

SHELLFISH INVESTIGATION

INFORMATION REPORT

1991 RAZOR CLAM REPORT

by

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INTRODUCTION

Razor clams from Clatsop Beach (Tillamook Head to Columbia River) were sampled two tides per tide series from March through July and periodically the rest of the year. Sport and commercial diggers were interviewed to obtain data on number, age composition and clams dug and harvest area. Data from beaches south of Tillamook Head were collected as time permitted. Random wastage and age-length samples were collected and other miscellaneous projects are reported.

SPORT FISHERY

Clatsop Beach

The total sport harvest was 723,000 clams which included 80,000 wasted clams. The harvest nearly equalled the ten year average. Diggers averaged 11.3 clams on 57,000 digger trips. Number of clams wasted (clams damaged and returned to beach) averaged 11.1%.

The spring and summer harvest was 535,000 clams which included 59,000 wasted clams. Diggers averaged 10.1 clams on 47,000 digging trips. Areas 1 and 2 together contributed 63% of the catch and 66% of the effort. Table 1 lists harvest, catch rates and number of diggers by area.

In early April, random samples indicated a lack of one year old clams in the fishery. The news media was used to notify diggers of this shortage. A reduction of effort was noted in following months. The age composition of sport dug clams in Table 2 shows the lack of one year old clams in the catch.

Table 1. Sport harvest of razor clams and number of diggers by area from Clatsop Beach, March to July 1991.

Area	Miles of Beach	# Digger Trips	Clams/Trip	# Clams Dug	# Clams Wasted	Total Harvest
1	3.6	15,211	11.2	169,948	21,220	191,168
2	6.2	14,359	10.0	142,995	17,854	160,849
3	5.0	7,888	8.1	63,878	7,976	71,854
4	1.2	1,215	12.4	15,080	1,883	16,963
5	2.0	8,563	9.7	83,451	10,420	93,871
Total		47,236	10.1	475,352	59,353	534,705

Area 1 - Columbia River South Jetty to Fort Stevens Park Road.

Area 2 - Fort Stevens Park Road to Sunset Beach Road.

Area 3 - Sunset Beach Road to Gearhart Beach Road.

Area 4 - Gearhart Beach Road to Necanicum River.

Area 5 - Necanicum River to Tillamook Head.

Table 2. Age composition in percent of sport dug clams from Clatsop Beach, 1986-1991.

Year of Harvest	Age					
	0	1	2	3	4	5+
1986	52.3	29.0	18.5	0.2	0.0	0.0
1987	14.2	82.2	3.6	0.0	0.0	0.0
1988	5.2	61.5	31.1	1.9	0.0	0.0
1989	28.1	55.3	12.1	3.4	1.0	0.0
1990	14.3	52.1	25.5	5.9	2.1	0.1
1991	16.0	26.5	47.0	8.5	1.6	0.4
10-yr avg	23.8	57.3	16.2	2.6	0.5	0.1

The fall fishery contributed 188,000 clams of which 21,000 were wasted. Diggers averaged 18.0 clams on 9,000 digger trips. Fall harvest is included in the annual harvest table, Table 3. The fall harvest was stopped November 17 when Public Health issued warnings on domoic acid in clams. Some confusion was noted and sports started digging after hearing crabs were safe to eat. The season was closed by staff December 23. From random samples in 1990 set was found to be abundant but small, setting late in the fall. The 1991 year class set in good numbers in the spring, late summer and late fall.

Many clam diggers continue to request a clam license because of the large number of out of state diggers on Clatsop beaches. A survey of 60 diggers showed that 63.3% have fishing licenses, 13.3% were juveniles and 83.3% of the diggers supported a license for shellfish.

Beaches South of Tillamook Head

Digging was reported on many beaches along the coast, but effort was minimal due to low numbers of clams. The best digging was found on North Umpqua beach and Yaquina Bay North Jetty beach.

COMMERCIAL FISHERY

Nearly 129,500 clams (28,471 pounds) were taken by 129 harvesters. Prices of \$3.00 per pound in the shell attracted 202 diggers into obtaining clam permits. Area 5 produced 53% of the poundage. Catch data by area are listed in Table 4.

Public Health banned commercial digging for human consumption on November 17. All clams dug after September 1 and not eaten were embargoed for more testing. Several diggers continued to dig for bait after the ban, landing 814 pounds before staff closed the season December 23.

Table 4. Commercial catch/effort and pounds landed by area.

	Area					Total
	1	2	3	4	5	
lbs/hour	4.0	5.0	2.2	7.2	7.9	5.7
% lbs landed	3.0	14.0	9.0	21.0	53.0	100.0

Age composition in Table 5 shows the lack of the 1989 year class in the catch. Fall random samples indicated that 64% of the population was not of commercial size and some wastage was observed in Areas 4 and 5. Wastage was minimal due to the price being dropped to \$1.50 per pound in the shell and processors limiting the number of diggers to about 50.

Table 5. Age composition in percent of commercially dug clams, Clatsop Beach, 1986-1991.

Year of Harvest	Age					
	0	1	2	3	4	5+
1986	10.0	30.0	58.0	2.0	0.0	0.0
1987	0.0	98.4	1.6	0.0	0.0	0.0
1988	15.6	60.0	21.6	2.6	0.2	0.0
1989	6.5	87.1	2.2	3.7	0.3	0.2
1990	0.0	52.3	42.9	3.7	0.8	0.3
1991	4.5	18.5	60.4	13.8	2.2	0.6
10 year avg.	14.4	60.2	21.5	3.4	0.4	0.1

MISCELLANEOUS PROJECTS

Summer Closure

Extending the summer closure was analyzed for a regulation review. The affect of the summer, July 15 to August 31, closure was to reduce effort by 20,000 digger trips and reduce the harvest of 0-age clams by 140,000. After the closure went into effect an average increase of 28,000 digger trips and a harvest of 48,000 0-age clams occurred in prior months. Wastage also increased from 12.1% to 20.0%. In reality we shifted effort to earlier in the year taking clams at a smaller size and increased the wastage.

To remedy the effects of the summer closure a digger education program was started in 1975. News media was used to inform diggers of low numbers of clams or large numbers of small clams. Programs and leaflets were developed and video tapes bought to inform diggers on how and what to dig to prevent wastage. The results of this program can be seen in the shift in effort from July and September to March through May. The harvest of 0-age clams has

declined and wastage declined from 13.7% in the 1970s to 10.6% in the last four years.

Several options were developed based on data from the summer closure and an education program.

- Option 1: Extend the summer closure to July 1. This would result in an average 5,000 digger trips displacement to other months and 11,000 0-aged clams being saved. The affect of an additional two weeks closure would have minimal effect on the fishery.
- Option 2: Extend the summer closure to June 15. This would result in effort being shifted to previous months resulting in lower catch per effort. An effort shift would result in 0-age clams being harvested at a smaller size and wastage would go up. This option is not feasible unless effort can be reduced.
- Option 3: Elimination of the fall commercial season. This would reduce the wastage of 0-age clams. Commercial diggers often keep only one clam out of ten. An ODFW regulation of a minimum size of 3 3/4 inches shell length reduces wastage in the spring but causes heavy sorting in the fall. Benefits would vary as wastage varies from year to year.
- Option 4: Create a shellfish license. This would benefit the fishery by reducing effort over the year. Reduced effort would improve catch rates and reduce harvest and wastage of 0-age clams. This would require legislative approval.
- Option 5: Continue to use educational approach and inform harvesters of population trends.

Staff recommended to continue using option 5 and proceed with option 4 to develop a shellfish sport license. The present summer was kept.

Clam Condition Sampling

Razor clam gills were collected and sent to OSU for analysis of NIX. Sampling clams for moisture content to test for a correlation to NIX was continued. Test results have produced correlations also to spawning. Test results in Table 6 show changes in moisture levels which affect condition of the clam.

Table 6. Percent of weight lost by two month periods, 1986-1991.

Tenyo Maru Oil Spill

The oil reached the north end of Clatsop Beach on August 7. Oil tar balls and film on the water could be detected on the clam flats on the morning minus tide. No losses of clams or clams in distress were observed over the next several tides.

Economic Survey

A survey evaluating the value of the sport fishery was delayed to 1992 because of the lack of time and the reduction of effort in April. A total of 139 interviews have been collected.

Domoic Acid

Domoic acid was first found in Washington razor clams in early November and as a result the beaches were closed November 11. Oregon Public Health tested Clatsop beach clams and found high levels of toxins and issued a ban on harvesting shellfish on November 17. Department of Fish and Wildlife Staff later closed the razor clam season on December 23.

Domoic acid is a water soluble substance produced by diatoms. Diatoms are ingested by filter feeding animals which store the toxic acid. Most contaminated animals flush the toxin quickly, however, it is apparent that razor clams accumulate and store the toxin. Warm blooded animals may be affected by Amnesia Shellfish Poison (ASP) by eating contaminated animals.

Clam samples were collected every two weeks for Domoic Acid testing. Results of these and other tests on Clatsop clams can be seen in Table 7. Levels ranged from above 20 ppm in early October to 122 ppm in early November and dropped to 45 ppm in late December. The level of concern for the public is 20 ppm. High levels were found in clams from Umpqua River north beach but no toxin was found in Newport clams.

Table 3. Annual harvest and effort data for the fishery.

Year	Commercial Fishery		Sport Fishery				Total
	# Diggers	# Clams	# Diggers	Clams/ trip	# Clams	Clam Wastage	
1955	295	904,000	56,000	22	1,212,000	295,000	2,411,000
1956	253	490,000	60,000	18	1,061,000	295,000	1,846,000
1957	193	336,000	77,000	21	1,646,000	416,000	2,398,000
1958#	221	386,000	89,000	19	1,679,000	218,000	2,283,000
1959	118	179,000	54,000	12	646,000	124,000	949,000
1960	93	154,000	48,000	12	596,000	46,000	796,000
1961	58	80,000	51,000	11	583,000	70,000	733,000
1962	79	102,000	56,000	16	892,000	105,000	1,099,000
1963	77	107,000	55,000	13	713,000	70,000	890,000
1964	125	125,000	71,000	16	1,098,000	264,000	1,487,000
1965	213	399,000	76,000	15	1,134,000	186,000	1,719,000
1966	217	282,000	78,000	14	1,052,000	434,000	1,768,000
1967	297	494,000	74,000	20	1,472,000	195,000	2,161,000
1968	340	361,000	64,000	13	831,000	162,000	1,354,000
1969	185	111,000	59,000	14	851,000	155,000	1,117,000
1970	79	61,000	56,000	13	715,000	125,000	901,000
1971	134	123,000	77,000	13	968,000	213,000	1,304,000
1972	76	49,000	69,000	9	636,000	139,000	824,000
1973#	111	89,000	76,000	10	725,000	159,000	973,000
1974	58	32,000	44,000	8	347,000	5,000	384,000
1975	146	171,000	75,000	10	785,000	157,000	1,113,000
1976	391	717,000	119,000	12	1,431,000	63,000	2,211,000
1977#	269	143,000	51,000	10	499,000	33,000	675,000
1978	253	205,000	72,000	12	849,000	137,000	1,191,000
1979	236	180,000	90,000	11	958,000	63,000	1,201,000
1980	145	116,000	70,000	11	747,000	143,000	1,006,000
1981	91	128,000	30,000	6	187,000	49,000	364,000
1982	209	165,000	84,000	9	758,000	123,000	1,046,000
1983#	9	1,000	32,000	3	105,000	12,000	118,000
1984*	34	37,000	23,000	15	341,000	15,000	393,000
1985*	340	303,000	94,000	10	984,000	147,000	1,434,000
1986*	51	18,000	46,000	5	260,000	33,000	311,000
1987*	173	236,000	68,000	15	1,010,000	83,000	1,329,000
1988*	178	161,000	84,000	11	1,016,000	168,000	1,345,000
1989*	228	195,000	97,000	11	1,082,000	136,000	1,413,000
1990*	151	75,000	55,000	11	579,000	61,000	715,000
1991*	129	130,000	57,000	11	643,000	80,000	853,000
10-yr avg	(150.2)	132,100 (14.7%)	64,000	10	677,800	85,800	895,700

* Fall fishery included
Occurrences of El Nino