

# THE CLATSOP BEACH RECREATIONAL AND COMMERCIAL RAZOR CLAM FISHERIES

Oregon Department of Fish and Wildlife  
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## INTRODUCTION

Razor clams are distributed along the entire Oregon coast, but over 90% of the harvest is taken from the south jetty of the Columbia River to Tillamook Head south of Seaside. This 18-mile area is called "Clatsop Beach" and is further divided into "North", "Gearhart", and "Seaside" beaches.

This report was prepared at the request of the Oregon Fish and Wildlife Commission which expressed concern over the activities of the commercial razor clam fishery. The report summarizes what is known about the Clatsop Beach razor clam fisheries and their effect on the resource.

## THE RESOURCE

Although razor clams are found along the entire coast, their production on beaches south of Seaside is sporadic. Even on Clatsop Beach, clam abundance varies from year to year and is largely controlled by natural phenomena such as weather, wind, ocean currents, slope of the beach, and beach stability. These factors affect the deposition and survival of larvae in the intertidal zone. Most clams in the catch are 1-to-2 years of age; hence, a year or more of low survival will seriously depress the subsequent number of harvestable clams.

In spite of heavy digging pressure, especially on Clatsop Beach, the resource is self-sustaining. A female razor clam produces 6-10 million eggs at each spawning. An unknown, but we believe substantial part of the population exists in the near-shore subtidal waters and contributes significant "seeding" of the intertidal beaches. These subtidal areas are not accessible to the present fisheries.

## THE FISHERIES

### Regulations

Prior to September 1954, the daily recreational bag limit was 36 clams. Thereafter, the daily limit was reduced to the first 24 clams taken with 48 clams in possession or in 7 consecutive days. An annual closed season from July 15 to August 31 on Clatsop Beach was instituted in 1967 to reduce clam wastage and harvest of small clams. These regulations are still in effect.

Commercial diggers, prior to 1954, were restricted to clams that were at least 3½ inches in length. In 1954, the size limit was increased to 4¼ inches in length, but reduced to 3-¾ inches in October 1972, and is still in force. Commercial digging was prohibited in the Cove area at Seaside until 1966, when the regulation was rescinded which opened the area to all diggers. Commercial diggers are also subject to the same summer closure as recreational diggers.

Recreational Fishery

The annual recreational harvest has averaged 938,000 clams since 1955 (Table 1). A record catch of 1.7 million clams occurred in 1958. The lowest catch on record occurred in 1974. However, the fourth highest harvest of 1.4 million clams was in 1976. This illustrates the variability of the harvest.

The number of recreational digger-trips has averaged 67,000 since 1955. The yearly number of digger-trips for the period 1955-66 averaged 64,300. An 8% increase has occurred over the last 11 years. A record of 119,000 digger-trips was recorded in 1976 when effort was spurred by a very abundant clam year class in their second year of life. Catch per digger-trip has averaged 14.0 clams since 1955; in 1976 it was 12.0 clams, the best since 1971.

Over 60% of the recreational digging occurs on the 3.2-mile Gearhart-Seaside beaches. Since 1969, an average of 56% of the harvest was taken from the 2-mile Seaside beach and 11% from the 1.2-mile Gearhart beach (Table 2).

Table 2. Annual Razor Clam Recreational Harvest (thousands of clams) by area, Clatsop Beaches, 1970-77

Area	Beach Miles	Year								Mean
		1970	1971	1972	1973	1974	1975	1976	1977	
Seaside	2.0	189	359	343	476	103	536	1,131	301	430
Gearhart	1.2	45	113	99	53	32	96	168	52	82
North Beaches	14.8	481	496	194	196	212	153	132	146	251
Total	18.0	715	968	636	725	347	785	1,431	499	763

Commercial Fishery

The annual commercial harvest has averaged 256,000 clams since 1955 (Table 1). A record commercial harvest of 1.9 million clams occurred in 1954 (Figure 1). For the years 1970 through 1977, the commercial fishery has taken an average of about 16.5% of the total harvest. In 1976, it took 717,000 clams or 33% of the harvest.

For the 41-year period (1935-75) an average of 261 (57 to 790) commercial diggers have taken part in the fishery. In 1976, about 391 diggers participated, the largest number since 1954 (430).

Most commercial diggers dig for the enjoyment of it and for supplementary income. The commercial catch in 1973 was one of the lowest on record and fisherman income was correspondingly modest. The top 10 diggers averaged 22.3 pounds per landing and 26.5 landings for 591 pounds of clams. At 75¢ per pound, they averaged gross earnings of \$443 each for the year. Of the 111 diggers reporting, the lowest effort-earning was 18 landings for 326 pounds and \$245 while the highest was 48 landings for 1,202 pounds and \$902. The average digger made 6.5 landings for 22 pounds of clams and \$107. Total revenue to the state for the 16,030 pounds landed in 1973 was \$64 in poundage fees and maximum of \$4,440 in license fees. The 1976 fishery, however, netted the state a maximal \$15,640 in license fees and \$470 in

Table 1. Annual Harvest of Recreational and Commercial Razor Clams, Effort (Digger-trips), Catch/effort, and Potential Clams/bag if Commercial Fishery Eliminated, 1955-1977, on Clatsop County Beaches.

Year	Recreational		Commercial Harvest	Recreational catch/trip	Potential Maximum Clams added/bag *
	Harvest	Effort			
1955	1,212,000	56,000	904,000	21.6	2.4
1956	1,061,000	60,000	490,000	17.7	6.3
1957	1,646,000	77,000	336,000	21.4	2.6
1958	1,679,000	89,000	386,000	18.9	4.3
1959	646,000	54,000	179,000	12.0	3.3
1960	596,000	48,000	154,000	12.4	3.2
1961	583,000	51,000	80,000	11.4	1.6
1962	892,000	56,000	102,000	15.9	1.8
1963	713,000	55,000	107,000	13.0	1.9
1964	1,098,000	71,000	125,000	15.5	1.8
1965	1,134,000	76,000	399,000	14.9	5.3
1966	1,052,000	78,000	282,000	13.6	3.6
1967	1,472,000	74,000	494,000	19.9	4.1
1968	831,000	64,000	361,000	13.0	5.6
1969	851,000	59,000	111,000	14.4	1.9
1970	715,000	56,000	61,000	12.8	1.1
1971	968,000	77,000	123,000	12.6	1.6
1972	636,000	69,000	49,000	9.2	.7
1973	725,000	76,000	89,000	9.5	1.2
1974	347,000	44,000	32,000	7.9	.7
1975	785,000	75,000	171,000	10.5	2.3
1976	1,431,000	119,000	717,000	12.0	6.0
1977	499,000	51,000	143,000	9.6	2.8
Mean	938,000	67,000	256,000	14.0	2.9

\* Wastage would reduce clams added to bag.

poundage fees. The total gross value to the fishermen at 90¢ per pound was \$105,000, compared to \$12,000 in 1973. Fishermen earned an average gross income of \$268 in 1976, about 2½ times that in 1973.

### Wastage

To many recreational diggers, only clams of a certain minimum size are acceptable and the clams less than that size are discarded onto the beach or reburied. Those discarded onto the beach are lost to predators and most of the reburied ones will die because they are broken or are improperly reburied.

Three natural occurrences combine that make small clams more accessible than large clams to the fishery; (1) the growth of clams in their first year to a size that attracts digger attention, (2) the annual change in beach profile that reduces the availability of larger clams, and (3) that, on the average, there are always more young clams than older clams because of natural mortality as well as fishing mortality. Clams spawned in the summer of one year reach 2-3 inches in length by July of the next year, when digging pressure is great. Such clams are very abundant and make a mark in the sand to which diggers are attracted, but the clams are small, so are discarded. The July 15-August 31 closure was instituted to reduce this loss to the resource. Wastage of first year clams for the period 1955-1966 averaged 211,000 clams. This was reduced by 39% since the summer closure went into effect. A 5.7% increase in the catch of second year and older clams has also been noted since the summer closure started.

The beach profile changes with the transition from southwest winter winds to northwest summer winds. Sand that has moved from high on the beach to lower levels in winter is returned to the high beach in the summer. Because razor clams do not change location laterally, the summer movement of sand from the lower beach areas to the higher areas reduces the availability of large clams to diggers by lowering the clams in relation to a given tidal level. Finally, only the higher beach levels populated primarily by small clams can be reached and dug in July and August. Clammers reject the small clams found there and wastage is high, usually in the 10-20% level but sometimes as much as 50% of the small clams dug. Good clamming years (abundance and availability of large clams) lessen the wastage.

### Effect of the Fishery

Not much is known about the proportion of available clams taken by the fishery except that the dynamic nature of the intertidal area must cause clam availability to change. However, razor clams grow very fast (an 11-month-old clam averages about 3 inches in length; 12 months later it averages about 4 inches in length) and the population fluctuates markedly year to year, independent of the effect of the fishery. An unknown but probably substantial part of the resource lies beyond the reach of the digger in deeper nearshore (subtidal) waters off the intertidal beaches. This "refuge" and each female clam's annual production of six to ten million eggs provide for adequate reproduction. When ocean currents and other environmental factors are favorable for depositing clam larvae in the intertidal area, and conditions for growth and survival are right, clams are abundant. If these conditions are unfavorable, clam abundance is mediocre or low. The fishery waxes and wanes pretty much in direct proportion to clam abundance. The fluctuations in annual catch have been substantial since 1947 (Figure 1 and Table 1).

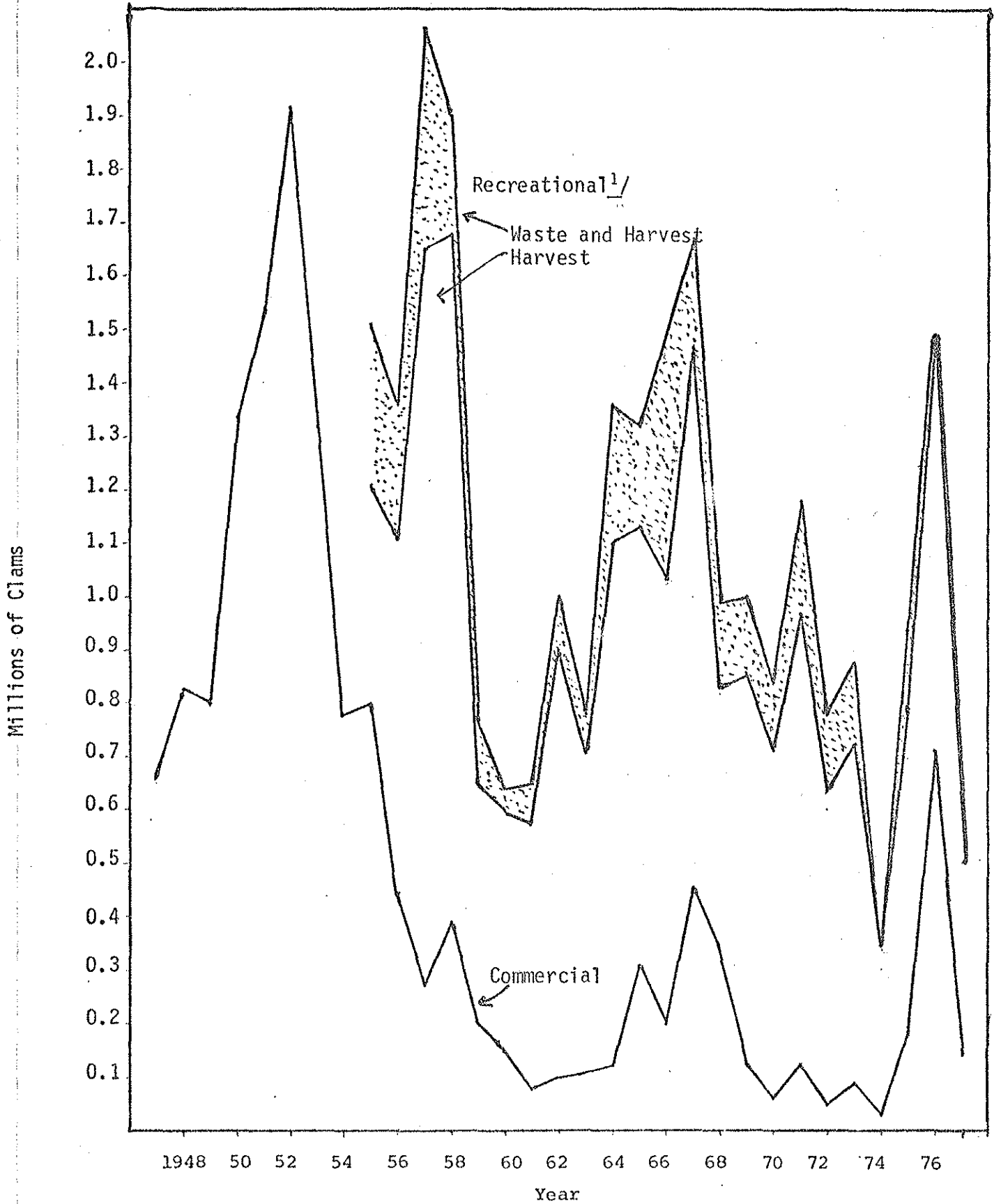


Figure 1. Annual Commercial and Recreational Harvest of Razor Clams from Clatsop Beach 1947 to 1977. Shaded Area Indicates Estimated Number of Clams Wasted.

1/ No data prior to 1955.

In spite of the thousands of diggers and hundreds of thousands of clams taken annually, the recreational harvest has shown no overall downward trend since 1959. The commercial fishery has declined greatly since 1952. Only a year of exceptional clam abundance like 1976, when a large number of 1 and 2-year-old clams is available, brings many new diggers into the commercial fishery.

A marking study done in 1973 in the Gearhart area sheds some light on what proportion of the resource might be harvested annually. This area was lightly utilized by commercial diggers, so preliminary results are applicable to the recreational segment. A total of 3,200 clams were marked during the July 15-August 31 closed period. About 14% of the marked clams were dug or recovered within the first year after marking; 1.6% in the second; and 0.2% in the third (Table 3). This suggests that a minimum of 14% of the available population might have been dug in that area. The very low recoveries in the second and succeeding years probably indicate a very high natural mortality rate of clams of the age marked, perhaps over 80% annually. Because the mark used was a small plastic disc glued to the shell with marine epoxy putty, mortality from marking was probably negligible. The effect of digging and reburial on the survival of clams is not known.

Table 3. Annual Recoveries of Tagged Razor Clams, Gearhart Beach, 1973-1976, and Percent Recovery.

Year	No. Tags Out	Tags Recovered Number	Recovered Percent	Adjustment for Tag Loss <sup>1/</sup>
1973-4	3,200	346	10.81	14.16%
1974-5	2,854	35	1.23	1.61
1975-6	2,819	4	0.14	0.18

<sup>1/</sup> 30.097% tag loss estimated. Adjustment = Percent x 1.30097

#### WASHINGTON FISHERY

One of the most frequently heard comments made by dissatisfied Oregon diggers is, "Why doesn't Oregon do like Washington?" We have learned over the years that few, if any, of these people really know what Washington is doing except that they have more razor clams than Oregon. However, there are logical reasons why Washington has more clams. First, Washington has about 60 miles of clam producing beach; Oregon has only about 25 miles of productive beach. Second, the clam producing area of Washington beaches ranges from 300-700 feet in width; the range in Oregon is 100-200 feet. Third, the average survival of larval clams appears to be much greater on Washington beaches. However, Washington has been plagued by the same problems as Oregon: a fluctuating harvest, harvest of small clams, and wastage. Their commercial fishery was gradually reduced, to correct it and finally eliminated in 1966. The problems persisted. Recreational daily bag limits were reduced to 18 clams, then 15. Night digging was prohibited and weekend digging only was permitted during the winter months. The problems still persisted. Finally, Washington followed Oregon's lead and enacted a summer closure from July 1 to September 30. The problems persist, but to a lesser degree. The main problem there appears to be one of a finite resource controlled by natural phenomena and an ever increasing number of diggers.

DISCUSSION

Razor clams offer people an enjoyable and important resource, available to resident and guest alike. While not large, the resource provides tens of thousands of digger trips annually to recreational diggers and through the commercial fishery, diner fare for thousands more at restaurants and at home.

Three questions asked about this fishery by recreational diggers are: (1) "Why aren't there more clams?", (2) "Why so large a bag limit as 24 for recreational digger?" and (3) "Why have a commercial fishery when the recreational fishery is taking a lot of razor clams?"

Clam production is a function of a spawning stock and environmental limitations. At this point we see no practical way to increase clam abundance. The spawning stock size is not believed to be limiting production. Rather, as discussed earlier, environmental conditions, including the small growing areas on the beach, restrict the number of clams produced. We would "be like Washington" if we had as suitable a clam habitat as Washington.

In answering the second question, we should look at why we have a recreational fishery in the first place and this is simply because people enjoy the experience of being on the beach and seeking out and capturing as elusive and delectable an item as the razor clam. While it is usually a wet and cold experience it is sufficiently rewarding in providing recreation and food to cause people to continue to participate. The recreational opportunity experienced justifies having the recreational fishery.

Whether people would continue to participate with a lower bag limit is problematical but likely. The long-term average catch is only 14 clams per trip (Table 1). A reduction of as much as 1/4 the bag limit (to 18) would affect about 20% of the diggers. The average person might catch more under a reduced bag limit, but not in proportion to the reduction to total catch caused by a lower bag limit. Maximum increases in the average bag limit by 4, 6, and 9 clam reductions are listed in Table 4.

Table 4. Results of Decreasing Bag Limit by 4, 6, and 9 Clams

Year Sampled	Average Annual Catch per Digger	Increase to Average Annual Catch per Digger With		
		20 Clam Limit	18 Clam Limit	15 Clam Limit
1973	9.5 clams	.6 clams		
1974	7.9 clams	.8 clams	1.3 clams	2.3 clams
1975	10.5 clams	.7 clams		

Diggers who consistently take a high part of the daily bag limit do so because of greater skill and a willingness to dig in the more productive surf and offshore bar areas. The average digger will not "inherit" this capability and so will not be able to claim part of the clams that the near-limit digger would forego with a reduced limit. The percentage of diggers by catch group for a poor and good harvest year are listed in Table 5. Since there is no demonstrated need for increased numbers of spawners, because of the existence of the offshore stock, the only reason at this time to take 6 or so clams away from the more successful diggers would be to attempt to distribute the catch among more diggers.

Table 5. Number of Diggers by Catch Group for 1974 and 1976 Sampling Data

No. of Clams Dug	Percentage of Diggers 1974	Percentage of Diggers 1976
24	14.5	26.6
21-23	2.7	1.8
19-20	2.6	1.3
16-18	3.3	2.4
11-15	5.1	3.5
0-10	56.3	39.9
0	15.5*	24.5*

\* Minimum Figure (Number based on actual count of diggers getting 0 clams).

Two other considerations should be considered in answering the second question. A reduced bag limit may aggravate the wastage problem by encouraging discard and replacement of small and broken clams with better clams. This is one of our biggest management problems now. Secondly, some people object to the commercial fishery for razor clams in principle or because of the numbers of clams commercial diggers are allowed to and do remove. These people would demand a modification in the commercial fishery before accepting a reduced bag limit for recreational diggers.

The third question pertains to the existence of the commercial fishery. The argument is made that removal of the commercial fishery would enhance the status of the "more valuable" recreational fishery. This position may be valid if economics is the basis for judgment, and people are induced to come to the beach more often by removal of the commercial fishery. Confirming information is not available but the possibility merits study.

Removal of the commercial fishery could affect another group of people, namely, those who do not or cannot dig their own clams. Nearly all restaurants along the coast and some in the Willamette Valley have razor clams on their menus. Many persons also buy clams, in the shell dressed or canned from retail markets. Razor clams in the marketplace in Oregon currently come from Oregon commercial harvest and are also imported from out of state. If Oregon did not have a commercial fishery the availability and price of clams would probably be adversely affected. It is important to note that while profit-making puts people into the commercial fishery, it is the service of making the resource available to the general public that justifies allowing a commercial fishery on a public resource.



What would removal of the commercial fishery provide to recreational diggers? In the period 1955-76, total elimination could have added an average maximum of 2.9 clams to the mean daily bag of recreational diggers (Table 1). The average would have been less than two clams per digger-trip during 1970-76. However, a commensurate increase in catch probably would not be realized, because commercial diggers are generally much more skilled than recreational diggers and often dig on offshore bars (using small boats for access) that are not dug by the average recreational digger.

One problem is that people who have difficulty finding or digging clams simply dislike seeing anyone with many clams. They think that the commercial digger affects their success and if commercial harvest continues there will soon be no clams. One alternative might be to restrict commercial digging to the less popular recreational digging areas to reduce conflict. However, all areas are popular at one time or another depending on the number of clams available. The State of Washington did this and reduced their commercial fishery to one of no consequence and then eliminated it with no demonstrated benefit to the recreational fishery. The assertion is frequently made that if Oregon adopted Washington regulations, Oregon would have more clams. However, as discussed earlier, our data suggests that reducing the bag limit and eliminating the commercial fishery would not increase the total population in numbers of clams or provide much of an increase to diggers. We believe that adequate spawning populations exist.

The limiting factor in Oregon appears to be the environment which in general is much less suitable than Washington's. As mentioned, currents favorable to the deposit of small clams in the intertidal zone are a requisite. It is this factor that accounts for the very good production from the "cove" at Seaside which is the only area in Oregon that matches Washington's better areas. South of the Clatsop beaches, unstable beaches and whimsical currents limit predictable razor clam production in the intertidal zone to a very few small areas.

Proposed long term management goals for the razor clam resource include providing for optimum use of the resource through recreational and commercial diggers. The fishery fluctuates greatly, but the resource so far has demonstrated an ability to cope with the pressures exerted upon it.