

Washington Razor Clam Management



Setting the 2012-2013 Season

WDFW has annually held a series of public meetings to obtain input regarding the season structure, bag limit and management of razor clams.

However, over the last couple of years, in consideration of the State's economic situation, the budget reductions facing WDFW, and cuts in staffing that have occurred WDFW has decided to replace public meetings and this cost. So, once again, for the 2012-2013 season public input is being solicited through the internet and via email.

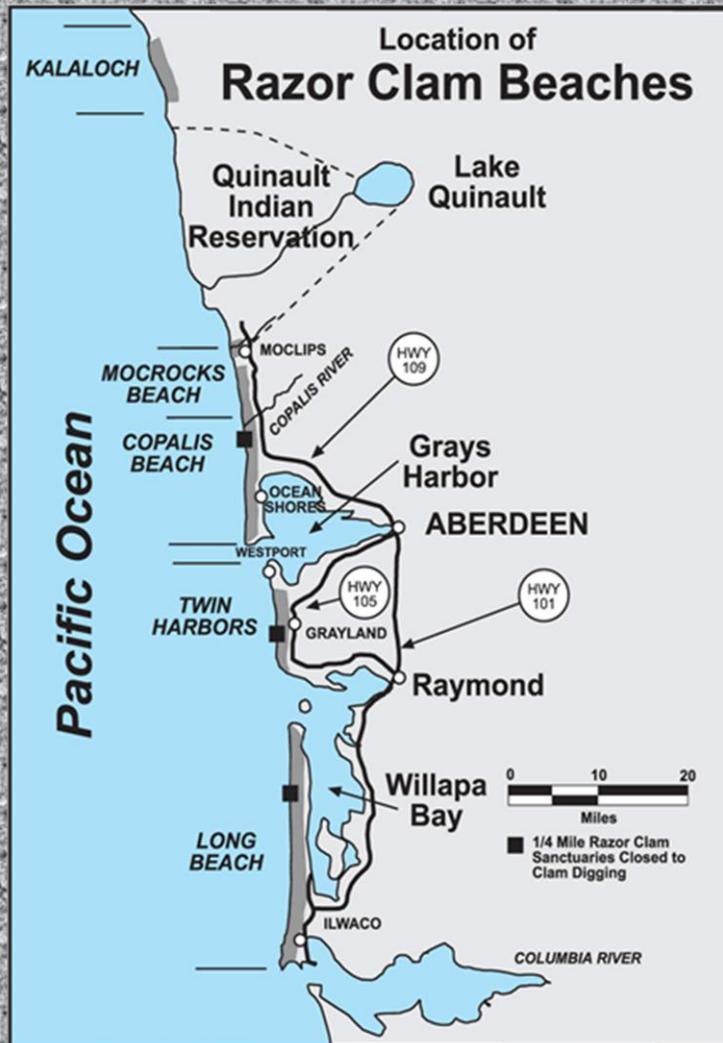
The following presentation is designed to provide you with much of the same information – in a similar format that has traditionally been used in the meetings.

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

What's Up?

CONTENTS OF THIS PRESENTATION

- Review of the 2011-12 Season
- Marine Toxin Update / ORHAB
- Status of Razor Clam Stocks
- Tribal Co-management
- Season Options for 2012-13



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 Cape Shoalwater 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 State of Washington has long understood the importance of razor clamming to the citizens of our state and the many visitors who come to enjoy this popular fishery.

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 senate. For more information see: <http://wdfw.wa.gov/commission/>

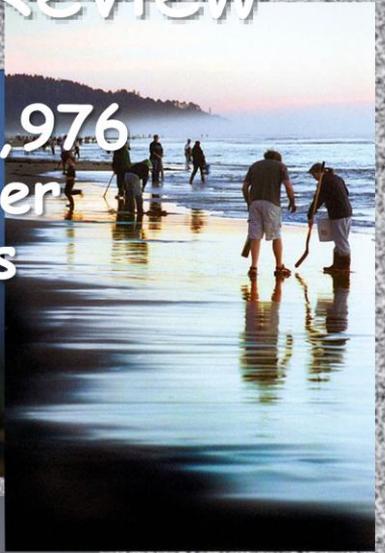
In it's Policy C3009 the FW Commission has provided seven objectives WDFW follows in managing this fishery.

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

2011-2012 Fishery Review



194,976 digger trips



Average of 13.2 clams per digger trip



2.5 million clams harvested.

Going into the 2011-12 recreational razor clam season, we knew that the TAC values for most beaches were lower than they had been in many seasons. This was especially true at Copalis, one of the most popular beaches with a TAC that was 50% lower than the historical average. As a direct result, this season had the lowest total effort and total harvest since the 2000-01 season.

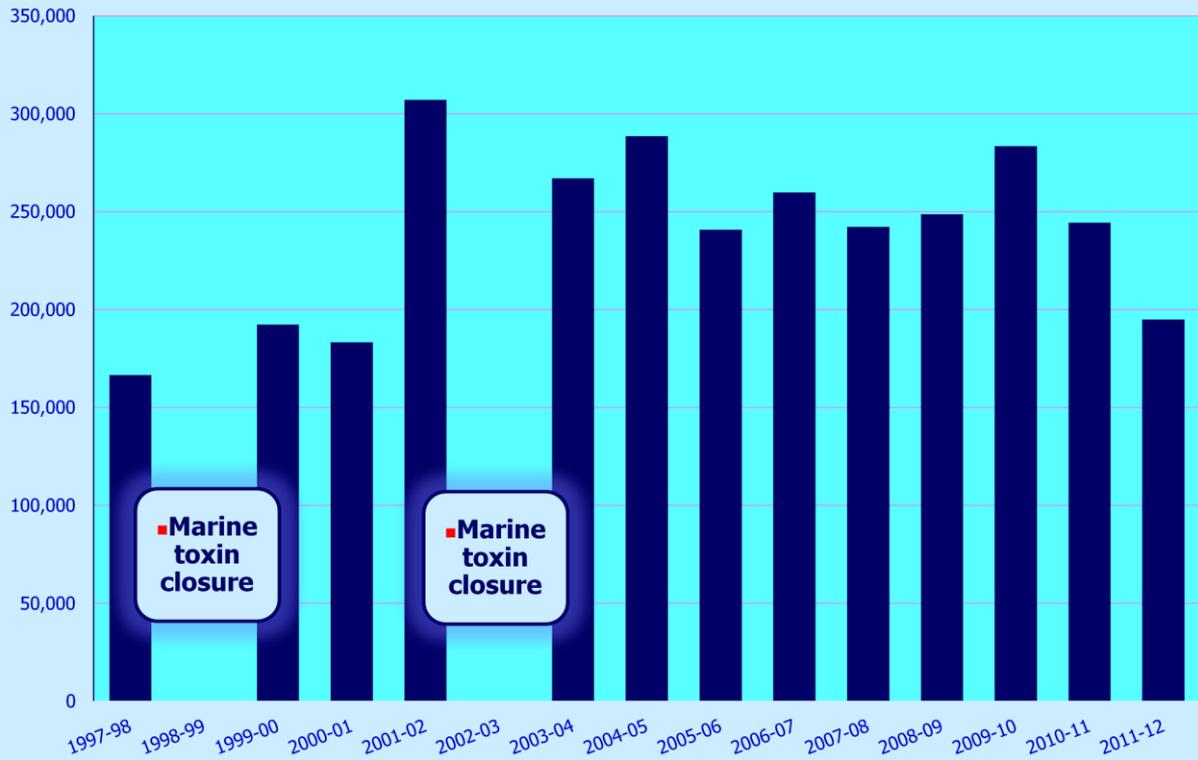
Going into the 2011-12 recreational razor clam season, we knew that the TAC values for most beaches were lower than they had been in many seasons. This was especially true at Copalis, one of the most popular beaches with a TAC that was 50% lower than the historical average. As a direct result, this season had the lowest total effort and total harvest since the 2000-01 season.

However, the 2011-12 season was not without its highlights.

- We were able to offer harvest during two weekends a month in November, December, February, March and April – on at least some beaches.
- November's dates included Thanksgiving weekend dig and with careful planning, we were able to include one day at Copalis.
- While there were no tides that coincided with the ever popular New Year's holiday period, we were able to offer an opener just prior to Christmas (Dec. 22 and 23.) These late afternoon openers proved to be very popular - although good weather and surf conditions likely played a part.
- In February 2012, for the first time in the history of our management of the fishery – the National Weather Service – in an official advisory, specifically advised razor clam diggers to be aware of potentially dangerous conditions caused by high surf. WDFW chose to pass on the NWS high surf advisory using our large razor clam email distribution list.
- With careful management, we were able to allow an opener that coincided with the very popular annual Ocean Shores Razor clam festival in March. This helped increase attendance for the festival and make it a very popular local event.
- WDFW and ONP agreed to wait until April before allowing the small razor clams the opportunity to grow. However, harvest during the three-day April opener (which had excellent weather conditions) was unsuccessful. No additional harvest occurred.

Washington Recreational Razor Clam Total Effort By Season 1997/98 through 2011/12

Digger trips



The economic impact of this fishery is also significant, especially during the quiet fall, winter and early spring months along the coast...the diggers that descend on these communities during monthly razor clam openings bring with them as much as \$22 million - during an average season. For more information see:

Dyson, K. and D.D. Huppert. 2010. Regional economic impacts of razor clam beach closures due to harmful algal blooms (HABS) on the Pacific coast of Washington. *Harmful Algae* 9: 264-271.

Washington Recreational Razor Clam

<i>20011-12 Season Totals</i>	HARVEST	EFFORT	<i>Average Daily Catch (clams/digger)</i>	<i>Total Digging Days</i>
Long beach	1,063,066	82,8471	12.8	23
Twin Harbors	563,138	40,632	13.9	26
Copalis	348,837	26,212	13.3	13
Mocrocks	597,700	44,002	13.6	20
Kalaloch	2,952	1,283	2.3	3
TOTAL	2,575,692	194,976	13.2	

Each of the five beaches is managed separately. A value for total allowable catch (TAC) is determined for each beach through 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. The average daily catch during the 2010-11 season was close to the legal daily bag limit of 15 clams per person. This was a good sign that even with some tough weather challenges, over the course of the entire season – most diggers took home their limit of 15 razor clams.

Month	Long beach	
October 2011	2 Days	Fri, Sat
November 2011	4 Days	Fri, Sat + Fri, Sat
December 2011	3 Days	Sat + Thu, Fri
January 2012	2 Days	Fri, Sat
February 2012	2 Days	Sat, Sun
March 2012	4 Days	Sat, Sun + Sat, Sun
April 2012	6 Days	Sat, Sun, Mon + Sat, Sun, Mon
May 2012	0 Days	
Totals:	23 Days	
	Effort = 82,847 digger trips	
	Harvest = 1,063,066 clams	
	(Including wastage of 3,000 clams)	
	Portion of TAC Harvested = 97.1%	

On Long Beach, 82,850 diggers we were able to try their hand at clam digging a total of 23 days - this compares to 35 days during the 2010-11 season.

Month	Twin Harbors	
October 2011	2 Days	Fri, Sat
November 2011	4 Days	Fri, Sat + Fri, Sat
December 2011	3 Days	Sat + Thu, Fri
January 2012	2 Days	Fri, Sat
February 2012	2 Days	Sat, Sun
March 2012	4 Days	Sat, Sun + Sat, Sun
April 2012	6 Days	Sat, Sun, Mon + Sat, Sun, Mon
May 2012	3 Days	Sat, Sun, Mon
Totals:		
	26 Days	
	Effort = 40,632 digger trips	
	Harvest = 563,138 clams	
	(Including wastage of 13,175 clams)	
	Portion of TAC Harvested = 91.4%	

Twin Harbors enjoyed more days of digging than any other beach with a total of 26 days. However, this is still a significant reduction over the 2010-11 season when we were able to offer 46 days. Digging success during several winter openers that experienced high surf and/or poor weather was very spotty. By the spring openers average catch rates improved considerably with an averages over 14.0 clams per digger trip during all the April and May open dates.

Month	Copalis	
October 2011	2 Days	Fri, Sat
November 2011	1 Days	Fri
December 2011	3 Days	Sat + Thu, Fri
January 2012	2 Days	Fri, Sat
February 2012	0 Days	
March 2012	3 Days	Sat, Sun + Sat
April 2012	2 Days	Sat + Mon
May 2012	0 Days	
Totals:		
	13 Days	
	Effort = 26,212 digger trips	
	Harvest = 348,837 clams	
	(Including wastage of 2,233 clams)	
	Portion of TAC Harvested = 93.9%	

The 13 days of harvest at Copalis during the 2011-12 season compares to 15 days in 2010-11; and 24 days in 2009-10.

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.

Month	Mocrocks	
October 2011	2 Days	Fri, Sat
November 2011	4 Days	Fri, Sat + Fri, Sat
December 2011	3 Days	Sat + Thu, Fri
January 2012	2 Days	Fri, Sat
February 2012	2 Days	Sat, Sun
March 2012	4 Days	Sat, Sun + Sat, Sun
April 2012	3 Days	Sat, Sun + Mon
May 2012	0 Days	
Totals:		
	20 Days	
	Effort = 44,002 digger trips	
	Harvest = 597,700 clams	
	(Including wastage of 6,700 clams)	
	Portion of TAC Harvested = 98.7%	

The 20 days of harvest at Mocrocks during the 2011-12 season compares to 20 days in 2010-11, 23 days in 2009-10.

It is interesting to note that while the 2011-12 season at Mocrocks had the same number of harvest days as the 2010-11 season - there were 6,600 more digger trips and 66,000 more clams harvested.

Mocrocks razor clam management beach is also 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.

Month	Kalaloch	
October 2011	0 Days	
November 2011	0 Days	
December 2011	0 Days	
January 2012	0 Days	
February 2012	0 Days	
March 2012	0 Days	
April 2012	3 Days	Sat, Sun, Mon
May 2012	0 Days	
Totals:	3 Days	
	Effort = 1,283 digger trips	
	Harvest = 2,952 clams	
	Portion of TAC Harvested = 2.0%	

WDFW and Olympic National park jointly made a decision to forgo harvest at Kalaloch during the 2011-12 season – until April. The plan was to provide the population on this beach a chance to recover from the decline it has experienced since 2009. The three day April opener was designed to provide a limited harvest opportunity. The weather and surf conditions during the opener were excellent, however digger success was very poor (an average of only 2.3 clams per digger trip). No additional harvest was scheduled during the 2011-12 season. The Quinault Indian Nation (QIN) and the Hoh Tribe both have federally adjudicated fishing rights on this beach and we share the total allowable catch (TAC) 50/50 and these two tribes. More details on state/tribal co- management of razor clams in Washington are found later in this presentation. In addition, because Kalaloch falls within the boundaries of the Olympic National Park - WDFW works very closely with staff at Olympic National Park in the joint management of the Kalaloch razor clam recreational fishery.

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. In fact, coast-wide a total of 24.6% 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 22% of planned razor clam digging opportunities have been lost due to high domoic acid levels, with the vast majority due to domoic acid.

This slide details the dangers domoic acid – in high levels – presents. More details can be found on the WDFW web site at :

http://wdfw.wa.gov/conservation/research/projects/algal_bloom/index.html

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 (as recently as the 2009-10 season when PSP persisted through the winter months and resulted in Long Beach having its January opener cancelled).

DSP Toxin

Diarrhetic Shellfish Poisoning (PSP)

- Produced by a dinoflagellate (*Dinophysis sp.*)
- Okadaic acid
- Causes nausea, vomiting, abdominal pain, and diarrhea, with diarrhea being the most commonly reported symptom
- No antidote
- Not destroyed by cooking/freezing
- Not easily detected

What is okadaic acid?

Okadaic acid is a naturally occurring marine toxin, called a “biotoxin”, that is produced by microscopic algae, specifically, the dinoflagellate *Dinophysis*. Shellfish eat these algae and can retain the toxin, sometimes at levels that can make people sick. Okadaic acid causes Diarrhetic Shellfish Poison (DSP) in humans who eat shellfish contaminated with the toxin.

What types of shellfish are affected?

All species of shellfish including clams, mussels, oysters, geoduck, and scallops are able to accumulate DSP toxin.

How do shellfish become contaminated with DSP?

Shellfish are filter feeders. They pump water through their systems, filtering out and eating algae and other food particles. When shellfish eat biotoxin producing algae, the biotoxin can accumulate in their tissue.

What causes unsafe levels of DSP?

It is normal for biotoxin producing algae to be present in marine water, usually in low numbers that cause no problems. The algae that produces the DSP toxin has been detected in Washington’s marine waters for some time, but has not produced toxin. That changed in June 2011 when the first confirmed DSP illnesses were

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 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.’”

Throughout the 2011-12 razor clam season, in regular tests of razor clam tissue, levels of both the toxin that produces PSP and domoic acid remained at very low, background levels. As of this writing (Sept. 13, 2012) levels of both toxins continue to remain low. However, experience tells us that this can change rapidly and levels of these toxins can accumulate in razor clams fairly quickly. Together with the Washington Department of Health we will continue to collect and test razor clam samples just prior to every opener to insure the clams you are harvesting and consuming are safe.

<http://www.nwfsc.noaa.gov/orhab/>



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The ORHAB project is bringing knowledge to the local communities on the Olympic peninsula of the Washington State coast, empowering the tribes and state managers to make scientifically-based decisions about managing and mitigating harmful algal bloom (HAB) impacts on coastal fishery resources.

The ORHAB Partnership was formed in June 1999 by local residents and coastal communities' in response to seemingly random closures of the shellfisheries due to outbreaks of marine biotoxins (Paralytic Shellfish Poison, PSP) and domoic acid contamination of razor clams. It became clear that in order to manage these outbreaks there was a need to better understand underlying dynamics of these disruptive HAB events. These research efforts, made possible by federal funding from NOAA, have been underway since the summer of 2000.

To find out more about ORHAB and HABs, please visit the navigation bar on the left.



[Acknowledgments](#) | [Disclaimer](#)

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In regards to monitoring and studying harmful algal blooms (HAB) and the resulting toxins, WDFW and WDOH do not operate alone. We are part of a larger partnership of agencies, tribes and universities all interested and involved in HAB monitoring and research.

For more information see :

http://wdfw.wa.gov/conservation/research/projects/algal_bloom/index.html

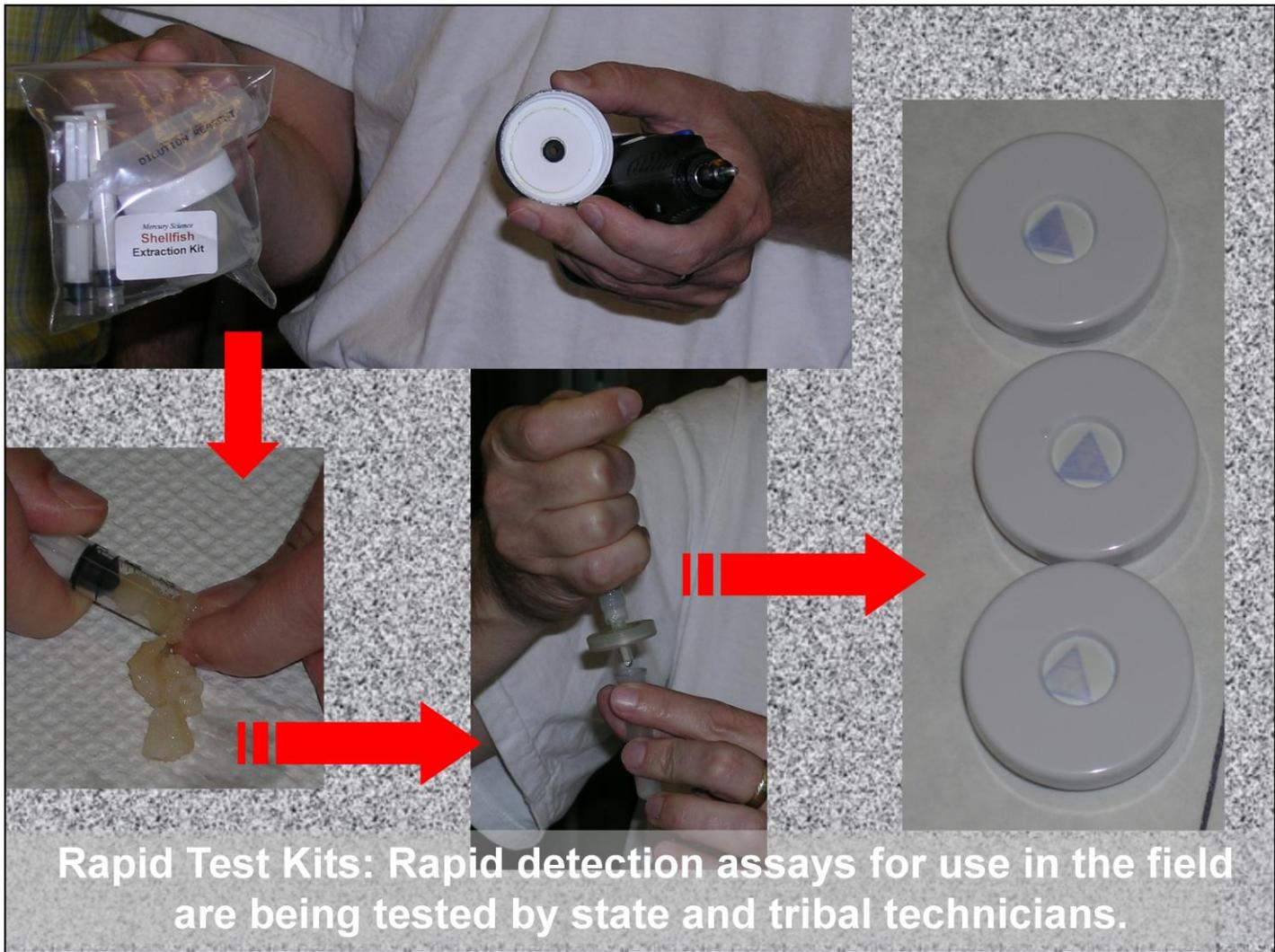


**WDFW's role:
monitor surf zone
plankton,
toxins, and
water quality...**



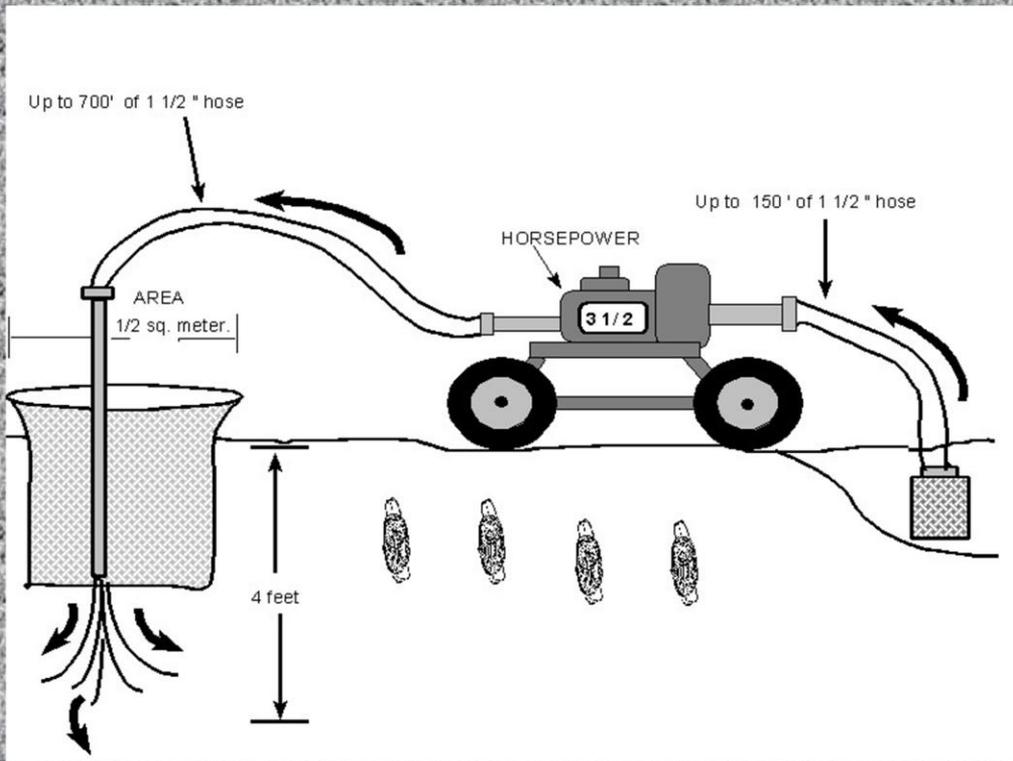
**...to determine
the environmental
conditions associated with blooms
of *Pseudo-nitzschia* species.**

To conduct WDFW's work with monitoring for HABs a staff member has received training by University and federal experts. He makes regular collections of plankton samples from the surf zone and then analyzes them to determine the presence of toxic cells. The data received from this monitoring program can provide us advance notice of pending problems and give us time to adjust openers and give razor clammers a heads up of what may be coming.



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 shellfish tissue without having to wait for the current time-consuming transport of samples to a distant laboratory.

Status of the Razor Clam Stocks



We can now turn our attention to the work WDFW does to annually determine the number of razor clams available on each beach.

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



...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 8th and for the most part was completed by late August.

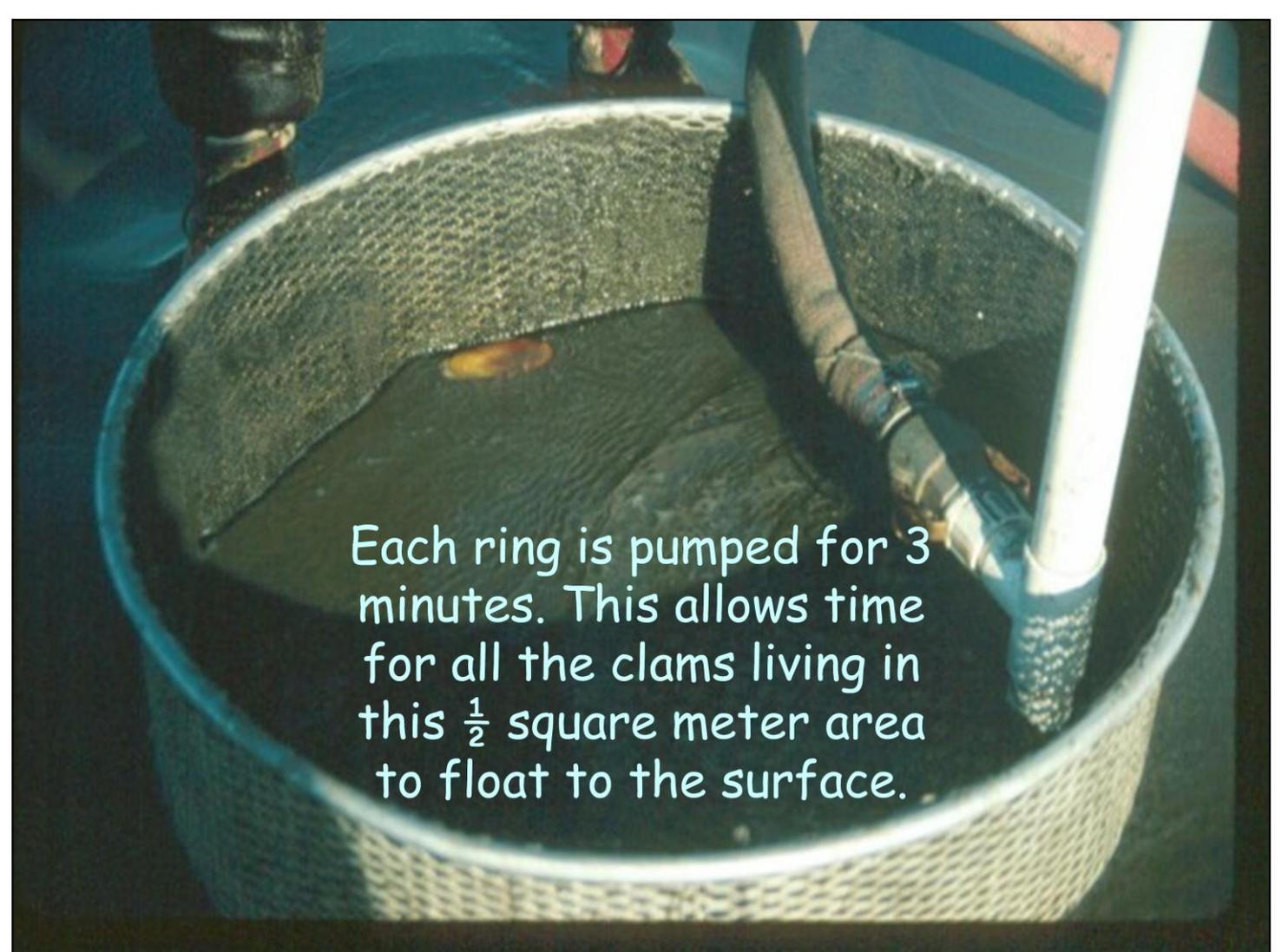
The survey method WDFW has been using since 1997 is the Pumped Area Method...all the historical population data reported later in this report includes only the years back to 1997. It is difficult to compare the population results from the new survey method with those generated by previous survey methods.

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.



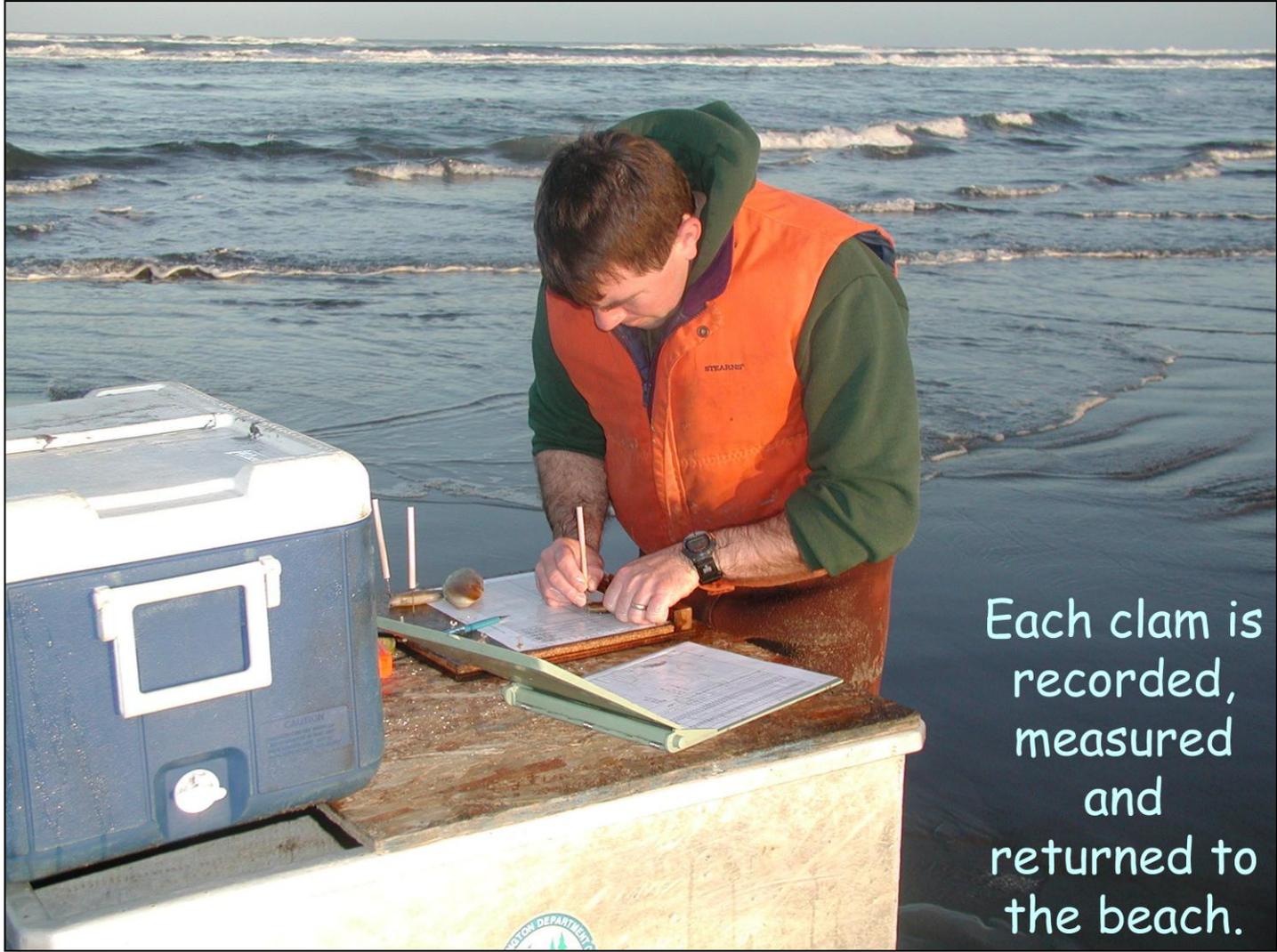
Water is pumped up the beach
and used to liquefy the sand
within a $\frac{1}{2}$ square meter
aluminum ring.

The Pumped Area Method uses water (pumped from the surf or a nearby lagoon) to liquefy the sand within an aluminum ring that is exactly $\frac{1}{2}$ square meter in area. Every clam that is within the area of the ring will float to the surface and can be counted as part of the random sample. The clams sampled range in size from full grown adults (6 inches plus) down to juvenile clams that are as small as 5 mm and have only recently settled into the sand from the larval stage. This provides us a way to make estimates for both the recruit sized clams (\leq or $<$ than 75 mm) and the pre-recruits clams ($>$ 75 mm). Any previous stock assessment method did not provide a basis for estimating pre-recruits.



Each ring is pumped for 3 minutes. This allows time for all the clams living in this $\frac{1}{2}$ square meter area to float to the surface.

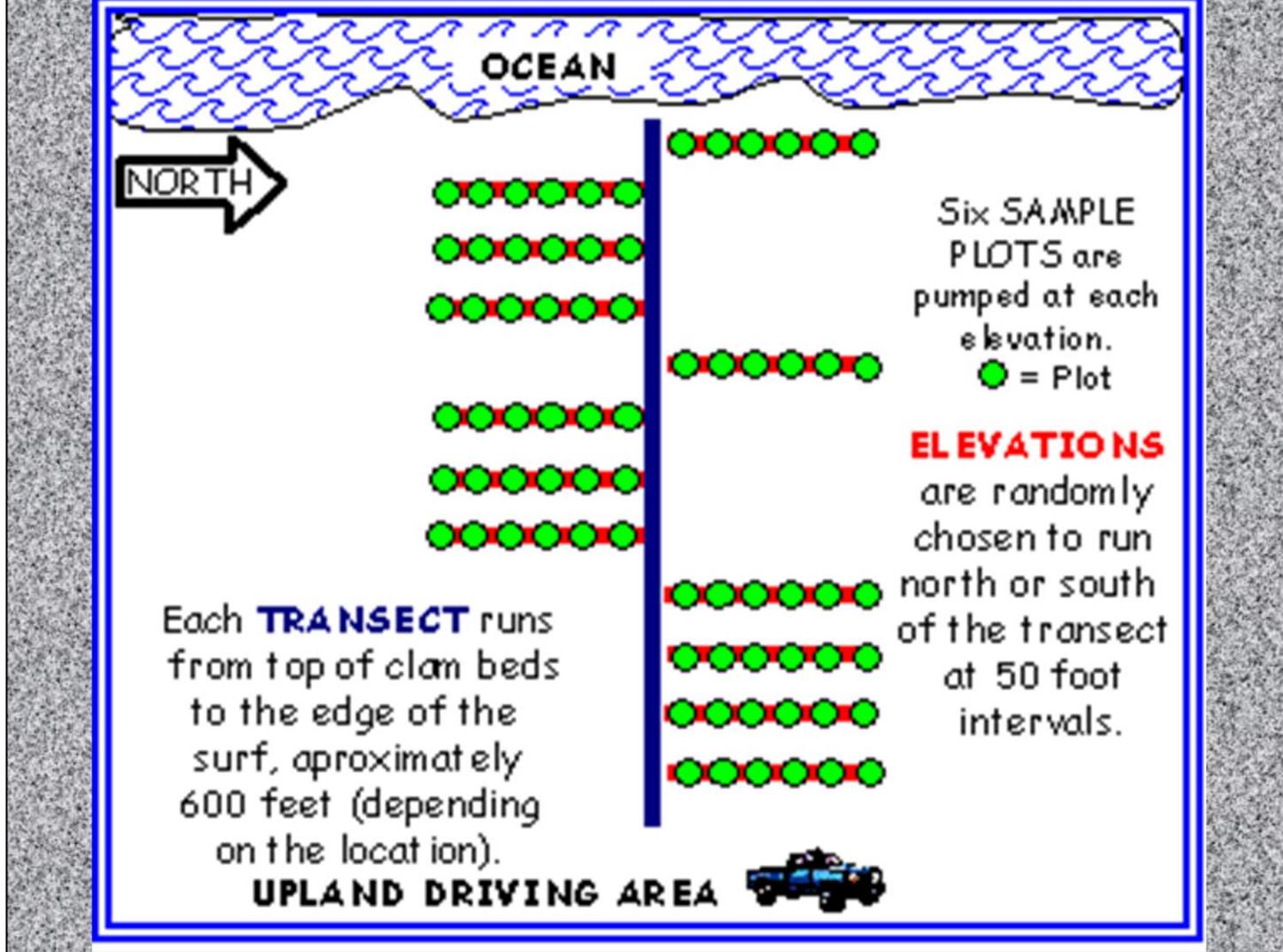
Each ring is pumped for 3 minutes allowing time for all the clams in the area of the ring to float to the surface and be pumped.



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

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.



Each of the five management beaches is sampled with randomly selected transects chosen approximately 1 mile apart. The sampling occurs during 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 50 foot intervals.



2012 Stock Assessment - Results

Good news! Our 2012 stock assessment shows that razor clam populations on all beaches, except at Kalaloch, show strong increases in the number of harvestable size clams and we are looking forward to a really great season. Kalaloch razor clam populations remain very weak.

How many days can we dig?

Stock assessment data :

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

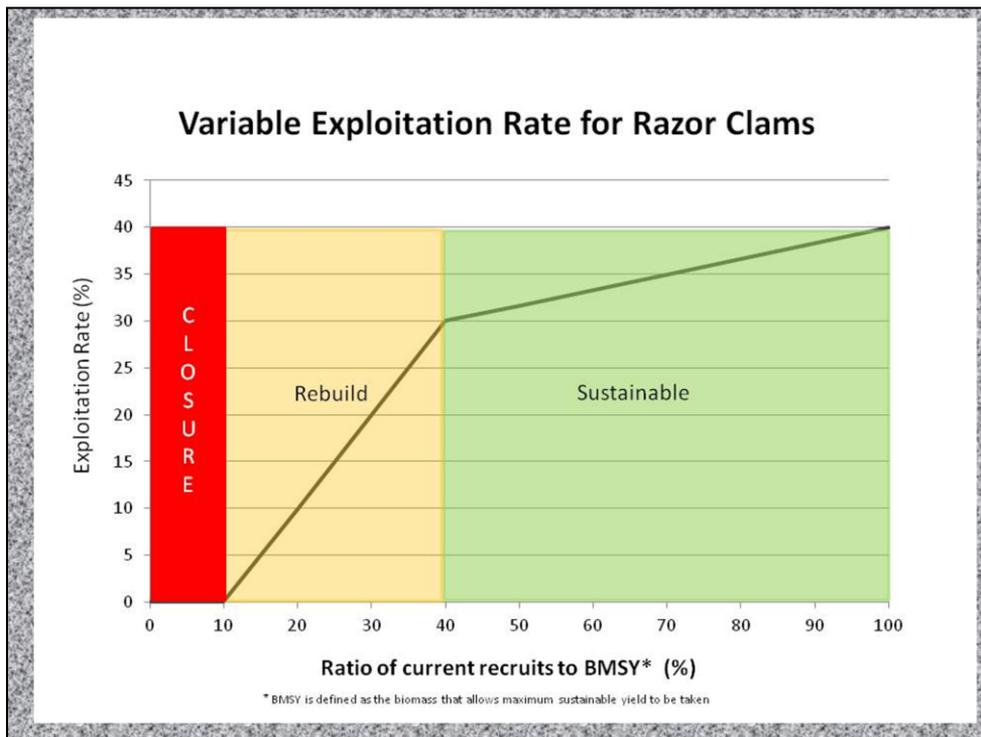
TAC (total allowable catch) =

Total clams 3 inches or greater x
current harvest rate of 30.0%.

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

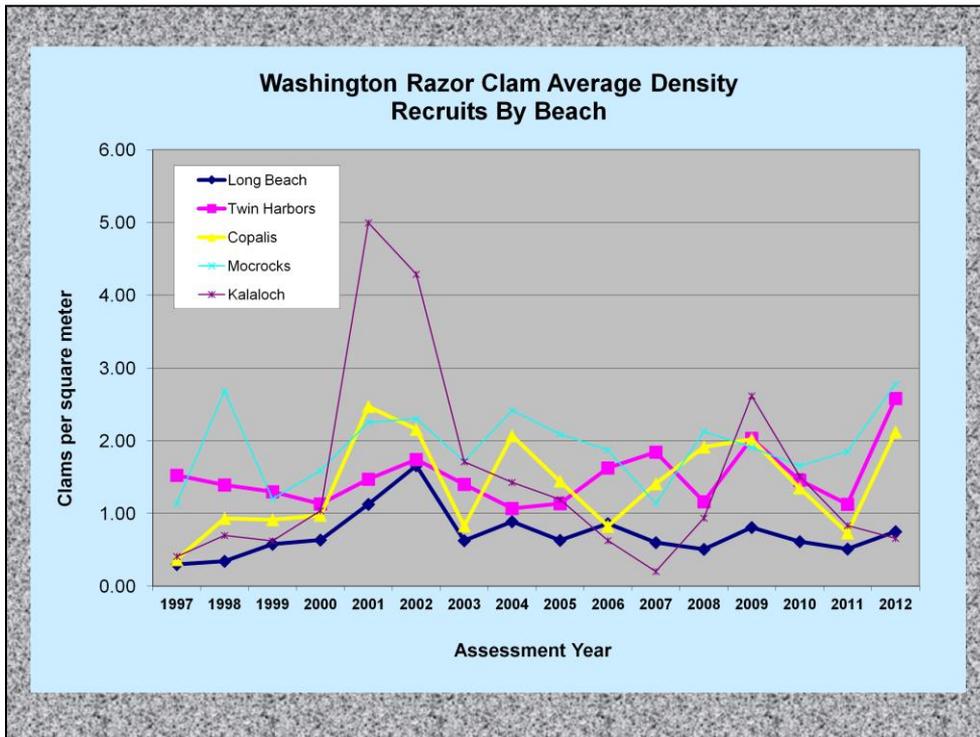
The stock assessment data provides us with estimates of the total number of clams and their average size. We use that to estimate the total number of clams that are at or over 3 inches (this size at which razor clams generally begin to make a clear “show” and are harvestable. The total allowable catch (TAC) for each beach is then calculated at 30% of the total number of clams at or over 3 inches.

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.



A new method of determining Total Allowable Catch (TAC): With the 2012-13 recreational razor clam season, WDFW is implementing a new management strategy for Long Beach and Twin Harbors. Rather than using a Static Exploitation Rate (ER) of 30%, we will be using 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 BMSY. The BMSY is practically defined as the highest historical density of clams for each beach.

This new 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 BMSY an automatic rebuilding strategy is employed. Anytime a population drops below 10% of BMSY then a fishery closure is automatically implemented.



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 to 1997. It is clear from this data that razor clam populations naturally move up and down 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. It is also easy to see that and this 16 year period, Mocrocks has the most dense populations, with Kalaloch, Copalis and Twin Harbors all having very similar overall densities. Long Beach in general has the least dense populations. This pattern compares very favorably to the long term history of Washington razor clam populations. The next several slides will show the specific data from each beach as measured in total number of clams. However, keep this chart comparing average density over all beaches in mind as you review the beach specific data.

In 2012 the average density (clams per square meter) by beach is : Long Beach = 0.75; Twin Harbors = 2.58; Copalis = 2.12; Mocrocks = 2.78; Kalaloch = 0.66.

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

YEAR	POPULATION (clams)		TAC (clams) Harvest rate @ 30%	HARVEST	% of TAC
	RECRUITS	PRE-RECRUITS	of recruits	TOTAL (clams)	harvested
2008-09	3,509,940	5,894,291	1,052,982	1,031,223	97.9%
2009-10	5,611,837	3,582,973	1,683,551	1,422,020	84.5%
2010-11	4,254,159	13,652,853	1,276,248	1,170,069	91.7%
2011-12	3,648,805	2,781,402	1,094,642	1,063,066	97.1%
2012-13	5,356,383	14,450,287	1,847,952*		
AVERAGE	4,476,225	8,072,361		1,171,559	

The 2012 assessment work shows a strong increase in both recruit and pre-recruit clams on Long Beach. Diggers can expect more days of harvest as a result of this stronger populations. The average density of razor clams on Long Beach is estimated from the 2012 assessment work to be 0.75 clams per square meter with the 15-year average density at 0.71 clams per square meter.

* The 2012-13 TAC was determined using the Variable Exploitation Rate. The current Long Beach razor clam recruit population 67.3% of the BSMY which was used to calculate a Variable Exploitation Rate for the 2012-13 season at Long Beach at 34.5%. See page 31 for more details.

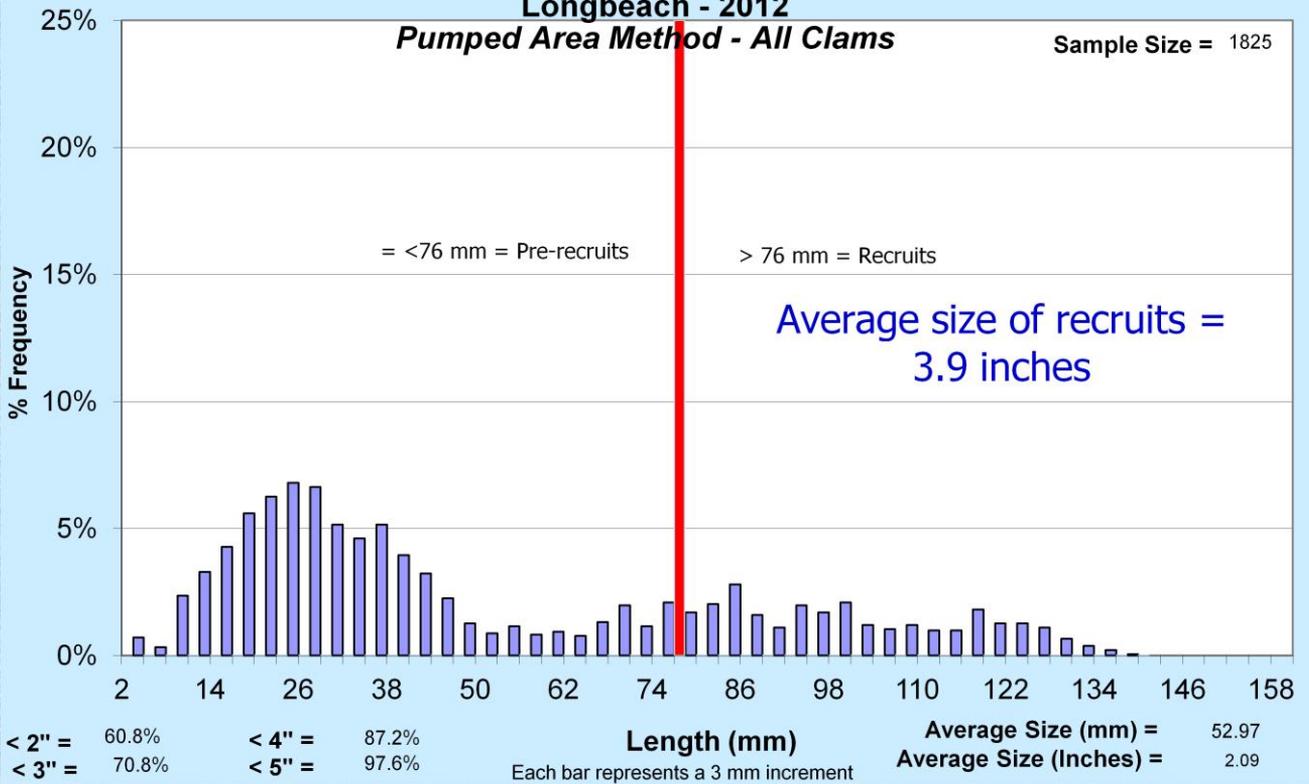
Washington Razor Clam

Size Frequency Distribution

Longbeach - 2012

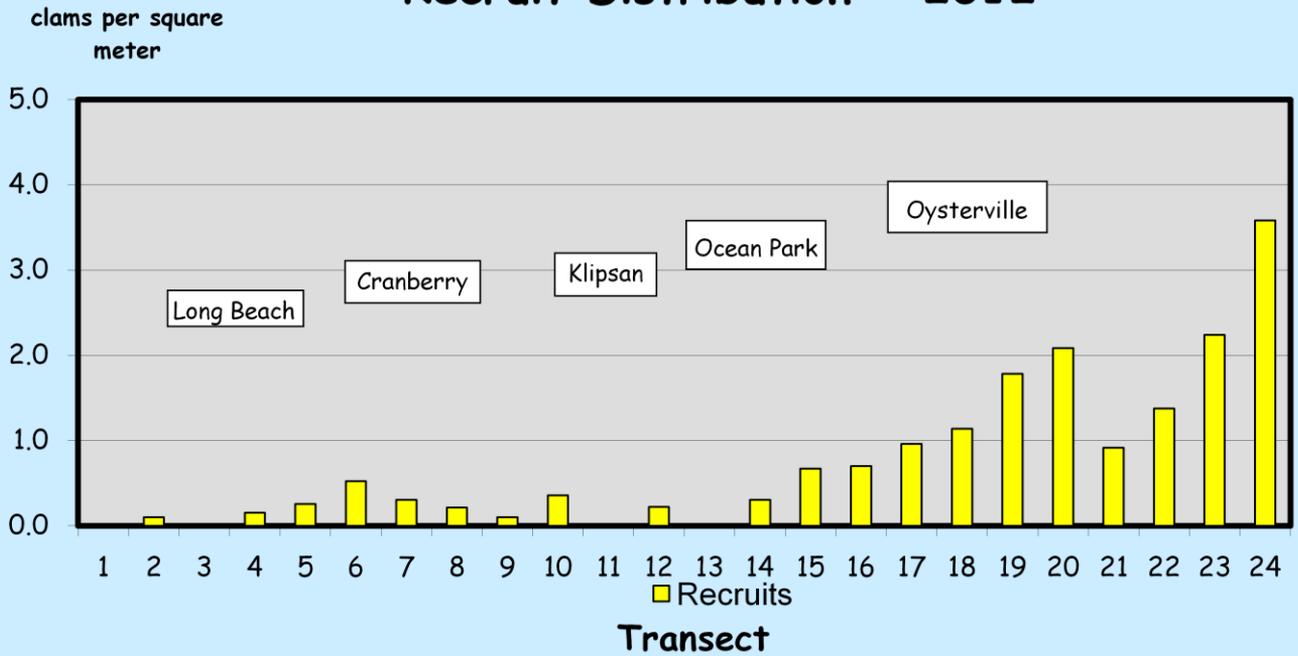
Pumped Area Method - All Clams

Sample Size = 1825



The average size of the Long Beach recruit clams found in our summer surveys was 3.99 inches is just slightly smaller than 2011 of 4.1 inches and a little larger than the 2010 average of 3.91 inches.

Long Beach Razor Clam Population Recruit Distribution - 2012



As is typically the case at Long Beach, the better digging is on the north end of the beach.

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

YEAR	POPULATION (clams)		TAC (clams)	HARVEST	% of TAC harvested
	RECRUITS	PRE-RECRUITS	of recruits	(clams) TOTAL	
2008-09	2,241,658	4,145,700	672,497	565,138	84.0%
2009-10	3,925,788	2,500,305	1,177,736	840,119	71.3%
2010-11	2,818,092	2,859,722	845,428	674,714	98.8%
2011-12	2,054,381	5,571,684	616,314	563,138	91.4%
2012-13	4,704,458	8,757,897	1,881,783*		
AVERAGE	3,148,875	4,767,041			

The total number of 4.7 million recruits we estimate following our 2012 stock assessment is exceptional and exceeds any population we have measured on this beach in the last 16 years - and is more than double the 2011 estimate. This translates to a density of 2.58 clams per square meter. The only beach that exceeds this density in 2012 is Mocrocks.

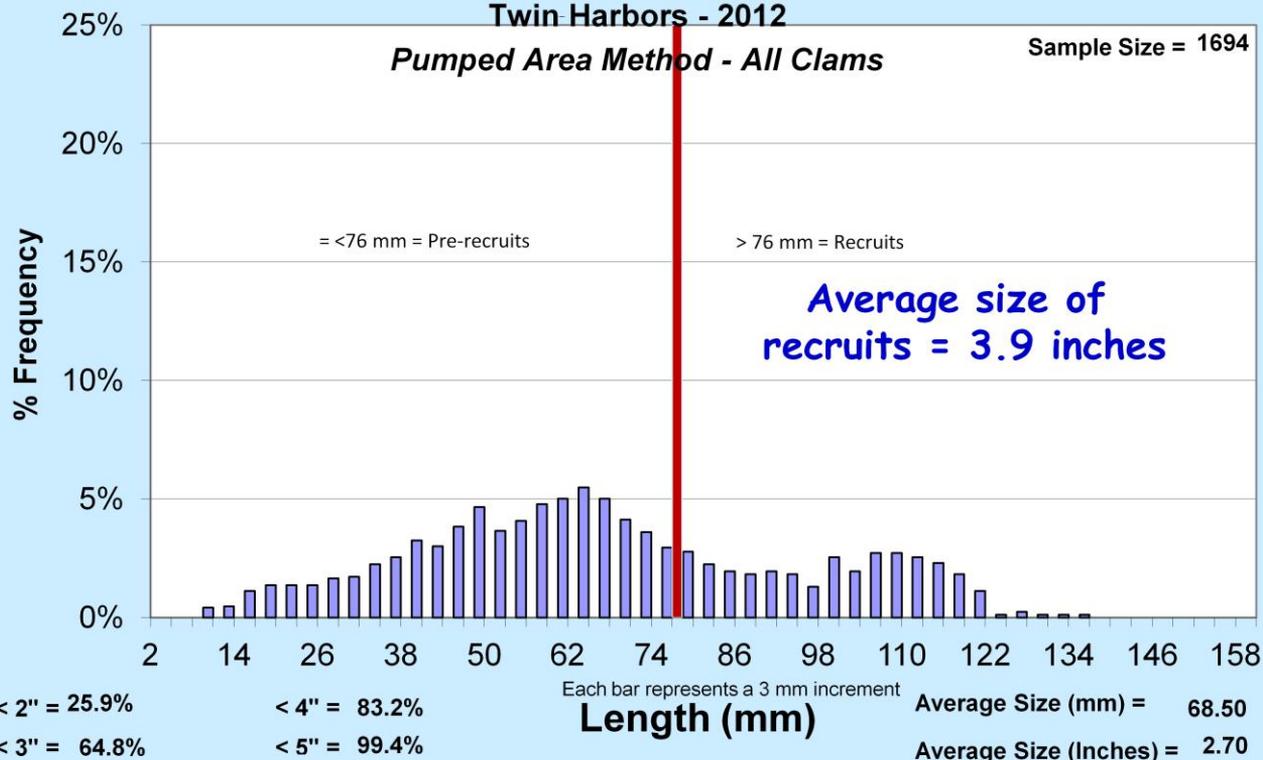
* The 2012-13 TAC was determined using the Variable Exploitation Rate. The current Twin Harbors razor clam recruit population 100% of the BSMY which was used to calculate a Variable Exploitation Rate for the 2012-13 season at Long Beach at 40% (the maximum allowed). See page 31 for more details.

Washington Razor Clam

Size Frequency Distribution
Twin Harbors - 2012

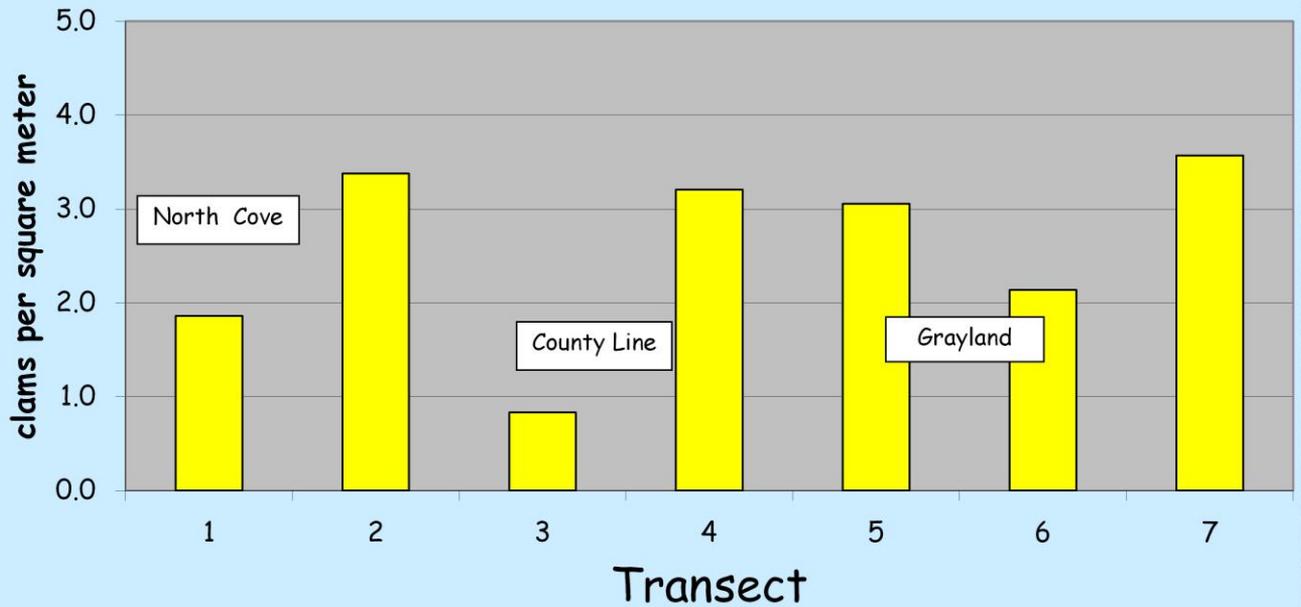
Pumped Area Method - All Clams

Sample Size = 1694



The average size of the Twin Harbors recruit clams found in our summer 2012 surveys was 3.92 inches which is larger than the 2011 average of 3.68 inches.

Twin Harbors Razor Clam Population Recruit Distribution - 2012



The 2012 assessment found good densities of clams at the most all locations along the Twin Harbors beach.

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

YEAR	POPULATION (clams)		TAC (clams)	State's Share	State's HARVEST	% of share harvested
	RECRUITS	PRE-RECRUITS	Harvest rate @ 30% of recruits	(50% w/ adjustments)	(clams) TOTAL	
2008-09	6,453,563	9,953,166	1,936,069	968,034	963,497	99.5%
2009-10	6,810,540	608,425	2,043,162	1,021,581	1,000,413	97.9%
2010-11	4,554,449	6,791,312	1,366,335	683,167	674,715	98.8%
2011-12	2,475,820	7,344,699	742,746	371,373	348,837	93.9%
2012-13	7,151,264	9,898,813	1,072,690			
AVERAGE	5,489,127	6,919,289				

Razor clam populations at Copalis are also showing a very strong increase in both recruits and pre-recruits. The density of recruits is 2.12 clams per square meter and this exceeds the 16 year average of 1.41 clams per square meter.

Washington Razor Clam

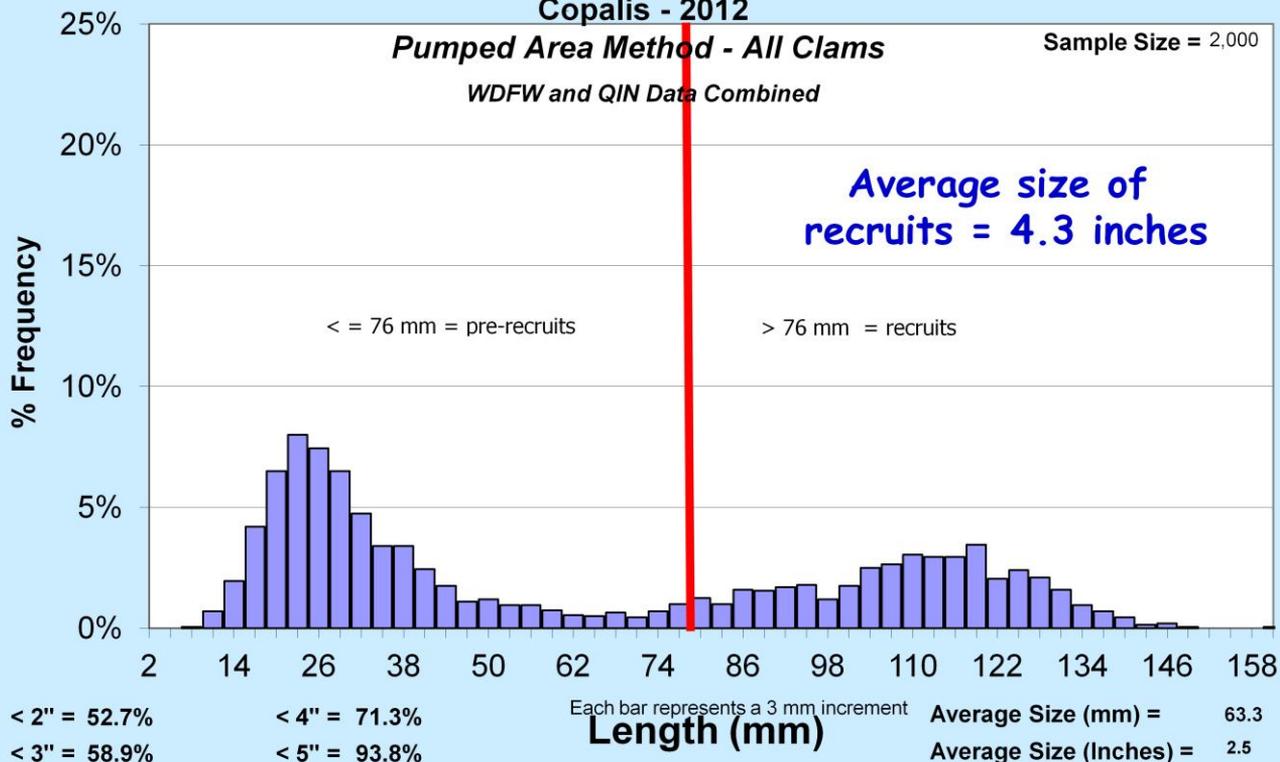
Size Frequency Distribution

Copalis - 2012

Pumped Area Method - All Clams

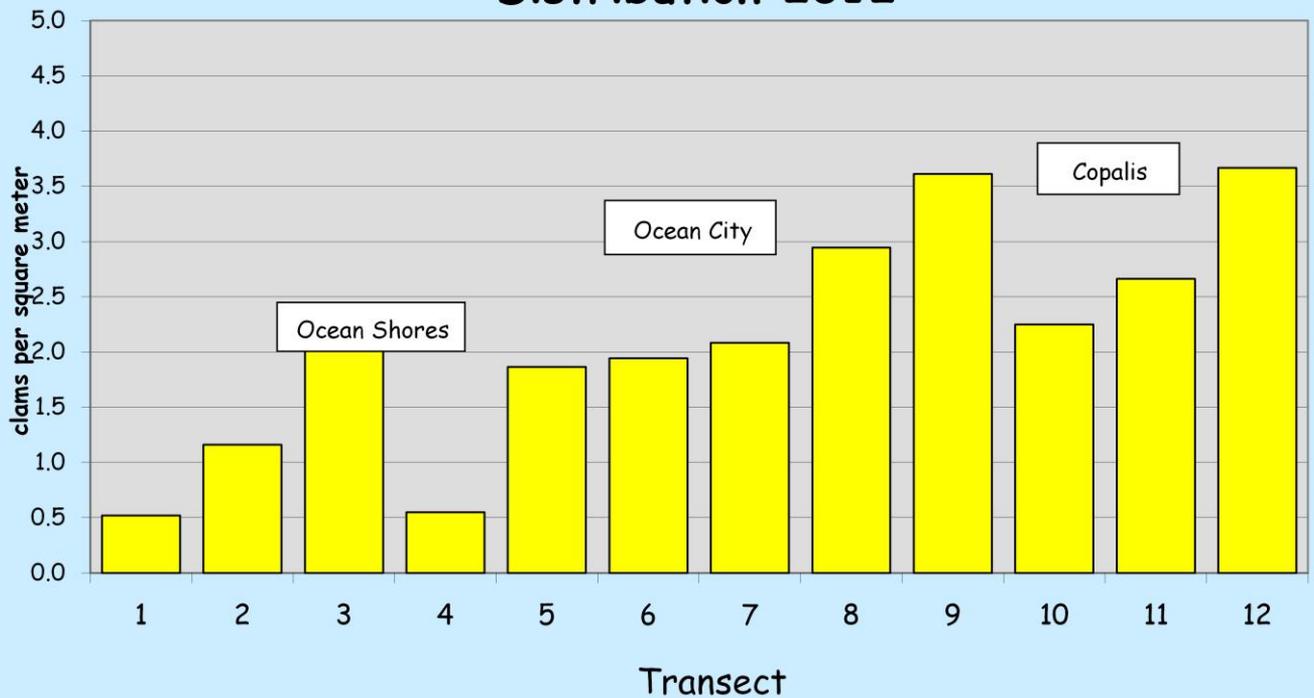
Sample Size = 2,000

WDFW and QIN Data Combined



The average size of the Copalis recruit clams found in our summer surveys was 4.3 inches which is larger than the 2011 average of 4.0 inches.

Copalis Razor Clam Recruit Population Distribution 2012



The southern boundary for our stock assessment at Copalis is 0.2 miles south of the Tarus Beach Approach. Beyond that razor clam populations are sparse.

Except for the traditionally lower densities of razor clams on the southern extreme of razor clam population on Copalis – the clams are fairly evenly distributed and show a strong increase in most all areas.

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

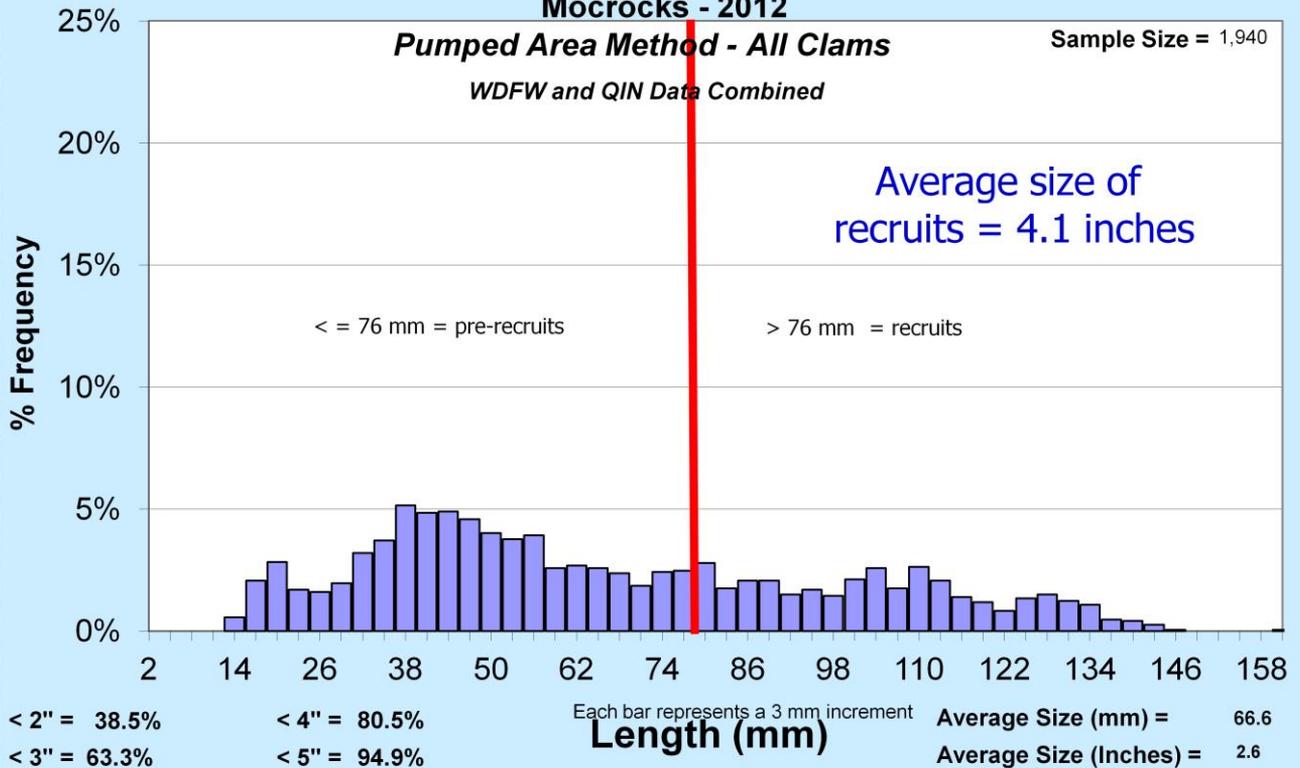
YEAR	POPULATION (clams)		TAC (clams)	State's Share	State's HARVEST	% of share harvested
	RECRUITS	PRE-RECRUITS	Harvest rate @ 30% of recruits	(50% w/ adjustments)	(clams) TOTAL	
2008-09	4,678,093	5,058,265	1,403,428	701,714	656,309	93.5%
2009-10	4,197,541	1,414,149	1,259,262	629,631	496,303	78.8%
2010-11	3,637,245	18,064,334	1,091,174	545,587	531,766	97.5%
2011-12	4,038,871	8,211,211	1,211,661	605,831	597,700	98.7%
2012-13	6,064,416	10,276,881	909,667			
AVERAGE	3,810,968	7,135,074				

Mocrocks continues to be “razor clam central” and this year’s population is the strongest in the last 16 years (when we starting using the pumped area method of stock assessment). In addition, the strong number of pre-recruit clams likely will mean that this populations will be strong into the future.

As always there may be periods during the coming season when Mocrocks is open when other beaches are not. It will be important for diggers to know which beach they are planning to harvest on and to pay attention to signs posted on beach approaches that would indicate a specific beach is closed to harvest.

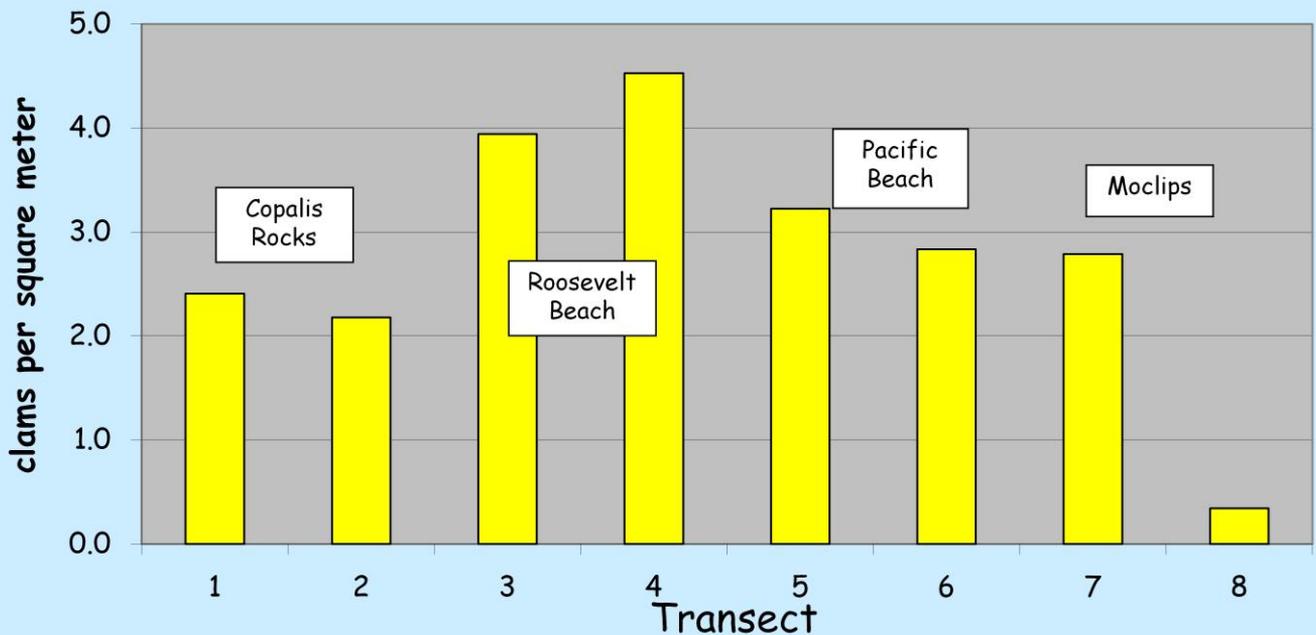
Washington Razor Clam

Size Frequency Distribution Mocrocks - 2012



Consistent recruitment (successful spawning) of razor clams at Mocrocks - over time is very evident with clams of most sizes present in our samples. Diggers will find a mix of both larger and smaller clams on this beach. We want to remind everyone that they are required to keep the first 15 clam regardless of size or condition.

Mocrocks Razor Clam Population- 2012 Recruit Distribution



Razor clam densities this year (2012) at Mocrocks are strong everywhere except the very north end of the beach. The two transects north and south of Roosevelt beach approach have the highest razor clam density (clams per square meter) of any location on the entire Washington coast.

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) TOTAL
	RECRUITS	PRE-RECRUITS	of recruits	SHARES	
2008-09	1,263,639	6,034,937	320,964	160,482	0
2009-10	3,532,257	3,251,387	897,193	448,597	46,373
2010-11	2,038,773	3,042,018	517,848	258,924	14,345
2011-12	1,138,272	2,321,662	289,121	144,561	2,952
2012-13	894,041	903,369	227,086	113,543	
AVERAGE	1,773,396	3,110,715			

A continued decline in recruit razor clam populations at Kalaloch is evident in this table. This population level is not unprecedented. In the last 16 years populations on this beach have been lower in 3 separate years. The average density of razor clams on Kalaloch is estimated from the 2012 assessment work to be 0.66 clams per square meters, more than 50% less than the 16-year average density which is 1.48 clams per square meter.

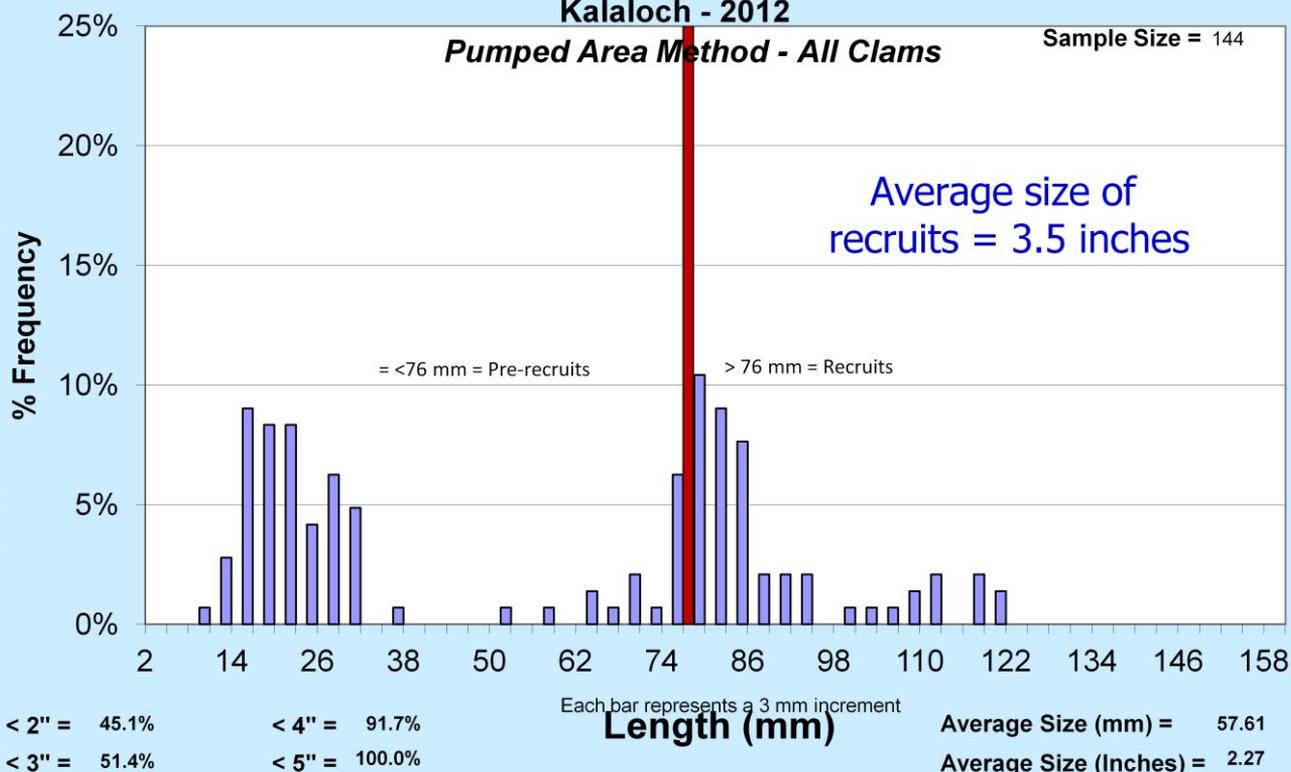
Recall that the Olympic National Park works closely with WDFW staff in the management of the recreational fishery on the Kalaloch beach. WDFW takes the lead in the population assessment work. ONP has the lead in harvest monitoring and enforcing the recreational fishery. Both groups work together to set specific dates when harvest will occur on this beach.

Washington Razor Clam

Size Frequency Distribution Kalaloch - 2012

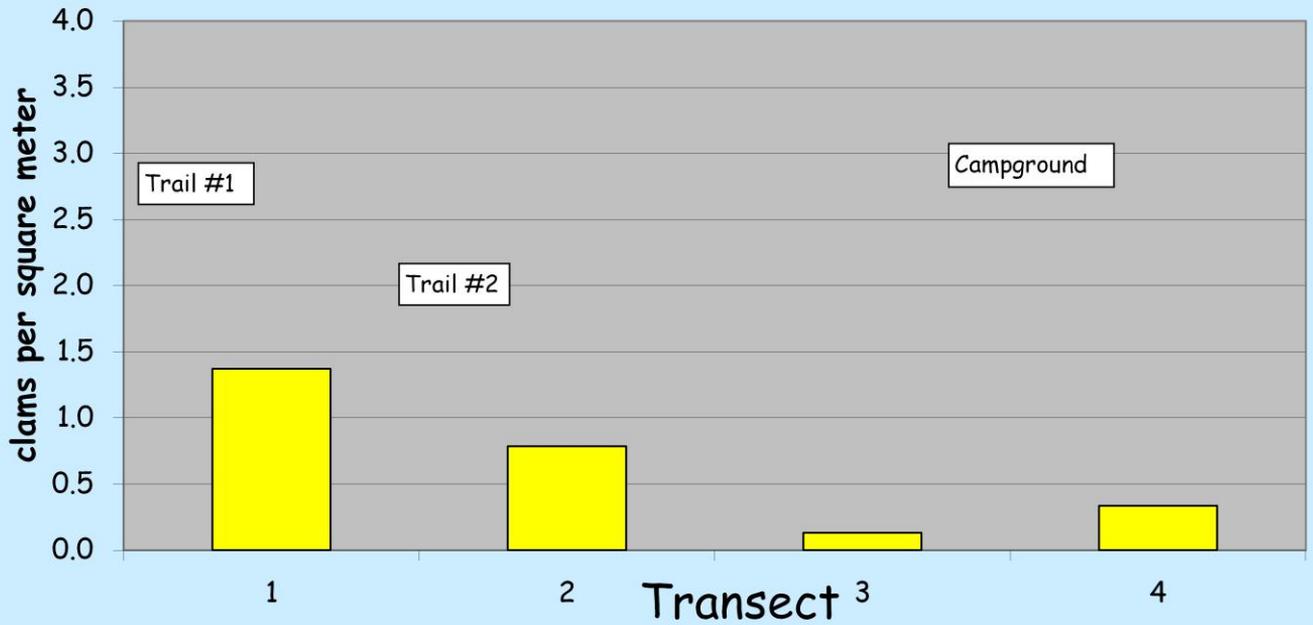
Pumped Area Method - All Clams

Sample Size = 144



Very few large clams were present during the summer 2012 assessment, with the average size of the recruits very small at 3.5 inches.

Kalaloch Clam Population Distribution - 2012



The only location on Kalaloch beach that shows an increase in the number of recruits is the transect at the south end near ONP Beach Trail #1.

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.

Tribal staff working on Copalis beach



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 $\frac{1}{2}$ of the sample transects are completed by QIN staff and $\frac{1}{2}$ 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 and walk sometime long distances down 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 QUINAULT 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 coastal 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.

	2012-13 TAC Share (clams)	2011-12 aver daily harvest (clams)
Long Beach	1,847,952*	46,200
Twin Harbors	1,881,783*	21,700
Copalis	1,072,690	26,800
Mocrocks	909,667	29,900
Kalaloch	113,543	

This is a recap of the 2012-13 Total Allowable Catch that will guide WDFW during the 2011-12 season. We also list here the average catch over all the days the 2011-12 season was open, by beach – except for Kalaloch where the harvest levels were very poor and not representative of a normal situation.

** The 2012-13 TAC for both Long Beach and Twin Harbors was determined using the Variable Exploitation Rate. See page 36 for more details.

SEASON OPTIONS

What do you think???

- Fall and Winter and/or Spring season only?
- Weekends (Friday/Saturday or Saturday/Sunday)?
- Weekdays (especially if daylight tides) ?
- Fewer winter and more spring tides.
- Two days / twice a month ???

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

However, 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 feedback on this method of
providing razor clam information – and any season structure
comments you might have.

How to get updated razor clam season information:

WDFW Web Site: <http://wdfw.wa.gov/>

Shellfish Rule Change Hotline: 1-866-880-5431

**Region Six (Montesano) 24 hour recording:
360-249-4628**

E-mail distribution list : sign up today.



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E-mail distribution list : sign up today.

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

>>> Dan Ayres 08/14/03 12:26PM >>>

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.

DOMOIC ACID UPDATE

The latest domoic acid levels were reported today(8/14/03) by the Washington Department of Health. Levels continue to drop on most all beaches, improving the chances for a fall season.

Long Beach Reserve; 3 ppm on 8/11/02 (down from 9 ppm on 7/15/03)

Twin Harbors Area CL; 17 ppm on 8/11/03 (up from 10 ppm on 7/15/03)

Copalis; 17 ppm on 8/11/03 (down from 36 ppm on 7/15/03)

Mocrocks; 12 ppm on 8/11/03 (down from 24 ppm on 7/21/03)

Kalaloch; 22 ppm on 8/10/03 (down from 28 ppm on 7/29/03)

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



WDFW's goal is to provide maximum harvest opportunities that are safe and enjoyable experiences.

Thanks again for visiting this presentation!

Dan L. Ayres

Coastal Shellfish Lead Biologist

Washington State Department of Fish and Wildlife

Region Six

48 Devonshire Road

Montesano, WA 98563 USA

Telephone: 360-249-4628 (ext. 209)