NOAA Technical Memorandum NMFS-AFSC-329
doi:10.7289/V5/TM-AFSC-329

Data Report: 2005 Gulf of Alaska Bottom Trawl Survey

N. W. Raring, E. A. Laman, P.G. von Szalay, M. E. Wilkins, and M. H. Martin

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Alaska Fisheries Science Center

September 2016

NOAA Technical Memorandum NMFS

The National Marine Fisheries Service's Alaska Fisheries Science Center uses the NOAA Technical Memorandum series to issue informal scientific and technical publications when complete formal review and editorial processing are not appropriate or feasible. Documents within this series reflect sound professional work and may be referenced in the formal scientific and technical literature.

The NMFS-AFSC Technical Memorandum series of the Alaska Fisheries Science Center continues the NMFS-F/NWC series established in 1970 by the Northwest Fisheries Center. The NMFS-NWFSC series is currently used by the Northwest Fisheries Science Center.

This document should be cited as follows:

Raring, N. W., E. A. Laman, P. G. von Szalay, M. E. Wilkins, and M. H. Martin. 2016. Data report: 2005 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-329, 233 p. doi:10.7289/V5/TM-AFSC-329.

Document available: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-329.pdf

NOAA Technical Memorandum NMFS-AFSC-329
doi:10.7289/V5/TM-AFSC-329

Data Report: 2005 Gulf of Alaska Bottom Trawl Survey

N. W. Raring, E. A. Laman. P. G. von Szalay,
M. E. Wilkins*, and M. H. Martin

Alaska Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
7600 Sand Point Way NE
Seattle, WA 98115

*AFSC retired

www.afsc.noaa.gov

U.S. DEPARTMENT OF COMMERCE
Penny. S. Pritzker, Secretary
National Oceanic and Atmospheric Administration
Kathryn D. Sullivan, Under Secretary and Administrator
National Marine Fisheries Service
Eileen Sobeck, Assistant Administrator for Fisheries

September 2016

This document is available to the public through:

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

www.ntis.gov

PREFACE

This data report is one of two types of standard reports presenting data from the 2005 Gulf of Alaska groundfish survey conducted by the National Marine Fisheries Service (NMFS). The two standard reports are:

1) **Cruise Report** outlines the survey objectives; documents itinerary, personnel, and vessels employed; and summarizes major accomplishments.

2) **Data Report** (this document), contains detailed descriptions of the survey planning and operation, species distribution and abundance charts, length frequency plots, tables of estimated biomass, catch per unit effort, average weight and length estimates, length-weight regression parameters, list of identified species, survey strata specifications and charts, and trawl descriptions and diagrams.

ABSTRACT

Scientists of the Groundfish Assessment Program of Alaska Fisheries Science Center's Resource Assessment and Conservation Engineering (RACE) Division conducted the fourth biennial groundfish assessment survey of the Gulf of Alaska during the summer of 2005. These surveys extend the series of surveys, previously conducted every 3 years between 1984 and 1999, which comprise the time series used in stock assessments of Gulf of Alaska groundfish resources. The survey area covered the continental shelf and upper continental slope to 1,000 m in the Gulf of Alaska from Islands of Four Mountains (170° 00′ W long.) to Dixon Entrance (132°40'W long.). The survey was conducted aboard three chartered commercial trawlers, the F/V *Northwest Explorer*, the F/V *Sea Storm*, and the F/V *Gladiator*. Trawl haul samples were collected successfully at 839 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 the principal groundfish within the survey area and to collect data to estimate biological parameters useful to groundfish researchers and managers including age, growth, length-weight relationships, feeding habits, and size, sex, and age composition. The survey also collected ancillary data requested by other research groups.

There were 693 taxa of fish and invertebrates captured in survey tows. Arrowtooth flounder (*Atheresthes stomias*), Pacific ocean perch (*Sebastes alutus*), giant grenadier

(*Albatrossia pectoralis*), Pacific halibut (*Hippoglossus stenolepis*), and walleye pollock (*Gadus chalcogrammus*), were, in descending order, the most abundant species within the survey area. Northern rockfish (*Sebastes polyspinis*), Pacific cod (*Gadus macrocephalus*), sablefish (*Anoplopoma fimbria*), and flathead sole (*Hippoglossoides elassodon*) were locally abundant in some areas. Survey results are presented including estimates of catch per unit of effort, biomass, population size composition, and length-weight relationships, as well as charts depicting the distribution of catch for commercially important species encountered during the survey.

CONTENTS

INTRODUCTION

The fourth biennial groundfish survey of groundfish and invertebrate resources of the Gulf of Alaska (GOA) was conducted during the summer of 2005 by the National Marine Fisheries Service's (NMFS) Alaska Fisheries Science Center (AFSC). Scientists from the Groundfish Assessment Program of AFSC's Resource Assessment and Conservation Engineering (RACE) Division in Seattle, Washington, were responsible for the survey's design and operations. The biennial regimen extends the series begun in 1984, previously conducted every 3 years between 1984 and 1999, which have provided a time series of distribution, abundance, and biological characteristics of GOA groundfish resources for the purpose of stock assessment and management.

In this report, we document the operations and results of the 2005 GOA bottom trawl survey. Results of routine analyses of distribution, relative abundance, size composition, and biological characteristics are shown for the principal groundfish species in each of the five International North Pacific Fisheries Commission (INPFC) statistical areas in the GOA: Shumagin, Chirikof, Kodiak, Yakutat, and Southeastern. These results provide stock assessment scientists and resource managers the most current information to be used for subsequent stock assessments and fishery evaluations. Only the 2005 survey results are presented and no comparisons are made to the results of previous GOA surveys.

The survey objectives were to:

1) Delineate the distributions of major groundfish and commercially important invertebrate species inhabiting the continental shelf and upper continental slope of the GOA in depths out to 1,000 m.

2) Collect data used to estimate the abundance of the major groundfish species.

3) Collect data on specific biological characters of interest to researchers and resource managers including:

- size, sex, and age composition
- growth and length-weight relationships
- food habits

4) Collect specimens and related information for special research projects including:

- Studies of rockfish and Atka mackerel maturity and growth;
- Taxonomic studies of snailfish, eelpouts, skates, cephalopods, crabs, snails, chitons, and sea stars;
- Studies of marine mammal forage species;
- Studies of skate egg case distributions and vulnerability to fishing;
- A seabird/fishery interaction study; and
- Rockfish and Atka mackerel phylogenetic studies.

METHODS

Survey Area

The Gulf of Alaska forms the northeastern border of the Pacific Ocean and consists of complex bathymetric features ranging from jagged, mountainous pinnacles to flat, muddy areas. These features provide a variety of habitats resulting in a complex ecosystem mosaic (Fig. 1). Prevailing rough bottom conditions in many areas require the standard use of rubber bobbin roller gear for all survey bottom trawling operations. The 2005 GOA survey included the entire continental shelf and upper portion of the continental slope down as deep as the 1,000 m depth contour.

The total area of the survey is approximately 320,000 km² (Table 1). The continental shelf, waters shallower than about 200 m and consisting of about 79% of the total Gulf of Alaska survey area, extends approximately 20 km (11 nautical miles (nmi)) off the Islands of Four Mountains , then widens to 220 km (120 nmi) off Cook Inlet and narrows to 40 km (22 nmi) off Dixon Entrance. Gullies intrude onto the shelf in many areas, extending from the upper slope to the inner shore. These gully areas make up about 16% of the total survey area. The outer shelf is bordered by the continental slope, a region approximately 20 km in width, which descends steeply to the abyssal Aleutian Trench in the western and central GOA and to the Alaska Plain in the eastern GOA. The survey assessed only that portion of the slope shallower than 1,000 m, an area of approximately 68,635 km². The survey was initially stratified by statistical areas erected by the International North Pacific Fisheries Commission (INPFC). While this commission was dissolved in 1992 and replaced by the North Pacific Anadromous Fish Commission (NPAFC) in 1993, reference to the original INPFC statistical survey areas has been maintained for survey consistency. Some of the INPFC areas directly correspond to the NMFS Reporting Areas:

Shumagin--610; Chirikof—620; and Kodiak—630. The Yakutat and Southeastern areas divide at the 137°W meridian, while the NMFS Reporting Areas Yakutat—640 and Southeastern—650 divide at the 140°W meridian. About 32% (101,489 km²) of the total survey area is within the Kodiak area (Table 1). The portion of the survey area contained within the Chirikof and the Shumagin area are approximately equal at about 21% (68,053 km²) and 20% (65,228 km²), respectively, while the Yakutat survey area makes up about 18% (57,197 km²). The Southeastern survey area comprises the smallest portion, about 9% of the total survey area (28,038 km²).

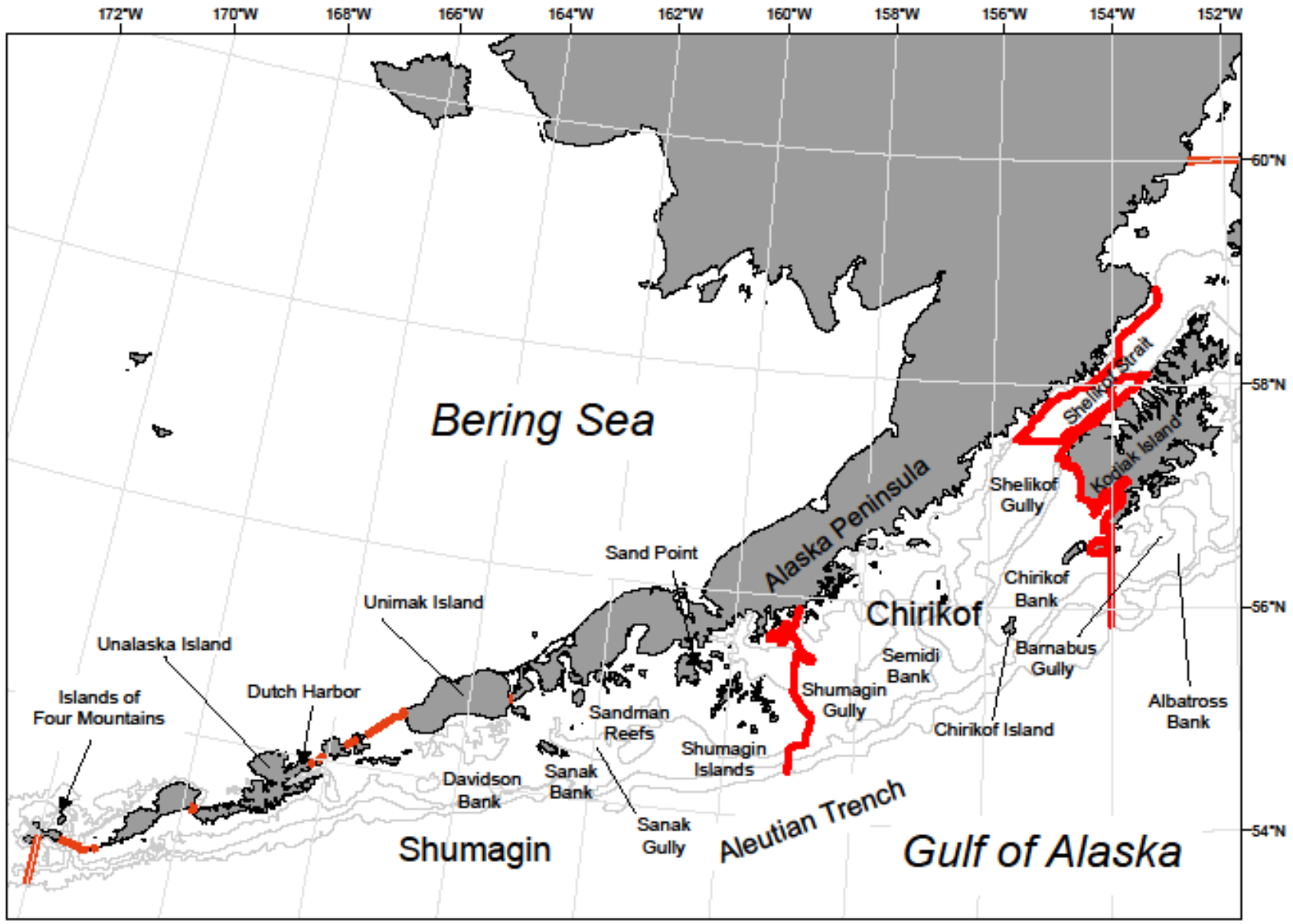

Figure 1. -- Bathymetric and geographic features of the survey area for the 2005 Gulf of Alaska biennial groundfish survey.

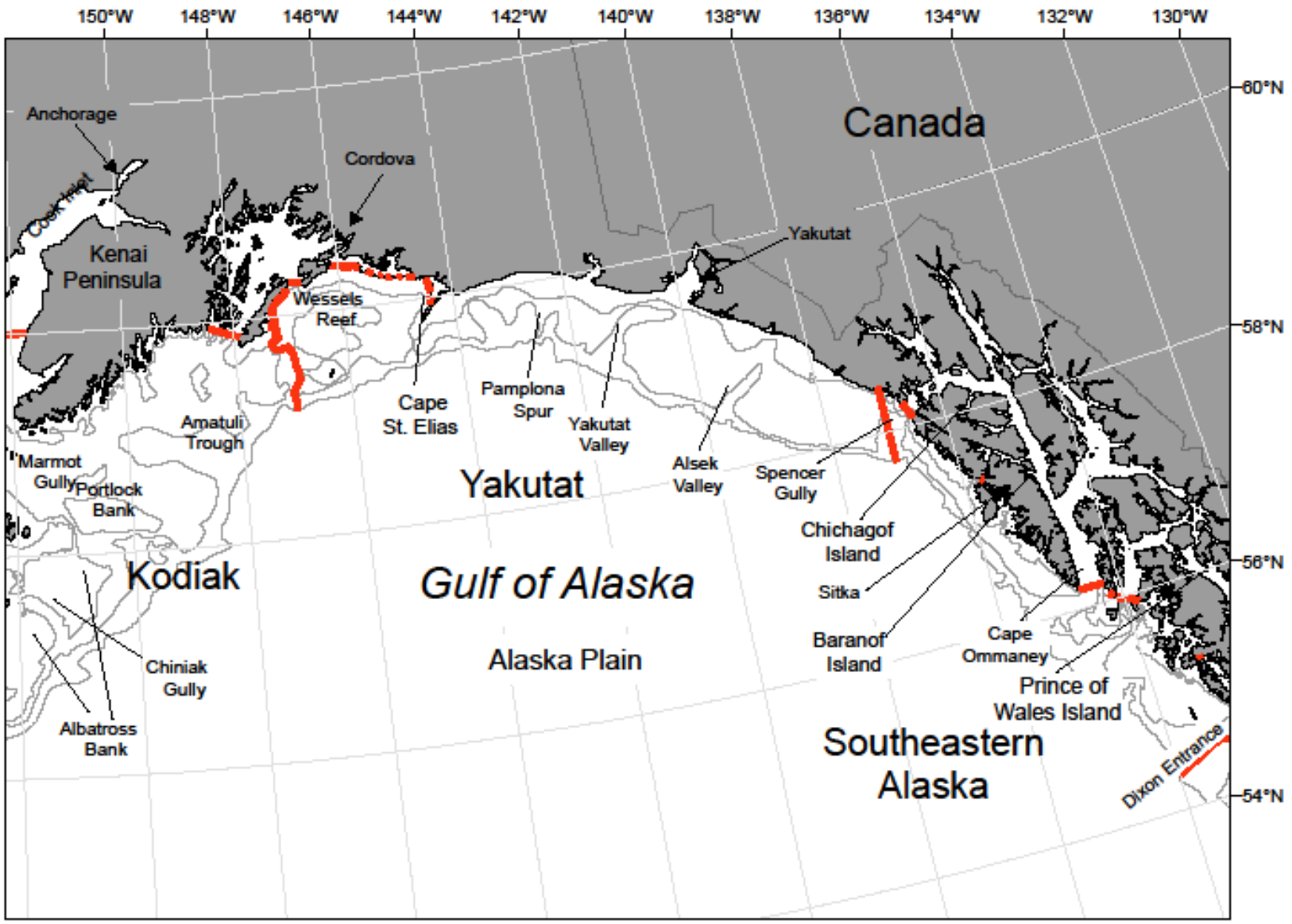

Figure 1. -- Continued.

Vessels

Since the inception of the Gulf of Alaska bottom trawl survey series in 1984, commercial trawlers with crews have been chartered to conduct the survey operations under the supervision and guidance of RACE Groundfish Assessment Program staff. Three vessels (occasionally two) have been chartered each survey period. It is essential that standardized methods be maintained since these surveys generate quantitative data for a time series to describe trends in abundance, distribution, and population biology characteristics of managed resources (Stauffer 2004). Stringent standards for selecting charter vessels are specified whenever new charters are arranged to ensure that the sampling platforms can adequately collect samples and do so in as similar a manner as possible within and between years. As such, vessels and crews must meet minimum criteria for size, main engine horsepower, fishing machinery, skipper and crew experience, and navigational and safety equipment. Continuity of suitable platforms has been further enhanced in the past decade through the use of multi-year charters, assuring both the government and the contractors a stable planning situation for as much as 4 years at a time.

In 2005, three U.S. commercial fishing vessels, the F/V *Pacific Explorer*, the F/V *Sea Storm*, and the F/V *Vesteraalen* were chartered to conduct the Gulf of Alaska bottom trawl survey. All three vessels were house-forward stern trawlers with stern ramps and two net storage reels (one each forward of the work deck and above the stern ramp on *Sea Storm* and *Gladiator* and two forward on the *Northwest Explorer*); telescoping deck cranes; propeller nozzles; and paired, controlled-tension hydraulic trawl winches with 1,280 to 1,460 m of 2.54 cm (*Gladiator* and *Sea Storm*) or 2.98 cm (*Northwest Explorer*) diameter steel cable. The *Northwest Explorer* is 49.4 m in overall length (LOA) and is powered by twin 1,800 HP main engines. The *Sea*

Storm and *Gladiator* are both 37.8 m (LOA) and powered by single continuous 1,710 HP main engines. Captain Shawn O'Brien skippered the *Northwest Explorer* for the first three legs, followed by Captain Dan Carney on the final leg. The *Gladiator* was operated by Captain Ed French for the first and third legs and by Captain Dan Clark for the second leg. The *Sea Storm* was operated by Captain Steve Branstiter for the first two and the final leg and by Captain Jerry Ellefson during the third leg. All vessels were equipped with global positioning system (GPS) receivers with video position plotters, at least two radars, single sideband and VHF transmitter-receivers, color video fish-finders, paper recorder depth sounders, and autopilots.

Fishing Gear

The fishing gear and protocols for deployment and recovery are described in detail in Stauffer (2004). All vessels used standard RACE Division Poly Nor'Eastern four-seam 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 during deployment were monitored and recorded using Scanmar acoustic net mensuration equipment mounted on the wing-tips and headrope of the trawl. Each trawl and associated rigging was measured and certified as conforming to standard measurements prior to its use in the survey.

Survey Design

The 2005 biennial survey used a stratified random sampling pattern consistent with previous GOA surveys (Britt and Martin 2000, Martin and Clausen 1995, Stark and Clausen 1995, Munro and Hoff 1995). The Gulf of Alaska was divided into 59 strata defined by water depth, bottom terrain (e.g., shelf, gully, and slope), and INPFC statistical area (Appendix A). As

in previous surveys, a modified Neyman optimal allocation strategy (Cochran 1977) based upon catch rates from the 1990-2003 surveys was used to allocate effort among strata. Neyman optimum allocation calculations were made for each of the principal groundfish species for each previous survey year using the estimated time to perform a tow in a given stratum as the cost variable. This cost was considered because trawl sets in deeper strata or strata with a greater probability of unacceptable gear performance generally takes longer to complete. A mean sample size was estimated for each species across years and then a weighted mean of the estimated sample sizes was calculated using each species' mean biomass multiplied by its ex-vessel value as the weighting variable. These numbers were rounded to whole numbers and represented the number of stations allocated to each stratum with the additional constraint that each stratum was required to have at least two samples.

The number of stations in each stratum was randomly selected without replacement from polygons formed from the intersection of a grid composed of cells 25 km^2 in area and the stratum boundaries. Since many of the polygons formed by this process are less than 25 km^2, the probability of selection was directly related to each polygon's area. Small polygons (less than 5 km^2 in area) were excluded from the pool available for assignment since a vessel would be unable to perform a valid tow within such a small area. To maximize efficient use of survey time and optimize fuel consumption, assignment of tows to vessels was non-random in the Central GOA where the shelf is nearly 200 km wide in places. In general, the *Northwest Explorer* was assigned to sample the outer shelf and slope stations, the *Sea Storm* the middle shelf stations, and the *Gladiator* the nearshore stations. However, tows in all strata, with the exception of those between Kodiak Island and Cook Inlet, were assigned randomly between at least two boats.

Initially, 777 stations were allocated among the 59 strata. Due to good weather and efficient use of time, it became obvious midway through the survey that the vessels would complete these stations well before the end of their charter periods. Consequently, 109 more stations were added to strata in the Central and Eastern GOA in the same proportion as the original allocation detailed above and assigned to either the *Sea Storm* or the *Northwest Explorer* for the fourth leg. Approximately two-thirds of these additional stations were ultimately sampled (see Results section).

Geographic center points of the assigned station polygons were considered to define the location of the station. Vessels were assigned stations and were directed to thoroughly search its corresponding area using echosounder returns to locate sufficient trawlable bottom to perform a successful 15-minute tow, preferably through the center point. If trawlable bottom could not be found in the immediate area of the assigned point, a suitable location within the station polygon was sought. If, in the judgment of the Field Party Chief and skipper, trawlable grounds could not be found within the polygon within 2 hours, a nearby alternate station was selected from successful tows completed during previous GOA surveys. If sufficient trawlable bottom was encountered while transiting to the alternate site, this location was selected for the sample instead of the other alternate station.

Data Collection Techniques

The protocols used by the AFSC's RACE Division for conducting bottom trawl surveys have been standardized (Stauffer 2004, Appendix 1). Criteria for a successful tow include maintaining a continuous vessel speed of 3 knots (5.56 m/sec) while keeping the net in contact with the bottom and in fishing configuration for 15 minutes. Occasionally, tows of shorter duration were necessary to avoid obstacles (and, hence, net damage) or when net configuration (e.g., reduced wing spread) indicated that an exceptionally large catch was affecting the performance of the trawl. The track of the vessel was recorded every 2 seconds during each tow using the vessel's GPS. Pressure at depth, water temperature, and time were recorded every 3 seconds during most tows using a Seabird SBE-39 bathythermograph placed on the headrope of the net. A bottom contact sensor was attached to the midpoint of the roller gear to record the date, time, and tilt angle relative to bottom, indicating the degree of contact with the bottom. The vertical and horizontal net openings were monitored with Scanmar net mensuration equipment. Backup surface water temperatures were measured at most stations with a bucket thermometer. To minimize fishing power differences between the survey vessels, standardized trawling and gear handling methods were practiced including the use of scope ratio tables (trawl warp relative to bottom depth) and maintaining a 3-knot trawling speed.

A trawl sample was considered successful if horizontal and vertical net openings remained within established tolerances, the roller gear maintained consistent contact with the bottom, the net suffered little or no damage during the tow, and there were no conflicts with derelict fishing gear. Trawl samples were considered unsuccessful when the Field Party Chief

judged that the catch was affected by trawl damage, an unstable trawl configuration, insufficient bottom contact, or in the event the duration of the tow was less than 10 minutes.

Collection and Processing of Samples

Catches were sorted to species or other appropriate taxonomic levels and then weighed in aggregate using an electronic motion-compensating scale. Catches weighing less than approximately 1,000 kg were emptied directly onto a sorting table, sorted by species, and weighed to the nearest 0.01 kg using a Marel model M1100 digital scale. Species groups weighing less than about 2 kg were generally weighed to the nearest 2 g on a Marel model M60 digital scale. Larger catches were processed in like manner by iteratively filling the sorting table from the codend, sorting, and weighing until the entire catch had been processed. Alternatively, the total weight of the catch was weighed with Measurement Systems International Portaweigh Model 4300 crane scale and the sorting table was filled with a portion of the catch. The excess catch was dumped into a deck bin and the dominant species, usually three or fewer, making up the bulk of the catch were identified. The contents of the deck bin were sorted, discarding the predominant species and retaining the non-dominant species, which were sorted and weighed with those from the table. Total weight estimates for the predominant species were calculated by expanding their proportion by weight from the sorted sample to the difference between the total catch weight and the total weight of all non-dominant species. Pacific halibut were measured and discarded as quickly as possible and their weights were estimated from length. Numbers and weights of all taxa were estimated for each haul.

Additional biological information was recorded from individuals of species of commercial value, ecological importance, or abundance in the survey area. A random subsample

of 100-300 individuals (target subsample size was species-dependent) of each of these species identified in the catch was sorted by sex, and individual fork lengths (FL) were measured using Polycorder (Omnidata) data loggers with barcode readers and barcoded length strips. Fish that could not be readily sexed were classified as unsexed and measured. Age structures were collected from randomly selected samples of walleye pollock (See Appendix Table B-1 for scientific names of fish species); random samples of sablefish from hauls shallower than 200 m; stratified samples (by haul, sex, and size) of Pacific ocean perch and rougheye rockfish; and stratified samples (by area, sex, and size) of other target species. Every attempt was made to distribute the age specimen collections over the entire survey area. Individuals sampled for age were measured to the nearest 1 cm (FL) and weighed to the nearest 2-5 g (scale accuracy depends on the weight of the specimen) with a Marel model M60 scale.

Stomach samples for selected species were collected throughout the survey area by biologists from the AFSC's Resource Ecology and Ecosystem Modeling (REEM) Program aboard the *Northwest Explorer*. Ancillary data and specimens including whole specimens, ovaries, a variety of tissues, and acoustic data were collected for several other research projects including reproductive biology studies of Atka mackerel and harlequin and sharpchin rockfishes; taxonomic studies of snailfish and eelpouts, and genetic/stock structure studies of Pacific ocean perch, northern and rougheye rockfishes, and Atka mackerel. Additional specimens and data were collected for studies measuring light level variability; determining marine mammal food habits; researching skate biology; investigating squid and octopus biology; and estimating rockfish catchability.

Abundance, Size Composition, and Length-Weight Relations

Biomass estimates were calculated using the area-swept method (Alverson and Pereyra 1969). The area swept was calculated as the product of estimated distance towed by the estimated mean net spread for each tow. The distance towed was assumed to be represented by the distance traveled over ground by the vessel between the time when the footrope came into contact with the bottom (on-bottom) and the time when the center of the footrope left the bottom (off-bottom). The distance traveled by the vessel was estimated by smoothing the GPS location data and measuring the distance along this line. The mean net spread was estimated by averaging the smoothed net spread readings from the Scanmar units between on-bottom and off-bottom positions. Net spreads for tows for which there were insufficient Scanmar readings were estimated by a stepwise generalized additive model using net number, net height (when available), mean speed over ground (when available), depth, total catch, and the actual scope/expected scope ratio as variables. For each species, catch-per unit effort (CPUE) was calculated as catch weight (kg) per area swept by the trawl in hectares (ha). Mean CPUE was calculated, including zero catches, within each stratum. Mean CPUE values of combined strata were calculated as the weighted average of the component strata CPUE means weighted by stratum area. Biomass estimates were calculated by multiplying each stratum mean CPUE by the stratum area and summing the results to obtain estimates by INPFC statistical 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 (in terms of numbers) were estimated by expanding the length-frequency 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.

Individual length and weight measurements were used to establish length-weight relationships. The length-weight allometric relationship was expressed as:

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

where W is weight (grams), L is length (mm), and a and b are the fitted parameters from a non-linear least squares regression. Parameters for the most common species are listed in Appendix C.

Survey 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 the scientific consistency and statistical continuity of the time series necessary to reliably monitor the status of fish stocks and forecast trends.

RESULTS

Out of a total of 905 attempted tows, 839 (93%) were completed successfully at originally allocated or supplemental survey stations. Fish biomass and size composition were derived from this set of successfully completed hauls (Table 1). Net spread measurements were successfully collected for 882 of all attempted hauls (97%) and all but 19 of the successful survey hauls. Net spread of successfully completed tows ranged from 11.8 to 20.7 m; net height of successful tows ranged from 4.1 to 10.0 m. Headrope depth and temperature measurements were successfully collected for 884 of all attempted tows (98%) and 821 of all successfully completed tows. Bottom temperatures ranged from 3.2° to 10.7° C. Sea surface temperatures were successfully collected for 887 of all attempted tows, 825 of successful tows, and ranged from 5.1° to 17.0° C.

Table 1. -- Number of stations allocated, attempted, and successfully completed, and sampling density (stations/1000 km^2) for the 2005 Gulf of Alaska biennial bottom trawl survey in International North Pacific Fisheries Commission statistical areas by depth. Supplemental stations are noted in parentheses.

INPFC Area	Depth Range (m)	Stations Allocated	Stations Attempted	Stations Successful	Area (km^2)	Stations/ 1000 km^2
Shumagin	1 - 100	118	122	117	41,289	2.83
	101 - 200	34	38	36	14,677	2.45
	201 - 300	12	14	12	2,788	4.30
	301 - 500	8	10	9	2,531	3.56
	501 - 700	5	4	4	2,006	1.99
	701 - 1000	2	2	2	1,937	1.03
	All depths	**179**	**190**	**180**	**65,228**	**2.76**
Chirikof	1 - 100	73 *(+14)*	72	71	26,035	2.73
	101 - 200	61 *(+11)*	62	62	23,849	2.60
	201 - 300	25 *(+4)*	26	25	11,546	2.17
	301 - 500	10 *(+2)*	12	10	1,604	6.23
	501 - 700	6 *(+1)*	6	6	1,953	3.07
	701 - 1000	2	3	3	3,066	0.98
	All depths	**177 *(+32)***	**181**	**177**	**68,053**	**2.60**
Kodiak	1 - 100	96 *(+17)*	112	109	38,516	2.83
	101 - 200	120 *(+21)*	141	139	43,332	3.21
	201 - 300	26 *(+5)*	29	29	11,490	2.52
	301 - 500	8 *(+1)*	8	8	2,912	2.75
	501 - 700	5 *(+1)*	6	5	1,745	2.87
	701 - 1000	3 *(+1)*	4	3	3,494	0.86
	All depths	**258 *(+46)***	**300**	**293**	**101,489**	**2.89**
Yakutat	1 - 100	13 *(+2)*	15	15	16,661	0.90
	101 - 200	35 *(+7)*	43	42	29,382	1.43
	201 - 300	18 *(+3)*	21	21	5,170	4.06
	301 - 500	7 *(+1)*	8	8	2,628	3.04
	501 - 700	3 *(+1)*	6	4	1,469	2.72
	701 - 1000	2	2	2	1,887	1.06
	All depths	**78 *(+14)***	**95**	**92**	**57,197**	**1.61**
Southeastern	1 - 100	9 *(+2)*	9	9	6,546	1.37
	101 - 200	30 *(+6)*	38	37	11,084	3.34
	201 - 300	29 *(+6)*	31	32	5,052	6.33
	301 - 500	11 *(+2)*	15	13	3,117	4.17
	501 - 700	4 *(+1)*	4	4	1,033	3.87
	701 - 1000	2	2	2	1,206	1.66
	All depths	**85 *(+17)***	**99**	**97**	**28,038**	**3.46**
All areas	1 - 100	309 *(+35)*	330	321	129,047	2.49
	101 - 200	280 *(+45)*	322	316	122,324	2.58
	201 - 300	110 *(+18)*	121	119	36,046	3.30
	301 - 500	44 *(+6)*	53	48	12,792	3.75
	501 - 700	23 *(+4)*	26	23	8,206	2.80
	701 - 1000	11 *(+1)*	13	12	11,590	1.04
	All depths	**777 *(+109)***	**865**	**839**	**320,005**	**2.62**

Catch Results by Area

During the 2005 survey there were 212 fish taxa from 40 families caught as well as 481 invertebrate taxa from 14 Phyla as defined by the RACE Species Codebook. Appendix B presents lists of fish (Appendix B-1) and invertebrate (Appendix B-2) species encountered during the survey. Relative abundance estimates, reported as CPUE, are presented in Table 2 for the 20 most abundant groundfish species in each of the five INPFC areas.

Over the entire survey area, arrowtooth flounder was the most abundant groundfish encountered during the survey (Table 2). Arrowtooth flounder had the highest CPUE of any species in four of the five INPFC areas, ranking fourth in the westernmost Shumagin area. Pacific ocean perch, giant grenadier, and Pacific halibut were also very important components of the Gulf-wide species composition.

In the Shumagin INPFC area, Pacific ocean perch had the greatest CPUE of any species, followed closely by giant grenadier, northern rockfish, and arrowtooth flounder. Walleye pollock, Pacific cod, Pacific halibut, and Atka mackerel were also relatively abundant in this area. In the Chirikof INPFC area, arrowtooth flounder dominated all other species in terms of CPUE. Giant grenadier, northern rockfish, Pacific halibut, walleye pollock, Pacific cod, and Pacific ocean perch were also important components of the species composition. In the Kodiak INPFC area, arrowtooth flounder was again by far the dominant component of the groundfish CPUE. Pacific ocean perch, Pacific halibut, giant grenadier, walleye pollock, and sablefish were also relatively abundant in this area. In the Yakutat INPFC area, arrowtooth flounder and Pacific ocean perch were the dominant species. The mean CPUEs of these species were either more than twice or almost twice that of the next most abundant species: Pacific halibut and giant

grenadier. In the Southeastern INPFC area, arrowtooth flounder and Pacific ocean perch were the most abundant species. Pacific halibut, Pacific herring, and silvergray rockfish were also important catch components.

Table 2. -- Mean CPUE (kg/ha) for the 20 most abundant groundfish in each International North Pacific Fisheries Commission area during the 2005 biennial Gulf of Alaska bottom trawl survey

Shumagin area		Chirikof area		Kodiak area	
Species	CPUE	Species	CPUE	Species	CPUE
Pacific ocean perch	38.5	arrowtooth flounder	81.7	arrowtooth flounder	87.2
giant grenadier	36.9	giant grenadier	19.0	Pacific ocean perch	29.6
northern rockfish	35.4	northern rockfish	15.1	Pacific halibut	27.6
arrowtooth flounder	33.0	Pacific halibut	12.8	giant grenadier	17.0
walleye pollock	21.4	Pacific cod	11.7	walleye pollock	14.2
Pacific cod	20.6	Pacific ocean perch	11.1	sablefish	13.1
Pacific halibut	17.0	walleye pollock	8.9	flathead sole	8.5
Atka mackerel	14.9	flathead sole	8.3	Pacific cod	7.9
dusky rockfish	10.6	sablefish	8.2	dusky rockfish	5.9
southern rock sole	9.8	dusky rockfish	5.6	southern rock sole	4.9
flathead sole	9.1	rex sole	4.1	rex sole	3.2
northern rock sole	9.0	southern rock sole	3.7	rougheye and blackspotted r	2.6
sablefish	4.8	Pacific sleeper shark	3.3	Dover sole	2.6
harlequin rockfish	4.1	eulachon	2.4	shortspine thornyhead	2.6
yellowfin sole	3.6	shortspine thornyhead	2.3	northern rockfish	2.5
shortspine thornyhead	3.4	Aleutian skate	2.1	eulachon	2.4
dark rockfish	3.3	northern rock sole	1.8	longnose skate	2.1
black rockfish	2.7	big skate	1.6	northern rock sole	2.0
starry flounder	2.5	longnose skate	1.2	Pacific sleeper shark	1.9
rex sole	2.0	popeye grenadier	1.2	yellowfin sole	1.7
Number of hauls	180	Number of hauls	177	Number of hauls	293

Yakutat area		Southeastern area		All areas	
Species	CPUE	Species	CPUE	Species	CPUE
arrowtooth flounder	29.8	arrowtooth flounder	26.0	arrowtooth flounder	59.4
Pacific ocean perch	13.6	Pacific ocean perch	22.2	Pacific ocean perch	24.0
Pacific halibut	7.7	Pacific halibut	15.2	giant grenadier	18.4
giant grenadier	7.2	Pacific herring	14.1	Pacific halibut	17.7
sablefish	5.8	silvergray rockfish	10.0	walleye pollock	11.9
spiny dogfish	5.1	walleye pollock	8.3	northern rockfish	11.2
Dover sole	4.4	spotted ratfish	7.9	Pacific cod	9.6
shortspine thornyhead	3.4	rex sole	5.8	sablefish	8.4
shortraker rockfish	3.0	sablefish	5.6	flathead sole	6.7
walleye pollock	2.4	Pacific hake	5.3	dusky rockfish	5.3
eulachon	2.4	Dover sole	4.9	southern rock sole	4.6
rex sole	2.0	lingcod	4.4	rex sole	3.2
flathead sole	2.0	shortspine thornyhead	4.0	Atka mackerel	3.2
lingcod	2.0	Pacific cod	3.9	shortspine thornyhead	3.0
silvergray rockfish	1.9	southern rock sole	2.8	northern rock sole	2.9
longnose skate	1.5	English sole	2.2	Dover sole	2.5
Pacific herring	1.0	rougheye and blackspotted rockfish	2.2	Pacific sleeper shark	1.8
rougheye and blackspotted r	0.9	redstripe rockfish	2.1	eulachon	1.7
sharpchin rockfish	0.8	sharpchin rockfish	1.9	yellowfin sole	1.5
harlequin rockfish	0.8	giant grenadier	1.3	spiny dogfish	1.5
Number of hauls	92	Number of hauls	97	Number of hauls	839

Catch Results by Species

For each commercially or ecologically important species, the following information is presented:

1. A brief synopsis of the data collected.
2. A table presenting the number of hauls, the number of hauls with catch, mean CPUE, estimated biomass with 95% confidence intervals, and mean weight of that species by INPFC area and depth.
3. A figure showing the distribution and relative abundance of that species.
4. A figure showing the estimated size composition of the population for that species. and
5. CPUE and biomass estimates (with 95% confidence intervals) by stratum for that species.

For other species that were locally abundant (other flatfish and other rockfish, skates, capelin, eulachon, and Pacific hake), only items 1, 2, and 5 above are presented.

The scientific names follow the seventh edition of the Common and Scientific Names of Fishes from the United States,Canada and Mexico (Lawrence et al. 2013). The exceptions to this are in the orders Pleuronectiformes (flatfish) and Scorpaeniformes (rockfish) scientific names. The names used throughout this report reflect recent reexamination of the phylogeny of these orders (Berendzen 1997, Cooper and Chapleau 1998, Ivankov 1996, Orr and Matarese 2000, Rass 1996, Orr and Blackburn 2004).

FLATFISHES

Arrowtooth flounder (*Atheresthes stomias*)

Arrowtooth flounder was the most abundant species caught in the 2005 survey (Table 2) with the highest mean CPUE in all INPFC areas except Shumagin, where it ranked fourth. Arrowtooth flounder were caught throughout the survey area at all depths, occurring in 91% of all tows, including 99% of the tows at depths between 101 and 500 m (Table 3). The highest densities generally occurred on the broad continental shelf in the Kodiak and eastern Chirikof INPFC areas, especially in the area northeast of Kodiak Island, around the Barren Islands, Albatross Gullies, and lower Shelikof Strait (Fig. 2 and Table 4). Mean densities were uniformly low on the continental slope at depths greater than 500 m and essentially zero at depths greater than 700 m. Mean weight generally increased with depth between 101 and 700 m (Table 3), as fish less than 40 cm FL were relatively rare at depths greater than 300 m (Fig. 3). A distinct length mode around 40 cm for males occurred at depths between 201 and 300 m in the Shumagin and Southeastern INPFC areas and at depths between 301 m and 1,000 m in the Southeastern and Yakutat INPFC areas. In addition, a length mode for females around 50-55 cm occurred in the Kodiak, Yakutat, and Southeastern INPFC areas between 301 and 1,000 m.

Table 3.-- Number of hauls, hauls with arrowtooth flounder, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	113	39.97	165,048	0.603	37.4
	101 - 200	36	36	30.64	44,970	0.496	35.8
	201 - 300	12	12	12.61	3,516	0.866	45.0
	301 - 500	9	9	5.09	1,288	1.157	48.2
	501 - 700	4	3	2.20	441	2.024	58.2
	701 - 1,000	2	1	0.09	17	0.441	39.0
	All Depths	180	174	33.00	215,278	0.582	37.2
Chirikof	1 - 100	71	54	74.20	193,178	0.517	36.8
	101 - 200	62	61	119.31	284,551	0.594	38.6
	201 - 300	25	25	66.73	77,044	1.040	46.9
	301 - 500	10	10	6.06	973	1.746	54.7
	501 - 700	6	3	0.49	96	2.232	59.4
	701 - 1,000	3	1	0.05	15	0.280	34.5
	All Depths	177	154	81.68	555,856	0.600	38.5
Kodiak	1 - 100	109	92	59.60	229,567	0.865	42.3
	101 - 200	139	139	133.25	577,389	0.750	41.7
	201 - 300	29	29	64.25	73,824	1.039	46.7
	301 - 500	8	7	15.23	4,435	1.415	51.4
	501 - 700	5	1	0.23	41	2.937	65.0
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	268	87.23	885,255	0.798	42.2
Yakutat	1 - 100	15	13	11.48	19,135	0.517	35.1
	101 - 200	42	42	43.66	128,295	0.566	36.6
	201 - 300	21	21	38.84	20,083	1.084	45.6
	301 - 500	8	8	11.07	2,910	1.124	48.2
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	84	29.80	170,423	0.598	37.1
Southeastern	1 - 100	9	5	0.89	583	0.474	29.9
	101 - 200	37	36	54.94	60,894	0.579	36.7
	201 - 300	32	32	10.12	5,115	0.860	42.6
	301 - 500	13	9	20.31	6,330	1.100	48.1
	501 - 700	4	1	0.35	36	1.813	57.5
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	83	26.02	72,958	0.618	37.5
All Areas	1 - 100	321	277	47.08	607,510	0.639	38.4
	101 - 200	316	314	89.61	1,096,099	0.656	39.5
	201 - 300	119	119	49.82	179,582	1.034	46.5
	301 - 500	48	43	12.46	15,934	1.212	49.2
	501 - 700	23	8	0.75	613	2.083	58.7
	701 - 1,000	12	2	0.03	32	0.347	36.4
	All Depths	839	763	59.37	1,899,770	0.676	39.6

All Areas and Depths Biomass, 95% confidence interval: 1,648,192 - 2,151,348 metric tons (t)

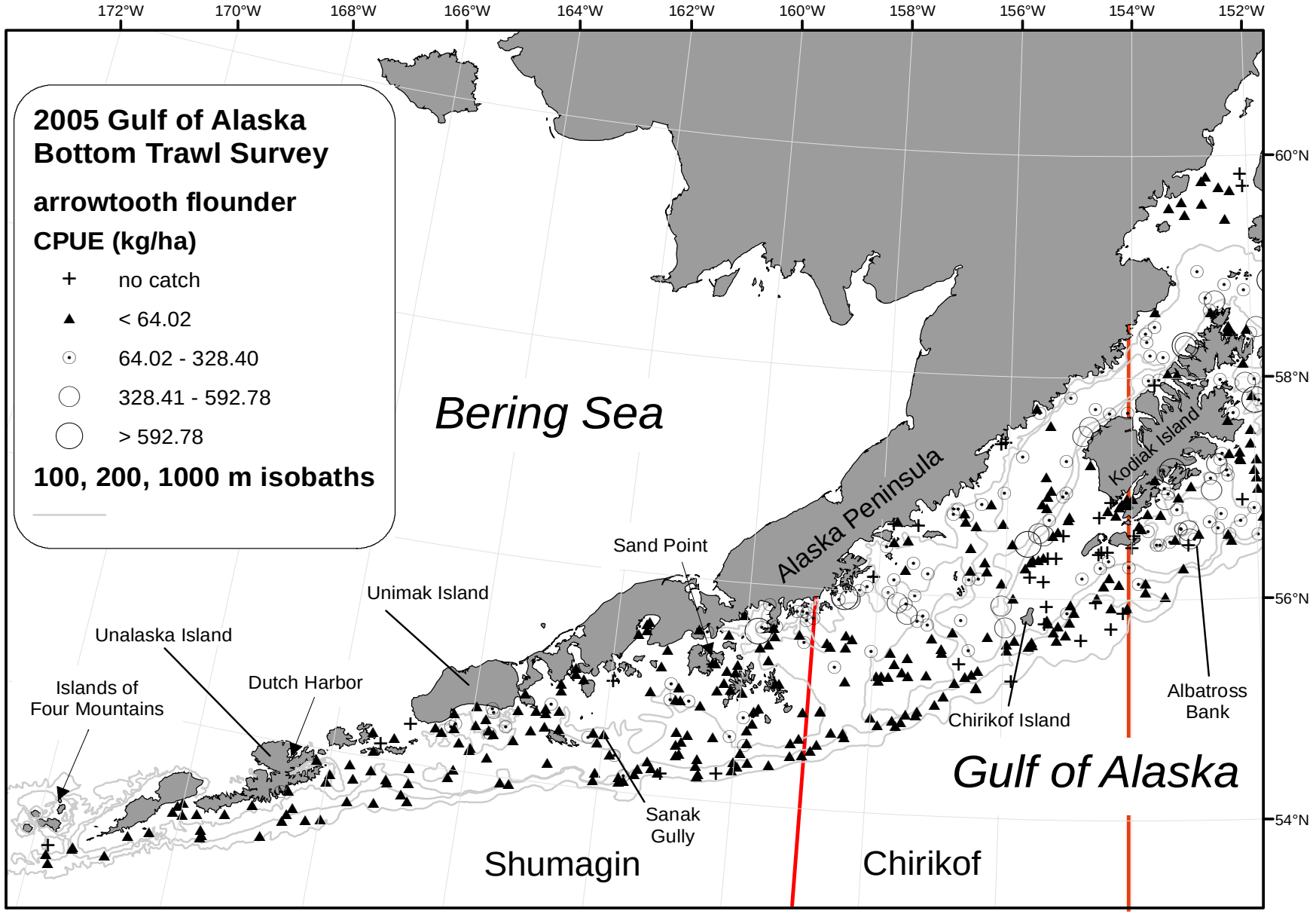

Figure 2 -- Distribution and relative abundance of arrowtooth flounder from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

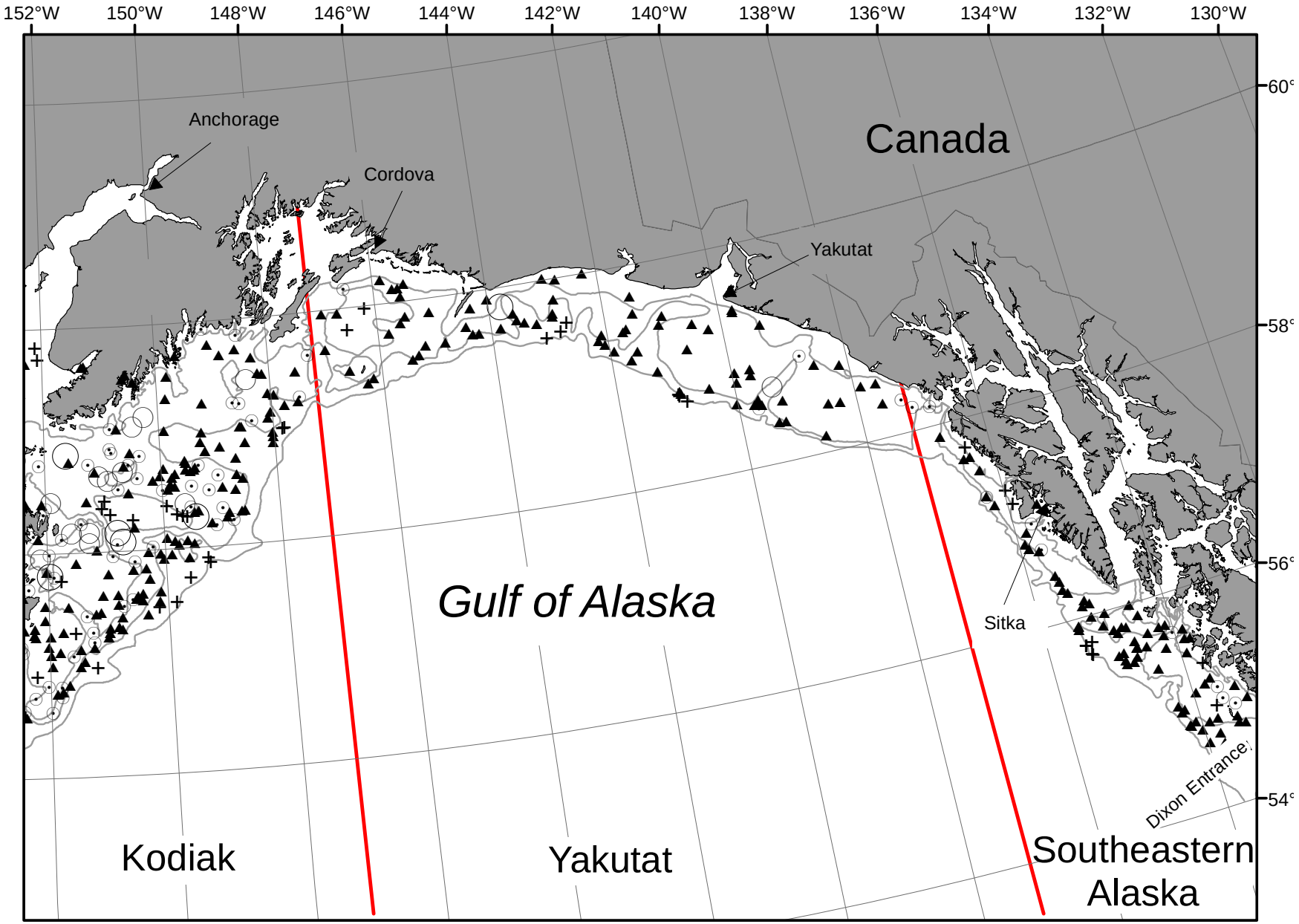

Figure 2 – Continued.

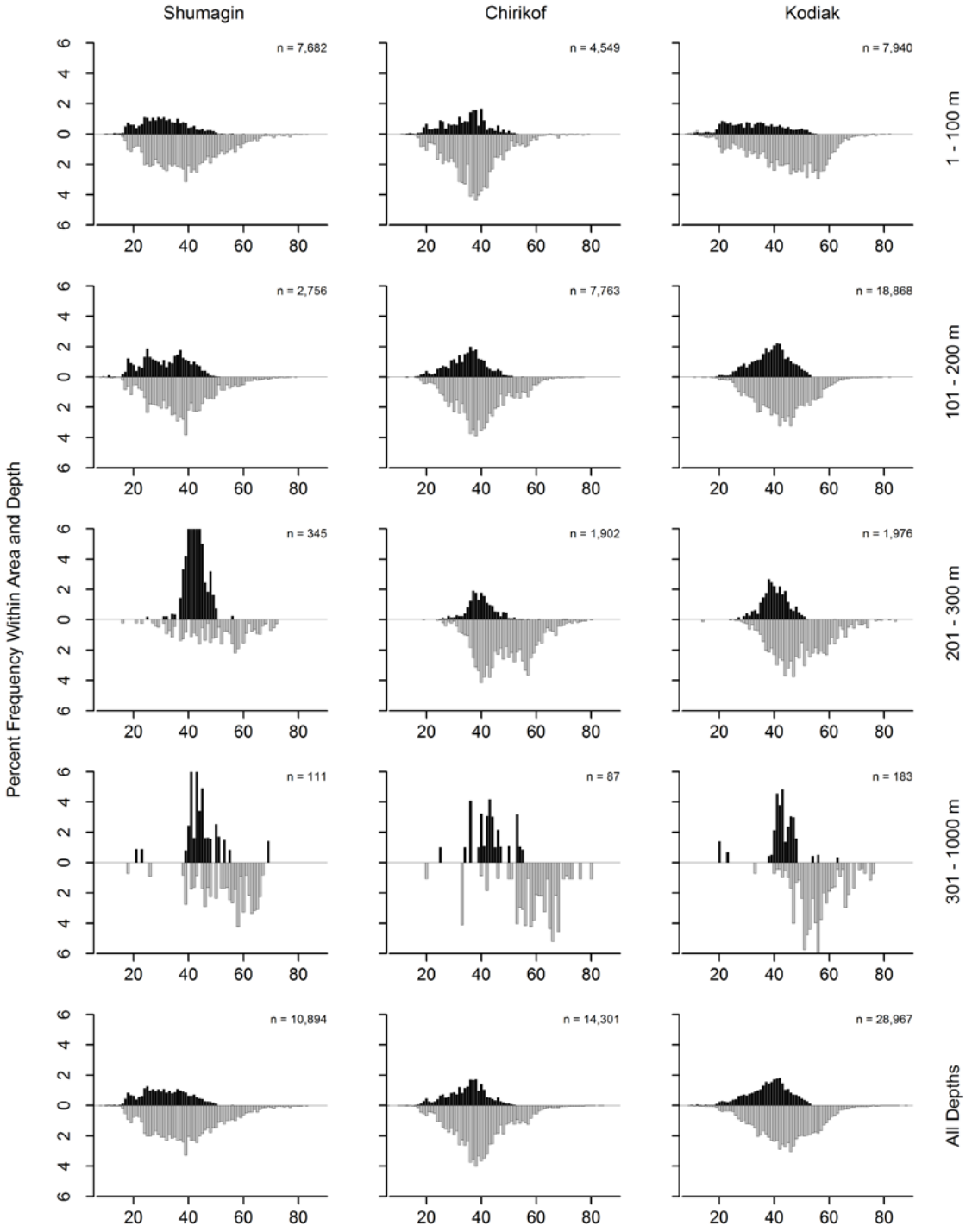

Figure 3. -- Size composition of arrowtooth flounder from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

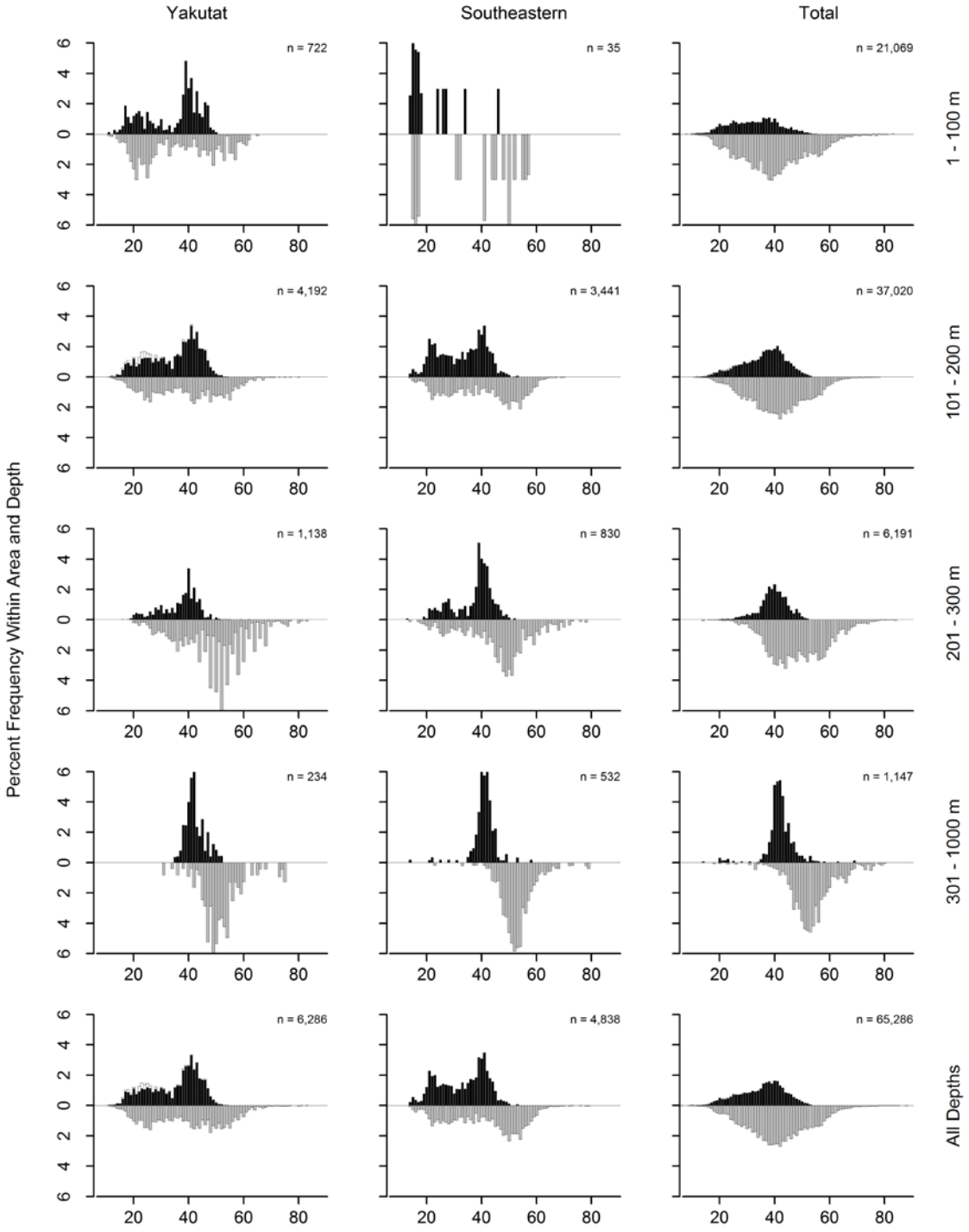

Figure 3. -- Continued (arrowtooth flounder).

Table 4. -- Catch per unit of effort by stratum for arrowtooth flounder sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Northern Kodiak Shallows	7	6	260.35	57,268	0	140,578
Kodiak	101 - 200	Albatross Gullies	32	32	217.27	171,895	103,740	240,050
Chirikof	101 - 200	Shelikof Edge	24	23	212.34	164,237	75,425	253,050
Kodiak	101 - 200	Barren Islands	16	16	169.20	185,799	87,227	284,371
Kodiak	1 - 100	Albatross Shallows	34	33	165.82	95,614	53,929	137,299
Chirikof	1 - 100	Upper Alaska Peninsula	15	10	133.13	105,716	6,980	204,452
Kodiak	101 - 200	Kenai Flats	22	22	105.66	127,604	61,829	193,379
Shumagin	1 - 100	Lower Alaska Peninsula	27	26	101.06	69,484	16,540	122,429
Yakutat	101 - 200	Yakataga Shelf	8	8	97.89	51,652	0	158,511
Chirikof	101 - 200	East Shumagin Gully	18	18	95.38	105,906	56,714	155,098
Kodiak	201 - 300	Upper Shelikof Gully	3	3	91.96	29,504	0	72,322
Kodiak	101 - 200	Portlock Flats	41	41	84.59	62,062	28,741	95,383
Chirikof	201 - 300	Lower Shelikof Gully	17	17	75.51	75,649	46,716	104,582
Chirikof	1 - 100	Semidi Bank	19	19	74.69	54,540	4,775	104,305
Kodiak	101 - 200	Kodiak Outer Shelf	28	28	59.75	30,029	16,154	43,905
Kodiak	201 - 300	Kenai Gullies	20	20	59.60	39,690	6,045	73,336
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	11	55.56	23,315	2,778	43,853
Yakutat	201 - 300	Yakutat Gullies	8	8	54.96	16,721	0	46,164
Southeastern	101 - 200	Prince of Wales Shelf	26	25	54.56	37,579	16,179	58,979
Shumagin	101 - 200	West Shumagin Gully	4	4	48.48	11,046	506	21,585
Yakutat	101 - 200	Middleton Shelf	12	12	44.45	32,652	14,593	50,710
Shumagin	101 - 200	Sanak Gully	11	11	41.52	17,627	5,156	30,098
Kodiak	1 - 100	Albatross Banks	49	36	37.21	57,315	24,795	89,835
Southeastern	301 - 500	Southeastern Slope	4	4	34.67	2,679	0	6,849
Shumagin	1 - 100	Davidson Bank	37	36	32.17	44,013	26,025	62,001
Shumagin	1 - 100	Shumagin Bank	31	31	30.85	38,247	18,292	58,202
Chirikof	1 - 100	Chirikof Bank	37	25	30.51	32,922	4,823	61,020
Chirikof	101 - 200	Chirikof Outer Shelf	20	20	28.75	14,408	8,388	20,428
Kodiak	201 - 300	Kodiak Slope	6	6	28.53	4,629	1,066	8,193
Yakutat	101 - 200	Yakutat Flats	11	11	26.66	24,077	0	50,259
Yakutat	101 - 200	Fairweather Shelf	11	11	25.77	19,915	5,813	34,017
Kodiak	1 - 100	Kenai Peninsula	6	6	23.02	12,107	5,451	18,763
Shumagin	101 - 200	Shumagin Outer Shelf	21	21	19.99	16,298	6,595	26,001
Yakutat	301 - 500	Yakutat Slope	6	6	17.24	2,622	1,269	3,974
Shumagin	1 - 100	Fox Islands	22	20	15.97	13,303	4,936	21,671
Yakutat	201 - 300	Yakutat Slope	13	13	15.80	3,362	810	5,914
Yakutat	1 - 100	Yakutat Shallows	8	8	15.73	15,645	3,100	28,190
Southeastern	301 - 500	Southeastern Deep Gullies	9	5	15.57	3,651	0	7,564
Kodiak	301 - 500	Kodiak Slope	8	7	15.23	4,435	47	8,823
Shumagin	201 - 300	Shumagin Slope	12	12	12.61	3,516	1,314	5,718
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	10.92	1,229	318	2,141
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	27	9.89	3,886	2,489	5,282
Chirikof	201 - 300	Chirikof Slope	8	8	9.13	1,396	898	1,893
Kodiak	1 - 100	Lower Cook Inlet	13	11	7.35	7,264	1,361	13,167
Chirikof	301 - 500	Chirikof Slope	10	10	6.06	973	0	2,255
Yakutat	1 - 100	Middleton Shallows	7	5	5.20	3,490	0	7,142
Shumagin	301 - 500	Shumagin Slope	9	9	5.09	1,288	299	2,276
Yakutat	301 - 500	Yakutat Gullies	2	2	2.60	288	119	458
Shumagin	501 - 700	Shumagin Slope	4	3	2.20	441	0	1,006
Southeastern	1 - 100	Southeastern Shallows	9	5	0.89	583	0	1,685
Chirikof	501 - 700	Chirikof Slope	6	3	0.49	96	0	219
Southeastern	501 - 700	Southeastern Slope	4	1	0.35	36	0	152
Kodiak	501 - 700	Kodiak Slope	5	1	0.23	41	0	153
Shumagin	701 - 1000	Shumagin Slope	2	1	0.09	17	0	228
Chirikof	701 - 1000	Chirikof Slope	3	1	0.05	15	0	80

Pacific halibut (*Hippoglossus stenolepis*)

Pacific halibut was the fourth most abundant species caught in the 2005 survey (Table 2) with the third highest mean CPUE in the Yakutat INPFC area. Pacific halibut were particularly abundant at depths less than 100 m where they were caught in approximately 94% of the tows, and 78% of the estimated halibut biomass was found at these depths(Table 5). The highest CPUEs were found at this depth range in all INPFC areas. The frequency of occurrence of Pacific halibut in tows decreased from west to east, ranging from about 84% of the tows in the Shumagin INPFC area to 52% of the tows in the Southeastern INPFC area. The highest densities were recorded on Albatross Banks northeast of Kodiak Island, in the Northern Kodiak Shallows stratum, and in the southeastern shallows in the Southeastern INPFC (Fig. 4 and Table 6). Most halibut were not sexed prior to length measurement. A pronounced length mode around 57 cm was noted in the shallowest depth zone of the Shumagin, Chirikof, and Kodiak INPFC areas, and around 62 cm in the Southeastern INPFC area in waters between 1 and 200 m (Fig. 5).

Table 5.-- Number of hauls, hauls with Pacific halibut, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	117	24.04	99,240	2.185	52.7
	101 - 200	36	27	6.92	10,150	2.854	64.4
	201 - 300	12	6	2.47	689	6.371	78.5
	301 - 500	9	2	4.19	1,061	8.991	89.8
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	152	17.04	111,140	2.258	53.7
Chirikof	1 - 100	71	71	25.52	66,431	1.957	52.0
	101 - 200	62	46	6.34	15,116	5.201	71.8
	201 - 300	25	13	4.18	4,826	8.141	85.1
	301 - 500	10	4	3.03	487	10.178	92.9
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	134	12.76	86,859	2.317	54.1
Kodiak	1 - 100	109	98	59.05	227,445	3.173	61.0
	101 - 200	139	110	11.49	49,806	5.799	75.6
	201 - 300	29	12	2.65	3,042	6.127	75.8
	301 - 500	8	1	0.81	236	8.202	86.5
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	221	27.64	280,530	3.473	62.6
Yakutat	1 - 100	15	10	14.68	24,453	4.048	65.4
	101 - 200	42	19	5.82	17,104	4.465	70.0
	201 - 300	21	8	2.43	1,259	6.813	78.8
	301 - 500	8	4	4.33	1,138	14.459	99.3
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	41	7.68	43,953	4.337	67.6
Southeastern	1 - 100	9	8	41.11	26,914	2.620	60.7
	101 - 200	37	29	12.62	13,988	3.301	63.9
	201 - 300	32	13	2.45	1,239	9.236	82.9
	301 - 500	13	1	1.09	339	26.796	127.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	51	15.15	42,480	2.898	61.9
All Areas	1 - 100	321	304	34.44	444,483	2.656	57.0
	101 - 200	316	231	8.68	106,164	4.592	70.3
	201 - 300	119	52	3.07	11,054	7.290	80.6
	301 - 500	48	12	2.55	3,260	11.403	94.2
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	599	17.65	564,961	2.938	58.9

All Areas and Depths Biomass, 95% confidence interval: 422,709 - 707,214 metric tons (t)

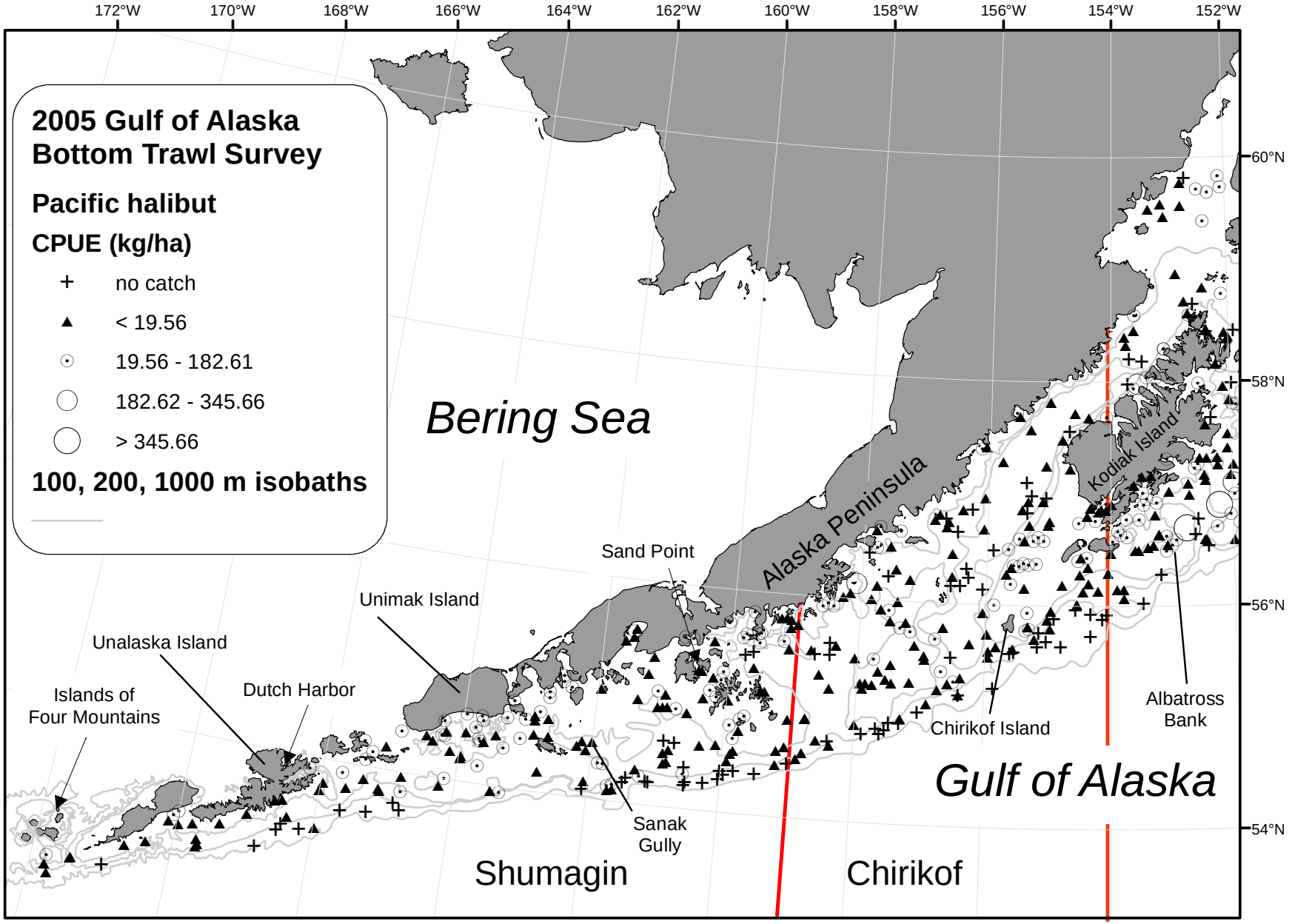

Figure 4. -- Distribution and relative abundance of Pacific halibut from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

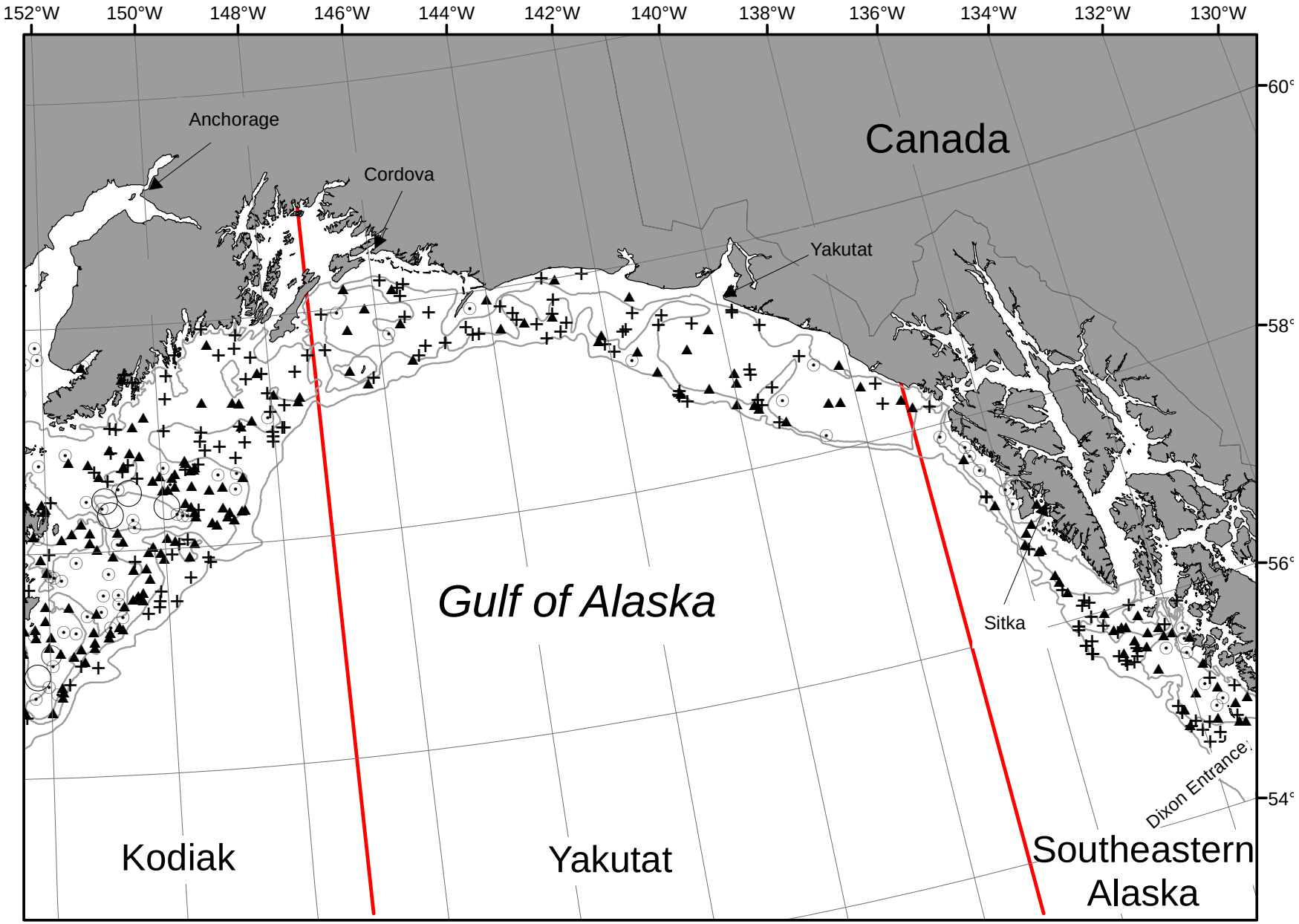

Figure 4 – Continued.

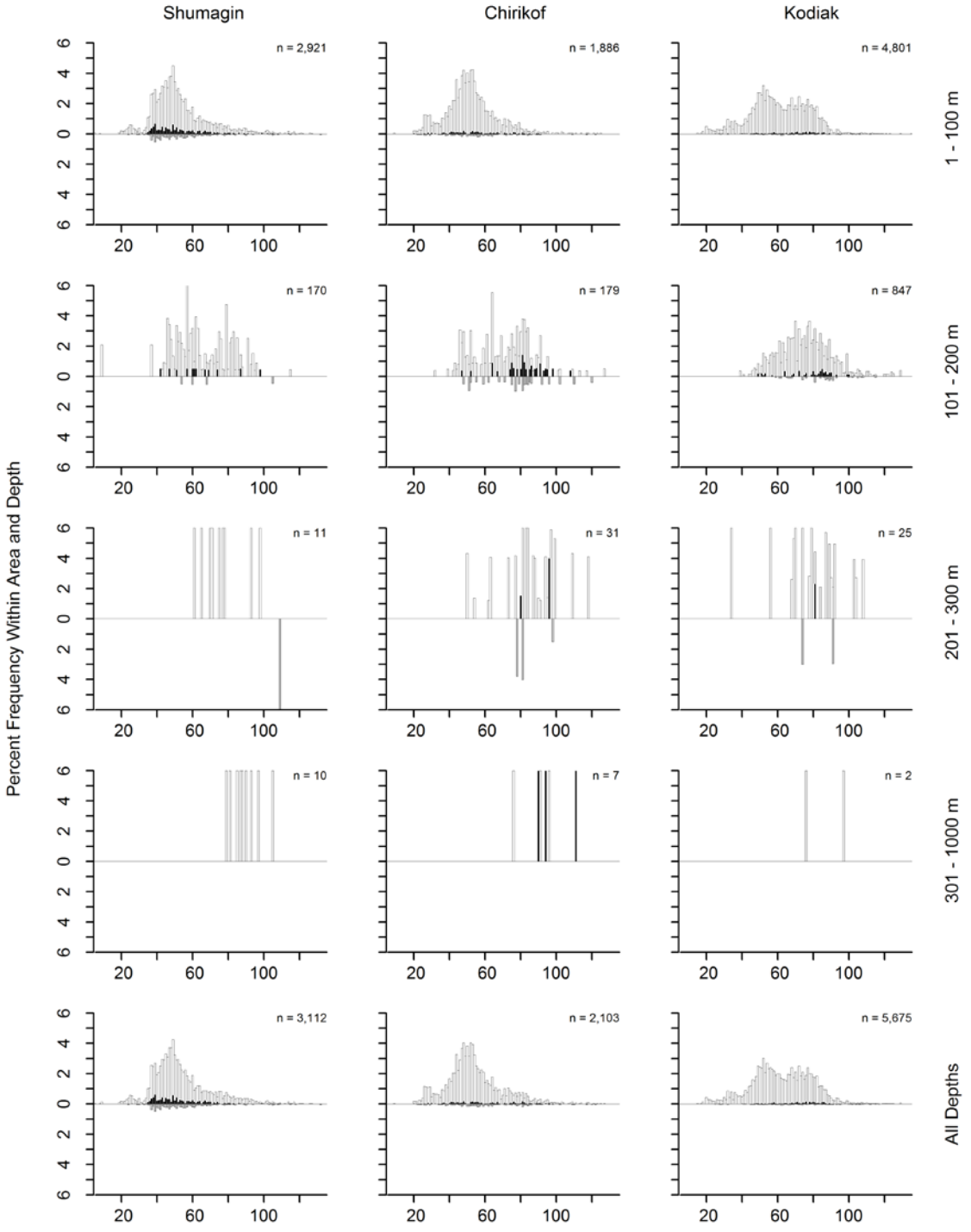

Figure 5. -- Size composition of Pacific halibut from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

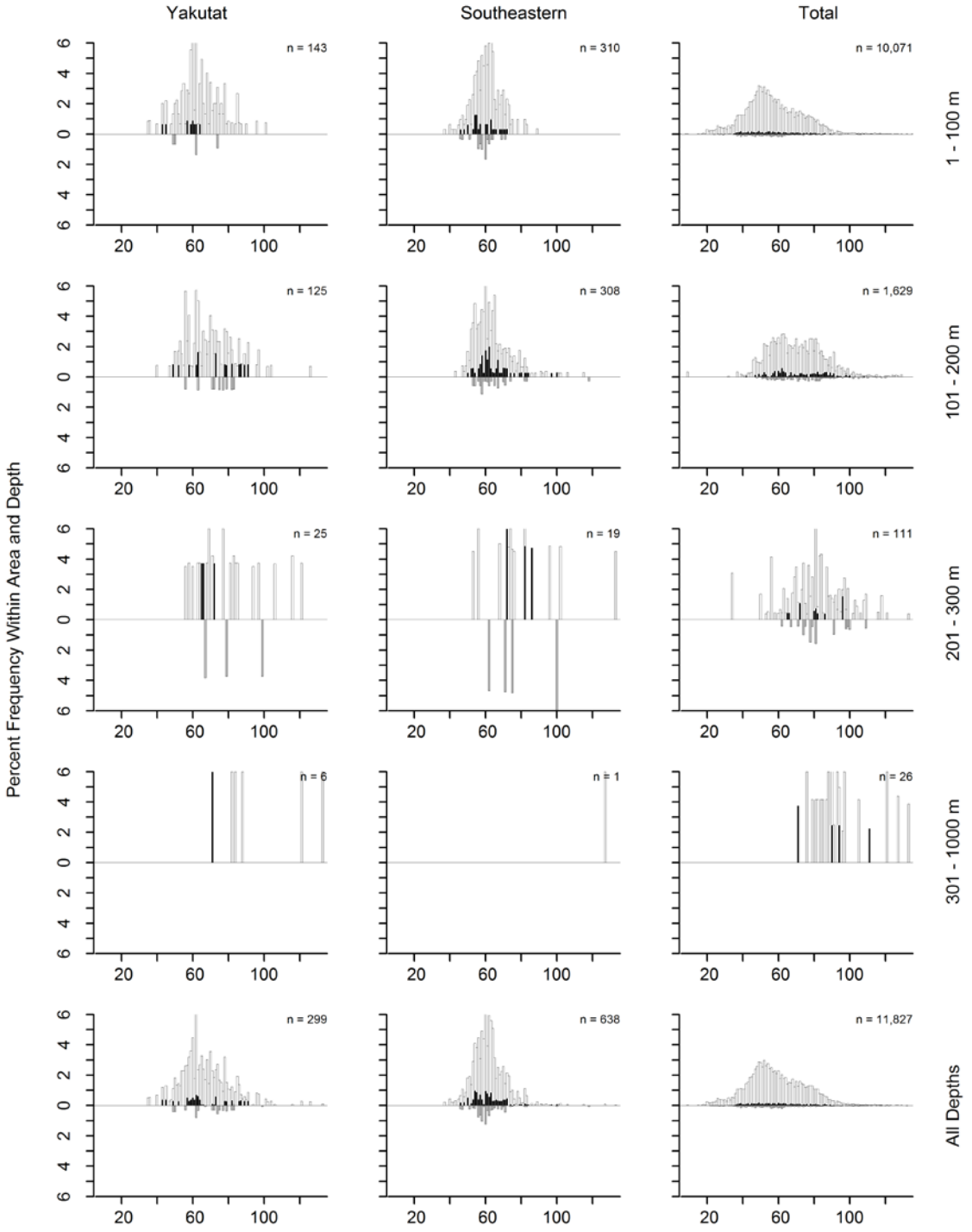

Figure 5. – Continued (Pacific halibut).

Table 6. -- Catch per unit of effort by stratum for Pacific halibut sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Albatross Banks	49	49	117.51	180,996	50,282	311,710
Kodiak	1 - 100	Northern Kodiak Shallows	7	7	66.88	14,711	1,509	27,913
Southeastern	1 - 100	Southeastern Shallows	9	8	41.11	26,914	332	53,496
Chirikof	1 - 100	Upper Alaska Peninsula	15	15	39.49	31,358	1,231	61,485
Shumagin	1 - 100	Lower Alaska Peninsula	27	27	30.57	21,021	15,737	26,304
Yakutat	1 - 100	Middleton Shallows	7	5	30.22	20,292	0	51,862
Kodiak	101 - 200	Portlock Flats	41	35	29.77	21,837	0	49,290
Shumagin	1 - 100	Davidson Bank	37	37	28.72	39,295	28,712	49,878
Chirikof	1 - 100	Chirikof Bank	37	37	23.05	24,875	18,860	30,890
Kodiak	1 - 100	Albatross Shallows	34	29	21.80	12,573	8,405	16,740
Shumagin	1 - 100	Fox Islands	22	22	18.79	15,655	9,244	22,067
Shumagin	1 - 100	Shumagin Bank	31	31	18.77	23,269	16,538	30,000
Kodiak	1 - 100	Lower Cook Inlet	13	12	18.66	18,447	7,114	29,780
Yakutat	101 - 200	Fairweather Shelf	11	9	14.29	11,043	4,855	17,231
Chirikof	1 - 100	Semidi Bank	19	19	13.97	10,198	7,969	12,427
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	10	13.69	5,745	0	13,128
Kodiak	101 - 200	Albatross Gullies	32	28	12.30	9,729	4,316	15,141
Southeastern	101 - 200	Prince of Wales Shelf	26	19	11.97	8,244	2,360	14,128
Chirikof	101 - 200	Shelikof Edge	24	17	10.13	7,837	3,187	12,487
Kodiak	101 - 200	Kodiak Outer Shelf	28	26	9.82	4,933	3,376	6,490
Kodiak	101 - 200	Barren Islands	16	12	9.11	10,000	4,186	15,813
Shumagin	101 - 200	Shumagin Outer Shelf	21	16	7.55	6,156	2,139	10,172
Shumagin	101 - 200	Sanak Gully	11	9	7.30	3,098	1,341	4,854
Chirikof	101 - 200	Chirikof Outer Shelf	20	16	6.80	3,407	1,578	5,236
Yakutat	201 - 300	Yakutat Slope	13	7	5.63	1,197	0	2,423
Chirikof	201 - 300	Chirikof Slope	8	5	4.46	681	139	1,223
Yakutat	301 - 500	Yakutat Gullies	2	1	4.39	486	0	6,661
Yakutat	101 - 200	Yakutat Flats	11	5	4.37	3,949	661	7,237
Yakutat	301 - 500	Yakutat Slope	6	3	4.28	652	0	1,624
Shumagin	301 - 500	Shumagin Slope	9	2	4.19	1,061	0	3,234
Yakutat	1 - 100	Yakutat Shallows	8	5	4.18	4,161	0	10,340
Chirikof	201 - 300	Lower Shelikof Gully	17	8	4.14	4,145	1,295	6,994
Shumagin	101 - 200	West Shumagin Gully	4	2	3.94	897	0	2,770
Chirikof	101 - 200	East Shumagin Gully	18	13	3.49	3,872	1,582	6,162
Kodiak	201 - 300	Kodiak Slope	6	2	3.07	498	0	1,569
Yakutat	101 - 200	Yakataga Shelf	8	2	3.03	1,601	0	4,333
Chirikof	301 - 500	Chirikof Slope	10	4	3.03	487	0	1,113
Kodiak	101 - 200	Kenai Flats	22	9	2.74	3,308	1,048	5,568
Kodiak	201 - 300	Kenai Gullies	20	7	2.70	1,799	112	3,486
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	10	2.58	1,014	136	1,891
Shumagin	201 - 300	Shumagin Slope	12	6	2.47	689	48	1,331
Kodiak	201 - 300	Upper Shelikof Gully	3	3	2.33	746	0	1,922
Southeastern	201 - 300	Baranof-Chichagof Slope	5	3	2.00	225	0	575
Southeastern	301 - 500	Southeastern Deep Gullies	9	1	1.45	339	0	1,122
Kodiak	1 - 100	Kenai Peninsula	6	1	1.37	718	0	2,565
Kodiak	301 - 500	Kodiak Slope	8	1	0.81	236	0	795
Yakutat	101 - 200	Middleton Shelf	12	3	0.70	511	0	1,293
Yakutat	201 - 300	Yakutat Gullies	8	1	0.20	62	0	208

Flathead sole (*Hippoglossoides elassodon*)

Flathead sole was the ninth most abundant species caught in the 2005 survey (Table 2). The population was primarily concentrated in bays around Kodiak Island and along the Alaska Peninsula near the Shumagin Islands, with 97% of the estimated biomass in waters less than 200 m deep and almost none found below 300 m (Fig. 6 and Tables 7-8). Although the mean CPUE was considerably higher in the Albatross Shallows and Lower Alaska Peninsula than in any of the other strata, the biomass of flathead sole was not predominant in any individual stratum. Only about 5% of the estimated biomass was found in the Yakutat and Southeastern INPFC areas even though those areas account for 27% of the total survey area. The mean weight of flathead sole increased overall with depth. (Table 7). The length frequency data showed a mode in males around 28-30 cm while females appeared slightly larger with a mode close to 32-35 cm in the Shumagin, Chirikof and Kodiak INPFC areas in waters between 1 and 200 m (Fig. 7).

Table 7.-- Number of hauls, hauls with flathead sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	86	12.48	51,541	0.273	29.3
	101 - 200	36	24	5.32	7,805	0.194	26.4
	201 - 300	12	4	0.40	112	0.237	28.4
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	114	9.12	59,458	0.259	28.8
Chirikof	1 - 100	71	35	5.93	15,447	0.314	30.8
	101 - 200	62	49	16.22	38,693	0.258	29.2
	201 - 300	25	17	1.81	2,089	0.390	34.7
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	101	8.26	56,229	0.275	29.7
Kodiak	1 - 100	109	54	11.90	45,847	0.313	30.8
	101 - 200	139	74	8.54	37,006	0.336	32.0
	201 - 300	29	18	2.58	2,961	0.345	32.2
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	146	8.46	85,814	0.324	31.4
Yakutat	1 - 100	15	11	1.12	1,860	0.189	25.4
	101 - 200	42	24	3.15	9,257	0.223	27.1
	201 - 300	21	8	0.25	131	0.212	27.4
	301 - 500	8	1	0.58	151	0.568	38.3
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	44	1.99	11,400	0.218	26.9
Southeastern	1 - 100	9	1	0.31	200	0.159	26.3
	101 - 200	37	8	0.10	108	0.200	26.8
	201 - 300	32	1	0.01	3	0.163	24.7
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	10	0.11	312	0.171	26.4
All Areas	1 - 100	321	187	8.90	114,895	0.290	29.9
	101 - 200	316	179	7.59	92,869	0.272	29.5
	201 - 300	119	48	1.47	5,297	0.352	32.8
	301 - 500	48	1	0.12	151	0.568	38.3
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	415	6.66	213,213	0.283	29.8

All Areas and Depths Biomass, 95% confidence interval: 179,663 - 246,762 metric tons (t)

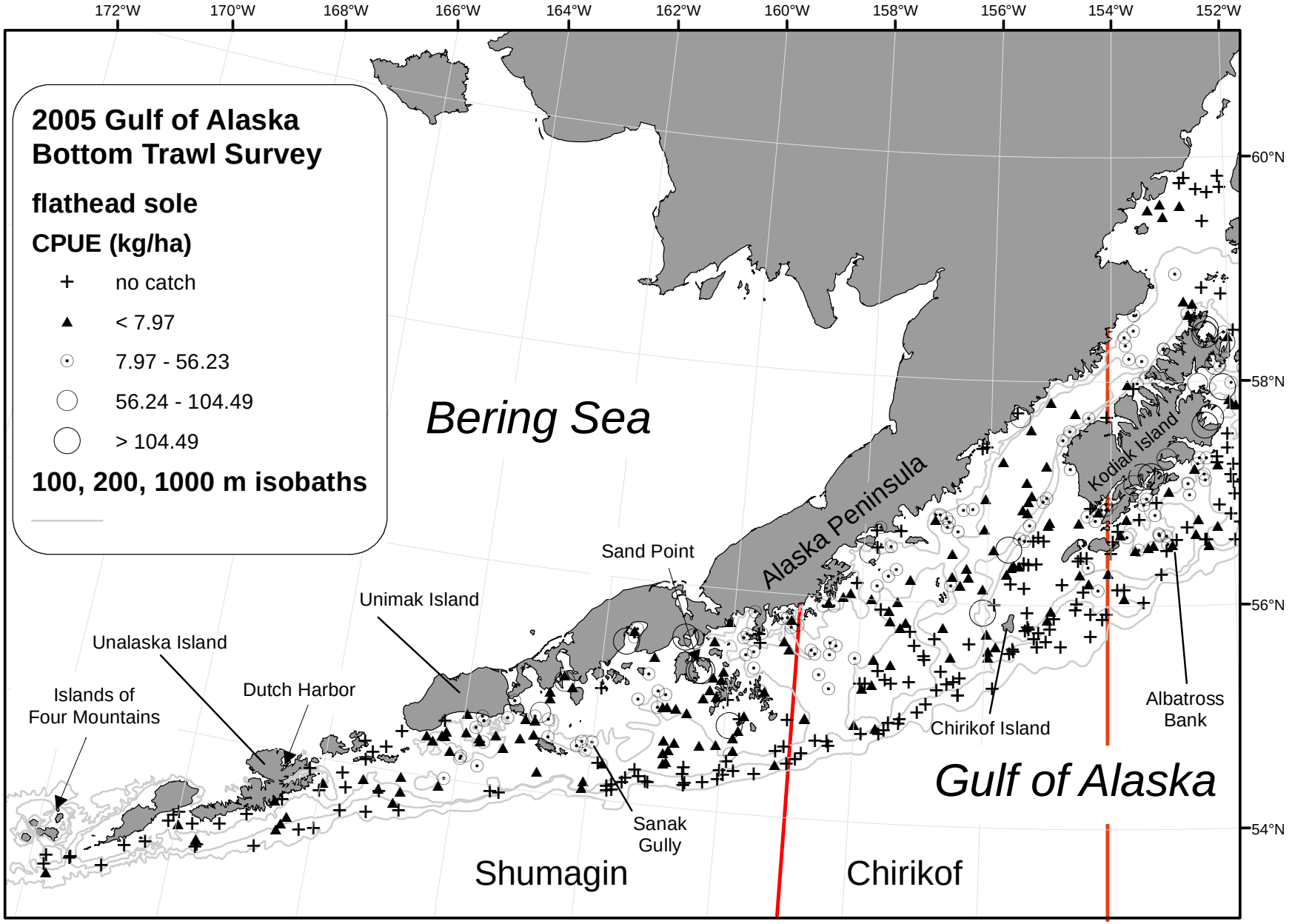

Figure 6. -- Distribution and relative abundance of flathead sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

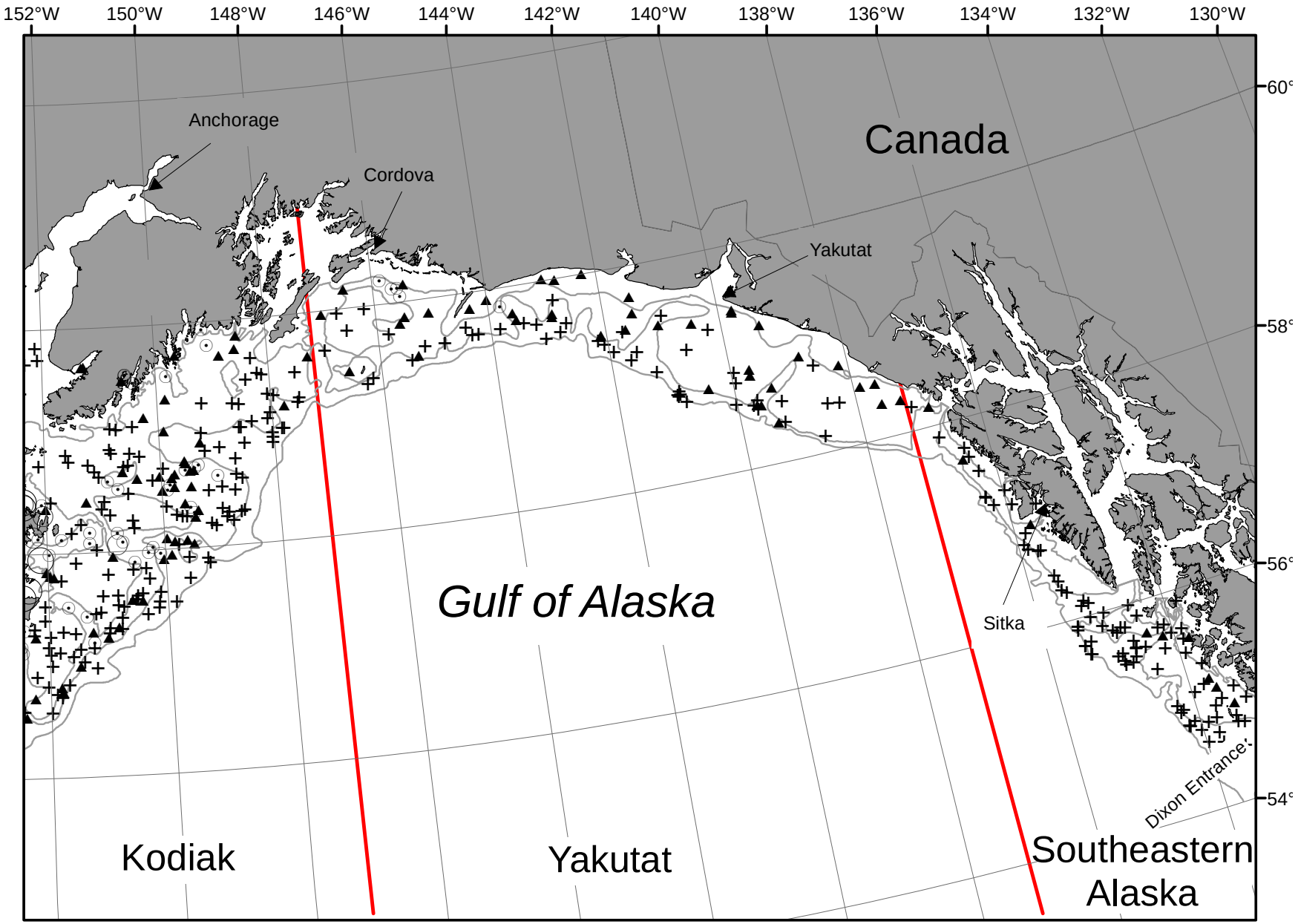

Figure 6. -- Continued.

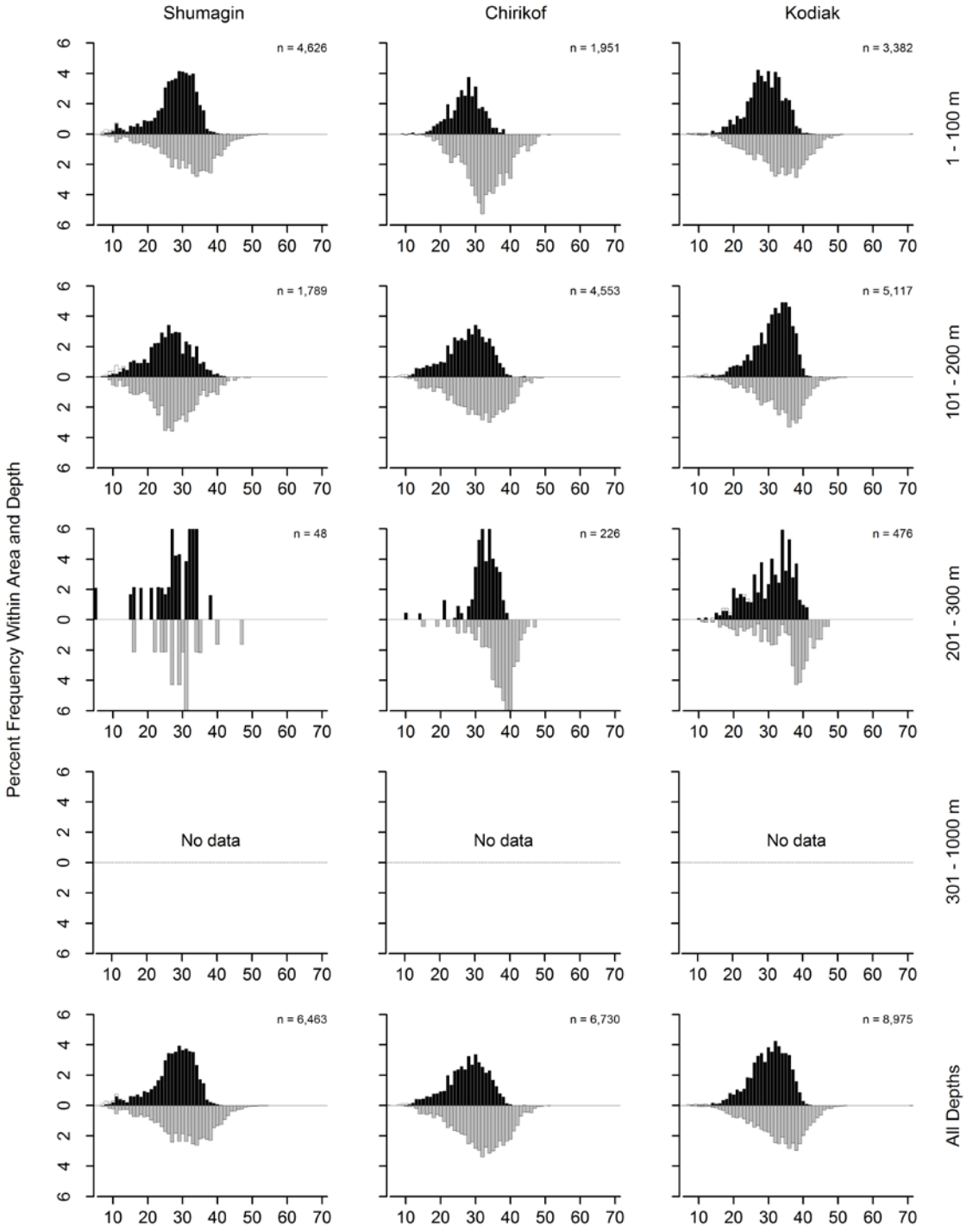

Figure 7. -- Size composition of flathead sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

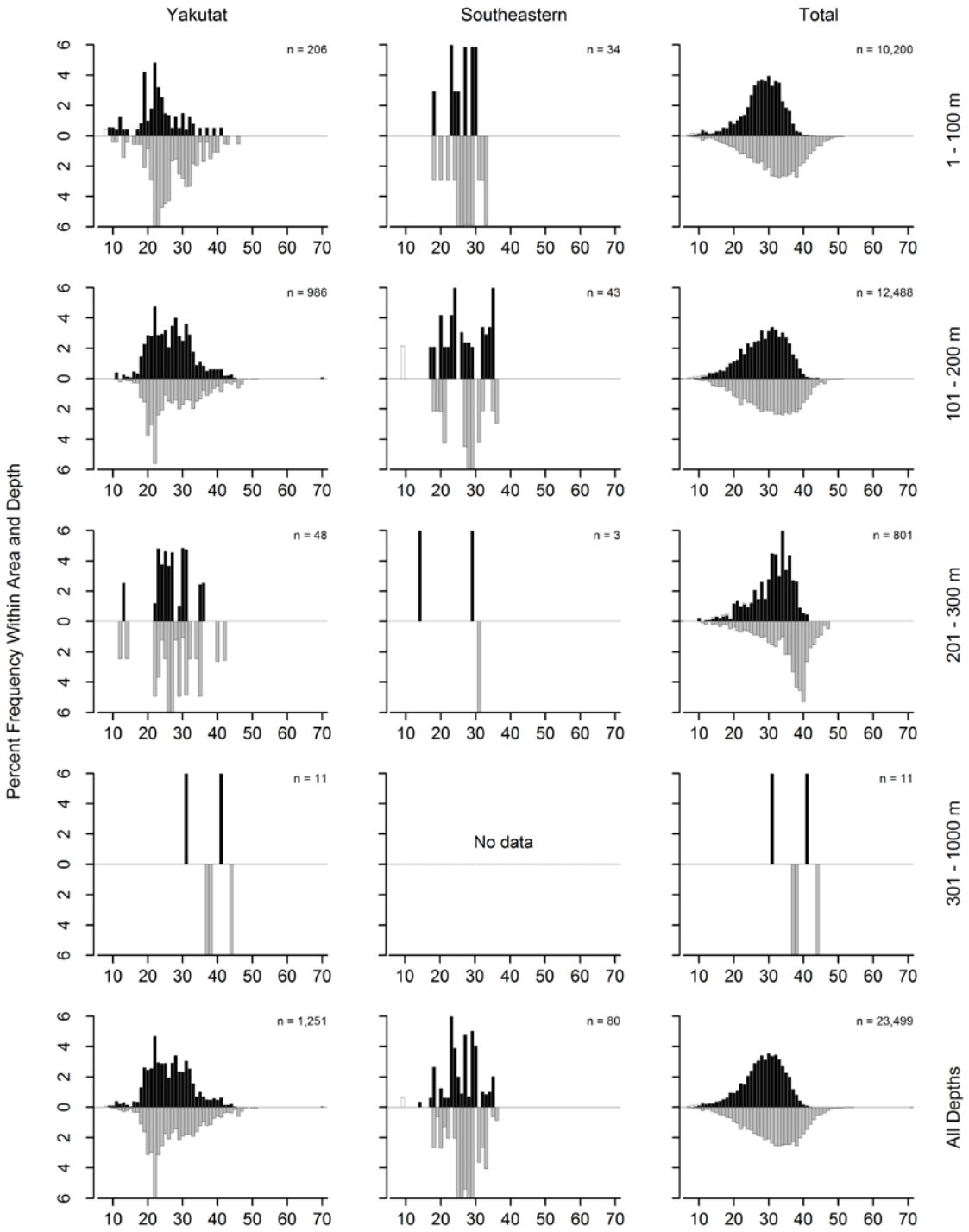

Figure 7. -- Continued (flathead sole).

Table 8. -- Catch per unit of effort by stratum for flathead sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Albatross Shallows	34	28	53.16	30,652	15,735	45,568
Shumagin	1 - 100	Lower Alaska Peninsula	27	24	30.20	20,762	7,822	33,703
Kodiak	1 - 100	Northern Kodiak Shallows	7	5	25.07	5,514	591	10,437
Chirikof	101 - 200	Shelikof Edge	24	22	25.05	19,377	8,539	30,215
Kodiak	101 - 200	Albatross Gullies	32	26	21.91	17,333	9,046	25,620
Shumagin	1 - 100	Shumagin Bank	31	26	17.79	22,060	5,821	38,299
Chirikof	101 - 200	East Shumagin Gully	18	18	16.75	18,601	11,427	25,774
Kodiak	1 - 100	Kenai Peninsula	6	5	12.08	6,355	0	12,745
Chirikof	1 - 100	Upper Alaska Peninsula	15	8	11.22	8,909	202	17,615
Kodiak	101 - 200	Barren Islands	16	9	10.59	11,633	1,671	21,595
Shumagin	101 - 200	West Shumagin Gully	4	4	10.16	2,314	722	3,906
Shumagin	101 - 200	Sanak Gully	11	11	9.47	4,022	2,114	5,929
Yakutat	101 - 200	Middleton Shelf	12	9	8.04	5,907	520	11,295
Shumagin	1 - 100	Davidson Bank	37	32	6.27	8,572	5,000	12,144
Chirikof	1 - 100	Chirikof Bank	37	19	5.78	6,235	2,842	9,628
Yakutat	101 - 200	Yakataga Shelf	8	4	5.09	2,687	0	8,375
Kodiak	101 - 200	Portlock Flats	41	22	4.37	3,208	1,892	4,523
Kodiak	101 - 200	Kenai Flats	22	9	3.62	4,373	663	8,083
Kodiak	201 - 300	Upper Shelikof Gully	3	3	3.38	1,083	0	2,582
Kodiak	201 - 300	Kenai Gullies	20	13	2.65	1,767	391	3,143
Chirikof	201 - 300	Lower Shelikof Gully	17	16	2.09	2,088	1,108	3,069
Shumagin	101 - 200	Shumagin Outer Shelf	21	9	1.80	1,470	0	3,619
Kodiak	1 - 100	Albatross Banks	49	10	1.63	2,514	0	5,033
Chirikof	101 - 200	Chirikof Outer Shelf	20	9	1.43	715	0	1,664
Yakutat	301 - 500	Yakutat Gullies	2	1	1.37	151	0	2,073
Yakutat	1 - 100	Yakutat Shallows	8	8	1.18	1,176	180	2,173
Yakutat	1 - 100	Middleton Shallows	7	3	1.02	684	0	1,756
Kodiak	101 - 200	Kodiak Outer Shelf	28	8	0.91	459	0	1,030
Kodiak	1 - 100	Lower Cook Inlet	13	6	0.82	813	0	1,952
Kodiak	201 - 300	Kodiak Slope	6	2	0.68	111	0	293
Yakutat	101 - 200	Yakutat Flats	11	7	0.62	559	0	1,675
Chirikof	1 - 100	Semidi Bank	19	8	0.42	304	0	650
Shumagin	201 - 300	Shumagin Slope	12	4	0.40	112	0	249
Yakutat	201 - 300	Yakutat Gullies	8	5	0.39	118	0	273
Southeastern	1 - 100	Southeastern Shallows	9	1	0.31	200	0	663
Shumagin	1 - 100	Fox Islands	22	4	0.18	146	0	362
Yakutat	101 - 200	Fairweather Shelf	11	4	0.14	104	0	241
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	3	0.10	41	0	105
Southeastern	101 - 200	Prince of Wales Shelf	26	5	0.10	67	0	154
Yakutat	201 - 300	Yakutat Slope	13	3	0.06	13	0	30
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	1	0.01	3	0	10
Chirikof	201 - 300	Chirikof Slope	8	1	0.01	1	0	3

Southern rock sole (*Lepidopsetta bilineata*)

Southern rock sole was the eleventh most abundant species caught in the 2005 survey (Table 2). The population was primarily confined to water depths less than 100 m in the Shumagin, Chirikof, and Kodiak INPFC areas which constituted 90% of the estimated biomass even though it made up only 33% of the survey area (Table 9). The highest concentrations occurred in bays around Kodiak Island and around the Shumagin Islands (Table 10 and Fig. 8). The CPUEs were generally very low in the Yakutat and Southeastern areas with only one stratum in the Southeastern INPFC area (Southeastern Shallows) having a relatively high catch rate of 11.25 kg/ha (Table 10). A relatively prominent length mode around 35 cm for males occurred in the shallowest depth zone of the Kodiak INPFC area and at 42-45 cm for females in the Shumagin INPFC area (Fig. 9).

Table 9.-- Number of hauls, hauls with southern rock sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	103	14.90	61,501	0.625	35.2
	101 - 200	36	17	1.69	2,474	0.817	39.1
	201 - 300	12	1	0.02	5	0.340	31.0
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	121	9.81	63,980	0.631	35.3
Chirikof	1 - 100	71	57	9.63	25,065	0.696	36.0
	101 - 200	62	9	0.10	233	0.820	39.1
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	66	3.72	25,298	0.697	36.0
Kodiak	1 - 100	109	83	11.97	46,120	0.595	34.0
	101 - 200	139	31	0.74	3,200	0.680	36.7
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	114	4.86	49,320	0.600	34.2
Yakutat	1 - 100	15	5	0.82	1,372	0.793	38.3
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	5	0.24	1,372	0.793	38.3
Southeastern	1 - 100	9	9	11.25	7,367	0.418	30.2
	101 - 200	37	9	0.32	356	0.452	31.8
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	18	2.75	7,724	0.420	30.3
All Areas	1 - 100	321	257	10.96	141,425	0.612	34.6
	101 - 200	316	66	0.51	6,263	0.711	37.2
	201 - 300	119	1	Trace	5	0.340	31.0
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	324	4.62	147,693	0.615	34.7

All Areas and Depths Biomass, 95% confidence interval: 117,527 - 177,859 metric tons (t)

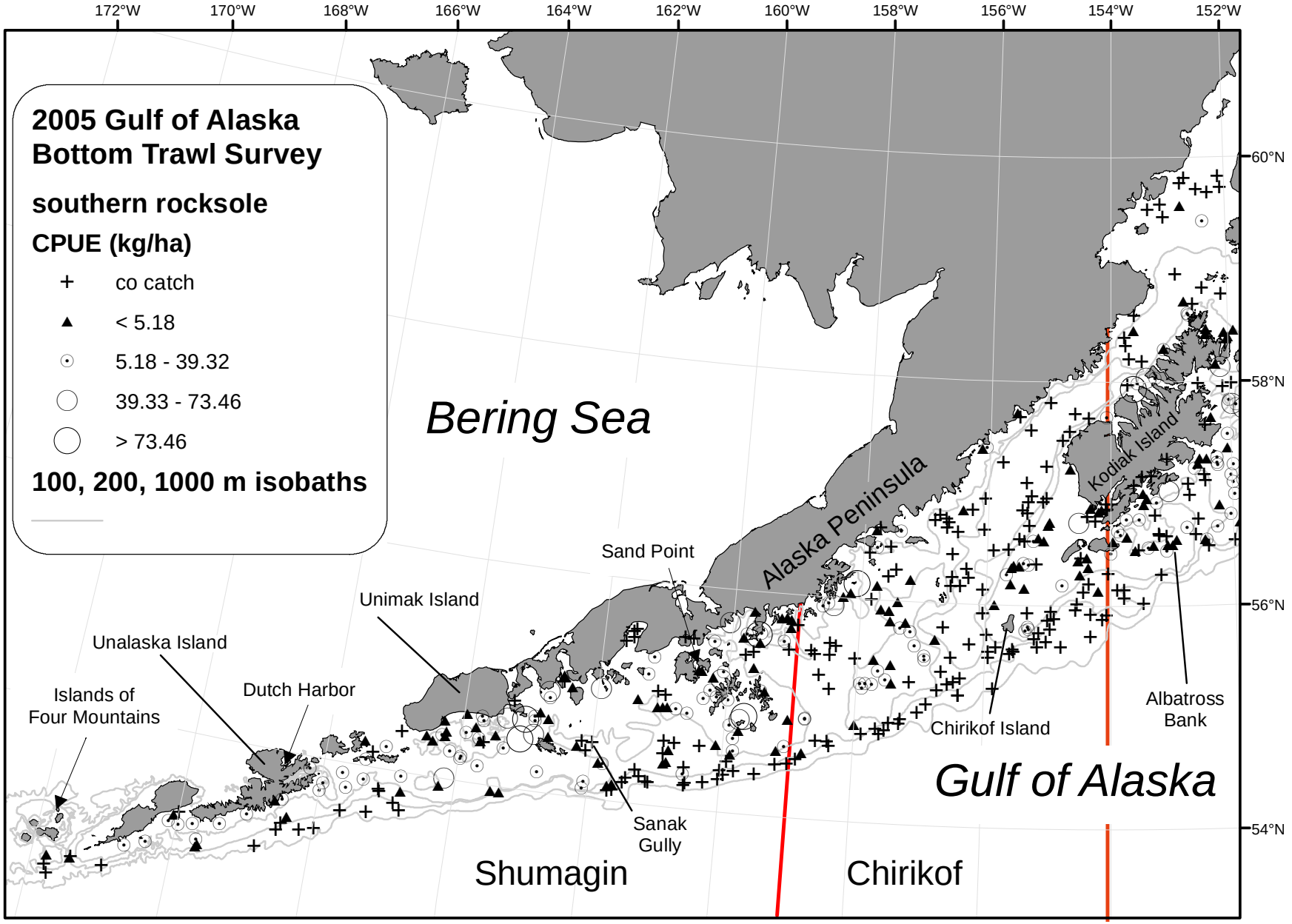

Figure 8. -- Distribution and relative abundance of southern rock sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

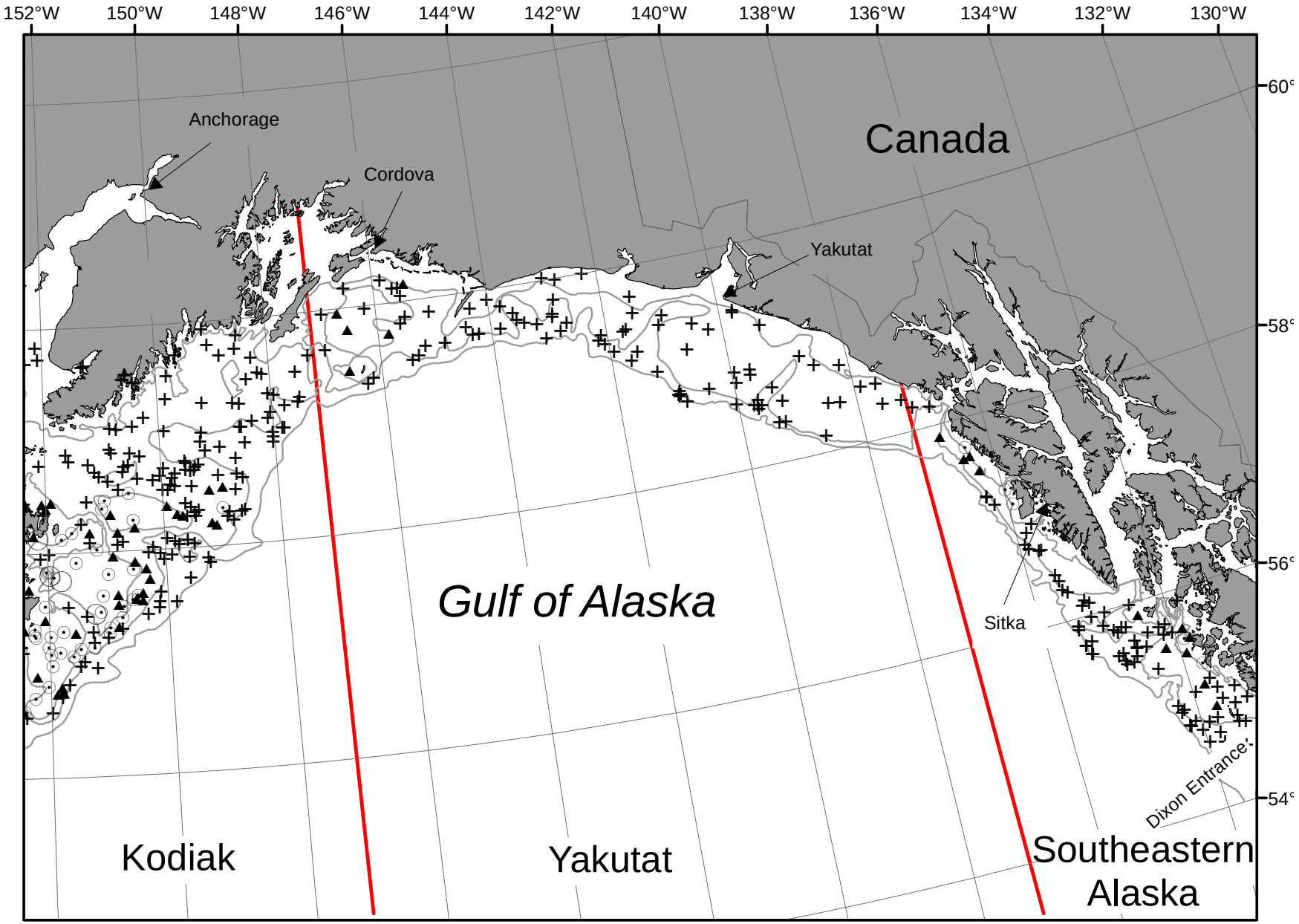

Figure 8 – Continued.

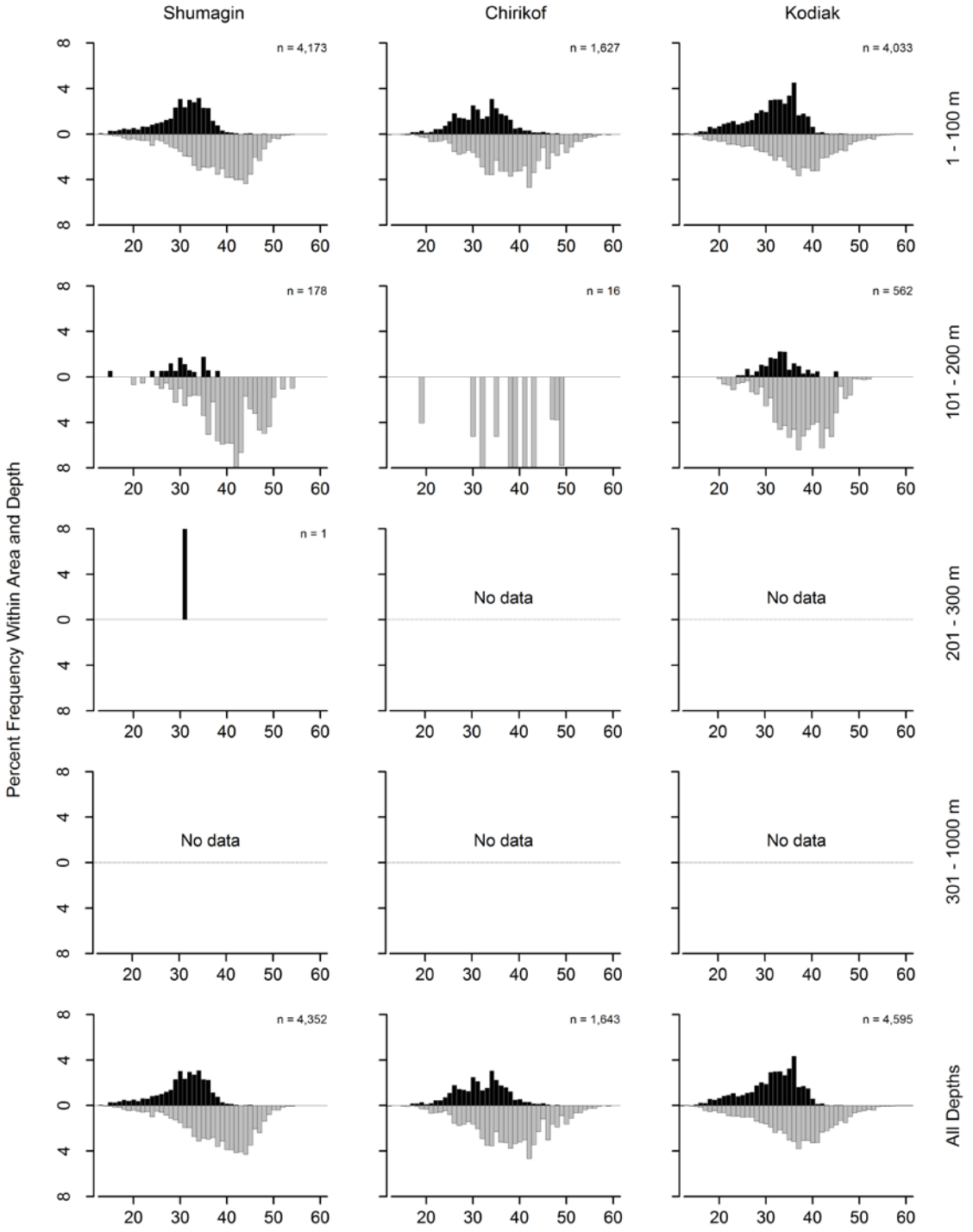

Figure 9. -- Size composition of southern rock sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

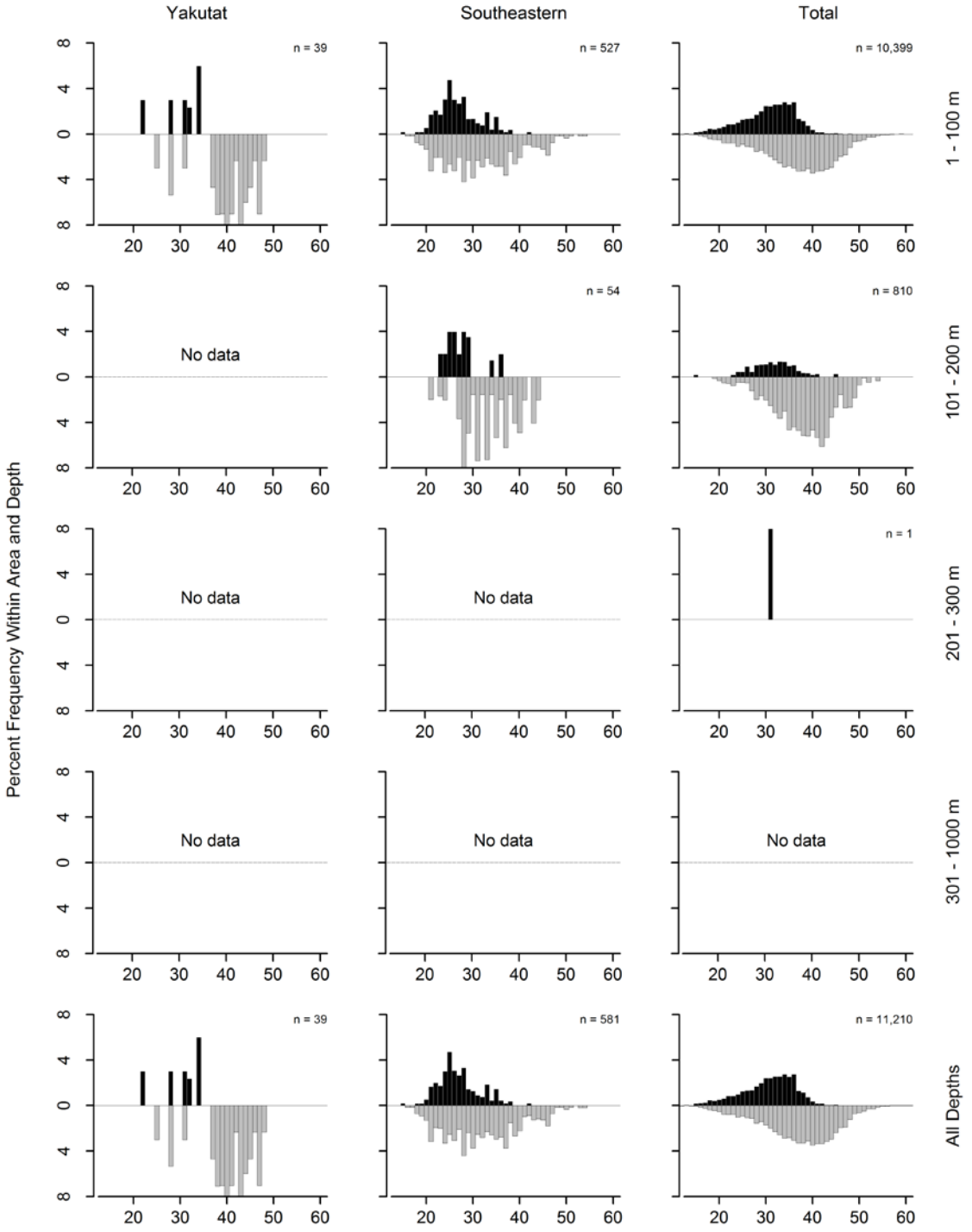

Figure 9. -- Continued (southern rock sole).

Table 10. -- Catch per unit of effort by stratum for southern rock sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Northern Kodiak Shallows	7	7	70.73	15,558	0	40,255
Chirikof	1 - 100	Upper Alaska Peninsula	15	12	15.18	12,056	587	23,526
Shumagin	1 - 100	Fox Islands	22	20	15.17	12,642	8,433	16,851
Shumagin	1 - 100	Shumagin Bank	31	29	14.89	18,465	9,095	27,836
Shumagin	1 - 100	Davidson Bank	37	35	14.86	20,336	8,138	32,533
Shumagin	1 - 100	Lower Alaska Peninsula	27	19	14.63	10,059	3,612	16,505
Kodiak	1 - 100	Albatross Banks	49	48	14.44	22,239	15,737	28,741
Kodiak	1 - 100	Albatross Shallows	34	26	12.12	6,987	3,294	10,679
Southeastern	1 - 100	Southeastern Shallows	9	9	11.25	7,367	2,609	12,126
Chirikof	1 - 100	Semidi Bank	19	18	9.34	6,817	3,594	10,040
Chirikof	1 - 100	Chirikof Bank	37	27	5.74	6,191	2,896	9,486
Kodiak	101 - 200	Kodiak Outer Shelf	28	12	3.23	1,622	482	2,762
Shumagin	101 - 200	Shumagin Outer Shelf	21	12	2.93	2,392	628	4,156
Yakutat	1 - 100	Middleton Shallows	7	5	2.04	1,372	0	2,818
Kodiak	1 - 100	Lower Cook Inlet	13	2	1.35	1,337	0	4,231
Kodiak	101 - 200	Albatross Gullies	32	11	1.02	809	0	1,632
Kodiak	101 - 200	Portlock Flats	41	6	0.98	716	0	1,659
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	4	0.55	229	0	501
Southeastern	101 - 200	Prince of Wales Shelf	26	5	0.19	127	0	265
Chirikof	101 - 200	Chirikof Outer Shelf	20	3	0.16	80	0	179
Shumagin	101 - 200	Sanak Gully	11	4	0.14	58	1	115
Chirikof	101 - 200	East Shumagin Gully	18	4	0.11	124	0	258
Shumagin	101 - 200	West Shumagin Gully	4	1	0.11	24	0	100
Kodiak	101 - 200	Barren Islands	16	2	0.05	53	0	134
Chirikof	101 - 200	Shelikof Edge	24	2	0.04	30	0	72
Shumagin	201 - 300	Shumagin Slope	12	1	0.02	5	0	16

Northern rock sole (*Lepidopsetta polyxystra*)

The northern rock sole was the fifteenth most commonly caught species over the entire survey area. The population was almost exclusively confined to depths less than 100 m and was only found in the Shumagin, Chirikof, and Kodiak INPFC areas (Tables 11-12 and Fig. 10). Northern rock sole were not caught east of 150ºW (Fig. 10). Approximately 62% of the total biomass was concentrated in the shallowest depth zone of the Shumagin INPFC area, which makes up less than 13% of the total survey area. Northern rock sole occurred in approximately 90% of the tows in this area and depth range. A very distinct length mode around 28 cm occurred for males at depths less than 100 m in the Shumagin INPFC area. A less prominent mode for males around 32 - 35 cm appeared in fish taken from the shallow waters of the Chirikof and Kodiak INPFC areas. Females appeared slightly larger in these shallow waters with a mode around 32 cm in the Shumagin area and around 37 to 38 cm in the Chirikof and Kodiak INPFC areas (Fig. 11).

Table 11.-- Number of hauls, hauls with northern rock sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	105	13.82	57,049	0.363	30.5
	101 - 200	36	17	1.06	1,549	0.550	35.2
	201 - 300	12	1	0.04	12	0.792	42.0
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	123	8.99	58,610	0.366	30.6
Chirikof	1 - 100	71	49	4.79	12,460	0.593	34.2
	101 - 200	62	1	0.00	9	0.667	38.0
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	50	1.83	12,469	0.593	34.2
Kodiak	1 - 100	109	76	5.22	20,097	0.570	33.5
	101 - 200	139	9	0.07	310	0.695	37.1
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	85	2.01	20,408	0.572	33.5
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	230	6.94	89,607	0.420	31.4
	101 - 200	316	27	0.15	1,868	0.570	35.4
	201 - 300	119	1	Trace	12	0.792	42.0
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	258	2.86	91,487	0.422	31.4

All Areas and Depths Biomass, 95% confidence interval: 71,445 - 111,528 metric tons (t)

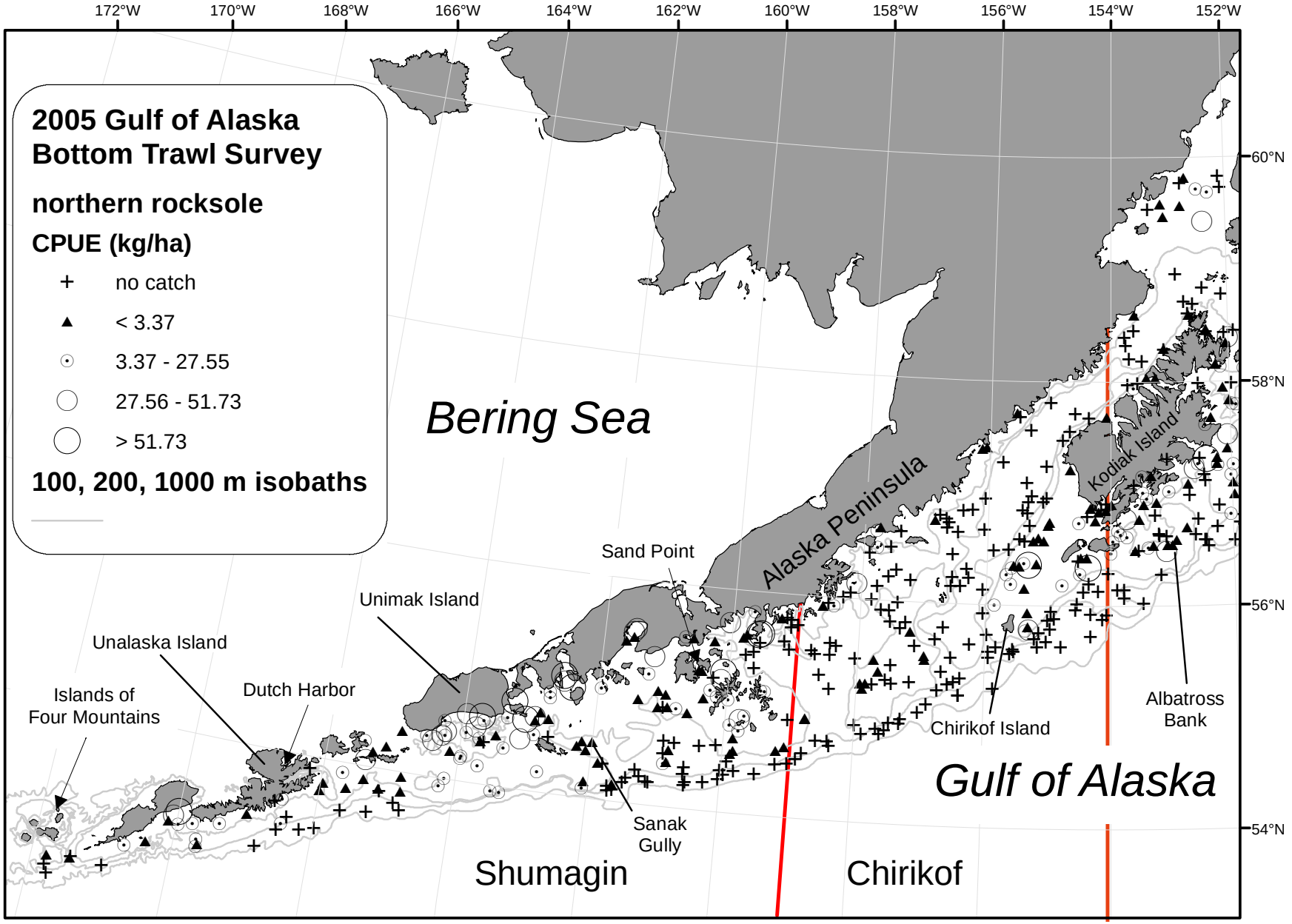

Figure 10. -- Distribution and relative abundance of northern rock sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

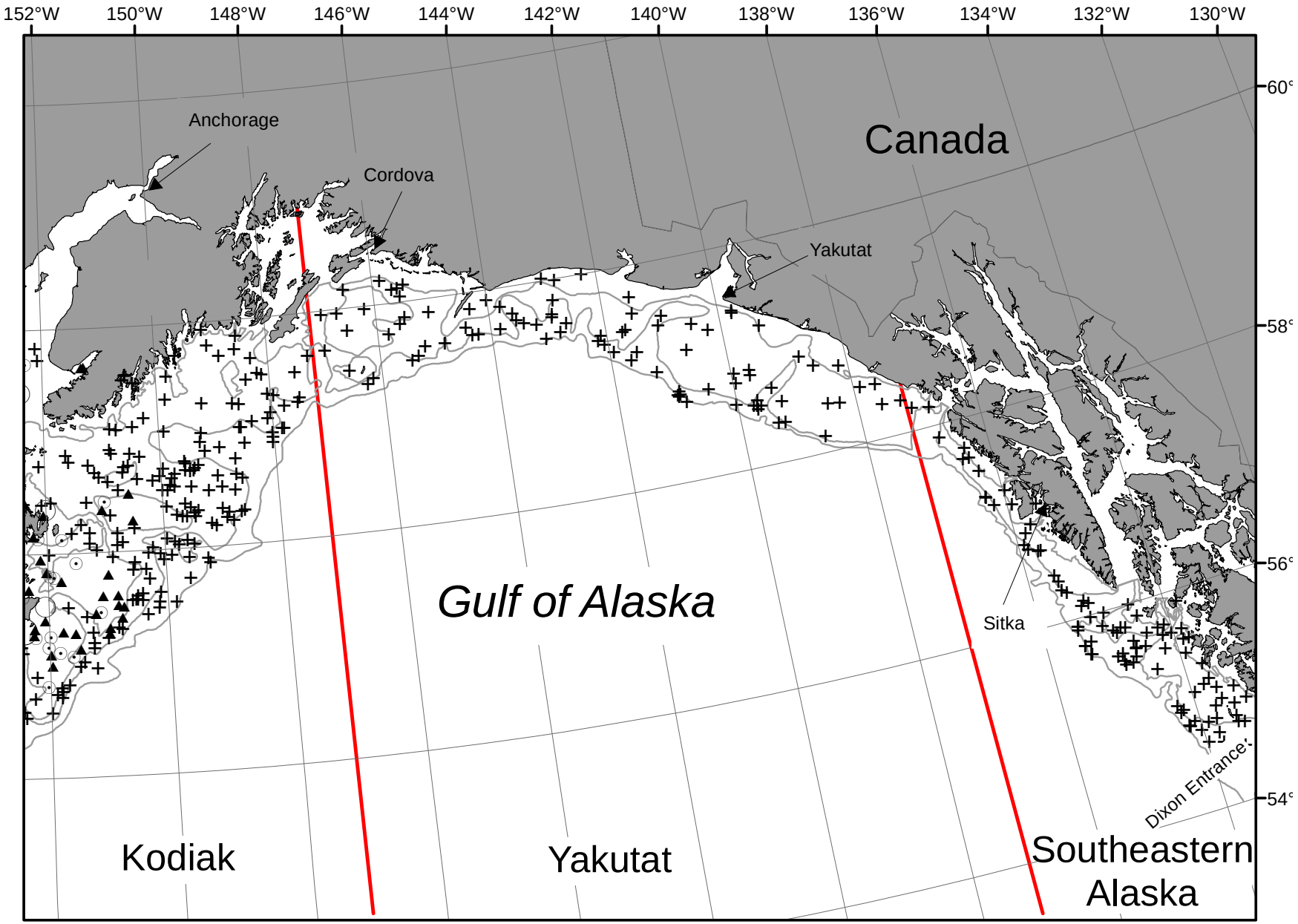

Figure 10 – Continued.

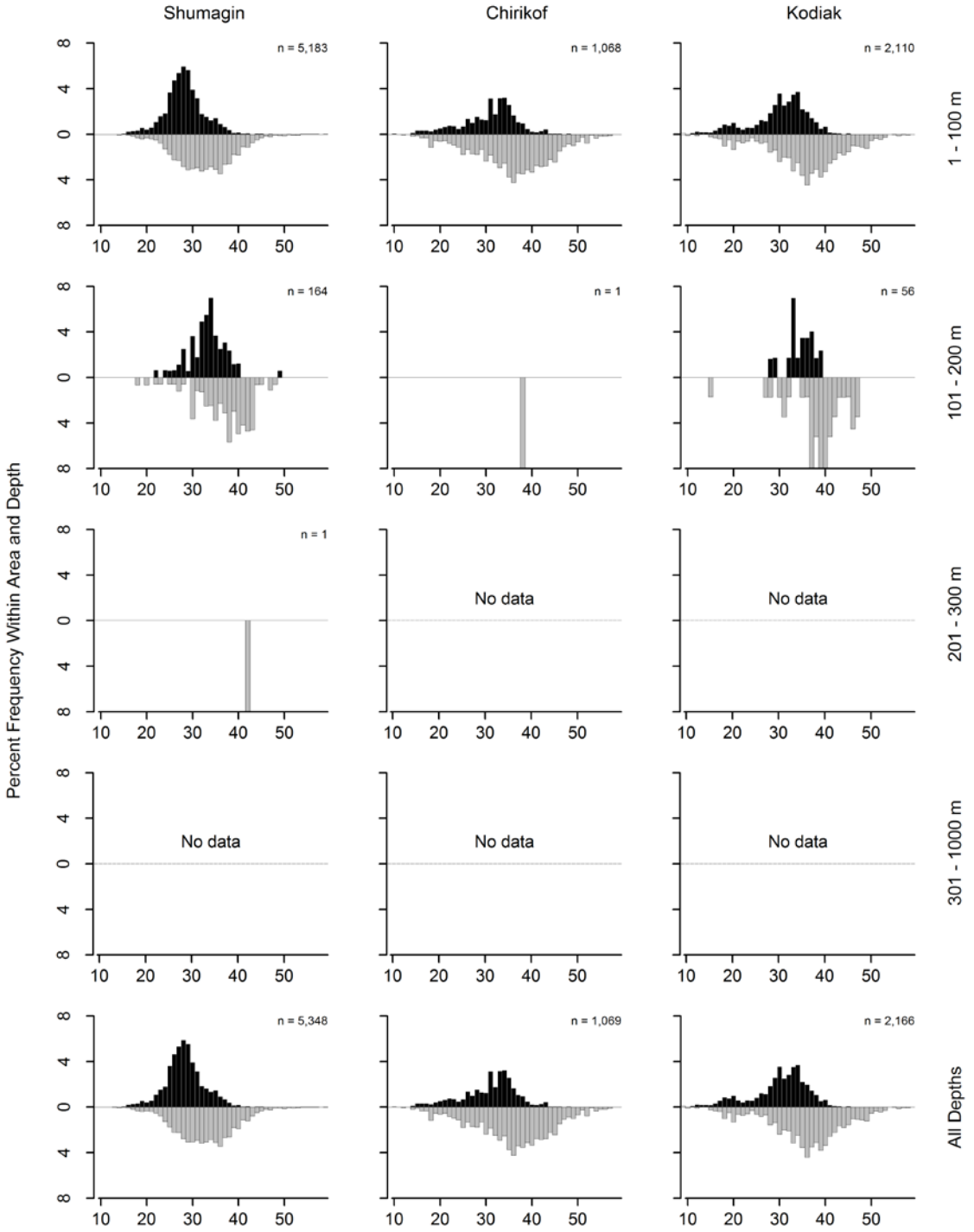

Figure 11. -- Size composition of northern rock sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

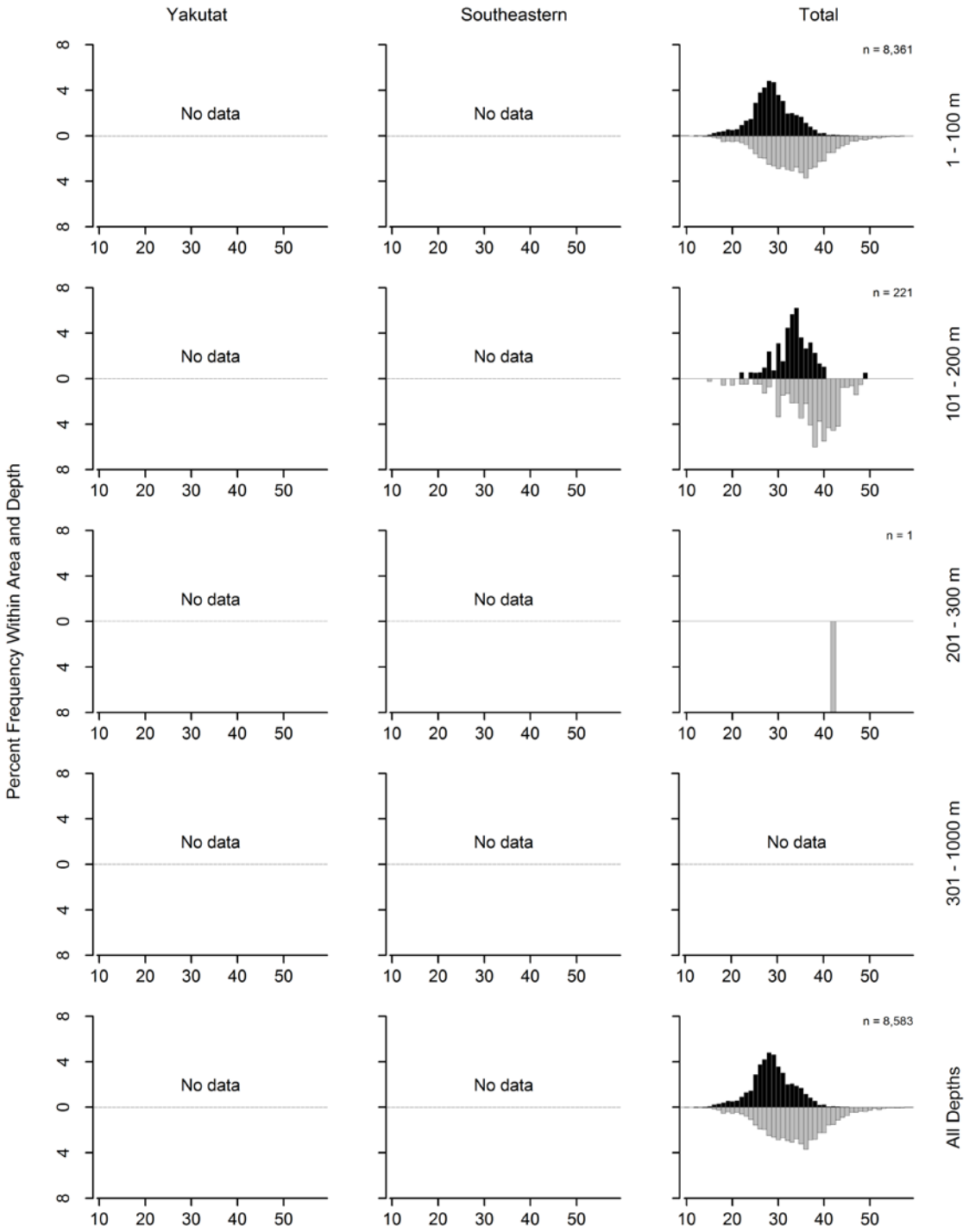

Figure 11. -- Continued (northern rock sole).

Table 12. -- Catch per unit of effort by stratum for northern rock sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Lower Alaska Peninsula	27	23	23.05	15,852	7,429	24,275
Shumagin	1 - 100	Davidson Bank	37	35	16.55	22,639	14,028	31,250
Shumagin	1 - 100	Fox Islands	22	20	10.17	8,471	2,300	14,643
Chirikof	1 - 100	Chirikof Bank	37	31	8.32	8,980	2,111	15,850
Shumagin	1 - 100	Shumagin Bank	31	27	8.14	10,087	3,357	16,817
Kodiak	1 - 100	Albatross Shallows	34	24	7.53	4,341	2,157	6,524
Kodiak	1 - 100	Albatross Banks	49	37	7.38	11,374	978	21,770
Chirikof	1 - 100	Upper Alaska Peninsula	15	10	4.09	3,247	0	6,553
Kodiak	1 - 100	Lower Cook Inlet	13	10	3.71	3,671	0	9,074
Kodiak	1 - 100	Northern Kodiak Shallows	7	5	3.23	711	0	2,128
Shumagin	101 - 200	Shumagin Outer Shelf	21	11	1.82	1,484	177	2,791
Kodiak	101 - 200	Kodiak Outer Shelf	28	4	0.51	255	0	655
Chirikof	1 - 100	Semidi Bank	19	8	0.32	233	60	406
Shumagin	101 - 200	Sanak Gully	11	6	0.15	65	14	116
Kodiak	101 - 200	Albatross Gullies	32	4	0.06	51	0	109
Shumagin	201 - 300	Shumagin Slope	12	1	0.04	12	0	38
Chirikof	101 - 200	Shelikof Edge	24	1	0.01	9	0	29
Kodiak	101 - 200	Portlock Flats	41	1	0.01	5	0	15

Rex sole (*Glyptocephalus zachirus*)

Rex sole was the twelfth most abundant species caught in this survey. They were caught in all of the INPFC areas in depths less than 700 m as well as one tow in the Southeastern INPFC which was greater than 700 m (Table 13). Although large catches of rex sole were rare, rex sole were present in approximately 85% of the tows between 101 and 500 m (Table 13). They were widely distributed within each INPFC area as well and were caught in 55 of the 59 strata over the entire survey area (Fig. 12 and Tables 13-14). The length frequency data showed a strong mode at 32 -35 cm FL in males in the Chirikof, Kodiak and Yakutat INPFC areas in water between 101 and 300 m. Females were slightly larger with a distince mode at 38 – 42 cm at these same depths mainly in the Chirikof and Kodiak INPFC area. A much higher fraction of large fish (greater than 40 cm FL) of both sexes occurred in the Shumagin, Chirikof, and Kodiak INPFC areas than in the Yakutat and Southeastern INPFC areas (Fig. 13).

Table 13.-- Number of hauls, hauls with rex sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	41	0.62	2,580	0.306	31.9
	101 - 200	36	30	6.07	8,902	0.364	35.9
	201 - 300	12	10	3.37	939	0.386	37.4
	301 - 500	9	6	1.32	335	0.483	40.2
	501 - 700	4	1	0.05	9	0.566	43.0
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	88	1.96	12,766	0.354	35.1
Chirikof	1 - 100	71	31	1.58	4,113	0.454	39.0
	101 - 200	62	54	7.55	17,998	0.376	36.4
	201 - 300	25	25	4.72	5,451	0.428	38.6
	301 - 500	10	7	3.06	491	0.340	36.4
	501 - 700	6	2	0.13	26	0.346	36.9
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	119	4.13	28,078	0.395	37.1
Kodiak	1 - 100	109	41	1.05	4,029	0.238	30.0
	101 - 200	139	116	5.25	22,768	0.389	36.5
	201 - 300	29	29	4.36	5,006	0.313	34.7
	301 - 500	8	7	2.22	646	0.257	33.8
	501 - 700	5	3	0.42	73	0.263	34.2
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	196	3.20	32,522	0.345	35.0
Yakutat	1 - 100	15	12	0.99	1,641	0.187	28.6
	101 - 200	42	26	2.28	6,711	0.189	29.8
	201 - 300	21	20	4.92	2,542	0.236	32.1
	301 - 500	8	7	2.39	629	0.206	31.4
	501 - 700	4	1	0.11	16	0.263	34.3
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	66	2.02	11,539	0.198	30.1
Southeastern	1 - 100	9	6	3.70	2,420	0.249	32.0
	101 - 200	37	32	7.83	8,681	0.204	30.7
	201 - 300	32	32	5.53	2,793	0.203	31.1
	301 - 500	13	13	7.81	2,434	0.279	34.5
	501 - 700	4	1	0.13	13	0.259	34.0
	701 - 1,000	2	1	0.08	10	0.444	39.0
	All Depths	97	85	5.83	16,351	0.218	31.4
All Areas	1 - 100	321	131	1.15	14,783	0.280	32.0
	101 - 200	316	258	5.32	65,060	0.311	34.1
	201 - 300	119	116	4.64	16,731	0.300	34.3
	301 - 500	48	40	3.55	4,535	0.276	34.2
	501 - 700	23	8	0.17	136	0.286	34.9
	701 - 1,000	12	1	0.01	10	0.444	39.0
	All Depths	839	554	3.16	101,255	0.303	33.8

All Areas and Depths Biomass, 95% confidence interval: 85,028 - 117,481 metric tons (t)

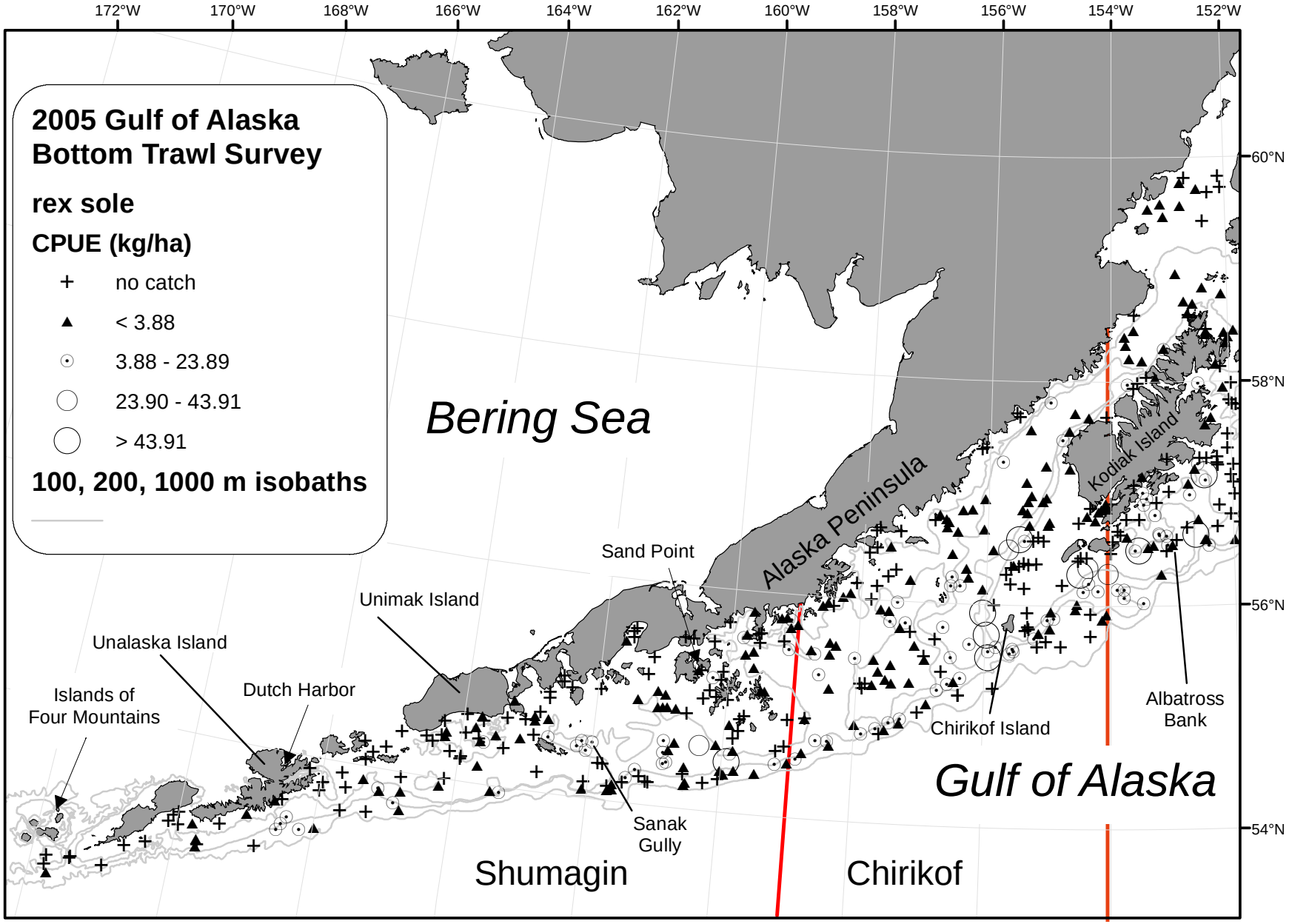

Figure 12. --Distribution and relative abundance of rex sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

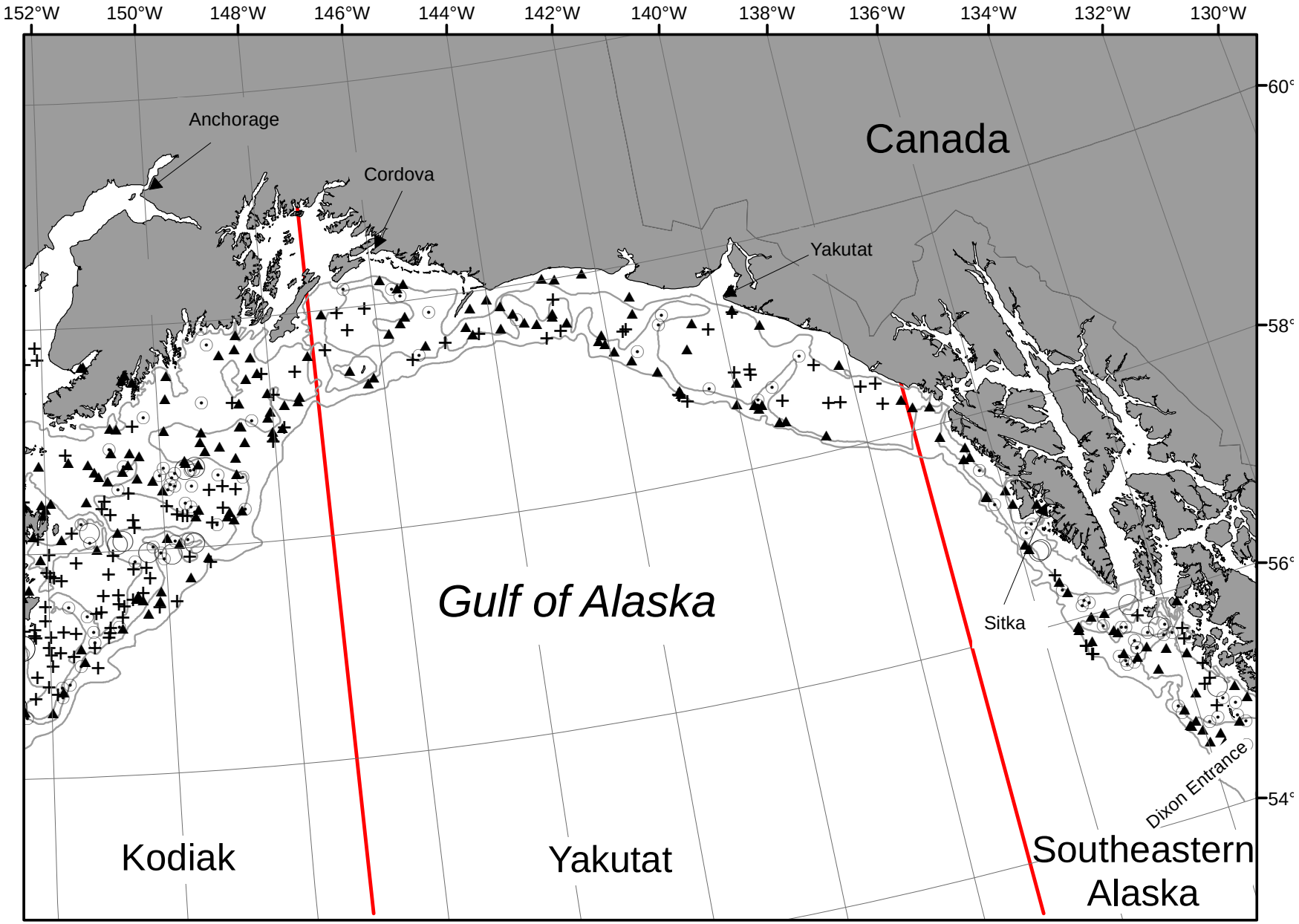

Figure 12 – Continued.

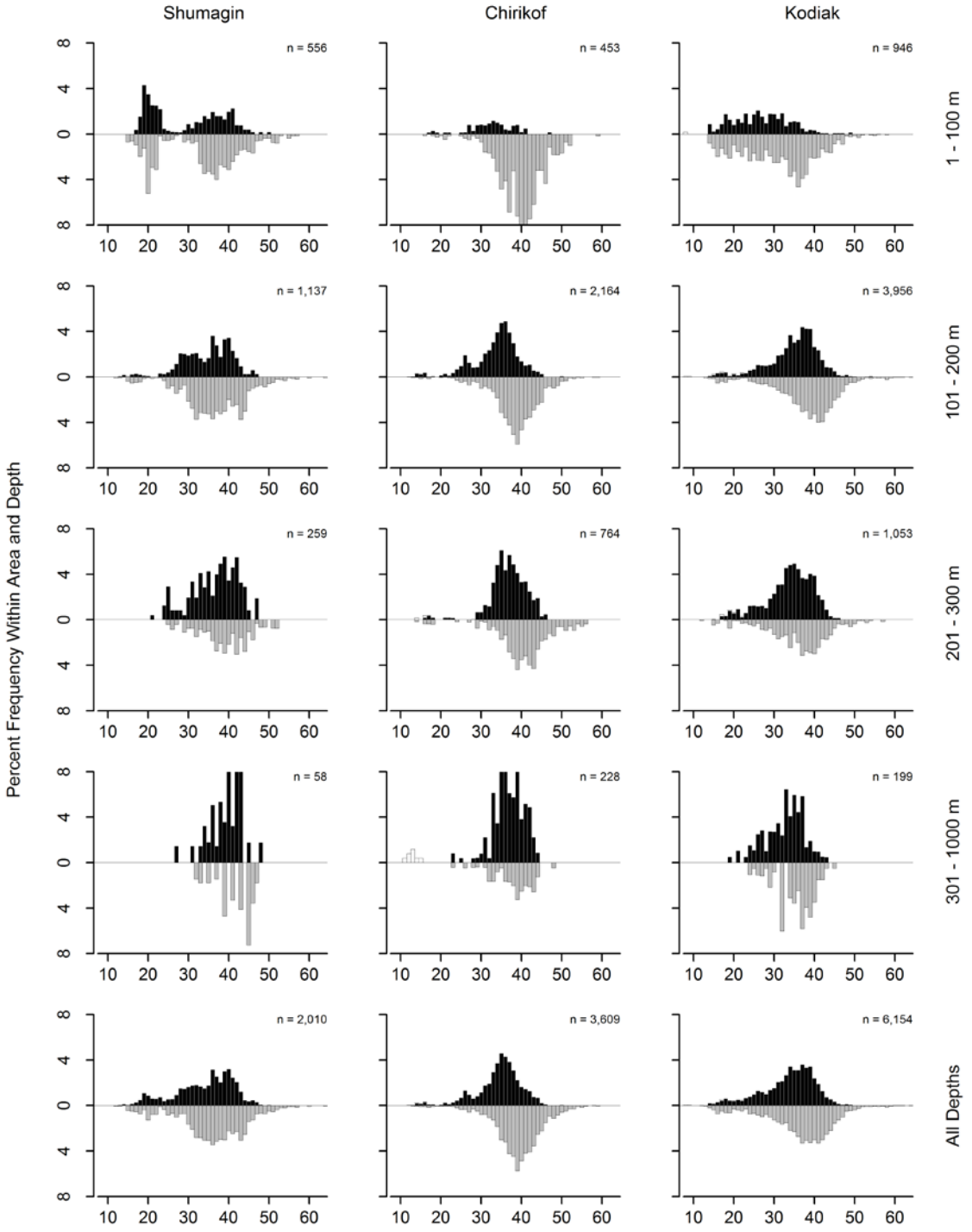

Figure 13. -- Size composition of rex sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

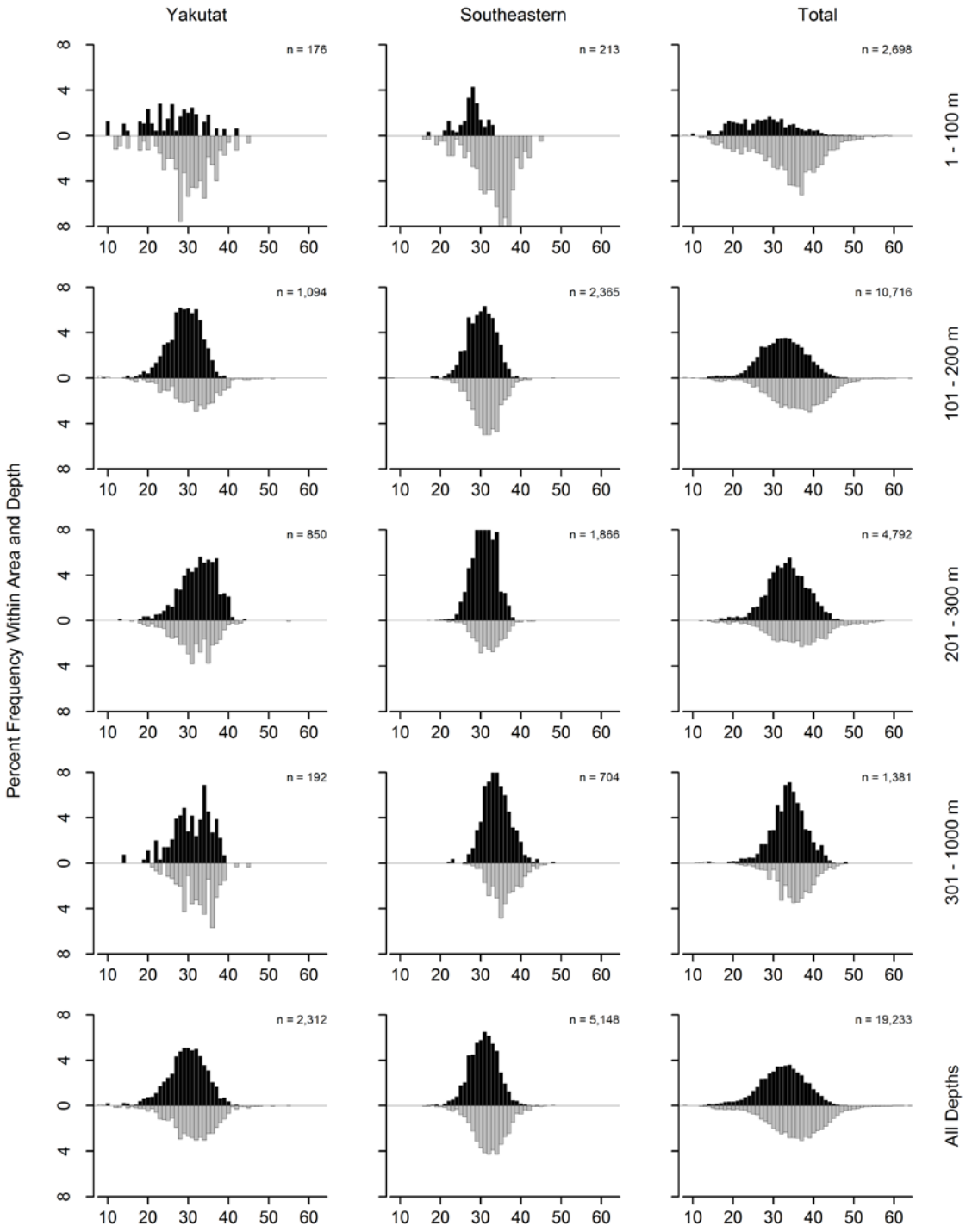

Figure 13. -- Continued (rex sole).

Table 14. -- Catch per unit of effort by stratum for rex sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	101 - 200	Albatross Gullies	32	27	17.48	13,831	4,701	22,962
Chirikof	101 - 200	Chirikof Outer Shelf	20	20	13.60	6,815	2,240	11,390
Chirikof	101 - 200	Shelikof Edge	24	21	10.51	8,131	2,359	13,902
Kodiak	201 - 300	Kodiak Slope	6	6	10.25	1,663	380	2,946
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	10	10.08	4,229	201	8,258
Southeastern	301 - 500	Southeastern Deep Gullies	9	9	9.71	2,277	860	3,694
Chirikof	201 - 300	Chirikof Slope	8	8	8.08	1,235	697	1,772
Shumagin	101 - 200	Sanak Gully	11	11	7.90	3,355	707	6,003
Yakutat	201 - 300	Yakutat Gullies	8	8	7.19	2,188	904	3,473
Southeastern	101 - 200	Prince of Wales Shelf	26	22	6.46	4,452	2,188	6,715
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	27	6.24	2,451	1,436	3,467
Kodiak	101 - 200	Portlock Flats	41	35	5.69	4,175	2,621	5,729
Shumagin	101 - 200	Shumagin Outer Shelf	21	15	5.43	4,425	371	8,479
Shumagin	101 - 200	West Shumagin Gully	4	4	4.93	1,122	0	3,549
Yakutat	101 - 200	Middleton Shelf	12	10	4.40	3,233	564	5,902
Chirikof	201 - 300	Lower Shelikof Gully	17	17	4.21	4,216	1,865	6,567
Kodiak	201 - 300	Kenai Gullies	20	20	4.01	2,671	705	4,636
Yakutat	301 - 500	Yakutat Gullies	2	2	3.92	434	223	645
Southeastern	1 - 100	Southeastern Shallows	9	6	3.70	2,420	0	7,892
Shumagin	201 - 300	Shumagin Slope	12	10	3.37	939	263	1,615
Kodiak	101 - 200	Kodiak Outer Shelf	28	22	3.34	1,676	315	3,038
Chirikof	301 - 500	Chirikof Slope	10	7	3.06	491	0	1,218
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	3.04	342	179	504
Chirikof	1 - 100	Chirikof Bank	37	13	3.01	3,246	0	7,428
Kodiak	1 - 100	Kenai Peninsula	6	6	2.91	1,532	0	3,275
Yakutat	101 - 200	Yakutat Flats	11	6	2.82	2,550	0	6,822
Chirikof	101 - 200	East Shumagin Gully	18	13	2.75	3,052	227	5,877
Kodiak	301 - 500	Kodiak Slope	8	7	2.22	646	0	1,376
Kodiak	201 - 300	Upper Shelikof Gully	3	3	2.10	672	0	3,069
Southeastern	301 - 500	Southeastern Slope	4	4	2.04	157	0	327
Kodiak	1 - 100	Albatross Shallows	34	18	2.03	1,171	319	2,023
Kodiak	1 - 100	Northern Kodiak Shallows	7	3	1.87	412	0	1,348
Yakutat	201 - 300	Yakutat Slope	13	12	1.66	354	153	554
Kodiak	101 - 200	Kenai Flats	22	17	1.59	1,921	590	3,253
Shumagin	301 - 500	Shumagin Slope	9	6	1.32	335	0	798
Yakutat	301 - 500	Yakutat Slope	6	5	1.28	195	61	328
Yakutat	1 - 100	Yakutat Shallows	8	8	1.28	1,273	267	2,279
Yakutat	101 - 200	Yakataga Shelf	8	5	1.19	628	0	1,271
Shumagin	1 - 100	Lower Alaska Peninsula	27	8	1.18	808	0	2,034
Kodiak	101 - 200	Barren Islands	16	15	1.06	1,165	602	1,727
Chirikof	1 - 100	Semidi Bank	19	14	0.98	713	47	1,379
Shumagin	1 - 100	Davidson Bank	37	15	0.69	949	218	1,681
Shumagin	1 - 100	Shumagin Bank	31	14	0.63	786	243	1,330
Yakutat	1 - 100	Middleton Shallows	7	4	0.55	368	0	787
Kodiak	1 - 100	Albatross Banks	49	6	0.52	800	0	1,967
Kodiak	501 - 700	Kodiak Slope	5	3	0.42	73	0	238
Yakutat	101 - 200	Fairweather Shelf	11	5	0.39	300	0	637
Chirikof	1 - 100	Upper Alaska Peninsula	15	4	0.19	154	0	390
Chirikof	501 - 700	Chirikof Slope	6	2	0.13	26	0	69
Southeastern	501 - 700	Southeastern Slope	4	1	0.13	13	0	54
Kodiak	1 - 100	Lower Cook Inlet	13	8	0.12	115	1	228
Yakutat	501 - 700	Yakutat Slope	4	1	0.11	16	0	66
Southeastern	701 - 1000	Southeastern Slope	2	1	0.08	10	0	130
Shumagin	501 - 700	Shumagin Slope	4	1	0.05	9	0	39
Shumagin	1 - 100	Fox Islands	22	4	0.04	37	0	82

Dover sole (*Microstomus pacificus*)

Dover sole was the sixteenth most abundant species caught in the survey. While large catches of Dover sole were relatively uncommon, they were caught in all depth ranges of all INPFC areas with the one excpetion than none were caught in the 700 – 1,000 m depth range in the Yakutat INPFC area. They were present in approximately 72% of the tows at depths greater than 100 m (Table 15) and had the greatest biomass in the Yakutat and Kodiak areas. This species was widely distributed and was caught in 57 of the 59 survey strata (Fig. 14 and Table 16). The highest mean CPUEs were generally recorded at depths between 200 and 500 m in the Southeastern and Yakutat INPFC areas (Table 16). Although the smallest fish were in the shallowest depth zone, there was not a consistent trend of increasing fish size at deeper depths (Fig. 15 and Table 15). In the length frequency data, males showed a relatively strong mode around 40-50 cm in deep water in all areas. No significant such trends were apparent in females. Overall, males made up approximately 59% of the population.

Table 15.-- Number of hauls, hauls with Dover sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	9	0.12	475	0.560	37.1
	101 - 200	36	13	0.32	468	0.615	38.5
	201 - 300	12	7	0.99	275	0.979	44.5
	301 - 500	9	5	1.80	455	1.010	46.0
	501 - 700	4	3	1.55	312	0.799	42.7
	701 - 1,000	2	2	4.38	848	1.021	45.2
	All Depths	180	39	0.43	2,832	0.795	41.6
Chirikof	1 - 100	71	13	0.63	1,633	0.686	39.4
	101 - 200	62	37	2.00	4,761	0.786	41.0
	201 - 300	25	20	2.54	2,934	0.989	44.3
	301 - 500	10	10	7.74	1,242	0.809	42.3
	501 - 700	6	6	3.09	604	0.767	41.7
	701 - 1,000	3	3	3.86	1,184	0.810	42.4
	All Depths	177	89	1.82	12,358	0.813	41.7
Kodiak	1 - 100	109	34	0.68	2,622	0.493	34.7
	101 - 200	139	94	3.47	15,044	0.913	42.6
	201 - 300	29	26	3.27	3,757	0.904	43.2
	301 - 500	8	8	12.02	3,500	0.875	43.1
	501 - 700	5	5	5.81	1,013	0.735	40.0
	701 - 1,000	3	2	1.68	588	1.040	43.4
	All Depths	293	169	2.61	26,524	0.832	41.3
Yakutat	1 - 100	15	9	0.86	1,429	0.323	30.0
	101 - 200	42	24	3.64	10,704	0.701	38.9
	201 - 300	21	21	16.45	8,502	0.828	41.7
	301 - 500	8	8	13.57	3,565	0.740	41.2
	501 - 700	4	4	6.65	977	0.906	42.4
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	66	4.40	25,177	0.702	39.0
Southeastern	1 - 100	9	3	0.76	495	0.287	30.5
	101 - 200	37	25	1.48	1,636	0.440	34.8
	201 - 300	32	32	4.37	2,207	0.414	34.4
	301 - 500	13	13	28.91	9,012	0.780	41.7
	501 - 700	4	4	2.21	228	0.978	45.0
	701 - 1,000	2	1	0.57	69	0.535	37.8
	All Depths	97	78	4.87	13,647	0.601	38.0
All Areas	1 - 100	321	68	0.52	6,654	0.453	33.7
	101 - 200	316	193	2.67	32,613	0.771	40.3
	201 - 300	119	106	4.90	17,675	0.768	40.7
	301 - 500	48	44	13.89	17,774	0.795	42.0
	501 - 700	23	22	3.82	3,134	0.810	41.6
	701 - 1,000	12	8	2.32	2,689	0.900	43.1
	All Depths	839	441	2.52	80,538	0.738	39.9

All Areas and Depths Biomass, 95% confidence interval: 66,807 - 94,268 metric tons (t)

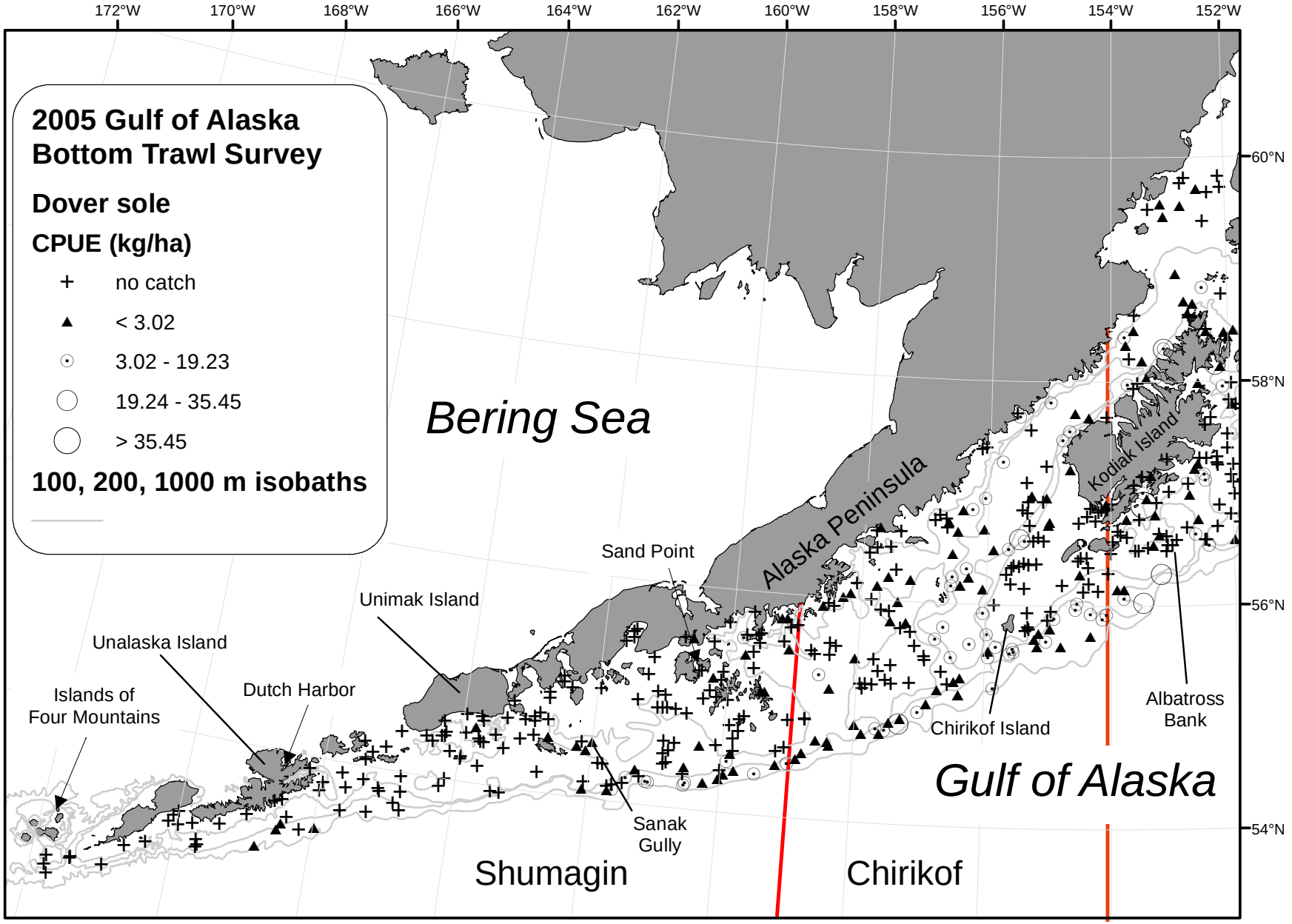

Figure 14. --Distribution and relative abundance of Dover sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

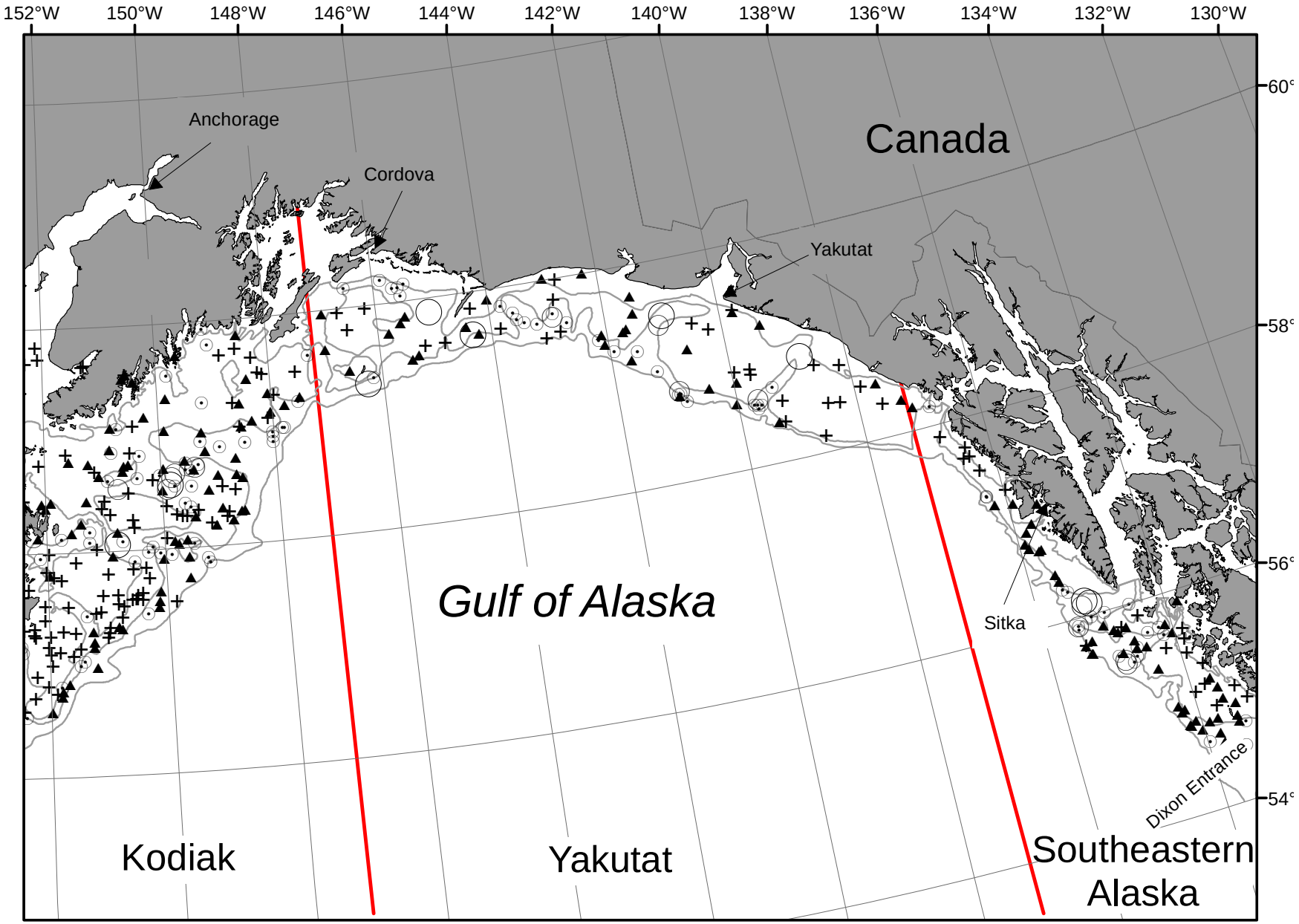

Figure 14 – Continued.

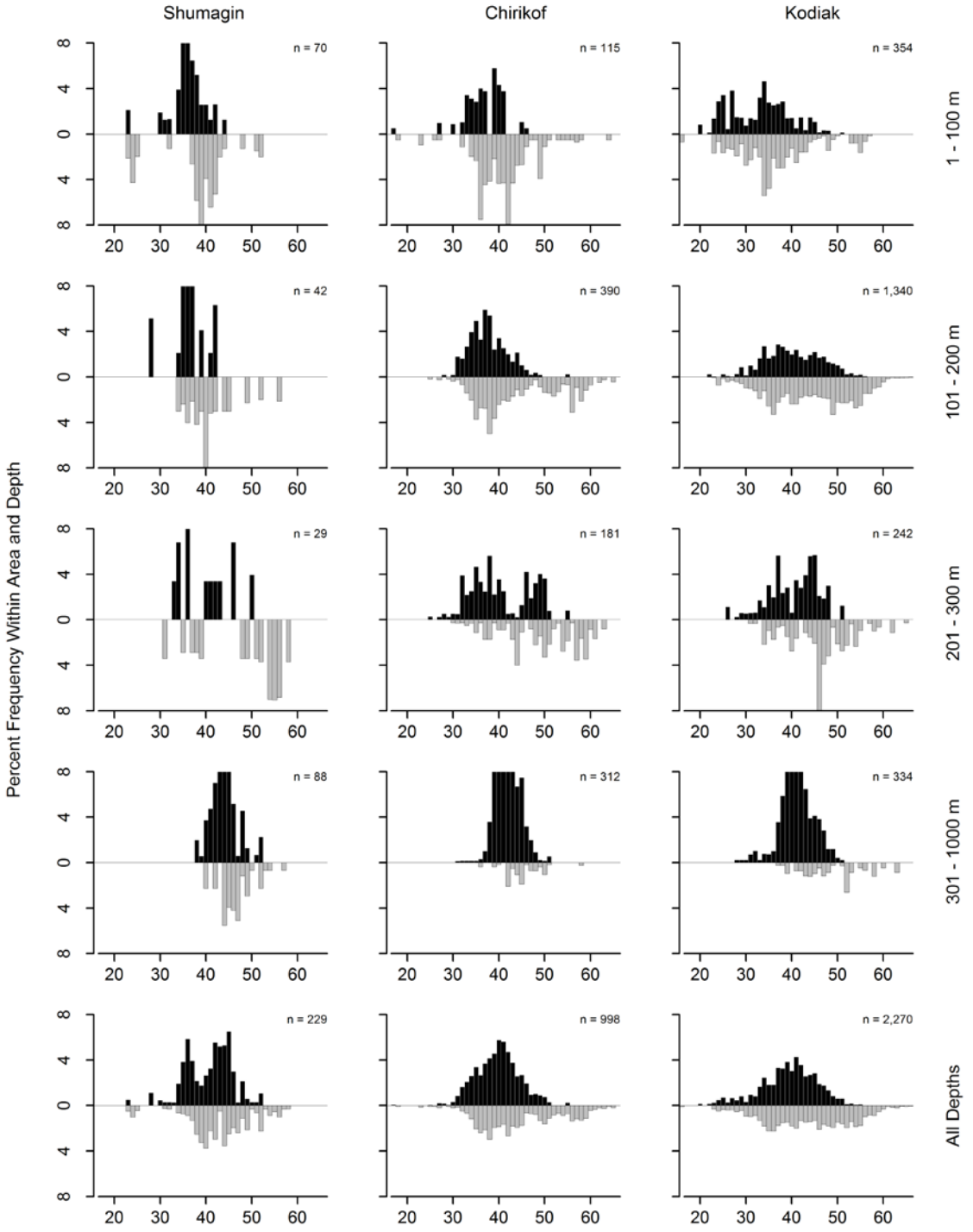

Figure 15. -- Size composition of Dover sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

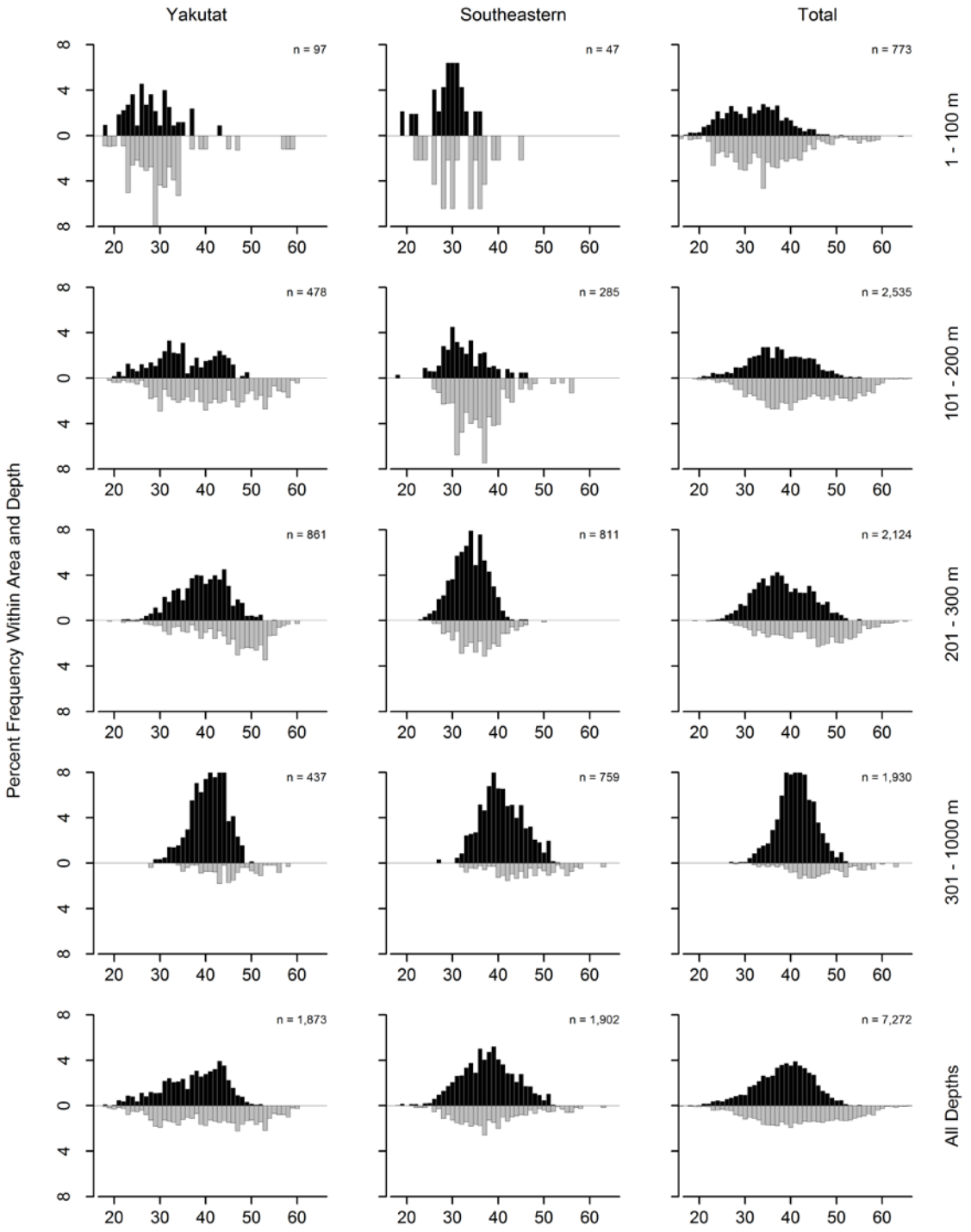

Figure 15. -- Continued (Dover sole).

Table 16. -- Catch per unit of effort by stratum for Dover sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	301 - 500	Southeastern Deep Gullies	9	9	34.11	7,995	642	15,349
Yakutat	201 - 300	Yakutat Gullies	8	8	20.53	6,246	2,546	9,945
Yakutat	301 - 500	Yakutat Slope	6	6	15.51	2,358	21	4,695
Southeastern	301 - 500	Southeastern Slope	4	4	13.16	1,016	356	1,677
Kodiak	301 - 500	Kodiak Slope	8	8	12.02	3,500	938	6,062
Yakutat	301 - 500	Yakutat Gullies	2	2	10.90	1,207	0	11,455
Yakutat	201 - 300	Yakutat Slope	13	13	10.61	2,257	664	3,849
Yakutat	101 - 200	Middleton Shelf	12	10	8.03	5,900	286	11,514
Chirikof	301 - 500	Chirikof Slope	10	10	7.74	1,242	123	2,361
Kodiak	101 - 200	Portlock Flats	41	32	7.40	5,430	3,042	7,817
Yakutat	501 - 700	Yakutat Slope	4	4	6.65	977	33	1,922
Kodiak	101 - 200	Albatross Gullies	32	19	5.91	4,678	1,402	7,954
Kodiak	501 - 700	Kodiak Slope	5	5	5.81	1,013	20	2,007
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	27	4.96	1,946	845	3,047
Kodiak	1 - 100	Northern Kodiak Shallows	7	4	4.85	1,066	0	2,672
Shumagin	701 - 1000	Shumagin Slope	2	2	4.38	848	0	3,403
Chirikof	101 - 200	Shelikof Edge	24	17	4.27	3,306	1,459	5,153
Yakutat	101 - 200	Yakutat Flats	11	5	3.91	3,531	0	10,856
Chirikof	201 - 300	Chirikof Slope	8	8	3.91	597	173	1,021
Chirikof	701 - 1000	Chirikof Slope	3	3	3.86	1,184	0	3,799
Kodiak	201 - 300	Upper Shelikof Gully	3	2	3.66	1,173	0	5,482
Kodiak	201 - 300	Kenai Gullies	20	18	3.13	2,085	1,010	3,160
Chirikof	501 - 700	Chirikof Slope	6	6	3.09	604	227	981
Kodiak	201 - 300	Kodiak Slope	6	6	3.08	500	177	823
Chirikof	201 - 300	Lower Shelikof Gully	17	12	2.33	2,337	944	3,729
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	2.32	261	114	409
Southeastern	501 - 700	Southeastern Slope	4	4	2.21	228	0	629
Kodiak	101 - 200	Barren Islands	16	12	2.05	2,252	149	4,356
Shumagin	301 - 500	Shumagin Slope	9	5	1.80	455	0	917
Kodiak	101 - 200	Kenai Flats	22	13	1.74	2,105	602	3,608
Yakutat	101 - 200	Yakataga Shelf	8	6	1.73	914	0	2,396
Kodiak	701 - 1000	Kodiak Slope	3	2	1.68	588	0	2,593
Shumagin	501 - 700	Shumagin Slope	4	3	1.55	312	0	1,163
Kodiak	1 - 100	Albatross Shallows	34	19	1.52	877	104	1,650
Chirikof	1 - 100	Upper Alaska Peninsula	15	5	1.51	1,201	0	3,325
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	7	1.50	629	36	1,221
Southeastern	101 - 200	Prince of Wales Shelf	26	18	1.46	1,008	215	1,800
Chirikof	101 - 200	Chirikof Outer Shelf	20	13	1.17	587	201	973
Kodiak	101 - 200	Kodiak Outer Shelf	28	18	1.15	579	156	1,001
Kodiak	1 - 100	Kenai Peninsula	6	5	1.09	574	0	1,792
Shumagin	201 - 300	Shumagin Slope	12	7	0.99	275	32	518
Yakutat	1 - 100	Yakutat Shallows	8	5	0.90	893	3	1,783
Yakutat	1 - 100	Middleton Shallows	7	4	0.80	536	0	1,404
Chirikof	101 - 200	East Shumagin Gully	18	7	0.78	869	0	1,893
Southeastern	1 - 100	Southeastern Shallows	9	3	0.76	495	0	1,605
Shumagin	101 - 200	West Shumagin Gully	4	2	0.67	153	0	575
Southeastern	701 - 1000	Southeastern Slope	2	1	0.57	69	0	946
Shumagin	1 - 100	Lower Alaska Peninsula	27	5	0.55	381	0	822
Yakutat	101 - 200	Fairweather Shelf	11	3	0.46	358	0	898
Chirikof	1 - 100	Chirikof Bank	37	6	0.31	329	0	927
Shumagin	101 - 200	Shumagin Outer Shelf	21	6	0.27	220	0	534
Shumagin	101 - 200	Sanak Gully	11	5	0.23	96	14	178
Chirikof	1 - 100	Semidi Bank	19	2	0.14	102	0	251
Shumagin	1 - 100	Shumagin Bank	31	3	0.07	89	0	249
Kodiak	1 - 100	Lower Cook Inlet	13	4	0.07	67	0	163
Kodiak	1 - 100	Albatross Banks	49	2	0.02	37	0	96
Shumagin	1 - 100	Davidson Bank	37	1	<0.01	5	0	15

Yellowfin sole (*Limanda aspera*)

Yellowfin sole ranked nineteenth in abundance among groundfishes within the GOA (Table 2). This species was locally abundant in bays around Kodiak Island and the Alaska Peninsula near the Shumagin Islands, but were not widely distributed in the survey area (Fig. 16). They were caught only in the three western INPFC areas and with the exception of one tow in the Kodiak area, they were always caught in water less than 100 m (Table 17). They were caught in only 10 of the 59 survey strata (Table 1). The highest CPUE came from the Lower Alaska Peninsula stratum in the Sumangin area. This stratum alone produced 47% of the estimated biomass (Tables 17 and 18). Both males and females had a fairly strong mode at about 30 cm in the Shumagin and Chirikof INPFC areas (Fig. 17).

Table 17.-- Number of hauls, hauls with yellowfin sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	25	5.64	23,276	0.347	29.7
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	25	3.57	23,276	0.347	29.7
Chirikof	1 - 100	71	12	3.01	7,827	0.406	30.7
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	12	1.15	7,827	0.406	30.7
Kodiak	1 - 100	109	13	4.57	17,589	0.285	26.7
	101 - 200	139	1	0.00	2	0.250	28.0
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	14	1.73	17,591	0.285	26.7
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	50	3.77	48,692	0.329	28.6
	101 - 200	316	1	0.00	2	0.250	28.0
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	51	1.52	48,694	0.329	28.6

All Areas and Depths Biomass, 95% confidence interval: 25,575 - 71,813 metric tons (t)

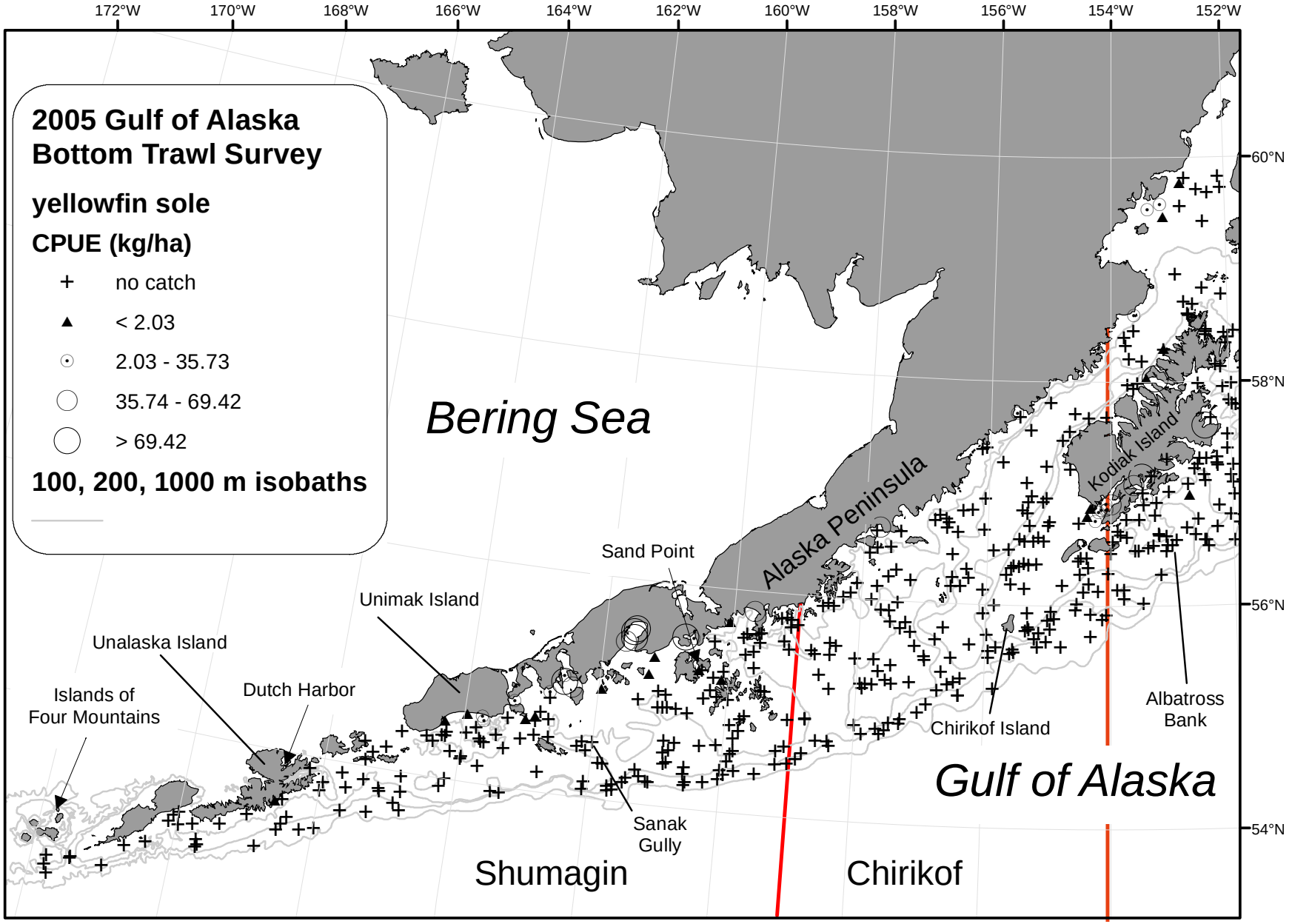

Figure 16. --Distribution and relative abundance of yellowfin sole from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

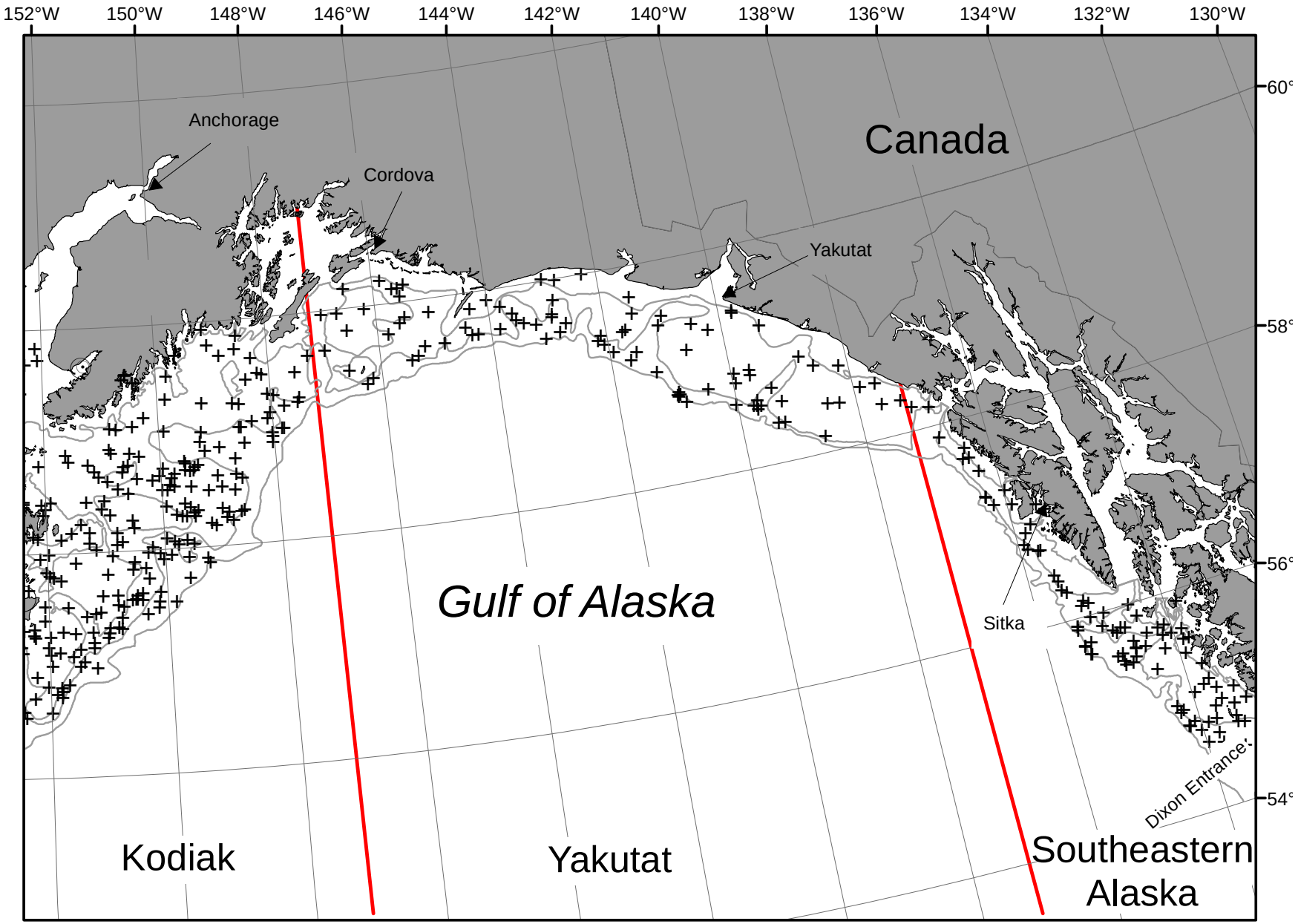

Figure 16. -- Continued.

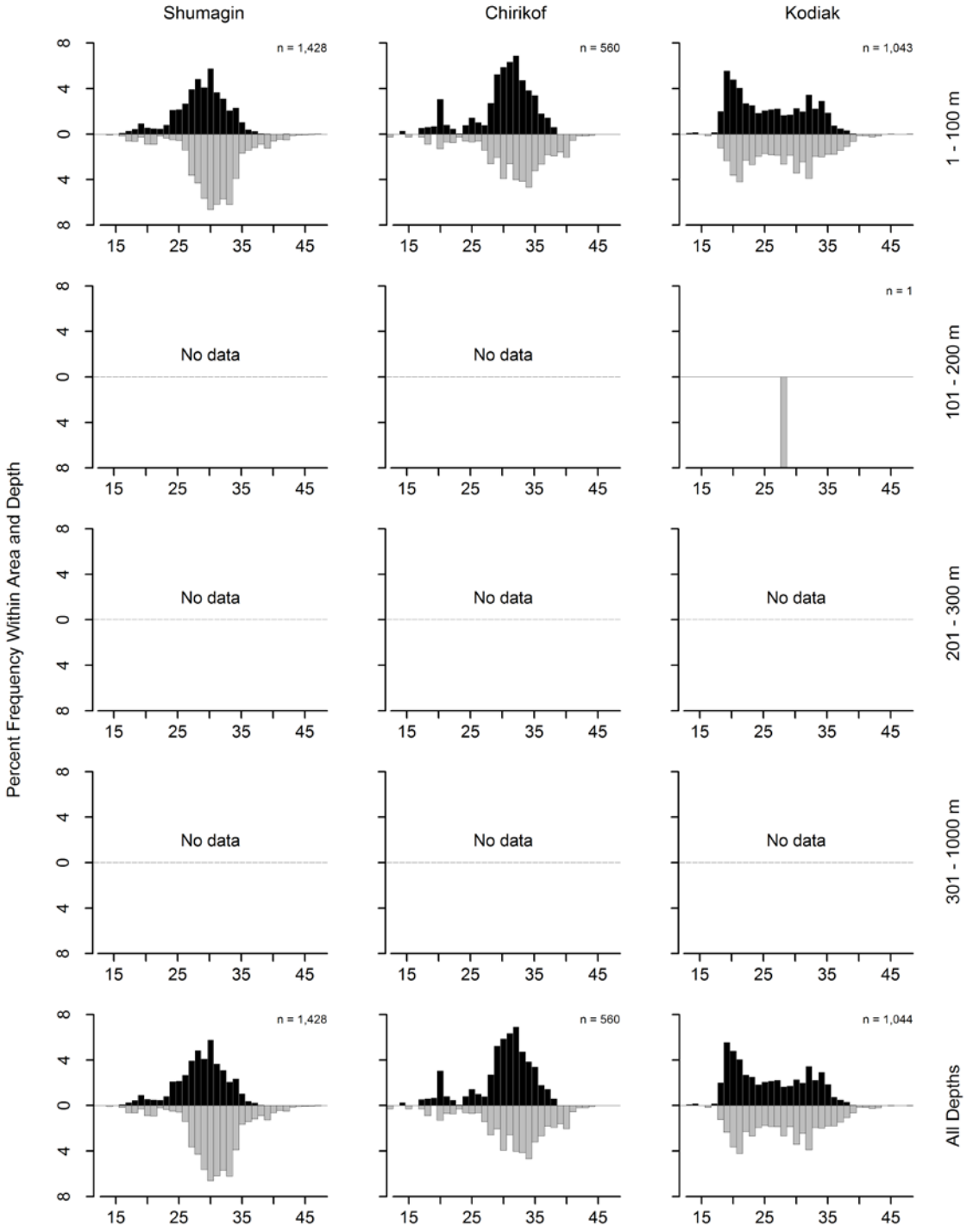

Figure 17. -- Size composition of yellowfin sole from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

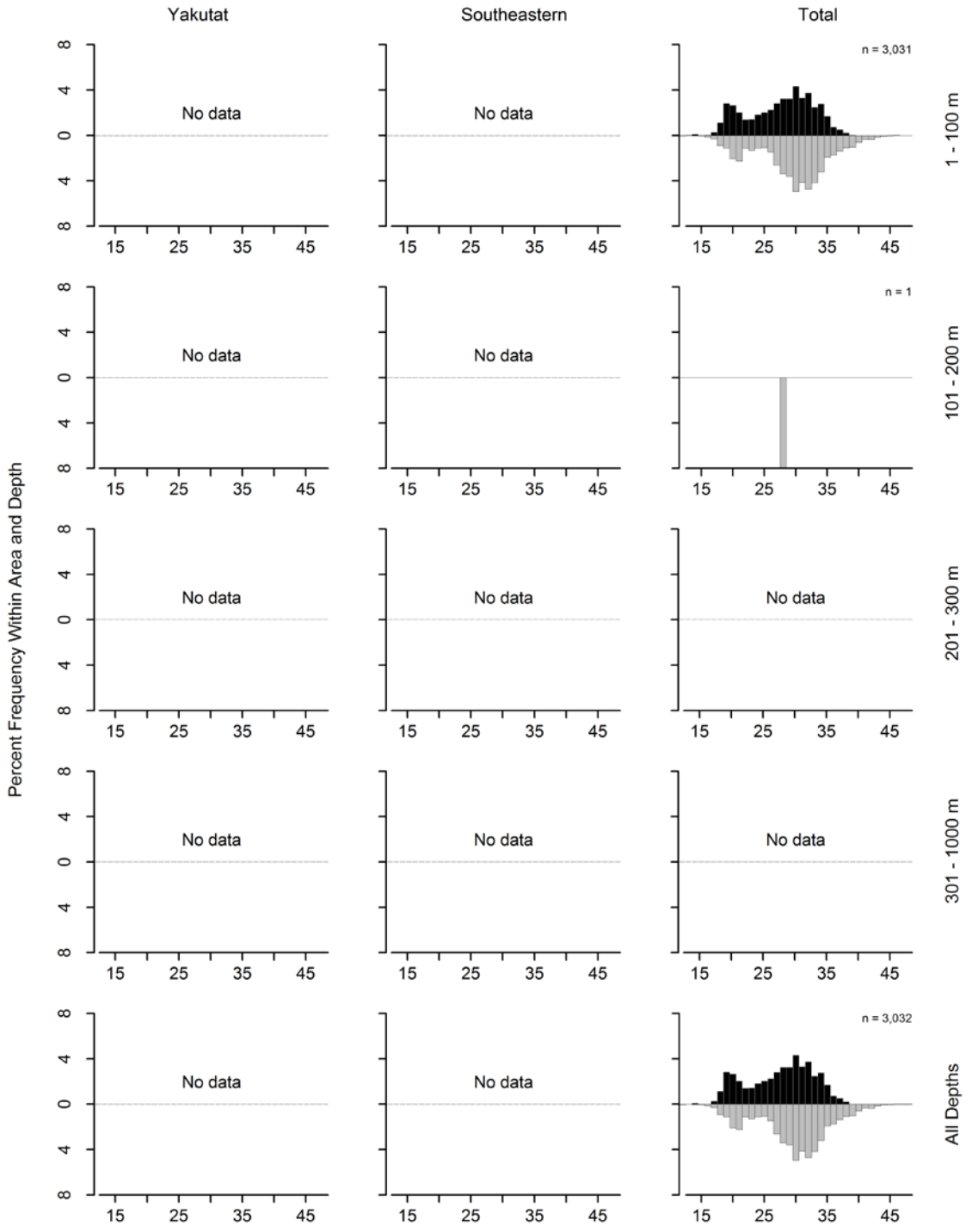

Figure 17. -- Continued (yellowfin sole).

Table 18. -- Catch per unit of effort by stratum for yellowfin sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Lower Alaska Peninsula	27	15	33.03	22,711	5,036	40,386
Kodiak	1 - 100	Albatross Shallows	34	4	12.65	7,294	0	17,345
Kodiak	1 - 100	Northern Kodiak Shallows	7	3	10.02	2,204	0	7,538
Kodiak	1 - 100	Lower Cook Inlet	13	6	8.18	8,091	125	16,056
Chirikof	1 - 100	Upper Alaska Peninsula	15	3	6.32	5,016	0	12,715
Chirikof	1 - 100	Chirikof Bank	37	9	2.60	2,811	174	5,447
Shumagin	1 - 100	Davidson Bank	37	6	0.30	405	0	868
Shumagin	1 - 100	Shumagin Bank	31	3	0.08	100	0	252
Shumagin	1 - 100	Fox Islands	22	1	0.07	62	0	189
Kodiak	101 - 200	Albatross Gullies	32	1	<0.01	2	0	7

Other Flatfishes

Alaska plaice (*Pleuronectes quadrituberculatus*)

Approximately 75% of the estimated biomass of Alaska plaice in the survey area came from the Upper and Lower Alaska Peninsula and Chirikof Bank strata, which together make up only 8% of the total survey area (Tables 19-20). Moderate densities were also recorded in the shallowest depth zone of the Northern Kodiak Shallows stratum. No Alaska plaice were caught in the Yakutat or Southeastern INPFC areas.

Starry flounder (*Platichthys stellatus*)

Catches of starry flounder exclusively confined to water depths less than 100 m and were caught in all but the Southeastern INPFC area (Table 21). The highest densities were recorded in Lower Alaska Peninsula and Davidson bank strata both in the Shumagin INPFC area (Table 22).

English sole (*Parophrys vetulus*)

English sole were encounted in all five INPFC areas in waters shallower than 300 m. Approximately 43% of the estimated biomass came from the Southeastern INPFC area (Table 23). Of that, most of the fish from this area came from a single stratum, the Southeastern Shallows (Table 24). The stratum which produced the highest CPUE and over 16% of the entire estimated biomas for the entire survey was the Nothern Kodiak Shallows stratum. Mean weight generally increased with depth (Table 23).

Butter sole (*Isopsetta isolepis*)

Butter sole were caught in all but the Southeastern INPFC area and were uncommon (Table 25). They were caught almost exclusively at depths less than 100 m. They were most common in the Kodiak INPFC area where they occurred in 31% of the shallow tows (Table 25). This area produced about 59% of the estimated biomass (Table 25). The strata with the highest CPUE included the Lower Cook Inlet, the Chirikof Bank and the Shumagin Bank strata (Table 26).

Table 19.-- Number of hauls, hauls with Alaska plaice, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	19	0.59	2,449	1.105	43.2
	101 - 200	36	1	0.01	18	0.606	37.5
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	20	0.38	2,467	1.098	43.2
Chirikof	1 - 100	71	16	1.49	3,871	0.796	36.6
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	16	0.57	3,871	0.796	36.6
Kodiak	1 - 100	109	13	0.41	1,588	1.546	46.6
	101 - 200	139	0	0.00	0	---	---
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	13	0.16	1,588	1.546	46.6
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	48	0.61	7,908	0.976	39.7
	101 - 200	316	1	0.00	18	0.606	37.5
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	49	0.25	7,926	0.974	39.7

All Areas and Depths Biomass, 95% confidence interval: 4,144 - 11,709 metric tons (t)

Table 20. -- Catch per unit of effort by stratum for Alaska plaice sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Lower Alaska Peninsula	27	13	3.05	2,097	675	3,519
Chirikof	1 - 100	Upper Alaska Peninsula	15	4	3.01	2,393	0	5,472
Chirikof	1 - 100	Chirikof Bank	37	12	1.37	1,478	536	2,419
Kodiak	1 - 100	Northern Kodiak Shallows	7	2	1.07	235	0	612
Kodiak	1 - 100	Albatross Shallows	34	8	0.88	506	0	1,125
Kodiak	1 - 100	Lower Cook Inlet	13	3	0.86	847	0	2,429
Shumagin	1 - 100	Shumagin Bank	31	2	0.16	198	0	533
Shumagin	1 - 100	Davidson Bank	37	4	0.11	154	0	363
Shumagin	101 - 200	Sanak Gully	11	1	0.04	18	0	59

Table 21.-- Number of hauls, hauls with starry flounder, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	21	3.90	16,122	1.798	50.0
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	21	2.47	16,122	1.798	50.0
Chirikof	1 - 100	71	19	1.25	3,258	2.033	50.4
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	19	0.48	3,258	2.033	50.4
Kodiak	1 - 100	109	18	1.78	6,848	1.969	51.1
	101 - 200	139	0	0.00	0	---	---
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	18	0.67	6,848	1.969	51.1
Yakutat	1 - 100	15	1	0.21	358	3.273	60.5
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	1	0.06	358	3.273	60.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	59	2.06	26,586	1.878	50.4
	101 - 200	316	0	0.00	0	---	---
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	59	0.83	26,586	1.878	50.4

All Areas and Depths Biomass, 95% confidence interval: 11,688 - 41,483 metric tons (t)

Table 22. -- Catch per unit of effort by stratum for starry flounder sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Lower Alaska Peninsula	27	13	10.96	7,536	1,524	13,548
Shumagin	1 - 100	Davidson Bank	37	5	6.13	8,388	0	20,521
Kodiak	1 - 100	Lower Cook Inlet	13	7	5.06	5,004	0	11,420
Chirikof	1 - 100	Upper Alaska Peninsula	15	8	2.16	1,717	497	2,937
Chirikof	1 - 100	Chirikof Bank	37	11	1.43	1,540	178	2,903
Kodiak	1 - 100	Northern Kodiak Shallows	7	1	1.05	232	0	798
Kodiak	1 - 100	Albatross Banks	49	5	0.77	1,182	0	2,931
Kodiak	1 - 100	Albatross Shallows	34	5	0.75	432	0	1,048
Yakutat	1 - 100	Yakutat Shallows	8	1	0.36	358	0	1,205
Shumagin	1 - 100	Shumagin Bank	31	2	0.14	173	0	454
Shumagin	1 - 100	Fox Islands	22	1	0.03	25	0	77

Table 23.-- Number of hauls, hauls with English sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	8	0.20	825	0.956	41.0
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	8	0.13	825	0.956	41.0
Chirikof	1 - 100	71	7	0.35	919	1.054	44.9
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	7	0.13	919	1.054	44.9
Kodiak	1 - 100	109	19	0.84	3,236	0.754	41.3
	101 - 200	139	1	0.06	241	1.320	49.6
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	20	0.34	3,477	0.777	41.6
Yakutat	1 - 100	15	7	1.85	3,079	0.378	32.3
	101 - 200	42	1	0.01	19	0.641	41.0
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	8	0.54	3,099	0.379	32.3
Southeastern	1 - 100	9	3	6.56	4,296	0.447	34.6
	101 - 200	37	12	1.73	1,916	0.537	37.5
	201 - 300	32	3	0.13	64	0.581	38.6
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	18	2.24	6,276	0.473	35.4
All Areas	1 - 100	321	44	0.96	12,355	0.520	35.6
	101 - 200	316	14	0.18	2,177	0.576	38.1
	201 - 300	119	3	0.02	64	0.581	38.6
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	61	0.46	14,595	0.528	36.0

All Areas and Depths Biomass, 95% confidence interval: 4,884 - 24,307 metric tons (t)

Table 24. -- Catch per unit of effort by stratum for English sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Northern Kodiak Shallows	7	2	10.72	2,359	0	6,086
Southeastern	1 - 100	Southeastern Shallows	9	3	6.56	4,296	0	13,318
Yakutat	1 - 100	Yakutat Shallows	8	6	2.85	2,837	316	5,358
Southeastern	101 - 200	Prince of Wales Shelf	26	7	1.92	1,323	0	2,777
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	5	1.41	593	0	1,547
Chirikof	1 - 100	Upper Alaska Peninsula	15	4	1.08	855	0	2,217
Kodiak	1 - 100	Albatross Shallows	34	11	0.53	306	0	620
Shumagin	1 - 100	Davidson Bank	37	2	0.48	659	0	1,972
Kodiak	1 - 100	Albatross Banks	49	5	0.36	556	0	1,135
Yakutat	1 - 100	Middleton Shallows	7	1	0.36	242	0	835
Kodiak	101 - 200	Albatross Gullies	32	1	0.31	241	0	733
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	3	0.16	64	0	140
Shumagin	1 - 100	Lower Alaska Peninsula	27	4	0.14	96	0	239
Chirikof	1 - 100	Chirikof Bank	37	3	0.06	64	0	140
Shumagin	1 - 100	Shumagin Bank	31	2	0.06	71	0	201
Yakutat	101 - 200	Fairweather Shelf	11	1	0.03	19	0	63
Kodiak	1 - 100	Lower Cook Inlet	13	1	0.02	15	0	47

Table 25.-- Number of hauls, hauls with butter sole, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	23	1.44	5,945	0.588	37.5
	101 - 200	36	1	0.00	7	0.356	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	24	0.91	5,952	0.588	37.5
Chirikof	1 - 100	71	29	1.80	4,673	0.346	31.3
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	29	0.69	4,673	0.346	31.3
Kodiak	1 - 100	109	34	4.04	15,549	0.258	29.0
	101 - 200	139	2	0.00	21	0.531	36.7
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	36	1.53	15,569	0.258	29.0
Yakutat	1 - 100	15	2	0.02	31	0.279	29.5
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	2	0.01	31	0.279	29.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	88	2.03	26,198	0.312	30.4
	101 - 200	316	3	0.00	28	0.470	36.7
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	91	0.82	26,226	0.312	30.4

All Areas and Depths Biomass, 95% confidence interval: 12,035 - 40,416 metric tons (t)

Table 26. -- Catch per unit of effort by stratum for butter sole sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Lower Cook Inlet	13	10	8.64	8,546	2,084	15,008
Chirikof	1 - 100	Chirikof Bank	37	26	3.92	4,230	1,542	6,918
Shumagin	1 - 100	Shumagin Bank	31	7	3.79	4,699	0	13,227
Kodiak	1 - 100	Albatross Banks	49	8	3.75	5,771	0	15,174
Kodiak	1 - 100	Albatross Shallows	34	14	2.02	1,167	105	2,229
Shumagin	1 - 100	Lower Alaska Peninsula	27	7	0.62	427	0	1,056
Shumagin	1 - 100	Davidson Bank	37	8	0.59	811	0	1,862
Chirikof	1 - 100	Upper Alaska Peninsula	15	3	0.56	444	0	1,090
Kodiak	1 - 100	Northern Kodiak Shallows	7	2	0.29	64	0	200
Shumagin	101 - 200	West Shumagin Gully	4	1	0.03	7	0	30
Yakutat	1 - 100	Yakutat Shallows	8	2	0.03	31	0	84
Kodiak	101 - 200	Albatross Gullies	32	2	0.03	21	0	54
Shumagin	1 - 100	Fox Islands	22	1	0.01	9	0	28

ROUNDFISHES

Walleye pollock (*Theragra chalcogramma*)

Walleye pollock was the fifth most abundant species caught in the 2005 survey (Table 2). Pollock were caught throughout the survey area at depths shallower than 500 m with depths shallower than 200 m producing almost 90% of the estimated biomass (Table 27). They were most common in the Kodiak and Shumagin INPFC areas which produced 74% of the total estimated biomass (Table 27). This species was found in 49 of the 59 survey strata (Table 28. The highest densities occurred in bays around Kodiak Island and in scattered areas throughout the Shumagin and Chirikof INPFC areas (Fig. 18). Specifically, the highest CPUEs came from the Albatross Shallows and Davidson Bank strata in the Kodiak and Shumagin INPFC areas respectively (Table 28). These two strata contained about 36% of the total estimated biomass despite representing only about 6% of the entire survey area (Fig. 18, Table 28). Although the mean weight was highest at the deepest depth in three of the five INPFC areas, there was no consistent trend in mean weight with depth over the entire survey area. Length frequency data from waters shallower than 300 m show a distinct bimodal distribution in each of the INPFC areas. While they vary in structure and size, these distributions show a mode at 15 to 25 cm and another between 45 and 60 cm. These data clearly indicate that the adult mode is much stronger in the Shumagin INPFC area while the juvenile mode is much more predominant in the Kodiak area.(Fig. 19).

Table 27.-- Number of hauls, hauls with walleye pollock, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	56	22.94	94,732	0.761	45.1
	101 - 200	36	30	29.73	43,636	0.865	49.0
	201 - 300	12	12	3.53	983	0.779	47.6
	301 - 500	9	2	0.32	81	0.790	47.2
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	100	21.38	139,432	0.791	46.3
Chirikof	1 - 100	71	28	17.35	45,159	1.413	53.8
	101 - 200	62	38	2.66	6,344	0.570	36.0
	201 - 300	25	23	7.99	9,225	0.164	20.4
	301 - 500	10	4	0.16	25	0.667	45.1
	501 - 700	6	1	0.21	42	1.009	52.0
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	94	8.93	60,796	0.611	32.9
Kodiak	1 - 100	109	58	20.81	80,143	0.557	33.2
	101 - 200	139	89	11.01	47,702	0.265	23.8
	201 - 300	29	28	11.92	13,698	0.257	23.2
	301 - 500	8	3	8.38	2,440	0.874	48.9
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	178	14.19	143,982	0.379	27.5
Yakutat	1 - 100	15	12	1.11	1,842	0.136	22.3
	101 - 200	42	38	2.70	7,925	0.252	26.7
	201 - 300	21	21	5.55	2,872	0.585	43.2
	301 - 500	8	5	3.84	1,010	0.777	48.7
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	76	2.39	13,648	0.267	27.7
Southeastern	1 - 100	9	4	0.80	525	0.101	19.5
	101 - 200	37	32	12.21	13,537	0.250	28.6
	201 - 300	32	31	18.31	9,250	0.614	42.3
	301 - 500	13	1	0.03	9	1.083	52.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	68	8.32	23,321	0.313	30.8
All Areas	1 - 100	321	158	17.23	222,401	0.697	39.2
	101 - 200	316	227	9.74	119,144	0.365	29.2
	201 - 300	119	115	9.99	36,028	0.275	25.2
	301 - 500	48	15	2.79	3,565	0.841	48.8
	501 - 700	23	1	0.05	42	1.009	52.0
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	516	11.91	381,178	0.488	32.7

All Areas and Depths Biomass, 95% confidence interval: 264,874 - 497,483 metric tons (t)

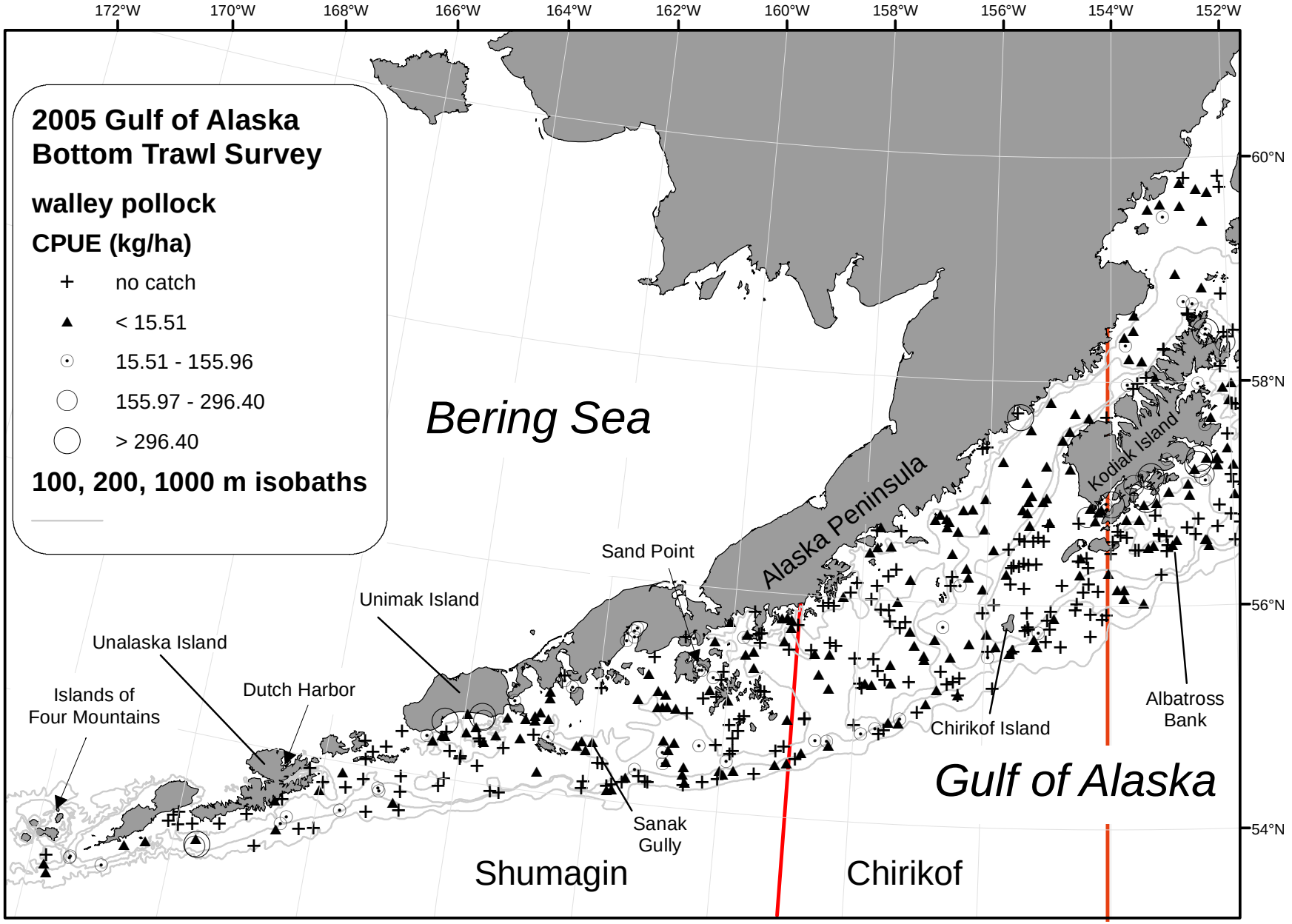

Figure 18. --Distribution and relative abundance of walleye pollock from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

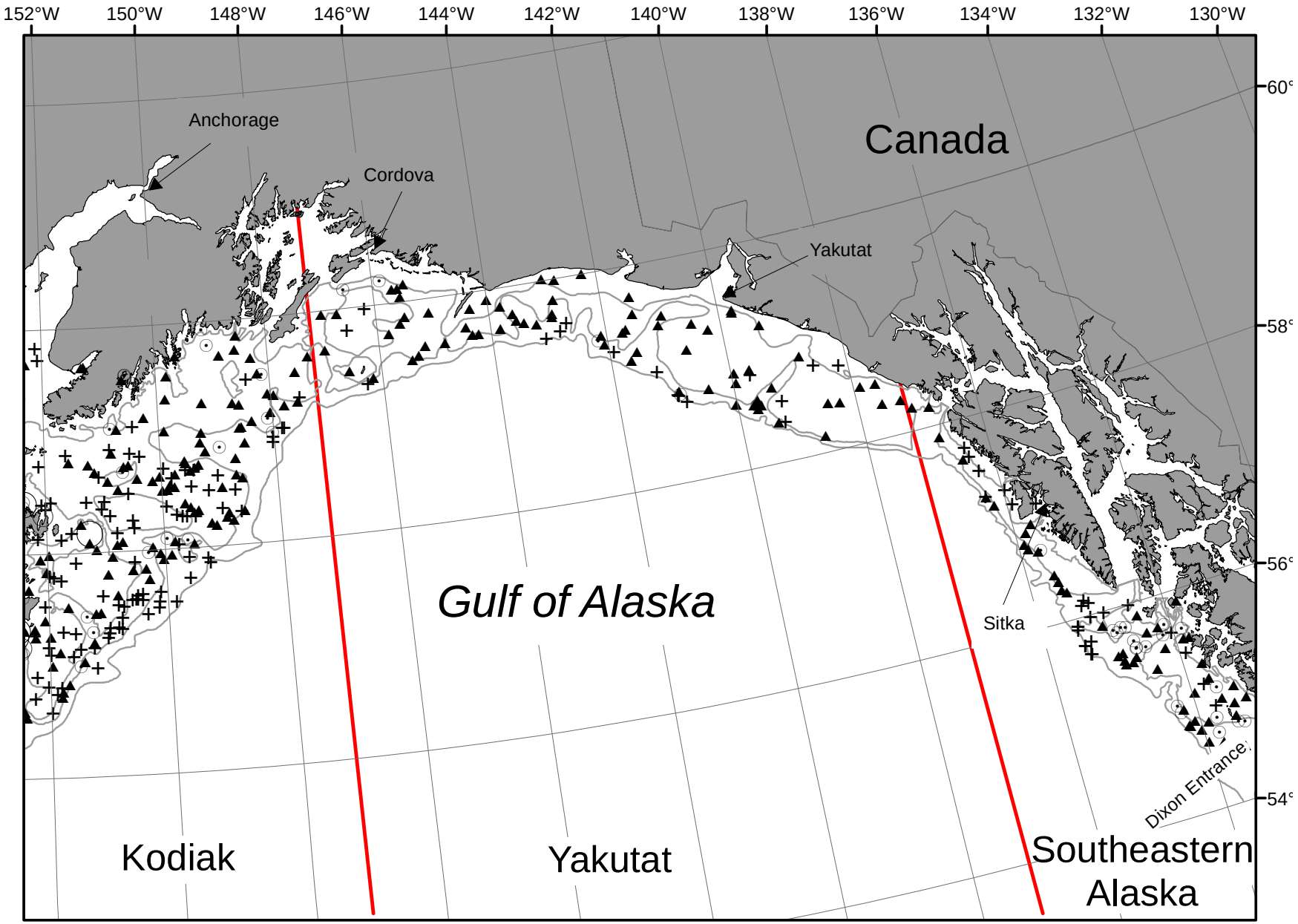

Figure 18. -- Continued.

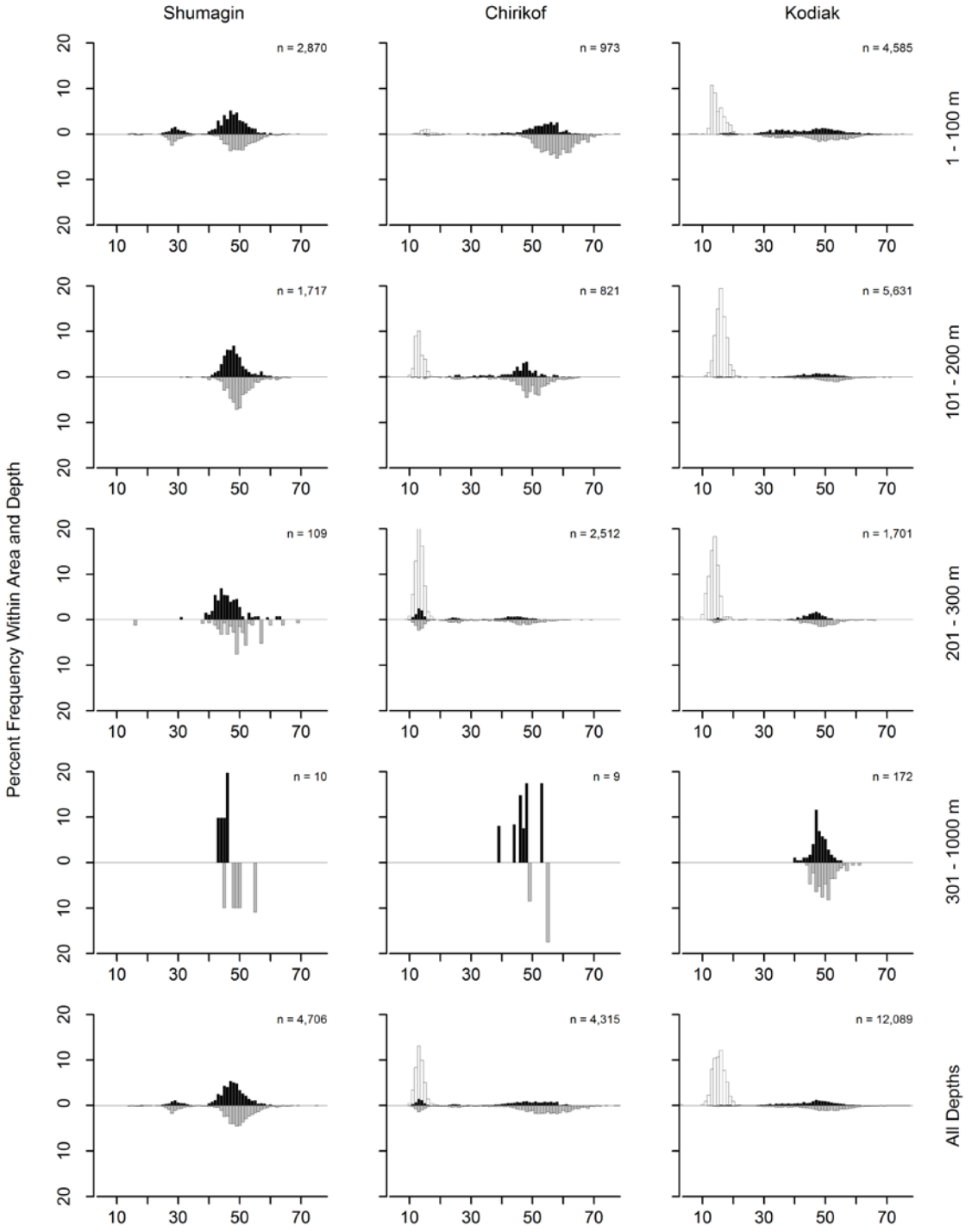

Figure 19. -- Size composition of walleye pollock from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

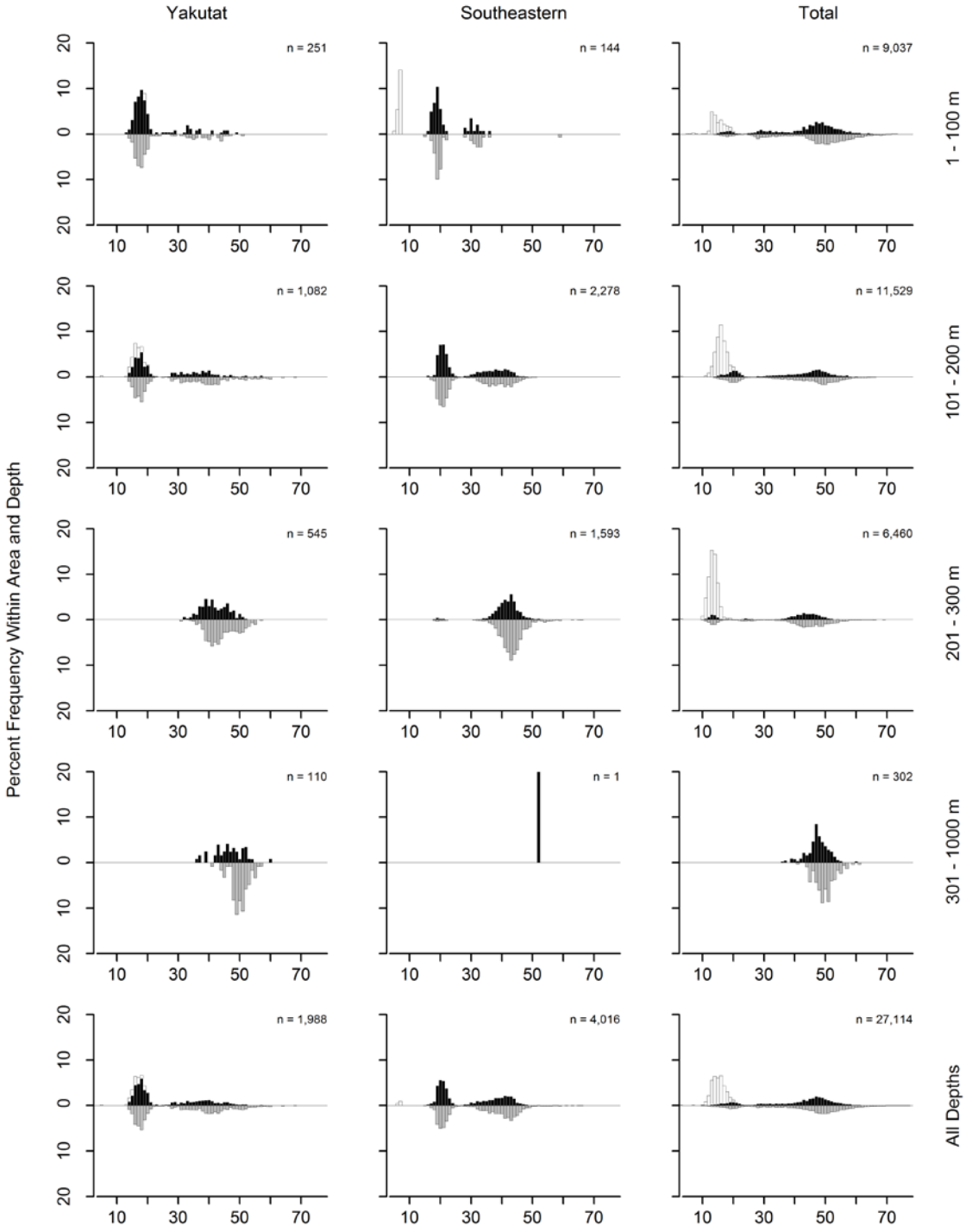

Figure 19. -- Continued (walleye pollock).

Table 28. -- Catch per unit of effort by stratum for walleye pollock sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Albatross Shallows	34	22	117.67	67,852	27,128	108,575
Shumagin	1 - 100	Davidson Bank	37	19	50.69	69,347	0	154,907
Shumagin	101 - 200	Shumagin Outer Shelf	21	16	48.19	39,296	2,131	76,460
Kodiak	101 - 200	Albatross Gullies	32	18	26.90	21,281	0	44,188
Chirikof	1 - 100	Chirikof Bank	37	14	26.22	28,296	0	65,106
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	26	22.68	8,908	3,358	14,457
Chirikof	1 - 100	Upper Alaska Peninsula	15	5	21.20	16,831	0	52,699
Shumagin	1 - 100	Lower Alaska Peninsula	27	19	17.75	12,207	4,208	20,206
Kodiak	1 - 100	Kenai Peninsula	6	6	17.25	9,071	178	17,965
Southeastern	101 - 200	Prince of Wales Shelf	26	23	16.48	11,353	5,175	17,532
Kodiak	201 - 300	Kenai Gullies	20	20	15.12	10,068	30	20,107
Kodiak	101 - 200	Kenai Flats	22	20	10.69	12,907	3,260	22,555
Shumagin	1 - 100	Shumagin Bank	31	13	10.59	13,131	0	27,837
Chirikof	201 - 300	Chirikof Slope	8	6	9.86	1,506	163	2,849
Kodiak	201 - 300	Upper Shelikof Gully	3	3	9.14	2,934	1,476	4,391
Kodiak	101 - 200	Barren Islands	16	12	9.06	9,950	1,754	18,145
Shumagin	101 - 200	Sanak Gully	11	11	8.86	3,762	1,168	6,357
Kodiak	301 - 500	Kodiak Slope	8	3	8.38	2,440	0	8,125
Chirikof	201 - 300	Lower Shelikof Gully	17	17	7.71	7,719	4,529	10,908
Yakutat	201 - 300	Yakutat Slope	13	13	7.59	1,614	358	2,870
Chirikof	101 - 200	Chirikof Outer Shelf	20	10	7.49	3,752	582	6,922
Yakutat	101 - 200	Middleton Shelf	12	12	6.42	4,714	1,767	7,662
Yakutat	301 - 500	Yakutat Slope	6	3	5.34	813	0	2,043
Kodiak	101 - 200	Kodiak Outer Shelf	28	12	5.23	2,630	0	6,790
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	9	5.20	2,183	672	3,695
Kodiak	201 - 300	Kodiak Slope	6	5	4.29	696	0	2,055
Yakutat	201 - 300	Yakutat Gullies	8	8	4.13	1,258	327	2,189
Shumagin	201 - 300	Shumagin Slope	12	12	3.53	983	128	1,839
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	3.04	342	156	528
Kodiak	1 - 100	Lower Cook Inlet	13	10	2.91	2,878	0	6,252
Yakutat	101 - 200	Yakataga Shelf	8	8	2.54	1,339	0	3,220
Shumagin	101 - 200	West Shumagin Gully	4	3	2.54	578	0	1,709
Chirikof	101 - 200	Shelikof Edge	24	20	2.41	1,864	0	4,091
Yakutat	301 - 500	Yakutat Gullies	2	2	1.78	197	0	1,541
Yakutat	1 - 100	Yakutat Shallows	8	7	1.76	1,746	0	3,785
Yakutat	101 - 200	Fairweather Shelf	11	8	1.57	1,214	0	2,768
Kodiak	101 - 200	Portlock Flats	41	27	1.27	934	299	1,570
Southeastern	1 - 100	Southeastern Shallows	9	4	0.80	525	0	1,695
Yakutat	101 - 200	Yakutat Flats	11	10	0.73	657	0	1,384
Chirikof	101 - 200	East Shumagin Gully	18	8	0.66	728	0	1,726
Shumagin	301 - 500	Shumagin Slope	9	2	0.32	81	0	239
Kodiak	1 - 100	Albatross Banks	49	19	0.22	340	0	865
Chirikof	501 - 700	Chirikof Slope	6	1	0.21	42	0	149
Chirikof	301 - 500	Chirikof Slope	10	4	0.16	25	0	54
Yakutat	1 - 100	Middleton Shallows	7	5	0.14	96	0	231
Southeastern	301 - 500	Southeastern Slope	4	1	0.12	9	0	38
Shumagin	1 - 100	Fox Islands	22	5	0.06	47	0	99
Chirikof	1 - 100	Semidi Bank	19	9	0.04	32	2	62
Kodiak	1 - 100	Northern Kodiak Shallows	7	1	0.01	2	0	7

Pacific cod (*Gadus macrocephalus*)

Pacific cod was the seventh most abundant species caught in the 2005 survey (Table 2). Cod were caught throughout the survey area in depths shallower than 300 m. Most were caught in the shallowest depth stratum which comprised over 78% of the estimated biomass (Table 29). Cod occurred in 76% of the tows at this depth range. Ninety-five percent of the total Pacific cod biomass was estimated from the three western areas with very low densities in the Yakutat and Southeastern INPFC areas (Table 29, Fig. 20). Pacific Cod were found in 39 of the 59 survey strata (Table 30). The four strata with the highest CPUEs- the Semidi and Davidson Banks, the Albatross shallows and the Lower Alaska Peninsula contained 53% of the estimated biomass while containing only 10% of the entire survey area (Table 30). Mean weight increased with depth. A very distinct length mode occurred for young-of-the-year around 20 cm FL at depths less than 100 m in the three western INPFC area (Fig. 21). In the Shumagin and Kodiak areas another mode occurred at about 40 cm and yet another is apparent at 60 cm at all three of these INPFC areas in waters shallower than 200 m.

Table 29.-- Number of hauls, hauls with Pacific cod, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	96	28.73	118,607	2.770	53.2
	101 - 200	36	30	9.13	13,395	3.390	64.6
	201 - 300	12	5	7.23	2,016	3.107	65.1
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	131	20.55	134,018	2.826	54.3
Chirikof	1 - 100	71	47	27.78	72,328	1.852	54.7
	101 - 200	62	36	2.51	5,989	2.492	59.9
	201 - 300	25	9	1.37	1,580	2.866	63.7
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	92	11.74	79,897	1.902	55.2
Kodiak	1 - 100	109	91	12.42	47,855	1.720	49.0
	101 - 200	139	90	6.70	29,044	2.210	57.3
	201 - 300	29	6	2.89	3,322	2.666	61.9
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	187	7.90	80,221	1.901	51.9
Yakutat	1 - 100	15	6	0.81	1,352	1.991	54.1
	101 - 200	42	4	0.59	1,736	3.003	63.4
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	10	0.54	3,088	2.456	58.4
Southeastern	1 - 100	9	3	1.02	669	0.766	38.5
	101 - 200	37	27	5.95	6,590	1.577	51.1
	201 - 300	32	22	7.14	3,607	1.884	55.3
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	52	3.88	10,867	1.559	50.7
All Areas	1 - 100	321	243	18.66	240,811	2.165	52.6
	101 - 200	316	187	4.64	56,754	2.340	57.8
	201 - 300	119	42	2.92	10,526	2.414	59.7
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	472	9.63	308,091	2.203	53.7

All Areas and Depths Biomass, 95% confidence interval: 144,669 - 471,512 metric tons (t)

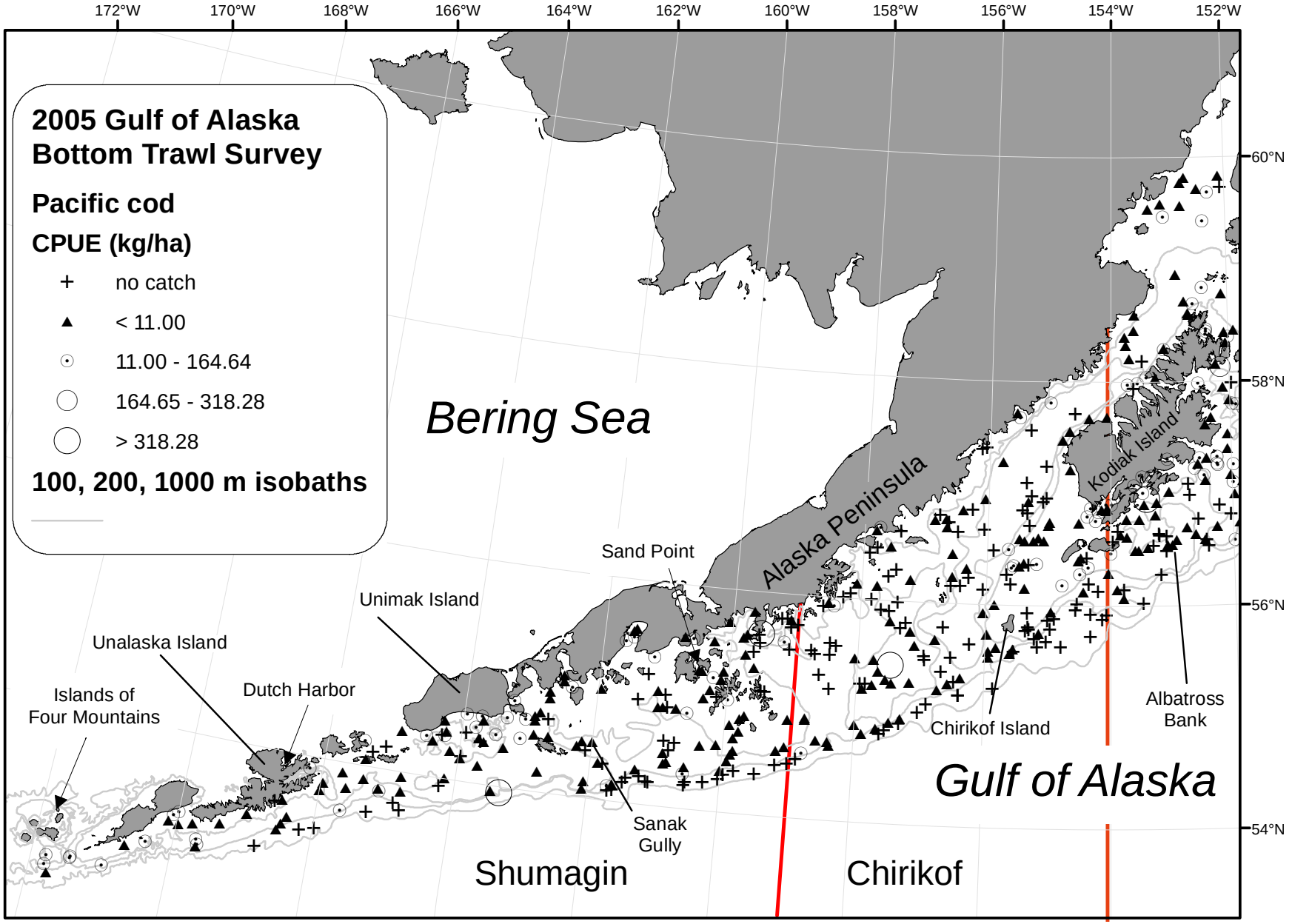

Figure 20. --Distribution and relative abundance of Pacific cod from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

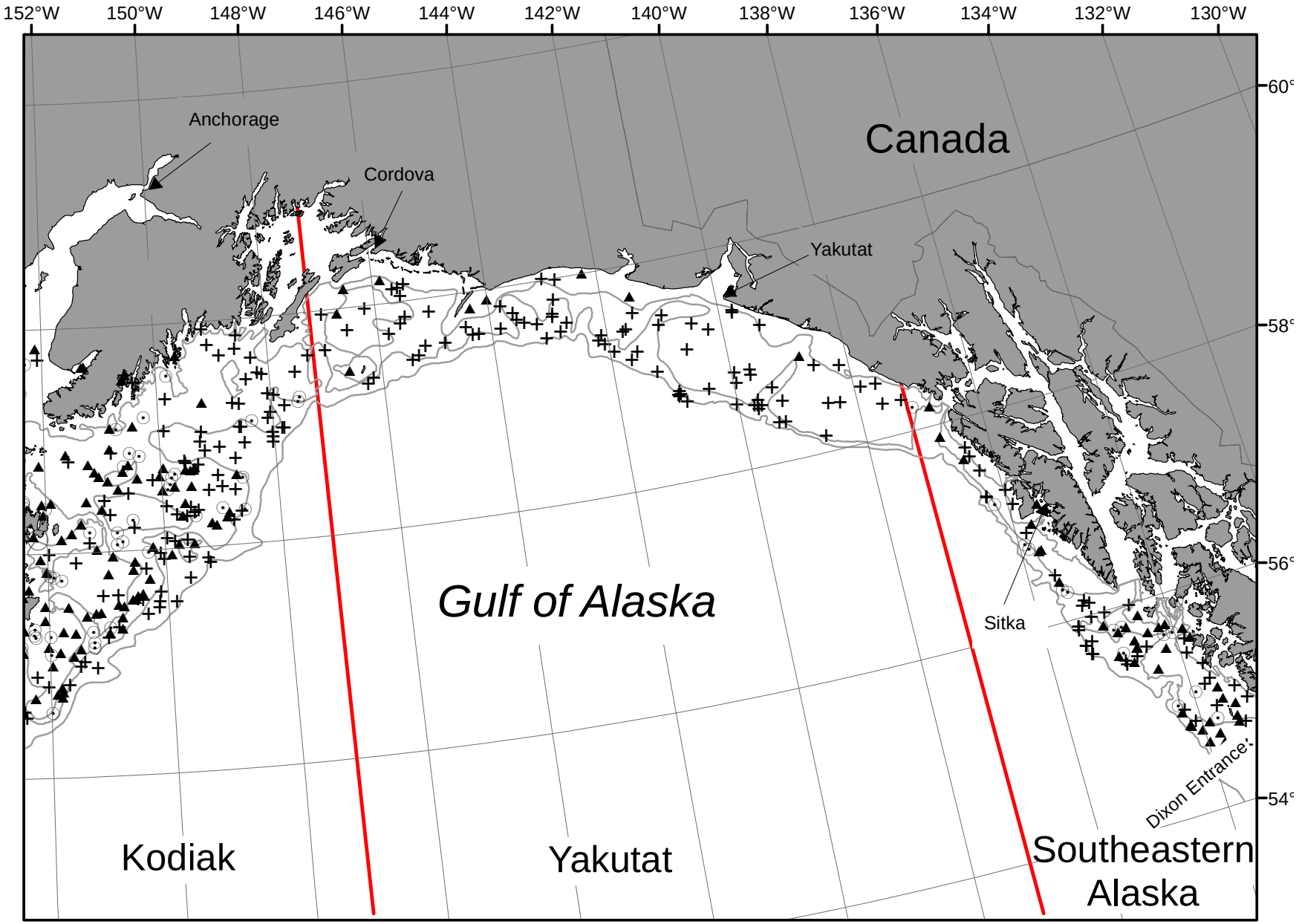

Figure 20. -- Continued.

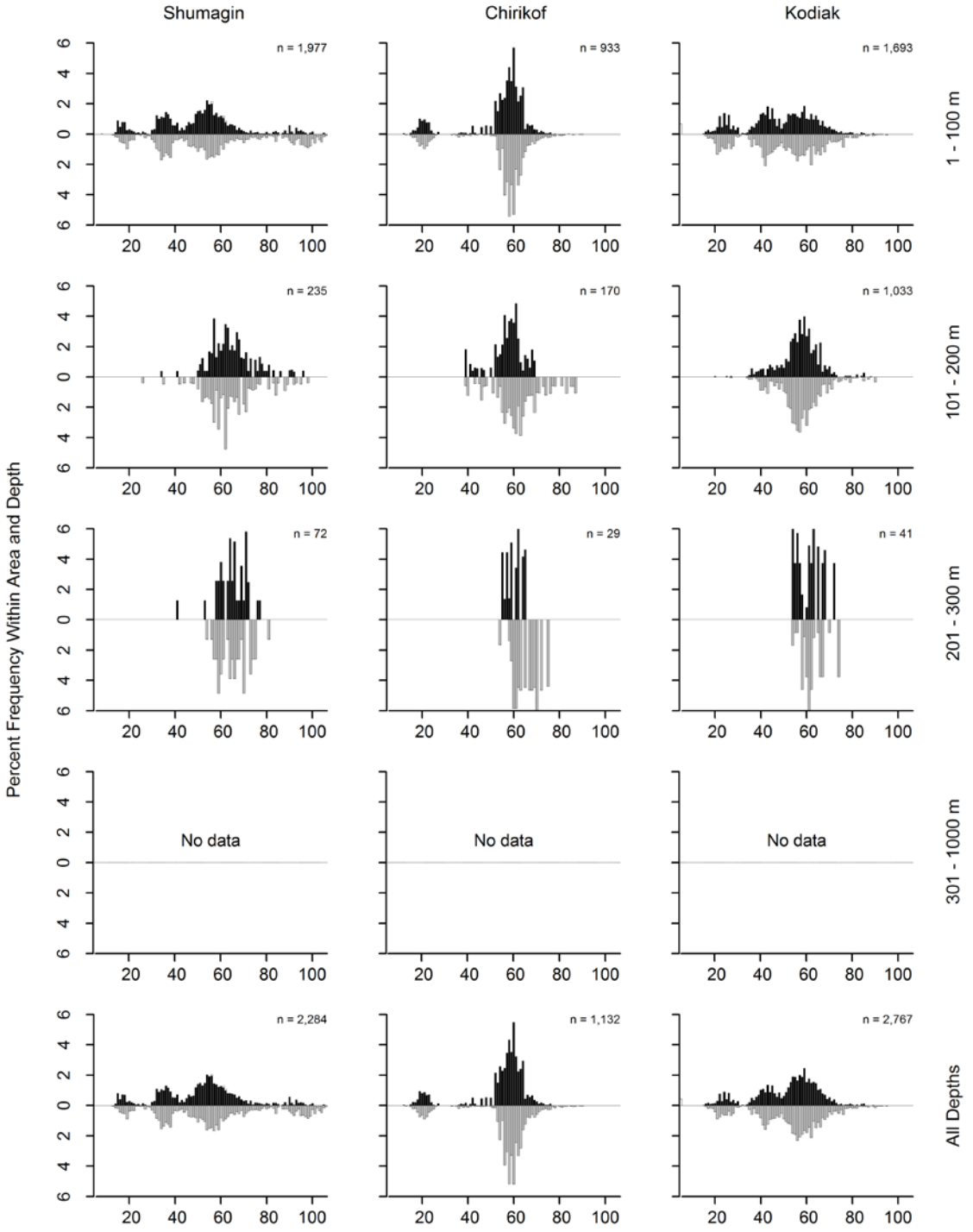

Figure 21. -- Size composition of Pacific cod from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

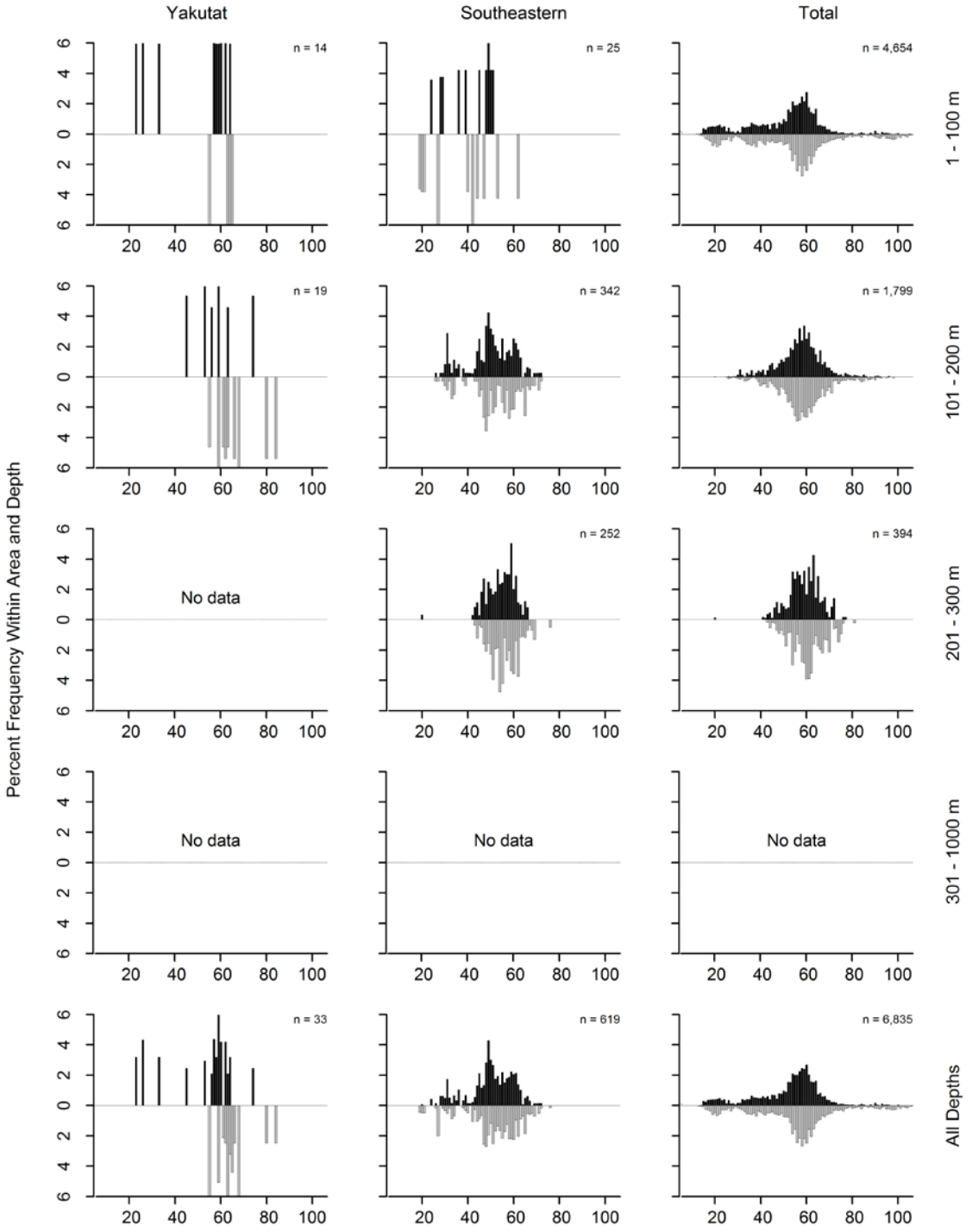

Figure 21. – Continued (Pacific cod).

Table 30. -- Catch per unit of effort by stratum for Pacific cod sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Chirikof	1 - 100	Semidi Bank	19	10	65.71	47,982	0	146,141
Shumagin	1 - 100	Davidson Bank	37	30	56.05	76,689	0	204,236
Kodiak	1 - 100	Albatross Shallows	34	32	30.87	17,799	3,657	31,940
Shumagin	1 - 100	Lower Alaska Peninsula	27	23	29.73	20,442	0	48,809
Shumagin	101 - 200	Shumagin Outer Shelf	21	21	15.40	12,553	4,250	20,856
Shumagin	1 - 100	Fox Islands	22	19	14.58	12,150	2,936	21,363
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	14.42	1,622	1,075	2,169
Chirikof	1 - 100	Upper Alaska Peninsula	15	8	13.40	10,637	0	24,413
Chirikof	1 - 100	Chirikof Bank	37	29	12.70	13,710	4,926	22,493
Kodiak	1 - 100	Lower Cook Inlet	13	13	11.77	11,639	0	23,679
Kodiak	1 - 100	Northern Kodiak Shallows	7	6	11.67	2,566	0	5,428
Kodiak	101 - 200	Barren Islands	16	14	9.49	10,418	64	20,773
Kodiak	201 - 300	Upper Shelikof Gully	3	1	8.81	2,826	0	14,984
Kodiak	1 - 100	Albatross Banks	49	36	8.29	12,766	3,382	22,150
Kodiak	101 - 200	Portlock Flats	41	29	8.20	6,016	3,158	8,875
Kodiak	101 - 200	Albatross Gullies	32	23	8.19	6,480	691	12,269
Southeastern	101 - 200	Prince of Wales Shelf	26	20	8.18	5,634	1,362	9,907
Shumagin	1 - 100	Shumagin Bank	31	24	7.52	9,326	3,720	14,933
Shumagin	201 - 300	Shumagin Slope	12	5	7.23	2,016	0	5,521
Kodiak	1 - 100	Kenai Peninsula	6	4	5.87	3,085	0	7,704
Kodiak	101 - 200	Kodiak Outer Shelf	28	18	5.54	2,783	1,261	4,305
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	17	5.05	1,985	257	3,713
Chirikof	101 - 200	Shelikof Edge	24	15	4.17	3,223	907	5,540
Chirikof	101 - 200	Chirikof Outer Shelf	20	16	3.27	1,640	624	2,656
Kodiak	101 - 200	Kenai Flats	22	6	2.77	3,346	442	6,250
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	7	2.28	956	27	1,885
Kodiak	201 - 300	Kodiak Slope	6	1	2.04	330	0	1,180
Chirikof	201 - 300	Chirikof Slope	8	5	1.93	295	0	641
Shumagin	101 - 200	Sanak Gully	11	7	1.76	746	0	1,539
Yakutat	101 - 200	Fairweather Shelf	11	1	1.36	1,054	0	3,401
Chirikof	201 - 300	Lower Shelikof Gully	17	4	1.28	1,285	0	2,904
Southeastern	1 - 100	Southeastern Shallows	9	3	1.02	669	0	2,034
Chirikof	101 - 200	East Shumagin Gully	18	5	1.01	1,126	45	2,206
Yakutat	1 - 100	Yakutat Shallows	8	4	0.93	921	0	2,145
Yakutat	1 - 100	Middleton Shallows	7	2	0.64	431	0	1,472
Yakutat	101 - 200	Middleton Shelf	12	2	0.56	414	0	1,192
Shumagin	101 - 200	West Shumagin Gully	4	2	0.42	96	0	273
Yakutat	101 - 200	Yakutat Flats	11	1	0.30	269	0	867
Kodiak	201 - 300	Kenai Gullies	20	4	0.25	167	0	345

Atka mackerel (*Pleurogrammus monopterygius*)

Atka mackerel was the thirteenth most abundant species caught in the 2005 survey (Table 2). Atka mackerel were caught in the three western INPFC areas, most commonly in waters less than 100 m in depth (Table 31). Mean CPUE and estimated biomass increased in a westerly direction with 90% of the estimated biomass occurring in the shallowest depth zone of the Shumagin INPFC area (Table 31, Fig. 22). The two strata with this highest CPUE produced 81% of the estimated biomass despite having only 8% of the survey area. Both of these strata produced a CPUE rate approximately three times that of the stratum with the next highest rate (Table 32). Over the entire area Atka mackerel were caught in about 14% of tows at depths less than 200 m compared with 33% in the Shumagin INPFC area. Most of the fish captured were longer than 40 cm FL (Fig. 23).

Table 31.-- Number of hauls, hauls with Atka mackerel, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	36	21.96	90,676	1.035	43.0
	101 - 200	36	15	4.39	6,440	0.973	42.2
	201 - 300	12	2	0.42	117	0.781	38.8
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	53	14.91	97,233	1.030	43.0
Chirikof	1 - 100	71	9	0.20	530	0.920	42.3
	101 - 200	62	22	0.68	1,611	0.985	42.7
	201 - 300	25	7	0.34	392	1.018	43.0
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	38	0.37	2,533	0.975	42.6
Kodiak	1 - 100	109	2	0.27	1,050	1.531	45.7
	101 - 200	139	7	0.02	97	1.214	44.2
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	9	0.11	1,147	1.498	45.3
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	47	7.15	92,256	1.038	43.0
	101 - 200	316	44	0.67	8,147	0.977	42.3
	201 - 300	119	9	0.14	510	0.952	41.8
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	100	3.15	100,912	1.032	43.0

All Areas and Depths Biomass, 95% confidence interval: 888 - 200,937 metric tons (t)

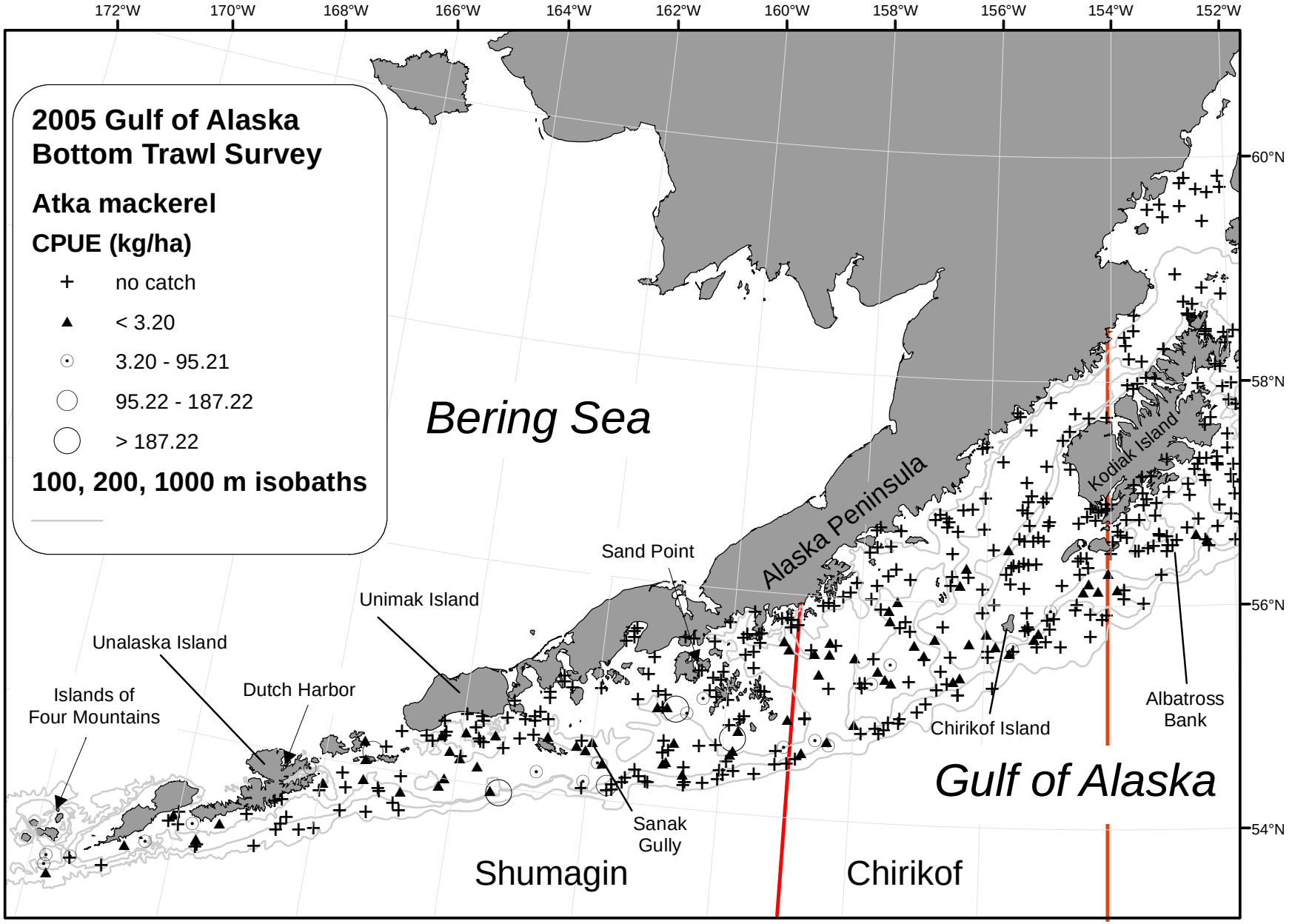

Figure 22. --Distribution and relative abundance of Atka mackerel from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

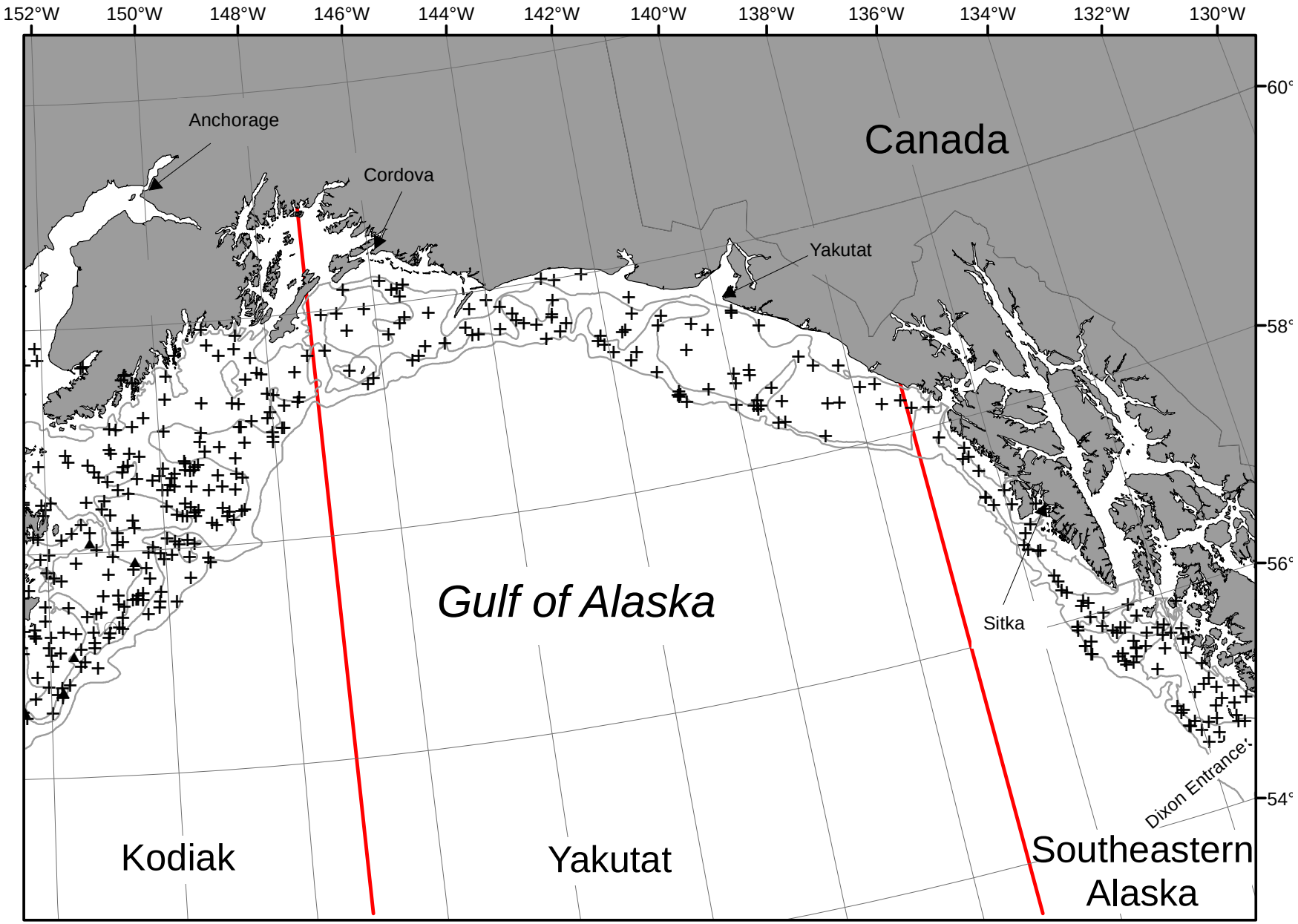

Figure 22. -- Continued.

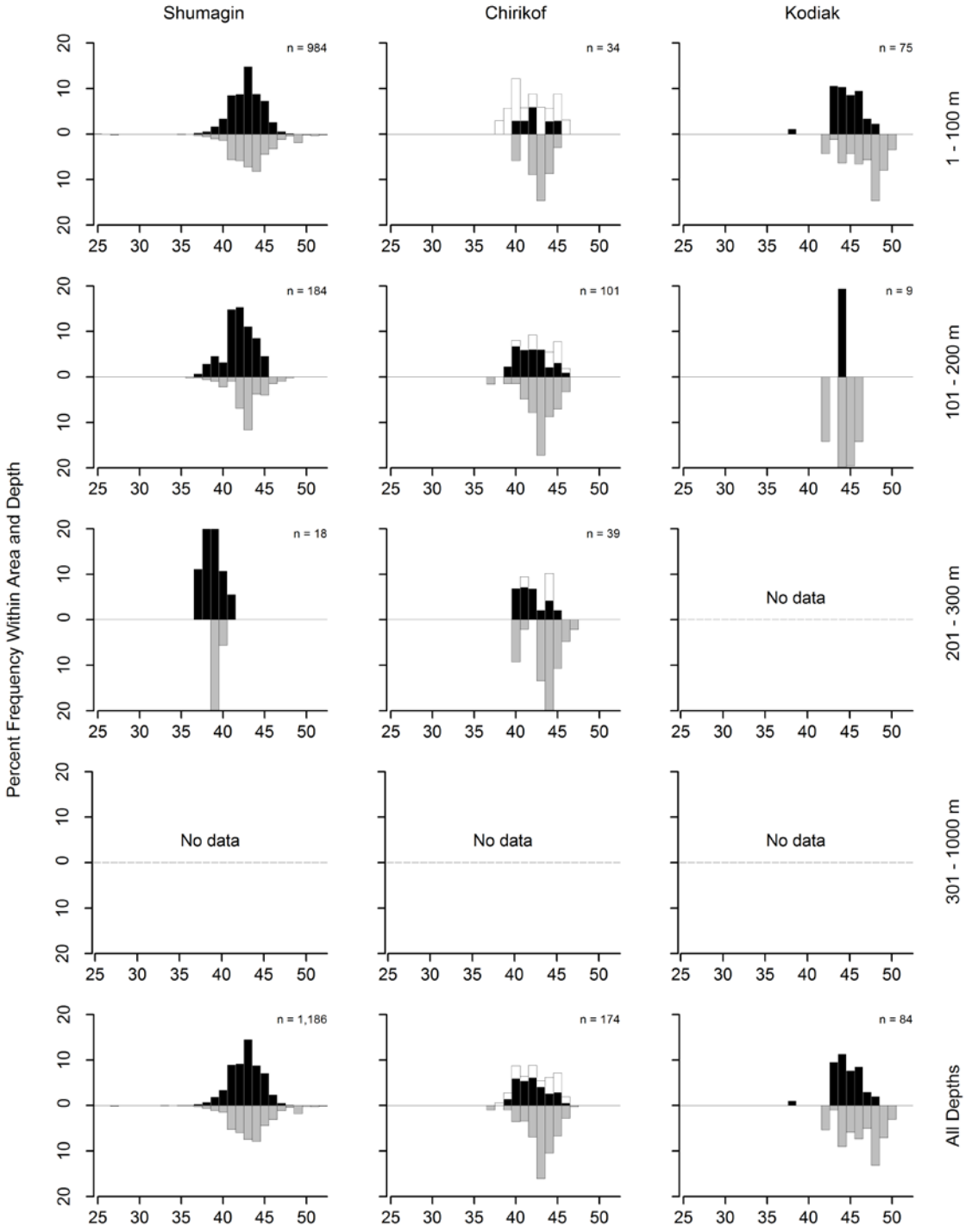

Figure 23. -- Size composition of Atka mackerel from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

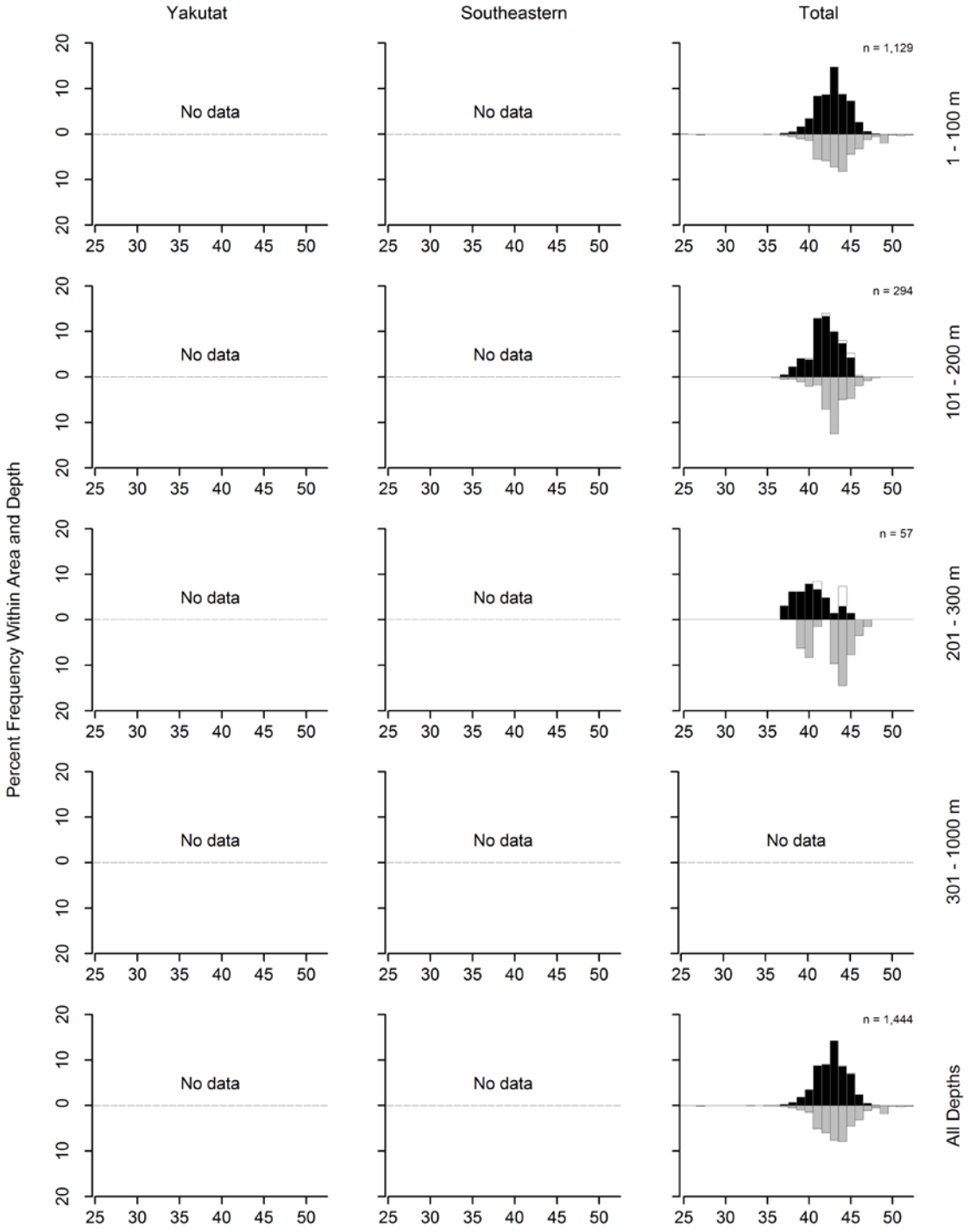

Figure 23. -- Continued (Atka mackerel).

Table 32. -- Catch per unit of effort by stratum for Atka mackerel sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Davidson Bank	37	14	31.76	43,455	0	130,471
Shumagin	1 - 100	Shumagin Bank	31	9	30.95	38,370	0	89,432
Shumagin	1 - 100	Fox Islands	22	12	10.60	8,833	0	20,225
Shumagin	101 - 200	Shumagin Outer Shelf	21	8	7.62	6,209	0	17,425
Chirikof	101 - 200	Chirikof Outer Shelf	20	13	2.25	1,129	0	2,385
Chirikof	201 - 300	Chirikof Slope	8	4	2.00	305	0	737
Kodiak	1 - 100	Albatross Shallows	34	1	1.28	737	0	2,241
Chirikof	1 - 100	Semidi Bank	19	9	0.73	530	56	1,003
Shumagin	201 - 300	Shumagin Slope	12	2	0.42	117	0	358
Shumagin	101 - 200	Sanak Gully	11	6	0.35	150	35	265
Shumagin	101 - 200	West Shumagin Gully	4	1	0.35	81	0	338
Chirikof	101 - 200	East Shumagin Gully	18	6	0.33	363	67	660
Kodiak	1 - 100	Albatross Banks	49	1	0.20	314	0	947
Chirikof	101 - 200	Shelikof Edge	24	3	0.15	118	0	298
Kodiak	101 - 200	Kodiak Outer Shelf	28	4	0.12	60	0	133
Chirikof	201 - 300	Lower Shelikof Gully	17	3	0.09	87	0	187
Kodiak	101 - 200	Albatross Gullies	32	3	0.05	36	0	78
Shumagin	1 - 100	Lower Alaska Peninsula	27	1	0.03	18	0	56

Sablefish (*Anoplopoma fimbria*)

Sablefish was the eighth most abundant species caught in the 2005 survey (Table 2). Sablefish occurred in every depth zone of every INPFC area of the survey. They were most abundant in the Kodiak area in depths between 100 and 500 m where 40% of the estimated biomass occurred (Table 33, Fig. 24). This species occurred in 54 of the 59 survey strata (Table 34). CPUEs were consistently highest in slope and gully strata. Of the top 20 survey strata ranked by CPUE sablefish were encounted in all but 4 of 123 tows. Over the entire survey area they occurred in 92% of tows in waters deeper than 200 m, including all tows deeper than 500 m, and 83% of the estimated biomass was recorded at depths deeper than 200 m (Fig. 24, Table 33). Mean weight generally increased with depth. A relatively distinct length mode for males occurred around 55 cm FL below 200 m in the Shumagin INPFC area and at about 65 cm in the same depth in the Chirikof and Kodiak INPFC areas (Fig. 25). No corresponding length mode occurred for females but females averaged about 5 cm greater than males. Another distinct, though minute, length mode occurred at approximately 40 cm FL for both males and females at depths less than 200 m in the Yakutat and Southeastern INPFC areas.

Table 33.-- Number of hauls, hauls with sablefish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	8	0.01	61	0.316	31.5
	101 - 200	36	8	0.99	1,460	1.569	54.5
	201 - 300	12	10	13.64	3,803	2.011	58.4
	301 - 500	9	9	30.35	7,682	2.108	58.9
	501 - 700	4	4	44.02	8,830	3.120	66.3
	701 - 1,000	2	2	50.17	9,719	3.624	69.5
	All Depths	180	41	4.84	31,554	2.593	62.1
Chirikof	1 - 100	71	8	0.03	70	0.325	33.3
	101 - 200	62	22	1.27	3,026	1.495	52.8
	201 - 300	25	25	12.87	14,863	2.830	63.8
	301 - 500	10	10	75.06	12,039	2.705	63.8
	501 - 700	6	6	63.18	12,340	3.248	67.3
	701 - 1,000	3	3	43.10	13,213	3.165	67.7
	All Depths	177	74	8.16	55,550	2.789	63.8
Kodiak	1 - 100	109	14	0.86	3,299	1.214	46.9
	101 - 200	139	67	6.54	28,340	2.408	60.5
	201 - 300	29	27	47.06	54,068	2.514	61.8
	301 - 500	8	8	91.14	26,537	2.772	64.4
	501 - 700	5	5	44.66	7,793	3.389	68.0
	701 - 1,000	3	3	36.93	12,902	3.378	67.5
	All Depths	293	124	13.10	132,939	2.572	61.9
Yakutat	1 - 100	15	5	0.39	643	0.419	35.5
	101 - 200	42	21	1.74	5,099	0.644	39.4
	201 - 300	21	21	15.27	7,896	3.275	63.7
	301 - 500	8	6	10.85	2,851	2.801	63.5
	501 - 700	4	4	49.11	7,216	3.615	68.9
	701 - 1,000	2	2	48.52	9,158	3.629	70.4
	All Depths	92	59	5.75	32,862	1.889	51.7
Southeastern	1 - 100	9	1	0.19	124	0.481	37.0
	101 - 200	37	21	1.27	1,411	0.711	41.7
	201 - 300	32	22	2.58	1,303	2.457	60.1
	301 - 500	13	13	13.83	4,312	3.057	65.1
	501 - 700	4	4	24.06	2,487	2.707	63.8
	701 - 1,000	2	2	50.85	6,134	2.530	62.0
	All Depths	97	63	5.62	15,770	2.095	56.5
All Areas	1 - 100	321	36	0.33	4,196	0.854	41.6
	101 - 200	316	139	3.22	39,336	1.598	51.3
	201 - 300	119	105	22.73	81,932	2.593	62.1
	301 - 500	48	46	41.76	53,420	2.658	63.3
	501 - 700	23	23	47.12	38,665	3.265	67.2
	701 - 1,000	12	12	44.11	51,125	3.272	67.5
	All Depths	839	361	8.40	268,674	2.472	60.3

All Areas and Depths Biomass, 95% confidence interval: 218,312 - 319,037 metric tons (t)

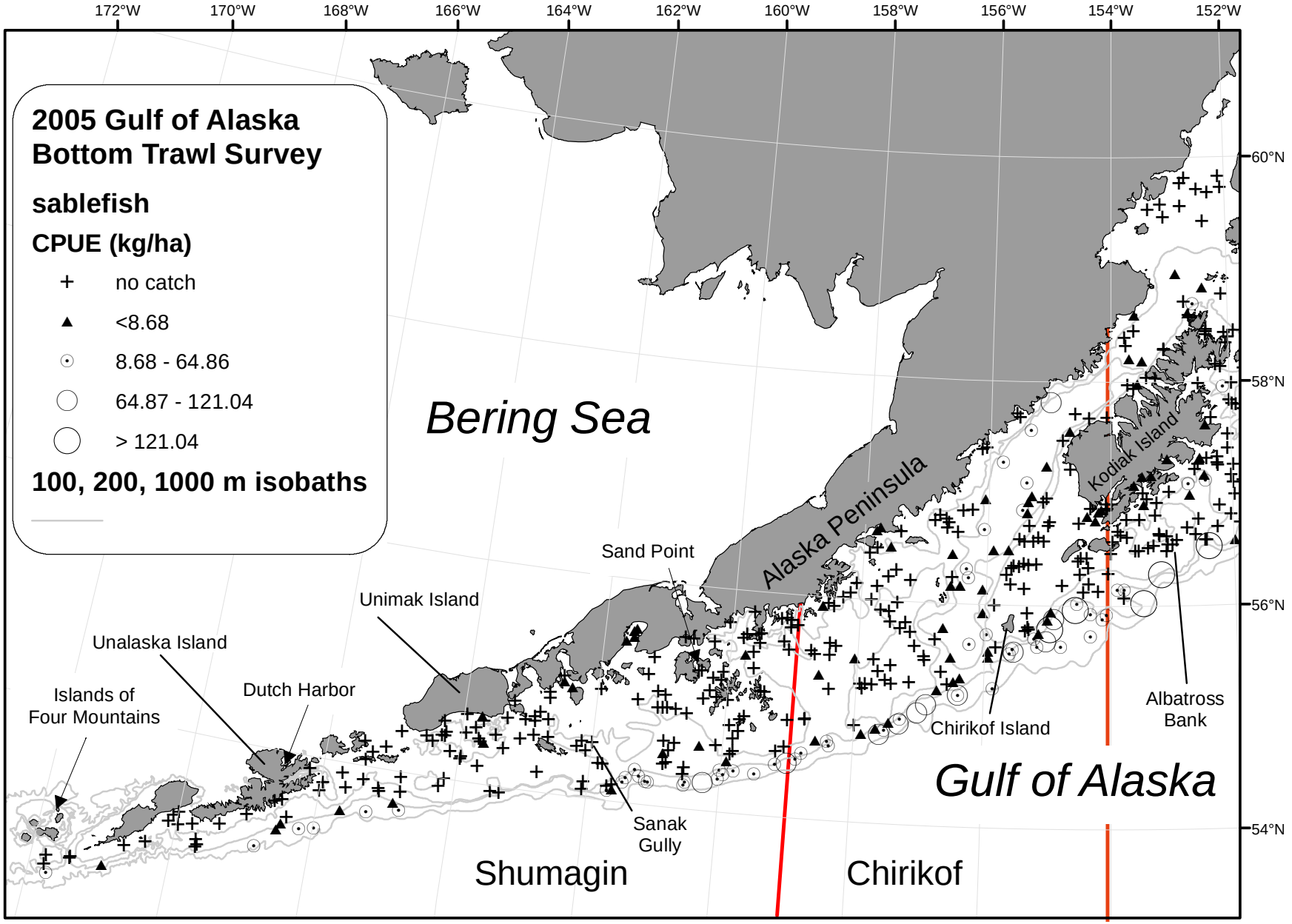

Figure 24. --Distribution and relative abundance of Sablefish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

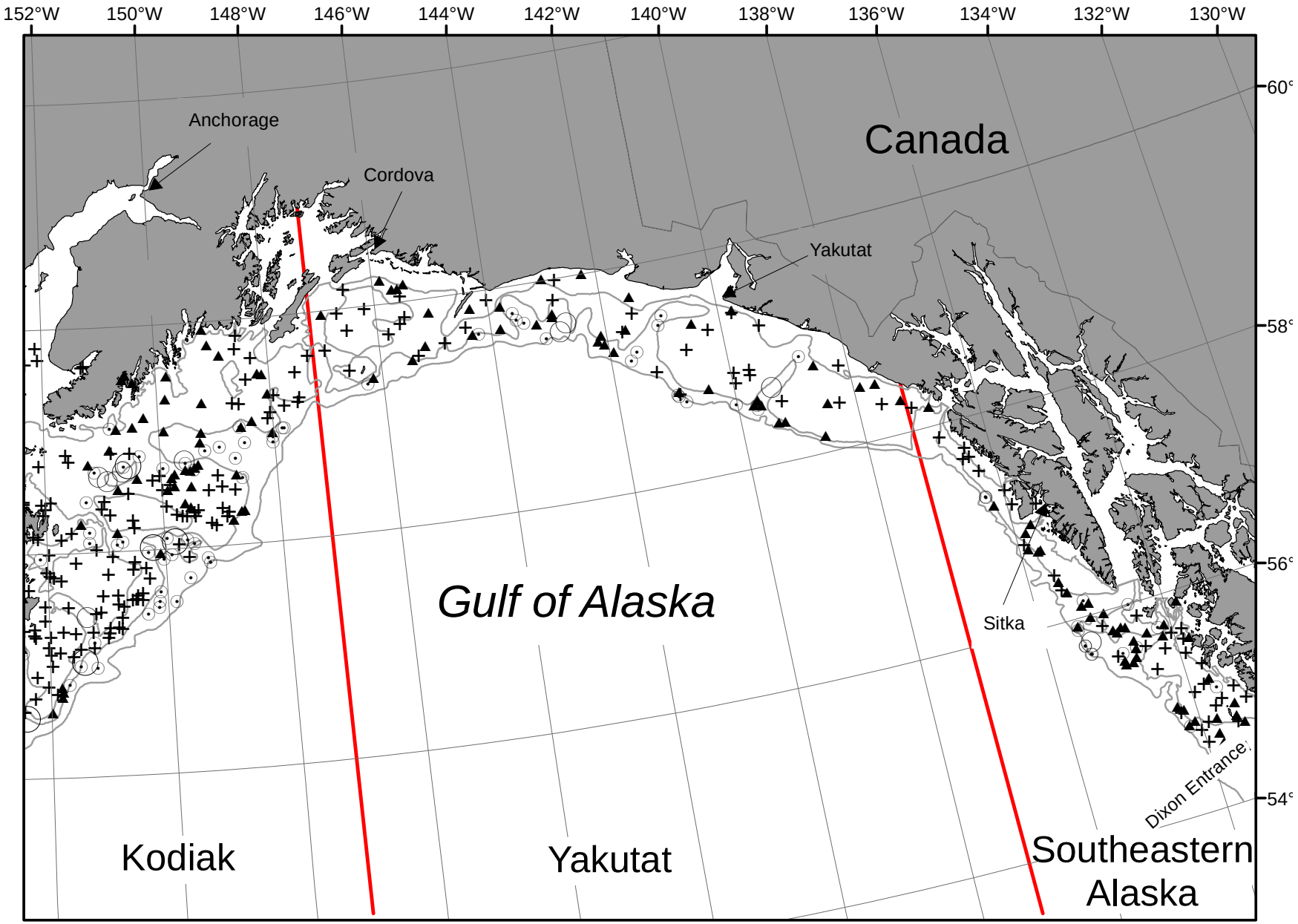

Figure 24. -- Continued.

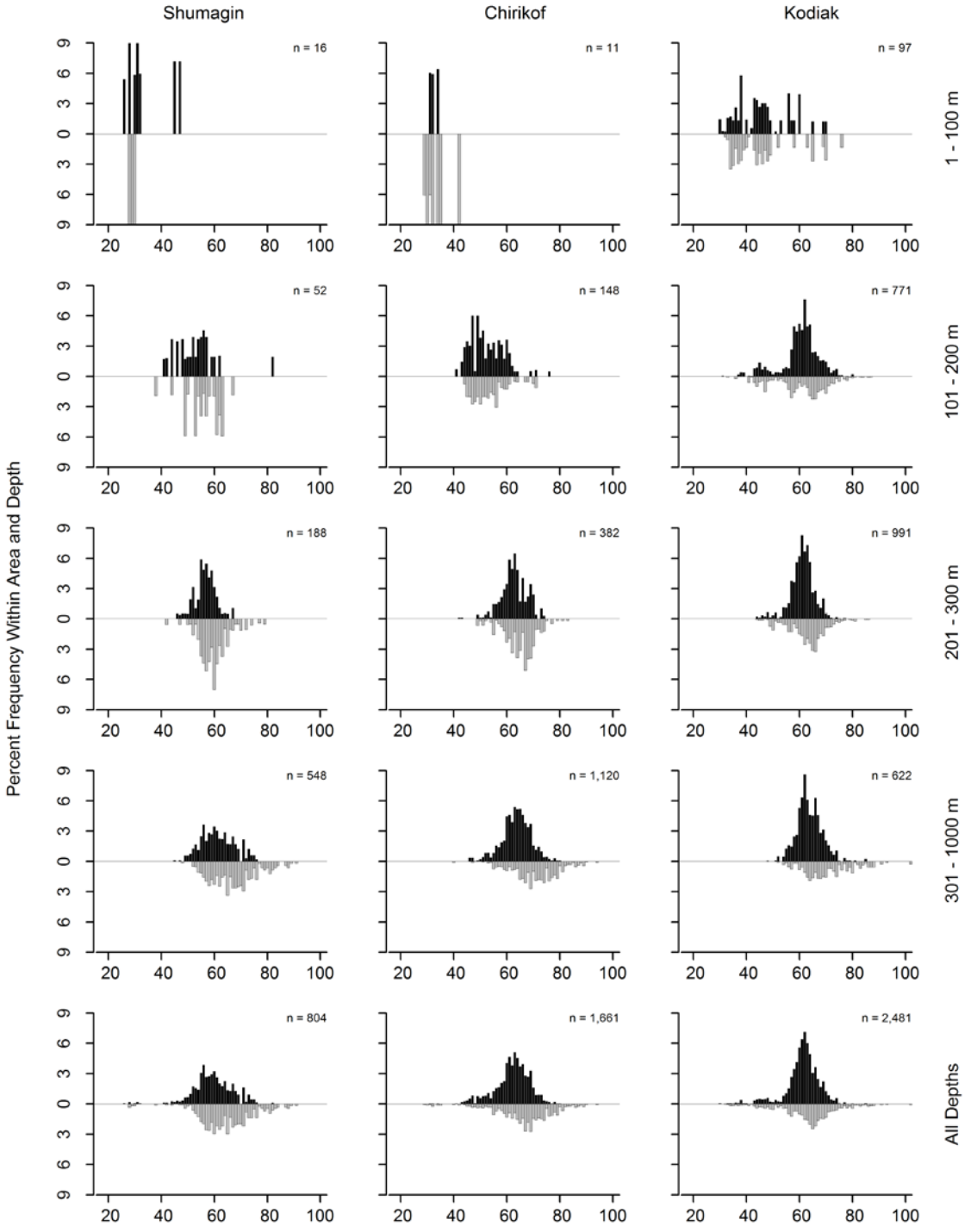

Figure 25. -- Size composition of sablefish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

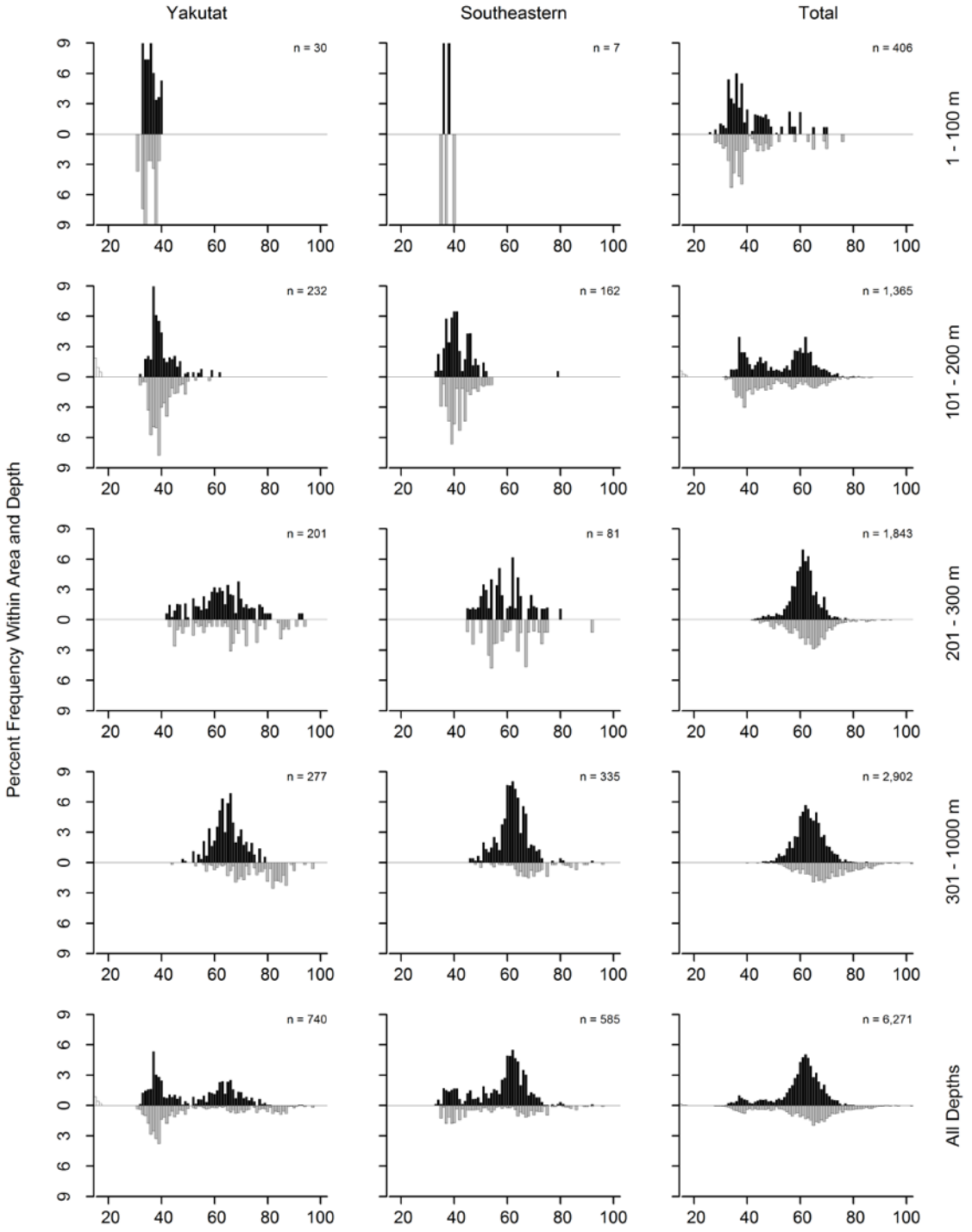

Figure 25. -- Continued (sablefish).

Table 34. -- Catch per unit of effort by stratum for sablefish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	301 - 500	Kodiak Slope	8	8	91.14	26,537	0	56,127
Chirikof	301 - 500	Chirikof Slope	10	10	75.06	12,039	8,368	15,709
Chirikof	501 - 700	Chirikof Slope	6	6	63.18	12,340	4,943	19,736
Kodiak	201 - 300	Kodiak Slope	6	6	61.23	9,935	0	21,732
Kodiak	201 - 300	Kenai Gullies	20	19	51.49	34,291	5,318	63,265
Southeastern	701 - 1000	Southeastern Slope	2	2	50.85	6,134	0	28,088
Shumagin	701 - 1000	Shumagin Slope	2	2	50.17	9,719	0	27,247
Yakutat	501 - 700	Yakutat Slope	4	4	49.11	7,216	0	15,227
Yakutat	701 - 1000	Yakutat Slope	2	2	48.52	9,158	0	53,543
Kodiak	501 - 700	Kodiak Slope	5	5	44.66	7,793	5,154	10,432
Shumagin	501 - 700	Shumagin Slope	4	4	44.02	8,830	0	18,360
Chirikof	701 - 1000	Chirikof Slope	3	3	43.10	13,213	0	37,367
Kodiak	701 - 1000	Kodiak Slope	3	3	36.93	12,902	0	32,288
Chirikof	201 - 300	Chirikof Slope	8	8	33.50	5,120	2,504	7,736
Kodiak	201 - 300	Upper Shelikof Gully	3	2	30.68	9,842	0	41,453
Shumagin	301 - 500	Shumagin Slope	9	9	30.35	7,682	4,224	11,140
Southeastern	501 - 700	Southeastern Slope	4	4	24.06	2,487	1,306	3,668
Yakutat	201 - 300	Yakutat Gullies	8	8	21.00	6,390	0	14,490
Southeastern	301 - 500	Southeastern Slope	4	4	17.56	1,357	0	2,796
Shumagin	201 - 300	Shumagin Slope	12	10	13.64	3,803	1,089	6,516
Southeastern	301 - 500	Southeastern Deep Gullies	9	9	12.60	2,955	1,796	4,113
Yakutat	301 - 500	Yakutat Gullies	2	2	12.47	1,381	0	5,518
Kodiak	101 - 200	Barren Islands	16	9	10.38	11,402	0	27,350
Chirikof	201 - 300	Lower Shelikof Gully	17	17	9.73	9,743	5,520	13,966
Yakutat	301 - 500	Yakutat Slope	6	4	9.67	1,470	0	3,555
Kodiak	101 - 200	Portlock Flats	41	22	9.06	6,647	0	14,117
Kodiak	101 - 200	Albatross Gullies	32	14	8.72	6,896	1,700	12,093
Yakutat	201 - 300	Yakutat Slope	13	13	7.08	1,506	680	2,332
Kodiak	1 - 100	Kenai Peninsula	6	6	5.97	3,140	0	8,004
Yakutat	101 - 200	Yakutat Flats	11	4	3.93	3,545	0	10,398
Chirikof	101 - 200	Chirikof Outer Shelf	20	13	2.92	1,462	288	2,635
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	19	2.91	1,143	654	1,631
Kodiak	101 - 200	Kenai Flats	22	13	2.07	2,496	923	4,068
Kodiak	101 - 200	Kodiak Outer Shelf	28	9	1.79	899	106	1,692
Shumagin	101 - 200	Shumagin Outer Shelf	21	5	1.69	1,377	0	3,402
Southeastern	101 - 200	Prince of Wales Shelf	26	15	1.60	1,101	329	1,873
Chirikof	101 - 200	Shelikof Edge	24	6	1.42	1,100	0	2,905
Southeastern	201 - 300	Baranof-Chichagof Slope	5	3	1.42	160	0	395
Yakutat	101 - 200	Fairweather Shelf	11	7	1.06	821	0	1,827
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	6	0.74	310	38	581
Yakutat	101 - 200	Middleton Shelf	12	6	0.61	451	18	885
Yakutat	101 - 200	Yakataga Shelf	8	4	0.54	282	0	735
Yakutat	1 - 100	Yakutat Shallows	8	4	0.47	469	0	1,269
Chirikof	101 - 200	East Shumagin Gully	18	3	0.42	464	0	1,107
Kodiak	1 - 100	Albatross Shallows	34	7	0.26	152	0	311
Yakutat	1 - 100	Middleton Shallows	7	1	0.26	173	0	597
Shumagin	101 - 200	West Shumagin Gully	4	1	0.21	49	0	204
Southeastern	1 - 100	Southeastern Shallows	9	1	0.19	124	0	410
Shumagin	101 - 200	Sanak Gully	11	2	0.08	34	0	92
Chirikof	1 - 100	Upper Alaska Peninsula	15	4	0.07	52	1	104
Shumagin	1 - 100	Lower Alaska Peninsula	27	6	0.05	32	0	68
Kodiak	1 - 100	Northern Kodiak Shallows	7	1	0.03	6	0	22
Shumagin	1 - 100	Davidson Bank	37	2	0.02	29	0	84
Chirikof	1 - 100	Chirikof Bank	37	4	0.02	18	0	35

Giant grenadier (*Albatrossia pectoralis*)

Giant grenadier was the third most abundant species caught in the 2005 survey (Table 2). They were caught throughout the survey area, although almost exclusively in slope strata at depths exceeding 300 m (Fig. 26, Tables 35-36). Approximately 92% of the biomass was found in the Shumagin, Chirikof, and Kodiak INPFC areas with most of the remainder in the Yakutat INPFC area. Giant grenadier occurred in 75% of tows in waters deeper than 300 m, including all of the tows deeper than 500 m, and over 97% of the estimated biomass was recorded at depths deeper than 300 m (Table 35). CPUEs were very high in the slope strata from Yakutat to the west where giant grenadier occurred (Table 36). Mean weight generally declined with depth to 700 m as the smaller males made up a larger fraction of the total population at deeper depths (Fig. 27, Table 35). A relatively distinct length mode occurred around 25-30 cm (snout to anal fin insertion) at all depths and INPFC areas (except for Southeastern) for females, whereas males exhibited no discernable length mode.

Table 35.-- Number of hauls, hauls with giant grenadier, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	0	0.00	0	---	---
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	4	45.34	12,641	3.335	28.4
	301 - 500	9	9	454.94	115,151	2.737	26.3
	501 - 700	4	4	380.92	76,397	2.652	28.9
	701 - 1,000	2	2	187.89	36,398	2.528	25.5
	All Depths	180	19	36.88	240,587	2.701	26.1
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	3	4.43	5,116	3.743	29.7
	301 - 500	10	10	343.11	55,033	2.941	27.3
	501 - 700	6	6	205.04	40,048	2.672	25.7
	701 - 1,000	3	3	94.38	28,933	3.216	27.6
	All Depths	177	22	18.97	129,130	2.930	26.8
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	0	0.00	0	---	---
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	7	157.73	45,928	2.870	27.3
	501 - 700	5	5	618.27	107,879	2.377	25.5
	701 - 1,000	3	3	54.78	19,140	2.020	24.1
	All Depths	293	15	17.04	172,947	2.441	25.7
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	2	12.69	3,335	3.425	29.1
	501 - 700	4	4	129.62	19,045	2.652	25.9
	701 - 1,000	2	2	98.57	18,603	1.866	23.3
	All Depths	92	8	7.17	40,983	2.261	24.6
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	4	24.11	2,492	1.232	19.5
	701 - 1,000	2	2	10.01	1,207	1.869	21.4
	All Depths	97	6	1.32	3,699	1.386	20.0
All Areas	1 - 100	321	0	0.00	0	---	---
	101 - 200	316	0	0.00	0	---	---
	201 - 300	119	7	4.93	17,757	3.443	28.7
	301 - 500	48	28	171.56	219,447	2.822	26.8
	501 - 700	23	23	299.60	245,860	2.499	25.5
	701 - 1,000	12	12	89.97	104,282	2.398	25.0
	All Depths	839	70	18.35	587,346	2.613	25.9

All Areas and Depths Biomass, 95% confidence interval: 420,489 - 754,202 metric tons (t)

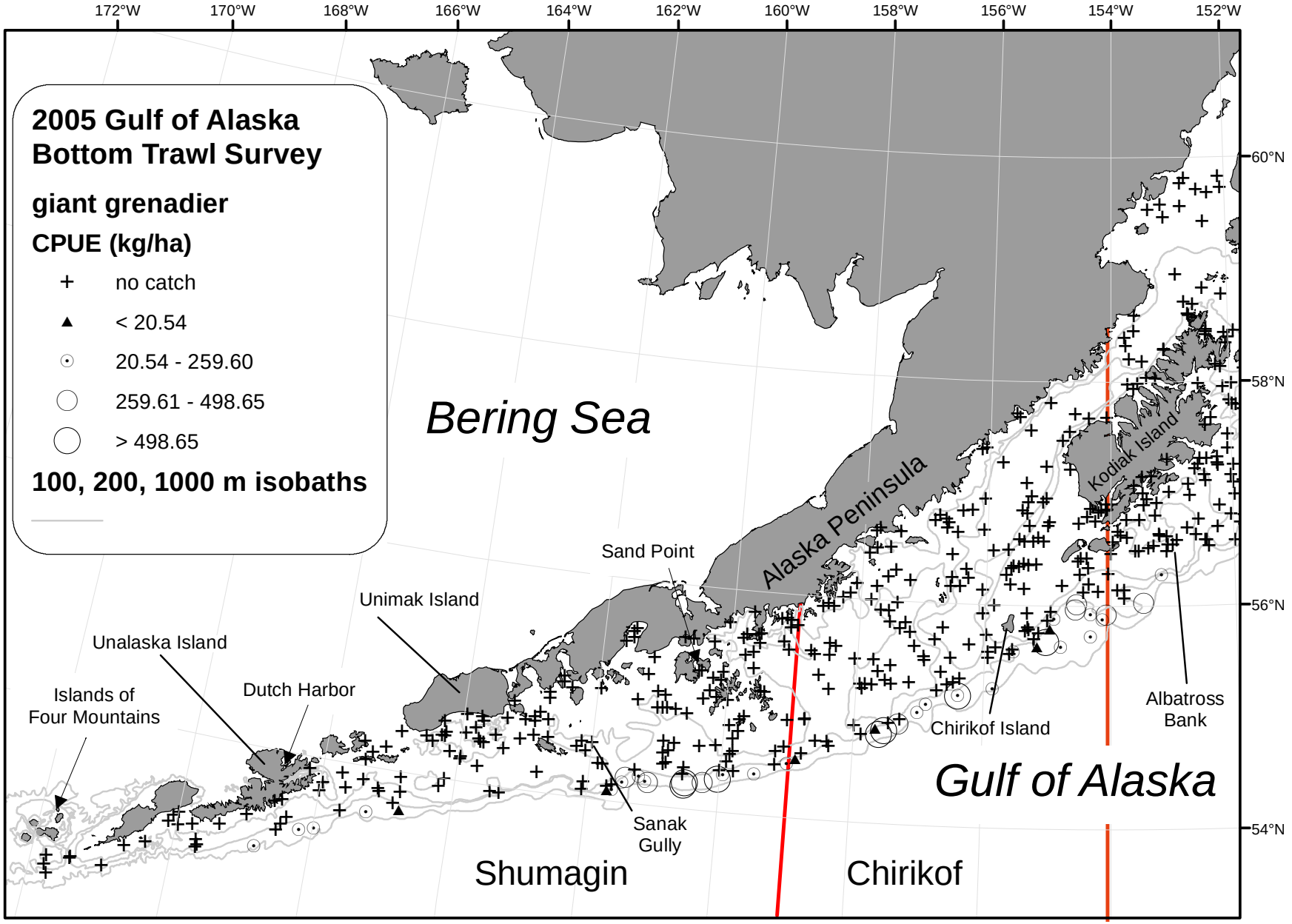

Figure 26. --Distribution and relative abundance of giant grenadier from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

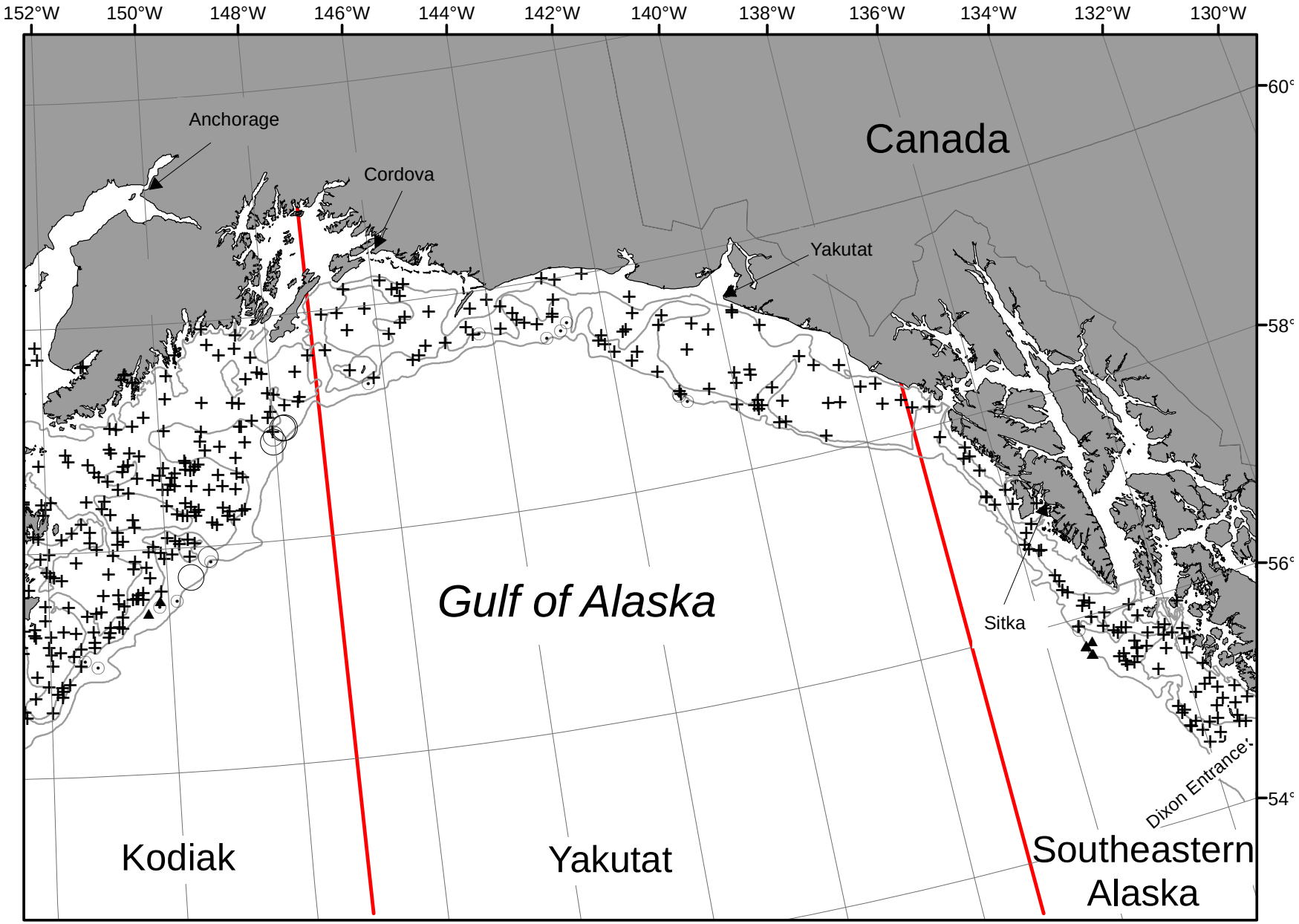

Figure 26 – Continued.

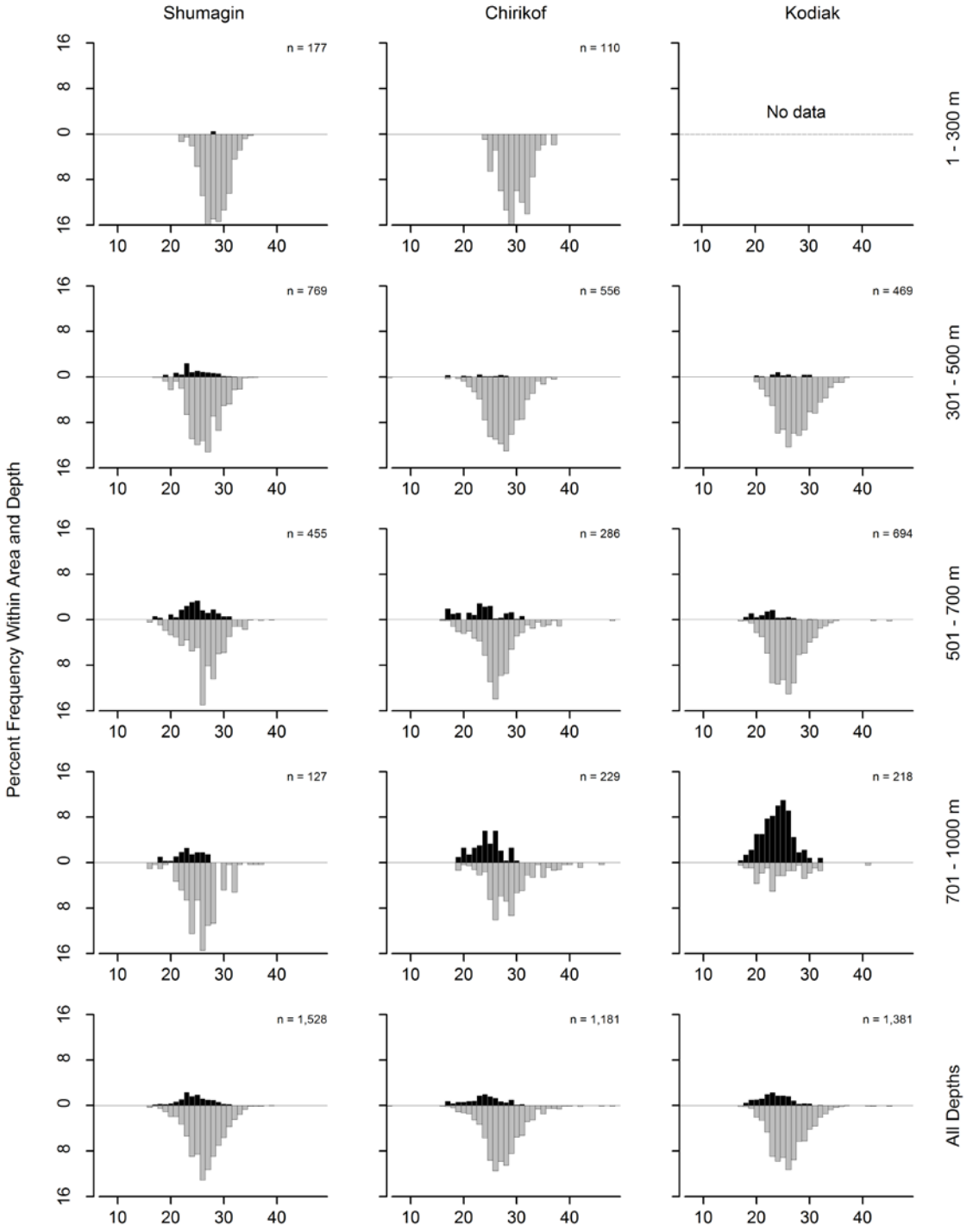

Figure 27. -- Size composition of giant grenadier from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

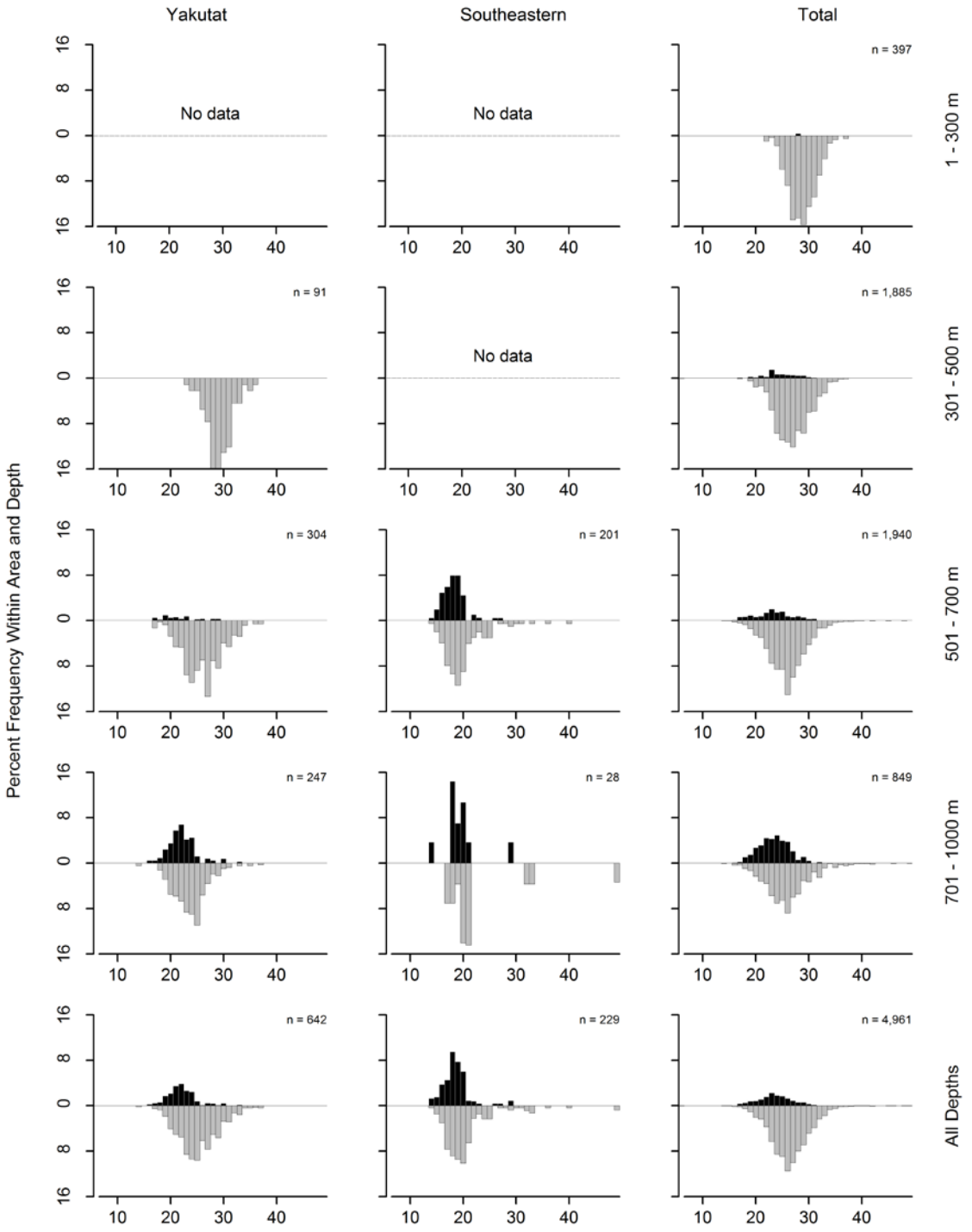

Figure 27. -- Continued (giant grenadier).

Table 36. -- Catch per unit of effort by stratum for giant grenadier sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	501 - 700	Kodiak Slope	5	5	618.27	107,879	61,496	154,262
Shumagin	301 - 500	Shumagin Slope	9	9	454.94	115,151	0	251,665
Shumagin	501 - 700	Shumagin Slope	4	4	380.92	76,397	0	185,864
Chirikof	301 - 500	Chirikof Slope	10	10	343.11	55,033	16,111	93,954
Chirikof	501 - 700	Chirikof Slope	6	6	205.04	40,048	873	79,223
Shumagin	701 - 1000	Shumagin Slope	2	2	187.89	36,398	0	292,692
Kodiak	301 - 500	Kodiak Slope	8	7	157.73	45,928	4,313	87,543
Yakutat	501 - 700	Yakutat Slope	4	4	129.62	19,045	3,591	34,499
Yakutat	701 - 1000	Yakutat Slope	2	2	98.57	18,603	0	136,825
Chirikof	701 - 1000	Chirikof Slope	3	3	94.38	28,933	18,779	39,087
Kodiak	701 - 1000	Kodiak Slope	3	3	54.78	19,140	0	58,601
Shumagin	201 - 300	Shumagin Slope	12	4	45.34	12,641	0	29,881
Chirikof	201 - 300	Chirikof Slope	8	3	33.48	5,116	0	16,636
Southeastern	501 - 700	Southeastern Slope	4	4	24.11	2,492	0	7,243
Yakutat	301 - 500	Yakutat Slope	6	2	21.94	3,335	0	8,827
Southeastern	701 - 1000	Southeastern Slope	2	2	10.01	1,207	0	4,738

ROCKFISHES

Pacific ocean perch (*Sebastes alutus*)

Pacific ocean perch was the second most abundant species caught in the 2005 survey, and was by far the most abundant and widely distributed rockfish species encountered in the survey (Table 2). They were caught in all five INPFC areas and were rarely caught in water deeper than 500 m. The most common depth range for this species was 100 – 300 m where 96% of the estimated biomass was found (Table 37, Fig 28). This species was encountered in 50 of the 59 survey strata (Table 38). CPUEs within these strata ranged from almost 600 to 0 kg/ha with a very gradual range between these two extremes. By far the highest CPUEs came from the Shumagin Slope, Yakutat Slope and Kodiak Slope strata, all in the 200 -300 m depth range (Table 38). The CPUEs in the Chirikof INPFC area was highest in the 101-200 m depth range while in the other four areas the 201 -300 m depth range produced the highest catch rates (Table 37). Mean weight generally increased with depth to 700 m. The proportion of fish smaller than 30 cm was extremely small at depths greater than 200 m in the Shumagin, Chirikof, and Kodiak INPC areas and at depths greater than 300 m in the Yakutat and Southeastern INPFC areas (Fig. 29, Table 37). Most modes ranged between 30 and 40 cm for males and females.

Table 37.-- Number of hauls, hauls with Pacific ocean perch, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	21	3.11	12,858	0.394	29.9
	101 - 200	36	21	49.85	73,160	0.438	31.5
	201 - 300	12	11	591.10	164,795	0.648	35.8
	301 - 500	9	5	0.25	63	0.545	32.9
	501 - 700	4	1	0.18	37	0.550	33.8
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	59	38.47	250,912	0.553	33.8
Chirikof	1 - 100	71	9	0.04	102	0.218	21.5
	101 - 200	62	34	26.78	63,875	0.615	35.3
	201 - 300	25	11	9.88	11,411	0.654	36.2
	301 - 500	10	5	0.23	37	0.702	36.8
	501 - 700	6	1	0.04	8	0.549	34.0
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	60	11.08	75,433	0.619	35.4
Kodiak	1 - 100	109	10	0.27	1,055	0.670	34.2
	101 - 200	139	85	49.89	216,185	0.711	36.6
	201 - 300	29	25	71.83	82,534	0.726	37.6
	301 - 500	8	5	0.98	286	0.716	36.5
	501 - 700	5	3	0.53	93	0.690	36.2
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	128	29.58	300,153	0.715	36.8
Yakutat	1 - 100	15	3	0.05	78	0.083	18.1
	101 - 200	42	29	3.93	11,556	0.166	22.0
	201 - 300	21	21	97.87	50,602	0.439	30.7
	301 - 500	8	7	58.78	15,446	0.681	36.1
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	60	13.58	77,682	0.373	28.3
Southeastern	1 - 100	9	1	0.01	5	0.143	22.0
	101 - 200	37	23	17.58	19,481	0.296	27.3
	201 - 300	32	32	78.73	39,777	0.557	33.0
	301 - 500	13	9	9.40	2,931	0.856	39.2
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	1	0.37	45	1.042	40.5
	All Depths	97	66	22.20	62,239	0.442	30.5
All Areas	1 - 100	321	44	1.09	14,098	0.395	29.6
	101 - 200	316	192	31.41	384,256	0.541	32.9
	201 - 300	119	100	96.85	349,119	0.610	34.8
	301 - 500	48	31	14.67	18,763	0.704	36.5
	501 - 700	23	5	0.17	138	0.637	35.3
	701 - 1,000	12	1	0.04	45	1.042	40.5
	All Depths	839	373	23.95	766,418	0.570	33.7

All Areas and Depths Biomass, 95% confidence interval: 473,214 - 1,059,622 metric tons (t)

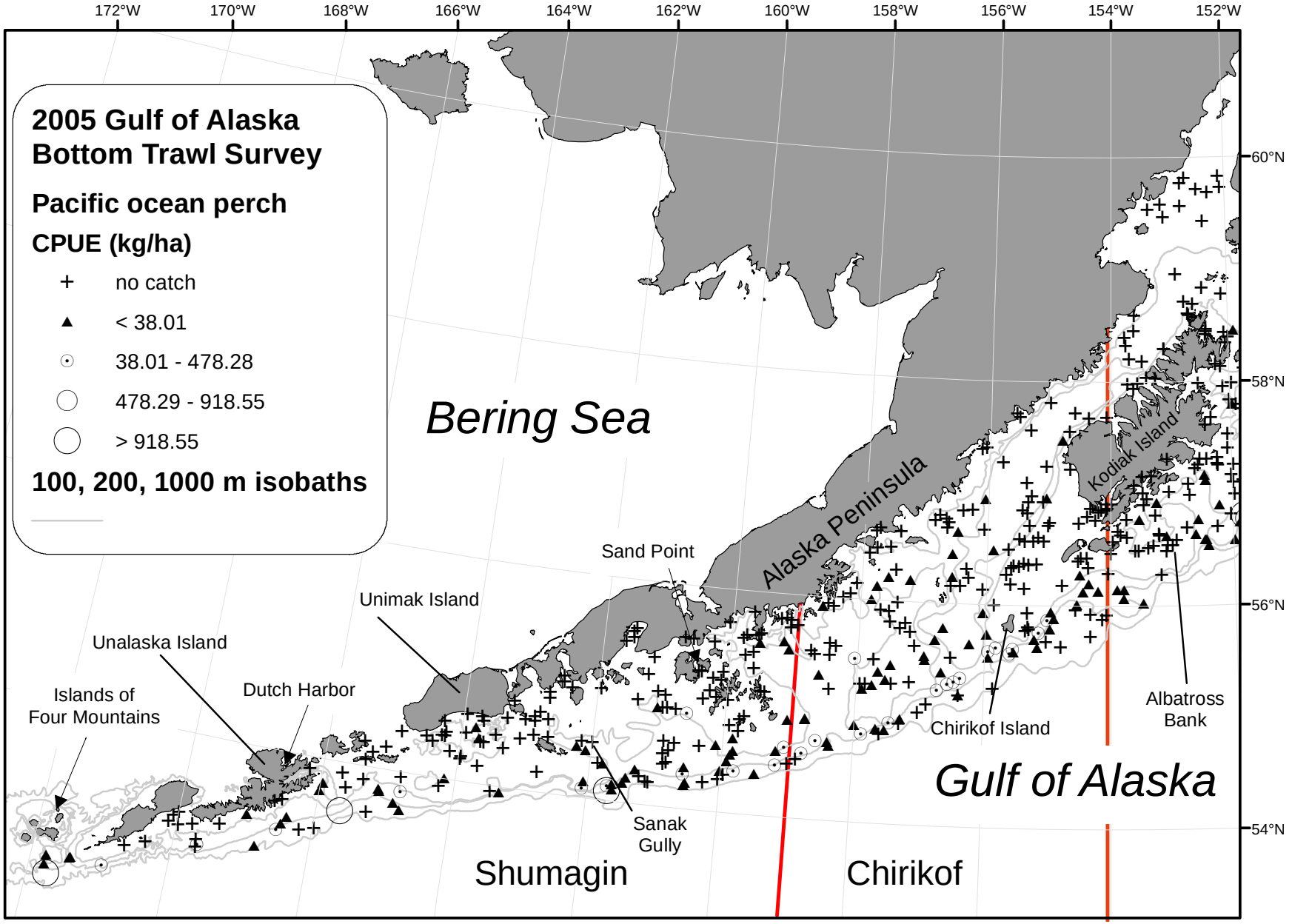

Figure 28. -- Distribution and relative abundance of Pacific Ocean perch from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

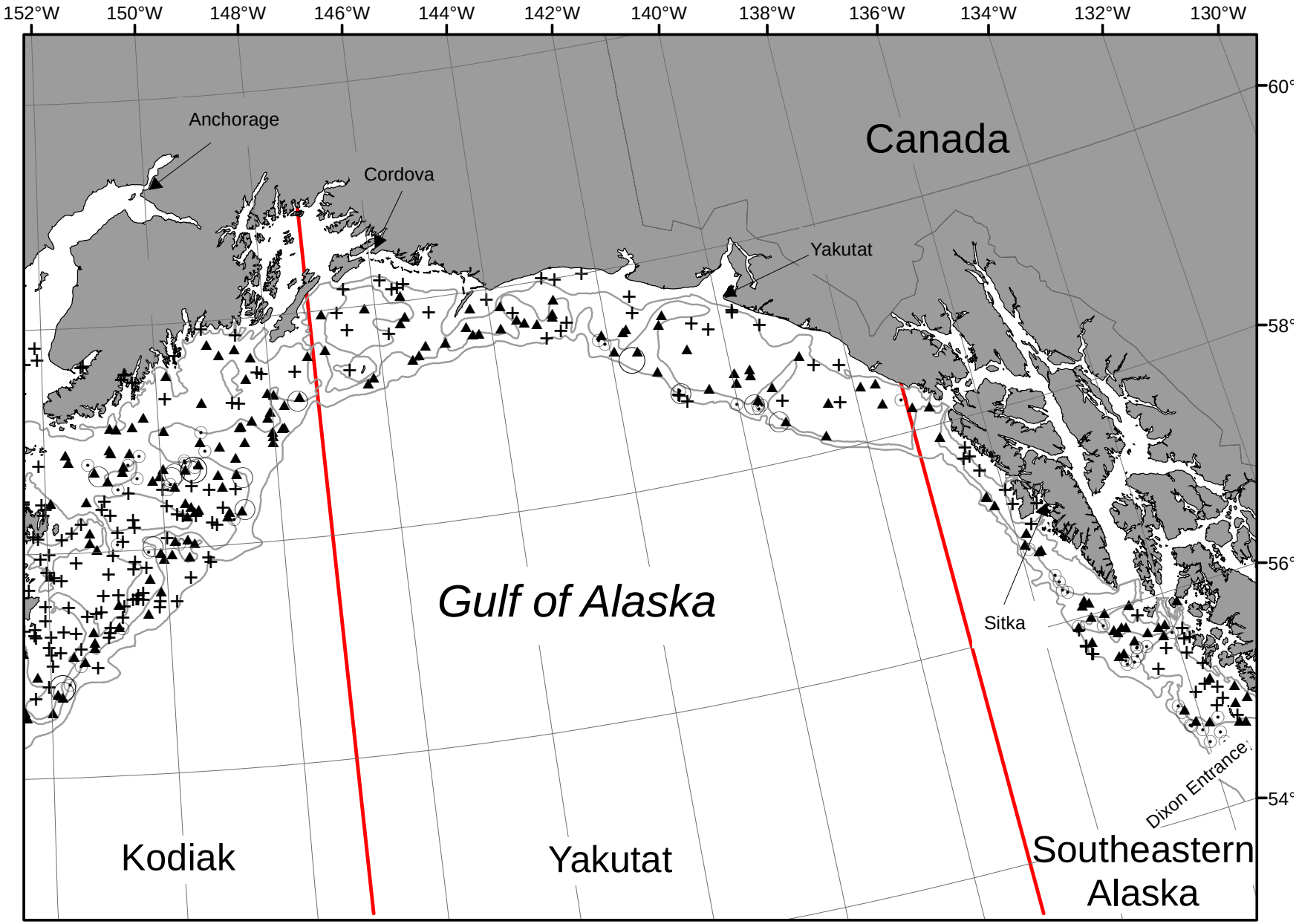

Figure 28. -- Continued.

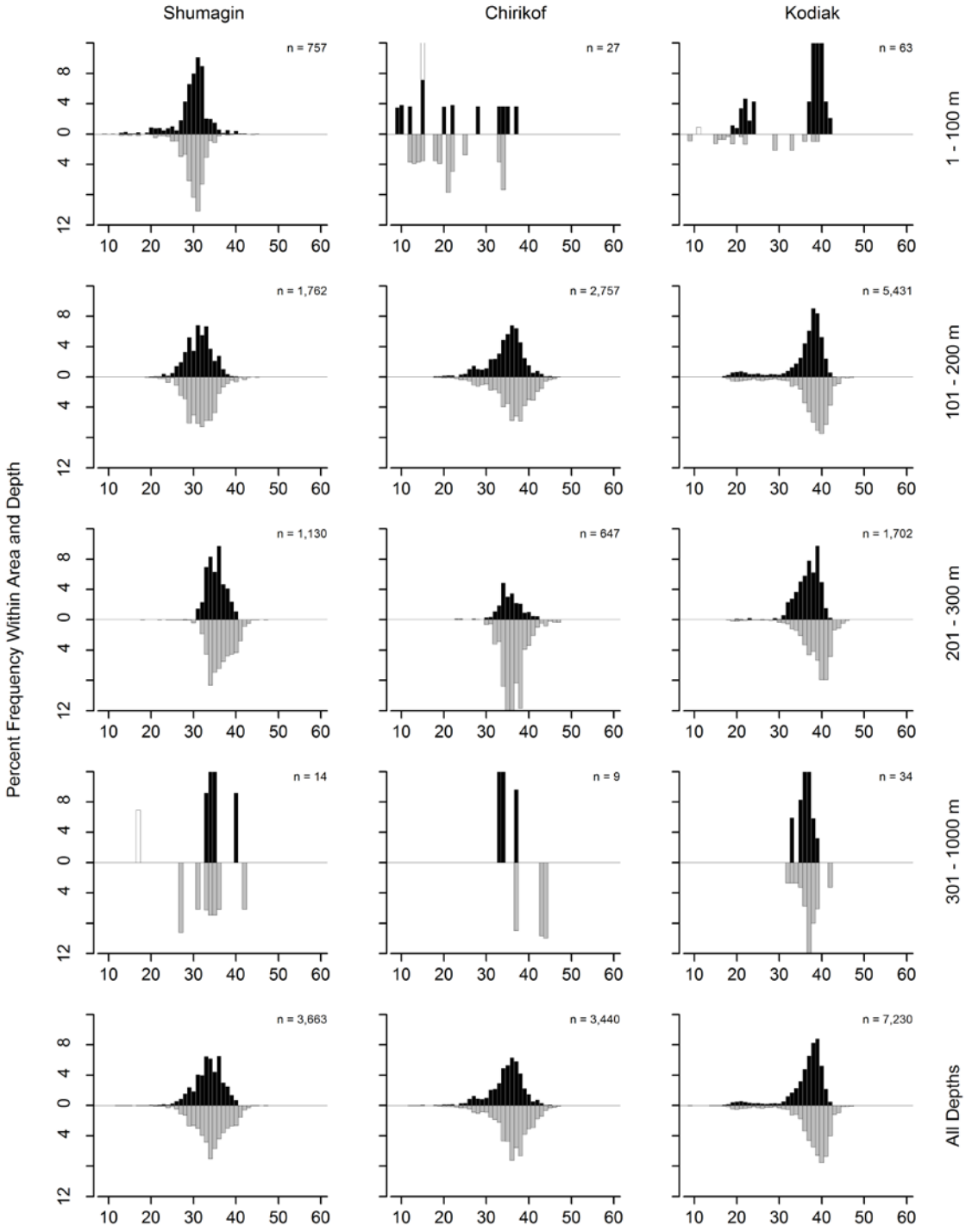

Figure 29. -- Size composition of Pacific ocean perch from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

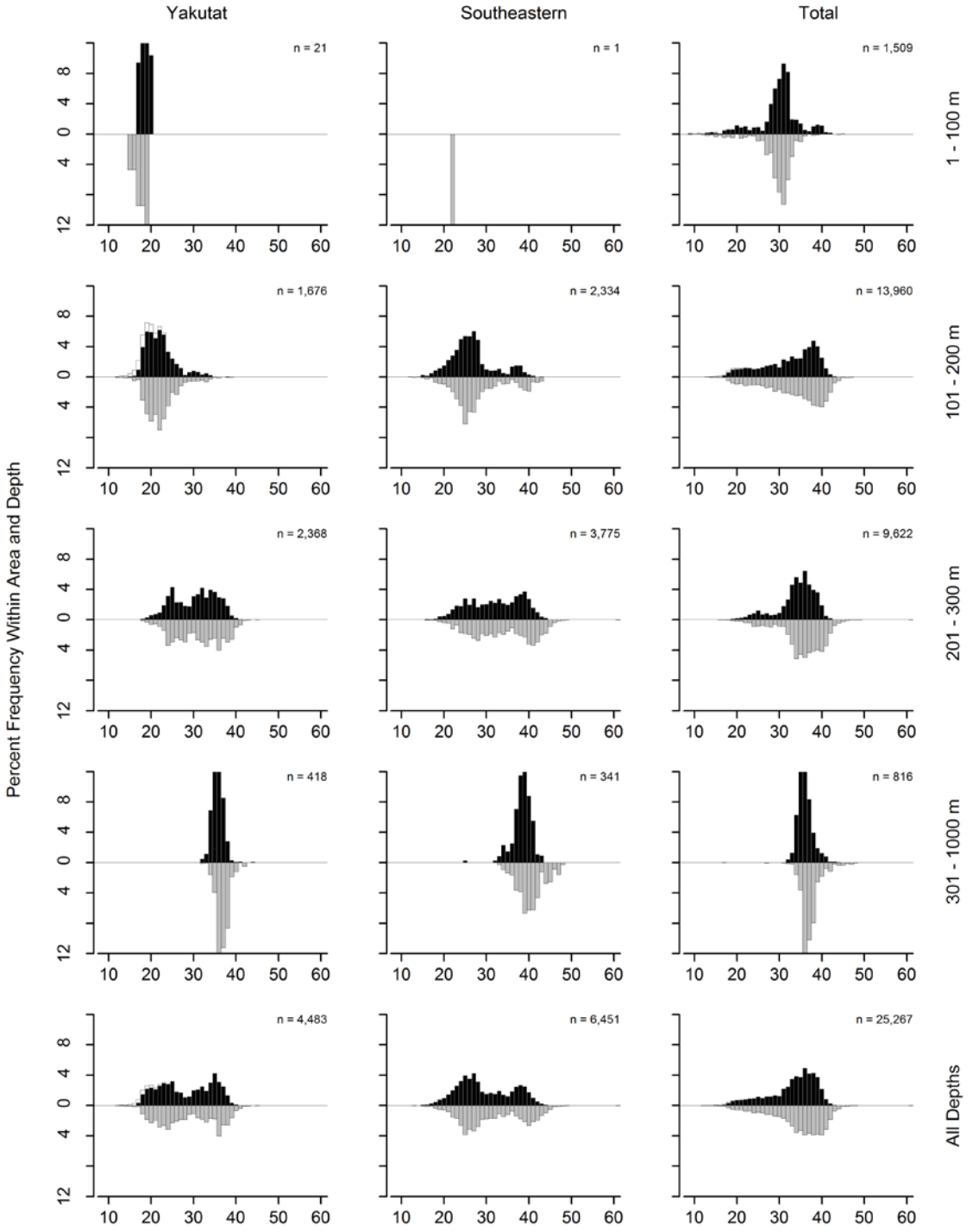

Figure 29. -- Continued (Pacific ocean perch).

Table 38. -- Catch per unit of effort by stratum for Pacific ocean perch sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	201 - 300	Shumagin Slope	12	11	591.10	164,795	0	423,344
Yakutat	201 - 300	Yakutat Slope	13	13	224.78	47,819	0	96,815
Kodiak	201 - 300	Kodiak Slope	6	6	210.32	34,127	0	92,475
Kodiak	101 - 200	Portlock Flats	41	32	128.78	94,476	31,697	157,255
Kodiak	101 - 200	Kodiak Outer Shelf	28	22	120.09	60,356	0	123,196
Chirikof	101 - 200	Chirikof Outer Shelf	20	19	115.39	57,819	25,889	89,750
Yakutat	301 - 500	Yakutat Slope	6	6	100.85	15,336	0	46,162
Shumagin	101 - 200	Shumagin Outer Shelf	21	17	89.67	73,115	0	164,431
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	27	89.00	34,950	18,998	50,902
Chirikof	201 - 300	Chirikof Slope	8	7	73.91	11,295	0	27,588
Kodiak	201 - 300	Kenai Gullies	20	19	72.69	48,407	0	106,461
Kodiak	101 - 200	Barren Islands	16	6	47.17	51,797	0	133,084
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	42.90	4,828	2,031	7,625
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	7	25.04	10,507	0	24,220
Southeastern	301 - 500	Southeastern Slope	4	4	19.04	1,471	0	5,107
Southeastern	101 - 200	Prince of Wales Shelf	26	16	13.03	8,973	2,122	15,825
Shumagin	1 - 100	Shumagin Bank	31	9	9.34	11,580	0	25,408
Yakutat	201 - 300	Yakutat Gullies	8	8	9.15	2,783	0	7,121
Yakutat	101 - 200	Fairweather Shelf	11	8	8.26	6,382	0	12,787
Kodiak	101 - 200	Albatross Gullies	32	11	6.53	5,165	0	12,372
Southeastern	301 - 500	Southeastern Deep Gullies	9	5	6.23	1,460	182	2,739
Yakutat	101 - 200	Yakataga Shelf	8	7	5.91	3,118	0	7,062
Chirikof	101 - 200	East Shumagin Gully	18	6	4.02	4,458	0	11,873
Kodiak	101 - 200	Kenai Flats	22	14	3.64	4,392	121	8,662
Chirikof	101 - 200	Shelikof Edge	24	9	2.07	1,598	0	3,739
Kodiak	1 - 100	Kenai Peninsula	6	1	1.89	994	0	3,549
Yakutat	101 - 200	Yakutat Flats	11	7	1.52	1,371	0	3,549
Yakutat	301 - 500	Yakutat Gullies	2	1	1.00	111	0	1,519
Kodiak	301 - 500	Kodiak Slope	8	5	0.98	286	0	756
Yakutat	101 - 200	Middleton Shelf	12	7	0.93	685	0	1,948
Shumagin	1 - 100	Davidson Bank	37	6	0.82	1,126	0	2,789
Kodiak	501 - 700	Kodiak Slope	5	3	0.53	93	0	291
Southeastern	701 - 1000	Southeastern Slope	2	1	0.37	45	0	613
Shumagin	301 - 500	Shumagin Slope	9	5	0.25	63	6	120
Chirikof	301 - 500	Chirikof Slope	10	5	0.23	37	2	73
Shumagin	501 - 700	Shumagin Slope	4	1	0.18	37	0	154
Shumagin	1 - 100	Fox Islands	22	4	0.14	119	0	287
Chirikof	1 - 100	Semidi Bank	19	7	0.13	96	0	261
Chirikof	201 - 300	Lower Shelikof Gully	17	4	0.12	116	0	246
Yakutat	1 - 100	Middleton Shallows	7	2	0.11	73	0	238
Shumagin	101 - 200	Sanak Gully	11	3	0.09	38	0	85
Shumagin	1 - 100	Lower Alaska Peninsula	27	2	0.05	34	0	98
Chirikof	501 - 700	Chirikof Slope	6	1	0.04	8	0	27
Kodiak	1 - 100	Albatross Banks	49	5	0.04	57	0	128
Shumagin	101 - 200	West Shumagin Gully	4	1	0.03	6	0	27
Southeastern	1 - 100	Southeastern Shallows	9	1	0.01	5	0	17
Kodiak	1 - 100	Albatross Shallows	34	4	0.01	4	0	8
Yakutat	1 - 100	Yakutat Shallows	8	1	0.01	5	0	17
Chirikof	1 - 100	Upper Alaska Peninsula	15	1	<0.01	3	0	10
Chirikof	1 - 100	Chirikof Bank	37	1	<0.01	3	0	8

Northern rockfish (*Sebastes polyspinis*)

Northern rockfish was the second most abundant rockfish species and the sixth most abundant species overall caught in the 2005 survey (Table 2). They were found primarily in the western and central Gulf of Alaska with about 93% of the estimated biomass in the Shumagin and Chirikof INPFC areas and almost all of the remainder in the Kodiak area (Fig. 30, Table 39). They did not occur in the southeastern area. They were almost exclusively found in waters shallower than 200 m, with less than 1% deeper than 200 m (Table 39). The highest CPUEs of northern rockfish were in the the Shumagin Outer Shelf and Davidson Bank strata, both with in the Shumagin INPFC area.(Table 40). The length distribution of northern rockfish caught during the survey was confined to a relatively narrow range between approximately 30 and 45 cm in all areas and depth ranges with a mode around 40 cm for both sexes in the three westernmost INPFC areas (Fig. 31).

Table 39.-- Number of hauls, hauls with northern rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	22	36.77	151,805	0.988	39.4
	101 - 200	36	20	54.02	79,287	0.959	39.6
	201 - 300	12	2	0.17	47	0.572	34.1
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	44	35.44	231,138	0.977	39.5
Chirikof	1 - 100	71	4	1.33	3,466	1.017	39.6
	101 - 200	62	21	41.39	98,705	0.793	37.2
	201 - 300	25	4	0.34	396	0.517	32.9
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	1	0.19	38	0.704	37.3
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	30	15.08	102,605	0.797	37.2
Kodiak	1 - 100	109	9	2.86	11,021	0.808	37.3
	101 - 200	139	47	2.89	12,517	0.721	36.5
	201 - 300	29	10	1.38	1,586	0.547	33.9
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	66	2.48	25,123	0.741	36.6
Yakutat	1 - 100	15	1	0.02	39	0.727	38.0
	101 - 200	42	1	0.01	17	0.627	36.0
	201 - 300	21	3	0.19	100	0.569	34.3
	301 - 500	8	1	0.02	4	0.433	33.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	6	0.03	160	0.602	35.2
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	36	12.89	166,331	0.974	39.2
	101 - 200	316	89	15.58	190,524	0.849	38.0
	201 - 300	119	19	0.59	2,129	0.543	33.7
	301 - 500	48	1	0.00	4	0.433	33.0
	501 - 700	23	1	0.05	38	0.704	37.3
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	146	11.22	359,026	0.899	38.5

All Areas and Depths Biomass, 95% confidence interval: 94,163 - 623,889 metric tons (t)

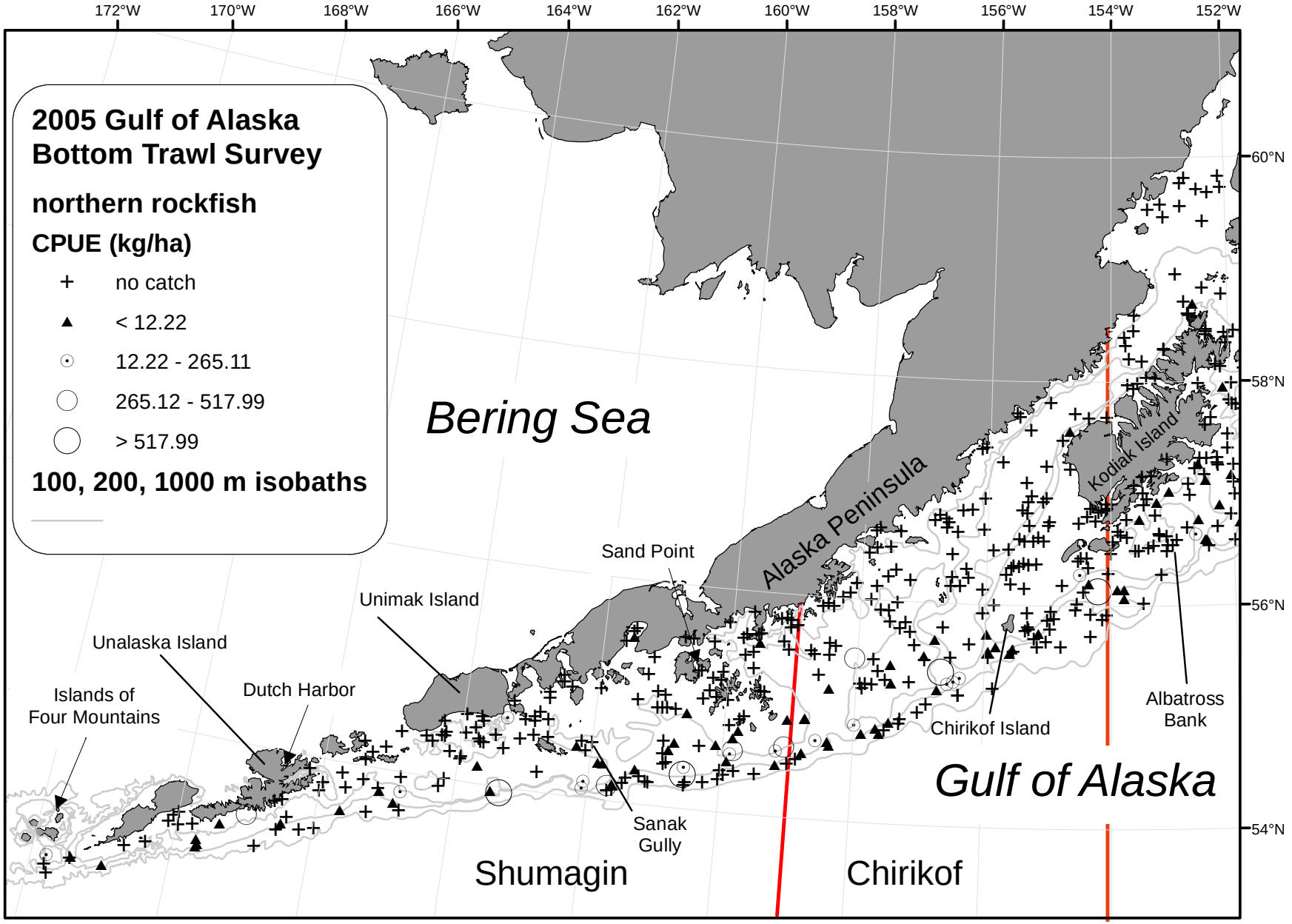

Figure 30. --Distribution and relative abundance of northern rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

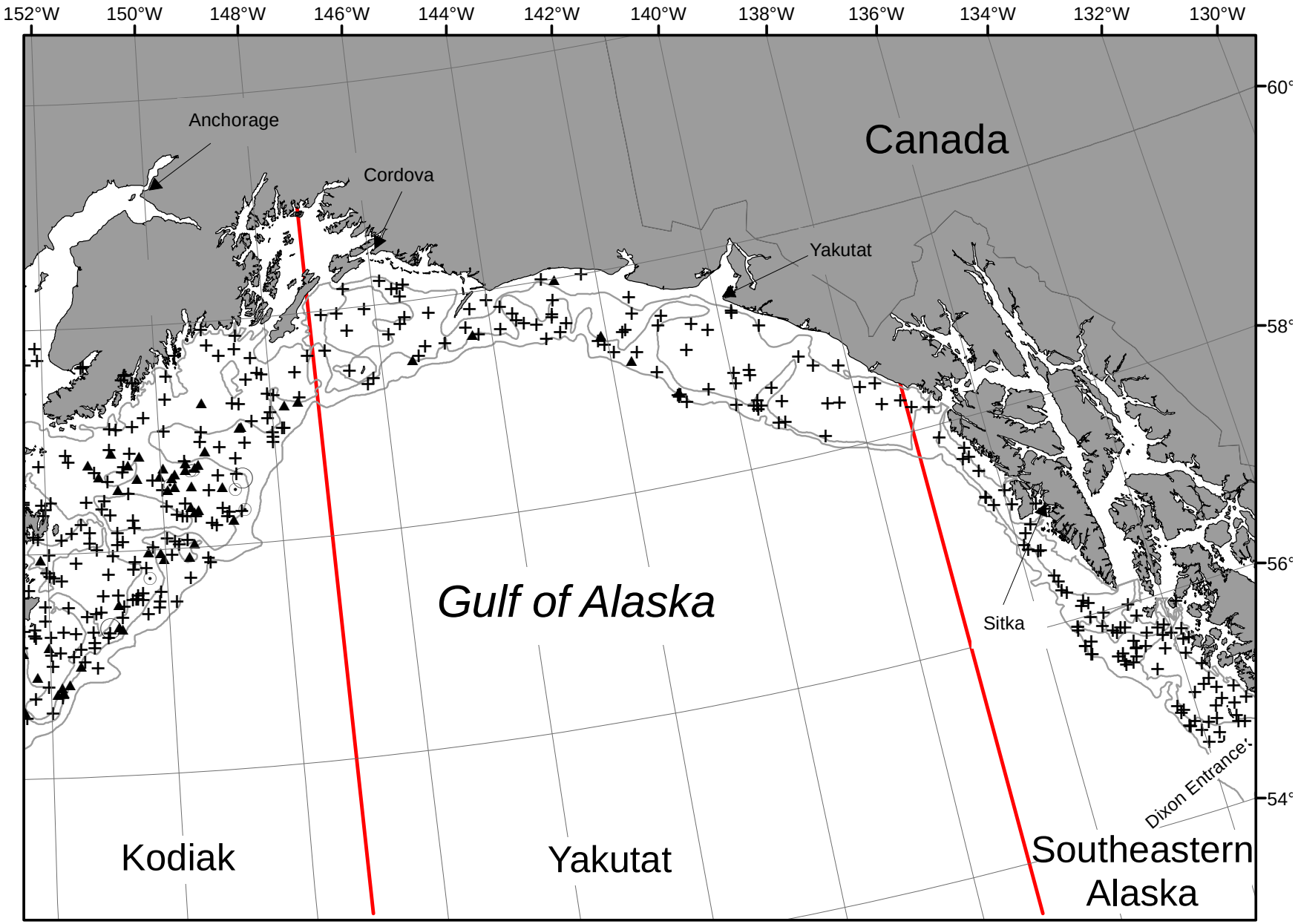

Figure 30. -- Continued.

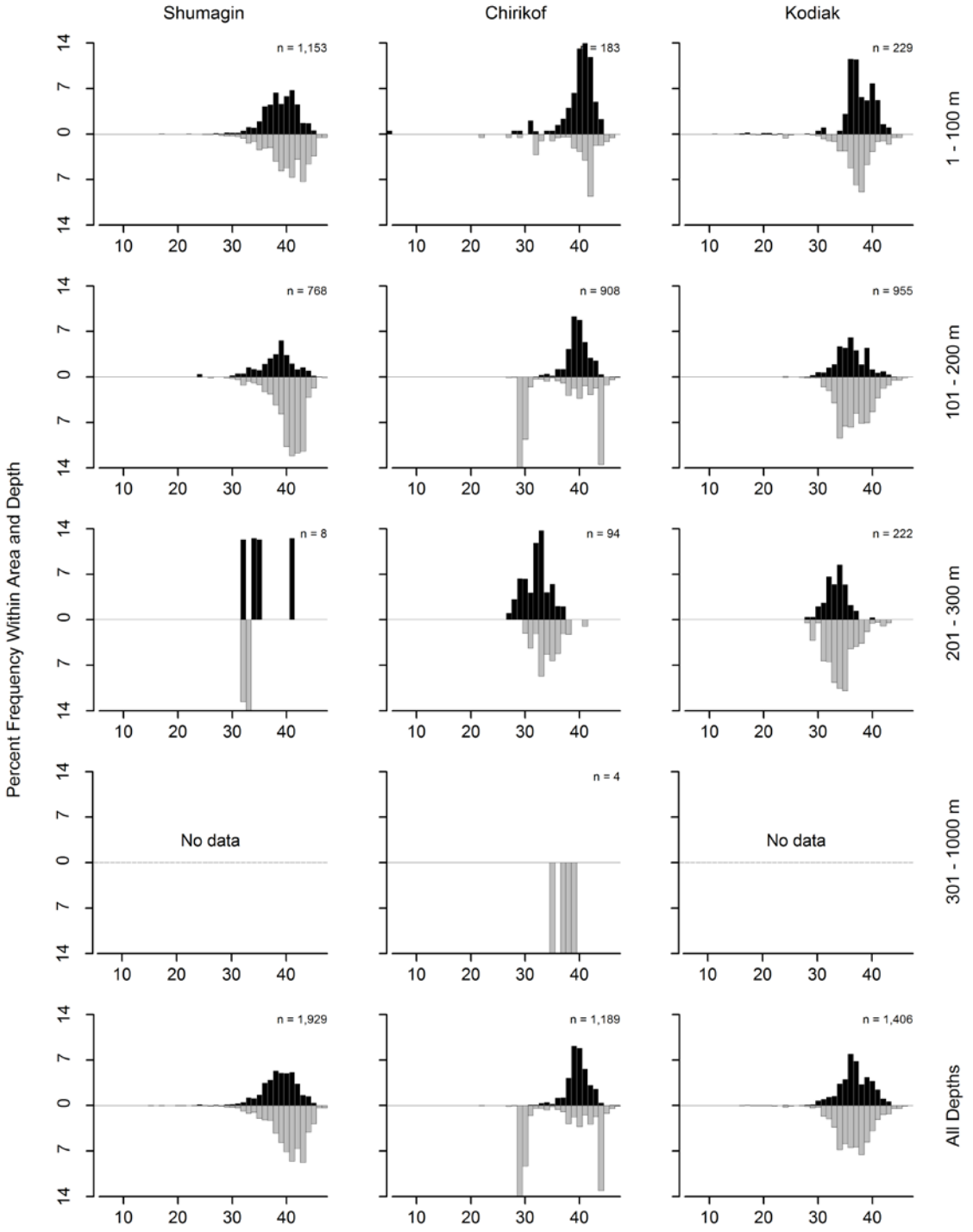

Figure 31. -- Size composition of northern rockfish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

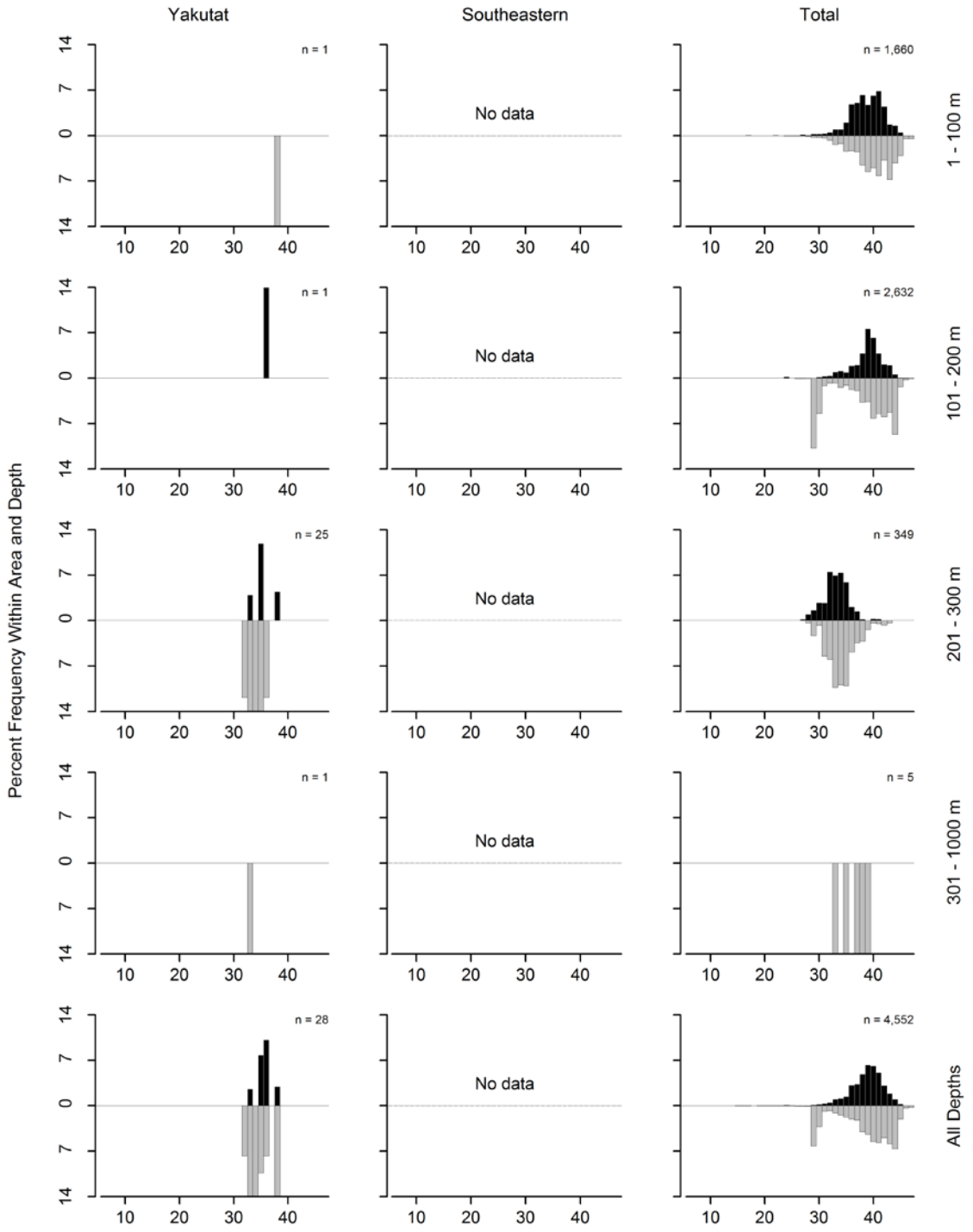

Figure 31. -- Continued (northern rockfish).

Table 40. -- Catch per unit of effort by stratum for northern rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	101 - 200	Shumagin Outer Shelf	21	17	97.19	79,245	0	190,414
Shumagin	1 - 100	Davidson Bank	37	7	78.65	107,597	0	320,061
Chirikof	101 - 200	Shelikof Edge	24	4	60.51	46,802	0	143,178
Chirikof	101 - 200	Chirikof Outer Shelf	20	15	56.12	28,118	0	71,700
Shumagin	1 - 100	Shumagin Bank	31	10	25.72	31,893	0	72,626
Chirikof	101 - 200	East Shumagin Gully	18	2	21.42	23,785	0	73,920
Shumagin	1 - 100	Fox Islands	22	3	14.66	12,213	0	35,981
Kodiak	101 - 200	Portlock Flats	41	25	14.20	10,419	0	24,482
Kodiak	201 - 300	Kodiak Slope	6	4	9.28	1,506	0	4,668
Kodiak	1 - 100	Albatross Banks	49	5	7.14	10,991	0	32,999
Chirikof	201 - 300	Chirikof Slope	8	4	2.59	396	0	938
Chirikof	1 - 100	Chirikof Bank	37	1	2.32	2,499	0	7,603
Kodiak	101 - 200	Kodiak Outer Shelf	28	12	1.38	694	162	1,226
Kodiak	101 - 200	Albatross Gullies	32	6	1.37	1,085	0	2,573
Chirikof	1 - 100	Semidi Bank	19	3	1.32	967	0	2,130
Yakutat	201 - 300	Yakutat Slope	13	3	0.47	100	0	284
Chirikof	501 - 700	Chirikof Slope	6	1	0.19	38	0	134
Shumagin	201 - 300	Shumagin Slope	12	2	0.17	47	0	120
Kodiak	101 - 200	Kenai Flats	22	1	0.15	184	0	567
Shumagin	1 - 100	Lower Alaska Peninsula	27	2	0.15	102	0	294
Kodiak	101 - 200	Barren Islands	16	3	0.12	135	0	343
Kodiak	201 - 300	Kenai Gullies	20	6	0.12	80	3	157
Shumagin	101 - 200	Sanak Gully	11	3	0.10	41	0	99
Kodiak	1 - 100	Albatross Shallows	34	4	0.05	30	0	62
Yakutat	1 - 100	Yakutat Shallows	8	1	0.04	39	0	133
Yakutat	101 - 200	Yakataga Shelf	8	1	0.03	17	0	56
Yakutat	301 - 500	Yakutat Slope	6	1	0.03	4	0	16

Rougheye rockfish (*Sebastes aleutianus*)

Rougheye rockfish were uncommon and were found throughout the survey area primarily on the upper continental slope and in the deeper gullies in the 101-500 m depth range, where approximately 96% of its biomass occurred (Fig. 32, Tables 41-42). The highest CPUEs were generally recorded in the 301-500 m range where rougheye rockfish were caught in approximately 75% of the tows (Table 41). Fish size generally increased with depth to 700 m (Fig. 33, Table 41). The only relatively distinct length mode occurred at around 48 cm FL for both males and females captured between 301 and 1,000 m in all but the Yakutat INPFC area. Otherwise length distributions were multimodal.

Table 41.-- Number of hauls, hauls with rougheye rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	4	0.01	40	0.279	21.6
	101 - 200	36	12	0.25	364	0.725	34.5
	201 - 300	12	10	5.58	1,556	0.982	37.3
	301 - 500	9	6	6.56	1,662	1.396	43.9
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	32	0.56	3,621	1.059	38.6
Chirikof	1 - 100	71	1	0.00	2	0.167	21.0
	101 - 200	62	22	0.85	2,032	0.536	29.2
	201 - 300	25	19	1.47	1,692	1.156	39.8
	301 - 500	10	4	15.18	2,435	1.358	43.5
	501 - 700	6	1	0.13	26	2.113	51.0
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	47	0.91	6,186	0.875	35.0
Kodiak	1 - 100	109	13	0.38	1,472	0.550	30.8
	101 - 200	139	44	2.37	10,280	0.669	30.9
	201 - 300	29	23	4.86	5,580	1.061	36.8
	301 - 500	8	7	31.69	9,228	1.158	41.2
	501 - 700	5	1	0.27	46	1.520	45.0
	701 - 1,000	3	1	0.30	106	2.472	57.0
	All Depths	293	89	2.63	26,712	0.852	34.6
Yakutat	1 - 100	15	1	0.00	8	0.047	14.0
	101 - 200	42	28	0.64	1,885	0.201	21.5
	201 - 300	21	15	2.18	1,125	0.664	30.8
	301 - 500	8	6	7.49	1,968	0.791	34.6
	501 - 700	4	2	0.66	97	2.119	52.3
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	52	0.89	5,083	0.369	25.1
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	1	0.04	50	0.143	19.4
	201 - 300	32	6	0.31	154	1.389	42.1
	301 - 500	13	13	19.12	5,959	1.510	44.3
	501 - 700	4	2	0.65	68	1.652	46.7
	701 - 1,000	2	1	0.25	30	1.254	45.0
	All Depths	97	23	2.23	6,260	1.401	42.3
All Areas	1 - 100	321	19	0.12	1,522	0.507	29.3
	101 - 200	316	107	1.19	14,611	0.497	27.7
	201 - 300	119	73	2.80	10,106	1.000	36.3
	301 - 500	48	36	16.61	21,252	1.223	41.4
	501 - 700	23	6	0.29	237	1.829	48.7
	701 - 1,000	12	2	0.12	136	2.038	52.7
	All Depths	839	243	1.50	47,862	0.797	33.2

All Areas and Depths Biomass, 95% confidence interval: 30,264 - 65,461 metric tons (t)

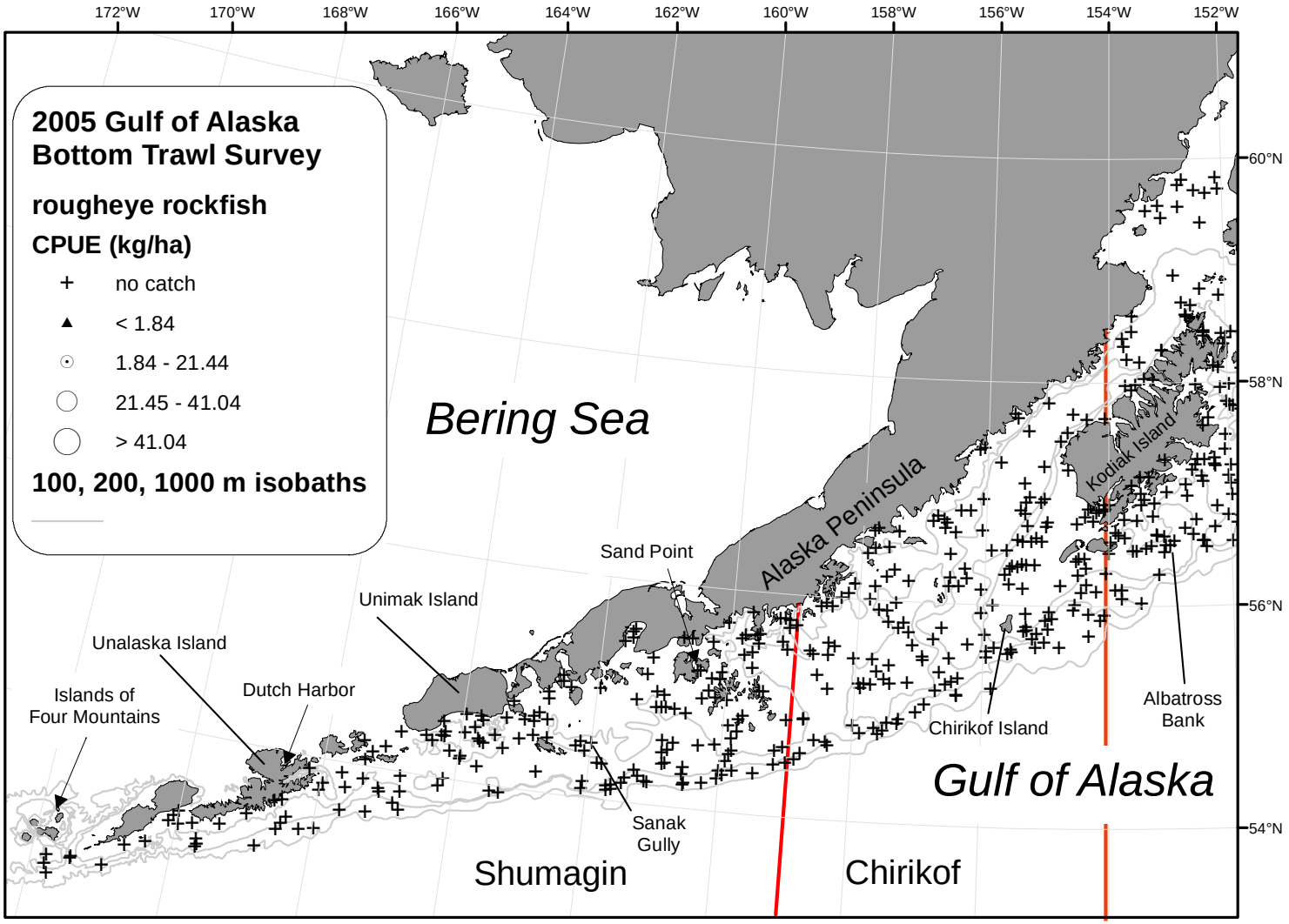

Figure 32. --Distribution and relative abundance of rougheye rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

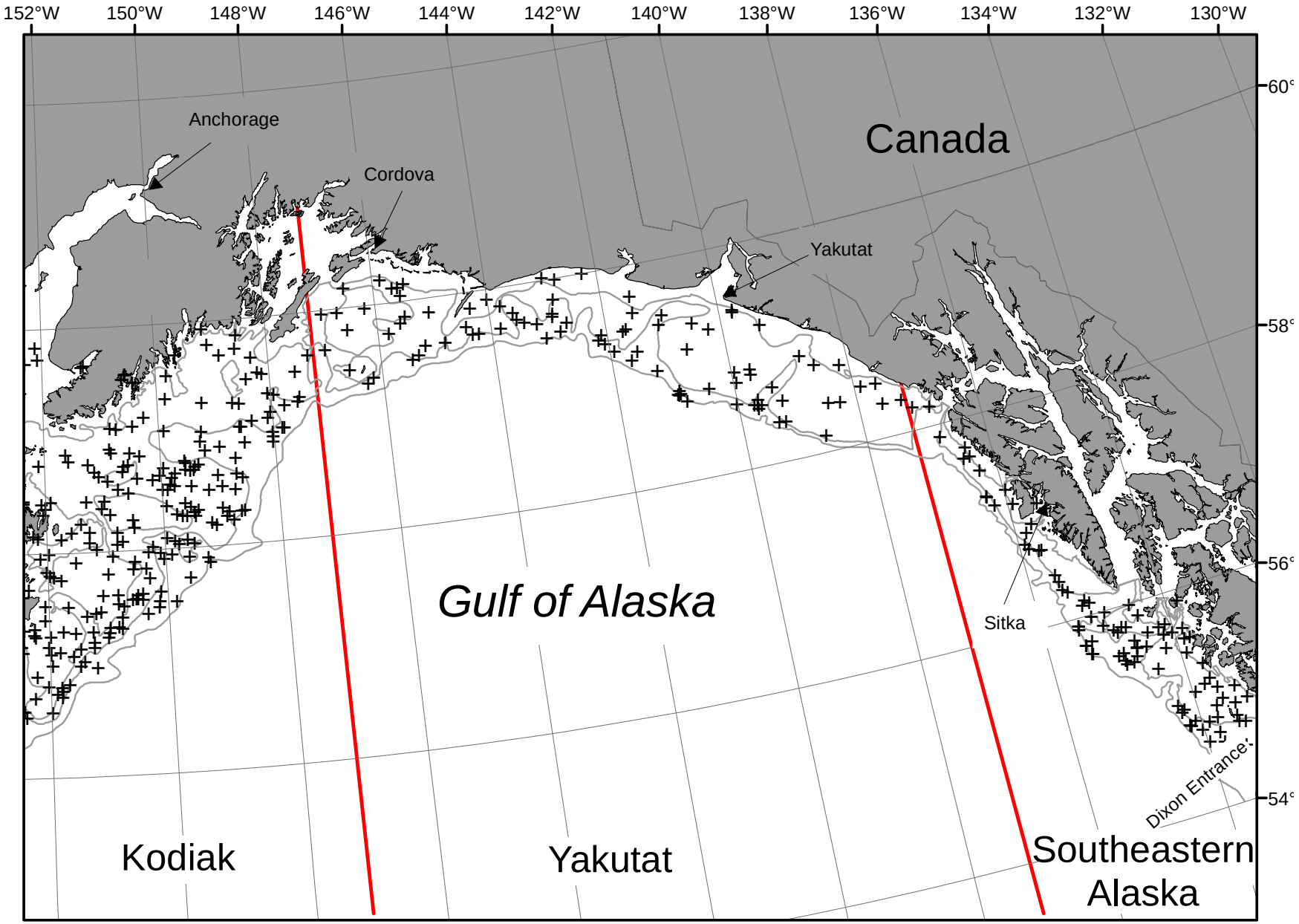

Figure 32. -- Continued.

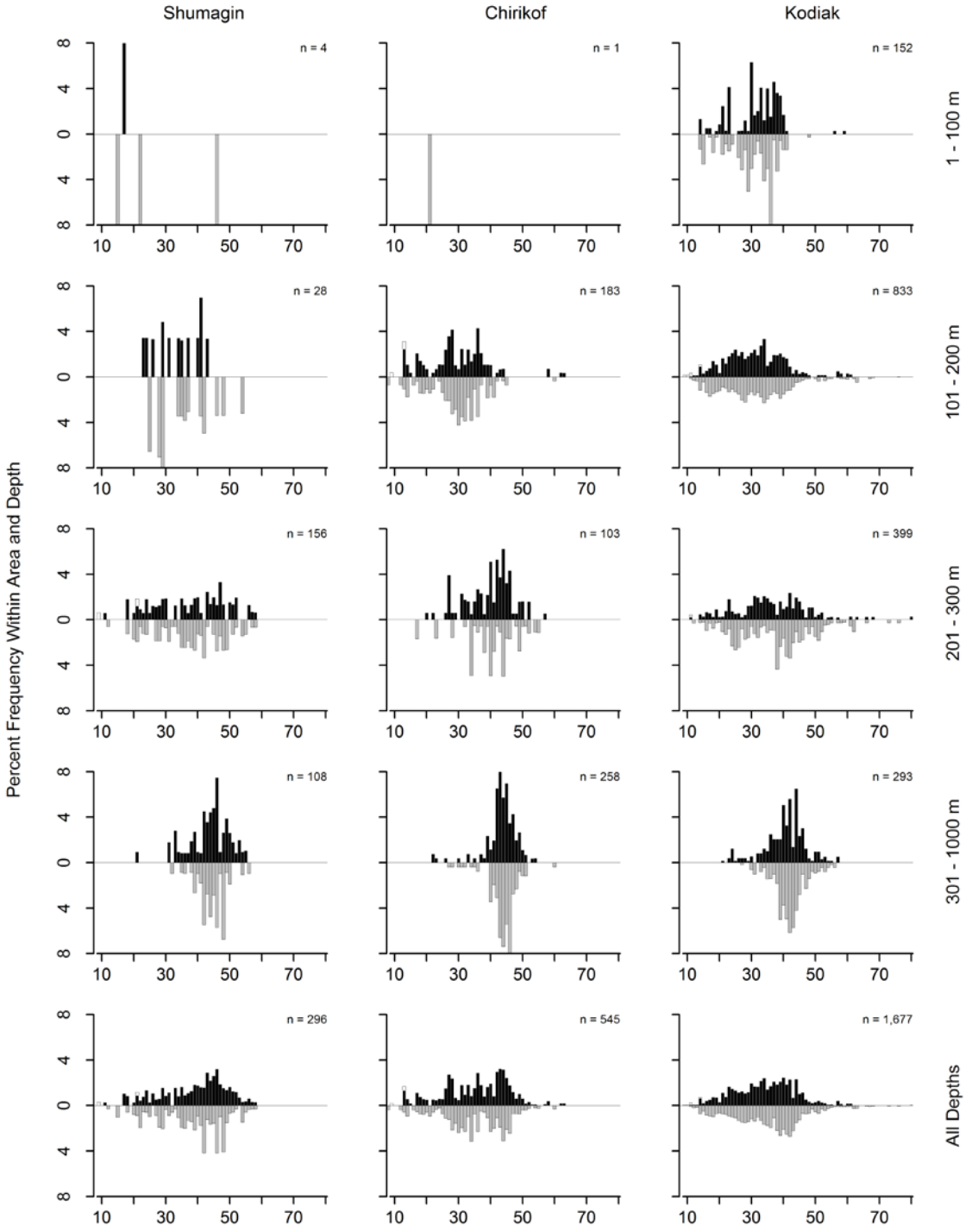

Figure 33. -- Size composition of rougheye rockfish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

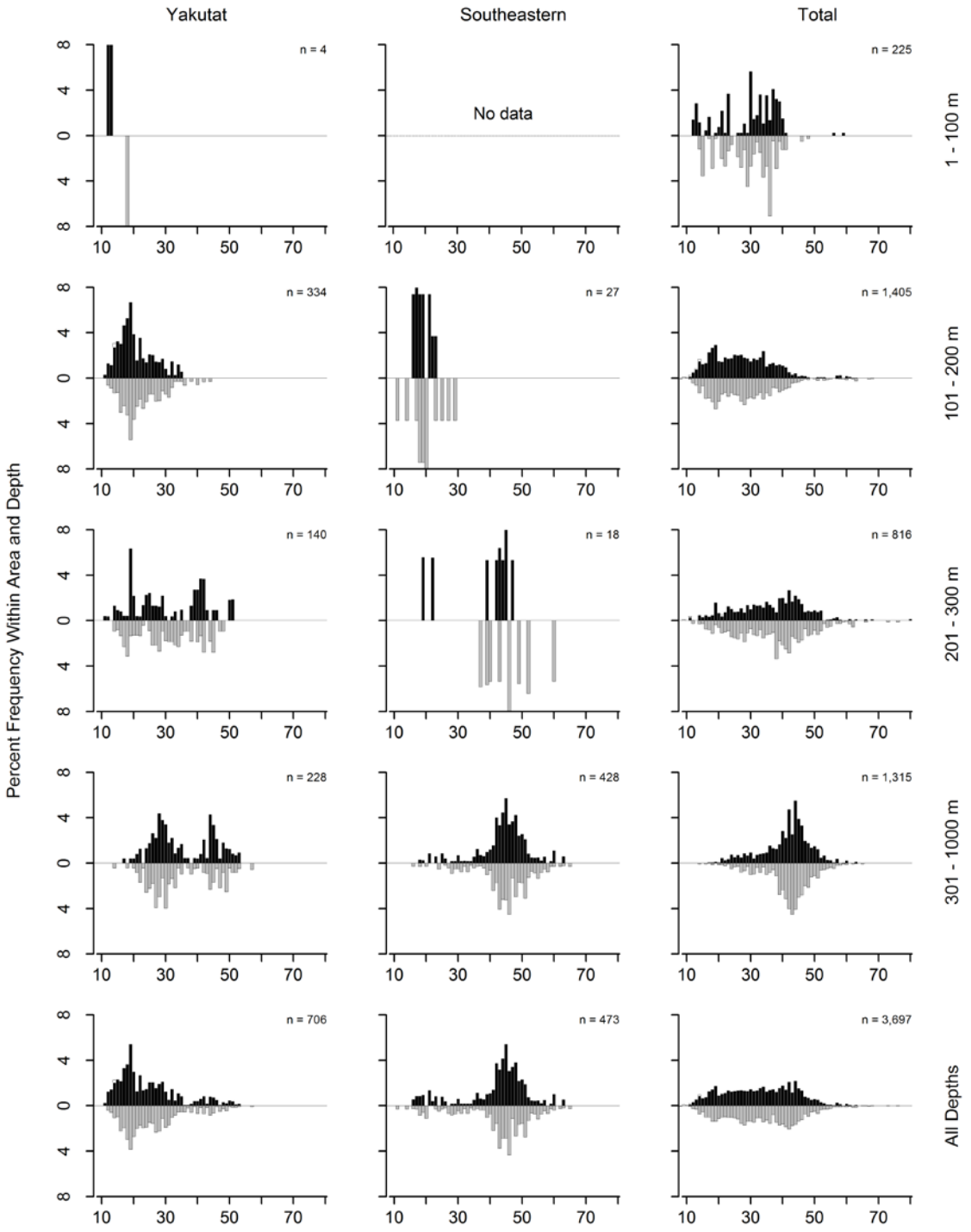

Figure 33. -- Continued (rougheye rockfish).

Table 42. --Catch per unit of effort by stratum for rougheye rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	301 - 500	Southeastern Slope	4	4	47.45	3666.4	639.2	6693.5
Kodiak	301 - 500	Kodiak Slope	8	7	31.69	9228.1	0	26224
Chirikof	301 - 500	Chirikof Slope	10	4	15.18	2435.3	0	5919.6
Kodiak	201 - 300	Kodiak Slope	6	5	14.20	2303.8	0	6639.2
Yakutat	301 - 500	Yakutat Slope	6	5	12.87	1956.7	0	4287
Southeastern	301 - 500	Southeastern Deep Gullies	9	9	9.78	2292.5	0	4905.4
Shumagin	301 - 500	Shumagin Slope	9	6	6.56	1661.5	249	3073.9
Kodiak	101 - 200	Kenai Flats	22	16	6.39	7719	1429.7	14008.3
Shumagin	201 - 300	Shumagin Slope	12	10	5.58	1555.5	27.1	3083.9
Kodiak	201 - 300	Kenai Gullies	20	16	4.55	3027.7	61.4	5994.1
Chirikof	201 - 300	Chirikof Slope	8	6	4.00	611.3	0	1253.4
Yakutat	201 - 300	Yakutat Gullies	8	7	3.34	1015.1	0	2234.5
Kodiak	1 - 100	Kenai Peninsula	6	4	1.88	986.3	0	2867.8
Kodiak	101 - 200	Albatross Gullies	32	11	1.71	1353.4	0	2765.6
Yakutat	101 - 200	Middleton Shelf	12	11	1.45	1064.8	315.2	1814.5
Chirikof	101 - 200	East Shumagin Gully	18	11	1.10	1223.7	403.4	2044.1
Chirikof	201 - 300	Lower Shelikof Gully	17	13	1.08	1080.5	311.5	1849.5
Kodiak	101 - 200	Portlock Flats	41	11	1.02	750.9	0	1645.7
Chirikof	101 - 200	Shelikof Edge	24	9	1.00	770.2	0.3	1540.1
Kodiak	1 - 100	Albatross Shallows	34	9	0.84	485.2	57.2	913.1
Kodiak	201 - 300	Upper Shelikof Gully	3	2	0.77	248	0	1107
Yakutat	101 - 200	Yakataga Shelf	8	6	0.76	400	29.9	770.2
Yakutat	501 - 700	Yakutat Slope	4	2	0.66	97.1	0	285.4
Southeastern	501 - 700	Southeastern Slope	4	2	0.65	67.6	0	192.9
Yakutat	201 - 300	Yakutat Slope	13	8	0.52	109.6	0	228.7
Shumagin	101 - 200	Sanak Gully	11	5	0.40	171.4	0	367.3
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	6	0.39	154.2	0	363.1
Kodiak	101 - 200	Barren Islands	16	3	0.38	414.2	0	1155.8
Yakutat	101 - 200	Fairweather Shelf	11	3	0.32	246.7	0	570.1
Kodiak	701 - 1000	Kodiak Slope	3	1	0.30	106.3	0	563.6
Kodiak	501 - 700	Kodiak Slope	5	1	0.27	46.4	0	175.4
Southeastern	701 - 1000	Southeastern Slope	2	1	0.25	29.8	0	408
Shumagin	101 - 200	West Shumagin Gully	4	2	0.22	51	0	151.5
Yakutat	101 - 200	Yakutat Flats	11	8	0.19	173.8	3.8	343.9
Shumagin	101 - 200	Shumagin Outer Shelf	21	5	0.17	141.4	1.4	281.5
Chirikof	501 - 700	Chirikof Slope	6	1	0.13	25.5	0	91
Yakutat	301 - 500	Yakutat Gullies	2	1	0.10	11	0	150.7
Kodiak	101 - 200	Kodiak Outer Shelf	28	3	0.09	42.5	0	95.2
Chirikof	101 - 200	Chirikof Outer Shelf	20	2	0.08	37.9	0	95.7
Southeastern	101 - 200	Prince of Wales Shelf	26	1	0.07	49.7	0	152.1
Shumagin	1 - 100	Fox Islands	22	1	0.02	19.8	0	61
Shumagin	1 - 100	Shumagin Bank	31	3	0.02	20.2	0	52.9
Yakutat	1 - 100	Middleton Shallows	7	1	0.01	8.3	0	28.5
Chirikof	1 - 100	Chirikof Bank	37	1	<0.01	2	0	6

Dusky rockfish (Sebastes variabilis)

Dusky rockfish was the third most abundant rockfish species and tenth most abundant species overall caught in the 2005 survey (Table 2). Although dusky rockfish were found throughout the survey area, they tended to occur in several localized areas along the outher shelf in water depths between 100 and 200 m, where approximately 76% of its estimated biomass was distributed (Fig. 34, Table 43). The highest CPUEs were recorded on the Portlock Flats and Shumagin Outer Shelf which, combined, accounted for over 47% of the estimated biomass even though these two strata constitute less than 5% of the survey area (Table 44). Both sexes showed a mode at about 45 cm in waters deeper than 100 m. Also fish smaller than about 40 cm FL were confined almost exclusively to depths less than 100 m (Fig. 35).

Table 43.-- Number of hauls, hauls with dusky rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	16	8.45	34,894	0.970	37.3
	101 - 200	36	13	23.41	34,361	1.446	43.5
	201 - 300	12	2	0.15	41	1.115	40.9
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	31	10.62	69,295	1.160	39.8
Chirikof	1 - 100	71	6	0.06	144	0.685	31.3
	101 - 200	62	18	15.67	37,375	1.655	44.0
	201 - 300	25	5	0.59	685	1.176	41.3
	301 - 500	10	1	0.07	12	1.800	46.0
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	30	5.62	38,216	1.635	43.8
Kodiak	1 - 100	109	9	0.25	976	0.715	30.7
	101 - 200	139	40	13.36	57,873	1.600	45.6
	201 - 300	29	7	1.09	1,248	1.415	43.9
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	56	5.92	60,097	1.565	45.0
Yakutat	1 - 100	15	2	0.42	703	1.435	45.8
	101 - 200	42	8	0.32	948	1.352	44.0
	201 - 300	21	6	1.53	791	1.544	45.5
	301 - 500	8	2	0.17	46	1.448	46.3
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	18	0.43	2,488	1.434	45.0
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	1	0.02	23	1.941	47.0
	201 - 300	32	3	0.70	356	1.530	44.5
	301 - 500	13	1	0.03	10	0.863	37.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	5	0.14	389	1.518	44.3
All Areas	1 - 100	321	33	2.85	36,716	0.966	37.1
	101 - 200	316	80	10.67	130,579	1.569	44.6
	201 - 300	119	23	0.87	3,121	1.389	43.6
	301 - 500	48	4	0.05	68	1.353	44.1
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	140	5.33	170,484	1.380	42.2

All Areas and Depths Biomass, 95% confidence interval: 68,202 - 272,766 metric tons (t)

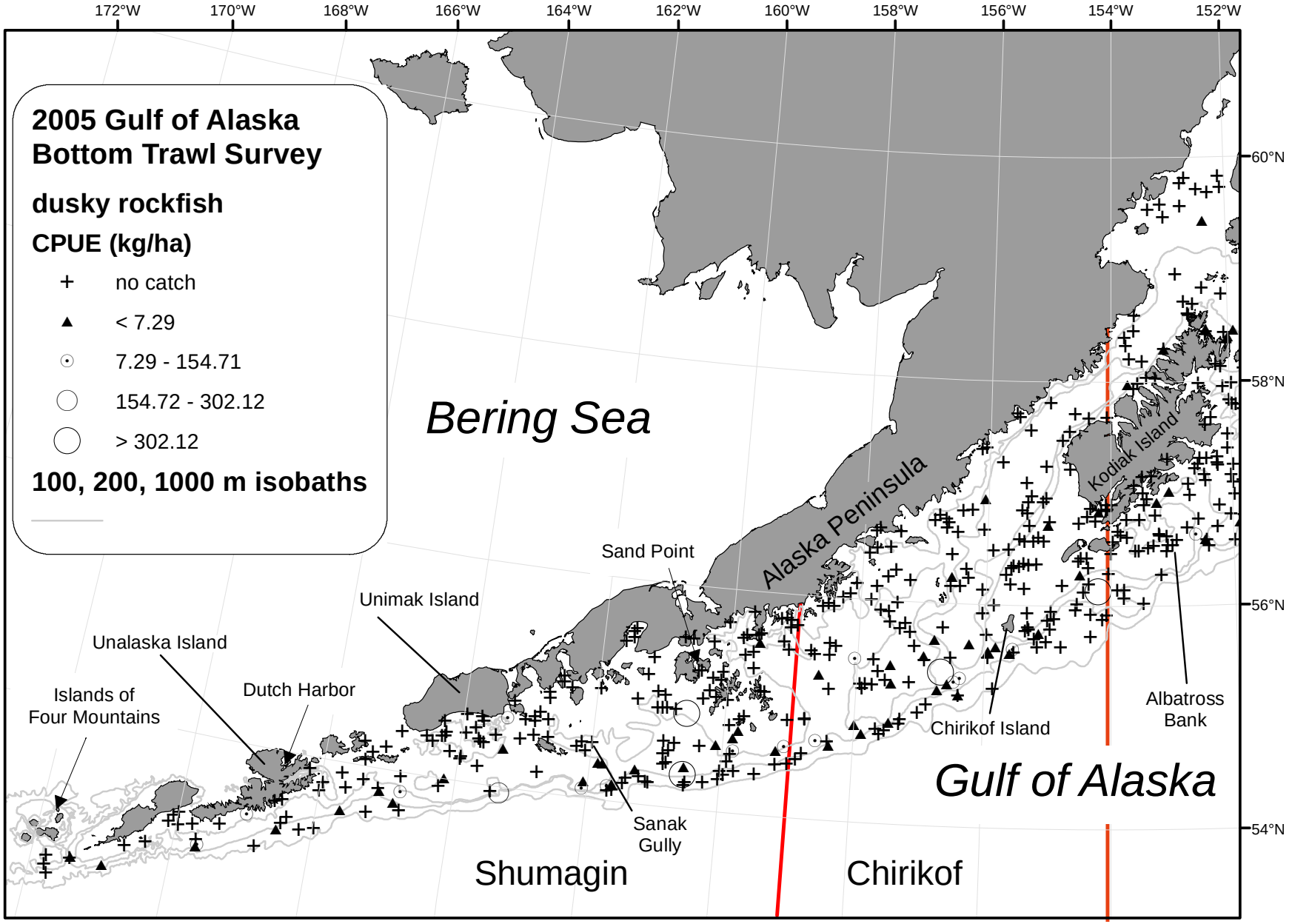

Figure 34. -- Distribution and relative abundance of dusky rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

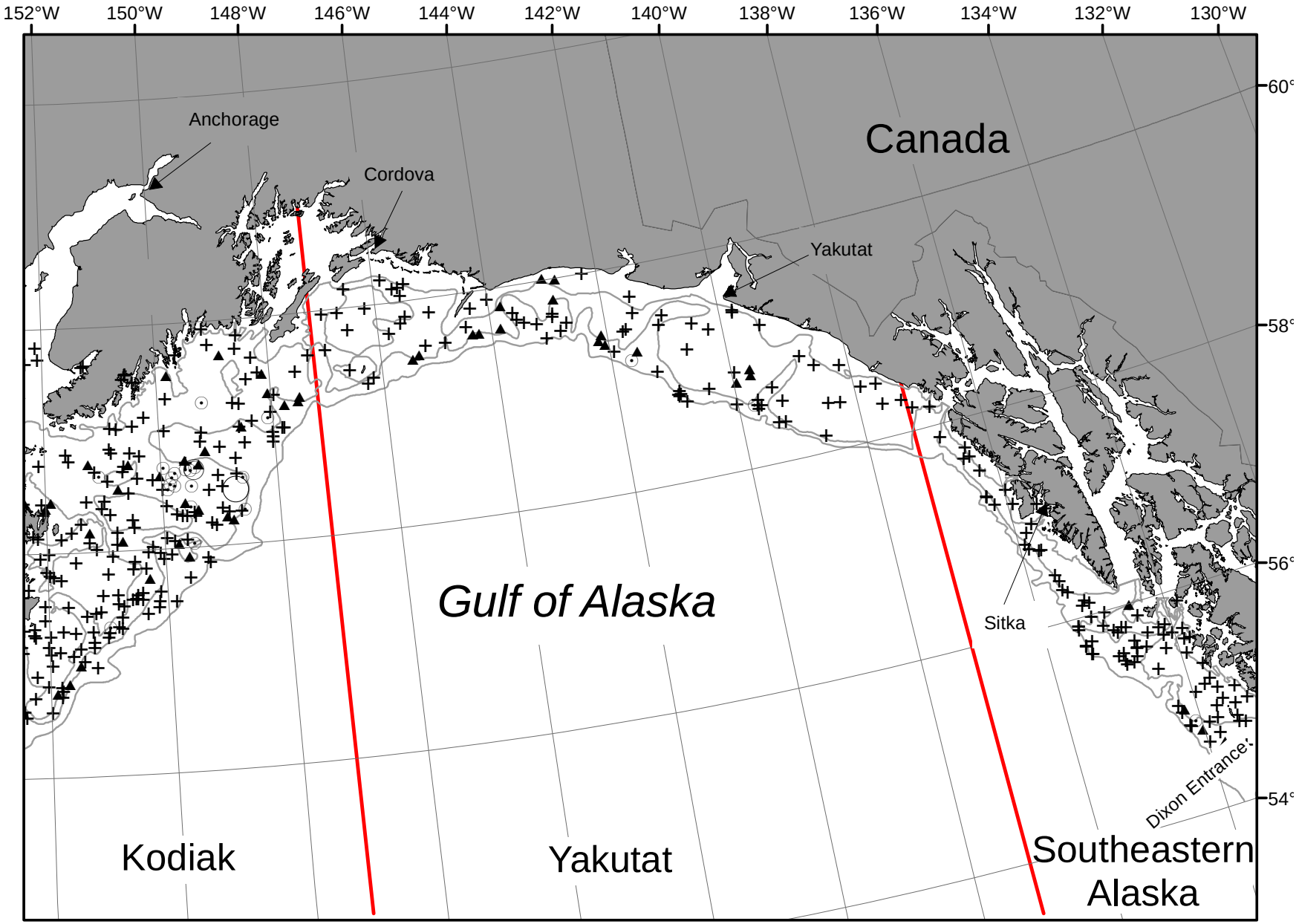

Figure 34. -- Continued.

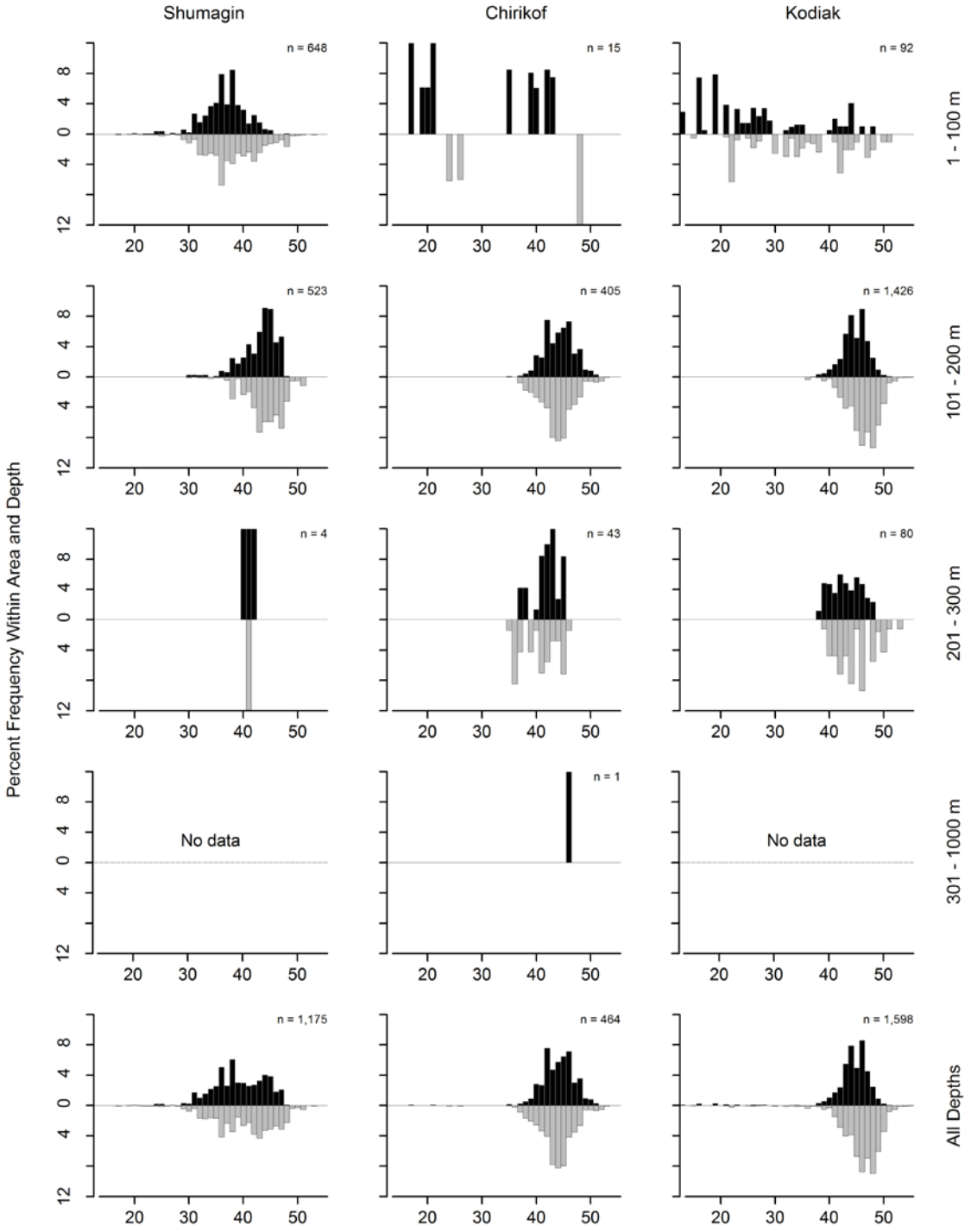

Figure 35. -- Size composition of dusky rockfish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

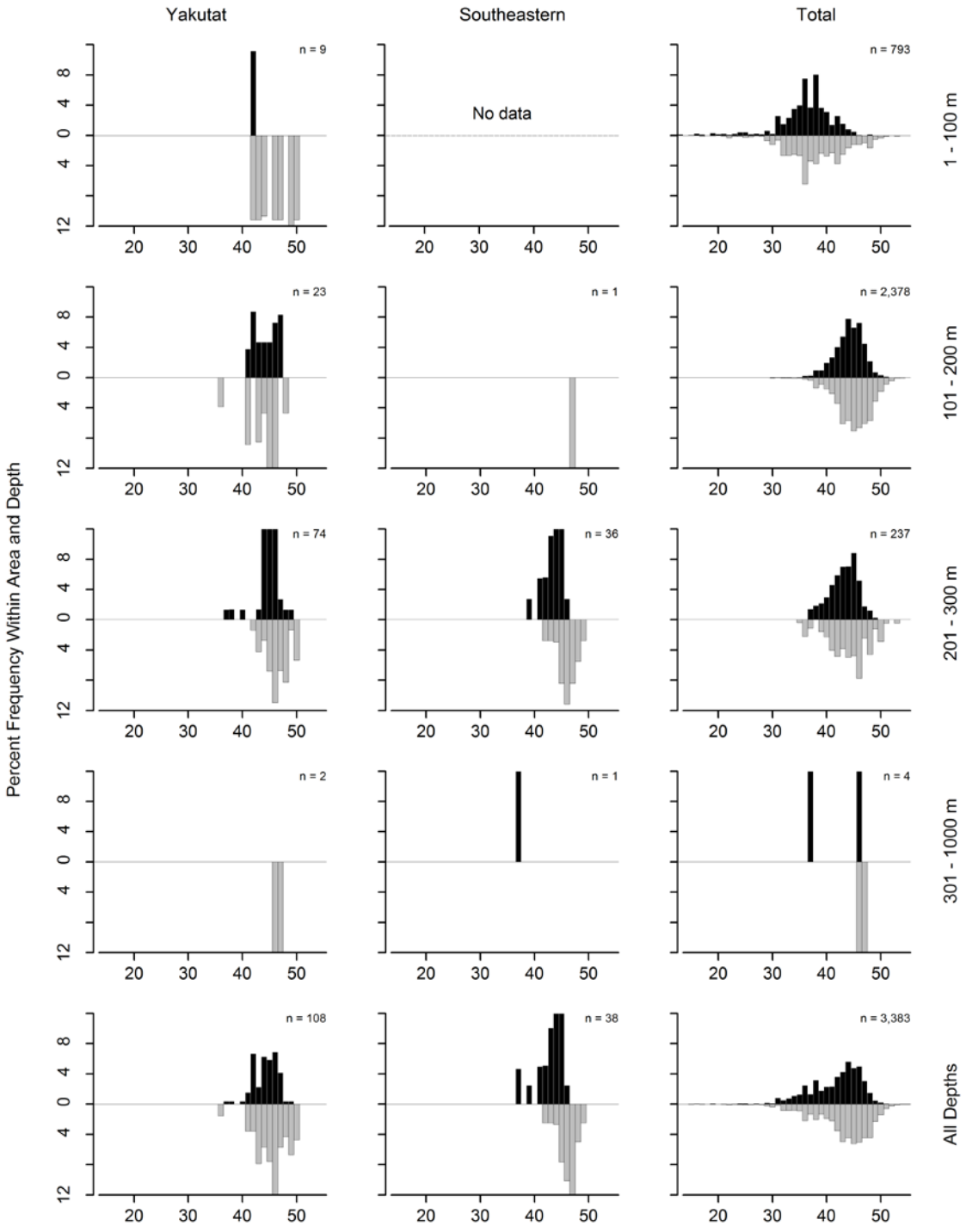

Figure 35. -- Continued (dusky rockfish).

Table 44. -- Catch per unit of effort by stratum for dusky rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	101 - 200	Portlock Flats	41	21	63.91	46,890	0	110,471
Shumagin	101 - 200	Shumagin Outer Shelf	21	13	42.14	34,361	0	78,231
Chirikof	101 - 200	Chirikof Outer Shelf	20	12	30.28	15,172	0	43,379
Chirikof	101 - 200	Shelikof Edge	24	4	27.79	21,497	0	65,845
Shumagin	1 - 100	Shumagin Bank	31	7	19.75	24,490	0	68,788
Kodiak	101 - 200	Kenai Flats	22	5	7.08	8,548	0	26,077
Shumagin	1 - 100	Davidson Bank	37	7	6.91	9,447	0	23,670
Kodiak	201 - 300	Kodiak Slope	6	3	5.73	930	0	3,156
Yakutat	201 - 300	Yakutat Slope	13	6	3.72	791	0	1,819
Chirikof	201 - 300	Chirikof Slope	8	3	2.06	315	0	787
Kodiak	101 - 200	Kodiak Outer Shelf	28	8	1.71	857	0	1,780
Shumagin	1 - 100	Fox Islands	22	1	1.13	944	0	2,907
Kodiak	101 - 200	Barren Islands	16	2	1.09	1,193	0	3,638
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	3	0.91	356	0	919
Yakutat	1 - 100	Yakutat Shallows	8	2	0.71	703	0	2,211
Yakutat	101 - 200	Yakutat Flats	11	3	0.65	586	0	1,651
Chirikof	101 - 200	East Shumagin Gully	18	2	0.64	707	0	2,066
Kodiak	1 - 100	Northern Kodiak Shallows	7	1	0.57	126	0	434
Kodiak	101 - 200	Albatross Gullies	32	4	0.49	386	0	983
Kodiak	201 - 300	Kenai Gullies	20	4	0.48	318	0	721
Yakutat	101 - 200	Yakataga Shelf	8	4	0.45	238	0	572
Kodiak	1 - 100	Albatross Banks	49	2	0.44	679	0	2,024
Chirikof	201 - 300	Lower Shelikof Gully	17	2	0.37	370	0	1,094
Yakutat	301 - 500	Yakutat Gullies	2	1	0.27	30	0	404
Yakutat	101 - 200	Middleton Shelf	12	1	0.17	124	0	396
Shumagin	201 - 300	Shumagin Slope	12	2	0.15	41	0	102
Kodiak	1 - 100	Albatross Shallows	34	5	0.12	71	0	147
Yakutat	301 - 500	Yakutat Slope	6	1	0.11	17	0	59
Kodiak	1 - 100	Lower Cook Inlet	13	1	0.10	101	0	320
Chirikof	1 - 100	Semidi Bank	19	3	0.10	72	0	157
Chirikof	301 - 500	Chirikof Slope	10	1	0.07	12	0	38
Chirikof	1 - 100	Chirikof Bank	37	3	0.07	72	0	188
Southeastern	301 - 500	Southeastern Deep Gullies	9	1	0.04	10	0	34
Southeastern	101 - 200	Prince of Wales Shelf	26	1	0.03	23	0	70
Shumagin	1 - 100	Lower Alaska Peninsula	27	1	0.02	13	0	40

Sharpchin rockfish (*Sebastes zacentrus*)

Sharpchin rockfish was an uncommon species and, although they were found in all five INPFC areas they were rarely captured west of Kodiak Island (Table 45, Fig. 36). This species was almost always encounted in depths between 101 and 300 m. The highest CPUEs were found in the Kodiak and Yakutat Slope strata. These strata contained 42% of the estimated biomass even though they represented only about 1% of the survey area (Table 46). The length frequency data for the Yakutat and Southeastern INFC area in the 200 – 300 m depth range showed a relatively strong mode for males at about 25 cm FL and at 25-30 cm for females. Data for those same two areas from 101 -200 m were multimodal with smaller fish more prevalent then deeper depths (Fig. 37).

Table 45.-- Number of hauls, hauls with sharpchin rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	0	0.00	0	---	---
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	3	0.70	195	0.462	30.6
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	3	0.03	195	0.462	30.6
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	2	Trace	7	0.302	27.9
	201 - 300	25	2	0.02	21	0.312	28.6
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	4	Trace	28	0.310	28.5
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	23	1.38	5,982	0.258	25.7
	201 - 300	29	1	4.13	4,748	0.285	26.6
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	24	1.06	10,730	0.270	26.1
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	11	0.20	597	0.110	19.4
	201 - 300	21	12	8.17	4,222	0.392	29.3
	301 - 500	8	2	0.03	9	0.285	27.2
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	25	0.84	4,827	0.297	26.0
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	12	2.46	2,732	0.203	23.8
	201 - 300	32	20	5.30	2,680	0.229	24.5
	301 - 500	13	1	Trace	1	0.063	15.5
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	33	1.93	5,413	0.215	24.1
All Areas	1 - 100	321	0	0.00	0	---	---
	101 - 200	316	48	0.76	9,317	0.222	24.3
	201 - 300	119	38	3.29	11,866	0.300	26.7
	301 - 500	48	3	0.01	10	0.193	22.4
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	89	0.66	21,193	0.259	25.5

All Areas and Depths Biomass, 95% confidence interval: 7,442 - 34,943 metric tons (t)

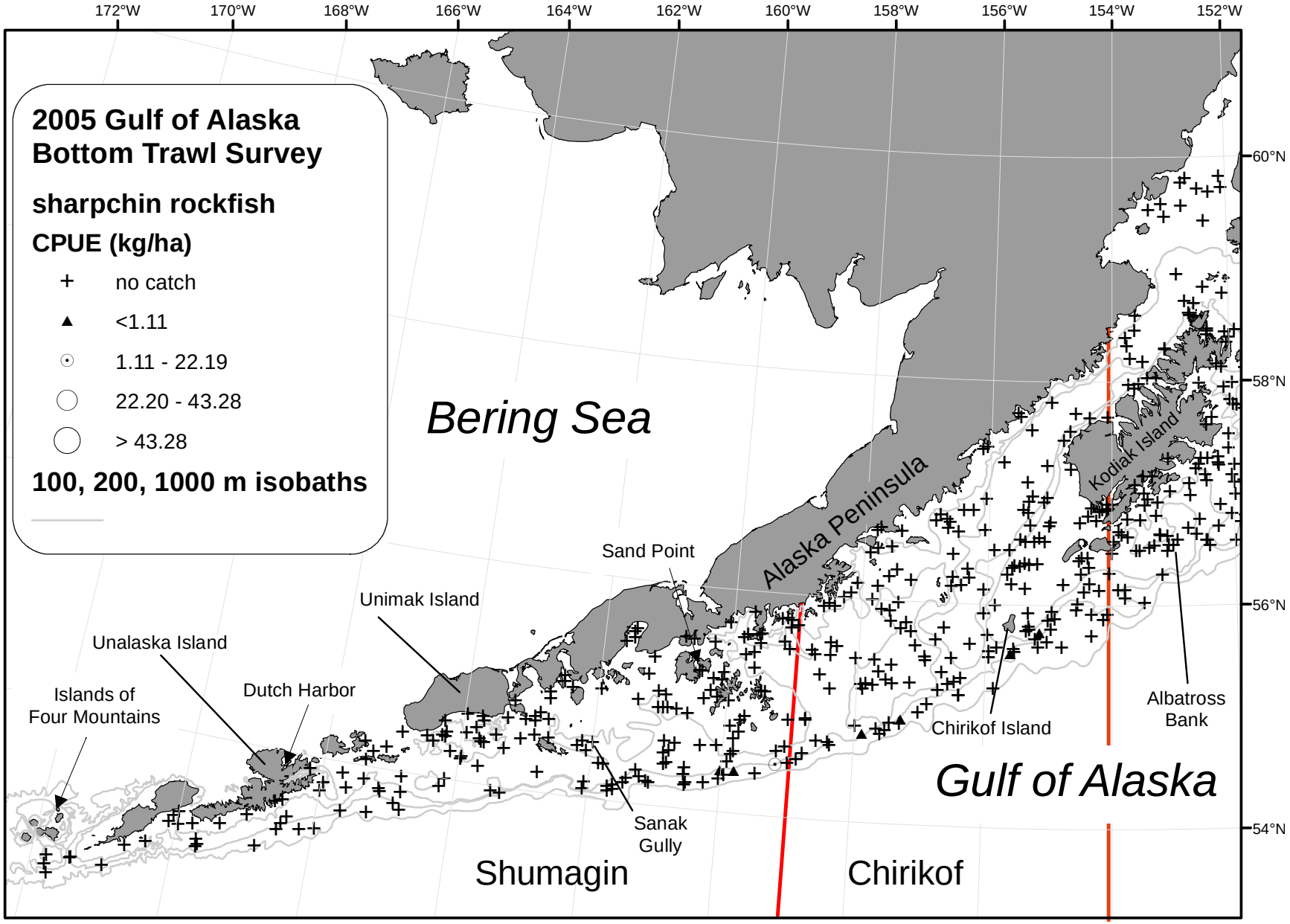

Figure 36. --Distribution and relative abundance of sharpchin rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

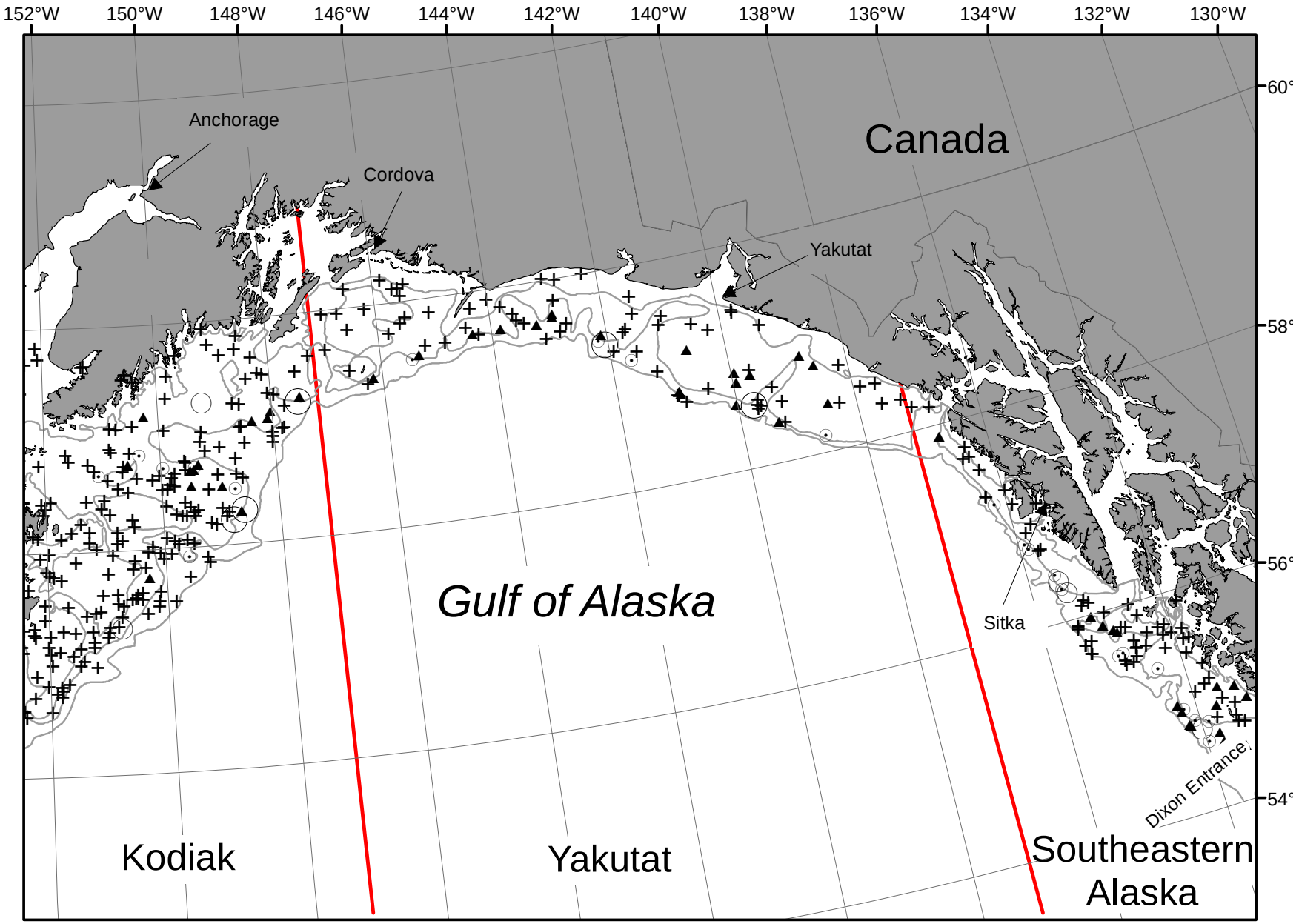

Figure 36. -- Continued.

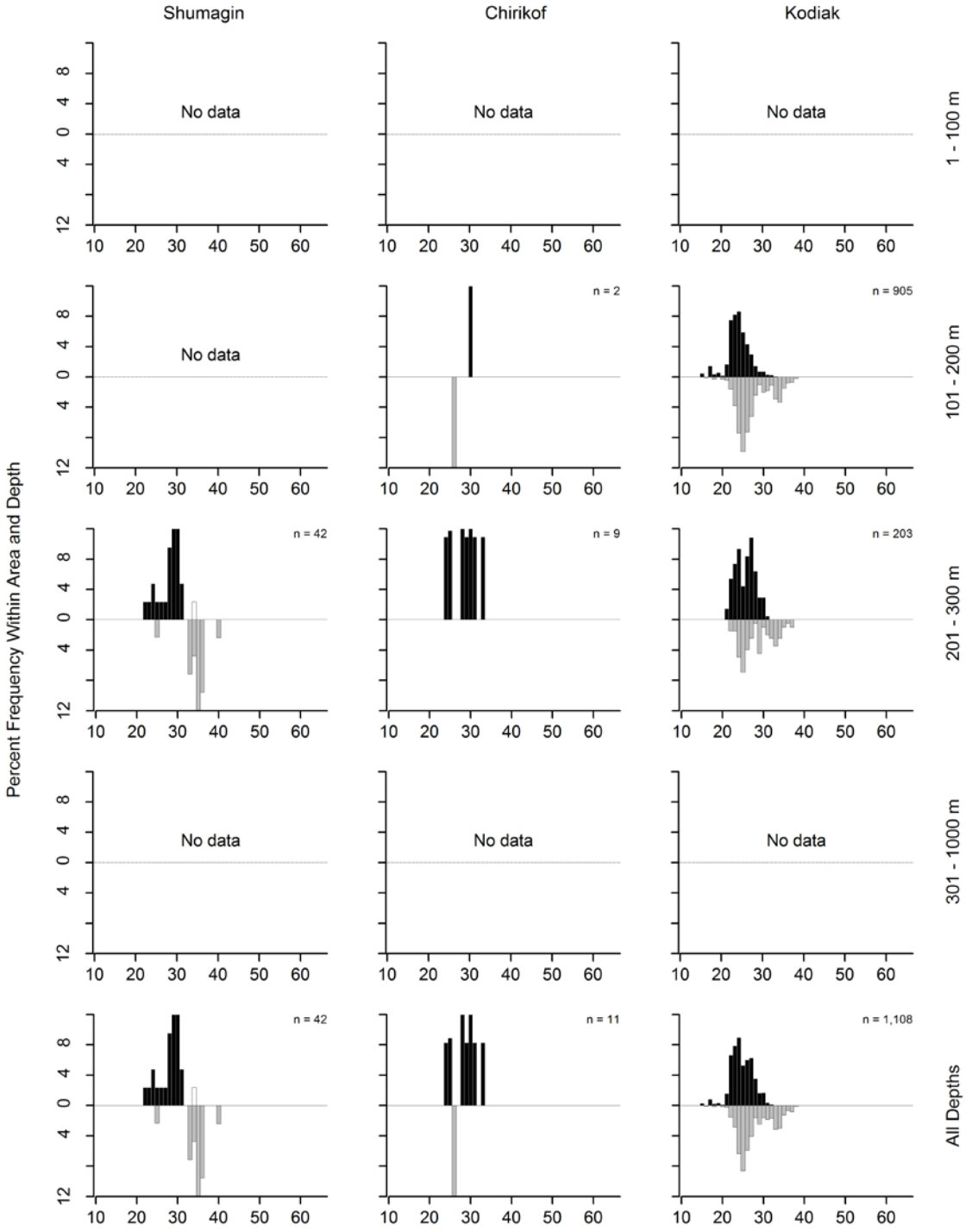

Figure 37. -- Size composition of sharpchin rockfish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

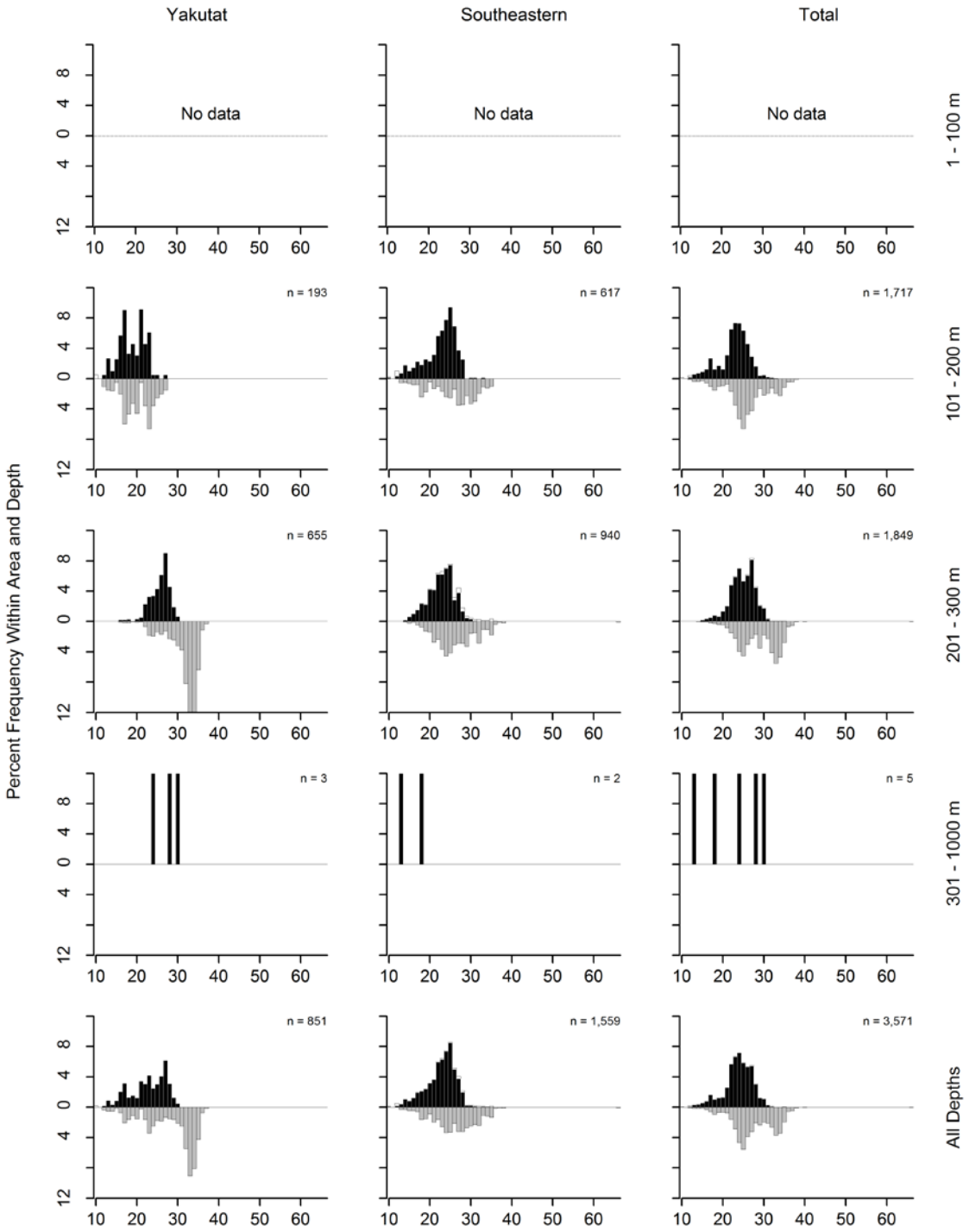

Figure 37. -- Continued (sharpchin rockfish).

Table 46. -- Catch per unit of effort by stratum for sharpchin rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	201 - 300	Kodiak Slope	6	1	29.26	4,748	0	16,956
Yakutat	201 - 300	Yakutat Slope	13	11	19.82	4,216	0	11,390
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	11.27	1,268	0	3,634
Kodiak	101 - 200	Kodiak Outer Shelf	28	8	6.52	3,274	0	7,328
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	3	5.41	2,270	0	5,924
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	15	3.60	1,412	92	2,732
Kodiak	101 - 200	Kenai Flats	22	3	1.84	2,219	0	6,758
Shumagin	201 - 300	Shumagin Slope	12	3	0.70	195	0	609
Southeastern	101 - 200	Prince of Wales Shelf	26	9	0.67	462	0	999
Yakutat	101 - 200	Fairweather Shelf	11	3	0.64	493	0	1,564
Kodiak	101 - 200	Portlock Flats	41	10	0.52	384	0	909
Yakutat	101 - 200	Yakataga Shelf	8	2	0.15	77	0	197
Chirikof	201 - 300	Chirikof Slope	8	2	0.14	21	0	62
Kodiak	101 - 200	Barren Islands	16	1	0.09	101	0	316
Yakutat	301 - 500	Yakutat Slope	6	2	0.06	9	0	27
Yakutat	101 - 200	Yakutat Flats	11	5	0.03	23	1	44
Yakutat	201 - 300	Yakutat Gullies	8	1	0.02	6	0	19
Chirikof	101 - 200	Chirikof Outer Shelf	20	2	0.01	7	0	16
Southeastern	301 - 500	Southeastern Deep Gullies	9	1	0.01	1	0	4
Kodiak	101 - 200	Albatross Gullies	32	1	0.01	4	0	12
Yakutat	101 - 200	Middleton Shelf	12	1	0.01	4	0	13

Shortraker rockfish (*Sebastes borealis*)

Shortraker rockfish were found throughout the survey area, but were uncommon. They almost exclusively occurred on the continental slope between depths of 200 to 700 m (Fig. 38, Table 47). The highest CPUEs were consistently recorded in the 301 and 500 m depth range, which accounted for approximately 73% of the total biomass (Table 47). In this depth range, shortraker rockfish were caught in about 85% of the tows. Shortraker rockfish were more abundant in the central and eastern Gulf of Alaska than in the western Gulf of Alaska. Approximately 65% of the estimated biomass was found in the Kodiak and Yakutat INPFC areas. The highest concentrations of shortraker rockfish were in the Yakutat Slope stratum which contained 30% of the estimated biomass depite making up less than 5% of the survey area (Table 48). Overall length data showed the highest frequencies between 55 and 60 cm FL for both sexes but varies in frequency among areas (Fig. 39).

Table 47.-- Number of hauls, hauls with shortraker rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	1	0.03	137	8.333	76.0
	101 - 200	36	2	0.06	91	2.604	54.5
	201 - 300	12	5	11.84	3,300	3.961	58.8
	301 - 500	9	6	9.42	2,384	1.926	47.3
	501 - 700	4	1	0.17	34	1.724	47.0
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	15	0.91	5,946	2.776	52.1
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	1	0.01	25	1.737	45.0
	201 - 300	25	4	0.44	507	2.389	51.2
	301 - 500	10	10	35.55	5,701	3.749	47.6
	501 - 700	6	2	0.56	109	4.352	63.7
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	17	0.93	6,342	3.578	56.8
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	2	0.08	365	7.744	77.5
	201 - 300	29	7	3.82	4,392	3.517	57.9
	301 - 500	8	7	20.44	5,952	3.565	57.6
	501 - 700	5	1	0.19	33	2.367	56.0
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	17	1.06	10,741	3.605	58.0
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	7	2.41	1,246	4.099	61.3
	301 - 500	8	8	54.71	14,377	4.480	62.9
	501 - 700	4	3	8.46	1,243	2.449	49.2
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	18	2.95	16,866	4.195	61.1
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	1	0.10	51	8.533	81.0
	301 - 500	13	10	8.41	2,622	4.695	64.4
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	11	0.95	2,673	4.735	64.6
All Areas	1 - 100	321	1	0.01	137	8.333	76.0
	101 - 200	316	5	0.04	481	4.977	64.3
	201 - 300	119	24	2.63	9,495	3.646	58.1
	301 - 500	48	41	24.26	31,037	3.787	58.6
	501 - 700	23	7	1.73	1,418	2.506	49.9
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	78	1.33	42,568	3.708	58.1

All Areas and Depths Biomass, 95% confidence interval: 25,603 - 59,532 metric tons (t)

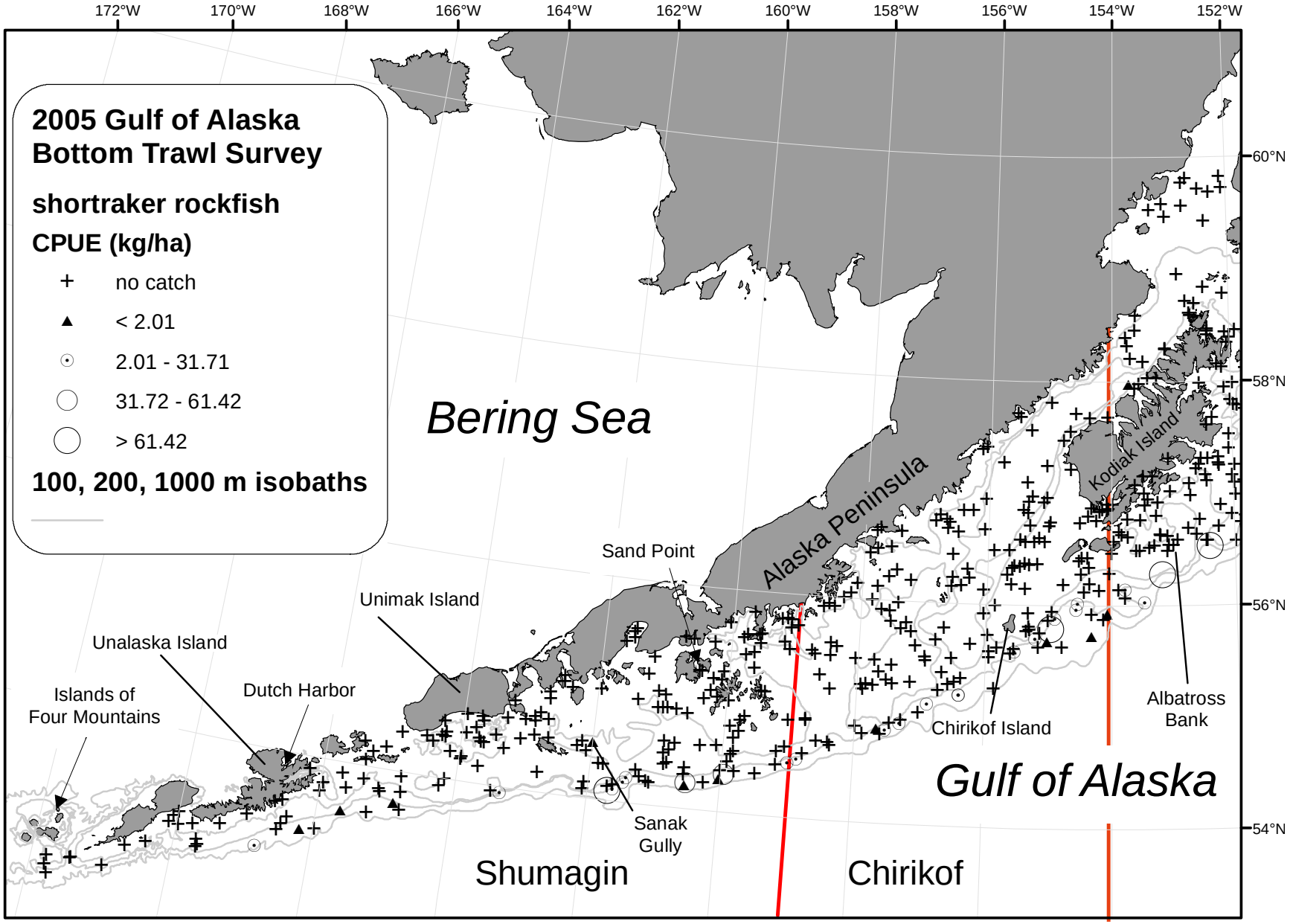

Figure 38. --Distribution and relative abundance of shortraker rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

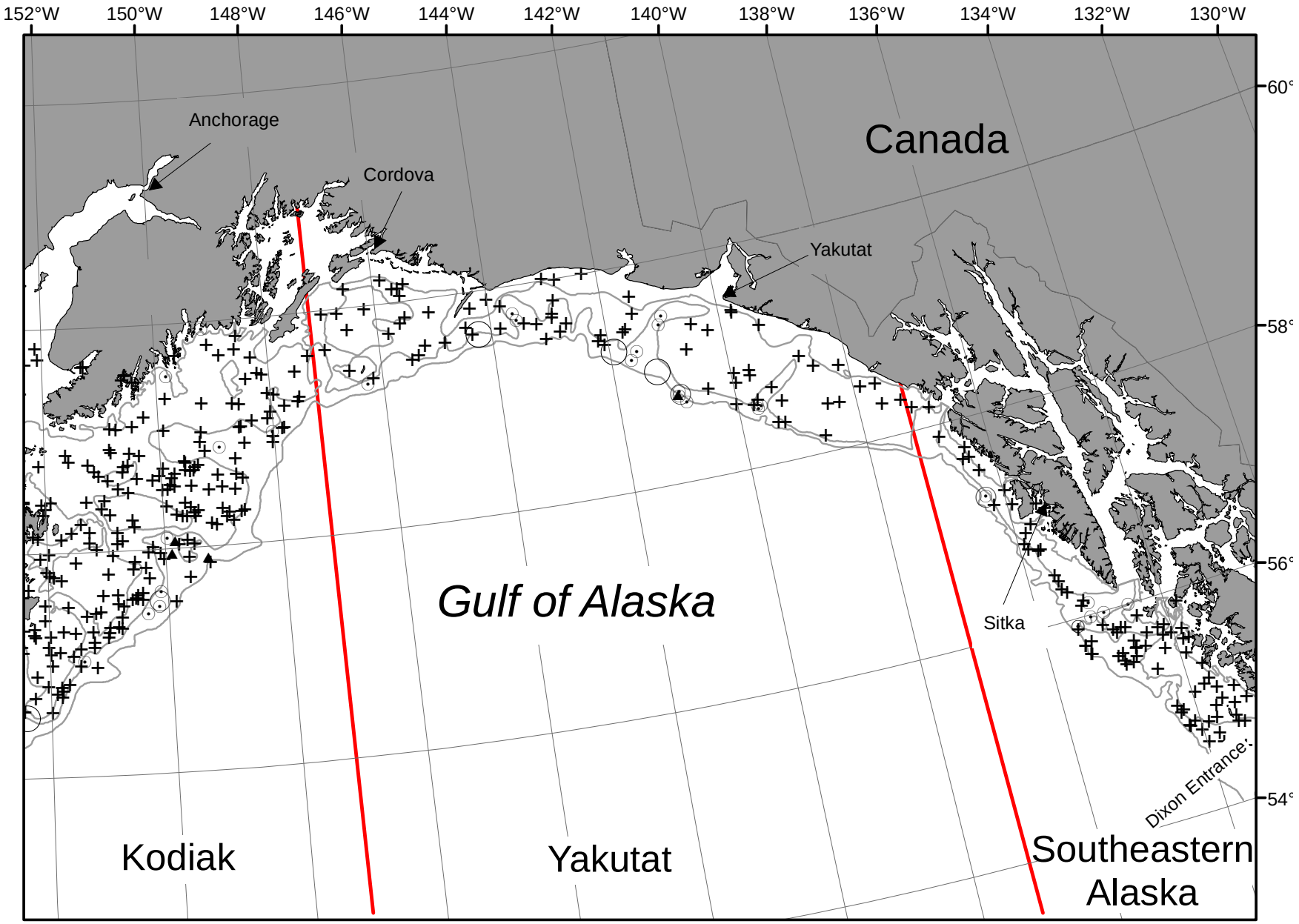

Figure 38. -- Continued.

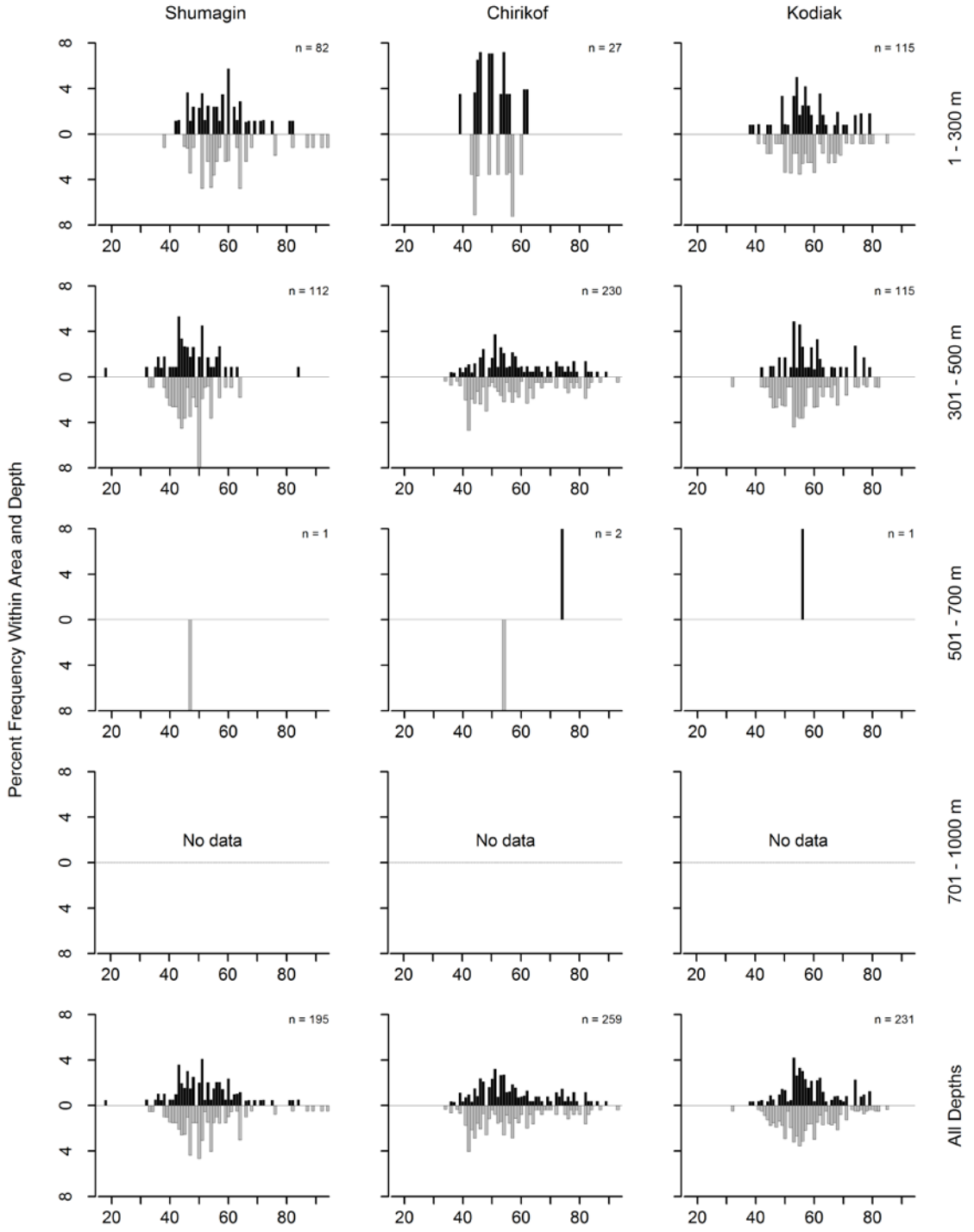

Figure 39. -- Size composition of shortraker rockfish from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

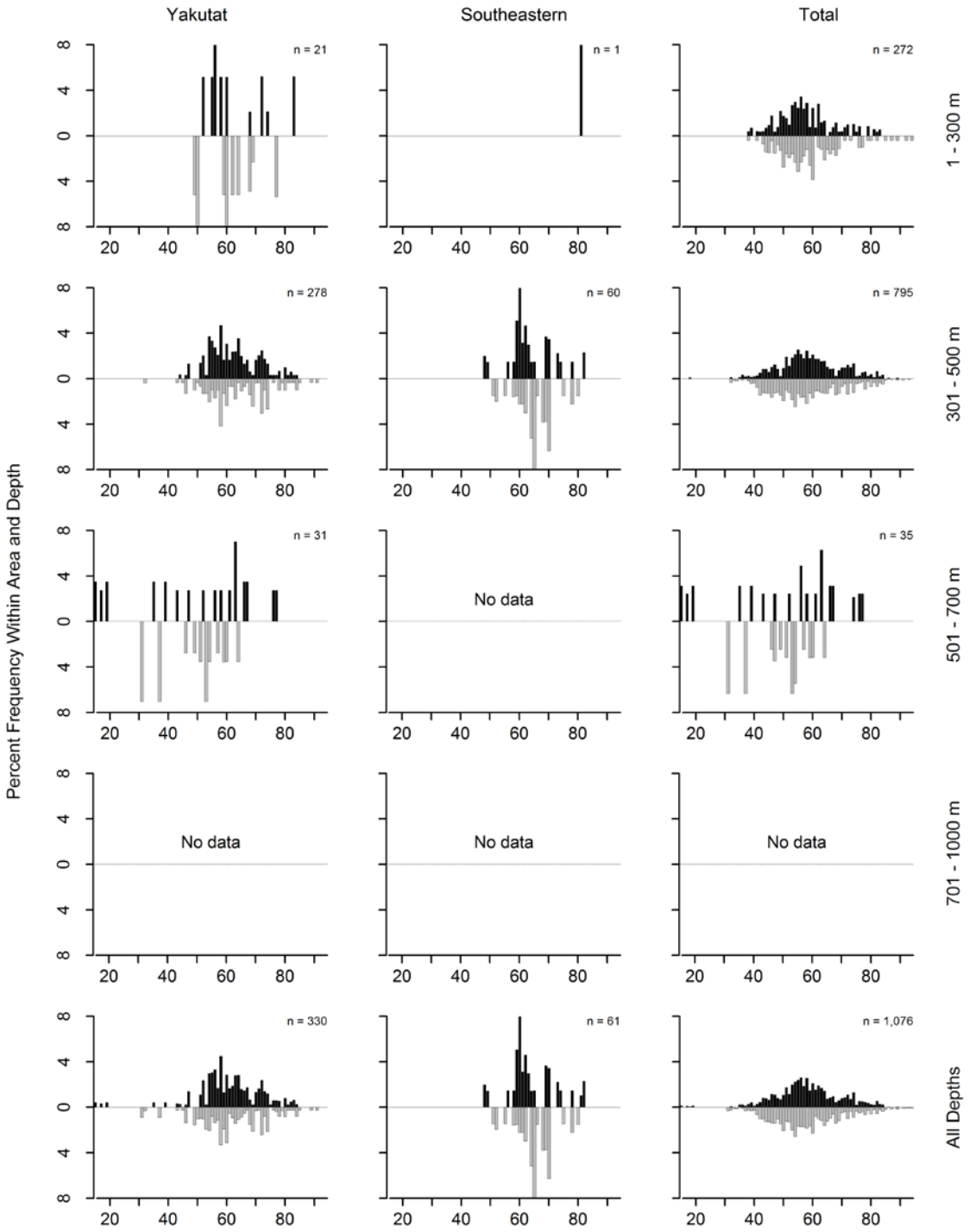

Figure 39. -- Continued (shortraker rockfish).

Table 48. -- Catch per unit of effort by stratum for shortraker rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Yakutat	301 - 500	Yakutat Slope	6	6	84.57	12,859	0	26,221
Chirikof	301 - 500	Chirikof Slope	10	10	35.55	5,701	0	14,693
Kodiak	201 - 300	Kodiak Slope	6	3	25.56	4,147	0	12,295
Southeastern	301 - 500	Southeastern Slope	4	4	23.04	1,780	0	4,579
Kodiak	301 - 500	Kodiak Slope	8	7	20.44	5,952	0	12,081
Yakutat	301 - 500	Yakutat Gullies	2	2	13.71	1,518	0	10,448
Shumagin	201 - 300	Shumagin Slope	12	5	11.84	3,300	0	8,465
Shumagin	301 - 500	Shumagin Slope	9	6	9.42	2,384	0	5,225
Yakutat	501 - 700	Yakutat Slope	4	3	8.46	1,243	0	3,340
Yakutat	201 - 300	Yakutat Gullies	8	4	3.70	1,126	0	2,554
Southeastern	301 - 500	Southeastern Deep Gullies	9	6	3.59	842	0	1,734
Chirikof	201 - 300	Chirikof Slope	8	4	3.32	507	0	1,218
Yakutat	201 - 300	Yakutat Slope	13	3	0.56	120	0	258
Chirikof	501 - 700	Chirikof Slope	6	2	0.56	109	0	304
Kodiak	201 - 300	Kenai Gullies	20	4	0.37	245	0	490
Kodiak	101 - 200	Kenai Flats	22	2	0.30	365	0	890
Kodiak	501 - 700	Kodiak Slope	5	1	0.19	33	0	123
Shumagin	501 - 700	Shumagin Slope	4	1	0.17	34	0	141
Shumagin	101 - 200	Sanak Gully	11	1	0.14	58	0	186
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	1	0.13	51	0	154
Shumagin	1 - 100	Davidson Bank	37	1	0.10	137	0	417
Shumagin	101 - 200	Shumagin Outer Shelf	21	1	0.04	34	0	104
Chirikof	101 - 200	Shelikof Edge	24	1	0.03	25	0	77

Shortspine thornyhead (*Sebastolobus alascanus*)

Shortspine thornyhead was the fourth most abundant rockfish species caught in the 2005 survey and fourteenth most abundant groundfish species (Table 2). Shortspine thornyhead were found throughout the survey area and at all depths, including all tows greater than 300 m (Fig. 40, Table 49). The greatest biomass occurred within the Shumagin and Kodiak areas. The highest CPUEs were generally recorded on the continental slope and deeper gullies in the 301 and 700 m depth range, which accounted for approximately 49% of its total biomass (Tables 49 and 50). Population length distributions were similar in all areas and at all depths, with both males and females exhibiting length modes between approximately 25 and 30 cm FL (Fig. 41).

Table 49.-- Number of hauls, hauls with shortspine thornyhead, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	2	0.02	63	0.170	19.2
	101 - 200	36	7	0.75	1,108	0.369	30.6
	201 - 300	12	9	19.91	5,550	0.180	23.2
	301 - 500	9	9	22.25	5,630	0.238	25.9
	501 - 700	4	4	31.80	6,377	0.260	27.2
	701 - 1,000	2	2	16.92	3,277	0.347	29.6
	All Depths	180	33	3.37	22,005	0.239	25.9
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	5	0.29	686	0.393	29.6
	201 - 300	25	12	3.05	3,519	0.301	27.5
	301 - 500	10	10	33.26	5,334	0.267	27.0
	501 - 700	6	6	12.53	2,448	0.260	27.0
	701 - 1,000	3	3	12.83	3,932	0.556	33.4
	All Depths	177	36	2.34	15,919	0.319	28.1
Kodiak	1 - 100	109	1	0.03	103	0.471	31.5
	101 - 200	139	20	0.53	2,314	0.294	27.8
	201 - 300	29	22	8.73	10,026	0.260	26.8
	301 - 500	8	8	18.70	5,446	0.208	25.0
	501 - 700	5	5	24.53	4,280	0.224	24.8
	701 - 1,000	3	3	12.39	4,330	0.272	27.5
	All Depths	293	59	2.61	26,499	0.246	26.2
Yakutat	1 - 100	15	1	0.01	14	0.350	30.0
	101 - 200	42	13	0.46	1,350	0.226	24.8
	201 - 300	21	20	11.20	5,792	0.228	25.3
	301 - 500	8	8	23.13	6,079	0.226	25.7
	501 - 700	4	4	26.84	3,943	0.213	24.0
	701 - 1,000	2	2	10.67	2,013	0.366	30.3
	All Depths	92	48	3.36	19,190	0.233	25.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	5	0.20	225	0.207	24.8
	201 - 300	32	29	6.80	3,437	0.194	24.1
	301 - 500	13	13	18.94	5,904	0.219	24.8
	501 - 700	4	4	11.27	1,165	0.409	30.7
	701 - 1,000	2	2	3.28	395	0.482	33.2
	All Depths	97	53	3.97	11,126	0.225	25.0
All Areas	1 - 100	321	4	0.01	180	0.288	26.3
	101 - 200	316	50	0.46	5,682	0.289	27.3
	201 - 300	119	92	7.86	28,324	0.228	25.3
	301 - 500	48	48	22.20	28,394	0.229	25.6
	501 - 700	23	23	22.19	18,213	0.245	25.9
	701 - 1,000	12	12	12.03	13,947	0.360	29.6
	All Depths	839	229	2.96	94,740	0.248	26.1

All Areas and Depths Biomass, 95% confidence interval: 86,966 - 102,514 metric tons (t)

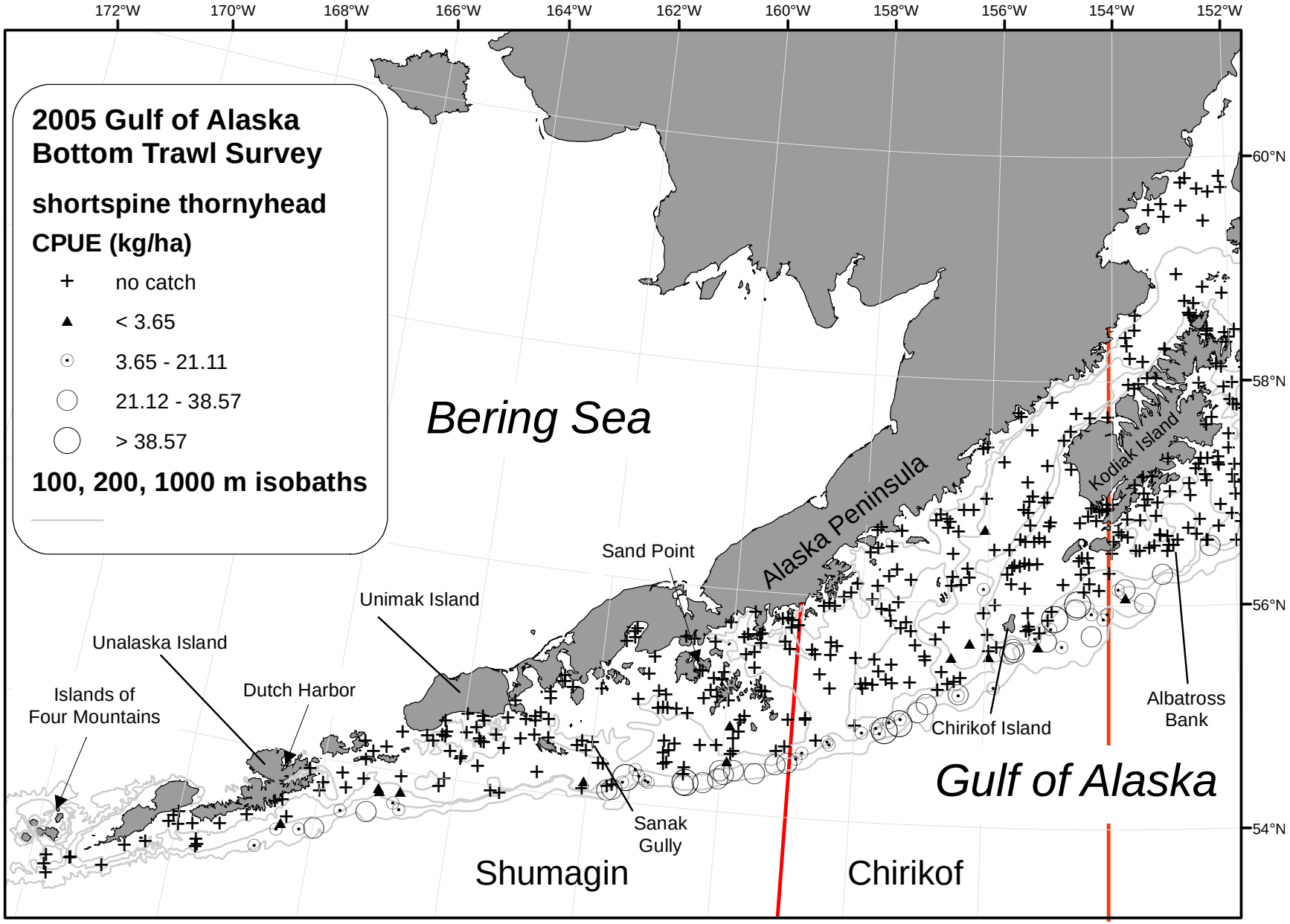

Figure 40. --Distribution and relative abundance of shortspine thornyhead rockfish from the 2005 Gulf of Alaska bottom trawl survey. Relative abundance is categorized as no catch, sample CPUE less than the mean CPUE, between the mean CPUE and two standard deviations above mean, between two and four standard deviations above the mean, and greater than four standard deviations above the mean.

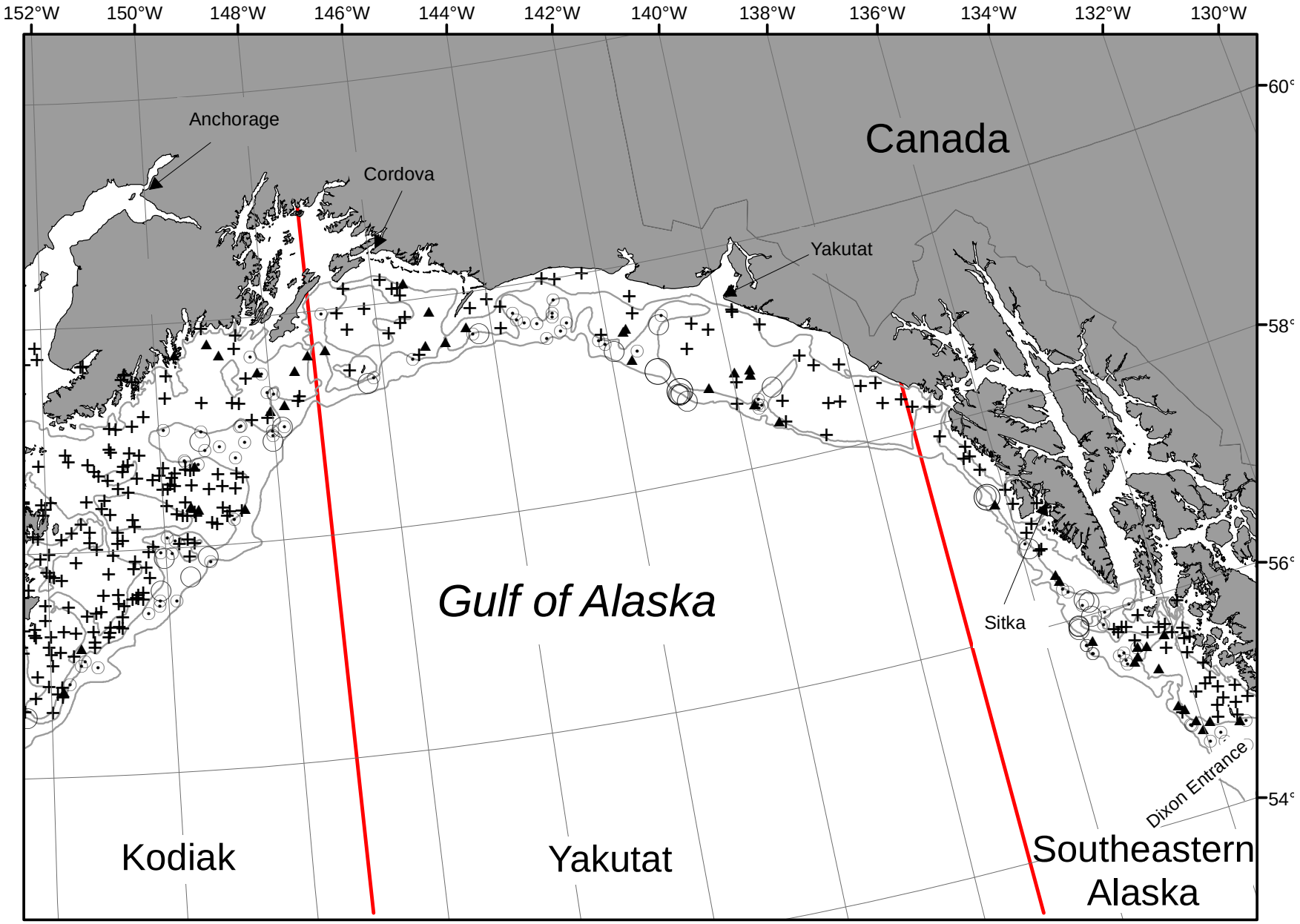

Figure 40. -- Continued.

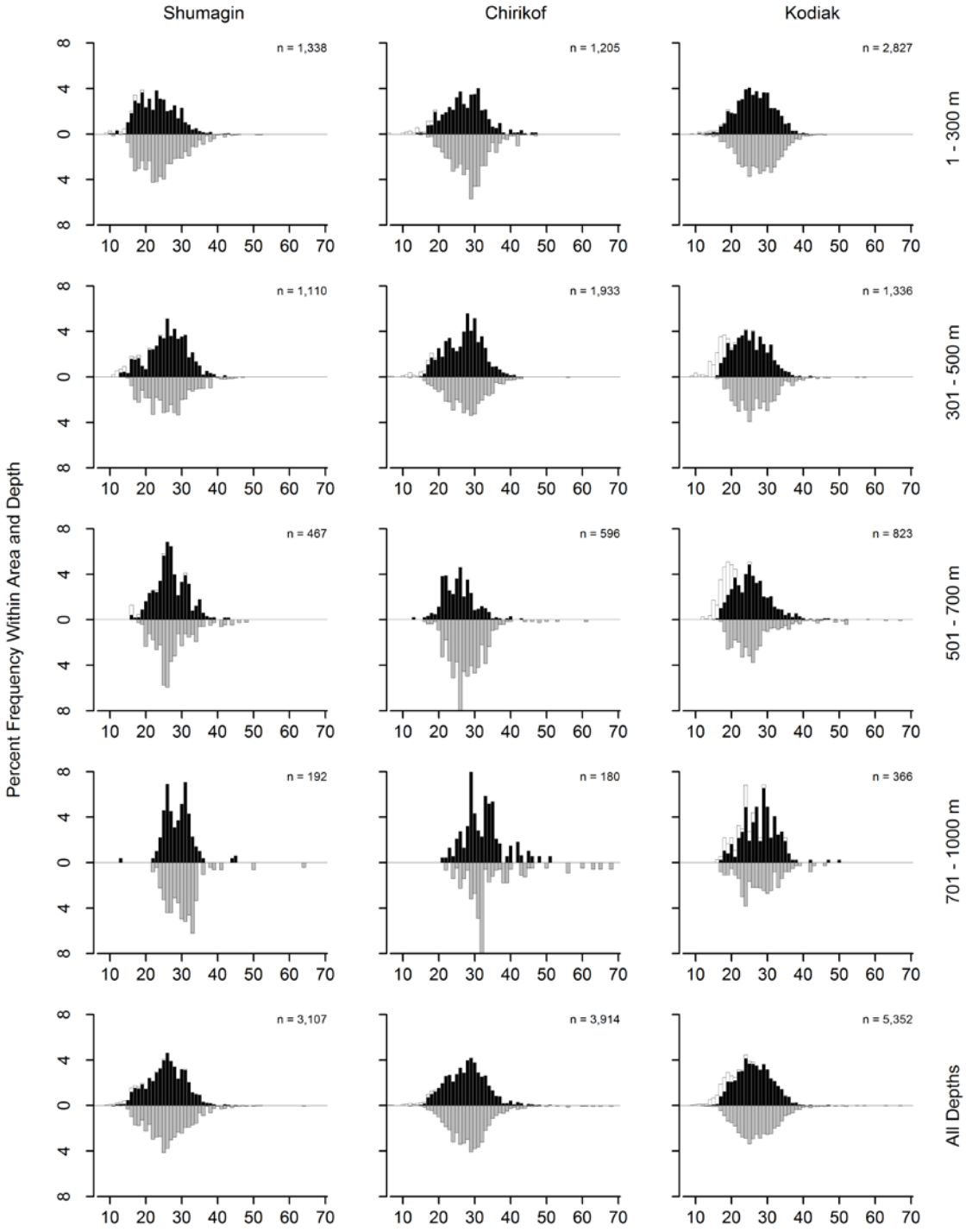

Figure 41. -- Size composition of shortspine thornyhead from the 2005 Gulf of Alaska bottom trawl survey by International North Pacific Fisheries Commission statistical areas and depth intervals. Males are shown in black, females in gray, and unsexed fish in white.

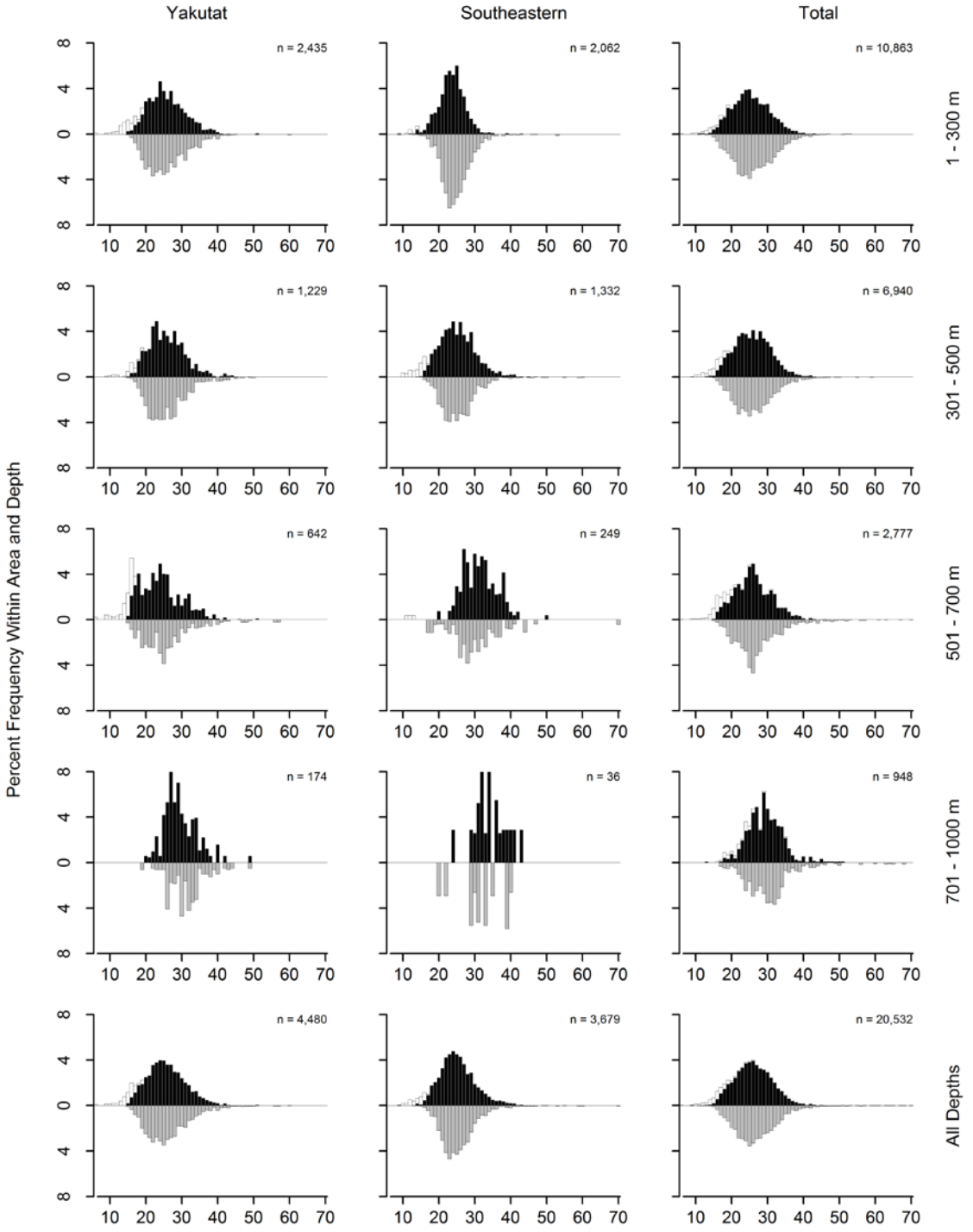

Figure 41. -- Continued (shortspine thornyhead).

Table 50. -- Catch per unit of effort by stratum for shortspine thornyhead sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	301 - 500	Southeastern Slope	4	4	38.64	2,986	2,262	3,709
Chirikof	301 - 500	Chirikof Slope	10	10	33.26	5,334	3,546	7,123
Yakutat	301 - 500	Yakutat Slope	6	6	31.89	4,849	3,526	6,171
Shumagin	501 - 700	Shumagin Slope	4	4	31.80	6,377	4,746	8,008
Yakutat	501 - 700	Yakutat Slope	4	4	26.84	3,943	1,668	6,217
Kodiak	501 - 700	Kodiak Slope	5	5	24.53	4,280	2,965	5,595
Shumagin	301 - 500	Shumagin Slope	9	9	22.25	5,630	2,416	8,844
Shumagin	201 - 300	Shumagin Slope	12	9	19.91	5,550	2,827	8,274
Kodiak	201 - 300	Kodiak Slope	6	6	19.28	3,128	1,589	4,668
Kodiak	301 - 500	Kodiak Slope	8	8	18.70	5,446	4,359	6,533
Chirikof	201 - 300	Chirikof Slope	8	8	18.14	2,773	1,866	3,680
Shumagin	701 - 1000	Shumagin Slope	2	2	16.92	3,277	0	13,235
Yakutat	201 - 300	Yakutat Gullies	8	8	13.43	4,087	2,123	6,051
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	12.86	1,447	256	2,639
Chirikof	701 - 1000	Chirikof Slope	3	3	12.83	3,932	0	10,179
Chirikof	501 - 700	Chirikof Slope	6	6	12.53	2,448	693	4,204
Southeastern	301 - 500	Southeastern Deep Gullies	9	9	12.45	2,919	1,621	4,217
Kodiak	701 - 1000	Kodiak Slope	3	3	12.39	4,330	1,141	7,519
Southeastern	501 - 700	Southeastern Slope	4	4	11.27	1,165	0	2,890
Yakutat	301 - 500	Yakutat Gullies	2	2	11.11	1,231	437	2,024
Yakutat	701 - 1000	Yakutat Slope	2	2	10.67	2,013	0	9,703
Kodiak	201 - 300	Kenai Gullies	20	16	10.36	6,898	4,581	9,215
Yakutat	201 - 300	Yakutat Slope	13	12	8.01	1,705	939	2,471
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	24	5.07	1,990	1,212	2,767
Southeastern	701 - 1000	Southeastern Slope	2	2	3.28	395	0	1,832
Chirikof	101 - 200	Chirikof Outer Shelf	20	5	1.37	686	26	1,346
Shumagin	101 - 200	Shumagin Outer Shelf	21	7	1.36	1,108	0	2,693
Kodiak	101 - 200	Kenai Flats	22	9	1.34	1,620	387	2,852
Yakutat	101 - 200	Middleton Shelf	12	5	1.15	847	0	1,863
Yakutat	101 - 200	Yakataga Shelf	8	4	0.91	481	0	1,412
Chirikof	201 - 300	Lower Shelikof Gully	17	4	0.75	746	0	1,996
Kodiak	101 - 200	Kodiak Outer Shelf	28	6	0.70	353	0	840
Kodiak	101 - 200	Portlock Flats	41	5	0.47	341	0	798
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	2	0.36	151	0	396
Kodiak	1 - 100	Kenai Peninsula	6	1	0.20	103	0	369
Southeastern	101 - 200	Prince of Wales Shelf	26	3	0.11	74	0	195
Shumagin	1 - 100	Shumagin Bank	31	1	0.04	47	0	143
Yakutat	101 - 200	Yakutat Flats	11	4	0.02	22	0	46
Yakutat	1 - 100	Middleton Shallows	7	1	0.02	14	0	48
Shumagin	1 - 100	Davidson Bank	37	1	0.01	16	0	48

Other Rockfishes

Dark rockfish (*Sebastes ciliatus*)

Dark rockfish were rarely caught over the course of the survey and were only encountered in the western three INPFC areas, mostly in depths between 100 and 200 m (Table 51). CPUE was the highest in the Shumagin outer shelf stratum which accounted for 78% of the biomass (Table 52). This estimate was based on only 2 hauls out of the 21 conducted in these three strata. The small amount of length data make it difficult to discern a clear mode in the length distribution in the other INPFC areas and depth zones.

Redstripe rockfish (*Sebastes proriger*)

Although they were caught in all of the INPFC areas, redstripe rockfish were caught in only 4.2% of the tows over the entire survey (Table 53). The stratum with the greatest estimated biomass is the Kenai Peninsula subdistrict in the 1-100 m depth range. This stratum, located in the Kodiak INPFC area contains 56% of the estimated biomass based on catch from a single tow. The second, third, and fourth strata in order of abundance were all in the Southeastern INPFC area in depth ranges between 100 and 300 m. These strata were the Baranof-Chichagof Slope, Prince of Wales Slope/Gullies and the Baranof-Chichagof Shelf strata (Table 54).

Silvergray rockfish (*Sebastes brevispinis*)

Silvergray rockfish were rare outside the Yakutat and Southeastern INPFC areas (Table 55). The highest mean CPUEs were recorded in the Prince of Wales Slope and Gullies , Yakutat Slope, and Prince of Wales Shelf strata. These three strata accounted for 85% of the total survey biomass estimate but comprise just over 4% of the total survey area (Table 56). Silvergray rockfish were typically caught in the 101 to 300 m depth range which accounted for over 99% of the estimated biomass for this survey. No fish were caught deeper than 500 m. Mean fish weight always increased with depth.

Harlequin rockfish (*Sebastes variegatus*)

Harlequin rockfish were caught infrequently and in low numbers throughout the survey area, primarily in the 101 to 200 m depth range, which accounted for approximately 85% of its total biomass estimate (Table 57). The highest mean CPUE from a single stratum was recorded in the Shumagin Outer Shelf stratum, which accounted for approximately 80% of the estimated biomass with less than 3% of the total survey area (Table 58).

Redbanded rockfish (*Sebastes babcocki*)

Redbanded rockfish were caught infrequently and in relatively low numbers in all five of the INPFC areas (Table 59). Approximately 81% of the total estimated biomass was in the Yakutat and Southeastern INPFC areas, with the highest mean CPUEs recorded in the 201 to 300 m depth range, which accounted for approximately 49% of its total biomass. Most of the remaining biomass was estimated to be in the 101 to 200 m depth range. Redbanded rockfish were not caught deeper than 500 m. The highest abundance was found in the Prince of Wales

Slope/Gullies and Yakutat Flats strata which accounted for about 38% of the total biomass but only constituted 4% of the survey area (Table 60).

Yelloweye rockfish (*Sebastes ruberrimus*)

Yelloweye rockfish were caught very infrequently and in very low numbers throughout the survey area (Table 1). No yelloweye rockfish were not caught deeper than 300 m. The highest mean CPUEs were generally recorded in the 101 to 200 m depth range, which accounted for almost 78% of its total biomass. Most were caught in shelf and outershelf strata (Table 62).

Rosethorn rockfish (*Sebastes helvomaculatus*)

Except for two hauls with extremely low CPUEs, one in the Shumagin and one in the Kodiak INPFC area, rosethorn rockfish were caught only in the Yakutat and Southeastern INPFC areas (Table 63). Mean CPUEs were low in all strata where rosethorn rockfish were caught, with the highest values recorded in the Prince of Wales Slope/Gullies and Prince of Wales Shelf strata (Table 64). Rosethorn rockfish were captured almost exclusively in the 101 to 300 m depth range.

Table 51.-- Number of hauls, hauls with dark rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	7	0.63	2,591	1.370	38.6
	101 - 200	36	2	12.85	18,863	1.315	41.2
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	9	3.29	21,454	1.322	40.9
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	1	0.16	389	0.916	44.3
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	1	0.06	389	0.916	44.3
Kodiak	1 - 100	109	2	0.61	2,338	1.034	40.2
	101 - 200	139	1	0.00	10	1.400	44.0
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	3	0.23	2,348	1.035	40.2
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	9	0.38	4,929	1.187	39.5
	101 - 200	316	4	1.57	19,261	1.304	41.2
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	13	0.76	24,191	1.278	40.9

All Areas and Depths Biomass, 95% confidence interval: 0 - 63,609 metric tons (t)

Table 52. -- Catch per unit of effort by stratum for dark rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	101 - 200	Shumagin Outer Shelf	21	2	23.13	18,863	0	58,173
Shumagin	1 - 100	Shumagin Bank	31	4	1.95	2,422	0	5,479
Kodiak	1 - 100	Albatross Banks	49	2	1.52	2,338	0	7,051
Chirikof	101 - 200	Chirikof Outer Shelf	20	1	0.78	389	0	1,203
Shumagin	1 - 100	Davidson Bank	37	2	0.12	167	0	405
Kodiak	101 - 200	Portlock Flats	41	1	0.01	10	0	30
Shumagin	1 - 100	Lower Alaska Peninsula	27	1	<0.01	2	0	7

Table 53.-- Number of hauls, hauls with redstripe rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	1	0.00	13	0.379	29.0
	101 - 200	36	3	1.90	2,783	0.744	37.0
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	4	0.43	2,796	0.740	37.0
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	1	0.00	5	0.567	34.0
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	1	Trace	5	0.567	34.0
Kodiak	1 - 100	109	1	3.13	12,067	0.445	31.9
	101 - 200	139	6	0.16	703	0.896	40.0
	201 - 300	29	1	0.05	52	0.494	33.2
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	8	1.26	12,822	0.458	32.2
Yakutat	1 - 100	15	1	0.02	35	0.172	22.2
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	2	0.20	102	0.856	39.4
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	3	0.02	137	0.425	28.6
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	6	2.75	3,052	0.644	35.3
	201 - 300	32	13	5.70	2,879	0.472	32.0
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	19	2.12	5,931	0.547	33.5
All Areas	1 - 100	321	3	0.94	12,115	0.443	31.9
	101 - 200	316	15	0.53	6,537	0.706	36.4
	201 - 300	119	17	0.84	3,038	0.480	32.2
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	35	0.68	21,691	0.505	32.9

All Areas and Depths Biomass, 95% confidence interval: 0 - 51,372 metric tons (t)

Table 54. -- Catch per unit of effort by stratum for redstripe rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Kenai Peninsula	6	1	22.94	12,067	0	43,092
Southeastern	201 - 300	Baranof-Chichagof Slope	5	1	7.41	834	0	3,150
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	12	5.21	2,045	0	4,588
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	2	3.76	1,576	0	4,081
Shumagin	101 - 200	Shumagin Outer Shelf	21	3	3.41	2,783	0	8,299
Southeastern	101 - 200	Prince of Wales Shelf	26	4	2.14	1,476	0	3,493
Kodiak	101 - 200	Kodiak Outer Shelf	28	3	1.32	664	0	2,016
Yakutat	201 - 300	Yakutat Slope	13	2	0.48	102	0	313
Kodiak	201 - 300	Kodiak Slope	6	1	0.32	52	0	185
Yakutat	1 - 100	Middleton Shallows	7	1	0.05	35	0	120
Chirikof	201 - 300	Chirikof Slope	8	1	0.03	5	0	17
Kodiak	101 - 200	Kenai Flats	22	1	0.02	25	0	78
Shumagin	1 - 100	Shumagin Bank	31	1	0.01	13	0	41
Kodiak	101 - 200	Barren Islands	16	1	0.01	13	0	39
Kodiak	101 - 200	Portlock Flats	41	1	<0.01	1	0	3

Table 55.-- Number of hauls, hauls with silvergray rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	2	0.00	18	0.536	35.5
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	2	0.00	18	0.536	35.5
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	5	0.27	652	1.196	43.4
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	5	0.10	652	1.196	43.4
Kodiak	1 - 100	109	2	0.02	65	0.792	39.5
	101 - 200	139	4	0.03	141	0.895	40.4
	201 - 300	29	1	0.19	216	1.869	51.4
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	7	0.04	421	1.188	43.7
Yakutat	1 - 100	15	2	0.05	81	0.233	24.7
	101 - 200	42	5	1.33	3,913	1.564	47.0
	201 - 300	21	6	13.23	6,840	2.447	53.2
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	13	1.89	10,834	1.920	48.7
Southeastern	1 - 100	9	1	0.04	23	0.625	37.0
	101 - 200	37	18	8.25	9,147	1.799	49.9
	201 - 300	32	28	37.04	18,713	1.891	51.9
	301 - 500	13	1	0.09	29	2.315	58.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	48	9.95	27,912	1.857	51.2
All Areas	1 - 100	321	7	0.01	187	0.375	28.8
	101 - 200	316	32	1.13	13,852	1.671	48.4
	201 - 300	119	35	7.15	25,769	2.012	52.2
	301 - 500	48	1	0.02	29	2.315	58.0
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	75	1.24	39,837	1.844	50.2

All Areas and Depths Biomass, 95% confidence interval: 8,250 - 71,424 metric tons (t)

Table 56. -- Catch per unit of effort by stratum for silvergray rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	24	46.44	18,236	0	45,377
Yakutat	201 - 300	Yakutat Slope	13	5	31.98	6,804	0	20,794
Southeastern	101 - 200	Prince of Wales Shelf	26	15	12.54	8,634	308	16,960
Yakutat	101 - 200	Fairweather Shelf	11	1	4.45	3,436	0	11,093
Southeastern	201 - 300	Baranof-Chichagof Slope	5	4	4.24	477	0	1,302
Kodiak	201 - 300	Kodiak Slope	6	1	1.33	216	0	770
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	3	1.22	513	0	1,257
Yakutat	101 - 200	Yakataga Shelf	8	1	0.60	315	0	1,061
Chirikof	101 - 200	East Shumagin Gully	18	1	0.46	506	0	1,575
Chirikof	101 - 200	Chirikof Outer Shelf	20	2	0.23	117	0	348
Yakutat	101 - 200	Yakutat Flats	11	2	0.16	144	0	366
Southeastern	301 - 500	Southeastern Deep Gullies	9	1	0.13	29	0	97
Yakutat	201 - 300	Yakutat Gullies	8	1	0.12	37	0	124
Yakutat	1 - 100	Middleton Shallows	7	2	0.12	81	0	215
Kodiak	1 - 100	Kenai Peninsula	6	1	0.11	60	0	214
Kodiak	101 - 200	Barren Islands	16	1	0.10	114	0	356
Chirikof	101 - 200	Shelikof Edge	24	2	0.04	28	0	72
Southeastern	1 - 100	Southeastern Shallows	9	1	0.04	23	0	76
Kodiak	101 - 200	Kodiak Outer Shelf	28	2	0.03	15	0	38
Yakutat	101 - 200	Middleton Shelf	12	1	0.03	18	0	58
Shumagin	1 - 100	Shumagin Bank	31	2	0.02	18	0	44
Kodiak	101 - 200	Portlock Flats	41	1	0.02	11	0	34
Kodiak	1 - 100	Albatross Shallows	34	1	0.01	5	0	16

Table 57.-- Number of hauls, hauls with harlequin rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	5	0.02	99	0.474	30.1
	101 - 200	36	5	18.08	26,533	0.634	34.4
	201 - 300	12	3	0.13	36	0.446	31.5
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	13	4.09	26,668	0.632	34.4
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	13	0.08	185	0.442	31.3
	201 - 300	25	3	0.03	34	0.446	31.6
	301 - 500	10	1	0.03	4	0.595	34.0
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	17	0.03	222	0.444	31.4
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	19	0.31	1,350	0.314	27.6
	201 - 300	29	2	0.31	356	0.453	32.8
	301 - 500	8	1	0.01	2	0.143	21.0
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	22	0.17	1,708	0.335	28.4
Yakutat	1 - 100	15	2	2.45	4,090	0.066	16.5
	101 - 200	42	5	0.05	155	0.197	23.2
	201 - 300	21	4	0.32	164	0.344	29.0
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	11	0.77	4,408	0.070	16.7
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	6	0.10	111	0.150	22.8
	201 - 300	32	6	0.01	5	0.111	19.8
	301 - 500	13	2	0.01	3	0.151	22.5
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	14	0.04	119	0.147	22.6
All Areas	1 - 100	321	7	0.32	4,188	0.068	16.5
	101 - 200	316	48	2.32	28,333	0.589	33.4
	201 - 300	119	18	0.17	595	0.406	31.0
	301 - 500	48	4	0.01	9	0.215	23.7
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	77	1.04	33,125	0.297	24.0

All Areas and Depths Biomass, 95% confidence interval: 0 - 77,144 metric tons (t)

Table 58. -- Catch per unit of effort by stratum for harlequin rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	101 - 200	Shumagin Outer Shelf	21	5	32.54	26,533	0	70,198
Yakutat	1 - 100	Middleton Shallows	7	2	6.09	4,090	0	13,845
Kodiak	201 - 300	Kodiak Slope	6	2	2.20	356	0	1,265
Kodiak	101 - 200	Kodiak Outer Shelf	28	7	0.80	400	0	903
Yakutat	201 - 300	Yakutat Slope	13	4	0.77	164	0	379
Kodiak	101 - 200	Kenai Flats	22	2	0.61	741	0	2,273
Kodiak	101 - 200	Portlock Flats	41	9	0.23	168	17	320
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	2	0.23	96	0	243
Chirikof	201 - 300	Chirikof Slope	8	3	0.22	34	0	74
Chirikof	101 - 200	Chirikof Outer Shelf	20	10	0.21	107	0	214
Yakutat	101 - 200	Yakataga Shelf	8	1	0.21	109	0	368
Shumagin	201 - 300	Shumagin Slope	12	3	0.13	36	0	86
Chirikof	101 - 200	East Shumagin Gully	18	1	0.06	69	0	214
Shumagin	1 - 100	Davidson Bank	37	1	0.06	80	0	242
Kodiak	101 - 200	Barren Islands	16	1	0.04	40	0	126
Yakutat	101 - 200	Middleton Shelf	12	1	0.03	18	0	59
Chirikof	301 - 500	Chirikof Slope	10	1	0.03	4	0	13
Southeastern	101 - 200	Prince of Wales Shelf	26	4	0.02	15	0	35
Yakutat	101 - 200	Fairweather Shelf	11	1	0.02	14	0	45
Shumagin	1 - 100	Shumagin Bank	31	3	0.02	19	0	41
Yakutat	101 - 200	Yakutat Flats	11	2	0.01	13	0	41
Southeastern	301 - 500	Southeastern Deep Gullies	9	2	0.01	3	0	8
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	6	0.01	5	1	9
Chirikof	101 - 200	Shelikof Edge	24	2	0.01	9	0	23
Kodiak	301 - 500	Kodiak Slope	8	1	0.01	2	0	7
Shumagin	1 - 100	Lower Alaska Peninsula	27	1	<0.01	1	0	2

Table 59.-- Number of hauls, hauls with redbanded rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	0	0.00	0	---	---
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	5	0.15	41	0.540	27.2
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	5	0.01	41	0.540	27.2
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	4	0.02	47	0.533	29.8
	201 - 300	25	5	0.11	127	0.953	36.6
	301 - 500	10	1	0.04	6	0.233	23.3
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	10	0.03	180	0.724	32.7
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	11	0.16	685	0.812	33.8
	201 - 300	29	9	0.13	145	0.506	28.4
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	20	0.08	830	0.735	32.5
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	4	0.37	1,098	1.910	42.0
	201 - 300	21	14	1.90	984	0.757	32.6
	301 - 500	8	4	0.49	129	0.432	28.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	22	0.39	2,211	1.017	34.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	10	0.59	650	1.280	38.7
	201 - 300	32	27	2.99	1,513	0.823	33.8
	301 - 500	13	6	0.78	242	0.512	29.6
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	43	0.86	2,405	0.853	34.0
All Areas	1 - 100	321	0	0.00	0	---	---
	101 - 200	316	29	0.20	2,480	1.231	37.2
	201 - 300	119	60	0.78	2,810	0.773	32.9
	301 - 500	48	11	0.29	377	0.472	28.8
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	100	0.18	5,667	0.879	33.7

All Areas and Depths Biomass, 95% confidence interval: 3,051 - 8,283 metric tons (t)

Table 60. -- Catch per unit of effort by stratum for redbanded rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	201 - 300	Baranof-Chichagof Slope	5	5	3.39	382	167	596
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	22	2.88	1,131	571	1,691
Southeastern	301 - 500	Southeastern Slope	4	3	2.84	219	0	597
Yakutat	201 - 300	Yakutat Slope	13	10	2.46	524	0	1,229
Yakutat	201 - 300	Yakutat Gullies	8	4	1.51	460	0	1,096
Yakutat	101 - 200	Yakutat Flats	11	3	1.18	1,065	0	3,141
Kodiak	101 - 200	Kodiak Outer Shelf	28	3	1.07	536	0	1,384
Yakutat	301 - 500	Yakutat Slope	6	4	0.85	129	0	290
Southeastern	101 - 200	Prince of Wales Shelf	26	6	0.76	522	0	1,272
Chirikof	201 - 300	Chirikof Slope	8	4	0.58	88	0	230
Kodiak	201 - 300	Kodiak Slope	6	3	0.37	60	0	149
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	4	0.31	128	0	278
Shumagin	201 - 300	Shumagin Slope	12	5	0.15	41	0	87
Kodiak	201 - 300	Kenai Gullies	20	6	0.13	84	0	171
Kodiak	101 - 200	Portlock Flats	41	3	0.10	71	0	189
Southeastern	301 - 500	Southeastern Deep Gullies	9	3	0.10	22	0	61
Yakutat	101 - 200	Yakataga Shelf	8	1	0.06	33	0	113
Kodiak	101 - 200	Kenai Flats	22	3	0.06	67	0	148
Chirikof	301 - 500	Chirikof Slope	10	1	0.04	6	0	21
Chirikof	201 - 300	Lower Shelikof Gully	17	1	0.04	39	0	123
Chirikof	101 - 200	Shelikof Edge	24	2	0.03	25	0	63
Chirikof	101 - 200	East Shumagin Gully	18	1	0.02	18	0	55
Kodiak	101 - 200	Albatross Gullies	32	2	0.01	11	0	30
Chirikof	101 - 200	Chirikof Outer Shelf	20	1	0.01	4	0	12

Table 61.-- Number of hauls, hauls with yelloweye rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	2	0.13	542	3.246	53.6
	101 - 200	36	3	0.25	363	2.492	50.0
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	5	0.14	905	2.894	51.9
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	2	0.05	117	3.158	53.1
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	2	0.02	117	3.158	53.1
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	6	0.20	870	3.583	55.6
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	6	0.09	870	3.583	55.6
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	4	0.23	672	4.645	61.5
	201 - 300	21	1	0.05	25	1.630	44.0
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	5	0.12	698	4.353	59.8
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	5	0.25	282	2.894	51.8
	201 - 300	32	3	0.18	91	3.980	58.4
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	8	0.13	373	3.099	53.1
All Areas	1 - 100	321	2	0.04	542	3.246	53.6
	101 - 200	316	20	0.19	2,304	3.450	55.0
	201 - 300	119	4	0.03	116	3.028	52.5
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	26	0.09	2,962	3.392	54.6

All Areas and Depths Biomass, 95% confidence interval: 1,264 - 4,659 metric tons (t)

Table 62. -- Catch per unit of effort by stratum for yelloweye rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	101 - 200	Kodiak Outer Shelf	28	3	0.86	430	0	1,054
Yakutat	101 - 200	Fairweather Shelf	11	2	0.68	523	0	1,343
Kodiak	101 - 200	Portlock Flats	41	3	0.60	440	0	1,110
Southeastern	201 - 300	Baranof-Chichagof Slope	5	1	0.49	55	0	208
Shumagin	101 - 200	Shumagin Outer Shelf	21	3	0.45	363	0	906
Shumagin	1 - 100	Davidson Bank	37	2	0.40	542	0	1,600
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	2	0.35	148	0	421
Southeastern	101 - 200	Prince of Wales Shelf	26	3	0.20	134	0	289
Chirikof	101 - 200	Chirikof Outer Shelf	20	1	0.16	78	0	241
Yakutat	101 - 200	Middleton Shelf	12	1	0.14	105	0	337
Yakutat	201 - 300	Yakutat Slope	13	1	0.12	25	0	80
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	2	0.09	36	0	89
Yakutat	101 - 200	Yakataga Shelf	8	1	0.08	45	0	150
Chirikof	101 - 200	East Shumagin Gully	18	1	0.04	39	0	121

Table 63.-- Number of hauls, hauls with rosethorn rockfish, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	0	0.00	0	---	---
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	1	0.02	7	0.329	28.0
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	1	Trace	7	0.329	28.0
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	0	0.00	0	---	---
Kodiak	1 - 100	109	0	0.00	0	---	---
	101 - 200	139	1	Trace	1	0.133	22.0
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	1	Trace	1	0.133	22.0
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	2	0.04	107	0.212	23.2
	201 - 300	21	1	0.01	3	0.115	19.0
	301 - 500	8	3	0.02	5	0.148	21.6
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	6	0.02	115	0.203	22.9
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	6	0.45	500	0.227	23.4
	201 - 300	32	16	0.82	415	0.212	23.9
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	22	0.33	914	0.220	23.6
All Areas	1 - 100	321	0	0.00	0	---	---
	101 - 200	316	9	0.05	608	0.224	23.4
	201 - 300	119	18	0.12	424	0.212	23.9
	301 - 500	48	3	0.00	5	0.148	21.6
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	30	0.03	1,037	0.218	23.6

All Areas and Depths Biomass, 95% confidence interval: 388 - 1,686 metric tons (t)

Table 64. -- Catch per unit of effort by stratum for rosethorn rockfish sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	13	0.96	375	136	614
Southeastern	101 - 200	Prince of Wales Shelf	26	5	0.70	479	0	1,071
Southeastern	201 - 300	Baranof-Chichagof Slope	5	3	0.35	40	0	104
Yakutat	101 - 200	Yakutat Flats	11	1	0.07	63	0	203
Yakutat	101 - 200	Fairweather Shelf	11	1	0.06	44	0	143
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	1	0.05	21	0	67
Yakutat	301 - 500	Yakutat Slope	6	3	0.03	5	0	11
Shumagin	201 - 300	Shumagin Slope	12	1	0.02	7	0	21
Yakutat	201 - 300	Yakutat Slope	13	1	0.02	3	0	10
Kodiak	101 - 200	Kodiak Outer Shelf	28	1	<0.01	1	0	4

SKATES

Alaska skate (*Bathyraja parmifera*)

Alaska skate were caught infrequently and in low numbers in the three westernmost INPFC areas in only 8 out of the 59 survey strata (Tables 65 and 66). Survey strata with the highest CPUEs included the Shelikof Edge, Chirikof Outer Shelf and East Shumagin Gully strata. All of these were in the 101 to 200 m depth range. No fish were caught deeper than 200 m.

Aleutian skate (*Bathyraja aleutica*)

Aleutian skate were caught in all five of the INFPC areas, but were most abundant in the Chirikof area and encountered in only a single tow in the Southeastern INPFC area (Table 67). This species occurred in 33 of the 59 survey strata (Table 68). They were found in all depth ranges, most frequently in the 201- 300 m depth range which over the entire survey area accounted for 46% of the estimated biomass (Table 67). The highest mean CPUEs were recorded in the Upper and Lower Shelikof Gully strata, which accounted for approximately 44% of the total estimated biomass even though other strata comprise only 4% of the total survey area (Table 68). Mean weight and length tended to decrease with depth (Table 67).

Bering skate (*Bathyraja interrupta*)

Bering skate were caught in low numbers throughout the survey area (Table 69). The highest CPUEs were recorded in the Upper Shelikof Gully in the Kodiak INPFC area (Table 70). Bering skate were caught in all depths to 700 m but the highest CPUEs were generally recorded in the 101 to 300 m depth range.

Big skate (*Raja binoculata*)

Big skate were caught in low numbers in approximately 9% of all survey hauls in all five of the INPFC areas, but were most abundant in the Kodiak and Chirikof areas (Table 71). The highest CPUEs were recorded in several of the shallowest strata of the survey area in waters less than 100 m (Table 72). Approximately 89% of the estimated biomass was located shallower than 100 m, with all of the remainder in waters between 101 and 200 m deep.

Longnose skate (*Raja rhina*)

Longnose skate were caught in relatively modest numbers in approximately 23% of all survey hauls in all five of the INPFC areas (Table 73). Approximately 52% of the estimated biomass was located in the Kodiak INPFC area. Longnose skate were caught in all depths to 500 m, with the highest densities in the 101 to 300 m depth range. The highest CPUEs were recorded in the Northern Kodiak Shallows and Yakutat Gullies strata (Table 74).

Table 65.-- Number of hauls, hauls with Alaska skate, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	4	0.05	211	3.491	78.0
	101 - 200	36	0	0.00	0	---	---
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	4	0.03	211	3.491	78.0
Chirikof	1 - 100	71	0	0.00	0	---	---
	101 - 200	62	6	0.16	393	3.398	76.5
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	6	0.06	393	3.398	76.5
Kodiak	1 - 100	109	1	0.00	8	0.211	31.0
	101 - 200	139	2	0.02	89	1.219	31.5
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	3	0.01	96	0.876	31.3
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	0	0.00	0	---	---
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	0	0.00	0	---	---
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	0	0.00	0	---	---
All Areas	1 - 100	321	5	0.02	218	2.231	59.9
	101 - 200	316	8	0.04	482	2.555	60.7
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	13	0.02	700	2.444	60.5

All Areas and Depths Biomass, 95% confidence interval: 249 - 1,150 metric tons (t)

Table 66. -- Catch per unit of effort by stratum for Alaska skate sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Chirikof	101 - 200	Shelikof Edge	24	2	0.24	188	0	458
Chirikof	101 - 200	Chirikof Outer Shelf	20	2	0.15	75	0	211
Chirikof	101 - 200	East Shumagin Gully	18	2	0.12	130	0	355
Shumagin	1 - 100	Davidson Bank	37	3	0.10	142	0	319
Shumagin	1 - 100	Lower Alaska Peninsula	27	1	0.10	68	0	208
Kodiak	101 - 200	Albatross Gullies	32	1	0.10	77	0	233
Kodiak	101 - 200	Barren Islands	16	1	0.01	12	0	38
Kodiak	1 - 100	Lower Cook Inlet	13	1	0.01	8	0	24

Table 67.-- Number of hauls, hauls with Aleutian skate, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	5	0.16	666	7.802	106.4
	101 - 200	36	3	0.41	609	8.225	106.5
	201 - 300	12	2	0.02	6	0.365	41.0
	301 - 500	9	3	0.16	41	1.182	62.4
	501 - 700	4	1	0.26	53	2.694	77.0
	701 - 1,000	2	1	0.40	77	2.041	69.0
	All Depths	180	15	0.22	1,453	5.398	88.0
Chirikof	1 - 100	71	5	0.42	1,085	8.794	114.3
	101 - 200	62	14	1.79	4,265	9.908	119.9
	201 - 300	25	13	7.52	8,688	7.028	108.2
	301 - 500	10	1	0.16	25	1.826	71.0
	501 - 700	6	2	0.78	152	1.955	61.9
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	35	2.09	14,215	7.554	109.1
Kodiak	1 - 100	109	6	0.21	806	6.598	91.6
	101 - 200	139	26	1.09	4,706	9.252	117.0
	201 - 300	29	5	2.17	2,495	6.224	103.3
	301 - 500	8	4	0.59	173	2.941	80.8
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	41	0.81	8,179	7.501	107.2
Yakutat	1 - 100	15	0	0.00	0	---	---
	101 - 200	42	1	0.12	350	9.439	124.0
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	1	0.15	40	1.857	70.5
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	2	0.07	389	6.671	104.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	1	0.05	16	1.468	63.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	1	0.01	16	1.468	63.0
All Areas	1 - 100	321	16	0.20	2,557	7.727	103.8
	101 - 200	316	44	0.81	9,930	9.455	117.7
	201 - 300	119	20	3.10	11,189	6.762	106.3
	301 - 500	48	10	0.23	295	2.112	72.3
	501 - 700	23	3	0.25	205	2.104	64.9
	701 - 1,000	12	1	0.07	77	2.041	69.0
	All Depths	839	94	0.76	24,253	7.326	106.6

All Areas and Depths Biomass, 95% confidence interval: 17,637 - 30,868 metric tons (t)

Table 68. -- Catch per unit of effort by stratum for Aleutian skate sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Chirikof	201 - 300	Lower Shelikof Gully	17	12	8.65	8,661	3,862	13,461
Kodiak	201 - 300	Upper Shelikof Gully	3	2	6.45	2,070	0	7,139
Chirikof	101 - 200	East Shumagin Gully	18	4	2.24	2,491	0	5,075
Kodiak	201 - 300	Kodiak Slope	6	1	2.04	331	0	1,183
Kodiak	101 - 200	Kodiak Outer Shelf	28	7	2.01	1,011	66	1,956
Kodiak	101 - 200	Albatross Gullies	32	11	1.90	1,503	633	2,372
Chirikof	101 - 200	Shelikof Edge	24	6	1.70	1,318	198	2,438
Kodiak	101 - 200	Barren Islands	16	3	1.60	1,758	0	3,787
Chirikof	101 - 200	Chirikof Outer Shelf	20	4	0.91	455	0	976
Chirikof	1 - 100	Semidi Bank	19	3	0.91	661	0	1,474
Chirikof	501 - 700	Chirikof Slope	6	2	0.78	152	0	402
Shumagin	101 - 200	Shumagin Outer Shelf	21	2	0.67	547	0	1,562
Kodiak	301 - 500	Kodiak Slope	8	4	0.59	173	0	379
Kodiak	101 - 200	Portlock Flats	41	5	0.59	434	42	826
Kodiak	1 - 100	Albatross Banks	49	3	0.41	628	0	1,352
Shumagin	701 - 1000	Shumagin Slope	2	1	0.40	77	0	1,057
Yakutat	101 - 200	Yakutat Flats	11	1	0.39	350	0	1,129
Shumagin	1 - 100	Davidson Bank	37	2	0.33	457	0	1,108
Chirikof	1 - 100	Upper Alaska Peninsula	15	1	0.31	248	0	780
Shumagin	501 - 700	Shumagin Slope	4	1	0.26	53	0	221
Yakutat	301 - 500	Yakutat Slope	6	1	0.26	40	0	141
Chirikof	201 - 300	Chirikof Slope	8	1	0.18	27	0	90
Kodiak	1 - 100	Kenai Peninsula	6	2	0.17	88	0	296
Chirikof	1 - 100	Chirikof Bank	37	1	0.16	176	0	535
Shumagin	301 - 500	Shumagin Slope	9	3	0.16	41	0	88
Chirikof	301 - 500	Chirikof Slope	10	1	0.16	25	0	82
Kodiak	1 - 100	Albatross Shallows	34	1	0.16	90	0	273
Shumagin	101 - 200	Sanak Gully	11	1	0.15	62	0	201
Kodiak	201 - 300	Kenai Gullies	20	2	0.14	94	0	235
Shumagin	1 - 100	Fox Islands	22	1	0.14	116	0	356
Shumagin	1 - 100	Shumagin Bank	31	2	0.08	94	0	229
Southeastern	301 - 500	Southeastern Deep Gullies	9	1	0.07	16	0	54
Shumagin	201 - 300	Shumagin Slope	12	2	0.02	6	0	17

Table 69.-- Number of hauls, hauls with Bering skate, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	2	0.01	56	1.763	65.5
	101 - 200	36	2	0.02	30	0.946	52.5
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	4	0.01	86	1.355	58.9
Chirikof	1 - 100	71	4	0.11	296	4.303	85.0
	101 - 200	62	11	0.28	664	1.896	62.8
	201 - 300	25	13	0.63	728	1.682	65.9
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	28	0.25	1,687	1.982	66.2
Kodiak	1 - 100	109	9	0.15	570	2.412	76.5
	101 - 200	139	29	0.26	1,145	1.524	63.9
	201 - 300	29	12	0.44	509	1.134	53.9
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	50	0.22	2,223	1.549	62.9
Yakutat	1 - 100	15	1	0.05	92	1.736	72.0
	101 - 200	42	3	0.05	133	1.667	65.5
	201 - 300	21	2	0.02	12	0.750	52.5
	301 - 500	8	1	0.09	25	2.296	77.0
	501 - 700	4	1	0.10	15	1.053	59.0
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	8	0.05	276	1.596	66.5
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	1	0.01	4	0.625	52.0
	301 - 500	13	4	0.20	62	1.209	60.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	5	0.02	66	1.145	59.1
All Areas	1 - 100	321	16	0.08	1,013	2.602	76.6
	101 - 200	316	45	0.16	1,971	1.626	63.4
	201 - 300	119	28	0.35	1,252	1.387	59.6
	301 - 500	48	5	0.07	87	1.398	63.0
	501 - 700	23	1	0.02	15	1.053	59.0
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	95	0.14	4,337	1.681	64.0

All Areas and Depths Biomass, 95% confidence interval: 3,229 - 5,446 metric tons (t)

Table 70. -- Catch per unit of effort by stratum for Bering skate sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	201 - 300	Upper Shelikof Gully	3	3	0.85	272	0	852
Chirikof	201 - 300	Lower Shelikof Gully	17	12	0.72	721	299	1,143
Kodiak	1 - 100	Kenai Peninsula	6	3	0.70	367	0	842
Chirikof	101 - 200	Shelikof Edge	24	8	0.67	520	124	917
Kodiak	101 - 200	Barren Islands	16	6	0.49	538	21	1,055
Kodiak	201 - 300	Kodiak Slope	6	2	0.30	48	0	161
Chirikof	101 - 200	Chirikof Outer Shelf	20	3	0.29	143	0	396
Kodiak	201 - 300	Kenai Gullies	20	7	0.28	188	28	348
Kodiak	101 - 200	Albatross Gullies	32	9	0.28	219	66	372
Southeastern	301 - 500	Southeastern Slope	4	1	0.27	21	0	89
Chirikof	1 - 100	Chirikof Bank	37	3	0.24	255	0	670
Kodiak	101 - 200	Portlock Flats	41	9	0.21	153	48	258
Southeastern	301 - 500	Southeastern Deep Gullies	9	3	0.17	41	0	94
Yakutat	101 - 200	Middleton Shelf	12	2	0.17	121	0	301
Yakutat	301 - 500	Yakutat Slope	6	1	0.16	25	0	89
Kodiak	101 - 200	Kenai Flats	22	3	0.16	189	0	442
Kodiak	1 - 100	Albatross Shallows	34	4	0.13	76	0	152
Yakutat	501 - 700	Yakutat Slope	4	1	0.10	15	0	61
Kodiak	101 - 200	Kodiak Outer Shelf	28	2	0.09	47	0	119
Kodiak	1 - 100	Lower Cook Inlet	13	1	0.09	91	0	288
Yakutat	1 - 100	Yakutat Shallows	8	1	0.09	92	0	308
Shumagin	101 - 200	Sanak Gully	11	2	0.07	30	0	83
Chirikof	1 - 100	Semidi Bank	19	1	0.06	41	0	127
Yakutat	201 - 300	Yakutat Slope	13	2	0.05	12	0	29
Chirikof	201 - 300	Chirikof Slope	8	1	0.04	7	0	22
Shumagin	1 - 100	Fox Islands	22	1	0.03	27	0	83
Kodiak	1 - 100	Albatross Banks	49	1	0.02	36	0	110
Yakutat	101 - 200	Yakataga Shelf	8	1	0.02	12	0	40
Shumagin	1 - 100	Davidson Bank	37	1	0.02	29	0	89
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	1	0.01	4	0	13

Table 71.-- Number of hauls, hauls with big skate, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	18	2.23	9,215	22.309	136.3
	101 - 200	36	3	0.39	577	10.812	120.2
	201 - 300	12	0	0.00	0	---	---
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	21	1.50	9,792	20.994	135.2
Chirikof	1 - 100	71	13	4.26	11,095	18.904	129.7
	101 - 200	62	0	0.00	0	---	---
	201 - 300	25	0	0.00	0	---	---
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	13	1.63	11,095	18.904	129.7
Kodiak	1 - 100	109	30	3.39	13,067	10.153	94.7
	101 - 200	139	2	0.32	1,382	25.679	146.2
	201 - 300	29	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	32	1.42	14,450	10.776	96.8
Yakutat	1 - 100	15	3	0.80	1,339	9.061	110.5
	101 - 200	42	5	0.78	2,293	16.235	120.2
	201 - 300	21	0	0.00	0	---	---
	301 - 500	8	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	8	0.63	3,632	12.568	115.3
Southeastern	1 - 100	9	2	0.54	352	5.163	83.7
	101 - 200	37	0	0.00	0	---	---
	201 - 300	32	0	0.00	0	---	---
	301 - 500	13	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	2	0.13	352	5.163	83.7
All Areas	1 - 100	321	66	2.72	35,068	14.011	110.4
	101 - 200	316	10	0.35	4,252	17.115	126.5
	201 - 300	119	0	0.00	0	---	---
	301 - 500	48	0	0.00	0	---	---
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	76	1.23	39,320	14.291	111.7

All Areas and Depths Biomass, 95% confidence interval: 26,617 - 52,023 metric tons (t)

Table 72. -- Catch per unit of effort by stratum for big skate sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Shumagin	1 - 100	Fox Islands	22	5	6.89	5,744	0	11,917
Kodiak	1 - 100	Lower Cook Inlet	13	7	6.71	6,635	832	12,438
Chirikof	1 - 100	Chirikof Bank	37	10	5.96	6,430	770	12,091
Chirikof	1 - 100	Upper Alaska Peninsula	15	3	5.87	4,664	0	10,723
Kodiak	1 - 100	Albatross Shallows	34	13	3.62	2,085	685	3,486
Kodiak	1 - 100	Albatross Banks	49	8	2.50	3,857	0	7,780
Kodiak	1 - 100	Northern Kodiak Shallows	7	2	2.23	490	0	1,414
Yakutat	101 - 200	Yakataga Shelf	8	2	1.98	1,046	0	2,934
Shumagin	1 - 100	Lower Alaska Peninsula	27	5	1.59	1,095	116	2,073
Shumagin	1 - 100	Shumagin Bank	31	6	1.47	1,823	0	3,682
Yakutat	101 - 200	Fairweather Shelf	11	1	0.99	767	0	2,476
Yakutat	1 - 100	Yakutat Shallows	8	2	0.95	945	0	2,547
Kodiak	101 - 200	Kenai Flats	22	1	0.73	885	0	2,727
Yakutat	101 - 200	Middleton Shelf	12	2	0.65	481	0	1,220
Shumagin	101 - 200	West Shumagin Gully	4	1	0.64	145	0	606
Yakutat	1 - 100	Middleton Shallows	7	1	0.59	394	0	1,357
Southeastern	1 - 100	Southeastern Shallows	9	2	0.54	352	0	915
Kodiak	101 - 200	Barren Islands	16	1	0.45	497	0	1,555
Shumagin	1 - 100	Davidson Bank	37	2	0.41	554	0	1,404
Shumagin	101 - 200	Shumagin Outer Shelf	21	1	0.37	301	0	928
Shumagin	101 - 200	Sanak Gully	11	1	0.31	131	0	424

Table 73.-- Number of hauls, hauls with longnose skate, mean CPUE, estimated biomass, mean weight, and mean length based on results of the 2005 Gulf of Alaska biennial bottom trawl survey. Results are presented by International North Pacific Fisheries Commission statistical area and depth stratum.

INPFC Area	Depth (m)	Number of Hauls	Hauls with Catch	Mean CPUE (kg/ha)	Estimated Biomass (t)	Mean Weight (kg)	Mean Length (cm)
Shumagin	1 - 100	117	1	0.02	63	3.923	84.0
	101 - 200	36	7	0.97	1,422	8.877	96.1
	201 - 300	12	2	0.84	234	7.706	105.3
	301 - 500	9	0	0.00	0	---	---
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	180	10	0.26	1,719	8.319	96.5
Chirikof	1 - 100	71	5	0.46	1,203	12.219	120.9
	101 - 200	62	16	1.33	3,161	7.436	100.4
	201 - 300	25	13	3.33	3,843	7.293	97.9
	301 - 500	10	0	0.00	0	---	---
	501 - 700	6	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	177	34	1.21	8,206	7.812	101.1
Kodiak	1 - 100	109	31	1.96	7,551	10.792	116.6
	101 - 200	139	57	2.71	11,760	9.053	108.3
	201 - 300	29	12	2.03	2,337	6.766	98.1
	301 - 500	8	0	0.00	0	---	---
	501 - 700	5	0	0.00	0	---	---
	701 - 1,000	3	0	0.00	0	---	---
	All Depths	293	100	2.13	21,647	9.235	109.3
Yakutat	1 - 100	15	4	0.52	874	5.293	79.0
	101 - 200	42	18	1.78	5,229	6.585	98.5
	201 - 300	21	13	3.32	1,717	7.204	105.2
	301 - 500	8	4	3.54	930	6.767	98.5
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	92	39	1.53	8,750	6.554	97.3
Southeastern	1 - 100	9	0	0.00	0	---	---
	101 - 200	37	4	0.59	652	10.202	108.4
	201 - 300	32	6	0.56	282	5.185	88.9
	301 - 500	13	2	0.61	191	5.541	90.0
	501 - 700	4	0	0.00	0	---	---
	701 - 1,000	2	0	0.00	0	---	---
	All Depths	97	12	0.40	1,126	7.363	97.4
All Areas	1 - 100	321	41	0.75	9,690	9.895	110.2
	101 - 200	316	102	1.82	22,225	8.104	103.6
	201 - 300	119	46	2.33	8,413	7.037	99.2
	301 - 500	48	6	0.88	1,122	6.521	96.8
	501 - 700	23	0	0.00	0	---	---
	701 - 1,000	12	0	0.00	0	---	---
	All Depths	839	195	1.30	41,449	8.145	103.6

All Areas and Depths Biomass, 95% confidence interval: 34,670 - 48,228 metric tons (t)

Table 74. -- Catch per unit of effort by stratum for longnose skate sorted by descending CPUE for the 2005 Gulf of Alaska bottom trawl survey.

INPFC area	Depth range	Stratum name	Number of hauls	Hauls with catch	CPUE (kg/ha)	Biomass (t)	Lower CI biomass	Upper CI biomass
Kodiak	1 - 100	Northern Kodiak Shallows	7	5	7.14	1,570	277	2,863
Yakutat	301 - 500	Yakutat Gullies	2	1	6.54	724	0	9,917
Kodiak	1 - 100	Kenai Peninsula	6	4	5.25	2,760	141	5,379
Kodiak	101 - 200	Kenai Flats	22	11	4.78	5,767	2,360	9,173
Kodiak	101 - 200	Portlock Flats	41	25	3.88	2,843	1,908	3,779
Chirikof	201 - 300	Lower Shelikof Gully	17	13	3.84	3,843	1,673	6,013
Yakutat	201 - 300	Yakutat Slope	13	9	3.80	809	268	1,351
Kodiak	101 - 200	Albatross Gullies	32	16	3.00	2,373	1,173	3,573
Kodiak	201 - 300	Kenai Gullies	20	8	2.99	1,991	244	3,738
Yakutat	201 - 300	Yakutat Gullies	8	4	2.98	908	0	1,998
Yakutat	101 - 200	Yakataga Shelf	8	4	2.84	1,501	0	3,404
Yakutat	101 - 200	Middleton Shelf	12	6	2.82	2,068	0	4,191
Kodiak	1 - 100	Albatross Shallows	34	13	2.60	1,499	755	2,242
Southeastern	301 - 500	Southeastern Slope	4	2	2.48	191	0	597
Chirikof	101 - 200	East Shumagin Gully	18	8	1.94	2,157	684	3,631
Yakutat	301 - 500	Yakutat Slope	6	3	1.36	207	0	533
Yakutat	1 - 100	Middleton Shallows	7	4	1.30	874	0	2,158
Shumagin	101 - 200	West Shumagin Gully	4	2	1.30	295	0	1,083
Yakutat	101 - 200	Fairweather Shelf	11	5	1.14	883	74	1,692
Kodiak	1 - 100	Albatross Banks	49	9	1.12	1,722	480	2,965
Shumagin	101 - 200	Shumagin Outer Shelf	21	3	1.08	880	0	1,945
Southeastern	201 - 300	Baranof-Chichagof Slope	5	2	1.04	117	0	329
Kodiak	101 - 200	Kodiak Outer Shelf	28	4	1.00	502	10	993
Chirikof	101 - 200	Shelikof Edge	24	6	0.95	734	62	1,406
Yakutat	101 - 200	Yakutat Flats	11	3	0.86	778	0	1,847
Shumagin	201 - 300	Shumagin Slope	12	2	0.84	234	0	636
Kodiak	201 - 300	Kodiak Slope	6	2	0.73	118	0	314
Kodiak	201 - 300	Upper Shelikof Gully	3	2	0.71	228	0	720
Chirikof	1 - 100	Upper Alaska Peninsula	15	2	0.71	564	0	1,402
Southeastern	101 - 200	Baranof-Chichagof Shelf	11	1	0.65	272	0	878
Chirikof	1 - 100	Chirikof Bank	37	3	0.59	639	0	1,475
Shumagin	101 - 200	Sanak Gully	11	2	0.58	248	0	621
Southeastern	101 - 200	Prince of Wales Shelf	26	3	0.55	380	0	825
Chirikof	101 - 200	Chirikof Outer Shelf	20	2	0.54	270	0	682
Southeastern	201 - 300	Prince of Wales Slope/Gullies	27	4	0.42	166	0	364
Kodiak	101 - 200	Barren Islands	16	1	0.25	276	0	864
Shumagin	1 - 100	Shumagin Bank	31	1	0.05	63	0	191

CITATIONS

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

Berendzen, P.B. 1997. Phylogenetic analysis of the Order Pleuronectiformes using molecular and morphological evidence. Abstracts of the 1997 Annual Meeting of the American Society of Ichthyologists and Herpetologists, Seattle, Washington.

Britt, L., and M.H. Martin. 2000. Data report: 1999 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-121, 249 p.

Cochran, W.G. 1977. Sampling Techniques. 3rd ed. Wiley Series in Probability and Mathematical Statistics - Applied. John Wiley & Sons. N.Y., NY 428 p.

Cooper, J., and F. Chapleau. 1998. The monophyletic status of *Pleuronectes* (Pleuronectidae: Pleuronectiformes). Abstracts of the 1996 Annual Meeting of the American Society of Ichthyologists and Herpetologists, New Orleans, Louisiana.

Ivankov, V.N. 1996. Review of the book by G.U. Lindberg and V.V. Fedorov, The fishes of the Sea of Japan and adjacent parts of the Sea of Okhotsk and the Yellow Sea. Part 6. Teleostomi, Osteichthyes, Actinopterygii. XXXI. Pleuronectiformes—Family Psettodidae-CCI—Family Cynoglossidae. J. Ichthyol. 36(7):549-550. [Transl. By P.A. Aleinikov.]

Martin, M.H., and D.M. Clausen. 1995. Data report: 1993 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-59, 217 p.

Munro, P.T., and R.Z. Hoff. 1995. Two demersal trawl surveys in the Gulf of Alaska: Implications of survey design and methods. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-50, 139 p.

Orr, J.W., and A.C. Matarese. 2000. Revision of the genus *Lepidopsetta* Gill, 1862 (Teleostei: Pleuronectidae) based on larval and adult morphology, with a description of a new species from the North Pacific Ocean and Bering Sea. Fish. Bull., U.S. 98:539-582.

Orr, J.W., and J.E. Blackburn. 2004. The dusky rockfishes (Teleostei: Scorpaeniformes) of the North Pacific Ocean: resurrection of *Sebastes variabilis* (Pallas, 1814) and a redescription of *Sebastes ciliatus* (Tilesius, 1813). Fish. Bull., U.S. 102:328-348.

Orr, J.W., and S. Hawkins. 2008. Species of the rougheye rockfish complex: resurrection of *Sebastes melanostictus* (Matsubara, 1934) and a redescription of *Sebastes aleutianus* (Jordan and Evermann, 1898) (Teleostei: Scorpaeniformes). Fish. Bull., U.S. 106:111-134.

Rass, T.S. 1996. On taxonomy of Pleuronectini (Pleuronectidae). J. Ichthyol. 36:546-548.

Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1991. Common and scientific names of fishes from the United States and Canada. Fifth ed. Am. Fish. Soc. Spec. Publ. No. 20. 183 p.

Stark, J.W., and D.M. Clausen. 1995. Data report: 1990 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-49, 221 p.

Stauffer, G. 2004. NOAA protocols for groundfish bottom trawl surveys of the Nation's fishery resources. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-65, 205 p. Available online at http://spo.nmfs.noaa.gov/tm/tm65.pdf.

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

APPENDIX A

Strata Specifications and Locations

Appendix Table A-1 presents the survey strata definitions for the 2005 Gulf of Alaska biennial bottom trawl survey including depth range, stratum name, and the area in square nautical miles and square kilometers. Appendix Table A-2 presents the summary strata code definitions. Appendix Figures A-1 through A-5 are charts showing the locations and extent of the strata as defined.

Appendix Table A-1. -- Survey strata used for the 2005 Gulf of Alaska biennial survey including depth, stratum code, name and area in square nautical miles (nmi^2) and square kilometers (km^2).

Depth range (m)	Stratum code	Stratum name	Area (nmi^2)	Area (km^2)
1 - 100	10	Fox Islands	2,430	8,333
	11	Davidson Bank	3,989	13,681
	12	Lower Alaska Peninsula	2,005	6,876
	13	Shumagin Bank	3,615	12,399
	20	Upper Alaska Peninsula	2,315	7,941
	21	Semidi Bank	2,129	7,302
	22	Chirikof Bank	3,147	10,792
	30	Albatross Shallows	1,681	5,766
	31	Albatross Banks	4,491	15,403
	32	Lower Cook Inlet	2,883	9,887
	33	Kenai Peninsula	1,534	5,260
	35	Northern Kodiak Shallows	641	2,200
	40	Yakutat Shallows	2,900	9,947
	41	Middleton Shallows	1,958	6,714
	50	Southeastern Shallows	1,909	6,546
	991	**Subtotal**	**37,628**	**129,047**
101 - 200	110	Sanak Gully	1,238	4,245
	111	Shumagin Outer Shelf	2,377	8,154
	112	West Shumagin Gully	664	2,278
	120	East Shumagin Gully	3,238	11,104
	121	Shelikof Edge	2,255	7,735
	122	Chirikof Outer Shelf	1,461	5,011
	130	Albatross Gullies	2,307	7,912
	131	Portlock Flats	2,139	7,336
	132	Barren Islands	3,202	10,981
	133	Kenai Flats	3,521	12,077
	134	Kodiak Outer Shelf	1,465	5,026
	140	Middleton Shelf	2,142	7,346
	141	Yakataga Shelf	1,539	5,277
	142	Yakutat Flats	2,634	9,032
	143	Fairweather Shelf	2,253	7,728
	150	Baranof-Chichagof Shelf	1,224	4,196
	151	Prince of Wales Shelf	2,008	6,888
	992	**Subtotal**	**35,668**	**122,324**

Appendix Table A-1 -- Cont.

Depth range (m)	Stratum code	Stratum name	Area (nmi^2)	Area (km^2)
201 - 300	210	Shumagin Slope	813	2,788
	220	Lower Shelikof Gully	2,921	10,018
	221	Chirikof Slope	446	1,528
	230	Kenai Gullies	1,942	6,659
	231	Kodiak Slope	473	1,623
	232	Upper Shelikof Gully	935	3,208
	240	Yakutat Gullies	887	3,043
	241	Yakutat Slope	620	2,127
	250	Baranof-Chichagof Slope	328	1,125
	251	Prince of Wales Slope/Gullies	1,145	3,927
	993	**Subtotal**	**10,511**	**36,047**
301 - 500	310	Shumagin Slope	738	2,531
	320	Chirikof Slope	468	1,604
	330	Kodiak Slope	849	2,912
	340	Yakutat Gullies	323	1,107
	341	Yakutat Slope	443	1,521
	350	Southeastern Deep Gullies	684	2,344
	351	Southeastern Slope	225	773
	994	**Subtotal**	**3,730**	**12,792**
501 - 700	410	Shumagin Slope	585	2,006
	420	Chirikof Slope	570	1,953
	430	Kodiak Slope	509	1,745
	440	Yakutat Slope	428	1,469
	450	Southeastern Slope	301	1,033
	995	**Subtotal**	**2,393**	**8,206**
701 – 1,000	510	Shumagin Slope	565	1,937
	520	Chirikof Slope	894	3,066
	530	Kodiak Slope	1,019	3,494
	540	Yakutat Slope	550	1,887
	550	Southeastern Slope	352	1,206
	996	**Subtotal**	**3,380**	**11,590**
1 – 1,000	**999**	**Grand Total**	**93,309**	**320,006**

Appendix Table A-2. -- Summary codes used for the 2005 Gulf of Alaska biennial bottom trawl survey including depth range, International North Pacific Fisheries Commission statistical areas and square area, and strata included in the summary area.

Summary code number	Depth range (m)	INPFC area	Area (nmi^2)	Area (km^2)	Strata included
911	1 - 100	**Shumagin**	12,039	41,289	10 -13
912	101 - 200		4,280	14,677	110 - 112
913	201 - 300		813	2,788	210
914	301 - 500		738	2,531	310
915	501 - 700		585	2,006	410
916	701 – 1,000		565	1,937	510
919	1 -1,000		19,020	65,228	
921	1 - 100	**Chirikof**	7,591	26,035	20-22
922	101 - 200		6,954	23,850	120-122
923	201 - 300		3,350	11,490	230, 231
924	301 - 500		468	1,604	320
925	501 - 700		570	1,953	420
926	701 – 1,000		894	3,066	520
929	1 -1,000		19,827	67,998	
931	1 - 100	**Kodiak**	11,230	38,516	30 - 33, 35
932	101 - 200		12,634	43,332	130 - 134
933	201 - 300		3,350	11,490	230 - 232
934	301 - 500		849	2,912	330
935	501 - 700		509	1,745	430
936	701 – 1,000		1,019	3,494	530
939	1 -1,000		29,591	101,489	

Appendix Table A-2 -- Cont.

Summary code number	Depth range (m)	INPFC area	Area (nmi^2)	Area (km^2)	Strata included
941	1- 100	**Yakutat**	4,858	16,661	240, 241
942	101 - 200		8,568	29,383	140 – 143
943	201 - 300		1,507	5,170	240, 241
944	301 - 500		766	2,628	340, 341
945	501 - 700		428	1,469	440
946	701 – 1,000		550	1,887	540
949	1 -1,000		16,677	57,198	
951	1 - 100	**Southeastern**	1,909	6,546	50
952	101 - 200		3,232	11,084	150, 151
953	201 - 300		1,473	5,052	250, 251
954	301 - 500		909	3,117	350, 351
955	501 - 700		301	1,033	450
956	701 – 1,000		352	1,206	550
959	1 -1,000		8,176	28,039	
999	1 – 1,000	**All Areas**	93,309	320,006	

APPENDIX B

Fish and Invertebrate Taxa Encountered

Appendix Tables B-1 and B-2 list fish and invertebrate taxa encountered and identified during the 2005 Gulf of Alaska biennial bottom trawl survey. Most common and scientific names are from Robins et al. (1991). Order of listings and common names used are for convenience and do not imply adherence to a particular phylogenetic system.

Appendix Table B-1. -- Fish taxa encountered during the 2005 Gulf of Alaska bottom trawl survey.

FAMILY	SPECIES_NAME	COMMON_NAME
Petromyzontidae	Petromyzontidae	lamprey unident.
Chimaeridae	*Hydrolagus colliei*	spotted ratfish
Lamnidae	*Lamna ditropis*	salmon shark
	Squalus acanthias	spiny dogfish
Squalidae	*Somniosus pacificus*	Pacific sleeper shark
Rajidae	*Bathyraja* sp.	
	Raja binoculata	big skate
	Bathyraja interrupta	Bering skate
	Raja rhina	longnose skate
	Bathyraja trachura	roughtail skate
	Bathyraja parmifera	Alaska skate
	Bathyraja aleutica	Aleutian skate
	Bathyraja lindbergi	commander skate
	Bathyraja maculata	whiteblotched skate
	Bathyraja mariposa	butterfly skate
	Bathyraja minispinosa	whitebrow skate
Nemichthyidae	Nemichthyidae	snipe eel unident.
Clupeidae	*Clupea pallasi*	Pacific herring
	Sardinops sagax	Pacific sardine
Argentinidae	Argentinidae	argentine unident.
Bathylagidae	Bathylagidae	deepsea smelt unident.
	Bathylagus pacificus	Pacific blacksmelt
	Bathylagus sp.	blacksmelt unident.
	Leuroglossus schmidti	northern smoothtongue
Osmeridae	Osmeridae	smelt unident.
	Thaleichthys pacificus	eulachon
	Mallotus villosus	capelin
	Spirinchus thaleichthys	longfin smelt
Salmonidae	Salmonidae	salmon and trouts unident.
	Oncorhynchus tshawytscha	chinook salmon
	Oncorhynchus kisutch	coho salmon
	Oncorhynchus gorbuscha	pink salmon
	Oncorhynchus keta	chum salmon
	Oncorhynchus nerka	sockeye salmon

	Salvelinus malma	Dolly Varden
Gonostomatidae	Gonostomatidae	bristlemouth unident.
	Cyclothone sp.	
Stomiidae	Stomiidae	barbeled dragonfish
Melanostomiidae	*Tactostoma macropus*	longfin dragonfish
Chauliodontidae	Chauliodontidae	viperfish unident.
	Chauliodus macouni	Pacific viperfish
Scopelarchidae	*Benthalbella* sp.	
	Benthalbella dentata	northern pearleye
Paralepidae	Paralepididae	barracudina unident.
Myctophidae	Myctophidae	lanternfish unident.
	Stenobrachius sp.	
	Stenobrachius leucopsarus	northern lampfish
	Stenobrachius nannochir	garnet lampfish
	Diaphus sp.	
	Diaphus theta	California headlightfish
	Lampanyctus sp.	
	Nannobrachium regale	pinpoint lampfish
	Lampanyctus jordani	brokenline lampfish
Macrouridae	*Coryphaenoides acrolepis*	Pacific grenadier
	Albatrossia pectoralis	giant grenadier
	Coryphaenoides cinereus	popeye grenadier
Moridae	*Antimora microlepis*	Pacific flatnose
Merluccidae	*Merluccius productus*	Pacific hake
Gadidae	*Microgadus proximus*	Pacific tomcod
	Gadus macrocephalus	Pacific cod
	Eleginus gracilis	saffron cod
	Gadus chalcogrammus	walleye pollock
Oneirodidae	Oneirodidae	dreamer unident.
	Oneirodes sp.	
	Oneirodes thompsoni	
Melamphaeidae	Melamphaidae	bigscale unident.
	Poromitra curilensis	crested bigscale
	Melamphaes lugubris	highsnout bigscale
Scorpaenidae	*Sebastolobus* sp.	thornyhead unident.
	Sebastolobus alascanus	shortspine thornyhead
	Sebastolobus altivelis	longspine thornyhead

	Sebastes sp.	rockfish unident.
	Sebastes alutus	Pacific ocean perch
	Sebastes brevispinis	silvergray rockfish
	Sebastes ciliatus	dark rockfish
	Sebastes variabilis	dusky rockfish
	Sebastes crameri	darkblotched rockfish
	Sebastes diploproa	splitnose rockfish
	Sebastes elongatus	greenstriped rockfish
	Sebastes emphaeus	Puget Sound rockfish
	Sebastes entomelas	widow rockfish
	Sebastes flavidus	yellowtail rockfish
	Sebastes helvomaculatus	rosethorn rockfish
	Sebastes maliger	quillback rockfish
	Sebastes melanops	black rockfish
	Sebastes paucispinis	bocaccio
	Sebastes pinniger	canary rockfish
	Sebastes polyspinis	northern rockfish
	Sebastes proriger	redstripe rockfish
	Sebastes ruberrimus	yelloweye rockfish
	Sebastes babcocki	redbanded rockfish
	Sebastes variegatus	harlequin rockfish
	Sebastes wilsoni	pygmy rockfish
	Sebastes zacentrus	sharpchin rockfish
	Sebastes borealis	shortraker rockfish
Anoplopomatidae	*Anoplopoma fimbria*	sablefish
Hexagrammidae	*Ophiodon elongatus*	lingcod
	Pleurogrammus monopterygius	Atka mackerel
	Hexagrammos stelleri	whitespotted greenling
	Hexagrammos lagocephalus	rock greenling
	Hexagrammos decagrammus	kelp greenling
Cottidae	Cottidae	sculpin unident.
	Thyriscus anoplus	sponge sculpin
	Icelinus filamentosus	threadfin sculpin
	Icelinus borealis	northern sculpin
	Gymnocanthus pistilliger	threaded sculpin
	Gymnocanthus galeatus	armorhead sculpin
	Bolinia euryptera	broadfin sculpin

	Malacocottus zonurus	darkfin sculpin
	Hemilepidotus zapus	longfin Irish lord
	Hemilepidotus hemilepidotus	red Irish lord
	Hemilepidotus jordani	yellow Irish lord
	Triglops sp.	
	Triglops forficata	scissortail sculpin
	Triglops scepticus	spectacled sculpin
	Triglops pingeli	ribbed sculpin
	Triglops macellus	roughspine sculpin
	Myoxocephalus polyacanthocephalus	great sculpin
	Myoxocephalus jaok	plain sculpin
	Leptocottus armatus	Pacific staghorn sculpin
	Dasycottus setiger	spinyhead sculpin
	Psychrolutes paradoxus	tadpole sculpin
	Psychrolutes phrictus	blob sculpin
	Rhamphocottus richardsoni	grunt sculpin
	Hemitripterus bolini	bigmouth sculpin
	Eurymen gyrinus	smoothcheek sculpin
	Icelus spiniger	thorny sculpin
	Rastrinus scutiger	roughskin sculpin
	Icelus sp.	
Agonidae	Agonidae	poacher unident.
	Leptagonus frenatus	sawback poacher
	Bathyagonus sp.	starsnout poacher unident.
	Bathyagonus alascanus	gray starsnout
	Bathyagonus infraspinatus	spinycheek starsnout
	Bathyagonus pentacanthus	bigeye poacher
	Bathyagonus nigripinnis	blackfin poacher
	Podothecus accipenserinus	sturgeon poacher
	Hypsagonus quadricornis	fourhorn poacher
Cyclopteridae	*Aptocyclus ventricosus*	smooth lumpsucker
	Lethotremus muticus	docked snailfish
	Eumicrotremus birulai	round lumpsucker
	Eumicrotremus orbis	Pacific spiny lumpsucker
	Eumicrotremus sp.	spiny lumpsuckers
	Eumicrotremus phrynoides	toad lumpsucker
	Liparidinae	snailfish unident.

	Liparis gibbus	variegated snailfish
	Crystallichthys cyclospilus	blotched snailfish
	Elassodiscus caudatus	humpback snailfish
	Careproctus sp.	
	Careproctus melanurus	blacktail snailfish
	Careproctus cypselurus	blackfin snailfish
	Careproctus furcellus	emarginate snailfish
	Paraliparis ulochir	blackfaced red snailfish
	Careproctus gilberti	smalldisk snailfish
	Careproctus colletti	Alaska snailfish
	Careproctus rastrinus	salmon snailfish
	Paraliparis dactylosus	red snailfish
	Paraliparis cephalus	swellhead snailfish
	Paraliparis sp.	
Bramidae	*Brama japonica*	Pacific pomfret
Bathymasteridae	Bathymasteridae	ronquil unident.
	Bathymaster signatus	searcher
Zoarcidae	Zoarcidae	eelpout unident.
	Bothrocara brunneum	twoline eelpout
	Bothrocara pusillum	Alaska eelpout
	Bothrocara zestum	western eelpout
	Lycenchelys crotalinus	snakehead eelpout
	Lycodapus mandibularis	pallid eelpout
	Lycodes sp.	
	Lycodes palearis	wattled eelpout
	Lycodes concolor	ebony eelpout
	Lycodes diapterus	black eelpout
	Lycodes brevipes	shortfin eelpout
	Lycodes pacificus	blackbelly eelpout
	Lycodapus sp.	
Stichaeidae	Stichaeidae	prickleback unident.
	Lumpenus maculatus	daubed shanny
	Lumpenus fabricii	slender eelblenny
	Lumpenus sagitta	snake prickleback
	Lumpenella longirostris	longsnout prickleback
	Chirolophis sp.	
	Chirolophis decoratus	decorated warbonnet

	Poroclinus rothrocki	whitebarred prickleback
	Bryozoichthys marjorius	pearly prickleback
Cryptacanthodidae	*Lyconectes aleutensis*	dwarf wrymouth
	Cryptacanthodes giganteus	giant wrymouth
Anarhichadidae	*Anarrhichthys ocellatus*	wolf-eel
	Anarhichas orientalis	Bering wolffish
Zaproridae	*Zaprora silenus*	prowfish
Trichodontidae	*Trichodon trichodon*	Pacific sandfish
Ammodytidae	*Ammodytes hexapterus*	Pacific sand lance
Icosteidae	*Icosteus aenigmaticus*	ragfish
Trichiuridae	*Lepidopus fitchi*	scabbardfish
Bothidae	*Citharichthys sordidus*	Pacific sanddab
Pleuronectidae	*Atheresthes stomias*	arrowtooth flounder
	Atheresthes evermanni	Kamchatka flounder
	Hippoglossus stenolepis	Pacific halibut
	Hippoglossoides elassodon	flathead sole
	Lyopsetta exilis	slender sole
	Eopsetta jordani	petrale sole
	Parophrys vetulus	English sole
	Microstomus pacificus	Dover sole
	Embassichthys bathybius	deepsea sole
	Glyptocephalus zachirus	rex sole
	Limanda aspera	yellowfin sole
	Platichthys stellatus	starry flounder
	Psettichthys melanostictus	sand sole
	Lepidopsetta polyxystra	northern rock sole
	Lepidopsetta bilineata	southern rock sole
	Isopsetta isolepis	butter sole
	Pleuronichthys decurrens	curlfin sole
	Pleuronectes quadrituberculatus	Alaska plaice

Appendix Table B-2. -- Invertebrate taxa encountered during the 2005 Gulf of Alaska bottom trawl survey.

PHYLUM	SPECIES_NAME	COMMON_NAME
Protozoa	Foraminifera	foraminiferan unident.
Porifera	Porifera	sponge unident.
	Suberites sp.	
	Suberites ficus	
	Aphrocallistes vastus	clay pipe sponge
	Mycale sp.	
	Mycale loveni	tree sponge
	Coelosphaeridae	ginseng sponge
	Geodia mesotriaena	
	Geodia sp.	
	Halichondria sp.	
	Halichondria panicea	barrel sponge
	Rhabdocalyptus sp.	cloud sponge
	Mycale bellabellensis	lampshade sponge
	Phakellia dalli	cat-o-nine-tails sponge
	Myxilla incrustans	scallop sponge
	Plicatellopsis amphispicula	firm finger sponge
	Histodermella sp. A (Clark 2006)	spud sponge
	Leucosolenia blanca	yellow leafy sponge
	Tethya sp.	ball sponge
	Polymastia pachymastia	black-orange spud
	Halichondria sitiens	black papilliate sponge
	Halichondria cf. *sitiens*	yellow green papillate
	Yellow papillate sponge	
	Stylissa sp.	drumstick sponge
	Neoesperiopsis rigida	soft finger sponge
	Neoesperiopsis infundibula	rough China hat sponge
	orange papilliate sponge	
	Neoesperiopsis digitata	
	Stelletta sp.	stone sponge
	Hexactinellida	glass sponge unident.
	Staurocalyptus sp.	

	Geodinella robusta	calcareous finger
	Craniella sp.	puffball sponges
Cnidaria	Cnidaria	coelenterate unident.
	Hydrozoa	
	Bonneviella sp. A (Clark, 2006)	champagne flute
	Scyphozoa	jellyfish unident.
	Chrysaora sp.	chrysaora jellyfish
	Periphylla periphylla	
	Chrysaora melanaster	
	Phacellophora camtschatica	egg yolk jelly
	Aequorea sp.	
	Atolla sp.	
	Aurelia sp.	
	Aurelia labiata	
	Aurelia aurita	
	Cyanea capillata	lion's mane
	Alyconaria	octocoral unident.
	Alcyonium sp.	
	Anthomastus sp.	
	Anthomastus sp. A	red anthomastus
	Gorgonacea	gorgonian coral
	Primnoa sp.	
	Primnoa willeyi	red tree coral
	Chrysopathes speciosa	
	Bathypathes sp.	
	Swiftia sp.	
	Swiftia simplex	
	Paragorgia arborea	Kamchatka coral
	Euplexaura marki	
	Callogorgia sp.	
	Calcigorgia sp.	
	Clavularia sp.	
	Pennatulacea	sea pen or sea whip
	Virgularia sp.	smoothstem seawhip
	Virgulariidae	sea whip unident.
	Stylatula sp.	slender seawhips
	Halipteris willemoesi	

	Halipteris californica	
	Ptilosarcus gurneyi	orange sea pen
	Anthoptilum grandiflorum	
	Actiniaria	sea anemone unident.
	Actinauge verrilli	reticulate anemone
	Paractinostola faeculenta	rough purple sea
	Metridium sp.	
	Metridium farcimen	gigantic anemone
	Stomphia sp.	
	Stomphia coccinea	swimming anemone
	Urticina sp.	
	Urticina crassicornis	mottled anemone
	Bathyphelia australis	hot dog sea anemone
	Cribrinopsis fernaldi	chevron-tentacled
	Liponema brevicornis	tentacle-shedding
	Actinostolidae	
	Scleractinia	stony coral unident.
	Javania cailleti	
	Stylasterina	hydrocoral unident.
	Stylaster sp.	
	Crypthelia trophostega	
	Stylaster campylecus	
	Cyclohelia lamellata	
	Cyclohelia sp.	
	Thouarella sp. 1 (Bayer et al.)	
	Errinopora sp.	
	Errinopora nanneca	
	Plumarella sp.	
	Isidella sp.	articulated bamboo
	Thouarella sp.	
	Fanellia compressa	
	Fanellia fraseri	
	Muriceides sp.	
	Amphilaphis sp.	
	Amphilaphis sp. 2	
	Arthrogorgia sp.	
Ctenophora	Ctenophora	comb jelly unident.

	Beroe sp.	
Annelida	Polychaeta	polychaete worm
	Aphroditidae	sea mouse unident.
	Aphrodita sp.	
	Aphrodita negligens	
	Glycera sp.	
	Polynoidae	scale worm unident.
	Eunoe sp.	
	Eunoe nodosa	giant scale worm
	Eunoe depressa	depressed scale worm
	Serpula vermicularis	
	Hirudinea	leech unident.
	Carcinobdella sp.	
	Notostomobdella cyclostoma	striped sea leech
Platyhelminthes	Platyhelminthes	flatworm unident.
Rhynchocoela	Nemertea	nemertean worm
Echiura	Echiura	echiuroid worm
Arthropoda	Amphipoda	amphipod unident.
	Isopoda	isopod unident.
	Mysidacea	mysid unident.
	Neognathophausia gigas	giant red mysid
	Neognathophausia ingens	red mysid
	Thoracica	barnacle unident.
	Balanus sp.	
	Balanus evermanni	giant barnacle
	Balanus rostratus	beaked barnacle
	Pandalus sp.	
	Pandalus jordani	ocean shrimp
	Pandalus eous	Alaskan pink
	Pandalus tridens	yellowleg pandalid
	Pandalus platyceros	spot shrimp
	Pandalus goniurus	humpy shrimp
	Pandalus hypsinotus	coonstripe shrimp
	Pandalopsis sp.	
	Pandalopsis dispar	sidestripe shrimp
	Pandalopsis ampla	
	Spirontocaris lamellicornis	

Eualus sp.	
Eualus barbatus	barbed eualid
Eualus gaimardii	
Eualus macrophthalmus	bigeye eualid
Eualus suckleyi	shortscale eualid
Lebbeus sp.	
Lebbeus groenlandicus	spiny lebbeid
Crangonidae	crangonid shrimp
Crangon sp.	
Crangon alaskensis	shell shrimp
Crangon communis	twospine crangon
Crangon dalli	ridged crangon
Crangon septemspinosa	sevenspine bay shrimp
Argis sp.	
Argis alaskensis	common argid
Argis dentata	Arctic argid
Sclerocrangon boreas	sculptured shrimp
Rhynocrangon sharpi	
Argis lar	kuro argid
Argis ovifer	split-eye argid
Paracrangon echinata	horned shrimp
Pasiphaea pacifica	Pacific glass shrimp
Pasiphaea tarda	crimson pasiphaeid
Notostomus japonicus	spinyridge shrimp
Cancer magister	Dungeness crab
Cancer oregonensis	Oregon rock crab
Pinnixa occidentalis	pea crab
Oregonia bifurca	
Oregonia gracilis	graceful decorator crab
Chorilia longipes	Longhorned decorator
Chionoecetes tanneri	grooved Tanner crab
Chionoecetes bairdi	Tanner crab
Chionoecetes angulatus	triangle Tanner crab
Hyas lyratus	Pacific lyre crab
Telmessus cheiragonus	helmet crab
Paguridae	hermit crab unident.
Discorsopagurus schmitti	

	Pagurus sp.	
	Pagurus brandti	sponge hermit
	Pagurus aleuticus	Aleutian hermit
	Labidochirus splendescens	splendid hermit
	Pagurus confragosus	knobbyhand hermit
	Pagurus cornutus	
	Pagurus dalli	whiteknee hermit
	Pagurus kennerlyi	bluespine hermit
	Pagurus trigonocheirus	fuzzy hermit crab
	Pagurus beringanus	Bering hermit
	Pagurus ochotensis	Alaskan hermit
	Pagurus rathbuni	longfinger hermit
	Pagurus stevensae	Stevens hermit crab
	Pagurus tanneri	longhand hermit
	Elassochirus tenuimanus	widehand hermit crab
	Pagurus capillatus	hairy hermit crab
	Elassochirus cavimanus	purple hermit
	Elassochirus gilli	Pacific red hermit
	Lopholithodes sp.	box crab unident.
	Lopholithodes foraminatus	box crab
	Acantholithodes hispidus	fuzzy crab
	Lithodes sp.	
	Lithodes couesi	scarlet king crab
	Lithodes aequispinus	golden king crab
	Rhinolithodes wosnessenskii	rhinoceros crab
	Phyllolithodes papillosus	flatspine triangle crab
	Paralithodes camtschaticus	red king crab
	Paralomis multispina	
	Placetron wosnessenskii	scaled crab
	Erimacrus isenbeckii	horsehair crab
	Pugettia gracilis	graceful kelp crab
	Munida quadrispina	pinchbug
Mollusca	*Neomenia* sp.	
	Neomenia efgamatoi	
	Polyplacophora	chiton unident.
	Lepidozona trifida	
	Lepidozona sp.	

Placiphorella sp.	
Placiphorella pacifica	
Tonicella sp.	Tonicella chitons
Nudibranchia	nudibranch unident.
Dendronotus sp.	
Tritonia sp.	
Tritonia diomedea	rosy tritonia
Triopha catalinae	sea-clown triopha
Armina californica	California armina
Anisodoris nobilis	Pacific sea lemon
Doridae	dorid nudibranch
Archidoris sp.	Archidoris nudibranch
Archidoris odhneri	white night doris
Gastropoda	snail unident.
Natica sp.	
Natica clausa	
Cryptonatica	Aleutian moonsnail
Cryptonatica	rusty moonsnail
Nucella lamellosa	frilled dogwinkle
Euspira pallida	pale moonsnail
Lamellaria sp.	
Crepidula sp.	slipper shell
Colus sp.	
Colus jordani	
Colus herendeenii	thin-ribbed whelk
Colus halli	shrew whelk
Japelion aleutica	
Pyrulofusus dexius	
Volutopsius sp.	
Pyrulofusus harpa	left-hand whelk
Volutopsius fragilis	fragile whelk
Volutopsius regularis	regular whelk
Beringius sp.	
Beringius kennicottii	
Beringius undatus	
Beringius sp. A (McLean & Clark)	Baxter's Beringius
Neptunea sp.	

Neptunea amianta	white neptune
Neptunea pribiloffensis	Pribilof whelk
Neptunea lyrata	lyre whelk
Neptunea ventricosa	fat whelk
Plicifusus kroyeri	
Volutopsius callorhinus	
Plicifusus griseus	gray whelk
Liomesus ooides	egg whelk
Ancistrolepis sp.	
Boreotrophon stuarti	winged trophon
Boreotrophon sp.	
Fusitriton oregonensis	Oregon triton
Bathybembix bairdii	
Cidarina cidaris	
Buccinum sp.	
Buccinum oedematum	swollen whelk
Buccinum viridum	turban whelk
Buccinum plectrum	sinuous whelk
Buccinum scalariforme	ladder whelk
Buccinum aleuticum	Aleut whelk
Buccinum polare	polar whelk
Arctomelon stearnsii	Alaska volute
Bivalvia	bivalve unident.
Mytilidae	mussel unident.
Modiolus modiolus	northern horsemussel
Mytilus sp.	
Mytilus edulis	blue mussel
Pectinidae	scallop unident.
Chlamys sp.	
Chlamys rubida	reddish scallop
Patinopecten caurinus	weathervane scallop
Parvamussium alaskense	Alaska glass-scallop
Hiatella arctica	Arctic hiatella
Panomya sp.	
Yoldia sp.	
Yoldia seminuda	crisscrossed yoldia
Nuculana fossa	trenched nutclam

Empleconia vaginata	vaginated limops
Musculus sp.	
Musculus discors	discordant mussel
Clinocardium sp.	
Clinocardium nuttallii	Nuttall cockle
Clinocardium ciliatum	hairy cockle
Saxidomus gigantea	butter clam
Humilaria kennerleyi	Kennerleys venus
Mactromeris polynyma	Arctic surfclam
Macoma sp.	
Serripes groenlandicus	Greenland cockle
Serripes laperousii	broad cockle
Pododesmus macrochisma	Alaska falsejingle
Pododesmus cepio	abalone jingle
Anomiidae	falsejingles unident.
Cephalopoda	cephalopod unident.
Benthoctopus leioderma	smoothskin octopus
Octopus sp.	
Japetella diaphana	
Opisthoteuthis californiana	flapjack devilfish
Octopus californicus	North Pacific bigeye
Octopus dofleini	giant octopus
Benthoctopus sp.	
Teuthoidea	squid unident.
Taningia danae	rhomboid squid
Rossia pacifica	eastern Pacific bobtail
Loligo opalescens	California market squid
Gonatidae sp.	
Gonatus sp.	
Berryteuthis magister	magistrate armhook
Gonatopsis sp.	
Gonatopsis borealis	boreopacific armhook
Galiteuthis phyllura	
Chiroteuthis calyx	
Taonius pavo	
Octopoteuthis deletron	
Histioteuthis sp.	jewel squids

Bryozoa	Bryozoa	bryozoan unident.
	Eucratea loricata	feathery bryozoan
	Flustra serrulata	leafy bryozoan
	Flustrellidra corniculata	
	Porella compressa	flattened bryozoan
	Rhamphostomella costata	ribbed bryozoan
	Cellepora ventricosa	coral bryozoan
Brachiopoda	Brachiopoda	lampshell unident.
	Terebratalia transversa	common brachiopod
	Terebratulina unguicula	snakeshead brachiopod
	Laqueus californianus	California lamp shell
	Laqueus vancouverensis	Vancouver lampshell
Echinodermata	Asteroidea	sea star unident.
	Evasterias sp.	
	Evasterias troschelii	mottled sea star
	Evasterias echinosoma	giant sea star
	Orthasterias koehleri	redbanded sea star
	Leptasterias hexactis	
	Leptasterias hylodes	Aleutian sea star
	Pycnopodia helianthoides	sunflower sea star
	Stylasterias forreri	long-rayed star
	Tarsaster alaskanus	
	Lethasterias nanimensis	blackspined sea star
	Pedicellaster magister	majestic sea star
	Stephanasterias albula	
	Poraniopsis inflata	thorny sea star
	Henricia sp. B (Clark, 2006)	white Henricia
	Henricia sp.	
	Henricia sanguinolenta	sanguine sea star
	Henricia aspera	ridged blood star
	Henricia leviuscula	blood sea star
	Henricia asthenactis	
	Henricia longispina	
	Henricia spiculifera	spiny Henricia
	Odontohenricia fisheri	
	Leptasterias polaris	
	Leptasterias arctica	

Leptasterias sp.	
Gephyreaster swifti	Swift's sea star
Pseudarchaster alascensis	
Hippasteria sp.	
Hippasteria kurilensis	
Hippasteria sp. A (Clark, 1999)	
Hippasteria sp. E (Clark)	Alaskan spiny star
Hippasteria californica	
Hippasteria spinosa	spiny red sea star
Pseudarchaster parelii	scarlet sea star
Mediaster aequalis	vermilion sea star
Ceramaster sp.	
Ceramaster japonicus	red bat star
Ceramaster patagonicus	orange bat sea star
Ceramaster arcticus	Arctic bat sea star
Luidia foliolata	sand sea star
Dermasterias imbricata	leather sea star
Solaster sp.	
Solaster endeca	northern sun sea star
Solaster dawsoni	morning sun sea star
Solaster stimpsoni	striped sun sea star
Solaster sp. A (Clark 1997)	
Solaster sp. B	
Solaster sp. C (Clark)	beautiful sun star
Solaster sp. D (Clark)	serpent sun star
Solaster sp. E (Clark)	Kessler sun star
Solaster sp. G (Clark)	ocher sun star
Solaster paxillatus	evening sun sea star
Crossaster sp.	
Crossaster borealis	grooved sea star
Crossaster sp. B (Clark)	pink rose star
Crossaster papposus	rose sea star
Heterozonias alternatus	cannonball sun star
Lophaster sp.	
Lophaster sp. A (Clark)	
Lophaster vexator	crested star
Lophaster furcilliger	crested sea star

Pteraster sp.	
Pteraster sp. A (Clark, 1999)	
Pteraster tesselatus	
Pteraster militaris	wrinkled star
Pteraster marssipus	
Pteraster pulvillus	
Diplopteraster multipes	pincushion sea star
Diplopteraster sp.	
Asterias amurensis	purple-orange sea star
Ctenodiscus crispatus	common mud star
Leptychaster sp.	
Leptychaster anomalus	
Leptychaster pacificus	
Leptychaster arcticus	North Pacific sea star
Dipsacaster borealis	northern sea star
Cheiraster dawsoni	fragile sea star
Nearchaster variabilis	
Nearchaster sp.	
Nearchaster pedicellaris	
Brisingella sp.	
Zoroaster evermanni	Evermann's seastar
Myxoderma sacculatum	
Echinacea	sea urchin unident.
Strongylocentrotus droebachiensis	green sea urchin
Strongylocentrotus sp.	
Strongylocentrotus franciscanus	red sea urchin
Strongylocentrotus polyacanthus	
Strongylocentrotus pallidus	white sea urchin
Allocentrotus fragilis	orange-pink sea urchin
Brisaster latifrons	heart urchin
Echinarachnius parma	parma sand dollar
Retiometra alascana	Alaskan crinoid
Florometra sp.	
Florometra serratissima	featherstar crinoid
Ophiuroidea	brittlestarfish unident.
Gorgonocephalus eucnemis	basketstar
Asteronyx sp.	

	Asteronyx loveni	serpent sea star
	Astrochele laevis	
	Ophiura sp.	
	Ophiura sarsi	notched brittlestar
	Stegophiura ponderosa	
	Ophiacantha sp.	
	Ophiacantha diplasia	
	Ophiopholis sp.	
	Ophiopholis longispina	
	Ophiopholis aculeata	ubiquitous brittle star
	Holothuroidea	sea cucumber unident.
	Cucumaria japonica	
	Parastichopus leukothele	giant orange cucumber
	Parastichopus californicus	California sea
	Pseudostichopus sp.	
	Pseudostichopus mollis	sandy sea cucumber
	Molpadia sp.	
	Molpadia intermedia	sweet sea potato
	Bathyplotes sp.	
	Cucumaria sp.	
	Cucumaria fallax	sea football
	Psolus sp.	
	Psolus squamatus	whitescaled sea
	Psolus japonicus	
	Synallactes sp.	
	Synallactes challengeri	
Chordata	Ascidiacea	tunicate unident.
	Thaliacea	salp unident.
	Styela sp.	
	Styela rustica	sea potato
	Boltenia sp.	
	Boltenia ovifera	
	Halocynthia sp.	sea peach unident.
	Halocynthia aurantium	sea peach
	Cnemidocarpa finmarkiensis	broad base tunicate
	Amaroucium sp.	
	Aplidium sp. A (Clark, 2006)	sea glob

Synoicum sp.	sea blob
Ascidia paratropa	glassy tunicate
Halocynthia hispidus	hairy tunicate
Molgula grifithsii	sea grape
Molgula retortiformis	sea clod

APPENDIX C

Weight-length relationships

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
Arrowtooth flounder	Male	3.821E-06	3.131	448
	Female	4.141E-06	3.122	710
	Both	3.869E-06	3.132	1160
Atka mackerel	Male	4.291E-07	3.584	168
	Female	4.451E-06	3.177	166
	Both	1.578E-06	3.358	334
Blackspotted rockfish	Male	5.543E-06	3.166	228
	Female	4.684E-06	3.195	192
	Both	5.161E-06	3.178	420
Pacific cod	Male	5.048E-06	3.116	267
	Female	4.925E-06	3.120	294
	Both	4.937E-06	3.121	561
Dover sole	Male	2.646E-06	3.214	231
	Female	2.550E-06	3.221	239
	Both	2.554E-06	3.221	470
Dusky rockfish	Male	9.436E-06	3.102	322
	Female	8.028E-06	3.128	421
	Both	8.724E-06	3.115	743
Flathead sole	Male	1.878E-06	3.263	320
	Female	2.299E-06	3.229	372
	Both	2.393E-06	3.221	704
Giant grenadier	Male	3.221E-03	2.408	129
	Female	6.978E-04	2.697	218
	Both	9.549E-04	2.639	347
Northern rockfish	Male	8.954E-06	3.090	320
	Female	9.277E-06	3.086	338
	Both	8.977E-06	3.091	658
Northern rock sole	Male	5.083E-06	3.136	224
	Female	3.480E-06	3.207	290
	Both	3.899E-06	3.186	514
Walleye pollock	Male	4.149E-06	3.104	676
	Female	4.658E-06	3.078	875
	Both	4.704E-06	3.079	1570
Pacific ocean perch	Male	8.128E-06	3.089	213
	Female	7.409E-06	3.104	205
	Both	7.486E-06	3.103	422
Rex sole	Male	5.451E-07	3.417	221
	Female	5.955E-07	3.407	275
	Both	5.524E-07	3.417	496
Rougheye rockfish	Male	8.619E-06	3.095	235
	Female	7.562E-06	3.121	256
	Both	7.616E-06	3.119	495
Sablefish	Male	1.691E-06	3.272	365
	Female	1.960E-06	3.247	277
	Both	1.776E-06	3.263	645
Sharpchin rockfish	Male	4.290E-06	3.210	232
	Female	3.866E-06	3.229	266
	Both	4.044E-06	3.221	498
Shortraker rockfish	Male	8.303E-06	3.105	141
	Female	6.630E-06	3.143	140
	Both	7.507E-06	3.122	281
Southern rock sole	Male	4.595E-06	3.164	220
	Female	4.030E-06	3.193	292
	Both	4.478E-06	3.172	513
Shortspine thornyhead	Male	4.160E-06	3.178	276
	Female	2.480E-06	3.268	283
	Both	3.294E-06	3.218	630

RECENT TECHNICAL MEMORANDUMS

Copies of this and other NOAA Technical Memorandums are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22167 (web site: *www.ntis.gov)*. Paper and electronic (.pdf) copies vary in price.

AFSC-

328 RARING, N. W., P. G. von SZALAY, M. H. MARTIN, M. E. WILKINS, and F. R. SHAW. 2016. Data report: 2001 Gulf of Alaska bottom trawl survey, 319 p. NTIS number pending.

327 DALY, B. J., C. E. ARMISTEAD, and R. J. FOY. 2016. The 2016 eastern Bering Sea continental shelf bottom trawl survey: Results for commercial crab, 167 p. NTIS number pending.

326 LEW, D. K., D. PUTNAM, and D. M. LARSON. 2016. Attitudes and preferences toward Pacific halibut management alternatives in the saltwater sport fishing charter sector in Alaska: Results from a survey of charter halibut permit holders, 58 p. NTIS number pending.

325 von SZALAY, P. G., and N. W. RARING. 2016. Data report: 2015 Gulf of Alaska bottom trawl survey, 249 p. NTIS number pending.

324 RUTECKI, T. L., C. J. RODGVELLER, and C. R. LUNSFORD. 2016. National Marine Fisheries Service longline survey data report and survey history, 1990-2014, 329 p. NTIS number pending.

323 M. M. MUTO, V. T. HELKER, R. P. ANGLISS, B. A. ALLEN, P. L. BOVENG, J. M. BREIWICK, M. F. CAMERON, P. J. CLAPHAM, S. P. DAHLE, M. E. DAHLHEIM, B. S. FADELY, M. C. FERGISON, L. W. FRITZ, R. C. HOBBS, Y. V. IVASHCHENKO, A. S. KENNEDY, J. M. LONDON, S. A. MIZROCH, R. R. REAM, E. L. RICHMOND, K. E. W. SHELDEN, R. G. TOWELL, P. R. WADE, J. M. WAITE, and A. N. ZERBINI. 2016. Alaska marine mammal stock assessments, 2015, 300 p. NTIS number pending.

322 FAUNCE, C., J. GASPAR, J. CAHALAN, S. LOWE, S. BARBEAUX, and R. WEBSTER. 2016. Deployment performance review of the 2015 North Pacific Groundfish and Halibut Observer Program, 54 p. NTIS number pending.

321 FRITZ, L., K. SWEENEY, R. TOWELL, and T. GELATT. 2016. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) conducted in Alaska in June-July 2013 through 2015, and an update on the status and trend of the western distinct population segment in Alaska, 72 p. NTIS number pending.

320 ECHAVE, K. B. 2016. Feasibility of tagging sablefish, *Anoplopoma fimbria*, with pop-off satellite tags in the northeast Pacific Ocean, 38 p. NTIS number pending.

319 BARBEAUX, S. J., S. ROMAIN, E. LOGERWELL, and D. FRASER. 2016. Aleutian Islands Cooperative Acoustic Survey Study, 2007, 35 p. NTIS number pending.

318 WHITEHOUSE, G. W., and K. Y. AYDIN. 2016. Trophic structure of the eastern Chukchi Sea: An updated mass balance food web model, 175 p. NTIS number pending.

317 SMITH, T. A., and R. A. MCCONNAUGHEY. 2016. The applicability of sonars for habitat mapping: a bibliography, 129 p. NTIS number pending.

316 TESTA, J. W. (editor). 2016. Fur seal investigations, 2013-2014, 126 p. NTIS number pending.

315 HELKER, V. T., M. M. MUTO, and L. A. JEMISON. 2016. Human-caused injury and mortality of NMFS-managed Alaska marine mammal stocks, 2010-2014, 89 p. NTIS number pending.

314 KONDZELA, C. M., J. A. WHITTLE, D. YATES, S. C. VULSTEK, H. T. NGUYEN, and J. R. GUYON. 2016. Genetic stock composition analysis of chum salmon from the prohibited species catch of the 2014 Bering Sea walleye pollock trawl fishery and Gulf of Alaska groundfish fisheries, 49 p. NTIS No. PB2016-102777.