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Juvenile Flatfish Survey of M/V Nucleus in Hecate Strait, August 11-25, 1980

M. Stocker, J. Fargo, W. R. Harling, and S. E. MacLellan

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Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

August 1981

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August 1981

JUVENILE FLATFISH SURVEY OF M/V NUCLEUS IN HECATE STRAIT,
AUGUST 11-25, 1980

by

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ABSTRACT

Stocker, M., J. Fargo, W. R. Harling, and S. E. MacLellan. 1980. Juvenile flatfish survey of M/V NUCLEUS in Hecate Strait, August 11-25, 1980. Can. Data. Rep. Fish. Aquat. Sci. 297: iii + 150 p.

The Pacific Biological Station conducted a trawl survey of Hecate Strait in August of 1980. The purpose of the survey was to assess the relative abundance of juvenile rock sole and English sole, and to collect biological samples. This report presents results of the survey regarding sample locations, catch rates, and biological data collected. Catch rates of juvenile rock sole and English sole were highest in the 20-50 fm depth range.

Key words: survey, abundance, rock sole, English sole, Hecate Strait

RÉSUMÉ

Stocker, M., J. Fargo, W. R. Harling, and S. E. MacLellan. 1980. Juvenile flatfish survey of M/V NUCLEUS in Hecate Strait, August 11-25, 1980. Can. Data. Rep. Fish. Aquat. Sci. 297: iii + 150 p.

En août 1980, la Station de biologie du Pacifique a effectué un levé par chalutage dans le détroit d'Hécate. Le levé avait pour but d'évaluer l'abondance relative de jeunes soles du Pacifique et de jeunes plies grands-pères et de récolter des spécimens biologiques. Le présent rapport présente les résultats du levé ayant trait aux endroits d'échantillonnage, aux taux de capture, ainsi qu'aux données biologiques recueillies. Les taux de capture les plus élevés de jeunes soles du Pacifique et de jeunes plies grands-pères furent enregistrés à des profondeurs variant entre 20 et 50 brasses.

Mots-clés: levé, abondance, sole du Pacifique, plie grand-père, détroit d'Hécate.

INTRODUCTION

Hecate Strait has supported an active fishery for rock sole (Lepidopsetta bilineata) since the mid 1940s. A fishery for English sole (Parophrys vetulus) primarily in northern Hecate Strait (Area 5D), has been active over this time period as well. Both fisheries have shown characteristic fluctuations in catch and effort over their histories. The extent that recruitment is associated with these fluctuations is little understood.

During August 1980, a flatfish survey was conducted in Hecate Strait. Rock sole and English sole juveniles were the principal targets of this stratified-random trawl survey. The purpose of the survey was to estimate relative abundance for juveniles (young-of-year through 4 yr olds) of both these species. Abundance indices from a series of consecutive years can be used to estimate mortality rates for juveniles and predict recruitment to the Hecate Strait fisheries.

Survey design along with haul locations, catch information, and biological and oceanographic data summaries are presented in this report. Analysis of data and detailed results will be the subject of subsequent reports.

VESSEL AND GEAR

The M/V NUCLEUS, a 20-m (65-ft) steel-hulled stern trawler was the vessel chartered for the survey.

The net used for sampling was a 21.3-m (70-ft) Gulf semi-balloon shrimp trawl (Fig. 1). The groundline differed from those of conventional shrimp trawls to enable the fishing of rough bottom. The groundline consisted of 5/8 x 6 x 24 cable in 3 sections. Wing sections were packed with 7.6-cm (3-in) rubber discs while the bosom section contained 15.2-cm (6-in) rubber discs. The groundline was fastened to the footrope with 25.4-cm (10-in) chain beackets. The shrimp net was fished with 27.4-m (15-fm) sweep lines.

The vessel net used for comparative fishing was a Skagen trawl rigged for fishing flatfish. A 3.8-cm (1.5-in) codend liner was used in the Skagen net. The sweeps for the Skagen net were 91.4 m (50 fm). Both nets were fished with the vessel's 2.7 x 1.4-m (9 x 4.5-ft) wooden doors.

SURVEY DESIGN

A grid of numbered squares of 5 min. latitude by 5 min. longitude was applied to the survey area in Hecate Strait. The survey area itself was divided into four depth strata based on previous biological information (Forrester 1969; Thomson and Forrester 1969) and information from previous flatfish surveys conducted in Hecate Strait (Ketchen 1956). Depth ranges of 0-18.3 m, 19-36.6 m, 37-91.4 m, and 92-182.9 m (0-10 fm, 11-20 fm, 21-50 fm, and 51-100 fm) contained the four strata.

Each stratum was weighted for sampling effort according to procedure outlined in Mackett, 1973. Densities for five age classes (ages 0-4) of juvenile rock sole and English sole in each stratum were rated as excellent, good, fair, poor or none based on results from two previous surveys (Ketchen, unpubl. data). Life history information and commercial fisheries data for the two species were also used as criteria for the ratings. A numerical value of 0-4 was associated with the ratings from none to excellent. In this manner each stratum was assigned a specific density rating with regard to five age classes of juvenile rock sole and English sole. A relative weighting for effort in each stratum was achieved by treating the density rating for each stratum as a percent of the density rating for the entire survey area.

After taking into account time limits for the survey and the total area to be covered, a total of 90 hauls was considered a maximum number for the survey. These 90 sampling locations were divided among the strata by using the relative density ratings for each stratum.

Selecting of the sampling stations involved applying the random number generator on a Xerox 530 computer to the numbered grid of the survey area. Location of hauls within each selected grid was left to the captain of the charter vessel, and often was a function of bottom type.

HAUL LOCATIONS AND SAMPLING

A total of 86 hauls were made during the survey (Fig. 2). Bridge log information and catch data by haul is contained in Appendix Table 1.

Haul durations were kept short (15-20 min) so that the entire catch could be placed in tubs and weighed. If the catch was too large for sampling total catch, procedure outlined by Westrheim (1967) was followed and representative subsamples were used. A list of biological samples taken during the cruise is contained in Table 1. Oceanographic data is summarized in Appendix Table 2. A list of species caught on the survey is contained in Appendix Table 3.

RESULTS

Rock sole comprised 31.3% of the total flatfish catch on the survey while English sole represented 23.5% of the total. Catch rates for juveniles of both species were highest in stratum 3 (21-50 fm). A summary of catch rates by depth strata is contained in Table 2. There was considerable variability in catch rates from different locations within each stratum.

Length frequencies for pre-recruit rock sole (ages 1-4) and English sole (ages 0-3) by depth stratum are contained in Fig. 3 and 4, respectively. Rock sole show little stratification at age with respect to depth, though slightly greater percentages of 1-yr-old fish ($\bar{x} \approx 10$ cm) were encountered in strata 1 (0-10 fm) and 2 (11-20 fm) as opposed to stratum 3 (21-50 fm). Catch rates for rock sole juveniles were higher in stratum 3 than in strata 1 and 2 combined.

English sole did show some stratification at age with respect to depth. In stratum 1, young-of-year fish ($\bar{x} \approx 10$ cm) predominated with lower concentrations of 1-yr-olds ($\bar{x} \approx 16$ cm). In stratum 2, 1-yr-olds were encountered in slightly greater numbers than young-of-year fish. Catch rates for both young-of-year and 1-yr-old fish were highest in stratum 2. In stratum 3, English sole juveniles aged 1-4 were encountered along with adult fish. Few juveniles of either species were encountered in stratum 4.

Length frequency summaries for rock sole and English sole juveniles are contained in Fig. 5 and 6. The most abundant rock sole age group were 2-yr-olds. One-year-old English sole were most abundant. Gear efficiency may be accountable for the lack of presence of very young fish of both species.

Length frequency data by haul are contained in Appendix Tables 4-11.

Maturity states were examined for 557 rock sole and 331 English sole (Tables 3, 4). Rock sole males were 100% mature at a length of 34 cm while females were 100% mature at 37 cm. English sole males were 100% mature at 31 cm while females were 100% mature at a length of 39 cm. Previous studies in Hecate Strait show English sole males 50% mature at 26 cm while females were 50% mature at 30 cm (Ketchen 1947). A study of rock sole in north Hecate Strait showed males 100% mature at 35 cm while females were 100% mature at 38 cm (Thomson and Forrester 1969).

Dogfish stomach contents were examined in an effort to determine predation on juvenile flatfish (Table 5). Flatfish species accounted for only 1.7% of the total species occurrences in stomachs of 161 feeding dogfish. Similar results with respect to flatfish have been obtained in studies on Dogfish Bank in 1977, 1978 (Beamish, Unpubl. data).

ACKNOWLEDGMENTS

We wish to extend our thanks to Captain Cliff Keeping and crewmen Les Edwards, Ray Fitzpatrick, and Bob Surphlis of the M/V NUCLEUS. Their cooperation aboard the vessel is appreciated.

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NET DIMENSIONS AND CHARACTERISTICS FOR BOTTOM TRAWL

VESSEL NUCLEUS NET 70' Gulf semi-balloon shrimp trawl

OBSERVATION PERIOD August 11-25, 1980

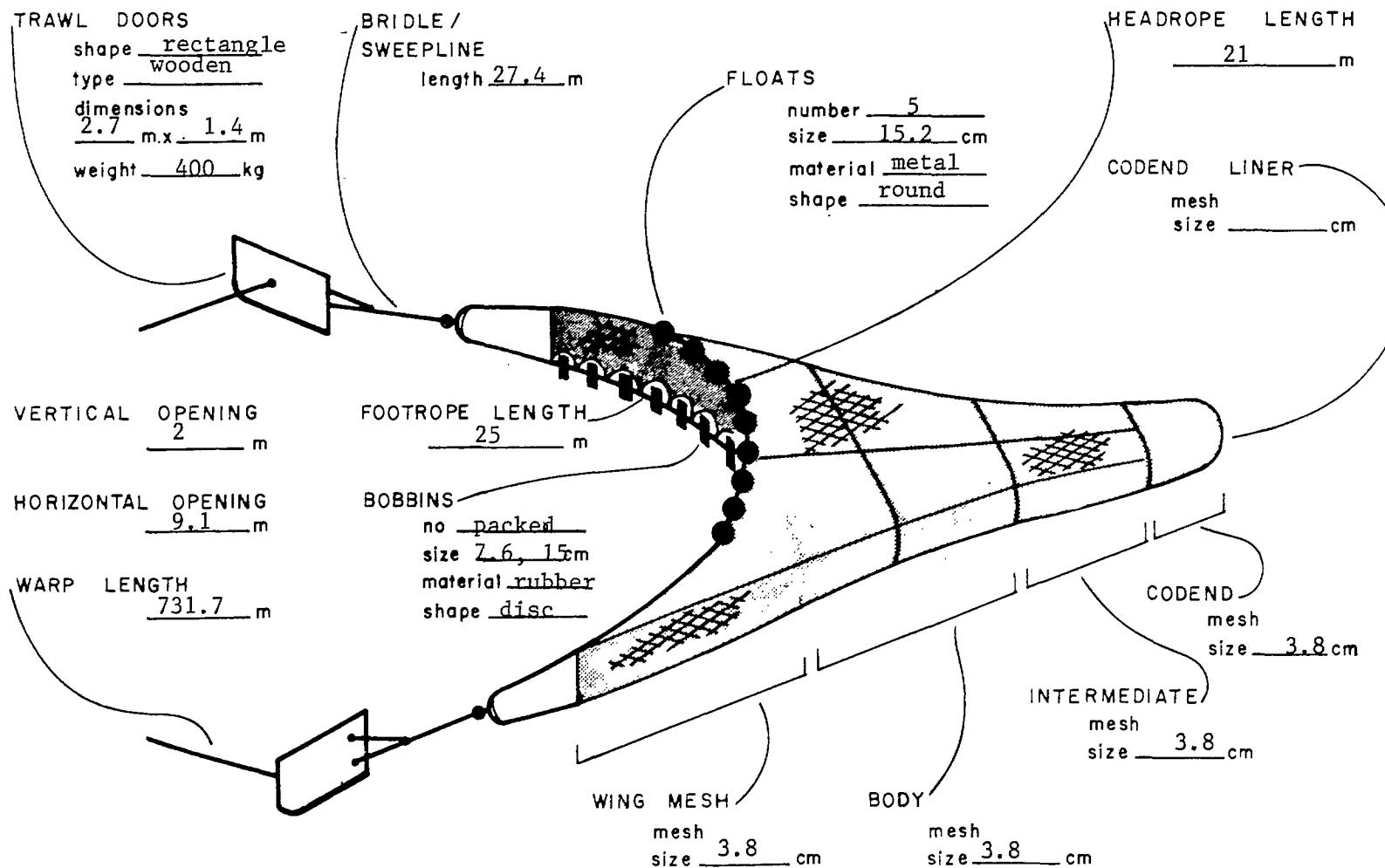
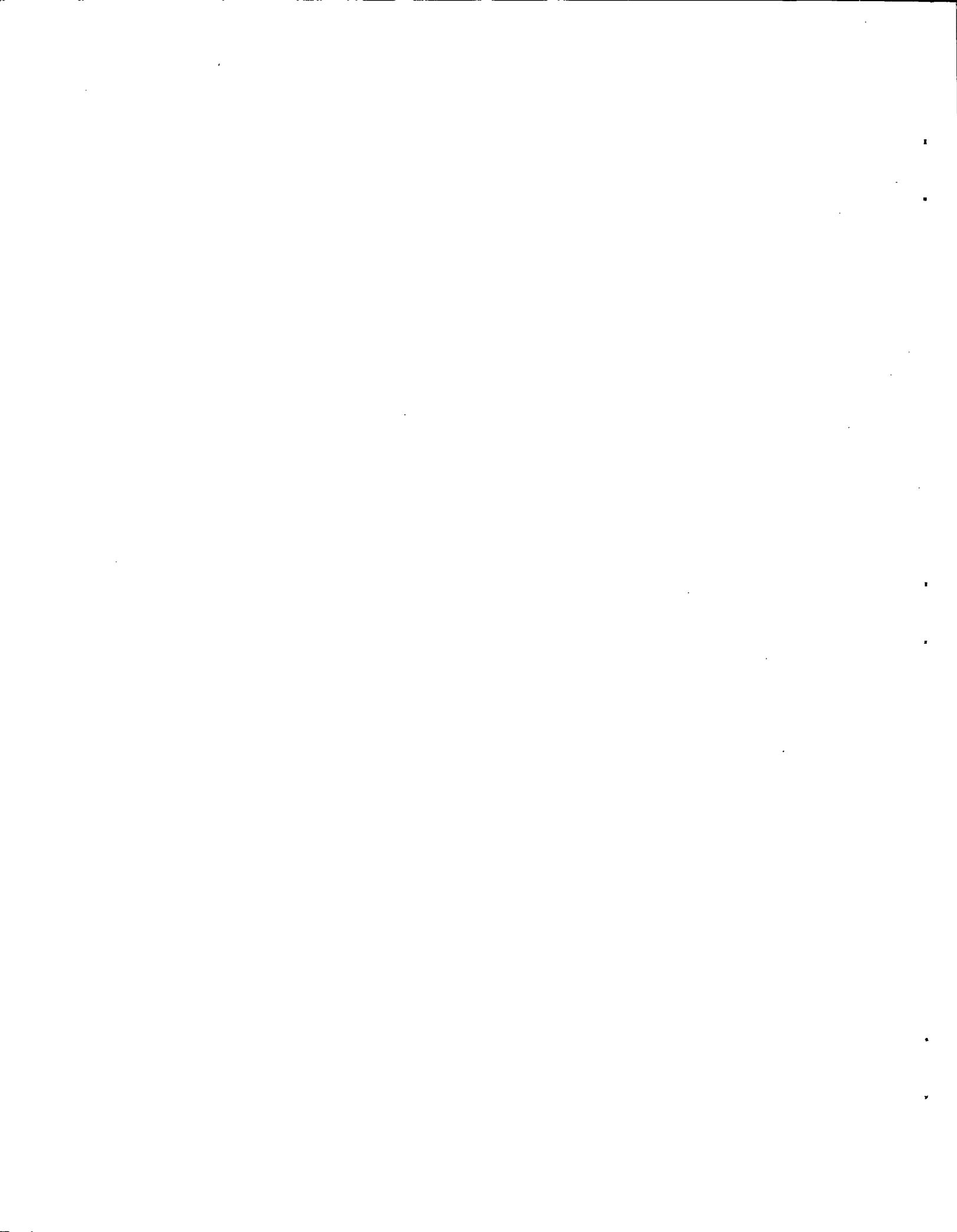


Fig. 1.



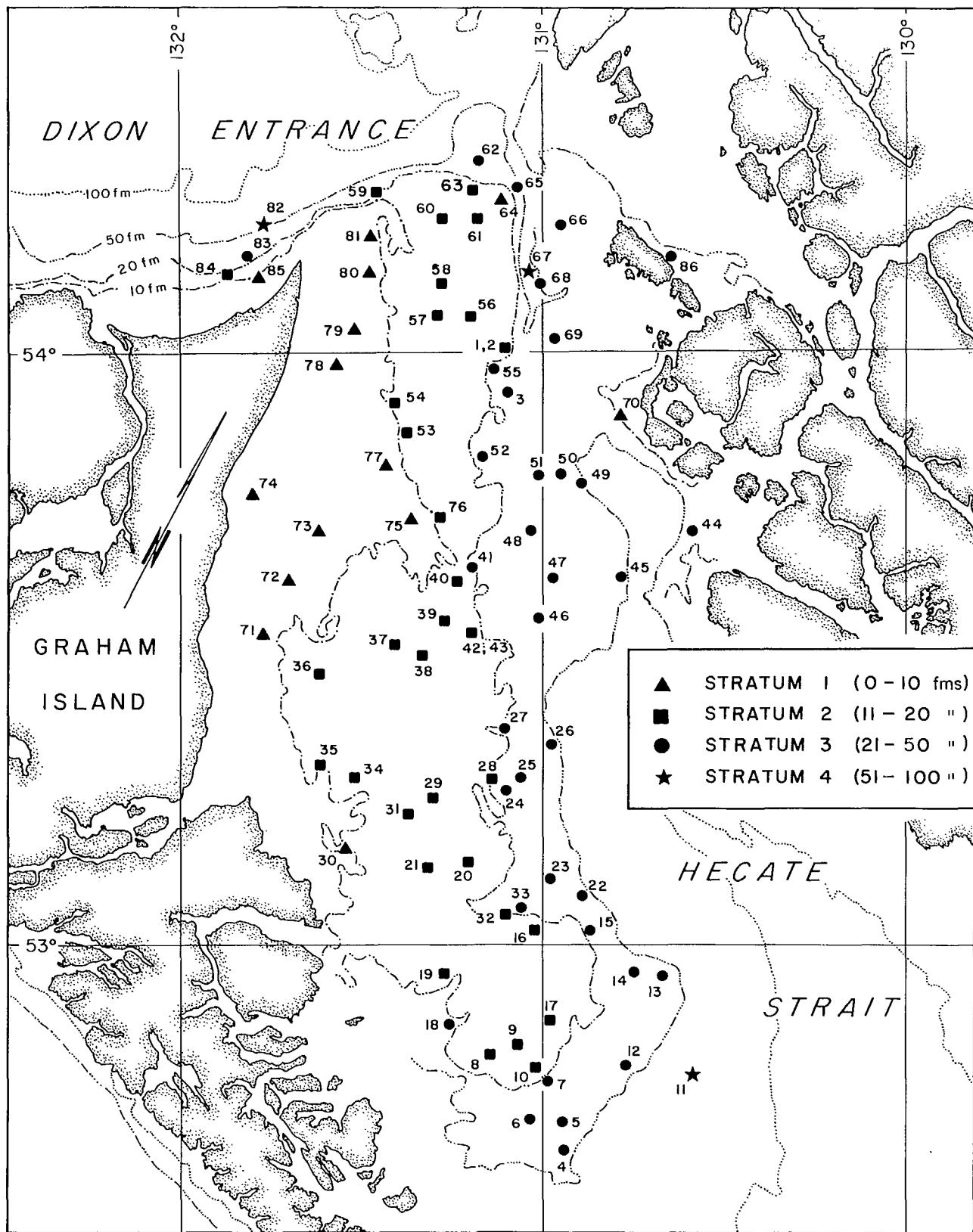
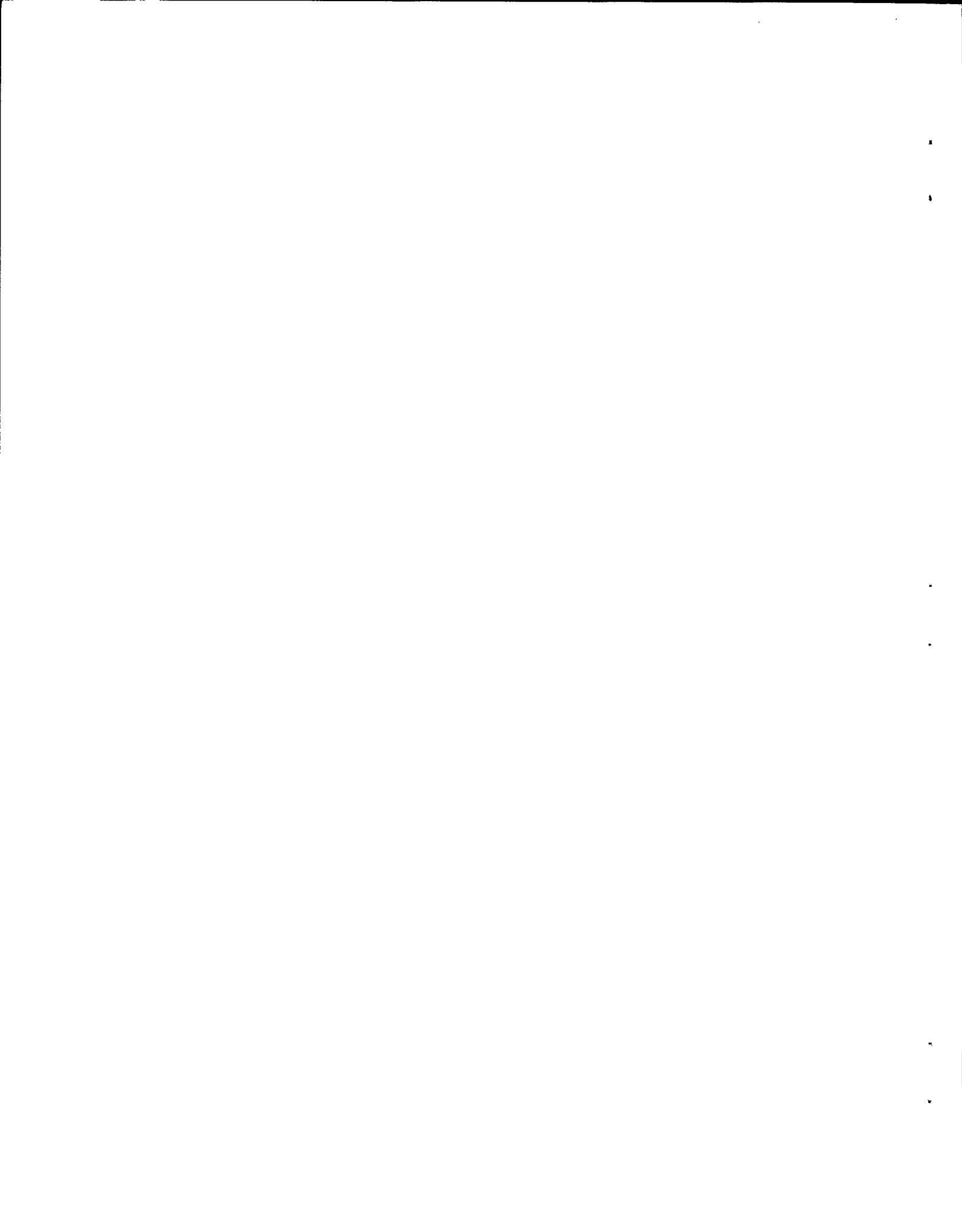


Fig. 2. Haul locations for M/V NUCLEUS flatfish survey, August 11-25, 1980.



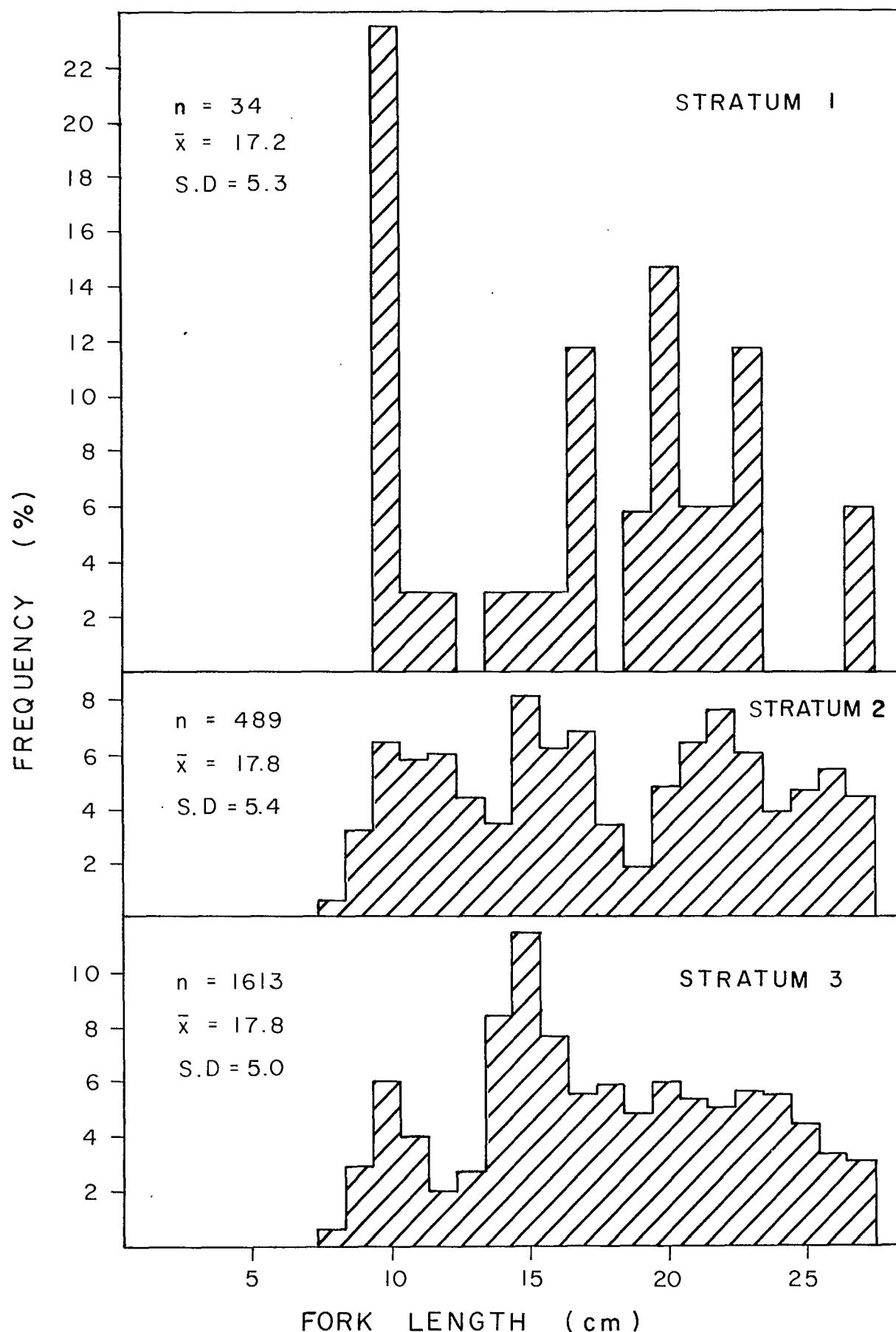
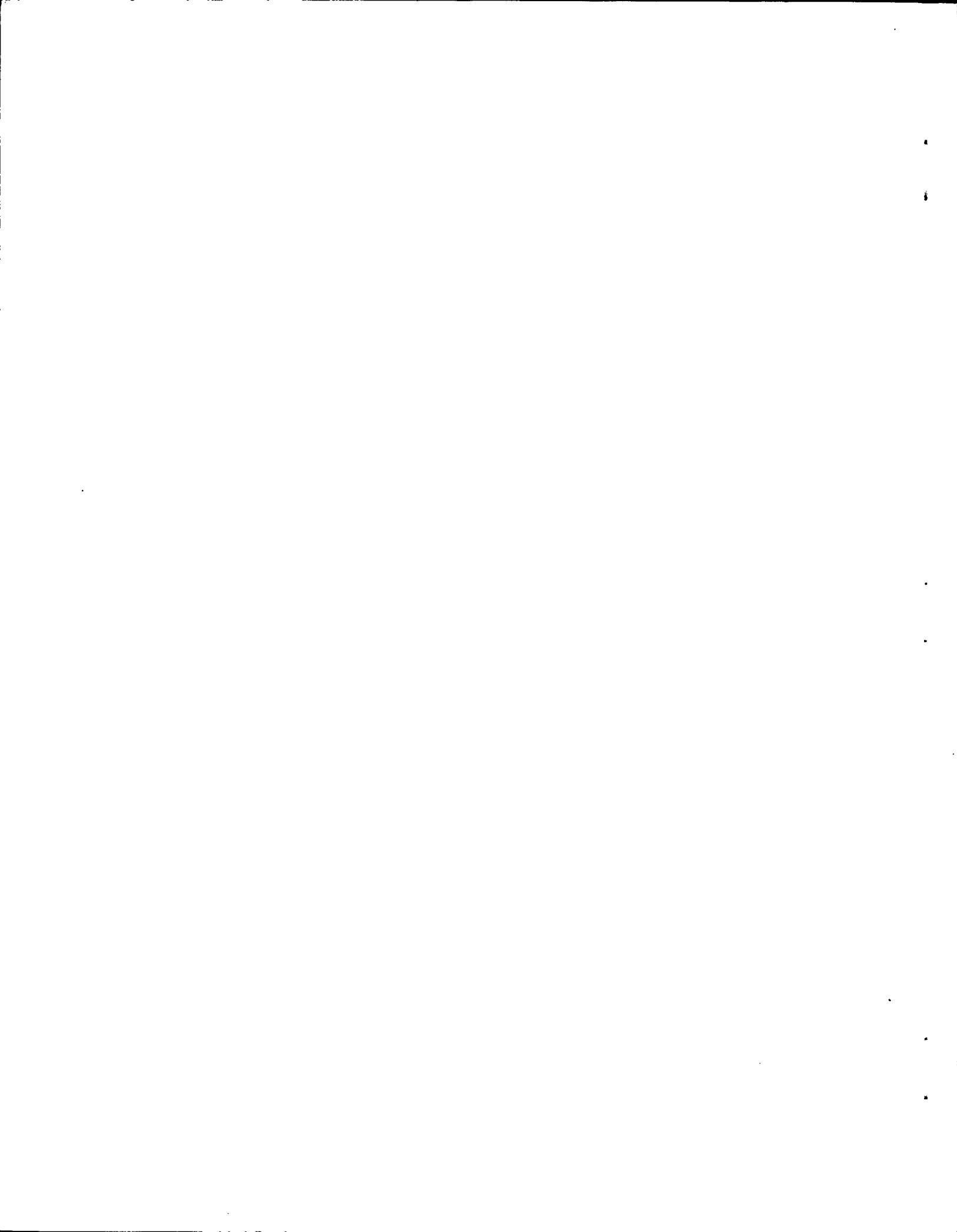
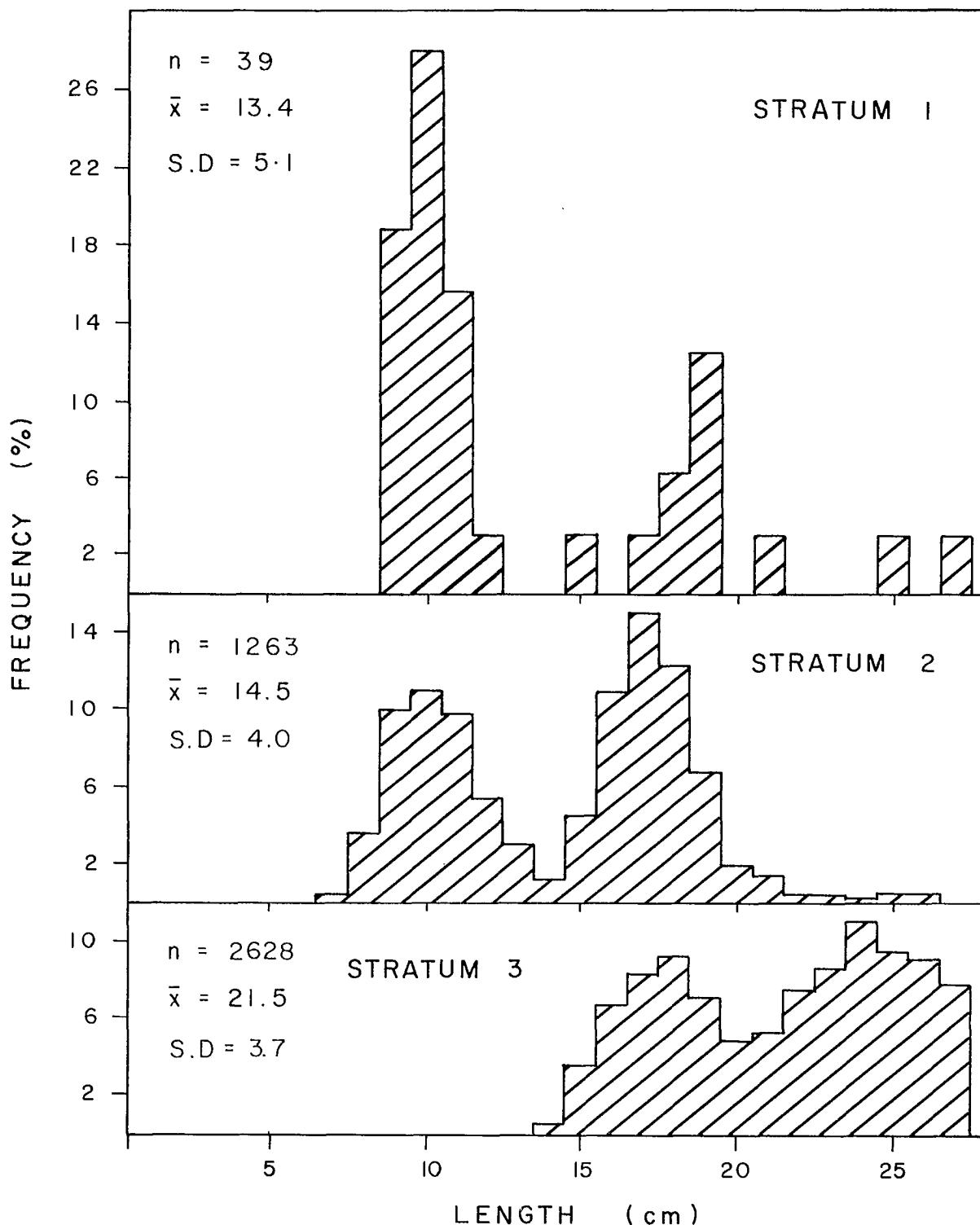
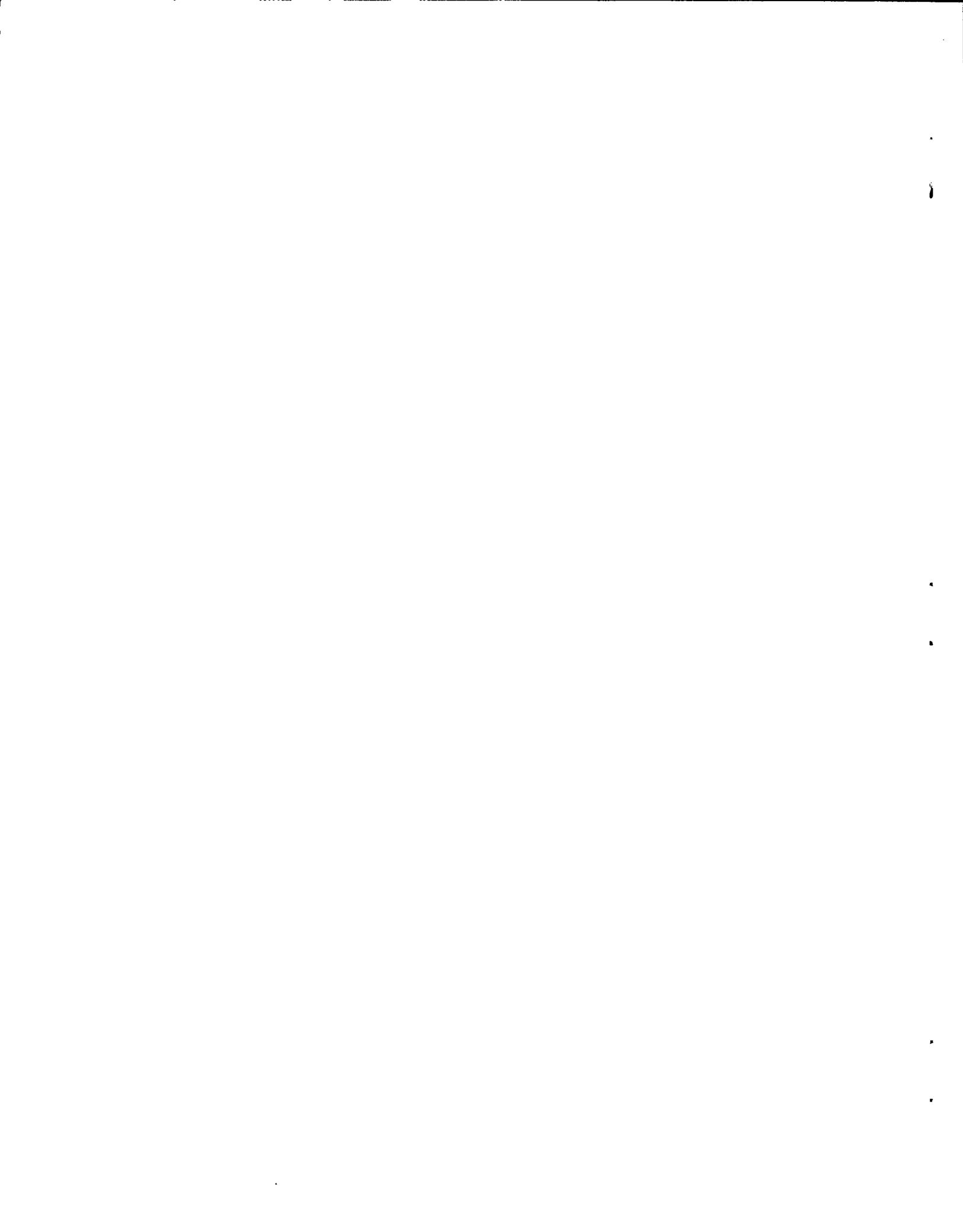


Fig. 3. Juvenile rock sole length frequencies by depth stratum (sexes combined).







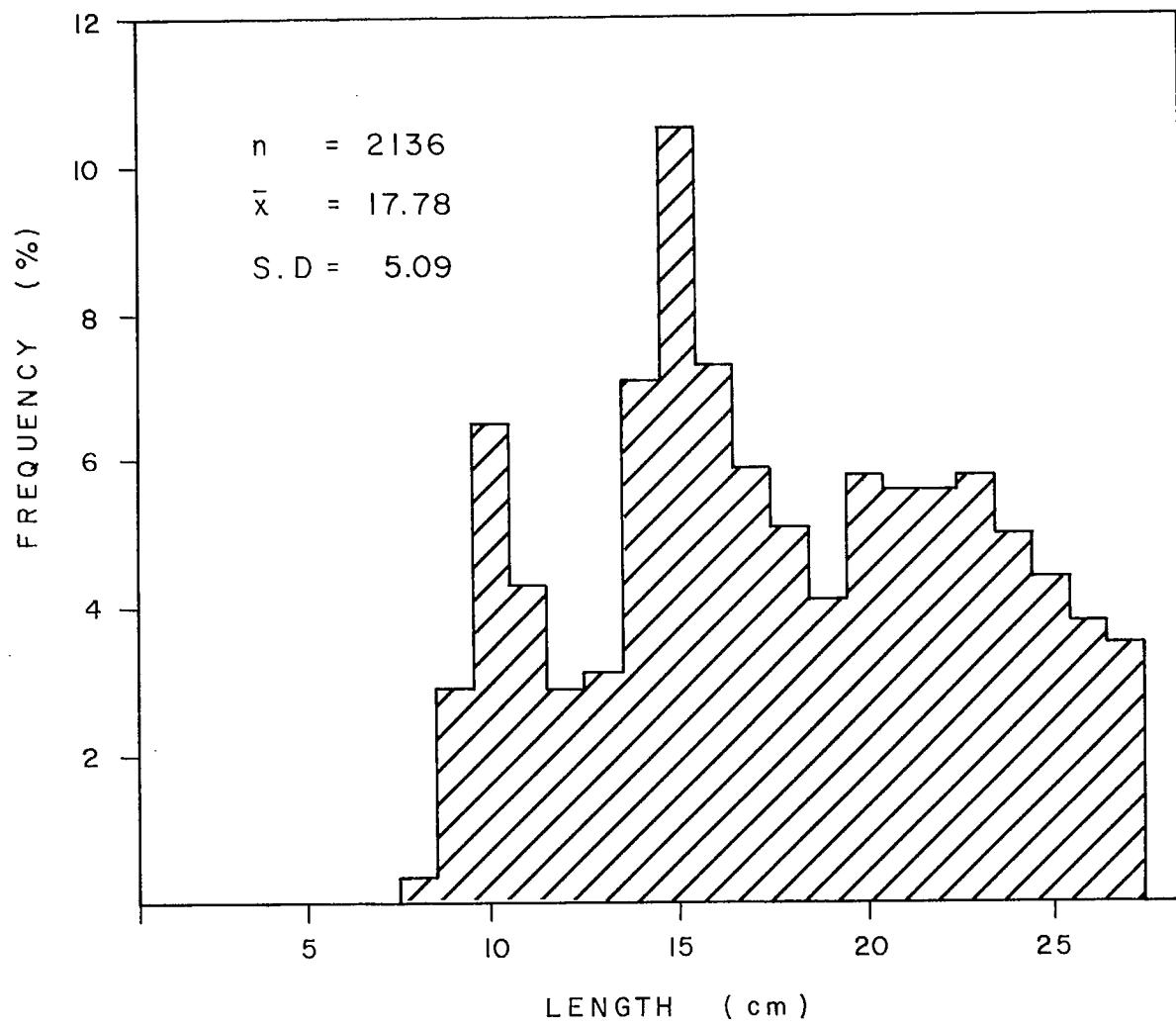
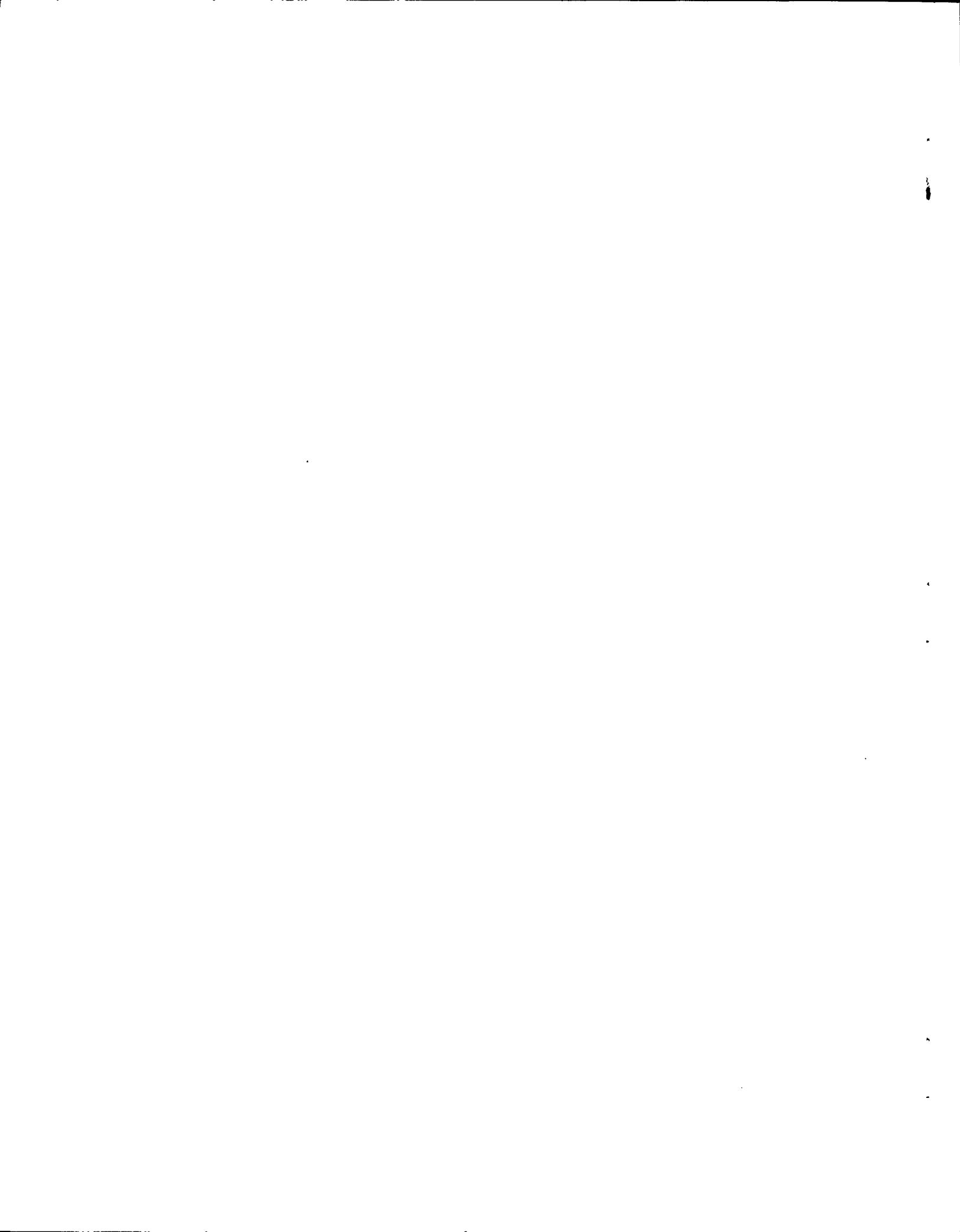


Fig. 5. Juvenile rock sole length frequencies (all strataums, sexes combined).



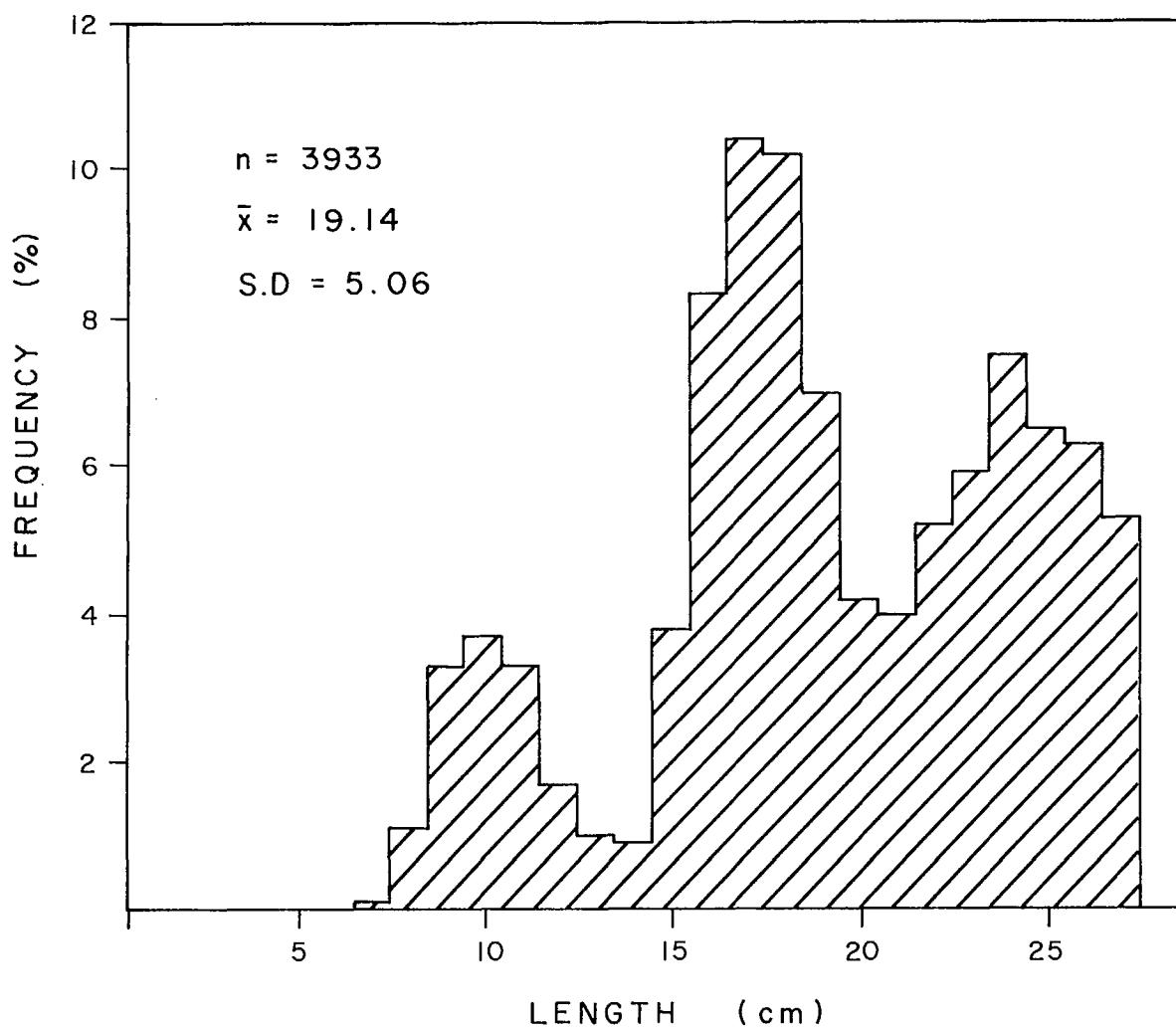


Fig. 6. Juvenile English sole length frequencies (all strataums, sexes combined).

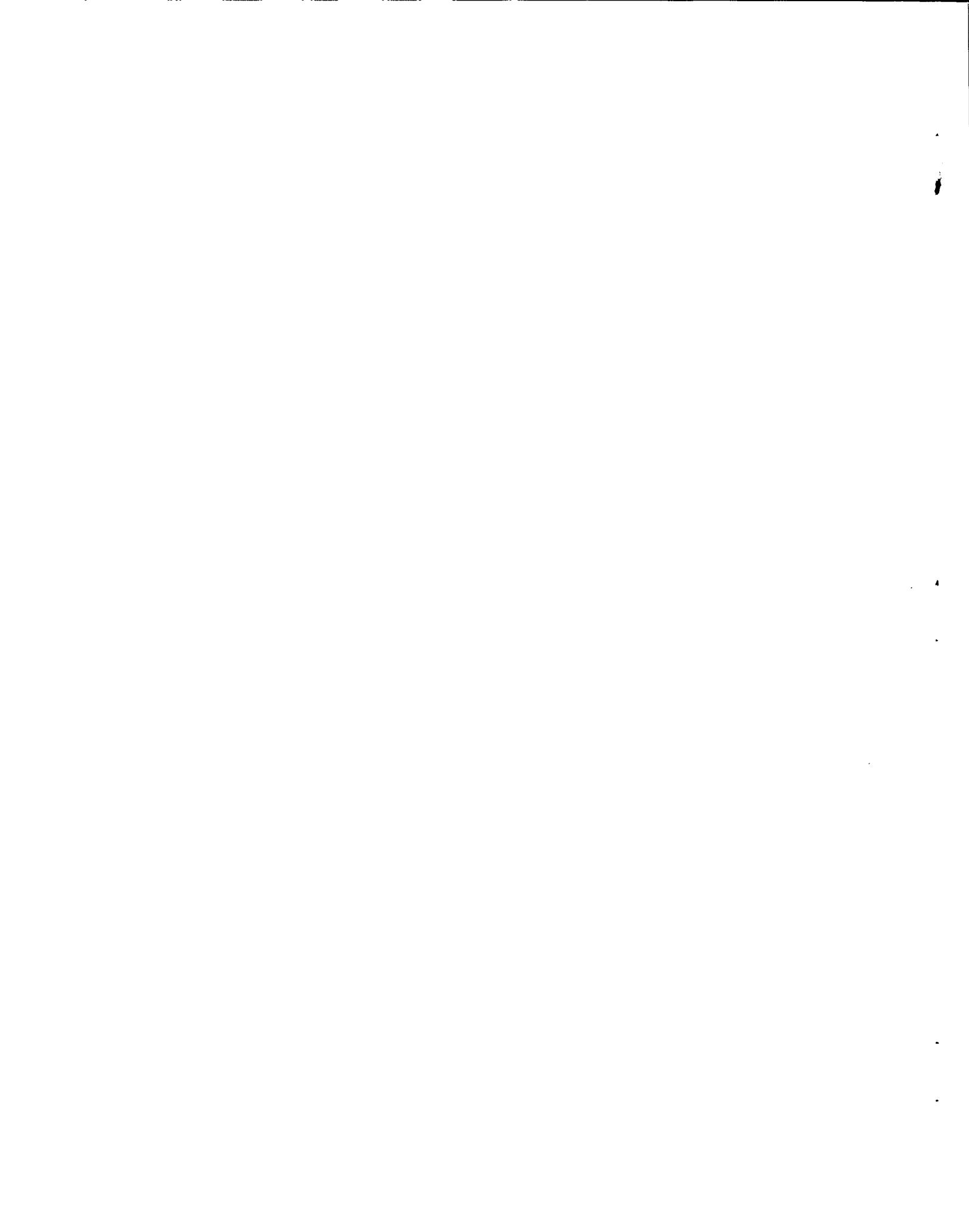


Table 1. Biological samples collected on M/V NUCLEUS flatfish survey,
August 11-25, 1980.

Species	Len-sex	Len-sex-age	Len-sex-age-mat	Len-sex-mat-stom
Dover sole	401			
English sole	4761	236	331	
Petrale sole	12			
Rock sole	2677	308	557	
Turbot	97			
Pacific cod	901	350		
Lingcod	9			
<u>S. wilsoni</u>			80	
Pollock	86			
Dogfish				404

Table 2. M/V NUCLEUS catch rates for English sole and rock sole in Hecate Strait, August 11-25, 1980.

Depth stratum	Species	Mean catch rate (kg/h)	Mean Catch Rate (no./h) (no. < 30 cm)
1 (0-10 fm)	English sole	0.48	16
	rock sole	22.43	17
2 (11-20 fm)	English sole	7.36	237
	rock sole	25.75	82
3 (21-50 fm)	English sole	94.75	729
	rock sole	93.97	241
4 (50-100 fm)	English sole	42.75	27
	rock sole	180.00	9

Table 3. Rock sole size at maturity, Hecate Strait.

Total Length (cm)	Males			Females		
	Mature	Immature	% Mature	Mature	Immature	% Mature
11		1	0.0		1	0.0
12		1	0.0		3	0.0
13		2	0.0		1	0.0
14		3	0.0		2	0.0
15		9	0.0		9	0.0
16		8	0.0		11	0.0
17		5	0.0		8	0.0
18		13	0.0		8	0.0
19		9	0.0		12	0.0
20		15	0.0		15	0.0
21		17	0.0		17	0.0
22		9	0.0	1	23	4.2
23		8	0.0		16	0.0
24		9	0.0	1	15	6.2
25		6	0.0		16	0.0
26		4	0.0		4	0.0
27	3	1	75.0		1	0.0
28		3	0.0		8	0.0
29	3	1	75.0		4	0.0
30	7	1	87.5		6	0.0
31	11		100.0		9	0.0
32	9	2	81.8	3	5	37.5
33	1	1	50.0	5	2	71.4
34	4		100.0	8	7	53.3
35	4		100.0	14	1	93.3
36	6		100.0	8	2	80.0
37	4		100.0	14		100.0
38	2		100.0	5		100.0
39	1		100.0	11		100.0
40				19		100.0
41				10		100.0
42				16		100.0
43				12		100.0
44				8		100.0
45				7		100.0
46				7		100.0
47				3		100.0
48				6		100.0
49				2		100.0
50				3		100.0
51				1		100.0
52				4		100.0
Total	55	128		168	206	

Table 4. English sole size at maturity, Hecate Strait.

Total Length (cm)	Males			Females		
	Mature	Immature	% Mature	Mature	Immature	% Mature
16		3	0.0		2	0.0
17		4	0.0		2	0.0
18		8	0.0		3	0.0
19		2	0.0		3	0.0
20		7	0.0		4	0.0
21		7	0.0		6	0.0
22		13	0.0		7	0.0
23	1	15	6.3		11	0.0
24		14	0.0		20	0.0
25		16	0.0		15	0.0
26	3	11	21.4	1	17	5.6
27	4	5	44.4		17	0.0
28	4	1	80.0		16	0.0
29	4	1	80.0		16	0.0
30	7	1	87.5		5	0.0
31	3		100.0	1	9	10.0
32	4		100.0		6	0.0
33	2		100.0	1	6	14.3
34	1		100.0		1	0.0
35					3	0.0
36				1	2	33.3
37				2	1	66.7
38				3	1	75.0
39				4		100.0
40				1		100.0
41				2		100.0
42				1		100.0
43						
Total	33	108		17	173	

Table 5. M/V NUCLEUS dogfish stomach contents, South Hecate Strait, August 12, 1980.

Food item	# Occurrences	% Total
Stomach empty	243	57.6
Octopus	93	22.0
Fish remains	17	4.0
Herring	14	3.3
Euphausiids	8	1.9
Squid	7	1.7
Digested matter	7	1.7
Rockfish	5	1.2
Crab	5	1.2
Jellyfish	5	1.2
Sole	3	0.7
Salmon	3	0.7
Squat lobster	3	0.7
Needlefish	2	0.5
Sculpin	2	0.5
Anemone	2	0.5
Ratfish	1	0.2
Polychaete	1	0.2
Shell	1	0.2
Total	422	100.0

APPENDIX TABLE 1. FISHING LOG FOR M/V NUCLEUS FLATFISH SURVEY
 AUGUST 11-AUGUST 25, 1980.
 (SEE FOOTNOTES FOR EXPLANATION OF TERMS)

HAUL NO.		1	2	3	4	5
DATE		AUG 11	AUG 11	AUG 11	AUG 12	AUG 12
STRATUM		2	2	3	3	3
START TIME	(PDT)	1855	1940	2100	0800	0925
DURATION	(MIN)	20	20	20	18	15
START N. LAT. (DEG)		054	054	053	052	052
(MIN)		03.3	03.3	56.2	39.3	41.8
W. LONG. (DEG)		131	131	131	130	130
(MIN)		02.0	02.0	06.0	56.5	56.2
DIRECTION (DEG.TRUE)		240	150	140	170	180
FINISH N. LAT. (DEG)		054	054	053	052	052
(MIN)		00.1	00.1	55.2	38.5	41.5
W. LONG. (DEG)		131	131	131	130	130
(MIN)		08.1	08.1	05.1	57.1	57.3
HAUL DISTANCE (N.M.)		1.1	1.1	0.8	0.9	1.2
DEPTH (FATHOMS)		15- 19	15- 20	28- 30	44- 44	36- 36
(METERS)		27- 34	27- 36	51- 54	80- 80	65- 65
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	13.5	..
BOTTOM		..	..	..	9.3	..
DEPTH (METERS)		..	..	..	91	..
TYPE OF GEAR		6	3	6	6	6
TOTAL CATCH (KG)		141	143	269	354	486
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		1	2	3	4	5
DATE		AUG 11	AUG 11	AUG 11	AUG 12	AUG 12
STRATUM		2	2	3	3	3
TOTAL CATCH	(KG)	141	143	295	354	486
ARROWTOOTH FLOUNDER		T	T	5	--	--
BUTTER SOLE		--	--	T	--	--
CURLFIN SOLE		2	1	1	--	--
DOVER SOLE		T	--	13	T	--
ENGLISH SOLE		9	9	39	--	--
FLATHEAD SOLE		--	--	--	--	--
PACIFIC HALIBUT		18	10	6	28	--
PACIFIC SANDDAB		T	T	26	--	T
PETRALE SOLE		--	--	T	--	--
REX SOLE		--	--	T	--	--
ROCK SOLE		30	24	29	6	3
SAND SOLE		T	1	--	--	--
SPECKLED SANDDAB		--	T	26	--	--
STARRY FLOUNDER		--	--	--	--	--
YELLOWFIN SOLE		--	--	--	--	--
OTHER FLATFISH		--	--	--	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	21	3	--
S. MALIGER		--	--	4	18	15
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	4	5
S. WILSONI		--	--	--	5	3
OTHER ROCKFISH		--	--	--	T	T
GREENLINGS		--	--	--	--	T
LINGCOD		--	--	7	T	1
PACIFIC COD		T	--	13	--	--
SABLEFISH		--	--	T	--	--
SHINER PERCH		--	--	--	--	--
WALLEYE POLLACK		T	--	--	--	--
OTHER ROUNDfISH		T	--	T	T	--
RATFISH		4	28	57	141	11
SKATES		18	14*	--	--	--
SPINY DOGFISH		57	56	48	129	388
OTHER SELACHII		--	--	--	--	--
INVERTEBRATES		3	--	--	20	60

APPENDIX TABLE 1 CONTINUED

HAUL NO.		6	7	8	9	10
DATE		AUG 12	AUG 12	AUG 12	AUG 12	AUG 12
STRATUM		3	3	2	2	2
START TIME	(PDT)	1040	1140	1340	1445	1630
DURATION	(MIN)	3	20	15	15	15
START N. LAT. (DEG) (MIN)		052 42.5	052 46.2	052 49.2	052 50.0	052 47.2
W. LONG. (DEG) (MIN)		131 01.0	130 58.6	131 08.5	131 03.7	131 00.9
DIRECTION (DEG.TRUE)		320	210	050	060	350
FINISH N. LAT. (DEG) (MIN)		052 42.6	052 45.6	052 50.0	052 50.3	052 48.1
W.LONG. (DEG) (MIN)		131 01.1	131 00.2	131 08.0	131 02.6	131 01.0
HAUL DISTANCE (N.M.)		0.1	1.0	0.8	0.8	0.8
DEPTH (FATHOMS) (METERS)		28- 26 51- 47	22- 22 40- 40	15- 16 27- 29	17- 18 31- 32	19- 19 34- 34
WATER TEMP. (DEG.C)						
SURFACE		..	13.7	13.8	..	..
BOTTOM		..	13.6	13.2	..	..
DEPTH (METERS)		..	46	34	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		100	2500	100	1041	454
REMARKS		SNAG USABLE	USABLE	SNAG UNUSABLE	USABLE	SNAG USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		6	7	8	9	10
DATE		AUG 12	AUG 12	AUG 12	AUG 12	AUG 12
STRATUM		3	3	2	2	2
TOTAL CATCH	(KG)	100	2500	100	1041	454
ARROWTOOTH FLOUNDER		--	--	--	--	--
BUTTER SOLE		--	--	--	--	--
CURLFIN SOLE		--	--	--	--	--
DOVER SOLE		--	--	--	--	--
ENGLISH SOLE		--	--	--	--	--
FLATHEAD SOLE		--	--	--	--	--
PACIFIC HALIBUT		--	--	--	--	--
PACIFIC SANDDAB		--	--	--	--	--
PETRALE SOLE		--	--	--	--	--
REX SOLE		--	--	--	--	--
ROCK SOLE		--	--	T	T	--
SAND SOLE		--	--	--	--	--
SPECKLED SANDDAB		--	--	--	--	--
STARRY FLOUNDER		--	--	--	--	--
YELLOWFIN SOLE		--	--	--	--	--
OTHER FLATFISH		--	--	--	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	T	37	--
S. MALIGER		--	--	T	17	--
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	--	--
S. WILSONI		--	--	--	--	--
OTHER ROCKFISH		--	--	--	T	--
GREENLINGS		--	--	T	--	--
LINGCOD		--	--	--	--	--
PACIFIC COD		--	--	--	--	--
SABLEFISH		--	--	--	--	--
SHINER PERCH		--	--	--	--	--
WALLEYE POLLOCK		--	--	--	--	--
OTHER ROUNDfISH		T	--	--	T	--
RATFISH		--	--	--	--	--
SKATES		--	--	--	--	--
SPINY DOGFISH	100	2500*	100*	977	454*	
OTHER SELACHII	--	--	--	--	--	--
INVERTEBRATES	--	--	--	10	--	--

APPENDIX TABLE 1 CONTINUED

HAUL NO.		11	12	13	14	15
DATE		AUG 12	AUG 13	AUG 13	AUG 13	AUG 13
STRATUM		4	3	3	3	3
START TIME (PDT)		1910	2110	0650	1040	1230
DURATION (MIN)		10	20	15	15	15
START N. LAT. (DEG)		052	052	052	052	053
(MIN)		46.3	48.0	57.6	58.0	02.0
W. LONG. (DEG)		130	130	130	130	130
(MIN)		35.3	46.9	41.3	43.7	53.3
DIRECTION (DEG.TRUE)		060	260	240	190	330
FINISH N. LAT. (DEG)		052	052	052	052	053
(MIN)		46.3	47.7	57.2	58.1	03.0
W.LONG. (DEG)		130	130	130	130	130
(MIN)		34.8	48.5	42.6	42.1	54.1
HAUL DISTANCE (N.M.)		0.3	1.0	0.9	1.0	1.1
DEPTH (FATHOMS)		70- 70	42- 39	30- 29	32- 32	20- 22
(METERS)		128-128	76- 71	54- 53	58- 58	36- 40
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	13.3	..
BOTTOM		..	..	..	7.6	..
DEPTH (METERS)		..	..	..	85	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		..	200	173	274	181
REMARKS		SNAG USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		11	12	13	14	15
DATE		AUG 12	AUG 13	AUG 13	AUG 13	AUG 13
STRATUM		4	3	3	3	3
TOTAL CATCH	(KG)	0	209	173	274	181
ARROWTOOTH FLOUNDER	..	T	..	..	..	..
BUTTER SOLE
CURLFIN SOLE	..	3	..	..	..	..
DOVER SOLE	..	T	..	..	..	..
ENGLISH SOLE	..	51	..	..	..	..
FLATHEAD SOLE
PACIFIC HALIBUT	..	20	56	30	1	..
PACIFIC SANDDAB	..	9	..	T	T	..
PETRALE SOLE	3	..	..
REX SOLE	..	3	..	..	..	..
ROCK SOLE	..	74	77	35	70	..
SAND SOLE
SPECKLED SANDDAB	..	9	..	..	..	..
STARRY FLOUNDER
YELLOWFIN SOLE
OTHER FLATFISH
S. BREVISPINIS
S. CAURINUS
S. MALIGER
S. NEBULOSUS
S. PAUCISPINIS
S. PINNIGER
S. PRORIGER
S. WILSONI
OTHER ROCKFISH
GREENLINGS
LINGCOD	6	..	..	..
PACIFIC COD	..	2	..	68	..	..
SABLEFISH
SHINER PERCH
WALLEYE POLLACK	..	2	..	..	..	..
OTHER ROUND FISH	..	T	T	T	..	..
RATFISH	..	10	5	T	..	..
SKATES	19	136*	100*	..
SPINY DOGFISH	..	26	7	2	10*	..
OTHER SELACHII
INVERTEBRATES	3	..	T	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		16	17	18	19	20
DATE		AUG 13	AUG 13	AUG 13	AUG 13	AUG 14
STRATUM		2	2	3	2	2
START TIME	(PDT)	1345	1647	1935	2135	0830
DURATION	(MIN)	18	5	15	10	15
START N. LAT. (DEG)		053	052	052	052	053
(MIN)		01.7	52.5	51.9	57.2	08.7
W. LONG. (DEG)		131	130	131	131	131
(MIN)		01.5	59.2	14.9	16.0	13.1
DIRECTION (DEG.TRUE)		240	350	238	120	035
FINISH N. LAT. (DEG)		053	052	052	052	053
(MIN)		01.5	52.7	51.3	56.7	08.7
W.LONG. (DEG)		131	130	131	131	131
(MIN)		02.7	59.2	15.7	15.8	11.8
HAUL DISTANCE (N.M.)		0.8	0.3	0.7	0.3	0.8
DEPTH (FATHOMS)		18- 19	16- 17	24- 26	12- 13	18- 15
(METERS)		32- 34	29- 31	43- 47	21- 23	32- 27
WATER TEMP. (DEG.C)						
SURFACE		14.1	..	..	13.5	..
BOTTOM		13.3	..	..	12.6	..
DEPTH (METERS)		40	..	..	28	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		100	216	261	..	20
REMARKS		USABLE	SNAG USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		16	17	18	19	20
DATE		AUG 13	AUG 13	AUG 13	AUG 13	AUG 14
STRATUM		2	2	3	2	2
TOTAL CATCH	(KG)	110	216	261	0	20
ARROWTOOTH FLOUNDER	
BUTTER SOLE	
CURLFIN SOLE		2	..	..
DOVER SOLE		T	..	..
ENGLISH SOLE		2	..	10	..	..
FLATHEAD SOLE	
PACIFIC HALIBUT		2	..	..
PACIFIC SANDDAB		T	..	21	..	..
PETRALE SOLE		2	..	..
REX SOLE	
ROCK SOLE		11	..	110	..	T
SAND SOLE		T	..	..	..	T
SPECKLED SANDDAB	
STARRY FLOUNDER	
YELLOWFIN SOLE	
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS		..	2	..	..	..
S. MALIGER		1	..	..
S. NEBULOSUS		..	2	..	..	..
S. PAUCISPINIS	
S. PINNIGER		34	..	..
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH		..	T	T	..	..
GREENLINGS		..	1	T	..	..
LINGCOD		..	1	T	..	..
PACIFIC COD		4	..	2	T	..
SABLEFISH	
SHINER PERCH	
WALLEYE POLLACK		1	..	..
OTHER ROUND FISH		T	..	T	..	T
RATFISH		1	..	..
SKATES		10*	..	..	..	..
SPINY DOGFISH		83*	200*	50	..	20
OTHER SELACHII	
INVERTEBRATES		T	10	25	..	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	21	22	23	24	25
DATE	AUG 14	AUG 14	AUG 14	AUG 14	AUG 14
STRATUM	2	3	3	3	3
START TIME (PDT)	1005	1305	1410	1630	1740
DURATION (MIN)	18	15	20	20	15
START N. LAT. (DEG) (MIN)	053 09.0	053 05.3	053 06.7	053 15.8	053 17.0
W. LONG. (DEG) (MIN)	131 18.8	130 54.0	130 58.8	131 06.7	131 04.5
DIRECTION (DEG.TRUE)	025	000	350	320	350
FINISH N. LAT. (DEG) (MIN)	053 09.8	053 06.2	053 07.4	053 16.8	053 17.8
W.LONG. (DEG) (MIN)	131 18.3	130 53.9	131 58.2	131 07.6	131 05.0
HAUL DISTANCE (N.M.)	0.9	0.9	0.9	1.2	0.9
DEPTH (FATHOMS) (METERS)	14- 15 25- 27	36- 42 65- 76	32- 32 58- 58	22- 22 40- 40	33- 36 60- 65
WATER TEMP. (DEG.C)					
SURFACE	..	..	..	..	..
BOTTOM	..	..	..	..	..
DEPTH (METERS)	..	..	..	..	..
TYPE OF GEAR	6	6	6	6	6
TOTAL CATCH (KG)	1358	184	108	234	144
REMARKS	USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		21	22	23	24	25
DATE		AUG 14	AUG 14	AUG 14	AUG 14	AUG 14
STRATUM		2	3	3	3	3
TOTAL CATCH	(KG)	1358	184	108	234	144
ARROWTOOTH FLOUNDER		..	2	T	..	..
BUTTER SOLE		..	..	..	..	..
CURLFIN SOLE		T	..	..	..	4
DOVER SOLE		..	T	T	..	..
ENGLISH SOLE		T	89	43	1	37
FLATHEAD SOLE		..	..	..	..	..
PACIFIC HALIBUT		2	10	20	19	34
PACIFIC SANDDAB		..	2	9	2	4
PETRALE SOLE		..	9	3	1	..
REX SOLE		..	4	..	..	T
ROCK SOLE		T	14	12	10	6
SAND SOLE		..	..	..	1	..
SPECKLED SANDDAB		..	..	..	..	..
STARRY FLOUNDER		..	..	..	..	..
YELLOWFIN SOLE		..	..	..	..	..
OTHER FLATFISH		..	..	..	..	..
S. BREVISPINIS		..	..	..	..	..
S. CAURINUS		..	..	..	..	..
S. MALIGER		..	..	..	..	..
S. NEBULOSUS		..	..	..	..	..
S. PAUCISPINIS		..	..	..	..	..
S. PINNIGER		..	..	..	..	..
S. PRORIGER		..	..	..	..	..
S. WILSONI		..	..	..	..	..
OTHER ROCKFISH		..	..	..	..	..
GREENLINGS		..	..	..	..	..
LINGCOD		..	..	..	..	..
PACIFIC COD		..	18	5	T	16
SABLEFISH		..	..	..	..	..
SHINER PERCH		3	1	..	..	..
WALLEYE POLLACK		..	30	..	..	..
OTHER ROUND FISH		..	T	T	..	T
RATFISH		..	T	6	..	13
SKATES		..	..	..	100*	10
SPINY DOGFISH	1350*	5	10	100*	100*	10
OTHER SELACHII		..	..	..	..	..
INVERTEBRATES		3	..	..	..	10

APPENDIX TABLE 1 CONTINUED

HAUL NO.		26	27	28	29	30
DATE		AUG 14	AUG 15	AUG 15	AUG 15	AUG 15
STRATUM		3	3	2	2	1
START TIME	(PDT)	1915	0740	0910	1115	1310
DURATION	(MIN)	17	10	17	5	15
START N. LAT. (DEG)		053	053	053	053	053
(MIN)		20.8	22.1	16.5	14.8	09.7
W. LONG. (DEG)		130	131	131	131	131
(MIN)		59.3	03.5	08.7	18.7	32.4
DIRECTION (DEG.TRUE)		150	300	130	025	305
FINISH N. LAT. (DEG)		053	053	053	053	053
(MIN)		21.5	22.7	16.1	15.0	10.2
W. LONG. (DEG)		130	131	131	131	131
(MIN)		58.7	05.9	07.3	18.5	32.9
HAUL DISTANCE (N.M.)		0.7	0.8	1.0	0.2	0.8
DEPTH (FATHOMS)		48- 48	28- 22	19- 19	17- 17	10- 10
(METERS)		87- 87	51- 40	34- 34	31- 31	18- 18
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	..	..
BOTTOM		..	..	..	..	..
DEPTH (METERS)		..	..	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		138	22	78	33	74
REMARKS		USABLE	SNAG USABLE	USABLE	SNAG USABLE	SNAG UNUSABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		26	27	28	29	30
DATE		AUG 14	AUG 15	AUG 15	AUG 15	AUG 15
STRATUM		3	3	2	2	1
TOTAL CATCH	(KG)	138	22	78	33	74
ARROWTOOTH FLOUNDER		27	--	--	--	--
BUTTER SOLE		--	--	--	--	--
CURLFIN SOLE		--	--	1	--	--
DOVER SOLE		T	--	--	--	--
ENGLISH SOLE		49	T	1	--	--
FLATHEAD SOLE		T	--	--	--	--
PACIFIC HALIBUT		9	--	5	--	--
PACIFIC SANDDAB		T	T	5	T	--
PETRALE SOLE		--	--	--	--	--
REX SOLE		21	--	--	--	--
ROCK SOLE		3	2	15	3	1
SAND SOLE		--	--	1	T	--
SPECKLED SANDDAB		--	--	--	--	--
STARRY FLOUNDER		--	--	--	--	--
YELLOWFIN SOLE		--	--	--	--	--
OTHER FLATFISH		--	--	--	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	--	T	--
S. MALIGER		--	T	--	T	--
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	--	--
S. WILSONI		--	--	--	--	--
OTHER ROCKFISH		--	--	--	--	--
GREENLINGS		--	--	--	T	--
LINGCOD		--	--	--	--	--
PACIFIC COD		9	--	--	T	--
SABLEFISH		1	--	--	--	--
SHINER PERCH		--	--	--	T	5
WALLEYE POLLOCK		T	--	--	--	--
OTHER ROUND FISH		T	--	T	--	--
RATFISH		7	--	--	--	--
SKATES		--	--	--	--	--
SPINY DOGFISH		11	20	50	30	68
OTHER SELACHII		--	--	--	--	--
INVERTEBRATES		1	--	--	--	--

APPENDIX TABLE 1 CONTINUED

HAUL NO.		31	32	33	34	35
DATE		AUG 15	AUG 15	AUG 15	AUG 16	AUG 16
STRATUM		2	2	3	2	2
START TIME (PDT)		1457	1730	1810	0750	0917
DURATION (MIN)		13	15	20	10	10
START N. LAT. (DEG) (MIN)		053 13.1	053 02.6	053 04.2	053 17.5	053 18.5
W. LONG. (DEG) (MIN)		131 22.2	131 07.5	131 04.3	131 31.1	131 37.2
DIRECTION (DEG.TRUE)		190	340	060	320	000
FINISH N. LAT. (DEG) (MIN)		053 12.8	053 03.5	053 03.9	053 18.0	053 19.1
W.LONG. (DEG) (MIN)		131 23.3	131 07.7	131 02.5	131 30.9	131 36.5
HAUL DISTANCE (N.M.)		0.8	0.9	1.2	0.5	0.7
DEPTH (FATHOMS) (METERS)		19- 19 34- 34	19- 19 34- 34	26- 26 47- 47	12- 10 21- 18	12- 10 21- 18
WATER TEMP. (DEG.C)						
SURFACE		14.0	..	13.7	..	..
BOTTOM		13.9	..	8.7	..	..
DEPTH (METERS)		38	..	57	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		683	95	110	1814	1814
REMARKS		USABLE	USABLE	USABLE	USABLE	SNAG USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		31	32	33	34	35
DATE		AUG 15	AUG 15	AUG 15	AUG 16	AUG 16
STRATUM		2	2	3	2	2
TOTAL CATCH	(KG)	683	95	110	1814	1814
ARROWTOOTH FLOUNDER		..	..	..	..	..
BUTTER SOLE		..	..	..	..	..
CURLFIN SOLE		..	..	..	..	..
DOVER SOLE		..	..	T	..	..
ENGLISH SOLE		1	3	..	..	..
FLATHEAD SOLE		..	..	..	..	..
PACIFIC HALIBUT		..	..	15	..	..
PACIFIC SANDDAB		..	T	40	..	..
PETRALE SOLE		..	..	..	..	..
REX SOLE		..	..	..	..	..
ROCK SOLE		1	5	17	..	..
SAND SOLE		1	..	9	..	..
SPECKLED SANDDAB		..	..	..	..	..
STARRY FLOUNDER		..	..	..	..	..
YELLOWFIN SOLE		..	..	..	..	..
OTHER FLATFISH		..	..	..	..	..
S. BREVISPINIS		..	..	..	..	..
S. CAURINUS		..	..	..	..	..
S. MALIGER		..	..	..	..	..
S. NEBULOSUS		..	..	..	..	..
S. PAUCISPINIS		..	..	..	..	..
S. PINNIGER		..	..	..	..	..
S. PRORIGER		..	..	..	..	..
S. WILSONI		..	..	..	..	..
OTHER ROCKFISH		..	..	..	..	..
GREENLINGS		..	..	..	..	..
LINGCOD		..	..	3	..	..
PACIFIC COD		..	T	16	..	..
SABLEFISH		..	..	..	..	..
SHINER PERCH		..	..	..	..	..
WALLEYE POLLOCK		..	..	..	..	..
OTHER ROUND FISH		..	1	T	..	..
RATFISH		..	..	..	..	..
SKATES		..	..	10	..	..
SPINY DOGFISH	680*	87	..	1814*	1814*	
OTHER SELACHII		..	..	..	..	..
INVERTEBRATES		..	T	..	..	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		36	37	38	39	40
DATE		AUG 16	AUG 16	AUG 16	AUG 16	AUG 16
STRATUM		2	2	2	2	2
START TIME	(PDT)	1225	1540	1645	1905	2007
DURATION	(MIN)	10	9	10	13	13
START N. LAT.	(DEG)	053	053	053	053	053
	(MIN)	28.4	30.7	29.5	33.3	37.2
W. LONG.	(DEG)	131	131	131	131	131
	(MIN)	36.7	24.5	20.5	15.8	14.1
DIRECTION	(DEG.TRUE)	030	290	270	025	180
FINISH N. LAT.	(DEG)	053	053	053	053	053
	(MIN)	28.9	31.2	30.1	33.9	36.8
W.LONG.	(DEG)	131	131	131	131	131
	(MIN)	36.2	25.1	21.3	15.2	14.8
HAUL DISTANCE	(N.M.)	0.7	0.6	0.7	0.8	0.6
DEPTH	(FATHOMS)	13- 12	14- 14	14- 13	14- 14	11- 12
	(METERS)	23- 21	25- 25	25- 23	25- 25	20- 21
WATER TEMP.	(DEG.C)					
SURFACE		..	..	..	..	..
BOTTOM		..	..	..	..	..
DEPTH	(METERS)	..	..	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH	(KG)	1008	273	1369	29	31
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		36	37	38	39	40
DATE		AUG 16	AUG 16	AUG 16	AUG 16	AUG 16
STRATUM		2	2	2	2	2
TOTAL CATCH	(KG)	1008	273	1369	29	31
ARROWTOOTH FLOUNDER		--	--	--	--	--
BUTTER SOLE		--	--	--	--	--
CURLFIN SOLE		--	--	--	--	--
DOVER SOLE		--	--	--	--	--
ENGLISH SOLE		3	T	2	T	T
FLATHEAD SOLE		--	--	--	--	--
PACIFIC HALIBUT		--	--	--	--	T
PACIFIC SANDDAB		--	--	--	--	--
PETRALE SOLE		--	--	--	--	--
REX SOLE		--	--	--	--	--
ROCK SOLE		T	T	4	T	4
SAND SOLE		2	T	2	2	1
SPECKLED SANDDAB		--	--	--	--	--
STARRY FLOUNDER		--	--	--	--	--
YELLOWFIN SOLE		--	--	--	--	--
OTHER FLATFISH		--	--	T	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	--	--	--
S. MALIGER		--	--	--	--	--
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	--	--
S. WILSONI		--	--	--	--	--
OTHER ROCKFISH		--	--	--	--	--
GREENLINGS		--	--	--	--	--
LINGCOD		--	--	--	--	--
PACIFIC COD		--	--	--	--	--
SABLEFISH		--	--	--	--	--
SHINER PERCH		3	--	--	--	--
WALLEYE POLLOCK		--	--	--	--	--
OTHER ROUNDfISH		T	T	T	T	T
RATFISH		--	--	--	--	--
SKATES		--	--	--	--	1
SPINY DOGFISH		1000*	272*	1361*	22*	20
OTHER SELACHII		--	--	--	--	--
INVERTEBRATES		T	1	T	5	5

APPENDIX TABLE 1 CONTINUED

HAUL NO.		41	42	43	44	45
DATE		AUG 17	AUG 17	AUG 17	AUG 18	AUG 18
STRATUM		3	2	2	3	3
START TIME (PDT)		0720	0955	1050	0748	0943
DURATION (MIN)		10	15	15	17	17
START N. LAT. (DEG) (MIN)		053 38.2	053 32.2	053 32.2	053 42.5	053 37.8
W. LONG. (DEG) (MIN)		131 11.7	131 11.1	131 11.1	130 33.9	130 47.2
DIRECTION (DEG.TRUE)		120	120	150	240	140
FINISH N. LAT. (DEG) (MIN)		053 37.7	053 31.3	053 31.2	053 42.2	053 36.6
W.LONG. (DEG) (MIN)		131 11.5	131 10.2	131 10.6	130 34.8	130 47.5
HAUL DISTANCE (N.M.)		0.5	1.1	1.0	0.7	1.2
DEPTH (FATHOMS) (METERS)		22- 21 40- 38	16- 15 29- 27	14- 14 25- 25	23- 28 42- 51	42- 43 76- 78
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	..	..
BOTTOM		..	..	..	..	..
DEPTH (METERS)		..	..	..	..	..
TYPE OF GEAR		6	6	3	6	6
TOTAL CATCH (KG)		428	54	171	131	525
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		41	42	43	44	45
DATE		AUG 17	AUG 17	AUG 17	AUG 18	AUG 18
STRATUM		3	2	2	3	3
TOTAL CATCH	(KG)	428	54	171	131	525
ARROWTOOTH FLOUNDER		21
BUTTER SOLE		..	T	7	..	T
CURLFIN SOLE		2	..
DOVER SOLE		T	T
ENGLISH SOLE		1	T	T	1	124
FLATHEAD SOLE	
PACIFIC HALIBUT		1	T	1	4	3
PACIFIC SANDDAB		T	..	..	5	..
PETRALE SOLE		3	..
REX SOLE		4
ROCK SOLE		86	10	20	45	2
SAND SOLE		T	..	8	..	T
SPECKLED SANDDAB	
STARRY FLOUNDER	
YELLOWFIN SOLE	
OTHER FLATFISH	
S. BREVISPINIS		6
S. CAURINUS	
S. MALIGER	
S. NEBULOSUS	
S. PAUCISPINIS	
S. PINNIGER		1
S. PRORIGER		86
S. WILSONI	
OTHER ROCKFISH	
GREENLINGS	
LINGCOD		T	..
PACIFIC COD		240	..	..	T	118
SABLEFISH		145
SHINER PERCH	
WALLEYE POLLOCK		T	..	..	..	2
OTHER ROUNDfISH		T	..	..	T	T
RATFISH		100*	36	..
SKATES		40	10	13	1	1
SPINY DOGFISH		20	27	22	27	2
OTHER SELACHII	
INVERTEBRATES		40	7	..	7	10

APPENDIX TABLE 1 CONTINUED

HAUL NO.		46	47	48	49	50
DATE		AUG 18	AUG 18	AUG 18	AUG 18	AUG 18
STRATUM		3	3	3	3	3
START TIME	(PDT)	1158	1330	1530	1711	1900
DURATION	(MIN)	10	15	15	15	15
START N. LAT. (DEG)		053	053	053	053	053
(MIN)		33.9	37.9	42.3	47.5	48.7
W. LONG. (DEG)		131	130	131	130	130
(MIN)		00.2	58.5	01.2	53.9	55.2
DIRECTION (DEG.TRUE)		170	090	110	305	130
FINISH N. LAT. (DEG)		053	053	053	053	053
(MIN)		33.3	37.3	41.6	48.5	47.9
W.LONG. (DEG)		131	130	131	130	130
(MIN)		00.3	57.6	00.5	54.3	54.7
HAUL DISTANCE (N.M.)		0.6	0.8	0.7	0.9	0.9
DEPTH	(FATHOMS)	27- 27	27- 26	22- 25	46- 46	40- 42
	(METERS)	49- 49	49- 47	40- 45	84- 84	73- 76
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	12.6	..
BOTTOM		..	..	..	7.9	..
DEPTH (METERS)		..	..	..	97	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH	(KG)	182	66	69	91	89
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	46	47	48	49	50
DATE	AUG 18	AUG 18	AUG 18	AUG 18	AUG 18
STRATUM	3	3	3	3	3
TOTAL CATCH (KG)	182	66	69	85	89
ARROWTOOTH FLOUNDER	21	5
BUTTER SOLE	T
CURLFIN SOLE	..	1	..	..	..
DOVER SOLE	10	3
ENGLISH SOLE	..	T	..	..	45
FLATHEAD SOLE	8	2
PACIFIC HALIBUT	..	4	1	10	..
PACIFIC SANDDAB	..	T	..	..	..
PETRALE SOLE
REX SOLE	22	20
ROCK SOLE	1	25	6	..	T
SAND SOLE
SPECKLED SANDDAB
STARRY FLOUNDER
YELLOWFIN SOLE
OTHER FLATFISH
 S. BREVISPINIS
S. CAURINUS
S. MALIGER	1	..	7	..	..
S. NEBULOSUS
S. PAUCISPINIS
S. PINNIGER
S. PRORIGER
S. WILSONI
OTHER ROCKFISH
 GREENLINGS	1	1	..	..	..
LINGCOD	11	..	..
PACIFIC COD	12	4
SABLEFISH	7
SHINER PERCH
WALLEYE POLLOCK	T	..
OTHER ROUND FISH	..	T	T	..	..
 RATFISH	124	5	3	..	..
SKATES	..	2	2	..	..
SPINY DOGFISH	4	..	4	..	3
OTHER SELACHII
 INVERTEBRATES	51	28	35	2	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		51	52	53	54	55
DATE		AUG 18	AUG 19	AUG 19	AUG 19	AUG 19
STRATUM		3	3	2	2	3
START TIME (PDT)		2030	0745	0939	1054	1255
DURATION (MIN)		14	13	4	11	14
START N. LAT. (DEG) (MIN)		053 48.0	053 49.8	053 52.5	053 55.1	053 59.8
W. LONG. (DEG) (MIN)		130 59.7	131 09.3	131 22.5	131 23.9	131 09.2
DIRECTION (DEG.TRUE)		040	130	125	135	110
FINISH N. LAT. (DEG) (MIN)		053 47.9	053 49.1	053 52.4	053 54.5	053 59.1
W.LONG. (DEG) (MIN)		130 58.5	131 08.7	131 22.3	131 23.6	131 08.5
HAUL DISTANCE (N.M.)		0.8	0.8	0.2	0.5	0.8
DEPTH (FATHOMS) (METERS)		28- 29 51- 53	24- 24 43- 43	13- 13 23- 23	12- 12 21- 21	20- 22 36- 40
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	..	..
BOTTOM		..	..	..	..	..
DEPTH (METERS)		..	..	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		101	190	13	456	50
REMARKS		USABLE	USABLE	SNAG USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		51	52	53	54	55
DATE		AUG 18	AUG 19	AUG 19	AUG 19	AUG 19
STRATUM		3	3	2	2	3
TOTAL CATCH	(KG)	101	190	13	456	50
ARROWTOOTH FLOUNDER	
BUTTER SOLE	
CURLFIN SOLE		T	T	..	..	..
DOVER SOLE	
ENGLISH SOLE		4	2	1	1	T
FLATHEAD SOLE	
PACIFIC HALIBUT		7	69	..	..	9
PACIFIC SANDDAB		1	2	..	..	T
PETRALE SOLE	
REX SOLE	
ROCK SOLE		30	53	2	..	29
SAND SOLE		T	..	..	4	T
SPECKLED SANDDAB	
STARRY FLOUNDER	
YELLOWFIN SOLE		T	..
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS	
S. MALIGER		..	5	..	..	..
S. NEBULOSUS	
S. PAUCISPINIS	
S. PINNIGER	
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH	
GREENLINGS		..	T	T	..	..
LINGCOD		4	T	..	..	1
PACIFIC COD		43	16	..	..	..
SABLEFISH	
SHINER PERCH	
WALLEYE POLLACK		T
OTHER ROUNDfISH		T	T	T	T	T
RATFISH		2	18	..	..	..
SKATES		10	..	..	1	..
SPINY DOGFISH		..	6	10	450*	..
OTHER SELACHII	
INVERTEBRATES		..	19	..	T	11

APPENDIX TABLE 1 CONTINUED

HAUL NO.		56	57	58	59	60
DATE		AUG 19	AUG 19	AUG 19	AUG 19	AUG 20
STRATUM		2	2	2	2	2
START TIME (PDT)		1430	1552	1720	1938	0700
DURATION (MIN)		15	13	17	16	15
START N. LAT. (DEG) (MIN)		054 04.2	054 03.5	054 07.4	054 17.1	054 12.1
W. LONG. (DEG) (MIN)		131 11.5	131 17.8	131 15.7	131 23.1	130 51.8
DIRECTION (DEG.TRUE)		100	130	140	030	150
FINISH N. LAT. (DEG) (MIN)		054 04.3	054 02.8	054 06.6	054 16.7	054 11.2
W.LONG. (DEG) (MIN)		131 10.6	131 17.3	131 14.8	131 21.5	130 51.7
HAUL DISTANCE (N.M.)		0.6	0.8	1.0	0.9	0.9
DEPTH (FATHOMS) (METERS)		18- 17 32- 31	16- 14 29- 25	18- 16 32- 29	20- 16 36- 29	14- 15 25- 27
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	12.8	..
BOTTOM		..	..	..	9.2	..
DEPTH (METERS)		..	..	..	28	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		67	77	..	43	39
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		56	57	58	59	60
DATE		AUG 19	AUG 19	AUG 19	AUG 19	AUG 20
STRATUM		2	2	2	2	2
TOTAL CATCH (KG)		67	77	0	43	39
ARROWTOOTH FLOUNDER		--	--	--	--	--
BUTTER SOLE		--	T	--	--	--
CURLFIN SOLE		T	--	--	--	--
DOVER SOLE		--	--	--	--	--
ENGLISH SOLE		T	3	T	T	T
FLATHEAD SOLE		--	--	--	--	--
PACIFIC HALIBUT		1	--	--	35	--
PACIFIC SANDDAB		--	--	--	--	--
PETRALE SOLE		--	--	--	--	--
REX SOLE		--	--	--	--	--
ROCK SOLE		19	5	--	--	T
SAND SOLE		--	5	T	1	2
SPECKLED SANDDAB		--	--	--	--	--
STARRY FLOUNDER		--	--	--	7	1
YELLOWFIN SOLE		--	--	--	--	--
OTHER FLATFISH		--	--	--	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	--	--	--
S. MALIGER		--	--	--	--	--
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	--	--
S. WILSONI		--	--	--	--	--
OTHER ROCKFISH		--	--	--	--	--
GREENLINGS		--	--	--	--	--
LINGCOD		1	--	--	--	--
PACIFIC COD		T	T	T	--	T
SABLEFISH		--	--	--	--	--
SHINER PERCH		--	--	--	--	--
WALLEYE POLLACK		--	--	T	--	--
OTHER ROUNDfISH		T	T	T	T	--
RATFISH		--	--	--	--	--
SKATES		--	30	--	--	30
SPINY DOGFISH		1	30	--	--	5
OTHER SELACHII		--	--	--	--	--
INVERTEBRATES		45	4	--	--	1

APPENDIX TABLE 1 CONTINUED

HAUL NO.	61	62	63	64	65
DATE	AUG 20	AUG 20	AUG 20	AUG 20	AUG 20
STRATUM	2	3	2	1	3
START TIME (PDT)	0750	0930	1040	1135	1234
DURATION (MIN)	17	24	14	18	15
START N. LAT. (DEG)	054	054	054	054	054
(MIN)	13.5	19.2	16.8	15.3	16.3
W. LONG. (DEG)	131	131	131	131	131
(MIN)	09.5	09.3	07.7	05.8	01.7
DIRECTION (DEG.TRUE)	090	075	210	270	150
FINISH N. LAT. (DEG)	054	054	054	054	054
(MIN)	12.6	18.4	16.1	15.3	15.6
W.LONG. (DEG)	131	131	131	131	131
(MIN)	08.9	07.6	08.1	04.7	01.8
HAUL DISTANCE (N.M.)	1.0	1.3	0.0	0.0	0.7
DEPTH (FATHOMS)	12- 12	34- 32	13- 10	8- 12	40- 40
(METERS)	21- 21	62- 58	23- 18	14- 21	73- 73
WATER TEMP. (DEG.C)					
SURFACE	..	..	..	..	..
BOTTOM	..	..	..	..	..
DEPTH (METERS)	..	..	..	..	..
TYPE OF GEAR	6	6	6	6	6
TOTAL CATCH (KG)	54	77	97	121	518
REMARKS	USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		61	62	63	64	65
DATE		AUG 20	AUG 20	AUG 20	AUG 20	AUG 20
STRATUM		2	3	2	1	3
TOTAL CATCH	(KG)	54	77	97	121	518
ARROWTOOTH FLOUNDER		..	T	..	..	47
BUTTER SOLE		..	1	2	..	3
CURLFIN SOLE	
DOVER SOLE		5
ENGLISH SOLE		T	17	..	2	300
FLATHEAD SOLE	
PACIFIC HALIBUT		1	..	6	4	..
PACIFIC SANDDAB	
PETRALE SOLE		T
REX SOLE		14
ROCK SOLE		13	3	70	88	3
SAND SOLE		T	4	..
SPECKLED SANDDAB	
STARRY FLOUNDER		10	..	3	10	..
YELLOWFIN SOLE	
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS	
S. MALIGER	
S. NEBULOSUS	
S. PAUCISPINIS	
S. PINNIGER	
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH	
GREENLINGS	
LINGCOD		..	10	..	..	35*
PACIFIC COD		..	1	..	..	25
SABLEFISH		1
SHINER PERCH	
WALLEYE POLLOCK		T	..
OTHER ROUND FISH		..	T	..	..	T
RATFISH	
SKATES		..	30	..	8	75
SPINY DOGFISH	
OTHER SELACHII	
INVERTEBRATES		30	15	16	5	10

APPENDIX TABLE 1 CONTINUED

HAUL NO.		66	67	68	69	70
DATE		AUG 20	AUG 20	AUG 20	AUG 21	AUG 20
STRATUM		3	4	3	3	1
START TIME	(PDT)	1418	1553	0855	0705	0901
DURATION	(MIN)	5	16	10	11	7
START N. LAT.	(DEG)	054	054	054	054	053
	(MIN)	13.0	08.4	07.0	02.2	54.5
W. LONG.	(DEG)	130	131	131	130	130
	(MIN)	55.0	01.2	03.2	56.9	46.4
DIRECTION	(DEG.TRUE)	180	200	150	105	120
FINISH N. LAT.	(DEG)	054	054	054	054	053
	(MIN)	12.8	07.6	06.4	01.8	54.5
W. LONG.	(DEG)	130	131	131	130	130
	(MIN)	55.2	02.2	03.3	56.0	45.8
HAUL DISTANCE	(N.M.)	0.2	1.0	0.6	0.6	0.3
DEPTH	(FATHOMS)	40- 40	56- 58	20- 36	34- 38	10- 10
	(METERS)	73- 73	102-106	36- 65	62- 69	18- 18
WATER TEMP.	(DEG.C)					
SURFACE		13.6	..	..	..	..
BOTTOM		7.6	..	..	..	..
DEPTH	(METERS)	84	..	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH	(KG)	14	1191	30	335	..
REMARKS		SNAG USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		66	67	68	69	70
DATE		AUG 20	AUG 20	AUG 20	AUG 21	AUG 20
STRATUM		3	4	3	3	1
TOTAL CATCH	(KG)	14	1191	30	335	0
ARROWTOOTH FLOUNDER		2	64	T	40	..
BUTTER SOLE		T	..	..
CURLFIN SOLE	
DOVER SOLE		..	109	T	T	..
ENGLISH SOLE		..	15	18	7	..
FLATHEAD SOLE		..	23	..	..	..
PACIFIC HALIBUT		..	50	2	3	..
PACIFIC SANDDAB	
PETRALE SOLE	
REX SOLE		..	185	T	T	..
ROCK SOLE		..	144	9	19	..
SAND SOLE		1	..	..
SPECKLED SANDDAB	
STARRY FLOUNDER	
YELLOWFIN SOLE	
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS	
S. MALIGER		7	..
S. NEBULOSUS	
S. PAUCISPINIS		5	..
S. PINNIGER	
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH		..	T	..	T	..
GREENLINGS	
LINGCOD		..	2	..	..	..
PACIFIC COD		2	123	..	19	..
SABLEFISH		..	10	..	226	..
SHINER PERCH	
WALLEYE POLLACK		..	375	..	T	..
OTHER ROUNDfISH		T	..
RATFISH		10	6	T	9	..
SKATES		..	70	..	..	..
SPINY DOGFISH		..	15	..	..	..
OTHER SELACHII	
INVERTEBRATES		T	..	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		71	72	73	74	75
DATE		AUG 23	AUG 23	AUG 23	AUG 23	AUG 23
STRATUM		1	1	1	1	1
START TIME	(PDT)	0831	0950	1123	1316	1551
DURATION	(MIN)	13	13	6	10	15
START N. LAT.	(DEG)	053	053	053	054	053
	(MIN)	32.5	37.6	42.7	47.0	43.7
W. LONG.	(DEG)	131	131	131	131	131
	(MIN)	46.1	42.2	36.6	47.5	21.8
DIRECTION	(DEG.TRUE)	030	150	160	350	190
FINISH N. LAT.	(DEG)	053	053	053	053	053
	(MIN)	33.1	37.0	42.5	47.5	42.9
W. LONG.	(DEG)	131	131	131	131	131
	(MIN)	45.3	41.9	36.5	47.7	21.8
HAUL DISTANCE	(N.M.)	0.7	0.7	0.2	0.5	0.8
DEPTH	(FATHOMS)	6- 8	10- 10	12- 12	6- 6	12- 11
	(METERS)	10- 14	18- 18	21- 21	10- 10	21- 20
WATER TEMP.	(DEG.C)					
SURFACE		15.0	..	..	15.4	..
BOTTOM		15.0	..	..	15.3	..
DEPTH	(METERS)	11	..	..	15	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH	(KG)	30	222	67	13	1329
REMARKS		USABLE	USABLE	SNAG USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		71	72	73	74	75
DATE		AUG 23	AUG 23	AUG 23	AUG 23	AUG 23
STRATUM		1	1	1	1	1
TOTAL CATCH	(KG)	30	222	67	13	1329
ARROWTOOTH FLOUNDER		--	--	--	--	--
BUTTER SOLE		T	--	--	--	--
CURLFIN SOLE		--	--	--	--	--
DOVER SOLE		--	--	--	--	--
ENGLISH SOLE		T	--	T	T	T
FLATHEAD SOLE		--	--	--	--	--
PACIFIC HALIBUT		--	--	--	--	36
PACIFIC SANDDAB		--	--	--	--	--
PETRALE SOLE		--	--	--	--	--
REX SOLE		--	--	--	--	--
ROCK SOLE		T	1	1	--	T
SAND SOLE		T	1	T	T	3*
SPECKLED SANDDAB		--	--	--	--	--
STARRY FLOUNDER		--	--	--	--	--
YELLOWFIN SOLE		--	T	1	T	1*
OTHER FLATFISH		--	--	--	--	--
S. BREVISPINIS		--	--	--	--	--
S. CAURINUS		--	--	--	--	--
S. MALIGER		--	--	--	--	--
S. NEBULOSUS		--	--	--	--	--
S. PAUCISPINIS		--	--	--	--	--
S. PINNIGER		--	--	--	--	--
S. PRORIGER		--	--	--	--	--
S. WILSONI		--	--	--	--	--
OTHER ROCKFISH		--	--	--	--	--
GREENLINGS		--	--	--	--	--
LINGCOD		--	--	--	--	--
PACIFIC COD		--	--	--	--	--
SABLEFISH		--	--	--	--	--
SHINER PERCH		--	--	--	--	--
WALLEYE POLLACK		--	--	--	--	--
OTHER ROUND FISH		T	--	T	T	T
RATFISH		--	--	--	--	--
SKATES		--	--	--	--	3*
SPINY DOGFISH		30*	220*	64*	9*	1286*
OTHER SELACHII		--	--	--	--	--
INVERTEBRATES		T	T	1	4	T

APPENDIX TABLE 1 CONTINUED

HAUL NO.		76	77	78	79	80
DATE		AUG 23	AUG 23	AUG 24	AUG 24	AUG 24
STRATUM		2	1	1	1	1
START TIME (PDT)		1656	1910	0750	0917	1025
DURATION (MIN)		10	10	10	10	10
START N. LAT. (DEG) (MIN)		053 44.0	053 49.0	053 58.5	054 03.7	054 07.9
W. LONG. (DEG) (MIN)		131 16.8	131 25.6	131 34.7	131 30.5	131 28.7
DIRECTION (DEG.TRUE)		210	140	120	140	150
FINISH N. LAT. (DEG) (MIN)		053 43.5	053 48.5	053 58.0	054 03.2	054 07.5
W.LONG. (DEG) (MIN)		131 17.2	131 25.1	131 34.2	131 30.1	131 28.6
HAUL DISTANCE (N.M.)		0.5	0.6	0.5	0.6	0.5
DEPTH (FATHOMS) (METERS)		20- 18 36- 32	8- 8 14- 14	6- 6 10- 10	10- 10 18- 18	10- 8 18- 14
WATER TEMP. (DEG.C)						
SURFACE		..	..	..	..	..
BOTTOM		..	..	..	..	..
DEPTH (METERS)		..	..	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		224	400	1556	..	667
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		76	77	78	79	80
DATE		AUG 23	AUG 23	AUG 24	AUG 24	AUG 24
STRATUM		2	1	1	1	1
TOTAL CATCH	(KG)	224	400	1556	0	667
ARROWTOOTH FLOUNDER	
BUTTER SOLE		25	..	..	..	T
CURLFIN SOLE	
DOVER SOLE	
ENGLISH SOLE		25	..	..	..	T
FLATHEAD SOLE	
PACIFIC HALIBUT		T	..	..	..	..
PACIFIC SANDDAB		T	..	..	..	..
PETRALE SOLE	
REX SOLE	
ROCK SOLE		11	T	..	..	..
SAND SOLE		58	2	..	..	1
SPECKLED SANDDAB	
STARRY FLOUNDER	
YELLOWFIN SOLE		..	T	..	..	T
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS	
S. MALIGER	
S. NEBULOSUS	
S. PAUCISPINIS	
S. PINNIGER	
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH	
GREENLINGS	
LINGCOD	
PACIFIC COD	
SABLEFISH	
SHINER PERCH	
WALLEYE POLLOCK		T	..	..	..	..
OTHER ROUND FISH		T	T	..	..	..
RATFISH	
SKATES		15	..	..	..	..
SPINY DOGFISH		90*	398*	1556*	..	666*
OTHER SELACHII	
INVERTEBRATES		T

APPENDIX TABLE 1 CONTINUED

HAUL NO.		81	82	83	84	85
DATE		AUG 24	AUG 24	AUG 24	AUG 24	AUG 24
STRATUM		1	4	3	2	1
START TIME (PDT)		1144	1435	1539	1640	1750
DURATION (MIN)		8	15	15	15	10
START N. LAT. (DEG) (MIN)		054 12.1	054 12.7	054 09.5	054 07.9	054 07.9
W. LONG. (DEG) (MIN)		131 28.2	131 45.5	131 49.2	131 52.4	131 47.3
DIRECTION (DEG.TRUE)		120	230	240	180	210
FINISH N. LAT. (DEG) (MIN)		054 11.7	054 12.5	054 09.5	054 07.8	054 07.9
W.LONG. (DEG) (MIN)		131 27.9	131 46.9	131 50.7	131 54.2	131 48.3
HAUL DISTANCE (N.M.)		0.4	0.9	0.8	1.0	0.6
DEPTH (FATHOMS) (METERS)		14- 13 25- 23	52- 50 95- 91	25- 26 45- 47	15- 14 27- 25	10- 10 18- 18
WATER TEMP. (DEG.C)						
SURFACE		13.0	13.6	..	..	..
BOTTOM		10.1	7.0	..	..	..
DEPTH (METERS)		18	95	..	..	..
TYPE OF GEAR		6	6	6	6	6
TOTAL CATCH (KG)		889	665	50	22	26
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.		81	82	83	84	85
DATE		AUG 24	AUG 24	AUG 24	AUG 24	AUG 24
STRATUM		1	4	3	2	1
TOTAL CATCH	(KG)	889	727	50	22	26
ARROWTOOTH FLOUNDER	..	92	T	T	..	..
BUTTER SOLE	3	..	..	..
CURLFIN SOLE	T	..	..	..
DOVER SOLE	..	2	..	T	..	..
ENGLISH SOLE	..	18	4	T	..	T
FLATHEAD SOLE	..	1	..	..	..	..
PACIFIC HALIBUT	..	40	5	7	12	
PACIFIC SANDDAB	5	..	..
PETRALE SOLE	2	2	..	
REX SOLE	..	9	T	..	..
ROCK SOLE	27	3	1	
SAND SOLE	
SPECKLED SANDDAB	
STARRY FLOUNDER	4
YELLOWFIN SOLE	
OTHER FLATFISH	
S. BREVISPINIS	
S. CAURINUS	
S. MALIGER	
S. NEBULOSUS	
S. PAUCISPINIS	
S. PINNIGER	
S. PRORIGER	
S. WILSONI	
OTHER ROCKFISH	
GREENLINGS	
LINGCOD	..	5	..	..	..
PACIFIC COD	..	40	T	T	1	
SABLEFISH	..	T	..	..	..
SHINER PERCH	
WALLEYE POLLACK	..	500*	T	..	..
OTHER ROUND FISH	
RATFISH	
SKATES	10	5	
SPINY DOGFISH	889*	20*	4*	..	..
OTHER SELACHII	
INVERTEBRATES	T	3	

APPENDIX TABLE 1 CONTINUED

HAUL NO.	86
DATE	AUG 25
STRATUM	3
START TIME (PDT)	1030
DURATION (MIN)	14
START N. LAT. (DEG) (MIN)	054 10.9
W. LONG. (DEG) (MIN)	130 39.3
DIRECTION (DEG.TRUE)	280
FINISH N. LAT. (DEG) (MIN)	054 11.3
W. LONG. (DEG) (MIN)	130 40.5
HAUL DISTANCE (N.M.)	0.8
DEPTH (FATHOMS) (METERS)	37- 40 67- 73
WATER TEMP. (DEG.C)	
SURFACE	..
BOTTOM	..
DEPTH (METERS)	..
TYPE OF GEAR	6
TOTAL CATCH (KG)	162
REMARKS	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	86
DATE	AUG 25
STRATUM	3
TOTAL CATCH (KG)	162
ARROWTOOTH FLOUNDER	3
BUTTER SOLE	..
CURLFIN SOLE	..
DOVER SOLE	8
ENGLISH SOLE	34
FLATHEAD SOLE	48
PACIFIC HALIBUT	8
PACIFIC SANDDAB	..
PETRALE SOLE	..
REX SOLE	18
ROCK SOLE	T
SAND SOLE	..
SPECKLED SANDDAB	..
STARRY FLOUNDER	..
YELLOWFIN SOLE	..
OTHER FLATFISH	..
S. BREVISPINIS	..
S. CAURINUS	..
S. MALIGER	T
S. NEBULOSUS	..
S. PAUCISPINIS	..
S. PINNIGER	..
S. PRORIGER	..
S. WILSONI	..
OTHER ROCKFISH	..
GREENLINGS	..
LINGCOD	..
PACIFIC COD	29
SABLEFISH	2
SHINER PERCH	..
WALLEYE POLLACK	5
OTHER ROUNDISH	..
RATFISH	7
SKATES	..
SPINY DOGFISH	..
OTHER SELACHII	..
INVERTEBRATES	T

Appendix Table 2. Oceanographic data summary, M/V NUCLEUS, Hecate Strait, August 11-25, 1980.

No.	Day/mo.	Time (PDT)	Position		Bottom depth (m)	Depth (m)/temperature (°C) (correction factor (+.3°) applied)											
			Lat. N	Long. W		0	10	25	35	50	60	70	73	75	80	91	
1	12/08	0800	52°39'	130°57'	91	0 13.5	10 12.9	25 11.9	35 11.6	50 11.6	60 11.5	70 11.0	73 11.0	75 10.3	80 9.5	91 9.3	
2	12/08	1200	52°46'	131°00'	46	0 13.7	10 13.6	25 13.6	46 13.6								
3	12/08	1400	52°50'	131°08'	34	0 13.8	15 13.3	20 13.2	25 13.2	34 13.2							
4	13/08	1130	52°58'	130°42'	85	0 13.3	5 13.1	16 12.8	22 12.7	25 12.0	35 11.3	42 9.7	50 9.6	55 9.3	75 9.3	80 8.9	85 7.6
5	13/08	1400	53°02'	131°03'	40	0 14.1	5 13.8	10 13.3	25 13.3	40 13.3							
6	13/08	2130	52°57'	131°16'	28	0 13.5	15 13.3	25 12.8	28 12.6								
7	15/08	1530	53°13'	131°23'	38	0 14.0	25 13.9	38 13.9									
8	15/08	1830	53°04'	131°02'	57	0 13.7	20 13.6	25 13.5	30 12.8	40 11.3	45 10.8	50 9.8	57 8.7				
9	18/08	1711	53°49'	130°54'	97	0 12.6	15 12.5	20 12.0	25 10.3	30 9.8	45 9.4	50 9.4	55 9.3	60 8.6	75 8.1	85 7.9	97 7.9
10	19/08	2000	54°17'	131°22'	28	0 12.8	5 12.8	10 11.3	12 10.3	25 9.3	28 9.2						
11	20/08	1500	54°13'	130°55'	84	0 13.6	5 13.3	10 12.8	15 11.3	25 10.3	30 9.6	45 8.3	50 8.2	55 8.2	60 7.8	75 7.8	84 7.6

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Appendix Table 2 (cont'd)

No.	Day/mo.	Time (PDT)	Position		Bottom depth (m)	Depth (m)/temperature (°C) (correction factor (+.3°) applied)												
			Lat. N	Long. W		0	5	10	15	20	25	30	35	50	55	75	85	95
12	23/08	0900	53°33'	131°45'	11	0	11											
						15.0	15.0											
13	23/08	1330	53°47'	131°48'	15	0	15											
						15.4	15.3											
14	24/08	1200	54°12'	131°28'	18	0	5	10	15	18								
						13.0	12.8	11.9	10.2	10.1								
15	24/08	1500	54°12'	131°47'	95	0	5	18	20	25	30	35	50	55	75	85	95	
						13.6	12.9	12.3	11.8	10.3	9.8	8.9	8.1	7.6	7.3	7.2	7.0	

Appendix Table 3. Scientific and common names of fishes and invertebrates caught by M/V NUCLEUS, August 11-25, 1980.

Common name	Scientific name
<u>Flatfish</u>	
Arrowtooth flounder	<u>Atheresthes stomias</u>
Butter sole	<u>Isopsetta isolepis</u>
C-O sole	<u>Pleuronichthys coenosus</u>
Curlfin sole	<u>Pleuronichthys decurrens</u>
Dover sole	<u>Microstomus pacificus</u>
English sole	<u>Parophrys vetulus</u>
Flathead sole	<u>Hippoglossoides elassodon</u>
Pacific halibut	<u>Hippoglossus stenolepis</u>
Pacific sandab	<u>Citharichthys sordidus</u>
Petrale sole	<u>Eopsetta jordani</u>
Rex sole	<u>Glyptocephalus zachirus</u>
Rock sole	<u>Lepidotetta bilineata</u>
Sand sole	<u>Psettichthys melanostictus</u>
Speckled sandab	<u>Citharichthys stigmaeus</u>
Starry flounder	<u>Platichthys stellatus</u>
Yellowfin sole	<u>Limanda aspera</u>
<u>Roundfish</u>	
Eelpouts	<u>Zoarcidae</u>
Eulachon	<u>Thaleichthys pacificus</u>
Greenlings	<u>Hexagrammidae</u>
Lingcod	<u>Ophiodon elongatus</u>
Pacific cod	<u>Gadus macrocephalus</u>
Pacific herring	<u>Clupea harengus pallasi</u>
Pacific tomcod	<u>Microgadus proximus</u>
Poachers	<u>Agonidae</u>
Boccacio	<u>Sebastes paucispinis</u>
Canary rockfish	<u>S. pinniger</u>
China rockfish	<u>S. nebulosus</u>
Cooper rockfish	<u>S. caurinus</u>
Greenstriped rockfish	<u>S. elongatus</u>
Harlequin rockfish	<u>S. varigatus</u>
Pacific ocean perch	<u>S. alutus</u>
Pygmy rockfish	<u>S. wilsoni</u>
Quillback rockfish	<u>S. maliger</u>
Redstripe rockfish	<u>S. proriger</u>
Sharpchin rockfish	<u>S. zacentrus</u>
Silvergray rockfish	<u>S. brevispinis</u>
Yellowtail rockfish	<u>S. flavidus</u>
Sablefish	<u>Anoplopoma fimbria</u>
Sandfish	<u>Trichodon trichodon</u>
Sculpins	<u>Cottidae</u>
Shiner perch	<u>Cymatogaster aggregata</u>
Walleye pollock	<u>Theragra chalcogramma</u>

Appendix Table 3 (cont'd)

Common name	Scientific name
<u>Selachii</u>	
Skates	Rajidae
Ratfish	<u>Hydrolagus colliei</u>
Spiny dogfish	<u>Squalus acanthias</u>
<u>Invertebrates</u>	
Anemones	Actiniaria
Brittle stars	Ophiuroidea
Crabs	Paguridae
Cucumber	<u>Parastichopus californicus</u>
Dungeness crab	<u>Cancer magister</u>
Nudibranchs	Nudibranchiata
Octopus	<u>Octopus dofleini</u>
Pink shrimp	<u>Pandalus borealis</u>
Sand dollar	Echinoidea
Squid	<u>Loligo opalescens</u>
Urchin	Echinoidea
Starfish	Asteroidea

Appendix Table 4. M/V NUCLEUS length frequencies by haul for rock sole, August 11-25, 1980.

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	1				2				3			
	M	F	U	T	M	F	U	T	M	F	U	T
50												
51												
52												
53												
54												
Totals	67	64	29	160	49	78	0	127	16	49	110	175

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole							
	Tow no.							
	4				12			
	M	F	U	T	M	F	U	T
7								
8								
9								
10					4	4		
11					6	6		
12					2	2		
13					1	1		
14		4	4		7	7		
15		1	1		14	14		
16					1	1		
17	1				4	4		
18	1				12	12		
19	4		4		3	3		
20	2		2	1	3		7	5
21	2		2	2	3		7	6
22	2		2	1	4		4	14
23	3		3	1	2		7	13
24	1	1		2	2		6	4
25				2	4		3	7
26					2			3
27	1			1	4		4	2
28					1		1	
29					1	1		
30						2		
31						1		
32					1	1		
33					2	3		
34	1			1			1	
35					4		2	
36	1		1	1	2		1	
37					4		2	1
38					5		1	3
39	2			2	8		1	
40					3		2	3
41					6		3	4
42	1			1	6		5	
43					3		7	
44					2		6	
45					9		9	
46					3		3	
47					4		4	1

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	4				12				13			
	M	F	U	T	M	F	U	T	M	F	U	T
48						2		2		4		4
49						1		1		1		1
50						1		1		1		1
51						1		1				
52												
53												
54												
Totals	18	5	5	28	15	85	54	154	45	91	208	344

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	4				15				16			
	M	F	U	T	M	F	U	T	M	F	U	T
7												
8												
9												
10												
11												
12												2
13			1	1								2
14		2	2									
15		4	4									
16		4	4				2	2				
17		1	1									
18		4	4									2
19		6	6									2
20	2	4			6	3			3			
21	1	2			3	2			2	1		1
22		5			5	1			1		1	
23	1	5			6	1	9		10			1
24	2	2			4	3	10		13			1
25		1			1	1	7		8			1
26		1			1	1	8		9		2	2
27						5			5	1		1
28												
29	1				1		1		1			1
30	1				1	2			2			
31					2	1			3	1		1
32					2				2	3		3
33	2				2	6	4		10	1		1
34	1	1			2	6	1		7	1		1
35		3			3	8	1		9	1		1
36	1	1			2	7	4		11			
37		1			1	5	1		6	1		1
38						1	6		7			1
39		3			3	2	4		6			1
40	1	4			5		2		2		2	2
41		3			3		5		5		1	1
42		2			2	1	2		3			1
43		1			1		2		2			
44	1	2			3		1		1			
45		3			3		5		5			
46							2		2			
47							1		1			

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	14				15				16			
M	F	U	T	M	F	U	T	M	F	U	T	
48					1			1				
49		1		1								
50		1		1								
51												
52												
53												
54												
Totals	14	46	22	82	48	89	2	139	10	12	5	27

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole							
	Tow no.							
	18		23		28			
	M	F	U	T	M	F	U	T
7								
8			1	1				
9			2	2				
10			4	4				
11							1	1
12					5	5	1	1
13			4	4	3	3	1	1
14			7	7			2	2
15			7	7			8	8
16			4	4			4	4
17			4	4	2	2	2	2
18			8	8				
19			5	5			2	2
20	1	2			3	1	1	5
21		2			2	1	2	5
22	1	2	3		1	1	2	3
23	1	4			5			5
24	3	1			4			
25	1				1		1	2
26		1			1		1	2
27	1	1	2		1	1	2	
28		2	2			1		
29	1				1			
30	5				5			
31	2	2			4			1
32	6	1			7			
33	4	2			6			2
34	9	1			10			3
35	1	5			6			1
36	2	6			8			1
37		3			3			2
38	1	7			8	1	1	3
39	1	3			4		2	1
40	1	4			5			1
41		7			7	2		
42		7			7			1
43	1	8			9			
44		8			8	3		
45		7			7			
46		10			10	2	2	1
47		4			4	2	2	1

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	18				23				28			
M	F	U	T	M	F	U	T	M	F	U	T	
48	3			3								
49	2			2								
50												
51												
52												
53												
54												
Totals	42	105	46	193	2	15	11	28	13	29	21	63

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	30				31				32			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	0	0	4	4	0	0	5	5	9	8	13	30

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	33				36				37			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
Totals	15	29	10	54	0	0	5	5	0	0	2	2

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	38				39				40			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	9	7	39	55	0	0	7	7	0	0	24	24

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole															
	Tow no.				41				42				43			
	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7																
8																
9									1		1					
10																
11							1			1						
12						1				1						
13																
14																
15											3		3			
16				1	1						1		1		1	
17						1				1		2			2	
18																
19																
20	1	1			2						3		3			
21	1				1					1	2		3			
22	2				2		1			1		5		5		
23		2			2	1				1		13		13		
24	4				4	3				3		11		11		
25	4	4			8		2			2	1	4		5		
26	5	5			10						3	6		9		
27	2	3			5	1	1			2		7		7		
28	1				1	1	2			3	1	4		5		
29						1				1		3		3		
30	3	3			6						2	2		4		
31	4	1			5						3	1		4		
32	5	3			8		1			1	2	2		4		
33	8	1			9	1				1	5		5			
34	5	1			6						6		6			
35	5	3			8		1			1	6		6			
36	1	3			4						8		8			
37	4	8			12											
38											6		6			
39		2			2			1		1	1		1			
40		2			2											
41		1			1						2		2			
42	1	1			2											
43		4			4						1		1			
44											1		1			
45			1		1						2		2			
46																
47											1		1			

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	41				42				43			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49									1			1
50												
51												
52												
53												
54												
Totals	56	49	1	106	11	9	1	21	53	69	0	122

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	44				45				46			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	70	105	12	187	0	1	7	8	0	0	5	5

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole															
	Tow no.				47				48				51			
	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7																
8			1	1												
9			8	8									9	9		
10			11	11									15	15		
11			4	4									10	10		
12			3	3									1	1		
13			6	6					2	2	1	2	1	2		
14	3	8	20	31					4	4	1	2			3	
15	6	8	11	25					4	4	3	4	1	8		
16	6	2	5	13	3	2	1	6	6	4	2	12				
17	1	3	6	10		1		1		1	1	1		2		
18	3	1			4	2	1		3	5			5			
19	1		3		4	2			2	6	6	1	13			
20	1	1			2	1	3		4	3	4		7			
21	3	6			9					6	3		9			
22	2	1			3	2	1		3	2	5		7			
23	3	1			4	1			1	2	4		6			
24	3				3		1		1	1	4		5			
25	1	3			4					2	1		3			
26	1				1	2	2		4		1		1			
27	1	3			4											
28		6			6						2		2			
29	2	1			3	1	1		2	1			1			
30						2			2	1			1			
31	2	3			5	1			1	2			2			
32	4	2			6					3			3			
33	4	2			6	1			1	1			1			
34	1				1	1			1	1	1	1	2			
35	2	2			4						1		1			
36		1			1											
37		2			2						1		1			
38											1		1			
39											2		2			
40											1		1			
41											2		2			
42		1			1						2		2			
43		1			1						1		1			
44											2		2			
45											1		1			
46																
47											1		1			

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	47				48				51			
M	F	U	T	M	F	U	T	M	F	U	T	
48									1			1
49												
50												
51												
52												
53												
54												
Totals	46	62	78	186	19	12	11	42	48	58	40	146

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.				52				55			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
Totals	15	63	135	213	39	38	19	96	20	23	18	61

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	57				60				61			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	16	10	30	56	0	0	1	1	25	16	0	41

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole															
	Tow no.				62				63				64			
	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7																
8																
9																
10															5	5
11																
12																
13																
14																1
15																1
16						1			1						1	1
17					1				1			2			2	
18																
19																
20														1		1
21																
22																
23						1			1		2				2	
24																
25																
26																
27																
28																
29					1				1							
30																
31		2	2	2					2		1	2				3
32					5	1			6	2	1					3
33										3	4					7
34						3			3	1	1					2
35							1		1	5	1					6
36		1	1	4	3				7							
37			1	1					2			1				1
38				1	1				2	2	1					3
39					4				4	3	4					7
40					8				8	1	1					2
41					6				6		4					4
42					7				7		4					4
43					5				5		5					5
44					1				1		3					3
45		1	1		3				3		5					5
46						2			2		4					4
47						1			1							

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	62				63				64			
M	F	U	T	M	F	U	T	M	F	U	T	
48					1		1		9		9	
49					1		1		2		2	
50					2		2		3		3	
51					1		1		1		1	
52					4		4		2		2	
53									1		1	
54												
Totals	0	0	4	4	15	58	0	73	22	63	7	92

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	65				67				68			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	0	0	5	5	110	43	0	153	12	24	0	36

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	69				71				72			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
Totals	30	34	0	64	0	0	1	1	0	0	6	6

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	73				75				76			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52										1		1
53												
54												
Totals	0	0	9	9	0	0	2	2	5	19	20	44

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole										
	Tow no.										
	77				83				84		
M	F	U	T	M	F	U	T	M	F	U	T
7											
8									2	2	
9									8	8	
10					1	1			10	10	
11					1	1					
12											
13											
14									1	1	
15											
16									6	6	
17					2	2			4	4	
18				1	6	7					
19					1	1					
20	1	1									
21		3	3			6					
22		1	1			2		1	1		2
23		1	1			2			2		2
24		2	5			7			1		1
25		2	5			7					
26		1	2			3					
27											
28				1			1				
29		1	2				3				
30				1			1				
31				3			3				
32				2			2				
33		1	1			2					
34				2		2		1			1
35				1		1			1		1
36				2		2					
37				1			1				
38											
39		1	1			2			1		1
40											
41				1			1				
42				2			2				
43											
44											
45				1			1				
46				1			1				
47				1			1				

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole											
	Tow no.											
	77				83				84			
M	F	U	T	M	F	U	T	M	F	U	T	
48					1		1					
49												
50												
51												
52												
53												
54												
Totals	0	0	1	1	13	42	11	66	2	6	31	39

Appendix Table 4 (cont'd)

Appendix Table 4 (cont'd)

Total length (cm)	Rock sole				Tow no.			
	85				86			
	M	F	U	T	M	F	U	T
48								
49								
50								
51								
52								
53								
54								
Totals	0	0	8	8	25	37	40	102

Appendix Table 5. M/V NUCLEUS length frequencies by haul for English sole, August 11-25, 1980.

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	1				2				12			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	140	140	0	0	65	65	200	60	153	413

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	16				18				22			
	M	F	U	T	M	F	U	T	M	F	U	T
7												
8												
9												
10												
11												
12												
13												
14							1	1				
15						10	10					
16						19	19					
17	1	1				19	19					
18						13	13					
19	1	1				11	11					
20	1	1	1	4		19	24					
21			3	5		1	9					
22			4	3		2	9					
23			1	3			4					
24			4				4					
25	1	1	2	4		6			1	1		
26			1	3		4			1	1		
27				1		1			1	1		
28									1	2	3	
29									2	2		
30				1		1	3	1	1	5		
31				3		3	1	5	3	9		
32				1		1	12	4	1	17		
33	1	1						12	2	14		
34			1			1	16	8		24		
35							22	12		34		
36	1	1		1		1	12	12		24		
37							18	9		27		
38							19	7		26		
39							16	7		23		
40							22	4		26		
41							20	6		26		
42							19	5		24		
43							22	1		23		
44							22	2		24		
45							19	1		20		
46							14	1		15		
47							6	1		7		

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	16				18				22			
	M	F	U	T	M	F	U	T	M	F	U	T
48									5	2		7
49									2	3		5
50										1		1
51										3		3
52									1	3		4
53												
54										2		2
55										1		1
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	6	6	17	29	95	141	283	104	12	399

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	23				25				26			
	M	F	U	T	M	F	U	T	M	F	U	T
7												
8												
9												
10												
11												
12								1	1			
13								1	1			
14								1	1			
15		3	3					5	5			
16		11	11	3	3	12	18					
17		18	18	4	2	16	22					
18		17	17	8	2	22	32					
19		5	5	2	2	9	13					
20	2	5		7	7	5		12				
21	11	13		24	5	7	1	13				
22	16	12		28	13	7		20				
23	29	14		43	10	7		17				
24	27	30		57	7	11		18	1			1
25	23	19		42	6	4		10				
26	9	15		24	7	7		14	1			1
27	3	2		5	5	8		13				
28	3	4		7	1	8		9				
29	1	7		8		5		5	3			3
30	3	4		7	3	4		7	2			2
31	1			1	1	3		4	7			7
32	1	2		3	1	1		2	4			4
33					1	3		4	2			2
34	2	1		3		2		2	2			2
35									7			7
36						2		2	5			5
37		1		1		2		2	3	1		4
38		1		1		2		2	7			7
39						4		4	5	1		6
40						1		1	2	2		4
41		1		1		2		2	1			1
42		3		3			1		2			2
43								1				
44												
45									2			2
46									1			1
47									2			2

Appendix Table 5 (cont'd)

Total Length (cm)	Species											
	Tow No.											
	23				25				26			
M	F	U	T	M	F	U	T	M	F	U	T	
48									1		1	
49									1		1	
50									2		2	
51									3		3	
52									3		3	
53									5		5	
54									3		3	
55									5		5	
56									1		1	
57									1		1	
58									2		2	
59												
60									1		1	
61										1		
62										1		1
Totals	131	134	54	319	84	105	68	257	52	40	0	92

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

English sole												
Tow no.												
Total length (cm)	28				31				32			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	1	1	0	0	12	12	0	0	31	31

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	33				36				38			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	106	172	286	564	10	12	262	284	0	0	38	38

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	39				40				42			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	2	2	0	0	1	1	0	0	7	7

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	45				49				50			
	M	F	U	T	M	F	U	T	M	F	U	T
7												
8												
9												
10												
11												
12												
13												
14												
15												
16										1		1
17												
18										1	1	2
19										1	3	1
20										2	3	1
21					2					8	6	14
22					10					21	14	1
23					8	8				19	28	1
24	2	1			3	10	16			26	24	28
25	2				2	12	8			20	26	11
26	3	3			6	28	10			38	14	13
27	2	1			3	43	16			59	22	13
28	3	3			6	32	16			48	13	2
29	7				7	12	18			30	10	6
30	14	3			17	12	18			30	1	4
31	6	2			8	2	14			16	2	2
32	6	2			8		6			6	1	2
33	6	1			7	4				4		
34	3	3			6		4			4		
35	2	3			5		4			4		
36	1	2			3	2				2		
37	1	3			4							
38	3	3			6						1	1
39	2				2		2			2		
40		2			2							
41	1				1		2			2		1
42		2			2		6			6		
43		3			3		4			4		
44		3			3		6			6		
45		1			1		6			6		
46		1			1		4			4		
47							4			4		

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	45				49				50			
M	F	U	T	M	F	U	T	M	F	U	T	
48		2			2							
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	64	44	0	108	177	172	0	349	165	139	6	310

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	51				52				54			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	5	7	17	29	2	7	12	21	0	0	44	44

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	55				56				57			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	3	3	0	0	1	1	0	0	46	46

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	58				60				61			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	6	6	0	0	12	12	0	0	3	3

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	62				64				65			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	5	34	0	39	0	0	14	14	163	262	0	425

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	68				69				71			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	26	30	224	280	5	18	0	23	0	0	2	2

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	73				74				75			
M	F	U	T	M	F	U	T	M	F	U	T	
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	0	0	3	3	0	0	8	8	0	0	4	4

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.				76				80			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	11	21	603	635	0	0	8	8	12	32	1	45

Appendix Table 5 (cont'd)

Appendix Table 5 (cont'd)

Total length (cm)	English sole											
	Tow no.											
	83				84				85			
	M	F	U	T	M	F	U	T	M	F	U	T
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
Totals	8	16	46	70	0	0	2	2	0	0	2	2

Appendix Table 5 (cont'd)

Total length (cm)	English sole			
	Tow no.			
	86			
M	F	U	T	
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26		1		1
27				
28				
29		3		3
30		1		1
31		2		2
32	2	3		5
33	1	4		5
34		3		3
35		10		10
36		6		6
37		4		4
38		2		2
39		3		3
40		2		2
41		1		1
42		1		1
43		3		3
44		4		4
45		2		2
46		1		1
47		1		1

Appendix Table 5 (cont'd)

Total length (cm)	English sole			
	Tow no.			
	M	F	U	T
48		1		1
49		1		1
50		1		1
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
Totals	4	59	0	63

Appendix Table 6. M/V NUCLEUS Dover sole length frequencies by haul, August 11-24, 1980.

Appendix Table 6 (cont'd)

Dover sole												
Tow no.												
Total length (cm)	3				49				65			
	M	F	U	T	M	F	U	T	M	F	U	T
50												
51												
52												
53												
Totals	0	0	178	178	10	32	0	42	2	15	19	36

Appendix Table 6 (cont'd)

Total length (cm)	Dover sole			
	Tow no.			
	M	F	U	T
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21			1	1
22				
23				
24				
25				
26	1	3		4
27	3	4	1	8
28	4	2		6
29	6	4		10
30	4			4
31	11	4		15
32	8	7		15
33	14	8		22
34	13	8		21
35	5	3		8
36	3	2		5
37	5	1		6
38	1	4		5
39		3		3
40		3		3
41		1		1
42		1		1
43		2		2
44		1		1
45				
46				
47		1		1
48				
49		1		1

Appendix Table 6 (cont'd)

Total length (cm)	Dover sole			
	Tow no.			
	M	F	U	T
50				
51		1		1
52				
53		1		1
Totals	78	65	2	145

Appendix Table 7. M/V NUCLEUS turbot length frequencies by haul, August 11-25, 1980.

Total length (cm)	Turbot			
	Tow no.			
	82			
M	F	U	T	
16			1	1
17			2	2
18			7	7
19			10	10
20	1	2		3
21		1		1
22	1	2		3
23	1	1		2
24		1		1
25				
26	1			1
27		1		1
28				
29	1	1		2
30				
31				
32		1		1
33	2			2
34		1		1
35		2		2
36				
37				
38		1		1
39	3			3
40	2	3		5
41		3		3
42	3	3		6
43	2	5		7
44		2		2
45		7		7
46		6		6
47		1		1
48		5		5
49		2		2
50		3		3
51		2		2
52				
53				
54		3		3
55		1		1
Totals	17	60	20	97

Appendix Table 8. M/V NUCLEUS Pacific cod length frequencies by haul, August 11-24, 1980.

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod											
	Tow no.				3				14			
	M	F	U	T	M	F	U	T	M	F	U	T
53												
54												
55												
56			1		1							
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
Totals	0	0	38	38	90	92	0	182	35	36	0	71

Appendix Table 8 (cont'd)

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod											
	Tow no.				23				25			
	M	F	U	T	M	F	U	T	M	F	U	T
53												
54												
55						1				1		
56												
57												
58												
59												
60												
61												
62												
63					1					1		
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
Totals	0	0	42	42	24	24	0	48	42	51	0	93

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod							
	Tow no.							
	41		45		51			
M	F	U	T	M	F	U	T	M
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22							1	1
23							1	1
24							1	1
25		1		1			9	8
26	1	1		2			14	10
27	8	4		12			15	15
28	8	11		19			12	19
29	7	6		13	1	4	5	15
30	13	9		22	4	2	6	13
31	13	5		18	4	2	6	5
32	7	6		13	2	5	7	4
33	8	4		12	7	4	11	2
34	6	5		11	3	5	8	1
35	4	1		5	5	4	9	2
36	1	4		5	7	7	14	1
37		1		1	3	3	6	
38	1	1		2	3	2	5	
39				4	1		5	
40					3	3	6	
41		1		1	1	1	2	
42				2	1		3	
43					2		2	
44								
45				1	1		2	
46								
47				1	1		2	
48				1	1		2	
49								
50								
51				1			1	
52				1			1	

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod											
	41				45				51			
	M	F	U	T	M	F	U	T	M	F	U	T
53						1			1			
54					2				2			
55												
56					1	1			2			
57						1			1			
58						2			2			
59					2	1			3			
60					1	1			2			
61					1	1			2			
62					1				1			
63					1				1			
64						2			2			
65						1			1			
66					1				1			
67												
68												
69												
70						1			1			
71					1	1			2			
72						1			1			
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
Totals	77	60	0	137	65	63	0	128	93	92	0	185

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod															
	Tow no.				52				65				67			
	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
12																
13																
14																
15							1				1					
16																
17																
18																
19																
20																
21																
22																
23																
24																
25	1	2			3											
26		6			6											
27	3	1			4	1				1						
28	5	6			11		3			3						
29	9	6			15	3	6			9						
30	5	5			10	5	6			11	1	1		2		
31	2	1			3	4	3			7						
32	2	1			3	5				5	1			1		
33	3	1			4		1			1	2	1		3		
34						3	3			6	3			3		
35						2	3			5	2	2		4		
36		1			1						1			1		
37		1			1	2				2	2	1		3		
38	1				1		1			1		1		1		
39						1				1		1		1		
40											1			1		
41																
42																
43											1	1		2		
44											2			2		
45												1		1		
46											2			2		
47												1		1		
48											1			1		
49					1				1	2				2		
50																
51												1		1		
52												1		1		

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod											
	52				65				67			
	M	F	U	T	M	F	U	T	M	F	U	T
53												
54												
55					1			1	1	1		2
56									1			1
57												
58										1		1
59												
60								1	2			3
61												
62												
63										1		1
64									2			2
65												
66								1				1
67							1					1
68												
69									1			1
70								2	1			3
71												
72												
73												
74												
75												
76								1	1			2
77							2	1				3
78								1				1
79												
80												
81										1		1
82												
83										1		1
84												
85												
86									1			1
Totals	31	31	0	62	29	26	0	55	31	27	0	58

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod										
	Tow no.										
	69				83						
M	F	U	T	M	F	U	T	M	F	U	T
12						7	7				
13						13	13				
14						17	17				
15						21	21				
16						14	14				
17						3	3				
18											
19											
20											
21											
22											
23											
24	2			2							
25	1			1							
26	2			2							
27		3		3							
28	3	2		5							
29	2			2							
30	3	2		5				1			1
31	2	5		7				2			2
32	3	3		6				1			1
33	2	1		3							
34	3			3					1		1
35	1	1		2							
36											
37		1		1					1		1
38									1		1
39								1			1
40								1	2		3
41	2			2				2	1		3
42	1			1				1			1
43								1	1		2
44											
45									2		2
46									1		1
47									1		1
48								1	1		2
49									1		1
50											
51								1			1
52									1		1

Appendix Table 8 (cont'd)

Fork length (cm)	Pacific cod											
	Tow no.											
	69				83				86			
	M	F	U	T	M	F	U	T	M	F	U	T
53												
54												
55												
56		1								2		
57												
58										1		
59												
60												
61												
62												
63		1								1		
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
Totals	27	20	0	47	0	0	75	75	12	18	0	30

Appendix Table 9. M/V NUCLEUS pollock length frequency,
August 11-25, 1980.

Fork length (cm)	Pollock			
	Tow no.			
	67			
	M	F	U	T
34		1		1
35	1	1		2
36	2			2
37		1		1
38				
39				
40		1		1
41		1		1
42		1		1
43		1		1
44	3	1		4
45	2	2		4
46	3	4		7
47	3	3		6
48	2	3		5
49	2	2		4
50	1	5		6
51	3			3
52		5		5
53	1	3		4
54	1			1
55	2	2		4
56	4	1		5
57		1		1
58		2		2
59		1		1
60		5		5
61		6		6
62				
63		2		2
64		1		1
Totals	34	52	0	86

Appendix Table 10. M/V NUCLEUS S. wilsoni length frequencies by haul, August 11-25, 1980.

Fork length (cm)	<u>S. wilsoni</u>			
	Tow no.			
	4			
M	F	U	T	
12	2	1		3
13	5	3		8
14	3	2		5
15	11	3		14
16	4	7		11
17	2	15		17
18		4		4
19		8		8
20		7		7
21		2		2
22		1		1
Totals	27	53	0	80

Appendix Table 11. M/V NUCLEUS dogfish length frequencies by haul, August 11-25, 1980.

Total length (cm)	Dogfish										
	Tow no.										
	4				5						
M	F	U	T	M	F	U	T	M	F	U	T
61											
62											
63											
64											
65											
66											
67											
68											
69											
70								1			1
71											
72											
73											
74								1			2
75											
76								1	2		3
77									2		2
78								1		1	
79								2		2	
80								1		1	
81								1		1	
82								1	2		3
83								1	4		5
84								1		1	
85								2		2	
86								6		6	
87							1	1		5	5
88	2				2		1	2		3	3
89	1				1		1			3	3
90	1	1			2		3	3		5	5
91		2			2		3	3		6	6
92	2				1		1			7	7
93	1	1			3		3			7	7
94					7		7			6	6
95					2		4	4		4	4
96					1		3	3		4	4
97					3		5	5		1	1
98					2		7	7		2	2
99					6		6			2	2
100	1	2			6		6			5	5
101					6		6				

Appendix Table 11 (cont'd)

Total length (cm)	Dogfish											
	Tow no.											
	4				5				9			
M	F	U	T	M	F	U	T	M	F	U	T	
102	3		3		8		8		1		1	
103	2		2		5		5		1		1	
104					2		2		3		3	
105					3		3		1		1	
106					3		3					
107	1		1		4		4		3		3	
108					1		1					
109	1		1		1		1		2		2	
110					1		1		1		1	
111									3		3	
112					1		1		1		1	
114					1		1					
115												
116												
117												
118												
Totals	8	21	0	29	1	81	0	82	5	109	0	114

Appendix Table 11 (cont'd)

Total length (cm)	Dogfish			
	Tow no.			
	10			
M	F	U	T	
61	1			1
62				
63				
64		1		1
65				
66				
67		1		1
68				
69				
70				
71				
72	1			1
73				
74		2		2
75		1		1
76		2		2
77				
78		2		2
79	1	1		2
80	1	1		2
81		1		1
82	1	2		3
83		2		2
84	1	6		7
85		3		3
86		6		6
87		5		5
88		4		4
89		5		5
90		9		9
91		7		7
92		4		4
93		5		5
94		6		6
95		11		11
96		8		8
97		12		12
98		5		5
99		9		9
100		14		14
101		5		5

Appendix Table 11 (cont'd)

Total length (cm)	Dogfish			
	Tow no.			
	10			
M	F	U	T	
102		4		4
103		6		6
104				
105		4		4
106		1		1
107		4		4
108		3		3
109		2		2
110		3		3
111				
112		2		2
113				
114		1		1
115		1		1
116		1		1
117				
118		1		1
Totals	6	173	0	179

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