G.B. Reed Groundfish Cruise No. 79-6, September 6-21, 1979

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G.B. REED GROUNDFISH CRUISE

NO. 79-6, SEPTEMBER 6-21, 1979

by

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ABSTRACT

Westrheim, S. J., R. P. Foucher, W. R. Harling, and W. Shaw. 1979. G.B. Reed Groundfish Cruise No. 79-6, September 6-21, 1979. Can. Data Rep. of Fish. and Aquat. Sci. No. 191: 64 p.

Primary purpose of the cruise was to investigate the distribution and abundance of Pacific cod (Gadus macrocephalus) in Hecate Strait. Secondary purposes were to collect hydrographic data in Queen Charlotte Sound and Hecate Strait, and sample surficial sediments in Hecate Strait. Pacific cod catch rates were 18-684 kg/hr at 32-89 fm. Few adult cod were caught, presumably because relatively warm water dispersed them to deeper cooler depths. Stomach contents were recorded for 103 Pacific cod. Principal surficial sediments, collected in Hecate Strait were sand at 10-70 fm and mud at depths deeper than 70 fm.

Key words: Pacific cod, distribution, abundance, length-frequency , diet, hydrography, surficial sediments, Hecate Strait, Queen Charlotte Sound.

RÉSUMÉ

Westrheim, S. J., R. P. Foucher, W. R. Harling, and W. Shaw. 1979. G.B. Reed Groundfish Cruise No. 79-6, September 6-21, 1979. Can. Data Rep. of Fish. and Aquat. Sci. No. 191: 64 p.

L'objet principal de l'expédition était l'étude de la distribution et de l'abondance de la morue du Pacifique (Gadus macrocephalus) dans le détroit d'Hécate. Les objectifs secondaires étaient la collecte de données hydrographiques dans les détroits de la Reine-Charlotte et d'Hécate, et le prélèvement d'échantillons des sédiments superficiels dans ce dernier détroit. Les taux de capture de la morue du Pacifique étaient de 18-684 kg/h à des profondeurs allant de 32 à 89 brasses. On a capturé peu d'adultes, probablement parce que la température relativement élevée de l'eau les a chassés vers des zones plus profondes et plus fraîches. On a analysé le contenu des estomacs de 102 morues du Pacifique. Les principaux sédiments superficiels recueillis dans le détroit d'Hécate etaient du sable de 10 à 70 brasses, et de la boue au-delà de 70 brasses.

Mots clés: Morue du Pacifique, distribution et abondance, détroit d'Hécate.

INTRODUCTION

G. B. REED Groundfish Cruise 79-6 was completed during September 6-21, 1979. Primary purpose of the cruise was to investigate the distribution and abundance of Pacific cod (Gadus macrocephalus) in Hecate Strait (Figure 1). Secondary purposes were to collect temperature and salinity data in Queen Charlotte Sound and Hecate Strait, and sample surficial sediments in Hecate Strait.

No port calls were made.

This project was supported in part with funds provided by the Department of the Environment, Province of British Columbia.

MATERIALS AND METHODS

Abundance and distribution of Pacific cod were investigated with echo sounder (SIMRAD EK-38), and the standard Granton (eastern) on-bottom trawl, equipped with a rubber-disc groundline (see Appendix Table 1 for description).

Water temperatures were collected with a bathythermograph (BT), XBT (expendable bathythermograph), or reversing thermometer. Water samples for salinity determination were collected with Nansen bottles. Salinities will be determined by Oceanography Program staff at the Pacific Biological Station.

Surficial sediments were collected with a Shipek bottom grab, and preliminary analysis completed at time of collection. Detailed analysis will be undertaken by geologists at the Geo-Science Center, Patricia Bay, B.C.

RESULTS

GENERAL

A total of 36 trawl hauls were completed, of which 33 were deemed usable (Fig. 1). Following is a summary of the total catch, by species:

Species	Catch (kg)	%
Arrowtooth flounder	10,264	25.7
Pacific cod	5,195	13.0
Rock sole	4,951	12.4
English sole	3,125	7.8
Sablefish	2,811	7.1
Pacific halibut	2,239 (763 fish)	5.6
Spiny dogfish	1,888	4.7
Skate	1,792	4.5
Walleye pollock	1,639	4.1
Other[a]	5,983	15.1
Total	39,887	100.0

[a]All other species whose individual total catches did not exceed 1,500 kg.

Detailed records by haul are contained in Appendix Table 1.

A total of 12,874 specimens (comprising 10 species) were sampled for fork length (Table 1). Pacific cod specimens totalled 7,349, of which scales were collected from 638; dorsal fin rays were collected from 328; and stomach contents were recorded for 102. Other species for which only lengths were recorded, were English sole (1,597), walleye pollock (1,383), Pacific halibut (763), Sebastes proriger (624), rock sole (464), S. alutus (304), sablefish (283), S. pinniger (84), and Pacific herring (21). Size compositions by haul are contained in Appendix Tables 2-8.

Hydrographic stations occupied totalled 54 -- 42 in Hecate Strait and 12 in Queen Charlotte Sound (Fig. 2). Water temperatures were collected at all of these stations and salinities at 9 stations. Detailed records, by station, are contained in Appendix Table 9.

Mean water temperatures in Hecate Strait, exclusive of Moresby Gully, ranged from 11.1-13.0°C at the surface, and 5.7-12.0°C on bottom (10-139 fm) (Table 2). Comparable values in July 1979 (GBR 79-4) were 11.5-13.8°C at the surface, and 6.2-11.3°C on bottom (10-99 fm). Bottom-water temperatures were warmer in September than July at all comparable 10-fm depth intervals except 10-19 and 30-39 fm.

Mean water temperatures in Moresby Gully were 12.8-14.6°C at the surface and 5.0-6.3°C (80-219 fm) on bottom (Table 2). Comparable temperatures in July 1979 (GBR 79-4) were 11.7-13.8°C at the surface, and 5.0-6.2°C on bottom (80-219 fm). Comparable on-bottom temperatures were warmer in September than July between 80-139 fm, but exhibited negligible difference between 140-219 fm.

Mean water temperatures in Queen Charlotte Sound were 13.7-15.1°C at the surface, and 5.7-6.5°C on bottom (80-199 fm) (Table 2). Comparable values in July 1979 (GBR 79-4) were 12.5-13.3°C at the surface, and 5.2-5.9°C on bottom (100-179 fm). Comparable on-bottom temperatures were warmer at all depth intervals in September than July.

Shipek grab stations totalled 97, all in Hecate Strait (Fig. 3). These were located on the following grounds: Two Peaks (3); Shell (13); Ole Spot (34); Horseshoe (24); Reef Island (3); and Ramsay Island (20). Predominant bottom sediment was sand at depths shallower than 70 fms, and mud at deeper depths. Detailed records of each grab are contained in Appendix Table 10.

For July and September 1979 combined, a total of 373 bottom grabs were taken on trawling grounds throughout Hecate Strait (Table 3). Predominant bottom sediment at 10-79 fm was sand, and at deeper depths, mud. The singular exception was Shell Ground, which is a mosaic of shell, sand, and gravelly sand. Intermittent patches of shell were detected on all other grounds except Two Peaks and Butterworth Edge.

PACIFIC COD

Catch rates for Pacific cod ranged from 18-684 kg (44-2,406 fish)/hr over a depth range of 30-89 fms (Table 4). Catch rates declined southward, from 134-684 kg/hr on Two Peaks Ground to 32-110 kg/hr on Horseshoe Ground. No discernible trend with depth was evident on any ground.

Sex ratios ranged from 43-60% males, but exhibited no trend among grounds or depths. Modal sizes generally delineated age classes -- 11-17 cm for age 0+; 26-38 cm for age 1+; 44-50 cm for age 2+; 56-59 cm for age 3+; and 71-74 cm for age 5+. Age class 4+ (ca. 65 cm) was not well represented, and indeed few adult cod (older than 2+) were caught, perhaps because bottom-water temperatures were too warm (>8°C) throughout most of the depths trawled.

Stomach contents were intermittently noted when Pacific cod were sampled for length and sex, and on one occasion (Haul #33), 102 stomachs were examined in detail. Table 5 summarizes the intermittent observations, by haul. Omnivorous nature of Pacific cod diet is evident. Of some interest was the record of a 17-cm Pacific cod found in the stomach of a 37-cm female Pacific cod (Haul #14). Relationship of fish length to diet for the specimens examined from Haul #33 is shown in Table 6. The 102 specimens ranged in length from 19 cm to 84 cm. Crustaceans were present in 72 stomachs, and fish in 15. Size range of cod with crustacea in their stomachs was 31-63 cm, compared to 34-84 cm for cod with fish in their stomachs.

PERSONNEL

S. J. Westrheim (i/c), R. P. Foucher, W. R. Harling, and W. Shaw, all of the Pacific Biological Station, were present during the entire cruise.

Table 1 . Summary of biological sampling (nos. of specimens), by species, during G.B. REED Groundfish Cruise No. 79-6, September 6-21, 1979.

Species	Appendix table no.	Length		Age determination		Stomach contents
		Total	By sex	Scales	Dorsal fin rays	
Pacific cod	2	7,349	2,901	638	328	102
English sole	3	1,597	-	-	-	-
Rock sole	4	464	95	-	-	-
Pacific halibut	5	763	-	-	-	-
Sebastes proriger	6	624	624	-	-	-
Walleye pollock	7	1,383	593	-	-	-
S. alutus	6	304	258	-	-	-
Sablefish	8	283	-	-	-	-
S. pinniger	6	84	84	-	-	-
Pacific herring	8	21	-	-	-	-
Total		12,874		638	328	102

Table 2. Surface and bottom water temperatures (°C), by area and depth interval, observed during G. B. REED groundfish cruise 79-6, September 6-21, 1979.

Depth interval (fm)	Surface temp (°C)		Bottom temp (°C)		No.[a]
	Mean[a]	Range	Mean[a]	Range	
			HECATE STRAIT (shallow)[b]		
10- 19	12.6(11.5)	12.4-12.7	10.5(11.3)	10.0-11.0	2(7)
20- 29	12.6(12.4)	-	12.0(10.2)	-	1(3)
30- 39	13.0(13.8)	-	8.8 (9.1)	-	1(1)
40- 49	12.3(12.1)	11.4-13.6	8.5 (8.2)	7.8- 9.4	7(2)
50- 59	12.8(11.7)	11.9-13.6	7.6 (6.8)	7.3- 7.7	4(9)
60- 69	12.5(12.0)	11.1-13.7	7.4 (6.2)	6.8- 7.9	4(5)
70- 79	13.4(11.9)	12.4-14.3	7.3 (6.3)	6.9- 8.1	6(2)
80- 89	13.1(12.2)	11.0-14.2	6.9 (6.5)	6.2- 7.2	5(3)
90- 99	- (11.5)	-	- (7.8)	-	-(1)
100-109	11.1 (-)	-	6.0 (-)	-	1(-)
130-139	12.0 (-)	11.5-12.5	5.7 (-)	5.6- 5.8	2(-)
			MORESBY GULLY[c]		
80- 99	12.8(13.8)	-	6.3 (6.2)	-	1(1)
100-119	12.8(12.4)	-	6.3 (5.8)	-	1(4)
120-139	14.4(11.7)	14.3-14.6	5.7 (5.3)	5.4- 5.9	3(2)
140-159	14.6(13.5)	-	5.1 (5.1)	-	1(1)
160-179	14.1 (-)	-	5.6 (-)	-	1(-)
180-199	13.8(13.1)	-	5.0 (5.0)	-	1(2)
200-219	13.4(12.9)	-	5.1 (5.0)	-	1(1)
			QUEEN CHARLOTTE SOUND		
80- 99	13.7 (-)	13.4-14.0	6.5 (-)	6.3- 6.7	2(-)
100-119	14.2(13.1)	12.4-15.4	6.3 (5.9)	5.8- 7.3	5(4)
120-139	14.7(13.3)	13.9-15.5	6.2 (5.8)	6.2- 6.2	2(5)
140-159	15.1(13.1)	-	6.0 (5.5)	-	1(2)
160-179	- (12.5)	-	- (5.2)	-	-(1)
180-199	14.4 (-)	13.4-14.5	5.7 (-)	5.5- 5.8	2(-)

[a]July, 1979 values in parentheses.
[b]Includes Dixon Entrance.
[c]>90 fm within Hecate Strait (52°-53°17'N).

Table 3. Principal types of bottom sediments in Hecate Strait, by ground, based on Shipek grab samples collected during July and September 1979.

Ground	No. of grabs	Depth (fm)	Principal sediment
Two Peaks	40	16–104	Sand @ 16–70 fm, sandy Mud @ 80 fm, Mud @ 90–104 fm.
Butterworth Edge	19	12– 65	gravelly Sand @ 12–22 fm, Sand @ 33–45 fm, muddy, gravelly Sand @ 56–65 fm, gravelly Sand @ 40 fm (East side).
Butterworth Flats	12	10– 33	Sand throughout, with patches of gravelly Sand and Shell on the eastern and western edges.
White Rocks	13	25– 75	fine Shell @ 25 fm, Sand @ 35–48 fm, muddy Sand @ 55–65 fm, sandy Mud @ 75 fm.
Shell	83	17– 61	Mosaic of Sand, Shell, and gravelly Sand.
Ole Spot	43	15– 79	gravelly Sand @ 15–30 fm, Sand @ 40–60 fm, Sand and Mud @ 60–79 fm.
Horseshoe	104	15– 80	sandy Shell @ 15– 30 fm, Sand and Gravel @ 40 fm bend, Sand @ 40–70 fm.
Reef Island	28	12– 94	Shell and Gravel @ 12–50 fm, Shell and Sand @ 20–30 fm, gravelly Sand @ 50–94 fm.
Ramsay Island	31	37– 71	sandy Gravel @ 37–57 fm, Sand @ 60–71 fm.

Table 4. Pacific cod catch rates and sex ratio, by depth interval, by area, (usable hauls only), G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Ground	Depth interval (fm)	No. of hauls	Catch rate (kg/hr)	Catch rate (no./hr)	Sex ratio[a] (% males)	Mode[b] (cm)
Two Peaks	40-49	4	467	716	46(708)	35;56;17
	50-59	9	618	365	49(1,644)	38;59;53;74;17
	60-69	1	684	314	43(157)	38;56;71;77
	70-79	1	134	108	52(54)	38;56
Shell Ground	30-39	2	485	2,406	48(124)	14;32
Bonilla	40-49	2	202	256	49(54)	17;56;50;32
	50-59	3	216	491	48(112)	17;44;32
	60-69	1	32	48	-(0)	47;17;35
Horseshoe	30-39	1	18	600	-(0)	11
	40-49	4	56	779	45(31)	17;26
	50-59	2	110	430	-(0)	32;17
	70-79	1	32	44	60(10)	17;50;35
	80-89	1	49	44	50(8)	47
Ramsay Island	30-39	1	-	-	-	-

[a]No. sampled for sex in brackets. Most small specimens not sexed (see Appendix Table 2).
[b]Descending magnitude. Based on length frequencies grouped into 3-cm intervals. 35 = 34 - 36; etc.

Table 5. Summary of casual observations on stomach contents of Pacific cod sampled for length and sex during GBR 79-6, September, 1979.

Haul No.	No. of Pacific cod		Stomach contents
	Measured	Sexed	
1	147	146	shrimp, crabs, bivalves, polychaetes, herring, flatfish
2	276	276	same as Haul #1, plus sipunculids
4	138	138	shrimp, Rossia sp., herring
14	884	124	sandlance in 24 of 124 examined; one lightly digested, 17-cm Pacific cod in stomach of 37-cm female.
21	31	31	shrimp, sandlance, flatfish
27	164	74	Octopus sp., Rossia sp., pollock
33	355	355	detailed records for 102 specimens, see Table 6.

Table 6. Incidence of crustaceans and fish in the stomachs of 102 Pacific cod, by length, collected from Haul No. 33, during GBR 79-6, September 1979.

Fork length[a] (cm)	Number examined	Crustaceans[b]		Fish[c]	
		N	%	N	%
20	1	-	-	-	-
23	0	-	-	-	-
26	0	-	-	-	-
29	0	-	-	-	-
32	6	5	83	-	-
35	20	19	95	1	5
38	26	24	92	1	4
41	7	7	100	0	-
44	5	4	80	1	20
47	1	1	100	0	-
50	2	2	100	0	-
53	3	1	33	1	33
56	8	4	50	2	25
59	9	4	44	2	22
62	2	1	50	0	-
65	1	-	-	0	-
68	2	-	-	2	100
71	3	-	-	1	33
74	4	-	-	2	50
77	0	-	-	0	-
80	1	-	-	1	100
83	1	-	-	1	100
Total	102	72		15	

[a]Measured to nearest cm. Grouped into 3-cm intervals: 20= 19-21, etc.
[b]Amphipods, crabs, euphausiids, and shrimp.
[c]Mostly flatfish, herring, and sandlance.

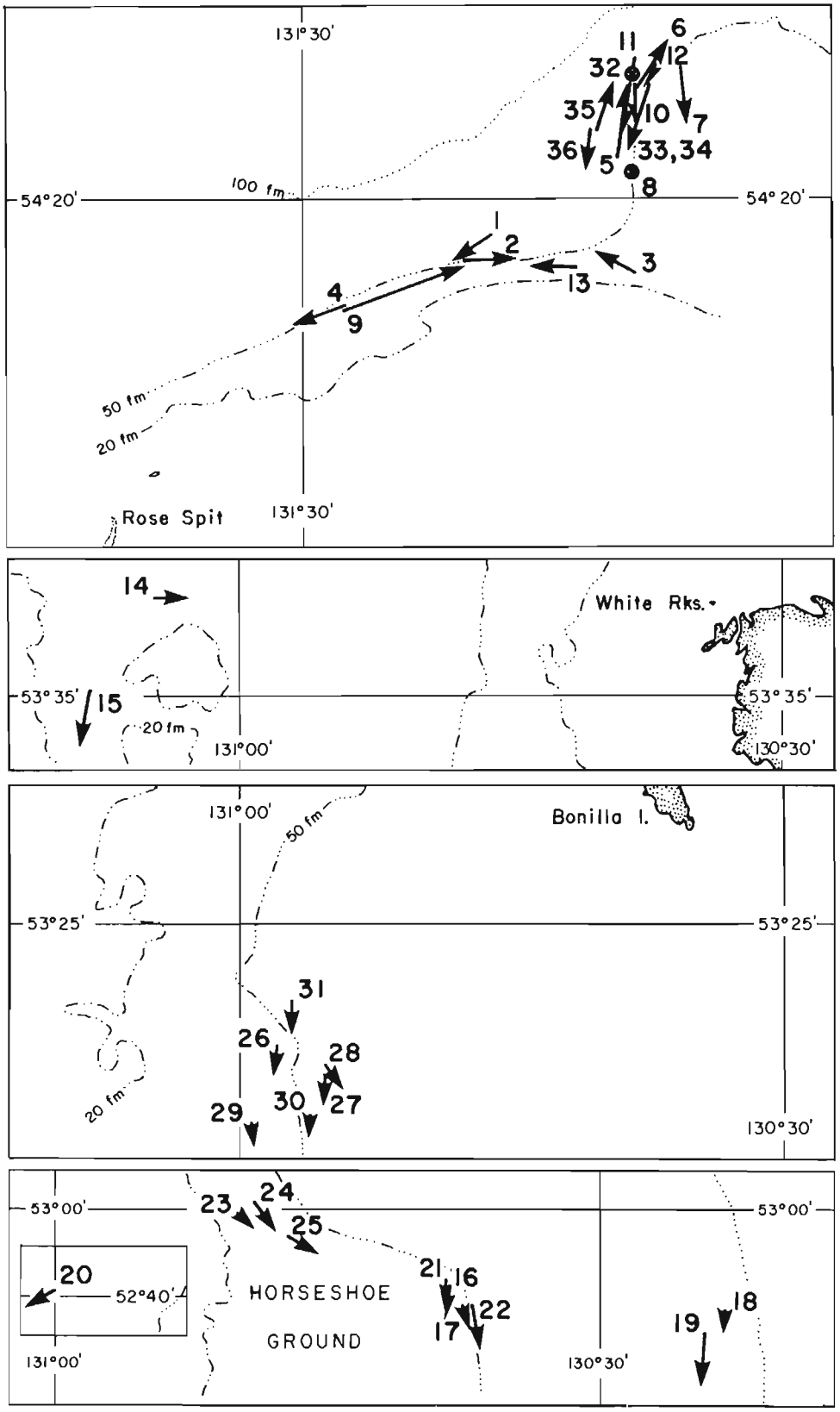

Fig. 1. Location of trawl hauls completed during GBR 79-6, September 6-21, 1979. (8 = snag haul).

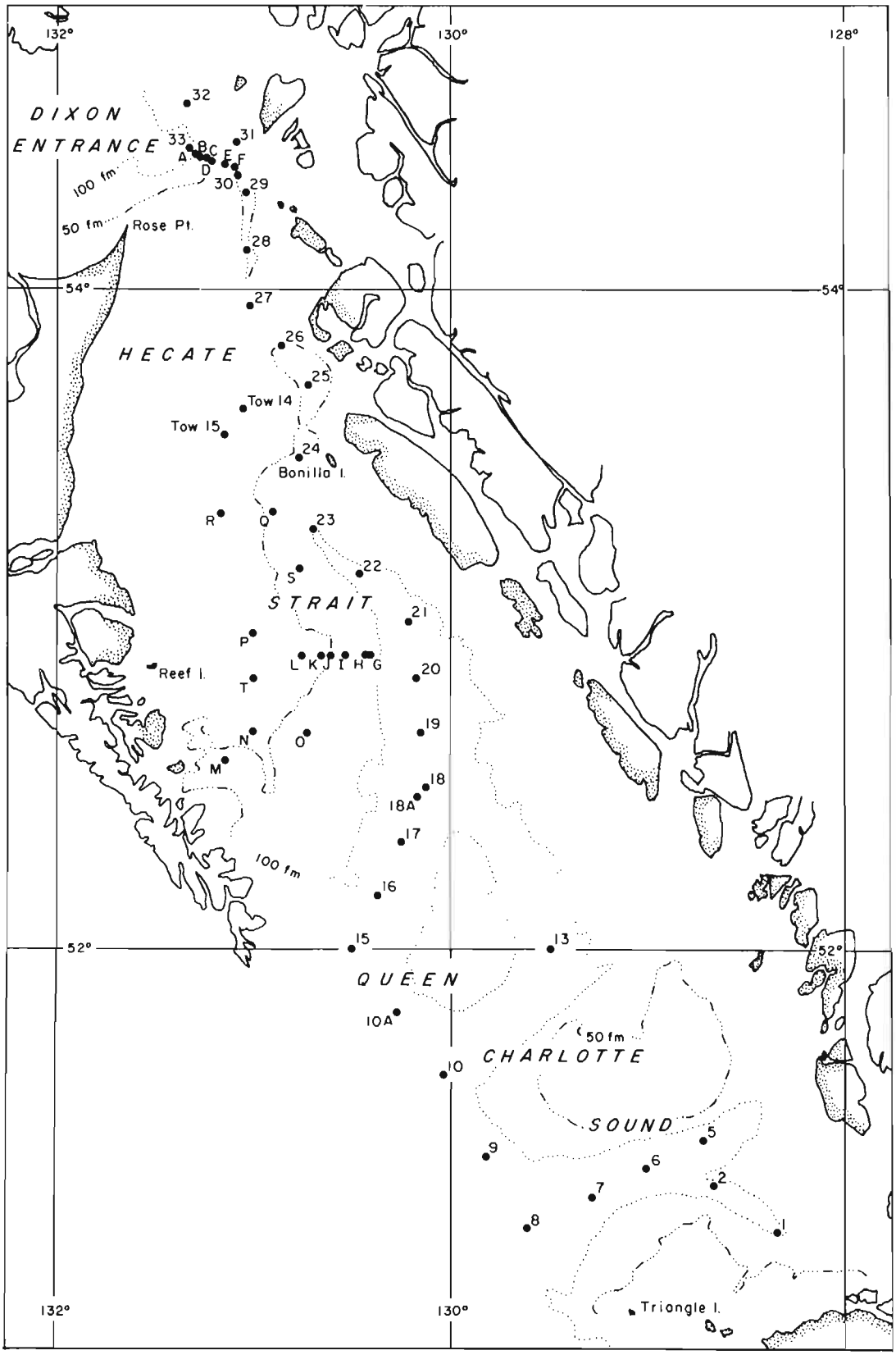

Fig. 2. Location of hydrographic stations occupied during GBR 79-6, September 6-21, 1979.

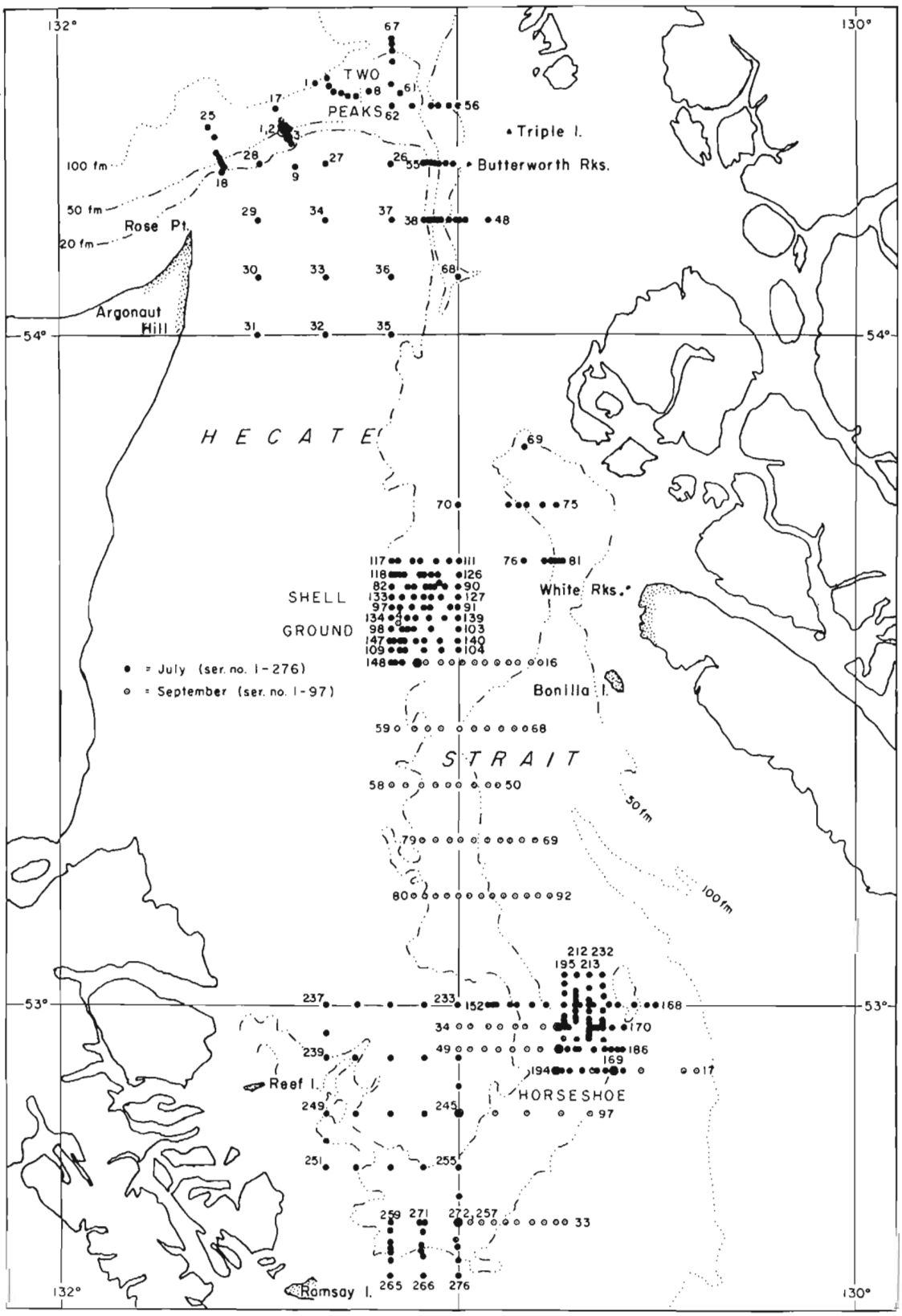

Fig. 3. Location of Shipek-grab stations occupied during GBR 79-4 (July) and GBR 79-6 (September).

APPENDIX TABLES

APPENDIX TABLE 1. FISHING LOG FOR G.B. REED GROUNDFISH CRUISE NO. 79-6, SEPT. 6 - 21, 1979

HAUL NO.		1	2	3	4	5
DATE		SEP 9	SEP 9	SEP 9	SEP 9	SEP 10
AREA		TP	TP	TP	TP	TP
START TIME	(PST)	0833	1000	1234	1525	0827
DURATION	(MIN)	30	30	30	30	30
START N. LAT.	(DEG)	054	054	054	054	054
	(MIN)	19.0	18.3	18.0	17.2	21.0
W. LONG.	(DEG)	131	131	131	131	131
	(MIN)	21.5	23.0	14.8	28.0	15.6
DIRECTION (DEG.TRUE)		220	090	280	245	010
FINISH N. LAT.	(DEG)	054	054	054	054	054
	(MIN)	18.4	18.4	18.5	16.7	23.0
W.LONG.	(DEG)	131	131	131	131	131
	(MIN)	23.0	20.5	16.5	30.3	15.2
HAUL DISTANCE (N.M.)		1.5	1.6	1.0	1.4	2.0
DEPTH	(FATHOMS)	67- 56	51- 51	38- 45	50- 52	57- 56
	(METERS)	122-102	93- 93	69- 82	91- 95	104-102
DEPTH INTERVAL	(FM)	50	50	40	50	50
TYPE OF GEAR		1	1	1	1	1
TOTAL CATCH	(KG)	777	819	229	569	..
REMARKS		USABLE	USABLE	USABLE	USABLE	UNUSABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	1	2	3	4	5
DATE	SEP 9	SEP 9	SEP 9	SEP 9	SEP 10
AREA	TP	TP	TP	TP	TP
TOTAL CATCH (KG)	777	819	229	569	0
ARROWTOOTH FLOUNDER	151	193	..	188	..
BUTTER SOLE	..	..	4	27	..
CURLFIN SOLE	..	..	..	..	..
DOVER SOLE	5	..	..	..	..
ENGLISH SOLE	5	15	9	13	..
FLATHEAD SOLE	4	1	..	1	..
PACIFIC HALIBUT	72	69	5	25	..
PACIFIC SANDDAB	..	..	..	..	..
PETRALE SOLE	..	..	..	..	..
REX SOLE	152	1	..	T	..
ROCK SOLE	..	..	..	1	..
STARRY FLOUNDER	..	26	12	..	..
OTHER FLATFISH	..	..	..	..	..
S. ALUTUS	T	..	..	..	..
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	10	33	9	17	..
S. CILIATUS	..	..	..	1	..
S. ELONGATUS	..	..	..	..	..
S. FLAVIDUS	29	15	1	5	..
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	..	..	..	22	..
S. PINNIGER	..	..	..	..	..
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	..	..	..	..	..
OTHER ROCKFISH	..	..	..	..	..
LINGCOD	..	1	..	10	..
PACIFIC COD	185	262	72	108	..
PACIFIC HERRING	..	..	..	..	..
POACHERS	T	..	..	..	..
SABLEFISH	73	99	1	40	..
WALLEYE POLLOCK	12	18	1	24	..
OTHER ROUNDFISH	T	..	..	..	..
RATFISH	..	..	..	..	..
SKATES	61	62	98	30	..
SPINY DOGFISH	18	10	12	39	..
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	..	14	5	18	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.	6	7	8	9	10
DATE	SEP 10	SEP 10	SEP 10	SEP 10	SEP 11
AREA	TP	TP	TP	TP	TP
START TIME (PST)	1005	1245	1522	1723	0828
DURATION (MIN)	30	30	11	62	30
START N. LAT. (DEG)	054	054	054	054	054
(MIN)	22.7	23.3	20.8	17.0	23.2
W. LONG. (DEG)	131	131	131	131	131
(MIN)	15.0	12.8	14.2	26.2	15.1
DIRECTION (DEG.TRUE)	360	215	195	065	150
FINISH N. LAT. (DEG)	054	054	054	054	054
(MIN)	24.0	22.0	20.5	18.1	22.0
W.LONG. (DEG)	131	131	131	131	131
(MIN)	13.5	12.5	15.3	23.0	14.7
HAUL DISTANCE (N.M.)	1.4	1.3	0.8	3.0	1.4
DEPTH (FATHOMS)	52- 60	42- 39	52- 55	45- 44	57- 52
(METERS)	95-109	76- 71	95-100	82- 80	104- 95
DEPTH INTERVAL (FM)	50	40	50	40	50
TYPE OF GEAR	1	1	1	1	1
TOTAL CATCH (KG)	2139	1070	..	2352	2032
REMARKS	USABLE	USABLE	UNUSABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	6	7	8	9	10
DATE	SEP 10	SEP 10	SEP 10	SEP 10	SEP 11
AREA	TP	TP	TP	TP	TP
TOTAL CATCH (KG)	2139	1070	0	2352	2032
ARROWTOOTH FLOUNDER	723	500	..	206	1021
BUTTER SOLE	..	12	..	104	..
CURLFIN SOLE	..	..	..	..	..
DOVER SOLE	T	..	..	..	1
ENGLISH SOLE	4	83	..	472	1
FLATHEAD SOLE	..	..	..	..	..
PACIFIC HALIBUT	333	195	..	200	121
PACIFIC SANDDAB	..	..	..	..	..
PETRALE SOLE	..	2	..	3	..
REX SOLE	5	1	..	..	1
ROCK SOLE	25	155	..	1	9
STARRY FLOUNDER	..	..	..	31	..
OTHER FLATFISH	..	..	..	..	..
S. ALUTUS	..	..	..	..	..
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	16	..	..	T	39
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	..	..	..
S. FLAVIDUS	1	..	..	..	39
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	16	..	..	..	7
S. PINNIGER	..	..	..	..	..
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	T	..	..	..	..
OTHER ROCKFISH	..	..	..	..	..
LINGCOD	1	..	..	48	10
PACIFIC COD	576	35	..	622	215
PACIFIC HERRING	..	1	..	4	..
POACHERS	..	..	..	..	..
SABLEFISH	154	11	..	5	408
WALLEYE POLLOCK	224	5	..	201	108
OTHER ROUNDFISH	..	..	..	..	..
RATFISH	..	..	..	..	..
SKATES	46	41	..	391	14
SPINY DOGFISH	15	21	..	64	38
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	..	8	..	..	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		11	12	13	14	15
DATE		SEP 11	SEP 11	SEP 11	SEP 12	SEP 12
AREA		TP	TP	TP	SH	SH
START TIME	(PST)	1008	1215	1443	0936	1258
DURATION	(MIN)	30	30	30	15	33
START N. LAT.	(DEG)	054	054	054	053	053
	(MIN)	23.7	23.6	18.2	38.2	35.2
W. LONG.	(DEG)	131	131	131	131	131
	(MIN)	14.8	13.9	17.6	04.4	08.1
DIRECTION (DEG.TRUE)		190	190	270	090	180
FINISH N. LAT.	(DEG)	054	054	054	053	053
	(MIN)	21.9	23.1	18.2	38.3	33.5
W.LONG.	(DEG)	131	131	131	131	131
	(MIN)	15.4	14.4	19.5	02.8	08.7
HAUL DISTANCE (N.M.)		1.0	0.8	1.2	0.6	1.8
DEPTH	(FATHOMS)	55- 55	51- 50	42- 45	39- 40	32- 34
	(METERS)	100-100	93- 91	76- 82	71- 73	58- 62
DEPTH INTERVAL	(FM)	50	50	40	30	30
TYPE OF GEAR		1	1	1	1	1
TOTAL CATCH	(KG)	1056	627	1070	769	3208
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	11	12	13	14	15
DATE	SEP 11	SEP 11	SEP 11	SEP 12	SEP 12
AREA	TP	TP	TP	SH	SH
TOTAL CATCH (KG)	1056	627	1070	769	3208
ARROWTOOTH FLOUNDER	545	246	199	..	..
BUTTER SOLE	..	1	26	..	6
CURLFIN SOLE	..	..	..	..	..
DOVER SOLE	..	..	..	..	2
ENGLISH SOLE	7	33	114	4	35
FLATHEAD SOLE	..	..	..	..	..
PACIFIC HALIBUT	201	38	12	27	8
PACIFIC SANDDAB	..	..	..	..	5
PETRALE SOLE	..	..	..	..	..
REX SOLE	4	10	..	T	5
ROCK SOLE	8	26	..	337	3004
STARRY FLOUNDER	..	..	37	..	..
OTHER FLATFISH	..	..	..	..	T
S. ALUTUS	..	..	..	..	..
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	11	1	3	..	..
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	..	..	..
S. FLAVIDUS	6	..	..	..	..
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	..	4	..	..	..
S. PINNIGER	..	..	..	..	..
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	..	..	..	..	..
OTHER ROCKFISH	T	..	..	..	..
LINGCOD	..	..	2	10	..
PACIFIC COD	129	126	454	349	39
PACIFIC HERRING	..	..	2	..	..
POACHERS	..	..	..	..	T
SABLEFISH	129	89	99	..	..
WALLEYE POLLOCK	2	..	11	1	1
OTHER ROUNDFISH	..	..	..	..	..
RATFISH	..	..	..	..	..
SKATES	2	51	70	..	39
SPINY DOGFISH	12	2	4	27	26
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	..	..	37	14	38

APPENDIX TABLE 1 CONTINUED

HAUL NO.		16	17	18	19	20
DATE		SEP 13	SEP 13	SEP 13	SEP 13	SEP 14
AREA		HS	HS	HS	HS	RAI
START TIME	(PST)	0820	1027	1259	1447	0855
DURATION	(MIN)	17	12	11	30	15
START N. LAT.	(DEG)	052	052	052	052	052
	(MIN)	57.5	56.8	56.7	55.9	40.2
W. LONG.	(DEG)	130	130	130	130	131
	(MIN)	38.3	37.5	23.2	24.3	00.1
DIRECTION (DEG.TRUE)		180	180	180	180	226
FINISH N. LAT.	(DEG)	052	052	052	052	052
	(MIN)	56.3	56.1	56.2	54.3	39.8
W.LONG.	(DEG)	130	130	130	130	131
	(MIN)	38.5	37.2	23.3	24.6	01.4
HAUL DISTANCE (N.M.)		1.0	0.8	0.7	1.6	0.8
DEPTH	(FATHOMS)	44- 45	51- 50	91- 85	70- 72	40- 38
	(METERS)	80- 82	93- 91	166-155	128-131	73- 69
DEPTH INTERVAL	(FM)	40	50	80	70	30
TYPE OF GEAR		1	1	1	1	1
TOTAL CATCH	(KG)	1517	725	1044	3192	544
REMARKS		USABLE	USABLE	SNAG USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	16	17	18	19	20
DATE	SEP 13	SEP 13	SEP 13	SEP 13	SEP 14
AREA	HS	HS	HS	HS	RAI
TOTAL CATCH (KG)	1517	725	1044	3192	544
ARROWTOOTH FLOUNDER	3	177	76	318	..
BUTTER SOLE	..	..	..	..	..
CURLFIN SOLE	T	..	..	..	..
DOVER SOLE	..	1	49	1	..
ENGLISH SOLE	31	196	..	68	..
FLATHEAD SOLE	..	..	T	..	..
PACIFIC HALIBUT	252	31	..	22	..
PACIFIC SANDDAB	..	..	..	..	..
PETRALE SOLE	44	4	2	..	..
REX SOLE	..	..	18	22	..
ROCK SOLE	621	220	..	12	T
STARRY FLOUNDER	..	..	..	..	..
OTHER FLATFISH	..	..	..	..	..
S. ALUTUS	..	..	99	..	..
S. BABCOCKI	..	..	40	..	..
S. BREVISPINIS	..	15	99	406	..
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	T	..	..
S. FLAVIDUS	..	..	4	9	..
S. MALIGER	..	..	..	..	19
S. PAUCISPINIS	..	..	2	35	..
S. PINNIGER	..	..	68	190	..
S. PRORIGER	..	..	209	1191	51
S. RUBERRIMUS	..	..	10	..	..
S. ZACENTRUS	..	..	10	..	..
OTHER ROCKFISH	..	..	..	..	..
LINGCOD	10	9	..	7	10
PACIFIC COD	6	51	9	16	..
PACIFIC HERRING	5	3	..	..	..
POACHERS	..	T	..	..	..
SABLEFISH	304	1	27	443	..
WALLEYE POLLOCK	..	1	213	359	..
OTHER ROUNDFISH	..	..	..	..	T
RATFISH	94	5	14	..	456
SKATES	5	..	..	..	..
SPINY DOGFISH	140	11	71	93	8
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	2	..	24	..	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		21	22	23	24	25
DATE		SEP 15	SEP 15	SEP 15	SEP 15	SEP 15
AREA		HS	HS	HS	HS	HS
START TIME	(PST)	0822	1010	1253	1408	1504
DURATION	(MIN)	15	30	10	16	15
START N. LAT.	(DEG)	052	052	052	053	052
	(MIN)	57.6	56.8	59.8	00.2	59.1
W. LONG.	(DEG)	130	130	130	130	130
	(MIN)	38.5	37.2	49.9	49.0	47.3
DIRECTION (DEG.TRUE)		180	180	140	150	140
FINISH N. LAT.	(DEG)	052	052	052	052	052
	(MIN)	57.0	55.4	59.4	59.4	58.6
W.LONG.	(DEG)	130	130	130	130	130
	(MIN)	38.6	36.7	49.3	48.2	45.9
HAUL DISTANCE (N.M.)		0.6	1.4	0.6	1.0	1.0
DEPTH	(FATHOMS)	43- 44	53- 50	37- 37	42- 42	41- 40
	(METERS)	78- 80	96- 91	67- 67	76- 76	74- 73
DEPTH INTERVAL	(FM)	40	50	30	40	40
TYPE OF GEAR		1	1	1	1	3
TOTAL CATCH	(KG)	351	1299	390	460	575
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	21	22	23	24	25
DATE	SEP 15	SEP 15	SEP 15	SEP 15	SEP 15
AREA	HS	HS	HS	HS	HS
TOTAL CATCH (KG)	351	1299	390	460	575
ARROWTOOTH FLOUNDER	22	76	T	..	18
BUTTER SOLE	T	..	..	..	1
CURLFIN SOLE	1	..	..	..	..
DOVER SOLE	..	1	..	1	1
ENGLISH SOLE	23	70	290	400	428
FLATHEAD SOLE	..	..	..	..	..
PACIFIC HALIBUT	125	60	3	..	7
PACIFIC SANDDAB	..	..	4	2	4
PETRALE SOLE	6	3	..	3	..
REX SOLE	..	1	1	9	20
ROCK SOLE	91	230	22	18	15
STARRY FLOUNDER	..	..	..	..	..
OTHER FLATFISH	..	..	..	..	..
S. ALUTUS	..	..	..	..	..
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	..	9	..	..	..
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	..	..	..
S. FLAVIDUS	..	..	..	..	..
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	..	..	..	..	..
S. PINNIGER	..	..	..	..	..
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	..	..	..	..	..
OTHER ROCKFISH	..	..	..	..	..
LINGCOD	6	61	..	..	..
PACIFIC COD	7	26	3	12	34
PACIFIC HERRING	..	2	..	..	T
POACHERS	..	..	..	..	9
SABLEFISH	T	1	..	..	..
WALLEYE POLLOCK	..	21	T	2	T
OTHER ROUNDFISH	..	..	T	T	T
RATFISH	..	336	..	..	..
SKATES	20	..	64	..	38
SPINY DOGFISH	44	398	4	4	..
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	6	4	..	9	..

APPENDIX TABLE 1 CONTINUED

HAUL NO.		26	27	28	29	30
DATE		SEP 16	SEP 16	SEP 16	SEP 16	SEP 16
AREA		BO	BO	BO	BO	BO
START TIME	(PST)	0820	0938	1057	1248	1416
DURATION	(MIN)	15	15	15	15	15
START N. LAT.	(DEG)	053	053	053	053	053
	(MIN)	20.9	19.9	20.4	18.5	18.7
W. LONG.	(DEG)	134	130	130	130	130
	(MIN)	57.9	55.3	55.3	59.4	56.0
DIRECTION (DEG.TRUE)		180	180	150	160	180
FINISH N. LAT.	(DEG)	053	053	053	053	053
	(MIN)	20.1	19.1	19.8	17.8	18.0
W.LONG.	(DEG)	130	130	130	130	130
	(MIN)	58.1	55.4	54.5	59.2	56.2
HAUL DISTANCE (N.M.)		0.9	0.7	0.8	0.7	0.6
DEPTH	(FATHOMS)	49- 50	55- 53	60- 62	44- 46	52- 51
	(METERS)	89- 91	100- 96	109-113	80- 84	95- 93
DEPTH INTERVAL	(FM)	40	50	60	40	50
TYPE OF GEAR		1	1	1	1	1
TOTAL CATCH	(KG)	426	924	1113	632	547
REMARKS		USABLE	USABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	26	27	28	29	30
DATE	SEP 16	SEP 16	SEP 16	SEP 16	SEP 16
AREA	80	80	80	80	80
TOTAL CATCH (KG)	426	924	1113	632	547
ARROWTOOTH FLOUNDER	40	200	460	T	66
BUTTER SOLE	..	..	..	..	..
CURLFIN SOLE	..	..	..	..	..
DOVER SOLE	T	..	T	T	T
ENGLISH SOLE	221	187	37	48	233
FLATHEAD SOLE	..	..	..	..	..
PACIFIC HALIBUT	20	35	2	68	9
PACIFIC SANDDAB	..	..	..	T	T
PETRALE SOLE	10	6	..	8	19
REX SOLE	33	30	91	T	22
ROCK SOLE	14	2	..	83	24
STARRY FLOUNDER	..	..	..	..	..
OTHER FLATFISH	..	..	..	..	..
S. ALUTUS	..	..	..	..	..
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	..	56	9	..	..
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	..	..	..
S. FLAVIDUS	..	..	..	..	..
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	..	..	..	..	..
S. PINNIGER	..	..	..	..	..
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	..	..	..	..	..
OTHER ROCKFISH	..	..	..	T	..
LINGCOD	..	1	1	5	..
PACIFIC COD	34	104	8	67	42
PACIFIC HERRING	T	T	..	T	1
POACHERS	..	1	T	T	..
SABLEFISH	3	28	100	..	15
WALLEYE POLLOCK	T	T	T	..	T
OTHER ROUNDFISH	..	T	..	T	..
RATFISH	6	13	136	249	21
SKATES	..	..	2	..	..
SPINY DOGFISH	41	249	263	19	88
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	4	12	4	85	7

APPENDIX TABLE 1 CONTINUED

HAUL NO.		31	32	33	34	35
DATE		SEP 16	SEP 17	SEP 17	SEP 17	SEP 17
AREA		BO	TP	TP	TP	TP
START TIME	(PST)	1545	0815	0846	1041	1328
DURATION	(MIN)	15	2	30	30	30
START N. LAT.	(DEG)	053	054	054	054	054
	(MIN)	22.5	23.2	22.7	22.7	21.9
W. LONG.	(DEG)	130	131	131	131	131
	(MIN)	57.3	14.8	14.4	14.7	16.6
DIRECTION (DEG.TRUE)		180	180	180	180	360
FINISH N. LAT.	(DEG)	053	000	054	054	054
	(MIN)	21.4	00.0	21.2	20.9	22.9
W.LONG.	(DEG)	130	100	131	131	131
	(MIN)	57.2	00.0	15.3	14.9	16.0
HAUL DISTANCE (N.M.)		0.7	0.0	1.8	1.9	1.3
DEPTH	(FATHOMS)	57- 55	53- 52	50- 55	53- 56	72- 68
	(METERS)	104-100	96- 95	91-100	96-102	131-124
DEPTH INTERVAL	(FM)	50	50	50	50	60
TYPE OF GEAR		1	1	1	1	1
TOTAL CATCH	(KG)	468	..	1916	2926	2733
REMARKS		USABLE	UNUSABLE	USABLE	USABLE	USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	31	32	33	34	35
DATE	SEP 16	SEP 17	SEP 17	SEP 17	SEP 17
AREA	BO	TP	TP	TP	TP
TOTAL CATCH (KG)	468	0	1916	2926	2733
ARROWTOOTH FLOUNDER	193	..	599	1530	1544
BUTTER SOLE	..	..	15	..	..
CURLFIN SOLE	..	..	..	..	..
DOVER SOLE	..	..	T	..	1
ENGLISH SOLE	13	..	77	8	..
FLATHEAD SOLE	2	..	..	..	T
PACIFIC HALIBUT	..	..	83	81	131
PACIFIC SANDDAB	..	..	..	..	..
PETRALE SOLE	..	..	..	3	..
REX SOLE	127	..	4	2	..
ROCK SOLE	2	..	13	17	1
STARRY FLOUNDER	..	..	..	..	..
OTHER FLATFISH	T	..	..	..	..
S. ALUTUS	..	..	..	..	12
S. BABCOCKI	..	..	..	..	..
S. BREVISPINIS	..	..	7	25	7
S. CILIATUS	..	..	..	..	..
S. ELONGATUS	..	..	..	1	..
S. FLAVIDUS	..	..	4	20	5
S. MALIGER	..	..	..	..	..
S. PAUCISPINIS	..	..	14	15	..
S. PINNIGER	..	..	..	5	2
S. PRORIGER	..	..	..	..	..
S. RUBERRIMUS	..	..	..	..	..
S. ZACENTRUS	..	..	..	..	..
OTHER ROCKFISH	..	..	..	..	..
LINGCOD	..	..	38	10	1
PACIFIC COD	16	..	463	716	342
PACIFIC HERRING	T	..	2	4	2
POACHERS	T	..	..	..	..
SABLEFISH	25	..	2	78	481
WALLEYE POLLOCK	T	..	34	252	118
OTHER ROUNDFISH	..	..	..	..	..
RATFISH	3	..	..	..	2
SKATES	2	..	535	144	52
SPINY DOGFISH	85	..	19	15	31
OTHER SELACHII	..	..	..	..	..
INVERTEBRATES	..	..	7	..	1

APPENDIX TABLE 1 CONTINUED

HAUL NO.		36
DATE		SEP 17
AREA		TP
START TIME	(PST)	1523
DURATION	(MIN)	30
START N. LAT.	(DEG)	054
	(MIN)	21.8
W. LONG.	(DEG)	131
	(MIN)	16.9
DIRECTION (DEG.TRUE)		180
FINISH N. LAT.	(DEG)	054
	(MIN)	20.8
W.LONG.	(DEG)	131
	(MIN)	17.1
HAUL DISTANCE (N.M.)		1.2
DEPTH	(FATHOMS)	74- 72
	(METERS)	135-131
DEPTH INTERVAL	(FM)	70
TYPE OF GEAR		1
TOTAL CATCH	(KG)	1388
REMARKS		USABLE

APPENDIX TABLE 1 CONTINUED

HAUL NO.	36
DATE	SEP 17
AREA	TP
TOTAL CATCH (KG)	1388
ARROWTOOTH FLOUNDER	970
BUTTER SOLE	..
CURLFIN SOLE	..
DOVER SOLE	1
ENGLISH SOLE	..
FLATHEAD SOLE	1
PACIFIC HALIBUT	4
PACIFIC SANDDAB	..
PETRALE SOLE	..
REX SOLE	9
ROCK SOLE	..
STARRY FLOUNDER	..
OTHER FLATFISH	..
S. ALUTUS	63
S. BABCOCKI	..
S. BREVISPINIS	..
S. CILIATUS	..
S. ELONGATUS	..
S. FLAVIDUS	..
S. MALIGER	..
S. PAUCISPINIS	3
S. PINNIGER	2
S. PRORIGER	..
S. RUBERRIMUS	..
S. ZACENTRUS	..
OTHER ROCKFISH	..
LINGCOD	..
PACIFIC COD	67
PACIFIC HERRING	..
POACHERS	..
SABLEFISH	195
WALLEYE POLLOCK	31
OTHER ROUNDFISH	..
RATFISH	..
SKATES	25
SPINY DOGFISH	17
OTHER SELACHIL	..
INVERTEBRATES	..

FOOTNOTES TO APPENDIX TABLE 1

Area: BO = Bonilla Edge; HS = Horseshoe; RAI = Ramsay Island: SH = Shell; TP = Two Peaks; WR = White Rocks.

Depth: At start and end of haul.

Depth Interval: 10-fm depth interval in which most of haul was made. 10 = 10-19; 20 = 20-29; etc.

Type of Gear: 1 = standard, on-bottom trawl equipped with rubber-disk groundline; 78-ft headrope; 109-ft footrope; 3-in mesh; 1.5-in liner in cod-end; 35-fm sweeplines; 1,400-lb Brompton doors.

Other (any category): Any species not constituting at least 0.5 kg in any haul.

Other flatfish: Slender sole (Haul 7).

Other rockfish: Sebastes ciliatus (Haul 7); S. maliger (Haul 18); S. zacentrus (Haul 25).

Other roundfish: Clingfish (Haul 25); eelpout (Hauls 25, 29); Pacific tomcod (Haul 7); sandlance (Haul 22).

Other selachii: Nil.

T = Trace = less than 1 kg.

Invertebrates: Details by category in Appendix Table 11.

Appendix Table 2. Size composition (nos. sampled) of Pacific cod, by sex, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)	Haul number												
	1[a]			2[a]		3[a]		4[a]		6[a]		7[a]	
	M	F	U	M	F	M	F	M	F	M	F	M	F
10	–	–	1	–	–	–	–	–	–	–	–	–	–
11	–	–	–	–	–	–	–	–	–	–	–	–	–
12	–	–	–	–	–	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–	–	–	–	–
14	–	–	–	–	–	–	–	–	–	–	–	–	–
15	–	–	–	–	–	–	–	–	–	–	–	–	–
16	–	–	–	–	–	–	–	–	–	–	–	–	–
17	–	–	–	–	–	–	–	–	–	–	–	–	–
18	–	–	–	–	–	–	–	–	–	–	–	–	–
19	–	–	–	–	–	–	–	–	–	–	–	–	–
20	–	–	–	–	–	–	–	–	–	–	–	–	–
21	–	–	–	–	–	–	–	–	–	–	–	–	–
22	–	–	–	–	–	–	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–	–	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	1	–	–	–
25	–	–	–	–	–	–	–	–	–	0	–	–	–
26	–	–	–	–	–	–	–	–	–	0	–	–	–
27	–	–	–	–	–	–	–	–	–	0	–	–	–
28	–	–	–	–	–	–	–	–	–	0	–	–	–
29	–	–	–	–	–	–	–	–	–	0	–	–	–
30	–	1	–	–	–	–	–	–	–	0	–	–	–
31	–	0	–	1	1	–	–	–	1	0	–	1	–
32	–	0	–	1	1	–	1	1	0	0	–	1	1
33	2	0	–	3	5	–	1	4	0	0	1	0	2
34	0	1	–	2	4	1	3	8	5	0	0	1	2
35	4	2	–	7	3	3	0	4	4	0	0	1	3
36	2	6	–	9	14	0	2	6	4	1	2	2	3
37	5	3	–	15	8	1	5	5	8	3	2	1	0
38	4	6	–	21	18	1	4	13	10	1	4	2	2
39	7	9	–	11	15	4	2	12	8	4	3	0	1
40	8	10	–	8	13	3	3	5	5	7	3	0	0
41	3	3	–	14	4	1	1	5	1	0	3	1	0
42	1	1	–	8	7	1	2	5	0	1	3	0	0
43	2	4	–	3	5	1	0	1	0	0	6	0	0
44	2	1	–	2	4	2	0	2	2	3	1	0	0
45	2	1	–	1	2	0	0	1	1	3	1	0	0
46	2	0	–	1	1	0	0	1	0	0	1	0	0
47	1	1	–	0	3	0	0	1	0	2	0	0	0
48	1	1	–	0	4	0	0	0	1	0	2	0	0
49	1	0	–	4	0	1	0	1	0	1	1	0	1
50	0	3	–	1	2	2	0	0	0	1	1	0	0
51	2	3	–	3	1	1	0	1	0	0	1	0	0
52	2	1	–	6	0	0	2	2	2	1	1	0	0
53	3	3	–	1	3	1	2	0	1	2	0	1	0
54	2	0	–	4	1	0	0	0	2	3	0	1	0

Appendix Table 2 cont'd.

Fork length (cm)	Haul number												
	1[a]			2[a]		3[a]		4[a]		6[a]		7[a]	
	M	F	U	M	F	M	F	M	F	M	F	M	F
55	3	1	–	2	0	1	1	0	0	2	0	2	0
56	1	0	–	2	0	0	1	0	0	1	0	0	0
57	3	2	–	3	1	1	1	1	0	1	1	1	0
58	2	2	–	2	1	1	0	1	0	0	5	1	0
59	0	2	–	1	4	0	0	0	0	2	3	0	0
60	0	2	–	3	2	1	0	0	0	4	3	0	1
61	0	1	–	0	0	2	1	0	0	5	2	0	1
62	0	0	–	0	0	–	1	0	0	2	3	0	–
63	2	1	–	1	0	–	0	0	0	1	1	0	–
64	0	0	–	0	2	–	0	0	1	2	3	2	–
65	0	0	–	1	0	–	2	0	–	4	3	–	–
66	2	0	–	0	0	–	–	0	–	2	2	–	–
67	0	0	–	0	0	–	–	0	–	4	1	–	–
68	0	0	–	0	2	–	–	1	–	0	2	–	–
69	1	0	–	0	0	–	–	0	–	2	2	–	–
70	1	0	–	0	1	–	–	0	–	3	2	–	–
71	–	0	–	1	1	–	–	1	–	6	5	–	–
72	–	1	–	–	1	–	–	–	–	0	5	–	–
73	–	0	–	–	–	–	–	–	–	4	3	–	–
74	–	0	–	–	–	–	–	–	–	6	4	–	–
75	–	1	–	–	–	–	–	–	–	5	2	–	–
76	–	1	–	–	–	–	–	–	–	0	3	–	–
77	–	0	–	–	–	–	–	–	–	0	1	–	–
78	–	0	–	–	–	–	–	–	–	1	4	–	–
79	–	0	–	–	–	–	–	–	–	1	1	–	–
80	–	0	–	–	–	–	–	–	–	–	1	–	–
81	–	1	–	–	–	–	–	–	–	–	3	–	–
82	–	–	–	–	–	–	–	–	–	–	2	–	–
83	–	–	–	–	–	–	–	–	–	–	0	–	–
84	–	–	–	–	–	–	–	–	–	–	1	–	–
85	–	–	–	–	–	–	–	–	–	–	2	–	–
86	–	–	–	–	–	–	–	–	–	–	1	–	–
87	–	–	–	–	–	–	–	–	–	–	–	–	–
88	–	–	–	–	–	–	–	–	–	–	–	–	–
89	–	–	–	–	–	–	–	–	–	–	0	–	–
90	–	–	–	–	–	–	–	–	–	–	–	–	–
91	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–
97	–	–	–	–	–	–	–	–	–	–	1	–	–
Total	71	75	1	142	134	29	35	82	56	92	108	18	17
% male	49			51		45		59		46		51	

[a]Total catch.
haul 1 - 1 at 10 cm, unsexed.

Appendix Table 2 cont'd.

Fork length (cm)	Haul number											
	9[a]			10[a]		11[a]		12[a]		13[a]		
	M	F	U	M	F	M	F	M	F	M	F	U
10	–	–	–	–	–	–	–	–	–	–	–	–
11	–	–	–	–	–	–	–	–	–	–	–	–
12	–	–	–	–	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–	–	–	–
14	–	–	–	–	–	–	–	–	–	–	–	–
15	–	–	1	–	–	–	–	–	–	–	–	–
16	–	–	1	–	–	–	–	–	–	–	–	–
17	–	–	4	–	–	–	–	–	–	–	–	–
18	–	–	2	–	–	–	–	–	–	–	–	–
19	–	–	0	–	–	–	–	–	–	–	–	–
20	–	–	0	–	–	–	–	–	–	1	–	–
21	–	–	0	–	–	–	–	–	–	1	–	–
22	–	–	0	–	–	–	–	–	–	0	–	–
23	–	–	0	–	–	–	–	–	–	0	–	–
24	–	–	0	–	–	–	–	–	–	0	–	–
25	–	–	0	–	–	–	–	–	–	0	–	–
26	–	–	0	–	–	–	–	–	–	0	–	–
27	–	–	0	–	–	–	–	–	–	0	–	–
28	–	–	0	–	–	–	–	–	–	0	–	–
29	–	1	4	–	–	–	–	–	–	0	–	–
30	1	0	3	–	–	–	–	–	1	1	2	–
31	0	2	13	–	–	–	–	–	1	4	1	1
32	1	5	25	1	1	–	–	1	1	8	13	12
33	5	6	39	0	0	–	–	0	0	15	12	14
34	5	9	59	0	0	–	–	1	1	28	22	32
35	11	10	68	2	0	–	–	3	2	27	40	47
36	6	9	94	1	1	–	1	4	3	34	33	55
37	3	11	96	1	1	1	1	2	4	30	34	34
38	8	6	100	1	1	1	0	5	1	20	27	24
39	5	7	69	1	0	0	2	2	1	15	26	33
40	4	3	51	1	1	0	0	1	6	15	8	21
41	4	4	44	1	1	2	1	0	0	5	3	13
42	2	1	32	0	0	0	0	1	2	3	2	7
43	1	2	17	1	1	0	0	0	0	2	0	1
44	1	1	4	0	2	1	0	0	0	2	5	4
45	0	2	5	0	0	0	1	0	0	0	0	1
46	0	1	3	0	0	1	0	0	0	0	1	1
47	1	2	7	0	0	1	0	1	0	0	0	1
48	0	0	2	0	0	1	0	0	0	0	0	0
49	0	0	1	0	0	0	0	0	1	0	0	0
50	0	0	3	0	0	0	0	0	0	0	1	1
51	0	0	2	2	1	0	0	1	0	0	2	1
52	2	0	2	0	0	1	1	0	1	0	1	0
53	0	1	8	1	1	0	0	2	0	0	1	0
54	0	0	4	0	0	1	0	1	0	2	1	1

Appendix Table 2 cont'd.

Fork length (cm)	Haul number											
	9a			10a		11a		12a		13a		
	M	F	U	M	F	M	F	M	F	M	F	U
55	0	0	6	1	2	0	0	0	0	1	1	0
56	1	0	4	2	1	0	0	0	2	0	0	2
57	1	0	4	0	1	0	2	0	0	0	1	2
58	1	1	8	0	0	0	1	1	0	0	2	0
59	–	1	4	0	0	1	1	2	1	1	0	0
60	–	0	5	0	1	1	1	3	0	0	0	1
61	–	0	1	0	0	0	0	0	0	0	0	1
62	–	0	0	0	1	0	0	2	0	0	0	–
63	–	0	1	1	0	0	0	1	1	0	0	–
64	–	0	0	1	0	0	0	0	0	0	1	–
65	–	0	0	0	0	0	0	0	0	0	0	–
66	–	0	0	2	0	0	0	1	0	2	0	–
67	–	0	0	0	0	1	1	1	0	1	1	–
68	–	0	0	1	0	0	1	0	1	–	0	–
69	–	0	0	0	0	0	0	0	2	–	1	–
70	–	1	1	1	0	1	3	1	3	–	–	–
71	–	–	–	2	2	0	2	–	0	–	–	–
72	–	–	–	1	1	0	1	–	0	–	–	–
73	–	–	–	2	3	0	1	–	0	–	–	–
74	–	–	–	2	1	1	1	–	1	–	–	–
75	–	–	–	1	3	0	1	–	0	–	–	–
76	–	–	–	2	0	0	2	–	1	–	–	–
77	–	–	–	1	0	0	1	–	1	–	–	–
78	–	–	–	0	0	1	0	–	0	–	–	–
79	–	–	–	0	1	0	1	–	1	–	–	–
80	–	–	–	2	1	0	–	–	1	–	–	–
81	–	–	–	–	0	1	–	–	–	–	–	–
82	–	–	–	–	0	–	–	–	–	–	–	–
83	–	–	–	–	0	–	–	–	–	–	–	–
84	–	–	–	–	2	–	–	–	–	–	–	–
85	–	–	–	–	1	–	–	–	–	–	–	–
86	–	–	–	–	0	–	–	–	–	–	–	–
87	–	–	–	–	0	–	–	–	–	–	–	–
88	–	–	–	–	0	–	–	–	–	–	–	–
89	–	–	–	–	1	–	–	–	–	–	–	–
90	–	–	–	–	–	–	–	–	–	–	–	–
91	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
97	–	–	–	–	–	–	–	–	–	–	–	–
Total	63	86	797	35	33	17	27	37	40	218	242	310
% male	42			51		39		48		47		

Appendix Table 2 cont'd.

Fork length (cm)	Haul number										
	14[a]			15[a]	16[a]	17[a]	18[a]		19[a]		
	M	F	U	U	U	U	M	F	M	F	U
10	–	–	–	–	–	–	–	–	–	–	–
11	–	–	–	32	–	–	–	–	–	–	1
12	–	–	–	102	1	–	–	–	–	–	1
13	–	–	–	192	3	2	–	–	–	–	0
14	–	–	–	217	5	0	–	–	–	–	2
15	–	–	–	149	8	1	–	–	–	–	2
16	–	–	–	93	8	5	–	–	–	–	3
17	–	–	–	102	12	3	–	–	–	–	1
18	–	–	–	83	6	1	–	–	–	–	2
19	–	–	–	25	1	1	–	–	–	–	–
20	–	–	–	9	0	1	–	–	–	–	–
21	–	–	–	0	0	0	–	–	–	–	–
22	–	–	–	0	0	0	–	–	–	–	–
23	–	–	–	0	0	1	–	–	–	–	–
24	–	–	–	0	0	2	–	–	–	–	–
25	–	–	–	0	2	1	–	–	–	–	–
26	–	–	1	1	2	5	–	–	–	–	–
27	–	–	2	5	1	14	–	–	–	–	–
28	2	1	15	3	0	13	–	1	–	–	–
29	3	4	36	7	2	9	–	0	–	–	–
30	2	7	80	4	2	8	–	0	–	–	–
31	6	11	93	9	1	12	–	0	–	–	–
32	15	7	103	3	3	18	–	0	–	–	–
33	8	9	99	1	0	16	–	0	–	–	–
34	7	7	117	3	2	17	–	0	1	–	–
35	8	7	86	–	–	10	–	0	0	–	–
36	2	7	56	–	–	14	–	0	1	–	–
37	2	3	30	–	–	5	–	0	0	–	–
38	1	1	15	–	–	3	–	0	1	–	–
39	3	–	15	–	–	0	–	0	0	–	–
40	1	–	2	–	–	1	–	0	0	–	–
41	–	–	5	–	–	0	–	0	1	–	–
42	–	–	3	–	–	0	–	0	0	–	–
43	–	–	0	–	–	1	–	0	0	–	–
44	–	–	0	–	–	–	–	1	0	–	–
45	–	–	0	–	–	–	–	0	0	–	–
46	–	–	1	–	–	–	1	0	1	–	–
47	–	–	0	–	–	–	0	0	0	–	–
48	–	–	0	–	–	–	1	1	0	–	–
49	–	–	0	–	–	–	0	1	0	1	–
50	–	–	0	–	–	–	0	–	0	0	–
51	–	–	0	–	–	–	0	–	1	1	–
52	–	–	0	–	–	–	0	–	–	0	–
53	–	–	0	–	–	–	0	–	–	0	–
54	–	–	0	–	–	–	0	–	–	0	–

Appendix Table 2 cont'd.

Fork length (cm)	Haul number										
	14[a]			15[a]	16[a]	17[a]	18[a]		19[a]		
	M	F	U	U	U	U	M	F	M	F	U
55	–	–	0	–	–	–	0	–	–	0	–
56	–	–	0	–	–	–	0	–	–	0	–
57	–	–	0	–	–	–	0	–	–	0	–
58	–	–	0	–	–	–	0	–	–	1	–
59	–	–	0	–	–	–	0	–	–	0	–
60	–	–	0	–	–	–	0	–	–	0	–
61	–	–	0	–	–	–	0	–	–	0	–
62	–	–	0	–	–	–	2	–	–	0	–
63	–	–	1	–	–	–	–	–	–	0	–
64	–	–	–	–	–	–	–	–	–	0	–
65	–	–	–	–	–	–	–	–	–	0	–
66	–	–	–	–	–	–	–	–	–	0	–
67	–	–	–	–	–	–	–	–	–	0	–
68	–	–	–	–	–	–	–	–	–	0	–
69	–	–	–	–	–	–	–	–	–	0	–
70	–	–	–	–	–	–	–	–	–	0	–
71	–	–	–	–	–	–	–	–	–	0	–
72	–	–	–	–	–	–	–	–	–	0	–
73	–	–	–	–	–	–	–	–	–	0	–
74	–	–	–	–	–	–	–	–	–	0	–
75	–	–	–	–	–	–	–	–	–	0	–
76	–	–	–	–	–	–	–	–	–	0	–
77	–	–	–	–	–	–	–	–	–	0	–
78	–	–	–	–	–	–	–	–	–	0	–
79	–	–	–	–	–	–	–	–	–	1	–
80	–	–	–	–	–	–	–	–	–	–	–
81	–	–	–	–	–	–	–	–	–	–	–
82	–	–	–	–	–	–	–	–	–	–	–
83	–	–	–	–	–	–	–	–	–	–	–
84	–	–	–	–	–	–	–	–	–	–	–
85	–	–	–	–	–	–	–	–	–	–	–
86	–	–	–	–	–	–	–	–	–	–	–
87	–	–	–	–	–	–	–	–	–	–	–
88	–	–	–	–	–	–	–	–	–	–	–
89	–	–	–	–	–	–	–	–	–	–	–
90	–	–	–	–	–	–	–	–	–	–	–
91	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
97	–	–	–	–	–	–	–	–	–	–	–
Total	60	64	760	1,040	59	164	4	4	6	4	12
% male	48			–	–	–	50		60		

Appendix Table 2 cont'd.

Fork length (cm)	Haul number										
	21		22	23	24	25	26	27			28
	M	F	U	U	U	U	U	M	F	U	U
10	–	–	–	2	–	–	–	–	–	1	–
11	–	–	1	15	–	5	–	–	–	0	–
12	–	–	3	28	–	9	1	–	–	6	–
13	–	–	2	17	–	29	2	–	–	9	–
14	–	–	3	12	–	39	3	–	–	15	–
15	–	–	9	7	–	79	7	–	–	14	–
16	–	–	12	8	–	137	3	–	–	20	–
17	–	–	12	6	–	166	4	–	–	14	3
18	–	–	4	3	1	103	4	–	–	7	0
19	–	–	5	0	1	55	2	–	–	3	0
20	–	–	0	1	2	14	0	–	–	1	0
21	–	–	0	0	0	4	0	–	–	–	0
22	–	–	1	0	0	0	0	–	–	–	0
23	–	–	1	0	0	5	0	–	–	–	0
24	–	1	0	0	4	5	0	–	–	–	0
25	–	0	6	0	0	7	0	–	–	–	0
26	1	0	4	0	5	10	0	–	–	–	0
27	5	4	8	1	2	9	0	–	–	–	0
28	1	5	5	–	7	1	0	–	–	–	0
29	0	2	11	–	9	1	0	–	–	–	0
30	2	3	9	–	4	2	0	–	–	–	0
31	3	1	10	–	5	–	1	–	3	–	0
32	1	1	9	–	4	–	2	2	0	–	0
33	0	–	10	–	3	–	0	1	2	–	1
34	0	–	2	–	0	–	1	3	0	–	0
35	1	–	6	–	0	–	2	0	0	–	2
36	–	–	2	–	0	–	0	0	0	–	0
37	–	–	0	–	1	–	0	0	1	–	0
38	–	–	2	–	1	–	0	0	1	–	0
39	–	–	–	–	–	–	0	1	0	–	0
40	–	–	–	–	–	–	1	0	0	–	0
41	–	–	–	–	–	–	0	0	0	–	0
42	–	–	–	–	–	–	0	3	1	–	0
43	–	–	–	–	–	–	1	0	1	–	0
44	–	–	–	–	–	–	2	4	1	–	0
45	–	–	–	–	–	–	0	4	2	–	0
46	–	–	–	–	–	–	0	1	3	–	3
47	–	–	–	–	–	–	1	1	3	–	1
48	–	–	–	–	–	–	2	1	1	–	0
49	–	–	–	–	–	–	0	2	1	–	0
50	–	–	–	–	–	–	3	2	1	–	0
51	–	–	–	–	–	–	1	0	3	–	2
52	–	–	–	–	–	–	0	2	2	–	–
53	–	–	–	–	–	–	0	0	1	–	–
54	–	–	–	–	–	–	4	0	1	–	–

Appendix Table 2 cont'd.

Fork length (cm)	Haul number										
	21		22	23	24	25	26	27			28
	M	F	U	U	U	U	U	M	F	U	U
55	–	–	–	–	–	–	0	1	2	–	–
56	–	–	–	–	–	–	2	3	2	–	–
57	–	–	–	–	–	–	1	0	0	–	–
58	–	–	–	–	–	–	0	0	0	–	–
59	–	–	–	–	–	–	0	0	0	–	–
60	–	–	–	–	–	–	0	0	0	–	–
61	–	–	–	–	–	–	0	2	0	–	–
62	–	–	–	–	–	–	0	0	0	–	–
63	–	–	–	–	–	–	0	0	0	–	–
64	–	–	–	–	–	–	0	0	2	–	–
65	–	–	–	–	–	–	0	0	0	–	–
66	–	–	–	–	–	–	0	0	0	–	–
67	–	–	–	–	–	–	0	0	1	–	–
68	–	–	–	–	–	–	0	1	0	–	–
69	–	–	–	–	–	–	0	–	0	–	–
70	–	–	–	–	–	–	0	–	0	–	–
71	–	–	–	–	–	–	0	–	2	–	–
72	–	–	–	–	–	–	1	–	0	–	–
73	–	–	–	–	–	–	–	–	0	–	–
74	–	–	–	–	–	–	–	–	1	–	–
75	–	–	–	–	–	–	–	–	1	–	–
76	–	–	–	–	–	–	–	–	–	–	–
77	–	–	–	–	–	–	–	–	–	–	–
78	–	–	–	–	–	–	–	–	–	–	–
79	–	–	–	–	–	–	–	–	–	–	–
80	–	–	–	–	–	–	–	–	–	–	–
81	–	–	–	–	–	–	–	–	–	–	–
82	–	–	–	–	–	–	–	–	–	–	–
83	–	–	–	–	–	–	–	–	–	–	–
84	–	–	–	–	–	–	–	–	–	–	–
85	–	–	–	–	–	–	–	–	–	–	–
86	–	–	–	–	–	–	–	–	–	–	–
87	–	–	–	–	–	–	–	–	–	–	–
88	–	–	–	–	–	–	–	–	–	–	–
89	–	–	–	–	–	–	–	–	–	–	–
90	–	–	–	–	–	–	–	–	–	–	–
91	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
97	–	–	–	–	–	–	–	–	–	–	–
Total	14	17	137	100	48	680	52	35	39	90	12
% male	45		–	–	–	–	–	47		–	–

Appendix Table 2 cont'd.

Fork length (cm)	Haul number														
	29			30			31	33		34		35		36	
	M	F	U	M	F	U	U	M	F	M	F	M	F	M	F
10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
11	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
12	–	–	4	–	–	9	3	–	–	–	–	–	–	–	–
13	–	–	1	–	–	14	3	–	–	–	–	–	–	–	–
14	–	–	4	–	–	14	3	–	–	–	–	–	–	–	–
15	–	–	0	–	–	25	4	–	–	–	–	–	–	–	–
16	–	–	4	–	–	20	5	–	1	–	–	–	–	–	–
17	–	–	5	–	–	27	5	1	0	1	–	–	–	–	–
18	–	–	1	–	–	12	2	3	0	0	–	–	–	1	–
19	–	–	2	–	–	3	1	1	0	0	–	–	–	0	–
20	–	–	1	–	–	1	0	0	0	0	–	–	–	0	–
21	–	–	–	–	–	–	0	0	0	0	–	–	–	0	–
22	–	–	–	–	–	–	0	0	0	0	–	–	–	0	–
23	–	–	–	–	–	–	0	0	0	0	–	–	–	0	–
24	–	–	–	–	–	–	0	0	0	0	–	–	–	0	–
25	1	–	–	–	–	–	0	0	0	0	–	–	–	0	–
26	0	–	–	–	1	–	0	0	0	0	–	–	–	0	–
27	0	–	–	–	0	–	0	0	0	0	–	–	–	0	–
28	0	–	–	–	0	–	0	0	0	0	–	–	–	0	–
29	1	1	–	–	0	–	0	0	0	0	–	–	–	0	–
30	1	1	–	–	1	–	0	0	1	0	–	–	–	0	–
31	1	1	–	–	1	–	0	0	0	1	–	–	–	0	–
32	3	1	–	–	2	–	0	5	3	2	1	–	–	0	1
33	0	0	–	–	1	–	0	6	3	2	5	–	–	0	0
34	1	0	–	–	2	–	0	8	4	3	7	1	1	1	0
35	1	0	–	1	2	–	0	8	17	4	12	0	2	1	1
36	0	0	–	1	0	–	1	15	17	12	12	3	5	2	4
37	0	0	–	0	0	–	0	17	19	13	11	1	5	2	4
38	0	0	–	0	0	–	1	18	16	2	14	4	5	1	1
39	1	0	–	1	0	–	1	10	11	7	7	4	5	6	1
40	0	2	–	0	0	–	0	7	9	5	4	0	6	2	1
41	1	0	–	0	0	–	1	5	2	5	7	3	3	3	0
42	0	0	–	1	1	–	0	5	5	5	5	1	1	0	1
43	0	0	–	1	1	–	0	5	5	1	2	2	2	0	0
44	0	2	–	0	2	–	0	1	3	2	0	0	1	0	1
45	0	2	–	2	0	–	2	2	1	3	1	0	2	0	0
46	2	1	–	0	0	–	1	1	0	0	0	1	0	1	0
47	1	0	–	1	1	–	0	1	2	2	2	2	1	0	0
48	1	0	–	2	0	–	2	0	1	4	5	2	0	0	0
49	0	1	–	1	0	–	0	3	1	0	0	1	0	0	1
50	1	2	–	2	0	–	0	1	3	0	3	0	0	1	0
51	1	2	–	1	1	–	2	2	0	2	3	4	3	0	0
52	0	1	–	1	0	–	0	3	2	3	4	0	2	1	3
53	0	1	–	1	1	–	0	2	1	1	4	2	0	0	1
54	1	3	–	2	1	–	1	2	3	2	1	4	2	2	0

Appendix Table 2 cont'd.

Fork length (cm)	Haul number														
	29			30			31	33		34		35		36	
	M	F	U	M	F	U	U	M	F	M	F	M	F	M	F
55	1	2	-	1	0	-	-	5	3	1	1	2	2	1	1
56	1	2	-	-	0	-	-	3	4	3	1	2	2	0	1
57	2	1	-	-	1	-	-	7	3	1	6	3	4	0	1
58	2	0	-	-	-	-	-	2	1	3	1	1	5	0	0
59	0	1	-	-	-	-	-	4	4	3	4	4	1	0	0
60	0	1	-	-	-	-	-	3	4	3	3	2	1	1	0
61	1	-	-	-	-	-	-	1	1	0	2	1	3	1	0
62	0	-	-	-	-	-	-	1	1	1	3	0	1	0	1
63	0	-	-	-	-	-	-	3	0	3	1	0	1	0	0
64	0	-	-	-	-	-	-	2	1	4	0	1	1	0	0
65	0	-	-	-	-	-	-	2	0	2	4	0	0	0	0
66	0	-	-	-	-	-	-	1	0	1	3	1	0	0	0
67	0	-	-	-	-	-	-	1	0	8	4	2	2	0	0
68	1	-	-	-	-	-	-	1	1	5	3	2	1	0	0
69	-	-	-	-	-	-	-	1	3	4	3	1	0	0	0
70	-	-	-	-	-	-	-	1	2	4	2	3	1	0	1
71	-	-	-	-	-	-	-	0	3	2	6	3	2	0	0
72	-	-	-	-	-	-	-	0	3	1	2	1	2	0	1
73	-	-	-	-	-	-	-	2	2	3	3	2	0	0	-
74	-	-	-	-	-	-	-	2	3	0	6	0	0	1	-
75	-	-	-	-	-	-	-	3	2	3	3	0	1	-	-
76	-	-	-	-	-	-	-	0	0	5	2	0	1	-	-
77	-	-	-	-	-	-	-	1	0	2	2	0	3	-	-
78	-	-	-	-	-	-	-	2	0	3	1	0	3	-	-
79	-	-	-	-	-	-	-	1	0	1	0	0	0	-	-
80	-	-	-	-	-	-	-	1	0	0	5	1	2	-	-
81	-	-	-	-	-	-	-	-	1	1	1	0	1	-	-
82	-	-	-	-	-	-	-	-	1	1	1	1	0	-	-
83	-	-	-	-	-	-	-	-	-	0	1	-	1	-	-
84	-	-	-	-	-	-	-	-	-	0	0	-	0	-	-
85	-	-	-	-	-	-	-	-	-	1	0	-	0	-	-
86	-	-	-	-	-	-	-	-	-	0	1	-	0	-	-
87	-	-	-	-	-	-	-	-	-	0	0	-	2	-	-
88	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
89	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
90	-	-	-	-	-	-	-	-	-	0	1	-	-	-	-
91	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Total	26	28	22	19	19	128	38	182	173	152	187	68	89	28	26
% male	48			50				51		45		43		52	

Appendix Table 3. Size composition[a] (nos. sampled) of English sole, by haul, G. R. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)	Haul number									
	9	15	17	23	24	25	26	27	28	30
	U	U	U	U	U	U	U	U	U	U
13	-	1	-	-	-	-	-	-	-	-
14	-	0	-	-	-	-	-	-	-	-
15	-	0	-	-	-	-	-	-	-	-
16	-	0	-	1	-	2	-	-	-	-
17	-	3	-	5	-	4	-	-	-	-
18	-	25	-	5	1	9	-	-	-	-
19	-	38	-	2	1	10	-	-	-	-
20	-	49	-	3	1	29	1	1	1	-
21	-	56	-	6	8	21	1	0	2	3
22	1	37	3	5	9	36	3	1	5	2
23	1	14	13	4	8	12	7	0	5	3
24	0	4	17	5	4	22	9	2	7	2
25	1	4	18	3	3	8	7	0	3	0
26	6	4	22	2	9	9	15	0	6	3
27	9	10	10	7	3	12	27	5	2	6
28	4	1	12	4	7	6	28	4	4	6
29	8	0	9	2	4	5	15	2	5	5
30	17	1	16	2	4	2	15	4	6	4
31	11	1	17	5	7	5	23	5	3	4
32	12	1	19	4	12	4	8	4	6	5
33	18	1	12	12	10	3	10	3	4	2
34	9	1	7	6	6	6	8	4	12	5
35	6	2	8	10	5	3	5	7	4	2
36	3	1	1	9	5	3	6	4	7	2
37	14	0	5	11	4	7	2	4	4	0
38	5	2	4	6	7	0	2	3	4	5
39	4	-	4	1	2	4	1	6	3	4
40	1	-	0	6	1	5	4	5	3	0
41	2	-	1	2	3	2	3	2	3	6
42	2	-	0	2	3	0	2	4	2	5
43	-	-	0	4	2	3	1	4	1	5
44	-	-	0	1	3	2	-	2	1	4
45	-	-	1	1	2	1	-	4	2	5
46	-	-	-	-	0	1	-	4	2	3
47	-	-	-	-	1	-	-	3	0	1
48	-	-	-	-	-	-	-	2	1	3
49	-	-	-	-	-	-	-	2	-	1
50	-	-	-	-	-	-	-	0	-	0
51	-	-	-	-	-	-	-	0	-	1
52	-	-	-	-	-	-	-	0	-	0
53	-	-	-	-	-	-	-	1	-	0
54	-	-	-	-	-	-	-	-	-	1
Total	134	256	199	136	135	236	203	92	108	98

[a]Selected sample, usually 1 full tub.

Appendix Table 4. Size composition[a] (nos. sampled) of rock sole, by sex, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)	Haul number					
	14[b]	15[b]	16[b]		17[b]	22[b]
	U	U	M	F	U	U
17	-	1	-	-	-	-
18	1	0	-	-	-	-
19	3	0	-	-	-	-
20	0	1	-	-	-	-
21	1	1	-	-	-	-
22	0	2	-	-	-	-
23	2	4	-	-	-	-
24	4	1	-	-	-	-
25	0	2	-	-	-	-
26	2	1	-	-	-	-
27	0	2	-	-	-	-
28	2	0	-	-	-	-
29	3	1	-	-	1	-
30	0	1	-	-	0	-
31	0	0	-	-	0	-
32	4	0	-	-	0	1
33	5	4	-	-	0	0
34	2	6	1	-	0	1
35	0	5	0	-	0	0
36	6	11	0	-	1	0
37	6	6	0	-	1	0
38	4	5	0	4	3	1
39	1	2	0	3	4	2
40	4	4	1	5	5	5
41	2	8	0	3	5	5
42	4	9	1	10	2	1
43	1	9	1	7	7	11
44	2	15	-	6	14	8
45	2	7	-	9	11	6
46	1	4	-	6	6	8
47	3	5	-	6	7	12
48	2	5	-	6	8	5
49	1	3	-	3	7	4
50	-	-	-	6	7	3
51	-	-	-	4	5	1
52	-	-	-	8	2	2
53	-	-	-	2	1	0
54	-	-	-	1	0	1
55	-	-	-	2	1	1
Total	68	125	4	91	98	78
% male	-	-	4		-	-

[a]Selected sample, 1-3 tubs from middle of sort.

Appendix Table 5. Size composition (nos. sampled) of Pacific halibut, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)[a]	Haul number													
	1	2	3	4	6	7	9	10	11	12	13	14	15	16
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	1	4	1	-	1	-	1	4	-	-
47	-	1	-	-	7	21	15	-	10	5	4	12	-	3
52	-	1	-	-	15	28	34	4	27	3	3	4	-	4
57	-	3	-	1	22	16	18	3	16	4	1	2	-	5
62	-	1	-	0	16	10	7	8	11	1	2	-	-	6
67	3	1	-	0	21	8	4	4	10	2	1	-	-	11
72	0	1	-	0	9	6	1	6	5	2	0	-	-	10
77	0	0	1	1	5	1	0	5	1	-	0	-	-	15
82	1	0	-	0	7	1	2	1	2	-	0	-	-	2
87	0	1	-	1	2	-	1	2	0	-	1	-	1	3
92	0	1	-	1	1	-	0	-	0	-	-	-	-	2
97	0	0	-	-	-	-	0	-	1	-	-	-	-	-
102	0	0	-	-	-	-	0	-	-	-	-	-	-	-
107	0	0	-	-	-	-	0	-	-	-	-	-	-	-
112	0	0	-	-	-	-	0	-	-	-	-	-	-	-
117	0	0	-	-	-	-	0	-	-	-	-	-	-	-
122	0	0	-	-	-	-	0	-	-	-	-	-	-	-
127	0	0	-	-	-	-	0	-	-	-	-	-	-	-
132	0	1	-	-	-	-	0	-	-	-	-	-	-	-
137	0	-	-	-	-	-	1	-	-	-	-	-	-	-
142	0	-	-	-	-	-	-	-	-	-	-	-	-	-
147	0	-	-	-	-	-	-	-	-	-	-	-	-	-
152	0	-	-	-	-	-	-	-	-	-	-	-	-	-
157	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5	11	1	4	106	95	84	33	84	17	13	22	1	61

[a]Measured to nearest cm. Grouped into 5-cm intervals, 37 = 35 - 39 cm.

Appendix Table 5 cont'd.

Fork length (cm)	Haul number														
	17	19	21	22	23	25	26	27	28	29	30	33	34	35	36
37	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
42	-	-	-	-	-	1	1	-	-	2	-	-	-	-	-
47	1	-	6	3	-	2	3	-	-	5	1	2	1	1	-
52	2	3	12	6	-	2	2	-	-	6	0	3	3	2	1
57	2	3	8	6	-	-	1	-	1	2	1	2	3	13	1
62	2	1	8	4	1	-	0	-	-	0	0	11	3	7	-
67	0	0	5	1	-	-	0	1	-	1	0	3	5	9	-
72	3	0	7	4	-	-	0	0	-	0	0	2	1	7	-
77	1	1	1	1	-	-	2	0	-	0	1	3	5	2	-
82	-	-	0	-	-	-	-	0	-	0	-	1	1	0	-
87	-	-	1	-	-	-	-	0	-	0	-	-	1	0	-
92	-	-	-	-	-	-	-	2	-	0	-	-	-	1	-
97	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
102	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
107	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
117	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
122	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
127	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
132	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
137	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
142	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
147	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11	8	48	25	1	5	9	3	1	18	3	27	23	42	2

Appendix Table 6. Size composition (nos. sampled) of Sebastes alutus, S. pinniger and S. proriger, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)	S. alutus							S. pinniger		S. proriger			
	Haul no.							Haul no.		Haul no.			
	18[b]			35[b]		36[b]		19[b]		18[a]		19[a]	
	M	F	U	M	F	M	F	M	F	M	F	M	F
13	-	-	1	-	-	-	-	-	-	-	-	-	-
14	-	-	0	-	-	-	-	-	-	-	-	-	-
15	-	-	2	-	-	-	-	-	-	-	-	-	-
16	-	-	21	-	-	-	-	-	-	-	-	-	-
17	-	-	16	-	-	-	-	-	-	-	-	-	-
18	-	-	4	-	-	2	1	-	-	-	-	-	-
19	-	-	1	-	-	0	0	-	-	-	-	-	-
20	-	-	0	-	-	0	2	-	-	-	-	-	-
21	-	-	1	-	-	0	2	-	-	-	-	-	-
22	-	-	-	-	-	2	1	-	-	-	-	-	-
23	-	-	-	-	-	2	1	-	-	-	-	-	-
24	-	-	-	1	-	1	0	-	-	2	-	-	-
25	1	-	-	0	-	2	2	-	-	5	1	3	-
26	0	-	-	1	1	4	0	-	-	13	1	5	1
27	1	3	-	0	2	3	2	-	-	29	3	14	1
28	2	1	-	2	0	4	3	-	-	42	6	17	4
29	0	0	-	0	0	2	5	-	-	42	9	30	14
30	1	0	-	0	3	5	5	-	-	44	25	20	17
31	0	0	-	1	0	12	1	-	-	14	6	6	14
32	0	0	-	2	1	8	6	-	-	8	16	3	22
33	3	2	-	0	0	14	7	-	-	13	12	3	19
34	6	3	-	1	3	12	8	-	-	5	19	2	18
35	2	1	-	2	2	8	6	-	-	1	14	1	11
36	3	0	-	0	0	4	1	-	-	1	7	2	3
37	2	0	-	1	1	1	1	-	1	1	2	0	1
38	1	0	-	-	0	0	1	-	0	-	1	0	3
39	2	0	-	-	1	1	-	1	0	-	5	0	5

Appendix Table 6 cont'd.

Fork length (cm)	S. alutus							S. pinniger		S. proriger			
	Haul no.							Haul no.		Haul no.			
	18[b]			35[b]		36[b]		19[b]		18[a]		19[a]	
	M	F	U	M	F	M	F	M	F	M	F	M	F
40	5	0	-	-	-	-	-	2	0	-	2	0	9
41	4	1	-	-	-	-	-	1	1	-	9	0	6
42	8	5	-	-	-	-	-	0	3	-	3	1	5
43	3	3	-	-	-	-	-	2	3	-	2	-	1
44	1	8	-	-	-	-	-	1	3	-	-	-	-
45	1	8	-	-	-	-	-	2	1	-	-	-	-
46	3	5	-	-	-	-	-	4	0	-	-	-	-
47	-	2	-	-	-	-	-	3	1	-	-	-	-
48	-	-	-	-	-	-	-	4	3	-	-	-	-
49	-	-	-	-	-	-	-	15	1	-	-	-	-
50	-	-	-	-	-	-	-	11	0	-	-	-	-
51	-	-	-	-	-	-	-	10	0	-	-	-	-
52	-	-	-	-	-	-	-	9	0	-	-	-	-
53	-	-	-	-	-	-	-	8	2	-	-	-	-
54	-	-	-	-	-	-	-	2	1	-	-	-	-
55	-	-	-	-	-	-	-	0	1	-	-	-	-
56	-	-	-	-	-	-	-	0	-	-	-	-	-
57	-	-	-	-	-	-	-	0	-	-	-	-	-
58	-	-	-	-	-	-	-	1	-	-	-	-	-
Total	49	42	46	11	14	87	55	66	18	220	143	107	154
% male	54			44		61		79		61		41	

[a]Random subsample of total catch (usually 2 to 4 full tubs).
[b]Total catch.

Appendix Table 7. Size composition (nos. sampled) of walleye pollock, by sex, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Fork length (cm)	Haul number													
	6[a]		9[a]	10[a]	15[b]	18[b]		19[b]		22[b]	23[a]	25[b]	26[b]	27[b]
	M	F	U	U	U	M	F	M	F	U	U	U	U	U
9	–	–	–	–	–	–	–	–	–	–	6	1	–	–
10	–	–	–	–	6	–	–	–	–	4	22	6	4	–
11	–	–	–	–	25	–	–	–	–	5	28	17	6	6
12	–	–	–	–	14	–	–	–	–	4	4	2	2	6
13	–	–	–	–	14	–	–	–	–	0	–	1	1	5
14	–	–	–	–	2	–	–	–	–	0	–	–	1	1
15	–	–	–	–	4	–	–	–	–	0	–	–	0	1
16	–	–	–	–	0	–	–	–	–	0	–	–	0	0
17	–	–	–	–	0	–	–	–	–	0	–	–	0	0
18	–	–	–	–	0	–	–	–	–	0	–	–	0	1
19	–	–	–	–	0	–	–	–	–	0	–	–	0	0
20	–	–	–	–	0	–	–	–	–	0	–	–	0	0
21	–	–	3	–	0	–	–	–	–	0	–	–	0	0
22	–	–	3	–	0	–	–	–	–	6	–	–	2	0
23	–	–	17	–	1	–	–	–	–	27	–	–	–	0
24	–	–	26	–	0	–	–	–	–	48	–	–	–	1
25	–	–	35	–	0	–	–	–	–	46	–	–	–	0
26	–	–	48	–	1	–	–	–	1	21	–	–	–	0
27	–	–	27	–	–	–	–	–	0	6	–	–	–	0
28	–	–	22	–	–	–	–	–	1	2	–	–	–	1
29	–	–	10	–	–	–	–	–	2	–	–	–	–	–
30	–	–	6	–	–	–	–	–	0	–	–	–	–	–
31	–	–	1	–	–	–	1	3	2	–	–	–	–	–
32	–	–	0	–	–	–	2	5	3	–	–	–	–	–
33	1	–	1	–	–	–	0	8	15	–	–	–	–	–
34	1	1	0	–	–	1	0	13	10	–	–	–	–	–
35	1	0	1	2	–	1	3	18	13	–	–	–	–	–
36	5	3	–	2	–	2	4	15	9	–	–	–	–	–
37	1	5	–	5	–	1	3	8	14	–	–	–	–	–
38	7	7	–	9	–	0	4	0	3	–	–	–	–	–
39	7	6	–	10	–	1	2	0	1	–	–	–	–	–
40	3	7	–	10	–	0	1	0	1	–	–	–	–	–

Appendix Table 7 cont'd.

Fork length (cm)	Haul number													
	6[a]		9[a]	10[a]	15[b]	18[b]		19[b]		22[b]	23[a]	25[b]	26[b]	27[b]
	M	F	U	U	U	M	F	M	F	U	U	U	U	U
41	3	10	-	10	-	0	0	0	0	-	-	-	-	-
42	3	5	-	11	-	0	2	0	0	-	-	-	-	-
43	2	1	-	7	-	0	0	0	0	-	-	-	-	-
44	5	2	-	6	-	0	1	0	0	-	-	-	-	-
45	0	3	-	2	-	2	0	0	2	-	-	-	-	-
46	0	1	-	1	-	1	0	0	0	-	-	-	-	-
47	1	-	-	0	-	4	1	1	0	-	-	-	-	-
48	-	-	-	0	-	5	1	1	1	-	-	-	-	-
49	-	-	-	0	-	6	2	1	2	-	-	-	-	-
50	-	-	-	0	-	1	4	1	1	-	-	-	-	-
51	-	-	-	0	-	1	7	4	4	-	-	-	-	-
52	-	-	-	0	-	3	4	3	1	-	-	-	-	-
53	-	-	-	0	-	8	4	1	0	-	-	-	-	-
54	-	-	-	0	-	9	6	0	3	-	-	-	-	-
55	-	-	-	0	-	3	18	0	0	-	-	-	-	-
56	-	-	-	1	-	4	6	3	0	-	-	-	-	-
57	-	-	-	1	-	2	7	0	1	-	-	-	-	-
58	-	-	-	-	-	2	11	0	0	-	-	-	-	-
59	-	-	-	-	-	2	2	1	2	-	-	-	-	-
60	-	-	-	-	-	1	5	-	1	-	-	-	-	-
61	-	-	-	-	-	1	2	-	-	-	-	-	-	-
62	-	-	-	-	-	0	2	-	-	-	-	-	-	-
63	-	-	-	-	-	1	1	-	-	-	-	-	-	-
64	-	-	-	-	-	-	0	-	-	-	-	-	-	-
65	-	-	-	-	-	-	1	-	-	-	-	-	-	-
66	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Total	40	51	200	77	67	62	109	86	93	169	60	27	16	22
% male	44		-	-	-	36		-	48		-	-	-	-

[a]Selected sample.
[b]Total catch.

Appendix Table 7 cont'd.

Fork length (cm)	Haul number 30 U	31 U	34[b] U	35[c] M	35[c] F
9	-	-	-	-	-
10	3	-	-	-	-
11	19	2	-	-	-
12	18	4	-	-	-
13	3	0	-	-	-
14	6	0	-	-	-
15	1	0	-	-	-
16	0	0	-	-	-
17	0	0	-	-	-
18	0	0	-	-	-
19	0	0	-	-	-
20	0	0	-	-	-
21	0	0	-	-	-
22	1	0	-	-	-
23	0	0	-	-	-
24	0	1	-	-	-
25	2	1	-	-	-
26	-	-	-	-	-
27	-	-	-	-	-
28	-	-	-	-	-
29	-	-	-	-	-
30	-	-	-	-	-
31	-	-	-	-	-
32	-	-	-	-	-
33	-	-	-	-	-
34	-	-	2	1	-
35	-	-	4	0	1
36	-	-	9	0	1
37	-	-	13	4	1
38	-	-	11	7	6
39	-	-	15	9	9
40	-	-	12	7	7

Appendix Table 7 cont'd.

Fork length (cm)	Haul number				
	30	31	34[b]	35[c]	
	U	U	U	M	F
41	-	-	6	9	12
42	-	-	8	7	9
43	-	-	6	5	9
44	-	-	2	4	6
45	-	-	1	2	1
46	-	-	0	2	1
47	-	-	0	2	0
48	-	-	0	2	0
49	-	-	0	0	0
50	-	-	0	0	1
51	-	-	0	0	0
52	-	-	1	5	0
53	-	-	0	0	0
54	-	-	0	1	0
55	-	-	0	2	2
56	-	-	0	2	2
57	-	-	0	1	2
58	-	-	0	0	3
59	-	-	0	0	1
60	-	-	1	1	1
61	-	-	-	-	0
62	-	-	-	-	1
63	-	-	-	-	3
64	-	-	-	-	-
65	-	-	-	-	-
66	-	-	-	-	-
Total	53	8	91	73	79
% male	-	-	-	48	

Appendix Table 8. Size composition (nos. sampled) of Pacific herring and sablefish, by haul, G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

	Pacific herring	Sablefish		
	Haul no.	Haul no.		
Fork length (cm)	17[a]	19[b]	35[b]	36[c]
	U	U	U	U
21	2	-	-	-
22	1	-	-	-
23	0	-	-	-
24	7	-	-	-
25	5	-	-	-
26	1	-	-	-
27	2	-	-	-
28	2	-	-	-
29	1	-	-	-
30	-	-	-	-
31	-	-	-	-
32	-	-	-	-
33	-	-	-	-
34	-	-	-	-
35	-	-	-	-
36	-	-	-	-
37	-	-	1	-
38	-	-	0	-
39	-	-	2	-
40	-	-	1	-
41	-	1	4	1
42	-	7	4	1
43	-	9	10	4
44	-	14	17	8
45	-	13	16	11
46	-	16	17	6
47	-	15	15	13
48	-	14	8	11
49	-	10	5	6
50	-	5	1	4
51	-	4	1	3
52	-	2	2	0
53	-	-	-	1
Total	21	110	104	69

[a]Total catch.
[b]Selected catch - 2 random tubs.
[c]Selected catch - 1 random tub.

Appendix Table 9. Oceanographic stations occupied during G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Station no.	Date (Sept)	Sounding (fm)	Position		Temperature °C		Depth (fm)	Sample type[a]
			Latitude	Longitude	Surface	Bottom		
1	7	100	51°07'	128°20'	14.0	6.3	99	XBT
2	7	98	51°15'	128°40'	14.0	6.3	100	XBT
5	7	118	51°24'	128°42.5'	12.3	6.0	113	XBT;NAN
6	7	134	51°18.5'	129°00'	15.5	6.2	130	XBT
7	7	164	51°13'	129°17'	15.4	6.0	155	XBT
8	7	190	51°07'	129°37'	14.8	5.8	182	XBT;NAN
9	7	134	51°21'	129°49'	13.8	6.2	126	XBT
10	7	190	51°36.5'	130°02'	13.6	5.5	185	XBT;NAN
10A	7	124	51°48'	130°16'	14.8	5.8	116	XBT
15	8	230	52°00'	130°30'	13.4	5.1	211	XBT;NAN
16	8	210	52°10'	130°22'	13.2	5.2	?	XBT
17	8	205	52°20'	130°15'	14.0	5.0	195	XBT
18	8	164	52°30'	130°07'	14.4	5.1	159	XBT
19	8	130	52°40'	130°09'	14.4	5.4	130	XBT
20	8	126	52°50'	130°10.5'	14.2	5.9	128	XBT
21	8	122	53°00'	130°12'	14.7	5.8	123	XBT;NAN
22	8	110	53°09'	130°27.5'	12.9	6.3	106	XBT
23	8	102	53°17'	130°41.5'	12.6	6.3	97	XBT
24	8	90	53°30'	130°46.0'	12.8	7.2	89	XBT
25	8	76	53°43'	130°43.0	12.3	6.9	74	XBT
26	8	52	53°50'	130°52'	12.6	7.5	52	XBT
27	8	46	53°57'	131°01'	12.7	7.9	47	XBT
28	8	62	54°07'	131°02'	13.6	7.9	64	XBT
29	8	69	54°17'	131°02'	13.0	7.2	71	XBT
30	8	59	54°20'	131°05'	12.8	7.3	51?	XBT
31	8	78	54°26'	131°05'	12.7	7.0	79?	XBT
32	8	62	54°33'	131°20'	11.7	7.5	62	XBT
33	8	138	54°25'	131°20'	11.5	5.6	137	XBT;NAN
33B	11	127	54°25'	131°20'	11.1	5.8	130	BT;NAN

Appendix Table 9 cont'd.

Station No.	Date (Sept)	Sounding (fm)	Position		Temperature °C		Depth (fm)	Sample Type[a]
			Latitude	Longitude	Surface	Bottom		
34	11	94	54°23.8'	131°17.7'	10.9	6.0	102	BT
B	11	80	54°23.6'	131°16.7'	10.9	6.2	86	BT
C	11	60	54°23.4'	131°15.0'	11.2	6.8	65	BT
D	11	40	54°22.8'	131°12.5'	11.5	8.1	46	BT
E	11	40	54°22.2'	131°08.9'	11.3	8.8	44	BT
F	11	52	54°21.4'	131°05.5'	11.9	7.7	55	BT
Tow 14	12	40	53°38.3'	131°02.8'	12.4	9.4	43	BT
Tow 15	12	36	53°34.3'	131°08.8'	11.8	9.3	40	BT
G	13	80	52°54'	130°24.1'	13.9	6.7	86	BT
H	13	70	52°53.8'	130°26'	14.2	7.3	75	BT
I	13	60	52°54'	130°32.2'	13.5	7.5	63	BT
J	13	50	52°54'	130°36.6'	13.6	7.7	56	BT
K	13	40	52°54'	130°39.4'	13.6	7.8	42	BT
L	13	30	52°54'	130°45'	12.9	8.8	33	BT
M	14	79	52°34.6'	130°09.3'	13.5'	7.1	81	BT
N	14	38	52°40'	130°00'	12.7	8.4	42	BT
O	14	71	52°40'	130°43.8'	14.4	7.4	72	BT
P	15	16	52°58'	131°00'	12.5	10.0	18	BT
Q	16	67	53°20'	130°54'	13.5	8.1	71	BT
R	16	16	53°20'	131°10'	12.4	11.0	18	BT
33C	17	120	54°25'	131°20'	12.0	5.8	132	BT;NAN
S	19	79	53°10'	130°46.1'	13.7	7.2	82	BT
T	19	16	52°50'	131°00'	12.6	12.0	20	BT
18A	19	163	52°28'	130°10'	14.0	5.6	163	XBT
13	20	114	52°00'	129°30'	15.3	7.3	110	XBT
5	20	120	51°24'	128°42'	15.4	6.3	116	XBT;NAN
1	20	101	51°07'	128°22'	13.4	6.7	97	XBT

[a] XBT = Expendable bathythermograph.
NAN = Nansen water bottle cast for temperature (reversing thermometers) and salinity at standard depths (0, 10, 20, 30, 50 metres plus increments of 25 meters to bottom).
BT = Retrievable bathythermograph (Wallace and Tierman).

Appendix Table 10. Contents and locations[a] of Shipek bottom grabs completed in Hecate Strait during G. B. REED Groundfish Cruise 79-6, September 6-21, 1979.

Area	Sample No.	Latitude	Longitude	Depth (fm)	Depth (m)	Contents of grab[b]	Remarks
Two Peaks	54°17.5' - 54°25.0'N; 131°17.8' - 131°26.0'W						
	1	54°17.8'	131°26.0'	45	82	S	-
	2	54°17.5'	131°26.0'	45	82	S	-
	3	54°17.9'	131°25.6'	50	91	S	-
Shell Ground	53°30.9' - 53°34.3'N; 130°47.4' - 131°08.8'W						
	4	53°34.3'	131°08.8'	40	73	Sh;S	-
	5	53°31.0'	131°06.0'	22	40	G;Sh	-
	6	53°31.0'	131°04.7'	24	44	Sh	-
	7	53°31.0'	131°02.5'	24	44	Sh;G	-
	8	53°31.0'	131°00.9'	26	48	G	-
	9	53°31.0'	130°59.3'	32	59	Sh;gS	-
	10	53°31.0'	130°57.7'	38	70	gS	-
	11	53°31.0'	130°55.8'	44	81	Sh;gS	-
	12	53°31.0'	130°54.0'	49	90	S	-
	13	53°30.9'	130°52.3'	51	93	S	fine grain
	14	53°31.0'	130°51.1	52	95	gS	-
	15	53°31.0'	130°49.2'	54	99	S	fine grain
	16	53°31.0'	130°47.4	61	112	S	fine grain

[a]See Figure 3 for chart of grab locations.

[b] G=gravel g=gravelly
M=mud m=muddy
S=sand s=sandy
Sh=shell sh=shelly

Appendix Table 10 cont'd.

Area	Sample No.	Latitude	Longitude	Depth (fm)	Depth (m)	Contents of grab[b]	Remarks
Ole Spot	53°20.0'N; 130°46.1' - 131°10.0'W						
	50	53°20.0'	130°54.0'	67	123	gS	-
	51	53°20.0'	130°55.6'	53	97	gS	-
	52	53°20.0'	130°57.6'	48	88	S	H_2S smell
	53	53°20.0'	130°59.7'	44	81	S	H_2S smell finer grain
	54	53°20.0'	131°01.4'	39	71	S	-
	55	53°20.0'	131°03.5'	30	55	gS	scallop shell 2 attempts
	56	53°20.0'	131°05.6'	23	42	ShS	-
	57	53°20.0'	131°07.8'	24	44	g;shS	-
	58	53°20.0'	131°10.0'	16	29	gS	-
	59	53°25.0'	131°09.0'	15	27	Sh;G	coarse gravel
	60	53°25.0'	131°06.5'	18	33	s;shg	cobble size
	61	53°25.0'	131°04.6'	25	46	Sh;S	-
	62	53°25.0'	131°02.6'	31	57	S	fine grain
	63	53°25.0'	131°00.2'	41	75	S	fine grain
	64	53°25.0'	130°57.8'	54	98	S	-
	65	53°25.0'	130°55.6'	59	108	S	fine grain
	66	53°25.0'	130°53.6'	69	126	gS	-
	67	53°25.0'	130°51.6'	68	124	mG	-
	68	53°25.0'	130°49.8'	85	155	M	-
	69	53°15.0'	130°48.5'	82	150	M	-
	70	53°15.0'	130°50.5'	67	122	S	-

Appendix Table 10 cont'd.

Area	Sample No.	Latitude	Longitude	Depth (fm)	Depth (m)	Contents of grab[b]	Remarks
Ole Spot cont'd	53°20.0'N; 130°46.1' - 131°10.0'W						
	71	53°15.0'	130°52.2'	66	121	S	-
	72	53°15.0'	130°53.7'	61	112	S	-
	73	53°15.0'	130°55.7'	53	97	S	-
	74	53°15.0'	130°57.5'	49	90	gS	-
	75	53°15.0'	130°59.4'	45	82	sG	-
	76	53°15.0'	131°01.3'	37	68	sh;gS	fine shell
	77	53°15.0'	131°03.3'	30	55	Sh;S	~50% mix
	78	53°15.0'	131°05.4'	22	40	sh;gS	coarse sand
	79	53°15.0'	131°07.3'	21	38	g;shS	-
	80	53°10.0'	131°06.7'	21	38	sSh	-
	81	53°10.0'	131°05.0'	24	44	gS	-
	82	53°10.0'	131°03.3	25	46	sh;gS	2 attempts cobble
	83	53°10.0'	131°01.7'	25	46	Sh	hard bottom trace

Appendix Table 10 cont'd.

Area	Sample No.	Latitude	Longitude	Depth (fm)	Depth (m)	Contents of grab[b]	Remarks
Horseshoe	52°50.0' - 52°58.0'N; 130°24.1' - 130°58.2'W						
	17	52°54.0'	130°24.1'	80	147	S	coarse grain
	18	52°53.8'	130°26.0'	70	128	S	finer grain
	19	52°54.0'	130°32.2'	60	110	S	finer grain
	20	52°54.0'	130°36.6'	51	94	Sh;gS	-
	21	52°54.0'	130°39.4'	40	73	Coral;Sh	2 attempts
	22	52°54.0'	130°45.0'	30	55	Sh	3 sandlance
	35	52°58.0'	130°58.1'	16	29	S;Sh	-
	36	52°58.0'	130°55.6'	18	33	Sh;S	-
	37	52°58.0'	130°53.7'	19	35	S;Sh	-
	38	52°58.0'	130°51.7'	20	37	Sh;S	2 corner samples no recovery
	39	52°58.0'	130°49.7'	30	55	Sh;S	-
	40	52°58.0'	130°47.4'	34	62	Sh;S	-
	41	52°58.0'	130°45.3'	35	64	Sh;S	-
	42	52°56.0'	130°45.0'	26	48	g;shS	coarse sand
	43	52°56.0'	130°47.5'	23	42	sG	very coarse sand
	44	52°56.0'	130°49.6'	25	46	Sh;S	-
	45	52°56.0'	130°51.8'	20	37	Sh;G	fine gravel
	46	52°56.0'	130°54.0'	17	31	sG	-
	47	52°56.0'	130°56.0'	18	-	sh;sG	-
	48	52°56.0'	130°58.2'	15	-	gSSh	-
	94	52°50.0'	130°54.7'	25	46	g;shS	-
	95	52°50.0'	130°49.7'	32	59	gS	very coarse sand
	96	52°50.0'	130°44.6'	40	73	S	fine grain
	97	52°50.0'	130°40.0'	51	93	mS	-

Appendix Table 10 cont'd.

Area	Sample No.	Latitude	Longitude	Depth (fm)	Depth (m)	Contents of grab[b]	Remarks
Reef Island	52°50.0' - 52°58.0'N; 131°000.0W						
	34	52°58.0'	131°00.0'	17	31	Sh;S	-
	49	52°56.0'	131°00.0'	17	31	Sh;S	-
	93	52°50.0'	131°00.0'	16	29	shG	barnacle
Ramsay Island	52°40.0'N;131°00.0' - 130°43.8'W						
	23	52°40.0'	131°00.0'	38	70	sG	Trace sand
	24	52°40.0'	131°00.0'	39	71	sG	repeated Stn.
	25	52°40.0;	130°58.2'	42	77	sG	~50% mix
	26	52°40.0'	130°56.5'	46	84	sG	-
	27	52°40.0'	130°54.7'	50	-	sG	-
	28	52°40.0'	130°52.9'	53	97	gS	-
	29	52°40.0'	130°51.2'	55	101	sG	-
	30	52°40.0'	130°48.8'	57	104	S	-
	31	52°40.0'	130°46.9'	61	-	S	-
	32	52°40.0'	130°44.9'	62	114	S	-
	33	52°40.0'	130°43.8'	71	130	S	-
	84	53°10.0'	131°00.0'	28	51	Sh;S	coarse sand
	85	53°10.0'	130°58.3'	34	62	gS	-
	86	53°10.0'	130°56.5'	45	82	Sh;g;mS	-
	87	53°10.0'	130°54.9'	51	93	S	fine sand
	88	53°10.0'	130°53.0'	56	106	g;mS	-
	89	53°10.0'	130°51.3'	64	117	g;mS	-
	90	53°10.0'	130°49.5'	68	124	G	-
	91	53°10.0'	130°47.8'	68	124	mS	-
	92	53°10.0'	130°46.1'	79	145	S	fine sand

Appendix Table 11. Catch (kg) of invertebrates, by category and haul, during G.B. REED Groundfish Cruise No. 79-6, September 6-21, 1979.

Category	Haul number																				Total
	2	3	4	7	13	14	15	16	18	20	21	22	24	26	27	28	29	30	33	35	
Anemone	-	-	-	-	-	5	5	-	-	-	2	1	9	-	-	-	5	-	-	-	27
Crab, Dungeness	-	-	-	1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Crinoid	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Cucumber	-	-	-	-	-	9	-	T	-	-	-	-	-	1	-	-	18	5	-	-	33
Jellyfish	-	-	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T
Scallop	-	-	-	-	-	-	-	-	-	-	-	T	-	2	-	-	45	-	-	-	47
Sea mouse	-	-	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T
Sea pen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	T	-	-	-	-	T
Sponge	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	23
Squid	-	-	-	-	-	-	-	-	-	T	-	-	-	-	-	-	-	-	-	-	T
Starfish[a]	14	5	18	7	37	-	29	2	T	-	4	1	-	1	12	4	8	2	7	1	152
Urchin	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	9	-	-	-	10
Total	14	5	18	8	37	14	38	2	24	T	6	4	9	4	12	4	85	7	7	1	299

[a]Including basket and brittle stars.