

Washington Razor Clam Management

Setting the 2022-23 Season



The following presentation is designed to provide you with general information on the management of the recreational razor clam fishery in Washington and specific information on what to expect for the 2022-23 season.

Thanks for taking the time to view this presentation. Any specific comments or questions can be directed to : razorclams@dfw.wa.gov

A photograph of two men outdoors. The man on the left is older, wearing glasses and a green zip-up jacket with a circular logo on the chest. He is holding a smartphone. The man on the right is younger, wearing a green beanie with a logo and a grey hoodie. He is looking down at something in his hands. The background is a sandy beach with a white SUV parked in the distance.

What's Up?

CONTENTS OF THIS PRESENTATION

Review of the 2021-22 Season

Marine Toxin Update / ORHAB

Status of Razor Clam Stocks

Tribal Co-management

How to Dig Razor Clams Video

Digging with Kids

Season Options for 2022-23

This presentation is designed to update you on the issues listed above and hopefully spur you to let us know what you think about our management of razor clams and how we can change or improve the work we do. Thanks for taking the time to read through the following information. In the photo, L to R, Dan Ayres, Coastal Shellfish Manager, Bryce Blumenthal, Coastal Shellfish Technician.

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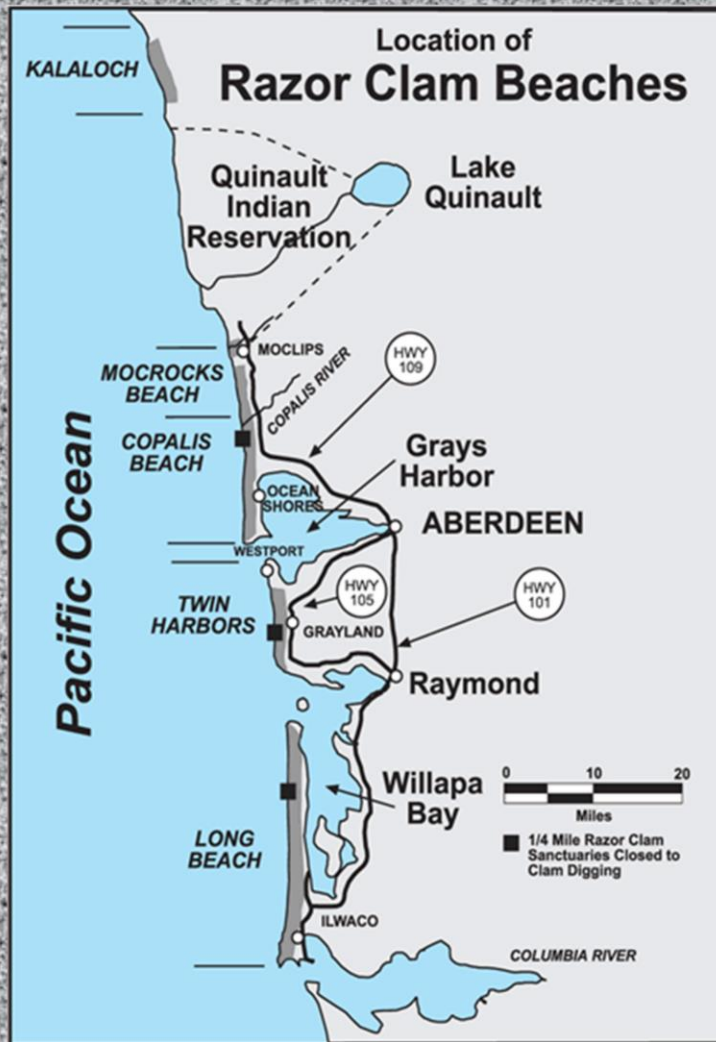
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Washington's razor clam habitat is divided into five management beaches. From the south, they are: Long Beach (from the Columbia River North Jetty to end of Leadbetter Point); Twin Harbors (from the northern shore of Willapa Bay to the Grays Harbor South Jetty); Copalis (from the Grays Harbor North Jetty to the Copalis River); Mocrocks (from the Copalis River to the south boundary of the Quinault Indian Reservation – just south of the Moclips River); Kalaloch (from Olympic National Park South Beach Campground to Brown's Point, just south of Olympic National Park Beach Trail # 3). Within these five management beaches there are a total of 58 miles of sandy beaches and prime habitat for the Pacific Razor Clam (*Siliqua patula*).



Razor Clam Digging In Washington State

WDFW's goal is to provide a safe and enjoyable recreational experience, while still protecting the resource.

The razor clam fishery in Washington is not only a significant source of revenue for tourism-dependent businesses such as restaurants and motels, but also an important source of community identity and basis for tribal subsistence. Razor clam harvesting, cleaning, cooking, eating, and canning have been an important focus of family relationships and local culture in Washington coastal communities for many generations.

FISH AND WILDLIFE COMMISSION
POLICY DECISION

POLICY TITLE:	Razor Clam Management	POLICY NUMBER:	POL-C3009
Cancels:		Effective Date	January 4, 1997
		Termination Date	(if applicable):
See Also:		Approved by:	<u>/s/ Lisa Pelly</u> Fish and Wildlife Commission Chair

The management objectives for the razor clam fishery are:

- Manage the razor clam resource on all coastal beaches for recreational use with a minor separate commercial fishery located only on detached spits of Willapa Bay.
 - Protect public health and safety.
 - Manage the resource to maintain stable and healthy populations.
 - Maximize recreational opportunity.
 - Provide a quality recreational experience.
 - Independently manage the razor clam populations on Kalaloch (*in cooperation with Olympic National Park*), Mocrocks, Copalis, Twin Harbors and Long Beach while considering the pertinent interactions of seasons, effort, opportunity and tribal allocations.
 - Provide for consistent commercial fishing opportunity that does not conflict with the recreational fishery.
-

The fishery is managed by WDFW staff with specific guidance provided by the Washington Fish and Wildlife Commission; nine citizen members serving six-year terms who are appointed by the governor and confirmed by the Washington State Senate. For more information see: <https://wdfw.wa.gov/about/commission>

In it's Policy C3009 the Fish and Wildlife Commission has provided seven objectives WDFW uses in managing this fishery.

Note that the management of the recreational razor clam fishery at Kalaloch occurs in cooperation with the Olympic National Park.

Washington Recreational Razor Clam Fishery Summarized by Season (October through May)

season	effort (digger trips)	harvest		fishery value*
		+ wastage (clams)	total harvest days#	
1997-98	166,630	1,934,256		\$15,128,365
1998-99		<i>season long closure due to high levels of marine toxins</i>		
1999-20	192,359	2,531,910		\$17,464,305
2000-01	183,375	2,479,525	20	\$16,648,646
2001-02	307,314	4,321,274	39	\$27,901,088
2002-03		<i>season long closure due to high levels of marine toxins</i>		
2003-04	267,053	3,325,575	18	\$24,245,785
2004-05	288,516	4,126,870	25	\$26,194,415
2005-06	240,768	3,284,198	26	\$21,859,366
2006-07	259,847	3,601,239	30	\$23,591,552
2007-08	242,317	3,030,840	40	\$22,000,000
2008-09	248,728	3,216,167	27	\$22,582,056
2009-10	283,444	3,805,228	46	\$25,733,927
2010-11	244,428	3,204,311	46	\$22,191,658
2011-12	194,976	2,575,693	26	\$17,701,903
2012-13	418,999	6,078,109	78	\$38,040,988
2013-14	451,046	6,285,205	105	\$40,950,540
2014-15	399,698	5,756,496	104	\$36,288,647
2015-16	327,545	4,531,856	94	\$29,737,864
2016-17	281,374	4,271,280	46	\$25,545,991
2017-18	257,004	2,840,843	20	\$23,333,435
2018-19	272,962	3,742,861	52	\$24,782,265
2019-20	253,927	3,592,727	66	\$23,054,074
2020-21	109,781	1,738,246	23	\$16,247,581
2021-22	484,388	8,352,279	120	\$71,689,424
10-year average	296,731	4,141,332	61	\$27,568,329
20-year average	276,655	3,790,427	47	\$25,431,589

* - economic data derived from University of Washington study.

- variable opening occur across five management beaches. This value represents the maximum number of days offered.

This table provides some perspective of how this fishery can vary by season. The number of digging days offered, number of diggers and total harvest are most influenced by the TAC (total allowable catch) that is developed each summer through of coast-wide razor clam stock assessment work. These numbers are also influenced by management changes over these years in the harvest rate WDFW uses to set the TAC. In addition, marine toxin closures, poor weather and surf conditions can also play a significant role each season. You will find more details about all of these topics in the slides to follow. After a one-two punch for razor clammers with the 2019-20 and 2020-21 seasons closed early due to COVID-19 and domoic acid respectively, the 2021-2022 season was a welcome return to form and a record year.

News / WDFW approves 9 days of razor clam digs beginning April 29; daily limit is 20 clams

WDFW approves 9 days of razor clam digs beginning April 29; daily limit is 20 clams

Date

April 29, 2021

Contact

Contact: Dan Ayres, 360-249-4628 ext. 209

Public Affairs Contact: Mark Yuasa, 360-902-2262

OLYMPIA – Shellfish managers with the Washington Department of Fish and Wildlife (WDFW) confirmed Friday that the final round of recreational razor clam digging will begin on May 7 to wrap up a memorable season.

"As we enter the homestretch of the 2021-2022 recreational razor clam season, it's quite clear that this will go down as one of the best in Washington history," said Dan Ayres, WDFW's assistant shellfish manager. "Looking to the future, we're confident that we have a promising new indicator for another great season starting this fall."

A total of 432,380 diggers from Sept. 17 to April 21 (111 digging days) have taken home more than 7.4 million razor clams. During digs on April 16-21 the daily limit was increased to 20 clams on all open beaches. Average harvest per digger was 16.8 clams per digger trip. Average harvest per digger trip was 16.8 clams per digger trip. Average harvest per digger trip was 16.8 clams per digger trip.

On all open beaches – Long Beach, Twin Harbors, Copalis, and Moclips – the daily limit through May 7 is 20 clams instead of the usual 15. Each digger's clams must be kept in a separate container, and all diggers must keep the first 20 clams they dig, regardless of size or condition. Diggers are reminded that a possession limit of shellfish is one daily limit in fresh form, and all other shellfish must be frozen or processed. Razor clams that are simply cleaned are not considered processed. For more information, please visit <https://www.eregulations.com/washington/fishing/>.

Digging is allowed during low tide from 12 a.m. through 11:59 a.m. only (digging hours extended to 1 p.m. on May 7).

2021-22 Fishery Review

484,324 digger trips

Harvest of 8.4 million clams

Average of 16.8 clams per digger trip



Overall, the 2021-22 season was a record year in terms of harvest and effort levels and economic value (see page 7). Favorable ocean conditions combined with the two previous seasons closing prematurely resulted in a healthy and abundant harvestable population. This also allowed WDFW to take unprecedented action in temporarily increasing the daily bag limit to 20 clams per digger. This temporary increase was in place between Sept. 17 and Dec. 23 and again between April 16 and May 7.

Washington Recreational Razor Clam

<i>2021-22 Season Totals</i>	HARVEST	EFFORT	Average Daily Catch (clams/digger)	Total Digging Days
Long Beach	3,319,570	189,384	16.8	119
Twin Harbors	2,119,823	123,715	16.9	108
Copalis	1,657,587	96,380	16.7	60
Mocrocks	1,255,299	74,908	16.5	53
Kalaloch	0	0	0	0
TOTAL	8,352,279	484,388	16.8	340

Each of the five beaches is managed separately (see page 4). The Total Allowable Catch (TAC) is determined for each beach using data collected in our annual summer razor clam stock assessment work (discussed more in the slides ahead). As a result, some beaches have more digging opportunities than others.

Note that the harvest listed here includes our estimates of wastage. The CPUE is calculated on the estimate of harvest, minus wastage.

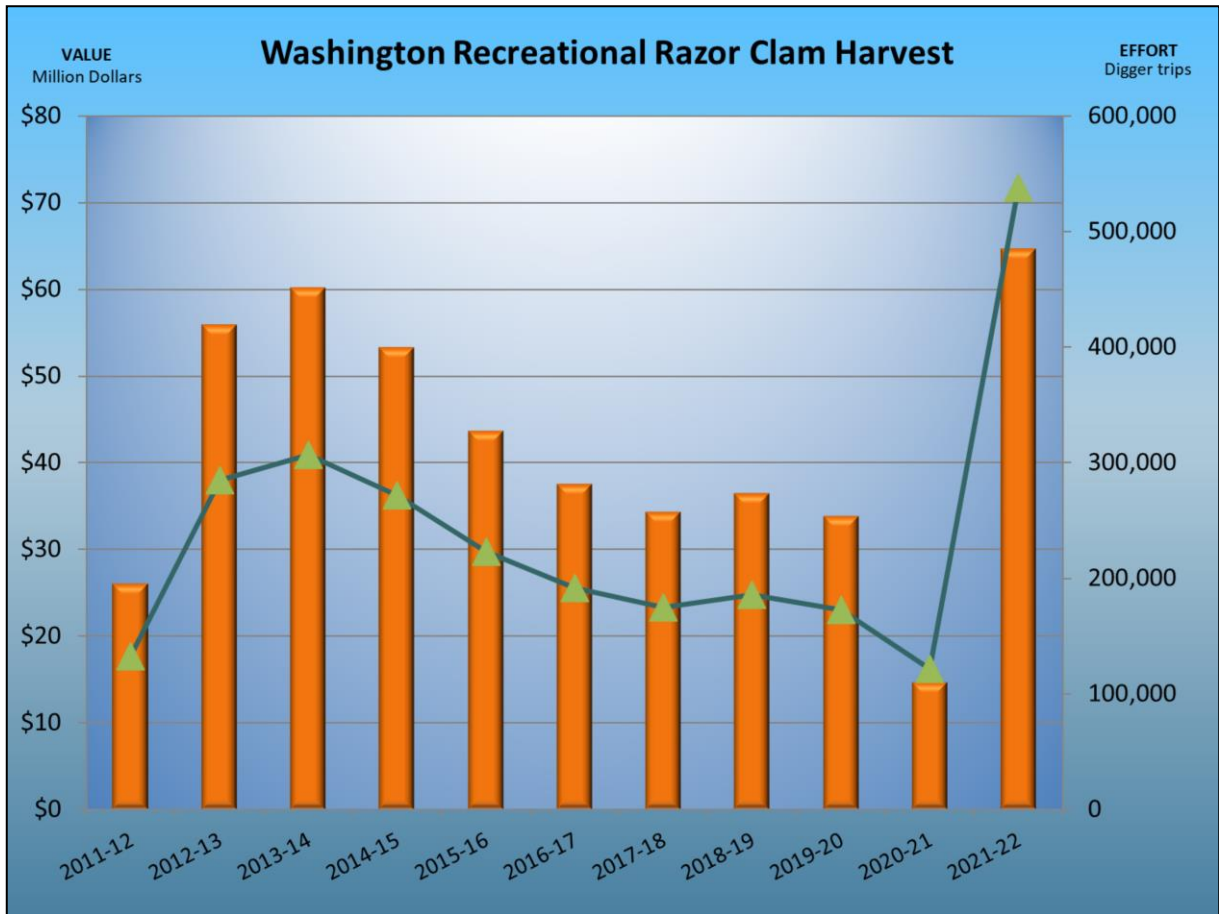


Washington Recreational Razor Clam Fishery

Days Open for Harvest by Season

Beach	2021-22	2020-21	2019-20	2018-19	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	average
Long Beach	119	12	66	4	16	11	94	104	72	42	23	56
Twin Harbors	108	12	63	53	18	46	0	104	105	78	26	61
Copalis	60	6	31	20	12	33	18	21	24	28	13	27
Mocrocks	53	12	32	33	20	35	26	43	54	30	20	36
Kalaloch	0	0	0	6	0	2	0	0	0	0	3	1

This table and the following chart that follows, provide some additional perspective of how this fishery can vary by season. The number of digging days offered, number of diggers and total harvest are most influenced by the TAC (total allowable catch) that is developed each summer through of coast-wide razor clam stock assessment work. These numbers are also influenced by management changes over these years in the harvest rate WDFW uses to set the TAC. In addition, marine toxin closures, poor weather and surf conditions can also play a significant role each season. We were fortunate to have a long and complete season this year after the past two were shortened by COVID19 and domoic acid toxicity, respectively. This season saw the most total digs in at least the last 30+ years.



This chart and the previous table provide some additional perspective of how this fishery can vary by season. The number of digging days offered, number of diggers and total harvest are most influenced by the TAC (total allowable catch) that is developed each summer through of coast-wide razor clam stock assessment work. These numbers are also influenced by management changes over these years in the harvest rate WDFW uses to set the TAC. In addition, marine toxin closures, poor weather and surf conditions can also play a significant role each season. You will find more details about all of these topics in the slides to follow. **Note the 2019-20 and 2020-21 seasons closed prematurely due to COVID-19 and elevated levels of domoic acid respectively.**

Month	Long Beach	
September 2021	9 Days	Fri - Sat
October 2021	16 Days	Sun – Mon, Tue – Mon
November 2021	17 Days	Wed – Wed, Tue – Wed
December 2021	20 Days	Wed – Thu, Wed – Thu, Thu – Fri
January 2022	15 Days	Sat – Wed, Fri – Thu, Sat – Mon
February 2022	10 Days	Tue – Thu, Mon – Fri, Sat – Mon
March 2022	11 Days	Tue – Fri, Wed – Tue
April 2022	14 Days	Fri – Wed, Sat – Thu, Fri – Sat
May 2022	7 Days	Sun – Sat
Totals:	119 Days	

We were finally able to take advantage of the large population of razor clams that we had been seeing during our summer stock assessments the past few years. With 119 harvest days, Long Beach was the beach with the most days of digging this past season. That’s almost one third of the calendar year!

Long Beach

119 Days

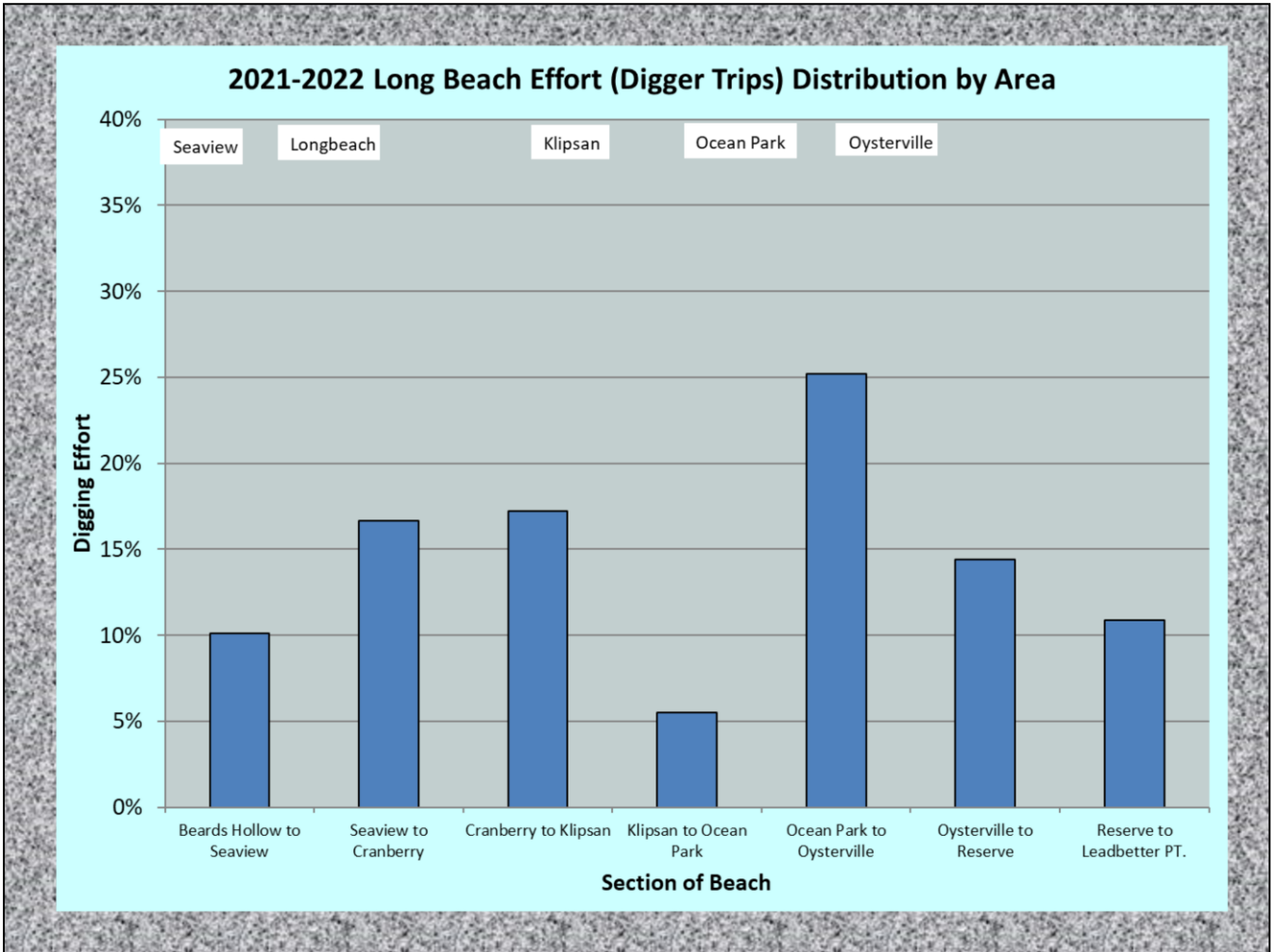
Effort = 189,384 digger trips

Harvest = 3,319,570 clams

(Including wastage of 132,391 clams)

Portion of TAC Harvested = 38.3%

Because of the large amount of digging opportunity, Long Beach was the beach with the most digger trips and clams harvested. Despite those coastwide highs we only harvested 38.3% of our TAC, which was the smallest proportion out of all the beaches. Standout PM Tides were Friday October 8 with an estimated effort of 5,809 diggers and 113,855 clams harvested and Saturday January 29 with 8,594 diggers and 124,608 clams. The AM Tide that saw the best turnout was Sunday May 1 with 4,057 diggers and 81,144 clams harvested.



The Y-Axis is the percentage of digging effort (totaling 100). The X-Axis is the harvested beach area, moving from south to north (left to right) and broken up into 7 sections. This season we saw less effort on the north end of the Long Beach peninsula compared to years past. This was because clam size and digging success was more consistent throughout the entire beach.

Month	Twin Harbors	
September 2021	9 Days	Fri - Sat
October 2021	16 Days	Sun – Mon, Tue – Mon
November 2021	17 Days	Wed – Wed, Tue – Wed
December 2021	20 Days	Wed – Thu, Wed – Thu, Thu – Fri
January 2022	9 Days	Sat – Tue, Sat – Tue, Sat
February 2022	5 Days	Tue – Wed, Thu – Fri, Sat
March 2022	11 Days	Tue – Fri, Wed – Tue
April 2022	14 Days	Fri – Wed, Sat – Thu, Fri – Sat
May 2022	7 Days	Sun – Sat
Totals:	108 Days	

On Twin Harbors, a strong population of harvestable sized recruit clams resulted in 108 days of digging this season, 2nd most of any beach.

Twin Harbors

108 Days

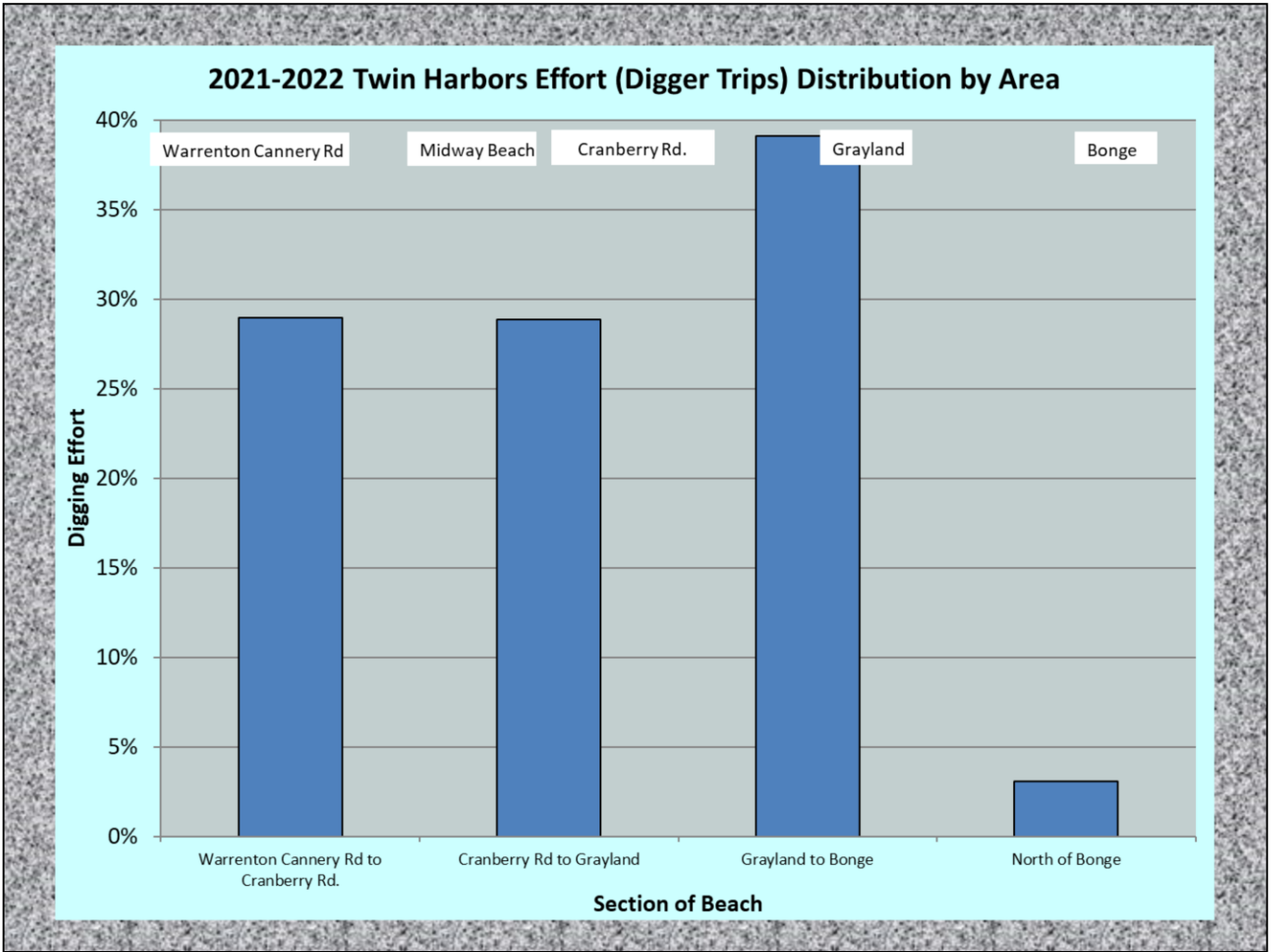
Effort = 123,715 digger trips

Harvest = 2,119,823 clams

(Including wastage of 26,909 clams)

Portion of TAC Harvested = 62.1%

A strong population of harvestable sized recruit clams allowed for the longest digging season in 10 years. The standout PM tide harvest was Saturday January 29 with 6,500 diggers and 94,560 clams. The standout AM tide harvest was Saturday May 7 with 3,018 diggers and 52,338 clams.



The Y-Axis is the percentage of digging effort (totaling 100). The X-Axis is the harvested beach area, moving from south to north (left to right) and broken up into 4 sections. This year the most frequented digging area was the stretch of beach between Grayland Beach Rd. and Bonge Rd.

Month	Copalis	
September 2021	5 Days	Sat, Mon, Wed, Fri, Sat
October 2021	9 Days	Sun, Tue, Thu, Sat, Mon, Tue, Thu, Sat, Mon
November 2021	9 Days	Thu, Sat, Mon, Wed, Tue, Thu, Sat, Mon, Wed
December 2021	10 Days	Wed, Fri, Sun, Tue, Thu, Thu, Sat, Mon, Wed, Fri
January 2022	6 Days	Sun, Tue, Sat, Mon, Wed, Sun
February 2022	5 Days	Tue, Thu, Wed, Fri, Sat
March 2022	5 Days	Wed, Fri, Thu, Sat, Mon
April 2022	7 Days	Sat, Mon, Wed, Sat, Mon, Wed, Fri
May 2022	4 Days	Sun, Tue, Thu, Sat
Totals:	60 days	

As many are aware, the Copalis razor clam management beach is one of three beaches WDFW co-manages with tribal governments. The Quinault Indian Nation (QIN) has federally adjudicated fishing rights on this beach and we share the total allowable catch (TAC) 50/50 with the QIN. More details on state/tribal co-management of razor clams in Washington are found later in this presentation.

As we have since the 2015-16 season, during the 2021-22 season the harvest schedules on Copalis and Mocrocks were a result of efforts to share weekend days between state and tribal fishers. In all cases diggers saw Mocrocks and Copalis open on alternate weekend days. This is one tool that state and tribal fishery managers can use to provide weekend opportunities to both state and tribal fishers. Copalis saw a total of 60 harvest days, the most in the past 10 years.

Copalis

60 Days

Effort = 96,380 digger trips

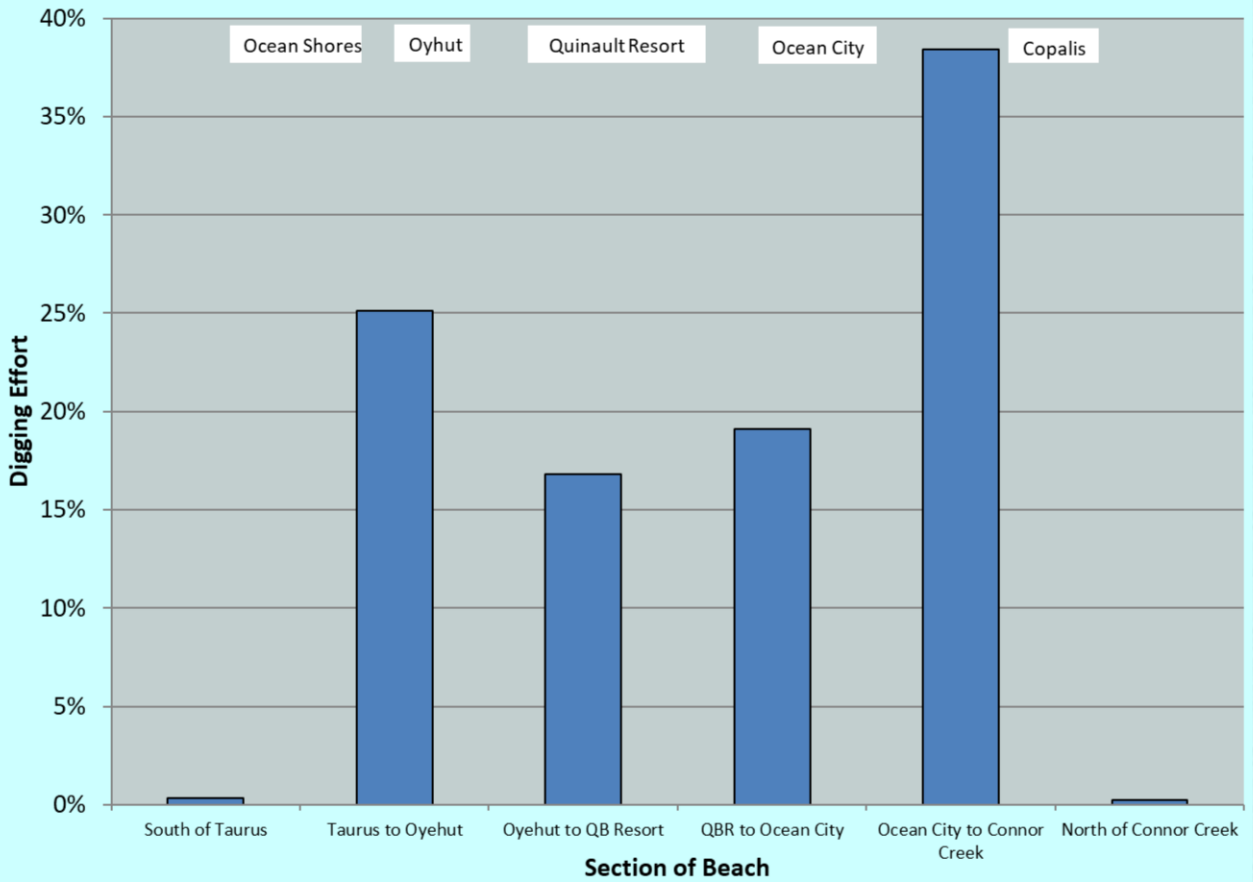
Harvest = 1,657,587 clams

(Including wastage of 45,517 clams)

Portion of TAC Harvested = 50.2%

A strong population of harvestable sized recruit clams allowed for the longest digging season in 10 years. The standout PM tide harvest was Saturday February 26 with 4,657 diggers and 62,185 clams. The standout AM tide harvest was Saturday May 7 with 4,385 diggers and 72,091 clams.

2021-2022 Copalis Effort (Digger Trips) Distribution by Area



The Y-Axis is the percentage of digging effort (totaling 100). The X-Axis is the harvested beach area, moving from south to north (left to right) and broken up into 6 sections. Similar to years past, the most frequented section was between the Ocean City approach and Conner Creek.

Month	Mocrocks	
September 2021	5 Days	Fri, Sun, Tue, Thu, Sat
October 2021	7 Days	Mon, Wed, Fri, Sun, Wed, Fri, Sun
November 2021	8 Days	Wed, Fri, Sun, Tue, Wed, Fri, Sun, Tue
December 2021	10 Days	Thu, Sat, Mon, Wed, Wed, Fri, Sun, Tue, Thu, Thu
January 2022	4 Days	Sat, Sun, Mon, Sat
February 2022	3 Days	Wed, Tue, Sun
March 2022	6 Days	Tue, Thu, Wed, Fri, Sun, Tue
April 2022	7 Days	Fri, Sun, Tue, Sun, Tue, Thu, Sat
May 2022	3 Days	Mon, Wed, Fri
Totals:	53 days	

As many are aware, the Mocrocks razor clam management beach is one of three beaches WDFW co-manages with tribal governments. The Quinault Indian Nation (QIN) has federally adjudicated fishing rights on this beach and we share the total allowable catch (TAC) 50/50 with the QIN. More details on state/tribal co-management of razor clams in Washington are found later in this presentation.

As we have since the 2015-16 season, the 2021-22 season harvest schedules on Copalis and Mocrocks were a result of efforts to share weekend days between state and tribal fishers. In all cases diggers saw Mocrocks and Copalis open on alternate weekend days. This is one tool that state and tribal fishery managers can use to provide weekend opportunities to both state and tribal fishers. A total of 53 harvest days this season make it the second most in the last 10 years.

Mocrocks

53 Days

Effort = 74,908 digger trips

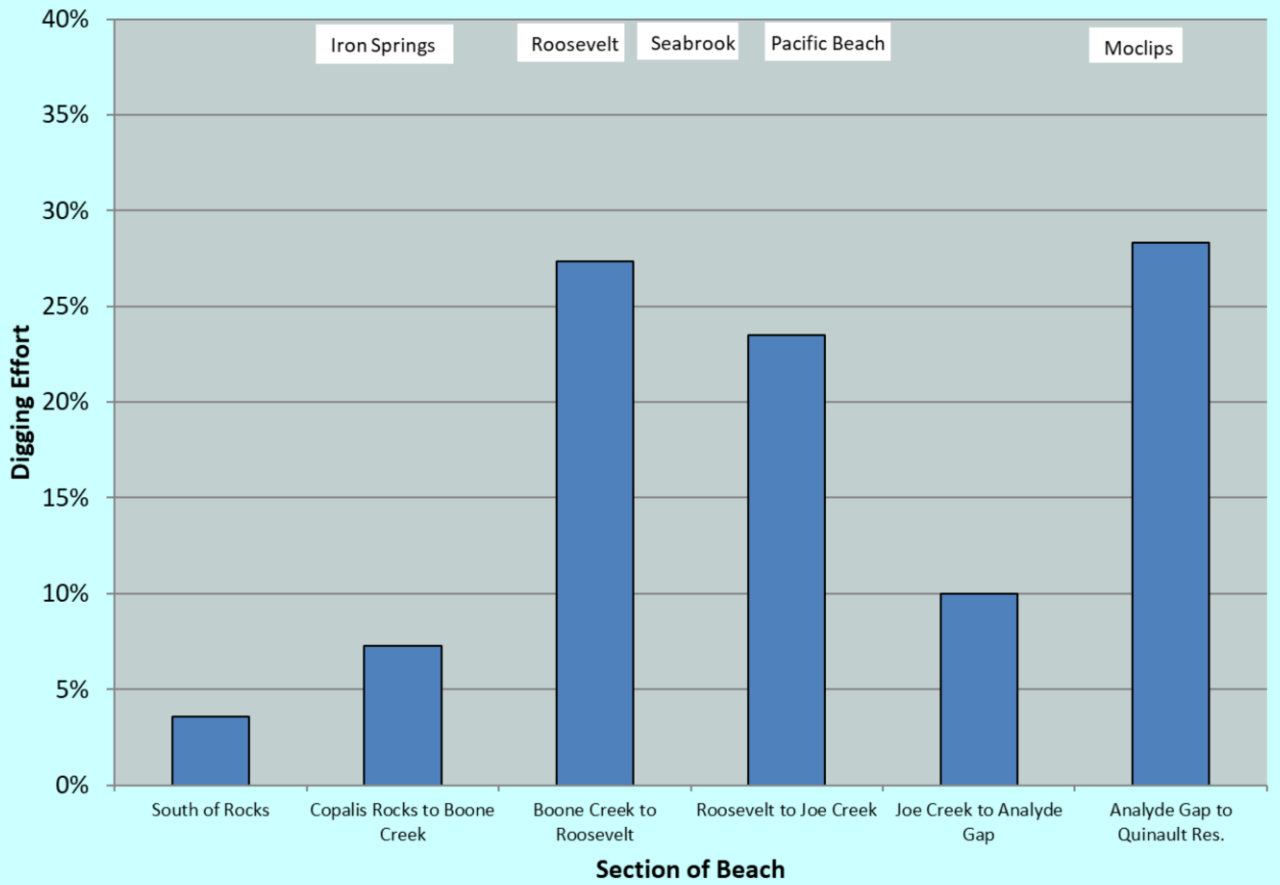
Harvest = 1,255,299 clams

(Including wastage of 22,196 clams)

Portion of TAC Harvested = 63.8%

A strong population of harvestable sized recruit clams allowed for a long and successful 2021-2022 season on Mocrocks. The standout PM tide harvest was Saturday January 29 with 6,202 diggers and 84,430 clams. The standout AM tide harvest was Sunday April 17 with 4,036 diggers and 77,720 clams.

2021-2022 Mocrocks Effort (Digger Trips) Distribution by Area



The Y-Axis is the percentage of digging effort (totaling 100). The X-Axis is the harvested beach area, moving from south to north (left to right) and broken up into 6 sections. Majority of digging effort occurred near Roosevelt Beach and Moclips approaches.

No razor clam harvest
occurred on Kalaloch
beach during the
2021-22 season.

Kalaloch remains a puzzle. The population assessment continues to indicate a sparse population of mostly just small clams. Kalaloch razor clams continue to struggle to reach a mature age, or at least a size that are suitable for harvest. Our best guess is that there are a combination of forces working to keep Kalaloch razor clam populations at low levels.

MARINE TOXINS



Now, onto a topic that can really play havoc with shellfish harvesting – as experienced razor clammers know all too well.

Naturally occurring Harmful Algal Blooms (HAB) produce toxins that are ingested by razor clams and then concentrate in their meat tissue.

The razor clam fishery has been closed three times for a full season and many times for shorter periods, due to levels of two marine toxins in razor clam tissue that have exceeded state and federal action levels. Coast-wide since 1992, a total of 26% of all potential harvest days have been cancelled due to marine toxins produced by HAB events.

Domoic Acid

Amnesic Shellfish Poisoning (ASP)

- Produced by a diatom (*Pseudo-nitzschia sp.*)
- Domoic acid - neurotoxin
- Nausea, dizziness, memory loss
- Stroke-like symptoms that can lead to death
- No antidote
- Not destroyed by cooking/freezing
- Not easily detected

The marine toxin domoic acid has been the most prevalent toxin affecting razor clams harvest along the Washington coast. It is produced by a naturally occurring member of the marine plankton community – a diatom – named *Pseudo-nitzschia*. Recent research has led to better understanding of where these diatoms originate and what oceanographic and weather conditions must be present to allow them to move closer to shore and affect razor clam populations. Since 1992 when domoic acid was first found in razor clam meat tissue a total of 25% of planned razor clam digging opportunities have been lost due to high marine toxin levels, with the vast majority due to domoic acid.

This slide details the dangers domoic acid – in high levels – presents.

PSP Toxin

Paralytic Shellfish Poisoning (PSP)

- Produced by a dinoflagellate (*Alexandrium* sp.)
- Saxitoxin- neurotoxin
- Numbness, finger tingling/toes, lips
- Can paralyze the diaphragm and lead to death
- No antidote
- Not destroyed by cooking/freezing
- Not easily detected

The toxin that causes paralytic shellfish poisoning (PSP) is produced by another naturally occurring member of the marine plankton community. This species is the dinoflagellate named *Alexandrium*. PSP has historically been less of a problem for the razor clam fishery. However, in past seasons there have been razor clam closures due to PSP.

WDFW is required to collect samples per strict WDOH protocol:

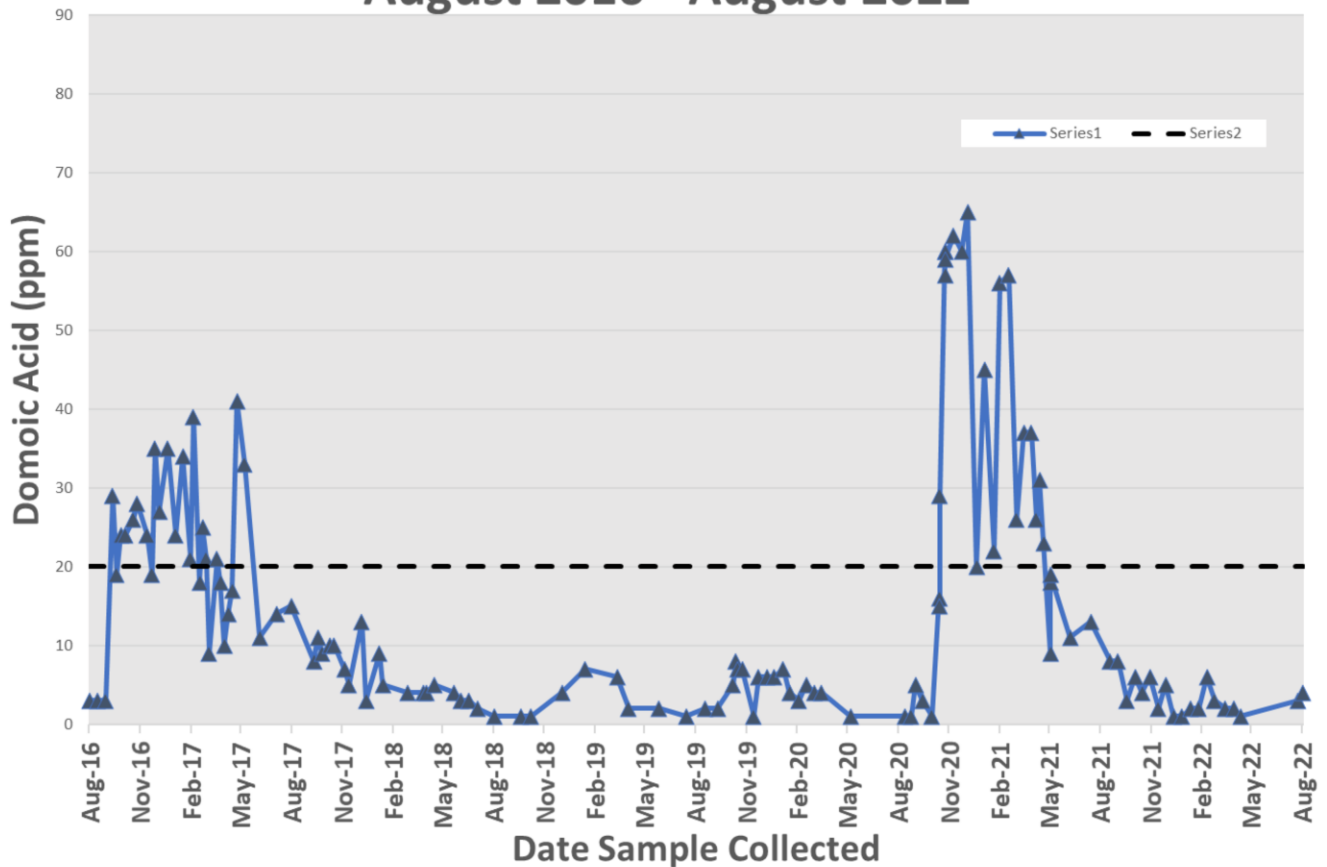
To open or remain open, ALL samples must test below
The action level...

- Samples from 3 areas per beach.
- 12 adult clams per sample.
- 2 collections 7-10 days apart (often means digging on poorer tides).
- Last collection as close to opening as possible.
- In-season collections also 7-10 days apart.



As a result of concern for the health of the many people who enjoy razor clams, WDFW works closely with staff at the Washington Department of Health (WDOH) to collect and transport clams to the WDOH lab (north of Seattle in Shoreline) for processing. These clams are collected on a strict schedule that allows for the final sample to be collected as close to the day of each period razor clamming is open. This is the reason our openers are always announced as tentative, until final marine toxin results are available.”

Domoic Acid Levels - Long Beach August 2016 - August 2022



Presented here are Washington Department of Health (WDOH) test results of domoic acid levels found in razor clam meat tissue. The razor clams are collected regularly from each razor clam management beach, by WDFW staff and delivered to the WDOH Public Health Lab in Shoreline, WA. To ensure quick turn-around of the results, WDFW staff often drive the clams directly to the lab as soon as possible after collection. This can be a 4 to 6 hour round-trip depending on Puget Sound traffic conditions but is necessary to ensure the clams you are taking home are safe to eat.

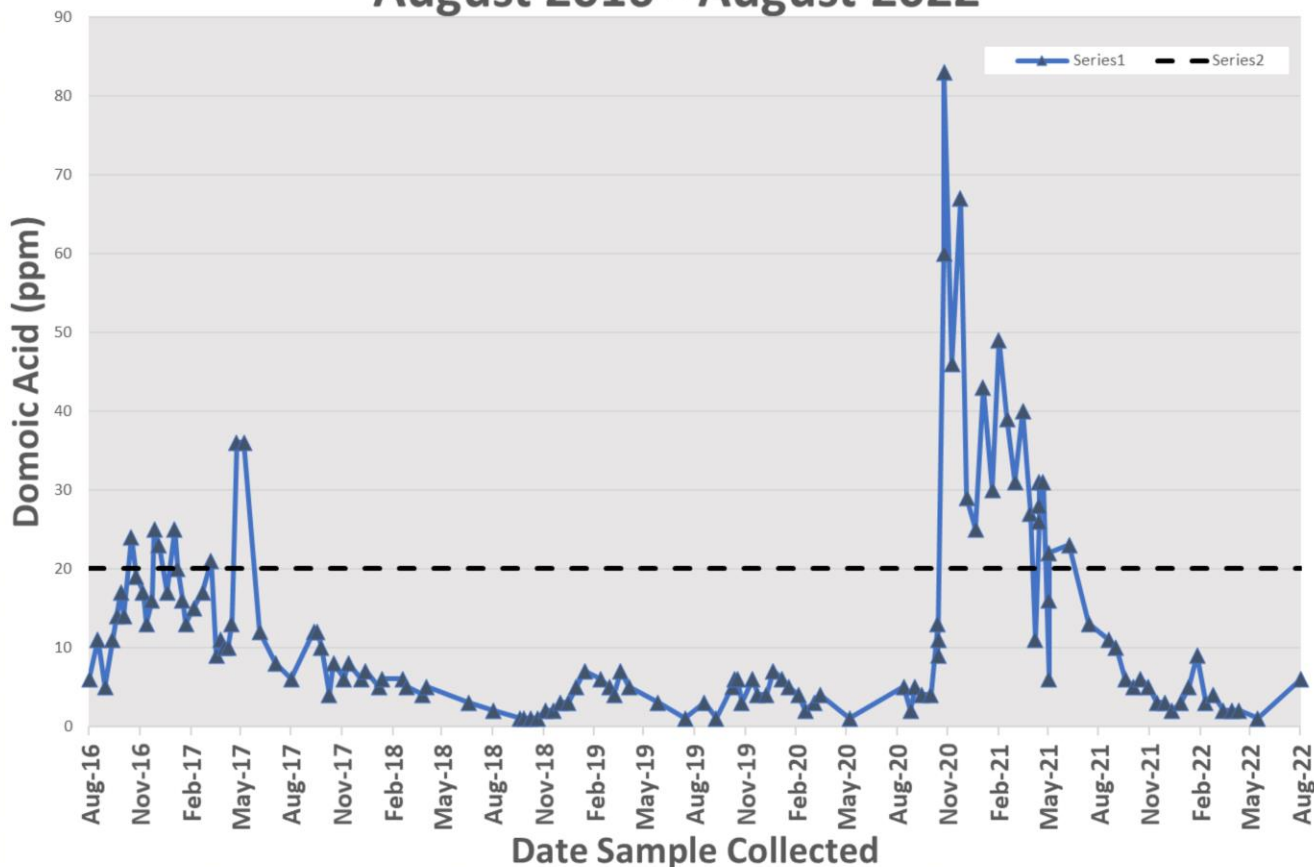
Recall, before a beach can be opened for the harvest of razor clams, WDOH protocol requires that all razor clam samples collected from that beach must test under the action level (20 ppm for domoic acid; 80 µg/100g for PSP; and 16 µg/100g for DSP) on both of the two required sample collections.

The most recent levels can be found at: <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>

For more information about domoic acid, see:

<https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish/Illnesses/Biotoxins/AmnesicShellfishPoisoning>

Domoic Acid Levels - Twin Harbors August 2016 - August 2022



Presented here are Washington Department of Health (WDOH) test results of domoic acid levels found in razor clam meat tissue. The razor clams are collected regularly from each razor clam management beach, by WDFW staff and delivered to the WDOH Public Health Lab in Shoreline, WA. To ensure quick turn-around of the results, WDFW staff often drive the clams directly to the lab as soon as possible after collection. This can be a 4 to 6 hour round-trip depending on Puget Sound traffic conditions, but is necessary to ensure the clams you are taking home are safe to eat.

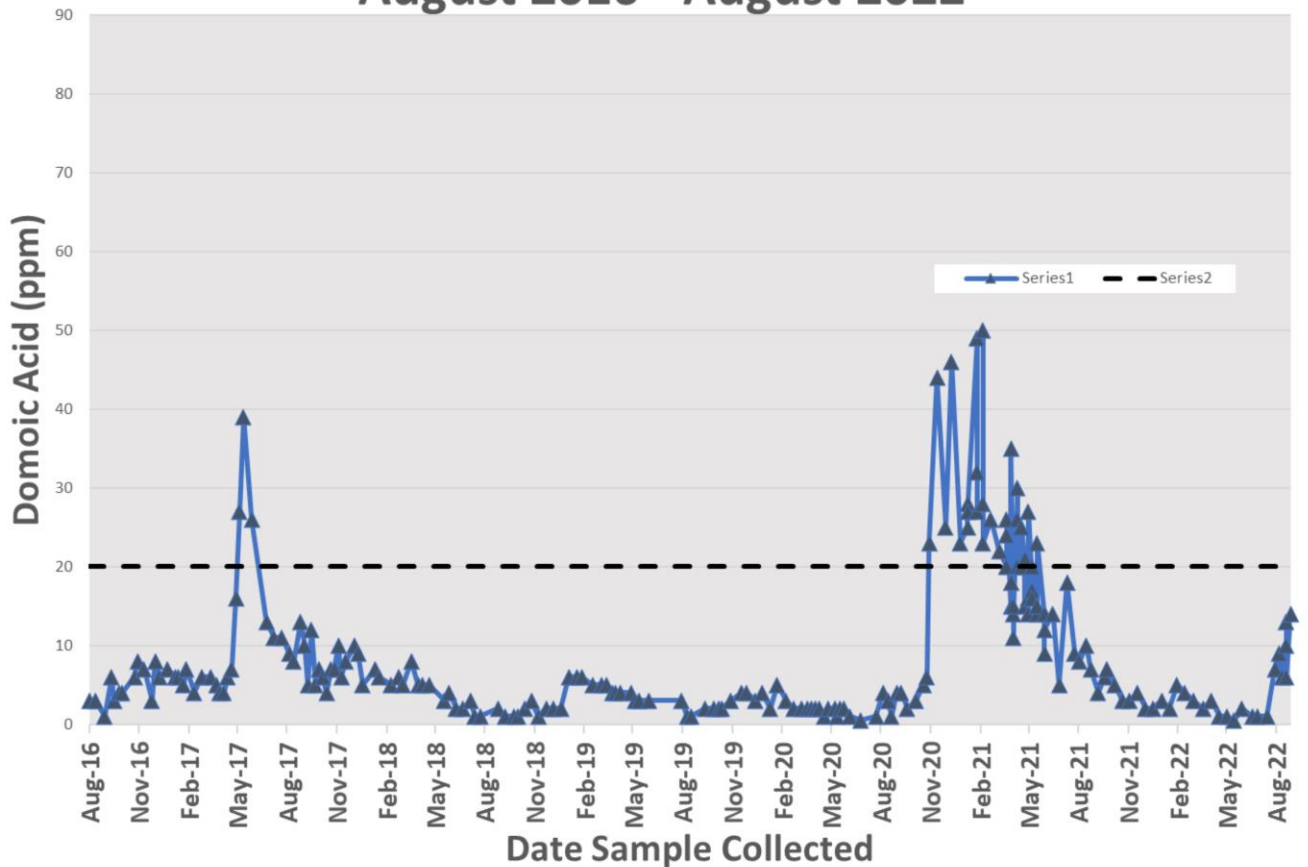
Recall, before a beach can be opened for the harvest of razor clams, WDOH protocol requires that all razor clam samples collected from that beach must test under the action level (20 ppm for domoic acid; 80 $\mu\text{g}/100\text{g}$ for PSP; and 16 $\mu\text{g}/100\text{g}$ for DSP) on both of the two required sample collections.

The most recent levels can be found at: <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>

For more information about domoic acid, see:

<https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish/Illnesses/Bio toxins/AmnesicShellfishPoisoning>

Domoic Acid Levels - Copalis August 2016 - August 2022



Presented here are Washington Department of Health (WDOH) test results of domoic acid levels found in razor clam meat tissue. The razor clams are collected regularly from each razor clam management beach, by WDFW staff and delivered to the WDOH Public Health Lab in Shoreline, WA. To ensure quick turn-around of the results, WDFW staff often drive the clams directly to the lab as soon as possible after collection. This can be a 4 to 6 hour round-trip depending on Puget Sound traffic conditions, but is necessary to ensure the clams you are taking home are safe to eat.

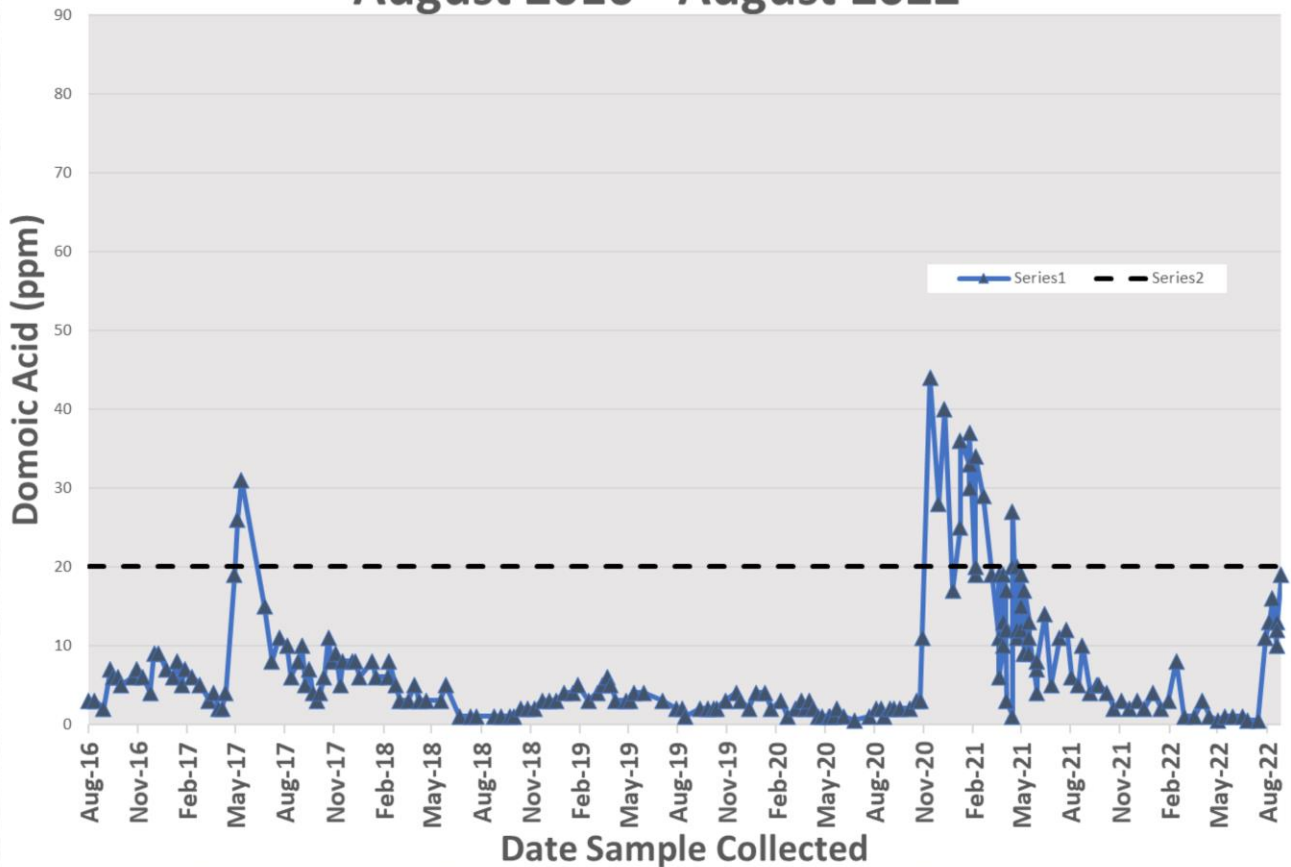
Recall, before a beach can be opened for the harvest of razor clams, WDOH protocol requires that all razor clam samples collected from that beach must test under the action level (20 ppm for domoic acid; 80 $\mu\text{g}/100\text{g}$ for PSP; and 16 $\mu\text{g}/100\text{g}$ for DSP) on both of the two required sample collections.

The most recent levels can be found at: <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>

For more information about domoic acid, see:

<https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish/Illnesses/Bio toxins/AmnesicShellfishPoisoning>

Domoic Acid Levels - Mocrocks August 2016 - August 2022



Presented here are Washington Department of Health (WDOH) test results of domoic acid levels found in razor clam meat tissue. The razor clams are collected regularly from each razor clam management beach, by WDFW staff and delivered to the WDOH Public Health Lab in Shoreline, WA. To ensure quick turn-around of the results, WDFW staff often drive the clams directly to the lab as soon as possible after collection. This can be a 4 to 6 hour round-trip depending on Puget Sound traffic conditions, but is necessary to ensure the clams you are taking home are safe to eat.

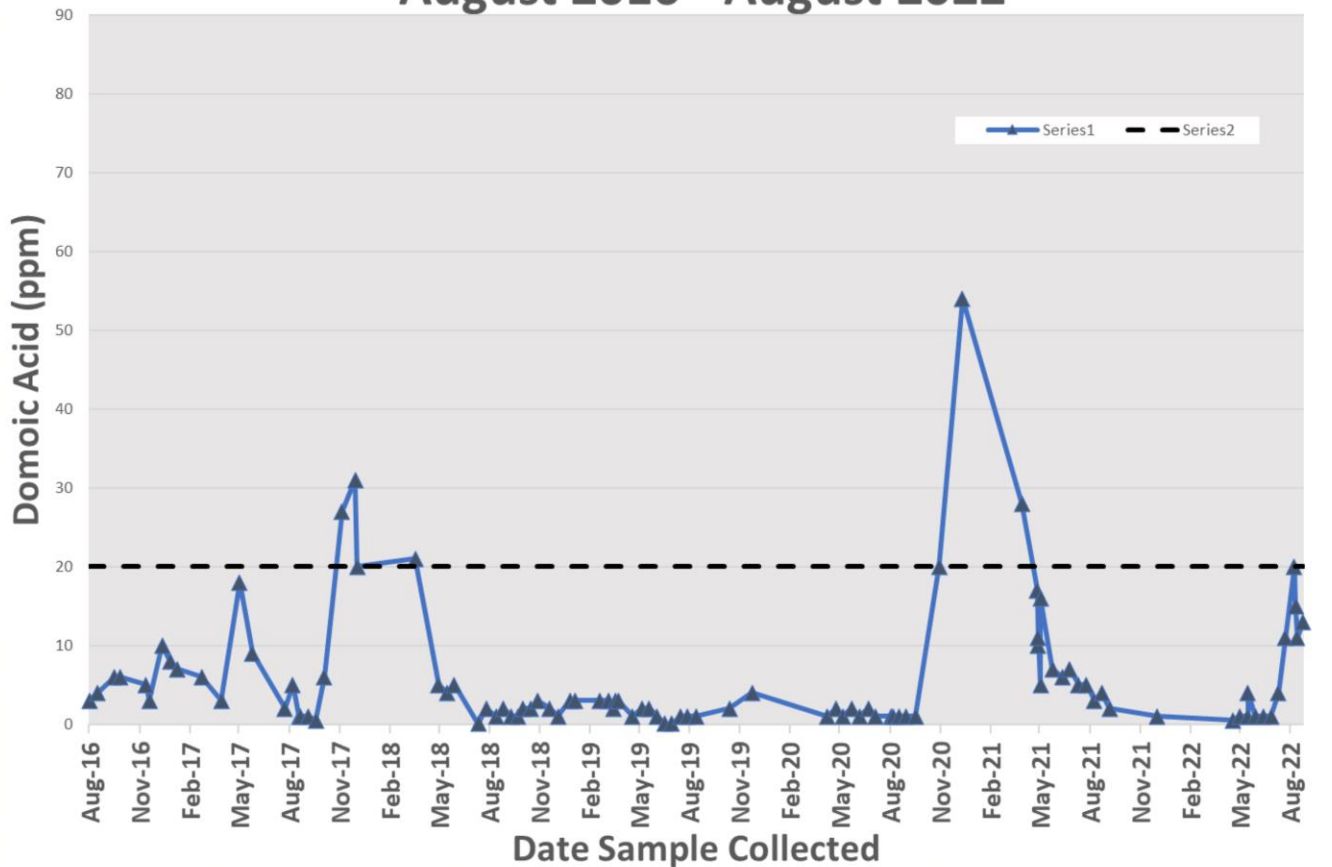
Recall, before a beach can be opened for the harvest of razor clams, WDOH protocol requires that all razor clam samples collected from that beach must test under the action level (20 ppm for domoic acid; 80 $\mu\text{g}/100\text{g}$ for PSP; and 16 $\mu\text{g}/100\text{g}$ for DSP) on both of the two required sample collections.

The most recent levels can be found at: <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>

For more information about domoic acid, see:

<https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish/Illnesses/Biotoxins/AmnesicShellfishPoisoning>

Domoic Acid Levels - Kalaloch August 2016 - August 2022



Presented here are Washington Department of Health (WDOH) test results of domoic acid levels found in razor clam meat tissue. The razor clams are collected regularly from each razor clam management beach, by WDFW staff and delivered to the WDOH Public Health Lab in Shoreline, WA. To ensure quick turn-around of the results, WDFW staff often drive the clams directly to the lab as soon as possible after collection. This can be a 4 to 6 hour round-trip depending on Puget Sound traffic conditions but is necessary to ensure the clams you are taking home are safe to eat.

Recall, before a beach can be opened for the harvest of razor clams, WDOH protocol requires that all razor clam samples collected from that beach must test under the action level (20 ppm for domoic acid; 80 µg/100g for PSP; and 16 µg/100g for DSP) on both of the two required sample collections.

The most recent levels can be found at: <https://wdfw.wa.gov/fishing/basics/domoic-acid/levels>

For more information about domoic acid, see: <https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/RecreationalShellfish/Issues/Biotoxins/AmnesicShellfishPoisoning>



Olympic Region Harmful Algal Blooms

ORHAB PARTNERSHIP

Harmful algal blooms (HABs) pose a significant threat to human health and fish and wildlife including threatened and endangered marine mammals and birds. Washington state's coastal economies also depend on revenue generated by recreational and commercial fisheries which can be disrupted by HAB events.

To better understand and mitigate for the impact of HABs managers and researchers from local state, federal, academic and tribal nations partnered to form Olympic Region Harmful Algal Bloom Monitoring (ORHAB) collaboration in 1999 . Initially funded through a NOAA-MERHAB grant ORHAB was successfully transitioned to state funding in 2004. The collaboration is focused on building early warning capabilities for HABs in Washington state and providing sound scientific data to contribute to the understating of HAB events coast wide.



For more information see : http://wdfw.wa.gov/conservation/research/projects/algae_bloom/index.html

The impacts of harmful algal blooms (HAB) on razor clam fisheries along the coast of Washington State was the impetus that brought together Seattle based NOAA HAB researchers, University of Washington oceanographers and marine algae experts, state and tribal fishery managers and human health experts to form a successful partnership - the **Olympic Region Harmful Algal Bloom (ORHAB)** project. Beginning in 2000 with five-years of funding from NOAA's Monitoring and Event Response for Harmful Algal Blooms ([MERHAB](#)) Program the ORHAB partnership provided for a host of activities that included the necessary scientific equipment and for the unique training of local technicians as HAB specialists. With the end of federal funding and primary reliance on state dollars generated by a surcharge on recreational shellfish licenses, the focus of the partnership is primarily on HAB event prediction and monitoring. These state funds provide for two HAB specialists, one working for WDFW and the other for the University of Washington. In addition, funding from the Quinault Indian Nation (QIN) provides a third HAB specialist who works for QIN. While employed by separate agencies these local experts work closely together to monitor for HAB events along the entire Washington coast. The ORHAB specialists regularly present and discuss their findings with staff biologists and public health experts from WDFW, QIN and the Washington Department of Health (WDOH). In addition, scientists from NOAA and the UW provide oversight and advice on a regular basis. Insight gained from the ORHAB partnership and the recently completed ECOHAB-PNW project has led to a better understanding of where HAB events originate and what environmental factors promote their growth. While much is yet to be learned, we can better manage our important shellfish fisheries because of these insights, good science, and hard work produced by well trained - and locally based - HAB specialists.

WDFW regularly monitors surf zone plankton, toxins, and water quality...



...to determine the environmental conditions associated with blooms of harmful species.



WDFW uses standardized processing and analysis of samples to generate data on HABs and the presence of biotoxins. The data received from this monitoring program can provide managers advance notice of pending problems for potential openers as well as give razor clammers a heads up of what may be coming. In the photo is Charlotte Berry-Powell, Coastal HAB/Shellfish Technician.



Transferring sample dilutions to a microplate



Adding domoic acid control to dilution series

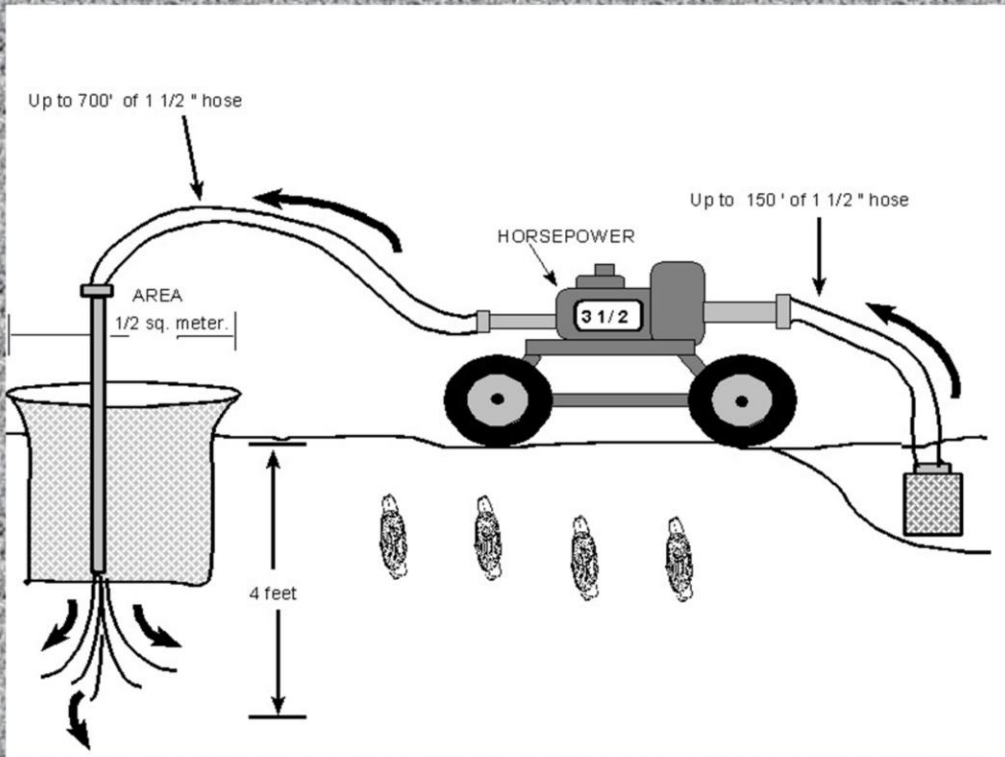


Loading microplate reader

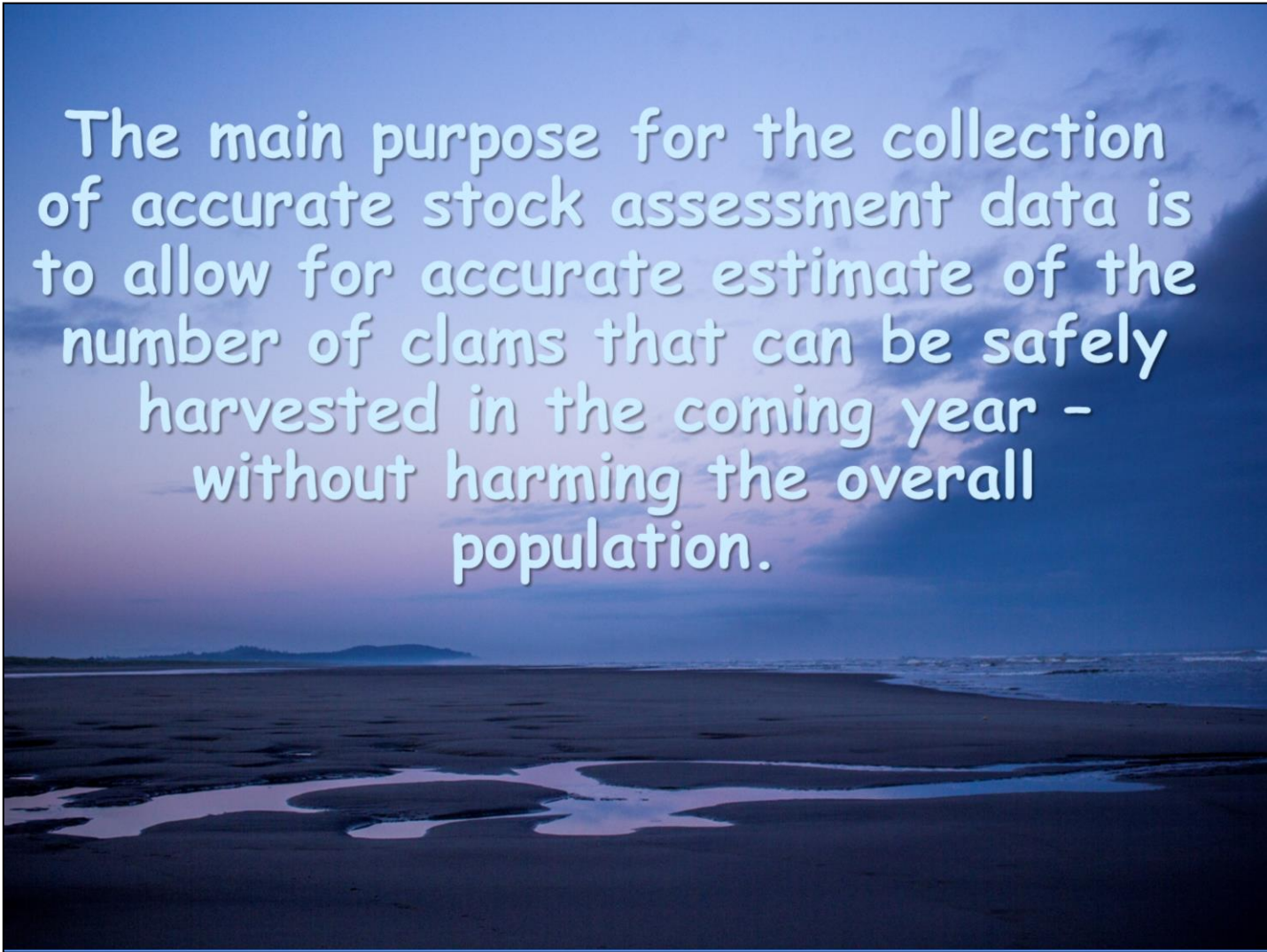
WDFW is now able to conduct a rapid field test using the ELISA method for the presence of domoic acid in shellfish and seawater

One major goal of the ORHAB project has been to develop and implement rapid detection technologies. This technology offers the promise of allowing field staff to determine the presence of toxins in seawater samples shellfish tissue without having to wait for the current time-consuming transport of samples to a distant laboratory. This process does not replace the regulatory testing conducted by the Washington Department of Health, but it does provide managers with an early warning of potential pending HAB issues.

Status of the Razor Clam Stocks



We now turn our attention to the work WDFW does to annually determine the number of razor clams available on each beach. This cartoon is a simplified version of how our razor clam stock assessment process works. You'll find more details in the following pages.



The main purpose for the collection of accurate stock assessment data is to allow for accurate estimate of the number of clams that can be safely harvested in the coming year - without harming the overall population.

The main purpose for the collection of accurate stock assessment data is to allow for an accurate estimate of the number of clams that can be safely harvested in the coming year – without harming the overall population.

The stock assessment data provides us with estimates of the total number of clams and their average size. We are then able to determine the total number of clams that are at or over 3 inches, this size at which razor clams generally begin to make a clear “show” and are harvestable. The total allowable catch (TAC) for each beach is then calculated “variable” harvest rate applied to the total number of clams at or over 3 inches. See page 44-45 for details.

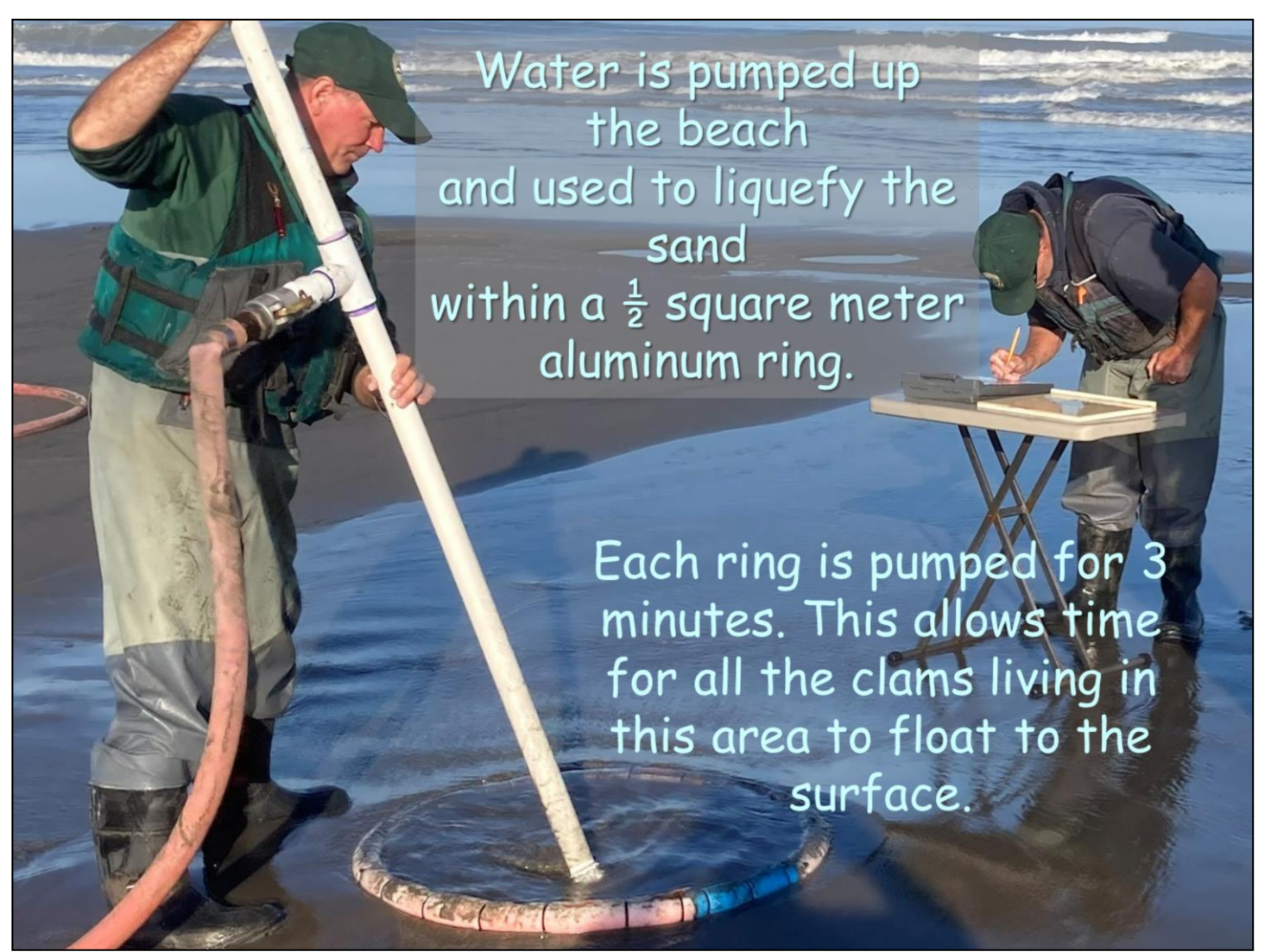
Know that razor clams that are 3 inches during our summer stock assessment will quickly grow and become a more suitable size as the season progresses.

Starting in May and ending in September
WDFW and tribal co-managers survey a total

of 58 miles of
Razor Clam habitat...
from the sound end of the
Long Beach Peninsula (Beard's Hollow) to
the north end of Kalaloch.

This year's work started on May 16 and was completed on August 11.

Surveying razor clams is not as easy as just digging all the clams in a known area. Razor clam digging requires the clam to "show" and not all clams "show" at the same time. As a result, it is not possible to dig every clam in a known area. The sampling method we use takes this into account and removes all the clams from a known area. WDFW uses the Pumped Area Method of sampling to provide accurate estimates of razor clam density. Read on for more information. In the photo, L to R, Travis Haring Coastal Shellfish Technician and Robert Morgan, Coastal Shellfish Biologist.

A photograph showing two technicians on a beach. The technician on the left is wearing a green jacket and waders, holding a long white pump pipe that is inserted into a circular aluminum ring in the shallow water. The technician on the right is wearing a blue jacket and waders, standing at a small table and writing on a clipboard. The background shows the ocean waves and a sandy beach.

Water is pumped up
the beach
and used to liquefy the
sand
within a $\frac{1}{2}$ square meter
aluminum ring.

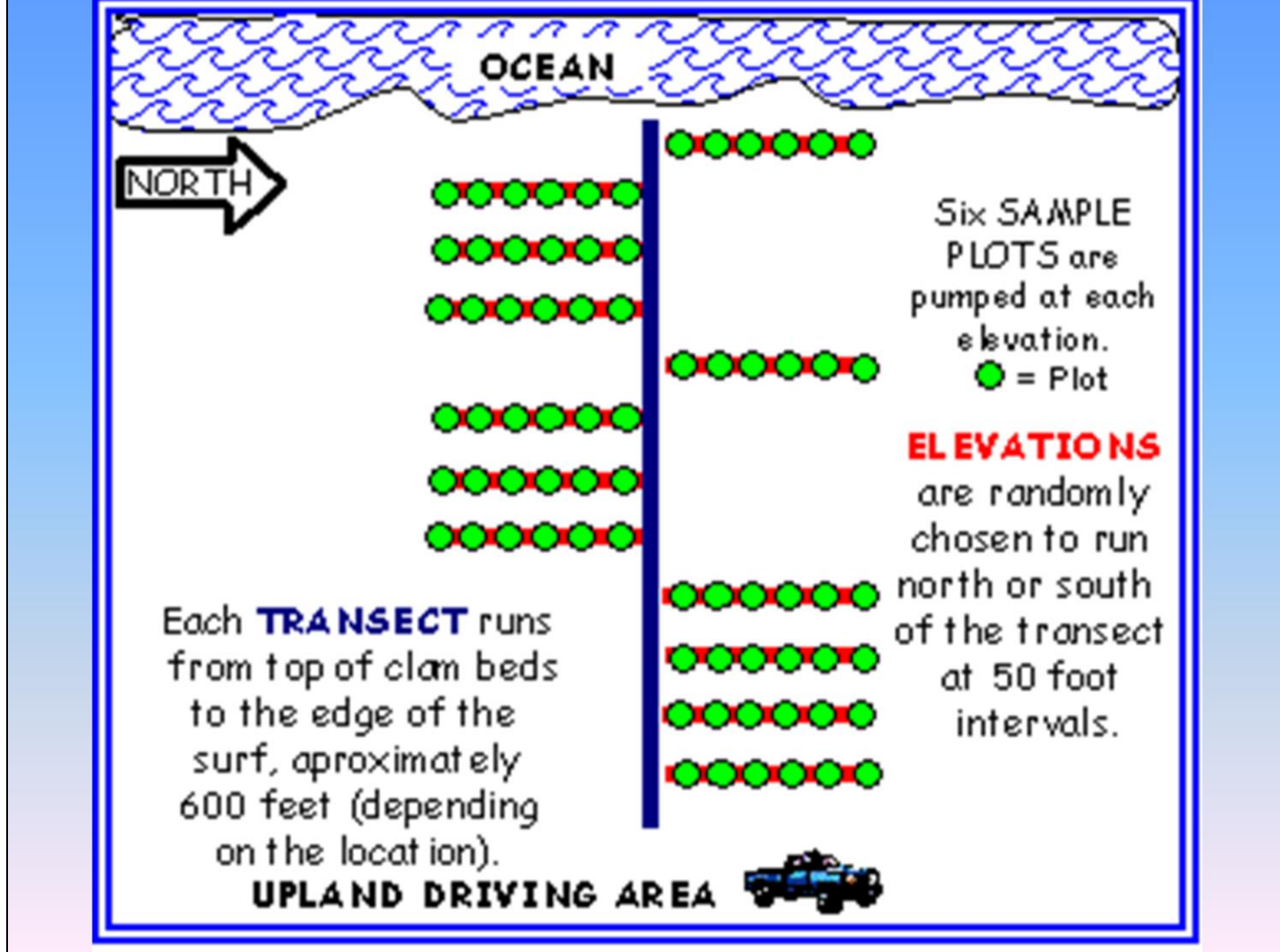
Each ring is pumped for 3
minutes. This allows time
for all the clams living in
this area to float to the
surface.

Each ring is pumped for 3 minutes allowing time for all the clams in the area of the ring to float to the surface and be counted. In the photo, L to R, Clayton Parson and Craig Lofton, Coastal Shellfish Technicians.



Each clam is measured and recorded and returned to the beach.

The Pumped Area Method allows biologists to obtain the full data set needed to estimate both recruit clams and pre-recruit clams. This is in contrast with previous razor clam population sampling methods that were unable to estimate pre-recruits. In the photo, L to R, Craig Loften and Charlotte Berry-Powell, Coastal Shellfish Technicians.



Each of the five management beaches is sampled with randomly selected transects chosen approximately one-mile apart. The sampling occurs during a good low tide, and begins at the top of the razor clam beds and moves out to the edge of the surf. Six plots (sample rings) are pumped at each 50 foot interval.

WDFW offers this video that discusses our razor clam stock assessment methods. Check it out at http://youtu.be/aC4fu6_8G8I



A video that demonstrates the WDFW stock assessment methods is available online. This will give you a better picture of the work we do each summer all along the Washington coast to make the best possible razor clam population estimates to be used in the management of the fishery. The video can be found at; http://youtu.be/aC4fu6_8G8I

Or go to <https://Youtube.com> and search for “Razor clams in Washington Stock Assessment”

In the photo L to R; Bryce Blumenthal, Robert Morgan, Craig Loftin and Charlotte Berry-Powell all members of the WDFW Coastal Shellfish Unit.

How many days can we dig?

Stock assessment data :

1. Estimate of the number clams
2. Estimate of the average size

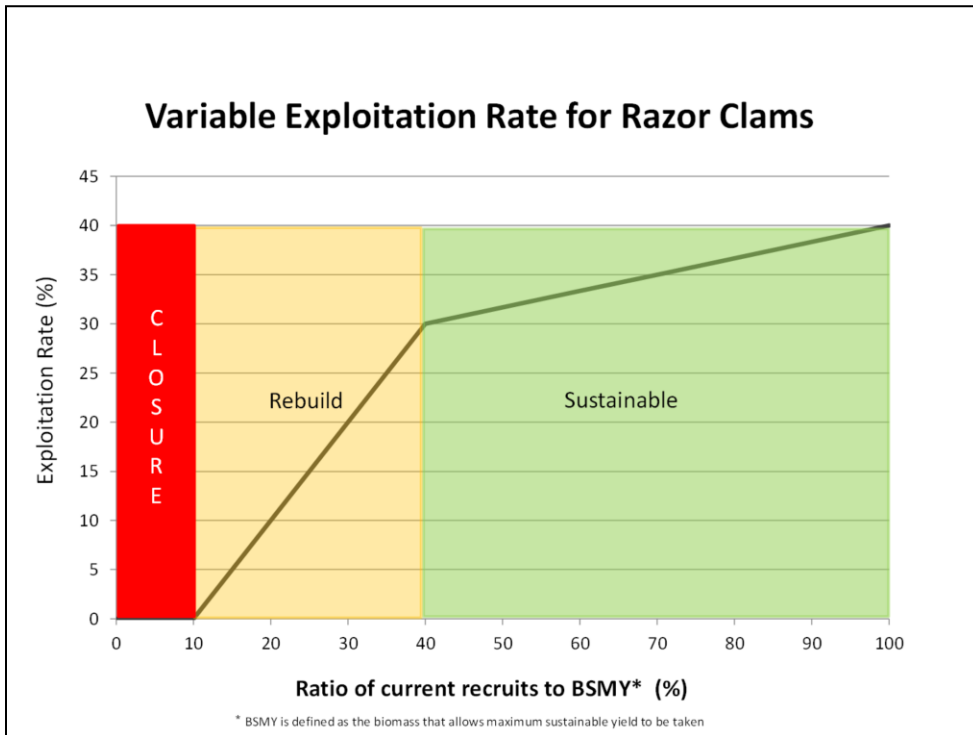
TAC (total allowable catch) =
Total clams 3 inches or greater x
variable harvest rate.

During the 2012-13 season, WDFW began using a new “variable” harvest rate on two beaches (rather than using a fixed harvest rate of 30%.)

On these beaches we determine the harvest rate based on the ratio of the **current population** of razor clams (as measured by our most recent stock assessment on each beach) and the **highest population** level measured (again on each beach). The maximum harvest rate possible (using the variable harvest rate method) is 40%.

This methods allows for more harvest during times of abundant populations while still preserving the spawning capacity of the population. It also includes an automatic rebuilding strategy (with a reduced harvest rate) during times when stocks are weak.

The variable harvest rate is being used to determine the TAC (total allowable catch) for Long Beach, Twin Harbors, Copalis and Mocrocks.



Starting with the 2012-13 recreational razor clam season, WDFW has used a modified management strategy. Rather than using a Static Exploitation Rate (ER) of 30%, we have adopted a Variable Exploitation Rate. As a result, the *harvest rate* used to develop the TAC will be *re-calculated* for each beach, each season. That rate will be based on the ratio of the current population of recruit sized clams (clams 3 inches or larger) compared to the entire biomass that allows the maximum sustained yield, or BSMY. The BSMY is practically defined as the highest historical density of clams for each beach. This method has two advantages. It allows the harvest of more clams (to a maximum of a 40% ER) when clam density is high (populations considered to be abundant) and it allows for a reduced harvest levels when densities are lower (smaller populations). When populations drop below 40% of BSMY an automatic rebuilding strategy is employed. Anytime a population drops below 10% of BSMY the fishery will be closed.

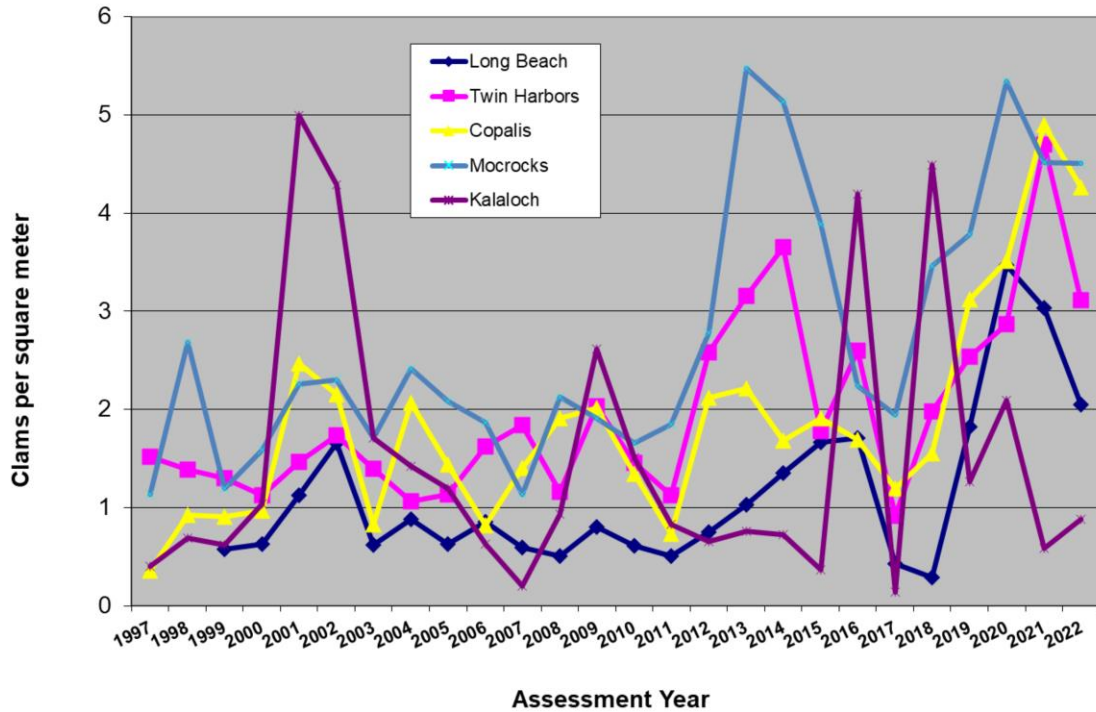
Copalis Rocks on a very low tide

2022 Stock Assessment – Results



The 2022 assessment of razor clam populations showed another abundant and healthy population. Read on for the details. In this photo stock assessment crew takes a closer look at Copalis Rocks on the southern end of Mocrocks Beach after completing a nearby transect.

Washington Razor Clam Average Density Recruits By Beach



The best way to compare razor clam populations between beaches is to look at the average density (on the razor clam beds over the entire length of each beach) as measured in our annual stock assessment work. This graph displays average density on each beach back over the last ten years. It is clear from this data that razor clam populations naturally change in abundance a fair amount. This is not an unexpected pattern in a shellfish population that is so heavily dependent on favorable oceanographic and weather conditions to allow for successful spawning and setting. As with any natural population, there are also disease processes that contribute to the variability in population levels. The 2020 results show improved populations on all beaches . More details to follow.

The 2022 the average density (clams per square meter) by beach was : Long Beach = 2.05; Twin Harbors = 3.11; Copalis = 4.26; Mocrocks = 4.50; Kalaloch = 0.90

For comparison: The 2021 average densities were; Long Beach = 3.03; Twin Harbors = 4.7; Copalis = 4.9; Mocrocks = 4.51; Kalaloch = 0.60. The 2020 average densities were; Long Beach = 3.47; Twin Harbors = 2.87; Copalis = 3.51; Mocrocks = 5.34; Kalaloch = 2.10. The 2019 average densities were; Long Beach = 1.82; Twin Harbors = 2.54; Copalis = 3.12; Mocrocks = 3.78; Kalaloch = 1.30. The 2018 average densities were; Long Beach = 0.29; Twin Harbors = 1.98; Copalis = 1.55; Mocrocks = 3.46; Kalaloch = 4.50. The 2017 the average density (clams per square meter) by beach was : Long Beach = 0.43; Twin Harbors = 0.92; Copalis = 1.20; Mocrocks = 1.95; Kalaloch = 0.02. The 2016 average density (clams per square meter) by beach was: Long Beach = 1.71; Twin Harbors = 2.60; Copalis = 1.69; Mocrocks = 2.24; Kalaloch = 4.19.

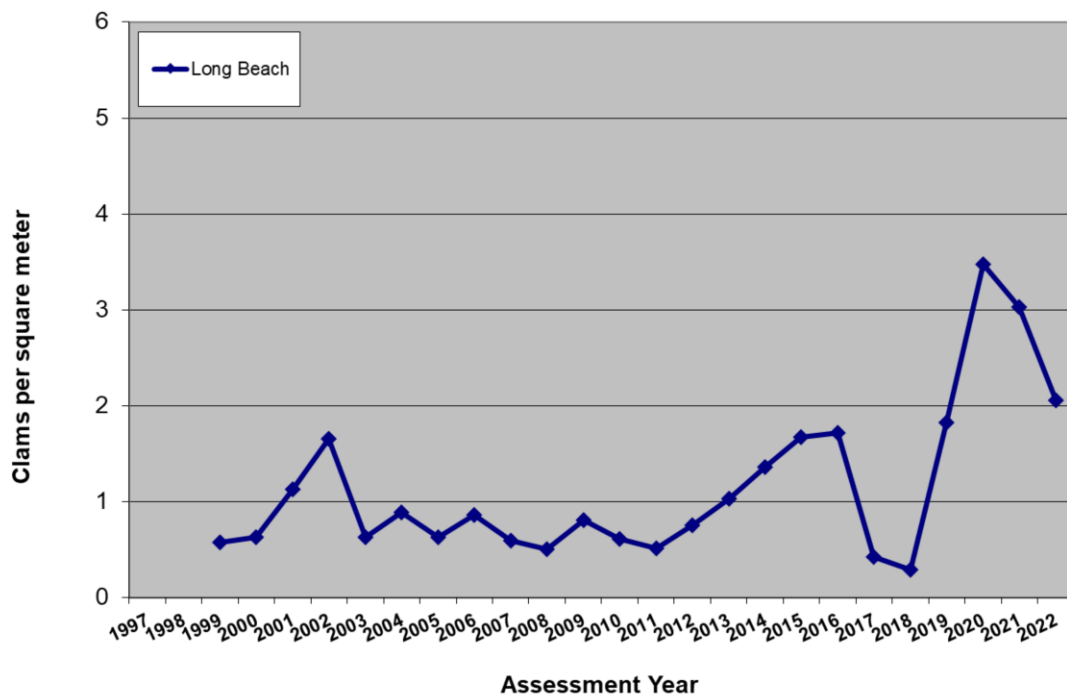
LONG BEACH RAZOR CLAM POPULATION, TOTAL ALLOWABLE CATCH (TAC) AND HARVEST DATA

YEAR	POPULATION (clams)		TAC (clams) of recruits	HARVEST TOTAL (clams)	% of TAC harvested
	RECRUITS	PRE-RECRUITS			
2017-18	3,062,033	191,526	872,680	839,747	96.2%
2018-19	2,084,734	9,947,737	333,557	645,290	193.5%
2019-20	13,013,667	25,598,579	5,205,467	1,644,196	31.6%
2020-21	24,791,968	34,470,221	9,916,787	520,200	5.2%
2021-22	21,648,063	21,923,271	8,659,225	3,337,846	38.5%
2022-23	14,663,725	796,817	5,865,490		
AVERAGE	13,210,698	15,488,025	5,142,201	1,164,546	

You will recall that the 2019 stock assessment results for Long Beach indicated that the number of harvestable (recruit) size clams was at a 25-year high with a strong stock of pre-recruits. The 2020 assessment on Long Beach showed a number of recruits that was nearly double 2019's high, with even stronger numbers of the smaller pre-recruit clams. The 2021 stock assessment showed decreases in both recruits and a pre-recruits compared to last year, but the resulting TAC is only slightly less. After a full season of digging, the 2022 stock assessment showed a decrease in recruit clams but is still larger than the impressive 2019 numbers. Alarmingly we saw much fewer pre-recruits this summer than any of the last 5 years, something we will be keeping an eye.

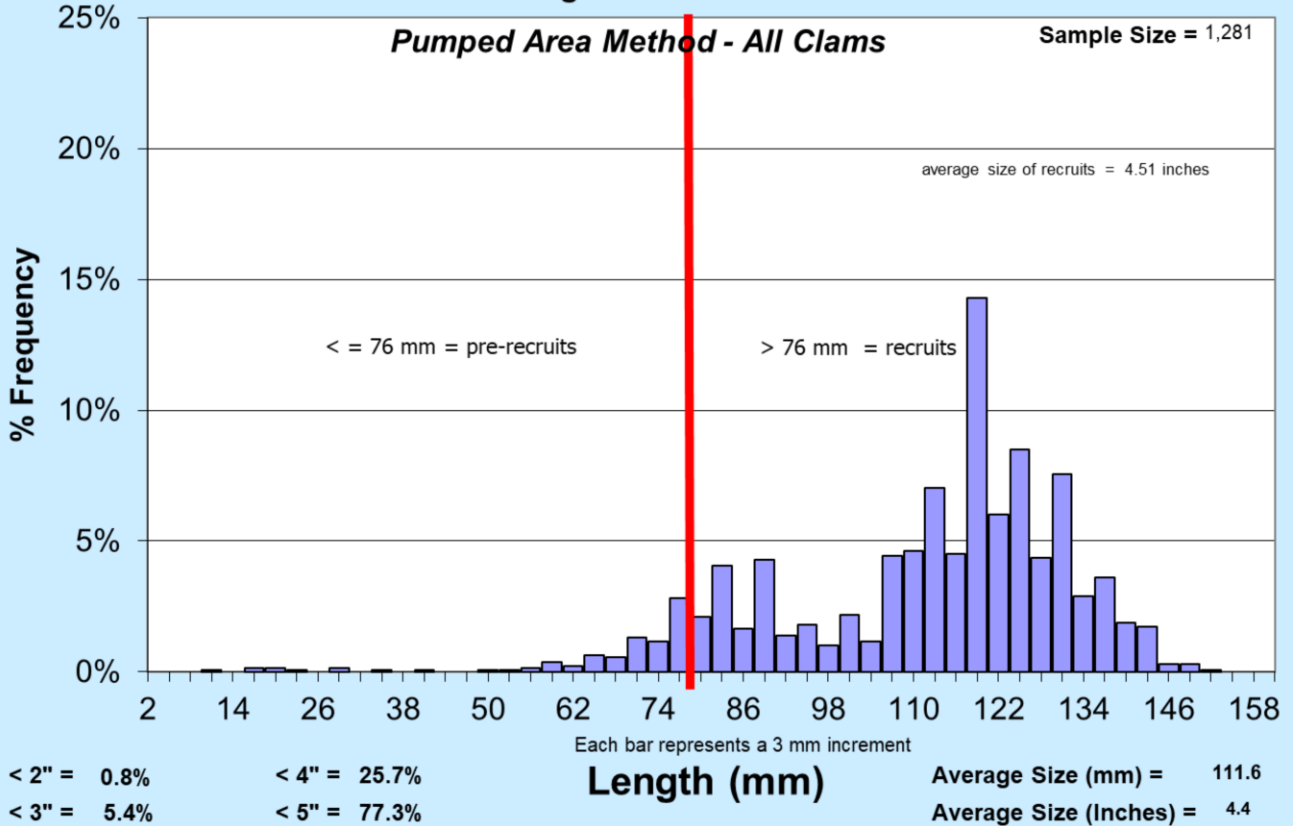
Recall; recruits are defined as clams => 76 mm (3 inches); pre-recruits are < 76 mm (3 inches)."

Washington Razor Clam Average Density Recruits By Beach



This is the same data that we presented in slide 47, although only the Long Beach historical population densities are included.

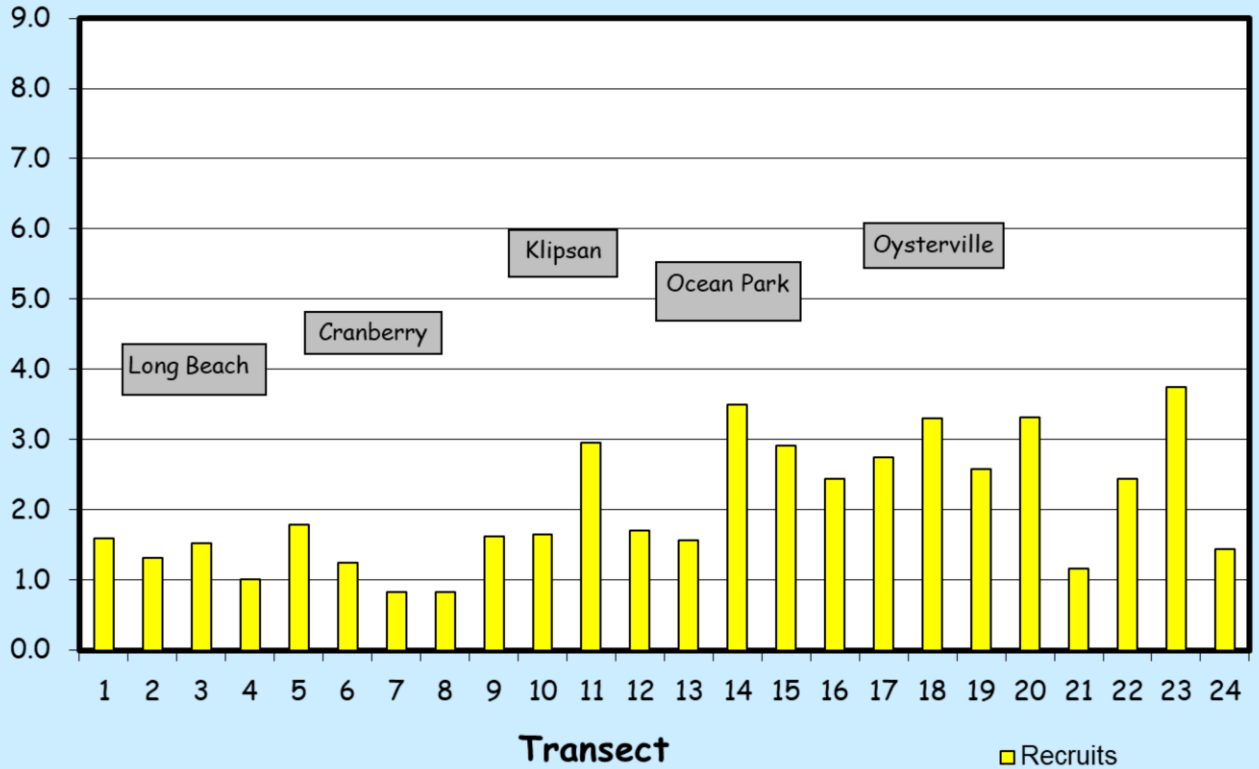
Washington Razor Clam Size Frequency Distribution Longbeach-2022



The average size of the Long Beach recruit clams found in our 2022 surveys was 4.51 inches. This compares to the average size in our 2021 survey of 4.35 inches; 2020 average of 4.3 inches; 2019 average of 3.68 inches; 2018 average of 4.2 inches ; 2017 average of 4.5; 2016 average of 4.3; 2015 average of 4.0 inches; and the 2014 average of 3.8 inches.

Long Beach Razor Clam Population Recruit Distribution - 2022

clams per square meter



The 2022 stock assessment showed a decrease in clam densities from years past. This results in a more uniform recruit concentration, with almost all areas showing densities above 1 clam per square meter. The highest density (y-axis) is near the top of the peninsula with ~3.75 clams per square meter.

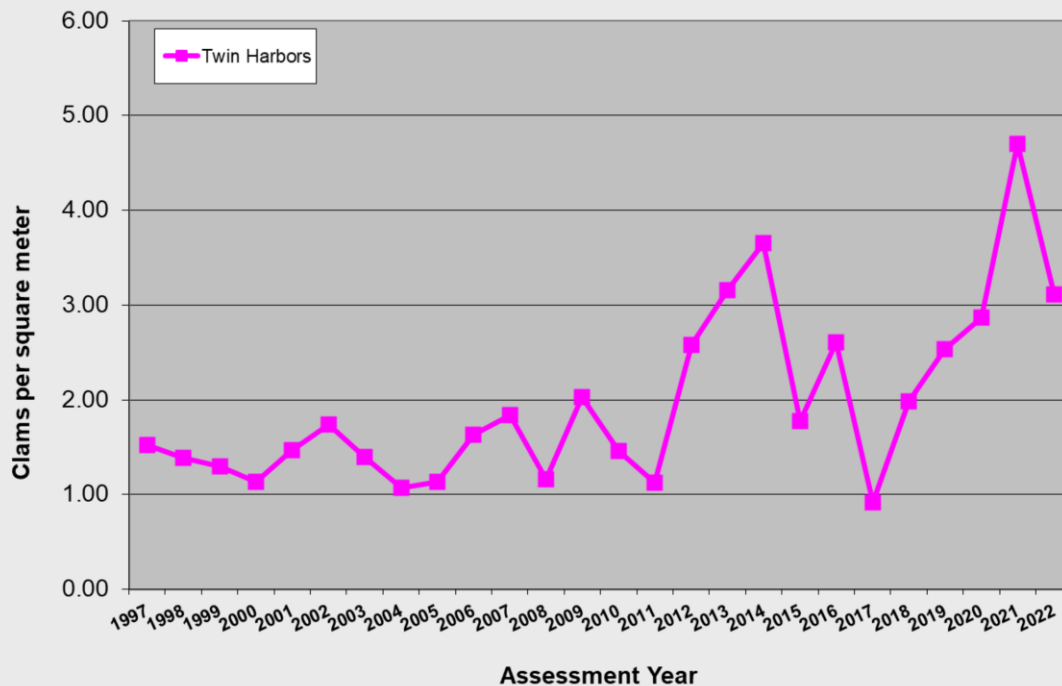
**TWIN HARBORS RAZOR CLAM POPULATION, TOTAL ALLOWABLE CATCH (TAC)
AND HARVEST DATA**

YEAR	POPULATION (clams)		TAC (clams) of recruits	HARVEST	% of TAC harvested
	RECRUITS	PRE- RECRUITS		(clams) TOTAL	
2017-18	1,677,810	1,533,197	506,699	632,295	124.8%
2018-19	3,614,103	1,752,009	1,373,359	1,188,410	86.3%
2019-20	4,608,068	1,391,989	1,843,227	755,166	41.0%
2020-21	5,210,727	2,878,451	2,084,291	307,172	14.7%
2021-22	8,529,445	4,559,006	3,411,778	2,120,314	62.1%
2022-23	5,646,634	2,323,486	2,258,653		
AVERAGE	4,881,131	2,406,358	1,913,001	1,000,671	

There is good news again this year for Twin Harbors diggers. Even after a long 2021-2022 digging season, the population is above average and there will be many days offered in the coming months.

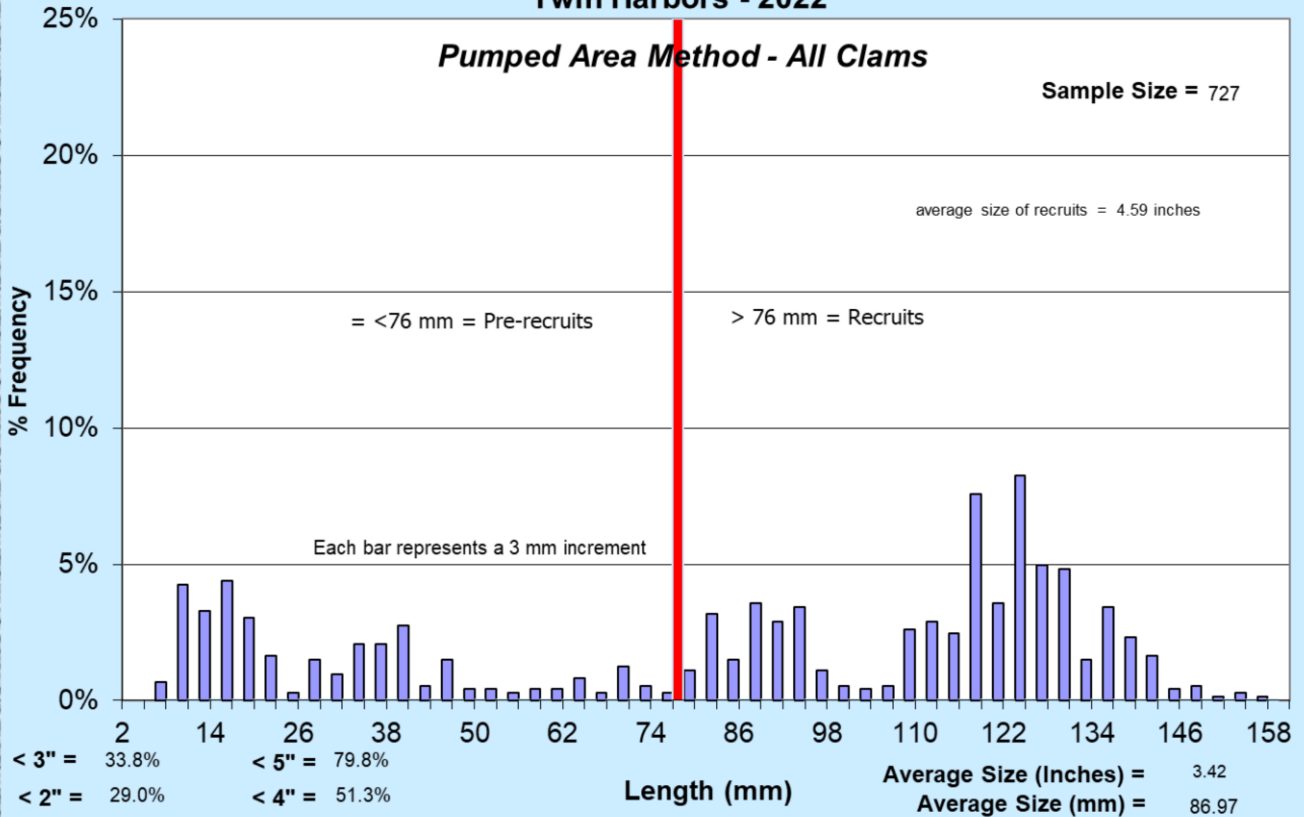
Recall; recruits are defined as clams => 76 mm (3 inches); pre-recruits are < 76 mm (3 inches).

Washington Razor Clam Average Density Recruits By Beach



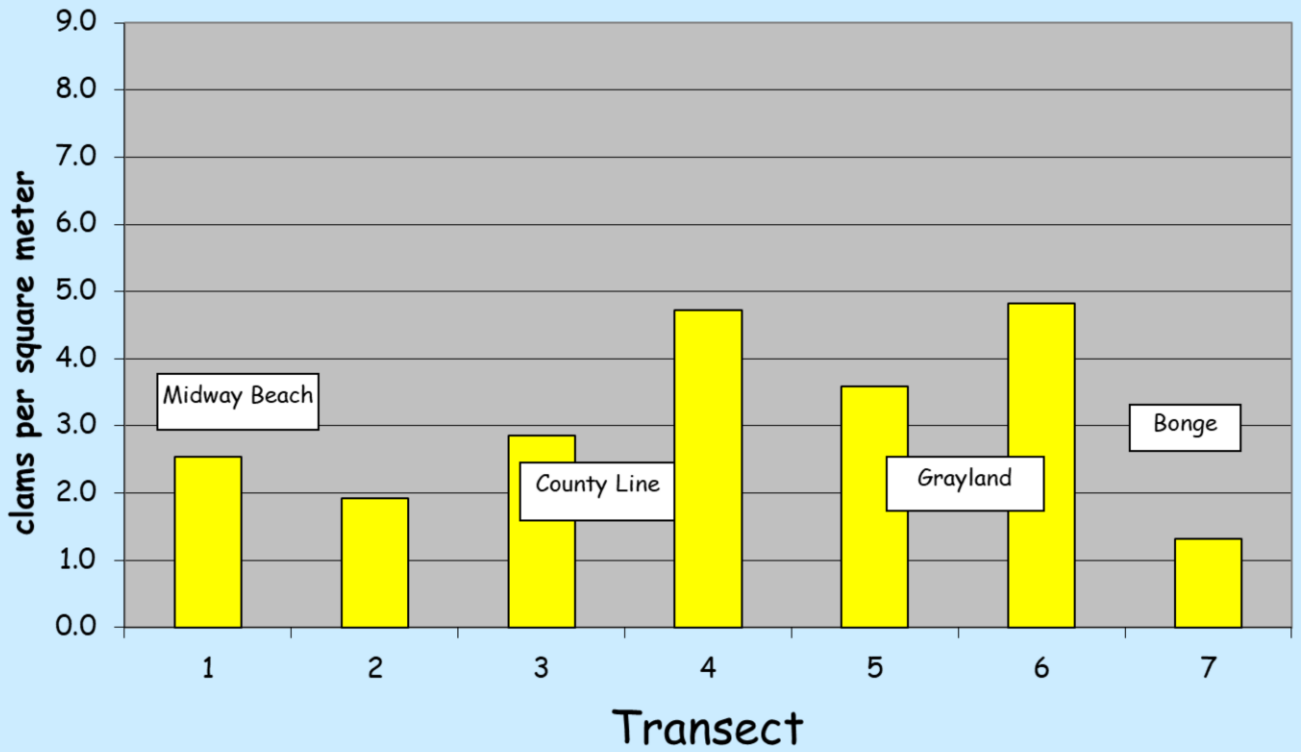
This is the same data that we presented in slide 47, although only the Twin Harbors historical population densities are included.

Washington Razor Clam Size Frequency Distribution Twin Harbors - 2022



The average size of the Twin Harbors recruit clams found in our summer 2022 surveys was 4.6 inches. This compares to 4.2 inches in 2021, 4.2 in 2020; 4.3 in 2019, 3.9 in 2018; 3.9 inches in 2017; and 4.4 inches in 2016.

Twin Harbors Razor Clam Population Recruit Distribution - 2022



Diggers will find good razor clam populations on most of the Twin Harbors beach, with mid beach digging looking to be the most prosperous.

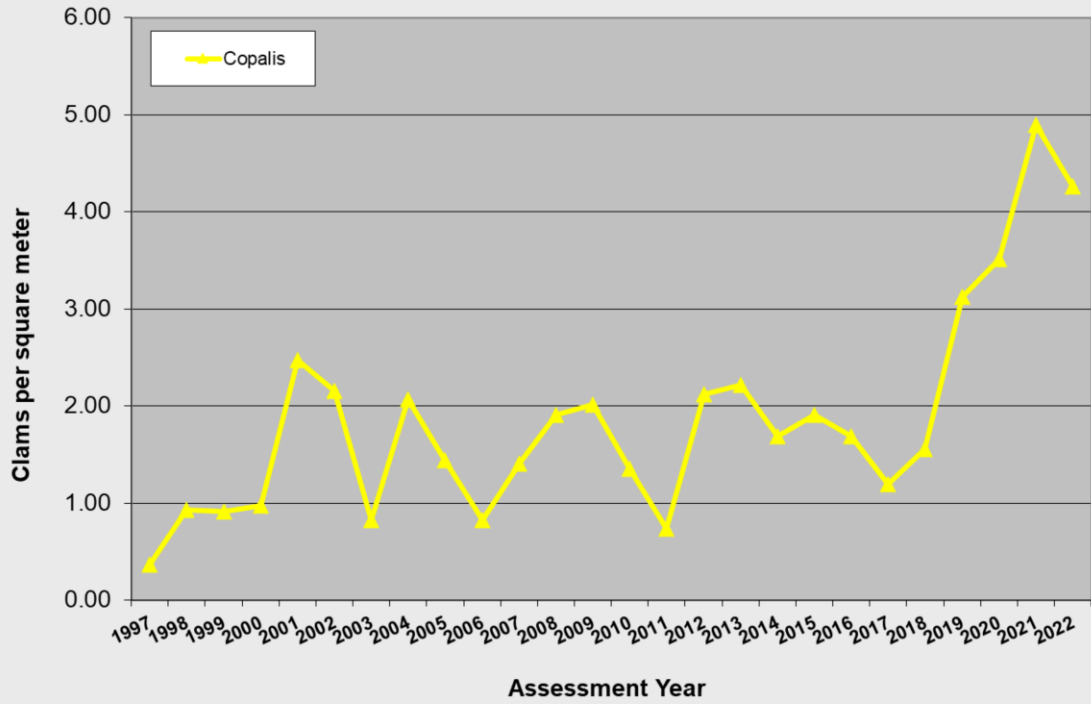
COPALIS RAZOR CLAM POPULATION, TOTAL ALLOWABLE CATCH (TAC) AND HARVEST DATA

YEAR	POPULATION (clams)		Total	State's Share	State's	% of share
	RECRUITS	PRE-RECRUITS	TAC (clams) of recruits	(50% w/ <i>adjustments</i>)	HARVEST (clams) TOTAL	
2017-18	4,040,482	6,232,276	1,325,278	591,366	577,191	97.6%
2018-19	5,236,188	8,332,329	1,864,083	860,768	869,470	101%
2019-20	10,536,758	6,375,231	4,214,703	2,036,079	725,451	35.6%
2020-21	11,848,503	12,560,196	4,739,401	2,369,701	245,870	10.4%
2021-22	16,519,110	15,426,336	6,607,644	3,303,822	1,657,587	50.2%
2022-23	14,369,717	8,845,252	5,747,887	2,873,943		
AVERAGE	9,636,208	9,785,274	4,083,166	2,005,947	815,114	

Another strong population of clams was observed on Copalis for the 2022-23 season. A slight decrease in recruits from the 2021-22 population, but that's to be expected after a long digging season.

Recall; recruits are defined as clams => 76 mm (3 inches); pre-recruits are < 76 mm (3 inches).

Washington Razor Clam Average Density Recruits By Beach



This is the same data that we presented in slide 47, although only the Copalis historical population densities are included.

Washington Razor Clam

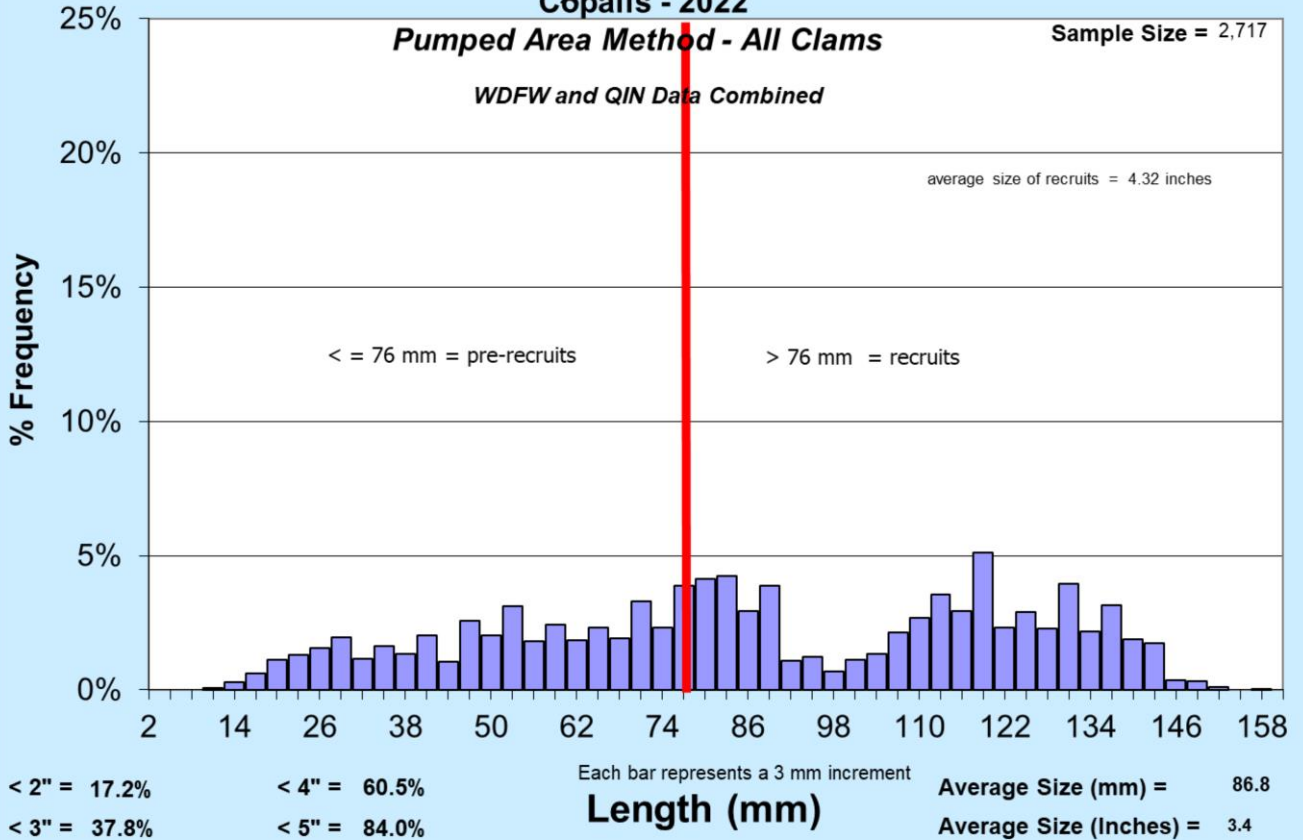
Size Frequency Distribution

Copalis - 2022

Pumped Area Method - All Clams

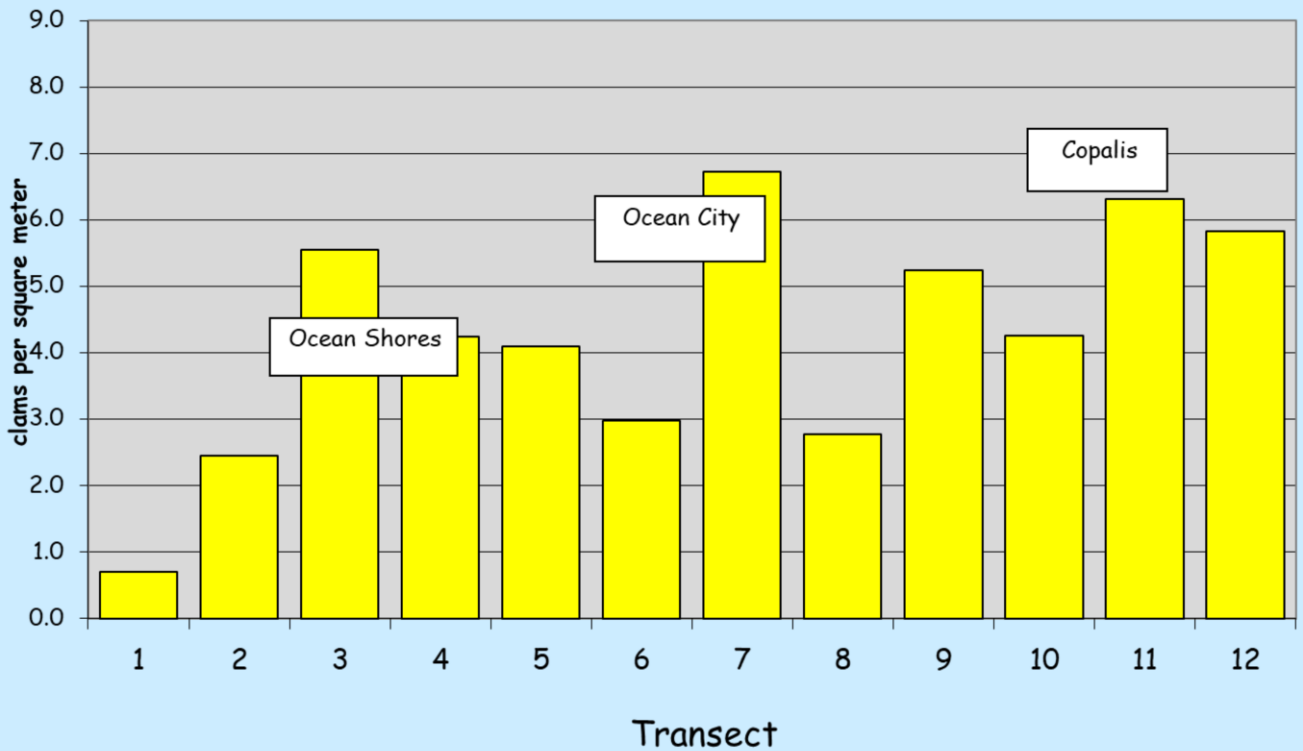
Sample Size = 2,717

WDFW and QIN Data Combined



The average size of the Copalis recruit clams found in our 2022 summer surveys was 4.32 inches; compared to 4.5 in 2021; 4.1 in 2020; 4.2 in 2019; 3.9 inches in 2018; 4.3 inches in 2017; 4.4 inches 2016.

Copalis Razor Clam Recruit Population Distribution 2022

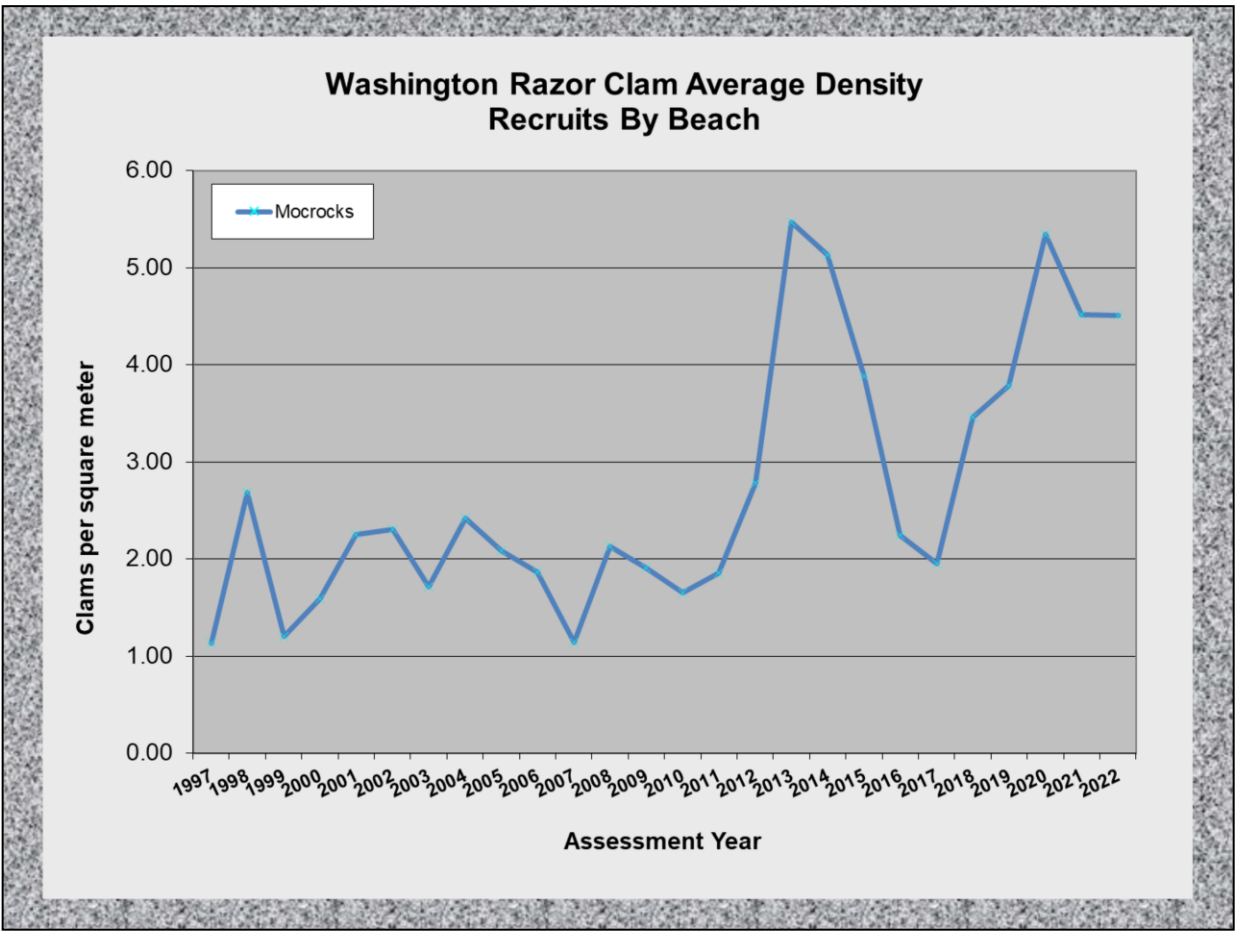


Digging should be good in almost every area of Copalis beach during the 2022-23 season, with all areas but the most southerly showing clam densities above 2 clams per square meter. The most clam dense area is again near Ocean City with a high of 6.72.

MOCROCKS RAZOR CLAM POPULATION, TOTAL ALLOWABLE CATCH (TAC) AND HARVEST DATA

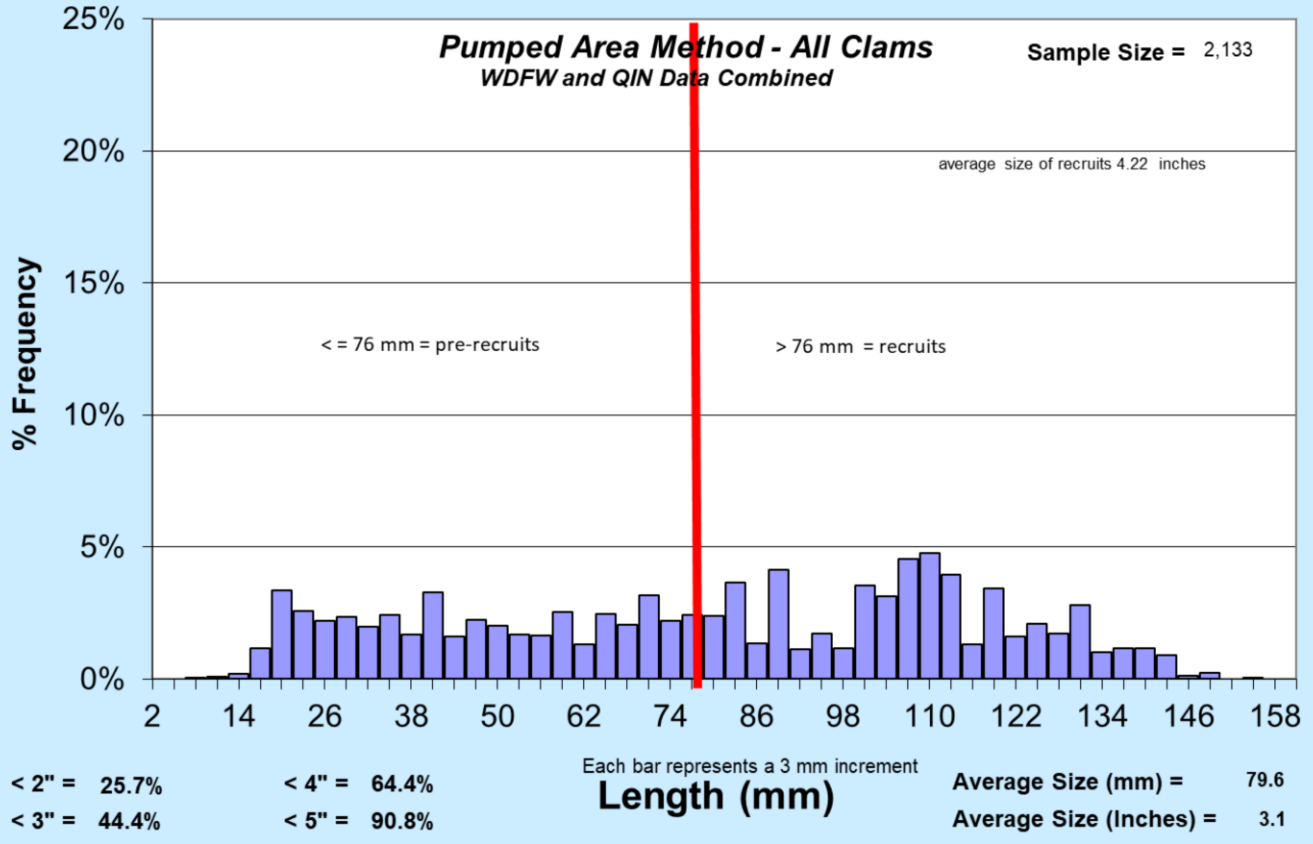
YEAR	POPULATION (clams)		Total	State's Share	State's	% of share harvested
	RECRUITS	PRE-RECRUITS	TAC (clams of recruits)	(50% w/ adjustments)	HARVEST (clams) TOTAL	
2017-18	4,253,303	11,427,124	1,556,709	778,355	791,610	101.7%
2018-19	7,536,298	6,947,904	3,014,519	1,507,260	1,146,233	76.0%
2019-20	8,249,452	7,500,707	3,299,781	1,649,890	467,915	28.4%
2020-21	11,653,105	7,140,413	4,661,242	2,330,621	665,004	28.5%
2021-22	9,844,546	48,183,071	3,937,819	1,968,909	1,255,299	63.8%
2022-23	9,823,659	7,704,916	3,929,463	1,964,732		
AVERAGE	8,307,341	16,239,844	3,400,428	1,700,214	721,010	

The 2022 stock assessment on Mocrocks showed a similar recruit clams and a large increase in pre-recruits.



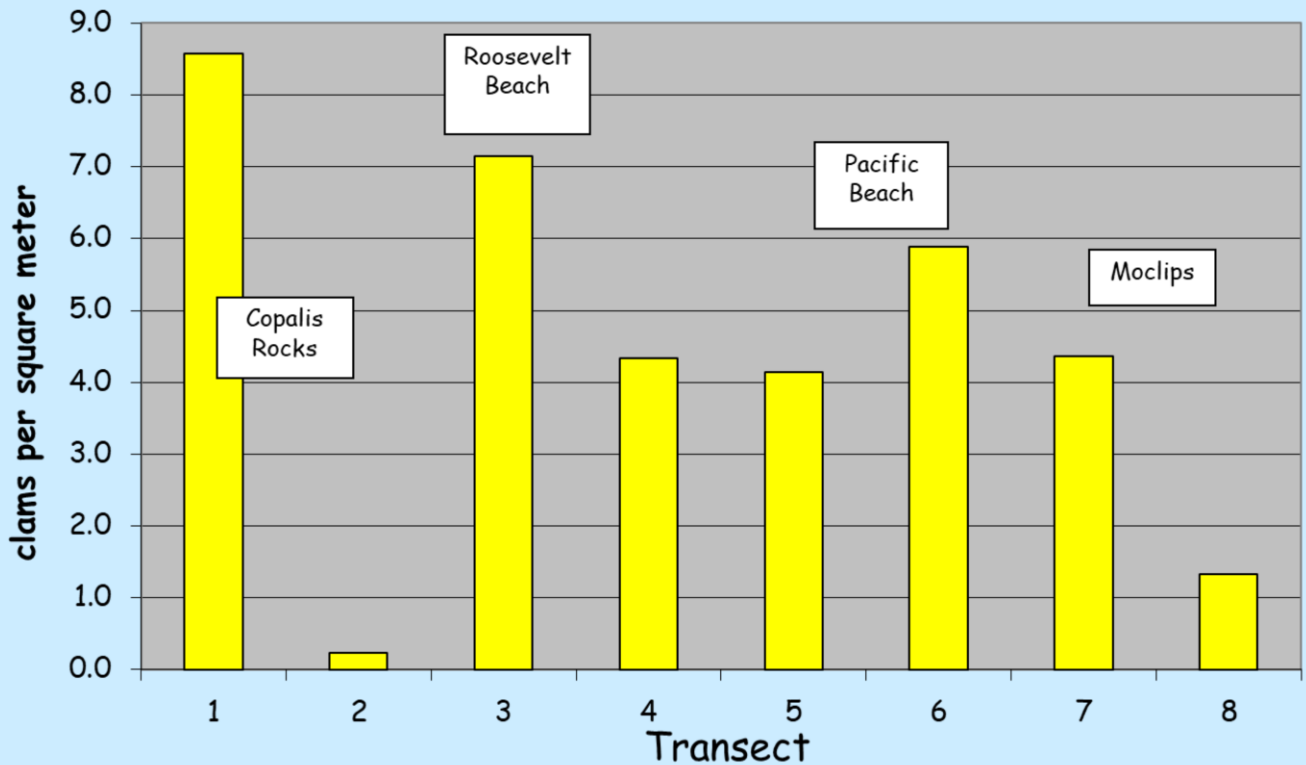
This is the same data that we presented in slide 47, although only the Mocrocks historical population densities are included.

Washington Razor Clam Size Frequency Distribution Mocrocks - 2022



The average size of the Mocrocks recruit clams found in our 2022 summer survey was 4.22 inches. This compares to 4.4 inches in 2021, 4.07 in 2020, 4.3 in 2019; 3.7 inches in 2018; 4.2 inches in 2017; and 4.7 inches in 2016.

Mocrocks Razor Clam Population- 2022 Recruit Distribution



The Mocrocks densities on recruit clams are historically more consistently strong than any other razor clam management beach. With the exception of two transects, all areas show a density above 4.0 clams per square meter. The 2022 densities tells us again that digging will be very good on this beach. Compare this to the 2020 and 2019 distribution in the next slides and you can see the changes in abundance.

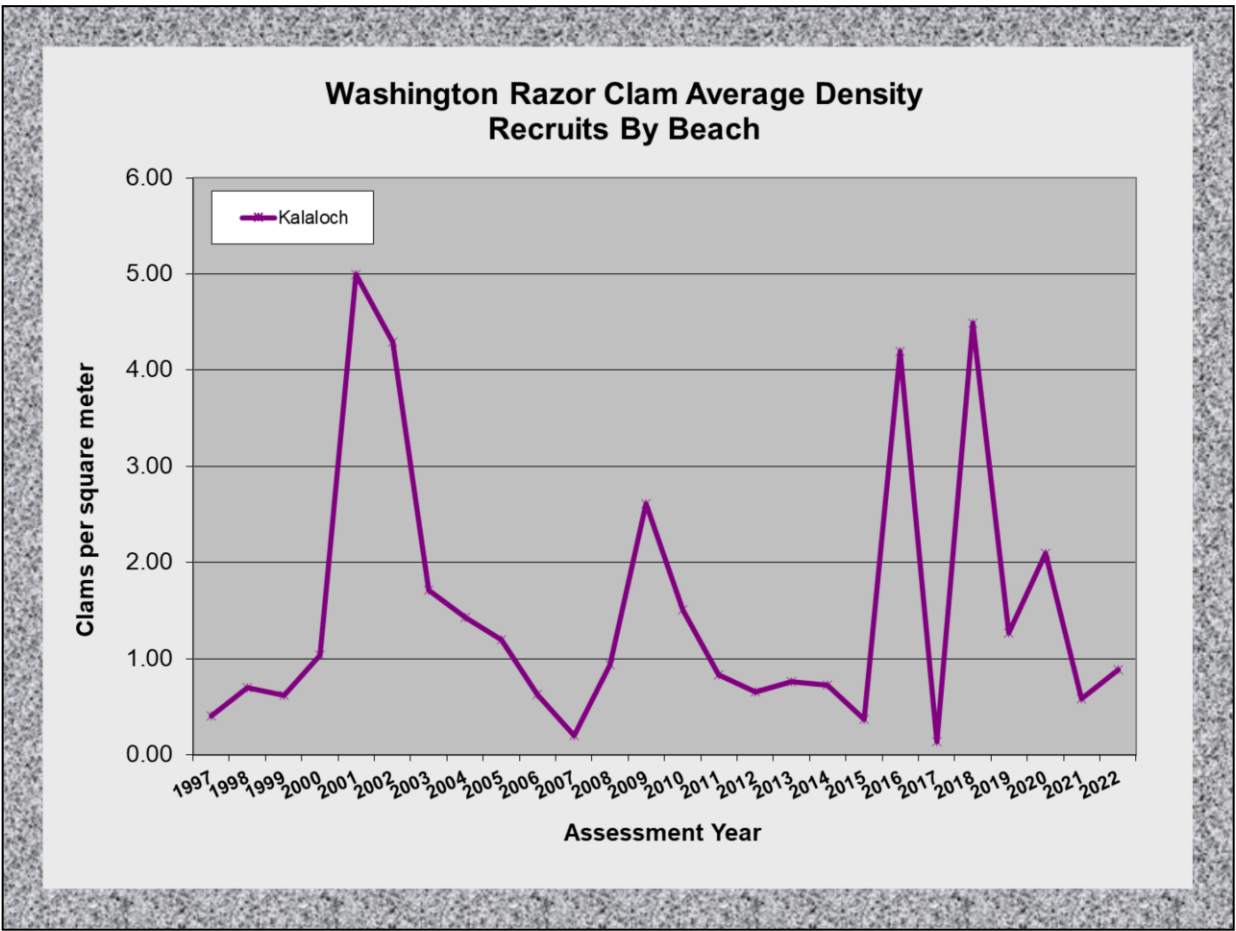
KALALOCH RAZOR CLAM POPULATION, TOTAL ALLOWABLE CATCH (TAC) AND HARVEST DATA

YEAR	POPULATION (clams)		TAC (clams) harvest rate 25.4%	50%	State's HARVEST (clams)
	RECRUITS	PRE-RECRUITS	of recruits	SHARES	TOTAL
2017-18	192,476	100,324,349	48,8898	24,444	0
2018-19	6,121,148	1,868,151	1,554,772	777,386	3,599
2019-20	1,728,824	10,990,139	439,121	219,561	0
2020-21	2,854,354	7,215,994	725,006	362,503	0
2021-22	800,434	97,441,944	203,310	101,655	0
2022-23	1,202,228	1,168,712	305,366	152,683	
AVERAGE	2,149,910	36,501,548			

The “on-again/off-again” nature of razor clam populations at Kalaloch seems to continue. While we found a nice population of razor clams at the time of our summer assessment at Kalaloch, you’ll see in the next slide that they are very small. No digging has yet been scheduled for this beach and we are interested to know what you think about making the trek out to this beach to dig clams that average just 3.42 inches?

Recall; recruits are defined as clams => 76 mm (3 inches); pre-recruits are < 76 mm (3 inches).

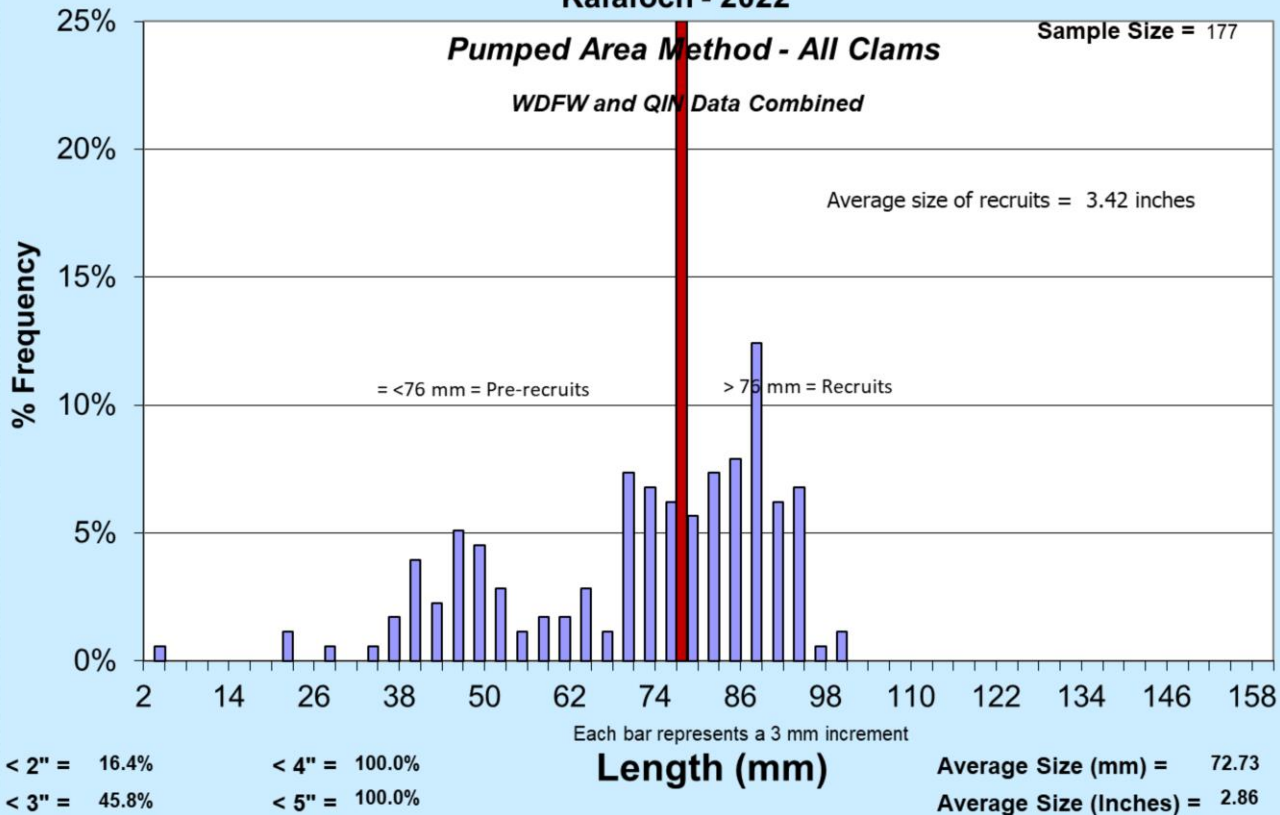
Because Kalaloch lies within the boundaries of the Olympic National Park, their staff works closely with WDFW staff in the management of the recreational fishery here. WDFW has the lead in the population assessment work. ONP has the lead in harvest monitoring and enforcing the recreational fishery. Both groups work together to set specific dates when harvest will occur on this beach.



This is the same data that we presented in slide 47, although only the Kalaloch historical population densities are included.

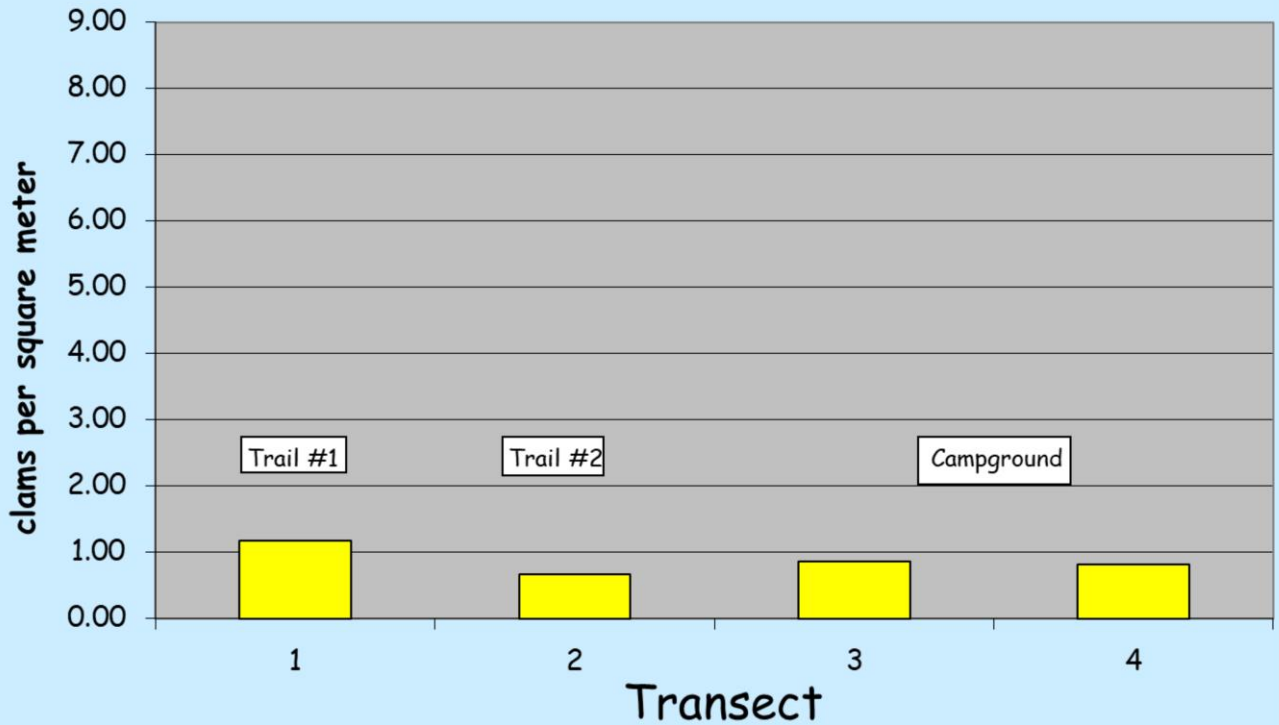
Washington Razor Clam

Size Frequency Distribution Kalaloch - 2022



The number of recruit clams found at Kalaloch in July 2022 were once again very small. Those we found in our survey transects had an average size of just 3.42 inches.

Kalaloch Clam Population Distribution - 2022



The densities of recruit clams (those greater than 3 inches) have improved some along Kalaloch beach, but they remain small.

Co-Management With Coastal Tribes

- Share the resource and share the work
 - ...complete joint stock assessments
 - ...determine TACs jointly
- Sign Fishery Management Plans annually
- Different seasons for different reasons
 - ...tribal C&S and or commercial seasons
 - ...State recreational seasons
- Each group monitors their own fishery
 - ...make individual harvest estimates / share data
 - ...provide enforcement

As was mentioned earlier, WDFW works closely with two coastal tribes in the management razor clam populations.

Quinault Tribal staff working on Kalaloch Beach in July 2011



The Quinault Indian Nation (QIN) shares the labor of the stock assessment work - with their own crews of biologists and technicians who also use the Pumped Area Method. Working side by side QIN and WDFW staff assess razor clam populations at Copalis, Mocrocks and Kalaloch. On each of these beaches half of the sample transects are completed by QIN staff and half by WDFW staff. The data is pooled and a joint population estimate is made.

At Kalaloch, the Hoh Tribe provides additional staff to assist in the assessment on that beach. Because there is no vehicle access on the Kalaloch beach – having extra people available to move the gear up and down trails to the beach is critical to the success of the work.

**2007-08 INTERIM RAZOR CLAM MANAGEMENT AGREEMENT
FOR COPALIS AND MOCROCKS BEACHES**

**ENTERED INTO BY THE STATE OF WASHINGTON
AND QUINULT INDIAN NATION**

August 28, 2007

This agreement establishes principles, concepts, and procedures, which will govern the non-Indian and treaty tribal fisheries for razor clams at Copalis and Mocrocks Beaches.

1. EFFECTIVE DATE

This agreement is effective on August 28, 2007.

2. TERM

The term of this agreement is until August 27, 2008, unless superseded by another agreement.

Each year in August WDFW and the costal tribes sit down and discuss the population estimates and proposed total allowable catch (TAC) for the co-managed beaches; Copalis, Mocrocks and Kalaloch. The result of those discussion is a an agreed to Fishery Management Plan signed by policy representatives of each group that guides the management of the fisheries in the coming season.

	2022-23 TAC Share (clams)	Projected average daily harvest (clams)
Long Beach	5,865,490	27,000
Twin Harbors	2,258,653	20,000
Copalis	2,873,943	27,000
Mocrocks	1,964,732	23,000
Kalaloch	152,683	

This is a recap of the Total Allowable Catch that will guide WDFW during the 2022-23 season. We also list here our projected average daily catch, by beach. Note that the average daily catch includes days with large crowds, excellent weather and good digging success and days with fewer people or poorer success (usually due to bad weather). It can be tricky to project this number, and we find daily harvest goes down when we have more days to offer.



For helpful instruction on how to dig, watch our video "Digging Razor Clams in Washington"

Check it out at:
<https://youtu.be/RBM9b5r6rMQ>

Or visit our website:
<https://wdfw.wa.gov/fishing/basics/digging-razor-clams>

We are pleased to offer you a video that should help new diggers learn how to dig razor clams. See it at: <https://youtu.be/RBM9b5r6rMQ> Or search You Tube for "Digging Razor Clams in Washington"

If you are one of our first time diggers we want to welcome you to this fun recreational activity that anyone can easily learn to do. After you've watch this video, and have additional questions, feel free to contact us at the email or phone numbers listed later in this document. Another good piece of advice, if you are on the beach and struggling to successfully dig clams, look around for an experienced digger and ask for advice. Most diggers are friendly and will be more than willing to give you some on-the-spot pointers. To you "old salts" who can dig a clam without blinking – consider offering some advice to those who might be new to razor clamming and look like they could use a few pointers.

<https://wdfw.wa.gov/fishing/basics/digging-razor-clams>

Dig with your kids, not for them . . .

Razor clamming is a fun and easy-to-learn activity that draws generations of families and friends to the Washington coast each year.

We understand that children have varying abilities when it comes to handling digging equipment. Adults may assist kids, but kids need to actively participate in the entire process of digging and gathering razor clams.

Watch our YouTube video online to see an example of how to dig razor clams with kids:
<http://www.youtube.com/thewdfw>



Also, please remember:

- Adults and youth age 15 and older need a license to dig razor clams; licenses are available at many local sporting goods retailers and online at wdfw.wa.gov;
- Everyone needs to dig his or her own limit, bring a separate container for his or her clams, and not dig more than the 15 clam limit;
- It is unlawful to dig for someone else or dig part of someone's limit, unless digging for a disabled harvester with a designated harvester card.
- You are required to keep the first 15 clams dug, regardless of size and condition. Wasting razor clams is against the law.

The Washington Department of Fish and Wildlife is asking for your help to ensure current and future generations continue to enjoy bountiful razor clam harvests.



For more on razor clam seasons, regulations, digging, and cooking your clams, visit WDFW's recreational razor clam website: <http://wdfw.wa.gov/fishing/shellfish/razorclams/>

**We hope you and your family
have a great time at the beach.**



Still have questions
about razor clam digging?

Call 360-249-4628



WDFW also has
a video titled:
"Digging Razor
Clams with Kids
in Washington"

Check it out at:

http://youtu.be/gl9p_PparVk

Razor clamming is a fun and easy-to-learn activity that draws generations of families and friends to the Washington coast each year. We understand that children have varying abilities when it comes to handling digging equipment. Adults may assist kids, but kids need to actively participate in the entire process of digging and gathering razor clams. Check out the video at:

http://youtu.be/gl9p_PparVk Also, please remember:

- Adults and youth age 15 and older need a license to dig razor clams; licenses are available at many local sporting goods retailers and online at wdfw.wa.gov;
- Everyone needs to dig his or her own limit, bring a separate container, and not dig more than the current clam limit;
- It is unlawful to dig for someone else or dig part of someone's limit, unless digging for a disabled harvester with a designated harvester card.
- You are required to keep the first 15 clams dug, regardless of size and condition. Wasting razor clams is against the law. The Washington Department of Fish and Wildlife is asking for your help to ensure current and future generations continue to enjoy bountiful razor clam harvests. For more information on razor clam seasons, regulations, digging, and cooking your clams, visit WDFW's recreational razor clam website: <http://wdfw.wa.gov/fishing/shellfish/razorclams/>

When you get home and need information on what to do with your catch, WDFW recently made: "How to Clean and Cook Razor Clams"

Check it out at:

<https://youtu.be/sTaRaHkFFEw>

Recipe inspiration can be found here:

<https://wdfw.medium.com/our-favorite-razor-clam-recipes-a4d3019548c9>



We are pleased to offer you a video that should help new diggers learn how to clean and cook razor clams. See it at: <https://youtu.be/sTaRaHkFFEw> Or search You Tube for "Digging Razor Clams in Washington"

For recipe inspiration visit our blog post:

<https://wdfw.medium.com/our-favorite-razor-clam-recipes-a4d3019548c9>

Common razor clam parasites

We are often contacted by razor clam diggers who have encountered a couple of relatively common razor clam parasites. The next two pages provides more details.

However, anytime you find something unusual while digging or while on the beach, don't hesitate to contact us at

TeamMontesano@dfw.wa.gov or
RazorClams@dfw.wa.gov

We are often contacted by razor clam diggers who have encountered a couple of relatively common razor clam parasites. The next two pages provides more details. However, anytime you find something unusual while digging or while on the beach, don't hesitate to contact us at TeamMontesano@dfw.wa.gov or RazorClams@dfw.wa.gov

Malacobdella silquae



A nemertean worm parasite found in the siphon, mantle, or gill cavity of pacific razor clams. It has a commensal relationship with the host, taking food from the clam's digestive system but otherwise causing no damage. Feel free to eat the clam since it is unharmed by the worm.



Malacobdella silquae. It is an uncommon, but not unusual razor clam parasite. It is a genus of nemertean worm and is found in the mantle and/or gill cavity of many species of clams and other bivalves. *Malacobdella* have a large posterior sucker, like that of a leech. It has a commensal relationship with the host razor clam, taking food from the clam's digestive system, but otherwise not harming the clam.

The geographic distribution among razor clams appears to be very patchy. However, it is not unusual to find more than one clam, each with a *Malacobdella* from a catch of razor clams taken from the same general area

Pinnixa sp. (Pea Crab)



There are many species of "pea crabs" in the family *Pinnixa*. They are found in the siphon, mantle, or gill cavity of razor clams and in many other regional invertebrates (clams, mussels, oysters, sea cucumbers, etc.) It has a commensal relationship with the host, taking food from the clam's digestive system but otherwise causing no damage. Feel free to eat the clam since it is unharmed by the crab.



They are an uncommon, but not unusual razor clam parasite usually discovered while cleaning clams. These organisms have a commensal relationship with the host razor clam, taking food from the clam's digestive system but otherwise not harming the clam. There are many different species of *Pinnixa* crab, and they can be found in the siphon, mantle, and gill cavity of many species of other bivalves and invertebrates.

The geographic distribution among razor clams appears to be patchy and their abundance is unpredictable. It is not unusual to find multiple clams with a pea crab inhabitant in a catch limit of razor clams. Since the crabs leave their hosts unscathed, please feel free to eat and enjoy those inhabited razor clams.

Washington 2022-23 Recreational Razor Clam

Tentative* Fall Harvest dates

**Pending final marine toxin test results*

NOTE: open beaches vary by day. Please pay close attention to this list of dates and beaches open.

AM TIDES ONLY

Sept. 22, Thursday, 5:03 a.m.; 0.4 feet; Long Beach, Twin Harbors, Copalis

Sept. 23, Friday, 5:41 a.m.; 0.1 feet; Long Beach, Twin Harbors, Mocrocks

Sept. 24, Saturday, 6:15 a.m.; 0.0 feet; Long Beach, Twin Harbors, Copalis

Sept. 25, Sunday, 6:48 a.m.; 0.1 feet; Long Beach, Twin Harbors, Mocrocks

Sept. 26, Monday, 7:19 a.m.; 0.3 feet; Long Beach, Twin Harbors, Copalis

PM TIDES ONLY

Sept. 27, Tuesday, 8:24 p.m.; minus-0.1 feet; Long Beach, Twin Harbors, Mocrocks

Sept. 28, Wednesday, 9:06 p.m.; -0.3 feet; Long Beach, Twin Harbors, Copalis

Sept. 29, Thursday, 9:51 p.m.; -0.4 feet; Long Beach, Twin Harbors, Mocrocks

Sept. 30, Friday, 10:43 p.m.; -0.2 feet; Long Beach, Twin Harbors, Copalis

Page 1 of 5. These dates remain tentative until final marine toxin tests have been completed, generally 5 days before the opening is scheduled to occur. This is to ensure the clams you harvest are safe to eat.

Feed back WDFW has received over the last several years is that most clam diggers like the season structure we've been using that allows for a few days of digging – each month – on as many beaches as possible.

Many coastal businesses have also said that such a season structure helps them by drawing people to coastal communities during periods of the year when fewer people would normally visit.

We are always open to suggestions and would be happy to hear any ideas about what might work better for you.

Oct. 8, Saturday, 6:21 p.m.; 0.5 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 9, Sunday, 7:05 p.m.; -0.1 feet; Long Beach, Twin Harbors, Copalis
Oct. 10, Monday, 7:46 p.m.; -0.5 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 11, Tuesday, 8:26 p.m.; -0.6 feet; Long Beach, Twin Harbors, Copalis
Oct. 12, Wednesday, 9:06 p.m.; -0.4 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 13, Thursday, 9:46 p.m.; -0.2 feet; Long Beach, Twin Harbors, Copalis
Oct. 14, Friday, 10:29 p.m.; 0.3 feet; Long Beach, Twin Harbors, Mocrocks

Oct. 24, Monday, 6:44 p.m.; 0.0 feet; Long Beach, Twin Harbors, Copalis
Oct. 25, Tuesday, 7:24 p.m.; -0.6 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 26, Wednesday, 8:05 p.m.; -1.0 feet; Long Beach, Twin Harbors, Copalis
Oct. 27, Thursday, 8:48 p.m.; -1.1 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 28, Friday, 9:35 p.m.; -1.0 feet; Long Beach, Twin Harbors, Copalis
Oct. 29, Saturday, 10:28 p.m.; -0.7 feet; Long Beach, Twin Harbors, Mocrocks
Oct. 30, Sunday, 11:27 p.m.; -0.3 feet; Long Beach, Twin Harbors, Copalis

Page 2 of 5. These dates remain tentative until final marine toxin tests have been completed, generally 5 days before the opening is scheduled to occur. This is to ensure the clams you harvest are safe to eat.

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SWITCH TO STANDARD TIME

Nov. 6, Sunday, 5:08 p.m.; 0.0 feet; Long Beach, Twin Harbors, Mocrocks

Nov. 7, Monday, 5:49 p.m.; -0.5 feet; Long Beach, Twin Harbors, Copalis

Nov. 8, Tuesday, 6:28 p.m.; -0.7 feet; Long Beach, Twin Harbors, Mocrocks

Nov. 9, Wednesday, 7:05 p.m.; -0.7 feet; Long Beach, Twin Harbors, Copalis

Nov. 10, Thursday, 7:42 p.m.; -0.6 feet; Long Beach, Twin Harbors, Mocrocks

**Nov. 11, Friday, 8:19 p.m.; -0.2 feet; Long Beach, Twin Harbors, Copalis
(Veterans Day)**

Nov. 12, Saturday, 8:59 p.m.; 0.1 feet; Long Beach, Twin Harbors, Mocrocks

Nov. 13, Sunday, 9:43 p.m.; 0.5 feet; Long Beach, Twin Harbors, Copalis

Page 3 of 5. These dates remain tentative until final marine toxin tests have been completed, generally 5 days before the opening is scheduled to occur. This is to ensure the clams you harvest are safe to eat.

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We are always open to suggestions and would be happy to hear any ideas about what might work better for you.

Nov. 22, Tuesday, 5:22 p.m.; -0.6 feet; Long Beach, Twin Harbors, Copalis
Nov. 23, Wednesday, 6:04 p.m.; -1.2 feet; Long Beach, Twin Harbors, Mocrocks
Nov. 24, Thursday, 6:48 p.m.; -1.6 feet; Long Beach, Twin Harbors, Copalis
(Thanksgiving Day)
Nov. 25, Friday, 7:35 p.m.; -1.6 feet; Long Beach, Twin Harbors, Mocrocks
Nov. 26, Saturday, 8:23 p.m.; -1.5 feet; Long Beach, Twin Harbors, Copalis
Nov. 27, Sunday, 9:15 p.m.; -1.1 feet; Long Beach, Twin Harbors, Mocrocks
Nov. 28, Monday, 10:10 p.m.; -0.5 feet; Long Beach, Twin Harbors, Copalis

Dec. 4, Sunday, 4:09 p.m.; 0.4 feet; Long Beach, Twin Harbors, Copalis
Dec. 5, Monday, 4:53 p.m.; -0.1 feet; Long Beach, Twin Harbors, Mocrocks
Dec. 6, Tuesday, 5:33 p.m.; -0.5 feet; Long Beach, Twin Harbors, Copalis
Dec. 7, Wednesday, 6:11 p.m.; -0.6 feet; Long Beach, Twin Harbors, Mocrocks
Dec. 8, Thursday, 6:47 p.m.; -0.6 feet; Long Beach, Twin Harbors, Copalis

Page 4 of 5. These dates remain tentative until final marine toxin tests have been completed, generally 5 days before the opening is scheduled to occur. This is to ensure the clams you harvest are safe to eat.

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Dec. 9, Friday, 7:23 p.m.; -0.5 feet; Long Beach, Twin Harbors, Mocrocks

Dec. 10, Saturday, 7:59 p.m.; -0.3 feet; Long Beach, Twin Harbors, Copalis

Dec. 11, Sunday, 8:35 p.m.; 0.0 feet; Long Beach, Twin Harbors, Mocrocks

Dec. 12, Monday, 9:13 p.m.; 0.3 feet; Long Beach, Twin Harbors, Copalis

Dec. 20, Tuesday, 4:14 p.m.; 0.0 feet; Long Beach, Twin Harbors, Mocrocks

Dec. 21, Wednesday, 5:02 p.m.; -0.8 feet; Long Beach, Twin Harbors, Copalis

Dec. 22, Thursday, 5:48 p.m.; -1.4 feet; Long Beach, Twin Harbors, Mocrocks

Dec. 23, Friday, 6:35 p.m.; -1.8 feet; Long Beach, Twin Harbors, Copalis

Dec. 24, Saturday, 7:23 p.m.; -1.9 feet; Long Beach, Twin Harbors, Mocrocks

**Dec. 25, Sunday, 8:10 p.m.; -1.6 feet; Long Beach, Twin Harbors, Copalis
(Christmas Day)**

Dec. 26, Monday, 8:58 p.m.; -1.2 feet; Long Beach, Twin Harbors, Mocrocks

Dec. 27, Tuesday, 9:47 p.m.; -0.5 feet; Long Beach, Twin Harbors, Copalis

Dec. 28, Wednesday, 10:37 p.m.; 0.3 feet; Long Beach, Twin Harbors, Mocrocks

Page 5 of 5. These dates remain tentative until final marine toxin tests have been completed, generally 5 days before the opening is scheduled to occur. This is to ensure the clams you harvest are safe to eat.

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We are always open to suggestions and would be happy to hear any ideas about what might work better for you.

What do you think???

Feel free to email your
comments and suggestions
to: razorclams@dfw.wa.gov

Thank you for taking the time to review this presentation. We are interested in your opinions regarding our management of the razor clam resource and specifically any suggestions or comments you have on the way we might structure the remaining dates for 2022-23 season.

Email your comments to : razorclams@dfw.wa.gov

To be added to our e-mail update list, please send an email request to: razorclams@dfw.wa.gov

Below is an excerpt of a message sent out to this list;

On Apr 4, 2017, at 3:44 PM, Ayres, Daniel L (DFW) <Daniel.Ayres@dfw.wa.gov> wrote:

You are receiving this message because you have expressed interest in Washington State's recreational razor clam fishery. If you do not wish to receive future messages, please reply by return e-mail.

SEASON UPDATE: We are happy to be able to finally include Long Beach in a razor clam opener. Not wanting to delay any longer than needed, Long Beach joins Twin Harbors in opening tomorrow (4/12). Copalis and Mocrocks will also open as previously scheduled. See the details below.

- April 12, Wednesday, 8:08 a.m., 0.0 feet; Twin Harbors, Long Beach
- April 13, Thursday, 8:43 a.m., 0.0 feet; Twin Harbors, Copalis, Long Beach
- April 14, Friday, 9:18 a.m., 0.1 feet; Twin Harbors, Mocrocks, Long Beach
- April 15, Saturday, 9:55 a.m., 0.3 feet; Twin Harbors, Copalis, Long Beach
- April 16, Sunday, 10:36 a.m., 0.5 feet; Twin Harbors, Mocrocks, Long Beach

beach must test under the action level (20 ppm for domoic acid; 80 µg/100g for PSP; and 16 µg/100g for DSP) on both of the two required sample collections.

Note that in all of these samples; only razor clam meat tissue is tested.

The following samples collected on April 9, 2017

Long Beach Area E (north):

- domoic acid = 10 ppm
- PSP = < 38 µg/100g
- DSP = none detected

Long Beach Area OY (middle):

- domoic acid = 9 ppm
- PSP = < 38 µg/100g
- DSP = none detected

Long Beach Area XA (middle):

You may be interested to know that we maintain an email distribution list for anyone specifically interested in razor clam related issues. The periodic updates sent out using this list include information on season openers, marine toxin levels and other pertinent topics. If you are interested in having your email address added to this list, please let us know by sending an email request to: razorclams@dfw.wa.gov



Thanks again for visiting this presentation! In the photo are some of the members of the WDFW Coastal Shellfish Unit, L to R, Craig Loften, Zach Forster, Clayton Parson, Robert Morgan, Janna Goulding and Bryce Blumenthal.

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