UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Alaska Fisheries Science Center
Resource Assessment and Conservation
Engineering Division
7600 Sand Point Way Northeast
BIN C15700, Building 4
Seattle, Washington 98115-0070

March 19, 1991 F/AKC1:WCF

CRUISE RESULTS

CHARTERED VESSEL CRUISE NO. 90-1
F/V PAT SAN MARIE AND F/V GREEN HOPE
1990 GULF OF ALASKA TRIENNIAL GROUNDFISH ASSESSMENT SURVEY
JUNE 1-SEPTEMBER 12, 1990

The third comprehensive triennial bottom trawl survey of the western and central Gulf of Alaska groundfish resources was recently completed by the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), Seattle, Washington. This report summarizes the preliminary results of the survey.

ITINERARY

The survey was conducted in four 25-day legs aboard the chartered commercial trawlers Pat San Marie and Green Hope between June 1 and September 12, 1990. On September 1, the Pat San Marie completed its portion of the triennial survey and began a 4-day cooperative survey for the International Pacific Halibut Commission (IPHC) off the Canadian west coast. The triennial survey extended from the Islands of Four Mountains (170°W) to Cape St. Elias (144°30'W). Sampling occurred at pre-selected stations at depths between 11 and 285 fm (20-520 m). A survey of the eastern Gulf of Alaska from Cape St. Elias to Dixon Entrance (132°W) was conducted by AFSC personnel from the Auke Bay Laboratory (ABL) and is summarized in a separate report.

OBJECTIVES

The triennial groundfish surveys are designed to describe and monitor the distribution, abundance, and biological condition of various groundfish stocks in the Gulf of Alaska. Previous surveys in this series were conducted in 1984 and 1987. The specific objectives of the 1990 survey were to:

1. Define the distribution and relative abundance of the principal groundfish and commercially-important invertebrate species inhabiting the western and central Gulf of Alaska.

2. Obtain data from which to estimate the absolute abundance of the principal groundfish species.

3. Collect data to define selected biological parameters, i.e., age, sex, size, growth, length-weight relationships, feeding habits, and age composition.

4. Collect accurate net mensuration data on the trawl gear used in the survey.

5. Test and compare three different environmental sensing systems for the collection of temperature and/or salinity data.

6. Obtain ancillary data and specimen collections, as requested by other research groups.

VESSELS AND GEAR

Two commercial bottom trawlers performed the trawl operations. The Pat San Marie is 101 ft (30.8 m) in overall length and powered by a single main engine with 850 continuous horsepower. Deck equipment included paired hydraulic winches with 600 fm (1,100 m) of 7/8" (2.2 cm) cable per drum, two hydraulic net reels (one mounted over the stern ramp and the other mounted forward on the working deck), and two winches (one moveable) mounted on the main boom for lifting. The Green Hope is 100 ft (30.7 m) in overall length and powered by a single main engine of 565 continuous horsepower. Deck equipment included paired hydraulic trawl winches with 800 fm (1,463 m) of 3/4" (1.91 cm) cable per drum, two hydraulic net reels (one mounted over the stern ramp and the other mounted forward on the working deck), and two stationary winches mounted on the main boom for lifting. Electronic equipment on both vessels consisted of two Loran C receivers with converters for geodetic positions, a Loran C video plotter, two radars, single band and VHF radios, paper and color video fish finders, and an autopilot.

Both vessels used standard RACE Division Poly-Nor'eastern high opening bottom trawls rigged with roller gear. Gear specifications included: a 89'-1" (27.2 m) headrope with twenty-one 12" (30 cm) diameter floats, and a 79'-7" (24.3 m) chain "fishing line" attached to a 81'-7" (24.9 m), 3/8" (.95 cm) diameter 6 x 19 galvanized wire footrope. The roller gear was 79'-6" (24.2 m) long and constructed of 3/4" (1.91 cm) diameter 6 x 19 galvanized wire rope, 14" (36 cm) rubber bobbins separated by a solid string of 4" (10 cm) rubber disks. In addition, 19'-6" (5.9 m) wire rope extensions with 4" (10 cm) and 8" (20 cm) rubber disks were used to span each lower flying wing section.

Trawls were constructed of 5" (12.7 cm) stretched-mesh polyethylene web with a 1-1/4" (3.2 cm) mesh nylon liner in the codend. Net rigging consisted of triple 180' (54.9 m) 5/8" (1.6 cm) diameter galvanized wire rope dandylines. The dandylines were rigged with 9", 18", and 24" chain extensions to the headrope, side, and bottom wing attachments, respectively. Steel V-doors 6' x 9' (1.83 x 2.74 m) weighing approximately 1,700 lb (800 kg) each were used. The fishing dimensions of the trawls were measured aboard each vessel using Scanmar[1] net measurement equipment. Preliminary examination of the data (from 68 and 57 hauls, respectively) revealed that the nets towed by the Pat San Marie had a mean path width, as measured between wingtips, of 51.5' (15.7 m), while those towed by the Green Hope had a mean path width of 48.9' (14.9 m).

Oceanographic data were collected throughout the cruise. Temperature and salinity profiles of the water column were gathered aboard the Pat San Marie, using a Sea-Bird[1] SEACAT model SBE 19 CTD profiler. While temperature profiles of the water column, using a TSK[1] model 250B MicroBT, were collected aboard the Green Hope. Sea surface temperature observations were taken aboard both vessels using bucket thermometers.

SURVEY DESIGN AND METHODS

The central and western Gulf of Alaska triennial survey area is dominated by the continental shelf, which is generally shallower than 200 m and varies in width from approximately 10 nm in the Fox Islands region to nearly 100 nm off the Kenai Peninsula and Kodiak Island. Representing approximately 90% of the 76,000 nm^2 survey area, the continental shelf is bisected by numerous 100-300 m troughs or gullies which extend from the outer shelf inshore to the coast. These bathymetric features, along with an extensive and complex shoreline region, provide a rich variety of habitat types for many juvenile and adult groundfish such as walleye pollock (*Theragra chalcogramma*), Pacific cod (*Gadus macrocephalus*), Pacific halibut (*Hippoglossus stenolepis*), rockfish (*Sebastes spp.*), and many invertebrates including several commercial crab species, scallops, and pandalid shrimp.

Adjacent to the continental shelf, at depths generally greater than 200 m but representing approximately 10% of the total survey area, the steep and rugged continental slope provides habitat for several important rockfish species, adult sablefish (*Anaplopoma fimbria*), shortspine thornyheads (*Sebastolobus alscanus*), and grenadiers (*Macrouridae*).

---

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

The sampling region was divided into 36 sampling strata based primarily on depth contours and geographical features such as banks, gullies, and flats. Two geographical features that bridged International North Pacific Fisheries Commission (INPFC) statistical areas, Shelikof Deep and Shumagin Gully, were divided into two strata. Where only minor overlapping of INPFC areas occurred, the stratum was kept intact.

For station selection, the survey area was overlaid by a square grid of points spaced 5 nm apart. Stations were selected randomly from this grid within each stratum. Station densities within strata were set proportionally to the variances of the catches obtained during the 1984 survey. These sampling densities were also used in the 1987 survey. Each randomly selected station was assigned a priority, based on completing 450, 600, or 750 successful stations, with expectations that under normal conditions 500-600 stations would be completed.

Survey tows were 30 minutes in duration, allowing 3-10 minutes sinking time between setting the winch brakes and beginning the tow. Sinking times varied and increased with bottom depth. Efforts were made to maintain each tow at a constant depth. In cases where depths increased during a tow trawl, warps increased accordingly. Catches were sorted to species, weighed, and enumerated according to standard AFSC protocol. A variety of biological data (age, length, sex, weight, and maturity of individual specimens) were taken. Special requests were also fulfilled for stomach, tissue, and whole fish samples.

RESULTS

A total of 807 pre-selected stations were randomly generated for this survey. Successful trawls were achieved at 508 of the 575 stations attempted and 60 stations were abandoned at sites considered untrawlable (Table 1, Figure 1). The 36 trawls in the Yakutat area are not listed in the following tables but are included in a separate report from the Auke Bay Laboratory. Because of time losses to bad weather and gear repairs, a majority of the lowest priority level stations were not sampled. Sea surface temperatures were observed at 520 stations, while temperature and salinity profiles were taken using a Seabird CTD at 97 of the stations trawled by the Pat San Marie. Seventy-five bottom temperatures were collected on the Green Hope using the TSK MicroBT. Additionally, 46 comparison tests of XBT probes, from two manufacturers (Sippican[1] and Sparton[1]), were conducted aboard the Pat San Marie.

---

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

A total of 102 fish species were identified in survey catches. In addition to the groundfish species, catches also contained representatives from numerous invertebrate orders. The types and numbers of biological data collected from fish are summarized in Table 2. The age structures collected, other than halibut otoliths, will be read by the age determination unit of the AFSC. Halibut otoliths will be processed by the IPHC.

Table 3 shows the dominant fish species caught by INPFC areas and depth strata, ranked in order of catch per unit effort (CPUE) expressed as kilograms of catch per nautical mile trawled (kg/nm). Arrowtooth flounder (Atheresthes stomias) dominated the catches in most INPFC areas. Other important catch components included walleye pollock, Pacific cod, and several flatfish species. The shallow, 1-100 m, strata catches were typically dominated by arrowtooth flounder and Pacific cod. Important species taken in the 101-200 m depth strata included arrowtooth flounder, walleye pollock, and Pacific cod, while the 200-300 m strata catches were dominated by arrowtooth flounder, walleye pollock, and sablefish. In the 301-500 m depth interval, giant grenadiers (Albatrossia pectoralis), rockfish, shortspine thornyheads, and Dover sole (Microstomus pacificus) acccounted for a large proportion of the total catch.

Length frequency summaries representing the number of fish measured per sex/centimeter interval are provided in Table 2.

PERSONNEL

PAT SAN MARIE

LEG I

DATES: June 1-25
PORTS: Dutch Harbor, AK-Sand Point, AK

FPC	Ronald Payne	AFSC
	Robin Harrison	AFSC
	Robert Caruso	AFSC
	Norm Parks	AFSC
	Gilbert St. Pierre	IPHC

LEG II

DATES: June 26-July 20
PORTS: Sand Point, AK-Kodiak, AK

FPC	William Flerx	AFSC
	Mark Wilkins	AFSC
	Ronald Dotson	SWFSC
	Calvin Blood	IPHC
	Karin Tammi	UW

GREEN HOPE

LEG I

DATES: June 1-25
PORTS: Dutch Harbor, AK-Sand Point, AK

FPC	Eric Brown	AFSC
	Jim Stark	AFSC
	David King	AFSC
	Craig Rose	AFSC

LEG II

DATES: June 26-July 20
PORTS: Sand Point, AK-Kodiak, AK

FPC	Peter Munro	AFSC
	Ken Weinberg	AFSC
	Jay Clark	AFSC
	Larry Haaga	AFSC
	Fred Bonde	AFSC

PAT SAN MARIE			GREEN HOPE		

LEG III

DATES:	July 24-August 17		**DATES:**	July 24-August 17	
PORTS:	Kodiak, AK- Kodiak, AK		**PORTS:**	Kodiak, AK- Kodiak, AK	
FPC	Eric Brown	AFSC	FPC	Ron Payne	AFSC
	Don Fisk	AFSC		Paul Raymore	AFSC
	Kirsten Rohrbach	AFSC		David Roetcisoender	AFSC
	Steve Carlson	NOAA		Lynn Faughnan	AFSC
	Mike Larsen	IPHC		Tamara Stanley*	NOAA

* Left vessel on July 26

LEG IV

DATES:	August 18-September 10		**DATES:**	August 18-September 12	
PORTS:	Kodiak, AK- Seattle, WA		**PORTS:**	Kodiak, AK- Kodiak, AK	
FPC	Peter Munro	AFSC	FPC	William Flerx	AFSC
	Ken Weinberg	AFSC		Robin Harrison	AFSC
	Jim Stark	AFSC		Mei Sun Yang	AFSC
	Lynn Faughnan	AFSC		Rebecca Klenk	AFSC
	Gilbert St. Pierre	IPHC			

FPC - Field Party Chief
IPHC - International Pacific Halibut Commission
SWFSC - Southwest Fisheries Science Center, La Jolla, CA
AFSC - Alaska Fisheries Science Center
UW - University of Washington
NOAA - NOAA Corps

For further information contact Dr. Gary Stauffer, Director, Resource Assessment and Conservation Engineering Division, Alaska Fisheries Science Center, National Marine Fisheries Service, 7600 Sand Point Way NE., Building 4, BIN C15700, Seattle, WA 98115-0070 -- Telephone (206) 526-4170.

Table 1.--Successful (S), unsuccessful (U), and abandoned (A) hauls by International North Pacific Fisheries Commission (INPFC) area and depth strata.

Depth Stratum		001-100	101-200	201-300	301-500	All depths
Shumagin						
	S	75	46	9	7	137
	U	33	1	0	0	34
	A	11	2	3	1	17
Chirikof						
	S	29	106	16	4	155
	U	6	10	1	1	18
	A	16	6	0	1	23
Kodiak						
	S	51	129	30	6	216
	U	3	9	3	0	15
	A	12	7	0	1	20
Total						
	S	155	281	55	17	508
	U	42	20	4	1	67
	A	39	15	3	3	60

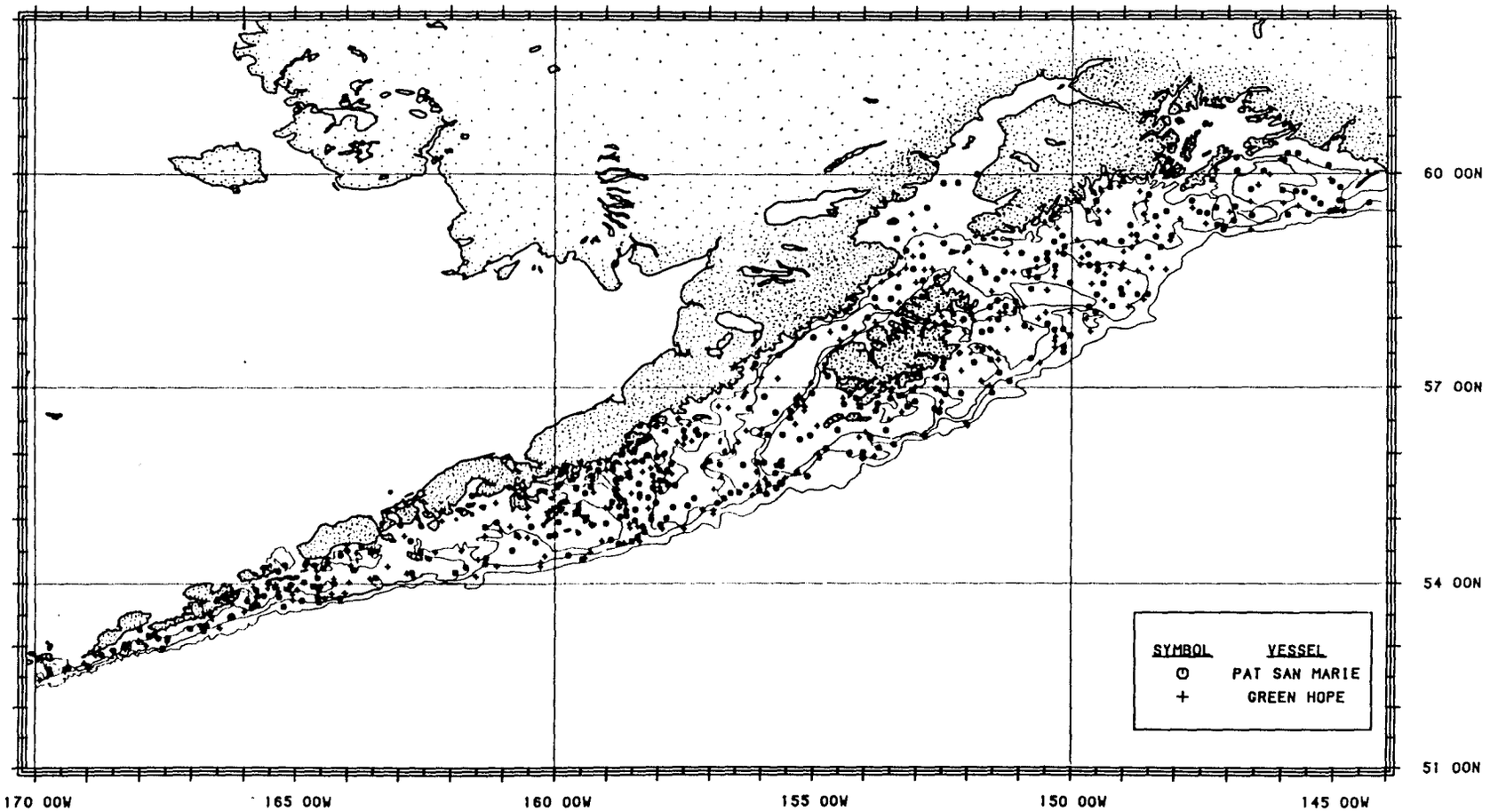

Figure 1. --Total survey stations attempted during the 1990 triennial bottom trawl survey of the central and western Gulf of Alaska, 4 June - 9 September, 1990.

Table 2.--Biological data collected during the 1990 central and western Gulf of Alaska triennial survey. Abbreviations: length frequency (LF), age structure[1] (Age), specimen weight (Wgt), maturity (Mat), stomach (St).

	Number of observations or specimens collected				
Species	*LF*	*Age*	*Wgt*	*Mat*	*St*
Walleye pollock	31,916	1,100	676	--	1,062
Pacific cod	11,172	501	296	--	948
Sablefish	4,190	40	--	--	339
Arrowtooth flounder	50,107	346	250	--	1,147
Pacific halibut	4,994	88	--	--	467
Rock sole	12,139	385	208	19	--
Flathead sole	23,826	333	214	133	--
Rex sole	12,462	401	153	--	--
Dover sole	5,695	213	146	--	--
Butter sole	938	--	--	--	--
English sole	266	--	--	109	--
Yellowfin sole	1,910	78	78	--	--
Alaska plaice	138	--	--	--	--
Starry flounder	199	--	--	--	--
Shortspine thornyhead	2,728	--	--	--	112
Pacific ocean perch	6,989	1,021	240	--	144
Northern rockfish	3,417	451	310	--	58
Rougheye rockfish	2,816	316	90	--	151
Shortraker rockfish	182	139	95	--	10
Dusky rockfish	832	148	93	--	42
Redstripe rockfish	313	--	--	--	--
Silvergray rockfish	147	--	--	--	--
Black rockfish	54	--	--	--	--
Widow rockfish	12	--	--	--	--
Yelloweye rockfish	2	--	--	--	--
Sharpchin rockfish	470	--	--	--	--
Harlequin rockfish	1,385	--	--	--	--
Puget Sound rockfish	66	--	--	--	--
Chum salmon	1	--	--	--	--
Atka mackerel	322	--	--	--	--
Giant grenadiers	17	--	--	--	--
Kelp greenling	56	--	--	--	--
Eulachon	79	--	--	--	--
Slender sole	1	--	--	--	--

[1]Scales and otoliths were collected from Pacific cod. Otoliths were collected from all other species.

Table 3.--Mean CPUE (kg/nm) for the 20 most abundant groundfish species by International North Pacific Fisheries Commission (INPFC) areas and depth strata during the 1990 GOA triennial groundfish survey.

SHUMAGIN AREA 1-100 m Species	CPUE	SHUMAGIN AREA 101-200 m Species	CPUE	SHUMAGIN AREA 201-300 m Species	CPUE	SHUMAGIN AREA 301-500 m Species	CPUE	SHUMAGIN AREA all depths Species	CPUE
Walleye pollock	100.5	Arrowtooth flounder	247.3	Walleye pollock	44.4	Giant grenadier	53.4	Arrowtooth flounder	103.7
Arrowtooth flounder	68.1	Walleye pollock	103.1	Pacific ocean perch	41.1	Shortspine thornyhead	11.0	Walleye pollock	94.8
Pacific cod	64.4	Pacific cod	53.1	Rex sole	15.3	Dover sole	8.0	Pacific cod	57.0
Rock sole	44.1	Pacific ocean perch	37.6	Arrowtooth flounder	12.4	Sablefish	7.1	Pacific halibut	36.7
Pacific halibut	42.1	Pacific halibut	33.0	Pacific cod	9.5	Rougheye rockfish	4.9	Rock sole	34.4
Flathead sole	31.3	Northern rockfish	25.6	Shortspine thornyhead	7.4	Shortraker rockfish	3.1	Flathead sole	27.1
Yellowfin sole	31.0	Flathead sole	23.8	Rougheye rockfish	6.2	Arrowtooth flounder	1.2	Yellowfin sole	21.8
Atka mackerel	18.4	Rock sole	17.0	Sablefish	5.5	Pacific grenadier	1.0	Northern rockfish	16.3
Northern rockfish	15.1	Sablefish	11.7	Pacific halibut	1.9	Rex sole	0.6	Atka mackerel	12.7
Yellow irish lord	5.0	Rex sole	6.9	Northern rockfish	1.3	Walleye pollock	0.5	Pacific ocean perch	11.4
Alaska plaice	1.8	Dusky rockfish	3.8	Flathead sole	1.2	Bigmouth sculpin	0.2	Yellow irish lord	3.6
Great sculpin	1.8	Dover sole	1.7	Blackfin sculpin	0.9	Blackfin sculpin	0.2	Sablefish	3.2
Pacific ocean perch	1.6	Big skate	1.5	Shortraker rockfish	0.8	Pacific cod	0.2	Rex sole	2.8
Kelp greenling	1.4	Yellowfin sole	1.5	Dover sole	0.5	Blacktail snailfish	0.2	Giant grenadier	2.1
Black rockfish	1.1	Bigmouth sculpin	0.9	Bigmouth sculpin	0.3	Pacific ocean perch	0.1	Dusky rockfish	1.4
Starry flounder	1.0	Eulachon	0.8	Dusky rockfish	0.3	Bering skate	0.1	Alaska plaice	1.3
Dusky rockfish	0.8	Yellow irish lord	0.6	Spectacled sculpin	0.2	Northern smoothtongue	0.1	Great sculpin	1.2
Rex sole	0.8	Alaska plaice	0.2	Spiny dogfish	0.2	Northern lampfish	0.*	Kelp greenling	1.0
Butter sole	0.7	Rougheye rockfish	0.2	Rock sole	0.1	Blackfin poacher	0.*	Dover sole	0.9
Bering wolffish	0.7	Harlequin rockfish	0.2	Searcher	0.1	---	0.*	Shortspine thornyhead	0.8
Number of hauls	75	Number of hauls	46	Number of hauls	9	Number of hauls	7	Number of hauls	137

CHIRIKOF AREA 1-100 m Species	CPUE	CHIRIKOF AREA 101-200 m Species	CPUE	CHIRIKOF AREA 201-300 m Species	CPUE	CHIRIKOF AREA 301-500 m Species	CPUE	CHIRIKOF AREA All depths Species	CPUE
Arrowtooth flounder	326.7	Arrowtooth flounder	376.2	Arrowtooth flounder	572.7	Giant grenadier	193.3	Arrowtooth flounder	381.6
Walleye pollock	119.3	Walleye pollock	95.3	Sablefish	91.0	Rougheye rockfish	93.0	Walleye pollock	97.9
Pacific cod	83.5	Pacific cod	77.6	Walleye pollock	67.9	Shortspine thornyhead	24.0	Pacific halibut	70.2
Pacific halibut	61.7	Pacific halibut	31.5	Pacific cod	34.3	Shortraker rockfish	23.9	Sablefish	40.9
Flathead sole	30.9	Flathead sole	22.7	Rex sole	31.4	Sablefish	22.7	Flathead sole	23.8
Rock sole	20.2	Rex sole	17.5	Dover sole	28.2	Dover sole	12.0	Sablefish	21.9
Dover sole	9.7	Pacific ocean perch	13.7	Pacific ocean perch	19.4	Arrowtooth flounder	8.7	Rex sole	14.3
Pacific herring	7.8	Sablefish	12.5	Pacific halibut	17.9	Rex sole	2.6	Dover sole	12.2
Rex sole	4.8	Dover sole	7.4	Flathead sole	12.7	Walleye pollock	0.8	Rock sole	9.7
Longnose skate	3.2	Northern rockfish	5.9	Eulachon	8.6	Darkfin sculpin	0.7	Pacific ocean perch	8.7
Yellowfin sole	3.0	Salmon shark	4.7	Bigmouth sculpin	6.3	Pacific ocean perch	0.3	Giant grenadier	5.0
Big skate	2.8	Eulachon	3.6	Rougheye rockfish	3.9	Sharpchin rockfish	0.*	Rougheye rockfish	4.6
Alaska plaice	2.2	Rock sole	3.1	Pacific sleeper shark	2.2	Blackfin sculpin	0.*	Pacific herring	3.4
Rougheye rockfish	2.2	Longnose skate	1.8	Aleutian skate	1.7	Northern rockfish	0.*	Eulachon	3.1
Salmon shark	1.3	Big skate	1.8	Longnose skate	1.4	Blackfin poacher	0.*	Northern rockfish	2.5
Butter sole	1.0	Bigmouth sculpin	1.8	Shortspine thornyhead	1.3	Northern smoothtongue	0.*	Salmon shark	2.3
Eulachon	0.5	Rougheye rockfish	1.5	Harlequin rockfish	1.3	Bigmouth sculpin	0.*	Longnose skate	2.3
Kelp greenling	0.5	Dusky rockfish	1.4	Prowfish	1.3	--		Bigmouth sculpin	2.0
Chinook salmon	0.5	Prowfish	1.0	Northern rockfish	1.1	--		Big skate	1.9
Bigmouth sculpin	0.4	Pacific herring	0.3	Bering skate	0.5	--		Yellowfin sole	1.3
Number of hauls	29	Number of hauls	106	Number of hauls	16	Number of hauls	4	Number of hauls	155

0.* = values greater than 0, but less than 0.05.

Table 3 (cont.)

KODIAK AREA 1-100 m Species	CPUE	KODIAK AREA 101-200 m Species	CPUE	KODIAK AREA 201-300 m Species	CPUE	KODIAK AREA 301-500 m Species	CPUE	KODIAK AREA All depths Species	CPUE
Arrowtooth flounder	98.7	Arrowtooth flounder	326.5	Walleye pollock	222.9	Rougheye rockfish	102.4	Arrowtooth flounder	206.0
Walleye pollock	80.6	Walleye Pollock	190.4	Arrowtooth flounder	172.6	Shortraker rockfish	21.0	Walleye pollock	144.0
Pacific halibut	57.3	Sablefish	43.7	Sablefish	122.2	Giant grenadier	18.9	Pacific halibut	39.3
Flathead sole	51.1	Northern rockfish	35.8	Pacific halibut	17.5	Dover sole	16.8	Sablefish	35.5
Rock sole	34.3	Pacific cod	33.9	Pacific ocean perch	15.9	Shortspine thornyhead	15.4	Flathead sole	31.7
Pacific cod	28.0	Pacific halibut	31.3	Dover sole	12.1	Arrowtooth flounder	13.2	Pacific cod	27.8
Butter sole	8.7	Dover sole	27.0	Pacific cod	11.1	Sablefish	11.3	Northern rockfish	16.0
Spiny dogfish	7.1	Flathead sole	22.3	Rex sole	11.0	Walleye pollock	6.3	Rock sole	15.2
Yellowfin sole	4.8	Rex sole	22.2	Flathead sole	8.5	Pacific ocean perch	6.0	Dover sole	14.7
Starry flounder	3.8	Dusky rockfish	9.2	Shortspine thornyhead	5.2	Rex sole	2.6	Rex sole	12.4
Rougheye rockfish	3.5	Harlequin rockfish	7.3	Rougheye rockfish	4.1	Bigmouth sculpin	1.6	Rougheye rockfish	7.4
Big skate	3.3	Pacific ocean perch	7.2	Eulachon	2.9	Blackfin sculpin	1.4	Pacific ocean perch	5.3
Sablefish	3.1	Eulachon	6.3	Salmon shark	2.7	Sharpchin rockfish	0.1	Spiny dogfish	4.4
Rex sole	2.9	Rougheye rockfish	5.3	Spiny dogfish	2.2	Flathead sole	0.1	Dusky rockfish	4.2
Dover sole	1.8	Spiny dogfish	2.9	Bigmouth sculpin	2.1	Northern lampfish	0.*	Butter sole	3.5
Yellow irish lord	1.2	Rock sole	2.7	Bering skate	1.0	Shortfin eelpout	0.*	Eulachon	3.5
Kelp greenling	0.9	Salmon shark	1.9	Dusky rockfish	0.6	Sturgeon poacher	0.*	Harlequin rockfish	3.2
Eulachon	0.9	Sharpchin rockfish	1.8	Longnose skate	0.6	--	-.-	Yellowfin sole	1.9
Great sculpin	0.7	Longnose skate	1.6	Smooth lumpsucker	0.4	--	-.-	Starry flounder	1.5
Alaska plaice	0.5	Prowfish	0.9	Prowfish	0.3	--	-.-	Big skate	1.4
Number of hauls	51	Number of hauls	129	Number of hauls	30	Number of hauls	6	Number of hauls	216

ALL AREAS 1-100 m Species	CPUE	ALL AREAS 101-200 m Species	CPUE	ALL AREAS 201-300 m Species	CPUE	ALL AREAS 301-500 m Species	CPUE	ALL AREAS All depths Species	CPUE
Arrowtooth flounder	141.2	Arrowtooth flounder	326.9	Arrowtooth flounder	334.1	Giant grenadier	71.1	Arrowtooth flounder	226.4
Walleye pollock	97.9	Walleye Pollock	147.1	Walleye pollock	134.8	Rougheye rockfish	65.6	Walleye pollock	117.0
Pacific cod	56.0	Pacific cod	50.0	Sablefish	95.9	Shortspine thornyhead	15.8	Pacific cod	48.1
Pacific halibut	52.3	Pacific halibut	31.7	Pacific cod	21.3	Shortraker rockfish	15.3	Pacific halibut	40.0
Flathead sole	38.3	Sablefish	28.9	Rex sole	20.6	Dover sole	12.6	Flathead sole	28.1
Rock sole	34.9	Northern rockfish	25.3	Pacific ocean perch	20.2	Sablefish	12.4	Sablefish	22.4
Yellowfin sole	14.9	Flathead sole	22.7	Dover sole	18.0	Arrowtooth flounder	8.0	Rock sole	19.1
Atka mackerel	7.4	Rex sole	18.1	Pacific halibut	16.0	Walleye pollock	3.0	Northern rockfish	12.3
Northern rockfish	6.2	Dover sole	16.8	Flathead sole	9.6	Pacific ocean perch	2.6	Rex sole	10.2
Butter sole	3.7	Pacific ocean perch	14.5	Eulachon	5.2	Rex sole	1.9	Dover sole	10.0
Dover sole	3.0	Dusky rockfish	5.9	Rougheye rockfish	4.2	Bigmouth sculpin	0.7	Pacific ocean perch	8.0
Spiny dogfish	2.6	Rock sole	5.4	Bigmouth sculpin	3.8	Blackfin sculpin	0.7	Yellow fin sole	7.4
Rex sole	2.5	Eulachon	4.5	Shortspine thornyhead	3.7	Pacific grenadier	0.4	Rougheye rockfish	4.7
Yellow irish lord	2.4	Harlequin rockfish	3.9	Salmon shark	1.2	Darkfin sculpin	0.2	Atka mackerel	3.6
Big skate	1.9	Rougheye rockfish	3.3	Spiny dogfish	1.0	Pacific cod	0.1	Eulachon	2.4
Pacific herring	1.9	Salmon shark	2.4	Pacific sleeper shark	1.0	Blacktail snailfish	0.1	Dusky rockfish	2.4
Rougheye rockfish	1.9	Spiny dogfish	1.5	Longnose skate	0.9	Shortfin eelpout	0.1	Giant grenadier	2.3
Starry flounder	1.8	Longnose skate	1.4	Aleutian skate	0.7	Sharpchin rockfish	0.1	Spiny dogfish	2.0
Alaska plaice	1.4	Bigmouth sculpin	1.1	Prowfish	0.7	Bering skate	0.*	Butter sole	1.8
Longnose skate	1.2	Sharpchin rockfish	0.9	Bering skate	0.7	Flathead sole	0.*	Harlequin rockfish	1.5
Number of hauls	155	Number of hauls	281	Number of hauls	55	Number of hauls	17	Number of hauls	508