

FISH COMMISSION OF OREGON
GROUNDFISH AND SHRIMP INVESTIGATIONS
Report of Cruise 71-5, Resource Survey

Vessel: R/V Commando, chartered research vessel.

Dates: September 3 - October 4, 1971.

Objectives: The purpose of the survey was to provide data for biomass estimates of flatfish and age data for forecasting year class strength of important commercial flatfish.

Methods: Trawling stations were determined by use of a 5x5 nautical mile grid with a random starting point. Tow locations were located by Loran (1L0), depth sounder and dead reckoning. Tows were three-fourths nautical mile in length or 10 Loran microseconds. All tows were made to the south except tows 48 and 72 which were made to the north.

Gear used was a 400-mesh eastern otter trawl constructed entirely of 3.5-inch mesh. Footrope-headrope measures were 77 and 60-feet, respectively. Sweep lines consisted of a 5-fathom dandy line and a 10-fathom bridle. There were eleven 8-inch floats attached to the headrope. The footrope was weighted with 25-30 pounds of chain. A 71-foot, 5/16-inch tickler chain was attached to each wing tip. The "V" type doors or otter boards measured 5x7 feet and weighed 1,050 pound each.

Results: The survey area extended south of Newport by 22-miles or five track lines further south than anticipated. This was due to unusually fair weather and excellent vessel support.

There were 111 stations plotted within the survey area, but only 91 tows provided useable data. Snags or net damage occurred on 10 tows and two tows (numbers 88 and 91) were replicates of standard tows. The remaining eight stations were unoccupied because of untrawlable bottom.

Catch rate by species, tow location and depth are shown in Table 1. Dungeness crab accounted for the major part of the weight shown in the miscellaneous category of Table 1. Table 2 lists the common and scientific names of fishes caught.

There were 9,319 fish sampled for age and sex composition. This figure is preliminary in that some age-weight samples taken can also be used in age composition. Preliminary numbers sampled by species is shown in Table 3.

Horizontal opening of the net was 28.8-feet with a scope ratio (length of towing warp to bottom depth) of 4:1, but 32.3-feet with a scope ratio of 8:1. Vertical opening was approximately 3.5-feet.

It was intended to make BT casts along every other track line, but the XBT malfunctioned on the second cast and was inoperable through the remainder of the cruise.

Other work performed was the incidental tagging of 35 lingcod. Also, various requests were fulfilled for specimens.

Personnel:

Robert Demory, Party Chief, 9/3 - 10/4
Brent Forsberg, Biologist, 9/3 - 10/4
Mike Hosie, Biologist, 9/3 - 9/24, 9/27, 10/1 - 10/4
Chuck Walters, Biologist, 9/3 - 9/15
John Beck, Wildlife Conservation Aid, 9/3 - 9/30
Bill Barss, Wildlife Conservation Aid, 9/16 - 9/21
Tom Gaumer, Biologist, 9/22 - 9/24
Walt Weber, Biologist, 9/24
John Fortune, Biologist, 9/25 - 9/26
Del Skeesick, Biologist, 9/25 - 9/26
Lou Fredd, Biologist, 9/30
Jim Steinfeld, Wildlife Conservation Aid, 9/30 - 10/1
Jack Robinson, Biologist, 9/27, 10/2 - 10/4
Tom Oswald, Vessel Captain
Olaf Roccus, Engineer
Chuck Fergeson, Cook

Robert L. Demory
Research Division
November, 1971

Table 1. Station Location and Catch by Haul, Groundfish Survey, Cruise 71-5.
September 3 to October 4, 1971.

Haul Numbers	1	2	3	4	5	6
Date	9/5	9/5	9/5	9/5	9/6	9/6
Loran, 1L0						
Start	3474	3480	3475	3472	3468	3409
End	3464	3470	3465	3462	3455	3399
Depth	16-17	40-42	60	70-68	78-77	80
Catch:						
Spiny dogfish		9				
Skate	5	16	17	15	121	50
Ratfish		14	22	15	1	1
Pacific cod		23	97		3	
Pacific hake		840	2,175	128		
Flatfish						
Pacific sanddab	4	30	1			
Arrowtooth flounder		7	124	96	60	52
Slender sole			9	2	T	
Petrale sole		321	4	3		
Flathead sole			9	3		
Sand sole	10					
Butter sole	3	T				
English sole	3	56	36	1		
Rock sole	1					
Dover sole		54	460	200	199	156
Rex sole		110	71	24	12	28
Starry flounder						
Curfin sole						
Rockfish						
Shortspine thornyhead						2
Bocaccio						
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish		7	16			
Canary rockfish		4	35	4	5	
Blackmouth rockfish				6	3	7
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Green striped rockfish				7	23	72
Rosethorn rockfish						
Sablefish		150	3	22	20	52
Lingcod	4	17	15		10	2
Miscellaneous ^{1/}	100	94	13	21	3	
Totals	130	1,752	3,107	547	460	422

^{1/} See Table 2 for species listed in this category.

* Snag

T - Trace

Table 1. (cont.)

Haul Numbers	7	8	9	10	11	12
Date	9/6	9/6	9/6	9/6	9/6	9/7
Loran, 1L0						
Start	3410	3419	3413	3414	3416	3356
End	3400	3409	3403	3404	3406	3346
Depth	72	61-60	50-49	36-38	13-14	29-30
Catch						
Spiny dogfish	53			7	12	
Skate	46	174	86	35	146	
Ratfish	25	40	62	19	132	
Pacific cod		14	24	10		
Pacific hake		2,203		83		
Flatfish						
Pacific sanddab		10	11	73		13
Arrowtooth flounder	84	64	4			
Slender sole	4	5				
Petrale sole	1	22	15	49		29
Flathead sole	20					
Sand sole					9	
Butter sole					18	
English sole		15	19	60	34	38
Rock sole						
Dover sole	265	260	20	1		
Rex sole	29	35	12	180		44
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead	36					
Bocaccio				1		
Silvergray rockfish						
Widow rockfish		1		4		
Black rockfish					8	
Yellowtail rockfish		87				
Canary rockfish		138			2	
Blackmouth rockfish		1				
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish						
Rosethorn rockfish						
Sablefish	120	32	1			
Lingcod		26	3	16		
Miscellaneous <u>1/</u>	43	55	2	34	1,468	13
Totals	726	3,182	259	572	1,829	137

Table 1. (cont.)

Haul Numbers	13	14	15	16	17	18
Date	9/7	9/7	9/7	9/8	9/8	9/8
Loran 110						
Start	3355	3354	3351	3348	3341	3273
End	3345	3344	3341	3338	3331	3263
Depth ..	50	62-63	76-77	82-83	100	108-106
Catch:						
Spiny dogfish	2	5				
Skate	62	80		42	65	98
Ratfish	26	102	21	6	11	17
Pacific cod		32				
Pacific hake	10	1,628		158	23	
Flatfish						
Pacific sanddab	24	18				
Arrowtooth flounder	3		68	72	80	37
Slender sole	5		5	1	3	1
Petrale sole	27	41	6		9	7
Flathead sole				14	6	
Sand sole						
Butter sole						
English sole	23	9				
Rock sole						
Dover sole	12	153	54	130	365	213
Rex sole	46	46	50	34	183	5
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead			7	7	43	
Bocaccio						
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish		3	6		6	
Canary rockfish		9		2		
Blackmouth rockfish		1			111	
Redstripe rockfish						
Pacific ocean perch					16	
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish					1	
Sharpchin rockfish					80	
Greenstriped rockfish		1		8	10	23
Rosethorn rockfish						
Sablefish		14	18	42	375	102
Lingcod	5	78		6	17	48
Miscellaneous <u>1/</u>	9	3		9	6	
Totals	254	2,223	235	531	1,410	551

Table 1. (cont.)

Haul Numbers	19	20	21	22	23	24
Date	9/8	9/8	9/8	9/9	9/9	9/9
Loran 1L0						
Start	3284	3290	3294	3292	3230	3231
End	3274	3280	3284	3282	3231	3221
Depth	81	71	49	39	21	49
Catch:						
Spiny dogfish		2	3			
Skate	8	79	1	102		32
Ratfish	7	37	54	46		40
Pacific cod						
Pacific hake	975	1,900		3		
Flatfish						
Pacific sanddab			30	28		44
Arrowtooth flounder	42	90		1		
Slender sole	7	3				
Petrale sole	2	2	22	28		26
Flathead sole	12	13				
Sand sole					3	
Butter sole					T	
English sole		5	34	19	T	50
Rock sole			T			
Dover sole	31	82	2			
Rex sole	23	42	44	110		19
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead						
Bocaccio		2				
Silvergray rockfish						
Widow rockfish		1				
Black rockfish					3	
Yellowtail rockfish						
Canary rockfish		132	8	8		
Blackmouth rockfish		1				
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish						
Rosethorn rockfish						
Sablefish	13	9	108	8		3
Lingcod	22		15			18
Miscellaneous <u>1/</u>	14		8	34		12
Totals	1,156	2,400	329	387	6	244

Table 1. (cont.)

Haul Numbers	25	26	27	28	29	30
Date	9/12	9/12	9/12	9/12	9/12	9/14
Loran 110						
Start	3230	3227	3224	3224	3155	2866
End	3220	3217	3214	3214	3145	2856
Depth	70-72	81-82	86	97-95	104-107	36-33
Catch:						
Spiny dogfish	1					
Skate	72	44	28		5	18
Ratfish	19	17				108
Pacific cod						4
Pacific hake	2,245	1,855	443		50	2
Flatfish						
Pacific sanddab						17
Arrowtooth flounder	118	92	50		15	
Slender sole	3	6	3			
Petrale sole	10	6				15
Flathead sole	5	18	4			
Sand sole						3
Butter sole						2
English sole	2					60
Rock sole						
Dover sole	68	30	25		92	3
Rex sole	32	17	18		20	56
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead			2		7	
Bocaccio					5	
Silvergray rockfish					11	
Widow rockfish						
Black rockfish						5
Yellowtail rockfish	17					62
Canary rockfish	5					
Blackmouth rockfish	9					
Redstripe rockfish						
Pacific ocean perch					14	
Yellowmouth rockfish					12	
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish					18	
Sharpchin rockfish					22	
Greenstriped rockfish	33				29	
Rosethorn rockfish						
Sablefish	7	1	3		10	
Lingcod	8					11
Miscellaneous <u>1/</u>	33	1	4		34	17
Totals	2,687	2,087	580		344	383

Table 1. (cont.)

Haul Numbers	31	32	33	34	35	36
Date	9/14	9/14	9/14	9/15	9/15	9/15
Loran 110						
Start	2809	2862	2791	2805	2748	2742
End	2791	2852	2781	2795	2738	2732
Depth	49	70-71	88-87	10-11	23-24	52-51
Catch:						
Spiny dogfish	4		5	2	7	5
Skate	10	24	26	122	32	5
Ratfish	7	27	5		62	12
Pacific cod						
Pacific hake		1,985	1,853			
Flatfish						
Pacific sanddab	16	2			5	5
Arrowtooth flounder	1	11	38			
Slender sole		T	1			
Petrale sole	22	11	8		15	15
Flathead sole			T			
Sand sole				17	7	
Butter sole				4	6	
English sole	30	9			138	46
Rock sole					1	
Dover sole	T	6	70			9
Rex sole	41	1	17		2	51
Starry flounder				2		
Curlfin sole					1	
Rockfish						
Shortspine thornyhead			2			
Bocaccio		52				
Silvergray rockfish						
Widow rockfish			2			
Black rockfish				36	3	
Yellowtail rockfish		18	4			
Canary rockfish		22	5		5	
Blackmouth rockfish			T			
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish			6			
Rosethorn rockfish						
Sablefish		68				
Lingcod		6	23	10	3	20
Miscellaneous <u>1/</u>				3	1	8
Totals	131	2,242	2,065	196	288	176

Table 1. (cont.)

Haul Numbers	37	38	39	40	41	42
Date	9/15	9/15	9/15	9/18	9/18	9/18
Loran 110						
Start	2732	2673	2676	2874	2913	2980
End	2722	2663	2666	2854	2906	2970
Depth	90	109-108	72	98-100	101	102-103
Catch:						
Spiny dogfish			10	12		3
Skate	36	42	8	151	3	30
Ratfish	3		5	4		13
Pacific cod					24	
Pacific hake	2,230		988	223	23	53
Flatfish						
Pacific sanddab			1			
Arrowtooth flounder	75	153	7	106	22	
Slender sole	T	T		1		
Petrale sole			7	1		
Flathead sole	1					
Sand sole						
Butter sole						
English sole			8			
Rock sole						
Dover sole	71	39	15	219	60	207
Rex sole	15	8	4	36	8	6
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead	3	1		72		15
Bocaccio	10	7	10	15		
Silvergray rockfish					9	
Widow rockfish	3		3		6	
Black rockfish						
Yellowtail rockfish		4	22	14		
Canary rockfish	10	4	22	18	5	8
Blackmouth rockfish						
Redstripe rockfish					128	
Pacific ocean perch						5
Yellowmouth rockfish					36	
Stripetail rockfish						47
Splitnose rockfish				1		3
Flag rockfish				34	10	2
Sharpchin rockfish		1		53	82	
Greenstriped rockfish	6	7		54	52	22
Rosethorn rockfish					10	
Sablefish	36	26	10	144	32	16
Lingcod	106	34		82		
Miscellaneous <u>1/</u>				2		2
Totals	2,605	326	1,120	1,242	510	432

Table 1. (cont.)

Haul Numbers	43	44	45	46	47	48
Date	9/18	9/19	9/19	9/19	9/19	9/19
Loran 110						
Start	3041	3201	3161	3156	3170	3160
End	3031	3191	3151	3146	3160	3170
Depth	106-107	106-108	106	87-90	81	81
Catch:						
Spiny dogfish						
Skate	20	20	3	10		46
Ratfish	18	8	2	14		4
Pacific cod						
Pacific hake	6		1,150			
Flatfish						
Pacific sanddab						
Arrowtooth flounder		51	27	44		24
Slender sole	T	2		1		3
Petrale sole	4	4				6
Flathead sole	1	8				
Sand sole						
Butter sole						
English sole						
Rock sole						
Dover sole	195	82	62	16		29
Rex sole	20	58	35	3		8
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead	62	30	5	3		
Bocaccio			5			
Silvergray rockfish		88	36			
Widow rockfish						
Black rockfish						
Yellowtail rockfish						
Canary rockfish		2	2			
Blackmouth rockfish	2					
Redstripe rockfish						
Pacific ocean perch	20		1			
Yellowmouth rockfish			38			
Stripetail rockfish	7	3	10			
Splitnose rockfish	6	1				
Flag rockfish		364	90			1
Sharpchin rockfish		3	2			
Greenstriped rockfish		6	3	256		22
Rosethorn rockfish			2			
Sablefish	14	18	15	6		3
Lingcod		18	68	4		6
Miscellaneous <u>1/</u>		1				
Totals	375	767	1,556	357		152

Table 1. (cont.)

Haul Numbers	49	50	51	52	53	54
Date	9/19	9/20	9/20	9/20	9/20	9/20
Loran 1L0						
Start	3168	3172	3117	3112	3051	3043
End	3158	3162	3107	3102	3044	3033
Depth	58-59	40	47	56-57	81-82	59-58
Catch:						
Spiny dogfish	12		9	3	4	11
Skate	4	88	6	6	82	22
Ratfish	35	4	7	60	30	64
Pacific cod						5
Pacific hake	2,208			875	23	25
Flatfish						
Pacific sanddab	15	33	18	26		20
Arrowtooth flounder	21	T		41	17	6
Slender sole		T	T	1	T	
Petrale sole	9	T	12	15	4	
Flathead sole						
Sand sole						
Butter sole						
English sole	86	13	46	3		99
Rock sole						
Dover sole	34		1	26	42	24
Rex sole	13	23	20	4	11	6
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead						
Bocaccio				6		T
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish						
Canary rockfish				6	3	
Blackmouth rockfish				T		
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish					1	
Greenstriped rockfish				76	6	1
Rosethorn rockfish						
Sablefish	36			7	3	
Lingcod		1		6		14
Miscellaneous <u>1/</u>	4	28	16	7		25
Totals	2,477	190	135	1,168	226	322

Table 1. (cont.)

Haul Numbers	55	56	57	58	59	60
Date	9/20	9/20	9/20	9/21	9/21	9/21
Loran 110						
Start	3050	2992	2925	2926	2983	2990
End	3040	2982	2915	2916	2973	2980
Depth	43	30-34	15-16	50-51	60-61	88-90
Catch:						
Spiny dogfish	2					
Skate	24	22	20	44	32	46
Ratfish	26	24	108	16	54	22
Pacific cod						
Pacific hake					13	580
Flatfish						
Pacific sanddab	88	55	1	43	9	
Arrowtooth flounder	1			T	7	13
Slender sole	T	T		T	T	1
Petrable sole	6	16	29	14	17	
Flathead sole						1
Sand sole			9			
Butter sole		T	10			
English sole	42	115	7	82	96	
Rock sole						
Dover sole	1			4	41	29
Rex sole	38	30	1	14	9	13
Starry flounder			T			
Curlfin sole						
Rockfish						
Shortspine thornyhead						36
Bocaccio						
Silvergray rockfish						
Widow rockfish					36	
Black rockfish			26			
Yellowtail rockfish					272	
Canary rockfish					1	
Blackmouth rockfish						
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish					13	4
Rosethorn rockfish						
Sablefish				T	1	6
Ling cod		18	12		38	36
Miscellaneous ^{1/}	6	16	14	38	8	4
Totals	234	296	237	255	647	791

Table 1. (Cont.)

Haul Numbers	61	62	63	64	65	66
Date	9/21	9/21	9/21	9/22	9/22	9/22
Loran 110						
Start	2918	2750	2679	2431	2494	2555
End	2908	2740	2659	2421	2484	2545
Depth	83-84	23-21	35	27-26	47-44	30
Catch:						
Spiny dogfish	20		12			3
Skate	60		14	50		24
Ratfish	15	248	11		26	4
Pacific cod						
Pacific hake	120					
Flatfish						
Pacific sanddab	T	6	7	6	8	5
Arrowtooth flounder	32					
Slender sole	2					
Petrale sole	9	24	3	4	175	8
Flathead sole						
Sandsole		25		13		
Butter sole		7	T	19		7
English sole		79	54	413	38	26
Rock sole						T
Dover sole	114	5		9		
Rex sole	16	13	6	10	5	T
Starry flounder		16	7	11		
Curlfin sole				23		
Rockfish						
Shortspine thornyhead						
Bocaccio	11					
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish	14					
Canary rockfish						
Blackmouth rockfish	3					
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish	3					
Greenstriped rockfish						
Rosethorn rockfish						
Sablefish	7					
Ling cod	42	22		8		46
Miscellaneous <u>1/</u>	14	9	27	1	8	15
Totals	482	454	141	567	260	138

Table 1. (cont.)

Haul Numbers	67	68	69	70	71	72
Date	9/22	9/22	9/22	9/23	9/23	9/23
Loran 1L0						
Start	2615	2612	2609	2431	2490	2546
End	2605	2602	2591	2421	2480	2536
Depth	39-38	74-73	100-97	44-42	72	66
Catch:						
Spiny dogfish	4	26				
Skate	28	46	8		8	9
Ratfish	10	29	6	20	10	28
Pacific cod						
Pacific hake						
Flatfish						
Pacific sanddab	15	T	1		19	11
Arrowtooth flounder		7	98		1	4
Slender sole		T	2		2	T
Petrale sole	15	3	6	10	6	10
Flathead sole						
Sand sole						
Butter sole						
English sole	61	18		13	4	71
Rock sole				T		2
Dover sole	1	15	136		2	30
Rex sole	34	16	22	T	8	6
Starry flounder						
Curlfin sole						
Rockfish						
Shortspine thornyhead						
Bocaccio						
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish			15			
Canary rockfish	8		30			
Blackmouth rockfish						
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish			T			
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish			22			
Rosethorn rockfish						
Sablefish		1	50			
Lingcod	18	23	14	22		
Miscellaneous <u>1/</u>	1	16	22	12	3	
Totals	195	200	432	77	63	171

Table 1. (cont.)

Haul Numbers	73	74	75	76	77	78
Date	9/23	9/24	9/24	9/25	9/25	9/25
Loran 1L0						
Start	2549	2425	2484	2417	2365	2364
End	2539	2415	2474	2407	2355	2354
Depth	86	65-61	83-82	81-78	36-35	45
Catch:						
Spiny dogfish	4	26		20	12	
Skate	48	48	86	17	33	11
Ratfish	34			17		26
Pacific cod						
Pacific hake						
Flatfish						
Pacific sanddab		15		3	18	2
Arrowtooth flounder	27		66	38		
Slender sole	9	T	T	2		
Petrale sole	28	35	8	4		6
Flathead sole						
Sand sole						
Butter sole					1	2
English sole		52			76	24
Rock sole					T	1
Dover sole	29	11	6	22		
Rex sole	12	7	4	7		5
Starry flounder						
Curlfin sole						1
Rockfish						
Shortspine thornyhead						
Bocaccio						
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish						
Canary rockfish		36				
Blackmouth rockfish						
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish				1		
Rosethorn rockfish						
Sablefish	15		8	21		
Lingcod				24		10
Miscellaneous $\frac{1}{}$	2	10			1	
Totals	208	240	178	176	141	88

Table 1. (cont.)

Haul Numbers	79*	80	81*	82	83	84
Date	9/25	9/25	9/25	9/26	9/26	9/26
Loran 110						
Start	2364	2353	2287	2309	2251	2308
End	2360	2343	2295	2299	2241	2298
Depth	57	93	60-64	28-26	32-33	44
Catch:						
Spiny dogfish		10			7	
Skate		32		48	48	40
Ratfish		24	16		80	15
Pacific cod						
Pacific hake						
Flatfish						
Pacific sanddab			1	3	22	4
Arrowtooth flounder		52				
Slender sole		7	T			
Petrale sole		2	20		27	12
Flathead sole		4				
Sand sole				12		
Butter sole				6		
English sole				77	139	35
Rock sole				T	3	T
Dover sole		68	8		2	
Rex sole			5	1	22	8
Starry flounder				4		
Curlfin sole				1		2
Rockfish						
Shortspine thornyhead						
Bocaccio						
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish						
Canary rockfish						
Blackmouth rockfish				T		
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish		1	1			
Rosethorn rockfish						
Sablefish		2				
Lingcod			9		22	
Miscellaneous <u>1/</u>		2		2	8	
Totals		204	60	154	380	116

Table 1. (Cont.)

Haul Numbers	85	86	87	88	89	90
Date	9/27	9/27	9/30	9/30	9/30	9/30
Loran 110						
Start	2239	2235	2193	2194	2183	2179
End	2229	2225	2183	2174	2173	2169
Depth	65-67	114-90	25-24	25-23	38	42
Catch:						
Spiny dogfish	5				3	4
Skate		26	44	180		12
Ratfish	10	9	216	470	16	5
Pacific cod						
Pacific hake			5			
Flatfish						
Pacific sanddab	12		18	29	144	39
Arrowtooth flounder		80				
Slender sole		5				
Petrale sole	9	140	37	58	7	22
Flathead sole						
Sand sole			11	21		
Butter sole			3	5	1	
English sole	48	28	148	314	128	105
Rock sole	4					
Dover sole	5	199		2	1	
Rex sole	8	17		5	42	51
Starry flounder				6		
Curlfin sole					1	3
Rockfish						
Shortspine thornyhead						
Bocaccio		124				
Silvergray rockfish		78				
Widow rockfish						
Black rockfish				8		
Yellowtail rockfish		12				
Canary rockfish		68				
Blackmouth rockfish						
Redstripe rockfish						
Pacific ocean perch		3				
Yellowmouth rockfish		12				
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish		13				
Greenstriped rockfish		57				
Rosethorn rockfish		1				
Sablefish		907			1	
Lingcod		10	10	15		
Miscellaneous <u>1</u> /	28	5	10	5		
Totals	129	1,794	502	1,118	344	241

Table 1. (cont.)

Haul Numbers	91	92*	93	94	95*	96
Date	9/30	9/30	10/1	10/1	10/1	10/1
Loran 110						
Start	2180	2174	2370	2160	2103	2104
End	2160	2164	2160	2170	2102	2196
Depth	42-43	62-59	16-14	79-82	56	50-51
Catch:						
Spiny dogfish	4		4			2
Skate	64	5	186	42		10
Ratfish	12			4		11
Pacific cod						
Pacific hake						
Flatfish						
Pacific sanddab	72					31
Arrowtooth flounder						
Slender sole						
Petrale sole	10	2	10	14		2
Flathead sole						
Sand sole			17			
Butter sole			8			
English sole	136		19	132		27
Rock sole		2				3
Dover sole	3			170		13
Rex sole	51	T		36		12
Starry flounder			22			
Curlfin sole	1					
Rockfish						
Shortspine thornyhead						
Bocaccio				32		
Silvergray rockfish						
Widow rockfish						
Black rockfish						
Yellowtail rockfish						
Canary rockfish				18		
Blackmouth rockfish						
Redstripe rockfish						
Pacific ocean perch						
Yellowmouth rockfish						
Stripetail rockfish						
Splitnose rockfish						
Flag rockfish						
Sharpchin rockfish						
Greenstriped rockfish		1		266		44
Rosethorn rockfish		2				
Sablefish				82		3
Lingcod	34	3	14			8
Miscellaneous <u>1/</u>			24	40		19
Totals	387	15	304	836		185

Table 1. (Cont.)

Haul Numbers	97	98	99	100
Date	10/2	10/2	10/2	10/3
Loran 1LO				
Start	2045	2051	2060	2059
End	2035	2041	2050	2049
Depth	56-55	55-54	47	36-37
Catch:				
Spiny dogfish	4	28	3	
Skate	14	26	30	82
Ratfish	4	8	24	
Pacific cod				
Pacific hake		770		
Flatfish				
Pacific sanddab	52	20	95	19
Arrowtooth flounder		4		
Slender sole	T			
Petrale sole	10	6	9	4
Flathead sole				
Sand sole				1
Butter sole				
English sole	34	82	73	55
Rock sole				
Dover sole	3	39	1	T
Rex sole	36	16	81	10
Starry flounder				
Curlfin sole				
Rockfish				
Shortspine thornyhead				
Bocaccio				
Silvergray rockfish				
Widow rockfish				
Black rockfish				
Yellowtail rockfish				
Canary rockfish				
Blackmouth rockfish				
Redstripe rockfish				
Pacific ocean perch				
Yellowmouth rockfish				
Stripetail rockfish				
Splitnose rockfish				
Flag rockfish				
Sharpchin rockfish				
Greenstriped rockfish				
Rosethorn rockfish				
Sablefish	1	15		T
Lingcod		3	T	22
Miscellaneous <u>1</u> /		1		
Totals	158	1,018	316	193

Table 1. (cont.)

Haul Numbers	101	102	103	Total
Date	10/3	10/3	10/3	
Loran 1L0				
Start	2124	2118	2117	
End	2114	2108	2107	
Depth	22	38	38-44	
Catch:				
Spiny dogfish			6	337
Skate	50	24	32	3,916
Ratfish	108	14	19	3,025
Pacific cod				236
Pacific hake				27,904
Flatfish				
Pacific sanddab	68	128	138	1,651
Arrowtooth flounder				2,233
Slender sole				96
Petrale sole	115	8	11	1,749
Flathead sole				119
Sand sole	18			176
Butter sole	6			108
English sole	45	281	322	4,441
Rock sole	38			55
Dover sole	3	T		5,054
Rex sole	2	103	160	2,622
Starry flounder				68
Curlfin sole	3			36
Rockfish				
Shortspine thornyhead				333
Bocaccio				280
Silvergray rockfish				222
Widow rockfish				56
Black rockfish				89
Yellowtail rockfish				579
Canary rockfish				625
Blackmouth rockfish				144
Redstripe rockfish				128
Pacific ocean perch				59
Yellowmouth rockfish				98
Stripetail rockfish				67
Splitnose rockfish				11
Flag rockfish				520
Sharpchin rockfish				260
Greenstriped rockfish				1,133
Rosethorn rockfish				15
Sablefish		T	2	2,669
Lingcod		28	24	1,257
Miscellaneous <u>1/</u>	77			2,575
Totals	533	586	714	64,946

Table 2. List of Common and Scientific Names of Fishes Caught on Cruise 71-5.

<u>Common Name</u>	<u>Scientific Name</u>
Spiny dogfish	<i>Squalus acanthias</i>
Pacific electric ray	<i>Torpedo californica</i>
Skates	<i>Raja</i> spp.
Ratfish	<i>Hydrolagus colliei</i>
Green sturgeon	<i>Acipenser medirostris</i>
American shad*	<i>Alosa sapidissima</i>
Chinook salmon*	<i>Oncorhynchus tshawytscha</i>
Surf smelt*	<i>Hypomesus pretiosus</i>
Eulachon*	<i>Thaleichthys pacificus</i>
Pacific cod	<i>Gadus macrocephalus</i>
Pacific hake	<i>Merluccius productus</i>
Pacific tomcod*	<i>Microgadus proximus</i>
Shiner perch*	<i>Cymatogaster aggregata</i>
Pile perch*	<i>Rhacochilus vacca</i>
Pacific mackerel*	<i>Scomber japonicus</i>
Bocaccio	<i>Sebastes paucispinis</i>
Silvergray rockfish	<i>S. brevispinis</i>
Widow rockfish	<i>S. entomelas</i>
Black rockfish	<i>S. melanops</i>
Yellowtail rockfish	<i>S. falvidus</i>
Canary rockfish	<i>S. pinniger</i>
Blackmouth rockfish	<i>S. crameri</i>
Redstripe rockfish	<i>S. proriger</i>
Pacific ocean perch	<i>S. alutus</i>
Stripetail rockfish	<i>S. saxicola</i>
Splitnose rockfish	<i>S. diploproa</i>
Flag rockfish	<i>S. rubrivinctus</i>
Sharpchin rockfish	<i>S. zacentrus</i>
Greenstriped rockfish	<i>S. elongatus</i>
Rosethorn rockfish	<i>S. helvomaculatus</i>
Shortspine thornyhead	<i>Sebastolobus alascanus</i>
Sablefish	<i>Anoplopoma fimbria</i>
Lingcod	<i>Ophiodon elongatus</i>
Sculpins*	Cottidae
Poachers*	Agonidae
Wolf-eel*	<i>Anarrhichthys ocellatus</i>
Giant wrymouth*	<i>Delolepis gigantea</i>
Eelpouts*	Zoarcidae
Speckled sanddab*	<i>Citharichthys stigmaeus</i>
Pacific sanddab	<i>Citharichthys sordidus</i>
Arrowtooth flounder	<i>Athiresthes stomias</i>
Petrale sole	<i>Eopsetta jordani</i>
Rex sole	<i>Glyptocephalus zachirus</i>
Flathead sole	<i>Hippoglossodes elassodon</i>
Pacific halibut	<i>Hippoglossus stenolepis</i>
Butter sole	<i>Isopsetta isolepis</i>
Rock sole	<i>Lepidopsetta bilineata</i>
Slender sole	<i>Lyopsetta exilis</i>
Dover sole	<i>Microstomus pacificus</i>
English sole	<i>Parophrys vetulus</i>
Starry flounder	<i>Platichthys stellatus</i>
Curlfin sole	<i>Pleuronichthys decurrens</i>
Sand sole	<i>Psettichthys melanostictus</i>
Invertebrates	
Dungeness crab*	<i>Cancer magister</i>

* Species listed in the miscellaneous category of Table 1.

Table 3. Preliminary Number of Fish Sampled on Cruise 71-5.

Species	Number Sampled
Rex sole	2,464
Pacific sand dab	1,705
Dover sole	1,535
English sole	1,395
Arrowtooth flounder	998
Petrale sole	812
Slender sole	162
Butter sole	109
Flathead sole	100
Sand sole	50
Rock sole	0
Total	9,330