From: hwbranch@aol.com
To: ECY RE Shoreline Rule;
Subject: geoduck aquiculture re-formated and edited E0008
Date: Monday, October 04, 2010 3:53:58 PM

Cedar Bouta
Washington Department of Ecology

Re: Intertidal Geoduck Aquiculture.

I understand the Department of Ecology is re-visiting geoduck aquaculture in the intertidal zone. I believe the damage to the upper beach from this process is undeniable, given the scale and concentration of the work and the fact that so many PVC tubes and so much netting is involved. I also believe that management of supposed pests, which includes virtually all naturally occurring species, through the use of manual removal, herbicides, pesticides and shotguns, is damaging. Although work supposedly does not directly impact forage fish spawning, I believe that the proximity and placement of all these activities is undeniably impacting spawning.

Furthermore, I believe that the scale of methods of geoduck aquiculture are going to impact ecological processes in the intertidal zone, even when activities are not directly in the intertidal zone.

Taylor Shellfish has put forth a number of studies claiming that water quality, the marine food chain, water circulation and native species will not be effected by expanded shellfish cultivation, or that any effects will be beneficial. Studies claim that increased shellfish production will remove a percentage of the nitrogen introduced into the environment by humans. Nitrogen is suggested to be a major water quality problem by over-fertilizing algal blooms that die off and create anoxic conditions.

Nitrogen and sunlight are also the essential building blocks of life. Nitrogen is utilized by phytoplankton (primary production) which is then consumed by zooplankton and so on up the food web. This happens best in shallow water with persistent patterns of circulation, the basic estuary. In South Puget Sound we've altered three out of four estuaries (don't forget the streams). Often the entire estuary is fed through a long pipe and dissolved oxygen and other basic parameters take a dive. The problem as often as not is changes in structure to tide flats, salt march and the upper beach

rather than the introduction of too many nutrients.

Shellfish don't eat nitrogen, they eat phytoplankton that has consumed nitrogen. Because phytoplankton reproduce rapidly, there is only a temporary lag in abundance. Taylor's studies thoroughly evaluate the potential effects on phytoplankton abundance spatially, seasonally and diurnally. The limiting factor in typical system is primary production. The rationale is that by assessing the impact on primary production we can predict impacts on the entire food web.

I don't believe this is true. Shellfish including mussels and geoducks that are grown commercially don't just eat phytoplankton, they eat zooplankton, from tiny protozoa that mimic phytoplankton to larger fish larvae, tiny insect-like babies that will become larger fish, crabs, barnacles and so on. Nearly all fish consume zooplankton during their larval phase and some fish continue to do so their entire lives. A single herring may consume thousands of copepods in a single day. Larger Zooplankton are important food for forage fish and growing fish larvae. They link primary producers with larger, higher trophic level animals. Because zooplankton reproduction tends to lag phytoplankton reproduction, the reduction in nitrogen contained in phytoplankton is probably more than offset by a reduction in herbivores such as copepods. Copepods, probably the most plentiful creature on earth, are the natural control of phytoplankton; they maintain balance in the system. The only benefit of large scale shellfish cultivation, if one can consider is a benefit, is that phytoplankton, herbivores and secondary consumers, i.e. everything, is reduced.

Taylor suggests that water quality in Totten Inlet has been impacted by, among other things, humans over-harvesting shellfish. Since we haven't been assessing dissolved oxygen for very long, this theory is entirely conjecture. Concerning the most basic, physical parameters, much of Puget Sound and Hood Canal is fjord-like. It's perfectly natural for the water column to be stratified and anoxic below a certain depth.

Taylor could make a better case that by over-harvesting resources and altering the structure of Puget Sound through dredging, filling and destroying almost all our estuaries, we damaged the ecosystem and shellfish growers are only filling an empty niche. But this would be a disjointed, weak argument as well. The sustainability of an ecosystem comprised of three kinds of bivalves is doubtful at best. Compacting and biological sameness create an environment where diseases can easily

spread. Outside influences such as acidification pose additional risks. And if any species crashes there may be nothing to replace it except bacteria and perhaps jellyfish.

Shellfish cultivation on area beaches without doubt impedes a host of important ecological processes including forage fish spawning. Virtually all native species, from ghost shrimp to macro-algae to diving ducks, are considered pests. This modus operandi runs antithetical to Ecosystem Based Management, the direction we are and must be heading.

We don't know the economic potential of all the fisheries that could be developed through restoration and enhancement of Puget Sound's natural ecosystems. It seems likely that rockfish, flatfish, salmon, herring, smelt and shellfish in combination would be marvelously productive. Sadly, estuarine and nearshore structure continues to suffer the woes of development. But this is no reason to allow shellfish cultivation to wreak havoc on what's left. "Geoduck farm" sounds so benevolent. But this isn't anything like farming. If anything we're talking about feed lots.

I have been a licensed captain in the past, operating charter, research and education vessels. I currently own a boat and am intending to offer educational cruises. I'd like to offer these cruises in South Puget Sound but I'm concerned that there will be little for customers to see. I can show them photos of scoters and other ducks and explain that twenty years ago this is what we would have seen. I believe that shellfish growers have shot what few ducks were remaining. Although they claim to not currently be doing this, the reason as explained in their latest pest management documents is that they are not permitted to do so. One can only assume that if the prohibition were lifted they would return to shooting ducks. Virtually all naturally occurring species are considered pests.

My family owned the oldest vineyard in the State on Stretch island. Their house and my aunt's house next door overlooked Puget Sound. The beach was beautiful and enjoyed by all. I don't know if it is now covered with PVC and netting. If I find out that it is, my heart will sink. It must be very sad for people who live on the waterfront to have to witness this assault.

Sincerely,

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