



Summary Report of the 2015 Commercial Fishery for Razor Clams (*Siliqua patula*)

Washington Department of Fish and Wildlife
Bruce E. Kauffman
PO Box 190
Ocean Park, WA 98640

February 2016

TABLE OF CONTENTS

Fishery Objectives and Preseason Planning	3
Biotoxin Sampling	3
Fishing Season	5
Licenses.....	5
Fishery Landings.....	6
Commercial Sales and Trends	12
Management Conclusions.....	12
 <u>List of Tables and Figures</u>	
Table 1. 2015 Commercial Razor Clam Fishery Biotoxin Results.....	4
Table 2. <i>Pseudo-nitzschia</i> Counts (cells/L).....	5
Table 3. Number of Licensed Commercial Razor Clam Diggers by Country (2009-2015).....	6
Table 4. Razor Clam Ex-Vessel Prices (per lb).....	7
Table 5. Commercial Razor Clam: Harvest Totals, Value, Season Length, and Licenses	10
Table 6. 2015 Commercial Razor Clam: Daily Landings, Effort, and Take Home Limits.....	11
Figure 1. Percentage of Licensed Commercial Razor Clam Diggers by County (2012-2015).....	6
Figure 2. 2004-2015 Total Pounds Landed vs. Number of Licensed Diggers and Season Length	7
Figure 3. 2004 – 2015 Average Number of Diggers Per Day and Catch per Unit Effort	8
Figure 4. 2013-2015 Average Pounds of Clams Dug per Person (CPUE) vs Tide Elevation	9

**WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW)
SUMMARY OF THE 2015 COMMERCIAL FISHERY
FOR RAZOR CLAMS (*Siliqua patula*)**

Fishery Objectives and Preseason Planning

During and after the 2014 season, WDFW received numerous requests from processors and diggers to move the season opening date up by one month to April 1. Traditionally the fishery has been a bait fishery for Dungeness crab but in recent years the percentage being utilized for the fresh market has been slowly increasing. The reasoning for this change in opening dates was to add more value to the fishery by allowing more opportunity to dig clams while they are in prime condition before spawning.

The public meeting usually scheduled in late March with the commercial harvesters to discuss pertinent information for the upcoming season was held one month earlier, on February 12, 2105. The purpose of this meeting was to gather additional input from harvesters and buyers on a proposal to change the season opening date from May 1 to April 1.

Three season options were considered, keeping the current opening date of May 1, an April 15 opener, or an April 1 opening. A poll of those in attendance showed zero support for the May 1 opening date, 43% supported the April 15 date and 57% supported the April 1 opening.

On March 9, 2015 WDFW announced the fishery would open on April 1, 2015 (pending biotoxin results) and would run just over 9 weeks, ending on June 7, 2015. An extra week (June 1-7) was added upfront to “mitigate” for the poorer (holdup) tides at the beginning of April

Biotoxin Sampling

Before the fishery opens, the Washington Department of Health (WDOH) protocols require two sets of razor clam samples be collected and results of the marine biotoxin tests must be below the federally established action levels. These sets of samples must be collected seven to ten days apart and before the planned opener. Each sample collected must test below 20 parts per million (ppm) for domoic acid, below 80 micrograms per 100 grams of meat tested ($\mu\text{g}/100\text{g}$) for paralytic shellfish poisoning (PSP) and below 16 micrograms per 100 grams of meat tested for Diarrhetic Shellfish Poisoning (DSP). Domoic acid (DA) is caused by the diatom *Pseudo nitzschia* (P-n), PSP is caused by the dinoflagellate *Alexandrium catenella*, and DSP is caused by the dinoflagellate *Dinophysis*. Monitoring of biotoxin levels continues once the fishery is underway with fishery samples collected from dealers every seven to ten days. Razor clams for pre-season biotoxin testing collected from one site on the spits in mid-March tested under the action levels (Table 1). Given the clean biotoxin samples collected on 3/16 and 3/23, on March 26th WDFW officially announced the season opener would begin on April 1.

Biotoxins have impacted the commercial razor clam fishery in the past. Commercial harvest in 1992, 1993 and 1999 was closed due to elevated levels of domoic acid (Table 5). The last time biotoxins tested over the action level was in 2003. In that year, an event that occurred in October 2002 delayed the season until August 2003 and was subsequently shut down after two days of digging. It later reopened for two weeks and the season ended on September 14, 2003.

Table 1. 2015 Commercial Razor Clam Fishery Biotoxin Results.

Collection Date	Sample Type	PSP Result (µg/100g)	Domoic Result (ppm)	DSP Result (µg/100g)
3/16/15	Pre-Season	NTD	1	NTD
3/23/15	Pre-Season	NTD	1	1
4/04/15	Fishery Sample	NTD	NTD	1
4/14/15	Fishery Sample	NTD	<1	<1
4/22/15	Fishery Sample	NTD	1	1
5/03/15	Fishery Sample	NTD	8	-
5/07/15	Fishery Sample	NTD	26	-
5/11/15	Monitoring	NTD	41	-
5/18/15	Monitoring	NTD	69	-
5/26/15	Monitoring	NTD	138	NTD
6/04/15	Monitoring	NTD	70	NTD
6/16/15	Monitoring	NTD	134	NTD
7/07/15	Monitoring	<38	43	NTD
7/22/15	Monitoring	NTD	96	NTD
8/05/15	Monitoring	<38	56	NTD
8/18/15	Monitoring	NTD	35	NTD
9/02/15	Monitoring	NTD	33	NTD

Action level: PSP 80µg/100g, Domoic 20ppm, DSP 16 µg/100g

WDFW conducts routine monitoring of the surf zone phytoplankton assemblage as part of the Olympic Region Harmful Algal Bloom (ORHAB) project. This monitoring program provides resource managers an early warning on harmful algal bloom events. The Pseudo-nitzschia cell counts taken on the ocean beaches at Long Beach (6 miles south of the detached spits) and at Twin Harbors (8 miles north of the detached spits) are shown in Table 2. Counts were virtually zero until April 19 when P-n showed up in water samples collected at Long Beach. By April 26 both Long Beach and Twin Harbors exceeded the 50,000 cells/L alert level for P-n. Once the alert level was reached, cell count monitoring increased in frequency. Cell counts peaked on May 7th and slowly dropped.

The first razor clam biotoxin sample after the cell count alert level was reached was collected on May 3, where levels increased from 1 ppm to 8 ppm. The next razor clam sample, taken four days later was 29 ppm DA, which was above the action level of 20 ppm. Subsequently the fishery was shut down to all harvest on May 8th and WDOH ordered all clams harvested on May 7th recalled and destroyed. Meanwhile DA levels on the detached spits continued to increase, plateauing at 138 on May 26. Subsequent samples for DA were taken roughly every two weeks until September. During the course of the summer sampling DA levels never fell below the action level of 20 ppm (Table 1).

Table 2. *Pseudo-nitzschia* Counts (cells/L)*

Pseudo-nitzschia Count (cells/L)					
Date	Long Beach	Twin Harbors	Date	Long Beach	Twin Harbors
04/19/15	3,000	0	05/11/15	1,668,000	885,000
04/22/15	10,000	0	05/13/15	1,348,000	831,000
04/26/15	70,000	187,000	05/15/15	1,222,000	476,000
04/29/15	224,000	169,000	05/18/15	180,000	287,000
05/04/15	375,000	683,000	05/20/15	349,000	330,000
05/06/15	941,000	-	05/24/15	48,000	319,000
05/07/15	2,200,000	2,248,000	05/28/15	46,000	123,000
05/08/15	-	415,000	06/01/15	46,000	291,000

*Alert level = 50,000 cells/L

Table 2 shows P-n levels thru 6/01/15 with rates at Long Beach declining downwards. It must be noted that this harmful algal bloom (HAB) did not end here, but continued to rise and fall throughout the summer. By mid-June counts at Long Beach increased to 500,000 cells/L and stayed in the 200,000-500,000 range until early August when levels fell below the action rate for almost two weeks. That was short lived as cell counts increased to 2,244,000 cells/L at the end of August which was the highest number of P-n ever seen in a Long Beach sample. Counts remained elevated (range 214,000 – 1,150,000 cells/L) thru September and into early October at both beaches. The first count under the alert level was taken on October 16 and the first sample with zero P-n cells wasn't until November 13, 2015.

It is important to note that the HAB event that led to the closure of the Washington commercial razor clam fishery was very wide spread. Also closed were the Washington recreational and tribal razor clam fisheries, Washington coastal sport and commercial Dungeness crab fisheries as well as similar fisheries in Oregon and California.

Fishing Season

The 2015 season opened as planned on April 1st and was scheduled to last just over nine weeks, ending on June 7th. The first two weeks of the season began with holdover low tides (+2.1 to +0.1 feet). Initial clam abundance and size was disappointing, especially when compared to the previous year. The poorer tides (as opposed to preferred minus tides), changes in configuration of the spits, and weather combined to impact landings with CPUE ranging from 24 to 65 pounds per digger (Table 6). Contrast this with the early holdover tides in the May 2014 season opening where the CPUE ranged from 73 to 121 pounds per digger (see Table 4 in Summary Report of the 2014 Commercial Fishery for Razor Clams).

With the record population levels on the nearby recreational razor clams beaches at Long Beach and Twin Harbors, the consensus was that better low tides combined with diggers having more time on the spits to locate clams, would result in an improvement in CPUE. In fact during the seven minus tides in mid-April there was not a significant increase in CPUE which ranged from 50 to 67 pounds per digger. By the time the season closed due to domoic acid, harvest was inching up with CPUE for the first minus tide run in May ranging from 52 to 86 pounds per digger. The overall CPUE for the short lived 2015 season was 57 pounds per digger per day, the lowest in the past 11 years (Figure 3).

Licenses

In 2015, 132 licenses were sold and of these, 118 were actively fished (Table 5). In 2014 145 licenses were sold and of these, 138 were actively fished. The number of diggers in the fishery has returned to more “normal” levels in contrast to the years 2009 - 2011 where the combination of a poor economy and robust clam populations drove participation rates up to the highest levels in over 20 years (Tables 3 & 5). Given the status of the fishery at this time we expect the effort level to remain close to the 2015 levels for the next few years. As in past years, diggers in 2015 were predominantly residents of Pacific (62%) and Grays Harbor (30%) counties (Figure 1, Table 3).

Figure 1. Percentage of Licensed Commercial Razor Clam Diggers by County (2012-2015).

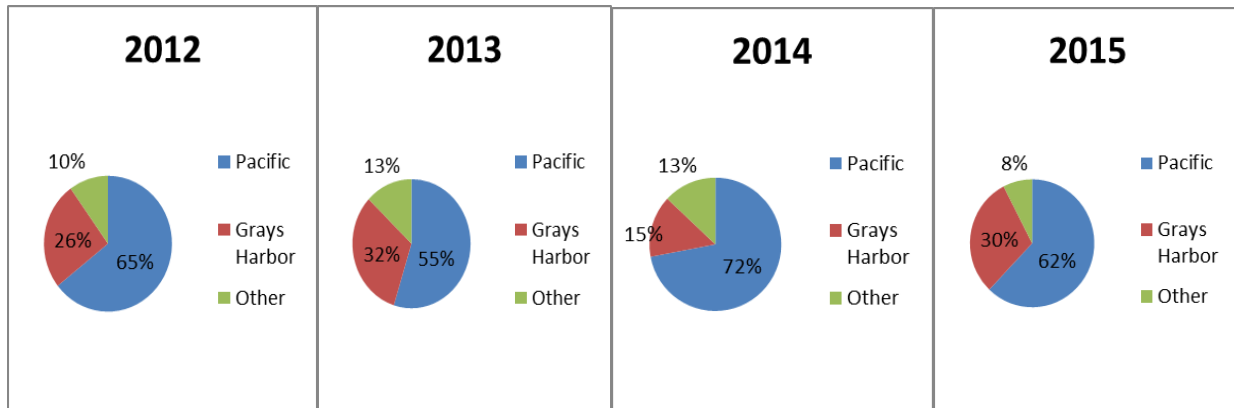


Table 3. Number of Licensed Commercial Razor Clam Diggers by County (2009-2015).

County	2009	2010	2011	2012	2013	2014	2015
Pacific	113	124	118	68	68	105	82
Grays Harbor	47	59	40	27	40	22	40
Other	25	24	16	10	16	18	10
Total	185	207	174	105	124	145	132

Fishery Landings

In total, the fishery landed 67,915 pounds of razor clams during the 37-day season (Tables 5 & 6). This is the lowest harvest seen since 2003 which was also a season cut short by biotoxin closures. The total direct value to diggers (ex-vessel value) was \$112,799 which again was the lowest amount since 2003. Prices paid during the 2015 season averaged \$1.66 per pound and ranged from \$1.60 to \$1.85 (Table 4). Prices paid during the 2014 season ranged from \$1.25 to \$2.40 per pound with an average price of \$1.99 per pound which was lower than the \$2.34 average price in 2013. One reason for the lower average price in 2015 was attributed to the poor 2014-2015 Dungeness crab season. The poor season lowered the demand for bait clams which resulted in some buyers still having clams in their freezers when the season opened.

Razor clams were landed on 36 days of the 37 day season; on average 32 diggers each day landed about 57 pounds of clams. In 2014, on average 47 diggers each day landed about 95 pounds of clams per day (Figure 3).

There were 102 personal use take home limits which comprised 8.5% of the 1,191 landings. Previous years take home percentages in 2014, 2013, 2012 and 2011 were 7.0%, 14.6%, 13.4% and 18.4% respectively. The drop in the past two years in take home limits could be from harvesters wanting to maximize their income or perhaps because diggers were able to satisfy their personal clam needs during the extensive recreational razor clam season.

Table 4. Razor Clam Ex-Vessel Prices (per lb)

Year	Average Price (per lb)	Low	High
2004	\$ 1.47	-	-
2005	\$ 1.50	-	-
2006	\$ 1.48	-	-
2007	\$ 1.50	-	-
2008	\$ 1.73	-	-
2009	\$ 1.63	\$ 1.00	\$ 1.80
2010	\$ 1.62	\$ 1.00	\$ 1.85
2011	\$ 1.75	\$ 1.40	\$ 2.00
2012	\$ 1.97	\$ 1.50	\$ 2.50
2013	\$ 2.34	\$ 1.60	\$ 2.75
2014	\$ 1.99	\$ 1.25	\$ 2.40
2015	\$ 1.66	\$ 1.60	\$ 1.85

Figure 2. 2004-2015 Total Pounds Landed vs. Number of Licensed Diggers and Season Length.

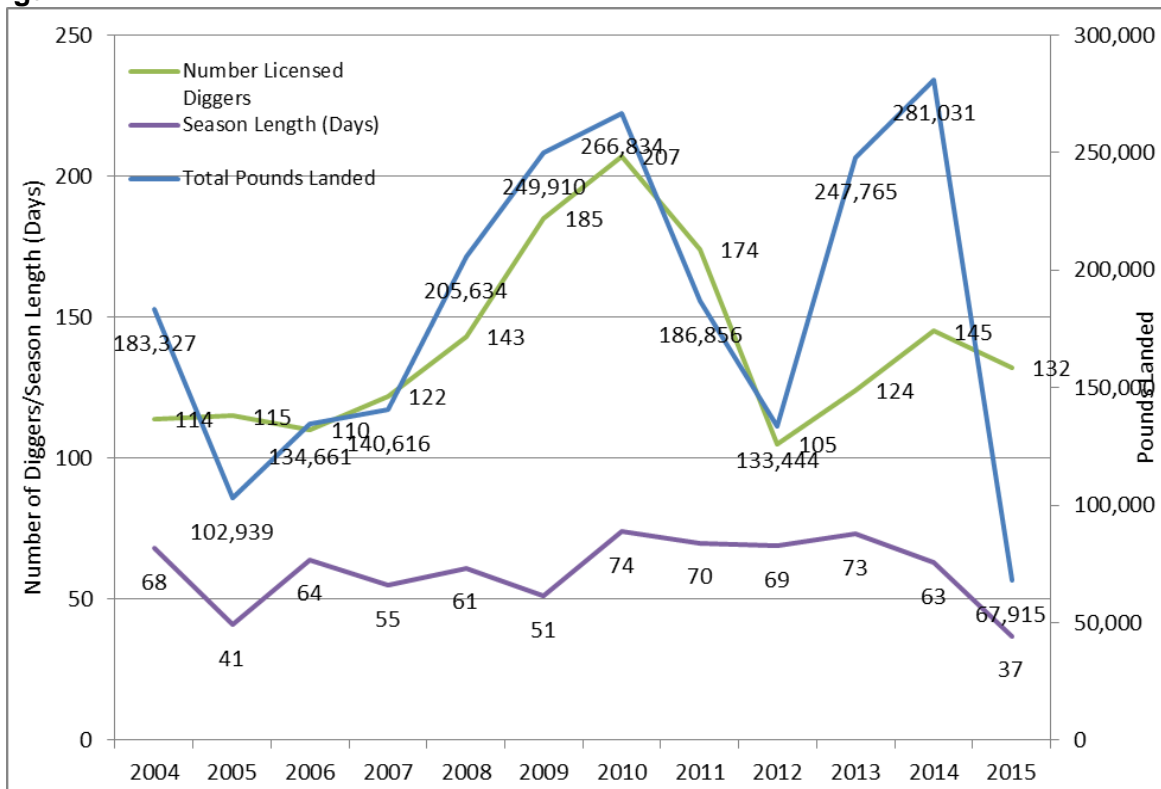
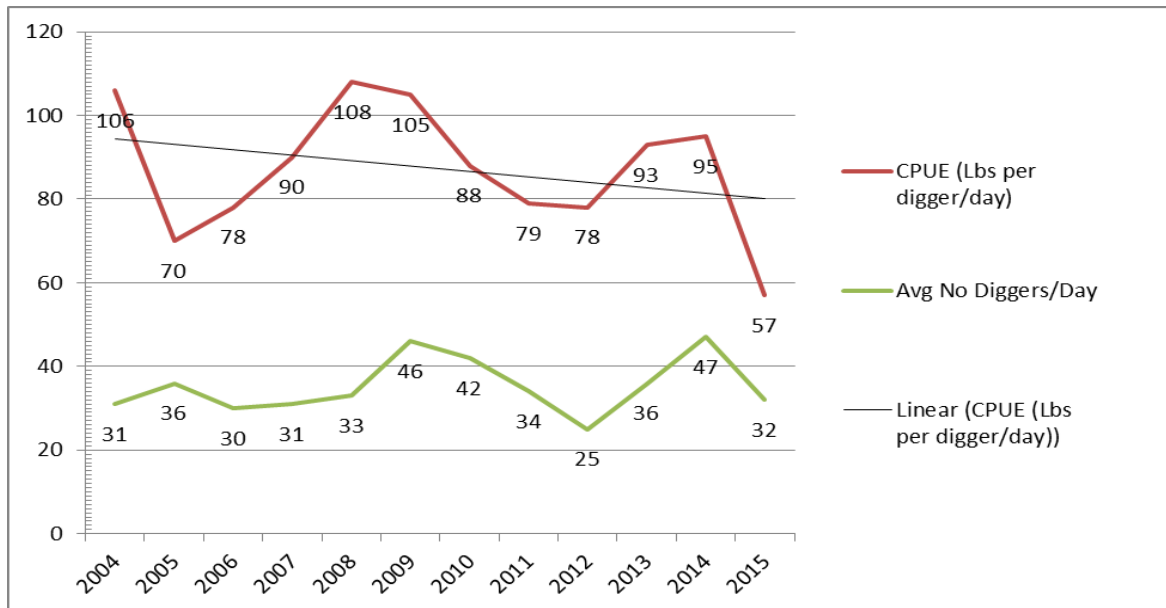


Figure 3. 2004 – 2015 Average Number of Diggers Per day and Catch Per Unit Effort



Discounting other factors such as weather or surf conditions, generally any tide less than +1.0 foot offers comparably good digging opportunity (Figure 4, Table 6). Catch per unit of effort (CPUE: in this case the total pounds of clams dug in one day divided by the number of diggers) was generally highest on tides that were between -2.0 feet and +0.5 feet.

Figure 4. 2013-2015 Average Pounds of Clams Dug per Person (CPUE) vs Tide Elevation

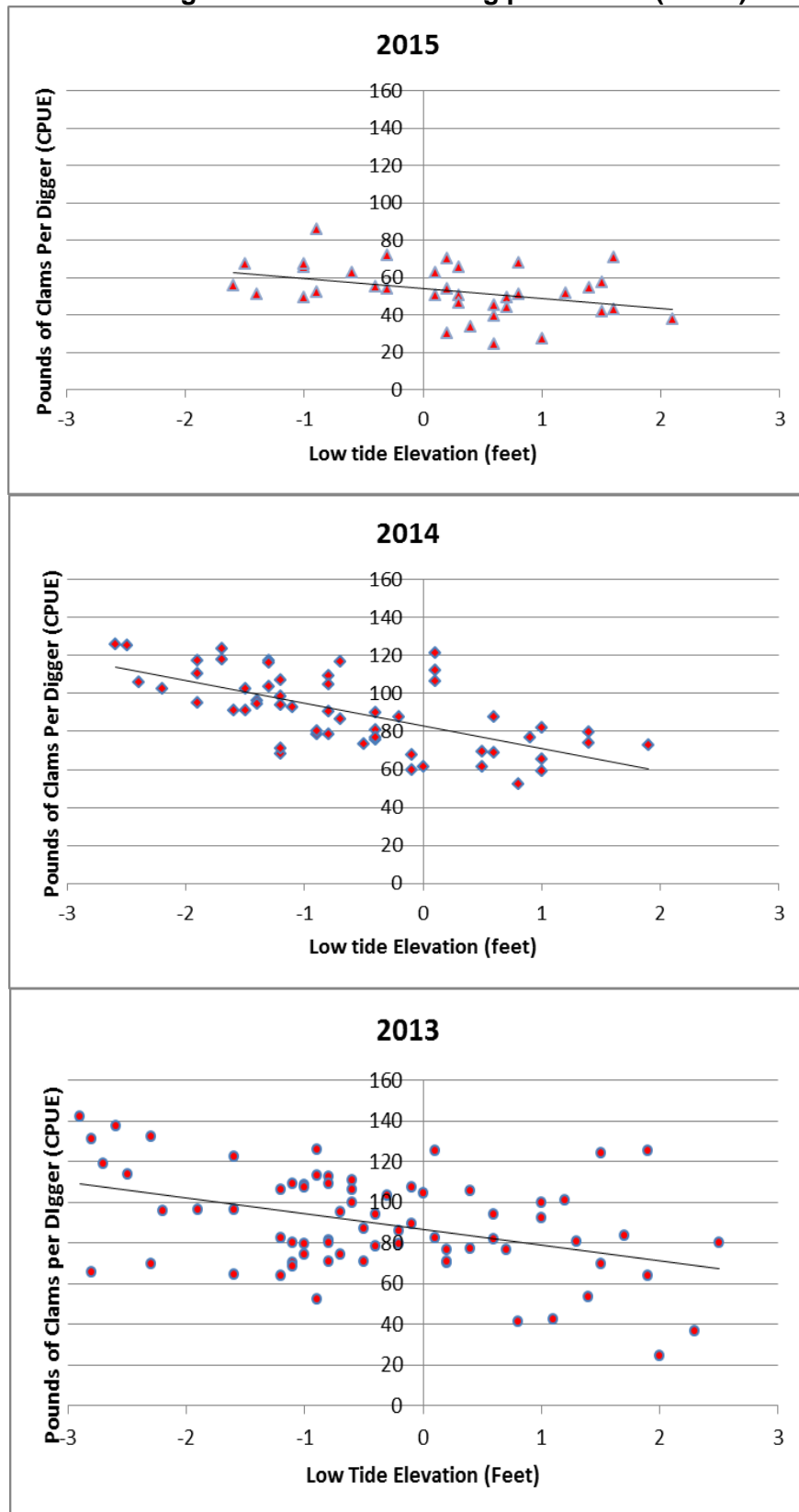


Table 5. Commercial Razor Clam: Harvest Totals, Value, Season Length and Licenses.

Washington Non-Treaty Commercial Razor Clam Fishery

Year	Pounds Landed	Ex-Vessel Value	Number			Non-Resident Licenses	License Revenue	License Fees	
			Days	Diggers	Licenses			Resident	Non-Resident
76	14,047	\$10,512		-	187		\$935	\$5	\$5
77	5,797	\$6,150		-	365		\$1,825	\$5	\$5
78	25,386	\$20,355		-	191		\$4,595	\$5	\$5
79	10,750	\$10,976		-	1,695		\$8,475	\$5	\$5
80	18,390	\$18,781	80	-	1,518		\$7,590	\$5	\$5
81	2,891	\$3,842	39	-	1,411		\$7,055	\$5	\$5
82	6,672	\$9,432	91	-	1,322		\$6,610	\$5	\$5
83	6,732	\$8,678	69	-	1,366		\$6,830	\$5	\$5
84	Nix Closure								
85	Nix Closure								
86	58,814	\$73,114	64	-	378	13	\$19,500	\$50	\$100
87	103	\$194	4	-	115	7	\$6,100	\$50	\$100
88	Closed due to low population levels								
89	20,140	\$35,161	28	-	205	2	\$10,350	\$50	\$100
90	26,553	\$48,073	36	-	290	6	\$14,800	\$50	\$100
91	26,630	\$44,106	42	-	267	8	\$13,750	\$50	\$100
92	Domoic Acid Closure								
93	Domoic Acid Closure								
94	46,854	\$59,487	40	-	95	3	\$12,500	\$130	\$180
95	88,290	\$109,364	38	-	127	0	\$16,510	\$130	\$180
96	25,188	\$29,295	37	-	110	1	\$14,350	\$130	\$180
97	2,849	\$3,579	21	-	28	3	\$3,790	\$130	\$180
98	4,485	\$6,558	24	-	40	0	\$5,200	\$130	\$180
99	Domoic Acid Closure								
00	69,595	\$84,106	51	-	79	0	\$10,270	\$130	\$180
01	75,744	\$77,439	47	62	97	0	\$12,610	\$130	\$180
02	119,777	\$118,349	46	97	105	0	\$13,650	\$130	\$180
03	17,474	\$21,169	18	40	44	0	\$5,720	\$130	\$180
04	183,327	\$269,139	68	112	114	0	\$14,820	\$130	\$180
05	102,939	\$154,746	41	112	115	3	\$15,490	\$130	\$180
06	134,661	\$199,469	64	103	110	0	\$14,300	\$130	\$180
07	140,616	\$211,118	55	119	122	1	\$16,040	\$130	\$180
08	205,634	\$355,705	61	108	143	0	\$18,590	\$130	\$180
09	249,910	\$407,130	51	164	185	4	\$24,250	\$130	\$180
10	266,834	\$431,519	74	184	207	2	\$27,010	\$130	\$180
11	186,856	\$327,022	70	155	174	3	\$22,770	\$130	\$180
12	133,444	\$262,611	69	104	105	2	\$24,785	\$235	\$290
13	247,765	\$579,159	73	121	124	2	\$29,250	\$235	\$290
14	281,031	\$559,552	63	135	145	0	\$34,075	\$235	\$290
15*	67,915	\$112,799	37	118	132	0	\$30,550	\$235	\$290

* Season closed early due to domoic acid

Table 6. 2015 Commercial Razor Clam: Daily Landings, Effort and Take Home Limits

Date	Day	Tide (ft)	Time	Number Landings	Daily Total Landings (lbs)	CPUE (lbs per digger/day)	Take Home Limits
04/01/15	Wednesday	+2.1	6:17	22	829	38	0
04/02/15	Thursday	+1.5	6:56	24	1,385	58	0
04/03/15	Friday	+1.0	7:32	22	600	27	1
04/04/15	Saturday	+0.6	8:07	54	2,460	46	6
04/05/15	Sunday	+0.3	8:41	30	1,523	51	4
04/06/15	Monday	+0.2	9:16	38	2,061	54	2
04/07/15	Tuesday	+0.1	9:53	48	2,423	50	2
04/08/15	Wednesday	+0.1	10:32	44	2,753	63	5
04/09/15	Thursday	+0.3	11:16	46	2,136	46	1
04/10/15	Friday	+0.4	12:07	18	604	34	4
04/11/15	Saturday	+0.6	13:07	7	169	24	7
04/12/15	Sunday	+0.7	14:13	18	891	50	2
04/13/15	Monday	+0.6	15:21	-	-		-
04/14/15	Tuesday	+0.5	16:24	9	354	39	2
04/15/15	Wednesday	+0.3	17:20	24	1,567	65	5
04/16/15	Thursday	+0.7	5:56	33	1,454	44	3
04/17/15	Friday	-0.3	6:47	54	2,929	54	5
04/18/15	Saturday	-1.0	7:36	64	4,209	66	9
04/19/15	Sunday	-1.5	8:23	78	5,230	67	7
04/20/15	Monday	-1.6	9:09	58	3,220	56	5
04/21/15	Tuesday	-1.4	9:55	47	2,391	51	2
04/22/15	Wednesday	-1.0	10:41	44	2,181	50	5
04/23/15	Thursday	-0.4	11:30	11	608	55	0
04/24/15	Friday	+0.2	12:22	10	301	30	1
04/25/15	Saturday	+0.8	13:19	18	921	51	1
04/26/15	Sunday	+1.2	14:20	12	622	52	1
04/27/15	Monday	+1.5	15:21	10	416	42	0
04/28/15	Tuesday	+1.6	16:16	4	282	71	0
04/29/15	Wednesday	+1.6	17:05	9	387	43	1
04/30/15	Thursday	+1.4	5:49	11	597	54	2
05/01/15	Friday	+0.8	6:29	25	1,694	68	2
05/02/15	Saturday	+0.2	7:07	54	3,775	70	2
05/03/15	Sunday	-0.3	7:43	53	3,806	72	6
05/04/15	Monday	-0.6	8:19	58	3,641	63	5
05/05/15	Tuesday	-0.9	8:55	30	1,565	52	1
05/06/15	Wednesday	-1.0	9:33	54	3,630	67	3
05/07/15	Thursday	-0.9	10:14	50	4,301*	86	0
Season Totals				1,191	67,915	57	102

* = product destroyed

Commercial Sales and Trends

Commercial buyers must be certified by the Washington Department of Health to purchase razor clams and the certification is renewed annually. Buyers must also have a WDFW wholesale dealer license and all razor clams purchased must be documented on shellfish receiving tickets. Typically, five to six companies register to buy razor clams each year. Most dealers are established wholesale seafood businesses in Pacific and Grays Harbor counties that operate year-round in various fisheries and they purchase the majority of clams. In addition, some wholesale buyers are simply individuals that have obtained the required licenses and certification to purchase razor clams only. Typically these dealers are commercial Dungeness crab fishers buying razor clams for bait. Generally there are two to three buyers that fit these criteria each season.

Dungeness crab fishers favor razor clams as bait because they are a natural food source of crabs and keep well in crab pot bait cans. While the majority of the harvested clams are still sold as crab bait, this percentage has varied over the past few years as more and more clams are destined to the fresh market.

The percentage of razor clams sold on the fresh market has been slowly increasing over the past few years. Part of this stems from the development of new markets in Asia that use overnight air shipping. In order to take advantage of these new markets and maximize the value of the fishery the clams need to be in good condition (unspawned). Generally as the season moves into June and early July most of the clams have spawned and are not suitable for the fresh market. In 2012 the percentage sold fresh was around 9%, in 2013 the percentage sold fresh was around 13% and in 2014 this increased to around 25%. It is estimated that the percentage of fresh sales in 2015 were at or below the 2014 levels.

Wholesalers point out the market for fresh razor clams are limited by their narrow 2-3 day shelf life and because profitability to the wholesaler is held in check by other razor clams entering the market. These other sources include the Quinault Indian Nation and clams coming from both Canada and Alaska. For some buyers the main benefit in purchasing razor clams comes from keeping their work crews employed during a typically slow time of year and providing superior quality bait to the commercial crabbers who fish in the winter months.

Management Conclusions

In recent years, dealers have tried take advantage of stable seasons and strong production to develop retail markets locally and overseas. Success has been mixed due to competition of razor clams from other sources and a limited shelf life. Key factors to maintaining and increasing market development are a spring/summer season and a generally consistent season start. These factors have directed season development and are balanced with tides, weather and the needs of the recreational fishery. In addition to the direct benefits related to the harvest of clams, the timing of the fishery provides an important economic bridge between crab and salmon seasons for both dealers and diggers. Within the constraints posed by population abundance and biotoxin levels, management of the fishery will continue to promote season predictability to support marketing opportunities for human consumption and to provide a reliable source of bait for the Dungeness crab fishery.