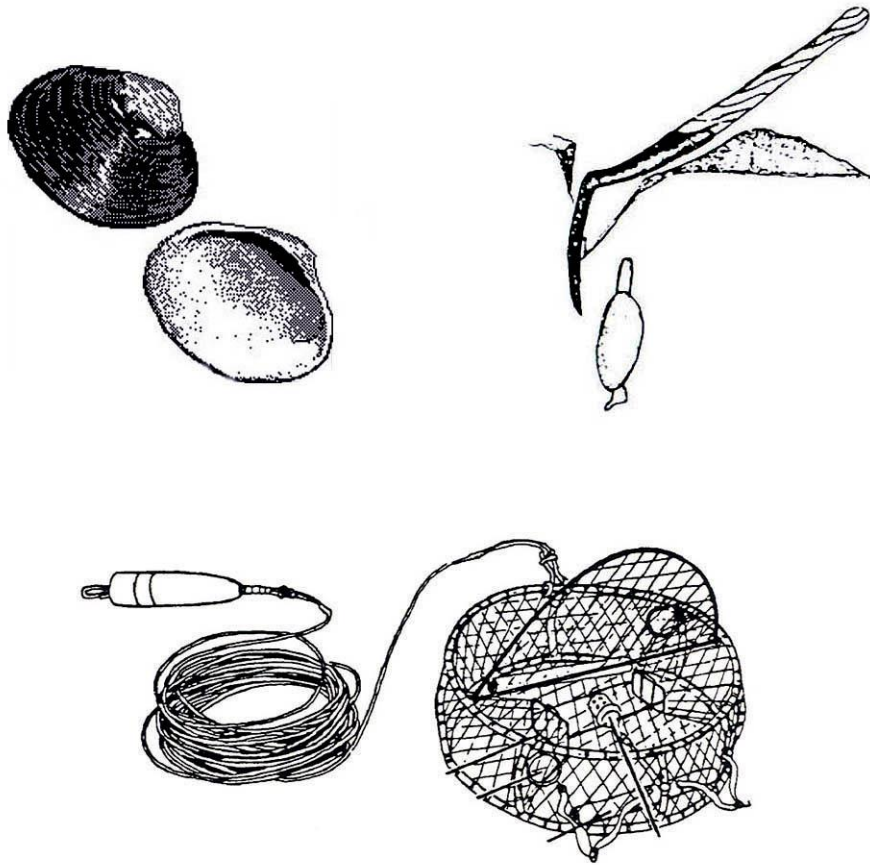


Shellfish / Estuarine Habitat Projects DATA REPORT

2001 Clatsop Beach Razor Clam Fishery



**Marine Resources Program
Oregon Department of Fish and Wildlife**

**2001 Clatsop Beach Razor Clam Fishery
Status Report**

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Introduction

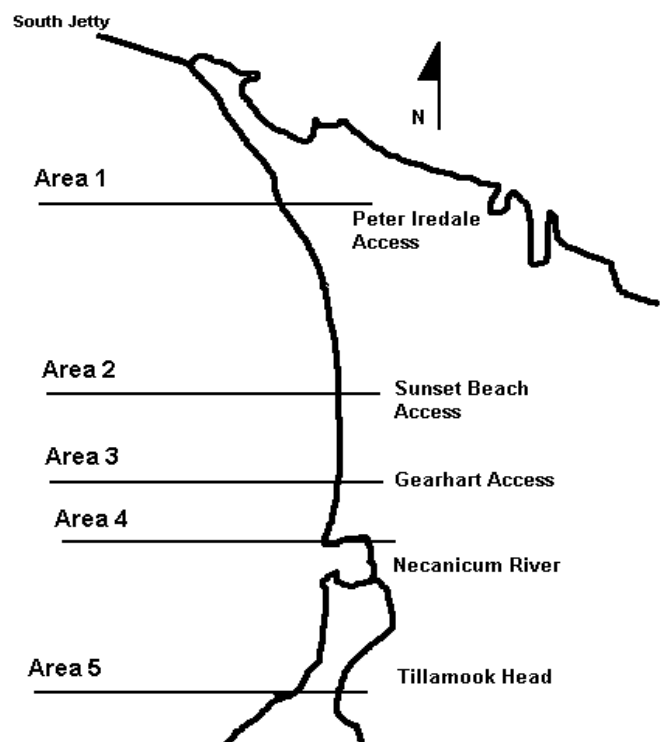
The 18-mile stretch of shoreline, known as the Clatsop Beaches, extends from the South Jetty of the Columbia River south to Tillamook Head. Better than 90% of Oregon's razor clam catch and effort occurs in this area. The Clatsop Beach razor clam fishery has been monitored by the Oregon Department of Fish and Wildlife (ODFW) since 1947 with catch and effort data compiled since 1955. Historically the fishery has been sampled on low-tide series, with sampling per tide series ranging from 2-8 days during the spring and summer months and as time and weather permitted the rest of the year. Recreational and commercial harvesters were interviewed to obtain data on effort, catch, age composition and harvest area. ODFW staff collects random age and length data, wastage analysis, and more recently samples for the Oregon Department of Agriculture to test for biological toxins.

Methods

Sampling Area Description

For sampling purposes, Clatsop Beach is categorized into 5 areas. Each area represents a distinct segment of the sampling area and estimates of total catch and effort are made separately for each area.

This sampling procedure accounts for variability in effort and catch rates. Area 1 (3.6 mi.) is from the South Jetty of the Columbia River to the Peter Iredale vehicle access point. Area 2 (6.2 mi.) is from the Peter Iredale access to the Sunset Beach vehicle access point. Area 3 (5.0 mi.) is from the Sunset Beach access to the Gearhart vehicle access point. Area 4 (1.2 mi.) is from the Gearhart access to the Necanicum River. Area 5 (2.0 mi.) is from the Necanicum River to Tillamook Head. It should be noted that Areas 4 and 5 are restricted to walk-on access only. Motorized vehicles are prohibited.



Statistical Sampling

Total catch and effort estimates were made for each low-tide series using a computer program that combined total effort estimates with observed catch rates in each area. Staff conducted random digger interviews at the vehicle access points on the beaches and with proper permission drove on the walk-on only beaches and interviewed diggers as they left the harvest area. Digger catch rates as well as catch per unit hour were determined. In March through July digger interviews were conducted 4 days per low-tide series (8 to 9 days each) to account for variability in catch rates.

Effort Estimates

Since 1955 a minimum of 4 effort counts have been made of all vehicles and diggers in each area of the Clatsop Beaches prior to maximum low-tide. Counts were made on both weekdays and weekends to take into account effort shifts. Since the late 1980's effort counts have been expanded using a computer program. Effort totals were combined for each area during the low-tide series to determine total effort for each beach area. Average digger trip lengths, average number of diggers per vehicle and the proportion of vehicles from each state were determined from the sampling data.

Expansion factors for vehicle and digger counts were developed in the 1970's and 1980's. At that time, vehicle and digger counts were made at ½ hour and one hour intervals in each area as well as the use of car counters at access points to develop effort profiles during low-tide series. From this, total vehicle and digger effort could be determined using Area Under the Curve (AUC). Expansion of effort counts are now performed in a computer program.

Biological Sampling

Random sampling of digger harvest for age composition and length frequencies were conducted during sampling interviews. Data collected was used to determine age composition per area during the year and each area total was combined to give overall age composition for the total harvest.

Results and Discussion

2001 Weather and Surf Conditions

Weather and the subsequent surf conditions are the most important factor in determining digger success for razor clams. Windy wet weather with associated high surf will substantially reduce digger success by making the clam "show" difficult if not impossible to

see. High surf conditions alone can decrease digger success, since the constant pounding of the waves makes the clams less likely to show when diggers stomp or pound. 2001 conditions were very favorable for clam harvest in the summer months. Surf conditions for the months of June and July were moderate with no large summer storms hitting the coast. December had a fair number of storms, which is not uncommon for the winter months. Southwest storms and high surf made digging poor to moderate for the month of December.

Biological Toxins

Periodically, algal blooms of certain species of phytoplankton that manufacture biological toxins are ingested by razor clams and stored in the muscles, gonads, gills and digestive systems. Two biological toxins that razor clams can become contaminated with are Paralytic Shellfish Poisoning (PSP) which is caused by a dinoflagellate and Domoic Acid (DA) which is caused by a diatom. Contaminated clams if consumed by warm-blooded animals can be harmful, affecting the neurological and gastrointestinal systems. The biological toxins cannot be cooked or soaked out, the clam needs to depurate (cleanse) the toxins out of its system. Depuration rates vary, with low levels getting flushed out in weeks while high levels may very well last the life of the clam.

The Oregon Department of Agriculture (ODA) is the agency responsible for the monitoring of the toxin levels in shellfish. In cooperation with ODFW staff, samples from up to four separate areas on Clatsop beach are collected every low-tide series for biological toxin analysis.

In 2001, DA was discovered in levels above the 20 parts per million threshold in late March. The Clatsop Beaches were closed on March 30th for all clam and mussel harvest. The toxin persisted at levels above the cut-off on the Clatsop Beaches for 63 days until June 1st when the Clatsop beaches were reopened to harvest. Clatsop beaches were closed to a PSP outbreak on July 12th and didn't reopen until July 30th (season was closed as per permanent summer conservation regulations). Another outbreak of DA occurred in late September and kept the Clatsop beaches closed until December 10th.

2001 Recreational Catch and Effort

Clam diggers made an estimated 7,300 digging trips on the Clatsop Beaches during 2001. The 2001 effort set an all-time low in digging effort on the Clatsop beaches being nearly 60% lower than the previous record low of 17,000 digger trips in 2000. Resulting catches of razor clams was 78,000, equaling the record low catch of 2000. This includes 8,000 clams wasted in the harvest process. The average catch per digger trip was 9.6 clams (Table 1).

The spring harvest started after a nearly three month ban on digging due to DA contamination. A harvest of 57,000 clams for the three low-tide series open until the summer conservation closure, accounted for 81% of the total recreational harvest.

Area 5 (Seaside) accounted for 30,000 clams or 53% of the summer harvest. Area 3 (Del Rey) accounted for 20% (11,000 clams) of the summer harvest.

When the season reopened in December after a 2 ½ month closure the majority of the harvest of 13,000 clams had shifted to Area 2 and Area 3, with 2,600 clams(20%) and 8,600 (66%) clams harvested respectively (Table 2). Winter effort might have been considerably higher had Washington not had a number of openers with the presence of many larger clams attracting diggers.

Age composition for the 2001 recreational fishery indicated a lack of older clams with less than 6% being 2 year or older age class clams. The majority of the harvest, 66%, was of the 0 age class, while the 1 year age class made up 28% of the harvest (Table 2).

With the majority of the best low-tide series of the season closed to harvest due to biological toxin contamination concerns, and the lack of clams over 3 ½ inches available, contributed to the record lows of effort and catch. On a more positive note, the 2000 year class, or the fresh “set” was one of the largest observed on the Clatsop beaches. Commercial and recreational harvesters who have been digging on the beaches for as many as 75 years believe this might be the biggest and most widespread set they can recall. Ocean conditions, if conducive, could increase catch and effort levels dramatically for the upcoming year.

South Coast Sampling

With the knowledge of a large fresh “set” on the Clatsop beaches, exploratory digs were conducted at two beaches south of Tillamook Head. On July 20, staff conducted an exploratory random age length frequency dig at Oswald West State Park (Shorts Sands beach). Digging commenced one hour prior to the low tide and continued for ½ hour after low water. A total of 53 razor clams were dug, with 47 (98%) age 0 clams, 4 (8%) being 1 year age class clams, 1 (2%) being a 3 year age class clam, and 1 (2%) being a 4 year age class clam. The number of 0 age class clams confirmed the presence of a set being south of Tillamook Head. The second dig was performed south of Coos Bay on December 30th at Whiskey Creek beach. Weather was not favorable for a night time dig with rain, wind, and high surf conditions. Due to poor weather conditions zero clams were observed or dug.

Cooperative Project

In September, the ODFW and Washington Department of Fish and Wildlife (WDFW), conducted a demonstration of the WDFW razor clam pump stock assessment technique on the Clatsop beaches. Developed in the early 1990's by a University of Alaska graduate student, the clam pump stock assessment technique has become the standard in determining razor clam population abundance. It is not only used by the WDFW, but also the Alaska Department of Fish and Game and the Haida Tribe on Queen Charlotte Islands of British Columbia, Canada. This technique is what WDFW uses to determine their harvestable population and subsequently set seasons within an Optimal Sustainable Yield (OSY). The purpose of the demonstration was to determine if the technique would work on

Oregon beaches and to examine if this technique revealed abundances of razors clams higher than with previous ODFW methods.

What the cooperative project revealed is that this technique works on Oregon beaches as well as it does on Washington beaches. It also revealed that there was a large and recent set of clams that had just “hit” the beach. With the number of small clams and the number of medium sized clams that were observed with this demonstration, it can be assumed that with a mild to moderate winter, the 2002 clam populations on the Clatsop beach could be quite healthy.

On the last day of the demonstration, a journalist with the local paper “The Daily Astorian”, observed the technique and wrote up a front page color article detailing the technique and some of the preliminary findings. This led to a number of letters to the editor in favor of the use of the technique by ODFW as well as an editorial column regarding the lack of razor clam management in Oregon compared to Washington.

2001 Commercial Fishery

The commercial fishery has been monitored since 1935, with the number of licensed diggers and catch recorded since 1947. Commercial catches are sampled at processors for age and length frequencies as well as clams per pound averages. Documented landings (i.e. fish tickets) are then used with the sampled clams per pound averages to determine estimated total commercial harvest. Required harvest logbooks are used to determine catch per area and yield per hour.

The annual harvest and the number of permitted diggers tend to fluctuate with the abundance of clams available. A record high harvest of 1,900,000 clams occurred in 1954 and in 1983 the record low occurred of 1,000 clams. In 1976, 391 commercial diggers participated, the highest since 1954 when 430 diggers participated (Table 3). The commercial fishery accounts for less than 20% of the total harvest on average. In years of high clam abundance the percentage is higher and in years of low clam abundance the percentage is smaller. Commercial harvest age composition fluctuates annually, but the trend has changed little over time due to minimum size requirements (Table 3).

The 2001 commercial harvest was 5,000 clams (987 pounds), well below the ten year average of 50,000 clams per year (Table 3). A total of 19 commercial harvesters were issued ODFW Shellfish Harvest Permits, yet only 9 made commercial landings in 2001. Low numbers of commercial sized clams most likely contributed to the lack of participation. The majority of the commercially harvested clams came from Area 5 (90%), the only portion of Clatsop beach that had hold-over clams from the previous years set. The age composition was 66% 2 year age class clams, 18% 3 year age class clams, 14% 1 year age class clams, and less than 3% 4 year or older age class clams (Table 4).

With the likelihood of a large quantity of commercial sized clams being available in upcoming years, the number of participants and harvest will surely increase.

Table 3. Annual commercial razor clam catch and effort, 1935-2001.

Year	Pounds Landed	Number of Landings	Number of Clams	Lbs. / Landing	Clams / Pound	Number of Diggers	Landings / Digger
1935						93	
1936						161	
1937						135	
1938						107	
1939						202	
1940						243	
1941	123,934					238	
1942	13,353					192	
1943	15,698					57	
1944	57,787					197	
1945	81,794					242	
1946	151,477		606,000			719	
1947	166,355	2,662	666,000	62.5	4.00	558	4.8
1948	206,835	6,849	827,000	30.2	4.00	505	13.6
1949	200,486	6,683	802,000	30.0	4.00	381	9.8
1950	335,091	12,416	1,340,000	27.0	4.00	790	15.7
1951	255,631	8,283	1,534,000	30.9	6.00	574	14.4
1952	319,165	11,095	1,915,000	28.8	6.00	613	18.1
1953	264,278	8,527	1,320,000	31.0	4.99	592	14.4
1954	156,215	7,628	781,000	20.5	5.00	430	17.7
1955	180,818	5,496	904,000	32.9	5.00	295	18.6
1956	97,899	3,231	490,000	30.3	5.01	253	12.8
1957	67,157	2,469	336,000	27.2	5.00	193	12.8
1958	82,140	2,832	386,000	29.0	4.70	221	12.8
1958	48,401	1,518	179,000	31.9	3.70	118	12.9
1960	34,126	1,258	154,000	27.1	4.51	93	13.5
1961	17,845	671	80,000	26.6	4.48	58	11.6
1962	24,221	910	102,000	26.6	4.21	79	11.5
1963	23,822	889	107,000	26.8	4.49	77	11.5
1964	35,300	1,245	125,000	28.4	3.54	125	10.0
1965	79,767	2,192	399,000	36.4	5.00	213	10.3
1966	82,852	2,208	282,000	37.5	3.40	217	10.2
1967	120,452	4,130	494,000	29.2	4.10	297	13.9
1968	92,462	3,119	361,000	29.6	3.90	340	9.2
1969	25,124	975	111,000	25.8	4.42	185	5.3
1970	14,806	635	61,000	23.3	4.12	79	8.0
1971	30,135	1,450	123,000	20.8	4.08	134	10.8
1972	12,550	688	49,000	18.2	3.90	76	9.1
1973	16,030	721	89,000	22.2	5.55	111	6.5
1974	8,553	461	32,000	18.6	3.74	58	7.9
1975	41,412	1,785	171,000	23.2	4.13	146	12.2
1976	118,019	5,160	717,000	22.9	6.08	391	13.2
1977	41,055	1,338	143,000	30.7	3.48	269	5.0
1978	40,000	1,810	205,000	22.1	5.13	253	7.2
1979	36,140	1,637	180,000	22.1	4.98	236	6.9
1980	20,291	919	116,000	22.1	5.72	145	6.3
1981	22,414	1,011	128,000	22.2	5.71	91	11.1
1982	26,524	1,806	165,000	14.7	6.22	209	8.6
1983	100	13	1,000	7.7	10.00	9	1.4
1984	5,803	323	37,000	18.0	6.38	34	9.5
1985	58,219	3,842	303,000	15.2	5.20	340	11.3
1986	2,935	302	18,000	9.7	6.13	51	5.9
1987	29,167	2,344	236,000	12.5	8.08	173	13.5
1988	33,910	2,695	161,000	12.6	4.72	178	15.1
1989	32,101	2,592	195,000	12.4	6.07	228	11.4
1990	13,474	1,337	75,000	10.1	5.57	151	8.9
1991	28,471	1,691	130,000	16.8	4.57	129	13.1
1992	7	1	35	7.0	5.00	81	0.0
1993	0	0	0	0.0	0.00	56	0.0
1994	19,116	651	78,000	29.4	4.08	107	6.1

1995	58,830	2,7050	276,000	21.7	4.69	159	17.0
1996	2,901	214	17,000	13.6	5.86	33	6.5
1997	2,011	217	8,000	9.3	3.98	13	16.7
1998	2,526	224	11,000	11.3	4.30	18	12.4
1999	483	45	2,000	10.7	4.96	12	3.8
2000	978	64	4,000	15.3	4.09	30	2.1
2001	987	62	5,000	15.9	5.07	24	2.6

Table 4. Annual age composition (percent) for the Clatsop Beach commercial razor fishery, 1955-2001.

Harvest Year	Percent Age composition						Com. Harvest (clams)
	0	1	2	3	4	5+	
1955	7.2	60.5	10.8	17.3	3.6	0.6	904,000
1956	4.5	52.6	29.9	8.9	3.9	0.2	490,000
1957	1.6	60.3	27.1	9.2	1.7	0.1	336,000
1958	0.6	55.2	27.9	13.2	2.9	0.2	386,000
1958	0.3	19.5	61.2	15.9	2.9	0.2	179,000
1960	0.4	53.9	25.0	16.6	3.7	0.4	154,000
1961	0.5	17.2	27.4	39.9	14.2	0.8	80,000
1962	3.1	69.4	19.8	6.5	1.0	0.2	102,000
1963	0.5	65.0	28.5	4.8	1.0	0.2	107,000
1964	0.3	55.0	27.2	13.0	4.0	0.5	125,000
1965	2.4	69.2	18.8	7.9	1.5	0.2	399,000
1966	0.2	31.3	47.4	12.3	8.0	0.8	282,000
1967	1.6	63.2	14.8	17.2	2.2	1.0	494,000
1968	0.1	39.0	39.3	12.6	7.5	1.5	361,000
1969							111,000
1970	1.0	30.3	28.5	27.0	12.2	1.0	61,000
1971	2.1	68.8	15.9	5.7	4.1	0.4	123,000
1972	0.0	9.9	78.0	11.4	0.7	0.0	49,000
1973	2.0	67.0	13.3	15.8	1.3	0.2	89,000
1974	0.4	40.0	35.9	13.0	10.2	0.2	32,000
1975	0.1	50.8	14.7	20.6	11.9	1.6	171,000
1976	8.7	87.4	2.6	0.9	0.4	0.0	717,000
1977	1.6	8.7	6.0	12.0	10.6	7.1	143,000
1978	0.8	70.8	10.7	12.6	3.4	1.7	205,000
1979	0.0	61.9	26.1	7.1	4.0	0.9	180,000
1980	0.7	90.9	7.5	0.7	.0	0.2	116,000
1981	1.4	89.8	8.8	0.0	.0	0.0	128,000
1982	0.4	98.7	0.7	0.2	.0	0.0	165,000
1983	2.5	65.5	24.0	8.0	.0	0.0	1,000
1984	93.7	5.1	1.2	0.0	.0	0.0	37,000
1985	11.2	85.8	2.7	0.2	0.1	0.0	303,000
1986	10.0	30.0	58.0	2.0	0.0	0.0	18,000
1987	0.0	98.4	1.6	0.0	0.0	0.0	236,000
1988	15.6	60.0	21.6	2.6	0.2	0.0	161,000
1989	6.5	87.1	2.2	3.7	0.3	0.2	195,000
1990	0.0	52.3	42.9	3.7	0.8	0.3	75,000
1991	1.5	18.5	60.4	13.8	2.2	0.6	130,000
1992							
1993							
							Seasons Closed Due to Biotoxins
1994	1.5	38.5	46.4	12.0	1.5	0.1	78,000
1995	0.0	20.7	43.2	22.9	10.4	2.8	276,000
1996	0.3	49.1	23.4	16.0	11.2	0.0	17,000
1997	0.0	25.0	33.8	39.0	1.2	0.0	8,000
1998	1.8	40.7	36.3	16.4	4.3	0.5	11,000
1999	0.0	25.0	34.8	37.0	3.0	0.2	2,000
2000	3.0	18.5	43.6	15.7	16.2	3.0	4,000
2001	0.0	14.0	33.0	18.0	3.0	0.0	5,000
10 Yr. Ave, 1993-2001	4.3	48.4	32.1	10.3	4.0	0.9	