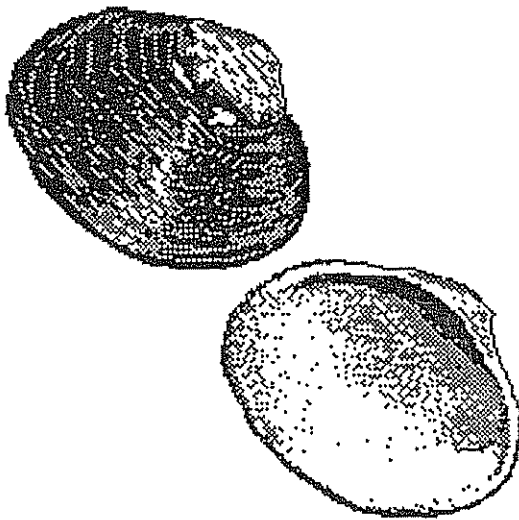


OREGON DEPARTMENT
OF
FISH AND WILDLIFE

BAY CLAM
DATA SERIES REPORT

1987



1987 BAY CLAM DATA SERIES REPORT

by

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Marine Region

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1987 BAY CLAM DATA SERIES REPORT

INTRODUCTION

This report summarizes the results of our bay clam studies in 1987. Activities summarized include recreational and commercial clam fishery monitoring, hatchery stock enhancement, and natural recruitment studies. This report is presented as a series of tables and figures with a minimum of discussion; other reports will evaluate the data presented here. The tables and figures included give a historical overview of clam harvesting activities and are presented in a manner to allow future analysis to show trends or changes in stock status and fishing activities. This report is intended primarily to be an internal document, to be used as a reference by the shellfish staff.

RECREATIONAL CLAM FISHERY

Recreational clam digger interviews are conducted annually on each of the major clam harvesting tideflats of the Tillamook, Netarts, Nestucca, Yaquina, Alsea, Siuslaw, Coos, and Coquille estuaries. Interviews are usually conducted by two shellfish staff members. A count of diggers is made on each tideflat at low tide; this provides a peak digger count for that day.

Currently, an effort is made to visit each tideflat at least two times per season, in the spring and again in midsummer. This is about half of the sampling effort that we expended annually from 1975 to 1984 to collect recreational use data.

We attempt to measure and age a minimum of 100 clams of each species for each tideflat. We measure the height of the cockle clam and the length of the butter, gaper, littleneck, and softshell clams. We age the various species of clams by counting annuli on the shell surface. The total number of annual checks is back-calculated to give year of recruitment.

Interview data collected included catch/effort, digger origin, species, age, and length composition. These data are presented for each tideflat in Appendix Tables 1-28. Table 29 summarizes the recreational activities presented in Tables 1-28 and Table 30 shows the peak counts of clam diggers taken at low tide for each of the surveyed tideflats.

In 1987, we interviewed 1,508 clam diggers that expended 2,154 hours of effort to harvest 25,313 clams (Table 29). The clam diggers averaged 16.8 clams/trip or 11.8 clams/hour. Digging success was slightly poorer in 1987 than in 1986 when 17.7 clams/trip were taken. This decrease was influenced by poorer digging on several major clam beds in Netarts, Yaquina, and Coos bays. Since 1977, when the Commission approved a reduction in bag limit from 36 to 20, clam digger harvest has ranged between 14.7 and 18.8 clams/trip. In 1976, prior to the reduced bag limit, clam diggers averaged 20.9 clams/trip.

As in previous years, most clam diggers traveled some distance to harvest clams. In 1987, 35.6% of the diggers were local county residents, 53.4% were from Oregon but living outside the county of harvest, and 10.9% were out-of-state residents (Table 29). These figures were generally the same as in 1986.

Since 1976, there has been a gradual increase in the percentage of local diggers participating in the fishery, whereas the percentage of out-of-state residents has remained nearly the same.

The cockle clam was the most frequently observed species in the recreational fishery representing 41.7% of the 1987 harvest (Table 29). Gaper, butter, softshell, and littleneck clams comprised 24.0, 15.3, 12.4, and 5.2% of the bag, respectively. These values fluctuate annually but the general trend shows a gradual decline in the gaper and softshell harvest and an increase in the take of cockle and butter clams. Littleneck clams have not shown a trend in the harvest. The reduced occurrence of gaper clams can be partially attributed to poor recruitment of this species in a number of our more popular clam beds, especially at Happy Camp in Netarts Bay.

Length composition data collected for each species shows a gradual increase in mean size for the softshell since 1984, the butter clam since 1985, and the littleneck clam since 1986. Decreases in mean size were observed for the cockle clam since 1985, and the gaper clam since 1986 (Table 29). Data collected on length composition since 1979 revealed only minor variations in overall mean size for each species (Figure 1). Gaper, softshell, butter, cockle, and littleneck clams averaged 107.9 mm, 92.7 mm, 83.0 mm, 61.9 mm, and 53.2 mm in 1987, respectively.

Changes in digging effort through time as reflected by peak digger counts revealed a general increase in digging effort from 1986 for most of the surveyed tideflats (Table 30). The largest

increase in peak digger counts was observed for the North Spit on Coos Bay (83 to 158 diggers). There was no apparent reason observed for this increase in digging activity.

COMMERCIAL CLAM HARVEST

In 1987, we issued 121 permits to commercial fishermen to harvest bay clams. Of this total 34 reported landing 46,283 lb of clams (Table 31). This is about half of the 1986 harvest when 40 clam diggers reported landing 82,609 lb of clams. Of the total clams landed in 1987, 43.6% (20,202 lb) were cockles. Tillamook Bay was the major producer with 81.5% (16,460 lb) of the total cockle harvest. Other clams harvested coastwide were littlenecks (14,140 lb), gapers (6,368 lb), butters (3,046 lb), and softshells (2,527 lb). The continuous decline in harvest of gaper clams since 1982, when 106,440 lb were taken, again illustrates poor recruitment of this species in several of our bays.

Tillamook Bay produced the most clams in 1987 with 22,936 lb reported (Table 32). Nehalem and Coos bays produced 10,723 lb, and 10,214 lb, respectively. Yaquina, Siuslaw, Coquille, and Alsea bays produced minor poundages of clams.

We collected age and length composition data for commercially harvested subtidal native littleneck clams in Nehalem Bay, cockle and littleneck clams in Tillamook Bay, gaper clams in Coos Bay, and intertidal cockle clams in Yaquina Bay. Figure 2 shows that the 1983 and 1984 year-class littleneck clams dominated the Nehalem Bay commercial harvest in 1987. The harvested clams averaged 40.6 mm in length. In 1986, the clams

averaged 41.8 mm in length. Cockle clams harvested subtidally in Tillamook Bay were primarily of the 1982 and 1983 year-classes (Figure 3). Six year-classes were represented in the harvest and the harvested clams averaged 62.8 mm in length. Littleneck clams were dominated by the 1982 year-class in the Tillamook Bay harvest (Figure 4). The clams averaged 48.1 mm in length. In Coos Bay, gaper clams harvested were primarily of the 1975 year-class and averaged 132.9 mm in length (Figure 5). Gapers harvested in 1986 averaged 130.8 mm.

We rarely encountered commercial fishermen harvesting clams intertidally. On one occasion we checked the commercial harvest of a fisherman in Yaquina Bay taking cockles for crab bait. The harvest was dominated by the 1985 year-class and the clams averaged 52.1 mm in length (Figure 6).

SPECIAL STUDIES

Hatchery Stock Enhancement

Tillamook Bay

No Manila clams were planted in Tillamook Bay in 1987. Clams planted in test plots in 1984 and 1985 were sampled for growth and survival. Table 33 summarizes the results of our Manila clam plants in Tillamook Bay since 1971. Of particular interest was the difference in survival of clams placed under Vexar netting as compared to uncovered clams. Covered clams showed a 15.0% survival of juvenile clams, 25 months after release, as compared to 0.3% survival for clams planted with no protection. Clams planted as adults in 1985 had survival rates

...ranging from 52 to 90%, 26 months after release. These clams were planted without protection of Vexar netting.

Yaquina Bay

Manila clam set planted under Vexar netting near King Slough in 1985 revealed a survival rate of 72%, 20 months later (Table 34). These clams, 18.1 mm when planted, averaged 41.2 mm in length.

During 1987, we sampled each of the 14 test plots established in 1986 to determine if various introduced substrate materials could impact survival of Manila clam set (Gaumer 1990). Also tested was the impact of 1/2-inch Vexar netting on clam survival.

Preliminary results of our tests revealed that at the 95% confidence level survival of clams released under netting was not significantly different than for those left uncovered whereas substrate material did have a highly significant impact on survival of clams (Table 35). When comparisons in survival of clams were made between substrate types, highly significant differences were recorded especially for clams released in a substrate containing a combination of pea gravel and ground oyster shell (Tables 36-37). No significant differences in clam survival were realized for clams releases in any of the other sediments or combination of sediment types.

In 1987, we continued to release hatchery produced Manila littleneck clams in Yaquina Bay near King Slough (Figure 7). We placed an estimated 100,000 clams averaging 6.7 mm and at a

density of 100/sq ft under Vexar netting and 20,000 were planted with no protection.

Coos Bay

Table 38 shows the results of our Manila littleneck clam plants in Coos Bay since 1973. We sampled the 1984, 1985, and 1986 planted clams in 1987 and recorded survival rates ranging from 0.8% to 88.7%. The poorest survival (0.8%) was for clams planted without Vexar protection near Valino Island. Clams released nearby under Vexar netting, produced a survival rate of 34.4%.

Natural Recruitment Studies

Yaquina Bay

We collected 11 subtidal dredge samples from an 18.4 acre area in Yaquina Bay in September 1987 to determine year-class strength, recruitment success, and population and biomass estimates (Figure 8). Each sample covered 1 sq ft of surface area; depth of samples averaged 12-14 inches.

The 11 samples produced 104 gaper clams (9.5/sq ft) that averaged 117.5 mm in length. No evidence of recruitment of gaper clams was observed nor were any 1979-86 year-class clams recovered from the area. The 1975 year-class continued to dominate the standing crop comprising 56.7% of the 1987 sample (Figure 9). We estimated that 7.6 million gapers, weighing 6.5 million lb, inhabited the area (Table 39).

Netarts Bay

In addition to the subtidal samples taken in Yaquina Bay, we collected five 1 sq ft intertidal samples in Netarts Bay to

determine recruitment success. Each sample averaged 3 inches in depth and was washed through a 3 mm sieve.

The five samples produced five 1987 year-class gaper clams (1.0/sq ft) (Figure 10). These clams averaged 5.7 mm in length. No evidence of 1986 year-class gapers was observed in the samples.

SIGN REPLACEMENT

In 1987, the shellfish staff continued a coastwide project of repairing or replacing regulation signs. We currently are maintaining 187 signs along the Oregon coast.

ACKNOWLEDGMENTS

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Table 1. Annual summary of recreational interview data; Garibaldi Flat, Tillamook Bay.

	1963	1965	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	758	319	13,048	104	207	252	239	597	456	359	219	132	200	107	290	277
No. Clams Sampled	19,053	8,414	389,946	2,472	4,825	4,647	4,631	11,104	8,728	6,558	4,249	2,471	3,729	2,128	5,598	5,491
No. Digger Hours	-	-	20,439	-	283	336	261	715	549	443	220	158	243	143	311	312
Hours/trip	-	-	1.6	-	1.4	1.3	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.1	1.1
Clams/trip	25.1	22.9	29.9	23.8	23.3	18.4	19.4	18.6	19.1	18.3	19.4	18.7	18.7	19.9	19.3	19.8
Clams/hour	-	-	19.1	-	17.0	13.8	17.7	15.5	15.9	14.0	14.6	15.6	15.4	14.9	18.0	17.6
Digger Origin (%)																
Local	-	38.0	21.0	-	32.9	27.8	33.1	30.2	22.4	27.6	38.8	37.7	30.0	28.0	17.9	23.5
State	-	62.0	73.0	-	57.0	57.3	55.2	64.7	72.6	63.5	57.1	46.9	67.5	66.4	78.6	67.9
Non-state	-	-	-	-	-	-	-	-	-	-	4.1	15.4	2.5	5.6	3.4	8.7
Species Comp. (%)																
Butter	27.0	-	16.3	20.7	18.2	10.5	11.5	13.5	28.7	42.8	45.8	39.7	38.8	39.5	32.9	41.6
Cockle	45.0	-	16.8	43.4	28.5	46.7	66.6	64.0	46.5	24.2	27.4	27.4	28.5	43.2	51.0	48.7
Gaper	7.0	-	5.4	5.3	18.5	17.2	7.1	9.6	7.1	5.7	6.0	4.5	0.7	1.8	1.0	1.3
Littleneck	21.0	-	60.8	29.7	34.7	24.9	14.7	12.7	17.7	27.2	20.8	28.4	32.1	15.4	15.1	8.0
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip																
Butter	6.8	-	5.0	4.9	4.2	1.9	2.2	2.5	5.5	7.8	8.9	7.4	7.2	7.9	6.3	8.2
Cockle	11.3	-	4.9	10.3	6.6	8.6	12.9	11.9	8.9	4.4	5.3	5.1	5.3	8.6	9.9	9.7
Gaper	1.8	-	1.6	1.3	4.3	3.2	1.4	1.8	1.4	1.4	1.2	0.9	0.1	0.4	0.2	0.2
Littleneck	5.3	-	18.4	7.0	8.1	4.6	2.8	2.4	3.4	5.0	4.0	5.3	6.0	3.1	2.9	1.6
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour																
Butter	-	-	3.2	-	3.1	1.5	2.0	2.1	4.6	6.3	6.7	6.2	6.0	5.9	5.9	7.3
Cockle	-	-	3.1	-	4.9	6.5	11.8	9.9	7.4	3.6	4.0	4.3	4.4	6.5	9.2	8.6
Gaper	-	-	1.1	-	3.2	2.4	1.3	1.5	1.1	0.9	0.9	0.7	0.1	0.3	0.2	0.2
Littleneck	-	-	11.7	-	5.9	3.5	2.6	2.0	2.8	4.0	3.0	4.4	4.9	2.3	2.7	1.4
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)																
Butter	-	-	-	77.3	81.6	83.8	83.0	72.3	64.8	70.6	70.3	68.8	78.4	71.4	75.5	79.4
Cockle	-	-	-	63.9	64.3	55.9	55.2	60.9	55.0	56.9	60.1	54.0	52.8	58.9	58.7	60.6
Gaper	-	-	-	67.5	56.8	69.3	82.0	84.2	90.2	91.3	114.1	107.9	108.0	106.9	99.4	67.9
Littleneck	-	-	-	36.7	36.8	39.4	38.2	38.5	36.5	39.5	38.0	37.0	38.3	39.5	39.9	40.4
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured																
Butter	-	-	-	219	536	394	145	555	304	413	379	481	203	241	231	110
Cockle	-	-	-	290	978	1,517	637	1,501	535	254	389	407	240	267	360	88
Gaper	-	-	-	74	349	538	84	327	111	81	7	21	2	17	5	31
Littleneck	-	-	-	297	518	862	233	171	187	251	392	461	236	131	322	142
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Table 2. Annual summary of recreational interview data; Bay Ocean, Tillamook Bay.

	1971	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	10,379	94	170	38	79	119	34	13	11	11	17	31	2
No. Clams Sampled	216,728	2,242	2,664	574	1,063	1,465	314	1	63	161	314	557	-
No. Digger Hours	16,156	171	333	70	146	216	58	17	16	12	23	38	2
Hours/trip	1.6	1.8	2.0	1.9	1.8	1.8	1.7	1.3	1.6	1.1	1.4	1.2	1.0
Clams/trip	20.9	23.9	15.7	15.1	13.5	12.3	9.2	<0.1	5.7	14.6	18.5	18.0	-
Clams/hour	13.4	13.1	8.0	8.2	7.3	6.8	5.5	<0.1	3.9	13.4	13.7	14.7	-
Digger Origin (%)													
Local	21.0	20.2	14.7	13.2	10.1	21.8	20.6	15.4	-	18.2	11.8	25.8	100.0
State	73.0	74.5	79.0	76.3	89.9	73.1	70.6	84.6	72.7	81.8	88.2	64.5	-
Non-state	16.0	5.3	6.5	10.5	-	5.0	8.8	-	27.3	-	-	9.7	-
Species Comp. (%)													
Butter	<0.1	0.1	0.6	-	-	0.4	-	-	-	-	21.7	27.8	-
Cockle	85.0	85.8	78.5	87.2	91.4	89.6	74.2	-	95.2	100.0	45.2	49.2	-
Gaper	8.8	12.3	17.5	12.2	8.0	7.1	1.3	-	-	-	33.1	20.1	-
Littleneck	1.3	0.1	0.8	-	0.1	0.5	1.3	-	-	-	-	2.9	-
Softshell	-	-	-	-	-	-	-	100.0	-	-	-	-	-
Clams/trip													
Butter	<0.1	<0.1	0.1	-	-	<0.1	-	-	-	-	4.0	5.0	-
Cockle	17.1	20.5	12.3	13.2	12.3	11.0	6.9	-	5.5	14.6	8.4	8.8	-
Gaper	1.8	2.9	2.7	1.8	1.1	0.9	0.1	-	-	-	6.1	3.6	-
Littleneck	0.3	<0.1	0.1	-	<0.1	<0.1	0.1	-	-	-	-	0.5	-
Softshell	-	-	-	-	-	-	-	<0.1	-	-	-	-	-
Clams/hour													
Butter	<0.1	<0.1	<0.1	-	-	<0.1	-	-	-	-	3.0	4.1	-
Cockle	11.0	11.3	6.3	7.1	6.7	6.1	4.1	-	3.8	13.4	6.2	7.2	-
Gaper	1.1	1.6	1.4	1.0	0.6	0.5	0.1	-	-	-	4.5	2.9	-
Littleneck	0.2	<0.1	0.1	-	<0.1	0.1	-	-	-	-	-	0.4	-
Softshell	-	-	-	-	-	-	-	<0.1	-	-	-	-	-
Size Comp. (x size)													
Butter	-	-	-	-	-	-	-	-	-	-	78.2	75.4	-
Cockle	-	66.0	66.1	64.0	68.4	71.2	60.6	-	67.6	69.8	68.6	71.0	-
Gaper	-	110.6	107.9	104.7	109.3	106.2	105.5	-	-	95.0	110.6	101.4	-
Littleneck	-	-	-	-	42.0	-	37.0	-	-	38.0	-	46.0	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured													
Butter	-	-	-	-	-	-	-	-	-	-	17	165	-
Cockle	-	1,075	781	318	525	277	213	-	59	77	122	182	-
Gaper	-	224	118	68	79	44	4	-	-	24	70	98	-
Littleneck	-	-	-	-	-	-	4	-	-	2	-	16	-
Softshell	-	-	-	-	-	-	-	1	-	-	-	-	-

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

Table 3. Annual summary of recreational interview data; Boat Basin, Tillamook Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	9	57	14	27	18
No. Clams Sampled	224	1,033	273	539	360
No. Digger Hours	22	78	21	57	19
Hours/trip	2.4	1.4	1.5	2.1	1.1
Clams/trip	24.9	18.1	19.5	20.0	20.0
Clams/hour	10.4	13.3	13.3	9.5	18.9
Digger Origin (%)					
Local	22.2	21.1	50.0	7.4	50.0
State	77.8	71.9	50.0	92.6	50.0
Non-state	-	7.0	-	-	-
Species Comp. (%)					
Butter	24.6	17.8	-	25.6	53.6
Cockle	34.8	28.3	98.9	73.1	40.0
Gaper	8.5	26.9	1.1	1.3	6.4
Littleneck	32.1	27.0	-	-	-
Softshell	-	-	-	-	-
Clams/trip					
Butter	6.1	3.2	-	5.1	10.7
Cockle	8.7	5.1	19.3	14.6	8.0
Gaper	2.1	4.9	0.2	0.3	1.3
Littleneck	8.0	4.9	-	-	-
Softshell	-	-	-	-	-
Clams/hour					
Butter	2.6	2.4	-	2.6	10.2
Cockle	3.6	3.8	13.2	6.9	7.6
Gaper	0.9	3.6	0.1	0.1	1.2
Littleneck	3.3	3.6	-	-	-
Softshell	-	-	-	-	-
Size Comp. (x size)					
Butter	-	75.6	-	97.2	83.0
Cockle	69.2	60.5	101.7	70.4	69.2
Gaper	98.8	98.4	105.5	-	127.0
Littleneck	37.8	42.1	-	-	-
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	-	47	-	21	57
Cockle	78	59	205	39	44
Gaper	18	14	2	-	23
Littleneck	67	28	-	-	-
Softshell	-	-	-	-	-

Table 4. Annual summary of recreational interview data; Happy Camp, Netarts Bay.

	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	5,106	18	141	187	146	222	106	71	168	280	84	99	60	103
No. Clams Sampled	85,230	164	1,709	2,727	1,747	2,823	1,293	991	2,020	2,994	1,009	1,010	579	709
No. Digger Hours	6,613	-	193	254	149	204	68	67	151	290	84	124	92	205
Hours/trip	1.3	-	1.4	1.4	1.0	0.9	0.6	0.9	0.9	1.0	1.0	1.3	1.5	2.0
Clams/trip	16.7	9.1	12.1	14.6	12.0	12.7	12.2	12.9	12.0	10.7	12.0	10.2	9.7	6.9
Clams/hour	12.9	-	8.9	10.7	11.7	13.8	19.1	14.8	13.4	10.3	12.0	8.1	6.3	3.5
Digger Origin (%)														
Local	17.6	-	29.1	14.9	11.0	28.4	17.9	40.3	48.2	22.5	29.8	32.3	31.7	10.7
State	74.8	-	66.0	75.9	71.2	59.9	73.6	50.6	44.0	72.9	64.3	53.5	66.7	87.4
Non-state	7.6	-	5.0	9.1	17.8	11.7	8.5	9.1	7.7	4.6	6.0	14.1	1.7	1.9
Species Comp. (%)														
Butter	2.6	47.1	20.8	9.2	5.8	7.7	5.4	13.7	5.0	0.7	3.7	4.0	7.9	15.9
Cockle	1.0	-	0.1	21.9	-	-	0.1	-	<0.1	0.1	4.0	0.4	2.1	2.1
Gaper	95.7	36.6	73.6	62.5	91.0	90.3	92.5	82.7	94.3	98.5	89.5	93.6	84.6	73.1
Littleneck	0.8	15.9	5.3	5.4	3.1	0.2	2.0	3.4	0.6	0.8	2.9	2.1	5.4	8.3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip														
Butter	0.4	3.3	2.5	1.3	0.7	1.0	0.7	1.8	0.6	0.1	0.4	0.4	0.8	1.1
Cockle	0.2	-	<0.1	3.2	-	-	<0.1	-	<0.1	<0.1	0.5	<0.1	0.2	0.1
Gaper	16.0	4.3	8.9	9.1	10.9	11.5	11.3	10.6	11.3	10.5	10.8	9.5	8.2	5.0
Littleneck	0.1	1.4	0.6	0.8	0.4	0.2	0.2	0.4	0.1	0.1	0.4	0.2	0.5	0.6
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour														
Butter	0.3	-	1.8	1.0	0.7	1.1	1.0	2.0	0.7	0.1	0.4	0.3	0.5	0.6
Cockle	0.1	-	<0.1	2.3	-	-	<0.1	-	<0.1	<0.1	0.5	<0.1	0.1	0.1
Gaper	12.3	-	6.5	6.7	10.7	12.5	17.7	12.3	12.7	10.2	10.8	7.6	5.3	2.5
Littleneck	0.1	-	0.5	0.6	0.4	0.3	0.4	0.5	0.1	0.1	0.4	0.2	0.3	0.3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)														
Butter	-	102.8	100.2	103.0	103.2	107.2	105.9	109.7	102.5	82.0	101.8	103.5	105.2	109.5
Cockle	-	-	-	-	-	-	-	-	-	31.0	-	54.0	47.6	-
Gaper	93.2	112.1	96.3	86.1	87.5	92.1	93.6	98.9	97.7	101.9	100.3	106.6	111.7	114.0
Littleneck	-	65.3	67.6	70.0	70.1	73.6	66.7	71.3	70.7	55.8	70.2	67.2	65.6	65.7
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured														
Butter	-	66	219	-	-	-	24	109	62	6	32	20	45	26
Cockle	-	190	-	-	-	-	-	-	-	1	-	1	8	-
Gaper	282	190	643	557	921	417	468	454	565	338	240	436	405	20
Littleneck	-	43	99	28	54	34	3	22	9	4	29	12	28	27
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Table 5. Annual summary of recreational interview data; Cape Lookout Sand Spit, Netarts Bay.

	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	6,473	43	76	509	72	85	63	80	56	118	71	52	42	71
No. Clams Sampled	115,811	1,038	2,433	9,293	1,324	1,560	1,074	1,397	1,029	2,174	1,362	1,040	819	1,409
No. Digger Hours	8,656	-	148	1,055	149	178	89	150	83	197	87	85	92	151
Hours/trip	1.3	-	1.9	2.1	2.1	2.1	1.4	1.9	1.5	1.7	1.2	1.6	2.2	2.1
Clams/trip	17.9	24.1	32.0	18.3	18.4	18.4	17.0	17.5	18.4	18.4	19.2	20.0	19.5	19.8
Clams/hour	13.4	-	16.5	8.8	8.9	8.8	12.1	9.3	12.4	11.1	15.8	12.2	9.0	9.4
Digger Origin (%)														
Local	17.6	-	23.7	23.1	22.2	36.5	17.5	12.5	44.6	38.1	43.7	53.8	31.0	26.8
State	74.8	-	76.3	66.6	77.8	61.2	76.2	81.3	51.8	53.4	52.1	44.2	40.5	62.0
Non-state	7.6	-	-	10.6	-	2.3	6.3	7.5	3.6	8.5	4.2	1.9	28.6	11.3
Species Comp. (%)														
Butter	38.4	49.0	15.8	6.6	2.0	5.5	1.9	7.7	0.3	11.0	11.0	16.0	7.0	10.6
Cockle	44.4	46.0	76.9	72.3	72.7	74.4	93.3	76.7	84.9	80.4	78.0	82.1	89.5	83.1
Gaper	8.9	2.7	3.7	15.3	22.4	16.0	4.8	13.3	12.1	5.9	9.0	0.2	3.4	3.2
Littleneck	6.9	1.3	3.2	2.1	1.3	3.8	-	1.9	2.6	2.6	0.1	1.7	0.1	0.9
Softshell	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
Clams/trip														
Butter	6.9	11.8	5.1	1.2	0.4	1.0	0.3	1.4	0.1	2.0	2.1	3.2	1.4	2.1
Cockle	8.0	11.1	24.6	13.2	13.4	13.6	15.9	13.4	15.6	14.8	15.0	16.4	17.5	16.5
Gaper	1.6	0.7	1.2	2.8	4.1	2.9	0.8	2.3	2.2	1.1	1.7	-	0.7	0.6
Littleneck	1.2	0.3	1.0	0.4	0.2	0.7	-	0.3	0.5	0.5	<0.1	0.3	-	0.2
Softshell	-	-	-	-	-	-	-	-	-	-	0.4	-	-	-
Clams/hour														
Butter	5.1	-	2.6	0.6	0.2	0.5	0.2	0.7	<0.1	1.2	1.7	2.0	0.6	1.0
Cockle	5.9	-	12.7	6.4	6.5	6.5	11.3	7.2	10.5	8.9	12.3	10.0	8.0	7.8
Gaper	1.2	-	0.6	1.3	2.0	1.4	0.6	1.2	1.5	0.7	1.4	-	0.3	0.3
Littleneck	0.9	-	0.5	0.2	0.1	0.3	-	0.2	0.3	0.3	<0.1	0.2	-	0.1
Softshell	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-
Size Comp. (x size)														
Butter	84.5	80.3	71.8	74.1	76.9	80.4	75.6	74.2	67.7	68.8	72.2	68.8	69.0	76.0
Cockle	65.4	73.3	73.0	75.7	72.7	75.2	72.2	72.0	71.3	69.5	70.0	75.2	72.3	71.2
Gaper	108.1	80.4	87.4	103.4	100.5	91.7	110.7	104.7	119.0	117.7	75.1	-	128.0	101.2
Littleneck	-	57.8	-	-	57.9	53.7	-	53.3	49.5	42.2	52.5	57.1	47.0	56.4
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured														
Butter	32	237	294	80	11	86	20	49	3	27	133	110	49	151
Cockle	245	257	674	851	555	812	525	486	534	238	240	542	277	223
Gaper	52	257	36	170	144	191	44	48	71	15	18	-	12	4
Littleneck	-	31	-	-	12	60	-	13	26	53	2	14	1	5
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Table 6. Annual summary of recreational interview data; Little Nestucca Flat, Nestucca Bay.

	1971	1977 ¹	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	1,466	34	16	38	23	22	22	62	23	14	2
No. Clams Sampled	23,211	1,049	484	1,120	357	653	623	1,386	561	431	57
No. Digger Hours	1,584	43	21	72	27	31	34	94	38	27	6
Hours/trip	1.1	1.3	1.3	1.9	1.2	1.4	1.5	1.5	1.7	1.9	3.0
Clams/trip	15.8	30.9	30.3	29.5	15.5	29.7	28.3	22.4	24.4	30.8	28.5
Clams/hour	14.7	24.4	23.2	15.6	13.2	21.4	18.6	14.7	14.8	16.3	9.5
Digger Origin (%)											
Local	12.4	52.9	18.8	-	13.0	4.5	18.2	21.0	4.3	42.9	100.0
State	73.5	47.1	62.5	86.8	87.0	86.4	77.3	59.7	52.2	57.1	-
Non-state	14.1	-	18.8	13.2	-	9.1	4.6	19.4	43.5	-	-
Species Comp. (%)											
Butter	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-
Softshell	100	100	100	100	100	100	100	100	100	100	100
Clams/trip											
Butter	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-
Softshell	15.8	30.9	30.3	29.5	15.5	29.7	28.3	22.4	24.4	30.8	28.5
Clams/hour											
Butter	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-
Softshell	14.7	24.4	23.2	15.6	13.2	21.4	18.6	14.7	14.8	16.3	9.5
Size Comp. (x size)											
Butter	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-
Softshell	-	86.0	84.2	79.9	78.3	75.6	80.5	76.6	76.8	72.9	-
No. Clams Measured											
Butter	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-
Softshell	-	250	332	254	163	547	300	240	132	116	-

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

Table 7. Annual summary of recreational interview data; Bridge Bed, Yaquina Bay.

	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	4,518	88	29	357	89	143	142	342	149	202	191	207	120	110
No. Clams Sampled	41,769	694	414	2,838	892	1,313	1,222	3,773	1,609	1,543	1,383	1,765	1,363	960
No. Digger Hours	6,769	-	36	488	110	120	160	354	154	274	265	304	153	160
Hours/trip	1.5	-	1.2	1.4	1.2	0.8	1.1	1.0	1.0	1.4	1.4	1.5	1.3	1.5
Clams/trip	9.2	7.9	14.3	7.9	10.0	9.2	8.6	11.0	10.8	7.6	7.2	8.5	11.4	8.7
Clams/hour	6.2	-	11.7	5.8	8.1	10.9	7.7	10.7	10.4	5.6	5.2	5.8	8.9	6.0
Digger Origin (%)														
Local	-	-	31.0	19.6	24.7	22.4	18.3	44.7	48.3	32.2	45.5	34.3	25.8	32.7
State	-	-	48.3	70.9	69.7	76.2	70.4	49.1	48.3	67.8	49.7	62.8	72.5	64.5
Non-state	-	-	20.7	9.5	4.5	1.4	11.3	6.1	3.4	-	4.7	2.9	1.7	2.7
Species Comp. (%) other ²	-	-	-	-	-	-	-	-	-	-	7.8	13.2	-	-
Butter	0.2	0.8	0.2	0.8	0.6	0.2	1.7	0.8	1.9	3.2	2.4	5.8	4.3	4.4
Cockle	79.4	42.1	72.2	45.4	24.6	7.9	1.4	15.7	7.2	12.9	5.2	11.2	14.4	2.8
Gaper	19.5	54.8	24.6	43.6	72.1	89.6	94.8	81.0	85.4	72.9	80.1	62.4	65.1	83.6
Littleneck	0.8	2.3	1.4	1.4	1.1	0.4	2.1	1.7	4.5	2.8	4.5	7.4	2.6	5.3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip														
Butter	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.3	0.2	0.5	0.5	0.4
Cockle	7.3	3.3	10.3	3.6	2.5	0.7	<0.1	1.7	0.8	1.0	0.4	1.0	1.6	0.6
Gaper	1.8	4.3	3.5	3.5	7.2	8.2	8.2	8.9	9.2	5.6	5.8	5.3	7.4	7.3
Littleneck	<0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.5	0.2	0.3	0.6	0.3	0.5
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour														
Butter	<0.1	-	<0.1	<0.1	0.1	<0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.4	0.3
Cockle	4.9	-	8.4	2.6	2.0	0.9	0.1	1.1	0.8	0.7	0.3	0.6	1.3	0.2
Gaper	1.2	-	2.9	2.5	5.9	9.8	7.3	8.6	8.9	4.1	4.2	3.6	5.8	5.0
Littleneck	-	-	-	-	-	-	-	-	-	0.2	0.2	0.4	0.2	0.3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)														
Butter	-	-	-	-	-	67.5	71.9	72.5	80.4	74.0	78.9	81.0	84.1	85.4
Cockle	60.5	49.3	46.7	57.5	69.9	66.8	55.8	57.4	65.1	66.9	73.2	56.4	64.4	60.7
Gaper	-	107.1	115.5	95.0	101.7	96.8	100.0	107.7	105.9	104.6	105.6	108.9	106.3	105.2
Littleneck	-	60.3	-	-	-	51.5	62.2	54.7	54.7	52.4	55.9	64.0	62.3	57.1
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured														
Butter	-	-	-	-	-	-	14	20	5	35	12	23	22	29
Cockle	-	276	205	592	202	51	6	536	86	138	41	67	57	7
Gaper	-	316	62	593	154	279	419	1,370	308	406	200	266	362	135
Littleneck	-	12	-	-	-	2	19	55	9	34	24	49	18	26
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹ Regulation change in bag limit; effective January 1, 1977.² Bentnose 7.0%, Inquinata 0.2%, other 0.6%.

Table 8. Annual summary of recreational interview data; Breakwater Bed, Yaquina Bay.

	1971	1975	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	1,455	46	48	20	10	21	16	14	17	63	39	31	65
No. Clams Sampled	22,175	515	511	270	142	261	166	157	190	654	489	303	125
No. Digger Hours	2,179	-	69	22	20	44	27	21	24	103	51	34	105
Hours/trip	1.5	-	1.4	1.1	2.0	2.1	1.7	1.5	1.4	1.6	1.3	1.1	1.6
Clams/trip	15.2	11.2	10.6	13.5	14.2	12.4	10.4	11.2	11.2	10.4	12.5	9.8	14.2
Clams/hour	10.2	-	7.4	12.6	7.1	5.9	6.1	7.7	7.9	6.4	9.7	8.9	8.9
Digger Origin (%)													
Local	-	-	35.4	55.0	30.0	28.6	18.8	71.4	52.9	30.2	61.5	32.3	55.4
State	-	-	64.6	45.0	-	71.4	50.0	28.6	47.1	66.7	33.3	67.7	41.5
Non-state	-	-	-	-	-	-	31.3	-	-	3.2	5.1	-	3.1
Species Comp. (%) other ²	-	-	-	-	-	-	-	-	-	15.9	2.9	-	-
Butter	1.2	1.5	1.4	0.7	-	6.5	1.8	2.5	1.1	5.8	3.7	7.3	3.0
Cockle	15.3	3.9	18.2	13.7	7.0	11.1	19.9	1.9	8.4	4.0	4.1	3.6	19.0
Gaper	83.0	95.0	78.9	84.4	84.5	81.2	75.3	94.9	85.8	71.6	87.5	82.8	73.4
Littleneck	0.4	0.2	0.8	0.4	-	1.1	1.2	0.6	0.5	2.8	1.8	5.9	4.5
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip													
Butter	0.2	<0.1	0.1	0.1	-	0.8	0.2	0.3	0.1	0.6	0.5	0.7	0.4
Cockle	2.3	0.4	1.9	1.8	1.0	1.4	2.1	0.2	0.9	0.4	0.5	0.4	2.7
Gaper	12.7	10.6	-	-	-	10.1	7.8	10.6	9.6	7.4	11.0	8.1	10.4
Littleneck	<0.1	<0.1	0.1	0.1	-	0.1	0.1	0.1	0.1	0.3	0.2	0.6	0.6
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour													
Butter	0.1	-	0.1	0.1	-	0.4	0.1	0.2	0.1	0.4	0.4	0.6	0.3
Cockle	1.6	-	1.3	1.7	0.5	0.6	1.2	0.1	0.7	0.3	0.4	0.3	1.7
Gaper	8.4	-	5.8	10.6	6.0	4.8	4.6	7.3	6.8	4.6	8.5	7.4	6.5
Littleneck	<0.1	-	0.1	0.1	-	0.1	0.1	<0.1	<0.1	0.2	0.2	0.5	0.4
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)													
Butter	<0.1	-	0.1	<0.1	<0.1	85.3	-	-	97.0	82.3	78.2	80.0	88.8
Cockle	75.6	-	72.5	76.1	-	-	62.6	-	81.6	70.1	69.6	67.2	65.5
Gaper	113.8	116.2	123.3	118.9	-	109.1	106.4	106.4	100.7	96.3	104.7	108.9	111.8
Littleneck	-	-	-	-	-	64.0	-	-	51.0	52.0	55.6	56.6	59.9
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured													
Butter	-	-	-	-	-	16	-	4	1	36	14	22	20
Cockle	-	-	-	79	37	-	27	3	12	32	16	11	129
Gaper	-	310	198	207	-	195	69	142	109	200	265	176	162
Littleneck	-	-	-	-	-	3	-	1	1	20	8	18	33
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-

¹ Regulation change in bag limit; effective January 1, 1977.² Bentnose Clam.

Table 9. Annual summary of recreational interview data; Idaho Point, Yaquina Bay.

	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	10,462	123	42	309	20	193	182	147	80	138	52	26	47	47
No. Clams Sampled	138,784	2,600	812	3,773	298	2,783	3,118	2,339	1,219	2,171	890	403	849	741
No. Digger Hours	15,621	-	77	464	25	248	302	222	145	219	83	42	77	52
Hours/trip	1.5	-	1.8	1.5	1.3	1.3	1.7	1.5	1.8	1.6	1.6	1.6	1.6	1.1
Clams/trip	13.3	21.1	19.3	12.2	14.9	14.4	17.1	15.9	15.2	15.7	17.1	15.5	18.1	15.8
Clams/hour	8.9	-	10.6	8.1	11.8	11.2	10.3	10.5	8.4	9.9	10.7	9.6	11.0	14.4
Digger Origin (%)														
Local	-	-	35.7	12.3	45.0	31.6	28.6	15.6	18.8	9.4	21.2	50.0	21.3	38.3
State	-	-	33.3	84.1	50.0	62.7	65.4	70.7	81.3	85.5	76.9	42.3	72.3	38.3
Non-state	-	-	31.0	3.6	5.0	5.7	6.0	13.6	-	5.1	1.9	7.7	6.4	23.4
Species Comp. (%) other ²														
Butter	0.03	<0.1	0.5	0.5	-	1.7	-	0.1	-	0.4	0.6	-	-	-
Cockle	77.7	93.2	72.5	78.5	83.9	70.2	87.2	93.4	95.0	85.5	97.1	99.0	93.9	99.3
Gaper	21.7	5.8	18.4	13.1	15.1	20.7	12.8	4.1	2.9	2.8	1.6	-	5.4	0.1
Littleneck	0.4	<0.1	0.1	0.2	-	0.1	-	0.5	0.9	0.7	0.3	1.0	0.7	0.5
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip														
Butter	<0.1	<0.1	0.1	0.1	-	0.2	-	-	-	0.1	0.1	-	-	-
Cockle	10.3	19.7	14.0	9.6	12.5	10.1	14.9	14.9	14.5	13.5	16.6	15.3	17.0	15.7
Gaper	2.9	1.2	3.6	1.6	2.3	3.0	2.2	0.6	0.4	0.4	0.3	-	1.0	-
Littleneck	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	0.1	0.1	0.2	0.1	0.1
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour														
Butter	0.1	-	0.1	0.1	-	0.2	-	-	-	<0.1	0.1	-	10.4	-
Cockle	6.9	-	7.7	6.4	9.9	7.9	1.3	9.8	8.0	8.5	10.4	9.5	0.6	14.3
Gaper	1.9	-	2.0	1.1	1.8	2.3	9.0	0.1	0.2	0.3	0.2	-	0.1	-
Littleneck	<0.1	-	<0.1	<0.1	-	<0.1	-	-	0.1	0.1	<0.1	0.1	-	0.1
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Size Comp. (x size)														
Butter	-	-	-	-	-	75.1	-	87.3	-	-	85.8	-	-	-
Cockle	61.0	58.6	58.3	60.2	59.0	58.2	57.8	54.3	54.4	52.6	52.3	56.8	56.7	45.7
Gaper	113.0	96.6	91.3	93.5	95.2	95.9	94.5	91.7	83.3	89.1	-	-	94.2	-
Littleneck	-	-	-	-	-	55.3	-	50.1	42.7	42.6	44.0	42.8	42.0	41.3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. Clams Measured														
Butter	-	-	-	-	-	-	-	4	-	-	5	-	-	-
Cockle	-	-	-	-	-	45	1,620	1,302	-	540	240	377	477	142
Gaper	-	369	522	1,804	250	1,471	181	75	-	40	-	-	5	-
Littleneck	-	171	126	173	42	24	-	9	-	5	4	4	2	3
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

² Bentnose clam.

Table 10. Annual summary of recreational interview data; Northwest Gas Plant, Yaquina Bay.

	1971	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	5,857	92	93	315	49	137	63	38	29	23	9	26	57	66
No. Clams Sampled	119,702	13,541	583	3,852	684	1,073	495	151	128	219	136	319	1,125	1,107
No. Digger Hours	8,725	-	139	402	67	165	84	54	33	25	13	33	71	75
Hours/trip	1.5	-	1.5	1.3	1.4	1.2	1.3	1.4	1.1	1.1	1.4	1.3	1.2	1.1
Clams/trip	20.4	14.7	17.0	12.2	14.0	7.8	7.9	4.0	4.4	9.5	15.1	12.3	19.7	16.8
Clams/hour	13.7	-	11.4	9.6	10.2	6.5	5.9	2.8	3.9	8.8	10.5	9.7	15.8	14.9
Digger Origin (%)														
Local	-	-	9.7	22.5	59.2	33.6	30.2	36.8	65.5	34.8	44.4	50.0	47.4	25.8
State	-	-	86.0	72.1	38.8	49.6	68.3	57.9	34.5	65.2	33.3	50.0	38.6	59.1
Non-state	-	-	4.3	5.4	2.0	16.8	1.5	5.3	-	-	22.2	-	14.0	15.2
Species Comp. (%) other ²														
Butter	0.6	1.9	0.1	1.1	0.1	0.2	0.6	2.0	-	1.8	2.2	4.7	-	-
Cockle	85.1	60.6	71.3	74.5	82.6	81.9	78.4	11.3	91.4	84.0	94.9	92.2	95.9	96.8
Gaper	12.7	29.8	22.0	13.8	16.8	11.9	19.6	34.4	7.0	-	-	0.3	-	-
Littleneck	0.7	1.3	0.3	0.5	0.4	0.6	1.4	2.0	1.6	13.7	2.9	2.8	3.0	2.9
Softshell	-	-	-	-	-	-	-	47.0	-	-	-	-	-	-
Clams/trip														
Butter	0.1	0.3	<0.1	0.1	<0.1	<0.1	0.1	0.1	-	<0.1	-	-	-	-
Cockle	17.4	8.9	12.1	9.1	11.5	6.4	6.2	0.4	4.0	8.0	14.3	11.3	18.9	16.2
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	1.3	0.4	0.3	0.6	0.5
Softshell	-	-	-	-	-	-	-	1.9	-	-	-	-	-	-
Clams/hour														
Butter	<0.1	-	<0.1	0.1	<0.1	<0.1	<0.1	0.1	-	<0.1	-	-	-	-
Cockle	11.7	-	8.1	7.1	8.5	5.3	4.6	0.3	3.6	7.4	9.9	8.9	15.2	14.4
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	1.2	0.3	0.3	0.5	0.4
Softshell	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-
Size Comp. (x size)														
Butter	-	-	-	-	-	-	99.0	80.0	-	97.0	-	-	-	-
Cockle	66.3	63.4	56.5	60.7	60.0	59.4	52.5	47.1	50.2	57.0	56.6	54.5	56.5	50.1
Gaper	95.3	91.3	91.5	92.8	101.1	94.9	96.0	88.8	87.3	96.5	-	33.0	-	-
Littleneck	-	-	-	-	-	-	47.4	48.0	45.5	45.8	-	48.6	51.3	43.6
Softshell	-	-	-	-	-	-	-	57.5	-	-	-	-	-	-
No. Clams Measured														
Butter	-	-	-	-	-	-	1	1	-	1	-	-	-	-
Cockle	-	219	648	889	525	606	349	18	60	177	122	293	408	431
Gaper	-	451	217	152	106	96	61	46	7	8	-	1	-	-
Littleneck	-	-	-	-	-	5	5	2	-	30	-	9	15	23
Softshell	-	-	-	-	-	-	-	2	-	-	-	-	-	-

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

² Bentnose clam.

Table 11. Annual summary of recreational interview data; Coquille Point, Yaquina Bay.

	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	11	53	27	-	7	13	20
No. Clams Sampled	24	267	147	-	45	28	287
No. Digger Hours	9	75	33	-	6	22	25
Hours/trip	0.8	1.4	1.2	-	0.8	1.7	1.2
Clams/trip	2.2	5.0	5.4	-	6.4	2.2	14.3
Clams/hour	2.7	3.6	4.5	-	8.2	1.3	11.5
Digger Origin (%)							
Local	-	9.4	25.9	-	57.1	46.2	35.0
State	100.0	75.5	55.6	-	42.9	23.1	35.0
Non-state	-	15.1	18.5	-	-	30.8	30.0
Species Comp. (%)							
Butter	4.2	3.0	40.1	-	60.0	7.1	15.3
Cockle	-	-	34.7	-	17.8	42.9	41.5
Gaper	95.8	93.3	15.7	-	-	-	36.2
Littleneck	-	3.0	8.2	-	22.2	35.7	2.1
Softshell	-	-	-	-	-	-	0.7
Clams/trip							
Butter	0.1	0.2	2.2	-	3.9	0.2	2.2
Cockle	-	-	1.9	-	1.1	0.9	6.0
Gaper	2.1	4.7	0.9	-	-	-	5.2
Littleneck	-	0.2	0.4	-	1.4	0.8	0.3
Softshell	-	-	-	-	-	-	0.1
Clams/hour							
Butter	0.1	0.1	1.8	-	4.9	0.1	1.8
Cockle	-	-	1.6	-	1.5	0.5	4.8
Gaper	2.6	3.3	0.7	-	-	-	4.2
Littleneck	-	0.1	0.4	-	1.8	0.5	0.2
Softshell	-	-	-	-	-	-	0.1
Size Comp. (x size)							
Butter	88.0	93.6	74.9	-	80.4	80.0	77.7
Cockle	-	-	47.2	-	38.6	37.5	-
Gaper	94.5	96.6	98.9	-	-	-	-
Littleneck	-	61.3	45.9	-	41.9	41.8	41.0
Softshell	-	-	-	-	-	-	-
No. Clams Measured							
Butter	1	5	22	-	27	2	39
Cockle	-	-	51	-	9	12	75
Gaper	23	142	15	-	-	-	1
Littleneck	-	4	12	-	10	10	5
Softshell	-	-	-	-	-	-	-

Table 12. Annual summary of recreational interview data; Critser's Island, Yaquina Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	42	14	11	29	12
No. Clams Sampled	1,380	491	377	906	297
No. Digger Hours	56	24	15	53	17
Hours/trip	1.3	1.7	1.4	1.8	1.4
Clams/trip	32.9	35.1	34.3	31.2	24.8
Clams/hour	24.6	20.9	25.1	17.3	18.0
Digger Origin (%)					
Local	40.5	50.0	81.8	48.3	100.0
State	59.5	50.0	18.2	51.7	-
Non-state	-	-	-	-	-
Species Comp. (%)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	100.0	100.0	100.0	100.0	100.0
Clams/trip					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	32.9	35.1	34.3	31.2	24.8
Clams/hour					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	24.6	20.9	25.1	17.3	18.0
Size Comp. (x size)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	82.5	93.3	93.1	85.4	94.5
No. Clams Measured					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	569	68	280	306	138

Table 13. Annual summary of recreational interview data; North Bank Softshell, Yaquina Bay.

	1984	1985	1986	1987
No. Diggers Sampled	26	27	10	25
No. Clams Sampled	971	698	156	709
No. Digger Hours	25	27	20	35
Hours/trip	0.9	1.0	2.0	1.4
Clams/trip	37.4	25.9	15.6	28.4
Clams/hour	39.6	25.9	7.8	20.3
Digger Origin (%)				
Local	84.6	51.9	100.0	40.0
State	15.4	33.3	-	60.0
Non-state	-	14.8	-	-
Species Comp. (%)				
Butter	-	-	-	-
Cockle	-	-	-	-
Gaper	-	-	-	-
Littleneck	-	-	-	-
Softshell	100.0	99.9	100.0	100.0
Clams/trip				
Butter	-	-	-	-
Cockle	-	-	-	-
Gaper	-	-	-	-
Littleneck	-	-	-	-
Softshell	37.4	25.8	15.6	28.4
Clams/hour				
Butter	-	-	-	-
Cockle	-	-	-	-
Gaper	-	-	-	-
Littleneck	-	-	-	-
Softshell	39.6	25.8	7.8	20.3
Size Comp. (x size)				
Butter	-	-	-	-
Cockle	-	-	-	-
Gaper	-	-	-	-
Littleneck	-	-	-	-
Softshell	74.6	63.6	83.5	65.6
No. Clams Measured				
Butter	-	-	-	-
Cockle	-	-	-	-
Gaper	-	-	-	-
Littleneck	-	-	-	-
Softshell	240	366	63	104

Table 14. Annual summary of recreational interview data; North Shore, Alsea Bay.

	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	4	3	-	-	-	20
No. Clams Sampled	71	22	-	-	-	329
No. Digger Hours	6	5	-	-	-	24
Hours/trip	1.5	1.5	-	-	-	1.2
Clams/trip	17.8	7.3	-	-	-	16.4
Clams/hour	11.8	4.9	-	-	-	13.7
Digger Origin (%)						
Local	100.0	-	-	-	-	90.0
State	-	100.0	-	-	-	10.0
Non-state	-	-	-	-	-	-
Species Comp. (%)						
Butter	-	-	-	-	-	-
Cockle	100.0	90.9	-	-	-	93.9
Gaper	-	-	-	-	-	5.8
Littleneck	-	4.6	-	-	-	0.3
Softshell	-	4.6	-	-	-	-
Clams/trip						
Butter	-	-	-	-	-	-
Cockle	17.8	6.7	-	-	-	15.4
Gaper	-	-	-	-	-	0.9
Littleneck	-	0.3	-	-	-	0.1
Softshell	-	0.3	-	-	-	-
Clams/hour						
Butter	-	-	-	-	-	-
Cockle	11.8	4.4	-	-	-	12.9
Gaper	-	-	-	-	-	0.8
Littleneck	-	0.2	-	-	-	-
Softshell	-	0.2	-	-	-	-
Size Comp. (x size)						
Butter	-	-	-	-	-	-
Cockle	80.1	71.0	-	-	-	76.5
Gaper	-	-	-	-	-	116.7
Littleneck	-	39.0	-	-	-	-
Softshell	-	58.0	-	-	-	-
No. Clams Measured						
Butter	-	-	-	-	-	-
Cockle	39	20	-	-	-	169
Gaper	-	-	-	-	-	19
Littleneck	-	-	-	-	-	-
Softshell	-	-	-	-	-	-

Table 15. Annual summary of recreational interview data; Bayshore, Alsea Bay.

	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	32	24	17	35	9	20
No. Clams Sampled	529	316	156	478	138	314
No. Digger Hours	46	40	29	61	18	27
Hours/trip	1.4	1.7	1.7	1.7	2.0	1.4
Clams/trip	16.5	13.2	9.2	13.7	15.3	15.7
Clams/hour	11.5	8.0	5.5	7.9	7.7	11.6
Digger Origin (%)						
Local	59.4	66.7	41.2	48.6	66.7	35.0
State	25.0	25.0	58.8	45.7	33.3	50.0
Non-state	15.6	8.3	-	5.7	-	15.0
Species Comp. (%)						
Butter	-	-	-	-	-	-
Cockle	99.8	99.7	98.7	88.9	94.2	90.4
Gaper	0.2	-	1.3	2.9	5.1	8.6
Littleneck	-	-	-	0.4	0.7	1.0
Softshell	-	0.3	-	7.5	-	-
Clams/trip						
Butter	-	-	-	-	-	-
Cockle	16.5	13.1	9.1	12.1	14.4	14.2
Gaper	<0.1	-	0.1	0.4	0.8	1.4
Littleneck	-	-	-	0.1	0.1	0.1
Softshell	-	<0.1	-	1.0	-	-
Clams/hour						
Butter	-	-	-	-	-	-
Cockle	11.5	8.0	5.4	7.0	7.2	10.5
Gaper	<0.1	-	0.1	0.2	0.4	1.0
Littleneck	-	-	-	-	0.1	-
Softshell	-	<0.1	-	0.6	-	-
Size Comp. (x size)						
Butter	-	-	-	-	-	-
Cockle	72.9	76.4	76.3	73.8	74.8	69.8
Gaper	-	-	116.0	130.9	121.7	85.5
Littleneck	-	-	-	44.0	49.0	48.0
Softshell	-	-	-	-	-	-
No. Clams Measured						
Butter	-	-	-	-	-	-
Cockle	159	295	154	331	109	180
Gaper	-	-	2	10	6	24
Littleneck	-	-	-	2	1	3
Softshell	-	-	-	-	-	-

Table 16. Annual summary of recreational interview data; Breakwater, Alsea Bay.

	1986	1987
No. Diggers Sampled	23	14
No. Clams Sampled	122	144
No. Digger Hours	25	24
Hours/trip	1.1	1.7
Clams/trip	5.3	10.3
Clams/hour	5.0	6.0
Digger Origin (%)		
Local	47.8	28.6
State	52.2	50.0
Non-state	-	21.4
Species Comp. (%)		
Butter	-	-
Cockle	89.3	81.9
Gaper	-	13.9
Littleneck	10.7	4.2
Softshell	-	-
Clams/trip		
Butter	-	-
Cockle	4.7	8.4
Gaper	-	1.4
Littleneck	0.6	0.4
Softshell	-	-
Clams/hour		
Butter	-	-
Cockle	4.4	4.9
Gaper	-	0.8
Littleneck	0.5	0.2
Softshell	-	-
Size Comp. (x size)		
Butter	47.0	-
Cockle	64.1	45.4
Gaper	-	120.8
Littleneck	45.1	45.8
Softshell	-	-
No. Clams Measured		
Butter	1	-
Cockle	83	138
Gaper	-	15
Littleneck	8	6
Softshell	-	-

Table 17. Annual summary of recreational interview data; Softshell, Alsea Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	4	5	5	8	14
No. Clams Sampled	91	138	151	148	431
No. Digger Hours	6	7	10	9	23
Hours/trip	1.5	1.4	2.0	1.1	1.6
Clams/trip	22.8	27.6	30.2	18.5	30.8
Clams/hour	15.2	19.7	15.1	16.4	19.2
Digger Origin (%)					
Local	50.0	60.0	80.0	50.0	78.6
State	50.0	-	20.0	25.0	21.4
Non-state	-	40.0	-	25.0	-
Species Comp. (%)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	100.0	100.0	100.0	100.0	100.0
Clams/trip					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	22.8	27.6	30.2	18.5	30.8
Clams/hour					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	15.2	19.7	15.1	16.4	19.2
Size Comp. (x size)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	96.8	94.6	95.0	97.1	94.0
No. Clams Measured					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	86	135	180	102	190

Table 18. Annual summary of recreational interview data; North Fork², Siuslaw Bay.

	1971	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	3,203	39	51	21	42	7	115	21	33	168	70	47	42
No. Clams Sampled	72,756	1,067	1,426	670	1,140	188	3,445	875	1,163	5,418	2,297	1,704	1,453
No. Digger Hours	4,844	54	101	32	55	5	145	28	32	231	104	65	67
Hours/trip	1.5	1.4	20.	1.5	1.3	0.7	1.3	1.3	1.0	1.4	1.5	1.4	1.6
Clams/trip	22.7	27.4	28.0	31.9	27.1	26.9	30.0	41.7	35.2	34.0	32.8	36.3	34.6
Clams/hour	15.0	19.8	14.1	21.3	20.6	37.6	23.7	31.3	36.3	24.7	22.2	26.4	21.7
Digger Origin (%)													
Local	-	12.8	28.8	28.6	19.0	28.6	38.3	47.6	51.5	27.4	17.1	34.0	35.7
State	-	84.6	66.7	71.4	47.6	71.4	48.7	52.4	42.4	67.3	70.0	61.7	64.3
Non-state	-	2.6	4.4	-	33.3	-	13.0	-	9.1	5.4	12.9	4.3	-
Species Comp. (%)													
Butter	-	-	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-	-	-
Softshell	100.0	100.0	100.0	100.0	100.0	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	35.2	34.0	32.8	36.3	34.6
Clams/hour													
Butter	-	-	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-	-	-
Softshell	15.0	19.8	14.1	21.3	20.6	37.6	23.7	31.3	36.3	24.7	22.2	26.4	21.7
Size Comp. (x size)													
Butter	-	-	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-	-	-
Softshell	-	107.4	96.5	99.0	89.5	90.0	89.4	90.7	92.8	95.0	99.2	96.1	97.8
No. Clams Measured													
Butter	-	-	-	-	-	-	-	-	-	-	-	-	-
Cockle	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaper	-	-	-	-	-	-	-	-	-	-	-	-	-
Littleneck	-	-	-	-	-	-	-	-	-	-	-	-	-
Softshell	-	741	408	335	676	110	1,629	757	867	297	670	670	585

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

² Includes digging on west side, east side and in North Fork of Siuslaw and near Florence.

Table 19. Annual summary of recreational interview data; Bolin Island, Umpqua Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	2	23	-	-	-
No. Clams Sampled	72	930	-	-	-
No. Digger Hours	4	69	-	-	-
Hours/trip	2.0	3.0	-	-	-
Clams/trip	36.0	40.4	-	-	-
Clams/hour	18.0	13.6	-	-	-
Digger Origin (%)					
Local	-	30.4	-	-	-
State	100.0	56.5	-	-	-
Non-state	-	13.0	-	-	-
Species Comp. (%)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	100.0	100.0	-	-	-
Clams/trip					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	36.0	40.4	-	-	-
Clams/hour					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	18.0	13.6	-	-	-
Size Comp. (x size)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-

Table 20. Annual summary of recreational interview data; Hanson's Marina - South Slough, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	6	-	-	-	1
No. Clams Sampled	101	-	-	-	18
No. Digger Hours	5	-	-	-	1
Hours/trip	0.8	-	-	-	1.0
Clams/trip	16.8	-	-	-	18.0
Clams/hour	22.4	-	-	-	18.0
Digger Origin (%)					
Local	100.0	-	-	-	100.0
State	-	-	-	-	-
Non-state	-	-	-	-	-
Species Comp. (%)					
Butter	4.0	-	-	-	-
Cockle	19.8	-	-	-	44.4
Gaper	69.3	-	-	-	55.6
Littleneck	1.2	-	-	-	-
Softshell	-	-	-	-	-
Clams/trip					
Butter	0.7	-	-	-	-
Cockle	3.3	-	-	-	8.0
Gaper	11.7	-	-	-	10.0
Littleneck	1.2	-	-	-	-
Softshell	-	-	-	-	-
Clams/hour					
Butter	0.9	-	-	-	-
Cockle	4.4	-	-	-	8.0
Gaper	15.6	-	-	-	10.0
Littleneck	1.6	-	-	-	-
Softshell	-	-	-	-	-
Size Comp. (x size) ¹					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-
No. Clams Measured ¹					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-

¹ Not taken.

Table 21. Annual summary of recreational interview data; Charleston Triangle, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	40	32	20	58	91
No. Clams Sampled	771	588	410	1,193	1,647
No. Digger Hours	44	27	25	75	105
Hours/trip	1.1	0.8	1.2	1.3	1.2
Clams/trip	19.3	18.4	20.5	20.6	18.1
Clams/hour	17.5	22.0	16.7	16.0	15.7
Digger Origin (%)					
Local	22.5	40.6	50.0	29.3	34.1
State	72.5	56.3	35.0	62.1	47.3
Non-state	5.0	3.1	15.0	8.6	18.1
Species Comp. (%)					
Butter	19.6	10.9	13.2	2.6	13.2
Cockle	55.1	69.2	56.6	66.5	47.3
Gaper	3.9	15.0	20.5	17.5	31.3
Littleneck	23.2	4.9	9.5	8.5	5.8
Softshell	-	-	-	0.3	0.1
Clams/trip					
Butter	3.8	2.0	2.7	0.5	2.4
Cockle	10.6	12.7	11.6	13.7	8.6
Gaper	0.8	2.8	4.2	3.6	5.7
Littleneck	4.5	0.9	1.9	1.8	1.1
Softshell	-	-	-	0.1	-
Clams/hour					
Butter	3.4	2.4	2.2	0.4	2.1
Cockle	9.7	15.2	9.5	10.6	7.4
Gaper	0.7	3.3	3.4	2.8	4.9
Littleneck	4.1	1.1	1.6	1.4	0.9
Softshell	-	-	-	0.1	-
Size Comp. (x size)					
Butter	73.3	80.2	82.5	75.3	78.2
Cockle	51.2	66.3	62.6	63.2	61.2
Gaper	88.6	95.2	98.2	97.3	99.1
Littleneck	55.2	57.6	61.3	61.1	58.9
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	39	17	52	15	118
Cockle	45	218	185	175	298
Gaper	26	54	67	30	187
Littleneck	18	159	41	51	64
Softshell	-	-	-	-	-

Table 22. Annual summary of recreational interview data; Charleston Flat, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	60	27	18	100	113
No. Clams Sampled	859	435	341	1,980	2,145
No. Digger Hours	125	29	32	180	185
Hours/trip	2.1	1.1	1.8	1.8	1.6
Clams/trip	14.3	16.1	18.9	19.8	19.0
Clams/hour	6.9	15.1	10.7	11.0	11.6
Digger Origin (%)					
Local	21.7	40.7	16.7	35.0	28.3
State	73.3	51.9	38.9	57.0	48.7
Non-state	5.0	7.4	44.4	8.0	23.0
Species Comp. (%)					
Butter	2.0	4.6	6.7	2.8	2.7
Cockle	46.6	60.9	72.4	83.3	63.9
Gaper	38.8	27.6	17.3	8.8	26.2
Littleneck	10.6	3.7	3.5	4.1	4.7
Softshell	-	3.0	-	0.1	-
Clams/trip					
Butter	0.3	0.7	1.3	0.6	0.5
Cockle	6.7	9.8	13.7	16.5	12.1
Gaper	5.6	4.4	3.3	1.8	5.0
Littleneck	1.5	0.6	0.7	0.8	0.9
Softshell	-	0.5	-	<0.1	-
Clams/hour					
Butter	0.1	0.7	0.7	0.3	0.3
Cockle	3.2	9.2	7.7	9.2	7.4
Gaper	2.7	4.6	1.8	1.0	3.0
Littleneck	0.7	0.6	0.4	0.5	0.5
Softshell	-	-	-	<0.1	-
Size Comp. (x size)					
Butter	84.0	78.1	75.0	78.9	81.3
Cockle	59.9	63.2	62.2	66.9	65.6
Gaper	100.6	105.9	110.1	109.1	109.0
Littleneck	55.0	65.0	62.2	60.5	58.4
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	1	13	20	43	44
Cockle	38	92	247	234	128
Gaper	13	80	58	70	188
Littleneck	3	2	13	30	86
Softshell	-	-	-	-	-

Table 23. Annual summary of recreational interview data; Peterson Flat, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	12	4	-	19	10
No. Clams Sampled	235	54	-	284	191
No. Digger Hours	24	5	-	41	15
Hours/trip	2.0	1.3	-	2.2	1.5
Clams/trip	19.6	13.5	-	14.9	19.1
Clams/hour	10.0	10.8	-	6.9	12.7
Digger Origin (%)					
Local	25.0	0	-	42.1	60.0
State	75.0	50.0	-	0.0	40.0
Non-state	-	50.0	-	57.9	-
Species Comp. (%) ¹ other ¹	-	7.4	-	-	-
Butter	8.1	-	-	3.5	2.1
Cockle	21.7	1.9	-	34.5	19.9
Gaper	45.1	88.9	-	60.2	68.1
Littleneck	25.1	1.9	-	1.4	9.9
Softshell	-	-	-	-	-
Clams/trip other ¹	-	1.0	-	-	-
Butter	1.6	-	-	0.5	0.4
Cockle	4.3	0.3	-	5.2	3.8
Gaper	8.8	12.0	-	9.0	13.0
Littleneck	4.9	0.3	-	0.2	1.9
Softshell	-	-	-	-	-
Clams/hour other ¹	-	0.8	-	-	-
Butter	0.8	-	-	0.2	0.3
Cockle	2.2	0.2	-	2.4	2.5
Gaper	4.5	9.6	-	4.2	8.7
Littleneck	2.5	0.2	-	0.1	1.3
Softshell	-	-	-	-	-
Size Comp. (x size)					
Butter	-	-	-	95.0	66.8
Cockle	-	-	-	64.9	66.8
Gaper	-	113.7	-	110.6	95.1
Littleneck	-	-	-	62.0	45.5
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	-	-	-	2	4
Cockle	-	-	-	43	38
Gaper	-	23	-	23	81
Littleneck	-	-	-	1	19
Softshell	-	-	-	-	-

¹ Bentnose clam.

Table 24. Annual summary of recreational interview data; Pigeon Point, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	111	43	10	68	64
No. Clams Sampled	1,681	679	190	1,160	1,003
No. Digger Hours	95	70	19	145	119
Hours/trip	0.9	1.6	1.9	2.1	1.9
Clams/trip	15.1	15.8	19.0	17.1	15.7
Clams/hour	17.7	9.7	10.0	8.0	8.4
Digger Origin (%)					
Local	45.9	65.1	20.0	51.5	32.8
State	48.6	27.9	60.0	41.2	51.6
Non-state	5.4	7.0	20.0	7.4	15.6
Species Comp. (%)					
Butter	27.1	36.4	47.9	56.5	48.6
Cockle	0.7	8.0	2.1	1.3	6.0
Gaper	51.2	32.7	10.0	17.2	11.1
Littleneck	20.9	22.5	39.5	24.1	33.3
Softshell	-	0.6	-	0.8	-
Clams/trip					
Butter	4.1	5.4	9.1	9.6	7.6
Cockle	0.1	1.3	0.4	0.2	0.9
Gaper	7.7	5.2	1.9	2.9	1.7
Littleneck	3.2	3.6	7.5	4.1	5.2
Softshell	-	0.1	-	0.1	-
Clams/hour					
Butter	4.8	3.5	4.8	4.5	4.1
Cockle	0.1	0.8	0.2	0.1	0.5
Gaper	9.1	3.2	1.0	1.4	0.9
Littleneck	3.7	2.2	3.9	1.9	2.8
Softshell	-	0.1	-	0.1	-
Size Comp. (x size)					
Butter	85.9	84.8	84.3	84.0	87.2
Cockle	37.9	-	40.0	-	-
Gaper	108.0	104.5	85.3	107.9	102.6
Littleneck	67.2	62.0	60.6	63.3	54.6
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	44	93	51	145	186
Cockle	7	-	4	-	-
Gaper	46	52	19	15	82
Littleneck	9	50	74	22	172
Softshell	-	-	-	-	-

Table 25. Annual summary of recreational interview data; Empire Flat, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	70	9	-	5	16
No. Clams Sampled	1,057	180	-	82	222
No. Digger Hours	99	9	-	9	32
Hours/trip	1.4	1.0	-	1.7	2.0
Clams/trip	15.1	20.0	-	16.4	13.9
Clams/hour	10.7	20.0	-	9.6	7.0
Digger Origin (%)					
Local	54.3	100.0	-	100.0	18.8
State	34.3	-	-	-	81.2
Non-state	11.4	-	-	-	-
Species Comp. (%)					
Butter	1.4	-	-	1.2	-
Cockle	11.2	13.3	-	68.3	19.4
Gaper	58.8	33.3	-	28.0	72.1
Littleneck	0.3	53.3	-	1.2	3.6
Softshell	-	-	-	-	0.5
Clams/trip					
Butter	0.2	-	-	0.2	-
Cockle	1.7	2.7	-	11.2	2.7
Gaper	8.9	6.7	-	4.6	10.0
Littleneck	<0.1	10.7	-	0.2	0.5
Softshell	-	-	-	-	0.1
Clams/hour					
Butter	0.2	-	-	0.1	-
Cockle	1.2	2.7	-	6.6	1.4
Gaper	6.3	6.7	-	2.7	5.1
Littleneck	<0.1	10.7	-	0.1	0.3
Softshell	-	-	-	-	-
Size Comp. (x size)					
Butter	-	-	-	-	-
Cockle	-	-	-	67.0	-
Gaper	-	-	-	95.7	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	-	-	-	-	-
Cockle	-	-	-	21	-
Gaper	-	-	-	12	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	-

Table 26. Annual summary of recreational interview data; North Spit, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	65	50	29	163	103
No. Clams Sampled	692	746	449	2,262	1,492
No. Digger Hours	93	82	59	246	151
Hours/trip	1.4	1.6	2.0	1.5	1.5
Clams/trip	10.7	14.9	15.5	13.9	14.5
Clams/hour	7.4	9.2	7.6	9.2	9.9
Digger Origin (%)					
Local	72.3	68.0	37.9	65.0	68.0
State	27.7	28.0	58.6	32.5	27.2
Non-state	-	4.0	3.4	2.5	4.9
Species Comp. (%)					
Butter	3.5	6.4	5.1	6.7	7.9
Cockle	17.6	22.0	17.1	13.7	18.1
Gaper	75.3	65.5	74.6	73.7	66.4
Littleneck	3.6	6.0	2.4	3.9	2.7
Softshell	-	-	-	-	0.1
Clams/trip					
Butter	0.4	1.0	0.8	0.9	1.1
Cockle	1.9	3.3	2.7	1.9	2.6
Gaper	8.0	9.8	11.6	10.2	9.6
Littleneck	0.4	0.9	0.4	0.5	0.4
Softshell	-	-	-	-	<0.1
Clams/hour					
Butter	0.3	0.6	0.4	0.6	0.8
Cockle	1.3	2.0	1.3	1.3	1.8
Gaper	5.6	6.0	5.7	6.8	6.6
Littleneck	0.3	0.6	0.2	0.4	0.3
Softshell	-	-	-	-	<0.1
Size Comp. (x size)					
Butter	-	77.0	81.8	87.0	85.2
Cockle	67.7	62.2	65.1	64.4	60.2
Gaper	109.6	111.2	100.5	122.7	114.6
Littleneck	72.0	59.5	46.5	64.4	60.6
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	-	28	9	21	65
Cockle	20	39	29	62	104
Gaper	185	138	117	71	159
Littleneck	2	28	2	14	37
Softshell	-	-	-	-	-

Table 27. Annual summary of recreational interview data; Clam Island, Coos Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	57	462	11	76	116
No. Clams Sampled	1,002	7,931	208	1,097	1,777
No. Digger Hours	82	737	15	98	134
Hours/trip	1.4	1.9	1.4	1.3	1.2
Clams/trip	17.6	17.2	18.9	14.4	15.3
Clams/hour	12.2	10.8	13.9	11.3	13.3
Digger Origin (%)					
Local	36.8	51.5	81.8	52.6	53.4
State	57.9	46.3	18.2	46.1	37.9
Non-state	5.3	2.2	-	1.3	8.6
Species Comp. (%)					
Butter	2.88	4.6	26.9	0.4	5.5
Cockle	36.5	33.7	12.5	26.7	26.6
Gaper	54.2	59.8	54.3	72.0	66.6
Littleneck	1.1	1.8	6.2	0.9	1.3
Softshell	5.4	-	-	-	-
Clams/trip					
Butter	0.5	0.8	5.1	0.1	0.8
Cockle	6.4	5.8	2.4	3.9	4.1
Gaper	9.5	10.3	10.3	10.4	10.2
Littleneck	0.2	0.3	1.2	0.1	0.2
Softshell	1.0	-	-	-	-
Clams/hour					
Butter	0.3	0.5	3.7	-	0.7
Cockle	4.5	3.6	1.7	3.0	3.5
Gaper	6.6	6.4	7.5	8.1	8.8
Littleneck	0.1	0.2	0.9	0.1	0.2
Softshell	0.7	-	-	-	-
Size Comp. (x size)					
Butter	78.7	95.0	89.5	97.0	86.3
Cockle	54.1	76.8	69.4	80.1	71.0
Gaper	107.7	121.0	119.2	118.8	115.7
Littleneck	55.5	68.0	66.9	-	61.9
Softshell	-	-	-	-	-
No. Clams Measured					
Butter	6	1	55	1	9
Cockle	8	12	25	43	102
Gaper	46	56	108	136	170
Littleneck	4	1	13	-	9
Softshell	-	-	-	-	-

Table 28. Annual summary of recreational interview data; Bandon Softshell, Coquille Bay.

	1983	1984	1985	1986	1987
No. Diggers Sampled	6	1	-	21	8
No. Clams Sampled	215	36	-	635	68
No. Digger Hours	5	2	-	35	16
Hours/trip	0.8	1.5	-	1.7	2.0
Clams/trip	35.8	36.0	-	30.2	8.5
Clams/hour	43.0	24.0	-	18.1	4.2
Digger Origin (%)					
Local	100.0	-	-	52.4	-
State	-	-	-	28.6	-
Non-state	-	100.0	-	19.0	100.0
Species Comp. (%)					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	100.0	100.0	-	100.0	100.0
Clams/trip					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	35.8	36.0	-	30.2	8.5
Clams/hour					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	43.0	24.0	-	18.1	4.2
Size Comp. (x size)¹					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	79.7
No. Clams Measured¹					
Butter	-	-	-	-	-
Cockle	-	-	-	-	-
Gaper	-	-	-	-	-
Littleneck	-	-	-	-	-
Softshell	-	-	-	-	68

¹ Not taken.

Table 29. Annual summary of recreational interview data; all estuaries combined.

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
No. Diggers Sampled	453	721	4,165	847	1,603	1,284	1,276	870	1,506	1,800	898	1,392	1,508
No. Clams Sampled	8,837	15,085	62,963	14,008	24,697	21,601	19,610	12,928	22,189	33,916	14,614	24,691	25,313
No. Digger Hours	-	1,101	6,833	1,187	1,986	1,718	1,606	1,104	2,113	2,589	1,303	2,128	2,154
Hours/trip	-	1.5	1.6	1.4	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.4
Clams/trip	19.5	20.9	15.1	16.5	15.4	16.8	15.4	14.9	14.7	18.8	16.3	17.7	16.8
Clams/hour	-	13.7	9.2	11.8	12.4	12.6	12.2	11.7	10.5	13.1	11.2	11.6	11.8
Digger Origin (%)													
Local	-	25.5	30.5	29.0	29.3	22.9	30.6	40.5	33.6	42.7	37.8	36.9	35.6
State	-	66.6	64.4	62.8	63.8	70.5	60.0	54.0	60.7	52.7	53.7	56.7	53.4
Non-state	-	7.9	5.1	8.3	7.0	6.6	9.4	5.5	5.7	4.7	8.6	6.4	10.9
Species Comp. (%)													
Butter	12.9	11.1	7.3	5.2	8.5	12.8	15.8	16.2	9.9	7.8	10.6	13.3	15.3
Cockle	58.7	48.2	46.9	56.6	53.1	44.3	29.3	31.3	31.2	22.7	32.2	40.7	41.7
Gaper	19.1	20.9	32.5	26.9	25.1	17.9	24.9	31.8	35.6	26.1	23.6	20.8	24.0
Littleneck	9.3	12.5	7.5	5.8	6.5	7.5	9.9	8.1	7.8	6.2	5.0	6.7	5.2
Softshell	0.1	7.2	5.8	5.5	6.7	17.5	20.1	12.5	15.4	37.2	28.7	17.1	12.4
Clams/trip													
Butter	2.5	2.3	1.0	0.9	1.3	2.2	2.4	2.4	1.4	1.5	1.7	2.4	2.6
Cockle	11.3	10.0	6.6	9.3	8.1	7.4	4.5	4.6	4.5	4.3	5.1	7.2	7.0
Gaper	3.7	4.4	4.6	4.4	3.8	3.0	3.8	4.7	5.1	4.9	3.8	3.7	4.0
Littleneck	1.8	2.6	1.1	1.0	1.0	1.3	1.5	1.2	1.1	1.2	0.8	1.2	0.9
Softshell	<0.1	1.5	0.8	0.9	1.0	2.9	3.1	1.9	2.2	6.9	4.6	3.0	2.1
Clams/hour													
Butter	-	1.5	0.6	0.6	1.0	1.6	1.9	1.9	1.0	1.0	1.2	1.5	1.8
Cockle	-	6.6	4.0	6.6	6.5	5.6	3.6	3.6	3.2	3.0	3.5	4.7	4.9
Gaper	-	2.9	2.8	3.1	3.1	2.2	3.0	3.7	3.6	3.4	2.6	2.4	2.8
Littleneck	-	1.7	0.6	0.7	0.3	0.9	1.2	1.0	0.8	0.8	0.5	0.8	0.6
Softshell	-	1.0	0.5	0.6	0.8	2.2	2.4	1.5	1.6	4.8	3.2	2.0	1.5
Size Comp. (x size)													
Butter	79.6	81.1	82.4	90.7	78.9	69.2	78.1	75.1	71.0	79.5	76.5	79.8	83.0
Cockle	61.4	63.2	62.3	62.6	63.1	60.2	55.3	63.2	60.8	62.0	64.2	63.3	61.9
Gaper	104.1	89.5	90.7	95.5	93.0	98.0	104.3	101.4	103.6	104.2	108.0	111.6	107.9
Littleneck	42.2	45.8	40.3	44.8	47.0	39.8	44.2	40.2	41.4	50.1	66.5	47.7	53.2
Softshell	-	95.5	101.9	83.3	89.5	86.4	88.2	81.8	87.7	86.0	88.4	91.0	92.7
No. Clams Measured	3,615	7,441	11,743	5,096	8,643	6,661	5,372	4,044	6,774	5,152	7,438	6,997	6,403

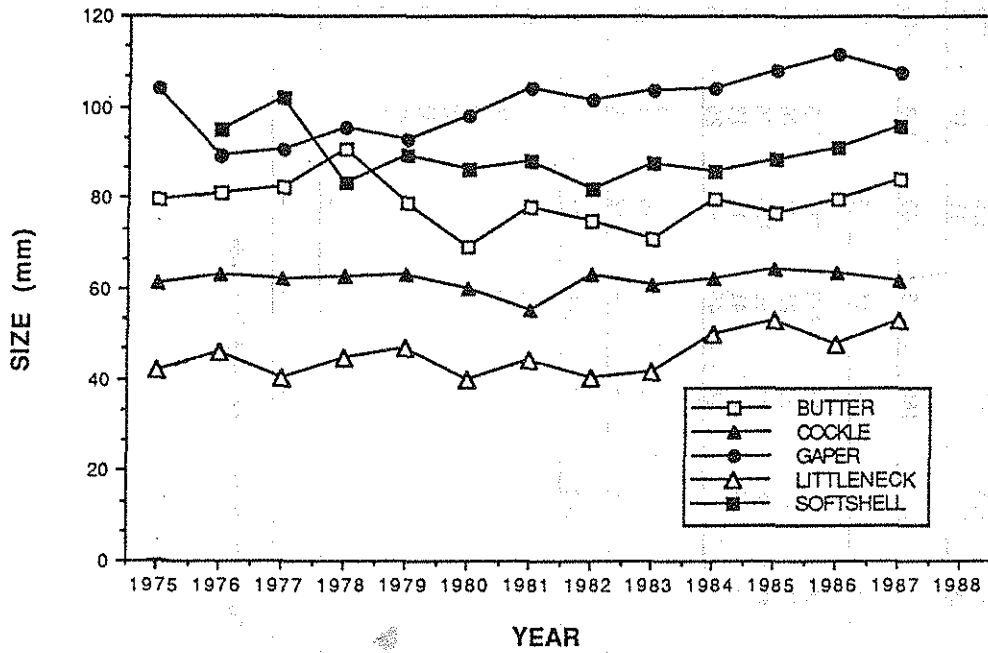


Figure 1. Length composition of recreationally harvested bay clams, all bays combined, 1975-87.

Table 30. Peak counts of clam diggers¹.

Estuary	Tideflat	1975	1976	1977 ¹	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Tillamook	Garibaldi Flat	425	350	131	225	256	300	460	516	487	350	118	380	400
	Bay Ocean	-	280	122	39	107	-	33	13	10	4	-	17	3
Netarts	Happy Camp	-	175	73	-	150	160	425	500	478	200	191	314	265
Nestucca	Little Nestucca	-	-	-	-	-	-	44	6	12	6	8	8	-
Yaquina	Bridge Bed	-	245	138	30	91	84	225	625	275	84	107	204	225
	Breakwater Bed	-	127	120	62	23	20	27	63	26	28	25	30	46
	Idaho Point	-	110	98	45	66	61	38	176	46	35	31	50	56
	NW Gas Plant	-	-	-	-	24	26	41	16	12	10	11	34	20
	Coquille Point	-	-	-	-	17	18	45	41	20	5	9	14	7
Alsea	North Beach	-	-	-	-	-	-	-	4	3	-	5	0	13
	Bay Shore	-	-	-	-	-	-	-	49	31	14	20	10	15
	Waldport Breakwater	-	-	-	-	-	-	-	12	9	-	22	22	4
Siuslaw	North Fork	-	55	-	-	109	57	146	33	22	43	41	44	56
Coos Bay	Charleston Triangle	-	-	-	-	-	-	-	-	31	24	41	39	87
	Charleston Flat	-	-	-	-	-	-	-	-	64	30	26	27	66
	Peterson Flat	-	-	-	-	-	-	-	-	5	-	2	15	14
	Fossil Point	-	-	-	-	-	-	-	-	38	-	0	44	-
	Pigeon Point	-	-	-	-	-	-	-	-	62	50	42	67	97
	Empire Flat	-	-	-	-	-	-	-	-	20	-	19	22	44
	Hanson's Marina	-	-	-	-	-	-	-	-	5	3	4	-	-
	Clam Island	-	-	-	-	-	-	-	-	-	58	-	86	119
North Spit	-	-	-	-	-	-	-	-	-	-	-	83	158	
Bandon	Softshell Bed	-	-	-	-	-	-	-	-	-	-	-	50	-

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

Table 31. Summary of pounds of bay clams reported commercially harvested in Oregon by species, 1970-87.

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	3,300	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	52	0	216,962
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	134,090
1983	4,035	2,579	95,091	34,444	36	0	136,185
1984	4,842	17,912	50,573	46,874	366	0	120,567
1985	1,646	29,412	20,121	46,266	1,809	0	99,254
1986	2,862	31,681	17,021	27,487	3,558	0	82,609
1987	3,046	20,202	6,368	14,140	2,527	0	46,283

Table 32. Summary of pounds of bay clams reported commercially harvested in major Oregon estuaries, 1970-87.

Year	Nehalem	Tillamook	Netarts	Yaquina	Alesea	Siuslaw	Umpqua	Coos	Coquille	Total
1970	258	7,819	2,210	444	0	0	10,631	4,522	0	25,884
1971	589	6,168	1,598	1,819	0	0	7,459	10,893	0	28,526
1972	80	9,637	914	57	70	0	6,105	44,642	0	61,505
1973	329	11,997	1,191	0	0	0	786	2,853	0	17,156
1974	882	9,309	2,049	398	0	0	445	3,232	0	16,315
1975	0	4,637	0	0	13	0	309	21,553	38	26,550
1976	0	998	0	0	480	0	0	86,576	0	88,054
1977	0	2,619	0	71,013	0	0	35	12,066	0	85,733
1978	0	3,111	0	172,047	0	0	0	41,804	0	216,962
1979	174	433	0	74,565	0	3,432	0	16,308	0	94,912
1980	373	5,320	486	244	0	9,109	0	65,935	0	81,467
1981	65	4,259	0	128	0	684	0	76,002	0	81,138
1982	10,862	11,501	37	15	0	223	25	111,427	0	134,090
1983	31,856	3,144	200	5,253	0	15	0	95,717	0	136,185
1984	23,069	42,663	0	22	0	50	0	54,763	0	120,567
1985	40,349	34,148	240	0	0	895	268	23,030	324	99,254
1986	30,545	28,737	480	6	0	1,206	0	19,557	2,078	82,609
1987	10,723	22,936	0	1,114	250	654	0	10,214	392	46,283

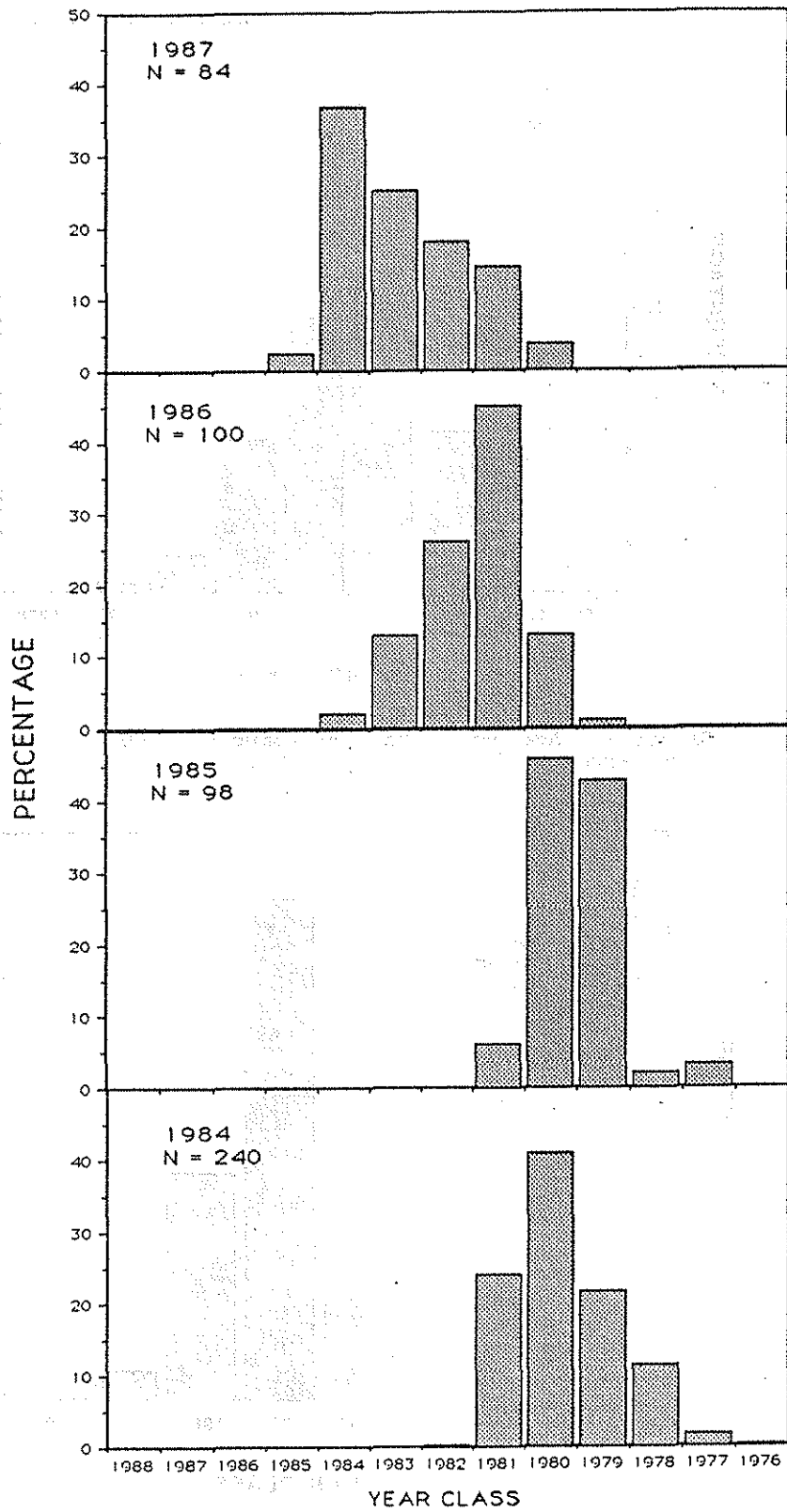


Figure 2. Age composition of commercial subtidal native littleneck clam harvest, Nehalem Bay, 1984-87.

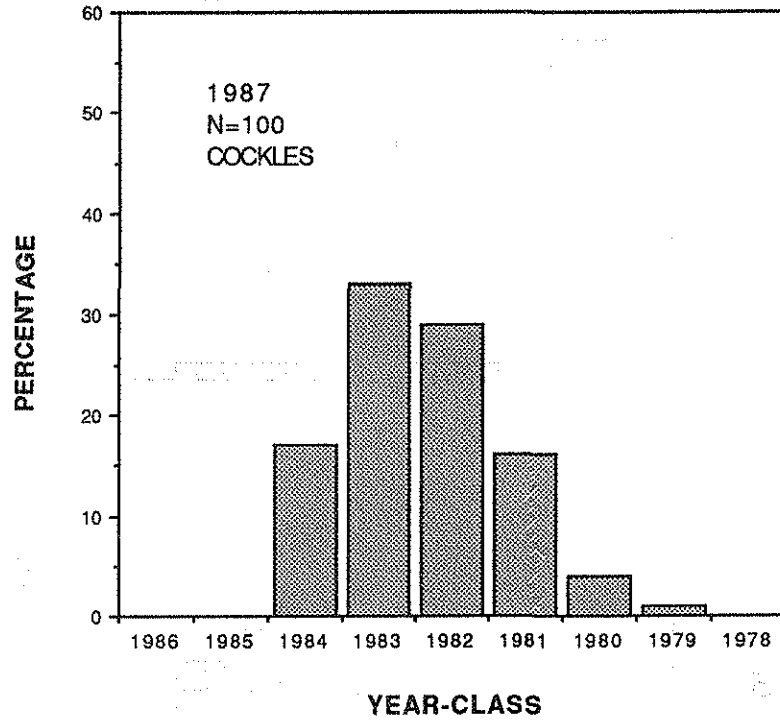


Figure 3. Age composition of commercial subtidal cockle clam harvest, Tillamook Bay, 1987.

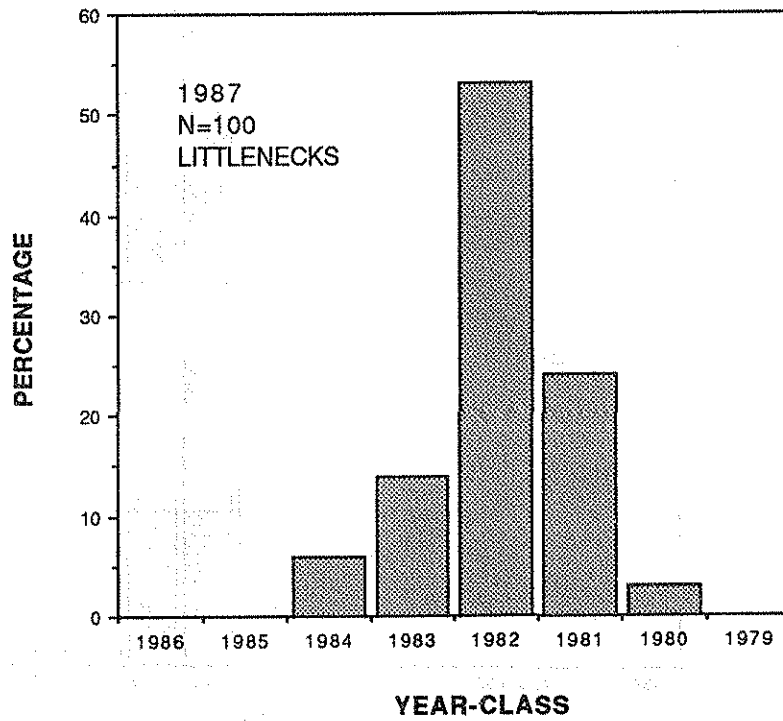


Figure 4. Age composition of commercial subtidal littleneck clam harvest, Tillamook Bay, 1987.

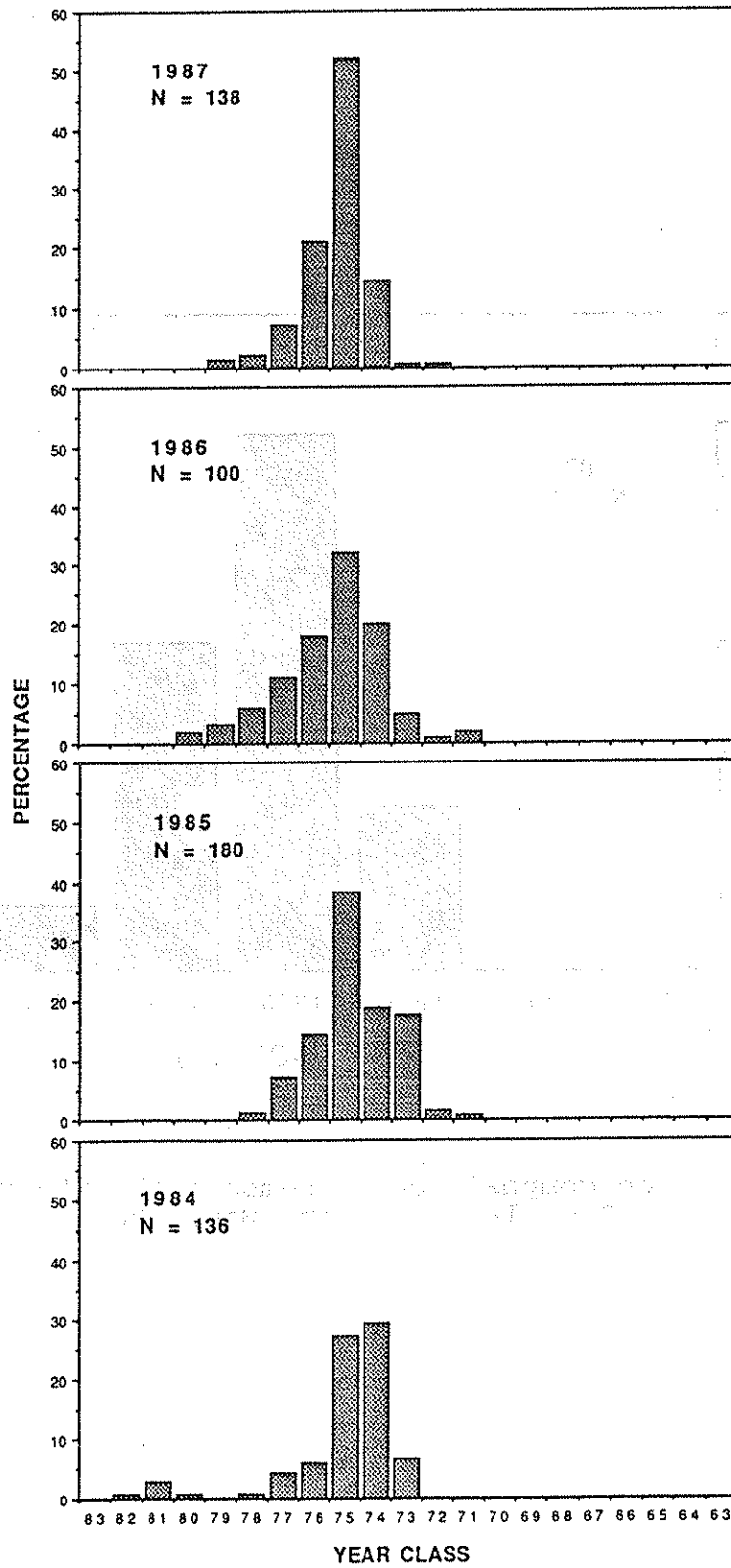


Figure 5. Age composition of commercial subtidal gaper clam harvest, Pigeon Point, Coos Bay, 1984-87.

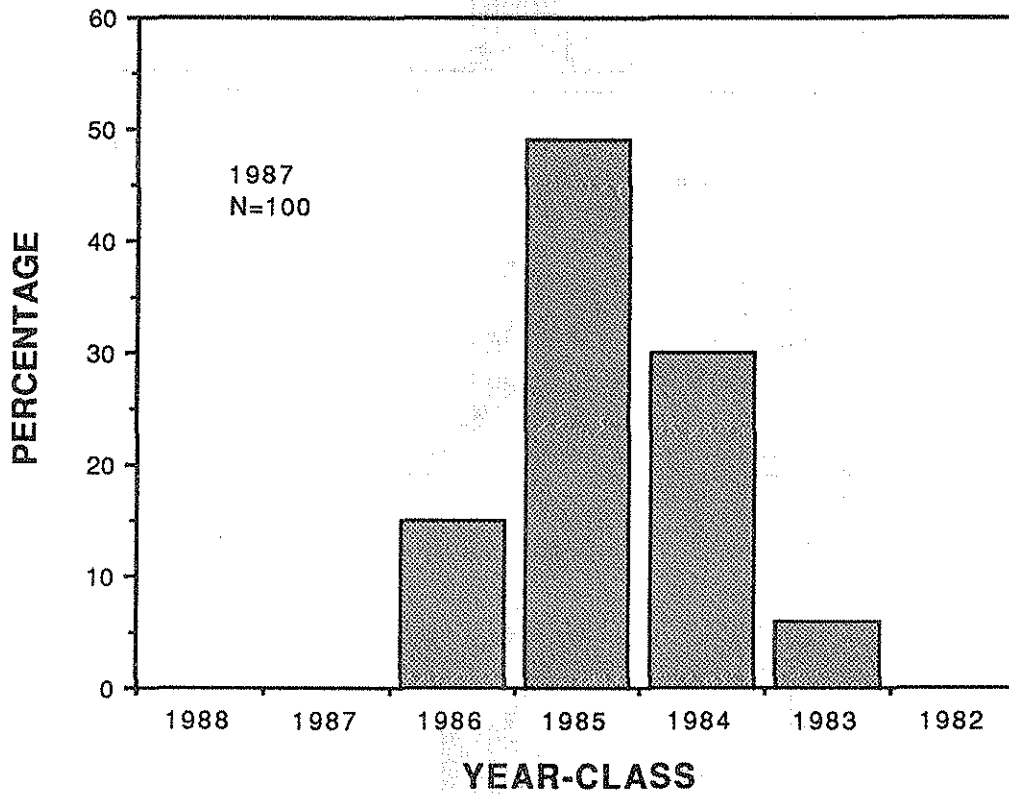


Figure 6. Age composition of commercial intertidal cockle clam harvest, Gas Plant, Yaquina Bay, 1987.

Table 33. Summary of experimental Manila littleneck clam plants in Tillamook Bay, 1971-87.

Plot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
1	9/18/71	20,000 ¹	6.3	50	5/16/72	-	0.0
2	3/4/83	2,000,000 ¹	-	800	2/21/84	14.1	0.4
					7/15/84	17.5	0.3
					8/02/85	30.2	0.1
3	4/16/83	1,000	41.1	5.2	7/15/84	41.8	19.2
4	6/16/83	10,000	-	22.2	9/08/83	31.0	18.9
					7/15/84	34.0	11.7
					8/02/85	37.6	0.6
5	6/30/83	10,000 ¹	-	44.0	9/08/83	13.6	0.7
					7/15/84	21.0	0.5
6	3/14/84	1,150	-	6.3	7/15/84	40.6	44.4
					8/02/85	-	0.0
7	3/14/84	700	-	10.6	7/15/84	39.1	17.0
					8/02/85	45.0	1.9
					5/28/86	-	0.0
8	3/14/84	4,000 ¹	-	79.6	7/15/84	-	0.0
9	5/07/84	2,400	-	10.0	7/15/84	36.6	100+
					8/02/85	42.2	100+
					5/28/86	47.8	37.5
					6/16/87	49.6	39.0
10	7/15/84	1,000	36.5	10.2	8/02/85	-	0.0
11	7/31/84	300	-	6.3	8/02/85	49.8	47.6
					5/28/86	49.3	71.4
					6/16/87	49.2	43.7
12	11/21/84	3,400	31.0	10.0	8/02/85	35.3	20.0
					5/28/86	38.1	2.0
					6/16/87	-	0.0
13	11/21/84	3,400	31.0	10.0	8/02/85	34.5	34.0
					5/28/86	40.0	20.0
					6/16/87	46.6	16.0

Table 33 (continued)

Plot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
14	11/21/84	13,500	31.0	10.0	8/02/85	35.8	56.0
					5/28/86	40.2	32.0
					6/16/87	44.3	20.0
15	4/09/85	10,200	37.0	10.0	8/02/85	44.2	82.0
					5/28/86	45.8	78.0
					6/16/87	48.8	90.0
16	4/09/85	12,700	37.0	10.0	8/02/85	40.0	96.0
					5/28/86	44.8	97.0
					6/16/87	47.9	84.0
17	4/09/85	7,700	37.0	10.0	8/02/85	44.2	54.0
					5/28/86	42.9	83.0
					6/16/87	49.5	52.0
18	4/25/85	100,000 ^{1,2}	-	100.0	7/25/86	25.0	14.8
					6/16/87	30.4	15.0
19	4/25/85	10,000 ¹	-	100.0	7/25/86	24.3	1.0
					6/16/87	30.4	0.3

¹ Hatchery produced clams, planted as set.

² Clams placed under "Vexar" netting.

Table 34. Summary of experimental Manila littleneck clam plants in Yaquina Bay, 1970-87.

Plot No.	Subplot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
1	1	9/20/71	20,000	5.7	50	5/12/72	10.0	16.5
						4/11/73	18.3	6.1
						4/24/74	-	1.3
	2	7/10/72	1,710	10.6	114	8/1/73	20.8	24.6
						7/22/74	20.6	1.2
	3	7/10/72	24,240	6.7	101	8/1/73	16.1	30.4
						7/22/74	-	0.0
	4	7/10/72	1,460	10.8	97			
	5	7/10/72	52,340	6.0	102			
6	7/12/72	130,000	6.6	120				
7	7/12/72	3,860	10.6	97				
8	9/7/72	35,000	-	194				
9	9/7/72	11,500	-	194				
10	9/7/72	11,700	4.1	98	8/1/73	11.8	4.1	
					7/22/74	-	0.0	
11	9/7/72	24,700	6.1	103	8/1/73	12.0	21.4	
					7/22/74	-	0.0	
12	9/7/72	1,700	-	-				
13	9/7/72	7,500	-	-				
14	9/7/72	1,700	-	156				
15	9/7/72	4,900	-	-				
16	9/7/72	78,000	-	-				
17-22	10/4/72	35,500	5.3	148	8/2/73	11.7	3.8	
					7/22/74	-	0.0	
2	1	4/19/72	800	3.6	80	9/6/72	19.1	-
						5/4/73	28.4	3.8
	2	4/19/72	800	3.7	80	9/3/72	22.0	-
						5/4/73	29.2	3.8
	3	4/19/72	800	6.5	80	9/6/72	22.6	-
5/4/73						30.7	1.3	
4	4/19/72	800	11.0	80	9/6/72	23.3	-	
					5/4/73	31.7	7.5	
5	4/19/72	1,250	3.7	125	5/4/73	29.6	1.3	

Table 34 (continued)

Plot No.	Subplot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
	6	4/19/72	1,250	6.5	125	5/4/73	-	0.0
	7	4/19/72	1,250	11.0	125	5/4/73	32.2	2.5
	8	4/19/72	2,000	3.7	200	5/4/73	29.8	2.5
	9	4/19/72	2,000	6.5	200	5/4/73	33.6	3.8
	10	4/19/72	2,000	11.0	200	5/4/73	-	0.0
3	1	5/22/70	4,000	3.0	20	8/18/70	12.0	8.0
						10/28/70	19.1	11.0
						1/7/71	19.6	4.0
						5/14/71	21.4	3.0
						4/18/72	33.9	0.0
	2	10/5/71	4,000	-	-	4/18/72	-	0.0
4	1	7/27/72	1,800	6.7	50	9/5/72	10.5	55.0
						4/23/73	16.4	34.4
						4/10/74	-	0.0
	2	7/27/72	1,800	6.7	50	9/5/72	9.8	83.0
						4/23/73	14.6	12.8
						4/10/74	-	0.0
	3	7/27/72	1,800	6.7	50	9/5/72	8.5	29.0
						4/23/73	14.6	26.3
						4/10/74	-	0.0
5	1	10/20/72	2,500	6.2	50	4/19/73	-	0.0
6	1	4/24/81	730 ¹	34.5	20.3	9/17/81	-	0.0
7	1	12/5/84	8,700 ¹	31.0	10	3/15/85	31.2	2.5
8	1	1/30/85	Betty Fowler dumped 3,000-5,000 lbs of dying clams into Yaquina Bay at their dock.					
9	1	8/1/85	4,300 ²	18.1	86	7/24/86	35.3	49.4
						4/17/87	41.2	72.0
10	1	7/24/86	2,500	6.7	100	4/17/87	15.8	0.4
	2	7/24/86	2,500 ²	6.7	100	4/17/87	22.3	0.4

Table 34 (continued)

Plot No.	Subplot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
	3	7/24/86	2,500	6.7	100	4/17/87	-	0.0
	4	7/24/86	2,500 ²	6.7	100	4/17/87	18.3	6.8
	5	7/24/86	2,500	6.7	100	4/17/87	18.9	1.2
	6	7/24/86	2,500 ²	6.7	100	4/17/87	-	0.0
	7	7/24/86	2,500	6.7	100	4/17/87	19.8	13.6
	8	7/24/86	2,500 ²	6.7	100	4/17/87	24.5	1.6
	9	7/24/86	2,500	6.7	100	4/17/87	20.3	20.8
	10	7/24/86	2,500 ²	6.7	100	4/17/87	17.8	20.8
	11	7/24/86	2,500	6.7	100	4/17/87	18.9	29.2
	12	7/24/86	2,500 ²	6.7	100	4/17/87	16.8	10.0
	13	7/24/86	2,500	6.7	100	4/17/87	18.9	7.2
	14	7/24/86	2,500 ²	6.7	100	4/17/87	19.7	89.2
11	1	8/19/86	100,000 ²	6.7	100	4/17/87	15.7	2.2
	2	8/19/86	10,000	6.7	100	4/17/87	-	0.0

¹ Planted as adult clams.

² Planted under "Vexar" netting.

Table 35. ANOVA for a two-factor analysis of variance on clams/ft².

Source	df	Sum of Squares	Mean Square	F-test	P Value
Covering (A)	1	175.112	175.112	2.088	.1521
Substrate (B)	6	3,397.959	566.327	6.754	.0001
AB	6	2,791.102	465.184	5.548	.0001
Error	84	7,043.429	83.850		

Table 36. ANOVA for one factor analysis of variance on substrate type and clams/ft².

Source	df	Sum of Squares	Mean Square	F-test	P Value
Between groups	6	3,397.959	566.327	5.149	.0001
Within groups	91	10,009.643	109.996		
Total	97	13,407.602			

Table 37. Multiple comparisons of survival of Manila clams planted in various substrate types, one factor ANOVA, 1987.

Comparison	Mean Difference	Fisher PLSD
Natural vs. raked	-1.071	7.875
Natural vs. whole shell	-0.071	7.875
Natural vs. ground shell	-2.571	7.875
Natural vs. gravel	-7.286	7.875
Natural vs. wholeshell and gravel	-6.857	7.875
Natural vs. groundshell and gravel	-17.786*	7.875
Raked vs. whole shell	1.000	7.875
Raked vs. groundshell	-1.500	7.875
Raked vs. gravel	-6.214	7.875
Raked vs. whole shell and gravel	-5.786	7.875
Raked vs. groundshell and gravel	-16.714*	7.875
Whole shell vs. ground shell	-2.500	7.875
Whole shell vs. gravel	-7.214	7.875
Whole shell vs. whole shell and gravel	-6.786	7.875
Whole shell vs. ground shell and gravel	-17.714*	7.875
Ground shell vs. gravel	-4.714	7.875
Ground shell vs. whole shell and gravel	-4.286	7.875
Ground shell vs. ground shell and gravel	-15.214*	7.875
Gravel vs. whole shell and gravel	-0.429	7.875
Gravel vs. ground shell and gravel	-10.500*	7.875
Whole shell and gravel vs. ground shell and gravel	-10.929*	7.875

* Significant at 95% confidence level.

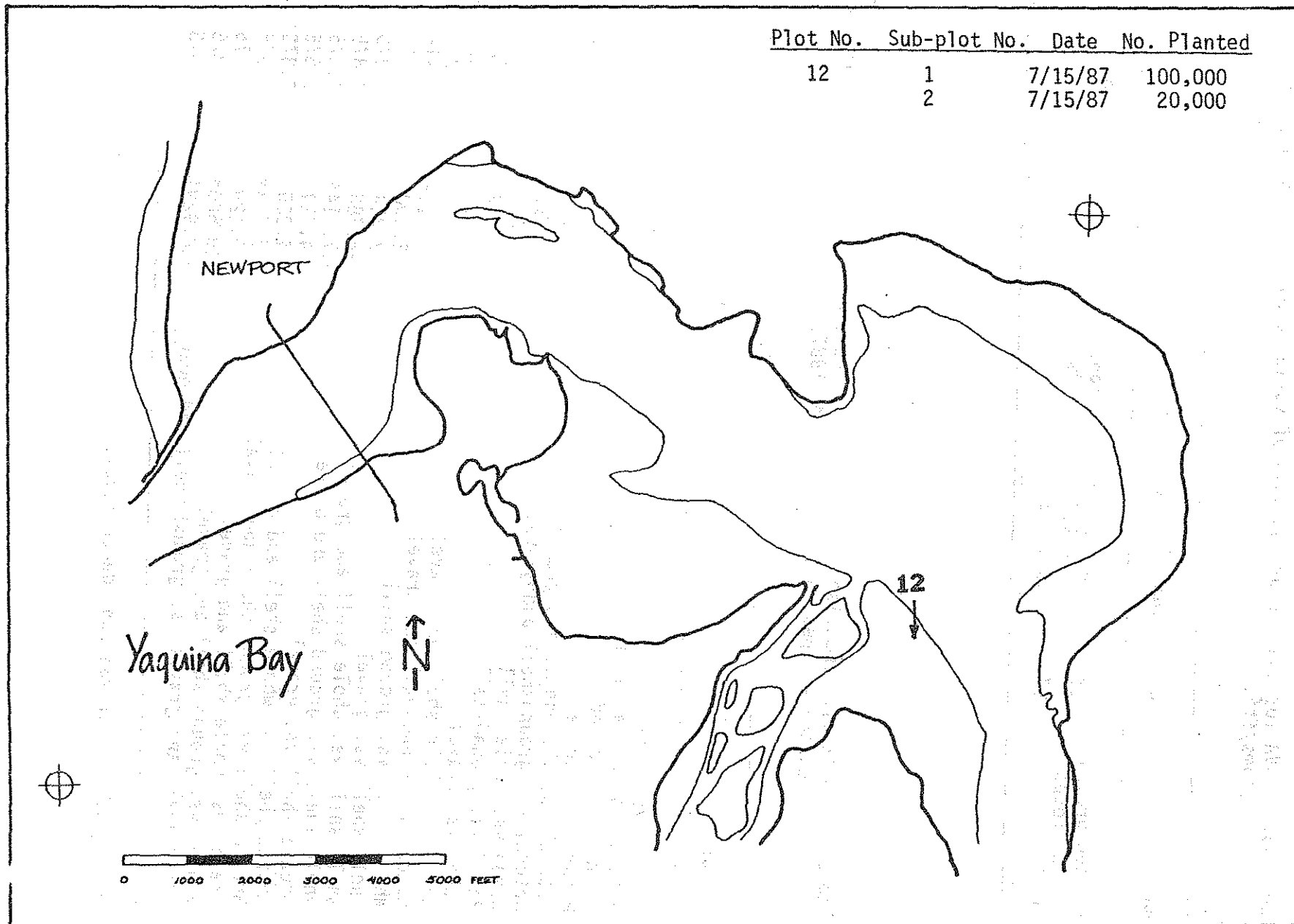


Figure 7. Location of Manila littleneck clam releases in Yaquina Bay, 1987.

Table 38. Summary of experimental Manila littleneck clam plants in Coos Bay, 1973-87.

Plot No.	Subplot No.	Planting Date	Number Released	Size at Release (mm)	Planting Density (ft ²)	Sample Date	Recovery Size (mm)	Survival (%)
1	1	8/17/73	11,550	7.1	50	5/8/74	-	0.0
2	1	8/17/73	11,500	7.1	50	5/8/74	-	0.0
3	1	12/19/84	12,660 ¹	31.0	10.3	5/8/85 7/19/85 5/29/86 2/24/87	32.3 35.8 40.1 41.4	39.8 35.0 10.0 10.7
4	1	7/19/85	17,000 ²	12.2	100	5/29/86 2/24/87	23.2 33.3	100+ 85.0
5	1	8/20/86	100,000 ²	6.7	100	2/24/87	12.5	88.7
6	1	8/20/86	3,300	6.7	132	2/24/87	12.5	78.8
7	1	8/20/86	10,000	6.7	100	2/24/87	10.9	30.0
8	1	9/19/86	10,000 ²	10.0	100	4/20/87	17.3	34.4
9	1	9/19/86	10,000	10.0	100	4/20/87	13.3	0.8

- ¹ Planted as adult clams.
² Planted under "Vexar" netting.

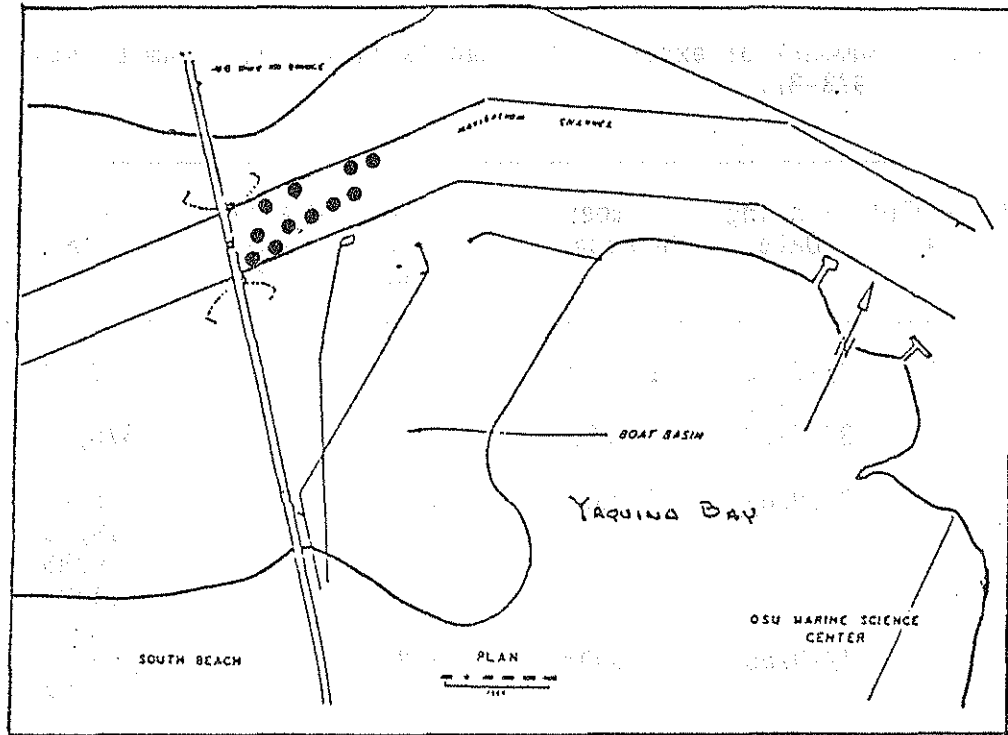


Figure 8. Subtidal clam survey area in Yaquina Bay, 1987.

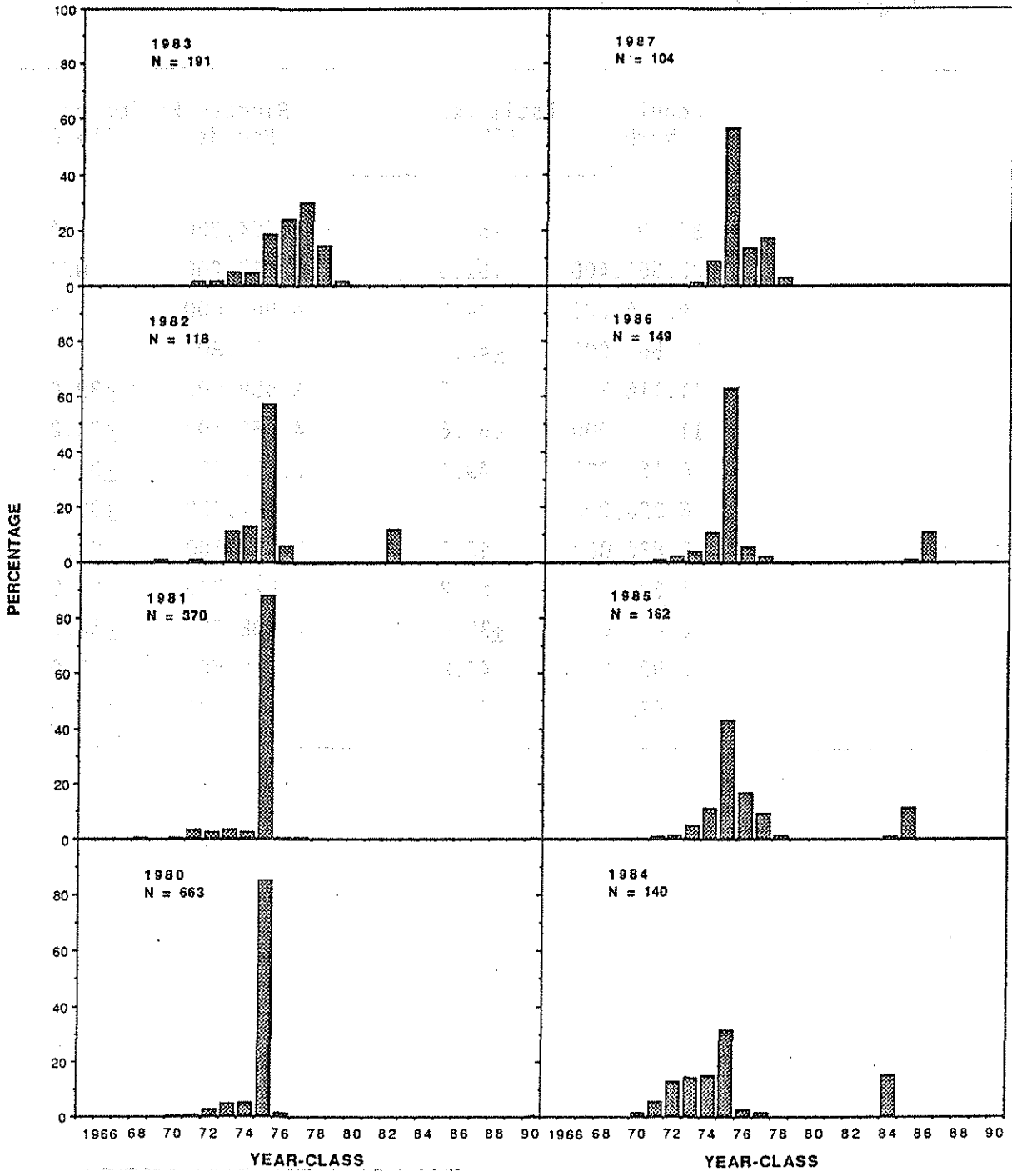


Figure 9. Age composition of subtidal gaper clams, Area 2, Yaquina Bay, 1980-87.

Table 39. Population and biomass estimates (95% CI) for gaper clams in Yaquina Bay, Area 2, 1975-87.

Year	Population Estimates Numbers	Estimates 95% CI	Biomass Estimates Pounds	Estimates 95% CI
1975	36,302,000	±56.1	5,084,200	N/A
1976	25,566,400	±51.5	5,217,200	N/A
1977	29,316,000	±44.5	4,969,000	N/A
1978	10,560,000	±48.9	4,136,800	N/A
1979	11,116,700	±51.7	3,459,900	±39.0
1980	11,050,000	±51.6	4,252,500	±33.2
1981	6,160,000	±49.4	2,569,700	±36.9
1982	6,320,000	±42.6	4,424,900	±30.4
1983	7,680,000	±40.3	5,042,100	±29.7
1984	5,600,000	±59.2	3,528,700	±54.2
1985	6,480,000	±32.6	4,708,200	±32.7
1986	5,920,000	±48.8	4,350,600	±50.0
1987	7,563,600	±66.1	6,507,400	±58.6

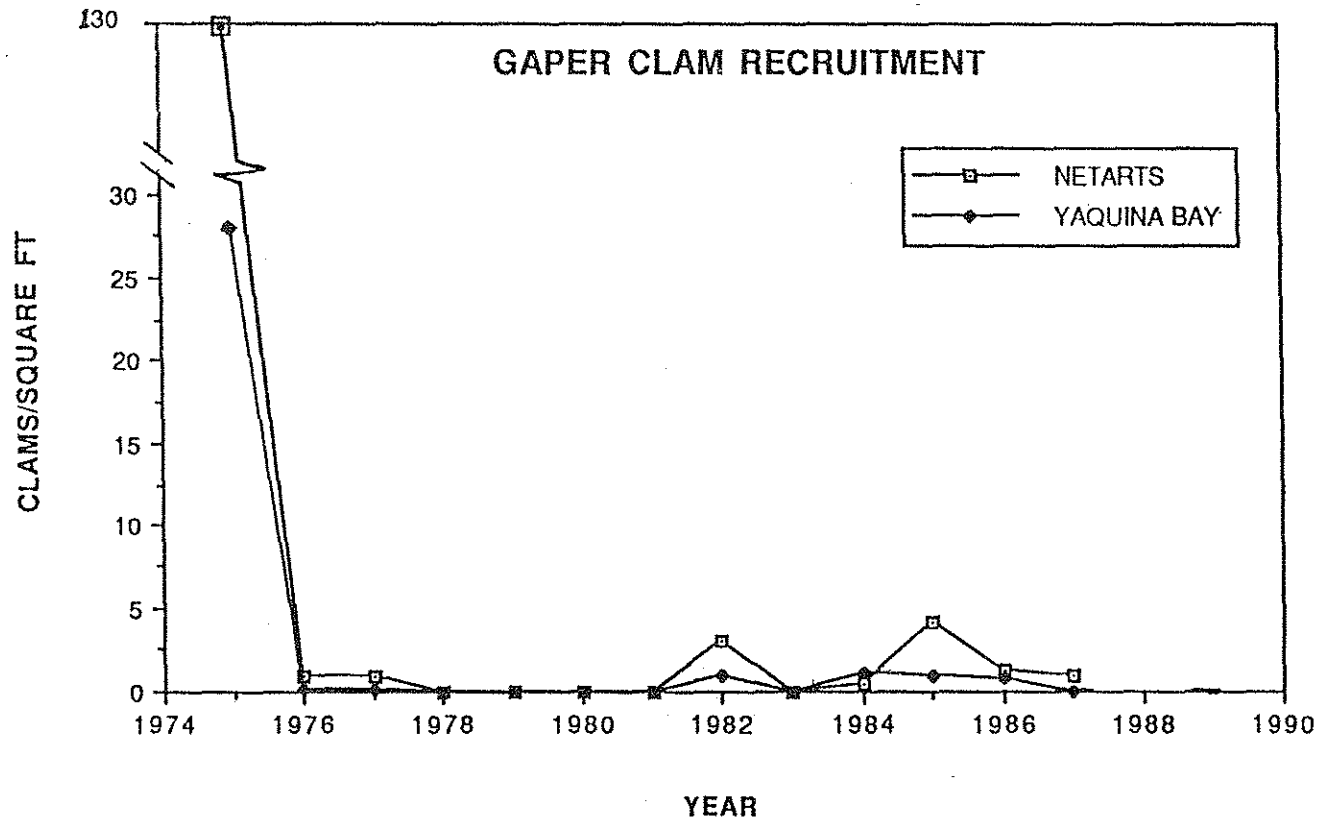


Figure 10. Recruitment of gaper clams in Netarts and Yaquina bays, 1975-87.