200	E Western Aleutians	22	1	0.63	79	0	243
Central Aleutians	1-100	Petrel Bank	9	1	0.59	57	0	188
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.54	8	0	115
Western Aleutians	301-500	W Western Aleutians	7	1	0.47	80	0	275
Central Aleutians	1-100	SW Central Aleutians	11	2	0.21	34	0	94

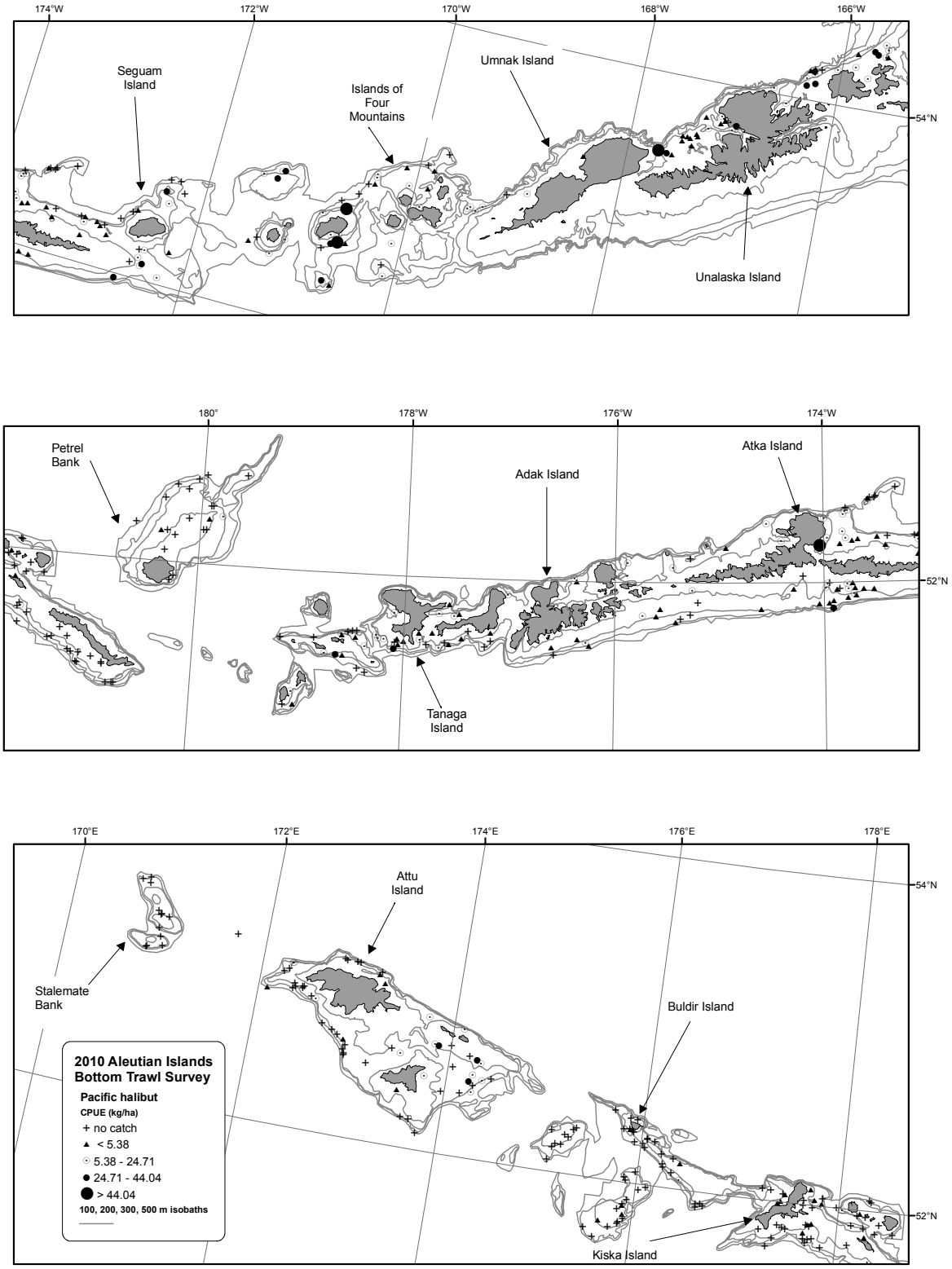

Figure 10. -- Distribution and relative abundance of Pacific halibut from the 2010 Aleutian Islands bottom trawl survey.

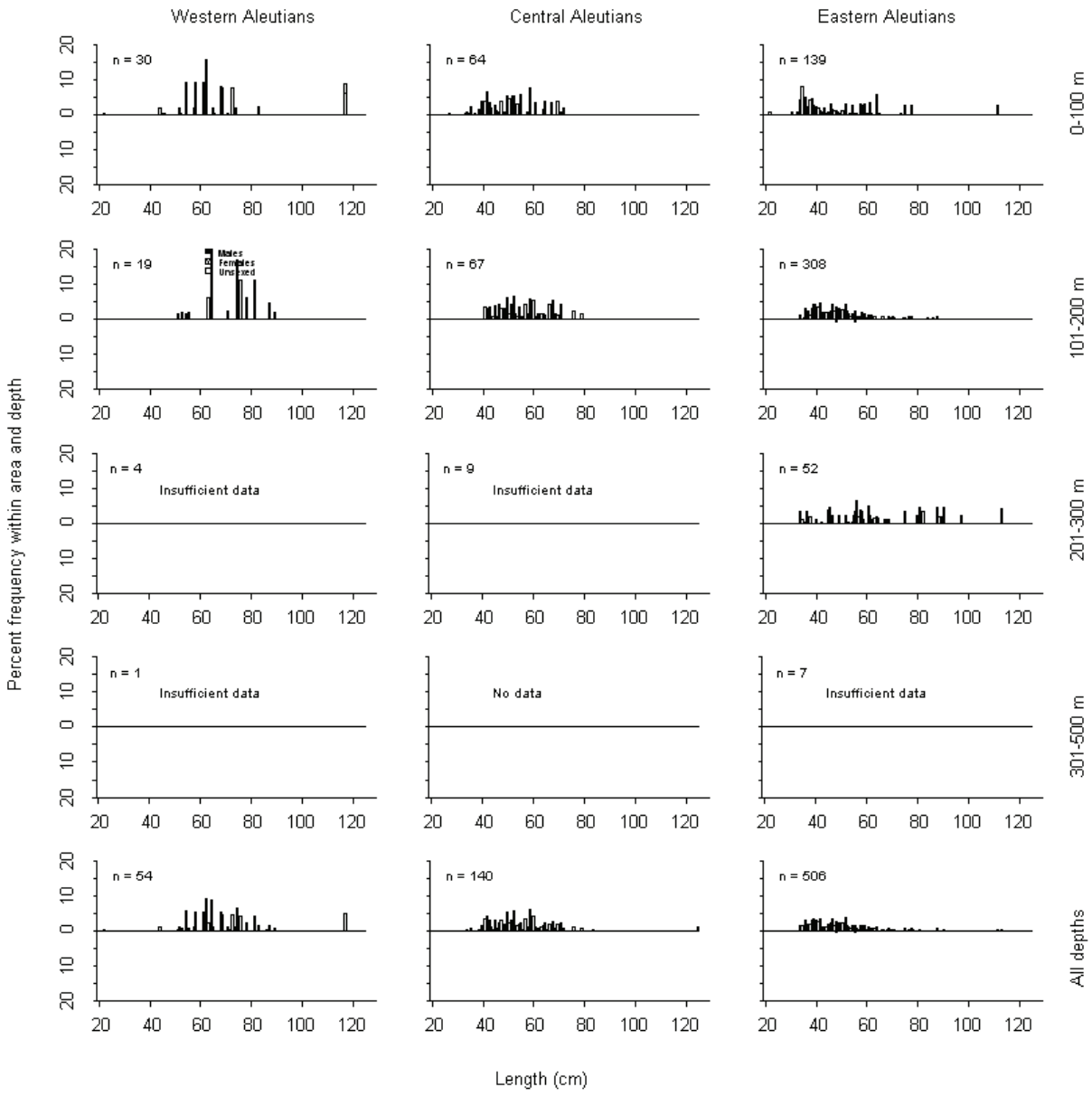

Figure 11. -- Size composition of Pacific halibut from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval. Pacific halibut were not sexed.

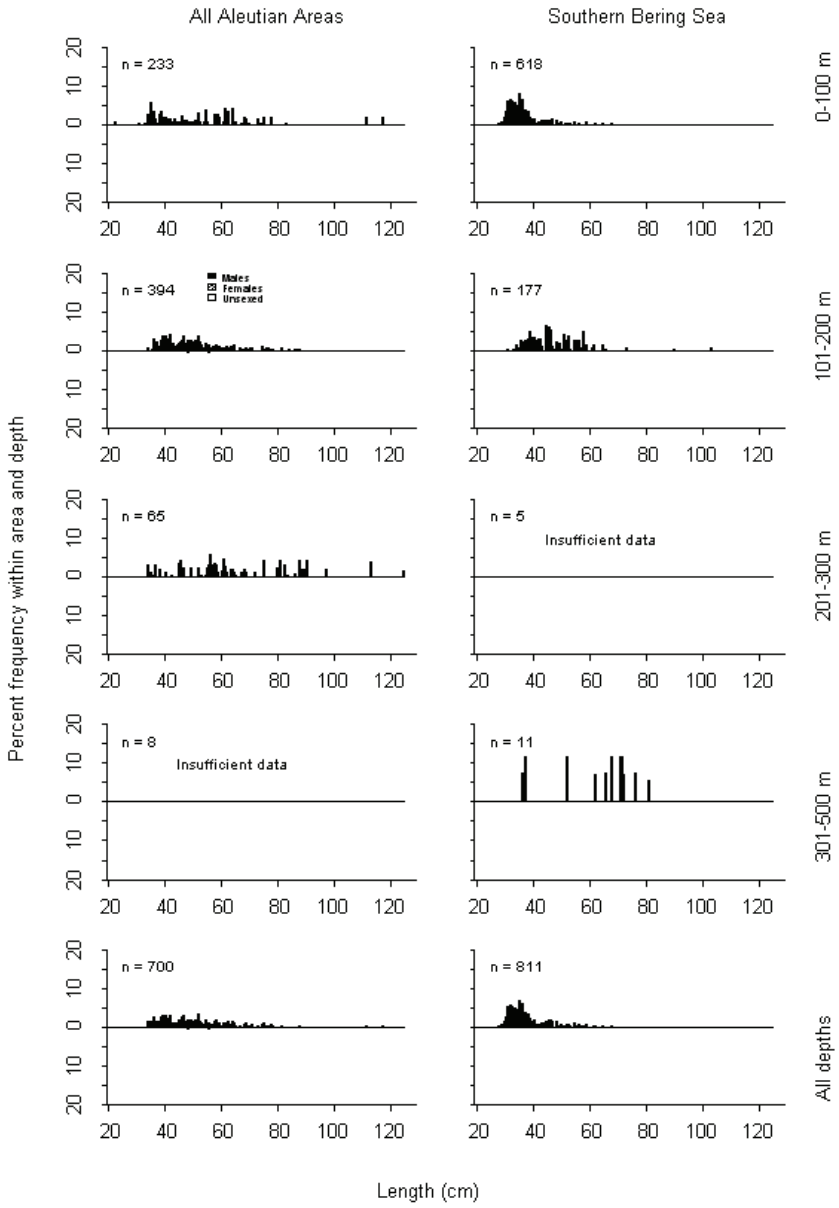

Figure 11. -- (continued).

Table 13. -- Total effort (number of trawl hauls), number of hauls with Greenland turbot, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	1	0.11	60	0	183	7.017
	201 - 300	22	2	0.56	97	0	270	5.756
	301 - 500	9	5	2.79	913	0	1,876	3.637
	All depths	118	8	0.70	1,071	100	2,042	3.871
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	0	---	---	---	---	---
	201 - 300	21	0	---	---	---	---	---
	301 - 500	12	6	3.79	1,507	698	2,316	4.528
	All depths	128	6	0.91	1,507	698	2,316	4.528
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	2	0.17	83	0	213	6.421
	301 - 500	12	4	6.36	3,612	0	11,010	3.046
	All depths	121	6	1.47	3,695	0	11,095	3.083
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	1	0.03	60	0	183	7.017
	201 - 300	76	4	0.21	180	0	387	6.044
	301 - 500	33	15	4.66	6,032	0	13,544	3.409
	All depths	367	20	1.10	6,272	0	13,790	3.469
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	1	2.85	161	0	574	2.620
	301 - 500	5	2	3.12	325	0	838	4.329
	All depths	51	3	0.65	486	0	1,092	3.561

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 2010 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	6	3	13.30	3,551	0	11,323
Central Aleutians	301-500	SW Central Aleutians	2	2	13.21	1,043	0	4,023
Western Aleutians	301-500	W Western Aleutians	7	4	4.29	733	0	1,655
Southern Bering Sea	301-500	Combined Southern Bering	5	2	3.12	325	0	879
Southern Bering Sea	201-300	Combined Southern Bering	5	1	2.85	161	0	607
Central Aleutians	301-500	SE Central Aleutians	2	1	1.71	122	0	1,678
Central Aleutians	301-500	N Central Aleutians	6	2	1.46	181	0	480
Central Aleutians	301-500	Petrel Bank	2	1	1.30	161	0	2,203
Western Aleutians	301-500	E Western Aleutians	2	1	1.15	180	0	2,465
Western Aleutians	201-300	W Western Aleutians	13	2	1.03	97	0	271
Eastern Aleutians	201-300	NE Eastern Aleutians	19	2	0.42	83	0	214
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	0.24	61	0	254
Western Aleutians	101-200	W Western Aleutians	33	1	0.15	60	0	183

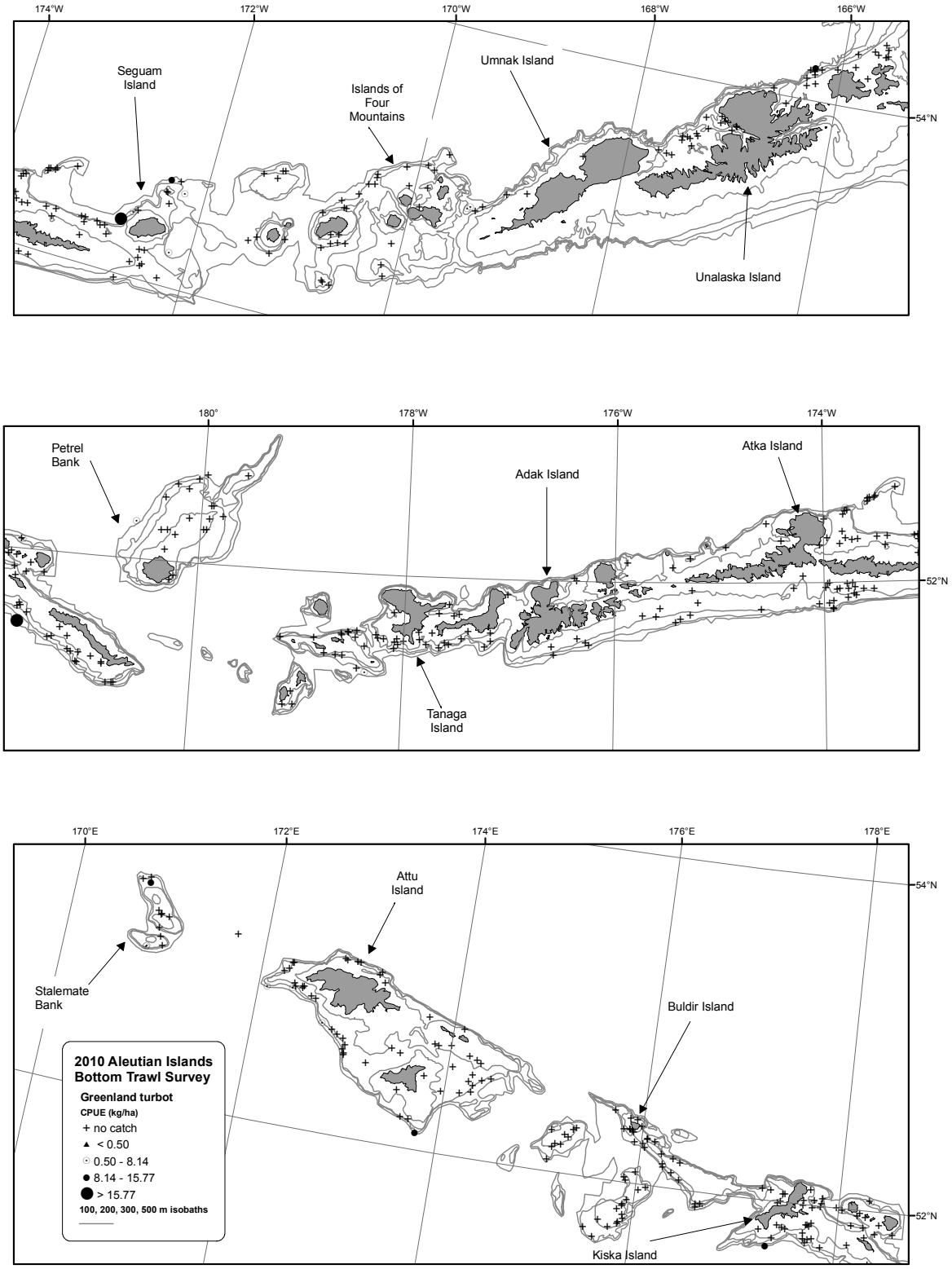

Figure 12. -- Distribution and relative abundance of Greenland turbot from the 2010 Aleutian Islands bottom trawl survey.

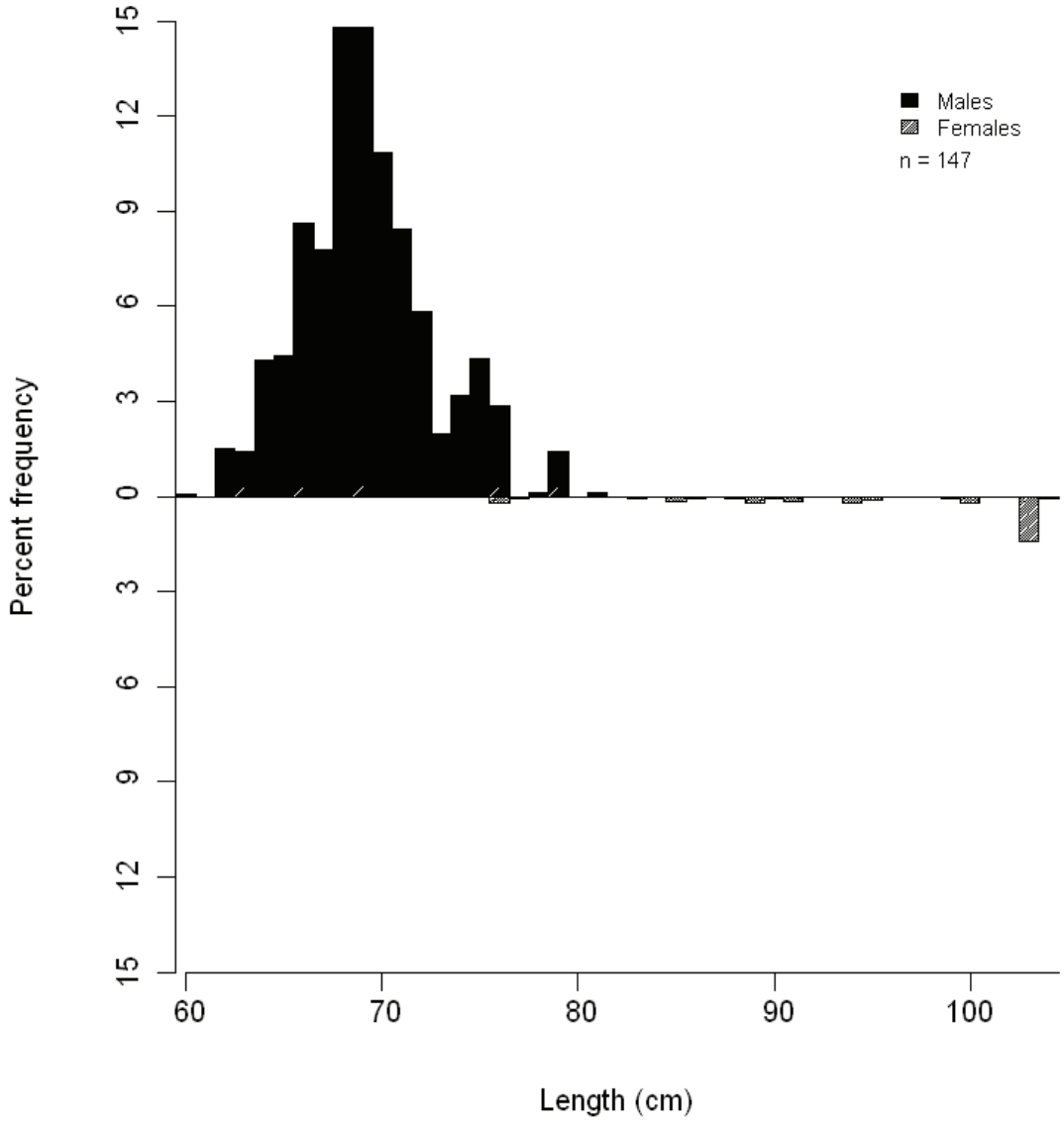

Figure 13. -- Size composition of Greenland turbot from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

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 11,811 t, with 79% found in the Western and Eastern Aleutian areas (Table 15). The highest mean CPUE was found in the Eastern Aleutians area in the 101-200 m depth interval, where flathead sole individual mean weight was among the smallest of any NPFMC-depth area. The highest stratum mean CPUEs by far were in the NW Eastern Aleutians area in 101-200 m. This stratum combined with the next three highest density strata (all less than 200 m) contained more than 73% of the total biomass even though the combined area of these strata only account for 14% of the survey area (Table 16). The six largest station-specific CPUEs were not concentrated in a particular area, but were spread out over the Aleutian chain between Unalaska in the east and Attu in the west (Fig. 14). Size compositions did not increase with depth, although females appear to reach greater size than males in most areas (Fig. 15).

Rex sole (*Glyptocephalus zachirus*)

Rex sole were found over the entire survey area, although at relatively low levels of abundance (Table 2). Mean CPUE was highest in different depth intervals in the different NPFMC areas: 101-200 m in the Western Aleutians and Southern Bering Sea areas, 201-300 m in the Eastern Aleutians, and 301-500 m in the Central Aleutians. The Southern Bering Sea contained about 31% of the estimated biomass even though it constitutes less than 12% of the survey area. (Tables 1 and 17). The stratum with the highest mean CPUE was in the E Southern Bering Sea, where the mean CPUE was more than twice that of the next highest (Table 18). The largest catches were centered around Unalaska Island (Fig. 16). Males were smaller than females in all areas and females dominated the catches in depths less than 200 m (Fig. 17). Individual length and weight data were not collected during this survey.

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 this species is mostly of biological interest as part of the Aleutian ecosystem. The highest stratum-specific estimated biomass was reported from the 301-500 m depth interval in the Central Aleutian area (Table 19), more specifically from three tows in the 301-500 m and 101-200 m depth intervals on Petrel Bank (Table 20). Length frequencies were similar for both sexes (Fig. 18).

Table 15. -- Total effort (number of trawl hauls), number of hauls with flathead sole, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	12	2.59	1,264	244	2,285	0.419
	101 - 200	55	36	5.14	2,732	1,464	3,999	0.245
	201 - 300	22	9	1.07	184	11	356	0.305
	301 - 500	9	0	---	---	---	---	---
	All depths	118	57	2.75	4,180	2,578	5,781	0.283
Central Aleutians	1 - 100	48	5	0.03	18	0	39	0.135
	101 - 200	47	4	0.05	22	0	49	0.477
	201 - 300	21	5	0.20	43	0	92	0.667
	301 - 500	12	0	---	---	---	---	---
	All depths	128	14	0.05	82	32	132	0.342
Eastern Aleutians	1 - 100	21	3	0.58	399	0	1,027	0.323
	101 - 200	55	15	5.88	4,567	0	14,190	0.216
	201 - 300	33	8	0.31	154	24	284	0.549
	301 - 500	12	0	---	---	---	---	---
	All depths	121	26	2.03	5,120	0	14,760	0.226
All Aleutian Areas	1 - 100	101	20	0.96	1,681	589	2,773	0.384
	101 - 200	157	55	4.14	7,320	0	17,096	0.227
	201 - 300	76	22	0.44	380	170	591	0.402
	301 - 500	33	0		---	---	---	---
	All depths	367	97	1.65	9,381	228	18,535	0.249
Southern Bering Sea	1 - 100	27	22	4.10	1,650	724	2,576	0.269
	101 - 200	14	10	4.14	766	20	1,513	0.213
	201 - 300	5	2	0.25	14	0	37	0.745
	301 - 500	5	0	---	---	---	---	---
	All depths	51	34	3.25	2,430	1,276	3,584	0.249

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 2010 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	NW Eastern Aleutians	4	3	22.57	3,598	0	14,550
Southern Bering Sea	1-100	E Southern Bering Sea	25	22	6.76	1,650	722	2,578
Western Aleutians	101-200	W Western Aleutians	33	30	6.55	2,661	1,396	3,927
Southern Bering Sea	101-200	E Southern Bering Sea	12	9	6.46	761	7	1,515
Eastern Aleutians	101-200	NE Eastern Aleutians	24	9	3.80	764	0	1,582
Western Aleutians	1-100	W Western Aleutians	13	12	3.42	1,264	235	2,294
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	3.11	394	0	1,244
Western Aleutians	201-300	W Western Aleutians	13	7	1.89	178	4	352
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	1.24	19	0	266
Eastern Aleutians	101-200	SW Eastern Aleutians	9	3	0.91	206	0	475
Central Aleutians	201-300	SE Central Aleutians	3	2	0.57	27	0	91
Eastern Aleutians	201-300	NE Eastern Aleutians	19	5	0.57	112	0	230
Western Aleutians	101-200	E Western Aleutians	22	6	0.56	71	0	142
Eastern Aleutians	201-300	SW Eastern Aleutians	4	2	0.32	23	0	82
Southern Bering Sea	201-300	Combined Southern Bering	5	2	0.25	14	0	38
Central Aleutians	201-300	SW Central Aleutians	6	1	0.20	9	0	31
Central Aleutians	101-200	SW Central Aleutians	18	3	0.17	18	0	44
Central Aleutians	201-300	N Central Aleutians	9	2	0.16	7	0	20
Central Aleutians	1-100	SW Central Aleutians	11	2	0.07	12	0	32
Western Aleutians	201-300	E Western Aleutians	9	2	0.07	6	0	14
Southern Bering Sea	101-200	W Southern Bering Sea	2	1	0.07	5	0	65
Central Aleutians	101-200	SE Central Aleutians	14	1	0.05	4	0	12
Central Aleutians	1-100	N Central Aleutians	16	3	0.03	6	0	16
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.03	5	0	67

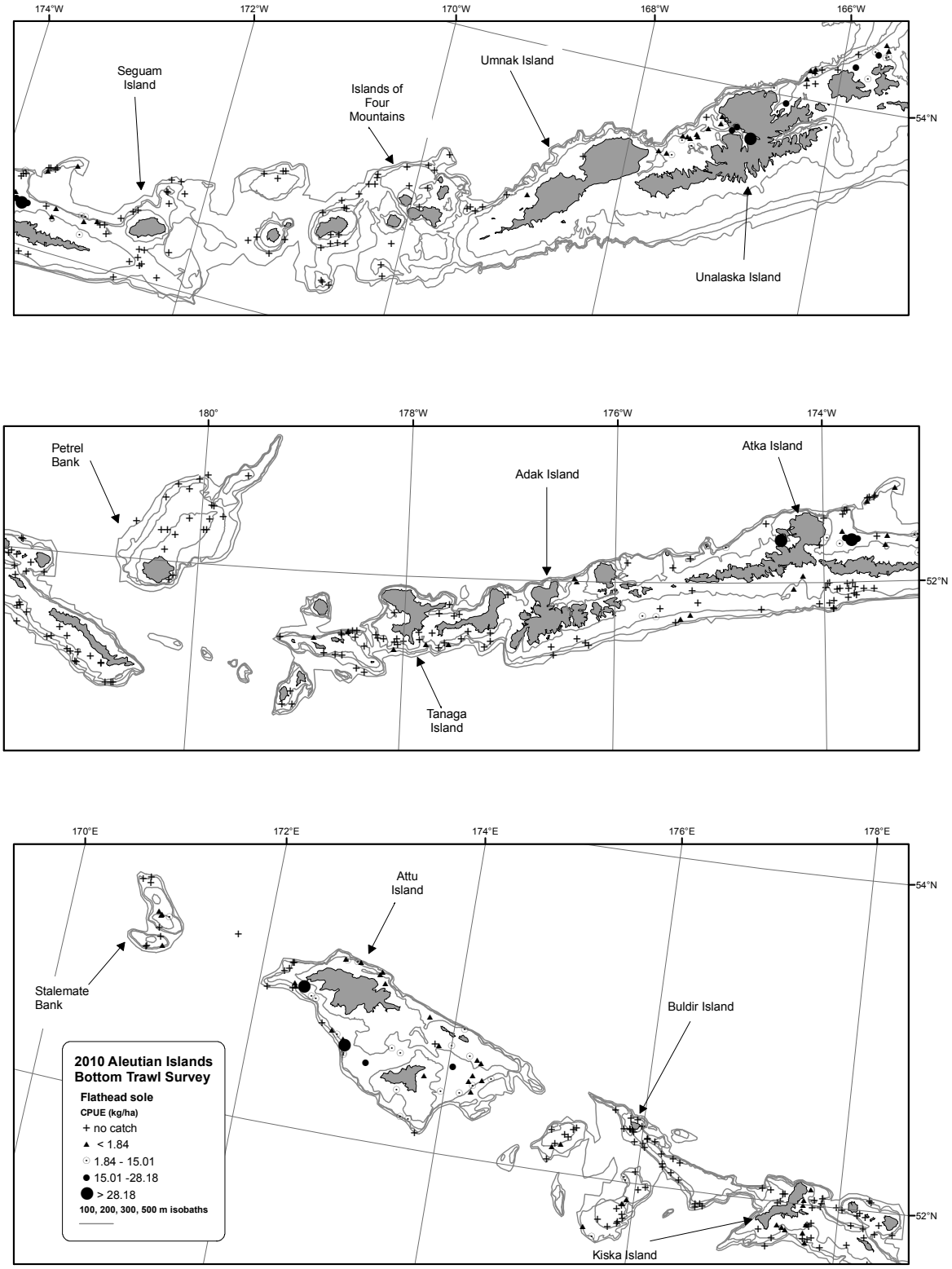

Figure 14. -- Distribution and relative abundance of flathead sole from the 2010 Aleutian Islands bottom trawl survey.

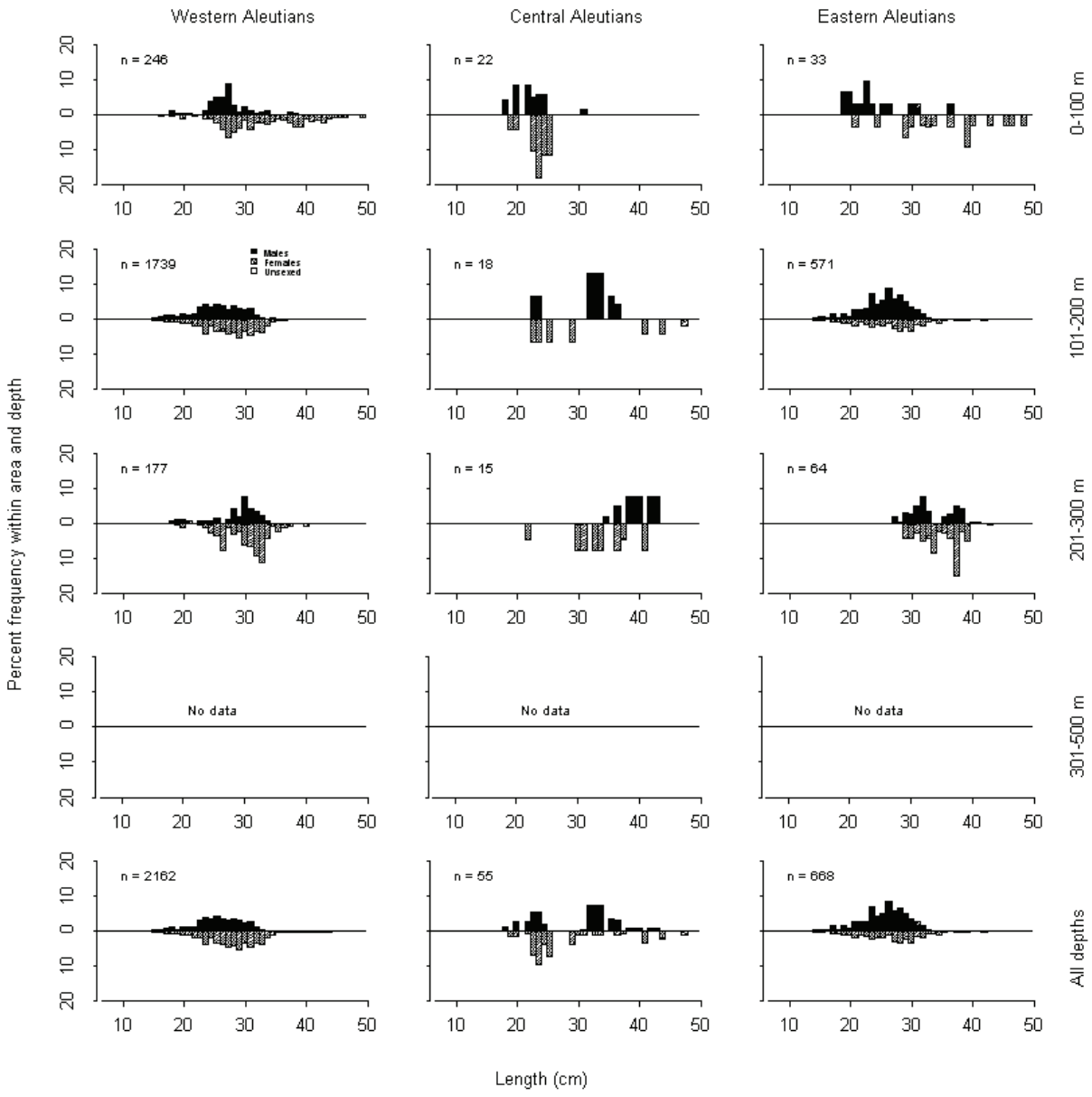

Figure 15. -- Size composition of flathead sole from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

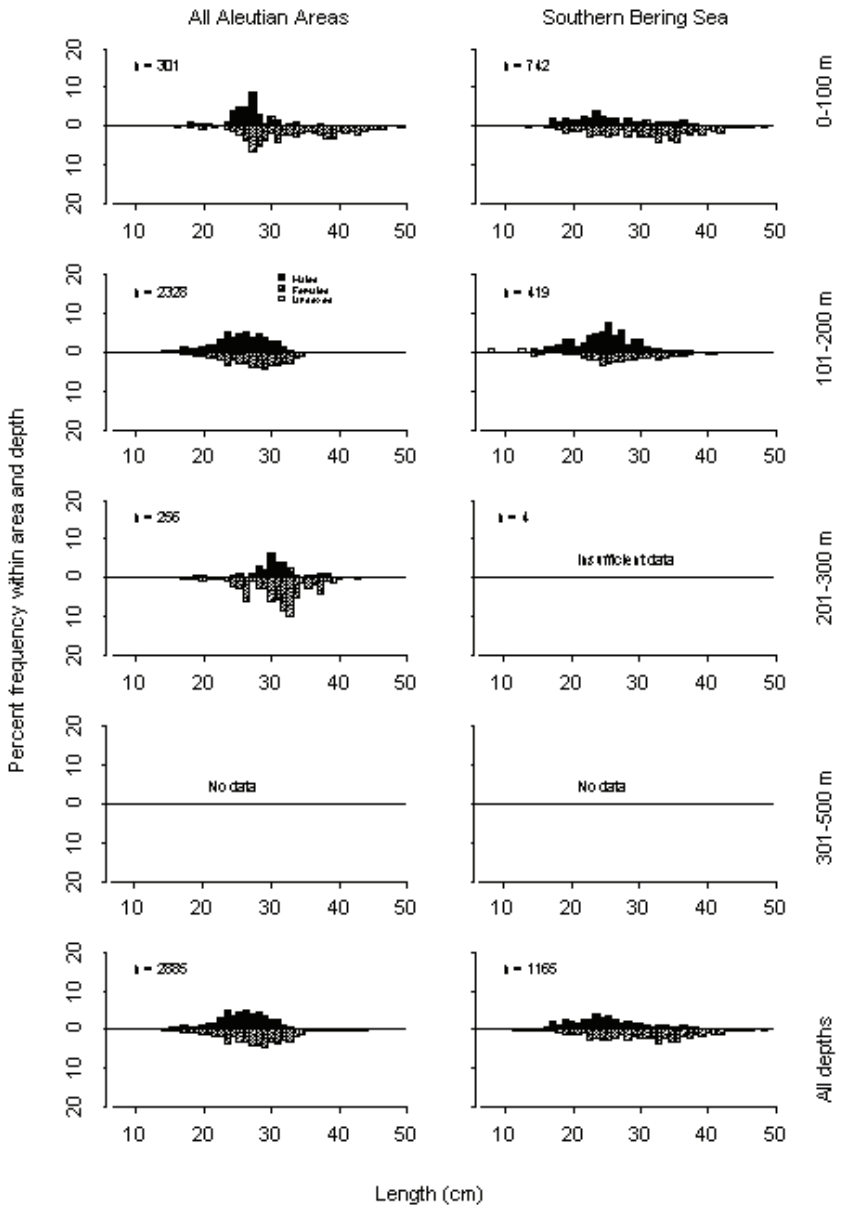

Figure 15. -- (continued).

Table 17. -- Total effort (number of trawl hauls), number of hauls with rex sole, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	9	0.65	319	40	599	0.727
	101 - 200	55	31	2.82	1,500	860	2,139	0.500
	201 - 300	22	10	1.29	223	27	418	0.375
	301 - 500	9	6	0.55	179	49	309	0.516
	All depths	118	56	1.46	2,221	1,502	2,939	0.507
Central Aleutians	1 - 100	48	2	0.02	9	0	28	0.164
	101 - 200	47	12	0.43	196	0	496	0.483
	201 - 300	21	9	2.89	610	123	1,097	0.601
	301 - 500	12	6	3.33	1,325	0	4,302	0.676
	All depths	128	29	1.29	2,141	0	4,486	0.623
Eastern Aleutians	1 - 100	21	1	0.21	147	0	613	0.478
	101 - 200	55	9	1.03	798	0	1,636	0.645
	201 - 300	33	13	2.42	1,188	0	2,450	0.593
	301 - 500	12	3	0.39	222	0	634	0.717
	All depths	121	26	0.93	2,355	825	3,884	0.610
All Aleutian Areas	1 - 100	101	12	0.27	475	43	907	0.593
	101 - 200	157	52	1.41	2,494	1,451	3,537	0.537
	201 - 300	76	32	2.31	2,021	670	3,371	0.559
	301 - 500	33	15	1.34	1,727	0	3,999	0.660
	All depths	367	111	1.18	6,716	4,206	9,225	0.575
Southern Bering Sea	1 - 100	27	15	1.39	561	232	889	0.511
	101 - 200	14	11	10.83	2,003	510	3,496	0.514
	201 - 300	5	2	5.56	313	0	866	0.589
	301 - 500	5	3	1.25	130	0	305	0.629
	All depths	51	31	4.02	3,007	1,455	4,558	0.525

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 2010 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 Sea	12	11	16.99	2,003	495	3,511
Eastern Aleutians	201-300	SW Eastern Aleutians	4	4	7.07	507	0	1,817
Central Aleutians	301-500	Petrel Bank	2	2	6.77	838	0	8,463
Central Aleutians	201-300	SW Central Aleutians	6	2	6.03	257	0	702
Southern Bering Sea	201-300	Combined Southern Bering	5	2	5.56	313	0	911
Central Aleutians	201-300	N Central Aleutians	9	4	4.41	193	0	464
Central Aleutians	301-500	N Central Aleutians	6	3	3.64	451	0	1,330
Eastern Aleutians	201-300	NE Eastern Aleutians	19	6	3.26	641	0	1,565
Western Aleutians	101-200	W Western Aleutians	33	24	3.11	1,266	653	1,878
Southern Bering Sea	1-100	E Southern Bering Sea	25	14	2.16	526	208	844
Eastern Aleutians	101-200	SW Eastern Aleutians	9	3	1.88	426	0	1,204
Western Aleutians	101-200	E Western Aleutians	22	7	1.87	234	48	420
Western Aleutians	201-300	W Western Aleutians	13	6	1.83	172	0	362
Western Aleutians	1-100	E Western Aleutians	19	7	1.65	195	41	349
Central Aleutians	201-300	Petrel Bank	3	2	1.60	123	0	421
Eastern Aleutians	101-200	NE Eastern Aleutians	24	4	1.33	267	0	599
Southern Bering Sea	301-500	Combined Southern Bering	5	3	1.25	130	0	319
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	1.16	147	0	778
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.79	35	0	474
Central Aleutians	201-300	SE Central Aleutians	3	1	0.77	37	0	195
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	2	0.70	188	0	611
Central Aleutians	101-200	Petrel Bank	6	1	0.69	119	0	425
Eastern Aleutians	101-200	NW Eastern Aleutians	4	2	0.66	105	0	396
Western Aleutians	201-300	E Western Aleutians	9	4	0.64	50	0	116
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.61	10	0	130
Western Aleutians	301-500	E Western Aleutians	2	2	0.60	93	35	151
Central Aleutians	101-200	SW Central Aleutians	18	8	0.54	57	7	107
Western Aleutians	301-500	W Western Aleutians	7	4	0.50	86	0	220
Central Aleutians	301-500	SW Central Aleutians	2	1	0.47	37	0	503
Western Aleutians	1-100	W Western Aleutians	13	2	0.34	124	0	359
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.22	35	0	474
Eastern Aleutians	201-300	SE Eastern Aleutians	8	2	0.15	31	0	79
Central Aleutians	101-200	N Central Aleutians	9	1	0.12	13	0	43
Central Aleutians	101-200	SE Central Aleutians	14	2	0.10	8	0	23
Central Aleutians	1-100	SW Central Aleutians	11	1	0.05	9	0	28
Central Aleutians	1-100	N Central Aleutians	16	1	0.00	0	0	1

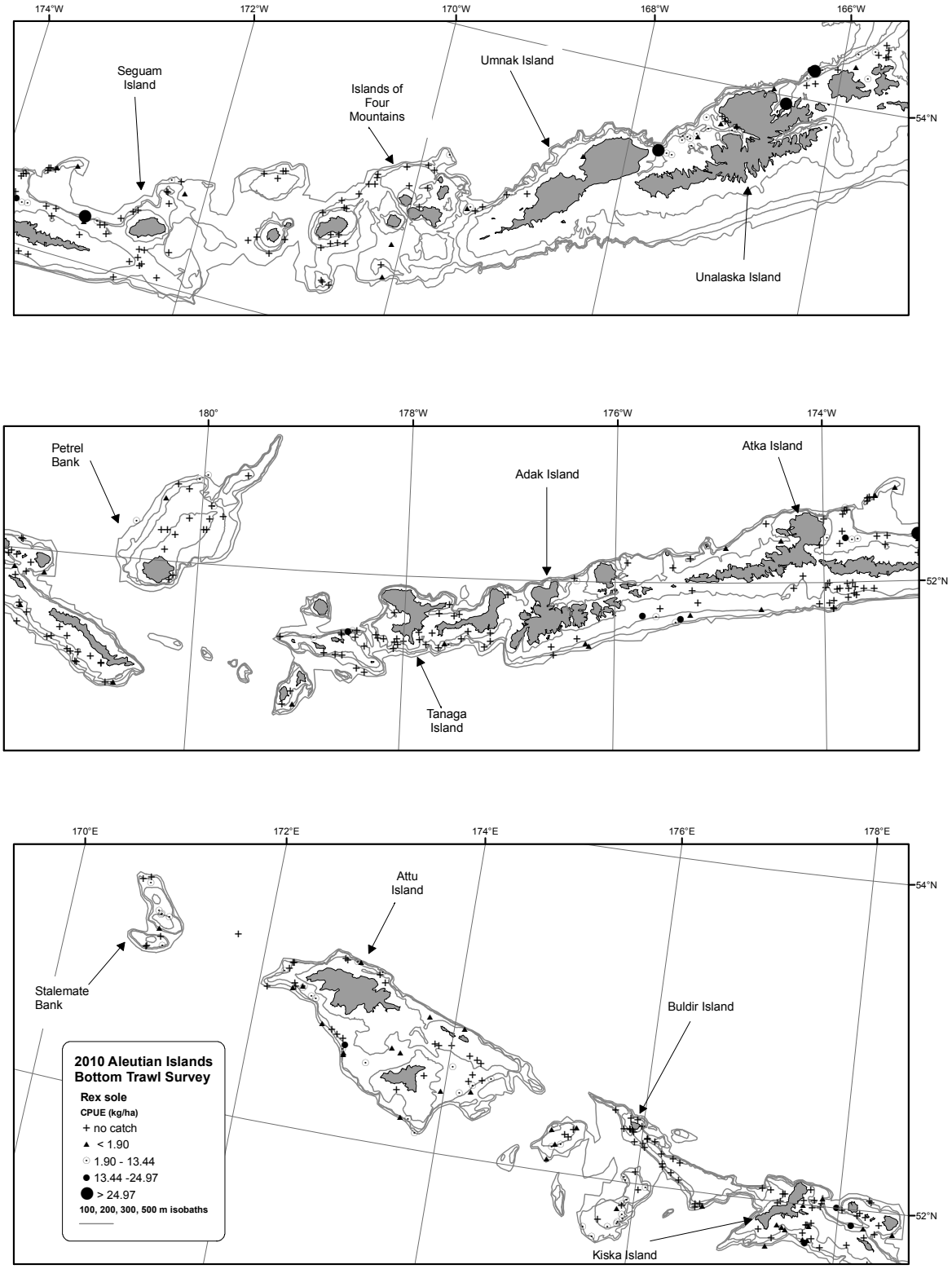

Figure 16. -- Distribution and relative abundance of rex sole from the 2010 Aleutian Islands bottom trawl survey.

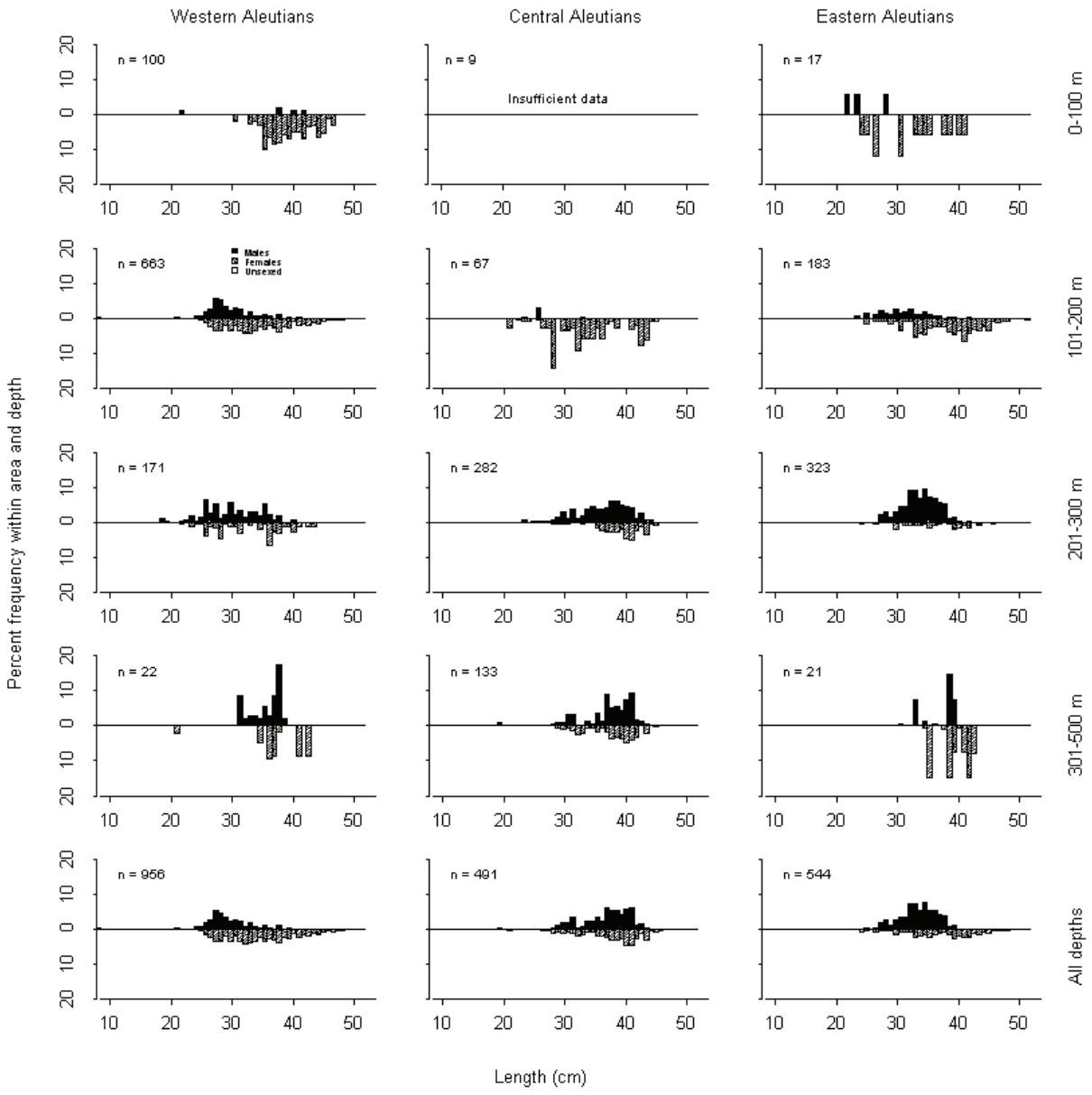

Figure 17. -- Size composition of rex sole from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

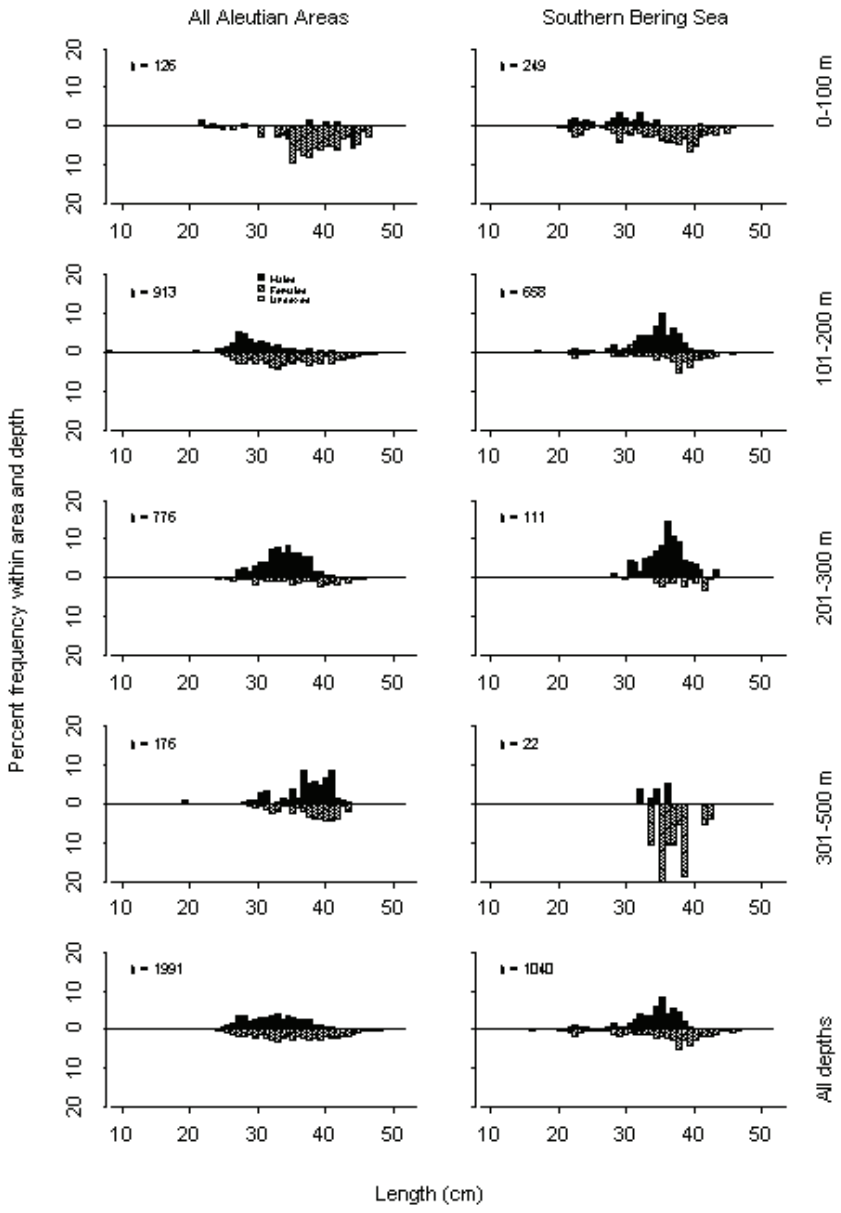

Figure 17. -- (continued).

Table 19. -- Total effort (number of trawl hauls), number of hauls with Dover sole, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	2	0.04	21	0	52	0.270
	101 - 200	55	11	0.12	63	8	118	0.675
	201 - 300	22	9	0.54	94	5	183	1.000
	301 - 500	9	2	0.15	48	0	136	1.616
	All depths	118	24	0.15	226	93	358	0.770
Central Aleutians	1 - 100	48	5	0.18	103	0	229	0.566
	101 - 200	47	3	1.85	853	0	2,860	0.684
	201 - 300	21	3	0.60	127	0	349	0.927
	301 - 500	12	4	3.51	1,396	0	4,311	1.625
	All depths	128	15	1.50	2,479	0	5,495	1.022
Eastern Aleutians	1 - 100	21	1	0.01	4	0	18	0.238
	101 - 200	55	1	<0.01	1	0	2	0.135
	201 - 300	33	4	0.15	71	0	235	0.856
	301 - 500	12	1	0.05	29	0	101	1.640
	All depths	121	7	0.04	105	0	252	0.857
All Aleutian Areas	1 - 100	101	8	0.07	128	6	249	0.463
	101 - 200	157	15	0.52	916	0	2,924	0.681
	201 - 300	76	16	0.33	292	55	530	0.930
	301 - 500	33	7	1.14	1,473	0	4,392	1.625
	All depths	367	46	0.49	2,809	0	5,834	0.989
Southern Bering Sea	1 - 100	27	1	<0.01	1	0	2	0.119
	101 - 200	14	4	0.16	30	0	65	0.660
	201 - 300	5	1	0.16	9	0	31	0.914
	301 - 500	5	2	0.25	26	0	76	1.438
	All depths	51	8	0.09	65	4	125	0.843

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 2010 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	Petrel Bank	2	1	6.29	778	0	10,661
Central Aleutians	301-500	SW Central Aleutians	2	1	5.99	473	0	6,479
Central Aleutians	101-200	Petrel Bank	6	3	4.91	853	0	2,961
Central Aleutians	201-300	Petrel Bank	3	2	1.61	124	0	423
Central Aleutians	301-500	SE Central Aleutians	2	1	1.13	81	0	1,108
Central Aleutians	1-100	Petrel Bank	9	3	1.03	99	0	228
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.81	58	0	243
Western Aleutians	201-300	W Western Aleutians	13	6	0.79	74	0	162
Central Aleutians	301-500	N Central Aleutians	6	1	0.52	64	0	230
Western Aleutians	101-200	E Western Aleutians	22	6	0.36	45	0	96
Western Aleutians	301-500	W Western Aleutians	7	2	0.28	48	0	139
Southern Bering Sea	101-200	E Southern Bering Sea	12	4	0.25	30	0	65
Western Aleutians	201-300	E Western Aleutians	9	3	0.25	20	0	46
Southern Bering Sea	301-500	Combined Southern Bering	5	2	0.25	26	0	80
Southern Bering Sea	201-300	Combined Southern Bering	5	1	0.16	9	0	33
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	1	0.11	29	0	104
Central Aleutians	201-300	N Central Aleutians	9	1	0.08	4	0	12
Western Aleutians	1-100	E Western Aleutians	19	1	0.08	9	0	29
Eastern Aleutians	201-300	NE Eastern Aleutians	19	2	0.06	12	0	33
Western Aleutians	101-200	W Western Aleutians	33	5	0.05	18	0	41
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	0.03	4	0	23
Western Aleutians	1-100	W Western Aleutians	13	1	0.03	11	0	36
Central Aleutians	1-100	SW Central Aleutians	11	1	0.01	2	0	7
Central Aleutians	1-100	N Central Aleutians	16	1	0.01	2	0	6
Eastern Aleutians	201-300	SE Eastern Aleutians	8	1	0.01	1	0	3
Eastern Aleutians	101-200	NE Eastern Aleutians	24	1	0.00	1	0	2
Southern Bering Sea	1-100	E Southern Bering Sea	25	1	0.00	1	0	2

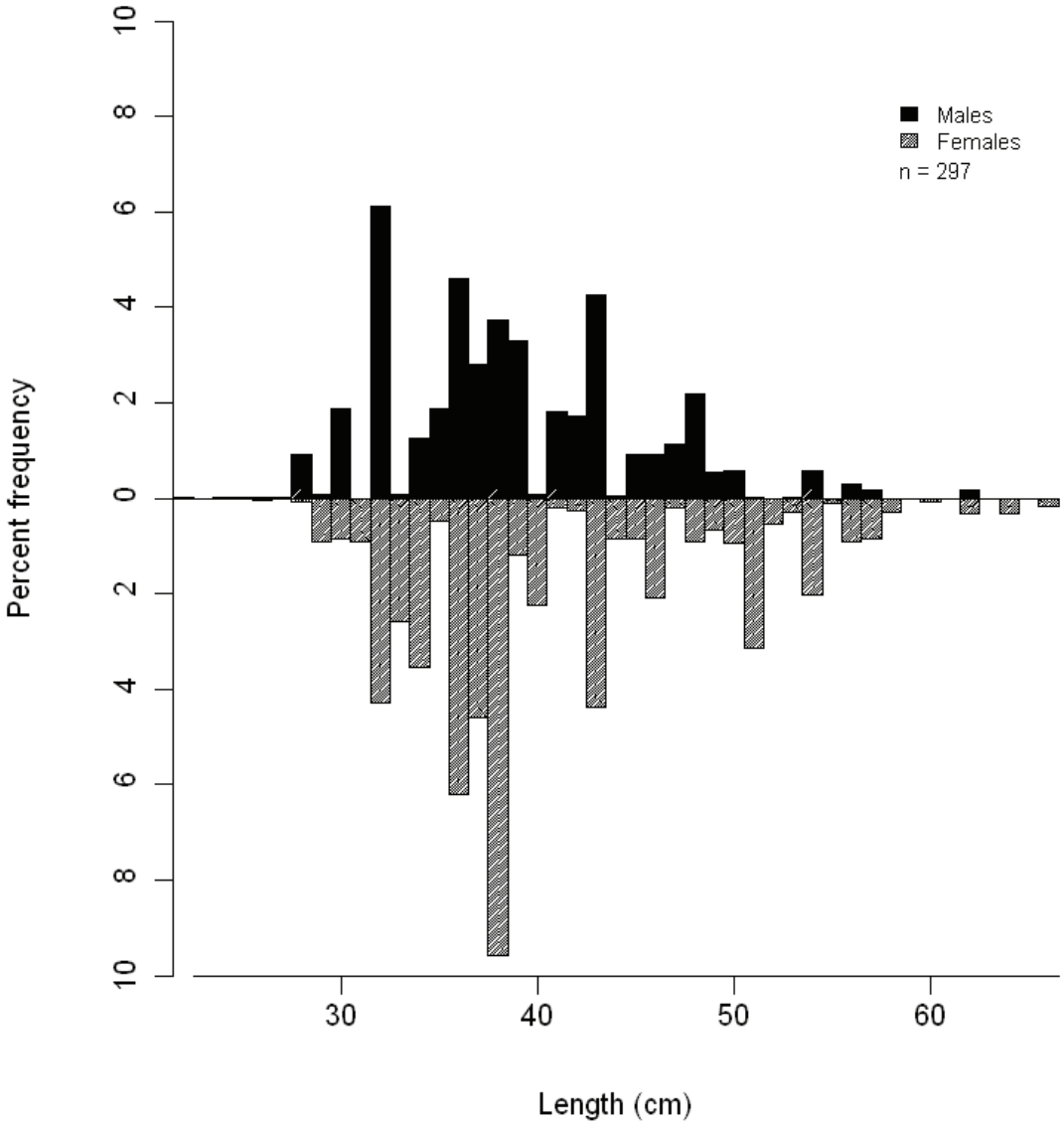

Figure 18. -- Size composition of Dover sole from the 2010 Aleutian Islands bottom trawl survey.

Roundfish

Atka mackerel (*Pleurogrammus monopterygius*)

Atka mackerel had the second highest mean CPUE and estimated biomass of all species in the 2010 survey (Table 2). Atka mackerel were distributed throughout the survey area (Fig. 19). Estimated biomass for the entire survey area surpassed 930,000 t. Atka mackerel mean CPUEs were relatively even throughout the survey area (Table 21). The highest Atka mackerel abundance by far in the Western and Eastern Aleutians areas was found in the 101-200 m depth interval, and in 1-100 m depth interval in the Central Aleutians and Southern Bering Sea areas. Atka mackerel was captured in 61% of all successful survey tows conducted shallower than 300 m. The highest stratum-specific mean CPUE and estimated biomass by far was found in the NE Eastern Aleutians subarea between the Islands of Four Mountains and Amchitka Island in the depth interval of 101-200 m (Table 22 and Fig. 19).

The largest mean size fish were found in the Eastern Aleutians and Southern Bering Sea areas, where the mean weights were more than twice that of the Central and Western Aleutian areas. Distinct length modes for males occurred only in the 201-300 m depth interval in each of the subareas and varied between 34 and 44 cm. Distinct length modes for females occurred at 47 and 50 cm in the 201-300 m and 101-200 m depth intervals, respectively in the Southern Bering Sea, and at 45 cm in the 101-200 m depth interval in the Eastern Aleutian area (Fig. 20). Appendix C lists the length-weight relationship parameters for male, female, and combined sexes of Atka mackerel.

Table 21. -- Total effort (number of trawl hauls), number of hauls with Atka mackerel, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	27	121.91	59,449	20,667	98,231	0.501
	101 - 200	55	44	368.24	195,819	0	496,872	0.440
	201 - 300	22	10	0.78	134	38	231	0.714
	301 - 500	9	1	0.05	17	0	92	0.700
	All depths	118	82	168.15	255,419	0	558,946	0.453
Central Aleutians	1 - 100	48	37	174.80	102,211	41,647	162,775	0.424
	101 - 200	47	33	209.43	96,457	0	211,654	0.574
	201 - 300	21	11	0.98	207	0	605	0.612
	301 - 500	12	0	---	---	---	---	---
	All depths	128	81	120.22	198,874	70,186	327,563	0.485
Eastern Aleutians	1 - 100	21	11	65.68	44,981	0	129,970	0.980
	101 - 200	55	26	421.09	327,105	0	885,871	1.177
	201 - 300	33	10	0.69	339	0	816	1.054
	301 - 500	12	1	0.01	5	0	17	0.202
	All depths	121	48	147.79	372,429	0	935,947	1.149
All Aleutian Areas	1 - 100	101	75	117.60	206,640	98,336	314,945	0.509
	101 - 200	157	103	350.10	619,380	0	1,250,522	0.695
	201 - 300	76	31	0.78	680	76	1,285	0.802
	301 - 500	33	2	0.02	22	0	100	0.453
	All depths	367	211	145.21	826,723	186,569	1,466,876	0.637
Southern Bering Sea	1 - 100	27	11	244.09	98,268	0	280,495	1.436
	101 - 200	14	8	26.58	4,914	0	11,986	1.440
	201 - 300	5	4	5.81	327	0	795	1.300
	301 - 500	5	1	0.18	19	0	67	1.039
	All depths	51	24	138.38	103,529	0	285,878	1.436

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 2010 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	24	11	1483.90	298,643	0	856,884
Western Aleutians	1-100	E Western Aleutians	19	19	439.13	51,963	14,192	89,734
Southern Bering Sea	1-100	E Southern Bering	25	11	402.70	98,268	0	280,849
Central Aleutians	1-100	Petrel Bank	9	9	388.43	37,290	1,431	73,149
Western Aleutians	101-200	W Western Aleutians	33	24	372.45	151,406	0	451,041
Western Aleutians	101-200	E Western Aleutians	22	20	354.61	44,413	14,675	74,151
Central Aleutians	1-100	SE Central Aleutians	12	8	302.07	35,163	0	81,682
Central Aleutians	101-200	SW Central Aleutians	18	17	273.70	28,802	0	63,786
Central Aleutians	101-200	Petrel Bank	6	4	264.43	45,892	0	154,324
Eastern Aleutians	1-100	SE Eastern Aleutians	13	9	258.20	44,944	0	130,681
Central Aleutians	101-200	SE Central Aleutians	14	8	230.82	17,353	0	44,196
Eastern Aleutians	101-200	SE Eastern Aleutians	18	15	149.78	28,462	0	87,224
Central Aleutians	1-100	N Central Aleutians	16	13	100.18	21,095	0	47,211
Central Aleutians	1-100	SW Central Aleutians	11	7	53.56	8,664	0	25,825
Central Aleutians	101-200	N Central Aleutians	9	4	41.37	4,410	0	10,998
Southern Bering Sea	101-200	E Southern Bering	12	7	40.64	4,793	0	11,931
Western Aleutians	1-100	W Western Aleutians	13	8	20.27	7,486	0	20,449
Southern Bering Sea	201-300	Combined Southern Bering	5	4	5.81	327	0	832
Central Aleutians	201-300	SW Central Aleutians	6	5	4.39	187	0	605
Southern Bering Sea	101-200	W Southern Bering	2	1	1.82	122	0	1,671
Eastern Aleutians	201-300	SE Eastern Aleutians	8	4	1.45	299	0	787
Western Aleutians	201-300	W Western Aleutians	13	5	1.07	101	7	194
Western Aleutians	201-300	E Western Aleutians	9	5	0.43	34	0	71
Central Aleutians	201-300	N Central Aleutians	9	5	0.36	16	0	35
Eastern Aleutians	201-300	NE Eastern Aleutians	19	6	0.20	40	4	75
Southern Bering Sea	301-500	Combined Southern Bering	5	1	0.18	19	0	71
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.18	34	0	467
Western Aleutians	301-500	E Western Aleutians	2	1	0.11	17	0	237
Central Aleutians	201-300	SE Central Aleutians	3	1	0.09	4	0	23
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	1	0.02	5	0	18
Eastern Aleutians	1-100	NW Eastern Aleutians	3	1	0.01	3	0	13

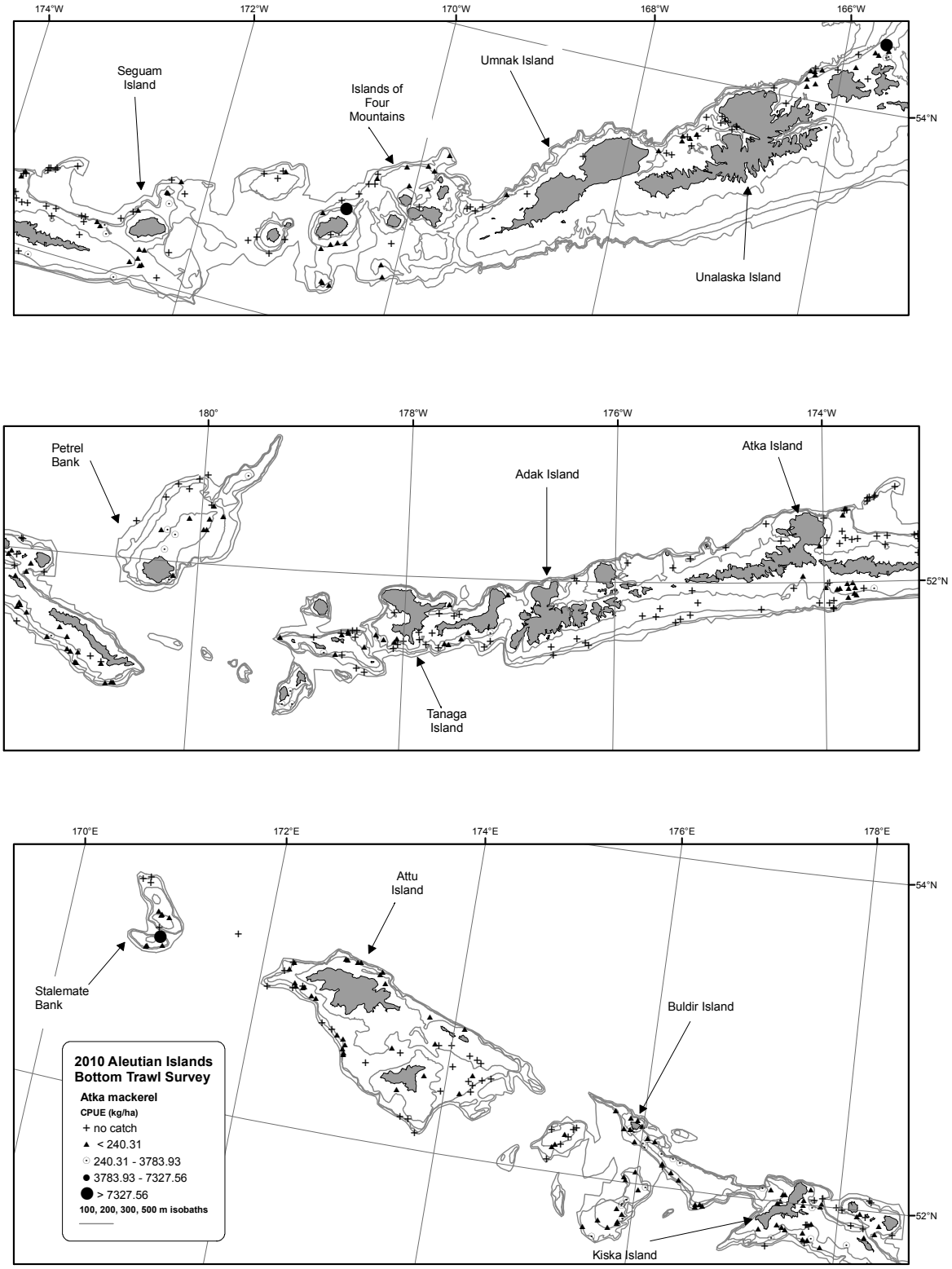

Figure 19. -- Distribution and relative abundance of Atka mackerel from the 2010 Aleutian Islands bottom trawl survey.

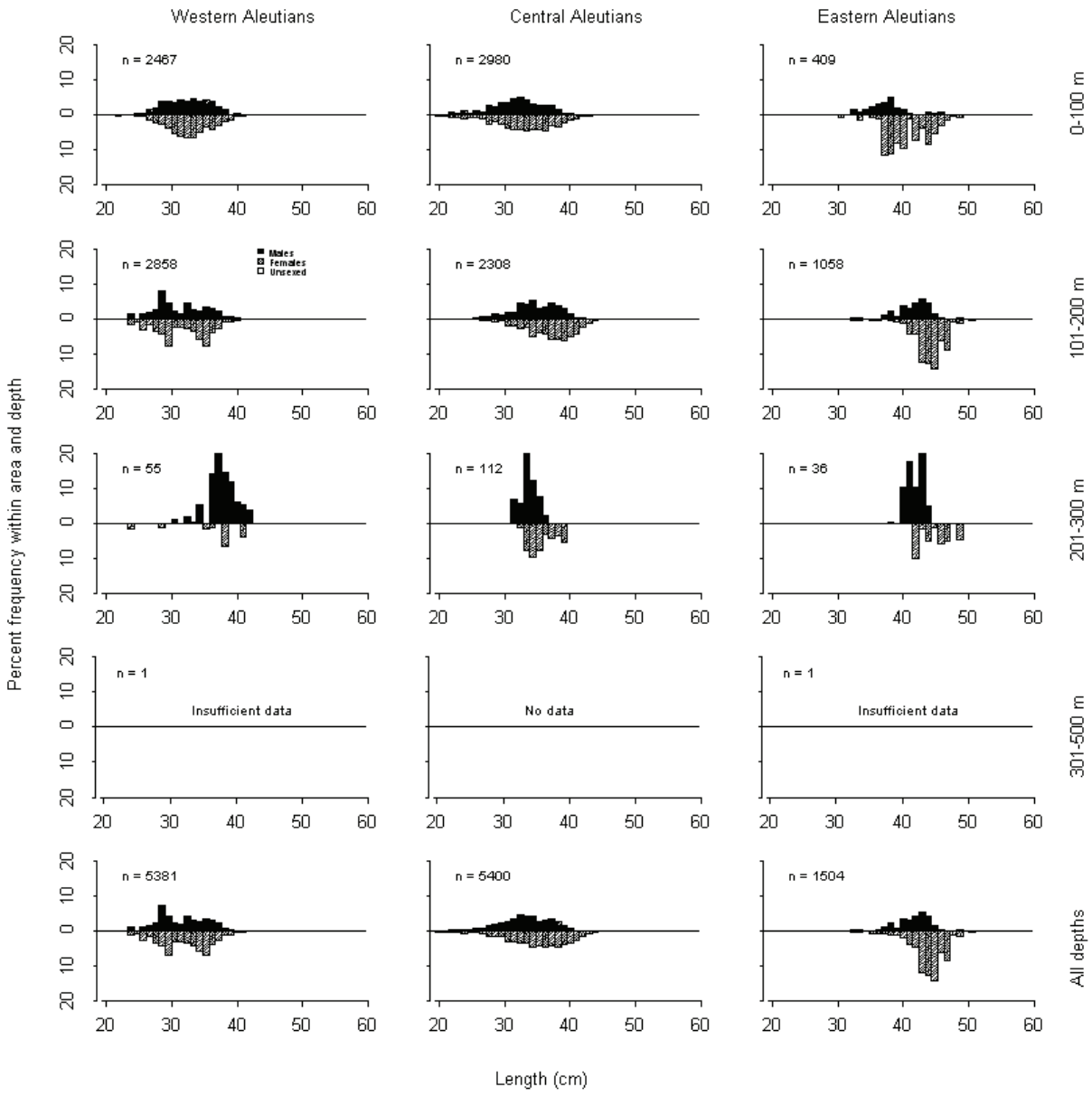

Figure 20. -- Size composition of Atka mackerel from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

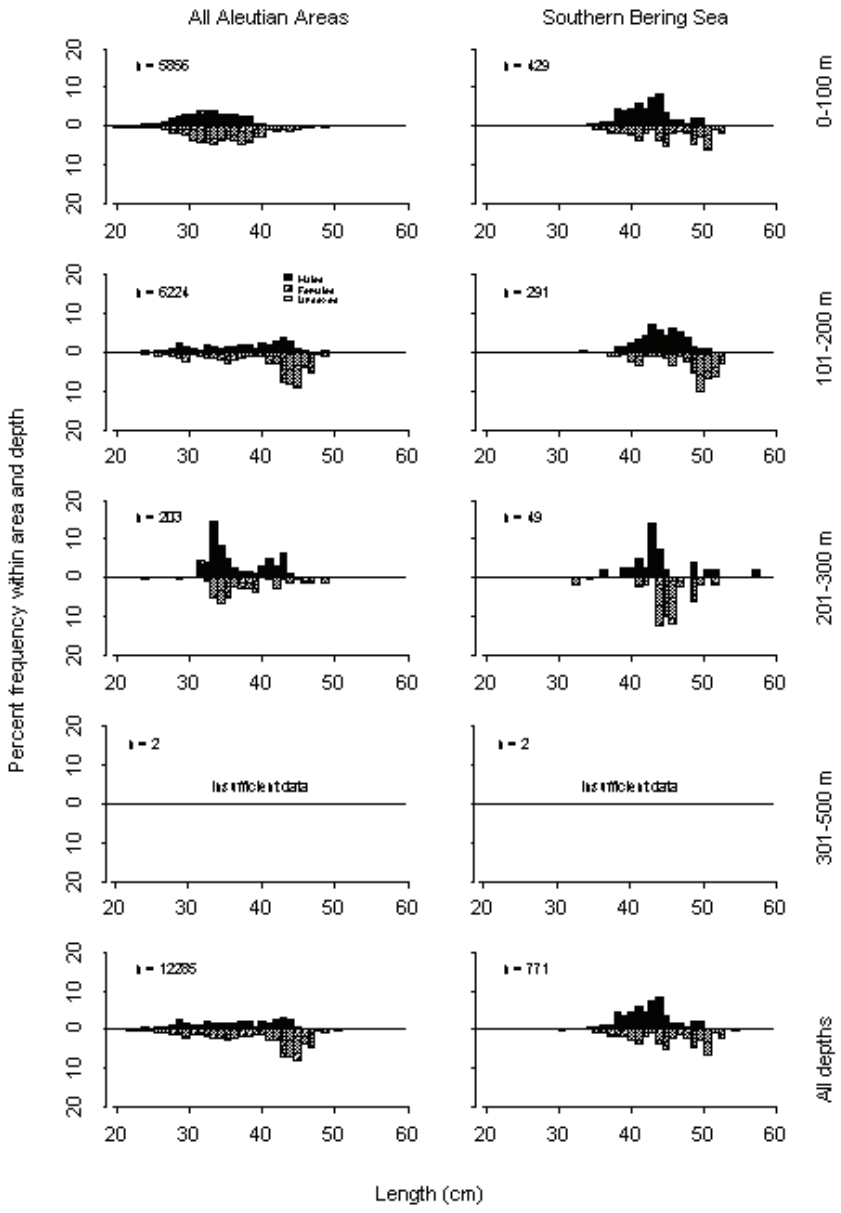

Figure 20. -- (continued).

Pacific cod (*Gadus macrocephalus*)

Pacific cod was the seventh most abundant species caught in the 2010 survey (Table 2). Mean CPUEs were highest in the shallowest depth interval (1-100 m) of the Western Aleutians and Southern Bering Sea areas and lowest in the Central Aleutians area. Pacific cod were distributed throughout the survey area but were rarely found in depths greater than 300 m (Table 23). The estimated biomass for the entire survey area was 68,576 t. Eighty-nine percent of the estimated biomass in the Aleutian areas was found in depths less than 200 m. The corresponding figure in the Southern Bering Sea area was 95%. Pacific cod were captured in 69% of all successful survey tows conducted at depths shallower than 300 m (Table 23). There were very few large catches of Pacific cod; only three exceeded four times the standard deviation of the mean CPUE (Fig. 21). The highest stratum-specific mean CPUE was observed in the 1-100 m depth interval of the E Western Aleutians, followed closely by the 101-200 m depth interval of the NE Eastern Aleutians (Table 24). Mean weight did not consistently increase or decrease with depth. The most distinct length frequency mode in the Aleutian areas occurred at approximately 50 cm for both sexes in the 101-200 m interval. Cod larger than 80 cm were uncommon in the Southern Bering Sea area but not in the Aleutian areas where they often ranged to 100 cm (Fig. 22). Appendix C lists the weight-length relationship parameters for male, female, and combined sexes of Pacific cod.

Walleye pollock (*Theragra chalcogramma*)

Walleye pollock mean CPUE was the fourth highest among species in the combined Aleutian areas and the highest in the Southern Bering Sea area (Table 2). Pollock were captured in all areas and depth intervals. Estimated total pollock biomass reached 250,000 t, with almost half of the total from the Eastern Aleutian Islands and half from the Southern Bering Sea (Table 25). The biomass in the Western Aleutians (< 10,000 t) and Central Aleutians (< 30,000 t) was relatively low. The highest subarea mean CPUEs were in the N Central Aleutians subarea (201-300 m), the E Southern Bering Sea (101-200 and 1-100 m depths), and the NE Eastern Aleutians subareas (101-200 and 201-200 m) (Table 26). The high mean CPUE in the N Central Aleutians subarea resulted from a single large catch that occurred immediately west of Tanaga Island, the high mean CPUE from the Eastern Aleutians area resulted from two large catches near Amlia Island, and the high mean CPUE in the Southeastern Bering Sea was influenced by large catches near Unimak Pass (Fig. 23). Juvenile pollock were caught in high abundance in the 1-100 m depth interval of all three Aleutian Islands areas (Fig. 24). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of pollock.

Table 23. -- Total effort (number of trawl hauls), number of hauls with Pacific cod, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	20	28.96	14,122	0	31,161	5.861
	101 - 200	55	32	13.25	7,048	671	13,425	2.478
	201 - 300	22	8	1.00	172	54	289	2.479
	301 - 500	9	0	---	---	---	---	---
	All depths	118	60	14.05	21,341	3,509	39,173	4.009
Central Aleutians	1 - 100	48	30	10.81	6,322	538	12,106	2.242
	101 - 200	47	32	8.65	3,985	2,595	5,375	2.130
	201 - 300	21	15	4.27	900	275	1,526	1.884
	301 - 500	12	0	---	---	---	---	---
	All depths	128	77	6.77	11,207	5,250	17,164	2.168
Eastern Aleutians	1 - 100	21	12	0.98	670	12	1,328	1.756
	101 - 200	55	43	22.33	17,350	7,052	27,647	2.392
	201 - 300	33	27	8.92	4,374	1,839	6,908	2.788
	301 - 500	12	4	1.56	885	0	1,978	2.367
	All depths	121	86	9.24	23,277	12,782	33,773	2.431
All Aleutian Areas	1 - 100	101	62	12.02	21,113	3,341	38,885	3.763
	101 - 200	157	107	16.04	28,383	16,442	40,323	2.372
	201 - 300	76	50	6.23	5,445	2,857	8,034	2.574
	301 - 500	33	4	0.68	885	0	1,978	2.367
	All depths	367	223	9.81	55,826	34,505	77,146	2.782
Southern Bering Sea	1 - 100	27	25	23.85	9,604	1,592	17,615	2.906
	101 - 200	14	14	13.37	2,473	1,280	3,665	2.469
	201 - 300	5	5	8.15	459	59	860	2.671
	301 - 500	5	2	2.06	215	0	554	3.046
	All depths	51	46	17.04	12,750	4,597	20,903	2.803

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 2010 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	19	9	69.20	8,189	0	23,221
Eastern Aleutians	101-200	NE Eastern Aleutians	24	17	57.89	11,651	1,732	21,571
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	28.55	445	312	578
Southern Bering Sea	1-100	E Southern Bering	25	23	26.77	6,532	1,463	11,602
Southern Bering Sea	1-100	W Southern Bering	2	2	19.37	3,071	0	22,330
Southern Bering Sea	101-200	E Southern Bering	12	12	18.24	2,150	1,221	3,080
Eastern Aleutians	101-200	SE Eastern Aleutians	18	17	18.22	3,462	722	6,203
Central Aleutians	1-100	N Central Aleutians	16	11	17.20	3,622	0	8,990
Central Aleutians	101-200	SE Central Aleutians	14	9	16.46	1,238	272	2,203
Western Aleutians	1-100	W Western Aleutians	13	11	16.06	5,933	0	14,398
Central Aleutians	101-200	SW Central Aleutians	18	16	15.02	1,580	779	2,381
Western Aleutians	101-200	W Western Aleutians	33	23	13.35	5,428	0	11,612
Western Aleutians	101-200	E Western Aleutians	22	9	12.94	1,620	36	3,204
Eastern Aleutians	201-300	SE Eastern Aleutians	8	7	12.39	2,554	236	4,872
Central Aleutians	1-100	SW Central Aleutians	11	6	11.36	1,838	0	4,409
Central Aleutians	101-200	N Central Aleutians	9	7	10.95	1,167	375	1,960
Central Aleutians	201-300	SE Central Aleutians	3	3	10.73	512	0	1,337
Eastern Aleutians	201-300	SW Eastern Aleutians	4	4	9.50	681	0	2,298
Southern Bering Sea	201-300	Combined Southern Bering	5	5	8.15	459	27	892
Eastern Aleutians	101-200	SW Eastern Aleutians	9	7	8.07	1,824	0	3,678
Central Aleutians	1-100	SE Central Aleutians	12	8	6.60	768	84	1,452
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	6.37	279	0	1,014
Central Aleutians	201-300	N Central Aleutians	9	8	6.02	265	101	428
Southern Bering Sea	101-200	W Southern Bering	2	2	4.81	322	0	3,821
Eastern Aleutians	201-300	NE Eastern Aleutians	19	14	3.53	694	292	1,096
Eastern Aleutians	1-100	SE Eastern Aleutians	13	9	3.00	522	0	1,096
Central Aleutians	201-300	SW Central Aleutians	6	4	2.91	124	0	367
Eastern Aleutians	101-200	NW Eastern Aleutians	4	2	2.59	412	0	1,466
Southern Bering Sea	301-500	Combined Southern Bering S	5	2	2.06	215	0	582
Western Aleutians	201-300	W Western Aleutians	13	7	1.69	159	42	275
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	1.49	384	0	1,606
Central Aleutians	1-100	Petrel Bank	9	5	0.98	94	0	199
Eastern Aleutians	301-500	Combined Eastern Aleutian I	6	1	0.83	222	0	791
Eastern Aleutians	1-100	NW Eastern Aleutians	3	1	0.63	123	0	650
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	0.20	25	0	94
Western Aleutians	201-300	E Western Aleutians	9	1	0.17	13	0	43

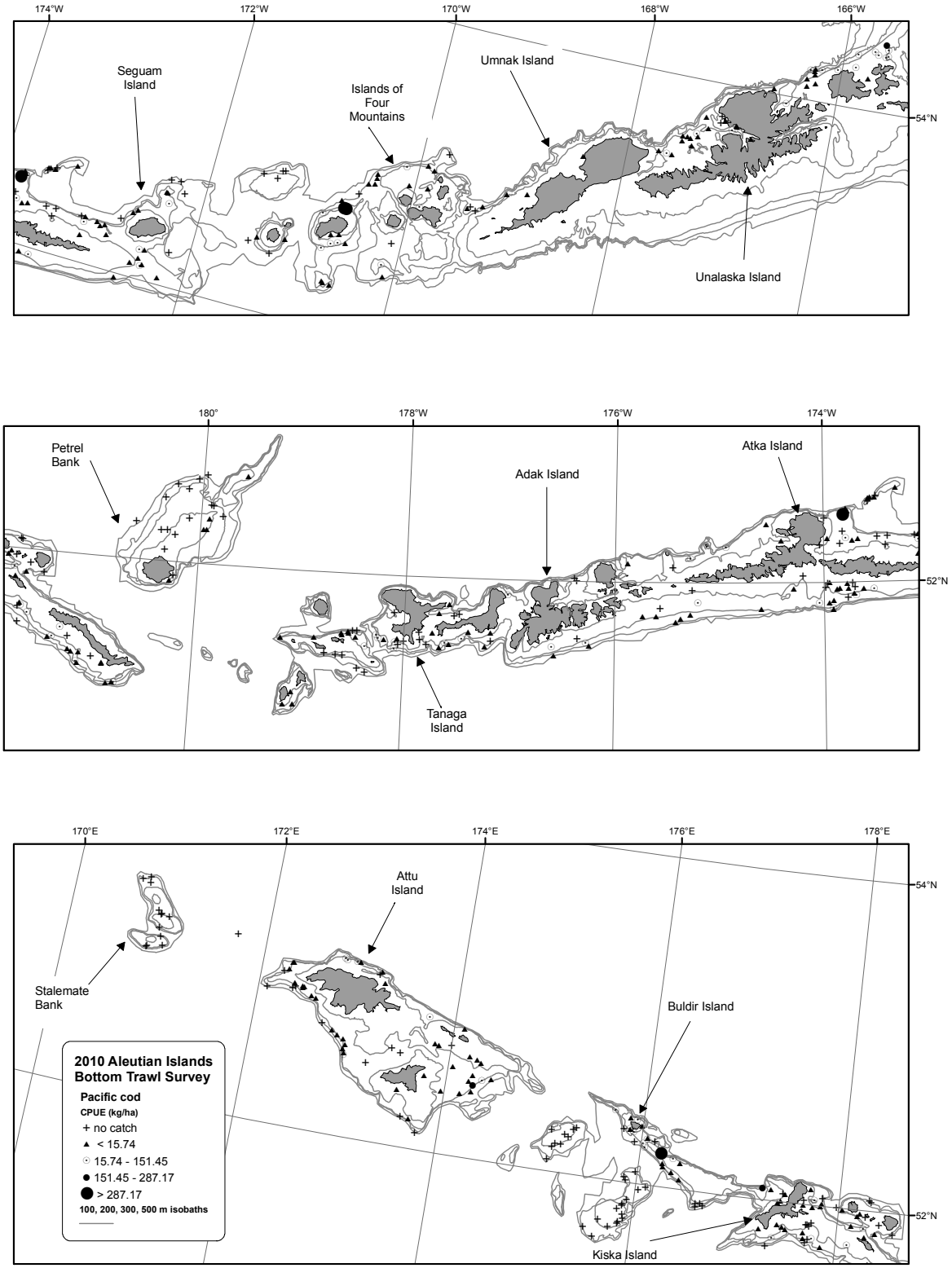

Figure 21. -- Distribution and relative abundance of Pacific cod from the 2010 Aleutian Islands bottom trawl survey.

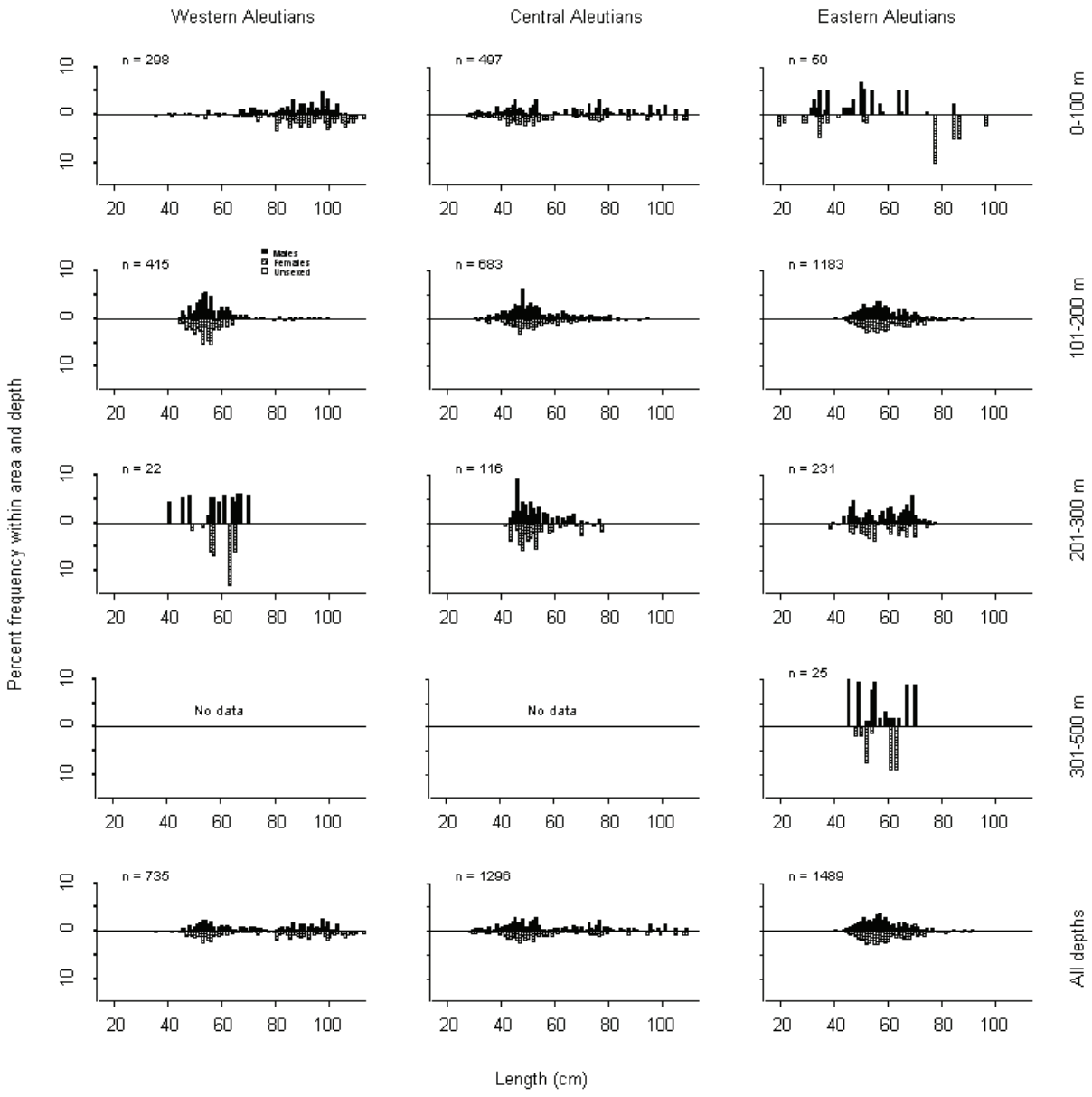

Figure 22. -- Size composition of Pacific cod from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

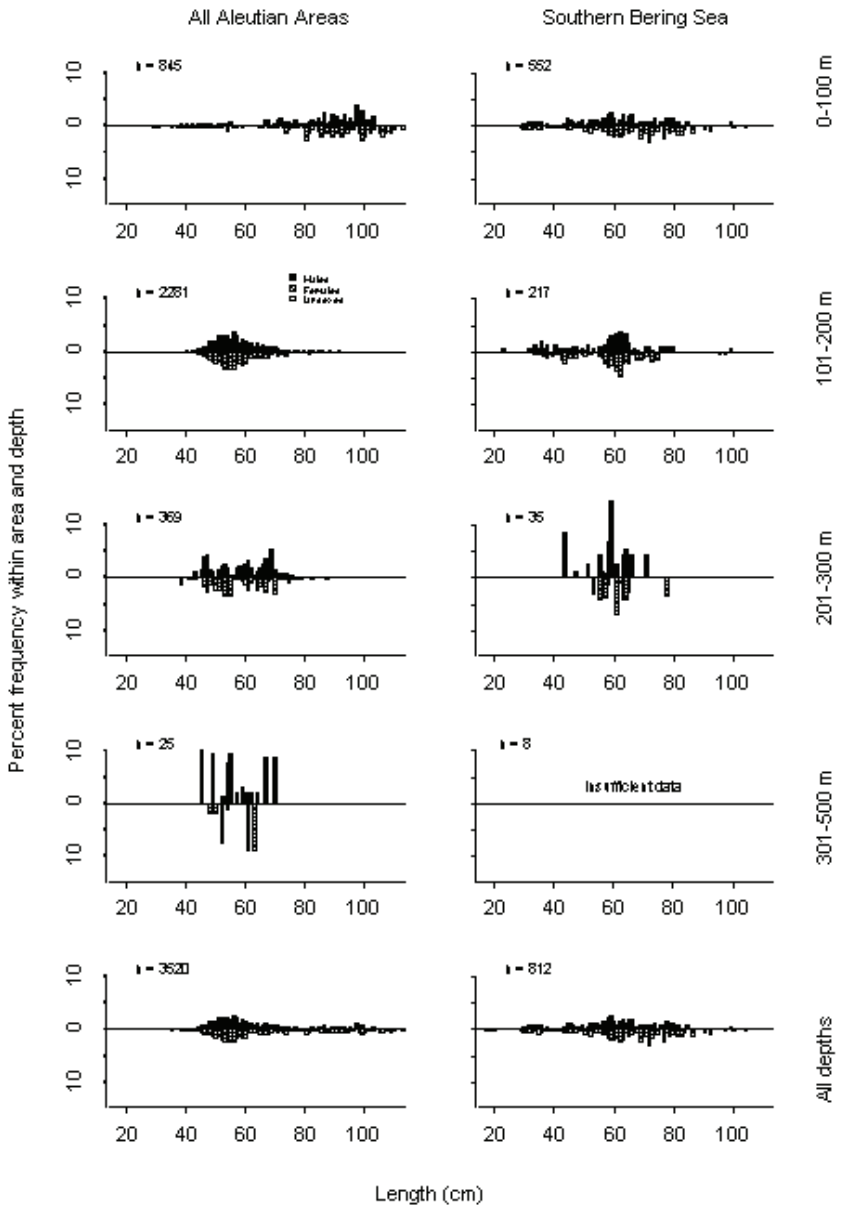

Figure 22. -- (continued).

Table 25. -- Total effort (number of trawl hauls), number of hauls with walleye pollock, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	15	3.45	1,681	0	5,167	0.051
	101 - 200	55	35	8.32	4,424	1,456	7,392	0.743
	201 - 300	22	18	10.49	1,809	0	4,149	1.559
	301 - 500	9	2	0.07	24	0	60	0.935
	All depths	118	70	5.23	7,938	2,973	12,902	0.198
Central Aleutians	1 - 100	48	10	0.65	378	0	964	0.223
	101 - 200	47	18	11.59	5,336	0	13,643	0.739
	201 - 300	21	17	104.95	22,132	0	62,275	1.728
	301 - 500	12	7	2.08	829	0	2,165	1.833
	All depths	128	52	17.33	28,675	0	67,201	1.293
Eastern Aleutians	1 - 100	21	7	0.06	43	0	141	0.027
	101 - 200	55	16	71.73	55,723	0	118,792	1.870
	201 - 300	33	24	97.14	47,615	0	108,686	1.466
	301 - 500	12	7	1.65	939	54	1,825	1.647
	All depths	121	54	41.40	104,320	18,928	189,712	1.619
All Aleutian Areas	1 - 100	101	32	1.20	2,103	0	5,637	0.058
	101 - 200	157	69	36.38	64,353	2,500	126,206	1.518
	201 - 300	76	59	81.93	71,555	487	142,623	1.540
	301 - 500	33	16	1.39	1,792	351	3,233	1.710
	All depths	367	176	24.75	140,932	47,925	233,940	1.112
Southern Bering Sea	1 - 100	27	21	172.31	69,372	0	140,718	1.153
	101 - 200	14	14	191.60	35,419	3,333	67,505	1.219
	201 - 300	5	5	99.3	5,599	0	12,486	1.447
	301 - 500	5	4	5.72	597	0	1,687	1.494
	All depths	51	44	148.35	110,986	33,824	188,148	1.187

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 2010 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	9	7	452.82	19,879	0	60,783
Southern Bering Sea	101-200	E Southern Bering Sea	12	12	300.10	35,386	2,976	67,796
Southern Bering Sea	1-100	E Southern Bering Sea	25	21	284.28	69,372	0	140,856
Eastern Aleutians	101-200	NE Eastern Aleutians	24	7	268.58	54,053	0	117,203
Eastern Aleutians	201-300	NE Eastern Aleutians	19	14	229.04	45,089	0	106,320
Southern Bering Sea	201-300	Combined Southern Bering	5	5	99.30	5,599	0	13,035
Central Aleutians	201-300	SW Central Aleutians	6	6	30.50	1,299	0	2,687
Central Aleutians	101-200	Petrel Bank	6	3	27.67	4,802	0	13,494
Western Aleutians	201-300	E Western Aleutians	9	7	17.55	1,375	0	3,737
Central Aleutians	201-300	Petrel Bank	3	3	12.17	933	519	1,346
Eastern Aleutians	201-300	SE Eastern Aleutians	8	6	11.06	2,280	0	5,611
Western Aleutians	101-200	W Western Aleutians	33	27	9.68	3,934	1,110	6,758
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	9.14	1,457	0	6,092
Central Aleutians	301-500	N Central Aleutians	6	4	6.03	747	0	2,148
Southern Bering Sea	301-500	Combined Southern Bering	5	4	5.72	597	0	1,774
Western Aleutians	201-300	W Western Aleutians	13	11	4.61	434	118	750
Western Aleutians	1-100	W Western Aleutians	13	11	4.50	1,663	0	5,179
Central Aleutians	101-200	SW Central Aleutians	18	8	3.91	412	0	1,020
Western Aleutians	101-200	E Western Aleutians	22	8	3.91	490	0	1,421
Central Aleutians	1-100	Petrel Bank	9	3	3.14	301	0	906
Eastern Aleutians	201-300	SW Eastern Aleutians	4	2	2.89	207	0	842
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	2.51	39	0	126
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	3	2.06	551	0	1,298
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	1.90	83	0	817
Eastern Aleutians	301-500	SE Eastern Aleutians	4	2	1.19	305	0	1,119
Central Aleutians	101-200	N Central Aleutians	9	4	1.13	121	0	353
Central Aleutians	301-500	SE Central Aleutians	2	2	0.74	53	0	212
Eastern Aleutians	101-200	SE Eastern Aleutians	18	3	0.69	131	0	331
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	0.50	33	0	406
Central Aleutians	201-300	SE Central Aleutians	3	1	0.44	21	0	111
Eastern Aleutians	101-200	SW Eastern Aleutians	9	5	0.36	82	0	231
Central Aleutians	1-100	N Central Aleutians	16	6	0.34	71	0	196
Eastern Aleutians	1-100	NE Eastern Aleutians	3	2	0.31	39	0	170
Central Aleutians	301-500	Petrel Bank	2	1	0.23	29	0	398
Western Aleutians	1-100	E Western Aleutians	19	4	0.15	18	0	37
Western Aleutians	301-500	W Western Aleutians	7	2	0.14	24	0	62
Central Aleutians	1-100	SW Central Aleutians	11	1	0.04	6	0	21
Central Aleutians	101-200	SE Central Aleutians	14	3	0.02	2	0	5
Eastern Aleutians	1-100	NW Eastern Aleutians	3	2	0.02	3	0	10
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.01	1	0	14
Eastern Aleutians	1-100	SE Eastern Aleutians	13	2	0.00	1	0	1

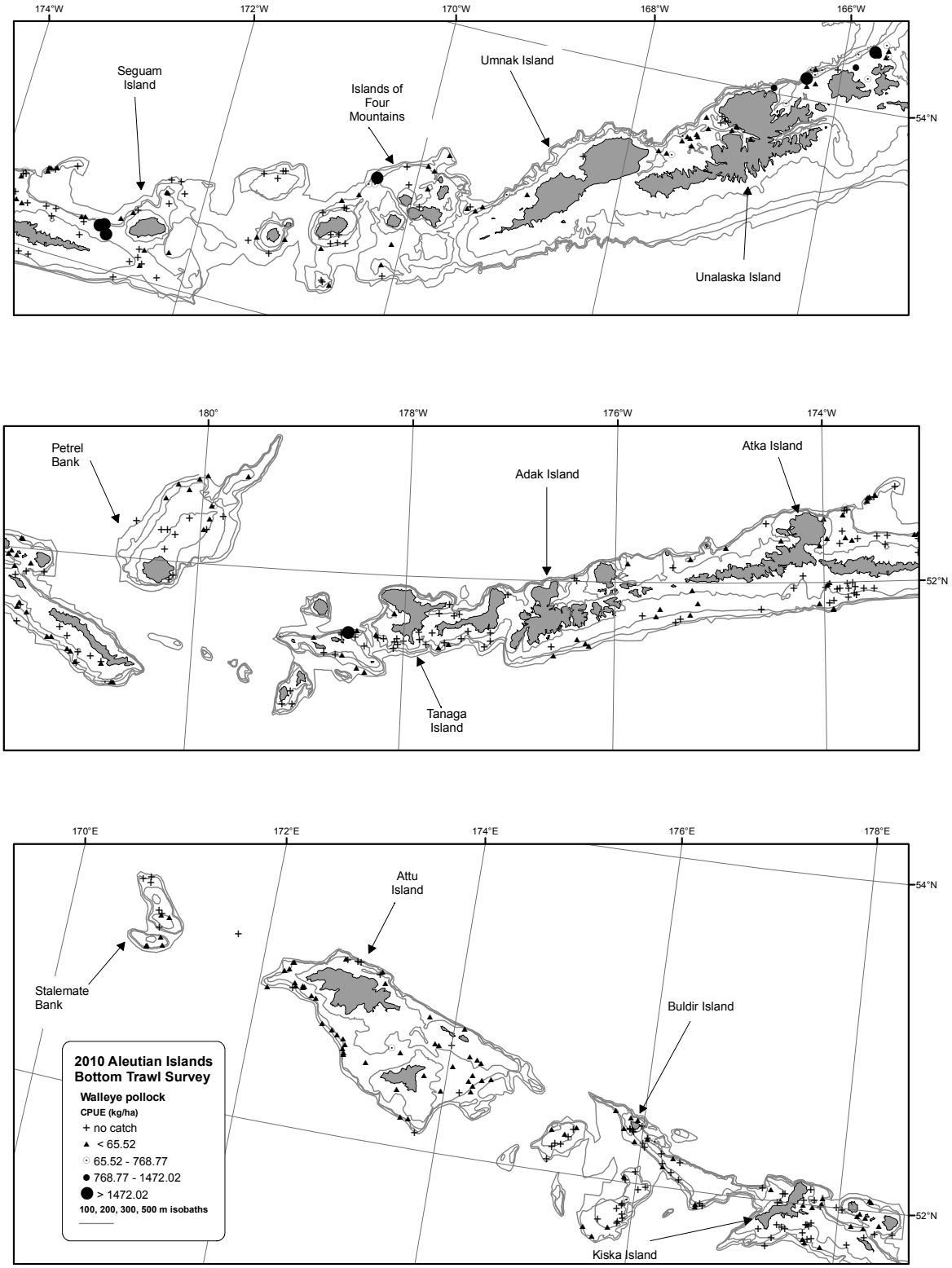

Figure 23. -- Distribution and relative abundance of walleye pollock from the 2010 Aleutian Islands bottom trawl survey.

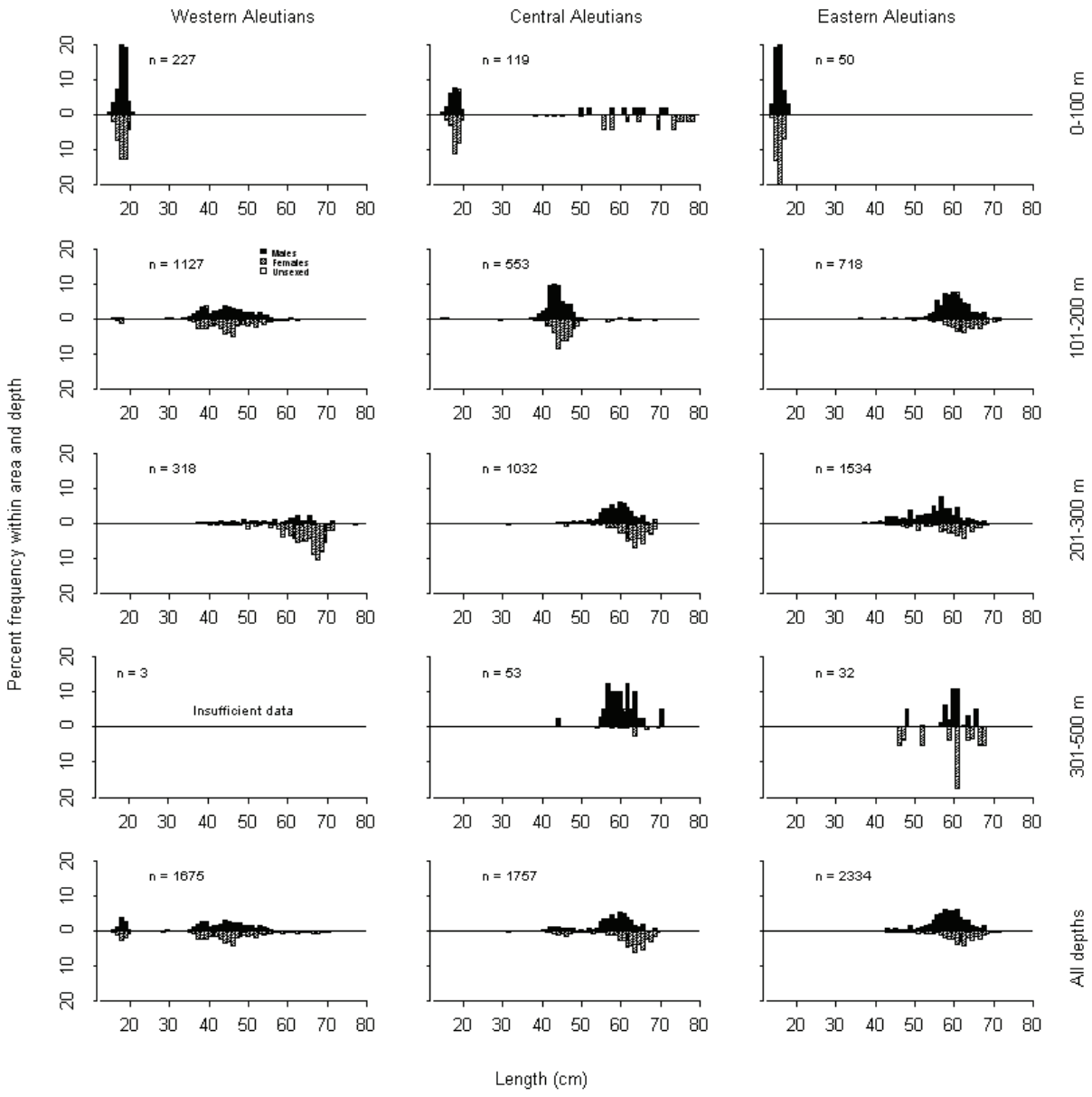

Figure 24. -- Size composition of walleye pollock from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

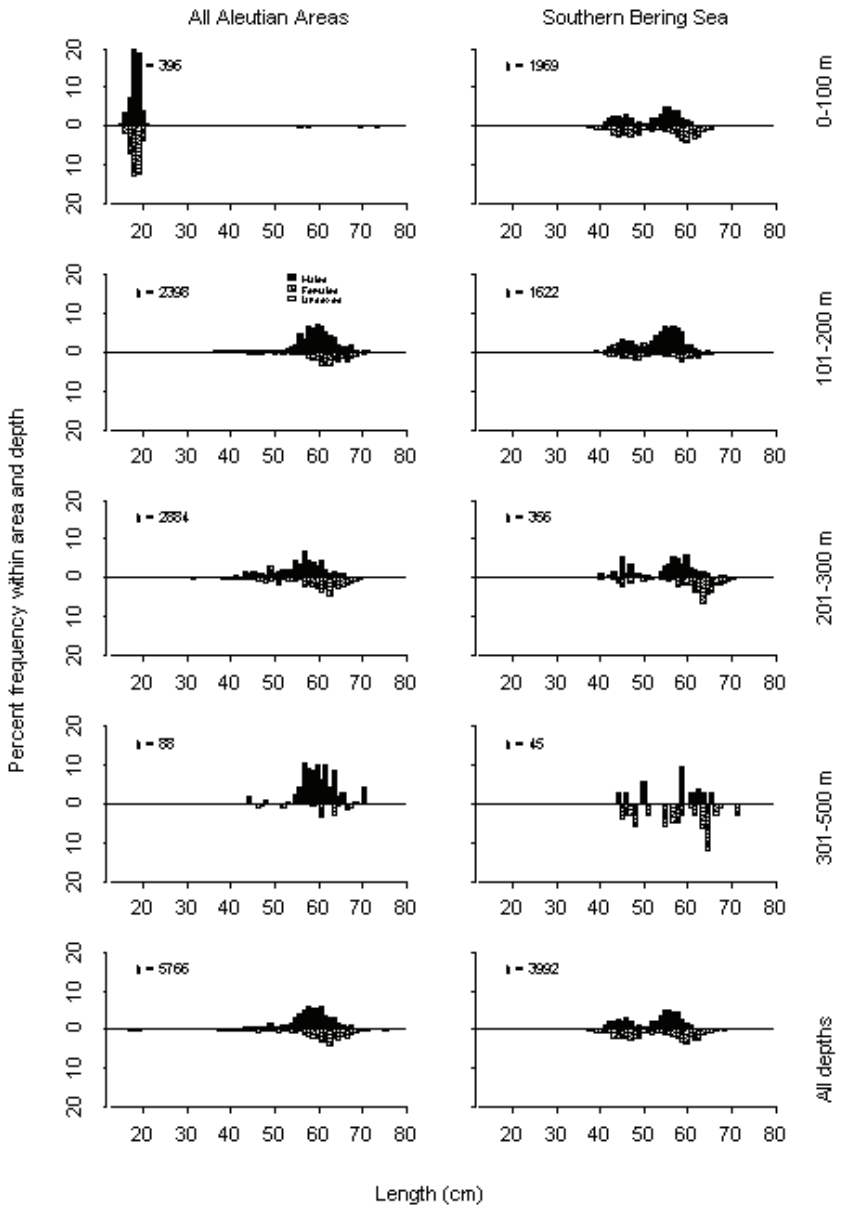

Figure 24. -- (continued).

Sablefish (*Anoplopoma fimbria*)

Sablefish habitat extends deeper than is sampled by this survey. Mean CPUE was highest in the Central Aleutians area (Table 2). Throughout the survey area, mean CPUE was always highest at depths deeper than 300 m (Table 27). Mean individual weight generally increased with increasing depth (Table 27). The total biomass estimate of 4,787 t is likely a considerable underestimate of the Aleutian Islands biomass because of the lack of sampling at depths deeper than 500 m. The three highest mean CPUEs were reported for the Central and Western Aleutian subareas in the 301-500 and 201-300 m depth intervals (Table 28). The two largest individual catches were reported west of Tanaga Island and northwest of Attu Island (Fig. 25). Figure 26 summarizes sablefish size composition data. Generally sablefish captured during the survey were in the middle of their normal adult size range. No length-weight data were collected for sablefish.

Giant grenadier (*Albatrossia pectoralis*)

Giant grenadier was the sixth most abundant species caught in the 2010 survey (Table 2). Catches of giant grenadier were almost completely restricted to the 301-500 m depth interval and all were recorded in the Aleutian areas (Table 29). Like sablefish, the biomass estimate is likely a considerable underestimate of the Aleutian Islands biomass because of the lack of sampling at depths deeper than 500 m. The mean CPUEs were similar among the three Aleutian areas but the highest estimated biomass was in the Eastern Aleutians area, which was primarily due to one very large catch west of Seguam Island (Table 30, Fig. 27). Females dominated the survey catches both in terms of numbers and individual sizes (Fig. 28). A prominent length mode occurred at 32 cm vent length for females and a less prominent mode occurred at 28 cm for males (Fig. 28). Appendix C lists the weight-length relationship parameters for male, female, and combined sexes of giant grenadier.

Table 27. -- Total effort (number of trawl hauls), number of hauls with sablefish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	0	---	---	---	---	---
	301 - 500	9	4	3.64	1,192	0	3,146	4.363
	All depths	118	4	0.78	1,192	0	3,146	4.363
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	0	---	---	---	---	---
	201 - 300	21	3	1.50	316	0	1,014	1.763
	301 - 500	12	6	6.10	2,427	0	7,679	3.226
	All depths	128	9	1.66	2,743	0	8,049	2.944
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	1	0.01	11	0	33	2.064
	201 - 300	33	2	0.05	27	0	66	1.664
	301 - 500	12	5	1.07	610	0	1,259	3.764
	All depths	121	8	0.26	647	0	1,298	3.534
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	1	0.01	11	0	33	2.064
	201 - 300	76	5	0.39	343	0	1,042	1.755
	301 - 500	33	15	3.27	4,229	0	9,348	3.561
	All depths	367	21	0.80	4,582	0	9,747	3.301
Southern Bering Sea	1 - 100	27	1	<0.01	2	0	5	0.377
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	0	---	---	---	---	---
	301 - 500	5	2	1.95	204	0	541	3.791
	All depths	51	3	0.27	205	0	543	3.542

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 2010 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	6	3	18.59	2,305	0	7,823
Central Aleutians	201-300	N Central Aleutians	9	3	7.21	316	0	1,028
Western Aleutians	301-500	W Western Aleutians	7	3	6.00	1,026	0	3,059
Southern Bering Sea	301-500	Combined Southern Bering	5	2	1.95	204	0	568
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	3	1.33	354	0	998
Central Aleutians	301-500	SW Central Aleutians	2	2	1.11	88	0	302
Western Aleutians	301-500	E Western Aleutians	2	1	1.06	166	0	2,276
Eastern Aleutians	301-500	SE Eastern Aleutians	4	2	0.99	256	0	730
Central Aleutians	301-500	SE Central Aleutians	2	1	0.47	34	0	462
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.15	11	0	44
Eastern Aleutians	201-300	NE Eastern Aleutians	19	1	0.08	16	0	49
Eastern Aleutians	101-200	SE Eastern Aleutians	18	1	0.06	11	0	33
Southern Bering Sea	1-100	E Southern Bering Sea	25	1	0.01	2	0	5

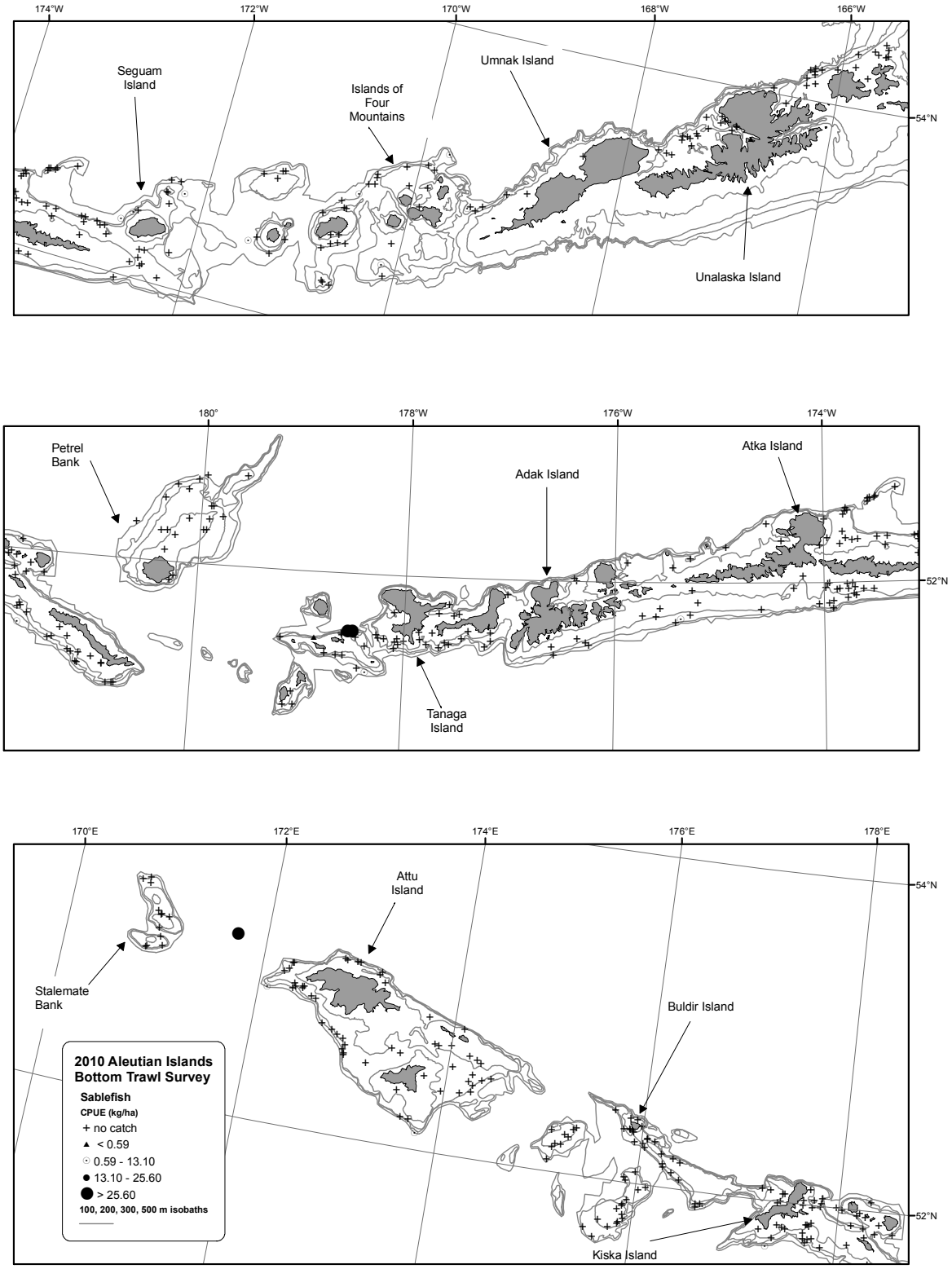

Figure 25. -- Distribution and relative abundance of sablefish from the 2010 Aleutian Islands bottom trawl survey.

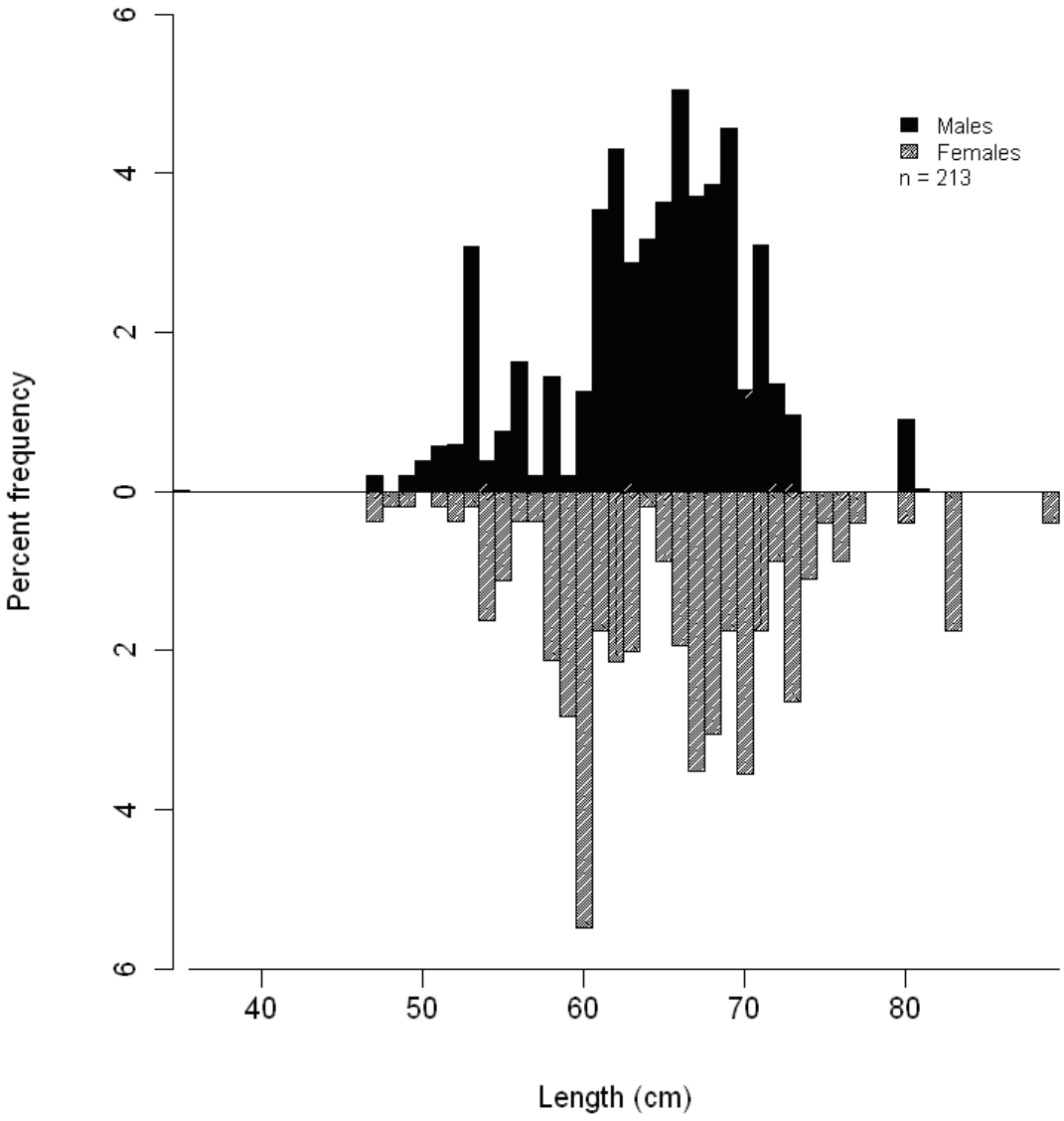

Figure 26. -- Size composition of sablefish from the 2010 Aleutian Islands bottom trawl survey.

Table 29. -- Total effort (number of trawl hauls), number of hauls with giant grenadier, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	1	0.13	23	0	72	6.582
	301 - 500	9	7	54.09	17,701	6,222	29,181	3.782
	All depths	118	8	11.67	17,724	6,244	29,204	3.784
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	0	---	---	---	---	---
	201 - 300	21	1	0.05	10	0	34	3.044
	301 - 500	12	7	56.54	22,507	0	51,013	4.638
	All depths	128	8	13.61	22,517	0	51,023	4.636
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	0	---	---	---	---	---
	301 - 500	12	3	53.68	30,508	0	85,832	4.314
	All depths	121	3	12.11	30,508	0	85,832	4.314
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	0	---	---	---	---	---
	201 - 300	76	2	0.04	33	0	85	4.874
	301 - 500	33	17	54.67	70,716	9,587	131,845	4.259
	All depths	367	19	12.43	70,748	9,619	131,877	4.259
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	0	---	---	---	---	---
	301 - 500	5	0	---	---	---	---	---
	All depths	51	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 2010 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	SW Central Aleutians	2	2	100.92	7,965	0	75,599
Central Aleutians	301-500	Petrel Bank	2	2	93.22	11,535	0	95,268
Western Aleutians	301-500	W Western Aleutians	7	6	88.36	15,118	5,536	24,701
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	77.68	20,000	0	83,640
Central Aleutians	301-500	SE Central Aleutians	2	1	40.80	2,914	0	39,942
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	2	39.35	10,508	0	30,922
Western Aleutians	301-500	E Western Aleutians	2	1	16.54	2,583	0	35,404
Central Aleutians	301-500	N Central Aleutians	6	2	0.75	93	0	243
Western Aleutians	201-300	W Western Aleutians	13	1	0.24	23	0	72
Central Aleutians	201-300	SW Central Aleutians	6	1	0.23	10	0	35

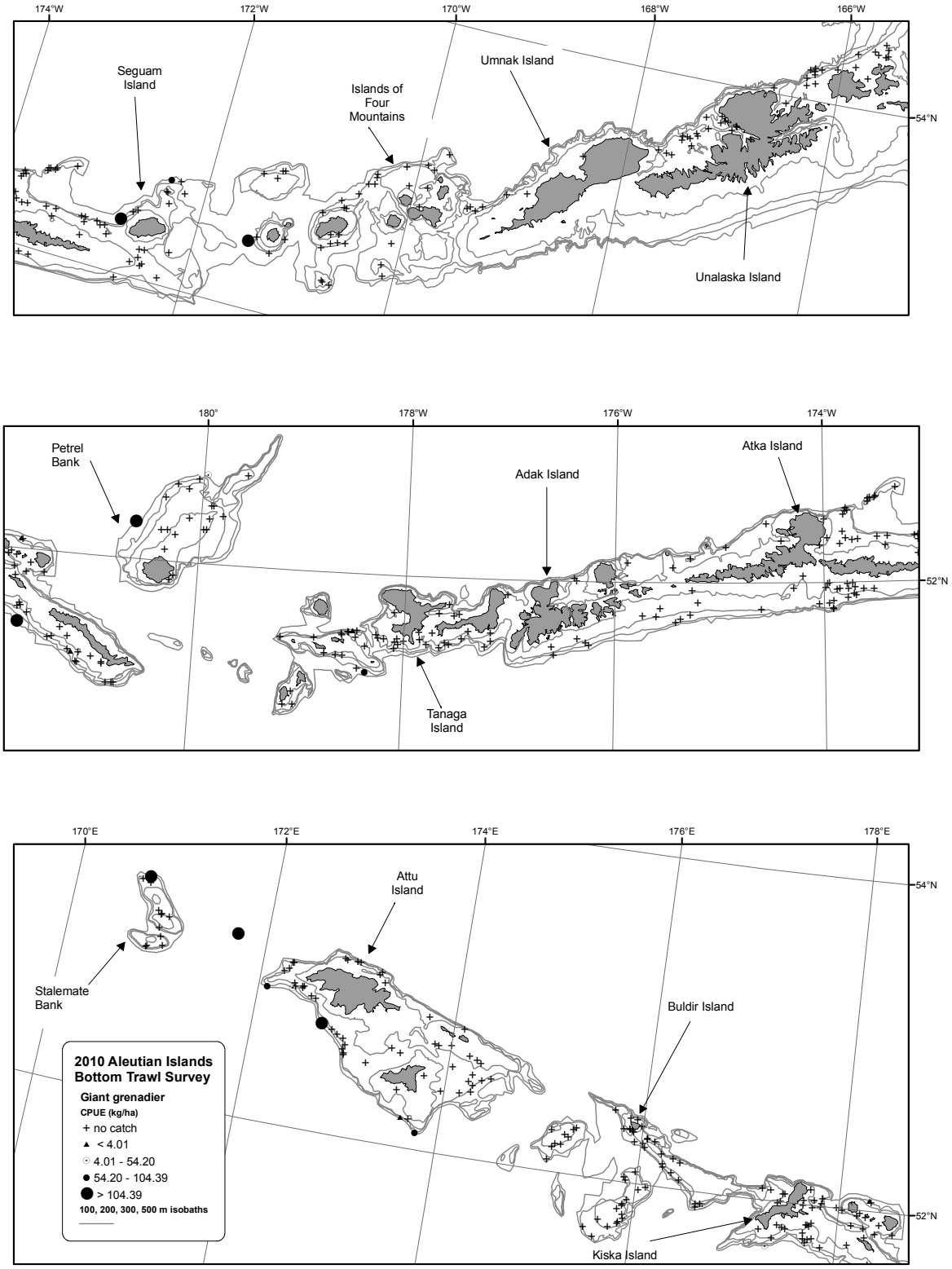

Figure 27. -- Distribution and relative abundance of giant grenadier from the 2010 Aleutian Islands bottom trawl survey.

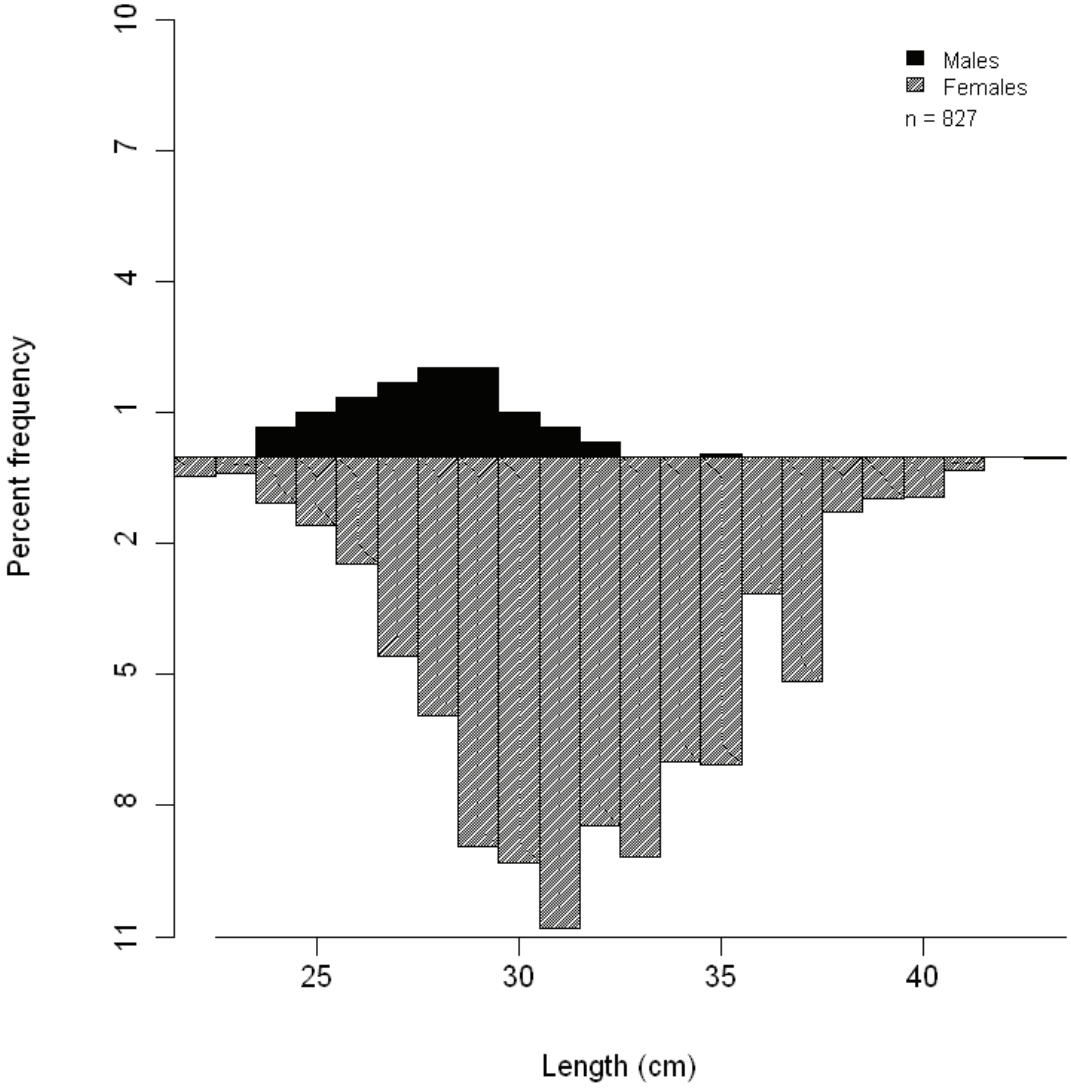

Figure 28. -- Size composition of giant grenadier from the 2010 Aleutian Islands bottom trawl survey.

Sculpins (Cottidae)

Most species of sculpins are probably not sampled well by the AFSC survey trawl. The small size of many of the species and their demersal orientation may result in escape under the footrope, especially on rough bottom. They are, however, biologically important, at least as a family. Twenty-seven species of sculpins were identified 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 caught in almost every survey trawl haul in the Aleutian Islands (Fig. 29).

The three largest sculpin species (yellow Irish lord, bigmouth sculpin and great sculpin) were captured throughout the survey area (Table 2) and in all depth intervals (Table 32). For these species, mean CPUE was highest in the Western Aleutians area and lowest in the Central Aleutians. The 1-100 m depth interval in the E Western Aleutians was the most productive subarea (Table 33).

Table 31. -- Sculpin species catch (weight and numbers) in the 2010 Aleutian Islands bottom trawl survey. Data are combined across areas and are shown for species identified in the catch.

Species name	Common name	Weight (kg)	Number
Hemilepidotus jordani	yellow Irish lord	1,318	2,069
Malacocottus zonurus	darkfin sculpin	765	7,642
Myoxocephalus polyacanthocephalus	great sculpin	238	68
Hemitripterus bolini	bigmouth sculpin	228	41
Triglops scepticus	spectacled sculpin	132	1,572
Gymnocanthus galeatus	armorhead sculpin	49	255
Triglops forficata	scissortail sculpin	18	223
Hemilepidotus zapus	longfin Irish lord	15	259
Dasycottus setiger	spinyhead sculpin	2	25
Enophrys lucasi	leister sculpin	1	5
Thyriscus anoplus	sponge sculpin	1	46
Triglops macellus	roughspine sculpin	1	14
Hemilepidotus hemilepidotus	red Irish lord	1	1
Enophrys diceraus	antlered sculpin	1	3
Bolinia euryptera	broadfin sculpin	<1	9
Triglops pingeli	ribbed sculpin	<1	13
Icelus euryops	wide-eye sculpin	<1	14
Psychrolutes phrictus	blob sculpin	<1	2
Rastrinus scutiger	roughskin sculpin	<1	13
Icelus uncinalis	uncinate sculpin	<1	2
Nautichthys oculofasciatus	sailfin sculpin	<1	4
Myoxocephalus quadricornis	fourhorn sculpin	<1	5
Archistes biseriatus	scaled sculpin	<1	1
Icelus spiniger	thorny sculpin	<1	1

Table 32. -- Total effort (number of trawl hauls), number of hauls with yellow Irish lord, bigmouth sculpin, and/or great sculpin. The mean CPUE, and biomass estimates with confidence intervals of these three species combined based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)
Western Aleutians	1 - 100	32	15	10.15	4,946	0	14,822
	101 - 200	55	22	0.56	293	39	605
	201 - 300	22	2	0.03	32	0	101
	301 - 500	9	1	0.17	55	0	186
	All depths	118	40	3.51	5,328	41	15,288
Central Aleutians	1 - 100	48	27	4.62	2,696	682	4,893
	101 - 200	47	26	1.71	787	364	1,281
	201 - 300	21	5	0.59	125	0	298
	301 - 500	12	0	0.00	0	0	0
	All depths	128	58	2.18	3,609	1,502	5,847
Eastern Aleutians	1 - 100	21	20	3.24	2,219	591	4,208
	101 - 200	55	39	3.05	2,369	1,083	3,691
	201 - 300	33	7	1.37	674	0	1,547
	301 - 500	12	3	1.20	684	0	2,189
	All depths	121	69	2.36	5,943	3,397	9,153
All Aleutian Areas	1 - 100	101	62	5.61	9,863	0	20,543
	101 - 200	157	87	1.94	3,449	1,874	5,037
	201 - 300	76	14	0.95	830	0	1,779
	301 - 500	33	4	0.57	739	0	2,265
	All depths	367	167	2.62	14,880	3,890	25,869
Southern Bering Sea	1 - 100	27	21	3.76	1,515	346	2,690
	101 - 200	14	13	3.93	727	0	1,687
	201 - 300	5	1	1.05	59	0	211
	301 - 500	5	1	0.95	99	0	355
	All depths	51	36	3.20	2,399	959	3,988

Table 33. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of combined yellow Irish lord, bigmouth sculpin, and great sculpin by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2010 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	19	11	39.22	4,642	0	14,009
Central Aleutians	1-100	Petrel Bank	9	8	18.29	1,756	127	3,403
Eastern Aleutians	1-100	SE Eastern Aleutians	13	12	7.62	1,325	464	2,200
Southern Bering Sea	1-100	E Southern Bering Sea	25	20	6.07	1,482	311	2,660
Southern Bering Sea	101-200	W Southern Bering Sea	2	2	5.48	367	0	3,423
Central Aleutians	1-100	SE Central Aleutians	12	6	5.42	631	0	1,775
Central Aleutians	101-200	SE Central Aleutians	14	11	5.10	383	125	668
Eastern Aleutians	101-200	SE Eastern Aleutians	18	16	4.72	897	310	1,508
Eastern Aleutians	101-200	NE Eastern Aleutians	24	11	3.82	769	64	1,496
Eastern Aleutians	1-100	NW Eastern Aleutians	3	2	3.41	659	0	3,051
Eastern Aleutians	201-300	SE Eastern Aleutians	8	4	3.15	648	0	1,541
Southern Bering Sea	101-200	E Southern Bering Sea	12	11	3.05	360	6	746
Eastern Aleutians	101-200	SW Eastern Aleutians	9	7	3.03	684	0	1,615
Eastern Aleutians	301-500	SE Eastern Aleutians	4	2	2.18	562	0	2,310
Eastern Aleutians	1-100	NE Eastern Aleutians	3	3	1.68	213	0	593
Central Aleutians	201-300	N Central Aleutians	9	2	1.67	73	0	220
Central Aleutians	101-200	N Central Aleutians	9	5	1.66	177	0	429
Central Aleutians	101-200	SW Central Aleutians	18	7	1.28	135	0	290
Central Aleutians	1-100	N Central Aleutians	16	7	1.19	250	0	583
Southern Bering Sea	201-300	Combined Southern Bering	5	1	1.05	59	0	223
Central Aleutians	201-300	SE Central Aleutians	3	2	0.98	47	0	218
Southern Bering Sea	301-500	Combined Southern Bering	5	1	0.95	99	0	375
Western Aleutians	1-100	W Western Aleutians	13	4	0.83	306	0	888
Western Aleutians	101-200	W Western Aleutians	33	12	0.68	276	27	582
Central Aleutians	101-200	Petrel Bank	6	2	0.53	92	0	287
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	1	0.45	121	0	432
Central Aleutians	1-100	SW Central Aleutians	11	2	0.37	60	0	170
Western Aleutians	301-500	W Western Aleutians	7	1	0.32	55	0	190
Western Aleutians	201-300	W Western Aleutians	13	1	0.29	27	0	85
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.21	33	0	450
Western Aleutians	101-200	E Western Aleutians	22	6	0.14	18	0	39
Eastern Aleutians	201-300	NE Eastern Aleutians	19	2	0.13	25	0	65
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	0.12	18	0	77
Eastern Aleutians	1-100	SW Eastern Aleutians	2	1	0.11	21	0	291
Central Aleutians	201-300	SW Central Aleutians	6	1	0.11	5	0	17
Western Aleutians	201-300	E Western Aleutians	9	1	0.06	5	0	16

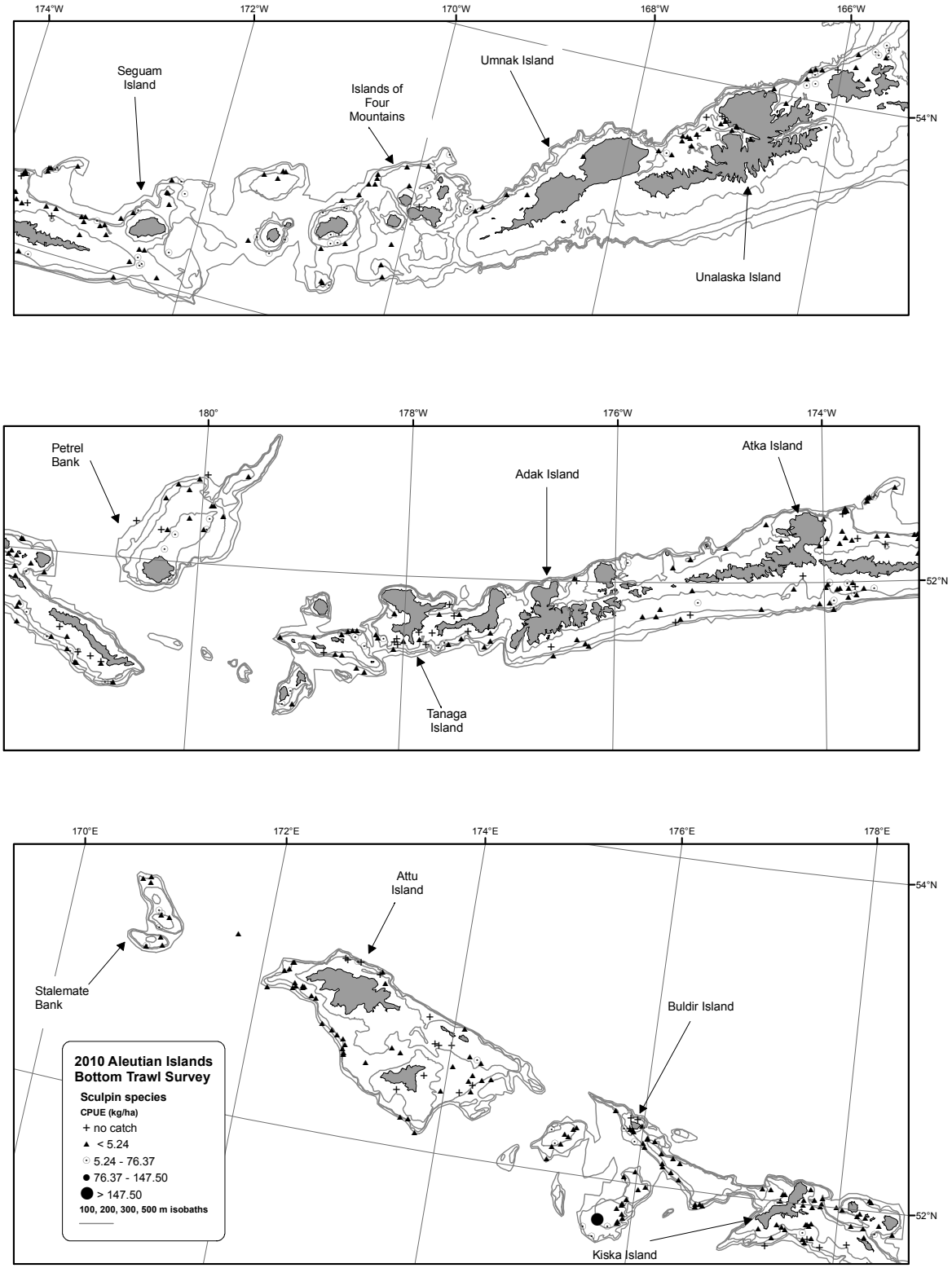

Figure 29. -- Distribution and relative abundance of all sculpin species from the 2010 Aleutian Islands bottom trawl survey.

Rockfishes

Pacific ocean perch (*Sebastes alutus*)

Pacific ocean perch (POP) was the most abundant species caught in the 2010 survey (Table 2). The highest area-specific catch rate was in the Western Aleutians area. The mean CPUE of POP by area decreased in an easterly direction (Table 34, Fig. 30). Estimated biomass for the entire survey area surpassed 976,000 t (Table 34) and more than 91% of the total estimated biomass was found in the Aleutian areas. Biomass and mean CPUE increased with depth to about 300 m, with the highest concentrations in the 201-300 m depth interval. In particular, the highest 10 stratum-specific mean CPUEs were all found in the 201-300 m depth interval (Table 35). Only 2 of the 81 tows in the 201-300 m depth interval did not contain POP. Mean weights generally increased with depth to 300 m (Table 34). Size composition data show relatively similar distributions for males and females in the three Aleutian areas, but in the Southern Bering Sea area the females were substantially larger than males at depths deeper than 100 m. A fairly distinct frequency mode occurred at approximately 30 cm for males in most areas deeper than 100 m, but no consistent and distinct frequency mode occurred for females (Fig. 31). Small POP (less than 25 cm) predominated in the 1-100 m depth interval, a mix of adult and juvenile sizes characterized the 101-200 m interval, and only adults were found in the two deepest strata. Appendix C lists the length-weight relationship parameters for male, female, and combined sexes of POP.

Table 34. -- Total effort (number of trawl hauls), number of hauls with Pacific ocean perch, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	6	9.15	4,462	0	10,536	0.281
	101 - 200	55	40	233.71	124,277	51,445	197,109	0.584
	201 - 300	22	22	1522.8	262,474	100,617	424,330	0.679
	301 - 500	9	7	14.43	4,721	0	12,515	0.604
	All depths	118	75	260.65	395,933	224,133	567,733	0.636
Central Aleutians	1 - 100	48	3	0.19	113	0	277	0.056
	101 - 200	47	28	94.49	43,518	6,388	80,648	0.657
	201 - 300	21	21	821.27	173,192	95,353	251,032	0.787
	301 - 500	12	9	12.25	4,877	0	14,466	0.717
	All depths	128	61	134.02	221,700	140,758	302,643	0.751
Eastern Aleutians	1 - 100	21	8	0.45	307	0	938	0.192
	101 - 200	55	29	52.42	40,717	0	97,989	0.516
	201 - 300	33	31	431.08	211,293	129,761	292,825	0.728
	301 - 500	12	10	25.15	14,290	0	29,865	0.656
	All depths	121	78	105.79	266,607	168,814	364,400	0.679
All Aleutian Areas	1 - 100	101	17	2.78	4,882	0	10,991	0.251
	101 - 200	157	97	117.86	208,512	112,307	304,718	0.582
	201 - 300	76	74	745.69	651,281	461,710	840,853	0.722
	301 - 500	33	26	18.47	23,887	4,263	43,512	0.656
	All depths	367	214	155.31	884,241	674,561	1,093,920	0.675
Southern Bering Sea	1 - 100	27	8	0.11	43	0	143	0.126
	101 - 200	14	9	156.07	28,852	0	75,860	0.872
	201 - 300	5	5	1005.62	56,703	0	166,702	0.829
	301 - 500	5	5	21.06	2,197	0	6,980	0.897
	All depths	51	27	117.35	87,794	0	196,262	0.842

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 2010 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	W Western Aleutians	13	13	1984.86	186,622	36,203	337,041
Eastern Aleutians	201-300	NW Eastern Aleutians	2	2	1610.95	25,119	0	105,939
Central Aleutians	201-300	N Central Aleutians	9	9	1354.26	59,453	14,455	104,451
Southern Bering Sea	201-300	Combined Southern Bering	5	5	1005.62	56,703	0	175,473
Western Aleutians	201-300	E Western Aleutians	9	9	968.23	75,852	0	154,713
Central Aleutians	201-300	SE Central Aleutians	3	3	890.67	42,517	0	132,760
Central Aleutians	201-300	SW Central Aleutians	6	6	726.13	30,936	1,967	59,904
Eastern Aleutians	201-300	NE Eastern Aleutians	19	17	704.97	138,779	66,533	211,025
Central Aleutians	201-300	Petrel Bank	3	3	525.65	40,287	0	99,890
Eastern Aleutians	201-300	SW Eastern Aleutians	4	4	326.90	23,418	0	77,105
Western Aleutians	101-200	E Western Aleutians	22	19	325.59	40,778	13,548	68,009
Southern Bering Sea	101-200	E Southern Bering Sea	12	9	244.69	28,852	0	76,335
Western Aleutians	101-200	W Western Aleutians	33	21	205.40	83,499	15,750	151,247
Central Aleutians	101-200	SW Central Aleutians	18	16	184.96	19,464	0	41,528
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	171.77	7,527	0	30,877
Central Aleutians	101-200	N Central Aleutians	9	2	126.69	13,506	0	44,389
Eastern Aleutians	201-300	SE Eastern Aleutians	8	8	116.36	23,977	3,182	44,772
Eastern Aleutians	101-200	SW Eastern Aleutians	9	3	101.26	22,894	0	75,431
Eastern Aleutians	101-200	NE Eastern Aleutians	24	11	81.40	16,382	0	42,300
Central Aleutians	101-200	SE Central Aleutians	14	7	43.19	3,247	0	8,272
Central Aleutians	101-200	Petrel Bank	6	3	42.07	7,301	0	19,551
Central Aleutians	301-500	N Central Aleutians	6	6	35.54	4,407	0	14,451
Western Aleutians	301-500	W Western Aleutians	7	5	24.14	4,131	0	12,294
Eastern Aleutians	301-500	SE Eastern Aleutians	4	4	23.70	6,103	0	22,896
Southern Bering Sea	301-500	Combined Southern Bering	5	5	21.06	2,197	0	7,362
Western Aleutians	1-100	W Western Aleutians	13	2	10.91	4,029	0	10,099
Eastern Aleutians	101-200	SE Eastern Aleutians	18	14	6.95	1,320	0	3,531
Central Aleutians	301-500	SE Central Aleutians	2	2	6.01	429	0	4,299
Western Aleutians	301-500	E Western Aleutians	2	2	3.78	590	0	7,530
Western Aleutians	1-100	E Western Aleutians	19	4	3.66	433	0	1,237
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	4	2.47	660	0	1,948
Eastern Aleutians	1-100	SE Eastern Aleutians	13	7	1.73	301	0	939
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	0.76	121	0	507
Central Aleutians	1-100	Petrel Bank	9	1	0.49	47	0	154
Central Aleutians	301-500	Petrel Bank	2	1	0.33	41	0	566
Central Aleutians	1-100	N Central Aleutians	16	2	0.32	67	0	203
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.14	22	0	295
Southern Bering Sea	1-100	E Southern Bering Sea	25	7	0.09	22	4	40
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	0.04	5	0	28

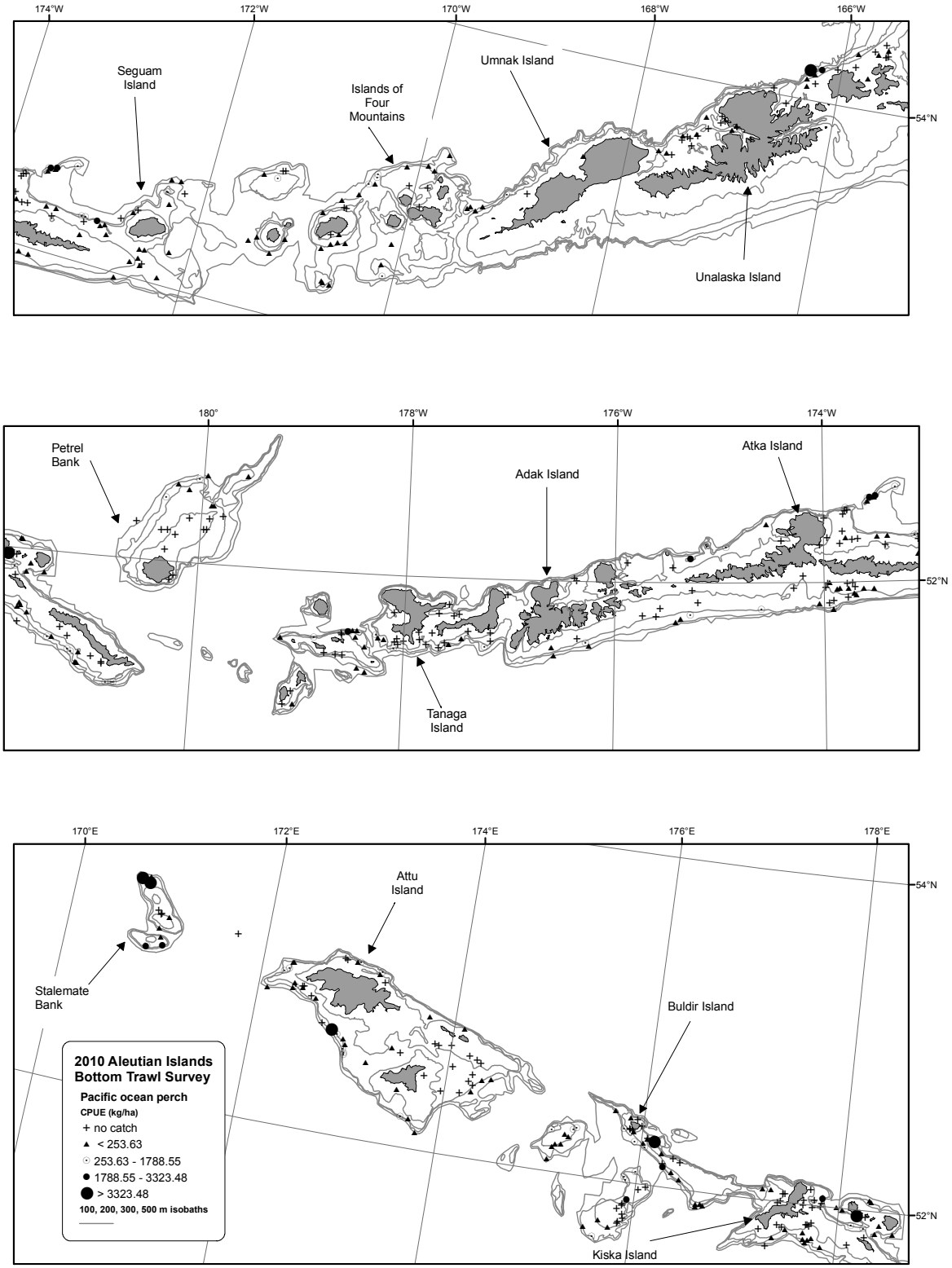

Figure 30. -- Distribution and relative abundance of Pacific ocean perch from the 2010 Aleutian Islands bottom trawl survey.

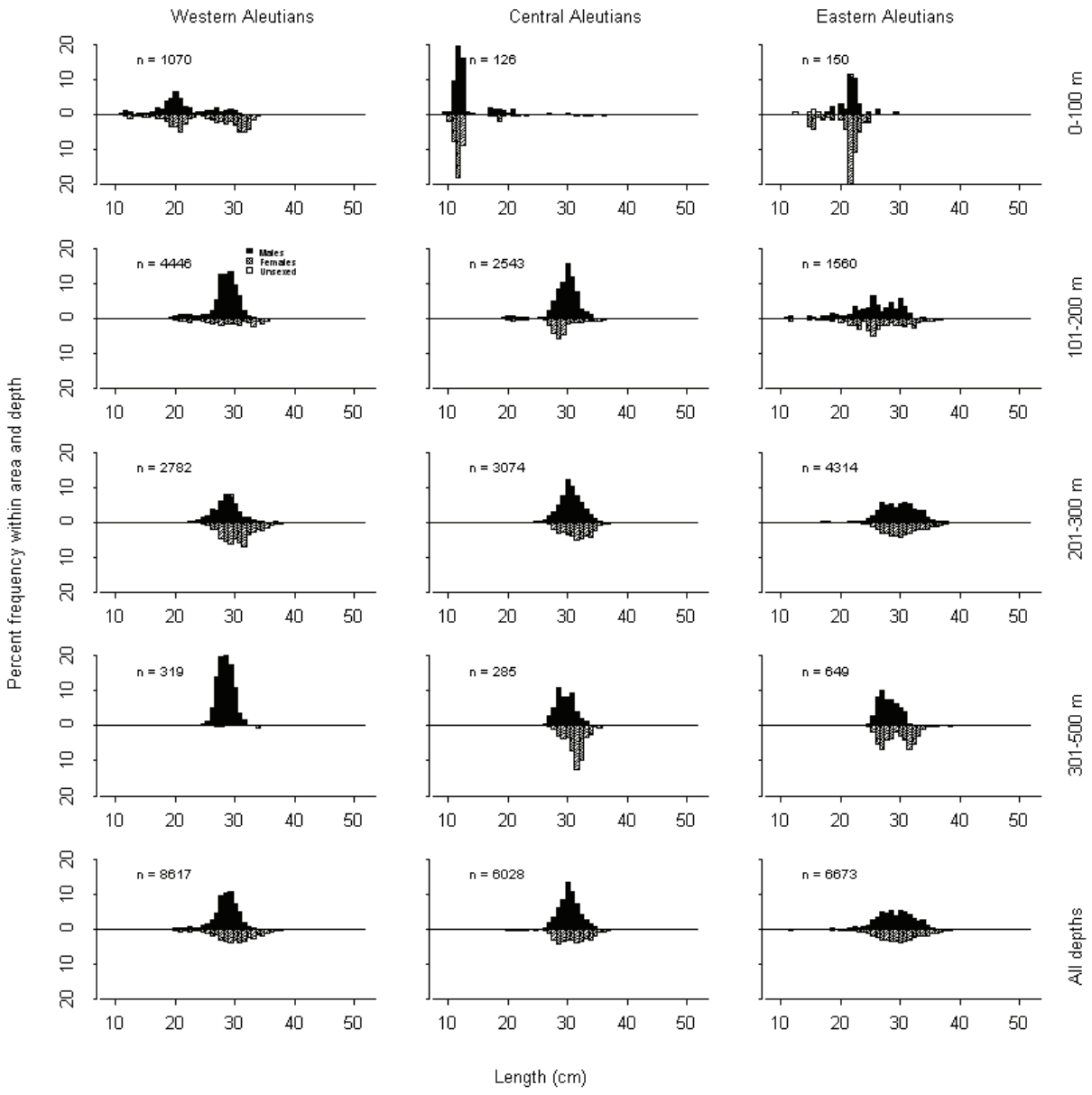

Figure 31. -- Size composition of Pacific ocean perch from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

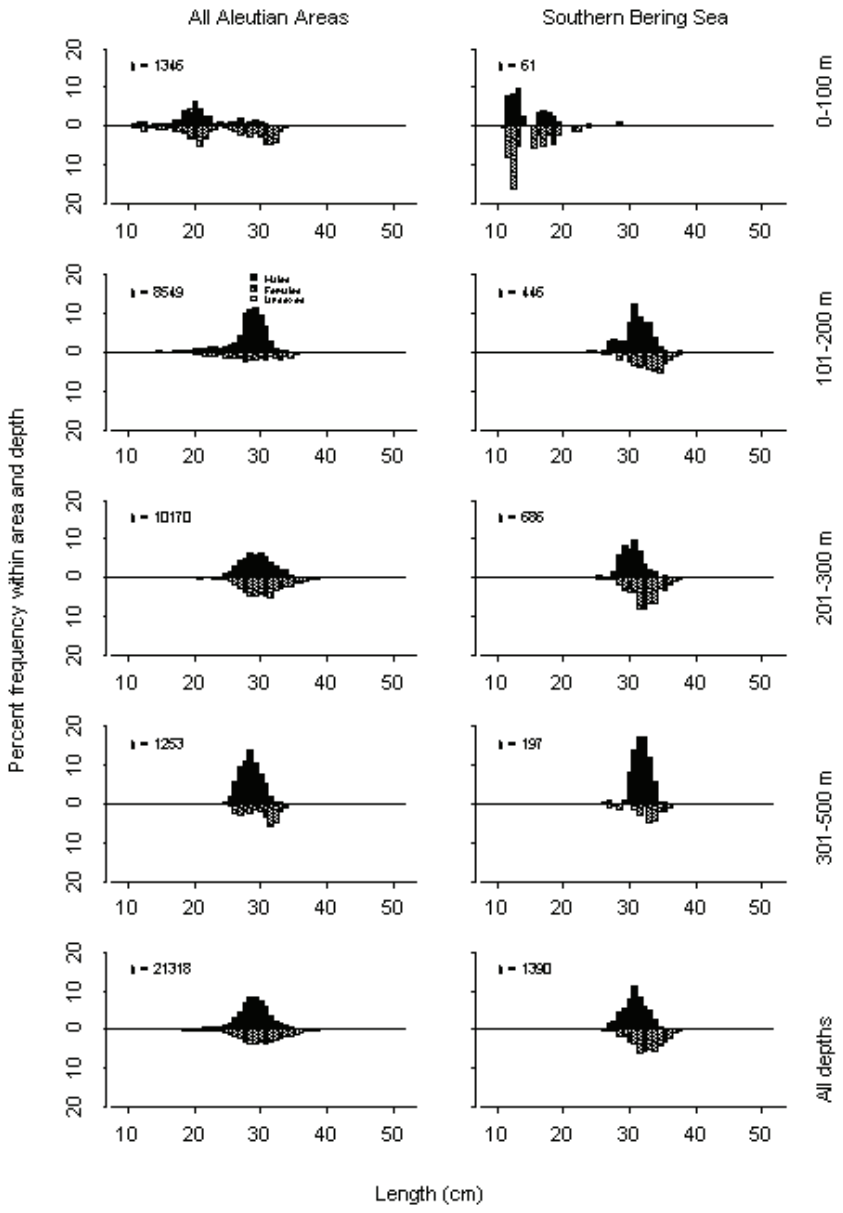

Figure 31. -- (continued).

Northern rockfish (*Sebastes polyspinis*)

Northern rockfish was the fourth most abundant species caught in the 2010 survey and the second most abundant rockfish species. Relative abundance was highest in the Western and Central Aleutian areas (Table 2). Northern rockfish were widely dispersed throughout the Aleutian Islands, but the largest catches were mostly west of 180° longitude (Fig. 32). Although they occurred relatively frequently in the Southern Bering Sea (35% of all tows), catch rates in this area were extremely low. Estimated total survey biomass was 217,000 t, with approximately 66% found in the Western Aleutians area (Table 36) and in depths less than 200 m (Table 37). Northern rockfish occurred in very low abundance in the 201-300 m depth interval and were almost absent in depths deeper than 300 m. They were captured in 51% of all successful tows shallower than 200 m. The highest mean CPUE occurred in the 101-200 m depth interval in the E Western Aleutians subarea, where northern rockfish where caught in 19 of the 22 tows (Table 37). Mean individual length and weight increased with depth to 300 m. A relatively distinct length mode occurred at 25 cm for females at all depth intervals less than 300 m in the Western and Central Aleutian areas, and at depths less than 200 m in the Eastern Aleutian area. Length modes for males were less distinct (Fig. 33). Appendix C lists the weight-length relationship parameters for male, female, and combined sexes of northern rockfish.

Table 36. -- Total effort (number of trawl hauls), number of hauls with northern rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	25	114.72	55,945	11,436	100,454	0.381
	101 - 200	55	40	165.00	87,741	15,081	160,400	0.480
	201 - 300	22	11	1.55	267	0	619	0.564
	301 - 500	9	0	---	---	---	---	---
	All depths	118	76	94.77	143,953	59,334	228,571	0.436
Central Aleutians	1 - 100	48	17	54.66	31,962	0	72,206	0.359
	101 - 200	47	26	41.35	19,045	5,668	32,421	0.514
	201 - 300	21	15	1.51	319	0	761	0.542
	301 - 500	12	1	0.01	5	0	17	0.573
	All depths	128	59	31.03	51,331	9,058	93,603	0.405
Eastern Aleutians	1 - 100	21	7	7.14	4,887	0	11,524	0.437
	101 - 200	55	22	21.48	16,686	0	38,129	0.563
	201 - 300	33	14	0.46	228	50	405	0.710
	301 - 500	12	2	0.08	46	0	153	0.607
	All depths	121	45	8.67	21,847	0	43,960	0.530
All Aleutian Areas	1 - 100	101	49	52.81	92,794	33,206	152,383	0.376
	101 - 200	157	88	69.79	123,471	47,425	199,517	0.495
	201 - 300	76	40	0.93	813	271	1,355	0.589
	301 - 500	33	3	0.04	51	0	159	0.604
	All depths	367	180	38.14	217,130	121,130	313,130	0.436
Southern Bering Sea	1 - 100	27	8	0.32	129	0	334	0.436
	101 - 200	14	7	0.16	30	9	51	0.525
	201 - 300	5	3	0.53	30	0	63	0.790
	301 - 500	5	0	---	---	---	---	---
	All depths	51	18	0.25	189	0	397	0.483

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 2010 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	22	19	441.36	55,278	0	119,848
Western Aleutians	1-100	E Western Aleutians	19	16	210.13	24,865	12,152	37,578
Central Aleutians	1-100	Petrel Bank	9	1	130.18	12,497	0	41,316
Central Aleutians	101-200	SW Central Aleutians	18	16	90.02	9,473	539	18,407
Western Aleutians	1-100	W Western Aleutians	13	9	84.15	31,080	0	74,001
Central Aleutians	1-100	N Central Aleutians	16	8	83.63	17,609	0	49,204
Western Aleutians	101-200	W Western Aleutians	33	21	79.86	32,463	0	69,495
Central Aleutians	101-200	SE Central Aleutians	14	4	55.73	4,190	0	13,143
Eastern Aleutians	101-200	NE Eastern Aleutians	24	6	47.97	9,653	0	29,126
Central Aleutians	101-200	N Central Aleutians	9	5	46.39	4,945	0	11,307
Eastern Aleutians	101-200	SE Eastern Aleutians	18	12	36.59	6,952	0	16,780
Eastern Aleutians	1-100	SE Eastern Aleutians	13	6	27.96	4,866	0	11,561
Central Aleutians	1-100	SW Central Aleutians	11	5	8.22	1,329	0	2,692
Central Aleutians	201-300	N Central Aleutians	9	6	4.91	215	0	667
Central Aleutians	1-100	SE Central Aleutians	12	3	4.53	527	0	1,323
Western Aleutians	201-300	E Western Aleutians	9	3	2.90	227	0	584
Central Aleutians	101-200	Petrel Bank	6	1	2.52	437	0	1,560
Central Aleutians	201-300	SW Central Aleutians	6	6	1.88	80	7	154
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.80	12	0	170
Southern Bering Sea	201-300	Combined Southern Bering	5	3	0.53	30	0	65
Eastern Aleutians	201-300	SE Eastern Aleutians	8	4	0.47	97	0	246
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.44	32	0	133
Eastern Aleutians	201-300	NE Eastern Aleutians	19	8	0.44	86	4	169
Southern Bering Sea	1-100	E Southern Bering Sea	25	7	0.43	104	0	300
Western Aleutians	201-300	W Western Aleutians	13	8	0.43	40	10	70
Central Aleutians	201-300	SE Central Aleutians	3	2	0.34	16	0	53
Eastern Aleutians	101-200	SW Eastern Aleutians	9	3	0.26	59	0	140
Southern Bering Sea	101-200	E Southern Bering Sea	12	7	0.26	30	9	51
Eastern Aleutians	301-500	SW Eastern Aleutians	2	1	0.19	8	0	112
Eastern Aleutians	1-100	NE Eastern Aleutians	3	1	0.17	21	0	112
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.15	24	0	332
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	0.15	38	0	158
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	0.14	22	0	91
Central Aleutians	201-300	Petrel Bank	3	1	0.09	7	0	35
Central Aleutians	301-500	N Central Aleutians	6	1	0.04	5	0	18

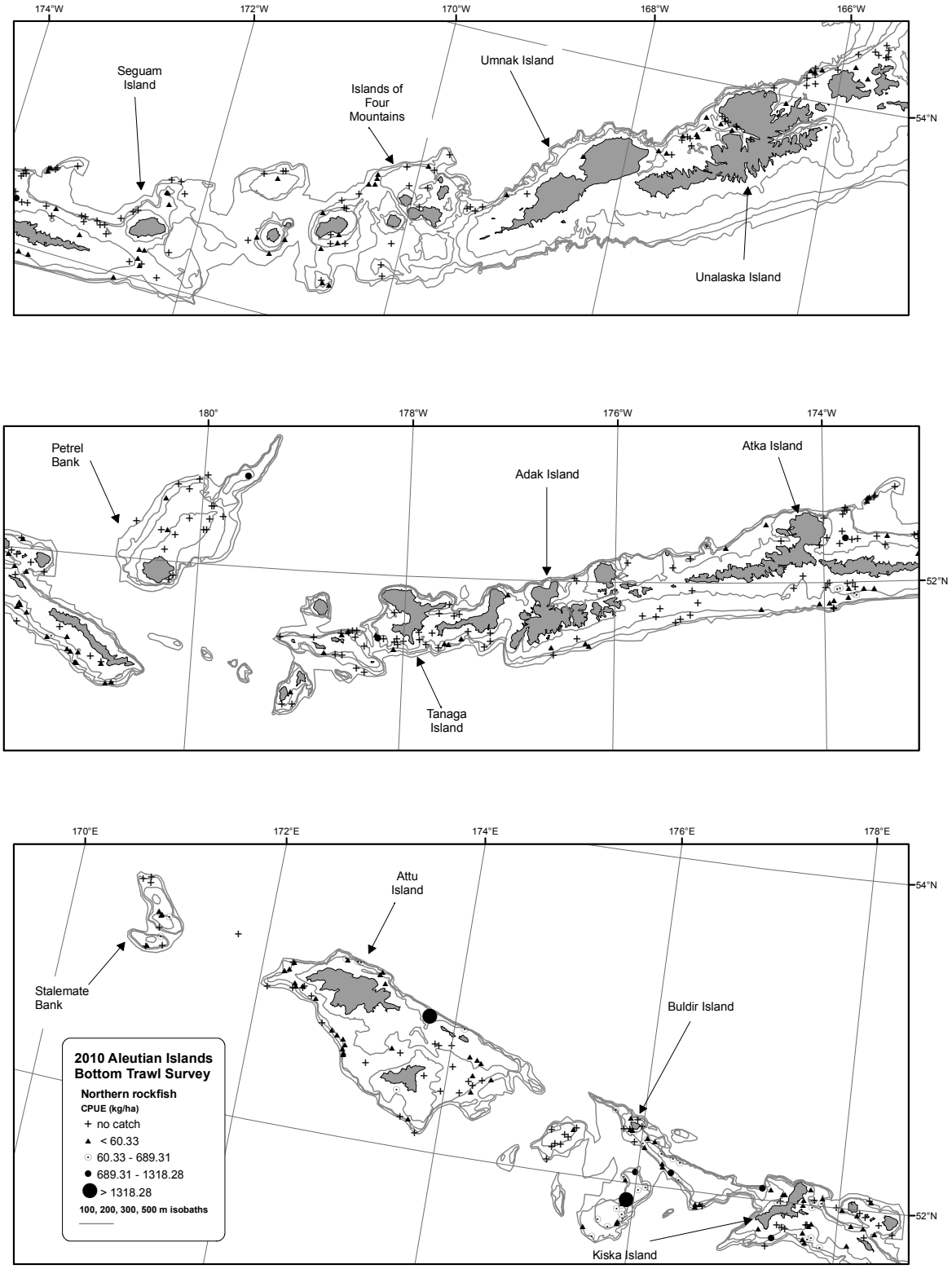

Figure 32. -- Distribution and relative abundance of northern rockfish from the 2010 Aleutian Islands bottom trawl survey.

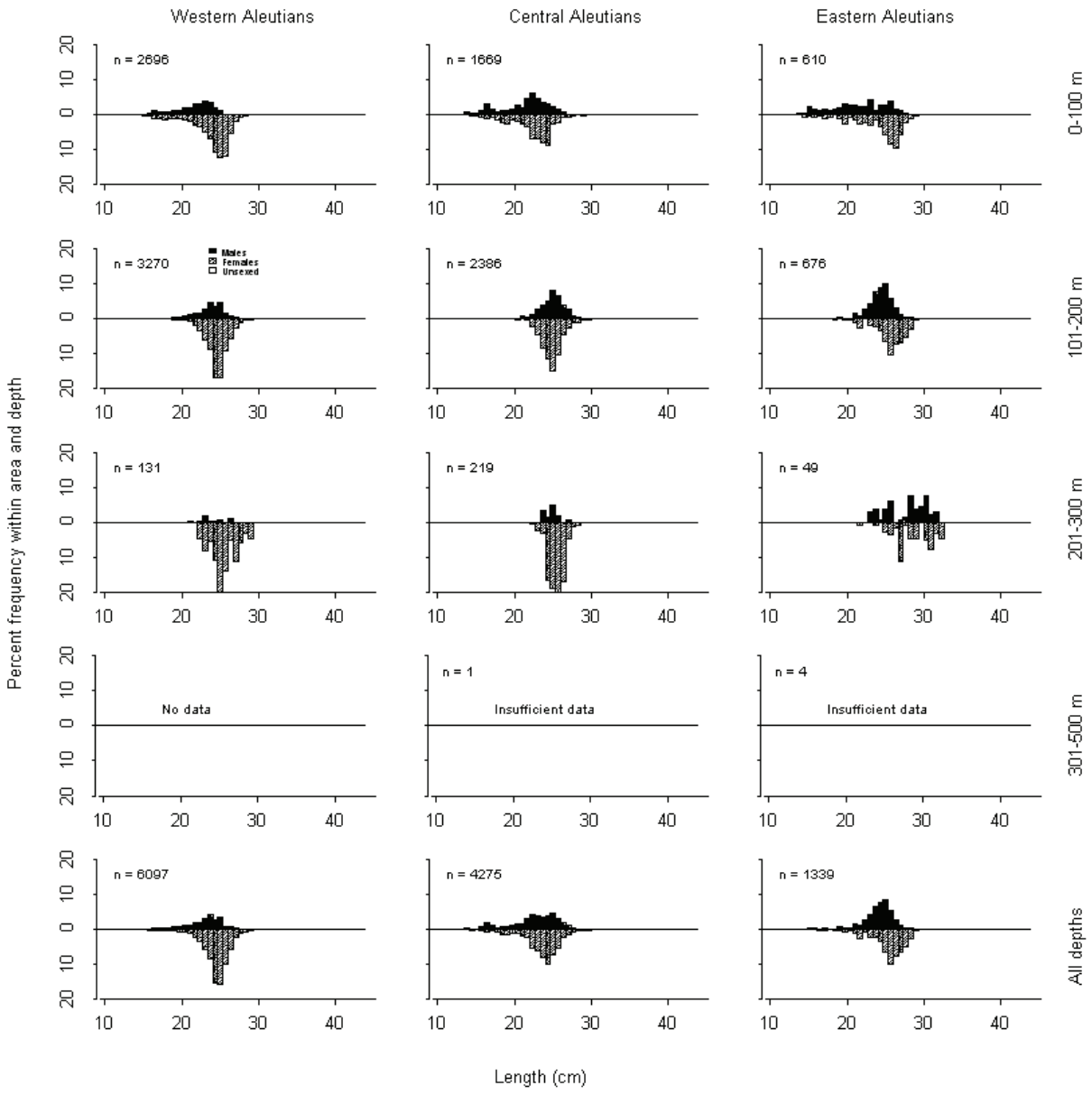

Figure 33. -- Size composition of northern rockfish from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

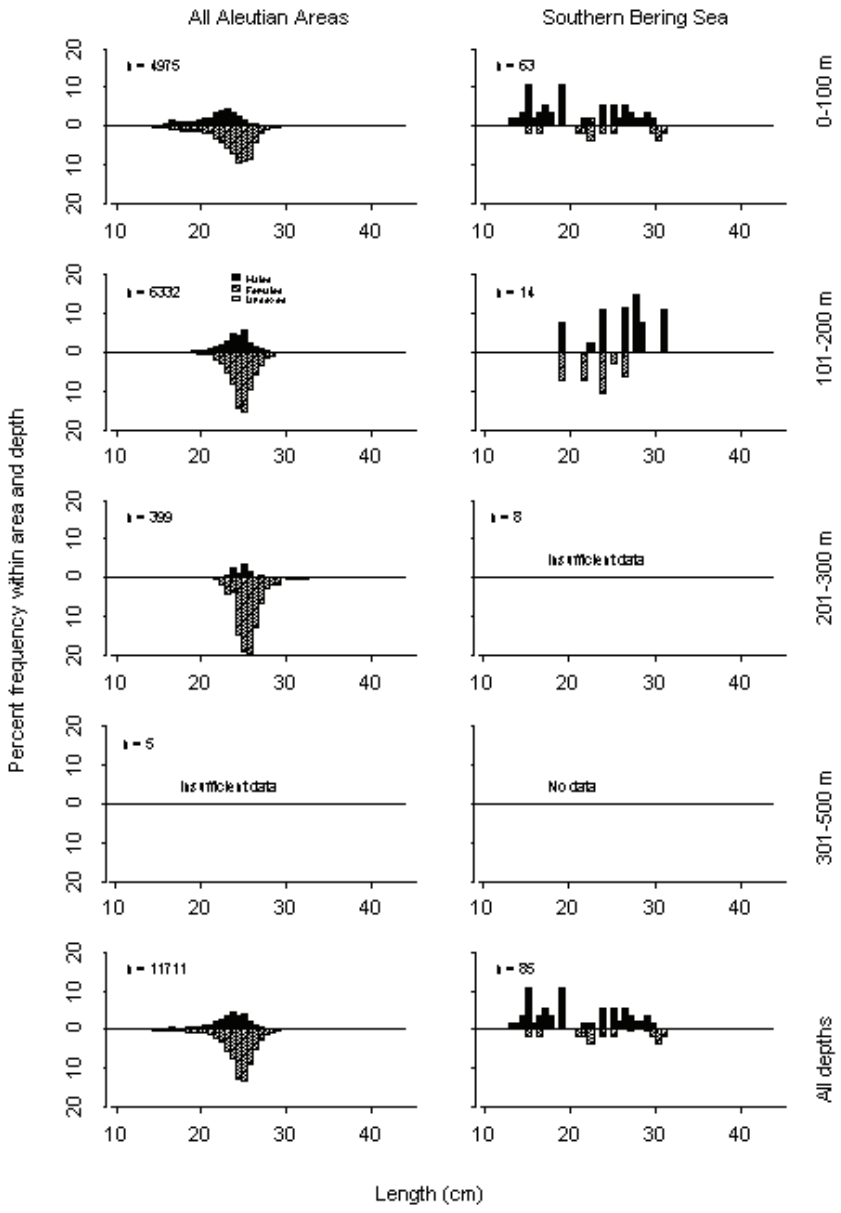

Figure 33. -- (continued).

Shortraker rockfish (*Sebastes borealis*)

Shortraker rockfish mean CPUE was higher than that of rougheye or blackspotted rockfish in all Aleutian survey areas except the Eastern Aleutians, where it was about equal with blackspotted (Table 2). The estimated biomass for this species was concentrated in 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 2010 AFSC survey are likely to have excluded some part of the shortraker rockfish population. The seven highest area-specific mean CPUEs were all in the 301-500 m depth interval (Table 39), with the highest CPUE estimate in the SE Central Aleutians subarea. All deep trawl hauls (301-500 m) in the Western and Central Aleutians produced catches of shortraker rockfish. One catch accounted for the entire biomass estimate in the Southern Bering Sea area (Table 39). Notable individual catches of shortraker rockfish occurred west of Tanaga Island and on Stalemate Bank (Fig. 34). Size compositions of males and females from the combined Aleutian areas were similar (Fig. 35). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of shortraker rockfish.

Rougheye rockfish (*Sebastes aleutianus*)

The rougheye rockfish biomass was mostly confined to the Eastern Aleutians area, where 73% of the 489 t total estimated biomass was found (Table 40). Rougheye rockfish were only found in the two deepest depth intervals (201-300 and 301-500 m), with 74% of the estimated biomass in the 301-500 m interval, and they only occurred in 10 of the 45 subareas (Table 41). However, the five largest catches (greater than four standard deviations of the mean) were distributed throughout the survey area between Umnak Island in the east and Agattu Island in the far west of the survey area. (Fig. 36). The size composition was similar for males and females (Fig. 37).

Blackspotted rockfish (*Sebastes melanostictus*)

Blackspotted rockfish were identified as a separate species for the first time in 2006. In previous years this species had not been distinguished from rougheye rockfish. The mean CPUE was highest in the Eastern Aleutians area where more than 50% of the estimated biomass occurred. Blackspotted rockfish were extremely rare in the Southern Bering Sea area. The average mean weight generally increased with depth in the Aleutian areas (Table 42). The eight largest catches all occurred west of Amlia Island (Fig. 38). The three highest stratum-specific mean CPUEs were in the 201-300 m and 301-500 m depth intervals and represented each of the three Aleutian subareas (Table 43). Length distributions were similar for males and females, with a minor mode at approximately 25 cm and larger one at approximately 45 cm (Fig. 39). Appendix C lists the weight-length relationship parameters for male, female, and combined sexes of blackspotted rockfish.

Table 38. -- Total effort (number of trawl hauls), number of hauls with shortraker rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	2	0.66	114	0	287	5.268
	301 - 500	9	9	20.21	6,615	0	15,446	1.784
	All depths	118	11	4.43	6,729	0	15,562	1.804
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	0	---	---	---	---	---
	201 - 300	21	3	1.59	335	0	1,293	3.408
	301 - 500	12	12	17.81	7,090	0	14,373	1.800
	All depths	128	15	4.49	7,424	78	14,770	1.839
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	3	0.86	420	0	1,257	1.815
	301 - 500	12	7	6.42	3,651	43	7,258	1.833
	All depths	121	10	1.62	4,071	372	7,770	1.831
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	0	---	---	---	---	---
	201 - 300	76	8	0.99	868	0	1,934	2.472
	301 - 500	33	28	13.42	17,355	7,785	26,926	1.800
	All depths	367	36	3.20	18,224	8,737	27,710	1.824
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	0	---	---	---	---	---
	301 - 500	5	1	0.14	15	0	54	1.462
	All depths	51	1	0.02	15	0	54	1.462

Table 39. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of shortraker rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2010 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	SE Central Aleutians	2	2	64.10	4,579	0	31,303
Western Aleutians	301-500	W Western Aleutians	7	7	25.07	4,290	0	9,661
Central Aleutians	301-500	SW Central Aleutians	2	2	16.66	1,315	0	11,086
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	15.52	680	0	4,747
Western Aleutians	301-500	E Western Aleutians	2	2	14.89	2,325	0	31,577
Central Aleutians	301-500	N Central Aleutians	6	6	8.85	1,098	0	2,308
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	3	6.67	1,782	0	4,729
Central Aleutians	201-300	SE Central Aleutians	3	1	6.30	301	0	1,594
Eastern Aleutians	301-500	SE Eastern Aleutians	4	2	4.62	1,189	0	4,567
Eastern Aleutians	201-300	SE Eastern Aleutians	8	1	1.75	360	0	1,211
Western Aleutians	201-300	W Western Aleutians	13	2	1.21	114	0	289
Central Aleutians	301-500	Petrel Bank	2	2	0.79	98	0	721
Central Aleutians	201-300	N Central Aleutians	9	2	0.78	34	0	86
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.27	19	0	81
Eastern Aleutians	201-300	NE Eastern Aleutians	19	1	0.21	41	0	128
Southern Bering Sea	301-500	Combined Southern Bering	5	1	0.14	15	0	57

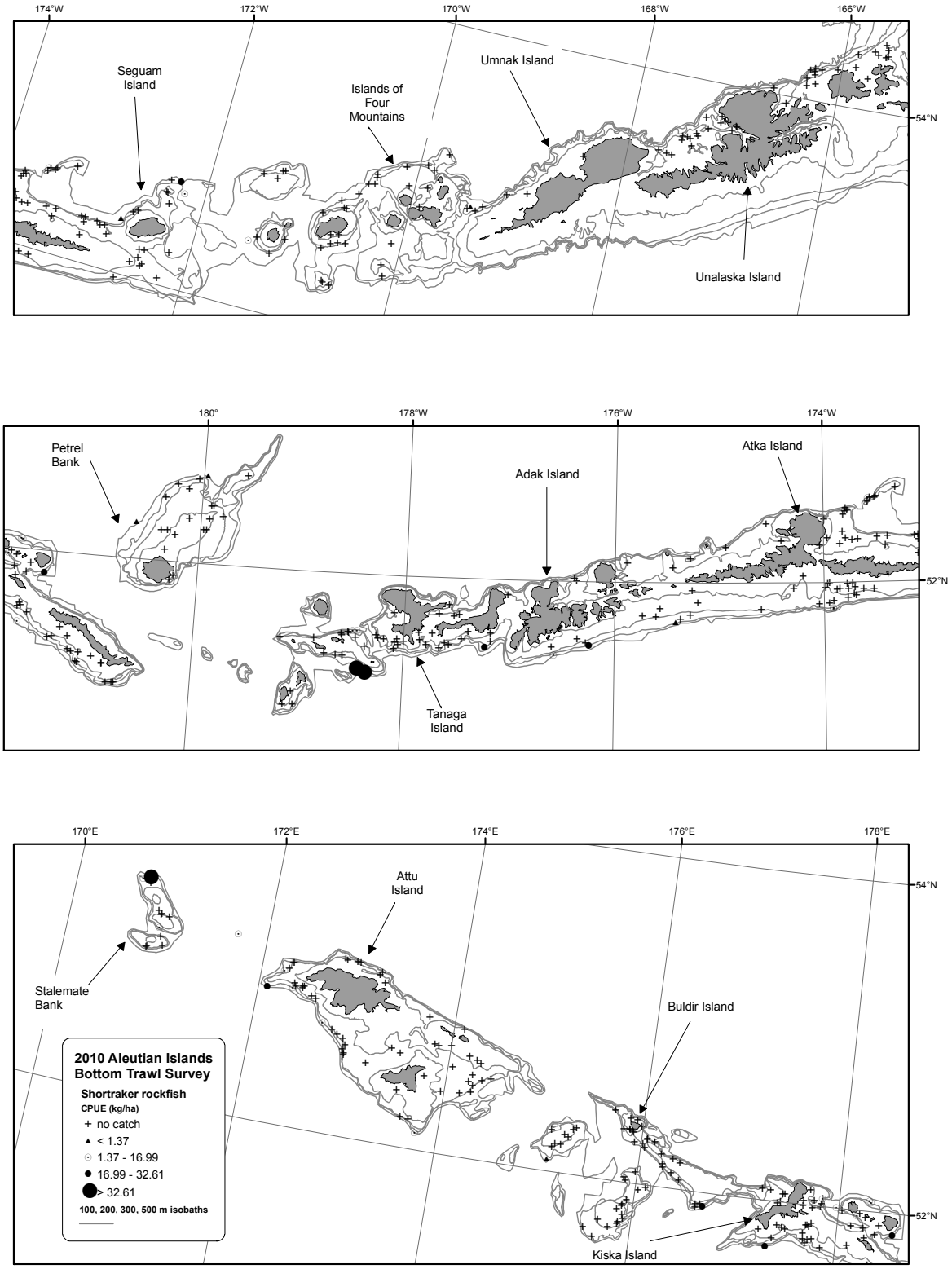

Figure 34. -- Distribution and relative abundance of shortraker rockfish from the 2010 Aleutian Islands bottom trawl survey.

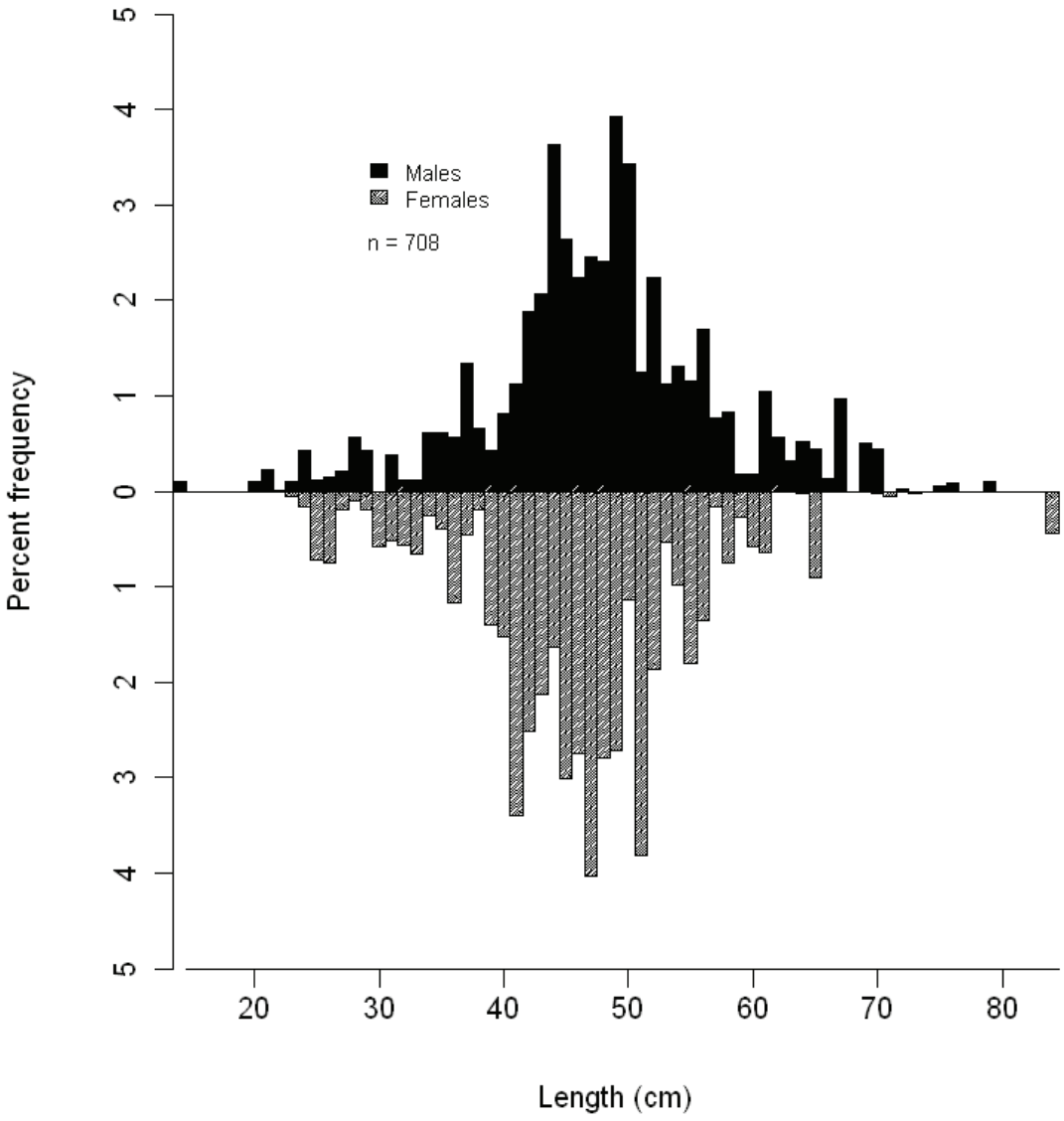

Figure 35. -- Size composition of shortraker rockfish from the 2010 Aleutian Islands bottom trawl survey.

Table 40. -- Total effort (number of trawl hauls), number of hauls with rougheye rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	1	0.01	2	0	7	0.154
	301 - 500	9	3	0.21	70	0	174	1.745
	All depths	118	4	0.05	72	0	177	1.312
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	0	---	---	---	---	---
	201 - 300	21	1	0.11	24	0	77	1.877
	301 - 500	12	0	---	---	---	---	---
	All depths	128	1	0.01	24	0	77	1.877
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	5	0.13	64	0	151	0.979
	301 - 500	12	3	0.52	293	0	826	1.987
	All depths	121	8	0.14	357	0	900	1.678
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	0	---	---	---	---	---
	201 - 300	76	7	0.1	90	0	192	0.967
	301 - 500	33	6	0.28	362	0	909	1.936
	All depths	367	13	0.08	452	0	972	1.615
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	2	0.66	37	0	110	1.343
	301 - 500	5	0	---	---	---	---	---
	All depths	51	2	0.05	37	0	110	1.343

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 2010 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	SW Eastern Aleutians	2	1	2.23	98	0	1,339
Southern Bering Sea	201-300	Combined Southern Bering	5	2	0.66	37	0	115
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	0.63	162	0	677
Central Aleutians	201-300	N Central Aleutians	9	1	0.54	24	0	78
Western Aleutians	301-500	W Western Aleutians	7	3	0.41	70	0	178
Eastern Aleutians	201-300	SE Eastern Aleutians	8	3	0.23	47	0	134
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	1	0.12	33	0	119
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.12	9	0	36
Eastern Aleutians	201-300	NE Eastern Aleutians	19	1	0.04	8	0	25
Western Aleutians	201-300	E Western Aleutians	9	1	0.03	2	0	8

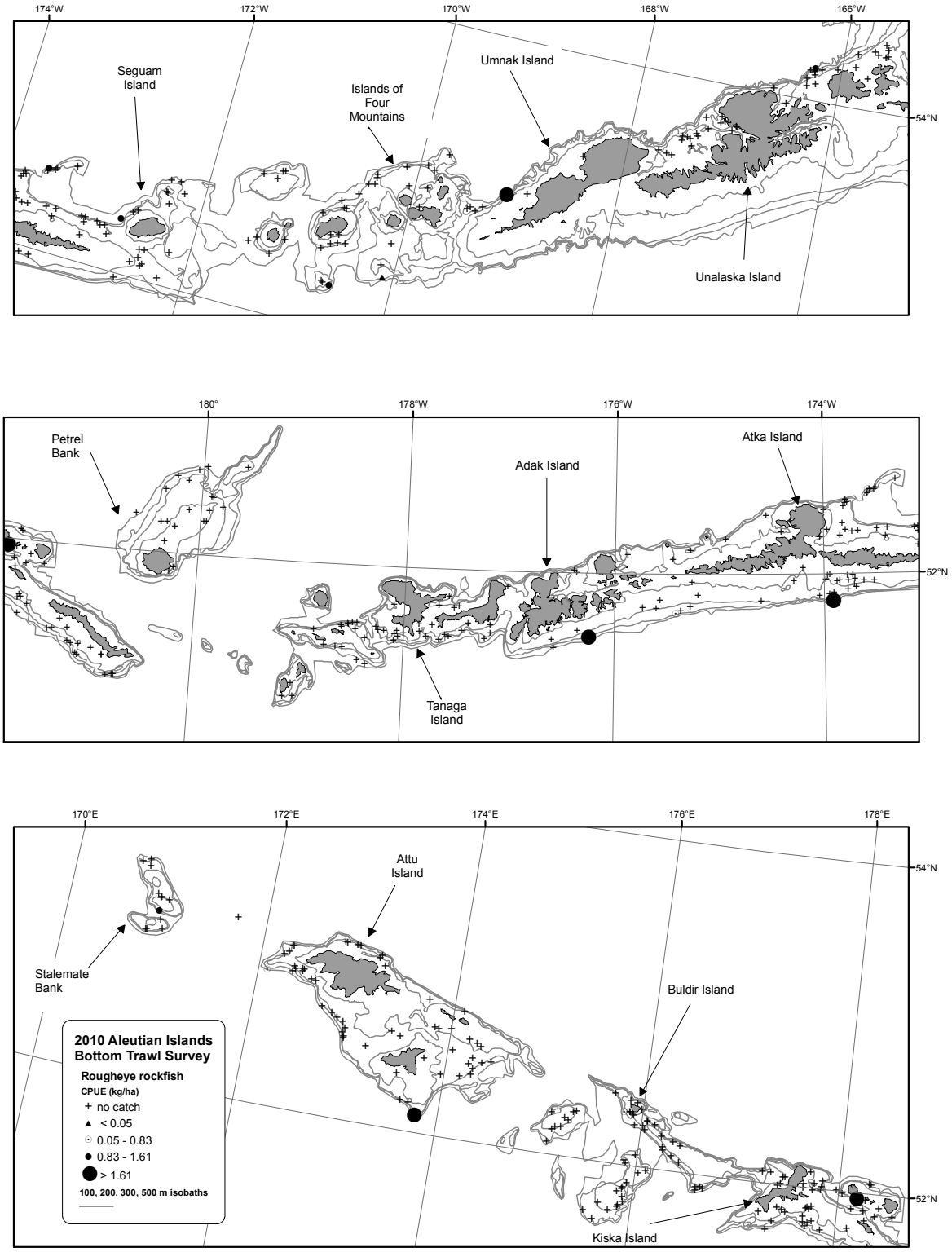

Figure 36. -- Distribution and relative abundance of rougheye rockfish from the 2010 Aleutian Islands bottom trawl survey.

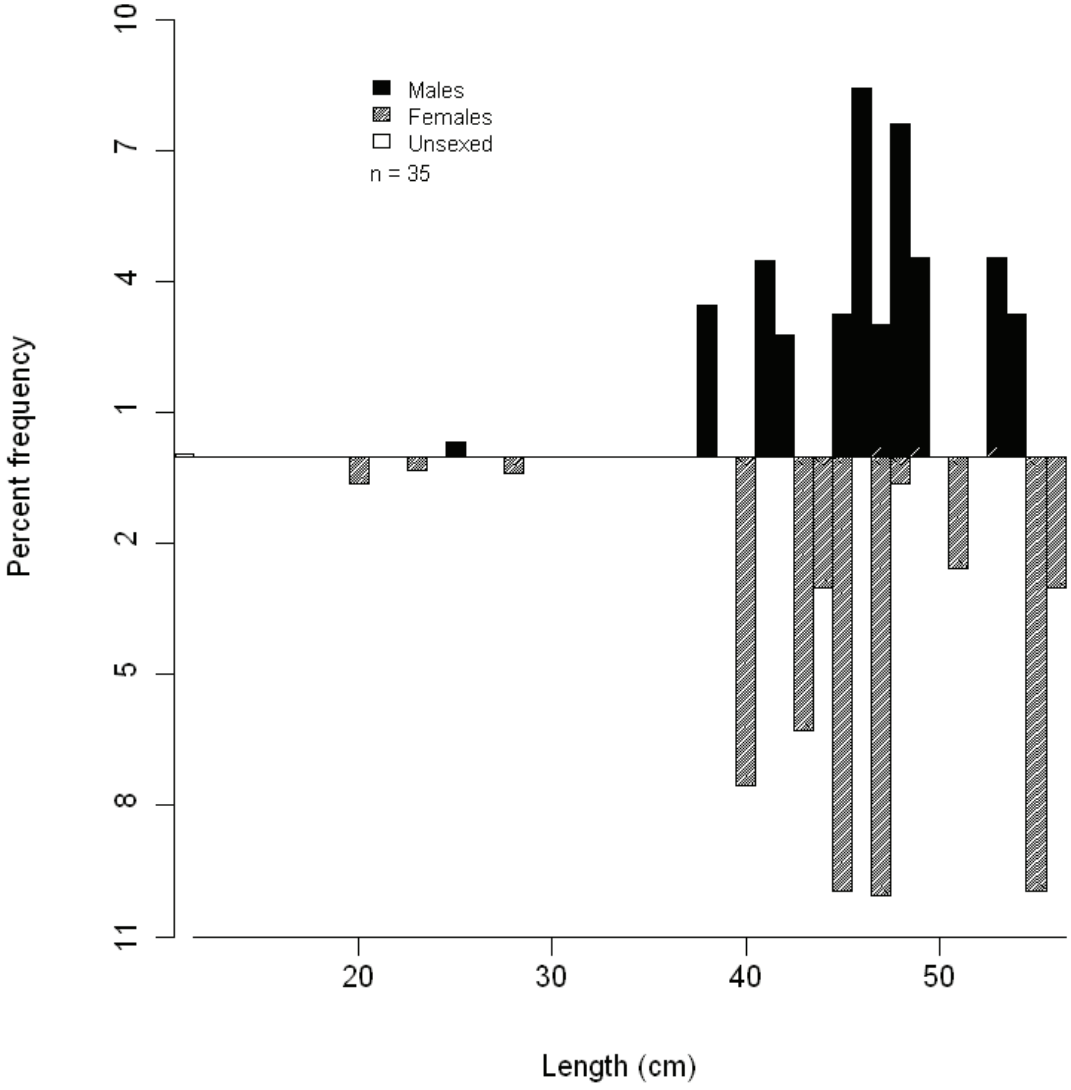

Figure 37. -- Size composition of rougheye rockfish from the 2010 Aleutian Islands bottom trawl survey.

Table 42. -- Total effort (number of trawl hauls), number of hauls with blackspotted rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	5	0.11	59	0	126	0.408
	201 - 300	22	11	4.84	834	0	2,026	0.876
	301 - 500	9	5	1.94	636	0	2,583	1.732
	All depths	118	21	1.01	1,529	0	3,761	1.044
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	2	0.02	8	0	24	0.420
	201 - 300	21	10	3.44	726	0	1,633	1.049
	301 - 500	12	10	3.72	1,481	545	2,417	1.561
	All depths	128	22	1.34	2,215	923	3,507	1.334
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	1	0.01	10	0	31	0.900
	201 - 300	33	13	1.21	591	0	1,258	0.846
	301 - 500	12	12	6.59	3,745	0	9,414	1.050
	All depths	121	26	1.72	4,345	0	10,073	1.016
All Aleutian Areas	1 - 100	101	0	---	---	---	---	---
	101 - 200	157	8	0.04	77	7	147	0.439
	201 - 300	76	34	2.46	2,151	614	3,687	0.918
	301 - 500	33	27	4.53	5,862	0	11,755	1.200
	All depths	367	69	1.42	8,089	1,853	14,326	1.093
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	1	0.01	1	0	3	0.264
	201 - 300	5	3	0.85	48	0	126	1.264
	301 - 500	5	4	1.28	134	19	249	1.219
	All depths	51	8	0.24	183	51	315	1.204

Table 43. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of blackspotted rockfish by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2010 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	SW Eastern Aleutians	2	2	25.21	1,105	0	7,728
Central Aleutians	201-300	N Central Aleutians	9	4	13.87	609	0	1,537
Western Aleutians	201-300	E Western Aleutians	9	7	9.10	713	0	1,921
Eastern Aleutians	301-500	SE Eastern Aleutians	4	4	9.10	2,343	0	8,616
Central Aleutians	301-500	SE Central Aleutians	2	2	9.07	648	0	4,197
Central Aleutians	301-500	N Central Aleutians	6	6	5.20	645	213	1,077
Western Aleutians	301-500	E Western Aleutians	2	1	2.83	442	0	6,055
Eastern Aleutians	201-300	SE Eastern Aleutians	8	4	2.03	418	0	1,063
Central Aleutians	201-300	SE Central Aleutians	3	2	1.86	89	0	343
Central Aleutians	301-500	Petrel Bank	2	1	1.29	160	0	2,189
Western Aleutians	201-300	W Western Aleutians	13	4	1.29	121	0	356
Southern Bering Sea	301-500	Combined Southern Bering	5	4	1.28	134	10	259
Western Aleutians	301-500	W Western Aleutians	7	4	1.14	194	0	432
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	6	1.11	297	21	573
Southern Bering Sea	201-300	Combined Southern Bering	5	3	0.85	48	0	132
Eastern Aleutians	201-300	NE Eastern Aleutians	19	8	0.82	161	0	395
Central Aleutians	201-300	SW Central Aleutians	6	3	0.59	25	0	54
Western Aleutians	101-200	E Western Aleutians	22	5	0.47	59	0	126
Central Aleutians	301-500	SW Central Aleutians	2	1	0.36	29	0	391
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.18	13	0	52
Central Aleutians	101-200	SW Central Aleutians	18	1	0.07	7	0	23
Central Aleutians	201-300	Petrel Bank	3	1	0.05	4	0	20
Eastern Aleutians	101-200	SW Eastern Aleutians	9	1	0.04	10	0	32
Southern Bering Sea	101-200	E Southern Bering Sea	12	1	0.01	1	0	4
Central Aleutians	101-200	SE Central Aleutians	14	1	0.01	1	0	2

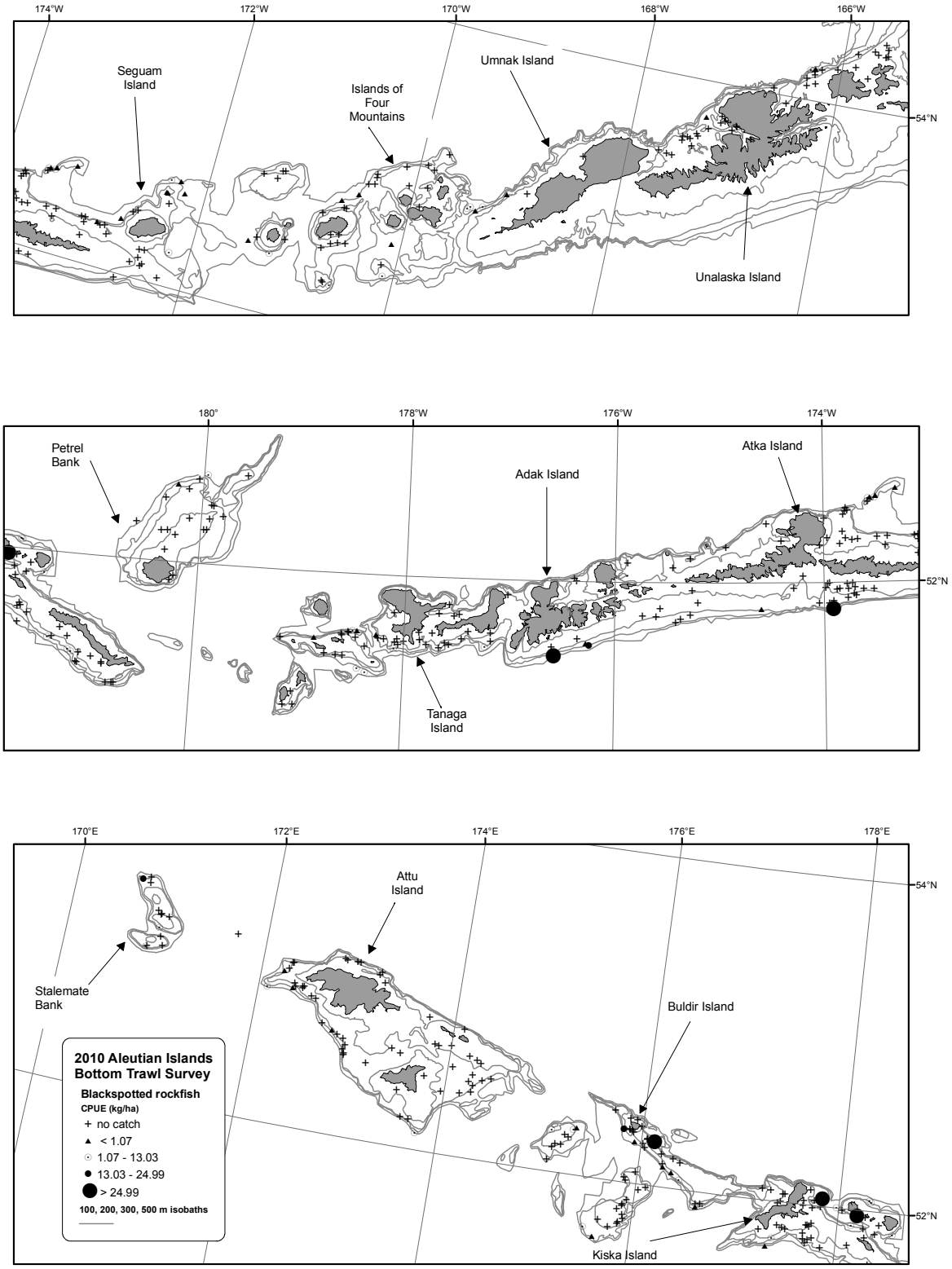

Figure 38. -- Distribution and relative abundance of blackspotted rockfish from the 2010 Aleutian Islands bottom trawl survey.

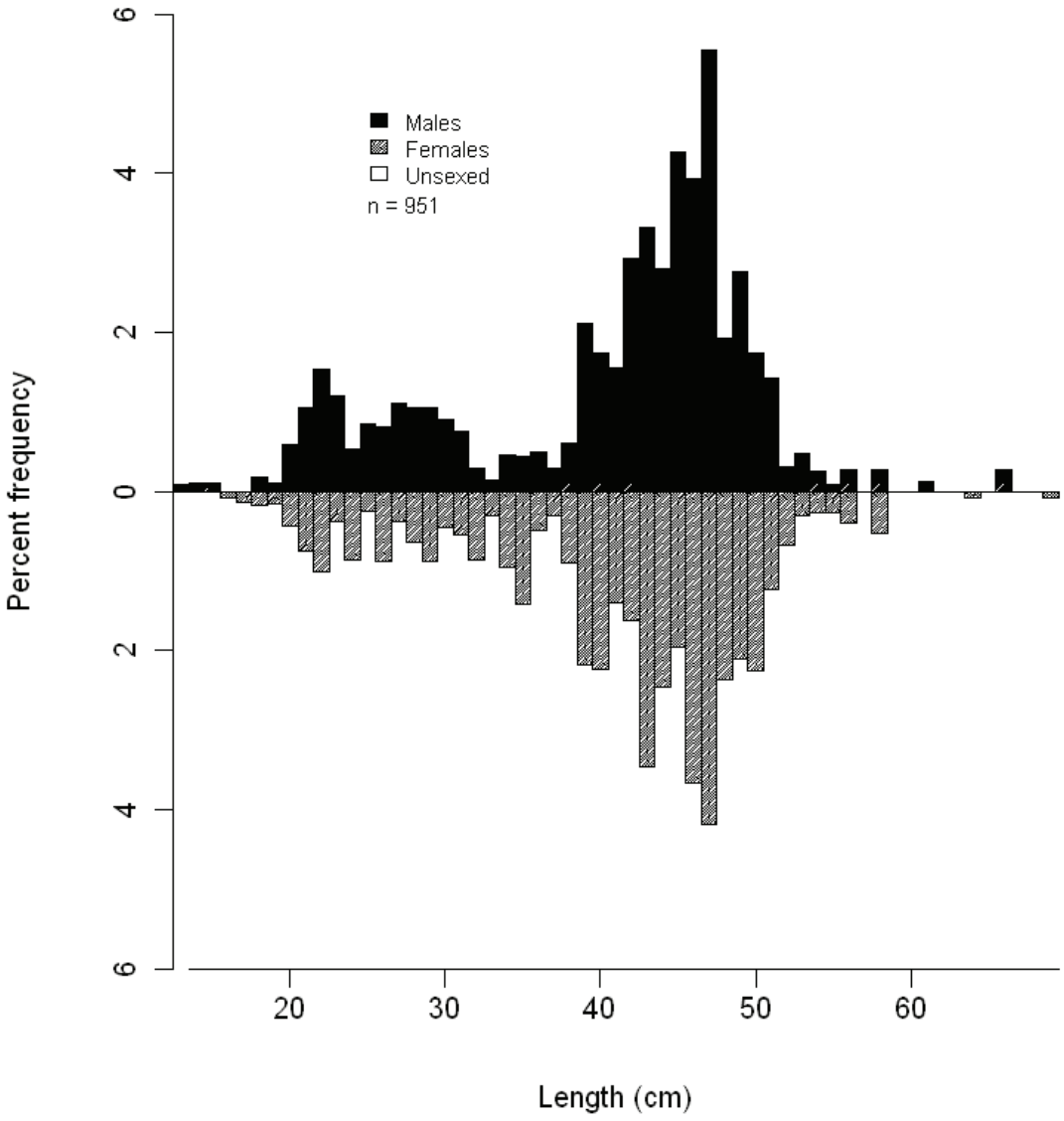

Figure 39. -- Size composition of blackspotted rockfish from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

Shortspine thornyhead (*Sebastolobus alascanus*)

Shortspine thornyheads were most abundant in the Western and Central Aleutian areas at depths greater than 200 m and catch rates were highest in the 301- 500 m depth interval (Table 44). They were caught in all trawl hauls in the 301-500 m depth interval in the Central and Western Aleutians areas and two subareas in this depth interval (W Western Aleutians and SW Central Aleutians) exhibited the highest CPUEs in the survey (Table 45). They were also common in the 201-300 m depth interval in the W Western Aleutians. Notable individual catches were made on Stalemate Bank and SE of Attu Island (Fig. 40). Biomass estimates from this survey are very likely underestimates of Aleutian Islands 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 not sampled by this survey. Mean size generally decreased with depth (Table 44). The size compositions of males and females were similar (Fig. 41). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of shortspine thornyhead.

Dusky rockfish (*Sebastes variabilis*)

Dusky rockfish were primarily distributed in the two shallowest depth strata (1-100 m and 101-200 m) at very low abundances throughout most of the survey area. They were almost completely absent in the Western Aleutian area, where they were caught in only one small haul. Dusky rockfish were most abundant at shallow depths (1-100 m) in the Central Aleutians area, where four hauls accounted for more than 39% of the total biomass (Table 46). This species was encountered in only 17 of the 45 subareas (Table 47). There was no trend in individual mean weight with increasing depth. Appendix C lists the length-weight relationship parameters for male, female, and combined sexes of dusky rockfish.

Dark rockfish (*Sebastes ciliatus*)

Dark rockfish, like dusky rockfish, were found in very low abundance in the Aleutian Islands. They only occurred in the shallowest depth interval; all but one dark rockfish catch occurred in the 1-100 m depth interval (Table 48). The total biomass was low and 64% of the biomass was found in the Western Aleutian Islands area. This species only occurred in seven of the 45 survey strata. The stratum-specific CPUE was by far highest in the E Western Aleutians subarea near Attu Island (Table 49).

Table 44. -- Total effort (number of trawl hauls), number of hauls with shortspine thornyhead, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	1	0.05	24	0	76	0.686
	101 - 200	55	9	0.90	477	0	972	0.664
	201 - 300	22	16	12.74	2,196	1,011	3,381	0.564
	301 - 500	9	9	28.74	9,405	3,132	15,679	0.462
	All depths	118	35	7.97	12,103	5,678	18,527	0.484
Central Aleutians	1 - 100	48	0	---	---	---	---	---
	101 - 200	47	2	0.01	6	0	16	0.834
	201 - 300	21	5	3.80	801	0	2,305	0.272
	301 - 500	12	12	10.80	4,301	3,195	5,406	0.503
	All depths	128	19	3.09	5,108	3,634	6,581	0.444
Eastern Aleutians	1 - 100	21	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	1	0.34	166	0	550	0.643
	301 - 500	12	5	1.23	698	0	1,487	0.832
	All depths	121	6	0.34	865	28	1,701	0.787
All Aleutian Areas	1 - 100	101	1	0.01	24	0	76	0.686
	101 - 200	157	11	0.27	483	0	978	0.666
	201 - 300	76	22	3.62	3,163	1,508	4,819	0.445
	301 - 500	33	26	11.13	14,404	8,004	20,804	0.485
	All depths	367	60	3.17	18,075	11,552	24,597	0.481
Southern Bering Sea	1 - 100	27	0	---	---	---	---	---
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	3	1.54	87	0	230	0.467
	301 - 500	5	3	9.26	966	0	2,943	0.404
	All depths	51	6	1.41	1,052	0	3,034	0.409

Table 45. -- 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 2010 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	7	7	45.21	7,736	1,154	14,319
Central Aleutians	301-500	SW Central Aleutians	2	2	37.26	2,941	1,640	4,242
Western Aleutians	201-300	W Western Aleutians	13	13	23.10	2,172	977	3,367
Western Aleutians	301-500	E Western Aleutians	2	2	10.69	1,669	0	6,822
Central Aleutians	201-300	Petrel Bank	3	2	9.72	745	0	2,773
Southern Bering Sea	301-500	Combined Southern Bering	5	3	9.26	966	0	3,100
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	7.81	342	0	3,794
Central Aleutians	301-500	SE Central Aleutians	2	2	7.61	543	0	2,787
Central Aleutians	301-500	N Central Aleutians	6	6	3.33	412	0	1,139
Central Aleutians	301-500	Petrel Bank	2	2	3.27	404	0	3,604
Southern Bering Sea	201-300	Combined Southern Bering	5	3	1.54	87	0	241
Central Aleutians	201-300	SW Central Aleutians	6	2	1.25	53	0	143
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	2	1.21	322	0	849
Western Aleutians	101-200	W Western Aleutians	33	7	1.08	437	0	927
Eastern Aleutians	201-300	SE Eastern Aleutians	8	1	0.81	166	0	560
Western Aleutians	101-200	E Western Aleutians	22	2	0.32	40	0	112
Western Aleutians	201-300	E Western Aleutians	9	3	0.31	24	0	63
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	0.13	34	0	141
Central Aleutians	201-300	N Central Aleutians	9	1	0.07	3	0	10
Western Aleutians	1-100	W Western Aleutians	13	1	0.07	24	0	77
Central Aleutians	101-200	SW Central Aleutians	18	1	0.05	5	0	15
Central Aleutians	101-200	SE Central Aleutians	14	1	0.01	1	0	3

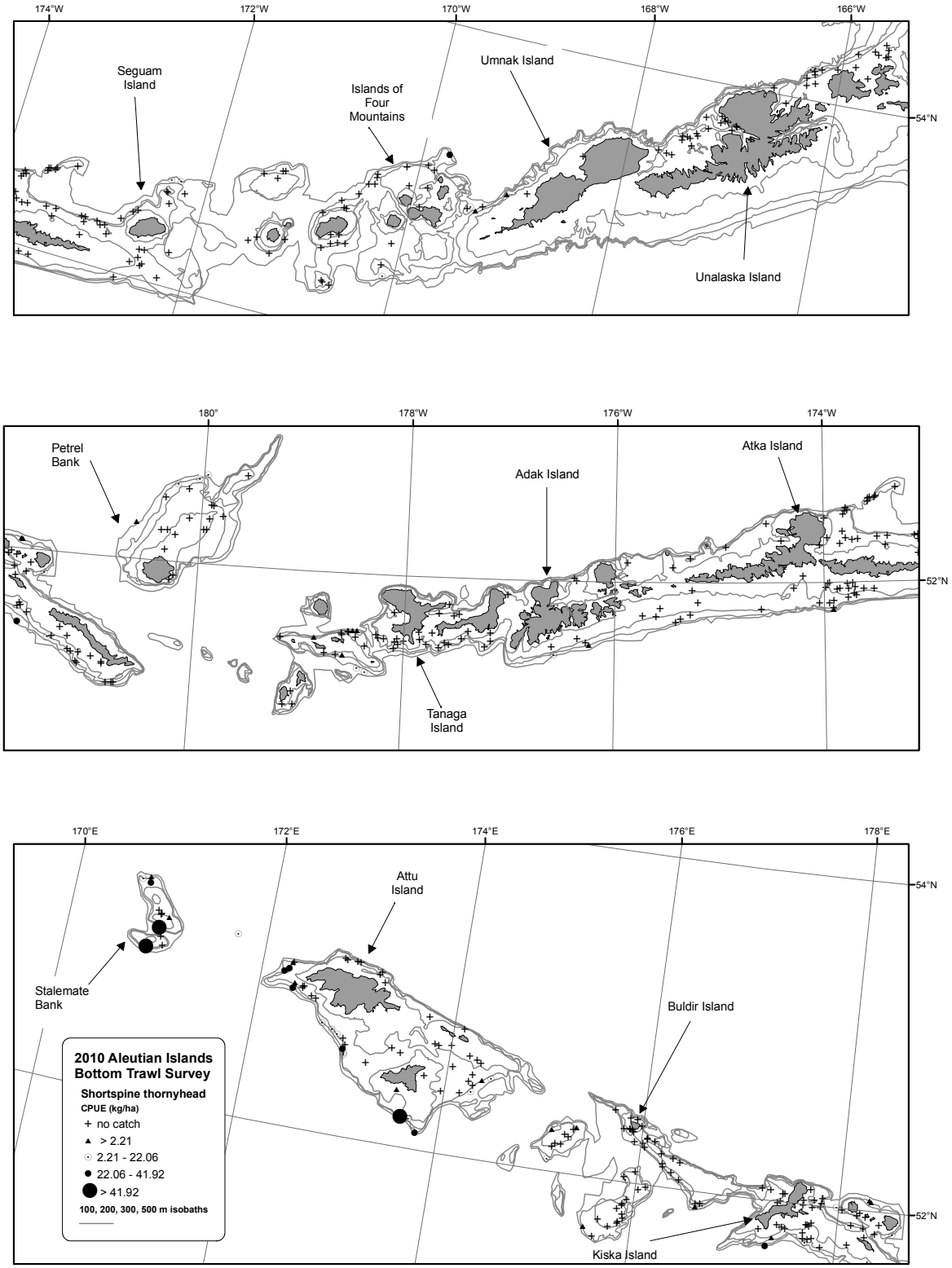

Figure 40. -- Distribution and relative abundance of shortspine thornyhead from the 2010 Aleutian Islands bottom trawl survey.

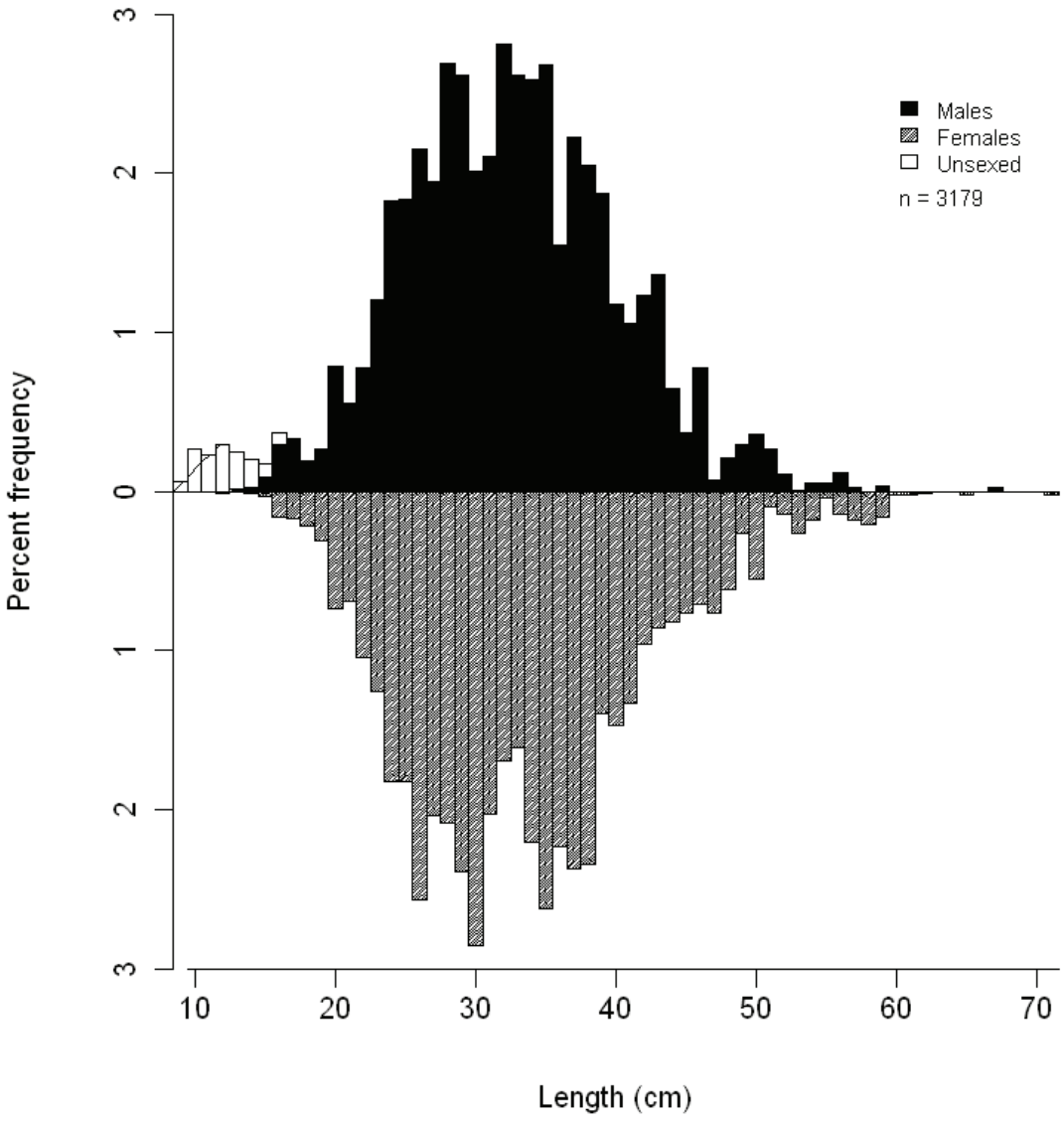

Figure 41. -- Size composition of shortspine thornyhead from the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

Table 46. -- Total effort (number of trawl hauls), number of hauls with dusky rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	0	---	---	---	---	---
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	1	0.04	7	0	22	1.890
	301 - 500	9	0	---	---	---	---	---
	All depths	118	1	<0.01	7	0	22	1.890
Central Aleutians	1 - 100	48	4	0.46	267	0	629	0.768
	101 - 200	47	5	0.13	61	0	144	1.174
	201 - 300	21	1	0.02	4	0	12	1.087
	301 - 500	12	0	---	---	---	---	---
	All depths	128	10	0.20	332	0	703	0.823
Eastern Aleutians	1 - 100	21	1	0.06	38	0	120	1.252
	101 - 200	55	5	0.09	73	5	141	1.412
	201 - 300	33	5	0.13	64	0	133	1.347
	301 - 500	12	1	0.08	46	0	174	1.581
	All depths	121	12	0.09	222	39	405	1.393
All Aleutian Areas	1 - 100	101	5	0.17	305	0	672	0.807
	101 - 200	157	10	0.08	134	30	239	1.293
	201 - 300	76	7	0.09	75	3	146	1.368
	301 - 500	33	1	0.04	46	0	174	1.581
	All depths	367	23	0.10	560	164	956	0.990
Southern Bering Sea	1 - 100	27	5	0.19	77	0	272	1.066
	101 - 200	14	3	0.23	43	0	105	1.328
	201 - 300	5	0	---	---	---	---	---
	301 - 500	5	0	---	---	---	---	---
	All depths	51	8	0.16	120	0	290	1.146

Table 47. -- 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 2010 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	SE Central Aleutians	12	2	0.97	113	0	315
Central Aleutians	1-100	SW Central Aleutians	11	1	0.88	142	0	459
Central Aleutians	101-200	SW Central Aleutians	18	4	0.52	55	0	138
Southern Bering Sea	101-200	E Southern Bering Sea	12	3	0.36	43	0	105
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.34	5	0	73
Eastern Aleutians	201-300	SE Eastern Aleutians	8	3	0.26	53	0	121
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	0.24	38	0	515
Eastern Aleutians	1-100	SE Eastern Aleutians	13	1	0.22	38	0	121
Eastern Aleutians	101-200	SE Eastern Aleutians	18	3	0.20	37	0	82
Eastern Aleutians	101-200	NE Eastern Aleutians	24	2	0.18	36	0	91
Eastern Aleutians	301-500	SE Eastern Aleutians	4	1	0.18	46	0	192
Southern Bering Sea	1-100	E Southern Bering Sea	25	4	0.16	40	0	91
Western Aleutians	201-300	E Western Aleutians	9	1	0.09	7	0	22
Central Aleutians	101-200	SE Central Aleutians	14	1	0.08	6	0	20
Central Aleutians	201-300	SW Central Aleutians	6	1	0.08	4	0	12
Central Aleutians	1-100	N Central Aleutians	16	1	0.06	12	0	37
Eastern Aleutians	201-300	NE Eastern Aleutians	19	1	0.03	6	0	18

Table 48. -- Total effort (number of trawl hauls), number of hauls with dark rockfish, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	11	0.64	313	100	527	0.927
	101 - 200	55	0	---	---	---	---	---
	201 - 300	22	0	---	---	---	---	---
	301 - 500	9	0	---	---	---	---	---
	All depths	118	11	0.21	313	100	527	0.927
Central Aleutians	1 - 100	48	3	0.27	158	0	373	0.956
	101 - 200	47	1	0.02	7	0	24	1.370
	201 - 300	21	0	---	---	---	---	---
	301 - 500	12	0	---	---	---	---	---
	All depths	128	4	0.10	165	0	381	0.969
Eastern Aleutians	1 - 100	21	1	0.01	10	0	32	1.531
	101 - 200	55	0	---	---	---	---	---
	201 - 300	33	0	---	---	---	---	---
	301 - 500	12	0	---	---	---	---	---
	All depths	121	1	<0.01	10	0	32	1.531
All Aleutian Areas	1 - 100	101	15	0.27	481	183	779	0.944
	101 - 200	157	1	<0.01	7	0	24	1.370
	201 - 300	76	0	---	---	---	---	---
	301 - 500	33	0	---	---	---	---	---
	All depths	367	16	0.09	488	190	786	0.949
Southern Bering Sea	1 - 100	27	1	<.01	2	0	5	0.380
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	0	---	---	---	---	---
	301 - 500	5	0	---	---	---	---	---
	All depths	51	1	<.01	2	0	5	0.380

Table 49. -- 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 2010 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	19	11	2.65	313	99	528
Central Aleutians	1-100	SE Central Aleutians	12	1	0.62	73	0	233
Central Aleutians	1-100	SW Central Aleutians	11	1	0.45	73	0	234
Central Aleutians	101-200	N Central Aleutians	9	1	0.07	7	0	24
Central Aleutians	1-100	N Central Aleutians	16	1	0.06	12	0	38
Eastern Aleutians	1-100	SE Eastern Aleutians	13	1	0.06	10	0	32
Southern Bering Sea	1-100	E Southern Bering Sea	25	1	0.01	2	0	5

Skates

Whiteblotched skate (*Bathyraja maculata*)

Whiteblotched skate was the most abundant species of skate caught in the Aleutian NPFMC areas and the second most abundant skate in the Southern Bering Sea area (Table 2). Whiteblotched skate CPUE was highest in the 101-200 m depth interval in all of the Aleutians NPFMC areas, but not in the Southern Bering Sea where no individuals were caught in this depth interval (Table 50). The highest stratum-specific mean CPUEs occurred in the NE Eastern Aleutian and the W Western Aleutian subareas in the 101-200 m depth interval (Table 51). Notably large catches were recorded east of Amlia Island and on Stalemate Bank (Fig. 42). The observed length range of this species was broad and the distribution was similar for males and females (Fig. 43). Appendix C lists the length-weight relationship parameters for male, female and combined sexes of whiteblotched skate.

Aleutian skate (*Bathyraja aleutica*)

Aleutian skate was distributed relatively evenly across the Western and Central Aleutian areas. The estimated biomass was approximately 8,700 t, with the highest abundance by far in the 101-200 m depth interval (Table 54). The highest stratum-specific mean CPUEs were observed in the 101-200 m depth interval of the SW Central Aleutians stratum and the 301-500 m depth interval of the Combined Southern Bering stratum (Table 55). Notably large catches were recorded near Yunaska Island, south of Amchitka Island, and on Stalemate Bank (Fig. 46). The observed length range of this species was broad, with females somewhat larger than males (Fig. 47).

Table 50. -- Total effort (number of trawl hauls), number of hauls with whiteblotched skate, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	1	4.31	2,104	0	6,648	6.622
	101 - 200	55	7	10.48	5,572	0	11,934	5.222
	201 - 300	22	3	0.71	123	0	280	9.371
	301 - 500	9	2	5.69	1,861	0	5,849	6.037
	All depths	118	13	6.36	9,659	1,331	17,988	5.662
Central Aleutians	1 - 100	48	3	0.25	147	0	321	10.668
	101 - 200	47	6	0.89	411	50	773	9.589
	201 - 300	21	2	0.46	96	0	266	5.847
	301 - 500	12	2	0.23	93	0	269	1.936
	All depths	128	13	0.45	747	300	1,193	6.177
Eastern Aleutians	1 - 100	21	1	0.12	84	0	264	8.234
	101 - 200	55	20	8.15	6,332	2,110	10,553	7.358
	201 - 300	33	15	6.26	3,070	1,274	4,865	6.771
	301 - 500	12	8	6.38	3,628	1,539	5,716	3.476
	All depths	121	44	5.2	13,112	8,093	18,131	5.539
All Aleutian Areas	1 - 100	101	5	1.33	2,334	0	6,885	6.832
	101 - 200	157	33	6.96	12,315	4,726	19,904	6.250
	201 - 300	76	20	3.77	3,289	1,479	5,099	6.810
	301 - 500	33	12	4.31	5,581	1,494	9,667	3.988
	All depths	367	70	4.13	23,518	13,944	33,093	5.607
Southern Bering Sea	1 - 100	27	1	0.41	164	0	872	4.489
	101 - 200	14	0	---	---	---	---	---
	201 - 300	5	2	1.09	61	0	158	6.060
	301 - 500	5	3	3.90	407	0	897	2.719
	All depths	51	6	0.85	633	0	1,443	3.221

Table 51. -- 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 2010 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	24	10	20.53	4,131	662	7,600
Western Aleutians	101-200	W Western Aleutians	33	6	13.65	5,549	0	11,911
Eastern Aleutians	101-200	SE Eastern Aleutians	18	10	11.58	2,200	0	4,829
Western Aleutians	301-500	W Western Aleutians	7	1	9.80	1,677	0	5,779
Eastern Aleutians	201-300	NE Eastern Aleutians	19	10	9.49	1,867	446	3,289
Eastern Aleutians	301-500	SE Eastern Aleutians	4	3	7.69	1,980	0	4,191
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	5	6.17	1,648	246	3,049
Eastern Aleutians	201-300	SE Eastern Aleutians	8	5	5.84	1,202	0	2,451
Western Aleutians	1-100	W Western Aleutians	13	1	5.70	2,104	0	6,688
Southern Bering Sea	301-500	Combined Southern Bering	5	3	3.90	407	0	936
Central Aleutians	101-200	SE Central Aleutians	14	3	2.84	213	0	498
Central Aleutians	201-300	N Central Aleutians	9	2	2.19	96	0	269
Central Aleutians	101-200	N Central Aleutians	9	2	1.37	146	0	377
Western Aleutians	301-500	E Western Aleutians	2	1	1.18	184	0	2,523
Southern Bering Sea	201-300	Combined Southern Bering	5	2	1.09	61	0	166
Southern Bering Sea	1-100	W Southern Bering Sea	2	1	1.04	164	0	2,254
Central Aleutians	1-100	Petrel Bank	9	2	0.93	90	0	233
Western Aleutians	201-300	E Western Aleutians	9	2	0.93	73	0	202
Central Aleutians	301-500	N Central Aleutians	6	1	0.60	74	0	266
Western Aleutians	201-300	W Western Aleutians	13	1	0.54	51	0	161
Central Aleutians	101-200	SW Central Aleutians	18	1	0.49	52	0	162
Eastern Aleutians	1-100	SE Eastern Aleutians	13	1	0.48	84	0	265
Central Aleutians	1-100	N Central Aleutians	16	1	0.27	57	0	178
Western Aleutians	101-200	E Western Aleutians	22	1	0.18	23	0	70
Central Aleutians	301-500	Petrel Bank	2	1	0.15	18	0	248

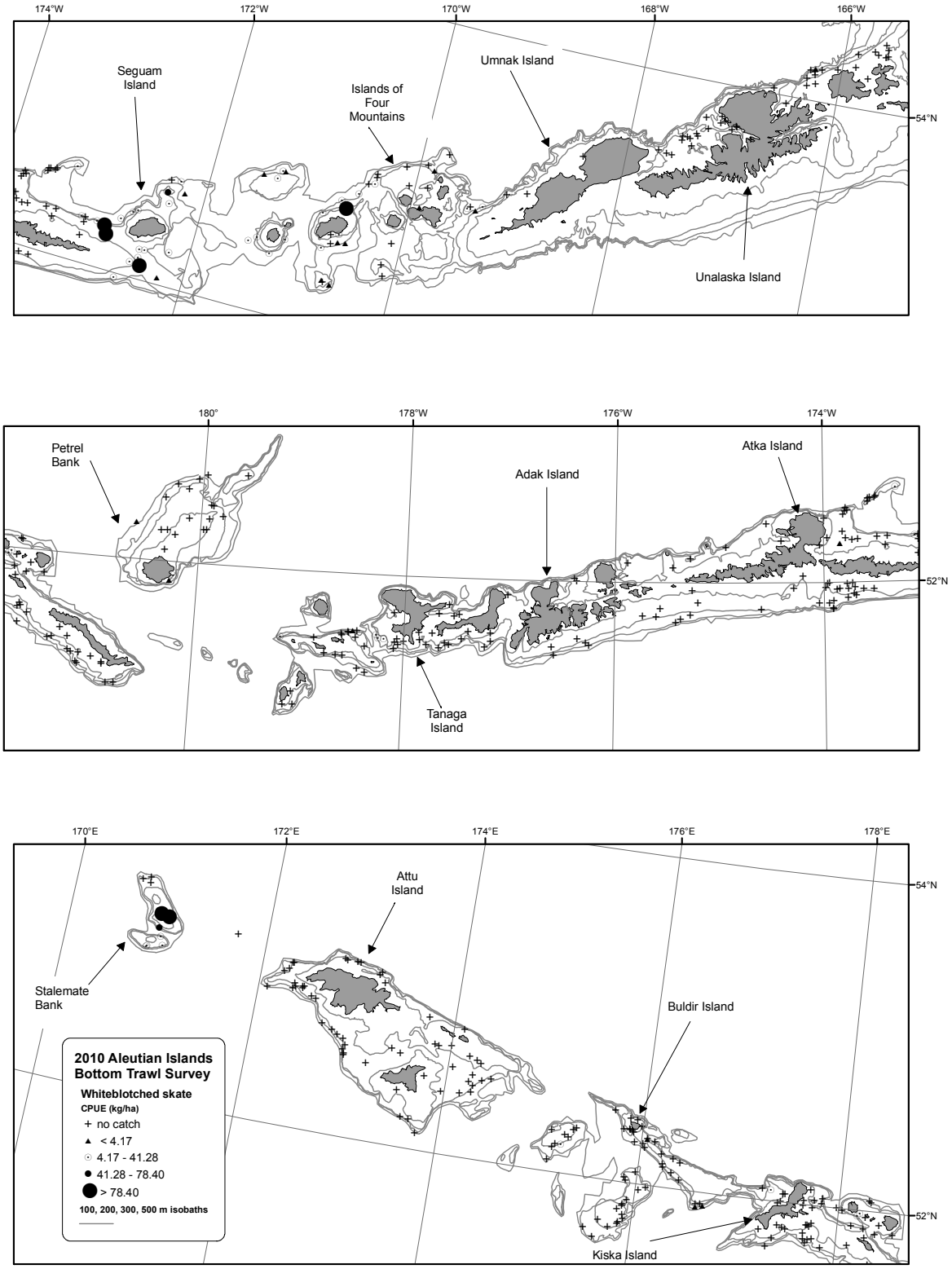

Figure 42. -- Distribution and relative abundance of whiteblotched skate from the 2010 Aleutian Islands bottom trawl survey.

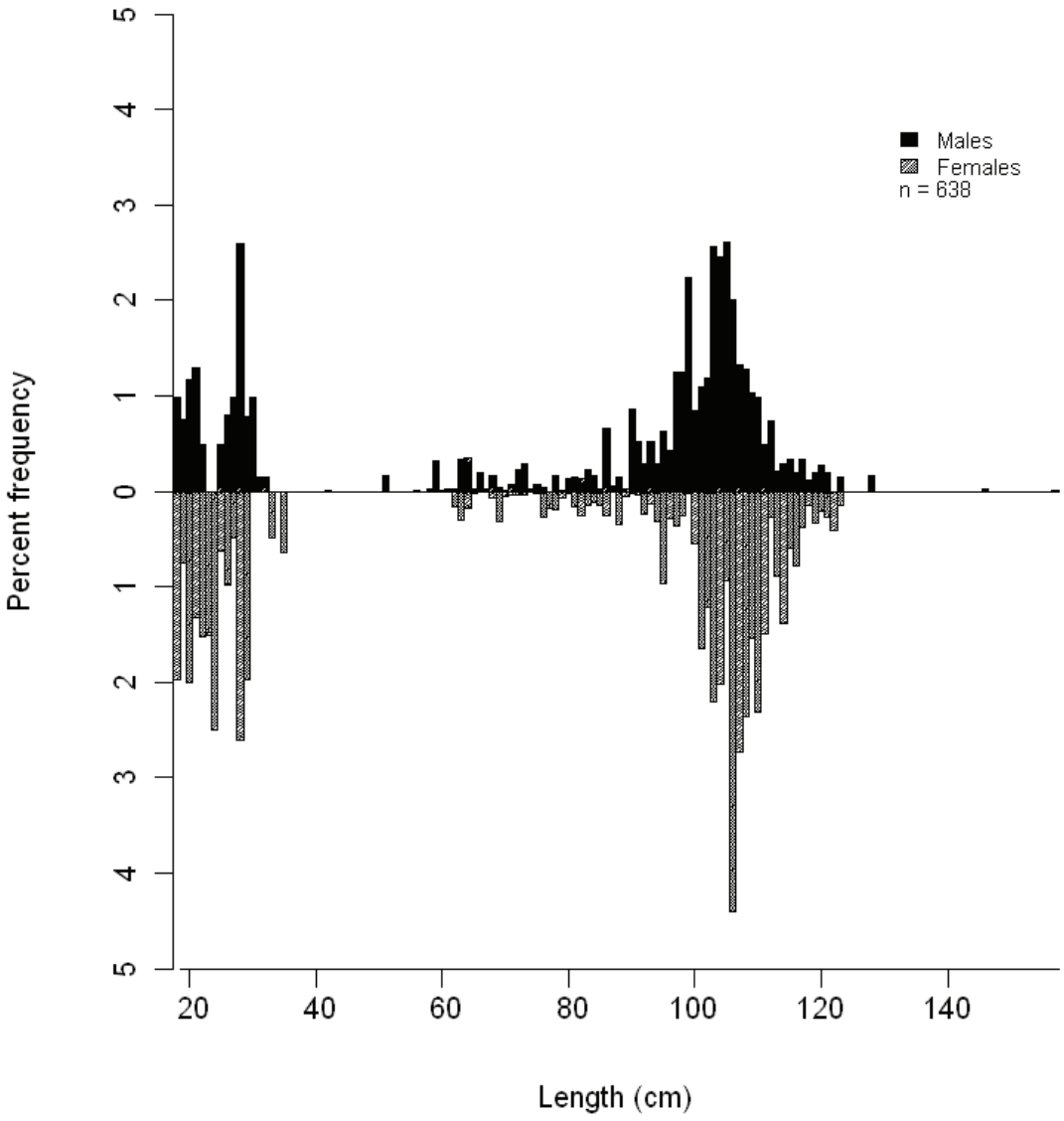

Figure 43. -- Size composition of whiteblotched skate from the 2010 Aleutian Islands bottom trawl survey.

Table 54. -- Total effort (number of trawl hauls), number of hauls with Aleutian skate, mean CPUE, biomass estimates with confidence intervals, and mean weight based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of 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	32	2	0.45	220	0	605	15.475
	101 - 200	55	9	3.53	1,879	0	3,868	14.329
	201 - 300	22	4	1.04	180	0	419	9.229
	301 - 500	9	1	0.13	43	0	144	4.261
	All depths	118	16	1.53	2,321	285	4,356	13.277
Central Aleutians	1 - 100	48	2	0.26	154	0	395	12.772
	101 - 200	47	11	3.99	1,838	0	3,785	14.132
	201 - 300	21	5	0.93	197	0	418	7.279
	301 - 500	12	4	0.94	374	0	1,333	3.263
	All depths	128	22	1.55	2,563	549	4,576	9.032
Eastern Aleutians	1 - 100	21	1	0.09	61	0	192	5.563
	101 - 200	55	8	2.20	1,711	0	3,559	11.276
	201 - 300	33	3	0.56	272	0	678	9.411
	301 - 500	12	0	---	---	---	---	---
	All depths	121	13	0.81	2,045	176	3,913	9.471
All Aleutian Areas	1 - 100	101	5	0.25	435	0	900	11.682
	101 - 200	157	28	3.07	5,428	2,176	8,680	13.145
	201 - 300	76	12	0.74	649	146	1,151	8.600
	301 - 500	33	6	0.32	417	0	1,393	2.800
	All depths	367	51	1.22	6,928	3,583	10,272	10.273
Southern Bering Sea	1 - 100	27	2	0.85	344	0	837	15.168
	101 - 200	14	4	3.48	643	0	1,434	12.041
	201 - 300	5	1	1.51	85	0	304	17.670
	301 - 500	5	2	6.92	721	0	2,103	82.549
	All depths	51	9	2.40	1,794	264	3,323	20.008

Table 55. -- 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 2010 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	SW Central Aleutians	18	3	13.08	1,377	0	3,320
Southern Bering Sea	301-500	Combined Southern Bering	5	2	6.92	721	0	2,213
Central Aleutians	101-200	SE Central Aleutians	14	7	5.16	388	65	711
Eastern Aleutians	101-200	NE Eastern Aleutians	24	3	4.95	996	0	2,711
Southern Bering Sea	101-200	E Southern Bering	12	3	3.97	468	0	1,116
Western Aleutians	101-200	W Western Aleutians	33	5	3.94	1,603	0	3,569
Central Aleutians	301-500	SE Central Aleutians	2	1	3.09	221	0	3,024
Southern Bering Sea	101-200	W Southern Bering	2	1	2.62	175	0	2,403
Central Aleutians	201-300	SW Central Aleutians	6	3	2.27	97	0	252
Eastern Aleutians	101-200	SW Eastern Aleutians	9	3	2.25	508	0	1,277
Western Aleutians	101-200	E Western Aleutians	22	4	2.21	276	0	581
Western Aleutians	201-300	E Western Aleutians	9	3	2.11	165	0	406
Central Aleutians	301-500	SW Central Aleutians	2	2	1.58	125	0	281
Southern Bering Sea	201-300	Combined Southern Bering	5	1	1.51	85	0	322
Southern Bering Sea	1-100	E Southern Bering	25	2	1.41	344	0	838
Central Aleutians	201-300	SE Central Aleutians	3	1	1.21	58	0	307
Central Aleutians	201-300	N Central Aleutians	9	1	0.96	42	0	139
Eastern Aleutians	201-300	SE Eastern Aleutians	8	1	0.78	161	0	542
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.74	53	0	222
Eastern Aleutians	101-200	NW Eastern Aleutians	4	1	0.65	104	0	436
Central Aleutians	1-100	SW Central Aleutians	11	1	0.62	101	0	326
Eastern Aleutians	101-200	SE Eastern Aleutians	18	1	0.54	103	0	319
Western Aleutians	1-100	W Western Aleutians	13	1	0.47	172	0	547
Central Aleutians	101-200	Petrel Bank	6	1	0.42	73	0	262
Western Aleutians	1-100	E Western Aleutians	19	1	0.40	48	0	148
Eastern Aleutians	1-100	SE Eastern Aleutians	13	1	0.35	61	0	194
Eastern Aleutians	201-300	NE Eastern Aleutians	19	1	0.30	58	0	180
Central Aleutians	1-100	N Central Aleutians	16	1	0.25	53	0	166
Western Aleutians	301-500	W Western Aleutians	7	1	0.25	43	0	147
Central Aleutians	301-500	Petrel Bank	2	1	0.23	29	0	394
Western Aleutians	201-300	W Western Aleutians	13	1	0.16	15	0	46
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	1	0.00	0	0	1

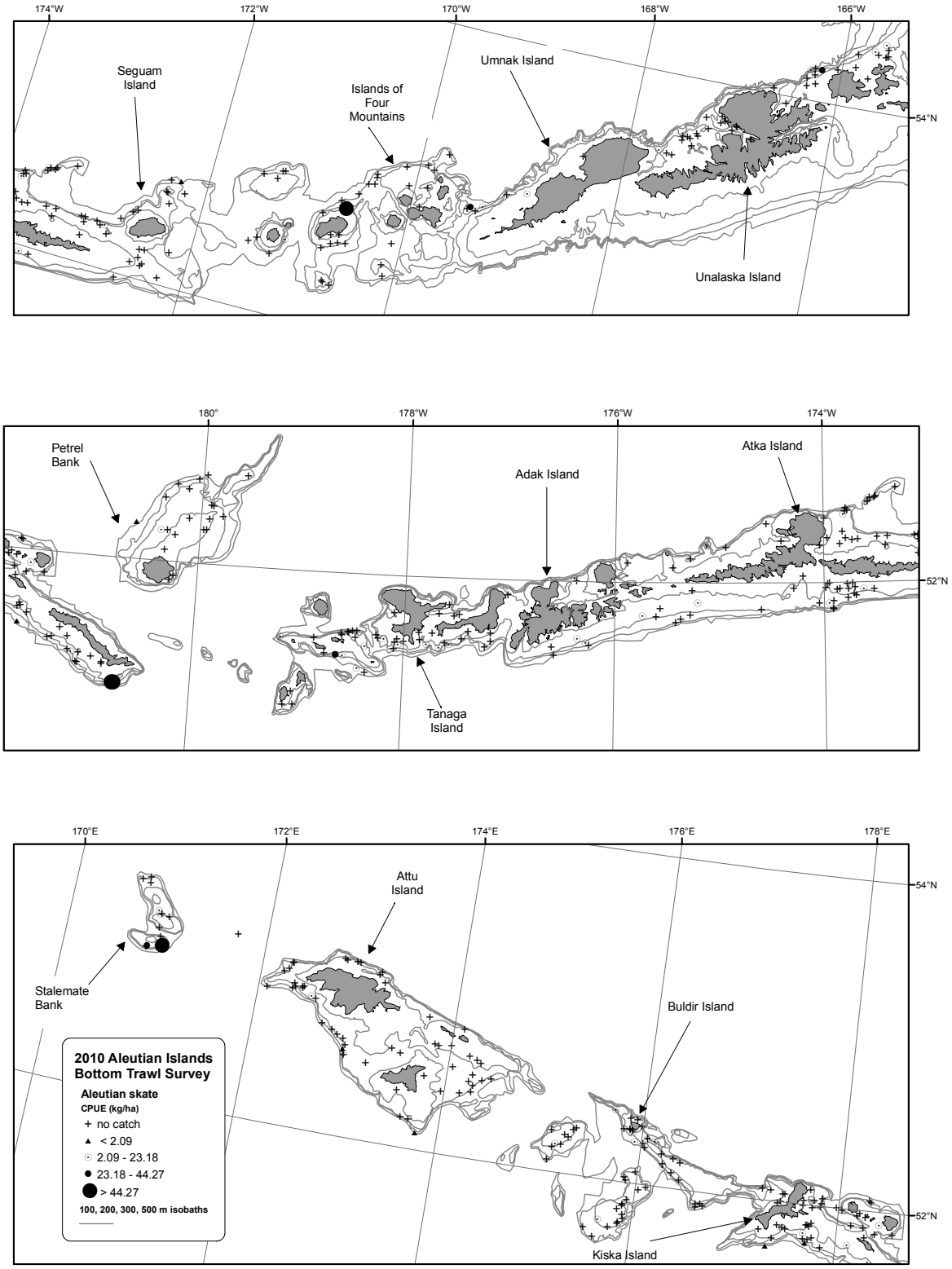

Figure 46. -- Distribution and relative abundance of Aleutian skate from the 2010 Aleutian Islands bottom trawl survey.

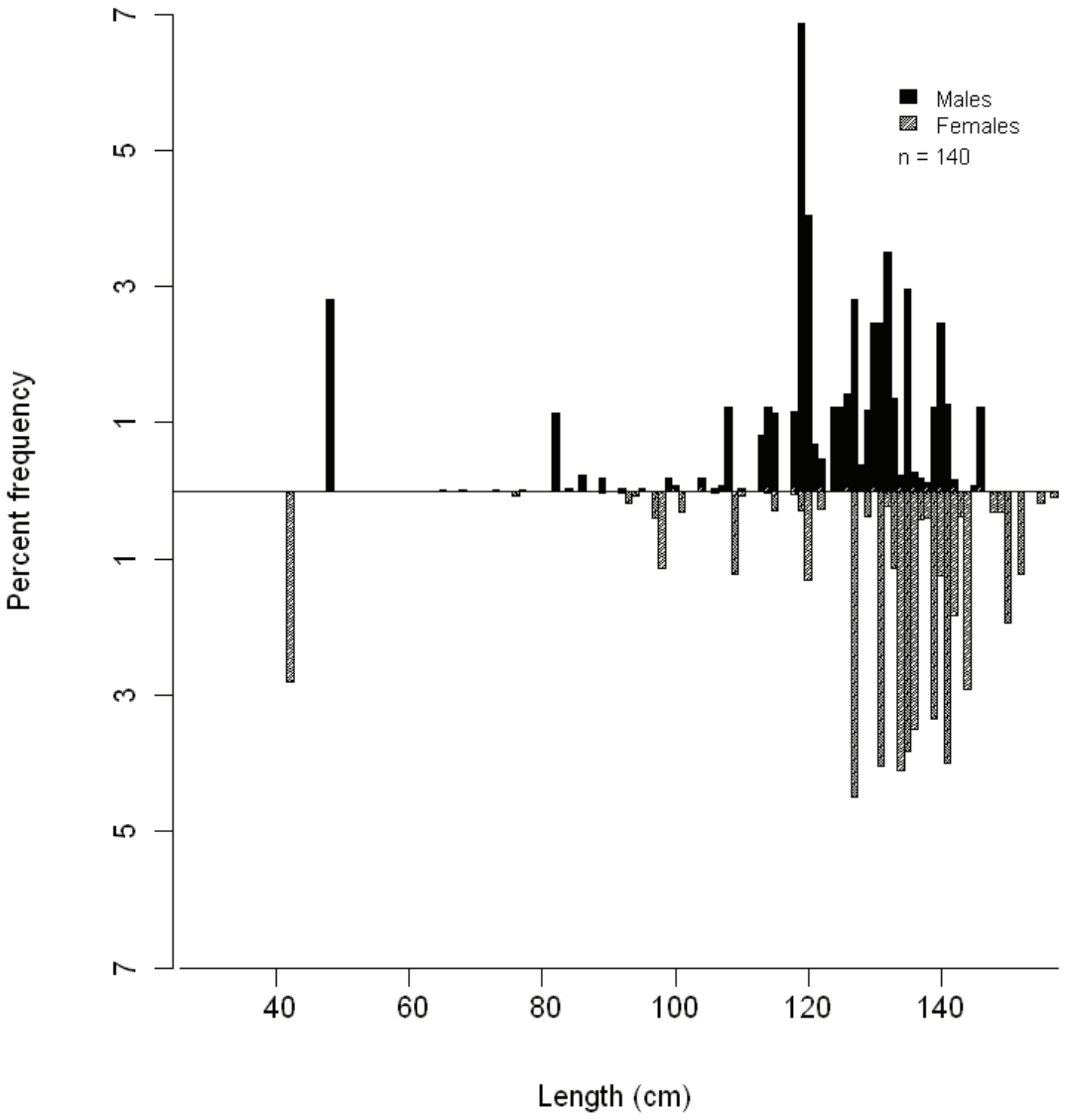

Figure 47. -- Size composition of Aleutian skate from the 2010 Aleutian Islands bottom trawl survey.

Miscellaneous skates

Miscellaneous skate species captured during the Aleutian Islands bottom trawl survey in 2010 included mud skate (*Bathyraja taranetzi*), leopard skate (*Bathyraja* sp. cf. *parmifera,* Orr et al., In press), deepsea skate (*Bathyraja abyssicola*), big skate (*Raja binoculata*), Bering skate (*Bathyraja interrupta*), commander skate (*Bathyraja lindbergi*), and butterfly skate (*Bathyraja mariposa*). The largest biomasses of the major species (mud skate, big skate, and Bering skate) were in the shallowest depth interval (1-100 m) in the Southern Bering Sea (big skate) and at the deepest depth interval (301-500 m) in the Central and Eastern Aleutians (mud and Bering skate, Table 56). The highest stratum-specific mean CPUEs were recorded in the 1-100 m depth interval of the W Southern Bering Sea stratum and in the 301-500 m depth interval of the SW Eastern Aleutians stratum (Fig. 57).

Table 56. -- Total effort (number of trawl hauls), number of hauls with miscellaneous skates (mud skate, big skate, and Bering skate), mean CPUE, and biomass estimates with confidence intervals based on the 2010 Aleutian Islands bottom trawl survey by NPFMC regulatory area and depth interval.

NPFMC area	Depth (m)	Number of hauls	Hauls with catch	Mean CPUE (kg/ha)	Estimated biomass (t)	Lower 95% biomass CI (t)	Upper 95% biomass CI (t)
Western Aleutians	1 - 100	32	3	0.03	13	---	30
	101 - 200	55	3	0.01	4	---	11
	201 - 300	22	3	0.07	13	---	29
	301 - 500	9	1	0.03	9	---	29
	All depths	118	10	0.03	38	8	69
Central Aleutians	1 - 100	48	5	0.07	43	---	87
	101 - 200	47	10	0.13	62	---	124
	201 - 300	21	8	0.49	104	---	235
	301 - 500	12	11	1.01	404	49	759
	All depths	128	34	0.37	613	244	983
Eastern Aleutians	1 - 100	21	0	---	---	---	---
	101 - 200	55	8	0.19	148	---	394
	201 - 300	33	6	0.30	148	---	338
	301 - 500	12	10	1.06	600	---	1,346
	All depths	121	24	0.36	896	29	1,860
All Aleutian Areas	1 - 100	101	8	0.03	56	10	102
	101 - 200	157	21	0.12	214	43	482
	201 - 300	76	17	0.30	265	45	485
	301 - 500	33	22	0.78	1,013	187	1,839
	All depths	367	68	0.27	1547	630	2,562
Southern Bering Sea	1 - 100	27	4	1.49	602	0	3,002
	101 - 200	14	3	0.38	72	---	185
	201 - 300	5	1	0.26	15	---	52
	301 - 500	5	1	0.04	5	---	16
	All depths	51	9	0.93	692	---	3,142

Table 57. -- Sampling effort, mean CPUE, and estimated biomass with 95% confidence intervals (CI) of miscellaneous skates (mud skate, big skate, and Bering skate) by NPFMC regulatory area and survey subarea, ranked by descending mean CPUE for the 2010 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 Sea	2	1	3.48	553	0	7,573
Eastern Aleutians	301-500	SW Eastern Aleutians	2	2	2.01	88	0	709
Central Aleutians	301-500	SE Central Aleutians	2	1	1.58	113	0	1,543
Central Aleutians	301-500	N Central Aleutians	6	6	1.31	162	7	317
Central Aleutians	201-300	N Central Aleutians	9	5	1.27	56	0	142
Eastern Aleutians	301-500	SE Eastern Aleutians	4	3	1.26	325	0	1,161
Eastern Aleutians	301-500	Combined Eastern Aleutian	6	5	0.70	188	0	476
Central Aleutians	301-500	Petrel Bank	2	2	0.65	80	0	734
Central Aleutians	301-500	SW Central Aleutians	2	2	0.63	50	0	152
Southern Bering Sea	101-200	E Southern Bering Sea	12	3	0.60	71	0	186
Eastern Aleutians	201-300	SE Eastern Aleutians	8	2	0.54	112	0	303
Eastern Aleutians	201-300	NW Eastern Aleutians	2	1	0.43	7	0	91
Eastern Aleutians	101-200	SE Eastern Aleutians	18	1	0.41	78	0	241
Central Aleutians	201-300	Petrel Bank	3	1	0.41	31	0	165
Central Aleutians	101-200	SE Central Aleutians	14	5	0.37	28	2	54
Central Aleutians	201-300	SE Central Aleutians	3	1	0.29	14	0	74
Central Aleutians	1-100	Petrel Bank	9	2	0.29	28	0	70
Southern Bering Sea	201-300	Combined Southern Bering	5	1	0.26	15	0	55
Central Aleutians	101-200	N Central Aleutians	9	1	0.23	25	0	82
Southern Bering Sea	1-100	E Southern Bering Sea	25	2	0.20	49	0	126
Eastern Aleutians	101-200	NE Eastern Aleutians	24	4	0.18	36	0	80
Eastern Aleutians	101-200	SW Eastern Aleutians	9	1	0.15	34	0	111
Western Aleutians	201-300	W Western Aleutians	13	3	0.14	13	0	29
Eastern Aleutians	201-300	SW Eastern Aleutians	4	1	0.13	10	0	40
Western Aleutians	1-100	E Western Aleutians	19	3	0.11	13	0	30
Central Aleutians	1-100	SE Central Aleutians	12	2	0.10	12	0	30
Eastern Aleutians	201-300	NE Eastern Aleutians	19	2	0.10	19	0	47
Central Aleutians	201-300	SW Central Aleutians	6	1	0.08	3	0	12
Central Aleutians	101-200	SW Central Aleutians	18	3	0.07	7	0	15
Western Aleutians	301-500	W Western Aleutians	7	1	0.05	9	0	29
Southern Bering Sea	301-500	Combined Southern Bering	5	1	0.04	5	0	17
Western Aleutians	101-200	E Western Aleutians	22	3	0.03	4	0	11
Central Aleutians	101-200	Petrel Bank	6	1	0.02	3	0	10
Central Aleutians	1-100	N Central Aleutians	16	1	0.02	4	0	11

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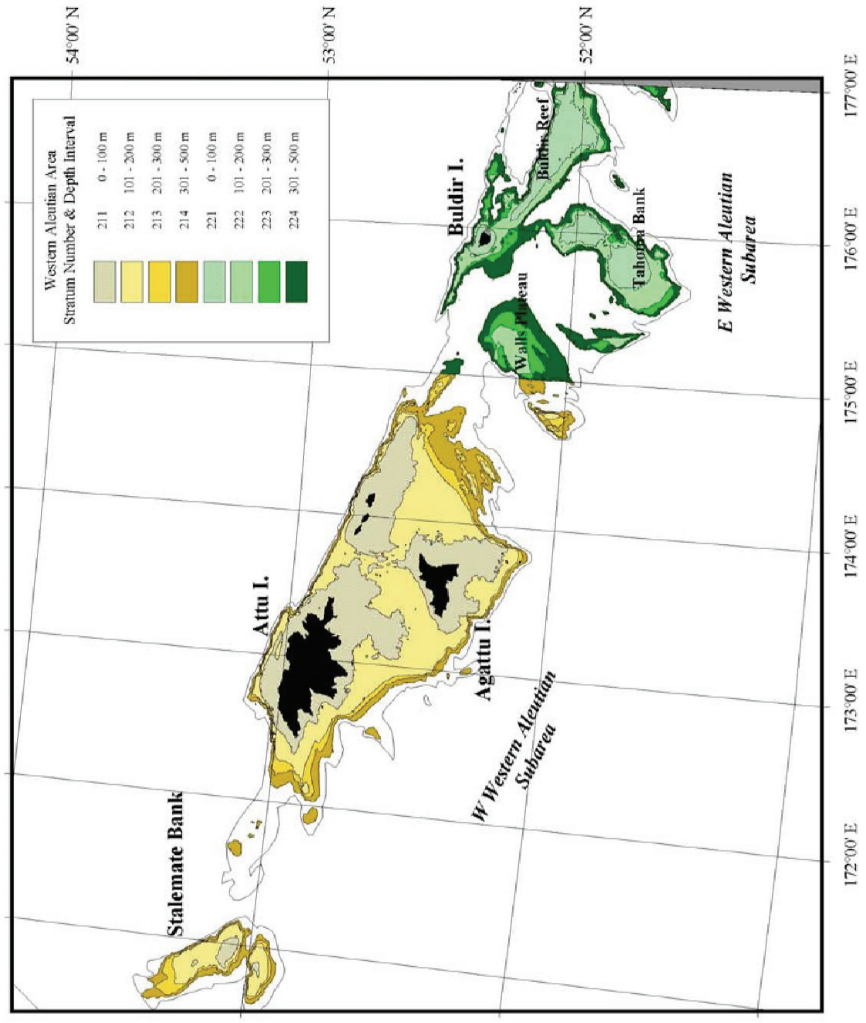
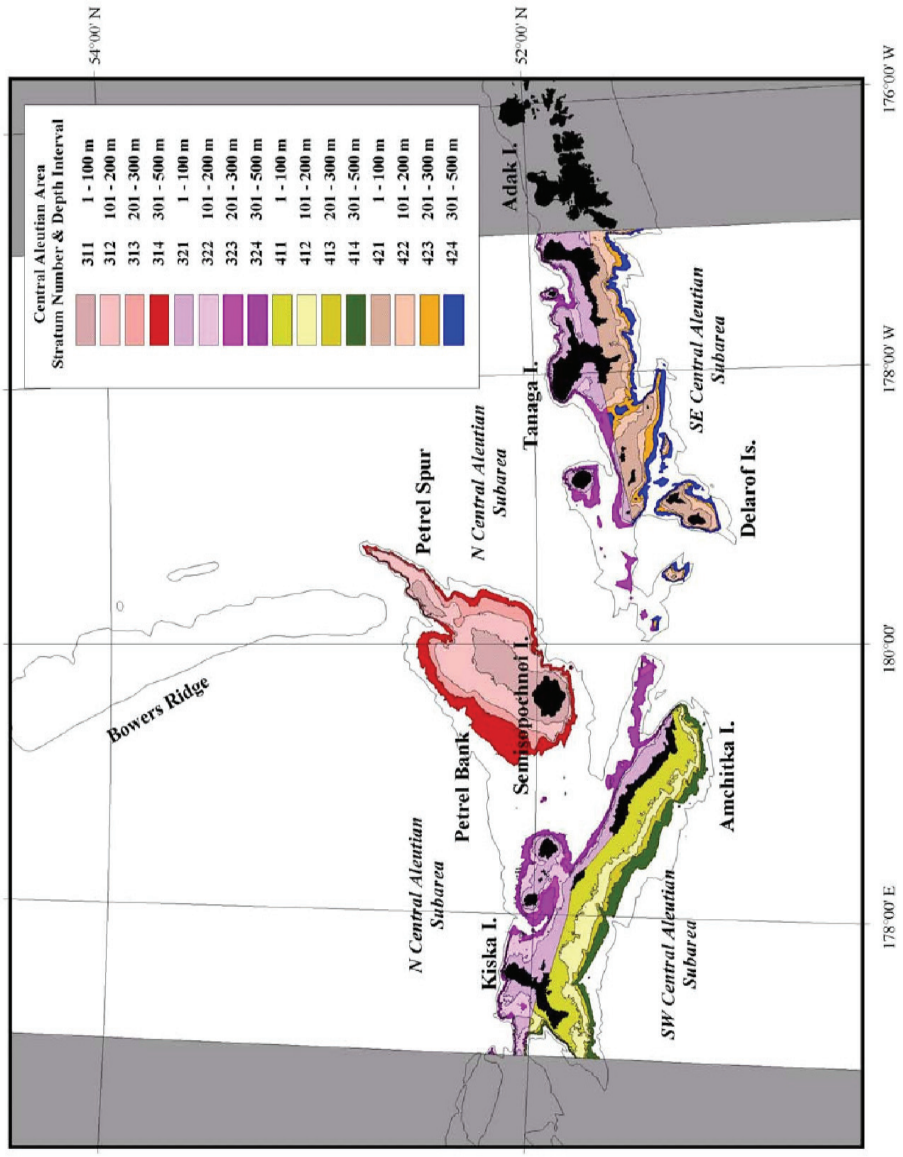
APPENDIX A

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

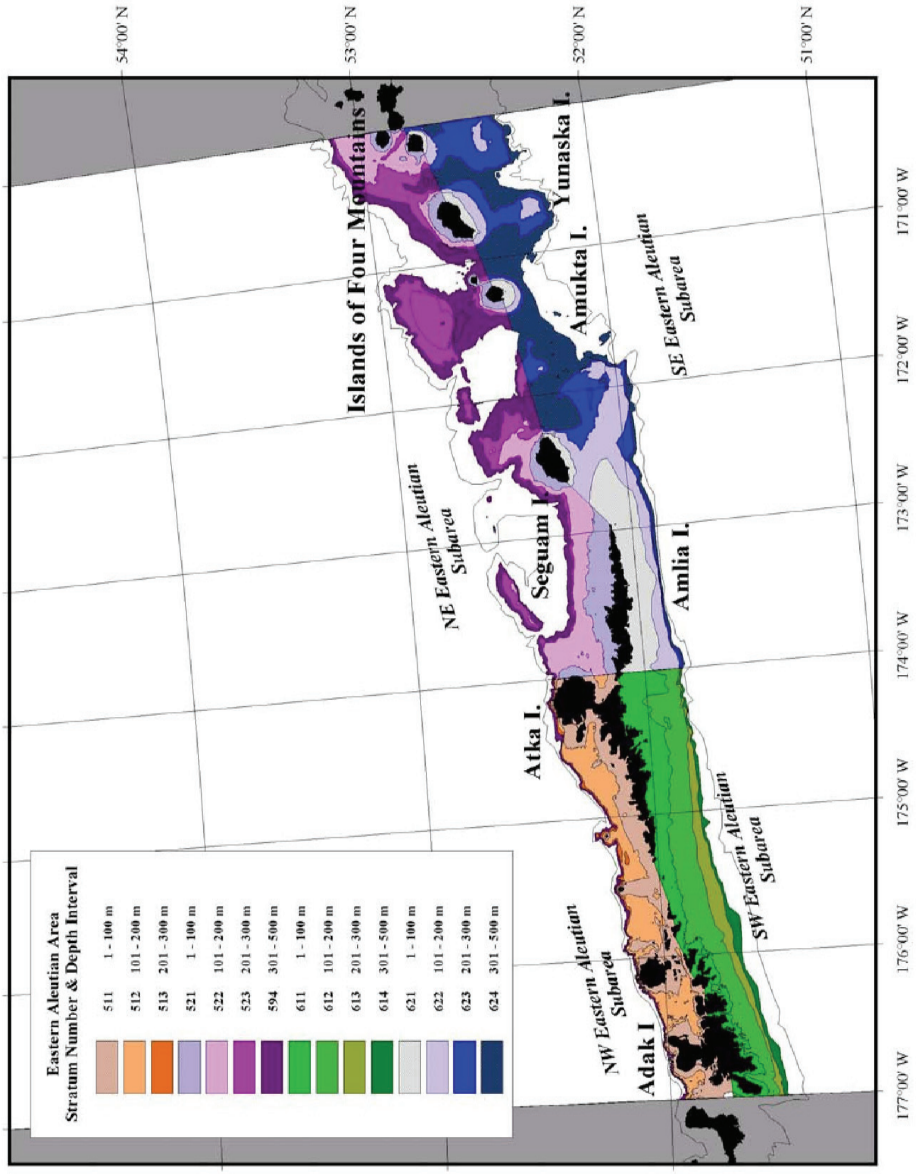
NPFMC Area	Subarea Description	Stratum Code	Depth Interval (m)	Area (km^2)
Western Aleutians	W Western Aleutians	211	1-100	3,693
	W Western Aleutians	212	101-200	4,065
	W Western Aleutians	213	201-300	940
	W Western Aleutians	214	301-500	1,711
	E Western Aleutians	221	1-100	1,183
	E Western Aleutians	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



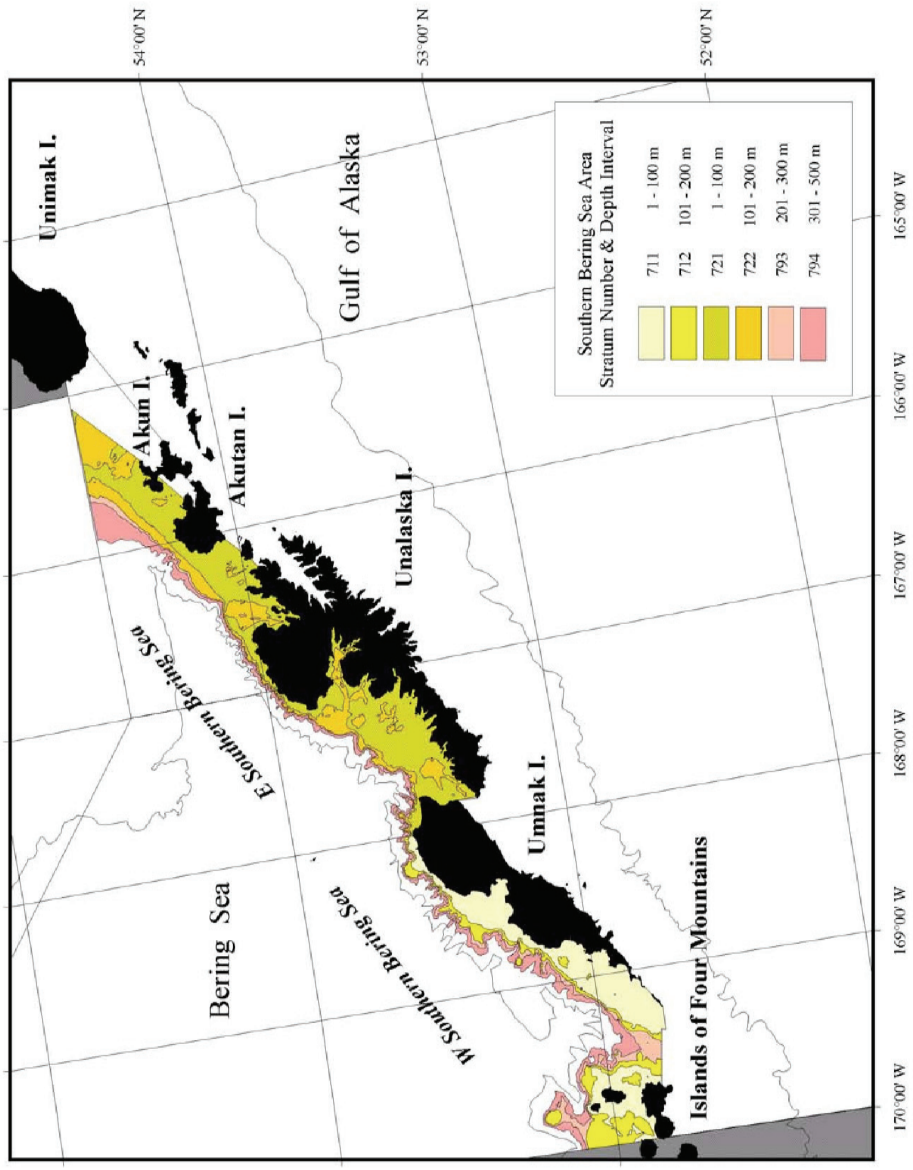
Appendix Figure A-1. -- Strata sampled during the 2010 Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-2. -- Strata sampled during the 2010 Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-3. -- Strata sampled during the 2010 Aleutian Islands groundfish trawl survey by NPFMC management area and sampling subarea.



Appendix Figure A-4. -- Strata sampled during the 2010 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 2010 Aleutian Islands bottom trawl survey.

Family	Species name	Common name
Petromyzontidae	*Lampetra tridentata*	Pacific lamprey
Squalidae	*Somniosus pacificus*	Pacific sleeper shark
Rajidae	*Bathyraja aleutica*	Aleutian skate
	Bathyraja interrupta	Bering skate
	Bathyraja lindbergi	commander skate
	Bathyraja maculata	whiteblotched skate
	Bathyraja mariposa	butterfly skate
	Bathyraja parmifera	Alaska skate
	Bathyraja sp. cf. *parmifera*	leopard skate
	Bathyraja taranetzi	mud skate
	Bathyraja trachura	roughtail skate
	Raja binoculata	big skate
Nemichthyidae	Nemichthyidae unident.	snipe eel unident.
Bathylagidae	*Bathylagus pacificus*	Pacific blacksmelt
	Leuroglossus schmidti	northern smoothtongue
Osmeridae	Osmeridae unident.	smelt unident.
	Mallotus villosus	capelin
	Thaleichthys pacificus	eulachon
Salmonidae	*Oncorhynchus keta*	chum salmon
	Oncorhynchus tshawytscha	chinook salmon
Melanostomiidae	*Tactostoma macropus*	longfin dragonfish
Chauliodontidae	*Chauliodus macouni*	Pacific viperfish
Notosudidae	*Scopelosaurus* sp.	
Paralepidae	*Magnisudis atlantica*	duckbill barracudina
Myctophidae	Myctophidae unident.	lanternfish unident.
	Diaphus theta	California headlightfish
	Lampanyctus sp.	
	Lampanyctus jordani	brokenline lampfish
	Nannobrachium sp.	
	Nannobrachium regale	pinpoint lampfish
	Protomyctophum sp.	
	Protomyctophum thompsoni	northern flashlightfish
	Stenobrachius sp.	
	Stenobrachius leucopsarus	northern lampfish
	Stenobrachius nannochir	garnet lampfish
	Tarletonbeania crenularis	blue lanternfish
Macrouridae	*Albatrossia pectoralis*	giant grenadier
	Coryphaenoides cinereus	popeye grenadier
Gadidae	*Gadus macrocephalus*	Pacific cod
	Theragra chalcogramma	walleye pollock
Melamphaidae	Melamphaidae unident.	bigscale unident.
	Melamphaes lugubris	highsnout bigscale
	Poromitra curilensis	crested bigscale
Scorpaenidae	*Sebastes* sp.	rockfish unident.

Family	Species name	Common name
	Sebastes aleutianus	rougheye rockfish
	Sebastes alutus	Pacific ocean perch
	Sebastes babcocki	redbanded rockfish
	Sebastes borealis	shortraker rockfish
	Sebastes ciliatus	dark rockfish
	Sebastes melanops	black rockfish
	Sebastes melanostictus	blackspotted rockfish
	Sebastes polyspinis	northern rockfish
	Sebastes variabilis	dusky rockfish
	Sebastes variegatus	harlequin rockfish
	Sebastes zacentrus	sharpchin rockfish
	Sebastolobus alascanus	shortspine thornyhead
	Sebastolobus macrochir	broadfin thornyhead
Anoplopomatidae	*Anoplopoma fimbria*	sablefish
Hexagrammidae	*Hexagrammos decagrammus*	kelp greenling
	Hexagrammos lagocephalus	rock greenling
	Pleurogrammus monopterygius	Atka mackerel
Cottidae	*Archistes biseriatus*	scaled sculpin
	Bolinia euryptera	broadfin sculpin
	Dasycottus setiger	spinyhead sculpin
	Enophrys lucasi	leister sculpin
	Gymnocanthus galeatus	armorhead sculpin
	Gymnocanthus pistilliger	threaded sculpin
	Hemilepidotus hemilepidotus	red Irish lord
	Hemilepidotus jordani	yellow Irish lord
	Hemilepidotus zapus	longfin Irish lord
	Hemitripterus bolini	bigmouth sculpin
	Icelinus sp.	
	Icelinus borealis	northern sculpin
	Icelus canaliculatus	blacknose sculpin
	Icelus euryops	wide-eye sculpin
	Icelus spiniger	thorny sculpin
	Icelus uncinalis	uncinate sculpin
	Malacocottus aleuticus	whitetail sculpin
	Malacocottus zonurus	darkfin sculpin
	Myoxocephalus polyacanthocephalus	great sculpin
	Nautichthys oculofasciatus	sailfin sculpin
	Rastrinus scutiger	roughskin sculpin
	Thyriscus anoplus	sponge sculpin
	Triglops sp.	
	Triglops forficata	scissortail sculpin
	Triglops macellus	roughspine sculpin
	Triglops metopias	crescent-tail sculpin
	Triglops pingeli	ribbed sculpin
	Triglops scepticus	spectacled sculpin
	Triglops xenostethus	scalybreasted sculpin
Agonidae	*Bathyagonus alascanus*	gray starsnout
	Bathyagonus nigripinnis	blackfin poacher
	Hypsagonus quadricornis	fourhorn poacher

Family	Species name	Common name
	Leptagonus frenatus	sawback poacher
	Leptagonus leptorhynchus	longnose poacher
	Podothecus accipenserinus	sturgeon poacher
Cyclopteridae	Cyclopteridae unident.	lumpsucker unident.
	Aptocyclus ventricosus	smooth lumpsucker
	Eumicrotremus sp.	spiny lumpsuckers
	Eumicrotremus orbis	Pacific spiny lumpsucker
	Eumicrotremus phrynoides	toad lumpsucker
	Lethotremus muticus	docked snailfish
Liparidae	Liparidae unident.	snailfish unident.
	Allocareproctus sp.	
	Allocareproctus jordani	cherry snailfish
	Allocareproctus kallaion	combed snailfish
	Allocareproctus tanix	peach snailfish
	Allocareproctus unangas	goldeneye snailfish
	Careproctus sp.	
	Careproctus candidus	bigeye snailfish
	Careproctus ectenes	shovelhead snailfish
	Careproctus furcellus	emarginate snailfish
	Careproctus melanurus	blacktail snailfish
	Careproctus rastrinus	salmon snailfish
	Crystallichthys cyclospilus	blotched snailfish
	Elassodiscus tremebundus	blacklip snailfish
	Liparis sp.	
	Liparis ochotensis	Okhotsk snailfish
	Lipariscus nanus	pygmy snailfish
	Lopholiparis flerxi	hardheaded snailfish
	Paraliparis sp.	
	Paraliparis cephalus	swellhead snailfish
Bathymasteridae	*Bathymaster caeruleofasciatus*	Alaskan ronquil
	Bathymaster signatus	searcher
Zoarcidae	*Bothrocara brunneum*	twoline eelpout
	Lycodes sp.	
	Lycodes akuugun	bicolor eelpout
	Lycodes beringi	Bering eelpout
	Lycodes brevipes	shortfin eelpout
	Lycodes concolor	ebony eelpout
	Lycodes palearis	wattled eelpout
	Puzanovia rubra	coral eelpout
Stichaeidae	Stichaeidae unident.	prickleback unident.
	Bryozoichthys sp.	
	Bryozoichthys lysimus	nutcracker prickleback
	Bryozoichthys marjorius	pearly prickleback
	Chirolophis decoratus	decorated warbonnet
	Lumpenus sagitta	snake prickleback
Zaproridae	*Zaprora silenus*	prowfish
Trichodontidae	*Trichodon trichodon*	Pacific sandfish
Ammodytidae	*Ammodytes hexapterus*	Pacific sand lance
Pleuronectidae	*Atheresthes* sp.	

Family	Species name	Common name
	Atheresthes evermanni	Kamchatka flounder
	Atheresthes stomias	arrowtooth flounder
	Glyptocephalus zachirus	rex sole
	Hippoglossoides elassodon	flathead sole
	Hippoglossus stenolepis	Pacific halibut
	Isopsetta isolepis	butter sole
	Lepidopsetta bilineata	southern rock sole
	Lepidopsetta polyxystra	northern rock sole
	Limanda aspera	yellowfin sole
	Microstomus pacificus	Dover sole
	Parophrys vetulus	English sole
	Platichthys stellatus	starry flounder
	Pleuronectes quadrituberculatus	Alaska plaice
	Reinhardtius hippoglossoides	Greenland turbot

Appendix Table B-2. -- Invertebrate species encountered and identified during the 2010 Aleutian Islands bottom trawl survey.

Phylum	Species name	Common name
Porifera	Porifera unident.	sponge unident.
	Aphrocallistes vastus	clay pipe sponge
	Asbestopluma sp. A	fuzzy sponge
	Axinella sp.	firm gray sponge
	Chondrocladia gigantea	carnivorous cattail sponge
	Cliona sp. A	rough bread crumb sponge
	Coelosphaeridae unident.	ginseng sponge
	Craniella sp.	puffball sponges
	Craniella cranium	baseball sponge
	Craniella spinosa	furry ball sponge
	Craniella villosa	
	Geodia sp.	
	Geodia mesotriaena	
	Geodinella robusta	calcareous finger sponge
	Halichondria sp.	
	Halichondria panicea	barrel sponge
	Halichondria sitiens	black papilliate sponge
	Histodermella sp. A	spud sponge
	Inflatella sp. 1	orange papillate sponge
	Isodictya palmata	prickly pear sponge
	Latrunculia sp. A	green papillate sponge
	Latrunculia sp. B	smooth green sponge
	Leucosolenia blanca	yellow leafy sponge
	Melonchela clathriata	lattice sponge
	Mycale loveni	tree sponge
	Mycalecarmia lobata	cotton ball sponge
	Myxilla brunnea	soft brown sponge
	Myxilla incrustans	scallop sponge
	Neoesperiopsis digitata	
	Neoesperiopsis infundibula	rough China hat sponge
	Neoesperiopsis rigida	soft finger sponge
	Phakellia beringensis	hat sponge
	Phakellia cribrosa	funnel sponge
	Phakellia dalli	cat-o-nine-tails sponge
	Plakina tanaga	white convoluted sponge
	Plicatellopsis amphispicula	firm finger sponge
	Polymastia sp.	
	Polymastia fluegeli	Flugel's nippled spong
	Polymastia robusta	long nippled sponge
	Polymastia sp. A	prolific nipple sponge
	Polymastia sp. B	orange nipple ball sponge
	Regadrella okinoseana	lacy basket sponge
	Rhabdocalyptus sp.	cloud sponge
	Scypha ciliata	hairy urn sponge
	Stelletta sp.	stone sponge
	Stelodoryx alaskensis	Alaskan lobed sponge

Phylum	Species name	Common name
	Stylocordyla sp.	
	Stylocordyla borealis	lollypop sponge
	Suberites sp.	
	Suberites domuncula	hermit sponge
	Suberites montiniger	peach sponge
	Tentorium semisuberites	two nipple sponge
	Tethya sp.	ball sponge
	Tetilla sp.	
	Tetilla sigmoanchoratum	spiny ball sponge
	Tetilla sp. A	spiky ball sponge
	Tetilla sp. B	knobby ball sponge
	Vulcanella sp.	
	Weberella bursa	pale mammilated sponge
	Yellow papillate sponge	
Cnidaria	Cnidaria unident.	coelenterate unident.
	Abietinaria sp.	
	Abietinaria greenei	bushy white hydroid
	Abietinaria sp. A	white tangled hydroid
	Actinauge verrilli	reticulate anemone
	Actiniaria unident.	sea anemone unident.
	Actiniidae unident.	actinid sea anemones unid.
	Actinistola sp. A	
	Actinistola sp. B	
	Actinostolidae unident.	
	Aequorea sp.	
	Aglaophenia sp.	
	Alaskagorgia aleutiana	
	Alcyonium sp.	
	Alcyonium sp. A	pink orange mushroom coral
	Amphilaphis sp.	
	Amphilaphis sp. 1	
	Amphilaphis sp. 2	
	Amphilaphis sp. 3	
	Amphilaphis sp. 4	
	Anthomastus sp.	
	Anthomastus sp. A	red anthomastus
	Anthomastus sp. B	gray anthomastus
	Anthoptilum murrayi	Murray sea pen
	Anthozoa unident.	
	Arthrogorgia sp.	
	Arthrogorgia otsukai	
	Arthrogorgia utinomi	
	Atolla sp.	
	Aurelia aurita	
	Aurelia labiata	
	Bathyphelia australis	hot dog sea anemone
	Bonneviella sp. A	champagne flute hydroid
	Calcigorgia spiculifera	
	Caryophyllia sp.	

Phylum	Species name	Common name
	Caryophyllia alaskensis	Alaska cup coral
	Caryophyllia arnoldi	
	Chrysaora fuscescens	sea nettle
	Chrysaora melanaster	
	Clavularia sp.	
	Clavularia incrustans	encrusting coral
	Cribrinopsis fernaldi	chevron-tentacled anemone
	Cryogorgia koolsae	
	Crypthelia trophostega	
	Cyanea capillata	lion's mane
	Cyclohelia sp.	
	Cyclohelia lamellata	
	Distichopora borealis	
	Errinopora sp.	
	Errinopora nanneca	
	Errinopora pourtalesi	
	Errinopora sp. B	pale-edged hydrocoral
	Fanellia sp.	
	Fanellia compressa	
	Fanellia fraseri	
	Gersemia sp.	sea raspberry
	Halipteris willemoesi	
	Hydrozoa unident.	
	Isidella sp.	articulated bamboo coral
	Javania sp.	
	Javania borealis	
	Liponema brevicornis	tentacle-shedding anemone
	Metridium sp.	
	Metridium farcimen	gigantic anemone
	Muriceides nigra	
	Muriceides sp. cf. *cylindrica*	
	Paractinostola faeculenta	rough purple sea anemone
	Paragorgia sp.	
	Paragorgia arborea	Kamchatka coral
	Pennatulacea unident.	sea pen or sea whip unident.
	Periphylla periphylla	
	Phacellophora camtschatica	egg yolk jelly
	Plumarella sp.	
	Plumarella sp. 1	
	Plumarella sp. 2	
	Primnoa sp.	
	Primnoa pacifica	
	Primnoa willeyi	red tree coral
	Primnoa wingi	
	Ptilosarcus gurneyi	orange sea pen
	Scyphozoa unident.	jellyfish unident.
	Sertulariidae unid.	Sertulariid hydroid
	Stomphia sp.	
	Stomphia didemon	cowardly anemone

Phylum	Species name	Common name
	Stylaster sp.	
	Stylaster brochi	
	Stylaster campylecus	
	Stylaster cancellatus	
	Stylaster moseleyana	
	Stylaster polyorchis	
	Stylaster sp. A	undulate hydrocoral
	Stylaster stejnegeri	
	Stylasterina unident.	hydrocoral unident.
	Thouarella sp.	
	Thouarella sp. 1	
	Thouarella sp. 2	
	Thouarella superba	
	Urticina lofotensis	
	Virgularia sp.	smoothstem seawhip
Annelida	*Aphrodita* sp.	
	Aphrodita negligens	
	Aphroditidae unident.	sea mouse unident.
	Arctonoe vittata	
	Chaetopterus sp.	
	Eunice valens	
	Eunoe sp.	
	Eunoe depressa	depressed scale worm
	Eunoe nodosa	giant scale worm
	Euphrosine multibranchiata	
	Gattyana ciliata	
	Hirudinea unident.	leech unident.
	Nereidae unident.	
	Notostomobdella sp.	
	Notostomobdella cyclostoma	striped sea leech
	Onuphis conchylega	gravel tube worm
	Polychaeta unident.	polychaete worm unident.
	Polynoidae unident.	scale worm unident.
	Serpula sp.	
	Serpula columbiana	
	Serpulidae unident.	serpulid worm
Nematoda	Nematoda unident.	nematode worm unident.
Rhynchocoela	*Cerebratulus californienesis*	
Echiura	Echiura unident.	echiuroid worm unident.
Sipuncula	Sipuncula unident.	peanut worm unid.
	Phascolosomatidae unident.	
Arthropoda	*Acantholithodes hispidus*	fuzzy crab
	Amphipoda unident.	amphipod unident.
	Arcturus sp. 1	
	Argis sp.	
	Argis dentata	Arctic argid
	Argis ovifer	split-eye argid
	Balanus sp.	
	Balanus evermanni	giant barnacle

Phylum	Species name	Common name
	Balanus nubilus	
	Balanus rostratus	beaked barnacle
	Bentheogennema borealis	
	Cancer oregonensis	Oregon rock crab
	Caprella sp.	caprellid amphipod unident.
	Chionoecetes bairdi	Tanner crab
	Chorilia longipes	Longhorned decorator crab
	Colossendeis sp.	
	Crangon communis	twospine crangon
	Crangon dalli	ridged crangon
	Elassochirus sp.	
	Elassochirus cavimanus	purple hermit
	Elassochirus gilli	Pacific red hermit
	Elassochirus tenuimanus	widehand hermit crab
	Erimacrus isenbeckii	horsehair crab
	Eualus sp.	
	Eualus biunguis	deepsea eualid
	Hapalogaster grebnitzkii	
	Hippolytidae unident.	hippolytid shrimp unident.
	Hyas coarctatus	circumboreal toad crab
	Hyas lyratus	Pacific lyre crab
	Idoteidae unid.	
	Isopoda unident.	isopod unident.
	Labidochirus splendescens	splendid hermit
	Lebbeus sp.	
	Lebbeus groenlandicus	spiny lebbeid
	Lithodes aequispinus	golden king crab
	Notostomus sp.	
	Notostomus japonicus	spinyridge shrimp
	Oregonia bifurca	
	Oregonia gracilis	graceful decorator crab
	Paguridae unident.	hermit crab unident.
	Pagurus sp.	
	Pagurus aleuticus	Aleutian hermit
	Pagurus brandti	sponge hermit
	Pagurus capillatus	hairy hermit crab
	Pagurus confragosus	knobbyhand hermit
	Pagurus cornutus	
	Pagurus dalli	whiteknee hermit
	Pagurus kennerlyi	bluespine hermit
	Pagurus ochotensis	Alaskan hermit
	Pagurus trigonocheirus	fuzzy hermit crab
	Pandalidae unident.	pandalid shrimp unident.
	Pandalopsis aleutica	
	Pandalopsis ampla	
	Pandalopsis dispar	sidestripe shrimp
	Pandalopsis longirostris	
	Pandalopsis sp. cf. *lamelligera*	
	Pandalus eous	Alaskan pink

Phylum	Species name	Common name
	Pandalus hypsinotus	coonstripe shrimp
	Pandalus jordani	ocean shrimp
	Pandalus stenolepis	roughpatch shrimp
	Pandalus tridens	yellowleg pandalid
	Paralithodes camtschaticus	red king crab
	Pasiphaea pacifica	Pacific glass shrimp
	Penaeidae unident.	penaeid shrimps
	Phyllolithodes papillosus	flatspine triangle crab
	Placetron wosnessenskii	scaled crab
	Pycnogonida unident.	sea spider unident.
	Rhinolithodes wosnessenskii	rhinoceros crab
	Rocinella angusta	
	Sclerocrangon boreas	sculptured shrimp
	Sergestes similis	Pacific sergestid
	Spirontocaris arcuata	Rathbun blade shrimp
	Spirontocaris lamellicornis	
Mollusca	*Anisodoris lentiginosa*	mottled pale sea-lemon
	Anomiidae unident.	falsejingles unident.
	Archidoris odhneri	white night doris
	Arctomelon sp.	
	Arctomelon sp. cf. *stearnsii*	
	Arctomelon stearnsii	Alaska volute
	Arctomelon tamikoae	
	Astarte sp.	
	Astarte borealis	boreal astarte
	Benthoctopus sibiricus	
	Beringius crebricostatus	thick-cord whelk
	Beringius sp.	
	Beringius kennicottii	
	Beringius sp. A	Baxter's Beringius
	Beringius sp. B	two-channeled Beringius
	Beringius sp. F	
	Beringius sp. G	
	Beringius sp. H	
	Beringius sp. I	
	Berryteuthis magister	magistrate armhook squid
	Bivalvia unident.	bivalve unident.
	Boreotrophon elegantulus	
	Buccinum sp.	
	Buccinum bulimuloideum	
	Buccinum eugrammatum	lirate whelk
	Buccinum picturatum	
	Buccinum scalariforme	ladder whelk
	Buccinum sigmatopleura	wavy whelk
	Bulbus fragilis	fragile moonsnail
	Chiroteuthis calyx	
	Chlamys sp.	
	Clinocardium blandum	low-rib cockle
	Colga pacifica	Pacific Colga

Phylum	Species name	Common name
	Colus herendeenii	thin-ribbed whelk
	Colus periscelidus	garter whelk
	Cranopsis major	great puncturella
	Cryptochiton stelleri	giant Pacific chiton
	Cryptonatica affinis	Arctic moonsnail
	Cyclocardia sp.	
	Dendronotus dalli	Dall's dendronotid
	Doridae unident.	dorid nudibranch unident.
	Fusitriton oregonensis	Oregon triton
	Gastropoda unident.	snail unident.
	Gonatopsis borealis	boreopacific armhook squid
	Hiatella arctica	Arctic hiatella
	Japelion sp. A	
	Lamellaria sp.	
	Macoma sp.	
	Modiolus modiolus	northern horsemussel
	Musculus discors	discordant mussel
	Mytilus edulis	blue mussel
	Neomenia sp.	
	Neptunea sp.	
	Neptunea insularis	
	Neptunea lyrata	lyre whelk
	Neptunea smirnia	
	Neptunea sp. A	
	Neptunea sp. C	
	Neptunea sp. G	
	Neptunea ventricosa	fat whelk
	Nudibranchia unident.	nudibranch unident.
	Octopodidae unident.	octopus unident.
	Octopus dofleini	giant octopus
	Onchidiopsis brevipes	
	Placiphorella sp.	
	Placiphorella pacifica	
	Placiphorella rufa	
	Pododesmus macrochisma	Alaska falsejingle
	Pyrulofusus sp.	
	Pyrulofusus deformis	warped whelk
	Pyrulofusus dexius	
	Pyrulofusus harpa	left-hand whelk
	Pyrulofusus melonis	
	Rossia pacifica	eastern Pacific bobtail
	Serripes sp.	
	Stigmatoteuthis dofleini	
	Teuthoidea unident.	squid unident.
	Tritonia sp.	
	Tritonia diomedea	rosy tritonia
	Velutina sp.	
	Velutina conica	conical lamellaria
	Velutina plicatilis	oblique lamellaria

Phylum	Species name	Common name
	Vilasina seminuda	
	Volutopsius sp.	
	Volutopsius callorhinus	
	Volutopsius simplex	simple whelk
	Volutopsius sp. D	
	Yoldia hyperborea	northern yoldia
Bryozoa	Bryozoa unident.	bryozoan unident.
	Alcyonidium sp.	
	Alcyonidium pedunculatum	
	Alcyonidium sp. A	medusa bryozoan
	Bugula californica	
	Cellephorina sp.	
	Costazia ventricosa	rusty bryozoan
	Dendrobeania sp.	
	Flustra serrulata	leafy bryozoan
	Flustrellidra corniculata	
	Hippodiplosia insculpta	
	Leieschara orientalis	
	Microporina borealis	
	Myriozoum subgracile	
	Phidolopora pacifica	lacy bryozoan
	Porella compressa	flattened bryozoan
	Rhamphostomella costata	ribbed bryozoan
	Tubiporella sp.	
Brachiopoda	Brachiopoda unident.	lampshell unident.
Echinodermata	*Allocentrotus fragilis*	orange-pink sea urchin
	Asteroidea unident.	sea star unident.
	Asteronychidae unident.	
	Asteronyx sp.	
	Asteronyx loveni	serpent sea star
	Astrochele sp.	
	Astrochele laevis	
	Astronebris tatafilius	
	Bathyplotes sp.	
	Ceramaster sp.	
	Ceramaster arcticus	Arctic bat sea star
	Ceramaster clarki	
	Ceramaster japonicus	red bat star
	Ceramaster patagonicus	orange bat sea star
	Ceramaster stellatus	
	Cheiraster dawsoni	fragile sea star
	Cheiraster sp. A	Aleutian fragile sea star
	Cladaster validus	
	Crossaster sp.	
	Crossaster papposus	rose sea star
	Crossaster sp. B	pink rose star
	Ctenodiscus crispatus	common mud star
	Cucumaria sp.	
	Cucumaria fallax	sea football

Phylum	Species name	Common name
	Cucumaria frondosa	
	Diplopteraster multipes	pincushion sea star
	Dipsacaster borealis	northern sea star
	Echinacea unident.	sea urchin unident.
	Evasterias echinosoma	giant sea star
	Fariometra sp.	dwarf feather star
	Florometra sp.	
	Florometra inexpectata	
	Gephyreaster swifti	Swift's sea star
	Gorgonocephalus eucnemis	basketstar
	Henricia sp.	
	Henricia aspera	ridged blood star
	Henricia asthenactis	
	Henricia leviuscula	blood sea star
	Henricia sanguinolenta	sanguine sea star
	Henricia sp. B	white Henricia
	Henricia sp. C	mottled Henricia
	Henricia spiculifera	spiny Henricia
	Hippasteria sp.	
	Hippasteria armata	
	Hippasteria californica	
	Hippasteria heathi	
	Hippasteria kurilensis	
	Hippasteria sp. A	
	Hippasteria sp. E	Alaskan spiny star
	Hippasteria spinosa	spiny red sea star
	Holothuroidea unident.	sea cucumber unident.
	Leptasterias sp.	
	Leptasterias groenlandica	
	Leptasterias hylodes	Aleutian sea star
	Leptasterias truculenta	giant Aleutian six-rayed star
	Leptychaster sp.	
	Leptychaster anomalus	
	Leptychaster arcticus	North Pacific sea star
	Leptychaster pacificus	
	Lethasterias nanimensis	blackspined sea star
	Lophaster sp.	
	Lophaster furcilliger	crested sea star
	Lophaster vexator	crested star
	Mediaster sp.	
	Mediaster aequalis	vermilion sea star
	Mediaster tenellus	
	Molpadia intermedia	sweet sea potato
	Odontohenricia sp.	
	Odontohenricia fisheri	
	Odontohenricia sp. B	
	Odontohenricia sp. C	
	Ophiacantha sp.	
	Ophiacantha cataleimmoida	

Phylum	Species name	Common name
	Ophiacantha enneactis	
	Ophiolebes sp.	
	Ophiolebes sp. B	
	Ophiopholis sp.	
	Ophiopholis aculeata	ubiquitous brittle star
	Ophiopholis longispina	
	Ophiura sarsi	notched brittlestar
	Ophiuroidea unident.	brittlestarfish unident.
	Orthasterias koehleri	redbanded sea star
	Pannychia moseleyi	deep sea papillate cucumber
	Pedicellaster magister	majestic sea star
	Pentamera lissoplaca	crescent sea cucumber
	Peribolaster biserialis	
	Pseudarchaster sp.	
	Pseudarchaster alascensis	
	Pseudarchaster parelii	scarlet sea star
	Psolus sp.	
	Psolus japonicus	
	Psolus sp. A	
	Psolus squamatus	whitescaled sea cucumber
	Pteraster sp.	
	Pteraster jordani	
	Pteraster marssipus	
	Pteraster militaris	wrinkled star
	Pteraster obscurus	obscure sea star
	Pteraster pulvillus	
	Pteraster sp. A	
	Pteraster sp. B	
	Pteraster sp. C	
	Pteraster sp. cf. *temnochiton*	
	Pteraster temnochiton	cushion sea star
	Pteraster tesselatus	
	Pycnopodia helianthoides	sunflower sea star
	Solaster sp.	
	Solaster dawsoni	morning sun sea star
	Solaster hypothrissus	
	Solaster sp. A	
	Solaster sp. B	
	Solaster sp. C	beautiful sun star
	Solaster sp. D	serpent sun star
	Solaster sp. E	Kessler sun star
	Solaster sp. F	Fisher sun star
	Solaster stimpsoni	striped sun sea star
	Stegophiura ponderosa	
	Stephanasterias albula	
	Strongylocentrotus sp.	
	Strongylocentrotus droebachiensis	green sea urchin
	Strongylocentrotus pallidus	white sea urchin
	Strongylocentrotus polyacanthus	

Phylum	Species name	Common name
	Stylasterias sp.	
	Stylasterias forreri	long-rayed star
	Synallactes challengeri	
	Synallactes sp. A	
	Thylonidium sp.	
Chordata	*Amaroucium soldatovi*	
	Aplidium new species a	orange aplidium
	Aplidium sp. A	sea glob
	Ascidia paratropa	glassy tunicate
	Ascidiacea unident.	tunicate unident.
	Boltenia sp.	
	Distaplia occidentalis	
	Distaplia smithi	
	Distaplia sp. A	
	Halocynthia aurantium	sea peach
	Halocynthia sp.	sea peach unident.
	Molgula sp.	
	Molgula grifithsii	sea grape
	Styela rustica	sea potato
	Styela sp. A	
	Styela sp. B	
	Synoicum sp.	sea blob
	Thaliacea unident.	salp unident.
	Tridemnum opacum	

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
Atheresthes stomias	Male	3.062E-06	3.172	279
	Female	1.953E-06	3.257	447
	Both	1.967E-06	3.253	726
Atheresthes evermanni	Male	2.305E-06	3.230	221
	Female	1.671E-06	3.288	239
	Both	1.849E-06	3.269	460
Reinhardtius hippoglossoides	Male	2.450E-05	2.833	62
	Female	4.631E-09	4.137	19
	Both	4.242E-08	3.806	81
Lepidopsetta polyxystra	Male	5.311E-06	3.125	271
	Female	4.997E-06	3.141	347
	Both	4.800E-06	3.146	618
Lepidopsetta bilineata	Male	5.353E-05	2.731	123
	Female	4.450E-06	3.167	195
	Both	7.897E-06	3.067	318
Albatrossia pectoralis	Male	1.449E-02	2.169	16
	Female	5.319E-03	2.354	137
	Both	5.030E-03	2.363	153
Gadus macrocephalus	Male	3.166E-06	3.201	348
	Female	3.464E-06	3.187	328
	Both	3.311E-06	3.194	676
Theragra chalcogramma	Male	8.030E-06	2.990	293
	Female	8.657E-06	2.973	295
	Both	8.384E-06	2.980	589
Pleurogrammus monopterygius	Male	1.435E-06	3.379	240
	Female	3.641E-06	3.211	326
	Both	2.485E-06	3.280	566
Sebastolobus alascanus	Male	2.203E-06	3.293	243
	Female	2.343E-06	3.284	278
	Both	2.248E-06	3.290	521
Sebastes melanostictus	Male	4.370E-06	3.216	237
	Female	3.288E-06	3.267	220
	Both	3.792E-06	3.242	457
Sebastes alutus	Male	6.810E-06	3.127	446
	Female	7.914E-06	3.097	504
	Both	7.486E-06	3.108	950
Sebastes variabilis	Male	6.970E-06	3.153	65
	Female	8.741E-06	3.113	55
	Both	7.553E-06	3.139	120
Sebastes polyspinis	Male	2.462E-05	2.906	255
	Female	1.744E-05	2.969	282
	Both	2.019E-05	2.942	537
Sebastes borealis	Male	1.071E-05	3.077	178
	Female	5.815E-06	3.174	189
	Both	7.761E-06	3.128	367
Hemilepidotus jordani	Male	2.423E-06	3.273	212
	Female	2.881E-06	3.252	200
	Both	2.944E-06	3.244	412
Bathyraja taranetzi	Male	1.086E-05	2.882	43
	Female	2.936E-06	3.099	49
	Both	5.504E-06	2.996	92
Bathyraja parmifera	Male	3.555E-06	3.098	103
	Female	1.408E-06	3.247	98
	Both	2.235E-06	3.172	201
Bathyraja maculata	Male	2.329E-06	3.148	129
	Female	1.883E-06	3.187	210
	Both	2.027E-06	3.173	339

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