G. B. Reed Groundfish Cruise Reports, 1963-66

by S. J. Westrheim

FISHERIES RESEARCH BOARD OF CANADA

TECHNICAL REPORT NO. 30

1967

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G.B. REED GROUNDFISH CRUISE REPORTS, 1963-66

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S. J. Westrheim

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Biological Station, Nanaimo, B. C.

August, 1967

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INTRODUCTION

In 1963, a program was launched to investigate the distribution, abundance, and biology of Pacific ocean perch (Sebastodes alutus) in the northeast Pacific Ocean. During the period 1963-66, 8 groundfish cruises were completed with the CGS G.B. Reed along the west coast of North America from Cape Blanco, Oregon, to Unalaska Island, Alaska.

Processed reports, for limited distribution, were prepared for each cruise which provided a general summary of cruise activities and a detailed log of all hauls including location, hydrographic data, and catch, in pounds, by species. This report consists of all 8 cruise reports assembled here for convenient reference by other investigators and interested members of the British Columbia groundfish industry.

In all cases, each trawl catch was segregated by species into tub lots (80-120 lb) and tub lots were weighed on a beam balance (1963) or platform scales (1964-66) to the nearest pound. For small catches (ca. $<$600 lb) of individual species, all tub lots were weighed. For large catches (ca. $\geq$600 lb), procedures varied. During 1963 and 1964, while sampling schemes were being developed, all, or a substantial portion, of the tub lots were weighed. During 1965 and 1966, sampling schemes were employed which had an accuracy of approximately $\pm$ 5% (Westrheim, In Press).

Ocean perch size composition information has been reported for these cruises in Manuscript Reports (Westrheim, 1965, 1966a, 1966b).

REFERENCES

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1966a. Catch rates, size composition, and sex ratio of Pacific ocean perch (Sebastodes alutus) caught in the eastern North Pacific Ocean (Cape Spencer, Alaska, to Cape Blanco, Oregon) by the G.B. Reed, August-September, 1965. Fish. Res. Bd. Canada, MS Rep. Biol., No. 867, 28 p.

1966b. Catch rates, size composition, and sex ratio of Pacific ocean perch (Sebastodes alutus) caught in the eastern North Pacific Ocean by the G.B. Reed, January-March, 1963-1965. Fish. Res. Bd. Canada, MS Rep. Biol., No. 869, 17 p.

1967. Catch rates, size composition, and sex ratio of Pacific ocean perch (Sebastodes alutus) caught in the eastern North Pacific Ocean (Vancouver Island, B. C., to Southeastern Alaska) by the G.B. Reed, August-October, 1966. Fish. Res. Bd. Canada, Tech. Rep. No. 16, 32 p.

In Press. Sampling research trawl catches at sea. J. Fish. Res. Bd. Canada.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 63-3

February 19 - March 25, 1963

Purpose

1. Conduct gear trials with groundfish and shrimp trawls.
2. Explore Queen Charlotte Sound and adjacent inlets (during inclement weather) for availability of groundfish.
3. Develop sampling and processing procedures for trawl catches of groundfish and shrimp.
4. Establish vertical water temperature regime.
5. Investigate type of bottom and organisms therein.

Area

1. Queen Charlotte Sound from 51° to 52° N Latitude and 128°30' to 131°00' W Longitude in 20-500 fathoms.
2. Bays and inlets adjacent to Queen Charlotte Sound, when inclement weather prevails.

Results

A. General

Deck gear repairs, necessitating shipyard time, interrupted the expedition twice, thus creating three parts to the cruise: February 19-26 (Part I); March 8-12 (Part II); and March 19-25 (Part III).

A total of 39 drags were completed utilizing two types of groundfish trawls and one shrimp trawl. During Part I (February 19-26), 19 drags were completed, all in Queen Charlotte Sound (Fig. 1): 9 with the manila groundfish trawl, and 10

with the semi-balloon shrimp trawl. During Part II (March 8-12), in Queen Charlotte Sound and Smith Sound, 6 drags were completed; 2 with the gunlene groundfish trawl (Queen Charlotte Sound), and 4 with the shrimp trawl (Smith Sound). During Part III (March 19-25), off Estevan Point (Vancouver Island), 14 drags were completed, all with the gunlene groundfish trawl (5 with a 1/2" cod-end liner). Part III activities were not conducted in Queen Charlotte Sound because of inclement weather and lack of time remaining to trawling activities.

Records of all "G. B. Reed" trawling are included in Appendix Tables 1 and 2. Appendix Table 3 lists the species of fish and invertebrates encountered in the catches. Part II of the cruise was terminated prematurely and the "Investigator No. 1" was dispatched from Nanaimo to pick up shrimp pots left in Smith Sound. While there the vessel completed 4 drags in Smith Sound with a shrimp trawl. Results of these activities are summarized in Appendix Tables 1A, 2A, and 2B.

B. Groundfish

Gear tests were conducted with 2 groundfish trawls -- a manila, eastern-type trawl (No. 41-5) and a gunlene western-type trawl (4-1/2" mesh). Tests of the manila trawl were inconclusive because the complete Dan Leno assembly was not available. The gunlene trawl, constructed by Captain Parker after Part I, proved to be satisfactory, although it may need additional weight to overcome a tendency for the wings to twist.

Explorations for winter availability of groundfish in Queen Charlotte Sound were limited to the eastern portion of the Sound due to inclement weather and the aforementioned repairs to deck gear. However, the limited results suggest that winter availability is low in the portion of the Sound explored. Trawling with the shrimp trawl in Smith Sound failed to yield commercial quantities of any marketable groundfish species. Trawling off the west coast of Vancouver Island (Off Estevan Point) was conducted on grounds regularly fished at this time of year by United States trawlers and hence was not considered to be exploratory work.

Deck sampling procedures could not be tested during Parts I and II due to the small catches made. However, during Part III catches were large enough to do so. Each trawl catch was separated by species into numbered galvanized tubs, 20" square, with a capacity of approximately 100 lbs. of flatfish or 70 lbs. of rockfish. Each tub was weighed and the tub number noted. Length-frequencies of the contents were obtained whenever feasible. Species so handled included brill, Dover sole, rex sole, and Pacific Ocean perch. Individual catches included up to 10 tubs of fish of a single species. Size composition and sex ratios did not differ appreciably among tubs from the same catch. These experiments will have to be enlarged to encompass other species and larger catches.

General biological information collected included samples of juvenile Pacific Ocean perch from Queen Charlotte Sound, Smith Sound, and off Estevan Point. Otoliths and scales were collected from these as well as adult ocean perch taken off Estevan Point for the age and growth study now underway. Sixteen species of rockfish (Family: Scorpaenidae) were identified in the catches and at least one represents a range extension and will be duly reported (see Appendix Table 3). Two other "types" presently defy identification and specimens have been preserved for more detailed examination.

C. Commercial Invertebrates

The 70-foot semi-balloon shrimp trawl (1-1/2" mesh) operated satisfactorily from the forward gallows. Otter boards (3-1/2 x 8 feet of 1-inch plywood) appeared to spread the trawl well. The net was set and hauled aboard easily by the crew. Prawn traps were fished without difficulty from the vessel's gillnetter; no more than 20 traps (24" x 12" x 12") are carried comfortably at one time and all groundlines and buoylines were reeled on the drum beforehand.

The main commercial shrimp caught in Queen Charlotte Sound was the smooth pink, with smaller amounts of prawns and sidestripes. In no case was the

catch of a single species or combined weight of several sufficient to support commercial fishing. Trawl catches in Smith Sound, though better than from offshore, do not indicate that the area itself, in view of its isolation, can support a shrimp fishery. However, if any stocks of shrimps in Queen Charlotte Sound are ever exploited then grounds in Smith Sound may serve as a secondary fishing area. Half of the prawn traps were lost in Smith Sound and the catch in those recovered by the "Investigator No. 1" (4.4 lbs. in 11 traps) was lower than sought for a commercial operation. As the bait was eaten it is likely that, after 5 days, more prawns had left the traps than remained.

Sampling procedure on deck did not differ appreciably from that outlined above for groundfish catches. Some large hauls were sorted on deck with assistance of the crew, and incidental fish were counted or weights taken before discarding. All shrimp catches, whether sorted initially on deck or not, were gone through on the sorting table in the fish-handling laboratory. Total catch was weighed there in plastic buckets (species separately in mixed hauls); also pound samples (on a "dairy" platform scale) for counts of whole shrimps, but the latter operation was transferred to the biological laboratory in rough weather. Normally the pound lots were suitable for weighing and sexing, except with larger species when additional specimens were taken. Error due to movement of the ship was not apparent with beam balance weighing but difficulty was found keeping the platform scale steady; counts of two or three lots were taken and averaged.

The shrimp sampling gave size and sex composition and reproductive condition. Age structure was mostly uncertain. Of interest was the mixing of two related shrimps, Pandalus jordani and P. borealis, offshore and inlet species respectively. Non-commercial crustacea were identified; the known range of one shrimp, Spirontocaris sica, was extended northward.

D. Other Invertebrates

The primary purpose of the participation of the Marine Invertebrate Investigation in this cruise was to establish:

1. Whether the groundfish trawl is a useful benthic invertebrate sampling gear.
2. Whether benthic studies can be effectively integrated with groundfish work without significant effect on the efficiency of either one.

Results

The variety and abundance of invertebrate types taken in both the large trawl and smaller shrimp trawl indicates these gears are well able to sample the larger surface living animals. If the infauna can be sampled by grab (and it seems possible to do so over the port side without loss of time to the trawling operations) a composite picture of the distribution of invertebrates on the fishing grounds may be obtained.

It seems, thus far, that the two investigations may be successfully integrated.

E. Vertical Temperature Regime

A total of 26 B.T. casts were made and an additional 4 casts with a reversing bottle, where bottom depth exceeded the capacity (150 fms.) of the B.T. In the Queen Charlotte Sound area, including Smith Sound and Goletas Channel, 22 B.T. casts were completed to depths ranging from 42 to 150 fms. The vertical temperature regime was approximately isothermal -- no thermocline was evident. Surface water temperatures ranged from 7.7° to 8.6° C., and bottom temperatures, 7.1° to 8.5° C. Off Estevan Point, 4 casts were completed with the B.T. and 4 with the reversing thermometer at depths ranging from 131 to 220 fms. No thermocline was evident. Surface water temperatures ranged from 8.2° to 8.9° C. and bottom temperatures, 5.3° to 6.3° C.

F. Type of Bottoms

A Dietz-LaFond bottom sampler was used to determine, if possible, the type of bottom over which the trawl nets fished. Success was generally poor. Rough seas and/or deep water (100 fms.) were thought to be the major factors affecting the bottom sampler.

G. Personnel

T. H. Butler	(Feb. 19 - Mar. 12)	D. Davenport	(Feb. 19 - Mar. 25)
D. B. Quayle	(Feb. 19 - 26)	J. Flury	(Feb. 19 - 26)
J. A. C. Thomson	(Feb. 19 - Mar. 25)	E. J. R. Lippa	(Mar. 19 - 25)
S. J. Westrheim*	(Feb. 19 - Mar. 25)	A. N. Yates	(Feb. 19 - Mar. 12)

* Chief Scientist

APPENDIX

Table 1. Fishing log for the "G. B. Reed" trawling during Cruise No. 3, February-March, 1963.

Drag No.	3-1	3-2	3-3	3-4	3-5	3-6	3-7
Date	Feb 21	Feb 21	Feb 21	Feb 22	Feb 22	Feb 23	Feb 23
Area[1]	QCS	QCS	QCS	QCS	QCS	QCS	QCS
Station No.	7	13	14	15	29	34	51
Starting time[2]	0935	1230	1620	0810	1040	0825	1100
Duration (min.)	65	65	60	60	60	65	60
Start: Lat.	51°	51°	51°	51°	51°	51°	51°
	06'	10'30"	11'30"	14'36"	21'36"	27'	39'30"
Long.	128°	128°	128°	128°	129°	128°	128°
	29'	33'30"	50'	56'	03'	38'	31'
End: Lat.	51°	51°	51°	51°	51°	51°	51°
	05'42"	12'	10'30"	14'24"	22'	31'	44'18"
Long.	128°	128°	128°	128°	128°	128°	128°
	32.5'	36'30"	39'	59'30"	55'	32'	33'30"
Depth (fms.)	85-75	92-98	71-75	120-127	115-112	65-60	75-80
Type of bottom[3]	S, M	S, M	-	-	M	S, M	-
Water Temp. (°C.)							
Surface	8.5	8.5	8.6	8.3	8.5	8.4	8.3
Bottom[4]	8.5	7.1	8.2	7.3	7.5	8.4	8.0
Net used[5]	Manila	Manila	Manila	Manila	Manila	Manila	Manila
Remarks	Not fishing	-	Not fishing	Not fishing	-	-	-
Total catch (lbs)	44	2,419	10	0	100	1,153	20

Table 1 continued

Drag No.	3-8	3-9	3-10	3-11	3-12	3-13	3-14
Date	Feb 23	Feb 23	Feb 24	Feb 24	Feb 24	Feb 24	Feb 25
Area[1]	QCS	QCS	QCS	QCS	QCS	QCS	QCS
Station No.	62	71	71	71	62	51	7
Starting time[2]	1325	1520	0730	0855	1005	1115	0750
Duration (min.)	60	60	30	35	30	30	30
Start: Lat.	51°	51°	51°	51°	51°	51°	51°
	45'	51'	54'	54'	49'30"	44'30"	06'30"
Long.	128°	128°	128°	128°	128°	128°	128°
	43'	41'	45'	45'	43'	34'	31'
End: Lat.	51°	51°	51°	51°	51°	51°	51°
	47'30"	52'30"	52'30"	52'30"	48'30"	44'	06'
Long.	128°	128°	128°	128°	128°	128°	128°
	44'30"	36'	43'	43'	42'	30'	30'
Depth (fms.)	45-50	75-72	70	73	55	80-70	76-80
Type of bottom[3]	-	-	S, M	S, M	-	-	-
Water Temp. (°C.)							
Surface	8.4	8.3	8.4	8.5	8.5	8.2	8.4
Bottom[4]	8.4	7.9	-	-	-	-	8.2
Net used[5]	Manila	Manila	shrimp	Shrimp	Shrimp	Shrimp	Shrimp
Remarks	-	-	Boards not functioning	-	-	-	-
Total catch (lbs)	50	25	0	140	74	228	79

Table 1 continued

Drag No.	3-15	3-16	3-17	3-18	3-19	3-20	3-21
Date	Feb 25	Feb 25	Feb 25	Feb 25	Feb 25	Mar 9	Mar 9
Area[1]	QCS	QCS	QCS	QCS	QCS	QCS	QCS
Station No.	13	14	15	29	28	1	1
Starting time[2]	0915	1100	1310	1440	1615	1025	1200
Duration (min.)	30	30	30	30	30	55	60
Start: Lat.	51°	51°	51°	51°	51°	51°	51°
	10'30"	11'42"	13'30"	22'	25'30"	00'00"	02'30"
Long.	128°	128°	129°	129°	128°	128°	128°
	33'30"	45'	05'	03'30"	52'	33'	36'
End: Lat.	51°	51°	51°	51°	51°	51°	51°
	10'	11'42"	14'12"	23'	25'48"	02'30"	00'
Long.	128°	128°	129°	129°	128°	128°	128°
	31'	43'	03'	01'	50'	36'	33'
Depth (fms.)	100	70	122-121	122-120	116-114	42-48	48-44
Type of bottom[3]	-	-	-	-	-	-	-
Water Temp. (°C.)							
Surface	8.4	8.5	8.5	8.5	8.5	-	8.0
Bottom[4]	7.2	8.2	6.9	6.8	7.2	-	8.5
Net used[5]	Shrimp	Shrimp	Shrimp	Shrimp	Shrimp	Gunl.	Gunl.
Remarks	-	-	-	-	Torn net	Wing twist	-
Total catch (lbs)	1,484	43	76	140	66	30	1

Table 1 continued

Drag No.	3-22	3-23	3-24	3-25	3-26	3-27	3-28
Date	Mar 9	Mar 10	Mar 10	Mar 10	Mar 20	Mar 21	Mar 21
Area[1]	SS	SS	SS	SS	EP	EP	EP
Station No.	137	137	-	-	-	-	-
Starting time[2]	1755	0815	1330	1540	1530	0630	0950
Duration (min.)	25	30	35	30	60	70	60
Start: Lat.	51°	51°	51°	51°	49°	49°	49°
	18'42"	18'	18'42"	19'36"	08'30"	11'18"	08'
Long.	127°	127°	127°	127°	127°	127°	127°
	37'48"	39'30"	34'36"	37'06"	03'	04'	02'
End: Lat.	51°	51°	51°	51°	49°	49°	49°
	17'36"	17'	18'18"	19'24"	11'18"	08'18"	10'18"
Long.	127°	127°	127°	127°	127°	127°	127°
	40'	40'12"	37'42"	28'48"	04'	02'	02'
Depth (fms.)	70	87-82	90-98	83-80	170-160	220-165	140-165
Type of bottom[3]	Gr M	-	M	-	M	Cl	-
Water Temp. (°C.)							
Surface	8.1	7.7	8.1	-	8.3	8.2	8.4
Bottom[4]	7.6	7.5	7.7[6]	-	5.5*	5.7*	6.0
Net used[5]	Shrimp	Shrimp	Shrimp	Shrimp	Gunl.	Gunl.	Gunl.
Remarks	95% sponge	-	-	-	Wing twist	-	-
Total catch (lbs.)	1,000	1,000	700	400	800	1,476	2,068

Table 1 continued

Drag No.	3-29	3-30	3-31	3-32	3-33	3-34	3-35
Date	Mar 22	Mar 22	Mar 22	Mar 23	Mar 23	Mar 23	Mar 23
Area[1]	EP	EP	EP	EP	EP	EP	EP
Station No.	-	-	-	-	-	-	-
Starting time[2]	0850	1300	1515	0655	0900	1115	1415
Duration (min.)	60	60	60	65	60	60	30
Start: Lat.	49°	49°	49°	49°	49°	49°	49°
	07'	06'	03'	08'	10'	06'	08'
Long.	127°	127°	126°	126°	127°	127°	126°
	02'	02'	55'	55'	00'	00'	55'
End: Lat.	49°	49°	49°	49°	49°	49°	49°
	10'	02'	01'36"	10'	06'	10'18"	09'30"
Long.	127°	127°	126°	127°	127°	126°	126°
	03'	01'	53'	00'	00'	57'36"	57'
Depth (fms.)	175-185	190-200	220	120	130	125	120
Type of bottom[3]	S, Cl	S, Cl	-	-	S, Cl	-	-
Water Temp. (°C.)							
Surface	8.4	8.6	8.9	8.2	-	-	-
Bottom[4]	6.0*	6.3	5.3*	6.1	-	-	-
Net used[5]	Gunl.	Gunl.	Gunl.	Gunl.	Gunl.	Gunl.	Gunl. + 1/2"L.
Remarks	-	-	-	-	-	-	-
Total catch (lbs.)	3,337	1,400	2,800	2,700	0	20	1,000

Table 1 continued

Drag No.	3-36	3-37	3-38	3-39
Date	Mar 23	Mar 24	Mar 24	Mar 24
Area[1]	EP	EP	EP	EP
Station No.	-	-	-	-
Starting time[2]	1530	0730	0850	1040
Duration (min.)	30	30	30	30
Start: Lat.	49°	49°	49°	49°
	09'	07'30"	10'	12'30"
Long.	126°	126°	127°	126°
	57'	56'	02'	58'
End: Lat.	49°	49°	49°	49°
	10'24"	10'	12'	10'
Long.	126°	126°	127°	126°
	57'36"	57'	02'	58'
Depth (fms.)	120	140	150	120
Type of bottom[3]	-	-	-	-
Water Temp. (°C.)				
Surface	-	8.3	-	-
Bottom[4]	-	5.9	-	-
Net used[5]	Gunl. + 1/2"L.	Gunl. + 1/2"L.	Gunl. + 1/2"L.	Gunl. + 1/2"L.
Remarks	-	-	-	X-Doors
Total catch (lbs.)	450	250	1,200	0

Footnotes to Table 1

[1]QCS = Queen Charlotte Sound; SS = Smith Sound; EP = Estevan Point (Vancouver Is.).

[2]PST.

[3]S = sand; M = mud; Gr = green; Hd = hard.

[4]Asterisk indicates reversing thermometer; otherwise, bathythermograph.

[5]Manila and Gunlene for groundfish.

[6]At 124 fms., 7.6 (off tow); at 150 fms., 7.5 (off tow).

Table 1A. Supplementary fishing log for the "Investigator No. 1" trawling in Smith Sound, March, 1963.

Drag No.	1	2	3	4
Date	Mar 16	Mar 16	Mar 16	Mar 16
Area	Off Indian Is.	Table Is.	Indian Is.	Jagged Is.
Lat.[1]	51°17'	51°16'	51°17'	51°18'
Long.[1]	127°39'	127°46'	127°39'	127°43'
Depth (fms.)	90-83	68-65	82-84	65-70
Duration (min.)	30	30	30	22
Type of bottom	Mud	Mud	Mud	Mud
Net used	70-Gulf	70-Gulf	70-Gulf	70-Gulf
Remarks	Towed with tide	Net torn	Against tide. Muddy tow.	-

[1]Approximate position at mid-tow.

Table 2. Catch log for the "G. B. Reed" trawling during Cruise No. 3, February-March, 1963.

Drag No.	3-1	3-2	3-3	3-4	3-5	3-6	3-7	3-8	3-9	3-10
Date	Feb 21	Feb 21	Feb 21	Feb 22	Feb 22	Feb 23	Feb 23	Feb 23	Feb 23	Feb 24
Total catch (lbs.)	44	2,419	10	0	100	1,153	20	50	25	0
Flatfish										
Brill	Tr[2]	-	-	-	-	20	-	-	Tr	-
Dover sole	-	-	-	-	-	-	-	-	-	-
Halibut[1]	(-)	(-)	(-)	(-)	(-)	(1)	(-)	(-)	(-)	(-)
Lemon sole	Tr	Tr	-	-	-	330	Tr	Tr	Tr	-
Rex sole	Tr	Tr	-	-	-	64	-	Tr	Tr	-
Rock sole	-	-	-	-	-	Tr	Tr	Tr	Tr	-
Sand dab	-	-	-	-	-	244	Tr	Tr	Tr	-
Turbot	Tr	20	-	-	Tr	64	Tr	-	Tr	-
Other	-	-	-	-	-	-	-	Tr	Tr	-
Roundfish										
Grey cod	Tr	Tr	-	-	-	Tr	-	-	-	-
Lingcod	28	Tr	-	-	-	42	-	-	-	-
Sablefish	-	Tr	-	-	Tr	Tr	-	-	-	-
Other	Tr	Tr	-	-	Tr	Tr	Tr	Tr	Tr	-
Pacific Ocean perch	-	-	-	-	-	-	-	-	-	-
Other rockfish	-	76	-	-	20	Tr	-	-	Tr	-
Dogfish	-	2,220	Tr	-	20	-	-	-	Tr	-
Ratfish	-	Tr	-	-	Tr	219	Tr	Tr	Tr	-
Skate	Tr	-	-	-	Tr	128	-	-	-	-
Invertebrates										
Pink shrimp	-	Tr	-	-	Tr	-	-	-	Tr	-
Other shrimp	-	-	-	-	-	-	-	-	Tr	-
Other	Tr	-	-	-	Tr	-	-	-	Tr	-

[1]Numbers.

[2]Less than 20 lbs.

Continued....

Table 2, continued

Drag No.	3-11	3-12	3-13	3-14	3-15	3-16	3-17	3-18	3-19	3-20
Date	Feb 24	Feb 24	Feb 24	Feb 25	Feb 25	Feb 25	Feb 25	Feb 25	Feb 25	Mar 9
Total catch (lbs.)	140	74	228	79	1,484	43	76	140	66	30
Flatfish										
Brill	Tr	Tr	-	Tr	Tr	Tr	-	-	-	-
Dover sole	-	Tr	-	-	-	-	-	Tr	-	-
Halibut[1]	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)
Lemon sole	30	Tr	50	-	-	Tr	-	-	-	-
Rex sole	30	-	-	Tr	Tr	Tr	Tr	Tr	Tr	-
Rock sole	-	40	-	-	-	-	-	-	-	-
Sand dab	Tr	Tr	Tr	Tr	Tr	-	-	-	-	-
Turbot	Tr	-	30	Tr	30	Tr	Tr	Tr	Tr	-
Other	Tr	-	-	-	-	-	-	-	-	Tr
Roundfish										
Grey cod	Tr	-	37	-	-	Tr	Tr	-	-	-
Lingcod	-	-	-	48	Tr	-	-	-	-	-
Sablefish	Tr	-	-	-	40	-	Tr	Tr	-	-
Other	Tr	-	Tr	-	Tr	Tr	Tr	Tr	Tr	-
Pacific Ocean perch	Tr	-	-	Tr	Tr	-	Tr	Tr	Tr	-
Other rockfish	Tr	-	41	Tr	Tr	Tr	-	Tr	32	-
Dogfish	-	-	Tr	-	1,240	-	-	36	Tr	-
Ratfish	Tr	-	-	-	Tr	-	Tr	Tr	Tr	-
Skate	-	-	Tr	-	-	Tr	-	Tr	-	Tr
Invertebrates										
Pink shrimp	5.8	-	-	0.7	1.2	0.8	Tr	Tr	Tr	-
Other shrimp	Tr	-	-	-	-	-	Tr	Tr	-	-
Other	-	Tr	-	Tr	-	Tr	20	Tr	Tr	-

[1]Numbers.

Continued....

Table 2, continued

Drag No.	3-21	3-22	3-23	3-24	3-25	3-26	3-27	3-28	3-29	3-30
Date	Mar 9	Mar 9	Mar 10	Mar 10	Mar 10	Mar 20	Mar 21	Mar 21	Mar 22	Mar 22
Total catch (lbs.)	1	1,000	1,000	700	400	800	1,476	2,068	3,337	1,400
Flatfish										
Brill	-	-	-	-	-	29	30	127	75	75
Dover sole	-	-	Tr	Tr	Tr	-	Tr	Tr	Tr	-
Halibut[1]	(-)	(-)	(-)	(-)	(-)	(2)	(1)	(2)	(6)	(4)
Lemon sole	-	-	Tr	Tr	Tr	-	-	-	-	-
Rex sole	-	-	Tr	-	Tr	Tr	20	105	30	Tr
Rock sole	-	-	-	-	-	-	-	-	-	-
Sand dab	-	Tr	-	-	-	-	-	-	-	-
Turbot	-	-	-	Tr	Tr	315	990	810	1,620	450
Other	-	-	Tr	Tr	160	Tr	-	Tr	-	-
Roundfish										
Grey cod	-	-	Tr	-	-	-	-	-	-	-
Lingcod	-	Tr	-	-	-	30	-	36	39	-
Sablefish	-	-	20	Tr	Tr	Tr	Tr	30	500	20
Other	-	Tr	Tr	60	Tr	Tr	Tr	Tr	Tr	Tr
Pacific Ocean perch	-	Tr	217	-	Tr	229	314	451	746	623
Other rockfish	-	-	21	Tr	44	81	88	234	228	142
Dogfish	-	-	250	Tr	Tr	50	-	110	20	-
Ratfish	-	Tr	150	400	150	-	-	20	-	-
Skate	Tr	-	100	20	-	-	Tr	101	Tr	Tr
Invertebrates										
Pink shrimp	-	Tr	60	Tr	Tr	-	-	-	-	-
Other shrimp	-	Tr	-	25	Tr	-	-	-	-	-
Other	-	950	100	Tr	Tr	Tr	Tr	Tr	Tr	Tr

[1]Numbers

Continued....

Table 2, continued

Drag No.	3-31	3-32	3-33	3-34	3-35	3-36	3-37	3-38	3-39
Date	Mar 22	Mar 23	Mar 23	Mar 23	Mar 23	Mar 23	Mar 24	Mar 24	Mar 24
Total catch (lbs.)	2,800	2,700	0	20	1,000	450	250	1,200	0
Flatfish									
Brill	612	313	-	Tr	150	89	22	156	-
Dover sole	308	-	-	-	-	-	-	-	-
Halibut[1]	(-)	(5)	(-)	(-)	(8)	(2)	(-)	(2)	(-)
Lemon sole	-	Tr	-	-	-	-	Tr	Tr	-
Rex sole	37	1,107	-	Tr	400	150	60	260	-
Rock sole	-	-	-	-	-	-	-	-	-
Sand dab	-	-	-	-	-	-	-	-	-
Turbot	1,170	135	-	Tr	90	50	60	400	-
Other	Tr	Tr	-	-	-	Tr	Tr	Tr	-
Roundfish									
Grey cod	-	70	-	-	20	Tr	Tr	-	-
Lingcod	-	35	-	-	20	-	20	-	-
Sablefish	250	Tr	-	-	Tr	-	-	20	-
Other	Tr	Tr	-	-	-	-	-	Tr	-
Pacific Ocean perch	133	Tr	-	-	Tr	Tr	Tr	201	-
Other rockfish	171	336	-	Tr	50	49	30	127	-
Dogfish	-	150	-	-	50	Tr	Tr	60	-
Ratfish	Tr	100	-	-	20	Tr	-	-	-
Skate	100	250	-	Tr	50	40	Tr	Tr	-
Invertebrates									
Pink shrimp	-	-	-	-	Tr	-	-	-	-
Other shrimp	-	-	-	-	-	-	-	-	-
Other	Tr	Tr	-	Tr	Tr	Tr	Tr	Tr	-

[1]Numbers.

Table 2A. Supplementary catch log for the "Investigator No. I" trawling in Smith Sound, March, 1963.

Drag No.	1	2	3	4
Date	Mar 16	Mar 16	Mar 16	Mar 16
Total catch (lbs.)	400	40	600	250
Flatfish				
Brill	-	-	-	-
Dover sole	Tr	Tr	Tr	Tr
Halibut	-	-	-	-
Lemon sole	-	-	-	-
Rex sole	Tr	Tr	Tr	Tr
Rock sole	-	-	-	-
Sand dab	-	-	-	-
Turbot	Tr	-	-	-
Other	Tr (slender) (flathead)	Tr	Tr	150
Roundfish				
Grey cod	-	Tr	Tr	-
Lingcod	-	-	-	-
Sablefish	Tr	-	Tr	-
Other	Tr (hake)	Tr	Tr	Tr
Pacific Ocean perch	50	Tr	100	-
Other rockfish	Tr	Tr	-	Tr
Dogfish	Tr	-	Tr	Tr
Ratfish	300	Tr	400	Tr
Skate	-	-	-	-
Invertebrates				
Pink shrimp	0.4	6.5	2.8	10.5
Sidestripe shrimp	29	-	22.2	18.1
Prawn	(1)	0.8	(4)	(1)
Humpback	-	-	-	-
Other shrimp	Tr	Tr	Tr	Tr
Other invertebrates	Tr	Tr	Tr	Tr

Table 2B. Shrimp trap catches in Smith Sound during "G. B. Reed" Cruise No. 3, February-March, 1963.

Set No.	1	2
Date	Set, 1100 hrs, Mar. 10	Set, 1200 hrs, Mar. 10 Lifted, 1500 hrs, Mar. 15
Location	Off Nab Patch, 51°18'N, 127°37'W	Off Bright Island 51°17'N, 127°38'W
No. traps	9	11
Depth (fms.)	50-70	52-54
Bait	Dogfish	Dogfish, squid
Hours out	-	123
Catch:		
Prawns	-	4.0 (25)
Others	-	0.4 humpback
Remarks	Traps not located on Mar. 15	Bait eaten

Table 3. List of fish and invertebrate species collected on "G. B. Reed" Cruise No. 3, February-March, 1963.

Common name	Scientific name
Flatfish	
Brill	Eopsetta jordani
Dover sole	Microstomus pacificus
Halibut	Hippoglossus stenolepis
Lemon sole	Parophrys vetulus
Rex sole	Glyptocephalus zachirus
Rock sole	Lepidopsetta bilineata
Sand dab	Citharichthys sp.
Turbot	Atheresthes stomias
Other	(see next page)
Roundfish	
Grey cod	Gadus macrocephalus
Lingcod	Ophiodon elongatus
Sablefish	Anoplopoma fimbria
Other	(see next page)
Pacific Ocean perch	Sebastodes alutus
Other rockfish	(see next page)
Dogfish	Squalus suckleyi
Ratfish	Hydrolagus colliei
Skate	Rajidae
Invertebrates	
Smooth pink shrimp	Pandalus jordani
Other shrimp	(see page 20)

Continued....

Common name	Scientific name
Miscellaneous crustacea	(see page 20)
Other	(see page 21)
Other flatfish	
Curlfin sole	Pleuronichthys decurrens
Flathead sole	Hippoglossoides elassodon
Sand sole	Psettichthys melanostictus
Slender sole	Lyopsetta exilis
Other roundfish	
Blenny	Pholidae
Eelpout	Zoarcidae
Eulachon	Thaleichthys pacificus
Hake	Merluccius productus
Herring	Clupea pallasii
Sculpin	Cottidae
Sea poacher	Agonidae
Snail fish	Liparidae
Tom cod	Microgadus proximus
Whiting	Theragra chalcogrammus
Other rockfish	
	Sebastodes aleutianus
	S. brevispinis
	S. crameri
	S. diploproa
	S. elongatus
	S. flavidus
	S. helvomaculatus
	S. levis

Continued....

Common name	Scientific name
	S. mystinus
	S. paucispinis
	S. pinniger
	S. proriger
	S. rubrivinctus
	S. saxicola
	S. sp. No. 1
	S. sp. No. 2
	Sebastolobus alascanus
Other shrimp	
Humpback	Pandalus hypsinotus
Pink	P. borealis
Prawn	P. platyceros
Sidestripe	Pandalopsis dispar
	Argis alaskensis
	A. dentata
	Crangon communis
	Evalus barbatus
	E. macrophthalma
	E. sp.
	Pandalus stenolepis
	P. montagui tridens
	Pasiphaea pacifica
Miscellaneous crustacea	
Box crab	Lopholithodes mandtii
Commercial crab	Cancer magister
	C. oregonensis

Continued....

Common name	Scientific name
Hermit crab	Pagurus sp.
Spider crab	Oregonia gracilis
	Chorilia longipes

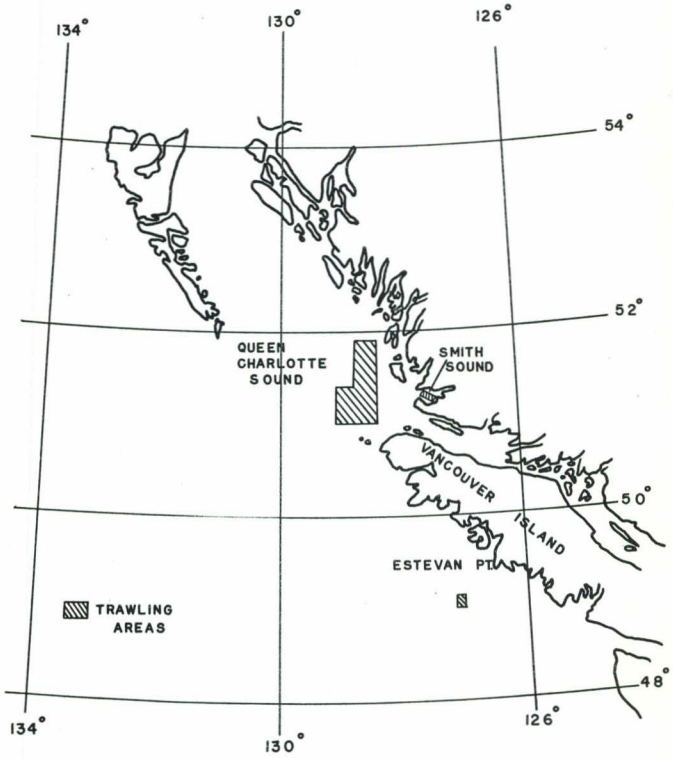

Figure 1. Chart of Queen Charlotte Sound and Vancouver Island showing trawling area of the "G.B. Reed" during Cruise No. 3.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 63-6

July 2 - August 5, 1963

PURPOSE

1. Conduct gear trials with groundfish trawls.
2. Develop and test sampling procedures for trawl catches of groundfish.
3. Explore the northwest section of Queen Charlotte Sound for trawlable bottom and concentrations of commercially utilizable groundfish.
4. Locate and sample concentrations of adult Pacific ocean perch in Dixon Entrance and in the Gulf of Alaska, from Cape Spencer to Middleton Island, for size, sex, and age composition.
5. Search for and sample benthic and pelagic aggregations of juvenile Pacific ocean perch for age determination and growth studies.
6. Record incidence of, and pertinent information on, other species of groundfish (including halibut) and invertebrates caught.
7. Establish vertical water temperature regimes in all trawling areas.
8. Determine type of bottom in all trawling areas.
9. Report incidental observations of commercial fishing operations.

AREAS (Figure 1)

1. Queen Charlotte Sound
   a. "Southeast Edge" of Goose Island Ground (Figure 2)
   b. Middle Ground (Figure 3)
2. Dixon Entrance (Figure 4)
3. Cape Spencer to Blying Sound (Figures 5, 6 and 7)

RESULTS

A total of 68 drags with groundfish and shrimp trawls were completed--53 with the groundfish trawls and 15 with the shrimp trawl (for juvenile Pacific ocean perch). Total catch was 110,228 pounds. Fishing areas included Queen Charlotte Sound, Dixon Entrance, and the Gulf of Alaska from Cape Spencer to Blying Sound. Fishing depths ranged from 16 to 167 fathoms, but were primarily centred around the 100-fathom depth.

Gear tests were conducted on the "Southeast Edge" of Goose Island Ground--a well-known and productive ocean perch fishing ground. Sufficient quantities of fish were caught to provide data for testing deck sampling procedures as well as the fishing gear. All deck machinery and fishing gear operated satisfactorily. Only the standard wire rope groundline was utilized at this time. Later in the cruise, in the Gulf of Alaska, both the rubber bobbins and chain beckets were used successfully on the groundline. The shrimp trawl again proved effective for catching juvenile ocean perch, particularly in Queen Charlotte Sound, but was deemed too fragile for the rougher trawling bottoms encountered in the Gulf of Alaska.

Increased effort to test deck sampling procedures, developed during "G. B. Reed" Cruise No. 3 (GBR #3), resulted in length measurements being collected from 32,294 fish of which 30,115 were Pacific ocean perch. Other species measured were: Dover sole (1,701); channel rockfish (311); sablefish (136); and true cod (31). Analysis of these data was essentially completed during the cruise and included the following: (1) inter-tub size composition heterogeneity within drags (varied geographically); (2) inter-tub sex ratio heterogeneity within drags (homogeneous everywhere); (3) empirical tests of ocean perch length-weight formula (geographical variation); and (4) compilation of tub weight-frequencies for all important species encountered.

Varied success was achieved in locating and sampling concentrations of Pacific ocean perch in Dixon Entrance (off Rose Spit) and in the Gulf of Alaska

from Cape Spencer to Blying Sound (Figure 1). The Dixon Entrance area yielded few ocean perch. Good catches of this species were made in Yakutat Canyon and Prince William Sound Trench (PWS Trench). Only moderate catches were made elsewhere. Standard procedure was to restrict fishing to areas where concentrations of fish appeared on the SIMRAD sounder. Fishing ceased each day about 5 P.M., and the remainder of the evening was spent scouting for fish concentrations on trawlable bottom in the area to be fished the following day. Virtually all the likely areas between Cape Spencer and Blying Sound were explored in this manner. Curiously, no concentrations of fish were ever observed on the bottom of the numerous submarine canyons explored. The fish were congregated on the top edges of the canyons or on the banks close by.

Moderate benthic concentrations of juvenile Pacific ocean perch were located in most areas, but in all cases few specimens were obtained of age groups 3 and older. Only the Goose Island area yielded any appreciable numbers of 1-year fish. Little effort was expended to locate pelagic concentrations when it was found that the Isaacs-Kidd trawl (3' size) was relatively ineffective in sampling a very dense plankton concentration near the surface. Scales and/or otoliths were collected from 1,352 ocean perch (869 juveniles and 483 adults) and 642 otoliths from juvenile fish were read, ages resolved, and age-length tables compiled during the cruise.

Tables I, II, III and IV provide the pertinent information on location of drags and species caught. A total of 19 species of rockfish were tentatively identified. Of these, 5, if properly identified represent range extensions. Virtually all halibut caught were discarded alive and visual estimates were made of the length of each fish. Table V summarizes the results of these "measurements" by area.

Bathythermograph casts were made at 55 stations during trawling operations and in addition, 8-cast stations were occupied daily on the return trip home

across the Gulf of Alaska. These latter observations were made at the request of POG in connection with synoptic studies of the thermocline in the North Pacific Ocean. Surface water temperatures, in the trawling areas, ranged from 12.0 to 14.9°C. but showed no geographic trend. Bottom temperatures, at 52 to 167 fms., ranged from 5.8 to 7.6°C. and varied inversely with depth, but showed no geographical trend.

Bottom grabs, with a Dietz-LaFond sampler, were successfully made at 48 trawling stations. Only one station produced an unsuccessful effort (3 casts). This is in sharp contrast to the poor success with the same type of instrument during GBR #3. The lack of success during the earlier cruise is now attributed to the spring adjustment being too tight. However, the relatively calm seas encountered during GBR #6 undoubtedly were also a factor favouring successful casts. Results of the bottom grabs are included in Tables I-IV.

Two sightings of Japanese fishing vessels occurred during the cruise. On July 29, off Cape St. Elias, the Japanese whaler Nikko-Maru No. 26 was hailed and came alongside for a short visit (between Mr. Tatara and the whaler's captain) and an exchange of "gifts". A second Japanese whaler, name not obtained, passed close by shortly after, but did not stop. On August 1, a Japanese gillnetter, Mitsu-Maru No. 23, was sighted and talked to, south of Middleton Island. This vessel was successfully fishing for sablefish with sunken gillnets in 300 fathoms of water.

PERSONNEL

S. J. Westrheim, Chief Scientist	(July 2 - August 5)
K. Tatara, Observer	(July 2 - August 5)
D. Davenport	(July 2 - August 5)
W. A. Harling	(July 11 - August 5)
E. J. R. Lippa	(July 2 - August 5)
R. M. Wilson	(July 2 - 11)

Table I. Fishing log for the "G. B. Reed" in Queen Charlotte Sound, July 1963, Cruise No. 6

Drag No.	1	2	3	4	5	6	7	8
Date	Jul 3	Jul 3	Jul 4	Jul 4	Jul 4	Jul 5	Jul 6	Jul 6
Area[1]	GI	GI	GI	GI	GI	GI	GI	GI
INPFC Stat. Area	030510	030510	030510	030510	030510	030510	030510	030510
Start (PDT)	1115	1505	0705	1245	1600	0630	0700	1250
Duration (min.)	60	120	115	60	60	90	90	90
Start: Lat.	51°	51°	51°	51°	51°	51°	51°	51°
	23'	22'	21'	18'	20'	20'	22'	20'
Long.	129°	129°	129°	129°	129°	129°	129°	129°
	02'	07'	08'	19'	16'	16'	04'	16'
End: Lat.	51°	51°	51°	51°	51°	51°	51°	51°
	26'	20'	19'	19'	21'	22'	20'	22'
Long.	128°	129°	129°	129°	129°	129°	129°	129°
	48'	23'	19'	14'	11'	04'	12'	04'
Depth (fms.)	96-100	128-110	124	140-138	116-126	110-122	120	120-122
Bottom type[2]	Gr M	Gr M	Gr M	Gr M	-	-	-	-
Water temp. (°C.)								
Surface	14.0	14.4	13.8	13.4	14.0	13.6	13.6	13.8
Bottom	6.1	5.8	5.8	5.8	6.0	6.0	6.1	6.0
Net used[3]	G-1 W	G-1 W	G-1 W	G-1 W	G-1 W	G-1 W	G-1 W	G-1 W
Remarks	-	-	-	-	-	-	-	-
Total catch (lbs.)	80	6,200	2,600	4,100	2,200	4,400	4,300	5,300

Table I, continued

Drag No.	9	10	11	12	13	14	15	16
Date	Jul 7	Jul 8	Jul 9	Jul 9	Jul 10	Jul 10	Jul 10	Jul 10
Area[1]	MG	MG	MG	MG	GI	GI	GI	GI
INPFC Stat. Area	031513	030513	031520	031520	030510	030510	030510	030510
Start (PDT)	1040	0720	1045	1315	0705	0830	0930	1040
Duration (min.)	30	30	20	3	15	15	15	15
Start: Lat.	51°	51°	52°	52°	51°	51°	51°	51°
	48'	56'	03.5'	12'	20'	22.5'	23'	23.5'
Long.	130°	129°	130°	130°	129°	129°	129°	129°
	08'	43'	03'	01'	12'	11'	09'	10'
End: Lat.	51°	51°	52°	-	51°	51°	51°	51°
	49.5'	58'	03.5'	-	20'	22.5'	23'	23.5'
Long.	130°	129°	130°	-	129°	129°	129°	129°
	10'	42.5'	01'	-	11'	10'	08'	09'
Depth (fms.)	106-104	70-84	78-76	75	120-122	110	100	92
Bottom type[2]	G,S	G	Gr S	Gr S	-	-	-	Gr M,S
Water temp. (°C.)								
Surface	13.5	13.4	13.6	13.9	-	-	-	13.7
Bottom	7.4	7.3	7.5	7.6	-	-	-	6.7
Net used[3]	G-1 W	G-1 W	G-1 W	G-1 W	S-1 -	S-1 -	S-1 -	S-1 -
Remarks	Torn wing	-	Rough bottom	Snag. Tore wing	1/2 catch escaped through cod-end	-	-	-
Total catch (lbs.)	Tr[4]	200	200	0	100	300	200	150

Table I, continued

Drag No.	17	18	19
Date	Jul 10	Jul 10	Jul 10
Area[1]	GI	GI	GI
INPFC Stat. Area	030510	030510	030510
Start (PDT)	1225	1330	1440
Duration (min.)	15	13	15
Start: Lat.	51°	51°	51°
	23.5'	20'	19'
Long.	129°	129°	129°
	10'	07'	11'
End: Lat.	51°	51°	51°
	23.5'	20'	19'
Long.	129°	129°	129°
	09'	08'	12'
Depth (fms.)	78	128	121-119
Bottom type[2]	-	Gr M,S	-
Water temp. (°C.)			
Surface	-	13.6	-
Bottom	-	6.3	-
Net used[3]	S-1	S-1	S-1
	-	-	-
Remarks	-	-	-
Total catch (lbs.)	100	40	350

Table I, continued

Drag No.	1	2	3	4	5	6	7	8
Date	Jul 3	Jul 3	Jul 4	Jul 4	Jul 4	Jul 5	Jul 6	Jul 6
Total catch (lbs.)	80	6,400	2,600	4,100	2,200	4,400	4,300	5,300
Flatfish								
Dover sole	-	2,966	310	1,886	63	641	373	122
English sole	-	-	-	-	-	Tr[4]	-	-
Halibut	(-)	(1)	(1)	(-)	(1)	(1)	(1)	(1)
Rex sole	Tr	Tr	Tr	-	Tr	138	Tr	36
Turbot	Tr	150	75	162	90	192	126	331
Other[5]	-	Tr	28	-	Tr	Tr	-	Tr
Roundfish								
Pollock	Tr	67	Tr	Tr	44	Tr	28	265
Sablefish	Tr	583	118	317	107	582	614	579
True cod	-	-	-	-	-	-	-	-
Other[6]	-	Tr	-	-	-	29	Tr	Tr
S. alutus	45	1,387	1,582	443	1,378	1,810	2,371	2,949
S. flavidus	-	Tr	-	-	-	-	-	Tr
S. rubrivinctus	Tr	730	312	542	294	756	603	811
Seb. alascanus	-	Tr	Tr	506	Tr	Tr	Tr	Tr
Other[7]	-	78	100	62	84	165	104	160
Dogfish	-	390	92	156	103	63	32	51
Ratfish	-	Tr	Tr	Tr	-	-	-	-
Skate	-	Tr	-	-	Tr	Tr	Tr	Tr
Invertebrates								
Pink shrimp	-	-	-	-	-	-	-	-
Other	Tr	Tr	Tr	-	-	-	-	Tr

Table I, continued

Drag No.	9	10	11	12	13	14	15	16
Date	Jul 7	Jul 8	Jul 9	Jul 10	Jul 10	Jul 10	Jul 10	Jul 10
Total catch (lbs.)	Tr[4]	200	200	0	100	300	200	150
Flatfish								
Dover sole	-	-	-	-	-	-	Tr	Tr
English sole	-	-	-	-	-	-	-	-
Halibut	(-)	(-)	(3)	(-)	(-)	(-)	(-)	(-)
Rex sole	-	-	Tr	-	Tr	Tr	Tr	Tr
Turbot	-	Tr	-	-	Tr	Tr	Tr	30
Other[5]	-	-	Tr	-	-	-	Tr	Tr
Roundfish								
Pollock	-	-	-	-	Tr	-	Tr	-
Sablefish	Tr	-	-	-	Tr	-	-	Tr
True cod	-	103	-	-	-	-	Tr	-
Other[6]	-	-	-	-	Tr	Tr	-	-
S. alutus	-	-	-	-	79	210	39	23
S. flavidus	-	-	-	-	-	-	-	-
S. rubrivinctus	-	-	-	-	Tr	Tr	-	-
Seb. alascanus	-	-	-	-	Tr	Tr	Tr	-
Other[7]	-	-	Tr	-	-	-	Tr	Tr
Dogfish	-	Tr	27	-	-	Tr	-	-
Ratfish	-	23	143	-	-	Tr	-	-
Skate	-	-	-	-	-	-	Tr	Tr
Invertebrates								
Pink shrimp	-	-	-	-	Tr	67	78	40
Other	-	42	43	-	-	Tr	Tr	-

Table I, continued

Drag No.	17	18	19
Date	Jul 10	Jul 10	Jul 10
Total catch (lbs.)	100	40	350
Flatfish			
Dover sole	Tr[4]	Tr	Tr
English sole	41	Tr	-
Halibut	(-)	(-)	(-)
Rex sole	Tr	-	Tr
Turbot	Tr	Tr	25
Other[5]	Tr	-	-
Roundfish			
Pollock	-	-	Tr
Sablefish	-	Tr	20
True cod	-	-	-
Other[6]	Tr	-	-
S. alutus	-	Tr	263
S. flavidus	81	-	-
S. rubrivinctus	-	-	Tr
Seb. alascanus	-	Tr	Tr
Other[7]	-	-	Tr
Dogfish	-	-	-
Ratfish	-	-	-
Skate	Tr	Tr	-
Invertebrates			
Pink shrimp	-	Tr	35
Other	-	Tr	Tr

Footnotes for Table I

[1] GI = "Southeast Edge" of Goose Island Ground
MG = Middle Ground

[2] Gr = green G = gravel R = rock
Gy = grey M = mud S = sand

[3] G-1 = Gunlene #1 (groundfish trawl) B = Bobbins on groundline
S-1 = Gulf balloon shrimp trawl #1 C = Chain beckets on groundline
W = Wire rope groundline
L = 1.5" mesh liner in cod-end

[4] Trace = less than 20 lbs.

[5] Other flatfish (never more than Trace in drag):
flathead sole; petrale sole; rock sole; sand dab; slender sole

[6] Other roundfish, except rockfish (never more than Trace in drag):
hake; lingcod; sea poacher

[7] Other rockfish (never more than Trace in drag):
S. aleutianus
S. brevispinis
S. crameri
S. diploproa
S. mystinus
S. paucispinis
S. pinniger
S. vexillaris

Table II. Fishing log for the "G. B. Reed" in Dixon Entrance, July 1963, Cruise No. 6

Drag No.	20	21	22	23	24	25	26	27
Date	Jul 13	Jul 13	Jul 13	Jul 13	Jul 14	Jul 14	Jul 14	Jul 14
Area[1]	DE	DE	DE	DE	DE	DE	DE	DE
INPFC Stat. Area	032540	032540	032540	032540	032540	032540	032540	032540
Start (PDT)	0745	1005	1345	1750	0705	0835	0945	1100
Duration (min.)	60	60	30	30	15	15	15	15
Start: Lat.	54°	54°	54°	54°	54°	54°	54°	54°
	18'	15.5'	12'	17'	17'	18'	17.5'	20.6'
Long.	131°	131°	131°	131°	131°	131°	131°	131°
	36'	41'	50'	42'	36'	35'	41'	43'
End: Lat.	54°	54°	54°	54°	54°	54°	54°	54°
	17.5'	13.5'	11'	18'	17'	18'	18'	20.6'
Long.	131°	131°	131°	131°	131°	131°	131°	131°
	40'	46'	52'	40'	37'	36'	42'	44'
Depth (fms.)	80-87	70-72	58-60	90-88	70	80	86-90	102-100
Bottom type[2]	Gr S	Gr S	G, S	Gr S	-	-	-	Gr S
Water temp. (°C.)								
Surface	13.3	13.1	13.2	13.3	-	-	-	13.3
Bottom	6.7	7.4	7.1	6.5	-	-	-	6.3
Net used[3]	G-1 B	G-1 B	G-1 B	G-1 B	S-1 -	S-1 -	S-1 -	S-1 -
Remarks	Cod-end fouled on ground rope Bobbins	-	Net torn on Danleno	-	-	-	-	-
Total catch (lbs.)	1,800	5,600	500	2,100	500	400	700	300

Table II, continued

Drag No.	28	29	30
Date	Jul 14	Jul 14	Jul 14
Area[1]	DE	DE	DE
INPFC Stat. Area	032540	032540	032540
Start (PDT)	1230	1330	1440
Duration (min.)	15	15	15
Start: Lat.	54°	54°	54°
	17.5'	14'	10'
Long.	131°	131°	131°
	40'	51'	45'
End: Lat.	54°	54°	54°
	17'	14'	10'
Long.	131°	131°	131°
	39'	52'	46'
Depth (fms.)	80-82	80	16
Bottom type[2]	-	-	-
Water temp. (°C.)			
Surface	-	-	-
Bottom	-	-	-
Net used[3]	S-1 -	S-1 -	S-1 -
Remarks	-	-	-
Total catch (lbs.)	100	100	50

Table II, continued

Drag No.	20	21	22	23	24	25	26	27
Date	Jul 13	Jul 13	Jul 13	Jul 13	Jul 14	Jul 14	Jul 14	Jul 14
Total catch (lbs.)	1,800	5,600	500	2,100	500	400	700	300
Flatfish								
Dover sole	67	816	Tr[4]	62	132	102	Tr	Tr
Flathead sole	49	50	-	-	-	-	-	-
Halibut	(2)	(14)	(-)	(-)	(-)	(-)	(-)	(-)
Petrale sole	Tr	104	Tr	Tr	-	-	Tr	-
Rex sole	30	322	Tr	66	Tr	28	Tr	Tr
Turbot	281	539	Tr	127	69	83	168	163
Other[5]	-	Tr	Tr	-	-	-	Tr	-
Roundfish								
Pollock	Tr	188	278	-	56	Tr	-	-
True cod	30	62	-	33	-	Tr	Tr	-
Other[6]	-	Tr	Tr	Tr	-	Tr	-	Tr
S. alutus	827	235	-	1,474	-	91	405	50
S. brevispinis	106	678	Tr	34	Tr	Tr	Tr	77
S. paucispinis	Tr	33	Tr	50	Tr	Tr	Tr	-
S. rubrivinctus	60	83	-	34	-	Tr	Tr	-
Other[7]	-	-	-	Tr	-	-	-	Tr
Dogfish	-	62	Tr	Tr	-	-	-	-
Ratfish	191	1,364	111	219	249	26	26	Tr
Skate	-	Tr	-	Tr	-	Tr	Tr	Tr
Invertebrates								
Pink shrimp	-	-	-	-	-	20	38	Tr
Other	Tr	Tr	-	-	Tr	Tr	Tr	Tr

Table II, continued

Drag No.	28	29	30
Date	Jul 14	Jul 14	Jul 14
Total catch (lbs.)	100	100	50
Flatfish			
Dover sole	Tr[4]	Tr	-
Flathead sole	-	-	-
Halibut	(-)	(-)	(-)
Petrale sole	-	-	Tr
Rex sole	Tr	Tr	-
Turbot	Tr	Tr	-
Other[5]	-	-	Tr
Roundfish			
Pollock	Tr	-	Tr
True cod	-	Tr	-
Other[6]	Tr	Tr	-
S. alutus	26	57	-
S. brevispinis	-	-	-
S. paucispinis	-	Tr	-
S. rubrivinctus	-	-	-
Other[7]	Tr	-	-
Dogfish	-	-	Tr
Ratfish	27	-	-
Skate	-	-	-
Invertebrates			
Pink shrimp	23	Tr	-
Other	Tr	-	Tr

Footnotes for Table II

[1] DE = Dixon Entrance

[2] Gr = green G = gravel R = rock
Gy = grey M = mud S = sand

[3] G-1 = Gunlene #1 (groundfish trawl) B = Rubber bobbins on groundline
S-1 = Gulf balloon shrimp trawl #1 C = Chain beckets on groundline
W = Wire rope groundline
L = 1.5" mesh liner in cod-end

[4] Trace = less than 20 lbs.

[5] Other flatfish (never more than Trace in drag):

butter sole; English sole; rock sole

[6] Other roundfish, except rockfish (never more than Trace in drag):

eulachon; hake; sablefish

[7] Other rockfish (never more than Trace in drag):

S. ciliatus

S. elongatus

S. flavidus

Seb. alascanus

Table III. Fishing log for the "G. B. Reed" in the Gulf of Alaska, Cape Spencer - Cape St. Elias, July 1963, Cruise No. 6

Drag No.	31	32	33	34	35	36	37	38
Date	Jul 16	Jul 16	Jul 17	Jul 17	Jul 17	Jul 18	Jul 18	Jul 18
Area[1]	AC	AC	YC	YC	YC	YC	YC	YC
INPFC Stat. Area	040583	040583	041590	042590	042590	042590	042590	041590
Start (PDT)	1115	1350	0700	1430	1600	0630	0915	1345
Duration (min.)	60	55	60	60	60	60	60	60
Start: Lat.	58°	58°	59°	59°	59°	59°	59°	59°
	34'	34'	26'	16'	20.7'	25'	24'	26'
Long.	139°	139°	140°	141°	141°	141°	141°	140°
	21'	40'	00'	15'	12'	02'	02'	42'
End: Lat.	58°	58°	59°	59°	59°	59°	59°	59°
	33.5'	36.5'	28'	20.7'	24'	22'	19.8'	25'
Long.	139°	139°	140°	141°	141°	141°	141°	140°
	30'	34'	01'	12'	07'	05'	04'	37'
Depth (fms.)	120-142	130-133	103-100	170-173	167-163	130-126	110-90	83-80
Bottom type[2]	Gy M	Gy M	Gy M	-	Gr S, M	Gr S, G	-	Gr M, G
Water temp. (°C.)								
Surface	14.7	14.9	14.7	-	14.3	14.0	13.7	13.8
Bottom	5.5	5.4	6.3	-	5.4	5.7	6.5	6.5
Net used[3]	G-1 B	G-1 B	G-1 B	G-1 B	G-1 B	G-1 B	G-1 B	G-1 B
Remarks	-	Torn wing	-	X Doors	-	-	12 tubs pop escaped	-
Total catch (lbs.)	600	1,200	1,100	0	3,000	1,900	2,800	150

Table III, continued

Drag No.	39	40	41	42	43	44	45	46
Date	Jul 19	Jul 19	Jul 19	Jul 20	Jul 20	Jul 20	Jul 21	Jul 25
Area[1]	YC	YC	YC	YC	YC	YC	LD	IC
INPFC Stat. Area	042590	042590	042590	040590	041590	040590	038580	043593
Start (PDT)	0620	1010	1335	0615	0830	1020	0640	1115
Duration (min.)	30	30	30	15	20	40	30	50
Start: Lat.	59°	59°	59°	59°	59°	59°	58°	59°
	25'	19'	18'	21'	22'	22'	14'	37'
Long.	141°	141°	141°	139°	140°	139°	137°	142°
	00'	02'	05'	59'	03'	58'	42'	29'
End: Lat.	59°	59°	59°	59°	59°	59°	58°	59°
	23'	22'	20'	21'	21'	22.5'	15'	39'
Long.	141°	141°	141°	139°	140°	140°	137°	142°
	01'	03'	04'	58'	00'	01'	40'	27'
Depth (fms.)	85-110	90	100-94	87-94	93	100-87	85-83	98-103
Bottom type[2]	Gr S,M,G	Gr S,G	Gr S,G, Shell	Gr S,G,Co	-	Gy M,S	Gy M,S	Gy M
Water temp. (°C.)								
Surface	13.6	13.5	13.9	14.2	-	14.2	13.6	12.8
Bottom	5.5	6.5	6.5	6.4	-	6.5	6.5	6.4
Net used[3]	G-1 B+L	G-1 B+L	G-1 B+L	S-1 -	G-1 B+L	G-1 B+L	G-1 B+L	G-1 B+L
Remarks	10 tubs pop escaped	6 tubs pop escaped	Few pop escaped	Snag	30% sponge	5% sponge	-	Hole in cod-end
Total catch (lbs.)	8,600	5,200	2,300	600	300	3,500	50	1,900

Table III, continued

Drag No.	47	48	49	50	51	52	53	54
Date	Jul 25	Jul 25	Jul 26	Jul 26	Jul 26	Jul 27	Jul 27	Jul 27
Area[1]	IC	IC	IC	IC	IB	KC	KC	KC
INPFC Stat. Area	043593	043593	043593	043593	042593	044593	044593	044593
Start (PDT)	1435	1530	0820	1335	1545	0630	1000	1540
Duration (min.)	5	20	30	30	30	5	30	40
Start: Lat.	59°	59°	59°	59°	59°	59°	59°	59°
	33'	33'	37'	40'	46'	39'	39'	51'
Long.	142°	142°	142°	142°	141°	143°	143°	143°
	34'	35'	29'	03'	49'	34'	34'	10'
End: Lat.	-	59°	59°	59°	59°	59°	59°	59°
	-	34'	39'	38'	48'	39'	37'	52'
Long.	-	142°	142°	142°	141°	143°	143°	143°
	-	35'	27'	05'	51'	34'	33'	12'
Depth (fms.)	73	100-88	97-95	84-91	59-52	80	85-87	82-79
Bottom type[2]	-	R,S,Silt	-	Gy M	Gy M	Gy M	-	Gy M
Water temp. (°C.)								
Surface	-	13.7	12.7	13.4	14.3	13.4	13.2	12.4
Bottom	-	6.6	6.4	6.5	6.6	6.6	6.7	6.6
Net used[3]	G-1 B+L	G-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 C+L	D-1 C+L
Remarks	Snag	Snag	-	-	-	Snag	-	-
Total catch (lbs.)	10	3,500	3,800	300	2,900	100	2,200	100

Table III, continued

Drag No.	55	56	57	58
Date	Jul 28	Jul 28	Jul 28	Jul 29
Area[1]	KC	KC	KB	KB
INPFC Stat. Area	044593	045593	045593	045593
Start (PDT)	0630	1310	1600	0835
Duration (min.)	13	30	30	35
Start: Lat.	59°	59°	59°	59°
	42'	41'	42.5'	41'
Long.	143°	144°	144°	144°
	42'	05'	26'	19'
End: Lat.	-	59°	59°	59°
	-	41'	43'	41'
Long.	-	144°	144°	144°
	-	09'	27'	22'
Depth (fms.)	78	68	72	72-71
Bottom type[2]	Gy M	Gy M	Gy M	Gy M
Water temp. (°C.)				
Surface	13.2	13.2	12.0	13.1
Bottom	6.5	6.4	6.7	6.4
Net used[3]	D-1 C+L	D-1 B+L	D-1 B+L	D-1 B+L
Remarks	Snag	-	-	-
Total catch (lbs.)	25	600	300	100

Table III, continued

Drag No.	31	32	33	34	35	36	37	38
Date	Jul 16	Jul 16	Jul 17	Jul 17	Jul 17	Jul 18	Jul 18	Jul 18
Total catch (lbs)	600	1,200	1,100	0	3,000	1,900	2,800	150
Flatfish								
Dover sole	Tr[4]	152	-	-	433	Tr	-	-
Flathead sole	62	Tr	134	-	Tr	Tr	-	-
Halibut	(-)	(1)	(-)	(-)	(-)	(1)	(1)	(3)
Rex sole	136	380	Tr	-	301	Tr	Tr	-
Turbot	173	241	512	-	1,176	134	285	67
Other[5]	Tr	Tr	-	-	-	-	-	-
Roundfish								
Lingcod	28	-	-	-	-	-	-	-
Pollock	-	20	109	-	Tr	119	76	-
Sablefish	Tr	104	40	-	676	43	77	Tr
Salmon, chum	-	-	-	-	-	-	-	-
Salmon, spring	-	-	-	-	-	-	-	-
Sculpin	-	Tr	-	-	Tr	25	-	-
True cod	44	Tr	-	-	-	85	230	35
Other[6]	-	Tr	Tr	-	-	-	-	-
S. alutus	58	75	194	-	124	1,446	2,094	33
S. aleutianus	Tr	30	23	-	Tr	-	-	-
S. brevispinis	105	-	-	-	-	Tr	42	-
S. ciliatus	-	-	-	-	-	-	-	-
S. rubrivinctus	Tr	57	Tr	-	-	Tr	-	-
S. zacentrus	-	-	-	-	-	-	-	-
Seb. alascanus	24	129	36	-	239	46	Tr	-
Other[7]	-	Tr	-	-	-	-	Tr	-
Dogfish	-	-	Tr	-	-	Tr	-	Tr
Skate	-	Tr	Tr	-	-	Tr	Tr	-
Invertebrates								
Shrimp	-	Tr	-	-	-	-	-	-
Other	Tr	Tr	Tr	-	Tr	Tr	Tr	Tr

Table III, continued

Drag No.	39	40	41	42	43	44	45	46
Date	Jul 19	Jul 19	Jul 19	Jul 20	Jul 20	Jul 20	Jul 21	Jul 25
Total catch (lbs)	8,600	5,200	2,300	600	300	3,500	50	1,900
Flatfish								
Dover sole	-	-	-	-	-	Tr[4]	-	-
Flathead sole	-	-	-	-	Tr	Tr	-	Tr
Halibut	(9)	(1)	(8)	(-)	(-)	(2)	(-)	(-)
Rex sole	Tr	Tr	Tr	Tr	Tr	Tr	-	Tr
Turbot	80	136	169	Tr	145	510	Tr	70
Other[5]	-	-	-	-	-	-	-	-
Roundfish								
Lingcod	-	-	-	-	-	-	-	-
Pollock	23	46	142	126	Tr	913	-	634
Sablefish	171	100	Tr	-	Tr	142	-	63
Salmon, chum	-	-	-	-	-	-	-	-
Salmon, spring	-	-	-	-	-	-	-	-
Sculpin	-	-	-	Tr	Tr	-	-	-
True cod	190	33	115	Tr	Tr	494	-	63
Other[6]	-	-	-	-	Tr	Tr	Tr	-
S. alutus	7,880	4,917	1,901	187	Tr	1,207	-	724
S. aleutianus	-	-	-	-	Tr	35	-	Tr
S. brevispinis	Tr	Tr	Tr	-	-	Tr	-	23
S. ciliatus	-	-	-	-	-	-	-	45
S. rubrivinctus	-	-	-	Tr	-	69	-	Tr
S. zacentrus	-	-	-	-	-	-	-	115
Seb. alascanus	-	-	-	-	-	Tr	-	Tr
Other[7]	-	-	-	-	-	Tr	Tr	Tr
Dogfish	-	-	-	-	-	-	-	-
Skate	-	-	-	-	-	Tr	Tr	-
Invertebrates								
Shrimp	-	-	-	-	-	Tr	-	-
Other	-	-	Tr	300	100	-	Tr	150

Table III, continued

Drag No.	47	48	49	50	51	52	53	54
Date	Jul 25	Jul 25	Jul 26	Jul 26	Jul 26	Jul 27	Jul 27	Jul 27
Total catch (lbs.)	10	3,500	3,800	300	2,900	100	2,200	100
Flatfish								
Dover sole	-	-	Tr[4]	Tr	-	-	-	-
Flathead sole	-	-	Tr	33	71	Tr	29	Tr
Halibut	(-)	(-)	(6)	(1)	(16)	(-)	(1)	(-)
Rex sole	-	-	Tr	Tr	Tr	Tr	-	-
Turbot	-	-	116	66	96	Tr	Tr	-
Other[5]	-	-	-	-	Tr	-	-	-
Roundfish								
Lingcod	-	Tr	-	-	-	-	-	-
Pollock	-	264	914	Tr	2,124	Tr	926	Tr
Sablefish	-	-	70	-	-	-	-	-
Salmon, chum	-	-	-	-	-	-	23	-
Salmon, spring	-	-	25	-	-	-	-	-
Sculpin	-	-	-	-	-	Tr	-	-
True cod	-	25	168	24	41	Tr	44	-
Other[6]	-	-	Tr	Tr	Tr	Tr	-	-
S. alutus	-	561	2,179	80	497	51	1,115	102
S. aleutianus	-	-	Tr	-	-	Tr	-	-
S. brevispinis	-	-	Tr	-	-	Tr	-	-
S. ciliatus	Tr	456	Tr	-	-	28	Tr	-
S. rubrivinctus	-	-	Tr	-	-	Tr	Tr	-
S. zacentrus	Tr	2,133	Tr	-	-	Tr	Tr	-
Seb. alascanus	-	-	Tr	46	-	-	-	Tr
Other[7]	Tr	Tr	Tr	-	-	Tr	Tr	-
Dogfish	-	-	-	Tr	-	-	-	-
Skate	-	-	21	Tr	-	-	-	-
Invertebrates								
Shrimp	Tr	Tr	-	Tr	-	-	-	-
Other	-	-	Tr	20	-	Tr	-	-

Table III, continued

Drag No.	55	56	57	58
Date	Jul 28	Jul 28	Jul 28	Jul 29
Total catch (lbs.)	25	600	300	100
Flatfish				
Dover sole	-	-	-	-
Flathead sole	-	Tr[4]	Tr	Tr
Halibut	(-)	(-)	(2)	(3)
Rex sole	-	Tr	Tr	-
Turbot	-	34	100	Tr
Other[5]	-	-	Tr	Tr
Roundfish				
Lingcod	-	-	-	-
Pollock	Tr	Tr	Tr	-
Sablefish	-	-	-	Tr
Salmon, chum	-	-	-	-
Salmon, spring	-	-	-	-
Sculpin	-	Tr	-	-
True cod	Tr	56	27	Tr
Other[6]	-	Tr	Tr	Tr
S. alutus	Tr	343	94	Tr
S. aleutianus	-	-	-	-
S. brevispinis	Tr	Tr	-	-
S. ciliatus	-	Tr	-	-
S. rubrivinctus	Tr	-	-	-
S. zacentrus	Tr	-	-	-
Seb. alascanus	-	-	-	-
Other[7]	-	Tr	-	-
Dogfish	-	-	-	-
Skate	-	-	Tr	Tr
Invertebrates				
Shrimp	-	Tr	Tr	-
Other	Tr	100	Tr	Tr

Footnotes for Table III

[1] AC = Alsek Canyon; IC = Icy Canyon; LD = Lituya Deep; TC = Tsivat Canyon; YC = Yakutat Canyon; IB = Icy Bank; KC = Kayak Canyon; KB = Kayak Bank.

[2] Gr = green G = gravel R = rock Co = coral
Gy = grey M = mud S = sand

[3] G-1 = Gunlene #1 (groundfish trawl) B = Rubber bobbins on groundline
S-1 = Gulf balloon shrimp trawl #1 C = Chain beckets on groundline
W = Wire rope groundline
L = 1.5" mesh liner in cod-end

[4] Trace = less than 20 lbs.

[5] Other flatfish (never more than Trace in drag):

English sole; rock sole; slender sole

[6] Other roundfish, except rockfish (never more than Trace in drag):

eel pout; eulachon; sea poacher; searcher

[7] Other rockfish (never more than Trace in drag):

S. crameri

S. flavidus

S. helvomaculatus

S. paucispinis

S. polyspinis

S. proriger

Table IV. Fishing log for the "G. B. Reed" in the Gulf of Alaska, Cape Spencer - Cape Clear, July-August 1963, Cruise No. 6

Drag No.	59	60	61	62	63	64	65	66
Date	Jul 29	Jul 30	Jul 30	Jul 30	Jul 31	Jul 31	Jul 31	Aug 1
Area[1]	MB	PWST	PWST	PWST	PWST	PWST	PWST	BB
INPFC Stat. Area	046593	047590	047593	047593	047593	048593	048593	048593
Start (PDT)	1730	1055	1310	1620	0725	1040	1340	0930
Duration (min.)	20	15	20	40	35	30	30	30
Start: Lat.	59°	59°	59°	59°	59°	59°	59°	59°
	31'	25'	30'	40'	48'	48'	42'	35'
Long.	145°	146°	146°	146°	146°	147°	147°	147°
	07'	50'	51'	57'	58'	12'	15'	55'
End: Lat.	59°	59°	59°	59°	59°	59°	59°	59°
	30'	26'	28.5'	37'	50'	50'	44'	35'
Long.	145°	146°	146°	146°	146°	147°	147°	147°
	08'	49'	49'	56'	57'	11'	14'	51'
Depth (fms.)	95-79	89-82	74-75	68-74	88	79	77-69	62
Bottom type[2]	Gy M	Gy M	Gy,M,S,G	Gy,M,S,G	Gy M	Gy M	Gy M,G Shell	Gy M,R
Water temp. (°C.)								
Surface	13.4	14.0	14.1	13.0	14.0	14.2	13.7	13.9
Bottom	6.5	6.3	6.6	6.4	6.3	6.6	6.6	6.6
Net used[3]	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L	D-1 B+L
Remarks	Snag Torn wing	-	-	-	-	-	-	-
Total catch (lbs.)	1,600	100	800	4,900	2,100	4,200	2,600	1,800

Table IV, continued

Drag. No.	67	68
Date	Aug 1	Aug 1
Area[1]	BD	BD
INPFC Stat. Area	049593	049593
Start (PDT)	1300	1620
Duration (min.)	30	25
Start: Lat.	59°	59°
	41'	36'
Long.	148°	148°
	24'	30'
End: Lat.	59°	59°
	40'	37'
Long.	148°	148°
	21'	29'
Depth (fms.)	77	80-81
Bottom type[2]	Gy M	Gy M
Water temp. (°C.)		
Surface	13.2	13.4
Bottom	6.2	6.1
Net used[3]	D-1 B+L	D-1 B+L
Remarks	-	-
Total catch (lbs.)	1,000	1,000

Table IV, continued

Drag No.	59	60	61	62	63	64	65	66
Date	Jul 29	Jul 30	Jul 30	Jul 30	Jul 31	Jul 31	Jul 31	Aug 1
Total catch (lbs)	1,600	100	800	4,900	2,100	4,200	2,600	1,800
Flatfish								
Flathead sole	937	Tr[4]	Tr	51	66	39	Tr	Tr
Halibut	(1)	(1)	(2)	(4)	(5)	(6)	(5)	(10)
Rex sole	24	Tr	Tr	51	50	39	Tr	Tr
Turbot	93	49	221	1,051	544	539	188	112
Other[5]	Tr	-	-	Tr	-	-	52	Tr
Roundfish								
Sablefish	22	-	-	140	300	Tr	-	Tr
True cod	238	-	27	178	117	266	905	208
Pollock	26	-	Tr	128	175	2,595	624	1,317
Other[6]	23	Tr	-	Tr	Tr	Tr	Tr	-
S. alutus	87	Tr	376	3,174	599	558	657	Tr
Other[7]	38	Tr	-	Tr	-	Tr	-	-
Mackerel shark	-	-	-	-	300	-	-	-
Skate	-	-	-	Tr	Tr	40	20	-
Invertebrates								
Shrimp	-	-	Tr	Tr	Tr	Tr	34	-
Other	Tr	Tr	Tr	52	Tr	Tr	Tr	Tr

Table IV, continued

Drag No.	67	68
Date	Aug 1	Aug 1
Total catch (lbs)	1,000	1,000
Flatfish		
Flathead sole	138	-
Halibut	(3)	(9)
Rex sole	Tr[4]	Tr
Turbot	166	162
Other[5]	-	-
Roundfish		
Sablefish	27	Tr
True cod	76	357
Pollock	28	272
Other[6]	Tr	Tr
S. alutus	532	75
Other[7]	Tr	-
Mackerel shark	-	-
Skate	Tr	-
Invertebrates		
Shrimp	-	-
Other	Tr	Tr

Footnotes for Table IV

[1] BB = Blying Bank; BD = Blying Deep; MB = Middle Bank; PWST = Prince William Sound Trench

[2] Gr = green G = gravel R = rock
Gy = grey M = mud S = sand

[3] D-1 = Drumfil #1 (groundfish trawl) B = Rubber bobbins on groundline
C = Chain beckets on groundline
W = Wire rope groundline
L = 1.5" mesh liner in cod-end

[4] Trace = less than 20 lbs.

[5] Other flatfish (never more than Trace in drag):

dover sole

[6] Other roundfish, except rockfish (never more than Trace in drag):

blenny; eel pout; eulachon; lingcod; sculpin; searcher

[7] Other rockfish (never more than Trace in drag):

S. aleutianus

S. ciliatus

S. polyspinis

S. ruberrimus

S. zacentrus

Seb. alascanus

Table V. Size composition of halibut caught, by area, during "G. B. Reed" Cruise No. 6, July - August 1963

Length (cm)	Numbers by Area[1] QCS	DE	CS-CSE	CSE-BS	Total
<66	3	1	7	13	24
66-82	1	0	28	17	46
82-135	5	10	19	12	46
>135	0	5	1	4	10
Total	9	16	55	46	126
Drags	19	11	28	10	68

[1] QCS = Queen Charlotte Sound
DE = Dixon Entrance
CS = Cape Spencer
CSE = Cape St. Elias
BS = Blying Sound

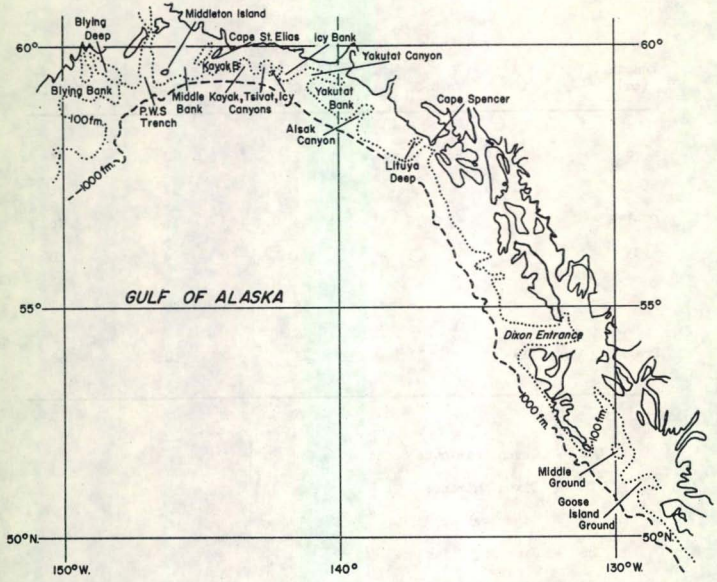

Fig. 1. Chart showing fishing areas of "G.B. Reed" during Cruise No. 6, July-August, 1963.

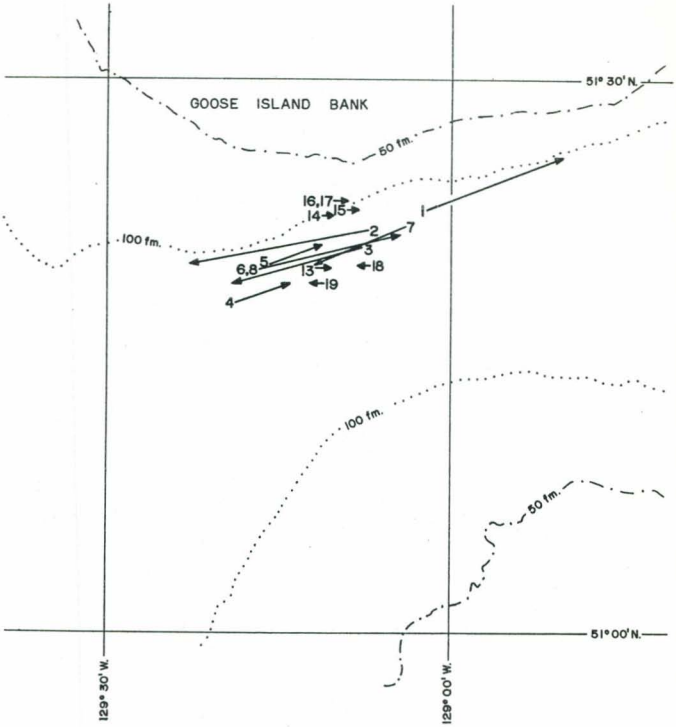

Fig. 2. Chart showing trawling area and drags taken by the "G.B. Reed" on "Southeast Edge" of Goose Island during Cruise No. 6, July-August, 1963.

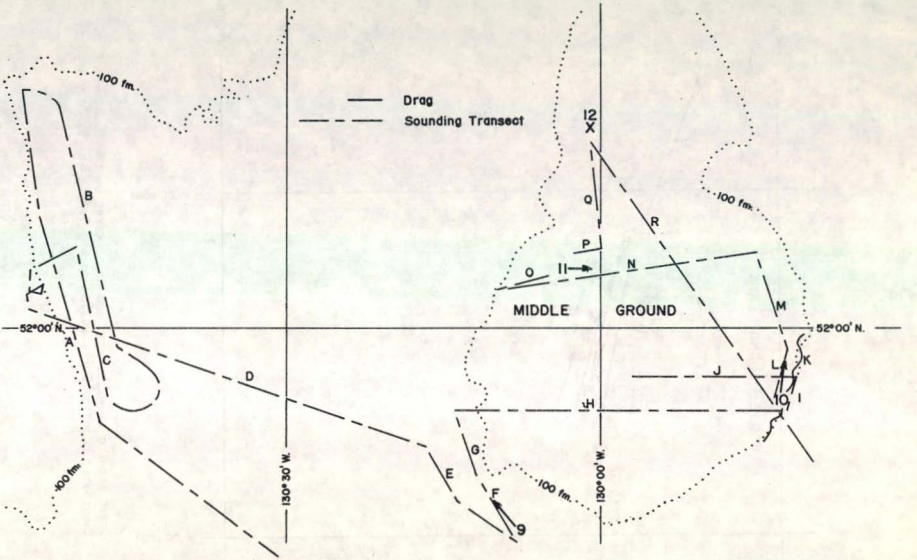

Fig. 3. Chart of northwest sector of Queen Charlotte Sound showing drags and sounding transects taken by the "G.B. Reed" during Cruise No. 6, July-August, 1963.

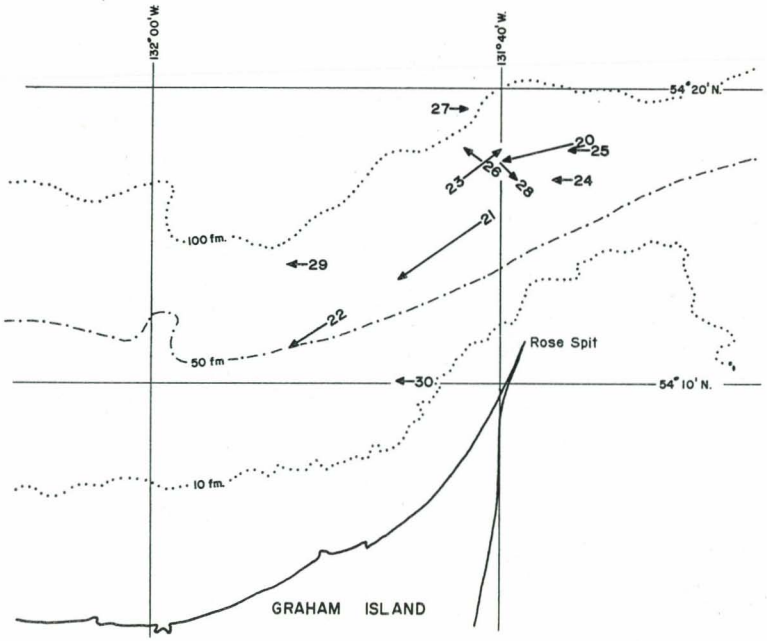

Fig. 4. Chart showing trawling area and drags taken by the "G.B. Reed" in Dixon Entrance during Cruise No. 6, July-August, 1963.

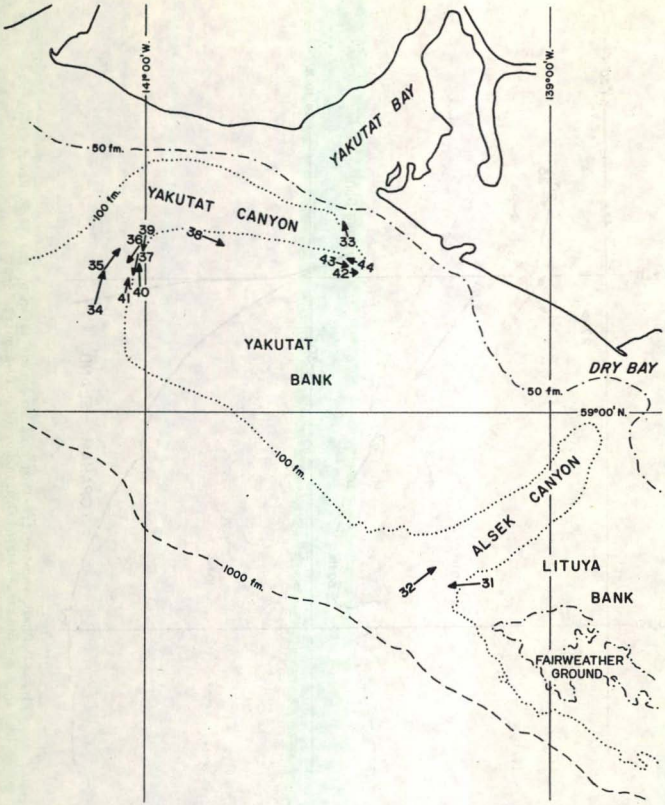

Fig. 5. Chart showing drags taken in Alsak and Yakutat Canyons by the "G.B. Reed" during Cruise No. 6, July-August, 1963.

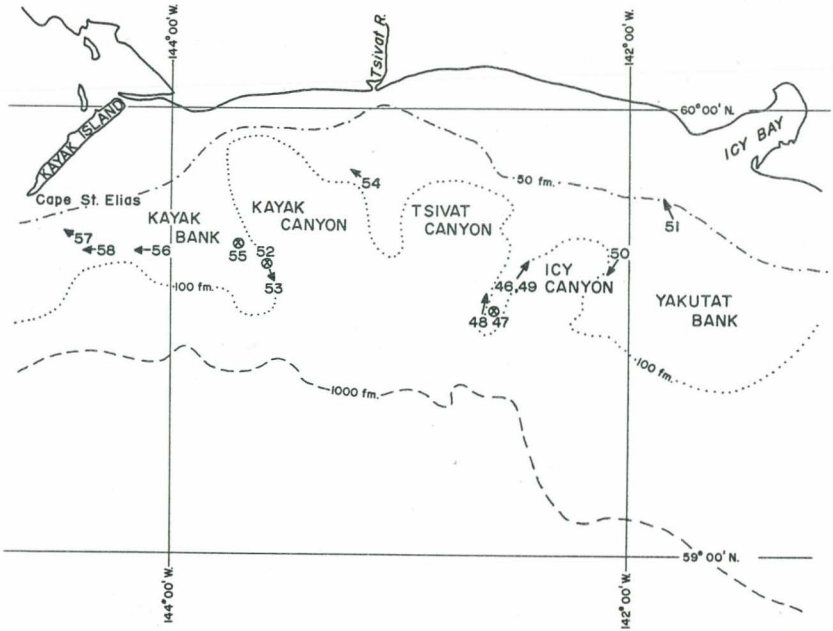

Fig. 6. Chart of trawling areas and drags taken by the "G.B. Reed" between Icy Bay and Cape St. Elias during Cruise No. 6, July-August, 1963.

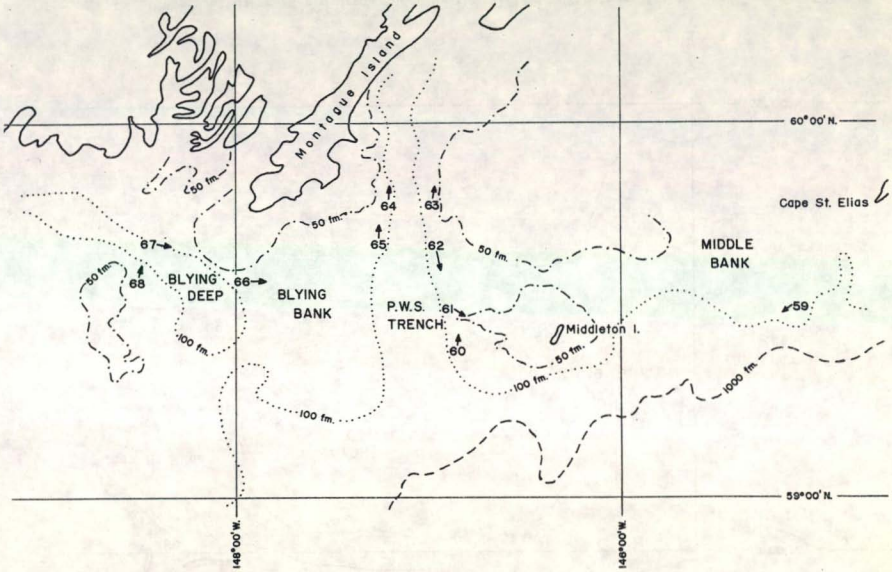

Fig. 7. Chart showing trawling areas and drags taken by the "G.B. Reed" during Cruise No. 6 from Cape St. Elias to Cape Cleare, July-August, 1963.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 63-7

August 20 - September 22, 1963

PURPOSE

1. Locate and sample concentrations of Pacific ocean perch (Sebastodes alutus) for size and age composition, and sex ratio.

2. Record incidence of, and pertinent information on, other species of groundfish (including halibut) and invertebrates.

3. Continue testing deck sampling procedures for Pacific ocean perch and other groundfish species.

4. Sample, along lateral transects, in 4 selected gullies near Kodiak Island for pink shrimp (Pandalus borealis), sidestripe shrimp (Pandalopsis dispar), and king crab (Paralithodes camtschatica).

5. Sample groundfish and shrimp trawling areas for non-commercial benthic invertebrate fauna with trawls, dredges, grabs, and camera.

6. Conduct technological studies concerning blood and tissue proteins in marine fishes and invertebrates, chalkiness in halibut, and effects of copper on quality of frozen halibut.

7. Establish vertical water temperature regimes in all trawling areas.

8. Determine type of bottom in all trawling areas.

9. Report incidental observations of commercial fishing operations.

AREAS

1. Seward Gully to Trinity Islands (Fig. 1).

2. Marmot, Chiniak, Barnabas, and Kiavak Gullies (Fig. 1).

PORTS OF CALL

1. Kodiak, Alaska: August 29; September 2-3, 4, 6, and 11-12.

RESULTS

A total of 81 drags with groundfish and shrimp trawls were completed - 25 with the groundfish trawl and 56 with the shrimp trawl. Total catch was 132,200 lb. In addition, 12 short drags (10 min each) were completed with an oyster dredge to sample the non-commercial benthic invertebrate fauna.

Observers during the cruise were: K. Tatara and H. Shimamura, scientists from the Tokai Regional Fisheries Research Laboratory (Tokyo, Japan); and J. B. Beals, biologist with the Alaska Department of Fish and Game (Juneau).

1. Ocean perch fishing procedures and gear were the same as those utilized throughout most of Cruise No. 63-6. The area along and around the 100-fathom contour (69-145 fm) was scouted with the SIMRAD sounder for fish concentrations and usually no set was made unless the sounder indicated fish present. Scouting began at the northeast corner of Seward Gully and extended to a point south of the Trinity Islands. Figures 2 and 3 show the location of all groundfish drags, and Table I contains the results of the drags. Only one type of groundfish trawl was utilized, viz. the modified western trawl equipped with rubber bobbins on the groundline and a 1.5-inch mesh liner in the codend. Net design and mesh size (4.5 inches, stretched measure between knots) were the same as described in the cruise report for Cruise No. 63-6. Maximum catch of ocean perch was 13,800 lb from a 30-minute haul. The shrimp trawl utilized in various gullies along the south shore of Kodiak Island failed to yield any appreciable numbers of ocean perch.

A total of 24,714 ocean perch was measured and of these, 6,741 were sexed. Scales and/or otoliths were collected from 388 of the sexed fish. Few juvenile perch were encountered on this cruise.

2. Catches from each haul were segretated by species (or family) and weighed with a beam balance. In the groundfish trawl catches, ocean perch predominated (62.9%) and halibut constituted 1.4%. Following is the species composition of the total catch from the groundfish trawl:

SPECIES	CATCH	PERCENT
	lb	
Ocean perch	73,298	62.9
Pollock	11,822	10.1
Turbot	9,053	7.8
True cod	5,371	4.6
Sharpchin rockfish	3,147	2.7
Rex sole	3,087	2.6
Dover sole	2,212	1.9
Sablefish	1,792	1.5
Flathead sole	1,607	1.4
Halibut	1,598	1.4
Other	3,613	3.1
TOTAL	116,600	100.0

In the shrimp trawl catches, pink shrimps predominated (53.0%). Halibut constituted 0.7%. Following is the species composition of the total catch from the shrimp trawl:

SPECIES	CATCH	PERCENT
	lb	
Pink shrimp	8,309	53.0
Turbot	1,267	8.1
Pollock	880	5.6
King crab	866	5.5
Sculpin	366	2.3
Eulachon	150	1.0
Ocean perch	144	0.9
Rock sole	130	0.8
Halibut	113	0.7
Other	3,375	22.1
TOTAL	15,600	100.0

3. Testing of deck sampling procedures continued as described in the cruise report for Cruise No. 63-6. Tub weight-frequency data were collected for ocean perch (316 tubs); Alaska pollock (100 tubs); turbot (58 tubs); true cod (44 tubs); and sharpchin rockfish (41 tubs). A new length-weight formula for ocean perch was computed when empirical tests at sea revealed that the original formula heretofore utilized had ceased to be satisfactory in this area.

4. Shrimp tows were made with a 70-foot Gulf of Mexico type semi-balloon otter trawl constructed of 1-1/2 inch nylon netting. The last two feet of the codend was lined with 1/2-inch cotton netting. Otter boards measured 3-1/2 by 8 feet. The trawl was towed from the forward gallows of the vessel.

Shrimp trawling was restricted to the "gullys" or depressions. Tows were made along section lines at intervals according to depth from the edge of the bank at one side to the deepest part of the gully and from there to the edge at the other side (Fig. 2 and 3). At the start, depth intervals were 5 fathoms on one slope and 10 fathoms on the other, but later tows were at intervals of 10 fathoms.

The main species of commercial shrimp was the "pink" (Pandalus borealis). Catches to over 2,600 pounds per 10-minute tow were made. Because tows were of short duration, the extent of bottom sampled was limited so it is not possible to assess commercial prospects. Small quantities of "sidestripe" shrimps (Pandalopsis dispar) were caught. King crabs (Paralithodes camtschatica) were caught in 23 tows (246 specimens) but most were ovigerous females and few males were commercial size. "Tanner" crabs (Chionoecetes bairdi) were caught in practically every tow; 372 specimens were sexed and measured. A total of 2,621 pink shrimps was sexed and measured (carapace length), and 553 specimens

of sidestripe shrimps. Counts of whole pink shrimps per pound extended from 61 to 268; for sidestripe counts ranged from 17 to 28. Shrimp trawling locations are shown in Fig. 2 and 2. Trawling log and catch by species are shown in Table II.

5. The general basic objectives of the participation of marine invertebrates in this cruise were to collect and determine distributional patterns of relatively deepwater invertebrates as well as to relate their distribution and abundance to fish stocks, bottom composition and oceanographic conditions. To round out the full ecological description of the fishing grounds, fish food as shown by stomach contents should be studied. This was not attempted on this cruise. It seems that these objectives may be attained most economically and expeditiously by the integration of groundfish and marine invertebrate studies.

The specific objectives were attempts to assess:

(a) The suitability of the standard trawls (fish and shrimp) as invertebrate collecting devices.

(b) The feasibility of using specific invertebrate sampling gears without too seriously interfering with the primary purpose of the cruise.

(c) The relationship between the results of bottom sampling and from the deepwater camera.

(d) The desirability of having a technician whose time would be devoted entirely, or nearly so, to invertebrate work.

As a result of this and other shorter cruises it is concluded:

(a) The standard fish and shrimp trawls, while not ideal collecting devices for marine invertebrates, do collect certain species on certain types of ground. More experience may show that some of these species that are collected regularly may be used as indicators of bottom type, general oceanographic conditions and of associated fish stocks.

(b) The regular use of the air-operated Petersen grab showed that specific gear could be operated without serious interference with the trawling operations. An additional once-daily haul, or whenever there might be a significant change in bottom type, by a biologist's dredge would be of considerable value.

(c) The results from the deepwater camera showed all gears were missing some of the organisms shown on the pictures. The bottom composition was shown very clearly and epifaunal organisms such as ophiuroids could be counted easily. Polychaetes, holothuroids, echinoids, ophiuroids, sponges, some shrimp and some fish were identified. The conclusion is that the camera is a valuable supporting tool in deepwater bottom studies and its use should be automatic with other sampling equipment.

(d) It appears desirable to have a marine invertebrate technician on all groundfish cruises, subject to the approval of the cruise director. With the camera operation, Petersen grab operation and sorting, collecting from the main trawls and sorting, operation and sorting of dredge hauls would keep a technician more than busy and would be more than the groundfish crew could handle thoroughly beyond their normal tasks.

Details of gear operation are given in Fig. 4 and Table II. The collections have yet to be sorted and identified.

6. As an extension of a project cataloguing the electrophoretic patterns of hemoglobin, plasma, and muscle proteins of teleosts and other marine animals, 170 samples from the following species were collected and shipped immediately by air to Vancouver for processing: rockfish (6 species: Sebastodes aleutianus; S. alutus; S. ciliatus; S. polyspinis; S. zacentrus; and Sebastolobus alascanus); butter sole; turbot; rex sole; Dover sole; flathead sole; rock sole; halibut; blackcod; grey cod; king crab; Tanner crab. Crab and halibut testes were also collected for a project dealing with the comparative aspects of nucleic acids in marine species.

Chalkiness of halibut is of concern to the fishing industry, and equipment for preliminary processing of tissues for future histological work was aboard. Unfortunately, none of the halibut examined exhibited "chalky" tissues.

Under laboratory conditions, salmon develop an off odour in refrigerated sea water in the presence of copper. Some halibut are shipped in this medium and more boats are being equipped to do this. Accordingly, small storage tests of halibut with and without copper in refrigerated sea water were conducted on board ship.

7. Vertical water temperature regimes were determined with a B.T. in all trawling areas. A total of 59 casts were made, including a supplementary series (3 casts) taken across the mid-section of Seward Gully although no fishing was conducted there. Surface temperatures ranged from 10.4° to 13.5°C and bottom temperatures, 5.0-7.8°C. Surface water temperatures were higher offshore and bottom water temperatures declined with depth. These data are included in Tables I, II and IV. In addition, five 8-cast stations were occupied in the Gulf of Alaska en route to and returning from the fishing area. These observations were made at the request of POG in connection with synoptic studies of the thermocline in the North Pacific Ocean.

8. Type of bottom was determined with Dietz-LaFond and Petersen grabs. Initially, both were used, but the former and smaller grab was soon abandoned when the two instruments yielded the same results. Bottom grabs were taken at 51 stations, including the 3 supplementary stations in Seward Gully. The results are shown in Tables I, II and IV.

9. Three large Soviet service vessels (processing or packing) were observed on August 25, at close range, off the mouth of Seward Gully. On August 26, several Soviet vessels were observed at long range in Albatross Gully. On August 28 a small (ca. 120 ft) Soviet side-trawler ("Rhynda") was observed, at close range, hauling a small catch of ocean perch aboard. We exchanged gifts with the crew of this vessel. On September 14 and 15, approximately 20 Soviet ships were observed at long range along the 100-fathom contour southsoutheast of the Trinity Islands.

PERSONNEL

Scientific personnel aboard during the cruise were as follows:

J. B. Beals, biologist observer (ADFG)	(Sep. 2 to Sep. 11)
T. H. Butler	(Aug. 20 to Sep. 4)
D. B. Quayle	(Sep. 11 to Sep. 22)
H. Shimamura, scientist-observer (Japan)	(Aug. 20 to Sep. 22)
K. Tatara, scientist-observer (Japan)	(Aug. 20 to Sep. 22)
W. E. Vanstone, Vancouver Technology Lab.	(Sep. 2 to Sep. 11)
S. J. Westrheim, chief scientist	(Aug. 20 to Sep. 6)
D. Davenport	(Aug. 20 to Sep. 22)
J. Flury	(Aug. 20 to Sep. 22)
A. N. Yates	(Aug. 20 to Sep. 22)

Table 1. Groundfish trawl fishing log for Cruise No. 7 of the "G.B. Reed" off Kodiak Island, August-September, 1963

Drag No.	1	2	3	4	5
Date	Aug 26	Aug 26	Aug 26	Aug 27	Aug 27
Area[1]	PB	PS	PB	AG	AG
INPFC Area	049580	049580	050580	050580	050580
Start (PDT)	0835	1245	1815	1030	1630
Duration (min.)	25	25	30	30	35
Start: N. Lat.	58° 07'	58° 07'	58° 19'	58° 07'	58° 06'
W. Long.	148° 50'	148° 50'	149° 39'	149° 42'	149° 35'
End: N. Lat.	58° 04'	58° 04'	58° 19'	58° 07'	58° 05'
W. Long.	148° 51'	148° 50'	149° 35'	149° 46'	149° 40'
Depth (fms.)	95-82-100	100-120	74-69	125	130
Bottom type[2]	Gy M	Gy M,G	Gy M,G	Gr M,S	Gr S, Si
Water temp (°C):					
Surface	12.8	12.9	11.9	12.2	12.5
Bottom	5.5	5.4	6.6	5.2	5.1
Net used[3]	D-1 BL ..... same net for all groundfish drags				
Remarks	-	Snag cod-end torn	-	-	-
Total catch (lb)	4,900	2,400	1,300	5,900	9,300

Table 1, continued

Drag No.	6	7	54	55	56
Date	Aug 28	Aug 28	Sep 7	Sep 7	Sep 7
Area[1]	CB	CB	CS-1	CS-1	CS-1
INPFC Area	051573	051573	051570	051570	052570
Start (PDT)	0730	1525	1045	1500	-
Duration (min.)	30	30	30	30	-
Start: N. Lat.	57° 50'	57° 37'	57° 21'	57° 13'	57° 12'
W. Long.	150° 09'	150° 19'	150° 40'	150° 54'	151° 00'
End: N. Lat.	57° 52'	57° 38'	57° 23'	57° 14'	- -
W. Long.	150° 10'	150° 16'	150° 36'	150° 51'	- -
Depth (fms.)	90-95	87-94	130	100-95	120
Bottom type[2]	Gr S	Gr S	-	S, G	-
Water temp. (°C):					
Surface	12.8	12.7	13.4	13.5	-
Bottom	5.6	5.6	5.2	5.3	-
Net used[3]	D-1 BL ... same net for all groundfish drags				
Remarks	ca. 2000 lb perch escaped through meshes at surface	-	-	-	X-doors
Total catch (lb)	10,100	2,100	2,200	4,200	-

Table 1, continued

Drag No.	57	58	59	60	61
Date	Sep 8	Sep 8	Sep 8	Sep 9	Sep 9
Area[1]	CS	AS	AS	AS	AS
INPFC Area	052570	052570	052563	052563	052563
Start (PDT)	0835	1355	1725	0840	1130
Duration (min.)	30	30	30	30	30
Start: N. Lat.	57° 10'	57° 03'	56° 55'	56° 51'	56° 44'
W. Long.	151° 05'	151° 28'	151° 34'	151° 40'	151° 45'
End: N. Lat.	57° 12'	57° 04.5'	56° 57'	56° 52.5'	56° 46'
W. Long.	151° 01'	151° 26'	151° 31'	151° 37'	151° 43'
Depth (fms.)	140-130	140-126	117-128	118-130	129-121
Bottom type[2]	G	G	S,G	S	S,G
Water temp. (°C):					
Surface	13.5	13.5	13.3	13.2	13.3
Bottom	5.3	5.5	5.4	5.3	5.9
Net used[3]	D-1... same net for all groundfish drags BL				
Remarks	Snag-Net torn	-	-	-	-
Total catch (lb)	5,700	2,100	2,100	3,800	3,400

Table 1, continued

Drag No.	62	63	64	65	66
Date	Sep 9	Sep 10	Sep 10	Sep 13	Sep 13
Area[1]	AS	AS	AS	AS	AS
INPFC Area	053563	053563	053560	053560	054560
Start (PDT)	1435	0840	1225	1035	1550
Duration (min.)	30	10	30	30	30
Start: N. Lat.	56° 31'	56° 31'	56° 29'	56° 20'	56° 16'
W. Long.	152° 02'	152° 18'	152° 34'	152° 42'	153° 16'
End: N. Lat.	56° 32'	56° 31'	56° 30'	56° 18'	56° 17'
W. Long.	151° 56'	152° 17'	152° 33'	152° 45'	153° 13'
Depth (fms.)	130 115 133	136-140	126-134	120-133	145-135
Bottom type[2]	S, G	S, M	S, G	M, S, G	S, M
Water temp. (°C):					
Surface	13.2	13.3	13.5	12.4	12.0
Bottom	5.0	5.2	5.4	5.4	5.3
Net used[3]	-	-	-	-	-
Remarks	-	-	Estimate 1000 lb P.O.P. lost through meshes	2400 lb brought aboard	-
Total catch (lb)	6,200	600	10,900	E16,000	400

Table 1, continued

Drag No.	67	68	69	70	71
Date	Sep 13	Sep 14	Sep 14	Sep 14	Sep 15
Area[1]	AS	AS	CS-2	CS-2	CS-2
INPFC Area	054560	054560	054553	055553	055560
Start (PDT)	1834	0835	1400	1730	0830
Duration (min.)	26	30	30	30	30
Start: N. Lat.	56° 13'	56° 10'	55° 54'	55° 58'	56° 01.5'
W. Long.	153° 20'	153° 36'	153° 49'	154° 05'	154° 32'
End: N. Lat.	56° 11'	56° 11'	55° 53'	55° 56.5'	56° 01'
W. Long.	153° 21'	153° 40'	153° 45'	154° 07'	154° 28'
Depth (fms.)	125	~~120~~ 130 130	129-126	94-95	126-120
Bottom type[2]	S,G,M	S,C	R,G	-	R
Water temp. (°C):					
Surface	11.9	12.7	11.8	12.7	12.2
Bottom	5.5	5.7	5.5	5.4	5.2
Net used[3]	D-1 ... same net for all groundfish drags BL				
Remarks	3300 lb brought aboard	-	-	-	Hard bottom net torn
Total catch (lb)	E10,000	4,500	1,600	500	6,400

Table 1, continued

Drag No.	1	2	3	4	5
Date	Aug 26	Aug 26	Aug 26	Aug 27	Aug 27
Total catch	4,900	2,400	1,300	5,900	9,300
Flatfish[4]					
Dover sole	21	Tr[5]	Tr	79	322
Flathead sole	-	-	306	79	297
Halibut[6]	(4)	(2)	(10)	(-)	(-)
Rex sole	99	50	120	79	556
Rock sole	-	-	Tr	-	-
Turbot	50	24	365	80	1,305
Other[7]	-	-	-	-	-
Roundfish[4]					
Pollock	Tr	Tr	32	2,700	3,405
Ronquil	20	-	-	-	-
Sablefish	-	Tr	-	Tr	50
Sculpin	79	-	22	Tr	Tr
True cod	1,091	1,558	129	123	200
Other[8]	Tr	24	Tr	-	Tr
S. alutus	400	20	173	2,736	3,160
S. brevispinis	25	-	-	-	-
S. ciliatus	92	Tr	Tr	-	-
S. polyspinis	21	Tr	-	-	-
S. zacentrus	2,608	539	Tr	-	-
Seb. alascanus	-	-	-	-	Tr
Other[9]	Tr	Tr	-	-	-
Invertebrates[4]					
King crab[6]	(-)	(-)	(-)	(-)	(-)
Tanner crab	-	-	Tr	-	-
Pink shrimp	Tr	-	-	Tr	-
Other	Tr	Tr	-	Tr	Tr

Table 1, continued

Drag No.	6	7	54	55	56
Date	Aug 28	Aug 28	Sep 7	Sep 7	Sep 7
Total catch	10,100	2,100	2,200	4,200	0
Flatfish[4]					
Dover sole	Tr[5]	Tr	207	Tr	-
Flathead sole	139	41	Tr	30	-
Halibut[6]	(6)	(3)	(-)	(2)	(-)
Rex sole	218	37	262	40	-
Rock sole	Tr	Tr	Tr	-	-
Turbot	611	407	209	157	-
Other[7]	-	Tr	-	-	-
Roundfish[4]					
Pollock	185	Tr	77	41	-
Ronquil	-	-	-	-	-
Sablefish	110	20	75	110	-
Sculpin	Tr	Tr	Tr	88	-
True cod	472	70	Tr	80	-
Other[8]	Tr	Tr	Tr	Tr	-
S. alutus	8,266	1,407	1,337	3,515	-
S. brevispinis	-	-	-	-	-
S. ciliatus	Tr	-	Tr	Tr	-
S. polyspinis	-	-	Tr	Tr	-
S. zacentrus	-	-	Tr	-	-
Seb. alascanus	-	Tr	Tr	Tr	-
Other[9]	-	-	-	-	-
Invertebrates[4]					
King crab[6]	(-)	(-)	(-)	(-)	(-)
Tanner crab	-	-	-	-	-
Pink shrimp	-	-	-	-	-
Other	Tr	-	Tr	Tr	-

Table 1, continued

Drag No.	57	58	59	60	61
Date	Sep 8	Sep 8	Sep 8	Sep 9	Sep 9
Total catch	5,700	2,100	2,100	3,800	3,400
Flatfish[4]					
Dover sole	281	106	73	300	60
Flathead sole	Tr[5]	Tr	61	51	25
Halibut[6]	(1)	(-)	(2)	(-)	(2)
Rex sole	262	83	182	288	46
Rock sole	-	-	-	-	-
Turbot	607	258	378	306	252
Other[7]	-	-	-	-	-
Roundfish[4]					
Pollock	102	139	42	90	77
Ronquil	43	-	-	-	-
Sablefish	60	Tr	-	Tr	510
Sculpin	104	Tr	Tr	Tr	88
True cod	43	-	Tr	Tr	Tr
Other[8]	-	-	-	Tr	-
S. alutus	4,114	1,484	1,184	2,673	2,070
S. brevispinis	-	-	-	-	-
S. ciliatus	Tr	-	-	Tr	Tr
S. polyspinis	-	Tr	Tr	-	-
S. zacentrus	-	-	-	-	-
Seb. alascanus	101	Tr	104	61	67
Other[9]	Tr	Tr	-	-	Tr
Invertebrates[4]					
King crab[6]	(-)	(-)	(-)	(1)	(-)
Tanner crab	-	Tr	-	-	-
Pink shrimp	-	-	-	-	-
Other	Tr	Tr	-	Tr	Tr

Table 1, continued

Drag No.	62	63	64	65	66
Date	Sep 9	Sep 10	Sep 10	Sep 13	Sep 13
Total catch	6,200	600	10,900	E16,000*	400
Flatfish[4]					
Dover sole	21	30	Tr	E 54	60
Flathead sole	Tr	-	Tr	-	Tr
Halibut[6]	(2)	(-)	(6)	E(20)	(-)
Rex sole	Tr	15	Tr	E 74	40
Rock sole	-	-	Tr	E 27	-
Turbot	264	45	664	E 304	97
Other[7]	-	-	-	-	-
Roundfish[4]					
Pollock	616	85	248	E 345	68
Ronquil	-	-	-	-	-
Sablefish	58	-	Tr	E 399	28
Sculpin	Tr	-	Tr	E 115	-
True cod	Tr	-	568	E 595	Tr
Other[8]	-	Tr	-	E 34	Tr
S. alutus	4,875	370	9,436	E13,818	96
S. brevispinis	-	-	-	-	-
S. ciliatus	Tr	-	Tr	E 27	-
S. polyspinis	-	-	Tr	E 20	-
S. zacentrus	-	-	-	-	-
Seb. alascanus	Tr	Tr	-	E 61	Tr
Other[9]	Tr	-	-	Tr	-
Invertebrates[4]					
King crab[6]	(-)	(-)	(-)	(-)	(-)
Tanner crab	-	Tr	-	-	-
Pink shrimp	-	-	-	Tr	Tr
Other	-	Tr	Tr	Tr	Tr

* Estimated. Only 2 splits (2,400 lb) brought on deck and sorted.

Table 1, continued

Drag No.	67	68	69	70	71
Date	Sep 13	Sep 14	Sep 14	Sep 14	Sep 15
Total catch	E10,000*	4,500	1,600	500	6,400
Flatfish[4]					
Dover sole	E 578	-	Tr[5]	Tr	20
Flathead sole	E 578	Tr	Tr	-	Tr
Halibut[6]	(E 9)	(-)	(-)	(2)	(2)
Rex sole	E 578	34	24	Tr	Tr
Rock sole	E 188	-	72	74	Tr
Turbot	E1,921	383	140	74	152
Other[7]	-	-	-	-	-
Roundfish[4]					
Pollock	E 830	175	42	Tr	2,523
Ronquil	-	-	-	-	-
Sablefish	E 161	65	146	Tr	Tr
Sculpin	E 30	20	64	Tr	Tr
True cod	E 21	365	Tr	Tr	56
Other[8]	-	-	Tr	-	Tr
S. alutus	E4,955	3,036	741	208	3,224
S. brevispinis	Tr	-	-	-	-
S. ciliatus	E 21	Tr	-	-	-
S. polyspinis	Tr	-	Tr	Tr	-
S. zacentrus	-	-	-	-	-
Seb. alascanus	E 110	160	278	37	96
Other[9]	-	Tr	Tr	-	-
Invertebrates[4]					
King crab[6]	(-)	(17)	(1)	(-)	(41)
Tanner crab	Tr	-	-	-	-
Pink shrimp	-	Tr	Tr	-	-
Other	Tr	Tr	Tr	-	Tr

* Estimated. Only 2 splits (3,300 lb) brought on deck and sorted.

Footnotes for Table I

[1] AG = Albatross Gully
AS = Albatross Slope
CB = Chiniak Bank
CS-1 = Chiniak Slope
CS-2 = Chirikof Slope
PB = Portlock Bank
PS = Portlock Slope

[2] Gr = green
Gy = grey
G = gravel
M = mud (silt)
R = rock
S = sand

[3] D-1 BL = Drumfill No. 1, 4-1/2" mesh, with 1-1/2" liner in cod-end, and equipped with rubber bobbins on groundline

[4]

Dover sole	Microstomus pacificus
Flathead sole	Hippoglossoides elassodon
Halibut	Hippoglossus stenolepis
Rex sole	Glyptocephalus zachirus
Rock sole	Lepidopsetta bilineata
Turbot	Atheresthes stomias
Pollock	Chalcogrammus aegilfinus
Ronquil	Ronquilus jordani
Sablefish	Anoplopoma fimbria
Sculpin	Cottidae
True cod	Gadus macrocephalus
King crab	Paralithodes camtschatica
Tanner crab	Chionoecetes bairdi
Pink shrimp	Pandalus borealis

[5] Trace = less than 20 lb

[6] Numbers

[7] Other Flatfish (never more than trace in drag):

English sole *Parophrys vetulus*

[8] Other Roundfish, other than rockfish (never more than trace in drag):

Eelpout	Zoarcidae
Eulachon	*Thaleichthys pacificus*
Greenling	Hexagrammidae
Lumpsucker	Cyclopteridae
Poacher	Agonidae
Prickleback	Stichaeidae
Ragfish	*Icosteus aenigmaticus*
Spring salmon	*Oncorhynchus tshawytscha*
Skate	*Rajidae*

[9] Other rockfish (never more than trace in drag):

Sebastodes aleutianus

S. proriger

S. rubrivinctus

Table 2. Shrimp trawl fishing log for Cruise No. 7 of the "G.B. Reed" off Kodiak Island, August-September 1963

Drag No.	8	9	10	11	12
Date	Aug 29	Aug 29	Aug 29	Aug 30	Aug 30
Area[1]	MG	-	-	-	-
INPFC Area	052573	052573	052580	052580	052580
Start (PDT)	1055	1225	1415	1540	1710
Duration (min.)	10	15	10	15	15
Start: N. Lat.	57° 57.4'	57° 59'	58° 01.7'	58° 02.2'	58° 02.6'
W. Long.	151° 38.7'	151° 36'	151° 38'	151° 37.5'	151° 37.5'
End: N. Lat.	57° 57.5'	57° 59'	58° 02'	58° 02.4'	58° 02.8'
W. Long.	151° 38'	151° 35.5'	151° 37'	151° 36'	151° 36.5'
Depth (fms.)	50	53/47/54	60-59	63-67	70-72
Bottom type[2]	S,Gr,M	-	S,Gr,M	-	S,M
Water temp. (°C)					
Surface	10.4	-	10.4	-	10.8
Bottom	7.4	-	7.3	-	7.1
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	Net torn ground-line broken	Load mostly fish	No count of in-cidental Crustacea	-
Total catch (lb)	5	15	37	71	100

Table 2, continued

Drag No.	13	14	15	16	17
Date	Aug 30	Aug 30	Aug 30	Aug 30	Aug 31
Area[1]	MG	-	-	-	-
INPFC Area	052580	052580	052580	052580	052580
Start (PDT)	1750	1825	1927	2010	0815
Duration (min.)	15	15	15	15	15
Start: N. Lat.	58° 03.2'	58° 03.8'	58° 04'	58° 04.9'	58° 05.7'
W. Long.	151° 37.5'	151° 36.5'	151° 38'	151° 38.2'	151° 36.7'
End: N. Lat.	58° 03.3'	58° 04'	58° 04'	58° 05'	58° 06'
W. Long.	151° 36.5'	151° 36.5'	151° 37'	151° 37'	151° 35.2'
Depth (fms.)	75	81-82	85	87-85	80-81
Bottom type[2]	-	S,M	-	S,M	-
Water temp. (°C)					
Surface	-	10.8	-	10.7	-
Bottom	-	7.0	-	6.6	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	133	290	416	147	247

Table 2, continued

Drag No.	18	19	20	21	22
Date	Aug 31	Aug 31	Aug 31	Aug 31	Aug 31
Area[1]	MG	-	-	-	-
INPFC Area	052580	052580	052580	051580	051580
Start (PDT)	0855	1035	1330	1720	1805
Duration (min.)	15	15	15	15	15
Start: N. Lat.	58° 07'	58° 08.3'	58° 09'	58° 11'	58° 09'
W. Long.	151° 38'	151° 37.5'	151° 37.5'	150° 52'	150° 47'
End: N. Lat.	58° 07'	58° 08'	58° 09.2'	58° 10.7'	58° 09'
W. Long.	151° 37'	151° 36.5'	151° 36.5'	150° 51'	150° 48'
Depth (fms.)	69-72	59-61	50-52	60-61	65-64
Bottom type[2]	S,G	-	S,M,Sh	S,G,Sh	-
Water temp. (°C)					
Surface	10.6	-	10.8	11.6	-
Bottom	6.4	-	7.3	6.2	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	Most of net lost	-	-
Total catch (lb)	439	2585	Tr	194	99

Table 2, continued

Drag No.	23	24	25	26	27
Date	Aug 31	Sep 1	Sep 1	Sep 1	Sep 1
Area[1]	MG	-	-	-	-
INPFC Area	051580	051580	051580	051580	051580
Start (PDT)	1905	0820	0855	1010	1115
Duration (min.)	15	10	15	15	10
Start: N. Lat.	58° 08.5'	58° 06'	58° 05.5'	58° 04.2'	58° 01.5'
W. Long.	150° 50'	150° 48'	150° 47'	150° 52'	150° 52'
End: N. Lat.	58° 07.5'	58° 06'	58° 05.5'	58° 04'	58° 02'
W. Long.	150° 51'	150° 47'	150° 48'	150° 51'	150° 52'
Depth (fms.)	70-71	75-76	80-81	82-83	70-68
Bottom type[2]	S,G,Sh	-	S,M,Sh	S,M	-
Water temp. (°C)					
Surface	11.4	-	11.4	-	10.9
Bottom	6.0	-	5.8	-	5.9
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	Net torn	-	-	Deepest part of gully	-
Total catch (lb)	264	44	62	482	18

Table 2, continued

Drag No.	28	29	30	31	32
Date	Sep 1	Sep 1	Sep 1	Sep 1	Sep 4
Area[1]	MG	-	-	-	CG
INPFC Area	051580	051580	051580	051573	052573
Start (PDT)	1255	1510	1610	1730	0820
Duration (min.)	15	15	15	15	10
Start: N. Lat.	58° 01'	58° 00'	58° 00'	57° 59.5'	57° 39'
W. Long.	150° 55'	150° 33'	150° 27'	150° 20'	151° 45'
End: N. Lat.	58° 00.5'	58° 00.5'	58° 00.5'	58° 00'	57° 39.2'
W. Long.	150° 54'	150° 32'	150° 27'	150° 21'	151° 46'
Depth (fms.)	62-61	75-80	92	99-98	52-50
Bottom type[2]	G,S,Sh	G,Gr,S,Sh	-	S,G	S
Water temp. (°C)					
Surface	11.3	12.7	12.4	12.7	12.4
Bottom	6.0	5.8	5.6	5.5	7.8
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	51	340	6	7	2

Table 2, continued

Drag No.	33	34	35	36	37
Date	Sep 4	Sep 4	Sep 4	Sep 4	Sep 4
Area[1]	CG	-	-	-	-
INPFC Area	052583	052573	052573	052573	051573
Start (PDT)	0855	1005	1050	1225	1315
Duration (min.)	15	15	15	15	15
Start: N. Lat.	58° 37.5'	57° 36.5'	57° 35.4'	57° 34'	57° 33.5'
W. Long.	151° 46'	151° 47'	151° 49'	151° 51'	151° 51.5'
End: N. Lat.	58° 37.7'	57° 36.8'	57° 35.7'	57° 34'	57° 33.7'
W. Long.	151° 47'	151° 48'	151° 50'	151° 52'	151° 52.5'
Depths (fms.)	60	72	81-80	86-88	80-83
Bottom type[2]	-	-	-	Gr,M	-
Water temp. (°C)					
Surface	-	12.3	-	12.2	-
Bottom	-	6.5	-	6.4	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	39	47	525	4	65

Table 2, continued

Drag No.	38	39	40	41	42
Date	Sep 4	Sep 4	Sep 5	Sep 5	Sep 5
Area[1]	CG	-	-	-	-
INPFC Area	052573	052573	052570	052570	052570
Start (PDT)	1400	1505	0830	0910	0955
Duration (min.)	15	15	15	15	15
Start: N. Lat.	57° 33.7'	57° 32.7'	57° 27.5'	57° 28'	57° 29'
W. Long.	151° 51'	151° 52.5'	151° 36'	151° 35'	151° 34'
End: N. Lat.	57° 34'	57° 33'	57° 28'	57° 28.2'	57° 29'
W. Long.	151° 52'	151° 53.5'	151° 36.2'	151° 36'	151° 35'
Depth (fms.)	70	62-63	59-60	70-72	81-79
Bottom type[2]	-	-	G,S,Sh	-	Gr,M
Water temp. (°C)					
Surface	11.7	-	12.5	-	12.6
Bottom	6.6	-	6.1	-	6.6
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	18	2	141	93	79

Table 2, continued

Drag No.	43	44	45	46	47
Date	Sep 5	Sep 5	Sep 5	Sep 5	Sep 5
Area[1]	CG	-	-	-	-
INPFC Area	052570	052573	052573	052573	052570
Start (PDT)	1110	1230	1335	1450	1720
Duration (min.)	15	15	15	10	15
Start: N. Lat.	57° 29.5'	57° 31.2'	57° 31.5'	57° 32'	57° 22.5'
W. Long.	151° 29'	151° 28.5'	151° 28'	151° 27'	151° 15'
End: N. Lat.	57° 29.7'	57° 31.4'	57° 31.7'		57° 23'
W. Long.	151° 30'	151° 29'	151° 29'		151° 15.2'
Depth (fms.)	78-80	70-66	60-59	48-50	50-51
Bottom type[2]	-	S,G,M	-	S,G,Sh	S,G,M
Water temp. (°C)					
Surface	-	12.6	-	12.6	12.3
Bottom	-	6.0	-	6.4	6.8
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	246	158	1,039	130	66

Table 2, continued

Drag No.	48	49	50	51	52
Date	Sep 5	Sep 5	Sep 6	Sep 6	Sep 6
Area[1]	CG	-	-	-	-
INPFC Area	052570	052570	052570	052570	052570
Start (PDT)	1805	1840	0815	0930	1035
Duration (min.)	15	15	15	15	15
Start: N. Lat.	57° 22'	57° 20.9'	57° 23'	57° 21.5'	57° 19.5'
W. Long.	151° 16.5'	151° 15'	151° 19'	151° 19.5'	151° 24.5'
End: N. Lat.	57° 22.2'	57° 21.1'	57° 23.5'	57° 22'	57° 19.8'
W. Long.	151° 17.5'	151° 16.2'	151° 19'	151° 19.5'	151° 24'
Depth (fms.)	61-60	70-67	80-78	70-73	62-65
Bottom type[2]	-	S,Gr,M	-	-	-
Water temp. (°C)					
Surface	-	13.0	-	12.0	-
Bottom	-	6.4	-	5.9	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	331	66	252	45	24

Table 2, continued

Drag No.	53	72	73	74	75
Date	Sep 6	Sep 15	Sep 15	Sep 15	Sep 16
Area[1]	CG	KG	-	-	-
INPFC Area	052570	054563	054563	054563	054563
Start (PDT)	1105	1725	1815	1854	0845
Duration (min.)	15	15	15	15	15
Start: N. Lat.	57° 19'	56° 43'	56° 43.1'	56° 42.5'	56° 43'
W. Long.	151° 26.5'	153° 22'	153° 19.4'	153° 19'	153° 07'
End: N. Lat.	57° 19.2'				
W. Long.	151° 27'				
Depth (fms.)	48-50	60	70	80	70
Bottom type[2]	-	S,G,M	-	M	-
Water temp. (°C)					
Surface	12.0	11.7	-	12.1	-
Bottom	6.6	6.5	-	6.3	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	Net torn lost wing	-	-	-	Small shrimp many lost through meshes
Total catch (lb)	19	166	392	1,373	821

Table 2, continued

Drag No.	76	77	78	79	80
Date	Sep 16	Sep 16	Sep 17	Sep 17	Sep 17
Area[1]	KG	-	BG	-	-
INPFC Area	054563	054563	053570	053563	053563
Start (PDT)	1000	1210	1000	1215	1305
Duration (min.)	15	10	15	15	15
Start: N. Lat.	56° 43'	56° 49'	57° 06'	56° 54'	56° 55'
W. Long.	153° 05'	153° 22'	152° 45'	152° 42'	152° 38'
End: N. Lat.					
W. Long.					
Depth (fms.)	61-59	78-82	84-82	72-70	82-81
Bottom type[2]	G,S,C	M	-	-	-
Water temp. (°C)					
Surface	12.2	-	-	12.6	-
Bottom	6.3	-	-	5.7	-
Net used[3]	S-L ... same type of net for all shrimp drags				
Remarks	-	-	-	-	-
Total catch (lb)	299	2,850	119	40	94

Table 2, continued

Drag No.	81
Date	Sep 17
Area[1]	BG
INPFC Area	053563
Start (PDT)	1445
Duration (min.)	15
Start: N. Lat.	56° 59'
W. Long.	152° 20'
End: N. Lat.	
W. Long.	
Depth (fms.)	60
Bottom type[2]	-
Water temp. (°C)	
Surface	12.5
Bottom	6.3
Net used[3]	S-L
Remarks	-
Total catch (lb)	79

Table 2, continued

Drag No.	8	9	10	11	12
Date	Aug 29	Aug 29	Aug 29	Aug 30	Aug 30
Total catch	5	15	37	71	100
Shrimp					
Pink	Tr[4]	Tr	1	Tr	12
Sidestripe	-	-	-	-	-
Other[5]	Tr	Tr	Tr	Tr	Tr
Crab					
King[6]	(1)	(-)	(-)	(-)	(-)
Tanner	Tr	Tr	Tr	Tr	Tr
Other[7]	-	-	-	-	-
Other Invertebrates	Tr	Tr	Tr	Tr	Tr
Flatfish					
Flathead sole	Tr	-	Tr	Tr	Tr
Halibut[6]	(-)	(-)	(-)	(-)	(-)
Rock sole	-	-	-	-	-
Turbot	Tr	Tr	20	25	80
Other[9]	-	-	-	-	-
Roundfish					
Pollock	Tr	Tr	Tr	Tr	Tr
Sablefish	-	-	-	-	-
Sculpin	-	-	Tr	Tr	Tr
Eelpout	-	-	-	Tr	Tr
Eulachon	-	-	-	-	-
Herring	Tr	Tr	Tr	Tr	Tr
Other[10]	Tr	Tr	Tr	-	Tr
S. alutus	-	-	-	-	-
Other[11]	-	Tr	Tr	Tr	-

Table 2, continued

Drag No.	13	14	15	16	17
Date	Aug 30	Aug 30	Aug 30	Aug 30	Aug 31
Total catch	133	290	416	147	247
Shrimp					
Pink	17	18	18	3	14
Sidestripe	3	18	18	6	3
Other[5]	Tr[4]	Tr	Tr	-	Tr
Crab					
King[6]	(13)	(6)	(11)	(-)	(-)
Tanner	Tr	Tr	Tr	Tr	Tr
Other[7]	-	-	-	-	Tr
Other Invertebrates	Tr	-	-	-	Tr
Flatfish					
Flathead sole	Tr	Tr	Tr	Tr	20
Halibut[6]	(-)	(1)	(-)	(1)	(2)
Rock sole	-	-	-	-	Tr
Turbot	40	100	250	100	150
Other[9]	-	-	Tr	-	Tr
Roundfish					
Pollock	Tr	-	-	-	25
Sablefish	Tr	Tr	Tr	-	Tr
Sculpin	Tr	Tr	Tr	Tr	Tr
Eelpout	Tr	Tr	50	Tr	Tr
Eulachon	Tr	100	50	Tr	Tr
Herring	-	Tr	-	-	-
Other[10]	Tr	Tr	Tr	Tr	Tr
S. alutus	-	-	-	Tr	Tr
Other[11]	-	Tr	Tr	-	Tr

Table 2, continued

Drag No.	18	19	20	21	22
Date	Aug 31	Aug 31	Aug 31	Aug 31	Aug 31
Total catch	439	2,585	-	194	99
Shrimp					
Pink	188	2,402	-	10	43
Sidestripe	18	-	-	-	-
Other[5]	Tr	Tr	-	Tr	Tr
Crab					
King[6]	(-)	(17)	(-)	(3)	(3)
Tanner	Tr	62	-	Tr	Tr
Other[7]	Tr	Tr	-	Tr	-
Other Invertebrates	Tr	Tr	-	Tr	-
Flatfish					
Flathead sole	Tr	-	-	Tr	Tr
Halibut[6]	(-)	(1)	(-)	(1)	(1)
Rock sole	-	-	-	50	-
Turbot	Tr	Tr	-	Tr	Tr
Other[9]	Tr	-	-	Tr	-
Roundfish					
Pollock	Tr	40	-	Tr	Tr
Sablefish	-	-	-	-	-
Sculpin	Tr	Tr	-	-	Tr
Eelpout	Tr	-	-	Tr	Tr
Eulachon	-	-	-	-	-
Herring	30	Tr	-	-	-
Other[10]	Tr	Tr	-	45	Tr
S. alutus	-	-	-	-	-
Other[11]	Tr	-	-	Tr	-

Table 2, continued

Drag No.	23	24	25	26	27
Date	Aug 31	Sep 1	Sep 1	Sep 1	Sep 1
Total catch	264	44	62	482	18
Shrimp					
Pink	116	3	4	2	Tr
Sidestripe	-	-	-	-	-
Other[5]	Tr	Tr	Tr	Tr	Tr
Crab					
King[6]	(1)	(1)	(-)	(25)	(-)
Tanner	Tr	Tr	-	Tr	Tr
Other[7]	-	-	-	-	-
Other Invertebrates	Tr	Tr	-	-	-
Flatfish					
Flathead sole	Tr	Tr	Tr	X[8]	Tr
Halibut[6]	(3)	(-)	(-)	(-)	(-)
Rock sole	Tr	-	-	X	-
Turbot	Tr	20	30	X	Tr
Other[9]	-	-	Tr	Tr	-
Roundfish					
Pollock	Tr	-	-	-	-
Sablefish	-	-	-	-	Tr
Sculpin	Tr	Tr	Tr	-	Tr
Eelpout	-	-	-	Tr	-
Eulachon	-	-	-	-	-
Herring	-	-	-	-	-
Other[10]	50	-	Tr	Tr	Tr
S. alutus	-	-	Tr	73	-
Other[11]	Tr	Tr	-	-	-

Table 2, continued

Drag No.	28	29	30	31	32
Date	Sep 1	Sep 1	Sep 1	Sep 1	Sep 4
Total catch	51	340	6	7	2
Shrimp					
Pink	33	Tr	Tr	-	Tr
Sidestripe	-	-	-	-	-
Other[5]	Tr	Tr	-	-	Tr
Crab					
King[6]	(-)	(-)	(-)	(-)	(-)
Tanner	Tr	-	-	-	-
Other[7]	Tr	Tr	-	-	-
Other Invertebrates	-	Tr	-	-	-
Flatfish					
Flathead sole	-	Tr	Tr	-	Tr
Halibut[6]	(-)	(-)	(-)	(-)	(-)
Rock sole	-	-	-	-	-
Turbot	Tr	Tr	-	Tr	Tr
Other[9]	-	-	-	-	Tr
Roundfish					
Pollock	Tr	Tr	-	Tr	-
Sablefish	Tr	-	-	-	-
Sculpin	Tr	-	-	-	-
Eelpout	-	-	-	-	Tr
Eulachon	-	Tr	-	-	-
Herring	-	-	-	-	Tr
Other[10]	Tr	40	-	-	Tr
S. alutus	-	-	280	Tr	-
Other[11]	-	-	Tr	Tr	-

Table 2, continued

Drag No.	33	34	35	36	37
Date	Sep 4	Sep 4	Sep 4	Sep 4	Sep 4
Total catch	39	47	525	4	65
Shrimp					
Pink	14	5	15	Tr	Tr
Sidestripe	-	Tr	Tr	3	Tr
Other[5]	-	Tr	Tr	-	Tr
Crab					
King[6]	(-)	(1)	(4)	(-)	(-)
Tanner	Tr	-	Tr	Tr	Tr
Other[7]	-	-	-	-	-
Other Invertebrates	Tr	-	-	-	-
Flatfish					
Flathead sole	Tr	Tr	X[8]	-	X
Halibut[6]	(-)	(-)	(-)	(-)	(1)
Rock sole	-	-	-	-	-
Turbot	Tr	Tr	X	-	X
Other[9]	-	-	-	-	-
Roundfish					
Pollock	Tr	-	-	-	-
Sablefish	-	-	Tr	-	-
Sculpin	Tr	Tr	-	-	-
Eelpout	-	Tr	-	-	-
Eulachon	-	-	-	-	-
Herring	Tr	-	-	-	-
Other[10]	Tr	-	-	Tr	
S. alutus	-	-	-	-	-
Other[11]	-	-	-	-	-

Table 2, continued

Drag No.	38	39	30	41	42
Date	Sep 4	Sep 4	Sep 5	Sep 5	Sep 5
Total catch	18	2	141	93	79
Shrimp					
Pink	Tr	-	-	1	Tr
Sidestripe	Tr	-	-	Tr	-
Other[5]	Tr	-	Tr	Tr	Tr
Crab					
King[6]	(-)	(-)	(9)	(2)	(1)
Tanner	-	Tr	Tr	Tr	Tr
Other[7]	-	-	-	-	-
Other invertebrates	-	-	Tr	-	Tr
Flatfish					
Flathead sole	Tr	-	Tr	Tr	Tr
Halibut[6]	(-)	(-)	(1)	(-)	(1)
Rock sole	-	-	30	-	-
Turbot	Tr	Tr	Tr	70	40
Other[9]	-	-	Tr	-	Tr
Roundfish					
Pollock	-	-	Tr	-	Tr
Sablefish	-	-	-	-	Tr
Sculpin	Tr	-	36	Tr	Tr
Eelpout	-	-	-	Tr	Tr
Eulachon	-	-	-	-	Tr
Herring	-	Tr	-	-	-
Other[10]	Tr	-	Tr	Tr	Tr
S. alutus	-	-	-	Tr	Tr
Other[11]	-	-	-	Tr	-

Table 2, continued

Drag No.	43	44	45	46	47
Date	Sep 5	Sep 5	Sep 5	Sep 5	Sep 5
Total catch	246	158	1,039	130	66
Shrimp					
Pink	8	14	499	66	Tr
Sidestripe	Tr	-	-	-	-
Other[5]	Tr	Tr	Tr	Tr	Tr
Crab					
King[6]	(8)	(6)	(16)	(2)	(12)
Tanner	Tr	Tr	36	Tr	Tr
Other[7]	-	Tr	Tr	-	-
Other invertebrates	Tr	Tr	Tr	Tr	-
Flatfish					
Flathead sole	40	20	-	-	-
Halibut[6]	(1)	(2)	(1)	(1)	(-)
Rock sole	50	Tr	-	-	-
Turbot	100	40	52	Tr	Tr
Other[9]	Tr	Tr	-	-	-
Roundfish					
Pollock	-	Tr	50	Tr	Tr
Sablefish	-	-	-	-	-
Sculpin	Tr	Tr	306	24	-
Eelpout	Tr	Tr	-	-	-
Eulachon	-	-	-	-	-
Herring	-	Tr	-	-	-
Other[10]	Tr	Tr	-	Tr	-
S. alutus	-	-	Tr	-	-
Other[11]	-	-	Tr	-	-

Table 2, continued

Drag No.	48	49	50	51	52
Date	Sep 5	Sep 5	Sep 6	Sep 6	Sep 6
Total catch	331	66	252	45	24
Shrimp					
Pink	51	2	105	Tr	-
Sidestripe	-	-	-	-	-
Other[5]	Tr	Tr	Tr	13	-
Crab					
King[6]	(38)	(3)	(2)	(-)	(-)
Tanner	-	Tr	Tr	Tr	Tr
Other[7]	-	-	-	Tr	Tr
Other invertebrates	Tr	Tr	Tr	Tr	Tr
Flatfish					
Flathead sole	30	Tr	Tr	-	-
Halibut[6]	(-)	(1)	(-)	(-)	(-)
Rock sole	-	-	-	-	Tr
Turbot	30	30	Tr	20	-
Other[9]	Tr	Tr	Tr	-	-
Roundfish					
Pollock	Tr	-	Tr	Tr	Tr
Sablefish	-	-	-	-	-
Sculpin	Tr	-	Tr	Tr	Tr
Eelpout	-	-	Tr	Tr	-
Eulachon	-	-	Tr	-	Tr
Herring	-	-	-	-	-
Other[10]	-	Tr	Tr	Tr	Tr
S. alutus	-	-	Tr	-	-
Other[11]	Tr	-	-	-	-

Table 2, continued

Drag No.	53	72	73	74	75
Date	Sep 6	Sep 15	Sep 15	Sep 15	Sep 16
Total catch	19	166	392	1,373	821
Shrimp					
Pink	-	Tr	12	1,088	749
Sidestripe	-	-	-	16	-
Other[5]	-	1	Tr	-	-
Crab					
King[6]	(-)	(-)	(-)	(-)	(-)
Tanner	-	Tr	Tr	-	Tr
Other[7]	-	Tr	-	-	-
Other invertebrates	Tr	Tr	-	Tr	Tr
Flatfish					
Flathead sole	-	Tr	Tr	Tr	Tr
Halibut[6]	(-)	(-)	(-)	(-)	(-)
Rock sole	Tr	Tr	-	-	-
Turbot	Tr	Tr	Tr	Tr	Tr
Other[9]	-	-	-	-	-
Roundfish					
Pollock	Tr	Tr	360	84	65
Sablefish	-	-	-	-	-
Sculpin	Tr	Tr	Tr	-	Tr
Eelpout	-	Tr	-	Tr	Tr
Eulachon	Tr	Tr	Tr	Tr	-
Herring	-	-	Tr	-	-
Other[10]	Tr	140	Tr	Tr	-
S. alutus	-	Tr	-	-	-
Other[11]	-	-	Tr	Tr	-

Table 2, continued

Drag No.	76	77	78	78	80	81
Date	Sep 16	Sep 16	Sep 17	Sep 17	Sep 17	Sep 17
Total catch	299	2,850	119	40	94	79
Shrimp						
Pink	185	2,607	3	Tr	Tr	1
Sidestripe	-	Tr	6	-	Tr	-
Other[5]	2	Tr	Tr	Tr	Tr	Tr
Crab						
King[6]	(-)	(-)	(-)	(-)	(-)	(-)
Tanner	Tr	Tr	Tr	Tr	Tr	Tr
Other[7]	-	-	-	-	-	-
Other invertebrates	Tr	-	Tr	Tr	Tr	Tr
Flatfish						
Flathead sole	-	-	X[8]	-	Tr	-
Halibut[6]	(1)	(-)	(-)	(1)	(-)	(-)
Rock sole	-	-	-	-	-	-
Turbot	Tr	Tr	X	Tr	70	Tr
Other[9]	-	-	-	-	-	-
Roundfish						
Pollock	38	218	-	Tr	Tr	-
Sablefish	-	-	Tr	-	Tr	-
Sculpin	Tr	Tr	Tr	Tr	-	Tr
Eelpout	Tr	-	-	-	-	-
Eulachon	-	-	Tr	-	Tr	-
Herring	-	-	-	-	-	-
Other[10]	Tr	-	Tr	Tr	-	Tr
S. alutus	-	-	-	-	-	71
Other[11]	Tr	-	-	Tr	-	Tr

Footnotes to Table 2

[1] BG = Barnabas Gully KG = Kiavak Gully
CG = Chiniak Gully MG = Marmot Gully

[2] Gr = green G = gravel
C = clay S = sand
M = mud (silt) Sh = shell

[3] S-L: 70' Gulf Balloon Trawl, 1-1/2" mesh, with 1/2" mesh liner

[4] Tr = Trace = less than 1 pound for any shrimp, and less than 20 pounds for fish

[5] Pandalus montagui tridens Argis dentata
P. goniurus Eualus barbatus
P. jordani E. avinus
Crangon alaskensis Lebbeus groenlandicus
C. communis L. polaris

[6] Numbers of individuals in parentheses

[7] Oregonia gracilis Placetron wosnessenskii
Hyas lyratus Rhinolithodes wosnessenskii
Lithodes aequispina Pagurus splendescens

[8] Fish unweighed

[9] Dover sole Microstomus pacificus
Rex sole Glyptocephalus zachirus

Footnotes to Table 2, continued

[10] True cod — Gadus macrocephalus
Sandfish — Trichodon trichodon
Searcher — Bathymaster signatus
Lump sucker — Eumicrotremus orbis
Pricklebacks — Stichaeidae
Poachers — Agonidae

[11] Sebastodes polyspinis
S. aleutianus

Table III. Oyster Dredge Fishing Log for Cruise No. 7 of the "G.B. Reed" off Kodiak Island, August - September, 1963.

DRAG NO.	DATE	POSITION				INPFC AREA	DEPTH
		N. Latitude		W. Longitude			fms.
		°	'	°	'		
1	Sept. 9	56	41.1	152	07	053563	20
2	Sept. 9	56	41.6	152	06.4	053563	30
3	Sept. 9	56	40	151	51	052563	120
4	Sept. 13	56	18	152	45	053560	140
5	Sept. 13	56	11	153	21	054560	110
6	Sept. 14	56	11	153	40	054560	140
7	Sept. 15	56	01	154	28	055560	130
8	Sept. 15	56	01	154	28	055560	130
9	Sept. 15	56	42	153	19	054563	70
10	Sept. 16	56	50	153	19	054563	90
11	Sept. 16	57	00	153	15	054570	65
12	Sept. 16	57	09.5	153	11	054570	25

Table IV. Location and results of supplementary B. T. casts and bottom grabs taken across the mid-section of Seward Gully on August 25 during Cruise No. 7, "G. B. Reed", August - September, 1963.

CAST NO.	1	2	3
Time (PDT)	1045	1210	1340
N. Lat.	58°42.5'	58°52'	59°02'
W. Long.	149°18'	149°14'	149°07'
Depth (fms.)	90	118	94
Bottom type[1]	Gy M, G	Gy M, G	Gy M, G
Water temperature (°C)			
Surface	12.5	12.4	12.4
Bottom	5.4	5.4	5.6

[1]See Footnote 2 in Table I.

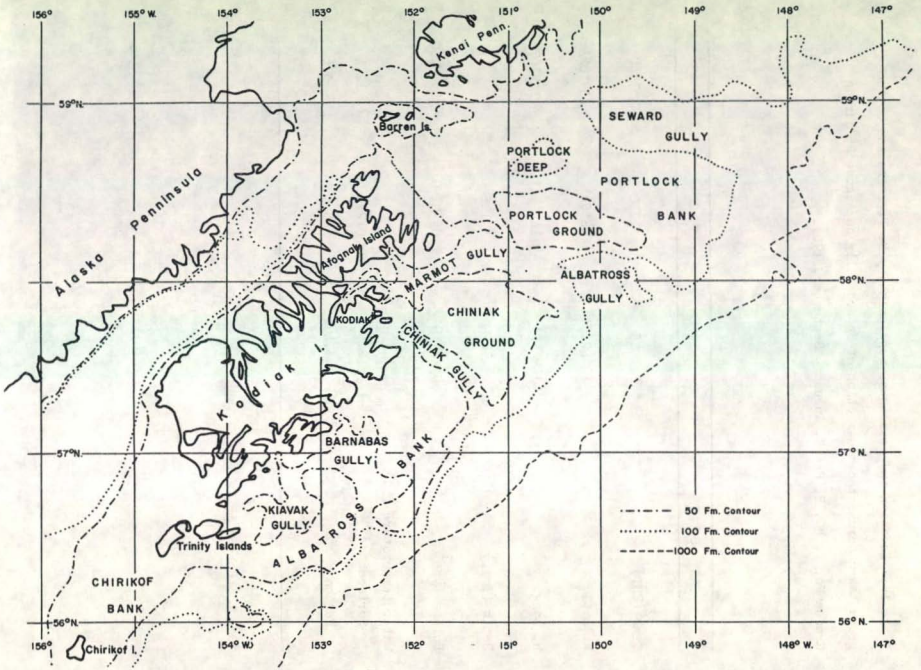

Figure 1. Chart of the Kodiak Island region explored during the G.B. Reed Cruise No. 7, August-September, 1963. (Overlay of USCGS No. 8500.)

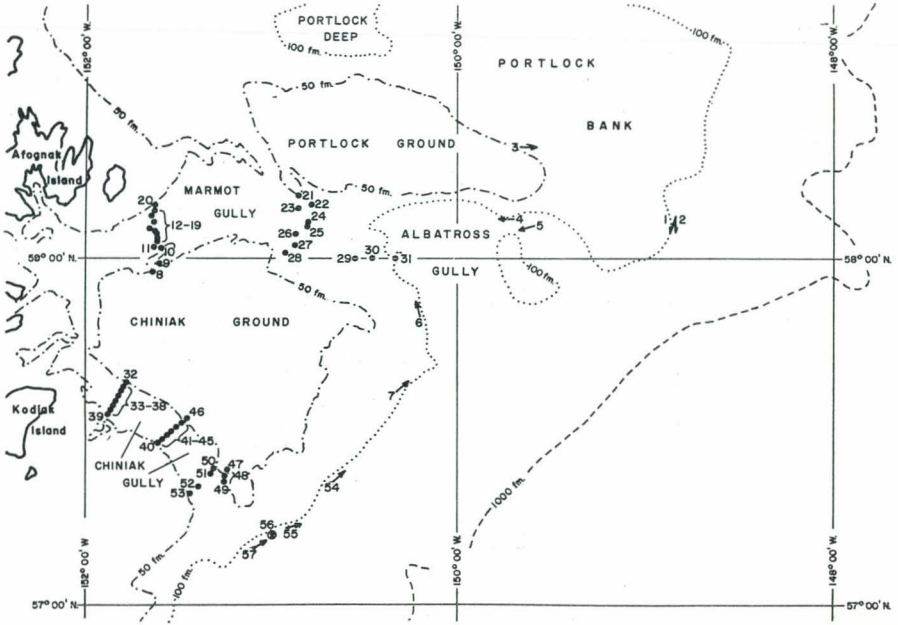

Fig. 2. Chart of the Kodiak Island region from Portlock Bank to Chiniak Gully showing the location of groundfish and shrimp trawls completed during "G.B. Reed" Cruise No. 7, July-August, 1963. (Overlay of USCGS Chart No. 8502).

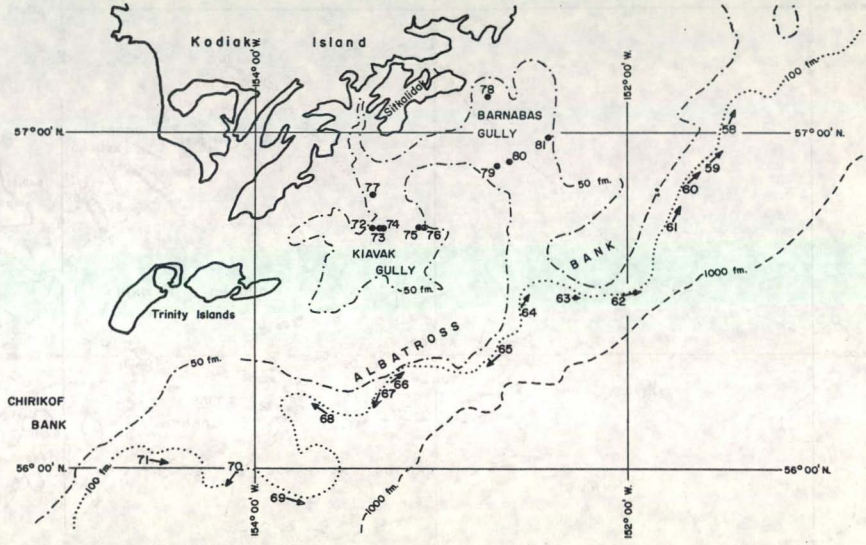

Fig. 3. Chart of the Kodiak Island region from Albatross Bank to Chirikof Bank showing the location of groundfish and shrimp trawls completed during "G.B. Reed" Cruise No. 7, July-August, 1963. (Overlay of USCGS Chart No. 8502).

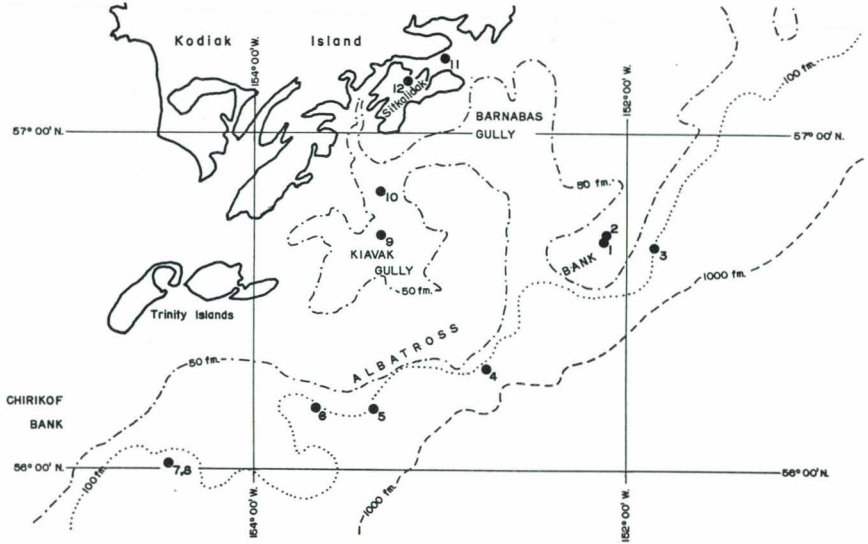

Fig. 4. Chart of the Kodiak Island region from Albatross Bank to Chirikof Bank showing the location of oyster dredge hauls completed during "G.B. Reed" Cruise No. 7, July-August, 1963. (Overlay of USCGS Chart No. 8502).

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 64-2

February 24 - March 15, 1964

PURPOSE

1. Determine winter availability and abundance of Pacific ocean perch (Sebastodes alutus) in Queen Charlotte Sound and adjacent inlets.
2. Locate and sample aggregations of juvenile ocean perch in the cruise area.
3. Record incidence of, and pertinent information on, other species of groundfish (including halibut) and invertebrates.
4. Collect fecundity and egg specific gravity data on flatfish encountered.
5. Establish vertical water temperature regimes in all trawling areas.
6. Determine type of bottom in all trawling areas.

AREAS

1. Queen Charlotte Sound and adjacent inlets (Fitz Hugh Sound, Rivers Inlet, and Smith Sound).
2. West coast of Vancouver Island: Quatsino Sound, Nootka Sound, and Estevan Deep.

RESULTS

A total of 44 hauls with groundfish and shrimp trawls were completed - 16 with the groundfish trawl and 28 with the shrimp trawl. Total catch was 39,100 lbs. Fishing depths ranged from 35 to 249 fathoms. Following is a summary of the total catch by species.

Species	Catch (lb)	Percent
Dogfish	9,600	24.6
Turbot	6,400	16.4
Pacific ocean perch	6,200	15.9
Sablefish	3,600	9.2
Ratfish	2,600	6.7
Dover sole	1,700	4.3
Hake	1,400	3.6
Shrimp	1,200	3.1
Skate	1,000	2.6
Halibut	500	1.3
Other[1]	4,900	12.3
Total	39,100	100.0

[1]No single species totalling more than 600 lb or 1.5%

Detailed vessel log and catch records are included in Table 1.

The groundfish trawl utilized was a 400-mesh eastern-type net (Gunlene no. 1) with 4.5-inch mesh (stretched measure between knots) throughout and a 1.5-inch mesh codend liner. The shrimp trawl was a 70-ft Gulf balloon trawl of 1.5-inch mesh throughout with a 0.5-inch mesh codend liner.

Explorations for ocean perch were conducted in Queen Charlotte Sound west of Goose Island Ground with little success, partly due to inclement weather. Figures 1 and 2 show the track lines followed during which the SIMRAD sounder was operating continuously. Some signs of fish were evident on the sounder. Unfortunately, adverse sea conditions for the rest of the cruise prevented a return to this area to trawl. Three hauls were made in this general region and are shown in Fig. 3. None yielded appreciable quantities of ocean perch.

The "southeast edge" of the Goose Island Ground was trawled to collect specimens of juvenile ocean perch whose presence was discovered during cruise no. 63-3 the previous winter (Fig. 3). This operation was quite successful.

Fitz Hugh Sound, Rivers Inlet, and Smith Sound were investigated for aggregations of ocean perch. Smith Sound yielded good catches of juvenile ocean perch (Fig. 4). The other two inlets yielded no ocean perch.

On the west coast of Vancouver Island, Quatsino Sound, Nootka Sound, and Estevan Deep were fished (Fig. 5). Quatsino Sound yielded good catches of juvenile ocean perch and shrimp, particularly at the mouth of the Sound. Nootka Sound yielded no ocean perch or shrimp. Estevan Deep was primarily fished to collect ripe male and female petrale sole for egg specific gravity studies and this goal was reached.

Site composition data were collected for ocean perch (2,784), sablefish (1,048), hake (780), Dover sole (725), petrale sole (313), lemon sole (125) and halibut (12). Otoliths were collected from 790 juvenile and 154 adult ocean perch.

B. T. casts were taken at 28 stations and, in addition, reversing bottle casts were made at 7 of these stations where the water depth exceeded 150 fathoms. Generally, the temperature stratification was isothermal except in Rivers Inlet (inversion at 10-100 m) and Nootka Sound (inversion from 40 m to the bottom). Surface temperatures ranged from 7.4 to 9.0°C and bottom temperatures 5.5 to 8.9°C. Results are included in Table 1.

Salinities were collected (surface and bottom) at 8 stations. Table 2 shows the results.

Bottom grabs were taken at 24 stations with a Dietz-LaFond sampler. It is interesting to note that all inlets except Rivers Inlet had green mud bottom. Rivers Inlet had a grey mud bottom. Results are included in Table 1.

PERSONNEL

Scientific personnel aboard during the cruise were as follows:

S. J. Westrheim	(February 24-March 15)
D. Davenport	(February 24-March 15)
W. A. Harling	(February 24-March 15)
E. J. R. Lippa	(February 24-March 15)

Table 1. Fishing log for the "G. B. Reed" during Cruise No. 64-2, February 24-March 15, 1964.

Haul No.	1	2	3	4	5	6
Date	Feb. 25	Feb. 26	Feb. 26	Feb. 28	Feb. 28	Feb. 28
Area[1]	CS	QCS	QCS	FS	FS	FS
Starting time (PST)	1340	1155	1615	0830	1240	1600
Duration (min.)	35	60	5	60	60	60
Start: N. Lat.	50° 41'	51° 15'	51° 18'	51° 38'	51° 51'	51° 44'
W. Long.	128° 43.7'	129° 22.5'	129° 47'	127° 55'	127° 55'	127° 55'
End: N. Lat.	50° 39.5'	51° 12.7'	51° 18'	51° 41.5'	51° 54'	51° 47.2'
W. Long.	128° 39.5'	129° 26'	129° 47'	127° 57.1'	127° 57'	127° 54.7'
Depth (fms.)	96-95	154-163	126	180-178	172-197	198-200
Type of bottom[2]	-	-	-	Gr, M	Gr, M	Gr, M
Water temp (°C):						
Surface	8.2	-	-	7.4	7.8	7.6
Bottom	6.3	-	-	7.6	7.7	7.7
Net used[3]	G-1/L	G-1/L	G-1/L	G-1/L	G-1/L	G-1/L
Remarks	Torn net winch re-wind failed	-	Snag, coral, sponge	-	-	-
Total catch (lbs.)	200	2,200	100	5,400	2,700	800

Table 1 continued

Haul No.	7	8	9	10	11	12
Date	Feb. 29	Feb. 29	Feb. 29	Mar. 1	Mar. 1	Mar. 1
Area[1]	RI	RI	RI	RI	SS	SS
Starting time (PST)	1040	1315	1535	0900	1325	1510
Duration (min.)	30	40	30	10	30	30
Start: N. Lat.	51° 40.6'	51° 38'	51° 39'	51° 37'	51° 17'	51° 18.2'
W. Long.	127° 20'	127° 31'	127° 27'	127° 31'	127° 40'	127° 38.4'
End: N. Lat.	51° 40'	51° 39'	51° 37.7'	51° 37.6'	51° 18'	51° 17.3'
W. Long.	127° 22.9'	127° 28'	127° 31'	127° 30.7'	127° 38.9'	127° 40'
Depth (fms.)	114-136	172-164	166	170-164	89-90	76-85
Type of bottom[2]	Gy M	Gy M	Gy M	Gy M	Gr, M	-
Water temp. (°C):						
Surface	7.8	7.8	7.6	7.4	7.5	-
Bottom	7.2	7.2	7.1	7.2	8.0	-
Net used[3]	G-1/L	G-1/L	G-1/L	G-1/L	S-1/L	S-1/L
Remarks	-	-	-	-	-	-
Total catch (lbs.)	1,300	600	1,000	200	1,300	700

Table 1 continued

Haul No.	13	14	15	16	17	18
Date	Mar. 2	Mar. 2	Mar. 2	Mar. 2	Mar. 4	Mar. 4
Area[1]	SS	SS	SS	SS	GI	GI
Starting time (PST)	0950	1300	1423	1605	0830	0945
Duration (min.)	25	25	20	25	30	30
Start: N. Lat.	51° 19.9'	51° 19.9'	51° 20.9'	51° 18.4'	51° 21'	51° 22.4'
W. Long.	127° 32.1'	127° 32.1'	127° 31.2'	127° 38.6'	129° 08.5'	129° 08.5'
End: N. Lat.	51° 19.6'	51° 19.6'	51° 20.5'	51° 18.7'	51° 21.2'	51° 23'
W. Long.	127° 33.5'	127° 33.5'	127° 32.7'	127° 37.4'	129° 06'	129° 07'
Depth (fms.)	64-74	64-72	100-116	73-46	120-124	110-114
Type of bottom[2]	Gr, M	-	Gr, M	Gr, M	Hd	Hd, S
Water temp. (°C):						
Surface	8.3	-	8.4	7.8	7.9	7.9
Bottom	8.1	-	8.0	8.0	5.8	5.8
Net used[3]	S-1/L	S-1/L	S-1/L	S-1/L	S-1/L	S-1/L
Remarks	-	-	-	-	-	-
Total catch (lbs.)	800	400	200	400	100	100

Table 1 continued

Haul No.	19	20	21	22	23	24
Date	Mar. 4	Mar. 4	Mar. 4	Mar. 4	Mar. 6	Mar. 6
Area[1]	GI	GI	GI	GI	GI	GI
Starting time (PST)	1100	1225	1330	1550	0850	0945
Duration (min.)	30	30	30	30	30	33
Start: N. Lat.	51° 24'	51° 24.6'	51° 25.4'	51° 26.4'	51° 24.6'	51° 24.2'
W. Long.	129° 05.6'	129° 05.3'	129° 01.5'	128° 57'	129° 06'	129° 10.5'
End: N. Lat.	51° 24.5'	51° 24.3'	51° 26'	51° 26'	51° 24.5'	51° 24'
W. Long.	129° 04'	129° 06.5'	128° 58.5'	129° 00'	129° 07.8'	129° 12'
Depth (fms.)	99	94-90	80	84-80	82-78	71-70
Type of bottom[2]	Hd, S	Hd, S	-	Hd, S	-	Hd, S
Water temp. (°C):						
Surface	7.9	7.9	-	7.8	-	7.8
Bottom	6.1	6.3	-	6.7	-	6.7
Net used[3]	S-1/L	S-1/L	S-1/L	G-1/L	S-1/L	S-1/L
Remarks	-	-	Stbd. door shattered	-	-	-
Total catch (lbs.)	100	100	0	40	100	100

Table 1 continued

Haul No.	25	26	27	28	29	30
Date	Mar. 6	Mar. 6	Mar. 7	Mar. 9	Mar. 9	Mar. 9
Area[1]	GI	GI	GI	QS	QS	QS
Starting time (PST)	1100	1230	0830	0950	1055	1237
Duration (min.)	30	30	3	30	30	30
Start: N. Lat.	51° 25.6'	51° 24.6'	51° 25.5'	50° 29.8'	50° 29.6'	50° 30.7'
W. Long.	129° 07'	129° 06'	129° 45'	127° 41.9'	127° 45.6'	127° 41.6'
End: N. Lat.	51° 25.4'	51° 24'	51° 25.5'	50° 29.5'	50° 30.2'	50° 30.2'
W. Long.	129° 08.5'	129° 07'	129° 45'	127° 43.5'	127° 44'	127° 43'
Depth (fms.)	60-61	80	98	68-59	60-62	61-66
Type of bottom[2]	Hd, S	-	-	Hd	-	G
Water temp (°C):						
Surface	7.8	-	7.8	8.3	-	-
Bottom	7.5	-	5.9	8.1	-	-
Net used[3]	S-1/L	S-1/L	G-1/L	S-1/L	S-1/L	S-1/L
Remarks	-	-	Snag, net torn	-	Bark & debris	Gravel
Total catch (lbs.)	2	14	100	300	1,500	400

Table 1 continued

Haul No.	31	32	33	34	35	36
Date	Mar. 9	Mar. 10	Mar. 10	Mar. 10	Mar. 10	Mar. 10
Area[1]	QS	QS	QS	QS	QS	QS
Starting time (PST)	1328	1015	1210	1350	1425	1500
Duration (min.)	27	30	15	15	15	15
Start: N. Lat.	50° 29.6'	50° 35.5'	50° 35.3'	50° 35.2'	50° 35.2'	50° 35.2'
W. Long.	127° 43.2'	127° 38.5'	127° 26.7'	127° 27.6'	127° 27.6'	127° 27.6'
End: N. Lat.	50° 29.4'	50° 35.6'	50° 35.1'	50° 35.1'	50° 35.1'	50° 35.1'
W. Long.	127° 45.3'	127° 36.9'	127° 28.2'	127° 29.2'	127° 29.2'	127° 29.2'
Depth (fms.)	64-58	60-64	35-47	48-62	48-62	57-62
Type of bottom[2]	-	Gr, M	Gr, M	-	-	-
Water temp. (°C):						
Surface	-	9.0	8.5	-	-	-
Bottom	-	8.8	8.8	-	-	-
Net used[3]	S-1/L	S-1/L	S-1/L	S-1/L	S-1/L	S-1/L
Remarks	-	-	Shell & seaweed	Net twisted	Net twisted	-
Total catch (lbs.)	1,100	100	200	0	0	0

Table 1 continued

Haul No.	37	38	39	40	41	42
Date	Mar. 12	Mar. 12	Mar. 13	Mar. 13	Mar. 13	Mar. 13
Area[1]	QS	QS	ED	ED	ED	ED
Starting time (PST)	0853	0950	0830	1240	1347	1615
Duration (min.)	17	10	60	12	30	45
Start: N. Lat.	50° 25.6'	50° 24.5'	48° 56.4'	49° 01'	48° 59.8'	49° 01.4'
W. Long.	127° 58.2'	127° 59.7'	126° 44'	126° 52'	126° 50'	126° 48.5'
End: N. Lat.	50° 26.5'	50° 25'	49° 00'	48° 59.8'	48° 58.7'	48° 59.6'
W. Long.	127° 58.7'	127° 58.4'	126° 47.2'	126° 50'	126° 47'	126° 45'
Depth (fms.)	70	75-71	196-204	249-242	240-238	180-175
Type of bottom[2]	Hd, S	-	Hd, S	-	-	-
Water temp. (°C):						
Surface	7.4	-	7.7	-	7.6	-
Bottom	7.5	-	5.6	-	5.5	-
Net used[3]	S-1/L	S-1/L	G-1/L	G-1/L	G-1/L	G-1/L
Remarks	-	-	-	Crossed doors	-	-
Total catch (lbs.)	200	200	6,400	0	2,800	6,800

Table 1 continued

Haul No.	43	44
Date	Mar. 14	Mar. 14
Area[1]	NS	NS
Starting time (PST)	1045	1240
Duration (min.)	15	10
Start: N. Lat.	49° 36.1'	49° 35'
W. Long.	126° 31.2'	126° 36.7'
End: N. Lat.	49° 35.9'	49° 34.9'
W. Long.	126° 32.2'	126° 36.9'
Depth (fms.)	85-80	50-47
Type of bottom[2]	Gr, M	-
Water temp. (°C):		
Surface	7.7	7.9
Bottom	8.9	8.9
Net used[3]	S-1/L	S-1/L
Remarks	-	-
Total catch (lbs.)	100	100

Table 1 continued

Haul No.	1	2	3	4	5	6
Date	Feb. 25	Feb. 26	Feb. 26	Feb. 28	Feb. 28	Feb. 28
Area	CS	QCS	QCS	FS	FS	FS
Total catch (lbs.)	200	2,200	100	5,400	2,700	800
Flatfish						
Dover sole	-	-	-	648	279	85
Flathead sole	-	-	-	356	Tr[4]	-
Halibut	-	-	-	135(2)	194(1)	19(1)
Lemon sole	-	-	-	-	-	-
Petrale sole	-	-	-	-	-	-
Rex sole	6	-	-	233	47	Tr
Slender sole	-	-	-	16	-	-
Turbot	2	299	5	212	58	Tr
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	-	-	-	43	30	-
Lingcod	-	4	-	-	-	-
Sablefish	-	2	-	393	425	66
Whiting	-	4	4	22	Tr	Tr
Other[6]	-	2	-	Tr	-	-
S. aleutianus	-	90	-	-	-	-
S. alutus	-	650	11	-	-	-
S. crameri	-	2	-	-	-	-
S. diploproa	-	-	-	-	-	-
S. pinniger	118	-	-	-	-	-
S. rubrivinctus	-	26	2	-	-	-
Seb. alascanus	-	1	13	-	Tr	-
Other[7]	96	23	50	17	-	-
Dogfish	-	919	-	2,557	1,139	487
Ratfish	Tr	184	2	318	277	137
Skate	-	-	-	323	232	38
Invertebrates						
Shrimp	-	Tr	-	-	Tr	-
Other	2	4	8	60	32	Tr

Table 1 continued

Haul No.	7	8	9	10	11	12
Date	Feb. 29	Feb. 29	Feb. 29	Mar. 1	Mar. 1	Mar. 1
Area	RI	RI	RI	RI	SS	SS
Total catch (lbs.)	1,300	600	1,000	200	1,300	700
Flatfish						
Dover sole	-	Tr[4]	Tr	Tr	12	3
Flathead sole	-	-	-	-	32	19
Halibut	-	-	55(1)	-	-	-
Lemon sole	-	-	-	-	16	-
Petrale sole	-	-	-	-	-	-
Rex sole	-	Tr	-	Tr	-	2
Slender sole	Tr	Tr	-	-	28	41
Turbot	Tr	Tr	Tr	-	29	8
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	449	44	170	20	110	19
Lingcod	-	-	-	-	7	-
Sablefish	24	22	98	-	323	135
Whiting	72	Tr	-	-	40	25
Other[6]	Tr	Tr	11	-	20	-
S. aleutianus	Tr	-	Tr	-	16	8
S. alutus	-	-	-	-	8	76
S. crameri	-	-	-	-	-	-
S. diploproa	-	-	-	-	-	-
S. pinniger	-	-	-	-	-	-
S. rubrivinctus	-	-	-	-	-	-
Seb. alascanus	-	-	-	-	-	-
Other[7]	-	-	-	-	26	3
Dogfish	633	368	526	93	40	26
Ratfish	35	123	108	24	518	234
Skate	10	28	72	Tr	29	-
Invertebrates						
Shrimp	Tr	-	2	Tr	44	64
Other	46	Tr	31	Tr	-	-

Table 1 continued

Haul No.	13	14	15	16	17	18
Date	Mar. 2	Mar. 2	Mar. 2	Mar. 2	Mar. 4	Mar. 4
Area	SS	SS	SS	SS	GT	GI
Total catch (lbs.)	800	400	200	400	100	100
Flatfish						
Dover sole	10	6	Tr[4]	-	-	-
Flathead sole	77	40	-	-	-	-
Halibut	-	-	-	-	-	-
Lemon sole	128	42	-	-	-	-
Petrale sole	-	-	-	-	-	-
Rex sole	8	-	-	1	-	-
Slender sole	82	70	Tr	27	Tr	-
Turbot	10	-	Tr	10	11	9
Other[5]	-	2	-	-	-	-
Roundfish						
Hake	81	60	Tr	2	Tr	-
Lingcod	-	-	-	-	-	-
Sablefish	52	35	-	13	12	10
Whiting	10	-	Tr	-	-	-
Other[6]	12	Tr	Tr	10	4	1
S. aleutianus	-	-	-	1	-	Tr
S. alutus	50	25	-	40	16	22
S. crameri	-	-	-	-	-	-
S. diploproa	-	-	-	-	-	-
S. pinniger	-	-	-	-	-	-
S. rubrivinctus	-	-	-	-	-	-
Seb. alascanus	-	-	-	-	-	-
Other[7]	5	Tr	-	6	-	-
Dogfish	14	4	Tr	-	2	-
Ratfish	227	72	-	125	-	6
Skate	Tr	-	Tr	-	-	-
Invertebrates						
Shrimp	46	31	Tr	185	32	32
Other	Tr	Tr	Tr	5	8	6

Table 1 continued

Haul No.	19	20	21	22	23	24
Date	Mar. 4	Mar. 4	Mar. 4	Mar. 4	Mar. 6	Mar. 6
Area	GI	GI	GI	GI	GI	GI
Total catch (lbs.)	100	100	0	40	100	100
Flatfish						
Dover sole	-	-	-	-	-	Tr[4]
Flathead sole	Tr	-	-	-	Tr	-
Halibut	-	-	-	5(1)	-	-
Lemon sole	-	-	-	-	6	3
Petrale sole	-	-	-	-	2	1
Rex sole	3	6	-	-	5	9
Slender sole	-	-	-	-	1	-
Turbot	13	25	-	12	8	5
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	-	-	-	-	-	-
Lingcod	-	-	-	-	-	-
Sablefish	10	8	-	-	10	-
Whiting	-	-	-	-	-	-
Other[6]	Tr	Tr	-	1	Tr	-
S. aleutianus	-	-	-	-	-	-
S. alutus	8	5	-	1	Tr	Tr
S. crameri	Tr	-	-	1	-	-
S. diploproa	-	-	-	-	-	-
S. pinniger	-	-	-	-	-	-
S. rubrivinctus	-	-	-	-	-	-
Seb. alascanus	-	-	-	-	-	-
Other[7]	6	-	-	-	4	-
Dogfish	-	-	-	15	-	-
Ratfish	-	Tr	-	3	Tr	4
Skate	-	Tr	-	-	20	94
Invertebrates						
Shrimp	51	74	-	-	1	-
Other	4	Tr	-	2	5	6

Table 1 continued

Haul No.	25	26	27	28	29	30
Date	Mar. 6	Mar. 6	Mar. 7	Mar. 9	Mar. 9	Mar. 9
Area	GI	GI	GI	QS	QS	QS
Total catch (lbs.)	2	14	100	300	1,500	400
Flatfish						
Dover sole	-	-	-	-	-	-
Flathead sole	-	-	-	6	2	4
Halibut	-	-	-	-	-	-
Lemon sole	-	-	1	-	-	-
Petrale sole	-	-	-	-	-	-
Rex sole	-	1	2	5	2	7
Slender sole	-	-	-	1	1	4
Turbot	-	-	2	2	2	5
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	-	-	-	50	15	81
Lingcod	-	5	7	-	-	-
Sablefish	-	-	4	-	-	-
Whiting	-	-	-	1	-	-
Other[6]	-	-	5	7	1	6
S. aleutianus	-	-	-	Tr[4]	-	Tr
S. alutus	-	Tr	Tr	1	2	1
S. crameri	-	-	-	Tr	-	-
S. diploproa	-	-	-	-	-	1
S. pinniger	-	-	2	-	-	-
S. rubrivinctus	-	-	-	-	-	-
Seb. alascanus	-	-	-	-	-	-
Other[7]	-	2	-	4	-	2
Dogfish	-	6	-	56	1,440	63
Ratfish	-	Tr	-	Tr	-	Tr
Skate	-	-	37	3	6	-
Invertebrates						
Shrimp	-	-	Tr	127	59	154
Other	2	-	3	-	-	-

Table 1 continued

Haul No.	31	32	33	34	35	36
Date	Mar. 9	Mar. 10	Mar. 10	Mar. 10	Mar. 10	Mar. 10
Area	QS	QS	QS	QS	QS	QS
Total catch (lbs.)	1,100	100	200	0	0	0
Flatfish						
Dover sole	-	3	1	-	-	-
Flathead sole	2	-	-	-	-	-
Halibut	-	-	-	-	-	-
Lemon sole	-	-	-	-	-	-
Petrale sole	-	-	-	-	-	-
Rex sole	1	1	1	-	-	-
Slender sole	1	13	5	-	-	-
Turbot	-	-	-	-	-	-
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	56	53	19	-	-	-
Lingcod	-	-	-	-	-	-
Sablefish	-	-	-	-	-	-
Whiting	-	7	-	-	-	-
Other[6]	2	Tr[4]	-	-	-	-
S. aleutianus	Tr	2	-	-	-	-
S. alutus	Tr	-	-	-	-	-
S. crameri	-	-	-	-	-	-
S. diploproa	-	-	-	-	-	-
S. pinniger	-	-	-	-	-	-
S. rubrivinctus	-	-	Tr	-	-	-
Seb. alascanus	-	-	-	-	-	-
Other[7]	Tr	-	78	-	-	-
Dogfish	1,015	48	-	-	-	-
Ratfish	Tr	3	16	-	-	-
Skate	-	-	5	-	-	-
Invertebrates						
Shrimp	68	2	10	-	-	-
Other	Tr	-	3	-	-	-

Table 1 continued

Haul No.	37	38	39	40	41	42
Date	Mar. 12	Mar. 12	Mar. 13	Mar. 13	Mar. 13	Mar. 13
Area	QS	QS	ED	ED	ED	ED
Total catch (lbs.)	200	200	6,400	0	2,800	6,800
Flatfish						
Dover sole	-	2	20	-	594	8
Flathead sole	3	20	-	-	-	-
Halibut	-	-	47(4)	-	19(1)	36(1)
Lemon sole	-	-	-	-	-	-
Petrale sole	-	-	315	-	183	81
Rex sole	15	5	121	-	65	30
Slender sole	3	5	-	-	-	60
Turbot	-	-	4,428	-	248	972
Other[5]	-	-	-	-	-	-
Roundfish						
Hake	4	2	18	-	21	14
Lingcod	-	6	110	-	-	33
Sablefish	-	-	480	-	1,288	179
Whiting	7	3	-	-	-	14
Other[6]	13	17	-	-	-	-
S. aleutianus	-	-	97	-	145	3
S. alutus	1	8	550	-	78	4,623
S. crameri	Tr[4]	Tr	31	-	3	135
S. diploproa	-	-	22	-	2	198
S. pinniger	-	-	-	-	-	-
S. rubrivinctus	-	-	29	-	-	234
Seb. alascanus	-	-	45	-	148	42
Other[7]	-	-	10	-	-	59
Dogfish	1	6	16	-	-	110
Ratfish	11	2	21	-	-	21
Skate	-	8	-	-	26	9
Invertebrates						
Shrimp	108	136	-	-	-	-
Other	Tr	Tr	-	-	Tr	-

Table 1 continued

Haul No.	43	44
Date	Mar. 14	Mar. 14
Area	NS	NS
Total catch (lbs.)	100	100
Flatfish		
Dover sole	5	35
Flathead sole	-	-
Halibut	-	-
Lemon sole	-	-
Petrale sole	-	3
Rex sole	-	6
Slender sole	12	2
Turbot	-	-
Other[5]	-	-
Roundfish		
Hake	6	3
Lingcod	-	-
Sablefish	1	-
Whiting	-	-
Other[6]	2	3
S. aleutianus	-	-
S. alutus	-	-
S. crameri	-	-
S. diploproa	-	-
S. pinniger	-	Tr[4]
S. rubrivinctus	-	-
Seb. alascanus	-	-
Other[7]	-	-
Dogfish	-	-
Ratfish	73	48
Skate	9	2
Invertebrates		
Shrimp	5	2
Other	-	-

Footnotes for Table 1

[1]Area: CS = SW Cape Scott
ED = Estevan Deep
FS = Fitz Hugh Sound
GI = "SE Edge" Goose Island Ground
NS = Nootka Sound
QCS = Queen Charlottle Sound, west of Goose Island Ground
QS = Quatsino Sound
RI = Rivers Inlet
SS = Smith Sound

[2]Type of bottom: Gr = green Gy = grey G = gravel Hd = hard
M = mud S = sand

[3]Net used: G-1/L = Gunlene #1, 400-mesh eastern-type groundfish trawl with rubber bobbins on groundrope and 1.5"-mesh liner in cod-end; S-1/L = 70' Gulf balloon shrimp trawl with 0.5"-mesh liner in the cod-end.

[4]Tr = Trace = less than 1 pound

[5]Other flatfish: Rock sole

[6]Other roundfish (other than rockfish): Blenny; Eel-pout; Eulachon; Greenling; Herring; Midshipman; Pacific cod; Sculpin; and Sea-poacher

[7]Other rockfish: Sebastodes brevispinis; S. elongatus; S. entomelas; S. flavidus; S. goodei (?); S. helvomaculatus; S. maliger;

Footnotes for Table 1 continued

S. ovalis (?); S. paucispinis; S. proriger; S. ruberrimus; S. vexillaris (?); S. zacentrus

Table 2. Salinities collected during Cruise No. 64-2 of the "G.B. Reed", February-March, 1964.

Haul No.	Area	Salinities (°/oo)		Depth (fms.)
		Surface	Bottom	
4	Fitz Hugh Sound	30.07	33.14	180
5	" " "	30.05	33.16	170
6	" " "	-	33.16	200
8	Rivers Inlet	27.44	33.19	161
10	" "	27.21	33.17	164
39	Estevan Deep	-	34.04	200
41	" "	-	34.06	232

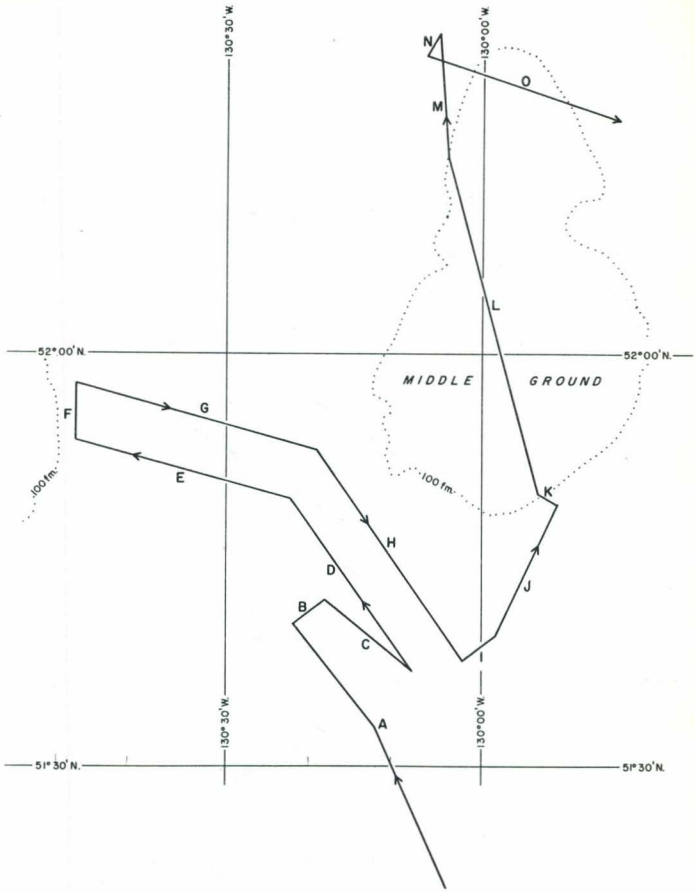

Fig. 1. Chart of western Queen Charlotte Sound showing the trackline scouted by the "G. B. Reed" on Cruise No. 64-2, February, 1964.

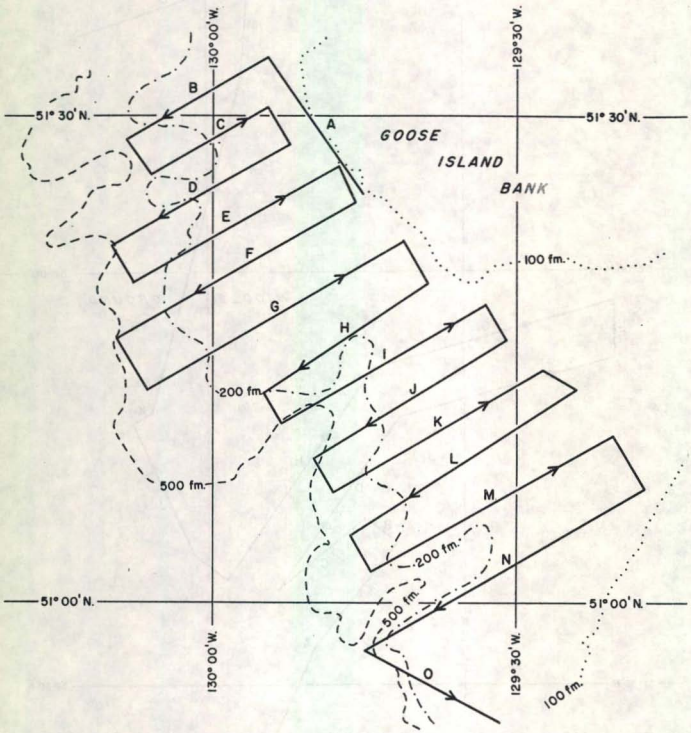

Fig. 2. Chart of western Queen Charlotte Sound showing trackline scouted by the "G. B. Reed" during Cruise No. 64-2, March, 1964.

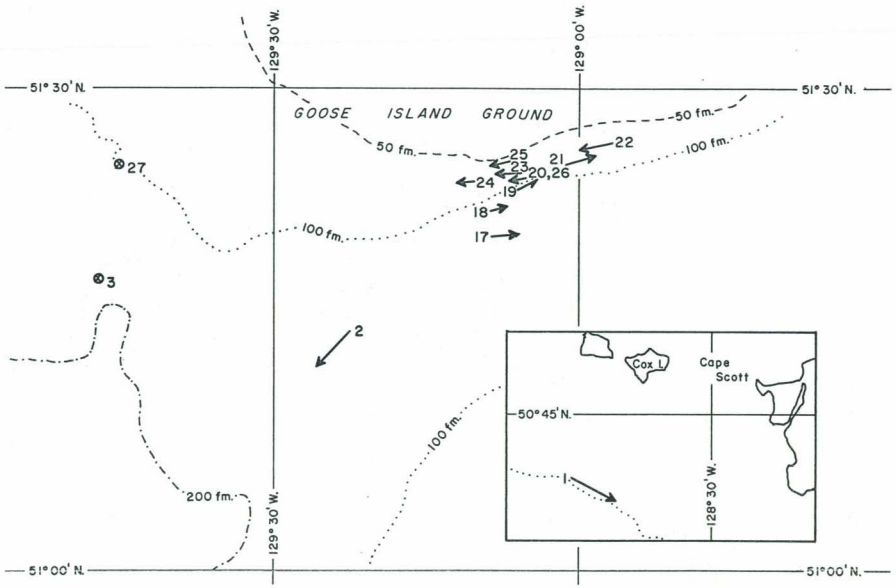

Fig. 3. Chart of Queen Charlotte Sound and Cape Scott (insert) showing location of trawl hauls made by the "G. B. Reed" during Cruise No. 64-2, February-March, 1964.

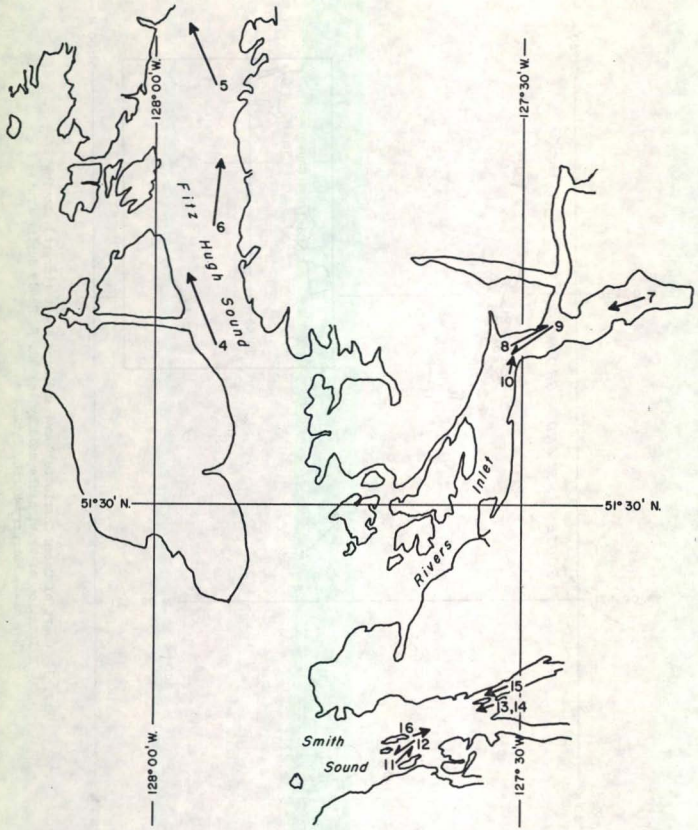

Fig. 4. Chart of Fitz Hugh Sound, Rivers Inlet, and Smith Sound showing location of trawl hauls made by the "G. B. Reed" during Cruise No. 64-2, February-March, 1964.

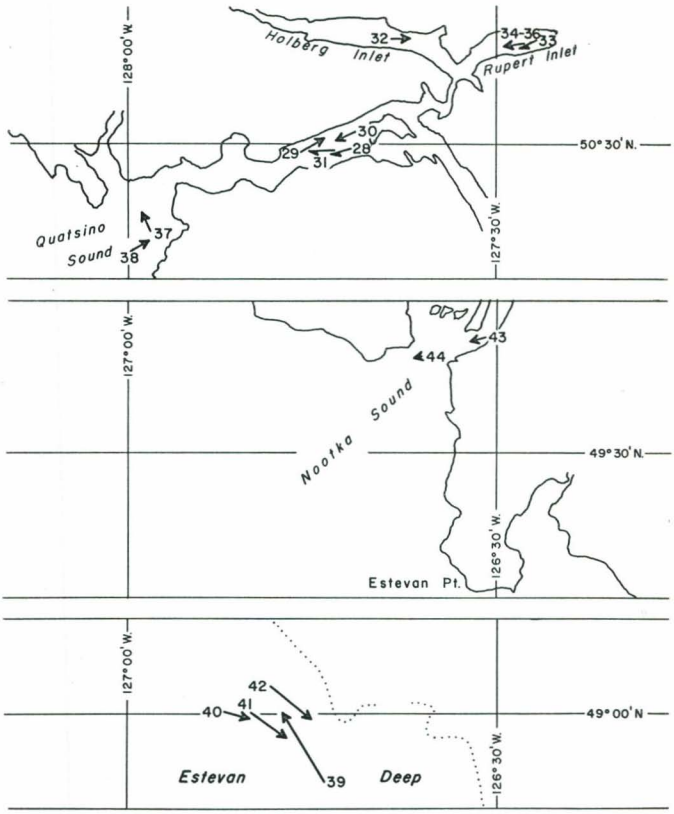

Fig. 5. Chart of Quatsino Sound, Nootka Sound, and Estevan Deep showing location of trawl hauls made by the "G. B. Reed" during Cruise No. 64-2, February-March, 1964.

CRUISE REPORT FOR THE G. B. REED

Groundfish Cruise No. 64-8

July 27 - August 22, 1964

PURPOSE

1. Locate and sample concentrations of Pacific ocean perch (Sebastodes alutus) for size and age composition, and sex ratio.
2. Record incidence of, and pertinent information on, other species of groundfish (including halibut) and invertebrates.
3. Continue testing deck-sampling procedures for Pacific ocean perch and other groundfish species.
4. Establish vertical water temperature regimes in all trawling areas.
5. Determine type of bottom in all trawling areas.
6. Make appropriate observations on Japanese and Russian fishing operations when encountered.

AREAS

1. Smith Sound (Queen Charlotte Sound) (Figure 1).
2. Chirikof Island - Unalaska Island (North Pacific Ocean) (Figure 1).

PORTS OF CALL

1. Sand Point, Alaska (Popof Island): August 22, 24-25.

RESULTS

A total of 40 hauls with shrimp and groundfish trawls were completed - 6 with the shrimp trawl and 34 with the groundfish trawl. Total catch was 83,000 lbs.

The cruise was divided into two parts, geographically. One day, July 28, was spent in Smith Sound (Queen Charlotte Sound) sampling a stock of juvenile ocean perch. Six hauls were made in this area with a 70-foot shrimp trawl and the total catch was 2,200 lbs. The second portion of the cruise was spent in Alaskan waters (Chirikof Island-Unalaska Island)

sampling stocks of Pacific ocean perch, sablefish, and Pacific cod. All hauls (34) were made with the bobbin groundfish trawl utilized in 1963 (GBR 63-6 and 63-7). The total catch was 80,800 lbs.

Guests during the cruise were Messrs. G. Cowan and K. Sandercock, graduate students from the University of British Columbia. They were present to collect samples of selected groundfish species for a racial study, and to collect specimens for the Museum of the Institute of Fisheries (U.B.C.). Their assistance in various phases of the work is gratefully acknowledged.

1. Trawling in Smith Sound was conducted in the same area as for GBR 64-2 (March 1964) Catches of juvenile ocean perch were disappointing. Only 134 specimens (age groups II-IX) were caught. The availability and/or abundance was substantially lower than that observed in March 1964 (GBR 64-2). Location of the hauls is shown in the insert of Figure 1. The total catch by species for the 6 hauls with the shrimp trawl is listed below:

SPECIES	POUNDS	PERCENT
Hake	500	22.7
Ratfish	300	13.6
Sponge	300	13.6
Slender sole	170	7.7
Shrimp	150	6.8
Sablefish	140	6.4
Dover sole	120	5.5
Turbot	110	5.0
Other[1]	410	18.6
Total	2200	99.9

[1]All species which contributed less than 100 lbs. in the total catch. No halibut were caught.

Appendix Table I contains the detailed log of fishing activities in Smith Sound during GBR 64-8.

2. A total of 34 hauls were completed in Alaskan waters from Chirikof Island to Unalaska Island. Figures 2, 3, and 4 show the location of the hauls. Twenty-three hauls were made for ocean perch along the outer continental shelf and upper continental slope (80-175 fms.), 9 in inshore waters (13-80 fms.) in search of Pacific cod and rock sole and 2 in deep water (238-252 fms.) for sablefish. All hauls were made with the eastern-type bobbin groundfish trawl (D-1) described in the cruise report for

GBR 63-6. D-1 was modified in 1964 so that the mesh size in the codend and intermediate was 3 inches rather than 4.5 inches as in 1963. A 1.5-inch mesh liner was again installed in the codend to retain any juvenile fish.

Ocean perch abundance was high throughout the fishing area. Catch rates ranged from 600 to 22,000 lbs. per hr. The average was 7,700 lbs. per hr. Availability was variable. Often the schools, as indicated on the sounder, remained 10-30 fms. off the bottom until late morning before settling to the bottom. They were rarely seen on the bottom during the night, in sharp contrast to their behaviour in 1963 (July-September) to the eastward (Kodiak Island to Yakutat Canyon).

Pacific cod were never found in substantial quantities. Reports from Sand Point residents indicated that cod "disappeared" from that area in the early 1950's.

Sablefish probably are plentiful in deeper waters. The two hauls completed yielded 1200-1500 lbs./hr. of marketable fish.

Halibut catches were zero in the two deep-water hauls, light in ocean perch hauls (0-4% by weight), and heavy (0-95%) in inshore hauls. Appendix Table II gives the details of the fishing operations.

Following is a summary of the total catch, by species, in Alaskan waters:

SPECIES	POUNDS	PERCENT
Pacific ocean perch	50,000	61.9
Pacific pollock	10,100	12.5
Grenadier	3,700	4.6
Turbot	3,300	4.1
Sablefish	2,300	2.9
Shrimp	1,700	2.1
Halibut[1]	1,500 (371)	1.9
S. polyspinis	1,400	1.7
Sculpin	1,000	1.2
Other[2]	5,800	7.2
Total	80,800	100.1

[1]Numbers in parentheses.

[2]All species which contributed less than 1,000 lbs. to the total catch.

3. Fork length measurements were taken from 63,514 fish and otoliths, scales and/or interopercle bones from 2,210. Substantial numbers (57,175) of ocean

perch were measured in conjunction with empirical tests of deck sampling procedures. Following is a summary of the information collected:

SPECIES	NUMBERS MEASURED	NO. OF OTOLITHS, ETC.
Pacific ocean perch	57,175	865
Yellowfin sole	1,529	205
S. polyspinis	1,132	127
Sablefish	885	248
Rock sole	619	374
Ratfish	576	..
Pacific pollock	435	..
Halibut	371	..
Pacific cod	259	214
Eulachon	258	..
Flathead sole	189	177
Sand sole	86	..
Total	63,514	2,210

4. B.T. casts were taken at 31 trawling stations and 3 casts with a reversing thermometer were made at trawling stations too deep for the B.T. In addition 8 "ocean series" B.T. casts were made across the Gulf of Alaska to and from the fishing grounds.

In Smith Sound, 3 B.T. casts were taken in 60-80 fms. Surface water temperatures were 15.5-16.5°C and bottom temperatures, 7.3-7.8°C. Bottom temperatures for the same area were 8.0-8.1°C in March 1964.

In the Alaska area, 31 B.T. (or reversing thermometer) casts were completed in depths of 21-270 fms. Surface water temperatures were 9.8-11.4°C. Inshore, surface water temperatures were generally cooler. Bottom temperatures ranged from 8.4°C at 21 fms. to 4.0°C at 270 fms. Appendix Tables I and II contain the detailed information.

5. Bottom grab casts with a Dietz-La Fond sampler were taken at 33 trawling stations. The details are included in Appendix Tables I and II.

6. One Japanese vessel was viewed at close range on the evening of August 7. This was the Tenyu-maru No. 29 which was hauling her sablefish longlines 60 miles E × S of Sanak Island in 240 fms. She was about as big as the G.B. Reed and appeared to have made a very successful set. Sablefish were hanging on nearly every hook. A few Russian vessels were sighted at long range, but none were close enough for identification.

PERSONNEL

Scientific personnel aboard during the cruise were as follows:

S. J. Westrheim
T. Pletcher
D. Davenport
W. A. Harling
C. Levings
G. Cowan (U.B.C.)
K. Sandercock (U.B.C.)

APPENDIX

Table I. Fishing log for the "G. B. Reed" in Smith Sound, July 28, 1964, GBR # 64-8. (All hauls made with 70' shrimp trawl.)

Haul No.		1	2	3	4	5	6
Start (PDT)		0610	0808	0938	1040	1255	1432
Duration (min.)		20	26	20	25	30	28
Start: N. Lat.	°	51	51	51	51	51	51
	'	20	20	20	18.4	17	17
W. Long.	°	127	127	127	127	127	127
	'	32	32	32	38.6	40	40
End: N. Lat.	°	51	51	51	51	51	51
	'	19.4	19.5	18.5	18.6	18.2	18.2
W. Long.	°	127	127	127	127	127	127
	'	33.2	33.2	33.2	37.5	38.3	38.3
Depth (fms.)		70-74	70-72	70	55-60	86-78	88-80
Bottom type[1]		GrM	..	..	GrM, G	Hd, Sp	..
Water temp. (°C):							
Surface		15.5	..	..	16.5	16.5	..
Bottom		7.8	..	..	7.7	7.3	..
Total Catch (lbs.)		214	372	341	36	894	348
Remarks:		..	..	..	Snag, net torn	..	Snag, Cod end lost.

Table I (continued)

Haul No.	1	2	3	4	5	6
Total Catch (lbs.)	210	370	340	40	890	350
Flatfish						
Dover sole	5	13	3	..	53	44
English sole	21	17	6	..	..	..
Flathead sole	29	35	21	Tr	..	..
Rex sole	4	4	3	Tr	..	6
Slender sole	28	51	27	Tr	41	26
Turbot	5	23	10	..	60	10
Roundfish						
Hake	3	110	226	Tr	87	69
Lingcod	..	..	..	..	23	..
Pacific cod	..	5	..	..	33	7
Sablefish	19	27	4	..	60	25
Other[2]	18	Tr[5]	Tr	5	..	Tr
Rockfish[3]						
S. aleutianus	6	6	1	..	19	12
S. alutus	11	20	5	15	10	2
S. diploproa	..	..	..	..	1	..
S. paucispinis	4	8	..	..	20	4
S. zacentrus	..	..	1	1	1	..
Selachii						
Ratfish	44	25	26	4	104	101
Skate	..	8	3	..	15	8
Invertebrates[4]						
Shrimp	17	20	5	11	67	34
Sponge	..	..	..	..	300	..

Footnotes to Table I.

[1]Bottom type: G = gravel Gr = green Hd = hard M = mud
Sp = sponge

[2]Other roundfish: eel pout; sea poachers; prickleback.

[3]Other rockfish (never more than trace in haul):
S. crameri; S. elongatus

[4]Other invertebrates (never more than Tr in haul):
crab; cucumber; starfish; urchin; clams; snails.

[5]Tr = Trace = < 1 lb.

Table II. Groundfish trawl fishing log for Cruise No. 64-8 of the "G. B. Reed," Chirikof Island to Unalaska Island, August 1964.

Haul No.			7	8	9	10	11	12
Date			Aug. 2	Aug. 2	Aug. 3	Aug. 4	Aug. 4	Aug. 4
Area[1]			CI	CI	CI	SI	SI	SI
INPFC Area			055553	056553	056553	057550	057550	057550
Start[2]			0845	1305	0830	0845	1255	1550
Duration (min.)			30	40	25	20	20	15
Start:	N. Lat.	°	55	55	55	55	55	55
		'	51	44	39	15	10	08
	W. Long.	°	154	155	155	156	156	156
		'	57	08	52	18	49	57
End:	N. Lat.	°	55	55	55	55	55	55
		'	49.5	42	41	16	09.2	07.5
	W. Long.	°	154	155	155	156	156	156
		'	58	09	53	23	51	59
Depth (fms.)			118-108	110-104	96-90	140-118	122-118	104-103
Bottom type[3]			S, G	Hd, S	Hd, G	Hd, G	S, G	Hd, G
Water temp. (°C.)								
Surface			10.1	10.1	11.0	11.0	10.8	11.3
Bottom			5.0	5.1	5.2	4.7	4.6	4.7
Net used[4]			D-1--------same net throughout cruise----------					
Total catch (lbs.)			1600	6800	7600	2100	6200	1200
Remarks:			..	..	..	..	..	..

Table II (continued)

Haul No.	13	14	15	16	17	18
Date	Aug. 5	Aug. 5	Aug. 5	Aug. 6	Aug. 6	Aug. 6
Area[1]	SiI	SiI	SiI	SiI	SiI	BI
INPFC Area	058543	059543	059543	059543	060540	060540
Start[2]	0830	1035	1335	0837	1225	1537
Duration (min.)	20	5	4	15	25	13
Start: N. Lat. °	54	54	54	54	54	54
'	48	48.5	47	30	26	26
W. Long. °	157	158	158	158	159	159
'	50	00	06	56	16	21
End: N. Lat. °	54	54	54	54	54	54
'	49	48.5	47	29	25.5	26
W. Long. °	157	158	158	158	159	159
'	48	00	07	56	19	19
Depth (fms.)	114-117	58	58	136-176	125-114	124-118
Bottom type[3]	Hd, S	..	G, GrS	Hd, S	Hd, S	Hd, S
Water temp. (°C.)						
Surface	10.8	..	11.3	10.8	10.7	10.6
Bottom	5.0	..	4.9	4.6	4.6	4.6
Net used[4]	D-1--------same net throughout cruise----------					
Total catch (lbs.)	5900	300	600	300	700	1800
Remarks:	..	snag	snag	..	..	..

Table II (continued)

Haul No.		19	20	21	22	23	24
Date		Aug. 7	Aug. 7	Aug. 8	Aug. 8	Aug. 8	Aug. 9
Area[1]		BI	UI	SaI	SaI	SaI	UI
INPFC Area		060540	061540	062540	062540	062540	061550
Start[2]		0940	1540	1120	1208	1250	1118
Duration (min.)		23	20	25	3	4	27
Start:	N. Lat. °	54	54	54	54	54	55
	'	26	17	13	13	13	18.6
	W. Long. °	159	160	161	161	161	160
	'	52	54	31	31	31	57.6
End:	N. Lat. °	54	54	54	..	54	55
	'	26	17	15	..	12.9	17
	W. Long. °	159	160	161	..	161	160
	'	48	49	30	..	32	56
Depth (fms.)		76-83	80-90	62-60	62	60-56	29-32
Bottom type[3]		Hd, S, G	R	..	..	Hd, G	GrS, M
Water temp (°C)							
Surface		10.6	10.4	..	..	9.8	10.0
Bottom		4.8	4.8	..	..	4.7	6.2
Net used[4]		D-1--------same net throughout cruise----------					
Total catch (lbs.)		4900	2100	0	0	700	400
Remarks		..	..	Crossed doors	Crossed doors	Snag	..

Table II (continued)

Haul No.	25	26	27	28	29	30
Date	Aug. 9	Aug. 9	Aug. 10	Aug. 10	Aug. 12	Aug. 12
Area[1]	UI	UI	NI	StB	NI	SaI
INPFC Area	062550	061550	060550	060553	061543	062540
Start[2] (Alaska D. L.)	1351	1630	0926	1426	0910	1310
Duration (min.)	27	20	30	31	15	12
Start: N. Lat. °	55	55	55	55	54	54
'	10	04.8	25.4	41.5	33.5	14
W. Long. °	161	160	159	159	160	161
'	02	47	59.8	57	55	34
End: N. Lat. °	55	55	55	55	54	54
'	12	04.4	23.5	40	32.7	13
W. Long °	161	160	159	159	160	161
'	03	45.5	59.4	56	57	37
Depth (fms.)	74-52	60-62	74-80	52-43	70	52
Bottom type[3]	GrM, S	G	GrM, G	GrS, M	Hd, S	GrM,S,G, Co
Water temp (°C)						
Surface	10.1	10.6	11.4	12.0	10.0	9.9
Bottom	6.0	5.4	4.4	6.1	4.5	4.5
Net used[4]	D-1--------same net throughout cruise----------					
Total catch (lbs.)	1600	500	1300	1000	500	4200
Remarks	..	..	..	..	..	..

Table II (continued)

Haul No.	31	32	33	34	35	36
Date	Aug. 13	Aug. 13	Aug. 13	Aug. 14	Aug. 14	Aug. 15
Area[1]	UnI	UnI	UnI	UaI	UaI	UaI
INPFC Area	065533	065533	065533	067530	067530	068530
Start[2]	0915	1314	1550	0840	1250	0830
Duration (min.)	15	31	20	15	30	20
Start: N. Lat. °	53	53	53	53	53	53
'	44.5	38.7	43	29	17.2	07
W. Long. °	164	164	164	166	166	167
'	11.5	44	40	01	34	06
End: N. Lat. °	53	53	53	53	53	53
'	45.5	38.8	43	28.5	17.2	06
W. Long. °	164	164	164	166	166	167
'	14.5	42	42	02.5	36	08
Depth (fms.)	110-98	238-252	80-78	80	112-104	102-98
Bottom type[3]	GyS	GrS,M,G	G	GrS, M	..	Hd, S
Water temp. (°C)						
Surface	9.8	10.3	9.8	9.9	10.2	9.9
Bottom	4.9	4.0	4.8	4.9	4.9	4.8
Net used[4]	D-1--------same net throughout cruise----------					
Total catch (lbs.)	7600	4300	2800	2100	5100	5000
Remarks	..	..	..	..	..	..

Table II (continued)

Haul No.		37	38	39	40
Date		Aug. 15	Aug. 16	Aug. 16	Aug. 16
Area[1]		UaI	UB	UB	SaI
INPFC Area		067530	065543	065543	064540
Start[2]		1340	0829	0931	1330
Duration (min.)		30	10	15	15
Start: N. Lat.	°	53	54	54	54
	'	14	35	36	22
W. Long.	°	166	164	164	163
	'	23	04	05	20
End: N. Lat.	°	53	54	54	54
	'	13.9	34	36	23
W. Long.	°	166	164	164	163
	'	25	05	01	19
Depth (fms.)		250-242	33	13-23	37-35
Bottom type[3]		Hd, S	S	GyS	DkS
Water temp. (°C)					
Surface		11.0	9.9	10.0	10.1
Bottom		4.0	6.7	8.4	5.2
Net used[4]		D-1--same net throughout cruise--			
Total catch (lbs.)		1100	300	200	400
Remarks		..	..	..	..

Table II (continued)

Haul No.	7	8	9	10
Date	Aug. 2	Aug. 2	Aug. 3	Aug. 4
Area[1]	CI	CI	CI	SI
Total Catch (lbs.)	1600	6800	7600	2100
FLATFISH:[5]				
Flathead sole	..	Tr[8]	110	..
Halibut[6]	..	85(3)	47(2)	..
Rex sole	125	216	14	..
Rock sole	..	193	..	..
Turbot	123	111	110	120
Yellowfin sole	..	..	..	..
Other[7]	6	Tr	..	..
ROCKFISH:				
S. aleutianus	1	..	..	2
S. alutus	883	4763	5787	1807
S. ciliatus	4	70	26	..
S. polyspinis	20	60	43	..
S. zacentrus	..	21	..	..
Seb. alascanus	138	237	..	114
Other[7]	..	1	8	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	..
Grenadier	..	..	..	..
Pacific cod	4	37	125	..
Pacific pollock	29	669	967	35
Sablefish	32	..	13	25
Sculpin	108	79	329	20
Searcher	2	37	..	..
Other[7]	2	..	12	..
SELACHII:[5]				
Skate	4	..	..	..
INVERTEBRATES[5]				
King crab	86	194	..	..
Shrimp	9	..	..	..
Tanner Crab	12	2	..	..
Other	1	Tr	..	1

Table II (continued)

Haul No.	11	12	13	14
Date	Aug. 4	Aug. 4	Aug. 5	Aug. 5
Area[1]	SI	SI	SiI	SiI
Total Catch (lbs.)	6200	1200	5900	300
FLATFISH:[5]				
Flathead sole	..	4	5	..
Halibut[6]	..	..	..	200(1)
Rex sole	10	30	20	1
Rock sole	..	..	1	4
Turbot	44	224	393	..
Yellowfin sole	..	..	..	..
Other[7]	..	2	21	..
ROCKFISH:				
S. aleutianus	3	..	Tr	..
S. alutus	6075	459	5308	62
S. ciliatus	2	..	..	2
S. polyspinis	..	..	..	36
S. zacentrus	..	..	..	..
Seb. alascanus	39	33	39	1
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	..
Grenadier	..	..	..	..
Pacific cod	..	..	..	2
Pacific pollock	44	95	28	..
Sablefish	43	314	68	..
Sculpin	48	27	33	2
Searcher	..	..	..	..
Other[7]	..	..	1	1
SELACHII:[5]				
Skate	..	3	..	..
INVERTEBRATES[5]				
King crab	..	..	..	..
Shrimp	..	..	..	..
Tanner Crab	..	..	..	..
Other	Tr	10	6	Tr

Table II (continued)

Haul No.	15	16	17	18
Date	Aug. 5	Aug. 5	Aug. 6	Aug. 6
Area[1]	SiI	SiI	SiI	BI
Total Catch (lbs.)	600	300	700	1500
FLATFISH:[5]				
Flathead sole	..	..	..	..
Halibut[6]	..	..	..	..
Rex sole	..	4	4	6
Rock sole	3	..	..	..
Turbot	1	27	67	75
Yellowfin sole	..	..	..	..
Other[7]	..	4	1	..
ROCKFISH:				
S. aleutianus	..	..	..	Tr
S. alutus	211	151	520	1507
S. ciliatus	6	..	..	..
S. polyspinis	329	..	..	1
S. zacentrus	17	..	..	..
Seb. alascanus	..	6	6	57
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	..
Grenadier	..	..	..	..
Pacific cod	..	..	..	3
Pacific pollock	2	14	109	105
Sablefish	..	4	18	38
Sculpin	Tr	6	2	3
Searcher	..	..	..	..
Other[7]	..	..	..	..
SELACHII:[5]				
Skate	..	..	..	9
INVERTEBRATES[5]				
King crab	..	..	..	..
Shrimp	..	Tr	..	1
Tanner Crab	..	..	..	..
Other	Tr	49	Tr	Tr

Table II (continued)

Haul No.	19	20	21	22
Date	Aug. 7	Aug. 7	Aug. 8	Aug. 8
Area[1]	BI	UI	SaI	SaI
Total Catch (lbs.)	4900	2100	..	..
FLATFISH:[5]				
Flathead sole	2	..	..	..
Halibut[6]	11(1)	87(1)	..	..
Rex sole	10	2	..	..
Rock sole	..	..	..	..
Turbot	103	215	..	..
Yellowfin sole	..	..	..	..
Other[7]	..	4	..	..
ROCKFISH:				
S. aleutianus	..	..	..	..
S. alutus	4544	1404	..	..
S. ciliatus	..	..	..	..
S. polyspinis	94	29	..	..
S. zacentrus	..	..	..	..
Seb. alascanus	3	..	..	..
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	..
Grenadier	..	..	..	..
Pacific cod	..	78	..	..
Pacific pollock	45	44	..	..
Sablefish	6	8	..	..
Sculpin	36	89	..	..
Searcher	68	5	..	..
Other[7]	..	..	..	..
SELACHII:[5]				
Skate	..	..	..	..
INVERTEBRATES:[5]				
King crab	..	..	..	..
Shrimp	..	..	..	..
Tanner Crab	..	..	..	..
Other	..	10	..	..

Table II (continued)

Haul No.	23	24	25	26
Date	Aug. 8	Aug. 9	Aug. 9	Aug. 9
Area[1]	SaI	UI	UI	UI
Total Catch (lbs.)	700	400	1600	500
FLATFISH:[5]				
Flathead sole	..	..	4	3
Halibut[6]	..	52(24)	71(17)	5(4)
Rex sole	..	..	..	..
Rock sole	3	..	Tr	..
Turbot	1	23	217	43
Yellowfin sole	..	178	Tr	1
Other[7]	..	8	5	..
ROCKFISH:				
S. aleutianus	..	..	..	..
S. alutus	626	..	..	..
S. ciliatus	1	..	..	..
S. polyspinis	16	..	..	..
S. zacentrus	..	..	..	..
Seb. alascanus	..	..	..	..
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	Tr	11	Tr
Grenadier	..	..	..	..
Pacific cod	..	5	33	135
Pacific pollock	42	25	63	5
Sablefish	..	0	28	..
Sculpin	2	Tr	50	35
Searcher	5	..	..	..
Other[7]	2	9	11	1
SELACHII:[5]				
Skate	..	42	..	..
INVERTEBRATES:[5]				
King crab	..	..	278	..
Shrimp	..	..	531	256
Tanner Crab	..	19	321	20
Other	Tr	10	4	12

Table II (continued)

Haul No.	27	28	29	30
Date	Aug. 10	Aug. 10	Aug. 12	Aug. 12
Area[1]	NI	StB	NI	SaI
Total catch (lbs.)	1300	1000	500	4200
FLATFISH:[5]				
Flathead sole	53	12	9	..
Halibut[6]	179(40)	84(29)	..	..
Rex sole	Tr	..	Tr	..
Rock sole	Tr	..	..	3
Turbot	319	17	426	3
Yellowfin sole	Tr	144	..	..
Other[7]	..	Tr	..	..
ROCKFISH:				
S. aleutianus	..	..	..	..
S. alutus	Tr	Tr	..	3273
S. ciliatus	..	..	..	44
S. polyspinis	Tr	..	..	780
S. zacentrus	..	..	..	34
Seb. alascanus	..	..	..	..
Other[7]	..	..	..	4
OTHER ROUNDFISH:[5]				
Eulachon	26	..	Tr	..
Grenadier	..	..	..	..
Pacific cod	9	7	..	14
Pacific pollock	20	8	..	62
Sablefish	17	..	30	..
Sculpin	3	11	22	1
Searcher	..	..	..	1
Other[7]	15	15	1	..
SELACHII:[5]				
Skate	36	..	1	..
INVERTEBRATES:[5]				
King crab	15	6	..	..
Shrimp	550	354	..	..
Tanner Crab	32	20	5	Tr
Other	..	363	8	8

Table II (continued)

Haul No.	31	32	33	34
Date	Aug. 13	Aug. 13	Aug. 13	Aug. 14
Area[1]	UnI	UnI	UnI	UaI
Total catch (lbs.)	7600	4300	2800	2100
FLATFISH:[5]				
Flathead sole	2	..	11	27
Halibut[6]	..	..	3(1)	29(4)
Rex sole	13	..	83	40
Rock sole	..	..	15	19
Turbot	192	..	46	73
Yellowfin sole	..	..	..	..
Other[7]	2	..	..	..
ROCKFISH:				
S. aleutianus	..	46	Tr	..
S. alutus	5509	4	2346	747
S. ciliatus	3	..	..	..
S. polyspinis	1	..	2	..
S. zacentrus	..	..	..	..
Seb. alascanus	69	187	Tr	..
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	..
Grenadier	..	3204	..	..
Pacific cod	11	..	21	31
Pacific pollock	1629	..	137	1110
Sablefish	2	750	118	..
Sculpin	69	..	19	..
Searcher	..	..	Tr	..
Other[7]	..	..	Tr	..
SELACHII:[5]				
Skate	..	112	Tr	..
INVERTEBRATES:[5]				
King crab	..	..	..	..
Shrimp	..	..	..	..
Tanner Crab	..	..	..	2
Other	93	13	..	..

Table II (continued)

Haul No.	35	36	37	38
Date	Aug. 14	Aug. 15	Aug. 15	Aug. 16
Area[1]	UaI	UaI	UaI	UB
Total catch (lbs.)	5000	5000	1100	300
FLATFISH:[5]				
Flathead sole	14	..	..	Tr
Halibut[6]	..	..	..	63(57)
Rex sole	33	22	..	..
Rock sole	40	68	..	50
Turbot	205	121	..	30
Yellowfin sole	..	..	..	51
Other[7]	..	Tr	4	17
ROCKFISH:				
S. aleutianus	..	..	..	..
S. alutus	1348	2639	..	..
S. ciliatus	..	..	..	..
S. polyspinis	8	2	..	..
S. zacentrus	..	..	..	..
Seb. alascanus	..	Tr	12	..
Other[7]	..	..	..	..
OTHER ROUNDFISH:[5]				
Eulachon	..	..	..	Tr
Grenadier	..	..	479	..
Pacific cod	166	417	..	37
Pacific pollock	3146	1656	..	3
Sablefish	145	85	595	..
Sculpin	9	33	Tr	Tr
Searcher	..	..	..	..
Other[7]	Tr	Tr	..	Tr
SELACHII:[5]				
Skate	Tr	..	..	..
INVERTEBRATES:[5]				
King crab	..	..	..	..
Shrimp	..	..	..	..
Tanner Crab	..	..	..	..
Other	Tr	..	Tr	8

Table II (continued)

Haul No.	39	40
Date	Aug. 16	Aug. 16
Area[1]	UB	SaI
Total catch (lbs.)	200	400
FLATFISH:[5]		
Flathead sole	..	..
Halibut[6]	199(177)	427(10)
Rex sole	..	..
Rock sole	12	10
Turbot	Tr	6
Yellowfin sole	2	..
Other[7]	16	1
ROCKFISH:		
S. aleutianus	..	..
S. alutus	..	..
S. ciliatus	..	..
S. polyspinis	..	..
S. zacentrus	..	..
Seb. alascanus	..	..
Other[7]	..	..
OTHER ROUNDFISH:[5]		
Eulachon	..	..
Grenadier	..	..
Pacific cod	..	3
Pacific pollock	..	Tr
Sablefish	..	..
Sculpin	..	2
Searcher	..	..
Other[7]	Tr	..
SELACHII:[5]		
Skate	..	..
INVERTEBRATES:[5]		
King crab	..	..
Shrimp	..	Tr
Tanner Crab	..	..
Other	1	Tr

Footnotes to Table II

[1]Area: BI = Bird Island; CI = Chirikof Island; NI = Nagai Island; SI = Semidi Islands; SaI = Sanak Island; StB = Stepovak Bay; SiI = Simeonof Island; UB = Unimak Bight; UI = Unga Island; UaI = Unalaska Island; UnI = Unimak Island

[2]Start: Pacific Daylight Time for hauls 7-23.

Alaska Daylight Time for hauls 24-40.

[3]Bottom type: Dk = dark Gr = green Gy = grey Hd = hard S = sand

Co = coral G = gravel M = mud R = rocky

[4]Net used: D-1: Drumfil No. 1: 400-mesh eastern-type groundfish trawl. Cod-end and intermediate mesh 3", body and wings 4.5", stretch measure between knots. Liner in cod-end with 1.5" mesh. Rubber bobbins on groundline.

[5]Flatfish:

Flathead sole	Hippoglossoides elassodon
Halibut	Hippoglossus stenolepis
Rex sole	Glyptocephalus zachirus
Rock sole	Lepidopsetta bilineata
Turbot	Atheresthes stomias
Yellowfin sole	Limanda aspera

Other Roundfish:

Eulachon	Thaleichthys pacificus
Grenadier	Coryphaenoididae
Pacific cod	Gadus macrocephalus
Pacific pollock	Theragra chalcogrammus
Sablefish	Anoplopoma fimbria
Sculpin	Cottidae
Searcher	Bathymasteridae

Selachii:

Skate	Rajidae

Footnotes for Table II (continued)

Invertebrates:

King crab	Paralithodes camtschatica
Shrimp	Pandalidae
Tanner Crab	Chionoecetes bairdi

[6]Numbers of halibut in parentheses.

[7]Other Flatfish (never more than 24 lbs. in haul):

Dover sole	Microstomus pacificus
English sole	Parophrys vetulus
Greenland halibut	Rheinhardtius hippoglossoides
Lemon sole	Pleuronectes quadrituberculatus
Sand sole	Psettichthys melanostictus

Other Rockfish (never more than 24 lbs. in haul):

S. brevispinis
S. rubrivinctus

Sebastolobus altivelis

Other Roundfish (never more than 24 lbs. in haul):

Chinook salmon	Oncorhynchus tshawytscha
Eel pout	Zoarcidae
Greenling	Hexagrammidae
Herring	Clupea pallasii
Poacher	Agonidae
Prickleback	Stichaeidae
Sandfish	Trichodon trichodon
Snailfish	Liparidae

[8]Tr = Trace = less than one pound

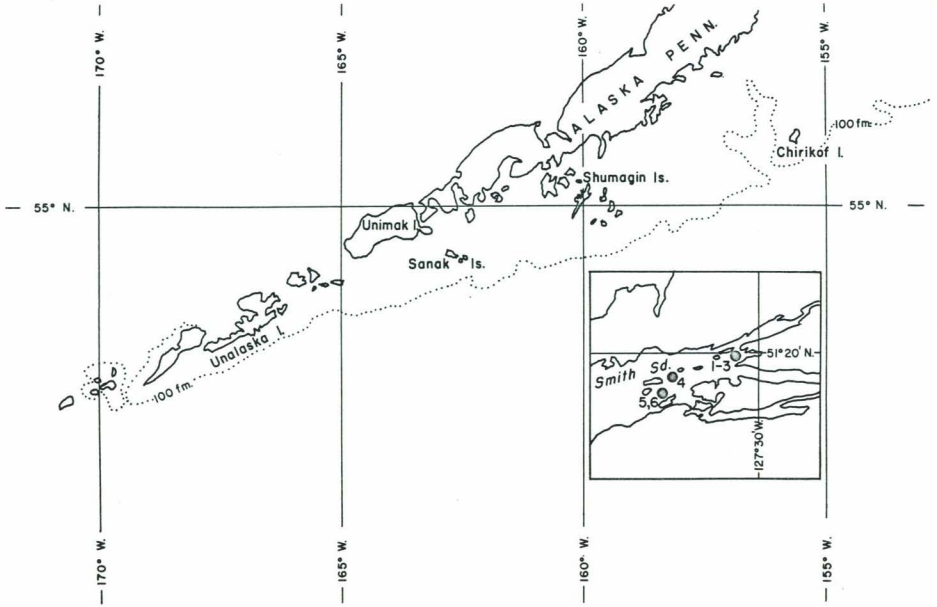

Fig. 1. Chart of Smith Sound and the Chirikof Island-Unalaska Island regions explored during the G.B. Reed Cruise No. 64-8, July-August 1964.

64-8

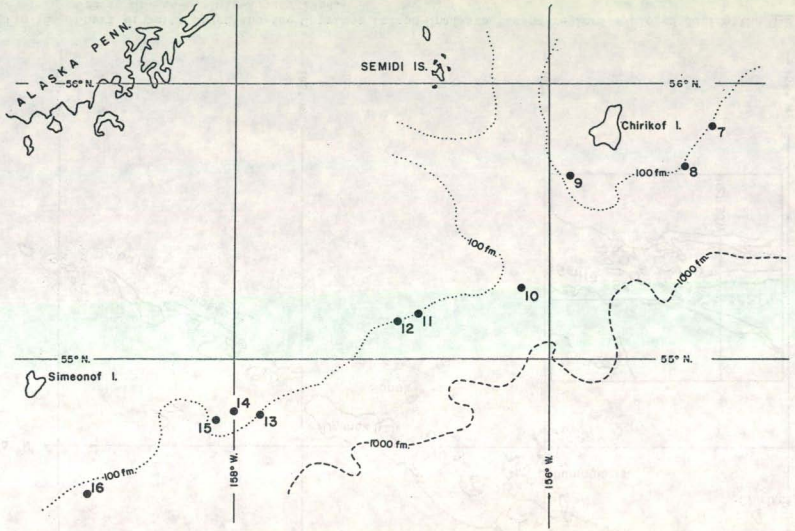

Fig. 2. Chart of the Chirikof Island-Simeonof Island region explored during G.B. Reed Cruise No. 64-8, showing location of hauls, by haul number, August 1964.

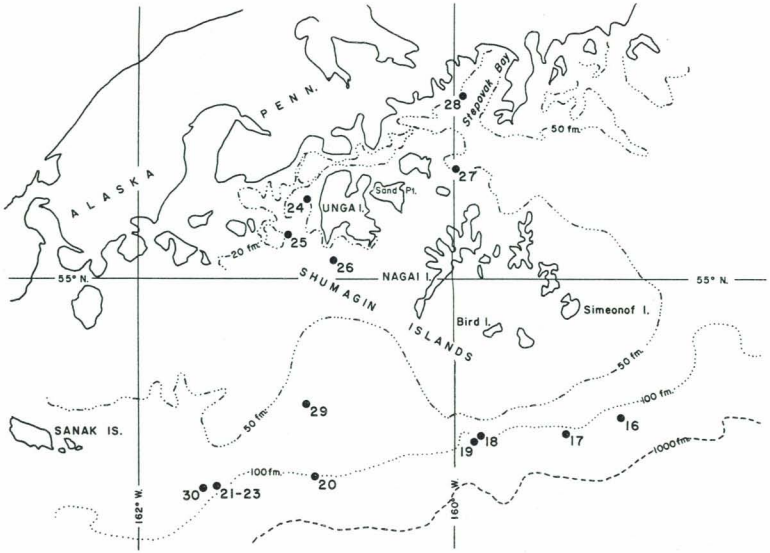

Fig. 3. Chart of the Simeonof Island-Sanak Island region explored during G.B. Reed Cruise No. 64-8, showing location of hauls, by haul number, August 1964.

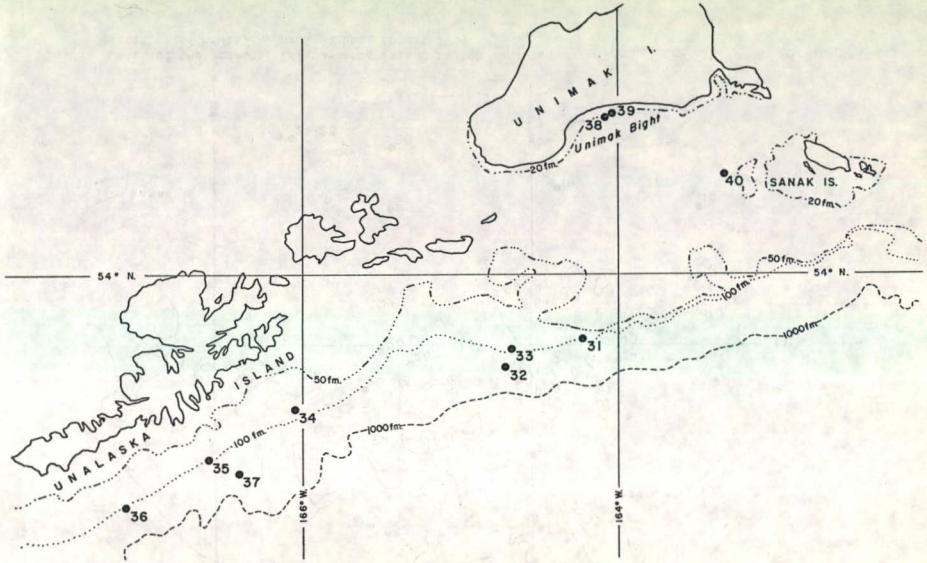

Fig. 4. Chart of the Sanak Island-Unalaska Island region explored during G.B. Reed Cruise No. 64-8, showing location of hauls, by haul number, August 1964.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 65-2

January 29 - March 18, 1965

PURPOSE

The G.B. Reed left Nanaimo January 29 on a 3-part groundfish cruise (Figure 1). The duration and purposes of each part are as follows:

Part I: (January 29-February 1)

1. Provide National Film Board personnel examples of trawling operations off the southwest coast of Vancouver Island.

Part II: (February 8-March 5)

1. Sample stocks of juvenile Pacific ocean perch (Sebastodes alutus) in Smith Sound (Queen Charlotte Sound) and Gowgaia Bay (Queen Charlotte Islands).

2. Investigate the winter availability and abundance of Pacific ocean perch in the Kodiak Island and Yakutat areas of the Gulf of Alaska.

Part III: (March 12-18)

1. Investigate the winter availability and abundance of Pacific ocean perch off the southwest coast of Vancouver Island.

At all trawling stations collect information on the type of bottom and the vertical water temperature regime.

PORTS OF CALL

1. Kodiak, Alaska - February 22-23

2. Juneau, Alaska - March 1

3. Petersburg, Alaska - March 2 (30 min)

4. Prince Rupert, B. C. - March 3 (2 hr)

RESULTS

General

A total of 47 trawl hauls were completed during the entire cruise. The total catch was 90,100 lb. Following are the catches by important species:

SPECIES	POUNDS
Pacific ocean perch	18,500
Turbot	13,800
Dover sole	7,500
Sculpin	7,400
Pacific cod	5,500
S. diploproa	4,900
Blackcod	4,100
Ratfish	3,300
Halibut	2,700
Greenling	2,700
S. aleutianus	2,100
Other*	17,600
TOTAL	90,100

*All species totalling less than 2,000 lb each.

A total of 25,226 fish (26 species) were measured, 2,151 otoliths collected (4 species), and 336 scales (1 species). The following table summarizes the results:

SPECIES	NUMBERS MEASURED	NUMBERS OF OTOLITHS	NUMBERS OF SCALES
Pacific ocean perch	8,776	1,274	..
Seb. alascanus	2,443	306	..
Pacific pollock	2,209	..	..
Pacific cod	1,935	..	..
Dover sole	1,871	..	..
Rock sole	1,784	185	..
Blackcod	1,298	386	336
Hake	1,014	..	..
Halibut	997	..	..
S. zacentrus	915	..	..
Greenling	761	..	..
Other[1]	1,223	..	..
TOTAL	25,226	2,151	336

[1]Fourteen species for each of which less than 252 were measured.

Details regarding type of bottom and water temperatures (surface and bottom) can be found in Appendix Tables I-IV. Surface and bottom water temperatures in the open ocean areas fished increased east and south of Kodiak Island. Following is a brief summary:

AREA	NUMBERS OF OBSERVATIONS	DEPTH RANGE	WATER TEMPERATURE (°C)	
		(fm)	surface	bottom
Kodiak Island	14	80-418	2.7-3.5	3.6-5.0
Yakutat	4	112-166	3.7-4.4	5.5-6.0
Vancouver Island	12	84-312	7.9-9.1	5.1-6.9

Miscellaneous activities included: (1) collection of hake hearts and otoliths for J. W. Smith via L. Margolis; (2) fillet samples of ocean perch, blackcod, and greenling for muscle protein analysis by H. Tsuyuki; (3) specific gravity of ocean perch larvae and blackcod eggs; (4) samples of S. aleutianus, S. crameri, S. diploproa, S. jordani, and Seb. alascanus for morphometric and meristic data; (5) live specimens of blackcod for holding studies at the Station, and miscellaneous species for the Vancouver

Aquarium; (6) three "ocean series" B.T. stations were occupied while crossing the Gulf of Alaska together with Secchi disc depths, surface water samples for phytoplankton pigments and Carbon 14 primary production measurements; (7) samples of various fishes and invertebrates for interested workers at the Station; and (8) collection of sculpin otoliths for J. E. Fitch.

Part I: (January 29-February 1)

Four hauls were completed off the southwest coast of Vancouver Island (2 in Barkley Sound) for National Film Board personnel. Catches were small, but apparently satisfactory (Figure 2 and Appendix Table I).

Part II: (February 8-March 5)

One day was spent sampling a stock of juvenile ocean perch in Smith Sound, and one day in Gowgaia Bay for the same purpose. Both efforts were successful (Figures 3 and 4, and Appendix Table II).

The remainder of Part II was spent in the Gulf of Alaska (Kodiak Island and Yakutat areas) investigating the winter availability of ocean perch (Figures 5 and 6, and Appendix Table III). Results suggested a much lower availability or abundance from that observed in the same areas during the summers of 1963 and 1964. Maximum catch rate was 3,200 lb/hr (Albatross Bank). Substantial quantities of greenling (Pleurogrammus monopterygius) and sculpin (chiefly Hemilepidotus) occupied areas where ocean perch were present during the summer months. Numerous Soviet vessels were observed, particularly in the Yakutat area.

Part III: (March 12-18)

All of Part III was spent off the southwest coast of Vancouver Island investigating the winter availability and abundance of ocean perch (Figure 2 and Appendix Table IV). Highest catch rates occurred at 188 fm off La Pérouse Bank (6,600 lb/hr).

Three species "new to B. C." were collected, viz., Sebastodes jordani, Rheinhardtius hippoglossoides, and Bothrocara brunneum.

PERSONNEL

Mr. M. Yesake, U. S. Bureau of Commercial Fisheries (Juneau) was aboard as an observer from February 22 to March 1. His assistance in various phases of the work is gratefully acknowledged. Regular personnel were as follows:

T. F. Pletcher	D. Davenport
S. J. Westrheim	W. R. Harling

APPENDIX TABLES

Table I. Fishing log for Part I of G. B. Reed Cruise No. 65-2 - west coast of Vancouver Island, January, 1965.

Haul No.		1	2	3	4
Date		Jan. 30	Jan. 30	Jan. 31	Jan. 31
Area[1]		BS	BS	ED	ED
Start (PST)		1125	1250	1000	1430
Duration (min)		15	15	60	30
Start: N. Lat.	°	48	48	49	49
	'	57.5	55.7	05.5	04
W. Long.	°	125	125	126	126
	'	10.3	11.7	53.5	53
Direction (°True)		175	210	320	330
End: N. Lat.	°	49	..	49	49
	'	57	..	07	05
W. Long.	°	125	..	126	126
	'	10.2	..	56.3	55.5
Depth (fm)		54	54-53	168-176	236-230
Water temp. (°C):					
Surface		5.7	..	8.5	..
Bottom		7.2	..	6.1	..
Bottom type[2]		..	..	Hd	Hd
Net used[3]		S-1	S-1	D-1	D-1
Total catch (lb)		161	48	1297	384
Remarks:		..	..	..	..

Table I (continued)

Haul No.	1	2	3	4
Date	Jan. 30	Jan. 30	Jan. 31	Jan. 31
Area[1]	BS	BS	ED	ED
Total catch (lb)	161	48	1297	384
Flatfish:				
Dover sole	..	..	Tr	17
Flathead sole	4	Tr	..	..
Petrale sole	..	..	44	..
Rex sole	..	Tr	6	7
Slender sole	24	Tr	5	..
Turbot	..	..	524	89
Rockfish:				
S. aleutianus	..[6]	..	27	144
S. alutus	Tr	..	466	31
S. crameri	..	..	5	..
S. diploproa	..	..	46	..
S. entomelas	..	..	17	..
S. flavidus	..	..	3	..
S. rubrivinctus	..	..	12	..
Seb. alascanus	..	..	18	23
Roundfish:				
Blackcod	..	..	10	42
Hake	12	12	6	9
Pacific pollock	42	3	6	..
Other[4]	18	18	Tr	Tr
Selachii:				
Dogfish	..	..	92	10
Ratfish	42	..	10	4
Skate	2	..	..	..
Invertebrates:[5]	17	15	Tr	8

Footnotes to Table I.

[1]Area: BS = Barkley Sound

ED = Estevan Deep

[2]Bottom type: Hd = hard

[3]Net used: S-1 = 70' shrimp trawl

D-1 = Drumfil No. 1, with rubber bobbins. Body mesh, 4.5"; Intermediate and cod-end, 3.0"; 1.5"-mesh liner in cod-end.

[4]Other Roundfish: eelpout, eulachon, herring, midshipman.

[5]Invertebrates: anemones, Dungeness crab, shrimp, squid, starfish, urchin.

[6]Tr = Trace = less than one pound

Table II. Fishing log for Part II-A of G. B. Reed Cruise No. 65-2 - Smith Sound and Gowgaia Bay, February, 1965.

Haul No.	5	6	7	8	9
Date	Feb. 9	Feb. 9	Feb. 9	Feb. 9	Feb. 9
Area[1]	SS	SS	SS	SS	SS
Start (PST)	0910	1023	1127	1239	1318
Duration (min)	18	14	15	15	15
Start: N. Lat. °	51	51	51	51	51
'	20	20	17	18.1	18.1
W. Long. °	127	127	127	127	127
'	32.3	32.3	40.3	39	39
Direction (°True)	260	270	050	040-070	040-070
End: N. Lat. °	51	51	51	51	51
'	19.6	19.6	17.6	18.6	18.6
W. Long. °	127	127	127	127	127
'	33.5	33.5	39.4	37.8	37.8
Depth (fm)	70	70-68	90-80	70-67	72-68
Water temp. (°C)					
Surface	4.6	..	6.2	5.9	..
Bottom	7.8	..	7.4	7.6	..
Bottom type[2]	..	..	..	..	..
Net used[3]	S-1	S-1	S-1	S-1	S-1
Total catch (lb)	421	441	389	153	207
Remarks:	..	..	..	..	..

Table II (continued)

Haul No.	10	11	12	13
Date	Feb. 9	Feb. 10	Feb. 10	Feb. 10
Area[1]	SS	GB	GB	GB
Start (PST)	1403	0830	0912	1526
Duration (min)	28	15	16	16
Start: N. Lat. °	51	52	52	52
'	17.3	24.5	24.8	24.8
W. Long. °	127	131	131	131
'	39.2	35	35	32.1
Direction (°True)	245	060	060	105
End: N. Lat. °	51	52	52	52
'	16.7	24.8	24.8	24.7
W. Long. °	127	131	131	131
'	41.8	34.2	34.2	31.3
Depth (fm)	84-78	36-32	34-36	28-20
Water temp. (°C)				
Surface	5.7	5.7	..	5.6
Bottom	6.9	6.4	..	6.4
Bottom type[2]	..	grS	..	grM,Sh
Net used[3]	S-1	S-1	S-1	S-1
Total catch (lb)	110	10	268	40
Remarks:	..	..	..	..

Table II (continued)

Haul No.	5	6	7	8	9
Date	Feb. 9	Feb. 9	Feb. 9	Feb. 9	Feb. 9
Area[1]	SS	SS	SS	SS	SS
Total catch (lb)	421	441	389	153	207
Flatfish:					
Curlfin sole	..	..	..	..	..
Dab (mottled)	..[7]	..	..	..	..
Dover sole	Tr	Tr	Tr	..	..
English sole	1	10	..	..	..
Flathead sole	108	40	..	..	..
Petrale	..	..	..	..	..
Rex sole	..	..	..	Tr	..
Rock sole	..	..	..	..	..
Slender sole	17	10	..	11	14
Turbot	..	Tr	..	..	..
Rockfish:					
S. aleutianus	3	..	9	..	..
S. alutus	28	31	..	17	43
S. crameri	..	..	..	..	..
S. diploproa	Tr	..	..	..	Tr
S. paucispinis	3	..	..	..	..
Other[4]	..	..	..	..	..
Roundfish:					
Blackcod	16	4	25	4	1
Hake	106	275	130	6	15
Lingcod	..	..	..	..	..
Pacific cod	..	..	..	..	..
Pacific pollock	3	2	16	18	33
Other[5]	Tr	Tr	Tr	1	1
Selachii:					
Dogfish	25	16	19	14	15
Ratfish	103	53	187	17	27
Skate	..	..	..	..	..

continued ...

Table II (continued)

Haul No.	10	11	12	13
Date	Feb. 9	Feb. 10	Feb. 10	Feb. 10
Area[1]	SS	GB	GB	GB
Total catch (lb)	110	10	268	40
Flatfish:				
Curlfin sole	..	..	5	2
Dab (mottled)	..	Tr	19	..
Dover sole	..	..	6	..
English sole	..	Tr	49	5
Flathead sole	..	..	3	5
Petrale	..	..	4	..
Rex sole	..	..	3	..
Rock sole	..	3	119	18
Slender sole	1	Tr	1	..
Turbot	..	..	7	..
Rockfish:				
S. aleutianus	4	..	..	..
S. alutus	..	..	Tr	..
S. crameri	1	..	..	..
S. diploproa	..	..	..	..
S. paucispinis	..	..	2	..
Other[4]	..	..	..	2
Roundfish:				
Blackcod	10	..	1	Tr
Hake	65	..	..	..
Lingcod	..	..	3	..
Pacific cod	..	..	1	..
Pacific pollock	3	..	10	Tr
Other[5]	Tr	Tr	6	Tr
Selachii:				
Dogfish	5	..	..	..
Ratfish	21	6	1	..
Skate	..	..	29	..

continued ...

Table II (continued)

Haul No.	5	6	7	8	9
Date	Feb. 9	Feb. 9	Feb. 9	Feb. 9	Feb. 9
Area[1]	SS	SS	SS	SS	SS
Total catch (lb)	421	441	389	153	207
Invertebrates:					
Anemones	..	..	..	..	..
Shrimp	4	Tr	1	65	58
Crinoids	..	..	..	..	..
Squid	4	..	2	..	..
Others[6]	Tr	..	Tr	..	..

Table II (continued)

Haul No.	10	11	12	13
Date	Feb. 9	Feb. 10	Feb. 10	Feb. 10
Area[1]	SS	GB	GB	GB
Total catch (lb)	110	10	268	40
Invertebrates:				
Anemones	..	..	..	1
Shrimp	..	Tr	Tr	Tr
Crinoids	..	..	..	7
Squid	Tr	Tr	..	Tr
Others[6]	Tr	Tr	..	Tr

Footnotes to Table II.

[1]Area: GB = Gowgaia Bay

SS = Smith Sound

[2]Bottom type: gr = green

M = mud

S = sand

Sh = shell

[3]Net used: S-1 = 70' shrimp trawl

[4]Other Rockfish: Sebastodes sp. #1 and #2.

[5]Other Roundfish: Cymatogaster; eelpout; eulachon; herring; midshipman; poacher; sculpin.

[6]Other Invertebrates: cucumber; jellyfish; octopus; snail; starfish.

[7]Tr = Trace = less than one pound

Table III. Fishing log for Part II-B of G. B. Reed Cruise No. 65-2 - Gulf of Alaska. (Groundfish trawl, D-1, used for all hauls in the Gulf.)

Haul No.		14	15	16	17	18
Date		Feb. 14	Feb. 18	Feb. 18	Feb. 19	Feb. 19
Area[1]		AB	AB	AB	AB	AB
INPFC Area[2]		052560	052563	051563	051563	051563
Start (AST)[3]		0905	1035	1605	0845	1045
Duration (min)		45	30	20	30	27
Start: N. Lat.	°	56	56	56	56	56
	'	16	31	33	35	33
W. Long.	°	152	152	151	151	151
	'	55	18	51	48	47
Direction (°True)		020	100	270	045	045
End: N. Lat.	°	56	56	56	56	56
	'	17	30	31	37	35
W. Long.	°	152	152	151	151	151
	'	48	14	55	44	44
Depth (fm)		100-146	133-170	196-164	172-170	186-210
Water temp. (°C)						
Surface		3.3	3.5	3.2	3.3	..
Bottom		5.0	4.8	4.4	4.8	..
Bottom type[4]		..	gyM	Hd, S	G, gyM	..
Total catch (lb)		4583	8746	1934	2847	19
Remarks:		..	..	..	..	Net fouled

Table III (continued)

Haul No.	19	20	21	22	23	24
Date	Feb. 19	Feb. 19	Feb. 20	Feb. 20	Feb. 20	Feb. 21
Area[1]	AB	AB	AB	AB	AB	AB
INPFC Area[2]	051563	051563	051563	051563	051563	051570
Start (AST)[3]	1240	1515	0838	1320	1500	0830
Duration (min)	31	33	30	30	30	30
Start: N. Lat. °	56	56	56	56	56	57
'	34	31.8	34	34	34	06
W. Long. °	151	151	151	151	151	151
'	47	49	49	53	54.5	17
Direction (°True)	045	045	040	045	045	050
End: N. Lat. °	56	56	56	56	56	57
'	35	32	36	35	35	08
W. Long. °	151	151	151	151	151	151
'	44	46	50	53	54	12
Depth (fm)	194-188	226-218	114-110	80-102	68-80	112-110
Water temp. (°C)						
Surface	3.3	3.2	3.4	3.5	3.5	3.2
Bottom	5.0	4.1	4.8	4.8	4.5	5.0
Bottom type[4]	..	..	..	..	..	Hd
Total catch (lb)	853	2536	4071	189	790	1436
Remarks:	..	..	..	..	..	..

Table III (continued)

Haul No.	25	26	27	28	29
Date	Feb. 21	Feb. 24	Feb. 25	Feb. 25	Feb. 26
Area[1]	AB	AG	PB	PB	IC
INPFC Area[2]	051570	050573	048580	048580	042593
Start (AST)[3]	1014	1406	0834	1030	1532
Duration (min)	30	31	36	60	18
Start: N. Lat. °	57	57	58	58	59
'	06	55.5	10	13	30
W. Long. °	151	150	148	148	142
'	03	14	51	43	34
Direction (°True)	050	130	360	150	040
End: N. Lat. °	57	57	58	58	59
'	07	55	11	09	31.5
W. Long. °	151	150	148	148	142
'	09	10.5	48	40	33
Depth (fm)	124-120	106-114	222-148	330-418	100-170
Water temp. (°C)					
Surface	2.7	3.5	3.5	3.5	..
Bottom	5.0	5.0	4.8	3.6	4.9
Bottom type[4]	Hd	grS	S, G, gyM	..	G
Total catch (lb)	5168	229	42	3853	684
Remarks:	..	..	..	..	..

Table III (continued)

Haul No.	30	31	32	33	34
Date	Feb. 27	Feb. 27	Feb. 27	Feb. 27	Feb. 28
Area[1]	YC	YC	YC	YC	AC
INPFC Area[2]	041590	041590	041590	041590	040583
Start (AST)[3]	0849	1018	1221	1533	0835
Duration (min)	30	30	31	31	19
Start: N. Lat. °	59	59	59	59	58
'	23	23	23	11	43
W. Long. °	141	141	141	141	140
'	01	02	08	09	27
Direction (°True)	020	020	020	020	080
End: N. Lat. °	59	59	59	59	58
'	25	25.5	26	14	43
W. Long. °	141	141	141	141	140
'	00	01	06	08.5	24
Depth (fm)	92-106	88-140	162-166	104-112	120-114
Water temp. (°C)					
Surface	..	3.7	4.0	3.8	4.4
Bottom	..	6.0	5.7	5.5	6.0
Bottom type[4]	..	G	S, gyM	..	..
Total catch (lb)	5	1321	794	36	0
Remarks:	..	..	..	..	Doors mudded down. Cod-end open.

Table III (continued)

Haul No.	14	15	16	17	18
Date	Feb. 14	Feb. 18	Feb. 18	Feb. 19	Feb. 19
Area[1]	AB	AB	AB	AB	AB
Total catch (lb)	4579	8746	1934	2847	19
Flatfish:					
Dover sole	..	66	22	1	Tr
English sole	..	..	..	1	..
Flathead sole	..	12	3	..	..
Halibut[5]	721(189)	649(269)	3(1)	53(9)	..
Rex sole	41	4	3	3	3
Rock sole	205	324	..	..	..
Turbot	572	1276	227	892	4
Rockfish:					
S. aleutianus	1	..	3	4	4
S. alutus	13	1628	932	783	..
S. brevispinis	..	..	..	1	..
S. ciliatus	11	3	..	..	..
S. polyspinis	6	4	42	..	..
S. zacentrus	1	..	..	Tr	..
Seb. alascanus	..	11	3	254	3
Other[6]	Tr[9]	..	..	1	..
Roundfish:					
Blackcod	2	28	3	9	..
Greenling	1	2233	461	..	..
Grenadier	..	..	..	..	..
Pacific cod	1532	337	174	544	..
Pacific pollock	95	387	39	255	5
Sculpin	1345	1767	8	38	..
Other[7]	30	..	Tr	1	..
Selachii:					
Dogfish	..	..	..	..	..
Skate	14	..	..	..	..
Invertebrates:[8]	3	17	11	7	Tr

Table III (continued)

Haul No.	19	20	21	22	23	24
Date	Feb. 19	Feb. 19	Feb. 20	Feb. 20	Feb. 20	Feb. 21
Area[1]	AB	AB	AB	AB	AB	AB
Total catch (lb)	853	2536	4071	189	790	1436
Flatfish:						
Dover sole	Tr	..	..	..	..	..
English sole	..	..	..	..	Tr	..
Flathead sole	9	..	76	2	60	10
Halibut[5]	39(4)	143(11)	544(187)	3(3)	25(15)	58(73)
Rex sole	80	111	Tr	..	9	5
Rock sole	..	..	91	2	17	686
Turbot	501	311	137	3	..	112
Rockfish:						
S. aleutianus	3	982	..	..	..	..
S. alutus	49	6	596	6	9	Tr
S. brevispinis	..	..	..	..	Tr	..
S. ciliatus	..	..	23	..	2	..
S. polyspinis	..	..	344	7	191	3
S. zacentrus	..	..	1	..	..	Tr
Seb. alascanus	89	71	1	..	..	..
Other[6]	1	..	1	..	..	..
Roundfish:						
Blackcod	9	40	3	..	..	4
Greenling	..	..	..	..	..	..
Grenadier	..	787	..	..	..	..
Pacific cod	12	..	2050	138	406	3
Pacific pollock	56	30	62	23	8	13
Sculpin	..	30	125	2	50	532
Other[7]	Tr	Tr	3	1	4	4
Selachii:						
Dogfish	..	..	..	..	..	..
Skate	..	..	..	..	..	..
Invertebrates:[8]	5	25	14	2	9	6

Table III (continued)

Haul No.	25	26	27	28	29
Date	Feb. 21	Feb. 24	Feb. 25	Feb. 25	Feb. 26
Area[1]	AB	AG	PB	PB	IC
Total catch (lb)	5168	229	42	3853	684
Flatfish:					
Dover sole	Tr	..	..	1782	..
English sole	..	..	..	..	..
Flathead sole	120	2	..	..	12
Halibut[5]	216(187)	81(37)	..	..	61(1)
Rex sole	Tr	1	Tr	..	4
Rock sole	120	111	3	..	..
Turbot	959	19	28	553	12
Rockfish:					
S. aleutianus	..	..	..	17	Tr
S. alutus	9	..	2	..	..
S. brevispinis	..	..	..	..	25
S. ciliatus	5	..	..	..	35
S. polyspinis	2	Tr	..	..	3
S. zacentrus	..	..	..	..	468
Seb. alascanus	..	..	5	58	Tr
Other[6]	..	..	..	..	3
Roundfish:					
Blackcod	38	..	..	435	..
Greenling	Tr	..	..	..	..
Grenadier	..	..	..	999	..
Pacific cod	132	1	..	..	19
Pacific pollock	50	Tr	..	1	31
Sculpin	3483	12	..	..	..
Other[7]	20	2	Tr	Tr	5
Selachii:					
Dogfish	..	..	..	..	..
Skate	..	..	..	8	..
Invertebrates:[8]	14	Tr	4	Tr	6

Table III (continued)

Haul No.	30	31	32	33	34
Date	Feb. 27	Feb. 27	Feb. 27	Feb. 27	Feb. 28
Area[1]	YC	YC	YC	YC	AC
Total catch (lb)	5	1321	794	36	0
Flatfish:					
Dover sole	..	..	..	..	..
English sole	..	..	..	..	..
Flathead sole	1	..	3	..	..
Halibut[5]	..	69(2)	21(3)	19(6)	..
Rex sole	Tr	Tr	26	..	..
Rock sole	..	..	..	..	..
Turbot	3	72	121	17	..
Rockfish:					
S. aleutianus	..	..	..	..	..
S. alutus	..	1156	3	..	..
S. brevispinis	..	..	..	..	..
S. ciliatus	..	..	1	..	..
S. polyspinis	..	..	..	..	..
S. zacentrus	..	..	..	..	..
Seb. alascanus	..	..	295	..	..
Other[6]	..	..	4	..	..
Roundfish:					
Blackcod	..	..	13	..	..
Greenling	..	..	..	..	..
Grenadier	..	..	..	..	..
Pacific cod	..	12	3	..	..
Pacific pollock	..	3	202	..	..
Sculpin	..	..	..	..	..
Other[7]	..	..	26	..	..
Selachii:					
Dogfish	..	..	49	..	..
Skate	..	..	23	..	..
Invertebrates:[8]	1	9	4	Tr	..

Footnotes to Table III.

[1]Area: AB = Albatross Bank; AC = Alsek Canyon; AG = Albatross Gully; IC = Icy Canyon; PB = Portlock Bank; YC = Yakutat Canyon.

[2]INPFC Area: Revised code.

[3]Start: AST = Alaska Standard Time.

[4]Bottom type: gr = green; gy = grey; G = gravel; Hd = hard, no sample in grab; M = mud; S = sand.

[5]Numbers caught in parentheses.

[6]Other Rockfish: Never more than 24 lb per haul: S. helvomaculatus, S. proriger, S. ruberrimus, S. rubrivinctus.

[7]Other Roundfish: chinook salmon (Oncorhynchus tshawytscha); eelpout (Zoarcidae); eulachon (Thaleichthys pacificus); herring (Clupea pallasii); lanternfish (Myctophidae); poacher (Agonidae); prow fish (Zaprora silensus); searcher (Bathymasteridae).

[8]Invertebrates: anemone; clams; crab (box, decorator, hermit, and king); octopus; sea cucumber; shrimp; snails; sponge; squid; starfish, tubeworms, urchins.

[9]Tr = Trace = less than one pound

Table IV. Fishing log for Part III of G. B. Reed Cruise No. 65-2 - west coast Vancouver Island. (All hauls with groundfish trawl, D-1.)

Haul No.	35	36	37	38
Date	Mar. 13	Mar. 13	Mar. 13	Mar. 14
Area[1]	LPB	LPB	LPB	LPB
Start (PST)[2]	0835	1240	1455	0830
Duration (min)	30	30	30	30
Start: N. Lat. °	48	48	48	48
'	18	17.5	20	18.5
W. Long. °	126	126	126	126
'	05	03.2	07	03
Direction (°True)	320	320	150	320
End: N. Lat. °	48	48	48	48
'	19	18.5	19	19.5
W. Long. °	126	126	126	126
'	06	04.5	06	04
Depth (fm)	238-224	264-246	276-312	188
Water temp. (°C)				
Surface	9.0	..	9.1	8.8
Bottom	5.7	..	5.1	5.8
Bottom type[3]	S	..	..	Hd, S
Total catch (lb)	4635	2105	343	9353
Remarks:	..	..	..	Est. 2000# rockfish lost at surface.

Table IV (continued)

Haul No.	39	40	41	42
Date	Mar. 14	Mar. 14	Mar. 15	Mar. 15
Area[1]	LPB	LPB	LPB	LPB
Start (PST)[2]	1328	1607	0831	1030
Duration (min)	32	30	34	30
Start: N. Lat. °	48	48	48	48
'	25	21.5	47	47
W. Long. °	126	126	126	126
'	06.5	00	15	20.5
Direction (°True)	150	270	320	320
End: N. Lat. °	48	48	48	48
'	23	22.7	48	48
W. Long. °	126	126	126	126
'	05	02	16	21.5
Depth (fm)	146-156	100-110	89-84	122-105
Water temp. (°C)				
Surface	8.9	8.7	8.0	8.4
Bottom	6.8	6.9	6.9	6.7
Bottom type[3]	S, G	Hd	Hd, S	G, gyC
Total catch (lb)	3725	2121	1114	3271
Remarks:	..	..	..	..

Table IV (continued)

Haul No.	43	44	45	46	47
Date	Mar. 15	Mar. 16	Mar. 16	Mar. 17	Mar. 17
Area[1]	LPB	LPB	LPB	LPB	LPB
Start (PST)[2]	1345	1046	1420	0829	1044
Duration (min)	30	30	30	30	30
Start: N. Lat. °	48	48	48	48	48
'	47.5	45.5	45	46	45
W. Long. °	126	126	126	126	126
'	30	21.5	24	34	34
Direction (°True)	090	320	290	140	140
End: N. Lat. °	48	48	48	48	48
'	47	46.5	45	45	44
W. Long. °	126	126	126	126	126
'	27.5	23.6	27	32	33
Depth (fm)	160-168	196-182	184-240	266-262	318-301
Water temp. (°C)					
Surface	8.6	7.9	7.9	7.9	7.9
Bottom	6.7	6.0	6.0	5.3	5.1
Bottom type[3]	..	G, grM	Hd, S	S	..
Total catch	1725	4350	9940	2604	732
Remarks:	..	..	..	..	..

Table IV (continued)

Haul No.	35	36	37	38
Date	Mar. 13	Mar. 13	Mar. 13	Mar. 14
Area[1]	LPB	LPB	LPB	LPB
Total catch (lb)	4635	2105	343	9353
Flatfish:				
Dover sole	1616	1249	222	1390
English sole	..	..	..	..
Halibut[4]	..	..	..	..
Petrale sole	240	2	..	164
Rex sole	6	12	Tr[3]	106
Slender sole	..	..	..	Tr
Turbot	459	42	1	2362
Rockfish:				
S. aleutianus	302	115	17	215
S. alutus	1255	487	16	3326
S. brevispinis	..	..	..	..
S. crameri	..	..	..	1231
S. diploproa	..	..	..	..
S. elongatus	..	..	..	..
S. entomelas	..	..	..	..
S. helvomaculatus	..	..	..	4
S. jordani	..	..	..	..
S. paucispinis	..	..	..	..
S. pinniger	..	..	..	..
S. proriger	..	..	..	..
S. rubrivinctus	..	..	..	41
S. zacentrus	..	..	..	..
Seb. alascanus	116	41	12	46
Roundfish:				
Blackcod	575	136	37	427
Hake	34	14	29	5
Lingcod	..	..	..	..
Pacific cod	..	..	..	..
Pacific pollock	..	..	..	..
Other[5]	6	2	8	Tr

continued ...

Table IV (continued)

Haul No.	39	40	41	42
Date	Mar. 14	Mar. 14	Mar. 15	Mar. 15
Area[1]	LPB	LPB	LPB	LPB
Total catch (lb)	3725	2121	1114	3271
Flatfish:				
Dover sole	2	..	..	..
English sole	Tr	..	..	..
Halibut[4]	25(1)	120(6)	..	..
Petrale sole	73	..	10	6
Rex sole	230	26	..	95
Slender sole	20	..	..	22
Turbot	522	26	20	95
Rockfish:				
S. aleutianus	..	..	..	..
S. alutus	2179	91	Tr	386
S. brevispinis	22	152	3	85
S. crameri	4	..	5	Tr
S. diploproa	264	..	..	12
S. elongatus	..	83	2	35
S. entomelas	42	..	..	..
S. helvomaculatus	29	81	..	99
S. jordani	..	10	..	..
S. paucispinis	..	..	..	24
S. pinniger	..	..	4	4
S. proriger	..	1	..	..
S. rubrivinctus	16	Tr	4	23
S. zacentrus	8	31	Tr	150
Seb. alascanus	64	Tr	..	24
Roundfish:				
Blackcod	65	21	..	60
Hake	..	..	..	..
Lingcod	..	28	..	39
Pacific cod	10	36	1	129
Pacific pollock	..	..	..	Tr
Other[5]	Tr	5	Tr	..

continued ...

Table IV (continued)

Haul No.	43	44	45	46	47
Date	Mar. 15	Mar. 16	Mar. 16	Mar. 17	Mar. 17
Area[1]	LPB	LPB	LPB	LPB	LPB
Total catch (lb)	1725	4350	9940	2604	732
Flatfish:					
Dover sole	..	11	47	924	120
English sole	..	..	..	..	..
Halibut[4]	..	11(1)	4(1)	36(1)	..
Petrale sole	14	..	..	..	..
Rex sole	143	46	47	57	13
Slender sole	109	10	..	..	..
Turbot	631	1374	1701	105	47
Rockfish:					
S. aleutianus	..	47	23	153	..
S. alutus	379	1599	2963	33	..
S. brevispinis	3	..	..	..	..
S. crameri	4	127	153	5	..
S. diploproa	2	318	4290	..	..
S. elongatus	Tr	..	..	..	..
S. entomelas	..	..	..	..	..
S. helvomaculatus	8	5	..	..	..
S. jordani	..	..	..	..	..
S. paucispinis	..	..	..	..	..
S. pinniger	..	..	..	..	..
S. rubrivinctus	5	173	68	..	..
S. zacentrus	2	..	..	..	..
Seb. alascanus	24	158	79	92	96
Roundfish:					
Blackcod	103	150	288	1060	431
Hake	..	4	..	12	..
Lingcod	11	..	..	..	..
Pacific cod	..	..	..	..	..
Pacific pollock	..	16	3	..	..
Other[5]	3	6	4	14	5

continued ...

Table IV (continued)

Haul No.	35	36	37	38
Date	Mar. 13	Mar. 13	Mar. 13	Mar. 14
Area[1]	LPB	LPB	LPB	LPB
Total catch (lb)	4635	2105	343	9353
Selachii:				
Dogfish	2	..	..	..
Ratfish	..	..	..	6
Skate	18	..	..	30
Other[6]	..	..	..	..
Invertebrates:[7]	6	5	1	Tr

Table IV (continued)

Haul No.	39	40	41	42
Date	Mar. 14	Mar. 14	Mar. 15	Mar. 15
Area[1]	LPB	LPB	LPB	LPB
Total catch (lb)	3725	2121	1114	3271
Selachii:				
Dogfish	5	159	521	423
Ratfish	19	1222	20	1510
Skate	121	28	25	49
Other[6]	..	..	..	..
Invertebrates:[7]	5	1	199	1

Table IV (continued)

Haul No.	43	44	45	46	47
Date	Mar. 15	Mar. 16	Mar. 16	Mar. 17	Mar. 17
Area[1]	LPB	LPB	LPB	LPB	LPB
Total catch (lb)	1725	4350	9940	2604	732
Selachii:					
Dogfish	122	226	185	3	..
Ratfish	47	21	18	..	..
Skate	111	42	67	96	14
Other[6]	..	..	..	3	..
Invertebrates:[7]	4	6	..	11	6

[1]Area: Off La Perouse Bank.

[2]Start: PST = Pacific Standard Time.

[3]Bottom type: gr = green; gy = grey; C = clay; G = gravel; Hd = hard; M = mud; S = sand.

[4]Numbers of halibut in parentheses.

[5]Other Roundfish: chinook salmon (Oncorhynchus tshawytscha); eelpout (Zoarcidae); eulachon (Thaleichthys pacificus); Greenland halibut (Rheinhardtius hippoglossoides); grenadier (Coryphaenoididae); hagfish (Polistotrema stouti); lamprey (Entosphenus tridentatus); lanternfish (Myctophidae); poacher (Agonidae); sculpin (Cottidae); snailfish (Liparidae); viperfish (Chauliodontidae).

[6]Other Selachii: brown cat shark (Apristurus brunneus).

[7]Invertebrates: anemone, brachiopod, chiton, crab (box, tanner), cucumber, flapjack devilfish, jellyfish, octopus, sea pen, shrimp, sponge, squid, snails, starfish, urchin.

[8]Tr = Trace = less than one pound.

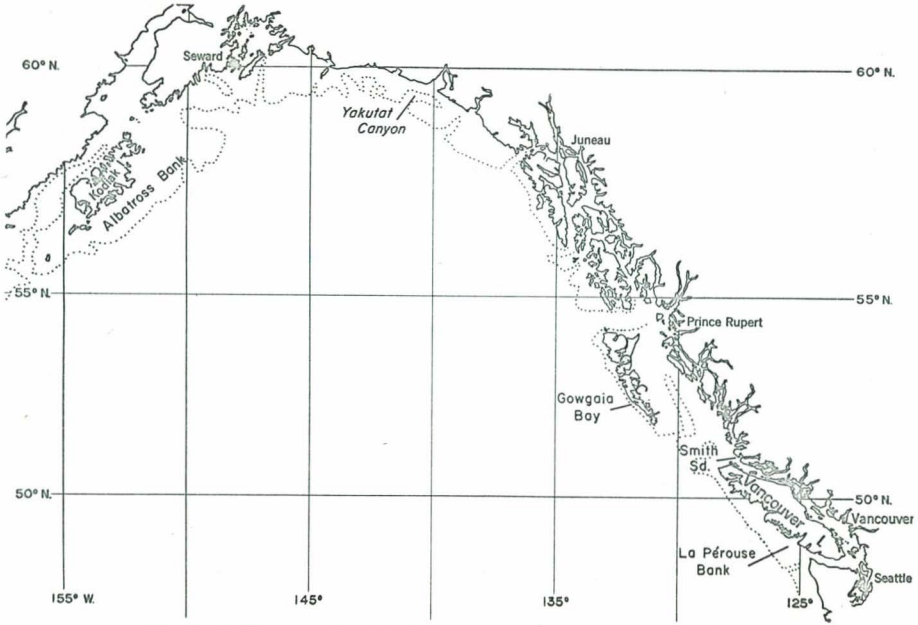

Fig. 1. Fishing areas for G. B. Reed Cruise No. 65-2, January-March 1965.

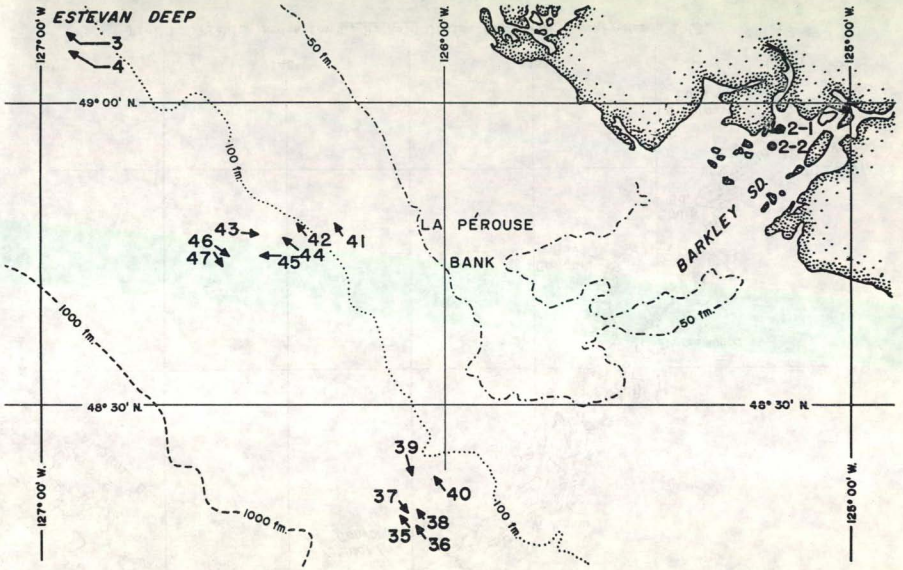

Fig. 2. Chart of the southwest coast of Vancouver Island showing location of trawl hauls completed during G. B. Reed Cruise No. 65-2, January and March 1965.

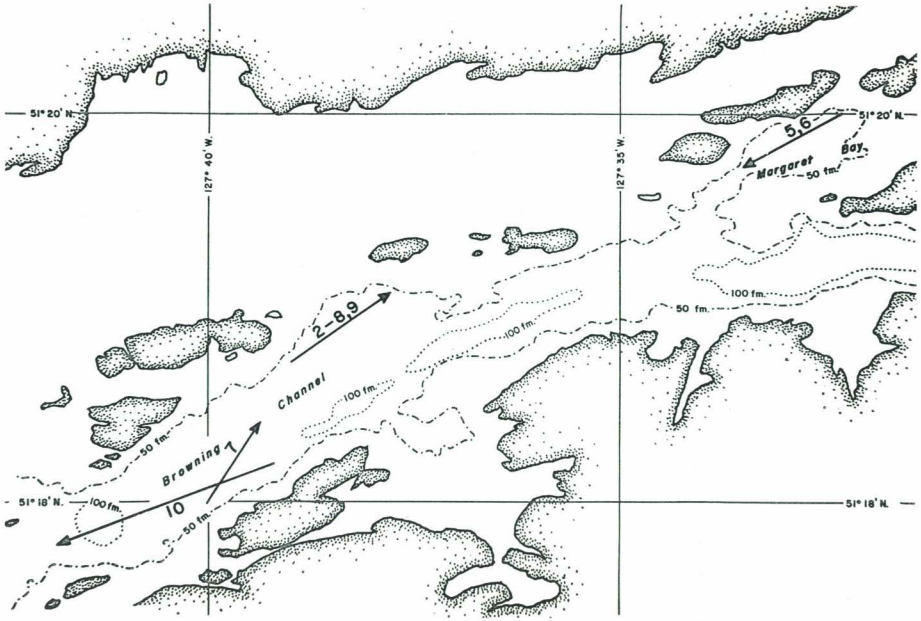

Fig. 3. Chart of Smith Sound showing location of trawl hauls completed during G. B. Reed Cruise No. 65-2, February 1965.

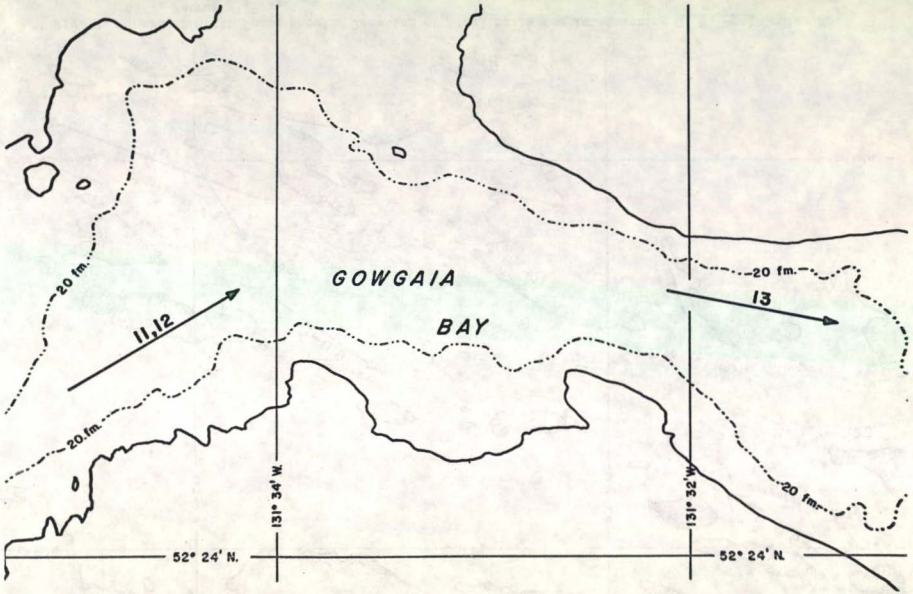

Fig. 4. Chart of Gowgaia Bay showing location of trawl hauls completed during G. B. Reed Cruise No. 65-2, February 1965.

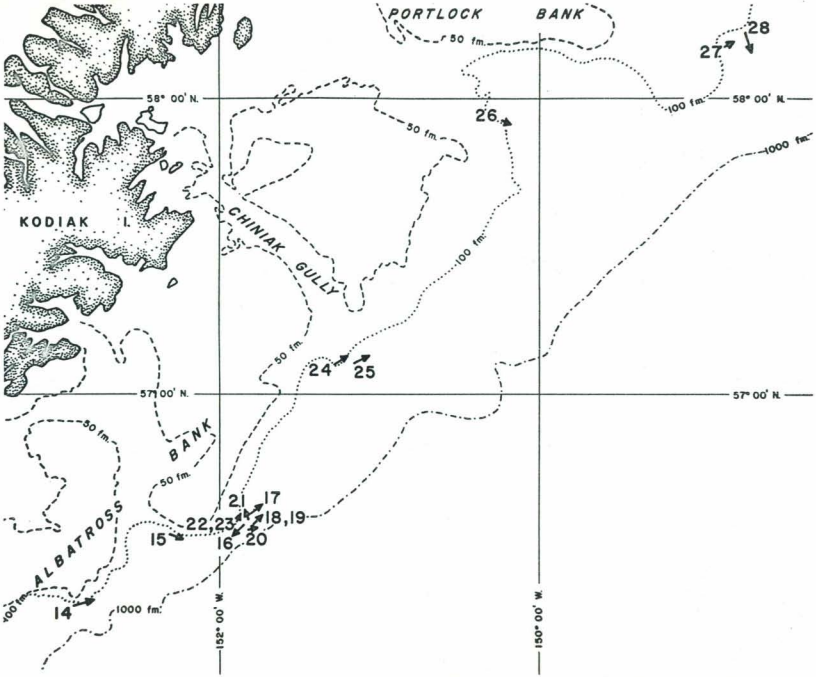

Fig. 5. Chart of Kodiak Island area showing location of trawl hauls completed during G. B. Reed Cruise No. 65-2, February 1965.

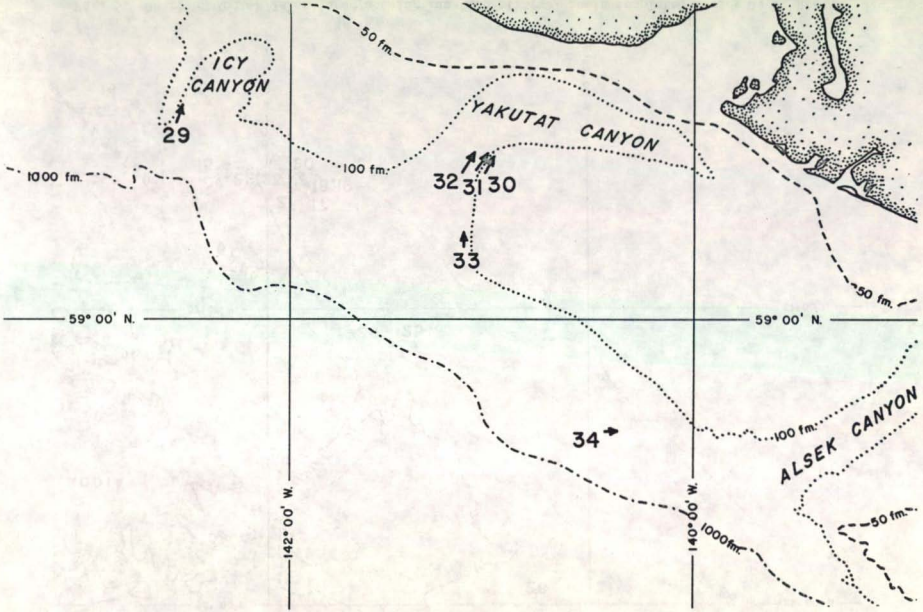

Fig. 6. Chart of Yakutat area showing location of trawl hauls completed during G. B. Reed Cruise No. 65-2, February 1965.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 65-3

August 23 - September 25, 1965

PURPOSE

1. Investigate Pacific ocean perch (Sebastodes alutus) availability, abundance, and biology in Queen Charlotte Sound and along the outer coast from Cape Spencer, Alaska, to Cape Blanco, Oregon.

2. Determine vertical water temperature regime, and bottom type, at all trawling stations.

3. Collect benthic invertebrate specimens with a Digby dredge once daily.

4. Collect material for protein analysis of muscle tissue, blood, and eye lens from marine fishes, for biochemical systematics, and determine feasibility of processing blood proteins aboard ship. (Project of the Vancouver Technology Station.)

5. Collect material for chromatographic analysis of plankton pigments, and determine feasibility of preliminary processing aboard ship. (Project of the Institute of Fisheries, U.B.C.)

6. Collect specimens of selected groundfish species for contract studies by the Institute of Fisheries (U.B.C.) for the Fisheries Research Board.

7. Collect specimens of benthic invertebrates and marine fishes for investigators at the Biological Station, University of British Columbia, and the National Museum.

PORTS OF CALL

1. Prince Rupert, B.C.: August 26 (medical treatment for crew member).

2. Sitka, Alaska: August 29-30 (storm).

3. Victoria, B.C.: September 13 (repair radar, fuel, and drop off two guests).

4. Port Angeles, Wash.: September 13 (pick up mail and two guests).

5. Astoria, Oregon: September 17-18 (pick up mail, drop off one guest, and pick up one guest).

6. Newport, Oregon: September 24 (drop off two guests).

RESULTS

1. A total of 84 groundfish trawl hauls were completed during the cruise. Following is a summary of the total catch by important species:

Species	Pounds	Percent
Ocean perch	147,700	49.9
Other rockfish	50,900	17.2
Hake	23,100	7.8
Pollock	20,700	7.0
Blackcod	7,700	2.6
Dover sole	7,400	2.5
Turbot	7,400	2.5
Halibut	1,400	0.5
Other	29,600	10.0
Total	295,900	100.0

Appendix Tables I-III contain the detailed results by haul.

The following table lists the numbers of fish measured and otoliths collected, by species:

Species	No. measured	Otoliths
Ocean perch	20,085	3,049
Pacific pollock	2,110	-
Sebastodes proriger	498	-
S. zacentrus	896	-
S. sp.	261	89
Dover sole	290	-
Seb. alascenus	416	-
Halibut	35	7
Total	24,591	3,145

Substantial catch rates (lb per hour) of ocean perch were obtained occasionally throughout most of the study area. Following is a list of the maximum catch rates in each major region:

Area	Max. lb/hr	Depth (fm)
SE Alaska	17,800	148-180
Queen Charlotte Sound	9,100	144-150
SW Vancouver Island	21,200	96-98
Washington coast	16,000	128-138
Oregon coast	2,900	128-134

The relatively low maximum catch rate of ocean perch off Oregon has been attributed primarily to seasonal availability rather than abundance.

Size composition of adult ocean perch differed appreciably. North of Dixon Entrance, the modal size ranged from 30 to 34 cm, whereas in, and south of, Queen Charlotte Sound, the modal size ranged from 36 to 42 cm.

2. Reversing bottle and/or bathythermograph casts were completed at 77 trawling stations. Following is a brief summary of the vertical water temperature regimes by region:

Region	Water temperature (°C)		Depth Range
	Surface	Bottom	(fm)
SE Alaska	10.7-13.8	5.3-5.9	80-160
Queen Charlotte Sound	13.8-14.7	6.2-6.4	81-150
SW Vancouver Island	11.5-12.8	5.4-7.2	77-228
Washington coast	12.5-14.3	7.0-7.5	85-150
Oregon coast	10.8-14.8	6.5-8.0	79-173

In general, surface water temperatures increased slightly from north to south and from inshore to offshore stations. Bottom temperatures increased from north to south, and decreased with depth. Details of individual observations are included in Tables I-III.

Bottom sediments were sampled with a modified Petersen grab, and the details are included in Tables I-III. Mechanical problems plagued the operation during most of the early portion of the cruise.

3. A total of 23 Digby dredge hauls were completed (one at the end of each fishing day). The locations of all hauls are listed in Table IV. The invertebrates collected were distributed to the Biological Station, University of British Columbia, and the National Museum.

4. Processing of fish blood samples, aboard the G.B. Reed, for electrophoretic analysis of proteins was successfully completed with minor adjustments to the equipment. Following is a summary of the samples collected.

Group	Blood, muscle, and eye lens		Muscle only	
	No. species	No. samples	No. species	No. samples
Flatfish	7	52	0	-
Rockfish	18	416	17	730
Other Roundfish	5	157	4	286
Selachii	2	7	2	15
Total	32	632	23	1,031

All of the blood and muscle samples and a portion of the eye lens samples will be processed at the Vancouver Technology Laboratory. The remaining eye lens samples will be processed at the Biological Laboratory of the Bureau of Commercial Fisheries, La Jolla, California.

5. Material was collected for chromatographic analysis of plankton pigments at 13 trawling stations (Cape Spencer - SW Vancouver Island). Preliminary processing (filtering, and freezing of residue) was successfully completed aboard ship.

6. Collections of benthic invertebrates and marine fishes were completed and nearly all scheduled quotas were achieved.

7. The assistance and cooperation of the numerous guests during the cruise are gratefully acknowledged. Dr. O. Kibesaki, scientist-observer from the Fisheries Agency of Japan, was particularly helpful in many ways.

PERSONNEL

D.E. Day	Washington Dept. of Fisheries	Sept. 13-17
O.Kibesaki	Fisheries Agency of Japan	Aug. 23-Sept. 25
A.R. Magill	Oregon Fish Commission	Sept. 17-24
H.H. Shippen	Bureau of Commercial Fisheries - Seattle	Sept. 13-24
S.J. Westrheim	Fisheries Research Board - Nanaimo	Aug. 23-Sept. 25
D. Davenport	Fisheries Research Board - Nanaimo	Aug. 23-Sept. 25
M. Dickman	University of British Columbia	Aug. 23-Sept. 13
P. Fraser	Fisheries Research Board - Nanaimo	Sept. 13-25
W.R. Harling	Fisheries Research Board - Nanaimo	Aug. 23-Sept. 25
L. McLeod	Fisheries Research Board - Nanaimo	Aug. 23-Sept. 25
A.T. Ronald	Fisheries Research Board - Vancouver	Aug. 23-Sept. 25
J. Scoggan	National Museum - Ottawa	Aug. 23-Sept. 13

APPENDIX

Table I. Fishing log for Part I of G.B. Reed groundfish cruise no. 65-3, Queen Charlotte Sound (Goose Island Ground), August, 1965.

Haul No.	1	2	3	4	5	6	7	8
Date	Aug. 24	Aug. 24	Aug. 24	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
INPFC Area[1]	029510	029510	029510	029510	029510	029510	029510	029510
Start (PDT)[2]	1034	1400	1623	0731	1005	1245	1446	1625
Duration (min)	30	30	30	30	30	30	30	30
Start: N. Lat. °	51	51	51	51	51	51	51	51
'	25	23	21.5	20	18	19.5	20.5	23
W. Long. °	129	129	129	129	129	129	129	129
'	00	09.5	07	05	18	20	21.5	24
Direction (°True)	260	250	250	280	300	270	270	270
End: N. Lat. °	51	51	51	51	51	51	51	51
'	24.5	22.5	20.8	18.5	18.5	18.5	19.5	24
W. Long. °	129	129	129	129	129	129	129	129
'	02	13.5	09.5	07	19.5	23	27	28
Depth (fm)	100-102	103-98	120-118	140-133	150-144	116-122	102-100	81-83
Water temp. (°C)								
Surface	14.2	13.8	13.8	13.8	13.9	14.3	14.4	14.7
Bottom	6.3	6.4	6.2	6.2	6.3	6.2	6.3	6.3
Bottom type[3]	gr M	gr M	gr M	gr M	gr M	..	..	gr M
Net used[4]	D-1	D-1	D-1	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	4600	2000	600	5900	5800	3600	60	800
Remarks	..	..	..	..	..	..	..	..

continued....

Table I (continued)

Haul No.	1	2	3	4	5	6	7	8
Date	Aug. 24	Aug. 24	Aug. 24	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
Total catch (lb)	4600	2000	600	5900	5800	3600	60	800
Flatfish[5]								
Dover sole	28	..	T	268	253	96	3	1
Halibut[6]	..	..	..	24(1)	12(1)	20(2)	..	..
Turbot	84	93	13	145	351	289	3	310
Other[7]	T[11]	23	..	1	T	4	..	48
Rockfish								
S. aleutianus	..	..	..	..	98	..	..	..
S. alutus	3898	1492	500	3535	4551	2221	..	32
S. brevispinis	..	83	..	..	..	..	..	21
S. flavidus	5	33	..	..	..	..	..	..
S. paucispinis	66	9	10	5	10	70	..	8
S. pinniger	..	..	..	..	..	..	..	236
S. proriger	1	..	..	..	..	..	..	48
S. rubrivinctus	219	146	13	682	119	130	6	37
Seb. alascanus	..	..	4	51	55	7	..	..
Other[8]	2	..	2	..	..	1	..	5
Other roundfish[9]								
Blackcod	30	25	5	160	41	142	..	21
Hake	174	10	8	1025	314	295	..	..
Lingcod	..	..	..	15	..	27	..	..
Pacific pollock	..	44	..	3	..	261	..	..
Other[10]	2	7	T	2	T	9	..	T
Invertebrates								
Shrimp	43	10	T	T	T	11	T	..
Urchin	5	T	..	T	T	24	35	..
Other	3	..	2	T	4	T	8	2

continued....

Footnotes to Table I

[1]INPFC Area: Revised code

[2]PDT: Pacific Daylight Time

[3]Bottom type: gr = green; M = mud

[4]Net used: D-1: Drumfil No. 1: 400-mesh eastern-type groundfish trawl. Cod-end and intermediate mesh 3", body and wings 4.5", stretch measure between knots. Liner in cod-end with 1.5" mesh. Rubber bobbins on groundline.

[5]Flatfish:

Dover sole	Microstomus pacificus
Halibut	Hippoglossus stenolepis
Turbot	Atheresthes stomias

[6]Halibut: Numbers of halibut in parentheses

[7]Other flatfish (never more than 24 lb per haul):

Curlfin sole	Pleuronichthys decurrens
English sole	Parophrys vetulus
Flathead sole	Hippoglossoides elassodon
Petrale sole	Eopsetta jordani
Rex sole	Glyptocephalus zachirus
Slender sole	Lyopsetta exilis

[8]Other rockfish (never more than 24 lb per haul)

S. crameri
S. diploproa
S. elongatus
S. ruberrimus
S. zacentrus

[9]Roundfish:

Blackcod	Anoplopoma fimbria
Hake	Merluccius productus
Lingcod	Ophiodon elongatus
Pacific pollock	Theragra chalcogrammus

[10]Other roundfish (never more than 24 lb per haul)

Eel pout	Zoarcidae
Eulachon	Thaleichthys pacificus
Poacher	Agonidae
Sandlance	Ammodytes hexapterus
Dogfish	Squalus suckleyi
Ratfish	Hydrolagus colliei
Skate	Rajdae

[11]T = Trace = less than one lb

Table II. Fishing log for Part II of G.B. Reed groundfish cruise no. 65-3, Cape Spencer-Dixon Entrance, August-September, 1965.

Haul No.	9	10	11	12	13
Date	Aug. 28	Aug. 28	Aug. 28	Aug. 29	Aug. 31
Area[1]	CC	CC	CC	KI	SS
INPFC Area[2]	036573	036573	036573	036570	035563
Start (PDT)[3]	0844	1102	1400	0748	1228
Duration (min)	30	30	23	5	30
Start: N. Lat. °	57	57	57	57	56
'	52	52	49.5	19	53
W. Long. °	136	136	136	136	136
'	53	50	50	18	00
Direction (°True)	180	200	180	140	150
End: N. Lat. °	57	57	57	..	56
'	49	51	48	..	51
W. Long. °	136	136	136	..	135
'	51	51	50.5	..	58
Depth (fm)	164-160	98-103	97-106	110	140-120
Water temp. (°C)					
Surface	13.3	13.2	13.8	13.1	12.3
Bottom	5.5	5.3	5.9	5.8	5.6
Bottom type[4]	..	..	S,G	..	..
Net used[5]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,900	2,500	2,300	100	12,500
Remarks	..	..	..	Snag	..

continued...

Table II (continued)

Haul No.	14	15	16	17	18
Date	Aug. 31	Sept. 1	Sept. 1	Sept. 1	Sept. 1
Area[1]	SS	KI	KI	KI	KI
INPFC Area[2]	035563	036570	036570	036570	036570
Start (PDT)[3]	1629	0738	0958	1230	1532
Duration (min)	30	30	20	29	30
Start: N. Lat. °	56	57	57	57	57
'	48	14	14.6	15.2	15
W. Long. °	135	136	136	136	136
'	57	15	14	10.5	03
Direction (°True)	140	170	170	150	180
End: N. Lat. °	56	57	57	57	57
'	46.5	13.5	13.5	13.7	13
W. Long. °	135	136	136	136	136
'	55	14	13.3	09	02.5
Depth (fm)	122-128	180-148	114-120	98	80-84
Water temp. (°C)					
Surface	13.3	12.2	11.9	12.7	12.0
Bottom	5.6	5.6	5.8	5.9	5.9
Bottom type[4]	..	..	..	..	..
Net used[5]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	E6,000	9,600	4,500	2,600	2,400
Remarks	Cod-end release failed alongside ship	..	..	..	..

continued...

Table II (continued)

Haul No.	19	20	21	22	23
Date	Sept. 2	Sept. 2	Sept. 2	Sept. 2	Sept. 3
Area[1]	SS	SS	SS	SS	CO
INPFC Area[2]	035563	035563	035563	035563	035560
Start (PDT)[3]	0716	0947	1418	1622	0725
Duration (min)	30	30	30	30	21
Start: N. Lat. °	56	56	56	56	56
'	49	49.3	47.5	40.7	18
W. Long. °	135	135	135	135	135
'	58	52	53	46.5	29
Direction (°True)	140	145	160	160	330
End: N. Lat. °	56	56	56	56	56
'	47.3	48	46	38.4	19
W. Long. °	135	135	135	135	135
'	56.3	50	52	47	30
Depth (fm)	122-126	101	109-112	124-118	105-106
Water temp. (°C)					
Surface	12.9	12.8	13.0	12.3	..
Bottom	5.5	5.6	5.6	5.4	..
Bottom type[4]	..	gr M	gr M	gr M	..
Net used[5]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	6,700	60	1,800	3,800	0
Remarks	..	Snag, net torn	..	..	Net twisted

continued...

Table II (continued)

Haul No.	24	25	26	27	28
Date	Sept. 3	Sept. 3	Sept. 3	Sept. 3	Sept. 4
Area[1]	CO	CO	CO	CO	IB
INPFC Area[2]	035560	035560	035560	035560	034553
Start (PDT)[3]	0823	1011	1222	1628	0821
Duration (min)	30	30	30	22	30
Start: N. Lat. °	56	56	56	56	55
'	19	16.5	14.5	10.2	42.5
W. Long. °	135	135	135	135	134
'	30	30	32	07.5	45
Direction (°True)	345	325	350	285	360
End: N. Lat. °	56	56	56	56	55
'	18	18	16	11	44
W. Long. °	135	135	135	135	134
'	27	33	33	10	45
Depth (fm)	104	114-125	214-142	142-148	106-109
Water temp. (°C)					
Surface	10.7	11.4	11.9	10.7	12.7
Bottom	5.7	5.5	5.6	5.7	5.8
Bottom type[4]	gr S, G	gr S, G	gr S, G	..	..
Net used[5]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,300	1,800	4,500	10	3,300
Remarks	..	..	..	Snag, net torn	..

continued...

Table II (continued)

Haul No.	29	30	31	32	33
Date	Sept. 4	Sept. 4	Sept. 4	Sept. 5	Sept. 5
Area[1]	IB	IB	IB	IB	IB
INPFC Area[2]	034553	034553	034553	034550	034550
Start (PDT)[3]	1057	1415	1633	0728	1012
Duration (min)	24	30	30	30	30
Start: N. Lat. °	55	55	55	55	55
'	38	34.7	34	25.5	27
W. Long. °	134	134	134	134	134
'	45	31.2	33	48.5	52
Direction (°True)	360	270	250	130	140
End: N. Lat. °	55	55	55	55	55
'	39.3	34.7	33.2	24.5	25.5
W. Long. °	134	134	134	134	134
'	45	34.5	34.7	46	50
Depth (fm)	117-112	128-138	134-131	119-117	122-125
Water temp. (°C)					
Surface	12.8	12.8	12.8	12.8	12.7
Bottom	5.7	5.7	5.8	5.7	5.7
Bottom type[4]	..	Hd	Hd	Hd	Hd
Net used[5]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,100	1,400	1,700	3,400	E13,000
Remarks	..	..	..	..	½ catch brought aboard

continued...

Table II (continued)

Haul No.	34	35	36	37	38	39
Date	Sept. 5	Sept. 6	Sept. 6	Sept. 7	Sept. 7	Sept. 7
Area[1]	IB	CB	FI	FI	FI	FI
INPFC Area[2]	034550	034550	034543	034543	034543	034543
Start (PDT)[3]	1718	0815	1728	0725	1045	1309
Duration (min)	30	10	43	35	31	30
Start: N. Lat. °	55	55	54	54	54	54
'	30	16.3	59.7	50	46	41.5
W. Long. °	135	134	134	134	134	134
'	00	07.2	17	00	11	07
Direction (°True)	130	180	160	180	160	150
End: N. Lat. °	55	55	54	54	54	54
'	29	15.8	58	49	44.3	40.5
W. Long. °	134	134	134	134	134	134
'	57.5	07.2	15	00	10	05.7
Depth (fm)	112-136	94-100	116-119	102-106	122-200	122
Water temp. (°C)						
Surface	13.2	12.2	12.4	12.6	12.9	13.0
Bottom	5.7	5.7	5.6	5.9	5.7	5.6
Bottom type[4]	Hd	Hd	..	..	..	..
Net used[5]	D-1	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,500	4,100	0	1,000	1,300	E12,200
Remarks	..	Broke ground-line	Net off bottom	..	..	½ catch brought aboard

continued....

Table II (continued)

Haul No.	9	10	11	12	13	14	15
Date	Aug. 28	Aug. 28	Aug. 28	Aug. 29	Aug. 31	Aug. 31	Sept. 1
Area[1]	CC	CC	CC	KI	SS	SS	KI
Total catch (lb)	1,900	2,500	2,300	100	12,500	E6,000+	9,600
Flatfish[6]							
Dover sole	36	..	..	..	2	..	2
English sole	..	..	..	..	..	..	..
Flathead sole	2	T	..	..	..	..	..
Halibut[7]	..	..	9(1)	..	..	..	..
Petrale sole	..	..	..	..	..	..	..
Rex sole	11	12	5	1	T	..	T
Turbot	407	940	249	12	122	x	141
Other[8]	4	..	..	..	..	..	..
Rockfish							
S. aleutianus	..	..	..	..	T	..	4
S. alutus	141	995	97	9	6321	E6000	8924
S. brevispinis	..	5	94	5	28	x	..
S. entomelas	..	..	..	..	6	..	..
S. proriger	..	..	..	..	..	..	..
S. rubrivinctus	..	4	5	..	12	x	7
S. zacentrus	..	..	1664	53	4	x	..
Seb. alascanus	173	61	3	T	43	..	35
Other[9]	2	..	36	..	10	x	..
Other roundfish							
Blackcod	19	66	..	..	55	..	98
Lingcod	..	..	21	..	63	..	..
Pacific cod	..	17	..	..	..	x	11
Pacific pollock	988	384	66	25	5967	x	371
Other[10]	..	T	4	..	1	..	3
Selachii							
Ratfish	..	..	..	..	..	..	..
Other[11]	..	5	..	..	..	..	..
Invertebrates							
Sponge	4	..	15	7	2	..	T
Squid	2	..	..	..	7	..	27
Urchin	90	20	15	..	..	..	..
Other	T[12]	12	15	..	T	..	2

continued...

Table II (continued)

Haul No.	16	17	18	19	20	21	22
Date	Sept. 1	Sept. 1	Sept. 1	Sept. 2	Sept. 2	Sept. 2	Sept. 2
Area[1]	KI	KI	KI	SS	SS	SS	SS
Total catch (lb)	4,500	2,600	2,400	6,700	60	1,800	3,800
Flatfish[6]							
Dover sole	1	41	..	12	..	1	3
English sole	..	44	2	..	..	..	..
Flathead sole	..	40	..	..	..	..	..
Halibut[7]	..	39(1)	50(2)	..	..	44(1)	..
Petrale sole	..	..	..	..	..	..	..
Rex sole	1	75	T	26	..	T	T
Turbot	125	1233	1201	330	6	86	131
Other[8]	..	T	..	..	..	..	..
Rockfish							
S. aleutianus	..	..	..	T	..	..	..
S. alutus	3206	158	1	5251	11	536	2319
S. brevispinis	36	..	4	21	7	11	20
S. entomelas	..	..	..	..	..	..	..
S. proriger	..	..	..	..	..	..	..
S. rubrivinctus	8	..	..	8	2	2	25
S. zacentrus	98	1	1	..	5	16	13
Seb. alascanus	59	..	..	37	5	40	42
Other[9]	4	..	..	2	..	1	..
Other roundfish							
Blackcod	69	86	314	172	7	21	79
Lingcod	..	18	..	..	..	..	22
Pacific cod	31	35	74	25	9	..	9
Pacific pollock	778	851	737	825	3	986	1130
Other[10]	14	..	..	2	..	T	1
Selachii							
Ratfish	..	..	..	..	..	..	..
Other[11]	..	..	..	4	..	6	..
Invertebrates							
Sponge	35	..	T	7	2	16	10
Squid	2	..	..	38	..	..	..
Urchin	..	T	T	..	T	2	..
Other	6	..	..	T	T	11	5

continued...

Table II (continued)

Haul No.	23	24	25	26	27	28	29
Date	Sept. 3	Sept. 3	Sept. 3	Sept. 3	Sept. 3	Sept. 4	Sept. 4
Area[1]	CO	CO	CO	CO	CO	IB	IB
Total catch (lb)	0	1,300	1,800	4,500	10	3,300	1,100
Flatfish[6]							
Dover sole	..	9	5	7	3	4	5
English sole	..	..	..	..	..	..	..
Flathead sole	..	..	..	..	..	3	12
Halibut[7]	..	..	..	..	..	..	..
Petrale sole	..	..	..	..	..	28	23
Rex sole	..	43	50	5	..	62	77
Turbot	..	72	108	126	..	172	173
Other[8]	..	..	..	..	..	2	T
Rockfish							
S. aleutianus	..	..	..	142	..	..	..
S. alutus	..	875	988	1794	2	2958	107
S. brevispinis	..	22	9	6	..	12	14
S. entomelas	..	..	..	..	..	..	..
S. proriger	..	..	..	..	..	..	29
S. rubrivinctus	..	5	5	4	..	..	193
S. zacentrus	..	37	5	37	..	..	..
Seb. alascanus	..	11	28	90	T	..	4
Other[9]	..	4	1	4	..	..	..
Other roundfish							
Blackcod	..	23	37	29	..	..	129
Lingcod	..	..	..	..	..	..	..
Pacific cod	..	32	..	..	..	..	63
Pacific pollock	..	120	518	2186	..	19	210
Other[10]	..	T	T	5	T	..	2
Selachii							
Ratfish	..	T	..	..	..	14	4
Other[11]	..	T	..	..	..	..	..
Invertebrates							
Sponge	..	30	..	9	4	3	..
Squid	..	4	..	14	..	..	..
Urchin	..	..	..	..	..	12	9
Other	..	11	10	4	1	1	1

continued...

Table II (continued)

Haul No.	30	31	32	33	34	35	36
Date	Sept. 4	Sept. 4	Sept. 5	Sept. 5	Sept. 5	Sept. 6	Sept. 6
Area[1]	IB	IB	IB	IB	IB	CB	FI
Total catch (lb)	1,400	1,700	3,400	E13,000	1,500	4,100	0
Flatfish[6]							
Dover sole	3	2	3	4	1	..	..
English sole	..	1	..	..	..	..	..
Flathead sole	..	..	..	..	2	..	..
Halibut[7]	..	..	4(1)	8(2)	527(10)	..	..
Petrale sole	..	..	..	..	2	..	..
Rex sole	38	15	2	2	7	..	..
Turbot	100	32	31	4	106	4	..
Other[8]	T	..	..	..	T	..	..
Rockfish							
S. aleutianus	6	..	..	..	..	..	..
S. alutus	241	371	228	7264	127	..	..
S. brevispinis	10	6	306	678	62	93	..
S. entomelas	..	..	..	..	29	..	..
S. proriger	..	..	3	2	219	3925	..
S. rubrivinctus	51	20	28	112	..	..	..
S. zacentrus	..	..	452	3882	186	45	..
Seb. alascanus	72	55	77	110	9	T	..
Other[9]	5	18	41	12	..	40	..
Other roundfish							
Blackcod	55	33	67	176	71	..	..
Lingcod	..	..	..	..	8	..	..
Pacific cod	27	31	25	..	26	..	..
Pacific pollock	748	1069	1846	680	52	..	..
Other[10]	..	1	10	26	T	10	..
Selachii							
Ratfish	6	20	11	12	29	..	..
Other[11]	..	10	..	..	..	..	..
Invertebrates							
Sponge	..	..	223	30	40	T	..
Squid	6	6	10	2	..	..	..
Urchin	14	8	..	..	..	..	..
Other	T	T	32	3	6	T	..

continued...

Table II (continued)

Haul No.	37	38	39
Date	Sept. 7	Sept. 7	Sept. 7
Area	FI	FI	FI
Total catch (lb)	1,000	1,300	E12,200
Flatfish			
Dover sole	4	..	..
English sole	..	..	..
Flathead sole	..	..	..
Halibut	..	..	..
Petrale sole	..	..	..
Rex sole	67	2	2
Turbot	50	49	42
Other	..	..	..
Rockfish			
S. aleutianus	..	5	..
S. alutus	649	1085	11584
S. brevispinis	33	29	142
S. entomelas	..	5	..
S. proriger	..	..	..
S. rubrivinctus	105	3	14
S. zacentrus	..	47	220
Seb. alascanus	36	29	22
Other	8	4	4
Other roundfish			
Blackcod	14	3	52
Lingcod	..	..	..
Pacific cod	9	..	..
Pacific pollock	14	5	126
Other	T	T	T
Selachii			
Ratfish	7	8	16
Other	13	..	..
Invertebrates			
Sponge	4	22	T
Squid	..	2	..
Urchin	6	2	..
Other	22	5	T

Footnotes to Table II

1. Area: CB = Cape Bartolome FI = Forrester Island KI = Kruzof Island
   CC = Cape Cross IB = Iphigenia Bay SS = Sitka Sound
   CO = Cape Ommaney

2. INPFC Area: Revised code

3. PDT: Pacific Daylight Time

4. Bottom type: gr = green; G = gravel; Hd = hard; M = mud; S = sand

5. Net used: D-1; see Footnote for Table I.

6. Flatfish:

English sole	Parophrys vetulus
Flathead sole	Hippoglossoides elassodon
Petrale sole	Eopsetta jordani
Rex sole	Glyptocephalus zachirus

7. Halibut: Numbers in parentheses

8. Other flatfish: Never more than 24 lb per haul: slender sole, Lyopsetta exilis

9. Other rockfish: Never more than 24 lb per haul: S. ciliatus; S. crameri; S. diploproa; S. elongatus; S. flavidus; S. helvomaculatus; S. paucispinis; S. pinniger; S. ruberrimus; S. sp.

10. Other roundfish: Never more than 24 lb per haul: eulachon (Thaleichthys pacificus); lanternfish (Myctophidae); poacher (Agonidae); prowfish (Zaprora silenus); sculpin (Cottidae).

11. Other Selachii: Never more than 24 lb per haul: dogfish (Squalus suckleyi); skate (Rajidae).

12. T = Trace = less than one lb.

Table III. Fishing log for Part III of G.B. Reed groundfish cruise no. 65-3, La Perouse Bank-Cape Blanco, September, 1965.

Haul No.		40	41	42	43	44
Date		Sept. 9	Sept. 9	Sept. 9	Sept. 10	Sept. 10
Area[1]		LB	LB	LB	LB	LB
Start (PDT)[2]		0842	1236	1508	0725	0933
Duration (min)		39	24	30	30	30
Start: N. Lat.	°	48	48	48	48	48
	'	50	51.7	50.5	50	49
W. Long.	°	126	126	126	126	126
	'	27	31	33	34	35
Direction (°True)		310	180	180	170	160
End: N. Lat.	°	48	48	48	48	48
	'	51.5	49.2	48.5	48	47.5
W. Long.	°	126	126	126	126	126
	'	29.5	31	31	33.5	34
Depth (fm)		98-96	115-117	128-135	156-160	176-184
Water temp. (°C)						
Surface		11.5	11.7	12.3	11.7	12.0
Bottom		7.0	6.7	6.4	6.2	5.9
Bottom type[3]		..	G	..	..	..
Net used[4]		D-1	D-1	D-1	D-1	D-1
Total catch (lb)		E25,700	8,500	6,900	5,200	1,600
Remarks		1/2 catch taken aboard	..	..	..	..

continued...

Table III (continued)

Haul No.	45	46	47	48	49
Date	Sept. 10	Sept. 10	Sept. 11	Sept. 11	Sept. 11
Area[1]	LB	LB	LB	LB	LB
Start (PDT)[2]	1236	1259	0820	0916	1028
Duration (min)	30	30	9	15	30
Start: N. Lat. °	48	48	48	48	48
'	49.5	49	55	54	55
W. Long. °	126	126	126	126	126
'	36	36.5	23.5	22.5	23
Direction (°True)	160	160	140	140	140
End: N. Lat. °	48	48	48	48	48
'	47.5	47	54	54	53.5
W. Long. °	126	126	126	126	126
'	34.5	35.5	23.5	22	22
Depth (fm)	200	234-232	82-83	84-86	86-88
Water temp. (°C)					
Surface	12.2	12.1	..	..	12.7
Bottom	5.7	5.4	..	..	7.1
Bottom type[3]	..	..	..	..	..
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	2,100	200	67	1,000	1,500
Remarks	..	..	Codend opened on bottom	...	..

continued...

Table III (continued)

Haul No.	50	51	52	53	54
Date	Sept. 11	Sept. 11	Sept. 12	Sept. 12	Sept. 12
Area[1]	LB	LB	LB	LB	LB
Start (PDT)[2]	1230	1440	0817	1046	1332
Duration (min)	30	30	30	30	30
Start: N. Lat. °	48	48	48	48	48
'	56.2	53.7	32.5	29	25
W. Long. °	126	126	126	126	125
'	20.5	24.7	06.2	07	53
Direction (°True)	140	180	140	140	150
End: N. Lat. °	48	48	48	48	48
'	55	52.5	31	27	21.5
W. Long. °	126	126	126	126	125
'	18.5	24.5	06	06	52
Depth (fm)	75-74	92-94	101-104	120-126	106-90
Water temp. (°C)					
Surface	12.8	11.8	11.0	11.2	11.3
Bottom	7.2	7.0	6.9	6.9	7.1
Bottom type[3]	..	..	..	..	..
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	2,800	1,900	6,600	1,300	E13,700
Remarks	..	..	..	..	1/2 catch brought aboard

continued...

Table III (continued)

Haul No.	55	56	57	58	59
Date	Sept. 14	Sept. 14	Sept. 14	Sept. 15	Sept. 15
Area[1]	CF	CF	CF	GH	GH
Start (PDT)[2]	0829	1330	1529	0920	1230
Duration (min)	26	15	38	27	24
Start: N. Lat. °	48	48	47	47	47
'	03	05.7	59	07	08
W. Long. °	125	125	125	124	124
'	17.5	19	15.2	58	57.8
Duration (°True)	210	235	310	190	150
End: N. Lat. °	48	48	48	47	47
'	01	04.7	00.3	06	06.3
W. Long. °	125	125	125	124	124
'	18	19.5	18.2	58	56.7
Depth (fm)	102-86	110-108	92-98	108-158	102-93
Water temp. (°C)					
Surface	12.5	13.0	12.6	13.0	12.7
Bottom	7.4	7.2	7.4	7.3	7.3
Bottom type[3]	..	..	..	..	..
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,600	800	3,200	2,000	2,500
Remarks	Wing torn	..	Wing torn	Wing torn	Wing torn

continued...

Table III (continued)

Haul No.	60	61	62	63	64
Date	Sept. 15	Sept. 16	Sept. 16	Sept. 16	Sept. 16
Area[1]	GH	WB	WB	WB	WB
Start (PDT)[2]	1720	0823	1048	1402	1648
Duration (min)	28	30	67	30	30
Start: N. Lat. °	46	46	46	46	46
'	57.4	39.5	40.5	45.5	45.5
W. Long. °	124	124	124	124	124
'	50	44	43	50	50
Direction (°True)	120	330	340	140	140
End: N. Lat. °	46	46	46	46	46
'	56	41	39.2	44	43.7
W. Long. °	124	125	124	124	124
'	49	45.5	44.7	48.4	48.9
Depth (fm)	116-164	126-116	96-160	138-128	148-140
Water temp. (°C)					
Surface	13.5	13.5	..	..	14.2
Bottom	7.4	7.0	..	..	7.5
Bottom type[3]	..	..	..	..	grCl, blS
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	1,700	E9,600	2,200	E9,000	2,000
Remarks	..	1/2 catch brought aboard	..	Winch broke. Codend clip failed	..

continued...

Table III (continued)

Haul No.	65	66	67	68	69
Date	Sept. 19	Sept. 19	Sept. 19	Sept. 19	Sept. 20
Area[1]	CR	CR	CR	CR	TB
Start (PDT)[2]	1108	1232	1435	1720	0823
Duration (min)	52	40	30	30	30
Start: N. Lat. °	46	46	46	46	45
'	03.8	06.3	05.5	04.3	29.5
W. Long. °	124	124	124	124	124
'	39	38.5	40.4	42	26.5
Direction (°True)	345	160	180	180	160
End: N. Lat. °	46	46	46	46	45
'	06.7	04.6	03	02.7	28
W. Long. °	124	124	124	124	124
'	39	39	42.2	42.9	26
Depth (fm)	98-103	97-100	114-128	138-140	134-128
Water temp. (°C)					
Surface	..	14.1	14.3	14.3	13.1
Bottom	..	7.3	7.1	7.1	7.4
Bottom type[3]	..	grM, S	grS, M	grS, M	grM, S
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	0	1,000	2,400	1,200	4,000
Remarks	X-Doors	..	..	..	..

continued...

Table III (continued)

Haul No.	70	71	72	73	74
Date	Sept. 20	Sept. 20	Sept. 20	Sept. 21	Sept. 21
Area[1]	TB	TB	TB	TB	TB
Start (PDT)[2]	1035	1456	1724	0824	0903
Duration (min)	30	30	30	5	33
Start: N. Lat. °	45	45	45	45	45
'	29.5	30.7	30.1	31.5	31.5
W. Long. °	124	124	124	124	124
'	28	28.6	23.5	19	18
Direction (°True)	160	180	160	160	130
End: N. Lat. °	45	45	45	..	45
'	28	28.8	28	..	29.5
W. Long. °	124	124	124	..	124
'	28	28	22.8	..	16
Depth (fm)	160-155	168-172	110-108	90	92-90
Water temp. (°C)					
Surface	13.4	13.3	13.6	..	12.9
Bottom	7.0	6.5	7.5	..	7.7
Bottom type[3]	grCl, M	grM, S, Cl	grS, M	..	grS, M
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	3,200	5,000	1,100	0	800
Remarks	Wing torn	..	..	X-Doors	..

continued...

Table III (continued)

Haul No.	75	76	77	78	79
Date	Sept. 21	Sept. 21	Sept. 21	Sept. 22	Sept. 22
Area[1]	TB	TB	TB	HB	HB
Start (PDT)[2]	1046	1316	1553	0820	1115
Duration (min)	30	35	30	31	45
Start: N. Lat. °	45	45	45	44	44
'	31.5	21.5	22.4	25	14
W. Long. °	124	124	124	124	124
'	13.5	18.7	21.4	46.5	55.5
Direction (°True)	180	160	160	200	020
End: N. Lat. °	45	45	45	44	44
'	29.5	20.2	20.5	23.5	16
W. Long. °	124	124	124	124	124
'	13.5	18	20.4	46.5	52.7
Depth (fm)	78-80	108-102	123-130	130-128	136-124
Water temp. (°C)					
Surface	12.7	14.8	14.8	12.3	12.4
Bottom	7.6	7.8	7.1	7.4	7.6
Bottom type[3]	grS, M	..	grM, Si	blM	grS
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	800	1,100	7,600	200	2,800
Remarks	..	..	..	..	..

continued...

Table III (continued)

Haul No.	80	81	82	83	84
Date	Sept. 22	Sept. 22	Sept. 23	Sept. 23	Sept. 23
Area[1]	HB	HB	CB	CB	CB
Start (PDT)[2]	1414	1724	0823	1000	1514
Duration (min)	40	30	30	30	30
Start: N. Lat. °	44	44	43	43	42
'	08.5	05	10	10.5	59.5
W. Long. °	124	124	124	124	124
'	58	56.6	42	45	52.5
Direction (°True)	000	000	350	210	000
End: N. Lat. °	44	44	43	43	43
'	10.8	06.5	11.5	09.5	02
W. Long. °	124	124	124	124	124
'	58	56.5	42	46.5	52.5
Depth (fm)	160-154	155-140	104-107	157-154	150-156
Water temp. (°C)					
Surface	12.8	12.0	10.8	11.4	12.4
Bottom	7.4	7.4	7.9	7.5	8.0
Bottom type[3]	blM, S	blM, S	grM, S	grS, M	grS, M
Net used[4]	D-1	D-1	D-1	D-1	D-1
Total catch (lb)	5,800	8,800	1,500	1,100	2,700
Remarks	..	..	..	..	..

continued...

Table III (continued)

Haul No.	40	41	42	43	44
Date	Sept. 9	Sept. 9	Sept. 9	Sept. 10	Sept. 10
Area[1]	LB	LB	LB	LB	LB
Total catch (lb)	E25,700	8,500	6,900	5,200	1,600
Flatfish[5]					
Dover sole	105	8	28	137	80
English sole	..	..	..	1	..
Halibut[6]	324(6)	..	..	..	..
Petrale sole	24	2	3	..	..
Rex sole	27	9	43	34	37
Slender sole	..	Tr	Tr	2	Tr
Turbot	..	..	14	32	13
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	..	9	6
S. alutus	13,809	6,592	5,145	3,477	518
S. brevispinis	693	71	7	..	..
S. crameri	..	..	289	127	72
S. diploproa	..	Tr	218	508	66
S. elongatus	45	53	4	..	..
S. entomelas	513	16	..	..	..
S. flavidus	2,004	..	..	..	..
S. helvomaculatus	84	26	65	1	..
S. paucispinis	174	11	27	..	..
S. pinniger	240	..	..	..	..
S. proriger	4,593	1	..	..	..
S. ruberrimus	42	..	..	..	..
S. rubrivinctus	54	7	84	44	39
S. saxicola	24	..	..	..	..
S. zacentrus	1,026	62	313	..	..
S. sp.	135	1,355	151	..	..
Seb. alascanus	15	9	29	35	..
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	321	134	100	129	54
Eulachon	..	..	..	..	..
Hake	1,413	24	186	571	712
Lingcod	15	..	..	..	..
Pacific cod	39	78	3	..	..
Other[10]	15	..	Tr	9	4
Selachii[11]					
Dogfish	..	..	10	..	..
Ratfish	..	16	28	6	3
Skate	..	..	..	7	3
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	Tr[13]	..	2	Tr	..
Sponge	2	2	149	6	1
Urchin	..	..	..	10	2
Other	4	1	14	13	14

continued...

Table III (continued)

Haul No.	45	46	47	48	49
Date	Sept. 10	Sept. 10	Sept. 11	Sept. 11	Sept. 11
Area[1]	LB	LB	LB	LB	LB
Total catch (lb)	2,100	200	67	1,000	1,500
Flatfish[5]					
Dover sole	89	22	4	193	336
English sole	..	..	..	Tr	..
Halibut[6]	..	..	..	..	21(1)
Petrale sole	..	..	..	..	..
Rex sole	7	6	..	9	16
Slender sole	Tr	..	Tr	Tr	1
Turbot	4	..	Tr	128	179
Other[7]	..	..	..	Tr	Tr
Rockfish					
S. aleutianus	110	60	..	..	..
S. alutus	597	51	10	217	274
S. brevispinis	..	..	..	..	..
S. crameri	162	6	..	Tr	..
S. diploproa	6	..	..	..	..
S. elongatus	..	..	..	3	6
S. entomelas	..	..	..	..	..
S. flavidus	..	..	..	..	15
S. helvomaculatus	..	..	..	..	..
S. paucispinis	..	..	..	12	14
S. pinniger	..	..	..	..	13
S. proriger	..	..	..	..	..
S. ruberrimus	..	..	..	..	..
S. rubrivinctus	9	..	..	53	40
S. saxicola	..	..	..	..	..
S. zacentrus	..	..	..	..	..
S. sp.	..	..	..	..	..
Seb. alascanus	9	3	1	31	82
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	68	12	..	16	69
Eulachon	..	..	Tr	15	25
Hake	1,043	81	2	226	54
Lingcod	..	..	..	..	3
Pacific cod	..	..	..	12	18
Other[10]	1	..	..	..	..
Selachii[11]					
Dogfish	..	..	..	4	..
Ratfish	..	..	..	3	27
Skate	4	4	50	60	52
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	..	..	..	47	231
Sponge	..	..	..	..	..
Urchin	Tr	..	..	20	26
Other	5	4	..	..	10

continued...

Table III (continued)

Haul No.	50	51	52	53	54
Date	Sept. 11	Sept. 11	Sept. 12	Sept. 12	Sept. 12
Area[1]	LB	LB	LB	LB	LB
Total catch (lb)	2,800	1,900	6,600	1,300	E13,700
Flatfish[5]					
Dover sole	43	199	20	5	24
English sole	..	..	..	..	..
Halibut[6]	..	..	..	..	..
Petrale sole	..	..	6	..	..
Rex sole	13	5	8	2	4
Slender sole	Tr	..	Tr	..	..
Turbot	268	162	6	..	10
Other[7]	..	..	4	..	..
Rockfish					
S. aleutianus	..	..	..	..	..
S. alutus	1	991	5,669	762	2,126
S. brevispinis	..	..	106	..	400
S. crameri	..	9	Tr	5	..
S. diploproa	..	..	..	7	1,062
S. elongatus	..	31	93	14	88
S. entomelas	4	10	6	..	106
S. flavidus	39	4	..	..	8
S. helvomaculatus	..	9	31	Tr	110
S. paucispinis	..	53	8	..	786
S. pinniger	6	3	..	..	30
S. proriger	..	Tr	1	..	478
S. ruberrimus	..	..	5	..	66
S. rubrivinctus	378	..	13	12	102
S. saxicola	..	..	..	..	..
S. zacentrus	..	2	4	2	934
S. sp.	..	..	..	..	7,324
Seb. alascanus	..	14	12	15	10
Other[8]	..	Tr	..	..	..
Other Roundfish[9]					
Blackcod	108	105	440	125	14
Eulachon	7	25	..	..	..
Hake	1,670	112	103	308	8
Lingcod	25	..	..	..	22
Pacific cod	13	15	32	5	..
Other[10]	Tr	Tr	Tr	3	Tr
Selachii[11]					
Dogfish	8	..	..	..	..
Ratfish	22	14	24	22	2
Skate	146	26	..	..	..
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	76	141	2	..	2
Sponge	..	..	..	Tr	Tr
Urchin	9	..	..	..	Tr
Other	..	Tr	13	Tr	Tr

continued...

Table III (continued)

Haul No.	55	56	57	58	59
Date	Sept. 14	Sept. 14	Sept. 14	Sept. 15	Sept. 15
Area[1]	CF	CF	CF	GH	GH
Total catch (lb)	1,600	800	3,200	2,000	2,500
Flatfish[5]					
Dover sole	18	11	5	59	26
English sole	..	..	..	..	..
Halibut[6]	..	..	38(1)	87(1)	55(2)
Petrale sole	2	10	..	8	7
Rex sole	8	Tr	10	17	23
Slender sole	2	..	..	..	..
Turbot	4	8	5	14	12
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	..	..	..
S. alutus	119	356	..	1,078	1,544
S. brevispinis	90	81	1,160	20	315
S. crameri	..	..	..	..	..
S. diploproa	..	..	..	6	1
S. elongatus	21	9	34	19	36
S. entomelas	..	..	3	..	..
S. flavidus	6	4	187	..	32
S. helvomaculatus	12	5	45	4	31
S. paucispinis	83	16	142	121	68
S. pinniger	38	..	880	..	16
S. proriger	67	2	..	..	51
S. ruberrimus	50	..	..	11	68
S. rubrivinctus	Tr	..	47	111	23
S. saxicola	..	..	..	..	17
S. zacentrus	836	251	409	232	75
S. sp.	4	..	..	..	..
Seb. alascanus	25	1	1	10	10
Other[8]	..	..	Tr	..	..
Other Roundfish[9]					
Blackcod	23	6	41	19	70
Eulachon	..	..	..	..	..
Hake	13	2	..	42	14
Lingcod	44	17	54	..	..
Pacific cod	..	6	83	14	17
Other[10]	Tr	..	Tr	Tr	Tr
Selachii[11]					
Dogfish	..	..	..	..	..
Ratfish	42	11	8	113	10
Skate	55	..	45	..	..
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	1	..	..	..	..
Sponge	..	..	..	..	..
Urchin	..	..	..	4	..
Other	Tr	2	10	5	17

continued...

Table III (continued)

Haul No.	60	61	62	63	64
Date	Sept. 15	Sept. 16	Sept. 16	Sept. 16	Sept. 16
Area[1]	GH	WB	WB	WB	WB
Total catch (lb)	1,700	E9,600	2,200	E9,000	2,000
Flatfish[5]					
Dover sole	132	70	41	..	36
English sole	..	..	..	..	2
Halibut[6]	..	..	..	..	..
Petrale sole	..	30	..	..	..
Rex sole	4	8	..	..	5
Slender sole	5	..	..	..	..
Turbot	76	62	127	..	22
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	6	..	..	..	..
S. alutus	445	7,814	1,066	E9,000	1,358
S. brevispinis	..	6	164	..	..
S. crameri	21	6	Tr	..	19
S. diploproa	65	24	..	..	322
S. elongatus	..	4	46	..	Tr
S. entomelas	..	..	129	..	4
S. flavidus	..	8	4	..	..
S. helvomaculatus	Tr	38	11	..	1
S. paucispinis	21	58	16	..	35
S. pinniger	..	..	..	..	..
S. proriger	..	..	1	..	..
S. ruberrimus	..	154	..	..	..
S. rubrivinctus	37	..	133	..	13
S. saxicola	..	..	230	..	..
S. zacentrus	2	666	34	..	46
S. sp.	..	..	..	..	..
Seb. alascanus	39	48	Tr	..	6
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	23	152	20	..	36
Eulachon	..	..	Tr	..	..
Hake	653	8	11	..	30
Lingcod	30	296	18	..	..
Pacific cod	..	18	..	..	9
Other[10]	Tr	Tr	Tr	..	2
Selachii[11]					
Dogfish	3	6	8	..	..
Ratfish	18	16	53	..	48
Skate	9	64	45	..	33
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	..	Tr	80	..	..
Sponge	..	..	..	..	..
Urchin	..	Tr	9	..	Tr
Other	132	Tr	Tr	..	Tr

continued...

Table III (continued)

Haul No.	65	66	67	68	69
Date	Sept. 19	Sept. 19	Sept. 19	Sept. 19	Sept. 20
Area[1]	CR	CR	CR	CR	TB
Total catch (lb)	0	1,000	2,400	1,200	4,000
Flatfish[5]					
Dover sole	..	66	66	9	129
English sole	..	..	Tr	..	..
Halibut[6]	..	..	16(1)	..	..
Petrale sole	..	..	..	..	Tr
Rex sole	..	23	18	Tr	19
Slender sole	..	..	Tr	..	..
Turbot	..	55	69	6	56
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	..	..	..
S. alutus	..	207	1,544	151	1,447
S. brevispinis	..	41	10	..	3
S. crameri	..	45	17	10	42
S. diploproa	..	Tr	34	30	621
S. elongatus	..	11	9	Tr	..
S. entomelas	..	..	4	2	21
S. flavidus	..	42	6	..	..
S. helvomaculatus	..	..	6	..	1
S. paucispinis	..	15	39	..	13
S. pinniger	..	20	..	..	..
S. proriger	..	..	..	..	..
S. ruberrimus	..	..	..	..	..
S. rubrivinctus	..	12	15	Tr	45
S. saxicola	..	112	..	..	..
S. zacentrus	..	3	25	2	127
S. sp.	..	..	6	..	..
Seb. alascanus	..	19	29	13	46
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	..	60	76	51	127
Eulachon	..	Tr	Tr	..	..
Hake	..	20	339	928	1,179
Lingcod	..	10	11	..	..
Pacific cod	..	..	..	..	..
Other[10]	..	Tr	Tr	Tr	Tr
Selachii[11]					
Dogfish	..	2	..	..	..
Ratfish	..	27	10	3	4
Skate	..	78	..	..	Tr
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	..	20	Tr	..	5
Sponge	..	..	..	..	..
Urchin	..	81	26	2	63
Other	..	Tr	Tr	10	2

continued...

Table III (continued)

Haul No.	70	71	72	73	74
Date	Sept. 20	Sept. 20	Sept. 20	Sept. 21	Sept. 21
Area[1]	TB	TB	TB	TB	TB
Total catch (lb)	3,200	5,000	1,100	0	800
Flatfish[5]					
Dover sole	113	964	182	..	36
English sole	..	..	Tr	..	..
Halibut[6]	..	..	21(1)	..	..
Petrale sole	..	..	..	..	3
Rex sole	70	286	89	..	12
Slender sole	..	..	..	..	Tr
Turbot	35	59	118	..	79
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	..	..	2
S. alutus	797	27	312	..	7
S. brevispinis	..	..	7	..	4
S. crameri	129	30	3	..	8
S. diploproa	626	603	2	..	..
S. elongatus	..	..	8	..	19
S. entomelas	11	..	7	..	..
S. flavidus	..	..	..	..	..
S. helvomaculatus	5	..	..	..	Tr
S. paucispinis	..	..	..	..	..
S. pinniger	..	..	..	..	..
S. proriger	..	..	2	..	..
S. ruberrimus	..	..	..	..	..
S. rubrivinctus	65	59	8	..	9
S. saxicola	..	..	5	..	110
S. zacentrus	2	..	Tr	..	11
S. sp.	3	..	3	..	..
Seb. alascanus	129	139	60	..	24
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	162	436	153	..	2
Eulachon	..	..	..	..	Tr
Hake	928	2,246	57	..	212
Lingcod	26	..	..	..	..
Pacific cod	..	..	8	..	..
Other[10]	7	3	Tr	..	2
Selachii[11]					
Dogfish	..	12	2	..	4
Ratfish	7	..	7	..	21
Skate	11	..	15	..	28
Other[12]	..	..	..	..	..
Invertebrates					
Shrimp	Tr	8	26	..	80
Sponge	..	..	..	..	..
Urchin	39	83	44	..	100
Other	Tr	1	3	..	..

continued...

Table III (continued)

Haul No.	75	76	77	78	79
Date	Sept. 21	Sept. 21	Sept. 21	Sept. 22	Sept. 22
Area[1]	TB	TB	TB	CL	CL
Total catch (lb)	800	1,100	7,600	200	2,800
Flatfish[5]					
Dover sole	72	28	46	1	30
English sole	..	1	..	1	107
Halibut[6]	..	..	..	..	..
Petrale sole	8	..	5	..	69
Rex sole	21	24	29	Tr	109
Slender sole	73	1	..	..	6
Turbot	85	52	38	..	96
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	1	..	..
S. alutus	Tr	394	745	7	64
S. brevispinis	..	..	..	..	191
S. crameri	3	28	149	61	..
S. diploproa	..	Tr	171	47	58
S. elongatus	4	1	..	..	17
S. entomelas	..	..	27	..	..
S. flavidus	11	..	..	..	..
S. helvomaculatus	..	..	..	1	68
S. paucispinis	..	..	18	..	..
S. pinniger	4	..	..	..	54
S. proriger	..	..	..	..	..
S. ruberrimus	..	..	..	..	20
S. rubrivinctus	112	Tr	2	24	246
S. saxicola	Tr	11	..	..	420
S. zacentrus	..	..	..	..	164
S. sp.	..	1	1	2	22
Seb. alascanus	9	12	41	2	4
Other[8]	..	Tr	..	..	..
Other Roundfish[9]					
Blackcod	16	142	169	..	360
Eulachon	..	..	..	..	Tr
Hake	257	369	6,120	78	..
Lingcod	6	..	5	..	390
Pacific cod	..	..	..	..	..
Other[10]	7	..	..	..	3
Selachii[11]					
Dogfish	7	9	..	..	29
Ratfish	5	..	2	..	30
Skate	..	..	..	..	10
Other[12]	..	..	..	..	60
Invertebrates					
Shrimp	40	13	7	Tr	10
Sponge	..	..	..	..	..
Urchin	29	53	65	Tr	200
Other	10	1	..	Tr	12

continued...

Table III (continued)

Haul No.	80	81	82	83	84
Date	Sept. 22	Sept. 22	Sept. 23	Sept. 23	Sept. 23
Area[1]	HB	HB	CB	CB	CB
Total catch (lb)	5,800	8,800	1,500	1,100	2,700
Flatfish[5]					
Dover sole	847	345	647	497	1,605
English sole	140	43	7	..	..
Halibut[6]	..	..	..	..	..
Petrale sole	15	20	6	..	..
Rex sole	644	334	45	175	57
Slender sole	6	2	Tr	Tr	Tr
Turbot	176	189	43	58	59
Other[7]	..	..	..	..	..
Rockfish					
S. aleutianus	..	..	2	..	..
S. alutus	591	959	8	29	2
S. brevispinis	..	..	..	..	..
S. emeri	953	4,709	3	4	195
S. diploproa	912	340	2	37	42
S. elongatus	..	..	33	Tr	..
S. entomelas	6	..	4	..	..
S. flavidus	..	..	..	..	..
S. helvomaculatus	..	2	8	..	Tr
S. paucispinis	45	53	7	..	..
S. pinniger	..	..	..	..	..
S. proriger	..	..	..	..	..
S. ruberrimus	..	..	..	..	..
S. rubrivinctus	78	58	119	27	47
S. saxicola	6	..	3	..	..
S. zacentrus	5	5	13	1	..
S. sp.	2	2	1	..	..
Seb. alascanus	3	27	17	55	77
Other[8]	..	..	..	..	..
Other Roundfish[9]					
Blackcod	526	1,001	125	67	481
Eulachon	..	..	..	..	..
Hake	634	442	68	83	61
Lingcod	..	..	20	..	..
Pacific cod	..	..	..	..	..
Other[10]	3	1	..	7	5
Selachii[11]					
Dogfish	7	1	15	21	6
Ratfish	22	43	6	4	15
Skate	40	2	58	..	10
Other[12]	..	..	..	..	5
Invertebrates					
Shrimp	..	Tr	24	..	..
Sponge	..	..	..	..	..
Urchin	94	192	197	17	70
Other	1	1	24	2	8

Footnotes to Table III

1. Area: CB = Cape Blanco GH = Grays Harbor TB = Tillamook Bay
CF = Cape Flattery HB = Heceta Bank WB = Willapa Bay
CR = Columbia River LB = La Perouse Bank

2. PDT: Pacific Daylight Time.

3. Bottom type: bl = black; gr = green; Cl = clay; G = gravel; M = mud; S = sand; Si = silt.

4. Net used: see description in Footnotes to Table I.

5. Flatfish: slender sole (Lyopsetta exilis).

6. Halibut: numbers in parentheses.

7. Other flatfish: Never more than 24 lb per haul: flathead sole (Hippoglossoides elassodon); rock sole (Lepidopsetta bilineata).

8. Other rockfish: Never more than 24 lb per haul: pygmy rockfish (Sebastodes wilsoni); shortbelly rockfish (S. jordani).

9. Roundfish: Eulachon (Thaleichthys pacificus); Pacific cod (Gadus macrocephalus).

10. Other roundfish: Never more than 24 lb per haul: anchovy (Engraulis mordax); eel pout (Zoarcidae); hagfish (Polistotrema stoutii); lanternfish (Myctophidae); poacher (Agonidae); sculpin (Cottidae); shad (Alosa sapidissima); snailfish (Careproctus melanurus); viper fish (Chauliodontidae).

11. Selachii: dogfish (Squalus suckleyi); ratfish (Hydrolagus colliei); skate (Rajidae).

12. Other Selachii: brown cat shark (Apristurus brunneus); electric ray (Torpedo californica).

13. Tr = Trace = less than one lb.

Table IV. Fishing log for the Digby dredge during G.B. Reed cruise no. 65-3, August-September, 1965.

Haul No.	Date	Area[1]	N. Lat.	W. Long.	Depth (fms)	Duration (min)
1	Aug. 24	QCS	51°20.8'	129°09.5'	120	20
2	" 25	QCS	51°23.5'	129°29'	84-85	10
3	" 28	CC	57°48'	136°50.5'	99-100	10
4	" 31	SS	56°46.5'	135°56'	118	10
5	Sept. 1	KI	57°13'	136°09'	90	10
6	" 2	SS	56°38.3'	135°47'	112	10
7	" 3	IB	56°11'	135°10'	158-152	10
8	" 4	IB	55°33'	134°34'	136	10
9	" 5	IB	55°29'	134°57.5'	142	10
10	" 6	IB	54°58'	134°15'	118-120	10
11	" 7	FI	54°29.8'	133°51.5'	130	10
12	" 9	LB	48°49.5'	126°30'	107-110	12
13	" 10	LB	48°49'	126°36.5'	180-170	10
14	" 11	LB	48°51.5'	126°23.2'	94-92	10
15	" 12	LB	48°21.5'	125°53'	88	10
16	" 14	CF	48°00.5'	125°18.5'	84-108	10
17	" 15	GH	46°56'	124°49'	180-170	10
18	" 16	WH	46°43'	124°47.5'	144-128	11
19	" 19	CR	46°01.5'	124°43'	174	10
20	" 20	TB	45°27'	124°21'	106-100	10
21	" 21	TB	45°19'	124°19.6'	130-126	10
22	" 22	HB	44°05'	124°57'	154-144	10
23	" 23	CB	43°06'	124°52'	176	10

[1]Area: CB = Cape Blanco; CC = Cape Cross; CF = Cape Flattery; CR = Columbia River; FI = Forrester Island; GH = Grays Harbor; IB = Iphigenia Bay; KI = Kruzof Island; LB = La Perouse Bank; QCS = Queen Charlotte Sound; SS = Sitka Sound; TB = Tillamook Bay; WH = Willapa Harbor.

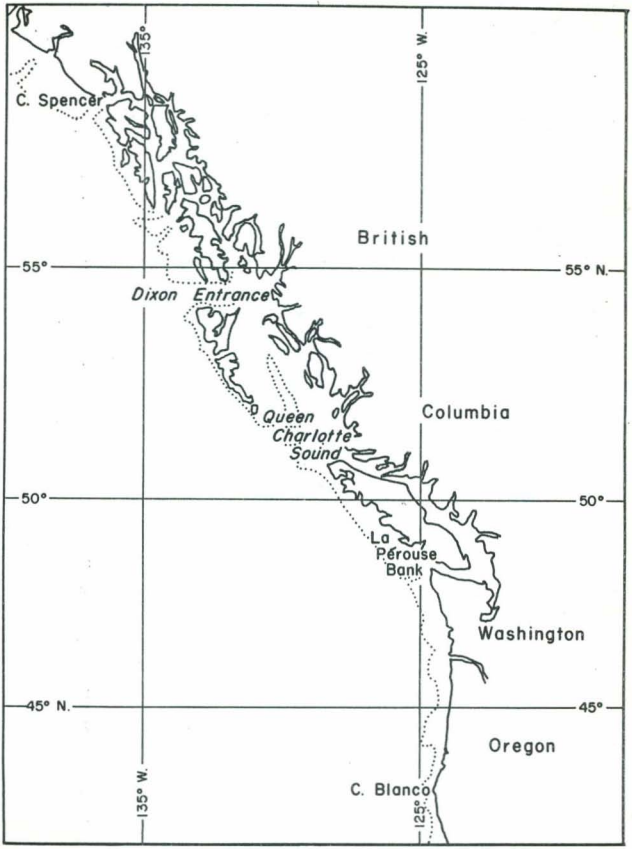

Fig. 1. Fishing areas for G.B. Reed groundfish cruise no. 65-3, August-September 1965.

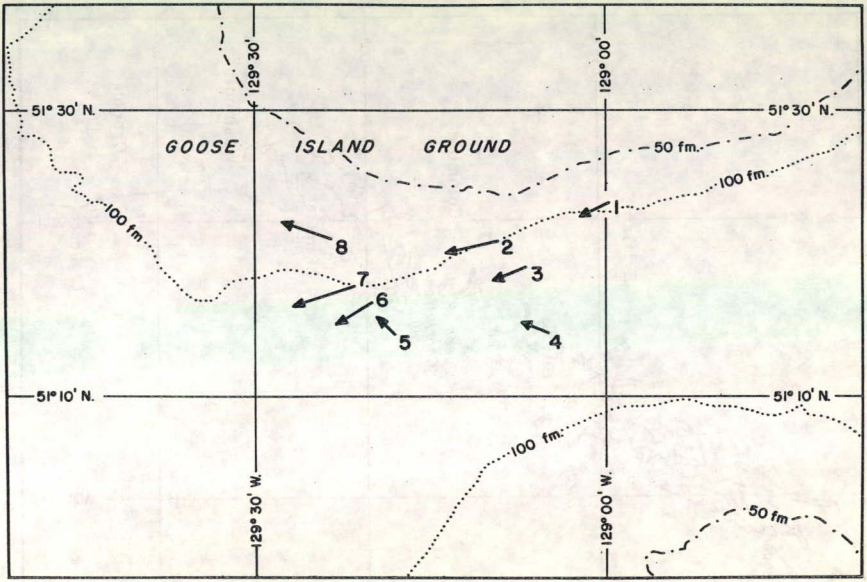

Fig. 2. Chart of southeast Queen Charlotte Sound showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

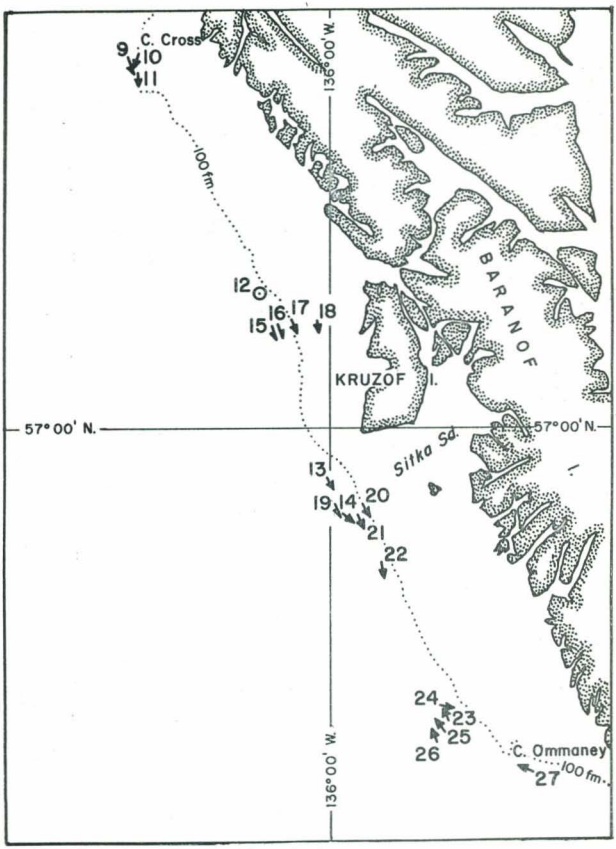

Fig. 3. Chart of the Cape Cross-Cape Ommaney area showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

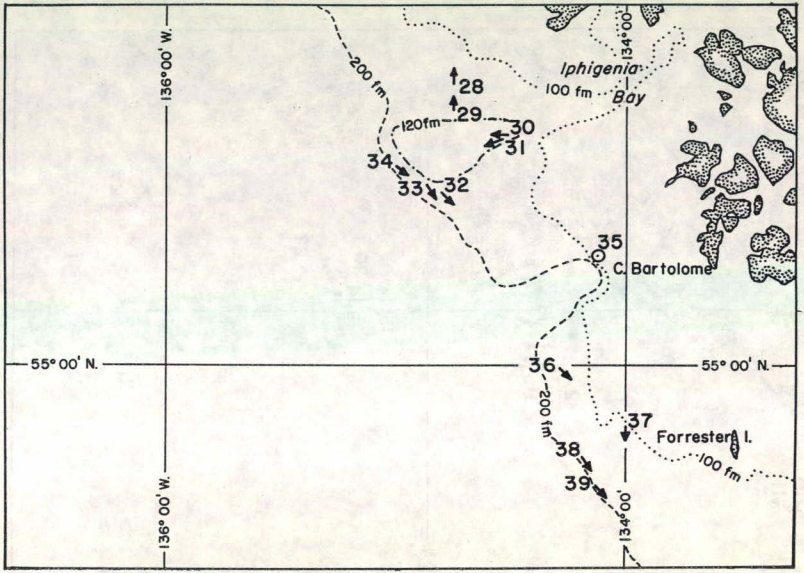

Fig. 4. Chart of the Iphigenia Bay–Forrester Island area showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

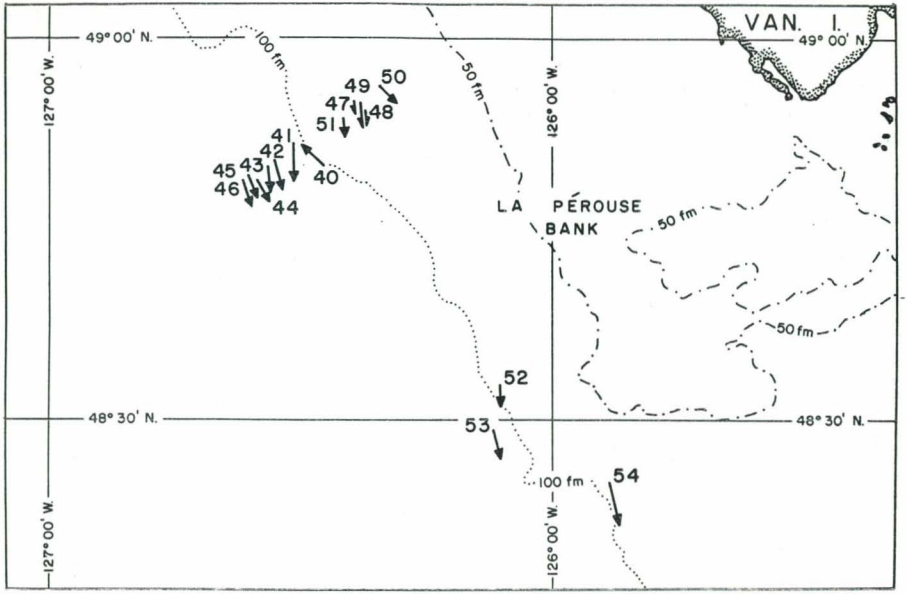

Fig. 5. Chart of the southwest coast of Vancouver Island showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

65-3

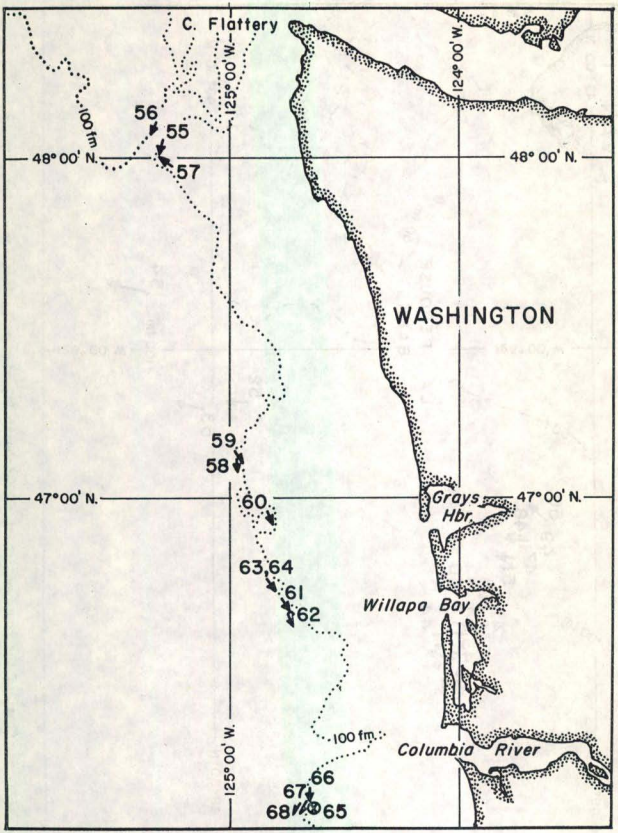

Fig. 6. Chart of the Cape Flattery-Columbia River area showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

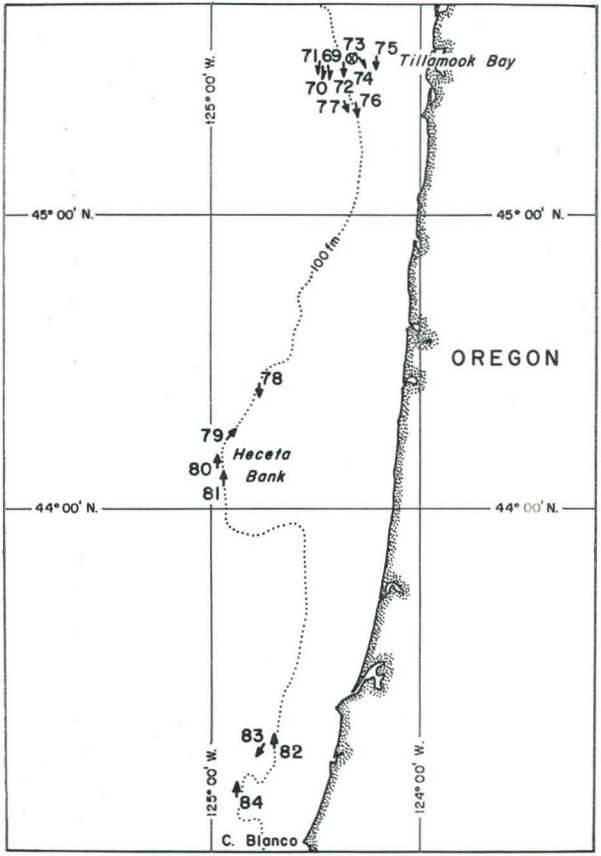

Fig. 7. Chart of the Tillamook Bay-Cape Blanco area showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 65-3.

CRUISE REPORT FOR THE G.B. REED

Groundfish Cruise No. 66-2

August 24 - October 2, 1966

PURPOSE

1. Investigate distribution and abundance of Pacific ocean perch (Sebastodes alutus) in certain waters of British Columbia and Southeast Alaska (Fig. 1).

2. Collect material for growth studies of adult Pacific ocean perch.

3. Collect material for systematics studies of marine fishes by protein electrophoresis.

4. Collect specimens of benthic invertebrates in trawling areas.

5. Collect information on water temperature and bottom type in trawling areas.

PORTS OF CALL

1. Sandspit, B. C. - August 29 (pick up air freight from Vancouver Technology Station).

2. Masset, B. C. - August 31-September 1 (pick up S. J. Westrheim).

3. Sitka, Alaska - September 4-5 (medical treatment for 2 crew members; storm).

4. Tasu, B. C. - September 12 (voting day).

5. Ucluelet, B. C. - September 22-23 (drop off W. A. Kennedy; medical treatment for crew member).

6. Winter Harbor, B. C. - September 27-28 (storm).

RESULTS

1. Cruise 66-2 was divided into 2 parts. During Part I (August 23-September 15), the vessel fished Goose Island Bank, Dixon Entrance, Southeast Alaska (Forrester Island and Sitka Sound), and the west and southeast coast of the Queen Charlotte Islands (Fig. 2-6). During Part II (September 21-October 2), the vessel fished off the west coast of Vancouver Island - Southwest La Pérouse Bank, and from Estevan Point to Triangle Island (Fig. 7-8).

2. A total of 64 groundfish trawl hauls were completed during the cruise. Following is a summary of the total catch by important species:

Species or group	Pounds	Percent
Ocean perch	82,200	43.1
S. sp. (nova?)	35,200	18.5
Other rockfish	35,700	18.7
Turbot	8,700	4.6
Black cod	6,600	3.5
Dover sole	4,600	2.4
Hake	3,400	1.8
Pacific pollock	3,200	1.7
Pacific cod	3,000	1.6
Halibut	1,200	0.6
Other	6,800	3.6
Total	190,600	100.1

Appendix Tables I and II contain the detailed results by haul.

The following table lists the numbers of fish measured and otoliths collected, by species:

Species	No. measured	Otoliths
S. alutus	14,942	11,482
S. proriger	2,717	849
S. zacentrus	2,208	274
S. sp. (nova?)	1,696	776
S. diploproa	934	122
Dover sole	735	-
Blackcod	729	-
S. helvomaculatus	437	127
Seb. alascanus	337	153
S. brevispinis	226	56
Pacific cod	206	-
S. entomelas	192	-
S. elongatus	127	-
S. rubrivinctus	120	-
S. pinniger	105	-
Halibut	42	-
Total	25,753	13,839

Substantial catch rates (lb per hour) of ocean perch were obtained occasionally throughout most of the study area. Following is a list of the maximum catch rates in each major region:

Area	Max. lb/hr	Depth (fm)
S. E. Alaska	10,000	108-111
Dixon Entrance	1,300	93-102
W. Queen Charlotte Islands	24,500	120-122
Queen Charlotte Sound	7,500	148-151
W. Vancouver Island	11,200	122-124

Of special interest was the unusual abundance (4,800-15,300 lb/hr) of ocean perch in "deep" water (182-204 fm) off the northwest coast of Graham Island (Haul nos. 29, 31, and 32). Prior to this cruise, no substantial catches of ocean perch had been reported at such depths during the summer.

Size composition of adult ocean perch followed the same pattern noted during GBR 65-3. North of Dixon Entrance, the modal size never exceeded 34 cm, whereas, south of Dixon Entrance the modal size ranged from 36 to 44 cm. In Dixon Entrance, modal sizes were 34 and 40 cm, but catch rates (lb/hr) were low.

Two items of interest concerning rockfish in general occurred during the cruise. First, a specimen tentatively identified as S. ciliatus was collected on the Canadian side of Dixon Entrance. If identification is correct, this represents the first record of this species in British Columbia waters. Second, substantial concentrations of a tentative new species of rockfish were discovered - (1) Southwest La Pérouse Bank, GBR 66-2-45 (also noted during GBR 65-3); (2) west of Triangle Island, GBR 66-2-63, 64; and (3) west of Rennell Sound, GBR 66-2-35, 38. Perhaps significantly, all three localities were characterized by snaggy bottom. The Triangle Island Ground was unique in that no ocean perch were found in the catches.

3. Reversing bottle and/or bathythermograph casts were completed at 62 trawling stations. Following is a brief summary of the vertical water temperature regimes by region:

Region	Water Temperature (°C)		Depth range (fm)
	Surface	Bottom	
S. E. Alaska	12.0-14.1	5.5-5.8	106-120
Dixon Entrance	12.2-13.5	5.7-6.2	77-127
W. Queen Charlotte Islands	12.4-13.4	4.9-8.3	37-188
Queen Charlotte Sound	11.5-13.9	5.0-7.0	44-183
W. Vancouver Island	12.0-14.5	6.0-7.3	80-230

Details of individual observations are included in Tables I and II.

Bottom sediment sampling, with a Dietz-LaFond grab, was attempted at the same 62 trawling stations with varied success. The grab was ineffective in deep water, >150 fm, and on hard bottom. The details are included in Tables I and II.

At the request of the biological oceanography section at POG, Secchi disc casts were taken regularly (62 trawling stations) to expand the coverage of conditions in the Northeast Pacific Ocean throughout the year and also to complement those observations taken at Ocean Weather Station P.

4. Seven Digby dredge hauls were completed (each at the end of a fishing day). Locations of all hauls are included in Table III. The invertebrates collected were distributed to the Biological Station, University of British Columbia, and the National Museum.

5. Personnel from the Vancouver Technology Station continued the biochemical systematics projects initiated on GBR 65-3. Additional samples for muscle and blood protein analyses were collected from marine fishes for comparative electrophoretic studies. Blood hemoglobins were processed and analyzed electrophoretically aboard ship to investigate stability characteristics, species specificity, and intra-species genetic polymorphisms useful in gene-frequency studies. Muscle samples were frozen for processing ashore.

Following is a summary of the samples collected:

Type of sample	Rockfish		Other roundfish	
	No. of spp.	No. of samples	No. of spp.	No. of samples
Blood	25	584	2	29
Muscle	18	205	2	402

6. Personnel from the National Museum and the University of British Columbia were aboard during Part I of the cruise to collect specimens of pelagic, benthic, and intertidal fauna (vertebrate and invertebrate).

7. On four occasions, foreign fishing vessels were observed. On September 2, west of Forrester Island, a Japanese stern trawler (later identified as the Mogami Maru) was sighted as well as a Soviet mothership, "Smolny". On September 5, west of Cape Ommaney, two large Soviet stern trawlers were observed. On September 22, southwest of La Pérouse Bank, the Soviet research vessel "Oganj" (SRT-M) came alongside for a brief visit. On the same date a Soviet stern trawler (BMRT) was observed on La Pérouse Bank. On September 24, southwest of Estevan Point, the Japanese stern trawler Mogami Maru came alongside for a brief visit and exchange of "pleasantries".

8. The assistance and cooperation of the numerous guests during the cruise were gratefully acknowledged. Mr. T. Maeba was particularly helpful.

PERSONNEL

G. I. McT. Cowan	University of British Columbia	Aug. 23-Sept. 15
W. A. Kennedy	Fisheries Research Board - Nanaimo	Sept. 21-23
T. Maeba	Fisheries Agency of Japan	Aug. 23-Oct. 2
R. L. Major	Bureau of Commercial Fisheries - Seattle	Aug. 23-Sept. 15
H. Tsuyuki	Fisheries Research Board - Vancouver	Sept. 21-Oct. 2
W. H. Van Uliet	National Museum of Canada - Ottawa	Aug. 23-Sept. 15
S. J. Westrheim	Fisheries Research Board - Nanaimo	Sept. 1-Oct. 2
D. Davenport	Fisheries Research Board - Nanaimo	Aug. 23-Oct. 2
W. R. Harling	Fisheries Research Board - Nanaimo	Aug. 23-Oct. 2
L. McLeod	Fisheries Research Board - Nanaimo	Aug. 23-Oct. 2
A. P. Ronald	Fisheries Research Board - Vancouver	Aug. 23-Sept. 15
M. S. Smith	Fisheries Research Board - Nanaimo	Aug. 23-Oct. 2

APPENDIX

Table I. Fishing log for Part I of G.B. Reed groundfish cruise no. 66-2, Queen Charlotte Sound to Sitka Sound, August-September, 1966.

Haul No.	1	2	3	4	5	6	7	8
Date	Aug. 25	Aug. 26	Aug. 26	Aug. 27	Aug. 27	Aug. 27	Aug. 27	Aug. 27
Area[1]	GI	GI	GI	GI	GI	GI	GI	GI
INPFC Area[2]	028510	028510	028510	029510	029510	029510	029510	029510
Start (PDT)[3]	1700	0732	0943	0732	1002	1141	1330	1506
Duration (min)	30	32	31	30	30	30	30	30
Start: N. Lat. °	51	51	51	51	51	51	51	51
'	22	22.8	26	20	22	23	23	25
W. Long. °	128	128	128	129	129	129	129	129
'	56	58	54	05	05	08	11	08.1
Direction (° True)	070	070	250	180	250	250	060	280
End: N. Lat. °	51	51	51	51	51	51	51	51
'	23	23	25	19	21	23	24	23.3
W. Long. °	128	128	128	129	129	129	129	129
'	54	56.5	56.5	04	07	09.5	09	11
Depth (fm)[4]	120	120-112	90-103	135-140	120-119	106-98	79-74	62-49
Water temp. (°C)								
Surface	13.9	13.3	..	12.8	13.2	13.3	13.3	13.3
Bottom	6.0	5.8	..	6.0	5.6	5.9	5.9	7.0
Bottom type[5]	..	..	..	..	gr M	gr M	..	..
Net used[6]	D-2	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	2800	2300	1000	2300	2300	1300	1800	3100
Remarks	..	..	..	..	..	..	..	..

continued . . .

Table I (continued)

Haul No.	9	10	11	12	13	14	15	16
Date	Aug. 28	Aug. 28	Aug. 28	Aug. 28	Aug. 28	Aug. 30	Aug. 30	Aug. 30
Area[1]	GI	GI	GI	GI	GI	DE	DE	DE
INPFC Area[2]	029510	029510	029510	029510	029510	032540	032540	032540
Start (PDT)[3]	0832	1043	1302	1507	1743	0720	0917	1337
Duration (min)	31	30	30	30	30	32	30	7
Start: N. Lat. °	51	51	51	51	51	54	54	54
'	18.5	20	21	22.1	16	17	18	13
W. Long. °	129	129	129	129	129	132	132	132
'	16.5	18.5	18	22.5	21.5	31	34	42
Direction (° True)	250	250	270	270	230	270	040	050
End: N. Lat. °	51	51	51	51	51	54	54	54
'	18	19.5	21	23	15	17	18.5	13.5
W. Long. °	129	129	129	129	129	132	132	132
'	18	20	20	23.5	23	32	32	41.5
Depth (fm)[4]	148-151	124-130	106-108	82-88	158-159	92-112	136	88-84
Water temp. (°C)								
Surface	13.3	13.2	13.0	12.8	13.0	13.2	13.5	12.2
Bottom	6.0	5.9	6.0	5.9	5.9	5.7	5.8	5.9
Bottom type[5]	gr S	gr S	..	..	..	S	S	..
Net used[6]	D-2	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	5400	3600	3100	1900	1800	700	600	400
Remarks	..	..	..	..	..	..	..	Net torn tangled

continued . . .

Table I (continued)

Haul No.	17	18	19	20	21	22	23	24
Date	Aug. 30	Aug. 31	Aug. 31	Sep. 1	Sep. 2	Sep. 2	Sep. 2	Sep. 3
Area[1]	DE	DE	DE	DE	FI	FI	FI	FI
INPFC Area[2]	032540	031540	032540	031540	034543	034543	034543	034543
Start (PDT)[3]	1625	0725	0910	1539	0900	1110	1442	0855
Duration (min)	2	30	30	30	30	30	31	50
Start: N. Lat. °	54	54	54	54	54	54	54	54
'	16.5	14	15	18.5	42	44.5	46.7	44.5
W. Long. °	132	131	132	131	134	134	134	134
'	40	57	03	51	05.5	00	45.1	05.5
Direction (° True)	..	270	270	270	340	330	330	310
End: N. Lat. °	54	54	54	54	54	54	54	54
'	16.2	14	16	18.3	43.5	45.5	47.5	45.5
W. Long. °	132	131	132	131	134	134	133	134
'	39.8	59	05.5	46.5	07.5	00.6	46.5	09
Depth (fm)[4]	82	77-74	93-102	124-126	120-119	111-108	116-113	118-117
Water temp. (°C)								
Surface	..	13.1	12.8	12.8	13.9	14.1	13.8	13.6
Bottom	..	6.2	6.0	5.9	5.5	5.7	5.7	5.7
Bottom type[5]	..	br S	S	..	gr S	gr G Sh (ell)	..	..
Net used[6]	D-2	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	0	2700	1600	910	2200	5500	490	5300
Remarks	x-doors	..	..	..	..	..	..	..

continued . . .

Table I (continued)

Haul No.	25	26	27	28	29	30	31	32
Date	Sep. 3	Sep. 5	Sep. 5	Sep. 5	Sep. 6	Sep. 7	Sep. 7	Sep. 7
Area[1]	FI	SS	SS	SS	LI	LI	LI	LI
INPFC Area[2]	034543	035563	035563	035563	033540	033533	033540	033540
Start (PDT)[3]	1335	1141	1330	1451	1550	0906	1306	1747
Duration (min)	34	28	2	22	63	22	45	21
Start: N. Lat. °	54	56	56	56	54	53	54	54
'	49	49	50	49	06.8	56.5	04.5	07.6
W. Long. °	134	135	135	135	133	133	133	133
'	09	58.8	53	55	25.3	24	33	31.3
Direction (° True)	150	360	360	180	225	180	160	170
End: N. Lat. °	54	56	56	56	54	53	54	54
'	48.5	50	50	49.8	05.2	55.4	03.3	07
W. Long. °	134	135	135	135	133	133	133	133
'	08	59	53	57	29.5	24	35	31.3
Depth (fm)[4]	110-115	117-110	106	108-109	196-200	37-40	186-182	202-204
Water temp. (°C)								
Surface	13.5	12.0	12.5	12.2	13.0	12.5	13.5	13.2
Bottom	5.6	5.7	5.8	5.6	4.9	8.3	5.0	5.1
Bottom type[5]	..	G	G	G	..	..	..	S
Net used[6]	D-2	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	3100	740	E 15	160	E5000	230	12,700	2100
Remarks	..	..	Snag	Snag	Pucker rope broke at surface	..	..	Snag

continued . . .

Table I (continued)

Haul No.	33	34	35	36	37	38
Date	Sep. 8	Sep. 9	Sep. 9	Sep. 10	Sep. 10	Sep. 10
Area[1]	LI	RS	RS	RS	RS	RS
INPFC Area[2]	033540	033530	033530	033530	033530	033530
Start (PDT)[3]	1314	0855	1302	1025	1310	1752
Duration (min)	4	3	10	1	4	7
Start: N. Lat. °	54	53	53	53	53	53
'	02.1	22.2	21.5	19.7	19.7	19
W. Long. °	133	133	133	133	133	133
'	23.2	07	05	02.2	02.5	04.3
Direction (°True)	180	153	060	010	150	150
End: N. Lat. °	..	..	53	..	..	53
'	..	..	22	..	..	19
N. Long. °	..	..	133	..	..	133
'	..	..	05.1	..	..	04.3
Depth (fm)[4]	60-58	113	118-114	104	108-107	120-122
Water temp. (°C)						
Surface	12.4	13.2	13.2	13.3	13.6	13.6
Bottom	7.1	5.9	6.0	6.1	6.1	5.8
Bottom type[5]	S	..	..	CR	R	..
Net used[6]	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	60	E170	11,800	250	120	5500
Remarks	Snag	Snag	Snag at tow's end	Snag	Snag	Snag

continued . . .

Table I (continued)

Haul No.	39	40	41	42	43
Date	Sep. 13	Sep. 13	Sep. 13	Sep. 14	Sep. 14
Area[1]	MI	MI	MI	GI	GI
INPFC Area[2]	030520	030520	030520	029510	029510
Start (PDT)[3]	1000	1241	1521	0725	1005
Duration (min)	30	30	26	25	35
Start: N. Lat. °	52	52	52	51	E51
'	04.6	05	06.7	23	22.8
W. Long. °	130	130	130	129	E129
'	36.5	33	30	12.5	08
Direction (°True)	180	180	180	240	100
End: N. Lat. °	52	52	52	E51	E51
'	03.3	03.7	05.5	22.5	22.5
W. Long. °	130	130	130	E129	E129
'	37	34	25.2	16	05.5
Depth (fm)[4]	120-137	152-162	193-188	70-72	101-107
Water temp. (°C)					
Surface	13.0	12.8	13.0	12.2	11.5
Bottom	5.8	5.7	5.0	6.2	6.1
Bottom type[5]	..	..	..	..	..
Net used[6]	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	3000	3100	380	2500	2600
Remarks	..	..	Snag net torn	Loran out	Loran out

Table I (continued)

Haul No.	1	2	3	4	5	6	7
Date	Aug. 25	Aug. 26	Aug. 26	Aug. 27	Aug. 27	Aug. 27	Aug. 27
Area[1]	GI	GI	GI	GI	GI	GI	GI
Total catch (lb)	2800	2300	1000	2300	2300	1300	1800
Flatfish[7]							
Dover sole	70	95	T	203	225	15	7
English sole	..	..	..	T	..	..	5
Halibut[8]	16(1)	9(1)	..	..	..	..	..
Rex sole	22	14	7	8	5	T	5
Rock sole	..	..	..	..	..	..	..
Turbot	511	241	187	68	120	130	84
Other[9]	23	T	..	T	..	..	T
Rockfish							
S. aleutianus	..	..	..	..	..	..	..
S. alutus	1825	1705	651	1315	1542	841	1427
S. brevispinis	7	15	..	..	..	T	66
S. entomelas	..	..	..	..	..	..	21
S. flavidus	..	..	..	..	..	..	24
S. helvomaculatus	..	..	..	T	..	..	..
S. paucispinis	44	15	T	40	..	10	18
S. pinniger	..	..	..	..	T	T	..
S. proriger	..	..	..	..	..	..	..
S. rubrivinctus	99	42	44	121	103	113	31
S. zacentrus	..	..	..	..	..	..	..
S. sp. (nova?)	..	..	..	..	..	..	..
Seb. alascanus	20	20	29	69	49	T	..
Other[10]	..	..	T	..	T	T	T
Other roundfish[11]							
Blackcod	78	154	102	419	239	189	31
Eulachon	..	..	..	..	..	..	..
Hake	32	25	..	20	T	..	..
Lingcod	..	..	5	..	..	..	30
Pacific cod	..	..	..	..	..	..	34
Pacific pollock	..	..	T	..	T	T	9
Other[12]	..	..	T	T	..	..	..
Selachii[13]							
Dogfish	T[14]	T	T	..	T	16	..
Ratfish	T	T	..	..	..	..	..
Skate	18	..	..	T	10	..	..
Invertebrates							
Coral	..	..	..	..	..	..	..
Shrimp	..	..	..	..	..	..	..
Sponge	..	..	..	..	..	..	..
Other	20	..	..	T	..	..	..

Table I (continued)

Haul No.	8	9	10	11	12	13	14
Date	Aug. 27	Aug. 28	Aug. 28	Aug. 28	Aug. 28	Aug. 28	Aug. 30
Area[1]	GI	GI	GI	GI	GI	GI	DE
Total catch (lb)	3100	5400	3600	3100	1900	1800	680
Flatfish[7]							
Dover sole	..	234	299	103	..	21	6
English sole	35	..	..	27	T	..	..
Halibut[8]	13(1)	36(2)	17(1)	9(1)	431(6)	9(1)	..
Rex sole	T	18	6	10	11	..	..
Rock sole	180	..	..	..	9	..	..
Turbot	36	158	95	163	142	44	164
Other[9]	T	..	T	..	..	..	..
Rockfish							
S. aleutianus	..	66	13	..	..	..	10
S. alutus	..	3866	2816	2451	31	1501	151
S. brevispinis	234	25	..	36	684	20	..
S. entomelas	..	..	..	..	..	..	..
S. flavidus	..	..	..	..	..	..	..
S. helvomaculatus	..	..	..	..	..	..	..
S. paucispinis	14	8	10	69	..	..	..
S. pinniger	..	..	..	26	516	T	..
S. proriger	..	..	..	..	..	..	..
S. rubrivinctus	..	134	123	78	..	T	216
S. zacentrus	..	..	..	..	..	..	..
S. sp. (nova?)	..	..	..	..	..	..	..
Seb. alascanus	..	92	18	T	..	87	20
Other[10]	T	..	10	T	24	..	..
Other roundfish[11]							
Blackcod	..	605	96	85	27	69	25
Eulachon	..	..	..	..	..	..	..
Hake	..	55	..	..	..	69	..
Lingcod	83	..	..	26	T	..	..
Pacific cod	2481	..	..	..	33	..	10
Pacific pollock	..	24	76	12	..	..	7
Other[12]	..	..	..	..	..	..	..
Selachii[13]							
Dogfish	..	10	T	..	..	..	..
Ratfish	T	14	7	T	T	T	71
Skate	..	45	22	25	..	12	..
Invertebrates							
Coral	..	..	..	..	..	..	..
Shrimp	..	..	..	..	..	..	..
Sponge	..	..	..	..	..	..	..
Other	..	..	..	T	T	T	..

Table I (continued)

Haul No.	15	16	17	18	19	20	21
Date	Aug. 30	Aug. 30	Aug. 30	Aug. 31	Aug. 31	Sep. 1	Sep. 2
Area[1]	DE	DE	DE	DE	DE	DE	FI
Total catch (lb)	650	380	0	2700	1600	910	2200
Flatfish[7]							
Dover sole	189	..	..	222	58	197	11
English sole	..	..	..	7	4	1	..
Halibut[8]	..	38(1)	..	51(1)	76(3)	..	..
Rex sole	31	5	..	17	24	37	26
Rock sole	..	..	..	..	..	..	..
Turbot	56	181	..	1134	342	162	82
Other[9]	..	..	..	5	8	..	..
Rockfish							
S. aleutianus	7	..	..	..	..	..	..
S. alutus	16	50	..	201	656	74	748
S. brevispinis	..	33	..	52	91	26	37
S. entomelas	..	..	..	..	..	..	..
S. flavidus	..	..	..	..	..	..	..
S. helvomaculatus	..	..	..	..	..	..	17
S. paucispinis	..	..	..	30	22	..	..
S. pinniger	..	..	..	..	..	..	..
S. proriger	..	..	..	..	..	..	2
S. rubrivinctus	19	T	..	248	52	67	1
S. zacentrus	..	..	..	T	..	..	90
S. sp. (nova?)	..	..	..	T	..	..	1
Seb. alascanus	90	..	..	21	70	140	50
Other[10]	..	T	..	5	..	..	T
Other roundfish[11]							
Blackcod	43	..	..	18	24	31	7
Eulachon	65	..	..	..	..	T	..
Hake	T	..	..	..	..	..	..
Lingcod	..	..	..	..	..	..	..
Pacific cod	T	17	..	23	50	..	2
Pacific pollock	..	T	..	317	71	129	1119
Other[12]	..	..	..	..	..	T	T
Selachii[13]							
Dogfish	..	18	..	22	15	4	..
Ratfish	133	..	..	345	46	45	19
Skate	..	33	..	..	..	..	..
Invertebrates							
Coral	..	..	..	..	..	..	..
Shrimp	T	T	..	25	..	T	T
Sponge	..	..	..	..	..	..	T
Other	T	..	..	T	T	T	T

Table I (continued)

Haul No.	22	23	24	25	26	27	28	29
Date	Sep. 2	Sep. 2	Sep. 3	Sep. 3	Sep. 5	Sep. 5	Sep. 5	Sep. 6
Area[1]	FI	FI	FI	FI	SS	SS	SS	LI
Total catch (lb)	5500	490	5300	3100	740	E15	170	E5000
Flatfish[7]								
Dover sole	..	5	13	..	10	..	1	..
English sole	..	..	..	..	..	..	..	..
Halibut[8]	83(1)	..	22(3)	86(1)	11(1)	..	..	..
Rex sole	3	42	41	10	19	..	5	..
Rock sole	..	..	..	..	..	..	..	..
Turbot	52	86	358	182	332	E5	49	x[15]
Other[9]	T	..	..	..	..	..	..	..
Rockfish								
S. aleutianus	..	..	..	..	..	..	..	x
S. alutus	5004	120	3775	2688	103	E5	31	E4500
S. brevispinis	40	29	117	15	11	..	3	x
S. entomelas	..	3	3	..	..	..	..	..
S. flavidus	..	..	..	..	..	..	..	..
S. helvomaculatus	14	4	26	22	5	..	3	x
S. paucispinis	..	..	..	..	..	..	..	x
S. pinniger	..	..	..	..	..	..	..	..
S. proriger	9	..	2	2	..	..	..	..
S. rubrivinctus	4	..	3	..	9	..	1	x
S. zacentrus	28	..	39	6	72	E1	10	..
S. sp. (nova?)	5	..	T	..	1	..	..	..
Seb. alascanus	31	84	87	18	71	E2	32	..
Other[10]	1	..	2	16	..	E2	..	x
Other roundfish[11]								
Black cod	10	14	77	..	49	..	18	..
Eulachon	..	..	..	..	T	..	T	..
Hake	..	..	..	..	..	..	..	..
Lingcod	..	..	..	..	..	..	..	..
Pacific cod	3	..	2	15	..	..	..	..
Pacific pollock	160	12	652	..	31	..	..	x
Other[12]	..	..	6	..	10	..	..	..
Selachii[13]								
Dogfish	..	..	..	..	..	..	..	..
Ratfish	20	17	31	33	..	..	..	..
Skate	..	22	..	..	..	..	..	..
Invertebrates								
Coral	..	..	T	..	..	..	..	..
Shrimp	T	50	T	..	T	..	T	..
Sponge	19	T	54	36	T	..	12	..
Other	5	2	6	3	7	..	T	..

Table I (continued)

Haul No.	30	31	32	33	34	35	36
Date	Sep. 7	Sep. 7	Sep. 7	Sep. 8	Sep. 9	Sep. 9	Sep.10
Area[1]	LI	LI	LI	LI	RS	RS	RS
Total catch (lb)	220	12,700	2100	60	E170	11,800	250
Flatfish[7]							
Dover sole	..	36	44	..	..	T	..
English sole	..	..	..	..	..	..	..
Halibut[8]	..	..	..	..	..	..	..
Rex sole	..	24	85	..	T	T	..
Rock sole	T	..	..	..	..	..	..
Turbot	..	307	85	..	..	13	1
Other[9]	..	..	..	..	..	..	..
Rockfish							
S. aleutianus	..	92	4	..	..	10	..
S. alutus	T	11,451	1665	..	E100	385	36
S. brevispinis	4	29	..	..	..	107	13
S. entomelas	..	..	..	..	..	38	..
S. flavidus	..	..	..	30	..	..	..
S. helvomaculatus	..	6	..	..	..	17	1
S. paucispinis	..	37	..	..	..	107	..
S. pinniger	..	..	..	..	..	..	..
S. proriger	43	..	..	5	E20	4392	17
S. rubrivinctus	..	11	4	..	..	..	..
S. zacentrus	..	..	..	T	T	33	86
S. sp. (nova?)	..	T	..	..	E50	6655	67
Seb. alascanus	..	65	71	..	..	T	..
Other[10]	25	..	11	..	..	4	..
Other roundfish[11]							
Blackcod	..	345	168	..	..	24	..
Eulachon	..	..	..	..	..	..	..
Hake	..	143	..	..	..	..	..
Lingcod	56	85	..	..	..	..	..
Pacific cod	..	..	..	..	..	..	..
Pacific pollock	..	59	..	..	..	..	..
Other[12]	2	6	..	..	..	..	..
Selachii[13]							
Dogfish	..	..	..	..	..	..	..
Ratfish	47	15	..	..	..	..	..
Skate	..	1	..	..	..	..	26
Invertebrates							
Coral	..	..	..	..	..	..	..
Shrimp	..	..	..	..	..	..	..
Sponge	12	..	1	25	..	..	..
Other	32	3	4	..	..	..	..

Table I (continued)

Haul No.	37	38	39	40	41	42	43
Date	Sep. 10	Sep.10	Sep.13	Sep. 13	Sep. 13	Sep. 14	Sep. 14
Area[1]	RS	RS	MI	MI	MI	GI	GI
Total catch (lb)	120	5500	3000	3100	380	2500	2600
Flatfish[7]							
Dover sole	..	T	16	26	68	6	12
English sole	..	..	..	..	..	2	..
Halibut[8]	..	..	22(1)	16(1)	..	33(3)	5(1)
Rex sole	..	..	12	8	37	12	17
Rock sole	..	..	..	..	..	3	..
Turbot	..	7	25	13	12	452	300
Other[9]	..	..	..	..	..	1	4
Rockfish							
S. aleutianus	..	..	..	20	17	..	..
S. alutus	64	2855	2576	2634	99	22	1524
S. brevispinis	7	23	..	3	..	108	4
S. entomelas	..	..	4	..	..	25	..
S. flavidus	..	..	..	..	..	764	..
S. helvomaculatus	2	53	1	4	..	..	..
S. paucispinis	..	55	5	34	..	14	46
S. pinniger	..	..	5	..	..	231	..
S. proriger	12	124	..	..	..	..	1
S. rubrivinctus	..	1	34	34	2	..	150
S. zacentrus	12	6	59	1	..	..	..
S. sp. (nova?)	23	2293	1	..	..	..	..
Seb. alascanus	..	1	11	66	6	..	9
Other[10]	..	..	..	17	..	..	..
Other roundfish[11]							
Blackcod	..	48	33	80	119	351	412
Eulachon	..	..	..	..	..	..	T
Hake	..	..	3	8	10	14	7
Lingcod	..	..	3	..	..	..	..
Pacific cod	..	..	..	7	..	14	..
Pacific pollock	..	..	21	6	..	377	13
Other[12]	..	..	..	8	..	T	T
Selachii[13]							
Dogfish	..	..	88	49	4	..	8
Ratfish	..	..	7	2	2	8	T
Skate	..	..	..	6	..	20	..
Invertebrates							
Coral	..	..	..	30	2	..	..
Shrimp	..	..	..	T	..	..	45
Sponge	T	2	..	..	2	..	..
Other	..	1	25	7	4	..	1

Footnotes to Table I

[1]Area: DE = Dixon Entrance
FI = W. of Forrester Island
GI = S. Goose Island Ground
LI = S.W. of Langara Island
MI = S.E. Moresby Island
RS = W. of Rennell Sound
SS = W. of Sitka Sound

[2]INPFC Area: Revised code

[3]PDT: Pacific Daylight Time

[4]Depth (fm): Depth at beginning and end of haul

[5]Bottom type: br = brown; gr = green; C = clay; G = gravel; M = mud; R = rock; S = sand; Sh = shell

[6]Net used: D-2 = Drumfil No. 1: 375-mesh eastern-type groundfish trawl. Codend and intermediate mesh 3", body and wings 4.5", internal measurement. Codend intermediate liner 1.5" mesh. Bobbin groundrope.

[7]Flatfish: Dover sole (Microstomus pacificus); English sole (Parophrys vetulus); halibut (Hippoglossus stenolepis); rex sole (Glyptocephalus zachirus); rock sole (Lepidopsetta bilineata); turbot (Atheresthes stomias)

[8]Halibut: Numbers of fish in parentheses.

[9]Other flatfish (never more than 24 lb per haul): Flathead sole (Hippoglossoides elassodon); petrale sole (Eopsetta jordani); slender sole (Lyopsetta exilis)

[10]Other rockfish (never more than 24 lb per haul): S. ciliatus; S. crameri; S. diploproa; S. elongatus; S. maliger; S. ruberrimus; S. wilsoni

[11]Other roundfish: blackcod (Anoplopoma fimbria); eulachon (Thaleichthys pacificus); hake (Merluccius productus); lingcod (Ophiodon elongatus); Pacific cod (Gadus macrocephalus); Pacific pollock (Theragra chalcogrammus).

[12]Other roundfish (never more than 24 lb per haul): eel pout (Zoarcidae); poacher (Agonidae); sculpin (Cottidae); prowfish (Zaprora silenus); chum salmon (Oncorhynchus keta); greenling (Hexagrammidae)

[13]Selachii: dogfish (Squalus suckleyi); ratfish (Hydrolagus colliei); skate (Rajidae)

[14]T = trace = less than 5 lb for hauls 1-20, and less than 1 lb for hauls 21-43.

[15]Observed in catch, but quantity not determinable

Table II. Fishing log for Part II of G.B. Reed cruise no. 66-2, Cape Flattery to Cape Scott, September, 1966.

Haul No.	44	45	46	47	48	49	50
Date	Sept.22	Sept.22	Sept.22	Sept.24	Sept.24	Sept.24	Sept.24
Area[1]	LP	LP	LP	EP	EP	EP	EP
Start (PDT)[2]	0752	1032	1502	0815	1007	1312	1731
Duration (min)	5	30	15	17	30	28	19
Start: N. Lat. °	48	48	48	49	49	49	49
'	21.2	22.2	23.4	06.1	06.6	05.7	07.6
W. Long. °	125	125	125	126	126	126	126
'	51	52.5	53	52.7	53.6	49.5	55.3
Direction (° True)	330	160	170	330	135	330	330
End: N. Lat. °	48	48	48	49	49	49	49
'	21.3	20.4	22.6	06.4	06.2	07.2	05.2
W. Long. °	125	125	125	126	126	126	126
'	51	51.4	52.6	52.9	52.5	50	53.7
Depth (fm)[3]	94-95	100-94	82-84	122	136-127	102-98	146-144
Water temp. (°C)							
Surface	14.1	14.5	13.5	12.5	13.0	13.0	12.5
Bottom	6.1	6.6	6.5	6.8	6.8	7.0	6.5
Bottom type[4]	M	gr, wh S	bl G	gr M	gr M	gy Cl	..
Net used[5]	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	1,400	11,200	3,100	1,300	3,200	2,600	1,500
Remarks	Snag	..	Snag Head-rope broken	x-doors	..	..	..

continued ....

Table II (continued)

Haul No.	51	52	53	54	55	56	57
Date	Sept.25	Sept.25	Sept.25	Sept.25	Sept.26	Sept.26	Sept.27
Area[1]	EP	EP	EP	EP	EP	EP	QS
Start (PDT)[2]	0830	1042	1501	1741	0728	0957	0935
Duration (min)	30	30	30	44	30	30	30
Start: N. Lat. °	49	49	49	49	49	49	50
'	04.5	07	07.5	11	19.5	22.2	22.5
W. Long °	126	126	126	126	127	127	128
'	53.2	56.5	59	56.4	10.9	12	24.4
Direction (° True)	330	150	136	170	335	140	330
End: N. Lat. °	49	49	49	49	49	49	50
'	06.3	05.2	06	08.5	21.4	21	25
W. Long. °	126	126	126	126	127	127	128
'	55.0	55.5	57.2	55	13.7	10.4	24.6
Depth (fm)[3]	180-178	204-201	232	112-116	122-124	109-107	116-104
Water temp. (°C)							
Surface	12.0	12.0	12.0	12.3	12.9	12.8	13.4
Bottom	6.5	6.0	5.4	6.9	6.8	6.9	7.0
Bottom type[4]	..	..	..	gr M	G, gr M	gr M	G
Net used[5]	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	2,100	1,400	1,100	2,500	7,400	7,400	2,100
Remarks	..	..	..	..	..	..	..

continued ....

Table II (continued)

Haul No.	58	59	60	61	62	63	64
Date	Sept.28	Sept.28	Sept.28	Sept.29	Sept.29	Sept.30	Sept.30
Area[1]	QS	QS	CP	CP	CP	TI	TI
Start (PDT)[2]	1002	1315	1841	0942	1449	0822	1228
Duration (min)	10	6	15	40	30	7	10
Start: N. Lat. °	50	50	50	50	50	50	50
'	25.7	23.8	32.5	37.1	41.4	49.9	53.3
W. Long. °	128	128	128	128	128	129	129
'	17.8	23.1	26	34	51.6	23	31.4
Direction (° True)	160	098	340	260	130	315	145
End: N. Lat. °	50	50	50	50	50	50	50
'	25.3	23.8	32.9	36.7	40.1	50	52.7
W. Long. °	128	128	128	128	128	129	129
'	17.7	22.7	27	37	49.2	23.1	31
Depth (fm)[3]	82-83	98-111	96-91	94	104-116	102-104	102-101
Water temp. (°C)							
Surface	12.9	14.4	13.5	13.8	13.8	13.7	13.7
Bottom	7.3	7.1	7.1	6.8	6.7	6.9	6.8
Bottom type[4]	..	gr S	gr S	gr S	br S	..	br S
Net used[5]	D-2	D-2	D-2	D-2	D-2	D-2	D-2
Total catch (lb)	250	680	3,100	1,700	3,800	12,100	E14,200
Remarks	Snag Wing torn	Snag	..	Snag At end of tow	..	Snag Head-rope broken	$\frac{2}{3}$ catch aboard Belly & wings torn

Table II (continued)

Haul No.	44	45	46	47	48	49	50
Date	Sept.22	Sept.22	Sept.22	Sept.24	Sept.24	Sept.24	Sept.24
Area[1]	LP	LP	LP	EP	EP	EP	EP
Total catch (lb)	1,400	11,200	3,100	1,300	3,200	2,600	1,500
Flatfish[6]							
Dover sole	..	26	45	255	90	266	240
Halibut[7]	..	104(2)	..	..	..	..	..
Petrale	..	..	7	22	23	65	17
Rex sole	..	8	18	72	52	81	109
Turbot	9	11	16	40	55	42	43
Other[8]	..	10	T	6	4	T	3
Rockfish							
S. aleutianus	..	..	..	..	..	..	..
S. alutus	99	1,658	524	450	905	653	334
S. brevispinis	37	146	682	..	8	21	3
S. crameri	..	..	..	5	1	..	1
S. diploproa	..	7	..	121	1,600	15	70
S. elongatus	12	56	37	..	18	37	..
S. entomelas	10	1,790	15	..	3	..	..
S. flavidus	..	..	..	..	..	..	..
S. helvomaculatus	19	102	44	..	19	33	..
S. paucispinis	15	1,198	193	..	7	23	..
S. pinniger	42	49	177	..	..	54	..
S. proriger	855	86	295	..	..	163	..
S. ruberrimus	13	20	46	..	..	..	..
S. rubrivinctus	..	24	479	14	14	11	4
S. zacentrus	50	466	327	..	82	154	..
S. sp. (nova?)	246	5,283	72	4	55	16	..
Seb. alascanus	..	1	..	21	28	T	31
Other[9]	T[13]	T	9	..	T	T	..
Other roundfish[10]							
Blackcod	5	41	18	49	26	761	38
Hake	2	71	..	155	90	..	504
Lingcod	..	12	..	10	..	..	18
Pacific cod	..	5	52	4	9	72	..
Other[11]	T	2	1	8	3	2	1
Selachii[12]							
Dogfish	..	..	..	14	30	18	22
Ratfish	4	25	20	2	26	55	12
Skate	..	22	13	15	13	46	32
Invertebrates	T	1	2	12	..	T	19

continued .....

Table II (continued)

Haul No.	51	52	53	54	55	56	57
Date	Sept.25	Sept.25	Sept.25	Sept.25	Sept.26	Sept.26	Sept.27
Area[1]	EP	EP	EP	EP	EP	EP	QS
Total catch (lb)	2,100	1,400	1,100	2,500	7,400	7,400	2,100
Flatfish[6]							
Dover sole	220	350	293	46	167	89	46
Halibut[7]	12(1)	..	..	6(1)	37(3)	32(1)	20(2)
Petrale	6	..	..	92	31	74	..
Rex sole	101	87	20	293	55	64	36
Turbot	381	177	16	180	116	49	44
Other[8]	5	6	2	T	T	..	..
Rockfish							
S. aleutianus	..	30	131	..	..	..	..
S. alutus	762	359	228	599	5,607	5,147	1,150
S. brevispinis	..	..	..	47	34	850	14
S. crameri	14	37	3	37	..	..	..
S. diploproa	7	14	..	156	3	..	..
S. elongatus	..	..	..	1	70	52	39
S. entomelas	..	..	..	..	20	14	..
S. flavidus	..	..	..	..	..	6	..
S. helvomaculatus	..	..	..	..	106	66	27
S. paucispinis	..	..	..	8	69	24	42
S. pinniger	..	..	..	4	..	44	4
S. proriger	..	..	..	..	..	31	375
S. ruberrimus	..	..	..	..	..	6	..
S. rubrivinctus	3	18	..	77	115	92	45
S. zacentrus	..	..	..	T	183	26	..
S. sp. (nova?)	..	..	..	19	..	..	30
Seb. alascanus	30	49	81	30	23	..	34
Other[9]	..	..	..	..	..	10	T
Other roundfish[10]							
Blackcod	187	119	175	53	339	153	..
Hake	303	112	53	614	159	208	26
Lingcod	..	..	..	9	37	31	64
Pacific cod	4	..	..	42	37	..	7
Other[11]	2	1	3	5	5	T	T
Selachii[12]							
Dogfish	..	14	..	55	27	111	27
Ratfish	1	..	..	27	92	24	15
Skate	11	5	27	44	10	38	12
Invertebrates	33	18	68	17	38	208	8

continued .....

Table II (continued)

Haul No.	58	59	60	61	62	63	64
Date	Sept.28	Sept.28	Sept.28	Sept.29	Sept.29	Sept.30	Sept.30
Area[1]	QS	QS	CP	CP	CP	TI	TI
Total catch (lb)	250	680	3,100	1,700	3,800	12,100	E14,200
Flatfish[6]							
Dover sole	14	7	214	2	44	11	..
Halibut[7]	..	..	6(1)	..	..	..	..
Petrale	2	4	..	..	27	5	..
Rex sole	..	3	100	5	61	5	..
Turbot	135	5	330	91	606	13	..
Other[8]	T	..	15	..	T	..	..
Rockfish							
S. aleutianus	..	..	..	..	..	..	..
S. alutus	T	421	84	235	1,405	..	..
S. brevispinis	42	73	144	106	788	490	66
S. crameri	..	..	..	..	..	..	..
S. diploproa	..	..	..	..	..	..	..
S. elongatus	..	T	14	4	7	3	2
S. entomelas	12	..	..	..	10	31	206
S. flavidus	3	..	..	..	79	32	..
S. helvomaculatus	1	6	2	2	..	..	6
S. paucispinis	4	..	9	12	..	55	29
S. pinniger	..	..	546	..	4	387	6
S. proriger	..	18	196	168	6	1,288	1,302
S. ruberrimus	11	..	..	..	..	25	150
S. rubrivinctus	..	14	534	41	150	18	2
S. zacentrus	2	67	29	403	4	1,101	1,056
S. sp. (nova?)	..	..	..	416	37	8,591	11,307
Seb. alascanus	..	5	3	..	2	..	..
Other[9]	..	..	21	2	..	..	T
Other roundfish[10]							
Blackcod	4	12	486	27	69	6	..
Hake	..	29	152	114	380	8	9
Lingcod	6	3	104	..	24	18	24
Pacific cod	1	..	..	20	15	11	..
Other[11]	T	T	3	..	15	..	..
Selachii[12]							
Dogfish	..	9	98	42	50	14	11
Ratfish	7	2	8	8	4	..	..
Skate	4	..	22	..	..	..	29
Invertebrates	1	T	15	5	1	T	T

Footnotes to Table II

[1]Area: EP = Estevan Point
CP = Cape Palmerston
LP = La Pérouse Bank
QS = Quatsino Sound
TI = Triangle Island

[2]PDT = Pacific Daylight Time

[3]Depth (fm) = depth at beginning and end of haul

[4]Bottom type: bl = black; br = brown; gr = green; gy = grey; wh = white; Cl = clay; G = gravel; M = mud; S = sand

[5]Net used: same net as in Part I

[6]Flatfish: see Footnote 7 in Table I

[7]Halibut: numbers of fish in parentheses

[8]Other flatfish: never more than 24 lb per haul: English sole (Parophrys vetulus); flathead sole (Hippoglossoides elassodon); slender sole (Lyopsetta exilis)

[9]Other rockfish: never more than 24 lb per haul: S. jordani; S. saxicola; S. wilsoni

[10]Other roundfish: see Footnote 11 in Table I

[11]Other roundfish: Agonidae; Cottidae; Liparidae; Myctophidae; Petromyzontidae; Zoarcidae

[12]Selachii: see Footnote 13 in Table I

[13]T = trace = less than one pound

Table III. Fishing log for the Digby dredge during G.B. Reed cruise no. 66-2, August-October, 1966.

Haul No.	Date	Area[1]	N. Lat.	W. Long.	Depth (fms)	Duration (min)
I	Aug. 30	DE	54°15'	132°14'	84-76	15
II	Sept. 1	DE	54°19'	131°53'	118-120	15
III	Sept. 2	FI	54°47.5'	133°45.5'	113-114	15
IV	Sept. 6	LI	54°06.1'	133°26.5'	186-194	16
V	Sept. 7	LI	54°07.8'	133°31'	200-201	15
VI	Sept. 9	RS	53°21.5'	133°05'	118-120	15
VII	Sept. 13	MI	52°07.7'	130°23.5'	172	15

[1] Area: DE = Dixon Entrance
FI = Forrester Island
LI = Langara Island
MI = Moresby Island
RS = Rennell Sound

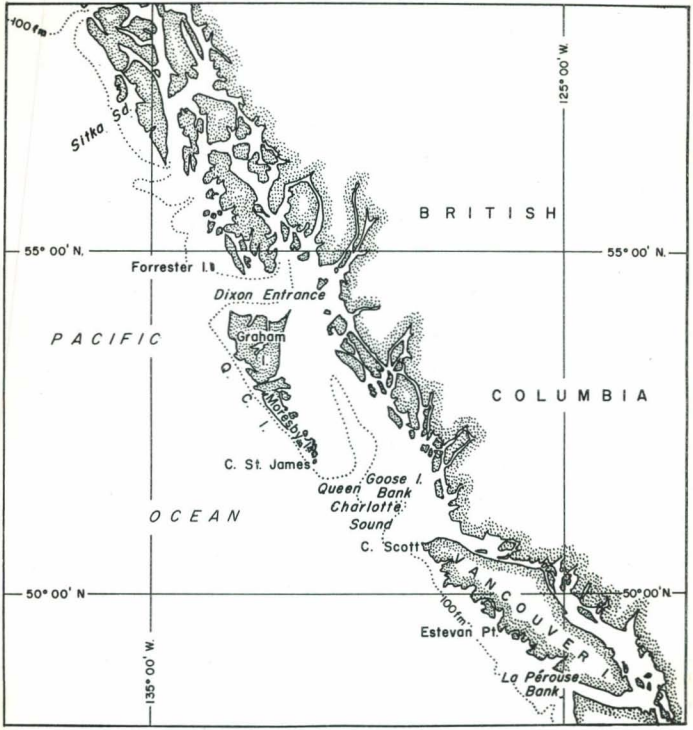

Fig. 1. Fishing areas for G.B. Reed groundfish cruise no. 66-2, August-October 1966.

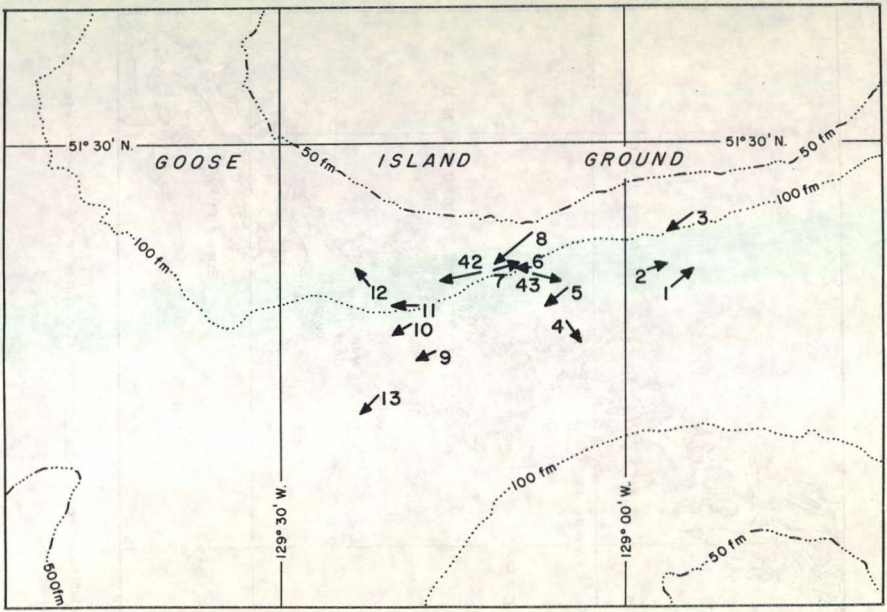

Fig. 2. Chart of southeast Queen Charlotte Sound showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 66-2.

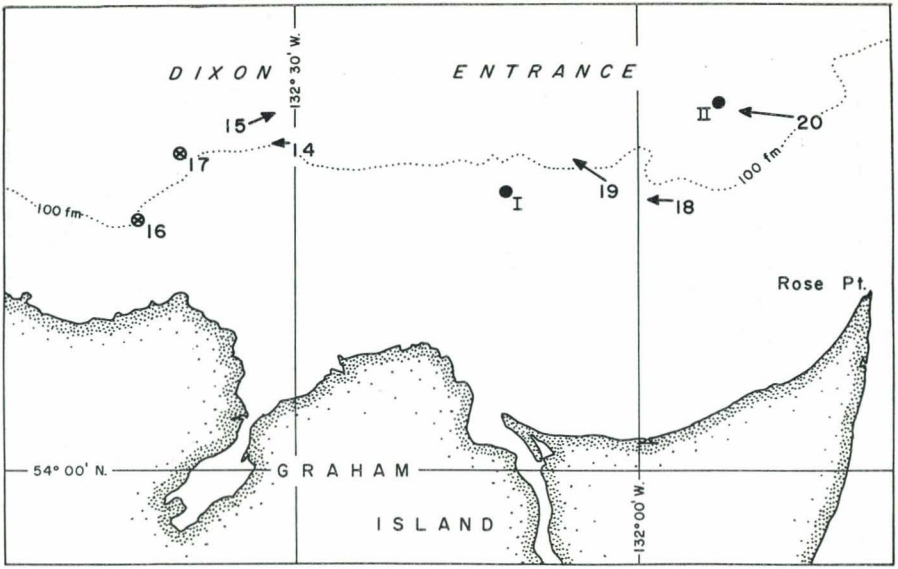

Fig. 3. Chart of Dixon Entrance showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 66-2. (Solid circles indicate location of Digby dredge hauls.)

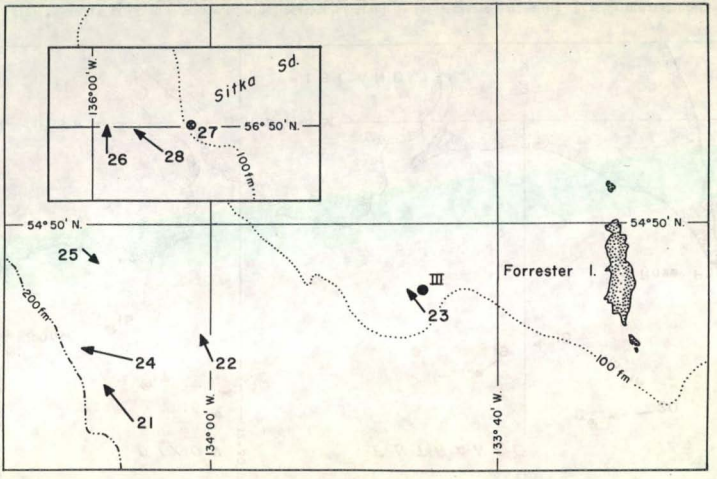

Fig. 4. Chart of Forrester Island and Sitka Sound (insert) showing trawl hauls completed during G.B. Reed groundfish cruise no. 66-2. (Solid circles indicate location of Digby dredge hauls.)

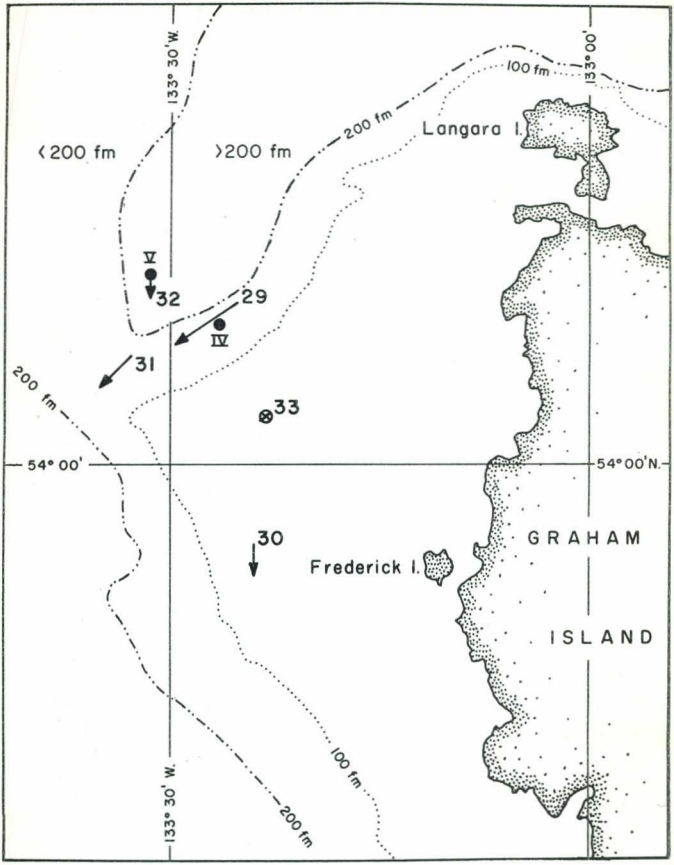

Fig. 5. Chart of northwest Graham Island showing trawl hauls completed during G.B. Reed groundfish cruise no. 66-2. (Solid circles indicate location of Digby dredge hauls.)

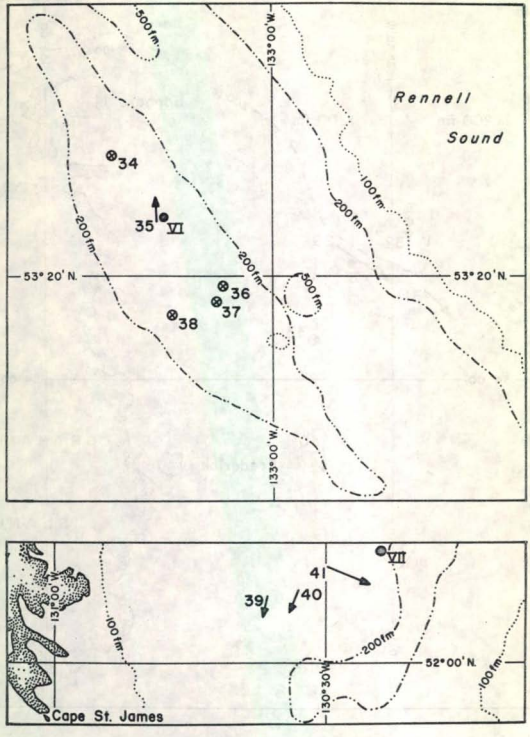

Fig. 6. Chart of west Graham Island and southeast Moresby Island (insert) showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 66-2. (Solid circles indicate location of Digby dredge hauls.)

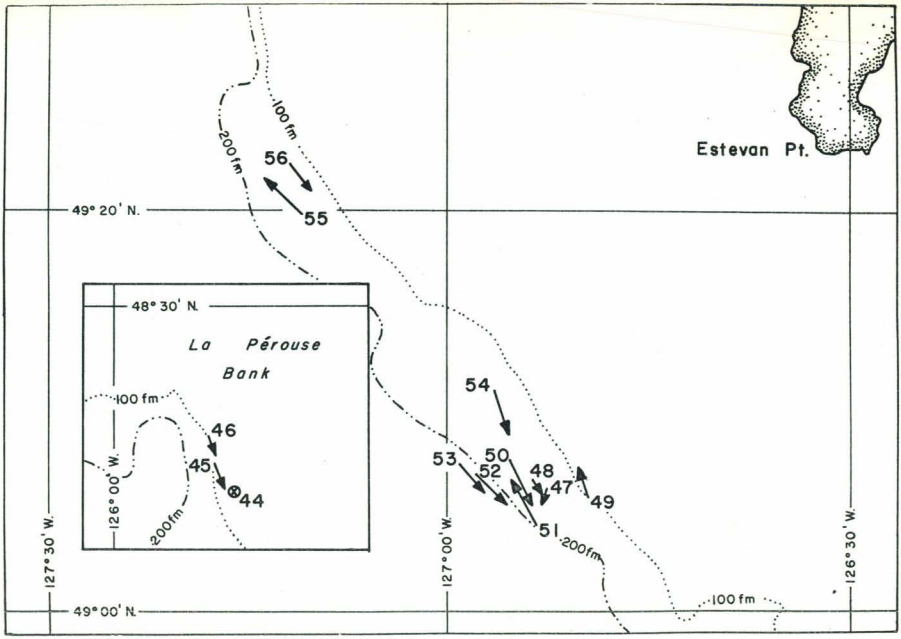

Fig. 7. Chart of Estevan Point and La Pérouse Bank (insert) areas off southwest Vancouver Island showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 66-2.

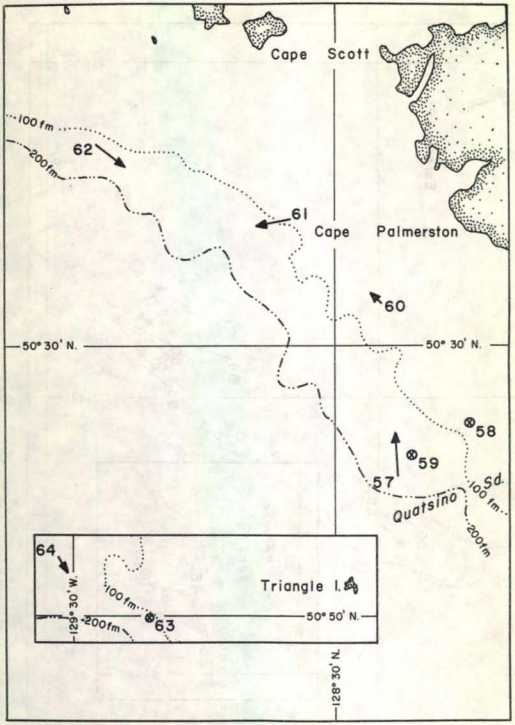

Fig. 8. Chart of Quatsino Sound, Cape Palmerston, and Triangle Island (insert) areas off northwest Vancouver Island showing location of trawl hauls completed during G.B. Reed groundfish cruise no. 66-2.