

## **6PPD-Q Spatial PAC meeting 2 Agenda**

Attendance: Valerie Chu, Brian Muegge, Christian Nilsen, Rhea Smith, Brandi Lubliner, Abby Barnes, Keisha chin, Christopher Clinton, Susan Cormier, Dan Kent, David Troutt, Derek Day, Karen Dinicola, Jon Halama, Chad Larson, Marisa Litz, Bob McKane, Nat Scholz, Ron McFarlane, Abbey Stockwell, Ed Kolodziej, Catherine Gockel, Tiffany (guest), Jesse Alton, Tyson Waldo, Jennifer Vanderhoof, other chime in...

**March 7, 2022 - Monday**

**1:00 pm Welcome – Rhea Smith, WA Ecology**

Literature Update: Recent literature findings over the last year. Efforts on TWRP and microplastic pathways pre-date knowing about the specific 6PPD byproducts such as 6PPD-quinone.

**1:05 David Troutt**  
**Nisqually Indian Tribe**  
***Salmon Recovery & Water Quality***

As a policy and decision maker it is my job to protect treaty rights. David is chair of Puget Sound Salmon Recovery Council. The council was concerned when news reached them ~18 months ago about tire contaminants acutely toxic to some salmonids.

There is a need for a Gov2Gov policy committee on 6PPD mitigation strategies. The Tribes are deeply concerned about 6PPD and pre-spawn mortality. We were able to get LLTK grant money to design a bioretention treatment pilot study on Ohop Creek to protect salmon from road runoff. Slides on the treatment train: capture trench, solids settling, biofiltration box and phosphorous polishing later. They are sampling using automated samplers run by Herrera consulting.

The bioretention box was fairly inexpensive, installable, and scalable. Likely we wouldn't have chosen this location when we look across a landscape. But this spot on Hwy 7 has a treaty right associated so this watershed is important to protect and conduct studies.

6PPD-quinone is effectively a chemical fish passage barrier. Interest and issues of all the prioritization schemes. And now that we know this takes fish this is a treaty violation and there needs to policy steering committee; a gov't to gov't conversation. Ninth Circuit court on culvert decision, we would like to be involved during these early discussions and work together to come up with effective solutions.

Questions:

- **Are you collecting baseline data for 6PPD-quinone and other road runoff contaminants?** David will share sampling plan with group, it was developed with Jen McIntyre from WSU-Puyallup.
- **What about BIBI and 6PPD-quinone correlations?** Too many confounding

factors that are known to impact BIBI and additional impacts. NOAA has tried to get WQ driver and macroinvertebrate abundance along pre-spawn mortality. Pre-spawn mortality and BIBI were correlated in recent paper. Kate MacNiell helped with an exposed healthy bugs project on west Seattle golf course; they built traps and the bugs move away from unfavorable circumstances. Mayflies and Daphnia are sensitive to unfiltered stormwater. However, it's hard to tease apart the response of the inverts that can leave vs those that cannot leave the stormwater input.

**1:25            Ron McFarlane**  
**Northwest Fisheries Indian Commission**  
***SWIFD/Salmonscape Fish Distribution Mapping***

SWIFD curated by Ron in cooperation with Arleta Agun at WDFW. Salmonscape (WDFW) and SWIFD (NWIFC) are co-curated. Originally the interactive fish distribution web map used DNR hydrography. Limiting factors were that the watershed based with advisory committees mapped what areas they were most interested in, not where the fish were, there was a need for more consistent, complete, species specific maps.

In 2006 the salmon maps began using USGS/WA Ecology NHD hydrography and moved in current direction to merge together data maintained by tribes and WDFW. It is important to note that these maps represent the presence of fish (not the absence). Known or documented fish distributions are verified by regional fishery biologists. Presumed distribution means that there is good habitat, but salmon have not been observed, but presumed they are there.

Example of a culvert bisecting good habitat; a biologist will identify (code) the section above the barrier as potential habitat. There has to be agreement between the biologists on how to classify habitat. Staffing/personnel/turnover has a limiting effect on data completeness, precludes all the streams being evaluated routinely. It is important to choose the most relevant base layers from the beginning and continually help update these baselayers: For instance, regional salmon biologists will try to enter fish barrier culvert and salmon species information, but the stream won't exist on the map, so they keep track of this information and update the NHD stewards. And they are unable to enter that there are fish in that unmapped stream. WDFW and NWIFC are trying to make a better commitment to the SWIFD updates, quarterly, but need to work with the available resources.

**QA/QC wise:**

WDFW or Tribes can update and the data is reviewed by NWIFC. They aim for high data quality with dedicated and well trained staff. Trying to focus on mapping where the fish are, the Tribes drive the assessment focus.

**Questions and Comments:**

- Marisa L – SWIFD is the oldest fish distribution effort. Additional tools have

been developed to provide evolving products on regional stock abundance and diversity (Brodi Cox's group; SASSY data).

- Arleta has code to link the SASSY data to SWIFD to better understand size of runs, abundance, and overlay with distribution.
- Valerie – **is anyone testing 6PPD-quinone toxicity on bull trout?** Nat is planning to test juvenile bull trout and thinks there is going to be some phylogenetic sorting. Salmonids sensitivity to 6PPD-quinone is variable. We have a paper coming out soon, French et al. in review, that will rank salmonid species by stormwater runoff sensitivity.

**1:45**                      **Tim Beechie**  
                                 **NOAA-**  
                                 ***Salmon Recovery Prioritization***

Habitat assessment and restoration planning (HARP) model developed for Chehalis Basin. What it does: considered the habitat needs throughout the salmon life history. They developed the HARP model to better understand what drives salmon population abundance and productivity trends. The model can help address the following questions:

1. Which restoration actions are most important (Jorgensen et al 2021 slide)?
2. What are the effects of climate change (Beechie et al. (in review))?
3. What are the combinations of actions (5 most important actions at different restoration intensities) -beechie et al in review)?

Since the Chehalis basin work, they've made some updates for Snohomish & Stillaguamish such as adding more complexity to the life histories, adding threat estimates of roads from Feist et al. 2017, and applied Feist + impervious to all the spawning reaches. (Chehalis version of the model had impervious area, but did not tease out roads and traffic). **There isn't a direct mitigation for roads or impervious that is currently built into the model.**

### **Questions**

- **Did they say why SW mitigation actions weren't built into the model for impervious/roads?** It was not added to the model because we don't have the baselayers, what would you put in? Where would you put them? How much does it reduce? What does it reduce?  
Nat added to Tim's response: how much mitigation assessments are needed at both landscape scale and site scale... no idea how much is going to be needed. Stormwater at the watershed scale, modeling framework is the same, but unknown how much do you have to do and across timescales.....lost connection with Nat here. NOAA/Ecotox and watershed program are working to add WQ info to HARP. Other uses for HARP & watershed program staff: barrier removal questions like where are the culverts that would be less impacted by this water quality issue. Looking forward to linking up more between Watershed and Ecotox

programs at NOAA, glad we are connecting programs and efforts.

- **What data is most needed for linking the WQ/ road runoff into this larger model?**

Answer - aside from the model used by Feist, not sure, but like Feist best right now. It is a threat map, but all we have until more work is available. We don't currently have a way to build in the road runoff mitigation action, a way to estimate % of road runoff have to be treated to get effects. More uncertainty in the fish life history than the habitats and WQ relationships.

Nat added to answer = **We don't know what the scope and scale of the problem yet.** What is the load like at the full watershed scale; sediments, seasons, temporal scales, landscapes attributes, ...lost Nat's connection again...what is the nature (scope and scale) of the problem? Essential big list of things that Nat said that we need to figure out before we can identify priority areas for mitigation action.

Rhea added – We need road runoff, stream, salmon and stormwater inventories/assessments

**2:00**                      **Break**

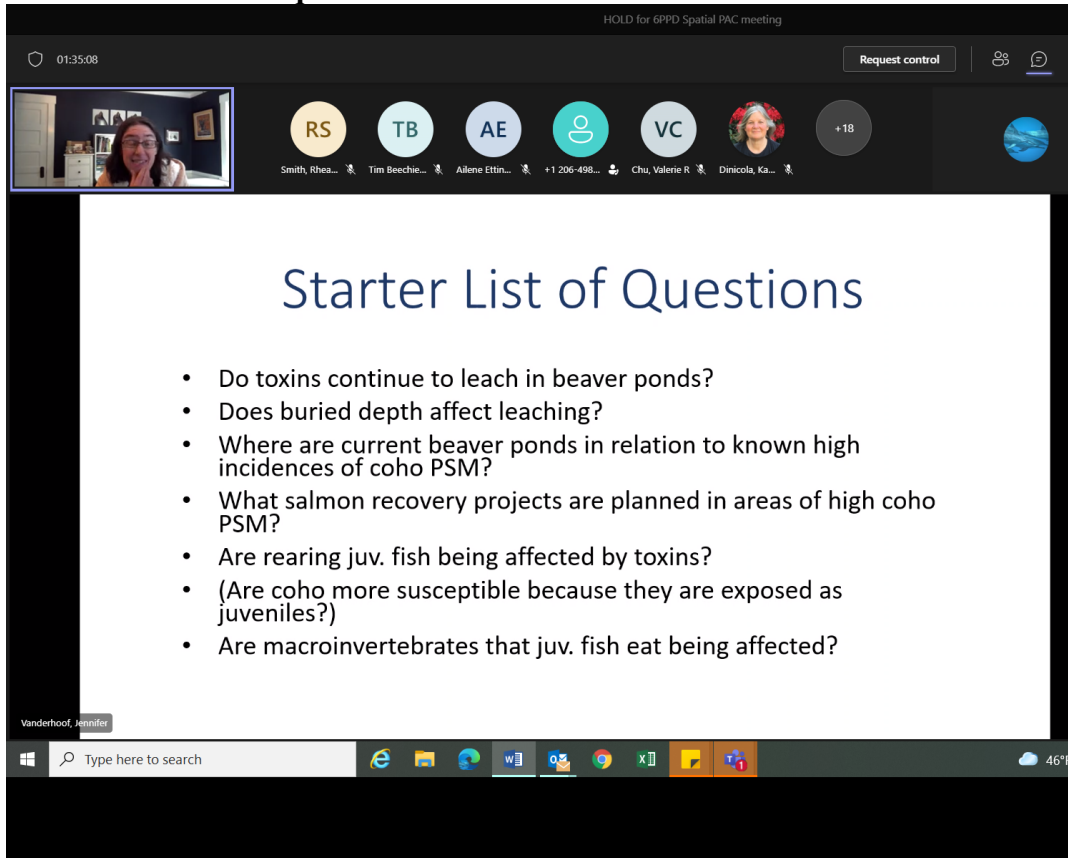
**2:10**                      **Jennifer Vanderhoof**  
**King County**  
***Beavers, Salmon, Toxics trapping & Water flow***

Beaver and fish distribution history. Most beavers were functionally exterminated before prior to logging. Roads and towns were all built without knowing about the role/distribution of beavers in the watershed. Most headwaters in PS watershed were beaver dominated areas. Laws changed in 2000 on trapping and motivation was lost to capture beavers, chinook were listed and riparian restoration efforts reintroduced their food (cottonwood). Beavers have made a come back in our watersheds for the first time in 200 years. Beavers help restore stream complexity from single channels to multichannel systems (Pollock et al 2014), which is natural flood control, by raising the water level and widening the floodplain (braided channels). Beavers help support coho by providing pools for juvenile coho. Beavers are ecosystem engineers through most of the lowland Puget Sound. Coho are already the athletes and can get anywhere but are poised to do better with beavers. Beavers are storing lots of transported sediment, more of a function of size of dam not pond, tons and tons of sediment. Rates of sedimentation range 1-40 cm/yr can be mitigated by beaver dams. **Not much literature on sediment filtering effects of beaver ponds, needs to be question for the group.**

Nat added= beaver trapping sediments is an important study set of questions as they re-enter the urban environment. There may be lots of processing of contaminants biological breakdowns, but could also become a pollutant reservoir.

Beaver dams periodically blow out, so there is natural cleaning process via structural failures, human interactions, etc. leading to remobilization of bound sediments. Currently working on understanding lifecycles of beaver dams themselves.

## Starter list of beaver questions:



HOLD for 6PPD Spatial PAC meeting

01:35:08

Request control

RS TB AE VC +18

Smith, Rhea... Tim Beechie... Allene Ettin... +1 206-498... Chu, Valerie R... Dinicola, Ka...

### Starter List of Questions

- Do toxins continue to leach in beaver ponds?
- Does buried depth affect leaching?
- Where are current beaver ponds in relation to known high incidences of coho PSM?
- What salmon recovery projects are planned in areas of high coho PSM?
- Are rearing juv. fish being affected by toxins?
- (Are coho more susceptible because they are exposed as juveniles?)
- Are macroinvertebrates that juv. fish eat being affected?

Vanderhoof, Jennifer

Type here to search

46°F

## 2:30 Updates & Discussion

NOAA has pre-spawn mortality maps, but at this point are out of date by 5 years. NOAA built a story map to support citizen science surveys, but it also needs to be updated.

**NOAA plans to double down on this effort in the coming months to share with everyone which watershed are impacted and share soon.** Need to gather the data in the fall and populate map in the spring. There are lots of considerations on getting citizen science participation. Field protocol is covered. Other things that came up were concerns about untrained folks unintentionally walking in streams over redds, cutting into fish, safety considerations around entering streams during high flows. Important to provide training for citizen scientists that want to help with surveys.

## 3:15 Wrap up

Rhea provided homework for the group to provide their comments and feedback on the how best to assess the scope and scale of 6PPD in the environment.

Rhea will reach out to participants with specific questions and information requests during the report writing process.

Key take aways from today:

- Salmon maps show where the fish have been observed/surveyed, but does not verify where they are absent. It is also possible that salmon use to be there, but because of chemical or physical fish barriers, they no longer can get there or have died out. Chinook and Steelhead have gotten more survey and recovery attention since they were listed, meanwhile wild coho populations have dwindled.
- We don't have the baselayers and inventories available to prioritize mitigation actions with any of the available spatial tools. We need to inventory the presence and absence of salmon, road/stormwater infrastructure, streams, cars and land cover to maximize habitat benefit, minimize cost, and identify the most feasible projects first for pilot studies.
- We need to understand the watershed ecosystem and habitat connectivity of mobile aquatic life.

### **Meeting Prep Resource Links:**

Statewide Integrated Fish Distribution (SWIFD) & Salmonscape - Washington Treaty Tribes and the Washington Department of Fish and Wildlife co-manage

Salmon and Steelhead Habitat Inventory Program (SSHIAP) – Washington Treaty Tribes and the Washington Department of Fish and Wildlife co-manage

Tribal Habitat Strategy - NWIFC

State of the Salmon Water