



1981 OREGON SHRIMP FISHERY

by

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INTRODUCTION

The ocean pink shrimp (*Pandalus jordani*) fishery is monitored by the Oregon Department of Fish and Wildlife through the use of logbooks, fish-tickets and market samples. From these sources, catch and effort statistics are developed as well as estimates of age composition and count per pound (grade) for pink shrimp. Incidental groundfish catch is monitored as well, however, no estimates of rockfish species composition are available. Efforts will be made in 1982 to estimate species composition of the shrimp trawl incidental catch of rockfish.

The data provided in synopsis form in this report support Department research and management needs. The details of the Groundfish and Shrimp Management program including research activities will be available in forthcoming annual reports.

1981 Oregon Shrimp Season

Catch and Effort

Oregon pink shrimp (*Pandalus jordani*) landings in 1981 totaled 25.9 million pounds (11,756 mt), 14% less than the 30.2 million pounds (13,420 mt) landed in 1980 (Saelens, Hunt, and Golden 1981) (Figure 1). Newport and Garibaldi were the only ports to show an increase in production over 1980 with landings of 7.0 and 1.3 million pounds respectively (Table 1).

Table 1. Annual shrimp landings at Oregon ports 1978-81 in thousands of pounds^{1/}.

Port	1978	1979	1980	1981
Astoria	7,414	7,647	9,225 ^{3/}	8,061
Garibaldi	3,166	1,473	1,116	1,312
Newport	20,595	7,124	6,311	7,000
Winchester Bay	1,084	821	690	348
Coos Bay	17,476	9,131	10,466	8,126
Port Orford	529	22	64	4
Gold Beach	-	42	-	2
Brookings	6,724	3,327	2,280	1,065
Total	56,997 ^{2/}	29,587	30,152	25,918

^{1/} Figures represent only the shrimp poundage landed at each port, not the poundage that was processed. (Some was transshipped to other ports).

^{2/} Record annual landing

^{3/} Includes 207.9 thousand pounds caught off southeast Alaska

A total of 249 vessels landed shrimp in Oregon in 1981, a decrease of 35 vessels from the 1980 total of 284 vessels (Table 2, Figure 2). The number of out-of-state vessels decreased from 62 in 1980 to 43 in 1981. Coos Bay again accommodated the largest portion of the fleet; 125 vessels, or 50% of the total fleet.

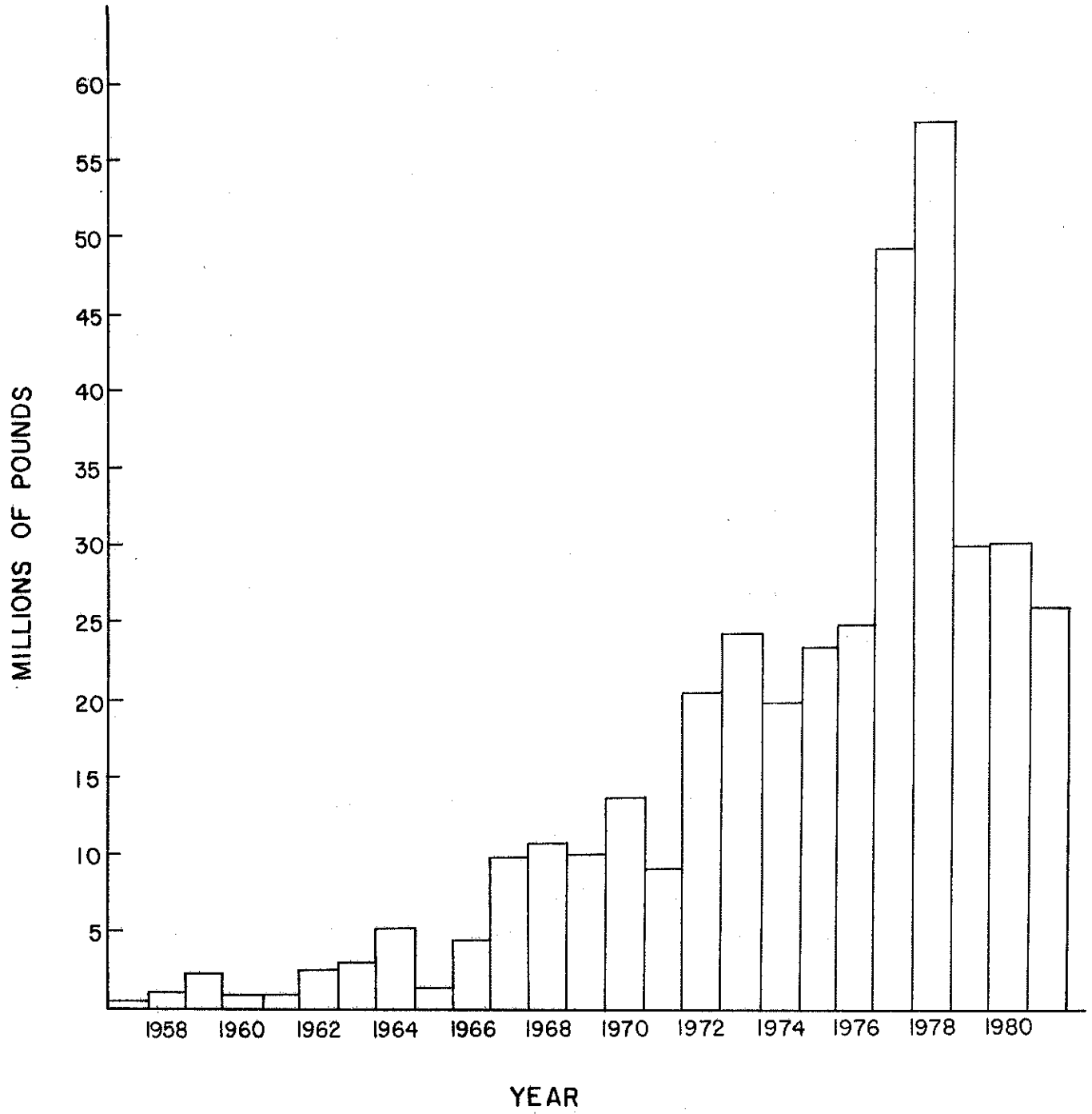


FIGURE I. Annual Oregon shrimp landings.

Table 2. Number of Vessels Delivering Shrimp by Port, 1980-81.

Port	Home Port		Oregon Transient ^{1/}		Out-of-State		Total	
	1980	1981	1980	1981	1980	1981	1980	1981
Astoria	45	33	39	30	8	13	92	76
Garibaldi	19	12	4	8	-	1	23	21
Newport	59	56	9	8	6	4	74	68
Winchester Bay	7	6	13	6	2	-	22	12
Coos Bay	69	68	36	32	28	25	133	125
Bandon	1	-	-	1	-	-	1	1
Port Orford	-	-	3	1	4	-	7	1
Gold Beach	-	-	-	1	-	-	-	1
Brookings	22	19	13	4	19	12	54	35
Total Oregon	222	206						
Out-of-State								
California	45	30						
Washington	17	13						
Total Vessels ^{2/} delivering to Oregon ports	284	249						

^{1/} Oregon vessels which delivered to ports other than their home ports.

^{2/} Oregon double-rig count is 138 for 1981.

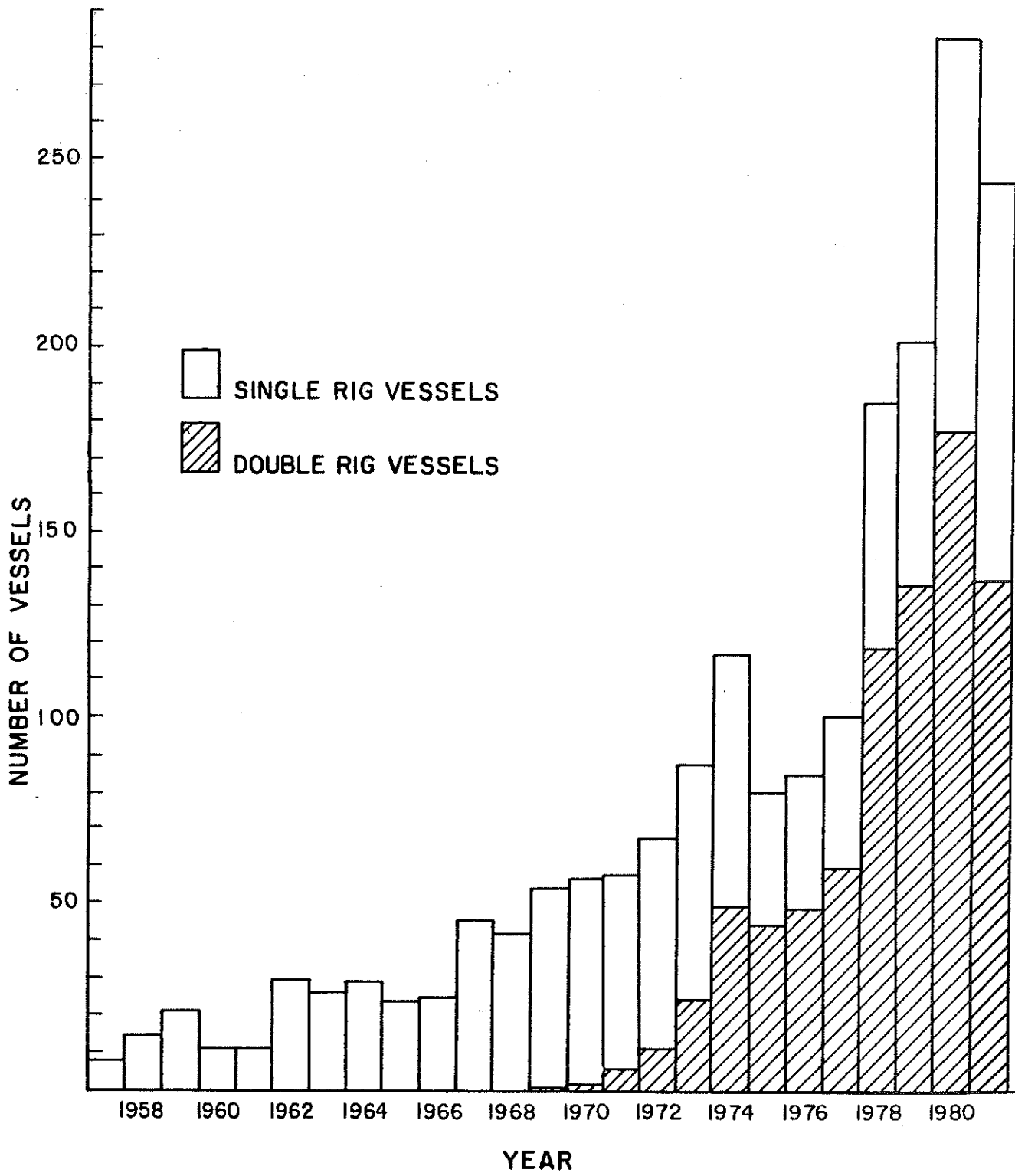


FIGURE 2. Annual number of shrimp vessels.

Catch, effort and catch per unit effort (CPUE) were highest during the first two months of the season. Over half of Oregon's annual landings or 13.3 million pounds were caught during April and May (Table 3). Effort peaked in May at 33,220 hours (single rig equivalents [SRE]) declining slowly through the remainder of the season (Table 4). Most of the effort was expended in area 22 (Mudhole) where 37,527 hours (SRE) yielded 6.5 million pounds, also the highest catch among all areas (Table 5).

Other important state statistical areas were area 21 (Cape Blanco bed), 26 (Cascade Head to Cape Falcon) off Oregon and area 32 (Destruction Island) off Washington which produced 5.3, 4.4 and 4.8 million pounds for 24,764, 27,527 and 20,476 hrs (SRE) of effort respectively (Figure 3 and Table 5).

Catch per unit effort was highest in April at 257 lbs/hr (SRE) declining to 144 lbs/hr (SRE) by June. Catch per unit effort remained somewhat stable from July through September, increasing slightly in October. The best annual CPUE's did not necessarily occur in areas of high production. Areas 18 and 19 had the highest annual CPUE at 248 and 243 lbs/hr (SRE) respectively (Table 5) but had fairly low production compared to other areas with lower CPUE.

Market Conditions

The number of processors in 1981 decreased by four for a total of 21. The number of peeler machines in use dropped from 87 in 1980 to 68 in 1981. The season opened with an ex-vessel price for shrimp at 52 cents per pound with a few deliveries purchased at 58 cents per pound. Buyers continued to pay 52 cents per pound through mid-July when the ex-vessel price dropped to 42 cents. However, few, if any, deliveries were made at that price. Fishermen received 43-52 cents per pound through September, and were only receiving 43-45 cents in October. The seasonal average ex-vessel price paid for

Table 3. Oregon 1981 Shrimp Catch in Thousands of Pounds and Cate-Per-Effort by Statistical Area for Single and Double-Rigged Vessels.

State Area	April	May	June	July	August	Sept.	Oct.	Total
32C	439.7	981.4	716.7	1,117.2	663.3	452.8	478.3	4,849.5
C/E ₁ ^{1/}	643.2	193.1	173.7	128.9	0	135.2	0	196.3
C/E ₂ ^{2/}	571.1	482.7	392.7	360.0	279.7	347.8	361.1	380.2
30C	98.5	580.6	326.7	378.2	412.8	357.6	91.3	2,245.7
C/E ₁	0	223.7	343.4	110.8	0	111.3	0	240.1
C/E ₂	293.1	369.6	257.2	243.4	248.9	259.3	193.8	272.3
29C	0	28.6	0	9.7	9.7	19.4	3.4	70.8
C/E ₁	0	0	0	0	0	0	0	0
C/E ₂	0	190.5	0	243.8	123.2	169.6	182.8	174.7
28C	20.8	136.9	90.4	30.4	48.4	77.8	75.7	480.4
C/E ₁	0	122.7	125.6	0	0	0	0	121.6
C/E ₂	244.6	228.8	222.8	113.8	228.3	208.2	507.0	229.8
26C	681.6	1,467.6	914.4	453.0	347.1	327.8	159.3	4,350.9
C/E ₁	167.2	120.1	88.0	0	0	0	0	129.7
C/E ₂	349.7	327.5	191.6	223.6	200.5	221.2	229.9	253.5
24C	142.5	191.6	19.0	282.5	240.7	100.3	238.3	1,215.0
C/E ₁	98.3	9.3	20.4	122.7	0	0	0	95.8
C/E ₂	216.7	250.8	108.2	293.3	211.8	190.7	327.8	245.6
22C	2,764.7	1,611.9	550.7	156.1	924.6	354.3	175.7	6,538.0
C/E ₁	225.9	141.5	89.1	102.9	173.5	118.8	43.3	161.7
C/E ₂	406.0	228.9	175.9	166.1	309.9	238.2	244.6	282.6
21C	2,732.8	873.0	425.1	94.8	352.8	362.3	496.2	5,336.8
C/E ₁	284.0	186.9	208.1	115.1	201.5	201.8	211.9	228.7
C/E ₂	463.0	262.0	235.5	261.5	308.0	239.8	257.0	338.1
20C	1.2	0	0.1	0	1.2	1.7	0	4.2
C/E ₁	0	0	0	0	0	0	0	0
C/E ₂	143.3	0	32.9	0	134.7	141.4	0	82.1
19C	41.5	303.1	88.5	44.5	85.8	12.3	14.6	590.4
C/E ₁	219.0	253.8	253.9	115.4	112.0	226.5	0	224.2
C/E ₂	234.1	422.0	362.3	410.9	477.3	377.2	337.8	400.4
18C	178.0	24.3	0	0	4.5	21.4	8.6	236.8
C/E ₁	240.2	93.1	0	0	0	225.6	0	218.6
C/E ₂	440.6	323.7	0	0	503.8	396.2	368.8	414.7
Total C	7,101.4	6,199.0	3,131.6	2,566.4	3,090.9	2,087.7	1,741.4	25,918.5
C/E ₁	251.4	167.8	141.4	113.2	178.3	177.6	207.3	193.4
C/E ₂	413.1	302.9	230.7	275.2	266.0	253.2	287.7	297.1

^{1/} C/E₁ Average catch in pounds per hour effort for single-rig vessels.

^{2/} C/E₂ Average catch in pounds per hour effort for double-rig vessels.

Table 4. Total catch (in thousands of pounds), hours of effort expended, and CPUE in the 1981 shrimp fishery by month.

	Month							Total
	April	May	June	July	August	September	October	
Single Rig								
Catch	1,204.8	697.4	264.7	71.0	183.8	186.5	115.1	2,723.2
Effort	4,792.0	4,155.7	1,871.7	627.1	1,030.7	1,049.8	554.9	14,081.9
CPUE	251.4	167.8	141.4	113.2	178.3	177.6	207.3	193.4
Double Rig								
Catch	5,896.7	5,501.5	2,866.9	2,495.4	2,907.1	1,901.2	1,626.4	23,195.3
Effort	14,275.8	18,165.3	12,425.9	9,066.9	10,927.8	7,508.3	5,654.2	78,024.2
CPUE	413.1	302.9	230.7	275.2	266.0	253.2	287.7	297.3
Total								
Catch	7,101.4	6,199.0	3,131.6	2,566.4	3,090.9	2,087.7	1,741.5	25,918.5
Effort (SRE)	27,633.3	33,220.2	21,753.1	15,134.1	18,515.2	13,063.1	9,601.6	138,920.6
CPUE (SRE)	257.0	186.6	144.0	169.6	166.9	159.8	181.4	186.6

(SRE) = Single Rig Equivalent

Table 5. Total catch (in thousands of pounds), hours of effort expended, and CPUE in the 1981 shrimp fishery by state statistical area.

	State Areas North of Cape Perpetua					Total
	32	30	29	28	26	
Single Rig						
Catch	76.0	20.8	-	20.7	45.9	179.2
Effort	387.4	86.7	4.0	170.2	354.1	1,167.7
CPUE	196.3	240.1	-	121.6	129.7	153.5
Double Rig						
Catch	4,773.4	2,224.9	70.8	459.7	4,305.0	13,033.0
Effort	12,555.6	8,171.2	405.2	2,000.4	16,983.1	44,997.6
CPUE	380.2	272.3	174.7	229.8	253.5	289.6
Total						
Catch	4,849.4	2,245.7	70.8	480.4	4,350.9	13,212.2
Effort (SRE)	20,476.4	13,160.6	652.3	3,370.8	27,527.1	73,163.9
CPUE (SRE)	236.8	170.6	108.5	142.5	158.0	180.6

	State Areas South of Cape Perpetua					Total
	22	21	20	19	18	
Single Rig						
Catch	974.4	1,362.1	-	149.4	58.0	2,543.9
Effort	6,026.2	5,956.0	-	666.4	265.6	12,914.2
CPUE	161.7	228.7	-	224.2	218.6	197.0
Double Rig						
Catch	5,563.6	3,974.7	4.2	441.0	178.7	10,162.2
Effort	19,688.1	11,755.3	50.8	1,101.5	430.9	33,026.6
CPUE	282.6	338.1	82.1	400.4	414.7	307.7
Total						
Catch	6,538.0	5,336.8	4.2	590.4	236.7	12,706.1
Effort (SRE)	37,527.2	24,764.5	81.3	2,428.8	955.0	65,756.8
CPUE (SRE)	174.2	215.5	51.7	243.1	247.9	193.2

(SRE) = Single Rig Equivalent

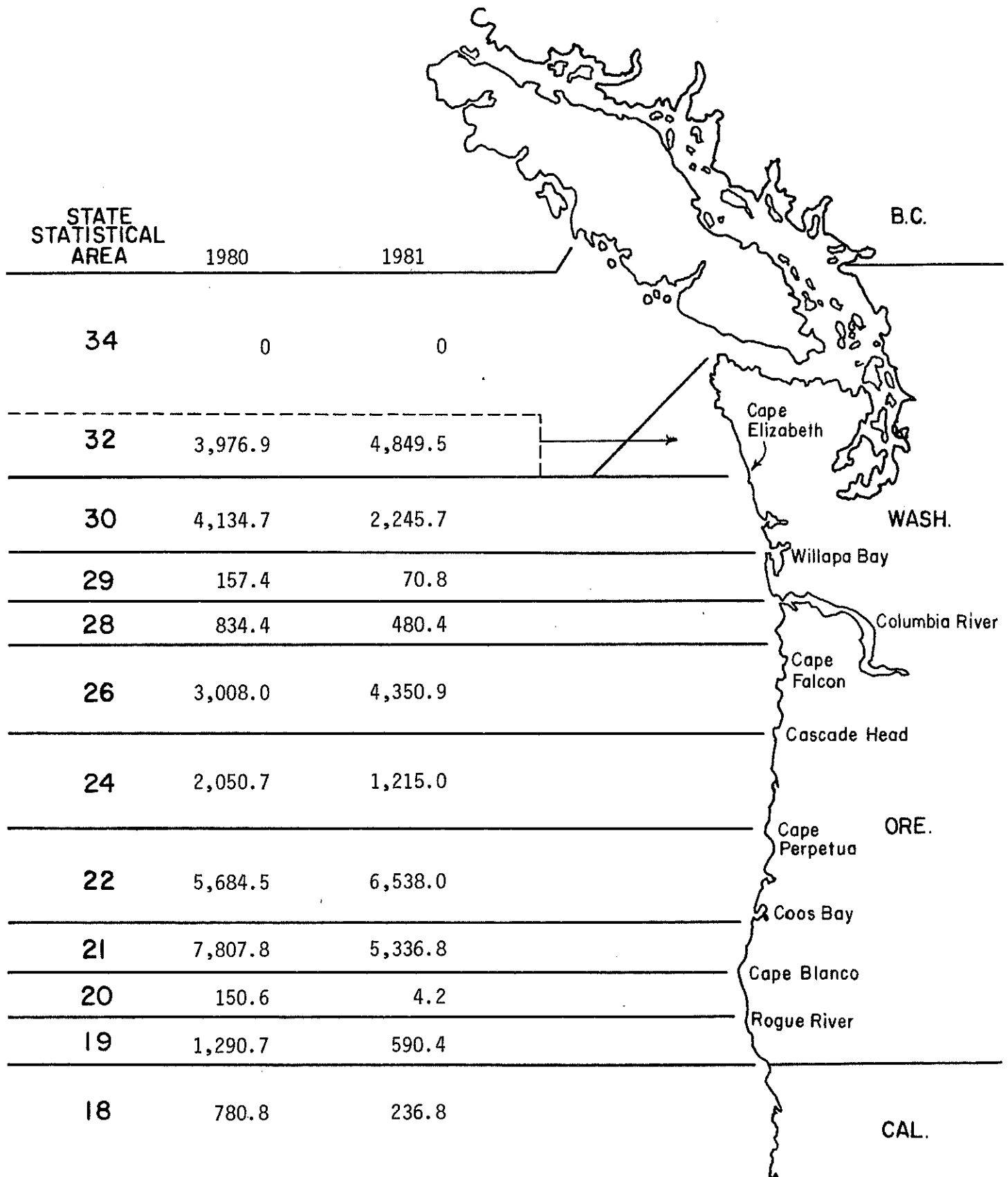


FIGURE 3. Oregon 1980 and 1981 shrimp landings, in thousands of pounds, by state statistical area of catch.

shrimp was 45 cents per pound, down from an average of 55 cents in 1980. Lower prices were partially responsible for the decline of effort or effort shift into other fisheries by mid summer.

Market Samples

The largest shrimp were found in State Area 24 (Cape Perpetua to Cascade Head) during August and October, at 68 shrimp per pound (Table 6). The smallest shrimp were found in State Area 32 (Destruction Island) during May at 166 shrimp per pound.

Zero-age shrimp were found during August in State Area 22 (Mudhole), and during October in State Areas 22, 21 (Cape Blanco to Cape Arago), and 19 (Ore-Calif. border to Rogue River). Over 80% of these shrimp were caught after October 15th during the newly extended season. Total landings in Oregon, by number of shrimp, were comprised of 0.1% zero-age shrimp, 55.8% age I, 39.2% age II, and 4.9% age III+.

Incidental Groundfish Catch

Incidentally caught groundfish totaled 2.2 million pounds (1000 mt) in 1981, down 23% from the 2.9 million pounds (1306 mt) landed in 1980. Rockfish was the major component of the incidental catch at 1.7 million pounds (785 mt), followed by Dover sole and lingcod at 151 (68 mt) and 107 (48 mt) thousand pounds respectively (Table 7). State areas 32, 22 and 30 were the top three producers of incidental catch at 720 (326 mt), 453 (206 mt) and 316 (143 mt) thousand pounds respectively.

PACIFIC COAST

Catch and Effort

Pacific coast landings of pink shrimp reached 68.9 million pounds (31,274 mt) in 1981, a 32% decrease from the 101 million pounds (45,900 mt)

Table 6. Oregon 1981 Monthly Shrimp Age Composition (by number), Count per Pound, and Number Sampled by State Statistical Area^{1/}.

State Area	Age	April	May	June	July	August	Sept.	Oct.
32	1	17.0	41.2	50.8	29.2	49.2	50.9	51.6
	2	77.2	49.2	46.5	69.9	50.8	43.1	45.7
	3+	5.8	9.6	2.7	0.9	0	6.0	2.7
	Ct	155.9	166.5	164.2	133.1	140.7	136.4	111.4
	N	676	376	299	113	457	318	512
30	1	44.9	45.7	46.5	54.2	72.0	56.7	53.6
	2	50.5	49.0	44.3	43.5	26.3	38.9	42.2
	3+	4.5	5.3	9.2	2.3	1.7	4.4	4.2
	Ct	140.4	138.9	126.1	123.9	125.6	107.4	100.3
	N	198	394	402	260	350	90	237
28	1	27.9	41.3	41.8	-	-	50.0	43.3
	2	65.2	53.9	48.0	-	-	43.6	55.8
	3+	6.9	4.8	10.2	-	-	6.4	0.9
	Ct	108.6	114.0	101.6	-	-	82.6	83.8
	N	362	414	402	-	-	110	231
26	1	36.6	40.4	43.4	68.7	80.5	47.2	58.3
	2	56.1	54.8	51.8	30.8	19.5	43.5	40.8
	3+	7.3	4.7	4.8	0.5	0	9.3	0.9
	Ct	109.4	98.4	95.2	118.0	104.5	75.4	83.6
	N	781	846	251	211	200	108	659
24	1	18.3	-	-	-	21.4	-	32.2
	2	68.3	-	-	-	67.6	-	62.4
	3+	13.4	-	-	-	11.0	-	5.4
	Ct	86.1	-	-	-	67.6	-	68.0
	N	202	-	-	-	299	-	447
22	1	54.5	64.4	27.0	74.1	67.7 ^{2/}	56.4	61.8 ^{3/}
	2	39.4	27.4	58.7	23.1	28.1	37.0	31.0
	3+	6.1	8.2	14.3	2.8	4.1	6.6	5.5
	Ct	111.8	156.4	73.8	102.1	89.7	80.9	80.1
	21	1	71.9	82.3	95.0	83.5	79.8	73.9
2		22.5	15.7	5.0	16.3	18.2	25.4	14.3
3+		5.6	2.0	0	0.2	2.0	0.7	0.7
Ct		133.6	148.4	156.1	118.8	108.6	92.0	98.9
N		995	198	201	596	99	701	851
19	1	50.2	26.5	59.3	65.3	776.2	92.5	79.9 ^{5/}
	2	40.7	65.1	33.2	33.6	22.8	6.7	19.3
	3+	9.1	8.4	7.5	1.1	1.0	0.8	0.4
	Ct	113.2	87.4	105.4	96.9	93.1	98.5	88.0
	N	462	430	398	450	399	401	274

^{1/} Due to low effort, no market samples were collected in Area 20 or 29

^{2/} Zero-age shrimp comprised 0.1 percent of the catch

^{3/} Zero-age shrimp comprised 1.7 percent of the catch

^{4/} Zero-age shrimp comprised 8.5 percent of the catch

^{5/} Zero-age shrimp comprised 0.4 percent of the catch

Table 7. Oregon 1981 incidental groundfish catch in pounds by State statistical area.

Species	State Area											Total
	32	30	29	28	26	24	22	21	20	19	18	
English sole	299	244	-	696	78	30	343	80	-	340	1	2,111
Rock sole	132	88	-	-	6	-	-	-	-	-	-	226
Petrале sole	356	455	-	855	1,009	163	1,581	1,119	-	-	-	5,538
Dover sole	32,312	16,892	1,453	3,511	16,996	4,679	60,083	13,270	16	1,241	1	150,954
Rex sole	3,271	2,524	167	602	1,671	25	1,420	160	-	-	-	9,840
Starry flounder	276	-	-	-	-	-	-	-	-	-	-	276
Other flatfish	13,955	2,976	380	838	820	-	180	14	-	-	-	19,163
Pac. True cod	12,952	4,335	9	1,698	100	10	-	-	-	-	-	19,104
Lingcod	42,055	17,323	968	2,771	6,761	4,313	19,320	11,774	-	1,615	219	107,119
Sablefish	21,168	12,103	215	2,382	23,258	12,245	5,448	753	5	-	-	77,577
Pac. ocean perch	8,901	3,158	8	1,067	33,798	17,651	9,418	3,126	5	-	-	77,132
Other rockfish	579,537	255,365	5,357	37,348	166,259	54,276	355,146	234,119	121	23,845	20,272	1,731,645
Misc. species	4,289	86	-	-	-	-	110	-	-	-	-	4,485
Dogfish	-	-	-	-	-	-	-	-	-	-	-	-
Animal food	-	-	-	-	-	-	-	-	-	-	-	-
Reduction use	-	-	-	-	-	-	-	-	-	-	-	-
Total Landings	719,503	315,549	8,557	51,768	250,756	93,392	453,049	264,415	147	27,541	20,493	2,205,170

landed in 1980 (Table 8), and the lowest total Pacific coast landings since 1969 when 64.8 million pounds (29,343 mt) were landed. At 28.1 million pounds (12,746 mt) Alaska recorded its lowest landings since 1966 when 28.2 million pounds (12,791 mt) were delivered.

Total catch for Oregon, Washington and California in 1981 was 39.6 million pounds (17,986 mt), 16% less than the combined total of 47.2 million pounds (21,410 mt) landed in 1980 (Figure 4). Washington shrimp landings totaled 10.1 million pounds (4,561 mt), or 20% less than the 1980 total of 12.6 million pounds (5,715 mt). Oregon-landing vessels fishing off Washington landed 7.2 million pounds (3,250 mt), or 28% of Oregon's total landings. The Destruction Island grounds (State Area 32) yielded a new record of 4.8 million pounds (2,200 mt), a 20% increase over the old record of 4.0 million pounds (1,804 mt) landed in 1980 (Oregon-landings). Oregon production from the Gray's Harbor bed (State Area 30) declined 47%; from 4.1 million pounds (1,875 mt) in 1980 to 2.2 million pounds (1,019 mt) in 1981.

California shrimp landings reached 3.7 million pounds (1,666 mt), a 16% decrease from the 4.4 million pounds (1,966 mt) landed in 1980. Oregon-landing vessels fishing off California (State Area 18) landed only 0.2 million pounds (106 mt).

Total fishing effort in SRE declined from 227 thousand hours in 1980, to 209 thousand hours in 1981 (Figure 5). Oregon and Washington effort declined while California effort increased slightly.

The combined CPUE for the three states was 190, slightly under the 202 pounds per hour calculated for 1980 (Figure 6). Catch per unit effort was 200, 179 and 203 lbs/hr (SRE) in Oregon, Washington and California respectively, for shrimp caught in waters adjacent to each state.

Table 8. Annual landings of shrimp by State, Province, and entire Pacific coast 1968-1981 (in thousands of pounds; primarily *Pandalus sp.*) source PMFC Crab & Shrimp Data Series and PMFC Annual Report for 1981.

Year	Alaska	Br. Columbia	Washington	Oregon	California	Total
1968	42,023	1,566	1,164	10,976	2,270	57,999
1969	47,851	2,119	1,425	10,505	2,948	64,848
1970	74,256	1,538	926	13,735	4,048	94,503
1971	94,891	735	678	9,291	3,081	108,676
1972	83,830	794	1,582	20,861	2,434	109,501
1973	119,964	1,729	5,271	24,517	1,240	152,720
1974	108,275	2,644	9,325	19,968	2,338	142,550
1975	98,535	1,728	10,167	23,893	4,993	139,316
1976	129,011	7,723	9,261	25,392	3,400	174,787
1977	116,891	6,176	11,803	48,580	15,640	199,090
1978	73,397	2,969	13,987	56,997	13,167	160,517
1979	50,916	1,578	12,135	29,587	4,922	99,138
1980	52,865	1,175	12,600	30,152	4,400	101,192
1981	28,100	1,200	10,055	25,918	3,673	68,946

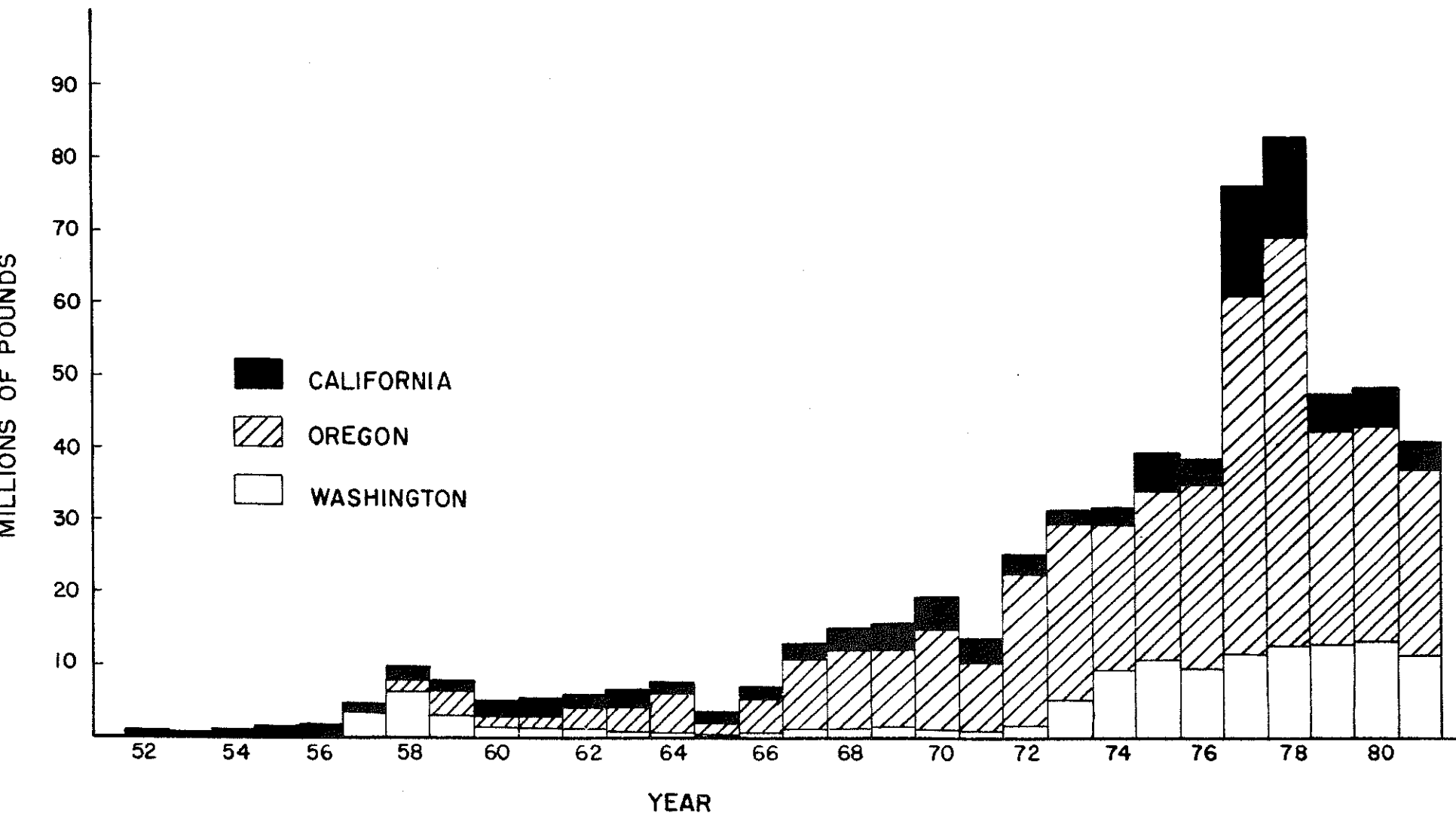


Figure 4. Pink shrimp landings by state, 1952-1981.

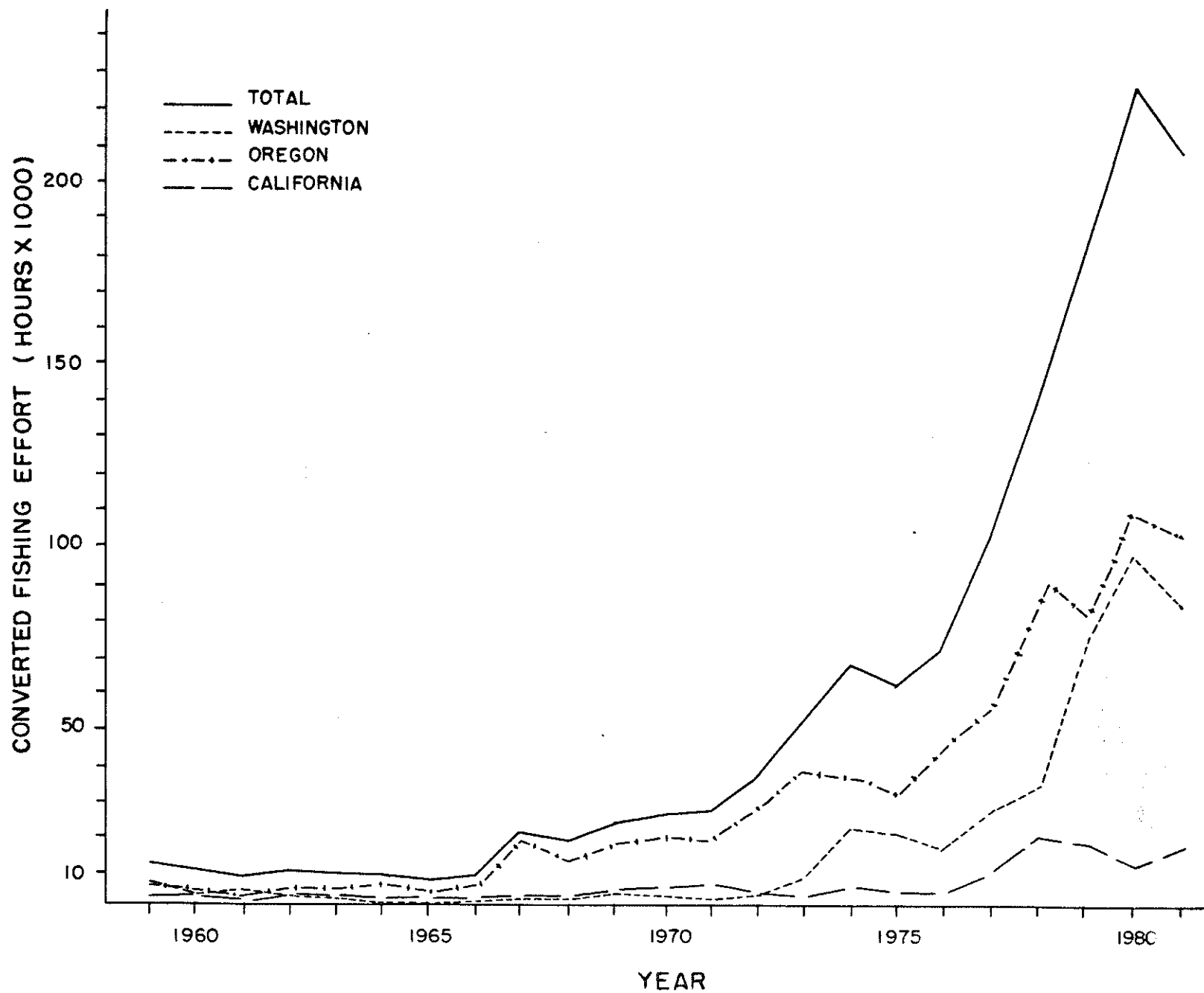


Figure 5. Converted fishing effort (in hours) for ocean pink shrimp by U.S. vessels coastwide and by state in adjacent waters.

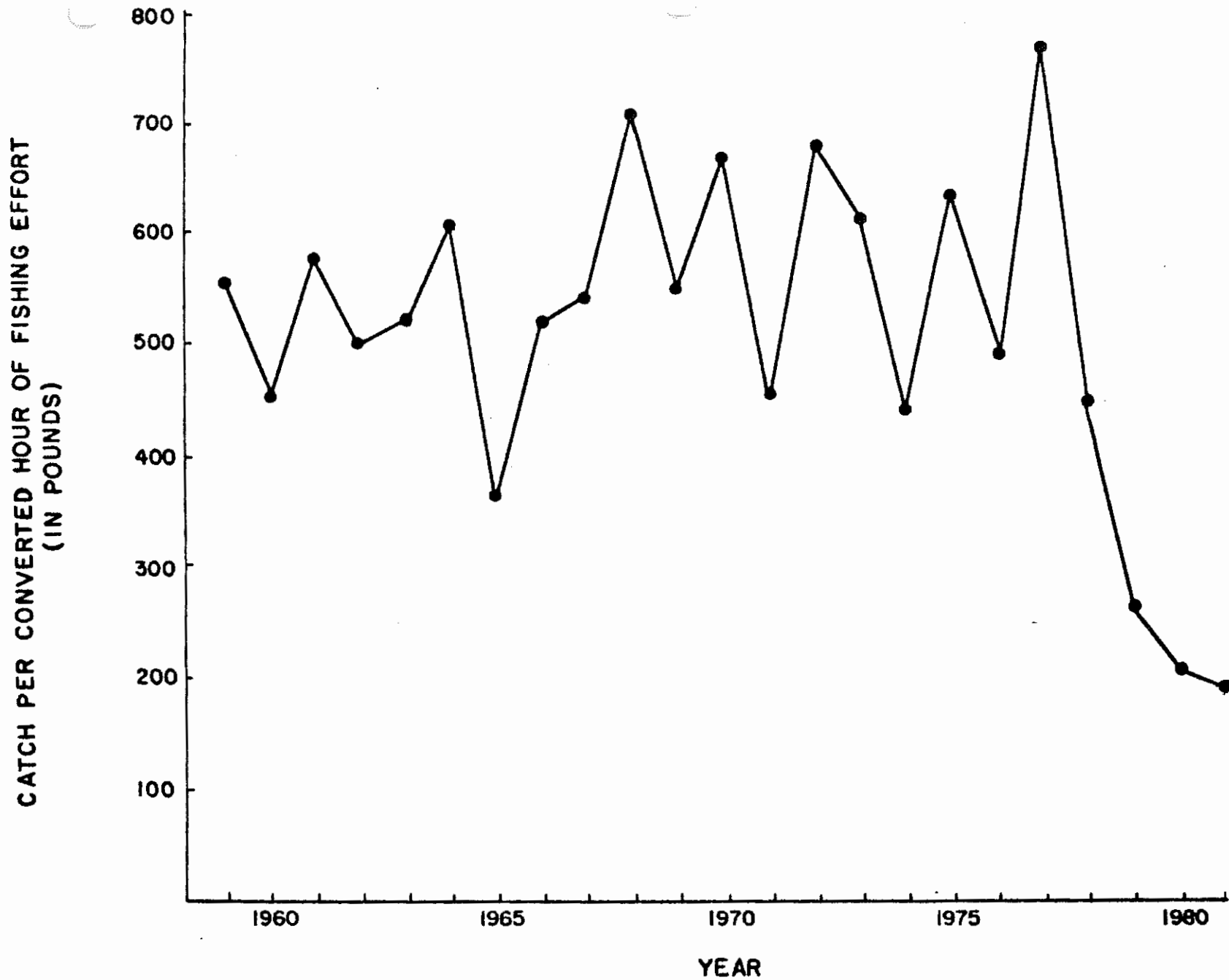


Figure 6. Washington, Oregon, and California pink shrimp catch per hour, 1958-1981
Fishing effort adjusted to single-rig equivalent hours.

SUMMARY

Although the overall catch was composed of 56% one-year-old shrimp, the 1979 year class contributed 39% of the catch as two-year-olds, and threes made up the balance at 5%. The presence of two and three-year-old shrimp reduced the count per pound considerably over 1980. Late season samples indicated the presence of 0 age shrimp. As seen last year and in seasons past, the presence of these small shrimp at the end of the season indicate a strong potential for a high percentage of one-year-old shrimp on the grounds during the following season. Additional processors will be using phosphates to gain higher yields from shrimp in 1982 and smaller shrimp will be easier to process.

There have been some alarming trends in catch-per-unit effort, total effort, distribution of the catch and age composition all pointing to classical signs of over-fishing seen in other fisheries. There has been a trend of increasing effort and decreasing CPUE in recent years (Table 9). Effort declined slightly in 1981 for the first time in 6 years although CPUE has remained low. Catches have declined from a peak of 57 million in 1978. Some state statistical areas appear to be devoid of shrimp. Over the past 10 years there has been a shift from catches of predominantly two and three year old shrimp to one and two year olds.

Dynamic modelling of Oregon's shrimp stocks currently underway may result in guidelines for optimum size of harvest to achieve maximum biological and economic yields. It is difficult to say whether or not we are heading into a recruitment over-fishing situation with Oregon's stocks. Efforts in the near future by Oregon's staff will be directed toward this problem.

Conservation measures suggested by the Pacific Fishery Management Council so far have been aimed at providing uniformity of regulations up and down

the coast including a uniform season, 1-3/8 inch minimum mesh size and maximum count per pound. To that end, Oregon will maintain the uniform season from April 1 to October 31 that was effective in 1981 and may add a maximum count per pound requirement. Oregon intends to complete a yield analysis before deciding on the 1-3/8 inch mesh size management measure.

Future catches will be tied to abundance, availability and market conditions. Depressed markets and higher costs have resulted in a reduction of effort in 1981. Effort may continue to decline in the short term as vessel operators find alternative and potentially more lucrative fisheries to participate in.

LITERATURE CITED

- Saelens, M.R., J.T. Golden, and E.A. Hunt. 1981.
1980 Oregon Shrimp Fishery. Informational Report 81-1. Oregon Department of Fish and Wildlife, 17 p.

Table 9. Annual Oregon shrimp landings in 1,000's of pounds and catch-per effort by statistical area for single and double-rigged vessels, 1968-1981.

Year	Area of Catch											
	34	32	30	29	28	26	24	22	21	20	19	18
1968 C		0	25.2	<u>1/</u>	1,771.6	2,660.8	325.9	4,062.8	238.9	1,302.7	307.2	281.2
C/E		-	494		792	635	556	580	636	1,087	554	895
1969 C		166.4	1,067.4	<u>1/</u>	1,220.0	3,852.1	251.1	3,666.9	159.4	2.1	15.0	140.4
C/E		692	690		662	567	430	431	398	58	157	551
1970 C		475.2	787.1	<u>1/</u>	601.3	2,915.8	2,207.6	4,686.9	199.7	1,550.4	141.9	168.0
C/E		775	539		497	560	675	565	494	1,228	443	740
1971 C		9.8	461.5	<u>1/</u>	430.2	5,575.9	<u>4/</u>	1,534.4	<u>5/</u>	656.0	576.0	46.7
C ₂ ^{2/}		1.9	190.2		337.0	1,762.1		0		0	0	0
C/E ₁ ^{3/}		416	497		368	465		357		879	472	341
C/E ₂		552	902		926	720		-		-	-	-
1972 C		0	1,553.6	<u>1/</u>	14.0	9,295.8	<u>4/</u>	7,011.3	<u>5/</u>	1,344.9	1,454.6	187.0
C ₂		0	606.7		0	4,381.0		400.4		0	0	0
C/E ₁		-	933		469	671		632		975	677	727
C/E ₂		-	1,253		-	1,001		1,213		-	-	-
1973 C		1,829.3	113.9	<u>1/</u>	105.9	8,665.9	<u>4/</u>	10,757.4	<u>5/</u>	2,240.7	802.3	0.9
C ₂		84.4	35.8		40.3	5,947.8		3,228.6		38.8	89.1	-
C/E ₁		722	383		489	617		627		1,098	549	132
C/E ₂		356	702		1,061	795		778		2,589	810	0
1974 C	893.2	2,526.3	2,936.0	642.5	626.0	5,366.6	<u>4/</u>	5,661.5	<u>5/</u>	1,038.2	251.8	25.6
C ₂	838.6	1,983.1	2,271.4	359.6	479.4	3,607.4		2,888.2		392.3	41.6	18.8
C/E ₁	872	746	592	624	639	362		355		565	213	171
C/E ₂	1,248	1,182	726	677	846	550		563		1,261	633	692
1975 C	1.9	259.9	2,630.4	1,350.1	734.0	4,936.9	2,780.4	9,502.4	927.0	754.1	14.8	0.6
C ₂	1.9	218.8	2,224.9	142.0	617.3	3,891.7	2,076.6	6,048.1	463.0	246.5	14.8	0
C/E ₁	-	556	827	551	590	608	603	731	903	654	-	158
C/E ₂	97	753	931	717	808	757	813	1,180	1,352	1,500	388	-

^{1/} Areas 30 and 29 combined through 1973

^{2/} C₂ is landed catch by double-rig vessels; included in C, all columns

^{3/} C/E₁ = catch per hour by single-rig vessels; C/E₂ = catch per hour by double-rig vessels

^{4/} Area 24 included with Area 26 data

^{5/} Area 21 included with Area 22 data

Table 9. Continued

Year	Area of Catch											
	34	32	30	29	28	26	24	22	21	20	19	18
1976 C	1,466.2	108.8	1,728.4	955.1	986.7	7,236.8	3,311.7	6,752.1	1,674.0	704.9	105.5	361.6
C ₂	1,120.3	92.2	1,358.0	665.1	727.3	6,459.1	2,899.1	4,491.3	538.5	254.8	81.7	227.1
C/E ₁	1,462	551	702	544	628	433	374	595	724	690	383	526
C/E ₂	1,394	594	745	542	730	658	582	800	875	963	829	993
1977 C	5.1	1,396.6	5,822.4	827.0	3,686.2	5,641.1	2,836.0	17,208.7	8,435.1	1,755.1	811.9	155.0
C ₂	5.1	1,196.5	5,239.9	587.3	2,870.3	4,649.2	2,639.1	12,601.1	4,844.4	571.0	307.0	126.1
C/E ₁	-	1,045	922	465	695	582	437	786	1,120	1,424	1,585	4,012
C/E ₂	565	1,170	1,052	751	886	751	790	1,232	1,526	1,920	1,424	1,838
1978 C	-	2,353.8	2,325.8	78.4	782.5	2,478.4	350.2	21,026.4	20,321.0	353.0	5,875.0	1,052.6
C ₂	-	2,154.0	2,090.0	70.5	748.2	2,027.8	325.7	18,024.8	16,021.0	306.8	3,213.0	889.4
C/E ₁	-	562	569	173	408	360	256	515	782	507	684	447
C/E ₂	-	691	585	248	490	461	420	927	1,085	769	1,112	855
1979 ^a /C	-	3,356.0	4,196.9	254.0	150.3	2,852.1	795.1	6,132.2	8,513.7	839.5	1,011.6	1,315.6
C ₂	-	3,223.3	4,050.6	225.8	150.3	2,756.1	719.7	4,994.0	6,937.9	650.7	608.0	1,045.0
C/E ₁	-	434	225	181	6	182	189	260	280	292	285	305
C/E ₂	-	413	325	212	300	311	257	419	490	565	477	635
1980 C	-	3,976.9	4,134.7	157.1	834.4	300.8	205.1	5,684.5	7,807.8	150.6	1,290.7	780.8
C ₂	-	3,844.6	4,060.3	149.4	817.3	276.8	185.5	4,425.8	5,643.6	114.9	795.1	537.2
C/E ₁	-	215	154	95	112	148	138.3	180.0	270.8	159.2	195.3	242.7
C/E ₂	-	344	288	246	305	221	224.6	258.5	413.6	292.4	318.4	616.2
1981 C	-	4,849.5	2,245.7	70.8	480.4	4,350.9	1,215.0	6,538.0	5,336.8	4.2	590.4	236.8
C ₂	-	4,773.4	2,224.9	70.8	459.7	4,304.9	1,199.2	5,563.6	3,974.7	4.2	441.0	178.7
C/E ₁	-	196	240	-	122	130	96	162	229	-	224	219
C/E ₂	-	380	272	175	230	254	246	282	338	82	400	415

a/ Catch and catch per unit effort based on preliminary landing estimates of 29.4 million pounds.

