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1982 Clam Studies

1982 CLAM STUDIES

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INFORMATION REPORT 83-11

Oregon Department of Fish and Wildlife
Marine Region, Newport, Oregon

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1982 BAY CLAM SUMMARY REPORT

INTRODUCTION

This report summarizes the results of our bay clam studies in 1982. Activities summarized include the recreational clam fishery, commercial clam fishery, hatchery stock enhancement studies, natural recruitment studies, and miscellaneous other project.

Recreational Clam Fishery

Recreational clam interviews are conducted annually on each of the major clam harvesting tideflats of the Tillamook, Netarts, Nestucca, Yaquina, Alsea, and Siuslaw estuaries.

Our 1982 recreational clam interviews revealed an increase in digging effort on most of the surveyed tideflats (Table 1). A part of this increase might be a result of the low tides in 1982 which were the lowest in 80 years and that they overlapped weekends. Consequently, beds were accessible for long time periods. Also there was a lot of advertising (newspaper, T.V., etc.) which told people about the low tides. Largest increases in peak digger counts were observed for the bridge bed (225 to 625 diggers) and Idaho Point (38 to 176 diggers) on Yaquina Bay.

Interview data collected included catch/effort, digger origin, species composition, and age and size composition. These data are summarized and presented in Tables 2-14.

Tillamook Bay

Garibaldi Flat. Catch/effort data revealed that clams/trip and clams/hour have remained relatively constant since the Department's regulation change in 1977 which reduced the bag limit from 36 to 20 clams.

Cockle clams declined from 66.6% of the total recreational catch in 1978 to 27.4% of the catch in 1982 (Table 2). This reflects a dramatic decrease

Table 1. Peak Counts of Clam Diggers^{1/}.

Estuary	Tideflat	1975	1976	1977	1978	1979	1980	1981	1982
Tillamook	Garibaldi Flat	425	350	131	225	256	300	460	516
	Bay Ocean	-	280	122	39	107	-	33	13
Netarts	Happy Camp	-	175	73	-	150	160	425	500
Nestucca	Little Nestucca	-	-	-	-	-	-	44	6
Yaquina	Bridge Bed	-	245	138	30	91	84	225	625
	Breakwater Bed	-	127	120	62	23	20	27	63
	Idaho Point	-	110	98	45	66	61	38	176
	NW Gas Plant	-	-	-	-	24	26	41	16
	Coquille Point	-	-	-	-	17	18	45	41
Alsea	North Beach	-	-	-	-	-	-	-	4
	Bay Shore	-	-	-	-	-	-	-	49
Siuslaw	North Fork	-	55	-	-	109	57	146	33

^{1/} Number of clam diggers actually on tideflat at time of count. Count occurred at or near low tide.

Table 2. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Tillamook

Tideflat: Garibaldi Flat

	1962	1963	1965	1971	1975	1976	1977 ^{1/}	1978	1979	1980	1981	1982
No. Diggers Sampled	149	758	319	13,048	104	207	252	239	597	456	359	219
No. Clams Sampled	3,296	19,053	8,414	389,946	2,472	4,825	4,647	4,631	11,104	8,728	6,558	4,249
No. Digger Hours	-	-	-	20,439	-	283.2	335.8	261.1	715.2	548.9	443.3	219.5
Hours/trip	-	-	-	1.6	-	1.4	1.3	1.1	1.2	1.2	1.2	1.3
Clams/trip	22.1	25.1	22.9	29.9	23.8	23.3	18.4	19.4	18.6	19.1	18.3	19.4
Clams/hour	-	-	-	19.1	-	17.0	13.8	17.7	15.5	15.9	14.0	14.6
Digger origin (%)												
Local	-	-	38	21	-	32.9	27.8	33.1	30.2	22.4	27.6	38.8
State	-	-	62	73	-	57.0	57.3	55.2	64.7	72.6	63.5	57.1
Non-State	-	-	-	-	-	-	-	-	-	-	-	4.1
Species Comp. (%)												
Butter	31.9	27.0	-	16.3	20.7	18.2	10.5	11.5	13.5	28.7	42.8	45.8
Cockle	38.2	45.0	-	16.8	43.4	28.5	46.7	66.6	64.0	46.5	24.2	27.4
Gaper	6.3	7.0	-	5.4	5.3	18.5	17.2	7.1	9.6	7.1	5.7	6.0
Littleneck	23.6	21.0	-	60.8	29.7	34.7	24.9	14.7	12.7	17.7	27.2	20.8
Softshell	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip												
Butter	7.1	6.8	-	5.0	4.9	4.2	1.9	2.2	2.5	5.5	7.8	8.9
Cockle	8.4	11.3	-	4.9	10.3	6.6	8.6	12.9	11.9	8.9	4.4	5.3
Gaper	1.4	1.8	-	1.6	1.3	4.3	3.2	1.4	1.8	1.4	1.4	1.2
Littleneck	5.2	5.3	-	18.4	7.0	8.1	4.6	2.8	2.4	3.4	5.0	4.0
Softshell	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour												
Butter	-	-	-	3.2	-	3.1	1.5	2.0	2.1	4.6	6.3	6.7
Cockle	-	-	-	3.1	-	4.9	6.5	11.8	9.9	7.4	3.6	4.0
Gaper	-	-	-	1.1	-	3.2	2.4	1.3	1.5	1.1	0.9	0.9
Littleneck	-	-	-	11.7	-	5.9	3.5	2.6	2.0	2.8	4.0	3.0
Softshell	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)												
Butter	-	-	-	-	77.3	81.6	83.8	83.0	72.3	64.8	70.6	70.3
Cockle	-	-	-	-	63.9	64.3	55.9	55.2	60.9	55.0	56.9	60.1
Gaper	-	-	-	-	67.5	56.8	69.3	82.0	84.2	90.2	91.3	114.1
Littleneck	-	-	-	-	36.7	36.8	39.4	38.2	38.5	36.5	39.5	38.0
Softshell	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured												
Butter	-	-	-	-	219	536	394	145	555	304	413	379
Cockle	-	-	-	-	290	978	1,517	637	1,501	535	254	389
Gaper	-	-	-	-	74	349	538	84	327	111	81	7
Littleneck	-	-	-	-	297	518	862	233	171	187	251	392
Softshell	-	-	-	-	-	-	-	-	-	-	-	-

1/ Regulation change in bag limit; effective January 1, 1977.

either in cockle clam availability or digger preference. We believe the harvest reduction is due to a decrease in cockle abundance intertidally. Butter clams, on the other hand, have increased from 10.5% of the harvest in 1977 to 45.8% in 1982. Percentage of harvest of gaper and native littleneck clams remained somewhat constant during these four years.

Mean size of gaper clams increased constantly since 1976. Butter clams exhibited an overall decrease in mean size, and mean size of cockle and littleneck clams changed little.

Bay Ocean Flat. Unlike the catch/effort on Garibaldi Flat, the Bay Ocean clam bed has experienced a dramatic decline in clam production. Catch/trip and catch/hour have declined steadily since 1976, to a low value of less than 0.1 animals per trip (Table 3). Total harvest for the 13 clam diggers interviewed in 1982 showed one softshell taken. Historically, cockle clams have made up over 75% of the harvest from this bed. Local oystermen claim a massive increase in sand shrimp in this area in recent years has been the major factor behind this occurrence.

Netarts Bay

Happy Camp. Clam digging on the Happy Camp clam bed continued to be very good in 1982 with 12.0 clams/trip being taken (Table 4). Since gaper clams made up nearly 95% of the harvest, this success rate suggests most diggers were getting their daily bag limit of 12 gapers. Over 87% of the harvested gapers were of the 1975 year-class. No 1977-82 year-class gapers were observed in the take. The gapers averaged 97.7 mm in size.

Cape Lookout Sand Spit. As with Happy Camp, the Cape Lookout sand spit continued to produce clams at a relatively constant rate. Catch/trip and catch/hour averaged 18.4 and 12.4 clams, respectively (Table 5). This was a slight increase over previous years. As in previous years, cockles were the

Table 3. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Tillamook

Tideflat: Bay Ocean

	1971	1976	1/ 1977	1978	1979	1980	1981	1982	19	19	19	19
No. Diggers Sampled	10,379	94	170	38	79	119	34	13				
No. Clams Sampled	216,728	2,242	2,664	574	1,063	1,465	314	1				
No. Digger Hours	16,156	171	333	70.4	146.1	215.6	57.5	17.0				
Hours/trip	1.6	1.8	2.0	1.9	1.8	1.8	1.7	1.3				
Clams/trip	20.9	23.9	15.7	15.1	13.5	12.3	9.2	<0.1				
Clams/hour	13.4	13.1	8.0	8.2	7.3	6.8	5.5	<0.1				
Digger origin (%)												
Local	21.0	20.2	14.7	13.2	10.1	21.8	20.6	15.4				
State	73.0	74.5	79.0	76.3	89.9	73.1	70.6	84.6				
Non-State	16.0	5.3	6.5	10.5	0.0	5.0	8.8	0.0				
Species Comp. (%)												
Butter	<0.1	0.1	0.6	-	-	0.4	-	-				
Cockle	85.0	85.8	78.5	87.3	91.4	89.6	74.2	-				
Gaper	8.8	12.3	17.5	12.2	8.0	7.1	1.3	-				
Littleneck	1.3	0.1	0.8	-	0.1	0.5	1.3	-				
Softshell	-	-	-	-	-	-	-	100.0				
Clams/trip												
Butter	<0.1	<0.1	0.1	-	-	<0.1	-	-				
Cockle	17.1	20.5	12.3	13.2	12.3	11.0	6.9	-				
Gaper	1.8	2.9	2.7	1.8	1.1	0.9	0.1	-				
Littleneck	0.3	<0.1	0.1	-	<0.1	<0.1	0.1	-				
Softshell	-	-	-	-	-	-	-	<0.1				
Clams/hour												
Butter	<0.1	<0.1	<0.1	-	-	<0.1	-	-				
Cockle	11.0	11.3	6.3	7.1	6.7	6.1	4.1	-				
Gaper	1.1	1.6	1.4	1.0	0.6	0.5	0.1	-				
Littleneck	0.2	<0.1	0.1	-	<0.1	<0.1	0.1	-				
Softshell	-	-	-	-	-	-	-	<0.1				
Size Comp. (x size)												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	66.0	66.1	64.0	68.4	71.2	60.6	-				
Gaper	-	110.6	107.9	104.7	109.3	106.2	105.5	-				
Littleneck	-	-	-	-	42.0	-	37.0	-				
Softshell	-	-	-	-	-	-	-	-				
No. Clams Measured												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	1,075	781	318	525	277	213	-				
Gaper	-	224	118	68	79	44	4	-				
Littleneck	-	-	-	-	-	-	4	-				
Softshell	-	-	-	-	-	-	-	1				

1/ Regulation change in bag limit; effective January 1, 1977.

Table 4. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Netarts

Tideflat: Happy Camp

	1971	1975	1976	1/ 1977	1978	1979	1980	1981	1982	19	19	19
No. Diggers Sampled	5,106	18	141	187	146	222	106	71	168			
No. Clams Sampled	85,230	164	1,709	2,727	1,747	2,823	1,293	991	2,020			
No. Digger Hours	6,613	-	193	254	149.2	204.4	67.7	66.8	150.5			
Hours/trip	1.3	-	1.4	1.4	1.0	0.9	0.6	0.9	0.9			
Clams/trip	16.7	9.1	12.1	14.6	12.0	12.7	12.2	12.9	12.0			
Clams/hour	12.9	-	8.9	10.7	11.7	13.8	19.1	14.8	13.4			
Digger origin (%)												
Local	17.6	-	29.1	14.9	11.0	28.4	17.9	40.3	48.2			
State	74.8	-	66.0	75.9	71.2	59.9	73.6	50.6	44.0			
Non-State	7.6	-	5.0	9.1	17.8	11.7	8.5	9.1	7.7			
Species Comp. (%)												
Butter	2.6	47.1	20.8	9.2	5.8	7.7	5.4	13.7	5.0			
Cockle	1.0	0.0	0.1	21.9	-	-	0.1	0	<0.1			
Gaper	95.7	36.6	73.6	62.5	91.0	90.3	92.5	82.7	94.3			
Littleneck	0.8	15.9	5.3	5.4	3.1	0.2	2.0	3.4	0.6			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/trip												
Butter	0.4	3.3	2.5	1.3	0.7	1.0	0.7	1.8	0.6			
Cockle	0.2	0.0	<0.1	3.2	0.0	-	<0.1	0	<0.1			
Gaper	16.0	4.3	8.9	9.1	10.9	11.5	11.3	10.6	11.3			
Littleneck	0.1	1.4	0.6	0.8	0.4	0.2	0.2	0.4	0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/hour												
Butter	0.3	-	1.8	1.0	0.7	1.1	1.0	2.0	0.7			
Cockle	0.1	-	<0.1	2.3	0.0	-	<0.1	0	<0.1			
Gaper	12.3	-	6.5	6.7	10.7	12.5	17.7	12.3	12.7			
Littleneck	0.1	-	0.5	0.6	0.4	0.3	0.4	0.5	0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Size Comp. (x size)												
Butter	-	102.8	100.2	103.0	103.2	107.2	105.9	109.7	102.5			
Cockle	-	-	-	-	-	-	-	-	-			
Gaper	93.2	112.1	96.3	86.1	87.5	92.1	93.6	98.9	97.7			
Littleneck	-	65.3	67.6	70.0	70.1	73.6	66.7	71.3	70.7			
Softshell	-	-	-	-	-	-	-	-	-			
No. Clams Measured												
Butter	-	66	219	-	-	-	24	109	62			
Cockle	-	190	-	-	-	-	-	-	-			
Gaper	282	190	643	557	921	417	468	454	565			
Littleneck	-	43	99	28	54	34	3	22	9			
Softshell	-	-	-	-	-	-	-	-	-			

1/ Regulation change in bag limit; effective January 1, 1977.

Table 5. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Netarts

Tideflat: Cape Lookout Sand Spit

	1971	1975	1976	1/ 1977	1978	1979	1980	1981	1982	19	19	19
No. Diggers Sampled	6,473	43	76	509	72	85	63	80	56			
No. Clams Sampled	115,811	1,038	2,433	9,293	1,324	1,560	1,074	1,397	1,029			
No. Digger Hours	8,656	-	148	1,055	148.8	178	88.5	149.5	83.0			
Hours/trip	1.3	-	1.9	2.1	2.1	2.1	1.4	1.9	1.5			
Clams/trip	17.9	24.1	32.0	18.3	18.4	18.4	17.0	17.5	18.4			
Clams/hour	13.4	-	16.5	8.8	8.9	8.8	12.1	9.3	12.4			
Digger origin (%)												
Local	17.6	-	23.7	23.1	22.2	36.5	17.5	12.5	44.6			
State	74.8	-	76.3	66.6	77.8	61.2	76.2	81.3	51.8			
Non-State	7.6	-	0.0	10.6	0.0	2.3	6.3	7.5	3.6			
Species Comp. (%)												
Butter	38.4	49.0	15.8	6.6	2.0	5.5	1.9	7.7	0.3			
Cockle	44.4	46.0	76.9	72.3	72.7	74.4	93.3	76.7	84.9			
Gaper	8.9	2.7	3.7	15.3	22.4	16.0	4.8	13.3	12.1			
Littleneck	6.9	1.3	3.2	2.1	1.3	3.8	-	1.9	2.6			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/trip												
Butter	6.9	11.8	5.1	1.2	0.4	1.0	0.3	1.4	0.1			
Cockle	8.0	11.1	24.6	13.2	13.4	13.6	15.9	13.4	15.6			
Gaper	1.6	0.7	1.2	2.8	4.1	2.9	0.8	2.3	2.2			
Littleneck	1.2	0.3	1.0	0.4	0.2	0.7	-	0.3	0.5			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/hour												
Butter	5.1	-	2.6	0.6	0.2	0.5	0.2	0.7	<0.1			
Cockle	5.9	-	12.7	6.4	6.5	6.5	11.3	7.2	10.5			
Gaper	1.2	-	0.6	1.3	2.0	1.4	0.6	1.2	1.5			
Littleneck	0.9	-	0.5	0.2	0.1	0.3	-	0.2	0.3			
Softshell	-	-	-	-	-	-	-	-	-			
Size Comp. (x size)												
Butter	84.5	80.3	71.8	74.1	76.9	80.4	75.6	74.2	67.7			
Cockle	65.4	73.3	73.0	75.7	72.7	75.2	72.2	72.0	71.3			
Gaper	108.1	80.4	87.4	103.4	100.5	91.7	110.7	104.7	119.0			
Littleneck	-	57.8	-	-	57.9	53.7	-	53.3	49.5			
Softshell	-	-	-	-	-	-	-	-	-			
No. Clams Measured												
Butter	32	237	294	80	11	86	20	49	3			
Cockle	245	257	674	851	555	812	525	486	534			
Gaper	52	257	36	170	144	191	44	48	71			
Littleneck	-	31	-	-	12	60	-	13	26			
Softshell	-	-	-	-	-	-	-	-	-			

1/ Regulation change in bag limit; effective January 1, 1977.

principal species collected representing nearly 85% of the take. Gaper, butter and native littleneck clams made up the remainder of the bag. Unlike Happy Camp, most of the gaper clams (69.2%) were of year-classes younger than 1975. Only 23.1% were of the 1975 year-class. The cockle clams averaged 71.3 mm in size and were dominated by the 1979 and 1980 year-classes.

Nestucca Bay

Little Nestucca Flat. After a relatively poor digging year in 1981, 1982 showed catch/effort back up to a respectable 29.7 clams/trip (Table 6). Soft-shell clams were the only species taken and averaged 75.6 mm in size. A majority of the softshells were of the 1978 and 1979 year-classes.

Yaquina Bay

Bridge Bed. Little change was seen in the catch/effort for this tideflat from previous years (Table 7). Gaper clams comprised over 85% of the harvest and averaged 105.9 mm in size. Over 63% of the gapers were of the 1975 year-class. Most of this fishery occurs on the gravel island under the 101 Highway Bridge.

Breakwater Bed. As with the bridge bed, catch/effort on the breakwater has remained relatively constant for the past several years (Table 8). Access is strictly by boat which limits the digging pressure on this area. Over 94% of the harvest is gaper clams. The gapers averaged 106.4 mm in size. No single year-class dominated the harvest.

Idaho Point. The past several years have shown a slight reduction in catch/effort of clams from this area (Table 9). The clam bed is subjected to a very intensive cockle fishery where 95% of the take is this species. The cockles averaged 54.4 mm in size. Since 1977, there has been a gradual decrease in mean size of the cockle suggesting possible over harvest. Cockles of the 1979 and 1980 year-classes were dominant in the 1982 harvest.

Table 6. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Nestucca

Tideflat: Little Nestucca Flat

	1971	1/1977	1979	1980	1981	1982	1983	19	19	19	19	19
No. Diggers Sampled	1,466	34	16	38	23	22						
No. Clams Sampled	23,211	1,049	484	1,120	357	653						
No. Digger Hours	1,584	43	21	72	27	31						
Hours/trip	1.1	1.3	1.3	1.9	1.2	1.4						
Clams/trip	15.8	30.9	30.3	29.5	15.5	29.7						
Clams/hour	14.7	24.4	23.2	15.6	13.2	21.4						
Digger origin (%)												
Local	12.4	52.9	18.8	0	13.0	4.5						
State	73.5	47.1	62.5	86.8	87.0	86.4						
Non-State	14.1	0	18.8	13.2	0.0	9.1						
Species Comp. (%)												
Butter												
Cockle	0	0	0	0	0	0						
Gaper	0	0	0	0	0	0						
Littleneck	0	0	0	0	0	0						
Softshell	100.0	100.0	100.0	100.0	100.0	100.0						
Clams/trip												
Butter												
Cockle	0	0	0	0	0	0						
Gaper	0	0	0	0	0	0						
Littleneck	0	0	0	0	0	0						
Softshell	15.8	30.9	30.3	29.5	15.5	29.7						
Clams/hour												
Butter												
Cockle	0	0	0	0	0	0						
Gaper	0	0	0	0	0	0						
Littleneck	0	0	0	0	0	0						
Softshell	14.7	24.4	23.2	15.6	13.2	21.4						
Size Comp. (x size)												
Butter												
Cockle	-	0	0	0	0	0						
Gaper	-	0	0	0	0	0						
Littleneck	-	0	0	0	0	0						
Softshell	-	86.0	84.2	79.9	78.3	75.6						
No. Clams Measured												
Butter												
Cockle	0	0	0	0	0	0						
Gaper	0	0	0	0	0	0						
Littleneck	0	0	0	0	0	0						
Softshell	0	250	332	254	163	547						

1/ Regulation change in bag limit; effective January 1, 1977.

Table 7. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Yaquina

Tideflat: Bridge Bed

	1/											
	1971	1972	1975	1976	1977	1978	1979	1980	1981	1982	19	19
No. Diggers Sampled	4,518	-	88	29	357	89	143	142	342	149		
No. Clams Sampled	41,769	-	694	414	2,838	892	1,313	1,222	3,773	1,609		
No. Digger Hours	6,769	-	-	36.0	488	109.9	120.0	159.5	353.9	154.0		
Hours/trip	1.5	-	-	1.2	1.4	1.2	0.8	1.1	1.0	1.0		
Clams/trip	9.2	-	7.9	14.3	7.9	10.0	9.2	8.6	11.0	10.8		
Clams/hour	6.2	-	-	11.7	5.8	8.1	10.9	7.7	10.7	10.4		
Digger origin (%)												
Local	-	-	-	31.0	19.6	24.7	22.4	18.3	44.7	48.3		
State	-	-	-	48.3	70.9	69.7	76.2	70.4	49.1	48.3		
Non-State	-	-	-	20.7	9.5	4.5	1.4	11.3	6.1	3.4		
Species Comp. (%)												
Butter	0.2	-	0.8	0.2	0.8	0.6	0.2	1.7	0.8	1.9		
Cockle	79.4	-	42.1	72.2	45.4	24.6	7.9	1.4	15.7	7.2		
Gaper	19.5	-	54.8	24.6	43.6	72.1	89.6	94.8	81.0	85.4		
Littleneck	0.8	-	2.3	1.4	1.4	1.1	0.4	2.1	1.7	4.5		
Softshell	-	-	-	-	-	-	-	-	-	-		
Clams/trip												
Butter	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2		
Cockle	7.3	-	3.3	10.3	3.6	2.5	0.7	<0.1	1.7	0.8		
Gaper	1.8	-	4.3	3.5	3.5	7.2	8.2	8.2	8.9	9.2		
Littleneck	<0.1	-	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.5		
Softshell	-	-	-	-	-	-	-	-	-	-		
Clams/hour												
Butter	<0.1	-	-	<0.1	<0.1	0.1	<0.1	0.1	0.1	0.2		
Cockle	4.9	-	-	8.4	2.6	2.0	0.9	0.1	1.1	0.8		
Gaper	1.2	-	-	2.9	2.5	5.9	9.8	7.3	8.6	8.9		
Littleneck	-	-	-	-	-	-	-	-	-	-		
Softshell	-	-	-	-	-	-	-	-	-	-		
Size Comp. (x size)												
Butter	-	-	-	-	-	-	67.5	71.9	72.5	80.4		
Cockle	60.5	31.1	49.3	46.7	57.5	69.9	66.8	55.8	57.4	65.1		
Gaper	-	-	107.1	115.5	95.0	101.7	96.8	100.0	107.7	105.9		
Littleneck	-	-	60.3	-	-	-	51.5	62.2	54.7	54.7		
Softshell	-	-	-	-	-	-	-	-	-	-		
No. Clams Measured												
Butter	-	-	-	-	-	-	-	14	20	5		
Cockle	-	25	276	205	592	202	51	6	536	86		
Gaper	-	-	316	62	593	154	279	419	1,370	308		
Littleneck	-	-	12	-	-	-	2	19	55	9		
Softshell	-	-	-	-	-	-	-	-	-	-		

1/ Regulation change in bag limit; effective January 1, 1977.

Table 8. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Yaquina

Tideflat: Breakwater

	1971	1975	1976	1/ 1977	1978	1979	1980	1981	1982	19	19	19
No. Diggers Sampled	1,455	46	-	48	20	10	21	16	14			
No. Clams Sampled	22,175	515	-	511	270	142	261	166	157			
No. Digger Hours	2,179	-	-	69.1	21.5	20.0	44	27	20.5			
Hours/trip	1.5	-	-	1.4	1.1	2.0	2.1	1.7	1.5			
Clams/trip	15.2	11.2	-	10.6	13.5	14.2	12.4	10.4	11.2			
Clams/hour	10.2	-	-	7.4	12.6	7.1	5.9	6.1	7.7			
Digger origin (%)												
Local	-	-	-	35.4	55.0	30.0	28.6	18.8	71.4			
State	-	-	-	64.6	45	-	71.4	50.0	28.6			
Non-State	-	-	-	-	-	-	-	31.3	0			
Species Comp. (%)												
Butter	1.2	1.5	-	1.4	0.7	0	6.5	1.8	2.5			
Cockle	15.3	3.9	-	18.2	13.7	7.0	11.1	19.9	1.9			
Gaper	83.0	95.0	-	78.9	84.4	84.5	81.2	75.3	94.9			
Littleneck	0.4	0.2	-	0.8	0.4	0	1.1	1.2	0.6			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/trip												
Butter	0.2	<0.1	-	0.1	0.1	0	0.8	0.2	0.3			
Cockle	2.3	0.4	-	1.9	1.8	1.0	1.4	2.1	0.2			
Gaper	12.7	10.6	-	-	0	0	10.1	7.8	10.6			
Littleneck	<0.1	<0.1	-	0.1	0.1	0	0.1	0.1	0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/hour												
Butter	0.1	-	-	0.1	0.1	0	0.4	0.1	0.2			
Cockle	1.6	-	-	1.3	1.7	0.5	0.6	1.2	0.1			
Gaper	8.4	-	-	5.8	10.6	6.0	4.8	4.6	7.3			
Littleneck	<0.1	-	-	0.1	0.1	0	0.1	0.1	<0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Size Comp. (x size)												
Butter	<0.1	-	-	0.1	<0.1	<0.1	85.3	-	-			
Cockle	75.6	-	-	72.5	76.1	-	-	62.6	-			
Gaper	113.8	116.2	-	123.3	118.9	-	109.1	106.4	106.4			
Littleneck	-	-	-	-	-	-	64.0	-	-			
Softshell	-	-	-	-	-	-	-	-	-			
No. Clams Measured												
Butter	-	-	-	-	-	-	16	0	4			
Cockle	-	-	-	-	79	37	0	27	3			
Gaper	-	310	-	198	207	-	195	69	142			
Littleneck	-	-	-	-	-	-	3	0	1			
Softshell	-	-	-	-	-	-	-	-	-			

1/ Regulation change in bag limit; effective January 1, 1977.

Table 9. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Yaquina

Tideflat: Idaho Point

	1971	1975	1976	1/ 1977	1978	1979	1980	1981	1982	19	19	19
No. Diggers Sampled	10,462	123	42	309	20	193	182	147	80			
No. Clams Sampled	138,784	2,600	812	3,773	298	2,783	3,118	2,339	1,219			
No. Digger Hours	15,621	-	76.5	464	25.2	247.8	301.6	222.3	144.5			
Hours/trip	1.5	-	1.8	1.5	1.3	1.3	1.7	1.5	1.8			
Clams/trip	13.3	21.1	19.3	12.2	14.9	14.4	17.1	15.9	15.2			
Clams/hour	8.9	-	10.6	8.1	11.8	11.2	10.3	10.5	8.4			
Digger origin (%)												
Local	-	-	35.7	12.3	45.0	31.6	28.6	15.6	18.8			
State	-	-	33.3	84.1	50.0	62.7	65.4	70.7	81.3			
Non-State	-	-	31.0	3.6	5.0	5.7	6.0	13.6	0			
Species Comp. (%)												
Butter	0.3	<0.1	0.5	0.5	0	1.7	0	0.1	0			
Cockle	77.7	93.2	72.5	78.5	83.9	70.2	87.2	93.4	95.0			
Gaper	21.7	5.8	18.4	13.1	15.1	20.7	12.8	4.1	2.9			
Littleneck	0.4	<0.1	0.1	0.2	0	0.1	0	0.5	0.9			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/trip												
Butter	<0.1	<0.1	0.1	0.1	0	0.2	0	0	0			
Cockle	10.3	19.7	14.0	9.6	12.5	10.1	14.9	14.9	14.5			
Gaper	2.9	1.2	3.6	1.6	2.3	3.0	2.2	0.6	0.4			
Littleneck	<0.1	<0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Clams/hour												
Butter	0.1	-	0.1	0.1	0	0.2	0	0	0			
Cockle	6.9	-	7.7	6.4	9.9	7.9	1.3	9.8	8.0			
Gaper	1.9	-	2.0	1.1	1.8	2.3	9.0	0.4	0.2			
Littleneck	<0.1	-	<0.1	<0.1	0	<0.1	0	0.0	0.1			
Softshell	-	-	-	-	-	-	-	-	-			
Size Comp. (x size)												
Butter	-	-	-	-	-	75.1	-	87.3	-			
Cockle	61.0	58.6	58.3	60.2	59.0	58.2	57.8	54.3	54.4			
Gaper	113.0	96.6	91.3	93.5	95.2	95.9	94.5	91.7	83.3			
Littleneck	-	-	-	-	-	55.3	-	50.1	42.7			
Softshell	-	-	-	-	-	-	-	-	-			
No. Clams Measured												
Butter	-	-	-	-	-	-	-	4	-			
Cockle	-	-	-	-	-	45	1,620	1,302	-			
Gaper	-	369	522	1,804	250	1,471	181	75	-			
Littleneck	-	171	126	173	42	24	-	9	-			
Softshell	-	-	-	-	-	-	-	-	-			

1/ Regulation change in bag limit; effective January 1, 1977.

Northwest Gas Plant. The harvest of clams from this clam bed has shown a steady and alarming rate of decline since 1971 (Table 10). Changes in shellfish regulations during 1977 had no apparent impact on changing this downward trend. Clam diggers averaged less than 4.5 clams/trip in 1982. Species composition data revealed that over 91% of the harvest was cockle clams, averaging 50.2 mm in size. The fishery was primarily on young cockles; over 51% were of the 1981 year-class.

Coquille Point. This tidelflat is starting to experience more digging pressure, perhaps because of the poor digging at the N.W. gas plant. Catch/effort has improved since 1981 with 5.0 clams/trip being taken (Table 11). Over 93% of the clams were gapers that averaged 96.6 mm in size.

Alsea Bay

Alsea Bay was added to our sampling program in 1982. Two areas were surveyed; North Shore and Bay Shore.

North Shore. Four diggers were interviewed and they averaged 17.8 cockles/digger (Table 12). The cockles averaged 80.1 mm in size and were primarily five-year-old clams (1976 year-class). The North Shore flat is located directly under the Alsea bridge on the north side of the estuary.

Bay Shore. We interviewed 32 diggers on this tidelflat and they averaged 16.5 clams/digger (Table 13). Over 99% of the clams taken were cockles that averaged 72.9 mm. Over 80% of the clams were of the 1978 and 1979 year-classes (3-4 year olds). This fishery occurs primarily subtidally with clams taken with long handled rakes made out of modified pitch forks.

Siuslaw Bay

The Siuslaw is the most southern estuary that we routinely survey.

Table 10. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Yaquina

Tideflat: Northwest Gas Plant

	1971	1975	1976	2/ 1977	1978	1979	1980	1981	1982	19	19	19
No. Diggers Sampled	5,857	92	93	315	49	137	63	38	29			
No. Clams Sampled	119,702	13,541	583	3,852	684	1,073	495	151	128			
No. Digger Hours	8,725	-	139.0	402.0	66.8	164.8	84.3	54.4	32.5			
Hours/trip	1.5	-	1.5	1.3	1.4	1.2	1.3	1.4	1.1			
Clams/trip	20.4	14.7	17.0	12.2	14.0	7.8	7.9	4.0	4.4			
Clams/hour	13.7	-	11.4	9.6	10.2	6.5	5.9	2.8	3.9			
Digger origin (%)												
Local	-	-	9.7	22.5	59.2	33.6	30.2	36.8	65.5			
State	-	-	86.0	72.1	38.8	49.6	68.3	57.9	34.5			
Non-State	-	-	4.3	5.4	2.0	16.8	1.5	5.3	0			
Species Comp. (%)												
Butter	0.6	1.9	0.1	1.1	0.1	0.2	0.6	2.0	0			
Cockle	85.1	60.6	71.3	74.5	82.6	81.9	78.4	11.3	91.4			
Gaper	12.7	29.8	22.0	13.8	16.8	11.9	19.6	34.4	7.0			
Littleneck	0.7	1.3	0.3	0.5	0.4	0.6	1.4	2.0	1.6			
Softshell	-	-	-	-	-	-	-	47.0	-			
Clams/trip												
Butter	0.1	0.3	<0.1	0.1	<0.1	<0.1	0.1	0.1	0			
Cockle	17.4	8.9	12.1	9.1	11.5	6.4	6.2	0.4	4.0			
Gaper	2.6	4.4	3.7	1.7	2.3	0.9	1.5	1.4	0.3			
Littleneck	0.1	0.2	<0.1	0.1	0.1	<0.1	0.1	0.1	0.1			
Softshell	-	-	-	-	-	-	-	1.9	-			
Clams/hour												
Butter	<0.1	-	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0			
Cockle	11.7	-	8.1	7.1	8.5	5.3	4.6	0.3	3.6			
Gaper	1.7	-	2.5	1.3	1.7	0.8	1.2	1.0	0.3			
Littleneck	<0.1	-	<0.1	0.1	<0.1	<0.1	0.1	0.1	0.1			
Softshell	-	-	-	-	-	-	-	1.3	-			
Size Comp. (x size)												
Butter	-	-	-	-	-	-	99.0	80.0	0			
Cockle ^{1/}	66.3	63.4	56.5	60.7	60.0	59.4	52.5	47.1	50.2			
Gaper	95.3	91.3	91.5	92.8	101.1	94.9	96.0	88.8	87.3			
Littleneck	-	-	-	-	-	-	47.4	48.0	45.5			
Softshell	-	-	-	-	-	-	-	57.5	-			
No. Clams Measured												
Butter	-	-	-	-	-	-	1	1	0			
Cockle	-	219	648	889	525	606	349	18	60			
Gaper	-	451	217	152	106	96	61	46	7			
Littleneck	-	-	-	-	-	5	5	2	0			
Softshell	-	-	-	-	-	-	-	2	-			

^{1/} 1972, Cockle = 66.6mm^{2/} Regulation change in bag limit; effective January 1, 1977.

Table 11. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Yaquina

Tideflat: Coquille Point

	1981	1982	19	19	19	19	19	19	19	19	19
No. Diggers Sampled	11	53									
No. Clams Sampled	24	267									
No. Digger Hours	9	75.0									
Hours/trip	0.8	1.4									
Clams/trip	2.2	5.0									
Clams/hour	2.7	3.6									
Digger origin (%)											
Local	0	9.4									
State	100	75.5									
Non-State	0	15.1									
Species Comp. (%)											
Butter	4.2	3.0									
Cockle	0	0									
Gaper	95.8	93.3									
Littleneck	0	3.0									
Softshell	-	-									
Clams/trip											
Butter	0.1	0.2									
Cockle	0	0									
Gaper	2.1	4.7									
Littleneck	0	0.2									
Softshell	-	-									
Clams/hour											
Butter	0.1	0.1									
Cockle	0	0									
Gaper	2.6	3.3									
Littleneck	0	0.1									
Softshell	-	-									
Size Comp. (x size)											
Butter	88.0	93.6									
Cockle	-	-									
Gaper	94.5	96.6									
Littleneck	-	61.3									
Softshell	-	-									
No. Clams Measured											
Butter	1	5									
Cockle	0	0									
Gaper	23	142									
Littleneck	0	4									
Softshell	-	-									

Table 12. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Alsea

Tideflat: North Shore

	1982	19	19	19	19	19	19	19	19	19	19
No. Diggers Sampled	4										
No. Clams Sampled	71										
No. Digger Hours	6.0										
Hours/trip	1.5										
Clams/trip	17.8										
Clams/hour	11.8										
Digger origin (%)											
Local	100.0										
State	0										
Non-State	0										
Species Comp. (%)											
Butter	0										
Cockle	100.0										
Gaper	0										
Littleneck	0										
Softshell	-										
Clams/trip											
Butter	0										
Cockle	17.8										
Gaper	0										
Littleneck	0										
Softshell	-										
Clams/hour											
Butter	0										
Cockle	11.8										
Gaper	0										
Littleneck	0										
Softshell	-										
Size Comp. (x size)											
Butter	0										
Cockle	80.1										
Gaper	0										
Littleneck	0										
Softshell	-										
No. Clams Measured											
Butter	0										
Cockle	39										
Gaper	0										
Littleneck	0										
Softshell	-										

Table 13. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Alsea

Tideflat: Bayshore

	1982	19	19	19	19	19	19	19	19	19	19
No. Diggers Sampled	32										
No. Clams Sampled	529										
No. Digger Hours	46										
Hours/trip	1.4										
Clams/trip	16.5										
Clams/hour	11.5										
Digger origin (%)											
Local	59.4										
State	25.0										
Non-State	15.6										
Species Comp. (%)											
Butter	-										
Cockle	99.8										
Gaper	0.2										
Littleneck	-										
Softshell	-										
Clams/trip											
Butter	-										
Cockle	16.5										
Gaper	<0.1										
Littleneck	-										
Softshell	-										
Clams/hour											
Butter	-										
Cockle	11.5										
Gaper	<0.1										
Littleneck	-										
Softshell	-										
Size Comp. (x size)											
Butter	-										
Cockle	72.9										
Gaper	-										
Littleneck	-										
Softshell	-										
No. Clams Measured											
Butter	-										
Cockle	159										
Gaper	-										
Littleneck	-										
Softshell	-										

North Fork Flat. Clam digging continues to be excellent on this clam bed where catch/effort information revealed over 41 clams/trip taken (Table 14). Considering that the bag limit is 36/person, the 41 clam average shows that a number of interviewed diggers exceeded their bag limits. Only softshell clams were taken from this area and they averaged 90.7 mm in size. Although the digging pressure is very heavy in this area, little impact has been observed on the availability or size of the clams.

Recreational Clam Fishery Summary

The 1977 shellfish regulation change reduced the bag limit of most clams from 36 to 20 and allowed sorting of unbroken hardshell clams. This change appears to have had little favorable impact on the intertidal hardshell clam stocks. The general decline in availability of these stocks suggest that digging pressure may still be depressing the recovery of our clam resources. One unmeasurable variable that undoubtedly has some bearing on the condition of clam stocks is the environment. We have reason to believe that environmental variation is a greater factor in stock decline than digging pressure. This has become apparent during the past decade, especially with the gaper clam, where in major subtidal portions of our estuaries we have observed little or no recruitment since 1975. These areas can be considered a control since little or no digging activity occurs there.

Commercial Clam Harvest

In 1982, 134,105 pounds of clams were reported to be commercially harvested in Oregon's estuaries (Table 15). Of this total, 106,440 pounds (79.4%) were gaper clams. Coos Bay produced 106,385 pounds (99.9%) of the total gaper harvest. Other clams reported harvested coastwide were native littlenecks (13,231 lbs), cockles (10,517 lbs), butters (3,654 lbs), and softshells (248 lbs). Forty-six fishermen reported landings in 1982, 15 more

Table 14. ANNUAL SUMMARY OF RECREATIONAL INTERVIEW DATA

Bay: Siuslaw

Tideflat: North Fork^{1/}

	1971	1976	1977	1978	1979	1980	1981	1982	19	19	19	19
No. Diggers Sampled	3,203	39	51	21	42	7	115	21				
No. Clams Sampled	72,756	1,067	1,426	670	1,140	188	3,445	875				
No. Digger Hours	4,844	54	101	31.5	55.3	5.0	145.2	28				
Hours/trip	1.5	1.4	2.0	1.5	1.3	0.7	1.3	1.3				
Clams/trip	22.7	27.4	28.0	31.9	27.1	26.9	30.0	41.7				
Clams/hour	15.0	19.8	14.1	21.3	20.6	37.6	23.7	31.3				
Digger origin (%)												
Local	-	12.8	28.8	28.6	19.0	28.6	38.3	47.6				
State	-	84.6	66.7	71.4	47.6	71.4	48.7	52.4				
Non-State	-	2.6	4.4	-	33.3	0	13.0	0				
Species Comp. (%)												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	-	-	-	-	-	-	-				
Gaper	-	-	-	-	-	-	-	-				
Littleneck	-	-	-	-	-	-	-	-				
Softshell	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0				
Clams/trip												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	-	-	-	-	-	-	-				
Gaper	-	-	-	-	-	-	-	-				
Littleneck	-	-	-	-	-	-	-	-				
Softshell	22.7	27.4	28.0	31.9	27.1	26.9	30.0	41.7				
Clams/hour												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	-	-	-	-	-	-	-				
Gaper	-	-	-	-	-	-	-	-				
Littleneck	-	-	-	-	-	-	-	-				
Softshell	15.0	19.8	14.1	21.3	20.6	37.6	23.7	31.3				
Size Comp. (x size)												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	-	-	-	-	-	-	-				
Gaper	-	-	-	-	-	-	-	-				
Littleneck	-	-	-	-	-	-	-	-				
Softshell	-	107.4	96.5	99.0	89.5	90.0	89.4	90.7				
No. Clams Measured												
Butter	-	-	-	-	-	-	-	-				
Cockle	-	-	-	-	-	-	-	-				
Gaper	-	-	-	-	-	-	-	-				
Littleneck	-	-	-	-	-	-	-	-				
Softshell	-	741	408	335	676	110	1,629	757				

^{1/} Includes digging on west side, east side and in North Fork of Siuslaw & near Florence

Table 15. Summary of pounds of Bay Clams Reported Harvested in Oregon, 1970-82.

Year	Butter	Cockle	Gaper	Littleneck	Softshell	Macoma	Total
1970	885	12,257	1,218	863	10,661	0	25,884
1971	217	9,391	10,345	639	7,714	220	28,526
1972	52	7,269	34,006	1,406	18,772	0	61,505
1973	95	5,756	185	9,771	1,349	0	17,156
1974	412	6,073	0	8,987	843	0	16,315
1975	0	6,855	15,024	4,311	360	0	26,550
1976	816	322	85,831	455	630	0	88,054
1977	607	859	81,775	232	1,366	894	85,733
1978	1,452	6,717	207,685	1,056	16	0	216,926
1979	606	2,299	91,028	0	979	0	94,912
1980	40	2,244	74,459	4,268	456	0	81,467
1981	2,409	4,580	68,508	4,892	749	0	81,138
1982	3,654	10,517	106,440	13,231	248	0	134,105

than in 1981. Five hundred thirty eight landings were made.

Coos Bay produced the most clams in 1982 with 111,427 lbs reported (Table 16). Tillamook and Nehalem bays produced 11,501 lbs and 10,862 lbs, respectively. Netarts, Yaquina, Siuslaw, and Umpqua bays all produced minor poundages of clams.

Commercial Clam Fishery by Mechanical Means

Yaquina Bay. No commercial clam harvesting permits were issued for Yaquina Bay in 1982. Three permits were issued in 1981. No mechanical harvest has occurred in Yaquina Bay since 1979.

Coos Bay. We issued seven commercial clam harvesting permits for Coos Bay in 1982; eight were issued in 1981. Of the seven permits issued, only two were used and resulted in a production of 88,341 pounds of clams. Of the 88,341 pounds, 85,551 pounds (96.8%) were gaper clams. Fishermen received 30 to 45¢/pound for the gaper clams.

The gaper clams harvested in the permit area averaged 134.2 mm in size and were primarily of the 1973, 74 and 75 year-classes (Figure 1). Clams harvested in 1981, from the same area, averaged 132.3 mm in size. No clams younger than the 1976 year-class were observed taken.

Commercial Clam Harvest by Hand

Commercial clam fishermen harvested a reported 43,614 lbs of clams by hand in Oregon's estuaries in 1982. Many of these clams were taken in Tillamook and Nehalem bays where a reported 11,501 lbs and 10,862 lbs, respectively, were taken. The Tillamook Bay landings were primarily intertidal cockles (84.8%) whereas the Nehalem Bay landings were entirely subtidal native littlenecks. The littlenecks brought \$1.00 to \$1.15/pound to the fishermen.

Oregon State Police (OSP) in Tillamook reported a concern expressed by

Table 16. Summary of Reported Commercial Harvest of Bay Clams in Major Oregon Estuaries, 1969-82.

Year	Nehalem	Tillamook	Netarts	Yaquina	Alsea	Siuslaw	Umpqua	Coos	Total
1970	258	7,819	2,210	444	0	0	10,631	4,522	25,884
1971 ^{1/}	589	5,948	1,598	1,819	0	0	7,459	10,893	28,306
1972	80	9,637	914	57	70	0	6,105	44,642	61,505
1973	329	11,997	1,191	0	0	0	786	2,853	17,156
1974 ^{1/}	882	9,309	2,409	398	0	0	445	3,232	16,675
1975 ^{1/}	0	4,637	0	0	13	0	309	21,553	26,512
1976 ^{1/}	0	820	0	0	480	0	0	86,529	87,829
1977 ^{1/}	0	1,881	0	71,013	0	0	35	12,066	84,995
1978 ^{1/}	0	2,905	0	172,047	0	0	0	41,804	216,756
1979	174	433	0	74,565	0	3,432	0	16,308	94,912
1980	373	5,320	486	244	0	9,109	0	65,935	81,467
1981	65	4,259	0	128	0	684	0	76,002	81,138
1982 ^{1/}	10,862	11,501	37	15	0	223	25	111,427	134,090

^{1/} Totals exclude landings of clams reported from Columbia River, Astoria, Bandon and Port Orford.

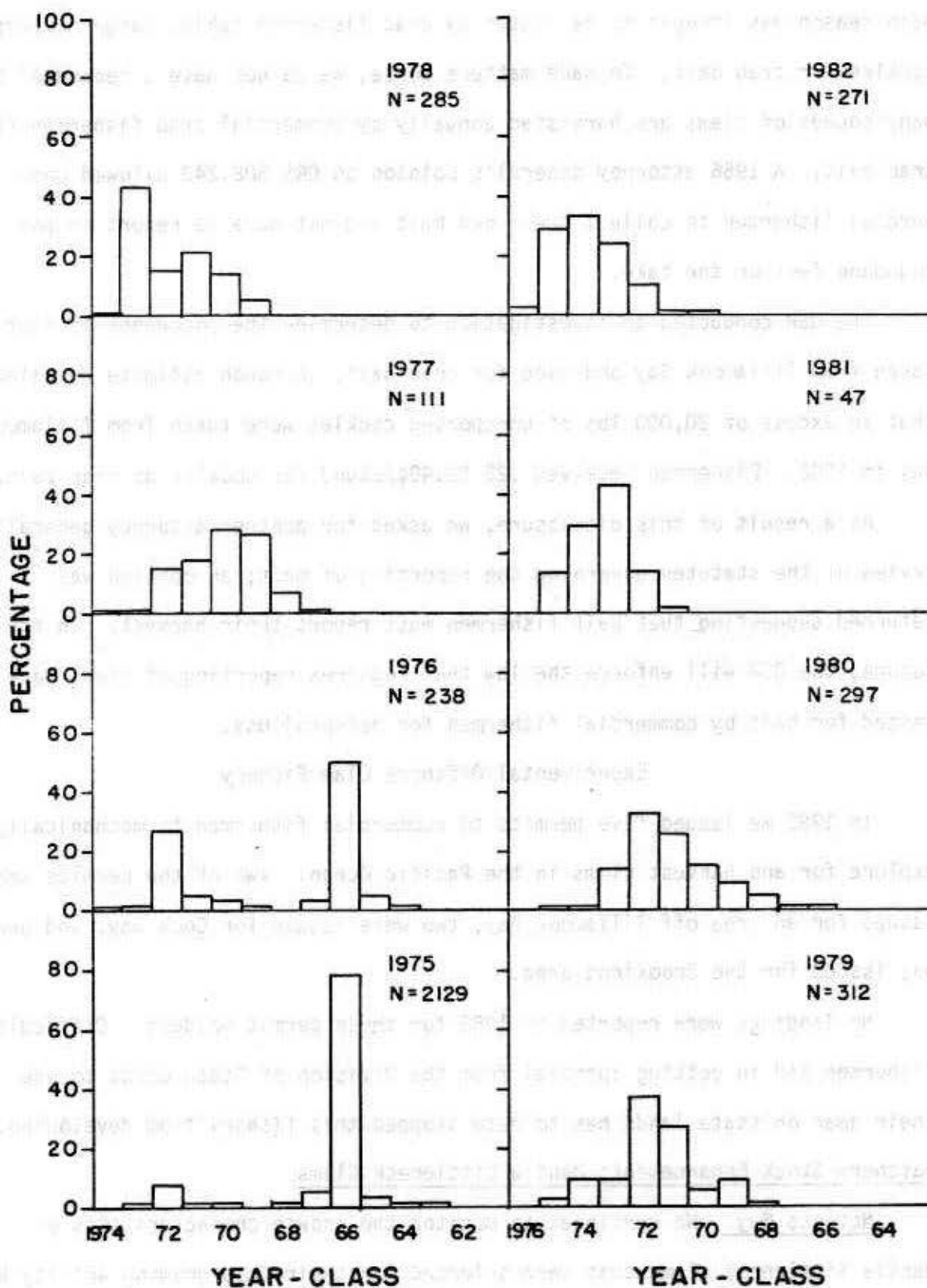


Figure 1. Age Composition of Commercial Subtidal Gaper Clam Harvest, Pigeon Point, Coos Bay, 1975-82.

local commercial clam diggers that cockle clams were becoming scarce. The main reason was thought to be caused by crab fishermen taking large numbers of cockles for crab bait. To make matters worse, we do not have a record of how many pounds of clams are harvested annually by commercial crab fishermen for crab bait. A 1966 attorney general's opinion on ORS 508.240 allowed commercial fishermen to collect their own bait and not have to report or pay poundage fees on the take.

The OSP conducted an investigation to determine the poundages of clams taken from Tillamook Bay and used for crab bait. A rough estimate revealed that in excess of 20,000 lbs of unreported cockles were taken from Tillamook Bay in 1982. Fishermen received .25 to .40¢/pound for cockles as crab bait.

As a result of this disclosure, we asked for another attorney general's review of the statutes governing the reporting of bait; an opinion was returned suggesting that bait fishermen must report their harvest. In the future, the OSP will enforce the law that requires reporting of clams harvested for bait by commercial fishermen for personal use.

Experimental Offshore Clam Fishery

In 1982 we issued five permits to commercial fishermen to mechanically explore for and harvest clams in the Pacific Ocean. Two of the permits were issued for an area off Tillamook Bay, two were issued for Coos Bay, and one was issued for the Brookings area.

No landings were reported in 1982 for these permit holders. Difficulties fishermen had in getting approval from the Division of State Lands to use their gear on state lands has to date stopped this fishery from developing.

Hatchery Stock Enhancement; Manila Littleneck Clams

Netarts Bay. We continued to monitor the growth characteristics of Manila littleneck clams that were selected for their fast growing ability vs.

normal growing clams (Gaumer and Lukas, 1975). We also compared growth of clams in a screened vs. unscreened area.

Results showed that clams spawned in August 1974 from fast growing parent stock grew 2.7 mm from June 1981 to July 1982, and averaged 43.1 mm in size whereas progeny from "normal" clams grew 1.4 mm and averaged 39.8 mm (Figure 2).

Manila clams planted in the fenced test plot averaged 40.4 mm, an increase of 0.2 mm since 1981, whereas clams planted in an adjacent unfenced test plot averaged 42.6 mm, an increase of 1.1 mm. Manilas planted adjacent to an eelgrass bed and at a slightly lower elevation were 48.0 mm in mean length, an increase of 4.2 mm since 1981 (Figure 3). Clams in all three test plots averaged 13.1 mm when released.

A new study was started in June 1982, in Netarts Bay, where 18,000 Manila littleneck clams, averaging 6.9 mm, were planted in a fenced test plot at a density of 100/ft². These clams were progeny of adults collected from the Netarts test area in 1981 and spawned and reared in the OSU laboratory by Wilbur Breese.

These clams will be monitored annually for growth and survival and hopefully will provide brood stock for natural enhancement.

Tillamook Bay. In March 1983, an estimated 2 million Manila littleneck clams were planted in Tillamook Bay adjacent to Hayes Oyster Co. These juvenile clams were the result of Wilbur Breese spawning Puget Sound Manila clams in 1982 and rearing the larvae and juvenile for approximately 8 months at the OSU laboratory. The young clams were released at the plus 1 to 2 foot tide level in a pea gravel/sand dredge spoil site. A 2,400ft² area was hand raked prior to scattering the clams at a density of 800/ft². The clams ranged in size from 1 to 12 mm.

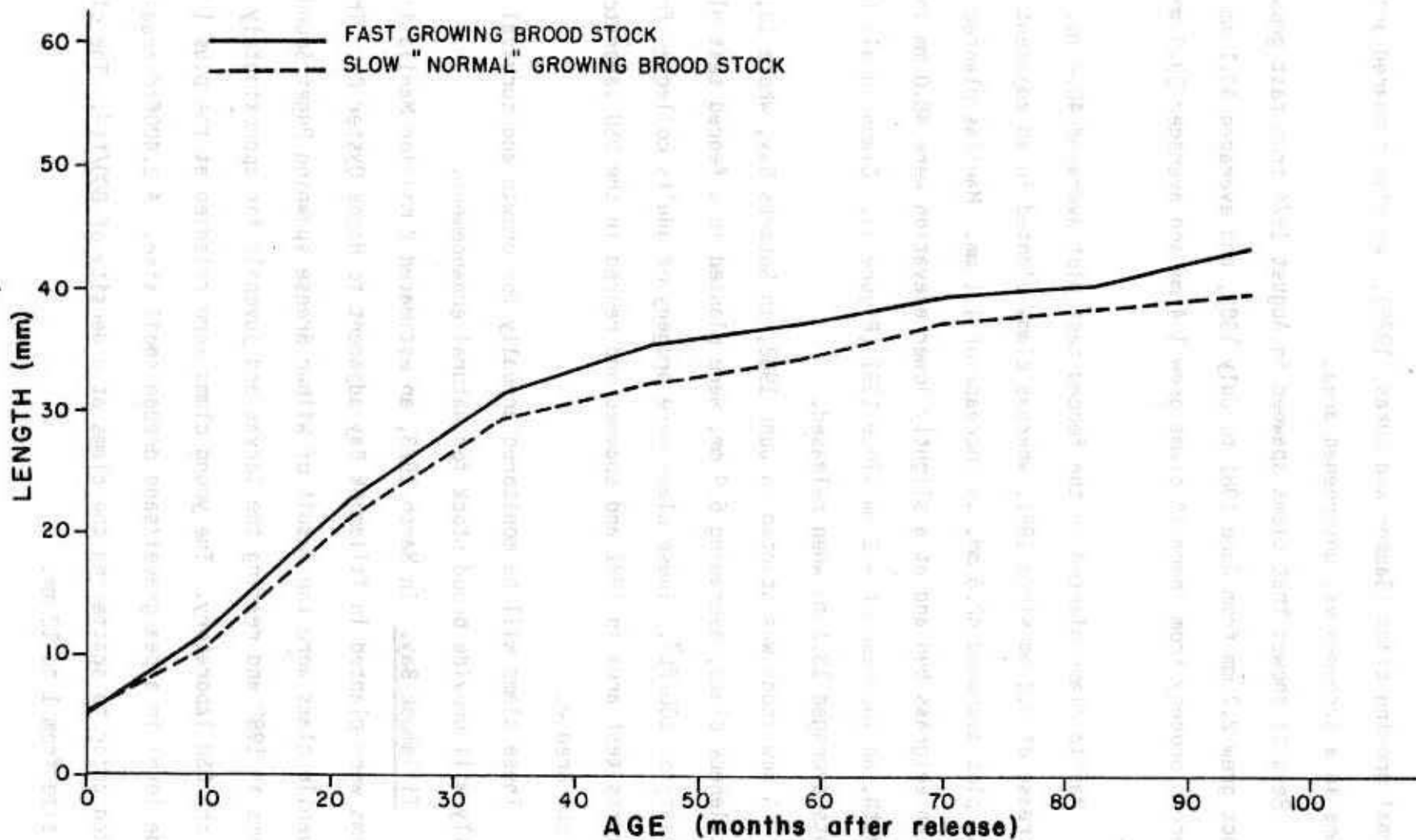


Figure 2. Growth Curve of Manila Littleneck Clams Spawmed and Planked from Normal and Fast Growing Brood Stock, Netarts Bay, 1974.

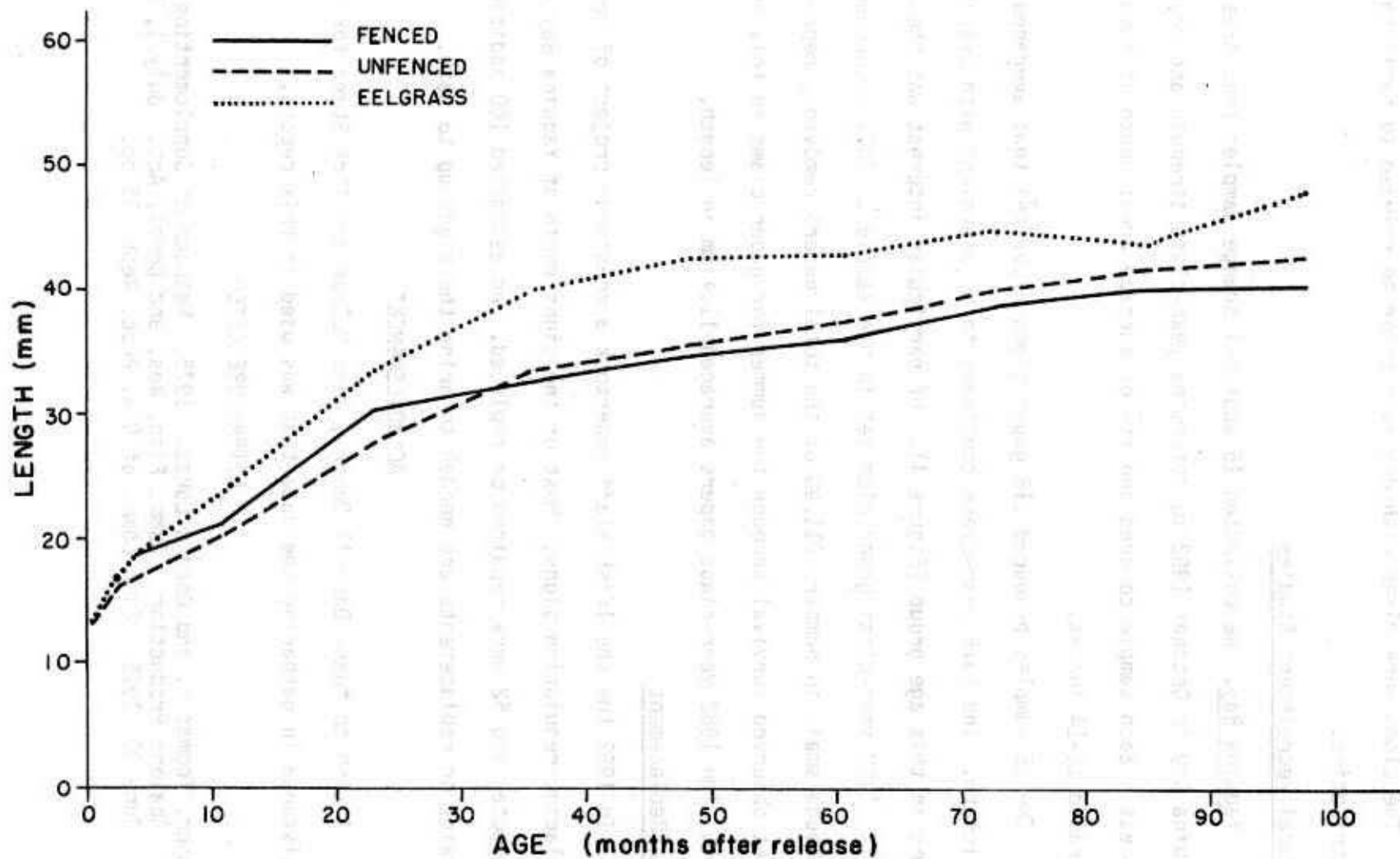


Figure 3. Growth Curve of Manila Littleneck Clams Planted in Fenced and Unfenced and Eelgrass Covered Areas of Netarts Bay, 1974.

The clams were mixed with dry sand prior to release to facilitate even distribution.

Natural Recruitment Studies

Yaquina Bay. We collected 15 subtidal dredge samples from Area 2 of Yaquina Bay in October 1982 to determine year-class strength and recruitment success. Each sample covered one ft² of surface area; depth of samples averaged 12-14 inches.

The 15 samples produced 118 gaper clams (7.9/ft²) that averaged 102.6 mm in length. The 1975 year-class continues to be prevalent with over 56% of the clams in this age group (Figure 4). Of particular interest was the occurrence of 14 1982 year-class gaper clam set in the samples. This occurrence, although small in numbers (11.9% of the total gapers removed), represents the first observed survival through the summer for gaper clams in this area since 1975. The 1982 year-class gapers averaged 11.4 mm in length.

Sign Replacement

In 1982 the shellfish staff undertook a coastwide project of repairing or replacing regulation signs. Most of the signs south of Yaquina Bay were inspected and 52 were repaired or replaced. An estimated 100 additional-repairs or replacements are needed to bring the signs up to date.

ACKNOWLEDGMENT

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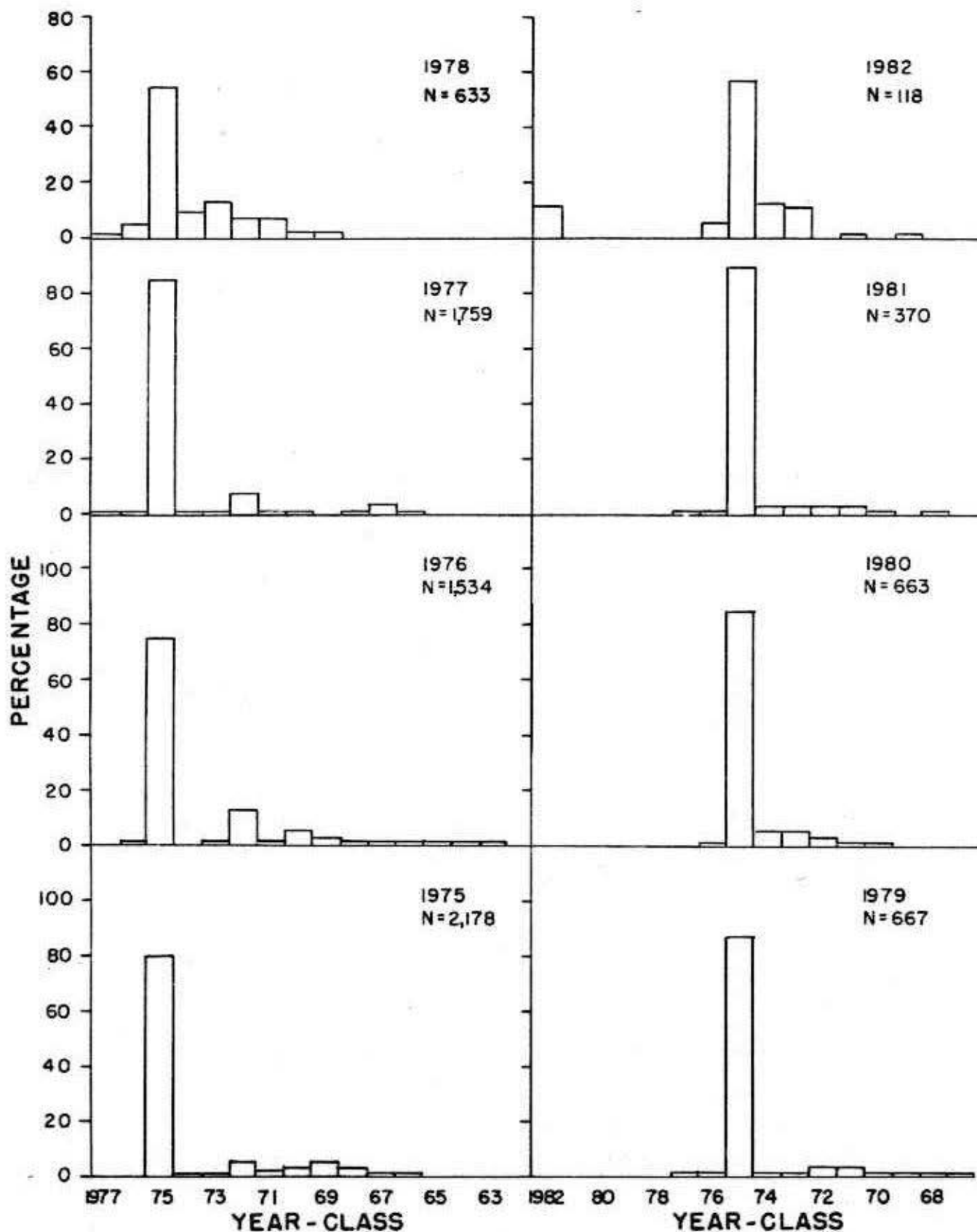


Figure 4. Age Composition of Subtidal Gaper Clams, Area 2, Yaquina Bay, 1975-82.