

[dnrforum](#) 7:04 am on May 3, 2010

## Monday, May 3 – Access

**Are there effects of geoduck aquaculture on public access and aesthetics, and if so, how can they be mitigated?**

[Background on Geoduck Aquaculture – DNR information & other perspectives.](#)

- **Denise McElney 2:30 pm on May 7, 2010 [Permalink](#)**

The effects of geoduck aquaculture on public access and aesthetics' are negative. They reduce public's ability to use the land that is leased for aquaculture and policed by the shellfish industry. They cause a hazard for recreational diving, swimming, boating, and beach combing, etc. As for aesthetics? All shellfish farms are just plain ugly. They disrupt the natural beauty and habitat function of the tidelands. They cause noise and debris pollution to nearby residents. Any shellfish farmer who claims to enjoy the aesthetics of an aquaculture farm is just seeing the dollar signs.

- **Linda Lentz 7:00 am on May 6, 2010 [Permalink](#)**

We have been farming geoducks, oysters and clams for over 17 years. We lease tidelands from many of our neighbors. Some of those folks have requested we leave an area open for them to have access down the beach for boating etc. After those first planting they have not requested the access be left open with the next crop because they have found no need for it. They don't use the lower part of the beach where the geoducks are planted and found it did not interfere with their recreation. After the tubes are removed they can freely walk and boat the entire farmed area. Perhaps if upland owners don't want to have DNR lease lands for aquaculture in front of their homes the upland owners should lease the lands from DNR and use them as if they were actually their own tidelands to use.

As far as aesthetics go which seem to be most of the concerns expressed here, I would like to point out something the shellfish farmers in South Sound having been doing for the last 5 years. In addition to patrolling our own farms and maintaining them we have had 11 Beach Clean ups covering most of the inlets in South Sound. There has been up to 14 different farms and the Squaxin tribe volunteering their paid staff to patrol over 100 miles of shoreline eleven different times. We have collected over 630 cubic yards of marine debris which is compared to 63 ten yard dump trucks of trash removed from Puget Sound. The bulk of this trash has been Styrofoam in addition to over 1000 tires. Less than 15% of the debris has

been related to aquaculture and very little of that has been geoduck related. This is an example of the good stewardship the shellfish farmers practice in Puget Sound. Our lives depend on the good water quality of Puget Sound. We are blessed to have such a productive and beautiful resource in our state. DNR has the responsibility to assure that it remains sustainable and productive for all the citizens.

- **Don Martinson 2:14 pm on May 6, 2010 [Permalink](#)**

“Perhaps if upland owners don’t want to have DNR lease lands for aquaculture in front of their homes the upland owners should lease the lands from DNR and use them as if they were actually their own tidelands to use”

Public lands actually ARE their tidelands, along with everyone else that pays property taxes. The public should decide who uses public lands and for what purpose. Based on what I’ve read on this forum, the public does not want commercial geoduck farming on its tidelands.

- **Bruce Olsen 8:24 am on May 7, 2010 [Permalink](#)**

I don’t understand why the affected waterfront Homeowners didn’t just bid on the acreage themselves. The process was open for public bid and if their bid was accepted they could then sink tens of thousands of their own hard earned money and time into getting multiple permits and licenses and getting written studies from specialists on every subject you can image, correspond with the Native American Tribes of the region for their approval and then put up with delay after delay after delay extending the time frame for approval out more than 4 to 5 years possibly more. Then they would have the opportunity to wait for an additional 6 years or longer to get any type of return on that investment.

Then again a waterfront owner could just leave the land fallow without planting anything for the length of their lease and pay the state the cash equivalency of their yearly lease totals and the agreed upon percentage of the sales just like a fully planted farm. That could be in the range \$20,000 to \$30,000 per year per acre depending upon survival rates. The state could use averages from the other farms to compute this total. That way the state would not have to wait five or six years for their money and that would increase their yield through the time value of money.

Of course the waterfront Homeowner would still be responsible for all the other components of the lease agreement. Some of those

being community outreach and the documentation concerning their efforts regarding outreach to their community, supplying public access on, through and around their farms and documentation of all visitors to their farm, seeding enhancement areas for the general public to dig in located within their farm, staffing personnel to sit on the beach at low tides to help the general public locate the enhanced areas dedicated to public use of their farm and carry insurance for the farm that covers the general public while they are on the farm enjoying the fruits of the Homeowners efforts and of course picking up all the trash along the entire beach that just happens to get tossed out by the public or just happens to wash up on the beaches surrounding their farms. Don't forget they will have to hire a scuba divers to patrol the bottom off shore to make sure there isn't an accumulation of farm debris and if found remediate it. Then they could control the aesthetics of their farm.

It is quite obvious to me reading all these comments that no one has actually read any of the proposals that were submitted to DNR concerning the requirements for obtaining one of these leases on public lands and subsequent alterations to that document by the Corp of Engineers or half of these comments would not have been posted.

- **William Burrows 9:05 am on May 7, 2010 [Permalink](#)**

Gee Bruce, did you read the RFO terms and conditions?  
Leaving the land fallow was not permitted under the Ts & Cs.

- **William Burrows 9:13 am on May 7, 2010 [Permalink](#)**

I suppose I should add that in addition the terms and conditions not allowing leaving the beach fallow, the adjacent land owners were not aware of any of the DNR's plans until several day before bids were due. Not really the kind of lead time one would need to submit a bid.

- **Bruce Olsen 9:52 am on May 7, 2010 [Permalink](#)**

I agree that notification from DNR about anything from the planned sitings to this forum is about as bad a communication job as I have ever seen. Stakeholders (shellfish

growers and homeowner) should have been informed up front prior to any actions by DNR. None of the affected neighbors were personally informed of their decision. This should have been discussed with us prior to opening the bidding selection process. We had less than 14 day to respond. We were told that no matter what we did this area would be leased even if it was not bid upon during the current bid process. So we prepared a bid for this lease based upon what we could live with as homeowners.

- **Bruce Olsen 10:03 am on May 7, 2010 [Permalink](#)**

Hi again William, I have read them too many times but that does not stop one from being creative. I am sure if you approached a bid with DNR that included both the lease price and the average cost of a return on a planted farm they would listen. With that approach it is win/win/win. The state gets the revenue it so badly needs, you get your aesthetics and the public gets an enhanced beach. What is not to like about that?

The state did listened to our low impact proposal and seemed to like it. They just have to wait a little longer for their returns as does our group .

- **Kathryn Townsend 8:59 am on May 7, 2010 [Permalink](#)**

Linda—I had the opportunity to review the ACOE forms (through a public records request) that were submitted by growers in South Puget Sound. I found that your documentation of your plantings far exceeded nearly all the other submissions and I was impressed by your conscientious attention to detail. The industry is also to be commended for their clean-up activities. However, it doesn't follow that just because you have convinced your neighbors to lease their private tidelands for geoduck farming, giving them a cut of the gross profit, that all other landowners would welcome such an agreement either for themselves or their communities. It is especially the case that communities may not welcome commercial geoduck farming on public lands because it is an intrusion to the cohesiveness of the community and there is no financial incentive for the community—it is taking away something from the community, not giving to it. The unfortunate consequence of some

of these farms, at least in Thurston County in areas that are not traditionally shellfish growing areas and because there was not any local permitting or notification of the activity or community buy-in in advance, was the disruption of the neighborhood and formation of neighborhood groups to protest the activity. Additionally, many of my neighbors who live right on the beach collected over a period of time many of the small nets that originally had covered the tubes—these small nets might easily be missed by the shellfish clean-up crew, but were more than apparent to the people intimately familiar with the beach in question. These small nets come off the tubes fairly easily it seems and we considered them an environmental hazard for wild life (along with the rubber bands that also came off). When we pointed this out to the grower on the beach, he denied any responsibility for it as the nets were found 1/4 mile from his farm. These are the sorts of experiences with growers that do lend themselves to a benign feeling about geoduck aquaculture. It is not just about pure aesthetics— aesthetics to many of us is a pervasive value having to do with the natural environment including the wildlife in its natural habitat—not an artificial plastic one or one that periodically liquefies the entire beach 3 feet down. Many of us will never agree that that is a common sense plan for the tidelands of Puget Sound.

- **Brian Allen 1:31 pm on May 5, 2010 [Permalink](#)**

As a geoduck farmer, we have lots of public use of the private tideland area above our cultivation plots. Mostly walkers from the neighborhood. Our geoduck plots go to the +1 ft. at the highest and are exposed less than 10% of the time during summer. We do not use invasive signage or deter people from visiting our properties.

The industry is working hard on developing new planting practices that, in part, are designed with aesthetics in mind. New practices take time to develop, test, work with suppliers and scale into commercial application. For example, we are currently scale-testing a black, flexible, mesh tube.

The shortest road between current industry standard planting and husbandry practices, and an evolved farming practice is applied aquaculture science. Where are the graduate programs in shellfish aquaculture at our State universities?

I can't understand why aesthetics are an issue for well maintained farm. No one seems to complain when wild lands are co-opted for agriculture.

- **[Curt Puddicombe](#) 4:24 pm on May 5, 2010 [Permalink](#)**

Upland agriculture and intertidal aquaculture are two separate issues and do not neatly compare, but I disagree with the premise that people give a pass to agriculture or development in rural/residential areas.

Again, the SMA clearly states that natural shorelines and aesthetics are important. People that move to a certain area for its natural vistas do so for a specific reasons. There should be more respect for that from the shellfish industry.

- **Peter Downey 1:53 pm on May 6, 2010 [Permalink](#)**

And the SMA clearly states that water dependent uses including aquaculture are supported and preferred uses.

- **[Curt Puddicombe](#) 5:59 pm on May 6, 2010 [Permalink](#)**

The SMA and the guidelines suggest that aquaculture is not a preferred use if it: results in the loss of ecological functions; if it adversely impacts eelgrass and microalgae; if it conflicts with navigation and other priority water dependent uses such as swimming, boating, fishing, water skiing, wading, etc.; or if it impacts the aesthetic qualities of the shoreline.

Geoduck aquaculture does not qualify as a preferred use based on the criteria set forth in the SMA and current guidelines.

<http://apps.leg.wa.gov/RCW/default.aspx?cite=90.58&full=true#90.58.020>

The Taylor Shellfish/Foss geoduck farm hearing in Pierce County in 2007 included several weeks of expert witness testimony on both sides of the issue. Hearing Examiner Terrance McCarthy ruled that geoduck tubes are indeed “structures”; that they “obstruct public use of the water”; and that they cause “habitat disruption”.

Also, once again, I’ll point out that in 1991, Joan K. Thomas, one of the original authors of the SMA said this:

“I have thought about this carefully over the years as I have seen my expectations frustrated. We have lost the full potential of the SMA to protect a valuable resource through fainthearted administration.”

“When the SMA was written in 1971, aquaculture meant oysters and clams, and one salmon raising operation. This activity was recognized and protected as water dependent. I do not read the original intent or the original guidelines to promote the industry as we know it today. In fact, the guidelines specified that navigational access not be restricted and that visual access of upland owners be considered. Aquaculture has become a sore point between local governments and the Department of Ecology – a fraying of the partnership.”

<http://www.caseinlet.org/uploads/washuw91002.pdf>

Of the South Puget Sound counties involved, only Pierce County has come close to administering the SMA correctly.

- [dnrforum](#) 1:24 pm on May 5, 2010 [Permalink](#)

On behalf of: Steve Wilson

Part 1: I'm proud to say my wife and I farm geoducks. We are a small family business with around six acres of leased tidelands, from ten different Lessors. We have been growing shellfish for the last ten years. Prior to that, I was a fisheries biologist and commercial fisherman, and my wife worked in health policy for the State of Washington. I have a BS in fisheries science and my wife has a PhD in statistics and measurement. We were both born and raised in Olympia, and have lived on the water for the last twenty five years in south Puget Sound. I only mention this so folks on this forum have a slight sense of who we are.

Monday's forum topic was public access of the tidelands, and aesthetics. Regarding public access, one of the joys of what we do is being able to show our farms to people that have never seen the aquaculture process. In the locations where we farm, beach access has never become an issue. We farm between +2' tidal elevation and extreme low tide, so when tubes are in place the beach is still open from +2' to the high tide line. When the tubes have been removed the entire beach is accessible. In our experience, people are really interested to learn about what we do. They wander the beach and are amazed at the diversity of marine life in and among the tubes, and we are happy to accommodate their curiosity. I would also note

that our farm near Hope Island State Park receives dozens of kayakers each year who will on calm days float motionless in inches of water to observe the bottom.

Unfortunately, we have encountered people who had no interest in the farm activity or beach ecology; they simply wanted to berate our employees or take photos that could be manipulated to show an anti-aquaculture point of view. Then the photos showed up on websites accompanied by statements that often were far from accurate. We also have found the occasional individual that considers farmed geoducks a bounty for the taking. Once we figured out who these folks were, then yes – we would invite them to stay off the private land; so you might say they have brought that situation upon themselves. In all other circumstances we have welcomed visitors as long as they respected our efforts.

- [dnrforum](#) 1:25 pm on May 5, 2010 [Permalink](#)

On behalf of: Steve Wilson

Part 2: In the emotional discussion about a DNR inter-tidal lease program for geoduck culture, those against the proposal stress their perceived loss of right-of-access to currently farmed tidelands. The point conveniently overlooked is tidelands farmed for geoducks are all on privately owned ground. Recent court decisions (unpublished) have held that the public does not have, under the Public Trust Doctrine, access rights to private tideland at low tide. You cannot lose what you never had, and if you or your children or grandchildren want to play on private tidelands, it should be with the owner or lessee's permission.

Having said all the above, most of our interactions with the public on our private tidelands also lead us to believe that there is no reason why farming and public access can't coexist on certain public tidelands. (Interestingly, the "public" as it is referenced in these discussions generally applies to neighboring waterfront residents. Not to demean their interests, but there is a larger segment of the public that may stand to benefit from a lease of state lands, and their input is largely unheard.) A well-managed farm has no need to exclude well-meaning visitors. A lease to farm on DNR tidelands can balance both the public and private interests; it doesn't have to be an all or nothing affair.

The second forum topic, aesthetics (i.e. "a branch of philosophy dealing with the nature of the beautiful, and with judgments concerning beauty"), is usually discussed from the perspective of geoduck culture causing a degradation of the pristine views of Puget Sound. Aesthetics are, first and foremost, subjective



valuations. It's interesting to consider an individual's baseline criteria regarding views. It seems the conditions that exist at the time someone first sees the Sound are forever fixed in their mind as how it should be into the future. For instance, in the case of my wife and me, we're imprinted on the 1950's when we were kids and the local shorelines were relatively uninhabited. Now we find people living cheek by jowl with their neighbors and talking about losing pristine views if they look at a farm on the neighbor's tideland.

For anyone that feels geoduck aquaculture is "ugly", I can find someone that feels a well tended farm is a beautiful and fascinating activity. The problem many folks have with aquaculture seems to stem from encountering poor farm practices. Setting aside all the hyperbole of the anti-aquaculture comments, there are without doubt growers and homeowners that plant geoducks and then do a poor job of managing the farm. It's a problem the growers' association is actively addressing; how to control the few bad apples in the business. Farming geoducks is not an inherently messy or intrusive activity. In our operations we use small LED headlamps, hospital grade mufflers on diesel harvest motors, and we constantly instruct our employees of the need to be aware how their behavior is perceived by others on the beach. As a community, we often put sanctions (in the form of ordinances) on noise, litter, air and water pollution, etc., but there isn't a sanction for ugly. To date, it's all in the eye of the beholder.

- **Dan Marcus 8:50 pm on May 6, 2010 [Permalink](#)**

The overarching policy of the SMA is to preserve the physical and aesthetic qualities of natural shorelines of the state to the greatest extent feasible. This is a mandate, not a suggestion, and "aesthetic qualities of natural shorelines" isn't vague or subjective language. To most people "natural shorelines" doesn't include pipes and nets.

In reference to recent unpublished court decisions, the "Bainbridge vs. Brennan" case comes to mind. This Court of Appeals case held that pedestrians only had the right to traverse over privately held tidelands when covered by water. This is interesting because the Foss family attorney wrote letters to nearby citizens stating that even if their kayak paddle touched the bottom, or their boat touched the bottom, this would be a trespass. But according to "Bainbridge vs. Brennan", this is not the case. In fact, according to this decision, anyone can walk on private tidelands provided there is water covering those tidelands,

even if only one millimeter deep or less. Even so, this Court of Appeals decision is not consistent with the Public Trust Doctrine, and likely would not be upheld by State Supreme Court.

There is lots of case law upholding public trust rights to private tidelands or beaches that are not covered by water. The most compelling is probably “City of Coeur D’Alene vs. Mackin”. In this case, the Supreme Court ruled that private beach owners cannot exclude the public from beaches below the high water mark when it is not covered by water.

Judicial skepticism of conveyances of public trust land and other trust resources by the State into private hands is well embedded in both state and federal courts. In the case of “City of Coeur D’Alene vs. Mackin”, the court noted, “[w]hen a state holds a resource which is available for the free use of the general public, the court will look with considerable skepticism upon any governmental conduct which is calculated either to relocate that resource to more restricted uses or to subject public uses to the self-interest of private parties.”

The jus publicum interest did not go away when the state sold the jus privatum interest in the tidelands of the state. The State Supreme Court has already affirmed that the public trust doctrine was in effect when the state sold the tidelands. There are strict limitations upon the State in order to convey the jus privatum to private ownership. The legislature must act through legislation to authorize the conveyance. The conveyance must be described in clear and definite language, with all ambiguities construed in favor of the State and against the grantee. The conveyance must primarily further the public interest, with benefits to private parties being secondary or corollary. There must be no substantial impairment of the public interest in the lands and waters remaining. Non-compliance with any of these requirements violates the Public Trust Doctrine, and can render the conveyance void.

Up to now, the public trust issue hasn’t been pushed because for years no one tried to restrict access to beaches and tidelands. That may now be changing.

- **Dorothy Walker 1:04 pm on May 5, 2010 [Permalink](#)**

Clearly the public has no access to public tidelands that are leased for shellfish “farming”. The public is effectively denied use of these public lands. In addition to being inaccessible, they become unusable because of

the mess and the obstacles created by pvc pipe, nets, etc. They are aesthetically ruined as are adjacent lands and beaches due to the unsightly appearance, smell and noise.

While I agree that the public needs more access to these beaches, the solution to that problem is not to limit water access to tidelands and beaches. And, it is not true that the enjoyment of Puget Sound is limited to the rich. One of the great things about this area is that anyone with a rowboat can enjoy our great natural resource.

- **Jeanette Mauer 12:25 pm on May 5, 2010 [Permalink](#)**

Having always been proud of our beautiful waterfront properties in the Puget Sound, our Tidelands are an integral part of the picture. Please DNR, don't let the noise, and unsightly dredging that take place in the Shellfish Farming Industry, disrupt this serenity. It is easy to see what an impact the nature of this harvesting has done to our marine life if one walks along any stretch of public beach.

- **Peter Downey 12:15 pm on May 5, 2010 [Permalink](#)**

I agree that DNR should lease property where the potential for land use conflicts are minimized. The North Navy parcel is on such property. Upland is Navy Reserve property with no public access. The site is only accessible by boat and then only with notification of the Bangor Harbor Patrol. (Failure to do so and you will be met by an armed patrol boat.) Interference with public access at this site is not an issue. Aesthetics at this site is also not an issue as the nearest residence is miles away and any light or noise emitted at the site would pale in comparison to Bangor. There may be other sites owned by the state with minimal land use conflicts that would be suitable for geoduck farming.

- **Marilyn Showalter 8:56 am on May 5, 2010 [Permalink](#)**

Yes, intertidal geoduck farming interferes with public access to beaches, and interferes severely with the aesthetics of those beaches. No, these effects cannot be mitigated as long as current farming methods are used.

The very beaches sought by geoduck farmers—remote and pristine—are the same beaches that have the highest value for public enjoyment, as well as the highest (and related) value for long-term environmental benefit. As soon as a beach is saturated with plastic tubes, netting, and one species that squeezes out others, that beach no longer the same beach. Access to that physical location is typically barred, but even if it weren't, the beach to which the public would have access is no longer the same pristine beach. So access has been denied by transforming and degrading the tidelands. Similarly, a beach with barges and engines and divers liquefying

the substrate is not the same as a quiet, natural bio-diverse beach. One use cancels out the other.

We have owned and enjoyed our unimproved waterfront property at Shine for 34 years. Sadly, the tidelands in front of it were chosen for a geoduck farming lease (though a highly irregular process, but that is another story). If this lease is allowed to proceed, the entire cove (which has upland public access at east and west ends) will change in character. Both neighboring private owners and the public will lose both in both the short term and long term. The losses will be physical, aesthetic, recreational, environmental, and economic.

Perhaps one day, there will be methods of commercial geoduck planting and harvesting that do not involve tubes, nets, extreme density, and destruction of biodiversity. Until then, geoduck farms should be prohibited on public tidelands.

- **William Burrows 8:37 am on May 5, 2010 [Permalink](#)**

I find the posts by Misters Marcus and McCabe to be "right on" regarding public access. Shellfish interests have characterized my opposition to geoduck aquaculture on public beaches as "self-serving" because one public beach, Fudge South on Harstine Island, abuts my property. In earlier posts I have described how this beach serves many of the public and why it is not appropriate to remove it from unrestricted public access by turning it over to the shellfish industry; I have also stated that the winning bidder for the beach has expressed similar sentiments.

My property is high-bank about 100 feet above the beach. I CANNOT see the beach from my home. I have to walk to the top of the bluff and look down to see the beach (and even then it is difficult because of the vegetation growing on the bluff). The bluff is a part of a larger feeder bluff that helps feed the Wilson Point sand spit.

In addition to having no "view" of the beach, I have NO access to the beach from my property. As a result, I rarely visit the beach. What I know about the beach comes from the sounds that carry up to my porch; children laughing and shouting as they play; adults shrieking as they are squirted by clams; boaters pulling their small craft onto the beach for a picnic; children and adults struggling to dig a hole deep enough to get a geoduck. In my opinion, this is how a public beach should be used and the DNR, in its custodial role, should retain public beaches for present and future generations. If someone wants to characterize this desire as self-serving, then fine by me.

What really angered me when I started to probe the DNR after being informed of their plans in 2007 was the total lack of credibility regarding the plans. Through public document requests, I found that the “science” they claimed to justify the site selections was basically visiting a WDFW website on forage fish. Other documents showed a great deal “cooperation”, one might even call it “collaboration” between the DNR and the shellfish industry to mislead the public. The DNR should not be an agent for industry; they should be the agent for the people of the state.

I really dislike the term “DNR beach”. When a citizen on Anderson Island described the public beach in front of her family home as “her beach”, a DNR representation chided her and stated that it really “wasn’t her beach”. Her response, which was received with a standing ovation, was “yes it is my beach, and [pointing to others in the audience], his beach, and her beach, and everyone else in the room’s beach.”

Let private industry work with private landowners and keep the public beaches unencumbered for all to enjoy.

- **Richard Wooster 8:01 am on May 5, 2010 [Permalink](#)**

The best method to address the aesthetic impact is to stop the expansion of commercial geoduck aquaculture. Next would be to prohibit the activities in the intertidal zones and require all activity to occur at mean low water depths of twenty feet or more. If activities occur on intertidal zones, the use of pvc tubes should be prohibited. If PVC tubes are not prohibited, they should be matched by color to the surrounding beaches and secured to prevent individual tubes from breaking away and becoming part of the man made waste in the Sound. Individual tube nets should be prohibited as they break away and litter the beaches. All tubes and exclusion netting should be biodegradable materials. Modification of the sites or stream runoff near the sites should be prohibited. Physical exclusion barriers surrounding sites should be prohibited. Site boundaries should be clearly marked and contact information for site operators should be posted. Appropriate set backs from property lines should be determined to prevent site activities from impacting neighboring properties. Site operations should occur only during daylight hours. The industry argues that during the winter months low tide only occurs at night. However, rural neighbors should not have to endure the night time intrusion onto sites. If night time activities are allowed, consideration should be given to the types of lights which are allowed to be used and strict noise regulations. All commercial activities should be prohibited on weekends and Federal holidays. Any floating equipment associated with the sites should be limited in size and/or limited in the duration such equipment may remain on site. Hydraulic stingers should be prohibited from being used for harvesting.

Preparation of sites and harvest activities should only occur under the supervision of licensed biologists to monitor, record and document the impact the activities of industrial aquaculture have upon resident species and the physical attributes of such sites. Site location should require an extensive biological and physical survey to document species and conditions present at the site before operations begin and subject to ongoing monitoring for changes to the site and its populations throughout the grow, harvest and post harvest cycles. The expenses of such surveys should be borne by the operators as a cost of conducting business and maintaining a permit. The number and locations of sites should be monitored so that the cumulative impact of multiple sites can be taken into consideration on for aesthetics, environmental impact and species diversity.

- **Richard Wooster 8:00 am on May 5, 2010 [Permalink](#)**

I have lived on Case Inlet for ten years. The expansion of geoduck operations into Case Inlet has been exploding in the past few years. Aesthetically the geoduck sites impact their surrounding environments visually, audibly, by smell, by intensive biomass, establishment of a monoculture, by exclusion of competing uses and human activity associated with the industrial aquaculture. The sight of 43,000 pvc pipes per acre is visibly jarring, particularly at low tide. The water clarity in the vicinity of these sites is greatly diminished, as anyone who has passed under the Stretch Island bridge into the waters behind Stretch Island can identify, Case Inlet's normally gin clear waters become murky and visibility drops to where you cannot see the bottom in less than four feet of water. The tubes make walking on the beach hazardous and contribute to litter and may interfere with the normal migration patterns of various fish and bottom dwelling creatures. The tubes sticking up make Kayaking over or beaching near the sites difficult. The operators exclude normally occurring populations of bottom creatures and operators have re-routed fresh water drainages near their sites and remove natural features that provide habitat. At low tide the sites give off a stench from collected materials. When activities occur at night, neighboring dogs are alerted and bark awakening other animals and their owners. Harvest time liquefies the beaches and destroys all diversity and any fledgling colonies of eel grass or other plants seeking to establish in the area. The sediment plume from harvest activities buries surrounding habitat with similar consequences.

- **John McCabe 5:19 am on May 5, 2010 [Permalink](#)**

Tris Carlson: I happen to be a "landlubber" with no residential or commercial shoreline interests and am hardly a member of the "privileged few". Fair weather permitting and armed with a cheap gps, I feel confident that even my humble fourteen footer with a ten horse egg beater can reach

most (all?) of our state's beautiful public shorelines safely. Many among us, that "public", regrettably by now considered a nuisance species of sorts so loathed by most commercial marine interests and, admittedly, a few of the "privileged few", deeply appreciate the unspoiled beauty of these tidelands. Like many other folks, I'm very grateful for that privilege, a privilege historically earned by the public. As public servants, I expect DNS to continue to protect that privilege for the public and their children. So far, I find Mr. Goldmark and his team capable of furthering this sacred public right, a refreshing change from the previous administration. However, I also feel, as noted elsewhere in this thread (and disputed by DNR), that this public tideland discussion has not been adequately advertised for public input. My finding this discussion is based on pure luck. This discussion deserves a few headlines like "Geobucks mining operations considered on public tideland".

- **Dan Marcus 9:01 pm on May 4, 2010 [Permalink](#)**

I think the previous comment sort of exemplifies the hypocrisy of the geoduck farm proponents in that they are now clamoring (no pun intended) all of a sudden for public access to state tidelands, while severely restricting access to the more than 70 percent of private tidelands that the public retains rights in under the public trust doctrine. One example is the Foss/Taylor Shellfish farm in Case Inlet. Signs are posted on both sides of the beach stating "Private Tidelands, No Trespassing", and letters from Foss' attorneys threaten prosecution if neighbors trespass. This is despite the fact that these neighbors have full prescriptive rights to those tidelands, not-with-standing their public trust rights. This is only one example of many. It should be embarrassingly disingenuous for geoduck farm proponents to attempt to argue that only the privileged can take advantage of public tidelands given these circumstances. The SMA was written in an attempt to head off the exact kinds of problems we are now seeing with geoduck aquaculture.

- **Tris Carlson 2:33 pm on May 4, 2010 [Permalink](#)**

I applaud DNR for this forum. In addressing the access issue it must be admitted that access to State Aquatic Lands has always been problematic. State intertidal lands that are not serviced by a public road or park are encumbered by private upland ownership and or natural barriers such as high banks which in turn makes access attainable only from the water. Only a privileged few can take advantage of the use of these tidelands which are quite extensive in Puget Sound. The fact that so very few use remote tidelands such as these protects the upland owners and allows them to enjoy their "pristine views" which are not theirs but are shielded from enjoyment from the balance of the citizens of the State. because of rightful private ownership expectations. DNR had previously chosen sites for

Geoduck leases that took into consideration the remoteness and required waterborne access that also had the least impact to upland views, thus leaving the Aquatic Lands that had the greatest ability for public use available and unencumbered except for the mentioned barriers. In fact, state aquatic tidelands that meet the criterion previously set out by DNR should be taken advantage of as an opportunity to generate income, for as the SMP clearly states in 90.58.020 as its first priority "recognize and protect statewide interest over local interest". Revenues thus generated could then be used to enhance or construct better public access points to State Lands thus allowing all citizens of the State to benefit from Geoduck aquaculture rather than only those who have their own private access from the upland or by those fortunate enough to have the time and wealth to access from the marine water.

- **William Burrows 3:20 pm on May 4, 2010 [Permalink](#)**

You need to visit the beaches the DNR selected. Yes, some are what one might call "remote", but others are anything but remote. The beach on Harstine Island is a small, 3-acre patch between low-bank communities to the north and south. These communities include about 100 homes. Walking to the "public beach" from either end is a simple stroll. Having "public access" and being "accessed by the public" are two very different things.

The beaches on Stretch Island also have a significant number of residents to the south. To the north is the Stretch Island State Park. Again, we are not talking about anything "remote".

- **Jules Michel 3:43 pm on May 4, 2010 [Permalink](#)**

The logic of this is flawed. If access is limited from the upland areas why would you create another barrier by allowing a geoduck farm to go in, blocking access from the water? If a family visits by boat – "privileged" or not – they will most likely do it at low tide to dig clams or enjoy whatever else is there to see. The state stopped selling tidelands in 1971 in order to preserve the rest for the enjoyment of everyone. Just because it is only accessible from the water does not mean it should become a farm, used by the "privileged" 3.5 full time equivalent workers, locking out everyone else.

- **Charlotte Smothers 10:16 am on May 4, 2010 [Permalink](#)**

I own 300 ft of tidelands on Case Inlet. I learned after moving here 8 years ago that most of the privately owned tidelands north and south of me was either in geoduck aquaculture, or was being considered for permits. On top



of that, DNR is looking at the deeper water in these same areas for potential income with geoduck aquaculture. This is all in a rural residential zone, relatively pristine with lots of sea life. The tidal acreage near me that Taylor Shellfish is “farming” is muddy and devoid of any sealife. There are usually barges offshore and often a crew of workers onsite. It is not uncommon to find netting hundreds of yards away, and I used to find the PVC tubing before the growing tubes were removed. I was told by a DNR rep that if the public tidelands in front of my beach was “farmed” a solution to enabling access to deeper water for swimming or boating would be to leave open a path between the PVC pipes. Oh yeah, when I’m swimming or launching my kayak no problem to stay on that path! I would rather open up my private beach to public access than open it up to aquaculture. I believe this sort of intensive planting will damage the habit for native wildlife for a long time.

- **Tim DeRouen 9:52 am on May 4, 2010 [Permalink](#)**

The DNR description of potential sites to be leased for commercial geoduck farming says that it should not be adjacent to developed residential areas. Yet, the sites being considered along Northeast Stretch Island are, in fact, in front of established residences that utilize them for recreational purposes. Also, I own tidelands up to median low tide on my property, but DNR is considering leasing the tidelands beyond mine for commercial geoduck farming. That would limit access to my own beach during low tides, which would seem to violate navigation rights. Leasing tidelands where there is no nearby development is one thing, but harming property values of adjacent residents and restricting navigation access to privately owned tidelands through such leases would likely make DNR subject to legal action.

- **William Burrows 10:32 am on May 4, 2010 [Permalink](#)**

Not only is the area in front of residential houses, it is also just south of a State Park (meaning that park visitors would have their enjoyment of the beach impacted).

The sites identified in 2006 and 2007 were chosen with no scientific basis regarding environmental impact (10 of the 13 sites that were bid on were adjacent to WDFW documented forage fish spawning areas).

I was told by someone in the shellfish industry that DNR staff and industry representatives cruised the waters with DNR staff pointing out public beaches with industry representatives determining their “geoduck aquaculture friendliness”. This can be confirmed because

one of the site pictures posted by the DNR shows two industry representatives on the beach with eyes down looking it over.

The most critical flaw in the past site selection process involved the lack of public involvement. There was considerable industry involvement, but the public was not consulted; instead, they were just “notified” post decisions.

When citizens of Anderson Island met with DNR representatives in a rather heated meeting regarding the geoduck site on their island, it was pointed out that the site proposed by the DNR was at the end of the Nisqually fetch with strong wave action. The DNR was “surprised” by this and as a consequence, withdrew the site because the water conditions were inappropriate for what they wanted to do there. Had there been a public hearing BEFORE the site was selected, this information would have been communicated.

At least there appears to be an effort to get public opinion here, but as several posters have pointed out, those impacted by the sites already selected were not notified of this discussion forum.

- **susan macomson 8:57 am on May 4, 2010 [Permalink](#)**

our family has paddled all over puget sound and the sight of these farms is horrible. but beyond that it is finding the chopped up or smashed remains of sea creatures. it is the loss of birds, crabs, and otters as well. After 3 years pristine beaches, I don't think so! rubber bands netting and pipes remind us that our beaches are over run by greed. The fact that they no longer have 90% percent of what was once there reminds us that our definition of pristine is vastly different..

As for being a wealthy waterfront owner, what we make doesn't touch what this industry is making but we do have to pay high taxes for our land unlike the taylor franchise industry. as for the big degrees lets remember all those harvard mba's at Goldman Sacs, massey, BC

- **John McCabe 8:30 am on May 4, 2010 [Permalink](#)**

I'm emphatically against any form of geoduck “farming” on any public tideland. Patrick Pressentin and others here have already described the circumstances and consequences succinctly. I actually can't imagine anyone who believes that stomping a bunch of 6 x 9” pvc pipes with plastic netting all over the tideland and ultimately liquefying the shore's substrate up to three feet down to get at those “geobucks” is not highly invasive to marine environments. As the commenter “breze” put it: “...lovely white pvc pipes remind me of a military cemetery with the headstones all in rows.” How ominously fitting an analogy. Anyone who

has not had the opportunity to observe what happens to tideland abused in this manner might simply watch a rerun of Mike Rowe's Dirty Jobs geoduck episode ( Discovery Channel).

- **Peter Downey 9:05 pm on May 3, 2010 [Permalink](#)**

The answer to aesthetics and access depends on the site. Aesthetic impacts are mitigated by the fact that geoduck aquaculture occurs only in the lowest intertidal zones and is exposed for only 5 to 7% of the time while tubes are in place. But tubes are only in place for 1 to 3 years. At all other times during the 5 to 7 year growing cycle, a geoduck beach is indiscernable from an unused beach. Moreover geoduck tubes are quickly "fouled" (2 to 3 weeks) with marine growth and from a distance are indistinguishable from a cobble beach. The aesthetic effect would occur if someone was to approach or walk in the planting area. As for public access, DNR should only choose site with limited upland public access to avoid use conflicts. DNR manages state forests for the public good, with some areas exclusively for public recreation and some areas for timber production and revenue generation. The same standard must be held for tideland. Those grounds most suited for geoduck production should be situated well away from beaches that are heavily used by the public (e.g. North Beach). This will also minimize aesthetic impacts.

- **[Kathryn Townsend 10:19 pm on May 4, 2010 \[Permalink\]\(#\)](#)**

I believe that Mr. Downey's statistics on the visibility of geoduck farms are misleading. We have done an analysis of visibility of geoduck tubes during summer months, since the lowest tides during daylight hours are in the summer (as opposed to the winter when lowest tides are at night). Visual and recreational impact of the tubes is greatest at the very time when the people of Puget Sound are likely to be using the beach and the waterways. Because the industry has stated that they do rotational planting, in at least some areas there will thus always be some portion of the beach with tubes.

This Geoduck Farm Visibility Chart demonstrates that the average percentage of daylight hours per day between Memorial Day weekend and Labor Day that the farms are visible is 19%. The number of days during this season that farms are visible some portion of the day is 76%. This is calculated for geoducks planted to a +2 tidal level in Thurston County, Washington, one of the counties of South Puget Sound where the geoduck farms are currently clustered. When calculated for a +3 tidal elevation, the amount of visibility rises to an average per day of 23% of daylight hours and 87% of the days of the summer. See:

<http://www.protectourshoreline.org/statistics/GeoduckFarmVisibilityChart.pdf>

- **Peter Downey 1:57 pm on May 6, 2010 [Permalink](#)**

Hmm – you exclude half the year’s data to make your point – but I am the one who has misleading numbers?

- **Kathryn Townsend 8:36 pm on May 6, 2010 [Permalink](#)**

Of course you may not agree, but I would call your statistic of 5-7% misleading because you apparently average the winter half of the year, when the tubes are probably almost never visible because the lowest tides are during the night, with the summer half of the year when tubes are highly visible because the lowest tides are during daylight hours. So you give the misleading impression that people will see the tubes throughout the year 5-7% of the time—which is not the case. Our statistics, on the other hand, are not misleading because our document shows the exact data on which the statistics are based, the exact time period of the data collection, and specifically why we used that time period. We used the summer months to show that this time period, when people (beach walkers, swimmers, boaters, kayakers, wind surfers, etc) typically use the beach, when kids are out of school and families use the beach, is the exact time period that the geoduck farms are highly visible and some part of them visible almost every day. You also leave out the concept of rotational planting.

If you would be willing to document and publish the data on which you base your 5-7% visibility statistic, then people can look at the data and make their own judgment. Without knowing specifically how this statistic was produced, anyone aware of the tidal patterns might find it suspect. But we would certainly be willing to review your data.

- **Bradley J. Johnson 9:04 pm on May 3, 2010 [Permalink](#)**

Previous commentators have written eloquently and at length — I shall write plainly & briefly. The aesthetic impact of geoduck farms on public

beaches is the same as if adding a gigantic, dangerous pile of garbage. It's just that simple. Can its impacts be mitigated? No, you cannot mitigate the aesthetic impact of a huge pile of junk stewn over acres of previously pristine beach.

It's ironic, that at a time when so many people & organizations have come together to clean up Puget Sound & restore its natural habitat (including the retrieval of lost fishing nets, and DNR's own program supplying free public buoys in order to decrease seabed damage from anchors), that DNR would actually contemplate \*adding\* more trash to the environment. Even under perfect circumstances, where no anti-predator nets or PVC tubes float away, it's still trash. Garbage is not defined in terms of mobility or lack thereof.

If geoduck farmers truly want to increase their harvest in a sane & sustainable way, they are more than welcome to join with the thousands of concerned citizens who spend their own time & money restoring Puget Sound.

- **Jerry Polley 8:59 pm on May 3, 2010 [Permalink](#)**

As a Fisheries Biologist (UW, "81), with experience in several commercial net fisheries (AK and WA), Seafood Processing (Universal Seafoods, Dutch Harbor AK), 15 years in private aquaculture (Domsea Farms/ Global Aqua LLC), a Washington native with a Masters degree in education, (currently teaching HS Environmental Science and Marine Science here in Kitsap County), I am passionate about our natural resources. I have also had a belly-full of elitist-waterfront homeowners and their NIMBY-commute-every-day-to-Seattle-attorney friends masquerading as environmentalists. This discussion should be about sustainability and best practices rather than what a tiny fraction of property owners want to see and hear on publicly owned beaches. Sustainable shellfish aquaculture is not rocket science and could be a wonderful, sustainable cottage industry in the Pacific Northwest. Mister Michel is absolutely correct: this discussion should definitely focus around specific siting and husbandry practices. A productive model, for example, is small, locally owned and operated farms, meticulously managed, properly sited, planted with heterogeneous, pedigreed stocks and harvested on a constantly rotational basis. I am delighted that the DNR is concerned with aesthetics, but we should be reminded that this same agency has permitted timber clear-cutting, rock quarry blasting and mineral extraction for a generation. Conservation is not the same as preservation. We taxpayers pay the DNR to productively and sustainably conserve our resources to produce revenue while serving the diverse needs of the public. With regards to aesthetics, geoduck farming is little different than agricultural farming: If you don't want to look at apple orchards, don't

live in Cashmere. In addition, I should remind everyone that normal tidal variation does a fine job of mitigating the aesthetic impact of intertidal aquaculture by keeping it underwater and in darkness roughly 80% of the year. When one factors in the opportunities for species enhancement, community outreach, education and local employment, I believe the benefits to the many clearly outweigh the gilded preferences of a few.

- **William Burrows 8:35 am on May 4, 2010 [Permalink](#)**

Unlike Cashmere and apple orchards, the shorelines of Washington State are controlled by State Law known as the Shoreline Management Act [RCW 90.58]. This act places as its second highest priority the need to “preserve the natural character of the shoreline [RCW 90.58.020]”. Nature does not place PVC pipes, netting, and rebar on the Puget Sound Beaches.

I am in agreement with the statement that “A productive model, for example, is small, locally owned and operated farms, meticulously managed, properly sited, planted with heterogeneous, pedigreed stocks and harvested on a constantly rotational basis.” Unfortunately, this does not describe geoduck aquaculture as it is currently taking place.

I will refrain from commenting on the reference to “elitist-waterfront homeowners and their NIMBY-commute-every-day-to-Seattle-attorney friends masquerading as environmentalists” as I believe that it is not relevant to the discussion.

- **William Burrows 9:48 am on May 4, 2010 [Permalink](#)**

Sorry to always dwell on the law, but it should be pointed out that the Shoreline Management Act was started by an Initiative from the people (Initiative 43) in 1970. Later, in 1972, Initiative 43-B was adopted by the people during that year’s general election.

So when I see statements like “I believe the benefits to the many clearly outweigh the gilded preferences of a few”, it is important to point out that all we are asking for is consideration and enforcement of the “will of the people”.

(Source:

[http://www.ecy.wa.gov/programs/sea/sma/guidelines/downloads/SMH\\_History.pdf](http://www.ecy.wa.gov/programs/sea/sma/guidelines/downloads/SMH_History.pdf))

- **[Curt Puddicombe](#) 10:22 am on May 4, 2010 [Permalink](#)**

The “NIMBY” comments are false stereotypes and I find them personally offensive. How about the shoreline property owners such as myself that have been in the area for 140 years? In particular, my family has owned waterfront property in a pristine area of Case Inlet for about 70 years, and there is no history of aquaculture in this area. Similarly, we know people that have owned waterfront here for 100 years, and they don’t want aquaculture here. And none of them are rich friends of attorneys.

Again, the SMA and the public trust doctrine are clear. The waters and the underlying lands are not comparable to upland apple orchards in any sense.

- **Dan Marcus 8:37 pm on May 3, 2010 [Permalink](#)**

The Shoreline Management Act is abundantly clear that physical and aesthetic qualities of natural shorelines shall be preserved..., and it is equally clear that geoduck aquaculture as practiced does not preserve physical and aesthetic qualities. This must be DNR’s guiding principal moving forward with respect to today’s question of access and aesthetics. Geoduck farming also restricts access by boat, whether dingy, kayak, rowboat, yacht or canoe. Access is not limited to public tidelands. The public also retains certain rights to private tidelands under the Jus Publicum of the Public Trust Doctrine. The Washington State Supreme Court has affirmed that the Public Trust is applicable to Puget Sound’s tidelands. The right to traverse is a basic right that has been upheld in case law from around the country. But unlike private tidelands, public tidelands afford citizens the only opportunity left for recreational shellfishing, so even 20 or 30 acres of public tidelands lost to commercial ventures is significant given the few remaining public tidelands left in South Puget Sound specifically. Just based on access and aesthetics alone, DNR should not lease public tidelands for commercial geoduck aquaculture as currently practiced in Puget Sound.

- **Teresa Stone 8:34 pm on May 3, 2010 [Permalink](#)**

Trying to stay on topic regarding aesthetics and to think of ways to mitigate any negative impact is extremely difficult when I come from the perspective of the natural beauty that currently is in place here on Stretch Island. I do not need to repeat the well-written and factual comments previously made. So please try to picture these facts of my experience at my home next to a public beach that is being considered for private profit geoduck farming. It is a clear summer day, the eagles are soaring, the salmon are jumping and it is so quiet I can hear the Madrona bark cracking and watch it float to the ground. There are at least 8 different birds visible and I can hear them all making different sounds. The waves lap quietly on

the beach in an easy uninterrupted rhythm. I hear the laughter of children on the beach and see fisherman just off shore. All is quiet and “in sync”. This is an environment as nature intended and that leads to health for those of us who made the choices necessary to live here. Now please take a minute to review the comments that describe the negative impact of geoduck farming. These two very different environments do not co-exist. I have lived next to a geoduck farming operation, I have experienced the noise, the mess and absolute disruption. It is very important to remember that not only are we discussing access for all citizens and the change in aesthetics for all citizens, but we are talking about my/our home. Case Inlet is used as a recreational site for thousands of citizens each year, it is teeming with folks who appreciate the natural beauty. Geoduck farming will take from not add to their experience. No amount of private money (plus yes, I know, a small amount of income to the state) can ever replace this experience of beauty and, I want to emphasize, health.

- **Amy Bettsworth 8:02 pm on May 3, 2010 [Permalink](#)**

Should public lands be leased by a private entity, they effectively are no longer public. Public access would be limited, if possible at all, as the geoduck business owners’ interest is to protect their investment and make a profit. Public beaches need to be maintained for public use and enjoyment for this and future generations.

As has been stated previously, the practices of industrialized geoduck farming are ugly, messy, environmentally unproven, and seemingly go against all practices of “cleaning up Puget Sound”. When we are spending billions to clean up our man made messes, it seems financially sound to maintain the existing public lands for public enjoyment. Please keep the very limited public intertidal beaches public and do not allow geoduck farming on them.

- **Barry Kirkeeng 7:48 pm on May 3, 2010 [Permalink](#)**

My wife and I moved to Stretch Is about 15 years ago for the beauty, peace, and natural tranquility. Leasing the public beach right in front of our home will destroy that peaceful natural beauty. Visually the tubes are an ugly eyesore. Not enough research has been done on the effects of the hydraulic pressure on the beach which is the foundation for the 100 ft cliff that protects our home and property. The risk is too high to local property owners on Stretch Island. Is the state of Washington willing to insure us that leasing the beach will not damage our property, our homes, and the value we have invested in our homes?

We have friends and family the visit us on a regular basis to enjoy quiet walks on the beach, leasing will prohibit those walks, and restrict access, and the enjoyment of a “natural setting” and the wildlife that are attracted.



We regularly enjoy eagles who are prone to getting tangled in the netting and tubes. The harvest noise will drive away much of the wildlife that we now enjoy.

Please do not approve these permits.

Barry Kikrkeeng

Stretch Island, Grapeview, WA

- **Patrick Pressentin 6:16 pm on May 3, 2010 [Permalink](#)**

Yes, of course there are effects, as the prior comments note. Aesthetics and public use includes the viability of the ecosystem. If the industry would take really degraded state tide lands and restore them to productive use in return for a lease term of years, thus mitigating any change they might make by the overall improvement of the ecology, leasing could be a benefit. Current leases are not. Like any business affected by costs, the geoduck farmer wants to lease the least cost locations of great ecological value and prevent normal natural habitat use and public use for that matter. So mitigation of this industrialized activity implies elimination of the effects on high ecologically valued tidal land. Farming geoducks implies a management of an ecosystem that was thousands of years in the making into a designed monoculture and the potential use of chemical and actual use of mechanical means to increase production. Recent management practices recorded at a shellfish aquaculture forum consider indigenous populations “pests” for elimination on geoduck farms. These include dungeness crabs, graceful crabs, horse clams, cockles, sanddollars, moon snails, barnacles, worms of all kinds, burrowing shrimp, even eelgrass—one of the most productive plant community in the Sound—and other kelp that can foul gear or increase labor cost, etc. Anything that competes with geoducks for habitat. The farming is industrialization of a habitat. Like industrialization of the forest, such action degrades the ecology for net loss environmentally. In forest land now, due to losses on private land, endangered species must be restored with extraordinary limited success on government managed land only. By leasing public tidal lands to managed production, this happens on the Sound for long term damage. We have endangered species in the Sound now; leases of areas of the public land to this industrial activity incrementally reduces the use by protected biodiversity the state is required to maintain, depleting by mechanical (rototilling, pressure water removal, liquifaction of substrate, etc) and chemical control the balance of nature. Any number of agencies and non-profits are working to restore Puget Sound from industrialized upland farming and manufacturing that historically, even currently through stormwater, contaminated the Sound and beaches. Adding tidal industrialization simplifies the habitat further. Any permitted leasing should not allow the tubes, the rototilling, the nets, etc that degrade biodiversity and aesthetics. Otherwise the leased tracts and adjacent tracts are aesthetically and biologically affected. Use of pesticides and herbicides,

introduction of invasive species and other management techniques to increase the growth of the “crop” changes the fundamental ecology of the substate that is public and ought to be prohibited. The state should not create environmental problems and leave them for later generations to repair as we are now doing through the ESA, MOTCA, and other state and federal law.

The economics of leasing create vested interests that the state—that is us—must thereafter care and feed. Examples of the limits on government after the fact are easy to find in the Atlantic salmon fish farms in Canada that now have depleted the natural stocks of pink salmon due to sea lice infestations denied for years by the industry. The farms by economic power became a political interest group in Canada and cessation of operations is not possible with the resulting environmental problems coursing through the whole Salish Sea.

- **Nancy Pearson 5:23 pm on May 3, 2010 [Permalink](#)**

There is nothing aesthetically positive about intertidal geoduck farming that I have seen, based on many photos and comments from landowners who have homes on or near the beaches where this activity takes place. People who build homes on marine waterfront do so to enjoy the intersection of land, water and sky with the beauty, tranquility and peacefulness that environment can provide. The noise, lights, visual appearance of the nets and tubes of geoduck farming is contrary to the quality of experience landowners expect to have at their shoreline homes. DNR should allow absolutely no expansion of commercial aquaculture – geoduck or otherwise — on beaches in residential areas.

Besides being a downright ugly addition to a beach, geoduck operations destroy public access. There is already a very limited amount of public beach available for recreation and awareness of marine life, compared to what existed for earlier generations. With expanded commercial aquaculture, where will our kids and grandkids be able to visit Puget Sound beaches? DNR should stop the expansion now by restricting new commercial geoduck leases to subtidal harvesting at a sustainable level.

DNR has a responsibility to keep our aquatic lands healthy and productive (naturally productive). I believe creating extensive leases to artificially farm geoducks on intertidal lands neither honors the heritage we enjoy nor allows us to pass it on to future generations.

- **Leslie Foss 4:55 pm on May 3, 2010 [Permalink](#)**

The tidelands that our family owns are private from high/high to low/low tide so the public access portion of the question is not applicable. For the past 11 years we have contracted with a shellfish company to farm

geoducks on the beach. In the beginning there were a few issues with aqua-trash which were quickly dealt with both by Taylor and our family and now that is not an issue. The visual aesthetic changes with the portion of the property that is being farmed and yes, there are tubes but that is part of the farming process. My family (all ages) has thoroughly enjoyed seeing all phases of this farming process. We have been swimming, fishing and beachcombing around the farming activities for all of these years with no inconvenience. There is still a diversity of shellfish and marine life and aside from members of the public who come and poach clams, leave open holes and leave trash on the beach, things are pretty much the same as they've always been.

It is important to note that well managed geoduck farms on rural, privately held tidelands are an appropriate and ecologically responsible use of that land.

- **breze 4:26 pm on May 3, 2010 [Permalink](#)**

There are many negative impacts on public access and aesthetics. Aesthetically they remind me of a military cemetery with all the headstones in a row then decorated with dead creatures who were caught on the nets. Low tide is a beautiful experience being able to view many creatures that normally you don't see; many species of Starfish, tube worms, Sand Dollars to name a couple. At low tide with geoduck farms.....

- **breze 4:16 pm on May 3, 2010 [Permalink](#)**

There are major negative impacts on public access and aesthetics of these farms. Public access? I was told I was not allowed to walk on any farmed beds and I definitely would not want to after harvest! If you walk on a harvested geoduck bed you could quickly sink in the soft sand and like quick sand it does not want to release you. A small child or horses and riders walking our beach I hope they don't walk over a newly harvested field.

Aesthetics? Yes the lovely white pvc pipes remind me of a military cemetery with the headstones all in rows. All decorated with the dead creatures caught on the nets. Not to mention after a storm how they are scattered on the beach until the tide takes them out.

- **Bertil F. Johnson 4:16 pm on May 3, 2010 [Permalink](#)**

Are there effects of geoduck aquaculture on public access? Of course! If you think you can, try to walk across intertidal beaches which have been leased for commercial geoduck operations. The lessor's employees have and will insist you get away from their geoduck farm. And they will be

firm, adamant and unyielding. And that is true if you try to go over their leased operation by boat, or kayak or the good old inflated inner tube. Furthermore, have you ever tried to negotiate what used to be a pristine sandy public beach now punctuated by 40,000 PVC tubes per acre stomped into the beach and then covered with anti-predator netting, rebar and such other obstructions required in the process of the commercial raising of geoducks? It can't be done! You certainly would not send your little child or grandchild into such a dangerous place. In short, the leased property is off limits to the public. There is no public access. Period..

Can the problem be mitigated? Sure. Don't lease state owned (DNR) recreational beaches for commercial aquaculture purposes. Recognize that intertidal ownership on Puget Sound is roughly 70% private and only 30% public. There are few public beaches for the citizens of this area and this state. For years a mantra of the DNR has been to manage the aquatic lands on behalf of all people of Washington State including that ever important facilitation of public access. Don't allow the pristine state owned beaches to be taken away from our generation and generations to come for the benefit of commercial shellfish companies who sell the geoducks primarily to the international "virility trade" buyers from foreign lands.

Are there aesthetic effects of geoduck aquaculture? Simply read the comments above. There is no mitigation available to reduce the visual and audio pollution produced by these commercial operations. At a hearing in Pierce County I attended a fellow whose name unfortunately I don't remember put it this way: "Picture looking over a white cedar railed pasture in which two well kept cows are silently munching the lush springtime grass sprinkled with daisies, with Mt. Rainier in the background caressed by the setting sun. Then, from the same spot picture looking over that same cedar railing at a commercial beef feed lot." The picture is clear to me. I hope it is to the powers to be at the DNR. The conversion of the few recreational beaches and tidelands of Puget Sound into "feedlots" that produce a non-essential commodity is not consistent with the stated mission or vision statement of the DNR or the mindset of the population of those who are residents of the Puget Sound area and those who visit this precious gem in our back yard.

- **Don Martinson 3:31 pm on May 3, 2010 [Permalink](#)**

I don't think it is possible to mitigate the impacts to access and aesthetics posed by geoduck farming in the intertidal. It's a fairly disruptive, obnoxious, and destructive commercial operation, often occurring in a residential setting. And it's probably illegal under the various state and federal laws from an environmental perspective.

- **Laura Hendricks 3:17 pm on May 3, 2010 [Permalink](#)**

Yes, there are significant impacts on public access and aesthetics and DNR should not be leasing intertidal beaches for geoduck aquaculture. DNR should not try to mitigate an activity that is not consistent with the rights of the public to enjoy the natural character of the shorelines or with the habitat goals for a Puget Sound and salmon recovery.

Even though industry is trying to convince our public officials that public access across DNR tidelands would be no problem if they are leased, that is just not the case. If a citizen complains about any aspect of the shellfish industry practices that are affecting the citizens or the wildlife, the following actions have already been taken by shellfish industry large corporations:

1. In Totten Inlet, several of us ( including a legislative aid) walked down the shoreline and were confronted by an industry employee who came up by boat and told us that we could not walk the shoreline as they owned/leased as far as we could see—and we were walking on state owned tidelands. This was not an isolated incident, as residents were told that they were not allowed to walk down the shoreline.
2. In the Steamboat Island area, Brenda called to ask if the shellfish industry could keep her from walking down the beach in front of her home since the following statement was contained in a letter to her: “Now that you have asked I will most assuredly respect your living arrangements and would ask that you do the same regarding our property rights on the beach we farm below and to either side of your living quarters.”
3. In Case Inlet, an attorney sent a letter to the adjacent neighborhood (12 homes) with the following statement: “North Bay’s property includes the tidelands exposed at low tide. Please do not enter the property, including grounding boats on the bottom where the tide would allow that to occur on land exposed at low tide. Do not go on the beach or uplands. If you do so, legal action will be taken.”

Until the geoduck aquaculture operations began in each of these neighborhoods, neighbors walked freely down the beaches without seeing “No Trespassing signs” or receiving warnings. There is no doubt that the expansion of industrial aquaculture pits citizens against large corporations and their lawyers. There is no mitigation that will solve this issue because geoduck aquaculture is destructive and does not belong in intertidal beaches.

- **jim Gibbons 4:35 pm on May 3, 2010 [Permalink](#)**

I think what’s being alluded to here is the fact that 70% of the tidelands are privately owned in the State of Washington. As far as I know, property owners still do have the right to say who can come onto their property. At least for now they do, in spite of some folks best efforts to say otherwise.

- **Peter Sloan 2:53 pm on May 3, 2010 [Permalink](#)**

In terms of public access and aesthetics, geoduck aquaculture is a disaster. A typical site is covered with thousands of PVC tubes, covered by nets secured with rebar. The public will not be able to walk those beaches! Boaters will not be able to access the beach from the water unless the tide is high enough to cover all the tubes. People cannot fish from the beach as their lures will get caught up in the nets. Effectively aquaculture prevents the public from utilizing these beaches.

From an aesthetic perspective, the tubes, netting not to mention the barges etc are ugly & detract from the beauty of the region. Face it, one of the reasons Puget Sound is such a desirable place to live is the natural beauty. From my understanding, aquaculture has a detrimental impact on the diversity of wildlife in the area. I believe that wildlife such as eagles, salmon, seals etc. is a significant contributor to the overall aesthetic of Puget Sound. I don't understand why the state would spend millions (billions) to restore habitat for the benefit of wildlife while at the same time consider leasing pristine shoreline for the expansion of industrial shellfish cultivation.

- **Lana Allen 2:51 pm on May 3, 2010 [Permalink](#)**

We live on the east side of Stretch Island in our "dream" retirement home built in 1997. We chose this location because of the pristine, unfettered view of the beach below and Case Inlet. We are boating enthusiasts and use our beach for loading and unloading grandchildren. These grandchildren enjoy the beach for swimming and love exploring our wonderful sea life.

On the mainland to the west of Stretch Island is a geoduck farm. We have seen for ourselves the destruction and pollution that this farming causes. We do not want geoduck aquaculture on our beautiful Stretch Island. Please go elsewhere!

- **Jim Gibbons 2:47 pm on May 3, 2010 [Permalink](#)**

A thought. In those instances where a landowner objects to the leasing of state owned tidelands in front of their home and the public does not have a land access to those tidelands, perhaps the landowners could provide a public easement to the tidelands in question in place of the shellfish farmer leasing the tidelands from the state.

- **Jules Michel 3:36 pm on May 3, 2010 [Permalink](#)**

Is the offer to stop geoduck farming if upland owners grant access to tidelands? That would be worth discussing.

- **Jim Gibbons 4:30 pm on May 3, 2010 [Permalink](#)**

The “suggestion” is that where folks don’t own their tidelands and the state is considering leasing the tidelands for shellfish farming, perhaps the upland owner could grant an easement to the state owned tidelands in exchange for not having the state lease the tidelands to the shellfish industry. In many instances the only public that can access the sandy beaches that have been mentioned is by relatively wealthier boat owners or shoreland owners. The average person really can’t afford to access all these “public” lands of DNR.

- **Jules Michel 7:10 am on May 4, 2010 [Permalink](#)**

Unfortunatley, many state owned recreational areas are not accessible by the average person, whether by choice; physical condition; time; or unfortunate financial problems. But sometimes a destination being a little more difficult to get to is what makes it all the more enjoyable, and where the alternative value of the property is found.

- **William Burrows 4:16 pm on May 3, 2010 [Permalink](#)**

A public beach does not need a public access point to be heavily used by the public. For example, the beach I know most about, Fudge South, is situated between two residential communities: Island Shores to the north and Smith Cove/Wilson Point to the south. It is also directly across from Joemma Beach State Park that has a boat launch. This beach is a “little bit of privacy” for the residents and their guests and other visitors because it is located below a high-bank. There is no view of any man-made structures from most of the beach.

Ironically, Kent Kingman, the person who co-owns the company whose bid was selected for this beach visited the beach in the summer of 2008 during a weekday. He was overwhelmed by the activity is observed on the beach; including boaters who had landed their crafts to enjoy the beach.

He was so overwhelmed that he wrote a letter to Commissioner Goldmark, expressing his concerns about using the beach for aquaculture. He asked the DNR if there was a possibility of the DNR finding another beach for his activities instead of the Fudge South beach.

I am sure his letter is on file in the Commissioner's Office.

- **Sorrels Newman 1:46 pm on May 3, 2010 [Permalink](#)**

Public beaches should not be privatized for the financial benefit of a few large aquaculture companies that have been lobbying for expansion. It is not in the best interest of citizens to not be able to freely walk the beaches, swim, fish or boat. You cannot safely swim around aquaculture, especially geoduck aquaculture that routinely uses rebar, nets and PVC which breaks into razor like shards. You cannot fish around these nets as your lures get caught. Last summer I walked out next to Joemma Beach and stepped on a broken piece of PVC protruding from the sand from a neighboring geoduck farm and my foot was badly cut. Since there was no label on the plastic, there was no one to take responsibility. Giving citizens a small corridor in the midst of all of this destruction is just not an acceptable alternative. We are also worried about our safety when we try to point out the problems and industry becomes very hostile.

We have seen grey whales in our area come close into shore where they would be right in the area where these masses of tubes would be planted. The grey whales feed off the bottom on mud and ghost shrimp that industry is trying to eliminate. What is going to happen when they ingest some of this plastic or get cut when their heavy weight crushes either the masses of tubes or ones that have become dislodged and are on the bottom of our bay? The wildlife is important to citizens who live here and also have rights of public access and cannot continue to be ignored until all of them are on the endangered species list.

- **Judith N. Sloan 1:40 pm on May 3, 2010 [Permalink](#)**

I certainly agree with the previous comments condemning the use of public beaches for geoduck farming. The farms are ugly, dangerous to passers by, noisy (especially when harvesting) and have no place on our limited public sandy beaches. I believe the subtidal harvest may have a place and has had little awareness by the public in years past. Please, DNR, do not allow geoduck farming on public beaches.

- **Jerry Johannes 1:32 pm on May 3, 2010 [Permalink](#)**

Aesthetically, geoduck operations are visual degradations of the intertidal areas. Who would desire to look at a mass of plastic tubes, plastic nets and rebar? Who would want to see the glare at night from lights on our shoreline? Who wants to see scows, dredges, boats on our shores? Geoduck aquaculture is a visual blight.



Aesthetically, the noise from geoduck operations is significant. The dredges, scows, boats, motors, generators and workers on the beach all impact the solitude of the beach.

The lights and the noise from these geoduck operations affect natural marine food webs and affect many native species in a negative fashion.

Keep our public tidelands open for public access and public use.

- **Gail Sheikhzadeh 1:21 pm on May 3, 2010 [Permalink](#)**

If we close our eyes, and pretend that we don't see the destruction of our beautiful Puget Sound by the farming methods of the commercial shellfish Industry, then we deserve none of the beauty that surrounds us. Seeing and hearing the shellfish industry barges dredging acres of tideland is disturbing. Is the resulting silt washing up on shore a danger to marine habitat? To watch the dredged material being dropped on the barges and carried away begs the question...how many sea critters are in that dredged material that is being taken away? Where is it being taken? There are no longer any tiny crabs scurrying around the beach. I've seen pictures of thousands of sand dollars destroyed by the shellfish farmers. Is this our idea of a healthy Puget Sound?

A recommendation on how this destruction can be mitigated: Get the shellfish industry farming practices and geoduck aquaculture issues out to the general public for input and discussion. There is a serious lack of information making the news in our Daily Olympian regarding the declining status of their Puget Sound beaches due to the effects of aquaculture. If more people know, more people will join into the discussion with ideas, solutions and opinions.

- **Kim Merriman 1:18 pm on May 3, 2010 [Permalink](#)**

To DNR Forum: I found this statement on your web site.

“The communities that DNR hopes to hear from include the scientific, aquaculture, environmental, federal, state, and local governmental; and interested residents of Washington State.”

Can you tell me how each of these entities would know of this forum?  
Was there a specific outreach program to ensure their participation?

The affects are wide-ranging depending on location – but I believe any PUBLIC beach should not be allowed to be planted in such mass quantities – if at all. It's akin to the carrying capacity of the land...but in this instance it's the beach. How much is too much? In order to assure enough survival and therefore a high harvest, PVC tubes and predator nets

are used. Anyone trying to walk a beach at low tide that has been planted this way cannot navigate the pipes and/or nets. They're not only unsightly, but they are barriers to being able to access and explore the marine life.

I would also like to suggest that "access" be viewed more broadly to include not only humans, but all the near-shore and marine ecosystem creatures that rely on the beaches as well.

Many things get trapped under the nets and cannot get out. Others cannot access what's underneath...needing those things for their own survival/existence. I have witnessed this with crab, small fish, heron, and eagles. A beach under this type of armor changes the natural relationship(s) between all creatures great and small that may require the marine life for their own life or simply as a tool for human exploration.

- [dnrforum](#) 2:34 pm on May 3, 2010 [Permalink](#)

Clarification: Ms Merriman, DNR used a number of communication tools to inform the above entities about the Geoduck Forum including, blogs, tweets, facebook updates, webpage updates and a press release.  
Thank you for your comment.

- **Teresa Stone 6:37 pm on May 3, 2010** [Permalink](#)

I think it should be pointed out that those of us who live directly by the beaches under consideration by Stretch Island were not directly informed even though we are in direct contact with DNR. We should be notified of any action or discussion of this issue since the negative impact on our environment will be huge.

- **Kathryn Townsend 8:04 pm on May 4, 2010** [Permalink](#)

The distribution list from the Shellfish Aquaculture Regulatory Committee was not notified and should have been. This would have notified representatives of all groups. If indeed the list was notified, then my name was not included nor my husband's name. There should have been a proactive notification by email.

- **Jerry Johannes 12:58 pm on May 3, 2010** [Permalink](#)

Aesthetically, geoduck operations are a visual degradation of the intertidal areas. Who wants to look at a mass of plastic tubes (eight miles of tubing per acre), plastic nets, and rebar? Who wants to see lights at night on our tidelands? Who wants to view scows, dredges, boats, and many workers on our tidelands? These operations are a visual blight.

Aesthetically, the noise from geoduck operations is significant. The scows, dredges, generators, PA systems, motors and noise of workers all impact the beauty and natural quality of the beach. The noise interrupts the natural quiet of the beach.

The disturbance (a scientific term) of lights and noise affects the natural processes of our marine food web and has the potential to negatively impact many of our native species.

Keep our public tidelands open for public access and public use.

- **Bart Madison 12:11 pm on May 3, 2010 [Permalink](#)**

Washington Sea grant WSG-TR-08-01 (rev 27 Oct 09) addressed the Ecological Effects of geoduck aquaculture and concluded in nearly every area of investigation that there was not enough known about the effects to reach a conclusion. They said that overall, little work has been done on the ecological impacts of these practices and that the research that has been conducted has not been subjected to formal peer review. So they focused their work on what has been done in other bivalve research which may or may not reflect the effects of geoduck activity at all. The effects on our ecological system have far reaching effects on the aesthetics of Puget Sound. In the area of Water Quality, while acknowledging the beneficial effects of filtration, Sea Grant notes that numerous studies have shown that filter feeding bivalves can locally decrease phytoplankton abundance. . . In Sedimentation, they found that at specific sites, sedimentation increased and at others there was little effect. This should lead to site specific analysis before permitting in lieu of general policy. There was no peer reviewed evaluation of the effects of tubes on the environment or on the community. There was no data on the effects on the benthic faunal community structure. There are no peer reviewed data published on the results of harvest techniques used in geoduck aquaculture. There are no peer reviewed studies available for Geoduck carrying capacity in Puget Sound. Given all these uncertainties and the State and Agencies mandate to employ the precautionary principle, I cannot imagine how we would be contemplating leasing public lands for this purpose. If our economic engine needs this geoduck driver so desperately, let's at least wait until we have more certainty in what we are doing. We are investing too much in recovery of Puget Sound to be engaging in activities that might compromise our whole effort.

As for public access, each of the leased areas will be, no doubt, off limits to the public.

- **Curt & Donna Fugere 11:26 am on May 3, 2010 [Permalink](#)**

We have witnessed the leasing to private enterprises near us. Needless to say, it is most unsightly, debris from harvested beaches have been spread about, the noises made during harvesting impacts the other property owners. However, we understand, it is the right of those tidal right owners to lease, but the state.....NO! We settled here to enjoy the pristine beaches, which includes a large sand dollar bed, a public boating only access state park which inspires beachcombing, the idea of anything other than what nature has provided will definitely negatively impact these shores as they are today. The “destruction for profit”, once damaged by man can never be replaced.

- **Dan Draais 10:57 am on May 3, 2010 [Permalink](#)**

I can imagine that there may be economic arguments that favor more geoduck farming, but it's hard to see how there can be anything other than negative effects with respect to aesthetics and access unless it's subtidal. That, however, seems likely to produce many more impacts on the marine ecosystems.

- **Judith Berry 10:36 am on May 3, 2010 [Permalink](#)**

Yes there are affects. Unsightly beaches with plastic pipes, netting, as well as loss of beach access by the PUBLIC and damage to subsurface of our beaches. Keep the PUBLIC BEACHES FOR THE PUBLIC USE and let the private parties who wish to lease to private parties do it on THEIR beach. Property owners on waterfront bought that property to be away from industrial noise and pollution. We do not need to be subjected to private use of the beaches for profit of private industry.

- **Jim Gibbons 10:36 am on May 3, 2010 [Permalink](#)**

I agree with the point that was made that “geoducks thrive in sub-tidal waters.” Sub-tidal waters would be any water below a -4.5' tidal elevation. Sub-tidal farming should be considered.

Reputable farmers using divers tended by harvest crew members wearing head phones to listen to the divers in the water and also using diesel engines would create almost no noise. I would welcome anyone to come out on the water and direct a decibel meter at our operation if they wanted to confirm this for themselves.

The aesthetics and public access issues would largely go away if the shellfish industry were farming sub-tidal waters. While the inter tidal industry will never go away, having sub-tidal farms would help mitigate many of the more controversial issues. For the most part, eel grass is non-existent in S. Puget Sound and where it does exist DNR could set rules to avoid it if sub-tidal farming were opened up.

With regards to inter tidal culture of geoduck on sandy beaches, I can understand why someone who does not own the beach in front of their house or which is visible from their house might not like that. Hopefully, DNR is taking that into account in their beach selections. There are more publicly owned sandy beaches in S. Puget Sound waters than people might realize, twenty miles or more by my calculations, although much of that is in Pierce County.

I am also reminded of the phrase “Beauty is in the eye of the beholder”. As a farmer I can emphatically state that I would much rather look at a good shellfish farming operation than I would at many of the shoreline homes I see along the S. Puget Sound water front.

This summer will mark the 13th year of our operating a geoduck farm next to a public park. We’ve not had any complaints that I am aware of nor have there been any access issues with regards to the farming on our privately owned tidelands, although we do have to police the recreational clammers who come onto our property. We have always been welcoming to the YMCA campers who continually bring their campers onto the farm for educational tours. In 13 years of having young children explore our farm there have been no problems. I would urge anyone to contact Camp Coleman to verify this.

Regarding the Purdy Spit geoduck operation. Virtually everyone in the farmed geoduck industry believes that citing a farm in a public park was a bad idea. Pierce County allowed that to happen. At some point in time the farmer was prohibited by the County from tending his farm. When the county took over the operation they stopped doing ANY maintenance and the debris issue became very problematic. Other industry members then attempted to help the County deal with THEIR maintenance issue, an issue they were woefully unprepared to do.

- [Curt Puddicombe 11:29 am on May 3, 2010 Permalink](#)

Gibbons, you may not like looking at some shoreline homes, and I can probably agree with some of that sentiment, but keep in mind that these homes were here before you were, that the SMA gives preference to shoreline residential development, and that shoreline homeowners pay a lot of property taxes.

Also, there are already guidelines in place on subtidal eelgrass with respect to the harvest of wild geoduck.

On eelgrass, it is not true that eelgrass is virtually non-existent in South Sound. Before geoduck/shellfish aquaculture expansion in North Bay, there was a large meadow of eelgrass. There is a unique type of native eelgrass in South Sound. Eelgrass is seasonal, and can establish/re-establish if sandy intertidal and shallow subtidal areas are left undisturbed. We're not going to increase eelgrass by covering the intertidal and subtidal with cultured geoduck. The Rockfish preservation plan calls for the restoration of eelgrass, and some of the best potential eelgrass areas are coincident with areas targeted for geoduck aquaculture.

- **William Burrows 12:23 pm on May 3, 2010 [Permalink](#)**

While sub-tidal may be defined at -4.5 feet, the DNR HCP for Native Geoduck Harvest restricts harvests to no closer than -18 feet. This is based on science that has determined any activity closer to the shoreline is harmful. Thus, the -18 foot line is an ecologically better boundary than than -4.5 feet.

In addition, the DNR/WDFW rules for sub-tidal harvest limits activity to daylight hours (8 am to 4 pm) so there is less impact on the people who live near the harvesting activity.

- **William Burrows 4:28 pm on May 3, 2010 [Permalink](#)**

To follow up my own post, the information I presented can be found in:

“Habitat Conservation Plan for Washington Department of Natural Resources’ Geoduck Fishery”, July 2008. Aquatic Resources Program.

You may find it at:

<http://www.nwr.noaa.gov/Salmon-Habitat/Habitat-Conservation-Plans/Geoduck/upload/Geoduck-HCP.pdf>

Specifically see Section 1-3 Plan Area, found on page 3.

- **[dnrforum](#) 8:49 am on May 4, 2010 [Permalink](#)**

Clarification: DNR does not currently have an HCP that covers aquaculture. Our sustainably managed

Wild Geoduck program is a separate activity that is not under discussion in this forum.

- **Jules Michel 11:50 am on May 4, 2010**  
[Permalink](#)

Thank you for clarifying that subtidal tidelands are not under consideration for leasing. There having being no subtidal planting in Puget Sound would put that option in question.

- **Jim Gibbons 5:04 pm on May 4, 2010** [Permalink](#)

A reply to Mr. Burrows comment above. My understanding is that the “DNR HCP for Native Geoduck Harvest restricts harvests to no closer than -18 feet” is a regulation for the geoduck “fishery.” I think it’s important to apply fishery laws to the fishery and shellfish aquaculture laws to shellfish farming.

I know the primary researcher that was in charge of developing the geoduck fishery and overseeing much of research for the fishery and while I hesitate to speak for him, it is my understanding that the 200 yard buffer is just that, a buffer. No research was done on the effects of harvesting in this area. It was done for two primary reasons: to protect eel grass (there is very little in S. Puget Sound) and as a noise buffer for shoreline owners. I would encourage unbiased and open minded individuals to come listen in on a geoduck farming harvest operation and see for themselves whether there is a problem with noise.

- **William Burrows 9:16 am on May 5, 2010**  
[Permalink](#)

[Note to moderator: This thread started with the original poster stating that sub-tidal farming should be considered and defining sub-tidal as any water below -4.5 feet. The follow-up posts addressed the advisability of defining sub-tidal at -4.5 feet or -18 feet. Documents supporting the -18 foot level were presented in the context of the statement that “sub-tidal farming should be considered”.

Furthermore, the DNR BMP for geoduck aquaculture, which will likely be effect when the 30+ acres are harvested by the those who trespassed on public land, allows “wet harvesting”, which is in directed contradiction to the SEIS published in 2001 as well as the DNR’s HCP for Geoduck Fishery.

Based on this issues, I believe that the discussion is valid and relevant to the intent of the forum.]

The real issue is not if it is or is not a fishery, the real issue is harvesting techniques, which are the same in both wild as well as planted culture. In addition, any harvesting in the water column, whether it is for wild culture or planted culture, exhibit the same “plume” issues. The Final Supplemental Environmental Impact Statement on the State of Washington Commercial Geoduck Fishery, May 23, 2001\* has things to say about the -18 foot shoreward limit.

On Page 49, it states that “Geoduck harvest in the shallow water is complicated by the fact that most eelgrass and herring spawning areas in Puget Sound are shoreward of the -18 ft. MLLW level. Herring spawning substrates and eelgrass will have to be avoided by any future geoduck harvest if it were to occur in shallow water.”

On page 82, discussing Salmon, the SEIS states that: “Geoduck tracts are also deeper (>18 ft MLLW (~5.5 m)) than juvenile rearing areas, including migratory corridors.”

On page 83, the SEIS quotes Dr. Charles Simenstad, with the University of Washington School of Fisheries, as follows: “The exclusionary principle of not allowing leasing/harvesting in water shallower than -18 ft. MLLW or 200 ft [sic yds] distance from shore (MHW); 2 ft. vertically from elevation of lower eelgrass margin, and within any regions of documented herring or forage fish spawning should under most conditions remove the influences of harvest-induced sediment plumes from migrating salmon. As the available information indicates that sediment plumes do not enter the nearshore zone, impacts to juvenile salmon



habitat and prey resource should also be protected from impact by these policies if effectively regulated.”

\*[http://www.dnr.wa.gov/Publications/aqr\\_geo\\_lowres2001\\_final\\_seis.pdf](http://www.dnr.wa.gov/Publications/aqr_geo_lowres2001_final_seis.pdf)

- **[Curt Puddicombe 9:27 am on May 5, 2010 Permalink](#)**

Geoduck farmers may say they do not like looking at some shoreline homes, and I can probably agree with some of that sentiment, but keep in mind that these homes were here first, that the SMA gives preference to shoreline residential development, and that shoreline homeowners pay a lot of property taxes.

Also, there are already guidelines in place on subtidal eelgrass with respect to the harvest of wild geoduck.

On eelgrass, it is not true that eelgrass is virtually non-existent in South Sound. Before geoduck/shellfish aquaculture expansion in North Bay, there was a large meadow of eelgrass. There is a unique type of native eelgrass in South Sound. Eelgrass is seasonal, and can establish/re-establish if sandy intertidal and shallow subtidal areas are left undisturbed. We’re not going to increase eelgrass by covering the intertidal and subtidal with cultured geoduck. The Rockfish preservation plan calls for the restoration of eelgrass, and some of the best potential eelgrass areas are coincident with areas targeted for geoduck aquaculture.

- **[Curt Puddicombe 10:33 am on May 3, 2010 Permalink](#)**

There are significant negative impacts on public access and aesthetics. The public cannot walk on a beach or on tidelands that are covered with 75 tons per acre of PVC pipes covered with nets. The public cannot walk on tidelands that have been recently liquified by hydraulic harvest. Beachcombing at low tide, and fishing, boating, wading, swimming and similar public trust activities at high tide are negatively impacted.

I did an interview with Deborah Wang of KUOW radio in 2008 at an unpermitted Seattle Shellfish geoduck site next to Joemma State Park, and she was afraid to walk on the tidelands there due to the pieces of rusty rebar and broken shards of PVC pipe laying around.

The aesthetic impacts are also significant, regardless of the color of the PVC. There are also barges, pumps, scows, nets and orange baskets. Even when the PVC and other paraphenalia are absent, the tidelands often

appear dead – devoid of natural life. There's the loss of sand dollars, star fish, moon snails and other intertidal species that the public would normally enjoy seeing. Instead, there's the Frankenstein-esq presence of an unnatural, freakish, dense monoculture of geoducks, and very little else. The artificial propagation of geoduck in the intertidal is not appropriate per the SMA and public trust for both public and private tidelands.

- **The rev. Sylvia Haase 10:03 am on May 3, 2010 [Permalink](#)**

As a waterfront property owner on Case Inlet, I oppose allowing private shellfish companies from using PUBLIC land or any other waterfront properties to be used for “farming”. The debris, the noise, the ruining of the land is something that cannot be endorsed. County codes do not allow me to own a business here, yet we have for-profit businesses along the waterfronts. We are called to be good stewards of creation, and the geoduck farming is not good stewardship. The bottom line is greed.

- **Robert Paradise 9:13 am on May 3, 2010 [Permalink](#)**

The Purdy spit was rented out for geoduck farming about 10 years ago. There was a constant mess of tubes nets and garbage in the area. Many people were injured by stepping on or tripping over tubes. Swimmers (like me) were entangled in netting. Several windsurfers were injured by hitting junk in the water. The operator had many confrontations with park visitors who were threatened and harassed. It cost the taxpayers alot in court costs to evict the operation. Some of the operators claim to be good citizens but are quick to file law suits that waste tax dollars. The only way to mitigate is not to allow this in the first place. Some operators claim they have new methods, but I visited a farm last week and noted rouge tubes washed up all along the beach and in deeper water. A dead grey whale was found to have plastic in its gut in the sound. Please do not allow expansion on public beaches.

- **Larry Mccallum 9:11 am on May 3, 2010 [Permalink](#)**

We live in a residential neighborhood in Victor, We lay awake at night listing to the continous noise from the generators/pumps running all night, then with boats, lights and workers it's grown to a 24/7 operation.. If it was any other residential neighborhood you'd be in jail for disturbing the peace. Whats next lease land for private hunting, private fishing area's or to people that can only afford to use our state lands. Private Business has no place on private State Lands. The word Public use to mean something. All I can say.. Is take Names and Vote.. it seems to get more attention.

- **Sarah Hannapel 8:12 am on May 3, 2010 [Permalink](#)**

Whether it's sandy or rocky beaches, at low tide, we have to navigate around these farms and be careful where we swim to avoid stepping on them. I have a problem with the aesthetics, water quality and taxation issues. TAXES: Why are residents who have to look at these unsightly farms and working houseboats paying the same, high waterfront property taxes as those who do not have a view of the geoducks? County is double dipping and residence ought to be compensated. WATER QUALITY: Why are we polluting our waterways for a food that is not largely consumed by Americans but rather exported to other countries? What are the plastics and large concentrations of geoducks doing to our environment? AESTHETICS: Waterfront residence have their views compromised. We have to look at the ugly farming and listen to the continuous noise from the semi-permanent houseboats anchored off our shores for several months – especially during the most popular seasons, Spring and Summer!

- **Jules Michel 7:51 am on May 3, 2010 [Permalink](#)**

Is there a map of what tidelands we are talking about?  
Thank you.

- **[dnrforum](#) 10:32 am on May 3, 2010 [Permalink](#)**

Clarification: Jules, thanks for the question. The topic “Geoduck aquaculture on state tidelands” isn't referring to specific tracts, but this is meant to be a public discussion about the overall policy direction. Hope that clears it up.

- **Jules Michel 12:44 pm on May 3, 2010 [Permalink](#)**

I appreciate the goal, and maybe this would have been better asked on Thursday's “Unknown” forum. But not knowing the acreage and location makes a discussion of today's topics – aesthetics, access and mitigation – a bit of a challenge. Tomorrow's discussion of economics and job creation becomes difficult not knowing if we're talking about 20 acres of sandy beaches or the entire subtidal basin of Puget Sound. If some clarity on acreage and location could be provided it may help focus the comments and result in a policy decision most everyone is comfortable with.

- **Bruce Olsen 6:21 pm on May 3, 2010 [Permalink](#)**

According to DNR website and lease offer maps ,  
there was a total of 16 acres offered in 2005 and 15

acres offered for bid in 2006. Not all of this acreage is available for planting with 20 to 25 foot setback for eel grass and access corridors for the public as a requirement on state leased property. The state according to DNR own website manages 68,100 acres of tideland. Then there is another estimated 86,510 acres of privately owned tidelands. When considering all the tideland 31 acres is 2/100 of 1% of that area that is being addressed in this forum.

- **Jules Michel 6:36 am on May 4, 2010**

[Permalink](#)

Is it? It would help greatly to have DNR confirm that all they are considering are these 31 acres and nothing else so everyone is clear on what we are discussing.

- **Bruce Olsen 8:57 am on May 4, 2010** [Permalink](#)

Update, I missed two of the sites on the first year so the overall total acreage offered for 2006 is 19 acres not 16 acres bringing the approximate total to 34 acres for lease.

2006

North Navy 3 acres – Dickerson Point 1 acre – East Stretch 2 acres – Haley 1 acre – Herron Lake 4 acres – Taylor Bay #1 2 acres – Taylor Bay #2 3 acres – Wilson Point #1 1 acre – Wilson Point #2 2 acres

2007

North Navy #3 2 acres – Discovery Bay 1/2 acre – Hood Head 2 acres – Shine 2 acres – East Stretch #2 2.5 acres – Fudge South 3 acres – Taylor Bay #3 2 acres – West Stretch 1 acres

- **Jules Michel 11:12 am on May 4, 2010**

[Permalink](#)

I wonder if DNR can clarify what amount of acreage this forum should consider when we provide input. They have clarified the subtidal area is not part of this discussion which was helpful. What is not clarified is what state tidelands this forum is focused on: is it only what Mr. Olsen is describing;

Mr. Gibbons' estimated 20 miles of shoreline in Pierce County; or the 68,000 acres noted by Mr. Olsen?

- **William Burrows 7:30 am on May 3, 2010 [Permalink](#)**

The Shoreline Management Act is clear [90.58.020]: "Permitted uses in the shorelines of the state shall be designed and conducted in a manner to minimize ... any interference with the public's use of the water" It states that agencies shall "Increase public access to publicly owned areas of the shoreline." Restricting the public's use of pristine, sandy public beaches, in exchange for private industry's for-profit activities, should not be permitted.

Geoducks thrive in subtidal Puget Sound. They can be harvested there with minimal impact on the public. That is where the DNR should focus their activities – not on the sandy, public beaches.

- **Michael B. Murphy 6:41 am on May 4, 2010 [Permalink](#)**

I have spent the past two years working on the SMP Update for Pierce County. The debate on aquaculture has been intense. I have listened to both sides of the issue. I have taken seriously the legislative mandate requiring "no net loss" of existing shoreline function. I have concluded with regard to Public Access to the shorelines the commercialization of public shorelines will severely restrict access and public use of those shorelines. When I proposed a measurable method to deal with the negative aesthetics which provided for methods to allow aquaculture, while minimizing the aesthetic impacts, the industry representatives rejected the method. The method would have allowed industry to proceed using materials that would blend into the natural surroundings using measures of color, value, and texture. The proposal would have allowed for innovation in designing new tools which were just as functional as existing tools but not aesthetically disrupting. Throughout the SAC committee and subcommittee meetings the industry took the position that they were innovative and always looking for better methods. I found that there was a disconnect between the words and actions on this issue in particular.

[dnrforum](#) 7:15 am on May 4, 2010

**Tuesday, May 4 – Economics**

**When seeking to balance the public benefits from state-owned aquatic lands, how much of a priority should DNR give to job creation and revenue generation when developing a geoduck aquaculture program on state tidelands?**

[Background on Geoduck Aquaculture – DNR information & other perspectives.](#)

- **Linda Lentz 11:45 am on May 7, 2010 [Permalink](#)**

In relation to economics of geoduck farming a new trend is in cultural tourism and Agritourism which is the public and chefs desire to learn and see more about how food is farmed. As geoduck farmers we have seen an increase in people requesting tours of our farm. We have school classes , chefs, agriculture groups, Politicians, Regulators and the general public They really enjoy learning about the whole process of planting and harvesting shellfish and geoduck is particularly fascinating to the public partly due to their strange appearance. It gives folks a real connection with how important our water quality is to the production of healthy sustainable shellfish. This is a growing trend that could become more of an income generating resource for rural communities.

- **William Burrows 12:28 pm on May 7, 2010 [Permalink](#)**

Fine, do it on private land.

- **Robert Paradise 8:28 am on May 6, 2010 [Permalink](#)**

Seems alot of parttime jobs are created. Do these workers then go on unemployment, a net burden?

Toung in cheek.. Bank robbers create many jobs, cops, lawyers, prison workers and so on....

- **Peter Downey 9:38 pm on May 6, 2010 [Permalink](#)**

So how many jobs- part time or therwise – have you created in the last five years? In the last 5 years I have had about 60 different individuals working on my beach. Only 3 of those were asked not to come back. Most are college or high school students on summer break and really happy and excited to have a summer job that pays them well and lets them go to school all fall winter and spring. Many are in there 4th or 5th year of employemt and at least 7 have siblings (or parents) that work on the farm. These jobs ae extremely important to them and none of them go on unemployment or are bank robbers. These are the people that are

our future. So really – what have you done to make this place a better world and give back to the community????

- **Bruce Olsen 8:30 am on May 7, 2010 [Permalink](#)**

There seems to be another economic advantage for the state that has not been discussed this section of this forum. How do you compute the amount of locally grown seafood eaten at local restaurants that would generate state sales taxes and employs thousands upon thousands of people in the restaurant business? I think we are talking about millions of dollars to the state coffers on top of the leases amounts and percentages of harvests totals discussed earlier. I am sure the state has numbers on how many salmon, bowls of oyster stew and sushi dinners have been served that come from locally grown sources. This total should be added to the economic benefits of all aquaculture farms in this state.

- **William Burrows 8:47 am on May 7, 2010 [Permalink](#)**

Please explain how the origin of the products sold at a restaurant impact the sales tax paid by the consumer.

- **Bruce Olsen 9:16 am on May 7, 2010 [Permalink](#)**

Hi William, this is from the Department of Revenues own website  
Sales of prepared food  
Washington law exempts most grocery type food from retail sales tax. However, the law does not exempt “prepared food,” “soft drinks” or “dietary supplements.” Businesses that sell these “foods” must collect sales tax. In addition, all alcoholic items are subject to retail sales tax.

What is a prepared food?

Most food that restaurants sell falls within the definition of prepared food or soft drinks and therefore is taxable. Prepared food is defined by law as any food where the seller: Combines two or more food ingredients and sells it as a single item (see certain exclusions below);

Sells the food in a heated state or heats the food; or  
Sells the food with eating utensils such as a plate, fork, knife, spoon or glass/cup straw.

Note: Utensils do not include containers and packaging.

The last I checked that tax was 9.5% of the total bill

- **William Burrows 10:32 am on May 7, 2010 [Permalink](#)**

Hey Bruce ... I guess I am too subtle. To be more direct, if I am served a prepared meal in Washington that includes oysters, does the fact that the oyster was grown in Washington or Louisiana impact the amount of sales tax I pay?

- **Bruce Olsen 11:28 am on May 7, 2010 [Permalink](#)**

Of course not William, the value in state sale tax would be the same except buying locally keeps more jobs in our state and that includes restaurant workers . Why would people come to the Pacific Northwest to eat shellfish from Louisiana or for that matter China. I don't think that would go over very well on anyone's menu. Alaska and British Columbia are better candidates for comparison. Buying locally does however cut down on the carbon footprint of the oysters that have to be shipped from Louisiana or China. When harvests are publicized they increase traffic to restaurants for these same items just like Copper River Salmon (Alaska) or Penn Cove Oysters (Washington) and that is a net plus for state coffers and the environment. Then the people that work in those industries are spending their money locally also.

- **William Burrows 12:33 pm on May 7, 2010 [Permalink](#)**

I am betting that there are not thousands of people coming



to Washington State because they could eat geoduck. I am just saying that I think it is a bit of hyperbole to say that “I think we are talking about millions of dollars to the state coffers on top of the leases amounts and percentages of harvests totals discussed earlier.”

- **Bruce Olsen 1:53 pm  
on May 7, 2010**  
[Permalink](#)

I didn't say tourist were coming here just to eat geoduck, however much I like the idea. I said “locally grown seafood.

The following is from a Seattle Time article on July 5th, 2009:

“After years of steady growth, statewide travel-related spending, adjusted for inflation, fell slightly last year to \$15.7 billion, an amount that generated \$1 billion in state and local taxes and nearly 4 percent of all jobs.”

I would bet some of these billions were spent on locally grown seafood.

I do not know what the exact totals for sales tax revenue concerning locally grown seafood are

either but I am sure  
this number is not in  
the thousands.

- **Bruce Olsen 8:35 am on May 7, 2010 [Permalink](#)**

Don't forget there is an economic value to shipping them overseas to the Chinese and Japanese markets. This is not a bad thing considering our balance of trade in this country.

- **Tom Giske 6:53 am on May 6, 2010 [Permalink](#)**

One more question ... why geoducks? Why not another shellfish that does not require PVC? Is it the economics? Do geoducks bring higher margins? Is there no-one who wants to grow shellfish that will be consumed locally?

- **Bruce Olsen 9:22 am on May 7, 2010 [Permalink](#)**

My neighbors and I would like to so. I also eat geoduck sashimi right here served on a plate with chopsticks in the wonderful state of Washington at a local sushi bar that buys locally grown seafood and I pay state sales taxes for the privilege of doing so.

- **Tom Giske 6:08 am on May 6, 2010 [Permalink](#)**

I have been reading this dialog with interest ... both sides seem dug in ... .with lots of PCP surrounding them. In Jefferson county we have something called a Conditional Use permit ... available to all counties ... requires that the situation at each site be taken into account ... and that the 'conditions' of that site be considered and mitigated, or the site abandoned due to specific conditions. Why can't both sides get together and agree on the conditions to be met, including those that would prohibit geoduck farming, and move on using the Conditional Use permit?

- **Tom Giske 6:46 am on May 6, 2010 [Permalink](#)**

Sorry about the typo ... I meant to say PVC ... I must have been out of body.

- **Michael B. Murphy 7:03 pm on May 5, 2010 [Permalink](#)**

I have read several of the pleadings in a lawsuit filed by one grower against Pierce County. The claims of losses and poverty contained in this forum are inconsistent with the claims made in those pleadings where the plaintiff was seeking damages against the County. Moreover if one were to believe the contentions herein one would question the business acumen

of those entering the business. Perhaps those making the claims should review CR 11 and RCW 9A.76.175. It would seem that hyperbole is not limited to those opposing aquaculture.

○ **Dorothy Walker 2:13 pm on May 5, 2010 [Permalink](#)**

What is an irreplaceable natural resource worth? Should we cut down the last of the redwoods and sell the lumber to Asia to create a few jobs? Should we kill all the native plants and animals on the public beaches of Puget Sound so the large shellfish producers can make an enormous profit and provide some employment in the short-term? You cannot fix this damage. You cannot repair the damage to the food chain. You cannot now know the costs of mitigating the environmental damage. In my opinion, the long-term benefits of the tourist, recreation and fishing industries far outweigh any short-term economic gain from geoduck leases. And, as pointed out by others, the public does not get a very big return for its sacrifice. The talk of using “remote” tidelands makes no sense at all. This is water for crying out loud! Chemicals, pollution, misuse in one area affects us all. I would bet there is some of that pvc pipe in the great Pacific Garbage Patch. Lastly, if you cannot quantify jobs lost as a result of shellfish/geoduck farming how can you consider jobs created?

▪ **Peter Downey 10:01 pm on May 6, 2010 [Permalink](#)**

1. geoduck farmers do not kill all the native plants and animals on their farms. come see – bring a biologist with you.
2. environmental effects have been shown to be short term and spatially confined to the farm area.
3. There is no long term damage to fix.
4. There is no damage to the food chain (quite the contrary in fact.)
5. culinary tourism based shellfish farming (and geoduck farming) is emerging as a huge draw.
6. There are no chemicals used in geoduck farming.
7. overall water quality is improved.
8. I'll take the bet of geoduck pvc tubes in the Pacific garbage patch – let say \$100. – Before you make that bet, know that PVC is heavier than water and could not be floating in the middle of the Pacific.
9. I know of no one claiming that jobs are lost from shellfish/geoduck farming.

Essentially I refute every single statement that you present here as false and baseless.

○ **Brian Allen 1:37 pm on May 5, 2010 [Permalink](#)**

Not being an economist, I can only think more jobs = better. I can tell you our small farm that cultivates about 3 acres in south sound for geoducks, in addition to other crops, employs 1 full time, 7 part-time, and 10 seasonal part-time employees. Our payroll is around \$60K/year.

- **William Burrows 9:25 am on May 6, 2010 [Permalink](#)**

That's an interesting statement; "more jobs = better." I was researching in the Mason County Journal archives and found almost the same argument written by management and employees of the smelter in Shelton that was closed down in the 1950s. In fact, I also found a letter from the Shelton Chamber of Commerce that included the same sentiment.

- **[dnrforum](#) 12:25 pm on May 5, 2010 [Permalink](#)**

On behalf of: Richard Wooster

Part 1: When evaluating the economic impact of industrial aquaculture the State needs to consider the economic impact and the carrying capacity of the Puget Sound in a historical perspective. Salmon are an excellent barometer of the health of Puget Sound. Each of us tends to view degradation of our environment in terms of what we have seen in our own lifetimes, without considering the degradation from populations that occurred before we set our personal baseline for what are normal populations of plants and animals. The extent to which salmon populated the Puget Sound and its estuaries in 1900 was far greater than in 1950, the 1950's salmon runs dwarfed the runs of the 1980's which were stronger than the today's salmon runs. The causes of the decline are many, upland development, highway runoff, overharvesting, habitat destruction, shoreline armoring, deforestation, and dams to name just a few.

We need to strive to return the carrying capacity of the Puget Sound's native salmon runs to historic levels. Our understanding of the environment has led to improvements reversing some impacts we have had upon our Puget Sound ecosystem. We have established shoreline buffers for rivers, streams and beachfronts. We understand oil and waste deposited in a sewer reaches our Puget Sound waters and have stopped dumping our wastes without evaluating the consequences. We are more careful in our applications of pesticides, herbicides and fertilizers to limit runoff and collateral damage. We are preparing to remove the two dams on the Elwa River that ended a legendary run of enormous King Salmon reaching the one hundred pound size. These are improvements turning the clock back are restoring the vitality of the Puget Sound. The dangers of introducing an unprecedented expansion of relatively unstudied, industrial aquaculture into the calculus of what makes a healthy and productive Puget Sound are at best significant and at worst catastrophic.

The DNR has information regarding the dollar impact upon Washington's economy of a sport fisher's rod caught salmon compared to a trawler's commercially harvested salmon. Each rod caught salmon is far more valuable in terms of what money it puts back into our economy. A productive sport salmon fishery generates jobs from tourism. Sport fishers stay in our hotels and motels, they eat at our restaurants, visit our museums, campgrounds, parks, towns and cities. Sport fishers shop in our stores. Sport fishers invest in fishing boats and vehicles to haul them. Sport fishers invest in gear and clothing, they hire guides, they buy licenses and provisions. They bring their families with them to enjoy the beauty offered by our magnificent setting.

The aesthetic impact of industrial geoduck operations can be gauged by comments in yesterday's forum. The sites are ugly and unless you are making money off of the site nobody likes the way they look, smell or impact the neighborhood.

- [dnrforum](#) 12:26 pm on May 5, 2010 [Permalink](#)

On behalf of: Richard Wooster

Part 2: More significantly, the danger presented by the introduction of an unstudied monoculture on the Puget Sound is extreme. Only now are the negative environmental impacts of the commercial net pens of farmed salmon in British Columbia and elsewhere becoming documented in the scientific community and the governments are beginning to take action. I have personally observed the summer coho virtually disappear from British Columbia's Desolation Sound in the last twenty years, coinciding with the arrival of the salmon pens. Only now are the effects of sea lice and other pests and debris associated with these industrial "sea farming" operations being brought before an increasingly angry public.

Scientists at the Sea Grant conferences note that the environmental impacts of long term intensive aquaculture of geoducks is not well studied. We most intensively study the impact of these operations before the State permits them to expand so that their impact can properly be evaluated on a site specific basis and what is the impact of such sites in the aggregate.

It has been argued in this forum that the role of the geoduck as a filter feeder is good for the environment because they filter out phytoplankton that can impact light penetration through the water by reducing excess quantities of phytoplankton. That bivalves have been used to "clean the water" in environments that are plagued by

excessive amounts of phytoplankton. However, those plantings are not in the levels found in industrial geoduck installations.

A typical geoduck installation has 43,000 pvc pipes per acre. Each pipe contains four geoducks. At harvest time each geoduck weighs between two to five pounds. That is a biomass of 516,000 pounds per acre assuming all survive and achieve an average weight of three pounds. That is the equivalent to 430 beef cattle weighing 1200 pounds each per acre. Industrial geoduck sites are the equivalent of a cattle feed lot parked on the floor of the Puget Sound. The impact of that biomass is significant. One geoduck operation I am familiar with produces so much feces and pseudo feces that the water is murky almost all the time. Until I visited the area at low tide I was not aware of why the water at that location was always so murky you could barely see the bottom while at the same time water a mile away was clear to the point you could tell if a coin was heads or tails in ten feet of water. That concentration of biomass on a single acre has dire environmental consequences.

Further, the current practice of industrial aquaculture is to strip the beach of all competing species and potential geoduck predators. What is the impact of the creation of these industrial deserts across acres of the Puget Sound on other species? How in turn does that impact the web of diversity across the Puget Sound? How will that affect migration of juvenile salmon and forage fish? How long will it take to reverse the adverse impact when studies confirm what we know intuitively to be true, the establishment of a monoculture and crowding a biomass artificially onto a habitat does not promote a healthy environment.

A significant economic consideration of allowing a rapid expansion of industrial aquaculture is the consequence of what the State will have to pay to “put the genie back into the bottle” if and when scientific study catches up with the impacts of industrial aquaculture upon our Puget Sound environment. I see a future where the State may have to pay significant damages or other compensation to revoke industrial aquaculture permits granted during this period before the impacts of such practices were fully understood. Those significant intangible costs can be avoided by not allowing this rapid expansion to take place until the impacts are fully understood by a period of concentrated study on the existing sites and their adjoining ecosystems. Part of the reason there is such a strong push to expand industrial aquaculture right now is to have as many facilities as possible established before the science and the public realize what the impact of these facilities have upon the

Puget Sound. The more sites created, the more risk upon the State and the more difficult it will be to quantify the impact of the individual sites upon the environment. When the pool is clean the source of a contaminant is easy to locate, as water quality degrades it is more difficult to locate the source of the decline.

While allowing expansion and then trying to restrict it at a later date could generate lawsuits and liability exposure, the State would also face suits from the other direction, brought by those who argue the allowance of expansion violates its duty to all the citizens above and beyond the limited commercial interests sought to be served by expanding industrial aquaculture. The State will be defending law suits from various stake holders for violations of its duties under the public trust doctrine to comply with the intent of the Shoreline Management Act and the State's overarching duty to protect our natural resources from threats.

The minor increase in revenue from taxation from the expansion of industrial aquaculture and jobs created is insignificant compared to moving forward in a carefully planned approach that fully studies the impact before allowing expansion with full mitigation measures in place. From my observations of the language spoken by workers at the sites, most workers are apparently here on agricultural visas from outside the United States. The Assessor – Treasurers of the various counties need to tax the tidelands placed into industrial aquaculture production at a rate that considers the economic value of the production. The revenue from rents charged from the leaseholds, if such leaseholds are allowed at all, must also take into account the income generated from the leases and be set sufficiently high to prevent a windfall to the industrial aquaculturists. The leases should also require the companies undertaking such actions to agree to defend, indemnify and hold harmless the state from all adverse consequences arising from all activities occurring on the leaseholds and provide a surety for mitigating such consequences, including restoring any adverse environmental impacts.

- **Harry Branch 12:17 pm on May 5, 2010 [Permalink](#)**

As someone who once found employment in the geoduck harvesting business, I can attest to the value of the resource and its potential economic benefits. Unfortunately, DNR has managed the harvest in ways that ignore basic reproductive needs. I don't believe the current model of beach feed lots will provide the kind of income that a well managed utilization of the resource would have. There are other species here with

economic value. We need to think ecosystem-wide, not just of this single species and we need to manage this single species in ways that are sustainable and ecosystem based.

- **Delores Brown 12:05 pm on May 5, 2010 [Permalink](#)**

When seeking to balance the public benefits from state-owned aquatic lands, how much of a priority should DNR give to job creation and revenue generation when developing a geoduck aquaculture program on state tidelands? ANSWER: A VERY LOW PRIORITY!

DNR's highest priority should be given to preserving the health and ecosystems of the Sound. While the geoduck aquaculture program may generate substantial income for a few private companies and some revenue for the state from leases, the environmental damage they cause far outweighs any benefit they provide. We taxpayers are already paying to repair damage caused by bad decisions made in the past, such as damage caused by over harvesting, pollution (including debris from geoduck and clam farms), etc., and we must certainly not make more bad decisions that allow even more ecological damage to occur, and thus force us to pay even more tax dollars to cleanup yet another mess caused by industry. Furthermore, public lands and waterways should remain as open as possible to the public that owns them.

- **Marilyn Showalter 9:32 am on May 5, 2010 [Permalink](#)**

The long-term economic health of the Puget Sound region depends on its long-term environmental health—especially the health of Puget Sound. DNR should take a long-term view, and should not permit commercial uses of tidelands until they have been proven not to harm the long-term environmental health of the region. To date, scientific studies do not exonerate current geoduck farming practices (tubes, nets, high density, harvesting methods, etc). The few jobs that new geoduck farms would provide are far outweighed by the risks to jobs in fishing, recreation, tourism, retirement communities and many other sectors for which the desirability of Puget Sound, including its environmental health, is a draw.

Don't eat your seed corn. Don't degrade the very beaches, natural and pristine, that support our environment and the jobs that depend on a healthy environment.

- **Kathryn Townsend 10:51 am on May 5, 2010 [Permalink](#)**

In any discussion such as this, it is important to understand the specifics of what we are talking about.

WDFW maps show that the remaining public beaches in Puget Sound are few indeed—so few that I wonder why DNR is



considering this at all but for the pressure obviously being exerted by the shellfish industry. When areas such as Totten Inlet have 30 of 33 miles of shoreline already taken for shellfish aquaculture (and I don't know if any of this is on publicly owned land with the exception of the trespass that was discovered a couple of years ago), the tidelands owned by the citizens of Washington State should remain as public beaches, not given over to commercial interests. If these maps don't show all the public intertidal areas owned by the state, then please provide maps that do so we know exactly what we are talking about and what is up for grabs.

South Puget Sound map:

<http://wdfw.wa.gov/fish/shelfish/beachreg/map13.htm>

Map index: <http://wdfw.wa.gov/fish/shelfish/beachreg/index.htm>

Since it was clear from the Foss/Taylor Shellfish Pierce County hearings that a one cycle (6-7 year) lease would be considered economically unfeasible by the grower, what we are talking about in essence is the permanent conversion of these public beaches to commercial development. This just seems wrong and should not be allowed. And there is no use bringing partisan politics into this as Mr. Gibbons attempted to do elsewhere on this forum. The people that I know who do not want geoduck aquaculture expansion onto public beaches are of all political stripes and colors.

- **Richard Wooster 8:10 am on May 5, 2010 [Permalink](#)**

While allowing expansion and then trying to restrict it at a later date could generate lawsuits and liability exposure, the State would also face suits from the other direction, brought by those who argue the allowance of expansion violates its duty to all the citizens above and beyond the limited commercial interests sought to be served by expanding industrial aquaculture. The State will be defending law suits from various stake holders for violations of its duties under the public trust doctrine to comply with the intent of the Shoreline Management Act and the State's overarching duty to protect our natural resources from threats.

The minor increase in revenue from taxation from the expansion of industrial aquaculture and jobs created is insignificant compared to moving forward in a carefully planned approach that fully studies the impact before allowing expansion with full mitigation measures in place. From my observations of the language spoken by workers at the sites, most workers are apparently here on agricultural visas from outside the United States. The Assessor –Treasurers of the various counties need to tax the tidelands placed into industrial aquaculture production at a rate that considers the economic value of the production. The revenue from rents charged from the leaseholds, if such leaseholds are allowed at all, must

also take into account the income generated from the leases and be set sufficiently high to prevent a windfall to the industrial aquaculturists. The leases should also require the companies undertaking such actions to agree to defend, indemnify and hold harmless the state from all adverse consequences arising from all activities occurring on the leaseholds and provide a surety for mitigating such consequences, including restoring any adverse environmental impacts.

- **Richard Wooster 8:09 am on May 5, 2010 [Permalink](#)**

The current practice of industrial aquaculture is to strip the beach of all competing species and potential geoduck predators. What is the impact of the creation of these industrial deserts across acres of the Puget Sound on other species? How in turn does that impact the web of diversity across the Puget Sound? How will that affect migration of juvenile salmon and forage fish? How long will it take to reverse the adverse impact when studies confirm what we know intuitively to be true, the establishment of a monoculture and crowding a biomass artificially onto a habitat does not promote a healthy environment.

A significant economic consideration of allowing a rapid expansion of industrial aquaculture is the consequence of what the State will have to pay to “put the genie back into the bottle” if and when scientific study catches up with the impacts of industrial aquaculture upon our Puget Sound environment. I see a future where the State may have to pay significant damages or other compensation to revoke industrial aquaculture permits granted during this period before the impacts of such practices were fully understood. Those significant intangible costs can be avoided by not allowing this rapid expansion to take place until the impacts are fully understood by a period of concentrated study on the existing sites and their adjoining ecosystems. Part of the reason there is such a strong push to expand industrial aquaculture right now is to have as many facilities as possible established before the science and the public realize what the impact of these facilities have upon the Puget Sound. The more sites created, the more risk upon the State and the more difficult it will be to quantify the impact of the individual sites upon the environment. When the pool is clean the source of a contaminant is easy to locate, as water quality degrades it is more difficult to locate the source of the decline.

- **Peter Downey 9:20 am on May 5, 2010 [Permalink](#)**

“The current practice of industrial aquaculture is to strip the beach of all competing species and potential geoduck predators” This is a false statement and has no bearing on the question.

“What is the impact of the creation of these industrial deserts

across acres of the Puget Sound” – Again more hyperbole that has no connection to reality and no relevance to the question. Please lets stick with the topic and get away from meaningless rhetoric.

- **William Burrows 9:29 am on May 6, 2010 [Permalink](#)**

It is too bad this forum does not have the ability to post images. I have pictures of shellfish employees racking up everything on the beach and using a wheelbarrow to haul the stuff away. I also have pictures of starfish that were collected, piled up, and then covered with caustic lye. It's really sad.

- **Richard Wooster 8:07 am on May 5, 2010 [Permalink](#)**

Scientists at the Sea Grant conferences note that the environmental impacts of long term intensive aquaculture of geoducks is not well studied. We most intensively study the impact of these operations before the State permits them to expand so that their impact can properly be evaluated on a site specific basis and what is the impact of such sites in the aggregate.

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- **Richard Wooster 8:06 am on May 5, 2010 [Permalink](#)**

The DNR has information regarding the dollar impact upon Washington's economy of a sport fisher's rod caught salmon compared to a trawler's commercially harvested salmon. Each rod caught salmon is far more valuable in terms of what money it puts back into our economy. A productive sport salmon fishery generates jobs from tourism. Sport fishers stay in our hotels and motels, they eat at our restaurants, visit our museums, campgrounds, parks, towns and cities. Sport fishers shop in our stores. Sport fishers invest in fishing boats and vehicles to haul them. Sport fishers invest in gear and clothing, they hire guides, they buy licenses and provisions. They bring their families with them to enjoy the beauty offered by our magnificent setting.

The aesthetic impact of industrial geoduck operations can be gauged by comments in yesterday's forum. The sites are ugly and unless you are making money off of the site nobody likes the way they look, smell or impact the neighborhood.

More significantly, the danger presented by the introduction of an unstudied monoculture on the Puget Sound is extreme. Only now are the negative environmental impacts of the commercial net pens of farmed salmon in British Columbia and elsewhere becoming documented in the scientific community and the governments are beginning to take action. I have personally observed the summer coho virtually disappear from British Columbia's Desolation Sound in the last twenty years, coinciding with the arrival of the salmon pens. Only now are the effects of sea lice and other pests and debris associated with these industrial "sea farming" operations being brought before an increasingly angry public.

- **Richard Wooster 8:05 am on May 5, 2010 [Permalink](#)**

I am President of the Case Inlet Shoreline Association. Our group represents nearly one hundred families, most of whom live on Case Inlet. The DNR removed my prior posts due to the length of my comments. When evaluating the economic impact of industrial aquaculture the State needs to consider the economic impact and the carrying capacity of the Puget Sound in a historical perspective. Salmon are an excellent barometer of the health of Puget Sound. Each of us tends to view degradation of our environment in terms of what we have seen in our own lifetimes, without considering the degradation from populations that occurred before we set our personal baseline for what are normal populations of plants and animals. The extent to which salmon populated the Puget Sound and its estuaries in 1900 was far greater than in 1950, the 1950's salmon runs dwarfed the runs of the 1980's which were stronger than the today's salmon runs. The causes of the decline are many, upland development, highway runoff, overharvesting, habitat destruction, shoreline armoring, deforestation, and dams to name just a few.

We need to strive to return the carrying capacity of the Puget Sound's native salmon runs to historic levels. Our understanding of the environment has led to improvements reversing some impacts we have had upon our Puget Sound ecosystem. We have established shoreline buffers for rivers, streams and beachfronts. We understand oil and waste deposited in a sewer reaches our Puget Sound waters and have stopped dumping our wastes without evaluating the consequences. We are more careful in our applications of pesticides, herbicides and fertilizers to limit runoff and collateral damage. We are preparing to remove the two dams on the Elwa River that ended a legendary run of enormous King Salmon reaching the one hundred pound size. These are improvements turning the clock back are restoring the vitality of the Puget Sound. The dangers of introducing an unprecedented expansion of relatively unstudied, industrial aquaculture into the calculus of what makes a healthy and productive Puget Sound are at best significant and at worst catastrophic.

- **Laura Hendricks 8:04 am on May 5, 2010 [Permalink](#)**

Industry stated in 2007 in the Shellfish Regulatory meetings that they had 250 acres of geoduck farming. Since the public records show that they gross more than \$1 million per acre, that would be bringing in \$250 million in gross revenue over a 5 year period. Industry can try to make it sound like they are doing this to help provide working wage jobs, but it is clear that the main people who benefit are the owners at the expense of the citizens of Washington. If they really want to employ people, they can do this on the uplands or in the subtidal waters where DNR is already harvesting geoducks on a limited basis. Mr. Downey stated that they only hire one full time and 5 part time workers which are not working wages especially when it takes less than 3 months to do the main work for the first year and very little for the next four years.

At the Pierce County meeting, we asked industry how many sites they wanted for expansion. After waiting for three months for an answer, they brought in the map of the county and stated that they wanted to expand in all of the shoreline designations including the natural designations. Industry has stated when they are trying to get decision makers to approve their applications that they can only expand in limited areas, but that is simply not true—they want it all.

- **Dan Marcus 3:47 am on May 5, 2010 [Permalink](#)**

The state and counties should be raising property taxes on private tidelands that are in commercial use commensurate with commercial uplands. Another source of revenues should come from water column leases on private tidelands. Commercial shellfish ventures are using public resources from the water column (phytoplankton) which they are currently

taking for free. Also in many cases they are denying the rights of the public to traverse public trust beaches and tidelands. When considering opening up state owned tidelands, DNR should consider the growth and density of current geoduck operations on private tidelands. Totten Inlet's beaches, for example, are more than 90% shellfish aquaculture, with most of that geoduck. Mason and Thurston County and the state have not administered the SMA properly by allowing this rapid expansion to occur without development or use permits, little or no public comment, and with no monitoring. The unchecked expansion on private beaches should provide an incentive to keep state tidelands in their natural condition to mitigate against the private growth, and to provide for the public interest that has been denied in the expansion of private tidelands.

- **Jim Gibbons 8:23 am on May 5, 2010 [Permalink](#)**

Two comments. If charging for the water column makes sense, maybe the state should consider charging terrestrial farmers for "air column leases" on state owned lands.

"The only way the statement of "Totten Inlet's beaches, for example, are more than 90% shellfish aquaculture" makes sense is by calling tidelands sold under the Bush or Callow Acts shellfish aquaculture. Otherwise the statement is not only flat out wrong, the number is not even remotely in the ball park. If calling tidelands sold under the Bush or Callow Acts – of 1895! – is aquaculture, then the statement about unchecked expansion is wrong because those lands have been around for over a hundred years. You can't have it both ways.

With regards to Totten being planted "with most of that geoduck," again, it's flat out incorrect. I'd be happy to bet anyone \$5,000 or \$50,000, their choice, that significantly less than 15% of Totten is planted in geoduck. I'll pay for the attorney and CPA firm of their choice to figure out the actual number."

- **Dan Marcus 4:28 pm on May 5, 2010 [Permalink](#)**

If you'll review the SMA and public trust doctrine, you'll see that the airspace over an upland parcel is not the equivalent to the water column over the tidal or intertidal. The waters, and all that they contain are public.

- **Jules Michel 4:47 am on May 6, 2010 [Permalink](#)**

This is an important policy point relating to economics and business management: what information is being used to

make tideland policy dedcsions? It's important to know how many tideland acres are owned by DNR in Puget Sound; what type are they (rocky/sandy); how many are producing shellfish; how many can be accessed by the public from where; etc. DNR's forest division has mapped virtually the entire state, creating a vast inventory of information (stream types; wetlands; soil types; soil stability; etc.) from which policy decision are made. It is important DNR manage its tideland resource with the same level of expertise and information.

- **Craig Olson 11:22 pm on May 4, 2010 [Permalink](#)**

Today's forum question is: "When seeking to balance the public benefits from state-owned aquatic lands, how much of a priority should DNR give to job creation and revenue generation when developing a geoduck aquaculture program on state tidelands?"

Given the massive and potentially irreversible ecological damage caused by commercial geoduck operations, DNR should give absolutely no weight to so-called "job creation" and "revenue generation." For the DNR to lease ANY further state owned lands would be highly irresponsible and indeed is in total contradiction to the mission statement of DNR's own website: "Forward-looking stewardship, protection, and leadership of state-owned lands." Moreover, as noted above, the inevitable and undoubtedly enormous cost of shoreline restoration in the future will vastly exceed any minute, short-term economic benefits of DNR leases to commercial geoduck operators.

- **[Bill Dewey 11:21 pm on May 4, 2010 \[Permalink\]\(#\)](#)**

Relative to the potential of job creation from farming geoduck on state lands, two years ago I surveyed the main geoduck producers regarding payroll. At that time I estimated the annual payroll associated with geoduck farming on private lands at around \$4 million. These are critical dollars being infused into rural western Washington's economy. These are relatively new jobs, most of which have come to be in the past 10 years. Importantly, they have also been stable jobs through the current recession when other sectors of the economy have slumped and laid employees off. If DNR made state tidelands available to expand geoduck aquaculture this would provide more crucial rural economic development and employment.

- **[Bill Dewey 10:36 pm on May 4, 2010 \[Permalink\]\(#\)](#)**

An important public benefit that has yet to be mentioned that would come from the revenue generated by leasing public lands for geoduck aquaculture is shoreline restoration and increased public access.

Eighty percent of the rent collected by the State from shellfish leases on State owned tide lands goes into the Aquatic Lands Enhancement Account (ALEA). Funds from this account are used to enhance public access and to promote habitat restoration on State owned aquatic lands.

There are dozens of ALEA funded public access and restoration projects throughout Puget Sound. In Mason County over a half a million dollars of ALEA funds have gone towards projects in recent years. Three notable ALEA projects are:

- \$31,642 for parking, signage, and a beach trail for public access to over 1 mile of state owned beach on Harstine Island
- \$36,000 for land acquisition to provide public access at Menard's Landing
- \$56,243 to create a trail for improved public access to clamming and oystering and for uplands habitat restoration in Case Inlet.

In 2005 following a 2 year feasibility study, DNR recommended to the legislature a pilot program leasing up to 25 acres per year for 10 years for a total of 250 acres of state owned tidelands for geoduck farming. At its full realization, this DNR leasing program at \$12,000/acre/year would generate \$3 million annually. Eighty percent of that would be \$2.4 million annually to fund ALEA public access and restoration programs.

By funding the ALEA program, geoduck farming on state owned tidelands is actually a significant benefit to enhancing and increasing public access to state owned aquatic lands.

RCW 79.105.010 says that "The DNR shall foster the commercial and recreational use of the aquatic environment for production of food, fibre, income, and public enjoyment from state owned aquatic lands and from associated waters..."

Consistent with this law, geoduck aquaculture produces food and income and is therefore an appropriate use of state tidelands.

- [Curt Puddicombe 9:45 am on May 5, 2010 Permalink](#)

Actually, it's RCW 79.105.050, not RCW 79.105.010, that states: The department shall foster the commercial and recreational use of the aquatic environment for production of food, fibre, income, and public enjoyment from state-owned aquatic lands and from associated waters, and to this end the department may develop and



improve production and harvesting of seaweeds and sealife attached to or growing on aquatic land or contained in aquaculture containers, but nothing in this section alters the responsibility of other state agencies for their normal management of fish, shellfish, game, and water.

<http://apps.leg.wa.gov/Rcw/default.aspx?cite=79.105.050>

RCW 79.105.010 states:

The legislature finds that state-owned aquatic lands are a finite natural resource of great value and an irreplaceable public heritage. The legislature recognizes that the state owns these aquatic lands in fee and has delegated to the department the responsibility to manage these lands for the benefit of the public. The legislature finds that water-dependent industries and activities have played a major role in the history of the state and will continue to be important in the future. The legislature finds that revenues derived from leases of state-owned aquatic lands should be used to enhance opportunities for public recreation, shoreline access, environmental protection, and other public benefits associated with the aquatic lands of the state. The legislature further finds that aquatic lands are faced with conflicting use demands.

<http://apps.leg.wa.gov/RCW/default.aspx?cite=79.105.010>

- **Richard Wooster 12:59 pm on May 5, 2010 [Permalink](#)**

Glad you provided text of the Shoreline Management act recognizing the legislative finding and policy that our state-owned aquatic lands are a finite natural resource of great value and an irreplaceable public heritage. Let's not sell or lease that public heritage with reckless abandon. Until existing industrial aquaculture is fully vetted for several years of a grow and harvest by close scientific monitoring of the impacts of such sites upon the water quality, species diversity and overall health of the environment.

- **Peter Downey 9:14 am on May 6, 2010 [Permalink](#)**

31 acres of public tidelands for geoduck aquaculture throughout the entire Puget Sound hardly seems like "reckless abandon." What is reckless abandon is the addition of 2 million people to the Puget Sound in the next 20 years. If we really care about the Sound, lets wok on requiring that all new stormwater

systems to service those new people go through secondary sewage treatment. Lets retrofit our existing stormwater mess. Hey – and lets use geoduck revenues to help accomplish that goal.

- [Curt Puddicombe 10:09 am on May 5, 2010 Permalink](#)

Merely producing food or income does not automatically qualify an activity as an appropriate use of state tidelands. Dredging Puget Sound for gravel would also produce income, but obviously it isn't an appropriate use. Likewise, neither is geoduck aquaculture.

The Shoreline Management Act states:

“Alterations of the natural conditions of the shorelines of the state, in those limited instances when authorized, shall be given priority for...development that will provide an opportunity for substantial numbers of people to enjoy the shorelines of the state.”

This statement clearly indicates that shoreline alterations will be (1), limited in instance, and (2), prioritized toward recreational uses.

The artificial introduction of millions of plastic tubes, plastic mesh bags, huge canopy predator exclusion nets, barges, pumps, hoses and nozzles, an unprecedented amount of anthropogenic activity and disturbances to the ecosystem is not consistent with the SMA on several levels. It does not preserve the natural character of the shoreline. It does not protect the resources and ecology of the shoreline. It decreases recreational opportunities for the public in the shoreline area. The public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines is not being preserved. It is an alteration of the natural condition of the shoreline. It is not a “reasonable or appropriate use”. It does not “promote and enhance the public interest”. It is contrary to the state's policy of “protecting against adverse effects to the waters of the state and their aquatic life”. It is not a preferred use consistent with prevention of damage to the environment. It does not meet the “no net loss of ecosystem function” criterion.

Intertidal geoduck aquaculture and harvest techniques adversely impacts eelgrass and sand dollars, depresses key prey invertebrates important to ESA listed salmon and juvenile rockfish, disrupts

resident and migratory birds, and significantly impacts the aesthetic qualities of the shoreline.

- **Laura Hendricks 10:12 pm on May 4, 2010 [Permalink](#)**

The revenue numbers from the Washington Shellfish vs Pierce County case documented that this grower made millions in a couple of years off of publicly owned park tidelands and left an environmental mess for others to pay for and clean up. In the Pierce County Taylor/Foss hearing, the 10 acres of planted geoducks were valued at “\$15-20 million” within the 5 year harvest, which will go on every 5 years. This get rich quick formula enriches the owners of these companies millions per acre per year. Industry tries to steer the conversation past the massive profits and try to convince the public that a few minimum wage jobs justify clearing the beaches of every native species that lives there and that the best sandy beaches that industry demands should be handed to them.

As far as taxes go, this industry does not normally pay sales tax, export tax, or excise tax. Very little Business and Occupational tax is paid with the exception that one large company pays over \$40,000 of taxes on its hatchery and equipment. The owners of Bush/Callow oyster lands pay less than \$5 per acre of property taxes. Over 90% of all intertidal geoducks are taken directly from the tidelands and flown or trucked out so these millions do not benefit the citizens of this state. Since we do not have a personal state income tax, industry owners cannot even say that their huge profits benefit the state of Washington. As most minimum wage employees are struggling to pay for the basic necessities like food that is not taxed, I guess that all of the money that is being made by the operators could be an increase in sales taxes if they purchased lots of goods and went out to eat frequently. The bottom line is that the main benefit that this industry can claim is that the export increases for the governors report, but few dollars really reach the citizens of the state. As nearly every industry was asked for increased taxes to help reduce the state deficit, this industry should be paying 1 cent tax on oysters since they are a luxury item just like the other taxes that were increased.

Many tideland owners have not been willing to lease out the tidelands that are shown on their deeds because they believe it is environmentally irresponsible. Industry has continuously knocked on shoreline owners doors and convinced them it was going to help the environment and their pocket books. All tideland owners including industry should be paying property taxes based on commercial rates on those tidelands used for commercial purposes. This would certainly bring in more revenue to the counties who could then hire people to do jobs that benefit all citizens of Washington. Mason County, which is the home of the shellfish industry, has significant financial difficulties which could be helped if industry had

to pay for permit fees or increased property taxes from the industry that is headquartered there.

Industry constantly talks about “those shoreline owners,” but most of the owners and families of the larger shellfish companies and their agents either live on the waterfront or are shoreline owners. We certainly would be interested in seeing a public access plan that they could test on their waterfront homes to see the best way for this idea to work.

- **Peter Downey 7:56 am on May 5, 2010 [Permalink](#)**

I incorporated my company in 2003. I have carried the risk of debt and taken an 80% drop in salary for the last 7 years. If all goes well, I'll be able to pay off my debt next year. I have literally labored night and day in the cold to scrape my company together. I have endured losses due to weather and theft. All this while providing badly needed jobs in a rural area during a recession. And you call this a “get rich quick formula”? That's just silly.

- **Jim Gibbons 8:44 am on May 5, 2010 [Permalink](#)**

I grow weary of continued “misrepresentations” by industry critics.

If Ms. Hendricks or any other critic of the shellfish industry will pay for an accountant of their choice, I will allow that accountant to inspect our financial records for the purposes of determining that none of our investors (i.e. the owners) have yet to earn back their original investment after 14 years! That hardly seems like a “get rich quick formula (that) enriches the owners of these companies” or is an industry that generates “massive profits.”

It is unclear to me whether Ms. Hendricks is implying that shellfish industry employees are paid minimum wages when she says “as most minimum wage employees.” Again, for purposes of determining the truth, if Ms. Hendricks or any other critic of the shellfish industry will pay for an accountant of their choice, I will allow that accountant to inspect our financial records for the purposes of determining whether any full-time employee of ours is paid less than \$12.50 per hour with 2 weeks paid vacation, 6 days of annual sick leave, dental and health insurance, and a dollar for dollar match up to 4% of salary for retirement.

Your continued misrepresentations call into question the veracity of everything you state.

- **Teresa Stone 9:42 pm on May 4, 2010 [Permalink](#)**

It is hard to imagine that the small number of jobs generated by geoduck farming on public lands would outweigh the negative impacts on the beauty of the remaining natural environment in the South Sound. I do not have expertise in this area, and I'd be willing to bet I will not have expertise in the remaining topics. But that does not de-value the positions I present. It is important in any discussion and particularly a public one, that the decision makers understand who is represented. I organize and share information related to this topic with 40 concerned citizens. The majority of them do not use the Internet, at any comfort level or at all. We all have agreed and trust Bill Burrows and Curt Puddicombe to speak for us regarding related science and law. They have spent hours/days educating us (at our request) so that we are informed and understand the impact of decisions that will be made. Economic gain (mostly private) in job generation and private profit must be judged against public economic loss in a number of ways, what will be the cost to taxpayers associated with geoduck farming (as mentioned in many comments) what is the cost in loss of tourism that is now growing stronger in the South Sound largely because it has an "unspoiled" reputation, and how can the DNR even consider the environmental loss to future generations? How can you put a dollar sign on that? A small number of new jobs in any one industry will not make up for an economic downturn like we have and are experiencing. Use of remaining public beaches should not be seen as a critical solution to economic hard times.

- **Kim Merriman 9:04 pm on May 4, 2010 [Permalink](#)**

There are several issues here that are not being compared as apples-to-apples comparisons. Mr. Gibbons states that his revenue is \$5.3 million which equates to about \$120K per employee. Does that mean that's what his employees make? If that's true, these would be some of the most highly paid jobs in the private sector – not to mention the "public" sector. Are his employees provided health care and retirement?

Where are the sales that make up the \$5.3 million? Are they local? Are they out of state? Out of country?

There is a difference between what it "costs" to the public in terms of pure economics, but what about the costs to the environment? How does that get factored in?

If the sales are out of state or out of country, they are exempt from the sales tax, which is what state and local governments depend on to provide services for the "public". If this is true, then most of that "income" is not distributed to the general public, but to the private property owner who leases his/her tidelands. But its the bedlands we're talking about here.

DNR's aquatic lands, according to statute are managed as a public trust, for the benefit for all, regardless of where they live. The uplands are managed as a fiduciary trust for the specific benefit of those trusts, i.e. colleges and schools. The income from leases like this would be deposited into the aquatic lands enhancement account subject to legislative appropriation and direction. Recently, the legislature has allocated this money for non-aquatic land enhancement purposes, i.e boat ramps, public access, recreation, etc.

We must ensure that the public truly benefits from these leases because the long-term consequences to the land, THEIR land, is a great debate – which this forum and others over the past several years have pointed out.

For example, what happens to any damage to any bedland? Is it the “public’s” responsibility or the farmer’s? I have picked up debris from adjacent and not-so-adjacent geoduck farming areas on my beach and the beach several hundred feet away. If there is this much debris floating around on the tide lands, how much of it has filtered down into the bedlands. Who picks it up? Who can actually access it and/or see it – in order to pick it up?

Hopefully, this forum will openly discuss the “costs” of environmental degradation.

- **Barry Kirkeeng 8:56 pm on May 4, 2010 [Permalink](#)**

While job creation is important, I believe that DNR also has to ask “at what cost?” What is the cost of loss of public beaches and shoreline that are now available to ALL citizens of Washington to use and enjoy. Aren't there enough privately owned beaches that the geoduck aquaculture can be used for job creation without having to “take” public beaches from the citizens of Washington-with very little economic gain for the state? What is the saturation point of geoduck aquaculture in a local area? Stretch Island already has many acres of privately owned shoreline that is leased to geoduck corporations-the economic impact of the loss of a natural shoreline, serenity, beauty, and a healthful lifestyle that are disrupted needs to be considered as an economic loss.

Please seriously consider the economic consequences, and permanent loss of public access to beaches and shoreline that is owned by the “public”.  
Barry Kirkeeng

- **Peter Sloan 8:32 pm on May 4, 2010 [Permalink](#)**

The natural diversity of the Pacific Northwest & Puget Sound in particular is our regions greatest asset. Industrializing public beaches to make a few dollars seems incredibly shortsighted. I agree with earlier comments that

the number of jobs is a drop in the bucket compared to the loss of pristine beaches. Please don't allow aquaculture on public beaches. The creation of a few relatively low paying jobs just isn't worth it.

- **Steve Wilson 5:25 pm on May 4, 2010 [Permalink](#)**

I see that many of the comments in today's forum are waaaay off topic. Is there an upcoming day to deal with science questions? I hope so, since there are many statements being made that have a tenuous connection with the truth.

My comments on revenue generation and job creation are these: a single farm site is just one piece of the puzzle for keeping our business viable. One small farm alone would not allow us to keep a staff employed full or part time. However, combined with our other farms, a lease of DNR ground may allow us to continue to offer employment and benefits to the local labor force.

We're not ashamed to say that for as small as we are, we pay a living wage plus medical and dental for four employees, \$13.50/hr for a half time position, and \$12/hr for our tide crews. The hourly pay is even higher for the night tides. From this perspective, we contribute to the local economy, help the balance of trade, and provide a low impact food product that someone in the world sees fit to buy. Our contribution is small but positive.

I hope that DNR would consider geoduck aquaculture as but one component in the portfolio of managed state resources that benefit all residents of Washington.

- **Matt Matayoshi 8:48 pm on May 4, 2010 [Permalink](#)**

As an organization that promotes jobs and opportunities for people to live and work locally the geoduck industry has provided great opportunity for Mason County. In a community that has a significant resource based economy it has been our experience that geoduck has been a great resource. The industry has stayed strong throughout this recent economic downturn. The industry provides over 3,000 jobs to folks on the west coast. A key component to the success of this business is the opportunity for exporting.

Money coming into our communities from outside contributes to our overall community wealth. Exported geoduck is a great example of the Economic Multiplier Effect, where payroll and profit dollars are spend and re-spent in

the local community, creating secondary jobs in our local service sectors, manufacturing and consumer goods industries.

This industry can continue to grow if additional tidelands are made available for the industry to invest in our future. It is also benefit to the State of Washington to lease tidelands as each acre of land generates on average \$11,000 annually.

I have been impressed by what I have learned as I have visited the tidelands and learned about these operations first hand. Geoducks and aquaculture restores habitat and for habitat for native species such as Horse Clams, Starfish, and other creatures. This is an industry that is both a benefit to the economy as well as the environment.

- **Jerry Johannes 5:07 pm on May 4, 2010 [Permalink](#)**

Industry has a pest management plan that controls/destroys the very species we love to observe on our beaches. So rock crabs, starfish, and moon snails are destroyed as they come to feed on geoduck monoculture (and other shellfish monoculture). Sand dollars are destroyed Sculpin and flounder are eliminated. Horse clams and ghost shrimp are extirpated. Gulls and crows are on the pest list. Scoters, a marine duck, are on the list. River otters, racoons, and coyotes are to be “controlled.” Eelgrass is listed as a “weed.” It must be remembered that these feedlots will attract scores of species looking to feed. They come and are killed. These actions and destructions rip gaping holes in the marine food web.

As the food web is altered and habitat is destroyed, forage fish and salmon suffer. It is well documented that habitat degradation is one of the main causes of salmon decline. Shellfish aquaculture is a threat/stressor to the marine environment. It is an impediment to salmon recovery.

And salmon recovery is where our efforts should go. It has been, and could be, an immense economic driver far surpassing the small revenue stream from leasing for aquaculture. Bring back our wild salmon so that thousands of jobs and scores of industries will be spawned again by salmon.

Let’s think long term and discard the short term “gold rush” mentality that prevails now. Our future generations will applaud us for our wisdom.

- **Terri Jeffreys 4:29 pm on May 4, 2010 [Permalink](#)**



As Director of the Shelton Mason County Chamber of Commerce, I can say with confidence preserving the viability of the the aquaculture industry is extremely important for the economy of Mason County. Shellfish farmers are the second largest employers in our county and contribute significantly to the overall economy through export sales. Shellfish farming has proven to be resilient in this economic recession softening the hardship on our population and local government revenues.

Shellfish farming is a clean industry and the private firms practicing in our area have been strong advocates for continued water quality improvements thereby enhancing our tourism efforts. Mason county businesses have benefitted greatly from the multiplier effect of a thriving aquaculture industry. Economically distressed counties such as ours depend on resource based industries to compensate for the amount of government owned land within our borders, lands that do not contribute to the local property tax base. Keeping state owned lands available for economic use is extremely important to rural counties such as ours.

DNR should give job creation great priority in their consideration of a geoduck program on state tidelands in order to continue to promote the economic health of rural counties and to promote the continuation of the shellfish industry.

Terri Jeffreys  
Shelton Mason County Chamber of Commerce

- **Jules Michel 4:07 pm on May 4, 2010 [Permalink](#)**

The economic downturn should not drop the priority of preserving the remaining tidelands for future generations any more than it should justify clear cutting the old growth forests DNR has under its management or clearing and grading wetlands for a development. Returns from geoduck cultivation will not be seen for five years. But the tidelands put into production will be removed from the public's use forever. What is the economic loss of no longer being able to enjoy something in its natural state? What is the economic loss of the ecological functions these tidelands provide for the species dependant on them? There is more to economic value than how many geoducks can be grown. The long term perspective – and economic value – of what we leave for our future generations' enjoyment should not be lost in the short term economic down turn. There are plenty of private tidelands to grow geoducks in for harvest later and plenty of subtidal tidelands to harvest existing geoducks now, both generating revenues and jobs.

- **Jim Gibbons 5:21 pm on May 4, 2010 [Permalink](#)**

I think the operative word in Mr. Michel's statement above is "plenty." Plenty of private tidelands and plenty of subtidal tidelands? Compared to what? He's not defined plenty or offered any measure or perspective on how he arrived at that conclusion. I also wonder if he's factored in the environmental and public opposition into his calculation of plenty of private tidelands. As a shellfish farmer who sees a definite road block to future growth of my company because of opposition by Mr. Michel and others with similar views I don't see plenty of tidelands on private tidelands open to shellfish farmers. There's been a quasi moratorium on new farms for almost 4 years now.

I've also yet to see any anti-shellfish farming individual acknowledge any good resulting from shellfish farming. I'm reminded of the current Republican Congress which seems to be the party of "no" while offering no constructive way forward.

- **Jules Michel 10:45 am on May 5, 2010 [Permalink](#)**

Yes, "plenty" is a subjective point of view. My subjective point of reference started with 308 acres which Seattle Shellfish's original Nation Wide Permit applications noted geoducks were being grown on. It seemed then to be plenty.

I will acknowledge this number is overstated, but I don't know by how much, nor did the Army Corps or Ecology which is why they required everyone's permits to be resubmitted, which in part has prevented any Nationwide 48 permits from being issued, causing a delay – or "moratorium" – to further expansion. Yes, questioning the accuracy of those permits created a "road block". I would consider it a "speed bump" allowing for consideration of everyone's views on what should occur on tidelands – private or public – to be considered, with accurate information at hand. I do appreciate the frustration it's caused.

- **Jim Gibbons 12:30 pm on May 5, 2010 [Permalink](#)**

I'm reminded of the current Republican Congress which seems to be the party of "no" while offering no constructive way forward.

- **Jules Michel 12:49 pm on May 5, 2010** [Permalink](#)

Sometimes things need to be slowed down until accurate information is obtained, something George Bush didn't feel was important.

- **Tris Carlson 4:06 pm on May 4, 2010** [Permalink](#)

The answer to the question posed is that a very high priority should be given to the job and revenue creation available to the State through the lease of State Aquatic Lands for not only geoduck but other species as well. State Aquatic Lands are a resource. DNR has an obligation to manage the resources of the State which includes protecting these resources and their use. Timber and minerals are also resources and indeed greatly contribute jobs and revenues both directly and indirectly to the State. Why should State Aquatic Lands be any different? Please do not argue that the SMP was written to only protect the shorelines of the State from any use one individual may dislike. This RCW was written to assure that the shorelines of the State were properly evaluated for specific use with certain enumerated exemptions. RCW 90.58.020 as a first priority states "recognize and protect statewide interest over local interest." Revenues generated by aquatic land leases for the culture of geoduck or other species can generate jobs and revenues that will help the average middle class family so that fewer of their taxes go to support those who have greater time and wealth to use state lands as well as promote the use of these revenues for the improvements relating to access of state lands.

- **Dan Marcus 3:20 am on May 5, 2010** [Permalink](#)

Aquatic lands are different because the waters are a public resource and the public retains certain rights to the underlying tidelands. Recognition and protection of statewide interest covers a broad range of issues. The state has an interest in the recovery of salmon, rockfish, orca and bird populations for example. It's a difficult balancing act for DNR, especially given the political pressure from the lobbying efforts of the shellfish industry.

- **Bertil F. Johnson 3:42 pm on May 4, 2010** [Permalink](#)

I adopt the 9:14 am posting of John C. Alessio. Well done. Also the postings of Curt Puddicome, Bill Burrows, Preston Troy and Ken Dailey.

The Public Trust concept, based in law, should override the comparatively paltry revenues that might be realized by leasing our precious and few

public beaches to commercial shell fish industries. If revenue from geoduck harvesting is the absolute political driver of exploring geoduck aquaculture the DNR, which is supposed to be the steward of the state's aquatic lands, should confine its efforts to the Wild Geoduck Program and leave our public recreational beaches and their varied delicate environmental ecosystems alone.

- **William Burrows 1:09 pm on May 4, 2010 [Permalink](#)**

The moderator asked for comments regarding state income based on potential leases. I totally agree with the posters who have stated that the value of keeping the public beaches available for all to enjoy and remain preserved in their natural character (as per the SMA) exceeds any state revenue a beach might generate.

That being said, the sites that have already received bids give us a sense of how much income the state would gain. The bids on the Fudge South beach (DNR RFO GA 07-01) have a net present value calculated by the DNR over a five-year cycle ranging from \$48,388/acre to \$80,376/acre. The state selected the \$80,376/acre bid in this case (but they did not select the high bidder in all cases).

The NPV of \$80,376/acre was the highest bid over all the sites put out for bid in the 2007 RFO process. The typical winning bid was a NPV of about \$60K/acre. Remember, we are talking about a net present value over 5-years (planting to harvest). We are not talking about a per year amount.

So there you have it – a real number to work with.

- **[Curt Puddicombe 2:22 pm on May 4, 2010 \[Permalink\]\(#\)](#)**

So we're talking about \$12K per acre per year rather than the \$20K – \$25K mentioned earlier. Or is there a percentage of harvest on top of that?

- **[Peter Downey 5:29 pm on May 4, 2010 \[Permalink\]\(#\)](#)**

Here' where \$20,000K to \$25K per acre per year comes from – (30000 tubes per acre \*1.5 animals per tube \*2lbs per animal\* \$12 lb.)/ 5 years to crop harvest \*10% lease fee= \$21,000 per year + \$1000 per year set lease fee = \$22,000/year. That was my proposal on the North Navy that was accepted by DNR. Densities could be higher, yield could be higher or lower, price could be higher or lower, but \$20K to 25K is in the ballpark.

- **Jim Gibbons 2:43 pm on May 4, 2010 [Permalink](#)**

One of the issues involved here is that DNR has to manage its lands for all the citizens of the state. Most citizens of the state probably never use Puget Sound, let alone the beaches of S. Puget Sound.

I am no terrestrial land farmer, but my understanding is that \$12,000 per acre per year is a fairly significant amount of money for an agricultural lease. Should the state ever be in the enviable position of having leased to geoduck farmers an area equivalent to that covered by just 5 irrigated crop circles (like those found in Eastern Washington), they would make \$9,600,000 per year. (160 acres x 5 x \$12,000) Given the eel grass beds found on inter tidal beaches in the main basin of Puget Sound or in the Hood Canal as well as given the opposition from neighboring shoreland owners, that probably isn't going to happen. But I believe it is feasible, practical, and in the state's interest to promote that development in sub-tidal waters.

- **William Burrows 4:41 pm on May 4, 2010 [Permalink](#)**

I am no terrestrial land farmer either, but if I could lease an acre of land for \$12,000 and get an annualized gross return of \$200,000, I might not consider it a bad price.

- **jim Gibbons 7:47 pm on May 4, 2010 [Permalink](#)**

I think you're trying to imply that the profits of geoduck farming are unreasonable. As I've stated in other posts, after 14 years my investors have yet to see a return of their capital. That hardly seems like exorbitant or excessive profits. I'd be happy to document that for you at my office if that seems important.

- **John Lentz 12:56 pm on May 4, 2010 [Permalink](#)**

Another economic benefit to any bivalve culture is the cleansing of the marine waters through filter feeding. The major source of pollution in all coastal waters surrounding the U.S. is nitrogen that is causing abnormally high algal blooms. These blooms cause the blocking of sunlight penetration that marine plants thrive on and contribute to low oxygen levels both during the bloom and as the algae rots on the bottom after it dies. The U.S. has spent tens of millions of dollars planting bivalves along the East Coast to gain the environmental benefits they provide. According,

the “EPA notes that mollusks are filter feeders, and in some cases, are recommended not only as a food source, but also as a pollution control technology in and of themselves”. Closer to home the Puget Sound Action Team has also recognized the critical benefits to our local waters that shellfish provide to offset the nutrient overloading from our expanding population: “These filtering and recycling processes are critical in regulating the health of coastal ecosystems. The processes take on even greater importance as human activities and related pollution discharges increase in shoreline areas. The processes help counteract the potentially damaging effects of excessive nutrient enrichment of coastal waters, a process known as eutrophication.” The one way to remove the nitrogen that reaches our waters from all sources( storm water, animal, fertilizers, waste treatment, and septic run-off, etc.) is to harvest the bivalves that feed from the algae. Otherwise, all the human added nitrogen continues to build up in the coastal waters and Puget Sound. The other economic and environmental benefit that is derived from all shellfish is their ability to sequester carbon in their shells that does not break down for thousands of years in some areas. What is the economic value from this type ecological services? Priceless! Instead of paying out public monies to get these ecological services from these proposed geoduck farms, farmers are willing to pay the state for the lease. According to Woods Hole Oceanographic Institute: ” Shellfish are by far the most cost-effective strategy to control pollution.” They calculated that 5000 oysters are needed to offset the nitrogen output of one person. Puget Sound basin has 5-6 million people living in it. We need more shellfish just as bio-remediation for the population we have now and this program is one way to get that at no cost to the very people that are creating the problem. The shellfish industry is not the source of the pollution, they are the group that is actually making a difference for the health of our coastal and inland marine waters by growing healthy nutritious bivalves that have filtered our waters and they want to pay the state for the privilege. If it is DNR’s responsibility to protect state owned beaches for the public good shouldn’t the water quality be considered as well?

- **William Burrows 2:53 pm on May 4, 2010 [Permalink](#)**

This is really a science topic for tomorrow, but there is much more to the issue of “filtering”. For example, filtering produces pseudofeces. Pseudofeces are broken down by bacterial action. This bacterial action can be positive or negative based on the density. Dr. Roger Newell is now studying if the density of geoduck used in aquaculture produce positive or negative impacts. Note that current flow is an important variable in this analysis because high current can dissipate the pseudofeces and reduce its density.

Another factor to consider is the impact on high-density aquaculture “filtering” of both zoo- and phytoplankton. The issue is what happens in low-current areas where there is not an abundance of plankton, such as small coves, lagoons, and the upper parts of inlets. Here one needs to consider the consumption of the phytoplankton and the destruction of the zooplankton by the extremely high density of planted shellfish and how that impacts the other organisms that also need the plankton for survival.

Nature has placed bivalves in Puget Sound for a very important purpose and that purpose is filtering. Most of the filtering takes place by the sub-tidal native geoducks. When humans place unnaturally high densities in places nature does not, one really has to be careful. The base of the food web is critical to health of ALL creatures.

It is much smarter to control nitrogen and phosphorous at the source and not try to solve that problem by creating potentially harmful side effects.

- **Peter Downey 5:56 pm on May 4, 2010 [Permalink](#)**

Interesting that you seem to have been told what tomorrow’s topic is before the rest of us. Or am I missing something here?

- **William Burrows 5:49 am on May 5, 2010 [Permalink](#)**

Yup, you’re missing something. See ...

<http://washingtondnr.wordpress.com/2010/04/29/dnr-forum-geoduck-aquaculture-on-state-tidelands---“conversation-starters”/>

- **Peter Downey 7:46 am on May 5, 2010 [Permalink](#)**

thank you

- **[Curt Puddicombe](#) 3:15 pm on May 4, 2010 [Permalink](#)**

I’m going to have to respond to this rhetoric. There’s a significant difference between commercial geoduck aquaculture and oyster restoration on the East Coast. One of the things some of us learned at Sea Grant 2007 was the simple fact that different habitats and

ecosystems are not comparative. Even North Puget Sound is a separate ecosystem from South Puget Sound, and what can be said of the North cannot be said of the South. South Sound even has a different kind of eelgrass.

Chesapeake Bay was overharvested of its oyster reefs, leaving less than one percent left. The Bay also suffers from massive amounts of agricultural runoff from the more than 150 rivers and streams that drain into it. Studies of Chesapeake Bay or Woods Hole oysters are practically entirely irrelevant to South Puget Sound.

Dr. Roger Newell, who is an expert and has written extensively on oyster restoration in Chesapeake Bay, said this at the Sea Grant symposium about geoduck expansion in South Sound: “It is an impossibly high standard to expect that bivalve aquaculture will not have any discernable effects on the ecosystem.” “Effects on the ecosystem is a subjective assessment, and what level of change is permissible needs to be defined by discussion and consensus among all stakeholders.”

Most of the nitrogen in South Puget Sound and Hood Canal is from massive deforestation of native conifers along the shoreline more than 100 years ago and the subsequent overgrowth of deciduous species such as Alder in their place. Complicating matters is the fact that South Sound is low flushing. It can also be shown that too many shellfish actually contribute to nitrogen loading and hypoxia/anoxia.

The mussel raft EIS that was performed for Totten Inlet demonstrated that dissolved oxygen is significantly reduced under the rafts and by as much as 200 meters down current of the rafts. So these shellfish aquaculture ventures are contributing to hypoxia, not mitigating against it.

[http://www.caseinlet.org/uploads/Mussel-Taylor\\_EIS-Water\\_Column\\_study\\_Oct\\_08\\_1\\_.pdf](http://www.caseinlet.org/uploads/Mussel-Taylor_EIS-Water_Column_study_Oct_08_1_.pdf)

Another study (Pietros and Rice) looked at the claim that farmed shellfish “cleans the water” found that filtration rates must exceed phytoplankton regeneration for this to occur. In this particular mesocosm study, this does not occur. In fact, phytoplankton production is actually stimulated from the wastes produced from shellfish farming.

<http://www.caseinlet.org/uploads/Pietros-Rice2003.pdf>



No studies currently exist specific to South Puget Sound to corroborate this claim that farmed shellfish are a net benefit in any way. In Willapa Bay, the shellfish industry has historically used Carbaryl, a chemical pesticide, to kill native filter feeders (burrowing shrimp) to enhance oyster production. Sand dollars are also filter feeders and perform an ecological function. The argument that only commercially valuable species are beneficial is typical industry propaganda.

- **Judith N. Sloan 12:38 pm on May 4, 2010 [Permalink](#)**

The duty of the DNR is to protect the public beaches for the good of the public...seems pretty straightforward. Creating a few jobs and putting lots and lots of money in the pockets of a few commercial growers seems an immoral as well as perhaps a criminal way to proceed. The value of our beaches is inestimable...lets keep them pristine.

- **[Sharon Barrea](#) 11:48 am on May 4, 2010 [Permalink](#)**

We are beach front property owners on the South Sound area, and the comments from both John C Alessio and Ken Dailey, state our feelings of this family far better then I can express them.  
The natural lands, beaches, and the water need to be kept available to the public, not commercial.

- **Sharron Coontz 11:31 am on May 4, 2010 [Permalink](#)**

I concur with Ken Dailey's statement. Seems to me that the Department of Natural Resources should be far more interested in protecting NATURAL resources than anything else. And what's happening on the Sound, with PVC pipe, artificial supplementing of one species, etc., is hardly natural. This is about the health of Puget Sound and preventing more degradation of the natural ecosystems there, not about, harsh as it sounds, extra jobs. And it seems fairly short-sighted of the shellfish industry not to recognize that, since one assumes they're in the business for the long haul.

- **Betty Garrison 10:45 am on May 4, 2010 [Permalink](#)**

To determine the REAL economics of the industry is VERY difficult.

The State has funded a number of studies. Of course the guidelines for the study can be manipulated to determine the results.

Then to determine if the lease are being complied with requires ongoing monitoring. Past encroachments eventually brought fines after MANY

MANY years, during which time the guilty party continued harvests which earned them more than they paid in the fine.

Here on Henderson Bay, Pierce County leased out some Park tideland for less than \$1,000 from which the estimated harvest value was more than \$1,000,000. The public didn't do too well on that transaction. Is DNR doing better? I don't know. What I do know is the County took action because the shellfish operator hadn't obtained permits. This led to a court case. As far as I know there was no recovery of funds for the "clean up" that followed. There are still geoduck tubes underwater to be seen at a low tide off the Purdy spit,

- **Peter Downey 11:10 am on May 4, 2010 [Permalink](#)**

Pierce County actually ensured that those tubes would remain in place by placing a "Stop Work" order on the farm. It was illegal for the farmer to clean up his mess. Purdy Spit is a good lesson in what should not be allowed to happen. Pierce County mismanaged that farm from the start in terms of the lease agreement, in relation to the tribes, in selection of the site, and in selection of the farmer. DNR must be held to a higher standard in each of these areas.

- **Peter Downey 10:34 am on May 4, 2010 [Permalink](#)**

DNR must balance the public good including revenue generation from resource lands. Jobs in rural communities are much needed and each acre of geoduck ground will directly produce about 1 full time job and 5 part time jobs each year (approximately 3.5 FTE). This does not include indirect employment through packing and shipping, not to mention indirect jobs associated with economic multipliers. Direct income to the state will be about \$20,000 to \$25,000 per acre per year. If upland property owners do not wish to see geoduck farms on state tidelands then they should compensate the state for their personal benefit at the state's expense. (Note that this would forgo needed jobs in rural communities.) Note also that very few state tidelands are actually good for geoduck aquaculture. Detrimental long term environmental impacts from geoduck aquaculture have not been demonstrated. With no use of herbicides, pesticides, fertilizers, antibiotics, growth hormones or feed, this is THE most sustainable food production system.

There is no "lost tax revenue" associated with geoduck farming. In fact the opposite occurs with sales tax revenue will increase due to new economic activity and there has been no record of property values going down near geoduck farms because of the geoduck farms.

Some private farms are in their 4th generation of production with no observed detrimental effects. There is no science that supports statements that this is a trade off between the environment and farming. DNR should ensure that any leases include a bond to ensure removal of all equipment at the end of the lease.

- **[Curt Puddicombe 11:09 am on May 4, 2010 Permalink](#)**

Long term adverse affects haven't been demonstrated because they haven't been researched. However, we all have seen with our eyes the eaglets that have been trapped in geoduck netting. This has been witnessed on multiple occasions, and this is a detrimental impact. We have all seen with our eyes the disappearance of eelgrass in the wake of geoduck aquaculture development, and this is a detrimental impact. We have all seen the destruction of sand dollars to make way for more geoduck, and this is a detrimental impact. No studies have addressed the use of PVC in the marine environment, yet we know that PVC breaks down and leeches dioxins throughout its life. I can go on.

It is the responsibility of the proponents to first prove no harm. This has not occurred. Rhetoric is not proof. The industry should be paying for research before expanding this industry instead of expecting the public to pay for it in response to this disaster, which is exactly what has been happening.

Jobs and income are not an excuse to compromise state and federal laws and alter the environment for a "product" that is not a legitmate food souce in the first place.

Upland property owners have a right to the quality and enjoyment of life that they expected when they purchased their property. If shellfish farmers don't like that, they should compensate the property owners.

- **[Peter Downey 11:37 am on May 4, 2010 Permalink](#)**

We have all seen the INCREASE of eelgrass due to geoduck farming in areas that support eelgrass and where canopy nets are not used. I have not seen a single eagle that has been negatively impacted on my farm as I do not use canopy nets and the use of canopy nets has been discouraged around eagle nests. (I have counted 17 eagles on my farm and 12 blue herons at one time though.) PVC is extremely stable at temperatures in the marine environment. It is also approved for use in drinking water

systems throughout the world. You are the one spouting rhetoric!

The industry has been paying for and supporting research and so far that research has show no long term effects. (note that when the industry pays for research, you dismiss that research as being paid for by the industry). It is impossible to prove a negative. Prove that there has been ANY long term effects from geoduck farms. There has been none.

Upland owners bought their property – they did not buy the tidelands, and those tidelands should be mangaged for the benefit of everyone. If DNR can collect a fee for their use and you wish to curtail that use for your own personal benefit, then you should be charged accordingly .

A better solution is to find state property without such landuse conflicts.

- [\*\*Curt Puddicombe 12:51 pm on May 4, 2010\*\*](#)  
[\*\*Permalink\*\*](#)

Shellfish aquaculture actually inhibits and decreases eelgrass. Here's an infrared picture of shellfish aquaculture in Samish Bay:

[http://www.caseinlet.org/uploads/aquaculture\\_in\\_eelgrass\\_1.pdf](http://www.caseinlet.org/uploads/aquaculture_in_eelgrass_1.pdf)

In terms of geoduck aquaculture specifically, eelgrass is also adversely affected. You can view the presentation by Dr. Jennifer Ruesink at Sea Grant from 2007.

<http://www.digitalwell.washington.edu/dwproddpt/1/58/6a/6a0cb005-46ea-45f0-aa3c-7f191159eedb.wmv>

Here, Dr. Ruesink suggests that geoduck aquaculture should not take place in eelgrass beds. The hydraulic harvest either eliminates the eelgrass or severely stunts its progress.

Here's the study by Dr. Ruesink and Micah Horwith from Samish Bay:

[http://www.caseinlet.org/uploads/Horwith\\_SoundScience\\_022609.pdf](http://www.caseinlet.org/uploads/Horwith_SoundScience_022609.pdf)

So the science is available that shellfish farming in general and geoduck farming in particular is harmful to eelgrass.

As far as the birds, here's a study that shows the decrease in birds where aquaculture is present:

[http://www.caseinlet.org/uploads/Shorebirds-Impacts\\_of\\_Aquaculture-Kelly\\_1\\_.pdf](http://www.caseinlet.org/uploads/Shorebirds-Impacts_of_Aquaculture-Kelly_1_.pdf)

As far as the shellfish industry funding research, what prevents the industry from funding independent research through Sea Grant or some other outlet? Instead, industry funds research through it's own biased outlets.

The argument of "proving a negative" is a logical fallacy based on the claim that a premise is false only because it has not been proven true, or vice versa. The burden of proof is always on the person making an assertion or proposition. In this case, the burden remains on the person claiming that an action (geoduck aquaculture) does no harm. You cannot make this claim by shifting the burden of proof to me or to someone else, or by claiming there is no evidence. The argumentum ad ignorantiam is a complete fallacy, and is irrelevant anyway to this debate because the science is available that geoduck aquaculture has adverse environmental impacts.

And again, under the SMA and the public trust doctrine, upland owners have a right to aesthetically natural shorelines, regardless of who owns the tidelands. That's not my opinion – that's the law.

- **Teresa Stone 10:01 pm on May 4, 2010**  
[Permalink](#)

And might I just add, that comments that imply negative things about upland property owners just amaze me. In my immediate area, 8 out of 12 adults all worked/work in public education. The others were/are

responsible small business owners or employees. We are all responsible contributing citizens, we pay taxes, vote, are/were employed for 30 or more years, contribute to our community in countless ways, are environmentally conscious and meet all codes, made sound financial decisions to be able to purchase our well deserved property with, yes, wonderful natural views and surrounding areas and on top of all that we share our property with a constant stream of friends and family. To have someone even suggest that we should pay more to preserve this is beyond comprehension.

- **William Burrows 12:15 pm on May 4, 2010 [Permalink](#)**

I would like to see some calculations to justify the statement that “each acre of geoduck ground will directly produce about 1 full time job and 5 part time jobs each year (approximately 3.5 FTE).” Geoduck aquaculture involves three major phases including: 1) site preparation/planting, 2) removing tubes, and 3) harvesting. Between these major phases, there is generally a net cleaning or replacement between planting and tube removal. Other than these activities, the site is visited on an occasional basis to be sure everything is OK.

Brian Phipps of Taylor Shellfish testified\* that a crew of 5 can harvest 3,500 to 4,000 pounds of culture per day (he defined a day as 4 hours because of tidal issues). In the same hearing, Dr. Jeffery Fisher testified that an acre of planted geoducks hold about 119,000 pounds of culture. So it seems that harvesting takes about 30 days. Assuming that the other two phases (planting and tube removal) also take 30 days, that is a total of 90, 4-hour days per acre. I believe that this is a very generous estimate.

Let us also assume that a site is visited 4 day/month (again 4 hour days) for inspection. That means that over the five-year planting/harvesting cycle, a total of 1,850 days, 90 days are used for direct site activity and 240 days are used for site inspection.

I find it difficult to see why a company would employ 3.5 FTE to cover 330 days over a 1,850 period. Maybe I am just missing something so please help me understand where you get your 3.5 FTE number.

\*Pierce County Administrative Appeal AA16-07, Taylor Resources, Inc.

- **Peter Downey 1:25 pm on May 4, 2010 [Permalink](#)**

My numbers are based on what it takes to run my 15 acre geoduck farm. (three acres a year in rotation). My experience shows that a 4 man crew can harvest only about 1000 lbs in a 4 hour tide period. But that does not include time for set up and break down of equipment, or transit to and from the site, or paperwork /documentation and sales management, or maintenance of equipment. That also assumes that everything operates correctly, that the team works effeciently, that the whole tidal elevation is exposed, and that the ground is fresh and the animals are close together (and the tide goes out as expected and a host of other things that can go wrong don't go wrong). If you only account for beach time on fresh ground then you end up with a much smaller number that is not real. Then there is dive harvest which has a completely different set of assumptions. You are also miscalculating planting and tube removal time and tube clean up time. It cannot be equated to harvest personnel at all. I use as many as 25 employees on a single tide run to plant. similar numbers are needed for tube removal. On top of all this is overall management and planning. I cannot verify anyone elses numbers, but speak from my own experience.

- **William Burrows 2:20 pm on May 4, 2010 [Permalink](#)**

So then it would fair to say that you are not really calculating the FTE per acre but instead averaging the cost of 3.5 FTE over a 15 acre planting. If you were really using 3.5 FTE per acre, then a 15 acre site would require  $15 \times 3.5 = 52.5$  FTE.

- **Peter Downey 5:47 pm on May 4, 2010 [Permalink](#)**

you're right – my math is wrong. its probably closer to 0.75 to 1 FTE per acre per year.

- **Jim Gibbons 2:26 pm on May 4, 2010 [Permalink](#)**

I'm not sure if this is helpful, but I have previously written that we did \$5.3 million in sales and have about 45 employees. That works out to about \$120,000 in sales per employee.

- **susan macomson 10:29 am on May 4, 2010 [Permalink](#)**

With the exception of the top dogs these are low paying jobs and not worth the huge damage this industry has already done to south Sound. I also wonder if all these jobs are going to legal workers. I know the industry's new agenda is to convince us they are going to feed the world, no this is high end food it will never feed the world, only the wealthy Japanese.

- **Jim Gibbons 11:01 am on May 4, 2010 [Permalink](#)**

I personally find this bit of "racial profiling" offensive. While the industry does employ relatively large numbers of hispanic employees, state and federal law requires prospective employees to provide valid identification to employers. As far as I can tell, the only other option employers would have in hiring would be to not hire people with certain ethnic backgrounds. I believe that would be illegal.

- **Preston Troy 9:51 am on May 4, 2010 [Permalink](#)**

Public benefits balance is the key issue in the intertidal geoduck manufacture discussion. Balance debate must include:

Destruction of native species (Best Practices Pest Management- Shellfish Industry) v.s. minimal job creation at largely minimum wage levels.  
Profits from offshore geoduck export are narrowly kept.  
Armoring and altering beaches held in public trust (reconfiguration, nets, rebar, pvc., etc.) v.s. minimal income to the State in lease revenue.  
Peripheral tax revenue to the State and general public enjoyment (fishing, shellfish licensing and equipment, tourism, boat sales, tideland property values, etc.) v.s. geoduck feedlot lease income.

The question of economic DNR public benefit balance cries out for a reversal of prior geoduck leasing practices and redirection toward public access and enjoyment.

- **Shina Wysocki 9:09 am on May 4, 2010 [Permalink](#)**

When asking about creating sustainable jobs in our state I believe the answer should be yes. Shellfish farmers have been a steady and loud voice



in the preservation of Puget Sound since statehood. Geoduck farmers along with the DNR can make a investment in the future of Puget Sound by working together to create farms that would contribute to the future of Washington State as a revenue source and by getting more people invested in water quality and the preservation of Puget Sound.

- **William Burrows 11:10 am on May 4, 2010 [Permalink](#)**

I would disagree with the statement that “Shellfish farmers have been a steady and loud voice in the preservation of Puget Sound since statehood.” Early practices of the shellfish industry have had very significant negative impacts. Consider that statements of Buhle and Ruesink in their article, “Impacts of invasive oyster drills on Olympia oyster recovery in Willapa Bay, Washington, United States” in the peer-reviewed journal, “Journal of Shellfisheries Research”.\*

“The Olympia oyster (*Ostrea lurida*) ([double dagger]) was historically abundant in Willapa Bay, WA, but populations were decimated by overexploitation in the mid to late-1800s and have failed to recover”

\* Source:

[http://findarticles.com/p/articles/mi\\_m0QPU/is\\_1\\_28/ai\\_n31639441/](http://findarticles.com/p/articles/mi_m0QPU/is_1_28/ai_n31639441/)

- **Jim Gibbons 3:57 pm on May 4, 2010 [Permalink](#)**

It was the voice of shellfish farmers who helped put a check on the pollution of the paper mills in the 1940's and 1950's.

It was shellfish “harvesters” who overexploited the Willapa in the late 1880's. Saying it was shellfish farmers who caused the overexploitation would be a bit like blaming salmon farmers for the demise of wild salmon along the west coast today or blaming today's buffalo ranchers for the demise of the buffalo in the 1800's.

- **William Burrows 5:21 pm on May 4, 2010 [Permalink](#)**

Actually, some do blame the salmon farmers for the decline in wild salmon — but I digress. You are right – it was the shellfish harvesters who decimated the Olympia oyster. It was shellfish aquaculture that

introduced the “invasive oyster drills” that are impacting the recovery.

- [Curt Puddicombe 8:37 am on May 4, 2010 Permalink](#)

It depends on the number of jobs and the amount of revenue generated of course, but generally as it stands, I don't think DNR should give this a lot of priority. The state's priorities are already codified under the SMA, so the priority must be to preserve the natural character of the shoreline to the greatest extent feasible, and not to develop unsightly commercial zones in the shoreline that tend to only benefit a few individuals and businesses. There is also the potential to impact other economic opportunities, such as tourism, recreational shellfish and fishing for example.

I would have to see some hard numbers, but my guess is that 30 acres of leased public tidelands for commercial geoduck isn't going to create a lot of jobs or produce much revenue for the state, and of course if this is going to be located in front of established private residences, then those property taxes should be reduced to compensate for the loss of use and quality of life and enjoyment. DNR should also look at pristine public tidelands as needed habitat areas for the recovery of salmon and rockfish as the main priority, as many of these habitats are lost to commercial geoduck operations on private tidelands.

- [Peter Downey 10:02 am on May 4, 2010 Permalink](#)

Perhaps DNR should charge the upland owners for the use of public tidelands when there is no other upland public access to those tidelands. Alternatively, a private upland owner could provide an easement for public access to those public tidelands. As it stands now, property taxes on lands abutting state tidelands with no other public access should actually be increased. The private property owner is in effect being given a priority use of the state lands with no compensation to the state. Private property owners who also own their tidelands pay taxes on the entire parcel. Another alternative is to reject the notion that a private property owner adjacent to public tidelands has anymore right to those tidelands than any other citizen of the state.

- [Curt Puddicombe 10:48 am on May 4, 2010 Permalink](#)

Waterfront property owners already pay for the use of public tidelands through their property and sales taxes, but more to the point: how do these property owners use public tidelands? By walking on them or looking at them? The SMA gives priority to shoreline residential development,

and establishes that the natural condition and aesthetics of the shoreline will be protected. Private tidelands that have been turned over to intensive commercial uses such as geoduck aquaculture, where citizens are not allowed access in spite of the public trust, should be taxed at a much higher rate. The perspective that tidelands primarily exist for business or commercial purposes first is counter to the SMA and the public trust doctrine to begin with. And in the process of that, the fundamental knowledge that the intrinsic value of these areas are essential and critical habitats for fish and birds is lost along the way.

- **John C. Alessio 8:14 am on May 4, 2010 [Permalink](#)**

The number of jobs created from this industry is a drop in the bucket compared to the damage done to our coast lines and beaches. Please consider the lost revenue and jobs from the damaged tourist industry. Please consider the lost tax revenue from devalued property attached to these beaches. Please consider the lost revenue from high income people finding beautiful retirement properties elsewhere — people who spend money in the local communities and often own or buy into local businesses. As the oil continues to spill into the ocean off the gulf of Mexico, it is difficult to believe that humans are still debating about how to further endanger our natural environment and make our waterways nothing more than eyesore industries. Are humans really that incapable of learning from experience? It is almost comical in a very sad sort of way. Jobs? There are thousands of jobs to be created just cleaning up the messes that humans have already made. Yet, you ask the question, “Should we create more jobs that will do more damage to our environment.” Surely that does not actually make sense to you? If you are really concerned about jobs, let us have a conversation about jobs that will make life better for everyone and all living beings — not just the few people who happen to be temporarily employed by this environmentally destructive inhumane eyesore industry. These people can be employed in other ways if we create the right opportunities

- **Ken Dailey 8:03 am on May 4, 2010 [Permalink](#)**

The DNR should be focused on the preservation of the natural resources of the state of Washington for all citizens from the present and in to the future to use. Not for a few to profit from. The bad taste of an eco system destroyed will far out last the good taste of revenue generated. If any question exists as to the destruction of the environment the answer must be no to development.

[dnrforum](#) 7:00 am on May 5, 2010

## Wednesday, May 5 – Science

### What does science tell us about the impacts of geoduck aquaculture on Puget Sound?

[Background on Geoduck Aquaculture – DNR information & other perspectives.](#)

- **Laura Hendricks 2:27 pm on May 7, 2010 [Permalink](#)**

Puget Sound residents should read the following report as few citizens realize that the aquaculture industry would like to turn Puget Sound into a “production estuary.

“The Ecological Role of Bivalve Shellfish Aquaculture in the Estuarine Environment”: (Dumbauld, Ruesink, Rumrill, 2009)

Page 215 outlines the concept of “production” estuary vs. a “conservancy” estuary. Puget Sound residents are being asked by the governor to support restoration and protection efforts to save Puget Sound and salmon, which is not consistent with NOAA and the aquaculture industry plans to convert it to an aquaculture “production” estuary.

Geoduck feedlots would definitely be considered “production” and are not consistent with preserving a conservancy estuary.

- **Tris Carlson 1:44 pm on May 6, 2010 [Permalink](#)**

Again simple research will lead you to the fact that PVC even in this form can be recycled. I am currently discussing the potential ports and required packaging with a national recycler on truckload quantities for export. The low ballpark price stated (without samples) was enough to get my attention. Guess who is interested in our PVC scrap. China! We can sell them cultured farm product and recycle our used materials at the same time.

- **Jules Michel 5:16 pm on May 6, 2010 [Permalink](#)**

It would seem more economical to simply re-use it. When the packaging and all the fuel necessary to get it from here to China are factored in, it doesn't seem very efficient.

- **[Curt Puddicombe](#) 9:21 am on May 7, 2010 [Permalink](#)**

Less than one percent of PVC is recycled. China incinerates it or throws it into a landfill. There are no environmental considerations in China, or considerations for clean air, water, or for human health.

<http://earth911.com/recycling/plastic/pvc/how-pvc-gets-recycled/>

<http://archive.greenpeace.org/toxics/html/content/pvc3.html>

- **Laura Hendricks 8:30 am on May 6, 2010 [Permalink](#)**

#### National Marine Services Biological Opinion-Army Corps NWP48-Shellfish Aquaculture

This biological opinion does state that existing aquaculture is not likely to result in any take, (harass or harm) of an individual endangered salmon. However, salmon recovery is the most important environmental issue in Puget Sound and impacts on salmon habitat are documented in this NMFS opinion that:

- Initially found that existing shellfish aquaculture is likely to adversely affect endangered Puget Sound Chinook salmon, but later changed this position due to uncertainty (page 3).
- The opinion states that the Army Corp of Engineers determined that existing shellfish aquaculture activities would not adversely affect critical habitat (CH) non-specifically, but would adversely affect essential fish habitat (EFH) (p 1), including EFH for groundfish (p 17).
- Both the NMFS (p 72, 85) and ACOE (p 1) concur that the action would adversely affect EFH.
- The opinion states that the proposed action is likely to adversely affect CH for Puget Sound Chinook salmon specifically (p 25). Conversely, the opinion also states that the action will not appreciably reduce the conservation value of designated critical habitat in general (p 57).
- According to the NMFS opinion, the BRT (biological review team) majority opinion is that the naturally spawned component of Puget Sound Chinook is likely to become endangered within the foreseeable future. The number two limiting factor is the degradation and loss of estuarine habitat (p 21).

The environmental effects on listed fish from farming shellfish in the intertidal zone are: (1) episodic water quality effects from physical interactions with the bottom (raking, tilling, and harvesting) increasing turbidity (2) Impacts to SAV(eelgrass) from aquaculture activities; (3) water quality and related effects from application of carbaryl insecticide to control burrowing shrimp in certain places; and (4) benthic disturbance. (p 39). NMFS Biological Opinion

[http://www.co.pierce.wa.us/xml/services/home/property/pals/landuse/smp\\_may09comm2.pdf](http://www.co.pierce.wa.us/xml/services/home/property/pals/landuse/smp_may09comm2.pdf) P.3-85.

We must protect our salmon if we want to protect our whales.

- **Jim Gibbons 8:54 am on May 6, 2010 [Permalink](#)**

Consider the source!!!

I am no scientist but it is my understanding that the Corps and the Services had to evaluate the NET EFFECTS of shellfish aquaculture. THEY HAVE DONE SO. In their opinion the NET BENEFITS outweigh the negative impacts.

On the very same page that much of the above quotes came from the document linked above states:

“Shellfish aquaculture activities are also reported, however, to contribute to water clarity via the filter feeding of cultured mollusks, removing phytoplankton from the water column. Such improved water quality can also contribute to improving habitat for the establishment of SAV (e.g., eelgrass). The presence of oyster shell habitat can also provide better habitat for the establishment of eelgrass than soft, bioturbated substrates (Dumbauld and Wyllie-Echeverria 2003). Graveling substrates for clam culture can also provide habitat better suited for various amphipod and copepod species, important prey items for the species considered in this consultation (Simenstad et al. 1991, Thom et al. 1993, Jamieson et al. 2001)”

- **[Curt Puddicombe 10:11 am on May 6, 2010 \[Permalink\]\(#\)](#)**

Shellfish aquaculture can have some positive as well as negative effects depending on the methods and practices, but the quotes above do not pertain to geoduck culture methods and practices.

- **Jerry Johannes 10:06 am on May 6, 2010 [Permalink](#)**

It is important to be aware that House Bill 2220 passed by our legislature mandates that research be done on geoduck aquaculture. These interim results were passed on recently to our legislators as outlined by HB 2220. Preliminary results of that research, done by Sea Grant can be accessed here:

<http://www.wsg.washington.edu/research/pdfs/reports/GeoduckIntProReport.pdf>

Preliminary results show:

1. Harvest of geoducks produced declines in worms and small crustaceans within the harvest zone.
2. Species composition at planted geoduck sites changed
3. Results indicate that eelgrass beds neighboring a geoduck farm are affected by aquacultural practices. Density, size, and flowering capability of eelgrass were all suppressed. (see page 13 of the report).

Also, of note, a parasite was found in 30% of the wild stock geoduck in Totten Inlet. This parasite, (a microsporidia type) has never been recorded in geoduck previously. It has not, before this discovery, been recorded in Canada or Puget Sound. (see page 11).

All of these results, from scientific inquiry, indicate that a vigorous precautionary approach should be used with respect to geoduck aquaculture

- **[Curt Puddicombe 12:59 pm on May 6, 2010 Permalink](#)**

Similar to shellfish aquaculture per the NMFS BO, bulkheads and docks also are not likely to result in any take (harass or harm) of an individual endangered salmon. But we're taking steps to restrict or ban these practices because of their negative impacts to fish habitat.

- **[Susan Hayes 7:30 am on May 6, 2010 Permalink](#)**

Science tells us that any monoculture is not environmentally sound. Biodiversity is what is healthy for any environment. Puget Sound is a fragile ecosystem that over millions of years has thrived and given many food from fish and shellfish. Puget Sound is for everyone in the state of Washington, it is a resource that should be protected. I urge any scientist or anyone else to show me where farming for one species has been sound environmental policy. The shellfish growers routinely spray the beach to kill 'predators' such as starfish, sand dollars, crab, natural vegetation, etc. The spray also kills anything that might compete for the plankton such as sea anenomes. Think about the secondary poisoning that is happening from the spray. Greed is what generates the planting of geoduck farms. We are not feeding the world, we are selling the shellfish to Japan and other rich countries that can afford the geoduck. Please look at common sense science, the idea of food webs and biodiversity. It is what is environmentally sound and healthy for Puget Sound.

- **[Jim Gibbons 8:10 am on May 6, 2010 Permalink](#)**

I have been farming shellfish for 14 years now. I know of NO farmers spraying the beach to kill starfish, sand dollars, crabs, or natural vegetation.

- **Peter Downey 8:39 am on May 6, 2010 [Permalink](#)**

No geoduck farmer sprays anything on their beach! To think such a thing is ridiculous. First – of all the creatures on the beach geoduck are probably the most sensitive (they can't hide in a shell and their soft tissue is always exposed.) Second no geoduck farm has an NPDES permit to spray anything. It does not happen.

- **susan Macomson 12:41 pm on May 6, 2010 [Permalink](#)**

Is that kind of like none of you trespass?

- **Peter Downey 1:36 pm on May 6, 2010 [Permalink](#)**

If you can provide documentation of any geoduck farmer spraying their tidelands, I will be the first to stand by you and call for their prosecution.

- **Jules Michel 5:01 pm on May 6, 2010 [Permalink](#)**

It may be better to say that “pests” are removed and most likely die, sprayed or otherwise. For example, recently a large number (wheel barrow full) of sand dollars were removed from a beach for preparation of something by a large geoduck farmer. It caused a stir and resulted in a well intended “amendment” being passed by PCSGA saying they would only move sand dollars to a similar tidal area. The problem, according to Richard Strathmann (Resident Associate Director at the Friday Harbor Labs), is that there no evidence of sand dollars being replanted and surviving. Yes, they weren't sprayed. And in the future, they won't be sprayed. But they'll still most likely die. As do star fish piled high with lime poured onto them. It reminds of the accused saying “I didn't kill him! The bullet did!”



- **susan Macomson 7:20 pm on May 6, 2010** [Permalink](#)

Kind of like you did when Taylor trespassed?

- **Tom Giske 6:14 am on May 6, 2010** [Permalink](#)

I have been reading this dialog with interest ... both sides seem dug in ... .with lots of PVC surrounding them. In Jeferson county we have something called a Conditional Use permit ... available to all counties ... requires that the situation at each site be taken into account ... and that the 'conditions' of that site be considered and mitigated, or the site abandoned due to specific conditions. Why can't both sides get together and agree on the conditions to be met, including those that would prohibit geoduck farming, and move on using the Conditional Use permit?

- **Curt Puddicombe 8:48 pm on May 5, 2010** [Permalink](#)

The current available science tells us that geoduck aquaculture does have adverse impacts on the ecosystem and habitat. Very simply, we know from the preliminary Sea Grant research that geoduck aquaculture significantly depresses eelgrass and sand dollars when planted in those areas of the intertidal. We know that geoduck harvest in the intertidal significantly depresses tube worms, copepods and amphipods, including *Corophium* sp., an important prey species for ESA listed Chinook. We also know that geoduck aquaculture is coincident with sand lance, another important prey species for Chinook.

And by logical inference, we can therefore say that geoduck aquaculture is likely to be a detriment to salmon recovery which can also impact Orca. Rockfish habitat restoration may also be impacted in the future.

Much more needs to be done to gauge the long term and cumulative affects.

- **Jim Gibbons 8:15 am on May 6, 2010** [Permalink](#)

The key concept that is missing here is that of NET EFFECTS. Salmon and Orcas need clean water as well. There's a reason why the public and the scientists have labeled the water at the mouth of the Mississippi River "the dead zone" and it has nothing to do with geoduck or other forms of shellfish farming and everything to do with nutrient pollution which according to the Woods Hole Oceanographic Institute shellfish help clean up.

- **[Curt Puddicombe 1:04 pm on May 7, 2010 Permalink](#)**

The Mississippi River is irrelevant. The pollution there is due to multi-state agricultural runoff. The Woods Hole Institute is also irrelevant. It refers to a different ecosystem and has nothing to do with Puget Sound or geoduck aquaculture. Also to reiterate, the Pietros and Rice scientific study and research suggests that the presence of shellfish does not result in a net decrease in phytoplankton, but actually results in conditions that are conducive to additional phytoplankton production.

What is more relevant: according to the Totten Inlet Mussel Raft EIS, mussel aquaculture actually contributes to excess nitrification and phytoplankton production, and even worse, to significant reductions in dissolved oxygen levels below the rafts and 200 meters down current, creating the same kinds of anoxic/hypoxic conditions that led to fish kills in Hood Canal. So shellfish aquaculture is actually part of the problem and not part of the solution as is falsely claimed ad infinitum and ad nauseum by geoduck proponents.

Also, as I have pointed out, an inordinate amount of filter feeding molluscs in the nearshore can also filter out fish eggs, crab zoeas and other valuable zooplankton in the water column. “Clean water” as used rhetorically by geoduck proponents is a misnomer. The water by nature has phytoplankton, zooplankton, etc in it, and this is vital to the survival of all aquatic species. Furthermore, shellfish themselves do not require waters that are free of bacteria to survive, it is only necessary if they are to be consumed by humans. In some cases, shellfish populations have recovered in some areas because the bacteria in the water resulted in less harvest pressure on those shellfish.

- **[Mike & Pat Winckoski 6:54 pm on May 5, 2010 Permalink](#)**

Science and experience tell us we need more conclusive information.

“All human activities have an effect on the environment, but in these early years of the 21st century, we are increasingly realizing that we have trod too heavily on the planet. ...

If aquaculture is to fulfill this great promise, however, governments and citizens alike must be vigilant. Short-term economic considerations will make it all too easy for marine aquaculture to slip into the ecologically

harmful methods of large-scale, intensive livestock production increasingly adopted on land.”

Quotes from Pew Charitable Trusts – Sustainable Marine Aquaculture: Fulfilling The Promise; Managing The Risks

It seems that time after time, and often with the best intentions, we have interfered with nature only to be faced with negative ramifications down the road. Global food production has created many new problems and, at this time, it has not been proven that large-scale aquaculture will be any different.

The research information listed on the DNR website contains phrases like “until more directly applicable studies are completed.” and “work needs to be done”. Once our environment has been manipulated to such a degree, the effects cannot easily be undone. There are certainly points to be made on both sides of the geoduck aquaculture issue, but the most important point is to proceed with extreme caution. What we do today will have consequences for future generations.

- **Jim Gibbons 8:42 am on May 6, 2010 [Permalink](#)**

With limited space and time all responders of this forum must selectively cull quotes from science to make their point. Unfortunatley, that may inadvertently lead to a misleading information.

For instances, the Pew document above also says this:

“...increased culture of filter-feeding mollusks—for commercial purposes and for wild stock restoration programs—has been proposed as a way to mitigate the harmful effects of eutrophication (NRC 2004).”

And this:

“One perspective is that the effects of the aquaculture industry, even if greatly expanded, would be small, especially when one considers that aquaculture wastes make up a small fraction of the pollutants.”

The same document can be sued to present two opposing points of view!  
entering coastal waters

- **Eleanor Olsen 5:23 pm on May 5, 2010 [Permalink](#)**

I don't know about you, but I do not want to ever feed my family food grown in China. I would much rather have locally grown food indigenous food including aquaculture, than risk eating polluted food. So if we don't have aquaculture in our back yard where do you think you will get your shellfish from. Is your water front septic system doing more damage to the sound than geoducks? I think we should have a moratorium on flushing until further studies can be done.

- **Don Martinson 2:09 pm on May 6, 2010 [Permalink](#)**

If you want local geoduck, you'll probably have to fly to China to get it, or at least to Chinatown in San Francisco. And if you ban flushing, the shellfish industry will have no excuse to expand operations based on the "mitigation of shoreline development" excuse.

- **Michael B. Murphy 5:02 pm on May 5, 2010 [Permalink](#)**

One does not need a PHD in marine biology to know that the concentrations of shellfish seen in commercial aquaculture do not exist in a natural environment. If said concentrations were beneficial to the environment and the overall ecosystem natural selection, having had two or three billion years to ponder the question would have created such concentrations. Apparently evolution is unaware that such concentrations can provide the owners of a harvestable crop generating upwards of a million dollars per acre. Shame on Darwin.

- **Mat Buldis 10:16 am on May 6, 2010 [Permalink](#)**

Geoduck are the most abundant species in Puget Sound. They often occur naturally in densities similar to those found in Aquaculture.

- **William Burrows 10:37 am on May 6, 2010 [Permalink](#)**

There are a few subtidal wild geoduck tracts that share similar densities but most tracts show lower densities than aquaculture planting. But that is not what is important. What is important is the fact that the marine ecosystem on the Nearshore and inter-tidal areas is much different than the subtidal ecosystem. Take for example forage fish spawning and the migration paths of certain salmon.

Look how Mother Nature allocated densities and you'll see no comparison.

- **Bertil F. Johnson 4:01 pm on May 5, 2010 [Permalink](#)**

It is clear from the dialogue so far posted today that one thing is clear: Good independent science has not told us enough yet about the impacts of geoduck aquaculture on Puget Sound. On the other hand, common sense (basic science it seems to me) leads to a simple conclusion when you walk on a Puget Sound Beach far from any geoduck or shell fish farm and find netting, PVC pipe and shell fish holding cages. That just can't be a good sign.

It seems so contradictory to me DNR joins with Puget Sound Partnership in an effort to clean up Puget Sound and then suggests it might be good to have geoduck farms on our few public beaches. There is no science that supports such a thing. Have a total and permanent moratorium on the leasing of our public beaches to the shell fish industry. Let common sense and the Public Trust prevail.

- **Betty Garrison 3:04 pm on May 5, 2010 [Permalink](#)**

The government wants to get plastics out of the water.

There can be no doubt that a storm surf with the suspended sand will erode the plastic tubes. The eroded particles will be in the beach and suspended in the water and consumed by the beach inhabitants. This combines with the leaching of chemicals from the tubes and is bad news. On a beach with a long fetch, a substantial number of the tubes will come loose and the erosion will be increased.

PVC is harder than styrofoam, but it still erodes. Just slower.

- **Tris Carlson 8:04 am on May 6, 2010 [Permalink](#)**

In reply to Mr. Puddicombe's figure in regards to the tonnage of PVC pipe used assuming 43,000 per acre. The PVC tube most frequently used is 4" nominal .075 wall with a weight of .6745 lbs/ft

A 10 inch piece (general primary length) weighs .56 lbs. Using the assumed 43,000 parts per acre this equates to right at 24,000 lbs or 1/6th of your calculations. I hope your other citations are better researched.

- **Jules Michel 9:20 am on May 6, 2010 [Permalink](#)**

12 tons seems a significant number to consider in the decision process, even if it's only 1/16 of an incorrect estimate.

- **[Curt Puddicombe 9:25 am on May 6, 2010 Permalink](#)**

Peter Downey disagrees with your weight calculations, and has suggested the weights are closer to 32,000 pounds per acre. See his earlier post. Obviously, it depends on who you talk to. I've seen a variety of different types, sizes and colors of PVC pipes used for geoduck aquaculture. Whatever the actual weights may be, the question persists whether or not PVC is environmentally correct at any weight or amount, and I'm questioning its use in the tidelands. This is a question that has not been answered – and I'm merely enquiring about the substance itself moreso than the actual amount itself, although that has some importance also. I'm interested in knowing how much of the pipes actually wear away. One way to determine this would be to weigh a new piece of pipe, and then to weigh it again after 4 or 5 years of use in the tidelands. I've seen PVC pipes on geoduck farms that are chipped, broken shards are laying around, the pipes are weathered and worn down, and I'm curious as to the possible long term consequences, especially when there has been efforts to get plastics out of the marine environment. I appreciate the other opinions on the actual weights, but the basic question remains. I'm also interested in how much of this ends up in a landfill, since PVC is apparently not recyclable.

Here's the URL for Greenpeace's page on PVC.

<http://www.greenpeace.org/usa/campaigns/toxics/go-pvc-free>

- **[Peter Downey 11:33 am on May 6, 2010 Permalink](#)**

My calculation was based on a rough estimate – (took 4 tubes and weighed them on a bathroom scale and rounded up- not very accurate.) My point was that you were way off in your first number(500% high). If Tris has a more accurate number – great.

- **[Joe 2:38 pm on May 5, 2010 Permalink](#)**

I won't try to refute any opinions here with scientific research, because as one of the posters above just noted, when you get down to the brass tacks, it's an emotional issue which has little connection to actual concern for the

environment. In fact, it seems ingenuous to make complaints about environmental impact of geoduck farming when one is viewing the activity from a waterfront home with a septic system, perched on a bulkhead. All of these things have caused damage to the natural environment, and bulkheads aren't known for being things of beauty. They do, however, save the homeowners' money and save their investment. Hence the lack of outcry over bulkheads.

There is currently an active geoduck farming operation in front of my house. During the summer we see PVC tubes (when the geoducks require them) for a few hours per day, at the most. Other times we see them less. My children enjoy playing on the beach, as there's plenty of room. They avoid running through the PVC tubes, of course, but do enjoy exploring among them and finding various sea creatures which live there in large amounts. It's actually far more populated with life now than when it was a mud flat. To the untrained eye, at least, there is no shortage of starfish, crabs, cockles, or any other creature naturally found on our beach.

Geoduck farmings creates jobs, puts money into hands of workers and landowners (on private lands, at any rate), and the beach recovers far faster than land which has been logged. The business which runs the farm in front of our house is very conscientious about keeping the beach clean, their workers are friendly and make a minimum of noise. I've never been kept awake by it, or been disturbed by it.

Even if the vocal complainers won't admit it, their sole issue is aesthetics, and everything else is a smokescreen. There is no *\*conclusive\** scientific evidence one way or the other I've ever seen reference to. I think the decision to allow or disallow farming of geoducks is going to have to be based upon whether or not the person who makes the ultimate decision is going to be willing to put up with the firestorm of complaints and litigation that this vocal group is going to launch if they lose.

- **Jules Michel 9:22 am on May 7, 2010 [Permalink](#)**

It is presumptive at best to assume people concerned about this policy only care about aesthetics. If the last paragraph above is to be considered relevant, then asking DNR to also consider most – if not all – in support of this have run out of tidelands to farm and are only concerned about their patient investors waiting for a return on their investment. Neither are correct and it serves no purpose to presume we know what everyone's agenda is.

- **Peter Downey 2:19 pm on May 5, 2010 [Permalink](#)**

Lets get a couple of Items straight. The density of geoducks on the most densely planted farm is far less than the densities of other farmed shellfish (e.g. manila clams, oysters, mussels ) Every shellfish farmer I know is a staunch advocate of saving Puget Sound. We have much more at risk than any shoreline homeowner. To insinuate that the science shows any long term or far reaching effects of geoduck farming is false. There are short term spatially confined effects. To say that we are creating a “monoculture” is also false. We use passive controls to protect our crops from predators which also creates opportunity for many other organisms to colonize (e.g. polychaetes, horse clams, butter clams, littleneck clams, barnacles, mussels, etc. etc. etc.) No pesticides or herbicides are used in geoduck aquaculture. No antibiotics are used, no growth hormones are used. And there are no feed inputs. Is it ugly? – yes to some. Is it imperiling Puget Sound? – not that any science has ever indicated.

- **Jules Michel 3:18 pm on May 5, 2010 [Permalink](#)**

Is it possible to get a reference to whatever study you are basing the “short term” effects statment on Peter? I’m not doubting it’s based on something, I’d just like to know what it is. I would also like to offer this definition found on monoculture: “Monoculture is the agricultural saying of producing or growing one single crop over a wide area. It is widely used in modern industrial agriculture” (Wikipedia). Finally, comparing oysters/manila clams aquaculture to geoduck aquaculture is somewhat questionable, especially in a forum focused on the science of geoduck aquaculture. As you know, they’re quite different.

- **Peter Downey 3:53 pm on May 5, 2010 [Permalink](#)**

Look at Glenn VanBlaricom’s research (UW SeaGrant) on short term vs. long term effects.

I can’t believe you are quoting wikipedia in a science forum. Monoculture is a single crop where all other species are excluded. Think of corn, soybeans or wheat and all that terrestrial farmers do to ensure that they have a monoculture (tilling spraying bioengineering). Its that kind of hyperbole that is not constructive. (same is true of refering geoduck farms as “feedlots” . I know of no feedlot owner that would provide no feed for their livestock or would tolerate a plethora of other species eating the feed that was available. ) While mussels , oysters and manila clams are different, the point is often made that geoduck densities are unsupportable in the environment. The reality



is that as far as biomass is concerned other species are farmed at greater densities than geoduck.

- **Jules Michel 4:33 pm on May 5, 2010 [Permalink](#)**

All I can find are VanBlaricom updates which say “Do not cite.” Is this what you’re basing your comment on, in this scientific forum?

- **Brian Allen 2:07 pm on May 5, 2010 [Permalink](#)**

I am a little amused that the folks who tune into this discussion are being asked to describe the science on specific effects geoduck aquaculture. Ecology work specific to cultivation and harvest of geoduck intertidally is mostly ongoing. Current science that looks at estuary function and shellfish aquaculture far and away showcases the net benefits. Just have a look at what millions of dollars are being spent on in New England and Chesapeake Bay – shellfish restoration to support both a struggling shellfish industry, and to battle to recover water quality and estuary function.

I raise the point of a shifting baseline on what is “natural”. It took quite a bit of engineering to bring the Puget Sound watershed, shorelines and estuary to the state it is in. It will likely take some engineered solutions to get Puget Sound recovery underway by 2020. Shellfish aquaculture has huge potential in Washington and could be part of the solution.

For the shoreline aquaculture opposition groups, the science is moot. They do not care what the best available science reveals. I am pasting an excerpt from a previous comment:

“However, I believe that we are all missing the point here. Even if intertidal farming is found to be not harmful to the environment in a scientific way, it is still ugly and dangerous to beach users.”

This a sentiment I’ve heard before. These people just don’t want to look at any commercial activity. Regardless if science eventually indicates net positive effects, or if we somehow do away with predator exclusion gear altogether. These few will still get in a twist over the commercial activity.

What I can offer on this is the following empirical anecdotes: I have only witnessed species richness increase with intertidal aquaculture. Beaches and species assemblages recover quickly (weeks) from intertidal geoduck harvests.

Currently the disturbance from geoduck harvest has been determined by DNR to be non-significant for subtidal harvests (EIS); academic scientists working on this have characterized the disturbance from geoduck harvest as not different from the ambient disturbance regime for intertidal beaches.

- **Mark Hersh 2:37 pm on May 5, 2010 [Permalink](#)**

Is there a comprehensive bibliography on the research conducted on geoduck aquaculture? If so, I'd appreciate a link.

- **[Curt Puddicombe 3:49 pm on May 5, 2010 \[Permalink\]\(#\)](#)**

<http://www.pcsga.org/pub/uploads/EnvironShellfishBibliography.pdf>

- **[Curt Puddicombe 8:55 am on May 6, 2010 \[Permalink\]\(#\)](#)**

It's not true that everyone opposed to geoduck aquaculture expansion is indifferent to science.

The idea that there is an increase in species richness with an increase in shellfish aquaculture isn't supported by the majority of the available science. I've included a few sources below that do not support that opinion:

“The intertidal regions that had been used for (shellfish) farming for 3 and 5 years had lower species richness...as compared to the intertidal region where no active farming occurred.” “...studies are needed to determine the scale to which intensive use of the foreshore for shellfish purposes alone is feasible without undue harm to the environment.”

Bendel-Young, L.I. 2006

<http://www.caseinlet.org/uploads/EnvConshellfish.pdf>

“Shellfish aquaculture in South Sound alters plant and animal assemblages and results in the loss of shallow nearshore habitat and habitat diversity important to salmon resources”. “We hypothesize that shellfish aquaculture reduces productivity, abundance, spatial structure, and diversity of salmon populations.”

South Sound Salmon Recovery Group, 2004

[http://www.protectourshoreline.org/articles/ChinookBullTrout\\_Recovery\\_SPS\\_Draft2\\_ShellfishAquacultureStressors.pdf](http://www.protectourshoreline.org/articles/ChinookBullTrout_Recovery_SPS_Draft2_ShellfishAquacultureStressors.pdf)

“Our results suggest a net decrease in total shorebird use in areas developed for aquaculture.”

California Fish and Game, Effects of Aquaculture on Habitat Use, 1996.

[http://www.caseinlet.org/uploads/Shorebirds-Impacts\\_of\\_Aquaculture-Kelly\\_1\\_.pdf](http://www.caseinlet.org/uploads/Shorebirds-Impacts_of_Aquaculture-Kelly_1_.pdf)

“Cultivating shellfish in the South Sound results in the loss of shallow nearshore habitat and habitat diversity that is important to salmon.”

The Puget Sound Salmon Recovery Plan,  
South Sound Watershed Profile, 2007, Ch. 5, pg. 299.

[http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/upload/Ch5\\_S\\_Sound.pdf](http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/upload/Ch5_S_Sound.pdf)

In Technical Report 2007-03, Marine Forage Fishes in Puget Sound by Dan Penttila of the WS Dept. of Fish and Wildlife: “These agencies (WA Dept. of Agriculture, WA Dept. of Natural Resources) together with WA Dept. of Fish & Wildlife should seek a coordinated approach to the management of the growing aquaculture industry, with an eye toward modification of habitat-damaging culture practices and the mitigation of existing habitat degradation for which the industry has been responsible.” “The bulk of the Puget Sound Basin’s shoreline is now in private ownership. The likelihood of continued financial and political pressure for shoreline modification by a landownership population largely ignorant of nearshore resource values and conservation risks is high.”

[http://pugetsoundnearshore.org/technical\\_papers/marine\\_fish.pdf](http://pugetsoundnearshore.org/technical_papers/marine_fish.pdf)

We still need research by independent fisheries biologists and nearshore specialists. Sea Grant as mandated by HB 2220 was supposed to accomplish this, but unfortunately lost its funding.

We also need the full perspective from both the scientific standpoint on the ground, and the social perspective, and that has to come from the careful consideration of all viewpoints from all stakeholders.

- **susan Macomson 1:14 pm on May 6, 2010 [Permalink](#)**

Well my observation on our beach over the last 4 years is a complete loss of life! No Crabs, Few if any starfish No fish or moonsnails. We have lost or sand dollar bed. We have only one heron when we used to have at least four, our otters pair is gone. Our osprey have gone and our diving duck numbers have gone way down. We even have fewer kingfishers. You see what you want to see when you want to get rich quick. The people that are

fighting you are fighting not so much about the looks but about the whole sale destruction, WE don't make money fighting you! I would also note that I have been told by 2 different farmers that your idea of beauty is to have those tubs through out the sound and as long as the water is clean you would just as soon have no other creatures in the sound. Kind of like driving through farm land in the mid west, lots of crops no pests.

- **Harry Branch 1:44 pm on May 5, 2010 [Permalink](#)**

Cost effective control of nutrients? In the most general terms, nutrients are consumed by phytoplankton (primary producers). Phytoplankton is consumed by copepods (secondary producers). Filter feeders are by comparison a small piece of the pie. We need a healthy ecosystem with intact structure (tide flats) to remediate nutrients which have always been present in the system, especially when millions of salmon died and rotted in area streams. To argue that aquaculture is any kind of a fix for nutrient loading is a reach.

- **David Fyfe 1:27 pm on May 5, 2010 [Permalink](#)**

I have been reading input for the last two and a half days. Given today's topic, I figure it's time I speak up. I have a Bachelor of Science in Marine Biology and my Master of Science degree thesis was on geoduck clams and was produced 25 years ago.

I see an occasional industry representative has weighed in and let's be honest, they know more about geoduck aquaculture than any other group represented here, but due to their self interest, their words are suspect by the other side. Several more of 'the other side' have weighed in, but with their 'moritorium until science gives it a clean bill of health' perspective, this would impose a standard that isn't applied to any other activity in the country. Nuclear Power Plants aren't held to this standard. I've spoken to a number of people representing this perspective, and have found that some don't consider geoduck aquaculture much less potentially harmful than nuclear power plants. Many in this group quote scientists or scientific papers, but they dismiss any scientist who represents his/her own opinion. I advise anyone reviewing these comments to check the references to 'science' before giving them any credence. The ones I've checked often don't support the positions that's been put forward. Then there are those I am interested in hearing from – the ones who have legitimate concerns – the ones who would consider things a little better if the industry were to address those concerns, and not hold out for a moratorium. Some of the legitimate concerns I've read so far are: 1. Audible noise in the middle of the night from a farm adjacent to a private residence. Does this occur? Can't we fix it somehow? 2. Large quantities of PVC shards. Wouldn't a

heavier, and yes, more expensive gauge of PVC cut down on some of this?  
3. The visual appearance of white tubes for the short period before they get fouled. Sand-colored tubes should minimize this objection. There are others, no doubt. Let's look for serious solutions to serious concerns.

Two final points: 1. Science can not prove that any activity will have no impact. All any scientific study can do is possibly conclude that no impact was found. These two are not at all the same. 2. While geoduck aquaculture clearly has some negative impacts, let's not ignore the positive ones, in addition to providing jobs, i.e. For the 5-6 years that a planted geoduck is in the ground, it turns 2-3 pounds of 'excess nutrients' (that originate from what we flush down our toilets, feeding naturally occurring algae, which are in turn eaten by geoducks), into highly nutritious and tasty seafood. The farmer then removes that 'excess nutrient' from Puget Sound. Unless you're in the camp that believes we need to be flushing more, this has to be seen as a positive.

Best of luck to those who have to try to sort through all the comments you get from this effort!

- **Laura Hendricks 1:18 pm on May 5, 2010 [Permalink](#)**

While natural densities of shellfish help filter the water, there is no independent scientific evidence that water quality has been improved in Puget Sound by industrial densities of shellfish. In fact, the following research is available that refutes the industry water quality promotion that the aquaculture industry should be allowed to expand and destroy our native species and salmon recovery in the name of "filtered water."

"Shellfish effects on plankton productivity can be measured. In 2003, the Pacific Shellfish Institute completed a comprehensive two-year study to evaluate phytoplankton abundance and seasonal change within and surrounding a mussel raft farm in southern Puget Sound. This farm has 8 multiple suspended culture units with a total surface area of one acre and a stocking density at harvest size of 240 tons. While phytoplankton abundance was on average 56.3% lower in the center of the raft units, the feeding effects on phytoplankton were localized and contained in the immediate raft system. Despite reductions in phytoplankton abundance within the mussel unit, phytoplankton concentration and community composition outside the raft system did not differ from reference conditions (PSI, 2003)." It should also be noted that dissolved oxygen was significantly lower under the mussel rafts and down current which can result in fish kills which is a major environmental problem.

"In a mesocosm study in Rhode Island, Pietros and Rice (2003) specifically investigated the "overgrazing hypothesis" that oyster

populations can deplete phytoplankton. They found that “based on rates of ammonia excretion by oysters and observed steady states of ammonia and other forms of inorganic nitrogen in mesocosm tanks, it can be hypothesized that ammonia generated by oysters is taken up by rapidly regenerating phytoplankton in the water column.” They concluded that oysters had no net effect in terms of depleting phytoplankton populations, but that oysters can produce changes in the relative abundance of different phytoplankton species.” Page 7

So, don't believe everything you hear.

- **Peter Downey 1:43 pm on May 5, 2010 [Permalink](#)**

You can't claim that there is “no independent scientific evidence” and then go on to cite a PSI study which is the very non “independent” source you just blasted. It's completely two faced. There is no study – independent or otherwise that points to negative water quality effects from aquaculture in the Puget Sound. To insinuate that dissolved oxygen downstream from the mussel raft was at a level that threatens fish is at best a negative manipulation of the findings. At worse...

- **Mark Hersh 2:33 pm on May 5, 2010 [Permalink](#)**

Is there independent research that indicates positive water quality effects from geoduck aquaculture in Puget Sound? Certainly a desktop exercise can result in showing that high levels of nutrient removal are realized from filter feeders. And even so, it seems to me that comprehensive studies are needed to determine the effect of geoduck aquaculture on the typical natural biological communities found at these sites.

- **Jules Michel 2:53 pm on May 5, 2010 [Permalink](#)**

It's important to stress that water quality is only one side of the geoduck. The other side is three feet down, under the sediments. To get there, pipes are put in, pipes are taken out, and 3' of sediment is liquefied, with the extraction churning the sediments. This transformation of the tideland sediment/ecosystem is what one of the long-term studies being performed by the University of Washington is looking at. The significance is found on page 2: “Clearly the development of geoduck aquaculture operations in a site will initiate or alter a number of biogeochemical and ecological processes potentially significant to local habitats

and benthic communities.” It is important to note again: This study is still in its preliminary stages, but its importance relating to future expansion policies should not be dismissed.

[http://www.wsg.washington.edu/research/pdfs/reports/VanBlaricom\\_RGD1a\\_2009.pdf](http://www.wsg.washington.edu/research/pdfs/reports/VanBlaricom_RGD1a_2009.pdf)

- **Mark Hersh 3:58 pm on May 5, 2010 [Permalink](#)**

Thanks for the link — this appears (upon a quick read) to be the kind of research I was hoping to find.

- **John Lentz 12:38 pm on May 5, 2010 [Permalink](#)**

The additional science that was funded by the legislature targets the specific questions that needed more study concerning geoduck aquaculture. One significant area of science that is well established that is not in question is the bio-remediation qualities of all bivalves. Their ability to filter and clarify the water are helping to keep Puget Sound in balance. The enormous loads of nitrogen discharged from upland sources are not benign, they are fertilizing the marine waters. This problem is considered to be the greatest threats to the marine waters around the entire US. As our population has increased this threat has, and will, become greater. As an example of the contribution bivalves have in keeping a more balanced environment, one can look at the Chesapeake Bay when almost all of it's oysters died suddenly from disease. Within a very short period of time most of the fish, crabs, sea grasses, and other species in the bay died from the incredible algal blooms that blocked sunlight beyond a few inches underwater and used up the available dissolved oxygen that most marine organisms need to survive. It was the bivalves that kept the algal blooms in check and helped maintained the diverse marine environment. Without those filter feeders the entire system crashed. The sound and other estuaries of this state have had aquaculture in them for over 100 years. The waters that are the healthiest are the the ones that have had shellfish aquaculture in them for that same period. It should not come as a surprise that the most unhealthy waters are adjacent to the population concentrations and associated effluents. In the big picture we need more filter feeders not less. The East and Gulf Coasts get that and are spending tens of millions of dollars to repopulate shellfish to clean the water and create essential habitat for marine species . I hope that we can learn from the other coasts tragic experiences and not repeat them.

- **Richard Wooster 1:13 pm on May 5, 2010 [Permalink](#)**

The situations described are different environments, with different levels of agricultural runoff and do not involve plantings at the

densities currently undertaken at the industrial aquaculture sites for geoducks in the Puget Sound. The levels of aquaculture historically practiced in Washington State are not comparable to the intensive, high density industrial aquaculture being rolled out today.

- **John Lentz 2:43 pm on May 5, 2010 [Permalink](#)**

You are correct that these are two different environments. They are both coastal bays. The nitrogen runoff, although from different sources is the same. It acts as fertilizer for the algae. The densities of oysters there far exceed the densities of farmed geoduck both in pounds of growth per year and numbers per square meter. The production levels for geoduck do not surpass the production levels of the more historic oyster and clams on a per acre per year calculation in Washington. “Intensive, high-density, industrial aquaculture”... very descriptive terms...but...not accurate.

- **Jim Gibbons 12:23 pm on May 5, 2010 [Permalink](#)**

An interesting topic which I would like to flip on its head.

Here’s the lead sentence from a November 17, 2009, press release: “In a decision with national relevance, a federal judge in Tallahassee Monday approved a consent decree that requires the U.S. Environmental Protection Agency to set legal limits on excess nutrients that trigger harmful algae blooms in Florida waters.” <http://www.ens-newsire.com/ens/nov2009/2009-11-17-092.asp>

Science does tell us that “nutrient over-enrichment is a significant problem for the coastal regions of the United States” (National Academy of Science through the National Research Council). Science also tells us that shellfish are by far the most cost-effective strategy to control pollution” (Woods Hole Oceanographic Institution). And along these same lines we know that “one type of aquaculture – mollusk farming – actually reduces nutrient pollution” (Environmental Defense). [http://www.pcsqa.org/pub/uploads/Environmental\\_quotes.pdf](http://www.pcsqa.org/pub/uploads/Environmental_quotes.pdf)

Geoduck aquaculture is the farming of mollusks. Let me repeat that for emphasis: geoduck farming is the farming of mollusks.

As the quote in the first paragraph shows, nutrient pollution has become such a huge problem in this country that the Environmental Protection Agency is trying to force the state of Florida to regulate the use of nitrogen which is the ultimate cause of excessive nutrient pollution. Where does



excess nitrogen come from? It comes from municipal treatment plants, individual septic systems, pet wastes, farm wastes, farm fertilizers, leaky oil from cars and trucks, garden fertilizers, and even yard waste. In short it comes from each and every one of us. We all contribute to the problem.

As far as I know, no one has yet quantified the positive impacts that geoduck aquaculture has on the waters of Puget Sound, the biggest impact being they filter Puget Sound waters of excessive nutrients. But some scientist at Woods Hole Oceanographic Institution has stated that shellfish (and geoduck are shellfish) are by far the most cost-effective strategy to control (this type of) pollution.

What are we in the State of Washington going to do about nutrient pollution? What is DNR doing about it? How will DNR put a value on that impact of geoduck aquaculture?

- **Jules Michel 2:27 pm on May 5, 2010 [Permalink](#)**

As noted, “no one has yet quantified the positive impacts that geoduck aquaculture has on the waters of Puget Sound” It would be interesting to know if anyone has considered whether the filtering capacity of shellfish really are significant enough to matter. Having grown up on Lake Washington, I saw first hand the lake go from a vibrant and living body of water to one like Mr. Lentz describes Chesapeake Bay being and then return to health again over a multi-decade time frame. The return to health had nothing to do with shellfish but with regulating all of those things described above. How much nitrogen and phosphate are being dumped into Puget Sound and what do shellfish actually remove? I don’t know, but if that’s the basis for a decision we should know.

- **Peter Downey 4:26 pm on May 5, 2010 [Permalink](#)**

Jules, I think your right. Until we put real controls on the inputs to Puget Sound, we won’t be able so solve the problems. It’s no coincidence that the same place where we have lost shellfish beds – Everett to Tacoma – is the same place whre we have lost eelgrass beds and is the same place where we have uncontrolled stromwater run -off from millions of people.

- **[Curt Puddicombe](#) 10:28 am on May 6, 2010 [Permalink](#)**

According to DNR studies, the small amount of wild subtidal harvest has no discernable effect on the overall filtering of phytoplankton. Therefore, the geoduck farmed in the intertidal is

not nearly enough to have any consequence on the overall abundance of phytoplankton. The comparison to Chesapeake Bay by the Woods Hole folks is quite irrelevant to South Puget Sound, and with the biomass of wild geoduck, the farmed amount is totally inconsequential in terms of filtering.

The problem is, the freakish density of geoduck farmed artificially in the intertidal can also consume fish eggs, crab zoeas and other valuable zooplankton in addition to the localized phytoplankton, so it also becomes a hazard to the survival of other species.

- **Harry Branch 12:08 pm on May 5, 2010 [Permalink](#)**

To plant and grow geoducks in the intertidal beach as described, virtually all other species are considered “pests”. Pests need to be controlled. This concept is unsustainable in the long run and a poor utilization of potential. We would be better advised to manage the geoduck harvest in ways that protect and enhance the resource and incorporate this highly productive natural ecosystem into the model instead of attempting to overwhelm it.

- **Kathryn Townsend 11:22 am on May 5, 2010 [Permalink](#)**

One of the factors that is not frequently discussed in this controversy is called “social carrying capacity”— the level of farm development that causes unacceptable social impacts.

See: <http://faculty.washington.edu/stevehar/Carrying%20capacity.pdf>

This scientific research paper by Christopher McKindsey was highlighted by the one of the leading expert marine biologists invited to present at the 2007 Seagrant Aquaculture Workshop in Seattle, Dr. Roger Newel, University of Maryland. Dr. Newel’s comments were apparently speedily forgotten by the industry and the agencies as I don’t believe the idea ever came up again in the SARC meetings.

However, it is obvious that with the attempt to expand shellfish production and in particular industrial geoduck production out of traditional shellfish areas into new areas in the last 10 to 15 years that social carrying capacity has been exceeded. This forum itself is evidence of the breadth of the breach of social carrying capacity. Thus the social sciences are as much as part of this discussion as the science that looks at core samples of the sediments. There are a lot of people that are opposed to this expansion on public beaches based on their community values and expectations. Social carrying capacity must be taken into consideration by the DNR.

- **Jim Gibbons 1:09 pm on May 5, 2010 [Permalink](#)**

I fear the poster of this message is trying to prove many of geoduck industry's points. Based on any reasonable comparison, the geoduck industry has no social impact except to a few shoreline owners with expensive views.

Last year our industry harvested 1.5 million pounds from maybe 30 acres of tidelands. In contrast:

The 4.3 million people of New Zealand harvested 145,000,000 pounds of mussels from 9,900 acres of water.  
[http://farm3.static.flickr.com/2239/2317927256\\_92e4d9283a.jpg?v=0](http://farm3.static.flickr.com/2239/2317927256_92e4d9283a.jpg?v=0)

The people of Japan, a country a little over twice as big as Washington, grew 350 times the amount of Manila Clams as our state and 3.5 times as many oysters.

Washington State terrestrial farmers farm 15 million acres of land in Washington compared to the geoduck industries 330 acres.

The 4.7 million people of Norway produced 1.3 BILLION pounds of farmed salmon.  
[http://newsimg.bbc.co.uk/media/images/40249000/jpg/\\_40249175\\_salmon\\_farm203bbc.jpg](http://newsimg.bbc.co.uk/media/images/40249000/jpg/_40249175_salmon_farm203bbc.jpg)

The 4.3 million people of British Columbia produced 200 million pounds of salmon worth \$800 million and providing 6,000 jobs.

Do you want to see what intensive aquaculture really looks like? Check out this aerial from China  
[http://maps.google.com/maps?hl=en&ie=UTF8&q=Dalian+China&fb=1&gl=us&ei=jN3hS9OFJ5HWMN3dqZQN&ved=0CBkQpQY&view=map&geocode=FfPGUQIds7E\\_Bw&split=0&sll=38.929856,121.610756&sspn=0.222192,0.339889&iwloc=A&sa=X](http://maps.google.com/maps?hl=en&ie=UTF8&q=Dalian+China&fb=1&gl=us&ei=jN3hS9OFJ5HWMN3dqZQN&ved=0CBkQpQY&view=map&geocode=FfPGUQIds7E_Bw&split=0&sll=38.929856,121.610756&sspn=0.222192,0.339889&iwloc=A&sa=X). This is where we're getting our shrimp.

Or check out this photo from Vigo Spain  
[http://maps.google.com/maps?hl=en&ie=UTF8&q=Dalian+China&fb=1&gl=us&ei=jN3hS9OFJ5HWMN3dqZQN&ved=0CBkQpQY&view=map&geocode=FfPGUQIds7E\\_Bw&split=0&sll=38.929856,121.610756&sspn=0.222192,0.339889&iwloc=A&sa=X](http://maps.google.com/maps?hl=en&ie=UTF8&q=Dalian+China&fb=1&gl=us&ei=jN3hS9OFJ5HWMN3dqZQN&ved=0CBkQpQY&view=map&geocode=FfPGUQIds7E_Bw&split=0&sll=38.929856,121.610756&sspn=0.222192,0.339889&iwloc=A&sa=X)

I could go on and on but I won't. The point is that by any objective measure the farmed geoduck production has close to zero social impact on 99.99% of the citizenry in Washington State. The only

folks affected are the shoreline owners and even then it's only a few vocal citizens.

- **Jules Michel 2:10 pm on May 5, 2010 [Permalink](#)**

Fortunately we live in a country where the public process allows all opinions to be considered – whether they be from individuals or wealthy corporations – before rushing into a decision about the use of the public's property, which is owned by 100% of the people. Because of that, decisions are more likely to be based on objective facts, not assumptions, and will encompass a broader perspective.

- **Kathryn Townsend 3:22 pm on May 5, 2010 [Permalink](#)**

Mr. Gibbons,

As one of the expert shellfish scientists said to your question at the 2007 Seagrant shellfish aquaculture workshop, a question that you posed about the “small amount of geoduck aquaculture acreage” in relation to all the acres of tideland in Puget Sound—that expert said your comparison was meaningless—that the comparison had to be made on a smaller scale—the scale of an inlet or smaller. So all your facts and figures about China shrimp and BC salmon farming are likewise meaningless for the purposes of this discussion. We are talking about expansion, probably permanent conversion, of Puget Sound publicly owned beaches to industrial geoduck aquaculture in the context of the Shoreline Management Act and the current goal to fund the protection and restoration of Puget Sound with taxpayer dollars . As I pointed out in another thread (with the WDFW maps), the number of these publicly owned beaches as opposed to privately owned beaches in Puget Sound is small. These publicly owned beaches should remain public and not be given over to commercial interests. That this forum was convened is evidence of social impact and your reversion to negative talking points about those who favor keeping the public beaches out of commercial reach is indicative of an attempt to deny social impact.

- **Jim Gibbons 4:19 pm on May 5, 2010 [Permalink](#)**

I think you're missing my point. You suggested that the “social carrying capacity” should be looked at. I was trying to make the point that other areas of the

world seem to farm quantities of shellfish and fish of far, far greater magnitudes than we do in our state, and they have yet to reach the “social carrying capacity” you speak of.

It would be a good exercise for DNR to attempt to see what percent of the anti-geoduck people contributing to this form are shoreline owners whose views are or would potentially be affected by geoduck farms.

IN SHORT WHERE IS THE PUBLIC WHO DOES NOT HAVE A VESTED PERSONAL INTEREST IN THE OUTCOME??

- **William Burrows 9:14 am on May 6, 2010**  
[Permalink](#)

All citizens of the state have a vested, personal interest in the outcome. The shoreline belongs to everyone and, as stated very clearly in the SMA, it must be protected and kept in its natural state whenever possible.

Your hypothesis that only shoreline property owners adjacent to proposed sites have an interest in the state’s shoreline is not correct (in my opinion and that of the majority of state voters who voted for the SMA).

- **Jules Michel 10:01 am on May 7, 2010**  
[Permalink](#)

To ask what percentage of “anti-geoduck people” are shoreline owners concerned about aesthetics is as relevant as asking what percentage of those commenting are companies who have run out of tidelands to use with investors waiting for a return on their investment. Neither statement serves to move this forward.

- **Dorothy Gist 11:16 am on May 5, 2010** [Permalink](#)

Richard, I totally agree with you. State tidelands should be left in as natural a state as possible. Commercial geoduck farming will not help the sound, visually or physically. It should be stopped.

- **Judith N. Sloan 10:47 am on May 5, 2010 [Permalink](#)**

I just reviewed the UW Sea Grant study which is still in early days...not scheduled to be finished until 2013..so the results are not available yet. However, I believe that we are all missing the point here. Even if intertidal farming is found to be not harmful to the environment in a scientific way, it is still ugly and dangerous to beach users. The PVC pipe and netting and rebar still get spread around the area, and harvesting leaves deep mud where previously there was beautiful sand. This should NOT happen!

- **Mary Lee Troy 10:34 am on May 5, 2010 [Permalink](#)**

Scientific evaluation requires controlled experiment and analysis prior to application. The genesis and intense spooling up of intertidal geoduck manufacture on DNR (and private) tidelands with little or no supporting impartial science (not generated or sponsored by the shellfish industry) is a contradiction of scientific method.

The question should be why did the State (DNR, WDFW, Ecology) allow the shellfish industry to install these massive feedlot farms without such studies prior to startup? Citizen stakeholders are now in a position of finding science. It should not be “prove geoduck farming does harm to the environment”. It should be incumbent on industry to first prove it doesn’t harm the environment, especially Puget Sound.

A moratorium should be declared and existing acreage reexamined case by case. Permits should be required as in any other building/ business permitting process. These permits should carry enough fees to support such a program ( which creates revenue and jobs for the State!).

The health and survival of Puget Sound is at stake, and we cannot get it wrong.

- **Peter Downey 11:24 am on May 5, 2010 [Permalink](#)**

You have no credibility if you claim that industry sponsored research is biased, and then state that “It should be incumbent on industry to first prove it doesn’t harm the environment.” Your reference to geoduck farms as “feedlots” shows your bias.

- **[Curt Puddicombe](#) 8:40 am on May 5, 2010 [Permalink](#)**

No studies have been initiated to discern the short term or long term affects of the massive, unprecedented amounts of PVC introduced into the tidelands and marine waters of South Sound from geoduck aquaculture.

One acre of geoduck with 43,000 pipes equals approximately 150,000 pounds, or 75 tons of PVC. Millions of pounds are being introduced into the marine environment with no scientific assessments of potential affects.

PVC, or polyvinyl chloride, is designed for indoor or underground use. It is not designed or intended to be used in the outdoor or marine environment where it is exposed to wind, wave and sand erosion, and to UV exposure, which breaks down PVC rapidly. You can look at some of the older PVC pipes used for geoduck aquaculture, and you can visibly see where it has been worn away or has partially broken down. Often, chips are visible and small pieces can be seen that have broken away from the pipes. This all goes into the waters and sediments of South Sound.

In 1987, Congress enacted the 'Marine Plastic Pollution Research and Control Act', which is intended to reduce plastics in the marine environment.

The PVC pipes used in geoduck aquaculture contain phthalates. According to a University of Washington study: 'Plastics: Possible Impacts on Children's Health', Pediatric Environmental Health Specialty Units: "Phthalates are man-made chemicals used as a 'plasticizer' in a variety of industrial and commonly used products. These chemicals are anti-androgenic, and can adversely impact androgen sensitive tissues during specific windows of development."

The use of PVC is banned in New York State and many other municipalities around the country because of its negative environmental impacts.

[http://www.healthybuilding.net/pvc/HBN\\_FS\\_PVC\\_in\\_Buildings.pdf](http://www.healthybuilding.net/pvc/HBN_FS_PVC_in_Buildings.pdf)

Throughout its entire life cycle, from manufacturing to disposal, PVC has high environmental costs. It contains a high percentage of chlorine, is made with the carcinogen vinyl chloride, plus dioxin and ethylene dichloride are by-products of its manufacture. PVC also leeches dioxins throughout its useable life.

- **Jim Gibbons 9:09 am on May 5, 2010 [Permalink](#)**

I looked at your link here. According to the "science" you're citing, fourteen BILLION pounds of PVC are LEGALLY used in everything from our water pipes, to our windows, the siding on our homes, as carpet backing, as shades & blinds, as shower curtains, as furniture, for virtually everything we touch. Curt Puddicombe, as a Maintenance Supervisor for a large Seattle real estate development company, you must come in contact with PVC almost

every minute of your working day and yet you're focused on the PVC used by geoduck farmers. That doesn't make sense to me.

- **[Curt Puddicombe 1:35 pm on May 5, 2010](#)** **[Permalink](#)**

Your comments and DNR's posting of them is noted and recorded.

Obviously I am aware of the ubiquitous nature of PVC as a building material. How does this disqualify my objection to PVC being used in the natural aquatic environment? If anything, my knowledge of the material makes me even more qualified to comment on the dangers of PVC in nearshore habitat areas.

- **Peter Downey 9:33 am on May 5, 2010** **[Permalink](#)**

Curt- your weights are off- A 10" piece of 4" diameter pvc weighs about 0.75 pounds or 32,250 lbs per acre at a density of 430000 tubes.

- **[Curt Puddicombe 10:12 am on May 5, 2010](#)** **[Permalink](#)**

My weight calculations are based on 6", schedule 40 pipe, which is what I have seen on the tidelands. You may use something different.

- **[Curt Puddicombe 10:25 am on May 5, 2010](#)** **[Permalink](#)**

Here's the size chart:

[http://www.engineeringtoolbox.com/pvc-cpvc-pipes-dimensions-d\\_795.html](http://www.engineeringtoolbox.com/pvc-cpvc-pipes-dimensions-d_795.html)

- **Peter Downey 11:14 am on May 5, 2010** **[Permalink](#)**

No one uses schedule 40 on geoduck farms. It's 4X as expensive. We use schedule 10. Your weights are wrong.

- **[Curt Puddicombe 12:04 pm on May 5, 2010](#)** **[Permalink](#)**

The pipes at the Stratford site appear to be 6", but let's use the schedule 10, 4" x 10" PVC pipe weights for the sake of argument.



That's 32,250 pounds per acre, or just over 16 tons per acre. Lets say that DNR leases 31 acres. That's still one million pounds, or 500 thousand tons of PVC total.

- **Kathryn Townsend 12:31 pm on May 5, 2010 [Permalink](#)**

And some 6-7 miles of whatever size diameter /10" length per acre of plastic pipe. Somebody correct me if I'm wrong about this.

- **Peter Downey 11:50 am on May 5, 2010 [Permalink](#)**

PVC used for geoduck farming is structural PVC and contains no phthalates. Phthalates are plasticizers used for making PVC bendable (like rubber duckies). Rigid structural PVC uses no phthalates. None of the PVC used in geoduck farms contain phthalates.

- **[Curt Puddicombe 12:10 pm on May 5, 2010 \[Permalink\]\(#\)](#)**

Is this true for all geoduck sites? The other problem with structural PVC is that it is brittle, and breaks easily. What about dioxins?

- **Peter Downey 12:50 pm on May 5, 2010 [Permalink](#)**

Yes – any site that uses PVC pipe uses structural pipe. While it is brittle and does break, all of my crew is instructed to pick up any plastic on the beach. To date we have picked up tons of other peoples waste from our beach (including 37 tires last year and 6 tires to date this year.) Our stretch of the beach is kept clean.- Come see if you'd like. (I think that most farmers give the same instructions to their crew). As for dioxins, all of the PVC used in shellfish farming is drinking water grade and does not contain or leach dioxins. Dioxins are produced through chemical reaction when PVC is burned, which is never done in shellfish farming. We are producing food without hebicides, pesticides, fertilizers, antibiotics, growth hormones, or feed inputs. Shellfish farmers are staunch supporters of

measures to ensure high water quality. It would be counterproductive to use materials that would contaminate our beaches.

- [Curt Puddicombe](#) 1:16 pm on May 5, 2010 [Permalink](#)

I've seen different types and sizes of PVC for geoduck on the beaches. I've seen schedule 40, thin fiberglass, 4" and 6" diameter, and anywhere from 10" to 14" in length. As the pipes wear away or break down, dioxins are released, and the worn away material gets into the environment. There are also concerns on the colorants used in the gray PVC.

- [Marcus Galindo](#) 3:22 pm on May 5, 2010 [Permalink](#)

“It is not designed or intended to be used in the outdoor or marine environment where it is exposed to wind, wave and sand erosion, and to UV exposure, which breaks down PVC rapidly.”

PVC is does not “break down” rapidly when exposed to natural elements. In fact it has a distinct advantage over other materials in its resistance to corrosion cause by natural solvents.

“In 1987, Congress enacted the ‘Marine Plastic Pollution Research and Control Act’, which is intended to reduce plastics in the marine environment.”

This act specifically makes it illegal to throw plastic trash off any vessel within the U.S. Exclusive Economic Zone (within 200 nautical miles of the shoreline). And also makes it illegal to throw any other garbage overboard while navigating in U.S. waters or within three miles of shore. This has nothing to do with the use of plastic products in aquaculture.

“The PVC pipes used in geoduck aquaculture contain phthalates.” This is completely untrue. PVC pipe is a rigid form of PVC and no phthalates or plasticizers are used.

“The use of PVC is banned in New York State and many other municipalities around the country because of its negative environmental impacts.”

This is another untrue statement; the state of New York has not banned the use of PVC and is used in various applications throughout the state. There is no known state or city that has a blanket ban on PVC. The PDF referenced uses no facts or documentation to support this claim.

“Throughout its entire life cycle, from manufacturing to disposal, PVC has high environmental costs. “

Plastic pipe has many advantages over heavier pipe materials that require more gasoline during transportation, installation or repairs.

“PVC also leeches dioxins throughout its useable life.”

Dioxins are only produced when some types of PVC pipe are burned and are a byproduct of that process only. Dioxins are chiefly produced by non-industrial unregulated sources, such as backyard burning of trash and residential wood burning.

- **[Curt Puddicombe](#) 4:06 pm on May 5, 2010 [Permalink](#)**

City of Seattle Rejects PVC Pipe in Favor of Environmentally Friendly Choice

<http://watoxics.org/news/pressroom/press-releases/pr-2005-03-29>

Science:

<http://www.cleanwaterpipeCouncil.org/>

New York Enforces Ban on PVC Pipe

<http://www.allbusiness.com/government/government-bodies-offices-regional-local/9052891-1.html>

- **[Sharron Coontz](#) 6:43 pm on May 5, 2010 [Permalink](#)**

Someone claimed that PVC, other than if it catches on fire, is perfectly harmless. But fire is a viable possibility. Consider the amount of PVC that could be ignited in a small fuelspill if a boat catches on fire and the fuel tank blows up – which happens. The flaming fuels then wash ashore on an acre of PVC pipe covered beach. There'd be enough dioxin in the air to do in the whole town.

But there's more — from Greenpeace:

The production of PVC and its feedstocks, vinyl chloride monomer and ethylene dichloride results in the release of hundreds of thousands of pounds of toxic chemicals into the environment each year, mainly in poor, communities of color in the Louisiana and Texas. PVC production is also a large source of dioxin into the environment. Google the Greenpeace PVC fact sheet for more information.

- **Peter Downey 8:34 am on May 6, 2010**  
[Permalink](#)

If a boat is spilling enough fuel to catch fire – you have a much bigger problem than the dioxins coming off ignited PVC. How about a meteor hitting a geoduck farm (for the year or so that tubes are in place) and igniting them? Or a nuclear weapon accidentally discharging over a geoduck farm. I'm sure all of those would create dioxins as well. Other than that PVC DOES NOT EMIT DIOXINS.

- **Richard Wooster 7:48 am on May 5, 2010** [Permalink](#)

Visit [caseinlet.org](http://caseinlet.org) to view extensive abstracts on the current state of research on geoducks and their impact on the environment. Science has established that the methods used for intertidal geoduck aquaculture including harvest with hydraulic stingers destroy eel grass beds. Scientists warn that significant studies are necessary to evaluate the impact of industrial aquaculture on our environment. Expansion of geoduck grow operations on State tidelands should be under a moratorium until peer reviewed studies are completed to avoid causing major adverse impacts on the environment and best practices can be established based upon information learned in detailed studies.

[dnrforum](#) 8:00 am on May 6, 2010

## Thursday, May 6 – Unknowns

**If DNR moved forward on a program leasing state-owned tidelands for geoduck aquaculture, are there significant unknowns that we need to be aware of, and if so, what are they?**

[Background on Geoduck Aquaculture – DNR information & other perspectives.](#)

- **Denise McElney 4:02 pm on May 7, 2010 [Permalink](#)**

I think the point here is that there are too many ‘unknowns’. Primarily, what is the long-term impact of the new invasive methods of geoduck aquaculture to the health of Puget Sound, salmon recovery, and endangered species preservation? What is the impact of toxic leaks from errant subtidal pvc pipes? How will the ecological balance be maintained when a monoculture environment results from geoduck farms? The list goes on and on and most are addressed below. Scientists in the 2007 SeaGrant symposium urged a ‘precautionary’ approach. DNR should not move forward with leasing programs of state-owned tidelands until objective peer-reviewed studies of long-term effects are understood.

- **Jim Gibbons 11:04 am on May 7, 2010 [Permalink](#)**

I am not a marine or fisheries scientist, but it is my understanding that the original management plan for the geoduck fishery assumed, and still assumes, that the geoduck fishery biomass would be fished down by 25-30% of what was originally there. For example, if the original biomass was 100 million pounds, to harvest the geoduck biomass on a sustainable basis the fishery had to fish the biomass down to 70-75 million pounds AND that is where the biomass would remain.

DNR and WDFW did some extensive research in the early 1980’s regarding enhancing the native geoduck beds. Presumably this would have brought the geoduck fishery biomass back up to it’s historic levels. Those early efforts failed.

I wonder if DNR has reached out to the industry at all regarding current geoduck planting techniques to see if they might be applicable in enhancing the native beds of geoduck?

- **Jim Gibbons 10:02 am on May 7, 2010 [Permalink](#)**

Was any science done to establish the 18’ DNR depth limit on the wild harvest or was it just a “precautionary type” buffer that folks at DNR established? It seems to me that a lot of people are hanging their hats on this number. How grounded is it?

- **[Des Marmfky](#) 5:04 am on May 7, 2010 [Permalink](#)**

Brilliant to be right here, looking towards reaching some brand-new good friends

- **susan Macomson 11:50 am on May 7, 2010 [Permalink](#)**

What we land owners don't know is who is actually regulating these guys? Oh, at every hearing or discussion we hear how terribly over regulated they are. The harvesters who go after deeper wild geoducks have to have someone on their boats to observe and make sure they are staying within the law. The Taylor shellfish franchises have no one who observes what they are doing. They say they don't trespass and it has taken us to prove they do, they say they don't spray we have pictures and witnesses, but no one comes out if you call. You are much more likely to be threatened by the industry than to get anyone to show up and over see what they are doing. They say they had nothing to do with the bird slaughters but try and get anyone to show up when they are shooting, well more than any quota. So who over sees them? Who protects our rights?

- **Laura Hendricks 2:00 am on May 7, 2010 [Permalink](#)**

A major unknown is the amount of plastic PVC pipe and plastic netting already sitting on the bottom of Puget Sound or washing up on beaches. The Northwest Straits derelict gear program reported aquaculture debris found in their recent derelict gear trawl. WDF&W produced an estimate of the significant amount of aquaculture debris laying on the bottom of Puget Sound that was shared during the Shellfish Regulatory meetings. The DF&W employee was chastised by industry for his estimates—yet industry is still not required to pay for the clean up efforts. While industry's cleaning up the beach publicity is a nice public relations tool, it should not be used to mask the fact that industry is putting tons of plastic into Puget Sound much of which is sitting in deep waters. Divers have verified this. What is the cumulative effect?

It is also unknown the extent of impacts on salmon critical and essential fish habitat. With the long time focus of the tribes efforts and litigation directed toward salmon recovery, they should be directing DNR to protect the sandy/gravel forage fish habitats and marine vegetation where most of the geoduck feedlots are located or proposed. There is little margin for error in these sensitive habitats and the tribes efforts to bring back salmon populations should continue to be the top priority, not the expansion of destructive aquaculture.

Industry has the most industrial aquaculture operations including geoduck in Totten Inlet and in Hood Canal of any water bodies in South Sound. Then it is an unknown why industry continues to try to convince citizens that their industrial densities of shellfish are the cure when Jeff Schreck from DNR stated that Totten is going "eutrophic" and numerous reports

state that Hood Canal is in serious environmental trouble. It seems that the hollow promises of improved water quality are just that.

It is also unknown why DNR ever discussed an intertidal leasing program that would ignore the advice of Dr. Charles Simenstad that is included in their document “Final SEIS-Supplemental Environmental Impact Statement, State of Washington Commercial Geoduck Fishery, May 23, 2001: “The exclusionary principle of not allowing leasing/harvesting in water shallower than -18 ft MLLW or 200 ft (sic yds) distance from shore (MHW); 2ft vertically from elevation of lower eelgrass margin, and within any regions of documented herring or forage fish spawning should under most conditions remove the influences of harvest-induced sediment plumes from migrating salmon. As the available information indicates that sediment plumes do not enter the nearshore zone, impacts to juvenile salmon habitat and prey resource should also be protected from impact by these policies if effectively regulated.” P 83.

The DNR intertidal geoduck leasing program is also contrary to the following EIS statements: Geoduck tracts are also deeper (>18ft MLLW (-5.5 m)) than juvenile rearing areas, including migratory corridors. Most young fish (30mm) entering Puget Sound are generally observed in shallow shoreline areas at a depth of 1 meter or less (Shepard 1981). Eelgrass beds, commonly used for juvenile salmon rearing habitat, are excluded from commercial geoduck harvest. All commercial geoduck harvest must occur at least two vertical feet seaward and deeper than eelgrass beds. A 180 ft horizontal buffer zone between eelgrass beds and geoduck harvest areas may be used when the slope is gradual. This optimizes harvest area and still provides a protective setback based on results of the Pentac study (Appendix 4 to the SEIS). The common practice is to establish boundaries using a 2 ft vertical buffer between eelgrass and geoduck harvest areas.” P 82.

- **Tris Carlson 4:53 pm on May 6, 2010 [Permalink](#)**

The question is to comment on significant unknowns. Who decides what is significant? The controversy of geoduck farming has gone on for a decade. I submit that all the significant topics have been discussed and dissected ad nauseam. I proffer that one significant unknown is whether or not DNR is going to make a decision based on the emotional social criteria, half truth science or conjecture that those opposed base argument upon or the over 100 years of accumulated information that is documented showing that this type of farming is a net benefit not only environmentally but economically, especially in the rural counties where most shellfish farming occurs. Another unknown might be that the opposition is concerned that DNR will find that leasing aquatic lands for this activity leads to all intertidal lands so owned to be open for such lease. I for one

would like to see the agency stick to its obligations of their first offerings, which is very small in acreage, monitor and make further decisions based on the results.

- **Jules Michel 5:22 pm on May 6, 2010 [Permalink](#)**

Every significant policy decision starts with a “very small” step. The objective is to be sure the first step is one which is based on facts and leads down the right path. For example, intertidal geoduck farming has not been going on for 100 years. Attempts to frame this as “us vs. them” is not productive. DNR’s obligation is to serve the public, and sometimes serving the public involves reviewing past decisions to be sure they are, in fact, in the public’s long term interest.

- **susan Macomson 11:20 am on May 7, 2010 [Permalink](#)**

I find it interesting that the industry wants to discount the opinion of home owners, and make the claim that all they care about is the look of farming. We are the first responders, we are the ones who see wheel barrels of sand dollars put where they will die. We are the ones who watch the bull dozers go up and down the beach. We are who finds the chopped up remains of crabs, starfish, and moon snails. We are who you fear will spread the word of your destructive practices for monetary gain. Even if it was only about looks why is that any less important? We bought and paid high prices, we pay high taxes for what? so you can come in and stick tubs everywhere? Threaten people who complain? This kind of farming is very new and very destructive. We are the first responders with many reasons to be concerned.

- **William Burrows 4:52 pm on May 6, 2010 [Permalink](#)**

A very significant unknown is how the SMA will be interpreted in the future and what impact that might have on any inter-tidal leases with the DNR.

In earlier posts, Peter Downey said that “The Shoreline Management Act SUPPORTS and PREFERS water dependent uses like aquaculture.” He also stated that “the SMA clearly states that water dependent uses including aquaculture are supported and preferred uses. “The SMA certainly makes provision for activities like aquaculture, but to say the aquaculture is “preferred” in the SMA requires a really bizarre parsing of the actual wording. This is a very important point, because not only is the shellfish industry making this statement, but so is the Department of Ecology.



I have written a response to his statements but that response exceeds the post-length restriction of this forum. The moderator suggested that I place my response on another server as a pdf file. I have done that and you can find it at:

<http://www.myvbprof.org/Docs/sma.pdf>

- **Bruce Olsen 3:41 pm on May 7, 2010 [Permalink](#)**

I have to agree with the first part of this statement concerning future interpretations of the Shoreline Management Act this could be a big issue given its existing wording.

I have read this act and your posting in it's entirety and I have come to a much differently conclusion. I see aquaculture fitting nicely into place under the first priority of the state and I don't think I can say this any better than our own Governor did in 2004.

"Cleaning and protecting Puget Sound must be at the top of our state agenda." "But I know from experience that state government can't do it alone." Gov. Gregoire said the health of the sound is critical to the state economy and the environment.

There you go straight from the top of the state government and the number one priority of the State of Washington as it concerns "ALL of its citizens." Please refer back to the order of preferences you stated for RCW 90.58.020. (1) Recognize and protect the statewide interest over local interest.

If cleaning up Puget Sound is recognized as the top priority and of "statewide interest", I don't know how you intend to do this without engaging with private partners (Shellfish farmers, concerned citizens, upland and tideland owners) and especially without the bivalves unless we as humans can learn to filter water as well as they do.

The "do nothing" approach has been tried and has failed miserably in the Chesapeake Bay for the last three hundred years and they are now paying the piper. The state of Virginia is buying all the equipment and all of the seed to the tune of \$60,000.00 per boatman per year to plant oysters and other shellfish to help turn their ecosystem around not to mention the boatman's economy. It is the most polluted body of water in our nation with Puget Sound being second.

Leaving it to the public to strip all of our beaches to unhealthy low levels of shellfish is also not acceptable solution. Leaving it to the public to be good stewards of our grandchildren's grandchildren planet and replace what they takes off the beaches is a pipe dream and we will see a steady decline in our ecosystem as a result.

The one thing I think we can agree on is that a geoducks needs water to survive so you can't locate a salt water dependent aquaculture farm in eastern Washington without a nightmare of engineering issues let alone environment issues.

Maybe the SMA should be rewritten more clearly in regards to aquaculture but it seems clear to me that the way it is written now, the state has the final say whether it fits into the first or the seventh category. If they want more farms for filtration of the Puget Sound or revenue from the sale of geoducks it fits into the first priority nicely, if they want less then it does not. Very vague and very subjective I know and as the lawyers always say: "for a fee I would argue" either side.

Right now I think the state could probably could use some extra revenue and from what I have heard next year will not be any better for the state budget. So the question remains are they or are they not of statewide interest? It seems in 2006 and 2007 they were a "statewide interest" or the leases would not have been put out for bid.

- **Jules Michel 4:32 pm on May 6, 2010 [Permalink](#)**

Thanks for making this happen.

- **Jules Michel 4:25 pm on May 6, 2010 [Permalink](#)**

The primarily economic unknowns I would consider necessary to clarify before a supportable decision could be made include:

1. Can an economic value be put on leaving tidelands in their current state and if so, what is that value now and what would its projected value in the future be?
2. What is the current inventory of tidelands controlled by DNR? This would include not only the gross number of acres, but also the types of tidelands which exist (e.g., sandy/rocky/mud). The most enjoyable tideland beaches are those which are also the most productive for geoducks – expansive, flat, sandy and protected.
3. Of the tidelands owned, what percentage are accessible from the upland areas? Are tidelands accessible only by boat less valuable?
4. What are the long term impacts from conversion of tidelands into

geoduck farms both on the immediate tideland area and on adjacent parcels?

5. What are the cumulative effects of adding additional acreage to current tidelands used for geoduck aquaculture (e.g., if adjacent to existing farms, what impact would all farms harvesting at the same time have on the surrounding areas)?

6. Will keeping tidelands out of production result in an increase in value received from other tidelands currently in production, offsetting the lost income from new geoduck farming? Conversely, will putting state tidelands into production decrease the value of private tidelands already in production, negating any net economic return?

7. Related to the above, what will the additional acreage added do to the current supply and price received for geoducks? e.g., if 30 additional acres are put into production, will that “crop” of 1.3 million geoducks in five years depress the market, putting other shellfish farmers into economic distress? Extended, will this have an effect on the value received for subtidal geoducks and negatively impact the dive harvesting industry?

8. What will those in favor of leasing do if it’s not leased? What will those concerned about leasing do if leasing is expanded?

9. When was the last time the subtidal population of geoducks was surveyed? My conversations with WDFW indicate in many cases it has been decades since the last inventory, leaving in question how many are actually available and whether the 2.7%(?) harvest figure is still reliable.

o **Jerry Johannes 2:30 pm on May 6, 2010 [Permalink](#)**

There are a number of significant unknowns that need clarification before a geoduck leasing program should even be considered.

First—the issue of plastics. With unprecedented use of plastics in the intertidal zone is there leaching of chemicals from the pipes and/or netting? There is some research that shows that the inexorable pounding of the waves breaks plastics on the marine bottom into smaller and smaller particles. PVC and netting rolls on the bottom.. A question that needs to be answered –how much material is out there? House bill 2220 mandated that marine litter be quantified (Section 4(2)(b)(i) by the SARC committee. Didn’t happen. There is some information that thousands or perhaps ten’s of thousands pieces are out there—this a huge unknown. Ingestion, entanglement, and exclusion are three threats from plastic in the environment.

Second, what are the effects of clearing the beach of rocks, woody debris, and macrophytes (water loving plants) before planting? In the Canadian Science Advisory Secretariat (CSAS) study “Effects of Shellfish Aquaculture on Fish Habitat”

[http://www.caseinlet.org/uploads/RES2006\\_011\\_e.pdf](http://www.caseinlet.org/uploads/RES2006_011_e.pdf) on page 45 it

states:

“While some physical effects of culture practices on macrophytes are indirect (altered nutrient cycling/pathways, increased turbidity or sedimentation) or unintentional (harvesting and personnel traffic) the majority of shellfish growers in some regions, such as the northwestern United States, have traditionally increased local water circulation for bivalve feeding by deliberately removing macrophytes from farm sites (Simenstad and Fresh 1995; Heffernan 1999). With the apparently high prevalence of this practice, it is surprising that no studies could be found which have examined the ecological consequences of intentional macrophyte removals for aquacultural purposes.”

Please remember that there are over 600 species of macrophytes in Puget Sound—everyone of them from 1/2" to 4 feet is habitat. The looming unknown here is what is this effect of clearing having on organisms that depend on this habitat?

As I mentioned earlier, HB 2220 mandated that Sea Grant do research on geoduck aquaculture. Please read here for the report that was distributed to our legislators:

<http://www.wsg.washington.edu/research/pdfs/reports/GeoduckIntProReport.pdf>

These preliminary results show:

- that harvest of geoduck produced declines in worms and small crustaceans within the harvest zone.
- that species composition at planted sites changed
- that results indicate that eelgrass beds neighboring a geoduck farm are affected by aquaculture practices. Density, size, and flowering capability of eelgrass were all suppressed. (See page 13 of above report)

Also, of note, a parasite was found in 30 % of the wild stock of geoduck in Totten Inlet. This parasite, (a microsporidia type) has never been recorded in geoduck previously. It has not heretofore been reported in Canada or Puget Sound. (See page 11)

The first unknown here is that science is not complete yet—Sea Grant needs to complete their work on the unknowns.

The second unknown is the relationship between cultured geoduck and wildstock. Is there an effect on either population and what is the role and effect of genetically altered stock?

Because this is such a new phenomenon on our intertidal shores, unknowns abound.

- **[Curt Puddicombe 1:44 pm on May 6, 2010 Permalink](#)**

There are many significant “unknowns” surrounding geoduck aquaculture, some which have previously been alluded to. The wearing away of PVC pipes is an absolute unknown. When any material wears away, it has to go somewhere, so this is a significant unknown based on the unprecedented amounts of PVC being placed in the sensitive intertidal aquatic environment. It may be inconsequential – we don’t know.

Some sources have speculated that the tidelands heal or recover from geoduck harvest within six months to one year, but this also remains an unknown. It’s also unknown if the recovery is complete, especially since those harvested tidelands are immediately put back into production. It is unknown how geoduck aquaculture affects fish behavior, especially bottom fish such as flounder that are dependent upon open, unstructured sandy intertidal habitats for feeding and avoiding predation. We don’t fully know how it may affect ESA listed fish, such as Chinook and rockfish, although the NMFS BO on page 25 states that shellfish aquaculture is likely to adversely affect critical habitat for endangered Puget Sound Chinook and Hood Canal Chum salmon.

The BO also states on page 72: “Review of the literature during consultation revealed divergent findings on many relevant issues such that there remains some uncertainty regarding the likelihood of the effects of these activities on the environment and whether or not likely effects would bear on EFH (essential fish habitat) and managed fish.”

- **[Jim Gibbons 11:44 am on May 6, 2010 Permalink](#)**

What do the tribes think about geoduck farming? How would they respond if DNR adopts a more restrictive policy regarding the leasing of State tidelands? We know that the Lummi and Jamestown tribes are interested in geoduck farming. I know that individuals at the Squaxin, Nisqually, Tulalip, and Suquamish tribes are interested in geoduck farming.

- **[Jules Michel 1:29 pm on May 6, 2010 Permalink](#)**

I’ve wondered that as well. I can’t speak for all of them, but the Lummi and Squaxin Tribes have tribal tidelands available and I believe it’s the Nisqually Tribe who is currently harvesting sub-tidal tracts off of Des Moines. And if I recall, there is a sharing of revenues from the sub-tidal harvesting they receive, and \$33 million to purchase additional tidelands – or whatever – if desired from the Rafeedie agreement. What would be interesting to know is whether the agreement between the shellfish growers and tribes

in 2007 had factored in the state's leasing of tidelands for geoduck cultivation.

- [dnrforum 11:16 am on May 6, 2010 Permalink](#)

Clarification:

Thank you for contributing.

Throughout the week DNR has asked questions pertaining to access, aesthetics, economics and science of Geoduck Aquaculture on State-owned Tidelands. Today we encourage contributors to discuss the "unknowns" we have not discussed and what "unknowns" need to be further clarified or explored.

- **Bill Trandum 12:03 pm on May 6, 2010 [Permalink](#)**

A significant unknown is the impact on adjacent beach uses and property values. The prevailing effluvial flow is from south to north as is the prevailing wind. Artificial inter tidal zone disruption and implantation of materials at the northern extremes would presumably affect only near neighbors. The same disruption on a south, east ,or west shoreline would result in some level of encroachment on properties to the north. It shouldn't be too hard to run a number of tests by placing markers on an east or west beach, including safely colored sediment, then disrupt both markers and sediment during a storm and see how far it travels.

The aesthetics of having a commercial site next door, and limiting residents' ability to beachcomb freely up and down the beach is another serious matter. DNR needs to figure out how to mitigate that as well.

- [brad newell 11:01 am on May 6, 2010 Permalink](#)

I live on Henderson Bay. During minus tides eel grass is visible just offshore. If geoduck farming is allowed adjacent to eel grass, who will monitor the farmers to insure that the "no net loss" rule, regarding eel grass, will be enforced?

I have heard previously, that all farming would maintain a minimum buffer of ten feet when eel grass is encountered. Is a ten foot buffer sufficient to prevent harm to existing eel grass stands?

Who is in charge of delineating eel grass locations prior to farming?

- **Bruce Olsen 9:46 am on May 7, 2010 [Permalink](#)**

I assume DNR will enforce the rules of their own leases and monitor the farms, the Army Corp of Engineers has increased the eel grass buffer to 25 feet and there are other methods proposed to further reduce turbidity. The answer to the last question is a qualified marine biologist.

- **Preston Troy 10:35 am on May 6, 2010 [Permalink](#)**

Major unknowns include carrying and flushing capacities coupled with shellfish industry “pest management” of South Puget Sound shallow embayments. The significant decline of herring, seasmelt, flounder, cabezon, sandshark, sea-run cutthroat, sand dollars, moonsnails, starfish, coho salmon populations in direct relation to the intensive saturation of commercial intertidal geoduck manufacture in recent years should bear witness that a major problem exists and is gaining momentum. The question of how much is too much should be patently obvious.

- **Jim Gibbons 10:47 am on May 6, 2010 [Permalink](#)**

This statement seems to have adopted the reasoning of “correlation equals causation.” Given that I think we should also look at the relationship between increased geoduck farming over the last 15 years and the increases in human populations in the Puget Sound basin, as increased use of cell phones over the last 15 years, and global warming.

- **Peter Downey 11:41 am on May 6, 2010 [Permalink](#)**

Coho and Summer Run Chum in Snow Creek and Salmon Creek at the head of Discovery Bay have rebounded since 2004 – in direct correlation to my planting my geoduck farm. But my geoduck farm had nothing to do with the restoration efforts on those creeks. A better example may be Kennedy Creek at the head of Totten inlet. It has some of the most vibrant runs of salmon in the south sound through one of the most intensely shellfish farmed inlets in the sound. The point is that shellfish need the same things as salmon to survive. Clean water and a working ecosystem. Anyone truly interested in salmon recovery and recovery of Puget Sound knows that shellfish farmers are a big ally.

- **William Burrows 1:52 pm on May 6, 2010 [Permalink](#)**

How about the Chinook Salmon in Totten?

- **Peter Downey 2:29 pm on May 6, 2010 [Permalink](#)**

My understanding is that Kennedy Creek never supported much of a chinook run. I think it's known for its chum and steelhead. Have to talk to someone at WDFW for that info.

- [Curt Puddicombe 4:14 pm on May 6, 2010 Permalink](#)

Some remnant Chinooks were recently discovered by F&W in Kennedy Creek. See salmonscape for details. There may have been a large run of Chinook there at one time. I don't know if the Chinook found were wild or hatchery.

- [Curt Puddicombe 2:14 pm on May 6, 2010 Permalink](#)

“The proposed action (existing shellfish aquaculture) is likely to adversely affect CH (critical habitat) for PS (Puget Sound) Chinook salmon and Hood Canal summer-run Chum salmon.”

National Marine Fisheries Service, p25

“Cultivating shellfish in the South Sound results in the loss of shallow nearshore habitat and habitat diversity that is important to salmon.”

The Puget Sound Salmon Recovery Plan,  
South Sound Watershed Profile, 2007, Ch. 5, pg. 299.

“Habitat modification and the covering of the substrate with predator exclusion nets may thus adversely impact the production of harpacticoid copepods and other epibenthic organisms, and hence adversely impact the successful feeding of salmon rearing in the area.”

The CSAS, (Canadian Science Advisory)  
review of the environmental impacts of intertidal shellfish aquaculture in Baynes Sound, 2001, page 44.

“Shellfish aquaculture in South Sound alters plant and animal assemblages and results in the loss of shallow nearshore habitat and habitat diversity important to salmon resources”. “We hypothesize that shellfish aquaculture reduces productivity, abundance, spatial structure, and diversity of salmon populations.”

see chart

The South Puget Sound Salmon Recovery Group,



review for Shared Strategy for Puget Sound, 2004, pg. 48(45).

“Therefore, it is the complex of habitats, composed of varying substrate types, vegetation types, tidal stages, and other physical, chemical, and biological factors that support salmon in the nearshore.” “Protecting and restoring the natural processes that form and maintain habitats is the key to success. The natural processes that form and maintain habitat in the nearshore serve as the foundation of the structure and functions that support salmon. Disruption of sediment and prey inputs, changes in hydrology and other processes results in a chain reaction, ultimately leading to lost or dysfunctional habitat for salmon. Impediments to natural processes need to be prevented or removed to allow for conditions conducive to salmon production.”

“For juvenile Chinook salmon in the smallest size classes examined (less than 90mm), diets were made up mostly of benthic/epibenthic prey.”

“The types of habitat responsible for prey production, the life history requirement of prey, and the seasonal and spatial patterns of prey abundance and distribution are important considerations in salmon conservation.”

Juvenile Salmonid Composition, King County

- **Jim Gibbons 10:21 am on May 6, 2010 [Permalink](#)**

What does the general public think of this issue?

All you really have here is the opinions of “shellfish farmers” wanting to continue with their lively hoods and for the most part “some shoreline owners” opposed to our activities. As I see it, we really have no clue what the general public thinks about geoduck farming.

Maybe DNR could commission a study to find out what the general public thinks. You could even get the shoreline owners and the shellfish growers nput on the questions.

- **William Burrows 10:34 am on May 6, 2010 [Permalink](#)**

We do know what the general public thinks — it’s called the Shoreline Management Act.

- **Peter Downey 10:53 am on May 6, 2010 [Permalink](#)**

Good Point. The Shoreline Management Act SUPPORTS and PREFERS water dependent uses like aquaculture.

- **Curt Puddicombe 2:22 pm on May 6, 2010 [Permalink](#)**

“I have thought about this carefully over the years as I have seen my expectations frustrated. We have lost the full potential of the SMA to protect a valuable resource through fainthearted administration.”

“When the SMA was written in 1971, aquaculture meant oysters and clams and one salmon raising operation. This activity was recognized and protected as water-dependent. I do not read the original intent or the original guidelines to promote the industry as we know it today. In fact, the guidelines specified that navigational access not be restricted and that visual access of upland owners be considered. Aquaculture has become a sore point between local governments and the Department of Ecology – a fraying of the partnership.”

Joan K. Thomas, WEC, one of the original drafters of the SMA, 1991.

<http://nsgl.gso.uri.edu/washu/washuw91002.pdf>

- **Jim Gibbons 10:58 am on May 6, 2010 [Permalink](#)**

Gee, I thought my comment was fairly constructive.

- **Jules Michel 10:55 am on May 6, 2010 [Permalink](#)**

I think the general public spoke when they elected Commissioner Goldmark. Whether due to his concern about the state not managing encroachment onto its tidelands in the interest of the general public or his concern about the impacts from clear cutting within steep water sheds, there was – in part – a feeling by a majority of the general public that DNR had lost its focus on managing state lands for general public. This forum is just one example of his implementation of a strategy to achieve the goal of transparency within the aquatic lands division, so everyone has a say in what state tidelands are used for.

- **Jim Gibbons 12:16 pm on May 6, 2010 [Permalink](#)**

This is an argument for the merits of a “democratic vote” which reminds me of one of my favorite definitions of democracy. Democracy is what happens when two wolves and a sheep get together and vote on lunch.

We are a Republic with laws to protect the rights of minorities, like those of geoduck farmers and the landowners who wish to lease them their tidelands.

- **Carol Paschal 12:35 pm on May 6, 2010 [Permalink](#)**

We also have a responsibility to protect adjacent landowners who lose enjoyment of their property and a decrease in its value due to the impacts of intensive geoduck farming. Don't they count as minorities?

- **Jules Michel 1:46 pm on May 6, 2010 [Permalink](#)**

The protection of rights does not mean you get whatever you want. It does ensure that if two wolves and a sheep get together and vote on lunch, there may be no lunch for anyone. Or I suppose one of the wolves may get eaten too.

- **Laura Hendricks 11:12 am on May 7, 2010 [Permalink](#)**

The general public has spoken out at several meetings and have sent letters to state agencies, but industry always tries to say only shoreline owners object. In 2007, we held a meeting in the Gig Harbor Rosedale Hall and over 140 attended that were both shoreline owners and upland owners. In 2008, we held two meetings at Anderson Island where over 120 Anderson Island residents attended that were shoreline owners and upland owners. Over 100 Harstine Island shoreline and upland residents came to meetings making comments on the problems with the expansion of aquaculture.

We think it would be a great idea if DNR or Ecology would send out to the public the shellfish industry new document draft “Pest Management Strategic Plan for Bivalves in Oregon and Washington,.” These state agencies should request public comments on how Washington citizens feel about the shellfish

industry removing, excluding feeding grounds, use/proposed use of chemicals and destruction of our native species that they consider as “pests” or “predators.”

The following list of native species that belong to the public and the public loves to see in Puget Sound are considered “Pests” that industry feels they have a right to remove/destroy ( P. 19):

1. Burrowing Shrimp-(Major food source for grey whales and other marine life and they also provide filtering function).
2. Cockles
3. Crabs
4. Horse Clams
5. Moon snail
6. Sand Dollars–Considered part of Essential Fish Habitat per ESA guidelines
7. Sea Stars
8. Perch
9. Shorebirds and Waterfowl (includes the surf scoters and ducks)
10. Mussels (musculista and native blue)–Considered natural resource in ESA guidelines
11. Flatfish and sculpin
12. Raccoon
13. River Otter

I attended the meeting and felt sickened as industry discussed each one of these native species and how they would control, remove or destroy these native species that were considered “predators” of their shellfish. It is no doubt that our native species are at risk when they either depended on some of those areas historically for food that are now netted off or they are attracted to the area because of additional food sources and are removed/destroyed.

Specifically industry discussed:

1. Expansion of the use of chemicals into other regions including Puget Sound to eradicate ghost and mud shrimp. Industry is already destroying native species as they aerially spray 3 Tons of carbaryl insecticide on up to 800 acres of Willapa Bay/Grays Harbor tidelands annually and is trying to be granted the use of imidacloprid pesticide on these tidelands and “other regions” which is extremely toxic to bees and banned in Germany and France.
2. Removing sand dollars from their beds and that “weed burners(propane flame throwers) have been used to burn off thick native mussel blankets covering clam ground.” P 49.
3. Harassing our ducks keeping them away from their historical feeding grounds and industry wants more hunting permits when

“depredation permits can be obtained.” P 40.

4. Classifying native eelgrass as a “weed” in this document while salmon recovery efforts are trying to protect and increase native eelgrass.

Citizens have reported to the Department of Fish and Wildlife the following practices by the shellfish industry: masses of sand dollar beds being destroyed, surf scoters/ducks being shot and the boats have been reported to come from industry owned docks, moonsnails are tossed like baseballs onto the banks, crabs are dismembered and thrown away and that sea stars are injected with bleach or piled up and covered with lime. It is documented that the largest industry companies have routinely removed eelgrass when installing their geoduck feedlots in Henderson Bay, North Bay, Samish Bay and “mowed by dragging cutting blades over the beds, which removes the majority of the overhead growth” in Wilapa Bay (P. 38 Draft Pest Document).

The public should be aware of all of this so state agencies will start protecting these native species from the hands of the shellfish industry who feel they can do whatever they want because of their lobbying efforts that have gone on for decades and the free shellfish bars.

- **Mark Hersh 2:20 pm on May 7, 2010 [Permalink](#)**

It would seem that a significant change in the way that the aquaculture industry controls species they consider pests would necessitate a reopening of the Endangered Species Act consultation for Clean Water Act Nationwide Permit #48.

And it would probably require an update of the Habitat Conservation Plan that DNR is pursuing.

- **susan Macomson 11:34 am on May 7, 2010 [Permalink](#)**

I think they should do a survey, but before they do that lets make sure everyone understands what you are doing. Let us make sure that everyone understands that you slaughter anything you consider a pest.

Lets make sure they know what those pests are. Moonsnails, starfish, crabs, otters, raccoons, diving birds, pretty much any living creature that is not a geoduck. Lets make sure they understand that you bulldoze beaches, leave trash, and threaten people. Lets make sure they understand you are noisy and do much

of your work in the middle of the night disrupting anyone living near by. I also think that the industry would need to stop buying people off with free shellfish.

o **Laura Hendricks 10:08 am on May 6, 2010 [Permalink](#)**

The following impacts to endangered salmon habitat from geoduck aquaculture have not been fully researched as of this date, but violate Federal protections on critical and essential fish habitat. Is DNR willing to throw caution to the wind as they go forward with this many issues that are known impacts, but no government agency has allocated the funds to research? We would hope the answer is no if you are truly using science as your guide to manage state resources. Citizens do not consider “Best Management Practices” as a suitable substitution for science as they are merely a marketing tool that paints a pretty picture, not the actual practices. This is especially evident when industry touts Best Management Practices that target the most pristine sandy/gravel beaches that are coincident with sand lance and smelt forage fish in South Puget Sound.

Geoduck Aquaculture Known Impacts By Category:

A. Habitat Modification

1. Dredging/scraping the substrate with barges and liquefying shoreline substrate for geoduck feedlots that removes necessary organisms and marine vegetation critical for salmon recovery
2. Permanently altering sandy/gravel substrate by using high pressure water hoses to liquefy substrate over 3 feet in depth that is a unique substrate composition and will not re-consolidate in exactly the same manner
3. Modifying forage fish spawning sandy/gravel habitat from drifting silt from adjacent substrate that is liquefied
4. Disturbing forage fish spawning and rearing habitat from perpetual operations in the immediate vicinity

B. Prey Base Impact

1. Introducing bivalves\* in the nearshore that are known to filter significant volumes of water ingesting fish eggs, crab and shrimp larvae (\*cockles (geoduck is a clam), mussels and scallops)
2. Liquefying substrate which suppressing tube worms and corophium that are an important prey base for salmon (per preliminary SeaGrant geoduck research)
3. Placing tubes and liquefying the same lower intertidal area where research shows that sand lance need to bury themselves at night to avoid predation. Sand lance comprise 60 % of the food source for juvenile salmon and are found in many of the sandy/gravel beaches that industry targets for expansion.

C. Migration

1. Placing structures in the intertidal area that causes salmon to alter

migration into deeper  
waters increasing predation

D. Water Quality

1. Liquefying substrate that does increase siltation in the water column that affects fish and salmon populations
2. Liquefying substrate that suspends organic matter, toxins, heavy metals

- **Peter Downey 9:46 am on May 6, 2010 [Permalink](#)**

The biggest unknown is if DNR will honor their current lease offerings that began in 2006. With ten of thousands of dollars spent to date on studies and permit development, and specific direction from the legislature to do so, DNR is setting themselves up for legal action by stalling the current program.

- **[Curt Puddicombe 10:47 am on May 6, 2010 \[Permalink\]\(#\)](#)**

Where's the benefit to the public in that?

- **Jim Gibbons 11:01 am on May 6, 2010 [Permalink](#)**

I think there's benefit in the citizenry being able to rely on their state agencies and if those agencies find that they have erred they should at least make reimburse folks for the costs they incurred. But then I am biased being the President of a company that was awarded some of those leases.

- **William Burrows 11:25 am on May 6, 2010 [Permalink](#)**

That's a good suggestion (I know, I am not supposed to agree with you). Reimbursing documented expenses would be much less expensive than being a defendant in a lawsuit – regard of who might file one.

- **Peter Downey 12:40 pm on May 6, 2010 [Permalink](#)**

Revenue generated for the state vs. expenditure of state funds on a lawsuit.

- **Jules Michel 11:03 am on May 6, 2010 [Permalink](#)**

Others in the industry felt legal action was needed to prove they should be allowed to encroach onto state lands. It was a terrible waste of time and money, with the end result being more of the general public becoming aware of the treasure found in the state's tidelands.

- **Peter Downey 11:17 am on May 6, 2010** [Permalink](#)

There is a difference between litigating an encroachment and litigating based on a letter of bid award and then issuance of a mitigated DNS by the DNR only to have the DNR refuse to sign a lease. I would not have spent the time and money responding to the bid, completing the site analysis, and developing the sepa document if I thought DNR would not honor their bid offering.

- **Jules Michel 12:57 pm on May 6, 2010** [Permalink](#)

As with the unknown of what the long term impact of geoduck aquaculture may have on the limited remaining tidelands there are, what the long term impact on the public's perception of the shellfish industry would be after another law suit is filed is also unknown. Having bid on many government projects, what is not unknown is that sometimes you lose, no matter how much effort you put in to it. It's part of the risk in doing business with the government.

- **[Curt Puddicombe](#) 12:58 pm on May 6, 2010** [Permalink](#)

Were you given a written guarantee that you would be issued a lease?

- **Peter Downey 1:08 pm on May 6, 2010** [Permalink](#)

Yes – that was the bid award letter. It appears I was dupped into expending funds by a dishonest agency that had no intent of upholding its promise. enough said – it will be up to the courts to decide.



- **Jules Michel 5:43 pm on May 6, 2010 [Permalink](#)**

It may help if we could see just what DNR agreed to do. Is there a pdf file somewhere?

- **Steve Wilson 9:08 am on May 6, 2010 [Permalink](#)**

Not to be in any way disrespectful to the forum, but ..... Is this a trick question? 😊

- **William Burrows 10:03 am on May 6, 2010 [Permalink](#)**

I must agree with Steve (hi Steve). It seems hard to talk about significant unknowns (or even insignificant ones) because an unknown is .. a .. not known.

Maybe the moderator can give an example of what is meant by an “unknown”

- **[dnrforum](#) 11:18 am on May 6, 2010 [Permalink](#)**

Clarification:

Thank you for contributing.

Throughout the week DNR has asked questions pertaining to access, aesthetics, economics and science of Geoduck Aquaculture on State-owned Tidelands. Today we encourage contributors to discuss the “unknowns” we have not discussed and what “unknowns” need to be further clarified or explored

- **Robert Paradise 9:01 am on May 6, 2010 [Permalink](#)**

Consider current and storm winds. The site near Joeemma has littered the bottom of Whiteman Cove with tubes and such. If the trash washes up on shore it can be taken care of , if the stuff gets into deep water it is near impossible to get. Out from Joeemma the water is over 200' deep.

Also ,at Purdy, beach erosion is a problem. It is hard to measure but the beach has dropped a foot or more.

When someone gets hurt or killed the taxpayers will be stuck with a big law suit. They state knew the danger and took no action.

- **Jim Gibbons 10:04 am on May 6, 2010 [Permalink](#)**

I'm not sure what to make of "the beach dropped a foot or more." During the Taylor hearings on the Foss ground, testimony was also made that Taylors tubes caused a slide on a 35' sand bank. Interestingly, immediately adjoining the sand bank in question there are sand banks 200' high.

[dnrforum](#) 8:37 am on May 7, 2010

## Friday May, 7 -

**“How do you view positive and negative aspects of geoduck aquaculture on state-owned tidelands compared to other approved activities, such as conservation easements, marinas and industrial facilities?”**

[Background on Geoduck Aquaculture – DNR information & other perspectives.](#)

- Kathryn Townsend 4:56 pm on May 7, 2010 [Permalink](#)

I take a community view and compare geoduck farming to the local marina. The marina might be private but has a public ramp. It is a general store, a site for People for Puget Sound Pier Peer events, has boat rentals, kayaking classes, musical events, barbeques and it is an all around community center for the neighborhood. Geoduck farming, on the other hand, provides a product that is mainly a super luxury food targeted for sale to foreign markets. See: <http://www.protectourshoreline.org/articles/DNRsubtidal/TheWorldGeoduckMarket2FullVersion.pdf> . Geoduck farming provides nothing to the community (any filtering benefit is canceled by the removal of the deep water geoducks from the Passage), has caused neighborhood problems and has angered adjacent and nearby residents.

I don't think it is worth converting our few remaining publicly owned beaches to industrial aquaculture for the purpose of growing a luxury food item for foreign markets. If DNR and the other agencies along with the governor want to keep citizens engaged in the civic process to protect and restore Puget Sound, then they must listen intently to the local communities, not just the shellfish industry. If Mrs. Lentz and her neighbors think its a grand idea to liquefy their private beaches and fill them with plastics and nets, then if they succeed in getting their permits, let them do it. But we have already seen that on Anderson Island, Stretch Island, Harstine Island and other areas, most of the community is decidedly opposed to leasing of public beaches for geoduck farming. We

predicted after the first offers to lease in 2006, that opposition would become stronger with the second offer to lease. This proved to be true. Many individuals turn down the financial incentive to lease their private tidelands because they feel there is a greater good in leaving the beach in its natural state. Thank goodness people like this still exist.

- **Paul Sparks 4:31 pm on May 7, 2010** [Permalink](#)

I am not sure this is a useful question. I think there are others that could be more useful in framing this dialogue. Especially so, in that both sides engaged here have resorted to the same set piece arguments which first emerged in the SAARC deliberations. For instance, the science discussion never really offered us anything new or revealing because the innovation (it is a genuine innovation) represented by Geoduck Aquaculture puts us in a zone where there is to date no substantive science to support the arguments of either side. The character of innovation is such that there is no accumulation of human experience to weigh the real long range consequences or merits of the new way of doing things. As an example, consider how the recent innovations involving derivatives and off shore drilling have affected us. Since we know that all forms of agriculture change the ecological character of their sites, a more useful approach, would be to try to frame the conversation in a way that leads us to the science that needs to be done. I think it is safe to presume that there will be Geoduck Aquaculture, so the most useful questions are the ones that allow us to know what the real ecological consequences are of supporting the growth of the industry, how do we separate some of the myths about shell fish farming from reality, and where and how to site geoduck farms in order to minimise impacts, and with that, is it reasonable to slow or limit the expansion until we have answers to those questions.? Mark Hersh's remarks above usefully point us towards one of those starting points.

A second range of questions should revolve around economics. Most American agriculture is subsidized. This is true for shell fish on DNR lands also where the rate setting philosophy reflects a tradition shaped by the contingencies addressed a 19th century legislature trying to keep puget sound and coastal settlers from starving out. If shellfish leases were offered at the same rates and in the same manner as prevail today for prime upland agricultural land, the resulting lease revenues which represent the interests of all the taxpayers would be dramatically higher. Would the expansion of this industry be as viable without the process that produces the current artificially low lease rates?(rates of 35 to 60% of the gross revenues minus production costs would be and are reasonable in upland farming depending on the production history or potential of the acreage. A previously unexploited tideland is the biological equivalent of a virgin prairie or an old growth forest. If we are willing to set aside the question of whether it is reasonable to exploit these lands(in and of itself, a

dubious proposition in this day and age) should we not get full value for that loss.

- **Bruce Olsen 4:50 pm on May 7, 2010 [Permalink](#)**

Where do I apply for this subsidy you are talking about? DNR or the State of Washington? If aquaculture as you say should have higher lease rates than where are the multiple bidders on these leases that would make them as valuable as the prime uplands you are talking about? Supply and demand still rule in in this economy. I am sure DNR could put a minimum of gross revenues on it's leases but at the numbers you have quoted I doubt you would have any takers.

- **Bruce Olsen 4:25 pm on May 7, 2010 [Permalink](#)**

Every single one of these functions has it's place in our society or at least they should. Rating one better or worst is not the point. Every one of these functions has their place, and they all have a worth to our society.

Placing an Industry in or around a Conservation areas should not be allowed or for that matter close to Shellfish farms but it might be appropriate next to a Marina. So adopting some form of land use codes regarding the tidelands may be in order.

Personally, my rating system based upon the least impact for the tidelands would be:

1. Conservation
2. Geoduck and shellfish farms
3. Marinas
4. Industrial usages

This is not to say I prefer the removal of Harbor island, part of downtown Seattle's sea wall or the removal of the baseball and football stadiums including all the fill dirt used including everything south of Yesler Ave across to West Seattle and returning it to a Conservation areas.

Marinas whether private or public seem to me to cause much more environmental damage to our shoreline than anything other than industrial sites. During construction they drive pilings into the bottom substrate. If they use chemical treatments on the logs pilings than those will leach into the water column. Tons upon Tons of rock are poured into the water to create breakwaters without regards to any of the life forms that are under them. After construction, the docks and boats shade the sea bottom and devoid it of all eelgrass and all other plant forms. The bottoms under the marinas become a dead zone of untreated human waste dumped directly

into our waters. Not to mention the toxic bottom paint from the boats leaching into our waters and oil and gas spills. It does have a public value in the moorage revenue and will employ some workers from large corporations and that would help the construction industry in this state.

What I find the most interesting in the overall discussion this week is that both sides are staunch supporters of the environment. They just see, read and process the information available a little differently. There is a common ground throughout this discussion and that is every single one of the contributors this week wants exactly the same thing.

“A cleaner more productive Puget Sound”.

- **Dorothy Walker 4:23 pm on May 7, 2010 [Permalink](#)**

All new leases, of any kind, of state owned tidelands should be consistent with habitat restoration.

- **Jules Michel 4:15 pm on May 7, 2010 [Permalink](#)**

At the core level this question asks whether it is in the public's interest to keep the remaining public intertidal tidelands as they are (equivalent to a conservation easement) or to convert some portion of them into geoduck farms, a step which would remove them from the general public's enjoyment – most likely forever – and alter whatever ecological functions they serve. It turns on whether the short term financial returns to the state and geoduck farmers outweigh their preservation for future generations.

In 1965 jobs and economic returns convinced the Port of Tacoma that the Nisqually Delta – the only remaining major river delta in Puget Sound – should become a deep water port. That decision drove a core group of people – Margaret McKenney, Florence Brodie, Gordon Alcorn and Dixie Lee Ray among others – who believed with a passion that a point in time had been reached where preservation of Puget Sound's shorelines outweighed the economic returns of industrial development. From that passion came the Shoreline Management Act, designed in part to stop the piecemeal development and fragmentation of the state's shorelines, including the tidelands.

The passion in the belief that the public's remaining Puget Sound tidelands are a unique treasure worth preserving is seen throughout the comments of the last five days. People feel there are enough private tidelands available for the shellfish industry to achieve a reasonable economic return and that taking the step of removing additional tidelands from the public's enjoyment is not in the public's long term interest.

Counter to that, perhaps reflected best in a December 16, 2009 heart felt letter written to Governor Gregoire by the largest shellfish company in Washington, is the belief the 8,500 acres it owns or leases in Washington State are not enough, forcing it to purchase tidelands in British Columbia, California and Hawaii. Comments from others in the shellfish industry throughout this forum also reflect the belief they should have more.

At what point is the balance between preserving DNR's remaining public tidelands there are for the future generations with removal of those tidelands through the continued expansion of the shellfish industry onto public tidelands reached? With the vast sub-tidal acreage made available for harvest by DNR, coupled with the large number of private tidelands already owned or leased by the shellfish industry, many feel – with great passion – DNR has achieved that balance and need go any further.

- **Paul Garrison 4:15 pm on May 7, 2010 [Permalink](#)**

Shellfish aquiculture is where the timber industry was 70-80 years ago. It took many years to gain unbiased science and determine how the timber industry impacted the environment. They did not recognize how wide was or how important the impact was. I was part of that industry.

One big difference: aquiculture is more complex and the impacts not as obvious to onlookers until the damage is severe and the cure difficult, if not impossible.

We have adequate aquiculture sites now to study what practices are destructive and need modification. What is the interaction between the farmed species and native species, including vegetation. With the limited flushing action of Puget Sound, we have little room for error. Hood Canal has proven how difficult it is to correct mismanagement. What are the effects of non-native or hybrid species? They all eat and excrete. At what point does a shellfish farm become a feedlot operation? Mark ALL equipment so when it is lost we know who lost it and where it came from. Light penetration is important to the health of tidelands. I took one trip to Totten Inlet and light penetration was very limited.

Basics too: shellfish farms need to provide sanitation just as builders must. Speaking of which: at Purdy we have a mile of park owned beach and ONE sanican. Whether park or shellfish farm, the MUST have adequate sanitation or close.

Regulation and policing of the industry must be separated from those who are regulated. DNR's first responsibility is the environment. If they can do this AND produce income for the state taxpayers, great! But make no

mistake, maximizing short term income could destroy the Skound and cost far more than the income produced. They must be held responsible.

Claims that farmed shellfish benefit the Sound are not enough to allow increase in the number or size of farms. Such claim must be verified without bias. What I have seen causes doubt. Some info on their web sites does as well.

I have boated and fished the Sound 50 years. I believe It has deteriorated more in the last 10 years than it did in the prior 40, with no cure in sight, When I see improvement, I will be more sure the State can manage this industry.

In conclusion: GO SLOW!!! Learn from what we have already done, Make corrections. Avoid the big mistakes that drive the last coffin nail into an already ailing Puget Sound.

- **Vicki Wilson 4:01 pm on May 7, 2010 [Permalink](#)**

To DNR Forum Manager: Is it possible to keep the forum open over the weekend?

- **[dnrforum](#) 4:13 pm on May 7, 2010 [Permalink](#)**

Vicki-Thanks for your interest in keeping the forum up over the weekend. We are pleased that there has been an exceptional amount of participation this week and we will be keeping with our original plan and closing comments at 5pm today. Thanks again.

- **Laura Hendricks 3:00 pm on May 7, 2010 [Permalink](#)**

Conservation easements, marinas and industrial facilities are totally different from industrial aquaculture. Conservation easements are generally approved to improve the natural character of the area. DNR is not siting new marinas and new industrial facilities in residential areas or in forage fish spawning areas or essential fish habitat. On the other hand, the aquaculture industry is demanding industrial expansion in residential areas where commercial activities have never been allowed or in documented forage fish or essential fish habitat where the native species grow the best. Even in the Maury Island gravel case, the courts ruled that the industrial dock expansion on DNR aquatic state lands was not consistent with habitat protection.

DNR must site operations so they do not interfere with salmon recovery. There is ample preliminary scientific evidence that these proposed industrial geoduck feedlot sites negatively impact substrate, prey base and

eelgrass. The Hydraulic Code Rule that governs shoreline development to prevent damage is not even being required for any kind of aquaculture which has the most direct impacts to the nearshore. Ecology has not issued a water certification for geoduck feedlots in compliance with the clean water act.

As we continue to learn from natural disasters like the Gulf of Mexico gulf oil spill, our natural resources are limited, fragile and once destroyed may never return. Allowing expansion of industrial operations must be scientifically based with adequate protections and industry lobbying cannot be allowed to override what is in the best interest of the public.

○ **William Burrows 1:26 pm on May 7, 2010 [Permalink](#)**

Two of the activities that are all win and no loss are public marinas and conservation easements. These two activities are very high priority in the SMA. The numbers of public marinas are controlled somewhat by economics. The numbers of conservation easements are also impacted by economics, but since they generate no income, the lease rates should be very low (compared to commercial activities).

Industrial easements and private marinas are a bit different. Correct me if I am wrong, but it is my understanding that most industrial easements are in areas that already have “industrial” activity. In that regard, they fit in with their surrounding environment. If an industrial facility was proposed in a non-industrial area, I would be opposed. A few, like power lines, are often not in an industrial area, but the benefit of power distribution is very widespread and likely justifies this activity.

Private marinas such as yacht clubs are problematic in my opinion. I would argue that adding any new yacht clubs should be scrutinized very carefully. With restricted memberships, the benefits are limited to a few. Although they are permitted under the SMA, they fall into the same category as aquaculture. That is, they are at the lowest priority, they are permitted only on a limited basis, and they are dependent on the use of the shoreline.

▪ **Mark Hersh 2:25 pm on May 7, 2010 [Permalink](#)**

I don't agree that public marinas are all win and no loss. Marinas simplify habitat, increase the likelihood of spills, etc.

▪ **Jim Gibbons 2:52 pm on May 7, 2010 [Permalink](#)**

So if a public marina happens to benefit many people, but causes lots of environmental impacts that might be okay?



And if a small group of individuals were interested in paying the state some huge amount of money for a small private marina which had no environmental impact that would not be okay because it only benefited a few? Do the fees going to the state count?

- **Tris Carlson 3:18 pm on May 7, 2010 [Permalink](#)**

Please cite exactly where in the SMA it states that aquaculture is at a lowest priority and are permitted only on a limited basis. I see nothing in the SMA that discusses private yacht clubs or aquaculture. As for positive or negative aspects as the question poses.

Geoduck aquaculture

Improves water quality, creates jobs, create revenues for government, and private industry, impacts shoreline aesthetics either positively or negatively depending on individual tastes, impacts the shoreline ecology to a minor and recoverable degree in a relatively short time, impacts the public's ability to use a portion of those particular shorelines for some contracted time, helps to offset human nutrient inputs, causes counties to make new laws or better enforce current laws regarding non point pollution, sequesters carbon, stimulates eelgrass growth, and puts generally idle state lands to productive use that at the end of the contract period can be allowed to return to a natural state.

Marinas and industrial facilities

create jobs and revenues as above, allows public access to the waters of the state, creates point and non point pollution, have long term degradation to the marine ecology, cause the prohibition of recreational and commercial shellfish taking within DOH guidelines, cause enormous amounts of taxpayer time and capital to ameliorate the adverse impacts that will possibly never allow the lands to return to their natural state.

Conservation easements essentially remove the land from commercial use, provide no revenue, and can cost the taxpayers for activities such as security and upkeep.

I have no animosity to either marinas or easements as they are just another use allowed in the SMA. Smokestack industries are a different matter.

- **[Curt Puddicombe 3:54 pm on May 7, 2010 \[Permalink\]\(#\)](#)**

The Shoreline Management Act states the following:

“The overarching policy is that the public’s opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the

state shall be preserved to the greatest extent feasible...”

Overarching means overriding, overruling, encompassing and overshadowing everything. It means predominate and paramount. It means that everything else in the Shoreline Management Act, including aquaculture, is under the umbrella of this one singular idea. This was the intention of the voters when the SMA was enacted into law. The SMA also very clearly gives priority to single family residences and shoreline recreational uses over aquaculture as a preferred use.

The Shoreline Management Act also states:

“Alterations of the natural conditions of the shorelines of the state, in those limited instances when authorized, shall be given priority for...development that will provide an opportunity for substantial numbers of people to enjoy the shorelines of the state.”

This statement clearly indicates that shoreline alterations will be (1), limited in instance, and (2), prioritized toward recreational uses.

In addition, there’s no scientific evidence or proof that geoduck aquaculture improves water quality. The geoducks artificial presence and densities in the intertidal are not natural, and geoducks can ingest valuable zooplankton out of the water column. Farmed geoducks also leave feces and pseudofeces as waste, which can promote phytoplankton production. The claim that geoduck farming improves water quality is false propaganda with no basis in fact, scientific or otherwise. Phytoplankton is seasonal, and the seasons of Fall and Winter are much better at improving “water quality” or in mitigating against “nutrient pollution” than any shellfish farming will ever be.

Also, geoduck aquaculture does not stimulate eelgrass growth – it suppresses it. This has been scientifically

acknowledged and I'm surprised that anyone is not aware of this by now. This was demonstrated at the Sea Grant presentation at the UW in 2007. Geoduck farming also introduces toxic plastics into the environment in unprecedented amounts.

State tidelands that are "idle" are otherwise serving their purpose as valuable habitat and natural vistas for citizens that are specified under the law (please review SMA). Public tidelands do not owe anyone a living, nor were they placed there as an ATM for any specific individuals or industry.

Whether the shoreline is recoverable at all, let alone in a "short time" is as yet, unknown. Since these areas are put back into production immediately, it is doubtful that any full recovery is occurring, and it certainly is not being put back into its natural state. The fact that there is any claim of a "recovery" in the first place certainly proves the point that damage is occurring, even if the suggestion here is implying that it is only temporary.

- **Linda Lentz 12:25 pm on May 7, 2010 [Permalink](#)**

The benefits of geoduck aquaculture on state lands far out weigh any negative aspects which mostly have been related to aesthetics. Sustainable farmed geoduck providing food, jobs, revenue for the state and filtering the water seems like a very positive use of our state tideland resources. Since there is currently no state lands leased for geoduck farming it would provide diversification in the use of our resource from other uses such as marinas, industrial facilities etc.

- **Mark Hersh 11:44 am on May 7, 2010 [Permalink](#)**

Yesterday the Ecosystem Coordination Board of the Puget Sound Partnership held a meeting and a workgroup that the ECB set up to examine shorelines protection reported back to the ECB. They said that Puget Sound can be divided into 812 "drift cells" that are distinct units where sediment and waves interact (erosion and deposition). In order for nearshore habitats to support ecological functions, the drift cells need to work reasonably naturally. It was stated (not sure whose estimate) that 23% of the drift cells in Puget Sound do not work well enough to support ecological functions.

So it seems to me that when granting new leases for whatever activity, DNR needs to have a good handle on what the negative impacts of the

activity are, then consider those impacts in the context of the more localized area of the Sound (inlet, for example), and how much of that area is properly functioning. Will the granting of the lease result in a too-great cumulative deficit of ecological function? How many acres of an inlet can be leased to geoduck aquaculture without obliterating the ecological function of the inlet? Or how many marinas can be allowed in an area?

When I speak of “impacts” I am only talking of ecological impacts. I am still trying to get a handle on the ecological impacts of geoduck aquaculture as opponents and proponents are pretty far apart. DNR probably has other things that they have to consider.

That really does not address the forum’s question of the day, but it seems to me that the question as phrased (or clarified) is not something easily addressed. Do I value marinas, conservation easements, or industrial sites more or less than geoduck aquaculture sites? I haven’t really given that any thought, nor am I likely to.

○ **Jim Gibbons 11:22 am on May 7, 2010 [Permalink](#)**

I think I get it. I assume DNR leases tidelands either directly to Boeing or to a Port facility that is leasing to Boeing and whether we might be better off not leasing to Boeing. I’ve read the Duwamish is a polluted mess for instance and maybe we should just shut them down and try and return the Duwamish to its original state. Boeing can’t even make an argument like the shellfish growers that their activities (building planes) are good for the environment. And if it’s too much to ask for, maybe we should just not give any more tideland leases to Boeing if they need to grow. Certainly we would be hard pressed to say that port facilities are good for the environment. It’s hard for me to make a comparison of what Boeing does to the environment through their port leases vs. what geoduck farmers are doing.

I suppose another comparison would be the relative value of right-of-way leases for power lines and roads and expansion of them. I can’t imagine that they are a good thing for the environment, either. And they’re certainly not aesthetically pleasing. Who wants to look at a bunch of power lines crossing the water like they do at Burley Lagoon. I suppose DNR could force them to go around the water or underneath the water.

Does the Washington State ferry system have to pay to use the waters? I can’t imagine that those big boats are very environmentally sensitive either. And what about the big dock facilities they have. And if I’m not mistaken those big boats operate with lights at night, they blow those big

horns 24 hours a day, and the props have to be chewing up some fish. Perhaps DNR should not allow them to expand either.

Good question.

- [dnrforum](#) 10:55 am on May 7, 2010 [Permalink](#)

Clarification:

The discussion we are hoping to generate today is along the lines of what Ms. Coontz addresses in her first post this morning.

Currently there are around 4,000 approved aquatic leases throughout the state. These range from industrial uses to marinas to habitat restoration projects.

There are potentially positive and potentially negative impacts to each DNR authorized activity on state-owned aquatic lands. We would like to hear how you value current authorizations to potential geoduck aquaculture on state tidelands.

- **Kathryn Townsend 10:32 am on May 7, 2010** [Permalink](#)

I agree with Mr. Gibbons—please give more of a clarification of the topic. Statistics would be appreciated, such as, how many marinas are currently leased on state land in Puget Sound and where (a map would be good) and how much acreage, how many conservation easements do you have currently, their acreage and an example of their lease terms, examples of industrial facilities and whether these are grandfathered in or have leases than can be terminated. More information, please.

- **Sharron Coontz 10:10 am on May 7, 2010** [Permalink](#)

I, too, am unclear as to what you're looking for here. If you're asking if a conservation easement is better than geoduck aquaculture, marinas and industrial facilities, then it's a resounding yes. Is the geoduck farm better than a huge industrial facility? One assumes so. But that's hardly reason for endorsing a practice that is so clearly out of balance with the natural order of things. The practices that have been alluded to by witnesses, the classification of native species as "pests" if they interfere with the industry, the fact that pvc has dioxins (which some people don't realize is the chemical in agent orange) which could be released with a fire, and just the absurdity of making one species completely dominant in numbers never intended by nature — all of these can lead to the old "unintended consequences" problem that can't be undone later.

This isn't relevant just to people who live on or own land by Puget Sound. It's a serious one that will affect everyone's way of life for years to come. The current crisis in the Gulf of Mexico is destroying the livelihoods of people who would've said, 2 months ago, that they supported the offshore drilling because of the jobs and boost to the economy it brought. I know there are people on this forum whose financial future is tied up in the industry. Something should be done to help them. But there is an issue of the greater good here. And the greater good means saving Puget Sound's health and beauty for generations to come.

- **Jim Gibbons 9:28 am on May 7, 2010 [Permalink](#)**

I would like some clarification on the question. Are the other DNR "approved activities" only occurring on tidelands or are you asking for comparisons to terrestrial DNR approved activities, too? Is there any time limit on these approved activities? Ones approved 5 years ago, 25 years ago, 50 years ago? Or are you talking about activities that need the ongoing approval of DNR to continue?

- **[dnrforum](#) 9:52 am on May 7, 2010 [Permalink](#)**

Clarification:

The DNR approved activities are those that only occur on state-owned aquatic lands.

- **Don Stave 3:15 pm on May 7, 2010 [Permalink](#)**

This forum appears to simply be a means of pacifying those of us who oppose the expansion of geoduck aquaculture rather than a means of determining what is in the best interest of the State. The most serious question remains the impact geoduck aquaculture has on the sound and it seems reasonable to expect the DNR in conjunction with other State agencies, as well as the Corp of Engineers, to have sufficient information to reach a proper conclusion. If not, perhaps they should contact the folks in British Columbia and inquire as to what their decision to curtail additional geoduck aquaculture was based on. While the protection of the Sound remains the primary concern, a second concern is the leasing of valuable public tidelands by the DNR effectively removing them from public access for periods of up to thirty years. It has been noted that the State has a thirty-percent ownership of the tidelands in Puget Sound, however; it should be recognized that the area most desirable for geoduck aquaculture is the South Sound where the State controls only ten-percent of tidelands,

ninety-percent is privately owned. It seems the aquaculture industry should be able to find sufficient tideland without the State leasing additional public beaches to the industry.

- **Bertil F. Johnson 3:21 pm on May 7, 2010 [Permalink](#)**

On the DNR AND GEODUCK AQUACULTURE main page “Site Characteristics” are set forth as follows: “Under the process initiated in 2003, (geoduck farm) site characteristics were chosen: A preference of no adjacent residential development, a preference for a beach with high bank, suitable beach sediments, an absence of eelgrass, low natural shellfish densities, low recreational or tribal shellfish use, more than 200’ from wild geoduck tracts, and good potential to be approved for Health Certification.” That is a starting point. And certainly no industrial facilities would be permitted under that standard. Conservation easements would be.

The site characteristics should be further narrowed in certain instances and policy established. The DNR should define and protect “recreational beaches” . There are very few of them compared to the remainder of public and private tidelands. Of all the tidelands in Puget Sound, about 70% are private and only 30% are public. “Recreational Public Beaches” that can be reached by water or upland or both, which provide for shallow fishing, for beach exploration and activity, kayaking, boating, sailing, a picnic or two, and such outdoor activity must be a rather small percentage of the tidelands of which the DNR is the steward for the public...the citizens of this state and visitors to this region. Such “recreational beaches” should be preserved in their natural state for this and future generations by a permanent moratorium on any leasing of those lands.