

Reasons Why 2022103702 Geoduck Aquaculture Project Should Not Be Approved

**Prepared by
Protect Henderson Inlet
an environmental nonprofit organization**

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Introduction:

We appreciate the opportunity to present this information to Sharon Rice, Hearing Examiner for Thurston County, as we believe that we have unique perspectives about the scientific facts pertaining to geoduck aquaculture, facts that have been systematically overlooked and misinterpreted. A full presentation of these facts would require far more than the 50 minutes allotted to us, and we can only present a summary of those arguments today. The full presentation copy can be read in Appendix A.

You've heard the pronouncements from the County and Taylor Shellfish about how wonderful this project will be for us all. However, it's time for a reality-check. It just isn't so, and I want to tell you why this project should not be approved.

Protect Henderson Inlet (PHI) is a registered 501(c)(3) organization in the State of Washington with primary goals of education, restoration, and prevention of harm to the environment, particularly Puget Sound and with focus on Henderson Inlet in Thurston County. Our website is at www.ProtectHendersonInlet.org.

PHI does not oppose aquaculture, recognizing that oyster and clam cultivation has occurred within the Salish Sea for thousands of years. We recognize and respect the rights of native peoples of the region. We recognize that commercial shellfish

growers produce food for us, that their industry provides other benefits to the region. We recognize that sometimes natural resources must be used for the good of the people and can negatively impact the environment. We believe that geoduck aquaculture does not represent a reasonable tradeoff for the environmental damage it does.

Based on thorough review of relevant science, PHI opposes the current methodology of geoduck aquaculture, a lucrative, but invasive practice with little local benefit. We are also highly concerned about the largely unknown cumulative impacts from rapid expansion of commercial aquaculture in the South Puget Sound and the potential impact of an industrialized waterfront.

Today, topics for presentation include:

- A Review of SMA/SMP Principles
- Misunderstood Science – why the Geoduck Aquaculture Research Project (GARP) report and other scientific studies do not actually support geoduck aquaculture.
- Impacts on forage fish from geoduck aquaculture
- Health Threats from plastic products used in geoduck aquaculture
- Negative impact on a beachfront marine education program for kids of Southwest Washington

Before beginning these presentations, I'd like to suggest some principles that frame these arguments:

1. From the Thurston County SMP "The applicant bears the **responsibility** to prove that their actions will be in compliance with the criterion set forth in regulations."
2. There can be no net loss of ecologic function from the applicant's actions

3. Fran Lebowitz said, “Think before you speak, **read** before you think”. To see the truth, simply read the material. Verify that what we say today is true.
4. In the words of Jack Reacher (or Tom Cruise, if you will), “**details matter.**”

Misunderstood Science

One year ago, I learned of Taylor Shellfish’s plan for Johnson Point Loop and resolved to learn more about it by studying the science. I am a scientist with extensive practical experience reading and evaluating scientific articles. At first glance, it seemed that science supported geoduck aquaculture, but when the details were studied, a much different story unfolds.

We will look at details of these scientific works:

- The Geoduck Aquaculture Research Project (GARP) 2013. Appendix 1B
- Shellfish Aquaculture in Washington State – Final report 2015 Appendix 1C
- Programmatic Biologic Assessments from NOAA and the Washington Division US Army Corp of Engineers Appendix 1D and 1E
- Assessing Potential Benthic Impacts of Harvesting the Pacific Geoduck Clam ...in British Columbia, included in Taylor Shellfish’s submission to Thurston County. Appendix 1F

For too long, the truth of the science has been misstated by government and industry. I am not the first to notice this.

Please read the scathing rebuke by Federal Judge Lasnik in his 2019 ruling against The US Corp of Engineers and Taylor Shellfish, in which he calls them out over their abuse of science. Referring to environmental impacts of aquaculture “Although the minimal impacts finding is repeated throughout the Corps’ Decision Document (see NWP003038, NWP003045-46, NWP003049, NWP003051, NWP003091, NWP003107), it is based on little more than selectively chosen statements from the scientific literature”. And ... “conclusory findings of minimal individual and cumulative impacts are not supported by substantial evidence in the record”. Appendix 1G

There were three scientific articles specifically cited by Taylor Shellfish in their arguments to the Thurston County Planning Commission in 2020 against restrictions being considered on geoduck aquaculture. In the letter from lawyer Dianni Taylor E, she stated “These studies demonstrate that, similar to other forms of shellfish aquaculture, geoduck farming does not have significant environmental impacts when properly managed.”

If you believe this false statement, you have been hoodwinked by an industry intent on regulatory capture.

Details matter, so let’s get into those details

The GARP Report

The GARP report is the most widely cited work concerning the current practice of geoduck aquaculture, and is referenced repeatedly by Taylor, the Shellfish Hearing Board, county governments, and hearing examiners. On detailed review it appears not to have been understood, or perhaps not even read by all. The lack of understanding of GARP is appalling. It does not claim that geoduck aquaculture is safe for the environment. Most of its findings are either negative or inconclusive towards establishing geoduck aquaculture as environmentally safe.

In fact, GARP’s exhaustive literature review sums it up well:

“There is a dearth of peer-reviewed information on *P. generosa* and its congenitors. This is particularly true for intertidal *P. generosa* in Puget Sound as no Washington State regulatory authority currently surveys intertidal geoduck.”

The research added by GARP adds little to this understanding, and only offers a glimpse into the effect of geoduck aquaculture on the environment.

Please *read* the GARP report, especially the recommendations section 4. Please also *read* the actual peer-reviewed scientific articles (not just the abstracts or

summarized versions in GARP) for the VanBlaricom and McDonald scientific papers finally published in scientific journals in 2015. See appendix H and I. *Details matter.*

The good news:

The GARP report does *suggest* that in a general sense, Puget Sound beaches are pretty resilient, and that the constant need to adapt to the harsh marine environment allows the inhabitants of the beach to bounce back after insults like the harvest phase of geoduck aquaculture.

The Bad news:

Unfortunately, there is no provision in this permit for such recovery. The permit applied for is perpetual, and geoduck operators prefer to immediately replant their sites with no fallow period. See notes from Seattle Shellfish/James II permit approved by you in July 2023. Eelgrass recovery is estimated at 5 years. Recovery of the other many species found in the beach is simply unknown.

Details that matter:

The literature review attached to GARP report cites scientific work that found 165 species on a typical sand/gravel beach. When this is used as a standard, both of these studies are extremely limited in that they scientifically assessed only a few species.

The Vanblaricom study identified 50 species, but only was able to generate statistics for 10 (20%). Of these 10, 3 were markedly reduced but “not to the point of extinction.” This is highly significant. 30% of the species evaluated were significantly reduced. Compared to the reference beach, that’s only 6%.

The McDonald study identified 68 species, but only 12 (18%) or 7% of reference beach were statistically evaluated, and the invasive harvest phase was not even included. Even the abstract calls this paper a “first look.”

As an example of the limitations of these studies, sand dollars, present by the thousands on our Henderson Inlet beaches including the proposed site, were not a studied species and will be purposefully removed during the planting phase of geoduck cultivation, eventually wiped out at this site.

More bad news:

The section of the report based on research from Drs Reusink and Horwith clearly shows that the harvest phase of geoduck cultivation kills eelgrass, and there are now major restrictions in place throughout Puget Sound because of this finding. While there is no native eelgrass in Henderson Inlet, these same authors also reported suspicion that whatever killed the eelgrass had more widespread negative impacts and recommended further investigation. This has not been done.

The bottom line is that these papers, which make up the main argument cited by industry that geoduck aquaculture is harmless, even in the most optimistic light, are weak. They do not have the strength to justify this invasive practice and do not establish *no net loss to the ecosystem*.

Unfinished work:

The recommendations of GARP in section 4 are incredibly important. First and foremost, the 21 authors and contributing scientists in their Section 4 conclusion, “Research Priorities & Monitoring Recommendations,” called for cumulative long-term studies to understand what happens when the same site is replanted or when a second site is placed near the first. None have been done. Instead, we have witnessed massive approval of permits for permanent geoduck aquaculture sites.

Genetic impacts: we know almost nothing

Assessment of the potential impact of geoduck aquaculture on native geoduck stocks was one of 6 priorities for the GARP study by legislative mandate, but *they did not study it*. This is highly relevant information, as the State of Washington sells contracts for harvest of wild geoduck in subtidal, state owned waters for substantial profit, with revenues going to the general fund. This legislative order to study the possible impact of hatchery geoduck stock raised in the intertidal zone was unfulfilled, as was the related mandate to assess sterile triploids for hatchery use.

Importantly, the GARP report did cite other studies that prove cultivated geoduck are reproductively active within 2-3 years.

A 2019 Sea Grant sponsored paper, *Effect of Geoduck Aquaculture on the Environment: A Synthesis of Current Knowledge* continues to raise alarms. <https://marine-aquaculture.extension.org/wp-content/uploads/2019/05/Effects-of-Geoduck-Aquaculture-on-the-Environment.pdf>

- “Hatchery-reared shellfish may differ genetically from their wild counterparts for multiple reasons”
- “wild geoduck populations have high levels of genetic variability that could be perturbed by an influx of cultured genotypes.”
- “Even if broodstock are collected locally, hatchery populations may differ from wild populations owing to random genetic drift or different selective pressures in the hatchery. These differences may reduce the fitness of cultured geoducks and cultured–wild hybrids in the natural environment (Lynch and O'Hely 2001, Ford 2002). As the differentiation between wild and cultured populations increases, the potential for negative genetic interactions between wild and cultured populations increases.”

We have no idea what the long-term effect of intertidal cultivation of millions of geoduck of limited genetic diversity will be to native geoduck locally or throughout the Salish Sea. This could have the same negative effect that has been seen from hatchery salmon on wild stocks. *The applicant bears the burden of proof, and they cannot prove either that there will be no net loss of ecologic function or that mitigation of these effects is possible.*

What we really know from GARP:

You will see when you look closely that this is early work, only partially done, and that the majority of findings were actually negative or inconclusive towards geoduck aquaculture.

- Planting on or near native eelgrass is prohibited because of GARP
- The two scientific studies funded in GARP represent early research, and although honestly performed, are weak; they do not have the strength in scientific terms to justify this practice on an industrial scale
- The cumulative impacts of repeated cultivation of geoduck at the same site or addition of nearby sites remains completely unstudied despite the strong recommendation for such in GARP
- The mandated evaluation of impact on genetics of wild geoduck was not done and remains an unknown

Other Science

Let's look at three other scientific works which are said to support geoduck aquaculture, but on review do not.

1. In December 2015, Washington Sea Grant issued the 84-page Final Report to the Washington State Legislature titled *Shellfish Aquaculture in Washington State*. Within that report are several scientific papers including *Evaluating Trophic and Non-Trophic Effects of Shellfish Aquaculture in the Central Puget Sound Food Web*, lead author Bridget Ferriss, P Sean McDonald included. Appendix G

In this paper, the authors used the same data previously obtained by McDonald in the GARP report to computer model outcomes from a 120% increase in geoduck aquaculture. They projected up to 20% change in other animals with some members increasing or decreasing by more than 20%.

Please see the attached graphic showing major decreases in small crabs, wild salmon, Walleye pollock, resident eagles (including bald eagles), resident birds, migratory eagles, great blue herons, and predatory gastropods, some of the decreases resulting from a decrease in small crustacean and demersal fish. This effect was especially prominent in birds. These effects predicted for Central Puget Sound would likely be greater in the more densely cultivated South Sound.

They concluded:

“the impact of antipredator structure (PVC tubes and nets) placed on geoduck plots had a larger influence on the surrounding food web by providing predation refuge or by changing foraging opportunities. In turn, these effects propagated throughout the food web.”

They go on to note that the model predicts substantial decrease in most bird groups from “bottom-up” effects (meaning impact on food sources)

including “most seabirds”. This is a reminder that the Marbled Murrelet is listed as protected by the Endangered Species Act (ESA) and is listed as a resident of Thurston County in the US Army COE Programmatic Biological Assessment. Additional listed species under the ESA in Thurston County include Bull Trout, Chinook Salmon, Steelhead, Boccaccio, Yelloweye Rockfish, Canary Rockfish, and Southern Resident Killer Whales.

This is important – the same data used in the GARP study makes dire predictions of what happens when modeled for expansion in the Ferriss study. Either way, this science does not prove geoduck aquaculture to be environmentally safe – indeed, it suggests quite the opposite. Empiric research has not been done, and we cannot suggest mitigation for effects that we don’t fully understand.

2. Next, let’s look at the Programmatic Biologic Assessments (PBA), both from NOAA and US Army Corp of Engineers Seattle District prominently cited by County and Industry.

Please keep in mind that the reason these Programmatic assessments are done is to evaluate a proposed activity like aquaculture for impact on species covered under the Endangered Species ACT (ESA). Their conclusions do not specifically endorse geoduck aquaculture, and details in these 400+ page documents outline many negative impacts on the environment. Let’s look at some details:

In the cover-letter from NOAA to the Corp of Engineers, the NOAA west coast regional administrator sums up effects of aquaculture and includes this statement – “NMFS also concludes that the proposed action is likely to adversely affect Puget Sound (PS) Chinook salmon (*O. tshawytscha*), Hood canal summer-run chum salmon (*O. keta*), North American green sturgeon (*Acipenser medirostris*), and their designated critical habitat.”

Regarding Puget Sound Chinook Salmon, it states in section 8.1, “the action would result in temporary in-water disturbance and noise associated with human activity and degradation of water quality such as increases in suspended sediments. These would occur broadly throughout the action area and occur on nearly daily basis for the 20-year period of the PBA

including when juvenile Chinook Salmon are present. These activities would displace juveniles.”

NOAA Section 7.1.4 titled Benthic Community states “Each phase of the aquaculture activity... results in physical disturbance of the benthic community and often a temporary decrease in abundance of many infaunal and epifaunal species” and gives multiple scientific references. Given the principle of no net loss of ecological function, the issuance of a perpetual permit, with no fallow period to allow for recovery of the beach is unacceptable and ignores the GARP report’s recommendation for cumulative impact analysis.

In section 7.1.5 Fish and Birds it states “In-water activity, noise, and increases in suspended sediment would displace many fish species and birds from localized work areas”. We will further discuss these factors in our presentation on forage fish. ”

The PBAs *mandate* mediation, but have also been sharply criticized in Federal Court for minimizing environmental impact.

3. Last, the paper submitted by Taylor Shellfish to the Thurston County Planning Department, Assessing Potential Benthic Impacts of Harvesting the Pacific Geoduck Clam ...in British Columbia is worthless in this argument. When *details* are examined, one of the two test sites was subtidal and has no relevance to this discussion. At the other, intertidal site, there were *no* geoduck harvested. There was a *simulated* harvest of only 500 square feet from which data was extrapolated. Basic mathematics show that this test site would represent only 1% of a typical 1-acre geoduck plot. There was no evidence presented that their data was scalable or relevant to this application. Including this paper is a typical industry tactic to obfuscate the truth surrounding geoduck aquaculture.

In summation of this review of available science, there is insufficient evidence in the scientific literature as cited by Taylor Shellfish or government that the current practice of geoduck aquaculture will have minimal impact on the ecosystem of Henderson Inlet or the greater Salish Sea. There is ample evidence of harm and potential harm, and there are many unanswered questions.

The burden of proof is on the applicant. When the details of the 10-year-old GARP report, the primary support document of Taylor Shellfish's argument, are reviewed, along with other science, **this research is insufficient to justify any permit for this invasive practice, much less one with no expiration date. The applicant cannot prove no net loss of ecologic function, nor can they prove that their actions can be mitigated.**

We, the members of Protect Henderson Inlet, recommend that you **not approve** this application for a 3.6-acre geoduck aquaculture project at Johnson Point Loop in Henderson Inlet.