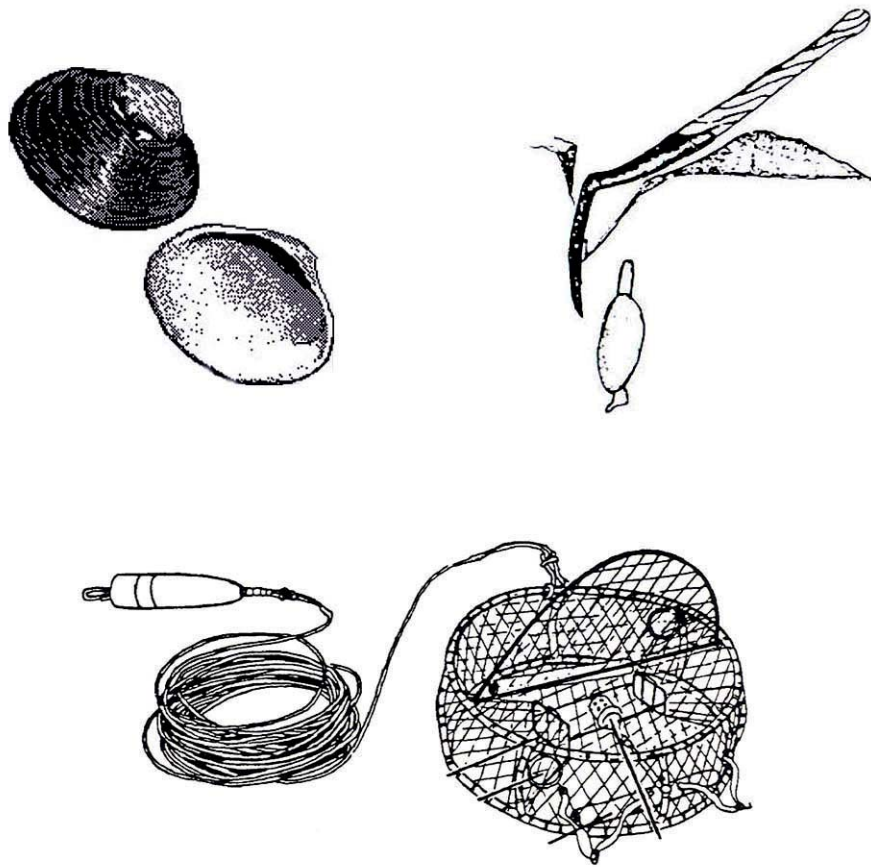


# Shellfish / Estuarine Habitat Projects DATA REPORT

## 2002 Clatsop Beach Razor Clam Fishery



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



**2002 Clatsop Beach Razor Clam Fishery  
Status Report**

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*Harvesters on the Clatsop Beaches*

## **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. Over 90% of Oregon's razor clam catch and effort occurs in this area. The Clatsop beach razor clam commercial fishery has been monitored by the Oregon Department of Fish and Wildlife (ODFW) since 1935. The recreational fishery has been monitored since 1955. Historically, the fishery has been sampled on low-tide series, with sampling per low-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, performs wastage analysis, and more recently assists in collecting samples for the Oregon Department of Agriculture (ODA) to test for biological toxins.

## Methods

### **Sampling Area Description**

For sampling purposes, Clatsop beach is divided into five 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.

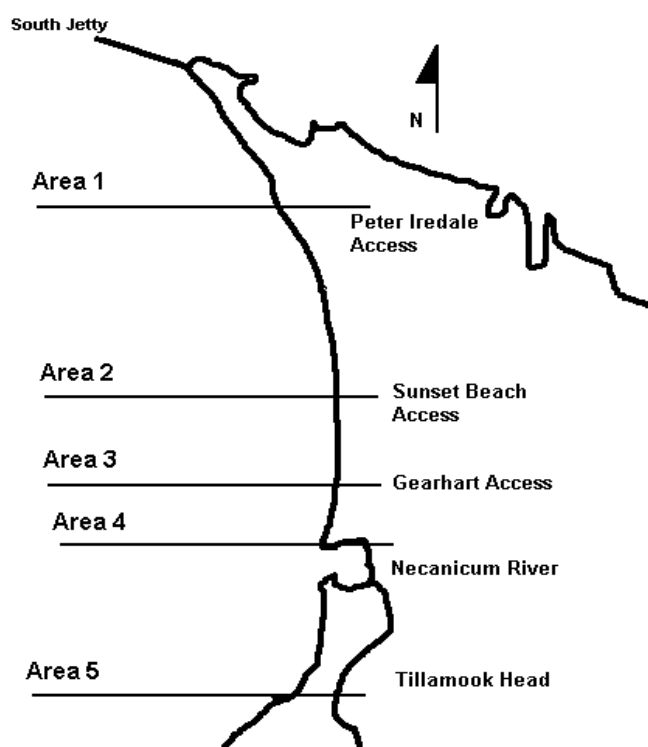
Area 2 (6.2 mi.) is from the Peter Iredale access to the Sunset beach vehicle access point.

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.

Areas 4 and 5 are restricted to walk-on access only.



### **Catch and Effort Estimates**

Staff conducted random digger interviews at the vehicle access points on the beaches in Areas 1-3 and interviewed diggers as they left the harvest area in Areas 4 and 5. Digger catch rates as well as catch per unit hour were determined. In March through July, digger interviews were conducted four days per low-tide series (eight to nine days each) to account for variability in catch rates.

Since 1955, a minimum of four effort counts during each low-tide series have been made of all vehicles and diggers in each area of the Clatsop beaches prior to maximum low-tide. Low-tide series are tides that are at or below the mean low tide of zero. Counts were made on both weekdays and weekends to take into account effort differences. Expansion factors for vehicle and digger counts were developed in the 1960s and 1970s. 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 were determined using the Area-Under-the-Curve calculation.

Effort totals were combined for each area during the low-tide series to determine total effort for each beach area. Average length of digger trips, average number of diggers per vehicle, and the proportion of vehicles from each state were determined from the sampling data. 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.

## **Biological Sampling**

Random sampling of digger harvest for age composition and length frequencies were conducted during sampling interviews. Data collected were 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**

### **Biological Toxins**

Periodically, algal blooms of certain species of phytoplankton that produce biological toxins are ingested by razor clams and stored in the muscles, gonads, gills and digestive systems. Two biological toxins that can contaminate razor clams 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 (several years).

The 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 beaches are collected every low-tide series for biological toxin analysis.

In 2002, DA was discovered in levels above the 20 parts per million threshold in early October. The Clatsop Beaches were closed on October 7<sup>th</sup> and the rest of the Oregon coast closed on November 4<sup>th</sup> for all clam and mussel harvest. The toxin persisted at levels above the cut-off on the entire coast through the end of the year, a total of 85 days. Information on beach closures due to high toxin levels can be obtained from the ODA Shellfish Hotline: 800-448-2474.

### **2002 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.

2002 conditions were very favorable for clam harvest in the early spring and summer months. Surf conditions for the months of April through July were moderate with no large summer storms hitting the coast.

## **2002 Recreational Catch and Effort**

Clam diggers made an estimated 147,000 digging trips on the Clatsop Beaches during 2002. The 2002 effort set an all-time high in digging trips on the Clatsop Beaches, nearly 24% higher than the previous record high of 119,000 digger trips in 1976. Resulting catches of razor clams was an all-time record high of 2,179,000, surpassing the previous record high catch of 2,062,000 in 1957. This includes 327,000 clams wasted in the harvest process. The average catch per digger trip, not including clams wasted, was 12.6 clams (Table 1).

A harvest of 311,000 clams for the sixth low-tide series was the highest series harvest for 2002. Even though this tide series occurred during Oregon’s spring break at the end of March with less than optimal tides, it accounted for almost 20% of the total recreational harvest. Harvest was the largest in Areas 2 and 3, where over 1.39 million clams (75%) were harvested recreationally. Area 5 (Seaside) accounted for 261,000 clams or 14% of the total harvest. Area 4 (Gearhart) accounted for 6% (112,000 clams) of the total harvest. Area 1 (South Jetty) accounted for 4% (83,000 clams) of the total harvest (Table 2). It should be noted that Area 1 is far more remote than the other areas and the closest access was for four wheel drive vehicles only.

When the season reopened in October after a 2 ½ month summer conservation closure the majority of the harvest had shifted to Area 5. Winter catch and effort would have been considerably higher had the beaches not been closed to biological toxins. Age composition for the 2002 recreational fishery indicated that the previous year’s clams had survived well, though there still was a lack of older clams with less than 1% being 3 year or older age class clams. The majority of the harvest, 62%, was of the 1 year age class, while the 2 year age class made up 27% of the harvest, and the 0 age class made up 11% of the harvest (Table 3).

Confirming observations from the previous year, 2002 would be known as the year the Clatsop Beaches returned to the digging of better than a generation ago. Razor clamming on the Clatsop Beaches became a very exciting topic with past users and new participants who came out in force to try their hand at digging. The large number of clams available, the large harvest and the large crowds congregating on the beach also brought along concerns by the public that management in Oregon was not active enough for the preservation of the resource. A local petition to close the season on the Clatsop Beaches by June 15<sup>th</sup> was sent to the Oregon Fish and Wildlife Commission (OFWC) and staff was requested to give a presentation to the OFWC at its June, 2002 meeting. Though no action was taken, it received plenty of attention. A grass-roots



organization, Friends of the Razor Clam (FORC), was also established in hopes of generating public interest in lobbying the state legislature for a shellfish license.

With the large harvest and effort came the problem of regulation violators. The Oregon State Police (OSP) had their hands full every low-tide series with any number of game violations. Compliance was below respectful standards and at one time it was determined that on average 1 out of every 5 people was in violation of some razor clam regulation.

## **Exploratory Sampling**

With the knowledge of a high abundance of clams on the Clatsop Beaches, exploratory digs were conducted at four beaches south of Tillamook Head. The 0 age class clams dominated the catch followed by the 2 year age class. This pattern would indicate that razor clams can have juvenile set on these beaches, but survival is limited. It should be noted that Oswald West Park had a high number of 1 year age class clams in 2001 which had a good conversion to 2 year clams (Table 4).

## **2002 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 1952 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 5). 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 5).

The 2002 commercial harvest was 481,000 clams (89,250 pounds), well above the ten year average of 50,000 clams per year (Table 5). The 2002 commercial harvest was the 5<sup>th</sup> highest total on record and the highest since 1976 (717,000 clams) A total of 255 commercial harvesters were issued ODFW Shellfish Harvest Permits the highest since 1995, yet only 111 made commercial landings in 2002. Poor human consumptive markets for razor clams most likely contributed to the lack of participation. For those who did participate the average landing was 49 pounds per delivery. The majority of the commercially harvested clams came from Areas 2 and 3 (<75%). The age composition was 67% 1 year age class clams, 23% 2 year age class clams, 8% 0 age class clams, and less than 3% 3 year or older age class clams (Table 6).

In 2002 ODFW took care of some regulation housekeeping to make the rules concurrent along the coast. The OFWC adopted the staff recommendation to require all non-human consumptive clams to be dyed prior to leaving the harvest area. The OFWC also adopted a rule to prohibit any digging activity during a toxin closure. This regulation made ODFW and ODA consistent with rules pertaining to closed shellfish areas.

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 1. Annual catch and effort data for the Clatsop Beach razor clam fishery, 1955-2002.**

Year	Recreational Fishery			Number of Clams Wasted	Total Rec. Harvest	Commercial Number of Clams	Total Harvest	
	Digger Trips	Catch per Unit Effort	Number of Clams					
1955	56,000	22	1,212,222	295,000	1,507,000	904,000	2,411,000	
1956	60,000	18	1,061,000	295,000	1,056,000	490,000	1,846,000	
1957	77,000	21	1,646,000	416,000	2,062,000	336,000	2,398,000	
1958	89,000	19	1,679,000	218,000	1,897,000	386,000	2,283,000	
1958	54,000	12	646,000	124,000	770,000	179,000	949,000	
1960	48,000	12	596,000	46,000	642,000	154,000	796,000	
1961	51,000	11	583,000	70,000	653,000	80,000	733,000	
1962	56,000	16	892,000	105,000	997,000	102,000	1,099,000	
1963	55,000	13	713,000	70,000	783,000	107,000	890,000	
1964	71,000	16	1,098,000	264,000	1,632,000	125,000	1,487,000	
1965	76,000	15	1,134,000	186,000	1,320,000	399,000	1,719,000	
1966	78,000	14	1,052,000	434,000	1,486,000	282,000	1,768,000	
1967	74,000	20	1,472,000	195,000	1,667,000	494,000	2,161,000	
1968	64,000	13	831,000	162,000	993,000	361,000	1,354,000	
1969	59,000	14	851,000	155,000	1,006,000	111,000	1,117,000	
1970	56,000	13	715,000	125,000	840,000	61,000	901,000	
1971	77,000	13	968,000	213,000	1,181,000	123,000	1,304,000	
1972	69,000	9	636,000	139,000	775,000	49,000	824,000	
1973	76,000	10	725,000	159,000	884,000	89,000	973,000	
1974	44,000	8	347,000	5,000	352,000	32,000	384,000	
1975	75,000	10	785,000	157,000	942,000	171,000	1,113,000	
1976	119,000	12	1,431,000	63,000	1,494,000	717,000	2,211,000	
1977	51,000	10	499,000	33,000	532,000	143,000	675,000	
1978	72,000	12	849,000	137,000	986,000	205,000	1,191,000	
1979	90,000	11	958,000	63,000	1,021,000	180,000	1,201,000	
1980	70,000	11	747,000	143,000	890,000	116,000	1,006,000	
1981	30,000	6	187,000	49,000	236,000	128,000	364,000	
1982	84,000	9	758,000	123,000	881,000	165,000	1,046,000	
1983	32,000	3	105,000	12,000	117,000	1,000	118,000	
1984	23,000	15	341,000	15,000	356,000	37,000	393,000	
1985	94,000	10	894,000	147,000	1,131,000	303,000	1,434,000	
1986	46,000	5	260,000	33,000	293,000	18,000	311,000	
1987	68,000	15	1,010,000	83,000	1,093,000	236,000	1,329,000	
1988	84,000	11	1,016,000	168,000	1,184,000	161,000	1,345,000	
1989	97,000	11	1,082,000	136,000	1,218,000	195,000	1,413,000	
1990	55,000	11	579,000	61,000	640,000	75,000	715,000	
1991	57,000	11	643,000	80,000	723,000	130,000	853,000	
1992								
1993								
			<b>Seasons Closed Due to Biotoxins</b>					
1994	59,000	15	885,000	0	885,000	78,000	963,000	
1995	91,000	10	912,000	67,000	979,000	276,000	1,255,000	
1996	21,000	9	192,000	11,000	203,000	17,000	220,000	
1997	27,000	7	186,000	47,000	233,000	8,000	241,000	
1998	21,000	7	149,000	12,000	161,000	11,000	172,000	
1999	32,000	5	167,000	10,000	177,000	2,000	179,000	
2000	17,000	5	78,000	0	78,000	4,000	82,000	
2001	7,300	10	70,000	8,000	78,000	5,000	83,000	
2002	147,000	13	1,852,000	327,000	2,179,000	481,000	2,660,000	

**Table 2. Recreational harvest (number of clams) by area, by tide series, 2002.**

	<b>Area 1</b>	<b>Area 2</b>	<b>Area 3</b>	<b>Area 4</b>	<b>Area 5</b>	<b>Total</b>	<b>Total Effort</b>	
<b>Series 1</b>	400	8,580	18,600	378	1,500	<b>29,458</b>	<b>2,590</b>	
<b>Series 2</b>	913	11,250	11,625	480	420	<b>24,688</b>	<b>2,229</b>	
<b>Series 3</b>	694	8,306	6,900	517	566	<b>16,980</b>	<b>1,719</b>	
<b>Series 4</b>	6,200	132,742	91,252	6,580	19,460	<b>256,234</b>	<b>18,840</b>	
<b>Series 5</b>	549	4,114	3,549	771	1,157	<b>10,140</b>	<b>750</b>	
<b>Series 6</b>	11,456	68,138	172,411	6,180	53,146	<b>311,331</b>	<b>24,770</b>	
<b>Series 7</b>	466	10,564	4,535	685	2,743	<b>18,993</b>	<b>2,243</b>	
<b>Series 8</b>	9,366	55,530	88,020	12,582	22,369	<b>187,867</b>	<b>13,014</b>	
<b>Series 9</b>	7,451	32,576	39,596	4,221	14,789	<b>98,633</b>	<b>6,995</b>	
<b>Series 10</b>	13,830	79,692	100,403	18,570	15,241	<b>227,736</b>	<b>19,557</b>	
<b>Series 11</b>	12,714	76,930	73,581	24,538	29,530	<b>217,293</b>	<b>15,728</b>	
<b>Series 12</b>	7,998	55,457	69,846	15,571	30,975	<b>179,847</b>	<b>13,370</b>	
<b>Series 13</b>	5,576	62,266	78,648	13,953	41,571	<b>202,014</b>	<b>16,276</b>	
<b>Series 14</b>								
<b>Series 15</b>								
<b>Series 16</b>		<b>ODFW SEASON CLOSURE</b>						
<b>Series 17</b>								
<b>Series 18</b>								
<b>Series 19</b>	5,620	14,587	15,738	7,120	27,579	<b>70,644</b>	<b>8,728</b>	
<b>Series 20</b>								
<b>Series 21</b>								
<b>Series 22</b>		<b>DOMOIC ACID TOXIN CLOSURE</b>						
<b>Series 23</b>								
<b>Series 24</b>								
<b>Series 25</b>								
<b>Sport Total</b>	<b>83,233</b>	<b>620,732</b>	<b>774,704</b>	<b>112,143</b>	<b>261,046</b>	<b>1,851,858</b>	<b>146,810</b>	

<b>Sport Total w/15% Wastage</b>	<b>2,178,656</b>	<b>CPUE</b>	<b>12.6</b>
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**Table 4. Age composition (percent) for exploratory samples, 2002.**

Area	Age					
	0	1	2	3	4	5
Indian Beach	50	0	50	0	0	0
Falcon Cove Beach	100	0	0	0	0	0
Oswald West Park Beach	22	16	60	2	0	0
Cape Meares Beach	46	14	40	0	0	0

**Table 5. Annual commercial razor clam catch and effort, 1935-2002.**

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

**Table 5. (continued)**

Year	Pounds Landed	Number of Landings	Number of Clams	Lbs. / Landing	Clams / Pound	Number of Diggers	Landings / Digger
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
2002	89,250	1,805	481,000	49.4	5.39	255	7.1







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