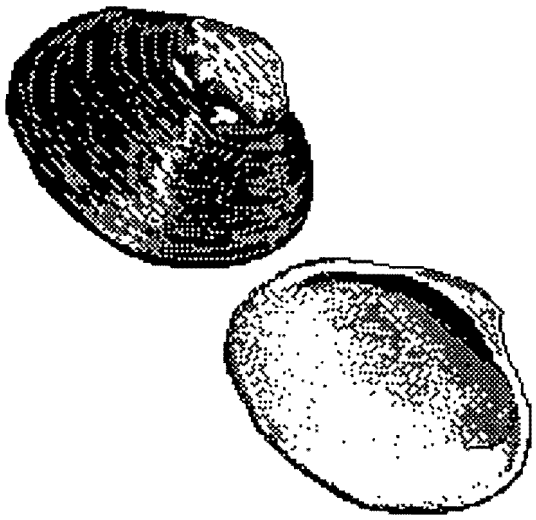
OREGON DEPARTMENT OF FISH AND WILDLIFE

BAY CLAM DATA SERIES REPORT

1993



1993 BAY CLAM DATA SERIES REPORT

by

John A. Johnson

Oregon Department of Fish and Wildlife
Marine Region
Newport, Oregon

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1993 BAY CLAM DATA SERIES REPORT

INTRODUCTION

This report summarizes the results of our bay clam studies in 1993. Activities summarized include recreational and commercial clam fishery. 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 of 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 were conducted annually on each of the major clam harvesting tideflats of the Tillamook, Netarts, Nestucca, Yaquina, Alsea, Siuslaw, and Coos estuaries. Also, the lower Umpqua triangle was added for 1991. Recreational clam digger interviews for 1992 were eliminated totally due to budgetary restraints for the first time since 1976. We decided to initiate a volunteer recreational clam use survey for selected estuaries in 1993. Volunteers conducted 3,137 interviews during selected low tides from April through July at key locations in Netarts, Tillamook, Yaquina and Umpqua bays. Volunteers examined 58,061 clams and gathered valuable data concerning catch per effort, species composition, digger origin, and peak use. Staff effort since 1976 has averaged only about 1,200 interviews each year at a very heavy cost of staff time and money. We hope to expand this program to cover other estuaries for 1994. These data are presented in Tables 1-8 and Table 9 shows peak counts of clam diggers taken at low tide for each of the surveyed tideflats.

In 1993 volunteers interviewed 3,137 clam diggers that expended 2,859 hours to harvest 58,061 clams (Table 10). The clam diggers averaged 18.5 clams/trip and 20.3 clams/hour. Digging success was better than in 1991 when 16.9 clams per trip and 11.5 clams per hour were taken.

The Commission approved a reduction in bag limit in 1977 from 36 to 20 as over-harvest was a real concern. Diggers have averaged from 14.7 to 18.8 clams per trip since that time.

Oregon clam diggers normally travel some distance to harvest clams. In 1993, 38.7% of the diggers were local county residents, 54.3% were from Oregon but living outside the county of harvest, and 7.0% were out-of-state residents (Table 10).

The cockle clam was, as usual, the most frequently observed species in the recreational fishery representing 45.7% of the 1993 harvest (Table 10). Gaper, littleneck, softshell and butter clams comprised 7.8, 16.9, 2.9, and 26.6% of the bag respectively.

No major changes in digging effort, with the exception of counts at Garibaldi Flat, were evident for 1993. The peak count at Garibaldi Flat was a four fold increase when compared to 1991. Peak count summary for 1993 is summarized in Table 9.

The Umpqua Triangle, located at the mouth of the Umpqua River has developed into an exciting new clam digging area and has been added to our annual clam creel census check areas. A "triangle" was created in 1980 when the "training" jetty was extended to join with the south jetty. The area is now protected from river current and wave action and apparently now has the correct habitat and growing conditions for hardshell clams.

COMMERCIAL CLAM HARVEST

We issued 111 permits to commercial fishermen to harvest bay clams in 1993 (Table 11). Thirty-eight fishermen reported landings of 127,730 lbs of clams. In 1992, 29 fishermen reported landings of 62,044 lbs. Cockle clams represented the bulk o the commercial catch in 1993 at 72,340 lbs (56.6%) (Table 12). Tillamook Bay was the major producer of bay clams in Oregon with 76,103 lbs (59.6%). The Nehalem, Umpqua and Coos estuaries followed in order producing 31,966, 7,105, and 5,698 lbs of clams in 1993 respectively (Table 13).

Commercial harvest of cockle clams in Tillamook Bay increased from 35,935 lbs in 1992 to 76,103 lbs in 1993. Native littleneck commercial harvest in Nehalem Bay had a dramatic increase from 4,597 lbs in 1992 to 31,966 lbs in 1993. As a result, we will pay particular attention to commercial harvest in these two bays in 1994.

SPECIAL STUDIES

Native Oyster Enhancement

Netarts Bay

We initiated a project to reestablish the native oyster into Netarts Bay in 1993. We spawned 300 Yaquina Bay native oysters at Whiskey Creek Oyster Hatchery in Netarts Bay. We set seed on culch and 6 million juvenile oysters were planted in July of 1993. A field investigation in August showed quarter-sized juveniles. We plan more enhancement work in Netarts in 1994.

APPENDIX

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

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
No. Diggers Sample	239	597	456	359	219	132	200	107	290	277	421	476	450	272	-	2,031
No. Clams Sampled	4,631	11,104	8,728	6,558	4,249	2,471	3,729	2,128	5,598	5,491	8,067	9,150	8,665	4,879	-	39,816
No. Digger Hours	261	715	549	443	220	158	243	143	311	312	452	631	568	354	-	1,469
Hours/trip	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.1	1.1	1.1	1.3	1.3	1.3	-	.72
Clams/trip	19.4	18.6	19.1	18.3	19.4	18.7	18.7	19.9	19.3	19.8	19.2	19.2	19.3	17.9	-	19.6
Clams/hour	17.7	15.5	15.9	14.0	14.6	15.6	15.4	14.9	18.0	17.6	17.9	14.5	15.3	13.8	-	27.1
Digger Origin (%)																
Local	33.1	30.2	22.4	27.6	38.8	37.7	30.0	28.0	17.9	23.5	35.2	21.0	17.6	30.1	-	36.0
State	55.2	64.7	72.6	63.5	57.1	46.9	67.5	66.4	78.6	67.9	57.0	69.1	79.8	60.3	-	56.9
Non-state	-	-	-	-	4.1	15.4	2.5	5.6	3.4	8.7	7.8	9.9	2.7	9.6	-	7.1
Species Comp. (%)																
Butter	11.5	13.5	28.7	42.8	45.8	39.7	38.8	39.5	32.9	41.6	34.0	45.6	49.0	17.8	-	27.9
Cockle	66.6	64.0	46.5	24.2	27.4	27.4	28.5	43.2	51.0	48.7	35.6	32.0	35.9	18.5	-	45.8
Gaper	7.1	9.6	7.1	5.7	6.0	4.5	0.7	1.8	1.0	1.3	0.9	1.1	1.5	1.3	-	1.8
Littleneck	14.7	12.7	17.7	27.2	20.8	28.4	32.1	15.4	15.1	8.0	29.6	21.3	13.4	62.4	-	24.2
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip																
Butter	2.2	2.5	5.5	7.8	8.9	7.4	7.2	7.9	6.3	8.2	6.5	8.8	9.4	3.2	-	5.5
Cockle	12.9	11.9	8.9	4.4	5.3	5.1	5.3	8.6	9.9	9.7	6.8	6.2	6.9	3.3	-	9.0
Gaper	1.4	1.8	1.4	1.4	1.2	0.9	0.1	0.4	0.2	0.2	0.2	0.2	0.3	0.2	-	0.4
Littleneck	2.8	2.4	3.4	5.0	4.0	5.3	6.0	3.1	2.9	1.6	5.7	4.1	2.6	11.2	-	4.7
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour																
Butter	2.0	2.1	4.6	6.3	6.7	6.2	6.0	5.9	5.9	7.3	6.1	6.6	7.5	2.5	-	7.5
Cockle	11.8	9.9	7.4	3.6	4.0	4.3	4.4	6.5	9.2	8.6	6.4	4.6	5.5	2.6	-	12.4
Gaper	1.3	1.5	1.1	0.9	0.9	0.7	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	-	0.5
Littleneck	2.6	2.0	2.8	4.0	3.0	4.4	4.9	2.3	2.7	1.4	5.3	3.1	2.0	8.6	-	6.6
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Annual summary of recreational interview data, central bay, Tillamook Bay.

	1993
No. Diggers Sampled	343
No. Clams Sampled	6,420
No. Digger Hours	375
Hours/trip	1.1
Clams/trip	18.7
Clams/hour	17.1
Digger Origin (%)	
Local	51.3
State	45.2
Non-state	3.5
Species Comp. (%)	
Butter	16.2
Cockle	79.0
Gaper	3.8
Littleneck	1.0
Softshell	-
Clams/trip	
Butter	3.0
Cockle	14.8
Gaper	1.4
Littleneck	.2
Softshell	-
Clams/hour	
Butter	2.8
Cockle	13.5
Gaper	.6
Littleneck	.2
Softshell	-

Table 3. Annual summary of recreational interview data, buoy 10, Tillamook Bay

	1993
No. Diggers Sampled	63
No. Clams Sampled	1,174
No. Digger Hours	64
Hours/trip	1.0
Clams/trip	18.6
Clams/hour	18.3
Digger Origin (%)	
Local	57.1
State	41.3
Non-state	1.6
Species Comp. (%)	
Butter	80.5
Cockle	18.7
Gaper	.8
Littleneck	-
Softshell	-
Clams/trip	
Butter	15.0
Cockle	3.5
Gaper	.1
Littleneck	-
Softshell	-
Clams/hour	
Butter	14.8
Cockle	3.4
Gaper	.1
Littleneck	-
Softshell	-

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

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
No. Diggers Sampled	146	222	106	71	168	280	84	99	60	103	108	91	62	27	-	23
No. Clams Sampled	1,747	2,823	1,293	991	2,020	2,994	1,009	1,010	579	709	1,068	870	398	390	-	255
No. Digger Hours	149	204	68	67	151	290	84	124	92	205	209	182	92	48	-	24
Hours/trip	1.0	0.9	0.6	0.9	0.9	1.0	1.0	1.3	1.5	2.0	1.9	2.0	1.5	1.5	-	1.0
Clams/trip	12.0	12.7	12.2	12.9	12.0	10.7	12.0	10.2	9.7	6.9	9.9	9.6	6.4	14.4	-	11.1
Clams/hour	11.7	13.8	19.1	14.8	13.4	10.3	12.0	8.1	6.3	3.5	5.1	4.8	4.3	8.1	-	10.6
Digger Origin (%)																
Local	11.0	28.4	17.9	40.3	48.2	22.5	29.8	32.3	31.7	10.7	16.7	25.3	16.1	55.6	-	43.5
State	71.2	59.9	73.6	50.6	44.0	72.9	64.3	53.5	66.7	87.4	65.7	65.9	51.6	37.0	-	56.5
Non-state	17.8	11.7	8.5	9.1	7.7	4.6	6.0	14.1	1.7	1.9	17.6	8.8	32.3	7.4	-	-
Species Comp. (%)																
Butter	5.8	7.7	5.4	13.7	5.0	0.7	3.7	4.0	7.9	15.9	20.8	16.3	14.8	52.6	-	82.0
Cockle	-	-	0.1	-	<0.1	0.1	4.0	0.4	2.1	2.1	3.4	1.8	1.3	10.5	-	4.7
Gaper	91.0	90.3	92.5	82.7	94.3	98.5	89.5	93.6	84.6	73.1	68.8	72.5	81.4	31.8	-	13.3
Littleneck	3.1	0.2	2.0	3.4	0.6	0.8	2.9	2.1	5.4	8.3	7.0	9.2	2.5	5.1	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/trip																
Butter	0.7	1.0	0.7	1.8	0.6	0.1	0.4	0.4	0.8	1.1	2.1	1.6	1.0	7.6	-	9.1
Cockle	-	-	<0.1	-	<0.1	<0.1	0.5	<0.1	0.2	0.1	0.3	0.2	0.1	1.5	-	.5
Gaper	10.9	11.5	11.3	10.6	11.3	10.5	10.8	9.5	8.2	5.0	6.8	6.9	5.2	4.6	-	1.5
Littleneck	0.4	0.2	0.2	0.4	0.1	0.1	0.4	0.2	0.5	0.6	0.7	0.9	0.2	0.7	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour																
Butter	0.7	1.1	1.0	2.0	0.7	0.1	0.4	0.3	0.5	0.6	1.1	0.8	0.6	4.3	-	8.7
Cockle	-	-	<0.1	-	<0.1	<0.1	0.5	<0.1	0.1	0.1	0.2	0.1	0.1	0.9	-	.5
Gaper	10.7	12.5	17.7	12.3	12.7	10.2	10.8	7.6	5.3	2.5	3.5	3.5	3.5	2.6	-	1.4
Littleneck	0.4	0.3	0.4	0.5	0.1	0.1	0.4	0.2	0.3	0.3	0.4	0.4	0.1	0.4	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
No. Diggers Sampled	72	85	63	80	56	118	71	52	42	71	147	100	117	35	-	244
No. Clams Sampled	1,324	1,560	1,074	1,397	1,029	2,174	1,362	1,040	819	1,409	2,765	1,713	2,314	387	-	4,649
No. Digger Hours	149	178	89	150	83	197	87	85	92	151	237	196	232	43	-	316
Hours/trip	2.1	2.1	1.4	1.9	1.5	1.7	1.2	1.6	2.2	2.1	1.6	2.0	2.0	1.2	-	1.3
Clams/trip	18.4	18.4	17.0	17.5	18.4	18.4	19.2	20.0	19.5	19.8	18.8	17.1	19.8	11.1	-	19.1
Clams/hour	8.9	8.8	12.1	9.3	12.4	11.1	15.8	12.2	9.0	9.4	11.7	8.8	10.0	9.1	-	14.7
Digger Origin (%)																
Local	22.2	36.5	17.5	12.5	44.6	38.1	43.7	53.8	31.0	26.8	18.4	44.0	31.6	8.6	-	52.0
State	77.8	61.2	76.2	81.3	51.8	53.4	52.1	44.2	40.5	62.0	67.3	43.0	64.1	57.1	-	40.0
Non-state	-	2.3	6.3	7.5	3.6	8.5	4.2	1.9	28.6	11.3	14.3	13.0	4.3	34.3	-	8.0
Species Comp. (%)																
Butter	2.0	5.5	1.9	7.7	0.3	11.0	11.0	16.0	7.0	10.6	4.1	18.2	13.9	9.8	-	44.0
Cockle	72.7	74.4	93.3	76.7	84.9	80.4	78.0	82.1	89.5	83.1	88.9	67.7	68.0	34.6	-	47.0
Gaper	22.4	16.0	4.8	13.3	12.1	5.9	9.0	0.2	3.4	3.2	3.0	5.7	11.9	52.5	-	6.9
Littleneck	1.3	3.8	-	1.9	2.6	2.6	0.1	1.7	0.1	0.9	0.9	7.7	0.6	0.8	-	2.1
Softshell	-	-	-	-	-	-	1.8	-	-	-	-	-	3.2	2.3	-	-
Clams/trip																
Butter	0.4	1.0	0.3	1.4	0.1	2.0	2.1	3.2	1.4	2.1	0.8	3.1	2.7	1.1	-	8.4
Cockle	13.4	13.6	15.9	13.4	15.6	14.8	15.0	16.4	17.5	16.5	16.7	11.6	13.4	3.8	-	9.0
Gaper	4.1	2.9	0.8	2.3	2.2	1.1	1.7	-	0.7	0.6	0.6	1.0	2.4	5.8	-	1.3
Littleneck	0.2	0.7	-	0.3	0.5	0.5	<0.1	0.3	-	0.2	0.2	1.3	0.1	0.1	-	.4
Softshell	-	-	-	-	-	-	0.4	-	-	-	-	-	0.6	0.3	-	-
Clams/hour																
Butter	0.2	0.5	0.2	0.7	<0.1	1.2	1.7	2.0	0.6	1.0	0.5	1.6	1.4	0.9	-	6.5
Cockle	6.5	6.5	11.3	7.2	10.5	8.9	12.3	10.0	8.0	7.8	10.4	5.9	6.8	3.2	-	6.9
Gaper	2.0	1.4	0.6	1.2	1.5	0.7	1.4	-	0.3	0.3	0.4	0.5	1.2	4.8	-	1.0
Littleneck	0.1	0.3	-	0.2	0.3	0.3	<0.1	0.2	-	0.1	0.1	0.7	0.1	0.1	-	.3
Softshell	-	-	-	-	-	-	0.3	-	-	-	-	-	0.3	0.2	-	-

Table 6. Annual summary of recreational interview data; Bridge Bed, Yaquina Bay.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
No. Diggers Sampled	89	143	142	342	149	202	191	207	120	110	102	108	91	72	-	319
No. Clams Sampled	892	1,313	1,222	3,773	1,609	1,543	1,383	1,765	1,363	960	814	834	1,031	818	-	3,612
No. Digger Hours	110	120	160	354	154	274	265	304	153	160	155	109	159	106	-	457
Hours/trip	1.2	0.8	1.1	1.0	1.0	1.4	1.4	1.5	1.3	1.5	1.5	1.0	1.7	1.5	-	1.4
Clams/trip	10.0	9.2	8.6	11.0	10.8	7.6	7.2	8.5	11.4	8.7	8.0	7.7	11.3	11.4	-	11.3
Clams/hour	8.1	10.9	7.7	10.7	10.4	5.6	5.2	5.8	8.9	6.0	5.3	7.7	6.5	7.7	-	7.9
Digger Origin (%)																
Local	24.7	22.4	18.3	44.7	48.3	32.2	45.5	34.3	25.8	32.7	18.6	38.0	28.6	26.4	-	26.3
State	69.7	76.2	70.4	49.1	48.3	67.8	49.7	62.8	72.5	64.5	72.5	62.0	64.8	63.9	-	67.1
Non-state	4.5	1.4	11.3	6.1	3.4	-	4.7	2.9	1.7	2.7	8.8	-	6.6	9.7	-	6.6
Species Comp. (%)																
Butter	0.6	0.2	1.7	0.8	1.9	3.2	2.4	5.8	4.3	4.4	1.8	3.9	1.9	1.6	-	2.8
Cockle	24.6	7.9	1.4	15.7	7.2	12.9	5.2	11.2	14.4	2.8	10.1	9.9	12.1	1.9	-	9.8
Gaper	72.1	89.6	94.8	81.0	85.4	72.9	80.1	62.4	65.1	83.6	39.9	69.1	60.2	93.3	-	85.0
Littleneck	1.1	0.4	2.1	1.7	4.5	2.8	4.5	7.4	2.6	5.3	3.7	3.6	3.8	3.1	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other[1]	-	-	-	-	-	-	7.8	13.2	-	-	-	-	-	-	-	2.4
Clams/trip																
Butter	<0.1	<0.1	<0.1	0.1	0.2	0.3	0.2	0.5	0.5	0.4	0.1	0.3	0.2	0.2	-	.3
Cockle	2.5	0.7	<0.1	1.7	0.8	1.0	0.4	1.0	1.6	0.6	0.8	0.8	1.4	0.2	-	1.1
Gaper	7.2	8.2	8.2	8.9	9.2	5.6	5.8	5.3	7.4	7.3	3.2	5.7	6.8	10.3	-	9.6
Littleneck	0.1	0.1	0.2	0.2	0.5	0.2	0.3	0.6	0.3	0.5	0.3	0.3	0.4	0.3	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clams/hour																
Butter	0.1	<0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.4	0.3	0.1	0.3	0.1	0.1	-	.22
Cockle	2.0	0.9	0.1	1.1	0.8	0.7	0.3	0.6	1.3	0.2	0.5	0.8	0.8	0.1	-	.77
Gaper	5.9	9.8	7.3	8.6	8.9	4.1	4.2	3.6	5.8	5.0	2.1	5.6	3.9	7.0	-	6.7
Littleneck	-	-	-	-	-	0.2	0.2	0.4	0.2	0.3	0.2	0.3	0.2	0.2	-	-
Softshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] Bentnose 7.0%, Inquinata 0.2%, other 0.6%.

Table 7. Annual summary of recreational interview data; Umpqua Triangle.

	1991	1992	1993
No. Diggers Sampled	59	-	66
No. Clams Sampled	894	-	569
No. Digger Hours	81	-	97
Hours/trip	1.4	-	1.5
Clams/trip	15.2	-	9.6
Clams/hour	11.1	-	5.8
Digger Origin (%)			
Local	52.5	-	47.0
State	33.9	-	25.8
Non-state	13.6	-	27.2
Species Comp. (%)			
Butter	0.0	-	-
Cockle	82.4	-	79.8
Gaper	17.4	-	20.0
Littleneck	0.1	-	-
Softshell	-	-	-
Clams/trip			
Butter	0.0	-	-
Cockle	12.5	-	6.9
Gaper	2.6	-	1.7
Littleneck	-	-	-
Softshell	-	-	-
Clams/hour			
Butter	0.0	-	-
Cockle	12.5	-	4.7
Gaper	2.6	-	1.2
Littleneck	-	-	-
Softshell	-	-	-

Table 8. Annual summary of recreational interview data; Smith River Bridge.

	1993
No. Diggers Sampled	48
No. Clams Sampled	1,566
No. Digger Hours	58
Hours/trip	1.2
Clams/trip	32.6
Clams/hour	27.0
Digger Origin (%)	
Local	37.5
State	52.1
Non-state	10.4
Species Comp. (%)	
Butter	-
Cockle	-
Gaper	-
Littleneck	-
Softshell	100
Clams/trip	
Butter	-
Cockle	-
Gaper	-
Littleneck	-
Softshell	32.6
Clams/hour	
Butter	-
Cockle	-
Gaper	-
Littleneck	-
Softshell	27.0

Table 9. Peak counts of clam diggers[1].

Estuary	Tideflat	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Tillamook	Garibaldi Flat	256	300	460	516	487	350	118	380	400	257	547	585	127	-	482
	Bay Ocean	107	-	33	13	10	4	-	17	3	-	-	-	-	-	-
Netarts	Happy Camp	150	160	425	500	478	200	191	314	265	116	163	126	-	-	150
Yaquina	Bridge Bed	91	84	225	625	275	84	107	204	225	110	235	158	176	-	61
Umpqua	Smith River Bridge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
	Umpqua Triangle	-	-	-	-	-	-	-	-	-	-	-	-	43	-	31

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

Table 10. Annual summary of recreational interview data; all estuaries combined.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
No. Diggers Sampled	847	1,603	1,284	1,276	870	1,506	1,800	898	1,392	1,508	1,324	1,549	1,363	1,131	-	3,137
No. Clams Sampled	14,008	24,697	21,601	19,610	12,928	22,189	33,916	14,614	24,691	25,313	21,986	26,708	22,847	19,059	-	58,061
No. Digger Hours	1,187	1,986	1,718	1,606	1,104	2,113	2,589	1,303	2,128	2,154	1,876	2,259	2,029	1,662	-	2,859
Hours/trip	1.4	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.4	1.4	1.5	1.5	1.5	-	.91
Clams/trip	16.5	15.4	16.8	15.4	14.9	14.7	18.8	16.3	17.7	16.8	16.6	17.2	16.8	16.9	-	18.5
Clams/hour	11.8	12.4	12.6	12.2	11.7	10.5	13.1	11.2	11.6	11.8	11.7	11.8	11.3	11.5	-	20.3
Digger Origin (%)																
Local	29.0	29.3	22.9	30.6	40.5	33.6	42.7	37.8	36.9	35.6	33.2	32.6	31.3	41.1	-	38.7
State	62.8	63.8	70.5	60.0	54.0	60.7	52.7	53.7	56.7	53.4	56.7	58.2	62.7	45.6	-	54.3
Non-state	8.3	7.0	6.6	9.4	5.5	5.7	4.7	8.6	6.4	10.9	10.1	9.2	5.9	13.3	-	7.0
Species Comp. (%)																
Butter	5.2	8.5	12.8	15.8	16.2	9.9	7.8	10.6	13.3	15.3	16.5	19.4	22.7	10.3	-	26.6
Cockle	56.6	53.1	44.3	29.3	31.3	31.2	22.7	32.2	40.7	41.7	37.7	26.8	30.4	28.9	-	45.7
Gaper	26.9	25.1	17.9	24.9	31.8	35.6	26.1	23.6	20.8	24.0	20.0	19.8	23.6	24.2	-	7.8
Littleneck	5.8	6.5	7.5	9.9	8.1	7.8	6.2	5.0	6.7	5.2	14.1	11.9	8.7	18.5	-	16.9
Softshell	5.5	6.7	17.5	20.1	12.5	15.4	37.2	28.7	17.1	12.4	9.3	20.9	12.4	18.2	-	2.9
Clams/trip																
Butter	0.9	1.3	2.2	2.4	2.4	1.4	1.5	1.7	2.4	2.6	2.7	3.4	3.8	1.7	-	4.9
Cockle	9.3	8.1	7.4	4.5	4.6	4.5	4.3	5.1	7.2	7.0	6.3	4.6	5.1	4.8	-	8.5
Gaper	4.4	3.8	3.0	3.8	4.7	5.1	4.9	3.8	3.7	4.0	3.3	3.4	4.0	4.0	-	1.4
Littleneck	1.0	1.0	1.3	1.5	1.2	1.1	1.2	0.8	1.2	0.9	2.3	2.0	1.5	3.1	-	3.1
Softshell	0.9	1.0	2.9	3.1	1.9	2.2	6.9	4.6	3.0	2.1	1.5	3.6	2.1	3.0	-	0.5
Clams/hour																
Butter	0.6	1.0	1.6	1.9	1.9	1.0	1.0	1.2	1.5	1.8	1.9	2.3	2.6	1.2	-	5.4
Cockle	6.6	6.5	5.6	3.6	3.6	3.2	3.0	3.5	4.7	4.9	4.4	3.2	3.4	3.3	-	9.3
Gaper	3.1	3.1	2.2	3.0	3.7	3.6	3.4	2.6	2.4	2.8	2.3	2.3	2.7	2.7	-	1.6
Littleneck	0.7	0.3	0.9	1.2	1.0	0.8	0.8	0.5	0.8	0.6	1.7	1.4	1.0	2.1	-	3.4
Softshell	0.6	0.8	2.2	2.4	1.5	1.6	4.8	3.2	2.0	1.5	1.1	2.5	1.4	2.1	-	0.6
Size Comp. (x size)																
Butter	90.7	78.9	69.2	78.1	75.1	71.0	79.5	76.5	79.8	83.0	83.9	78.5	78.5	81.6	-	-
Cockle	62.6	63.1	60.2	55.3	63.2	60.8	62.0	64.2	63.3	61.9	63.9	63.5	61.4	63.0	-	-
Gaper	95.5	93.0	98.0	104.3	101.4	103.6	104.2	108.0	111.6	107.9	110.3	110.4	113.7	120.0	-	-
Littleneck	44.8	47.0	39.8	44.2	40.2	41.4	50.1	66.5	47.7	53.2	52.0	51.8	53.4	46.3	-	-
Softshell	83.3	89.5	86.4	88.2	81.8	87.7	86.0	88.4	91.0	92.7	87.9	87.5	89.6	89.0	-	-
No. Clams Measured	5,096	8,643	6,661	5,372	4,044	6,774	5,152	7,438	6,997	6,403	5,990	6,853	5,448	6,781	-	-

Table 11. Oregon commercial clam harvest in pounds, 1970-93.

Year	Harvest (lb)	# Diggers	# Landings	Ave. lb/ landing	# Permits Issued
1970	25,884	40	258	100.3	0
1971	28,526	50	230	124.0	0
1972	61,523	37	354	174.8	0
1973	17,156	19	187	91.7	0
1974	16,315	23	182	39.6	0
1975	25,908	19	116	227.3	0
1976	88,054	7	97	946.8	0
1977	85,733	29	155	304.0	0
1978	216,926	15	218	943.2	0
1979	94,912	19	128	741.5	0
1980	80,467	36	176	442.1	0
1981	81,138	30	336	222.5	0
1982	134,105	46	538	245.3	0
1983	136,185	41	811	168.0	0
1984	120,574	30	704	171.3	0
1985	99,254	44	614	161.7	65
1986	82,829	36	664	124.7	65
1987	46,283	34	385	120.2	121
1988	44,696	28	258	173.2	136
1989	60,482	24	221	273.7	111
1990	72,756	38	384	189.5	92
1991	87,842	40	473	185.7	126
1992	62,044	29	410	151.3	115
1993	127,730	38	733	174.3	111

Table 12. Summary of pounds of bay clams reported commercially harvested in Oregon by species, 1970-93.

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	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
1988	2,492	30,068	3,816	6,884	1,436	0	44,696
1989	3,806	44,344	5,164	6,032	1,136	0	60,482
1990	4,604	45,607	10,391	7,521	4,633	0	72,756
1991	3,690	58,282	8,660	8,708	9,215	0	87,842
1992	475	35,800	8,609	10,980	6,180	0	62,044
1993	6,382	72,340	4,169	35,913	7,312	0	127,730

Table 13. Summary of pounds of bay clams reported commercially harvested in major Oregon estuaries, 1970-93.

Year	Nehalem	Tillamook	Netarts	Yaquina	Alsea	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
1988	0	34,450	0	1,153	230	1,200	28	7,086	549	44,696
1989	80	49,650	0	2,790	993	600	150	6,183	36	60,482
1990	5,810	47,198	0	1,543	410	0	3,432	14,363	0	72,756
1991	6,331	50,860	7,451	1,013	530	120	8,322	12,501	60	87,842
1992	4,597	35,935	879	7,067	1,398	0	6,095	5,986	87	62,044
1993	31,966	76,103	54	2,843	1,495	93	7,105	5,698	0	127,730