

Washington Razor Clam Management



Setting the 2011-2012 Season

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

As we did last year, 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. For the 2011-2012 season public input is being solicited through the internet and via email.

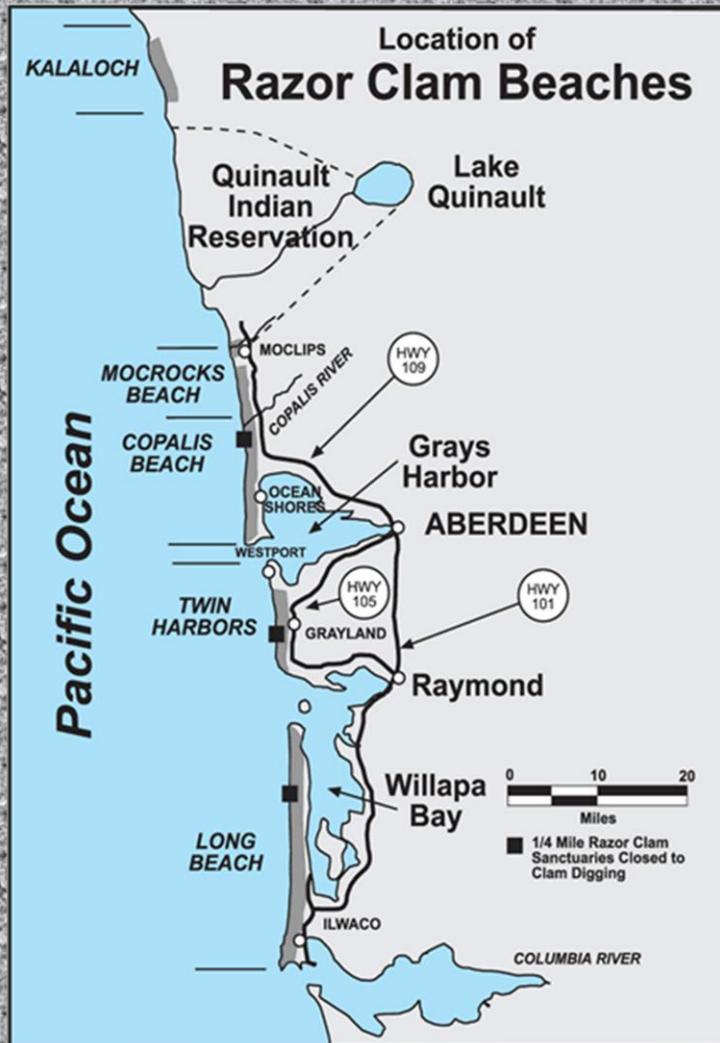
The following presentation is designed to provide you with much of the same information – in a similar format that has traditionally been used in the meetings.

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 SLIDE SHOW

- Review of the 2010-11 Season
- Marine Toxin Update / ORHAB
- Status of Razor Clam Stocks
- Tribal Co-management
- Season Options for 2011-12



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 54 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*), Mocoocks, 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.

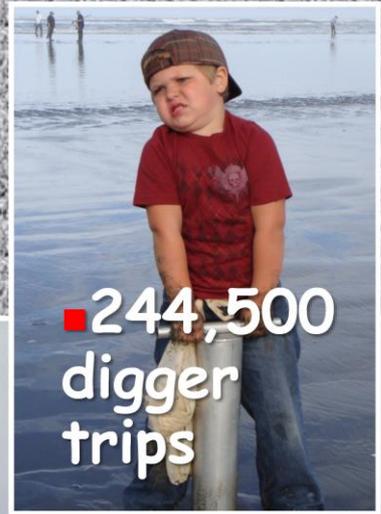
Note that the management of the recreational razor clam fishery at Kalaloch occurs in cooperation with the Olympic National Park.

2010-2011 Fishery Review

■ 3.2 million clams harvested.



■ 244,500 digger trips



■ Average of 13.1 clams per digger trip



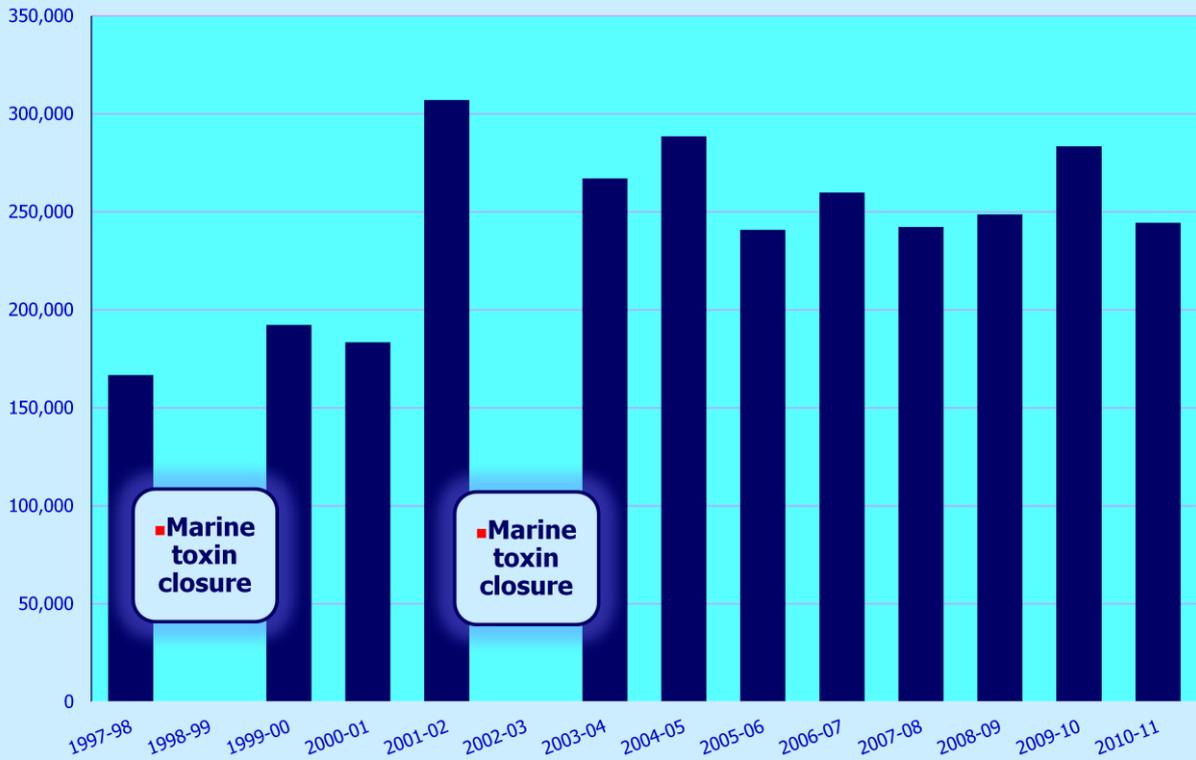
The 2010-11 fishery was successful on many levels – each opener had some unique challenges - often with good weather one day followed by extremely rough weather the next.

The season's highlights include:

- WDFW offered Harvest openers during every month between October and May.
- In addition, some beaches had two openers in November, December and in April.
- The low tide tables allowed for digging over the three-day New Year's Holiday with over 19,000 participating just on New Year's Eve – even though temperatures hovered just above freezing.
-
- Following the February opener at Kalaloch digging was suspended by Olympic National Park due to concerns over poor catch rates.
- On Saturday March 19th recreational opener the coincided with the very popular annual Ocean Shores Razor Clam Festival attended by over 7,000 people. A later afternoon low tide saw many festival goers head to the beach a see first hand what razor clamming is all about.
- WDFW found higher than usual wastage rates during some of the spring digs, particularly at Twin Harbors. Agency enforcement officers cited a number of diggers for wastage.

Washington Recreational Razor Clam Total Effort By Season 1997/98 through 2010/11

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>20010-11 Season Totals</i>	HARVEST	EFFORT	Average Daily Catch (clams/digger)	Total Digging Days
Long beach	1,170,069	87,471	13.4	35
Twin Harbors	813,417	66,566	12.2	46
Copalis	674,714	50,533	13.4	15
Mocrocks	531,766	37,749	14.1	20
Kalaloch	14,345	2,163	6.6	12
TOTAL	3,204,311	244,429	13.1	

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. A 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 2010	2 Days	Fri, Sat
November 2010	4 Days	Fri, Sat + Sat, Sun
December 2010	3 Days	Sat, Sun + Fri (New Years Eve)
January 2011	4 Days	Sat (New Years Day) + Thu, Fri, Sat
February 2011	2 Days	Fri, Sat
March 2011	4 Days	Sat thru Tue
April 2011	8 Days	Thu , Fri, Sat + Tue thru Sun
May 2011	8 Days	Tue thru Sun + Sat, Sun
Totals:		
	35 Days	
	Effort = 87,417 digger trips	
	Harvest = 1,170,069 clams	
	(Including wastage of 8,000 clams)	
	Portion of TAC Harvested = 91.7%	

On Long Beach, diggers we able to try their hand at clam digging a total of 35 days - this compares to 37 days during the 2009-10 season.

Month	Twin Harbors	
October 2010	4 Days	Thu thru Sun
November 2010	6 Days	Fri thru Mon + Sat, Sun
December 2010	5 Days	Fri thru Mon + Fri (New Years Eve)
January 2011	5 Days	Sat(New Years Day), Sun + Thu thru Sat
February 2011	3 Days	Thu thru Sat
March 2011	4 Days	Sat thru Tue
April 2011	8 Days	Thu thru Sat + Tue thru Sat
May 2011	11 Days	Tue thru Sun + Wed thru Sun
Totals:		
	46 Days	
	Effort = 66,566 digger trips	
	Harvest = 813,417 clams	
	(Including wastage of 16,000 clams)	
	Portion of TAC Harvested = 96.2%	

Twin Harbors enjoyed more days of digging than any other beach with a total of 46 days. This is the same as offered during the 2009-10 season. Digging during periods of high surf or poor weather was very spotty with those arriving early doing the best. During the spring openers average catch rates improved considerably with an average in April of 14.7 clams per digger trip and 13.8 clams per digger trip in May

Month	Copalis	
October 2010	2 Days	Fri, Sat
November 2010	2 Days	Fri, Sat
December 2010	3 Days	Sat, Sun + Fri (New Years Eve)
January 2011	1 Days	Sat (New Years Day)
February 2011	2 Days	Fri, Sat
March 2011	2 Days	Sat, Sun
April 2011	3 Days	Thu thru Sat
May 2011	0 Days	
Totals:		
	15 Days	
	Effort = 50,533 digger trips	
	Harvest = 674,714 clams	
	(Including wastage of 10,500 clams)	
	Portion of TAC Harvested = 98.8%	

With a The 15 days of harvest at Copalis during the 2009-10 season compares to 24 days in 2009-10; and 24 days in 2008-09

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 2010	2 Days	Fri, Sat
November 2010	2 Days	Fri, Sat
December 2010	3 Days	Sat, Sun + Fri (New Years Eve)
January 2011	1 Days	Sat (New Years Day)
February 2011	2 Days	Fri, Sat
March 2011	2 Days	Sat, Sun
April 2011	3 Days	Thu thru Sat
May 2011	5 Days	Sat, Sun + Fri thru Sun
Totals:		
	20 Days	
	Effort = 37,749 digger trips	
	Harvest = 531,766 clams	
	(Including wastage of 11,000 clams)	
	Portion of TAC Harvested = 97.5%	

The 20 days of harvest at Mocrocks during the 2010-11 season compares to 23 days in 2009-10 , 25 days in 2008-09 and 11 days in 2007-08.

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 2009	2 Days	Fri, Sat
November 2009	2 Days	Fri, Sat
December 2009	3 Days	Sat, Sun + Fri (New Years Eve)
January 2010	3 Days	Sat (New Years Day) + Fri, Sat
February 2010	2 Days	Fri, Sat
March 2010	0 Days	<i>Closed...see web link for details</i>
April 2010	0 Days	
May 2010	0 Days	
http://www.nps.gov/olymp/parknews/2011-razor-clam-harvest-suspended.htm		
Totals:	12 Days	
	Effort = 2,163 digger trips	
	Harvest = 14,345 clams	
	Portion of TAC Harvested = 5.5%	

Olympic National Park closed the Kalaloch Beach razor clam fishery for the rest of the harvest season, effective March 7, 2011, in order to protect the health of the razor clam population.

Details can be found at : <http://www.nps.gov/olymp/parknews/2011-razor-clam-harvest-suspended.htm>

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

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 marine toxin 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 it's January opener cancelled).

WDFW is required to collect samples per strict WDOH protocol:

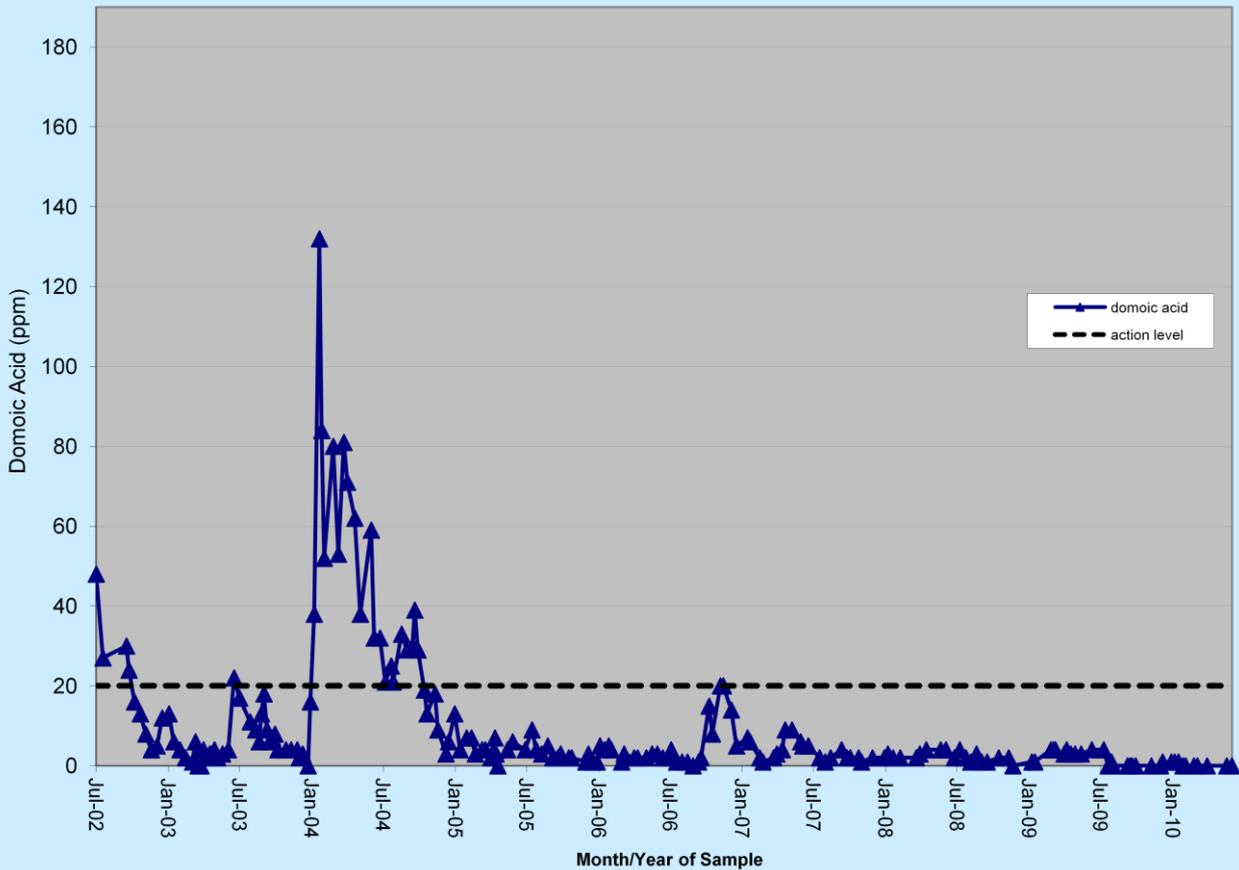
To open or remain open, ALL samples must test below
The action level...

- 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.’”

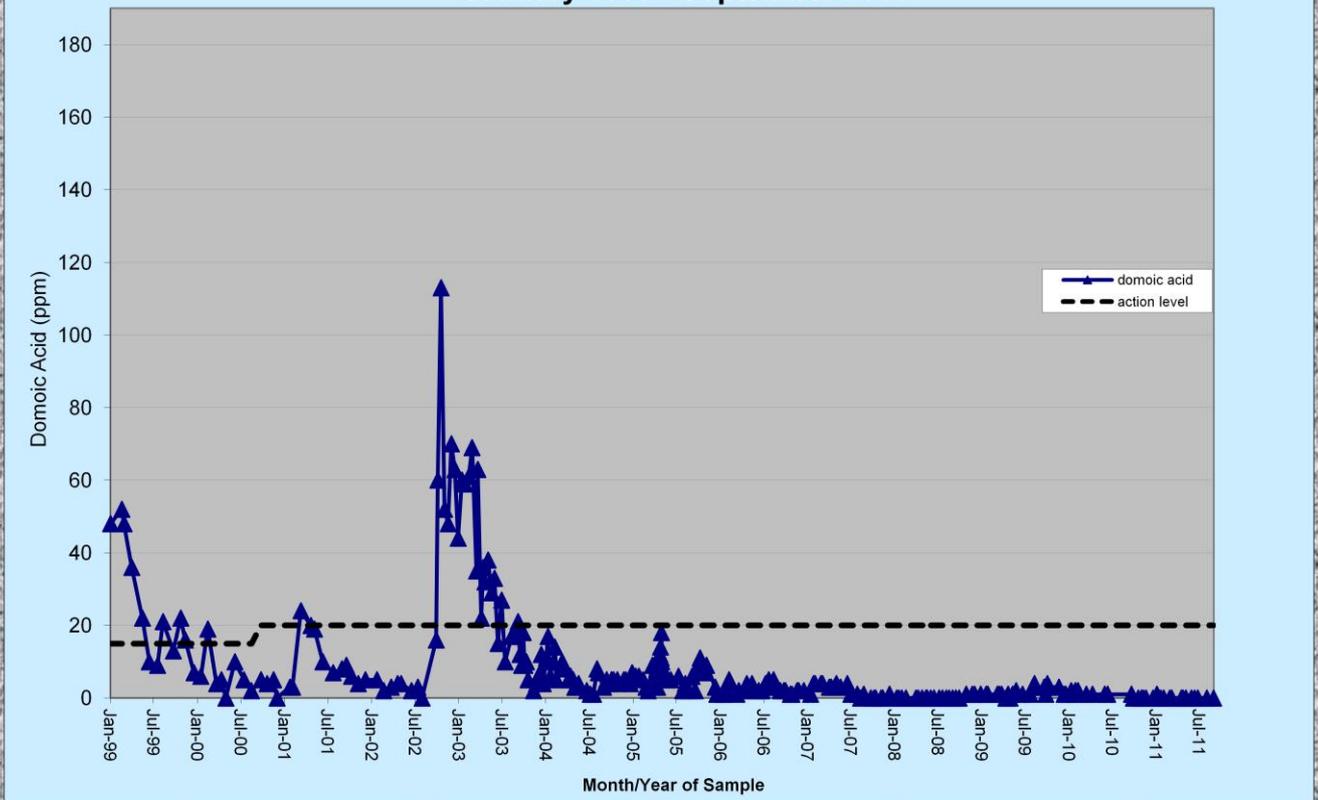
Domoic Acid Levels - Long Beach July 2002 - August 2010



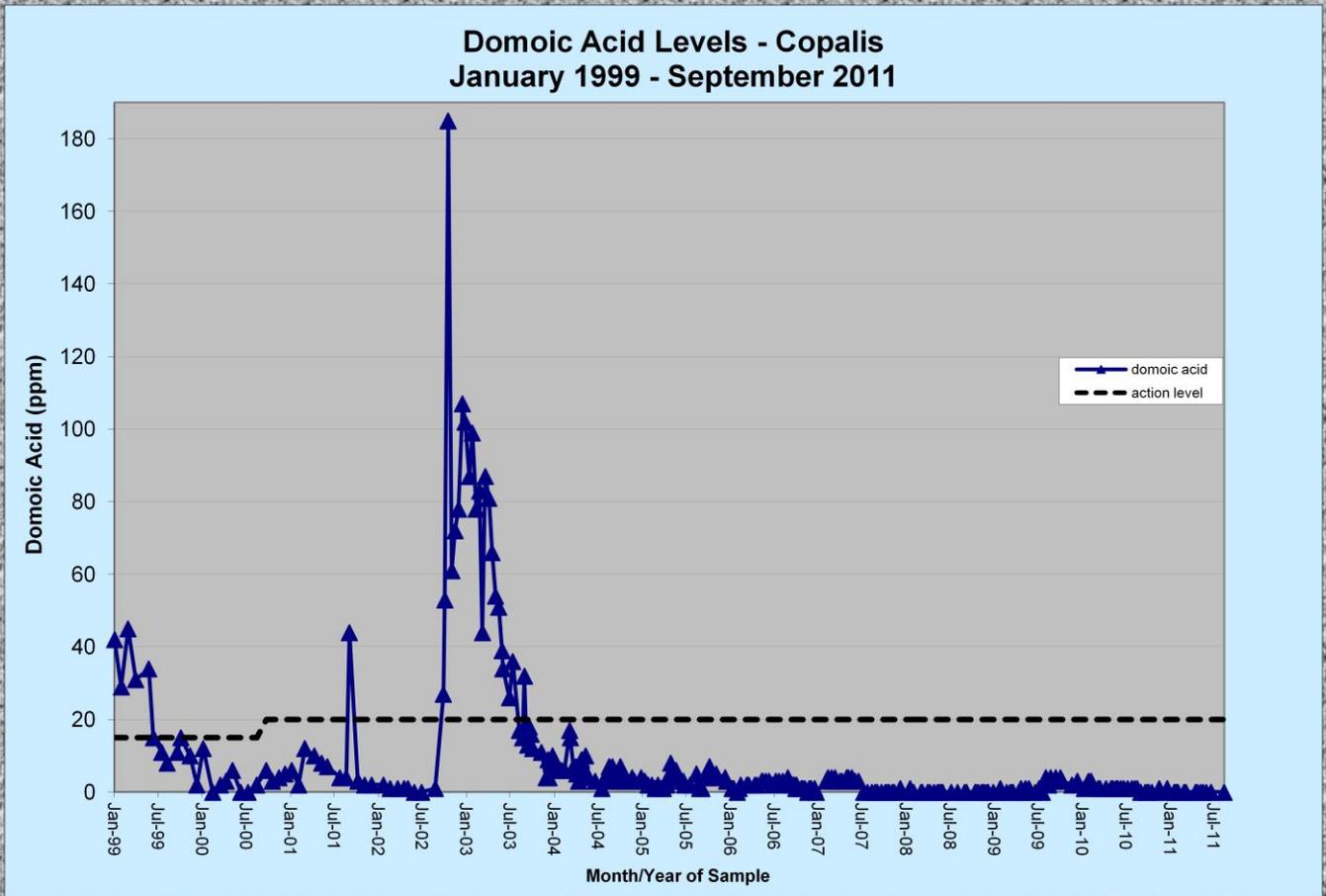
The next series of slides show domoic acid levels – as measured in razor clam edible tissue by the Washington Department of Health - Public Health Lab located north of Seattle in Shoreline. The state and federal “action level” for domoic acid is 20 ppm (parts per million). Anytime a razor clam sample meets or exceeds the action level – the fishery cannot open – or if it is open, it must immediately close.

The last domoic acid related razor clam closure occurred here at Long beach in April, 2005.

Domoic Acid Levels - Twin Harbors
January 1999 - September 2011

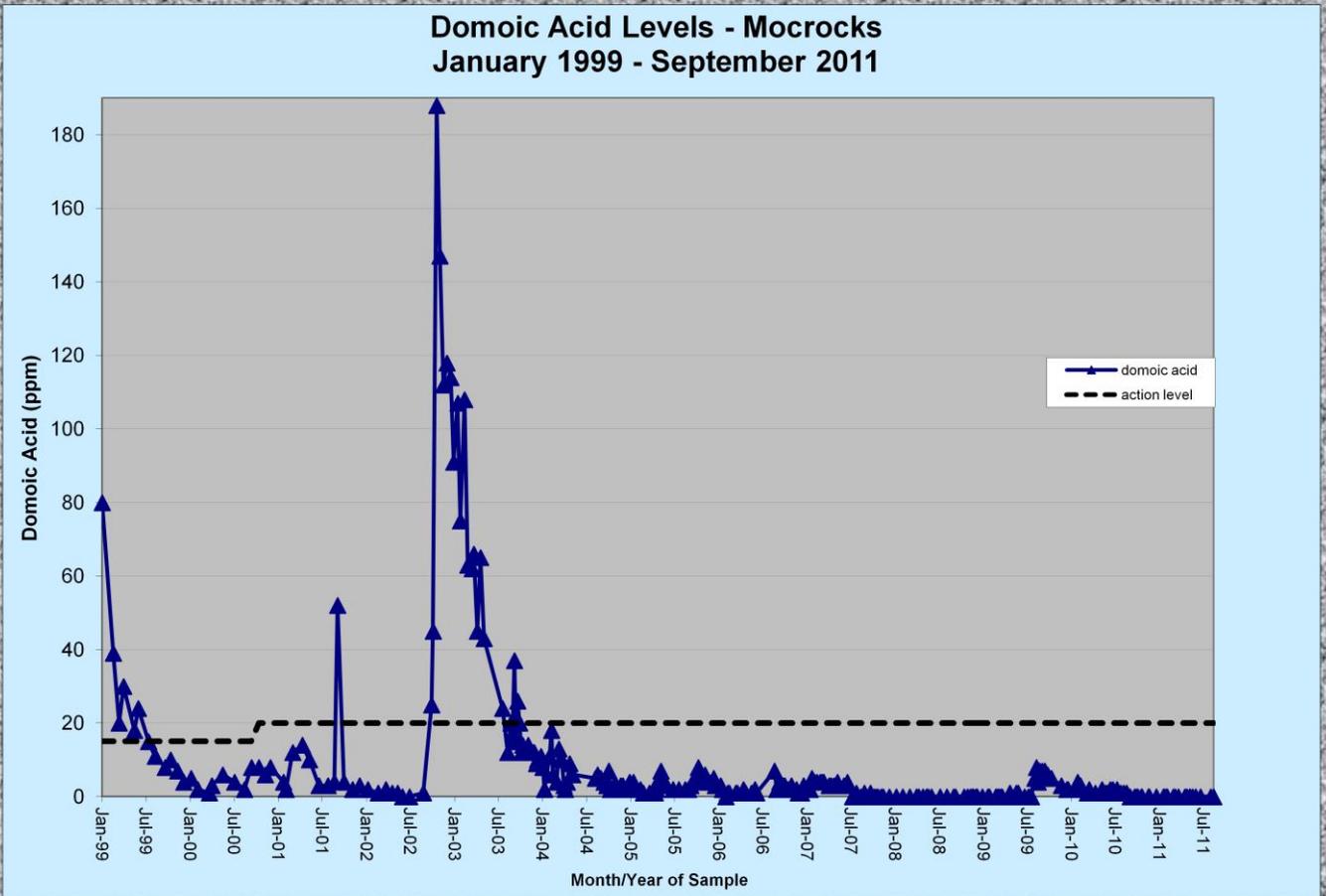


As discussed in the previous slide, the recent history of domoic acid related razor clam closures at Twin Harbors has been good. The domoic acid levels in Twin Harbors razor clam edible tissue last approached the 20 ppm action level in May of 2005.



The domoic acid levels at Copalis have not been a concern since March of 2004.

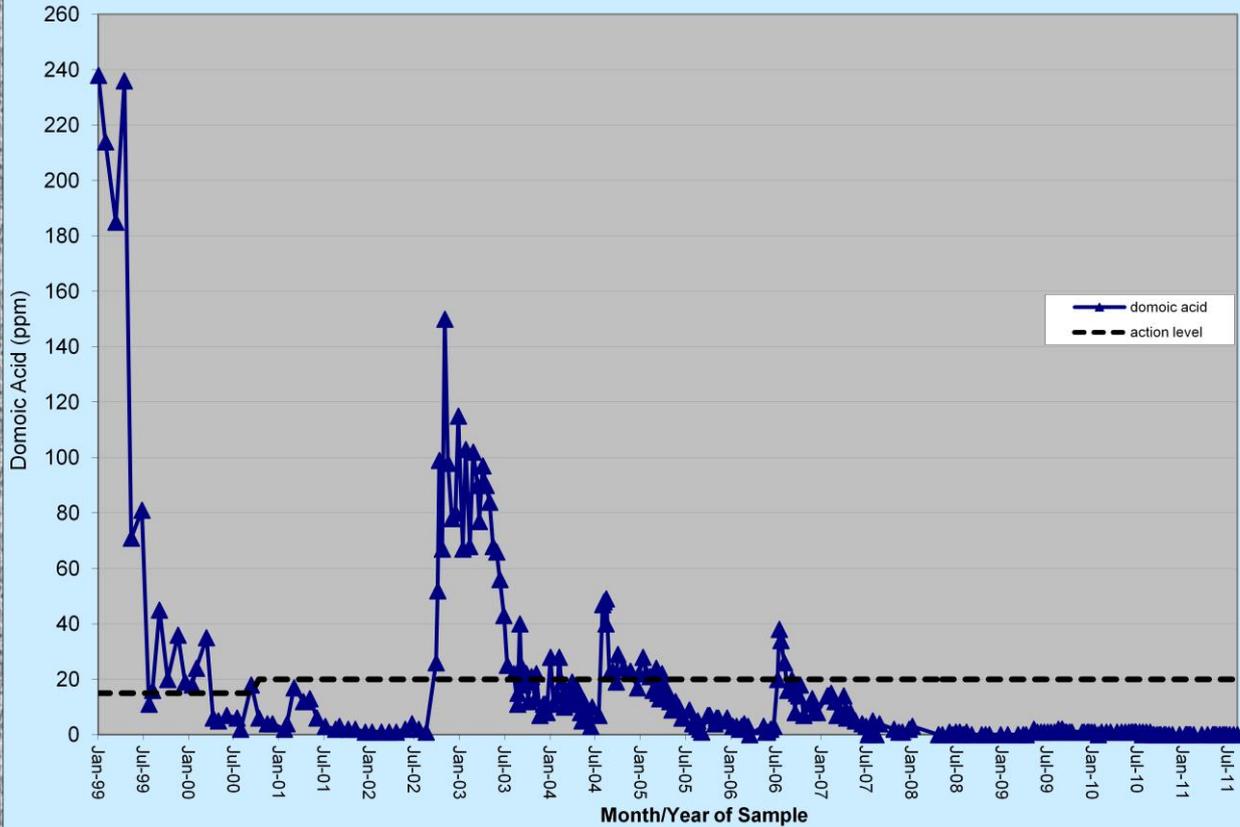
Please see the discussion on the previous slides for more details.



The domoic acid levels at Mocrocks have not been a concern since February of 2004.

Please see the discussion on the previous slides for more details.

Domoic Acid Levels - Kalaloch January 1999 - September 2011



The domoic acid levels at Kalaloch have not been a concern since the summer of 2006.

However, this graph shows that domoic acid is more likely to be a problem on the north coast including the Kalaloch area, than elsewhere on the coast.

Recent research conducted by federal scientists at NOAA and researchers at the University of Washington has shown that the area at the mouth of the Strait of Juan de Fuca is an “initiation site” for large blooms of Pseudo-nitzschia the diatom that can produce high levels of domoic acid.

For more information see: Trainer, V. L., B. M. Hickey, E. J. Lessard, W. P. Cochlan, C. G. Trick, M. L. Wells, A. MacFadyen, and S. K. Moore. 2009. Variability of *Pseudo-nitzschia* and domoic acid in the Juan de Fuca eddy region and its adjacent shelves. *Limnol. Oceanogr.* 54(1): 289-308.

Found at : www.nospam.aslo.org/lo/pdf/vol_54/issue_1/0289.pdf

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



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Olympic Region Harmful Algal Blooms

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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

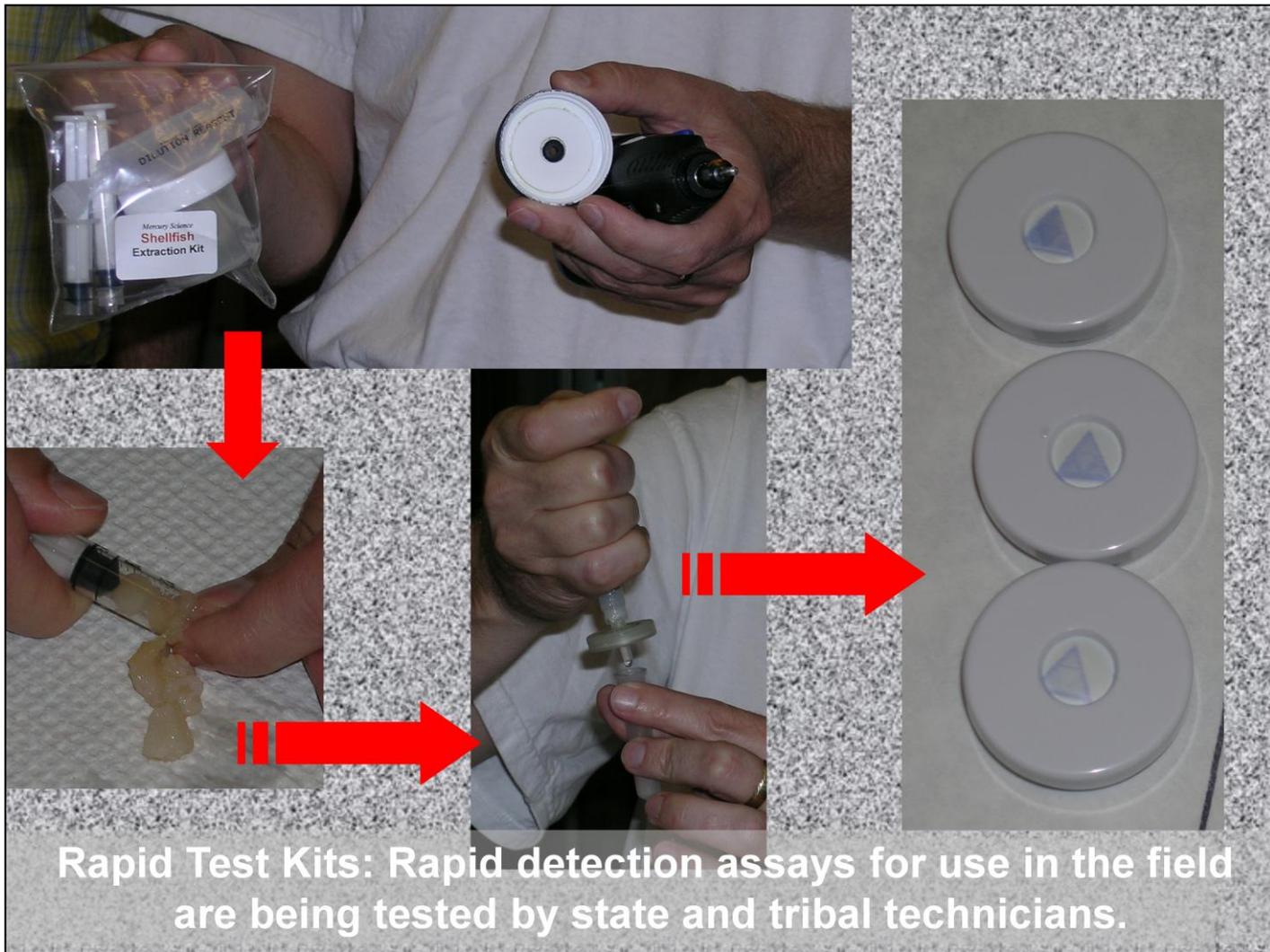


**WDFW's role:
monitor surf zone
plankton,
toxins, and
water quality...**



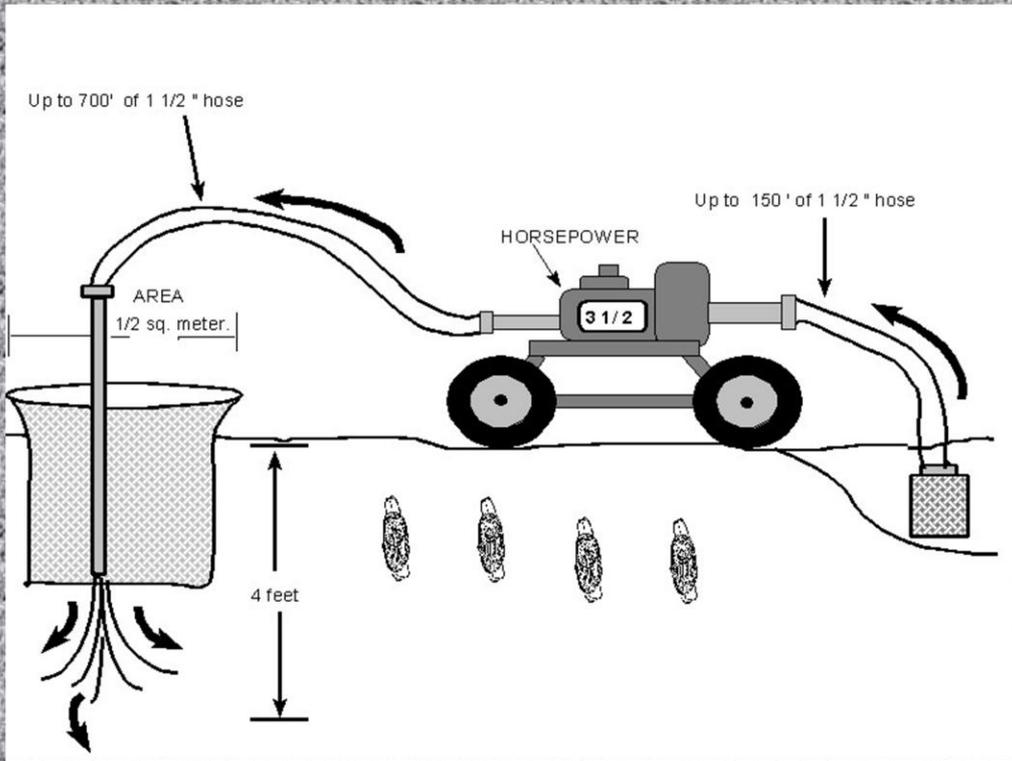
**...to determine
the environmental
conditions associated with blooms
of *Pseudo-nitzschia* species.**

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 17th and for the most part was completed by late August.

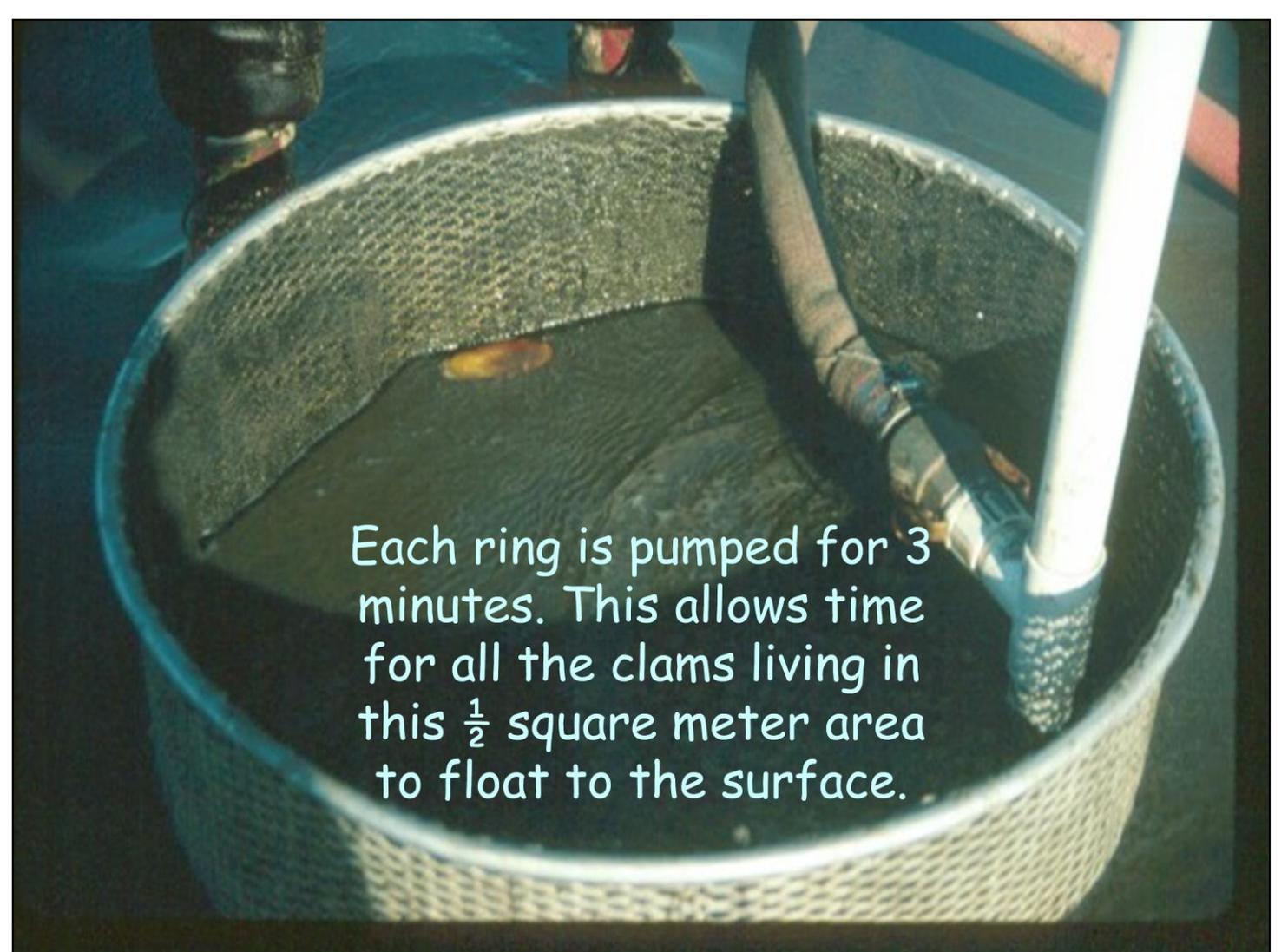
The survey method WDFW has been using since 1997 is the Pumped Area Method...

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.



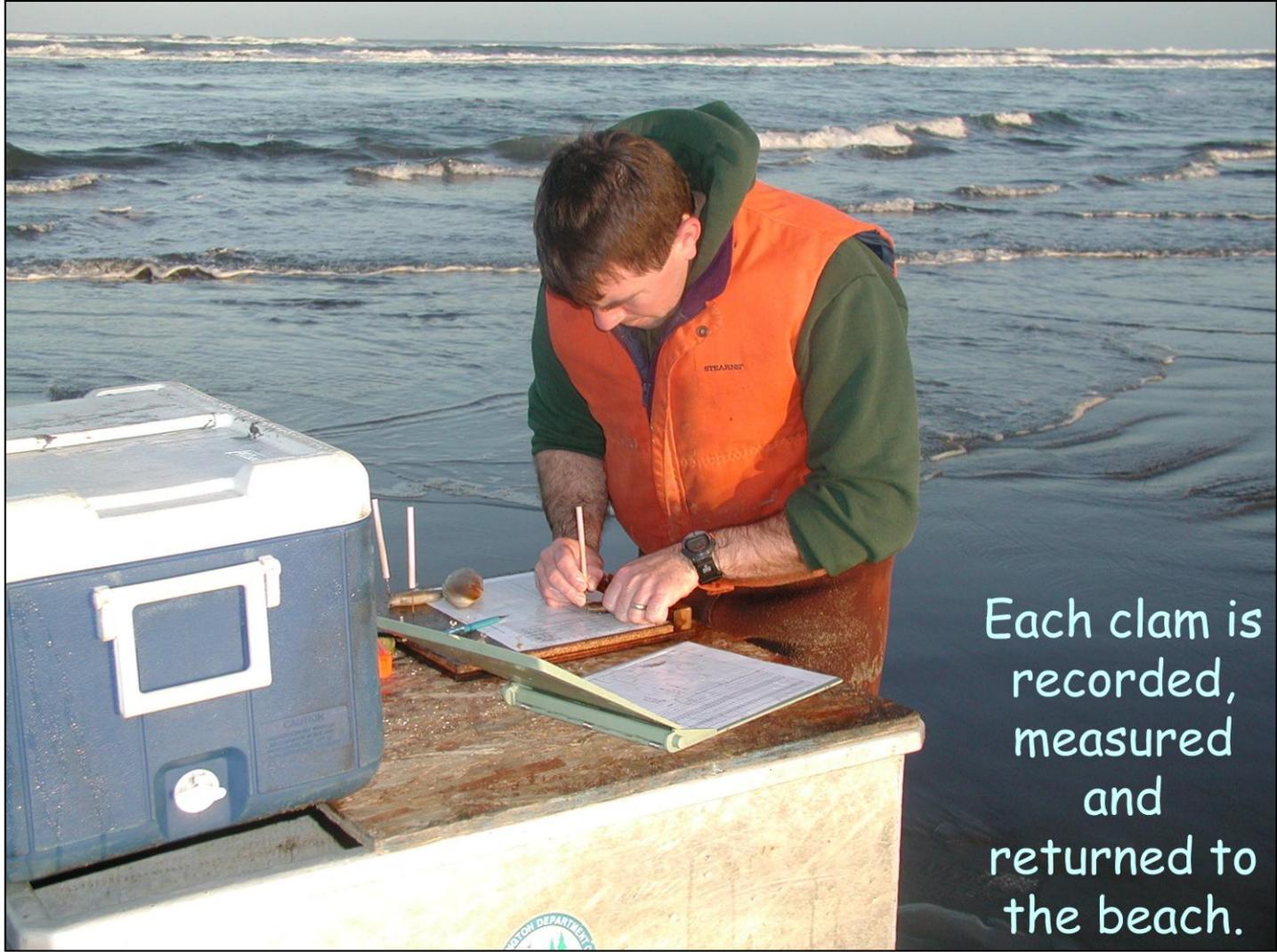
Water is pumped up the beach
and used to liquefy the sand
within a $\frac{1}{2}$ square meter
aluminum ring.

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.

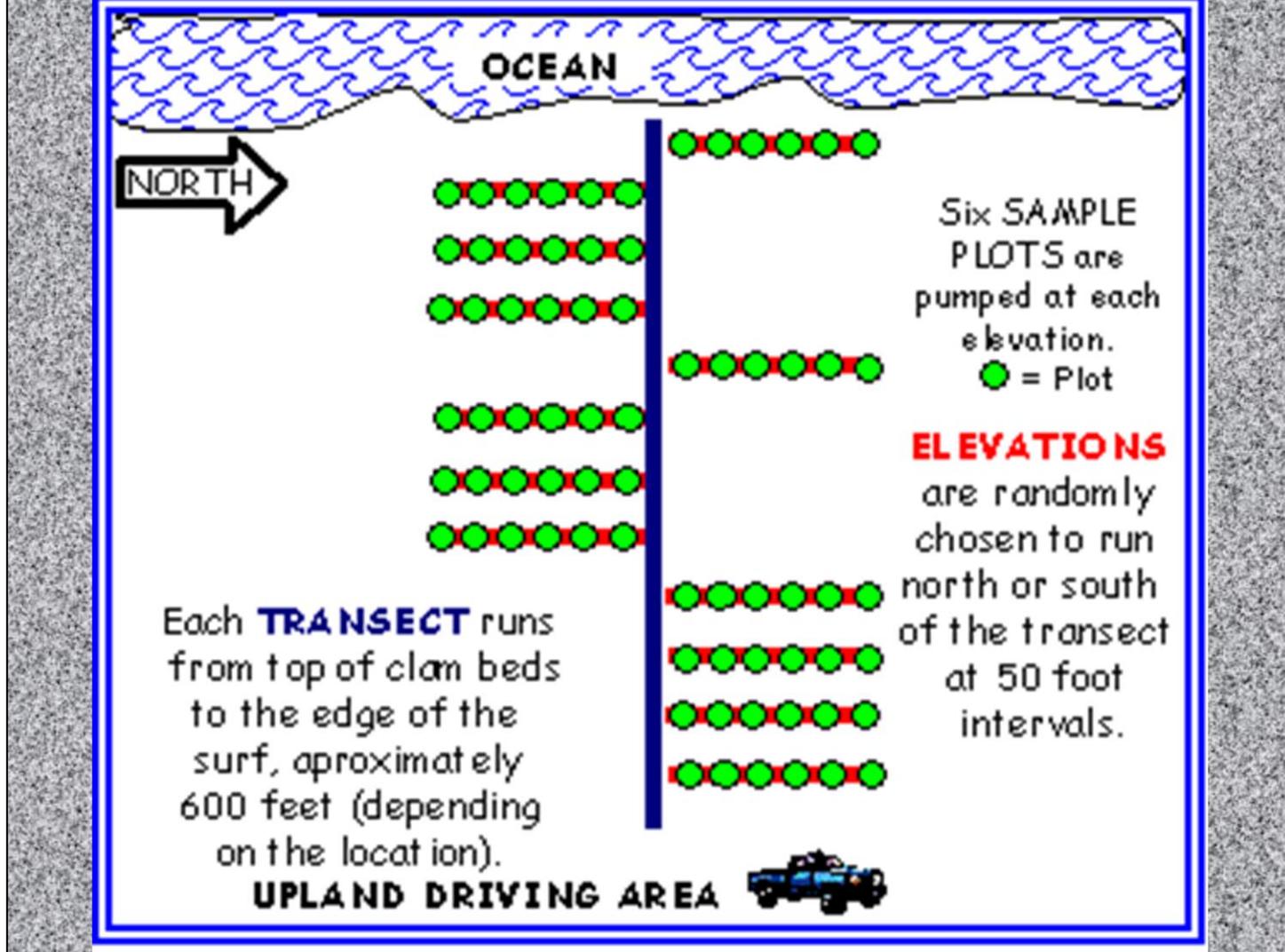
Each ring is pumped for 3 minutes allowing time for all the clams in the area of the ring to float to the surface and be pumped.



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.



2011 Stock Assessment – Results

Over all the results of the 2010 razor clam stock assessment show a decrease in the TAC (total allowable catch) on each beach. This should not be a surprise to those who attended our meetings last year. At that time we reported a low number of pre-recruit clams on each beach.

The good news is – there has been a very nice rebound in the number of pre-recruits this year – which should lead to more clams in future seasons.

■ How many days can we dig?

Stock assessment data :

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

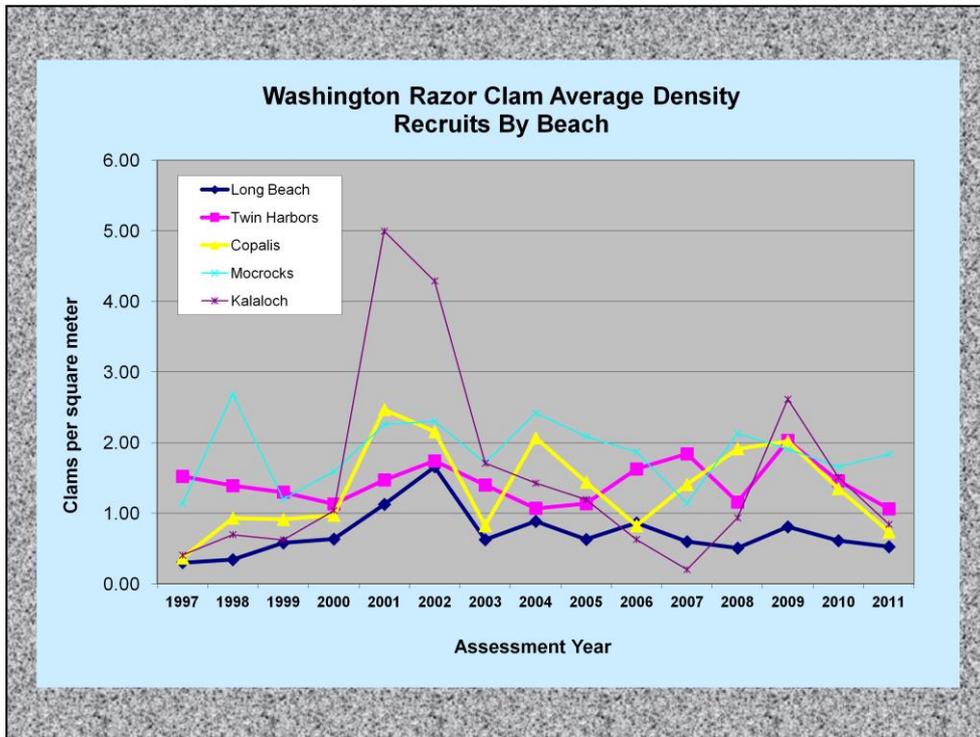
TAC (total allowable catch) =

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.



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 15 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 2011 the average density (clams per square meter) by beach is : Long Beach = 0.51; Twin Harbors = 1.13; Copalis = 0.73; Mocrocks = 1.85; Kalaloch = 0.84.

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

YEAR	POPULATION (clams)		TAC (clams) Harvest rate @ 30% of recruits	HARVEST	
	RECRUITS	PRE-RECRUITS		TOTAL (clams)	% of TAC harvested
2007-08	4,151,123	444,971	1,245,337	1,227,519	98.6%
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		
AVERAGE	4,235,173	5,271,298	1,270,552	1,212,708	

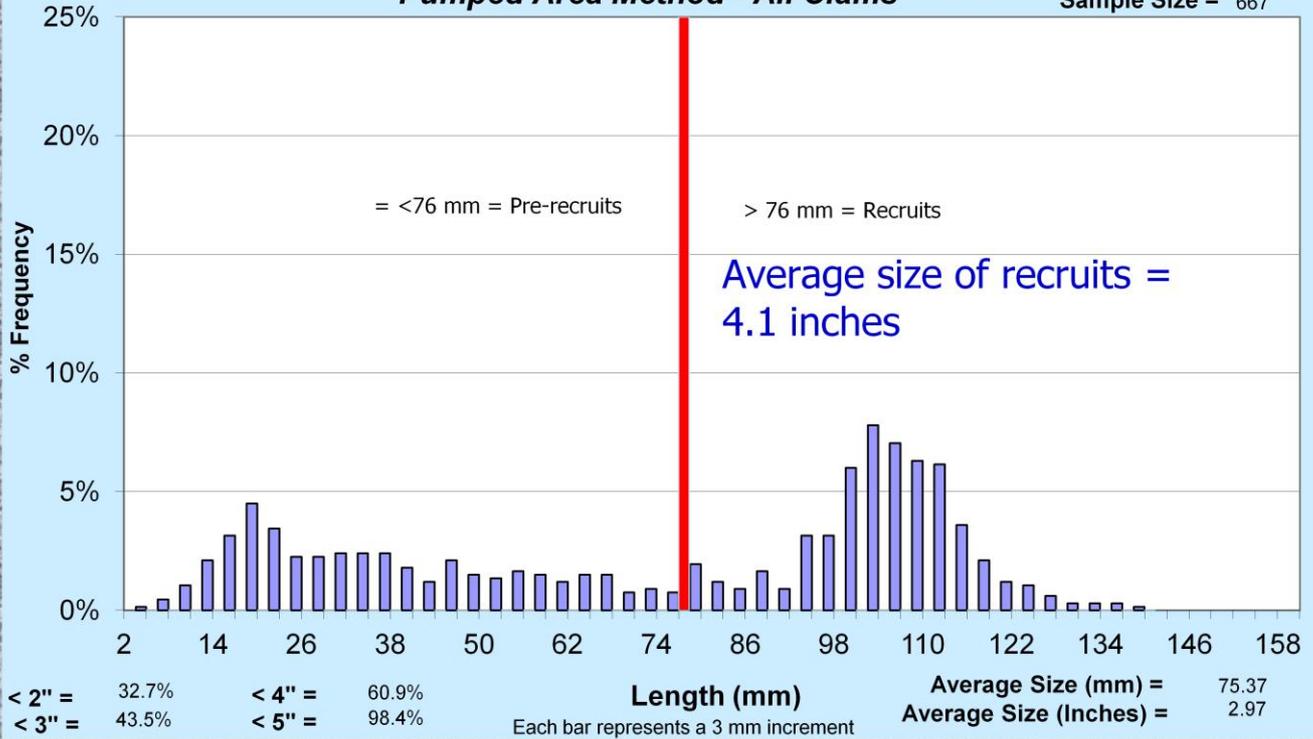
The 2011 assessment work shows a decrease in both recruit and pre-recruit clams on Long Beach. Diggers can expect fewer days of harvest as a result of lower populations. In addition the average density of razor clams on Long Beach is estimated from the 2011 assessment work to be 0.51 clams per square meter with the 15-year average density at 0.71 clams per square meter.

Washington Razor Clam

Size Frequency Distribution
Longbeach - 2011

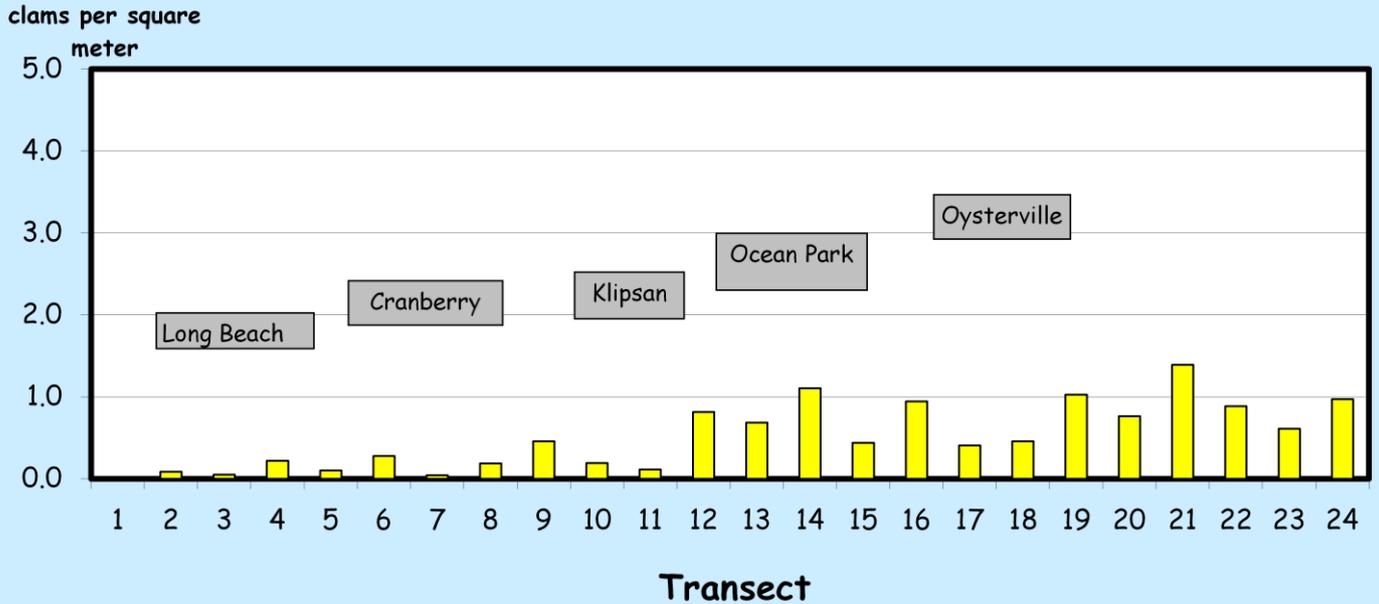
Pumped Area Method - All Clams

Sample Size = 667



The average size of the Long Beach recruit clams found in our summer surveys was 4.1 inches is a little larger than 2010 of 3.9 inches and a little smaller than the 2009 average of 4.2 inches.

Long Beach Razor Clam Population Recruit Distribution - 2011



As is typically the case at Long Beach, the better digging is on the north end of the beach. However, the mid-sections of the beach around Ocean Park have a larger portion of the recruit size clams than during most years.

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

YEAR	POPULATION (clams)		TAC (clams) Harvest rate @ 30%	HARVEST (clams)	% of TAC
	RECRUITS	PRE-RECRUITS	of recruits	TOTAL	harvested
2007-08	3,934,566	1,724,588	1,180,370	825,539	69.9%
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		
AVERAGE	2,994,897	3,360,400	898,469	761,053	

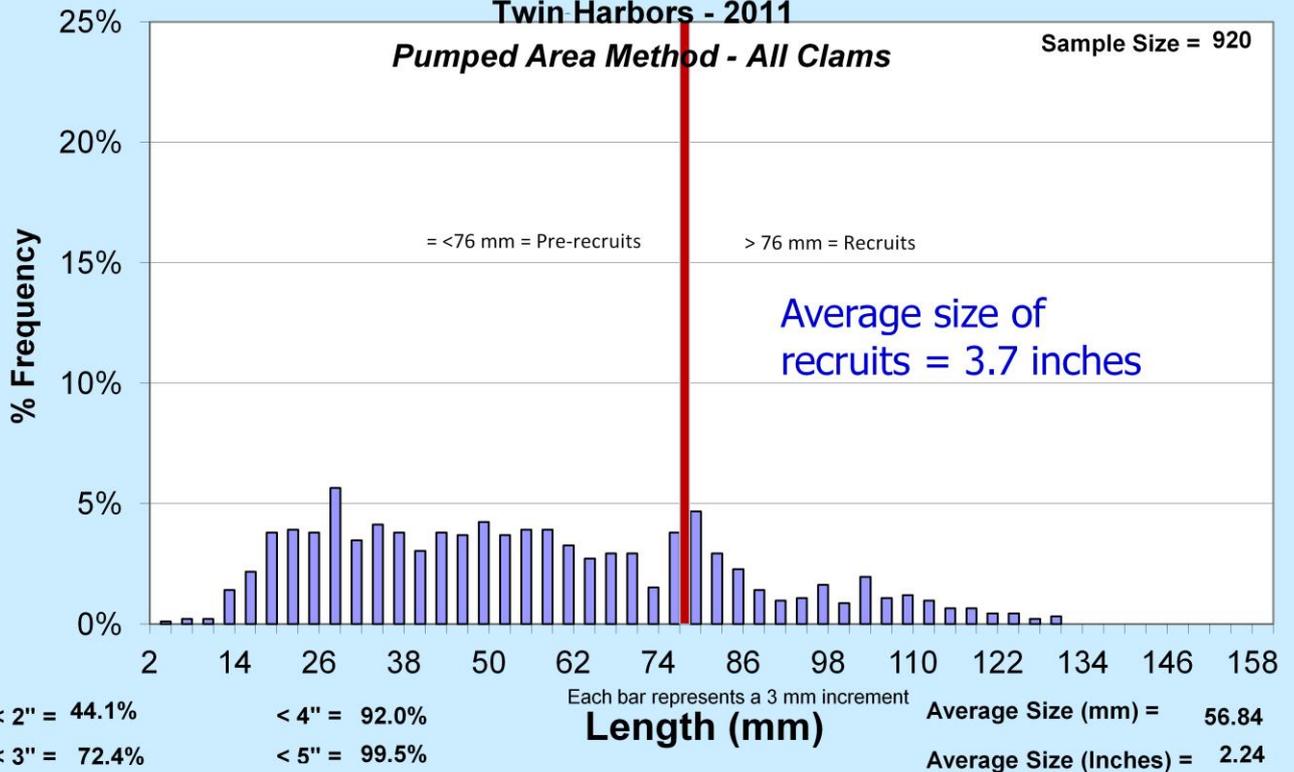
The number of recruit clams is down over last year and over the 5-year average. In addition the average density of razor clams on Twin Harbors is estimated from the 2011 assessment work to be 1.13 clams per square meter with the 15-year average density at 1.42 clams per square meter. However, we are pleased to see the number of pre-recruits has increased.

Washington Razor Clam

Size Frequency Distribution Twin Harbors - 2011

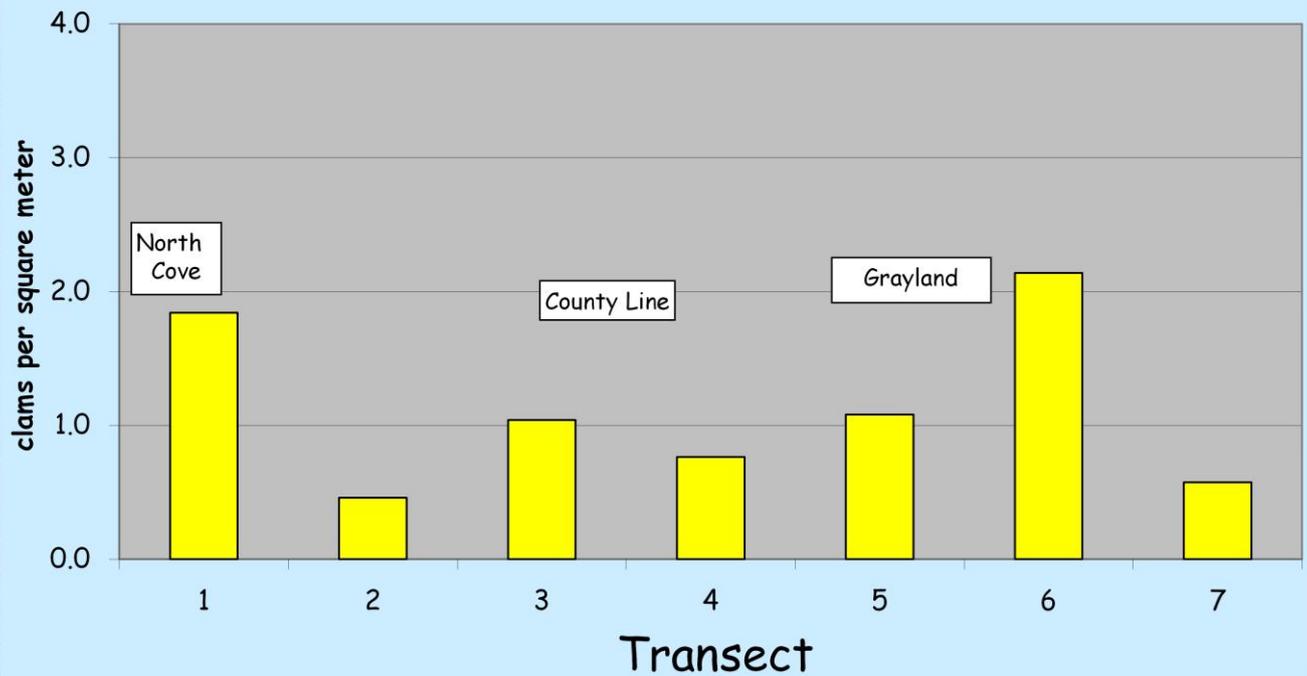
Pumped Area Method - All Clams

Sample Size = 920



The average size of the Twin Harbors recruit clams found in our summer surveys was 3.7 inches is a little smaller than 2010 of 3.9 inches. The 2009 average recruit size was 4.2 inches. The 2011 pre-recruit clams are in general larger and have a much better chance of survival to recruit size in the months ahead.

Twin Harbors Razor Clam Population Recruit Distribution - 2011



The 2011 assessment found good densities of clams at the south end and just north of the Grayland beach approach.

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

YEAR	POPULATION (clams)		TAC (clams)	State's Share	State's HARVEST (clams)
	RECRUITS	PRE-RECRUITS	Harvest rate @ 30% of recruits	(50% w/ adjustments)	TOTAL
2007-08	4,751,308	6,567,921	1,425,392	712,696	636,376
2008-09	6,453,563	9,953,166	1,936,069	968,034	963,497
2009-10	6,810,540	608,425	2,043,162	1,021,581	1,000,413
2010-11	4,554,449	6,791,312	1,366,335	683,167	674,715
2011-12	2,475,820	7,344,699	742,746	371,373	
AVERAGE	5,009,136	6,253,105	1,502,741	751,370	818,750

Copalis razor clam populations are down over the five year period displayed in this table. While the current level is not unprecedented, as it is very similar to levels seen in 1997, 2003 and 2006, we are watching the situation closely. In addition the average density of razor clams on Copalis is estimated from the 2011 assessment work to be 0.73 clams per square meter with the 15-year average density at 1.36 clams per square meter. We are pleased to see a large number of pre-recruit clams and will looking to see if they survive and will help reverse this downward trend. Nevertheless, diggers who prefer Copalis will certainly see fewer digging days during the 2011-12 season.

In situations like this –at times we may open other beaches and leave Copalis closed. This has always been difficult because of the popularity of this beach that includes areas like Ocean Shores and Ocean City. Please make yourself familiar with which areas are open before heading to the beach and pay attention to signs posted at beach approaches. This will help you avoid receiving a citation from a Fish and Wildlife Enforcement officer for digging on a closed beach.

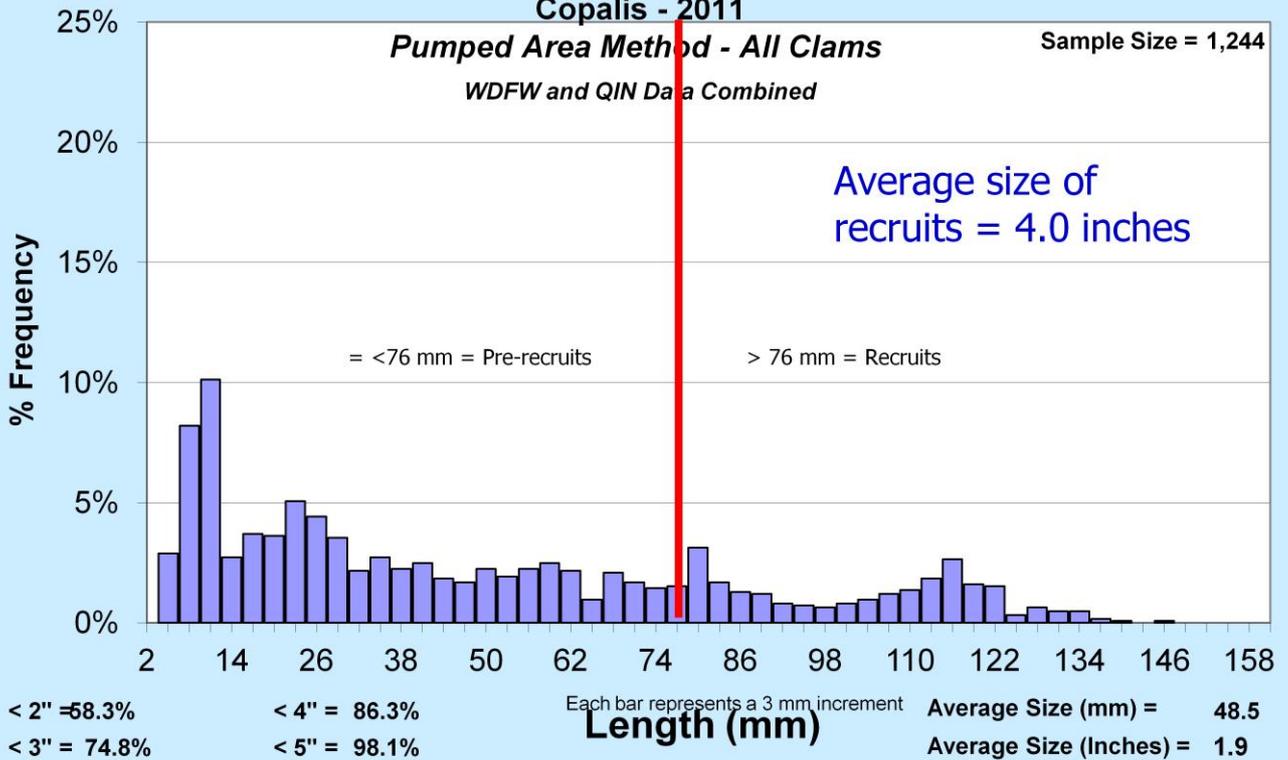
Washington Razor Clam

Size Frequency Distribution
Copalis - 2011

Pumped Area Method - All Clams

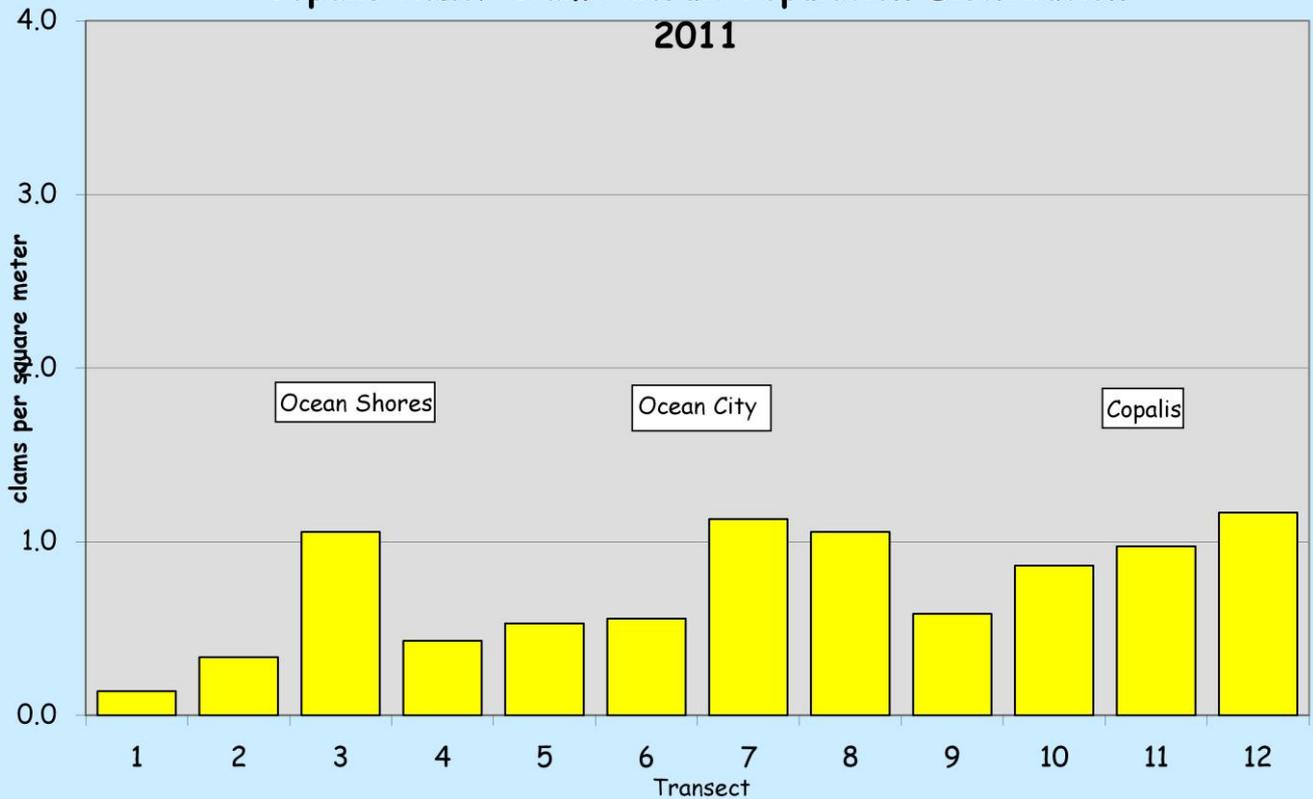
Sample Size = 1,244

WDFW and QIN Data Combined



The average size of the Copalis recruit clams found in our summer surveys was 4.04 inches which is slightly smaller than the 2010 average of 4.1 inches.

Copalis Razor Clam Recruit Population Distribution 2011



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.

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	
2007-08	2,503,092	2,927,413	750,928	375,464	341,406	90.9%
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		
AVERAGE	3,810,968	7,135,074	1,143,291	571,645	506,446	

Mocrocks is the one bright spot in Washington's razor clam populations. Past successful spawning has led to an increased level of recruit sized clams on this beach and the current population is just above the 5-year average for both recruits and pre-recruits. In addition the average density of razor clams on Mocrocks is estimated from the 2011 assessment work to be 1.85 clams per square meter with the 15-year average density at 1.86 clams per square meter.

There likely will 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.

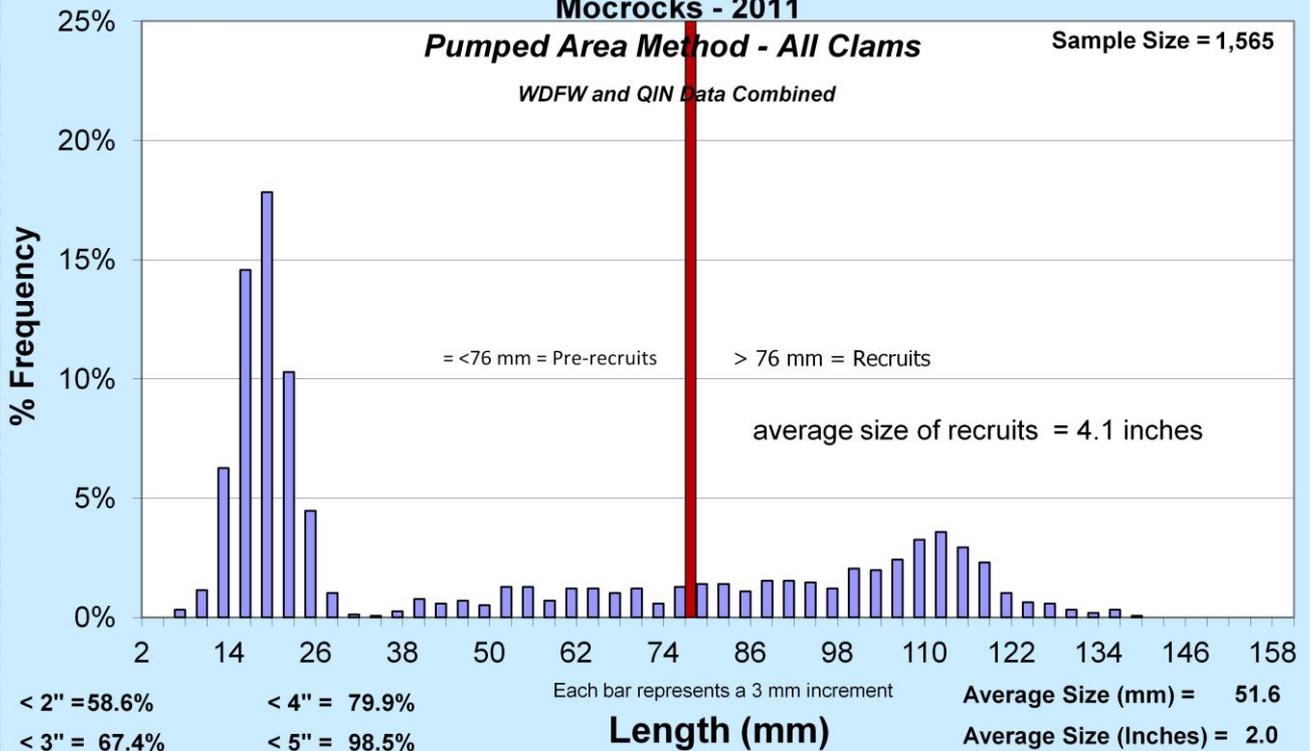
Washington Razor Clam

Size Frequency Distribution Mocrocks - 2011

Pumped Area Method - All Clams

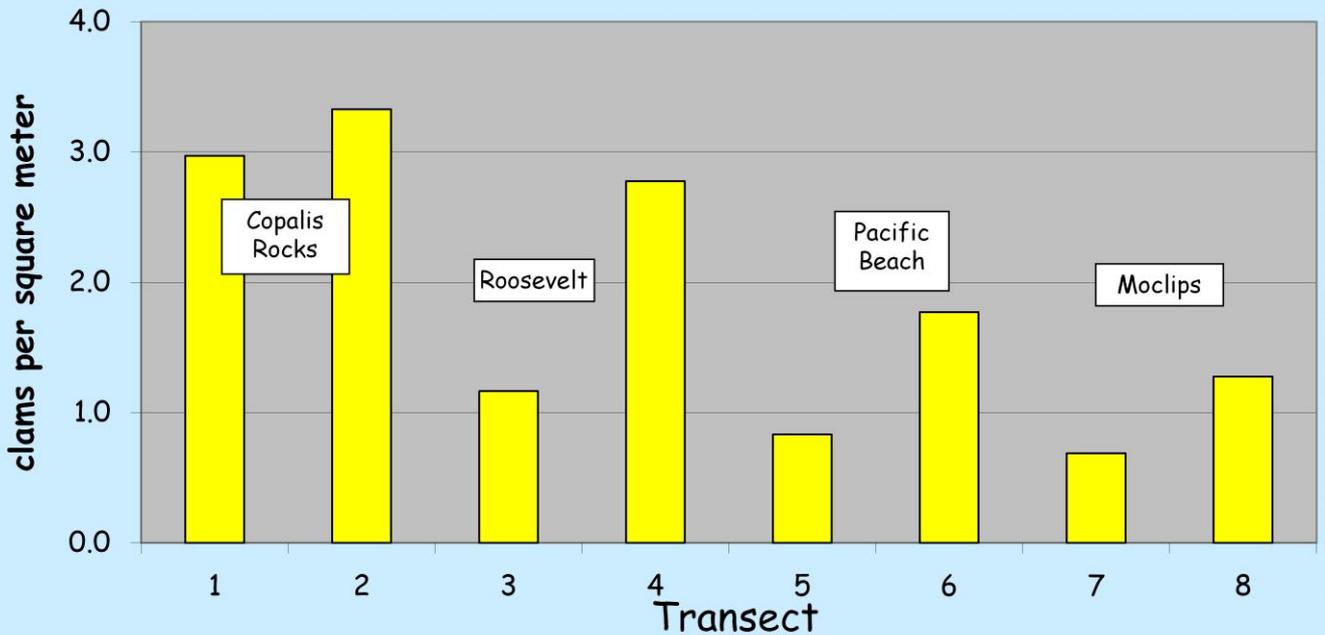
Sample Size = 1,565

WDFW and QIN Data Combined



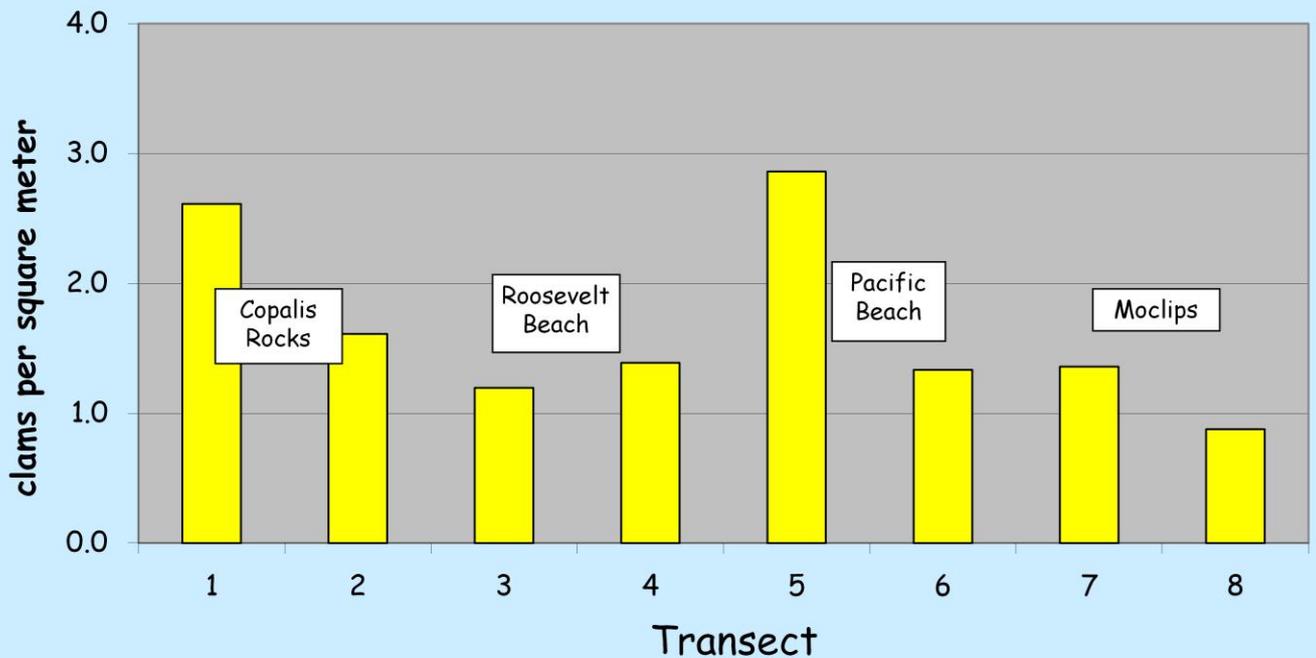
A recruitment of small clams is very evident – in addition there are a good number of clams in the 4.5 inch (~112 mm) range. We will be watching for problems with wastage on this beach with many very small clams mixed in with a good supply of much larger clams and want to remind diggers that they are required to keep the first 15 clams

Mocrocks Razor Clam Population- 2011 Recruit Distribution



Razor clam densities this year at Mocrocks are especially strong north and south of the Copalis Rocks and north of the Roosevelt Beach approach, however diggers will find good number of recruit sized clams most everywhere.

Mocrocks Razor Clam Population- 2010 Recruit Distribution



Like Copalis, razor clam densities this year at Mocrocks are again fairly consistent along the entire beach – with the higher densities south of the Copalis Rocks and South of Joe Creek (south of Pacific Beach).

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

YEAR	POPULATION (clams)		TAC (clams) harvest rate 25.4% of recruits	50% SHARES	State's
	RECRUITS	PRE-RECRUITS			HARVEST (clams) TOTAL
2007-08	271,868	791,486	69,054	34,527	0
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	
AVERAGE	1,648,962	3,088,338	418,836	209,418	30,359

A continued decline in recruit razor clam populations at Kalaloch is evident in this table. This population level is not unprecedented. In the last 15 years populations on this beach have been lower in 5 separate years. In addition the average density of razor clams on Kalaloch is estimated from the 2011 assessment work to be 0.84 clams per square meter with the 15-year average density at 1.54 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 – with ONP assistance. 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.

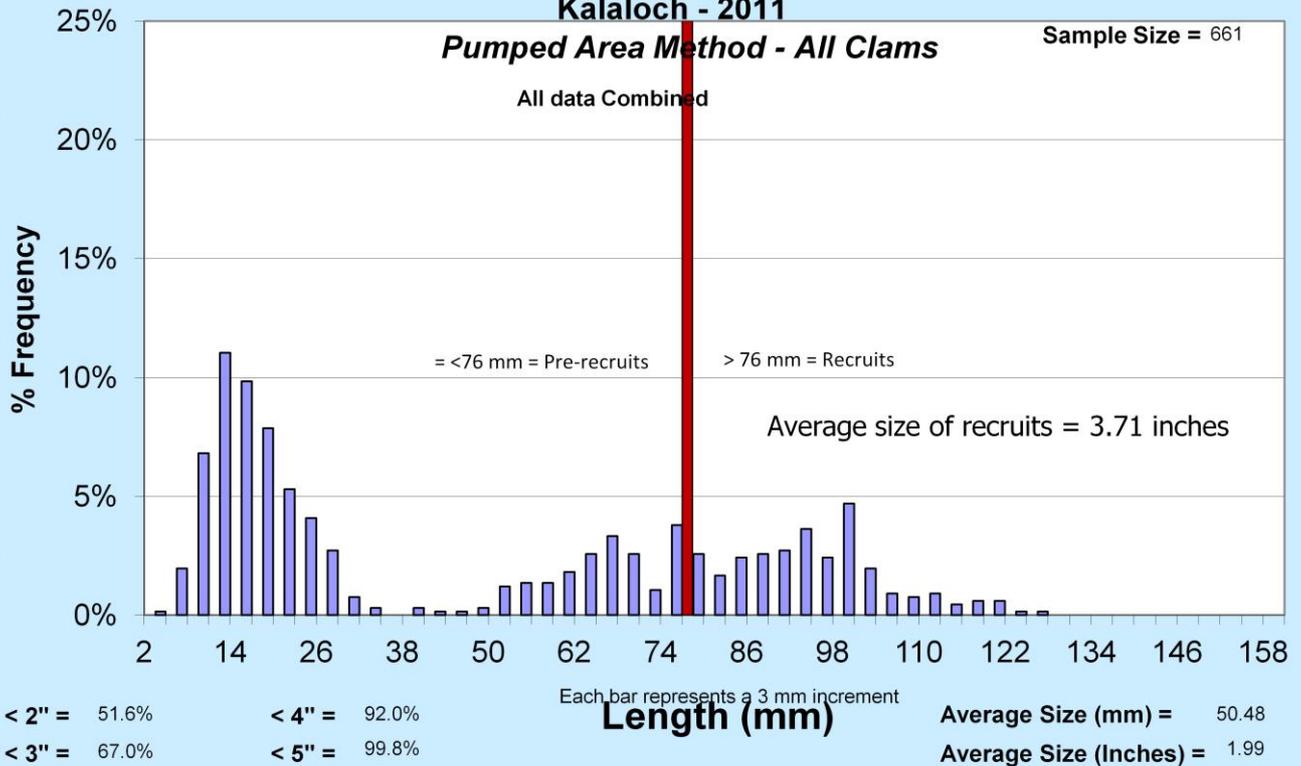
Washington Razor Clam

Size Frequency Distribution Kalaloch - 2011

Pumped Area Method - All Clams

Sample Size = 661

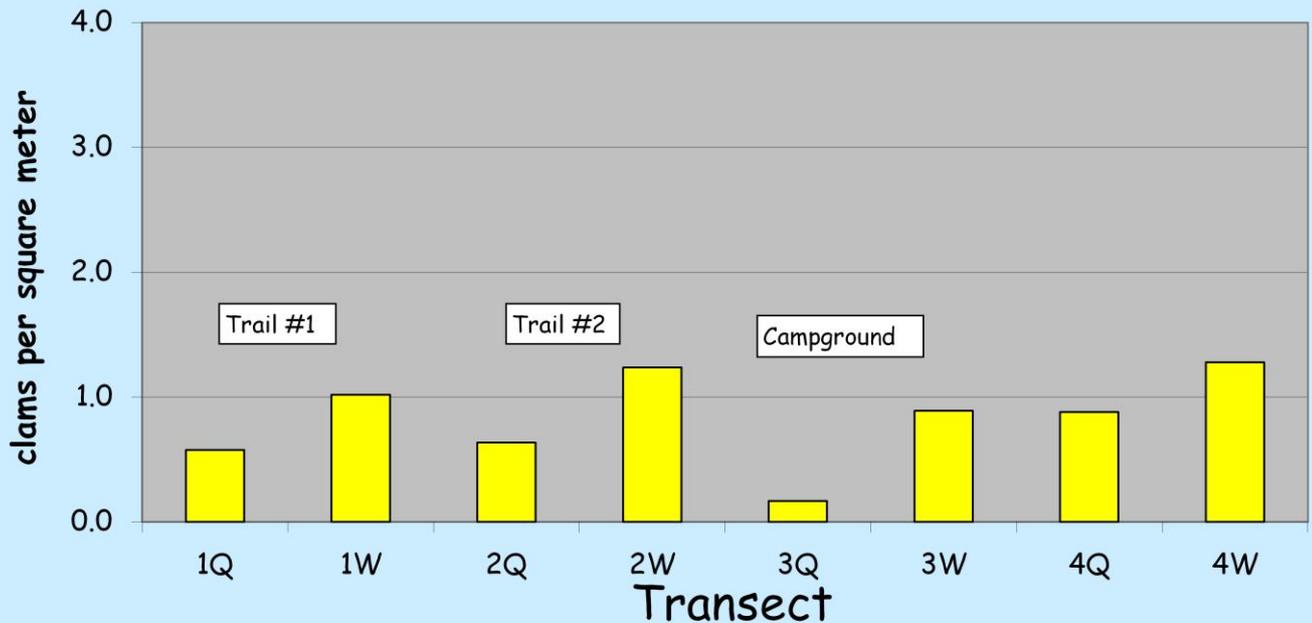
All data Combined



There is a mix of clams present at Kalaloch with a large number of very small recruit clams that are less than 1 inch and another group between 3 and 4 inches. The average size of 3.7 inches compares to the 2010 average of 4.0 inches.

Kalaloch Clam Population Recruit Distribution - 2011

WDFW/ONP and QIN Data



Since the 2010 assessment there has been an increase in the number of pre-recruit clams in front of the Campground and on the beach north of the Campground. The southern portions of the beach now have recruit clams when few if any were present in 2010.

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 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.

	2011-12 TAC Share (clams)	2010-11 aver daily harvest (clams)
Long Beach	1,094,642	33,199
Twin Harbors	616,314	18,263
Copalis	371,373	44,277
Mocrocks	605,831	26,038
Kalaloch	144,561	1,195

This is a recap of the 2011-12 Total Allowable Catch that will guide WDFW during the 2011-12 season. We also list here the average catch over all the days the 2010-11 season was open, by beach.

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

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Montesano, WA 98563 USA

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