

FISH COMMISSION OF OREGON
DATA REPORT SERIES

**CATCH AND EFFORT DATA BY
DEPTH INTERVAL FOR AREAS
FISHED BY OREGON SHRIMP
TRAWLERS, 1958-66**

**GARY S. MILBURN
AND
JACK G. ROBINSON**

REPORT NUMBER 2.

JUNE 1969

DATA REPORT SERIES

This series has been established for the purpose of distributing large amounts of tabular and graphic reference material. The information may consist of various forms of catch statistics, measurements of environmental conditions and biological data on various fishes. Prior to 1969, this type of information was included in the Investigational Reports of the Fish Commission.

These Data Reports are not regarded as scientific publications, but the information contained in them is considered as final and may be cited.

CATCH AND EFFORT DATA BY DEPTH INTERVAL
FOR AREAS FISHED BY OREGON
SHRIMP TRAWLERS, 1958-66

Gary S. Milburn

and

Jack G. Robinson

Data Report No. 2

Fish Commission of Oregon
Research Division
Clackamas, Oregon

Funds Supplied in Part by the
United States Department of Interior
Fish and Wildlife Service
Bureau of Commercial Fisheries
Commercial Fisheries Research and Development Act of 1964
Contract Numbers 14-17-0007-344 and -514

June 1969

TABLE OF CONTENTS

	<u>Page No.</u>
INTRODUCTION.....	1
SOURCES OF INFORMATION.....	1
METHODS.....	2
SHRIMP FISHING AREAS.....	2
ACKNOWLEDGMENTS.....	5

LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1	Area designations for shrimp catch and effort by Oregon-based vessels.....	3

LIST OF TABLES

<u>Table No.</u>		
1	Boundaries of shrimp fishing areas in Oregon.....	2
2	Summary of Oregon shrimp landings by year, month and depth for area 1 for 1960-64.....	6
3	Summary of Oregon shrimp landings by year, month and depth for area 2 for 1958-65.....	9
4	Summary of Oregon shrimp landings by year, month and depth for area 3 for 1959-66.....	14
5	Summary of Oregon shrimp landings by year, month and depth for area 4 for 1964-66.....	18
6	Summary of Oregon shrimp landings by year, month and depth for area 5a for 1959-66.....	19
7	Summary of Oregon shrimp landings by year, month and depth for area 5b for 1964.....	27
8	Summary of Oregon shrimp landings by year, month and depth for area 6 for 1962-66.....	28
9	Summary of Oregon shrimp landings by year, month and depth for area 7 for 1962-66.....	34
10	Summary of Oregon shrimp landings by year, month and depth for area 8 for 1959-66.....	37
11	Summary of Oregon shrimp landings by year, month and depth for area 9 for 1959-66.....	42

CATCH AND EFFORT DATA BY DEPTH INTERVAL FOR AREAS FISHED BY OREGON
SHRIMP TRAWLERS, 1958-66

INTRODUCTION

This report summarizes available commercial catch, effort and catch per unit of effort data for pink shrimp, Pandalus jordani Rathbun, fished by Oregon-based vessels during the period from 1958 to 1966. The data are tabulated by 10-fathom (18.3 meter) depth interval for area and month. These data have been included in other reports, notably the PMFC Data Series, but have not been tabulated before by depth of catch. This report may prove useful to researchers and fishermen by providing information on distribution of shrimp by depth of substrate, as reflected by pounds of shrimp landed per tow hour. However, these data are biased by the fact that most fishing effort is applied to areas where the best catches are made and thus may not always reflect the abundance of shrimp throughout the bed. Population density near the perimeter of the shrimp bed usually drops off, and this is reflected by a change in the pounds of shrimp caught per tow hour. The density of shrimp by depth range may vary from area to area. The amount of bottom area within each 10-fathom depth interval varies along the coast because of the difference in the slope of the continental shelf. For example, the width of the three intervals between 60 and 90 fathoms off Port Orford is 1 mile, while off Tillamook Head it is 3 miles. Both research and commercial fishing have shown that shrimp concentrations are usually found on a green mud or muddy sand bottom that is flat or has a gentle slope.

SOURCES OF INFORMATION

The Fish Commission has records obtained from shrimp boat logbooks since 1958 which provide data on date, time, duration, location, depth and catch by tow. Some of the logbook information is complete but records vary with

2.

individuals and between years. Prior to 1966, data were obtained on a voluntary basis. Since 1966 the Fish Commission has required that such records be kept.

METHODS

Information was compiled from logbook data for nine areas of catch (Figure 1) by month and by 10-fathom depth interval. Where possible, actual reported deliveries were used. Most data, however, are based on hails (estimates) only. Logs without depth, time or area fished were excluded. Unassignable landings were not prorated. Therefore, most catch and effort totals in this report will be less than totals reported for the same area in other published reports.

SHRIMP FISHING AREAS

Shrimp landed in Oregon were assigned to nine areas of catch (Figure 1). They include major areas of fishing and are usually separated by either natural boundaries--reefs or other bottom obstructions--or by geo-economic boundaries, such as location of nearest port or processor (Table 1).

Table 1. Boundaries of shrimp fishing areas in Oregon

Area	Boundaries	
	Northern	Southern
1	Cape Elizabeth	Astoria Canyon
2	Astoria Canyon	Cape Meares
3	Cape Meares	Cascade Head
4	Cascade Head	Cape Perpetua
5	Cape Perpetua	Cape Arago
6	Cape Arago	Cape Blanco
7	Cape Blanco	Rogue River Reef
8	Rogue River Reef	Point St. George
9	Point St. George	Cape Mendocino

Area 1 is off Washington and is bounded by Cape Elizabeth and Astoria Canyon. Most catches within this area come from between 60 and 70 fathoms off Grays Harbor. This area is not frequently fished by Oregon fishermen.

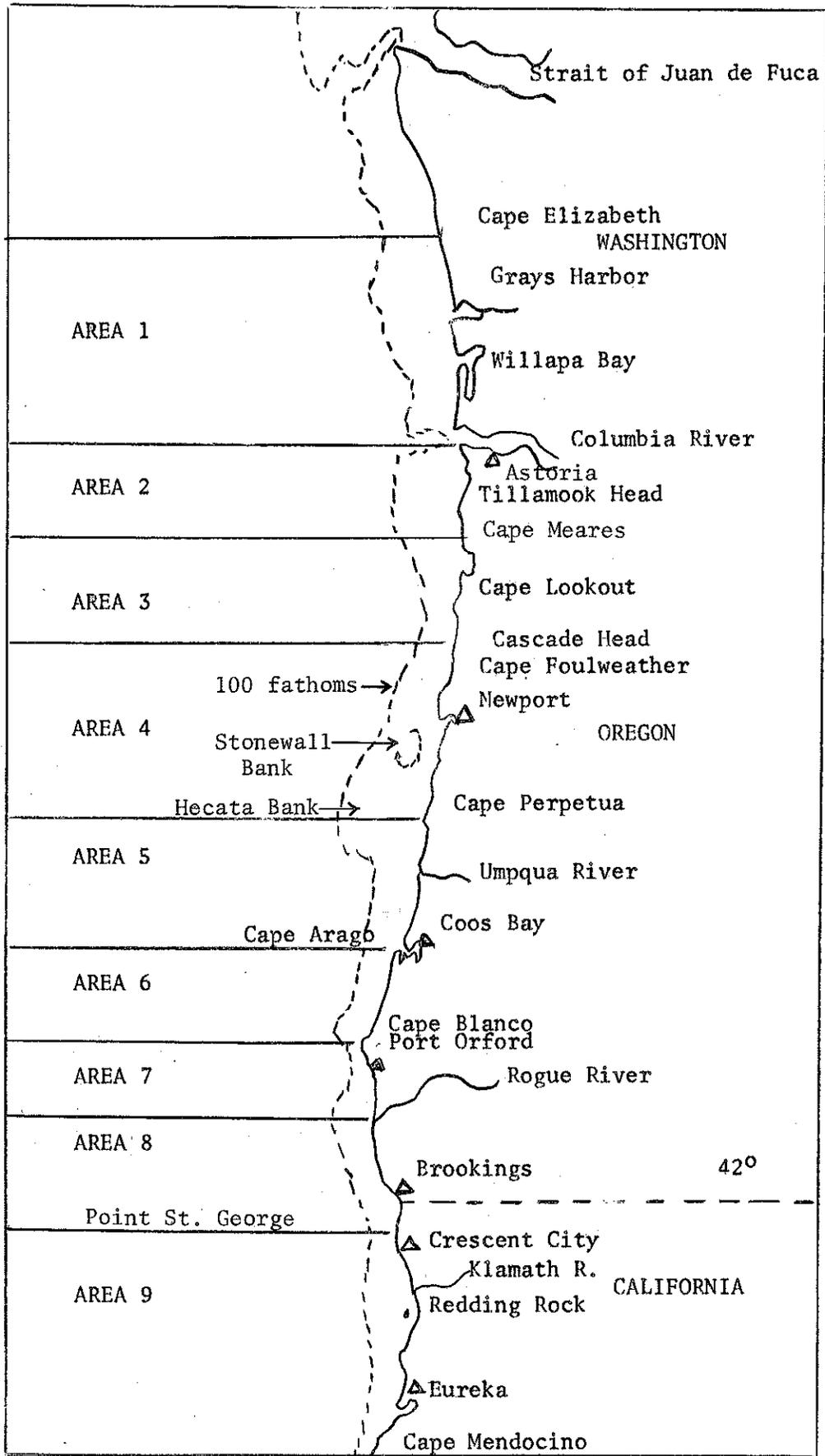


Figure 1. Area designations for shrimp catch and effort by Oregon-based vessels.

4.

Area 2 is bounded by the Astoria Canyon and Cape Meares and it includes a shrimp fishing area centered off Tillamook Head in 60-80 fathoms which has been fished by Astoria area fishermen since 1957.

Area 3 includes a fishing center off Cape Lookout in 70-90 fathoms. The area is bounded by Cape Meares and Cascade Head. This area has been subject to fishing by Astoria area fishermen since 1958.

Area 4 includes a shrimp population located between 80-100 fathoms off Cape Foulweather. Fishing by Newport-based trawlers has occurred here since 1964. Although the boundaries extend from Cascade Head to Cape Perpetua, no fishing has been done between Cape Perpetua and Yaquina Bay due to untrawlable bottom on Hecata and Stonewall banks.

Area 5, from Cape Perpetua to Cape Arago, includes a shrimp concentration located northwest of Coos Bay which has been of major importance in the Oregon fishery since 1962. Area 5 is divided into two parts. Area 5a includes the above mentioned area, where the major effort is expended between 80 and 100 fathoms, and an area off the Umpqua River in 50-60 fathoms. This area is not frequently fished. All data for 50-60 fathoms come from fishing off the Umpqua. Area 5b is on the southeastern bight of Hecata Bank and has yielded marginal catches at times.

Area 6, from Cape Arago to Cape Blanco, includes a shrimp bed centered off Coquille Point in 60-80 fathoms extending from Coquille Bank to Cape Arago. Coos Bay and, infrequently, Port Orford-based vessels have fished in Area 6 since 1962.

Area 7, between Cape Blanco and the Rogue River reef, includes a shrimp population off Port Orford that may be discreet. Port Orford vessels have fished in area 7 since 1964 as have Brookings-based vessels since 1962. Major depths fished are between 60 and 70 fathoms.

Area 8 extends from the Rogue River reef to Pt. St. George. The major fishing effort is in 60-75 fathoms from Mack Arch to Pt. St. George. It has been fished by Brookings-based vessels since 1959.

Area 9 is off northern California between Pt. St. George and Cape Mendocino. Most fishing in area 9 was done off the Klamath River and Redding Rock in 60-80 fathoms. Boats from Brookings have fished this area since 1959.

The continental shelf in areas 7 to 9 is steep and fishing usually confined to comparatively narrow depth intervals.

Tables 2 through 11 summarize data for the respective areas by 10-fathom depth interval, month and year.

ACKNOWLEDGMENTS

The tabulation and publication of this material was made possible through funds supplied by the Commercial Fisheries Research and Development Act of 1964 (PL 88-309) as Bureau of Commercial Fisheries Contracts 14-17-0007-344 and -514.

Special thanks are due to James M. Meehan for his many useful suggestions and technical assistance, to the many Fish Commission of Oregon personnel who collected data and certainly to the fishermen who painstakingly kept the logbook information on which this report is based.

Table 2. Summary of Oregon shrimp landings by year, month and depth for area 1 for 1960-64

Depth (fms)	Month			Total
	June	July	August	
1960 Summary				
40-49				
Pounds			100	100
Hours			1.8	1.8
Lb/hr			56	56
50-59				
Pounds			700	700
Hours			7.2	7.2
Lb/hr			97	97
60-69				
Pounds			1,500	1,500
Hours			9.5	9.5
Lb/hr			158	158
Total				
Pounds			2,300	2,300
Hours			18.5	18.5
Lb/hr			124	124
1961 Summary				
60-69				
Pounds	7,300	17,400	8,800	33,500
Hours	19.3	48.8	27.0	95.1
Lb/hr	378	357	326	352
70-79				
Pounds	20,400	22,300	12,500	55,200
Hours	49.3	51.3	40.1	140.7
Lb/hr	414	435	312	392
80-89				
Pounds		3,600		3,600
Hours		11.0		11.0
Lb/hr		327		327
Total				
Pounds	27,700	43,300	21,300	92,300
Hours	68.6	111.1	67.1	246.8
Lb/hr	404	390	317	374

Table 2. (Cont'd)

Depth (fms)	Month			Total
	June	July	August	
1962 Summary				
50-59				
Pounds		500		500
Hours		2.5		2.5
Lb/hr		200		200
60-69				
Pounds	15,225	12,800		28,025
Hours	50.1	32.6		82.7
Lb/hr	304	393		339
70-79				
Pounds	10,350	400		10,750
Hours	36.8	2.3		39.1
Lb/hr	281	174		275
Total				
Pounds	25,575	13,700		39,275
Hours	86.9	37.4		124.3
Lb/hr	294	366		316
1963 Summary				
50-59				
Pounds	6,250			6,250
Hours	14.3			14.3
Lb/hr	437			437
60-69				
Pounds	500			500
Hours	2.6			2.6
Lb/hr	192			192
70-79				
Pounds		600		600
Hours		3.5		3.5
Lb/hr		171		171
Total				
Pounds	6,750	600		7,350
Hours	16.9	3.5		20.4
Lb/hr	399	171		360

8.

Table 2. (Cont'd)

Depth (fms)	Month			Total
	June	July	August	
1964 Summary				
50-59				
Pounds		1,250		1,250
Hours		2.3		2.3
Lb/hr		543		543
60-69				
Pounds		1,850		1,850
Hours		4.8		4.8
Lb/hr		385		385
Total				
Pounds		3,100		3,100
Hours		7.1		7.1
Lb/hr		437		437

Hours 5.2 2.5 3.1 9.0 19.8
 Lb/hr 423 240 65 367 318

Table 3. (Cont'd)

Depth (fms)	Month												
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Total			
1962 Summary													
60-69					2,250	250							2,500
Pounds					9.0	3.3							12.3
Hours					250	76							203
Lb/hr													
70-79				8,415	15,104	950		3,800					28,269
Pounds				24.5	45.0	5.0		15.1					89.6
Hours				343	336	190		252					316
Lb/hr													
80-89					14,450	350							21,900
Pounds					39.3	2.7		7,100					58.2
Hours					368	130		438					376
Lb/hr													
Total													
Pounds				8,415	31,804	1,550		3,800					52,669
Hours				24.5	93.3	11.0		15.1					160.1
Lb/hr				343	341	141		252					329
1963 Summary													
50-59													
Pounds													500
Hours													4.2
Lb/hr													119
60-69													
Pounds													37,300
Hours													64.9
Lb/hr													575
70-79													
Pounds													8,700
Hours													19.2
Lb/hr													453

11.

Table 3. (Cont'd)

Depth (fms)	Month												Total
	Jan.	Feb.	March	April	May	June	July	August	Sept.				
80-89							7,000	30,100	2,500				39,600
Pounds							4.0	66.3	8.0				78.3
Hours							1,750	454	313				506
Lb/hr													
Total													
Pounds					4,340	3,100	68,150	30,900	48,500				154,990
Hours					12.5	11.5	74.1	72.5	92.1				262.7
Lb/hr					347	270	920	426	527				590
1964 Summary													
70-79							20,300	24,450					58,350
Pounds							42.5	43.9					105.2
Hours							478	557					555
Lb/hr													
80-89							900	8,500					33,700
Pounds							3.7	19.1					51.8
Hours							243	445					651
Lb/hr													
Total													
Pounds					37,750	32,950	21,200						92,050
Hours					46.8	63.0	46.2						157.0
Lb/hr					807	523	459						586
1965 Summary													
60-69													300
Pounds													1.0
Hours													300
Lb/hr													

Table 3. (Cont'd)

Depth (fms)	Month												Total	
	Jan.	Feb.	March	April	May	June	July	August	Sept.					
70-79														
Pounds					1,000									1,000
Hours					2.0									2.0
Lb/hr					500									500
80-89														
Pounds				600	1,100									1,700
Hours				4.3	4.5									8.8
Lb/hr				140	244									193
Total														
Pounds				600	2,400									3,000
Hours				4.3	7.5									11.8
Lb/hr				140	320									254

Table 4. Summary of Oregon shrimp landings by year, month and depth for area 3 for 1959-66.

Depth (fms)	Month							Total
	Feb.	April	May	June	July	August	Sept.	
1959 Summary								
80-89								
Pounds					2,800			2,800
Hours					8.6			8.6
Lb/hr					326			326
90-99								
Pounds		7,511						7,511
Hours		21.5						21.5
Lb/hr		349						349
Total								
Pounds		7,511			2,800			10,311
Hours		21.5			8.6			30.1
Lb/hr		349			326			343
1960 Summary								
70-79								
Pounds			0	500				500
Hours			2.0	2.2				4.2
Lb/hr			0	227				119
80-89								
Pounds		5,600	17,545		1,400	2,200		26,745
Hours		17.9	40.4		5.3	7.8		71.4
Lb/hr		313	434		264	282		375
90-99								
Pounds		8,500	30,395	500		11,300	3,200	53,895
Hours		22.3	70.3	2.8		31.3	7.3	134.0
Lb/hr		381	432	179		361	438	402
Total								
Pounds		14,100	47,940	1,000	1,400	13,500	3,200	81,140
Hours		40.2	112.7	5.0	5.3	39.1	7.3	209.6
Lb/hr		351	425	200	264	345	438	387

Table 4. (Cont'd)

Total	Depth (fms)	Month						Total
		Feb.	April	May	June	July	August	
1961 Summary								
2,800	70-79							
8.6	Pounds					0		0
326	Hours					2.0		2.0
	Lb/hr					0		0
7,511	80-89							
21.5	Pounds			500	2,500	1,800		1,200
349	Hours			3.0	9.8	6.5		3.1
	Lb/hr			167	255	277		387
0,311	90-99							
30.1	Pounds			1,500	7,500	8,625	500	1,900
343	Hours			2.0	18.3	37.6	2.7	5.6
	Lb/hr			750	410	229	185	339
	Total							
	Pounds			2,000	10,000	10,425	500	3,100
	Hours			5.0	28.1	46.1	2.7	8.7
	Lb/hr			400	356	226	185	356
500								
4.2								
119								
1962 Summary								
5,745	70-79							
71.4	Pounds						400	400
375	Hours						2.0	2.0
	Lb/hr						200	200
5,895	80-89							
34.0	Pounds			1,100			200	1,300
402	Hours			5.2			2.0	7.2
	Lb/hr			212			100	181
5,140	90-99							
09.6	Pounds	200		680	1,500		16,500	12,500
387	Hours	1.4		3.2	5.5		43.5	21.0
	Lb/hr	143		213	273		379	595
	Total							
	Pounds	200		1,780	1,500		17,100	12,500
	Hours	1.4		8.4	5.5		47.5	21.0
	Lb/hr	143		212	273		360	595

Table 4. (Cont'd)

Depth (fms)	Month							Total
	Feb.	April	May	June	July	August	Sept.	
1963 Summary								
60-69								
Pounds				0				0
Hours				3.0				3.0
Lb/hr				0				0
70-79								
Pounds						13,200	3,300	16,500
Hours						26.3	7.8	34.1
Lb/hr						502	423	484
80-89								
Pounds				33,300	28,500	52,860	29,500	144,160
Hours				80.9	72.7	117.7	76.2	347.5
Lb/hr				412	392	449	387	415
90-99								
Pounds		9,800	37,970	23,850	3,750	4,600		79,970
Hours		13.7	86.9	62.9	4.9	16.6		185.0
Lb/hr		715	437	379	765	277		432
Total								
Pounds		9,800	37,970	57,150	32,250	70,660	32,800	240,630
Hours		13.7	86.9	146.8	77.6	160.6	84.0	569.6
Lb/hr		715	437	389	416	440	390	422
1964 Summary								
70-79								
Pounds						750		750
Hours						3.3		3.3
Lb/hr						227		227
80-89								
Pounds		14,300	32,750	12,910	2,300			62,260
Hours		22.6	40.5	26.2	9.5			98.8
Lb/hr		633	809	493	242			630
90-99								
Pounds		28,450	57,450	9,450	550			95,900
Hours		41.1	71.5	17.3	2.1			132.0
Lb/hr		692	803	546	262			727
100-109								
Pounds						100		100
Hours						1.6		1.6
Lb/hr						63		63

Table 5. Summary of Oregon shrimp landings by year, month and depth for area 4 for 1964-66

Depth (fms)	Month				Total
	June	July	August	Sept.	
1964 Summary					
80-89					
Pounds	950	600			1,550
Hours	2.6	4.6			7.2
Lb/hr	365	130			215
120-129					
Pounds		100			100
Hours		1.3			1.3
Lb/hr		77			77
Total					
Pounds	950	700			1,650
Hours	2.6	5.9			8.5
Lb/hr	365	119			194
1966 Summary					
70-79					
Pounds	37,710	45,675	10,395	1,620	95,400
Hours	51.3	71.2	27.8	4.7	155.0
Lb/hr	735	642	374	345	615
80-89					
Pounds	133,383	84,105	92,522	59,895	369,905
Hours	165.5	117.1	190.7	185.1	658.4
Lb/hr	806	718	485	324	562
90-99					
Pounds	3,060	13,365	6,900	720	24,045
Hours	4.3	21.3	12.8	3.0	41.4
Lb/hr	712	627	539	240	581
100-109					
Pounds		3,690		90	3,780
Hours		6.8		1.5	8.3
Lb/hr		543		60	455
Total					
Pounds	174,153	146,835	109,817	62,325	493,130
Hours	221.1	216.4	231.3	194.3	863.1
Lb/hr	788	679	475	321	571

Table 6. (Cont'd)

Depth (fms)	Month											
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Total
90-99												
Pounds	13,728	13,076	3,348	1,790	31,942							
Hours	12.6	27.8	11.6	23.8	75.4							
Lb/hr	1,090	470	289	75	424							
100-109												
Pounds		6,655			6,655							
Hours		13.3			13.3							
Lb/hr		500			500							
Total												
Pounds	37,283	36,602	80,174	104,647	77,180	30,281	6,367	560	373,094			
Hours	40.0	43.7	138.2	245.6	202.4	82.8	25.7	6.0	784.4			
Lb/hr	932	838	580	426	381	366	248	93	476			
1962 Summary												
50-59												
Pounds		0	100		400							
Hours		2.7	3.0		4.0							
Lb/hr		0	33		100							
70-79												
Pounds		150	295		400							
Hours		2.8	3.1		2.7							
Lb/hr		54	95		148							
80-89												
Pounds	746	29,908	56,431	14,047	25,478	197,968						
Hours	6.5	75.0	129.1	38.1	99.2	556.3						
Lb/hr	115	399	437	369	257	356						
90-99												
Pounds	5,739	25,320	107,502	62,711	6,635	304,416						
Hours	11.6	76.7	239.4	164.3	31.5	846.4						
Lb/hr	495	330	449	382	211	360						

Table 6. (Cont'd)

Depth (fms)	Month												Total			
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.					
100-109																
Pounds	15,845	160	5,650	10,888			0									32,543
Hours	10.3	3.3	7.6	17.2			1.0									39.4
Lb/hr	1,538	48	743	633			0									826
110-119																
Pounds	12,450	0														12,450
Hours	16.7	1.5														18.2
Lb/hr	746	0														684
Total																
Pounds	33,862	58,740	235,991	242,205	72,724	42,041	88,394	128,588	139,025	56,793	3,500	1,101,863				
Hours	37.6	76.1	333.5	440.0	246.9	112.8	203.0	233.9	220.7	80.1	9.5	1,994.1				
Lb/hr	901	772	708	550	295	373	435	550	630	709	368	553				
<u>1964 Summary</u>																
50-59																
Pounds				0		63,828	31,858	47,335	1,460			144,481				
Hours				1.5		88.4	75.3	108.2	6.6			280.0				
Lb/hr				0		722	423	437	221			516				
60-69																
Pounds						17,320	16,240	20,216	500	11,400		65,676				
Hours						28.8	42.8	57.2	2.8	21.3		152.9				
Lb/hr						601	379	353	179	535		430				
70-79																
Pounds		9,350	13,579	0	300		77,097	28,161	54,705	72,262		255,454				
Hours		8.9	14.1	2.0	3.9		180.9	91.3	97.2	131.8		530.1				
Lb/hr		1,051	963	0	77		426	308	563	543		482				
80-89																
Pounds		115,931	118,269	139,910	6,022	41,665	110,211	139,163	209,308	78,574		959,053				
Hours		125.9	146.8	108.8	29.1	64.7	298.1	410.4	332.2	180.2		1,696.2				
Lb/hr		921	806	1,286	207	644	370	339	630	436		565				

Table 6. (Cont'd)

Depth (fms)	Month												Total				
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.						
90-99																	
Pounds	37,277	129,701	53,030	1,150	5,390	21,194	94,264	45,624	4,047	391,677							
Hours	34.3	150.9	53.2	7.0	17.5	63.4	245.3	83.7	21.8	677.1							
Lb/hr	1,087	860	997	164	308	334	384	545	186	578							
100-109																	
Pounds	6,300	74,629	8,210	4,960	5,900	99,999											
Hours	9.1	98.9	19.5	12.5	8.7	148.7											
Lb/hr	692	755	421	397	678	672											
110-119																	
Pounds	13,550	14,3	14,050														
Hours	14.3	948	16.3														
Lb/hr	948	862	16.3														
120-129																	
Pounds	1,000	1,000	1,000														
Hours	1.5	1.5	1.5														
Lb/hr	667	667	667														
Total																	
Pounds	168,858	350,728	201,150	7,472	128,203	262,060	335,039	311,597	166,283	1,931,390							
Hours	178.2	426.5	185.0	40.0	199.4	675.0	921.1	522.5	355.1	3,502.8							
Lb/hr	948	822	1,087	187	643	388	364	596	468	551							
50-59																	
Pounds	1,040	450	240	0	450	1,040											
Hours	4.5	2.0	1.5	1.0	2.0	4.5											
Lb/hr	231	225	160	0	225	231											
60-69																	
Pounds	690	690	690	690	690	690											
Hours	4.5	4.5	4.5	4.5	4.5	4.5											
Lb/hr	153	153	153	153	153	153											

1965 Summary



Table 7. Summary of Oregon shrimp landings by year, month and depth for area 5b for 1964

Depth (fms)	July	Total
1964 Summary		
70-79		
Pounds	18,700	18,700
Hours	47.8	47.8
Lb/hr	391	391
80-89		
Pounds	3,450	3,450
Hours	8.5	8.5
Lb/hr	406	406
90-99		
Pounds	100	100
Hours	0.3	0.3
Lb/hr	333	333
Total		
Pounds	22,250	22,250
Hours	56.6	56.6
Lb/hr	393	393

Table 8. (Cont'd)

Depth (fms)	Month											
	Feb.	March	April	May	June	July	August	Sept.	Oct.	Total		
120-129												
Pounds							6,312					6,312
Hours							12.7					12.7
Lb/hr							497					497
130-139												
Pounds							1,685					1,685
Hours							2.0					2.0
Lb/hr							843					843
Total												
Pounds			11,706	34,873	9,785	86,469	57,748	75,520	1,520			277,621
Hours			23.5	54.0	24.6	102.8	64.9	132.3	13.4			415.5
Lb/hr			498	646	398	841	890	571	113			668
1963 Summary												
50-59												
Pounds				80	2,608	743		4,850				8,281
Hours				0.6	2.3	1.5		11.6				16.0
Lb/hr				133	1,134	495		418				518
60-69												
Pounds				66,245	82,790	24,442		100				173,577
Hours				62.0	124.6	25.8		1.9				214.3
Lb/hr				1,068	664	947		53				810
70-79												
Pounds	9,680				5,240	35,585						50,505
Hours	5.2				11.9	44.1						61.2
Lb/hr	1,862				440	807						825
80-89												
Pounds	70,778	1,500		40	3,820	28,010						104,148
Hours	32.9	1.9		1.8	7.7	55.3						99.6
Lb/hr	2,151	789		22	496	507						1,046

9,680
5.2
1,862

70,778
32.9
2,151

Table 8. (Cont'd)

Depth (fms)	Month												Total					
	Feb.	March	April	May	June	July	August	Sept.	Oct.									
100-109																		
Pounds				1,800														1,800
Hours				3.1														3.1
Lb/hr				581														581
Total				363,690	496,974	120,156	99,443	245,711	2,910									1,582,011
Pounds	5,957	112,216	134,954	367.2	542.9	254.5	234.1	292.8	9.5									1,856.1
Hours	0.8	59.7	94.6	990	915	472	425	839	306									852
Lb/hr	7,446	1,880	1,427															
1965 Summary																		
50-59																		
Pounds		15,778	240	880			5,670											22,568
Hours		53.6	1.8	3.5			14.7											73.6
Lb/hr		294	133	251			386											307
60-69																		
Pounds		26,334	2,160	0	3,563	11,200		47,780	350									91,387
Hours		66.6	8.0	1.5	10.6	19.4		84.6	2.0									192.7
Lb/hr		395	270	0	336	577		565	175									474
70-79																		
Pounds		32,470	3,410	400	4,665	1,525	400	2,850	0									45,720
Hours		76.3	20.9	1.5	16.5	5.7	1.7	7.6	1.3									131.5
Lb/hr		426	163	267	283	268	235	375	0									348
80-89																		
Pounds			0	0	2,160	4,960	1,530											8,650
Hours			1.5	2.0	7.9	13.6	2.3											27.3
Lb/hr			0	0	273	365	665											317
90-99																		
Pounds					1,752	3,562	100											5,414
Hours					8.0	19.2	2.0											29.2
Lb/hr					219	186	50											185

Table 8. (Cont'd)

Depth (fms)	Month										Total	
	Feb.	March	April	May	June	July	August	Sept.	Oct.			
80-89												
Pounds		161		1,754	13,105		450		510			15,980
Hours		2.0		6.8	21.0		2.0		3.3			35.1
Lb/hr		81		258	624		225		155			455
90-99												
Pounds					7,777		14,621					22,398
Hours					21.0		27.3					48.3
Lb/hr					370		536					464
100-109												
Pounds				70	200		1,750					2,020
Hours				1.5	4.2		7.3					13.0
Lb/hr				47	48		240					155
Total												
Pounds		161	0	218,181	378,944	33,668	81,355	26,183	42,448			780,940
Hours		2.0	1.8	286.8	630.4	82.8	194.6	46.8	137.4			1,382.6
Lb/hr		81	0	761	601	407	418	559	309			565

Table 9. Summary of Oregon shrimp landings by year, month and depth for area 7 for 1962-66

Depth (fms)	Month							Total
	April	May	June	July	August	Sept.	Oct.	
1962 Summary								
60-69								
Pounds						10,900		10,900
Hours						16.0		16.0
Lb/hr						681		681
Total								
Pounds						10,900		10,900
Hours						16.0		16.0
Lb/hr						681		681
1963 Summary								
50-59								
Pounds				3,500				3,500
Hours				8.3				8.3
Lb/hr				422				422
60-69								
Pounds				100				100
Hours				1.5				1.5
Lb/hr				67				67
Total								
Pounds				3,600				3,600
Hours				9.8				9.8
Lb/hr				367				367
1964 Summary								
50-59								
Pounds	0		0	5,100	1,310	900	14,400	21,710
Hours	0.8		1.0	12.4	2.0	2.8	29.2	48.2
Lb/hr	0		0	411	655	321	493	450
60-69								
Pounds		17,300	14,300	176,550	5,815	66,650	18,150	298,765
Hours		13.3	18.9	219.9	16.5	73.4	33.8	375.8
Lb/hr		1,301	757	803	352	908	537	795
70-79								
Pounds	32,450	6,900	1,000	16,900	700	37,400	1,700	97,050
Hours	22.7	4.3	1.2	31.2	2.0	51.4	4.8	117.6
Lb/hr	1,430	1,605	833	542	350	728	354	825

Table 9. (Cont'd)

Depth (fms)	Month							Total
	April	May	June	July	August	Sept.	Oct.	
80-89								
Pounds	0							0
Hours	1.5							1.5
Lb/hr	0							0
Total								
Pounds	32,450	24,200	15,300	198,550	7,825	104,950	34,250	417,525
Hours	25.0	17.6	21.1	263.5	20.5	127.6	67.8	543.1
Lb/hr	1,298	1,375	725	754	382	822	505	769
1965 Summary								
40-49								
Pounds					100			100
Hours					1.5			1.5
Lb/hr					67			67
50-59								
Pounds					16,600	3,050		19,650
Hours					51.8	9.1		60.9
Lb/hr					320	335		323
60-69								
Pounds	50	2,000	8,650	41,600	64,900	21,600	1,000	139,800
Hours	3.8	3.5	17.7	71.9	142.1	34.1	4.3	277.4
Lb/hr	13	571	489	579	457	633	233	504
70-79								
Pounds		2,300	900	400	1,750			5,350
Hours		5.1	2.2	1.2	5.0			13.5
Lb/hr		451	409	333	350			396
Total								
Pounds	50	4,300	9,550	42,000	83,350	24,650	1,000	164,900
Hours	3.8	8.6	19.9	73.1	200.4	43.2	4.3	353.3
Lb/hr	13	500	480	575	416	571	233	467
1966 Summary								
50-59								
Pounds			81,750	11,900	29,930		500	124,080
Hours			87.0	22.1	44.5		1.5	155.1
Lb/hr			940	538	673		333	800

Table 9. (Cont'd)

Depth (fms)	Month							Total
	April	May	June	July	August	Sept.	Oct.	
60-69								
Pounds		20,200	80,125	56,100	19,230	37,700	1,600	214,955
Hours		25.4	83.8	78.5	36.2	45.6	9.8	279.3
Lb/hr		795	956	715	531	827	163	770
70-79								
Pounds			0	30,200	7,150		3,150	40,500
Hours			1.0	45.7	12.4		10.1	69.2
Lb/hr			0	661	577		312	585
Total								
Pounds		20,200	161,875	98,200	56,310	37,700	5,250	379,535
Hours		25.4	171.8	146.3	93.1	45.6	21.4	503.6
Lb/hr		795	942	671	605	827	245	754

Table 10. Summary of Oregon shrimp landings by year, month and depth for area 8 for 1959-66

Depth (fms)	Month											Total
	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.		
1959 Summary												
50-59						2,700	6,698	700				10,098
Pounds						9.0	17.5	1.8				28.3
Hours						300	383	389				357
Lb/hr												
60-69					500	14,440	50,733	12,800				78,583
Pounds					5.5	34.1	123.5	21.2				184.3
Hours					91	423	411	604				426
Lb/hr												
70-79						2,000	300					2,300
Pounds						5.7	1.0					6.7
Hours						351	300					343
Lb/hr												
Total					500	19,250	57,731	13,500				90,981
Pounds					5.5	48.8	142.0	23.0				219.3
Hours					91	394	407	587				415
Lb/hr												
1960 Summary												
40-49						4,000						5,950
Pounds						22.6						27.7
Hours						177						215
Lb/hr												
50-59					3,595	23,465	52,480	5,085				104,133
Pounds					14.4	76.0	115.7	16.5				295.4
Hours					225	309	454	308				353
Lb/hr												
60-69					1,245	9,675	1,390	25,250				81,890
Pounds					4.4	31.4	6.2	61.5				178.8
Hours					10	308	224	411				458
Lb/hr												

Table 10. (Cont'd)

Depth (fms)	Month											
	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Total	
Total												
Pounds					2,350	22,825	193,427	77,450	94,050			390,102
Hours					20.2	70.5	643.7	297.0	230.8			1,262.2
Lb/hr					116	324	300	261	407			309
	1966 Summary											
50-59												
Pounds						350	300					650
Hours						2.5	2.5					5.0
Lb/hr						140	120					130
60-69												
Pounds					22,550	41,500	26,500	16,350	5,530			112,430
Hours					80.2	71.6	90.3	74.0	15.5			331.6
Lb/hr					281	580	293	221	357			339
70-79												
Pounds						6,550	500					7,050
Hours						12.3	3.0					15.3
Lb/hr						533	167					461
Total												
Pounds					22,550	48,400	27,300	16,350	5,530			120,130
Hours					80.2	86.4	95.8	74.0	15.5			351.9
Lb/hr					281	560	285	221	357			341

Table 11. Summary of Oregon shrimp landings by year, month and depth for area 9 for 1959-66

Depth (fms)	Month										Total
	Feb.	Mar.	April	May	June	July	August	Sept.	Oct.		
1959 Summary											
60-69											
Pounds				850	2,275	1,600	22,540				27,265
Hours				1.0	1.4	4.0	37.0				43.4
Lb/hr				850	1,625	400	609				628
70-79											
Pounds					4,780	10,600					15,380
Hours					3.5	18.8					22.3
Lb/hr					1,366	564					690
80-89											
Pounds					2,220						2,220
Hours					2.7						2.7
Lb/hr					822						822
Total											
Pounds				850	9,275	12,200	22,540				44,865
Hours				1.0	7.6	22.8	37.0				68.4
Lb/hr				850	1,220	535	609				656
1960 Summary											
40-49											
Pounds						13,100					13,100
Hours						16.4					16.4
Lb/hr						799					799
50-59											
Pounds			700	12,275		13,650	31,620	2,200			60,445
Hours			1.3	15.7		18.5	29.4	2.8			67.7
Lb/hr			538	782		738	1,076	786			893
60-69											
Pounds		50	2,700								2,750
Hours		2.0	5.9								7.9
Lb/hr		25	458								348
70-79											
Pounds								250			250
Hours								2.6			2.6
Lb/hr								96			96
Total											
Pounds		50	3,400	12,275		26,750	31,620	2,450			76,545
Hours		2.0	7.2	15.7		34.9	29.4	5.4			94.6
Lb/hr		25	472	782		766	1,076	454			809

Table 11. (Cont'd)

Depth (fms)	Month									Total
	Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	
1961 Summary										
40-49										
Pounds						0	420	1,330	15,120	16,870
Hours						1.0	1.8	4.0	16.8	23.6
Lb/hr						0	233	333	900	715
50-59										
Pounds					6,330	50,046	68,100	18,490	6,720	149,686
Hours					17.8	78.7	85.1	32.4	10.5	224.5
Lb/hr					356	636	800	571	640	667
60-69										
Pounds					29,200	33,840	47,445	6,580	2,380	119,445
Hours					53.8	59.9	50.9	9.7	3.8	178.1
Lb/hr					543	565	932	678	626	671
70-79										
Pounds							32,840	1,840		34,680
Hours							27.6	5.0		32.6
Lb/hr							1,190	368		1,064
Total										
Pounds					35,530	83,886	148,805	28,240	24,220	320,681
Hours					71.6	139.6	165.4	51.1	31.1	458.8
Lb/hr					396	601	900	553	779	699
1962 Summary										
40-49										
Pounds			10,830	5,200	0			400	600	17,030
Hours			16.6	3.0	1.2			1.5	1.5	23.8
Lb/hr			652	1,733	0			267	400	716
50-59										
Pounds			29,250	16,250		2,800	100	39,655	32,645	120,700
Hours			40.0	38.6		4.5	1.4	67.3	38.6	190.4
Lb/hr			731	421		622	71	589	846	634
60-69										
Pounds			21,300	44,790	900		11,380	9,800		88,170
Hours			39.5	63.2	4.0		25.7	4.5		136.9
Lb/hr			539	709	225		443	218		644
70-79										
Pounds	800		115	87,698	35,105	14,040	87,820	59,037	28,000	312,615
Hours	4.0		1.0	139.5	55.7	33.1	134.5	88.1	23.9	479.8
Lb/hr	200		115	629	630	424	653	670	1,172	652

Depth (fms)	Month									Total
	Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	
80-89										
Pounds		150	9,000	91,482	28,535	5,150	50,010	6,210	300	190,837
Hours		1.2	11.8	110.3	48.1	14.0	88.9	17.4	0.5	292.2
Lb/hr		125	763	829	593	368	563	357	600	653
90-99										
Pounds					2,400	1,200	7,020			10,620
Hours					5.6	8.7	10.9			25.2
Lb/hr					429	138	644			421
100-109										
Pounds					6,200					6,200
Hours					11.1					11.1
Lb/hr					559					559
110-119										
Pounds					400					400
Hours					1.0					1.0
Lb/hr					400					400
Total										
Pounds	800	150	70,495	245,420	73,540	23,190	156,330	115,102	61,545	746,572
Hours	4.0	1.2	108.9	354.6	126.7	60.3	261.4	178.8	64.5	1,160.4
Lb/hr	200	125	647	692	580	385	598	644	954	643

1963 Summary

50-59										
Pounds			2,700		3,800		0			6,500
Hours			6.0		12.0		1.0			19.0
Lb/hr			450		317		0			342
60-69										
Pounds			53,200	12,655	8,480	24,600	21,100		100	120,135
Hours			82.6	16.8	21.0	52.7	53.0		0.9	227.0
Lb/hr			644	753	404	467	398		111	529
70-79										
Pounds			4,500	30,320	29,405	41,539	75,965	36,800	27,175	245,804
Hours			8.3	60.8	56.7	96.4	165.0	60.0	59.5	506.7
Lb/hr			542	499	519	431	460	613	457	485
80-89										
Pounds					2,125	4,510	21,545	3,270	3,105	34,555
Hours					6.3	18.9	44.2	7.0	10.5	86.9
Lb/hr					337	239	487	467	296	398
90-99										
Pounds									50	50
Hours									2.0	2.0
Lb/hr									25	25
Total										
Pounds			60,400	42,975	43,810	70,649	118,610	40,170	30,430	407,044
Hours			96.9	77.6	96.0	168.0	263.2	67.0	72.9	841.6
Lb/hr			623	554	456	421	451	600	417	484

Table 11. (Cont'd)

Depth (fms)	Month						Total
	May	June	July	August	Sept.	Oct.	
1964 Summary							
60-69							
Pounds				100	3,100	18,400	21,600
Hours				4.3	6.3	30.4	41.0
Lb/hr				23	492	605	527
70-79							
Pounds	22,840	42,400	27,650	75,650	25,350	20,100	213,990
Hours	47.3	82.8	60.2	121.3	47.5	45.6	404.7
Lb/hr	483	512	459	624	534	441	529
80-89							
Pounds	4,050	2,800	300				7,150
Hours	9.3	10.0	2.0				21.3
Lb/hr	435	280	150				336
Total							
Pounds	26,890	45,200	27,950	75,750	28,450	38,500	242,740
Hours	56.6	92.8	62.2	125.6	53.8	76.0	467.0
Lb/hr	475	487	449	603	529	507	520
1965 Summary							
60-69							
Pounds						200	200
Hours						2.0	2.0
Lb/hr						100	100
70-79							
Pounds			3,000			26,900	29,900
Hours			8.5			35.9	44.4
Lb/hr			353			749	673
Total							
Pounds			3,000			27,100	30,100
Hours			8.5			37.9	46.4
Lb/hr			353			715	649

Table 11. (Cont'd)

Depth (Fms)	Month			Total
	May	June	July	
1966 Summary				
60-69				
Pounds		2,700	9,200	11,900
Hours		6.5	15.8	22.3
Lb/hr		415	582	534
70-79				
Pounds		19,500	9,000	28,500
Hours		45.3	26.2	71.5
Lb/hr		430	344	399
80-89				
Pounds	3,850		500	4,350
Hours	7.5		2.0	9.5
Lb/hr	513		250	458
Total				
Pounds	3,850	22,200	18,700	44,750
Hours	7.5	51.8	44.0	103.3
Lb/hr	513	429	425	433