Industrial Shellfish Aquaculture is Converting Puget Sound Aquatic Habitat to Agricultural Use

How much expansion is good for Puget Sound?

Geoduck farm, Nisqually Reach, 6/30/07
Copyright © Coalition to Preserve Puget Sound Habitat, 2007, all rights reserved.
Our concerns are:

Habitat degradation and fragmentation

The trend of converting natural ecosystems to agricultural use

The extent of expansion

Environmental impacts: unknown

Invasive species and disease

Interference with recreational and residential uses

Marine debris

Zangle Cove, 4/29/06

Approximately 43,500 tubes planted per acre (about 8 miles of PVC pipe) with either individual net tops or canopy nets that cover the entire installation;
"...geoduck is a super luxury item which only the rich can afford. The product's price in the Chinese market can reach $60 to $100 per pound. If the price of the product were to fall by 50 percent, it will still be out of the price range of most of the population."


Geoducks are not an essential food.

Geoduck and oyster bag operation – Totten Inlet
Shellfish Industry ‘working waterfront’

New intensive methods are converting natural beaches into single use agricultural zones. How does this square with the requirement of the Shoreline Management Act to achieve “no net loss” in ecological function?

To the average person, it is common sense that this is a disturbance to both people and wildlife.

“We believe the environmental impacts are at worst benign and at best they’re beneficial.”
--Shellfish Industry, Seattle Times, 10/5/06

Totten Inlet 6/26/06
(as reported by Totten Inlet residents)
In the last 10 years the shellfish industry has moved out of traditional shellfish growing areas into new territory in Thurston County, using non-traditional high intensity methods on fragile tidelands.

Industry is now targeting areas in Case and Carr Inlets in Pierce County and further north, along with subtidal lands.

Another new geoduck farm, Pickering Passage 7/07, in surf smelt and rock sole spawning area. Close to sand lance and herring spawning areas.  

--WDFW Surf Smelt, Sand Lance, Rock Sole and Herring Map, 2007
Where are these farms being installed?

In a variety of locations and sediment types.

DOH states that 137,000 acres of tidelands are approved for shellfish harvest in Puget Sound.

New geoduck planting on Zangle Cove, an area rich in intertidal marine life. 6/2006
Industry has advocated for subtidal geoduck aquaculture in legislative hearings and community geoduck forums. DNR is leasing 570 acres of intertidal and subtidal aquatic lands for shellfish and net fish pen culture in Puget Sound, Hood Canal and the Strait of Juan de Fuca as of 8/07.
Multiple parcel installations degrade and fragment habitat.

Migratory shore birds and all Puget Sound salmon depend on the nearshore habitat, including Endangered Species Act listed Puget Sound Chinook Salmon.

DOH, WDFW and Army Corps records show geoducks planted here on a large swath of beach stretching hundreds of feet along the shoreline:
34 parcels
64 acres

Nisqually Reach
6/30/07
Limited visual survey of geoduck operations in South Puget Sound as of 7/30/07.

Blocked areas are where visual surveys of existing geoduck aquaculture have been done by boat at low tide in South Puget Sound. Red marks show geoduck operations that have been seen in those blocked areas. Some areas in Totten and Eld Inlet have multiple types of culture—geoduck, oyster bags, oysters on racks, manila clam netting.
How much habitat loss is acceptable?

PVC tubes, Nisqually Reach, new planting, 6/30/07

Vexar tunnels, Nisqually Reach, 6/30/07

The South Puget Sound Salmon Recovery Group identifies shellfish aquaculture as one of the twelve major human-induced stressors on natural processes specific to South Puget Sound.

--The Development of Nearshore Stressor Conceptual Models for Chinook Recovery Planning in South Puget Sound. 2005
Predator exclusion netting changes the ecological character of the shoreline.

Henderson Inlet canopy net, 6/01/07

Eld Inlet, newly install netting over geoduck tubes, 7/29/07

Newly installed canopy net, Totten Inlet, 7/30/07

Canopy net over new planting, Case Inlet, 6/07
Predator exclusion netting both excludes and entraps wildlife.

There have now been three documented instances of eagles trapped in geoduck netting.
Activity, once established, is ongoing.

Citizens in Mason, Thurston and Pierce Counties are reporting that shellfish growers leave barges such as these for prolonged periods of time in front of shoreline properties.

Zangle Cove, 1/07
Wilson Point, Hartstene Island, 6/30/07

Eld Inlet, 7/29/07
Nisqually Reach, 6/30/07
Expanding shellfish farms using new methods is becoming the norm in South Puget Sound inlets.

The scale of comparison must be relevant.

New planting, Totten Inlet, 7/30/07

The shellfish industry claims that there are only 150 acres of geoduck culture in Puget Sound. Most of this acreage appears to be clustered in the low flushing inlets and coves of South Puget Sound. It is important to quantify linear feet of aquaculture in these inlets and coves to determine cumulative impact to habitat for endangered species.
Is industry's claim of 150 acres of commercial geoduck culture as 1/1000 of all tideland acres in Puget Sound meaningful? Is it even accurate?

1595 acres claimed for existing geoduck farms

10% of the total tideland acreage in South Puget Sound Basin

1595--the number of acres claimed as existing geoduck farms in South Puget Sound.

- Mason County: 800 acres
- Thurston County: 750 acres
- Pierce County: 45 acres
- Taylor Shellfish: 491 acres
- Seattle Shellfish: 309 acres
- Other Growers: 795 acres

--Preliminary totals of Army Corps of Engineers NWP 48 Report Forms 6/2007 received as a FOIA request.

With planned expansion in Pierce County, the numbers will increase.

South Puget Sound Basin - 15,725 tideland acres (south of Tacoma Narrows)

--The Shape and Form of Puget Sound, Robert Burns, a Washington Sea Grant Publication, 1985
How many of these miles use canopy nets, oyster bags, PVC geoduck tubes, and/or water jet harvesting?

According to APHETI, streambeds channels have been altered.

Totten Inlet – 90% of shoreline miles in shellfish aquaculture.

30 miles of farmed tidelands in Totten Inlet per Taylor Powerpoint Presentation.

33 Miles of shoreline in Totten Inlet per APHETI.
Shellfish industry claims 10,629 acres as existing geoduck aquaculture in Puget Sound and Willapa Bay.

Taylor Shellfish – 90% of claimed geoduck acres

10,629 acres claimed as existing geoduck aquaculture.*

9,475 acres claimed by Taylor Shellfish.*

6000 acres Willapa Bay -- Taylor
2300 acres Samish Bay -- Taylor
1175 acres Puget Sound -- Taylor
1154 acres Puget Sound -- Other growers

*Per Department of Ecology list of Army Corps of Engineers NWP 48 Report Forms, dated 6/29/07

Geoduck harvester ‘in the hole,’ Case Inlet 8/14/07
To what extent does shellfish aquaculture, as a human induced stressor, disrupt the function of natural beach processes?

Eld Inlet, 7/29/07

One hypothesis is that “shellfish aquaculture reduces productivity, abundance, spatial structure, and diversity of salmon populations” in South Sound.

Beaches are permanently converted to commercial aquaculture use.

Areas under shellfish aquaculture lose their unique characteristics. *Bendell-Young study on intertidal shellfish farming from Simon Fraser Univ. 2006*

Densities of harvestable cultured geoducks are approximately 19-23 per square meter based on industry statistics.

Natural densities of wild geoducks average 2 per square meter in South Puget Sound. *"Comprehensive Literature Review of Issues Relating to Geoduck Ecology" 2004*

Shellfish filter large particles and can consume zooplankton as well as copepods (the biggest source of protein in the ocean), crab larvae, fish eggs and crustacean larvae. *CSAS, 2006*
Shellfish do not magically “clean the water” of all bad things.

If shellfish consume fecal coliform, toxic bacteria or contaminants they cannot be harvested or eaten.

Growers say “clean” to mean filtering phytoplankton out of the water. Phytoplankton is the basic food source for other aquatic species as well as shellfish.

In agricultural densities, excessive shellfish feces and pseudofeces can contribute to toxic conditions. (See Studies, slide 48).

Do filtration benefits outweigh these impacts?
--Habitat degradation and fragmentation
--Liquefaction of tideland using water jets
--Plastics and canopy nets covering beaches
--Increased shellfish waste in low flushing inlets
--Industrialization of shoreline
Are geoducks good for filtering Puget Sound...or not?

Shellfish growers claim that the filtering capabilities of their commercial geoduck will mitigate for nutrients coming into Puget Sound from upland development. --Taylor Shellfish Presentation 2007.

But DNR claims (with the help of industry) that filtering capacity of native geoducks harvested from subtidal areas is insignificant. --DNR Habitat Conservation Plan, July, 2007

Yearly harvest of native subtidal geoducks is up to 4 million pounds. --DNR website

So its OK to remove the native geoducks from the Sound (some live over 165 years), but we have to convert our tidelands to industrial geoduck farms to filter the water and save Puget Sound? Illogical at best.
Destruction of eelgrass habitat.

Eelgrass is an important habitat for herring spawning and it provides protection for small fin fish, including juvenile salmonids.

Annual progress report of a UW study on the interaction of filter feeders and eelgrass observes “direct negative effects of disturbance and of geoducks on eelgrass” and “little evidence of indirect positive effects of geoducks” on eelgrass. --Sally Hacker, OSU and Jennifer Ruesink, UW 2005

Eelgrass in Zangle Cove, 5/13/07
Is geoduck waste really good for eelgrass...or not?

A Pacific Coast Shellfish Growers Association brochure states that:
"As digested algae is expelled into the beach sediment, the remaining nutrients become more readily used by eelgrass, essentially providing a fertilizing function."

The ongoing OSU/UW study on eelgrass and geoducks says: "'fertilizer' effect does not result in enhanced growth rates of eelgrass."

Industry says:
"So long as the geoduck farming does not substantially disturb eelgrass (i.e., geoduck are not planted in the eelgrass), geoduck culture has little effect on eelgrass." –Taylor Shellfish Presentation 2007.

Eelgrass in Zangle Cove, 6/2006
Is industry data reliable and unbiased?

Pacific Coast Shellfish Growers Association promotional literature, states that "a recently conducted comprehensive biological assessment found that geoduck farming practices are not likely to adversely affect any listed threatened or endangered species or essential fish habitat." – DRAFT Programmatic Biological Evaluation of Potential Impacts of Intertidal Geoduck Culture Facilities to Endangered Species and Essential Fish Habitat, prepared for Taylor Shellfish, Seattle Shellfish and Chelsea Farms by Entrix, Inc. 10/27/04

A principal author of the Entrix draft document signed a lease with a property owner on Totten Inlet to conduct commercial geoduck farming on June 5, 2004, just before the Biological Evaluation was published. -- per recently obtained Army Corps of Engineers NWP 48 Report Forms.

Chinook Salmon, moving up the Nisqually. Photo USFW
Is shellfish aquaculture gear really mostly invisible as industry claims?

An analysis of daylight hours between Memorial Day and Labor Day, when the beach is most often used, shows geoduck gear visibility:

<table>
<thead>
<tr>
<th>Planted at +2 beach elevation:</th>
<th>Planted at +3 beach elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible an average of 19% daylight hours</td>
<td>Visible an average of 23% daylight hours</td>
</tr>
<tr>
<td>Visible 76% of the days.</td>
<td>Visible 87% of the days.</td>
</tr>
</tbody>
</table>

Almost all Army Corps NWP 48 Report Forms we reviewed for existing geoduck aquaculture included multiple species, some planted up to +10 tidal elevation.

Oyster bags and Manila clam canopy nets are visible most days for long time periods during the summer.

Geoduck farm (after tubes pulled) and oyster bags at higher beach elevation. Eld Inlet 7/29/07
Fact or fiction: water jet harvesting is the same as boat wake or wind storm.

Pacific Coast Shellfish Growers Association states in relation to hydraulic water jet harvesting of geoducks that impacts ‘are temporary and well within the range of disturbance caused by boat wakes or a winter storm.’ --Letter from PCSGA to Pierce County 10/5/07

Ordinary citizens view with disbelief a comparison of boat wakes or wind storms with water jet harvesting of geoducks.

Any boat wake, wind storm or other climate event that would cause liquefaction of entire acres of tideland sediment up to three feet in depth would rightly be viewed as an extraordinary event, not an ordinary one.

Totten Inlet geoduck harvester, 2006
How does hydraulic water jet harvest change the beach?

Geoduck growers ECOP's state that “the beach will be lowered about 1-2 inches by the harvest.”

(This is the equivalent of 13-26 dump trucks of material per acre.)
The Geoduck Growers Environmental Codes of Practice (ECOP) state that the “harvester will not harvest geoduck one at a time producing single holes but will systematically emulsify the substrate with the water jet.”

Commentary from *Dirty Jobs* Geoduck Segment with Mike Rowe, describing geoduck harvest:

You’re going to take the pressure hose and shove it in here and turn the sand to liquid... and you’re going to be “in the hole.” Just dig around your feet and you go down.

I take this hose and I squirt it on my feet liquefying the sand around me and slowly sink into the beach.

Work down (with water jet)...reach down and feel the neck of the geoduck...then pull it up when it loosens up.

The *Dirty Jobs* segment clearly shows workers kneeling or sitting up to hip or waist in the hole created by the water jet.

Photo from Totten Inlet harvest 2006 (not Dirty Jobs)
What happens when sediments are emulsified up to three feet deep in large areas on the tidelands?

For example: “Little research has been conducted on geoduck toxicity induced by the ingestion of Alexandrium catenella cysts” which “overwinter in surface sediments where they are buried.” Toxic “cysts are reintroduced to the water column by currents or other types of disturbance such as dredging or harvesting.”

—Comprehensive Literature Review of Issues Relating to Geoduck Ecology and Aquaculture Production. Prepared by DNR by UW and the Pacific Shellfish Institute. This is one of the primary documents used by industry to support their expansion plans.

Henderson Inlet, 6/30/07
When the beach is liquefied, where do the sediment plumes go?

Case Inlet geoduck harvesters 'in the hole,' 8/14/07
"At the end of harvest the ‘beach will have been turned upside down--a moonscape yielding hundreds of pounds of high-grade geoducks and a by catch of any worm or clam that was living in the sand.” – *Cashing in on Geoducks, Seattle PI, 8/21/04*
Marine debris around geoduck farms.

Loose tubes, Henderson Inlet, 6/1/07
Loose tubes, Pickering Passage, 6/17/07
Loose tubes, Eld Inlet 7/30/07
Loose tubes, Zangle Cove, 4/12/07
WA Dept Fish & Wildlife staff estimate PVC tube and net debris in deep water areas of South Puget Sound

100" x 24" Vexar plastic net identified as belonging to shellfish company found on beach in Case Inlet 5/20/07.

Net tops found on beach opposite geoduck farm, Zangle Cove 2006

2005 Washington State Fish & Wildlife bottom fish survey trawl finds aquaculture debris in South Puget Sound from 30-120' depth. Biologists extrapolate to 21,600 tubes and 61,600 nets for a total of 83,200 estimated items.
Mussel rafts in low flushing inlets.

Bivalves can be stocked at such high intensities that "anaerobic microbial pathways dominate, and sulfur reducing bacteria produce high levels of hydrogen sulfide that are toxic to benthic...species."

--Dr. Roger Newell, University of Maryland, on possible impacts from shellfish aquaculture.

Mussel rafts--Gallagher Cove, Totten Inlet
independent scientific study of the bottom below the mussel farm that incorporates random sampling of the bottom, video surveys, and sediment analyses for porewater chemistry and benthic species diversity in relation to control sites outside mussel farm.
Mussel rafts propagate non-native species.

An Environmental Impact Study regarding mussel raft installations in Totten Inlet, mandated by Thurston County in 1999, is still ongoing.

*Mytilus galloprovincialis*, the Mediterranean mussel, is listed in the *100 of the World’s Worst Invasive Alien Species* list. [www.issg.org](http://www.issg.org), [www.conservationinstitute.org](http://www.conservationinstitute.org), nas.er.usgs.gov

‘The proposed mussel farms will have a probable significant adverse environmental impact to the Totten Inlet and to the waters of Puget Sound” relating to “the establishment of the Gallo mussel as a common form of mussel within Puget Sound waters and impacts related to said introduction.’ From Hearings Examiner’s conclusions, Thurston County, 1999

With EIS still pending, why is the industry allowed to sell the gallo mussels to the public?

Non-native (Gallo) Mediterranean mussel has hybridized with native mussel.
Totten Inlet, 6/2006
Mussel rafts a congregation point for invasive tunicates.

'The invasive colonial tunicate, *Didemnum sp.*, is native to Europe and probably came to this region in ballast water discharged from ships, as hitchhikers on recreational boats, or on shellfish and/or shellfish equipment brought to the region from other locations.'--Washington State's Response to an Invasion of Non-Native Tunicates, Accomplishments, Challenges and Next Steps, Report to the Legislature. February 2007.

*Dirty Jobs* segment on the Gallagher Cove mussel farm shows extent of tunicates on mussels and on gear.

What steps is industry taking to remove tunicate infestation?
Plastic “kiddie” pools are used as nurseries for geoduck seed. Clam and oyster seed is transported to and from Hawaii and geoduck seed from Washington and Oregon hatcheries “under strict regulations governing control of invasive species” according to Taylor Shellfish.

How does industry ensure compliance so that disease, parasites and non-native species are not introduced into Puget Sound?
There is currently no siting criteria to take into account habitat preservation related to large swaths of shellfish aquaculture installations and cumulative impact.

This large geoduck farm is just south of a proposed DNR 2006 geoduck lease site.

Another large farm is in the distance.

Henderson Inlet, 6/1/07
DNR and commercial growers are siting geoduck farm leases in forage fish spawning areas. Forage fish are important critical prey species for predators such as salmon.

‘Standard aquaculture practices may have profound effects on the benthic ecology of Washington state’s tidelands and the conservation of forage fish spawning areas, especially for herring.’ --Marine Forage Fishes in Puget Sound, WDFW, 2007

Photo and map from DNR website 2007 lease offering for Shine Beach, Hood Canal
A 2 acre DNR lease parcel is not much, right? Think again.

The total DNR geoduck acreage for this parcel in Hood Canal is now 7 acres. Will another two acres be added at North Navy in 2008? This plan of incrementally increasing acreage fits well with the geoduck grower strategy of rotational planting.

http://www.dnr.wa.gov/htdocs/aqr/aquaculture/index.htm

This map shows three DNR geoduck lease parcels at North Navy:

2006 North Navy #1 lease, 3 acres

2006 Taylor Shellfish monitoring site, North Navy #2 lease, 2 acres.

2007 North Navy #3 lease, 2 acres.

Multiple parcels are also in Taylor Bay (Pierce County) and Stretch Island (Mason County)
Expansion of shellfish aquaculture into traditionally residential areas represents a major land use conflict for adjacent property owners and other citizens who have the goal of protecting the tidelands for natural habitat and traditional recreational use.

The issue is not that tubes or nets remain in place for only 1-2 years.

The issue is that there is no siting criteria for these operations and once put into aquaculture use, the shellfish industry states the tideland is intended for “a perpetual cycle of planting, cultivation and harvesting.”

--Taylor Shellfish Notice of Appeal of Administrative Determination, 8/22/07

Zangle Cove, 4/29/06
Shellfish aquaculture operations bring an industrial zone to quiet residential neighborhoods. Conflicts include:

--Day and night time noise disturbance to both wildlife and adjacent property owners and intense smell during harvest
--Aquaculture debris, utility vehicles and workers on the beach
--Barges left directly in front of residential properties for prolonged periods
--Demand for use of neighborhood roads for access and parking
--Access to the water eliminated for some adjacent property owners at low tide
--Permanent alteration of the character of the beach with rotational plantings and multiple species.

"...the interests of all stakeholders need to be addressed...in order to assess the social carrying capacity of the management area."
—Review of recent carrying capacity models for bivalve culture and recommendations for research and management. McKindsey, 2006

Zangle Cove, 2006-2007
Current shellfish industry practices.

Heavy equipment on tidelands is not consistent with telling school children and adults to walk carefully on the beach.

Heavy equipment and modification of tidelands are not consistent with the objective of the Puget Sound Partnership to protect habitat.

Industry is demanding upland access to the beach for operations in Pierce County.

The industry is legally challenging rules and conditions.

Oakland Bay, Mason County. 8/07
Dutcher’s Cove is an example of what it at risk from expanding shellfish aquaculture.

New application in Pierce County for a 26 acre shellfish farm with at least 21 acres for geoducks.

Residents who have resided in this cove for 50 to 100 years or more now face the prospect of a cove converted to single agriculture use on a perpetual and permanent basis.

Industry says citizens just have to “get used to it.”

Dutcher Cove application for massive geoduck farm submitted 7/19/07 in Pierce County
Operation in Hammersley Inlet is another example of current shellfish industry practices.

Small cove in Hammersley Inlet with a geoduck farm and plastic "kiddie pool" seed nurseries. August 26, 2007. These tidelands are owned by the shellfish company, not the shoreline residents. It is a documented herring and surf smelt spawning area.

--WDFW Surf Smelt, Sand Lance, Rock Sole and Herring Map, 2007
Examples of High density raft leases in Baynes Sound, British Columbia

Photo courtesy of Association for Responsible Shellfish Farming
www.responsibleshellfishfarming.ca
Examples of long-line culture in British Columbia.

High density beach lease in Baynes Sound, BC

Photos courtesy of Association for Responsible Shellfish Farming
www.responsibleshellfishfarming.ca
Canadians suspend applications for intertidal geoduck farming

'Applications for new intertidal geoduck aquaculture are currently not being accepted due to gaps in understanding of geoduck aquaculture techniques on fish habitat.'

http://www.agf.gov.bc.ca/fisheries/Shellfish/geoduck/main.htm


'SENSITIVE INTER-TIDAL AREA'

'Observe marine life. Do not collect or remove anything from the beach.' 'Please respect the habitat critical to the survival of inter-tidal life.' 'Kelp, driftwood, rocks, sand, gravel and shells are essential materials building a healthy inter-tidal zone.' 'Take pictures home only!'
Long term goals of the shellfish industry are indicated by industry ‘Goals and Research Priorities for 2015.’ We have received no response to our written request for clarification of these goals.

"Explore options under the Endangered Species Act (ESA) Sections 7 and 10, to develop a regional general permit in cooperation with the Army Corp to provide growers with protection from prosecution under the ESA, Clean Water Act, Rivers and Harbors Act and Marine Mammal Protection Act."

"3.3.2. (H) Identify gaps in current understanding of shellfish ecology specific to West Coast ecosystems and pursue research to fill those gaps. The final goal is to gain a clear understanding of the ecological impacts associated with:

- Oyster culture - bottom, rack and bag, bag, intertidal longline, stake, suspended (longline, tray, lantern net, bag), mechanical dredge harvesting as well as culture of native Olympia and assorted non-native species.
- Clam (Manila & native) culture - bottom and bag, hand and mechanical harvesting.
- Mussel culture - suspended raft & long line, Mytilus galloprovincialis and M. trossulus.
- Geoduck culture - intertidal, subtidal, hydraulic harvesting (intertidal geoduck), predator exclusion.
- Other species not yet commonly grown for aquaculture purposes.
- Integrated Pest Management (IPM) of burrowing shrimp, European green crab, red rock crab, Dungeness crab, shore crab, diving ducks, starfish, oyster drills, gulls, crows and moon snails by the use of deterrents, exclusion or destruction.
- Substrate modification (culching, graveling, tillling, harrowing, mowing).
- Carrying capacity - modeling of intensively cultured estuaries and an understanding of key phytoplankton species affecting growth, health and survival of shellfish (look at models developed in France, New Zealand, and Maine)."

--Excerpts from Pacific Shellfish Institute West Coast Shellfish Research and Education 2015 Goals and Priorities. For full document go to http://www.pacshelf.org/
<table>
<thead>
<tr>
<th>NOAA Aquaculture Program</th>
<th>World Wildlife Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Washington Aquaculture Opportunities for Growth</strong></td>
<td><strong>Draft Goals of the World Wildlife Fund</strong></td>
</tr>
<tr>
<td>Shellfish production, including oysters, mussels, Manila clams, and geoduck clams</td>
<td><strong>Molluscan Dialog:</strong></td>
</tr>
<tr>
<td>New finfish species such as black cod</td>
<td>Develop and implement performance-based, measurable standards that will minimize the potential negative effects of mollusc aquaculture, while permitting the shellfish farming industry to remain economically viable.</td>
</tr>
<tr>
<td>Culture of salmon and steelhead</td>
<td><strong>Continue to promote the beneficial environmental and social aspects of shellfish cultivations.</strong></td>
</tr>
<tr>
<td>Open ocean aquaculture in the Strait of Juan de Fuca</td>
<td><a href="http://www.worldwildlife.org/cci/dialogues/mollusc.cfm">www.worldwildlife.org/cci/dialogues/mollusc.cfm</a></td>
</tr>
<tr>
<td>Production of submersible offshore fish cages</td>
<td>10/15/07</td>
</tr>
<tr>
<td><a href="http://www.aquaculture.noaa.gov">www.aquaculture.noaa.gov</a></td>
<td>9/12/07</td>
</tr>
</tbody>
</table>

When Puget Sound is turned over to the aquaculture industry, will citizens have a say?
Worldwide studies document environmental impacts of intensive shellfish aquaculture.

Totten Inlet 2006
Manila nets, oyster bags, geoduck tubes all on same tidal area.

Click on this link for a list of summaries of worldwide studies on the impacts of intensive shellfish aquaculture.

http://ProtectOurShoreline.org/articles/Studies_IntensiveShellfishAquaculture.pdf

Click on this link to read a "Data Gap Analysis" related to geoduck aquaculture from Puget Sound biologists.

Comments from the “Bivalve Experts” at the Washington Sea Grant Shellfish Aquaculture Workshop

- Baseline and ecological mapping of shoreline habitat is necessary to making informed decisions.
- Spatial scale of effects should be related to meaningful regional scales, such as drift cells (not to the entire Puget Sound)
- Environmental conditions should be monitored at aquaculture site.
- Practices are cumulative and have the potential to adversely affect foreshore ecology.
- The precautionary principal should be followed when there is lack of data.
- Both ecological and social carrying capacity must be considered in siting of shellfish aquaculture, not just production carrying capacity
- Shellfish farms will cause increase in some species and decrease in others.

Sea Grant Shellfish Aquaculture Workshop final recommendations
http://www.wsg.washington.edu/research/geoduck/WSGBivalveWorkshop_Recommendations.pdf
We share all of the eight objectives of our Governor for the Puget Sound Partnership initiative and especially the objective to protect habitat.

We welcome the Sea Grant Shellfish Aquaculture Workshop Scientist recommendations.

We support the following:

- Identification and documentation of all existing shellfish farms in every Puget Sound County;
- Assessment of current and future expansion of shellfish farming as to cumulative impacts;
- Baseline and environmental impact studies before additional plantings using new shellfish farming techniques are allowed.
- A substantial development permitting process for shellfish aquaculture on a site specific basis.
For more information go to:

Coalition to Preserve Puget Sound Habitat

http://www.ProtectOurShoreline.org
http://www.APHETI.com
http://www.HendersonBayShorelineAssociation.com
http://www.NoGeoduckFarm.com
http://www.Caselnlet.org

Coalition Contact: lhendricks@comcast.net

Canadian partners:
http://www.responsibleshellfishfarming.ca

Supporting organizations:
The Washington Council of Trout Unlimited

Last updated 11/20/07
Copyright © Coalition to Preserve Puget Sound Habitat, 2007, all rights reserved.
Chapter 19.600 Shoreline Use and Modification Development Standards

19.600.115 Aquaculture

A. Environment Designations Permit Requirements

Where aquaculture is proposed in the following upland designations, the identified permit requirements shall apply: Where proposed in the adjacent aquatic designation, the corresponding upland designation shall be used to determine permit requirements:

1. Mining, Shoreline Residential, Urban Conservancy, Rural Conservancy, and Natural: Except as otherwise stated in this section, an SDP shall be required for new aquaculture activities that meet the definition of substantial development under the Shoreline Management Act and this Shoreline Master Program. Exempt if definition of substantial development is not met.

   According to the 2011 ruling by Judge Tabor, geoduck operations require an SDP because the tubes constitute a “structure.” See pages 6-7 of the Tabor ruling.

2. Natural: A CUP shall be required where the proposal requires new structure or facilities.

3. Geoduck aquaculture in all designations:

   a. A CUP shall be required for all new commercial geoduck aquaculture and an administrative CUP for existing aquaculture being converted to commercial geoduck aquaculture;

   This section should clarify the distinctions between and SDP, a CUP and an Administrative CUP. If an Administrative CUP is simply an authorization on paper without the actual requirements of an SDP or a CUP, then it is worthless. Andrew was unable to adequately explain the differences in these definitions at the Planning Commission meeting on this topic and this section has no clarity on the subject. The conversion of existing aquaculture to commercial geoduck aquaculture involves the use of some 7 miles/16 tons of PVD/HDPE plastics placed on an acre of tideland, with the addition of heavy plastic netting to cover this acre. This is not a small “conversion” and it requires all the permitting requirements of a new commercial geoduck operation, which it essentially is, in any case.

   b. An SDP shall be required for the planting, growing and harvesting of farm-raised geoducks only if the specific project or practice causes substantial interference with normal public use of the surface waters.
According to the 2011 ruling by Judge Tabor, geoduck operations require an SDP because the tubes constitute a "structure." See pages 6-7 of the Tabor ruling. The above requirement that exempts operations from obtaining an SDP is in contradiction to the Tabor ruling, to our understanding of that ruling.

c. Wildstock geoduck harvest associated with the state and tribal co-managed geoduck fishery is not aquaculture. Since a fishery does not constitute development under this Program, it is not subject to its regulations.

4. Certain aquaculture developments and supplemental wild stock seeding may be exempt from SDP requirements pursuant to the exemption criteria at Section 19.500.100(C) of this Program. Such activities shall also comply with all state and federal requirements, including but not limited to Department of Health certification and license, or Shellfish Import or Shellfish Transfer permits, where applicable.

Define "certain aquaculture developments." Make it easy for the ordinary reader to understand specifically what you are talking about. Give examples. Using the term "certain aquaculture developments" lacks clarity.

B. Application Requirements

In addition to the minimum application requirements in Section 19.500.105(C), aquaculture applications shall include the following information if not already provided in the local, state or federal permit applications. Where requested information is not applicable to a specific proposal, the application shall not be required to include all items listed under this section as long as it is demonstrated why the information does not apply, with concurrence from the Department.

Where is the phrase "where requested information is not applicable to a specific proposal" defined? Give examples of what is meant by this.

1. A site plan, including:
   a. The perimeter of the proposed aquaculture operation area;
   b. Existing bathymetry depths based on mean lower low water (MLLW datum);
   c. Adjacent upland use, vegetation, presence of structures, docks, bulkheads and other modifications;
   d. Areas where specific substrate modification will take place or structures will be constructed or installed;
   e. Access provisions for marine or vehicle traffic, processing structures or facilities, and
   f. Location of storage or processing structures or facilities.

2. A baseline description of existing and seasonal conditions, including best available information. Where applicable to the subject proposal, the following should be included if already part of information submitted for another federal or state agency. Note: information regarding wind conditions, current flows and flushing rates (items 3-5) will generally not be applicable to shellfish aquaculture applications.

   Define "best available information" and where it comes from. This is language obfuscation.
a. Water quality;
b. Tidal variations;
c. Prevailing storm wind conditions;
d. Current flows at each tidal cycle;
e. Flushing rates;

**Why delete c-e? In the case of Zangle Cove, naturally occurring native eelgrass (DNR was monitoring and very interested because it was the furthest south in Puget Sound that native eelgrass had been found) was completely gone after a winter of harvesting on a geoduck operation up current from the area of eelgrass. Items c-e are important in terms of determining impacts of the geoduck harvest operations and the siltation that occurs as a result of the harvest methods.**

f. Littoral drift;
g. Sediment dispersal, including areas of differing substrate composition;
h. Areas of aquatic, intertidal and upland vegetation complexes; a vegetation habitat survey (see Section 8.10. Biological and Habitat Surveys) must be conducted according to the most current WDFW eelgrass and macroalgae survey guidelines;
i. Aquatic and benthic organisms present, including forage fish, and spawning and other lifecycle use of, or adjacent to, the site;
j. Probable direct, indirect and cumulative impacts to items B.1. - B.9. above; and
k. Visual assessment, including photo analysis / simulation of the proposed activity demonstrating visual impacts within 1,500 feet of the proposed project site. Where predator exclusion devices are proposed, the assessment shall include an analysis of visual impacts of proposed predator exclusion devices at mean high and mean low tides.

**If the operator (Taylor Shellfish in the case of Zangle Cove) does not abide by the permitted tide height on the operation, then all bets are off for visual impact. When Taylor's tide height permission was reported to the County and substantiated by a professional survey, the County did nothing about it, in fact apparently completely ignored it. So what is the meaning and purpose of visual assessment analysis if County personnel don't actually give any credence to this issue?**

3. An operational plan, which includes the following, when applicable should be included if already part of information submitted for another federal or state agency:

   What is the meaning of the phrase “when applicable”? That is an unintelligible phrase that makes the sentence incomprehensible. Also, this sentence makes it appear that an operational plan is not a requirement if NOT already part of information submitted for another federal or state agency. This item should be re-written to clarify its meaning.

   There should be a requirement that the “operation plan” be submitted to the immediate neighborhood—any household that can see the operation, not just within 1500 feet.

   a. Species, and quantity to be reared;
   b. Source of aquatic product;
   c. Implementation methods, including density, schedule, phasing options, time of day, and anticipated lighting and noise levels;
d. Number of employees/workers necessary for the project, including average and peak employment;

e. Methods and location of waste disposal and sanitation facilities;

f. Methods for planting and harvest;

g. Methods for predation control, including types of predator exclusion devices:

"Predator Exclusion" is improper language. This should be "wildlife exclusion."

h. Food and equipment storage;

There are rules about where barges and boats can be anchored in marine waters and for how long and the necessary permits. One operator in Zangle Cove, when complaints were made, simply moved his barge from one side of the Cove to the other every 3 days. What are the rules. This should be addressed here.

i. Anticipated use of any feed, herbicides, antibiotics, vaccines, growth stimulants, antifouling agents, or other chemicals and an assessment of predicted impacts;

Sounds like this is giving general permission to use feed, herbicides, antibiotics, etc. Is that what your intention is? If so, it should be stated clearly. If this is not allowed in Puget Sound, then there should be a link to the specific language in this document that refers where feed, herbicides, antibiotics, vaccines, etc. are allowed and where they are not allowed.

j. Methods to address pollutant loading, including biological oxygen demand (BOD);

k. A schedule for water quality monitoring, where required; and

l. Other measures to achieve no net loss of ecological functions consistent with the mitigation sequence described in WAC173-26-201(2)(e).

Please explain to us how putting 7 miles of PVC/HDPE weighing approximately 16 tons along with heavy duty plastic netting on an acre of tideland (especially in an estuary), is consistent with "no net loss of ecological functions." This type of language and the reality of industrial aquaculture is exactly why citizens in the County view with disbelief and incredulity any idea that the County wants to help preserve Puget Sound for the orcas and the salmon.

4. Other applications and reports, when applicable or requested depending on site specific details determined during permit review, to ensure compliance with permit conditions, which may include:

a. An accepted Washington Department of Natural Resources lease application, including a waiver of preference rights to access for navigation from the upland property owner, if applicable;

b. An accepted Washington Department of Ecology National Pollutant Discharge Elimination System (NPDES) permit, if applicable;

c. An accepted Washington Department of Health beach certification number;

d. An accepted WDFW aquatic farm permit, and/or fish transport permit;

e. Water quality studies;

f. Reports on solids accumulation on the bottom resulting from the permitted activity along with its biological effects;
g. Report on growth, productivity, and chemical contamination of shoreline plants and animals within or adjacent to the proposed site:

Clarify what you are talking about here. Growth and productivity on the shoreline or on the tideland – be specific about what you mean. Chemical contamination from the upland or from the aquaculture operation – again, be specific about what you mean. This is an incoherent sentence. Please clarify.

h. Noise level assessments, including mitigation measures to ensure compliance with Chapter 10.36 & 10.38 TCC; and/or


Point to the section that talks about the rules related to “introduction of aquatic species not previously cultivated in Washington State.” This item makes it sound like there is no regulation of this. Is this true?

C. Development Standards

I. General Standards.

a. Aquaculture is dependent on the use of the water area and, when consistent with control of pollution and prevention of damage to the environment, shall be a preferred use.

This document fails to mention other preferred uses, giving the impression that aquaculture is the only preferred use or “the” preferred use. For example, in 19.600.165-C:

12. As required by RCW 90.58.100(4), applications providing for wilderness beaches, ecological study areas, and recreational uses for the public on state-owned shorelines shall be considered a preferred use.

On the Department of Ecology website “preferred use” for the shoreline is defined:


Shoreline use

The SMA establishes the concept of preferred shoreline uses. These uses are consistent with controlling pollution, preventing damage to the natural environment, or are unique to or dependent upon use of Washington’s shorelines. Preferred uses include:

- Single-family residences
- Ports
- Shoreline recreational uses
- Water-dependent industrial and commercial developments
- Other developments providing public access opportunities
As much as possible, shorelines should be reserved for "water-oriented" uses, including those that are "water-dependent," "water-related," and for "water-enjoyment."

Preferred uses for **shorelines of statewide significance** are designed to:

- Recognize and protect statewide over local interests
- Preserve the natural character of the shoreline
- Result in long-term rather than short-term benefits
- Protect shoreline resources and environment
- Increase public access to publicly-owned shoreline areas
- Expand recreational shoreline opportunities for the public

Our comment: even though in the Thurston County SMP document aquaculture is continually referenced as a "preferred use," the fact that writers of the document do not mention other "preferred uses" gives a skewed understanding of the importance of aquaculture. There are obviously several other "preferred uses."

The question remains: can converting our natural tidelands to industrial geoduck aquaculture prevent damage to the environment. If it can't, then it is NOT a preferred use according to the Department of Ecology.

We also do not believe that industrial geoduck aquaculture on the tidelands of Puget Sound is a "statewide interest" that should be protected. It is a tiny industry that makes money selling live geoduck to wealthy Asians because of their belief that consuming geoducks enhances virility—something along the lines of rhino horns. This is, in fact, local interest, not statewide interest, which would be more appropriately defined as preserving Puget Sound and its tideland habitat for our orcas and our native salmon. Nobody wants to talk about this—but its something that needs to be discussed.

---

b. Proposed residential subdivisions and other land uses and developments which may impact aquaculture operations shall provide facilities to prevent any adverse water quality impacts to such operations.

c. Site preparation and construction in the vicinity of aquaculture operations shall not result in off-site erosion, siltation, or other reductions in water quality.

Citizens of this County WANT to protect the environment and to keep Puget Sound clean for our orcas and our salmon and for our children and grandchildren. But when citizens realize that the push for clean water is so that their neighbor can put in a geoduck operation with 7 miles/16 tons of PVC/HDPE per square acre, so that he/she can make a lot of money selling live geoduck to the wealthy in Asian nations who believe that geoducks are an aphrodisiac, we feel rightly betrayed by our county officials.

b. When a shoreline substantial development or conditional use permit is issued for a new aquaculture use or development, that permit shall apply to the initial siting, construction, and planting or stocking of the facility or farm. Authorization to conduct such activities shall be valid for a period of five years with a possible extension per Section 19.500.105(H) of this Program. After an aquaculture use or development is established
under a shoreline permit, continued operation of the use or development, including, but not limited to, maintenance, harvest, replanting, restocking or changing the culture technique shall not require a new or renewed permit unless otherwise provided in the conditions of approval, or if required pursuant to permit revision criteria in WAC 173-27-100 or this Program. Changing of the species cultivated shall be subject to applicable standards of this Program, including, but not limited to, monitoring and adaptive management in accordance with standard g, below.

This is unclear and contradictory. First this it is says that an initial permit is valid for 5 years, but than it says “after an aquaculture use or development is established under a shoreline permit, it doesn’t require a new or renewed permit unless otherwise provided…” This sounds like it was written by the shellfish industry. So once the tideland is given over to the industry, then they can basically do what they want forever? 

Given the dramatic rejection of the current science and cumulative impact analysis by a federal judge in the action with the Army Corps, it makes no sense to automatically renew permits.

Aquaculture shall not be permitted in areas where it would result in a net loss of shoreline ecological functions, or where adverse impacts to critical saltwater and freshwater habitats cannot be mitigated according to the mitigation sequencing requirements of this Program (see Section 19.400.100(A)).

A site-specific cumulative impact analysis should be prepared and take into account exiting and anticipated future aquaculture development.

d. Aquaculture shall not significantly conflict with navigation and other water-dependent uses.

e. Aquaculture activities proposed within Shorelines of statewide significance shall first be subject to the policies for shorelines of statewide significance contained in Chapter 19.300 (General Goals and Policies) of this Program, and then the policies and regulations contained in this section, in that order of preference.

f. In general, when considering new aquaculture activities, refer to policies at Section 19.300.130(E-K) for siting and design preferences.

g. Project applicants proposing to introduce aquatic species that have not previously been cultivated in Washington State are responsible for pursuing required state and federal approvals relating to the introduction of such species, as determined by applicable state and federal agencies. A plan for monitoring and adaptive management shall also be submitted for County review, unless the operation is conducted in a fully contained system with no water exchange to the shoreline. The County shall provide notice and time to comment for appropriate agencies in accordance with County procedural requirements, and shall circulate the monitoring and adaptive management plan. Upon approval, the plan shall become a condition of project approval.

h. Over-water structures and/or equipment, and any items stored upon such structures such as materials, garbage, tools, or apparatus, shall be designed and maintained to minimize visual impacts. The maximum height for items stored upon such structures shall be limited to three feet, as measured from the surface of the raft or the dock, unless shoreline conditions serve to minimize visual impacts (for example: high bank environments, shorelines without residential development), but in no case shall the height exceed six feet. Height limitations do not apply to materials and apparatus removed from the site on
a daily basis. Materials that are not necessary for the immediate and regular operation of the facility shall not be stored waterward of the OHWM.

Aquaculture barges should be included in this category.

i. Aquaculture structures and equipment used on tidelands below ordinary high water shall be of sound construction, with the owners' identifying marks where feasible, and shall be so maintained. Abandoned or unsafe structures and/or equipment shall be promptly removed or repaired by the owner.

j. No processing of any aquaculture product, except for the sorting and culling of the cultured organism and the washing or removal of surface materials or organisms after harvest, shall occur in or over the water unless specifically approved by permit. All other processing and related facilities shall be located on land and shall be subject to the regulations for Commercial and Industrial Uses (Section 24.10.100), in addition to the provisions of this section.

k. No garbage, wastes or debris shall be allowed to accumulate at the site of any aquaculture operation, except for in proper receptacles.

l. All floating and submerged aquaculture structures and facilities in navigable waters shall be marked in accordance with U.S. Coast Guard requirements.

m. The rights of treaty tribes to aquatic resources within their usual and accustomed areas are addressed through direct coordination between the applicant/proponent and the affected tribe(s). Thurston County will notify affected tribes of new shoreline permit applications utilizing the applicable notification process in Title 20.60 TCC.

n. In order to avoid or limit the ecological and aesthetic impacts from aquaculture siting and operations, the following shall apply:

   i. Predator exclusion devices shall be firmly attached or secured so as not become dislodged.

   ii. Predator exclusion devices shall blend with the natural environment.

   There is no way to make "predator exclusion devices" blend in with the natural environment. This might be called "wishful thinking" if it were not so ridiculous. There is nothing about PVC or HDPE that correlates with the "natural environment." In the case of geoduck aquaculture, we are talking about approximately 7 miles of PVC/HDPE weighing up to 16 tons on a single acre of tideland, covered by plastic netting. The industry uses the tubes over and over and eventually they crack, chip and probably release microchips of plastic onto the tideland. We previously sent photos of such tubes to the County planners.

   iii. Aquaculture operators shall routinely inspect and maintain predator exclusion devices.

   iv. Predator exclusion devices such as rubber bands, small nets, and area netting can be dislodged and pose a hazard to birds, marine mammals, and other wildlife and domestic animals, and thus are subject to Thurston County Public Nuisance regulations (Chapter 10 TCC).

   v. Predator exclusion devices shall be removed as soon as they are no longer needed to perform protective functions.
vi. Predator exclusion methods shall not be designed to intentionally kill or injure wildlife. Predator exclusion methods shall comply with federal and state regulations as determined by applicable federal and state agencies.

So it is OK if "predator exclusion devices" (i.e., wildlife exclusion devices) inadvertently kill or injure wildlife. We just want to make sure that the killing of native wildlife is not intentional. This is irrational.

vii. When determined necessary to minimize aesthetic and habitat impacts of large-scale projects, the County may require a phased approach to operation. This includes planting and harvesting areas on a rotational basis within the same tideland parcel.

So with a phased approach we get a basically permanent view of the PVC/HDPE plastics and nets—potentially, forever, because after 5 years, no permits are required.

o. Where aquaculture occurs on state owned aquatic lands, the project proponent shall contact and adhere to Washington Department of Natural Resources requirements.


a. In addition to the general development standards above, commercial geoduck aquaculture shall only be allowed where sediments, topography, land and water access support geoduck aquaculture operations without significant clearing or grading.

What is the definition of "significant" in this sentence and who determines what type/amount of clearing or grading is "significant"? The Thurston County planners have told us that they don't have enough staff to do any monitoring of the geoduck farms they permit. The one employee who spoke to us about this went on to say that they rely on citizens such as ourselves to monitor the aquaculture installations. Yet when we report violations of the permit, we are ignored.

b. All permits shall take into account that commercial geoduck operators have the right to harvest geoduck once planted.

There is no need for this type of statement in the SMP.

c. All subsequent cycles of planting and harvest shall not require a new CUP, subject to WAC 173-27-100.

As noted earlier, the operators can just use the tidelands for industrial aquaculture forever. Doesn't sound like a well-thought out plan for saving Puget Sound, our orcas and our salmon.

d. A single CUP may be submitted for multiple sites within an inlet, bay or other defined feature, provided the sites are all under control of the same applicant and within the Program's jurisdiction.

e. Commercial geoduck aquaculture workers shall be allowed to accomplish on-site work during low-tides, which may occur at night or on weekends. Where such activities are
necessary, noise and light impacts to nearby residents shall be mitigated to the greatest extent practicable.

Please define “mitigated to the greatest extent practicable.” Sounds like you are saying the operators can do whatever they want.

4. Additional Standards for Net Pens. Fish net pens and rafts shall meet the following criteria:

   After the net-pen disaster in Puget Sound, it should be obvious that they should be banned—that is if we want to save our oceans and our native salmon

   a. Fish net pens shall meet, at a minimum, state approved administrative guidelines for the management of net pen cultures. In the event there is a conflict in requirements, the more restrictive shall prevail.

   b. Alternative facilities and technologies that reduce ecological and aesthetic impacts shall be preferred to traditional floating net pens.

   c. Anchors that minimize disturbance to substrate, such as helical anchors, shall be employed.

   d. Net pen facilities shall be located no closer than 1,500 feet from the OHWM, unless a specific lesser distance is determined to be appropriate based upon a visual impact analysis or due to potential impacts to navigational lines.

   e. Net cleaning activities shall be conducted on a frequent enough basis so as not to violate state water quality standards.

   f. In the event of a significant fish kill at the site of the net pen facility, the facility operator shall submit a timely report to the Thurston County Environmental Health Section and the Thurston County Department of Resource Stewardship stating the cause of death and shall detail remedial action(s) to be implemented to prevent reoccurrence.

   g. New floating net pens shall be prohibited in Thurston County’s South Puget Sound jurisdictional area until updates to Ecology’s guidance on Recommendations for Managing Commercial Finfish Aquaculture is completed and can be reviewed by county staff to evaluate possible environmental benefits and impacts.

Other Notes:

In Andrew DelloIribis’ analysis of the GMHB’s decisions regarding the Pierce County SMP, for most of the items you refer to you say that “This is unlikely to be an issue in Thurston County.” We would specifically like to know how you determined what is important to the citizens of Thurston County and why you would so peremptorily write off any concern about these issues.

1. The petitioner (Taylor Shellfish) continually used the argument that Pierce County’s prohibitions related to aquaculture were “unsupported by science and technical information.” Judge Lasnik, in the recent ACOF ruling, appears to agree that there is not enough science, but his conclusion is opposite to that of the shellfish industry, i.e., he basically states that there is not enough science to determine that there are no impacts from shellfish aquaculture and that impacts are obvious to the observer.
2. Petitioner also states in “A” that “prohibition of aquaculture activities in areas abutting the Natural shoreline... fails to foster and give preference to aquaculture.” As we list above from the Department of Ecology website, aquaculture is not “THE” preferred use, as this statement from the industry implies. Other preferred uses include:

- Single-family residences
- Ports
- Shoreline recreational uses
- Water-dependent industrial and commercial developments
- Other developments providing public access opportunities

3. In most of the issues outlined by Andrew Defibis of Thurston County, the Petitioner, Taylor Shellfish, uses or attempts to use the arguments of “lack of science and technical information” and “preferred use of aquaculture.”

We wonder if the members of the GMHB looked at the concept of “preferred use” as outlined on the Department of Ecology website. Again, shellfish aquaculture may be “a” preferred use that apparently falls under the category of “water-dependent industrial and commercial developments” but it is not listed specifically as such on at least this page of the DOE website. It is not “the” preferred use that the industry wants everyone to buy into.

Hi Andrew,

Attached are the rulings by Judge Thomas Bjorgen and Judge Gary Tabor related to the AG Opinion that you posted on the SMP website.

We suggest that it would be honest and principled to include these rulings in your list of important documents for tonight's meeting. Ironically, Thurston County prosecuting attorney, Jeff Fancher, argued these cases and won against the shellfish industry. Now the County appears to support the shellfish industry. Please explain.

Please add the following Power Point to citizen concerns related to shellfish aquaculture.
https://protectourshoreline.org/slideshow/POS_ShellfishAquacultureConcerns.pdf

Kathryn and Patrick Townsend
Dear Thurston County Planning Commission,

Following is a link to the Protect Our Shoreline powerpoint detailing citizen concerns related to Shellfish Aquaculture. This powerpoint was created in 2006 and gives visual information about shellfish aquaculture in Puget Sound. As you can imagine, the tideland acreage being used for these activities is greater now than it was in 2006.

https://protectourshoreline.org/slideshow/POS_ShellfishAquacultureConcerns.pdf

Thanks,
Kathryn and Patrick Townsend