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Groundfish Food Habits and Predation on Commercially Important Prey Species in the Eastern Bering Sea From 1993 Through 1996

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Groundfish Food Habits and Predation on
Commercially Important Prey Species in the
Eastern Bering Sea from 1993 through 1996

by

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ABSTRACT

This document describes the feeding habits of major groundfish species in the eastern Bering Sea based on stomach content information collected during the summers of 1993, 1994, 1995, and 1996. The total consumption of commercially important prey species by groundfish populations is calculated for the main feeding period of May through September during 1993, 1994, 1995, and 1996. Estimated predation mortality in terms of numbers and biomass during this period is presented. These estimates are compared with existing knowledge of prey species abundance. Possible impact of predation on prey species abundance patterns is discussed. Diet information on butterfly sculpin (*Hemilepidotus papilio*) and marbled (*Lycodes raridens*), wattled (*L. palaeris*), and shortfin (*L. brevipes*) eelpouts is also presented.

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EXECUTIVE SUMMARY

This document summarizes groundfish predation on commercially important stocks of fish and crabs on the eastern Bering Sea shelf from 1993 through 1996. The amount of predation is calculated using estimates of predator biomass, daily ration, and the proportion of various prey categories in the stomach contents. Estimates are presented in terms of number and biomass of prey consumed during the main sampling period of May through September of each year.

Predator and Prey Species

The following groundfish predators are included in this report because they are dominant members of the eastern Bering Sea shelf fish fauna that consume commercially important fish or crab. The commercially important prey eaten by some of these predators are also listed below:

Groundfish predators

Walleye pollock
Pacific cod
Yellowfin sole
Greenland turbot
Arrowtooth flounder
Flathead sole
Pacific halibut
Alaska plaice
Northern rock sole
Skates
Marbled eelpout
Wattled eelpout
Shortfin eelpout
Butterfly sculpin

Commercially important prey

Walleye pollock
Pacific cod
Yellowfin sole
Greenland turbot
Arrowtooth flounder
Flathead sole
Northern rock sole
Pacific halibut
Pacific herring
King crabs
Snow crab
Tanner crab
Osmerids

Total Groundfish Consumption Estimates

The total amount of each prey consumed from May through September of 1984 through 1996 is presented in Tables 1 and 2. These estimates are the sum of the consumption by each predator species. Unlike previous reports, the estimated consumption of walleye pollock (*Theragra chalcogramma*) does not include cannibalism for the period October through December due to low sample sizes. Biomass consumed was converted to number consumed using available prey size information. When prey size information was lacking or incomplete for a predator, number consumed is an underestimate and is shown in parentheses.

Estimated number-at-age of snow crab (*Chionoecetes opilio*), Tanner crab (*C. bairdi*), and walleye pollock consumed by groundfish predators are presented in Tables 3-5 and Figure 1. Total numbers of age-0 snow crab consumed were small from 1993 through 1996; however, age-1 consumption was larger than previous years, possibly indicating large recruitment in those years. Consumption of Tanner crab of all ages groups in recent years was low, a potential indication of low recruitment. Age-0 walleye pollock consumption was relatively high in 1994 and 1996, possibly indicating high recruitment.

Miscellaneous Species General Diet

Butterfly sculpins exhibited a diverse, primarily benthic diet composed of amphipods (10%), polychaete worms (15%), shrimp (12%), echiurid worms (7%), walleye pollock (7%), and larvaceans (24%) by weight. Little dietary variation was seen with predator size for butterfly sculpins. Wattled, marbled and shortfin eelpouts also primarily consumed benthic organisms such as polychaete worms (20-30%), amphipods (10-40%), brittle stars (25%) and miscellaneous fish (3-15%) including sculpins, pricklebacks, Pacific herring, snailfish, capelin and walleye pollock. Polychaete worms were more important by weight to smaller eelpouts while fish prey became more important with size.

Table 1.-- Estimated total biomass (metric tons) by year of commercially important prey consumed by groundfish from May through September in the eastern Bering Sea. Consumption of walleye pollock includes cannibalism estimates for 1985-96.

Prey	Year								
	1984	1985	1986	1987	1988	1989	1990	1991	1992
King crabs	2,684	1,136	2,867	845	568	1,935	348	8	1,035
Snow crab (<i>Chionoecetes opilio</i>)	98,818	132,467	149,078	151,242	62,173	129,343	149,049	139,349	102,086
Tanner crab (<i>Chionoecetes bairdi</i>)	63,189	89,991	48,822	107,134	55,825	88,520	63,432	40,179	36,516
Pacific cod	13,430	9,978	9,302	8,881	1,330	7,762	42,534	3,075	4,123
Walleye pollock	314,783*	1,443,121	1,158,022	697,131	706,000	745,825	1,813,469	852,814	926,936
Pacific herring	0	19,322	44,440	12,286	5,440	79	16,410	10,674	3,600
Atka mackerel	0	0	0	1,650	0	0	3,187	0	0
Arrowtooth flounder	4,327	15,436	781	13,761	0	464	832	1,164	10,551
Flathead sole	9,787	5,929	13,993	1,965	1,454	25,718	7,325	3,260	12,312
Rock sole	8,020	20,843	38,804	18,552	5,156	15,283	6,309	10,677	36,038
Yellowfin sole	56,291	28,359	42,330	17,394	9,671	7,190	5,203	5,394	6,391
Greenland turbot	3,919	0	0	0	16	17,635	12,922	635	2,559
Pacific halibut	89	0	0	0	185	0	0	68	1,481
Alaska plaice	0	0	0	0	0	13	0	0	557

* Walleye pollock cannibalism estimate was not available for 1984.

Table 1.--Continued

Prey	1993	1994	1995	1996
King crabs	2,066	5,126	6,286	5,025
Snow crab (<i>Chionoecetes opilio</i>)	170,588	268,499	243,405	252,082
Tanner crab (<i>Chionoecetes bairdi</i>)	257,256	62,987	84,696	78,773
Pacific cod	9,835	30,190	15,319	7,563
Walleye pollock	1,315,784	1,745,306	2,293,032	2,087,906
Pacific herring	124	2,353	8,369	3,248
Atka mackerel	0	0	0	0
Arrowtooth flounder	5,837	1,601	7,682	8,508
Flathead sole	18,542	26,428	4,795	37,492
Rock sole	74,572	40,289	38,340	37,293
Yellowfin sole	15,871	23,538	28,979	3,236
Greenland turbot	15,360	286	5	1,442
Pacific halibut	1,126	2,189	14	59
Alaska plaice	45	574	0	0

Table 2.-- Estimated number (millions) by year of commercially important prey consumed by groundfish from May through September in the eastern Bering Sea. Values in parentheses indicate cells with some missing prey size data and are underestimates. Consumption of walleye pollock includes cannibalism estimates for 1985-96.

Prey	Year									
	1984	1985	1986	1987	1988	1989	1990	1991	1992	
King crabs	(35,566) ^a	(2)	(5)	(1)	8	(3)	(0)	(1)	1	
Snow crab (<i>Chionoecetes opilio</i>)	(30,921)	12,235	13,042	(10,666)	11,870	(20,805)	67,938	(34,941)	(38,042)	
Tanner crab (<i>Chionoecetes bairdi</i>)	(152,850)	(13,926)	9,898	42,632	14,659	(27,244)	20,514	18,512	(6,614)	
Pacific cod	(1,124)	3,263	(76)	8,194	2	(75)	(6,772)	(61)	(29)	
Walleye pollock	(47,832) ^b	(664,467)	(160,511)	91,049	56,858	554,766	(228,351)	(31,119)	(48,062)	
Pacific herring	0	(303)	(554)	(23)	140	(1)	(909)	71	(0)	
Atka mackerel	0	0	0	8	0	0	(0)	0	0	
Arrowtooth flounder	1,920	(3)	(40)	3,791	0	(101)	174	13	(25,874)	
Flathead sole	363	2,128	381	210	761	(4,292)	(4,623)	146	(261)	
Rock sole	23,611	5,514	1,688	1,531	(5,809)	1,694	975	(1,035)	(709)	
Yellowfin sole	480	313	651	63,767	(87)	16,909	78	48	(118)	
Greenland turbot	81,721	0	0	0	17	(30,328)	34,128	1,278	17,215	
Pacific halibut	728	0	0	0	665	0	0	507	(2,093)	
Alaska plaice	0	0	0	0	0	9	0	0	(0)	

Table 2. (Con't)

Prey	1993	1994	1995	1996
King crabs	(0)	(513)	(1)	(0)
Snow crab (<i>Chionoecetes opilio</i>)	(21,085)	20,169	(99,400)	(17595)
Tanner crab (<i>Chionoecetes bairdi</i>)	18,842	9,680	(6,495)	6,563
Pacific cod	6,516	(1,327)	(27)	(270)
Walleye pollock	284,406	770,195	386,085	650,679
Pacific herring	8	74	(271)	25
Atka mackerel	0	0	0	0
Arrowtooth flounder	(90)	25	84	2,768
Flathead sole	2,452	542	454	194,859
Rock sole	17,117	256,594	816	20,343
Yellowfin sole	172	513	428	302
Greenland turbot	88,186	1,075	11	9,138
Pacific halibut	1,695	(0)	30	1,585
Alaska plaice	(0)	(7,146)	(0)	0

^a Most king crab consumed in 1984 were blue king crab megalops larvae. ^bWalleye pollock cannibalism estimate was not available for 1984.

Table 3. Estimated number (millions) of snow crab, *Chionoecetes opilio*, consumed by age by groundfish from May through September in the eastern Bering Sea.

Age	Year												
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
-	-	-	-	-	312.07	-	2,386.71	12,414.24	3,474.40	21.00	-	777.00	-
1	28,596.70	7,001.20	5,880.00	5,293.27	10,016.68	17,238.94	7,486.98	5,843.12	2,980.90	17,026.00	13,746.00	94,862.00	11,816.00
2	1,700.50	4,385.50	6,464.40	2,808.65	920.02	2,530.76	499.14	151.02	63.38	2,520.00	3,388.00	1,191.00	2,653.00
3	559.10	792.00	655.90	1,513.75	530.21	925.31	90.36	96.84	33.56	1,322.00	2,810.00	2,292.00	3,008.00
4	64.60	56.20	41.50	16.23	68.96	102.14	47.76	6.46	42.83	137.00	181.00	239.00	75.00
5	-	-	-	9.02	-	4.14	3.54	-	19.23	50.00	63.00	38.00	43.00
6	-	-	-	13.20	-	4.14	-	-	-	10.00	-	24.00	-

Table 4. Estimated number (millions) of Tanner crab, *Chionoecetes bairdi*, consumed by age by groundfish from May through September in the eastern Bering Sea.

Age	Year												
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
-	139,312.90	5,371.70	3,370.70	27,883.16	1,074.11	18,646.08	6.83	730.54	-	744.00	4,143.00	141.00	469.00
1	13,161.40	7,693.00	6,644.70	10,637.84	13,204.82	7,925.99	62,464.29	29,376.67	34,918.99	15,413.00	4,979.00	5,476.00	5,240.00
2	296.30	650.50	191.10	576.12	361.90	549.16	4,737.75	4,319.00	2,596.80	2,074.00	391.00	689.00	591.00
3	87.60	197.60	6.50	98.75	11.84	82.06	637.84	457.88	432.76	474.00	138.00	167.00	263.00
4	-	12.90	-	-	2.76	32.45	91.31	52.94	78.21	64.00	26.00	22.00	-
5	-	-	-	-	2.76	8.05	-	3.49	13.94	54.00	4.00	-	-
6	-	-	-	-	-	-	-	-	1.26	18.00	-	-	-

Table 5. Estimated number (millions) of walleye pollock, *Theragra chalcogramma* consumed by age by groundfish from May through September in the eastern Bering Sea.

Age	Year												
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
-	43,819.42	642,951.50	121,822.70	80,252.80	43,635.30	544,371.20	177,071.06	8,962.40	31,857.13	258,642.00	756,387.00	360,794.00	634,703.00
1	4,042.00	26,667.90	37,203.10	9,220.75	11,826.20	9,193.03	48,480.70	20,871.53	13,966.42	22,985.00	10,873.00	18,234.00	14,153.00
2	188.10	546.60	1,092.10	1,627.61	673.74	486.78	1,981.31	823.98	1,019.12	1,423.00	1,137.00	5,879.00	1,005.00
3	152.50	210.00	347.90	205.46	187.25	156.48	344.22	151.73	705.12	632.00	830.00	304.00	132.00
4	77.30	97.00	59.20	33.13	230.55	164.29	187.53	98.44	201.42	238.00	372.00	262.00	279.00
5	50.50	48.90	67.00	13.04	126.82	154.44	124.37	54.12	80.51	245.00	274.00	213.00	153.00
6+	39.70	32.00	87.10	9.50	135.65	216.17	161.53	157.27	232.43	241.00	321.00	399.00	254.00

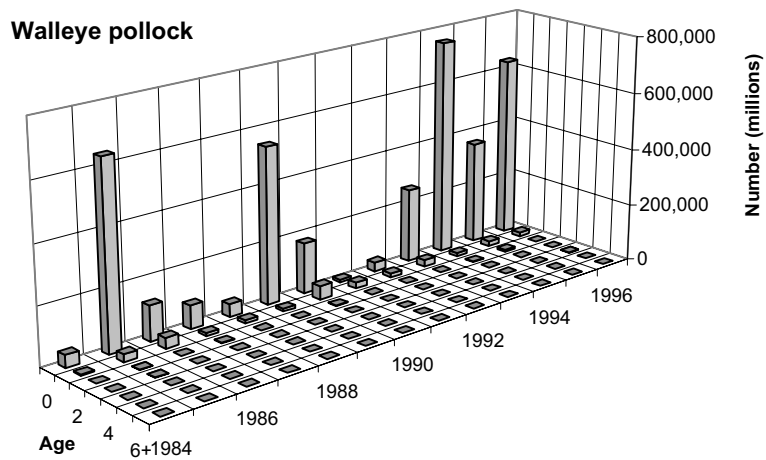
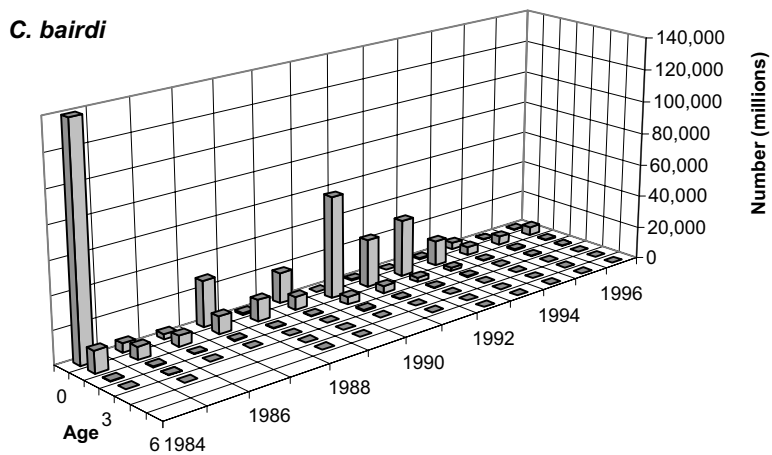
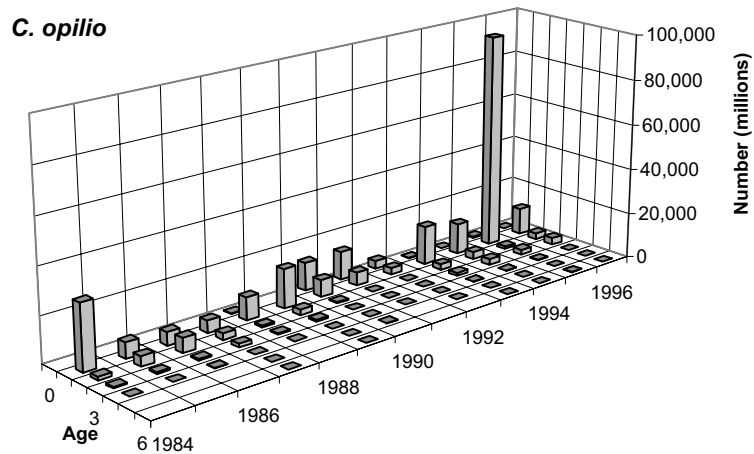


Figure 1.-- Estimated number at-age of snow crabs (*Chionoecetes opilio*), Tanner crabs (*C. bairdi*), and walleye pollock (*Theragra chalcogramma*), consumed by groundfish during months 5 to 9 from 1984 to 1996 in the eastern Bering Sea. (There was no cannibalism estimate for walleye pollock in 1984.)

INTRODUCTION

Many large marine fish are predators of either juvenile or small adult fish and crab. Because predation forms the largest part of natural mortality of young fish and crab, it is important to estimate the magnitude of predation loss on commercially important populations. Population models that assume constant natural mortality rates due to a lack of information on actual rates can be improved by providing more accurate estimates of predation losses. The move toward multispecies management of stocks can be helped through studying the food web connections between components of marine ecosystems, which include fish, crabs, marine mammals, and birds.

The primary purpose of the Trophic Interactions Program of the Resource Ecology and Fisheries Management Division (REFM) at the Alaska Fisheries Science Center (AFSC) is to study the consumption of commercially important fish or crab by key fish predators in the eastern Bering Sea. These fish and the fish they consume are commercially important species and form a major part of the groundfish biomass in the eastern Bering Sea. Program objectives include providing impact assessments relating to fish predation effects on prey species populations, improving population model estimates of predation mortality by marine fish, and detecting possible changes in abundance and distribution of juvenile fish and crab populations.

This paper reports the progress of the Trophic Interactions Program of the REFM Division of the AFSC in analyzing available data from 1993 through 1996 on the predation of commercially important fish and crab species. The first section details the methods used to estimate the total biomass and numbers of prey consumed by the major groundfish species in the area. The second section summarizes the consumption of commercially important prey by all the major predators. Appendices summarize the diet and total prey consumption by the following predators: walleye pollock, Pacific cod (*Gadus macrocephalus*), yellowfin sole (*Limanda aspera*), flathead sole (*Hippoglossoides elassodon*), northern rock sole (*Lepidopsetta polyxystra*), Alaska plaice (*Pleuronectes quadrituberculatus*), Greenland turbot (*Reinhardtius hippoglossoides*), arrowtooth flounder (*Atheresthes stomias*), Pacific halibut (*Hippoglossus stenolepis*), and skates (Rajidae). Diet information alone (i.e. no estimates of total prey consumption) is presented in Appendix H for marbled eelpout (*Lycodes raridens*), wattled eelpout (*L. palearis*), shortfin eelpout (*L. brevipes*), and butterfly sculpin (*Hemilepidotus papilio*) from 1994. This is the fourth in a series of papers (Livingston et al, 1991; Livingston, 1993; and Livingston and deReynier 1996) detailing the diets and consumption estimates of commercially important groundfish in the eastern Bering Sea.

METHODS

Sample Collection and Laboratory Analysis

Stomachs were collected from major groundfish species during 1993, 1994, 1995, and 1996 in the eastern Bering Sea (Fig. 2). Samples were taken primarily during May through September using bottom and pelagic trawl gear on research and commercial fishing vessels. Sampling occurred throughout the 24-hour day, although most sampling occurred between 0600 and 2000 Alaska Daylight Time. For all species, stomachs were removed at sea and placed in cloth bags labeled with information regarding the location of capture, fork length, sex, and sexual maturity of the fish. Fish showing evidence of regurgitation (i.e., food in the mouth or throat or a flaccid stomach) were not included in the sample. Stomachs were preserved in 10% formalin and later transferred to 70% ethyl alcohol. Contents were identified to the lowest taxonomic level possible and enumerated. Wet weights were recorded after the contents were blotted with paper towels. Standard length (SL) measurements of prey fish and carapace width (CW) or lengths (CL) of crab prey were taken when whole prey were available.

The prey category "offal" was used if the ingested item had obviously been discarded from a processor (i.e., a consumed fish that had its head sliced off with a clean diagonal cut).

Data Analysis

Prey Consumption by Predator Populations

Estimates of the total biomass of each prey species consumed by the continental shelf portion of each groundfish population were calculated according to

$$C_i = DR_i * D * B_i * P_i , \quad \text{Eq. (1)}$$

where C_i is the consumption (by weight) of a prey species by size group i of a predator species, DR_i is the daily ration (as a proportion of body weight daily, BWD) of predator size group i , D is the number of days in the sampling period when the prey species was vulnerable to predation, B_i is the biomass of the predator size group i , and P_i is the proportion by weight of the prey species in the diet of predator size group i .

Total consumption estimates (Equation 1) were computed for each major eastern Bering Sea strata (Fig. 1). These strata were devised by the Resource Assessment and Conservation Engineering (RACE) Division of the AFSC to reflect, in general, natural boundaries based on bottom depth. Strata 1 and 2 are considered the inner continental shelf, strata 3 and 4 are the middle shelf, and strata 5 and 6 are the outer shelf zones.

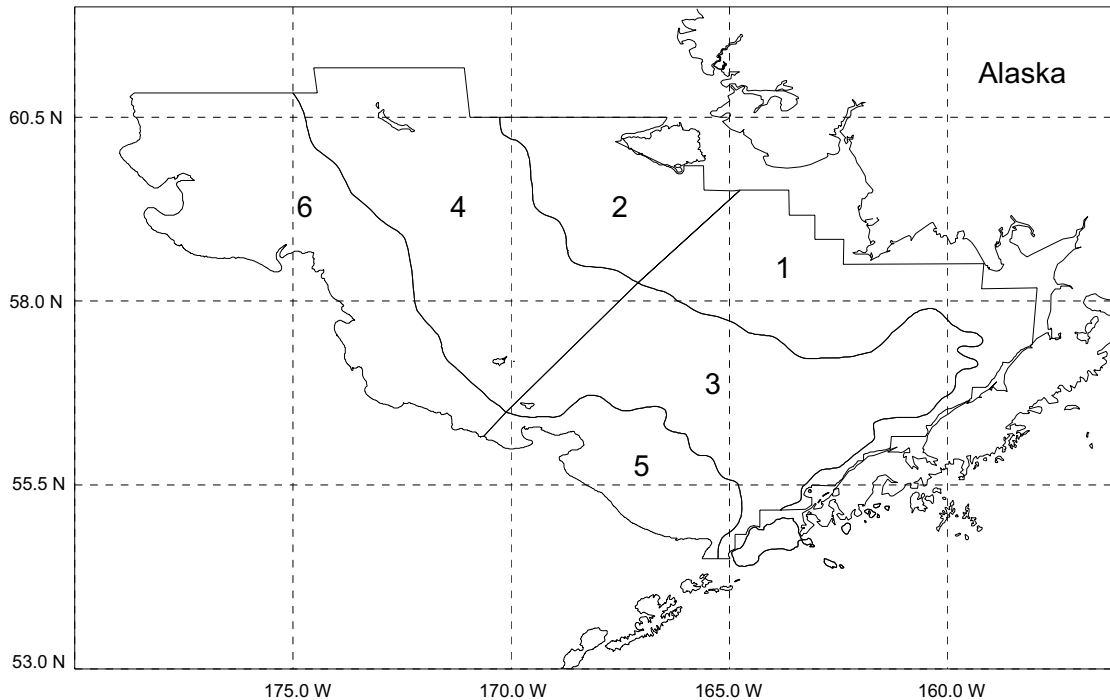


Figure 2. Map of the eastern Bering Sea showing strata used in this report.

Predator size groupings used for total consumption estimates were based on size groupings used previously (Livingston et al. 1986, Livingston 1991, Livingston et al. 1993) and on knowledge of each predator's diet. If consumption of commercially important prey groups differed among predator sizes, then predator size groups were chosen to minimize such consumption differences within a size group.

Daily ration (DR) estimates were derived using some basic bioenergetic considerations as an alternative to using rations estimated from gastric evacuation rate models and field-estimated stomach content weights. As Livingston et al. (1986) found, estimates derived from gastric evacuation rate models tend to be lower than expected based on known annual growth patterns of eastern Bering Sea species. Part of the problem with rations estimated in this fashion may be due to undetected regurgitation of stomach contents from field collections. It is believed that more realistic rations can be derived using bioenergetic variables such as annual growth increments and food conversion efficiency estimates; thus, that is the approach used here. Daily growth in weight of each species size group was estimated from annual growth increments by length and length-weight relationships for each species. A gross conversion efficiency

rate of food to somatic tissue for juvenile fish was assumed to be 25% and for adult fish was assumed to be 10% based on estimates presented by Brett and Groves (1979). Daily growth increments could thus be converted to the amount of food required to produce that growth. When the daily food requirements are divided by mean fish weight, the result is daily ration expressed as a fraction of body weight. Daily rations of each species, by size group used were:

Predator	Predator size (cm)	Daily ration
Pacific cod	<30	0.012
	30-50	0.009
	≥60	0.007
Walleye pollock	<30	0.011
	30-39	0.011
	40-49	0.008
	≥50	0.004
Greenland turbot	<30	0.011
	30-49	0.013
	≥50	0.005
Arrowtooth flounder	<20	0.009
	20-39	0.009
	≥40	0.007
Pacific halibut	<30	0.014
	30-50	0.010
	≥60	0.004
Flathead sole	all sizes	0.007
Yellowfin sole	all sizes	0.004
Alaska plaice	all sizes	0.005
Northern rock sole	all sizes	0.007
Skates	all sizes	0.007

The time period of analysis (D) for total consumption estimates by all predator species was a May through September, or 153 days. The analysis was restricted to this time period because most stomach samples were collected during this period and survey estimates of groundfish biomass were obtained at this time. Unquantified

migrations of fish into different strata occur and insufficient numbers of stomach samples were taken in each stratum outside of this time period. Thus, total consumption estimates made outside of this time period would not be very reliable. Since May through September probably represent most of the main feeding and growth period for groundfish in the eastern Bering Sea, these total consumption estimates can be considered conservative estimates of total annual predation removals by these groundfish populations.

Total consumption estimates of king crabs (family Lithodidae) by Pacific cod were restricted to a 31-day period during May through September when it is most likely that soft-shell (newly molted) king crabs were available. Unlike previous reports, total consumption estimates for walleye pollock cannibalism were not made for October through December because of low sample sizes during this period in 1993 through 1996.

Predator biomass estimates (B) (listed in the respective appendix for each species) for flathead sole, rock sole, Alaska plaice, Greenland turbot, arrowtooth flounder, yellowfin sole, Pacific halibut, and skates were obtained from RACE Division bottom trawl survey data¹. These trawl surveys are conducted in the eastern Bering Sea during May to August of each year. Biomass estimates of arrowtooth flounder and Greenland turbot include only the shelf portion of the populations. Biomass estimates of walleye pollock, a semipelagic fish, were obtained from age-structured model results². Biomass estimates of Pacific cod were obtained from length-structured model results³. Biomasses of species obtained from model outputs were apportioned into each stratum by using the proportion of the trawl survey biomass found in each stratum.

The proportion by weight of each prey item in the diet of each predator size group was calculated for each stratum in the following fashion. First, all stomach content data for a particular predator size group that were collected in a stratum during May through September in a given year were used. Estimates of the percentage by weight of a given prey item in the stomach contents were then calculated for each 20 nautical mile square in the stratum where stomachs were collected. The estimated percent by weight of the prey item in the whole stratum was then calculated as the average of the percentages from each 20 nautical mile square. Standard errors of the stratum percentages were derived from the variance between squares.

1 Gary Walters, Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA, 98115, Pers. Commun., 2002.

2 James Ianelli, Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA, 98115, Pers. Commun., 2002.

3 Grant Thompson, Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA, 98115, Pers. Commun., 2002.

For strata where prey size information was available, total consumption estimates in terms of biomass were converted to number of prey. The size frequency of a particular prey in the stomach contents of a given predator size group from a stratum in a particular year during May through September was used along with the length-weight relationship for the prey to convert biomass consumed within a particular prey size interval to number consumed. If prey size information for a given predator size group was not available for a given stratum, the size frequency of that prey in all strata combined for the predator size group was used. Finally, when no prey size information was available, the number consumed could not be estimated.

Snow and Tanner crabs and walleye pollock were assigned to approximate age groups based on the following age-length conversions:

Age (years)	Carapace width (mm)		Standard length (cm)
	<i>C. opilio</i>	<i>C. bairdi</i>	Walleye pollock
0	<5	<9	<10
1	5-24	9-34	10-19
2	25-39	35-49	20-27
3	40-59	50-69	28-33
4	60-74	70-84	34-37
5	75-94	85-104	38-40
6+	≥95	≥105	≥41

RESULTS AND DISCUSSION

Groundfish Predation on Commercially Important Prey

The total impact of groundfish predation on a particular prey species was estimated by summing the individual predator species removals described in the appendices. Comparison of total fish predation with each predator species' removals provides an indication of which predator population tends to be the most important source of mortality for a prey population. Also, comparison of total predation removals with prey population size demonstrates the relative importance of predation as a source of mortality. Finally, interannual fluctuations in predation on a particular age group of prey may give early indications of changes in abundance of prey age groups before they are vulnerable to assessment by trawl survey. The total consumption of each important prey group is summarized in terms of estimated biomass and numbers removed by groundfish predation in the eastern Bering Sea for segments of the years 1993 through 1996.

King Crabs

Tables 6-7 and Figure 3 present the estimated total biomass and number of king crabs consumed by all groundfish predators for 31 days during May through September in 1993 through 1996.

Red king crab--Pacific cod was the main predator of red king crabs (*Paralithodes camtschatica*) and king crabs that could not be identified to the species level. Most of the unidentified king crabs consumed by Pacific cod were assumed to be red king crabs based on the locations where unidentified king crabs were consumed. These crabs were assumed to be soft-shell females based on the timing and location of consumption by Pacific cod. Walleye pollock and yellowfin sole were minor predators on unidentified king crabs and probably consumed pelagic larvae. Pacific halibut was also a minor consumer of king crab. The largest amounts of king crab consumed were by Pacific cod consuming king crab legs in all years. Pacific cod consumption of red king crab and unidentified king crab (not including legs only consumption) was 2,202, 4,941, 6,830 and 5,025 metric tons (t) in 1993, 1994, 1995, and 1996, respectively. Groundfish predation on king crab in terms of biomass during these four years was somewhat higher than the estimated predation for the 1990-92 period, which ranged from 329 t to 1,037 t (Livingston and deReynier 1996). Abundance of female red king crab (Rugolo et al. 2001) during the 1993 through 1996 period was about the same as abundance in 1990 through 1992. Consumption of king crab legs was higher in all years than the consumption of whole-body crab.

Table 7. –Estimated numbers (millions) of king crabs consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea.

Prey	Predator	1993	1994	1995	1996
King crab legs	Pacific cod				
	Pacific halibut				
	Skates				
	Yellowfin sole				
	Total				
Lithodidae	Pacific cod				
	Pacific halibut				
	Walleye pollock				
	Yellowfin sole				
	Total				
<i>Paralithodes</i> spp.	Pacific cod				
	Total				
Red king crab	Pacific cod	(0)	(513)	(0)	
	Pacific halibut			1	
	Total	(0)	(513)	(1)	

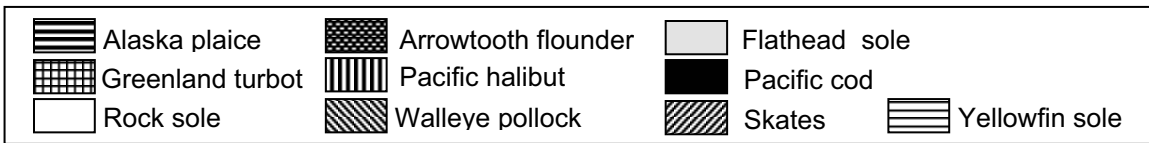
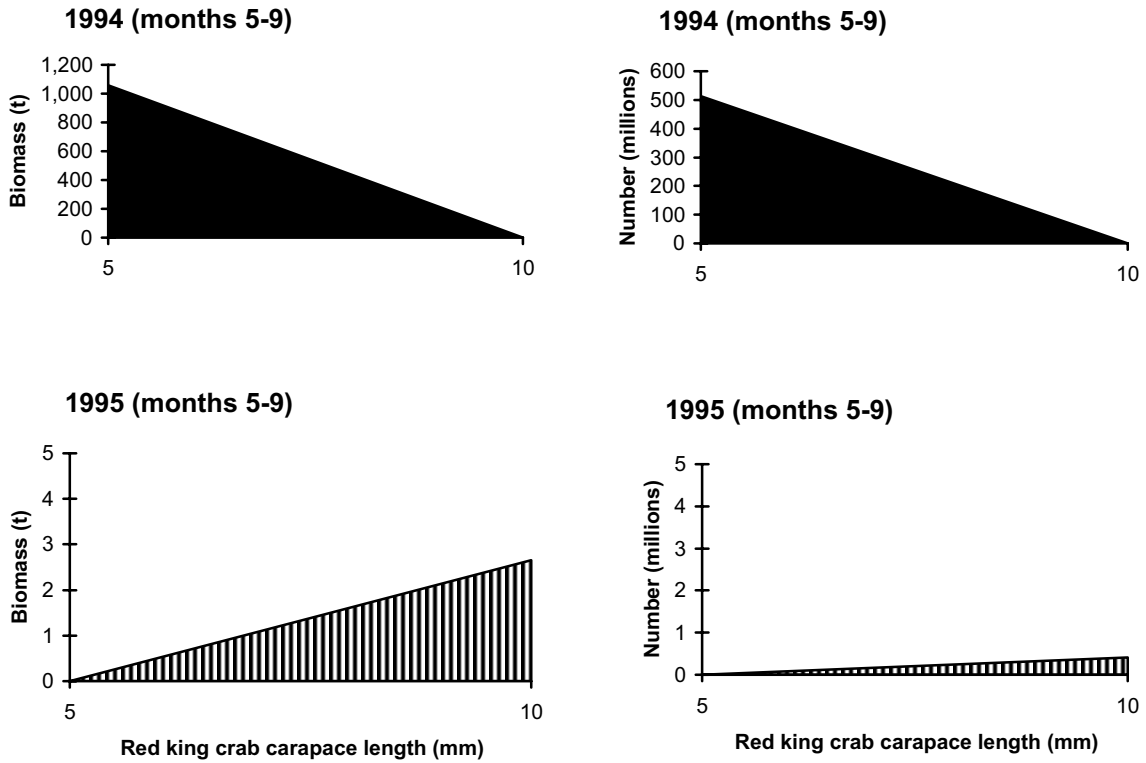


Figure 3. -- Estimated biomass (metric tons) and numbers of red king crab consumed by groundfish predators during May through September in 1994 and 1995 in the eastern Bering Sea by prey size. Note differing y-axes between years.

Snow and Tanner Crabs

Total biomass of snow and Tanner crabs consumed by groundfish predators is presented in Table 8. Table 9 presents data on the estimated number of snow crabs consumed in areas where prey size information was available, so they should be considered the minimum number consumed by groundfish predators. Figures 4-5 show the biomass and numbers removed by prey size.

Snow crabs--The main predator of snow crabs, in terms of estimated biomass removed, was Pacific cod, consuming at least 75% of the total biomass removals of snow crabs in all four years. The remaining predators were flathead sole, walleye pollock, Pacific halibut, rock sole, skates, and yellowfin sole. Biomass of snow crabs consumed by Pacific cod was highest in 1993 (192,644 t) and lowest in 1994 (48,432 t), and numbers consumed by Pacific cod showed a similar trend during the time period. Unlike the 1990 to 1992 period, consumption of snow crab by the other groundfish predators did not occur every year, particularly 1996, and was less prevalent in the small mouthed flatfish. This could indicate the availability of fewer small snow crab in the 1993 to 1996 period compared to the 1990 to 1992 period.

Most of the sampled snow crab consumed in 1993 through 1996 were less than 20 mm CW or approximately age 0 to age 1. Rugolo et al. (2001) show a steady decline in the numbers of snow crab through this time period. The large numbers of ages 0-1 crab consumed in 1995 may be a reflection of above-average numbers of small crab recruiting into the southeastern Bering Sea shelf population in subsequent years as noted by Rugolo et al. (2001). Monitoring the amount of predation on small crabs by these predators may provide early indications of the presence of abundant year classes of crabs.

Tanner crabs--Estimated total biomass of Tanner crabs consumed by all predators was highest in 1994 (268,499 t) and lowest in 1993 (170,588 t). Like snow crabs, most of the biomass removed was due to Pacific cod predation (> 76%). Pacific cod also consumed the largest number of mostly small (< 25 mm CW) Tanner crab unlike the 1990-1992 period (Livingston and deReynier 1996). Total number consumed was highest in 1993 (18,842 million) but was much lower than the estimate of total number consumed in 1984, which was 152,850 million (Livingston 1991). This may be an indication that there has not been any increased recruitment of Tanner crab since 1984.

Roundfish

Roundfish, for the purposes of this report, is defined as any groundfish species that is not a flatfish. Total estimated biomass and minimum numbers of Pacific cod, walleye pollock, Pacific herring (*Clupea pallasii*), and fish from the smelt family Osmeridae consumed by all groundfish predators are summarized in Tables 10-11 and Figures 7-10.

Table 8. –Estimated biomass (metric tons) of snow crabs (*Chionoecetes opilio*), Tanner crabs (*C. bairdi*), and unidentified *Chionoecetes* consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea.

Prey	Predator	1993	1994	1995	1996
Tanner crab	Flathead sole	13,073	3,267	7,238	
	Pacific cod	192,644	48,432	70,862	78,436
	Pacific halibut	3,235	2,147	5,522	
	Rock sole			362	
	Skates	20,662	9,140	712	337
	Walleye pollock	3,632		<1	
	Yellowfin sole	24,009			
	Total		257,256	62,987	84,696
Snow crab	Alaska plaice	35	2,819	520	
	Arrowtooth flounder			1	
	Flathead sole	187	2,055	14,706	
	Pacific cod	134,360	240,775	186,095	228,343
	Pacific halibut	6,622	2,865	4,934	6
	Rock sole	1,745		6,362	589
	Skates	26,305	14,341	13,131	22,912
	Walleye pollock		89	446	234
	Yellowfin sole	1,333	5,555	17,211	
Total		170,588	268,499	243,405	252,082
Unid. <i>Chionoecetes</i>	Alaska plaice	144			
	Arrowtooth flounder				127
	Flathead sole	638	7,518	87	219
	Pacific cod	72,104	51,468	79,348	51,724
	Pacific halibut	2,243	1,838	3,113	
	Rock sole	5,322			47
	Skates	26,990	17,204	38,923	30,679
	Walleye pollock	3,513	5,696	1,502	
	Yellowfin sole	1,088	50	6,404	
Total		112,043	83,775	129,378	82,796

Table 9. –Estimated numbers (millions) of snow crabs (*Chionoecetes opilio*), Tanner crabs (*C. bairdi*), and unidentified *Chionoecetes* consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea.

Prey	Predator	1993	1994	1995	1996
Tanner crab	Flathead sole	3,366	5,220	801	
	Pacific cod	10,684	3,417	5,335	6,415
	Pacific halibut	296	82	334	
	Rock sole			(0)	
	Skates	1,709	961	24	148
	Walleye pollock	782		(0)	
	Yellowfin sole	2,005			
	Total		18,842	9,680	(6,495)
Snow crab	Alaska plaice	(0)	3,194	970	
	Arrowtooth flounder			(0)	
	Flathead sole	212	540	14,910	
	Pacific cod	10,076	13,189	9,699	16,512
	Pacific halibut	683	114	129	1
	Rock sole	9,182		33,482	(0)
	Skates	471	847	408	1,047
	Walleye pollock			0	35
	Yellowfin sole	461	2,285	39,800	
Total		(21,085)	20,169	(99,400)	(17,595)
Unid. <i>Chionoecetes</i>	Alaska plaice	(0)			
	Arrowtooth flounder				110
	Flathead sole	45,817	(0)	6,235	
	Pacific cod	13,113	61,574	15,188	15,206
	Pacific halibut	458	(32)	(0)	
	Rock sole	20,717			(0)
	Skates	2,546	32,397	6,860	16,264
	Walleye pollock	(0)	(0)	(0)	
	Yellowfin sole	368	(0)	460,134	
Total		(83,020)	(94,002)	(488,417)	(31,580)

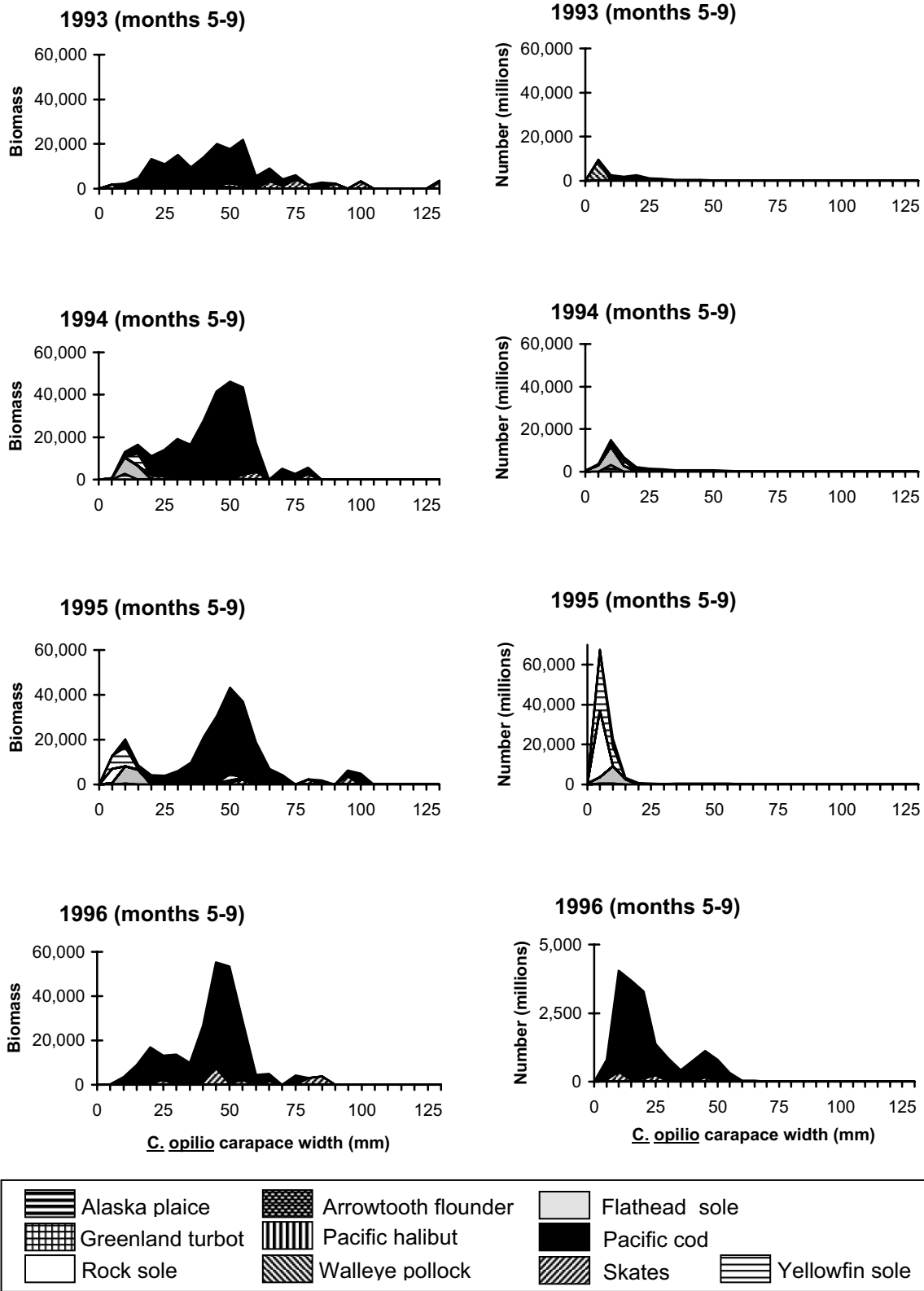


Figure 4. -- Estimated biomass (metric tons) and numbers of *Chionoecetes opilio* consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

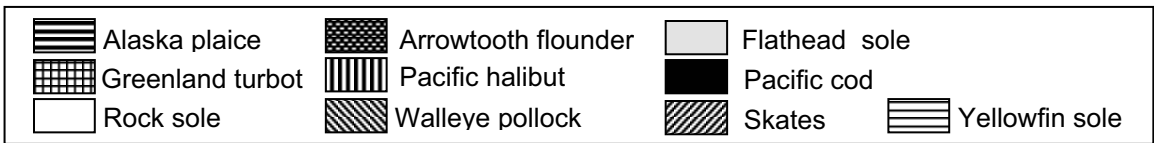
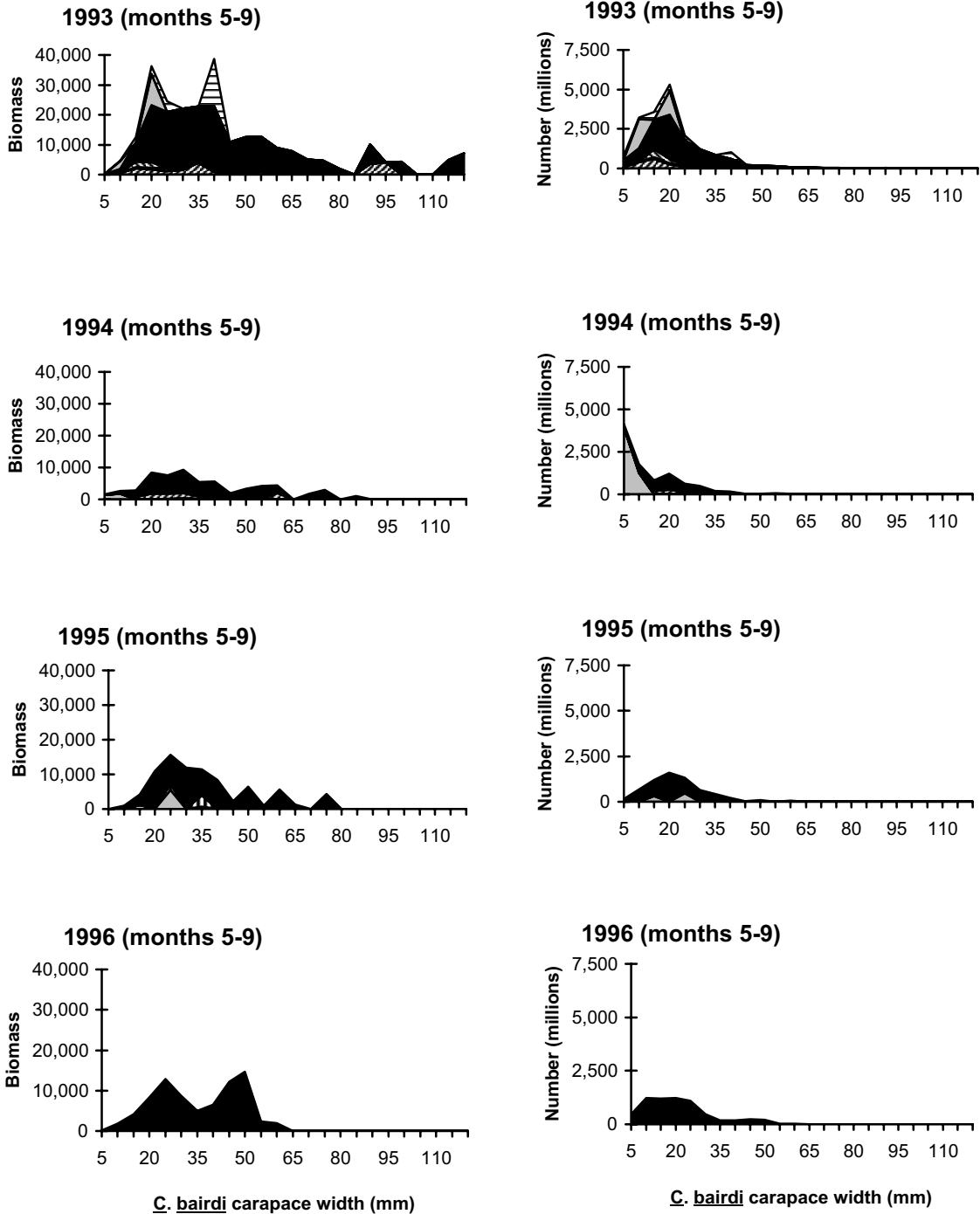


Figure 5. -- Estimated biomass (metric tons) and numbers of *Chionoectes bairdi* consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size.

Table 6. –Estimated biomass (metric tons) of king crabs consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea.

Prey	Predator	1993	1994	1995	1996
King crab legs	Pacific cod	6,135	29,496	12,720	7,945
	Pacific halibut	1,757	257	1,242	
	Skates		986		
	Yellowfin sole			1,409	
	Total	7,892	30,739	15,371	7,945
Lithodidae	Pacific cod	5	904	2,168	5,025
	Pacific halibut	56	51	30	
	Walleye pollock	8			
	Yellowfin sole		135		
	Total	68	1,089	2,198	5,025
<i>Paralithodes</i> spp.	Pacific cod		2,809	2,331	
	Total		2,809	2,331	
Red king crab	Pacific cod	1,997	1,228	1,754	
	Pacific halibut			3	
	Total	1,997	1,228	1,757	

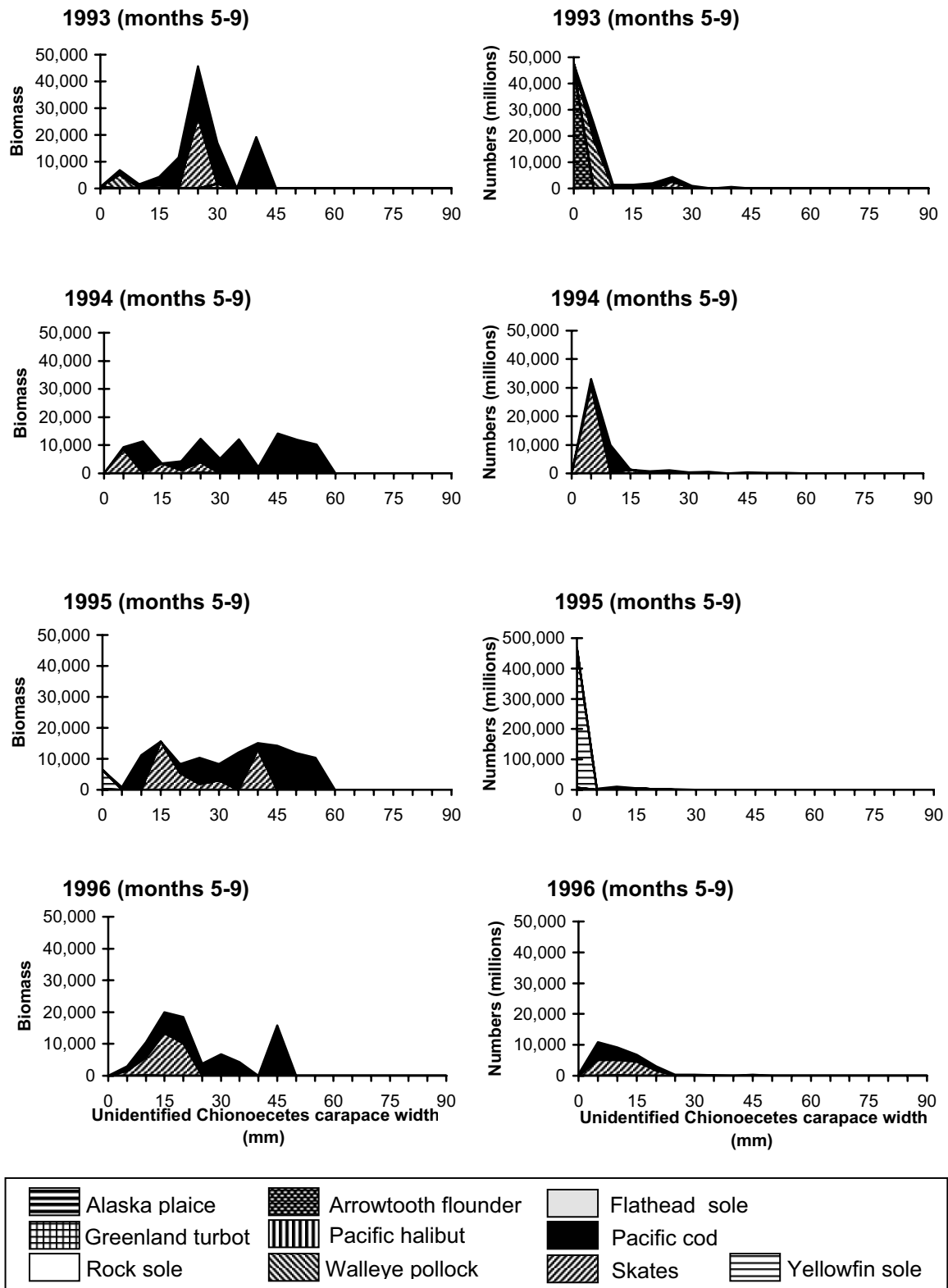


Figure 6. -- Estimated biomass (metric tons) and numbers of unidentified *Chionoecetes* consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes.

Table 10. –Estimated biomass (metric tons) of roundfish consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea (n.s. = not sampled).

Prey	Predator	1993	1994	1995	1996
Osmerids	Arrowtooth flounder	14,498	6,247		
	Flathead sole	5,705	123	535	
	Pacific cod	37,972	3,017	6,152	
	Pacific halibut	8,677	269		
	Skates	2,324			32
	Walleye pollock	12,939	683	560	
	Total		82,116	10,339	7,248
Pacific cod	Arrowtooth flounder			71	
	Flathead sole		2,928		
	Greenland turbot		232	832	n.s.
	Pacific cod	9,249	20,922	13,432	3,649
	Pacific halibut	586	3,096	983	64
	Skates		1,727		1,532
	Walleye pollock		1,284		
	Yellowfin sole				2,318
Total		9,835	30,190	15,319	7,563
Pacific herring	Pacific cod			11,465	3,248
	Pacific halibut			2,750	
	Walleye pollock	124	2,353		
	Yellowfin sole			4,154	
Total		124	2,353	18,369	3,248
Walleye pollock	Arrowtooth flounder	270,853	244,008	113,357	326,570
	Flathead sole	26,801	33,159	65,395	
	Greenland turbot	23,181	35,531	18,667	n.s.
	Pacific cod	429,773	498,921	488,151	283,387
	Pacific halibut	44,887	56,589	28,561	29,284
	Rock sole	173		38,167	
	Skates	141,769	174,511	114,827	146,254
	Walleye pollock	368,894	682,962	1,425,445	1,286,063
	Yellowfin sole	9,453	19,624	462	16,347
Total	1,315,784	1,745,306	2,293,032	2,087,906	

Table 11. –Estimated numbers (millions) of roundfish consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea (n.s. = not sampled).

Prey	Predator	1993	1994	1995	1996
Osmerids	Arrowtooth flounder	(897)	(0)		
	Flathead sole	545	19	(0)	
	Pacific cod	3,909	411	604	
	Pacific halibut	863	(20)		
	Skates	97			5
	Walleye pollock	5,531	75	70	
	Total		(11,842)	(525)	(674)
Pacific cod	Arrowtooth flounder			(0)	
	Flathead sole		(0)		
	Greenland turbot		(0)	(0)	n.s.
	Pacific cod	6,516	820	23	11
	Pacific halibut	1	60	4	(0)
	Skates		408		(0)
	Walleye pollock		39		
	Yellowfin sole				258
Total		6,517	(1,327)	(27)	(270)
Pacific herring	Pacific cod			(246)	25
	Pacific halibut			(7)	
	Walleye pollock	8	74		
	Yellowfin sole			18	
Total		8	74	(271)	25
Walleye pollock	Arrowtooth flounder	6,421	14,578	8,618	12,065
	Flathead sole	3,059	5,884	8,049	
	Greenland turbot	424	263	32	n.s.
	Pacific cod	3,897	4,864	4,069	20,500
	Pacific halibut	999	788	227	3,480
	Rock sole	1,362		97	
	Skates	774	981	188	468
	Walleye pollock	266,601	731,074	364,574	606,379
	Yellowfin sole	869	11,764	200	7,787
	Total	284,406	770,195	386,085	650,679

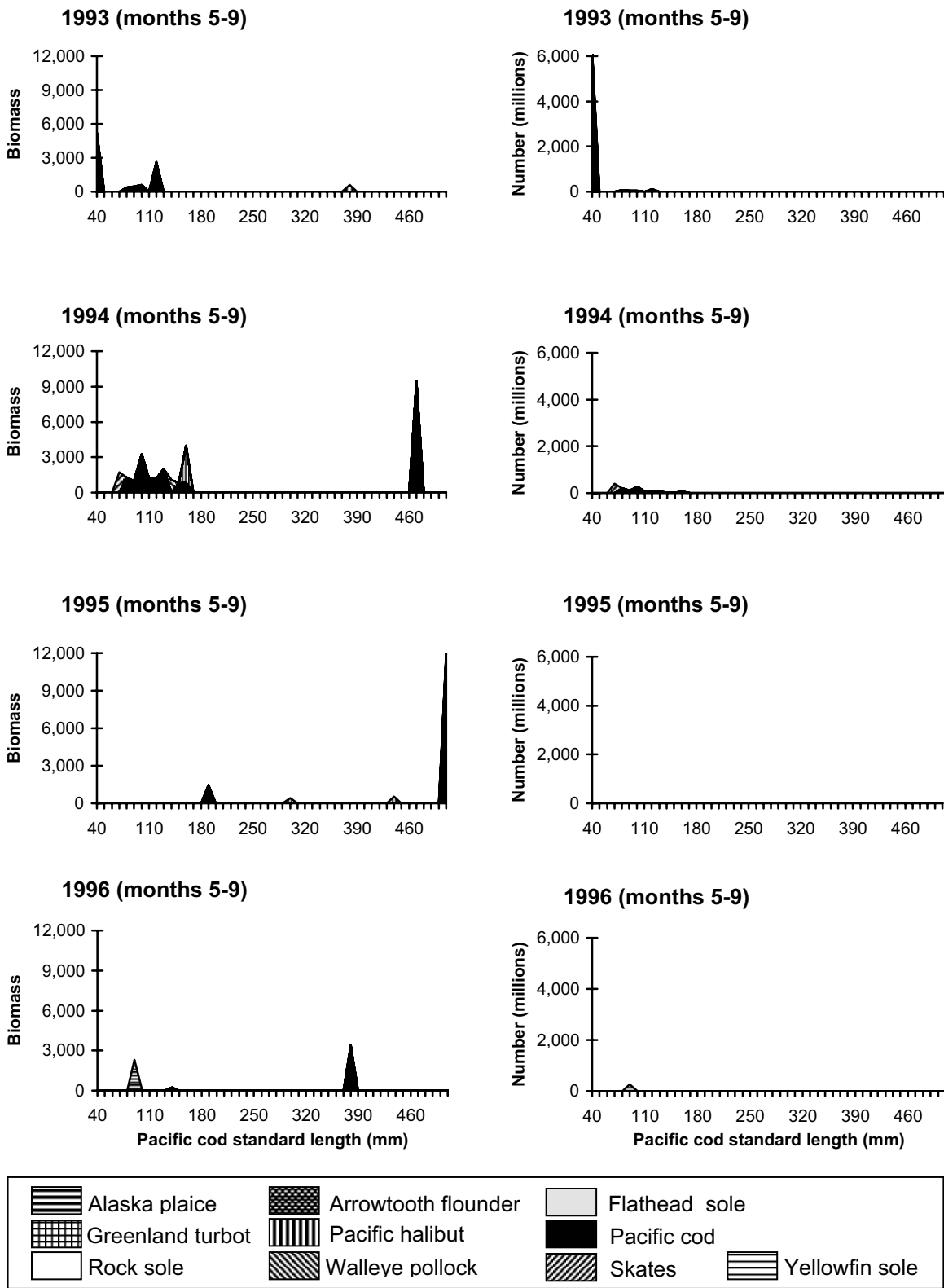


Figure 7. -- Estimated biomass (metric tons) and numbers of Pacific cod consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size.

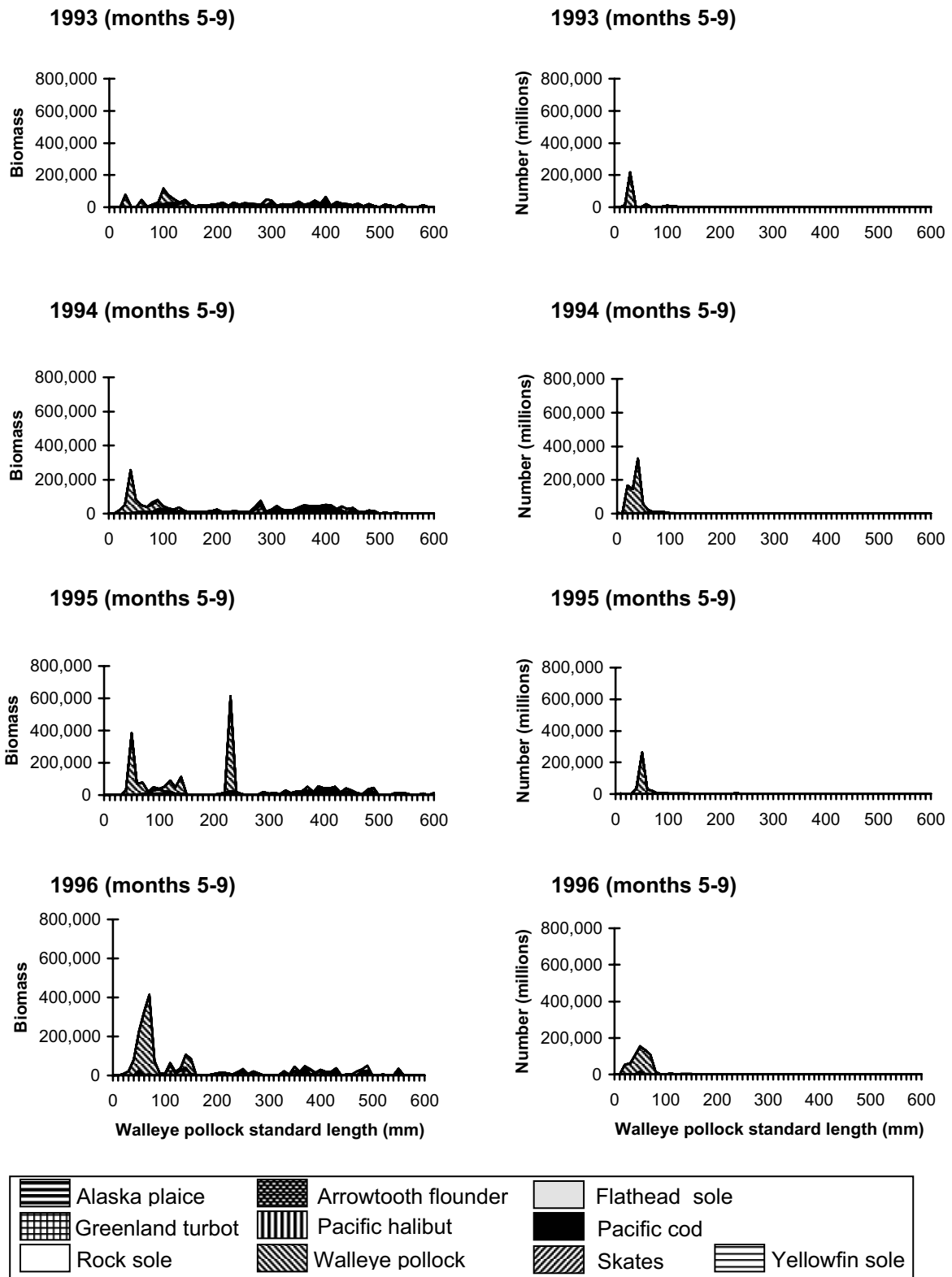


Figure 8 . -- Estimated biomass (metric tons) and numbers of walleye pollock consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size.

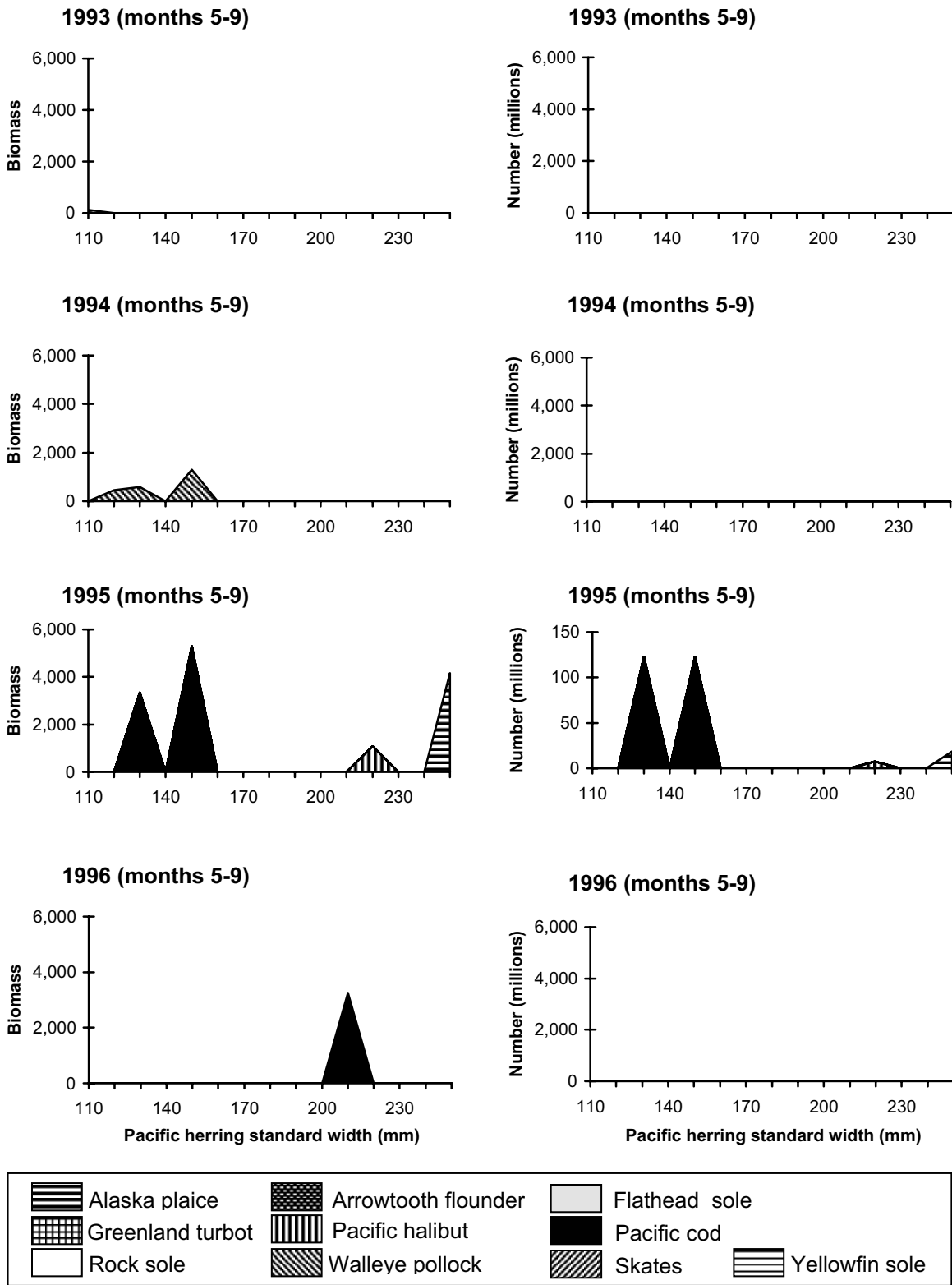


Figure 9. -- Estimated biomass (metric tons) and numbers of Pacific herring consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

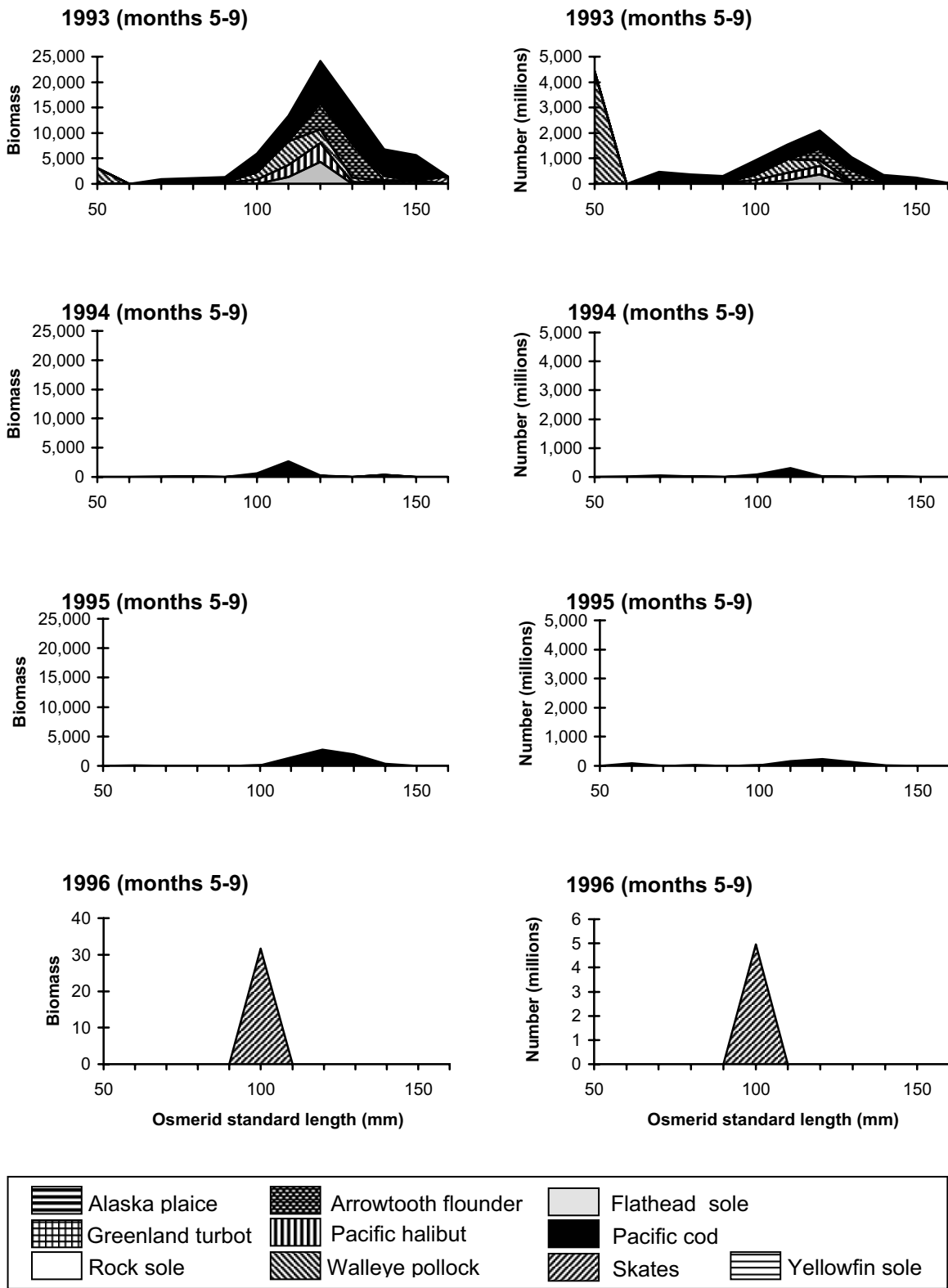


Figure 10. -- Estimated biomass (metric tons) and numbers of Osmerids consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

Pacific cod--Total estimated biomass of Pacific cod consumed by groundfish predators (Table 10) was highest in 1994 (30,190 t) and lowest in 1996 (7,563 t). Predators on Pacific cod include Pacific cod, walleye pollock, skates, Greenland turbot, Pacific halibut, arrowtooth flounder, flathead sole, and yellowfin sole. Pacific cod cannibalism was the largest source of predation mortality occurring each year. The number consumed was highest in 1993 (6.5 billion) and was primarily due to Pacific cod cannibalism on age-0 fish. There does not seem to be any relationship between the number of age-0 Pacific cod consumed in a year and the strength of that Pacific cod year class. For example, Thompson and Dorn (2001) reported that the 1993, 1994 and 1995 year classes were below average while the 1996 year class was average and our data show that 1993 and 1994 were the years with the largest biomass of age-0 and age-1 Pacific cod consumed. It appears that Pacific cod is not a major dietary component of any groundfish species. Therefore, consumption of Pacific cod tends to be a sporadic occurrence that may not necessarily be related to its abundance. Spatial factors may be important in determining amount of overlap between juveniles and adults in different years and this should be further investigated.

Walleye pollock--Walleye pollock was consumed by most of the major groundfish predators considered here. Walleye pollock cannibalism dominated walleye pollock removals in terms of numbers in all years and was also the largest in terms of biomass in all years except 1993. Pacific cod was the next most important predator in terms of biomass removals, while arrowtooth flounder was the next most important predator in terms of numbers removed all years except 1996 (Pacific cod).

Sizes of walleye pollock consumed by predators indicate most were age-0 walleye pollock (less than 14 cm SL) in all years (Fig. 8). Pacific cod tended to consume a wide range of walleye pollock sizes, mainly from 5 to 50 cm SL. Most age-1 pollock (approximately 14-22 cm SL) were consumed by Pacific cod, walleye pollock, and arrowtooth flounder. Similar numbers of age-0 walleye pollock were consumed during all four years. Generally, the numbers of age-0 consumed corresponds well with the age-1 model estimates of Ianelli et al. (2001) for the following year. However, the numbers at age-1 for 1995 from Ianelli et al. (2001) were much smaller than average, while 1994 was the year in which the largest predation upon age-0 walleye pollock took place.

Pacific herring--Pacific cod, Pacific halibut, walleye pollock, and yellowfin sole consumed Pacific herring. Walleye pollock consumed the most herring in 1993 and 1994 while Pacific cod were the dominant predator in 1995 and 1996. No groundfish predator consumed Pacific herring in all 3 years. The biomass of Pacific herring consumed by predators was highest in 1995 (18,369 t) and was much lower in the other 3 years.

Little size information was available on Pacific herring consumed by groundfish predators. However, those consumed in 1995 were primarily immature (< 20 cm). Pacific herring consumption by groundfish predators tended to be sporadic in time and space and may depend on encounter rates of Pacific herring schools rather than overall

biomass. Furthermore, most of the Pacific herring available during the summer feeding period on the shelf are immature Pacific herring because adults have moved inshore to spawn. Pacific herring may constitute a larger fraction of the diet of groundfish predators in other time periods when adult Pacific herring have migrated to outer shelf waters for the winter feeding period. However, we have insufficient samples during autumn and winter to quantify Pacific herring consumption during those periods.

Osmerids (Smelts)--Smelts were consumed by several groundfish species in 1993 through 1996: arrowtooth flounder, flathead sole, Pacific cod, Pacific halibut, skates and walleye pollock. Estimates of the biomass of smelt consumed over the four years were 82,116 t, 10,339 t, 7,248 t, and 32 t, respectively. Consumption in 1993 was about nine times larger than consumption during the 1990-92 time period (Livingston and deReynier 1996). Pacific cod tended to be the most important predator on smelts in each year. Sizes of smelts consumed ranged from 5 to 15 cm SL.

Flatfish

Arrowtooth flounder--Arrowtooth flounder was consumed by arrowtooth flounder, Pacific cod, skates and walleye pollock (Tables 12-13). Estimated total biomass consumed ranged from 1,601 t in 1994 to 8,508 t in 1996. Pacific cod consumed the most arrowtooth flounder by weight in all years except 1994 (skates). Estimated numbers of arrowtooth flounder consumed were highest for Pacific cod in all years as well except 1996 (skates).

Total biomass consumed in each year can be compared with the estimated standing stock of arrowtooth flounder to determine the relative importance of predation on the arrowtooth flounder population. Total consumption in each year, expressed as a percentage of trawl-estimated biomass of arrowtooth flounder, is less than 2%. This is a small percentage of the arrowtooth flounder population, indicating predation is probably not a major source of mortality. Examination of possible predation impact on arrowtooth flounder is too small to be assessed by the trawl survey given the current state of knowledge about juvenile arrowtooth flounder abundance. Consumption estimates of arrowtooth flounder were higher in most years reported here than in the 1990-1992 period (Livingston and deReynier 1996) despite below average recruitment during the current period compared with average recruitment during 1990-92 (Wilderbuer and Sample 2001).

Flathead sole--Estimated total biomass and number of flathead sole consumed by groundfish predators was highest in 1996 (37,492 t and 194,859 million, respectively). Most of the biomass consumed in the first three years was by Pacific cod and by skates in 1996. Other predators of flathead sole included arrowtooth flounder, Greenland turbot, Pacific halibut, and walleye pollock.

Table 12. –Estimated biomass (metric tons) of flatfish consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea (n.s. = not sampled).

Prey	Predator	1993	1994	1995	1996
Alaska plaice	Pacific cod	45	78		
	Pacific halibut		207		
	Yellowfin sole		288	<1	
	Total	45	574	<1	
Arrowtooth flounder	Arrowtooth flounder	2,889			
	Pacific cod	2,945	448	7,682	8,075
	Skates		1,153		21
	Walleye pollock	3			412
Total	5,837	1,601	7,682	8,508	
Flathead sole	Arrowtooth flounder	7,225			8,396
	Greenland turbot			1,665	n.s.
	Pacific cod	9,608	15,414	16,377	11,398
	Pacific halibut	36	1,378		
	Skates	628	9,635	6,753	17,698
	Walleye pollock	1,044			
Total	18,542	26,428	24,795	37,492	
Greenland turbot	Pacific cod	4	137		16
	Walleye pollock	15,357	148	5	1,426
	Total	15,360	286	5	1,442
Pacific halibut	Pacific cod	555	2,189		20
	Skates	495			2
	Walleye pollock	76		14	36
	Total	1,126	2,189	14	59
Rock sole	Arrowtooth flounder				487
	Flathead sole			437	
	Pacific cod	61,085	17,103	26,547	35,435
	Pacific halibut	5,356	1,984	748	
	Skates	4,827	19,865	10,590	675
	Walleye pollock	3,237	1,319	19	696
	Yellowfin sole	67	18		
Total	74,572	40,289	38,340	37,293	
Yellowfin sole	Pacific cod	12,870	22,959	27,260	3,236
	Pacific halibut	2,092	288	1,273	
	Skates	909	292	446	
	Total	15,871	23,538	28,979	3,236

Table 13. –Estimated numbers (millions) of flatfish consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea (n.s. = not sampled).

Prey	Predator	1993	1994	1995	1996
Alaska plaice	Pacific cod	(0)	(0)		
	Pacific halibut		1		
	Yellowfin sole		7,145	(0)	
	Total	(0)	(7,146)	(0)	
Arrowtooth flounder	Arrowtooth flounder	67			
	Pacific cod	(23)	7	84	138
	Skates				2,624
	Walleye pollock		17		7
	Total	(90)	24	84	2,768
Flathead sole	Arrowtooth flounder	1,893			
	Greenland turbot			12	n.s.
	Pacific cod	472	276	335	194,411
	Pacific halibut	1	151		
	Skates		114	107	352
	Walleye pollock	86			
Total	2,451	541	454	194,859	
Greenland turbot	Pacific cod	5	141		23
	Walleye pollock	88,181	934	11	9,115
	Total	88,186	1,075	11	9,138
Pacific halibut	Pacific cod	87	(0)		121
	Skates	172			10
	Walleye pollock	1,435		30	1,454
	Total	1,695	(0)	30	1,585
Rock sole	Arrowtooth flounder				49
	Flathead sole			160	
	Pacific cod	698	255,405	330	560
	Pacific halibut	167	19	10	
	Skates	367	276	313	64
	Walleye pollock	15,532	79	3	19,669
	Yellowfin sole	352	815		
	Total	17,117	256,594	816	20,343
Yellowfin sole	Pacific cod	120	507	391	302
	Pacific halibut	29	1	25	
	Skates	23	5	12	
	Total	172	513	427	302

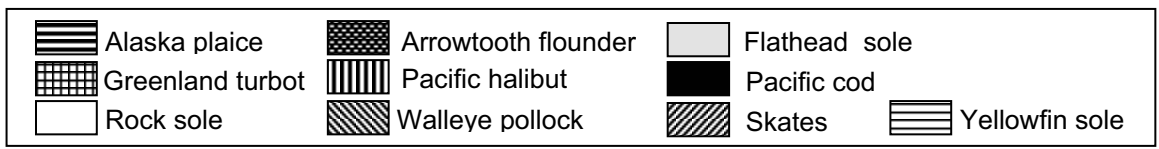
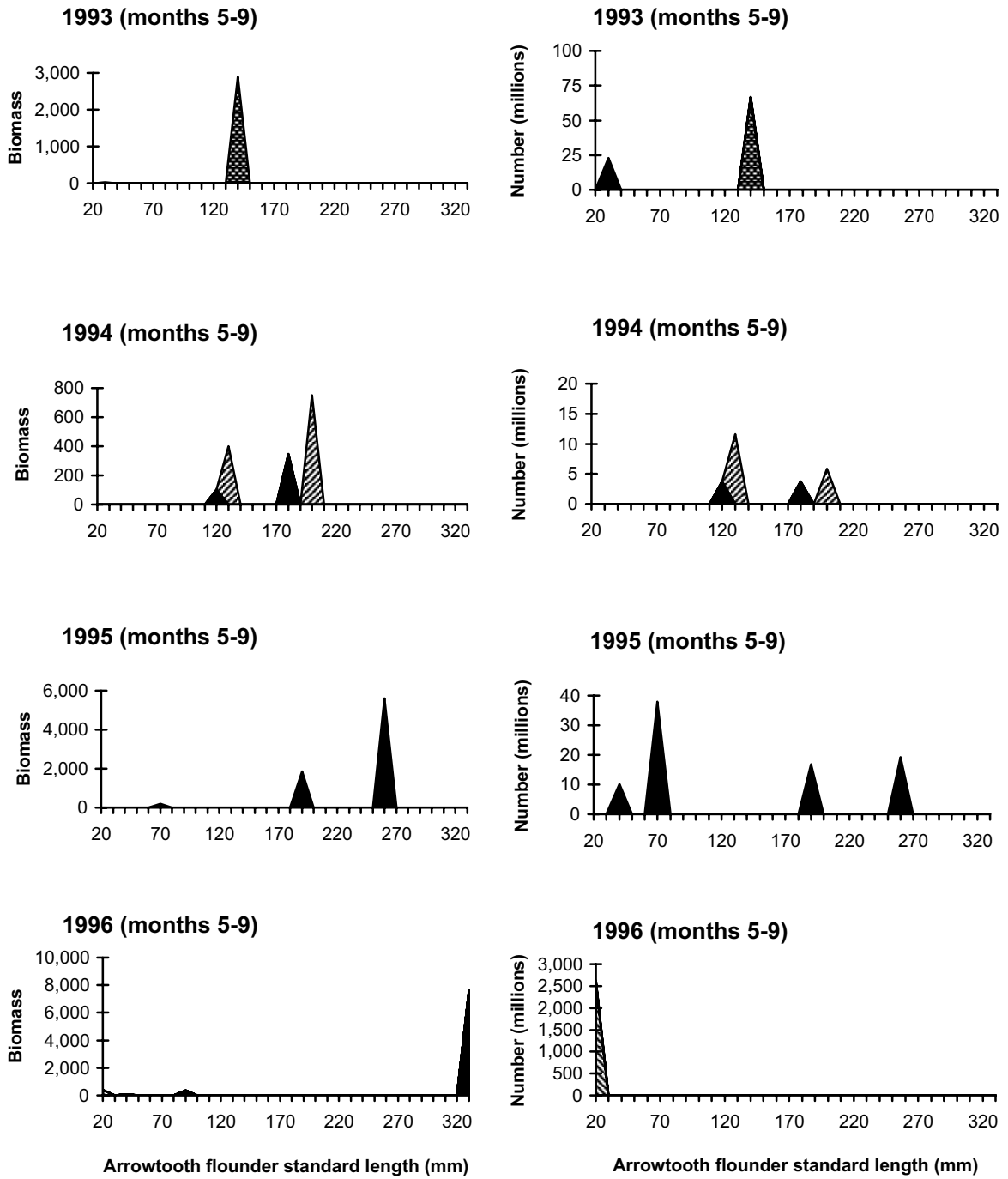


Figure 11 . -- Estimated biomass (metric tons) and numbers of arrowtooth flounder consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

Most of the flathead sole consumed were less than 20 cm SL or younger than age 3. Walters and Wilderbuer (1990) report that flathead sole do not recruit to trawl fisheries until age 3, and although some age-2 fish are caught in research trawls, they are probably not fully recruited. This precludes a relevant comparison of predator removals of juveniles with the juvenile flathead sole population size. Pacific cod consumed large numbers of flathead sole that were possibly age 0 in 1996 (Fig. 12). This might be an indication of an abundant year class produced in 1996.

Rock sole--Total estimated biomass of rock sole consumed by groundfish predators ranged from 37,293 t in 1996 to 74,572 t in 1993. The number of rock sole ranged from 816 million in 1995 to 256,594 million in 1994. Pacific cod was the most important predator in terms of biomass and number removals. Other predators included Pacific halibut, skates, walleye pollock, arrowtooth flounder, flathead sole, and yellowfin sole. Size composition of rock sole consumed was less than 5 cm in all years except 1995 when the size range included fish up to 25 cm SL (Fig. 13). Most of these sizes are probably not fully vulnerable to trawl surveys. Biomass estimates of rock sole in the eastern Bering sea were relatively stable during this time period (Wilderbuer and Walters 2001), therefore fluctuations in consumption estimates are likely due to spatial variation in predators and prey.

Yellowfin sole--Pacific cod, skates and Pacific halibut were predators of yellowfin sole during the 1993 to 1996 period. Pacific cod predation in terms of biomass and number dominated all three years. Consumption by all groundfish in terms of biomass was somewhat varied across years, ranging from 3,236 t in 1996 to 28,979 t in 1992. Consumption was slightly higher in this period than in the 1990 to 1992 period. These changes in consumption do not seem to be related to changes in biomass of yellowfin sole on the shelf because total biomass of yellowfin sole has been relatively stable from 1984 to 1996 according to stock synthesis model results (Wilderbuer and Nichol 2001).

Most predation was on yellowfin sole ranging in size from 3 to 25 cm SL (ages 3-10) (Fig. 14). When estimates of total yellowfin sole consumption in terms of biomass are compared to the biomass estimated from trawl surveys, it appears that groundfish predation constitutes only a small proportion (~1%) of the standing stock biomass.

Greenland turbot--Pacific cod and walleye pollock were the only groundfish that consumed Greenland turbot (Tables 12-13). The amount consumed was highest in 1993. Walleye pollock was the main predator on Greenland turbot in all four years (Fig. 15). Sizes of Greenland turbot consumed by walleye pollock ranged from 1 to 4 cm SL (probably age 0). It is unclear whether there is a relationship between the number consumed at age 0 and estimates of recruitment at age 1 from Ianelli et al. (2001). Our data show the largest numbers of Greenland turbot, presumably age 0, were consumed in 1993 and Ianelli et al. (2001) show that the 1993 year class was equal to or smaller than other year classes at age 1 where smaller numbers were consumed.

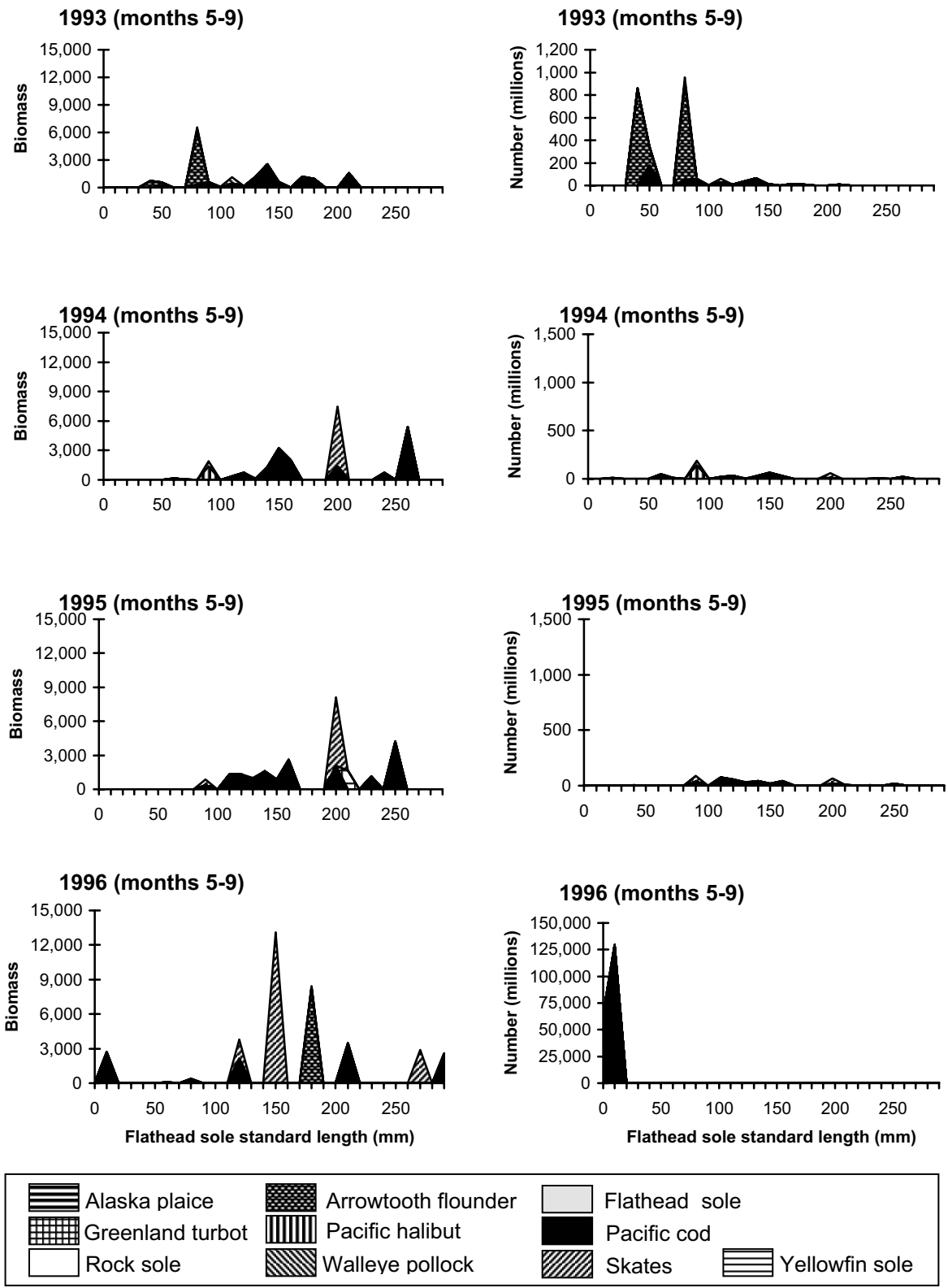


Figure 12 . -- Estimated biomass (metric tons) and numbers of flathead sole consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

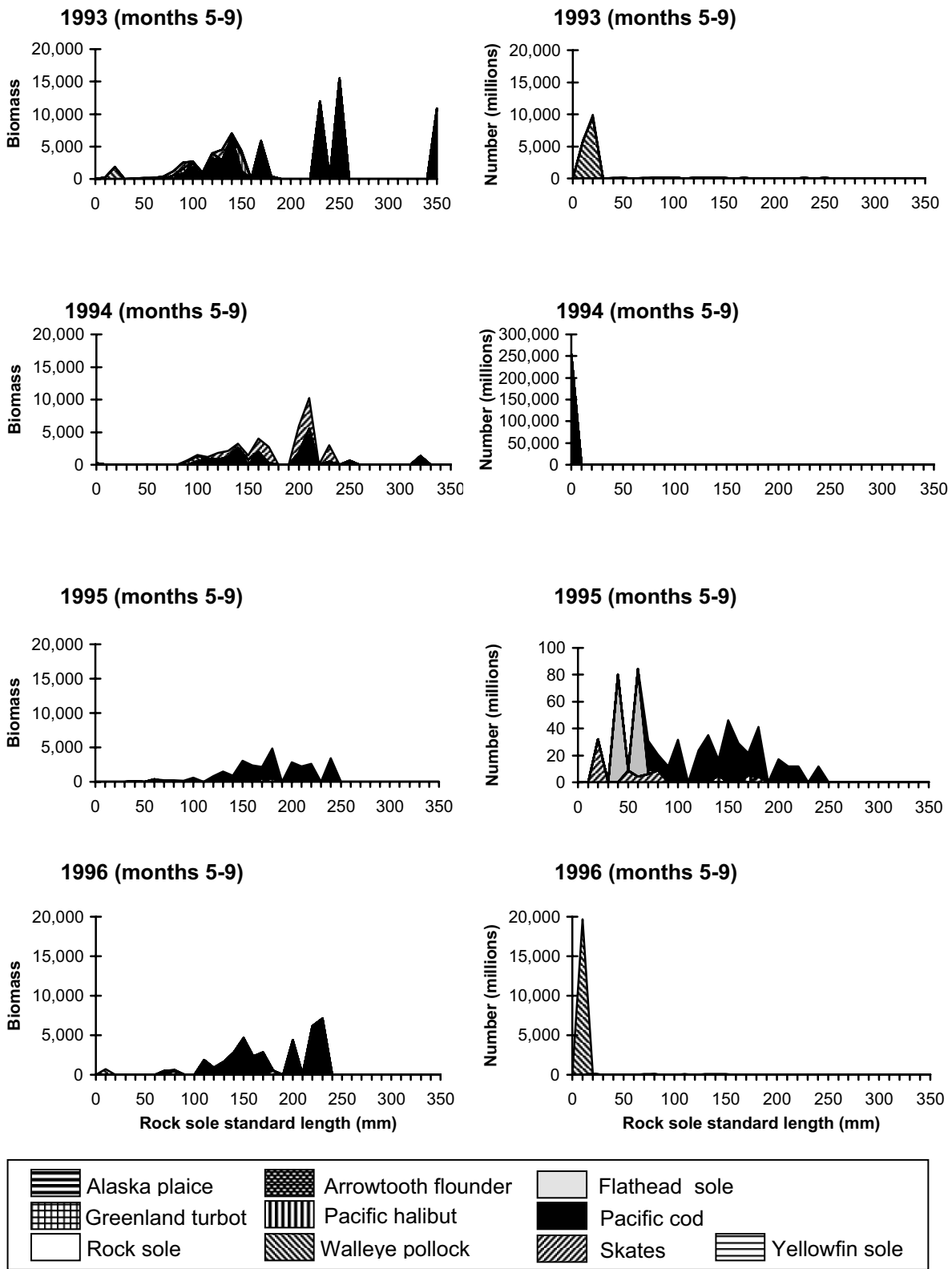


Figure 13. -- Estimated biomass (metric tons) and numbers of rock sole consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

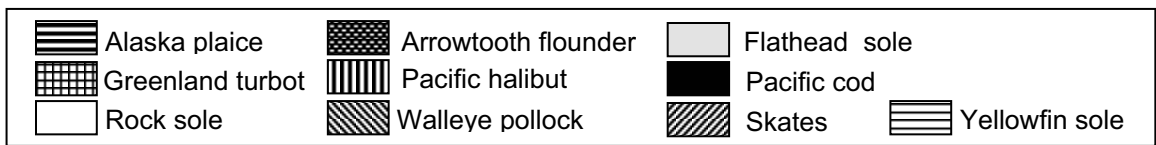
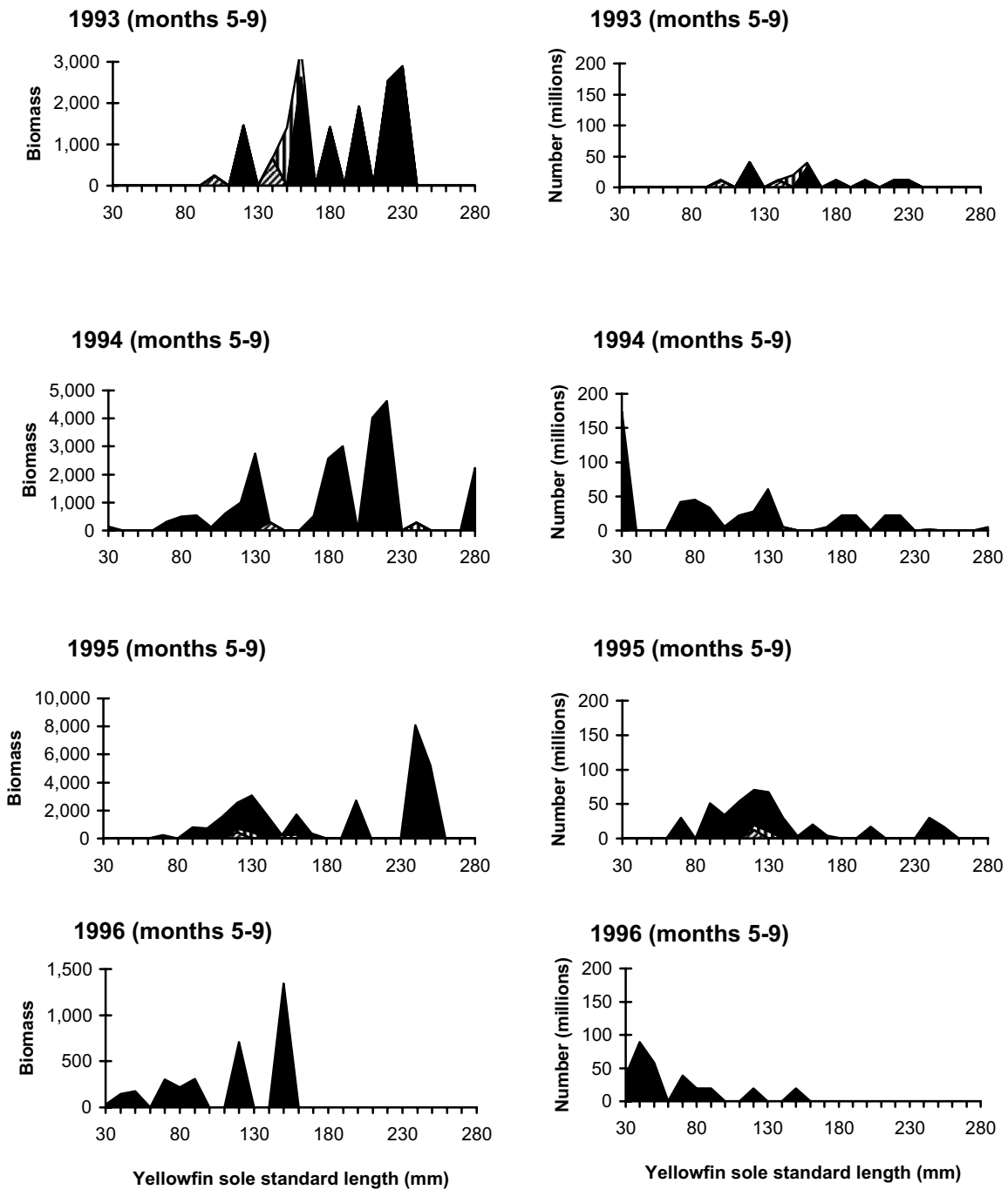


Figure 14 . -- Estimated biomass (metric tons) and numbers of yellowfin sole consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

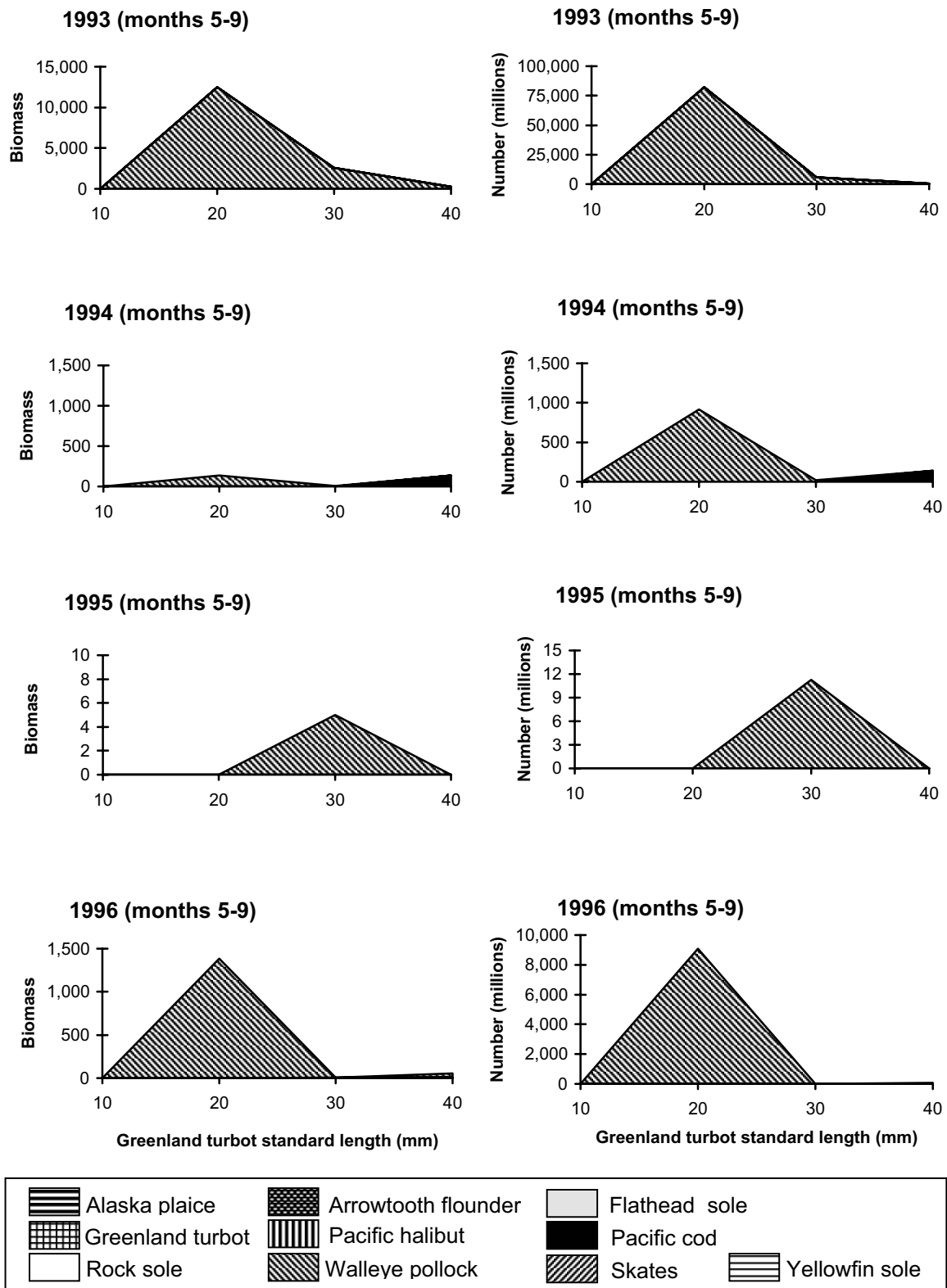


Figure 15. -- Estimated biomass (metric tons) and numbers of Greenland turbot consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years.

Pacific halibut--Pacific halibut was consumed by Pacific cod, skates, and walleye pollock (Tables 12-13). Sizes consumed ranged mostly from 1 to 6 cm SL (probably age 0) (Fig. 16). The size of Pacific halibut consumed suggests they were post-larvae that had not yet settled to the bottom. Deriso (1987) suggests that Pacific halibut may be transported into the Bering Sea from the Gulf of Alaska. It is possible that groundfish consumption of Pacific halibut is a transitory phenomenon, occurring during restricted time periods when postlarvae are swept into shallow waters and start settling to the bottom.

Alaska plaice—Alaska plaice was consumed in small amounts relative to other flatfish prey by Pacific cod, Pacific halibut and yellowfin sole. The largest consumption estimates were by yellowfin sole in 1994 (288 t and 7,145 million). Yellowfin sole consumption was focused on Alaska plaice less than 2 cm SL, likely age-0 fish (Fig. 17). Consumption estimates such as these indicate that predation mortality by groundfish is an insignificant impact on the Alaska plaice population.

Offal

Several groundfish species consumed fish processing offal during the 1993 to 1996 period (Table 14). Pacific cod, walleye pollock, arrowtooth flounder, northern rock sole, yellowfin sole, Pacific halibut and skates consumed offal. In general, Pacific cod tended to consume the most offal. Total amounts of offal consumed were relatively stable across years, ranging from 50,607 t in 1993 to 92,013 t in 1994, approximately half the amount seen in the 1990-92 period (Livingston and deReynier 1996). Because most of these groundfish predators are predators of pollock and most of the offal produced is from processing of pollock, there is probably not much disruption of normal energy pathways due to offal consumption.

Miscellaneous Species General Diet

Diet information alone (i.e. no estimates of total prey consumption) is presented in Appendix H for marbled eelpout (*Lycodes ravidens*), wattled eelpout (*L. palearis*), shortfin eelpout (*L. brevipes*), and butterfly sculpin (*Hemilepidotus papilio*) for 1994. Butterfly sculpins exhibited a diverse, primarily benthic diet composed amphipods (10%), polychaete worms (15%), shrimp (12%), echiurid worms (7%), walleye pollock (7%), and larvaceans (24%) by weight. Little dietary variation was seen with predator size for butterfly sculpins. Wattled, marbled and shortfin eelpouts also primarily consumed benthic organisms such as polychaete worms (20-30%), amphipods (10-40%), brittle stars (25%) and miscellaneous fish(3-15%) including sculpins, pricklebacks, Pacific herring, snailfish, capelin and walleye pollock. Polychaete worms were more important by weight to smaller eelpouts while fish prey became more important with size.

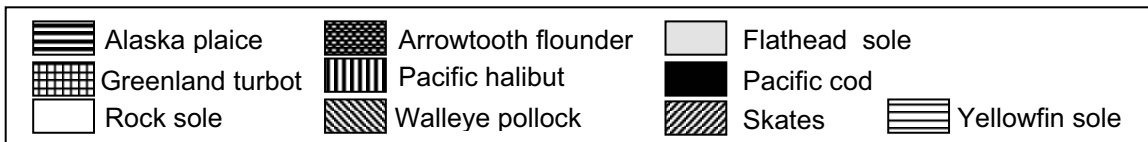
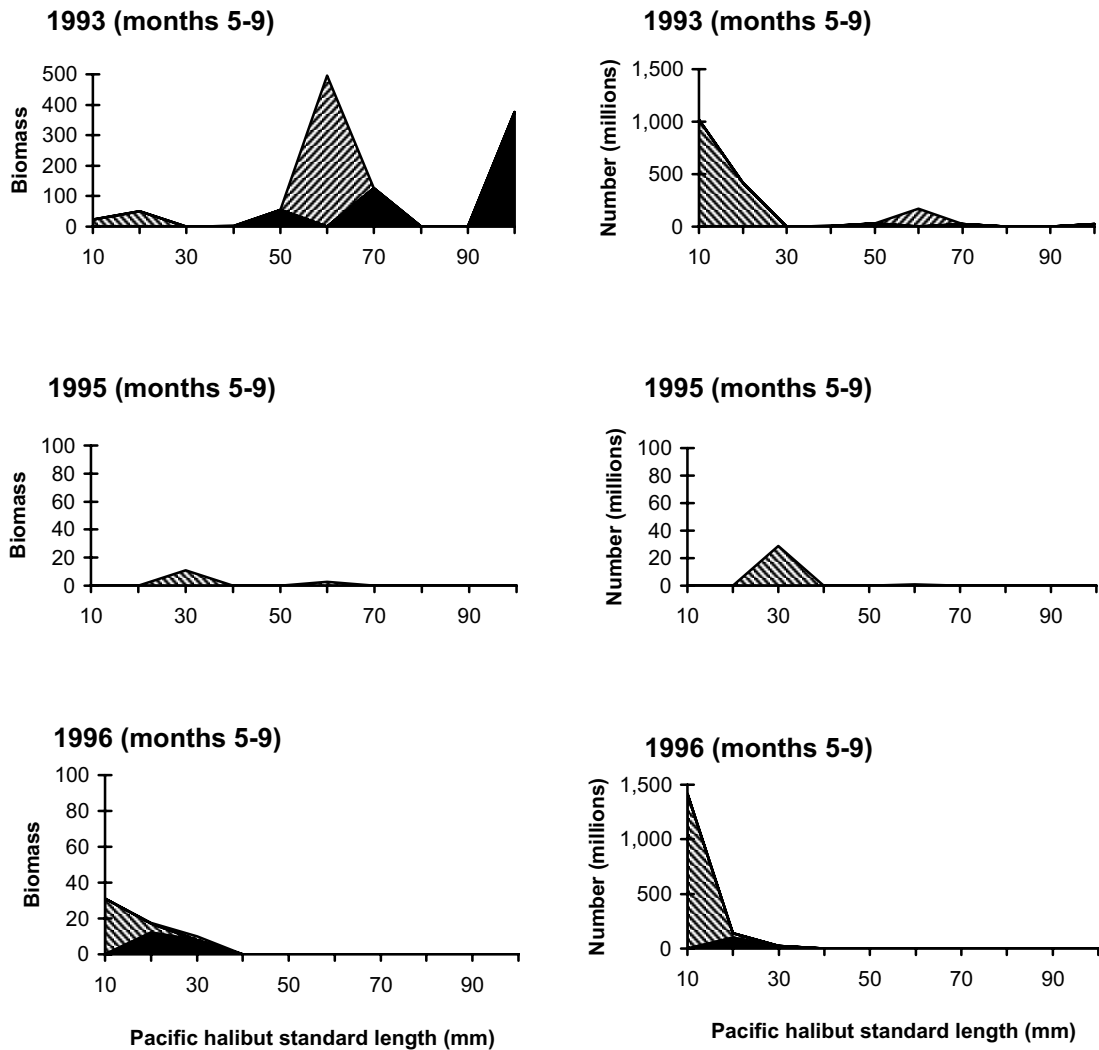


Figure 16. -- Estimated biomass (metric tons) and numbers of Pacific halibut consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. Note differing y-axes between years. (No measurable Pacific halibut were found in 1994)

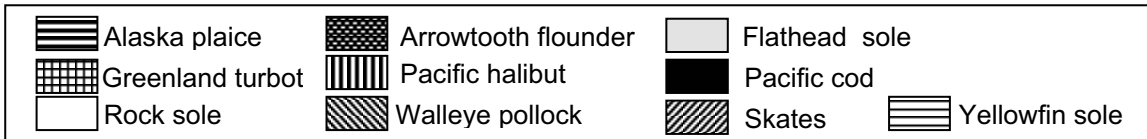
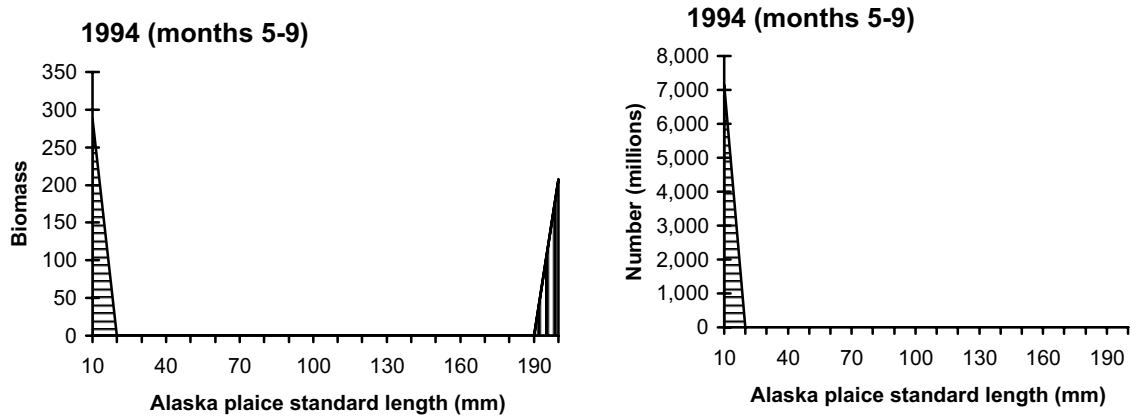


Figure 17. -- Estimated biomass (metric tons) and numbers of Alaska plaice consumed by groundfish predators during May through September in 1993 through 1996 in the eastern Bering Sea by prey size. No measureable Alaska plaice were found in 1993 or 1995, and none were consumed in 1996.

Table 14. –Estimated biomass (metric tons) of offal consumed by groundfish by year during months 5 through 9 in the eastern Bering Sea.

Prey	Predator	1993	1994	1995	1996
Offal	Arrowtooth flounder	3,323		2,559	656
	Pacific cod	45,391	54,101	14,838	32,225
	Pacific halibut	144	1,953	3,784	75
	Rock sole				11,853
	Skates	8,265	9,588	7,420	22,907
	Walleye pollock	15,509	21,824	11,413	
	Yellowfin sole		4,548	10,592	
	Total	72,632	92,013	50,607	67,716

CONCLUSIONS

Predation by Pacific cod on Tanner and snow crabs in the eastern Bering Sea indicates a possible strong recruitment of snow crab in 1995 but no indication of increased recruitment for Tanner crab. Walleye pollock cannibalism was the most important source of groundfish predation on age-0 walleye pollock. Age-0 pollock consumption by groundfish was relatively high in 1994 and 1996. However, we know from survey and fishery data that the 1996 year class of walleye pollock was above-average while the 1994 year class was below average. A better understanding of Tanner and snow crab size at-age and of the juvenile abundances of both these crabs as well as walleye pollock are needed to determine whether predation is a density-dependent factor controlling population size.

In many cases, groundfish appeared to be an early sampler of Tanner and snow crabs abundance, and several flatfish species. Again, more information on juvenile abundance of these prey species may determine whether this predation is an early indicator of the presence of abundant year classes.

Consumption estimates for all prey should be viewed at the present time more as indices of consumption rather than actual consumption for several reasons. First, most of the calculations consider only the time period from May through September in each year. Although this is the main feeding period for most fishes in the Bering Sea, consumption of prey certainly occurs during other parts of the year. Inadequate numbers and spatial distribution of stomach samples during other parts of the year combined with gaps in knowledge about the seasonal migrations of groundfish predators make calculation of predation in other parts of the year difficult without seasonal resource assessment surveys in the area.

Predation estimates during the time period considered here may be underestimates for prey that are consumed year-round, such as Tanner and snow crabs that are consumed by Pacific cod. Estimates for groundfish predation on newly settling stages of crabs and flatfishes may be overestimates if the prey species are not available to the predator during the whole time period. Also, for prey that have a very limited spatial distribution within a stratum, such as red and blue king crabs, inadequate stomach sampling throughout the whole stratum can provide biased estimates of consumption. For these prey, consumption estimates would be biased upwards if sampling was concentrated more in areas where king crabs occur and estimates would be biased downwards if stomach sampling was not performed in king crab areas.

Estimates of total numbers consumed are underestimates for some prey because prey size could not always be determined due to advanced digestion of the prey.

CITATIONS

- Brett, J. R., and T. D. D. Groves. 1979. Physiological energetics. *In* W. S. Hoar, D. J. Randall, and J. R. Brett (editors), *Fish physiology*, Vol. VIII: Bioenergetics and growth, p.279-352. Academic Press, New York.
- Deriso, R. B. 1987. Pacific halibut: Biology, fishery, and management. *Northwest Environ. J.* 3:129-144.
- Ianelli, J. N., T. Buckley, T. Honkalehto, G. Walters, and N. Williamson. 2001. Stock assessment of Greenland turbot. *In* Stock assessment and fishery evaluation report of the Bering Sea/Aleutian Islands region North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.
- Ianelli, J. N., T. K. Wilderbuer, and T. M. Sample. 2001. Stock assessment of Greenland turbot. *In* Stock assessment and fishery evaluation report of the Bering Sea/Aleutian Islands region. North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.
- Livingston, P. A. 1991. Groundfish food habits and predation on commercially important prey species in the eastern Bering Sea from 1984 to 1986. U. S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-207.
- Livingston, P. A., D. A. Dwyer, D. L. Wencker, M. S. Yang, and G. M. Lang. 1986. Trophic interactions of key fish species in the eastern Bering Sea. *Int. N. Pac. Fish. Comm. Bull.* 47:49-65.
- Livingston, P. A., A. Ward, G. M. Lang, and M-S. Yang. 1993. Groundfish food habits and predation on commercially important prey species in the eastern Bering Sea from 1987 to 1989. U. S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-11. 192p.
- Livingston, P. A. and Y. deReynier 1996. Groundfish food habits and predation on commercially important prey species in the eastern Bering Sea from 1990 to 1992. U. S. Dep. Commer., AFSC Proc. Rep. 96-04. 214p.
- Rugolo, L.J., J. A. Haaga, and R.A. MacIntosh 2001. Report to industry on the 2001 eastern Bering Sea crab survey. AFSC Processed Rep. 2001-07, 62 p. Alaska Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, 7600 Sand Point Way NE., Seattle, WA 98115.
- Thompson, G. G. and M. W. Dorn. 2001. Pacific cod. *In* Stock assessment and fishery evaluation report of the Bering Sea/Aleutian Islands region. North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.

Walters, G.E. and T. K. Wilderbuer. 1990. Other flatfish. *In* L-L. Low and R. E. Narita (editors), Condition of groundfish resources in the Bering Sea-Aleutian Islands region as assessed in 1988, p. 123-141. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-178.

Wilderbuer, T. K. and D. Nichol. 2001. Yellowfin sole. *In* Stock assessment and fishery evaluation document for groundfish resources in the Bering Sea/Aleutian Islands region. North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.

Wilderbuer, T. K. and T. M. Sample. 2001. Arrowtooth flounder. *In* Stock assessment and fishery evaluation report of the Bering Sea/Aleutian Islands region. North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.

Wilderbuer, T. K. and G. Walters. 2001. Rock sole. *In* Stock assessment and fishery evaluation report of the Bering Sea/Aleutian Islands region. North Pacific Fishery Management Council, 605 W. 4th Ave., Suite 306, Anchorage, AK 99501.

APPENDIX A. - WALLEYE POLLOCK (*Theragra chalcogramma*)

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Table A-1.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea for 1993 through 1996, from stock assessment estimates divided into strata by bottom trawl survey estimates.

Predator Size (cm)	Stratum	93	94	95	96
<30	1	90,155	36,476	4300	24,070
	2	116,044	24,034	7697	13,876
	3	203,618	441,147	46,427	136,396
	4	490,423	307,403	100,605	139,398
	5	2,422	1,631	539	8,208
	6	300,821	1,800,497	545,437	328,147
Subtotal		1,203,483	2,611,188	705,005	650,095
30-39	1	343,193	1,473	1,928	24,335
	2	0	0	0	0
	3	4,170,242	812,035	362,643	807,932
	4	859,014	318,669	672,674	2,191,364
	5	587,364	103,330	160,751	0
	6	1,342,156	2,716,253	4,247,153	1,173,804
Subtotal		7,301,969	3,951,760	5,445,149	4,197,435
40-49	1	192,98	58,936	381	1,162
	2	0	154	0	103
	3	356,731	1,790,115	1,591,865	1,324,894
	4	117,475	245,755	430,540	1,278,727
	5	84,137	636,633	514,058	24,543
	6	192,676	977,280	1,568,893	630,790
Subtotal		770,317	3,708,873	4,105,737	3,260,219
>50	1	145,142	117,998	79,881	127,798
	2	31,628	39,827	9,562	35,785
	3	252,422	163,929	308,805	519,921
	4	326,445	137,952	116,600	244,249
	5	61,273	30,320	41,805	41,737
	6	322,124	252,727	82,538	190,296
Subtotal		1,139,034	742,753	639,191	1,159,786
Total		10,414,803	11,01,4574	10,895,082	9,267,535

Table A-2.--Prey items (expressed in mean percent frequency of occurrence and mean total weight) of walleye pollock (*Theragra chalcogramma*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida Textulariina (foram)	0.01	0.06
Porifera (sponge)	<0.01	0.02
Polychaeta (worm)	0.19	1.06
Polynoidae (polychaete)	0.01	0.13
Phyllodocidae (polychaete)	0.01	0.29
Nephtyidae (polychaete)	0.08	0.14
Glyceridae (polychaete)	0.01	0.13
Goniadidae (polychaete)	0.01	0.10
Lumbrineridae	0.01	0.07
Arabellidae (polychaete)	<0.01	0.02
Flabelligeridae (polychaete)	0.04	0.02
Ampharetidae (polychaete)	<0.01	0.02
<i>Artacama</i> sp. (polychaete)	0.02	0.02
<i>Artacama proboscidea</i> (polychaete)	0.01	0.02
Trichobranchidae (polychaete)	0.04	0.04
Gastropoda (snail)	0.02	0.09
Naticidae (snail)	0.02	0.02
Pteropoda (Thecosomata and Gymnosomata)	0.06	0.31
Thecosomata (pteropod)	0.07	0.19
Gymnosomata (pteropod)	<0.01	0.02
Bivalvia (clam)	0.03	0.43
Nuculidae	<0.01	0.09
Cephalopoda (squid and octopus)	0.08	0.06
Teuthoidea (squid)	0.56	0.82
Teuthoidea oegopsida (squid)	0.24	0.18
Octopoda (octopus)	<0.01	0.02
Crustacea	0.05	0.33
Calanoida (copepod)	12.99	32.80
Cirripedia (barnacle)	<0.01	0.03
Malacostraca	<0.01	0.04
Malacostraca Leptostraca	<0.01	0.03
Mysidacea Mysida (mysid)	0.66	2.75
Mysidae (mysid)	2.14	7.49
Cumacea (cumacean)	0.56	4.55
Gammaridea (amphipod)	2.92	13.04
Amphipoda Hyperiidea (amphipod)	2.24	11.50
<i>Themisto</i> sp. (amphipod)	1.32	10.66
Caprellidea (amphipod)	0.01	0.12
Eucarida	0.01	0.14
Euphausiacea (euphausiid)	12.39	28.69
Euphausiidae (euphausiid)	9.41	15.86
<i>Thysanoessa</i> sp. (euphausiid)	10.24	16.60
<i>Thysanoessa inermis</i> (euphausiid)	1.95	3.03
<i>Thysanoessa longipes</i> (euphausiid)	<0.01	0.04
<i>Thysanoessa raschii</i> (euphausiid)	4.60	5.12
<i>Thysanoessa spinifera</i> (euphausiid)	0.04	0.25
Decapoda (shrimp and crab)	0.01	0.15
Reptantia (crab)	0.05	0.55
Caridea (shrimp)	0.82	5.93
Hippolytidae (shrimp)	0.21	0.56
<i>Lebbeus</i> sp. (shrimp)	0.01	0.04
<i>Eualus</i> sp. (shrimp)	0.21	0.34
<i>Eualus avinus</i> (shrimp)	0.01	0.02
Pandalidae (shrimp)	0.91	1.98
<i>Pandalus</i> sp. (shrimp)	1.03	0.92
<i>Pandalus borealis</i> (shrimp)	2.92	2.50
<i>Pandalus goniurus</i> (shrimp)	0.51	0.88
Crangonidae (shrimp)	0.24	1.22

Table A-2.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Crangon dalli</i> (shrimp)	3.74	6.63
<i>Crangon communis</i> (shrimp)	0.16	0.22
<i>Argis lar</i> (shrimp)	0.68	1.22
<i>Argis dentata</i> (shrimp)	0.01	0.02
<i>Argis levior</i> (Nelson's argid)	0.04	0.05
Natantia (shrimp)	0.14	1.88
Anomura (crab)	<0.01	0.14
Paguridae (hermit crab)	0.30	1.80
Lithodidae (king crab)	<0.01	0.19
<i>Paralithodes platypus</i> (blue king crab)	<0.01	0.02
<i>Decapoda brachyura</i> (crab)	0.01	0.31
Majidae (spider crab)	<0.01	0.02
<i>Hyas</i> sp. (lyre crab)	0.01	0.02
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.35	0.23
<i>Chionoecetes bairdi</i> (Tanner crab)	0.04	0.19
<i>Telmessus cheiragonus</i> (hair crab)	<0.01	0.06
Sipuncula (marine worm)	<0.01	0.02
Echiura (marine worm)	0.58	0.76
<i>Echiurus echiurus</i> (marine worm)	0.06	0.06
Ophiuroidea (brittle star)	<0.01	0.16
Chaetognatha (arrow worm)	1.47	6.09
Larvacea Copelata	1.66	4.17
Osteichthyes Teleostei (fish)	1.37	3.98
Non-gadoid Fish Remains	0.38	0.84
<i>Clupea pallasii</i> (Pacific herring)	0.04	0.06
<i>Mallotus villosus</i> (capelin)	1.03	1.04
<i>Thaleichthys pacificus</i> (eulachon)	<0.01	0.03
Myctophidae (lanternfish)	0.24	0.15
Gadidae (gadid fish)	1.19	1.52
<i>Theragra chalcogramma</i> (walleye pollock)	12.30	8.21
Zoarcidae (eelpout)	0.20	0.12
Scorpaeniformes (rockfish and cottid)	<0.01	0.03
Scorpaenidae	<0.01	0.02
Cottoidei (sculpin)	<0.01	0.10
Cottidae (sculpin)	0.06	0.45
<i>Artedius</i> sp. (Irish lord)	<0.01	0.06
<i>Hemilepidotus</i> sp. (sculpin)	0.01	0.06
<i>Hemilepidotus hemilepidotus</i> (red Irish lord)	<0.01	0.10
<i>Hemilepidotus jordani</i> (yellow Irish lord)	<0.01	0.05
Agonidae (poacher)	0.02	0.09
<i>Podothecus acipenserinus</i> (sturgeon poacher)	<0.01	0.02
Cyclopteridae (snailfish)	0.05	0.07
<i>Liparis</i> sp. (snailfish)	<0.01	0.03
<i>Ronquilis jordani</i> (ronquil)	<0.01	0.02
Stichaeidae (prickleback)	0.26	0.52
<i>Lumpenus</i> sp. (prickleback)	<0.01	0.03
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	<0.01	0.02
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.31	0.48
Pleuronectiformes Pleuronectoidei (flatfish)	<0.01	0.05
Pleuronectidae (flatfish)	0.05	0.25
<i>Atheresthes</i> sp.	<0.01	0.02
<i>Hippoglossoides elassodon</i> (flathead sole)	0.11	0.14
<i>Lepidopsetta</i> sp. (rock soles)	<0.01	0.02
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.13	0.60
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	<0.01	0.03
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	0.31	1.15
<i>Hippoglossus stenolepis</i> (Pacific halibut)	0.01	0.08
Aves (bird part)	0.01	0.05
Unidentified organic material	0.23	0.77
Unidentified eggs	0.01	0.05
Unidentified worm-like organism	0.04	0.04

Table A-2.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Fishery discards	2.06	0.59
Unidentified tube	0.03	0.30
Overboard material (non-fishery)	0.14	0.04
Unidentified algae	0.02	0.05
Unidentified material	0.03	0.16

Total prey weight	23,606 g
Total non-empty stomachs	3906
Total empty stomachs	231
Number of hauls	268

Table A-3.--Prey items (expressed in mean percent frequency of occurrence and mean total weight) of walleye pollock (*Theragra chalcogramma*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	0.32	1.89
Polynoidae (polychaete)	0.01	0.09
Phyllodocidae (polychaete)	<0.01	0.02
Nephtyidae (polychaete)	0.10	0.13
Goniadidae (polychaete)	0.02	0.36
Lumbrineridae	0.06	0.09
Maldanidae (polychaete)	0.01	0.02
Terebellidae (polychaete)	0.20	0.30
Phyllodocida (polychaete)	<0.01	0.02
Gastropoda (snail)	0.02	0.08
Pteropoda (Thecosomata and Gymnosomata)	0.19	0.95
Thecosomata (pteropod)	<0.01	0.07
Gymnosomata (pteropod)	<0.01	0.04
Pectinidae (scallops)	<0.01	0.02
Cephalopoda (squid & octopus)	<0.01	0.01
Teuthoidea (squid)	0.14	0.38
Teuthoidea oegopsida (squid)	0.07	0.04
Crustacea	<0.01	0.04
Calanoida (copepod)	25.90	44.21
Calanidae (copepod)	0.05	0.05
<i>Neocalanus cristatus</i>	0.31	0.54
<i>Calanus pacificus</i> (copepod)	<0.01	0.02
<i>Candacia</i> sp. (copepod)	<0.01	0.01
<i>Candacia columbiae</i> (copepod)	0.01	0.14
Malacostraca Leptostraca	<0.01	0.01
Peracarida Mysidacea (mysid)	<0.01	0.02
Mysidacea Mysida (mysid)	0.64	1.98
Mysidae (mysid)	1.96	6.21
<i>Holmesiella anomala</i> (mysid)	0.03	0.02
Cumacea (cumacean)	0.25	2.01
Amphipoda (amphipod)	<0.01	0.02
Gammaridea (amphipod)	2.24	6.74
Ampeliscidae (amphipod)	0.16	0.16
<i>Cyphocaris</i> sp. (amphipod)	<0.01	0.01
Amphipoda Hyperiidea (amphipod)	0.16	2.97
Hyperiididae (amphipod)	0.01	0.04
<i>Themisto</i> sp. (amphipod)	1.64	12.62
Euphausiacea (euphausiid)	14.72	30.77
Euphausiidae (euphausiid)	0.62	1.19
<i>Euphausia pacifica</i> (euphausiid)	<0.01	0.02
<i>Thysanoessa</i> sp. (euphausiid)	10.25	12.22
<i>Thysanoessa inermis</i> (euphausiid)	3.67	4.65
<i>Thysanoessa longipes</i> (euphausiid)	0.01	0.26
<i>Thysanoessa raschii</i> (euphausiid)	4.95	6.40
<i>Thysanoessa spinifera</i> (euphausiid)	0.01	0.07
Decapoda (shrimp and crab)	0.01	0.04
Reptantia (crab)	<0.01	0.02
Caridea (shrimp)	0.33	1.75
Hippolytidae (shrimp)	0.16	0.66
<i>Eualus gaimurdii</i> (shrimp)	0.12	0.19
Pandalidae (shrimp)	0.78	1.44
<i>Pandalus</i> sp. (shrimp)	0.04	0.07
<i>Pandalus borealis</i> (shrimp)	1.89	1.52
<i>Pandalus goniurus</i> (shrimp)	1.68	1.60
Crangonidae (shrimp)	0.28	1.17
<i>Crangon</i> sp. (shrimp)	<0.01	0.06
<i>Crangon dalli</i> (shrimp)	0.71	1.16
<i>Crangon communis</i> (shrimp)	2.14	2.85
<i>Argis</i> sp. (shrimp)	0.03	0.11

Table A-3.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Argis lar</i> (shrimp)	0.38	0.46
Paguridae (hermit crab)	0.10	1.29
<i>Decapoda brachyura</i> (crab)	0.17	0.60
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.02	0.61
<i>Chionoecetes opilio</i> (snow crab)	<0.01	0.03
Echiura (marine worm)	0.50	0.59
Ophiuroidea Ophiurida (brittle star)	<0.01	0.02
Chaetognatha (arrow worm)	2.51	6.48
Larvacea Copelata	4.52	7.80
Osteichthyes Teleostei (fish)	0.39	1.36
Non-gadoid Fish Remains	0.20	0.40
<i>Clupea pallasii</i> (Pacific herring)	0.35	0.21
<i>Mallotus villosus</i> (capelin)	0.12	0.18
Myctophidae (lanternfish)	0.33	0.51
<i>Stenobrachius leucopsarus</i> (northern lampfish)	0.07	0.04
Gadidae (gadid fish)	0.49	0.96
<i>Gadus macrocephalus</i> (Pacific cod)	0.13	0.06
<i>Theragra chalcogramma</i> (walleye pollock)	10.84	6.39
Zoarcidae (eelpout)	0.04	0.07
Cottoidei (sculpin)	0.09	0.08
Cottidae (sculpin)	0.03	0.07
<i>Hemilepidotus hemilepidotus</i> (red Irish lord)	<0.01	0.02
Agonidae (poacher)	0.05	0.06
Cyclopteridae (snailfish)	<0.01	0.04
Stichaeidae (prickleback)	0.13	0.13
<i>Lumpenus</i> sp. (prickleback)	0.05	0.02
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.34	0.25
Pleuronectiformes Pleuronectoidei (flatfish)	0.07	0.04
Pleuronectidae (flatfish)	<0.01	0.02
<i>Atheresthes</i> sp.	<0.01	0.01
<i>Hippoglossus</i> sp. (flatfish)	<0.01	0.01
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.15	0.06
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	<0.01	0.06
Aves (bird part)	0.01	0.04
Unidentified organic material	0.21	0.47
Fishery discards	0.80	0.32
Unidentified tube	<0.01	0.02

Total prey weight	22,982 g
Total non-empty stomachs	4336
Total empty stomachs	216
Number of hauls	285

Table A-4.--Prey items (expressed in mean percent frequency of occurrence and mean total weight) of walleye pollock (*Theragra chalcogramma*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Cnidaria	<0.01	0.02
Polychaeta (worm)	0.19	1.57
Polynoidae (polychaete)	0.02	0.17
Phyllodocidae (polychaete)	0.07	0.19
Nereidae (polychaete)	<0.01	0.02
Nephtyidae (polychaete)	0.28	0.27
Glyceridae (polychaete)	0.01	0.18
Goniadidae (polychaete)	0.01	0.20
Lumbrineridae	0.03	0.20
Terebellidae (polychaete)	0.04	0.11
Eunicida (polychaete)	0.01	0.13
Phyllodocida (polychaete)	<0.01	0.15
Glyceriformia	0.04	1.11
Pteropoda (Thecosomata and Gymnosomata)	0.08	0.50
Bivalvia (clam)	<0.01	0.12
Cephalopoda (squid and octopus)	0.07	0.05
<i>Teuthoidea oegopsida</i> (squid)	0.08	0.09
Octopoda (octopus)	0.02	0.04
Crustacea	0.05	0.16
Calanoida (copepod)	16.80	38.44
<i>Neocalanus cristatus</i>	<0.01	0.07
<i>Calanus marshallae</i> (copepod)	0.08	0.37
<i>Neocalanus plumchrus</i>	<0.01	0.08
<i>Candacia columbiae</i> (copepod)	<0.01	0.02
Malacostraca	<0.01	0.03
Malacostraca Leptostraca	0.02	0.36
Mysidacea Mysida (mysid)	1.07	3.04
Mysidae (mysid)	2.82	12.63
<i>Neomysis czerniawskii</i> (mysid)	<0.01	0.01
<i>Pseudomma truncatum</i> (mysid)	<0.01	0.03
Cumacea (cumacean)	0.55	5.50
Amphipoda (amphipod)	<0.01	0.02
Gammaridea (amphipod)	4.51	16.49
Ampeliscidae (amphipod)	0.02	0.17
Amphipoda Hyperiidea (amphipod)	1.60	5.07
<i>Themisto</i> sp. (amphipod)	2.50	6.26
Caprellidea (amphipod)	<0.01	0.06
Eucarida	<0.01	0.03
Euphausiacea (euphausiid)	7.41	18.54
Euphausiidae (euphausiid)	7.08	9.94
<i>Euphausia</i> sp. (euphausiid)	0.05	0.02
<i>Thysanoessa</i> sp. (euphausiid)	17.98	17.79
<i>Thysanoessa inermis</i> (euphausiid)	0.93	1.38
<i>Thysanoessa raschii</i> (euphausiid)	5.30	5.19
<i>Thysanoessa spinifera</i> (euphausiid)	<0.01	0.06
Caridea (shrimp)	0.48	1.74
Hippolytidae (shrimp)	0.12	0.42
<i>Eualus</i> sp. (shrimp)	0.02	0.19
<i>Eualus avinus</i> (shrimp)	0.02	0.11
Pandalidae (shrimp)	0.34	1.08
<i>Pandalus</i> sp. (shrimp)	0.02	0.09
<i>Pandalus borealis</i> (shrimp)	1.78	1.30
<i>Pandalus goniurus</i> (shrimp)	1.13	0.79
Crangonidae (shrimp)	0.38	1.43
<i>Crangon</i> sp. (shrimp)	0.05	0.79
<i>Crangon alaskensis</i> (shrimp)	<0.01	0.05
<i>Crangon dalli</i> (shrimp)	1.71	3.74
<i>Crangon communis</i> (shrimp)	0.34	0.36
<i>Argis</i> sp. (shrimp)	0.02	0.12

Table A-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Anomura (crab)	<0.01	0.01
Paguridae (hermit crab)	0.31	1.01
Majidae (spider crab)	0.14	0.03
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.41	0.43
<i>Chionoecetes opilio</i> (snow crab)	0.03	0.13
<i>Chionoecetes bairdi</i> (Tanner crab)	<0.01	0.01
Echiura (marine worm)	0.67	1.26
<i>Echiurus echiurus</i> (marine worm)	0.01	0.03
Ophiuroidea Ophiurida (brittle star)	<0.01	0.03
Chaetognatha (arrow worm)	5.41	11.87
Larvacea Copelata	3.66	6.59
Osteichthyes Teleostei (fish)	0.74	1.86
Non-gadoid Fish Remains	0.33	0.96
<i>Mallotus villosus</i> (capelin)	0.06	0.07
Myctophidae (lanternfish)	0.11	0.05
Gadidae (gadid fish)	0.24	0.56
<i>Eliginus gracilis</i> (saffron cod)	0.22	0.03
<i>Theragra chalcogramma</i> (walleye pollock)	10.14	5.40
Zoarcidae (eelpout)	0.33	0.38
Scorpaeniformes (rockfish and cottid)	<0.01	0.04
Cottoidei (sculpin)	0.01	0.05
Cottidae (sculpin)	0.14	0.07
<i>Hemilepidotus hemilepidotus</i> (red Irish lord)	<0.01	0.02
Agonidae (poacher)	0.01	0.03
Stichaeidae (prickleback)	0.22	0.20
<i>Ammodytes</i> sp. (sandlance)	0.06	0.08
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.09	0.85
Pleuronectidae (flatfish)	0.04	0.07
<i>Lepidopsetta polyxystra</i> (northern rock sole)	<0.01	0.02
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	<0.01	0.05
<i>Hippoglossus stenolepis</i> (Pacific halibut)	<0.01	0.07
Unidentified organic material	0.19	0.30
Fishery discards	0.22	0.07
Overboard material (non-fishery)	0.02	0.03

Total prey weight	32,203 g
Total non-empty stomachs	3614
Total empty stomachs	205
Number of hauls	213

Table A-5.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of *Theragra chalcogramma* (walleye pollock) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	1.00	2.77
Polynoidae (polychaete)	0.03	0.02
Phyllodocidae (polychaete)	0.01	0.03
Nephtyidae (polychaete)	<0.01	0.04
Glyceridae (polychaete)	<0.01	0.02
Opheliidae (polychaete)	<0.01	0.04
Pteropoda (Thecosomata and Gymnosomata)	<0.01	0.07
Bivalvia (clam)	<0.01	0.07
Calanoida (copepod)	23.87	36.72
<i>Calanus marshallae</i> (copepod)	0.02	0.08
Harpacticoida (copepod)	0.01	0.02
Mysidacea Mysida (mysid)	6.83	13.29
Mysidae (mysid)	<0.01	0.04
<i>Pseudomma truncatum</i> (mysid)	<0.01	0.04
Cumacea (cumacean)	0.50	1.72
Gammaridea (amphipod)	2.66	7.95
Amphipoda Hyperiidea (amphipod)	2.05	5.83
Hyperiidae (amphipod)	<0.01	0.03
<i>Themisto</i> sp. (amphipod)	0.38	2.56
Euphausiacea (euphausiid)	21.51	40.93
Euphausiidae (euphausiid)	3.06	3.93
<i>Thysanoessa</i> sp. (euphausiid)	0.17	0.56
<i>Thysanoessa inermis</i> (euphausiid)	1.88	2.12
<i>Thysanoessa raschii</i> (euphausiid)	10.78	9.37
<i>Thysanoessa spinifera</i> (euphausiid)	0.39	0.84
Decapoda (shrimp and crab)	<0.01	0.05
Reptantia (crab)	<0.01	0.02
Caridea (shrimp)	0.37	1.25
Hippolytidae (shrimp)	0.12	0.48
Pandalidae (shrimp)	0.30	0.80
<i>Pandalus</i> sp. (shrimp)	0.01	0.06
<i>Pandalus borealis</i> (shrimp)	0.06	0.09
<i>Pandalus goniurus</i> (shrimp)	0.16	0.15
Crangonidae (shrimp)	0.20	0.72
<i>Crangon</i> sp. (shrimp)	0.01	0.04
<i>Crangon dalli</i> (shrimp)	1.59	2.78
<i>Crangon communis</i> (shrimp)	0.09	0.19
<i>Argis</i> sp. (shrimp)	0.17	0.22
<i>Argis lar</i> (shrimp)	0.07	0.44
Paguridae (hermit crab)	<0.01	0.19
Decapoda brachyura (crab)	0.01	0.09
<i>Chionoecetes opilio</i> (snow crab)	0.06	0.44
Echiura (marine worm)	0.22	0.25
Chaetognatha (arrow worm)	0.37	1.71
Larvacea Copelata	2.44	6.85
Osteichthyes Teleostei (fish)	2.67	5.20
Non-gadoid Fish Remains	0.07	0.21
<i>Thaleichthys pacificus</i> (eulachon)	0.18	0.05
Myctophidae (lanternfish)	0.05	0.02
Gadidae (gadid fish)	1.30	1.06
<i>Theragra chalcogramma</i> (walleye pollock)	12.69	8.03
Zoarcidae (eelpout)	0.29	0.14
Cottoidei (sculpin)	0.18	0.27
Stichaeidae (prickleback)	0.18	0.60
<i>Ammodytes</i> sp. (sandlance)	0.14	0.09
Pleuronectidae (flatfish)	0.03	0.20
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.04	0.18
<i>Lepidopsetta bilineata</i> (southern rock sole)	<0.01	0.04
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	0.02	0.18

Table A-5.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Hippoglossus stenolepis</i> (Pacific halibut)	<0.01	0.13
Unidentified organic material	0.08	0.44
Fishery discards	0.67	0.13

Total prey weight	13,441 g
Total non-empty stomachs	2482
Total empty stomachs	58
Number of hauls	228

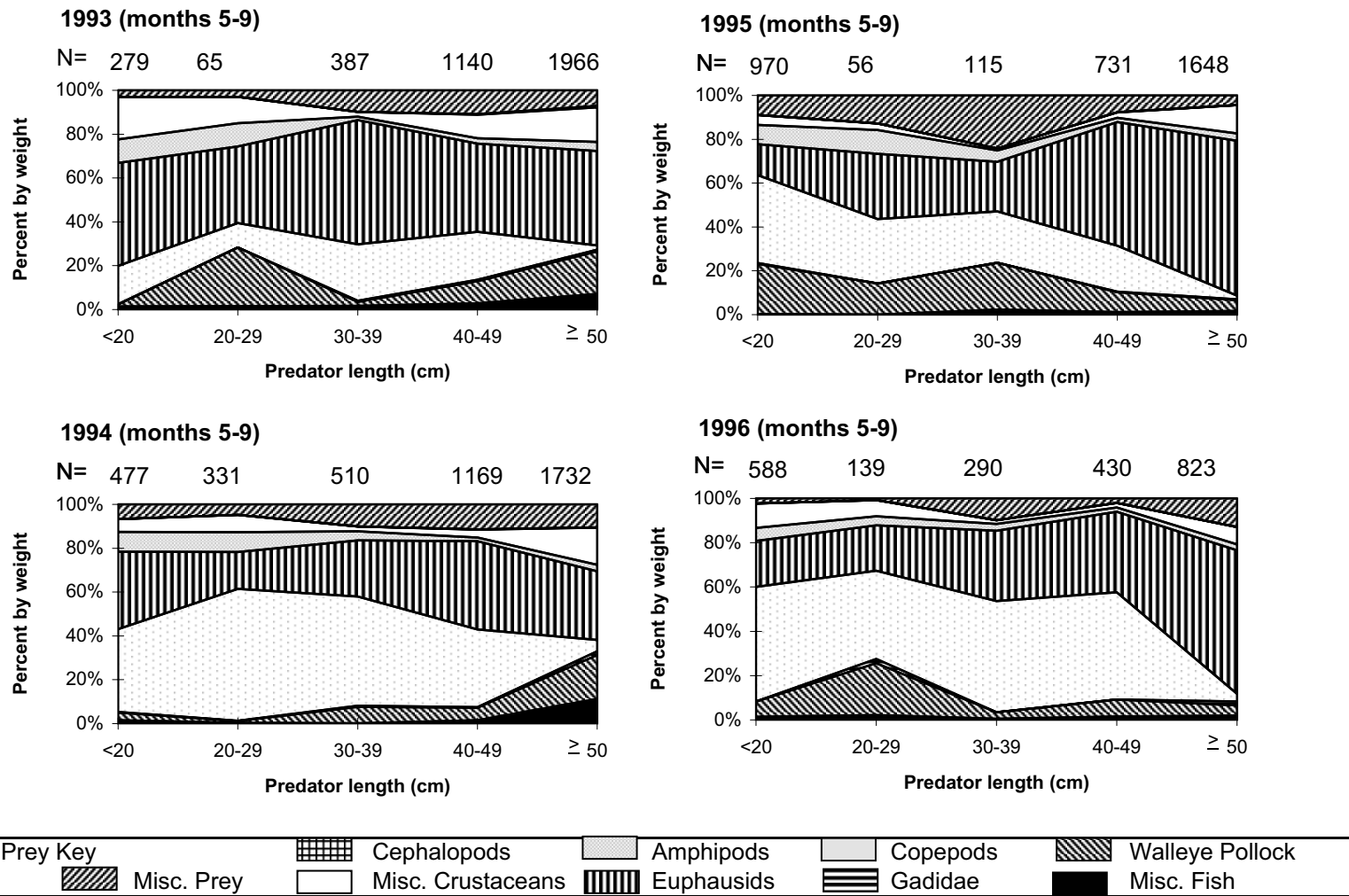


Figure A-1. -- Diet composition of walleye pollock, in terms of mean average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

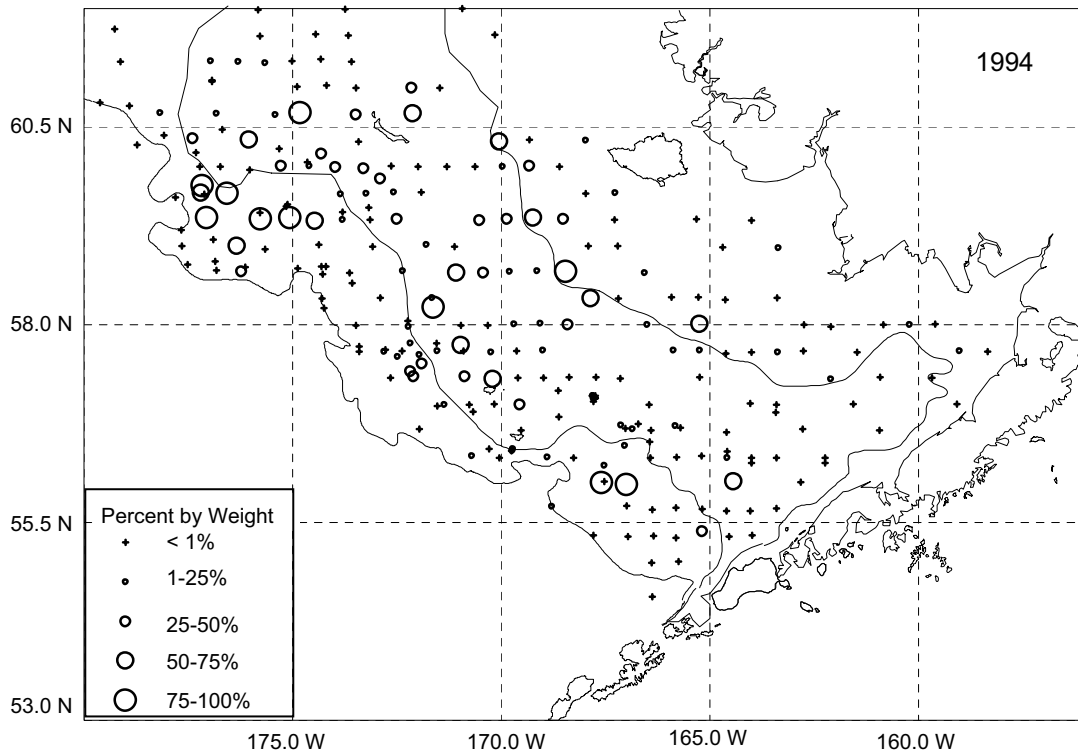
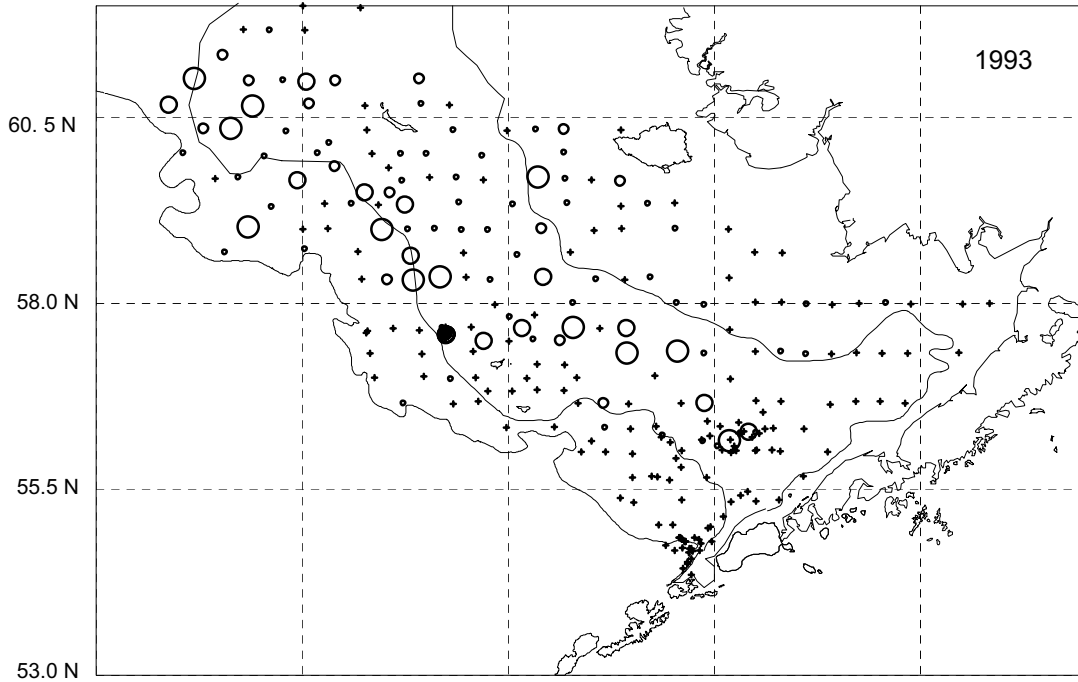


Figure A-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of walleye pollock by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

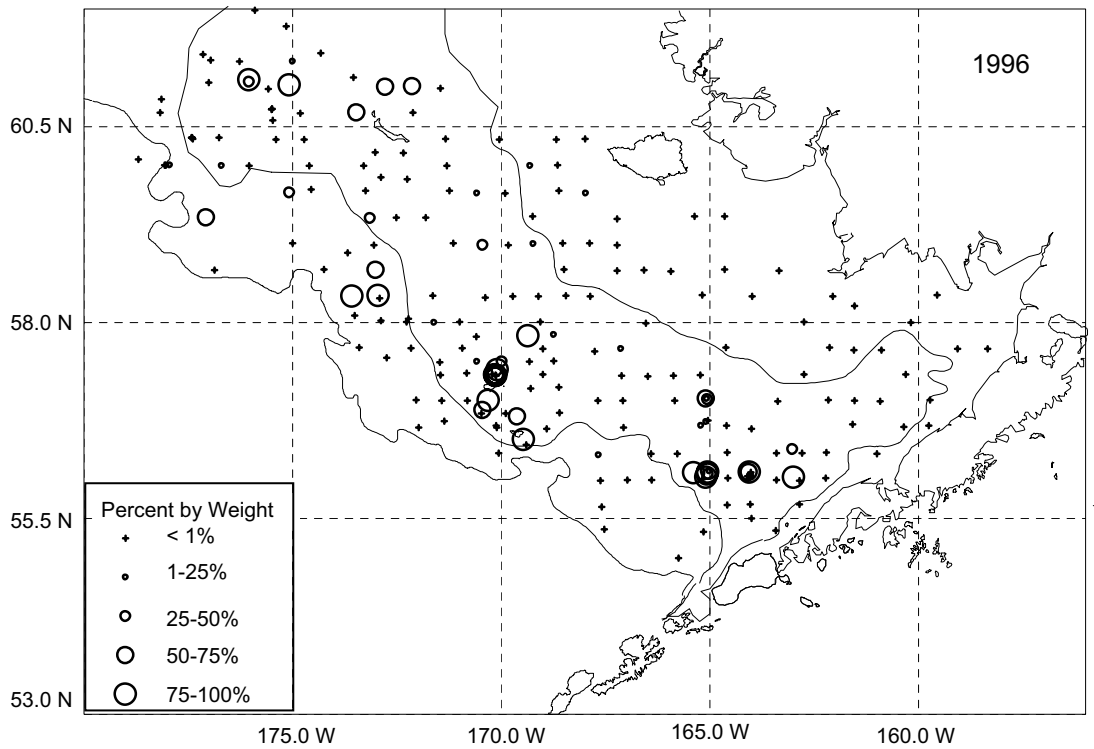
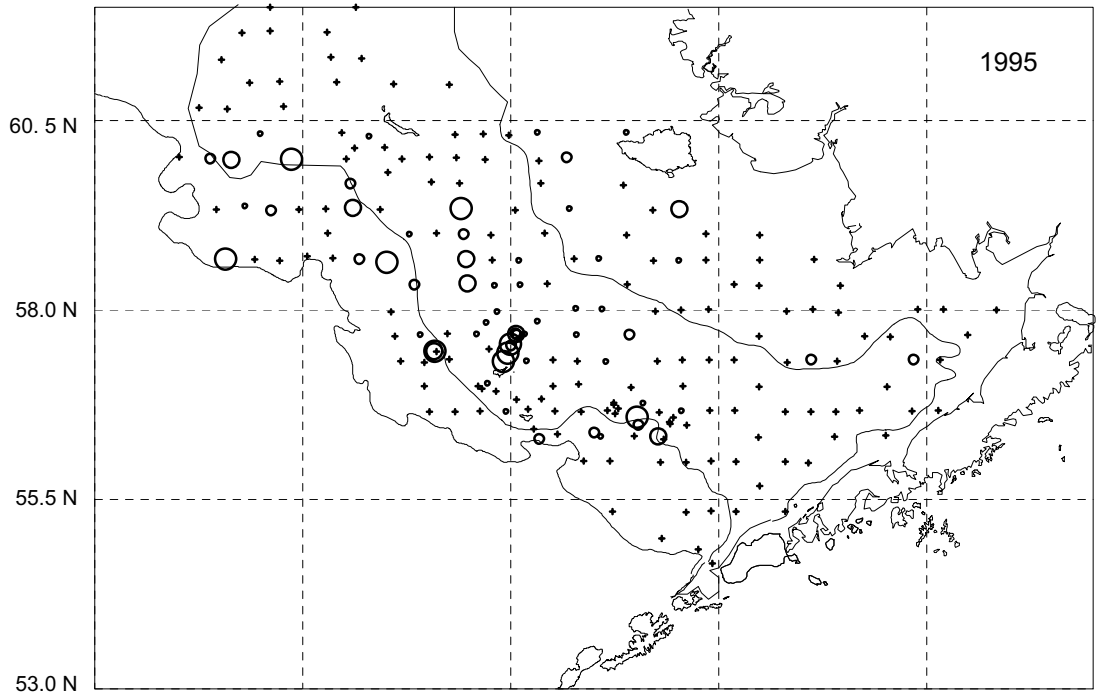


Figure A-2. Continued.

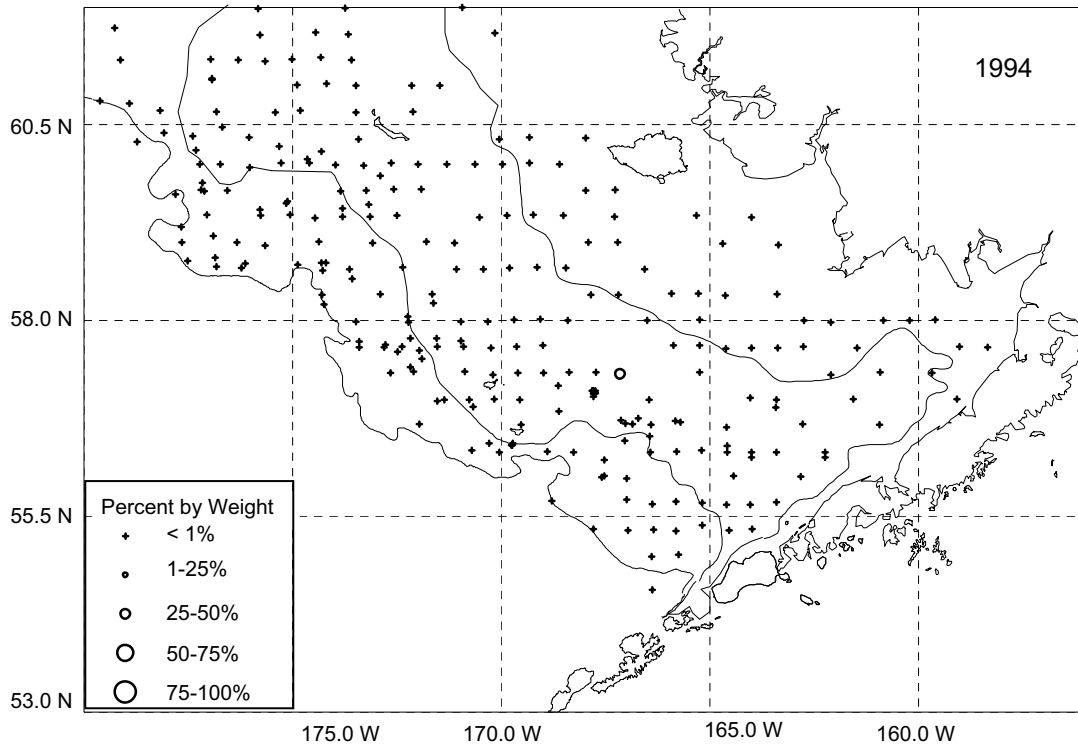


Figure A-3.-- Percent by weight of Pacific cod (*Gadus macrocephalus*) in the diet of walleye pollock (*Theragra chalcogramma*) by sampling station during May through September in 1994 in the eastern Bering Sea.

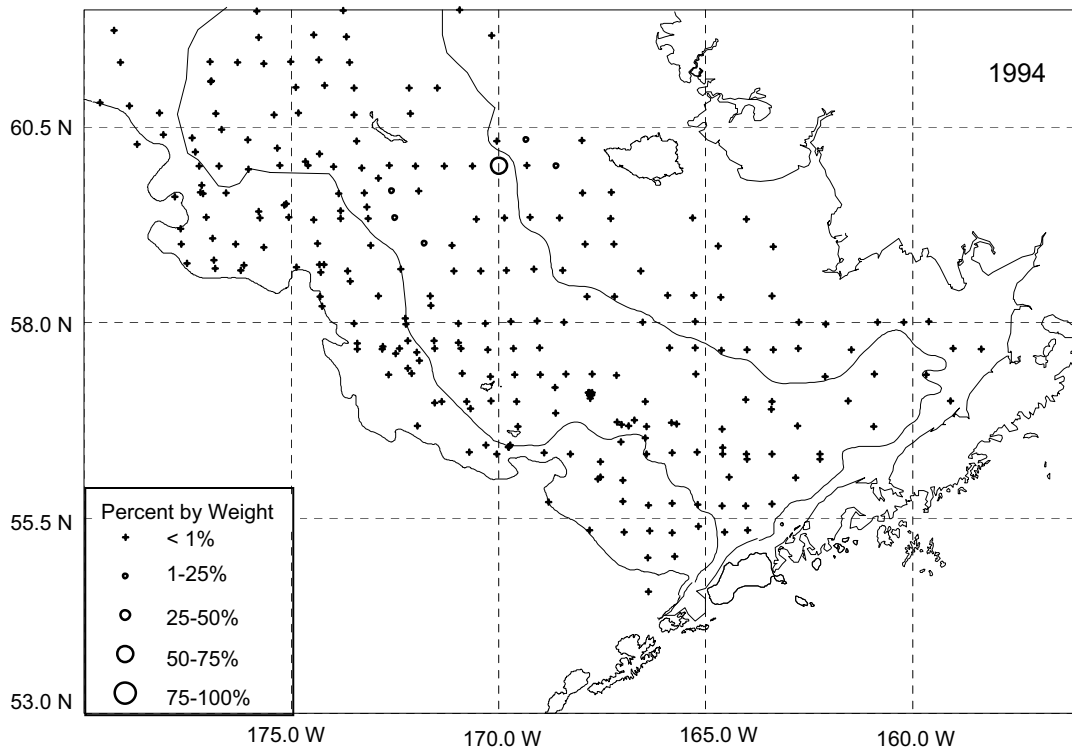


Figure A-4.-- Percent by weight of Pacific herring (*Clupea pallasii*) in the diet of walleye pollock (*Theragra chalcogramma*) by sampling station during May through September in 1994 in the eastern Bering Sea.

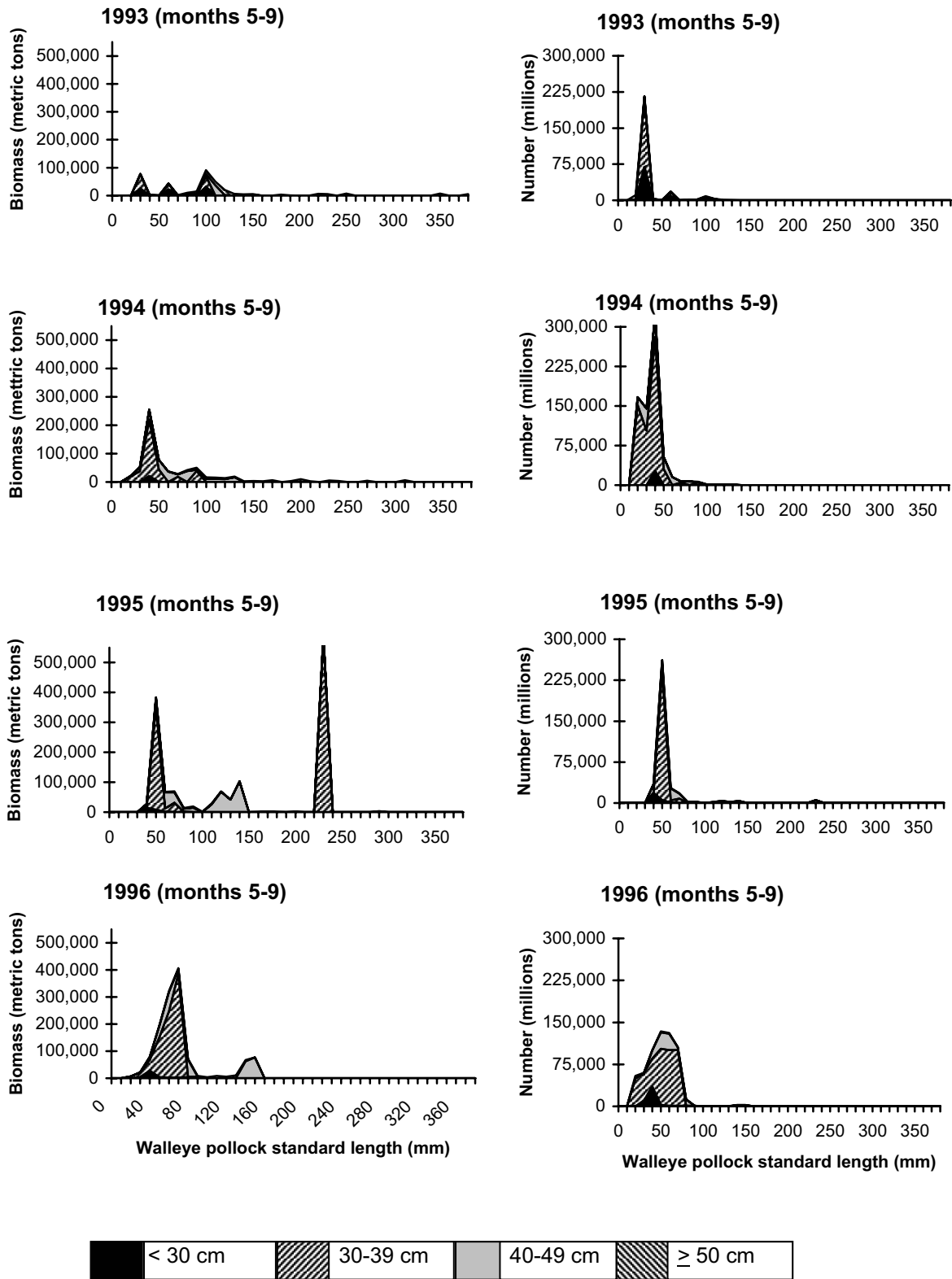


Figure A-5. -- Biomass and number of prey walleye pollock (*Theragra chalcogramma*) consumed by four size groups of walleye pollock in the eastern Bering Sea during May through September of 1993, 1994, 1995, and 1996 by prey size.

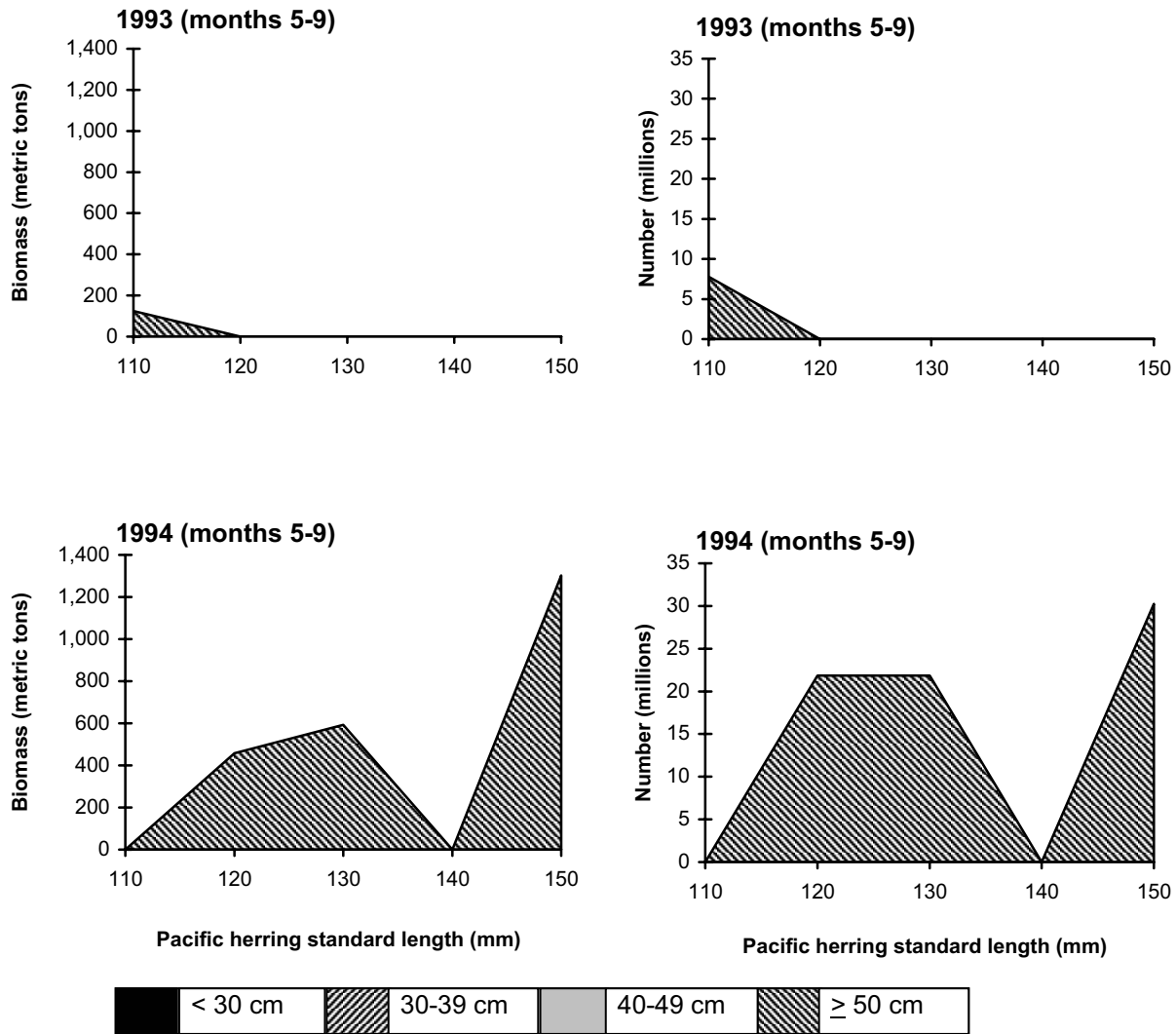


Figure A-6. -- Biomass and number of Pacific herring (*Clupea pallasii*) consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1993 and 1994 by prey size.

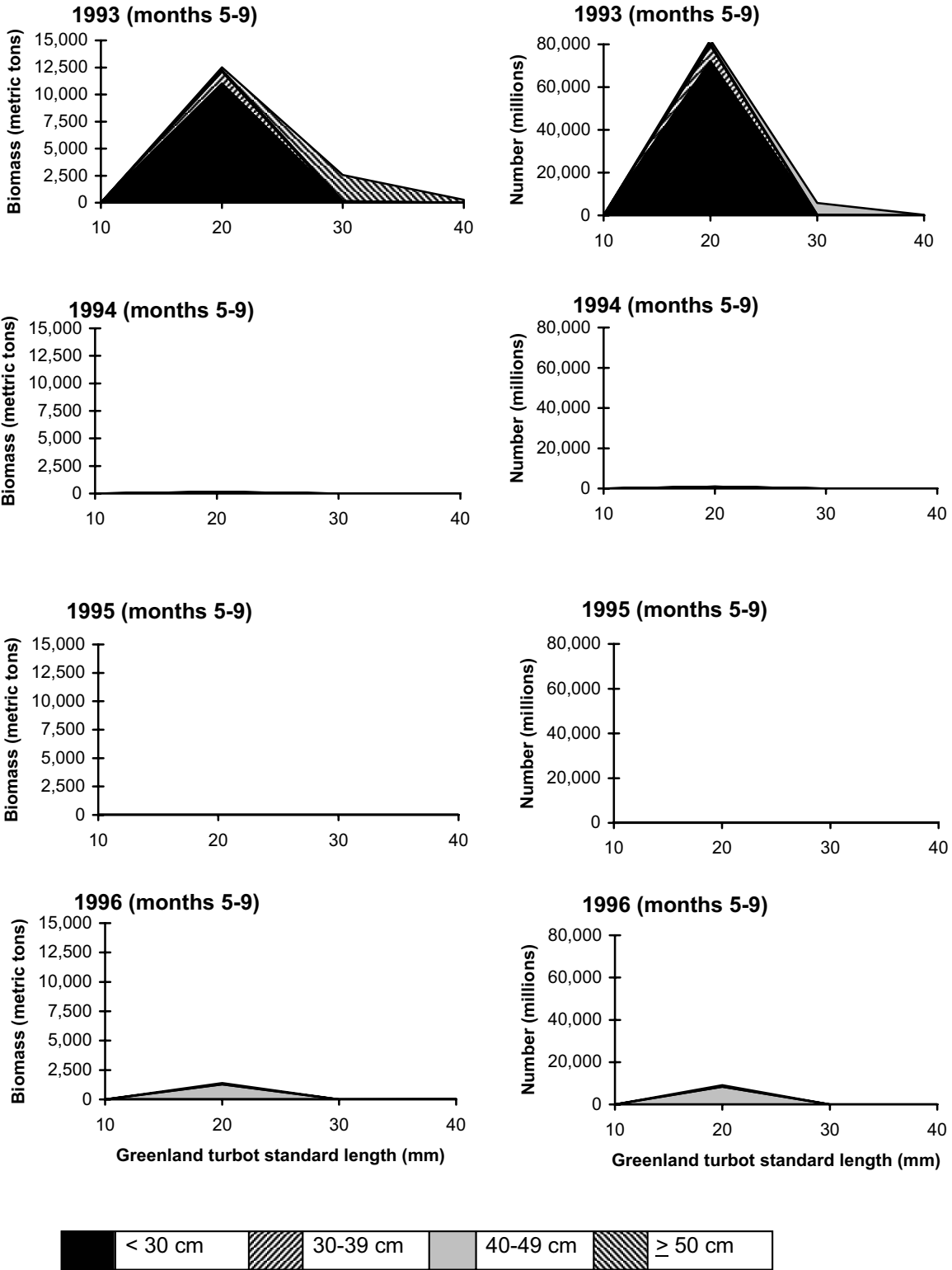


Figure A-7. -- Biomass and number of Greenland turbot (*Reinhardtius hippoglossoides*) consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1993, 1994, 1995, and 1996 by prey size.

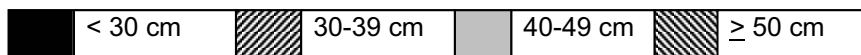
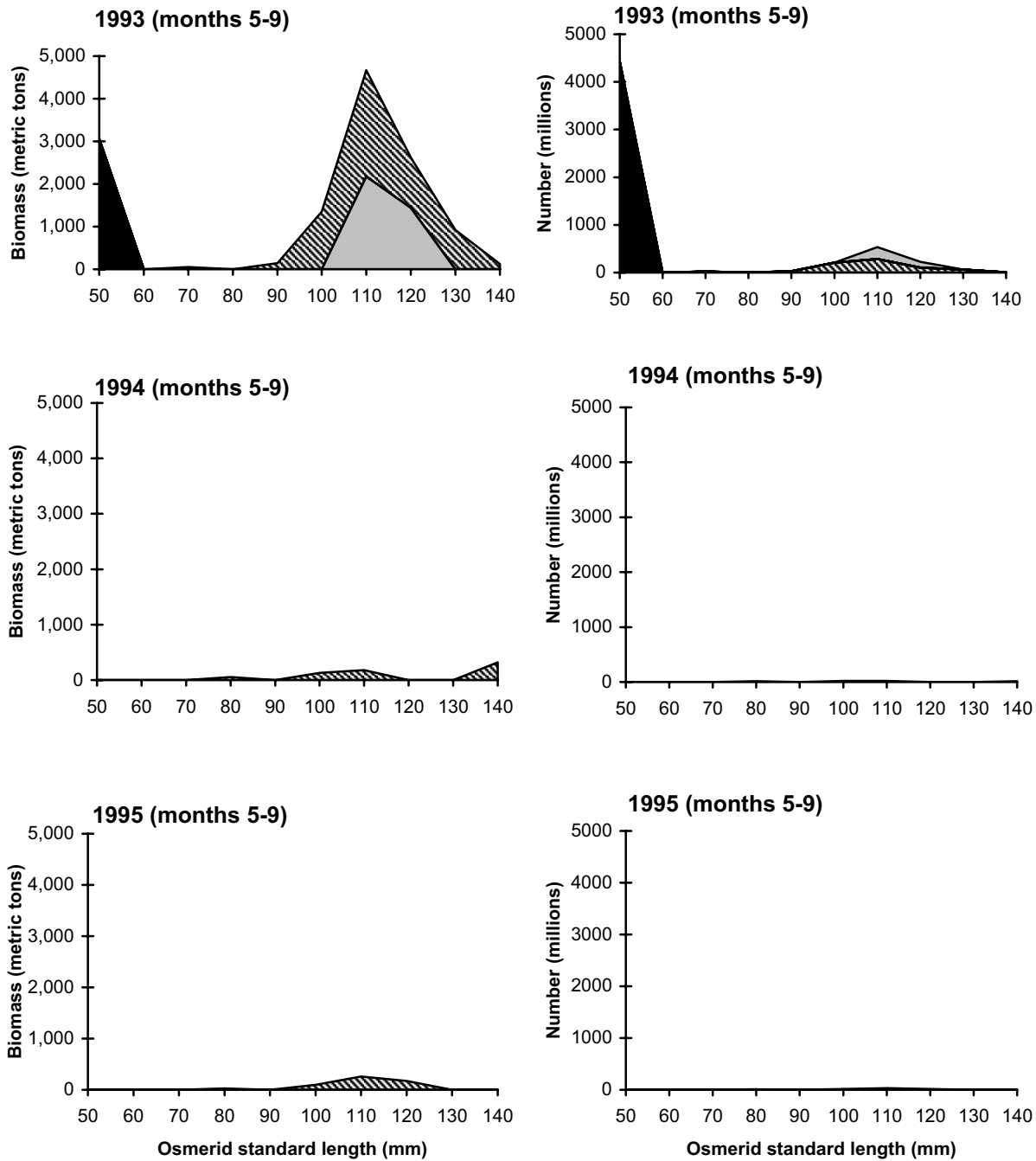


Figure A-8. -- Biomass and number of osmerids consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1993, 1994, and 1995 by prey size.

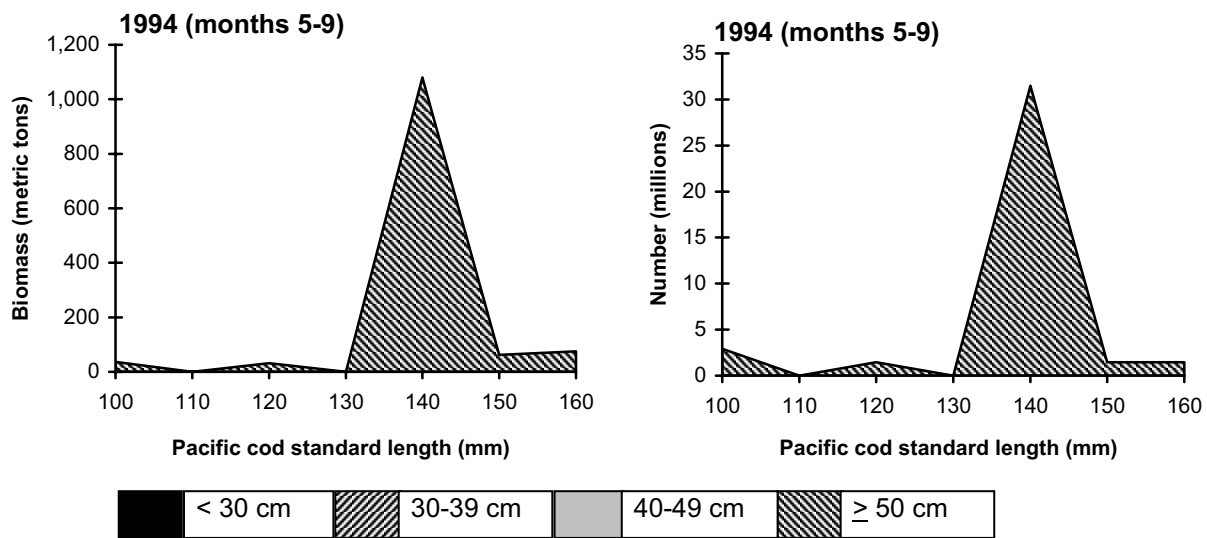


Figure A-9. -- Biomass and number of Pacific cod (*Gadus macrocephalus*) consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1994 by prey size.

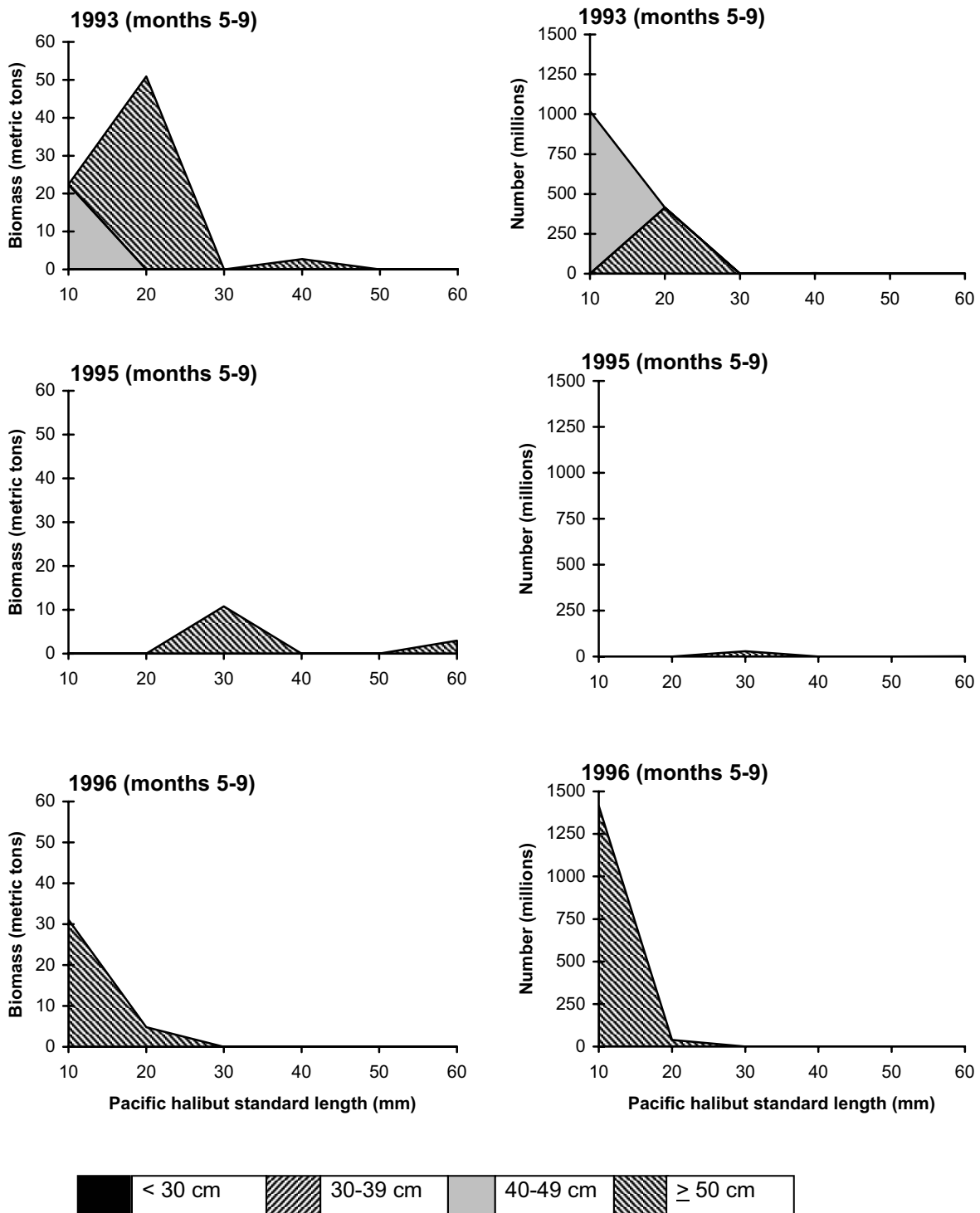


Figure A-10. -- Biomass and number of Pacific halibut (*Hippoglossus stenolepis*) consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1993, 1995, and 1996 by prey size.

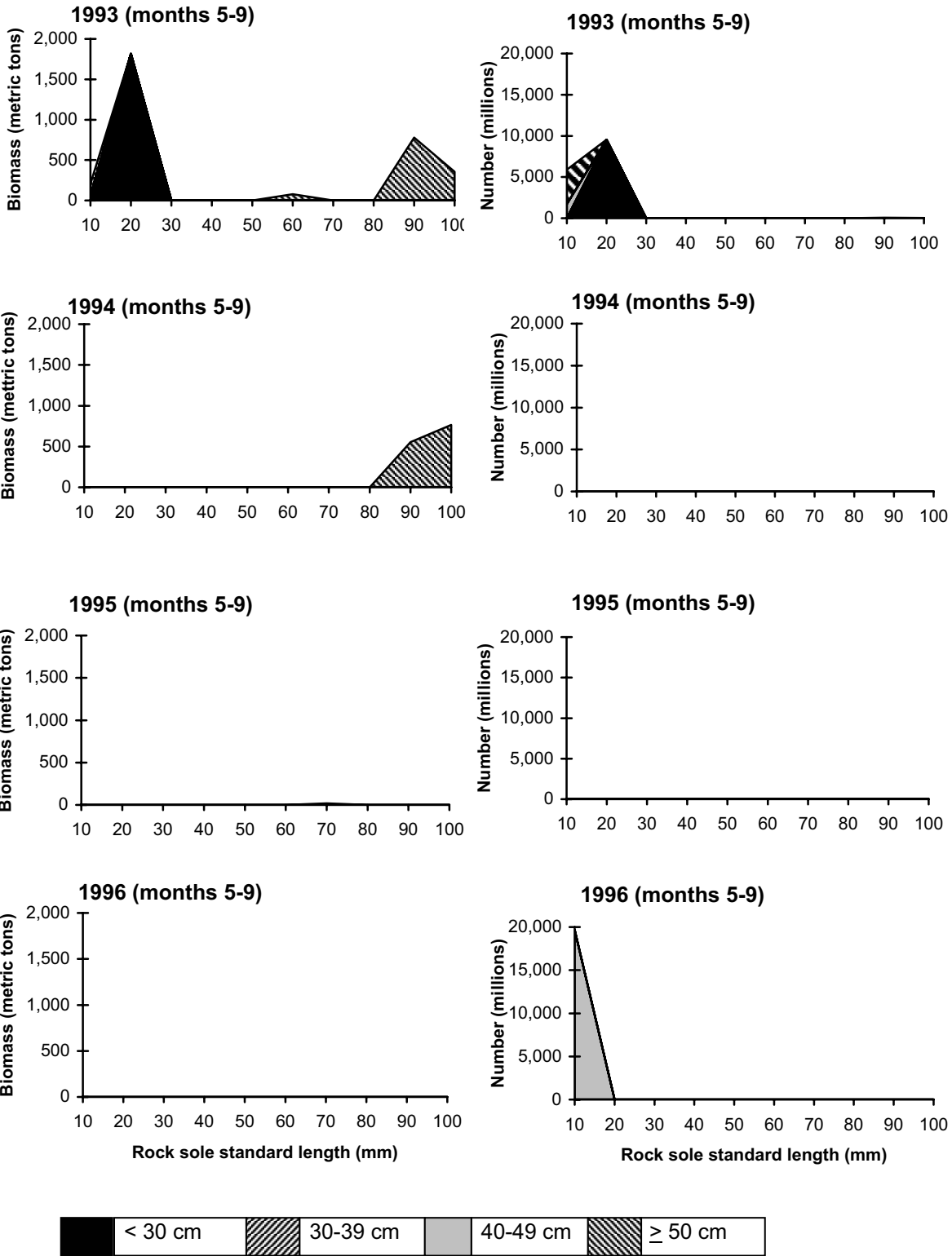


Figure A-11. -- Biomass and number of northern rock sole (*Lepidopsetta polyxystra*) consumed by four size groups of walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea during May through September of 1993, 1994, 1995, and 1996 by prey size.

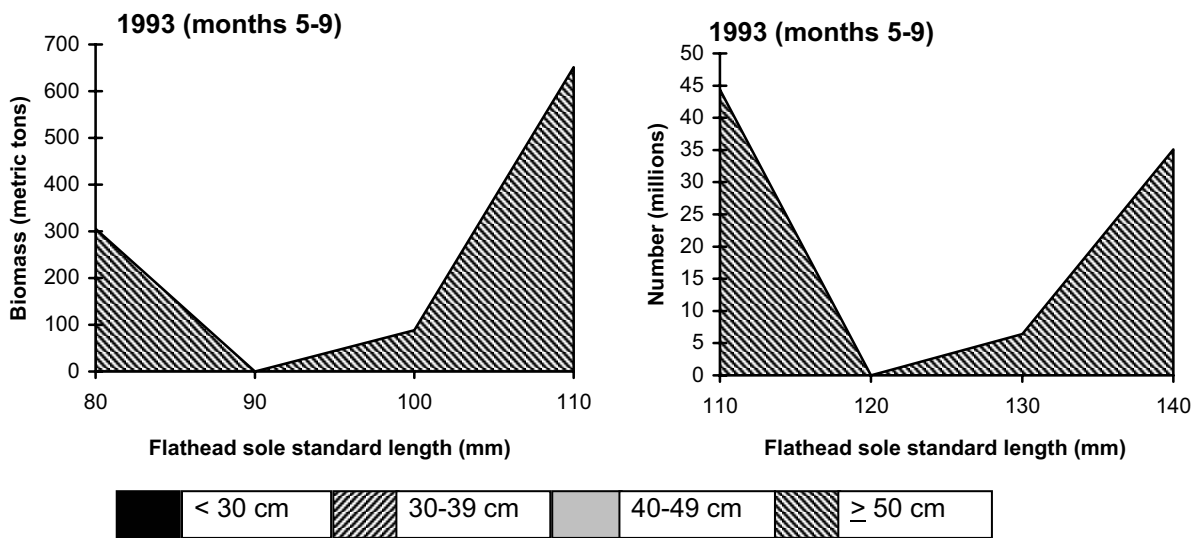


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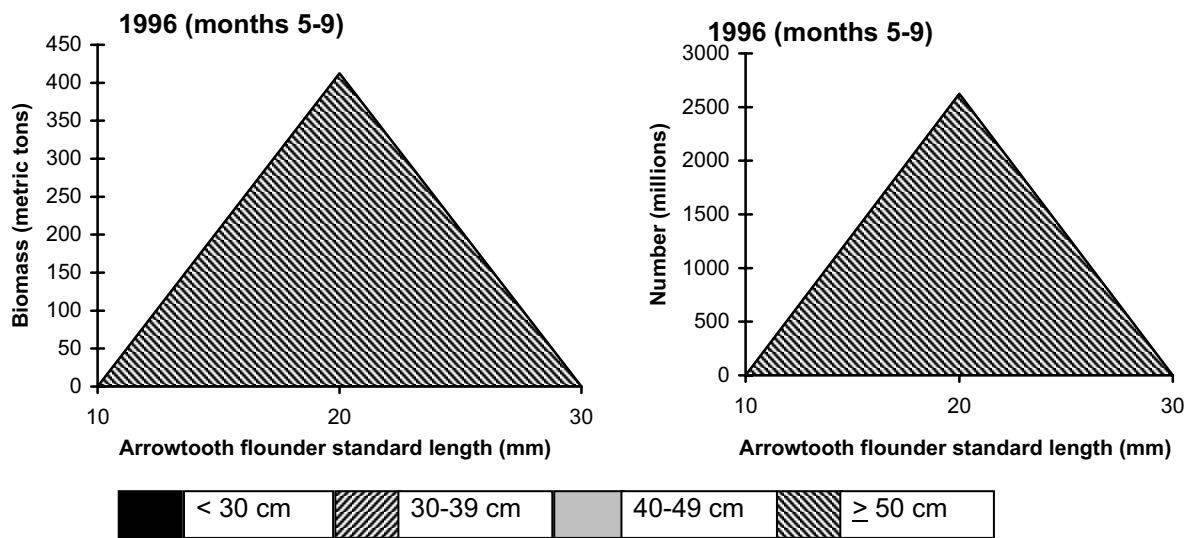


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Table B-1.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of Pacific cod (*Gadus macrocephalus*) in the eastern Bering Sea for 1993 through 1996, from the stock assessment estimates.

Predator Size (cm)	Stratum	93	94	95	96
< 30	1	9,968	10,227	7,825	5,925
	2	6,679	648	1,971	1,184
	3	8,181	3,908	3,088	6,319
	4	11,580	14,400	6,166	4,072
	5	0	0	10	2
	6	129	1,057	450	19
Subtotal		36,537	30,240	19,510	17,521
30-49	1	160,528	158,377	127,821	61,626
	2	22,517	15,634	33,331	23,231
	3	140,853	96,755	86,637	147,162
	4	155,808	118,526	130,663	155,071
	5	16,368	13,388	14,642	9,768
	6	60,364	123,677	125,976	40,991
Subtotal		556,438	526,357	519,070	437,849
> 60	1	202,148	187,285	229,516	210,781
	2	39,093	50,283	19,823	31,900
	3	334,047	229,952	291,252	302,458
	4	163,432	140,155	100,103	225,308
	5	96,415	59,542	102,649	64,099
	6	260,446	502,717	383,504	276,059
Subtotal		1,095,581	1,169,934	1,126,847	1,110,605
Total		1,688,556	1,726,531	1,665,427	1,565,975

Table B-2.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of *Gadus macrocephalus* (Pacific cod) collected in the eastern Bering Sea in 1993, May through September.

Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida Textulariina(foram)	<0.01	0.03
Anthozoa (anemome)	0.03	0.03
Polychaeta (worm)	1.51	18.00
Aphroditidae (sea mouse)	0.19	0.99
Polynoidae (polychaete)	0.45	1.23
Phyllodocidae (polychaete)	0.03	0.39
Tomopteridae (polychaete)	<0.01	0.05
Nephtyidae (polychaete)	0.23	1.46
Glyceridae (polychaete)	<0.01	0.02
Onuphidae (polychaete)	<0.01	0.12
Lumbrineridae	0.04	0.38
Spionidae (polychaete)	<0.01	0.07
Flabelligeridae (polychaete)	<0.01	0.05
<i>Flabelligera</i> sp. (polychaete)	<0.01	0.02
Scalibregmidae	<0.01	0.04
Opheliidae (polychaete)	0.01	0.03
Maldanidae (polychaete)	0.02	0.33
Ampharetidae (polychaete)	0.01	0.18
Terebellidae (polychaete)	0.05	0.34
<i>Terebellides stroemi</i> (polychaete)	<0.01	0.03
Phyllodocida (polychaete)	0.02	0.24
Terebellida (polychaete)	<0.01	0.06
Mollusca	0.04	0.22
Gastropoda (snail)	0.13	1.72
<i>Natica</i> sp. (moonsnail)	0.02	0.10
Buccinidae (snail)	0.01	0.14
Neptuneidae (snail)	0.02	0.07
Bivalvia (clam)	0.17	2.83
Nuculidae	0.01	0.16
<i>Yoldia</i> sp. (clam)	0.04	0.17
Pectinidae (scallops)	<0.01	0.05
Cardiidae (cockle)	0.04	0.29
Cephalopoda (squid & octopus)	0.12	0.40
Teuthoidea (squid)	0.04	0.63
Octopoda (octopus)	1.16	3.64
Crustacea	0.04	0.19
Calanoida (copepod)	0.02	0.39
Calanidae (copepod)	<0.01	0.09
Cirripedia (barnacle)	<0.01	0.04
Mysidacea Mysida (mysid)	0.59	1.86
Mysidae (mysid)	0.82	6.35
<i>Neomysis rayii</i> (mysid)	0.01	0.14
Cumacea (cumacean)	0.16	1.53
Isopoda (isopod)	0.02	0.31
Gammaridea (amphipod)	3.61	34.07
Ampeliscidae (amphipod)	0.02	0.80
<i>Maera loveni</i> (amphipod)	<0.01	0.07
Amphipoda Hyperiidea (amphipod)	<0.01	0.03
<i>Themisto</i> sp. (amphipod)	0.19	0.20
Caprellidea (amphipod)	0.01	0.20
Euphausiacea (euphausiid)	0.57	3.95
Euphausiidae (euphausiid)	0.25	0.90
<i>Thysanoessa</i> sp. (euphausiid)	0.79	1.48
<i>Thysanoessa inermis</i> (euphausiid)	<0.01	0.03
<i>Thysanoessa raschii</i> (euphausiid)	0.62	0.86
Reptantia (crab)	0.50	2.68
Caridea (shrimp)	0.20	3.11
Hippolytidae (shrimp)	0.20	1.94
<i>Spirontocaris</i> sp. (shrimp)	<0.01	0.05
<i>Spirontocaris arcuata</i> (shrimp)	0.03	0.11

Table B-2.--Continued.

Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Lebbeus groenlandicus</i> (shrimp)	0.02	0.02
<i>Eualus</i> sp. (shrimp)	0.02	0.77
Pandalidae (shrimp)	1.27	7.24
<i>Pandalus</i> sp. (shrimp)	0.33	1.37
<i>Pandalus borealis</i> (shrimp)	2.38	8.56
<i>Pandalus goniurus</i> (shrimp)	0.15	0.39
<i>Pandalus jordani</i> (shrimp)	0.03	0.20
<i>Pandalus montagui tridens</i> (shrimp)	<0.01	0.08
Crangonidae (shrimp)	0.41	5.56
<i>Crangon</i> sp. (shrimp)	0.04	0.70
<i>Crangon alaskensis</i> (shrimp)	0.13	0.39
<i>Crangon dalli</i> (shrimp)	2.86	18.76
<i>Crangon communis</i> (shrimp)	0.89	7.71
<i>Argis</i> sp. (shrimp)	0.07	0.56
<i>Argis lar</i> (shrimp)	0.43	2.23
Natantia (shrimp)	0.04	1.03
Anomura (crab)	<0.01	0.03
Paguridae (hermit crab)	6.53	19.33
Lithodidae (king crab)	0.02	0.04
Lithodidae (legs only)	0.30	0.23
<i>Paralithodes camtschatica</i> (red king crab)	0.41	0.09
Decapoda brachyura (crab)	0.01	0.11
<i>Hyas</i> sp. (lyre crab)	0.07	0.30
<i>Hyas lyratus</i> (lyre crab)	0.01	0.33
<i>Chionoecetes</i> sp. (snow and Tanner crab)	2.80	6.39
<i>Chionoecetes opilio</i> (snow crab)	7.58	18.42
<i>Chionoecetes bairdi</i> (Tanner crab)	9.53	26.66
<i>Telmessus cheiragonus</i> (hair crab)	0.12	0.12
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.26	0.85
<i>Cancer</i> sp. (crab)	<0.01	0.05
<i>Cancer oregonensis</i> (pygmy cancer crab)	0.06	0.10
Pinnotheridae (pea crab)	0.03	0.54
<i>Pinnixa</i> sp. (pea crab)	0.03	0.88
Sipuncula (marine worm)	0.04	0.24
Echiura (marine worm)	3.64	12.00
Echiuridae (marine worm)	<0.01	0.07
<i>Echiurus echiurus</i> (marine worm)	0.01	0.04
Priapulida (worm)	0.24	0.31
Ectoprocta (bryozoan)	<0.01	0.17
Asteroidea (starfish)	<0.01	0.05
<i>Ctenodiscus crispatus</i> (mud sea star)	<0.01	0.04
Ophiuroidea <i>Euryalina</i> (basket star)	<0.01	0.04
Ophiuroidea <i>Ophiurida</i> (brittle star)	<0.01	0.23
<i>Echinacea</i> sp. (sea urchin)	0.03	0.02
Holothuroidea (sea cucumber)	0.02	0.07
Chaetognatha (arrow worm)	<0.01	0.17
Rajidae (skate)	0.08	0.12
Osteichthyes Teleostei (fish)	0.41	4.69
Non-gadoid Fish Remains	1.13	5.73
Fish eggs	<0.01	0.02
Coregonus (salmonidae)	0.39	0.02
Osmeridae (smelts)	0.01	0.02
<i>Mallotus villosus</i> (capelin)	1.03	1.04
Gadidae (gadid fish)	0.53	1.79
<i>Gadus macrocephalus</i> (Pacific cod)	0.44	0.38
<i>Theragra chalcogramma</i> (walleye pollock)	23.34	21.43
Zoarcidae (eelpout)	7.45	15.91
<i>Lycodes brevipes</i> (shortfin eelpout)	0.05	0.05
<i>Lycodes palearis</i> (wattled eelpout)	0.67	0.73
Cottoidei (sculpin)	0.34	1.21
Icelidae (sculpin)	0.07	0.17
<i>Icelus</i> sp. (sculpin)	0.01	0.14
<i>Icelus spiniger</i> (thorny sculpin)	0.01	0.06
Cottidae (sculpin)	0.52	1.88

Table B-2.--Continued.

Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Hemitripterus bolini</i> (bigmouth sculpin)	0.12	0.07
<i>Triglops szepticus</i> (spectacled sculpin)	0.02	0.03
Agonidae (poacher)	0.39	1.05
<i>Sarritor frenatus</i> (sawback poacher)	<0.01	0.05
Cyclopteridae (snailfish)	0.08	0.14
<i>Ptilichthys goodei</i> (quillfish)	<0.01	0.05
Stichaeidae (prickleback)	0.59	2.50
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	0.02	0.05
<i>Cryptacanthodes aleutensis</i> (dwarf wrymouth)	0.20	0.31
<i>Ammodytes</i> sp. (sandlance)	0.31	0.50
<i>Ammodytes hexapterus</i> (Pacific sandlance)	1.29	1.34
<i>Pleuronectiformes Pleuronectoidei</i> (flatfish)	0.14	0.48
Pleuronectidae (flatfish)	0.45	1.51
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.13	0.34
<i>Hippoglossus</i> sp. (flatfish)	<0.01	0.03
<i>Hippoglossoides elassodon</i> (flathead sole)	0.70	1.25
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.90	1.06
<i>Pleuronectes asper</i> (yellowfin sole)	0.44	0.25
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	<0.01	0.02
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	<0.01	0.13
<i>Hippoglossus stenolepis</i> (Pacific halibut)	0.02	0.14
Aves (bird part)	0.02	0.05
Unidentified organic material	0.09	0.79
Unidentified eggs	<0.01	0.03
Unidentified worm-like organism	0.06	0.80
Fishery discards	2.66	2.33
Unidentified tube	0.01	0.26
Overboard material (non-fishery)	<0.01	0.02
Unidentified material	<0.01	0.03

Total prey weight	111,531 g
Total non-empty stomachs	2505
Total empty stomachs	33
Number of hauls	218

Table B-3.--Prey items (expressed in mean percent frequency of occurrence and mean percent weight) Pacific cod (*Gadus macrocephalus*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean Weight	Mean % Frequency of Occurrence
Cnidaria	<0.01	0.02
Anthozoa (anemome)	0.15	0.19
Polychaeta (worm)	2.66	19.32
Aphroditidae (sea mouse)	0.09	0.35
Polynoidae (polychaete)	0.09	0.40
Euprosinidae	0.24	0.73
Phyllodocidae (polychaete)	0.02	0.21
Nereidae (polychaete)	0.03	0.31
Nephtyidae (polychaete)	0.21	1.78
Goniadidae (polychaete)	<0.01	0.02
Onuphidae (polychaete)	0.01	0.16
Eunicidae	<0.01	0.02
Orbiniidae (polychaete)	<0.01	0.04
Flabelligeridae (polychaete)	<0.01	0.02
Opheliidae (polychaete)	0.05	0.61
Capitellidae (polychaete)	<0.01	0.07
Maldanidae (polychaete)	0.01	0.19
Ampharetidae (polychaete)	<0.01	0.02
Terebellidae (polychaete)	<0.01	0.03
Sabellidae (polychaete)	<0.01	0.10
Phyllodocida (polychaete)	<0.01	0.06
Terebellida (polychaete)	0.01	0.07
Hirudinea (leech)	0.04	0.32
Mollusca	0.02	0.05
Gastropoda (snail)	0.88	3.42
<i>Natica</i> sp. (moonsnail)	<0.01	0.02
<i>Fusitriton oregonensis</i> (snail)	0.03	0.04
<i>eastern Beringius</i> sp. (snail)	0.04	0.02
Bivalvia (clam)	0.50	2.10
<i>Nuculana</i> sp. (clam)	<0.01	0.17
<i>Yoldia</i> sp. (clam)	0.01	0.81
Mytilidae (mussel)	0.01	0.05
Pectinidae (scallop)	<0.01	0.02
<i>Chlamys</i> sp. (scallop)	0.02	0.02
Cardiidae (cockle)	0.32	0.88
<i>Spisula polynyma</i> (clam)	<0.01	0.04
Cephalopoda (squid and octopus)	<0.01	0.10
Teuthoidea (squid)	<0.01	0.16
Teuthoidea oegopsida (squid)	0.01	0.05
Octopoda (octopus)	0.96	2.19
Octopodidae (octopus)	<0.01	0.03
<i>Octopus</i> sp. (octopus)	0.39	1.25
Crustacea	<0.01	0.19
Calanoida (copepod)	<0.01	0.02
Calanidae (copepod)	<0.01	0.04
Cirripedia (barnacle)	<0.01	0.05
Mysidacea Mysida (mysid)	1.15	4.72
Mysidae (mysid)	0.45	2.14
<i>Pseudomma truncatum</i> (mysid)	0.11	1.29
<i>Stilomysis</i> sp. (mysid)	<0.01	0.02
Cumacea (cumacean)	0.01	0.25
Isopoda (isopod)	<0.01	0.19
Peracarida Isopoda Valvifera	<0.01	0.05
Idoteidae (isopod)	0.02	0.03
Gammaridea (amphipod)	1.41	18.56
miscellaneous gammaridea	0.00	0.38
Ampeliscidae (amphipod)	0.18	2.17
<i>Ampelisca</i> sp. (amphipod)	<0.01	0.16
Gammaridae (amphipod)	0.03	0.63

Table B-3.--Continued.

Prey Name	Mean Weight	Mean % Frequency of Occurrence
<i>Maera loveni</i> (amphipod)	0.22	0.94
Lysianassidae (amphipod)	<0.01	0.34
Amphipoda Hyperiidea (amphipod)	<0.01	0.02
Caprellidea (amphipod)	<0.01	0.05
Caprellidae (amphipod)	<0.01	0.22
Euphausiacea (euphausiid)	0.11	0.57
Euphausiidae (euphausiid)	0.14	0.78
<i>Euphausia</i> sp. (euphausiid)	0.01	0.02
<i>Thysanoessa</i> sp. (euphausiid)	0.07	0.39
<i>Thysanoessa inermis</i> (euphausiid)	0.01	0.12
<i>Thysanoessa raschii</i> (euphausiid)	0.52	0.69
Decapoda (shrimp and crab)	<0.01	0.06
Reptantia (crab)	1.28	4.31
Caridea (shrimp)	0.93	4.18
Hippolytidae (shrimp)	1.73	3.41
<i>Spirontocaris</i> sp. (shrimp)	<0.01	0.02
<i>Spirontocaris lamellicornis</i> (shrimp)	<0.01	0.12
<i>Spirontocaris ochotensis</i> (shrimp)	<0.01	0.31
<i>Lebbeus</i> sp. (shrimp)	<0.01	0.05
<i>Eualus</i> sp. (shrimp)	<0.01	0.05
<i>Eualus barbata</i> (shrimp)	<0.01	0.02
<i>Eualus biunguis</i> (shrimp)	<0.01	0.02
<i>Eualus macrophthalma</i> (shrimp)	<0.01	0.02
<i>Eualus suckleyi</i> (shrimp)	0.02	0.17
<i>Eualus gaimurdii</i> (shrimp)	<0.01	0.07
<i>Heptacarpus</i> sp. (shrimp)	<0.01	0.03
Pandalidae (shrimp)	1.13	4.07
<i>Pandalus</i> sp. (shrimp)	0.42	1.79
<i>Pandalus borealis</i> (shrimp)	0.58	1.50
<i>Pandalus goniurus</i> (shrimp)	0.43	1.73
<i>Pandalus jordani</i> (shrimp)	0.38	1.05
<i>Pandalus montagui tridens</i> (shrimp)	0.04	0.07
<i>Pandalopsis ampla</i> (shrimp)	0.02	0.02
Crangonidae (shrimp)	0.42	5.32
<i>Crangon</i> sp. (shrimp)	0.09	2.00
<i>Crangon alaskensis</i> (shrimp)	0.35	1.95
<i>Crangon stylirostris</i> (shrimp)	<0.01	0.03
<i>Crangon dalli</i> (shrimp)	1.71	10.85
<i>Crangon communis</i> (shrimp)	0.19	4.77
<i>Argis</i> sp. (shrimp)	0.14	0.80
<i>Argis lar</i> (shrimp)	0.09	0.75
<i>Argis dentata</i> (shrimp)	<0.01	0.11
Natantia (shrimp)	0.63	3.54
Anomura (crab)	0.01	0.14
Paguridae (hermit crab)	5.34	17.10
<i>Pagurus</i> sp. (hermit crab)	0.02	0.18
<i>Pagurus aleuticus</i>	0.11	0.49
<i>Pagurus rathbuni</i> (hermit crab)	0.01	0.12
Lithodidae (king crab)	0.36	0.22
Lithodidae (legs only)	0.09	0.05
<i>Hapalogaster grebnitzkii</i>	<0.01	0.03
<i>Paralithodes</i> sp. (king crab)	0.76	0.36
<i>Paralithodes camtschatica</i> (red king crab)	0.25	0.19
Majidae (spider crab)	0.02	0.16
Majidae legs	0.01	0.17
<i>Hyas</i> sp. (lyre crab)	0.02	0.13
<i>Hyas lyratus</i> (lyre crab)	0.42	0.41
<i>Hyas coarctatus</i> (lyre crab)	0.13	0.23
<i>Hyas coarctatus aleutaceus</i> (lyre crab)	0.07	0.03
<i>Chionoecetes</i> sp. (snow and Tanner crab)	2.29	5.73
<i>Chionoecetes opilio</i> (snow crab)	12.46	21.91
<i>Chionoecetes bairdi</i> (Tanner crab)	1.91	8.16

Table B-3.--Continued.

Prey Name	Mean Weight	Mean % Frequency of Occurrence
Atelecyclidae (crab)	0.01	0.05
<i>Telmessus cheiragonus</i> (hair crab)	0.68	1.18
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.21	0.69
<i>Cancer oregonensis</i> (pygmy Cancer crab)	0.00	0.05
<i>Pinnixa</i> sp. (pea crab)	0.15	0.55
Sipuncula (marine worm)	0.03	0.13
Echiura (marine worm)	1.20	4.72
Echiuridae (marine worm)	0.99	2.36
<i>Echiurus</i> sp. (marine worm)	0.57	1.61
<i>Echiurus echiurus</i> (marine worm)	1.44	2.94
Priapulida (worm)	0.28	0.49
Asteroidea (starfish)	0.01	0.05
Asteriidae (starfish)	0.02	0.05
Ophiuroidea Euryalina (basket star)	0.01	0.08
Ophiuroidea Ophiurida (brittle star)	<0.01	0.09
Ophiuridae (brittle star)	<0.01	0.06
Clypeasteridae (sand dollar)	<0.01	0.06
Holothuroidea (sea cucumber)	0.03	0.05
Urochordata (<i>tunicate</i>)	0.07	0.08
<i>Boltenia</i> sp. (sea onion)	0.01	0.05
<i>Boltenia echinata</i> (sea onion)	<0.01	0.04
Rajidae (skate)	0.01	0.02
<i>Osteichthyes Teleostei</i> (fish)	1.71	10.90
Non-gadoid Fish Remains	2.19	4.23
Osmeridae (smelts)	0.17	0.07
<i>Mallotus villosus</i> (capelin)	0.29	0.33
Gadidae (gadid fish)	1.23	3.88
<i>Gadus macrocephalus</i> (Pacific cod)	1.07	1.14
<i>Theragra chalcogramma</i> (walleye pollock)	23.06	22.94
Zoarcidae (eelpout)	2.07	5.58
<i>Lycodapus</i> sp. (eelpout)	0.01	0.06
<i>Lycodes</i> sp. (eelpout unid)	0.08	0.10
<i>Lycodes brevipes</i> (shortfin eelpout)	0.56	1.36
<i>Lycodes palearis</i> (wattled eelpout)	0.76	0.89
<i>Lycodes raridens</i> (marbled eelpout)	<0.01	0.02
Scorpaenidae	0.08	0.05
<i>Sebastes alutus</i> (Pacific ocean perch)	0.19	0.04
Hexagrammidae (greenling)	0.13	0.10
<i>Hexagrammos stelleri</i> (white-spotted greenling)	0.06	0.04
Cottoidei (sculpin)	0.70	1.19
<i>Icelus</i> sp. (sculpin)	0.01	0.04
<i>Icelus spiniger</i> (thorny sculpin)	<0.01	0.02
Cottidae (sculpin)	0.27	0.16
<i>Dasycottus setiger</i> (spinyhead sculpin)	0.02	0.05
<i>Myoxocephalus</i> sp. (sculpin)	0.02	0.06
<i>Triglops pingeli</i> (ribbed sculpin)	<0.01	0.05
Agonidae (poacher)	0.32	0.59
<i>Anoplagonus inermis</i> (smooth alligatorfish)	<0.01	0.03
<i>Asterotheca</i> sp. (poacher)	0.01	0.06
<i>Podothecus acipenserinus</i> (sturgeon poacher)	0.06	0.10
<i>Sarritor frenatus</i> (sawback poacher)	0.01	0.04
Cyclopteridae (snailfish)	0.01	0.02
<i>Careproctus cypselurus</i> (blackfinned redsnail)	<0.01	0.02
<i>Trichodon trichodon</i> (Pacific sandfish)	0.09	0.05
<i>Bathymaster signatus</i> (searcher)	0.14	0.14
<i>Ptilichthys goodei</i> (quillfish)	0.01	0.08
Stichaeidae (prickleback)	0.41	2.20
<i>Lumpenella longirostris</i> (prickleback)	0.04	0.10
<i>Lumpenus</i> sp. (prickleback)	0.04	0.13
<i>Lumpenus fabricii</i> (slender eelblenny)	0.05	0.13
<i>Lumpenus sagitta</i> (snake prickleback)	0.10	0.08
<i>Lumpenus maculatus</i> (daubed shanny)	0.35	0.57
<i>Poroclinus</i> sp. (prickleback)	<0.01	0.02

Table B-3.--Continued.

Prey Name	Mean Weight	Mean % Frequency of Occurrence
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	0.01	0.06
<i>Cryptacanthodes aleutensis</i> (dwarf wrymouth)	<0.01	0.02
<i>Ammodytes</i> sp. (sandlance)	1.34	2.54
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.44	0.70
<i>Pleuronectiformes Pleuronectoidei</i> (flatfish)	0.07	0.13
Pleuronectidae (flatfish)	2.53	4.38
<i>Atheresthes evermanni</i> (Kamchatka flounder)	0.01	0.01
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.01	0.03
<i>Hippoglossoides elassodon</i> (flathead sole)	0.58	1.18
<i>Hippoglossoides robustus</i> (eastern Bering flounder)	0.12	0.07
<i>Lepidopsetta</i> sp. (rock soles)	0.01	0.05
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.09	1.04
<i>Pleuronectes asper</i> (yellowfin sole)	1.26	0.98
<i>Pleuronectes proboscideus</i> (longhead dab)	0.47	0.34
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	0.02	0.05
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	<0.01	0.06
<i>Hippoglossus stenolepis</i> (Pacific halibut)	0.20	0.04
Unidentified organic material	0.65	2.15
Unidentified eggs	0.01	0.15
Unidentified worm-like organism	0.04	0.14
Fishery discards	2.85	1.87
Unidentified tube	0.01	0.47
Overboard material (non-fishery)	0.01	0.07
Wood	<0.01	0.02
Unidentified algae	0.03	0.03
Rocks	0.04	0.71
Unidentified material	<0.01	0.05

Total prey weight	139,954 g
Total non-empty stomachs	2560
Total empty stomachs	32
Number of hauls	210

Table B-4.--Prey items (expressed in mean percent frequency of occurrence and mean percent weight) Pacific cod (*Gadus macrocephalus*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida (protozoan)	<0.01	0.08
Porifera (sponge)	<0.01	0.03
Hydrozoa Hydroida (hydroid)	<0.01	0.03
Scyphozoa (jellyfish)	<0.01	0.03
Anthozoa (anemome)	0.31	0.45
Polychaeta (worm)	2.36	18.81
Aphroditidae (sea mouse)	0.43	1.42
Polynoidae (polychaete)	0.02	0.31
Phyllodocidae (polychaete)	0.04	0.73
Nereidae (polychaete)	<0.01	0.15
Nephtyidae (polychaete)	0.26	1.66
<i>Nephtys</i> sp. (polychaete)	0.01	0.12
Glyceridae (polychaete)	<0.01	0.03
Goniadidae (polychaete)	0.01	0.14
Flabelligeridae (polychaete)	0.01	0.14
<i>Flabelligera</i> sp. (polychaete)	0.03	0.08
Opheliidae (polychaete)	0.01	0.29
Capitellidae (polychaete)	0.02	0.06
Maldanidae (polychaete)	0.02	0.22
<i>Maldanella</i> sp. (polychaete)	<0.01	0.03
Sabellaridae	<0.01	0.03
Terebellidae (polychaete)	<0.01	0.03
Phyllodocida (polychaete)	<0.01	0.03
Terebellida (polychaete)	0.02	0.16
Hirudinea (leech)	0.04	0.24
Mollusca	0.03	0.05
Gastropoda (snail)	0.96	3.11
<i>Crepidula grandis</i> (grand slipper shell)	<0.01	0.03
Naticidae (snail)	0.01	0.09
<i>Polinices pallida</i> (snail)	<0.01	0.03
<i>Buccinum</i> sp. (snail)	0.02	0.03
Neptuneidae (snail)	<0.01	0.04
<i>eastern Beringius</i> sp. (snail)	<0.01	0.03
<i>Colus halli</i> (snail)	0.02	0.08
<i>Neptunea</i> sp. (snail)	0.18	0.05
Bivalvia (clam)	0.14	1.70
<i>Nucula</i> sp. (clam)	0.11	0.25
<i>Nuculana</i> sp. (clam)	<0.01	0.02
<i>Yoldia</i> sp. (clam)	0.03	0.46
Pectinidae (scallops)	<0.01	0.07
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	0.01	0.03
<i>Astarte</i> sp. (clam)	<0.01	0.09
Cardiidae (cockle)	0.01	0.13
<i>Serripes greenlandeus</i> (Greenland cockle)	0.01	0.03
<i>Spisula polynyma</i> (clam)	<0.01	0.03
<i>Siliqua</i> sp. (razor clam)	0.01	0.06
Cephalopoda (squid and octopus)	<0.01	0.02
Teuthoidea (squid)	0.05	0.18
<i>Teuthoidea oegopsida</i> (squid)	<0.01	0.18
Octopoda (octopus)	0.78	2.23
Octopodidae (octopus)	<0.01	0.10
<i>Octopus</i> sp. (octopus)	<0.01	0.03
Crustacea	<0.01	0.06
Calanoida (copepod)	<0.01	0.03
Peracarida Mysidacea (mysid)	0.03	0.57
Mysidacea Mysida (mysid)	0.77	4.53
Mysidae (mysid)	0.13	1.45
<i>Pseudomma truncatum</i> (mysid)	0.24	1.34
Cumacea (cumacean)	0.02	0.68

Table B-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Isopoda (isopod)	0.02	0.59
Gammaridea (amphipod)	2.77	19.48
Miscellaneuos gammaridea	<0.01	0.13
Ampeliscidae (amphipod)	0.19	2.17
<i>Ampelisca</i> sp. (amphipod)	0.04	0.54
Corophiidae (amphipod)	<0.01	0.03
Gammaridae (amphipod)	0.02	0.31
<i>Maera</i> sp. (amphipod)	0.03	0.42
<i>Maera loveni</i> (amphipod)	0.14	0.87
Lysianassidae (amphipod)	0.03	0.86
<i>Anonyx</i> sp. (amphipod)	0.03	1.44
Amphipoda Hyperiidea (amphipod)	<0.01	0.06
Caprellidea (amphipod)	0.06	0.41
Euphausiacea (euphausiid)	0.12	1.13
Euphausiidae (euphausiid)	0.64	4.82
<i>Euphausia</i> sp. (euphausiid)	<0.01	0.06
<i>Thysanoessa</i> sp. (euphausiid)	0.78	1.41
<i>Thysanoessa inermis</i> (euphausiid)	0.01	0.08
<i>Thysanoessa raschii</i> (euphausiid)	0.24	0.97
Reptantia (crab)	0.33	1.74
Decapoda Reptantia legs	0.01	0.06
Caridea (shrimp)	0.50	4.19
Hippolytidae (shrimp)	0.50	2.45
<i>Spirontocaris lamellicornis</i> (shrimp)	<0.01	0.04
<i>Spirontocaris ochotensis</i> (shrimp)	<0.01	0.34
<i>Eualus gaimurdii</i> (shrimp)	0.01	0.05
<i>Eualus avinus</i> (shrimp)	0.01	0.03
Pandalidae (shrimp)	0.95	4.89
<i>Pandalus</i> sp. (shrimp)	1.17	2.28
<i>Pandalus borealis</i> (shrimp)	0.51	1.63
<i>Pandalus goniurus</i> (shrimp)	0.72	1.79
<i>Pandalus jordani</i> (shrimp)	0.03	0.10
<i>Pandalus montagui tridens</i> (shrimp)	0.07	0.32
<i>Pandalopsis</i> sp. (shrimp)	0.01	0.03
Crangonidae (shrimp)	0.44	4.97
<i>Crangon</i> sp. (shrimp)	0.29	3.61
<i>Crangon alaskensis</i> (shrimp)	0.11	1.03
<i>Crangon stylirostris</i> (shrimp)	0.01	0.05
<i>Crangon dalli</i> (shrimp)	0.93	7.05
<i>Crangon communis</i> (shrimp)	0.21	3.67
<i>Argis</i> sp. (shrimp)	0.19	1.02
<i>Argis lar</i> (shrimp)	0.06	0.77
<i>Argis dentata</i> (shrimp)	0.03	0.33
Natantia (shrimp)	0.21	2.42
Anomura (crab)	0.03	0.21
Paguridae (hermit crab)	4.76	16.24
Paguridae legs	0.20	0.96
<i>Pagurus</i> sp. (hermit crab)	0.10	0.24
<i>Pagurus ochotensis</i> (hermit crab)	0.11	0.08
<i>Pagurus aleuticus</i>	0.58	0.81
<i>Pagurus trigonocheirus</i> (hermit crab)	0.14	0.28
<i>Pagurus rathbuni</i> (hermit crab)	<0.01	0.03
<i>Elassochirus</i> sp.	<0.01	0.05
Lithodidae (king crab)	0.46	0.34
Lithodidae (king crab - legs only)	0.55	0.55
<i>Paralithodes</i> sp. (king crab)	0.59	0.46
<i>Paralithodes camtschatica</i> (red king crab)	0.40	0.09
<i>Lopholithodes</i> sp. (box crab)	<0.01	0.03
Decapoda brachyura (crab)	<0.01	0.04
Decapoda Reptantia legs	<0.01	0.03
Majidae (spider crab)	0.07	0.16
Majidae legs	0.17	0.48

Table B-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Oregonia</i> sp. (decorator crab)	<0.01	0.03
<i>Oregonia gracilis</i> (decorator crab)	0.13	0.51
<i>Hyas</i> sp. (lyre crab)	0.28	0.20
<i>Hyas lyratus</i> (lyre crab)	0.02	0.18
<i>Hyas coarctatus</i> (lyre crab)	0.33	0.92
<i>Chionoecetes</i> sp. (snow and Tanner crab)	3.91	8.15
<i>Chionoecetes opilio</i> (snow crab)	9.43	15.28
<i>Chionoecetes bairdi</i> (Tanner crab)	3.74	10.08
<i>Telmessus cheiragonus</i> (hair crab)	0.64	0.62
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.12	0.34
<i>Cancer oregonensis</i> (pygmy Cancer crab)	<0.01	0.05
Pinnotheridae (pea crab)	<0.01	0.05
<i>Pinnixa</i> sp. (pea crab)	0.04	1.06
Sipuncula (marine worm)	0.05	0.24
Echiura (marine worm)	2.99	6.90
Echiuridae (marine worm)	0.63	1.97
<i>Echiurus</i> sp. (marine worm)	0.24	1.00
<i>Echiurus echiurus</i> (marine worm)	2.23	3.73
Priapulida (worm)	0.03	0.19
Ectoprocta (bryozoan)	0.07	0.13
Asteroidea (starfish)	0.09	0.25
<i>Ctenodiscus crispatus</i> (mud sea star)	<0.01	0.08
Asteriidae (starfish)	0.01	0.03
Ophiuroidea Euryalina (basket star)	<0.01	0.03
Ophiuroidea Ophiurida (brittle star)	<0.01	0.04
Ophiuridae (brittle star)	0.01	0.11
<i>Ophiura sarsi</i> (brittle star)	0.02	0.10
Echinoidea (sea urchin and sand dollar)	0.01	0.05
Urochordata (tunicate)	0.15	0.31
<i>Boltenia</i> sp. (sea onion)	<0.01	0.05
<i>Boltenia echinata</i> (sea onion)	0.05	0.08
Osteichthyes Teleostei (fish)	1.39	9.06
Non-gadoid Fish Remains	1.79	6.61
Fish eggs	<0.01	0.04
<i>Clupea pallasii</i> (Pacific herring)	0.87	0.67
Osmeridae (smelts)	0.01	0.03
<i>Mallotus villosus</i> (capelin)	0.16	0.39
<i>Thaleichthys pacificus</i> (eulachon)	0.03	0.11
Bathylagidae (deepsea smelts)	0.10	0.06
Gadidae (gadid fish)	1.29	3.47
<i>Gadus macrocephalus</i> (Pacific cod)	0.79	0.36
<i>Theragra chalcogramma</i> (walleye pollock)	22.96	17.94
<i>T. chalcogramma</i> eggs (pollock eggs)	<0.01	0.06
Zoarcidae (eelpout)	2.72	6.54
<i>Lycodes</i> sp. (eelpout)	1.33	1.82
<i>Lycodes brevipes</i> (shortfin eelpout)	0.99	2.44
<i>Lycodes palearis</i> (wattled eelpout)	0.72	1.40
Scorpaeniformes (rockfish and cottid)	0.01	0.06
Scorpaenidae	0.02	0.03
<i>Sebastes</i> sp. (rockfish)	<0.01	0.03
Cottoidei (sculpin)	0.87	1.72
Icelidae (sculpin)	<0.01	0.03
<i>Icelus spiniger</i> (thorny sculpin)	<0.01	0.03
Cottidae (sculpin)	0.28	0.34
<i>Dasycottus setiger</i> (spinyhead sculpin)	0.01	0.03
<i>Gymnocanthus pistilliger</i> (threaded sculpin)	0.05	0.11
<i>Myoxocephalus</i> sp. (sculpin)	<0.01	0.04
Agonidae (poacher)	0.23	0.44
<i>Aspidophoroides bartoni</i> (Aleutian alligatorfish)	0.06	0.13
<i>Asterotheca</i> sp. (poacher)	0.01	0.07
<i>Ocella dodecaedron</i> (eastern Bering poacher)	0.15	0.12
<i>Sarritor frenatus</i> (sawback poacher)	0.01	0.12

Table B-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Xeneretmus</i> sp. (poacher)	<0.01	0.03
<i>Liparis</i> sp. (snailfish)	0.01	0.03
<i>Trichodon trichodon</i> (Pacific sandfish)	0.01	0.03
<i>Ptilichthys goodei</i> (quillfish)	<0.01	0.05
Stichaeidae (prickleback)	0.78	1.80
<i>Poroclinus</i> sp. (prickleback)	0.01	0.03
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	<0.01	0.03
Cryptacanthodidae (wrymouth)	<0.01	0.03
<i>Cryptacanthodes aleutensis</i> (dwarf wrymouth)	0.05	0.23
<i>Zaprora silenus</i> (prowfish)	0.04	0.04
<i>Ammodytes</i> sp. (sandlance)	1.09	3.97
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.09	0.99
Pleuronectidae (flatfish)	2.72	4.09
<i>Atheresthes evermanni</i> (Kamchatka flounder)	0.02	0.03
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.36	0.21
<i>Hippoglossoides elassodon</i> (flathead sole)	0.81	0.75
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.13	0.96
<i>Pleuronectes asper</i> (yellowfin sole)	1.16	1.20
<i>Pleuronectes proboscideus</i> (longhead dab)	0.16	0.17
<i>Limanda sakhalinensis</i> (Sakalin sole)	0.03	0.03
Aves (bird part)	<0.01	0.07
Unidentified organic material	0.25	1.43
Unidentified eggs	0.07	0.58
Unidentified worm-like organism	0.07	0.26
Fishery discards	0.96	1.05
Unidentified tube	0.02	0.43
Overboard material (non-fishery)	0.05	0.06
Wood	0.02	0.28
Unidentified algae	<0.01	0.08
Rocks	0.20	1.34

Total prey weight	132,026 g
Total non-empty stomachs	2564
Total empty stomachs	21
Number of hauls	198

Table B-5.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Pacific cod (*Gadus macrocephalus*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Porifera (sponge)	0.27	0.27
Hydrozoa Hydroida (hydroid)	0.01	0.03
Anthozoa (anemome)	0.05	0.37
Polychaeta (worm)	3.79	24.04
Aphroditidae (sea mouse)	0.50	1.00
Polynoidae (polychaete)	0.03	0.11
Phyllodocidae (polychaete)	0.18	1.44
Nereidae (polychaete)	0.10	0.27
Nephtyidae (polychaete)	0.31	0.81
Glyceridae (polychaete)	<0.01	0.05
Onuphidae (polychaete)	<0.01	0.03
Flabelligeridae (polychaete)	<0.01	0.06
Opheliidae (polychaete)	0.05	0.05
Maldanidae (polychaete)	<0.01	0.11
Terebellidae (polychaete)	0.16	0.16
Eunicida (polychaete)	0.02	0.02
Hirudinea (leech)	<0.01	0.08
Mollusca	0.01	0.05
Gastropoda (snail)	1.03	4.48
<i>Natica</i> sp. (moonsnail)	<0.01	0.03
<i>Colus halli</i> (snail)	<0.01	0.04
Bivalvia (clam)	0.75	3.62
<i>Yoldia</i> sp. (clam)	<0.01	0.22
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	<0.01	0.18
Cardiidae (cockle)	<0.01	0.15
<i>Clinocardium ciliatum</i> (Iceland cockle)	0.01	0.06
<i>Spisula polynyma</i> (clam)	<0.01	0.03
Cephalopoda (squid and octopus)	0.04	0.30
Teuthoidea (squid)	0.46	0.79
Octopoda (octopus)	0.72	1.96
Crustacea	0.11	0.59
Ostracoda	<0.01	0.06
Calanoida (copepod)	0.06	1.46
Lepadomorpha (pedunculate barnacles)	0.06	0.06
Gnathophausia sp.	<0.01	0.05
Mysidacea Mysida (mysid)	1.07	8.65
Mysidae (mysid)	0.22	1.87
<i>Pseudomma truncatum</i> (mysid)	<0.01	0.08
Cumacea (cumacean)	<0.01	0.20
Isopoda (isopod)	<0.01	0.22
Gammaridea (amphipod)	2.01	22.78
Ampeliscidae (amphipod)	0.12	1.11
<i>Ampelisca</i> sp. (amphipod)	0.02	0.17
Gammaridae (amphipod)	<0.01	0.11
<i>Maera</i> sp. (amphipod)	0.01	0.22
<i>Maera loveni</i> (amphipod)	0.08	1.23
<i>Eohaustorius eous</i> (amphipod)	<0.01	0.06
Lysianassidae (amphipod)	0.08	0.89
<i>Anonyx</i> sp. (amphipod)	0.11	1.83
Amphipoda Hyperiidea (amphipod)	<0.01	0.05
Caprellidea (amphipod)	0.01	0.62
Euphausiacea (euphausiid)	0.48	2.00
Euphausiidae (euphausiid)	2.03	4.64
<i>Thysanoessa</i> sp. (euphausiid)	<0.01	0.05
<i>Thysanoessa raschii</i> (euphausiid)	0.34	0.81
Reptantia (crab)	0.20	1.57
Caridea (shrimp)	0.35	5.29
Hippolytidae (shrimp)	0.38	2.74
<i>Spirontocaris</i> sp. (shrimp)	0.01	0.11

Table B-5.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Spirontocaris ochotensis</i> (shrimp)	<0.01	0.08
<i>Spirontocaris arcuata</i> (shrimp)	0.05	0.35
<i>Lebbeus</i> sp. (shrimp)	<0.01	0.03
<i>Eualus</i> sp. (shrimp)	<0.01	0.03
<i>Eualus suckleyi</i> (shrimp)	<0.01	0.03
<i>Heptacarpus</i> sp. (shrimp)	<0.01	0.03
<i>Heptacarpus moseri</i> (shrimp)	<0.01	0.03
Pandalidae (shrimp)	0.19	1.61
<i>Pandalus</i> sp. (shrimp)	0.04	0.37
<i>Pandalus borealis</i> (shrimp)	0.01	0.33
<i>Pandalus jordani</i> (shrimp)	0.02	0.05
<i>Pandalus montagui tridens</i> (shrimp)	0.17	0.27
Crangonidae (shrimp)	0.51	4.11
<i>Crangon</i> sp. (shrimp)	1.50	8.11
<i>Crangon dalli</i> (shrimp)	3.48	13.39
<i>Crangon communis</i> (shrimp)	0.17	2.42
<i>Sclerocrangon sharpi</i> (shrimp)	<0.01	0.05
<i>Argis</i> sp. (shrimp)	0.09	0.74
<i>Argis lar</i> (shrimp)	0.29	1.33
<i>Argis dentata</i> (shrimp)	<0.01	0.06
<i>Argis ovifer</i> (shrimp)	<0.01	0.02
<i>Rhynocrangon</i> sp.	<0.01	0.11
Natantia (shrimp)	0.06	0.33
Paguridae (hermit crab)	10.00	20.51
Paguridae legs	0.01	0.10
<i>Pagurus aleuticus</i>	0.09	0.07
<i>Elassochirus</i> sp.	<0.01	0.03
<i>Elassochirus gilli</i> (red hermit crab)	0.02	0.08
Lithodidae (king crab)	0.84	0.38
Lithodidae (legs only)	0.15	0.46
<i>Hapalogaster grebnitzkii</i>	0.18	0.35
<i>Paralithodes</i> sp. (king crab)	0.03	0.11
Majidae (spider crab)	0.05	0.34
Majidae legs	0.18	0.43
<i>Oregonia gracilis</i> (decorator crab)	<0.01	0.03
<i>Hyas</i> sp. (lyre crab)	0.06	0.51
<i>Hyas lyratus</i> (lyre crab)	0.05	0.30
<i>Hyas coarctatus</i> (lyre crab)	0.48	0.53
<i>Chionoecetes</i> sp. (snow and Tanner crab)	2.79	7.31
<i>Chionoecetes opilio</i> (snow crab)	10.03	17.01
<i>Chionoecetes bairdi</i> (Tanner crab)	3.70	8.03
Atelecyclidae (crab)	0.01	0.11
<i>Telmessus cheiragonus</i> (hair crab)	0.66	0.48
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.64	1.37
<i>Cancer oregonensis</i> (pygmy Cancer crab)	0.05	0.22
Pinnotheridae (pea crab)	0.02	0.30
<i>Pinnixa</i> sp. (pea crab)	0.62	1.86
Sipuncula (marine worm)	0.02	0.07
Echiura (marine worm)	5.09	11.30
Echiuridae (marine worm)	0.18	0.58
<i>Echiurus</i> sp. (marine worm)	0.50	1.52
<i>Echiurus echiurus</i> (marine worm)	1.40	1.95
Priapulida (worm)	0.08	0.30
Asteroidea (starfish)	0.01	0.05
Asteriidae (starfish)	<0.01	0.05
Ophiuroidea Ophiurida (brittle star)	0.03	0.37
Holothuroidea (sea cucumber)	0.18	0.11
Urochordata (tunicate)	<0.01	0.09
<i>Boltenia</i> sp. (sea onion)	0.02	0.11
<i>Boltenia echinata</i> (sea onion)	<0.01	0.06
Rajidae (skate)	0.16	0.09
Osteichthyes	<0.01	0.07
Osteichthyes Teleostei (fish)	1.54	9.12

Table B-5.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Non-gadoid Fish Remains	1.19	5.53
<i>Clupea pallasii</i> (Pacific herring)	0.09	0.06
<i>Thaleichthys pacificus</i> (eulachon)	0.23	0.24
Myctophidae (lanternfish)	0.01	0.05
Gadidae (gadid fish)	0.52	1.21
<i>Gadus macrocephalus</i> (Pacific cod)	0.21	0.28
<i>Microgadus proximus</i> (Pacific tomcod)	0.04	0.06
<i>Theragra chalcogramma</i> (walleye pollock)	13.85	14.06
Zoarcidae (eelpout)	3.94	6.50
<i>Lycodes</i> sp. (eelpout unid)	0.44	0.44
<i>Lycodes brevipes</i> (shortfin eelpout)	0.67	1.09
<i>Lycodes palearis</i> (wattled eelpout)	0.12	0.20
Cottoidei (sculpin)	1.56	4.56
<i>Dasycottus setiger</i> (spinyhead sculpin)	0.09	0.09
<i>Gymnocanthus</i> (sculpin)	0.13	0.11
<i>Gymnocanthus galeatus</i> (sculpin)	0.52	0.76
Agonidae (poacher)	0.11	0.61
<i>Aspidophoroides bartoni</i> (Aleutian alligatorfish)	<0.01	0.03
<i>Ocella dodecaedron</i> (eastern Bering poacher)	<0.01	0.06
Cyclopteridae (snailfish)	0.05	0.16
<i>Bathymaster</i> sp. (searcher)	<0.01	0.03
<i>Bathymaster signatus</i> (searcher)	0.01	0.06
<i>Ptilichthys goodei</i> (quillfish)	0.05	0.16
Stichaeidae (prickleback)	0.54	2.09
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	<0.01	0.14
Cryptacanthodidae (wrymouth)	<0.01	0.05
<i>Cryptacanthodes aleutensis</i> (dwarf wrymouth)	0.01	0.05
<i>Ammodytes</i> sp. (sandlance)	0.48	0.80
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.37	0.53
Pleuronectidae (flatfish)	4.71	5.90
<i>Atheresthes</i> sp.	0.17	0.05
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.30	0.23
<i>Hippoglossoides elassodon</i> (flathead sole)	0.48	0.76
<i>Hippoglossoides robustus</i> (eastern Bering flounder)	0.21	0.14
<i>Lepidopsetta</i> sp. (rock sole type)	1.17	0.58
<i>Lepidopsetta bilineata</i> (southern rock sole)	0.42	0.16
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.49	1.16
<i>Pleuronectes asper</i> (yellowfin sole)	0.25	0.55
<i>Pleuronectes proboscideus</i> (longhead dab)	0.45	0.24
<i>Reinhardtius hippoglossoides</i> (Greenland turbot)	0.01	0.08
<i>Hippoglossus stenolepis</i> (Pacific halibut)	0.01	0.24
Unidentified organic material	0.21	1.19
Unidentified eggs	<0.01	0.05
Unidentified worm-like organism	0.56	0.77
Fishery discards	1.61	1.06
Unidentified algae	0.01	0.05
Rocks	<0.01	0.07

Total prey weight	62,809 g
Total non-empty stomachs	1663
Total empty stomachs	14
Number of hauls	185

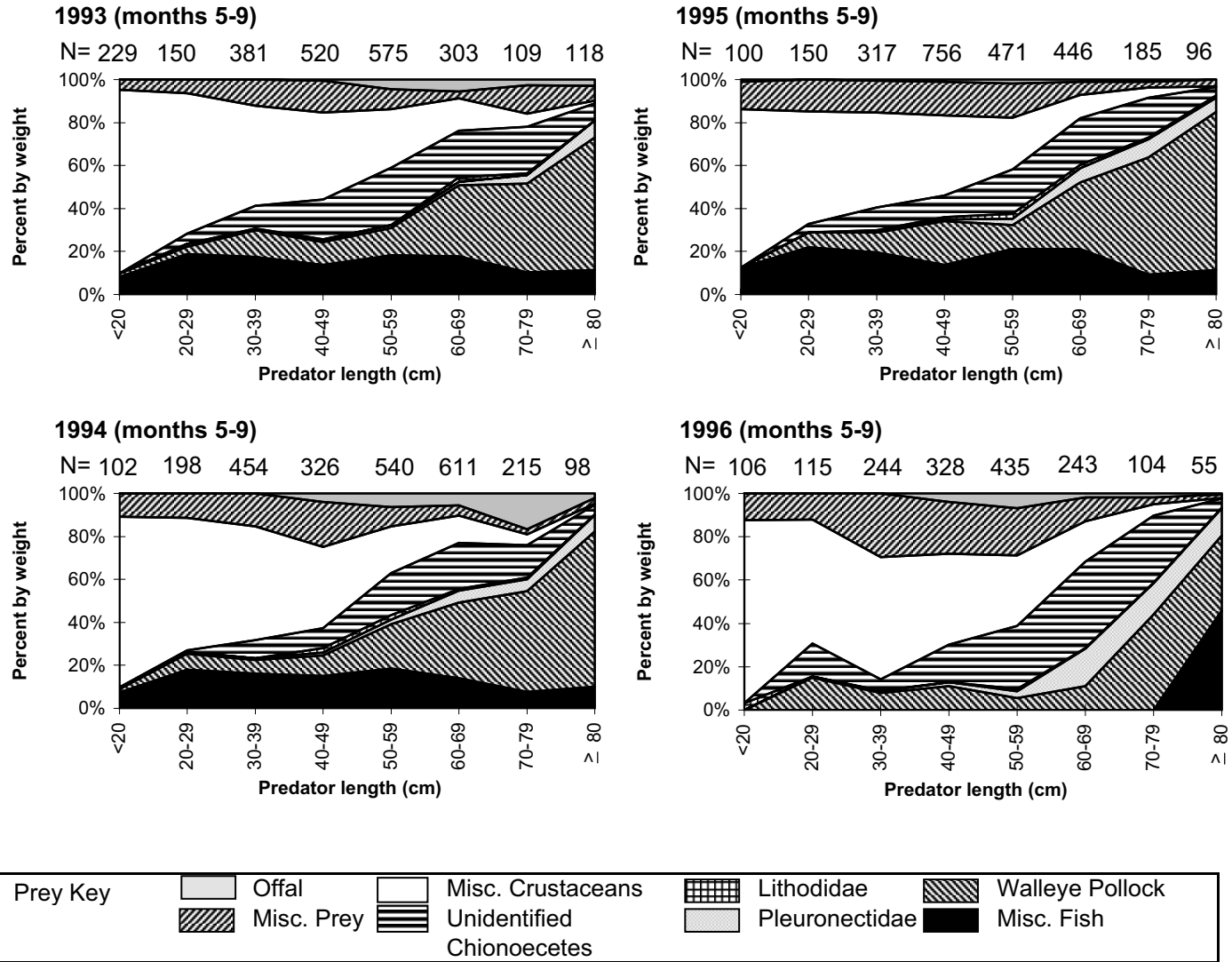


Figure B-1. -- Diet composition of Pacific cod, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

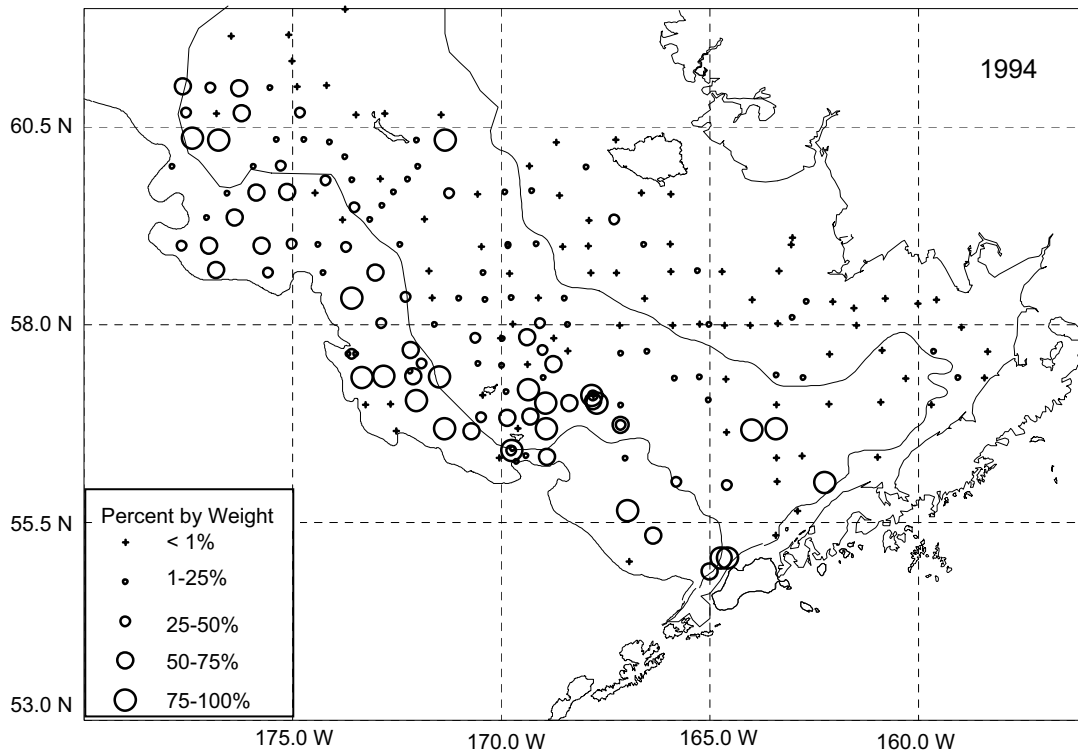
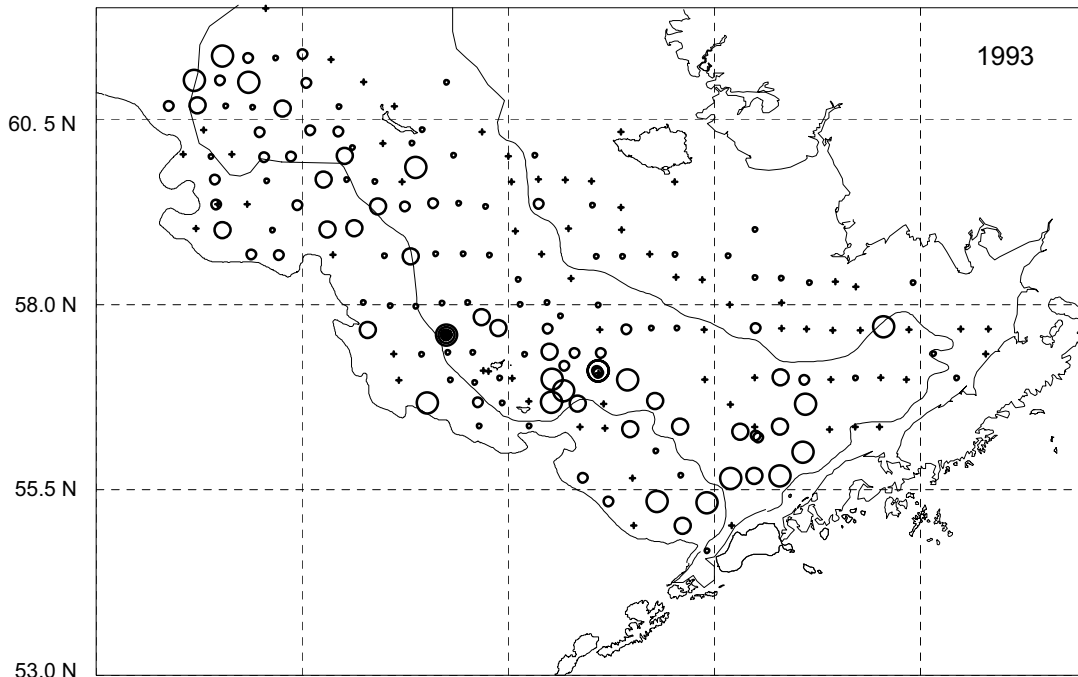


Figure B-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

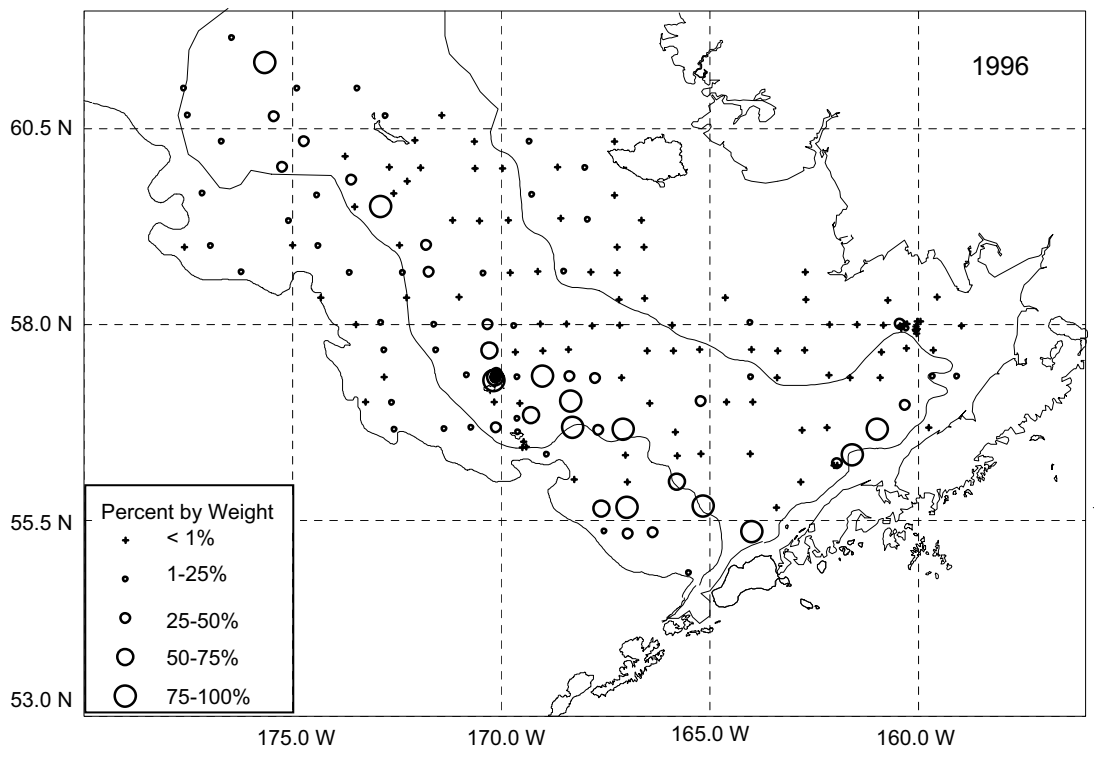
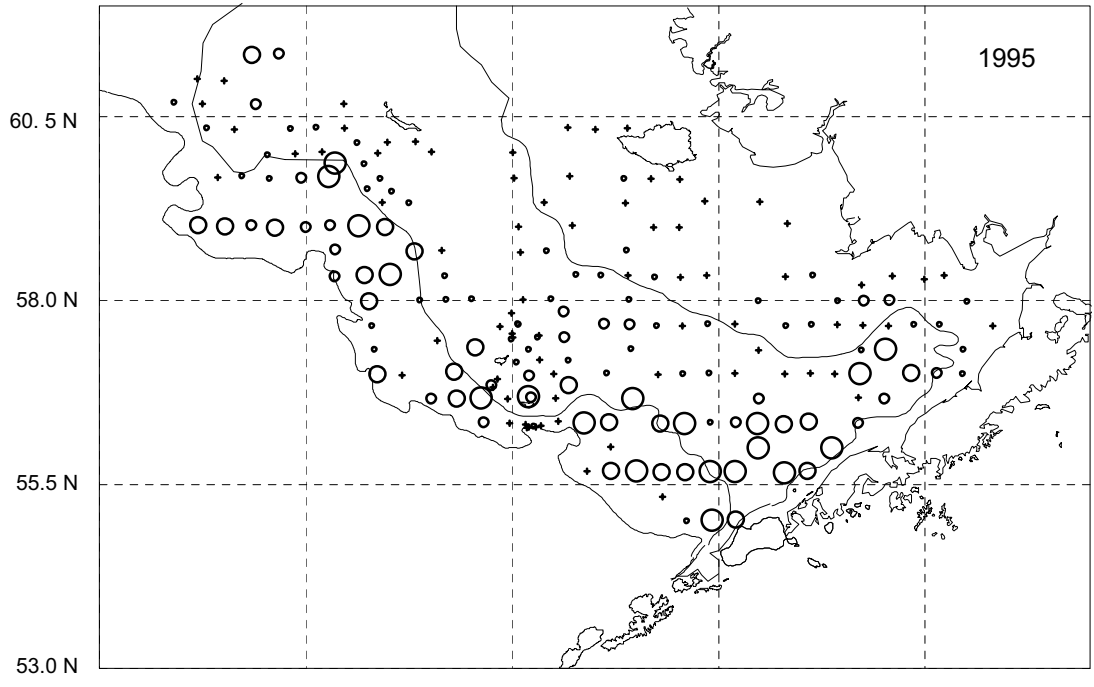


Figure B-2.-- Continued.

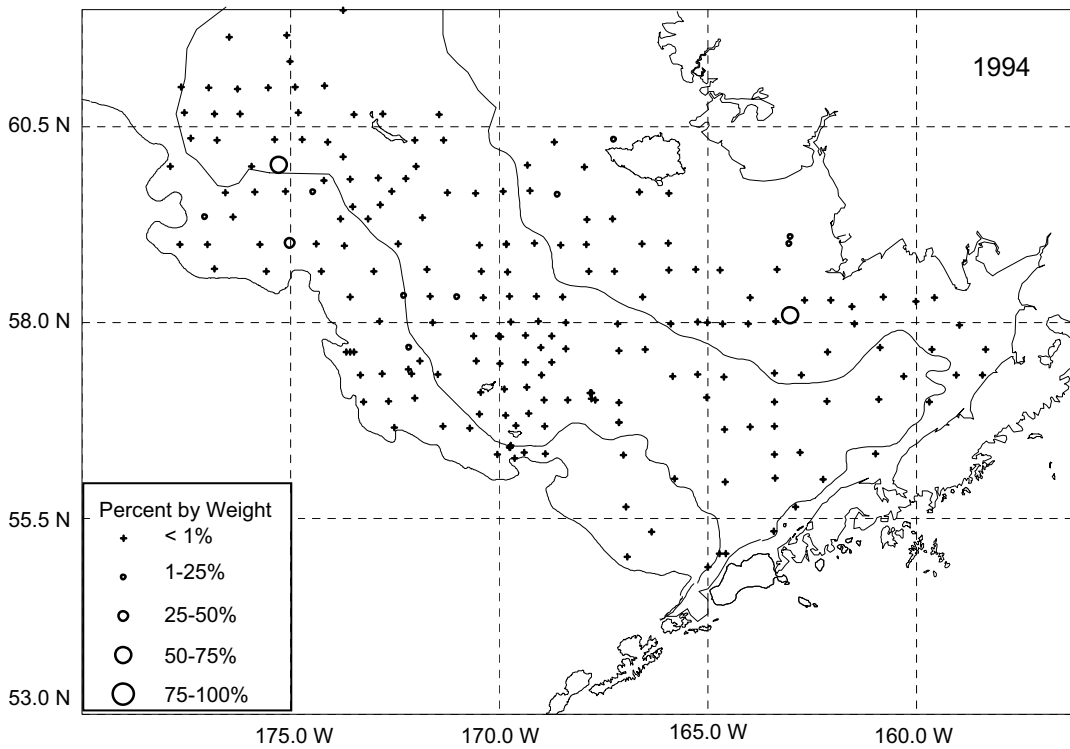
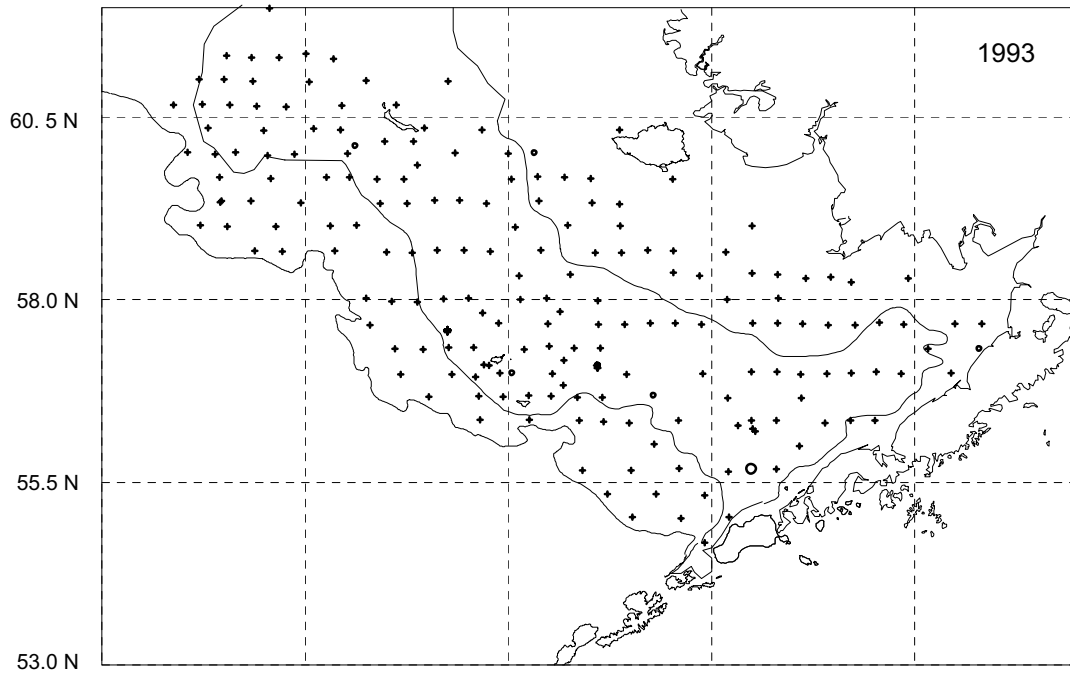


Figure B-3.-- Percent by weight of Pacific cod (*Gadus macrocephalus*) in the diet of Pacific cod by sampling station during May through September in 1993, 1994, 1995 and 1996 in the eastern Bering Sea.

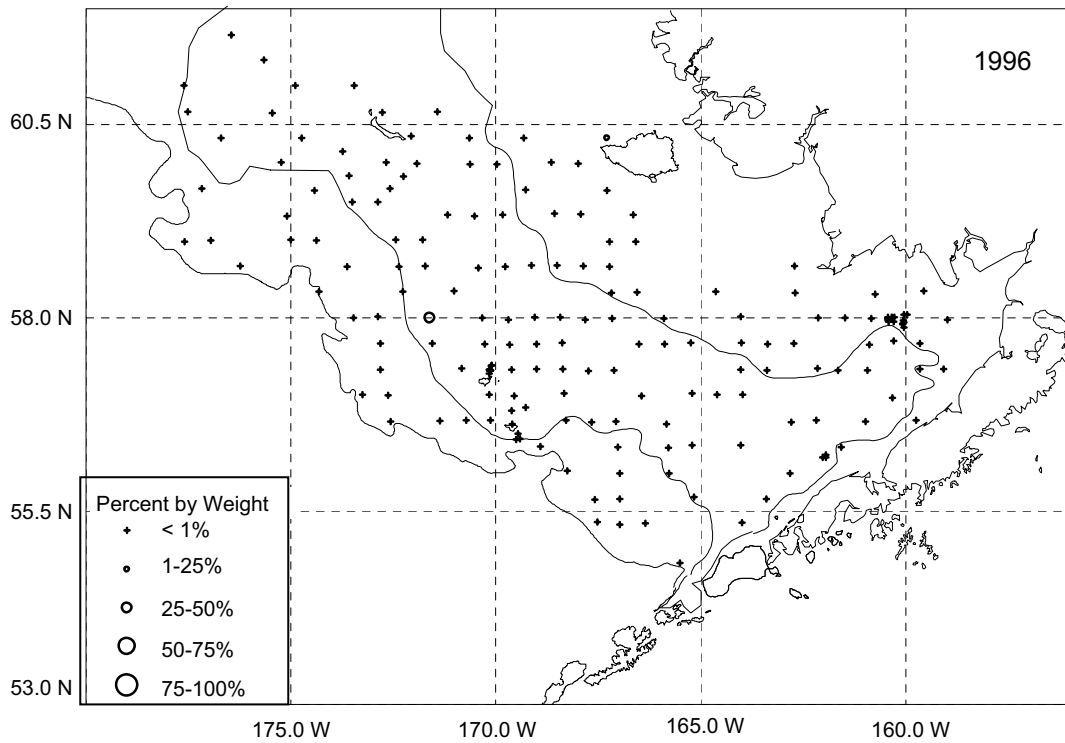
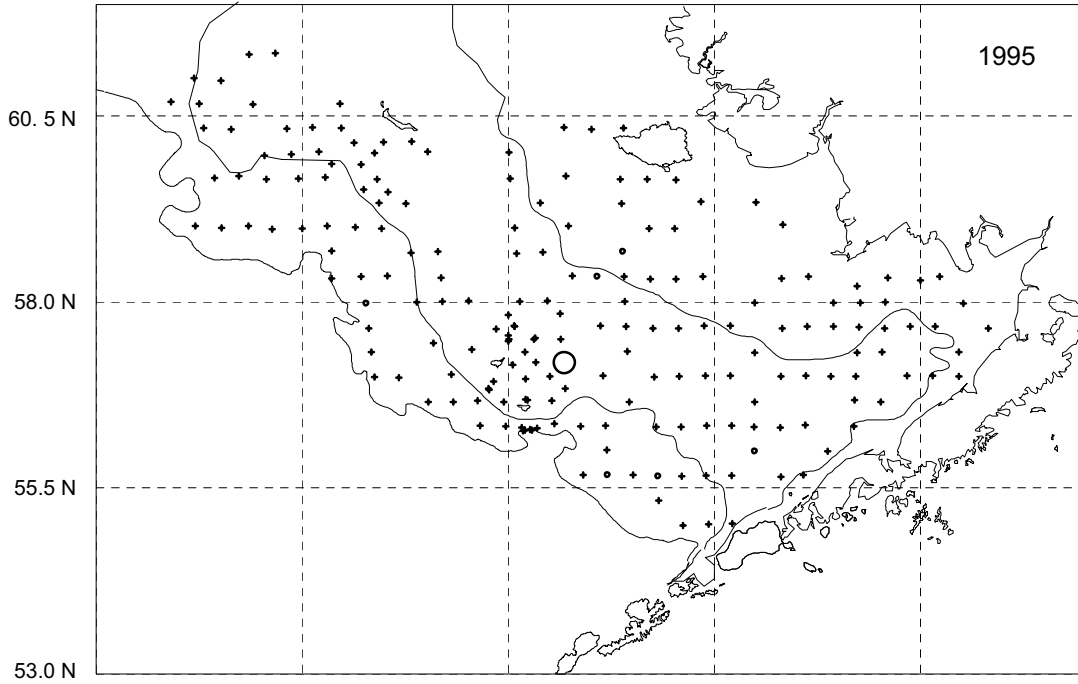


Figure B-3.-- Continued.

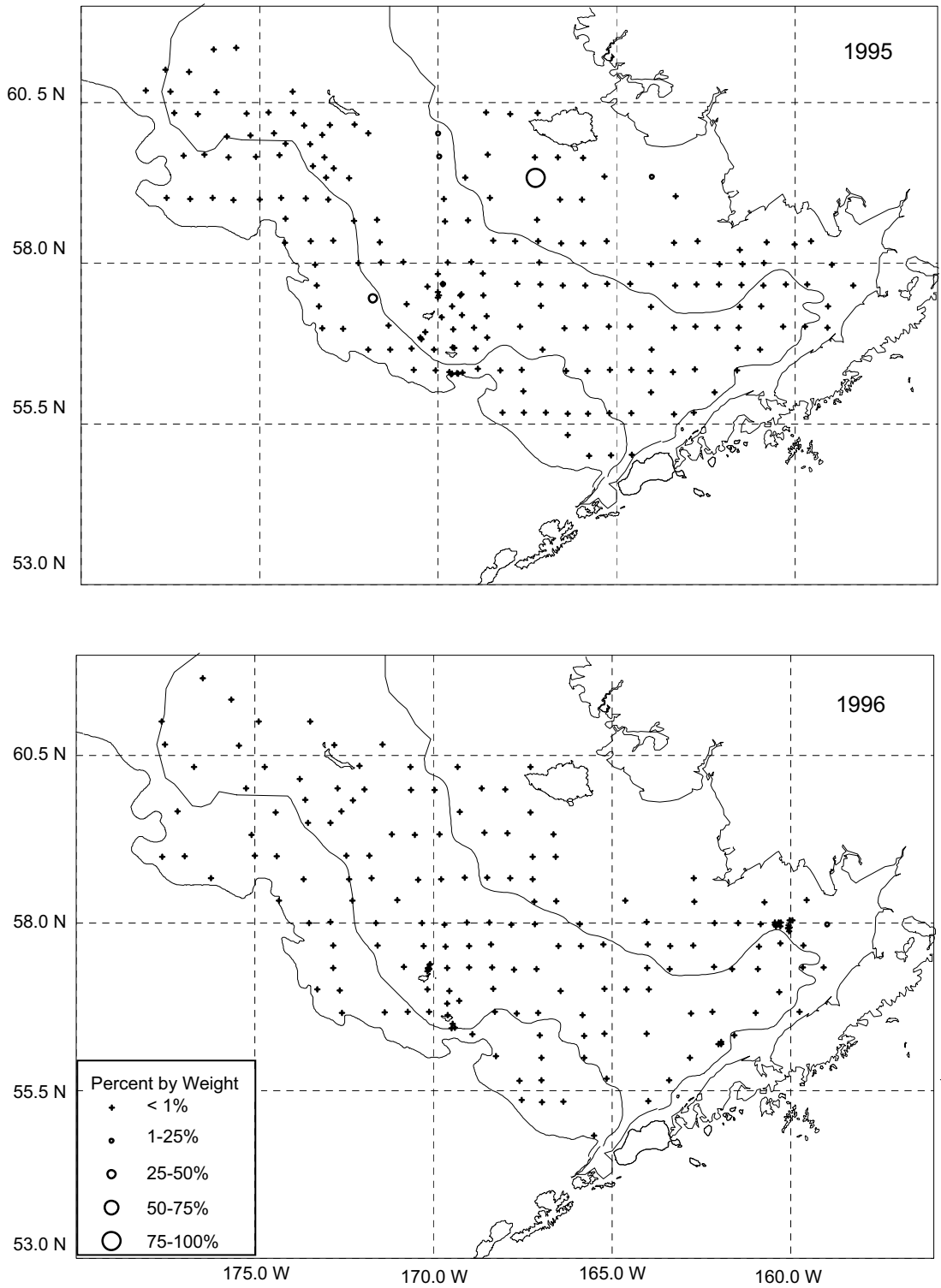


Figure B-4.-- Percent by weight of Pacific herring (*Clupea pallasii*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1995 and 1996 in the eastern Bering Sea.

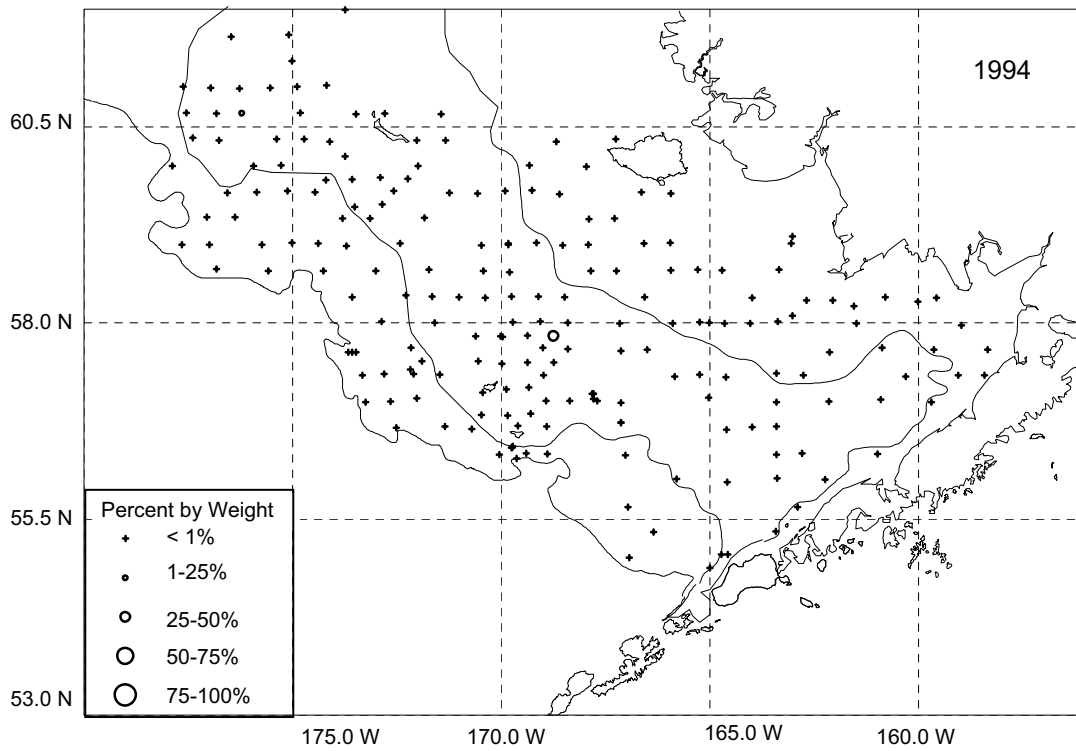


Figure B-5.-- Percent by weight of Pacific halibut (*Hippoglossus stenolepis*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1994 in the eastern Bering Sea.

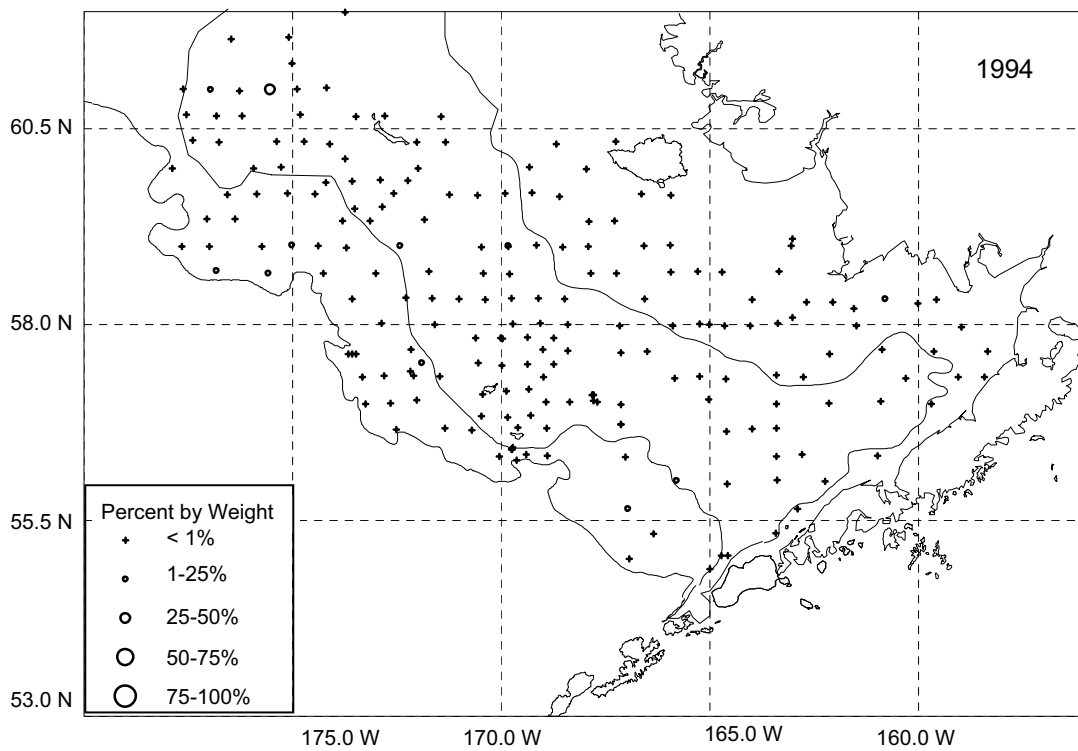
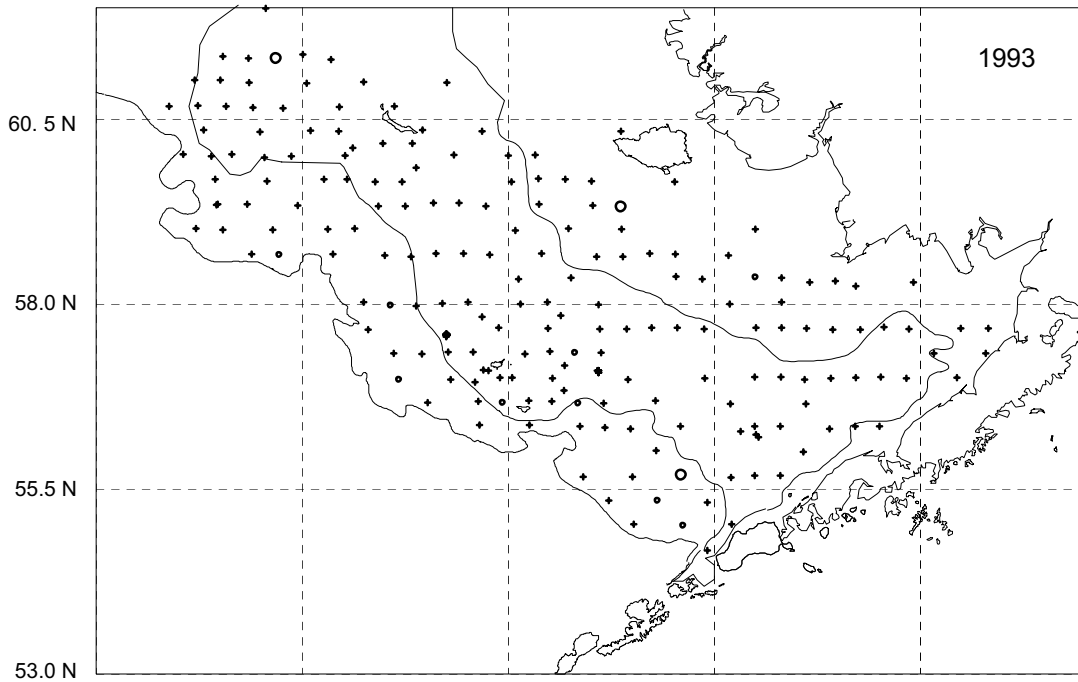


Figure B-6.-- Percent by weight of flathead sole (*Hippoglossoides elassodon*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

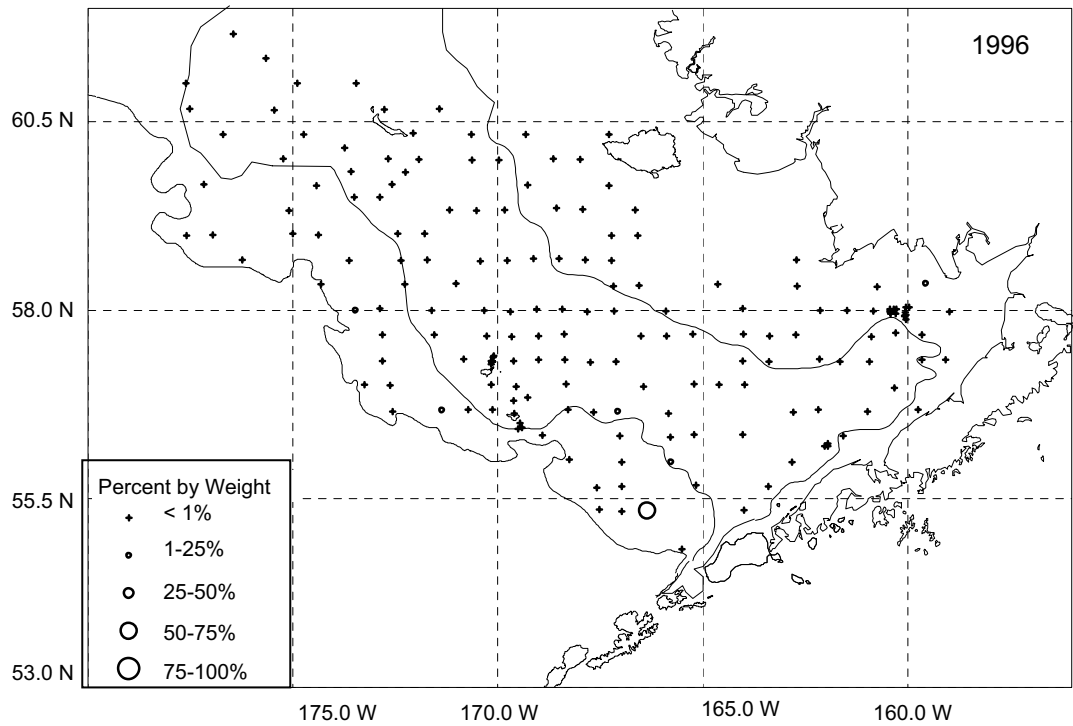
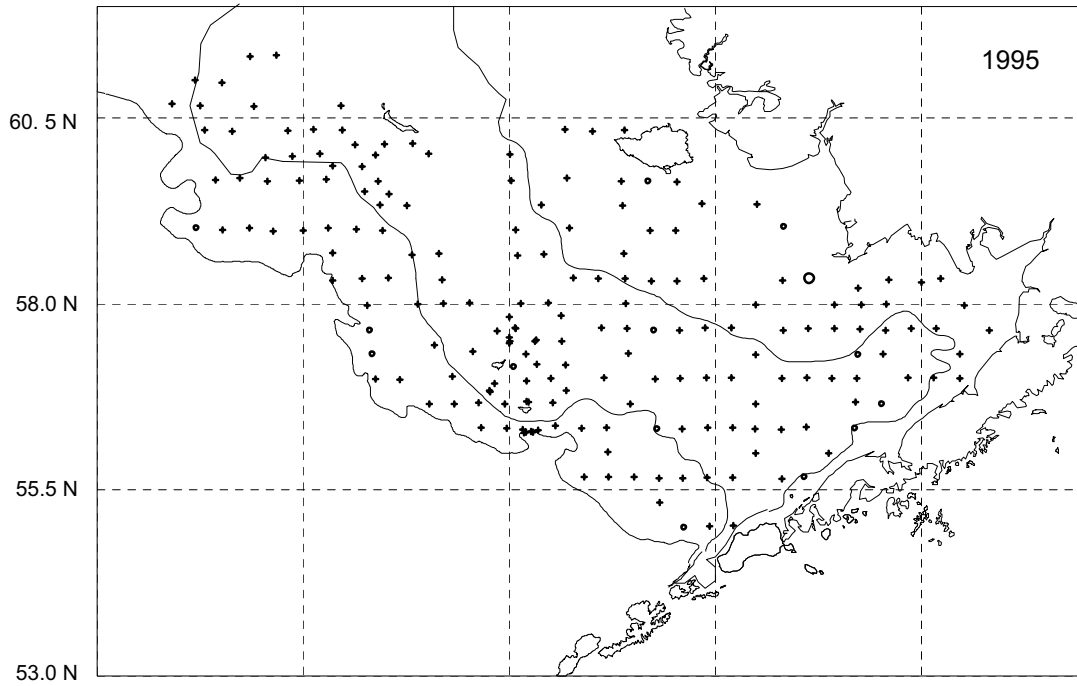


Figure B-6.-- Continued.

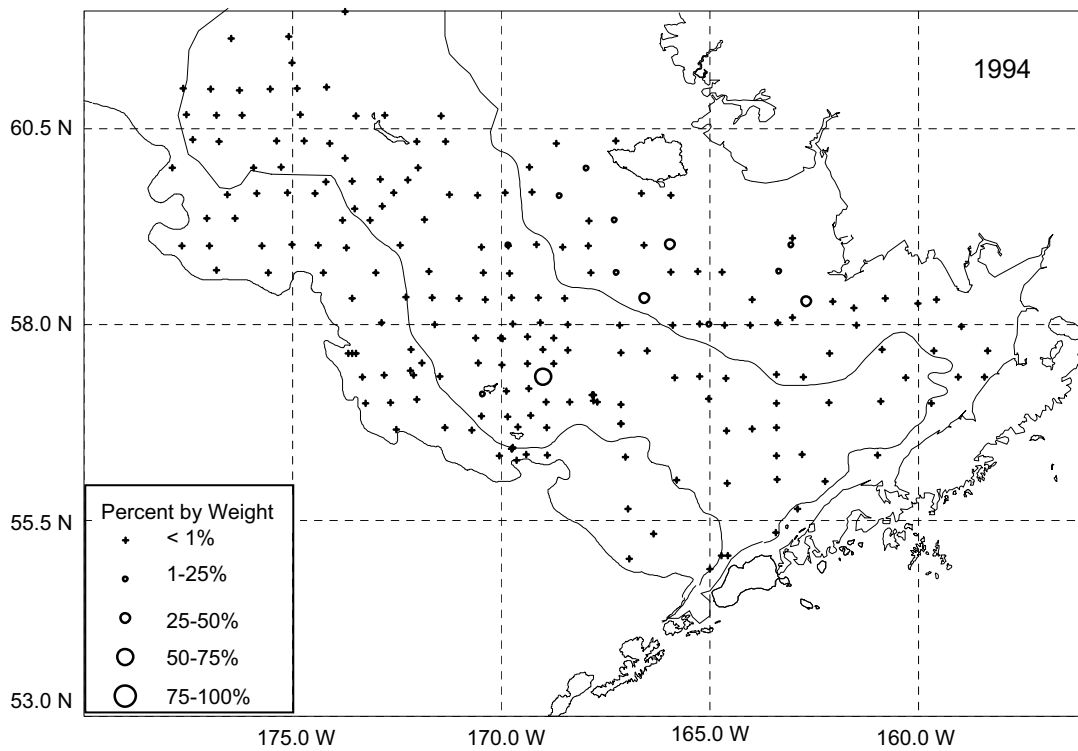
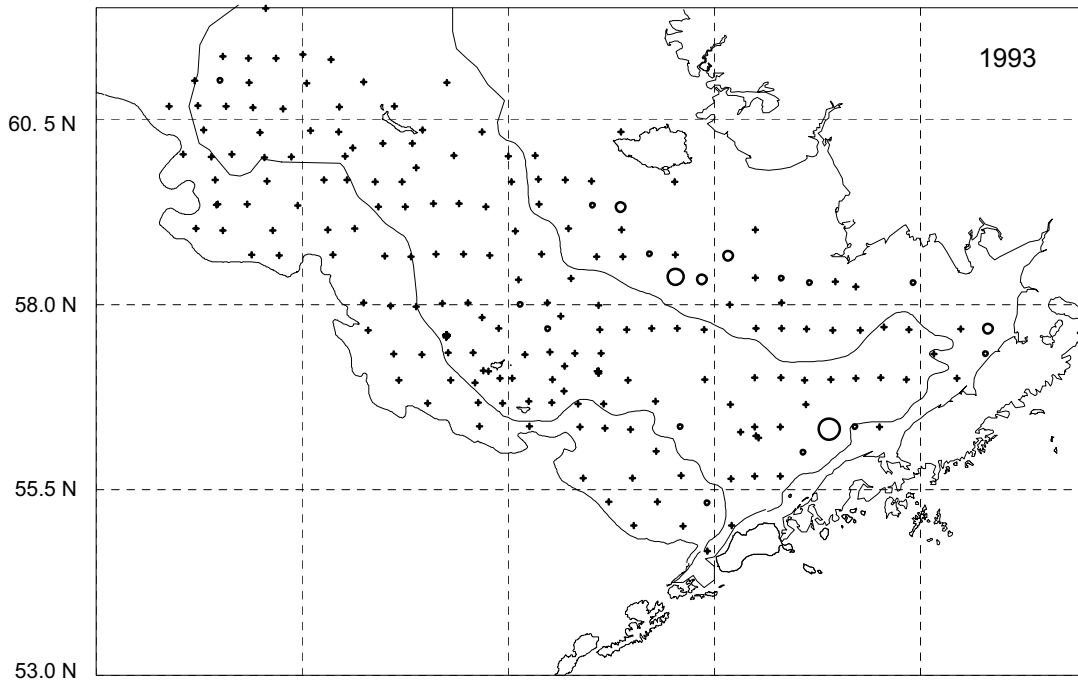


Figure B-7.-- Percent by weight of northern rock sole (*Lepidopsetta polyxystra*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

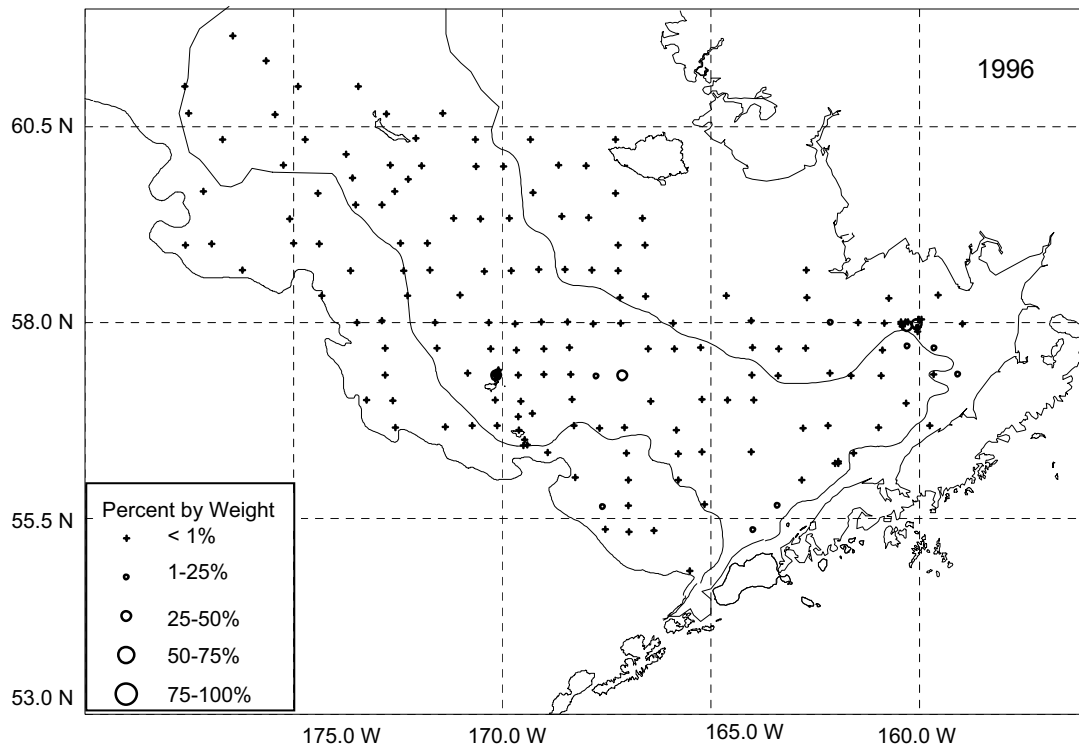
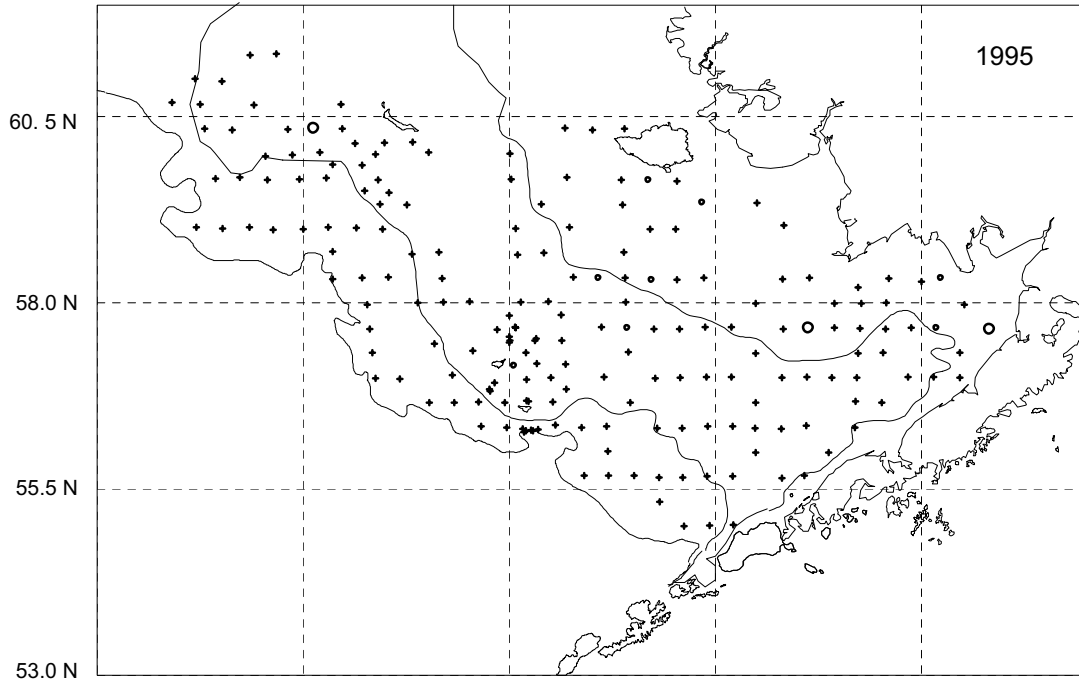


Figure B-7.-- Continued.

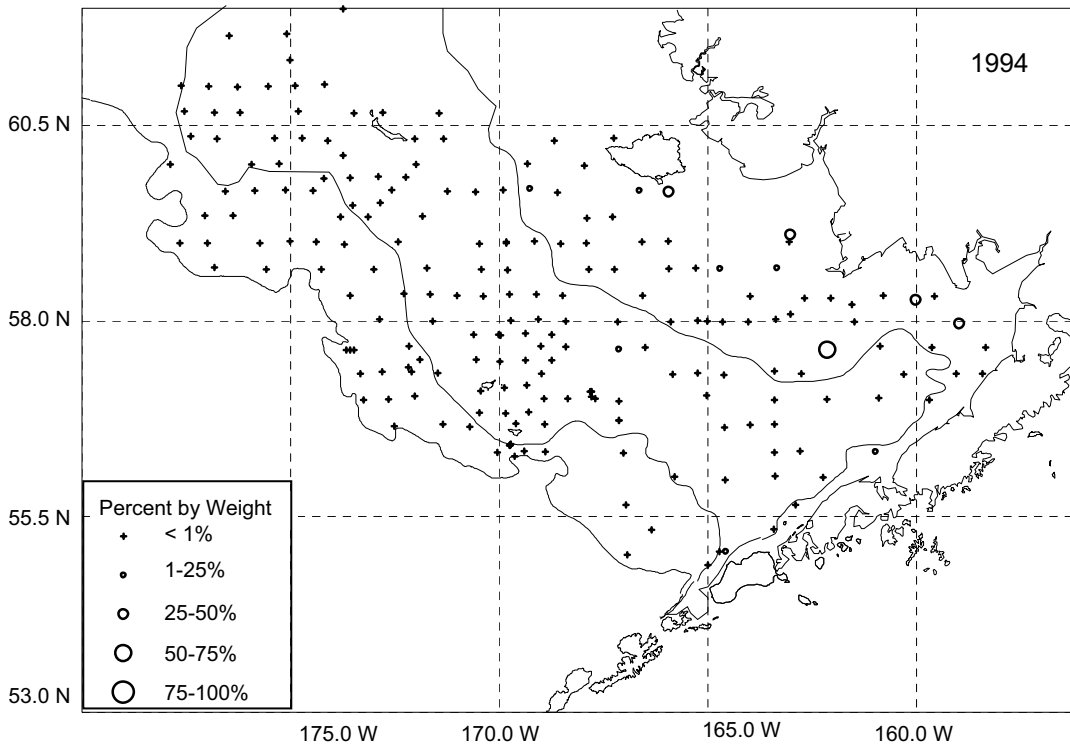
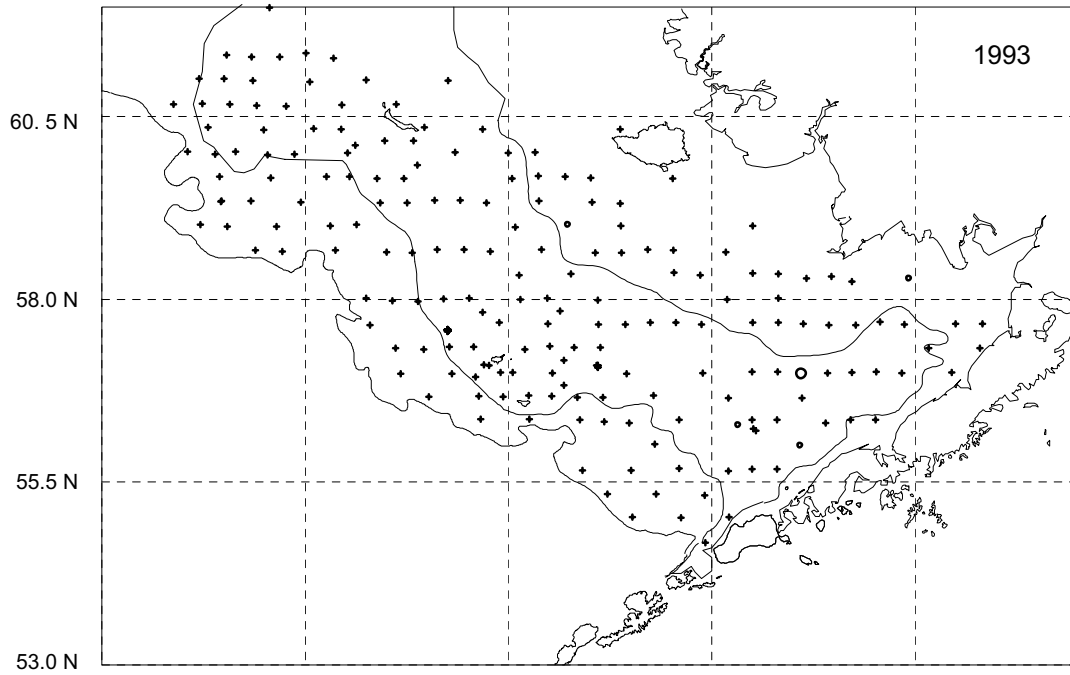


Figure B-8.-- Percent by weight of yellowfin sole (*Limanda aspera*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

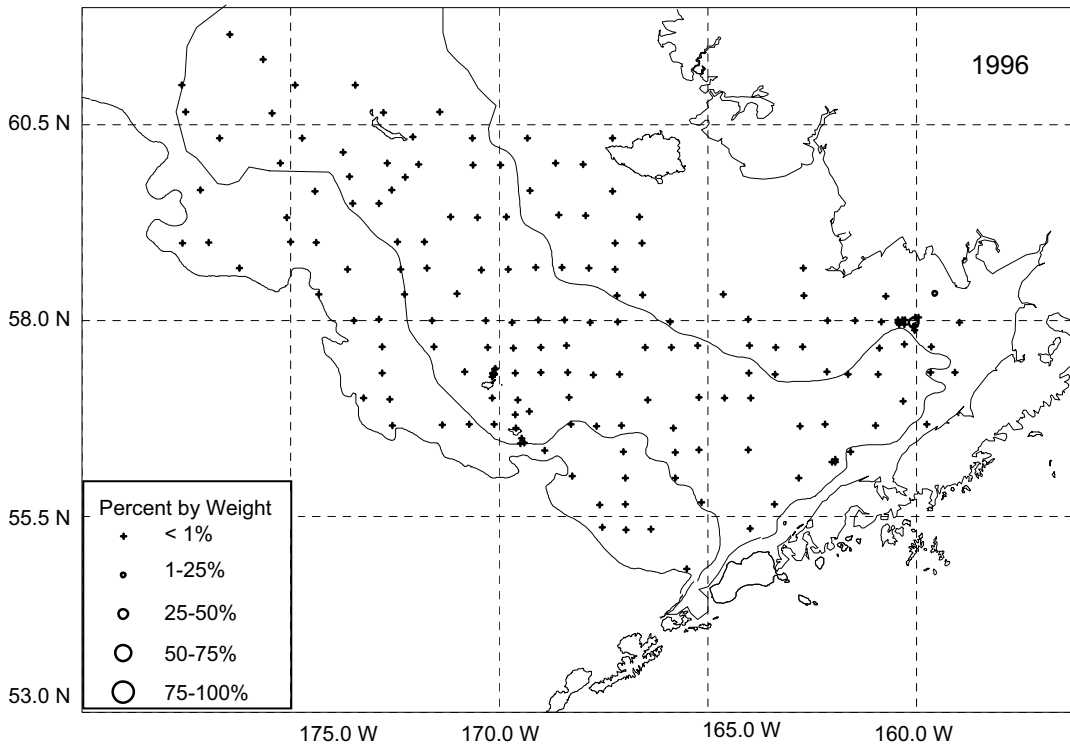
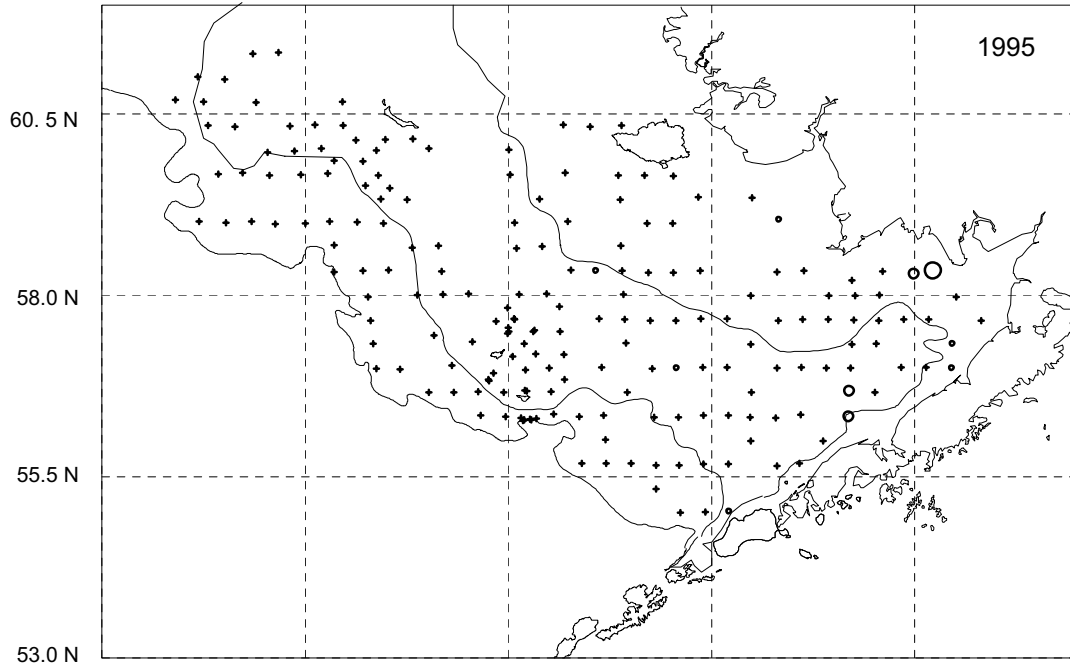


Figure B-8.-- Continued.

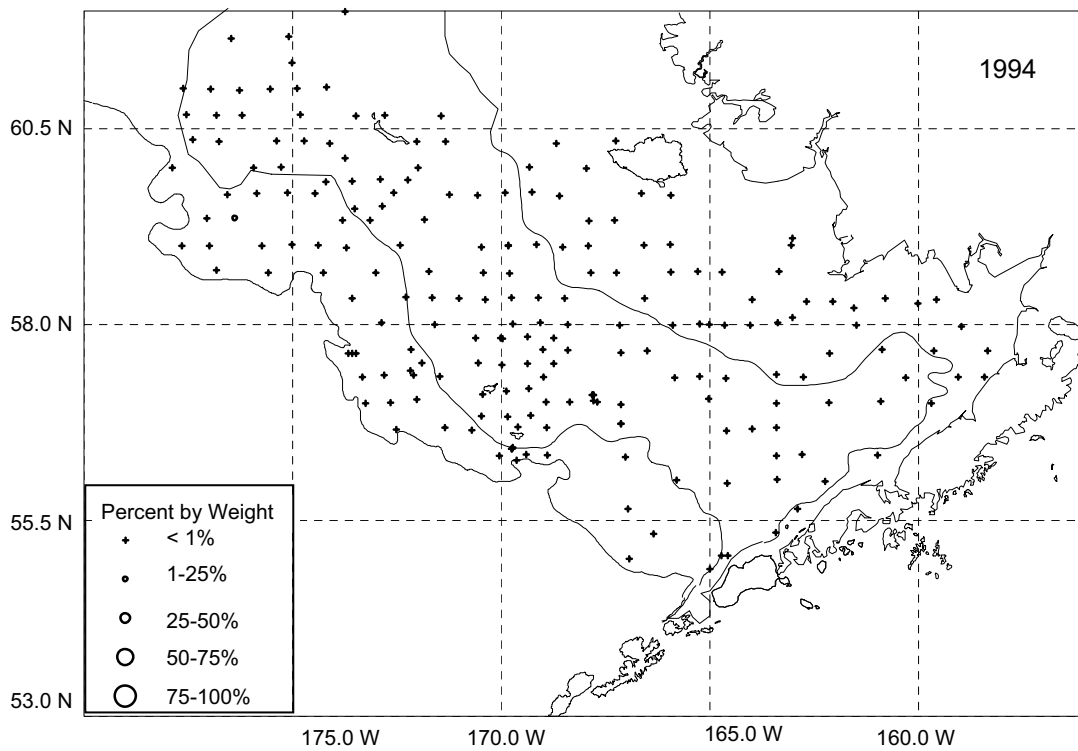
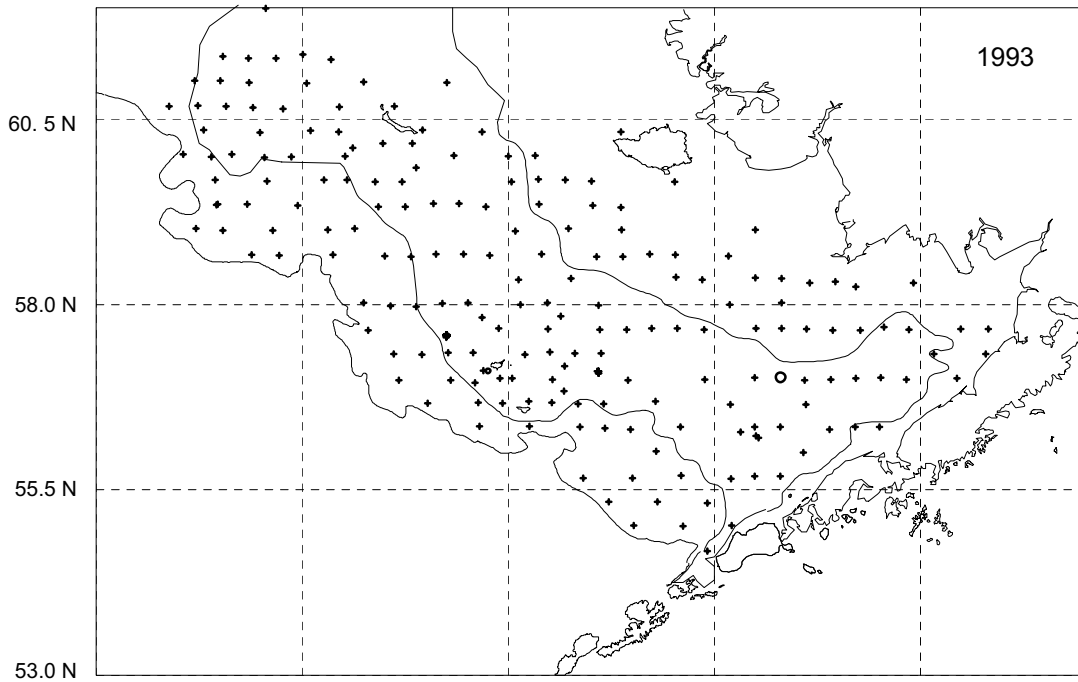


Figure B-9.-- Percent by weight of arrowtooth flounder (*Atheresthes stomias*) in the diet of Pacific cod (*Gadus macrocephalus*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

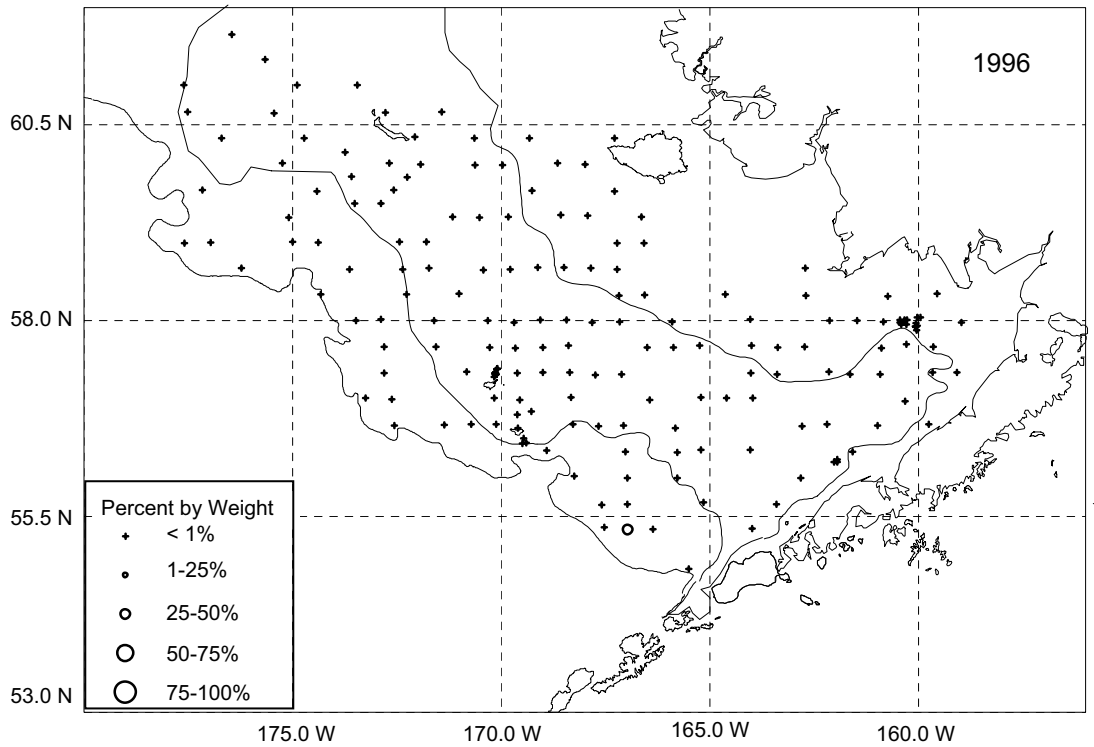
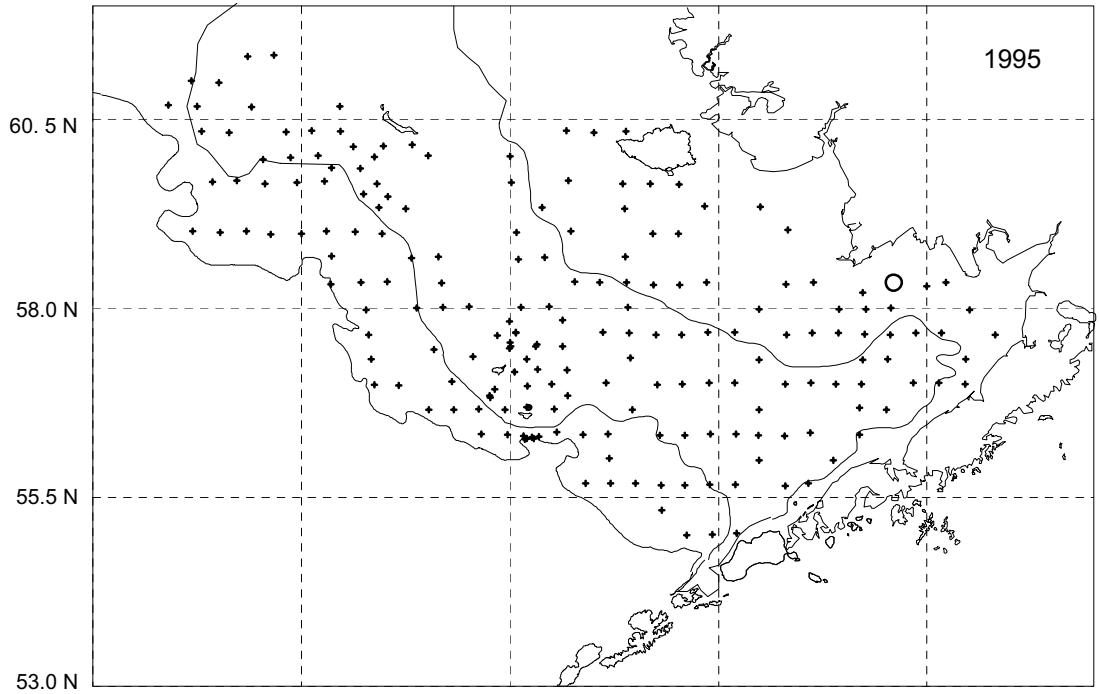


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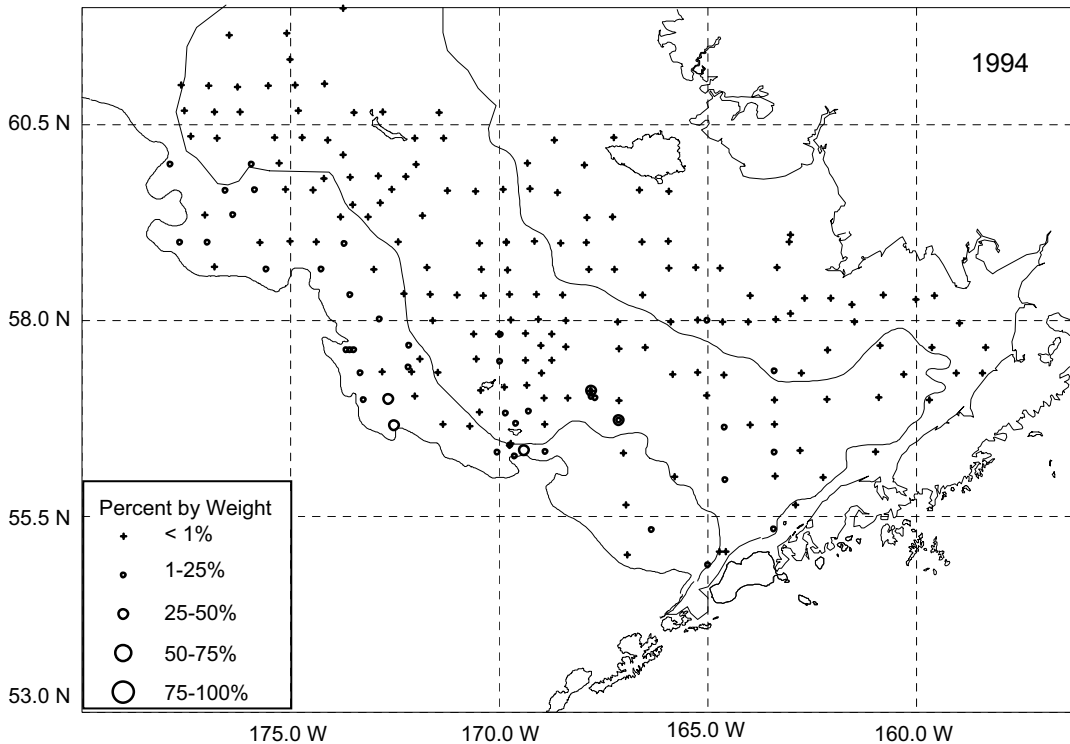
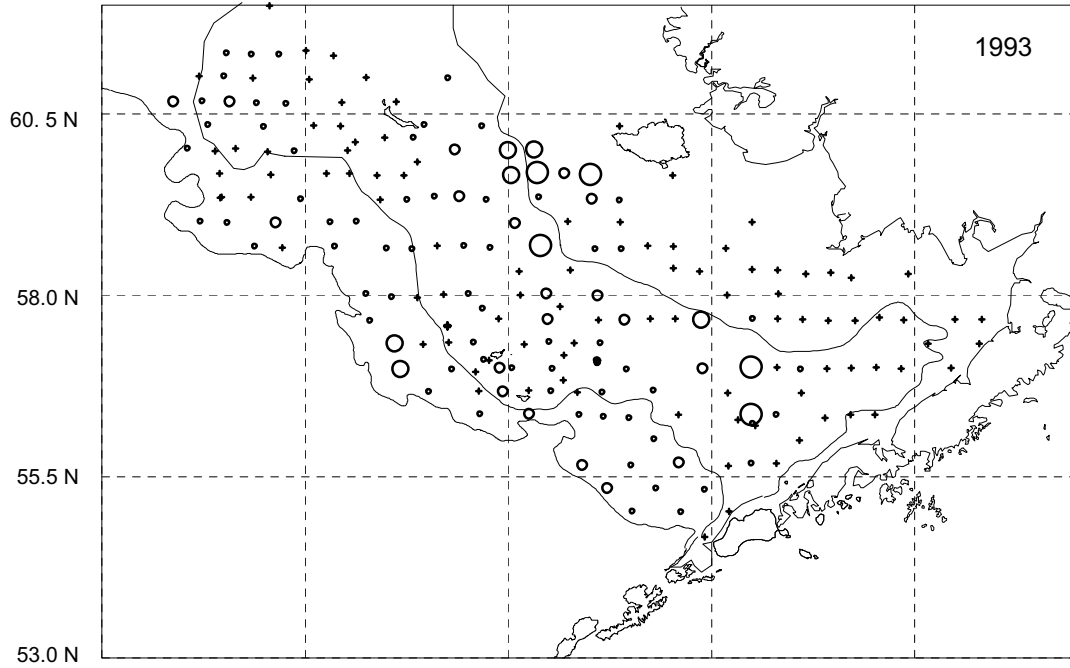


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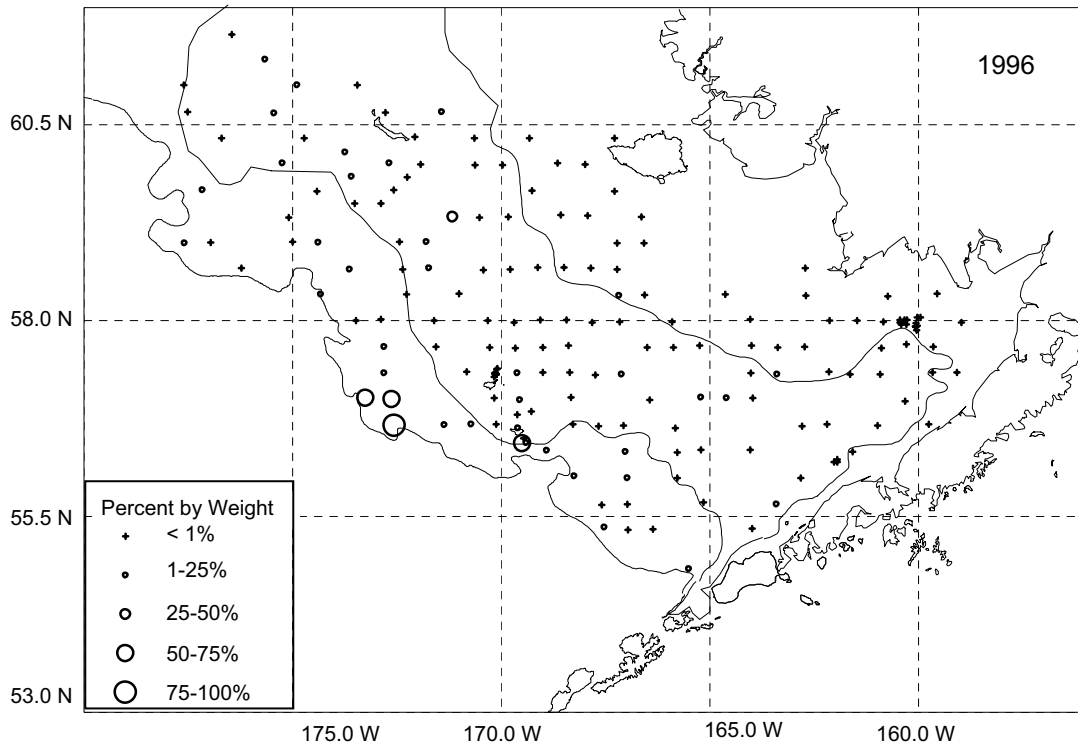
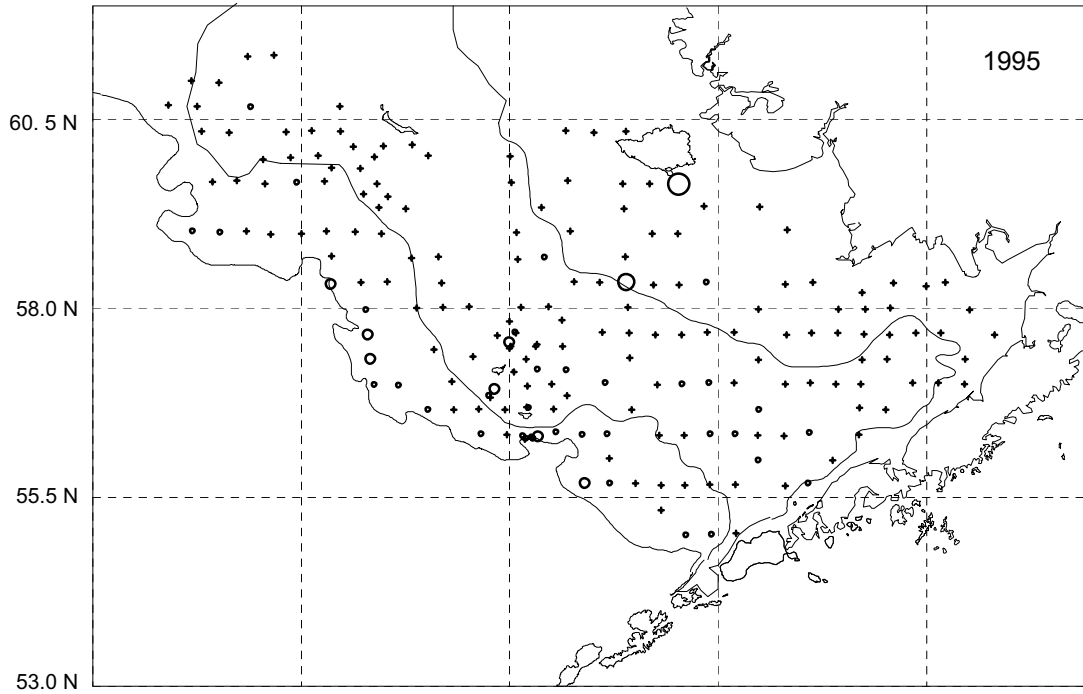


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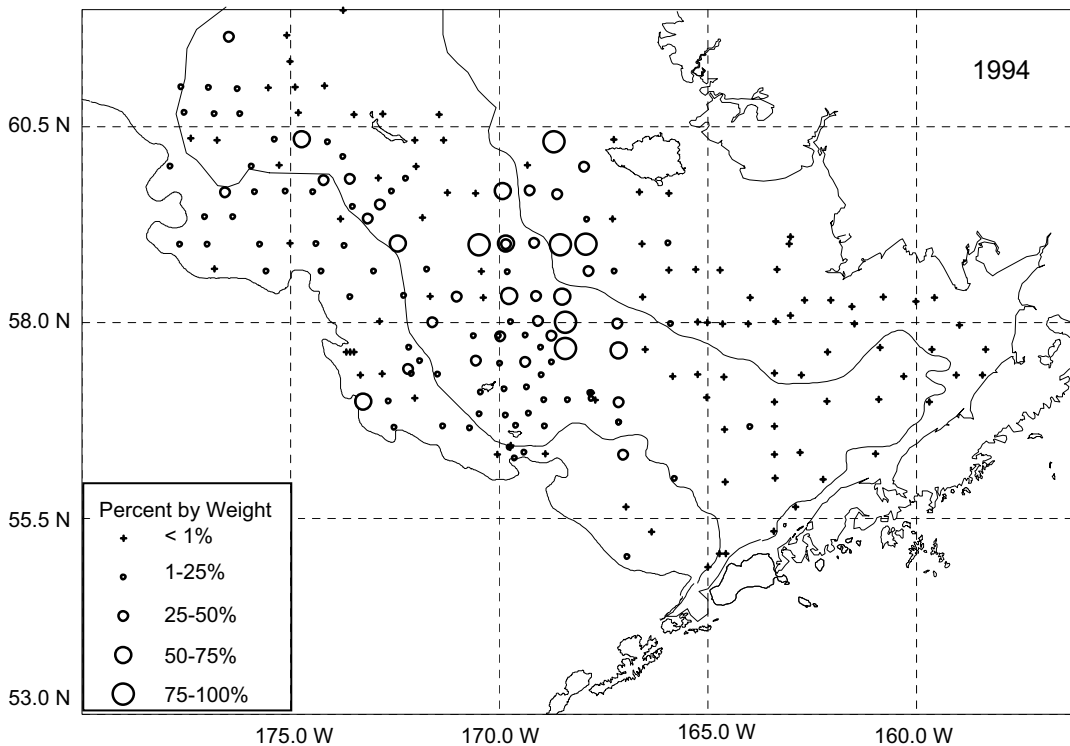
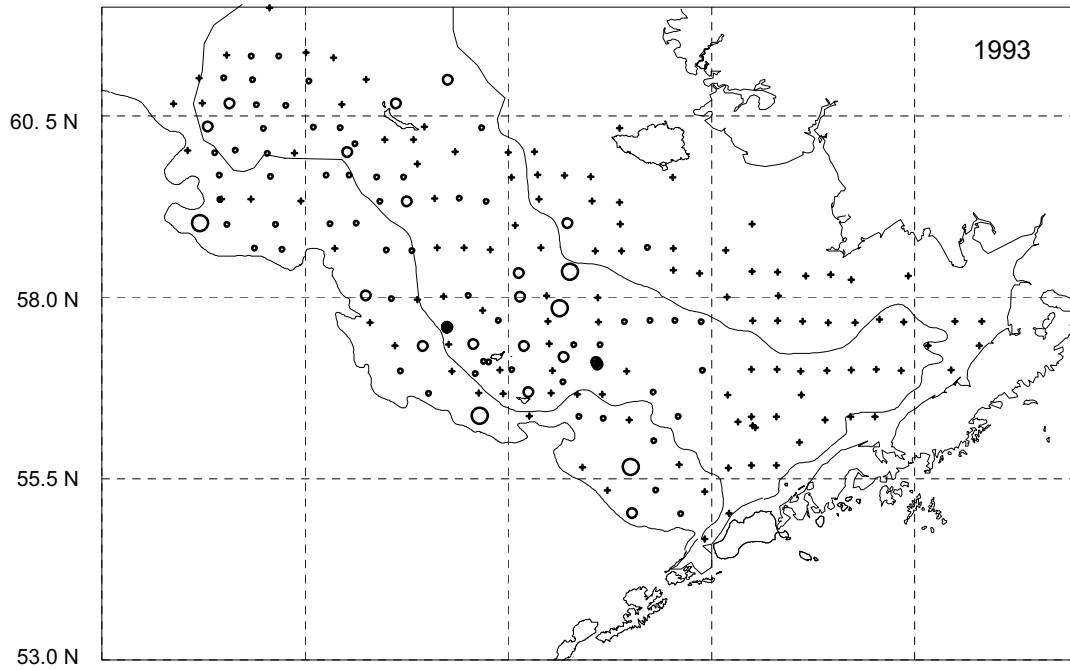


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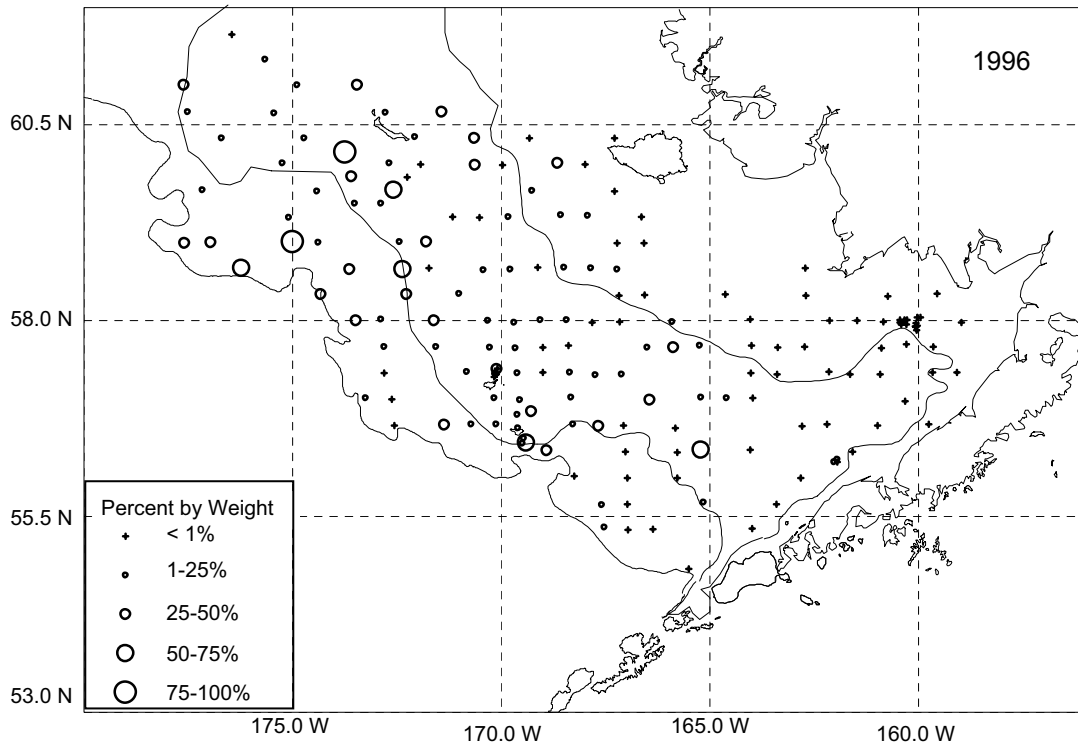
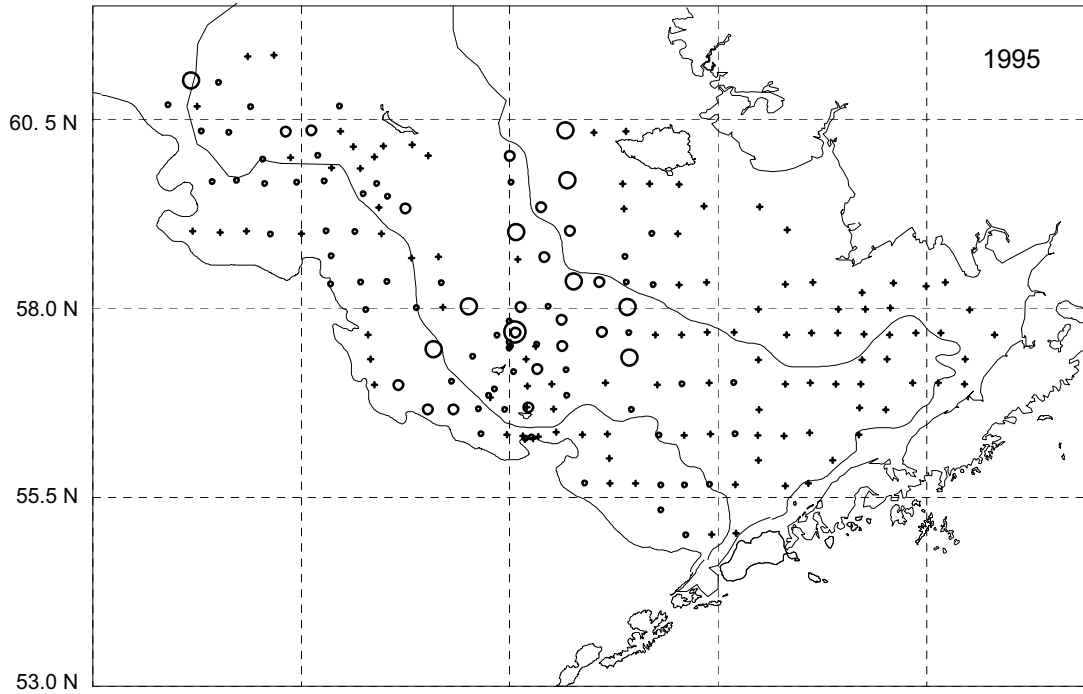


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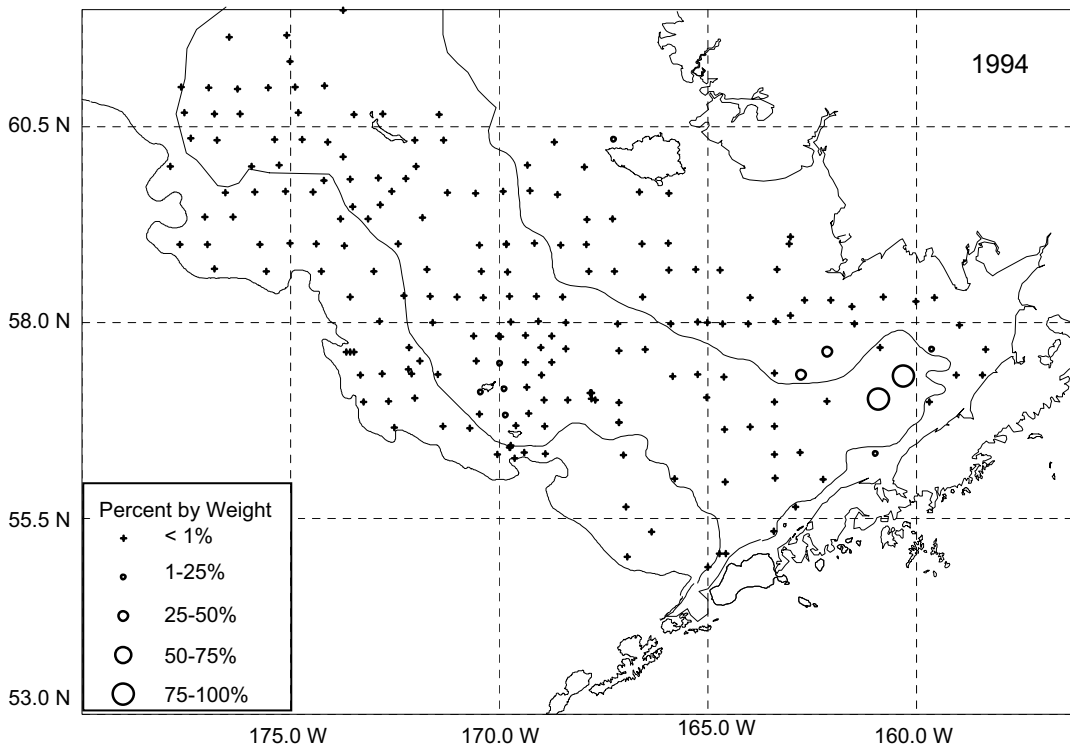
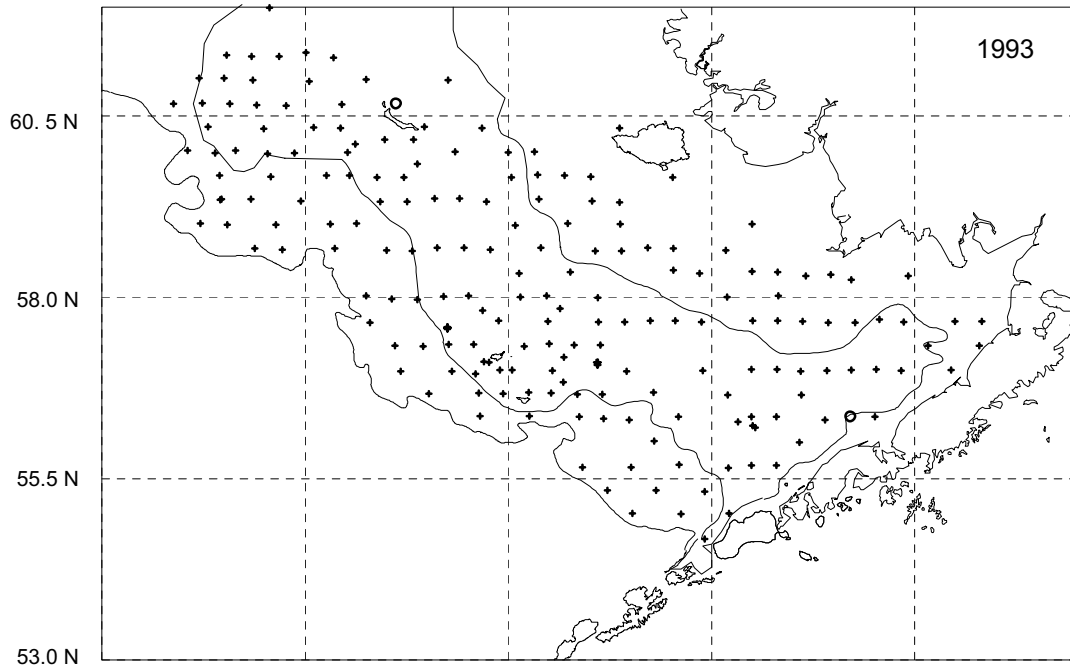


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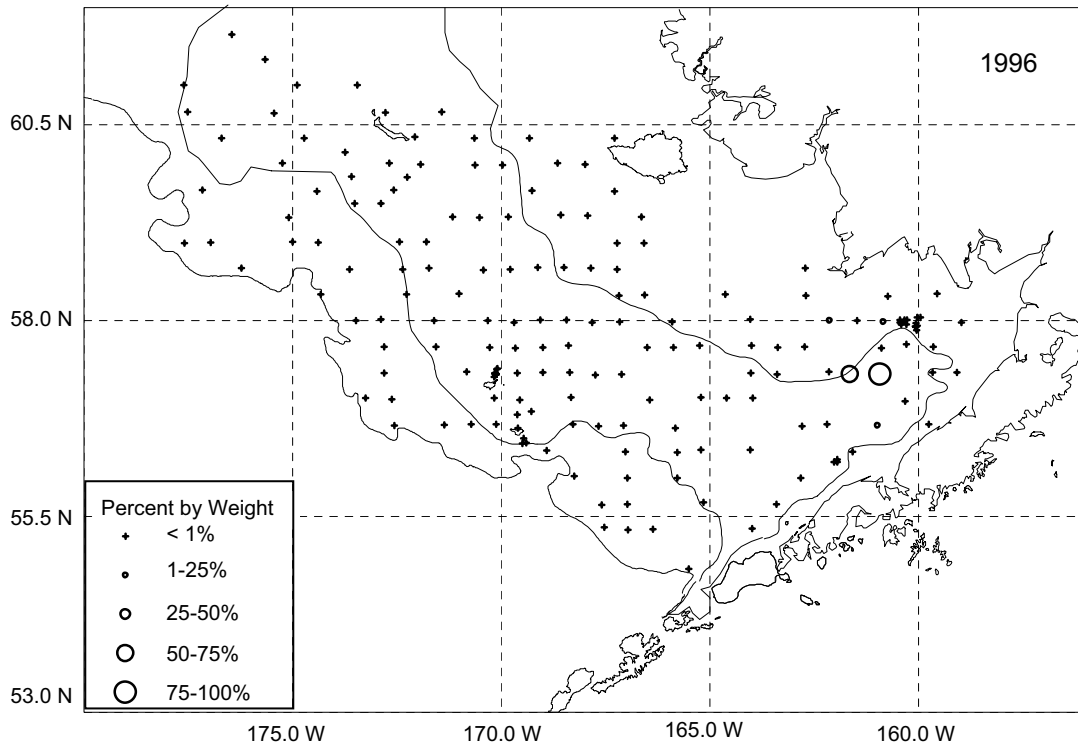
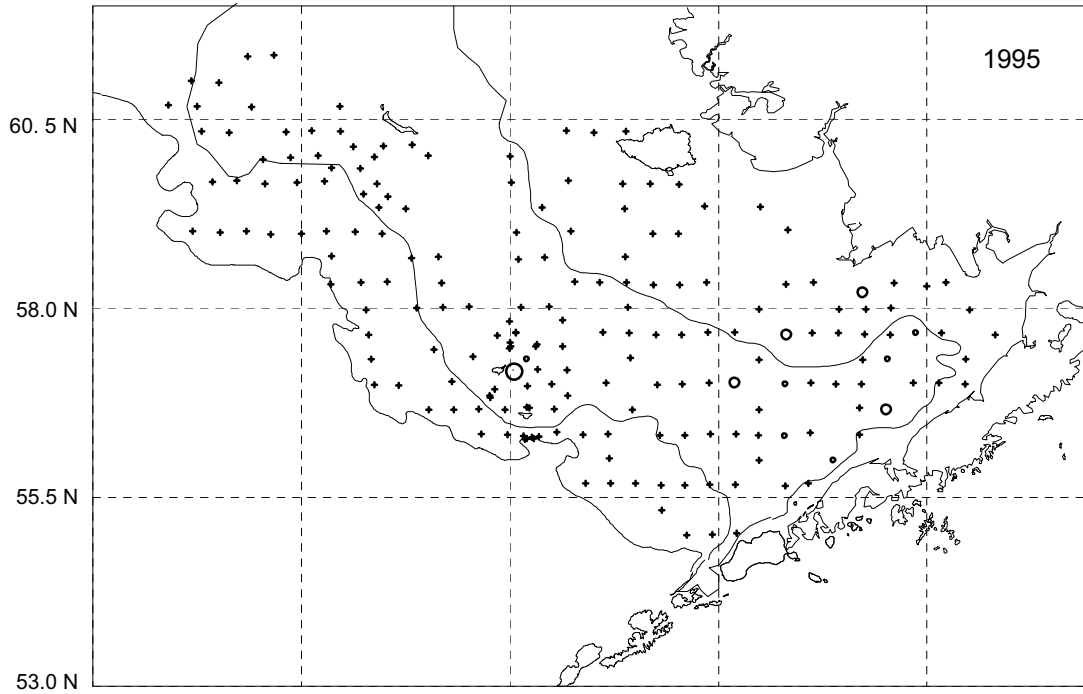


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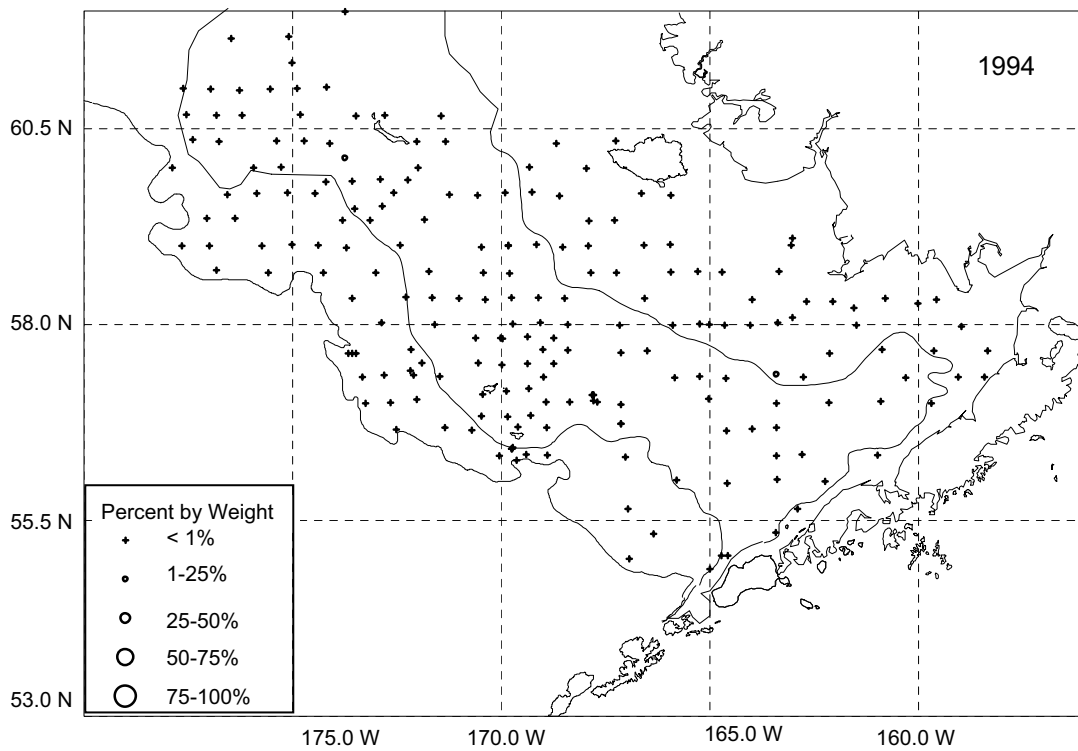
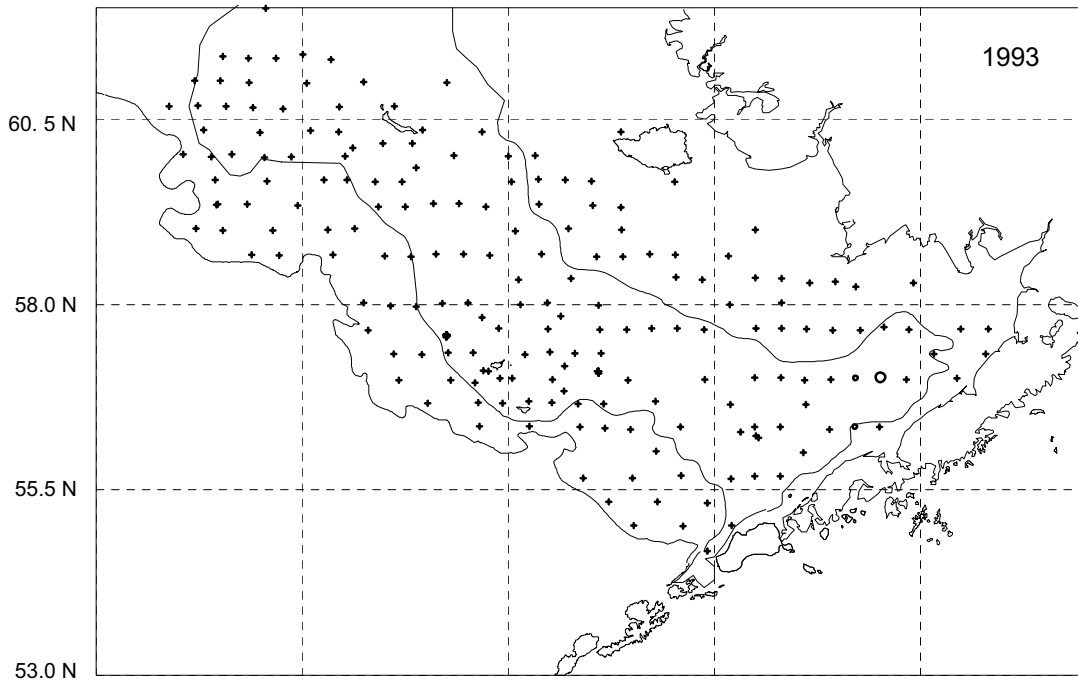


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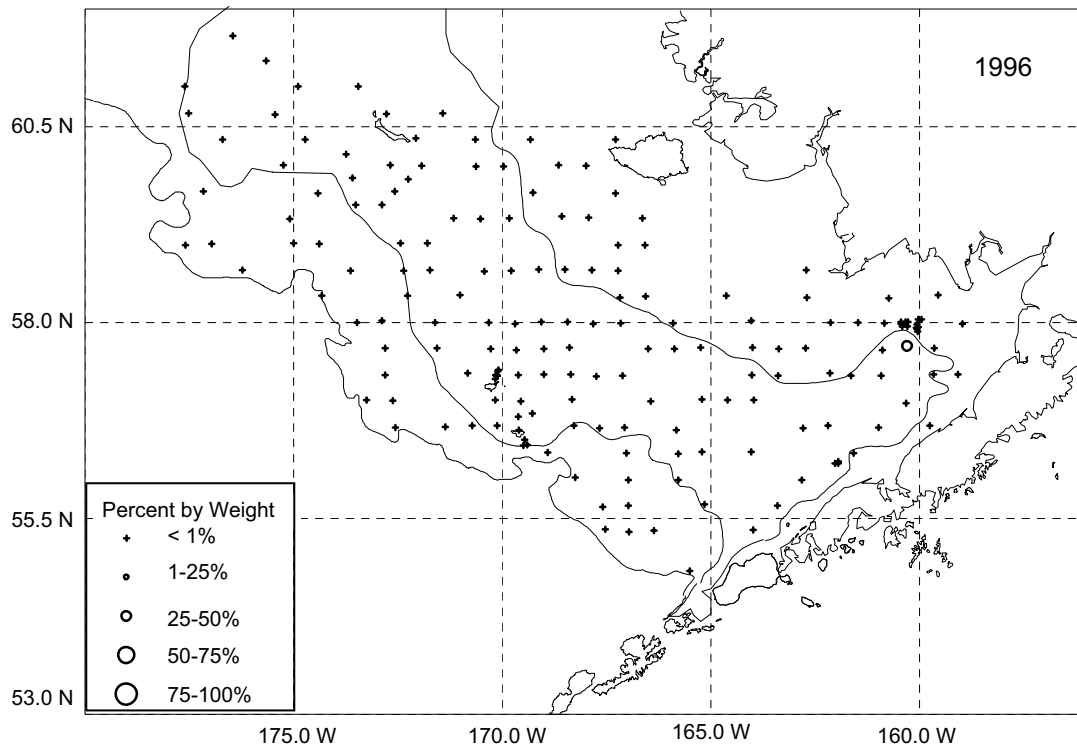
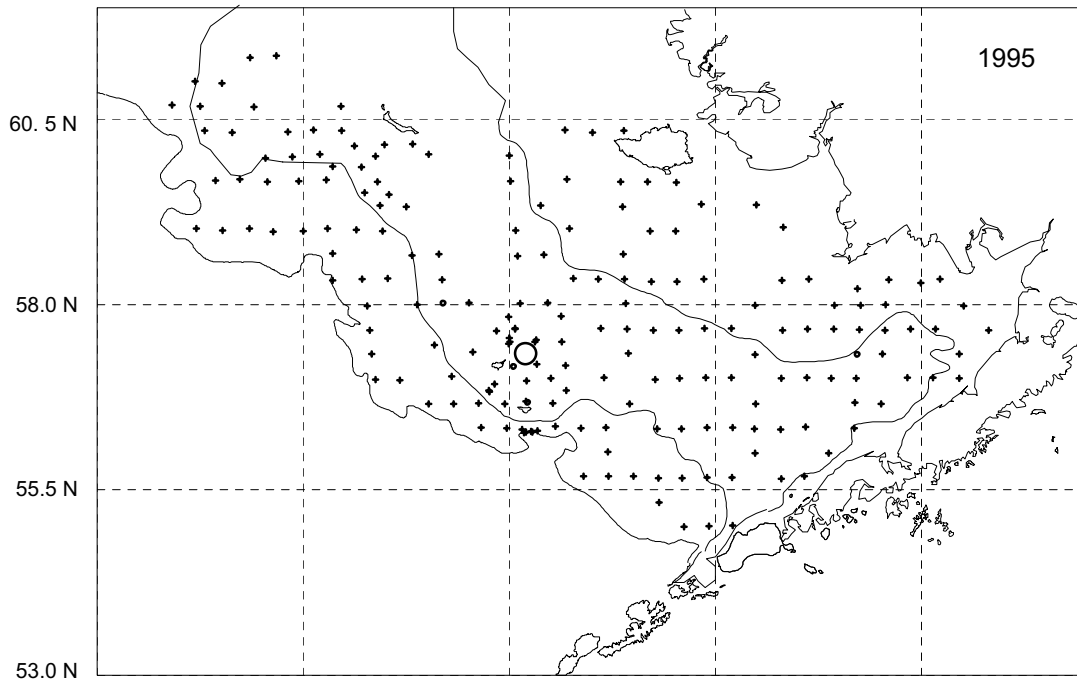


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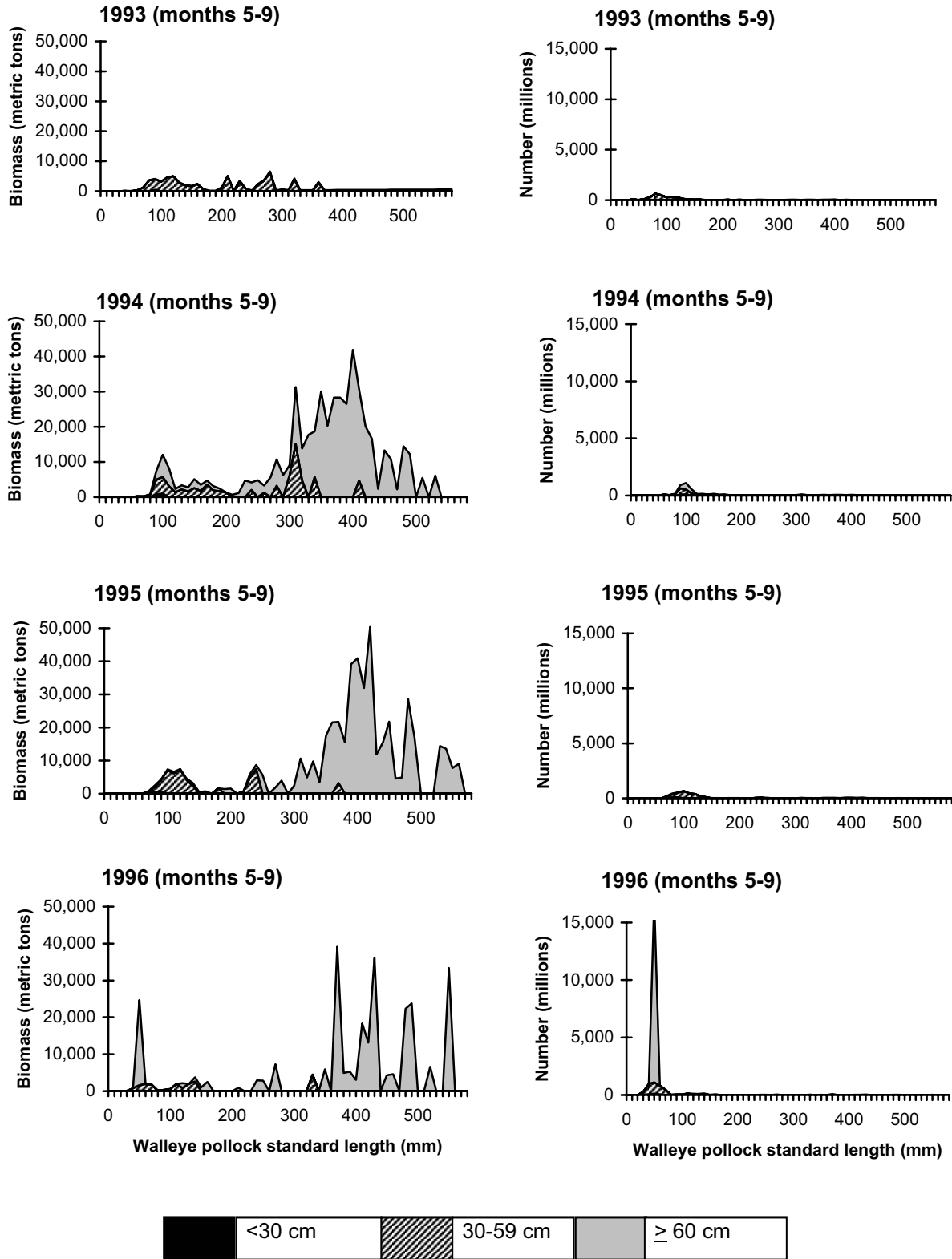


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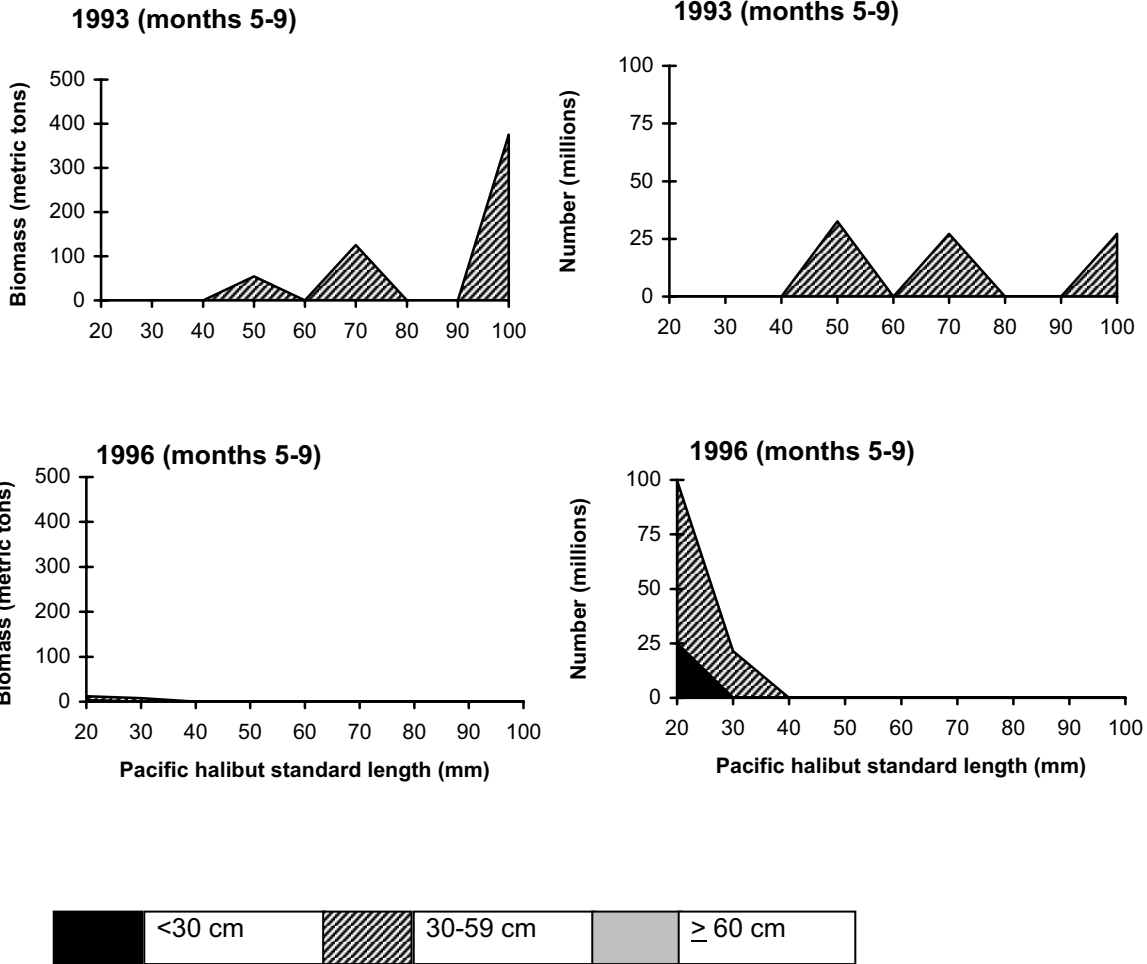


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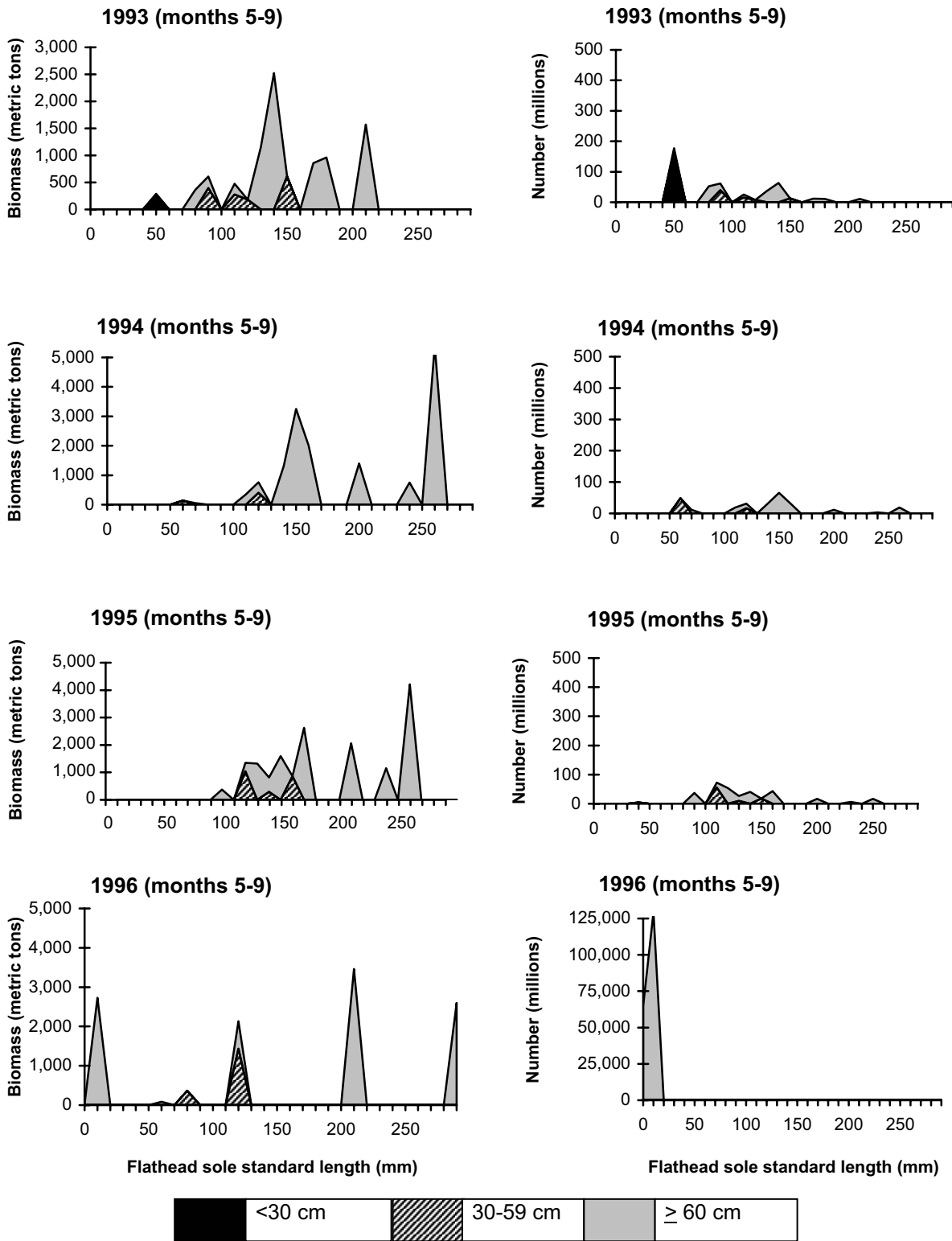


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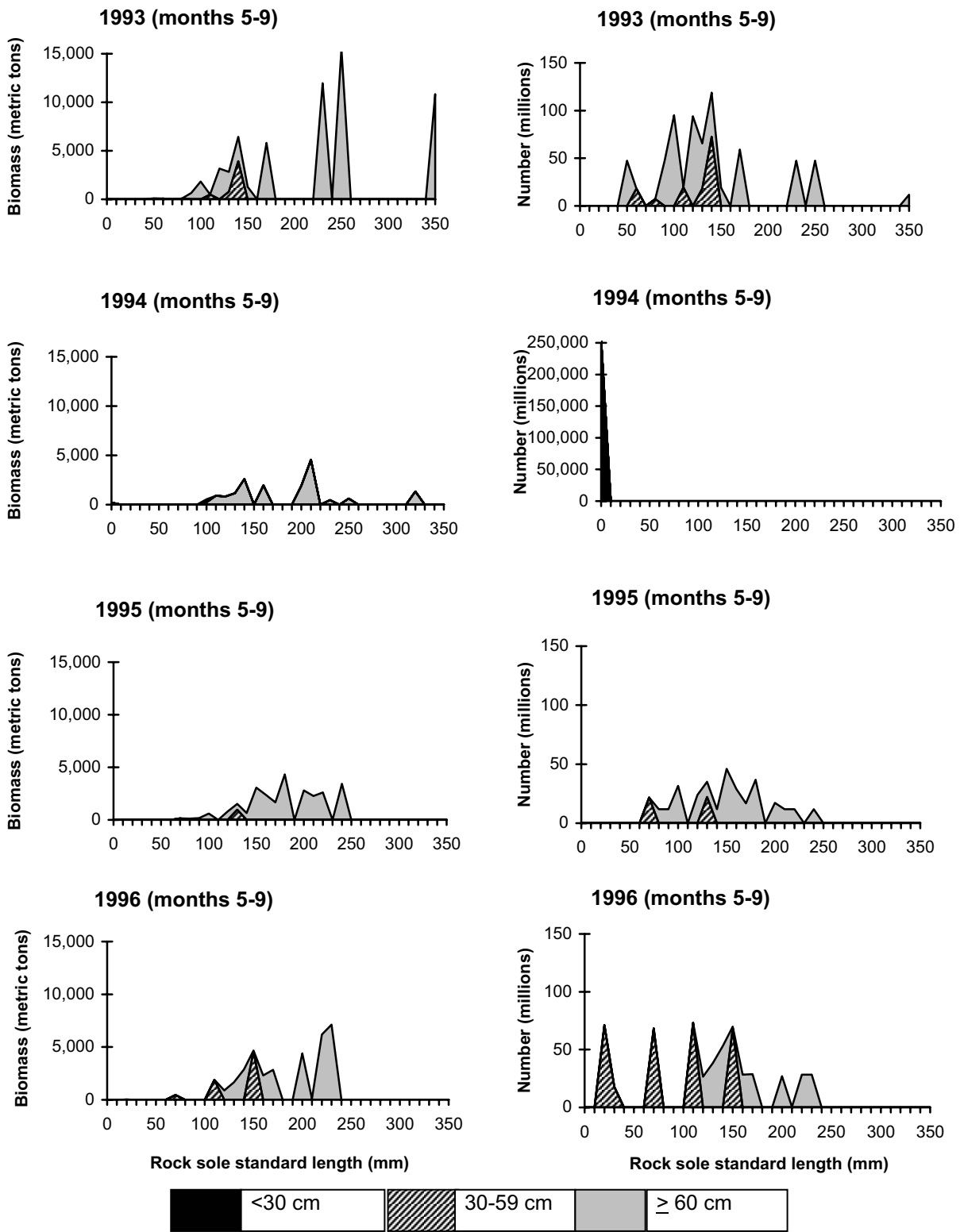


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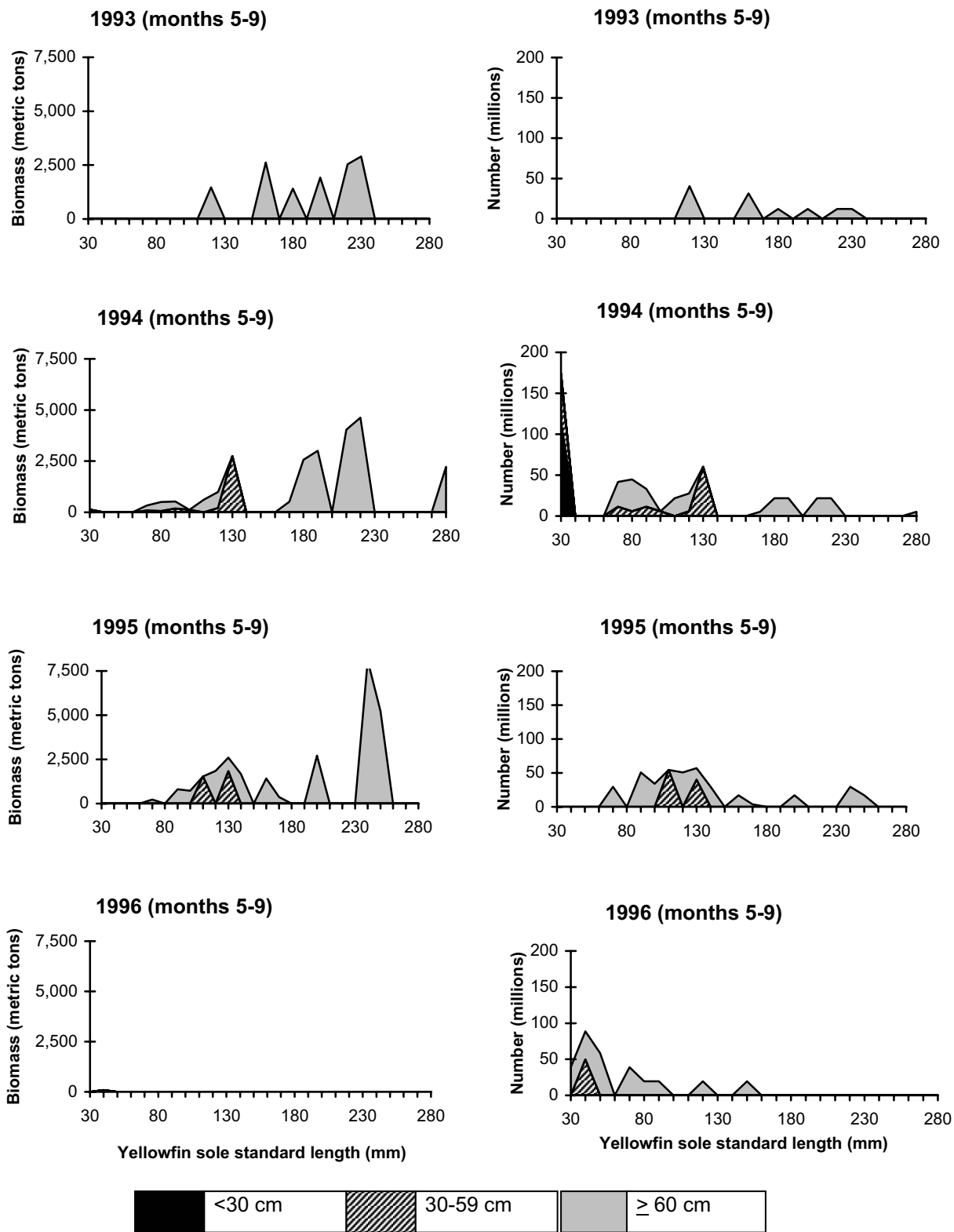


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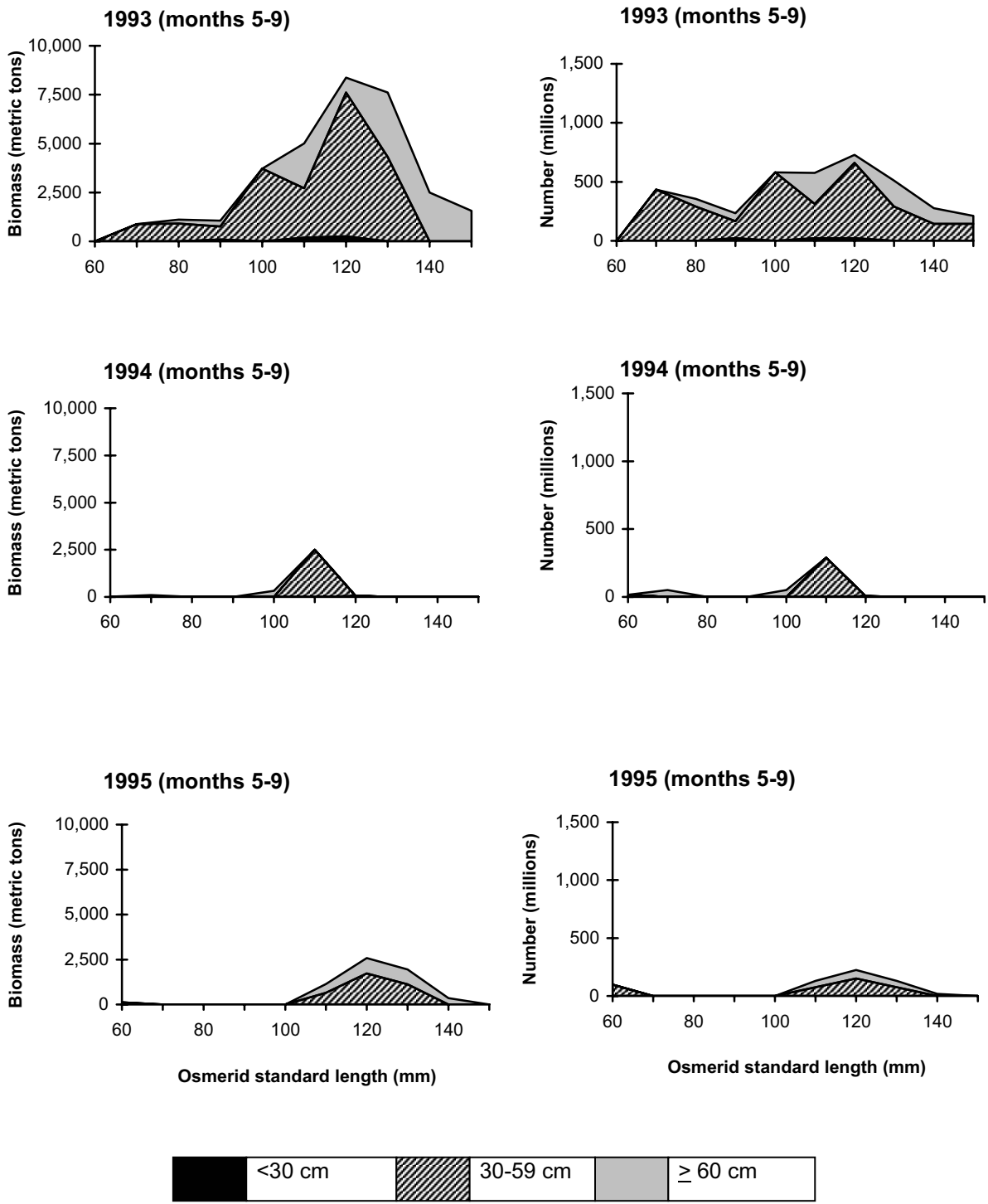


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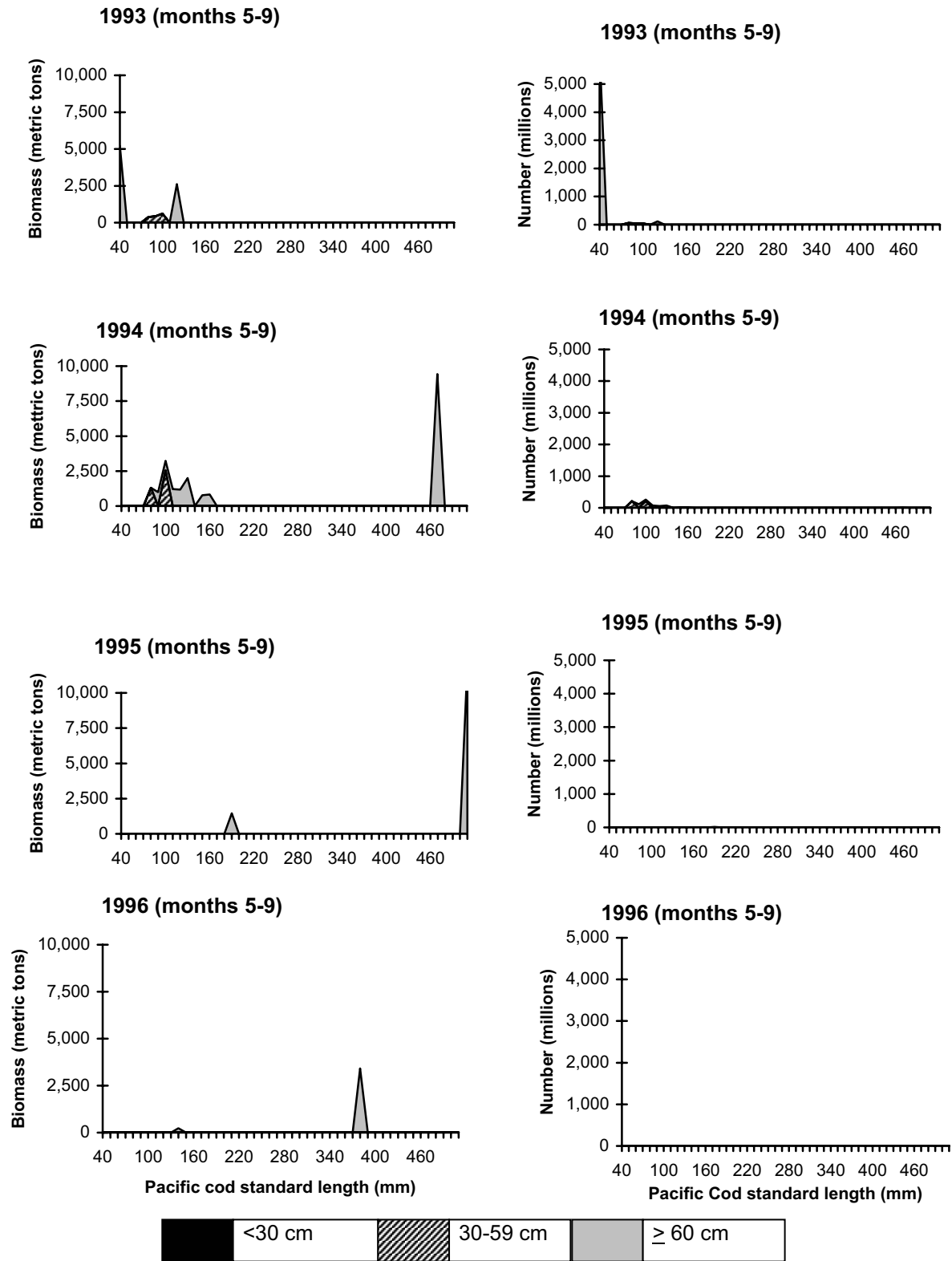


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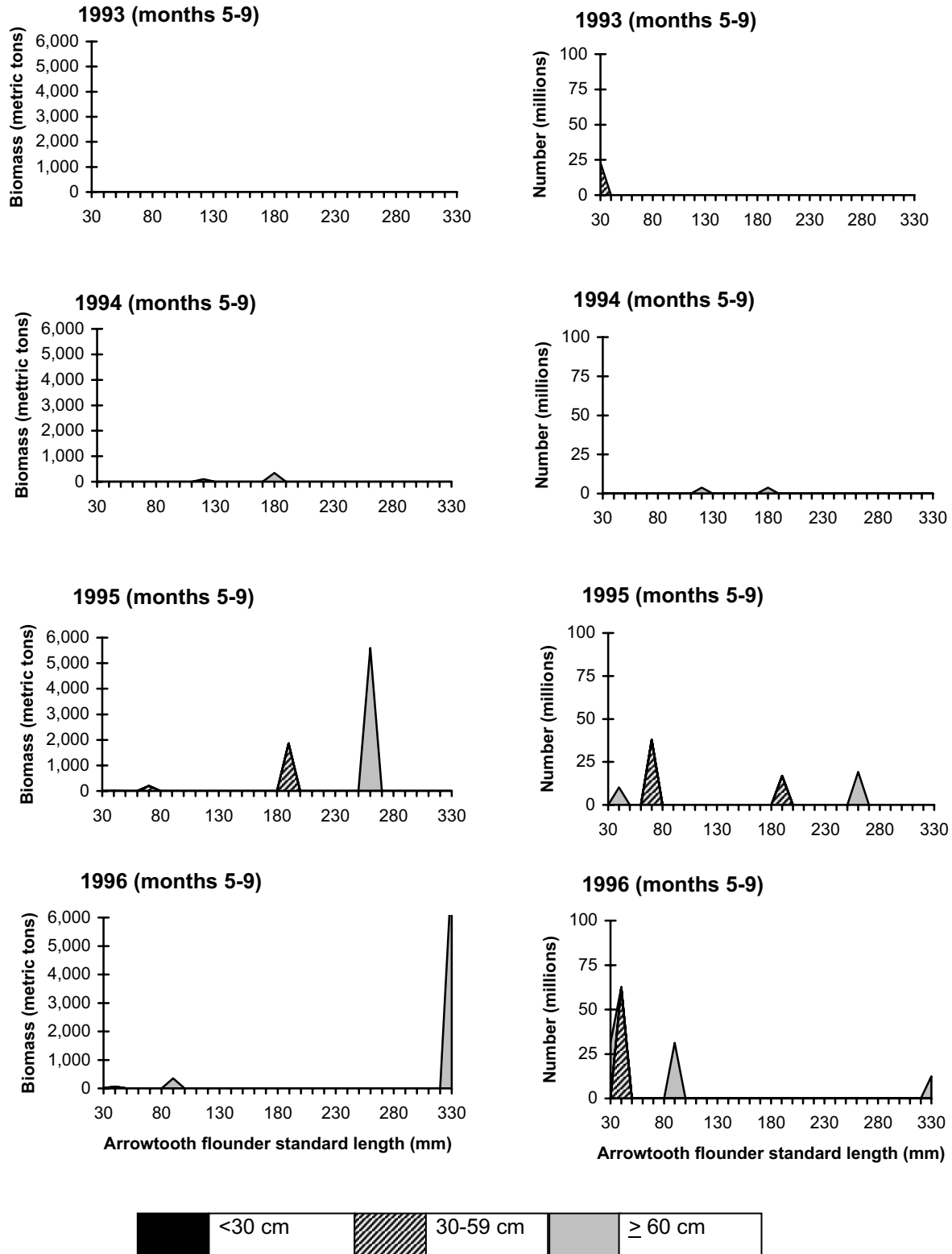


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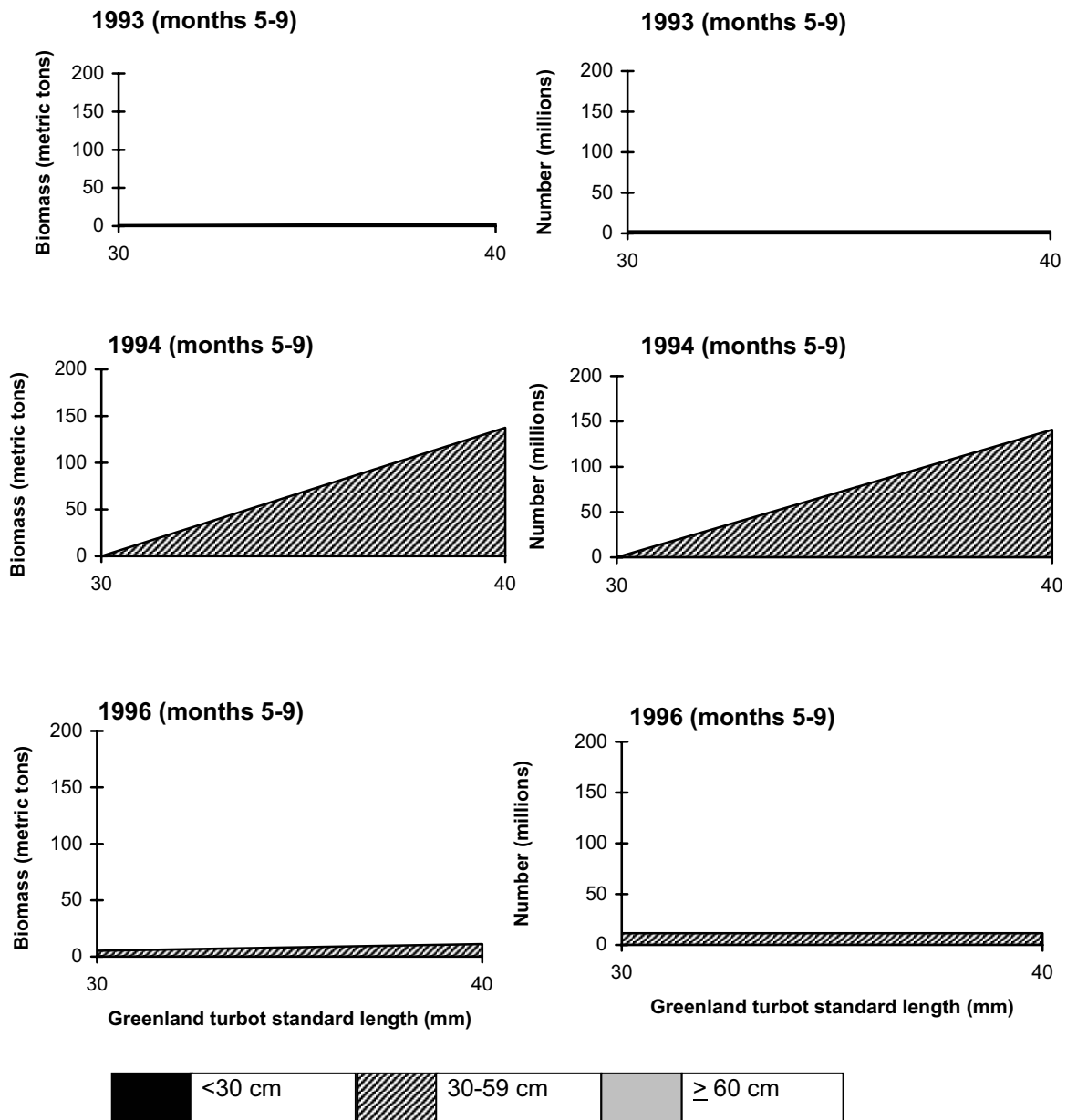


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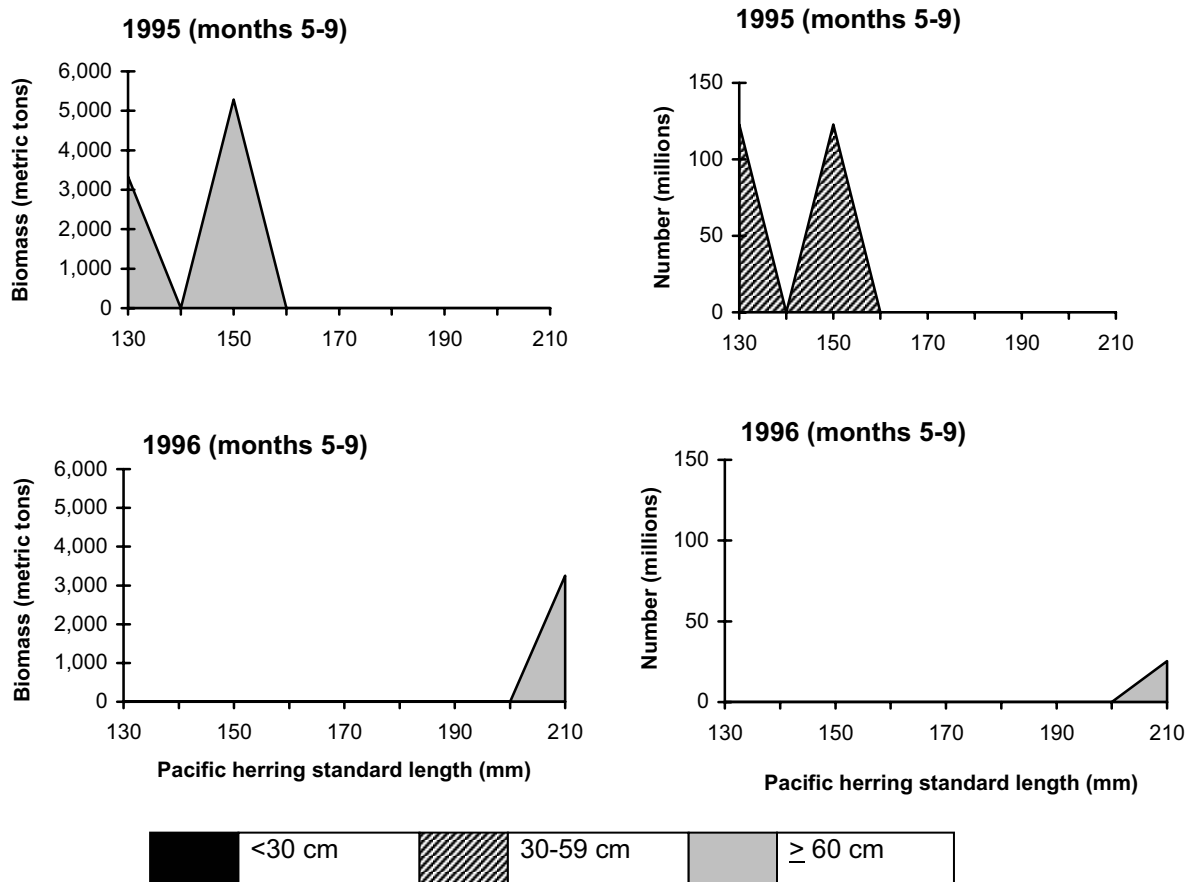


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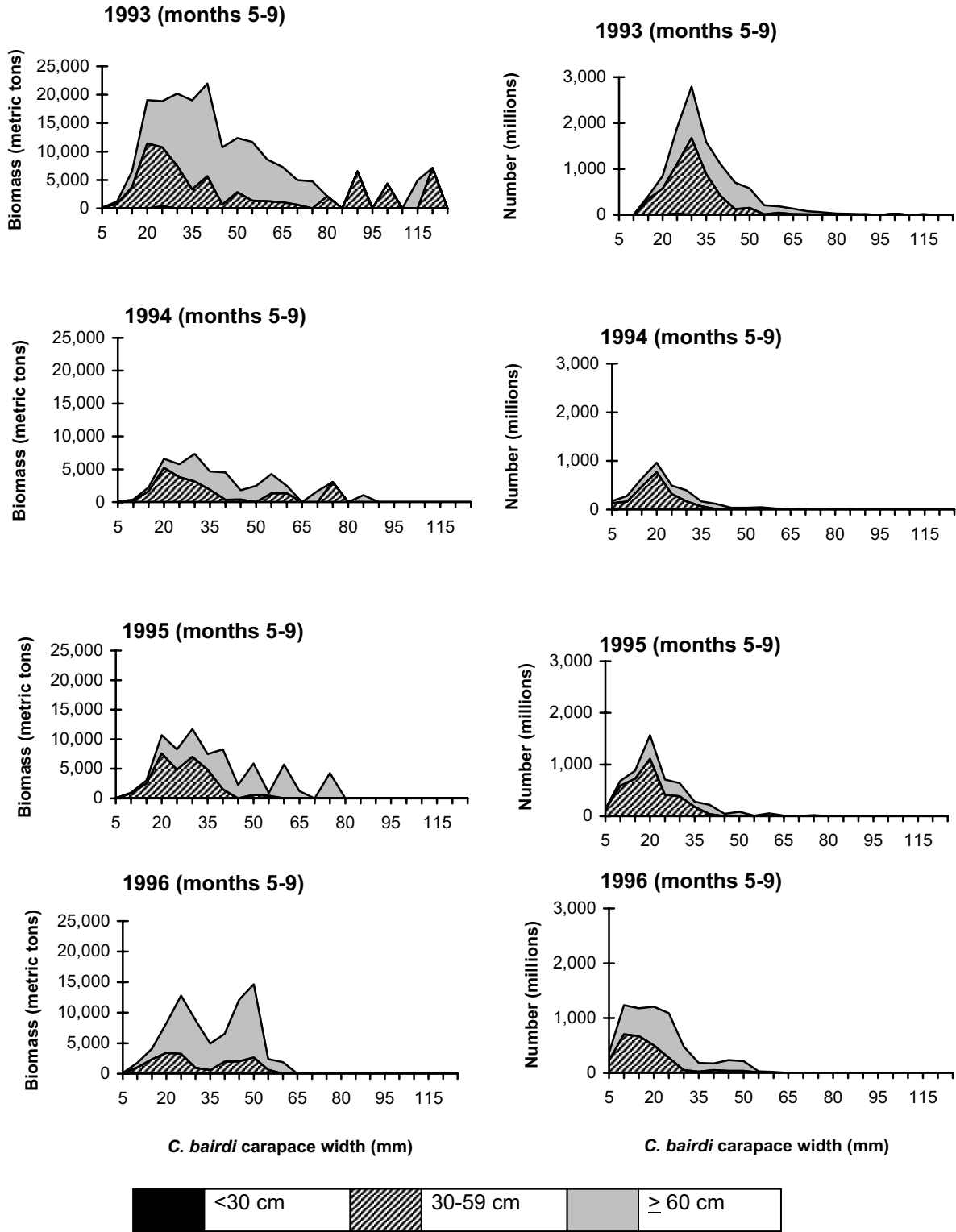


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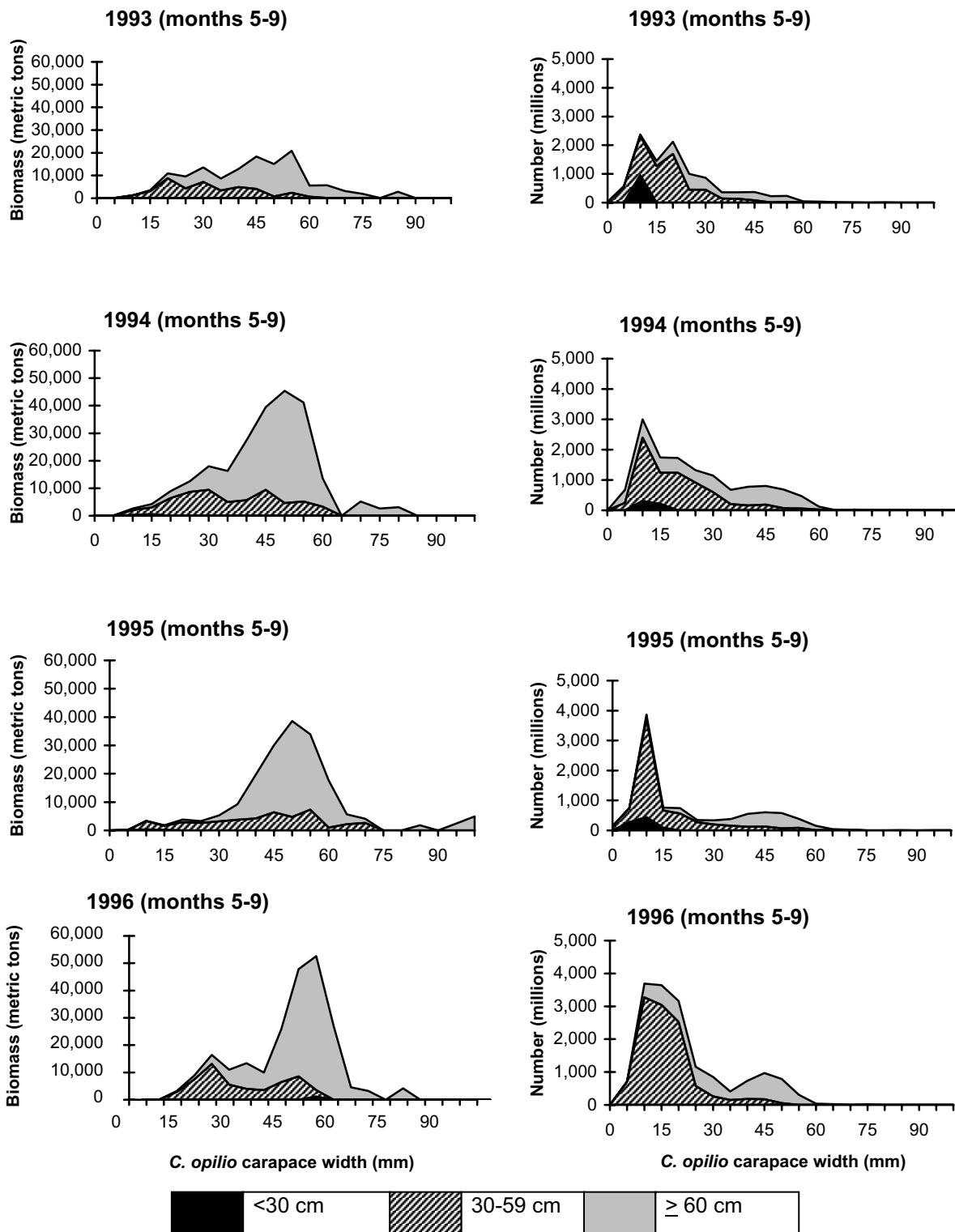


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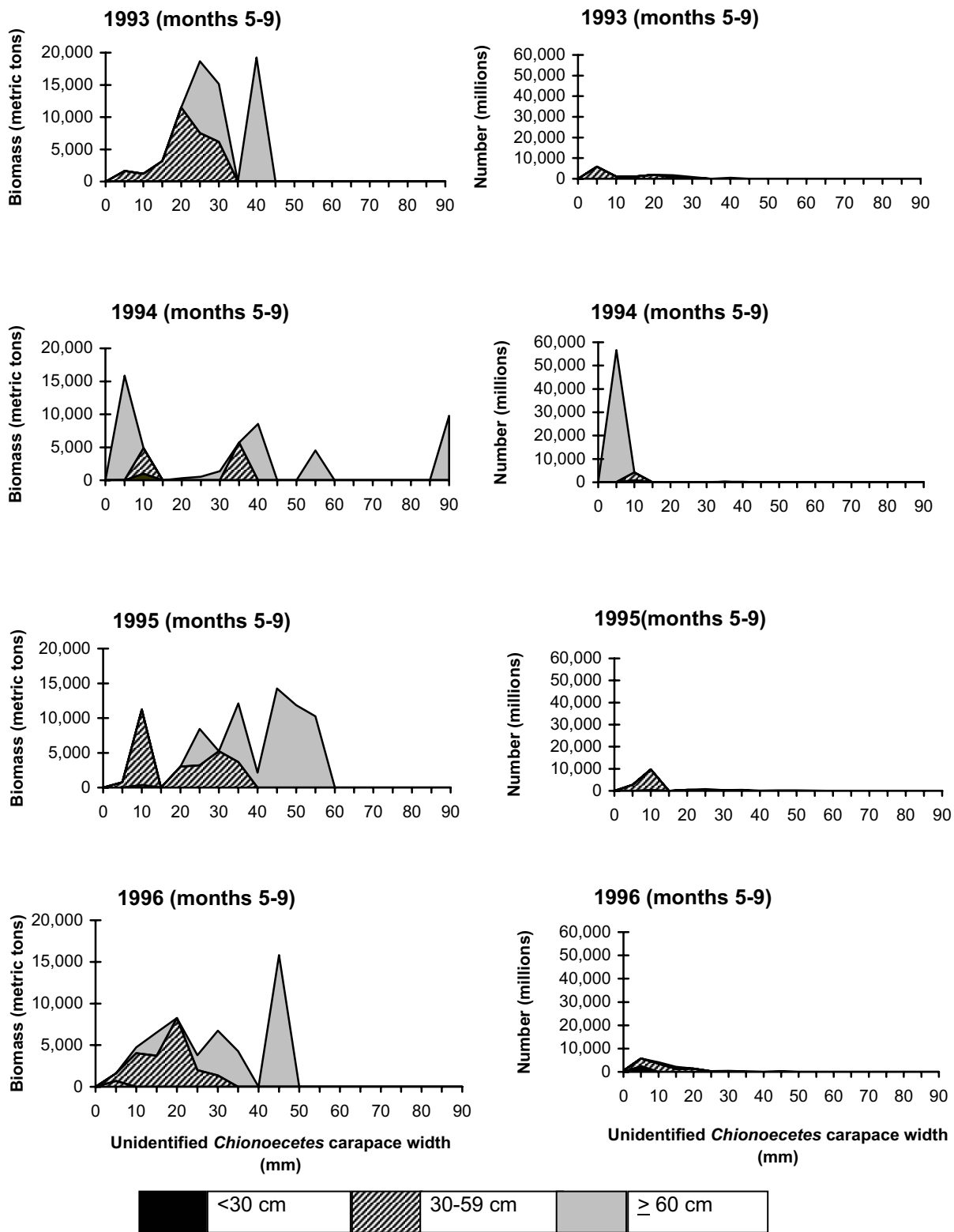
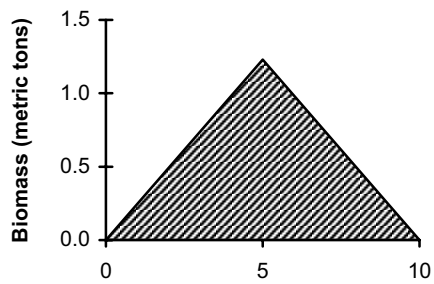


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1994 (months 5-9)



1994 (months 5-9)

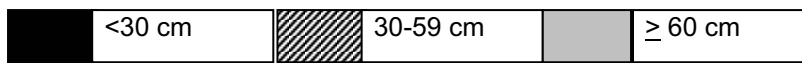
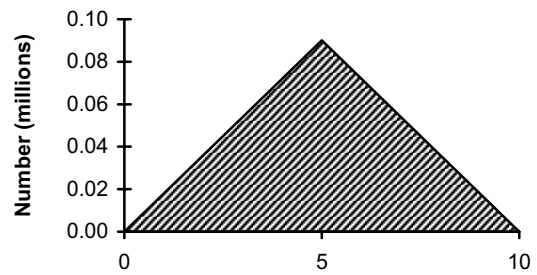


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APPENDIX C. - YELLOWFIN SOLE (*Limanda aspera*), FLATHEAD SOLE (*Hippoglossoides elassodon*), NORTHERN ROCK SOLE (*Lepidopsetta polyxystra*), AND ALASKA PLAICE (*Pleuronectes quadrituberculatus*)

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Table C-1.--Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of yellowfin sole (*Limanda aspera*) in the eastern Bering Sea for 1993 through 1996, from the bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
All Sizes	1	1,016,562	1,245,478	991,079	989,320
	2	347,377	465,687	284,636	383,045
	3	791,534	691,378	533,231	633,467
	4	309,078	207,066	200,287	292,088
	5	791	530	350	471
	6	100	336	88	169
Subtotal		2,465,442	2,610,475	2,009,671	2,298,560
Total		2,465,442	2,610,475	2,009,671	2,298,560

Table C-2.--Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of flathead sole (*Hippoglossoides elassodon*) in the eastern Bering Sea for 1993 through 1996, from the bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
All Sizes	1	37,882	39,675	27,780	30,260
	2	225	481	861	322
	3	266,929	339,499	274,017	284,735
	4	67,636	67,057	56,478	67,479
	5	87,262	102,782	78,843	69,290
	6	150,325	176,717	155,433	164,288
	Subtotal	610,259	726,211	593,412	616,374
Total		610,259	726,211	593,412	616,374

Table C-3.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of northern rock sole (*Lepidopsetta polyxystra*) in the eastern Bering Sea for 1993 through 1996, from the bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
All Sizes	1	1,177,421	1,644,930	1,178,978	908,652
	2	198,650	197,585	236,181	379,664
	3	346,904	501,186	354,451	391,203
	4	361,362	474,525	305,201	419,291
	5	2,332	4,082	5,510	4,089
	6	36,866	71,886	94,726	80,172
Subtotal		2,123,535	2,894,194	2,175,047	2,183,071
Total		2,123,535	2,894,194	2,175,047	2,183,071

Table C-4.--Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of Alaska plaice (*Pleuronectes quadrituberculatus*) in the eastern Bering Sea for 1993 through 1996, from bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
All Sizes	1	122,568	148,420	94,566	100,505
	2	37,335	74,813	56,864	44,483
	3	140,207	135,154	134,968	135,393
	4	196,760	247,791	247,172	226,561
	5		35		
	6	18,320	16,866	18,721	22,384
Subtotal		515,190	623,079	552,291	529,326
Total		515,190	623,079	552,291	529,326

Table C.5--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of yellowfin sole (*Limanda aspera*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida Textulariina (foram)	0.15	1.23
Anthozoa (anemome)	0.08	0.46
Polychaeta (worm)	13.28	27.09
Polynoidae (polychaete)	0.11	0.53
Phyllodocidae (polychaete)	0.27	1.37
Nephtyidae (polychaete)	4.88	5.72
Glyceridae (polychaete)	0.37	0.30
Goniadidae (polychaete)	0.10	0.65
Lumbrineridae	0.27	0.33
Cirratulidae (polychaete)	0.41	0.25
Scalibregmidae	0.02	0.14
Opheliidae (polychaete)	0.78	1.50
<i>Travisia</i> sp. (polychaete)	0.03	0.25
<i>Sternaspis scutata</i> (polychaete)	0.01	0.25
Maldanidae (polychaete)	0.73	2.15
Ampharetidae (polychaete)	1.08	1.26
Terebellidae (polychaete)	0.55	1.32
Trichobranchidae (polychaete)	0.02	0.14
Terebellida (polychaete)	0.66	0.74
Gastropoda (snail)	1.68	2.45
Bivalvia (clam)	10.94	16.58
<i>Yoldia</i> sp. (clam)	1.18	1.78
Cardiidae (cockle)	0.42	0.51
Cephalopoda (squid & octopus)	0.18	0.31
Cirripedia (barnacle)	0.03	0.13
Mysidacea Mysida (mysid)	0.18	0.66
Mysidae (mysid)	0.19	0.25
Cumacea (cumacean)	3.70	13.10
Isopoda (isopod)	0.08	0.42
Gammaridea (amphipod)	13.62	42.41
Caprellidea (amphipod)	0.08	0.35
Euphausiacea (euphausiid)	0.51	2.02
Euphausiidae (euphausiid)	0.27	0.51
<i>Euphausia</i> sp. (euphausiid)	0.46	0.13
<i>Thysanoessa</i> sp. (euphausiid)	1.18	0.62
Reptantia (crab)	0.10	0.31
Caridea (shrimp)	0.06	0.50
Hippolytidae (shrimp)	0.33	0.23
Crangonidae (shrimp)	0.13	0.48
<i>Crangon dalli</i> (shrimp)	2.56	2.37
Paguridae (hermit crab)	4.18	4.34
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.13	0.69
<i>Chionoecetes opilio</i> (snow crab)	0.21	0.73
<i>Chionoecetes bairdi</i> (Tanner crab)	1.65	1.39
<i>Telmessus cheiragonus</i> (hair crab)	0.01	0.20
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.36	0.20
Pinnotheridae (pea crab)	0.13	0.34
Sipuncula (marine worm)	0.33	0.23
Echiura (marine worm)	15.08	9.85
Priapulida (worm)	1.41	0.62
Ectoprocta (bryozoan)	0.06	0.20
Ophiuroidea Ophiurida (brittle star)	4.65	13.26
Ophiuroidea ophiurida chilophiurina (brittle star)	<0.01	0.11
Ophiuridae (brittle star)	0.50	2.82
<i>Echinacea</i> sp. (sea urchin)	<0.01	0.20
Echinoidea Clypeasteroidea (sand dollar)	0.69	0.72
Sand dollar	1.96	4.17
Holothuroidea (sea cucumber)	0.42	0.48
Osteichthyes Teleostei (fish)	0.51	1.16

Table C-5.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Non-gadoid Fish Remains	0.34	0.68
<i>Theragra chalcogramma</i> (walleye pollock)	0.55	0.28
Zoarcidae (eelpout)	0.12	0.10
Cottidae (sculpin)	0.03	0.14
<i>Hemilepidotus</i> sp. (sculpin)	0.01	0.11
Stichaeidae (prickleback)	0.15	0.34
<i>Ammodytes hexapterus</i> (Pacific sandlance)	1.45	0.85
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.01	0.11
Unidentified organic material	2.82	3.63
Unidentified worm-like organism	0.02	0.42
Unidentified tube	0.08	0.16
Overboard material (non-fishery)	0.49	0.13

Total prey weight	1,543 g
Total non-empty stomachs	618
Total empty stomachs	343
Number of hauls	99

Table C-6.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of yellowfin sole (*Limanda aspera*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida (protozoan)	0.01	1.89
Porifera (sponge)	0.14	0.26
Hydrozoa	0.07	0.38
Hydrozoa Hydroida (hydroid)	0.03	0.07
Scyphozoa (jellyfish)	0.28	0.38
Anthozoa (anemome)	<0.01	0.10
Polychaeta (worm)	17.86	38.16
Polynoidae (polychaete)	0.20	3.72
Phyllodocidae (polychaete)	0.11	1.06
Nereidae (polychaete)	0.18	2.12
Nephtyidae (polychaete)	4.21	3.77
Glyceridae (polychaete)	0.01	0.10
Goniadidae (polychaete)	0.02	0.60
<i>Goniada</i> sp. (polychaete)	<0.01	0.15
Lumbrineridae	<0.01	0.10
Orbiniidae (polychaete)	0.38	1.32
Cirratulidae (polychaete)	<0.01	0.11
Flabelligeridae (polychaete)	0.18	0.42
<i>Brada</i> sp. (polychaete)	0.05	0.10
<i>Flabelligera</i> sp. (polychaete)	0.09	0.15
Opheliidae (polychaete)	1.22	3.12
<i>Travisia</i> sp. (polychaete)	<0.01	0.17
<i>Sternaspis scutata</i> (polychaete)	0.01	0.10
Capitellidae (polychaete)	0.01	0.10
Maldanidae (polychaete)	1.54	2.81
Ampharetidae (polychaete)	0.94	0.91
Terebellidae (polychaete)	0.08	0.17
Sabellidae (polychaete)	0.21	0.11
Phyllodocida (polychaete)	0.01	0.22
Terebellida (polychaete)	1.66	1.31
Mollusca	0.07	0.62
Gastropoda (snail)	1.24	3.72
Pteropoda (Thecosomata and Gymnosomata)	0.02	0.43
Gymnosomata (pteropod)	0.01	0.40
Nudibranchia (sea slug)	<0.01	0.15
Bivalvia (clam)	5.23	15.53
<i>Nuculana</i> sp. (clam)	0.33	0.60
<i>Yoldia</i> sp. (clam)	1.77	1.14
Cardiidae (Cockle)	1.46	1.24
<i>Clinocardium</i> sp. (cockle)	1.46	1.33
<i>Spisula</i> sp. (clam)	0.05	0.13
<i>Spisula polynyma</i> (clam)	0.90	1.67
<i>Siliqua</i> sp.(razor clam)	0.37	0.09
Crustacea	<0.01	0.33
Ostracoda	0.01	0.20
Calanoida (copepod)	0.06	0.11
Cirripedia (barnacle)	0.02	0.11
Malacostraca	<0.01	0.15
Malacostraca Leptostraca	<0.01	0.46
Peracarida Mysidacea (mysid)	0.05	0.35
Mysidacea Mysida (mysid)	0.04	0.57
Mysidae (mysid)	0.01	0.15
<i>Archaeomysis grebnitzkii</i> (mysid)	0.02	0.11
<i>Pseudomma truncatum</i> (mysid)	0.79	2.68
Cumacea (cumacean)	2.14	13.78
<i>Lamprops</i> sp. (cumacean)	<0.01	0.10
Isopoda (isopod)	<0.01	0.33
Flabellifera (isopod)	0.03	0.23
Peracarida Isopoda Valvifera	0.01	0.68

Table C-6.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Arcturidae	0.13	0.35
Amphipoda (amphipod)	<0.01	0.10
miscellaneous gammaridea	0.28	2.40
Ampeliscidae (amphipod)	0.04	0.32
Gammaridae (amphipod)	0.36	1.27
<i>Maera loveni</i> (amphipod)	0.11	0.33
Lysianassidae (amphipod)	<0.01	0.10
<i>Anonyx</i> sp. (amphipod)	0.01	0.11
<i>Westwoodilla</i> sp. (amphipod)	<0.01	0.10
Amphipoda Hyperiidea (amphipod)	0.40	2.52
Caprellidea (amphipod)	0.06	1.61
Caprellidae (amphipod)	0.04	1.00
Euphausiacea (euphausiid)	0.17	1.96
Euphausiidae (euphausiid)	0.04	0.13
<i>Thysanoessa</i> sp. (euphausiid)	0.04	0.10
<i>Thysanoessa inermis</i> (euphausiid)	<0.01	0.34
<i>Thysanoessa raschii</i> (euphausiid)	0.57	1.46
Decapoda (shrimp and crab)	<0.01	0.10
Reptantia (crab)	0.14	0.25
Caridea (shrimp)	0.32	0.52
<i>Eualus fabricii</i> (shrimp)	0.02	0.11
<i>Eualus gaimurdii</i> (shrimp)	0.59	0.54
Pandalidae (shrimp)	0.08	0.11
<i>Pandalus borealis</i> (shrimp)	0.02	0.11
Crangonidae (shrimp)	0.84	1.58
<i>Crangon</i> sp. (shrimp)	0.75	0.44
<i>Crangon alaskensis</i> (shrimp)	0.11	0.13
<i>Crangon dalli</i> (shrimp)	2.32	1.21
<i>Argis</i> sp. (shrimp)	0.39	0.25
Natantia (shrimp)	0.19	0.87
Paguridae (hermit crab)	2.20	3.67
<i>Pagurus</i> sp. (hermit crab)	0.04	0.29
Lithodidae (king crab)	0.05	0.15
Majidae (spider crab)	0.01	0.15
Majidae legs	<0.01	0.11
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.01	0.33
<i>Chionoecetes opilio</i> (snow crab)	0.30	0.11
Sipuncula (marine worm)	0.85	0.23
Echiura (marine worm)	5.53	2.67
Echiuridae (marine worm)	0.25	0.70
<i>Echiurus</i> sp. (marine worm)	0.51	0.96
<i>Echiurus echiurus</i> (marine worm)	5.34	4.80
Priapulida (worm)	0.20	0.31
Echinodermata (sea star, cucumber, urchin)	<0.01	0.11
Asteroidea (starfish)	0.01	0.10
Ophiuroidea (basket & brittle star)	0.03	0.41
Ophiuroidea Ophiurida (brittle star)	1.50	4.51
Ophiuridae (brittle star)	1.09	5.54
<i>Ophiura</i> sp. (brittle star)	0.04	0.37
<i>Ophiura leptoctenia</i> (brittle star)	0.01	0.20
<i>Ophiura sarsi</i> (brittle star)	2.18	2.29
<i>Ophiopholis aculeata</i> (ubiquitous brittle star)	0.04	0.20
Amphiuridae (brittle star)	0.01	0.17
Echinoidea (sea urchin and sand dollar)	0.38	1.28
Echinoidea Clypeasteroidea (sand dollar)	1.29	3.55
Sand dollar	<0.01	0.15
Clypeasteridae (sand dollar)	1.18	4.60
Holothuroidea (sea cucumber)	1.54	1.04
<i>Pentamera</i> sp.	2.46	2.79
Urochordata (tunicate)	0.81	3.22
Ascidiacea (sea squirt)	0.01	0.10
Larvacea Copelata	0.84	0.65
Oikopleuridae	0.22	0.60

Table C-6.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Osteichthyes Holostei (fish)	<0.01	0.15
Osteichthyes Teleostei (fish)	0.23	0.87
Non-gadoid Fish Remains	0.20	0.33
Fish eggs	<0.01	0.10
Gadidae (gadid fish)	0.17	0.11
<i>Theragra chalcogramma</i> (walleye pollock)	1.04	0.49
Cottoidei (sculpin)	<0.01	0.10
<i>Podothecus acipenserinus</i> (sturgeon poacher)	<0.01	0.10
<i>Sarritor frenatus</i> (sawback poacher)	<0.01	0.15
<i>Lumpenus fabricii</i> (slender eelblenny)	0.09	0.10
<i>Ammodytes</i> sp. (sandlance)	0.92	0.30
Pleuronectidae (flatfish)	<0.01	0.17
<i>Lepidopsetta polyxystra</i> (northern rock sole)	<0.01	0.10
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	0.01	0.28
Aves (bird part)	<0.01	0.11
Unidentified organic material	3.78	10.16
Unidentified eggs	0.01	0.29
Unidentified worm-like organism	0.45	0.57
Fishery discards	0.60	0.31
Unidentified tube	<0.01	0.11

Total prey weight	1,470 g
Total non-empty stomachs	813
Total empty stomachs	224
Number of hauls	98

Table C-7.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of yellowfin sole (*Limanda aspera*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Cnidaria	0.17	0.10
Hydrozoa	0.03	0.10
Hydrozoa Hydroida (hydroid)	0.49	0.93
Scyphozoa (jellyfish)	0.32	0.21
Anthozoa (anemome)	0.06	0.09
Polychaeta (worm)	19.35	44.81
Polynoidae (polychaete)	0.05	0.41
Phyllodocidae (polychaete)	0.15	0.28
Nephtyidae (polychaete)	1.88	2.92
Opheliidae (polychaete)	1.65	2.62
Sternaspidae (polychaete)	0.02	0.17
Maldanidae (polychaete)	0.22	0.37
Terebellida (polychaete)	0.53	0.65
Hirudinea (leech)	0.04	0.09
Gastropoda (snail)	0.56	2.00
Pteropoda (Thecosomata and Gymnosomata)	0.15	0.26
Bivalvia (clam)	7.83	12.10
<i>Yoldia</i> sp. (clam)	0.19	0.34
Cardiidae (cockle)	0.05	0.09
<i>Clinocardium ciliatum</i> (Iceland cockle)	0.54	0.51
<i>Spisula polynyma</i> (clam)	0.15	0.10
Crustacea	0.01	0.11
Mysidacea Mysida (mysid)	1.57	3.16
<i>Pseudomma truncatum</i> (mysid)	0.01	0.10
Cumacea (cumacean)	1.48	8.87
Isopoda (isopod)	0.02	0.12
Gammaridea (amphipod)	17.45	46.05
Amphipoda Hyperiidea (amphipod)	0.02	0.26
Caprellidea (amphipod)	0.10	0.47
Euphausiacea (euphausiid)	1.46	2.91
<i>Thysanoessa raschii</i> (euphausiid)	1.87	1.68
Caridea (shrimp)	0.60	1.43
Crangonidae (shrimp)	1.05	0.94
<i>Crangon dalli</i> (shrimp)	1.79	0.79
<i>Argis</i> sp. (shrimp)	0.13	0.10
Anomura (crab)	0.04	0.28
Paguridae (hermit crab)	1.68	2.05
Lithodidae (legs only)	0.11	0.09
Majidae (spider crab)	0.01	0.14
Majidae legs	0.36	0.64
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.71	1.12
<i>Chionoecetes opilio</i> (snow crab)	1.80	0.96
Sipuncula (marine worm)	1.19	0.20
Echiura (marine worm)	11.31	6.54
<i>Echiurus echiurus</i> (marine worm)	1.25	1.42
Priapulida (worm)	0.13	0.18
Echinodermata (sea star, cucumber, urchin)	<0.01	0.10
Ophiuroidea Ophiurida (brittle star)	2.08	7.85
Ophiuridae (brittle star)	0.05	0.52
Echinoidea (sea urchin and sand dollar)	0.14	0.54
Echinoidea Clypeasteroidea (sand dollar)	2.02	4.50
Clypeasteridae (sand dollar)	0.01	0.22
Holothuroidea (sea cucumber)	0.60	0.57
Urochordata (tunicate)	2.34	4.59
Larvacea Copelata	5.64	5.72
Osteichthyes Teleostei (fish)	1.41	0.74
<i>Clupea pallasii</i> (Pacific herring)	0.82	0.12
<i>Theragra chalcogramma</i> (walleye pollock)	0.16	0.35
Stichaeidae (prickleback)	0.52	0.20

Table C-7.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Ammodytes</i> sp. (sandlance)	0.56	0.37
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	<0.01	0.09
Unidentified organic material	1.46	3.11
Unidentified eggs	0.01	0.17
Unidentified worm-like organism	0.31	0.42
Fishery discards	1.27	0.24
Unidentified algae	<0.01	0.09

Total prey weight	1,750 g
Total non-empty stomachs	1,037
Total empty stomachs	90
Number of hauls	115

Table C-8.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of yellowfin sole (*Limanda aspera*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Hydrozoa Hydroida (hydroid)	0.03	2.47
Scyphozoa (jellyfish)	5.21	5.55
Polychaeta (worm)	7.74	26.03
Nephtyidae (polychaete)	4.48	7.73
Lumbrineridae	0.44	0.35
Opheliidae (polychaete)	3.81	7.95
Maldanidae (polychaete)	0.07	1.52
Gastropoda (snail)	2.72	7.27
Bivalvia (clam)	25.29	25.00
<i>Yoldia</i> sp. (clam)	0.10	0.80
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	0.23	6.82
<i>Serripes groenlandicus</i> (Greenland cockle)	0.18	0.91
<i>Spisula polynyma</i> (clam)	0.61	2.05
<i>Siliqua alta</i> (northern razor clam)	3.57	2.27
Cumacea (cumacean)	0.15	3.33
Gammaridea (amphipod)	12.99	36.26
Euphausiacea (euphausiid)	0.62	2.62
<i>Thysanoessa raschii</i> (euphausiid)	1.16	1.56
Crangonidae (shrimp)	0.23	1.14
Paguridae (hermit crab)	0.44	0.91
<i>Telmessus cheiragonus</i> (hair crab)	0.36	0.65
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.93	0.65
Echiura (marine worm)	3.79	2.85
Ophiuroidea Euryalina (basket star)	0.01	0.45
Ophiuroidea Ophiurida (brittle star)	0.14	2.95
Ophiuridae (brittle star)	0.06	0.91
Amphiuridae (brittle star)	0.04	0.45
Echinoidea (sea urchin and sand dollar)	0.04	1.82
Echinoidea Clypeasteroidea (sand dollar)	2.00	10.53
Chaetognatha (arrow worm)	0.85	2.27
Urochordata (tunicate)	10.45	16.59
Osteichthyes Teleostei (fish)	0.52	5.15
Non-gadoid Fish Remains	0.07	0.91
Gadidae (gadid fish)	0.87	0.35
<i>Gadus macrocephalus</i> (Pacific cod)	0.86	0.91
<i>Theragra chalcogramma</i> (walleye pollock)	4.83	11.67
Cottoidei (sculpin)	0.09	0.65
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.16	1.52
Unidentified organic material	3.88	6.73

Total prey weight	270 g
Total non-empty stomachs	104
Total empty stomachs	66
Number of hauls	22

Table C-9.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of flathead sole (*Hippoglossoides elassodon*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida Textulariina(foram)	<0.01	0.26
Polychaeta (worm)	3.45	4.40
Polynoidae (polychaete)	0.04	0.53
Lumbrineridae	0.02	0.35
Opheliidae (polychaete)	0.01	0.21
Ampharetidae (polychaete)	0.63	0.26
Terebellidae (polychaete)	0.18	0.26
Pteropoda (Thecosomata and Gymnosomata)	0.03	0.21
Bivalvia (clam)	0.56	2.36
Nuculidae	0.54	0.79
<i>Yoldia</i> sp. (clam)	2.79	3.41
Pectinidae (scallops)	1.22	1.35
Mysidacea Mysida (mysid)	1.22	3.74
Mysidae (mysid)	3.50	9.06
Gammaridea (amphipod)	4.60	9.90
<i>Themisto</i> sp. (amphipod)	0.20	0.48
Euphausiacea (euphausiid)	1.66	2.23
<i>Thysanoessa raschii</i> (euphausiid)	0.07	0.21
Caridea (shrimp)	2.15	3.69
Hippolytidae (shrimp)	0.19	0.57
<i>Eualus</i> sp. (shrimp)	0.17	0.18
Pandalidae (shrimp)	1.39	2.44
<i>Pandalus borealis</i> (shrimp)	6.70	5.10
Crangonidae (shrimp)	1.11	2.84
<i>Crangon dalli</i> (shrimp)	5.27	5.90
<i>Crangon communis</i> (shrimp)	2.71	3.46
<i>Argis</i> sp. (shrimp)	0.15	0.21
<i>Argis lar</i> (shrimp)	1.71	1.68
Paguridae (hermit crab)	2.65	2.60
Galatheidae (pelagic slip crabs)	0.07	0.26
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.19	0.89
<i>Chionoecetes opilio</i> (snow crab)	0.06	0.42
<i>Chionoecetes bairdi</i> (Tanner crab)	1.78	1.53
Echiura (marine worm)	0.56	1.01
Ophiuroidea Ophiurida (brittle star)	32.10	38.84
Osteichthyes Teleostei (fish)	1.09	1.26
Non-gadoid Fish Remains	1.58	1.30
<i>Mallotus villosus</i> (capelin)	2.45	0.74
Gadidae (gadid fish)	0.14	0.21
<i>Theragra chalcogramma</i> (walleye pollock)	10.39	7.44
Zoarcidae (eelpout)	0.04	0.21
Cottidae (sculpin)	0.40	0.21
Stichaeidae (prickleback)	4.14	2.79
Unidentified organic material	0.08	0.26

Total prey weight	937 g
Total non-empty stomachs	367
Total empty stomachs	122
Number of hauls	95

Table C-10.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of flathead sole (*Hippoglossoides elassodon*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida (protozoan)	<0.01	0.26
Polychaeta (worm)	4.70	6.18
Polynoidae (polychaete)	0.03	0.52
Nephtyidae (polychaete)	0.04	0.52
Eunicidae	0.91	0.78
Lumbrineridae	0.70	0.35
Maldanidae (polychaete)	0.38	1.30
Oweniidae (polychaete)	0.88	0.63
Ampharetidae (polychaete)	0.07	0.52
Gastropoda (snail)	0.56	1.04
Buccinidae (snail)	<0.01	0.26
Bivalvia (clam)	1.46	2.83
Nuculana sp. (clam)	0.17	0.21
<i>Yoldia</i> sp. (clam)	1.74	2.34
Cardiidae (cockle)	0.97	0.26
<i>Spisula polynyma</i> (clam)	0.04	0.26
Calanoida (copepod)	0.71	1.04
Calanidae (copepod)	<0.01	0.56
<i>Calanus</i> sp.	0.05	1.39
Mysidacea Mysida (mysid)	4.75	10.30
Mysidae (mysid)	2.31	4.46
<i>Neomysis rayii</i> (mysid)	0.01	0.35
<i>Pseudomma truncatum</i> (mysid)	2.45	4.90
Cumacea (cumacean)	0.06	1.46
Peracarida Isopoda Valvifera	0.06	0.42
Arcturidae	<0.01	0.35
Gammaridea (amphipod)	2.80	11.15
miscellaneous gammaridea	<0.01	0.82
Gammaridae (amphipod)	0.01	0.35
<i>Maera loveni</i> (amphipod)	0.65	0.52
Caprellidea (amphipod)	<0.01	0.21
Caprellidae (amphipod)	0.03	0.21
Euphausiacea (euphausiid)	0.21	1.22
Euphausiidae (euphausiid)	1.60	3.21
<i>Thysanoessa inermis</i> (euphausiid)	1.13	0.87
<i>Thysanoessa raschii</i> (euphausiid)	1.04	1.67
<i>Thysanoessa spinifera</i> (euphausiid)	0.40	0.35
Caridea (shrimp)	0.05	0.99
Hippolytidae (shrimp)	<0.01	0.26
<i>Eualus gaimurdii</i> (shrimp)	0.83	0.52
Pandalidae (shrimp)	2.61	2.19
<i>Pandalus</i> sp. (shrimp)	0.49	0.73
<i>Pandalus borealis</i> (shrimp)	2.94	2.17
<i>Pandalus goniurus</i> (shrimp)	0.99	0.68
<i>Pandalus jordani</i> (shrimp)	0.21	0.52
Crangonidae (shrimp)	2.23	3.07
<i>Crangon</i> sp. (shrimp)	0.06	0.42
<i>Crangon dalli</i> (shrimp)	5.53	8.09
<i>Crangon communis</i> (shrimp)	0.93	1.04
<i>Argis</i> sp. (shrimp)	1.04	1.04
Natantia (shrimp)	1.12	1.51
Paguridae (hermit crab)	2.21	4.17
<i>Pagurus</i> sp. (hermit crab)	0.13	0.26
<i>Pagurus rathbuni</i> (hermit crab)	0.48	1.04
<i>Chionoecetes</i> sp. (snow and Tanner crab)	1.10	1.22
<i>Chionoecetes opilio</i> (snow crab)	0.18	0.52
<i>Chionoecetes bairdi</i> (Tanner crab)	0.70	1.74
Echiura (marine worm)	0.04	0.35
Echiuridae (marine worm)	0.23	0.42

Table C-10.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Ophiuroidea Ophiurida (brittle star)	9.61	15.17
Ophiuridae (brittle star)	8.02	12.38
<i>Ophiura</i> sp. (brittle star)	0.16	0.87
<i>Ophiura leptoctenia</i> (brittle star)	0.02	0.35
<i>Ophiura sarsi</i> (brittle star)	14.10	12.15
Amphiuridae (brittle star)	<0.01	0.35
Holothuroidea (sea cucumber)	0.10	0.35
Osteichthyes Teleostei (fish)	0.66	0.56
Non-gadoid Fish Remains	0.66	0.56
Osmeridae (smelts)	0.30	0.42
Gadidae (gadid fish)	0.26	0.63
<i>Theragra chalcogramma</i> (walleye pollock)	6.70	4.77
Zoarcidae (eelpout)	1.04	1.04
Cottidae (sculpin)	1.04	1.04
<i>Lumpenus</i> sp. (prickleback)	0.47	0.26
<i>Ammodytes</i> sp. (sandlance)	0.58	0.26
Unidentified organic material	0.16	0.95
Unidentified worm-like organism	1.04	1.30

Total prey weight	616 g
Total non-empty stomachs	258
Total empty stomachs	164
Number of hauls	96

Table C-11.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of flathead sole (*Hippoglossoides elassodon*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	8.89	21.58
Polynoidae (polychaete)	0.05	0.26
Nephtyidae (polychaete)	0.49	0.26
Flabelligeridae (polychaete)	0.08	0.35
Maldanidae (polychaete)	1.30	0.74
Terebellida (polychaete order)	0.10	0.26
Gastropoda (snail)	0.01	0.21
Bivalvia (clam)	0.98	2.29
<i>Yoldia</i> sp. (clam)	3.87	5.26
<i>Clinocardium ciliatum</i> (Iceland cockle)	0.31	0.42
Calanoida (copepod)	0.14	0.42
Mysidacea Mysida (mysid)	11.61	22.19
<i>Pseudomma truncatum</i> (mysid)	0.07	0.61
Cumacea (cumacean)	0.05	1.41
Gammaridea (amphipod)	2.52	16.84
Amphipoda Hyperiidea (amphipod)	0.04	0.26
Euphausiacea (euphausiid)	0.35	1.53
<i>Thysanoessa</i> sp. (euphausiid)	<0.01	0.13
<i>Thysanoessa raschii</i> (euphausiid)	0.03	0.18
Caridea (shrimp)	0.42	2.04
Hippolytidae (shrimp)	0.54	1.00
Pandalidae (shrimp)	4.03	3.82
<i>Pandalus borealis</i> (shrimp)	3.09	1.49
<i>Pandalus goniurus</i> (shrimp)	0.09	0.77
Crangonidae (shrimp)	0.30	1.00
<i>Crangon</i> sp. (shrimp)	0.32	0.65
<i>Crangon dalli</i> (shrimp)	4.82	8.53
<i>Crangon communis</i> (shrimp)	1.84	2.26
<i>Argis</i> sp. (shrimp)	0.59	0.47
<i>Argis lar</i> (shrimp)	0.82	0.26
Anomura (crab)	0.11	0.61
Paguridae (hermit crab)	4.29	2.74
<i>Pagurus ochotensis</i> (hermit crab)	0.09	0.21
<i>Pagurus aleuticus</i>	0.49	0.21
Decapoda brachyura (crab)	0.02	0.26
Majidae legs	0.03	0.53
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.04	0.62
<i>Chionoecetes opilio</i> (snow crab)	2.52	4.53
<i>Chionoecetes bairdi</i> (Tanner crab)	1.38	0.39
Atelecyclidae (crab)	0.02	0.26
Echiura (marine worm)	2.54	1.79
Ophiuroidea Ophiurida (brittle star)	22.49	33.12
Ophiuridae (brittle star)	0.06	0.56
Osteichthyes Teleostei (fish)	1.17	2.66
<i>Mallotus villosus</i> (capelin)	0.15	0.18
Gadidae (gadid fish)	0.10	0.42
<i>Theragra chalcogramma</i> (walleye pollock)	13.92	9.54
Stichaeidae (prickleback)	1.37	0.96
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.12	0.39
Unidentified organic material	1.32	2.42

Total prey weight	716 g
Total non-empty stomachs	392
Total empty stomachs	58
Number of hauls	95

Table C-12.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of flathead sole (*Hippoglossoides elassodon*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Hydrozoa Hydroida (hydroid)	0.03	1.33
Polychaeta (worm)	2.60	13.17
Bivalvia (clam)	3.53	1.33
Cardiidae (cockle)	0.03	0.95
Calanoida (copepod)	4.61	6.67
Mysidacea Mysida (mysid)	15.68	30.33
Cumacea (cumacean)	0.02	1.33
Gammaridea (amphipod)	7.20	17.22
Amphipoda Hyperiidea (amphipod)	1.03	2.22
Caridea (shrimp)	3.79	1.67
<i>Pandalus goniurus</i> (shrimp)	4.11	2.67
<i>Crangon dalli</i> (shrimp)	15.34	21.67
Anomura (crab)	0.07	2.22
Paguridae (hermit crab)	7.98	7.44
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.02	1.90
Echiura (marine worm)	5.09	2.22
Ophiuroidea Ophiurida (brittle star)	8.95	13.33
<i>Ophiuroidea ophiurida chilophiurina</i> (brittle star)	0.03	0.95
Ophiuridae (brittle star)	6.57	5.71
Cottoidei (sculpin)	0.90	1.67
<i>Ammodytes</i> sp. (sandlance)	11.24	3.33
Unidentified organic material	1.19	3.89

Total prey weight	121 g
Total non-empty stomachs	65
Total empty stomachs	13
Number of hauls	15

Table C-13.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of northern rock sole (*Lepidopsetta polyxystra*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida (protozoan)	0.01	0.47
Foraminiferida Textulariina(foram)	0.08	1.33
Anthozoa (anemome)	0.10	0.47
Polychaeta (worm)	33.25	57.82
Polynoidae (polychaete)	0.43	3.64
Phyllodocidae (polychaete)	0.19	1.88
Syllidae (polychaete)	0.00	0.23
Nephtyidae (polychaete)	6.42	8.32
Glyceridae (polychaete)	0.01	0.23
Goniadidae (polychaete)	0.65	3.58
Lumbrineridae	0.03	0.47
Arabellidae (polychaete)	0.05	0.23
Orbiniidae (polychaete)	0.05	0.63
Spionidae (polychaete)	0.14	0.23
Chaetopteridae (polychaete)	0.23	0.19
Cirratulidae (polychaete)	0.05	0.23
Flabelligeridae (polychaete)	0.05	0.47
Scalibregmidae	0.45	0.47
<i>Scalibregma</i> sp. (polychaete genus)	0.10	0.23
Opheliidae (polychaete)	0.38	3.14
<i>Travisia</i> sp. (polychaete)	2.72	3.49
Maldanidae (polychaete)	0.98	2.03
Ampharetidae (polychaete)	1.42	3.08
Terebellidae (polychaete)	0.02	0.23
Trichobranchidae (polychaete)	0.20	0.23
Sabellidae (polychaete)	0.24	1.45
Eunicida (polychaete)	0.08	0.23
Glyceriformia	0.05	1.86
Terebellida (polychaete)	1.10	1.22
Gastropoda (snail)	0.03	0.93
Bivalvia (clam)	6.26	19.26
<i>Yoldia</i> sp. (clam)	0.75	1.22
Malacostraca Leptostraca	0.01	0.93
Mysidae (mysid)	0.05	0.81
Cumacea (cumacean)	0.99	10.99
Isopoda (isopod)	0.06	0.23
Gammaridea (amphipod)	15.91	55.92
Caprellidea (amphipod)	0.01	0.64
Euphausiacea (euphausiid)	0.08	1.32
Euphausiidae (euphausiid)	0.06	0.93
<i>Thysanoessa raschii</i> (euphausiid)	0.03	0.23
Reptantia (crab)	0.04	0.93
Caridea (shrimp)	0.15	0.52
Hippolytidae (shrimp)	0.01	0.23
Pandalidae (shrimp)	0.07	0.23
<i>Pandalus goniurus</i> (shrimp)	0.07	0.23
Crangonidae (shrimp)	0.09	0.86
<i>Crangon</i> sp. (shrimp)	0.01	0.23
<i>Crangon dalli</i> (shrimp)	1.50	1.45
<i>Argis</i> sp. (shrimp)	0.03	0.23
<i>Argis lar</i> (shrimp)	0.06	0.23
Natantia (shrimp)	0.07	0.23
Paguridae (hermit crab)	2.12	2.15
<i>Hyas lyratus</i> (lyre crab)	0.01	0.23
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.24	0.70
<i>Chionoecetes opilio</i> (snow crab)	0.10	0.64
<i>Telmessus cheiragonus</i> (hair crab)	0.07	0.23
<i>Pinnixa</i> sp. (pea crab)	0.09	0.23
Sipuncula (marine worm)	2.51	1.47

Table C-13.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Echiura (marine worm)	4.08	4.84
Priapulida (worm)	1.48	1.98
Ophiuroidea Ophiurida (brittle star)	4.14	8.04
Ophiuridae (brittle star)	0.77	1.40
<i>Echinacea</i> sp. (sea urchin)	0.27	0.52
Echinoidea Clypeasteroidea (sand dollar)	0.31	3.31
Sand dollar	0.09	0.52
Holothuroidea (sea cucumber)	0.22	0.70
Osteichthyes Teleostei (fish)	0.12	0.70
Non-gadoid Fish Remains	0.71	0.47
Osmeridae (smelts)	0.08	0.23
<i>Theragra chalcogramma</i> (walleye pollock)	0.01	0.12
Stichaeidae (prickleback)	0.09	0.23
<i>Ammodytes</i> sp. (sandlance)	0.73	0.47
<i>Ammodytes hexapterus</i> (Pacific sandlance)	3.81	2.67
Unidentified organic material	0.84	2.60
Unidentified worm-like organism	1.27	2.31

Total prey weight	1,181 g
Total non-empty stomachs	398
Total empty stomachs	48
Number of hauls	86

Table C-14.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of northern rock sole (*Lepidopsetta polyxystra*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Anthozoa (anemome)	1.26	0.89
Platyhelminthes	0.26	1.03
Polychaeta (worm)	33.76	54.47
Aphroditidae (sea mouse)	0.63	0.68
Polynoidae (polychaete)	0.16	0.55
Sigalionidae	0.35	0.27
Phyllodocidae (polychaete)	0.10	1.99
Nereidae (polychaete)	0.05	1.03
Nephtyidae (polychaete)	2.16	3.84
<i>Nephtys</i> sp. (polychaete)	0.68	0.68
Glyceridae (polychaete)	1.09	4.50
Goniadidae (polychaete)	0.49	3.33
<i>Goniada</i> sp. (polychaete)	0.09	1.53
Onuphidae (polychaete)	0.06	0.50
Eunicidae	1.40	1.19
Arabellidae (polychaete)	0.22	0.82
Orbiniidae (polychaete)	0.51	0.91
<i>Aricidea</i> sp. (polychaete)	<0.01	0.34
Spionidae (polychaete)	0.03	0.34
Flabelligeridae (polychaete)	0.49	1.42
Opheliidae (polychaete)	4.79	9.13
Maldanidae (polychaete)	0.64	3.42
Pectinariidae (polychaete)	0.11	0.34
Ampharetidae (polychaete)	0.18	0.23
Eunicida (polychaete)	0.30	0.62
Terebellida (polychaete)	0.91	1.64
Hirudinea (leech)	0.15	0.55
Gastropoda (snail)	0.17	0.62
Pteropoda (Thecosomata and Gymnosomata)	1.37	1.37
Thecosomata (pteropod)	0.06	0.34
Bivalvia (clam)	7.09	22.65
<i>Nucula</i> sp. (clam)	0.30	2.05
Cardiidae (Cockle)	0.04	0.27
Myidae (clam)	0.03	0.34
Malacostraca Leptostraca	0.04	0.62
Mysidacea Mysida (mysid)	0.05	0.27
Mysidae (mysid)	0.32	0.68
Cumacea (cumacean)	1.16	3.63
Peracarida Isopoda Valvifera	0.08	0.46
Arcturidae	0.01	0.46
Gammaridea (amphipod)	12.41	43.49
Ampeliscidae (amphipod)	0.62	1.80
<i>Ampelisca</i> sp. (amphipod)	0.24	0.55
Gammaridae (amphipod)	0.15	1.07
<i>Maera</i> sp. (amphipod)	0.06	0.27
<i>Maera loveni</i> (amphipod)	0.79	1.07
Caprellidea (amphipod)	<0.01	0.27
Caridea (shrimp)	0.47	0.27
Crangonidae (shrimp)	0.85	0.96
<i>Crangon</i> sp. (shrimp)	0.23	0.27
<i>Crangon alaskensis</i> (shrimp)	0.79	0.34
Paguridae (hermit crab)	3.10	2.58
Echiura (marine worm)	3.52	4.16
<i>Echiurus</i> sp. (marine worm)	1.06	0.96
<i>Echiurus echiurus</i> (marine worm)	4.43	3.13
Priapulida (worm)	0.38	0.27
Ophiuroidea Ophiurida (brittle star)	0.35	1.44
Ophiuridae (brittle star)	0.54	2.21

Table C-14.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Ophiura sarsi</i> (brittle star)	0.41	0.46
Echinoidea Clypeasteroida (sand dollar)	0.01	0.73
Clypeasteridae (sand dollar)	0.40	3.06
Holothuroidea (sea cucumber)	0.65	2.26
Urochordata (tunicate)	0.63	3.20
Larvacea Copelata	0.51	0.34
Osteichthyes Teleostei (fish)	0.07	0.46
Non-gadoid Fish Remains	0.58	0.50
Zoarcidae (eelpout)	0.53	0.34
<i>Ammodytes</i> sp. (sandlance)	2.56	1.44
Unidentified organic material	1.34	2.01
Unidentified worm-like organism	0.03	0.27
Unidentified tube	0.69	1.07

Total prey weight	633 g
Total non-empty stomachs	288
Total empty stomachs	99
Number of hauls	73

Table C-15.--Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of northern rock sole (*Lepidopsetta polyxystra*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Anthozoa (anemome)	0.76	0.95
Polychaeta (worm)	37.87	74.31
Polynoidae (polychaete)	0.18	0.77
Phyllodocidae (polychaete)	0.10	0.90
Nereidae (polychaete)	0.04	0.59
Nephtyidae (polychaete)	5.99	9.82
<i>Nephtys</i> sp. (polychaete)	0.01	0.23
Arabellidae (polychaete)	0.36	1.80
Orbiniidae (polychaete)	0.71	1.49
Opheliidae (polychaete)	3.44	10.11
<i>Sternaspis scutata</i> (polychaete)	0.02	0.18
Maldanidae (polychaete)	3.89	12.12
Sabellaridae	0.10	0.36
Ampharetidae (polychaete)	0.02	0.23
Terebellidae (polychaete)	1.01	2.22
<i>Terebellides</i> sp. (polychaete)	0.06	0.23
Terebellida (polychaete)	1.24	3.93
Hirudinea (leech)	0.25	0.18
Gastropoda (snail)	0.01	0.41
Bivalvia (clam)	2.02	11.94
<i>Yoldia</i> sp. (clam)	0.67	2.10
Crustacea	0.64	0.45
Lophogastria (mysid)	0.01	0.18
Mysidacea Mysida (mysid)	1.44	2.70
Mysidae (mysid)	0.00	0.30
<i>Pseudomma truncatum</i> (mysid)	0.01	0.45
Cumacea (cumacean)	0.19	2.43
Isopoda (isopod)	0.46	0.23
Gammaridea (amphipod)	13.04	47.58
Ampeliscidae (amphipod)	0.90	1.08
Gammaridae (amphipod)	0.02	0.18
<i>Maera loveni</i> (amphipod)	0.13	0.36
Caprellidea (amphipod)	0.09	0.45
Euphausiacea (euphausiid)	0.05	0.72
Reptantia (crab)	0.09	0.36
Crangonidae (shrimp)	0.18	1.07
<i>Crangon</i> sp. (shrimp)	0.09	0.30
<i>Crangon dalli</i> (shrimp)	0.48	1.76
<i>Crangon communis</i> (shrimp)	0.35	0.90
Anomura (crab)	0.13	0.41
Paguridae (hermit crab)	0.25	0.54
<i>Hyas lyratus</i> (lyre crab)	0.00	0.18
<i>Chionoecetes opilio</i> (snow crab)	0.36	0.74
<i>Chionoecetes bairdi</i> (Tanner crab)	0.05	0.18
Atelecyclidae (crab)	0.28	0.23
Sipuncula (marine worm)	0.58	0.33
Echiura (marine worm)	4.77	8.02
Echiuridae (marine worm)	0.03	0.18
<i>Echiurus echiurus</i> (marine worm)	0.34	0.18
Priapulida (worm)	0.93	1.41
Ophiuroidea Ophiurida (brittle star)	3.37	5.95
Ophiuridae (brittle star)	0.01	0.90
Echinoidea (sea urchin and sand dollar)	0.06	0.23
Echinoidea Clypeasteroidea (sand dollar)	0.59	6.55
Clypeasteridae (sand dollar)	0.00	0.18
Urochordata (tunicate)	0.15	0.59
Larvacea Copelata	0.49	0.30
Osteichthyes Teleostei (fish)	0.24	0.98
Non-gadoid Fish Remains	0.27	0.23

Table C-15.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Gadidae (gadid fish)	0.90	0.90
<i>Theragra chalcogramma</i> (walleye pollock)	2.64	1.76
Zoarcidae (eelpout)	0.35	0.23
<i>Ammodytes</i> sp. (sandlance)	4.61	4.41
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.71	0.60
Unidentified organic material	0.95	1.41
Unidentified tube	0.01	0.18

Total prey weight	1,315 g
Total non-empty stomachs	448
Total empty stomachs	62
Number of hauls	111

Table C-16.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of northern rock sole (*Lepidopsetta polyxystra*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Porifera (sponge)	0.02	0.34
Cnidaria	0.55	0.69
Hydrozoa	0.06	0.34
Hydrozoa Hydroida (hydroid)	0.28	0.34
Scyphozoa (jellyfish)	0.23	0.34
Polychaeta (worm)	28.07	68.02
Polynoidae (polychaete)	0.05	0.69
Phyllodocidae (polychaete)	0.58	15.43
Nephtyidae (polychaete)	9.19	23.02
Onuphidae (polychaete)	1.54	10.06
Lumbrineridae	0.37	3.79
Orbiniidae (polychaete)	0.02	0.34
Chaetopteridae (polychaete)	0.00	0.43
Flabelligeridae (polychaete)	0.34	0.34
Scalibregmidae	0.44	0.69
Opheliidae (polychaete)	6.26	15.95
<i>Travisia</i> sp. (polychaete)	0.09	1.03
Sternaspidae (polychaete)	0.43	0.34
<i>Sternaspis scutata</i> (polychaete)	0.02	0.34
Maldanidae (polychaete)	1.76	11.98
Ampharetidae (polychaete)	0.16	1.12
Terebellidae (polychaete)	0.07	0.43
Trichobranchidae (polychaete)	0.00	0.34
<i>Terebellides</i> sp. (polychaete)	0.15	1.38
Sabellidae (polychaete)	1.34	2.76
Eunicida (polychaete)	0.11	1.81
Phyllodocida (pllychaete)	0.75	1.12
Glyceriformia	0.01	1.03
Sabellida (polychaete)	0.35	0.69
Terebellida (polychaete)	1.58	9.05
Gastropoda (snail)	0.90	4.54
<i>Natica</i> sp. (moonshell)	0.08	0.63
<i>Polinices pallida</i> (snail)	0.02	0.34
Bivalvia (clam)	2.30	16.24
<i>Yoldia</i> sp. (clam)	2.05	6.21
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	0.02	0.34
<i>Clinocardium</i> sp. (cockle)	0.01	0.34
<i>Clinocardium ciliatum</i> (Iceland cockle)	0.27	0.69
<i>Serripes groenlandicus</i> (Greenland cockle)	0.42	1.72
<i>Spisula polynyma</i> (clam)	1.62	1.72
<i>Siliqua</i> sp.(razor clam)	0.01	0.34
<i>Macoma</i> sp. (clam)	0.23	0.34
<i>Tellina</i> sp. (clam)	0.21	0.43
<i>Mya</i> sp. (soft shell clam)	0.10	0.34
Crustacea	0.12	0.52
Mysidacea Mysida (mysid)	1.20	2.76
Cumacea (cumacean)	2.64	11.03
Isopoda (isopod)	0.02	0.69
Gammaridea (amphipod)	6.74	48.42
Caprellidea (amphipod)	0.12	3.51
Euphausiacea (euphausiid)	0.51	2.07
<i>Thysanoessa</i> sp. (euphausiid)	0.06	0.34
<i>Thysanoessa inermis</i> (euphausiid)	0.08	0.34
<i>Thysanoessa raschii</i> (euphausiid)	0.24	0.95
Caridea (shrimp)	0.04	0.78
Crangonidae (shrimp)	0.24	0.86
<i>Crangon</i> sp. (shrimp)	0.47	0.57
<i>Crangon dalli</i> (shrimp)	1.19	1.38
Paguridae (hermit crab)	0.01	0.34

Table C-16.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Hyas lyratus</i> (lyre crab)	0.02	0.34
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.01	0.34
<i>Chionoecetes opilio</i> (snow crab)	0.07	0.34
<i>Telmessus cheiragonus</i> (hair crab)	0.17	0.34
<i>Pinnixa</i> sp. (pea crab)	0.04	0.69
Echiura (marine worm)	8.79	10.92
Priapulida (worm)	3.08	4.57
Echinodermata (sea star, cucumber, urchin)	0.01	0.34
Asteroidea (starfish)	0.00	0.43
Ophiuroidea Ophiurida (brittle star)	0.42	3.28
Brittle star legs	0.04	0.34
Ophiuridae (brittle star)	0.10	1.03
<i>Ophiura</i> sp. (brittle star)	0.01	0.34
<i>Ophiura leptoctenia</i> (brittle star)	1.72	1.72
<i>Ophiura sarsi</i> (brittle star)	0.19	1.38
Amphiuridae (brittle star)	0.95	3.68
<i>Amphiopholis</i> sp. (brittle star)	0.13	1.03
Echinoidea (sea urchin and sand dollar)	0.50	3.88
Echinoidea Clypeasteroidea (sand dollar)	1.64	11.24
Sand dollar	0.07	1.78
Chaetognatha (arrow worm)	0.39	0.43
Urochordata (tunicate)	0.88	6.01
Osteichthyes Teleostei (fish)	0.14	1.61
Non-gadoid Fish Remains	0.99	0.57
<i>Icelinus</i> sp.	0.01	0.34
Unidentified organic material	0.77	4.14
Unidentified worm-like organism	1.21	4.02
Fishery discards	0.78	0.34
Unidentified tube	0.09	0.69
Unidentified algae	0.04	0.34

Total prey weight	524 g
Total non-empty stomachs	264
Total empty stomachs	34
Number of hauls	58

Table C-17.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Alaska plaice (*Pleuronectes quadrituberculatus*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida Textulariina(foram)	0.03	0.53
Anthozoa (anemome)	0.72	2.58
Polychaeta (worm)	4.65	21.67
Aphroditidae (sea mouse)	0.62	0.80
Polynoidae (polychaete)	1.12	6.36
<i>Polynoe</i> sp. (polychaete)	<0.01	0.27
<i>Polynoe canadensis</i> (polychaete)	0.02	0.27
Phyllodocidae (polychaete)	1.23	8.47
Nephtyidae (polychaete)	13.33	28.16
Glyceridae (polychaete)	0.05	0.76
Goniadidae (polychaete)	0.04	1.07
Onuphidae (polychaete)	0.17	1.87
Lumbrineridae	0.78	4.96
Orbiniidae (polychaete)	0.05	2.20
Spionidae (polychaete)	0.03	0.22
Chaetopteridae (polychaete)	0.20	0.56
Cirratulidae (polychaete)	0.01	0.71
Flabelligeridae (polychaete)	0.24	1.47
<i>Flabelligera</i> sp. (polychaete)	0.01	0.27
Scalibregmidae	0.28	1.20
Opheliidae (polychaete)	2.16	6.82
<i>Travisia</i> sp. (polychaete)	0.31	1.33
Sternaspidae (polychaete)	0.21	1.07
<i>Sternaspis scutata</i> (polychaete)	0.10	1.07
Maldanidae (polychaete)	10.20	35.31
<i>Nicomache lumbricalis</i> (polychaete)	<0.01	0.27
Oweniidae (polychaete)	0.34	0.53
Ampharetidae (polychaete)	10.16	30.73
Terebellidae (polychaete)	9.81	15.69
<i>Amphitrite cirrata</i> (polychaete)	0.35	0.33
<i>Neoamphitrite groenlandica</i> (polychaete)	0.43	0.33
<i>Polycirrus</i> sp. (polychaete)	0.25	1.07
<i>Artacama</i> sp. (polychaete)	1.07	3.00
Trichobranchidae (polychaete)	0.01	0.27
<i>Terebellides</i> sp. (polychaete)	0.08	0.53
<i>Terebellides stroemi</i> (polychaete)	0.20	0.80
Sabellidae (polychaete)	1.94	7.87
Eunicida (polychaete)	0.05	0.53
Phyllodocida (polychaete)	0.64	0.98
Sabellida (polychaete)	0.02	0.60
Terebellida (polychaete)	0.78	3.78
Mollusca	0.16	0.33
Gastropoda (snail)	0.04	1.40
Polyplacophora	0.04	0.27
Bivalvia (clam)	6.60	20.89
<i>Yoldia</i> sp. (clam)	0.38	1.53
Cumacea (cumacean)	0.19	2.67
Gammaridea (amphipod)	8.42	45.56
Caprellidea (amphipod)	<0.01	0.27
Reptantia (crab)	<0.01	0.27
<i>Crangon dalli</i> (shrimp)	0.03	0.27
Paguridae (hermit crab)	0.04	0.27
<i>Hyas lyratus</i> (lyre crab)	0.02	0.27
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.03	0.60
<i>Chionoecetes opilio</i> (snow crab)	0.01	0.33
Sipuncula (marine worm)	12.51	16.58
Echiura (marine worm)	4.13	7.60
Priapulida (worm)	0.37	0.53

Table C-17.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Ophiuroidea Ophiurida (brittle star)	0.36	4.44
Sand dollar	0.10	1.20
<i>Ammodytes hexapterus</i> (Pacific sandlance)	1.41	1.33
Unidentified organic material	0.09	0.87
Unidentified worm-like organism	0.16	1.40

Total prey weight	2,589 g
Total non-empty stomachs	273
Total empty stomachs	24
Number of hauls	75

Table C-18.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Alaska plaice (*Pleuronectes quadrituberculatus*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Foraminiferida (protozoan)	<0.01	0.76
Polychaeta (worm)	26.85	55.51
Polynoidae (polychaete)	0.51	1.53
Phyllodocidae (polychaete)	0.93	1.81
Nephtyidae (polychaete)	12.97	22.68
<i>Nephtys</i> sp. (polychaete)	0.19	0.56
Glyceridae (polychaete)	0.12	0.34
<i>Glycera</i> sp. (polychaete)	0.07	1.69
Goniadidae (polychaete)	0.11	1.10
Eunicidae	0.20	0.85
Arabellidae (polychaete)	0.80	1.24
Flabelligeridae (polychaete)	0.60	1.33
<i>Flabelligera</i> sp. (polychaete)	0.21	1.61
Opheliidae (polychaete)	2.20	7.18
<i>Ophelia limacina</i> (polychaete)	0.13	0.34
<i>Travisia</i> sp. (polychaete)	0.21	0.34
Sternaspidae (polychaete)	0.06	0.76
Maldanidae (polychaete)	3.24	8.93
<i>Maldanella</i> sp. (polychaete)	0.13	0.34
Sabellaridae	1.08	0.56
Sabellidae (polychaete)	0.28	0.56
Eunicida (polychaete)	0.72	0.42
Phyllodocida (polychaete)	0.06	0.34
Terebellida (polychaete)	2.95	6.69
Gastropoda (snail)	0.27	1.78
Bivalvia (clam)	7.42	24.46
<i>Nucula</i> sp. (clam)	0.15	1.13
<i>Nuculana</i> sp. (clam)	0.04	0.34
<i>Yoldia</i> sp. (clam)	1.20	1.86
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	0.01	0.34
Cardiidae (cockle)	0.55	0.42
<i>Spisula polynyma</i> (clam)	3.49	3.73
<i>Siliqua alta</i> (northern razor clam)	2.89	1.53
Cumacea (cumacean)	0.25	1.69
Isopoda (isopod)	0.02	0.99
Gammaridea (amphipod)	6.01	37.01
Ampeliscidae (amphipod)	1.12	4.49
Gammaridae (amphipod)	0.04	0.34
<i>Maera loveni</i> (amphipod)	0.49	1.95
Paguridae (hermit crab)	0.03	0.34
<i>Chionoecetes opilio</i> (snow crab)	0.40	0.34
Sipuncula (marine worm)	0.93	0.90
Echiura (marine worm)	13.20	23.31
<i>Echiurus</i> sp. (marine worm)	3.87	5.85
<i>Echiurus echiurus</i> (marine worm)	0.63	0.34
Priapulida (worm)	0.70	2.03

Table C-18.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Ophiuroidea Ophiurida (brittle star)	0.46	3.84
Ophiurida (brittle star)	0.01	0.34
<i>Amphipholis squamata</i> (brittle star)	0.10	0.34
Echinoidea Clypeasteroida (sand dollar)	0.01	0.34
Clypeasteridae (sand dollar)	0.53	2.54
<i>Ammodytes</i> sp. (sandlance)	0.54	1.36
Unidentified organic material	0.04	1.19

Total prey weight	947 g
Total non-empty stomachs	222
Total empty stomachs	39
Number of hauls	59

Table C-19.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Alaska plaice (*Pleuronectes quadrituberculatus*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Scyphozoa (jellyfish)	0.16	0.30
Polychaeta (worm)	33.01	74.42
Polynoidae (polychaete)	0.05	0.30
Nephtyidae (polychaete)	10.60	12.68
Orbiniidae (polychaete)	0.19	0.30
Opheliidae (polychaete)	1.90	3.71
Maldanidae (polychaete)	3.80	14.02
Terebellida (polychaete)	7.15	12.42
Hirudinea (leech)	0.73	0.98
Gastropoda (snail)	0.13	3.43
Bivalvia (clam)	8.43	21.31
<i>Yoldia</i> sp. (clam)	1.61	1.21
<i>Siliqua</i> sp. (razor clam)	0.17	0.61
<i>Siliqua alta</i> (northern razor clam)	0.86	0.25
Crustacea	<0.01	0.38
Mysidacea Mysida (mysid)	0.02	0.30
Gammaridea (amphipod)	9.94	45.98
Paguridae (hermit crab)	0.01	0.30
<i>Chionoecetes opilio</i> (snow crab)	0.13	0.98
Sipuncula (marine worm)	2.14	2.80
Echiura (marine worm)	15.77	27.78
Priapulida (worm)	0.47	1.21
Ophiuroidea Ophiurida (brittle star)	0.41	3.31
Echinoidea Clypeasteroidea (sand dollar)	0.01	0.30
Holothuroidea (sea cucumber)	0.08	0.38
Urochordata (tunicate)	0.02	0.61
Larvacea Copelata	0.81	0.30
Unidentified organic material	0.62	2.22
Unidentified worm-like organism	0.78	0.81

Total prey weight	1,903 g
Total non-empty stomachs	308
Total empty stomachs	7
Number of hauls	66

Table C-20.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Alaska plaice (*Pleuronectes quadrituberculatus*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Cnidaria	0.01	0.63
Annelida (worm)	0.05	0.63
Polychaeta (worm)	21.17	68.28
Polynoidae (polychaete)	0.34	2.50
Phyllodocidae (polychaete)	0.83	9.84
Nephtyidae (polychaete)	9.94	22.34
Goniadidae (polychaete)	0.04	0.63
Onuphidae (polychaete)	1.09	5.63
Lumbrineridae	1.58	2.97
Cirratulidae (polychaete)	0.02	0.63
Opheliidae (polychaete)	2.73	15.16
Sternaspidae (polychaete)	0.32	1.41
Maldanidae (polychaete)	5.28	17.19
Ampharetidae (polychaete)	0.67	2.03
Trichobranchidae (polychaete)	3.63	3.59
<i>Terebellides</i> sp. (polychaete)	1.36	1.25
Eunicida (polychaete)	0.64	0.63
Sabellida (polychaete)	0.61	0.78
Terebellida (polychaete)	3.28	9.38
Gastropoda (snail)	0.87	17.19
Pteropoda (Thecosomata and Gymnosomata)	0.01	1.25
Bivalvia (clam)	9.38	34.43
<i>Yoldia</i> sp. (clam)	3.20	5.31
<i>Cyclocardia crebricostata</i> (thickribbed cardita)	0.01	1.25
Cardiidae (Cockle)	0.13	1.56
<i>Clinocardium</i> sp. (cockle)	0.25	2.03
<i>Spisula polynyma</i> (clam)	1.79	1.04
<i>Mya</i> sp. (soft shell clam)	0.32	0.63
Cumacea (cumacean)	0.02	1.25
Isopoda (isopod)	0.01	0.63
Gammaridea (amphipod)	5.18	42.03
<i>Crangon communis</i> (shrimp)	0.13	0.78
<i>Pinnixa</i> sp. (pea crab)	0.53	1.25
Echiura (marine worm)	16.88	20.00
Priapulida (worm)	1.14	2.97
Ophiuroidea Euryalina (basket star)	0.01	0.63
Ophiuroidea Ophiurida (brittle star)	1.17	9.69
Ophiuridae (brittle star)	0.01	0.63
Amphiuridae (brittle star)	0.78	3.44
<i>Amphiopholis</i> sp. (brittle star)	0.62	1.41
Echinoidea (sea urchin and sand dollar)	<0.01	0.63
Echinoidea Clypeasteroidea (sand dollar)	0.56	6.25
Holothuroidea (sea cucumber)	0.11	0.63
Urochordata (tunicate)	0.79	5.78
Osteichthyes Teleostei (fish)	0.01	0.63
<i>Thaleichthys pacificus</i> (eulachon)	0.84	0.63
<i>Ammodytes</i> sp. (sandlance)	1.27	0.63
Unidentified organic material	0.34	5.63
Unidentified worm-like organism	0.05	0.63

Total prey weight 460 g
 Total non-empty stomachs 147
 Total empty stomachs 11
 Number of hauls 32

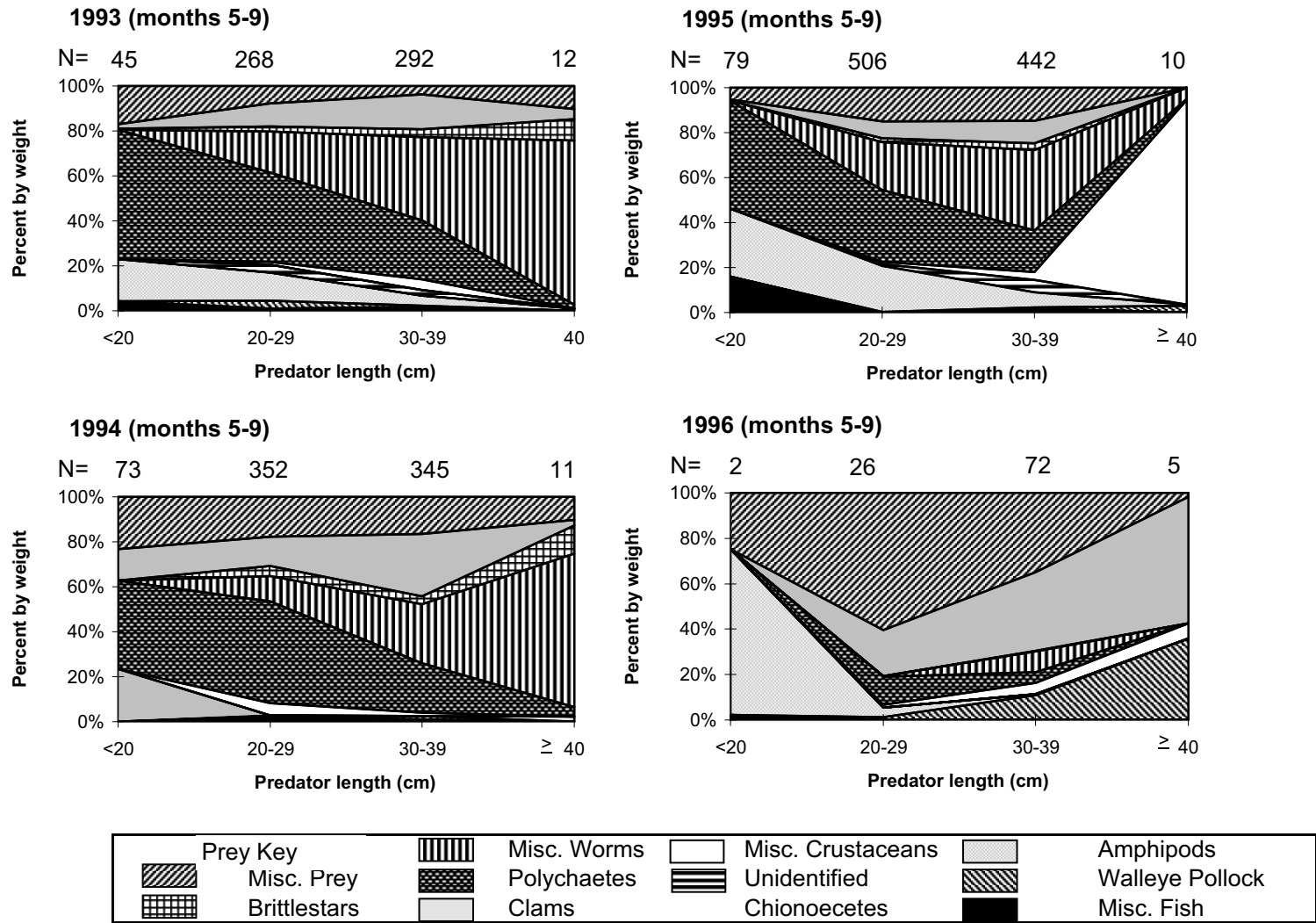


Figure C-1. -- Diet composition of yellowfin sole, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

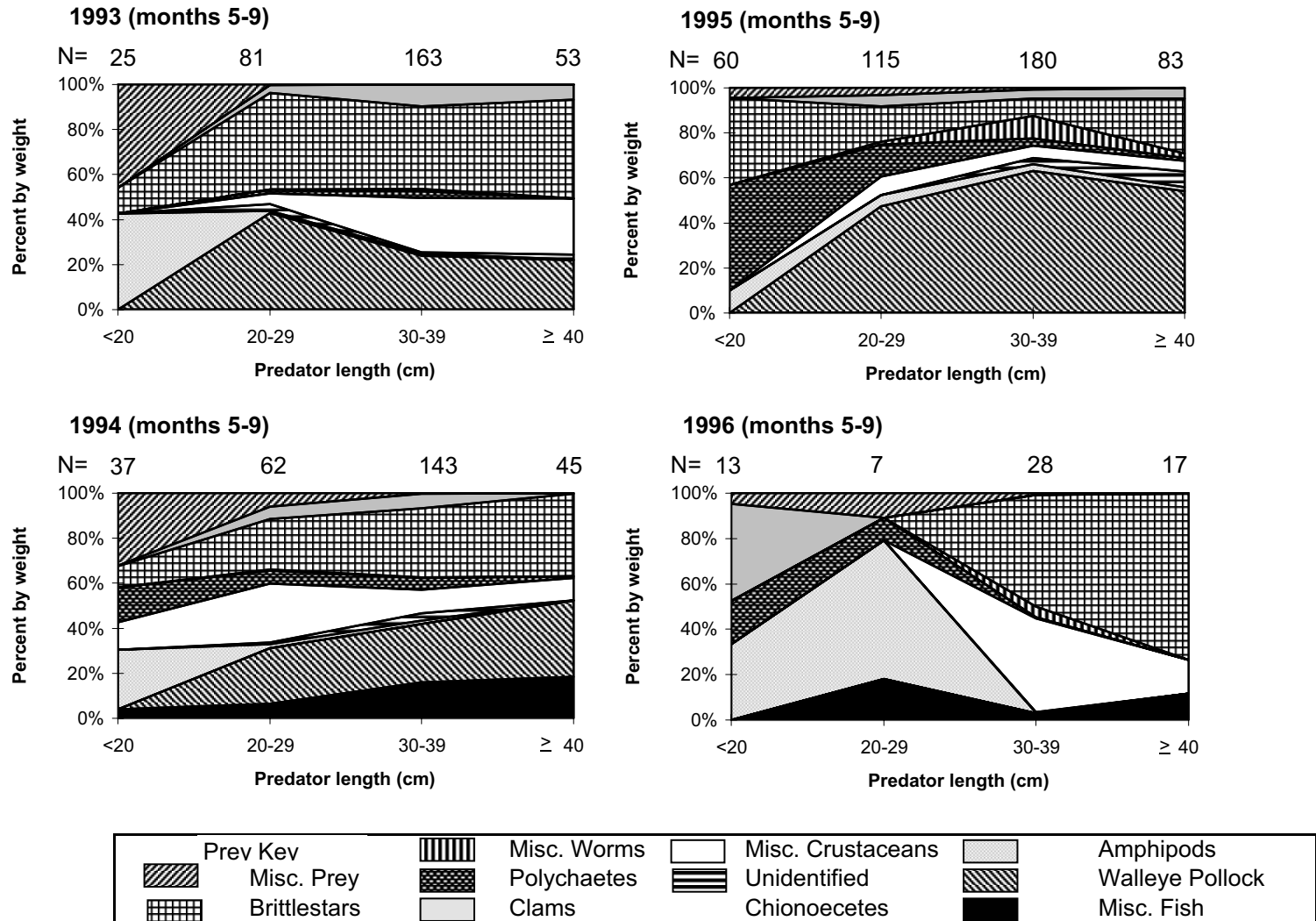


Figure C-2. -- Diet composition of flathead sole, in terms of percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of stomachs.

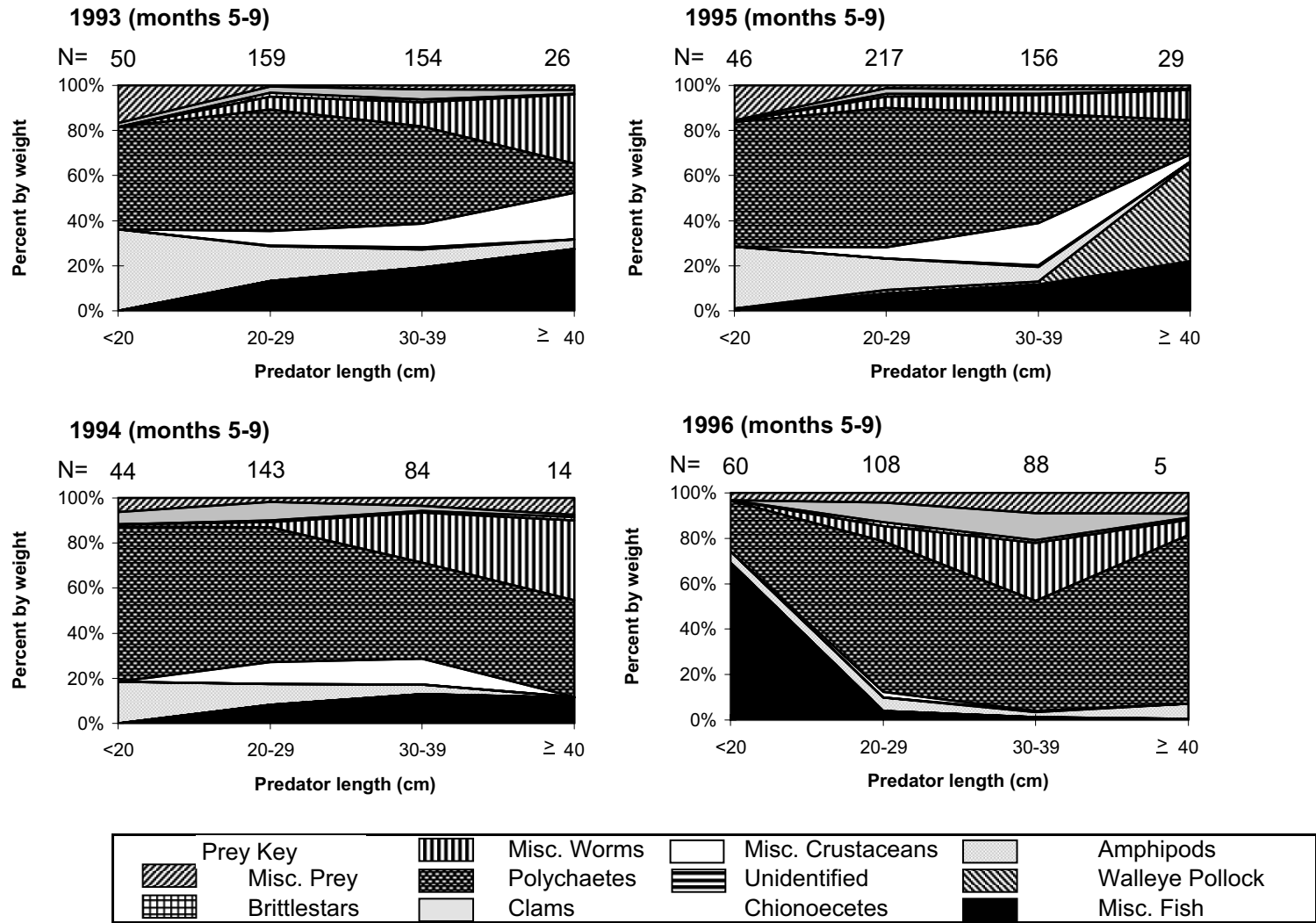


Figure C-3. -- Diet composition of rock sole, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

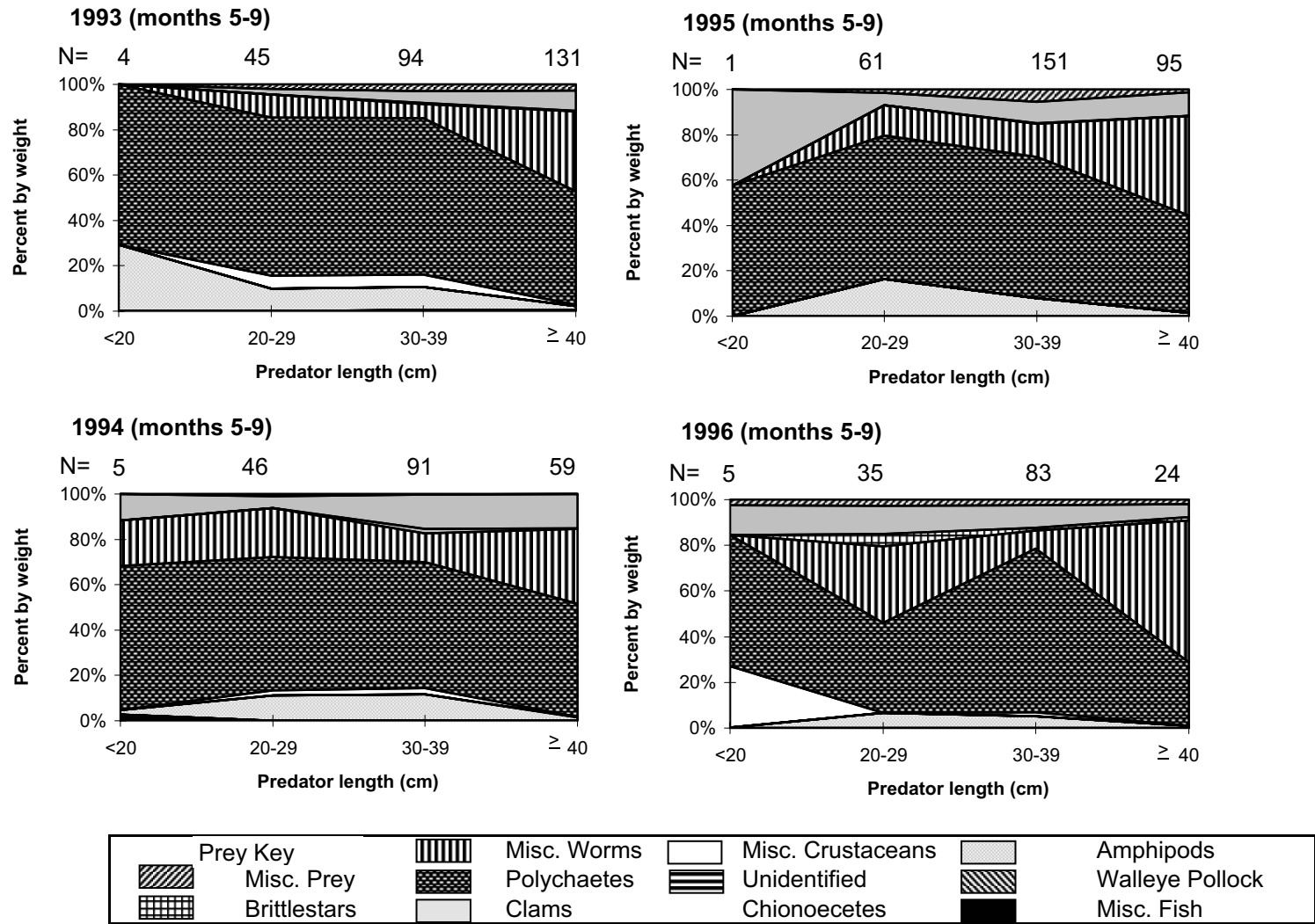


Figure C-4. -- Diet composition of Alaska plaice, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

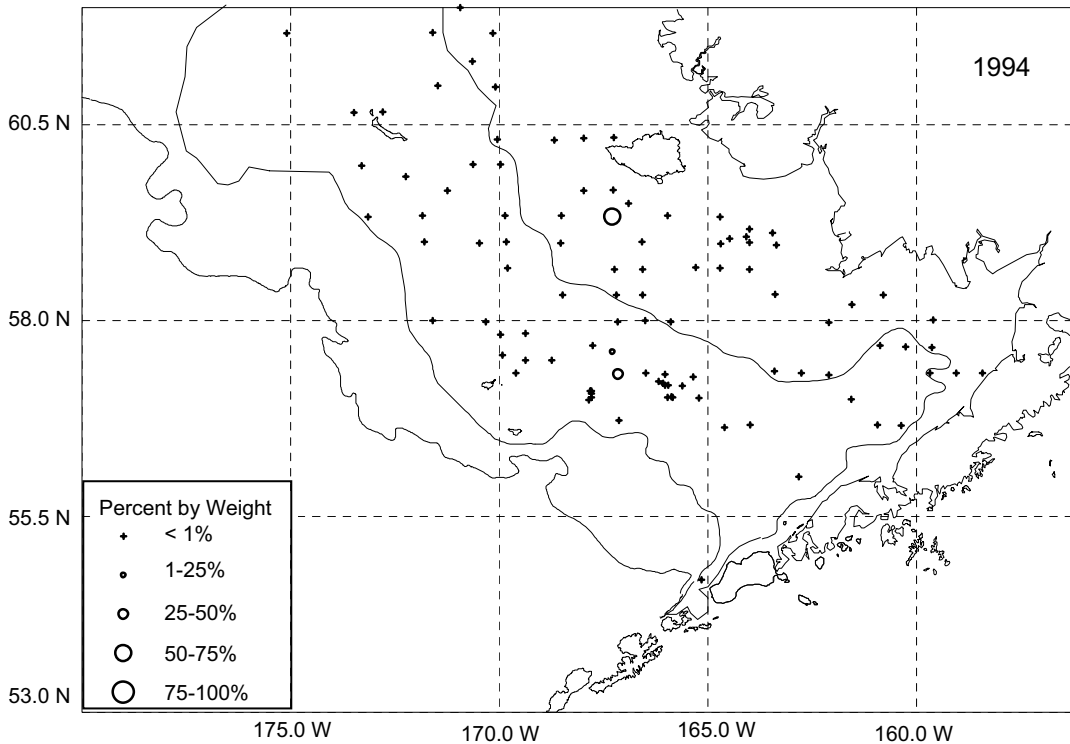
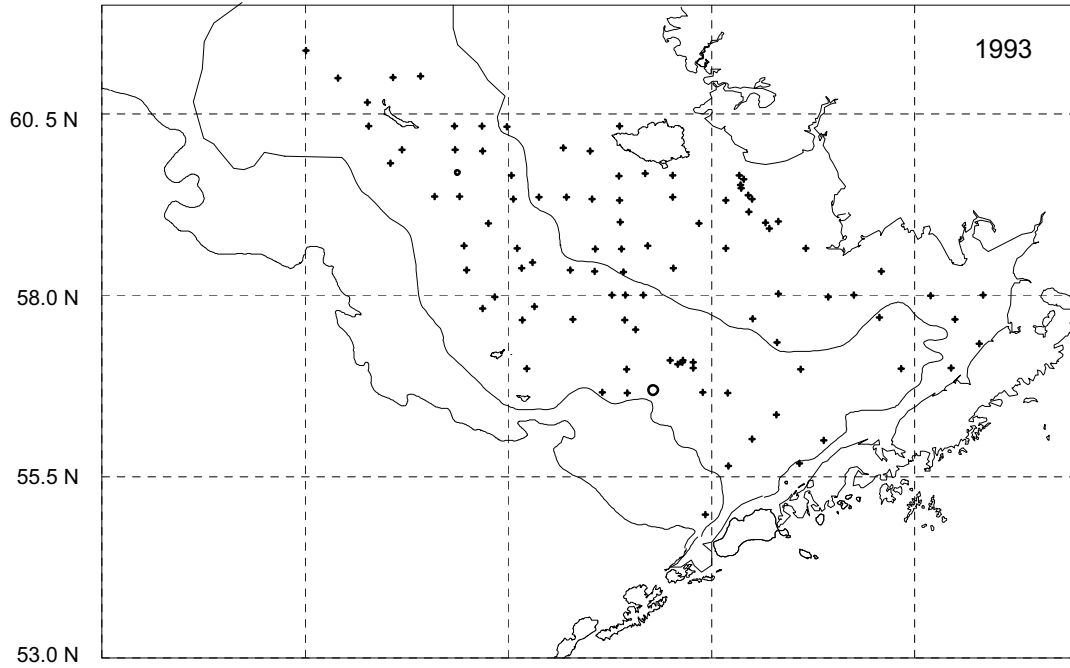


Figure C-5.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of yellowfin sole (*Limanda aspera*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

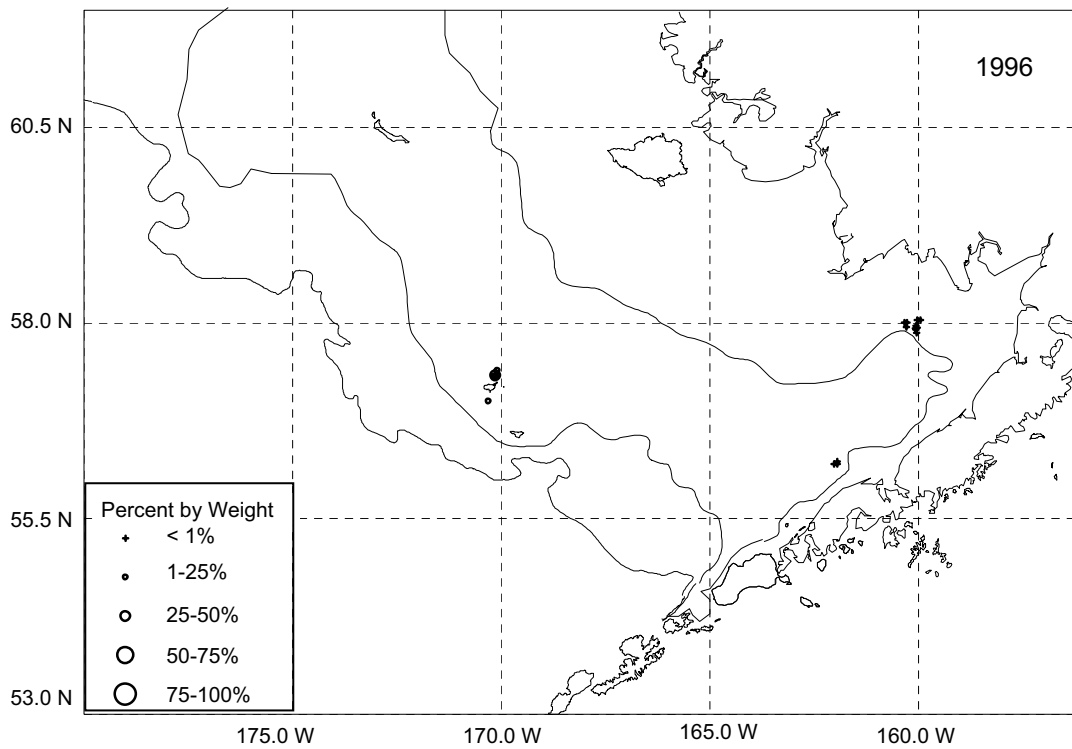
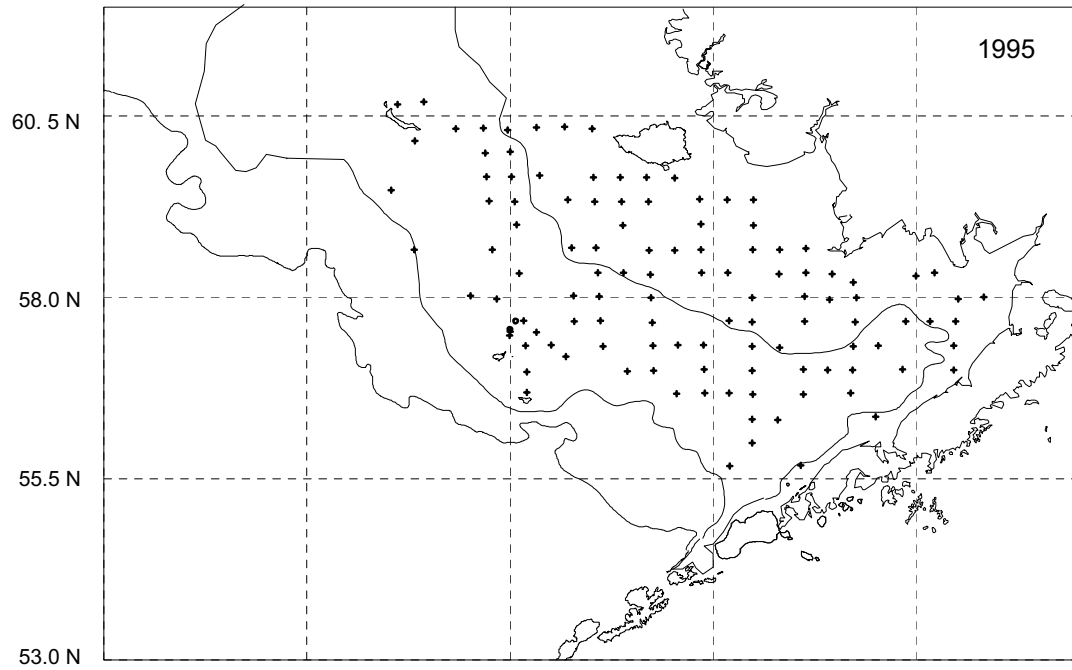


Figure C-5.-- Continued.

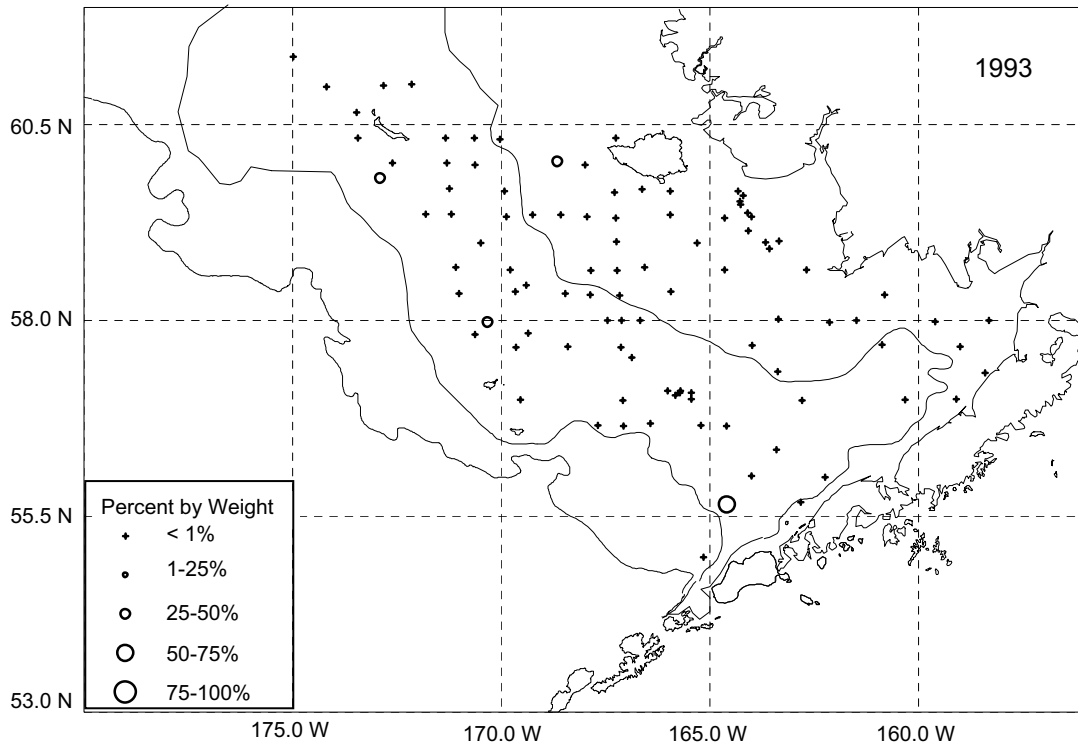


Figure C-6.-- Percent by weight of Tanner crab (*Chionoecetes bairdi*) in the diet of yellowfin sole (*Limanda aspera*) by sampling station during May through September in 1993 in the eastern Bering Sea.

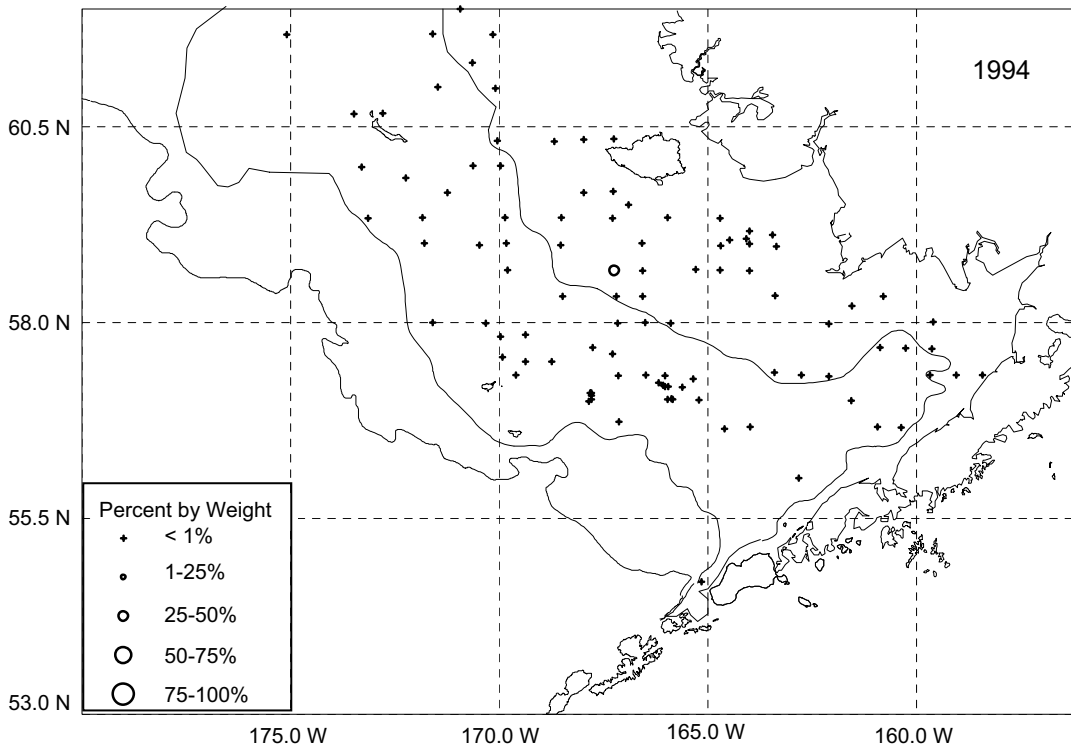
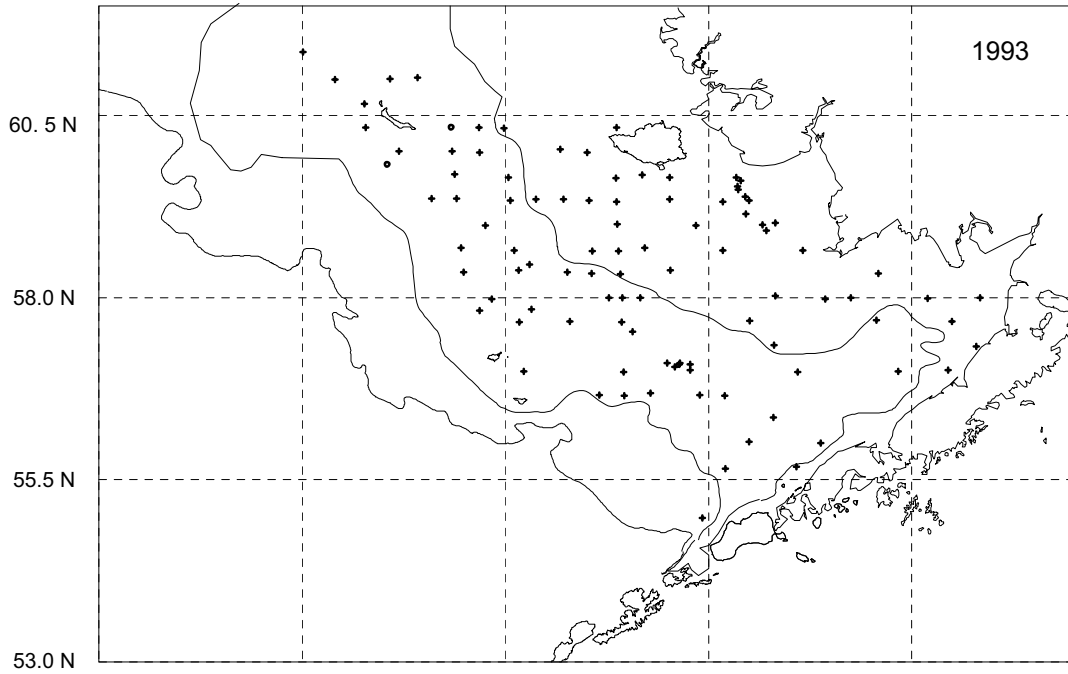


Figure C-7.-- Percent by weight of snow crab (*Chionoecetes opilio*) in the diet of yellowfin sole (*Limanda aspera*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

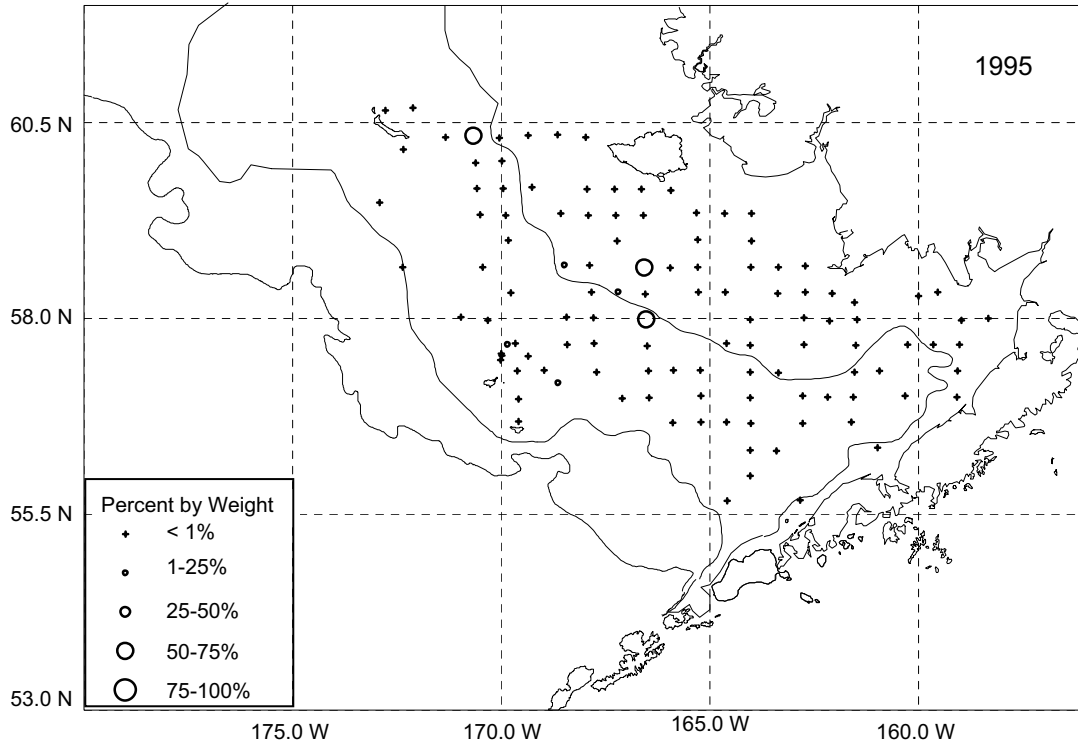


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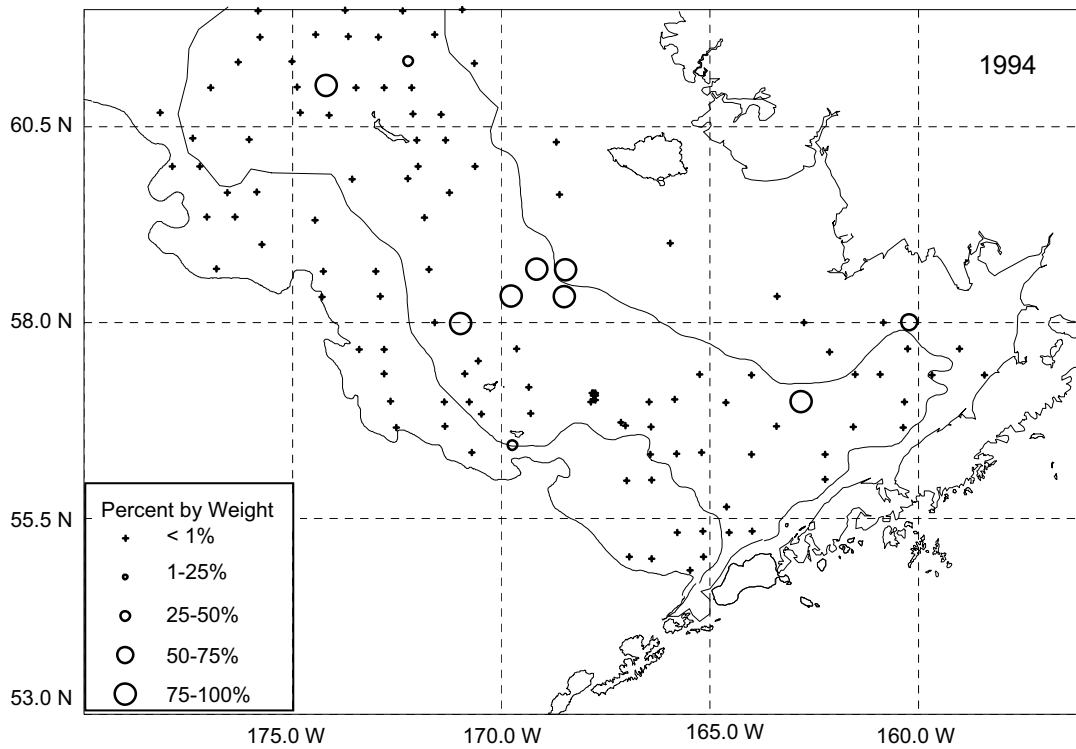
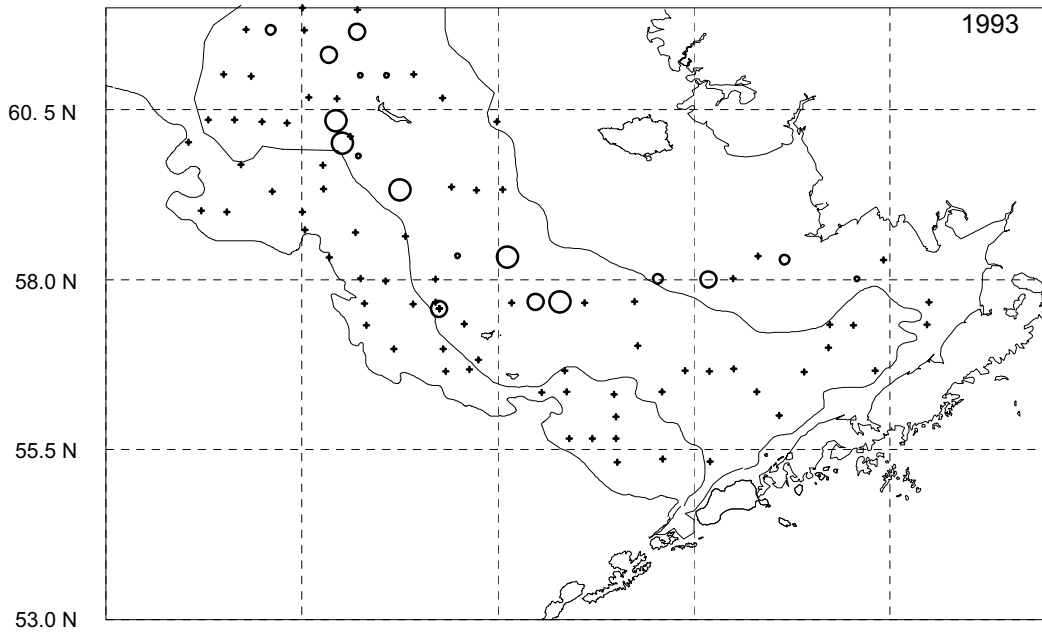


Figure C-8.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of flathead sole (*Hippoglossoides elassodon*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

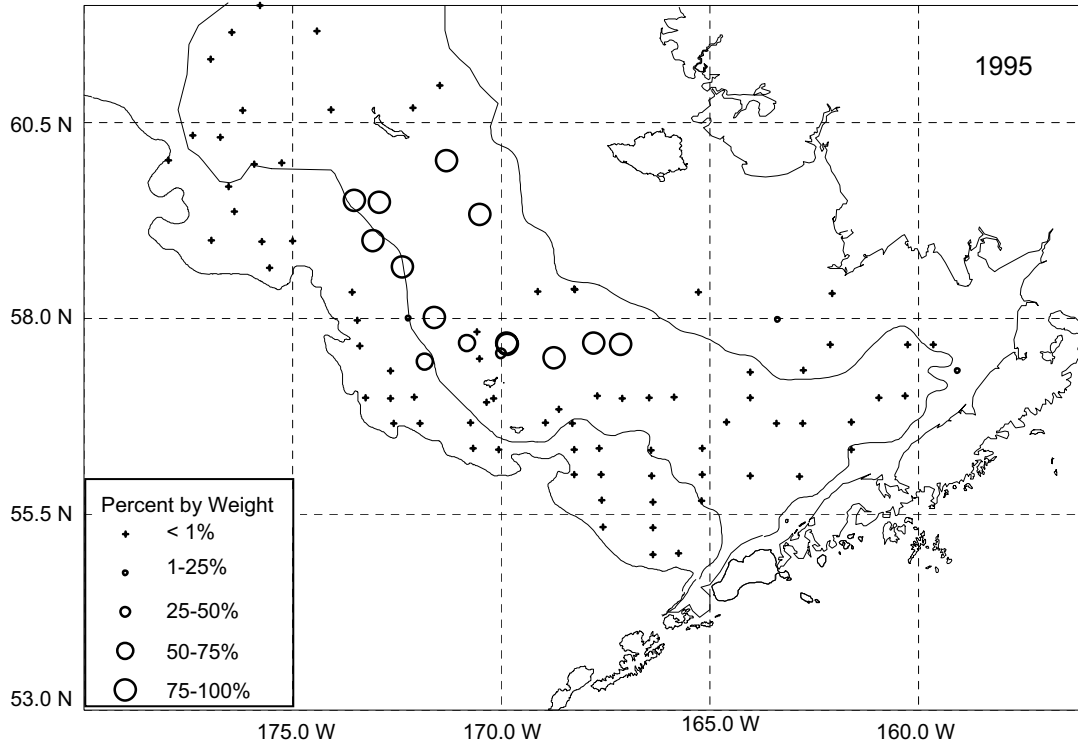


Figure C-8.-- Continued.

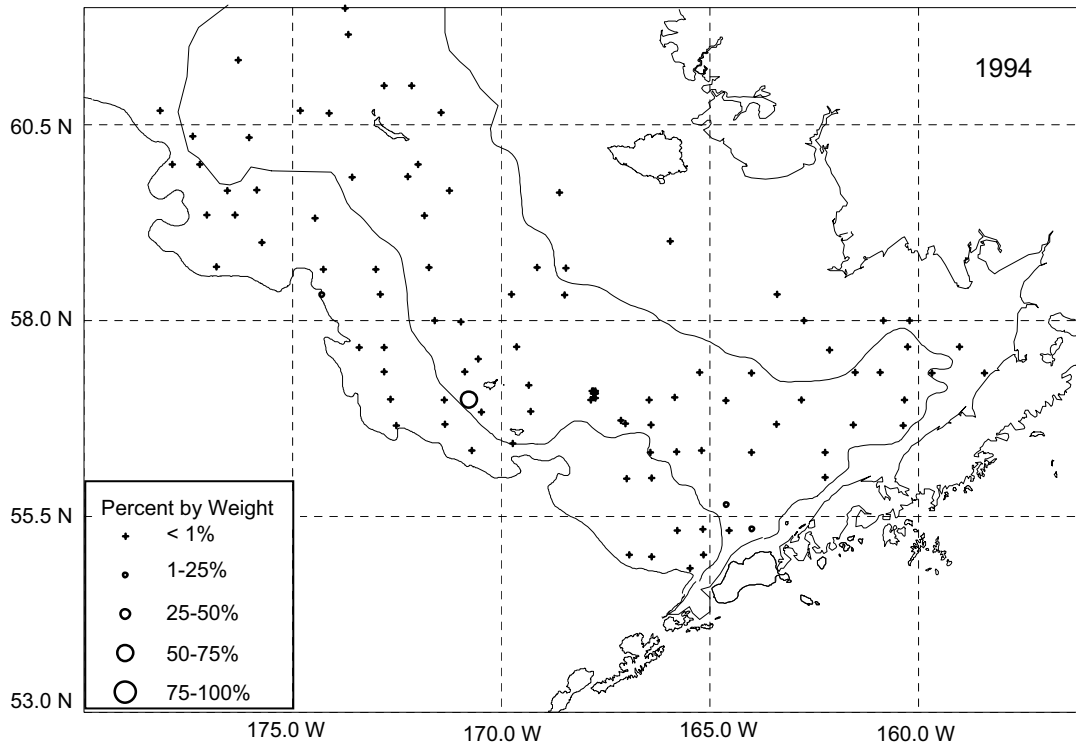
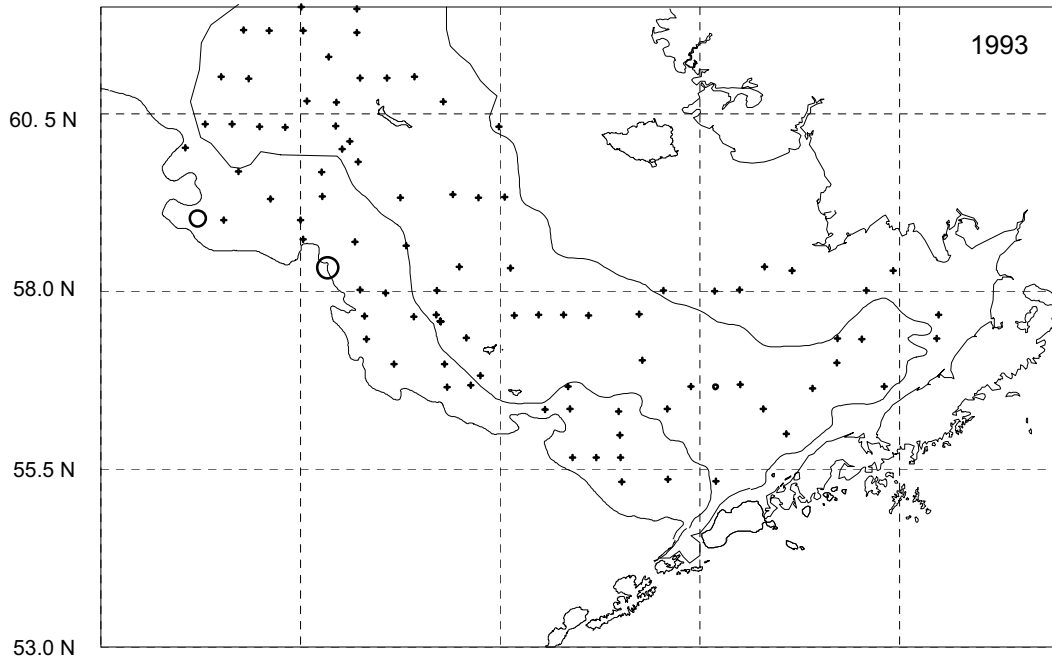


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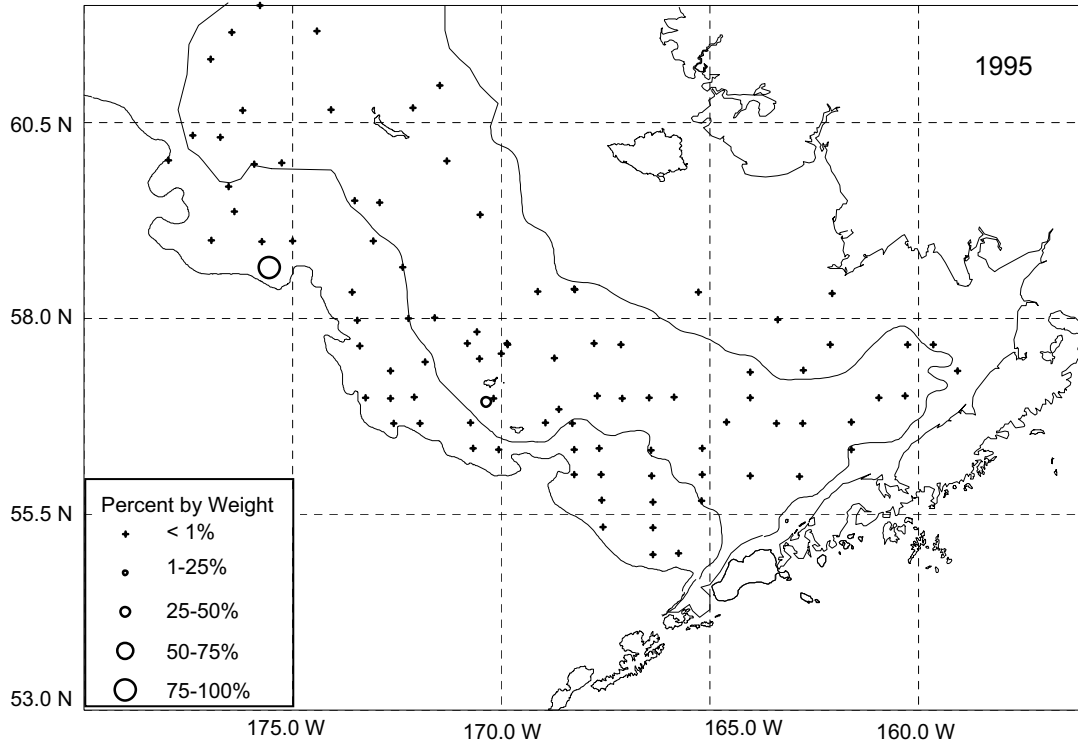


Figure C-9.-- Continued.

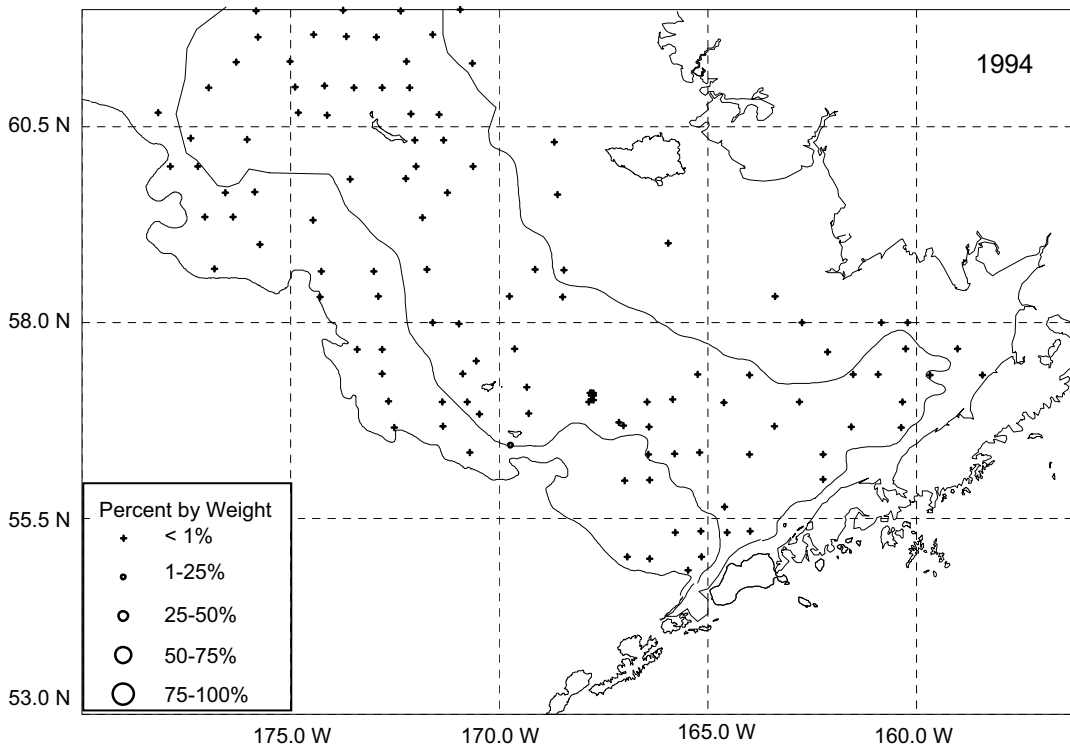
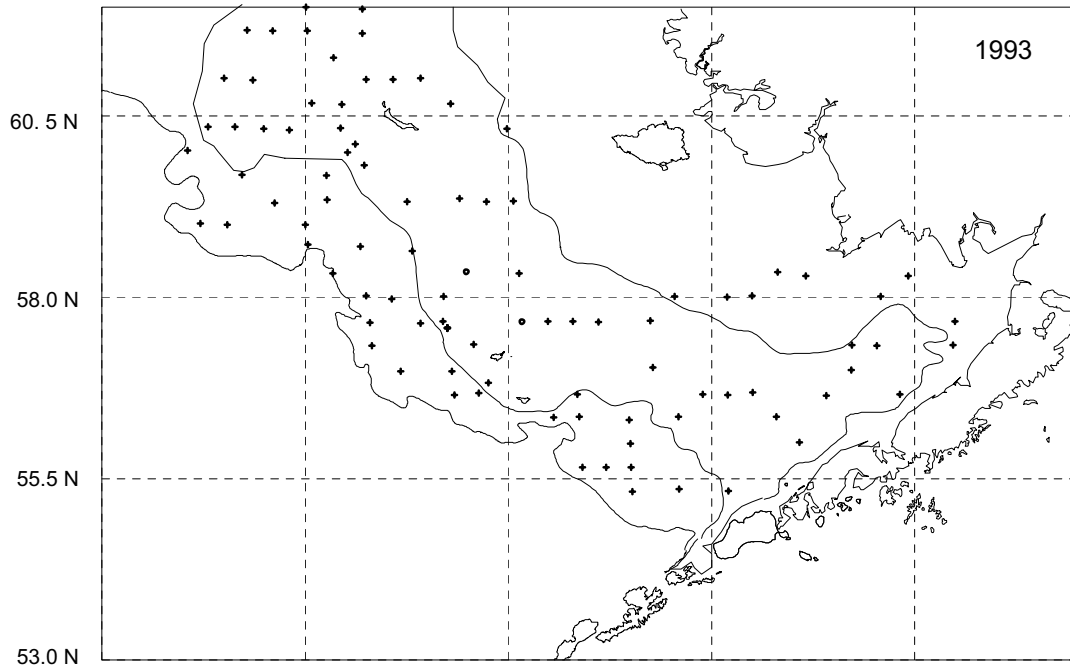


Figure C-10.-- Percent by weight of snow crab (*Chionoecetes opilio*) in the diet of flathead sole (*Hippoglossoides elassodon*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

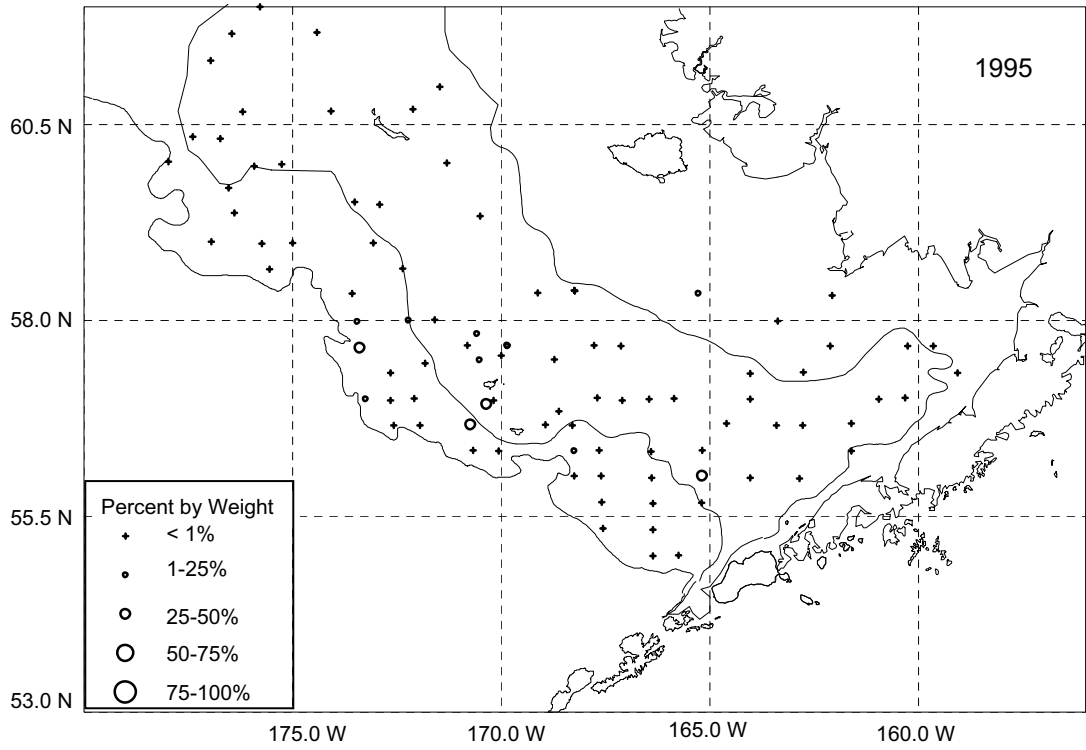


Figure C-10.-- Continued.

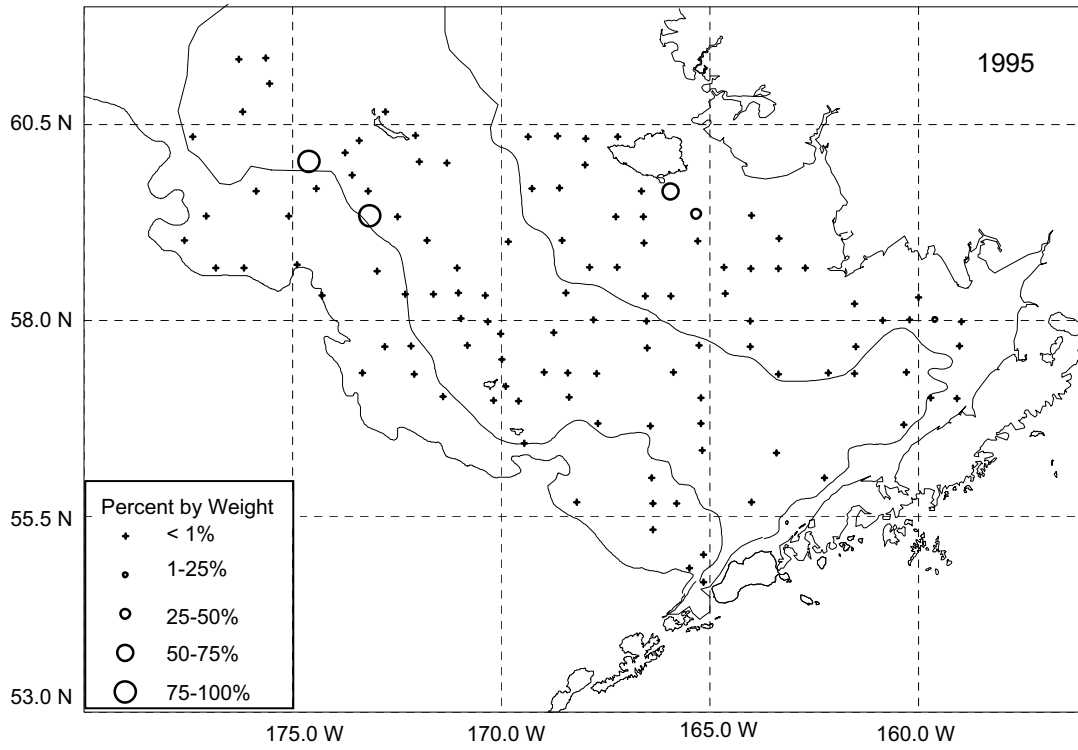


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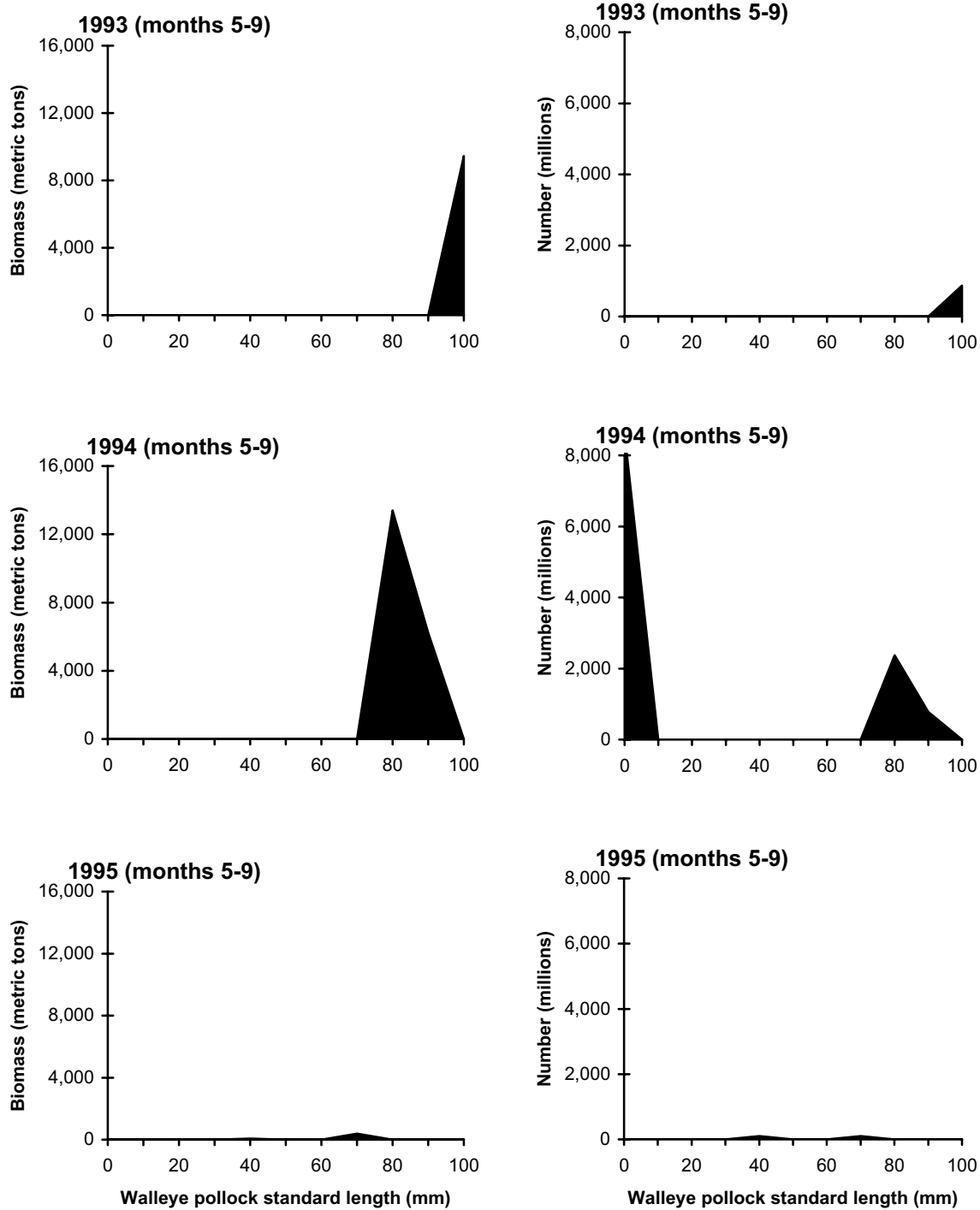


Figure C-12. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by yellowfin sole (*Limanda aspera*) during May through September of 1993, 1994, and 1995 by prey size.

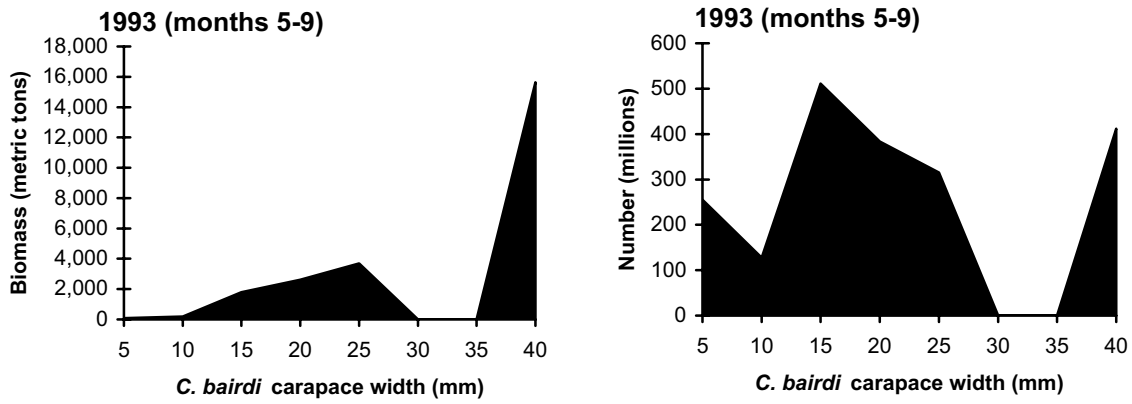


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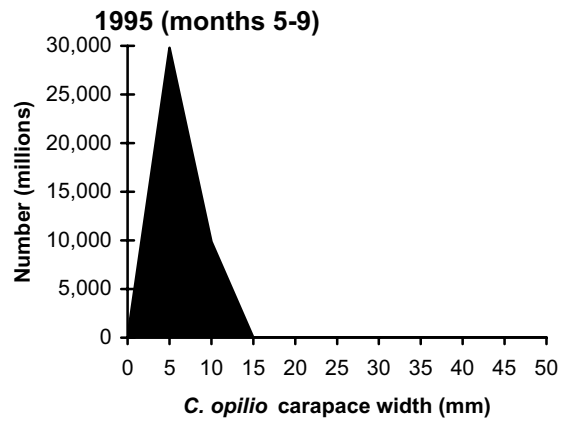
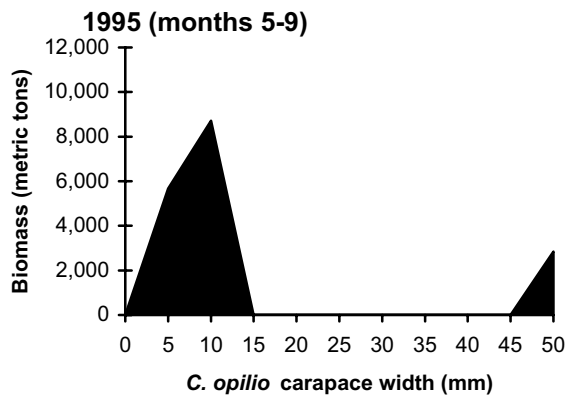
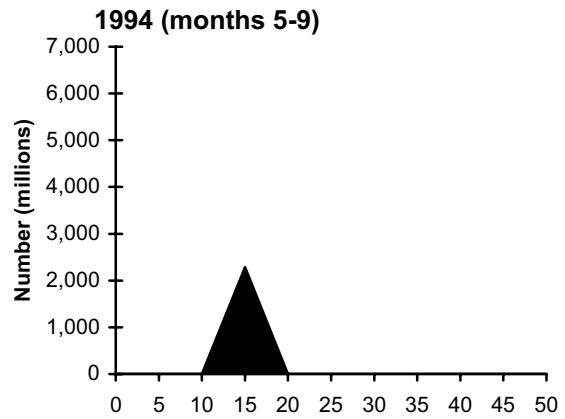
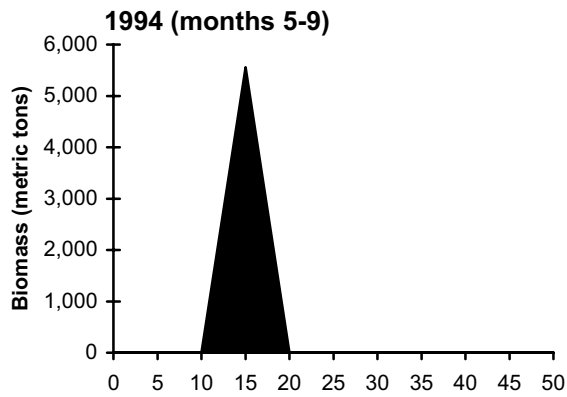
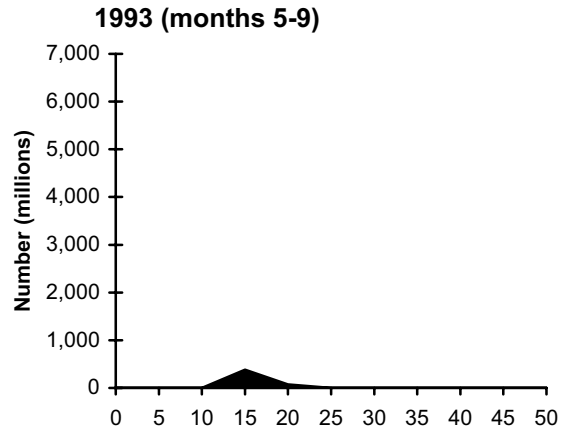
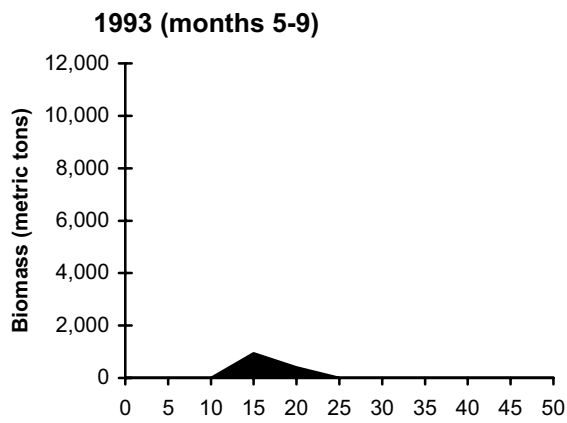


Figure C-14. -- Biomass and number of snow crab (*Chionoecetes opilio*) consumed by yellowfin sole (*Limanda aspera*) during May through September of 1993, 1994, and 1995 by prey size.

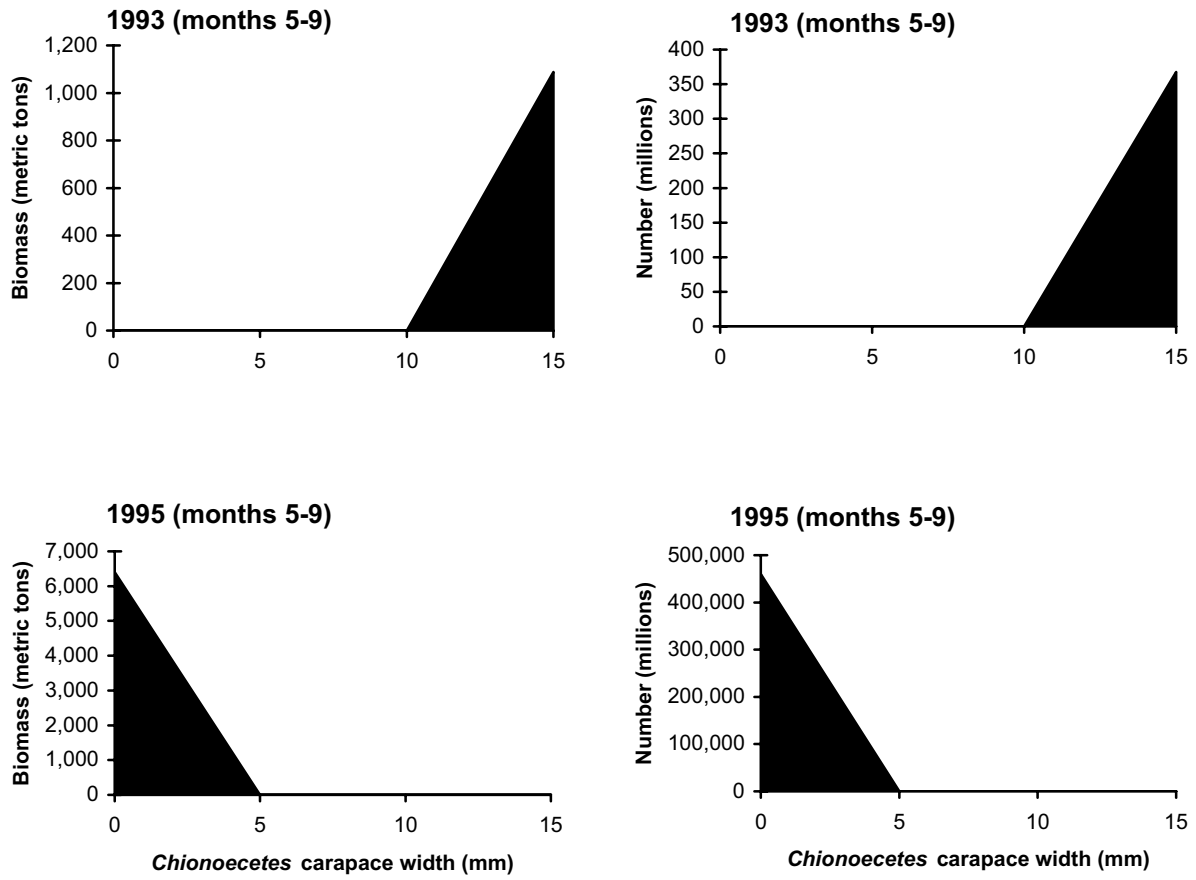


Figure C-15. -- Biomass and number of unidentified *Chionoecetes* consumed by yellowfin sole (*Limanda aspera*) during May through September of 1993 and 1995 by prey size.

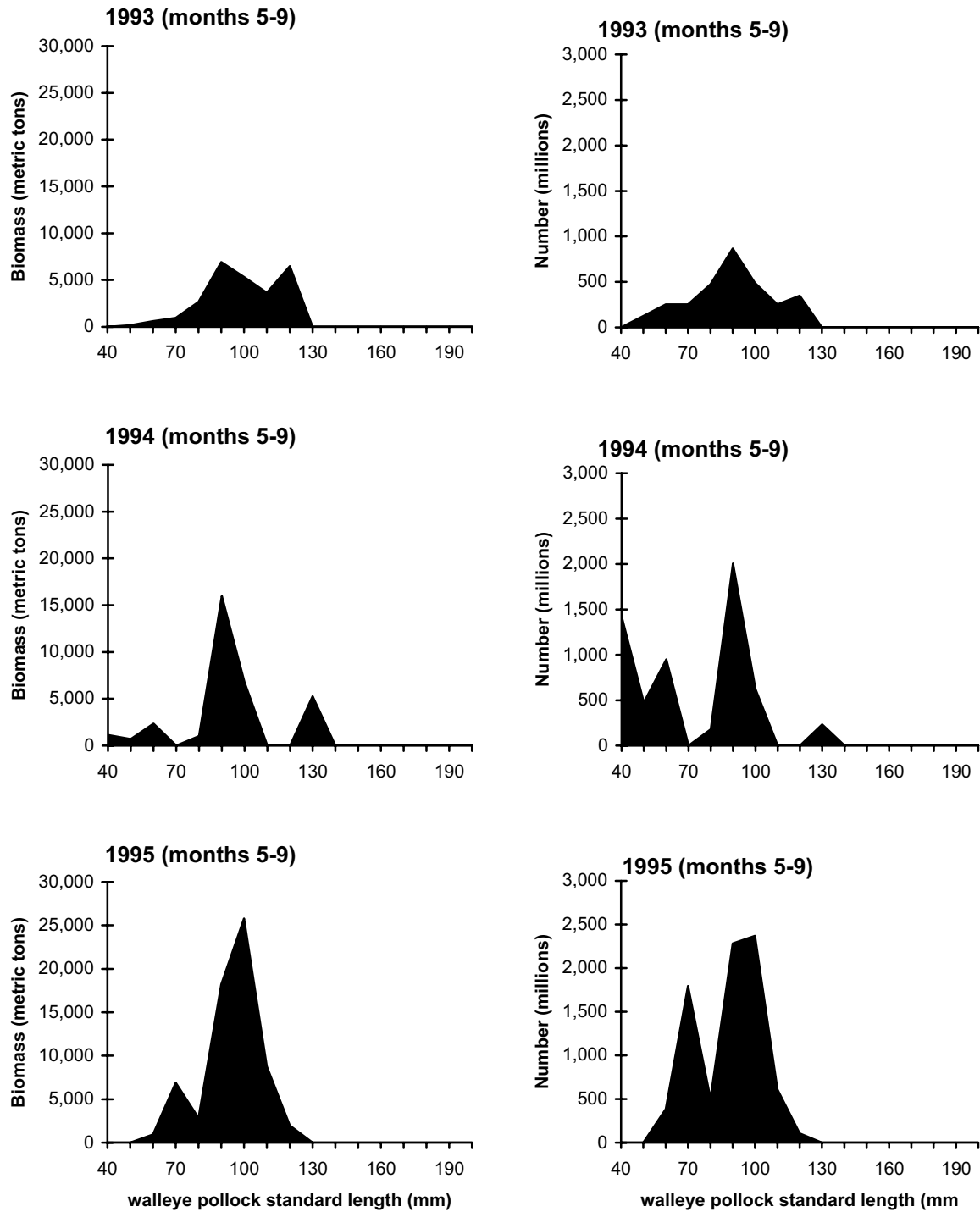


Figure C-16. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by flathead sole (*Hippoglossoides elassodon*) during May through September of 1993, 1994, and 1995 by prey size.

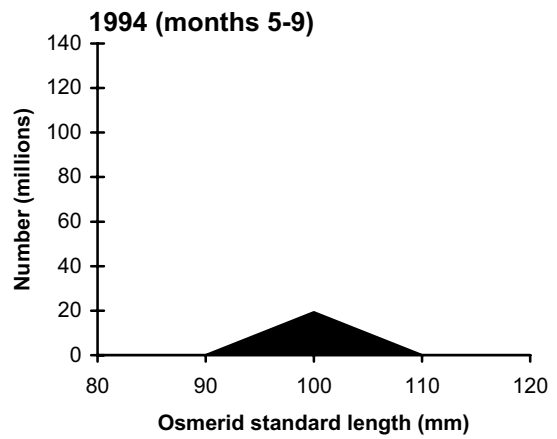
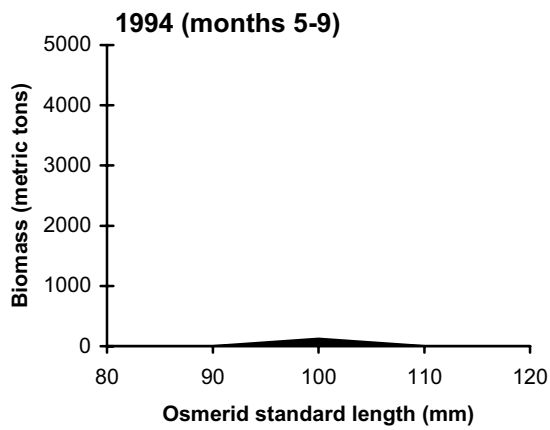
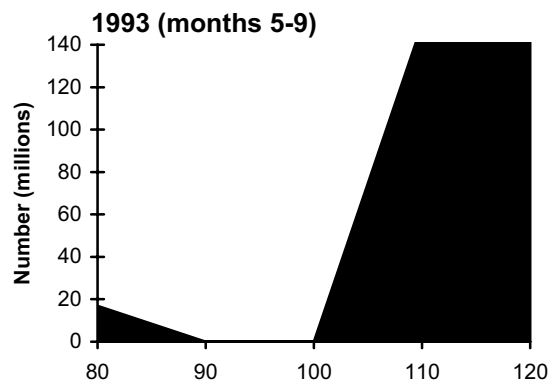
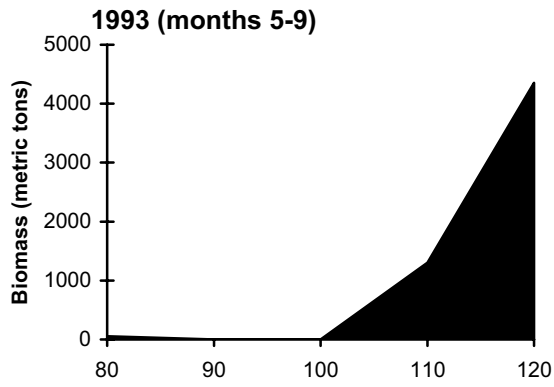


Figure C-17. -- Biomass and number of osmerids consumed by flathead sole (*Hippoglossoides elassodon*) during May through September of 1993 and 1994 by prey size.

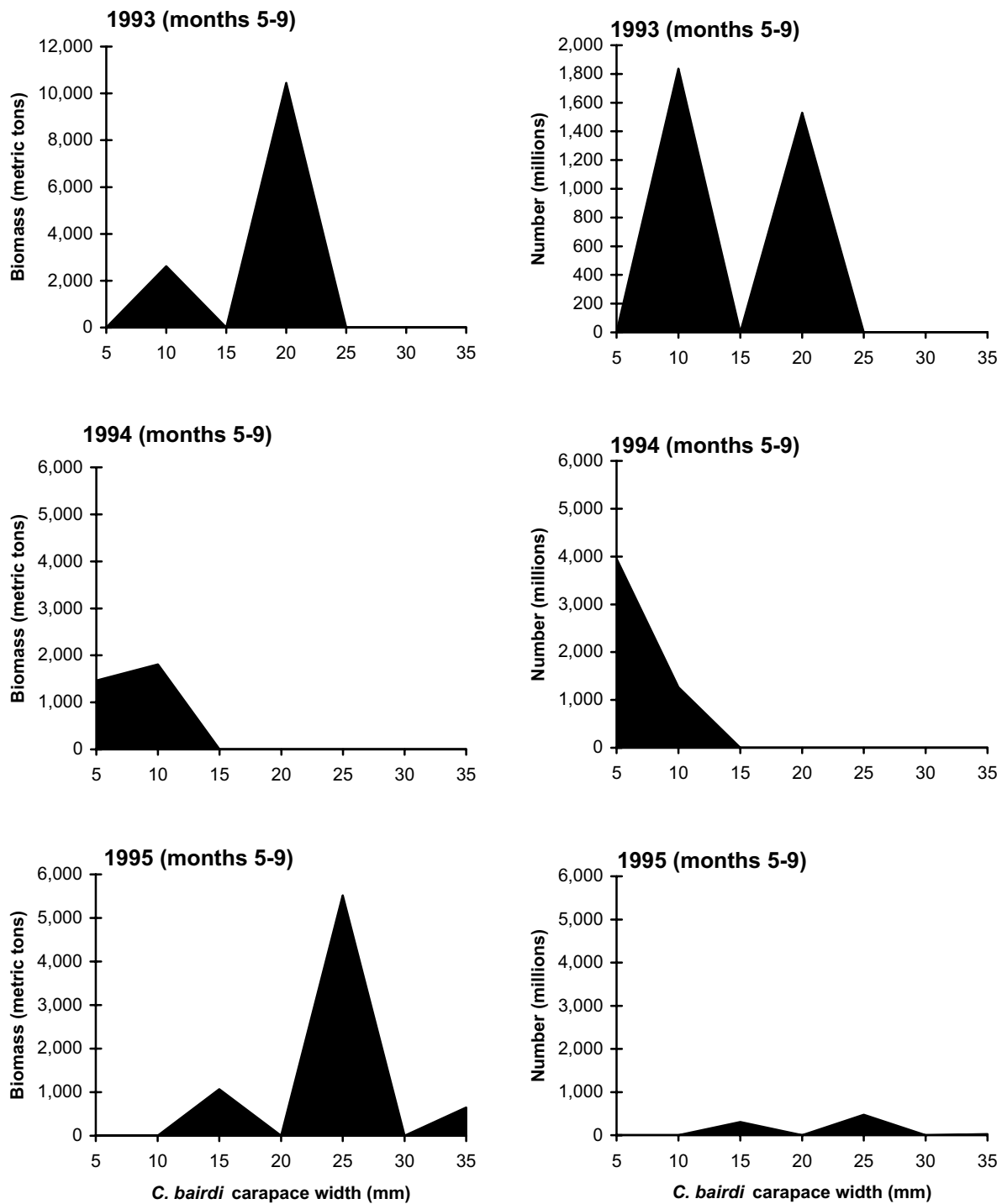


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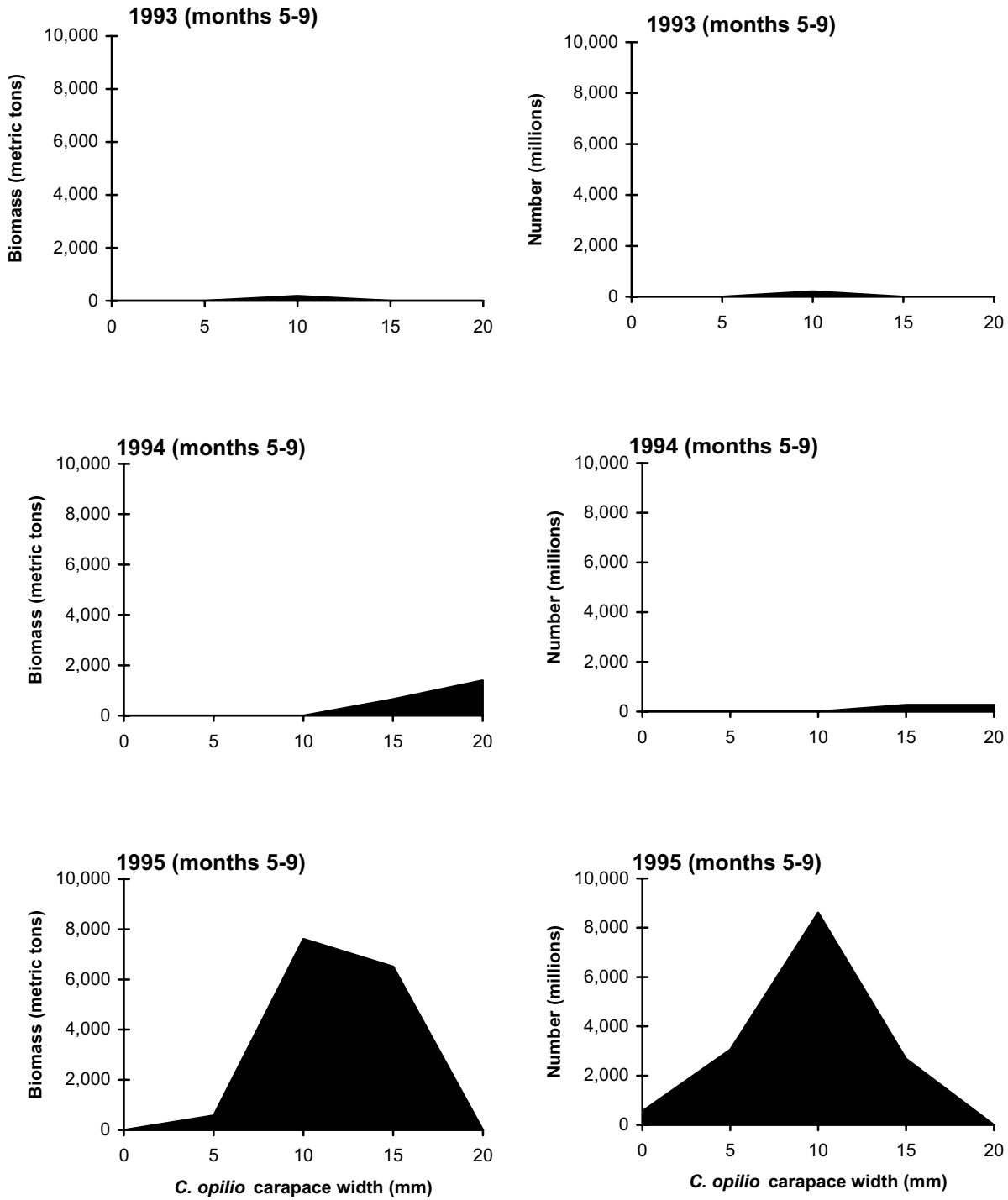


Figure C-19. -- Biomass and number of snow crab (*Chionoecetes opilio*) consumed by flathead sole (*Hippoglossoides elassodon*) during May through September of 1993, 1994, and 1995 by prey size.

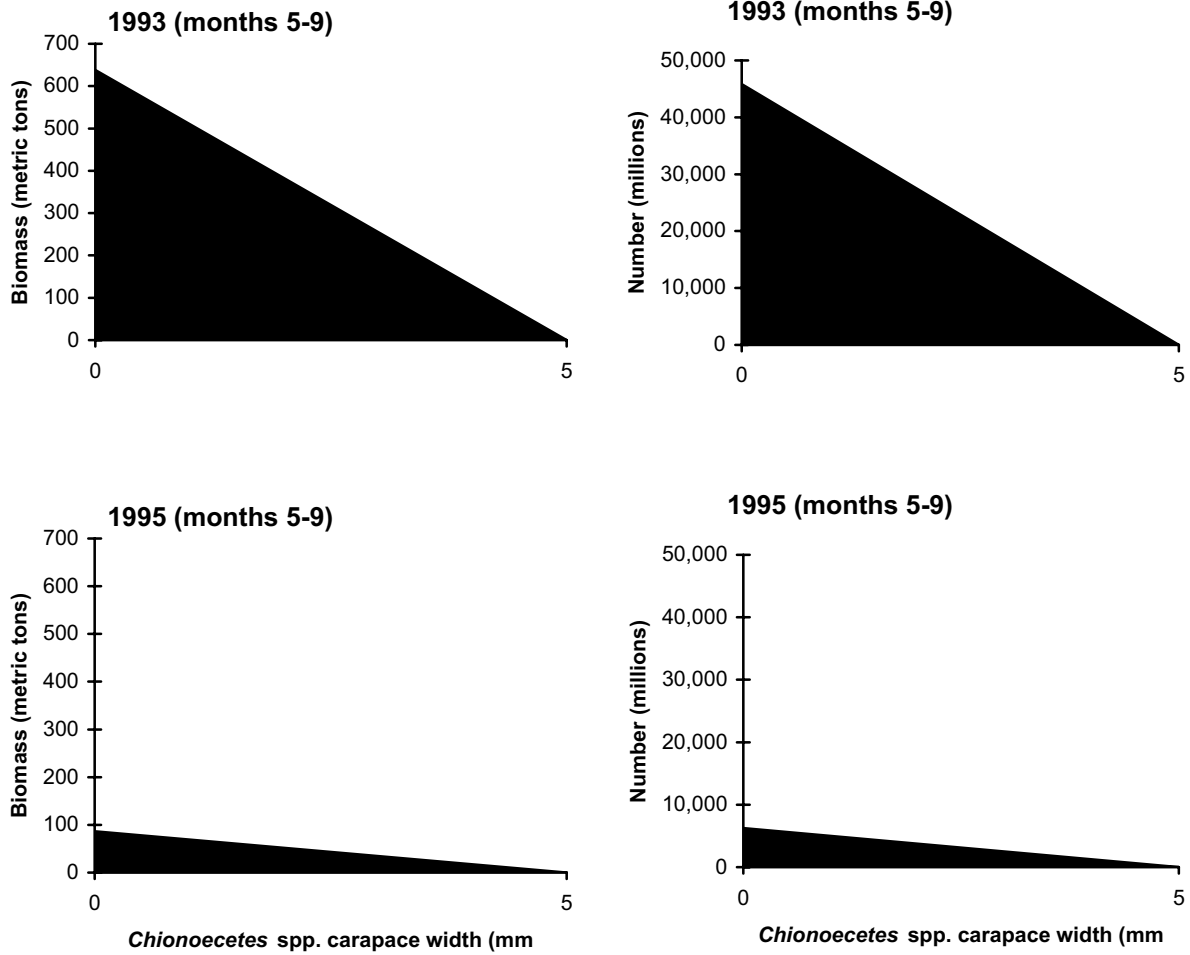


Figure C-20. -- Biomass and number of unidentified *Chionoecetes* consumed by flathead sole (*Hippoglossoides elassodon*) during May through September of 1993 and 1995 by prey size.

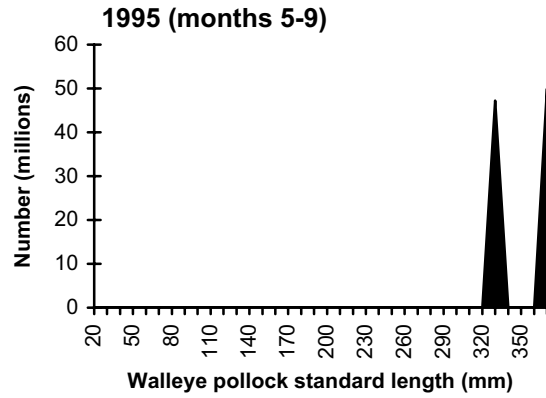
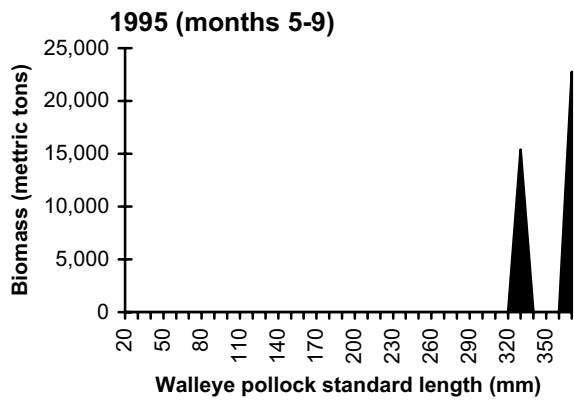
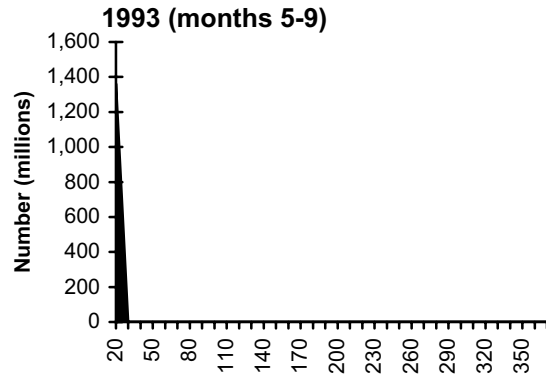
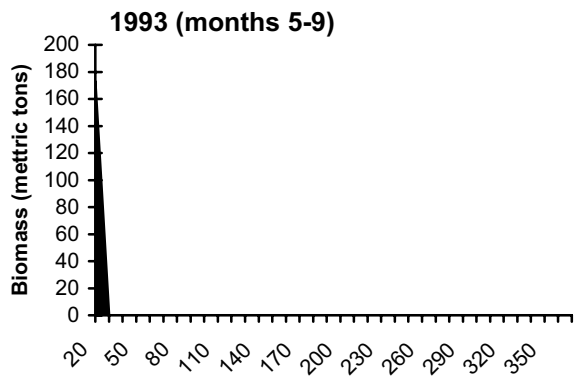


Figure C-21. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by northern rock sole (*Lepidopsetta polyxystra*) during May through September of 1993 and 1995 by prey size.

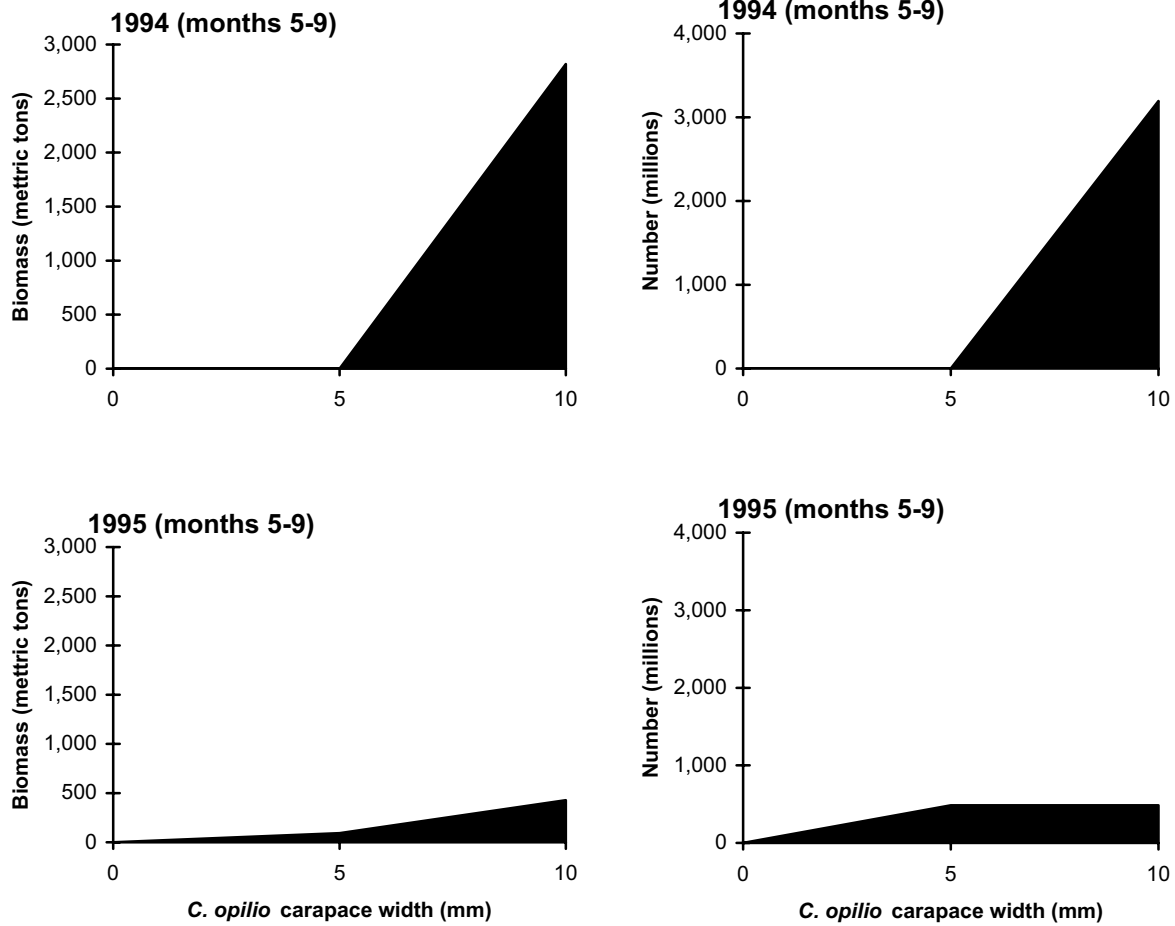


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APPENDIX D. - GREENLAND TURBOT (*Reinhardtius hippoglossoides*)

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Table D-1.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of Greenland turbot (*Reinhardtius hippoglossoides*) in the eastern Bering Sea for 1993 through 1996, from the bottom trawl survey.

Predator Size (cm)	Stratum	93	94	95	96
<30	1				
	2				
	3				
	4	35	1	1	22
	5				
	6	169	16	49	2
Subtotal		204	17	50	24
30-49	1				
	2				
	3				
	4	983	392	38	154
	5				
	6	4,695	6,348	3,523	701
Subtotal		5,678	6,740	3,561	855
>50	1				
	2				
	3		2,124	1,040	1,581
	4	2,338	1,690	855	5,741
	5	769	216	221	808
	6	21,409	37,983	29,052	21,284
Subtotal		24,516	42,013	31,168	29,414
Total		30,398	48,770	34,779	30,293

Table D-2.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Greenland turbot (*Reinhardtius hippoglossoides*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Amphipoda Hyperiidea (amphipod)	4.00	4.00
<i>Crangon communis</i> (shrimp)	0.09	0.80
Natantia (shrimp)	0.03	2.67
Osteichthyes Teleostei (fish)	4.89	16.33
Gadidae (gadid fish)	3.60	9.33
<i>Theragra chalcogramma</i> (walleye pollock)	87.39	72.53
Unidentified organic material	0.01	1.00

Total prey weight	6,905 g
Total non-empty stomachs	69
Total empty stomachs	31
Number of hauls	25

Table D-3.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Greenland turbot (*Reinhardtius hippoglossoides*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Caridea (shrimp)	0.01	0.87
Pandalidae (shrimp)	0.11	0.87
Osteichthyes Teleostei (fish)	4.47	9.35
Non-gadoid Fish Remains	0.13	0.87
Gadidae (gadid fish)	9.16	12.68
<i>Gadus macrocephalus</i> (Pacific cod)	2.23	0.87
<i>Theragra chalcogramma</i> (walleye pollock)	83.61	79.71
Zoarcidae (eelpout)	0.18	1.45
Unidentified organic material	0.09	2.17

Total prey weight 10,010 g
Total non-empty stomachs 67
Total empty stomachs 26
Number of hauls 23

Table D-4.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Greenland turbot (*Reinhardtius hippoglossoides*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Euphausiidae (euphausiid)	<0.01	2.22
Caridea (shrimp)	0.04	1.67
<i>Pandalus</i> sp. (shrimp)	0.21	2.22
Osteichthyes Teleostei (fish)	3.27	6.22
Non-gadoid Fish Remains	0.22	3.89
Gadidae (gadid fish)	2.56	7.63
<i>Gadus macrocephalus</i> (Pacific cod)	2.97	5.56
<i>Theragra chalcogramma</i> (walleye pollock)	84.59	94.30
Zoarcidae (eelpout)	0.34	1.33
Pleuronectidae (flatfish)	0.08	2.44
<i>Hippoglossoides elassodon</i> (flathead sole)	5.71	2.22

Total prey weight	9,331 g
Total non-empty stomachs	55
Total empty stomachs	20
Number of hauls	15

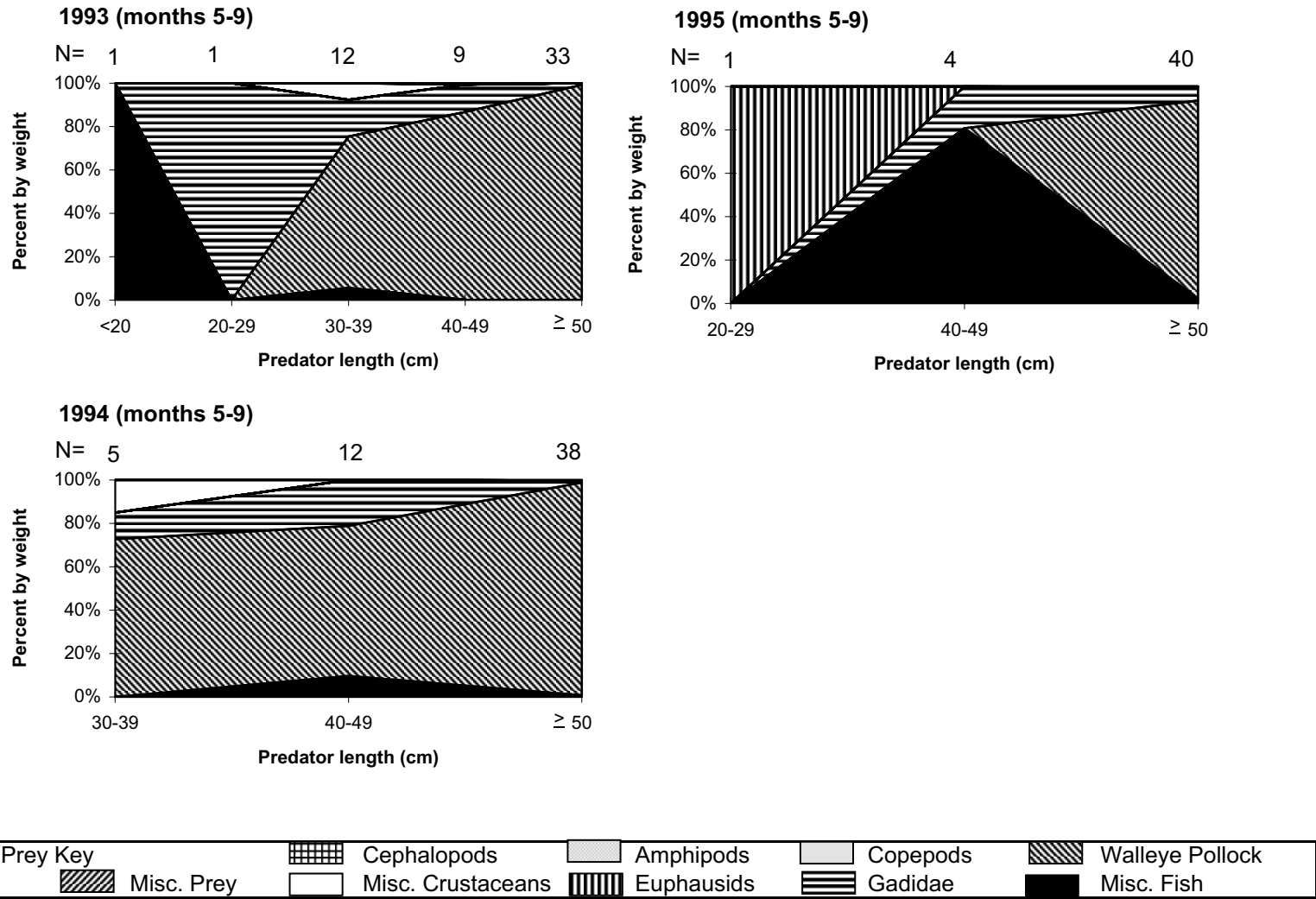


Figure D-1. -- Diet composition of Greenland turbot, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

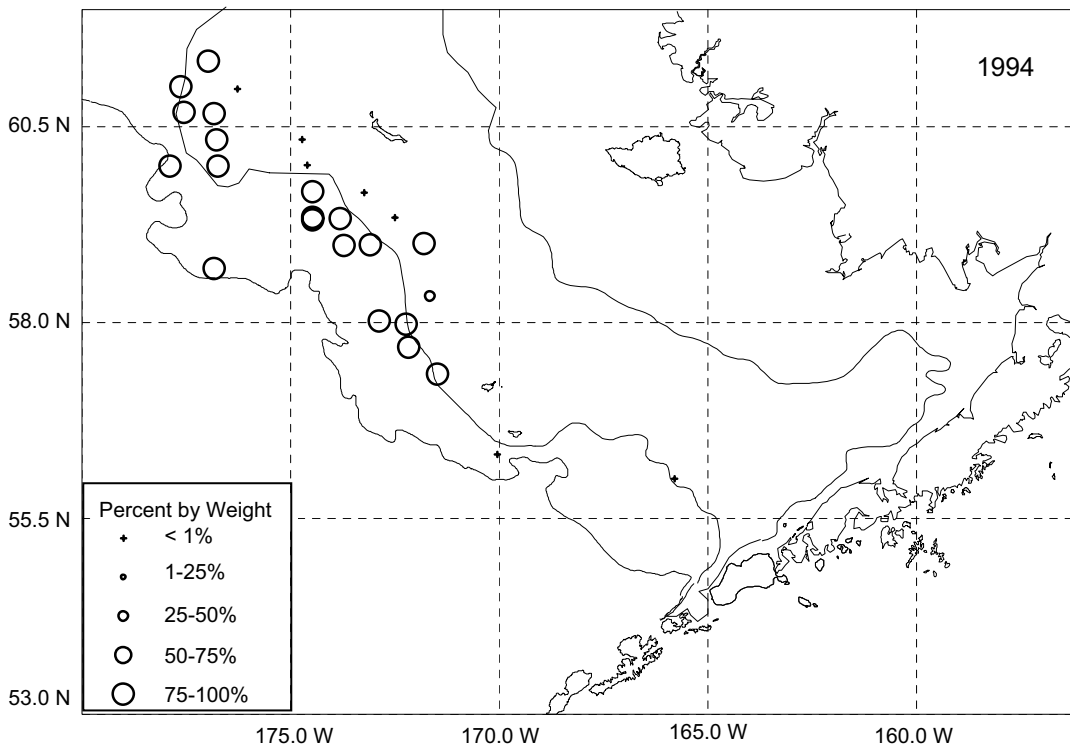
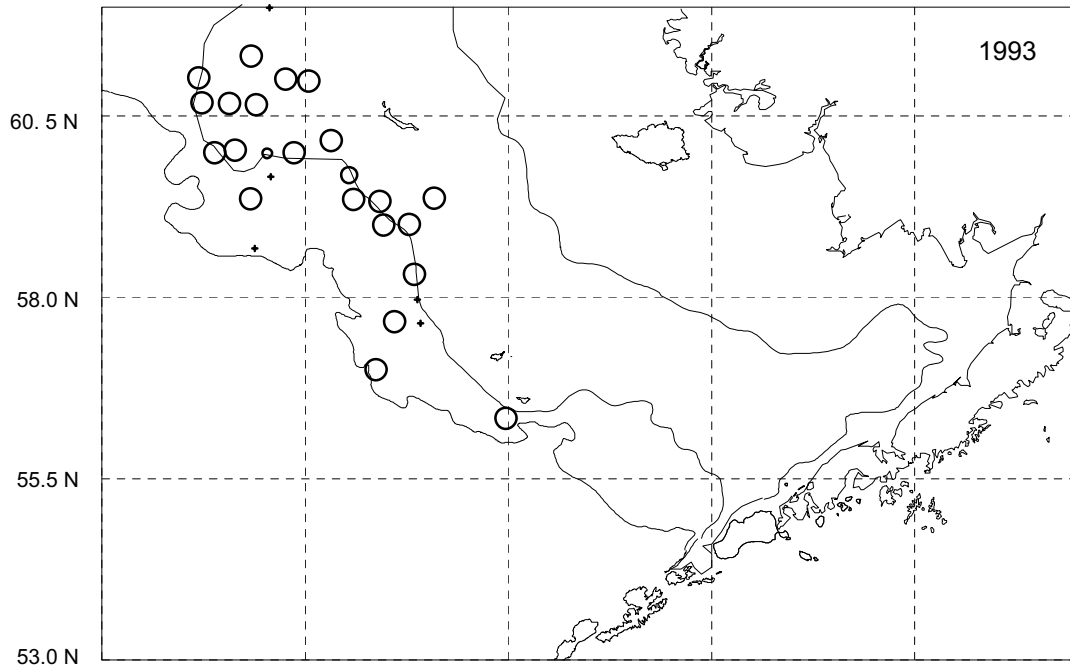


Figure D-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of Greenland turbot (*Reinhardtius hippoglossoides*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

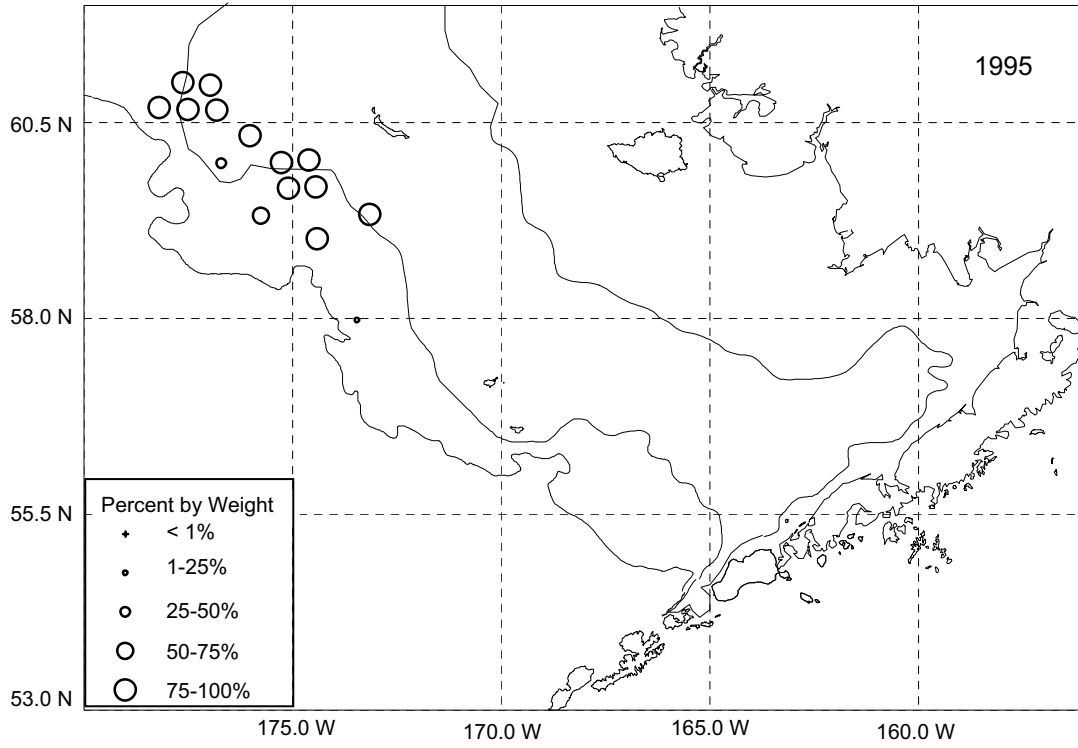


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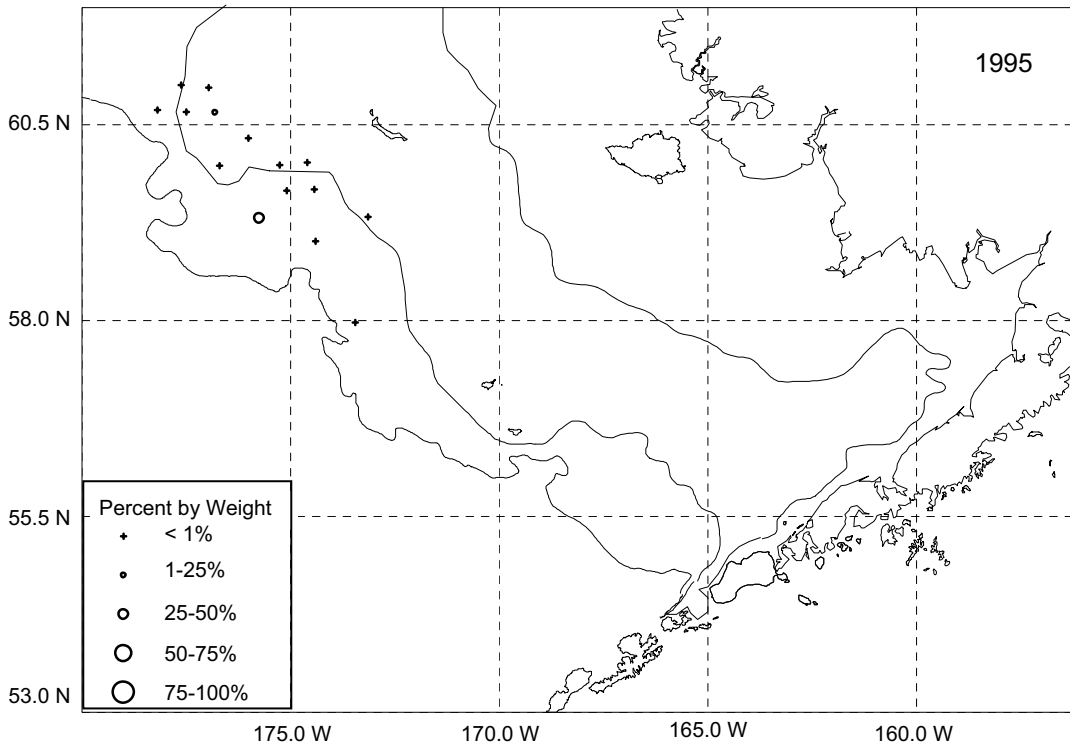
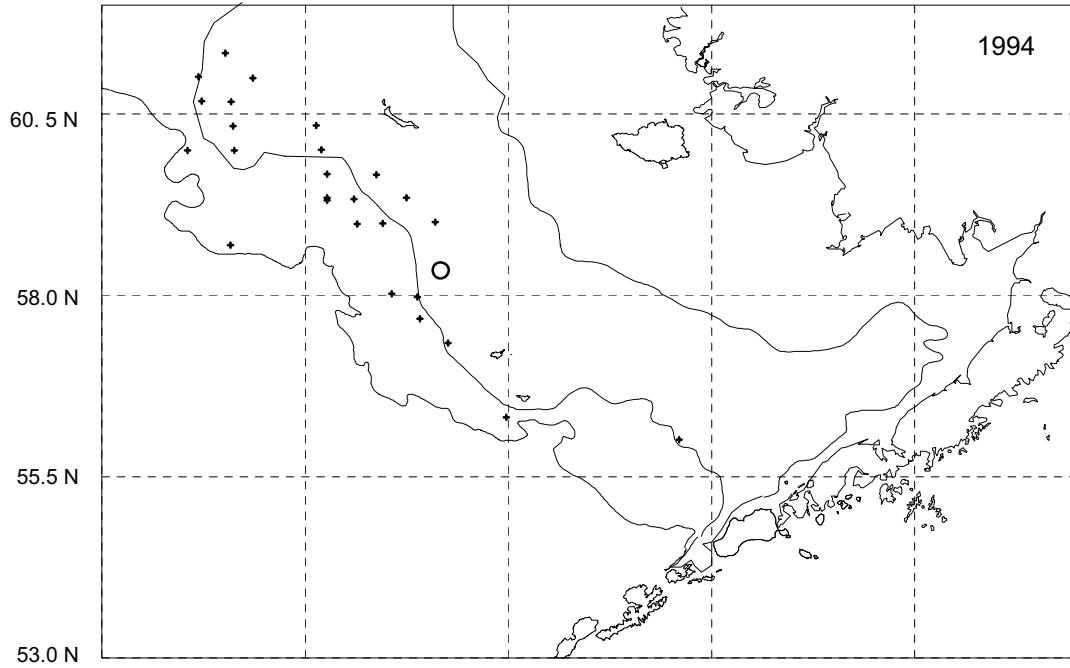


Figure D-3.-- Percent by weight of Pacific cod (*Gadus macrocephalus*) in the diet of Greenland turbot (*Reinhardtius hippoglossoides*) by sampling station during May through September in 1994 and 1995 in the eastern Bering Sea.

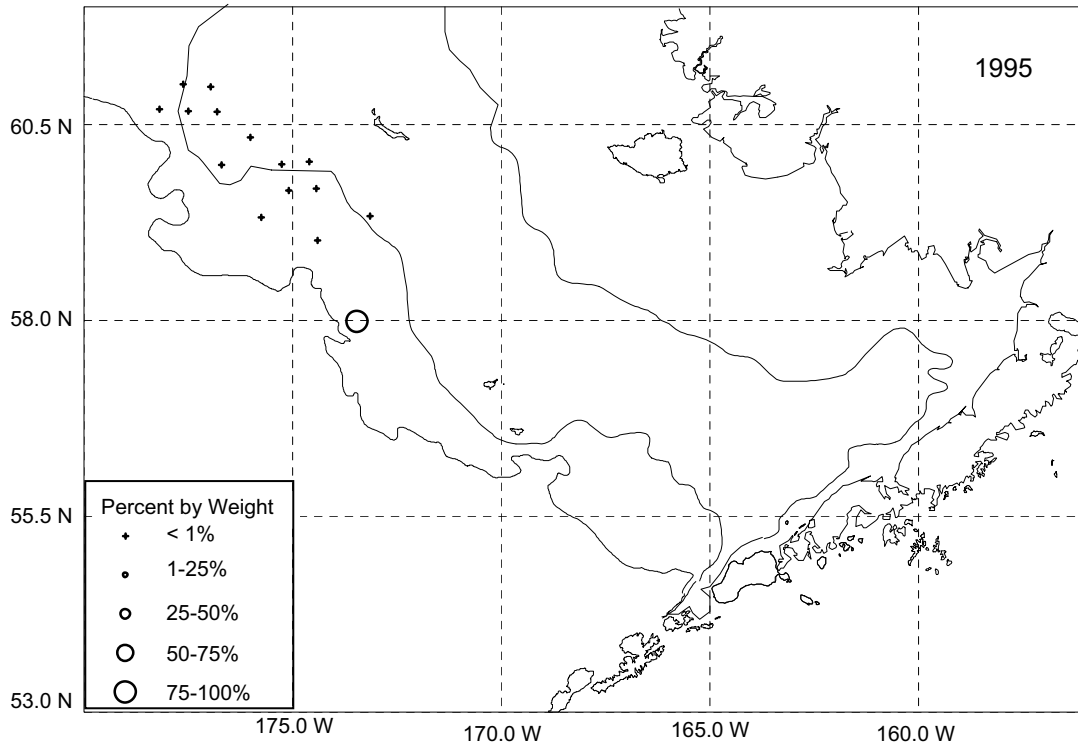


Figure D-4.-- Percent by weight of flathead sole (*Hippoglossoides elassodon*) in the diet of Greenland turbot (*Reinhardtius hippoglossoides*) by sampling station during May through September in 1995 in the eastern Bering Sea.

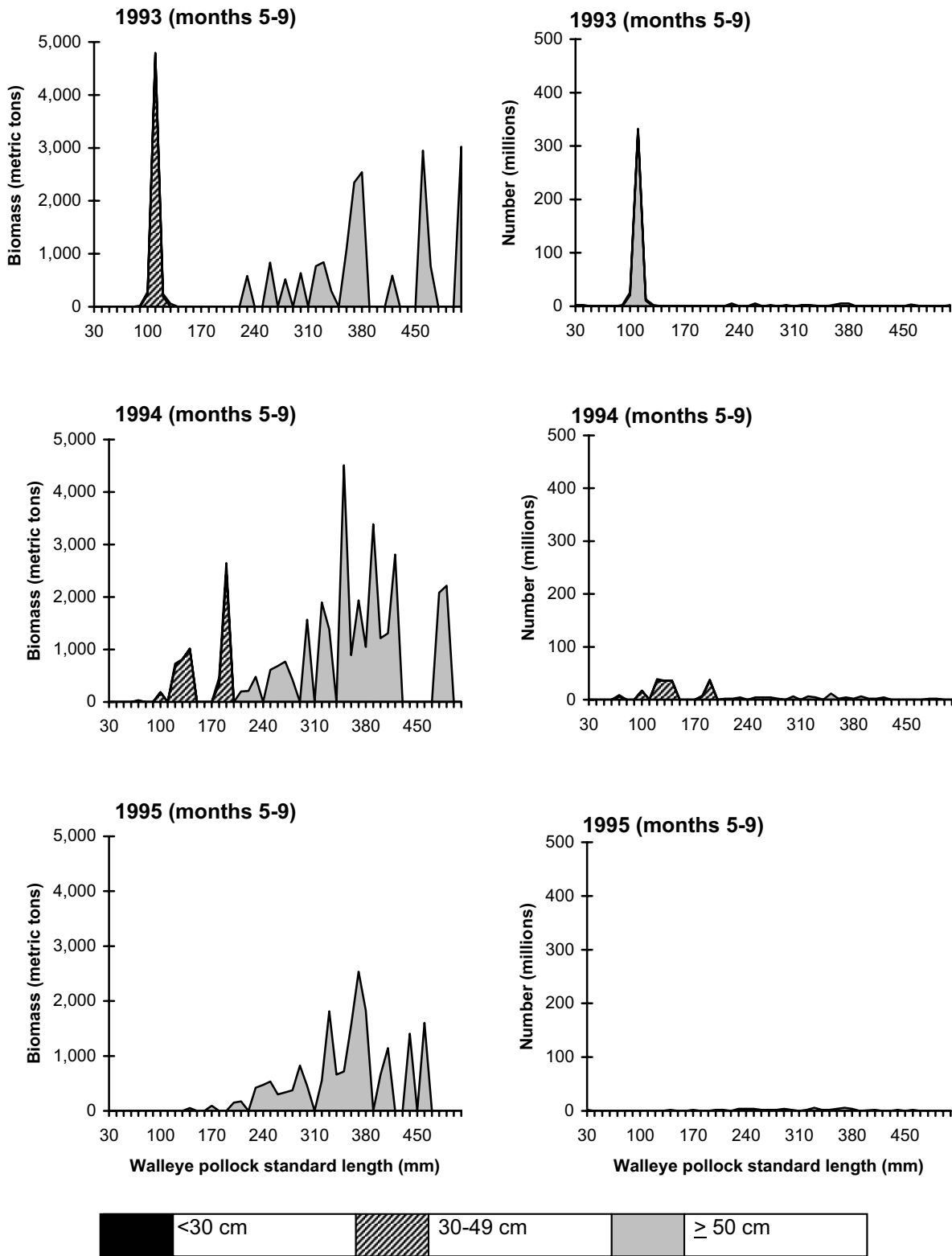


Figure D-5. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by three size groups of Greenland turbot (*Reinhardtius hippoglossoides*) during May through September of 1993, 1994, and 1995 by prey size.

APPENDIX E. - ARROWTOOTH FLOUNDER (*Atherestes stomias*)

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Table E-1.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of arrowtooth flounder (*Atheresthes stomias*) in the eastern Bering Sea for 1993 through 1996, from the bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
< 20	1	15	0	0	7
	2	0	0	0	0
	3	390	436	134	180
	4	208	943	259	27
	5	452	190	273	533
	6	254	876	428	237
Subtotal		1,319	2,445	1,094	984
20-39	1	2,074	1,348	424	39
	2				
	3	49,901	39,664	28,689	23,459
	4	8,715	6,992	6,981	4,410
	5	32,831	37,381	34,983	42,357
	6	20,104	20,441	16,691	18,890
Subtotal		113,625	105,826	87,768	89,155
> 40	1	3,666	4,735	1,720	2,534
	2				
	3	72,882	122,301	115,352	133,812
	4	16,434	13,907	3,887	24,109
	5	116,353	135,335	135,623	135,002
	6	214,483	186,057	135,362	170,761
Subtotal		423,818	462,335	391,944	466,218
Total		538,762	570,606	480,806	556,357

Table E-2.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of arrowtooth flounder (*Atheresthes stomias*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	0.02	0.35
Gastropoda (snail)	0.04	0.15
Bivalvia (clam)	<0.01	0.23
Nuculidae	0.10	0.35
Teuthoidea (squid)	0.17	0.28
Mysidae (mysid)	0.04	0.42
Gammaridea (amphipod)	0.06	0.30
Euphausiacea (euphausiid)	4.49	6.87
Euphausiidae (euphausiid)	2.63	2.90
Caridea (shrimp)	0.34	1.51
Hippolytidae (shrimp)	0.25	0.69
Pandalidae (shrimp)	1.43	2.45
<i>Pandalus</i> sp. (shrimp)	0.19	0.62
<i>Pandalus borealis</i> (shrimp)	0.17	0.73
Crangonidae (shrimp)	0.35	2.89
<i>Crangon</i> sp. (shrimp)	0.01	0.52
<i>Crangon dalli</i> (shrimp)	1.52	2.85
<i>Crangon communis</i> (shrimp)	0.31	0.63
Natantia (shrimp)	0.05	1.27
Ophiuroidea Ophiurida (brittle star)	0.02	0.54
Osteichthyes Teleostei (fish)	4.32	12.62
Non-gadoid Fish Remains	5.15	7.41
Osmeridae (smelts)	1.13	1.10
<i>Mallotus villosus</i> (capelin)	2.25	1.50
Gadidae (gadid fish)	8.53	13.30
<i>Theragra chalcogramma</i> (walleye pollock)	53.45	39.36
Zoarcidae (eelpout)	8.75	5.95
<i>Lycodes palearis</i> (wattled eelpout)	0.11	0.20
Cottoidei (sculpin)	0.07	0.15
Cottidae (sculpin)	0.05	0.25
Stichaeidae (prickleback)	1.43	0.87
<i>Atheresthes stomias</i> (arrowtooth flounder)	0.43	0.23
<i>Hippoglossoides elassodon</i> (flathead sole)	2.04	1.17
Unidentified organic material	0.04	0.84
Fishery discards	0.07	0.28

Total prey weight	8,129 g
Total non-empty stomachs	406
Total empty stomachs	177
Number of hauls	72

Table E-3.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of arrowtooth flounder (*Atheresthes stomias*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Hydrozoa Hydroida (hydroid)	0.09	0.34
Scyphozoa (jellyfish)	0.15	2.07
Polychaeta (worm)	0.07	1.49
Ampharetidae (polychaete)	0.02	0.17
Bivalvia (clam)	0.07	0.92
Teuthoidea (squid)	<0.01	0.25
Crustacea	0.02	0.34
Mysidacea Mysida (mysid)	1.86	2.93
Gammaridea (amphipod)	0.95	0.95
Euphausiacea (euphausiid)	0.74	5.80
Euphausiidae (euphausiid)	5.83	12.38
<i>Thysanoessa inermis</i> (euphausiid)	0.61	0.52
<i>Thysanoessa longipes</i> (euphausiid)	<0.01	0.25
<i>Thysanoessa raschii</i> (euphausiid)	2.33	2.24
<i>Thysanoessa spinifera</i> (euphausiid)	0.33	1.28
Caridea (shrimp)	1.99	2.01
<i>Eualus gaimurdii</i> (shrimp)	0.96	0.86
Pandalidae (shrimp)	0.72	2.22
<i>Pandalus</i> sp. (shrimp)	0.11	0.42
<i>Pandalus borealis</i> (shrimp)	0.36	0.54
<i>Pandalopsis dispar</i> (sidestripe shrimp)	0.04	0.43
Crangonidae (shrimp)	0.76	1.90
<i>Crangon</i> sp. (shrimp)	0.03	0.33
<i>Crangon dalli</i> (shrimp)	0.05	0.63
<i>Crangon communis</i> (shrimp)	0.04	0.36
<i>Argis</i> sp. (shrimp)	0.77	0.94
<i>Argis lar</i> (shrimp)	0.07	0.19
Natantia (shrimp)	1.86	2.83
<i>Pagurus aleuticus</i>	0.12	0.25
Larvacea Copelata	0.15	0.17
Osteichthyes Teleostei (fish)	10.29	14.19
Non-gadoid Fish Remains	2.91	3.32
Fish eggs	0.29	0.34
Osmeridae (smelts)	0.24	0.34
<i>Mallotus villosus</i> (capelin)	1.55	0.86
<i>Thaleichthys pacificus</i> (eulachon)	3.06	2.16
Gadidae (gadid fish)	9.70	11.27
<i>Theragra chalcogramma</i> (walleye pollock)	45.63	34.52
Zoarcidae (eelpout)	0.89	1.58
<i>Lycodes palearis</i> (wattled eelpout)	0.58	0.43
Scorpaenidae	0.52	2.07
Cottoidei (sculpin)	0.86	0.89
Stichaeidae (prickleback)	0.65	0.94
Unidentified organic material	1.74	3.05
Unidentified tube	<0.01	0.17

Total prey weight	4,276 g
Total non-empty stomachs	294
Total empty stomachs	253
Number of hauls	58

Table E-4.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of arrowtooth flounder(*Atheresthes stomias*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Scyphozoa (jellyfish)	<0.01	0.16
Polychaeta (worm)	4.09	9.01
Maldanidae (polychaete)	0.05	0.13
Bivalvia (clam)	0.82	0.48
Teuthoidea oegopsida (squid)	3.25	2.69
Crustacea	0.05	0.33
Calanoida (copepod)	0.01	0.10
Mysidacea Mysida (mysid)	0.15	1.69
Mysidae (mysid)	0.02	0.36
Gammaridea (amphipod)	0.14	0.56
Amphipoda Hyperiidea (amphipod)	<0.01	0.16
Euphausiacea (euphausiid)	3.20	5.58
Euphausiidae (euphausiid)	5.36	9.76
<i>Thysanoessa</i> sp. (euphausiid)	0.47	2.36
<i>Thysanoessa inermis</i> (euphausiid)	1.58	1.18
<i>Thysanoessa raschii</i> (euphausiid)	0.39	0.52
<i>Thysanoessa spinifera</i> (euphausiid)	0.17	0.36
Caridea (shrimp)	0.19	0.69
Pandalidae (shrimp)	1.61	2.12
<i>Pandalus</i> sp. (shrimp)	0.86	1.31
<i>Pandalus borealis</i> (shrimp)	0.03	0.18
<i>Pandalus goniurus</i> (shrimp)	0.21	0.22
Crangonidae (shrimp)	0.33	0.69
<i>Crangon</i> sp. (shrimp)	1.04	1.09
<i>Crangon alaskensis</i> (shrimp)	0.03	0.06
<i>Crangon dalli</i> (shrimp)	0.01	0.36
<i>Crangon communis</i> (shrimp)	1.25	1.30
<i>Argis</i> sp. (shrimp)	0.09	0.20
Natantia (shrimp)	0.39	0.94
Paguridae (hermit crab)	0.02	0.13
<i>Chionoecetes opilio</i> (snow crab)	<0.01	0.04
Ophiuroidea Euryalina (basket star)	0.02	0.20
Ophiuridae (brittle star)	0.16	0.20
Osteichthyes Teleostei (fish)	7.34	15.41
Non-gadoid Fish Remains	6.31	4.87
<i>Thaleichthys pacificus</i> (eulachon)	1.74	0.44
Gadidae (gadid fish)	15.45	12.26
<i>Gadus macrocephalus</i> (Pacific cod)	0.10	0.09
<i>Theragra chalcogramma</i> (walleye pollock)	31.59	22.82
Zoarcidae (eelpout)	2.74	1.80
<i>Lycodes brevipes</i> (shortfin eelpout)	1.69	0.56
Cottoidei (sculpin)	0.72	0.32
<i>Icelus spiniger</i> (thorny sculpin)	0.46	0.29
Stichaeidae (prickleback)	0.20	0.87
<i>Poroclinus</i> sp. (prickleback)	0.58	0.48
<i>Poroclinus rothrocki</i> (whitebarred prickleback)	0.07	0.24
Pleuronectidae (flatfish)	2.53	0.90
Unidentified organic material	1.84	3.55
Fishery discards	0.66	0.48

Total prey weight	3,176 g
Total non-empty stomachs	461
Total empty stomachs	306
Number of hauls	70

Table E-5.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of arowtooth flounder (*Atheresthes stomias*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	0.70	5.95
Polynoidae (polychaete)	0.10	1.72
Gastropoda (snail)	0.00	0.05
Cephalopoda (squid & octopus)	0.05	0.34
Crustacea	0.00	0.34
Copepoda	0.00	0.22
Mysidacea Mysida (mysid)	0.95	2.51
Cumacea (cumacean)	0.00	0.19
Gammaridea (amphipod)	2.83	2.03
Euphausiacea (euphausiid)	5.03	5.41
Euphausiidae (euphausiid)	1.36	2.27
<i>Thysanoessa</i> sp. (euphausiid)	0.01	0.65
<i>Thysanoessa inermis</i> (euphausiid)	0.05	0.99
<i>Thysanoessa spinifera</i> (euphausiid)	0.07	0.91
Caridea (shrimp)	0.11	1.90
<i>Pandalus</i> sp. (shrimp)	0.12	0.07
<i>Crangon communis</i> (shrimp)	0.86	1.15
<i>Argis</i> sp. (shrimp)	0.03	0.78
Anomura (crab)	0.12	0.29
Paguridae (hermit crab)	0.43	0.36
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.02	1.72
Osteichthyes	0.00	0.86
Osteichthyes Teleostei (fish)	5.98	11.57
Non-gadoid Fish Remains	2.13	1.20
Gadidae (gadid fish)	8.36	11.20
<i>Theragra chalcogramma</i> (walleye pollock)	60.37	48.46
Zoarcidae (eelpout)	4.64	3.40
<i>Lycodes brevipes</i> (shortfin eelpout)	1.61	1.72
Pleuronectidae (flatfish)	2.13	1.58
<i>Hippoglossoides elassodon</i> (flathead sole)	0.93	0.43
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.39	0.16
Unidentified organic material	0.03	0.63
Unidentified worm-like organism	0.12	0.43
Fishery discards	0.48	0.05

Total prey weight	4,489 g
Total non-empty stomachs	435
Total empty stomachs	149
Number of hauls	58

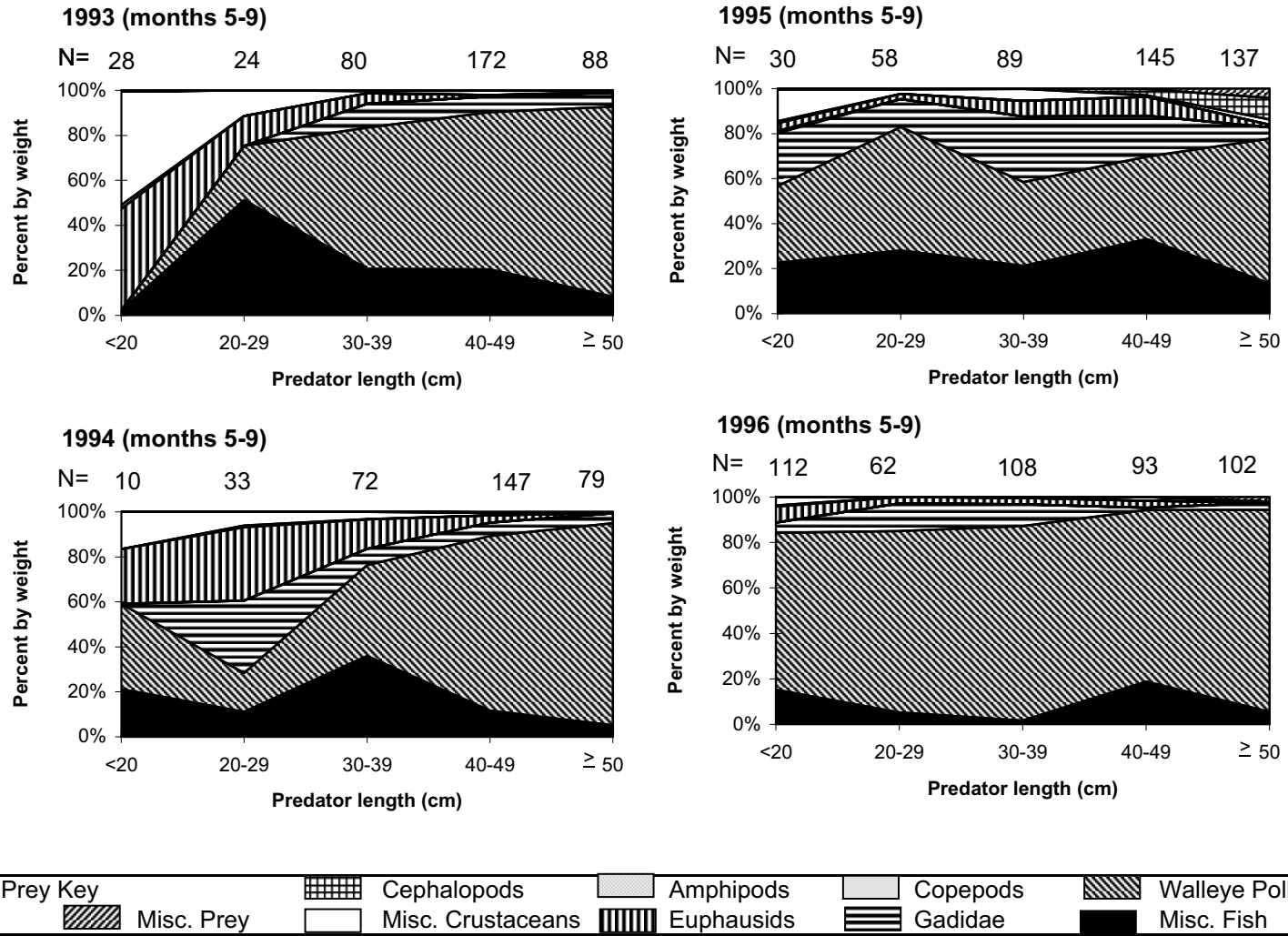


Figure E-1 -- Diet composition of arrowtooth flounder, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

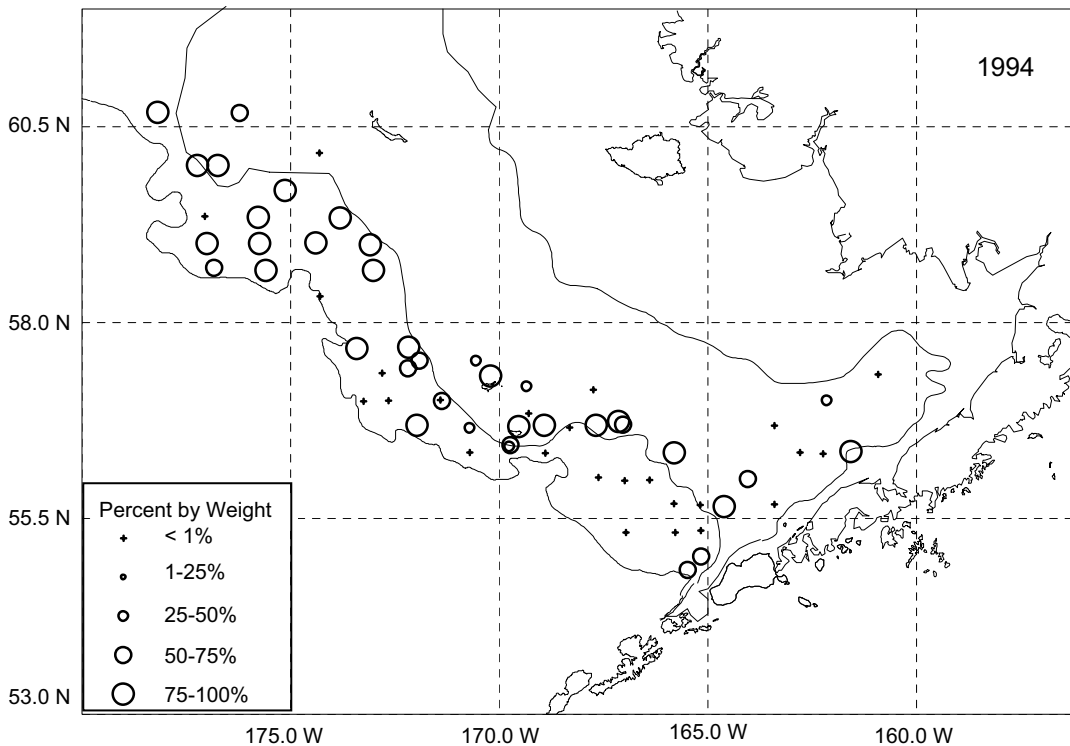
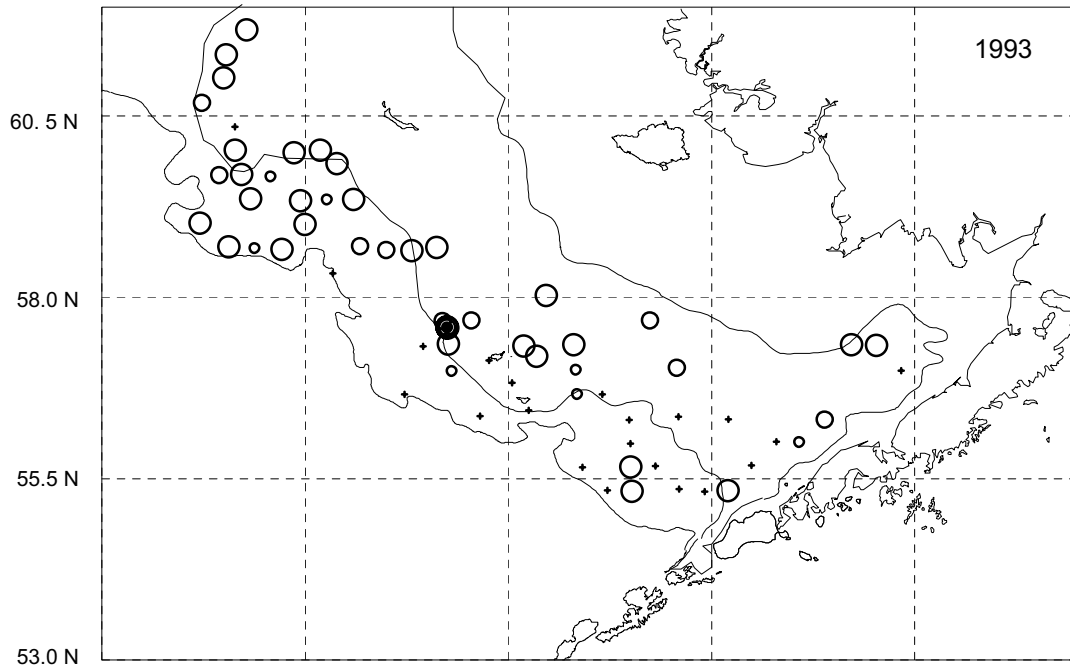


Figure E-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of arrowtooth flounder (*Atheresthes stomias*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

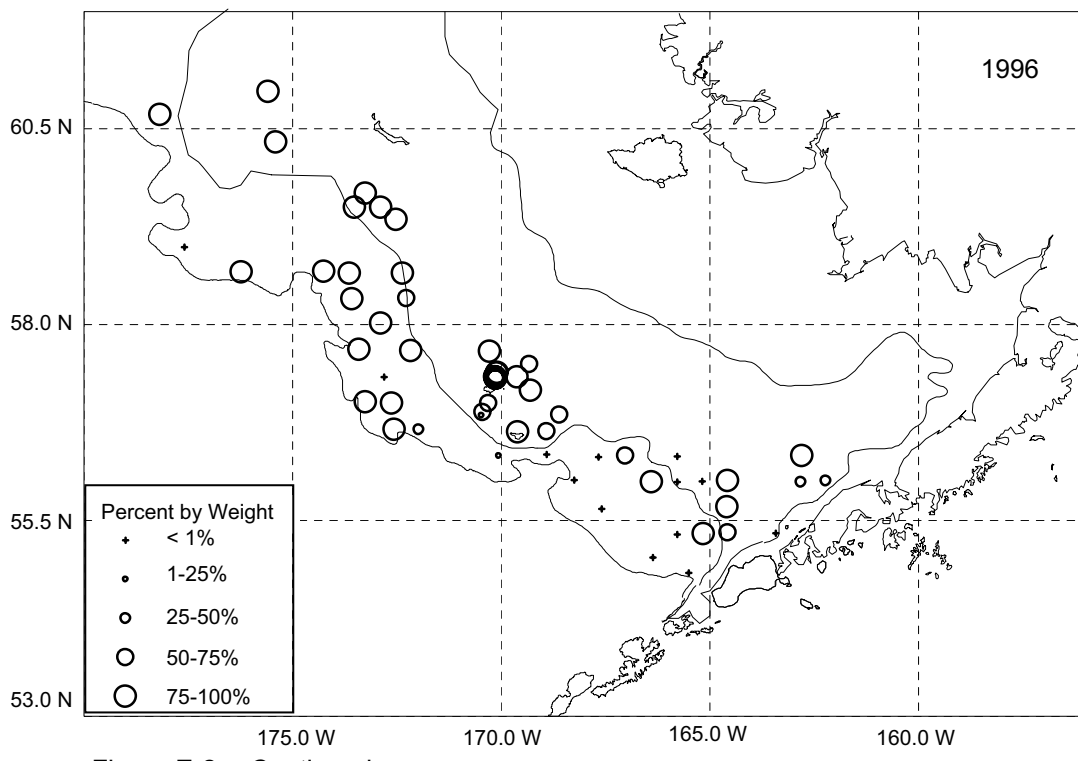
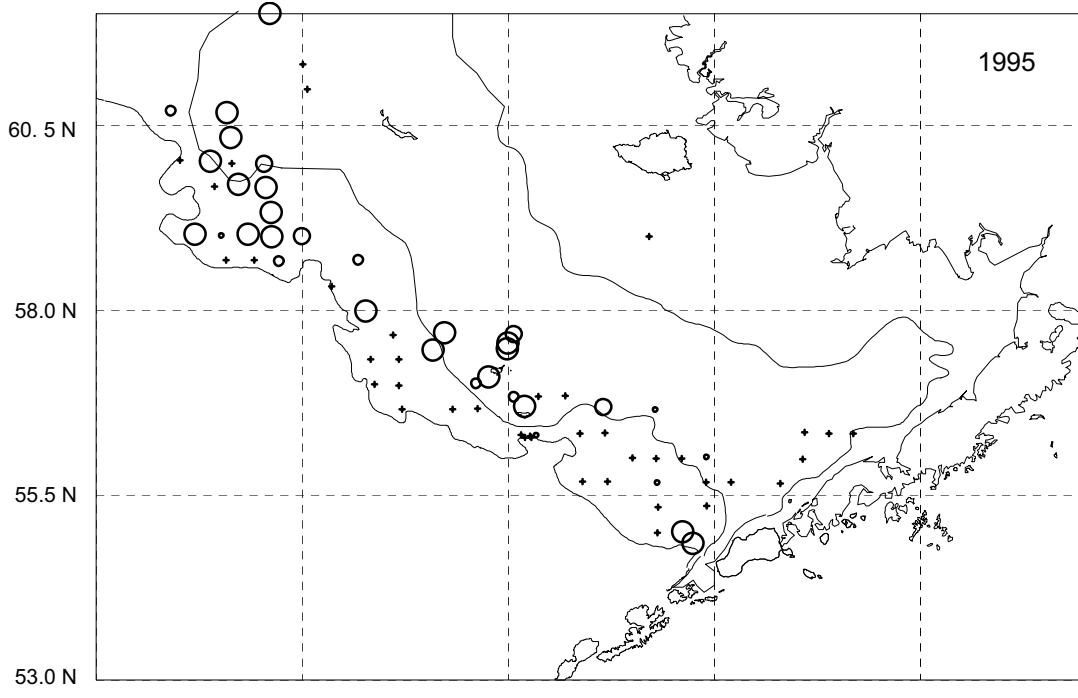


Figure E-2.-- Continued.

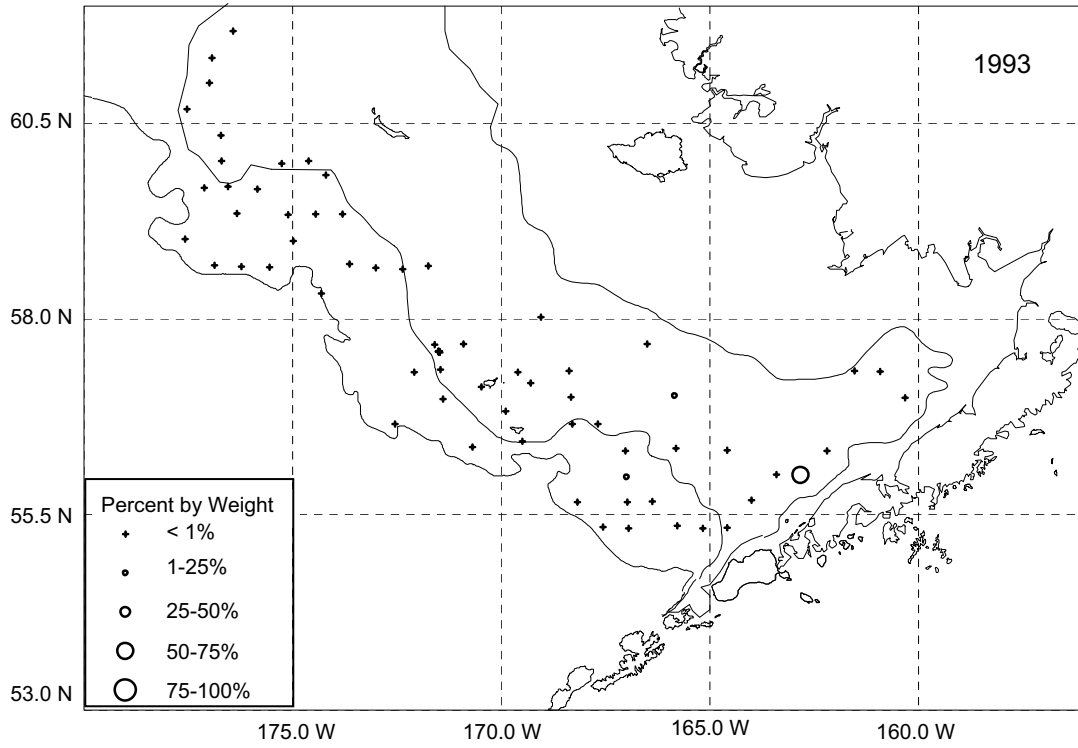


Figure E-3.-- Percent by weight of smelts (osmeriids) in the diet of arrowtooth flounder (*Atheresthes stomias*) by sampling station during May through September in 1993 in the eastern Bering Sea.

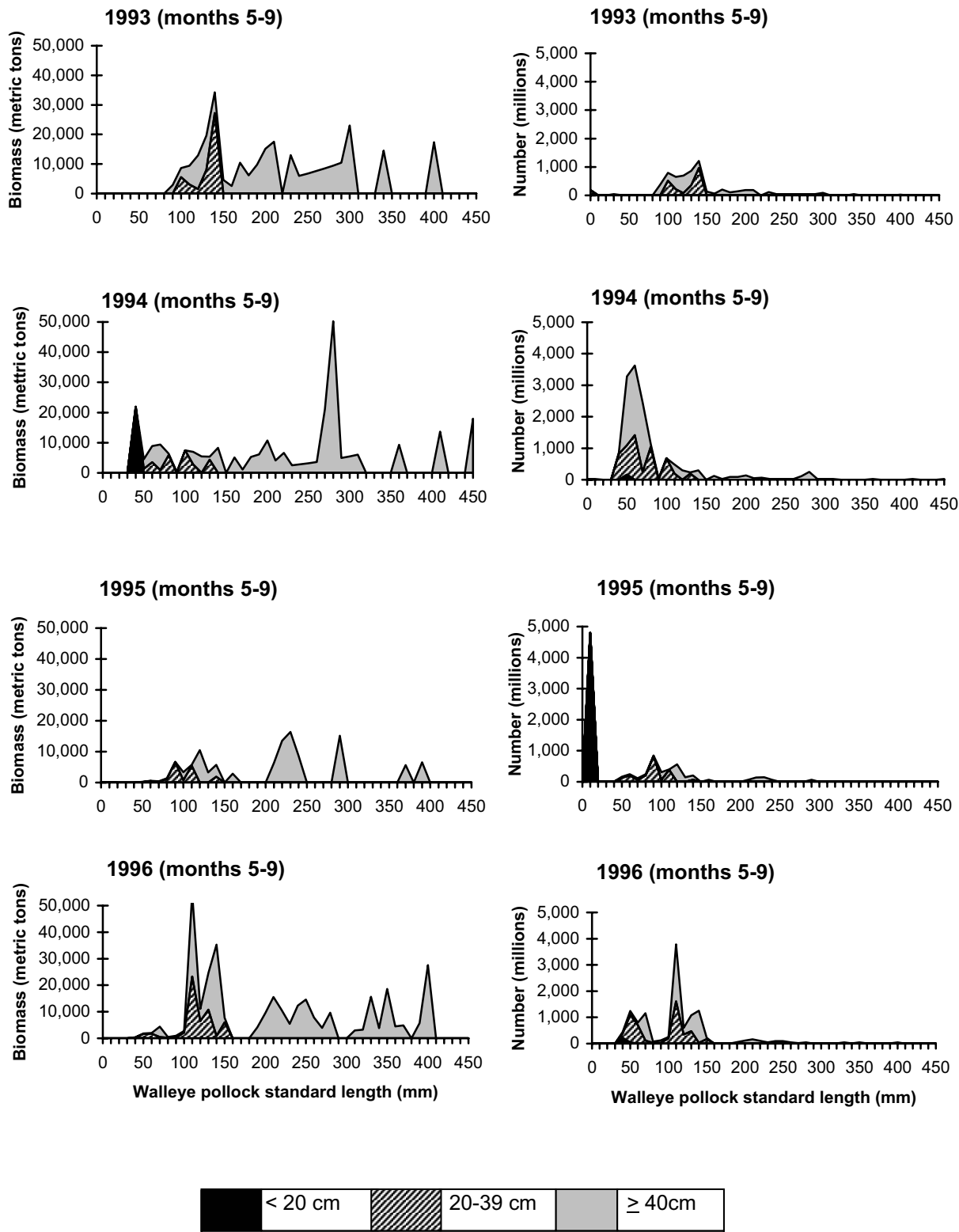


Figure E-4. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by three size groups of arrowtooth flounder (*Atheresthes stomias*) during May through September of 1993, 1994, 1995, and 1996 by prey size.

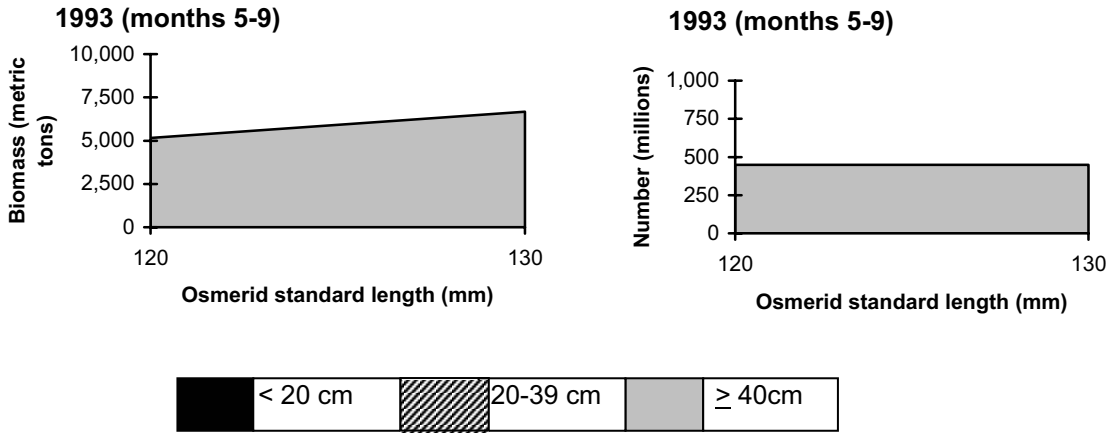


Figure E-5. -- Estimated biomass and numbers of Osmerid consumed by three size groups of arrowtooth flounder in the eastern Bering Sea in 1993 (months 5-9).

APPENDIX F. - PACIFIC HALIBUT (*Hippoglossus stenolepis*)

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Table F-1.-- Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of Pacific halibut (*Hippoglossus stenolepis*) in the eastern Bering Sea for 1993 through 1996, from bottom trawl shelf survey estimates of Pacific halibut < 80cm and CAGEAN model estimates of \geq 80 cm Pacific halibut.

Predator Size (cm)	Stratum	93	94	95	96
< 30	1	34	174	18	154
	2	16	7	25	1
	3	6	0	27	9
	4	0	4	0	0
	5	0	0	0	0
	6	0	0	0	0
Subtotal		56	185	70	164
30-59	1	19,521	8,954	5,359	4,179
	2	7,918	2,949	4,075	3,011
	3	8,271	8,986	4,731	1,968
	4	9,983	7,138	2,357	983
	5	831	808	1,157	182
	6	3,220	3,191	1,783	776
Subtotal		49,744	32,026	19,462	11,099
> 60	1	28,708	34,273	28,933	30,711
	2	7,183	7,259	9,667	11,096
	3	18,154	31,631	32,146	28,997
	4	16,445	12,945	13,666	17,364
	5	14,657	14,247	19,222	11,940
	6	26,337	30,765	30,678	59,105
Subtotal		111,484	131,120	134,312	159,213
Total		161,284	163,331	153,844	170,476

Table F-2.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Pacific halibut (*Hippoglossus stenolepis*) collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Anthozoa (anemome)	0.85	1.45
Polychaeta (worm)	0.00	0.14
Hirudinea (leech)	0.01	0.18
Gastropoda (snail)	0.05	1.30
Buccinidae (snail)	0.00	0.54
Bivalvia (clam)	0.00	0.85
<i>Yoldia</i> sp. (clam)	0.01	0.30
Octopoda (octopus)	0.09	2.58
<i>Octopus</i> sp. (octopus)	1.97	2.17
Mysidae (mysid)	0.00	0.11
Gammaridea (amphipod)	0.03	1.70
Caprellidea (amphipod)	0.01	0.54
Euphausiacea (euphausiid)	0.24	1.59
Reptantia (crab)	0.05	1.65
Caridea (shrimp)	0.02	1.00
Pandalidae (shrimp)	0.79	3.24
<i>Pandalus</i> sp. (shrimp)	0.01	0.24
<i>Pandalus borealis</i> (shrimp)	0.05	0.42
<i>Pandalus goniurus</i> (shrimp)	1.11	1.47
Crangonidae (shrimp)	0.03	0.56
<i>Crangon dalli</i> (shrimp)	1.19	2.93
<i>Argis lar</i> (shrimp)	0.09	0.59
Paguridae (hermit crab)	11.65	29.26
<i>Elassochirus cavimanus</i> (purple hermit crab)	0.02	0.27
Lithodidae (king crab)	0.12	0.12
<i>Paralithodes</i> sp. (king crab)	0.18	0.11
<i>Hyas</i> sp. (lyre crab)	0.17	0.54
<i>Hyas lyratus</i> (lyre crab)	0.05	0.27
<i>Chionoecetes</i> sp. (snow and Tanner crab)	1.38	3.23
<i>Chionoecetes opilio</i> (snow crab)	5.21	18.65
<i>Chionoecetes bairdi</i> (Tanner crab)	1.14	9.47
<i>Telmessus cheiragonus</i> (hair crab)	0.09	0.14
<i>Pinnixa</i> sp. (pea crab)	0.00	0.22
Echiura (marine worm)	0.05	0.22
Ectoprocta (bryozoan)	0.00	0.12
Ophiuroidea Ophiurida (brittle star)	0.00	0.36
Osteichthyes Teleostei (fish)	2.50	6.46
Non-gadoid Fish Remains	1.35	4.17
Osmeridae (smelts)	0.16	0.66
<i>Mallotus villosus</i> (capelin)	4.28	3.62
Gadidae (gadid fish)	3.27	9.01
<i>Boreogadus saida</i> (Arctic cod)	0.01	0.11
<i>Gadus macrocephalus</i> (Pacific cod)	0.73	1.28
<i>Theragra chalcogramma</i> (walleye pollock)	44.18	55.54
Zoarcidae (eelpout)	3.68	7.19
<i>Lycodes brevipes</i> (shortfin eelpout)	0.03	0.22
<i>Lycodes palearis</i> (wattled eelpout)	0.83	0.70
Cottoidei (Sculpin)	0.51	0.91
Cottidae (sculpin)	3.15	2.19
Agonidae (poacher)	0.45	0.95
Stichaeidae (prickleback)	0.10	0.58
<i>Ammodytes hexapterus</i> (Pacific sandlance)	1.92	3.57
Pleuronectiformes Pleuronectoidei (flatfish)	0.31	0.74
Pleuronectidae (flatfish)	0.49	1.00
<i>Hippoglossoides elassodon</i> (flathead sole)	0.60	1.90
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.54	1.30
<i>Pleuronectes asper</i> (yellowfin sole)	1.12	0.60
Unidentified organic material	0.38	0.82
Unidentified worm-like organism	0.03	0.14

Table F-2.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Fishery discards	1.27	3.12
Overboard material (non-fishery)	0.45	0.54

Total prey weight	29,678 g
Total non-empty stomachs	356
Total empty stomachs	21
Number of hauls	92

Table F-3.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) Pacific halibut (*Hippoglossus stenolepis*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	<0.01	0.63
Nephtyidae (polychaete)	<0.01	0.53
Gastropoda (snail)	<0.01	0.29
Bivalvia (clam)	0.86	0.36
<i>Nuculana</i> sp. (clam)	<0.01	0.09
Cardiidae (cockle)	0.01	0.10
<i>Clinocardium</i> sp. (cockle)	<0.01	0.32
Octopoda (octopus)	0.49	1.19
<i>Octopus</i> sp. (octopus)	0.79	3.64
Mysidacea Mysida (mysid)	0.02	0.53
Mysidae (mysid)	0.01	0.44
Gammaridea (amphipod)	<0.01	0.63
<i>Thysanoessa</i> sp. (euphausiid)	<0.01	0.18
<i>Thysanoessa raschii</i> (euphausiid)	0.01	0.26
Reptantia (crab)	0.30	0.53
Caridea (shrimp)	0.02	1.21
Hippolytidae (shrimp)	0.01	0.29
Pandalidae (shrimp)	0.30	2.62
<i>Pandalus borealis</i> (shrimp)	0.06	1.52
<i>Pandalus goniurus</i> (shrimp)	0.06	0.33
<i>Pandalus jordani</i> (shrimp)	0.41	0.89
Crangonidae (shrimp)	0.19	1.85
<i>Crangon alaskensis</i> (shrimp)	0.02	1.76
<i>Crangon stylirostris</i> (shrimp)	<0.01	0.40
<i>Crangon dalli</i> (shrimp)	0.56	5.54
<i>Crangon communis</i> (shrimp)	0.06	0.73
<i>Argis</i> sp. (shrimp)	0.02	0.16
<i>Argis dentata</i> (shrimp)	<0.01	0.20
Paguridae (hermit crab)	5.77	16.97
<i>Pagurus aleuticus</i>	1.28	3.82
<i>Pagurus rathbuni</i> (hermit crab)	0.01	0.10
<i>Elassochirus cavimanus</i> (purple hermit crab)	0.03	0.10
Lithodidae (king crab)	0.53	0.68
<i>Hyas</i> sp. (lyre crab)	0.29	0.60
<i>Hyas lyratus</i> (lyre crab)	0.35	0.66
<i>Hyas coarctatus</i> (lyre crab)	0.55	1.02
<i>Chionoecetes</i> sp. (snow and Tanner crab)	2.04	4.31
<i>Chionoecetes opilio</i> (snow crab)	2.97	8.78
<i>Chionoecetes bairdi</i> (Tanner crab)	1.46	4.64
<i>Telmessus cheiragonus</i> (hair crab)	1.10	1.59
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.68	0.32
Sipuncula (marine worm)	0.06	0.40
Echiura (marine worm)	0.01	0.20
Echinodermata (sea star, cucumber, urchin)	0.05	0.32
<i>Ophiura sarsi</i> (brittle star)	<0.01	0.40
Rajidae (skate)	0.10	0.32
Osteichthyes Teleostei (fish)	0.45	4.13
Non-gadoid Fish Remains	3.45	8.21
Osmeridae (smelts)	0.16	0.16
<i>Mallotus villosus</i> (capelin)	0.22	0.61
Gadidae (gadid fish)	1.04	2.50
<i>Gadus macrocephalus</i> (Pacific cod)	1.92	1.80
<i>Theragra chalcogramma</i> (walleye pollock)	48.50	59.37
Zoarcidae (eelpout)	3.25	6.06
<i>Lycodes</i> sp. (eelpout)	0.21	0.32
<i>Lycodes palearis</i> (wattled eelpout)	0.90	1.59
Cottoidei (sculpin)	1.03	2.89
Cottidae (sculpin)	0.27	0.53
<i>Gymnocanthus galeatus</i> (sculpin)	0.57	0.26

Table F-3.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Gymnocanthus pistilliger</i> (threaded sculpin)	0.24	0.18
<i>Myoxocephalus polyacanthocephalus</i> (great sculpin)	0.08	0.18
Agonidae (poacher)	0.14	0.23
<i>Asterotheca</i> sp. (poacher)	0.19	0.33
<i>Ocella dodecaedron</i> (eastern Bering poacher)	2.80	3.56
<i>Bathymaster</i> sp. (searcher)	0.13	0.23
<i>Bathymaster signatus</i> (searcher)	0.23	0.20
Stichaeidae (prickleback)	0.01	0.09
<i>Lumpenus sagitta</i> (snake prickleback)	0.34	0.26
<i>Ammodytes</i> sp. (sandlance)	3.71	7.67
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.82	0.95
Pleuronectidae (flatfish)	2.12	6.32
<i>Errex zachirus</i> (rex sole)	1.04	0.53
<i>Hippoglossoides elassodon</i> (flathead sole)	0.56	0.87
<i>Lepidopsetta polyxystra</i> (N rock sole)	2.34	1.95
<i>Pleuronectes asper</i> (yellowfin sole)	0.62	1.59
<i>Pleuronectes proboscideus</i> (longhead dab)	0.32	0.39
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	0.44	1.59
Fishery discards	0.42	0.40

Total prey weight	25,821 g
Total non-empty stomachs	284
Total empty stomachs	58
Number of hauls	63

Table F-4.--Prey items (expressed in mean percent frequency of occurrence, and mean percent total weight) of Pacific halibut (*Hippoglossus stenolepis*) collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Aphroditidae (sea mouse)	0.05	2.02
Gastropoda (snail)	0.13	2.20
<i>Crepidula grandis</i> (grand slipper shell)	0.02	0.23
Bivalvia (clam)	0.20	0.69
Teuthoidea (squid)	<0.01	0.36
Octopoda (octopus)	1.50	3.90
Isopoda (isopod)	0.01	0.20
Gammaridea (amphipod)	<0.01	0.19
Euphausiidae (euphausiid)	<0.01	0.43
Reptantia (crab)	0.58	4.22
Caridea (shrimp)	0.01	0.38
Hippolytidae (shrimp)	0.09	2.00
Pandalidae (shrimp)	0.10	1.69
<i>Pandalus</i> sp. (shrimp)	0.56	3.29
<i>Pandalus borealis</i> (shrimp)	1.38	2.73
<i>Pandalus goniurus</i> (shrimp)	<0.01	0.30
Crangonidae (shrimp)	0.06	1.25
<i>Crangon</i> sp. (shrimp)	0.01	1.07
<i>Crangon dalli</i> (shrimp)	0.03	0.79
<i>Crangon communis</i> (shrimp)	0.01	0.43
Natantia (shrimp)	<0.01	0.20
Paguridae (hermit crab)	9.89	23.37
<i>Pagurus</i> sp. (hermit crab)	0.04	0.23
<i>Elassachirus tenuimanus</i>	0.03	0.20
Lithodidae (king crab)	1.12	0.55
<i>Paralithodes camtschatica</i> (red king crab)	<0.01	0.10
<i>Hyas</i> sp. (lyre crab)	0.87	1.71
<i>Hyas lyratus</i> (lyre crab)	0.03	0.70
<i>Chionoecetes</i> sp. (snow and Tanner crab)	2.86	5.42
<i>Chionoecetes opilio</i> (snow crab)	5.66	9.67
<i>Chionoecetes bairdi</i> (Tanner crab)	3.97	10.33
<i>Telmessus cheiragonus</i> (hair crab)	0.24	0.20
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.11	0.55
Echiura (marine worm)	0.65	0.91
<i>Echiurus echiurus</i> (marine worm)	0.32	0.94
Rajidae (skate)	0.02	0.18
<i>Bathyraja</i> sp. (skate)	1.04	1.82
Osteichthyes Teleostei (fish)	1.42	10.34
Non-gadoid Fish Remains	7.96	16.75
Clupeidae	0.20	0.20
<i>Clupea pallasii</i> (Pacific herring)	1.27	0.40
<i>Thaleichthys pacificus</i> (eulachon)	0.81	1.66
Gadidae (gadid fish)	3.82	5.83
<i>Gadus macrocephalus</i> (Pacific cod)	1.93	2.52
<i>Theragra chalcogramma</i> (walleye pollock)	31.39	49.30
Zoarcidae (eelpout)	1.50	1.88
<i>Lycodes</i> sp. (eelpout unid)	0.04	0.23
<i>Lycodes brevipes</i> (shortfin eelpout)	0.01	0.18
<i>Lycodes palearis</i> (wattled eelpout)	1.12	1.09
Cottoidei (sculpin)	0.21	1.62
Icelidae (sculpin)	0.01	0.23
<i>Icelus spiniger</i> (thorny sculpin)	0.02	0.18
Cottidae (sculpin)	0.30	0.67
<i>Myoxocephalus</i> sp. (sculpin)	1.41	0.61
<i>Triglops</i> sp. (sculpin)	0.02	0.18
Agonidae (poacher)	0.15	0.48
<i>Asterotheca</i> sp. (poacher)	0.02	0.20
<i>Podothecus acipenserinus</i> (sturgeon poacher)	1.88	0.83
<i>Ocella dodecaedron</i> (eastern Bering poacher)	0.37	1.29

Table F-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Sarritor frenatus</i> (sawback poacher)	0.14	0.23
<i>Trichodon trichodon</i> (Pacific sandfish)	1.72	0.45
<i>Anarhichas orientalis</i> (eastern Bering wolffish)	0.07	0.10
Stichaeidae (prickleback)	0.06	0.58
<i>Lumpenus</i> sp. (prickleback)	0.09	0.36
<i>Lumpenus sagitta</i> (snake prickleback)	0.19	0.36
<i>Lumpenus maculatus</i> (daubed shanny)	0.01	0.18
<i>Ammodytes</i> sp. (sandlance)	2.25	5.91
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.68	1.64
Pleuronectidae (flatfish)	2.61	5.42
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.35	0.36
<i>Pleuronectes asper</i> (yellowfin sole)	1.17	1.59
<i>Pleuronectes proboscideus</i> (longhead dab)	0.31	0.36
Fishery discards	2.86	2.91
Unidentified tube	<0.01	0.36

Total prey weight	29,390 g
Total non-empty stomachs	257
Total empty stomachs	24
Number of hauls	55

Table F-5.--Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of Pacific halibut (*Hippoglossus stenolepis*) collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Gastropoda (snail)	0.07	1.90
Bivalvia (clam)	0.17	1.11
Pectinidae (scallops)	1.07	6.67
Octopoda (octopus)	7.67	13.33
Gammaridea (amphipod)	0.03	1.51
<i>Thysanoessa</i> sp. (euphausiid)	<0.01	0.95
<i>Crangon dalli</i> (shrimp)	0.35	1.56
Paguridae (hermit crab)	14.02	22.37
Majidae legs	0.03	0.37
<i>Hyas</i> sp. (lyre crab)	0.03	2.22
<i>Chionoecetes opilio</i> (snow crab)	0.09	0.44
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	2.81	1.11
<i>Cancer oregonensis</i> (pygmy cancer crab)	0.02	2.22
Sand dollar	<0.01	0.37
Osteichthyes Teleostei (fish)	0.09	3.11
Non-gadoid Fish Remains	2.00	3.51
Gadidae (gadid fish)	1.29	8.03
<i>Gadus macrocephalus</i> (Pacific cod)	0.05	2.22
<i>Theragra chalcogramma</i> (walleye pollock)	57.89	60.57
<i>Eumicrotremus</i> spp. (lumpsuckers)	1.22	0.44
Pleuronectidae (flatfish)	8.97	11.32
Unidentified organic material	0.13	0.56
Fishery discards	2.02	0.39

Total prey weight	1,786 g
Total non-empty stomachs	98
Total empty stomachs	39
Number of hauls	15

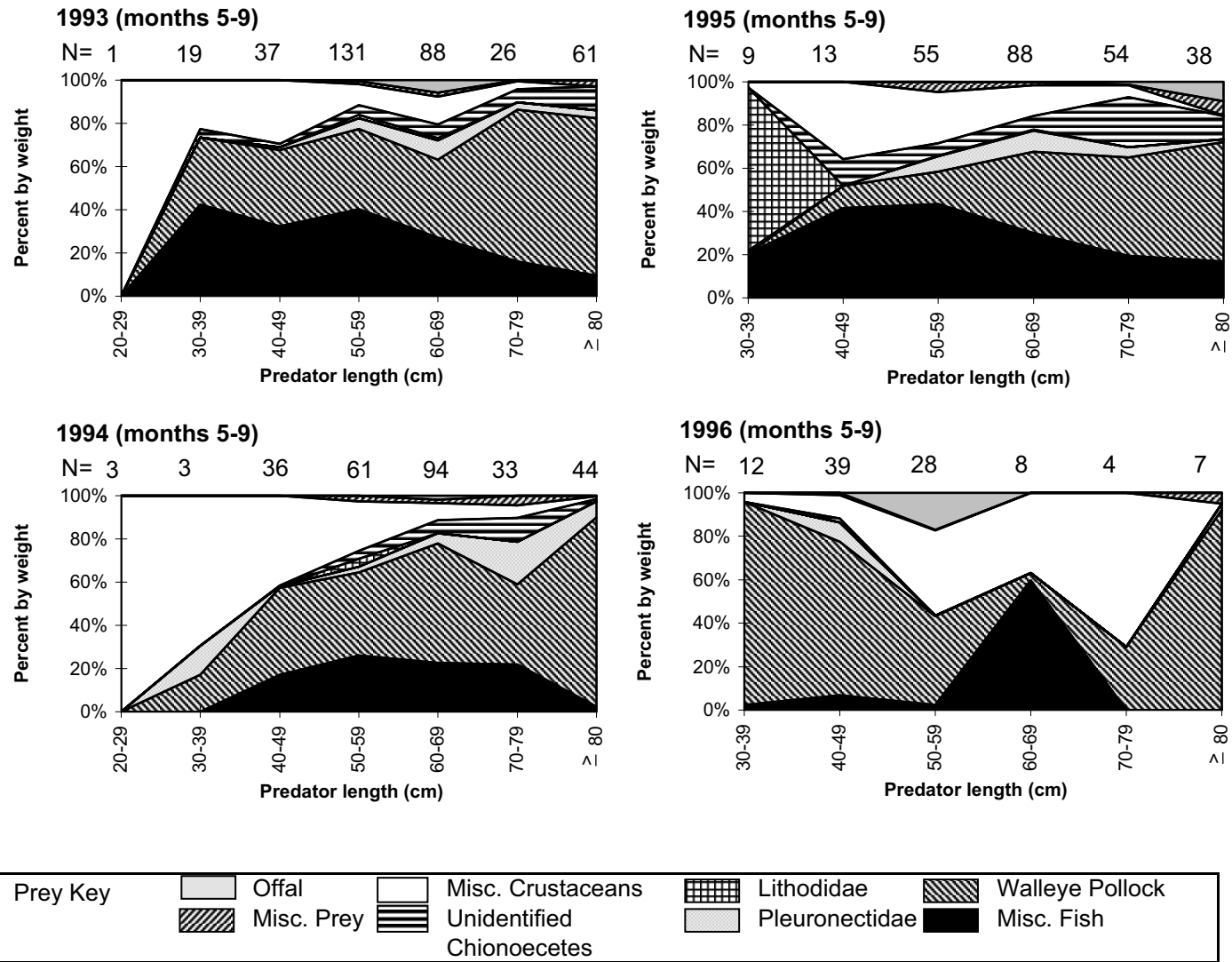


Figure F-1. -- Diet composition of Pacific halibut, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

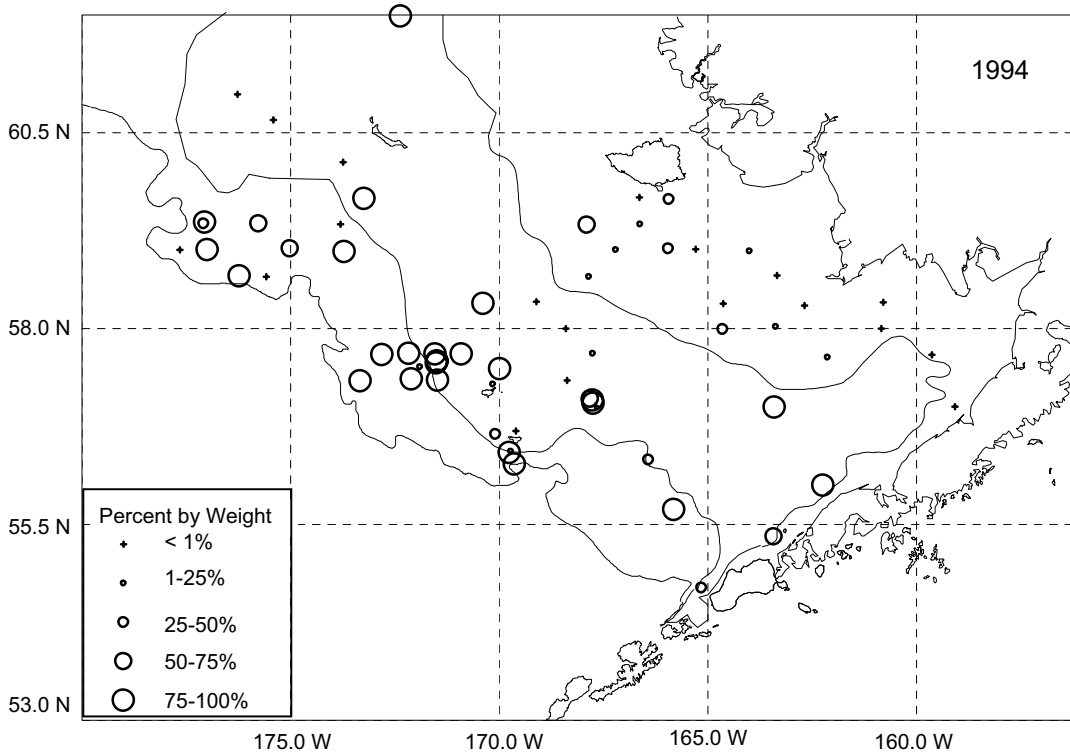
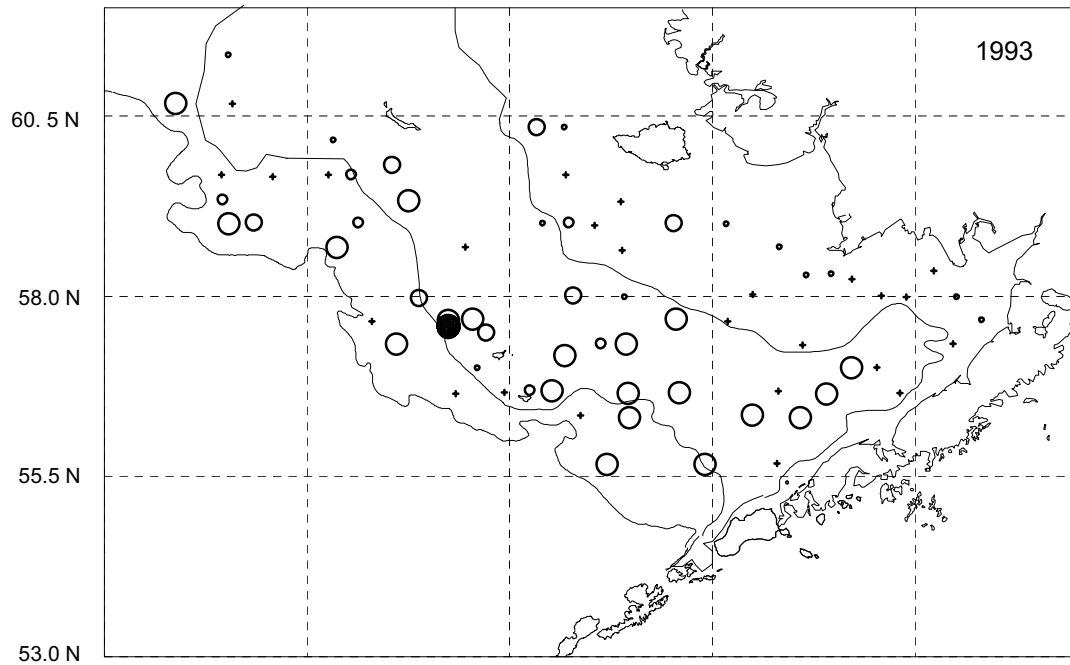


Figure F-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

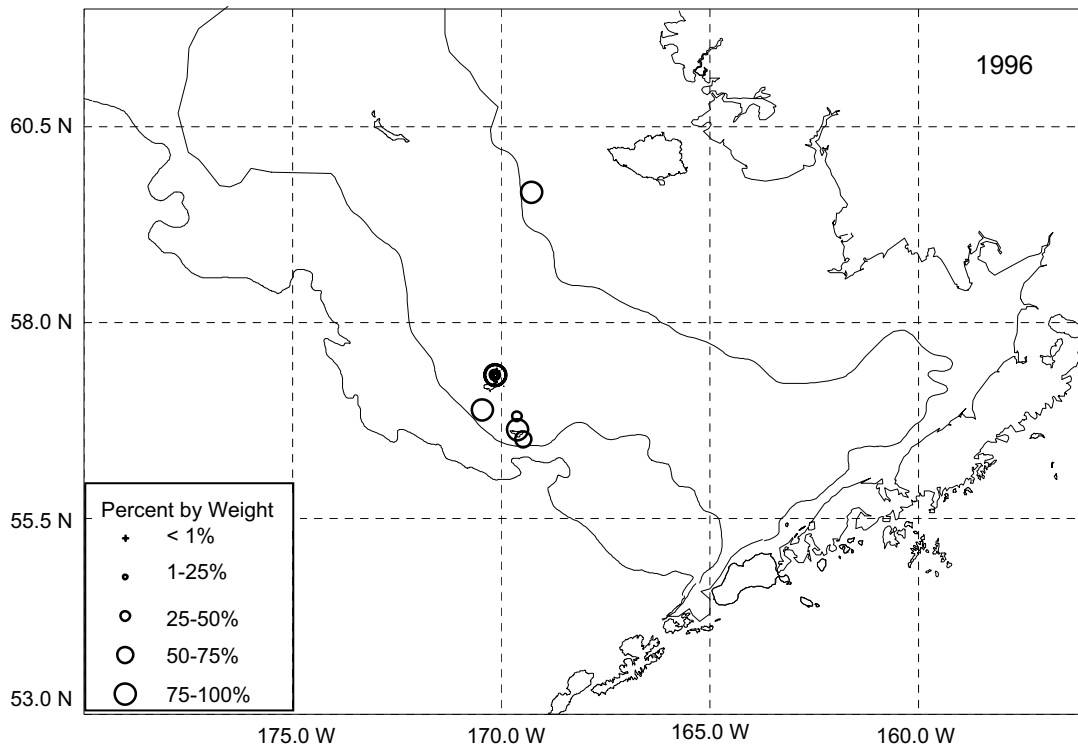
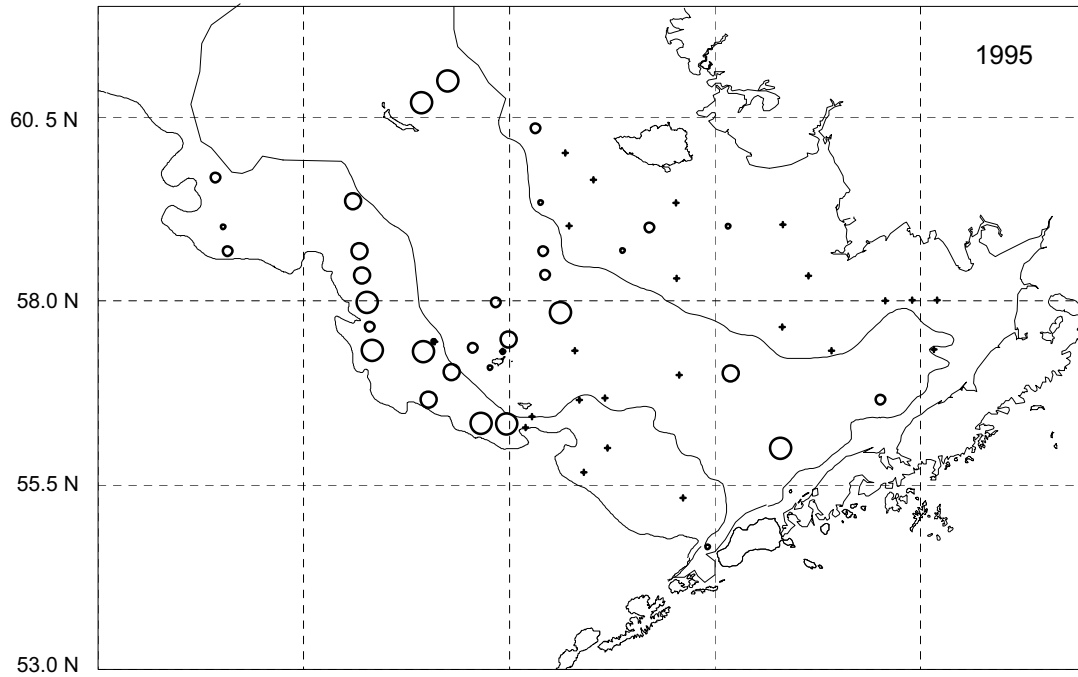


Figure F-2.-- Continued.

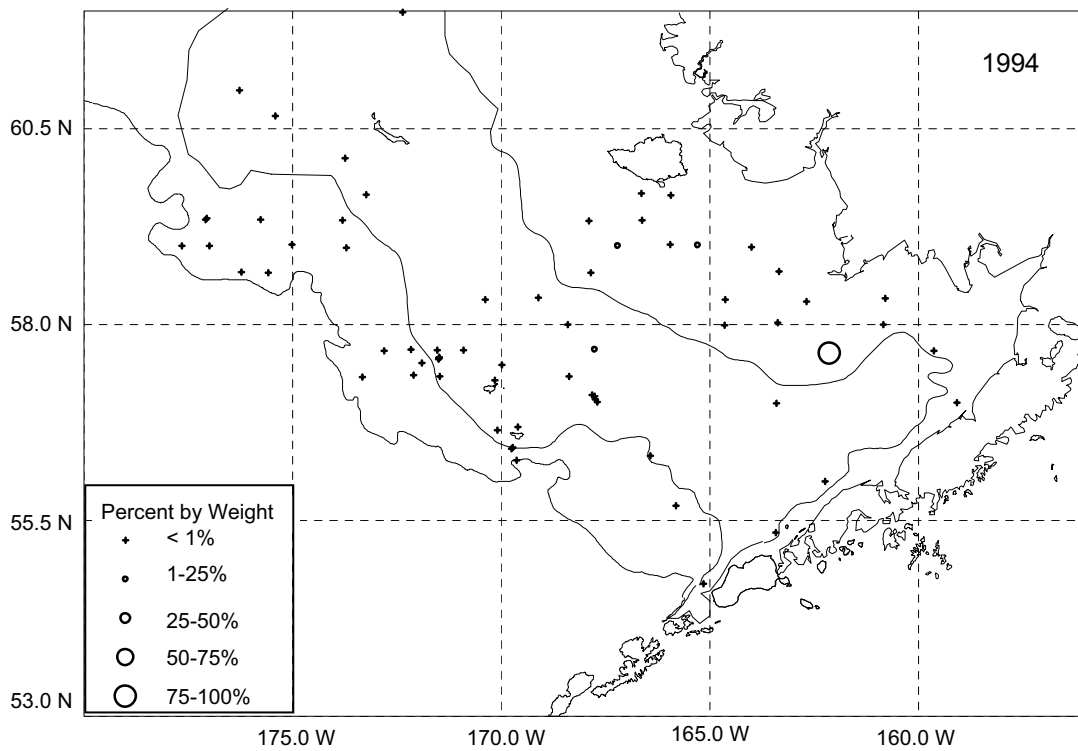
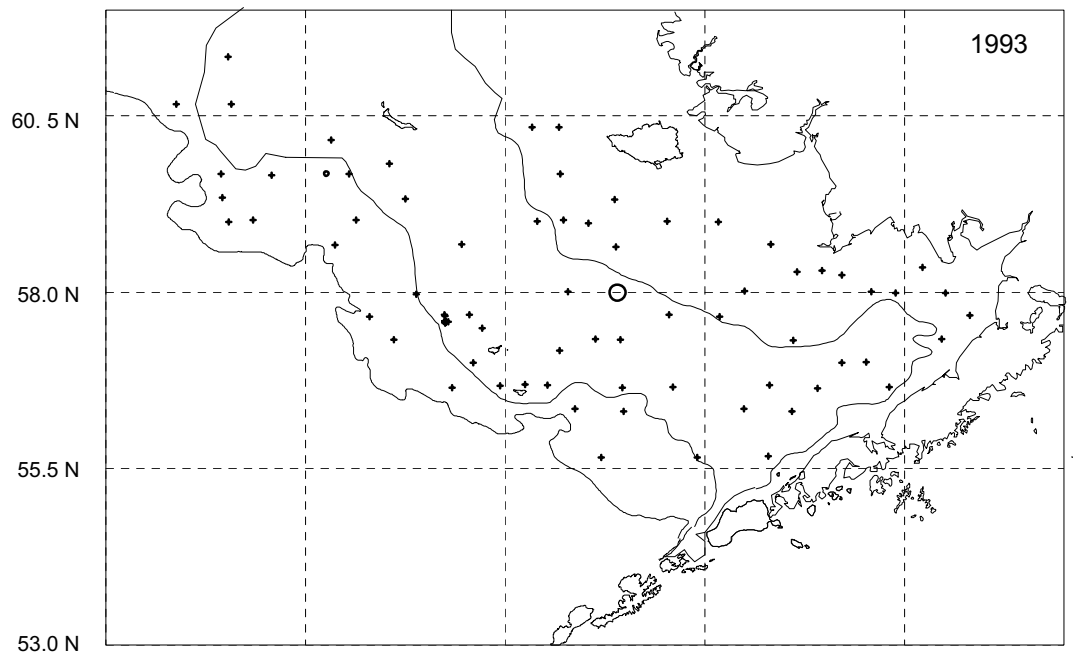
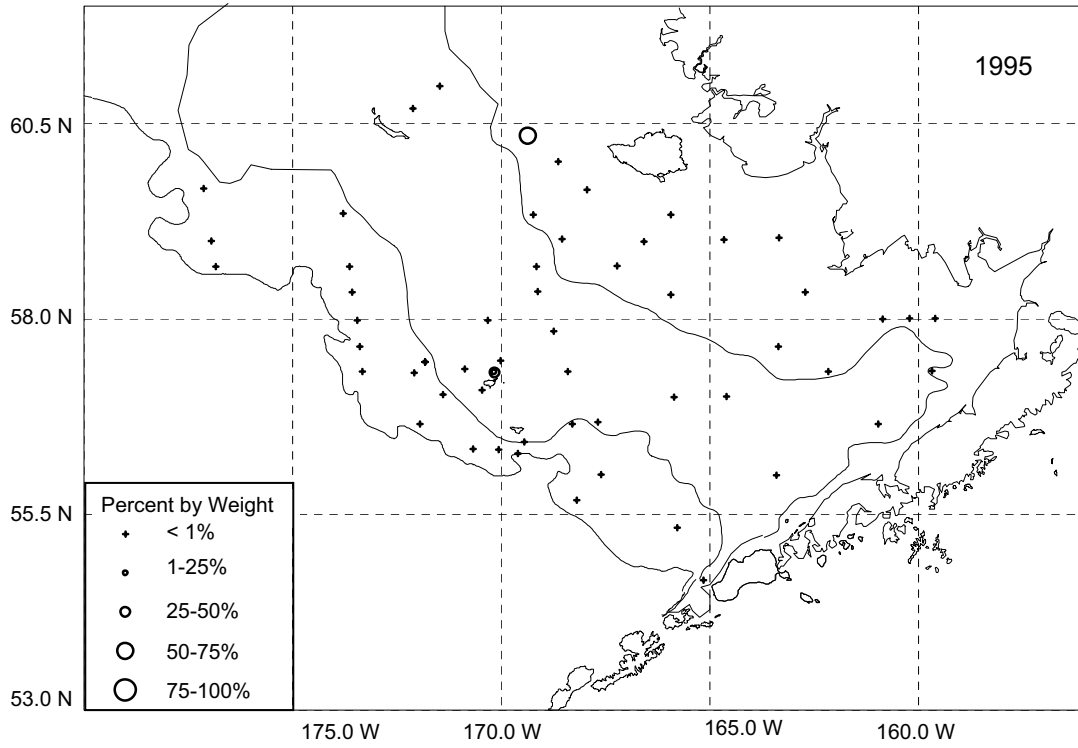


Figure F-3.-- Percent by weight of Pacific cod (*Gadus macrocephalus*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.



F-3.-- Continued.

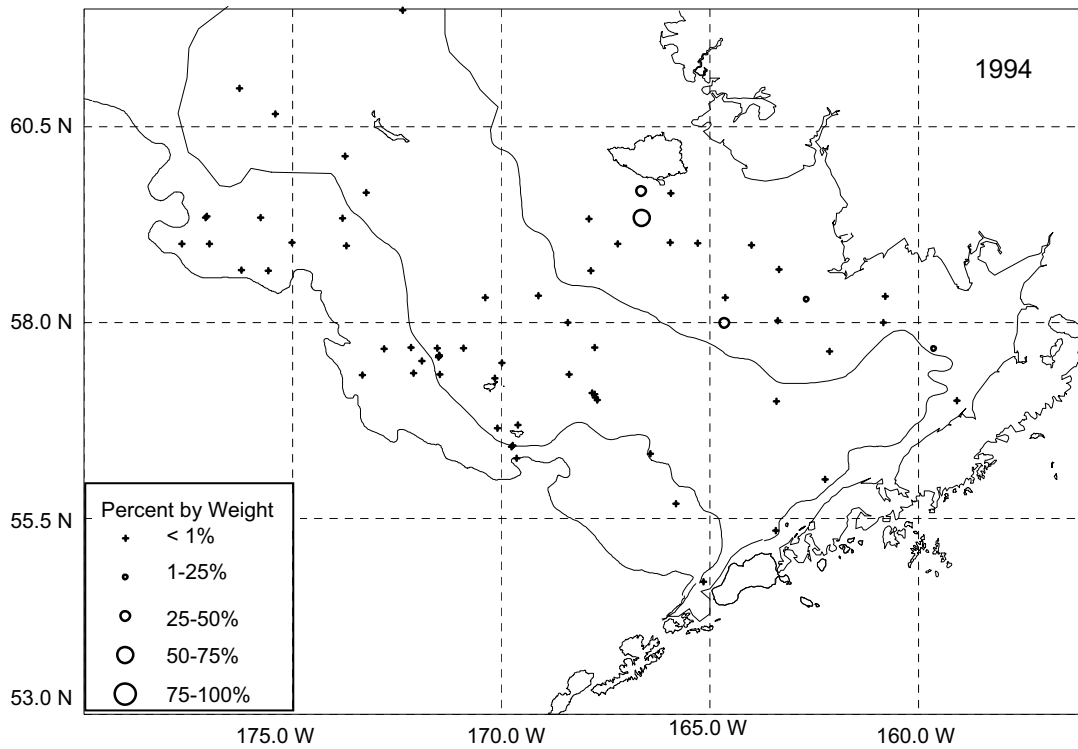
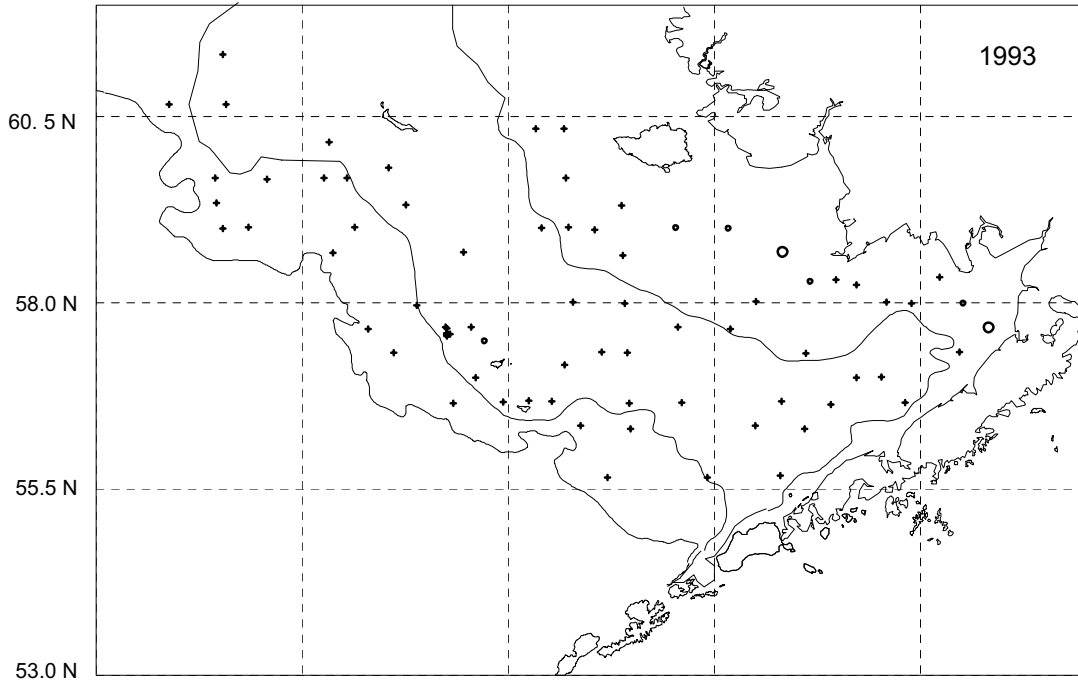


Figure F-4.-- Percent by weight of northern rock sole (*Lepidopsetta polyxystra*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

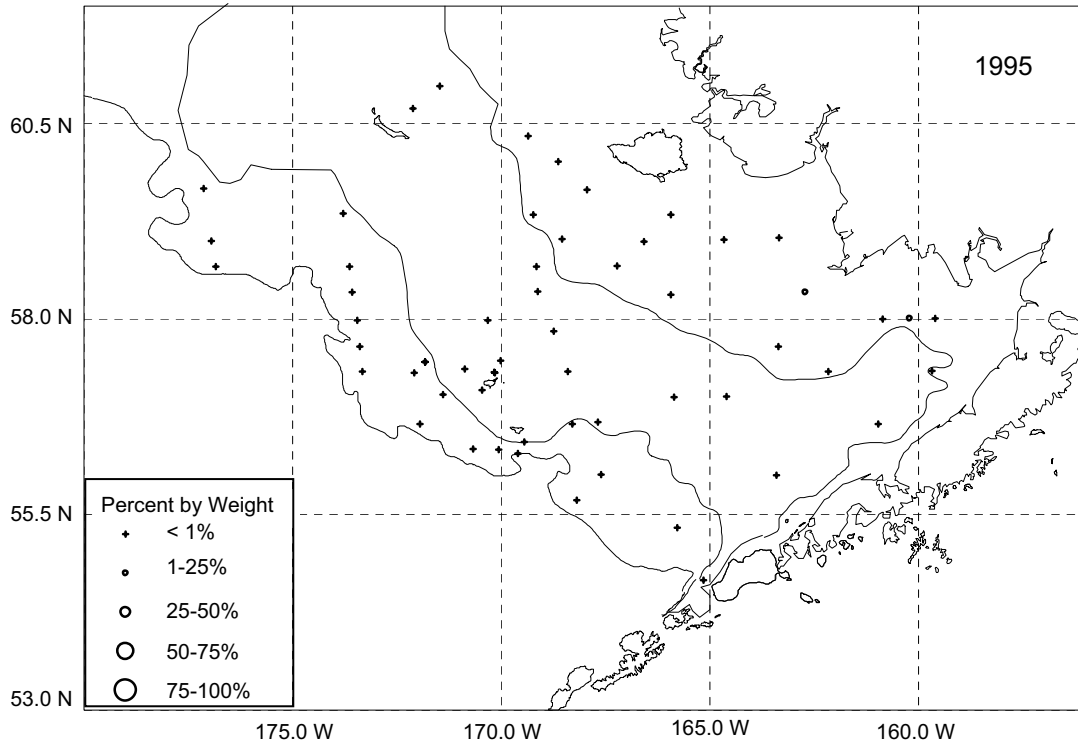


Figure F-4.-- Continued.

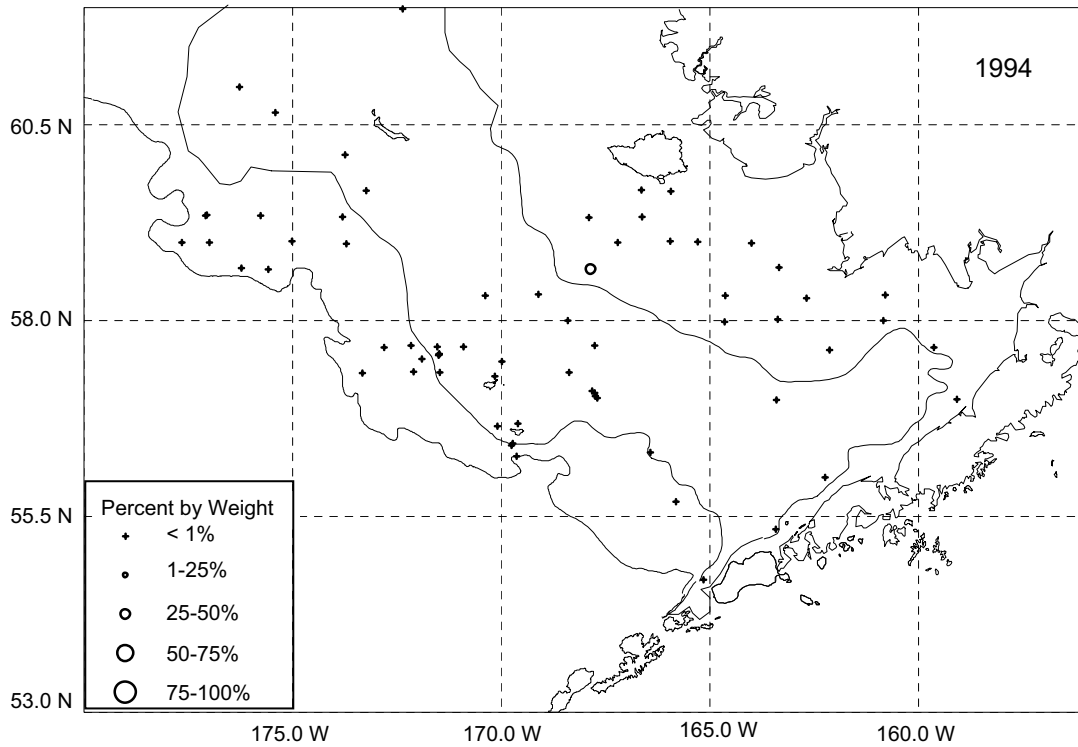
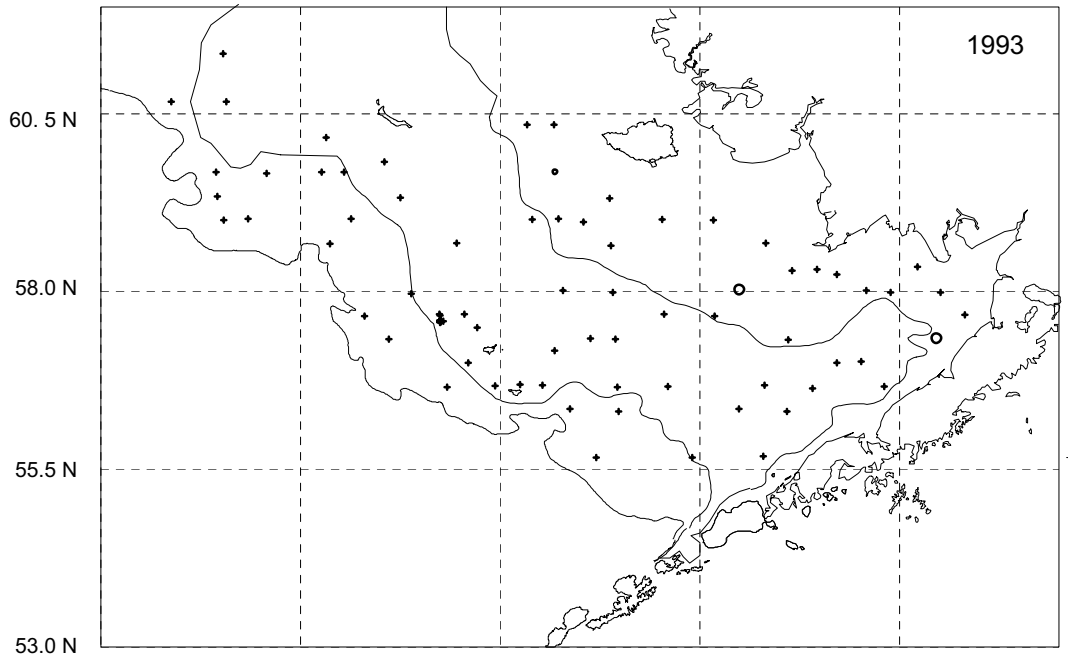


Figure F-5.-- Percent by weight of yellowfin sole (*Limanda aspera*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

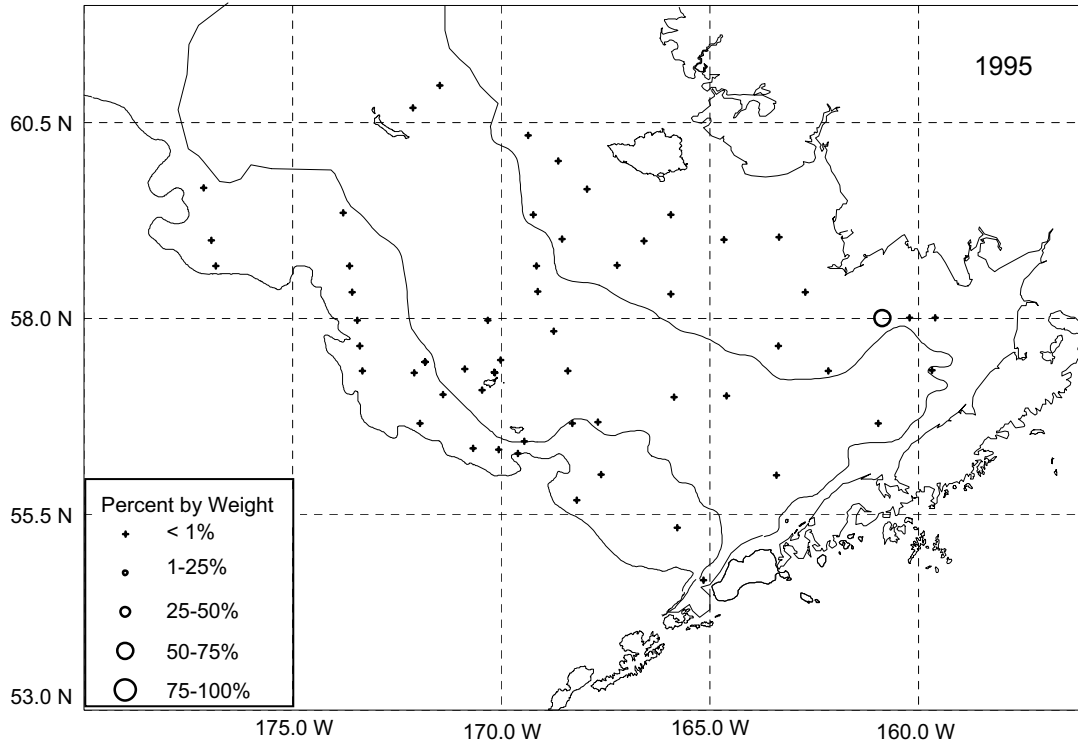


Figure F-5.-- Continued.

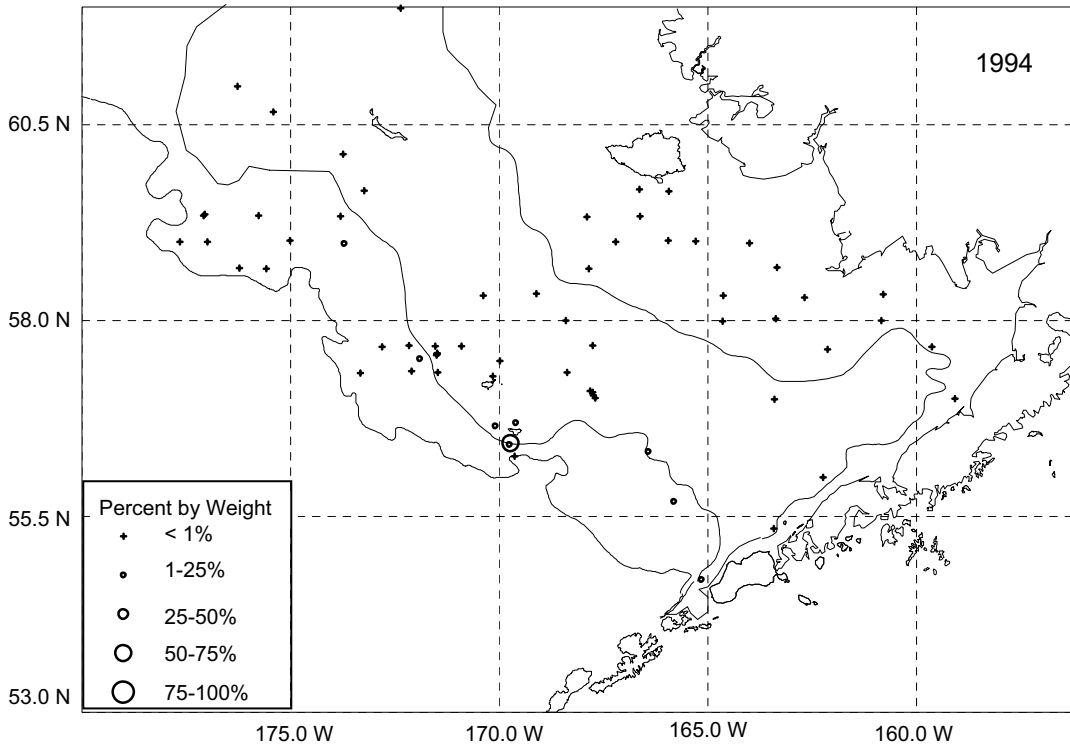
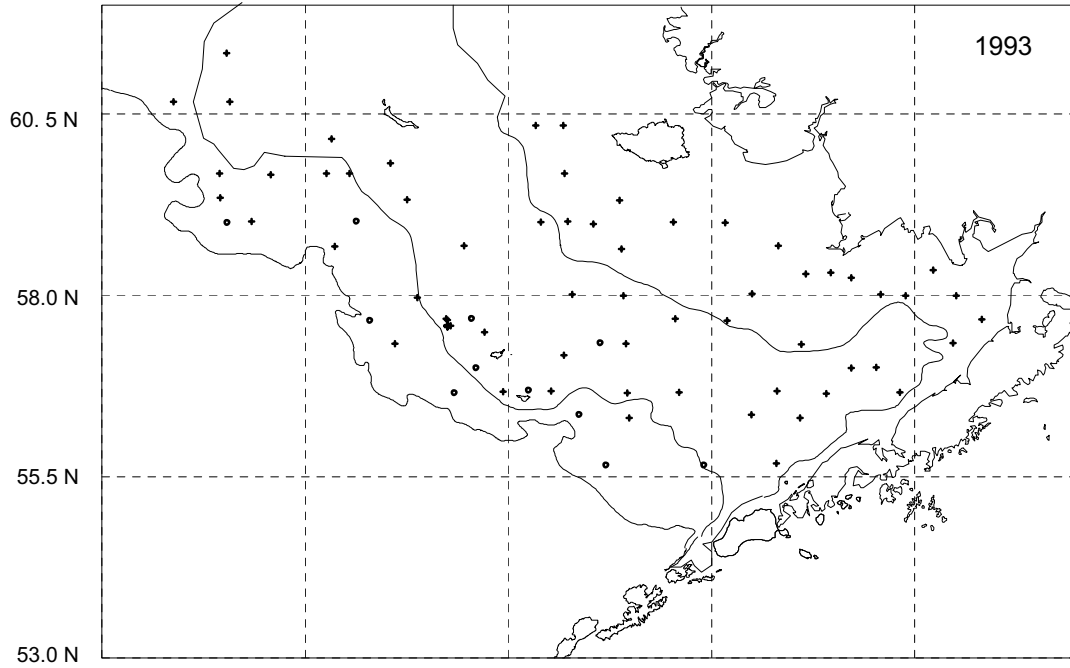


Figure F-6.-- Percent by weight of Tanner crab (*Chionoecetes bairdi*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

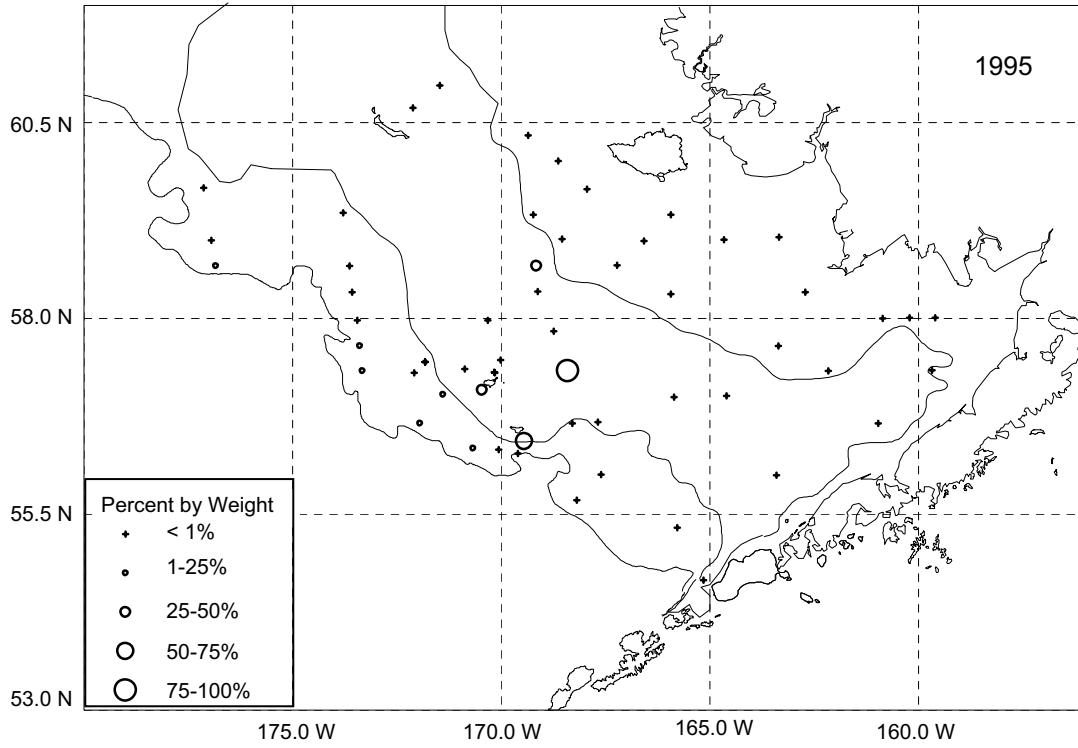


Figure F-6.-- Continued.

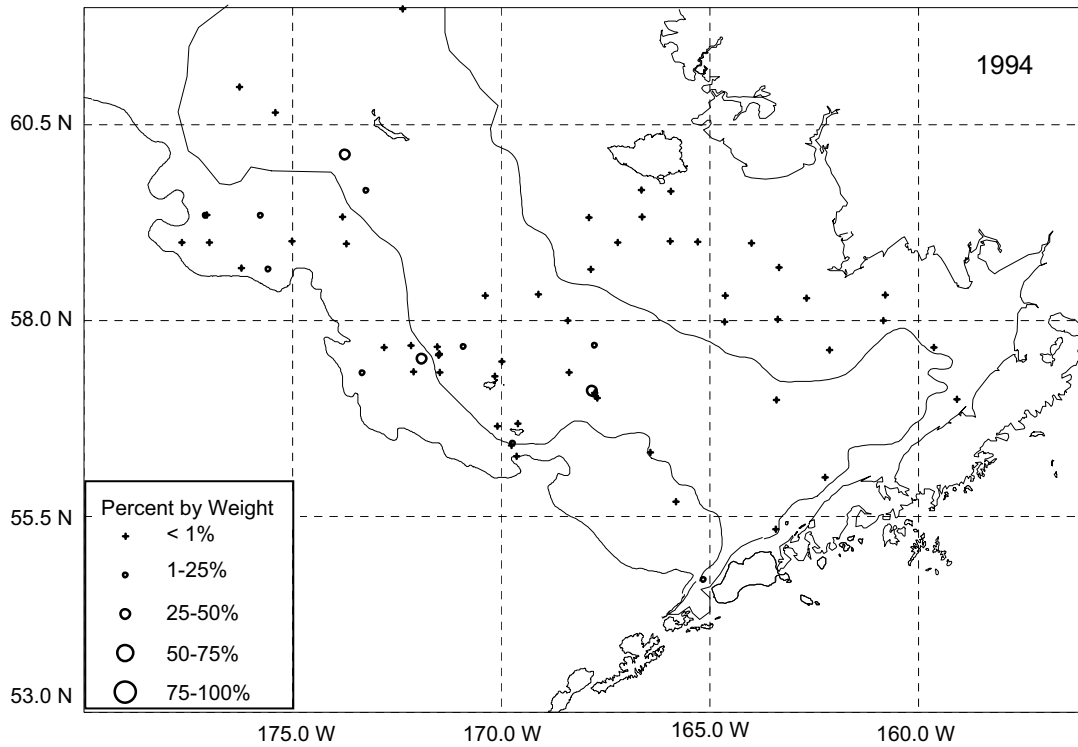
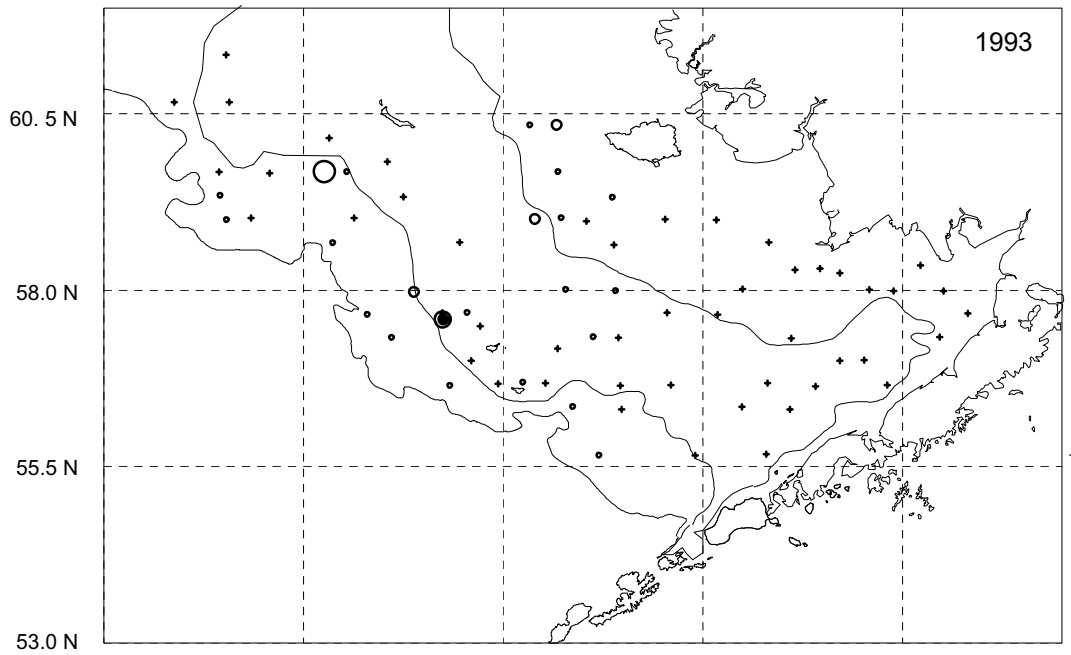
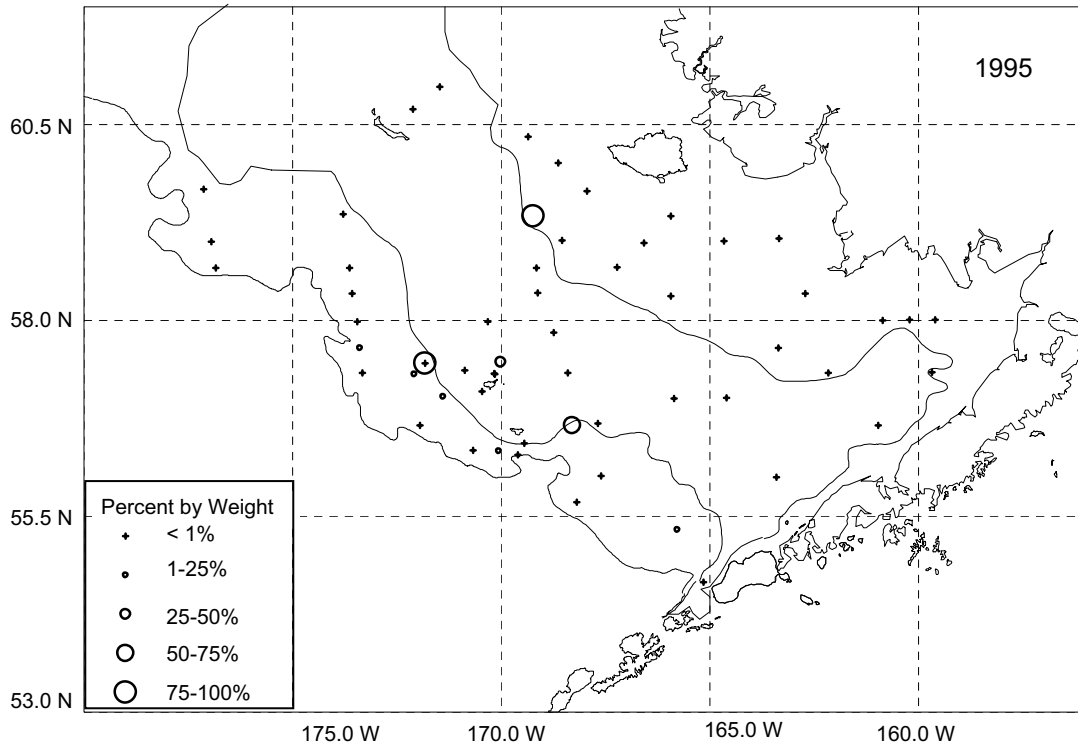


Figure F-7.-- Percent by weight of snow crab (*Chionoecetes opilio*) in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.



F-7.-- Continued.

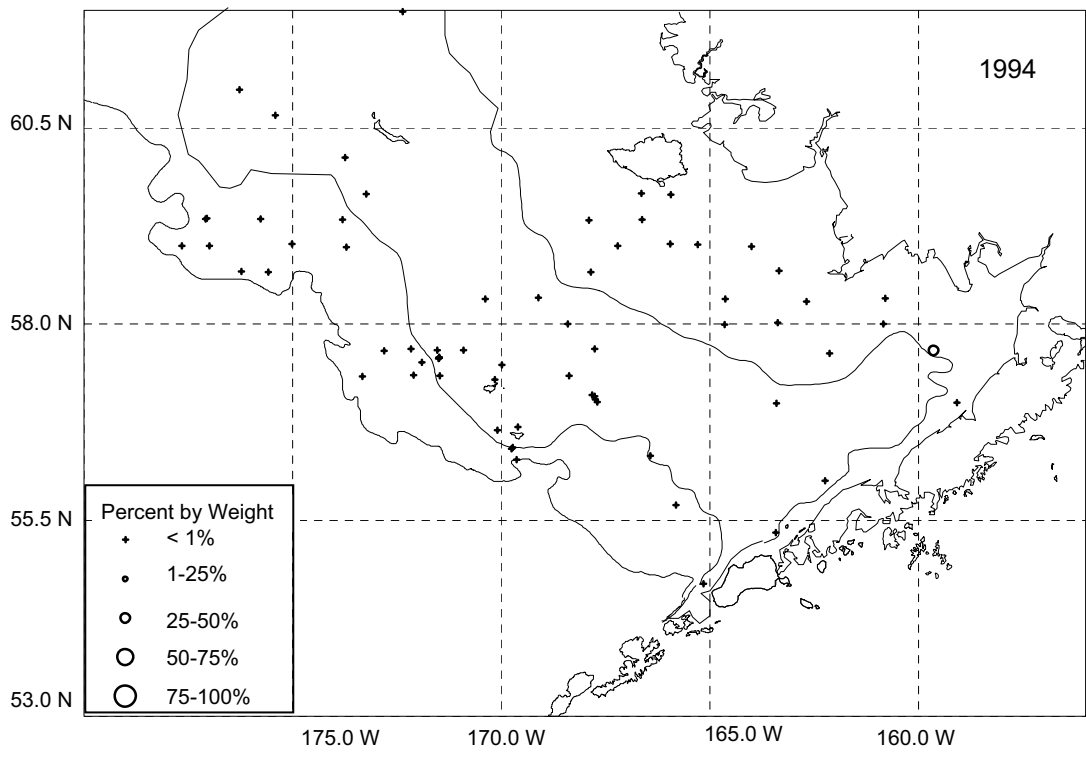
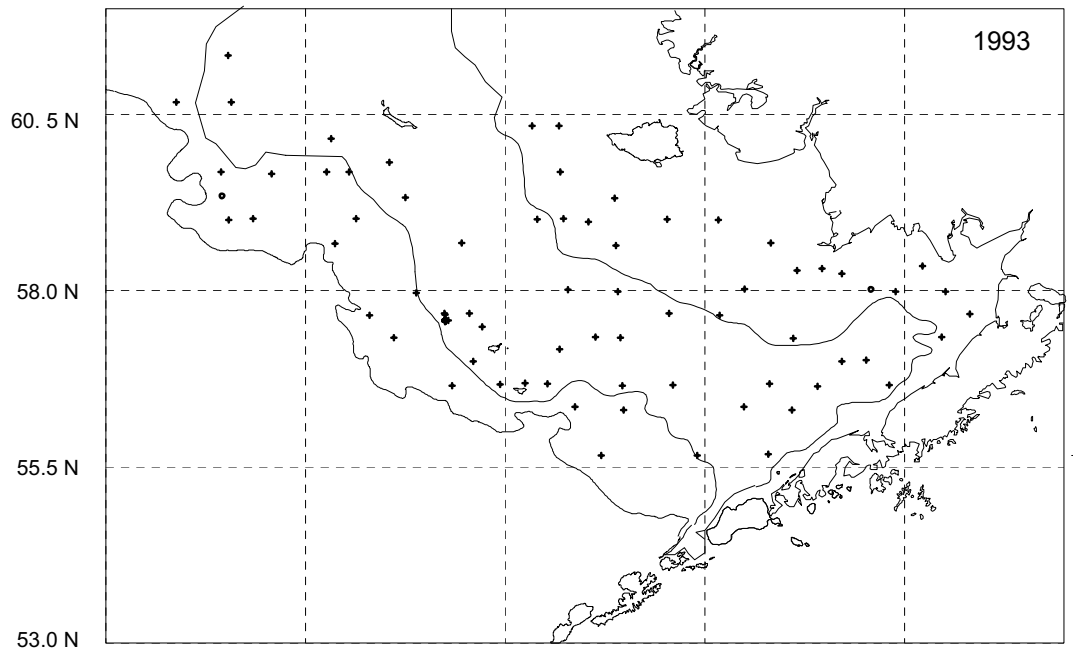


Figure F-8.-- Percent by weight of Lithodidae in the diet of Pacific halibut (*Hippoglossus stenolepis*) by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.

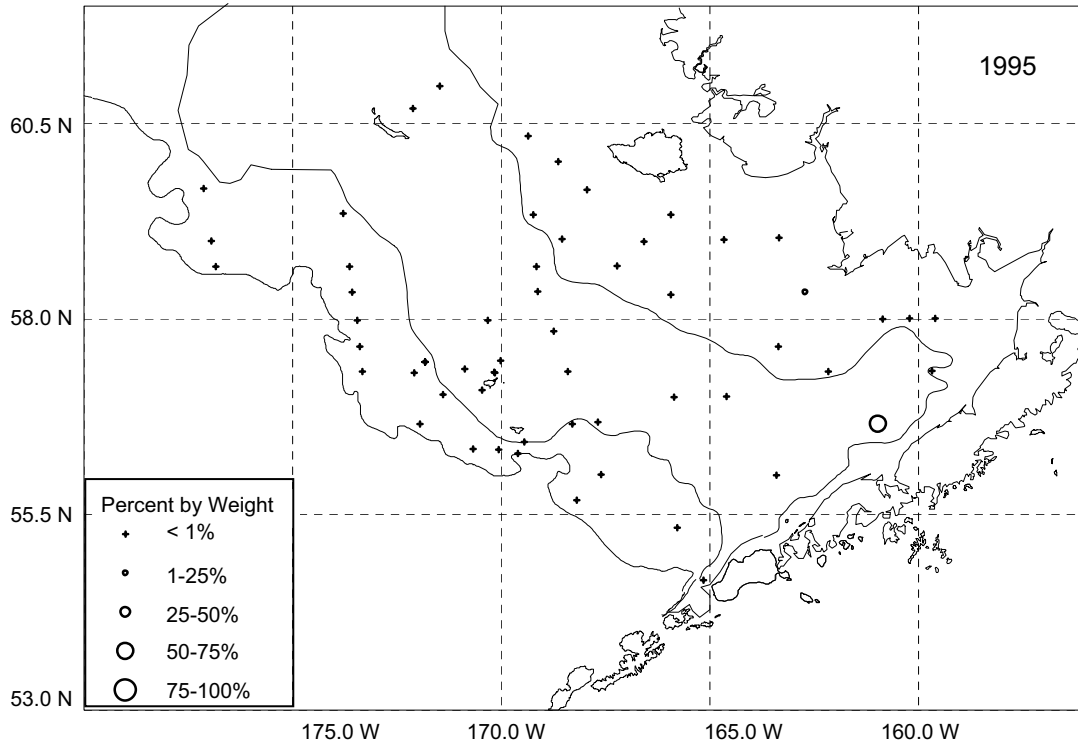


Figure F-8.-- Continued

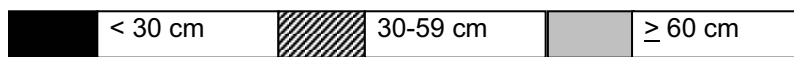
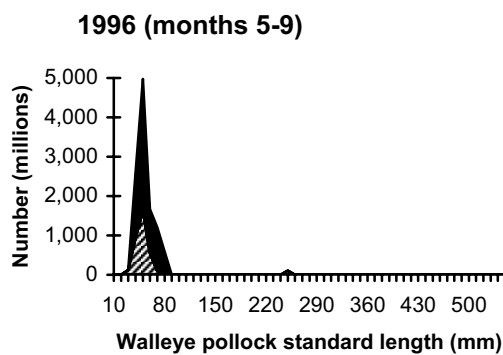
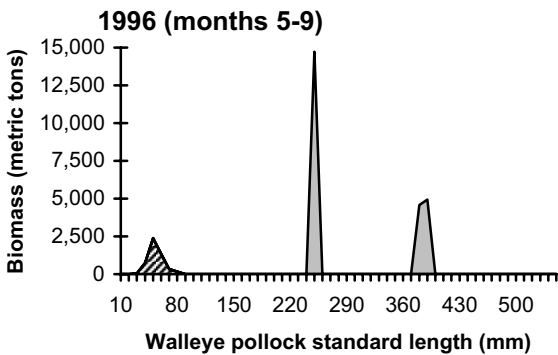
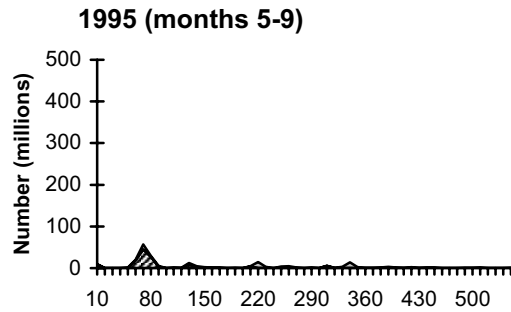
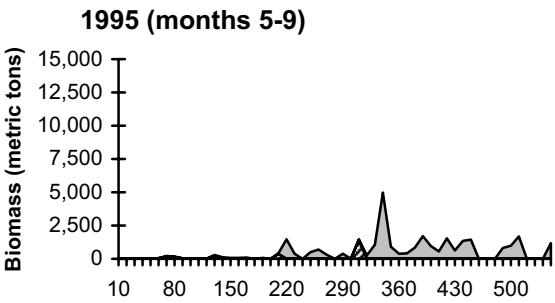
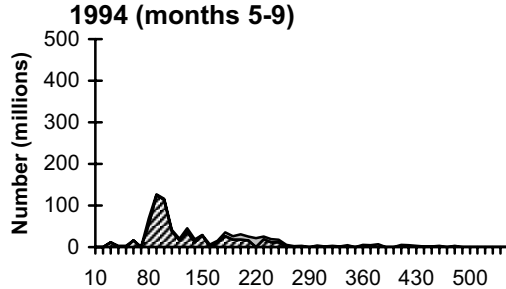
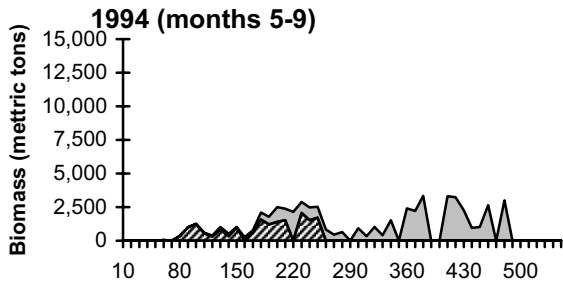
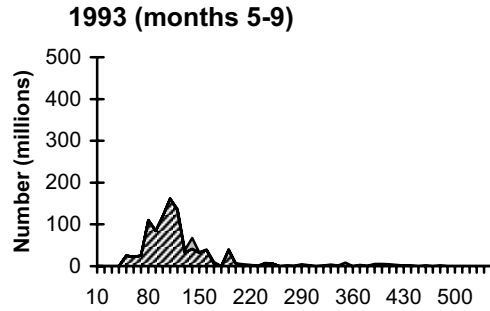
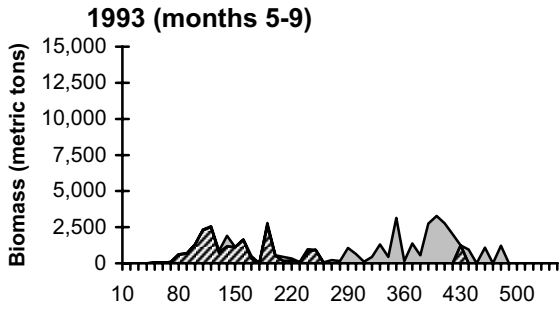


Figure F-9. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994, 1995, and 1996 by prey size.

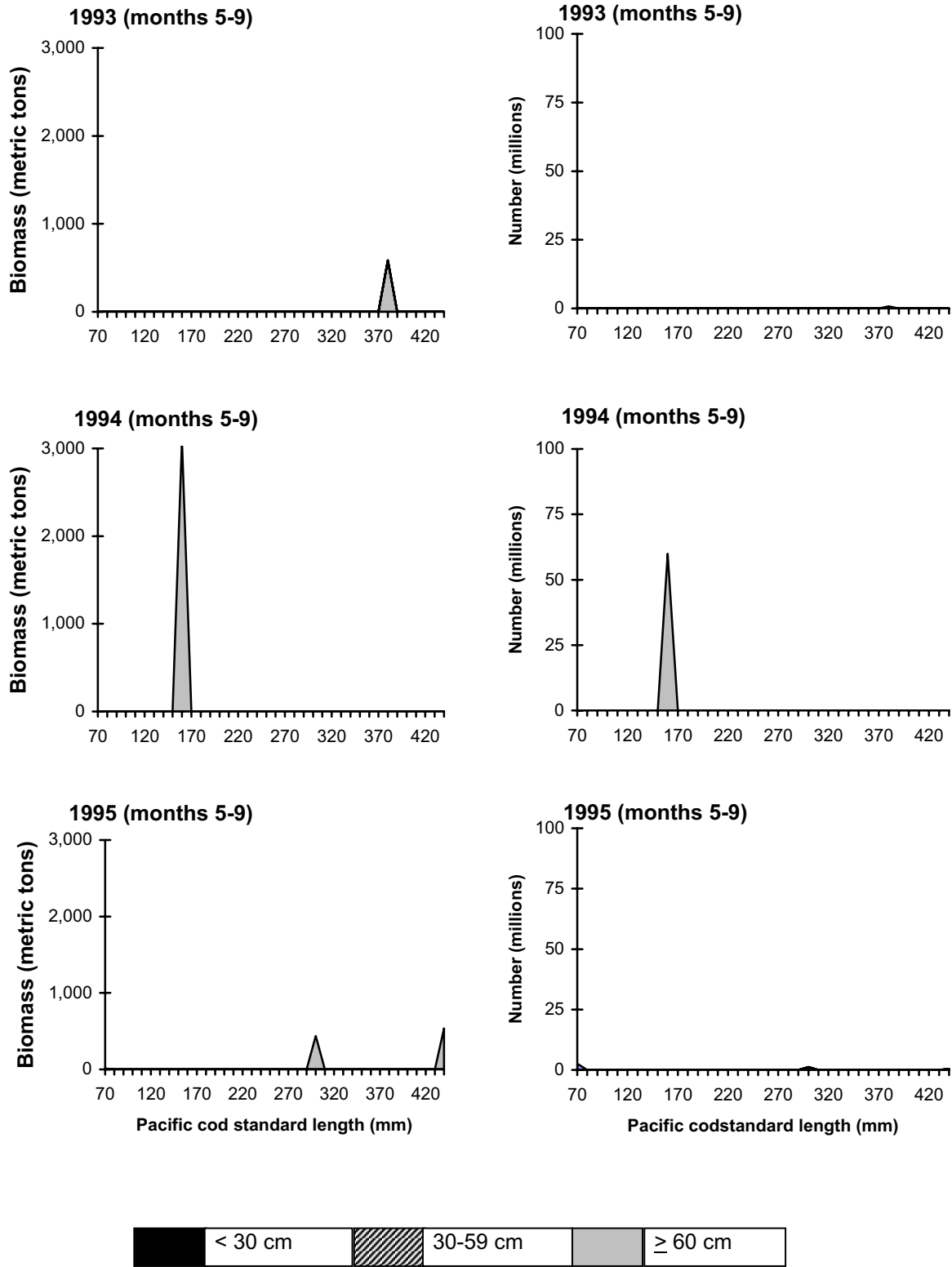


Figure F-10. -- Biomass and number of Pacific cod (*Gadus macrocephalus*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994 and 1995 by prey size.

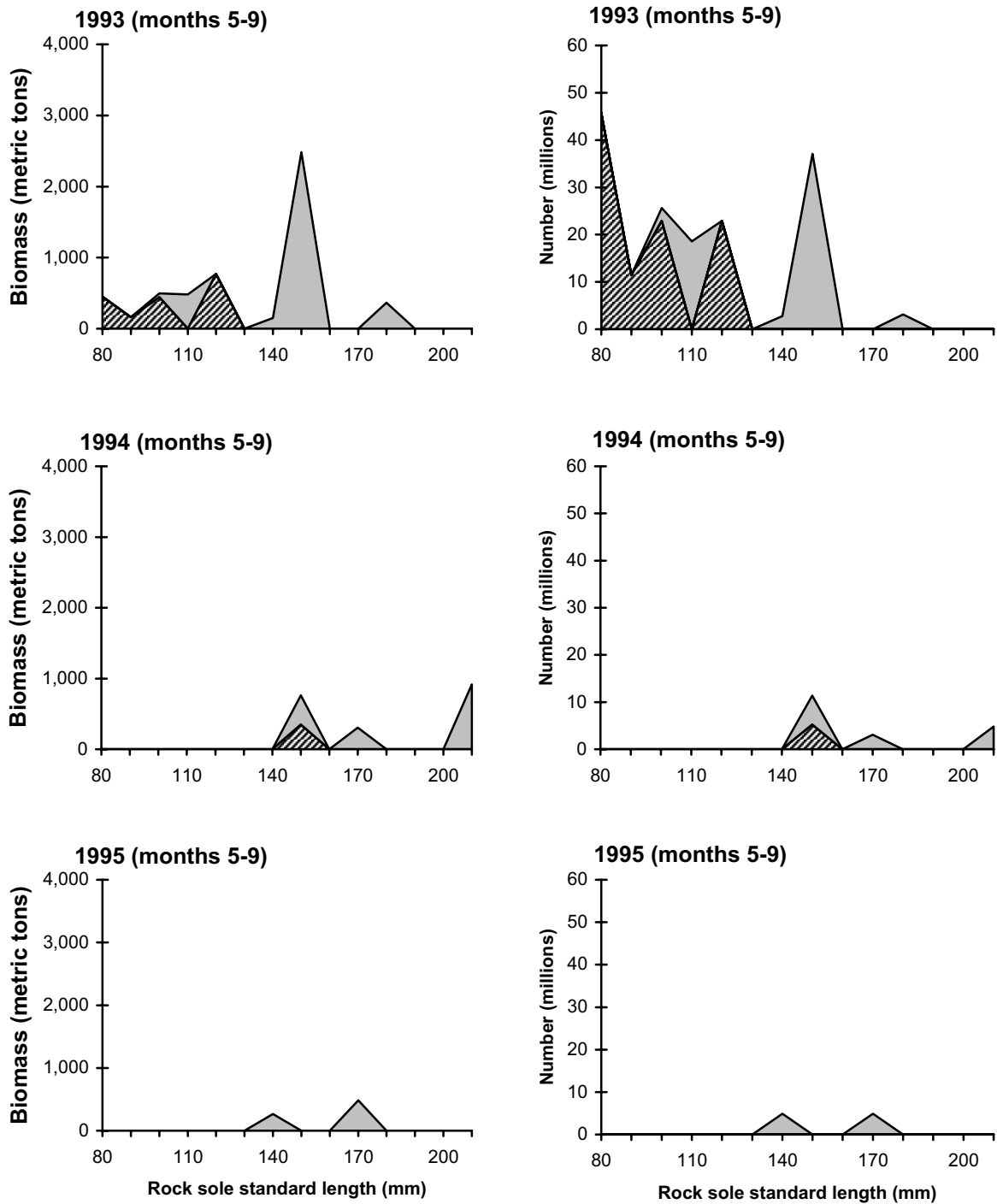


Figure F-11. -- Biomass and number of northern rock sole (*Lepidopsetta polyxystra*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994, and 1995 by prey size.

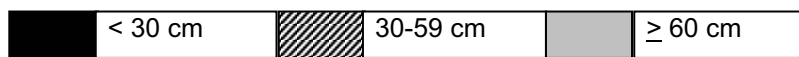
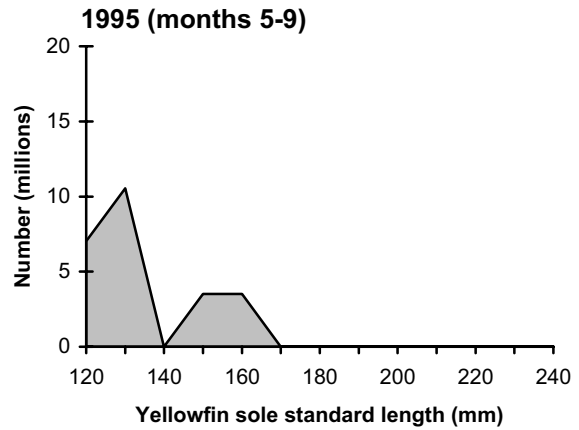
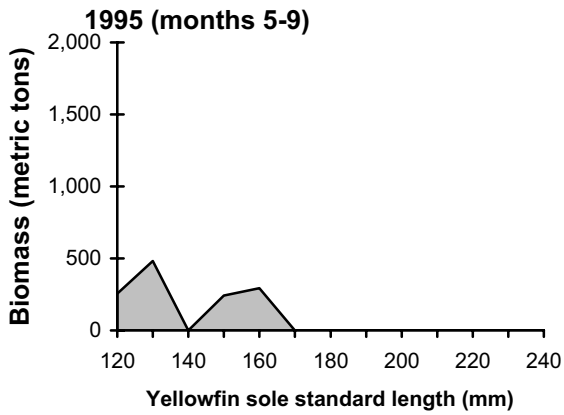
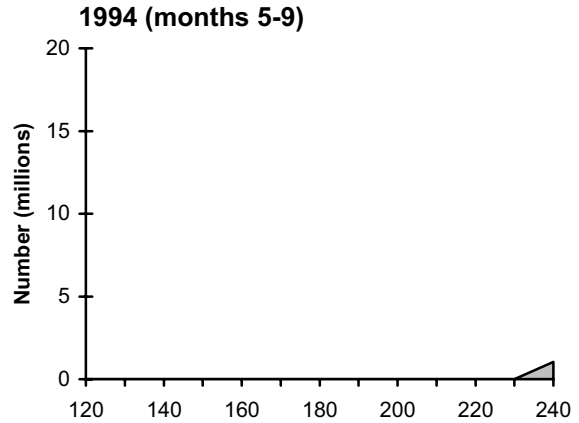
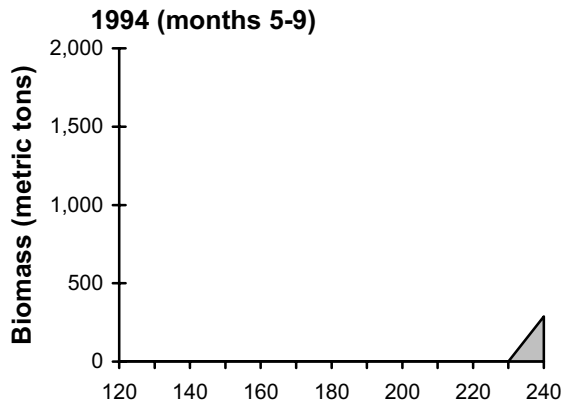
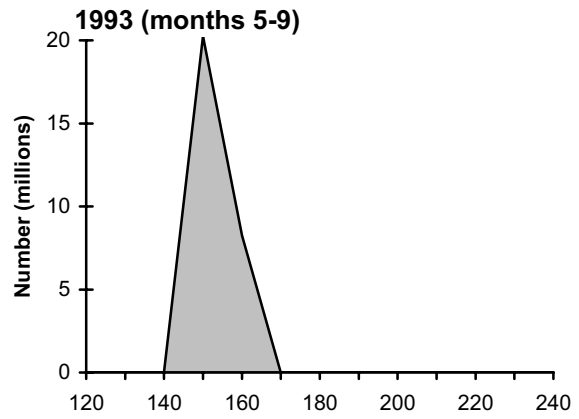
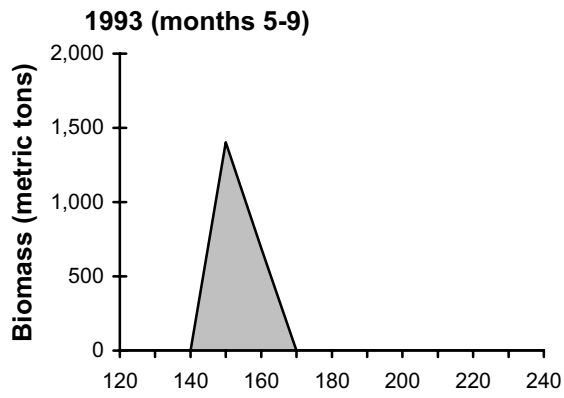


Figure F-12 . -- Biomass and number of yellowfin sole (*Limanda aspera*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994, and 1995 by prey size.

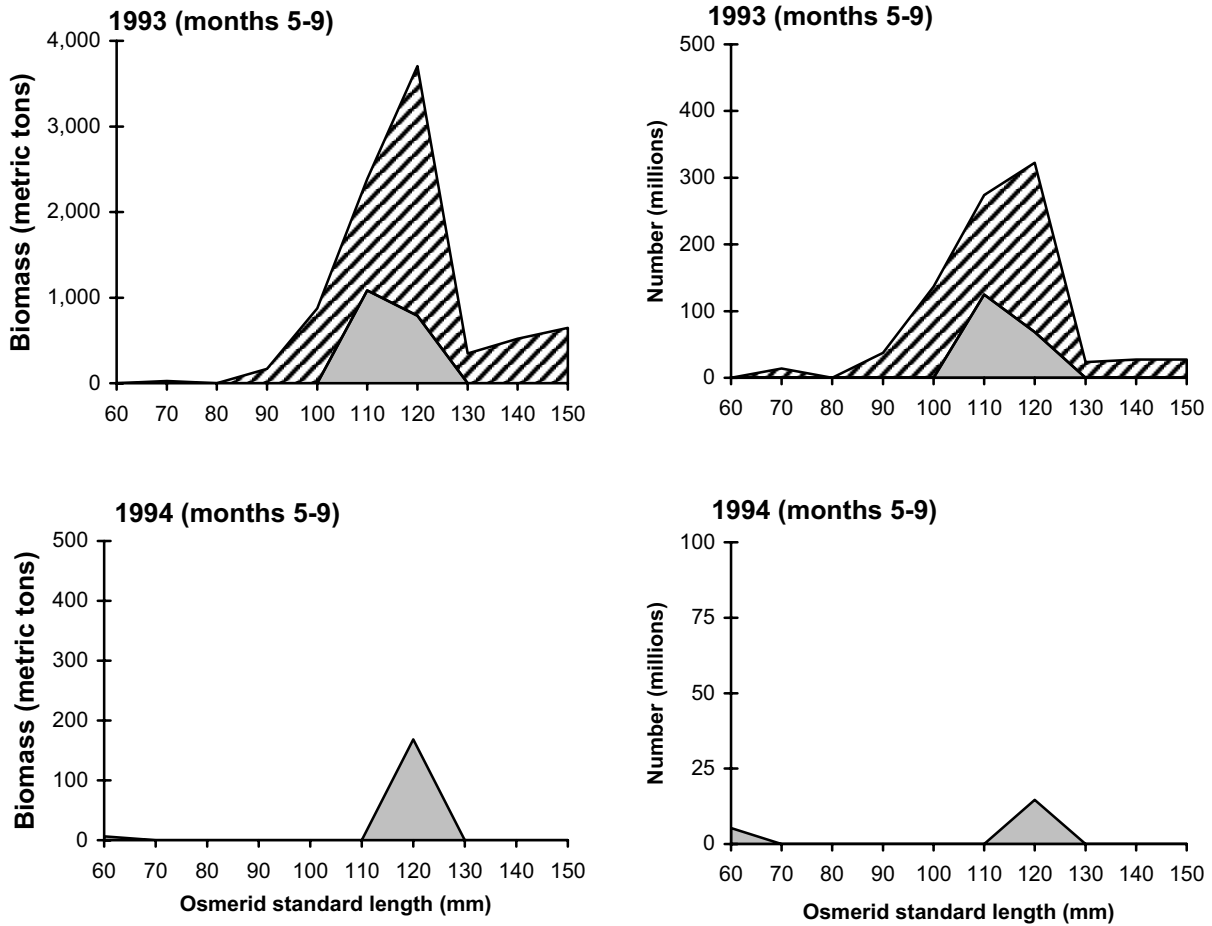


Figure F-13. -- Biomass and number of osmerids consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993 and 1994 by prey size.

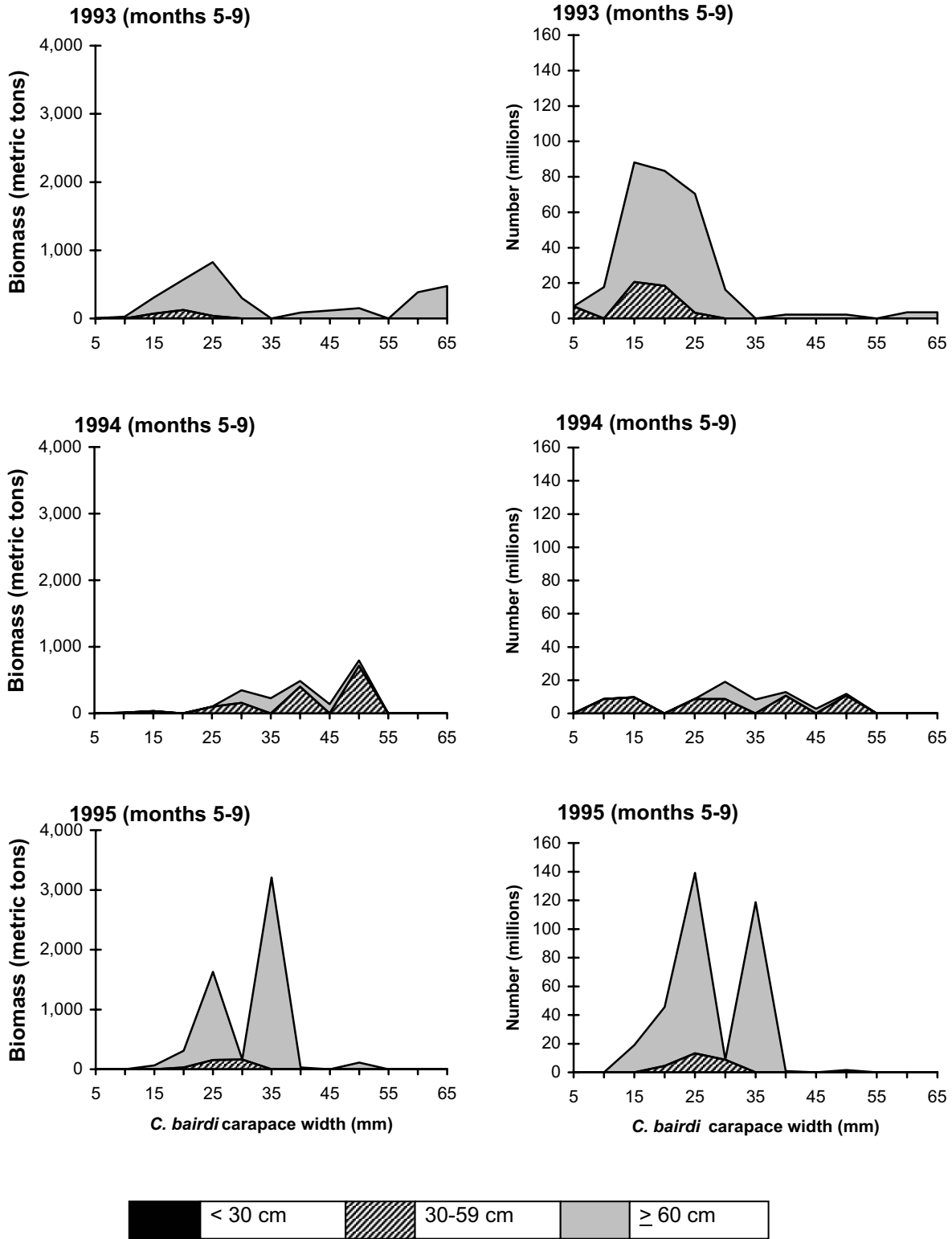


Figure F-14 . -- Biomass and number of Tanner crab (*Chionoecetes bairdi*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994, and 1995 by prey size.

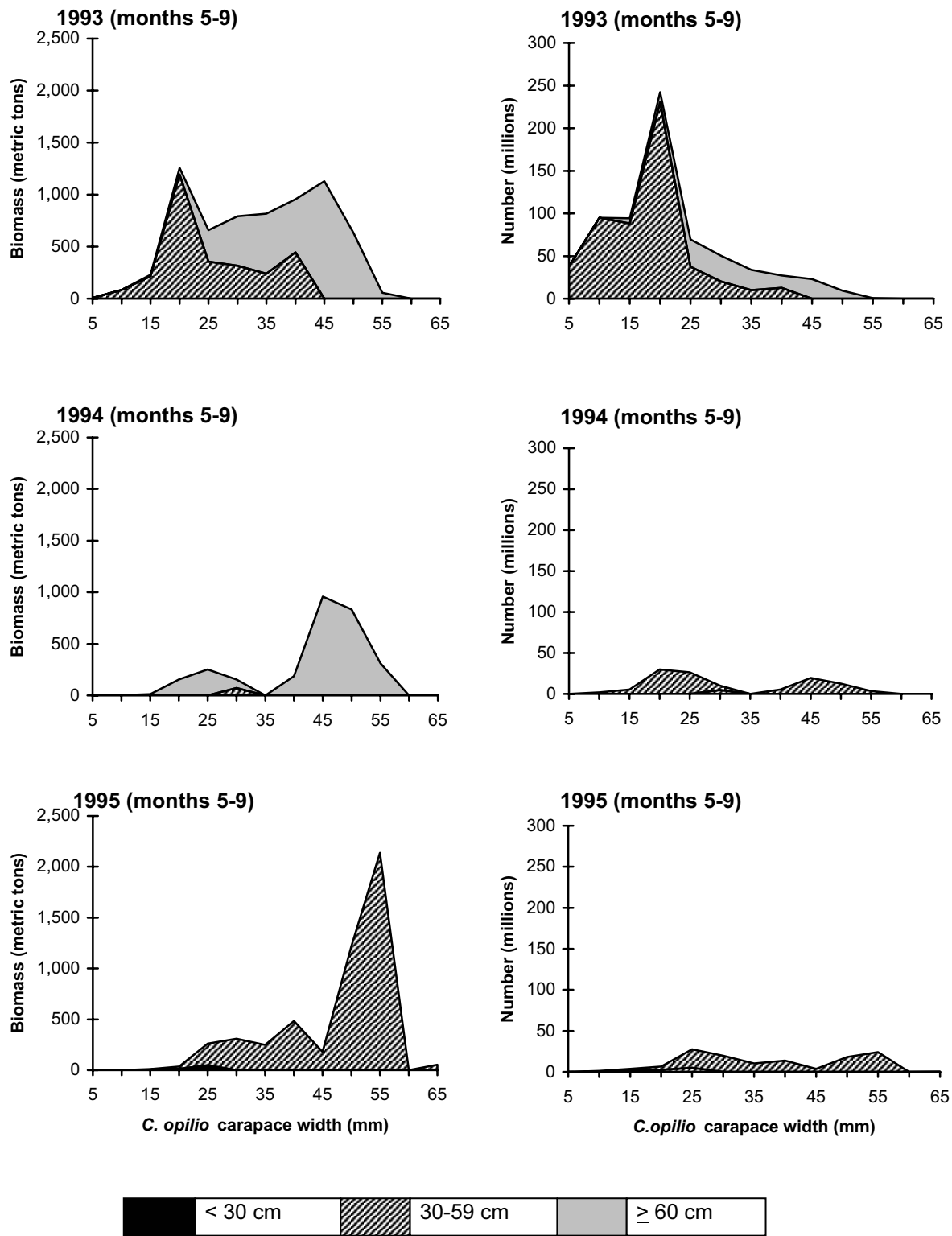


Figure F-15. -- Biomass and number of snow crab (*Chionoecetes opilio*) consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993, 1994, and 1995 by prey size.

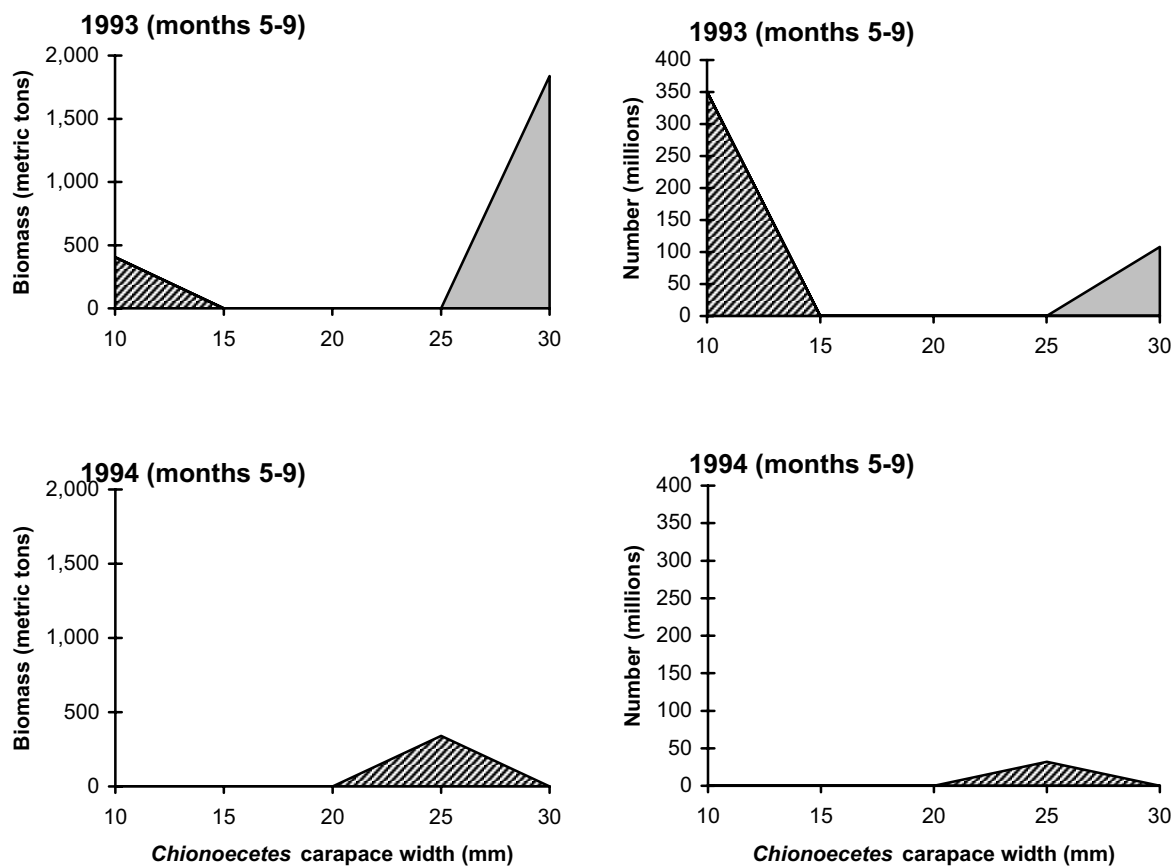


Figure F-16. -- Biomass and number of unidentified *Chionoecetes* consumed by three size groups of Pacific halibut (*Hippoglossus stenolepis*) during May through September of 1993 and 1994 by prey size.

APPENDIX G. – SKATES

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Table G-1.--Mid-year estimates of biomass in metric tons (by predator size, stratum, and year) of skates in the eastern Bering Sea for 1996, from bottom trawl shelf survey.

Predator Size (cm)	Stratum	93	94	95	96
All Sizes	1	23,781	9,082	12,041	12,225
	2	7,913	10,223	8,988	50,842
	3	64,356	97,436	82,246	81,120
	4	103,675	78,673	78,643	115,801
	5	30,079	43,039	41,057	33,992
	6	145,077	175,601	168,484	128,111
Subtotal		374,881	414,054	391,459	422,091
Total		374,881	414,054	391,459	422,091

Table G-2.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of skates collected in the eastern Bering Sea in 1993, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polynoidae (polychaete)	0.03	1.92
Nephtyidae (polychaete)	0.03	0.96
Gammaridea (amphipod)	1.52	27.92
Reptantia (crab)	0.95	6.41
Caridea (shrimp)	0.06	1.92
Pandalidae (shrimp)	0.71	7.95
<i>Pandalus borealis</i> (shrimp)	0.89	13.46
Crangonidae (shrimp)	0.08	2.88
<i>Crangon dalli</i> (shrimp)	0.45	6.87
<i>Argis lar</i> (shrimp)	1.02	12.71
Paguridae (hermit crab)	2.57	9.11
<i>Chionoecetes</i> sp. (snow and Tanner crab)	5.03	5.72
<i>Chionoecetes opilio</i> (snow crab)	9.03	12.69
<i>Chionoecetes bairdi</i> (Tanner crab)	1.85	18.92
Echiura (marine worm)	0.02	0.96
Osteichthyes Teleostei (fish)	1.58	7.33
Non-gadoid Fish Remains	1.37	4.62
<i>Theragra chalcogramma</i> (walleye pollock)	47.87	28.86
Zoarcidae (eelpout)	8.45	14.81
<i>Lycodes palearis</i> (wattled eelpout)	7.55	5.38
Cyclopteridae (snailfish)	0.01	0.96
Pleuronectiformes Pleuronectoidei (flatfish)	1.49	2.56
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.47	1.54
<i>Hippoglossus stenolepis</i> (Pacific halibut)	0.74	1.54
Fishery discards	6.25	3.66

Total prey weight	4,790 g
Total non-empty stomachs	62
Total empty stomachs	14
Number of hauls	13

Table G-3.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of skates collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	2.98	14.00
Polynoidae (polychaete)	0.22	1.70
Nephtyidae (polychaete)	0.30	1.99
Mollusca	0.01	0.23
Teuthoidea (squid)	0.06	0.45
Crustacea	0.14	0.57
Calanidae (copepod)	<0.01	0.57
Mysidacea Mysida (mysid)	0.24	2.48
Mysidae (mysid)	<0.01	1.14
Isopoda (isopod)	0.02	0.95
Peracarida Isopoda Valvifera	<0.01	0.45
Gammaridea (amphipod)	7.30	30.74
<i>Maera loveni</i> (amphipod)	0.01	0.32
Amphipoda Hyperiidea (amphipod)	0.01	0.45
Euphausiidae (euphausiid)	<0.01	0.28
Reptantia (crab)	0.01	0.23
Caridea (shrimp)	0.12	6.21
Hippolytidae (shrimp)	0.85	9.51
Spirontocaris arcuata (shrimp)	0.02	0.28
<i>Lebbeus groenlandicus</i> (shrimp)	0.16	2.27
<i>Eualus gaimurdii</i> (shrimp)	0.28	5.57
Pandalidae (shrimp)	0.35	3.30
<i>Pandalus borealis</i> (shrimp)	0.12	1.59
<i>Pandalus goniurus</i> (shrimp)	0.03	0.68
<i>Pandalus jordani</i> (shrimp)	0.01	0.80
Crangonidae (shrimp)	0.06	2.44
<i>Crangon</i> sp. (shrimp)	0.23	2.27
<i>Crangon dalli</i> (shrimp)	0.09	2.27
<i>Crangon communis</i> (shrimp)	0.44	7.28
<i>Argis</i> sp. (shrimp)	0.27	4.32
<i>Argis lar</i> (shrimp)	0.69	6.61
<i>Argis dentata</i> (shrimp)	0.75	0.77
<i>Argis ovifer</i> (shrimp)	0.03	0.28
<i>Argis crassa</i>	0.16	2.27
Natantia (shrimp)	0.02	0.57
Paguridae (hermit crab)	5.82	22.08
Majidae (spider crab)	0.46	1.14
Majidae legs (for <i>C. opilio</i> , <i>C. bairdi</i> , etc)	0.05	0.57
<i>Hyas</i> sp. (lyre crab)	0.02	0.57
<i>Hyas lyratus</i> (lyre crab)	1.91	2.56
<i>Chionoecetes</i> sp. (snow and Tanner crab)	3.95	15.46
<i>Chionoecetes opilio</i> (snow crab)	6.03	24.30
<i>Chionoecetes bairdi</i> (Tanner crab)	1.29	4.57
Echiura (marine worm)	0.01	0.23
Ophiuroidea Ophiurida (brittle star)	<0.01	0.23
Ophiuroidea ophiurida chilophiurina (brittle star)	0.18	2.27
Ophiuridae (brittle star)	0.02	0.45
Osteichthyes Teleostei (fish)	0.39	5.49
Non-gadoid Fish Remains	0.55	2.71
Salmonidae (salmon, whitefish)	1.90	0.57
Coregonus (salmonidae)	3.55	1.59
<i>Oncorhynchus keta</i> (chum salmon)	2.15	0.45
Gadidae (gadid fish)	0.63	5.44
<i>Gadus macrocephalus</i> (Pacific cod)	1.69	3.30
<i>Theragra chalcogramma</i> (walleye pollock)	23.82	22.74
Zoarcidae (eelpout)	12.20	18.32
<i>Lycodes</i> sp. (eelpout unid)	2.26	1.14
<i>Lycodes palearis</i> (wattled eelpout)	2.16	1.82

Table G-3.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Scorpaenidae	0.29	0.28
Cottoidei (sculpin)	0.59	0.98
Cottidae (sculpin)	0.11	0.99
<i>Hemilepidotus</i> sp. (sculpin)	<0.01	0.23
Agonidae (poacher)	0.01	0.57
Cyclopteridae (snailfish)	0.39	3.41
Stichaeidae (prickleback)	1.59	4.91
Pleuronectidae (flatfish)	2.07	3.34
<i>Atheresthes stomias</i> (arrowtooth flounder)	1.03	0.65
<i>Hippoglossoides elassodon</i> (flathead sole)	0.67	0.45
<i>Hippoglossoides robustus</i> (eastern Bering flounder)	3.10	2.58
<i>Lepidopsetta polyxystra</i> (northern rock sole)	1.41	1.69
Unidentified organic material	0.36	3.18
Fishery discards	1.36	1.56

Total prey weight	9,951 g
Total non-empty stomachs	221
Total empty stomachs	25
Number of hauls	44

Table G-4.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of skates collected in the eastern Bering Sea in 1995, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Scyphozoa (jellyfish)	0.82	3.01
Polychaeta (worm)	0.68	4.81
Aphroditidae (sea mouse)	0.32	1.99
Polynoidae (polychaete)	0.02	0.32
Nephtyidae (polychaete)	0.32	1.66
Maldanidae (polychaete)	<0.01	0.38
Crustacea	0.24	1.14
<i>Gnathophausia</i> sp.	0.16	1.78
<i>Gnathophausia gigas</i> (mysid)	0.29	1.00
Mysidacea Mysida (mysid)	0.02	1.08
Mysidae (mysid)	0.04	1.08
Isopoda (isopod)	<0.01	0.15
Phreatoicidea (Isopod suborder)	0.32	0.19
Gammaridea (amphipod)	5.12	21.48
Ampeliscidae (amphipod)	1.33	3.88
<i>Ampelisca</i> sp. (amphipod)	<0.01	0.15
<i>Maera loveni</i> (amphipod)	0.39	2.50
Euphausiacea (euphausiid)	0.01	0.50
Euphausiidae (euphausiid)	0.06	1.21
Reptantia (crab)	1.65	5.34
Caridea (shrimp)	<0.01	0.68
Hippolytidae (shrimp)	0.58	4.66
<i>Lebbeus groenlandicus</i> (shrimp)	0.01	0.14
Pandalidae (shrimp)	1.15	1.10
<i>Pandalus</i> sp. (shrimp)	0.32	2.01
<i>Pandalus goniurus</i> (shrimp)	0.23	0.51
Crangonidae (shrimp)	0.15	2.14
<i>Crangon</i> sp. (shrimp)	0.81	8.37
<i>Crangon dalli</i> (shrimp)	1.04	3.59
<i>Crangon communis</i> (shrimp)	0.07	1.38
<i>Argis</i> sp. (shrimp)	0.32	1.81
<i>Argis lar</i> (shrimp)	1.03	4.32
Natantia (shrimp)	0.25	1.54
Paguridae (hermit crab)	10.25	22.13
Majidae (spider crab)	0.09	0.15
Majidae legs (for <i>C. opilio</i> , <i>C. bairdi</i> , etc)	0.54	2.21
<i>Hyas</i> sp. (lyre crab)	1.10	2.24
<i>Hyas lyratus</i> (lyre crab)	0.06	0.17
<i>Hyas coarctatus</i> (lyre crab)	0.50	1.66
<i>Chionoecetes</i> sp. (snow and Tanner crab)	9.10	16.21
<i>Chionoecetes opilio</i> (snow crab)	5.22	6.46
<i>Chionoecetes bairdi</i> (Tanner crab)	0.14	0.77
Atelecyclidae (crab)	0.06	0.31
<i>Cancer oregonensis</i> (pygmy Cancer crab)	<0.01	0.26
Chaetognatha (arrow worm)	<0.01	0.22
Osteichthyes Teleostei (fish)	0.56	4.91
Non-gadoid Fish Remains	1.10	3.75
Gadidae (gadid fish)	4.37	3.69
<i>Theragra chalcogramma</i> (walleye pollock)	19.69	12.13
Zoarcidae (eelpout)	9.12	11.97
<i>Lycodes ravidens</i> (marbled eelpout)	0.76	0.51
Cottoidei (Sculpin)	1.30	5.34
<i>Hemilepidotus papilio</i> (butterfly sculpin)	0.72	0.14
Agonidae (poacher)	0.11	0.26
<i>Podothecus acipenserinus</i> (sturgeon poacher)	0.25	0.31
Cyclopteridae (snailfish)	0.04	0.17
Bathymaster sp. (searcher)	0.03	0.19
Stichaeidae (prickleback)	0.84	5.85

Table G-4.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Poroclinus rothrocki</i> (whitebarred pricklback)	0.05	0.22
<i>Ammodytes</i> sp. (sandlance)	1.18	2.27
Pleuronectidae (flatfish)	6.41	9.47
<i>Hippoglossoides elassodon</i> (flathead sole)	1.49	2.91
<i>Lepidopsetta polyxystra</i> (northern rock sole)	3.36	3.61
<i>Pleuronectes asper</i> (yellowfin sole)	0.15	0.77
Unidentified organic material	1.73	3.96
Fishery discards	1.93	1.63

Total prey weight	16,598 g
Total non-empty stomachs	321
Total empty stomachs	58
Number of hauls	65

Table G-5.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of skates collected in the eastern Bering Sea in 1996, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	2.32	12.43
Aphroditidae (sea mouse)	0.01	0.10
Polynoidae (polychaete)	0.30	4.57
Nephtyidae (polychaete)	0.26	2.61
Opheliidae (polychaete)	<0.01	0.12
Gastropoda (snail)	0.01	0.30
<i>Yoldia scissurata</i> (clam)	<0.01	0.60
Crustacea	0.06	1.02
Mysidacea Mysida (mysid)	0.13	6.23
Mysidae (mysid)	<0.01	0.71
Cumacea (cumacean)	<0.01	0.17
Isopoda (isopod)	<0.01	0.24
Peracarida Isopoda Valvifera	0.01	0.41
Gammaridea (amphipod)	6.95	27.53
Ampeliscidae (amphipod)	1.36	4.87
<i>Maera loveni</i> (amphipod)	0.03	0.44
<i>Protomeдея</i> sp. (amphipod)	<0.01	0.17
<i>Anonyx</i> sp. (amphipod)	0.50	2.61
Euphausiacea (euphausiid)	0.01	1.58
Euphausiidae (euphausiid)	0.01	0.61
<i>Thysanoessa</i> sp. (euphausiid)	<0.01	0.17
<i>Thysanoessa raschii</i> (euphausiid)	<0.01	0.20
Decapoda (shrimp and crab)	0.10	0.47
Reptantia (crab)	0.20	2.23
Caridea (shrimp)	0.32	5.40
Hippolytidae (shrimp)	0.88	4.04
<i>Spirontocaris</i> sp. (shrimp)	0.03	0.17
<i>Spirontocaris ochotensis</i> (shrimp)	0.01	0.30
<i>Spirontocaris arcuata</i> (shrimp)	0.01	0.30
<i>Eualus</i> sp. (shrimp)	0.02	0.71
Pandalidae (shrimp)	1.26	2.11
<i>Pandalus</i> sp. (shrimp)	0.01	0.40
<i>Pandalus goniurus</i> (shrimp)	0.02	0.50
Crangonidae (shrimp)	0.96	7.34
<i>Crangon</i> sp. (shrimp)	0.10	1.63
<i>Crangon dalli</i> (shrimp)	0.82	7.40
<i>Crangon communis</i> (shrimp)	0.50	2.06
<i>Argis</i> sp. (shrimp)	0.87	6.14
<i>Argis lar</i> (shrimp)	4.30	12.56
Natantia (shrimp)	0.02	0.59
Anomura (crab)	0.13	0.27
Paguridae (hermit crab)	5.45	19.03
Decapoda Reptantia legs (for unident. crabs)	<0.01	0.30
Majidae legs (for <i>C. opilio</i> , <i>C. bairdi</i> , etc)	0.41	1.54
<i>Oregonia</i> sp. (decorator crab)	0.18	0.30
<i>Oregonia gracilis</i> (decorator crab)	0.13	0.30
<i>Oregonia bifurca</i> (Decorator crab)	0.11	0.60
<i>Hyas lyratus</i> (lyre crab)	0.04	0.30
<i>Chionoecetes</i> sp. (snow and Tanner crab)	9.97	14.52
<i>Chionoecetes opilio</i> (snow crab)	7.34	9.21
<i>Chionoecetes bairdi</i> (Tanner crab)	0.11	0.92
<i>Erimacrus isenbeckii</i> (Korean horse-hair crab)	0.53	0.90
Echiura (marine worm)	<0.01	0.24
Ophiuroidea Ophiurida (brittle star)	<0.01	0.47
Urochordata (tunicate)	0.15	0.90
Asciacea (sea squirt)	<0.01	0.13
Osteichthyes Teleostei (fish)	2.59	6.15
Non-gadoid Fish Remains	1.74	6.91

Table G-5.--Continued.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
<i>Gadidae</i> (gadid fish)	0.87	1.50
<i>Gadus macrocephalus</i> (Pacific cod)	0.19	0.15
<i>Theragra chalcogramma</i> (walleye pollock)	23.68	19.15
<i>Zoarcidae</i> (eelpout)	3.73	5.27
<i>Lycodes palearis</i> (wattled eelpout)	0.71	0.28
Cottoidei (Sculpin)	0.59	1.80
Cottidae (sculpin)	0.19	0.90
<i>Hemilepidotus hemilepidotus</i> (red Irish lord)	<0.01	0.17
<i>Triglops pingeli</i> (ribbed sculpin)	0.08	0.30
Agonidae (poacher)	0.81	2.29
<i>Leptagonus leptorhynchus</i> (longnose poacher)	0.01	0.30
<i>Bathymaster</i> sp. (searcher)	0.01	0.30
Stichaeidae (prickleback)	1.39	1.94
<i>Ammodytes hexapterus</i> (Pacific sandlance)	0.23	1.10
Pleuronectidae (flatfish)	8.02	12.16
<i>Hippoglossoides elassodon</i> (flathead sole)	1.31	1.45
<i>Hippoglossoides robustus</i> (eastern Bering flounder)	1.18	1.20
<i>Lepidopsetta</i> sp. (rock sole type)	<0.01	0.24
<i>Lepidopsetta polyxystra</i> (northern rock sole)	0.10	0.84
Unidentified organic material	0.05	1.22
Sand	0.07	0.17
Unidentified worm-like organism	<0.01	0.24
Fishery discards	5.51	2.16

Total prey weight	13,829 g
Total non-empty stomachs	364
Total empty stomachs	32
Number of hauls	83

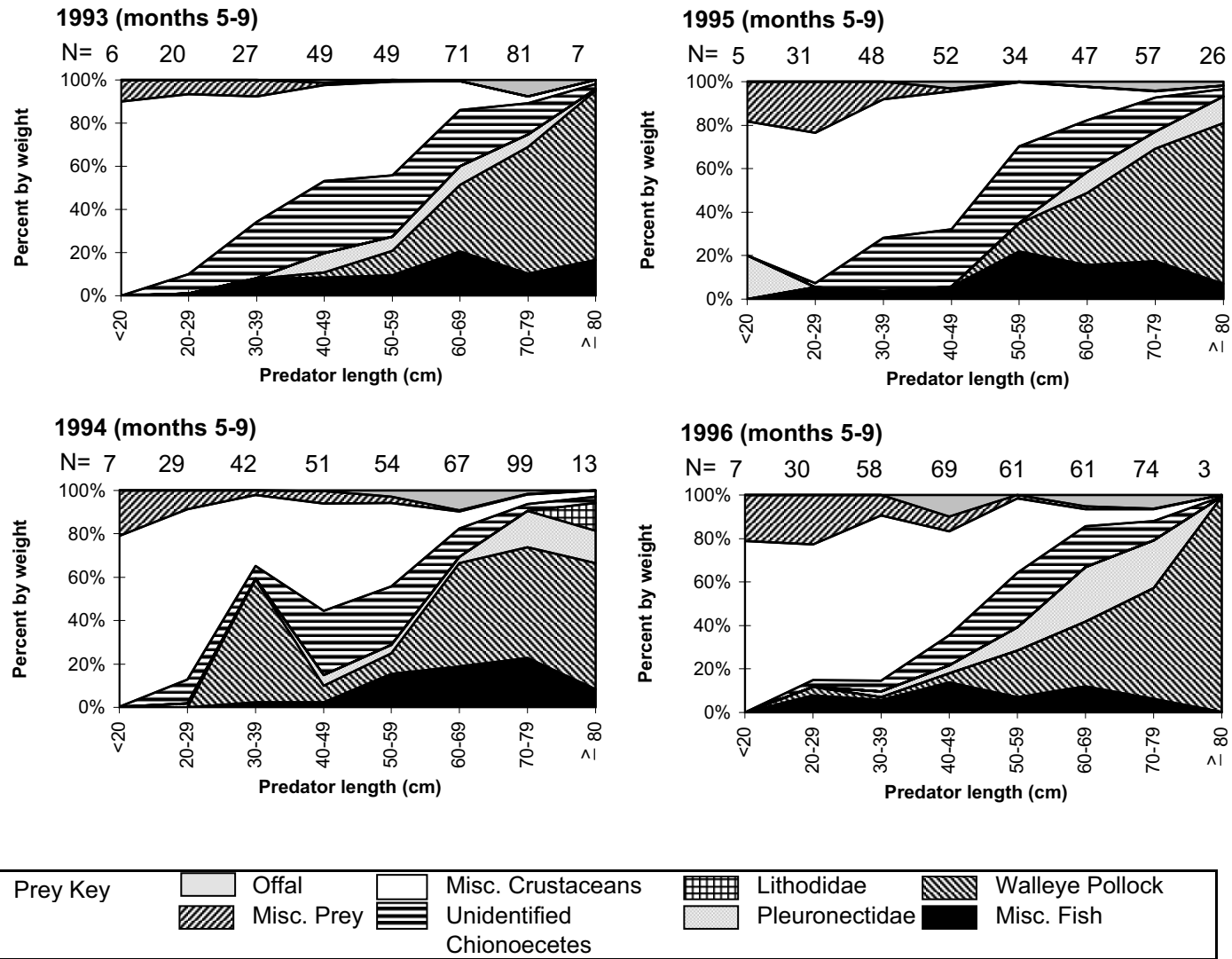


Figure G-1. -- Diet composition of skates, in terms of average percent by weight, during months 5 to 9 by year and by predator size in the Bering Sea; N = number of full stomachs.

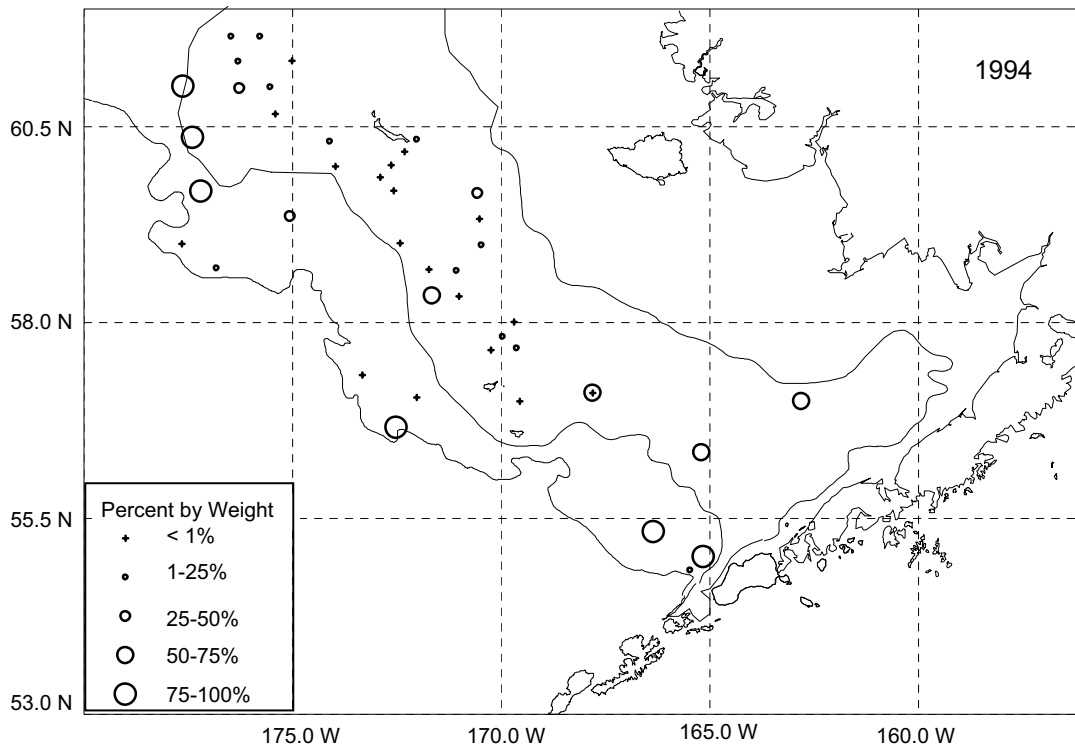
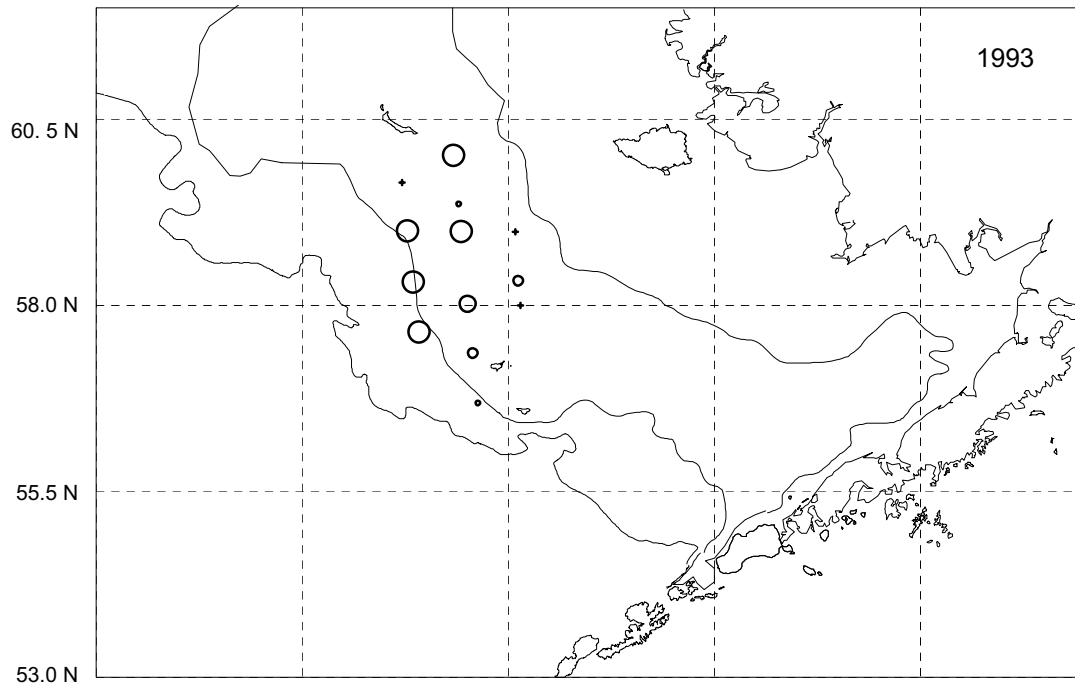


Figure G-2.-- Percent by weight of walleye pollock (*Theragra chalcogramma*) in the diet of skates by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

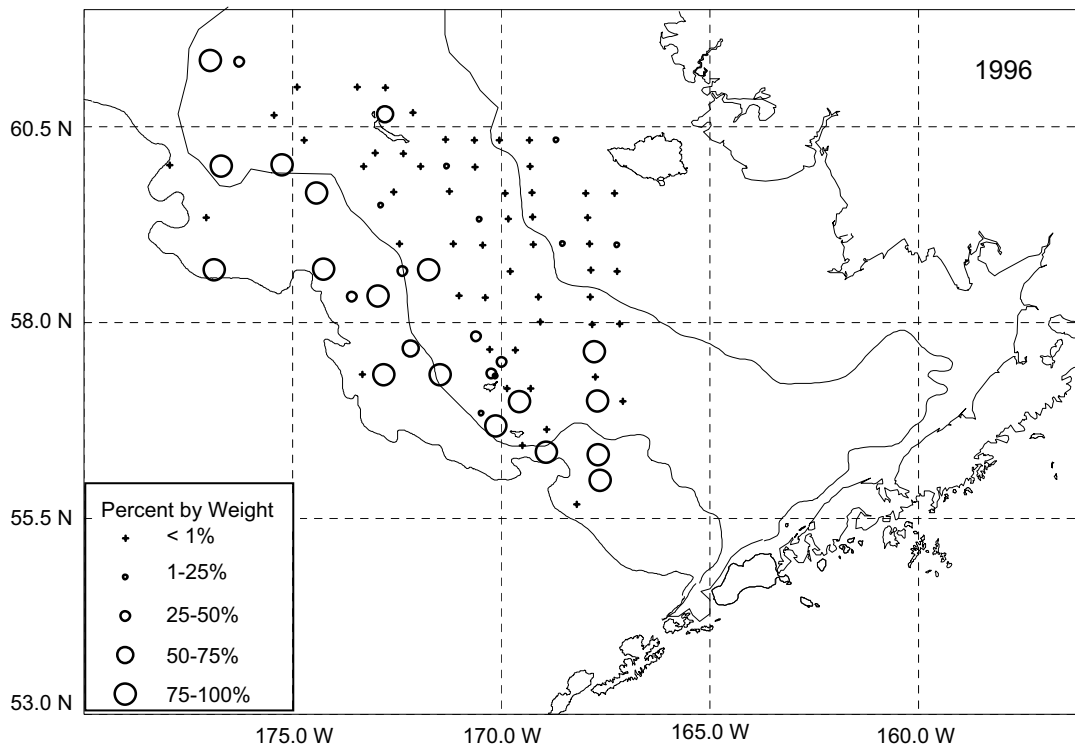
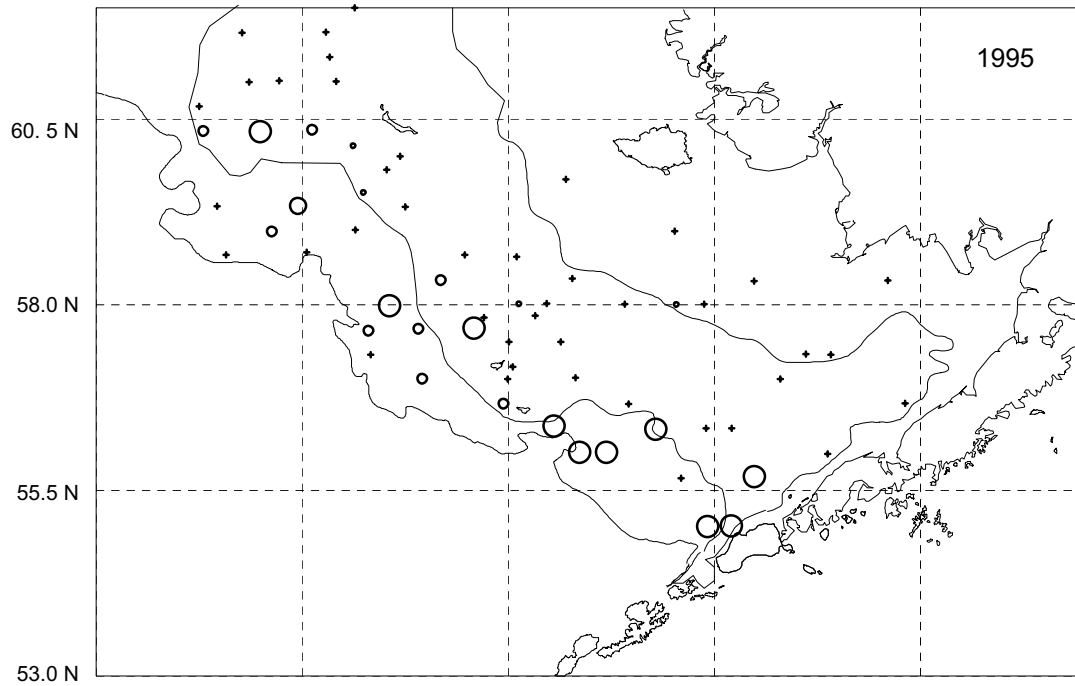
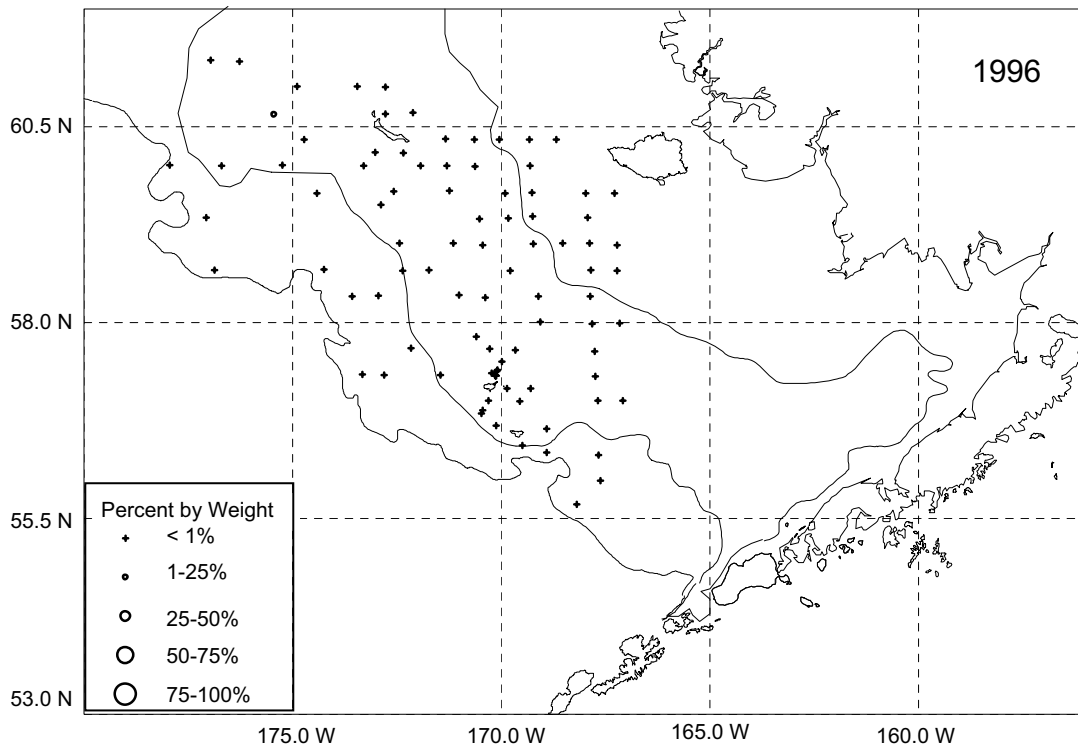
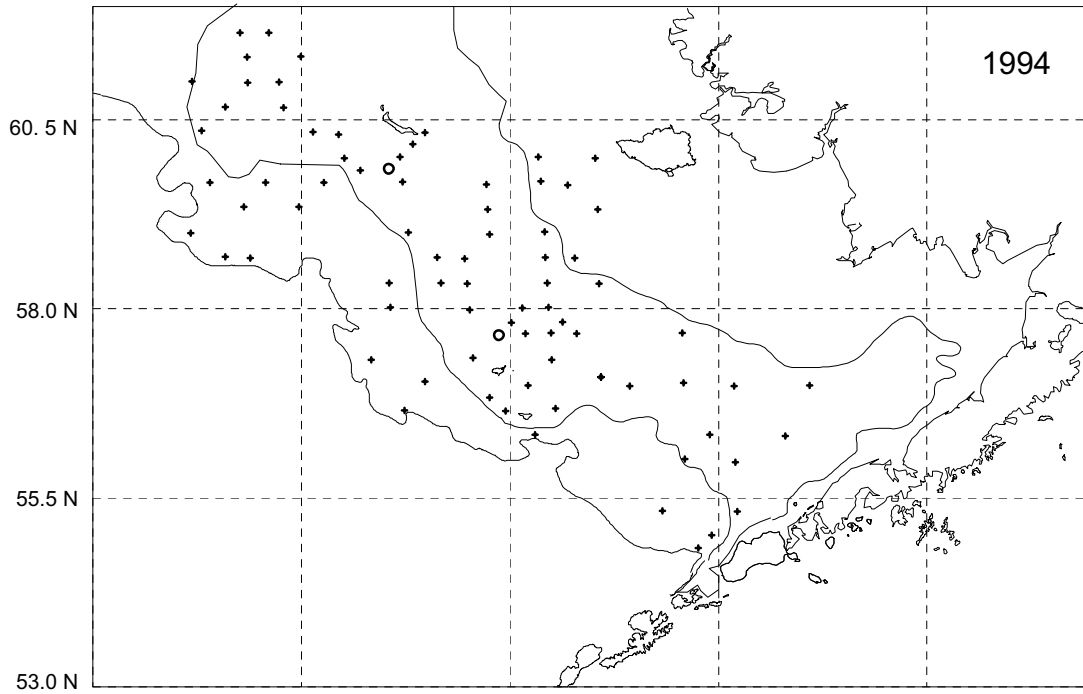


Figure G-2.-- Continued.



G-3.-- Percent by weight of Pacific cod (*Gadus macrocephalus*) in the diet of skates by sampling station during May through September in 1994 and 1996 in the eastern Bering Sea.

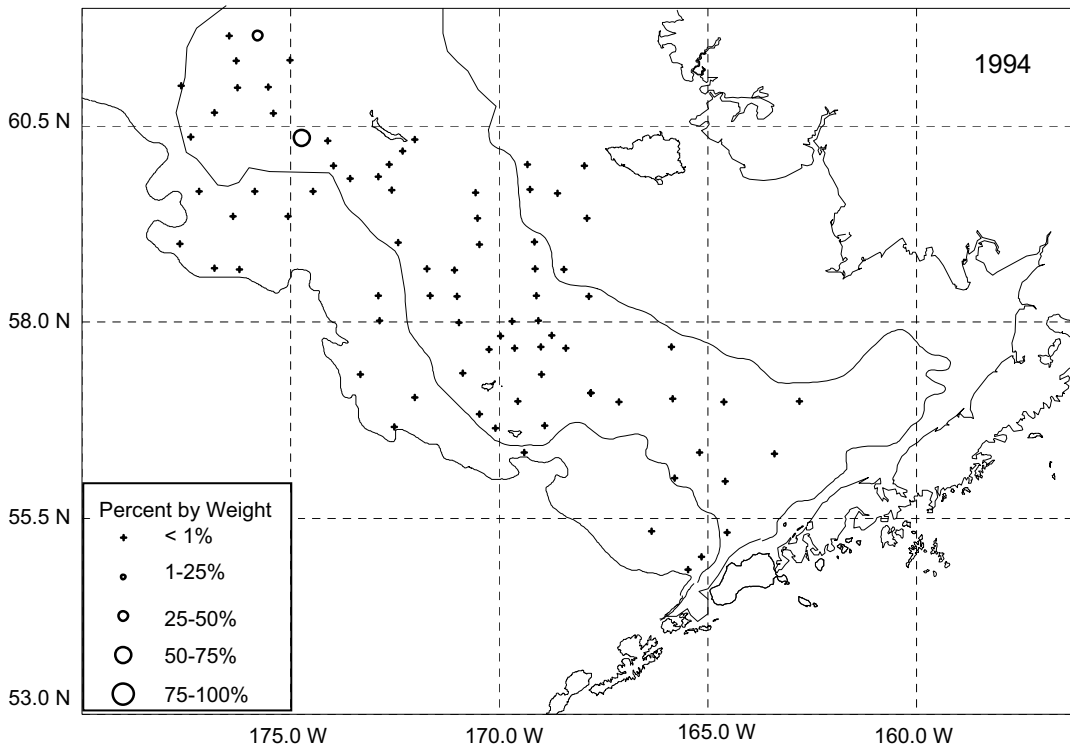
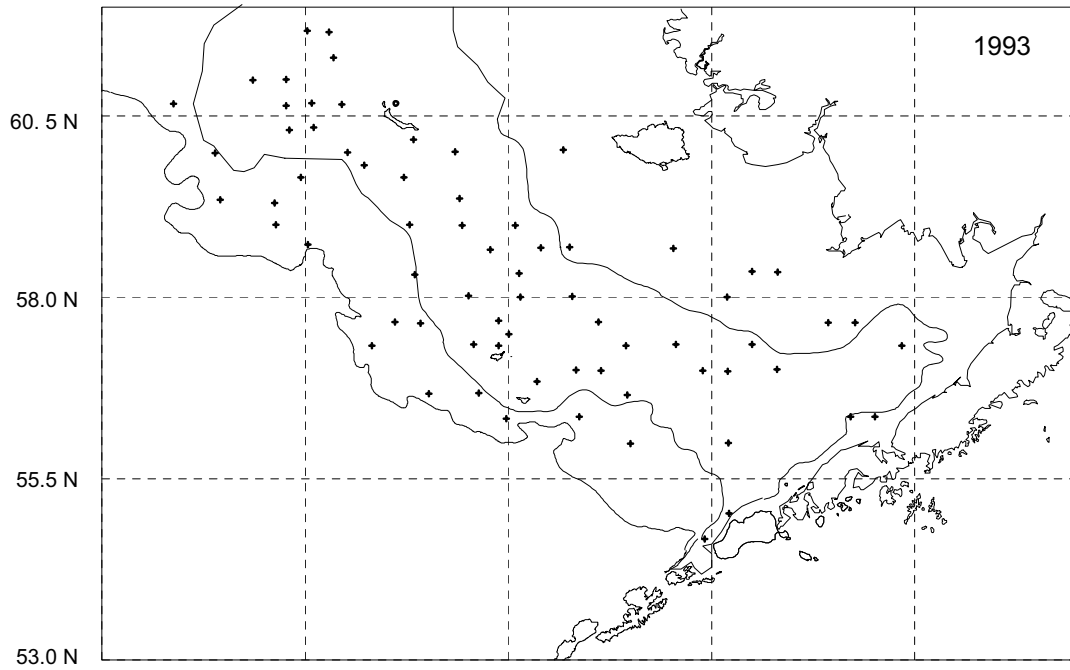


Figure G-4.-- Percent by weight of flathead sole (*Hippoglossoides elassodon*) in the diet of skates by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

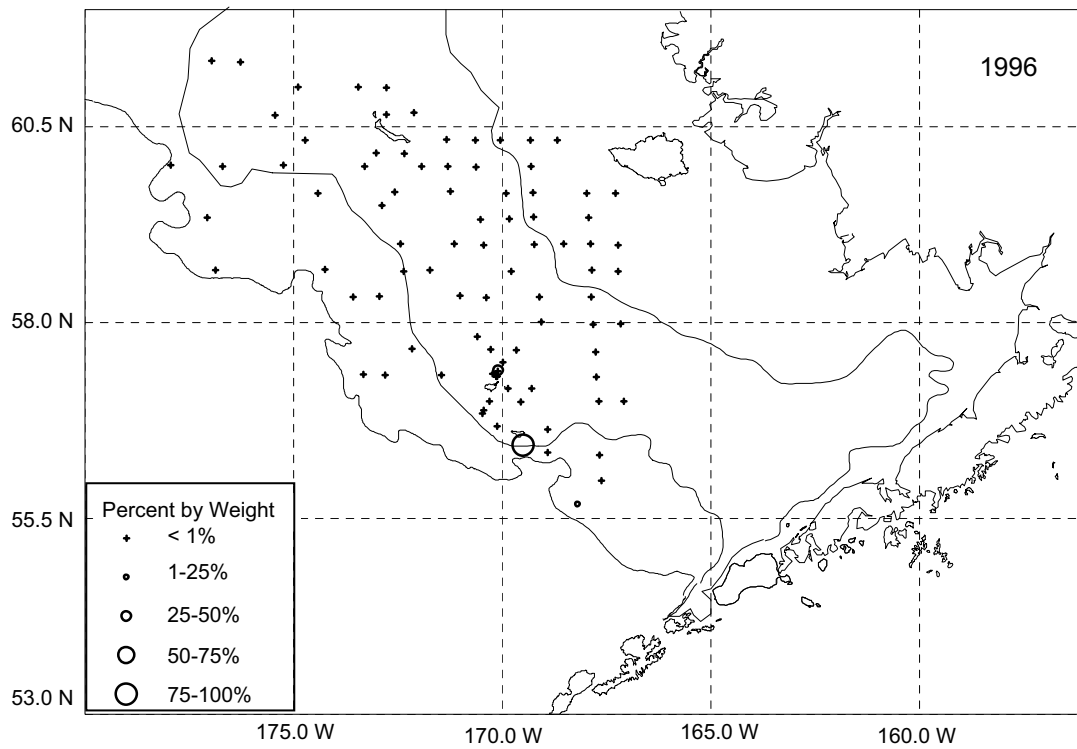
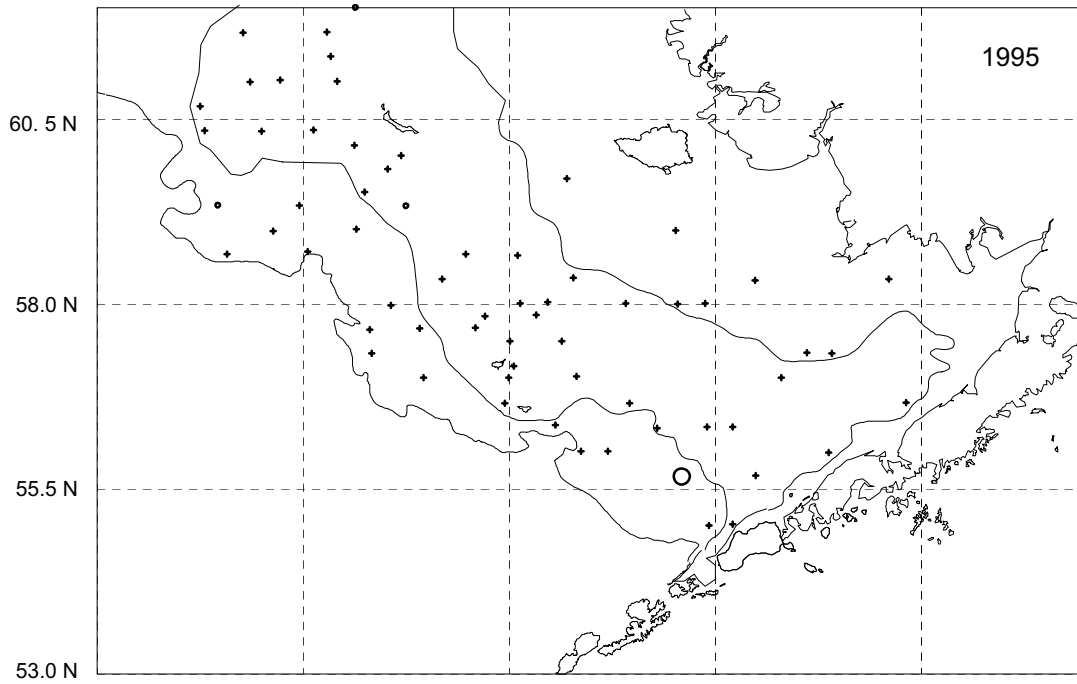
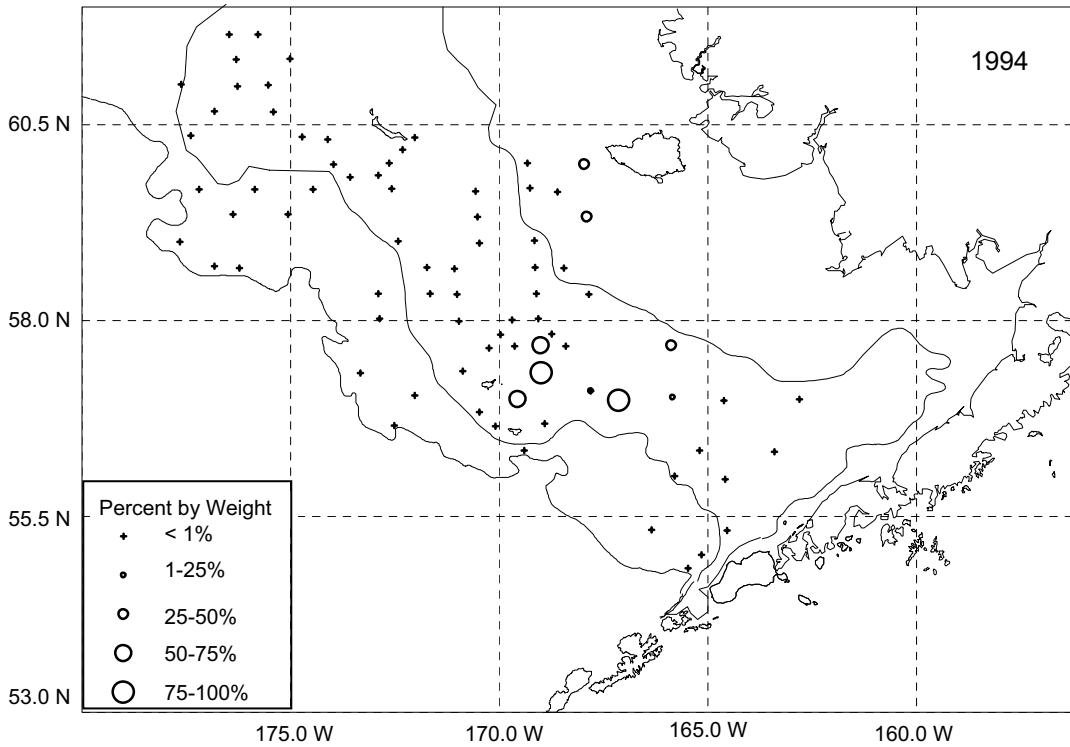
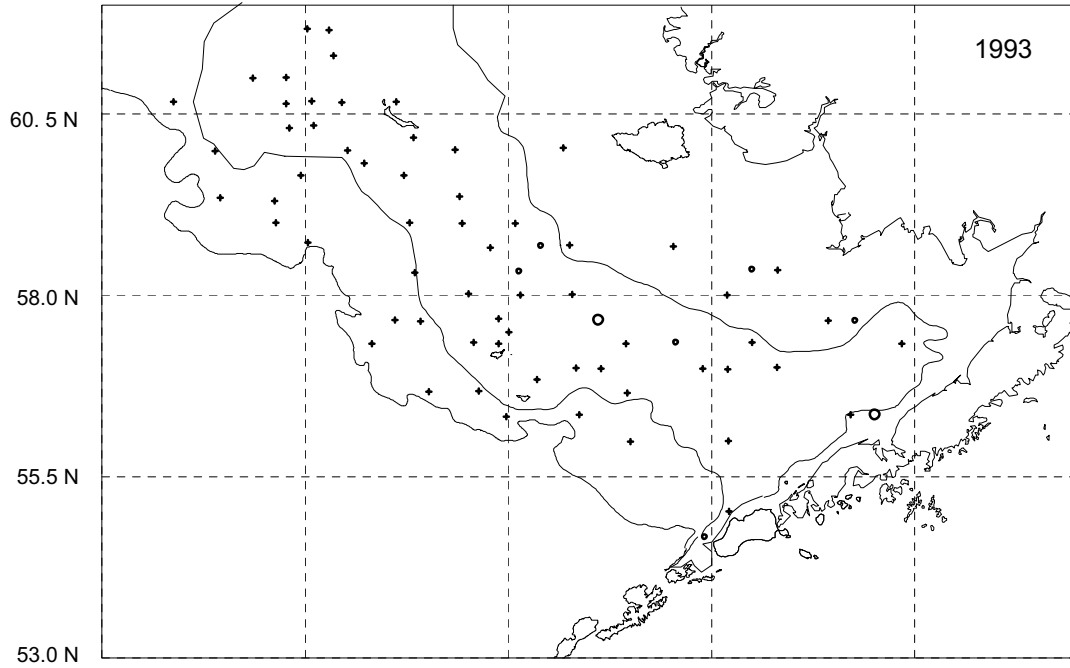
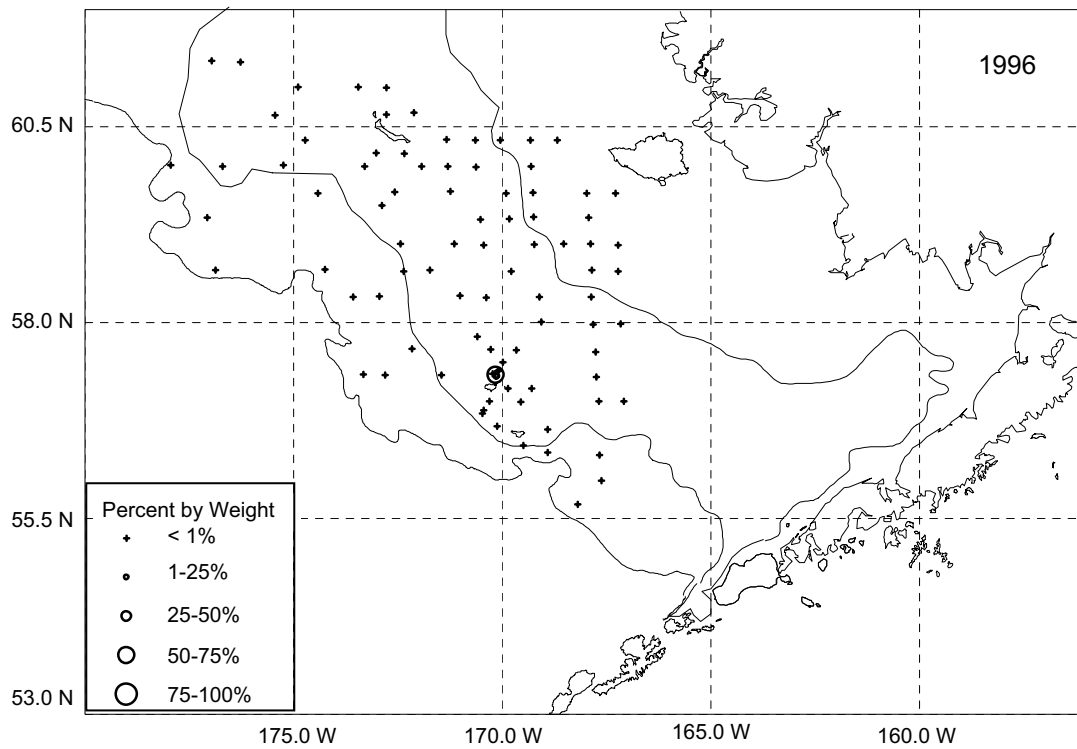
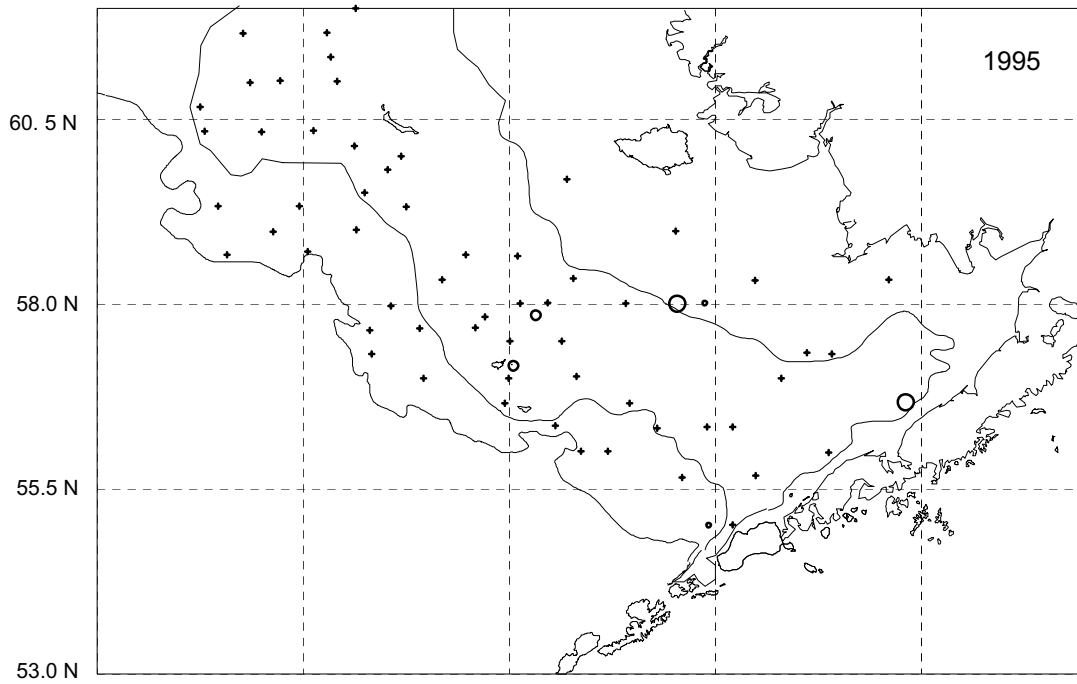


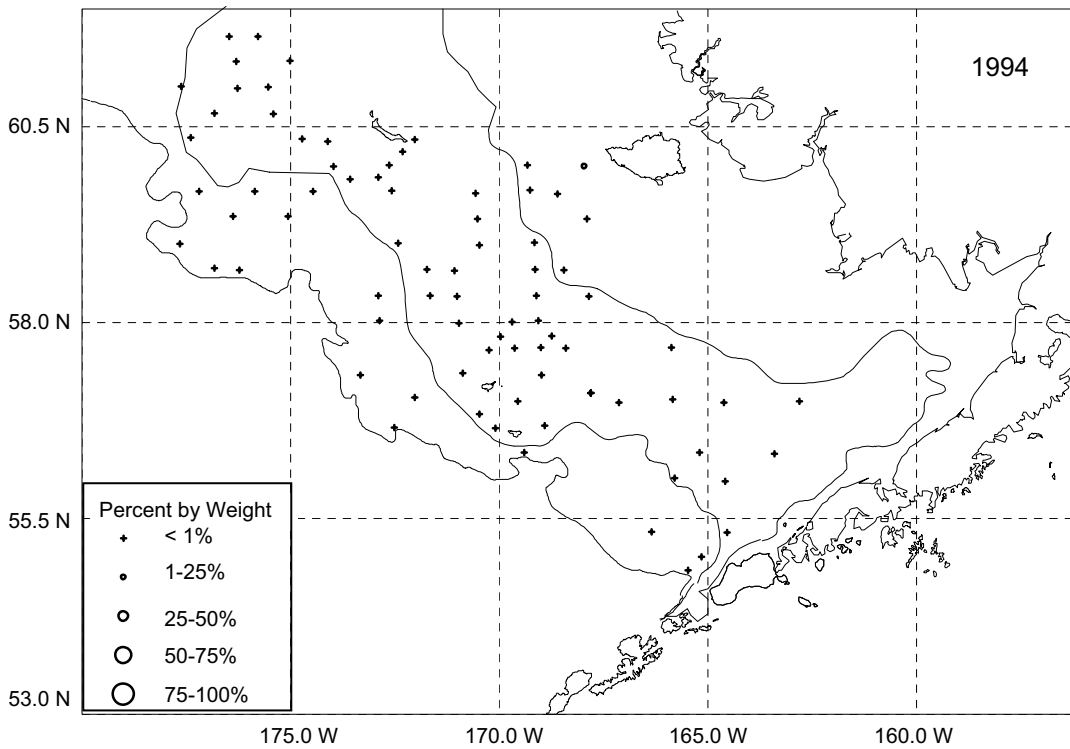
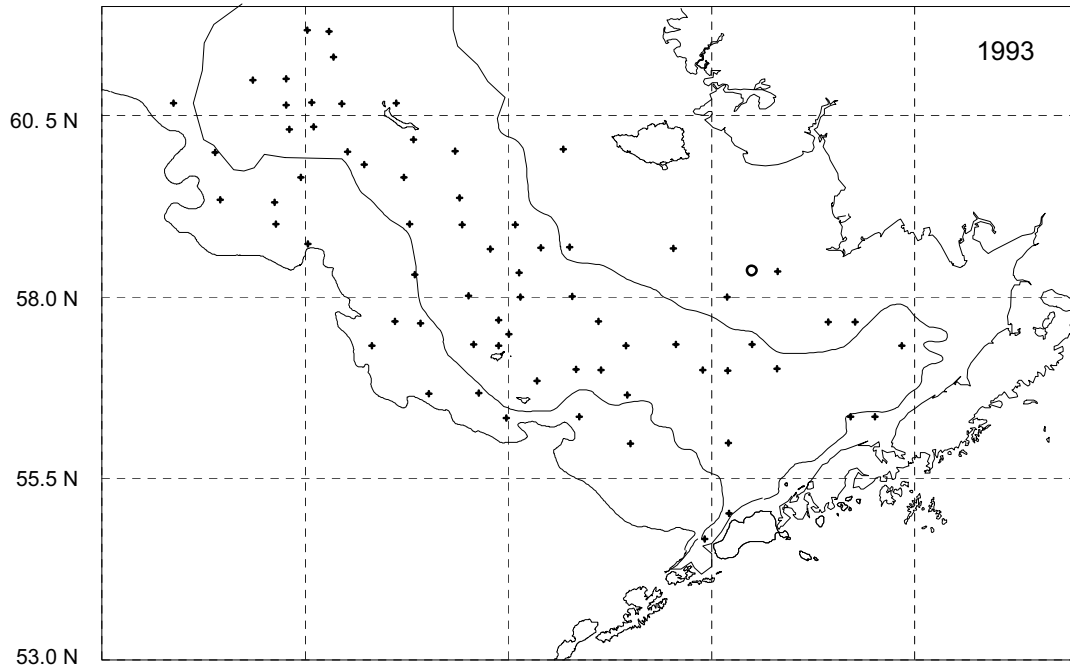
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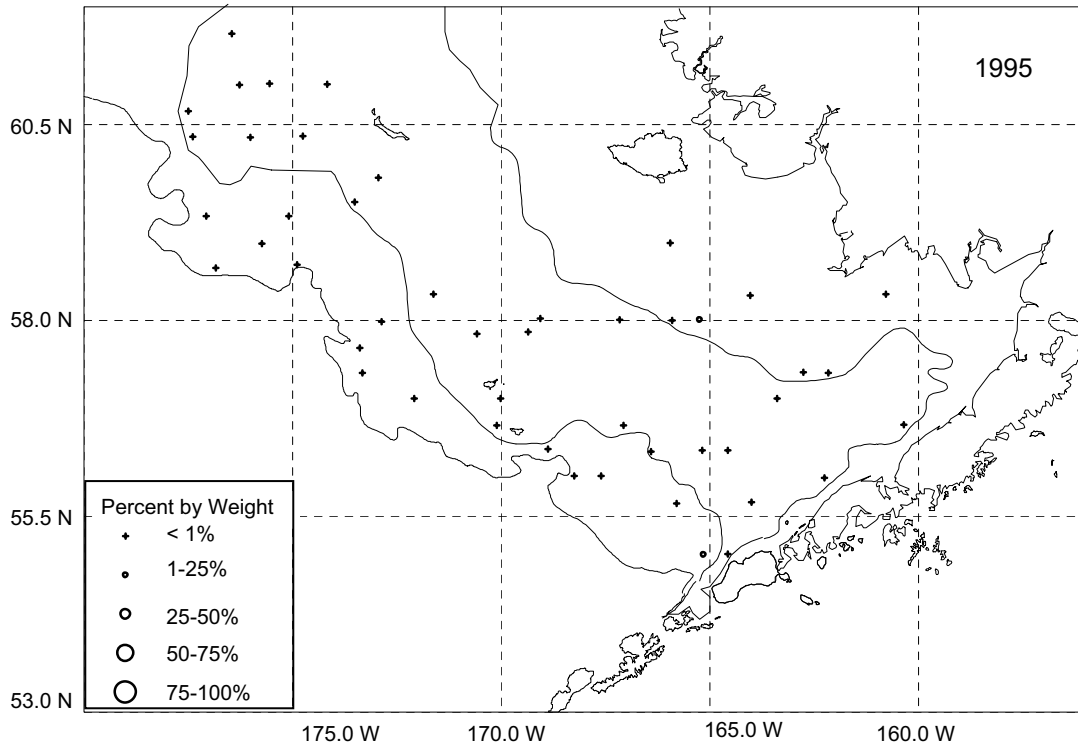
G-5.-- Percent by weight of northern rock sole (*Lepidopsetta polyxystra*) in the diet of skates by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.



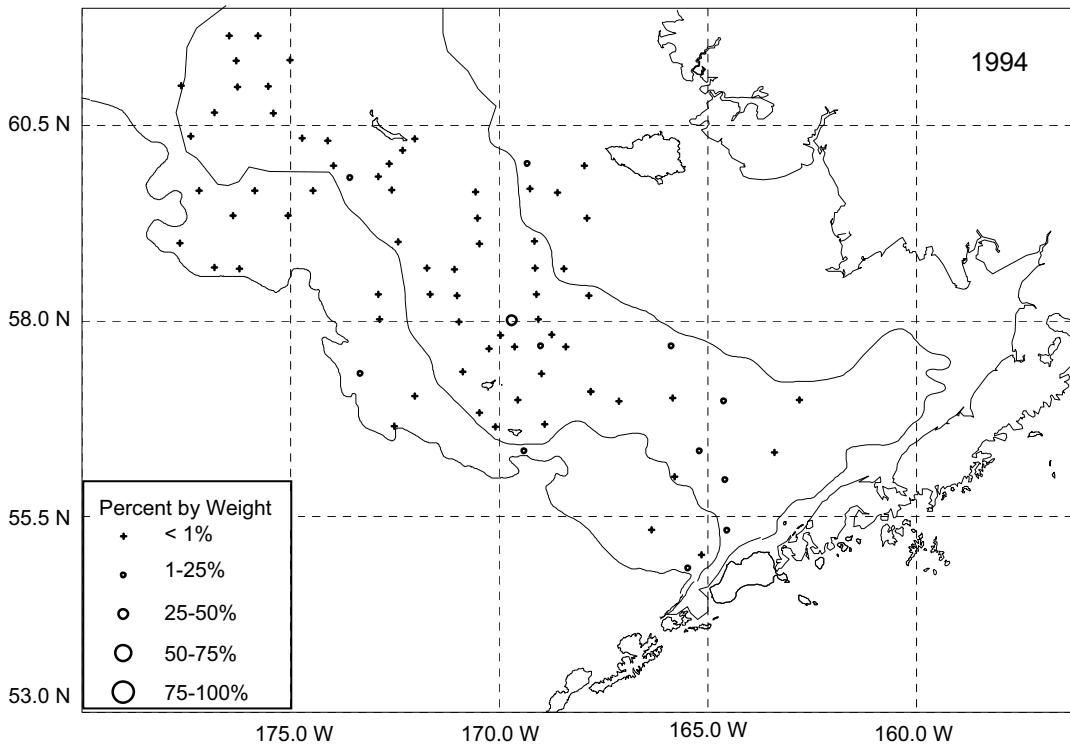
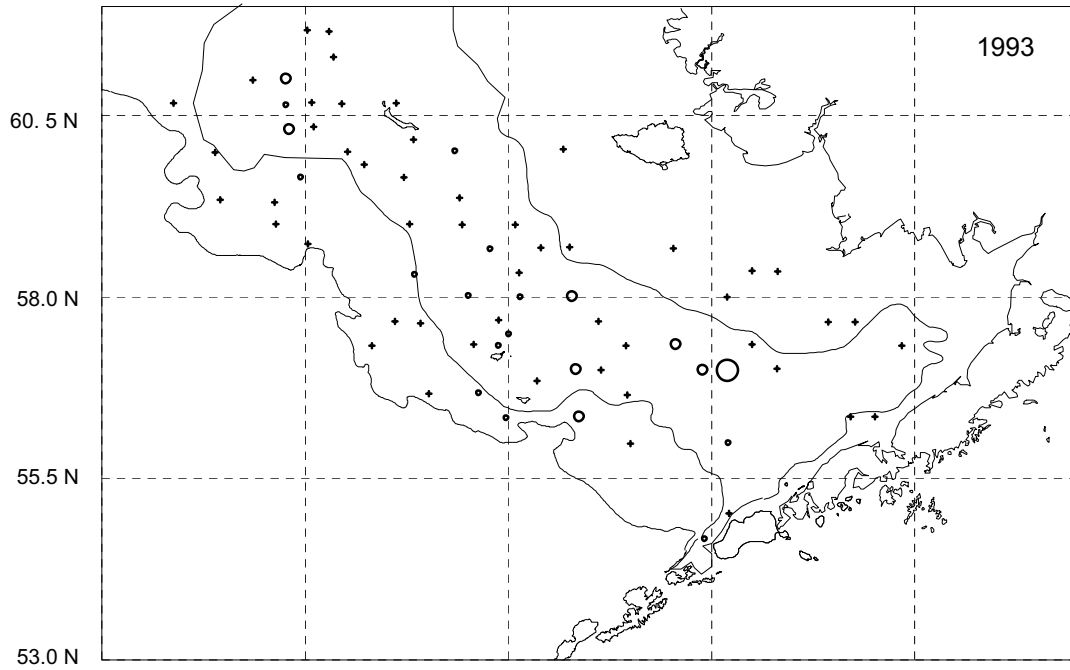
G-5.-- Continued.



G-6.-- Percent by weight of yellowfin sole (*Limanda aspera*) in the diet of skates by sampling station during May through September in 1993, 1994, and 1995 in the eastern Bering Sea.



G-6.-- Continued.



G-7.-- Percent by weight of Tanner crab (*Chionoecetes bairdi*) in the diet of skates by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

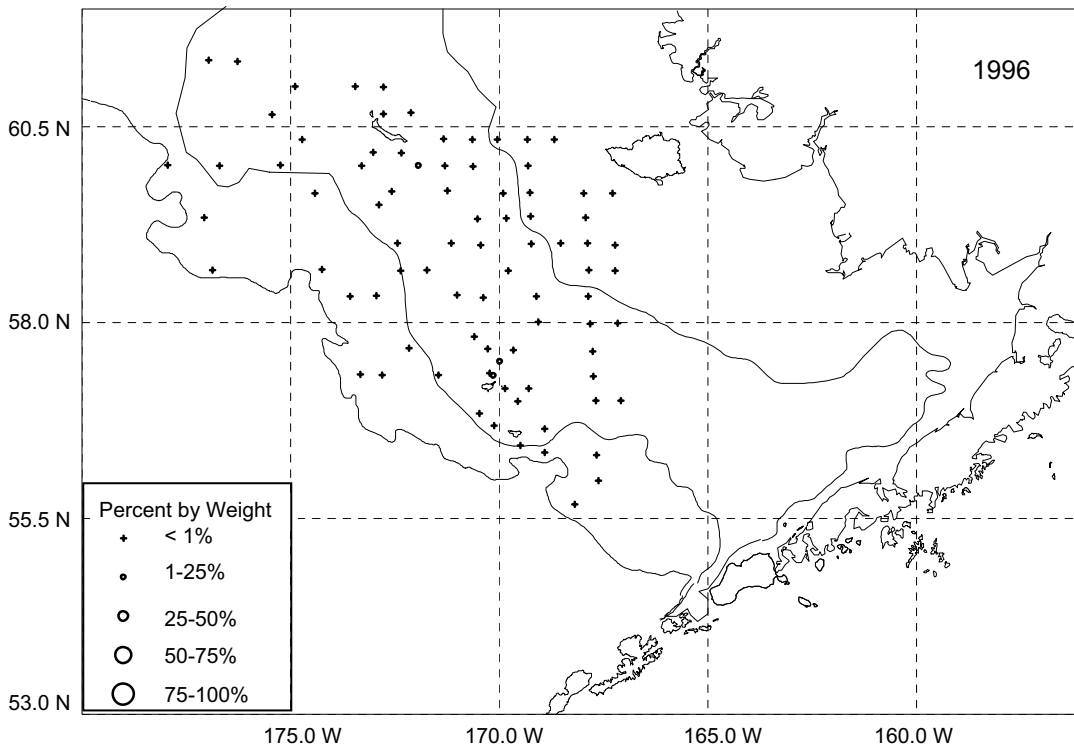
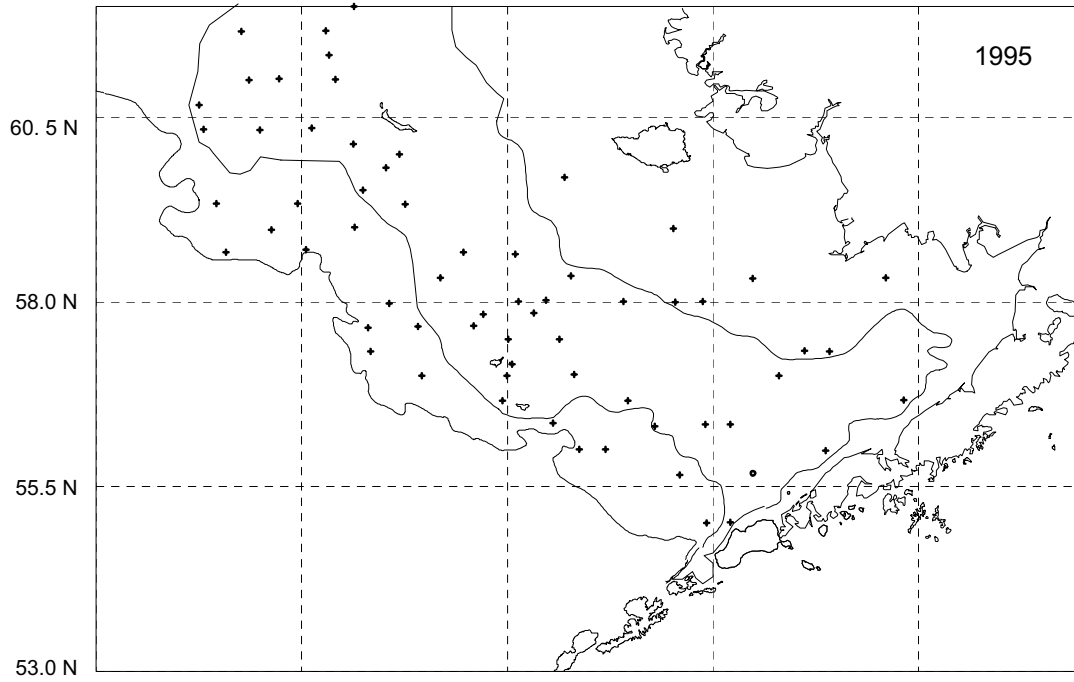
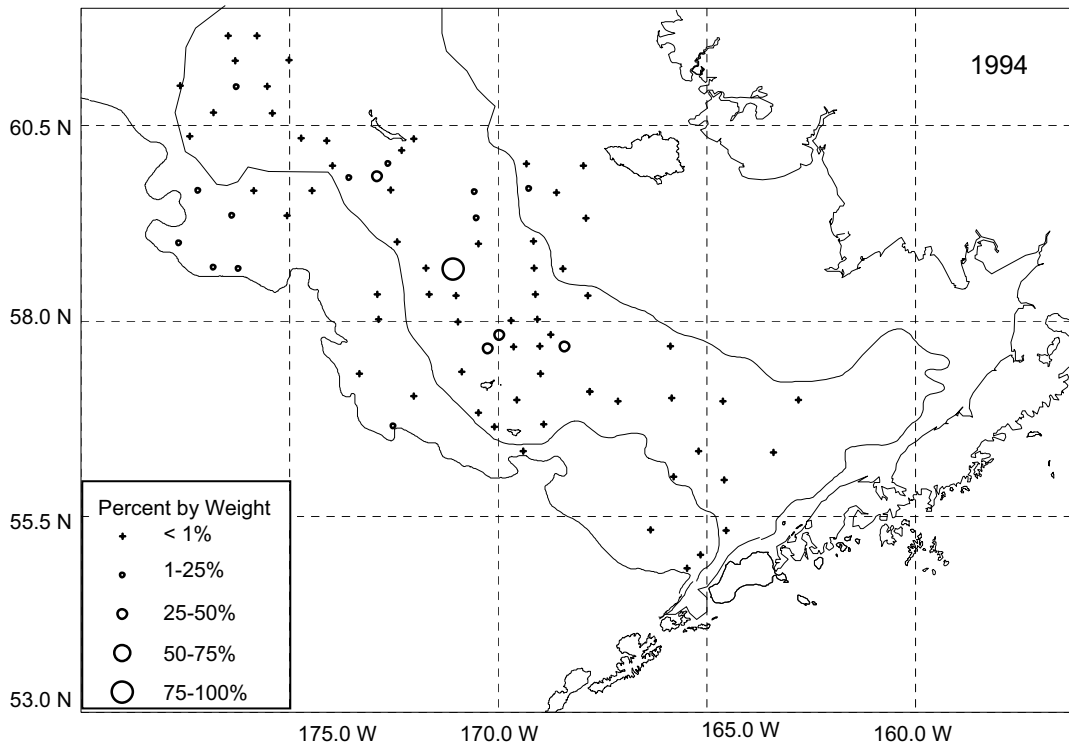
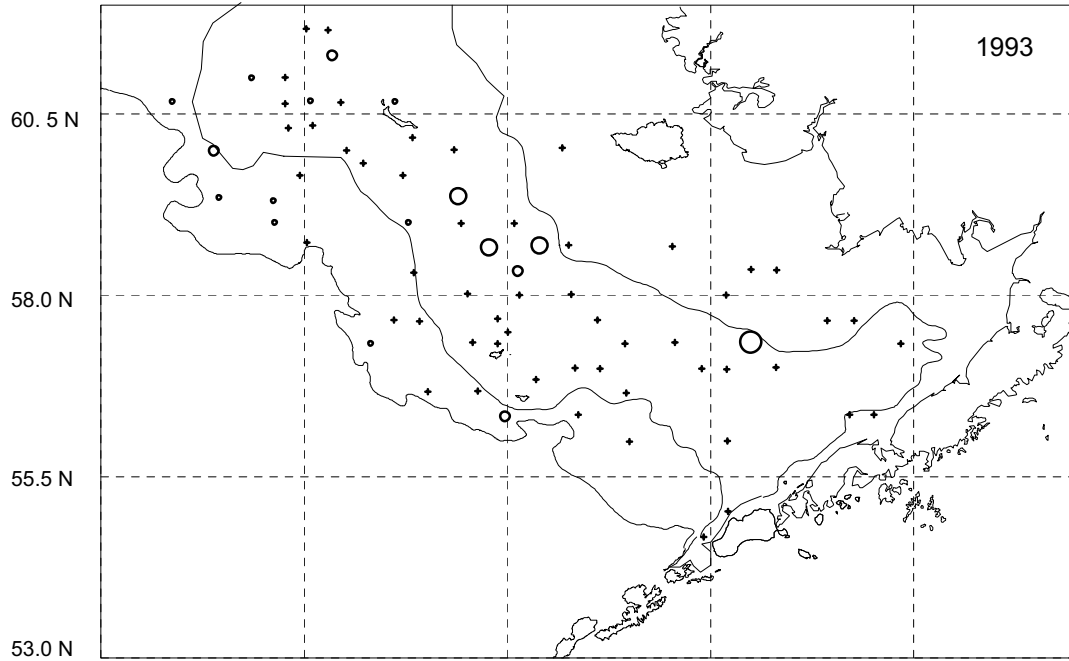


Figure G-7.-- Continued.



G-8.-- Percent by weight of snow crab (*Chionoecetes opilio*) in the diet of skates by sampling station during May through September in 1993, 1994, 1995, and 1996 in the eastern Bering Sea.

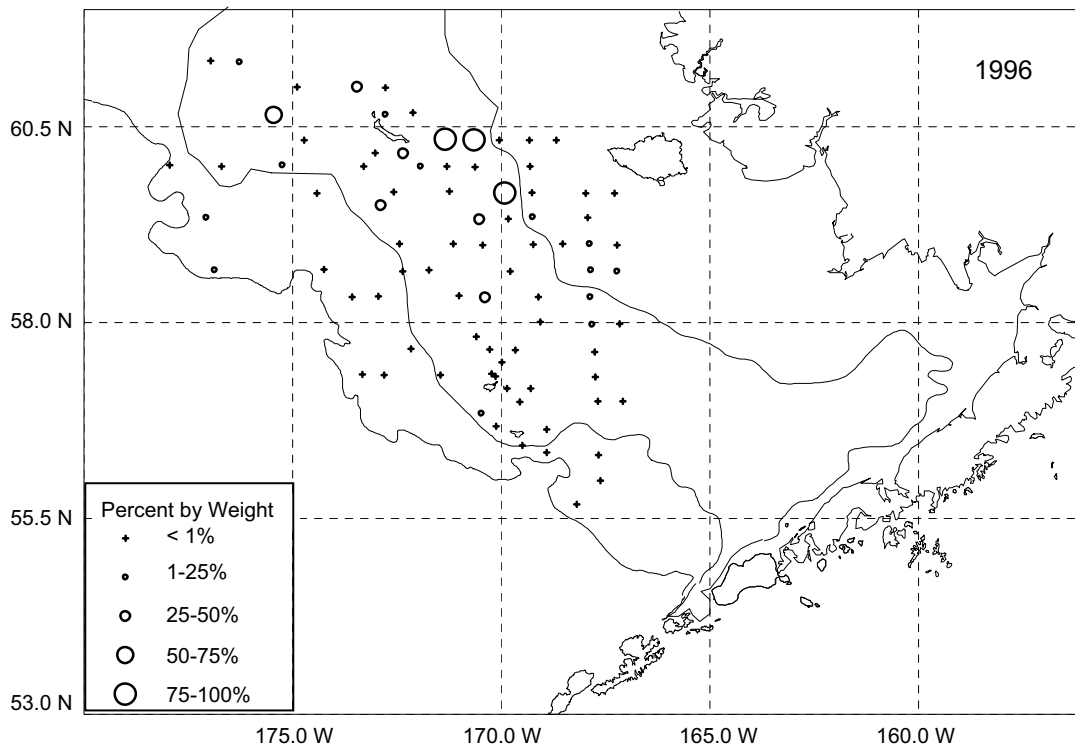
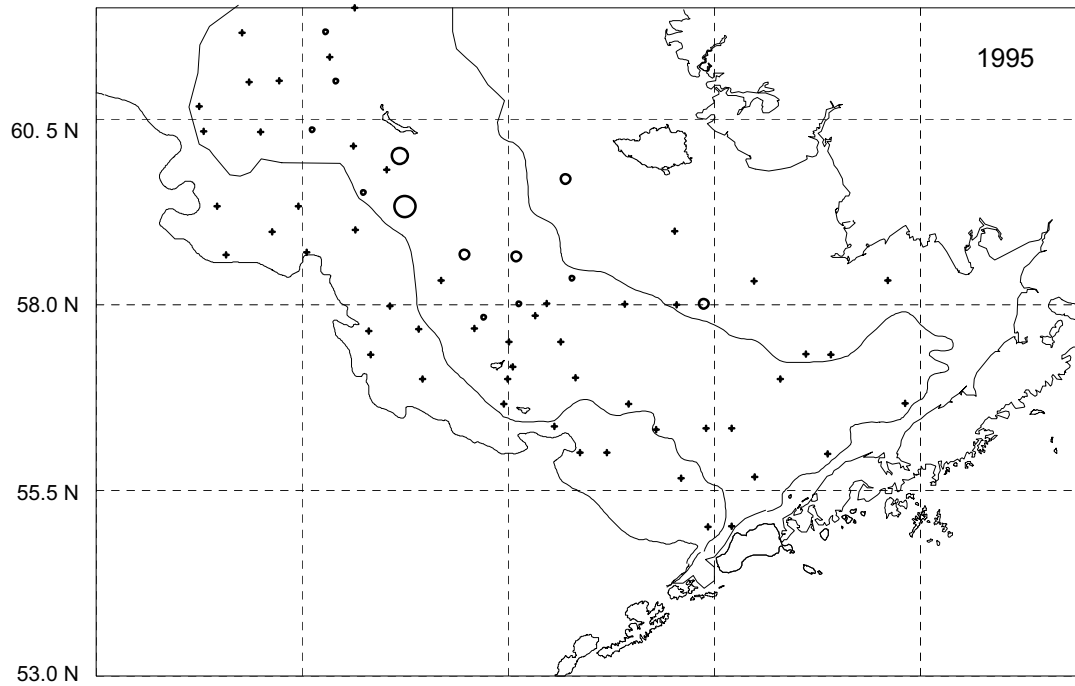


Figure G-8.-- Continued.

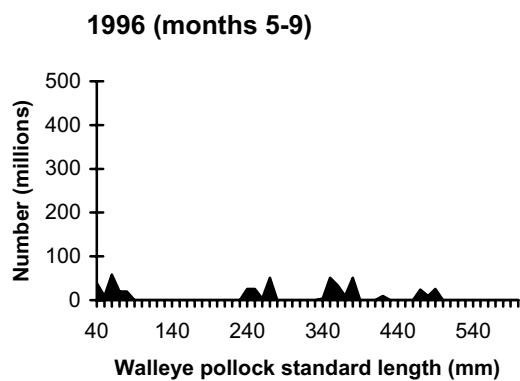
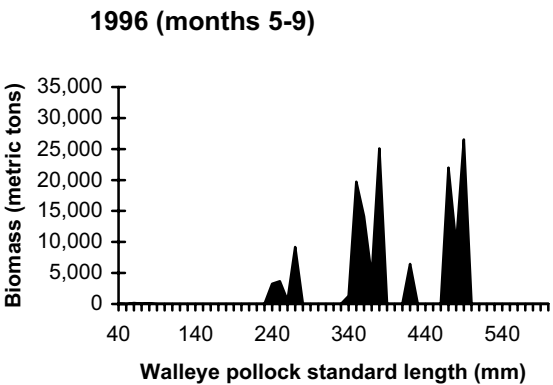
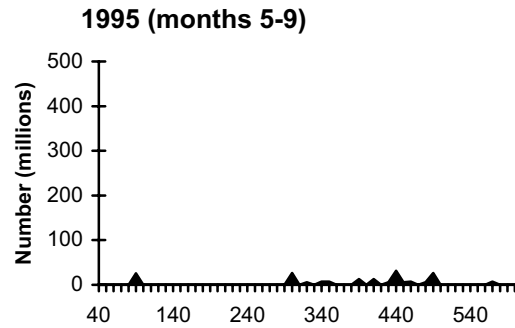
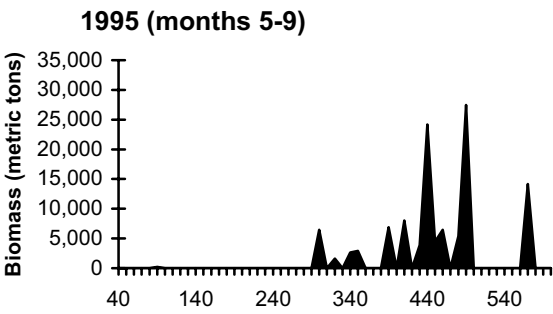
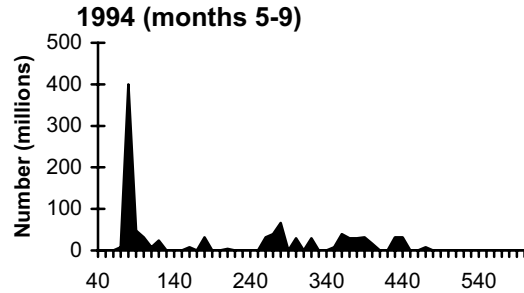
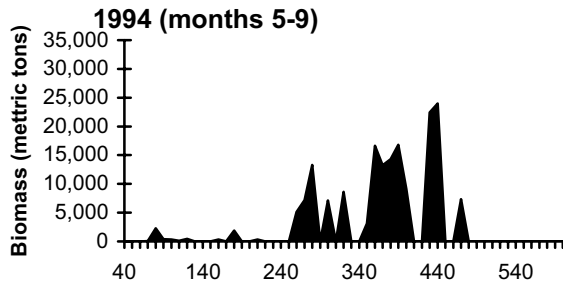
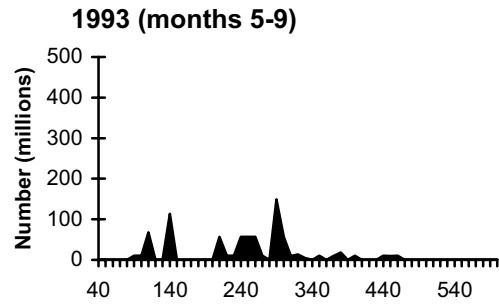
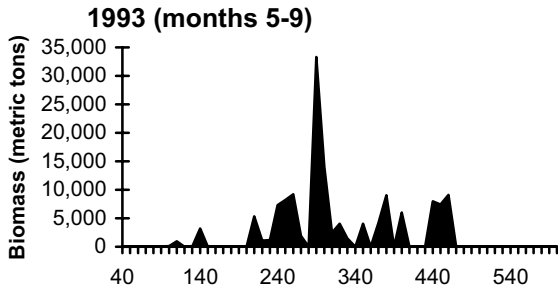


Figure G-9. -- Biomass and number of walleye pollock (*Theragra chalcogramma*) consumed by skates during May through September of 1993, 1994, 1995, and 1996 by prey size.

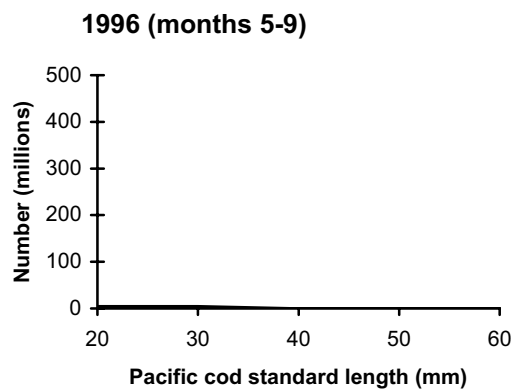
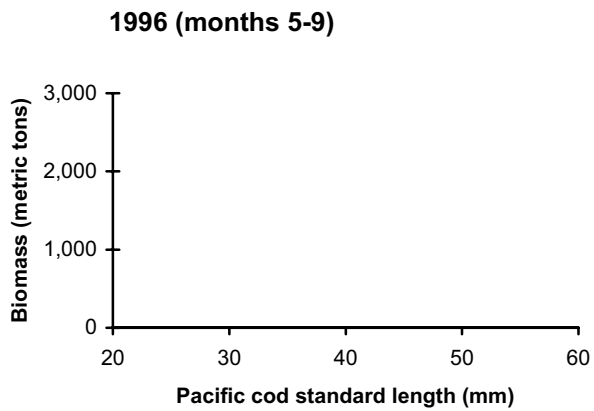
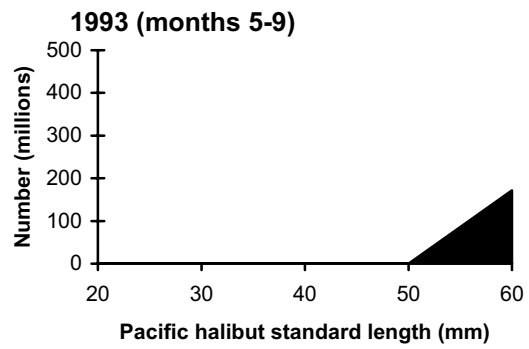
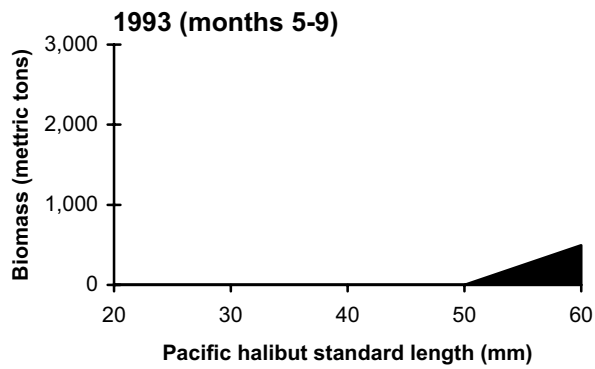
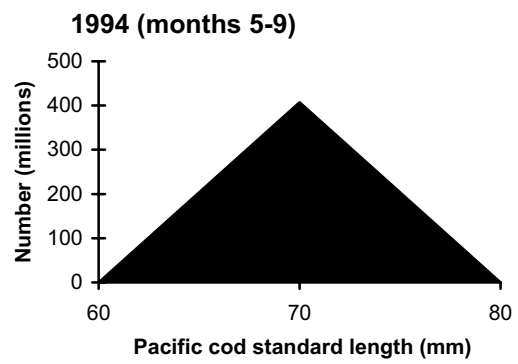
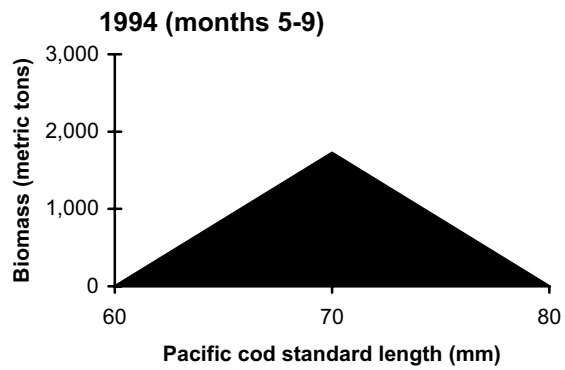


Figure G-10. -- Biomass and number of Pacific cod (*Gadus macrocephalus*) consumed by skates during May through September of 1993, 1994, and 1995 by prey size.

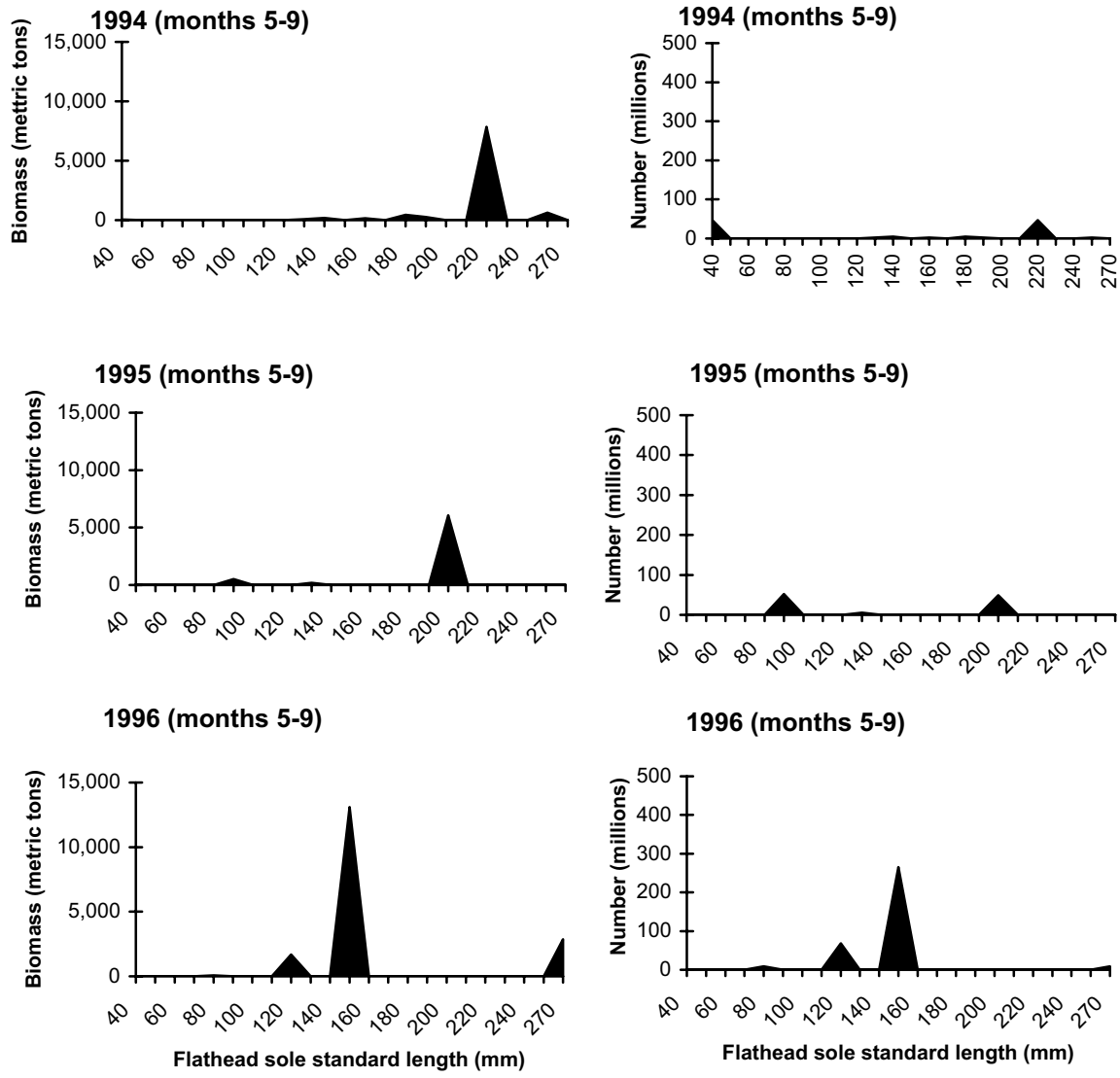


Figure G-11. -- Biomass and number of flathead sole (*Hippoglossoides elassodon*) consumed by skates during May through September of 1994, 1995, and 1996 by prey size.

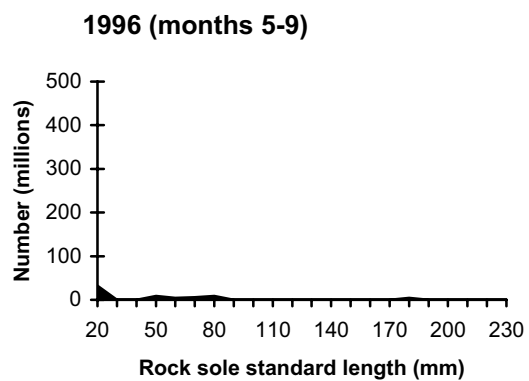
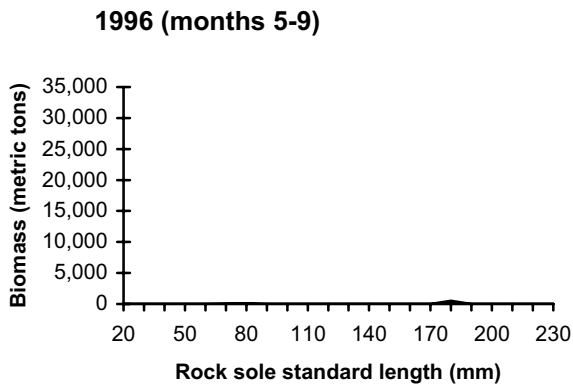
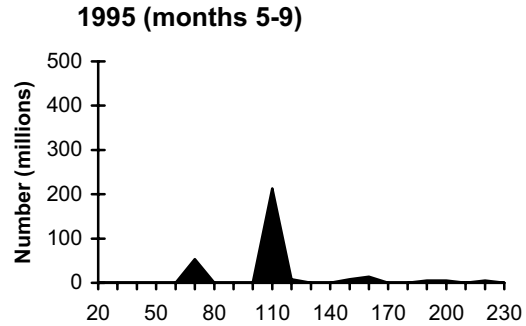
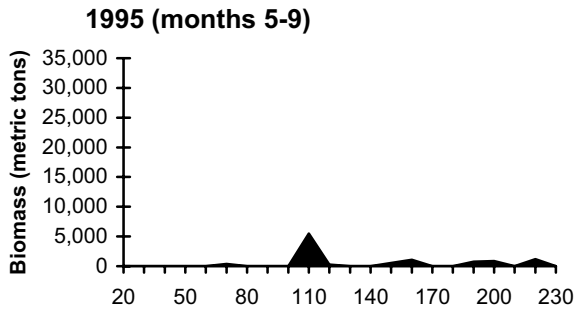
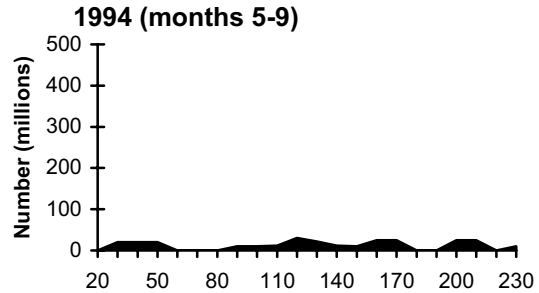
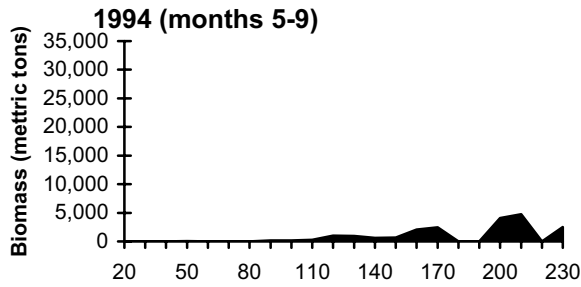
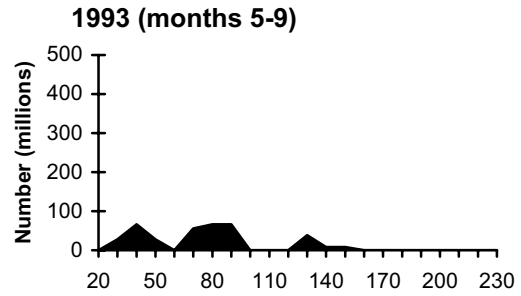
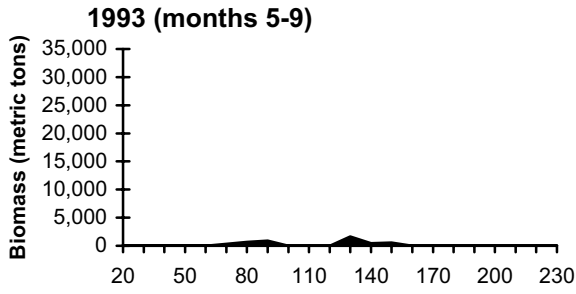


Figure G-12. -- Biomass and number of northern rock sole (*Lepidopsetta polyxystra*) consumed by skates during May through September of 1993, 1994, 1995, and 1996 by prey size.

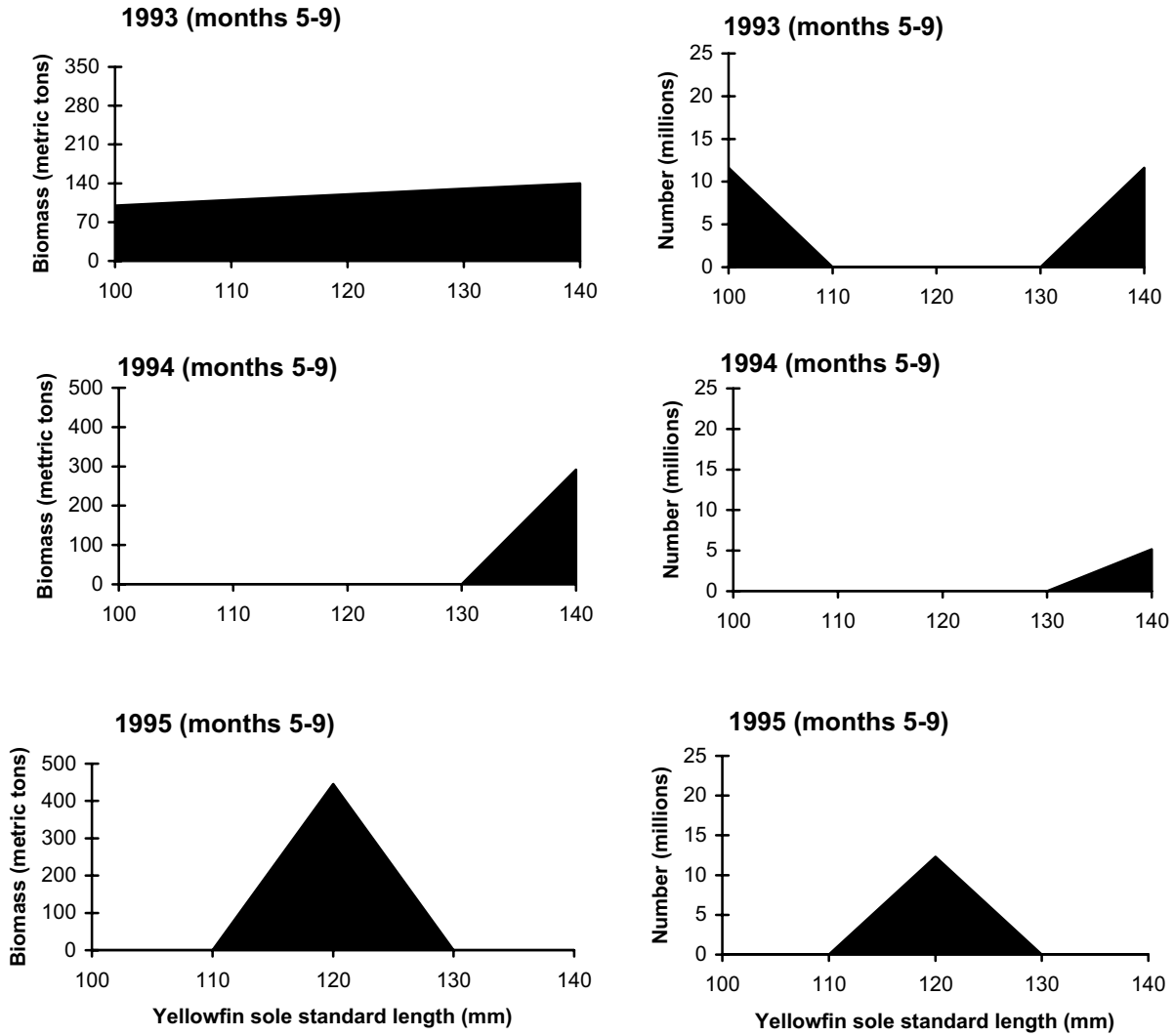


Figure G-13. -- Biomass and number of yellowfin sole (*Limanda aspera*) consumed by skates during May through September of 1993, 1994, and 1995 by prey size.

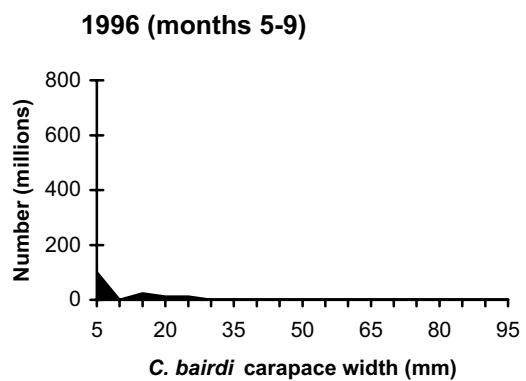
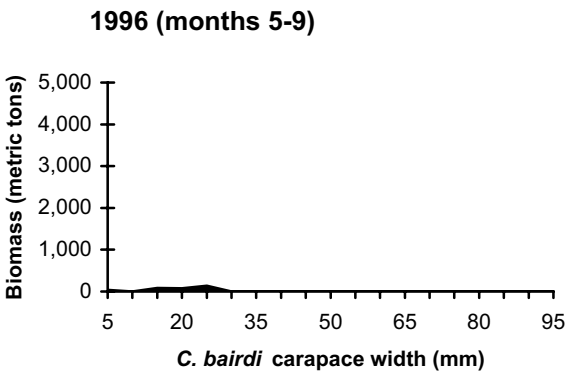
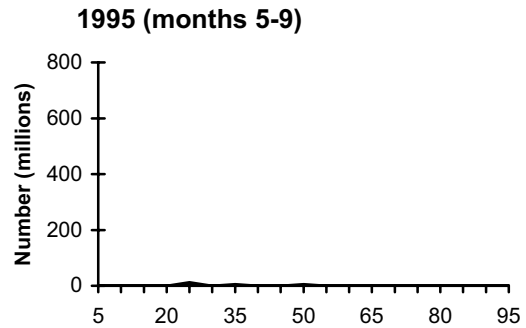
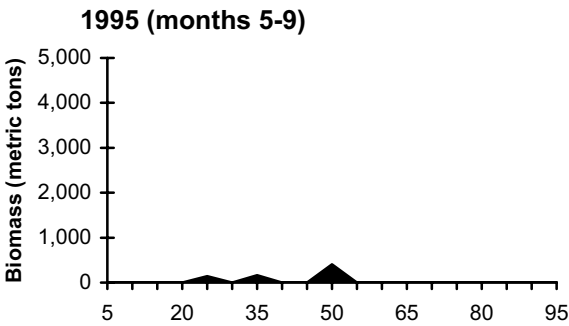
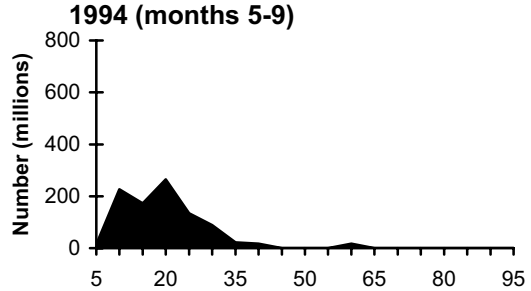
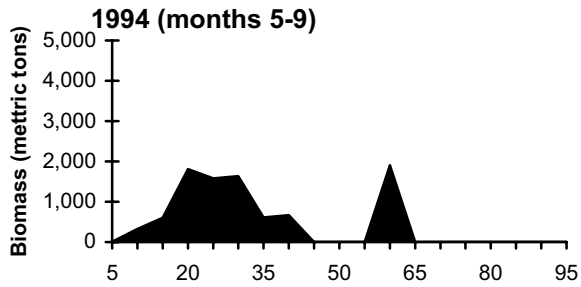
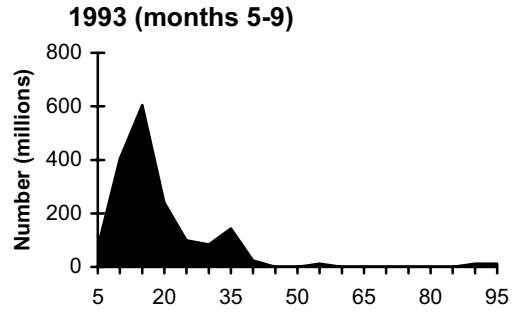
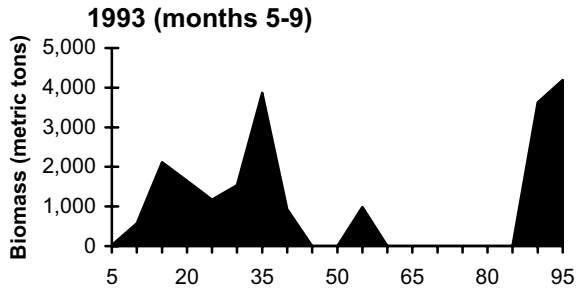


Figure G -14. -- Biomass and number of Tanner crab (*Chionoecetes bairdi*) consumed by skates during May through September of 1993, 1994, 1995, and 1996 by prey size.

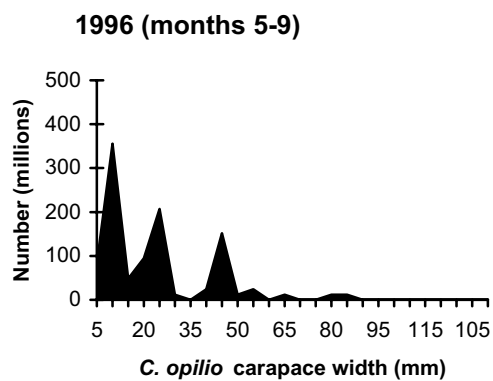
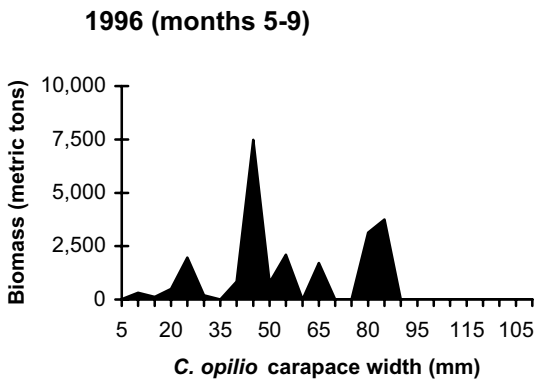
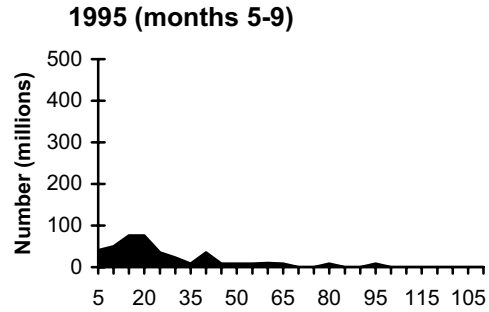
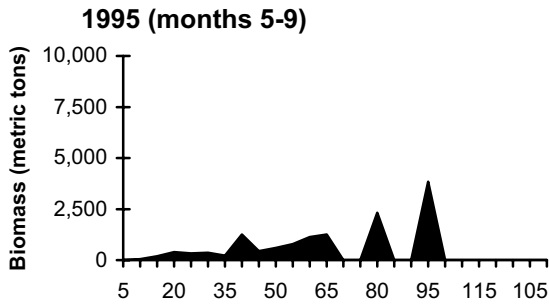
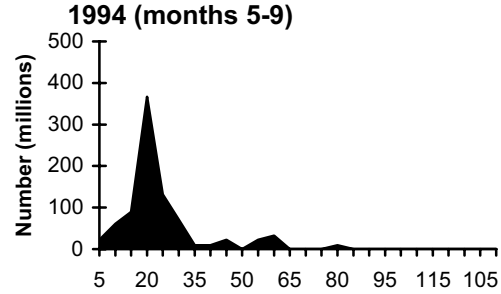
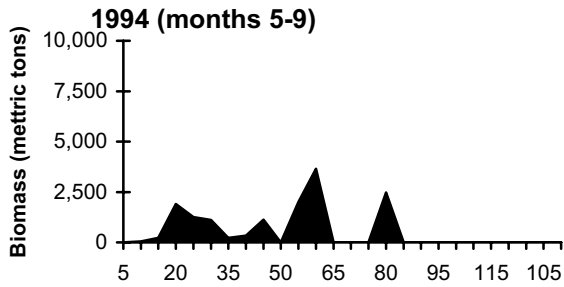
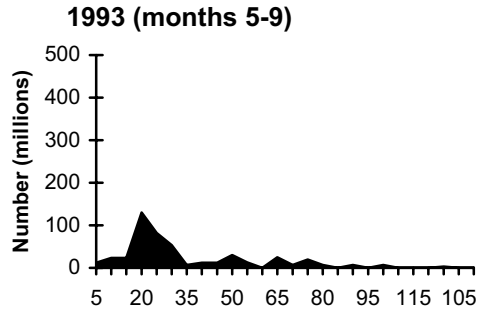
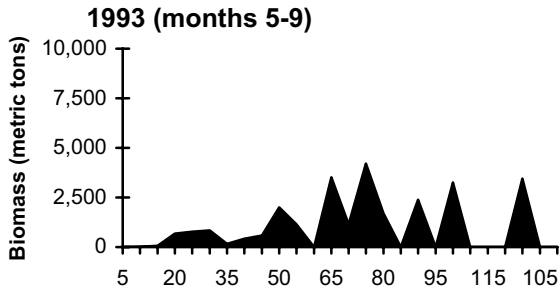


Figure G-15. -- Biomass and number of snow crab (*Chionoecetes opilio*) consumed by skates during May through September of 1993, 1994, 1995, and 1996 by prey size.

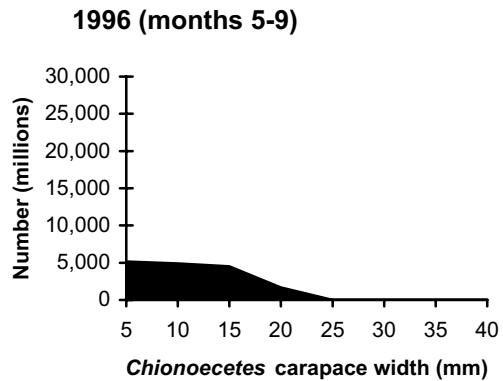
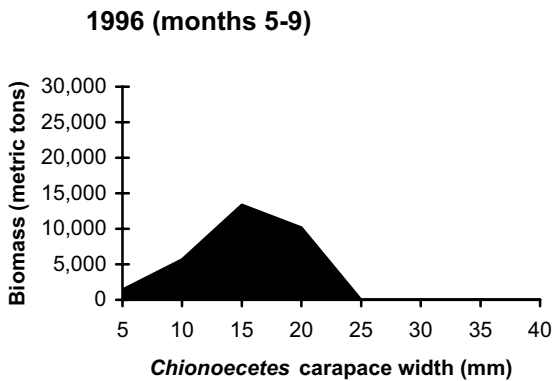
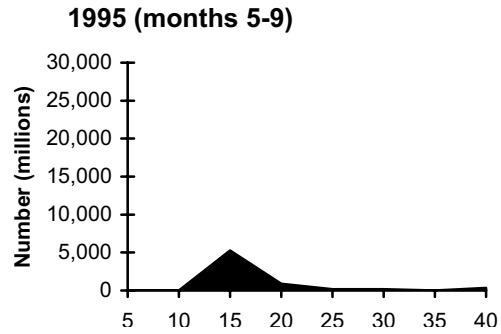
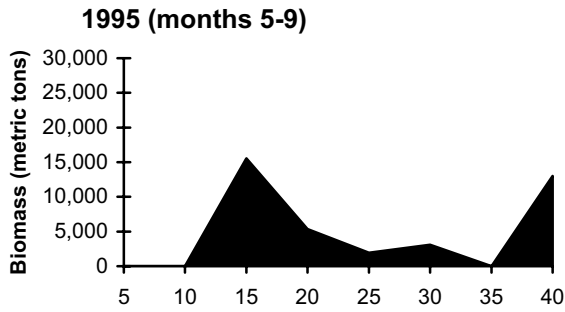
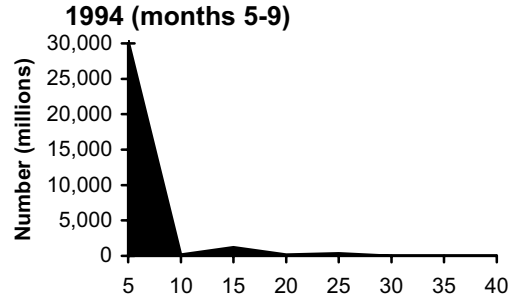
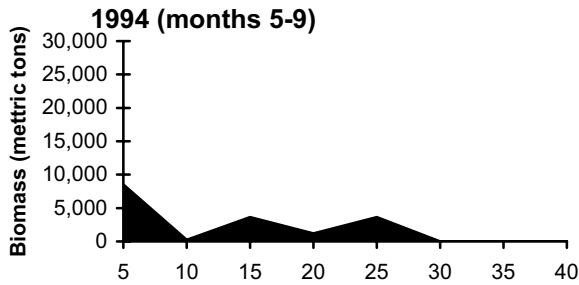
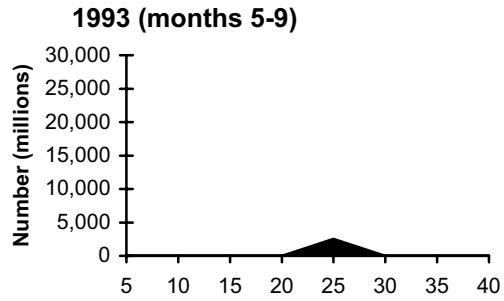
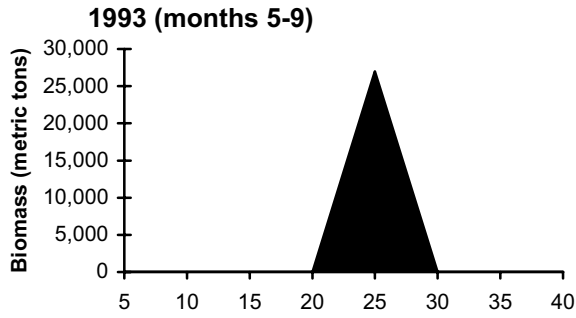


Figure G-16. -- Biomass and number of unidentified *Chionoecetes* consumed by skates during May through September of 1993, 1994, 1995, and 1996 by prey size.

**APPENDIX H. - MARBLED EELPOUT (*Lycodes raridens*), WATTLED EELPOOUT
(*L. palearis*), SHORTFIN EELPOUT (*L. brevipes*), AND BUTTERFLY SCULPIN
(*Hemilepidotus papilio*).**

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Table H-1.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of marbled eelpout (*Lycodes ravidens*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	5.89	20.35
Polynoidae (polychaete)	0.50	6.74
Phyllodocidae (polychaete)	0.01	0.60
Nephtyidae (polychaete)	6.34	16.70
Phyllodocida (polychaete)	0.03	0.68
Bivalvia (clam)	1.14	7.51
<i>Yoldia</i> sp. (clam)	8.83	19.82
Mysidacea Mysida (mysid)	<0.01	0.53
Cumacea (cumacean)	0.01	0.48
Gammaridea (amphipod)	54.47	78.49
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.21	1.01
<i>Chionoecetes opilio</i> (snow crab)	0.09	0.48
Echiura (marine worm)	5.49	6.23
Ophiuroidea Ophiurida (brittle star)	0.30	4.76
<i>Mallotus villosus</i> (capelin)	1.77	1.59
<i>Theragra chalcogramma</i> (walleye pollock)	5.08	2.31
Cyclopteridae (snailfish)	0.97	0.53
Stichaeidae (prickleback)	3.20	4.07
<i>Lumpenella longirostris</i>	3.98	1.53
<i>Lumpenus maculatus</i> (daubed shanny)	1.06	1.53
Fishery discards	0.62	0.53

Total prey weight	1021 g
Total non-empty stomachs	136
Total empty stomachs	5
Number of hauls	21

Table H-2.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of wattled eelpout (*Lycodes palearis*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	18.36	34.06
Polynoidae (polychaete)	0.98	2.70
Nephtyidae (polychaete)	0.52	3.44
Maldanidae (polychaete)	0.11	0.43
Bivalvia (clam)	0.33	1.92
<i>Yoldia</i> sp. (clam)	10.19	9.05
Cumacea (cumacean)	1.07	7.68
Isopoda (isopod)	0.69	0.79
Gammaridea (amphipod)	39.47	74.29
Caprellidea (amphipod)	0.05	0.48
<i>Crangon</i> sp. (shrimp)	0.19	0.95
<i>Crangon communis</i> (shrimp)	1.51	7.14
<i>Argis</i> sp. (shrimp)	0.08	0.48
Paguridae (hermit crab)	0.09	0.60
<i>Chionoecetes</i> sp. (snow and Tanner crab)	1.16	1.27
<i>Chionoecetes opilio</i> (snow crab)	11.94	15.24
Echiura (marine worm)	0.81	1.62
Ophiuroidea Ophiurida (brittle star)	1.33	7.30
<i>Clupea pallasii</i> (Pacific herring)	1.20	0.53
<i>Lycodes brevipes</i> (shortfin eelpout)	1.60	2.38
Stichaeidae (prickleback)	3.70	0.48
<i>Lumpenus maculatus</i> (daubed shanny)	3.57	0.60
Unidentified organic material	1.01	1.27
Unidentified worm-like organism	0.04	0.95

Total prey weight	273 g
Total non-empty stomachs	108
Total empty stomachs	24
Number of hauls	21

Table H-3.-- Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of shortfin eelpout (*Lycodes brevipes*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	28.08	49.10
Nephtyidae (polychaete)	0.29	0.70
Opheliidae (polychaete)	0.05	0.70
Maldanidae (polychaete)	7.66	6.21
Bivalvia (clam)	0.68	1.71
<i>Yoldia</i> sp. (clam)	3.28	1.71
Calanoida (copepod)	0.02	1.62
Cumacea (cumacean)	3.95	20.89
Gammaridea (amphipod)	24.36	56.21
Euphausiacea (euphausiid)	0.05	0.70
Paguridae (hermit crab)	0.70	0.70
<i>Chionoecetes opilio</i> (snow crab)	3.33	8.55
Echiura (marine worm)	0.58	0.77
Ophiuroidea Ophiurida (brittle star)	23.32	32.13
Cottoidei (Sculpin)	3.65	7.69

Total prey weight	23 g
Total non-empty stomachs	94
Total empty stomachs	13
Number of hauls	13

Table H 4 .— Prey items (expressed in mean percent frequency of occurrence and mean percent weight) of butterfly sculpin (*Hemilepidotus papilio*) collected in the eastern Bering Sea in 1994, May through September.

Prey Name	Mean % Weight	Mean % Frequency of Occurrence
Polychaeta (worm)	13.57	52.65
Polynoidae (polychaete)	0.05	3.33
Nereidae (polychaete)	1.17	0.59
Nephtyidae (polychaete)	0.31	1.83
Glyceridae (polychaete)	0.16	0.98
Flabelligeridae (polychaete)	0.46	1.24
Pteropoda (Thecosomata and Gymnosomata)	1.32	7.81
Mysidacea Mysida (mysid)	0.05	1.18
Isopoda (isopod)	0.32	1.76
Gammaridea (amphipod)	6.72	52.91
Amphipoda Hyperiidea (amphipod)	2.49	18.79
Hyperiidae (amphipod)	0.05	2.55
Caprellidea (amphipod)	0.24	2.06
Euphausiacea (euphausiid)	0.54	6.90
<i>Thysanoessa inermis</i> (euphausiid)	0.49	0.65
<i>Thysanoessa raschii</i> (euphausiid)	1.28	2.22
Caridea (shrimp)	0.32	5.36
Hippolytidae (shrimp)	4.17	18.10
<i>Spirontocaris</i> sp. (shrimp)	0.38	1.96
<i>Eualus</i> sp. (shrimp)	0.96	0.59
<i>Eualus gaimurdii</i> (shrimp)	0.51	4.12
Pandalidae (shrimp)	5.37	12.94
<i>Pandalus borealis</i> (shrimp)	0.18	0.59
<i>Pandalus goniurus</i> (shrimp)	0.30	0.59
Crangonidae (shrimp)	0.17	2.42
<i>Argis lar</i> (shrimp)	0.40	2.42
<i>Argis dentata</i> (shrimp)	0.03	0.59
Natantia (shrimp)	0.27	3.14
Paguridae (hermit crab)	0.63	2.42
<i>Hapalogaster grebnitzkii</i>	0.12	0.59
<i>Chionoecetes</i> sp. (snow and Tanner crab)	0.44	3.99
<i>Chionoecetes opilio</i> (snow crab)	0.53	3.33
<i>Pinnixa</i> sp. (pea crab)	0.02	0.59
Echiura (marine worm)	6.33	10.20
Echiuridae (marine worm)	0.89	2.94
Priapulida (worm)	1.11	1.18
Larvacea Copelata	23.80	44.90
Osteichthyes Teleostei (fish)	0.49	3.07
Non-gadoid Fish Remains	0.51	1.24
<i>Mallotus villosus</i> (capelin)	0.24	0.59
Gadidae (gadid fish)	1.69	9.58
<i>Boreogadus saida</i> (Arctic cod)	2.69	4.77
<i>Theragra chalcogramma</i> (walleye pollock)	6.92	6.80
Zoarcidae (eelpout)	1.91	1.76
Cottoidei (sculpin)	0.49	1.24
Cottidae (sculpin)	0.44	1.18
<i>Hemilepidotus</i> sp. (sculpin)	0.03	1.47
<i>Myoxocephalus</i> sp. (sculpin)	0.46	5.88
Agonidae (poacher)	0.03	0.59
Cyclopteridae (snailfish)	1.51	1.18
Stichaeidae (prickleback)	2.18	5.36
<i>Lumpenus maculatus</i> (daubed shanny)	0.83	1.18
<i>Pleuronectes quadrituberculatus</i> (Alaska plaice)	<0.01	1.83
<i>Hippoglossus stenolepis</i> (Pacific halibut)	<0.01	0.59
Unidentified organic material	2.98	7.25
Unidentified eggs	0.01	0.59
Unidentified worm-like organism	0.25	1.18
Fishery discards	0.19	0.59

Table H.4—Continued.

Total prey weight	1,889 g
Total non-empty stomachs	139
Total empty stomachs	2
Number of hauls	17

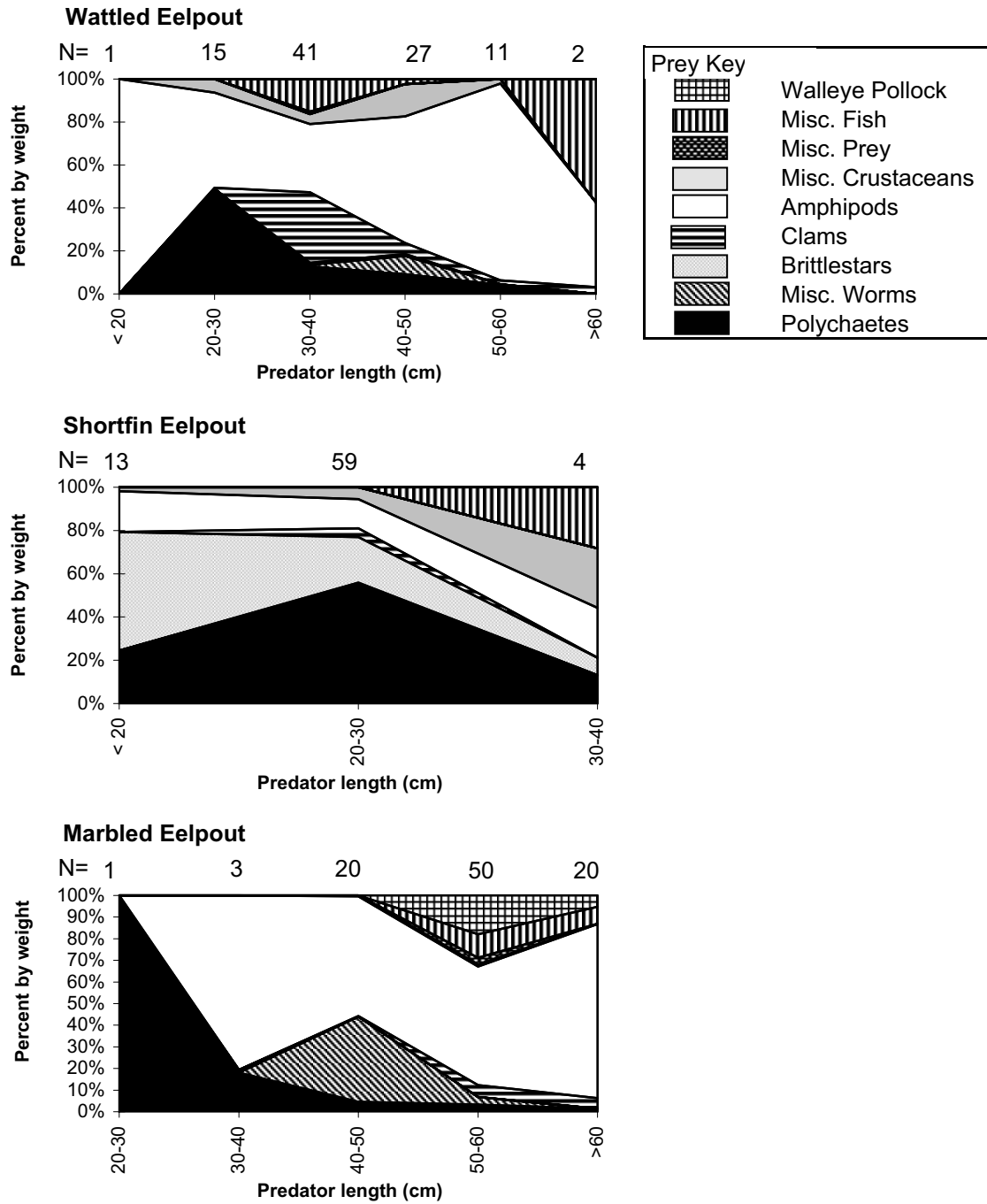


Figure H-1. -- Diet composition of eelpouts, in terms of average percent by weight, in the eastern Bering Sea in 1994, May through September. N = number of full stomachs.

APPENDIX I. - DATA VALUES BY STRATUM

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Table I-1.-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	3	Pacific cod	2	Alaska plaice	0.02	0.02	34	253	45.38	45.38
1993	2	Walleye pollock	4	Alaska plaice	0	0	17	167	0.02	0.02
1993	5	Arrowtooth flounder	2	Arrowtooth flounder	6.39	6.39	8	19	2889.37	2889.37
1993	3	Pacific cod	3	Arrowtooth flounder	0.82	0.82	31	106	2933.92	2933.92
1993	4	Pacific cod	2	Arrowtooth flounder	0.01	0.01	46	588	10.73	10.73
1993	4	Walleye pollock	4	Arrowtooth flounder	0	0	54	717	2.92	2.92
1993	3	Flathead sole	1	Bairdi Tanner crab	0.92	0.92	15	52	2620.58	2620.58
1993	6	Flathead sole	1	Bairdi Tanner crab	6.49	4.68	24	82	10452.39	7538.91
1993	1	Pacific cod	2	Bairdi Tanner crab	0.13	0.13	21	201	284.33	284.33
1993	2	Pacific cod	2	Bairdi Tanner crab	20.59	10.99	11	74	6385.58	3406.94
1993	2	Pacific cod	3	Bairdi Tanner crab	32.54	16.28	6	13	13624.85	6814.58
1993	3	Pacific cod	2	Bairdi Tanner crab	12.94	3.84	34	253	25091.26	7450.7
1993	3	Pacific cod	3	Bairdi Tanner crab	8.52	3.95	31	106	30469.58	14121.75
1993	4	Pacific cod	1	Bairdi Tanner crab	1.64	1.64	30	130	348.7	348.7
1993	4	Pacific cod	2	Bairdi Tanner crab	11.16	2.37	46	588	23943.66	5093.59
1993	4	Pacific cod	3	Bairdi Tanner crab	18.85	5.12	34	120	33000.42	8961.12
1993	5	Pacific cod	2	Bairdi Tanner crab	17.59	5.45	13	70	3964.63	1227.91
1993	5	Pacific cod	3	Bairdi Tanner crab	19.7	6.55	14	62	20337.85	6761.79
1993	6	Pacific cod	2	Bairdi Tanner crab	13.81	3.29	41	290	11479.43	2737.63
1993	6	Pacific cod	3	Bairdi Tanner crab	8.5	2.86	40	185	23713.84	7984.11
1993	3	Pacific halibut	2	Bairdi Tanner crab	1.33	1.33	7	18	168.25	168.25
1993	3	Pacific halibut	3	Bairdi Tanner crab	0.29	0.2	14	25	32.19	21.98
1993	4	Pacific halibut	3	Bairdi Tanner crab	3.49	3.05	8	60	351.05	307.12
1993	5	Pacific halibut	3	Bairdi Tanner crab	10.52	5.28	3	7	944.1	473.81
1993	6	Pacific halibut	2	Bairdi Tanner crab	1.4	0.99	9	17	68.94	48.57
1993	6	Pacific halibut	3	Bairdi Tanner crab	10.36	7.26	14	50	1670.32	1170.03
1993	3	Skates	1	Bairdi Tanner crab	13.21	6.94	15	59	9106.9	4783.81
1993	4	Skates	1	Bairdi Tanner crab	2.75	1.71	22	118	3057.22	1903.8
1993	5	Skates	1	Bairdi Tanner crab	12.24	10.84	3	12	3943.74	3492.63
1993	6	Skates	1	Bairdi Tanner crab	2.93	1.9	16	97	4554.39	2951.14
1993	3	Walleye pollock	4	Bairdi Tanner crab	0.06	0.06	39	316	85.61	85.61
1993	4	Walleye pollock	3	Bairdi Tanner crab	2.47	2.47	30	184	3546.81	3546.81
1993	2	Yellowfin sole	1	Bairdi Tanner crab	1.74	1.74	16	97	3690.88	3690.88
1993	3	Yellowfin sole	1	Bairdi Tanner crab	3.23	3.23	19	135	15637.38	15637.38
1993	4	Yellowfin sole	1	Bairdi Tanner crab	2.47	1.75	30	193	4680.99	3305.24
1993	4	Walleye pollock	4	Blue king crab	0	0	54	717	0.17	0.17
1993	4	Arrowtooth flounder	3	Flathead sole	1.72	1.72	7	41	303.3	303.3

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	5	Arrowtooth flounder	2	Flathead sole	14.71	12.38	8	19	6648.28	5596.3
1993	6	Arrowtooth flounder	3	Flathead sole	0.12	0.12	24	152	273.47	273.47
1993	1	Pacific cod	1	Flathead sole	1.28	1.28	19	142	234.37	234.37
1993	2	Pacific cod	3	Flathead sole	5.86	5.86	6	13	2455.57	2455.57
1993	3	Pacific cod	2	Flathead sole	0.14	0.1	34	253	262.78	192.65
1993	4	Pacific cod	2	Flathead sole	0.04	0.04	46	588	89.12	89.12
1993	4	Pacific cod	3	Flathead sole	0.5	0.5	34	120	877.96	875.78
1993	5	Pacific cod	2	Flathead sole	4.31	3.27	13	70	970.68	736.22
1993	5	Pacific cod	3	Flathead sole	3.28	2.57	14	62	3382.2	2653.08
1993	6	Pacific cod	2	Flathead sole	0.22	0.15	41	290	181.8	127.21
1993	6	Pacific cod	3	Flathead sole	0.41	0.31	40	185	1153.71	873.9
1993	4	Pacific halibut	3	Flathead sole	0.35	0.35	8	60	35.53	35.53
1993	4	Skates	1	Flathead sole	0.57	0.57	22	118	628.46	628.46
1993	3	Walleye pollock	4	Flathead sole	0.42	0.42	39	316	651.1	651.1
1993	4	Walleye pollock	4	Flathead sole	0.04	0.04	54	717	88.14	88.14
1993	6	Walleye pollock	4	Flathead sole	0.15	0.15	36	300	305.19	305.19
1993	3	Arrowtooth flounder	2	Gadidae	1.13	1.13	8	26	777.62	777.62
1993	4	Arrowtooth flounder	2	Gadidae	3.32	2.36	7	37	398.5	282.82
1993	4	Arrowtooth flounder	3	Gadidae	22.74	13.57	7	41	4003.11	2388.77
1993	6	Arrowtooth flounder	2	Gadidae	6.29	4.29	14	22	1741.48	1188.68
1993	6	Arrowtooth flounder	3	Gadidae	10.11	3.16	24	152	23232.72	7251
1993	4	Flathead sole	1	Gadidae	0.57	0.57	23	113	410.21	410.21
1993	4	Greenland turbot	2	Gadidae	5.21	5.21	2	6	101.83	101.83
1993	6	Greenland turbot	1	Gadidae	50	50	2	2	142.21	142.21
1993	6	Greenland turbot	2	Gadidae	8.24	4.24	9	15	769.09	395.53
1993	6	Greenland turbot	3	Gadidae	4.24	4.24	14	26	694.41	694.41
1993	1	Pacific cod	2	Gadidae	0.04	0.04	21	201	79.43	79.43
1993	3	Pacific cod	2	Gadidae	0.29	0.29	34	253	571.1	564.94
1993	3	Pacific cod	3	Gadidae	0.03	0.03	31	106	120.65	108.27
1993	4	Pacific cod	1	Gadidae	0.05	0.05	30	130	10.2	10.2
1993	4	Pacific cod	2	Gadidae	0.3	0.14	46	588	642.26	308.55
1993	4	Pacific cod	3	Gadidae	1.13	1.08	34	120	1979.72	1885.04
1993	5	Pacific cod	3	Gadidae	0.52	0.52	14	62	541.21	541.21
1993	6	Pacific cod	2	Gadidae	1.03	0.68	41	290	856.28	568.64
1993	6	Pacific cod	3	Gadidae	1.04	0.63	40	185	2914.6	1745.44
1993	2	Pacific halibut	2	Gadidae	4.58	3.81	8	50	555.44	461.8
1993	3	Pacific halibut	2	Gadidae	0.07	0.07	7	18	8.38	8.38

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	4	Pacific halibut	2	Gadidae	2.86	2.86	8	40	436.28	436.28
1993	4	Pacific halibut	3	Gadidae	0.93	0.48	8	60	93.54	48.73
1993	6	Pacific halibut	3	Gadidae	1.71	1.71	14	50	276.31	276.31
1993	3	Skates	1	Gadidae	0.21	0.21	15	59	144.61	144.61
1993	4	Skates	1	Gadidae	0.03	0.03	22	118	31.75	31.75
1993	6	Skates	1	Gadidae	0.56	0.38	16	97	874.56	585.63
1993	2	Walleye pollock	4	Gadidae	0.08	0.08	17	167	16.34	16.34
1993	3	Walleye pollock	4	Gadidae	1.17	0.9	39	316	1804.05	1390.51
1993	4	Walleye pollock	1	Gadidae	0.63	0.63	21	118	5216.7	5216.7
1993	4	Walleye pollock	2	Gadidae	6.77	6.77	13	29	97864.16	97864.16
1993	4	Walleye pollock	3	Gadidae	0.53	0.53	30	184	757.83	757.83
1993	4	Walleye pollock	4	Gadidae	2.21	0.99	54	717	4425.12	1972.18
1993	5	Walleye pollock	3	Gadidae	0.67	0.46	21	177	691.13	476.73
1993	5	Walleye pollock	4	Gadidae	1.04	1.04	20	174	388.62	388.62
1993	6	Walleye pollock	2	Gadidae	5.51	5.51	16	44	124568.9	124568.9
1993	6	Walleye pollock	3	Gadidae	3.88	1.64	36	243	9146.18	3866.5
1993	6	Walleye pollock	4	Gadidae	1.32	0.49	36	300	2604.53	970.47
1993	4	Pacific cod	2	Greenland turbot	0	0	46	588	3.63	3.63
1993	2	Walleye pollock	4	Greenland turbot	0.12	0.12	17	167	22.77	22.77
1993	3	Walleye pollock	3	Greenland turbot	0.03	0.03	42	469	135.95	135.95
1993	3	Walleye pollock	4	Greenland turbot	0.02	0.02	39	316	30.72	30.72
1993	4	Walleye pollock	1	Greenland turbot	1.33	1.33	21	118	11005.09	11005.09
1993	4	Walleye pollock	4	Greenland turbot	1.3	0.68	54	717	2587.77	1363.14
1993	5	Walleye pollock	2	Greenland turbot	0.11	0.11	16	75	1123.33	1123.33
1993	6	Walleye pollock	3	Greenland turbot	0.05	0.03	36	243	113.63	79.4
1993	6	Walleye pollock	4	Greenland turbot	0.17	0.12	36	300	337.46	237.5
1993	1	Pacific cod	3	King crab legs	1.55	1.5	16	44	3354.59	3253.43
1993	3	Pacific cod	2	King crab legs	1.26	0.96	34	253	2438.55	1869.49
1993	4	Pacific cod	3	King crab legs	0.2	0.2	34	120	341.9	341.9
1993	1	Pacific halibut	3	King crab legs	10	10	10	21	1756.93	1756.93
1993	4	Pacific cod	2	Lithodidae	0.01	0.01	46	588	4.97	4.97
1993	6	Pacific halibut	2	Lithodidae	5.58	5.58	9	17	55.67	55.67
1993	3	Walleye pollock	3	Lithodidae	0	0	42	469	0.67	0.67
1993	3	Walleye pollock	4	Lithodidae	0.01	0.01	39	316	2.85	2.85
1993	4	Walleye pollock	3	Lithodidae	0	0	30	184	0.38	0.38
1993	4	Walleye pollock	4	Lithodidae	0.01	0.01	54	717	3.78	2.42
1993	5	Arrowtooth flounder	3	Offal	2.67	2.67	9	28	3323.04	3323.04

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	3	Pacific cod	2	Offal	2.69	1.78	34	253	5213.35	3455.61
1993	3	Pacific cod	3	Offal	6.36	3.75	31	106	22761.81	13433.02
1993	4	Pacific cod	2	Offal	2.11	1.39	46	588	4520.83	2973.04
1993	4	Pacific cod	3	Offal	6.17	3.51	34	120	10804.28	6142.67
1993	5	Pacific cod	2	Offal	2.46	2.21	13	70	554.53	498.03
1993	6	Pacific cod	3	Offal	0.55	0.45	40	185	1535.96	1241.89
1993	4	Pacific halibut	2	Offal	0.58	0.58	8	40	88.76	88.76
1993	4	Pacific halibut	3	Offal	0.55	0.55	8	60	55.62	55.62
1993	4	Skates	1	Offal	6.91	4.06	22	118	7675.02	4511.12
1993	6	Skates	1	Offal	0.38	0.38	16	97	590.15	590.15
1993	3	Walleye pollock	3	Offal	2.03	1.89	42	469	8859.2	8263.64
1993	3	Walleye pollock	4	Offal	3.19	2.04	39	316	4923.39	3154.74
1993	4	Walleye pollock	4	Offal	0	0	54	717	8.13	8.13
1993	5	Walleye pollock	4	Offal	4.58	4.58	20	174	1718.1	1718.1
1993	3	Alaska plaice	1	Opilio snow crab	0.03	0.03	15	48	35.26	35.26
1993	4	Flathead sole	1	Opilio snow crab	0.26	0.19	23	113	187.38	136.09
1993	1	Pacific cod	2	Opilio snow crab	0.02	0.02	21	201	52.97	52.97
1993	2	Pacific cod	2	Opilio snow crab	3.65	3.3	11	74	1132.17	1022.64
1993	2	Pacific cod	3	Opilio snow crab	8.83	8.83	6	13	3698.39	3698.39
1993	3	Pacific cod	2	Opilio snow crab	6.09	1.8	34	253	11811.82	3488.38
1993	3	Pacific cod	3	Opilio snow crab	3.54	1.71	31	106	12663.78	6122.3
1993	4	Pacific cod	1	Opilio snow crab	3.96	3.37	30	130	840.94	716.43
1993	4	Pacific cod	2	Opilio snow crab	9.83	2.47	46	588	21084.34	5299.66
1993	4	Pacific cod	3	Opilio snow crab	16.81	5.01	34	120	29422.08	8777.16
1993	5	Pacific cod	2	Opilio snow crab	1.59	1.15	13	70	357.39	258.93
1993	5	Pacific cod	3	Opilio snow crab	8.82	5.39	14	62	9106.09	5564.23
1993	6	Pacific cod	2	Opilio snow crab	7.64	2.11	41	290	6351.55	1749.88
1993	6	Pacific cod	3	Opilio snow crab	13.57	3.53	40	185	37838.66	9853.58
1993	2	Pacific halibut	2	Opilio snow crab	3.19	2.23	8	50	386.76	269.93
1993	2	Pacific halibut	3	Opilio snow crab	16.38	11.09	7	12	720.12	487.54
1993	3	Pacific halibut	2	Opilio snow crab	1.41	1.41	7	18	178.76	178.76
1993	3	Pacific halibut	3	Opilio snow crab	1.45	1	14	25	160.6	110.56
1993	4	Pacific halibut	2	Opilio snow crab	9.75	6.72	8	40	1489.78	1027.07
1993	4	Pacific halibut	3	Opilio snow crab	2.45	1.25	8	60	246.18	125.63
1993	5	Pacific halibut	3	Opilio snow crab	4.92	3.23	3	7	440.91	289.63
1993	6	Pacific halibut	2	Opilio snow crab	16.31	7.19	9	17	803.4	354.11
1993	6	Pacific halibut	3	Opilio snow crab	13.62	6.78	14	50	2195.18	1092.66

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	3	Rock sole	1	Opilio snow crab	0.2	0.2	14	71	749.51	749.51
1993	4	Rock sole	1	Opilio snow crab	0.26	0.2	24	117	995.07	788.48
1993	3	Skates	1	Opilio snow crab	5	5	15	59	3449.71	3449.71
1993	4	Skates	1	Opilio snow crab	11.22	4.78	22	118	12454.95	5311.36
1993	5	Skates	1	Opilio snow crab	12.26	12.26	3	12	3949.03	3949.03
1993	6	Skates	1	Opilio snow crab	4.15	2.14	16	97	6451.76	3319.73
1993	4	Yellowfin sole	1	Opilio snow crab	0.7	0.62	30	193	1333.12	1173.02
1993	3	Arrowtooth flounder	3	Osmerids	7.84	6.53	15	39	6119.92	5100.93
1993	5	Arrowtooth flounder	2	Osmerids	5.9	5.9	8	19	2665.88	2665.88
1993	5	Arrowtooth flounder	3	Osmerids	4.58	4.58	9	28	5712.25	5712.25
1993	1	Flathead sole	1	Osmerids	6.6	6.6	9	31	2679.07	2679.07
1993	2	Flathead sole	1	Osmerids	83.19	0	1	4	200.46	0
1993	4	Flathead sole	1	Osmerids	3.9	3.9	23	113	2825.71	2825.71
1993	1	Pacific cod	1	Osmerids	2.98	2.98	19	142	545.52	545.52
1993	1	Pacific cod	2	Osmerids	10.1	5.67	21	201	22335.19	12532.19
1993	1	Pacific cod	3	Osmerids	4.43	3.06	16	44	9594.62	6624.77
1993	2	Pacific cod	2	Osmerids	0.53	0.53	11	74	165.35	165.35
1993	2	Pacific cod	3	Osmerids	3.17	3.17	6	13	1325.84	1325.84
1993	3	Pacific cod	2	Osmerids	2.07	1.44	34	253	4005.54	2795.87
1993	1	Pacific halibut	2	Osmerids	12.28	7.04	12	62	3667.13	2102.09
1993	1	Pacific halibut	3	Osmerids	5.61	5.23	10	21	986.3	918.72
1993	2	Pacific halibut	2	Osmerids	25.89	14.04	8	50	3136.28	1700.77
1993	2	Pacific halibut	3	Osmerids	20.19	13.13	7	12	887.56	577.22
1993	1	Skates	1	Osmerids	9.13	9.13	8	16	2324.09	2324.09
1993	1	Walleye pollock	1	Osmerids	2.02	2.02	9	73	3058.14	3058.14
1993	1	Walleye pollock	3	Osmerids	15.32	15.32	5	12	3619.09	3619.09
1993	1	Walleye pollock	4	Osmerids	5.03	2.47	23	246	4470.33	2196.65
1993	2	Walleye pollock	4	Osmerids	8.41	3.79	17	167	1627.37	733.53
1993	4	Walleye pollock	4	Osmerids	0.08	0.08	54	717	164.53	164.53
1993	1	Pacific cod	3	Pacific cod	1.21	1.21	16	44	2612.76	2612.76
1993	2	Pacific cod	2	Pacific cod	3.38	3.38	11	74	1047.92	1047.92
1993	3	Pacific cod	3	Pacific cod	1.46	1.18	31	106	5206.9	4222.49
1993	4	Pacific cod	2	Pacific cod	0.18	0.13	46	588	381.03	280.38
1993	3	Pacific halibut	3	Pacific cod	4.46	4.46	14	25	495.51	495.51
1993	6	Pacific halibut	3	Pacific cod	0.56	0.56	14	50	90.92	90.92
1993	1	Pacific cod	2	Pacific halibut	0.23	0.19	21	201	500.25	416.33
1993	5	Pacific cod	2	Pacific halibut	0.24	0.24	13	70	54.34	54.34

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	4	Skates	1	Pacific halibut	0.45	0.43	22	118	495.36	482.97
1993	2	Walleye pollock	4	Pacific halibut	0.01	0.01	17	167	2.73	2.73
1993	3	Walleye pollock	3	Pacific halibut	0.01	0.01	42	469	22.39	22.39
1993	4	Walleye pollock	4	Pacific halibut	0.03	0.02	54	717	50.91	35.76
1993	2	Walleye pollock	4	Pacific herring	0.64	0.64	17	167	123.71	123.71
1993	1	Pacific cod	2	Pleuronectidae	0.87	0.72	21	201	1919.01	1587.93
1993	1	Pacific cod	3	Pleuronectidae	5.88	3.87	16	44	12725.27	8387.29
1993	2	Pacific cod	3	Pleuronectidae	0.83	0.83	6	13	348.91	348.91
1993	3	Pacific cod	2	Pleuronectidae	0.34	0.24	34	253	654.19	457.03
1993	3	Pacific cod	3	Pleuronectidae	0.88	0.62	31	106	3141.41	2211.81
1993	4	Pacific cod	2	Pleuronectidae	0.5	0.3	46	588	1062.48	639.96
1993	4	Pacific cod	3	Pleuronectidae	0.5	0.48	34	120	876.46	848.1
1993	5	Pacific cod	2	Pleuronectidae	0.01	0.01	13	70	1.61	1.61
1993	6	Pacific cod	2	Pleuronectidae	0.1	0.07	41	290	79.94	61.65
1993	6	Pacific cod	3	Pleuronectidae	0.62	0.5	40	185	1728.76	1386.57
1993	1	Pacific halibut	2	Pleuronectidae	7.48	3.6	12	62	2235.51	1075.33
1993	1	Pacific halibut	3	Pleuronectidae	0.71	0.71	10	21	124.31	124.31
1993	2	Pacific halibut	3	Pleuronectidae	0.57	0.57	7	12	24.86	24.86
1993	4	Pacific halibut	3	Pleuronectidae	8.6	8.49	8	60	865.13	854.14
1993	1	Skates	1	Pleuronectidae	8.65	6.26	8	16	2203.21	1593.74
1993	3	Skates	1	Pleuronectidae	0.64	0.35	15	59	441.06	242.59
1993	4	Skates	1	Pleuronectidae	2.05	1	22	118	2278.3	1113.85
1993	6	Skates	1	Pleuronectidae	0.35	0.35	16	97	542.59	542.59
1993	3	Walleye pollock	3	Pleuronectidae	0	0	42	469	8.3	8.3
1993	4	Walleye pollock	3	Pleuronectidae	1.02	1.02	30	184	1466.65	1466.65
1993	4	Walleye pollock	4	Pleuronectidae	0.26	0.12	54	717	523.8	243.57
1993	1	Pacific cod	3	Red king crab	3.11	3.11	16	44	1364.37	1364.37
1993	4	Pacific cod	3	Red king crab	1.78	1.78	34	120	633.04	633.04
1993	1	Pacific cod	2	Rock sole	0.39	0.25	21	201	857.29	543.86
1993	1	Pacific cod	3	Rock sole	17.7	6.41	16	44	38322.32	13873.95
1993	2	Pacific cod	2	Rock sole	0.23	0.23	11	74	70.27	70.27
1993	2	Pacific cod	3	Rock sole	9.72	7.98	6	13	4071.3	3339.83
1993	3	Pacific cod	2	Rock sole	2.02	2.02	34	253	3916.77	3916.77
1993	3	Pacific cod	3	Rock sole	3.32	3.19	31	106	11886.08	11419.31
1993	4	Pacific cod	2	Rock sole	0.24	0.24	46	588	505.21	505.21
1993	4	Pacific cod	3	Rock sole	0.73	0.73	34	120	1280.98	1280.98
1993	5	Pacific cod	3	Rock sole	0.17	0.17	14	62	174.41	174.41

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	1	Pacific halibut	2	Rock sole	6.11	3.12	12	62	1825.66	932.31
1993	1	Pacific halibut	3	Rock sole	16.86	8.67	10	21	2961.68	1523.99
1993	2	Pacific halibut	3	Rock sole	4.64	4.64	7	12	203.77	203.77
1993	4	Pacific halibut	3	Rock sole	3.62	3.62	8	60	364.83	364.83
1993	1	Skates	1	Rock sole	4.54	3.3	8	16	1155.21	839.22
1993	3	Skates	1	Rock sole	3.83	2.19	15	59	2640.94	1506.74
1993	4	Skates	1	Rock sole	0.93	0.7	22	118	1031.24	773.07
1993	1	Walleye pollock	4	Rock sole	1.36	0.84	23	246	1210.88	750.39
1993	3	Walleye pollock	3	Rock sole	0.01	0.01	42	469	22.39	22.39
1993	4	Walleye pollock	4	Rock sole	0.07	0.04	54	717	143.17	70.81
1993	5	Walleye pollock	3	Rock sole	0.04	0.04	21	177	37.91	37.91
1993	5	Walleye pollock	4	Rock sole	0.01	0.01	20	174	4.9	4.9
1993	6	Walleye pollock	1	Rock sole	0.36	0.36	15	57	1817.42	1817.42
1993	2	Yellowfin sole	1	Rock sole	0.03	0.03	16	97	66.97	66.97
1993	4	Walleye pollock	4	Rockfish	0	0	54	717	6.6	6.6
1993	2	Alaska plaice	1	Unid. Chionoecetes	0.02	0.02	12	58	5.88	5.88
1993	4	Alaska plaice	1	Unid. Chionoecetes	0.09	0.09	21	124	138.49	138.49
1993	4	Flathead sole	1	Unid. Chionoecetes	0.77	0.72	23	113	554.97	524.41
1993	5	Flathead sole	1	Unid. Chionoecetes	0.09	0.09	10	40	82.71	82.71
1993	1	Pacific cod	2	Unid. Chionoecetes	4.55	3.11	21	201	10058.13	6870.62
1993	1	Pacific cod	3	Unid. Chionoecetes	1.23	1.23	16	44	2663.32	2663.32
1993	2	Pacific cod	3	Unid. Chionoecetes	2.33	2.33	6	13	976.93	976.93
1993	3	Pacific cod	1	Unid. Chionoecetes	7.69	7.69	13	23	1155.41	1155.41
1993	3	Pacific cod	2	Unid. Chionoecetes	3.61	2.15	34	253	6999.29	4167.26
1993	3	Pacific cod	3	Unid. Chionoecetes	4.17	2.66	31	106	14923.42	9504.97
1993	4	Pacific cod	1	Unid. Chionoecetes	1.65	1.65	30	130	349.8	349.8
1993	4	Pacific cod	2	Unid. Chionoecetes	3.76	1.22	46	588	8077.03	2613.02
1993	4	Pacific cod	3	Unid. Chionoecetes	4.13	2.08	34	120	7220.93	3640.68
1993	5	Pacific cod	2	Unid. Chionoecetes	10.53	7.7	13	70	2373.04	1735.82
1993	5	Pacific cod	3	Unid. Chionoecetes	6.55	3.5	14	62	6758.57	3610.15
1993	6	Pacific cod	2	Unid. Chionoecetes	4.48	1.48	41	290	3721.84	1230.72
1993	6	Pacific cod	3	Unid. Chionoecetes	2.45	1.03	40	185	6826.37	2880.03
1993	2	Pacific halibut	3	Unid. Chionoecetes	17.14	14.09	7	12	753.6	619.57
1993	3	Pacific halibut	2	Unid. Chionoecetes	1.75	1.75	7	18	221.05	221.05
1993	3	Pacific halibut	3	Unid. Chionoecetes	0.06	0.06	14	25	7.07	7.07
1993	4	Pacific halibut	3	Unid. Chionoecetes	9.88	8.22	8	60	994.71	827.57
1993	6	Pacific halibut	2	Unid. Chionoecetes	3.72	3.59	9	17	183.47	177.07

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	6	Pacific halibut	3	Unid. Chionoecetes	0.51	0.36	14	50	82.82	57.55
1993	2	Rock sole	1	Unid. Chionoecetes	0.25	0.23	11	52	525.09	478.99
1993	3	Rock sole	1	Unid. Chionoecetes	1.29	1.29	14	71	4796.85	4796.85
1993	1	Skates	1	Unid. Chionoecetes	8.13	5.43	8	16	2070.87	1382.13
1993	2	Skates	1	Unid. Chionoecetes	20.84	20.84	2	8	1766.01	1766.01
1993	3	Skates	1	Unid. Chionoecetes	11.79	7.16	15	59	8127.42	4931.8
1993	4	Skates	1	Unid. Chionoecetes	3.84	1.72	22	118	4259.38	1906.72
1993	5	Skates	1	Unid. Chionoecetes	25.94	18.65	3	12	8356.36	6007.31
1993	6	Skates	1	Unid. Chionoecetes	1.55	0.69	16	97	2410.18	1071.47
1993	1	Walleye pollock	4	Unid. Chionoecetes	1.27	1.27	23	246	1127.74	1127.74
1993	4	Walleye pollock	4	Unid. Chionoecetes	1.19	1.18	54	717	2380.34	2361.91
1993	5	Walleye pollock	3	Unid. Chionoecetes	0.01	0.01	21	177	5.35	5.35
1993	3	Yellowfin sole	1	Unid. Chionoecetes	0.09	0.07	19	135	414.71	357.25
1993	4	Yellowfin sole	1	Unid. Chionoecetes	0.36	0.36	30	193	673.55	673.55
1993	3	Arrowtooth flounder	2	Walleye pollock	39.18	16.26	8	26	26924.39	11173.09
1993	3	Arrowtooth flounder	3	Walleye pollock	38.96	10.56	15	39	30408.02	8239.52
1993	4	Arrowtooth flounder	2	Walleye pollock	36.22	17.44	7	37	4346.46	2093.25
1993	4	Arrowtooth flounder	3	Walleye pollock	72.72	12.75	7	41	12799.52	2243.81
1993	5	Arrowtooth flounder	2	Walleye pollock	9.31	9.31	8	19	4209.05	4209.05
1993	5	Arrowtooth flounder	3	Walleye pollock	24.43	12.68	9	28	30448.29	15797.05
1993	6	Arrowtooth flounder	2	Walleye pollock	36.35	12.29	14	22	10063.43	3402.38
1993	6	Arrowtooth flounder	3	Walleye pollock	66.02	7.14	24	152	151653.4	16391.39
1993	1	Flathead sole	1	Walleye pollock	18.41	8.3	9	31	7467.82	3366.91
1993	4	Flathead sole	1	Walleye pollock	26.69	7.72	23	113	19333.37	5591.69
1993	4	Greenland turbot	2	Walleye pollock	44.79	44.79	2	6	875.76	875.76
1993	4	Greenland turbot	3	Walleye pollock	99.98	0.02	3	5	1788.26	0.31
1993	5	Greenland turbot	3	Walleye pollock	100	0	1	2	588.29	0
1993	6	Greenland turbot	2	Walleye pollock	46.11	15.17	9	15	4306.11	1416.67
1993	6	Greenland turbot	3	Walleye pollock	95.39	4.22	14	26	15622.73	690.96
1993	1	Pacific cod	1	Walleye pollock	0.71	0.51	19	142	130.58	92.67
1993	1	Pacific cod	2	Walleye pollock	2.5	2.28	21	201	5529.37	5049.91
1993	1	Pacific cod	3	Walleye pollock	3.55	1.67	16	44	7677.32	3619.95
1993	2	Pacific cod	2	Walleye pollock	4.96	2.57	11	74	1539.27	797.16
1993	3	Pacific cod	2	Walleye pollock	7.25	2.49	34	253	14067.07	4825.77
1993	3	Pacific cod	3	Walleye pollock	52.29	7.52	31	106	187068.3	26895.53
1993	4	Pacific cod	1	Walleye pollock	1.89	1.34	30	130	402.24	284.81
1993	4	Pacific cod	2	Walleye pollock	12.32	2.49	46	588	26438.9	5341.29

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	4	Pacific cod	3	Walleye pollock	23.72	5.42	34	120	41521.94	9494.3
1993	5	Pacific cod	2	Walleye pollock	5.07	3.57	13	70	1143.12	803.96
1993	5	Pacific cod	3	Walleye pollock	34.15	9.37	14	62	35260.76	9680.3
1993	6	Pacific cod	2	Walleye pollock	12.51	3.23	41	290	10394.83	2682.77
1993	6	Pacific cod	3	Walleye pollock	35.35	5.02	40	185	98598.87	14010.33
1993	1	Pacific halibut	2	Walleye pollock	5.93	3.19	12	62	1770.71	952.34
1993	1	Pacific halibut	3	Walleye pollock	3.59	3.59	10	21	630.62	630.62
1993	2	Pacific halibut	2	Walleye pollock	24.6	11.58	8	50	2979.66	1403.02
1993	2	Pacific halibut	3	Walleye pollock	19.81	14.43	7	12	871.02	634.48
1993	3	Pacific halibut	2	Walleye pollock	50.17	17.76	7	18	6348.31	2247.12
1993	3	Pacific halibut	3	Walleye pollock	73.93	10.71	14	25	8213.61	1189.5
1993	4	Pacific halibut	2	Walleye pollock	41.49	12.29	8	40	6337.44	1877.75
1993	4	Pacific halibut	3	Walleye pollock	42.75	12.9	8	60	4302.36	1298.35
1993	5	Pacific halibut	3	Walleye pollock	58.69	30.15	3	7	5264.15	2704.11
1993	6	Pacific halibut	2	Walleye pollock	32.75	15.47	9	17	1613.46	762.07
1993	6	Pacific halibut	3	Walleye pollock	40.67	11.01	14	50	6555.57	1774.28
1993	3	Rock sole	1	Walleye pollock	0.05	0.05	14	71	173.22	173.22
1993	1	Skates	1	Walleye pollock	10.91	7.82	8	16	2777.49	1991
1993	3	Skates	1	Walleye pollock	37.56	11.09	15	59	25887.78	7645.72
1993	4	Skates	1	Walleye pollock	28.51	7.92	22	118	31653.44	8799.44
1993	5	Skates	1	Walleye pollock	24.5	12.27	3	12	7891.42	3951.39
1993	6	Skates	1	Walleye pollock	47.34	8.96	16	97	73558.87	13914.34
1993	1	Walleye pollock	4	Walleye pollock	3.82	1.42	23	246	3393.08	1263.95
1993	2	Walleye pollock	1	Walleye pollock	11.5	11.5	6	50	22450.16	22450.16
1993	2	Walleye pollock	4	Walleye pollock	13.85	5.28	17	167	2680.46	1021.91
1993	3	Walleye pollock	2	Walleye pollock	0.29	0.27	28	201	20507.96	18601.5
1993	3	Walleye pollock	3	Walleye pollock	6.1	2.99	42	469	26643.82	13034.08
1993	3	Walleye pollock	4	Walleye pollock	14.42	4.3	39	316	22277.26	6640.88
1993	4	Walleye pollock	1	Walleye pollock	3.04	1.69	21	118	25090.56	13958.47
1993	4	Walleye pollock	2	Walleye pollock	2.57	2.57	13	29	37181.83	37181.83
1993	4	Walleye pollock	3	Walleye pollock	7.77	4.04	30	184	11179.45	5808.26
1993	4	Walleye pollock	4	Walleye pollock	19.98	3.62	54	717	39916.6	7231.96
1993	5	Walleye pollock	2	Walleye pollock	0.19	0.19	16	75	1859.7	1859.7
1993	5	Walleye pollock	3	Walleye pollock	0.02	0.02	21	177	17.92	17.92
1993	5	Walleye pollock	4	Walleye pollock	2.94	2.81	20	174	1102.3	1053.23
1993	6	Walleye pollock	1	Walleye pollock	6.27	6.27	15	57	31726.99	31726.99
1993	6	Walleye pollock	2	Walleye pollock	2.27	2.27	16	44	51319.45	51319.45

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1993	6	Walleye pollock	3	Walleye pollock	10.63	3.64	36	243	25062.85	8584.69
1993	6	Walleye pollock	4	Walleye pollock	23.58	5.48	36	300	46484.06	10799.88
1993	3	Yellowfin sole	1	Walleye pollock	1.65	1.65	19	135	7975.59	7975.59
1993	4	Yellowfin sole	1	Walleye pollock	0.78	0.78	30	193	1477.22	1477.22
1993	1	Pacific cod	3	Yellowfin sole	1.21	1.21	16	44	2624.58	2624.58
1993	2	Pacific cod	3	Yellowfin sole	3.5	3.5	6	13	1465.4	1465.4
1993	3	Pacific cod	3	Yellowfin sole	2.45	1.6	31	106	8779.94	5733.42
1993	1	Pacific halibut	3	Yellowfin sole	11.19	7.47	10	21	1966.62	1311.83
1993	2	Pacific halibut	3	Yellowfin sole	2.84	2.84	7	12	125.03	125.03
1993	1	Skates	1	Yellowfin sole	3.57	3.57	8	16	909.25	909.25
1994	2	Pacific cod	2	Alaska plaice	0.36	0.36	14	69	78.4	78.4
1994	2	Pacific halibut	3	Alaska plaice	4.66	4.66	6	21	207.14	207.14
1994	3	Yellowfin sole	1	Alaska plaice	0.07	0.06	21	252	287.03	257.2
1994	4	Yellowfin sole	1	Alaska plaice	0	0	22	138	1.12	1.12
1994	6	Pacific cod	3	Arrowtooth flounder	0.08	0.06	40	377	447.71	312.96
1994	4	Skates	1	Arrowtooth flounder	1.37	1.37	33	139	1153.1	1153.1
1994	3	Flathead sole	1	Bairdi Tanner crab	0.38	0.29	24	94	1374.65	1053.94
1994	4	Flathead sole	1	Bairdi Tanner crab	2.36	2.36	23	64	1693.2	1693.2
1994	6	Flathead sole	1	Bairdi Tanner crab	0.11	0.11	23	66	199.49	199.49
1994	1	Pacific cod	2	Bairdi Tanner crab	0.14	0.14	27	282	310.25	310.25
1994	1	Pacific cod	3	Bairdi Tanner crab	0.2	0.2	21	57	398.55	398.55
1994	2	Pacific cod	2	Bairdi Tanner crab	0.23	0.23	14	69	48.86	48.86
1994	3	Pacific cod	2	Bairdi Tanner crab	4.13	1.51	30	307	5508.44	2007.93
1994	3	Pacific cod	3	Bairdi Tanner crab	1.25	0.74	20	126	3066.49	1822.55
1994	4	Pacific cod	2	Bairdi Tanner crab	0.55	0.29	43	377	893.95	475.31
1994	4	Pacific cod	3	Bairdi Tanner crab	0.19	0.16	40	190	288.23	235.31
1994	5	Pacific cod	2	Bairdi Tanner crab	25.5	11.89	6	37	4700.23	2191.63
1994	5	Pacific cod	3	Bairdi Tanner crab	5.43	2.44	8	95	3462.51	1556.86
1994	6	Pacific cod	2	Bairdi Tanner crab	6.47	2.71	37	242	11011.71	4618.38
1994	6	Pacific cod	3	Bairdi Tanner crab	3.48	1.34	40	377	18742.8	7212.45
1994	3	Pacific halibut	2	Bairdi Tanner crab	2.2	1.77	7	27	302.98	242.78
1994	3	Pacific halibut	3	Bairdi Tanner crab	0.23	0.23	6	24	45.49	45.49
1994	4	Pacific halibut	3	Bairdi Tanner crab	1.7	1.7	8	22	135.04	135.04
1994	5	Pacific halibut	2	Bairdi Tanner crab	90.4	0	1	2	1117.54	0
1994	5	Pacific halibut	3	Bairdi Tanner crab	3.75	0.06	2	11	327.3	5.22
1994	6	Pacific halibut	2	Bairdi Tanner crab	0.08	0.08	4	14	3.81	3.81
1994	6	Pacific halibut	3	Bairdi Tanner crab	1.14	1	11	54	214.92	188.36

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	2	Skates	1	Bairdi Tanner crab	0.17	0.17	6	10	18.25	18.25
1994	3	Skates	1	Bairdi Tanner crab	4.28	2.06	12	69	4469.55	2148.54
1994	4	Skates	1	Bairdi Tanner crab	1.14	0.97	33	139	958.37	815.01
1994	5	Skates	1	Bairdi Tanner crab	6.69	4.28	4	29	3081.61	1971.49
1994	6	Skates	1	Bairdi Tanner crab	0.33	0.28	17	114	612.57	530.15
1994	1	Pacific cod	2	Flathead sole	0.06	0.06	27	282	138.83	138.83
1994	1	Pacific cod	3	Flathead sole	1.54	1.54	21	57	3079.82	3079.82
1994	3	Pacific cod	3	Flathead sole	1.91	1.32	20	126	4710.43	3244.07
1994	4	Pacific cod	2	Flathead sole	0.25	0.18	43	377	403.03	290.81
1994	5	Pacific cod	3	Flathead sole	1.88	1.7	8	95	1201.38	1085.51
1994	6	Pacific cod	3	Flathead sole	1.09	0.58	40	377	5880.83	3107.08
1994	1	Pacific halibut	3	Flathead sole	1.6	1.08	10	39	335.2	227.4
1994	3	Pacific halibut	2	Flathead sole	0.01	0.01	7	27	1.48	1.48
1994	3	Pacific halibut	3	Flathead sole	5.38	5.38	6	24	1041.8	1041.8
1994	4	Skates	1	Flathead sole	2.55	2.55	33	139	2151.37	2151.37
1994	6	Skates	1	Flathead sole	3.98	3.95	17	114	7483.65	7424.21
1994	3	Arrowtooth flounder	2	Gadidae	16.67	11.24	12	29	9102.89	6137.17
1994	3	Arrowtooth flounder	3	Gadidae	15.27	9.09	13	42	20000.7	11908.42
1994	4	Arrowtooth flounder	3	Gadidae	49.25	49.25	2	5	7334.89	7334.89
1994	5	Arrowtooth flounder	2	Gadidae	1.39	1.15	10	35	717.76	592.6
1994	5	Arrowtooth flounder	3	Gadidae	0.06	0.06	10	44	89.8	89.8
1994	6	Arrowtooth flounder	2	Gadidae	34.59	12.4	12	32	9736.05	3488.94
1994	6	Arrowtooth flounder	3	Gadidae	13.13	5.11	26	131	26162.81	10191.87
1994	1	Flathead sole	1	Gadidae	1.15	1.15	8	28	490.37	490.37
1994	3	Flathead sole	1	Gadidae	0.64	0.64	24	94	2339.44	2339.44
1994	4	Flathead sole	1	Gadidae	1.35	1.35	23	64	967.43	967.43
1994	6	Greenland turbot	2	Gadidae	29.04	18.33	7	13	3666.74	2314.02
1994	6	Greenland turbot	3	Gadidae	0.57	0.5	13	34	166.85	145.46
1994	1	Pacific cod	1	Gadidae	3.97	3.97	21	100	745.54	745.54
1994	1	Pacific cod	2	Gadidae	0.32	0.18	27	282	694.87	391.39
1994	1	Pacific cod	3	Gadidae	0.82	0.36	21	57	1640.48	713.87
1994	2	Pacific cod	1	Gadidae	3.66	2.52	11	32	43.55	29.99
1994	2	Pacific cod	2	Gadidae	2.06	1.14	14	69	444.12	245.67
1994	2	Pacific cod	3	Gadidae	0.41	0.28	14	77	220.34	149.78
1994	3	Pacific cod	2	Gadidae	2.73	1.65	30	307	3640.08	2193.73
1994	3	Pacific cod	3	Gadidae	0.02	0.02	20	126	46.35	42.1
1994	4	Pacific cod	1	Gadidae	1.94	1.15	31	125	512.82	304.56

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Pacific cod	2	Gadidae	2.36	0.82	43	377	3848.73	1343.23
1994	4	Pacific cod	3	Gadidae	1.3	0.54	40	190	1947.57	803.89
1994	5	Pacific cod	2	Gadidae	2.81	2.81	6	37	518.11	518.11
1994	5	Pacific cod	3	Gadidae	0.29	0.29	8	95	187.48	187.48
1994	6	Pacific cod	2	Gadidae	0.9	0.28	37	242	1536.43	480.3
1994	6	Pacific cod	3	Gadidae	1.81	0.65	40	377	9765.03	3526.28
1994	2	Pacific halibut	2	Gadidae	0.24	0.24	6	19	11.04	11.04
1994	2	Pacific halibut	3	Gadidae	2.11	2.11	6	21	93.91	93.91
1994	3	Pacific halibut	2	Gadidae	1.21	1.21	7	27	166.65	166.65
1994	3	Pacific halibut	3	Gadidae	0.02	0.02	6	24	4.03	4.03
1994	4	Pacific halibut	3	Gadidae	3.65	3.65	8	22	288.96	288.96
1994	6	Pacific halibut	2	Gadidae	4.74	4.74	4	14	231.41	231.41
1994	6	Pacific halibut	3	Gadidae	0.59	0.4	11	54	111.35	75.08
1994	3	Skates	1	Gadidae	0.06	0.06	12	69	64.68	64.68
1994	4	Skates	1	Gadidae	0.54	0.39	33	139	451.45	324.67
1994	6	Skates	1	Gadidae	1.61	0.89	17	114	3032.44	1672.06
1994	2	Walleye pollock	4	Gadidae	0.22	0.14	16	213	54.77	33.35
1994	3	Walleye pollock	4	Gadidae	1.71	1.71	35	263	1719.85	1719.85
1994	4	Walleye pollock	1	Gadidae	5.48	5.26	19	225	28365.85	27189.99
1994	4	Walleye pollock	2	Gadidae	0.25	0.25	8	25	1327.09	1327.09
1994	4	Walleye pollock	3	Gadidae	1.32	0.9	13	87	3982.41	2720.04
1994	4	Walleye pollock	4	Gadidae	1.35	0.42	41	515	1142.78	357.09
1994	5	Walleye pollock	3	Gadidae	0.04	0.04	11	111	280.97	280.97
1994	6	Walleye pollock	2	Gadidae	2.64	2.3	26	99	120739.7	104956
1994	6	Walleye pollock	3	Gadidae	0.31	0.22	36	303	3677.14	2691.32
1994	6	Walleye pollock	4	Gadidae	0.8	0.47	37	317	1240.59	719.24
1994	3	Yellowfin sole	1	Gadidae	0.78	0.78	21	252	3311.23	3311.23
1994	6	Pacific cod	2	Greenland turbot	0.08	0.07	37	242	137.47	126.81
1994	4	Walleye pollock	3	Greenland turbot	0.05	0.05	13	87	139.58	139.58
1994	5	Walleye pollock	4	Greenland turbot	0.01	0.01	11	84	2.04	2.04
1994	6	Walleye pollock	4	Greenland turbot	0	0	37	317	6.58	6.58
1994	1	Pacific cod	2	King crab legs	2.77	2.03	27	282	6045.76	4437.43
1994	1	Pacific cod	3	King crab legs	0.27	0.27	21	57	536.8	536.8
1994	3	Pacific cod	2	King crab legs	2.88	2.88	30	307	3837.75	3837.75
1994	3	Pacific cod	3	King crab legs	5	5	20	126	12313.93	12313.93
1994	4	Pacific cod	2	King crab legs	1.95	1.93	43	377	3179.6	3149.57
1994	4	Pacific cod	3	King crab legs	2.39	1.86	40	190	3582.47	2798.69

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	1	Pacific halibut	2	King crab legs	1.88	1.88	9	20	257	257
1994	4	Skates	1	King crab legs	1.17	1.17	33	139	985.65	985.65
1994	1	Pacific cod	3	Lithodidae	1.49	1.49	21	57	606.75	606.75
1994	2	Pacific cod	2	Lithodidae	6.81	6.81	14	69	297.13	297.13
1994	1	Pacific halibut	2	Lithodidae	1.83	1.83	9	20	50.71	50.71
1994	3	Yellowfin sole	1	Lithodidae	0.16	0.16	21	252	134.9	134.9
1994	1	Pacific cod	2	Offal	1.78	1.33	27	282	3881.99	2904.73
1994	1	Pacific cod	3	Offal	5.16	3.56	21	57	10351.38	7145.6
1994	2	Pacific cod	3	Offal	3.36	3.36	14	77	1807.86	1807.86
1994	3	Pacific cod	2	Offal	3.71	2.27	30	307	4948.87	3020.94
1994	3	Pacific cod	3	Offal	0.16	0.14	20	126	389.48	352.42
1994	4	Pacific cod	2	Offal	1.21	1.06	43	377	1977.7	1723.32
1994	4	Pacific cod	3	Offal	0.68	0.51	40	190	1015.96	764.12
1994	5	Pacific cod	2	Offal	7.21	7.21	6	37	1328.91	1328.91
1994	5	Pacific cod	3	Offal	2.12	1.45	8	95	1349.13	923.97
1994	6	Pacific cod	1	Offal	5.52	5.52	5	16	107.07	107.07
1994	6	Pacific cod	2	Offal	6.63	3.44	37	242	11288.4	5852.08
1994	6	Pacific cod	3	Offal	2.91	2.13	40	377	15653.93	11464.83
1994	3	Pacific halibut	2	Offal	0.14	0.14	7	27	18.6	18.6
1994	3	Pacific halibut	3	Offal	9.99	9.99	6	24	1934.41	1934.41
1994	3	Skates	1	Offal	1.66	1.66	12	69	1734.67	1734.67
1994	4	Skates	1	Offal	1.03	0.59	33	139	871.68	496.85
1994	6	Skates	1	Offal	3.71	2.7	17	114	6981.32	5083.8
1994	4	Walleye pollock	4	Offal	0.3	0.3	41	515	255.54	255.54
1994	6	Walleye pollock	2	Offal	0.31	0.31	26	99	14088.16	14088.16
1994	6	Walleye pollock	4	Offal	4.84	3.02	37	317	7479.98	4672.51
1994	1	Yellowfin sole	1	Offal	0.14	0.14	21	243	1038.91	1038.91
1994	3	Yellowfin sole	1	Offal	0.83	0.83	21	252	3508.76	3508.76
1994	4	Alaska plaice	1	Opilio snow crab	1.49	1.49	16	45	2819.45	2819.45
1994	5	Flathead sole	1	Opilio snow crab	1.87	1.87	9	26	2055.43	2055.43
1994	1	Pacific cod	1	Opilio snow crab	0.43	0.43	21	100	80.83	80.83
1994	1	Pacific cod	2	Opilio snow crab	0.16	0.16	27	282	354.95	354.95
1994	2	Pacific cod	2	Opilio snow crab	20.89	7.24	14	69	4496.79	1558.47
1994	2	Pacific cod	3	Opilio snow crab	31.44	9.42	14	77	16930.06	5071.65
1994	3	Pacific cod	2	Opilio snow crab	8.77	2.82	30	307	11680.9	3760.88
1994	3	Pacific cod	3	Opilio snow crab	14.31	5.68	20	126	35253.32	13995.87
1994	4	Pacific cod	1	Opilio snow crab	2.73	1.9	31	125	721.2	502.56

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Pacific cod	2	Opilio snow crab	19.3	3.23	43	377	31503.16	5266.12
1994	4	Pacific cod	3	Opilio snow crab	30.99	5.21	40	190	46520.04	7822.91
1994	5	Pacific cod	2	Opilio snow crab	5.74	4.07	6	37	1058.92	749.59
1994	5	Pacific cod	3	Opilio snow crab	7.95	7.06	8	95	5071.48	4503.74
1994	6	Pacific cod	2	Opilio snow crab	7.65	1.54	37	242	13027.79	2630.12
1994	6	Pacific cod	3	Opilio snow crab	13.76	2.86	40	377	74075.22	15399.84
1994	3	Pacific halibut	2	Opilio snow crab	0.53	0.53	7	27	72.77	72.77
1994	3	Pacific halibut	3	Opilio snow crab	6.27	4.31	6	24	1214	834.37
1994	4	Pacific halibut	3	Opilio snow crab	6.23	5.13	8	22	493.86	406.02
1994	5	Pacific halibut	3	Opilio snow crab	1.43	1.43	2	11	124.28	124.28
1994	6	Pacific halibut	3	Opilio snow crab	5.1	2.99	11	54	960.47	562.64
1994	2	Skates	1	Opilio snow crab	0.9	0.9	6	10	98.02	98.02
1994	3	Skates	1	Opilio snow crab	0.06	0.06	12	69	67.41	67.41
1994	4	Skates	1	Opilio snow crab	8.45	3.09	33	139	7121.38	2601.37
1994	6	Skates	1	Opilio snow crab	3.75	1.5	17	114	7053.73	2822.56
1994	6	Walleye pollock	2	Opilio snow crab	0	0	26	99	80.95	80.95
1994	6	Walleye pollock	3	Opilio snow crab	0	0	36	303	8.34	8.34
1994	2	Yellowfin sole	1	Opilio snow crab	1.95	1.95	15	148	5554.53	5554.53
1994	3	Arrowtooth flounder	2	Osmerids	5.34	5.34	12	29	2917.51	2917.51
1994	3	Arrowtooth flounder	3	Osmerids	2.54	2.54	13	42	3329.95	3329.95
1994	2	Flathead sole	1	Osmerids	23.9	23.9	4	5	123.11	123.11
1994	1	Pacific cod	2	Osmerids	0.7	0.7	27	282	1530.84	1530.84
1994	2	Pacific cod	1	Osmerids	6.31	6.31	11	32	75.12	75.12
1994	2	Pacific cod	2	Osmerids	0.19	0.19	14	69	40.85	40.85
1994	2	Pacific cod	3	Osmerids	0.8	0.67	14	77	432.85	358.95
1994	3	Pacific cod	2	Osmerids	0.7	0.61	30	307	937.39	813.94
1994	1	Pacific halibut	3	Osmerids	0.8	0.8	10	39	168.64	168.64
1994	2	Pacific halibut	2	Osmerids	2.07	2.07	6	19	93.35	93.35
1994	2	Pacific halibut	3	Osmerids	0.15	0.15	6	21	6.53	6.53
1994	1	Walleye pollock	4	Osmerids	0.43	0.43	23	268	310.11	310.11
1994	2	Walleye pollock	4	Osmerids	1.53	0.9	16	213	373.05	218.18
1994	4	Flathead sole	1	Pacific cod	4.08	4.08	23	64	2927.68	2927.68
1994	4	Greenland turbot	2	Pacific cod	29.78	29.78	2	4	232.19	232.19
1994	1	Pacific cod	3	Pacific cod	2.98	2.59	21	57	5983.8	5186.38
1994	2	Pacific cod	3	Pacific cod	1.52	1.41	14	77	821.11	758.79
1994	3	Pacific cod	2	Pacific cod	0.14	0.14	30	307	182.13	182.13
1994	3	Pacific cod	3	Pacific cod	0.03	0.03	20	126	73.78	73.78

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Pacific cod	3	Pacific cod	0.55	0.55	40	190	821.68	821.68
1994	6	Pacific cod	2	Pacific cod	2.15	1.73	37	242	3669.3	2950.63
1994	6	Pacific cod	3	Pacific cod	1.74	1.32	40	377	9370.02	7089.01
1994	1	Pacific halibut	3	Pacific cod	10.33	9.97	10	39	2166.6	2090.96
1994	2	Pacific halibut	3	Pacific cod	4.17	4.17	6	21	185.35	185.35
1994	3	Pacific halibut	3	Pacific cod	3.85	3.85	6	24	744.48	744.48
1994	4	Skates	1	Pacific cod	2.05	1.45	33	139	1727.31	1223.3
1994	1	Walleye pollock	4	Pacific cod	0.35	0.25	23	268	254.66	178.6
1994	3	Walleye pollock	4	Pacific cod	1.03	1.03	35	263	1029.8	1029.8
1994	4	Pacific cod	3	Pacific halibut	1.11	1.11	40	190	1668.74	1668.74
1994	6	Pacific cod	3	Pacific halibut	0.1	0.1	40	377	520.64	520.64
1994	1	Walleye pollock	4	Pacific herring	0.51	0.51	23	268	371.31	371.31
1994	2	Walleye pollock	4	Pacific herring	1	0.7	16	213	243.53	171.34
1994	4	Walleye pollock	4	Pacific herring	2.06	1.4	41	515	1738.04	1180.42
1994	2	Skates	1	Pacific salmon	10.5	10.5	6	10	1149.63	1149.63
1994	4	Skates	1	Pacific salmon	2.87	2.87	33	139	2418.99	2418.99
1994	1	Pacific cod	2	<i>Paralithodes</i> spp.	0.02	0.02	27	282	7.7	7.7
1994	3	Pacific cod	3	<i>Paralithodes</i> spp.	5	5	20	126	2494.98	2494.98
1994	4	Pacific cod	3	<i>Paralithodes</i> spp.	1.01	0.71	40	190	305.84	216.34
1994	1	Pacific cod	2	Pleuronectidae	2.38	1.11	27	282	5185.3	2411.82
1994	1	Pacific cod	3	Pleuronectidae	18.96	6.03	21	57	38021.22	12102.93
1994	2	Pacific cod	1	Pleuronectidae	0.21	0.21	11	32	2.56	2.56
1994	2	Pacific cod	2	Pleuronectidae	1.65	0.74	14	69	354.39	158.44
1994	2	Pacific cod	3	Pleuronectidae	8.34	3.53	14	77	4493.91	1902.95
1994	3	Pacific cod	2	Pleuronectidae	0.35	0.28	30	307	464.48	376.01
1994	3	Pacific cod	3	Pleuronectidae	0.5	0.28	20	126	1239.98	692.15
1994	4	Pacific cod	2	Pleuronectidae	1.05	0.55	43	377	1709.95	898.54
1994	4	Pacific cod	3	Pleuronectidae	4.69	1.57	40	190	7044.83	2355.7
1994	5	Pacific cod	2	Pleuronectidae	0.27	0.27	6	37	50.63	50.63
1994	5	Pacific cod	3	Pleuronectidae	1.36	0.85	8	95	864.87	538.98
1994	6	Pacific cod	2	Pleuronectidae	0.01	0.01	37	242	17.2	17.2
1994	6	Pacific cod	3	Pleuronectidae	0.81	0.36	40	377	4368.75	1920.82
1994	1	Pacific halibut	3	Pleuronectidae	14.46	8.52	10	39	3033.88	1787.33
1994	2	Pacific halibut	2	Pleuronectidae	1.75	1.75	6	19	79.15	79.15
1994	2	Pacific halibut	3	Pleuronectidae	13.19	5.21	6	21	585.92	231.64
1994	3	Pacific halibut	2	Pleuronectidae	0.22	0.22	7	27	29.88	29.88
1994	4	Pacific halibut	2	Pleuronectidae	0.49	0.49	8	18	53.21	53.21

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Pacific halibut	3	Pleuronectidae	0.25	0.25	8	22	19.81	19.81
1994	2	Skates	1	Pleuronectidae	7.38	4.75	6	10	808.1	520.42
1994	3	Skates	1	Pleuronectidae	8.66	4.29	12	69	9033.29	4479.5
1994	4	Skates	1	Pleuronectidae	4.7	2.63	33	139	3962.68	2217.9
1994	6	Skates	1	Pleuronectidae	0.43	0.36	17	114	816.23	670.23
1994	2	Walleye pollock	4	Pleuronectidae	0.76	0.76	16	213	185.28	185.28
1994	3	Walleye pollock	3	Pleuronectidae	0.04	0.04	29	395	963.73	963.73
1994	4	Walleye pollock	4	Pleuronectidae	0.03	0.03	41	515	26.61	26.61
1994	3	Yellowfin sole	1	Pleuronectidae	0	0	21	252	9.42	9.42
1994	3	Pacific cod	2	Red king crab	2.39	2.39	30	307	643.85	643.85
1994	4	Pacific cod	2	Red king crab	1.25	1.19	43	377	411.95	392.72
1994	4	Pacific cod	3	Red king crab	0.57	0.57	40	190	171.86	171.86
1994	1	Pacific cod	1	Rock sole	0.41	0.41	21	100	77.18	77.18
1994	1	Pacific cod	3	Rock sole	4.96	2.47	21	57	9957.04	4959.31
1994	2	Pacific cod	3	Rock sole	7.55	4.21	14	77	4063.97	2269.68
1994	3	Pacific cod	3	Rock sole	0.06	0.06	20	126	145.18	145.18
1994	4	Pacific cod	1	Rock sole	0.45	0.45	31	125	120.12	120.12
1994	4	Pacific cod	2	Rock sole	0.19	0.14	43	377	311.38	227.21
1994	4	Pacific cod	3	Rock sole	1.62	1.62	40	190	2428.3	2428.3
1994	1	Pacific halibut	2	Rock sole	2.54	2.54	9	20	348.46	348.46
1994	1	Pacific halibut	3	Rock sole	4.37	3.08	10	39	916.64	645.29
1994	2	Pacific halibut	3	Rock sole	16.17	10.72	6	21	718.49	476.09
1994	2	Skates	1	Rock sole	13.08	8.48	6	10	1432.32	928.75
1994	3	Skates	1	Rock sole	12.82	7.05	12	69	13383.1	7353.67
1994	4	Skates	1	Rock sole	5.99	3.42	33	139	5050.03	2884.58
1994	1	Walleye pollock	4	Rock sole	1.83	1.68	23	268	1319.2	1211.44
1994	4	Yellowfin sole	1	Rock sole	0.01	0.01	22	138	17.53	17.53
1994	3	Arrowtooth flounder	3	Rockfish	0.13	0.13	13	42	164.77	164.77
1994	6	Arrowtooth flounder	1	Rockfish	5.68	5.68	5	5	68.54	68.54
1994	6	Arrowtooth flounder	3	Rockfish	2.49	2.49	26	131	4968.51	4968.51
1994	6	Pacific cod	3	Rockfish	1.83	1.39	40	377	9827.87	7484.41
1994	5	Skates	1	Rockfish	3.16	3.16	4	29	1455.28	1455.28
1994	3	Flathead sole	1	Unid. Chionoecetes	0.2	0.17	24	94	722.95	636.06
1994	5	Flathead sole	1	Unid. Chionoecetes	0.02	0.02	9	26	22.84	22.84
1994	6	Flathead sole	1	Unid. Chionoecetes	3.58	3.58	23	66	6772.32	6772.32
1994	1	Pacific cod	2	Unid. Chionoecetes	0.88	0.66	27	282	1923.77	1438.58
1994	2	Pacific cod	2	Unid. Chionoecetes	0.03	0.03	14	69	6.47	6.47

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	2	Pacific cod	3	Unid. Chionoecetes	3.67	2.23	14	77	1976.87	1200.01
1994	3	Pacific cod	2	Unid. Chionoecetes	2.17	0.85	30	307	2888.21	1135.19
1994	3	Pacific cod	3	Unid. Chionoecetes	6.42	4.98	20	126	15814.41	12259.39
1994	4	Pacific cod	1	Unid. Chionoecetes	3.5	3.23	31	125	924.46	853.47
1994	4	Pacific cod	2	Unid. Chionoecetes	1.61	0.42	43	377	2633.47	679.79
1994	4	Pacific cod	3	Unid. Chionoecetes	5.92	2.32	40	190	8892.84	3480.67
1994	5	Pacific cod	2	Unid. Chionoecetes	1.94	1.12	6	37	357.72	206.66
1994	5	Pacific cod	3	Unid. Chionoecetes	13.19	12.41	8	95	8410.64	7913.22
1994	6	Pacific cod	1	Unid. Chionoecetes	3.51	3.51	5	16	68.17	68.17
1994	6	Pacific cod	2	Unid. Chionoecetes	1.04	0.72	37	242	1778.93	1218.24
1994	6	Pacific cod	3	Unid. Chionoecetes	1.08	0.41	40	377	5791.77	2225.33
1994	3	Pacific halibut	2	Unid. Chionoecetes	0.11	0.11	7	27	15.06	15.06
1994	3	Pacific halibut	3	Unid. Chionoecetes	1.05	0.88	6	24	203.18	170.57
1994	4	Pacific halibut	2	Unid. Chionoecetes	13.58	12.39	8	18	1483.28	1353.33
1994	5	Pacific halibut	3	Unid. Chionoecetes	0.69	0.69	2	11	59.98	59.98
1994	6	Pacific halibut	3	Unid. Chionoecetes	0.41	0.39	11	54	76.43	73.53
1994	2	Skates	1	Unid. Chionoecetes	3.35	3.35	6	10	366.98	366.98
1994	3	Skates	1	Unid. Chionoecetes	8.05	3.47	12	69	8398.53	3618.62
1994	4	Skates	1	Unid. Chionoecetes	4.14	1.34	33	139	3484.19	1127.38
1994	5	Skates	1	Unid. Chionoecetes	7.59	5.36	4	29	3500.67	2470.38
1994	6	Skates	1	Unid. Chionoecetes	0.77	0.29	17	114	1453.98	542.26
1994	1	Walleye pollock	1	Unid. Chionoecetes	0.15	0.15	9	65	90.95	90.95
1994	4	Walleye pollock	1	Unid. Chionoecetes	0.02	0.02	19	225	83.36	83.36
1994	4	Walleye pollock	3	Unid. Chionoecetes	0.55	0.55	13	87	1662.45	1662.45
1994	4	Walleye pollock	4	Unid. Chionoecetes	0	0	41	515	0.8	0.8
1994	5	Walleye pollock	2	Unid. Chionoecetes	1.33	1.33	2	11	2318.73	2318.73
1994	5	Walleye pollock	3	Unid. Chionoecetes	0.02	0.02	11	111	159.91	159.91
1994	5	Walleye pollock	4	Unid. Chionoecetes	0.02	0.02	11	84	3.25	3.25
1994	6	Walleye pollock	1	Unid. Chionoecetes	0.02	0.02	23	99	467.75	467.75
1994	6	Walleye pollock	2	Unid. Chionoecetes	0.02	0.01	26	99	768.72	568.03
1994	6	Walleye pollock	3	Unid. Chionoecetes	0.01	0.01	36	303	140.31	98.22
1994	3	Yellowfin sole	1	Unid. Chionoecetes	0.01	0.01	21	252	24.1	24.1
1994	4	Yellowfin sole	1	Unid. Chionoecetes	0.02	0.02	22	138	26.11	26.11
1994	1	Arrowtooth flounder	3	Walleye pollock	99.77	0	1	4	5059.31	0
1994	3	Arrowtooth flounder	2	Walleye pollock	10.8	8.42	12	29	5897.89	4596.18
1994	3	Arrowtooth flounder	3	Walleye pollock	45.57	13.17	13	42	59686.34	17247.43
1994	4	Arrowtooth flounder	2	Walleye pollock	49.59	26.21	3	7	4774.53	2523.22

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Arrowtooth flounder	3	Walleye pollock	28.11	28.11	2	5	4187.27	4187.27
1994	5	Arrowtooth flounder	2	Walleye pollock	15.33	10.25	10	35	7892.81	5274.83
1994	5	Arrowtooth flounder	3	Walleye pollock	11.58	7.75	10	44	16779.8	11232.4
1994	6	Arrowtooth flounder	1	Walleye pollock	20	20	5	5	241.25	241.25
1994	6	Arrowtooth flounder	2	Walleye pollock	29.41	12.82	12	32	8278.81	3607.6
1994	6	Arrowtooth flounder	3	Walleye pollock	65.85	7.85	26	131	131209.8	15643.35
1994	1	Flathead sole	1	Walleye pollock	7.62	7.62	8	28	3236.83	3236.83
1994	2	Flathead sole	1	Walleye pollock	25	25	4	5	128.79	128.79
1994	3	Flathead sole	1	Walleye pollock	3.23	3.23	24	94	11748.26	11748.26
1994	4	Flathead sole	1	Walleye pollock	19.35	7.87	23	64	13899.16	5650.45
1994	5	Flathead sole	1	Walleye pollock	3.77	3.77	9	26	4146.38	4146.38
1994	4	Greenland turbot	2	Walleye pollock	70.22	29.78	2	4	547.5	232.19
1994	4	Greenland turbot	3	Walleye pollock	99.87	0.13	2	4	1291.16	1.69
1994	6	Greenland turbot	2	Walleye pollock	39.6	18.71	7	13	5000.58	2362.1
1994	6	Greenland turbot	3	Walleye pollock	98.74	0.82	13	34	28691.66	238.9
1994	1	Pacific cod	1	Walleye pollock	0.35	0.35	21	100	65.41	65.41
1994	1	Pacific cod	2	Walleye pollock	3.89	2.12	27	282	8473.95	4625.48
1994	1	Pacific cod	3	Walleye pollock	6.11	4.7	21	57	12253.15	9430.74
1994	2	Pacific cod	1	Walleye pollock	7.54	7.18	11	32	89.74	85.46
1994	2	Pacific cod	2	Walleye pollock	4.83	3.25	14	69	1040.73	700.45
1994	2	Pacific cod	3	Walleye pollock	2.03	1.39	14	77	1093.35	747.44
1994	3	Pacific cod	2	Walleye pollock	8.98	3.76	30	307	11968.45	5010
1994	3	Pacific cod	3	Walleye pollock	45.44	9.13	20	126	111902.6	22472.92
1994	4	Pacific cod	1	Walleye pollock	6.91	2.6	31	125	1827.22	686.97
1994	4	Pacific cod	2	Walleye pollock	13.09	3.29	43	377	21356.46	5371.19
1994	4	Pacific cod	3	Walleye pollock	18.73	4.37	40	190	28118.7	6559.18
1994	5	Pacific cod	2	Walleye pollock	3.93	2.44	6	37	724.98	448.92
1994	5	Pacific cod	3	Walleye pollock	41.85	12.95	8	95	26687.85	8255.19
1994	6	Pacific cod	2	Walleye pollock	17.7	3.6	37	242	30142.03	6132.73
1994	6	Pacific cod	3	Walleye pollock	45.17	4.73	40	377	243176.3	25485.45
1994	1	Pacific halibut	2	Walleye pollock	20.28	12.93	9	20	2778.29	1771.82
1994	1	Pacific halibut	3	Walleye pollock	6.26	4.77	10	39	1313.42	1000.57
1994	2	Pacific halibut	2	Walleye pollock	29.07	16.36	6	19	1311.42	737.97
1994	2	Pacific halibut	3	Walleye pollock	15.29	6.69	6	21	679.18	297.04
1994	3	Pacific halibut	2	Walleye pollock	38.47	15.65	7	27	5289.57	2152.15
1994	3	Pacific halibut	3	Walleye pollock	55.49	14.68	6	24	10741.96	2841.46
1994	4	Pacific halibut	2	Walleye pollock	47.87	16.53	8	18	5227.78	1805.71

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1994	4	Pacific halibut	3	Walleye pollock	53.5	17.12	8	22	4238.08	1356.23
1994	5	Pacific halibut	3	Walleye pollock	89.35	6.96	2	11	7790.51	606.57
1994	6	Pacific halibut	2	Walleye pollock	53.09	26.65	4	14	2592.13	1301.29
1994	6	Pacific halibut	3	Walleye pollock	77.68	10.01	11	54	14626.46	1885.62
1994	2	Skates	1	Walleye pollock	19.84	12.36	6	10	2172.27	1352.97
1994	3	Skates	1	Walleye pollock	46.2	9.7	12	69	48206.32	10126.47
1994	4	Skates	1	Walleye pollock	17.89	5.39	33	139	15072.68	4539.01
1994	5	Skates	1	Walleye pollock	64.55	18.31	4	29	29754.14	8441.74
1994	6	Skates	1	Walleye pollock	42.17	9.48	17	114	79305.61	17828.41
1994	1	Walleye pollock	4	Walleye pollock	3.56	2.52	23	268	2571.44	1818.57
1994	2	Walleye pollock	3	Walleye pollock	38.88	38.88	2	3	73.29	73.29
1994	2	Walleye pollock	4	Walleye pollock	18.58	6.8	16	213	4529.3	1657.42
1994	3	Walleye pollock	2	Walleye pollock	5.52	4.61	18	58	75391.03	62942.93
1994	3	Walleye pollock	3	Walleye pollock	2.33	2.1	29	395	51056.19	45924.61
1994	3	Walleye pollock	4	Walleye pollock	3.85	2.5	35	263	3857.73	2511.23
1994	4	Walleye pollock	1	Walleye pollock	4.12	3.21	19	225	21292.15	16623.47
1994	4	Walleye pollock	2	Walleye pollock	20.25	13.73	8	25	108609.4	73662.35
1994	4	Walleye pollock	3	Walleye pollock	10.91	5.8	13	87	32815.33	17445
1994	4	Walleye pollock	4	Walleye pollock	21.74	3.82	41	515	18350.96	3229
1994	5	Walleye pollock	2	Walleye pollock	36.31	36.31	2	11	63146.84	63146.84
1994	5	Walleye pollock	3	Walleye pollock	7.73	6.15	11	111	60272.12	47892.71
1994	5	Walleye pollock	4	Walleye pollock	14.57	8.89	11	84	2704.25	1648.91
1994	6	Walleye pollock	2	Walleye pollock	2.42	1.94	26	99	110830.2	88636.47
1994	6	Walleye pollock	3	Walleye pollock	6.63	3.2	36	303	79317.66	38277
1994	6	Walleye pollock	4	Walleye pollock	31.13	5.85	37	317	48144.59	9054.3
1994	2	Yellowfin sole	1	Walleye pollock	4.7	4.7	15	148	13396.06	13396.06
1994	3	Yellowfin sole	1	Walleye pollock	1.47	1.36	21	252	6220.76	5764
1994	4	Yellowfin sole	1	Walleye pollock	0.01	0.01	22	138	7.46	7.46
1994	1	Pacific cod	1	Yellowfin sole	0.47	0.47	21	100	87.91	87.91
1994	1	Pacific cod	2	Yellowfin sole	1.28	0.88	27	282	2791.55	1928.76
1994	1	Pacific cod	3	Yellowfin sole	8.18	3.8	21	57	16408.04	7627.44
1994	2	Pacific cod	2	Yellowfin sole	3.09	2.9	14	69	666.28	623.67
1994	2	Pacific cod	3	Yellowfin sole	0.49	0.49	14	77	261.73	261.73
1994	3	Pacific cod	3	Yellowfin sole	1.11	0.84	20	126	2743.44	2058.06
1994	2	Pacific halibut	3	Yellowfin sole	6.47	6.47	6	21	287.55	287.55
1994	2	Skates	1	Yellowfin sole	2.67	2.67	6	10	291.97	291.97
1995	2	Yellowfin sole	1	Alaska plaice	0	0	19	170	0.3	0.3

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	1	Pacific cod	2	Arrowtooth flounder	0.22	0.22	24	225	389.25	389.25
1995	1	Pacific cod	3	Arrowtooth flounder	2.28	2.28	23	119	5598.92	5598.92
1995	3	Pacific cod	2	Arrowtooth flounder	1.26	1.26	41	386	1498.13	1498.13
1995	4	Pacific cod	3	Arrowtooth flounder	0.01	0.01	24	70	10.67	10.67
1995	6	Pacific cod	2	Arrowtooth flounder	0.11	0.11	41	385	184.92	184.92
1995	4	Flathead sole	1	Bairdi Tanner crab	1.07	1.07	26	137	648.4	648.4
1995	5	Flathead sole	1	Bairdi Tanner crab	1.27	1.27	13	50	1068.7	1068.7
1995	6	Flathead sole	1	Bairdi Tanner crab	3.32	3.32	27	115	5521.35	5521.35
1995	1	Pacific cod	2	Bairdi Tanner crab	0.75	0.75	24	225	1326.72	1326.72
1995	1	Pacific cod	3	Bairdi Tanner crab	0.07	0.07	23	119	179.18	179.18
1995	2	Pacific cod	2	Bairdi Tanner crab	8.18	8.18	11	54	3756.55	3756.55
1995	2	Pacific cod	3	Bairdi Tanner crab	4.6	4.6	11	38	977.37	977.37
1995	3	Pacific cod	2	Bairdi Tanner crab	5.3	2.22	41	386	6327.62	2653.43
1995	3	Pacific cod	3	Bairdi Tanner crab	2.5	1.29	35	156	7790.04	4020.43
1995	4	Pacific cod	2	Bairdi Tanner crab	1.32	1.02	35	412	2381.8	1831.03
1995	4	Pacific cod	3	Bairdi Tanner crab	2.66	1.43	24	70	2856.24	1534.75
1995	5	Pacific cod	2	Bairdi Tanner crab	22.31	7.51	11	76	4497.9	1515
1995	5	Pacific cod	3	Bairdi Tanner crab	7.72	4.61	11	76	8486.76	5062.62
1995	6	Pacific cod	2	Bairdi Tanner crab	6.92	2.68	41	385	12005.6	4641.06
1995	6	Pacific cod	3	Bairdi Tanner crab	4.94	1.93	38	262	20276.08	7938.86
1995	3	Pacific halibut	3	Bairdi Tanner crab	23.22	15.26	8	15	4568.06	3002.2
1995	4	Pacific halibut	2	Bairdi Tanner crab	8.84	8.84	3	27	318.66	318.66
1995	4	Pacific halibut	3	Bairdi Tanner crab	3.05	3.05	9	23	255.4	255.4
1995	6	Pacific halibut	2	Bairdi Tanner crab	1.08	1.08	6	10	29.53	29.53
1995	6	Pacific halibut	3	Bairdi Tanner crab	1.87	0.81	12	74	350.56	152.99
1995	6	Rock sole	1	Bairdi Tanner crab	0.36	0.36	17	67	361.91	361.91
1995	3	Skates	1	Bairdi Tanner crab	0.81	0.77	11	36	711.85	679.71
1995	5	Walleye pollock	4	Bairdi Tanner crab	0	0	13	116	0.14	0.14
1995	6	Greenland turbot	3	Flathead sole	7.49	7.49	12	39	1664.98	1664.98
1995	1	Pacific cod	2	Flathead sole	0.59	0.59	24	225	1040.15	1040.15
1995	1	Pacific cod	3	Flathead sole	2.77	1.91	23	119	6819.7	4702
1995	2	Pacific cod	3	Flathead sole	1.44	1.44	11	38	305.83	305.83
1995	3	Pacific cod	2	Flathead sole	0.25	0.25	41	386	294.1	294.1
1995	3	Pacific cod	3	Flathead sole	1.09	0.75	35	156	3400.15	2346.69
1995	4	Pacific cod	3	Flathead sole	0.93	0.93	24	70	993.18	993.18
1995	5	Pacific cod	2	Flathead sole	0.02	0.02	11	76	3.65	3.65
1995	5	Pacific cod	3	Flathead sole	1.39	1.39	11	76	1532.33	1532.33

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	6	Pacific cod	2	Flathead sole	0.5	0.37	41	385	860.37	634.86
1995	6	Pacific cod	3	Flathead sole	0.27	0.25	38	262	1127.13	1036.05
1995	4	Skates	1	Flathead sole	0.21	0.21	20	136	177.9	177.9
1995	5	Skates	1	Flathead sole	13.78	13.78	5	19	6061.17	6061.17
1995	6	Skates	1	Flathead sole	0.29	0.29	15	95	514.34	514.34
1995	3	Arrowtooth flounder	1	Gadidae	81.82	0	1	3	150.97	0
1995	3	Arrowtooth flounder	2	Gadidae	27.62	13.95	10	30	10909.25	5511.36
1995	3	Arrowtooth flounder	3	Gadidae	36.69	14.19	11	27	45323.28	17525.65
1995	4	Arrowtooth flounder	1	Gadidae	33.33	33.33	3	10	118.88	118.88
1995	4	Arrowtooth flounder	2	Gadidae	29.72	11.67	5	32	2856.65	1121.54
1995	4	Arrowtooth flounder	3	Gadidae	30.64	18.56	4	43	1275.44	772.82
1995	5	Arrowtooth flounder	2	Gadidae	8.62	5.91	12	43	4150.73	2846.54
1995	5	Arrowtooth flounder	3	Gadidae	3.72	3.72	12	92	5409.68	5409.68
1995	6	Arrowtooth flounder	1	Gadidae	6.76	6.76	7	14	39.85	39.85
1995	6	Arrowtooth flounder	2	Gadidae	15.01	9.14	12	41	3449.34	2100.7
1995	6	Arrowtooth flounder	3	Gadidae	14.09	5.65	26	92	20427.74	8191.25
1995	4	Flathead sole	1	Gadidae	0.36	0.34	26	137	219.06	202.99
1995	6	Greenland turbot	2	Gadidae	25	25	4	4	1751.81	1751.81
1995	6	Greenland turbot	3	Gadidae	2.81	1.89	12	39	625.09	420.76
1995	1	Pacific cod	2	Gadidae	1.21	0.7	24	225	2124.9	1223.28
1995	1	Pacific cod	3	Gadidae	4.42	1.81	23	119	10855.8	4452.64
1995	3	Pacific cod	2	Gadidae	0.35	0.27	41	386	412.54	326.27
1995	3	Pacific cod	3	Gadidae	1.79	0.98	35	156	5596.71	3065.7
1995	4	Pacific cod	1	Gadidae	5.01	3.04	24	112	566.78	344.48
1995	4	Pacific cod	2	Gadidae	1.39	0.8	35	412	2502	1441.27
1995	4	Pacific cod	3	Gadidae	1.04	0.59	24	70	1112.54	634.14
1995	5	Pacific cod	3	Gadidae	0.26	0.22	11	76	289.14	241.58
1995	6	Pacific cod	1	Gadidae	2.21	2.21	4	6	18.24	18.24
1995	6	Pacific cod	2	Gadidae	0.82	0.35	41	385	1426.63	608.69
1995	6	Pacific cod	3	Gadidae	0.73	0.29	38	262	3010.64	1174.51
1995	1	Pacific halibut	2	Gadidae	2.39	2.39	6	17	195.87	195.87
1995	1	Pacific halibut	3	Gadidae	4.36	3.76	9	31	771.52	665.6
1995	2	Pacific halibut	3	Gadidae	6.71	6.71	7	21	397.13	397.13
1995	3	Pacific halibut	3	Gadidae	3.78	3.78	8	15	744	744
1995	4	Pacific halibut	3	Gadidae	8.1	8.1	9	23	677.45	677.45
1995	5	Pacific halibut	3	Gadidae	1.85	1.85	4	16	217.68	217.68
1995	6	Pacific halibut	2	Gadidae	5.1	5.1	6	10	139.06	139.06

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	6	Pacific halibut	3	Gadidae	3.55	2.4	12	74	666.92	450.14
1995	6	Rock sole	1	Gadidae	5.88	5.88	17	67	5967.74	5967.74
1995	3	Skates	1	Gadidae	8.99	8.61	11	36	7915.46	7582.77
1995	4	Skates	1	Gadidae	0.64	0.64	20	136	535.68	535.68
1995	5	Skates	1	Gadidae	1.36	1.36	5	19	596.43	596.43
1995	6	Skates	1	Gadidae	11.03	5.79	15	95	19907.88	10441.33
1995	1	Walleye pollock	4	Gadidae	0	0	26	357	1.23	1.23
1995	2	Walleye pollock	4	Gadidae	0.17	0.14	15	149	10.22	8.15
1995	3	Walleye pollock	3	Gadidae	0.01	0.01	26	238	243.88	218.48
1995	3	Walleye pollock	4	Gadidae	0.09	0.08	40	535	162.31	145.76
1995	4	Walleye pollock	3	Gadidae	0.63	0.52	14	182	3298.39	2760.36
1995	4	Walleye pollock	4	Gadidae	0.12	0.07	32	328	89.01	48.32
1995	5	Walleye pollock	4	Gadidae	0.02	0.02	13	116	5.92	5.92
1995	6	Walleye pollock	1	Gadidae	0.43	0.43	19	210	3925.53	3925.53
1995	6	Walleye pollock	3	Gadidae	0.03	0.03	26	229	523.73	523.73
1995	6	Walleye pollock	4	Gadidae	1.86	1.25	27	157	938.49	633.52
1995	4	Walleye pollock	4	Greenland turbot	0.01	0.01	32	328	4.99	4.03
1995	1	Pacific cod	2	King crab legs	0.18	0.18	24	225	321.77	320.84
1995	3	Pacific cod	2	King crab legs	2.79	1.68	41	386	3325.01	2008.28
1995	3	Pacific cod	3	King crab legs	2.44	2.4	35	156	7606.96	7483.77
1995	4	Pacific cod	2	King crab legs	0.48	0.37	35	412	866.81	657.48
1995	4	Pacific cod	3	King crab legs	0.55	0.55	24	70	591.99	591.99
1995	6	Pacific cod	2	King crab legs	0	0	41	385	5.22	5.22
1995	6	Pacific cod	3	King crab legs	0	0	38	262	2.25	2.25
1995	3	Pacific halibut	2	King crab legs	17.16	17.16	5	11	1242.3	1242.3
1995	3	Yellowfin sole	1	King crab legs	0.43	0.43	30	286	1408.57	1408.57
1995	1	Pacific cod	3	Lithodidae	2	2	23	119	995.85	995.85
1995	3	Pacific cod	3	Lithodidae	1.77	1.62	35	156	1121.59	1021.65
1995	4	Pacific cod	2	Lithodidae	0.14	0.14	35	412	50.34	50.34
1995	1	Pacific halibut	3	Lithodidae	0.84	0.84	9	31	30.04	30.04
1995	6	Arrowtooth flounder	3	Offal	1.77	1.77	26	92	2559.16	2559.16
1995	2	Pacific cod	2	Offal	0.3	0.22	11	54	138.52	102.01
1995	3	Pacific cod	2	Offal	1.69	0.94	41	386	2017.71	1122.12
1995	3	Pacific cod	3	Offal	0.91	0.51	35	156	2825.87	1603.1
1995	4	Pacific cod	1	Offal	0.07	0.07	24	112	7.39	7.39
1995	4	Pacific cod	2	Offal	1.18	0.9	35	412	2131.59	1625.52
1995	4	Pacific cod	3	Offal	4.74	3.34	24	70	5077.42	3580.18

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	5	Pacific cod	2	Offal	2.27	2.27	11	76	457.24	457.24
1995	6	Pacific cod	2	Offal	0.52	0.37	41	385	900.45	639.09
1995	6	Pacific cod	3	Offal	0.31	0.19	38	262	1281.9	787.54
1995	4	Pacific halibut	3	Offal	0.23	0.23	9	23	19.15	19.15
1995	5	Pacific halibut	3	Offal	25	25	4	16	2940.97	2940.97
1995	6	Pacific halibut	3	Offal	4.39	4.06	12	74	824.32	763.15
1995	1	Skates	1	Offal	6.92	6.92	6	10	891.89	891.89
1995	4	Skates	1	Offal	2.26	1.26	20	136	1906.73	1061
1995	6	Skates	1	Offal	2.56	2.56	15	95	4621.72	4621.72
1995	1	Walleye pollock	4	Offal	0	0	26	357	1	1
1995	3	Walleye pollock	4	Offal	0.14	0.14	40	535	256.16	256.16
1995	4	Walleye pollock	3	Offal	2.12	2.12	14	182	11155.57	11155.57
1995	3	Yellowfin sole	1	Offal	3.23	3.23	30	286	10536.36	10536.36
1995	4	Yellowfin sole	1	Offal	0.05	0.05	27	266	55.88	55.88
1995	2	Alaska plaice	1	Opilio snow crab	0.28	0.28	11	55	122.22	122.22
1995	4	Alaska plaice	1	Opilio snow crab	0.21	0.18	27	128	397.97	336.13
1995	4	Arrowtooth flounder	3	Opilio snow crab	0.02	0.02	4	43	0.64	0.64
1995	1	Flathead sole	1	Opilio snow crab	0.38	0.38	8	35	111.8	111.8
1995	3	Flathead sole	1	Opilio snow crab	2	2	23	101	5882.96	5882.96
1995	4	Flathead sole	1	Opilio snow crab	1.74	0.99	26	137	1050.11	597.3
1995	5	Flathead sole	1	Opilio snow crab	0.31	0.31	13	50	263.7	263.7
1995	6	Flathead sole	1	Opilio snow crab	4.44	2.26	27	115	7397.69	3764.2
1995	1	Pacific cod	3	Opilio snow crab	0.15	0.15	23	119	376.32	376.32
1995	2	Pacific cod	1	Opilio snow crab	1	1	10	51	36.19	36.19
1995	2	Pacific cod	2	Opilio snow crab	9.44	5.52	11	54	4332.93	2533.57
1995	2	Pacific cod	3	Opilio snow crab	23.48	9.91	11	38	4985.37	2104.96
1995	3	Pacific cod	2	Opilio snow crab	1.63	1.11	41	386	1949.71	1326.33
1995	3	Pacific cod	3	Opilio snow crab	8.49	3.62	35	156	26493.27	11290.93
1995	4	Pacific cod	1	Opilio snow crab	5.47	3.1	24	112	619.37	350.44
1995	4	Pacific cod	2	Opilio snow crab	14.2	2.56	35	412	25546.44	4598.05
1995	4	Pacific cod	3	Opilio snow crab	32.21	6.2	24	70	34531.48	6641.69
1995	5	Pacific cod	2	Opilio snow crab	3.19	2.14	11	76	644.08	432.26
1995	5	Pacific cod	3	Opilio snow crab	5.33	2.5	11	76	5862.57	2746.95
1995	6	Pacific cod	2	Opilio snow crab	7.47	2.36	41	385	12952.15	4099.11
1995	6	Pacific cod	3	Opilio snow crab	16.5	3.72	38	262	67765	15262.72
1995	2	Pacific halibut	3	Opilio snow crab	11.26	11.26	7	21	666.35	666.35
1995	4	Pacific halibut	3	Opilio snow crab	3.09	3.09	9	23	258.47	258.47

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	5	Pacific halibut	3	Opilio snow crab	23.97	16.08	4	16	2819.78	1891.09
1995	6	Pacific halibut	2	Opilio snow crab	2.51	2.51	6	10	68.43	68.43
1995	6	Pacific halibut	3	Opilio snow crab	5.97	4.06	12	74	1120.51	761.83
1995	3	Rock sole	1	Opilio snow crab	1.06	1.02	20	87	4025.74	3869.63
1995	4	Rock sole	1	Opilio snow crab	0.71	0.64	27	107	2335.99	2076.36
1995	1	Skates	1	Opilio snow crab	4.35	4.35	6	10	561.17	561.17
1995	2	Skates	1	Opilio snow crab	13.01	13.01	2	4	1251.94	1251.94
1995	3	Skates	1	Opilio snow crab	0.02	0.02	11	36	19.57	19.57
1995	4	Skates	1	Opilio snow crab	12.93	5.44	20	136	10891.82	4577.82
1995	5	Skates	1	Opilio snow crab	0.14	0.14	5	19	61.47	61.47
1995	6	Skates	1	Opilio snow crab	0.19	0.15	15	95	345	262.92
1995	2	Walleye pollock	4	Opilio snow crab	0.38	0.38	15	149	22.15	22.15
1995	3	Walleye pollock	3	Opilio snow crab	0.01	0.01	26	238	238.69	238.69
1995	4	Walleye pollock	1	Opilio snow crab	0	0	39	643	0.53	0.53
1995	4	Walleye pollock	3	Opilio snow crab	0	0	14	182	1.64	1.64
1995	5	Walleye pollock	4	Opilio snow crab	0	0	13	116	0.15	0.15
1995	6	Walleye pollock	3	Opilio snow crab	0.01	0.01	26	229	182.63	182.63
1995	2	Yellowfin sole	1	Opilio snow crab	3.74	3.03	19	170	6513.44	5274.69
1995	3	Yellowfin sole	1	Opilio snow crab	2.41	1.98	30	286	7859.5	6450.11
1995	4	Yellowfin sole	1	Opilio snow crab	2.32	2.28	27	266	2838.19	2796.02
1995	1	Flathead sole	1	Osmerids	1.8	1.8	8	35	535.44	535.44
1995	1	Pacific cod	2	Osmerids	0.98	0.98	24	225	1718.89	1718.89
1995	1	Pacific cod	3	Osmerids	1.03	0.74	23	119	2526.17	1829.87
1995	2	Pacific cod	2	Osmerids	0.16	0.16	11	54	74.42	74.42
1995	5	Pacific cod	2	Osmerids	9.09	9.09	11	76	1832.91	1832.91
1995	1	Walleye pollock	4	Osmerids	0.06	0.06	26	357	29.44	29.44
1995	3	Walleye pollock	4	Osmerids	0.28	0.28	40	535	530.32	530.32
1995	4	Arrowtooth flounder	3	Pacific cod	1.72	1.72	4	43	71.47	71.47
1995	6	Greenland turbot	3	Pacific cod	3.74	3.38	12	39	832	751.04
1995	2	Pacific cod	3	Pacific cod	6.1	6.1	11	38	1294.64	1294.64
1995	3	Pacific cod	3	Pacific cod	2.71	2.47	35	156	8451.61	7693.47
1995	4	Pacific cod	3	Pacific cod	0.61	0.61	24	70	648.63	648.63
1995	5	Pacific cod	3	Pacific cod	2.21	2.06	11	76	2429.61	2264.88
1995	6	Pacific cod	3	Pacific cod	0.15	0.15	38	262	607.38	607.38
1995	2	Pacific halibut	3	Pacific cod	9.05	9.05	7	21	535.19	535.19
1995	4	Pacific halibut	2	Pacific cod	0.3	0.3	3	27	10.93	10.93
1995	4	Pacific halibut	3	Pacific cod	5.23	5.23	9	23	437.05	437.05

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	4	Walleye pollock	4	Pacific halibut	0.02	0.01	32	328	10.81	7.62
1995	6	Walleye pollock	4	Pacific halibut	0.01	0.01	27	157	2.96	2.96
1995	1	Pacific cod	3	Pacific herring	0.82	0.82	23	119	2006.13	2006.13
1995	2	Pacific cod	2	Pacific herring	8.59	8.59	11	54	3944.73	3944.73
1995	4	Pacific cod	2	Pacific herring	0.32	0.22	35	412	573.8	401.74
1995	4	Pacific cod	3	Pacific herring	0.78	0.78	24	70	836.24	836.24
1995	6	Pacific cod	2	Pacific herring	2.37	2.37	41	385	4104.02	4104.02
1995	2	Pacific halibut	2	Pacific herring	17.39	17.39	4	11	1084.5	1084.5
1995	3	Pacific halibut	3	Pacific herring	8.47	8.47	8	15	1665.99	1665.99
1995	4	Yellowfin sole	1	Pacific herring	3.39	3.39	27	266	4153.84	4153.84
1995	1	Pacific cod	3	<i>Paralithodes</i> spp.	1.47	1.47	23	119	731.27	731.27
1995	3	Pacific cod	2	<i>Paralithodes</i> spp.	1.11	1.11	41	386	268.68	268.68
1995	3	Pacific cod	3	<i>Paralithodes</i> spp.	1.56	1.32	35	156	983.45	831.62
1995	4	Pacific cod	3	<i>Paralithodes</i> spp.	1.6	1.6	24	70	347.34	347.34
1995	4	Arrowtooth flounder	3	Pleuronectidae	4.82	4.82	4	43	200.56	200.56
1995	5	Arrowtooth flounder	2	Pleuronectidae	8.46	5.9	12	43	4075.85	2839.94
1995	5	Arrowtooth flounder	3	Pleuronectidae	13.99	9.46	12	92	20326.97	13734.08
1995	6	Greenland turbot	3	Pleuronectidae	0.1	0.08	12	39	23.02	18.35
1995	1	Pacific cod	2	Pleuronectidae	3.13	1.64	24	225	5509.95	2882.45
1995	1	Pacific cod	3	Pleuronectidae	17.68	4.77	23	119	43466.95	11732.06
1995	2	Pacific cod	2	Pleuronectidae	1.03	0.83	11	54	473.12	379.17
1995	2	Pacific cod	3	Pleuronectidae	8.92	4.5	11	38	1893.39	954.77
1995	3	Pacific cod	2	Pleuronectidae	1.7	1.25	41	386	2023.26	1485.94
1995	3	Pacific cod	3	Pleuronectidae	2.52	1.85	35	156	7859.42	5755.39
1995	4	Pacific cod	2	Pleuronectidae	0.02	0.02	35	412	33.89	33.89
1995	4	Pacific cod	3	Pleuronectidae	0.89	0.73	24	70	949.39	785.57
1995	5	Pacific cod	2	Pleuronectidae	0.01	0.01	11	76	1.77	1.77
1995	5	Pacific cod	3	Pleuronectidae	1.38	1.06	11	76	1518.3	1166.54
1995	6	Pacific cod	2	Pleuronectidae	0.41	0.25	41	385	712.07	434.71
1995	6	Pacific cod	3	Pleuronectidae	0.4	0.17	38	262	1624.9	715.84
1995	1	Pacific halibut	2	Pleuronectidae	11.27	11.27	6	17	924.14	924.14
1995	1	Pacific halibut	3	Pleuronectidae	13.41	6.67	9	31	2373.82	1181.08
1995	2	Pacific halibut	3	Pleuronectidae	8.36	4.8	7	21	494.59	283.77
1995	4	Pacific halibut	2	Pleuronectidae	0.43	0.43	3	27	15.43	15.43
1995	4	Pacific halibut	3	Pleuronectidae	1.3	1.3	9	23	109.04	109.04
1995	1	Skates	1	Pleuronectidae	16.79	16.64	6	10	2164.87	2146.26
1995	2	Skates	1	Pleuronectidae	0.87	0.87	2	4	84.07	84.07

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	3	Skates	1	Pleuronectidae	12.29	9.25	11	36	10824.47	8146.82
1995	4	Skates	1	Pleuronectidae	1.54	0.87	20	136	1296.89	735.9
1995	5	Skates	1	Pleuronectidae	6.22	6.22	5	19	2733.24	2733.24
1995	6	Skates	1	Pleuronectidae	5.76	4.03	15	95	10391.77	7267.34
1995	1	Walleye pollock	4	Pleuronectidae	0.54	0.52	26	357	262.09	252.51
1995	5	Pacific cod	3	Walleye pollock eggs	0	0	11	76	0.06	0.06
1995	3	Pacific cod	3	Red king crab	1.45	1.45	35	156	916.12	916.12
1995	4	Pacific cod	2	Red king crab	2.3	2.3	35	412	838.34	838.34
1995	4	Pacific halibut	2	Red king crab	0.36	0.36	3	27	2.66	2.66
1995	1	Flathead sole	1	Rock sole	1.47	1.09	8	35	436.52	323.26
1995	1	Pacific cod	2	Rock sole	0.55	0.55	24	225	959.62	959.62
1995	1	Pacific cod	3	Rock sole	7.3	3.38	23	119	17945.92	8301.05
1995	2	Pacific cod	3	Rock sole	2.32	1.56	11	38	493	331.7
1995	3	Pacific cod	3	Rock sole	0.73	0.73	35	156	2278.02	2278.02
1995	4	Pacific cod	2	Rock sole	0.08	0.08	35	412	143.29	143.29
1995	4	Pacific cod	3	Rock sole	0.96	0.75	24	70	1028.27	807.34
1995	6	Pacific cod	3	Rock sole	0.9	0.9	38	262	3699.06	3699.06
1995	1	Pacific halibut	3	Rock sole	4.22	3.41	9	31	747.51	603.15
1995	1	Skates	1	Rock sole	11.42	9.32	6	10	1473.29	1201.71
1995	3	Skates	1	Rock sole	6.26	6.26	11	36	5514.59	5514.59
1995	4	Skates	1	Rock sole	3.86	2.78	20	136	3248.3	2338.35
1995	5	Skates	1	Rock sole	0.8	0.8	5	19	353.34	353.34
1995	1	Walleye pollock	4	Rock sole	0.04	0.04	26	357	19.46	19.46
1995	1	Pacific cod	3	Rockfish	0.2	0.2	23	119	487.54	487.54
1995	6	Pacific cod	3	Rockfish	0	0	38	262	20.36	20.36
1995	4	Flathead sole	1	Unid. Chionoecetes	0.14	0.13	26	137	86.77	77.46
1995	1	Pacific cod	2	Unid. Chionoecetes	2.54	1.57	24	225	4477.56	2767.04
1995	1	Pacific cod	3	Unid. Chionoecetes	1.66	1.57	23	119	4075.23	3867.29
1995	2	Pacific cod	2	Unid. Chionoecetes	1.2	1.2	11	54	549.67	549.67
1995	2	Pacific cod	3	Unid. Chionoecetes	7.91	4.93	11	38	1678.7	1046.66
1995	3	Pacific cod	2	Unid. Chionoecetes	3.23	1.57	41	386	3857.08	1868.26
1995	3	Pacific cod	3	Unid. Chionoecetes	5.86	2.62	35	156	18282.56	8164.62
1995	4	Pacific cod	1	Unid. Chionoecetes	2.5	2.3	24	112	282.89	260.84
1995	4	Pacific cod	2	Unid. Chionoecetes	5.71	1.64	35	412	10280.7	2944.47
1995	4	Pacific cod	3	Unid. Chionoecetes	8.42	3.44	24	70	9022.3	3689.98
1995	5	Pacific cod	2	Unid. Chionoecetes	12.81	8.12	11	76	2583.37	1636.76
1995	5	Pacific cod	3	Unid. Chionoecetes	3.02	2.39	11	76	3317.03	2623.38

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	6	Pacific cod	1	Unid. Chionoecetes	8.59	8.59	4	6	70.98	70.98
1995	6	Pacific cod	2	Unid. Chionoecetes	2.9	0.9	41	385	5031.52	1563.06
1995	6	Pacific cod	3	Unid. Chionoecetes	3.86	1.81	38	262	15838.65	7451.89
1995	1	Pacific halibut	2	Unid. Chionoecetes	14.15	14.15	6	17	1160.36	1160.36
1995	2	Pacific halibut	3	Unid. Chionoecetes	14.29	14.29	7	21	845.17	845.17
1995	4	Pacific halibut	2	Unid. Chionoecetes	6.4	6.4	3	27	230.7	230.7
1995	4	Pacific halibut	3	Unid. Chionoecetes	0.15	0.15	9	23	12.41	12.41
1995	5	Pacific halibut	3	Unid. Chionoecetes	7.19	6.78	4	16	845.36	797.66
1995	6	Pacific halibut	3	Unid. Chionoecetes	0.1	0.06	12	74	19.36	11.62
1995	2	Skates	1	Unid. Chionoecetes	29.69	7.6	2	4	2858.13	731.27
1995	3	Skates	1	Unid. Chionoecetes	12.01	8.06	11	36	10580.49	7099.34
1995	4	Skates	1	Unid. Chionoecetes	13.46	3.41	20	136	11339.77	2868.33
1995	5	Skates	1	Unid. Chionoecetes	2.58	2.05	5	19	1133.86	901.09
1995	6	Skates	1	Unid. Chionoecetes	7.21	3.67	15	95	13011.03	6630.11
1995	2	Walleye pollock	4	Unid. Chionoecetes	3.77	2.58	15	149	220.77	151.12
1995	3	Walleye pollock	3	Unid. Chionoecetes	0.01	0.01	26	238	163.22	163.22
1995	3	Walleye pollock	4	Unid. Chionoecetes	0	0	40	535	8.97	8.97
1995	4	Walleye pollock	3	Unid. Chionoecetes	0.01	0.01	14	182	67.01	48.16
1995	4	Walleye pollock	4	Unid. Chionoecetes	0.97	0.71	32	328	689.07	505.41
1995	5	Walleye pollock	4	Unid. Chionoecetes	0.01	0.01	13	116	2.86	2.86
1995	6	Walleye pollock	1	Unid. Chionoecetes	0	0	19	210	25.88	25.88
1995	6	Walleye pollock	2	Unid. Chionoecetes	0	0	21	62	324.17	324.17
1995	2	Yellowfin sole	1	Unid. Chionoecetes	1.33	1.33	19	170	2313.33	2313.33
1995	3	Yellowfin sole	1	Unid. Chionoecetes	0.85	0.79	30	286	2782.76	2591.83
1995	4	Yellowfin sole	1	Unid. Chionoecetes	1.07	0.79	27	266	1307.9	973.75
1995	3	Arrowtooth flounder	2	Walleye pollock	14.73	10.31	10	30	5817.86	4074.48
1995	3	Arrowtooth flounder	3	Walleye pollock	9.49	8.47	11	27	11718.22	10468.34
1995	4	Arrowtooth flounder	1	Walleye pollock	32.33	32.33	3	10	115.31	115.31
1995	4	Arrowtooth flounder	2	Walleye pollock	64.42	13.22	5	32	6192.21	1270.86
1995	4	Arrowtooth flounder	3	Walleye pollock	55.81	19.26	4	43	2323.21	801.78
1995	5	Arrowtooth flounder	1	Walleye pollock	33.33	33.33	3	3	125.31	125.31
1995	5	Arrowtooth flounder	2	Walleye pollock	5.83	5.83	12	43	2810.01	2810.01
1995	5	Arrowtooth flounder	3	Walleye pollock	8.44	8.23	12	92	12263.95	11959.49
1995	6	Arrowtooth flounder	2	Walleye pollock	8.19	8.19	12	41	1881.45	1881.45
1995	6	Arrowtooth flounder	3	Walleye pollock	48.36	8.72	26	92	70109.58	12644.14
1995	1	Flathead sole	1	Walleye pollock	2.31	1.52	8	35	687.13	452.62
1995	3	Flathead sole	1	Walleye pollock	7.99	5.54	23	101	23443.61	16265.38

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	4	Flathead sole	1	Walleye pollock	41.4	8.56	26	137	25040.65	5177.08
1995	6	Flathead sole	1	Walleye pollock	9.75	4.97	27	115	16224.1	8270.71
1995	4	Greenland turbot	3	Walleye pollock	100	0	1	1	654.08	0
1995	6	Greenland turbot	3	Walleye pollock	81.05	8.8	12	39	18012.48	1956.45
1995	1	Pacific cod	2	Walleye pollock	2.63	1.57	24	225	4631.02	2762.14
1995	1	Pacific cod	3	Walleye pollock	13.35	4.34	23	119	32804.64	10662.83
1995	2	Pacific cod	1	Walleye pollock	5.67	5.67	10	51	205.11	205.11
1995	2	Pacific cod	2	Walleye pollock	1.66	1.59	11	54	763.02	728.46
1995	2	Pacific cod	3	Walleye pollock	2.36	1.37	11	38	500.92	290.26
1995	3	Pacific cod	2	Walleye pollock	9.28	3.28	41	386	11073.33	3914.99
1995	3	Pacific cod	3	Walleye pollock	48.79	6.96	35	156	152192.8	21699.81
1995	4	Pacific cod	1	Walleye pollock	10.5	5.05	24	112	1188.36	571.78
1995	4	Pacific cod	2	Walleye pollock	4.95	1.85	35	412	8907.99	3319.66
1995	4	Pacific cod	3	Walleye pollock	15.99	5.76	24	70	17142.86	6174.47
1995	5	Pacific cod	2	Walleye pollock	9.02	9	11	76	1819.05	1814.12
1995	5	Pacific cod	3	Walleye pollock	50.22	13.11	11	76	55205.14	14413.74
1995	6	Pacific cod	1	Walleye pollock	5.06	5.06	4	6	41.81	41.81
1995	6	Pacific cod	2	Walleye pollock	13.4	3.27	41	385	23249.51	5668.32
1995	6	Pacific cod	3	Walleye pollock	43.44	5.41	38	262	178425	22215.8
1995	1	Pacific halibut	2	Walleye pollock	0.29	0.29	6	17	24.06	24.06
1995	1	Pacific halibut	3	Walleye pollock	0.24	0.24	9	31	42.37	42.37
1995	2	Pacific halibut	2	Walleye pollock	4.03	3.03	4	11	251.57	188.74
1995	2	Pacific halibut	3	Walleye pollock	18.11	9.62	7	21	1071.49	569.12
1995	3	Pacific halibut	2	Walleye pollock	20	20	5	11	1447.69	1447.69
1995	3	Pacific halibut	3	Walleye pollock	32.3	14.71	8	15	6354.92	2894.82
1995	4	Pacific halibut	2	Walleye pollock	8.9	4.7	3	27	320.84	169.66
1995	4	Pacific halibut	3	Walleye pollock	55.61	12.47	9	23	4650.6	1043.21
1995	5	Pacific halibut	3	Walleye pollock	20.08	20.08	4	16	2361.64	2361.64
1995	6	Pacific halibut	2	Walleye pollock	12.82	8.37	6	10	349.66	228.21
1995	6	Pacific halibut	3	Walleye pollock	62.24	7.48	12	74	11686.21	1403.77
1995	1	Rock sole	1	Walleye pollock	0.52	0.52	24	94	6610.29	6610.29
1995	2	Rock sole	1	Walleye pollock	6.33	4.43	16	70	16020.29	11194.18
1995	4	Rock sole	1	Walleye pollock	2.93	2.93	27	107	9569.1	9569.1
1995	6	Rock sole	1	Walleye pollock	5.88	5.88	17	67	5967.74	5967.74
1995	1	Skates	1	Walleye pollock	2.72	2.72	6	10	351.35	351.35
1995	3	Skates	1	Walleye pollock	25.37	13.12	11	36	22348.88	11552.75
1995	4	Skates	1	Walleye pollock	9.75	5.38	20	136	8214.66	4528.93

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1995	5	Skates	1	Walleye pollock	68.28	17.55	5	19	30025.29	7716.08
1995	6	Skates	1	Walleye pollock	29.86	7.97	15	95	53887.21	14382.58
1995	1	Walleye pollock	4	Walleye pollock	1.29	1.08	26	357	630.03	527.16
1995	2	Walleye pollock	4	Walleye pollock	8.51	4.14	15	149	497.86	242.48
1995	3	Walleye pollock	1	Walleye pollock	1.89	1.89	14	86	1474.28	1474.28
1995	3	Walleye pollock	2	Walleye pollock	6.83	6.83	7	31	41673.74	41673.74
1995	3	Walleye pollock	3	Walleye pollock	0	0	26	238	26.33	26.33
1995	3	Walleye pollock	4	Walleye pollock	2.92	1.5	40	535	5523.44	2834.43
1995	4	Walleye pollock	1	Walleye pollock	9.33	4.2	39	643	15794.76	7108.85
1995	4	Walleye pollock	2	Walleye pollock	30.17	19.24	6	12	341520	217773.9
1995	4	Walleye pollock	3	Walleye pollock	8.26	5.31	14	182	43519.68	27971.99
1995	4	Walleye pollock	4	Walleye pollock	14	4.27	32	328	9987.29	3046.22
1995	5	Walleye pollock	2	Walleye pollock	20.99	20.99	2	10	56800.35	56800.35
1995	5	Walleye pollock	3	Walleye pollock	8.08	5.8	12	80	50863.25	36496.77
1995	5	Walleye pollock	4	Walleye pollock	4.73	3.14	13	116	1209.15	804.08
1995	6	Walleye pollock	1	Walleye pollock	0.92	0.92	19	210	8476.56	8476.56
1995	6	Walleye pollock	2	Walleye pollock	7.53	4.55	21	62	538308.9	325481.8
1995	6	Walleye pollock	3	Walleye pollock	15.52	5.16	26	229	297954.9	99054.38
1995	6	Walleye pollock	4	Walleye pollock	22.14	6.8	27	157	11184.17	3434.84
1995	4	Yellowfin sole	1	Walleye pollock	0.38	0.26	27	266	461.98	320.61
1995	1	Pacific cod	2	Yellowfin sole	1.04	1.04	24	225	1826.56	1826.56
1995	1	Pacific cod	3	Yellowfin sole	7.82	3.54	23	119	19234.05	8711.69
1995	3	Pacific cod	2	Yellowfin sole	1.29	1.29	41	386	1541.12	1541.12
1995	3	Pacific cod	3	Yellowfin sole	1.37	1	35	156	4287.16	3108.64
1995	4	Pacific cod	3	Yellowfin sole	0.35	0.35	24	70	371.04	371.04
1995	1	Pacific halibut	3	Yellowfin sole	7.19	7.19	9	31	1273.27	1273.27
1995	1	Skates	1	Yellowfin sole	1.01	1.01	6	10	130.54	130.54
1995	5	Skates	1	Yellowfin sole	0.72	0.72	5	19	315.11	315.11
1996	3	Pacific cod	3	Arrowtooth flounder	1.49	1.49	23	56	4830.84	4830.84
1996	4	Pacific cod	2	Arrowtooth flounder	0.03	0.03	43	420	65.41	65.41
1996	4	Pacific cod	3	Arrowtooth flounder	0.12	0.12	27	79	278.41	278.41
1996	5	Pacific cod	3	Arrowtooth flounder	4.22	4.22	10	34	2900.06	2900.06
1996	4	Skates	1	Arrowtooth flounder	0.02	0.02	42	183	20.87	20.87
1996	5	Walleye pollock	4	Arrowtooth flounder	1.61	1.61	6	29	412.45	412.45
1996	1	Pacific cod	2	Bairdi Tanner crab	0.38	0.28	18	76	325.2	241.03
1996	2	Pacific cod	2	Bairdi Tanner crab	0.64	0.64	11	54	203.26	203.26
1996	3	Pacific cod	2	Bairdi Tanner crab	1.99	0.96	32	213	4025.68	1950.52

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	3	Pacific cod	3	Bairdi Tanner crab	0.99	0.73	23	56	3214.68	2354.51
1996	4	Pacific cod	2	Bairdi Tanner crab	2.46	1.23	43	420	5250.96	2618.01
1996	4	Pacific cod	3	Bairdi Tanner crab	4.13	2.71	27	79	9957.56	6545.14
1996	5	Pacific cod	2	Bairdi Tanner crab	10.88	5.02	8	39	1463.52	675.25
1996	5	Pacific cod	3	Bairdi Tanner crab	16.05	7.55	10	34	11018.33	5184.45
1996	6	Pacific cod	2	Bairdi Tanner crab	13.62	4.51	25	151	7686.94	2544.2
1996	6	Pacific cod	3	Bairdi Tanner crab	11.94	4.52	26	144	35290.35	13355.01
1996	4	Skates	1	Bairdi Tanner crab	0.24	0.14	42	183	299.44	178.54
1996	5	Skates	1	Bairdi Tanner crab	0.1	0.1	4	11	37.22	37.22
1996	5	Arrowtooth flounder	3	Flathead sole	5.81	5.81	10	29	8395.64	8395.64
1996	1	Pacific cod	3	Flathead sole	1.22	1.22	12	51	2756.64	2756.64
1996	3	Pacific cod	2	Flathead sole	0.71	0.71	32	213	1431.44	1431.44
1996	3	Pacific cod	3	Flathead sole	0.8	0.8	23	56	2595.88	2595.88
1996	5	Pacific cod	3	Flathead sole	5.04	5.04	10	34	3461.88	3461.88
1996	6	Pacific cod	2	Flathead sole	0.65	0.54	25	151	364.57	305.65
1996	6	Pacific cod	3	Flathead sole	0.27	0.27	26	144	787.18	787.18
1996	3	Skates	1	Flathead sole	15.07	15.07	6	29	13089.36	13089.36
1996	4	Skates	1	Flathead sole	2.37	2.33	42	183	2935.26	2887.13
1996	5	Skates	1	Flathead sole	4.6	4.6	4	11	1673.71	1673.71
1996	3	Arrowtooth flounder	1	Gadidae	9.52	9.52	3	10	23.61	23.61
1996	3	Arrowtooth flounder	2	Gadidae	13.55	10.91	9	20	4376.31	3523.99
1996	3	Arrowtooth flounder	3	Gadidae	3.46	3.46	12	36	4960.03	4960.03
1996	4	Arrowtooth flounder	1	Gadidae	1.8	1.8	2	94	0.67	0.67
1996	4	Arrowtooth flounder	2	Gadidae	15.41	8.38	6	117	936	508.88
1996	4	Arrowtooth flounder	3	Gadidae	4.59	4.45	11	70	1185.91	1148.82
1996	5	Arrowtooth flounder	2	Gadidae	24.98	16.35	8	14	14568.11	9537.07
1996	5	Arrowtooth flounder	3	Gadidae	12.53	10.04	10	29	18113.71	14514.47
1996	6	Arrowtooth flounder	1	Gadidae	38.12	38.12	2	3	124.39	124.39
1996	6	Arrowtooth flounder	2	Gadidae	9.26	5.91	10	19	2409.79	1536.5
1996	6	Arrowtooth flounder	3	Gadidae	1.82	1.72	16	60	3331.71	3144.33
1996	1	Pacific cod	1	Gadidae	1.76	1.76	12	74	191.8	191.8
1996	1	Pacific cod	3	Gadidae	0.5	0.49	12	51	1125.41	1099.59
1996	3	Pacific cod	2	Gadidae	0.52	0.49	32	213	1060.34	985.77
1996	3	Pacific cod	3	Gadidae	0.11	0.11	23	56	361.57	361.57
1996	4	Pacific cod	2	Gadidae	0.78	0.67	43	420	1655.12	1425.71
1996	4	Pacific cod	3	Gadidae	1.09	0.96	27	79	2633.75	2324.18
1996	5	Pacific cod	2	Gadidae	2.16	2.16	8	39	290.89	290.89

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	6	Pacific cod	2	Gadidae	0.36	0.36	25	151	200.45	200.45
1996	6	Pacific cod	3	Gadidae	0.77	0.71	26	144	2272.01	2112.78
1996	3	Pacific halibut	3	Gadidae	0.3	0.3	2	4	52.82	52.82
1996	4	Pacific halibut	2	Gadidae	0.79	0.79	2	78	11.83	11.83
1996	4	Pacific halibut	3	Gadidae	0.07	0.07	3	15	6.95	6.95
1996	4	Skates	1	Gadidae	1.65	0.89	42	183	2040.6	1108.03
1996	6	Skates	1	Gadidae	0.25	0.14	14	72	346.03	196.41
1996	3	Walleye pollock	1	Gadidae	0.11	0.11	25	216	256.04	256.04
1996	4	Walleye pollock	1	Gadidae	1.04	0.89	23	142	2431.92	2083.1
1996	4	Walleye pollock	3	Gadidae	0.17	0.14	29	124	2736.83	2116.22
1996	4	Walleye pollock	4	Gadidae	2.48	2.13	44	261	3712.39	3186.77
1996	6	Walleye pollock	4	Gadidae	8.13	5.27	20	73	9473.36	6139.72
1996	4	Yellowfin sole	1	Gadidae	1.21	1.21	2	69	2170.92	2170.92
1996	4	Pacific cod	2	Greenland turbot	0.01	0.01	43	420	16.26	16.26
1996	4	Walleye pollock	3	Greenland turbot	0.08	0.08	29	124	1275.23	1275.23
1996	4	Walleye pollock	4	Greenland turbot	0.03	0.03	44	261	41.77	41.77
1996	5	Walleye pollock	4	Greenland turbot	0.43	0.43	6	29	108.95	108.95
1996	1	Pacific cod	3	King crab legs	0.55	0.49	12	51	1239.9	1107.93
1996	3	Pacific cod	1	King crab legs	2.41	2.41	10	19	279.98	279.98
1996	3	Pacific cod	2	King crab legs	0.43	0.39	32	213	879.91	789.11
1996	3	Pacific cod	3	King crab legs	1.71	1.71	23	56	5542.92	5542.92
1996	4	Pacific cod	2	King crab legs	0	0	43	420	2.55	2.55
1996	1	Pacific cod	3	Lithodidae	6.76	6.76	12	51	3092.37	3092.37
1996	3	Pacific cod	2	Lithodidae	4.71	3.34	32	213	1932.61	1369.39
1996	4	Arrowtooth flounder	3	Offal	2.54	2.54	11	70	656.18	656.18
1996	2	Pacific cod	2	Offal	2.75	2.75	11	54	879.57	879.57
1996	3	Pacific cod	2	Offal	2.1	2.1	32	213	4258.23	4258.23
1996	3	Pacific cod	3	Offal	0.35	0.35	23	56	1148	1148
1996	4	Pacific cod	2	Offal	5.75	2.57	43	420	12273.47	5482.9
1996	4	Pacific cod	3	Offal	3.92	3.38	27	79	9447.48	8153.21
1996	5	Pacific cod	3	Offal	1.35	1.35	10	34	924.88	924.88
1996	6	Pacific cod	2	Offal	1.29	1.2	25	151	727.32	674.7
1996	6	Pacific cod	3	Offal	0.87	0.77	26	144	2565.74	2288.97
1996	4	Pacific halibut	2	Offal	4.99	4.99	2	78	75.09	75.09
1996	3	Rock sole	1	Offal	2.83	2.83	16	71	11853.08	11853.08
1996	2	Skates	1	Offal	2.72	2.72	14	67	1479.74	1479.74
1996	3	Skates	1	Offal	9.16	9.16	6	29	7957.3	7957.3

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	4	Skates	1	Offal	5.98	2.99	42	183	7416.99	3709.92
1996	6	Skates	1	Offal	4.41	4.41	14	72	6053.12	6053.12
1996	1	Pacific cod	2	Opilio snow crab	0.42	0.42	18	76	355.12	355.12
1996	2	Pacific cod	2	Opilio snow crab	9.83	3.08	11	54	3144.41	985.08
1996	2	Pacific cod	3	Opilio snow crab	6.76	6.76	8	23	2308.51	2308.51
1996	3	Pacific cod	1	Opilio snow crab	9.7	9.7	10	19	1125.08	1125.08
1996	3	Pacific cod	2	Opilio snow crab	11.04	3.12	32	213	22374.05	6319.68
1996	3	Pacific cod	3	Opilio snow crab	4.36	2.04	23	56	14121.79	6609.5
1996	4	Pacific cod	2	Opilio snow crab	10.21	2.61	43	420	21811.66	5578.93
1996	4	Pacific cod	3	Opilio snow crab	23.68	5.37	27	79	57132.69	12960.12
1996	5	Pacific cod	2	Opilio snow crab	4.8	3.11	8	39	645.75	417.9
1996	5	Pacific cod	3	Opilio snow crab	7.17	6.75	10	34	4919.46	4635.92
1996	6	Pacific cod	2	Opilio snow crab	9.99	2.61	25	151	5639.74	1474.94
1996	6	Pacific cod	3	Opilio snow crab	32.05	5.55	26	144	94764.4	16405.61
1996	4	Pacific halibut	2	Opilio snow crab	0.38	0.38	2	78	5.71	5.71
1996	6	Rock sole	1	Opilio snow crab	0.69	0.69	6	26	588.54	588.54
1996	2	Skates	1	Opilio snow crab	1.76	1.04	14	67	955.97	564.8
1996	3	Skates	1	Opilio snow crab	0.1	0.1	6	29	88.1	88.1
1996	4	Skates	1	Opilio snow crab	11.96	3.9	42	183	14831.34	4842.43
1996	5	Skates	1	Opilio snow crab	0.07	0.07	4	11	26.62	26.62
1996	6	Skates	1	Opilio snow crab	5.11	4.43	14	72	7009.8	6077.58
1996	2	Walleye pollock	4	Opilio snow crab	1.07	1.07	12	98	233.63	233.63
1996	4	Skates	1	Osmerids	0.03	0.03	42	183	31.75	31.75
1996	1	Pacific cod	3	Pacific cod	0.02	0.02	12	51	37.55	37.55
1996	2	Pacific cod	3	Pacific cod	0.68	0.68	8	23	232.66	232.66
1996	4	Pacific cod	3	Pacific cod	1.4	1.4	27	79	3378.48	3378.48
1996	3	Pacific halibut	3	Pacific cod	0.36	0.36	2	4	63.75	63.75
1996	6	Skates	1	Pacific cod	1.12	1.12	14	72	1531.89	1531.89
1996	4	Yellowfin sole	1	Pacific cod	1.3	1.3	2	69	2318.33	2318.33
1996	4	Pacific cod	1	Pacific halibut	0.04	0.04	11	73	3.06	3.06
1996	4	Pacific cod	2	Pacific halibut	0.01	0.01	43	420	17.23	17.23
1996	4	Skates	1	Pacific halibut	0	0	42	183	2.44	2.44
1996	4	Walleye pollock	4	Pacific halibut	0	0	44	261	4.78	4.78
1996	5	Walleye pollock	4	Pacific halibut	0.12	0.12	6	29	31.13	31.13
1996	1	Pacific cod	3	Pacific herring	1.44	1.44	12	51	3248.28	3248.28
1996	3	Arrowtooth flounder	3	Pleuronectidae	4.84	3.85	12	36	6943.13	5514.88
1996	4	Arrowtooth flounder	1	Pleuronectidae	0.22	0.22	2	94	0.08	0.08

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	5	Arrowtooth flounder	3	Pleuronectidae	9.54	8.59	10	29	13799.02	12421.2
1996	1	Pacific cod	2	Pleuronectidae	2.66	1.47	18	76	2257.39	1248.57
1996	1	Pacific cod	3	Pleuronectidae	34.82	9.72	12	51	78602.04	21933.78
1996	2	Pacific cod	2	Pleuronectidae	3.47	2.23	11	54	1109.64	711.98
1996	2	Pacific cod	3	Pleuronectidae	9	4.87	8	23	3073.83	1664.13
1996	3	Pacific cod	2	Pleuronectidae	0.12	0.12	32	213	244.71	244.71
1996	3	Pacific cod	3	Pleuronectidae	10.81	5.68	23	56	35006.66	18384.69
1996	4	Pacific cod	1	Pleuronectidae	0.11	0.11	11	73	8.24	8.24
1996	4	Pacific cod	2	Pleuronectidae	0.06	0.03	43	420	118.32	69.88
1996	4	Pacific cod	3	Pleuronectidae	5.71	3.95	27	79	13782.69	9530.21
1996	5	Pacific cod	2	Pleuronectidae	0.59	0.59	8	39	79.32	79.32
1996	5	Pacific cod	3	Pleuronectidae	0.58	0.32	10	34	401.35	216.87
1996	6	Pacific cod	2	Pleuronectidae	0.54	0.5	25	151	303.71	279.49
1996	6	Pacific cod	3	Pleuronectidae	0.67	0.3	26	144	1985.82	882.25
1996	4	Pacific halibut	2	Pleuronectidae	1.93	1.93	2	78	29.1	29.1
1996	4	Pacific halibut	3	Pleuronectidae	1.29	1.29	3	15	136.78	136.78
1996	2	Skates	1	Pleuronectidae	29.72	7.4	14	67	16182.43	4032.01
1996	3	Skates	1	Pleuronectidae	0.59	0.59	6	29	512.56	512.56
1996	4	Skates	1	Pleuronectidae	4.63	1.96	42	183	5740.88	2429.71
1996	5	Skates	1	Pleuronectidae	16.61	16.61	4	11	6045.72	6045.72
1996	2	Walleye pollock	4	Pleuronectidae	0.02	0.02	12	98	3.6	3.6
1996	4	Walleye pollock	3	Pleuronectidae	0.14	0.14	29	124	2202.67	2202.67
1996	4	Walleye pollock	4	Pleuronectidae	0.04	0.04	44	261	59.44	59.44
1996	6	Walleye pollock	3	Pleuronectidae	1.71	1.71	19	103	13181.22	13181.22
1996	4	Arrowtooth flounder	1	Rock sole	0.22	0.22	2	94	0.08	0.08
1996	4	Arrowtooth flounder	3	Rock sole	1.89	1.89	11	70	487.1	487.1
1996	1	Pacific cod	2	Rock sole	1.35	1.35	18	76	1141.8	1141.8
1996	1	Pacific cod	3	Rock sole	3.52	1.93	12	51	7939.63	4346.27
1996	2	Pacific cod	2	Rock sole	2.32	2.32	11	54	743.21	743.21
1996	2	Pacific cod	3	Rock sole	8	8	8	23	2732.16	2732.16
1996	3	Pacific cod	2	Rock sole	2.48	2	32	213	5029.51	4050.43
1996	3	Pacific cod	3	Rock sole	4.74	2.98	23	56	15347.12	9646.97
1996	4	Pacific cod	2	Rock sole	0.01	0.01	43	420	23.65	23.65
1996	4	Pacific cod	3	Rock sole	0.67	0.67	27	79	1614.79	1614.79
1996	5	Pacific cod	3	Rock sole	1.26	1.26	10	34	862.94	862.94
1996	2	Skates	1	Rock sole	0.08	0.06	14	67	41.89	34.65
1996	4	Skates	1	Rock sole	0.51	0.51	42	183	633.5	633.5

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	4	Walleye pollock	3	Rock sole	0.04	0.04	29	124	695.58	695.58
1996	6	Arrowtooth flounder	3	Unid. Chionoecetes	0.07	0.07	16	60	126.67	126.67
1996	4	Flathead sole	1	Unid. Chionoecetes	0.3	0	1	7	219.28	0
1996	1	Pacific cod	2	Unid. Chionoecetes	0.96	0.96	18	76	811.6	811.6
1996	2	Pacific cod	2	Unid. Chionoecetes	4.93	4.22	11	54	1577.4	1348.58
1996	2	Pacific cod	3	Unid. Chionoecetes	0.24	0.24	8	23	83.16	83.16
1996	3	Pacific cod	2	Unid. Chionoecetes	2.59	1.85	32	213	5242.9	3742.99
1996	3	Pacific cod	3	Unid. Chionoecetes	0.35	0.34	23	56	1146.49	1108.67
1996	4	Pacific cod	1	Unid. Chionoecetes	9.13	9.09	11	73	682.94	679.33
1996	4	Pacific cod	2	Unid. Chionoecetes	3.37	1.28	43	420	7200.76	2723.49
1996	4	Pacific cod	3	Unid. Chionoecetes	2.87	1.78	27	79	6923.86	4305.15
1996	5	Pacific cod	2	Unid. Chionoecetes	11.79	7.22	8	39	1585.35	971.76
1996	5	Pacific cod	3	Unid. Chionoecetes	5.1	2.69	10	34	3498.87	1849.37
1996	6	Pacific cod	2	Unid. Chionoecetes	6.89	2.77	25	151	3891.17	1563.96
1996	6	Pacific cod	3	Unid. Chionoecetes	6.45	2.39	26	144	19079.27	7075.69
1996	6	Rock sole	1	Unid. Chionoecetes	0.05	0.05	6	26	47.08	47.08
1996	2	Skates	1	Unid. Chionoecetes	11.83	4.68	14	67	6439.41	2550.53
1996	3	Skates	1	Unid. Chionoecetes	0.13	0.08	6	29	112.3	71.46
1996	4	Skates	1	Unid. Chionoecetes	14.02	4.2	42	183	17392.09	5207.04
1996	5	Skates	1	Unid. Chionoecetes	0.86	0.86	4	11	314.28	314.28
1996	6	Skates	1	Unid. Chionoecetes	4.68	4.25	14	72	6421.08	5831.45
1996	3	Arrowtooth flounder	1	Walleye pollock	23.81	23.81	3	10	59.01	59.01
1996	3	Arrowtooth flounder	2	Walleye pollock	49.28	16.02	9	20	15919.82	5174.33
1996	3	Arrowtooth flounder	3	Walleye pollock	43.06	12.58	12	36	61705.5	18030.54
1996	4	Arrowtooth flounder	1	Walleye pollock	39.43	39.43	2	94	14.66	14.66
1996	4	Arrowtooth flounder	2	Walleye pollock	81.66	8.6	6	117	4959.03	522.17
1996	4	Arrowtooth flounder	3	Walleye pollock	82.76	6.38	11	70	21368.03	1648.62
1996	5	Arrowtooth flounder	2	Walleye pollock	25	16.37	8	14	14581.4	9545.77
1996	5	Arrowtooth flounder	3	Walleye pollock	23.61	12.36	10	29	34138.62	17864.43
1996	6	Arrowtooth flounder	1	Walleye pollock	50	50	2	3	163.17	163.17
1996	6	Arrowtooth flounder	2	Walleye pollock	70.73	13.09	10	19	18398.04	3406.03
1996	6	Arrowtooth flounder	3	Walleye pollock	84.9	8.46	16	60	155262.4	15474.4
1996	1	Pacific cod	2	Walleye pollock	4.34	4.34	18	76	3683.84	3683.84
1996	1	Pacific cod	3	Walleye pollock	10.22	8.13	12	51	23075.15	18362.61
1996	2	Pacific cod	2	Walleye pollock	2.8	1.69	11	54	896.54	541.89
1996	2	Pacific cod	3	Walleye pollock	5.29	2.84	8	23	1806.13	971.93
1996	3	Pacific cod	2	Walleye pollock	1.27	1.1	32	213	2571.7	2222.99

Table I-1(continued).-- Estimates of total fish and crab prey consumed (in metric tons) by groundfish populations in the eastern Bering Sea from May through September by year, stratum, predator and predator size groups.

YEAR	STRATUM	PREDATOR	PREDATOR SIZE GROUP	PREY	MEAN % WEIGHT	SE MEAN % WEIGHT	NO. OF STATIONS	NO. OF FULL STOMACHS	BIOMASS CONSUMED (TONS)	SE BIOMASS CONSUMED (TONS)
1996	3	Pacific cod	3	Walleye pollock	41.68	8.46	23	56	135002.2	27411.03
1996	4	Pacific cod	1	Walleye pollock	4.17	4.17	11	73	312.11	312.11
1996	4	Pacific cod	2	Walleye pollock	3.36	1.43	43	420	7181.75	3061.12
1996	4	Pacific cod	3	Walleye pollock	23.12	5.89	27	79	55785.26	14215.88
1996	5	Pacific cod	2	Walleye pollock	8.7	6.41	8	39	1170.83	862.15
1996	5	Pacific cod	3	Walleye pollock	34.85	12	10	34	23927.22	8237.96
1996	6	Pacific cod	2	Walleye pollock	5.65	2.41	25	151	3186.97	1357.67
1996	6	Pacific cod	3	Walleye pollock	8.38	2.08	26	144	24787.63	6146.46
1996	2	Pacific halibut	2	Walleye pollock	100	0	1	1	4606.83	0
1996	3	Pacific halibut	3	Walleye pollock	82.97	14.97	2	4	14724.63	2657.24
1996	4	Pacific halibut	2	Walleye pollock	26.66	26.66	2	78	401.03	401.03
1996	4	Pacific halibut	3	Walleye pollock	89.88	10.12	3	15	9551.56	1075.21
1996	2	Skates	1	Walleye pollock	1.24	0.69	14	67	676.5	376.74
1996	3	Skates	1	Walleye pollock	31.35	19.89	6	29	27239.98	17279.51
1996	4	Skates	1	Walleye pollock	12.7	4.24	42	183	15749.39	5257.76
1996	5	Skates	1	Walleye pollock	75	25	4	11	27304.07	9101.36
1996	6	Skates	1	Walleye pollock	54.87	11.45	14	72	75284.09	15710.01
1996	2	Walleye pollock	4	Walleye pollock	2.04	1.39	12	98	447.56	303.63
1996	3	Walleye pollock	1	Walleye pollock	10.02	5.64	25	216	23001.44	12951.07
1996	3	Walleye pollock	2	Walleye pollock	22.32	16.49	6	12	303477.5	224273.2
1996	3	Walleye pollock	3	Walleye pollock	4.03	4.03	18	70	65342.02	65342.02
1996	3	Walleye pollock	4	Walleye pollock	2.37	2.1	31	213	7538.5	6672.3
1996	4	Walleye pollock	1	Walleye pollock	11.63	5.99	23	142	27274.63	14046.72
1996	4	Walleye pollock	2	Walleye pollock	14.48	10.4	9	29	534149.4	383460.5
1996	4	Walleye pollock	3	Walleye pollock	9.32	4.66	29	124	145826.6	73006.59
1996	4	Walleye pollock	4	Walleye pollock	10.78	3.8	44	261	16114.33	5676.64
1996	5	Walleye pollock	4	Walleye pollock	2.13	2.13	6	29	544.74	544.74
1996	6	Walleye pollock	3	Walleye pollock	17.99	7.7	19	103	138923.2	59458.72
1996	6	Walleye pollock	4	Walleye pollock	20.11	7.92	20	73	23423.55	9226.63
1996	4	Yellowfin sole	1	Walleye pollock	9.14	2.56	2	69	16347.28	4569.26
1996	1	Pacific cod	2	Yellowfin sole	0.1	0.1	18	76	82.62	82.62
1996	1	Pacific cod	3	Yellowfin sole	1.4	1.4	12	51	3152.93	3152.93

Table I-2. –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate cells with missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
Alaska plaice	Pacific halibut	< 30	2		1.21			
	Yellowfin sole	All sizes	3		7,117.47			
			4		27.75			
Alaska plaice Total					7,146.43			
Arrowtooth flounder	Arrowtooth flounder	20-39	5	66.72				
	Pacific cod	30-59	1			6.72		
			3			13.54		
			4	(23)			62.57	
			6			34.63		
								19.18
								10.21
							47.22	
							4.74	
						7.42		
		Walleye pollock	≥ 50	5				2,623.82
	Skate	All sizes	4		17.41		6.6	
Arrowtooth flounder Total				89.72	24.83	84.28	2,768.17	
Bairdi Tanner crab	Pacific cod	< 30	4	29.77				
		30-59	1	24.27	16.89	177.33	132.24	
			2	436.5	7.44	204.48	29.73	
			3	1,171.39	890.71	821.98	465.08	
			4	2,365.46	62.18	364.21	823.88	
			5	318.19	513.68	660.51	423.81	
			6	1,066.75	670.86	1,357.44	719.77	
		≥ 60	1		10.5	7.47		
			2	527.1		40.64		
			3	1,720.59	208.06	285.6	52.74	
			4	1,287.91	12.25	92.85	175.59	
			5	882.96	184.44	241.09	631.1	
			6	853.53	839.87	1,081.88	2,961.02	
	Flathead sole	All sizes	3	1,836.95	3,718.72			

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)					
				1993	1994	1995	1996		
Bairdi Tanner crab, continued			4		1,186.89	23.98			
			5			306.07			
			6	1,529.03	314.69	471.33			
			Pacific halibut	30-59	3	41.18	34.64		
					4			24.29	
					5		21.2		
	6	7.85			1.09	2.26			
		≥ 60	3	3.59	2.48	235.72			
			4	6.72	3.6	44.64			
			5	42.4	13.34				
			6	194.52	5.48	26.88			
	Walleye pollock	40-49	4	769.97		(0)			
			≥ 50	3	12.52				
	Skate	All sizes	2		12.79				
			3	159.18	245.7	24.16			
			4	474.68	217.88		46.91		
			5	660.47	461.76		100.69		
			6	414.23	22.65				
	Yellowfin sole	All sizes	2	315.07					
			3	411.95					
			4	1,277.54					
	Bairdi Tanner crab Total				18,842.3	9,679.79	6,494.81	6,562.56	
	Flathead sole	Arrowtooth flounder	20-39	5	1,722.22				
≥ 40				4	4.13				
				5			95.35		
6		6	166.86						
Pacific cod		< 30	1	143					
		30-59	1		48.82	56.06			
			3	45.5		9.37	58.7		
			4	6.96	16.53				
			5	37.44		4.32			
6		7.46		17.44	105.7				

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)					
				1993	1994	1995	1996		
Flathead sole, continued		≥ 60	1		37.64	75.95	194,159		
			2	105.52		4.05			
			3		31.02	107.55	6.41		
			4	23.4		13.07			
			5	65.46	23.7	38.64	24.05		
			6	36.76	118.27	8.9	57.82		
			9						
			Greenland turbot	≥ 50	6			11.57	
			Pacific halibut	30-59	3		12.45		
		≥ 60	1		33.82				
			3		105.12				
			4	0.66					
	Walleye pollock	≥ 50	3	35.09					
			4	6.4					
			6	44.38					
	Skate	All sizes	3				265.27		
			4		24.7	5.67	17.86		
			5			49.2	68.63		
			6		89.16	51.9			
	Flathead sole Total				2,451.24	541.23	453.69	194,859	
	Greenland turbot	Pacific cod	30-59	4	5.12			22.92	
				6		140.8			
		Walleye pollock	< 30	4	7,2133.2				
5				7,362.93					
3				307.01					
4					914.88		8,358.52		
6			744.8						
≥ 50			2	76.5					
			3	69.38					
			4	6,876.25		11.28	42.77		
	5		4.6		714.11				

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
Greenland turbot, continued			6	611.1	14.86			
Greenland turbot Total				88,186.3	1,075.14	11.28	9,138.32	
Opilio snow crab	Alaska plaice	All sizes	2	(0)		227.86		
			4		3,193.75	741.94		
	Pacific cod	< 30	1		91.57			
			2			190.46		
			3				16.84	
			4	952.58	435.28	616.3		
			30-59	1	7.15	22.6		93.28
				2	40.59	205.89	113.47	361.98
		3	2,346.35	1541.6	271.15	5,352.86		
		4	3,350.95	3,493.33	4,790.06	4,353.47		
		5	55.44	332.53	63.15	140.99		
		6	449.62	1241.34	866.7	620.09		
		≥ 60	1				15.56	
			2	140.03	452.6	82.42	113.91	
	3		545.47	1,601.55	340.43	403.81		
	4		855.44	1,382.18	583.79	1,365.25		
	5		204.1	175.28	103.9	114.93		
	6		1,128.28	2,213.04	1,661.91	3,574.11		
	Flathead sole	All sizes	1			126.64		
			3			2,420.1		
			4	212.26		1,168.63		
			5		539.92	1387.9		
			6			9,806.59		
Pacific halibut			30-59	2	29.85			
	3	84.5		4.63				
	4	214.5				1.1		
	6	202.8			10.29			
	≥ 60	2	29.92			9.97		
		3	6.3	21.24				
		4	4.27	37.01	5.34			
		5	29.34	3.68	78.93			
		6	81.76	47.61	24.67			

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
Opilio snow crab, continued	Walleye pollock	≥ 50	2			0.33	35.3	
			5			0		
	N. rock sole	All sizes	3	3,944.75		21,187.9	(0)	
			4	5,237.17		12,294.6		
	Skate	All sizes	1			11.88		
			2		6.24	26.47	138.42	
			3	3.14	9.18	0.4	164.24	
			4	77.28	558.99	206.78	251.37	
			5	25.92		3.91	30.16	
			6	364.29	272.65	158.88	462.4	
	Yellowfin sole	All sizes	2		2285	1,3943.8		
			3			25,729.3		
			4	461.35		127.41		
	Opilio snow crab Total				21,085.4	20,168.7	99,399.8	17,594.5
	Osmerid	Arrowtooth flounder	≥ 40	3	(464.2)	(0)		
5				(433.28)				
Pacific cod		< 30	1	66.12				
			2		19.75			
			30-59	1	2,592.78	176.09	147.68	
				2	18.58	4.7	60.02	
				3	348.37	107.82		
			5			191.74		
≥ 60		1	794.13		205.01			
		2	89.16	102.64				
Flathead sole		All sizes	1	265.36				
			2	33.92	19.23	(0)		
			4	245.76				
Pacific halibut		30-59	1	330.21				
			2	338.88				
	≥ 60	1	113.45	(14.67)				
		2	79.98	(5.27)				

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
Osmerid, continued	Walleye pollock	< 30	1	4,430.53				
			1	375.87				
		≥ 50	1	539.24	41.1	9.42		
			2	170.96	33.92			
				3		60.12		
				4	14.31			
	Skate	All sizes	1	97.16				
			4				4.96	
	Osmerids Total				11,842.3	525.19	673.99	4.96
	Pacific cod	Pacific cod	30-59	2	98.42			
3					19.56			
4				60.45				
6					393.94			
≥ 60				1	121.95	292.12		0.15
				2		91.52	14.76	6.78
		3	6,235.21	0.76	4.45			
		4		15.91	0.66	4.47		
				5		2.44		
				6	6.37	0.62		
Pacific halibut		30-59	≥ 60	4			2.58	
				1		41.94		
				2		3.59	0.45	
				3	0.66	14.41		
				4			1.21	
				6	0.12			
Walleye pollock		≥ 50	1		8.76			
	3			30.03				
Skate	All sizes	4		407.71		(0)		
		8						
Yellowfin sole	All sizes	4				258.4		
Pacific cod Total				6,516.81	1,326.62	27.17	269.8	

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)			
				1993	1994	1995	1996
Pacific halibut	Pacific cod	< 30	4				24.92
			1	54.32	(0)		
			4			96.24	
	Walleye pollock	40-49	3	1,018.22			
			2	3.17			
				4	414.4	28.78	38.87
				5			1,415.49
				6		1.03	
	Skate	All sizes	4	171.92			9.8
			Pacific halibut Total			1,694.65	29.81
Pacific herring	Pacific cod	30-59	2		(112.4)		
			4		(16.36)		
			6		(116.94)		
		≥ 60	1			25.27	
	Pacific halibut	30-59	2		(7.25)		
	Walleye pollock	≥ 50	1		11.07		
			2	7.79	5.66		
			4		57.21		
Yellowfin sole	All sizes	4			18.27		
Pacific herring Total			7.79	73.94	271.22	25.27	
Red king crab	Pacific cod	30-59	3		(312.55)		
			4		(199.98)		
	Pacific halibut	30-59	4			0.41	
Red king crab Total				512.53	0.41		
N. rock sole	Arrowtooth flounder	≥ 40	4				49.49

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
N. rock sole, continued	Pacific cod	< 30	1		99,822.3			
			4		155,356			
		30-59	1	36.28			22.27	44.18
			2	7.14				28.76
			3	72.38				136.82
			4	19.55	16.11	21.73		88.94
		≥ 60	1	426.77	120.49	202.64		104.16
			2	92.7	82.23	15.8		27.74
			3	23.04	3.37	21.24		83.37
			4	19.14	5.67	14.79		37.47
			5	1.23				8.51
			6				31.47	
	Flathead sole	All sizes	1			160.2		
	Pacific halibut	30-59	1	103.01	5.21			
		≥ 60	1	55.64	4.83	9.8		
			2	5.54	9.28			
	Walleye pollock	< 30	6	9547.7				
			40-49	3	633.19			
				4				19,669.5
		≥ 50	5	1072.1				
			1	92.25	79.04	2.95		
4			4,048.67					
Skate		All sizes	5	138.48				
			1	195.51		24.24		
	2			34.92		12.34		
	3		154.76	100.48	213.38			
	4		17.04	140.1	21.56	51.56		
Yellowfin sole	All sizes	5			53.58			
		2	351.82					
		4		814.52				
N. rock sole Total				17,117	256,594	815.65	20,342.8	

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)					
				1993	1994	1995	1996		
Unidentified Chionoecetes	Arrowtooth flounder	≥ 40	6				109.7		
	Pacific cod	< 30	4		800.61	244.99	2,440.56		
			6		59.03	61.47			
			30-59	1	2,449.04	348.33	875.68	214.2	
				2		1.17	476.03	416.34	
				3	4,909.15	2,501.28	419.48	1,351.77	
				4	972.42	441.89	10,705.9	6,946.47	
				5	139.27	64.78	224.16	555.55	
				6	2,540.04	322.1	719.28	749.55	
				≥ 60	1	142.28		88.25	
					2	52.2	49.37	36.35	6.5
					3	797.27	56514.4	822.26	89.89
					4	385.77	49.18	195.39	542.72
			5	361.07	229.62	71.82	193.2		
			6	364.69	191.72	246.96	1699.2		
	Flathead sole	All sizes	4	39,875.4	(0)	6234.8			
			5	5,942.51					
Pacific halibut	30-59	3	191.43	(0)	(0)				
		6	158.89						
		≥ 60	2	44.23					
			3	0.41	19.16				
			4	58.38					
N. rock sole	All sizes	2	3,575.12						
		3	1,7142.1						
Skate	All sizes	1	195.32						
		2	166.56	120.15	282.13	3,518.21			
		3	766.55	30,013	1,044.34	61.36			
		4	401.73	328.62	1,039.02	8,545.68			
		5	788.14	1,182.15	101.07	630.4			
		6	227.32	752.99	4,393.74	3508.2			
Yellowfin sole	All sizes	2			166,215				

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)			
				1993	1994	1995	1996
Unidentified Chionoecetes, continued			3	(140.05)	(0)	199,944	
			4	(227.45)		93,974.2	
Unidentified Chionoecetes Total				83,019.6	94,002.5	488,417	31,579.5
Walleye pollock	Arrowtooth flounder	< 20	3				40.27
			4			14.46	10.53
			5			4,799.99	
			6		164.62		207.42
		20-39	3	1196.8	1,043.87	729.4	1,201.47
			4	224.46	438.93	764.97	1,868.03
			5	149.21	2,696.95	309.2	1,011.08
			6	752.28	1,335.31	130.46	872.1
		≥ 40	1		27.95		
			3	1,249.68	908.96	728.91	4,053.88
			4	341.15	100.15	220.94	346.48
			5	121.08	6,488.55	37.14	500.57
	Pacific cod	< 30	1	97.13	10.3		
			2		17.2	25.72	
			4	50.43	257.19	204.18	220.86
			6			6.57	
		30-59	1	302.34	72.27	40.88	449.99
			2	118.16	113.16	115.69	69.42
			3	886.18	143.21	346.27	431.7
			4	1,344.63	1,238.2	878.19	2,708.48
			5	4.92	17.12	100.12	143.04
			6	178.85	412.81	1,208.51	49
		≥ 60	1	21.86	1,110.05	75.96	15,745.9
			2		98.22	88.66	4.5
3	377.46		262.45	265	226.68		
4	125.03		110.18	95.82	177.09		
5	83.48		51.68	79.66	31.26		
6	307		949.65	537.93	241.54		
Flathead sole	All sizes	1	663.76	142.64	279.36		
		2		15.85			
		3		1,472.92	2,889.8		

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)				
				1993	1994	1995	1996	
Walleye pollock, continued			4	2,395.25	1,407.57	2674		
			5		2,844.86			
			6			2,205.74		
	Greenland turbot	30-49	4	62.78	28.6			
			6	298.59	143.8			
		≥ 50	4	2.49	9.45	1.14		
			5	0.89				
			6	59.16	80.57	61.13		
		Pacific halibut	30-59	1	154.01	91.65	3.02	
				2	179.55	162.47	53.06	3,073.24
				3	374.52	118.9	5.34	
				4	180.88	163.93	54.54	267.52
	6			7	45.74	3.74		
	6							
	≥ 60		1	22.36	24.98	11.05		
			2	7.62	6.73	6.34		
			3	21.25	27.45	27.92	101.88	
			4	18.56	17.44	17.28	37.08	
			5	10.02	16.09	4.86		
			6	23.51	112.69	40.02		
	Walleye pollock	< 30	2	9,127.17				
			3			490	11,027.4	
			4	69,510	27,065.1	14,040.4	40,093.9	
			6	2,916.69		10,774.8		
30-39			3	8,337.56	217,246	1,4381.1	162,662	
			4	3,418.16	75,725.8	23,3045	286,300	
		5	713.76	78,290.3	2,697.36			
		6	1,42174	176,924	4,751.58			
40-49		2		12.97				
		3	3,005.29	41,324.1	18.19	11,564.9		
		4	1,445.02	8,309.09	31,854.2	78,443.1		
		5	2.95	31,785.9	22,759.2			
		6	8,160.49	70,103.5	25,530.4	4,426.4		
		6						
≥ 50		1	501.53	180.39	294.42			
		2	332.54	521.35	113.69	79.21		
		3	1,520.66	662.88	1,443.3	2,059.66		

Table I-2 (Continued). –Estimated number (millions) of prey consumed by groundfish predators in the eastern Bering Sea from May through September 1993 through 1996, by predator size group and stratum. Numbers in parentheses indicate missing prey size information.

Prey	Predator	Predator Size (cm)	Stratum	Number (millions)					
				1993	1994	1995	1996		
Walleye pollock, continued			4	3,744.83	1,549.79	1,354.68	4,197.42		
			5	8,666.33	494.4	700.98	4,282.79		
			6	3,024.87	878.18	324.94	1,242.24		
			N. rock sole	All sizes	1			16.9	
					2			40.96	
					3	1361.86			
	4					20.97			
	6					18.31			
	Skate	All sizes	1	8.9		0.51			
			2		384.47		2.78		
			3	55.01	152.51	32.76	40.54		
			4	105	87.59	38.93	116.9		
			5	35.36	132.92	37.15	111.13		
			6	569.3	223.92	78.87	196.95		
	Yellowfin sole	All sizes	2		2,370.97				
			3	733.2	779.92				
			4	135.8	8,613.13	200	7787.49		
	Walleye pollock Total				284,406	770,195	386,085	650,679	
	Yellowfin sole	Pacific cod	< 30	1		114.22			
				2					
			30-59	1		120.12	39.96	49.89	
				2		40.06			
				3			54.6		
≥ 60			1	31.42	196.47	254.25	252.58		
		2	40.4	25.74					
		3	48.04	10.36	38.07				
		4			3.72				
Pacific halibut		≥ 60	1	27.01		24.59			
			2	1.5	1.05				
Skate		All sizes	1	23.28		3.6			
			2		5.15				
	5				8.69				
Yellowfin sole Total				171.65	513.17	427.48	302.47		

