

Meeting Notes

Shellfish Aquaculture Regulatory Committee

May 5, 2008, 2008

9:15 a.m. – 3:45 p.m.

Ecology Headquarters

Lacey, Washington

Members Present: Diane Cooper, Ward Willits, Sarah Dzinbal, Morris Barker, Nick Jambor, Bryan Harrison, Bruce Wishart, Eric Hurlburt, Jeff Dickison, Laura Hendricks (alt), Blain Reeves (alt), Rich Childers (alt), Dave Risvold (alt)

Ecology Staff: Perry Lund, Jeanne Koenings, Tom Clingman

Interested Agency Staff: David Fyfe (NWIFC), Cathy Barker (DOH)

Other Interested Parties: Bill Burrows (Harstine/Stretch Island), Marilyn Showalter (property owner), Kris Mansfield (Harstine island), Cinde Donoghue (Thurston County), Jennifer Hopper (Taylor Shellfish)

Presenters: Raechel Waters (Sea Grant), Brian Phipps (Taylor Shellfish), Celia Barton (DNR)

Facilitator: Annie Szvetecz, Department of Ecology

Note taker: Candice Holcombe, Department of Ecology

Introductions

Committee Business

(Perry Lund, Ecology)

Review Agenda:

- No comments. Approved by consensus.

Announcements:

- Today Morris will be distributing copies of what's in DFW's system regarding production and acreage
- Rich Childers is Morris Barker's new alternate for DFW.
- Sally Toteff (Ecology) will be represented by an alternate at the June meeting. It may be someone other than the regular alternate.
- Diane will be gone in June as well – her alternate will be here.
- Ecology staff will be out of office for a work training the rest of this week, so follow-up materials may be delayed by a few days.

Sea Grant Update: (Raechel Waters, Associate Director)

- *This presentation will be posted to committee website.*
- Seven preliminary proposals were received; seven full proposals were received.
- Four projects were recommended for funding in the 2007–2009 biennium. Two are being combined as a large integrated project.
 - **First project: Geochemical and Ecological Consequences of Disturbances Associated with Geoduck Aquaculture Operations in Washington:** Large,

- integrated team of researchers from Univ. of Washington and Univ. of Maryland, examining environmental effects of structures and harvesting.
- **Second project: Cultured-Wild Geoduck Interactions:** A five-year study that will provide baseline data on disease prevalence in wild geoduck populations (Years 1–2) and use of sterile triploid geoducks (Years 3–5). Researchers from UW.
 - **Third project: Resilience of Soft-Sediment Communities after Geoduck (*Panopea abrupta*) Harvest in Samish Bay, Washington:** A four-year focused study that will examine the unique conditions in Samish Bay where a new eelgrass meadow has established since geoducks were outplanted in 2002. Project will address the effects of harvest and out-planting activities. Researchers from UW.
- One project was recommended for funding later in the program.
 - Two projects were not recommended for funding - outside of the scope of the SSHB 2220 research priorities.
 - Sea Grant expects projects to have discrete results at the end of first biennium, will continue from there with available funding.
 - Working to coordinate with other ongoing research, supported by both Sea Grant and National Marine Aquaculture Initiative to avoid duplication (see slide for more).
 - Data collection on the eelgrass study has already begun – the others are ready to start.
 - Will have annual reports for each project – continued funding will be contingent on the continued progress of research. Each research team will provide web presence on the Sea Grant site (for example, through a blog, reporting preliminary data, posting photos...)
 - Amounts of money to each project: \$650k total:
 - Integrated structure/harvest study: \$431,000
 - Eelgrass study: \$85,000
 - Disease study: \$134,000?
 - Most of the UW researchers are providing in-kind time.
 - The large team will begin site selection today – will report as soon as possible.
 - Samish Bay site (eelgrass): Harvest was set to begin today, but rainstorm caused delay – won't start until Wednesday now. They have delayed harvest since April to allow baseline data collection in April.
 - See presentation slide 13 for program timeline.
 - Project summaries, updates and preliminary results will be provided on the WSG Web Site at: http://wsg.washington.edu/research/geoduck/current_research.html
 - **Questions:**
 - (Laura) With multiple harvesting, will research be fit to how it's actually done? A: Yes, we're sampling pre-harvest, during harvest, post-harvest. And continuing through subsequent pass-throughs and outplantings.
 - (Laura) Are you looking to find farm areas with adjacent control areas? A: We're looking more at distance of the response, to see how far away the response extends, and the timing of response.
 - (Laura) Has anyone talked about depth strata analysis? A: Eelgrass study will be coordinating with large study to make sure techniques are compatible; all

are doing coring and stratified coring, will be looking at both cross-shore and alongshore gradients

Potential Guidelines – Presentations and Discussions

Site preparation & Predator Exclusion (Brian Phipps, Taylor Shellfish)

- (Brian brought equipment to demonstrate.)
- The only things we've ever done to prepare a bed is to remove dead oysters shell with a rake, and used a boat or barge to load shell onto. We must remove anything hard that would prevent us from inserting the tube.
- Bruce clarifies that Brian is speaking for Taylor only. Says he has heard that some growers actually grade beaches. Brian: I've never heard of anyone doing that. We will clear sand dollars in order to avoid killing them. (We've have tried to grow geoducks in sand dollars and it doesn't work.) We transplant the sand dollars to an area with the same substrate, but inadequate depth for geoduck.
- Is vegetation a limiting factor? Diane: The best beaches for aquaculture are sandy, flat, clear, but that's not always the case. Perry: So there's no conflict with vegetation? Brian: We can't plant near eelgrass – we have a buffer.
- Sally: Do you encounter other debris that you have to remove (tires, etc.) Brian: We've picked up an average of 100 tires on semiannual beach cleanups.
- Sally: When sand dollars are moved, do you check back to see how healthy they appear? Brian: Well, they're still there – you see a few dead ones, but not many.
- Diane: Not all farmers will transplant sand dollars. We need to maximize the ground to be farmed.
- Bruce question to Raechel – are you looking at harvest only? Raechel: The 6-year program will follow entire the culture cycle: pre-harvest to outplanting.
- Diane: Obviously there are effects to what we do, both positive and benign. We're putting species there that weren't there before.
- Brian shows tubes (4 or 6 inch), individual nets, and large nets that hold tubes in place (to avoid debris) and protects. When we pull the tube, we lay net on the ground – crabs can't get through it, but geoduck can still feed through them. Survival rates are low using only a net and no tubes.
- Q: What's the difference between tubes? A: 6-inch tubes let them spread out a little more, 4 inch tubes cost half as much.
- Materials: These are nylon – some people use vexar. Nylon doesn't rip as easily. We were putting down 18 pieces of net with rebar to hold it down instead of....
- Do you sometimes switch netting types? A: In springtime we will buy 20 x 20 instead of 40 smalls nets....
- Are there any options for more natural materials on predator exclusion devices? A: Some farmers are doing studies on biodegradable tubes, etc (like peat). Initial results show that adding more organic matter to the environment will degrade and affect the ecosystem. Ended up with an organic anoxic area, which is not good for geoduck or the environment.
- Bruce: Are you interested in controlling moon snails, etc.? Is this the limit of predator control, or are there other species you need to keep out? A: Nets do keep moon snails and starfish out. We leave the larger net on for a couple of months after removing tubes, but then the geoduck are on their own.

- Types of predators: red rock, Dungeness crab, scoters, ducks, starfish, moon snails – we use different devices for different types, but these are all that we use.
- Amount of rebar used? Just a couple of pieces? A: I think it's one piece every ten feet. I'll have to get number on that for you. We went from using a T-shape to more of a J-shape, because T's would break. 50x50 parcels, 4.5 per side.
- Have you done any testing on iron oxidizing in the water? Answer: No (?)
- Vegetation: Pierce County application – video showed tremendous amount of vegetation – comment was that because there's no eelgrass, there's no problem. Are you removing gracilaria, red algae, green algae, etc? A: According to the info we got from Ecology, there are 525 acres of geoduck. I know I'm one of the largest players, I have ~83 acres, plan to go to 100. I haven't removed anything other than what I've talked about.
- Are geoducks, clams, and oysters on the same site? Yes.
- Are they forage fish areas? A: I know our plantings don't go above +4 or +5. I don't know. I just plant where they tell me to.
- According to Ecology info, geoducks average from -4.5 to +7... A: No, we go to -2.3: geoduck to +2, then a couple of feet of clams and oysters. Maybe a +4.
- Diane: This is about predator exclusion, not manila and oysters.
- Bryan H: Are they all a standard 6-year harvest, or does it depend on the site? A: Yes, depends on site could be 5–6 years.
- Do you let a site lay fallow for any period, or quickly rotate it back into production? A: I'll replant as soon after harvest as I can. Sometimes if harvest is at end of summer, it must sit until next spring. We've done both, replanted immediately and waited a year.
- How frequently do workers come in by land vs. by boat? A: 90% by boat. Foss farm has their own road, so we use it. Stretch Island site has upland access through a homeowner.
- What is the general predation rate without exclusion devices (i.e., natural). A: We're lucky to have 50% of original seed survive to harvest.
- Sarah: I think there's a misconception about what you do with tubes after they're not necessary. Some seem to think you dispose of them, but they're actually collected and re-used, yes?
- Brain: Here's what we do: We bring the tubes in by barge, set them up on the beach using ropes to get them straight. We stand on the tubes with our feet and wiggle to get them to go down. To remove the tubes, we pull them by hand, then put them on a barge, and let them sit until next year.
- Do you have any method of tube accounting? A: Yes. The person stomping keeps track and the planting person counts, to get a cross-reference. And the puller keeps track and enters that number so we can see if we lost any. We just started this a few years ago so we don't have any numbers yet on loss rate.
- Perry: I'm hearing that tubes are in for about 18 months, nets for 2 years. Are there absolute minimums? What if Pierce County said you had to have tubes out in one year? And the nets in 18 months. What would that mean for you, what would be the consequences? Answer: On the tubes, we've been doing this for 15 years. To make a living, we are right where we need to be with that. We leave tubes and nets in for as short a time as we can. What if we come up with a new technique that doesn't involve tubes? Do you have to convene again to figure out new guidelines?

- So you think 18 months is the upper limit (nets or tubes)? A: Yes, but some people leave them in for 2 years. Perry: We may need to avoid leaving it too open-ended.
- Nick: Does everyone plant at about the same time so everyone is on same cycle? What drives when the tubes come out – size of geoduck? How do you keep track of tubes you've taken out? A: We have big white bags, put 100 in each, put them out back on our property. For planting, we're dependent on when we get seeds. Sometimes we do plant in August. Depth of geoduck is 12-16 inches is where they should be to be clear of predation.
- Ward: Have you done any netting or planting of geoduck underwater with divers? A: I don't know.
- Clarification on sand dollar removal? A: It depends on tidal height – higher than +2 we'd leave it. If lower, we'd remove what we need to and leave rest. We have only removed sand dollars from a few sites.
- Once installed, how often are nets cleaned? A: We remove after the first year, put the other large mesh one down. Then remove tubes and put this one down (which?) The net is down, sand covers it. I've read about some growers needing to clean algae, etc. after some time. If we planted in May and come back next May to remove this one, then 6 months later when we remove tubes, we put it back for a couple of months. Not enough algae build up to hurt anything.
- Laura: You're creating an artificial habitat – when you remove the net, you're removing that habitat, which is fish habitat. How often is the net coming off, being cleaned and being removed? Answer: 2 removals over two years. When we started there was nothing there, now there's fish habitat there. Are you saying we shouldn't take it back to its original condition?
- Diane: Guidelines, timelines, etc. Suggest we look at performance rather than specific prescriptions, for example “tubes must be removed when there's no farming going on.” Until we know if there's any problem with their presence during use, why set a limit on it? Guidelines should look at outcomes rather than prescriptions. Different growers do it differently.
- Bryan H: Question about big vs. small nets. Is industry doing research on a better way to encapsulate over individual tubes--screw top with holes, for example--to get away from nets?
- Brian: We started with individual nets. Tahoma Audubon wanted the single nets if eagle's nest is in the area so fledglings can't get caught. We are trying individual tunnels instead of tubes. Someone tried some kind of cap over tube, but didn't stay on. But yes, people are trying different things.
- What determines elevation of planting? Site conditions?
- Sarah: Anything lower than extreme low tide -3.4 to 4(?) is probably DNR land, except for Bush-Callow Act lands.
- Do you get fouling on vexar more than nylon netting? A: Can't say - I've only used vexar on manila clams. It rips too easily on tubes to use for geoduck.
- How often does harvest NOT happen in 20 consecutive days? A: We try to get it done quickly, so we can replant, but some circumstances can delay (e.g., a closure).
- Bruce: Do you rake the entire beach? And how deep? A: We scoop sand dollars with the shovel rake. If it's real rocky on top, we'll remove rocks.

- Jeanne: Some growers will harvest wild geoduck on beach before planting, yes? A: Before planting you have to bring the tribes out to inventory so they get 50%. Sometimes we'll harvest just to give tribes their 50% other times we'll...
- Perry: regarding the storage of tubes during downtime, the big bags. What are you doing with them when they're not in the ground? I've seen pics of them being put on barges and then the barges sit. Do you have a warehouse or are they sitting on the water? A. We have an area behind our plant. Ours are not on the water. I know that there was one barge, up in Pierce County on a spit that got bashed in storm and we had to go rescue it – there were tubes on it.
- When you're in transition – how long would they be in bags on a barge being moved around? When we get photos of barges with bags of tubes, are they just in transit? A: When we're stomping we usually load up the day before – we'll go out and stomp them – one day – then we'll go reload it again – it's moved and put back every day – if we have two, it's every two days. When you're pulling, it's going to be empty at night, filled during day in winter. We unload after the tide. Depends on the site we're farming. We might get it there a day early.
- Do you take care to store those in a way to not ground out? We will put them on barges on the beach, then we're setting the bags of tubes out. How large of a barge? 12 or 14 x 48. When not being used, stored at plant.
- Bruce: There's a lot of discussion about tubes – they're most visible aspect of operation. I'm concerned about site preparation. When you're removing rocks, shells, woody debris— like what a farmer would do to plow fields— it's a pretty dramatic transformation of nearshore habitat. You can't remove all those materials without impact – crabs need rocks as shelters from predators – for example. Need to look at this more closely. I'm okay, depending on scale of operations. What concerns me is that we're not looking at cumulative impacts. If it's done on large scale, if this material's removal happens across an entire bay, the impact would be far reaching.
- Laura: What are the PVC tubes made of? A. Not sure exactly. They're from PW Pipe out of Fife.
- Laura: I've have scientist asking me what we're doing about nearshore habitat, fish habitat. If you're putting them in forage fish areas, critical salmon habitat... You should be free to do what you need to do to make money, but scale and site selection are key. Appendix E and H talk about diking and stream channeling you do with stream culture and clam culture – if you were in fact putting oysters and clams above geoduck. If you're combining the three species on one site, this is severe alteration of the nearshore.
- Morris: Having PVC tubes out of water and in storage – reduce spread of drills (?) There is value in having it sit there rather than immediately rotating it back into water. They're usually out for 6 months at a time.
- Diane: I think Bruce has impression that we go into these farm areas and prepare the whole bed, and we don't. How many beaches do you have to do removal of materials? A: I've only removed sand dollars on 4-6 beaches. Not many. The beach does not get tilled as a standard course of action. Geoduck can't grow on rocky beaches. They need sandy environment – we might just have a single sand dollar bed or a large rock to remove.
- Could have a BMP that you don't remove materials from any beach. Even on a sandy substrate, would have quite a few rocks. Would you be comfortable with that, agreeing to not remove rocks, woody debris?

- Ward: We've had geoduck farming in our neighborhood for 10 years or so. I've never seen them do more than a couple of pitchforks of sand dollars. They want sandy beaches, so there isn't too much material to remove. They are planting on sandy beaches to begin with.
- Laura: We're only hearing from one grower – we can't assume this isn't happening because one grower says they don't do it. I have two emails saying they use a gator (?) to take all rocks off the beach. A property owner has said the grower prepares the beach like a pasture, clearing everything off.
- Nick: In my bed in Willapa, we sometime get big logs coming down. We need to take into account different situations and not try to quantify limits too rigidly.
- Diane: I invite the committee to come to a site and watch site prep, etc., so you can see what's actually involved.
- Bryan: Do we have good enough resources for local govt' to...? If we say "Do area-wide nets except when ...", is there good enough data and resources to know when that's the case?
- Morris: There is info on a state level they can draw on, and we're always adding to it. I don't know whether it's sufficient for all locals. Lots of info on forage fish, herring timing, salmon migration, nesting for herons, eagles.
- Sally: On the BMP for no removal of vegetation or rock. Would like to add that length of time on tubes, nets, monitoring sites to make sure predator exclusion isn't going off site, that we look to some language on a BMP that's not 100% prescriptive, could set limits/standards, then add "unless otherwise specified in a permit".
- Diane: I want to make sure as we move into guidelines, that we look at "why" behind guidelines. We can set better parameters if we understand the reason behind them.
- *Note: Laura Hendricks requested the following be added to the notes:*
- Do the geoducks that are planted furthest from the bank grow better? Brian: Yes.
- Do you know why? Brian: No.

Baseline Data Collection & Recordkeeping (Celia Barton, DNR)

- Passing around two papers, which are only a portion of the BMPs: summary and recordkeeping.
- I would call these pre-leasing conditions more than baseline data collection – things we would make lessee do before entering into a lease. On a geoduck RFP, there needs to be upfront info; people need to be prepared to be held accountable for a long list of things we will require. Certification and insurance: telling people that at proposal submittal, we want to make sure you understand you will need to do this. They come in with initial application, saying yes, I understand what I will have to do.
- #6: Get all necessary permits, provide land survey, baseline and biological survey on existing resources, insurance and bond. If they get a lease, will have to keep up with reporting and recording requirements in BMPs, comply with BMPs.
- #8 abide by tribal sharing and notification requirements (court ordered).
- Land Survey: must be done by licensed surveyor. Can be extensive and difficult – cost is variable – no less than \$3k, even if markers are close. Need to show tidal depth, meander line, name of title benchmarks, and at minimum must show where extreme low tide crosses lease areas. Submitted to DNR survey office – needs to be reviewed and

- Has a list of survey requirements – Sarah will send them to Ecology to post on website – they’re from the request-for-offers document.
- Nick: If ownership changes, do they have to resurvey, and how is the boundary marked?
A: Surveys are assumable, transferable by assignment. At that point, we review the survey to see if it needs to be updated to current survey standards. Corners are marked as in BMPs – we want them marked visibly sometimes, other times it’s not necessary. Corners need to be fixed with helical anchor where you could hang a buoy on it if necessary.
- Bruce: Would you resurvey if vegetation expands or contracts? A: Corners are set with survey-grade GPS coordinates and won’t change during course of lease. Vegetation would fall under the biological survey.

Baseline survey work

- Document abundance and distribution of naturally occurring recruited shellfish stock in the area – commercially valuable shellfish – geoduck, oysters, manila clams, littleneck clams. Multiple purposes: to look at abundance prior to any activity by grower. Subject to treaty sharing on sustainable basis – 50% of naturally occurring shellfish is subject to treaty sharing and goes to tribe. Surveying intertidal geoduck is trickier. One cubic foot (1 ft x 1 ft x 1 ft deep) – you won’t find geoduck there. You can walk on the beach when there’s water there looking for shows (geoduck sticking their necks out), but walking is not an accurate way to inventory. If they’re not feeding when tide is out or shallow water you won’t see them. We looked at diving when site is submerged – at most to 13-foot depth – lots of visibility problems – biggest problem – complete lack of show data. Subtidal geoduck survey – over course of a week they dive a certain area and mark all geoduck that are feeding, then go back next day and repeat, and so on. Then come up with a “show plot”. But we don’t have show plots for intertidal geoduck data. Assumed intertidal geoduck will behave different than subtidal geoduck. We don’t have the statistical numbers we would need to find validity in a survey. We’ve worked through all options and decided that an expert consultant would walk the beach with the tribes most likely, and try to get an estimate of the number of geoduck. When the beach is harvested prior to planting, those will be split with tribe. Harvest serves as confirmation of numbers. Estimates have been pretty accurate.
- Sharing plan needs to be worked out between state, lessee, tribes before a lease – don’t want to surprise tribes. We work out how to share resources, etc. By court order, the official notification process to tribes is at least 30 days before leasing.
- Does tribal sharing apply to private beaches too? Yes.
- Eelgrass survey – use DFW standards. Randy Carman is revamping the eelgrass survey standards – three tiered approach: 1) see if there are any resources in area, 2) known resource, no herring spawn; 3) known resource, known herring spawn.
- Bruce: Looking at eelgrass only, or other kind of vegetation of concern? A: Not in a sandy beach.
- Perry: It does say “all attached or rooted vegetation”; we’re not stating the DNR BMPs are what we want to use, just a starting point for discussion.

- We tried not to be too prescriptive – outcome oriented approach – dictate results more than methods.
- Need a lot of details in recordkeeping to correlate...
- Log of activities, log of contacts.
- Annual review: Looking at compliance with BMPs – record of mitigation methods, contacts with neighbors, outcome of those, etc.
- Record of on-the-ground impacts – where are they walking – eelgrass boundary – has it changed?
- Events and issues: comments, complaints, resolution, correspondence with property owners, recreational users, actions taken in response to complaints, spills, cleanups.
- Noise readings at 200 yards – WAC is 55 decibels, locals can be more stringent. (10 decibels less at night.)
- How often do you actually get logs within 10 days? A. Haven't actually done it yet.
- How much driving are you doing on the beach? A. DNR requires that everyone access by water unless it's not possible.
- Biological baseline survey: existing shellfish, attached and rooted vegetation. Adaptive management – more than just salmon and eelgrass – if we are going to do baseline surveys and do adaptive management, we need more extensive baseline data (within reason).
- Detailed view of community effects is in dedicated monitoring leases.
- Ward: The way it's written, you're expecting and encouraging people to make complaints – and want to know what measures are taken – what if a company is operating within the guidelines of the lease? How do they respond? A: What I've seen is industry working with people to make slight adjustments to address their concerns. We expect lessees to establish working relationships with adjacent property owners
- Bryan: Do you have some boundaries where you say it's such a valuable site due to xyz, and do you have BMPs regarding time windows for planting and harvesting?
- First question: We picked the sites for geoduck aquaculture, went to DFW, biologist of intertidal shellfish resources – we picked sites that weren't valuable for treaty fishing, etc.
- Bryan: Are these timing issues, etc. reflected in BMPs, or is this information we can get? A: I would say if the farm site is in the area of some species of concern, we'd ask that they modify farm activity for certain windows of time. Pierce County required a forage fish habitat survey – local shoreline permitting entities are picking up that rule.
- Sarah: There are some places in our BMPs where we have limits on specific things like timing, etc. We expect what this group is doing will help inform our BMPs. It's not written down as a strict protocol - a lot of criteria will come from the survey we do. We use overlays to do first-level screening, then it's site specific.
- Laura: PSP (Puget Sound Partnership) doesn't see forage fish mentioned as a concern – see only avoiding spawning sites, but PSP is going much more in depth. What critical areas are you staying out of? Or are you just leasing it and requiring a baseline survey? Where do you draw the line and exclude an area completely?
- Perry: DNR's BMPs are just an example. This isn't a critique of their BMPs – that's a later discussion. We are talking about recordkeeping and baseline data collection. In the baseline, I don't see anything about sediment and water quality. Do you do that? A: In

our environmental monitoring, the span of what we're looking at includes sediment baseline monitoring.

- Perry: We need a copy of the more robust set of questions you ask in the environmental monitoring program. A: We don't have that yet. We have defined the scope of what we're going to look at, and we're working with Sea Grant to make sure our specific protocols are complementary to Sea Grant's effort. We hope to be done with this sometime this summer.
- Perry: We want info that helps us with siting before anything else. If the answer's no, we'll move on. If the answer is yes, we need to have a good list of questions to ask. If we have good info out there through DNR's work, there's no point in us repeating.
- Sarah: There's a big difference between baseline survey and monitoring. The sites we'll have are in Hood Canal ____, and one will be in South Sound. We'll be looking at the effects of geoduck aquaculture through all phases – we can take a site with virgin conditions, no prior geoduck aquaculture, and get good baseline. We'll probably have grain size analysis, benthic analysis, transect type survey, eelgrass/rooted vegetation survey (Sarah will send the draft monitoring doc to us). We'll be using 3 control sites for each monitoring site.
- Bruce: It's hard to know what's necessary for the baseline survey if we don't know how it's going to be regulated. Who's doing the surveys and how is it handled? I'm concerned about people hiring their own contractor who might just give them the answer they want. Providing some insulation between the lessee and the contractor would be good, and there are several ways to do that.
- Sarah: That's a very good point, which is why we will require biological baseline survey to be done by someone certified by DNR, and the land survey to be done by licensed surveyor. The Attorney General's office told us we cannot dictate to a lessee who they must contract with; we can only set criteria.
- Perry: Local governments will often have lists of approved consultants for certain kinds of work—they may have more latitude there than state does.
- Bruce: Could also have a government entity do the survey (for a fee).
- Morris – we provide training to biological firms and provide a list of qualified consultants.
- Bruce: I mean having a fee of some kind that covers the costs of the government's hiring a contractor.
- Sally: Record keeping: maybe 5 months ago we talked about recordkeeping and struggled to come up with what kinds of things would be good. So thank you for bringing such an organized product for us.
- Nick: Asked earlier about costs – I see some ongoing costs. If I were to come up with a lease from DNR – if I go through these hoops, does it matter what we find with biological assessment? I would assume you've already made sure that the land is suitable for geoduck aquaculture. Is there this level of scrutiny on all of your aquatic land uses (marinas, bulkheads)? A: Depends on use – there is generally higher level of scrutiny in geoduck leases than other forms of aquaculture because of the nature of this activity. We decided to partner in the risk of the farm—we charge a production-based rent, whereas Willapa is a flat rate for grow-out of farmer's product.

- Diane: This is state ground and the geoduck industry is primarily on private ground; so there is a higher level of scrutiny, due to public interest and higher returns. That seems appropriate.
- Perry: The homework piece for each of us is to think about the things we want to have included in recommendations.

Adaptive Management Discussion (Tom Clingman)

- HB2220 outlines essentially an adaptive management strategy. It outlines parallel tracks of improving regulatory framework, kicking off a research program, and at various places along the way the two will intersect. So this is an important topic:
- There are many definitions of adaptive management (see handout). Parallels to wetlands management and their take on adaptive management. With regard to geoduck aquaculture, at least three clusters of info would be applicable:
 - Site monitoring, including baseline studies and ongoing monitoring, can be applied through permits.
 - Compliance monitoring – is the permittee adhering to process, protocols, requirements, producing intended result? We can't know if our conditions are even working if we don't monitor and assess.
 - Scientific monitoring – bill has committed funding to this, to include three biennia.
- See Tom's handout (on website) for more details on this.

Discussion:

- Bruce: I'm skeptical of adaptive management and have concerns. I prefer the precautionary approach. Let's start with a high standard and work our way backward. Too often, adaptive management starts low, then moves up if necessary. We had hoped to have the science before setting BMPs, but I understand why that's not realistic with the harvest cycles and research schedule. Even with a lot of data gathering, it can be difficult to have a definitive answer. Then there's inertia – it can be hard to come back and redo guidelines and standards. I think it can be done well, and the precautionary principle is part of it: start higher and use science to move back down. But that's not usually how it's approached. It's a question of who should bear the risk?
- Eric: I'm a fan of adaptive management, of taking new info you've gained and strengthening or weakening things based on the new info. I agree the baseline is critical. Baseline standards must be based on best available science. Flexible rulemaking means bureaucrats making decisions, which many tend to avoid.
- Diane: There are three concepts omitted from this document. How are you distinguishing between monitoring and adaptive management? Some of this document refers to monitoring, not adaptive management. To us, adaptive management is using BAS and adapting future projects to new science as it comes in. The other is regulatory certainty. Changing a project to set new outcomes in progress is not adaptive management. Can adapt a project to better reach the desired/required outcome, but shouldn't change the expected outcome mid-project. If standards change, they should apply to new farms, new projects, not existing ones. The basis of the precautionary principle is that when we know

there's a negative impact, we proceed cautiously – not proceeding at all in the absence of evidence is a moratorium.

- Laura: Hearings Board case – determined that county didn't comply with adaptive management, quoted fish habitat, appropriate changes quickly, etc. (get from her).
- Sally: If there is ongoing monitoring and data coming in, adaptive management is triggered. It takes time (or consultants' time) to manage that, and that involves additional costs. Perry, what part of this do you think we'll use in our recommendations? At some future point will you look to us for a working definition from the committee?
- Perry: Clarification that the case referenced was GMA-related. I agree there's some good language in there about what adaptive management is and how it works. The flaw they found was that the adaptive management plan wouldn't work because they didn't set up baseline conditions correctly, didn't get adequate info. For our purposes, the underlying purposes of the GMA are different from what we're working with here. I'd be happy to post that case decision on our website if you'd like. Regarding regulatory certainty – I agree it's a critical issue, but I also think that it's going to be hard to convince any of us that once a farm is in operation, you can continue to operate the way you were the day you started operations. I believe there's real intent in the structure of shoreline permits (default for 5 years), so that we have opportunity to revisit an activity. I also think the real intent with the change legislature made a few years ago—to give local governments options to set different permit limits when appropriate—recognized that 5 years won't work everywhere. We need to reconcile that legislature said there are limits to these permits. I understand from a business standpoint the need to operate in a predictable way, but I don't think we'll be able to agree that once you're in operation you can continue to operate that way regardless of what we learn in the meantime.
- Dave: I am philosophically behind adaptive management, but the administrative realities can be a nightmare. Enforcement? Triggers? Appeals? Has to be a number we can use to indicate when something good or bad has happened, and a way to quantify the action required to rectify it.
- Diane: I don't mean to imply that once a permit is in we ... within the permit, if we had numbers, that's an outcome we know we have to meet – that's a regulatory certainty in a sense. We're not opposed to having a list of requirements we have to meet. But that's monitoring and compliance, not adaptive management. We're not asking for bulkheads and marinas to be pulled, although we know they're harmful. Of course with new info, requirements for new permits will have to be changed, but they shouldn't apply to existing permits. I think we need to be a little more creative, deliberative, and innovative to make the standards truly fit the activity.
- Bryan: I do think we're blending monitoring and enforcement of existing permits with adaptive management for new permits. I hope we move to a spot where a span of time for a permit covers the entire range of activity for a planting and harvest cycle. We may find some real significant impact during the time span of some of the existing permits – may end up with a short list of critical issues. That's not to say you can't harvest, but maybe delay to a more appropriate time. We should avoid changing the game within the existing permit round unless it's really critical. State standards for what makes that short list would be helpful.
- Laura: Please clarify what you mean by monitoring – state, local, or industry? We would need to determine who's going to do it. Second – if industry feels they can't go in and put

in a commitment to farm, we have to have to look at expansion plans. We have to look at scale and location, then when critical info comes in, we don't have to make huge changes because those sites aren't critical to forage fish, etc.

- Tom: Clarify that we are in fact required to update guidelines when the science work is complete. We hope to see scientific work being done that will offer some interim results that can be used to inform permits and SMP updates. I encourage people to take look at the literature review – there is quite a bit of info on a wide range of topics. If it's useful, I can add to the some of the points raised in discussion here today to this document.
- Diane: It is the industry's perspective that these are difficult questions—a lot of companies have a lot of money invested. We're not afraid to talk about regulations and standards and precautions, but I would ask that everyone recognize that we do have a vested interest out there. We need regulatory certainty. And recognize that we're out there farming. We're not there to grow sand dollars – we're there to grow geoducks. At the same time, we're willing to work through these questions.
- Perry: Tom and I need to think about how we factor in the distinction between adaptive management and compliance monitoring. I know your concern about regulatory certainty, and we share it, but we also need environmental certainty, and adaptive management is about balancing that. The question of who's doing the monitoring is a legitimate one. For Ecology to assume that burden, we'd have to change things and others would have to change things for us, so we're probably looking at either local governments or industry or consultants. We have to be cautious about creating unfunded mandates. Does a typical permit fee incorporate the concept of routine, ongoing inspection and compliance? (Tom: in the short term only – not long-term)
- Dave: That doesn't necessarily cover if something goes wrong and you end up going out there [to a site] 6 or 8 times. That's not covered. It's unlikely that we'd have the staff or expertise available to do a lot of the technical monitoring. The most we can do is maintain a list of credentialed professionals in the fields.
- Sally: Tom, could you put into this document what has been learned from successful adaptive management? That is, watch out for this, avoid that. More examples from other regulatory programs using adaptive management?
- Laura: We've never had farming like this before – a lot of states set up other agencies and establish fees. We have to look outside of box, not try to make it fit existing state and local structures. Perry: Please provide these examples to us so Candice can distribute.
- Nick: Outfalls – a lot of permits, assume a lot of monitoring, some adaptive management? Do you have examples of the kind of monitoring and adaptive management you would have for outfalls?
- Sarah: When we sign a lease with someone, we cannot change the terms mid-lease. Leases are for 10 years, based on BAS. Our adaptive management would be programmatic, or we'd be sued. For the next lease, you adapt BMPs based on new info.
- Nick: Who decides we need to change the standards?
- Celia: For outfalls, it's a partnership. There's a clause that says you have to meet all current applicable law ordinances, etc., so when NPDES is changed or updated, have to meet new terms and conditions. HPA has terms, ongoing things in HPA are pulled into lease document. Monitoring is a burden put on lessee. We have someone who reviews monitoring data coming in.

Issues pending from previous meeting

- More information on invasive species and farming. Blain sent around report on this, it is on website. Have linked to a couple of relevant sites on our website.
- Follow up on predator exclusion devices:– done today.
- List of data overlays for siting decisions – this is continuing conversation. Another meeting of the group ?
- Perry sent out schedule of Task 3.
- Krystal was going to do some homework and send suggestions to Perry on Audubon’s input for recommendations. Haven’t received. Annie will follow up.
- Info on existing aquaculture growing areas. Morris has some info on this that he’s going to share with us now. We will post it to the website.
 - Three attachments showing aquaculture growing areas for the state. Listing by each reporting area of what is reported by species for each area by what growers are reporting/registering (from aquatic farm registration). Would need to verify against production records to see what’s actually being grown. Then, how many farmers are growing each species by area (self-reported). May be just growing in a band, or on the whole parcel. Should have this info in electronic database in the future (6-12 months). Note that there may be some overlap of wild and cultured harvest. Wild harvest probably would not show up on this list – would have to go to reports on wild harvest. There may be more than one person claiming the wild harvest areas, so may not add up.
 - Jeff: there are species listed on this that are not cultivated – they must be wild harvest.
 - This is from aquatic farm registrations. They fill in species that they “might” grow, so you end up with a lot of “fluff”.
 - Laura: I would like to present documents that I got from Ecology showing that the number of acres of geoduck farming reported to Ecology is 525 acres.
 - Diane: Clarification: When we first reported to Ecology, someone might have a 100-acre farm, but only have 5 acres of geoduck, but they reported 100 acres. They have revised the form, and growers are now reporting more accurately. For the two largest growers, they have 165 acres total.
 - Perry: I will try to get Jessica or Loree to come and report on their current understanding of this.
 - Laura: Highest regional densities – 18 per square meter highest reported in South Sound (p 7); page 21: Statement last time that geoduck feces is no worse than worm feces – read quote (Newell) about stimulating phytoplankton growth; and as filterers, geoduck can only be helpful if the ecological carrying capacity is not exceeded.
 - Page 25 – Perry mentioned there is not a concern about bivalves consuming copepods and zooplankton; shows mussels consume organisms up to 3 mm in length, cockles and scallops also capable of this, larva of most commercial species might be threatened.
 - David Fyfe, NWIFC: Correction – I made a comment regarding the assumption of the nature of feces and the difference between human and shellfish feces, saying geoduck feces was more like worm feces. Newell’s paper was referring to suspended culture, so this reference is not appropriate for geoduck.

- Ward: I think Laura has been bringing selective pieces of documents to make certain points. Last month it was about ducks being killed. I am tired of it. *(Note: Laura requested immediately after meeting that the notes reflect she provided the documentation on which her comments were based to Perry at the meeting.)*
- David Fyfe, NWIFC – Let’s enforce the rules that we’re speaking of with regard to geoduck and not bring in other species.
- Perry –I have a note to myself that says “threatened list”. Does anyone remember what that is about?
- Next meeting: Dr. Ken Chu to talk about aquaculture, including some of the questions about beneficial effects of shellfish in aquatic environment.
- The framework Sally put together after last meeting is a skeleton outline, kind of table of contents for a potential section in guidelines. We need to start filling in those blanks, adding depth, content, adding/subtracting topics. Will send out electronically.
- Second thing: Proposed schedule for work on Task 3 for the rest of this year has been distributed. Please feel free to suggest ideas to add this. There’s a lot of white space.
- Will get someone from Ecology to come speak to acreage numbers – with the caveat that Ecology’s purpose for collecting these numbers is very different from this group’s (Corps’ Nationwide Permit) – it’s apples and oranges. Will have someone give status report on the latest numbers, but note that these are not the final numbers.
- Diane: Regarding the blank spaces on Task 3 schedule, I’d like to see if we could get more input on lighting, noise, tube color, etc. Additional perspectives from landowners? Have asked Laura several times for this. We received from Save Our Shorelines some very specific suggestions on this – good starting point.
- Bruce: Lighting is more than a nuisance issue – could be environmental effects.
- Sally: When I walked out of last meeting, I was thinking about “how do we get to a place where we can start to populate something that will be useful to people working with Tom and Perry to develop guidelines?” I tried to find where in the Shoreline guidelines these would be nestled. Tried to figure out an outline or table of contents. Others might have better templates -- it’s incomplete, but it’s a start for me to envision how I could see our work going forward. If others have ideas, can share with Candice for distribution. Annie: do we want to set a deadline for those comments? Perry: If folks want to do this, I’d say a week to 10 days before next meeting. List will likely get bigger before it gets smaller.
- Ideas for a schedule right now? No response. June-August discussion; September – start nailing down recommendations. October – arm-wrestling, November – report.

Action items

- SHB Decision on adaptation management (Swinomish) – Post.
- DNR draft monitoring lease – Post.
- Tom will revise adaptive management draft with comments of group and distribute.
- Should include “lessons learned” from other programs and more examples.
- Laura will send other examples of funding adaptive management.

- Ecology will provide update on reported acres of farms versus geoduck at next meeting.
- Staff will send Sally's outline around electronically.

Future Schedule/agendas/discussion

- Ecology's acreage numbers for 401's.
- Schedule and outline of shoreline guidelines.
- More information from property owners on farming details – documents from Save Our Shorelines.

Adjourn: (time) 3:07

Public Comments

Bill Burrows (shoreline property owner): Just want to address adaptive management vs. precautionary approach. In my academic background over 30 years, my research focus was on decision making in the face of uncertainty (which is most decisions). First: A big issue, I think, is the measure of risk and consequences when choosing one approach over another. Example: Boeing developing lighting for the fuselage. It won't be perfect when they start. When they take their first test flight, they won't take 200 passengers and take from Seattle to New York. They will use test pilots. Using adaptive management in that context doesn't make sense – the risks are too high. At the northwest Workshop on Bivalve Aquaculture, there was a short discussion of adaptive management vs precaution. How do you regulate something when you know little about it? Roger Newell said in fisheries science, they use the the precautionary approach when they don't know. So everything that's not known has equal validity? He said no, we have to make value judgments. Want to put some questions before the committee: Is the risk of damaging ESA threatened Chinook acceptable? What about the risk of PVC? Is the loss of habitat for migratory birds worth the risk? We can't answer these, because we don't know what science says about those. Real questions to ask: Are we risking moving any species from threatened to endangered? You can't fix that once you reach that stage, and you're in real trouble. Adaptive management doesn't make sense here. It is a very difficult process to do correctly. We have a situation here where there are some very important issues that need to be addressed correctly.

Marilyn Showalter (shoreline property owner): My thoughts are along the same lines. Risk management: who should bear the risk? Naturally businesses want to minimize their risks, and if they can they will lay them onto the public or environment. It's just the nature of things; I don't mean to impugn anyone. It's what has brought us to the environmental state we're in today. Adaptive management is a bad policy if it's based on "mush". It might be good if you have the confidence that you're probably in a good arena of activity. Where you know very little, adaptive management is dangerous. The less you know, the more cautious you should be. The longer the commitment, the more cautious you should be in the beginning (e.g., 10-yr lease versus 5-yr lease). The greater the area, the more cautious you should be. There is the potential for unleashing vested interests over a broad area. Regulations should be tested against worst case scenarios. The more vulnerable the resource you're talking about, the more cautious you should be. I hope we all know that Puget Sound, even more so on Hood Canal, is in an extremely

vulnerable state. Very little is known about geoduck aquaculture. Diane said we don't know that they cause harm. The principle of "innocent until proven guilty" is fine for criminal justice, but not for the environment. This is a new industry, so you don't have a lot of vested interests that will protect their turf once it goes wrong. If you can find out beforehand whether it's fundamentally a safe activity, you're much better off than if you pretend that if things go wrong, you can fix it later. Today's discussion of tubes talked a little about chemistry—PVC and BPA—does this kind of tube have BPA? (Perry response: No.)

David Fyfe (NWIFC): I'd like to give appreciation and commendations for everyone here. I have a request of you. I've come to all but one or two of these meetings, and I see just about everyone participating and providing input. Everyone I see here is aggressively pursuing this to the best of their ability—not only at the table, but in the audience too. People are paying close attention and taking this seriously. There are regular faces in the audience who come when they don't have to. And commendations, too, to the people who come to present. We're getting high-quality people giving high-level expert opinions. Despite our disagreements, we're all here for the same reason: concern about the environment and Puget Sound. I would like to pose something to you now that we're pretty far along in the process and have made lots of progress. What would you think if at some point we went around and asked people, "At this stage of the game, do you think this has been a success or failure to this point? If 'failure' is your reply, provide a brief synopsis of why." There is still time to shift course if necessary to ensure that everyone feels it's a success.