

Meeting Notes

Shellfish Aquaculture Regulatory Committee

April 14, 2008, 2008

9:15 a.m. – 3:45 p.m.

Ecology Headquarters

Lacey, Washington

Members Present: Sarah Dzinbal, Nick Jambor, Cyrilla Cook, Yongwen Gao, Laura Hendricks, Morris Barker, Krystal Kyer, Ward Willits, Sally Toteff, Bryan Harrison, Diane Cooper, Lisa Veneroso, Lee Faulconer (Alt.), Blaine Reeves (Alt.)

Ecology Staff: Perry Lund, Jeanne Koenings, Tom Clingman

Interested Agency Staff: Casey Ehorn (USACE), David Fyfe (NWIFC), Curt Garigan (Senate Committee), Adrienne Stuart (Rep. Lantz's office)

Other Interested Parties: Paul Sparks (WCTU), Jerry Johannes (Anderson Island), Kyle Deerkop (Shellfish Industry), Marie Duckworth (property owner), Kris Mansfield (property owner), Marilyn Showalter (property owner)

Presenters: Dave Nyswander (WDFW), Scott Berbells (WDOH), Kathy Barker (WDOH), Kathy Taylor (WDOE), Joe Evenson (WDFW)

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.
- **Comments and approval of March meeting summary**
 - Candice has added a question that Laura Hendricks asked Dan Penttila, but wasn't reflected in the meeting summary. Corrected version will be on website in the next couple of days.
 - Sarah: Laura, studies, appendix document...? Sarah has brought copies if anyone would like to see. Sediment transfer gradient subtidal.
 - Dave Nyswander: Red algae, gracilariopsis, more important in south and central sound , make note of that in terms of management.
 - Perry – I think that was well addressed in the discussion.
 - **Approved by consensus.**
- **Quick Announcements**
 - Annie S.: Action Items – Reminder: after 2:15 break, we will review issues pending from the March meeting.
 - Nearshore reports CD – available today
 - Perry – working on an updated timeline/action plan. Will distribute soon.
 - Sea Grant written update sent to committee, copies available today. They should be at May 5th meeting.

Task 3: Environment, Fish & Wildlife Topics, and Potential Guidelines for Geoduck Aquaculture

Panel Presentations

- Marine Birds (Dave Nyswander, WDFW)
- Water Quality (Scott Berbells, WDOH)
- Shellfish Bed Certification (Cathy Barker, DOH)
- GIS-based mapping (Kathy Taylor, WDOE)

Marine Birds (Dave Nyswander, WDFW)

- See PowerPoint on committee website for more information.
- DFW website – online mapping icon – interactive mapping; Go Hunt, SalmonScape, Marine Bird Density Atlas
- Marine Bird Atlas: Does not include all species, about 7 summer species, 12-13 winter species.
- Pigeon Guillemot, breeds throughout Puget Sound in the summer. Feed along nearshore, forage fish, nearshore fish; if obstacles interfere with those kinds of species, would have impact on these birds.
- Scoters defend their feeding territory in the winter as well as summer (one species in particular – Goldeneye)
- Surf scoter decline, white wing scoter is stable (preliminary evidence)
- Significant decline not seen in other families of birds (buff, gold, merg, olds, hadu)
- There are a couple of months out of the year when scoters are not present in Puget Sound (see slide)
- Site fidelity – 90% of birds come back to same area in winter.
- Nocturnal vs diurnal distribution – Nocturnal resting areas identified – important areas. In spring that key area becomes the big staging ground.
- Not all sites coincide with herring spawn.
- Key molting areas, it's a high-stress time for them.
- Puget Sound Partnership website provides a video of changing baselines.
- Recommendations for aquaculture are included in presentation.

Water Quality (Scott Berbells, WDOH)

- Typically for growing area portion of requirements, WA uses federal standards (not stricter)
- Sanitary survey - for shellfish classification, sanitary survey is a report made of three topics (see slide)
- 1800 marine water stations through Puget Sound and outer coast, sample 6-12 times year for fecal coliform, at least 30 samples, then evaluate results. See slide for standards
- Watershed-wide survey of shoreline uses that might impact shellfish aquaculture: all drainages & discharges, wildlife populations, agricultural activities, shoreline on-site sewage system checks (mostly residential), industrial operations, all other “potential impacts”.
- Sees shellfish activities moving into more developed areas, and more development moving into Shellfish aquaculture areas (bringing more stormwater issues).
- Marina: defined as 10 or more vessels, estimating how many boats will discharge their sewage. Closures not based on actual water quality but on potential disruption.
- Growing area classification: Approved, Conditionally Approved, Restricted, Prohibited, Unclassified, (see slide for details)
- Where are water quality problems usually found? (see slide)
 - Development: on-site sewage problems, stormwater runoff, pet waste;
 - Mouths of rivers creeks small drainages
 - Urbanized areas with impermeable surfaces
 - Agricultural sites
 - Shallow inner bays with limited flushing

- Classification (see slide) can be changed at any time, as soon as a problem is detected. Otherwise, annual evaluation of every growing area looking at samples and new pollution course info; every three years we reevaluate every growing area, surveys, samples, etc.; and every 12 years, we update sanitary survey.

Bed Certification (Cathy Barker, DOH)

- See presentation on Committee Website.

GIS-based mapping (Kathy Taylor, WDOE)

- See presentation on Committee Website.

Question and Answer session:

- Bryan H.: Has your agency (WDFW) tried to capture some of the key factors to sustaining those populations and how that might relate to shellfish?
- Dave Nyswander: That's where we started some of the focus study I told you about – to fill in some continuing gaps. It used to be that birds eating shellfish product were allowed to be killed – that was stopped in the 1990s. The nets and other exclusion devices you see are compensation for that. In order to hunt sea ducks, you have to get a harvest card. The commission that sets these limits has given us some recommendations. We're trying to pin some of that down. With some species we've been able to identify one key factor causing declines (ex. herons, eagles). That's not the case here. We're looking at the role of hunting – especially with sea ducks. There is no magic silver bullet to explain right now – it remains to be seen.
- Diane C.: We've seen an increase of scoters on clam farms. They seem to ignore harassment techniques – we've tried a variety of methods. Several slides you showed seem to show concentrated populations of scoter – maybe in winter? They seem to be right on top of historically significant shellfish (clam) areas. What does that say to you?
- Dave N.: It's a bit of a mystery in the overall decline, including other regions (e.g., San Francisco Bay). Has the overall quality in the Sound gone down? We don't see that right now. Clearly they do move around. Once they've cleaned off new deposited mussels on rafts they'll go somewhere else. There are some movement patterns. All birds we marked were older than 3rd year adult, primarily females. We don't know as much about sub-adults. Last summer we did 800 transects of harlequins and scoters, saw that some adults are clumped a little differently. They key into certain sites, and keep high site fidelity – it's possible that new ones come in and figure out new feeding areas.
- Diane C.: USDA has industry animal damage control data.
- Joe Everson: If they're in those areas, it's likely because commercial shellfish growers and scoters like the same kind of habitat. Where you see large densities, it doesn't mean they're sitting on top of the shellfish beds; they can be feeding on wild mussels, or crustaceans and not even bivalves.
- Sally T.: If a big part of the bird population reduction is due to habitat loss and changes in the food web, what is it about aquaculture production that limits sea bird food and habitat?
- Dave N.: We can't say aquaculture is to blame, or it might only be one factor– that remains to be seen. The nets clearly would stop various birds from feeding in those areas. Would likely also stop sand lance in those areas, but there are a multitude of factors involved.
- Laura H.: Our concern is the expansion of farming. It's a competition now between aquaculture and sand lance/birds, pocket estuaries. In Pierce County, 60 acres of applications are in process, all in sensitive pocket areas, and there are DNR applications in spawning areas. If expansion continues, where do they go? Should this be a plan where WDFW works with someone to limit the extent of expansion?
- Dave N.: If you're wise about how you select sites, you may lose some birds and not others.
- Laura H.: With plastics and tubes: we see pieces broken off where they've hit rocks, pieces of small nets. In Henderson inlet, I'm getting an average of 10 rubber bands, 5 pieces of small nets per week, and that's 2 years after the operation.

- Dave N.: Those small pieces of plastic can be picked up by birds, and if they pick up enough of it, it can have effects, such as to reproductive capability, I think.
- Diane C.: We're using 90% canopy nets now.
- Dave N.: It's a trade-off: birds can go in and feed in between with the tubes and small nets, and the canopy can sink into the mud.
- Diane: Nets and tubes are on geoduck plots for about 12-18 months. Then the tubes come out, and the nets stay on a little longer to "train" geoducks to stay under – about 2 years total. Then we wait another 4 years or so until harvest.
- Laura H.: With geoduck harvesting in winter months, if birds are coming back to the same places and they come back to same place this year and there are nets and tubes, or harvest at night low tide...there are only 67 low-tide days from November through February. I assume that's when the birds will be feeding too.
- Dave N.: These birds are diving feeders, they don't feed in intertidal areas. Sea Grant and another study (on Whidbey Island gray whales) show that geoduck harvest actually assists sea ducks. They follow along and pick up food. The harvest of geoducks doesn't appear to be as detrimental as I might have expected.
- Joe E.: Regarding wintertime sea ducks – daytime high tides allow sea ducks to get into these areas, they don't forage at night, they go to nocturnal resting areas, and that's when harvest is occurring. Some species do feed at night, but not scoters.
- Krystal: With regard to scoters and shellfish liking the same kind of habitats, and other birds in that habitat, are you doing or planning on doing any wildlife monitoring for injury mortality, molting and nesting impacts, future long-term studies on ongoing operations—are there any underway?
- Dave: We're only able to do them on an as-needed basis – funding is an issue. I believe there is need for it, but it will probably be driven by folks like you, and the industry. This might be the kind of thing to look at if you can find the funding.
- Diane: We're caught between a rock and hard place. We've been observing shellfish farms for decades, we have lots of anecdotal evidence, and lots of work has been done in BC, Humboldt, California. What we're finding today, is that we've been asked not to participate in or fund any kind of research or monitoring, because it's perceived as biased. Second, despite the idea that we're expanding throughout Puget Sound, we're not. The amount of ground we're covering with geoduck aquaculture is nowhere near what has historically been used for shellfish farming as a whole.
- Nick J.: What percentage of the nearshore is available for aquaculture, in terms of water quality? And what percentage has been lost due to water quality?
- Scott B.: There are about 2400 shoreline miles in Puget Sound, so far we have about 800 miles classified (one third) – there are some prohibited areas, I don't know as far as expansion how far we can go. We're getting a lot of subtidal geoduck requests encroaching on the I-5 corridor (as around Commencement Bay). Have doubled the shellfish shoreline we've classified (...since when?); a good portion of the classified areas are classified commercial growing areas.
- Cathy: Seems like it varies. Behind Harstine Island, for instance, I don't believe there have been many requests for harvest sites.
- Nick: in a new area how long would it take to classify?
- Answer: About 5 years – we sample about 5-6 times per year, and need 30 samples. In the past we have increased sampling – we're hesitant to do that now. We're just trying to hold ground on shoreline surveys, and new requests go to the bottom of pile, it may be 2-5 years before we can do a shoreline survey on a new site.
- Cathy: Active harvest sites: 90% are in south Puget Sound (Eld Inlet, Totten Inlet...) Moving out of the area, don't see any more until the Tulalip tribal area. Nearly all of Hood Canal.
- Sally to Dave: On bird populations, did I hear you say that with predatory exclusion devices, the canopy nets would have less impact than small individual nets?
- Dave: No one has evaluated that yet, so we don't know. Except that bigger nets are more likely to stay intact and not float away.
- Diane: In areas of raptors, small nets are less likely to cause the birds to get caught.

- Joe: Large nets cover a large area and prohibit any kind of forage.
- Diane: Actually, we see the birds go right into manila clam nets – we'll lose a million dollars worth of clams in a season to that.
- Perry: Sanitary survey report for a specific growing area, that big green swath covering most of Puget Sound, but your report is much more focused than that – when we're getting down to looking at specific sites, how do you correlate that broad information?
- Scott: 97 different growing areas - set up by hydrodynamics –sanitary reports for each of those areas. Part of that is a shoreline survey with pollution source info for each part of it.
- Perry: In classifying new areas, is that just initiated through requests?
- Cathy: For the most part. If we get a request on a place that is not classified, I'll ask them if they can add another water quality station, maybe move sanitary line – it may take 5 years, would be in pending file until then.
- Scott: When we get a request, we will set marine water stations. Shoreline survey will be scheduled on a priority basis – new sites to bottom of list unless we're already doing a routine shoreline survey in the area, then they will be scheduled as time allows.
- Perry: How significant is the correlation between water quality (coliform) and specific bird species?
- Scott: We have a lot of "potential" sources in our reports – doesn't necessarily lead to a closure.
- Yongwen: 1994-2008 decline in sea bird- lowest year is 1997-98 on chart – any reason that year in particular that the population dropped so low then?
- Dave: It was more like 200-2001. Initially I thought there was climate change, decadal oscillation change – thought the marine birds would come back - would depend on that to solve problem.
- Yongwen – doing a study with DNR? Lowest level in 1997? Hood canal? Looks like 1994 decline started, lowest level 1997-8.
- Yongwen: Is it okay for us to use/share the data on the Coastal Atlas?
- Kathy: Yes, it's public info – you can use but, but cannot make money off of it. Just cite it to Ecology Coastal Atlas. But we'd like to see it used.
- Laura: Pierce County has applications in for 60 acres of expansion. You mention if you're planting, netting, tubing, and harvesting, you're changing the food that's out there and only planting geoduck. If some of them are feeding on different things – and now it goes to monoculture.
- Dave: Yes you would expect that it would, but I can't quantify it. I would have preferred individual nets so the birds could still come in and feed between, if you could find a way to control debris.
- Laura: Mason County suit – over 100 ducks were shot by an aquaculturist because they were eating clams. No one knew where to tell them to go to stop it – where do people go for that?
- Dave: Was this was not during hunting season?
- Laura: I don't know.
- Dave: If you think they are hunting out of season or breaking other laws, you would go to law enforcement for fish and wildlife. If they have a permit, they can kill up to **??? 200 per season?** (Missed.) This is an example of the mixture of human activities we're trying to mesh.
- Laura to Scott: At the Sea Grant conference, Newell talked about the need to monitor water quality for excrement (ammonia) to make sure it's not becoming a pollution source. Are we doing any monitoring over shellfish beds for excrement?
- Scott: We're not. Just fecal coliform, temperature, and salinity.
- Laura: Do you test for cadmium or heavy metals?
- Scott: Typically no. We have done some individual studies, but not regularly.
- Laura: What about pesticides? Willapa Bay/spartina grass. Effect of pesticides of birds and humans?
- Dave: It biodegrades quickly enough that they don't believe there are impacts, but I'm not very knowledgeable on this. Heavy metal monitoring is expensive, we would need to figure out funding.
- Sarah: Is fecal matter only produced by warm blooded animals?
- Answer: Yes.

- Other question: missed completely.. Answer: Scaup (sp?) – we don't have the same movement documentation available for other species. Sea ducks, like a lot of sea birds, need more protection; they are longer lived with lower reproduction rates.
- Sarah: If you had to protect certain life stages or sites, what are the real factors – where should we be looking for data?
- Dave: We are revisiting the idea that breeding grounds are most important. Winter feeding and spring staging are prerequisites for breeding. It would be a mesh of different habitats.
- Sarah: Do you have a sense for how the birds are affected by nighttime operations?
- Dave: If they're being harassed all the time you could see some impact. Collisions with birds in resting ground and oil spills would be the biggest risks.
- Sarah: Should we be using similar buffers to reserves or recreational?
- Dave: Yes, and I would suggest changes from season to season and time of day – have room to work creatively within parameters.
- Sarah: Are the birds affected by boat motors?
- Dave: Collisions are the biggest danger at nighttime (besides oil spills). They're resting at high densities.
- Cyrilla: SMPs, knowledge of where shellfish are located, impacts of various development e.g. marina)
- Scott: We would hope so, but it doesn't always happen. On other shoreline development, we're getting better relationships and communications with county health departments. So we're getting more proactive and there have been big improvements, but we still have a way to go.
- Bryan: Spartina and carbaryl (pesticide). This is a Willapa Bay, not a Puget Sound, issue. Spartina – pesticide carbaryl, the chemical is low toxicity and short lived. control, EIS to respond to that. Bird populations are dramatically increasing as Spartina goes down. When you bring birds back you bring a lot of fecal coliform back. It's the right thing to do for environment, but has an adverse effect on shellfish aquaculture. We're trying to get to an issue of birds as an indicator species. Is there some logical way to approach this? If we take those birds that are currently threatened, endangered, or sensitive, can we correlate through mapping of habitat or what we know in fish & wildlife between those birds and what they need, and where geoduck can be grown, to overlap habitat or stressors to the birds?
- Kathy T.: If we have the information, we can layer it. Not sure whether we have all of the information – we're trying to determine that.
- Diane: We also need to determine what part of geoduck aquaculture is the problem for the birds. Could you maybe do it through drift cells, since you don't have info on substrate?
- Sarah: DNR is starting to get substrate info, but it's not high-resolution. We need to get on the ground and look at the sites. If we had a list of data sets that could be pulled in and we could use them together, to identify areas and look at site-by-site basis...
- Perry: Bryan spoke to threatened, endangered, sensitive species (TES) having a higher level of regulatory priority/authority. Dave, which of these, if any, are TES species?
- Dave: There are such a small number of threatened and endangered species – the ones we're talking about aren't on the list. We'd mainly be concerned with sensitive species – some of these may be candidates at some point.
- Diane: Response question about water quality downgrade of a shellfish site: the county is required to initiate a response in the form of a plan designation of specific area, and is required by law to work on fixing the problem. Regarding TES species, for each site we have to get an individual Corps permit which requires looking at TES species for new permits.
- Laura: I talked to the Corps on Friday, and they still don't have a definition of new vs. existing aquaculture, especially in terms of increasing densities. We're concerned about that. How does all this relate to No Net Loss (NNL)?
- Perry: We have had a lot of internal discussion of NNL. Without hard data on positive or negative effects, we're left with trying to come up with BMPs, buffers, modifying planting/harvest schedule around life history schedules of certain species. The problem with NLL – it's a great slogan, but what does it mean? (Dave: And what can you enforce?)

- Laura to Scott: Pesticides – I’m reading that a lot of animals are showing up with pesticides. Are we spraying for anything in Puget Sound, or is it just coming from upland? Perry: Ecology only issues a general permit, Dept of Agriculture regulates the activities.
- Laura: Expanding operations, “relay” stations, are showing up more, are they an anomaly?
- Scott: We have very few relays. Taylor has one. When liquefying sediments, there’s the possibility of re-suspending contaminated sediment. We’ve done our research when we issue a permit on sediment contaminants. We’re not taking core samples, but we survey the type of use/industry along the shoreline to determine if there is a threat of contamination.
- Perry: What about historic industrial activities?
- Scott: We have additional follow-up process – one site right now at a subtidal geoduck site near a superfund site (Eagle Harbor).
- Perry: Let’s say there’s a hypothetical industrial logging operation 50 years ago – do you go back and consider what was there and do a higher level of review and evaluation than otherwise?
- Scott: A better example might be the Asarco smelter, which left arsenic all over the shoreline. We would want to look at geoduck in that case since they’re so long lived.
- Cyrilla: Species of concern vs. ESA-listed species. I hope this group will come to consensus on species we want to protect. Just because they’re not on a list doesn’t mean we shouldn’t be trying to protect them. Since we don’t have the science yet from Sea Grant, at least we could focus on hot spots, circle areas where most of them are congregating, and apply adaptive management as we learn more.
- Nick: Because of the shellfish industry, we have this extensive monitoring program for water quality. You said earlier you’re not looking into new areas because there’s no time or budget. In my mind, especially in Willapa, having the shellfish industry there has influenced how careful we are about nearshore development. Shellfish aquaculture brings with it an environmental watchdog for water quality. Do you monitor anywhere other than shellfish growing areas?
- Scott: All of our stations are in existing or proposed shellfish areas.
- Perry: We have an extensive water quality monitoring program.
- Krystal: Spartina may not be an issue in the Sound, but what do we know about the interaction between shellfish aquaculture and other invasive plants, animals, etc.? Does it help decrease some things, or promote, or is it neutral?
- Diane is on national invasive species council representing shellfish growers.
- Krystal: Could geoduck aquaculture promote or inhibit the growth of other invasive species?
- Diane: There seems to be evidence that disturbed areas can promote other species moving in, if those species are invasive. Our activities alone, do they affect invasive species? I’m not aware of any evidence there.
- Cyrilla: Keep in mind that species can be non-native without being invasive.
- Kathy: There is a good literature review about factors that increase the likelihood of non-native and invasive species (like algae/seaweeds). (Annual Review of Ecology, Evolution, Systematics, Volume 37, 2007)
- Blain: The DNR conducted a rapid survey of exotic organisms in 2000 and found that aquaculture was a potential mechanism for 35 out of 40 exotic species found during the survey. The data suggests that most of the organisms were introduced during the first half of the 20th century when aquaculture practices were very different than they are today. (See publication on committee website under “research” link).
- Yongwen: (did not understand this comment) Any _____ should have a basis, based on habitat or food chain. Proposal with DNR/WDFW – didn’t get funded. Some phenomenon, some connection maybe the problem isn’t _____ it’s _____. Must be new research, not old fashioned.
- Nick to Dave: Regarding the eagle stuck in a predator net: that in a way is pretty shocking. Have you guys seen anything like this or had people tell you about this – is it common?
- Dave: We have a problem with ghost nets, but this is a different story. I hadn’t heard about it until someone mentioned it to me.
- Laura: We’ve had five of them. Talons are getting caught in nets.
- Dave: I’d have to know more about the situation and mechanics to comment on that.

- Sarah: Juvenile eagles have a response where they won't release their talons when they are pulled.
- Dave: Yes, this may have been a factor.
- Diane: The incidents we have heard of have been immature eagles, DFW said the same thing. So we agreed that in areas where we know of eaglets, we will use small nets on individual tubes rather than large nets.
- Nick: Are there any birds other than raptors that could get caught?
- Joe: It's hard to say – some birds could get under them but I don't think that's been measured.
- Krystal: That's why we need monitoring – to know if birds are having trouble with nets.
- Perry to Kathy: I'm encouraged by the interagency meeting you're going to today on the Coastal Atlas. Do you have a sense of what information is out there that Ecology can put up on the atlas to help us make siting and operations decisions or give guidance? What have we already got and what key parts are we missing that you would ask for from other agencies?
- Kathy: DNR has some data layers on ownership, I'm not sure if they're for public display.
- Sarah: Ownership of some of those lands is in dispute, and it's not to parcel level.
- Kathy: We do have information on pocket estuaries, DNR has more specific data on eelgrass than we have in the ShoreZone layer currently available on the Coastal Atlas. We're looking at cross-linking with SalmonScape. Could do a specific project for the committee with specific data layers, not just on Coastal Atlas. It would take some time, but if the committee is interested, I'm sure between us at Ecology, DNR, DFW, and DOH, we could access the right data layers and put them together.
- Sally to Dave: Can you speak to the scale of the impact that hunting has on sea ducks, etc. Also in natural environment, geoduck live in broader (less dense?) geographic locations than when they are farmed. (Increased fecal material with increased density? Where do we look for help with that answer?)
- Cathy: I thought Taylor helped fund a study that addressed that.
- Diane: Geoduck display a very wide range of densities in the wild. Some wild densities are comparable to some of the densities we use in farming. Fecal densities in geoduck beds are less than an oyster bed. We know from decades of study that the amount oyster beds produce is biomass vs filtration vs excretion – we know those numbers for geoducks, and it's only one or two thirds the amount of an oyster bed.
- Sarah: _____ ?
- David Fyfe (NWIFC) I'm hearing a presumption that feces are bad. Human feces, no good. Geoduck, no worse than worm feces. We don't think of worm feces as pollution, it's a natural byproduct – it's composed of the plant matter than they consume.
- Diane: And when they're harvested, this is removed from the system.
- Dave: On the hunting issue, we have some data and are gathering more. Some counties killed more than the 3% harvest rates for Harlequin. We're working to determine a survival model to find sustainable rates. If we are already taking the full harvest rate through hunting, we need to be cautious about taking any more out of the system through other causes.
- Laura: I'm concerned about information being used by this committee that is not documented. On densities, there may be one or two tracks that are equal to intertidal densities (we're not talking about subtidal) We just had a geoduck literature review saying there's no information on feces.
- Perry: Regarding densities, Diane was speaking of overlapping ranges.
- Laura to Dave: Small net rubber bands: we've seen a _____ with a rubber band around his torso. It's a tradeoff – if birds can feed between the tubes, they risk entanglement in rubber bands.
- Diane: Adaptive management: BMPs haven't worked, that's why we're here.
- Laura: For adaptive management, you need baseline data, monitoring, and enforcement. Is DFW going to monitor and enforce regulations on these impacts? I don't think Ecology or DNR have funding for that.

- Joe: It depends what you mean by impact. If this committee recommends that a particular impact be monitored, I believe there would be support for funding for it.
- Morris: DOH can't enforce [redacted] where there's not HPA authority.
- Morris: Hunting – Migratory Bird Act. International treaty. Feds look at migratory water fowl and when hunting seasons are and determine rates, how many days of hunting are allowed. States can take more conservative actions, but not more liberal actions,
- Sarah: To clarify, the density of geoducks in wildstock fisheries is on DNR website. There is a very wide difference between tracks.
- Laura: The information I'm referring to came from the DNR EIS. The average density is not the same if you look at all tracks.
- Sarah: We have already updated our BMPs twice and I'm recording ideas for more updates in response to things we discuss here and learn. That's part of adaptive management,
- Bryan: To the question of "where's the mechanism" – I believe this committee, this process is the mechanism. Talked about Pacific County model for having industry bear the cost and time of baseline data and monitoring themselves.
- Yongwen to Scott: Where is the minimum 30 samples requirement from?
- Scott: It's handed down from FDA monitoring laws.
- Perry: Pigeon Guillemots nest in sandy clay bluffs. Is there a buffer that they need for their nesting/rearing, and what are the feeding patterns associated with that nesting and what happens to the fledglings?
- Dave: Railroad tracks and bulkheads are a problem here—they need cliff faces they can burrow into to protect their young. They lay eggs in May to early June, young probably come out in August. Geoduck farming not likely to affect them too much, unless it's affecting forage fish. I would recommend buffer/distance between nest and operations. Depends on the noise, and how you set up the system. We could probably come up with some guidelines on that if operations are getting close.
- Laura to Bryan: Declining species competing for the same estuary, being monitored by industry that's making money off of it, enforced by county that has no money for enforcement, and no one believes the citizen's reports of problems. There must be protection for these animals. Where is it going to come from?
- Adaptive management – on a broader level than site or study-specific?
- Each local government approaches it differently
- More adaptive management system... needs to change, WDFW needs to provide input to Ecology
- Should go to WDFW commission with request for more oversight and monitoring
- Sally to Krystal: On this discussion around bird habitat, etc., is there some way to use this information for developing a framework for guidelines regarding your interests? Do you have anything in mind?
- Krystal: This has been a good discussion, and I have notes to take back to my people about this. Putting data on the Coastal Atlas would be good, to see things concretely instead of talking about them abstractly. Other than that, I have no specific ideas right now.
- Bryan: Regarding Pacific herring overlap with habitat use – is there some linkage between that species and some of the birds we've been talking about. Are there themes that connect these?
- Perry: The broad one is utilization of the nearshore environment. It's back to the idea of the Venn diagram, focusing on areas of overlap. I think there is a link, and exploring it and making sure we identify it is an important part of what we're doing were.
- Comment: All species are sharing water and chemistry make-up – need more parameters monitored. Sea Grant proposal did not get funded for more bivalve chemistry-- need to look broader to get better information

Review Pending Issues from Last Meeting:

- Nick: In notes from March about the "5-mile radius natal delta exclusion zone", the way it's written seems like it goes beyond our discussion.

- Perry: We're not talking about identifying an exclusion zone. That's the way it was referred to by Doug Myers at the last meeting.
- Diane: It was being spoken of hypothetically, acknowledging there is already some development in those areas, and in some cases geoduck may even be desirable in terms of water quality.
- Morris: I think the point was that those are high priority areas to protect.
- Perry to Bryan: Does Pacific County have a set list of information you ask every aquaculture farmer to provide?
- Bryan: No, and I think since we're specific to geoduck that is something that will come from this committee in the form of guidelines.
- Nick: I'm curious from the last meeting about asking local government what they need to make these guidelines work in SMPs. Did I understand that we were going to invite them here to talk to us? And if so, is there a reason Grays and Pacific counties haven't been invited?
- Perry: They're not going to be here with us, That's an ongoing side conversation – they will report to the committee, maybe in July. Grays and Pacific counties were not invited because the SMP conversation is specific to geoducks, and Grays and Pacific are not involved in geoduck farming.
- Diane: 1) I would caution that we don't just assume that there is an impact to the entire nearshore with everything surrounding geoduck farming. When we start designing guidelines, we need to address known impacts or potential impacts that we know exist. We need to not assume impacts where there may be none. 2) We need to be deliberate about the data layers we request, to make sure it will serve our purpose, because agencies will be investing resources to get it for us. 3) We asked the homeowners to provide us information – we think that's very important. We still don't have info from homeowners on their issue: aesthetics. There are some very easy fixes to those issues. We would like to request those again.
- Annie: I would like to suggest that we get the big list of data we might want and then cut it down to a shorter list of what's feasible and most useful.
- Laura: We cannot make regulations about scientific impacts when we don't have science. I thought we are supposed to be protecting Puget Sound – we advocate using the precautionary approach. We know the beach is lowered 1-2 inches and nearshore environment is affected, and that needs to be addressed. We will not discuss tube color because that will not mitigate the environmental effects we are concerned about.
- Morris: **Salmonscape, WRIAs.** I would suggest smaller than a 5-mile radius around natal deltas – we're talking about many small streams, etc. not just the Nisqually.
- Possible/desirable data layers for mapping + General discussion of mapping:
 - Dataset/map for SARC "geoduck tool"
 - Bird aggregations – forage and resting, nesting
 - ≤ 5 miles from natal estuaries and pocket estuaries
 - Look at hotspots
 - Issue of different resolution and scales not helpful
 - Data that describes ecological function
 - Links to "no net loss" of function
 - Connect guidelines to potential impacts
 - Site specific survey mandatory – as alternative to looking at a broader planning level
 - Perry – How do you define the natal stream, where the limit starts?
 - Morris: There are a variety of ways to define that.
 - Cyrilla: Don't we want to create maps, overlay data, and identify hot spots for protection (eelgrass, salmon habitat, pocket estuaries, existing shellfish, existing development)? What do we need to know to have the info we need to make good decisions?
 - Blain: As someone who has spent a lot of time working with spatial data, our shorezone inventory data set is at landscape scale – this is not the use it was created for. I suggest making a site-specific inventory mandatory before beginning a geoduck farm -- unless you're talking planning and zoning, which seemed to be abandoned by this committee at an early meeting in favor of BMPs.
 - Nick: The first things to look at would be what areas are certified, to find out where I can farm (without waiting 5-6 years for a survey to be done). Then you do a site-specific survey. This committee can set the terms for what growers have to look at.

- Diane: I agree. The layers that are out there on the different maps have different resolutions, different scales, different kinds of info. I don't know that they're going to be helpful to deciding whether a geoduck farm is appropriate at a given site. We can put all of this together and growers are still going to go out and do a site-specific survey – so it's not going to get us very far.
- Cyrilla: I wasn't think we're going to go site-by-site to evaluate, but in order to come up with recommendations, it would be helpful to know if the entire shoreline is forage fish habitat, because then we can't require that it not be. We need to get a feel for lay of the land to know how any potential guidelines play on the ground to know whether they're reasonable.
- Krystal: I don't agree that we want to leave it up to one group of people to decide for everyone how we're going to protect Puget Sound. What I want to say is that the regulations we're trying to come up with will be part of SMP guidelines, and the criteria for SMPs now is No Net Loss of ecological function. What are the ecological functions and what data is available to answer that question? If we'd still like to look at maps (which I'd like to, but not at everything) maybe it would be useful for the panelists from the last two meeting to sit down together and give input with data they know is out there and put together a draft for us to see.
- Perry: I understand concerns about the limitations of maps, and I don't think it would be used as a decision-making tool—more as a screening tool. If we have data layers with eelgrass and forage fish and some NOAA change information, why not use that?
- Sarah: I agree. I just went to SalmonScape to look at forage fish habitat. There is very useful info out there for screening. We can provide a list of datasets that should be used as tool by counties in decision-making, with stipulations that they should avoid pocket estuaries, etc.
- Bryan: On the broad brush we may trip over where this one species of bird is hanging out at night – maybe there are only three such sites in all of the Sound. It's not too much to keep them out of here or there. When you are siting geoduck aquaculture you need to consider whether this areas is (xyz) and explain why, what local governments should look for and why. If locals are given general guidance and allowed to implement in their own context and circumstances, they will feel more ownership of their decisions and priorities. What is good for one county is not necessarily good for another.
- Diane: There will be things out there we recognize as important, and we can map those. But we need to make sure that if we're going to regulate an industry based on where "this" is, or one person's perception of where "this" is, we need to have this based in fact/ground-truthing, I need to see evidence that geoduck aquaculture does in fact impact some of the things we're talking about mapping. It may not be the case, and it may be that geoduck have some benefits.
- Laura: We need to use mapping as a base to where we should be looking. I agree that counties need flexibility, but we need certain high-value, high-risk issues identified, and others are more site-specific. Regulations need to protect the areas where it does not fit. Until the science is in, we need to follow the precautionary principle until we have more information.
 - What data do we have to help us with siting decisions?
 - DNR data on geoduck areas
 - WDFW – SalmonScape
 - Kathy : We can make a special data layer collection for SARC if you tell us what you need
 - More issues with using maps/data – it's a snapshot in time only; still need ground-truth
 - Provide list of datasets with recommendations to avoid/minimize
 - Connecting impacts of farms to what is mapped
 - Broader list includes: Marine vegetation, forage fish
 - Mapping to help determine if an area is permitted
 - Fish indicator – herring - link to birds and habitat protection?
 - Use of nearshore environment....focus on areas of overlap
 - As grower: Open Water Quality grower area, substrate, sensitive resources areas

- Use maps to inform potential guidelines
- Panelists should help develop draft map/layers
- Maps are valuable screening tool - can include caveats and limitations

Action items:

- Comment: We need more expert information on invasive species and farming. (Perry asks that anyone who has important information on this topic (send it to him for distribution rather than devoting meeting time to this.)
- Diane: I can bring examples of predator exclusion devices.
- Perry, Yes. And Laura, if you have documentation of some of these examples you've cited, please share them with the committee.
- List of datasets to help determine suitability for siting farms
- Perry will send out proposed schedule for work on Task 3
- Krystal: I will do some homework and send materials to Perry for the next meeting on some of our ideas for siting and bird and wildlife species and other things we talked about today.
- Perry: Main topics for next meeting are baseline data collection and adaptive management. I too don't want to collect data unless it will really be helpful – data collection costs a lot of money and resources.
- Perry: Please send agenda requests to Perry and Candice. If you have ideas for other topics, and if you know of anyone who can talk to us about these topics, please let me know.

Final Comments:

- Laura: We still need a report on the numbers of acres for existing shellfish aquaculture, especially geoduck aquaculture. What's the status of that project?
- Discussion of what "department" means in (which legislation?). Diane: it's both Dept of Ag and _____?
- Perry: I think Laura is misrepresenting legislation and the report required. (NWP info...?) A report of the kind you're talking about, and making the numbers consistent, is a great recommendation to come out of this committee, but it's not reasonable to make demands to have this right now.
- Nick: I've really enjoyed the last two meetings when there has been a panel – will we have this next month too?
- Perry: Given the topics we're going to be discussing, I don't really see the opportunity for a panel.
- Nick: Task 3 – On guidelines to assist local governments with SMPs, I've given some thought to what guidelines could be. I believe each site will be different. Maps and overlays can be helpful, but I'm not sure I wouldn't have the counties start to interpret all this data. If they want to, they can walk the site to look for eelgrass or whatever we suggest they look for. I'm started to feel a sense of how I would write this in my own mind, so I'm feeling good about that today.
- Sarah: I'm starting to get a sense of how I would write this, too. I think it comes down to some things that are inviolable. Then you'd have BMPs to be protective. Two potential areas we need to look at are those flooded with water covering the upper part of the beaches – could get silt there – when there are _____ on the beach, you don't harvest.
- Diane: On the concept of NNL and net benefits: We seem to make policy decisions in isolation from the other policies that are being written. If you look at this on a landscape basis, shellfish farming is a net benefit. There may be some localized impacts, but on a landscape level it is a net benefit. I would challenge anyone to say there is a net loss.

Adjourn: 3:45

Public Comment:

Paul Sparks (Washington Council of Trout Unlimited):

First, I have been a logger, a commercial fisherman and in my later years, an environmentalist. As a consequence, I think I have a perspective on resource issues from both sides of the fence. Many of the consequences of the things that I did as a young man cannot be undone today. The question before you is how to regulate a practice where there is strong circumstantial evidence for a potential for lasting harm to the near shore environment. If we were talking about a food product or commodity necessary to the survival of millions, I'd be willing to make concessions but in this instance we are talking about upscale consumer products and not necessities for life. The public interest should outweigh the private interest until it is clear what the real outcomes will be.

Second issue...I support the idea of mapping. When dealing with an issue I want to understand the scale of a problem. Without understanding that, how can this group make decisions? Would you be willing to publically admit that you have had this issue before you for the best part of a year without maps delineating the areas under cultivation, held for cultivation but unexploited, and habitat suitable for future exploitation.

Third, praise and compliments for the idea of overlay maps. Here is what I'd like to see:

1. All the current plantations and the entire habitat suitable for growing geoducks. (Given the high profit margin and the fact that seed will inevitably become more readily available there is a potential for a short term boom where marginal habitat predictably will be exploited.) What areas are available for cultivation? What areas are at risk?
2. What are the water quality limitations?
3. Nesting and feeding habitat for both birds that feed on invertebrates and forage fish. I don't think it is necessary to map where scoters sleep at night but you do need to think about protecting the areas where they feed.
4. Eel grass and Laminaria. Both need to be mapped.
5. Spawning, refuge, and foraging habitat for Surf Smelt, Sand Lance, and Herring. Mapping should include both known spawning habitat and potential spawning habitat
6. ESA listed salmonids...salmon recovery is a game of inches with the high rates of ocean harvest leaving less than 4% of the fish available as spawners. Even small losses have critical consequences. Map overlays should include salmonid uses of the near shore habitat at all life stages. When Doug Myers used the term exclusion zones it was deliberate. That intention should not be minimized by relabeling in the committee's discussions. Mapping potential exclusion zones might be less comprehensive but in the long term would be more realistic because it represents the intentions of the Near Shore Partnership.

Kris Mansfield (Harstine Island property owner): I grew up walking the beaches of Puget Sound and especially Harstine Island. These tidelands are an ecosystem that is alive and an important part of what makes up Puget Sound. What impacts these tidelands can impact the entire food chain. This form of aquaculture, geoduck farming, will impact the tidelands and beyond—forever. Our beach is documented as a Sand lance area which the threatened Chinook salmon feed on. We have our migration of Buffleheads, Goldeneyes, and other diving ducks that are dependent on these tidelands. For these reasons I feel that the leasing of tidelands for the purpose of geoduck farming is wrong. Quoting a friend, geoduck farming is far from the oyster farming of our grandfathers. This is a far more invasive method of growing shellfish which has not been experienced in the Puget Sound. You are all aware of the process. We have no idea what the long-term and potentially irreversible consequences of this activity are. No studies have been done on what birds and marine life will be displaced and the loss of forage fish. We are finding out that the PVC pipes are toxic to humans and marine life. I believe these activities should be stopped until the science is done—and done by an independent source, not by the industry best management practices. What's going to happen if the Asian market for geoducks collapses? Who will be responsible for restoring our tidelands to their original condition, if that will even be possible at all? There is a real negative impact happening here and it's not just shellfish farming as usual. We all need to pay attention to what's going on.

Marilyn Showalter (Property owner in Hood Canal Shine, Washington, property is natural with no bulkhead): 1) The burden of proof should fall on those proposing geoduck farms to demonstrate they are safe. Some say there is no evidence of harm or that we don't have the studies showing harm, but which way should this cut? I heard Perry say it's going to get down to where we don't really know, so we're going to have to go with BMPs. But supposing you knew nothing at all about geoduck farming, one way or the other. In that case, I think most people would say we should not go forward. I suggest that you have to have a) confidence based on b) substantial evidence that there is c) no net loss or no significant harm. Once you've crossed that threshold, then adaptive management is the way to incorporate new science. As an exercise, imagine that your suggested regulations were going to be applied to salmon pens 10-15 years ago. We really didn't know much then, and shouldn't have gone forward. It may be that geoducks are nothing like that, but if you don't have the evidence, don't go forward. 2) Make sure your evidence is about geoducks, not other shellfish. I've heard a lot of talk of clams and oysters as if they're the same as geoducks. They are different species with different seeding, planting, and harvesting practices. It is not the same activity. 3) PVC: I haven't heard this group delve into the environmental effects of PVC. This needs to be addressed, especially given recent reports. 4) Please use microphones. I couldn't hear much of the discussion.

Marie Duckworth (Stretch Island property owner): I was going to talk about PVC pipe (already emailed comments to Ecology on this topic). But what I'd like to say now is that I really feel like we're proceeding without the necessary science. We're not ready to proceed, and we're talking about the things we need to do for the guidelines. While we're talking about it, they're continuing to develop more shoreline. I appreciate the candor of the committee in admitting that getting the information will take a lot of time. I am frustrated that I continue to see new geoduck farms popping up and getting notice from DNR that they're doing new developments.

Kyle Deerkop (Shellfish Industry): I'd just like to speak in support of Diane's closing comment that shellfish farming can have net beneficial effects for Puget Sound. When the question was posed about how much of Puget Sound is approved for shellfish farming, the response was 800 out of about 2500 miles. That was certified not just for shellfish farming, but also for swimming. Cultural, tribes, recreational uses all benefit. Regarding threats to birds, I almost hit a red-tail hawk coming out this meeting. One eagle has been confirmed to have drowned, one to two have been caught in the nets and have gotten out. It's important to keep this in perspective. Spartina is mostly a Willapa Bay issue, but also in the north Sound. It causes a lot of siltation, which is not good for shellfish or for [REDACTED]. Shellfish can help remove effluent from uplands. Regarding heavy metals, concern about chemicals: I read recently that there is more cadmium in a cigarette than in a contaminated oyster. Regarding Scoters off of Harstine Island, we send a lot of employees to safety hazmat training so that we can respond swiftly to these kinds of situations. I also do work in debris cleanup, both aquaculture and non-aquaculture. When we collect debris, the percentage that is from aquaculture is fairly low. We have a lot of interest in birds, salmon, natal streams, bulkheads, etc. We can look into all of those things. Shellfish aquaculture is a net benefit for Washington waters.

Public Comments End: 4:15