

6PPD Spatial Technical Advisory Committee Meeting 1

Feb. 23rd, 2022

Attachments: Attendee list SPAC meeting 1

Summary of STAC Recommendations on Proposed Scope:

- Prioritize road runoff mitigation efforts on protection of most sensitive salmonids including coho and steelhead – however, there is a need to incorporate new research on sublethal effects, therefore safest to consider all salmon habitat at this early stage
- Request tribes to provide STAC with priority lists of salmon habitat to protect from road runoff disturbances

Key points and action items:

- 1) David Troutt – Recognized that coho and steelhead are most impacted by urbanization and road runoff, however, it remains important to address and protect all salmonid species from road runoff and associated toxic chemicals.

Actions –

- a. David will provide the 6PPD STAC with further guidance on how best to incorporate tribal treaty rights into the prioritization process, an initial suggestion was to use the salmon recovery board framework.
 - b. The importance of incorporating tribal treaty rights in road runoff reduction study prioritization efforts should be highlighted. The Northwest Indian Fisheries Commission Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAIP) is identified as a critical resource for prioritization strategies. Spatial prioritization efforts are incorporating the SWIFD salmon distribution GIS layers and Ecology is coordinating the use of this data with NWIFC GIS data stewards.
- 2) David Troutt – Reminded the group how essential it is to consider each tribe individually and the importance of a State wide prioritization, not a Puget Sound biased approach.

Response –

- a. Ecology will continue to coordinate prioritization efforts with NWIFC GIS Stewards and salmon recovery lead entities, who will help connect Ecology staff with Tribal GIS WQ/Salmon prioritization efforts across the State for effective coordination and inclusion of culturally important stocks.
- b. David suggested considering a salmon recovery board funding structure for road runoff mitigation.

- 3) Karen Dinicola – Re-emphasized the lethal concentration of 6PPD-Quinone is so low that it is not source limited. Therefore, traffic counts alone are not enough to prioritize further studies and BMP placements to treat 6PPD-Q

Response –

- a. Ecology staff will emphasize the toxicity and persistence of 6PPD and related tire chemicals in the Proviso report and incorporate the PAC’s strategies on how best to prioritize.
 - b. WSDOTs goal is to incorporate/assess the most appropriate BMPs to effectively reduce and/or treat road runoff prior to entering receiving waters during fish passage improvement projects and road/SW retrofit sites near fish bearing streams.
- 4) David Troutt – “do we know how many cars over what period of time produces the levels of 6PPD-q that kills coho?”

Response -

- a. Ed agreed that this is a data gap, “from my perspective, I consider that question to be a data gap. I don't think the mass balance from tire to creek is understood at the current time.”
 - b. Nat informed the STAC that NOAA has plans to test their models and build this correlation this fall: “A core long-term objective with these models is the formulation of testable hypotheses – ie sorting road networks into traffic intensity categories (as a proxy for 6PPD-Q loading), and then validate the model predictions with targeted field sampling for water and salmon mortality. This is where the NOAA team is going in the fall”.
- 5) Susan is going to share a link to the smaller hydrologic units from StreamCAT available via Federal EPA. She suggested reviewing where this data will be stored and how it will be seen.
- 6) Derek – there is a need to separate out different impacts to salmon and aquatic habitat, using a magnifying glass to find hot spots.

Response –

- a. Rhea - will follow up with Derek, the group likes the magnifying glass concept, but perhaps a criteria filtering process? Find 6PPD-Q priority areas that could support salmon if water quality is improved, habitat that is 1) accessible, 2) good habitat (pebbles, riffles, tree canopy cover, meets TMDL criteria, especially TSS, 3) good B-IBI, 4) good, consistent flow all year round, 5) has good connectivity to rearing habitat, BUT it has tire contaminant/road runoff disturbance..... either at or on the way to the spawning grounds – This might be the low hanging fruit.
- 7) Ecology staff will follow up with a mitigation matrix.

Presentations

1:00 pm Welcome – Rhea Smith, Ecology

Summary Notes:

- Thank you for participating in this technical advisory committee and exploring strategies to prioritize and assess best management practice efforts to treat 6PPD-Quinone toxicity and effectively fill in numerous data gaps to protect aquatic life.
- Initial thoughts are to focus BMP assessments in areas where roads and salmon habitat collide. Coho are more sensitive to 6PPD-Q than other salmonids and tend to utilize small tributaries residing in lowlands where urban road runoff is greatest.
- However, researchers are currently conducting additional studies to explore sub-lethal effects to other salmonids and aquatic biota. Therefore, it is important to utilize adaptive management strategies to incorporate new information as well, so we may want to cast a wide net until sub-lethal effects are understood.
- Review of the Proviso goals and timeline and why defining priority areas is important, (5 point slide).
- BMPs effective at treating 6PPD-Q are currently being evaluated by stormwater engineers. Promising work done by Jen McIntyre suggests that infiltration removes or reduces 6PPD-Q from road runoff to counteract lethal effects to coho, this is an ongoing study to see if the sediments/organics become saturated with tire chemicals and whether or not effectiveness decreases over time.
- LC50 of 6PPD-quinone is very low so it won't take much to be lethal to Coho/Steelhead.
- Building Cities in the Rain provides guidance for new development, however, improving and updating old road and stormwater infrastructure is more challenging and overwhelming.
- Propose that the STAC start by identifying areas where coho and steelhead, who reside in small streams across the lowlands (>10,000 streams on the West-side of Washington) that are at a higher risk of exposure to road runoff transporting tire chemicals.
- The STAC will address and identify tire wear particle (TWP) sinks, inverts, all salmonids, however, with the need to prioritize, want to start at this first round of priority areas.
- Ecology staff appreciates the multi-disciplinary integration that this group represents and grateful that folks are at the table to help steer the prioritization effort.
- Peter & Lundin recent publication incorporates Feist work on spatial vulnerability mapping and correlates URMS with the biological metric of B-IBI.
- Guiding laws for context CWA, ESA, Boldt Decision. Chinook are listed therefore most resources have been allocated to their habitat recovery efforts that tend to be further up in the watershed, over the last decade, meanwhile Coho, who are not listed (yet), are hardest hit by urban road runoff and 6PPD-Q simply because of their habitat usage of small tributaries in the lowlands.
- NWIFC released the State of the Salmon Report that calls for watershed approach, this supports the need for multi-stakeholder efforts like 6PPD Spatial PAC working group.

1:10 Ailene Ettinger
Washington (State) - Nature Conservancy

Prioritizing Conservation Actions in Urbanizing Landscapes

Summary Notes:

- Ailene is a Quantitative Ecologist, post-doc at NOAA.
- There is far more work to do right now to address impacts of stormwater and aquatic biota than capacity, hence the need for prioritization efforts.
- A way to prioritize might include cost/effort-effectiveness; conservation metrics e.g. diversity (y-axis) and effort (x axis). These metrics were the basis of the urbanization prioritization map.
- There is gaps in data such as Coho habitat assessments, used Salmonscape.
- Study correlated pre-spawn mortality and urbanization and aimed to define a threshold between restoration vs preservation priorities to use for decision making, where to invest resource/recovery efforts.
- Coho habitat metric yielded a different map than a chinook habitat metric. Ailene mentioned that GSI (where, how much) that 'is designed to break this relationship' is a data gap. Important to be able to toggle between species specific prioritizations, otherwise efforts are diluted.
- There is a need for updated and more standardized coho distribution maps.

1:30 Christian Nilsen
Geosyntec & Washington Nature Conservancy

Summary Notes:

- Stormwater Heatmap full release is expected on March 7th
- Intended for stormwater planners/managers.
- Focus is to predict pollutant concentrations in the landscape, and allows analysis at all scales, WRIA to neighborhoods.
- Layers used include HRLC, hydrology, climate change, land cover, and ... NAIP, NOAA C-CAP 30m and went to 1 m². Focused on roads, driveways, rooftops, etc. that are important for stormwater modeling.
- Impervious statistics are very good and land cover are good. TSS, TKN, TP, TZinc, TCopper from **2015 Hobbs et al** report and used mixed effects spatial linear regressions to extrapolate.
- There are some explanatory variables that could be useful for predicting 6PPD-Q such as PM2.5 copper & zinc, on-road exhaust CO2 dataset (Vulcan – Oakridge Natl Lab – predicts emissions across the country). They bought traffic data package from Kalibrate (more than WSDOT + manual traffic counts). Launch on March 7 and will continue to curate and update for climate change etc.
- Question (David) = How many cars over what period of time produces the levels of 6PDD-Q yields a lethal concentration?
 - A (from Nat) = A core long-term objective with these models is the formulation of testable hypotheses – ie sorting road networks into traffic intensity categories (as a proxy for 6PPD-Q loading), and then validate the model predictions with targeted field sampling for water and salmon mortality. This is where the NOAA team is going in the fall.

- A (from Ed) = from my perspective, I consider that question to be a data gap, I don't think the mass balance from tire to creek is understood at the current time
- Question (Cristiana?) = there is an EPA roadway-based model for air quality that has tire wear, has anyone looked at this model? A=starting point papers can be shared Tian et al 2020 to help

1:50 Colin Hume
WA Ecology
Watershed Characterization Project

Summary Notes:

- EPA/NEP and SI funded effort to help groups/WRIAs/cities/towns/counties/tribes across the Puget Sound area with conservation and prioritization planning. Wide array of applications over the years
- All spatial indices are available for users via web based story maps.
- Physical units (water flow, soils), WQ (transport of pollutants across landscape/aquascape), habitat units. Uses hand edited 'assessment units' which are smaller than HUC 12s, but have only done this for Puget Sound area thus far.
- Case Study – Mukilteo project demonstrated how a local government used WCP to build maps of SMAP requirements and stormwater management/planning aspect of their comprehensive planning process. Gives a planning framework to prioritization with a stormwater focus.

2:10 Keisha Chinn & Tony Bush
Washington Department of Transportation
Road Runoff Reduction Plans & GIS Road Metrics

Summary Notes (Tony):

- 2018 Stormwater retrofit approach development started in 2013
- Three types of retrofits;
 - 1) project based (part of permit requirements);
 - 2) opportunity based- no reg requirement but can and often put together more WQ treatment for a separate project (fish passage);
 - 3) standalone retrofit program that is the 2018 prioritization effort. Prioritizations used point system where any retrofits over 8pts made it on the list.
- WSDOT is now working on a 2nd round of prioritization efforts, where more weight will be placed on Environmental Justice, Cultural Importance and Tribal Treaty Rights including protecting salmon/aquatic life habitat.
- Summer spawning was a secondary metric refers to habitats with water flow impacts (dries up in summer).
 - Q (David) – Why summer spawning metric? Concerned that this leaves out 95% of spawning grounds used during Fall/Winter/Spring

- A (Tony) - Clarified that this was not the only fish criteria that it is used to identify streams that are also impacted by water flow (dries up and strands salmon).
- Salmon spawning areas and fish barriers were given more points, used salmonscape for fish distributions.
- Currently every bridge/fish passage/barrier retrofit is assessed for BMPs installation, beyond what their Ecology issued Water Quality Permit currently requires.
- SB 5974 has additional prioritization measure and so may affect the current list and the priority standing of existing high quality sites. In other words, WSDOT is reassessing their priorities to incorporate new information and concern regarding tire chemicals.
- WSDOT is working with Ecology and 6PPD Spatial TAC and providing data to help with prioritization efforts. Most data is publically available here <https://gisdata-wsdot.opendata.arcgis.com/>
- Keisha showed a list of variables from initial discussions with Rhea et al.
 - Q (Susan) = could the road surface type affect the temperature and be important for kinetic development of the transformation of 6PPD-Q from parent 6PPD contaminant in tires. Might be able to utilize temperature satellite remote sensing data.
 - A (Keisha & Jesse) = temperature data is unknown except for the mountain passes for safety and letting the snow plows know when to plow (snow sensors).
 - A (Cristiana)= Motor Vehicle Estimate? (MOVES) is an air quality model that makes use of lots of vehicle information and tire wear is one of the parameters that it estimates. It would be a time consuming effort (on the scale of the Watershed Characterization Effort) to mine and use for this purpose, but is available for phase 2 of these efforts.

2:30 Break

2:40 Round Table Discussion – Prioritization

Strategies

Summary Notes:

Introductions and links EPA’s Watershed Explorer <https://www.epa.gov/water-research/freshwater-explorer>

David Troutt:

- 1) Makes sense to start with Coho, but don't move too far away from other species yet because sub-lethal effects are poorly understood at this stage.
- 2) There are multiple Tribes in WA with distinct treaty rights – treaty protected watersheds will need to be a highlight of this effort for regional prioritization. If we focus on only urban areas we will systematically be leaving out treaty boundaries for all areas of WA.
 - a. Rhea asked David for help assuring proper connections to NWIFC and direct connections to each First Nation, beyond folks already part of this STAC.
 - b. Rhea clarified that the proviso is a statewide, inclusive, prioritization effort, Rhea will follow up with David on his suggestion for using the Salmon Recovery Board as a framework.
 - c. Colin commented, “to account for this (TTR) we may need to provide multiple prioritizations rounds. Maybe a regional/statewide prioritization scheme. Then a second "level" prioritization within a given tribal treaty protected area. Assuming we can represent these spatially with enough accuracy. Just a thought.”
 - d. Rhea – The Salmon Recovery Lead Entities would satisfy these recommendations and they have the salmon recovery project prioritization framework, but would need the resources to help with road runoff mitigation prioritizations (GSI).
 - e. David replied – “I might suggest a roll up from a treaty right perspective to a regional/statewide consideration. Build from the ground up.”
 - f. Karen – “we can approach this problem from several prioritization concepts and compare the results”
 - g. David – “I could envision 16 treaty based priority lists moving forward to address the top 3 or 5 or 10 in each area.”
 - h. Karen – “in the end, \$ will need to either be directed or it could be spread like peanut butter”
 - i. Colin – “Maybe develop an overall prioritization framework that provides some consistency for comparison sake, then work within each tribal treaty protected area and get more specific data inputs which can roll up and provide somewhat of an "apples to apples" comparison?”
 - j. David – “Look to the SRFB funding model as a possible way to think about allocating resources - it is decidedly not peanut butter spreading.”
 - k. Karen – “We would very much like to see the tribes' lists, David. Those will be hard to argue against as being high priorities.”
 - l. David – “I agree, it just the scale of prioritization. Nisqually's treaty rights must be considered in this approach. This is fundamentally a treaty right issue.”

Ed Kolodziej:

In response to seasonality, need to consider spring too – “note that our current data indicates that we should be seeing juvenile mortality during spring storms, based simply on 6PPDQ concentrations exceeding LC50 values. Fraser River citizen scientists also documented juvenile mortality near Vancouver BC last spring.”

Bob McKane:

EPA has two proposals out for funding, expansion of VELMA and also a climate change aspect for Nisqually

Bob Black:

Clarification is needed by the group: There are so many ways to prioritize. Prioritizing aquatic habitats or areas where pre spawn mortality has been observed without also prioritizing the delivery mechanisms (the source from tires/traffic?) would be un-logical. Assessments upstream of the critical habitat will be needed. Where is the tire chemical entering streams at lethal concentrations (gets back to David’s original question).

Rhea:

- 1) Working on a Matrix table listing all metrics used for an assortment of related prioritization efforts to help the group visualize available data and decide which to utilize, AND assign data gaps to help with 6PPD-Q & TWP monitoring strategies and conduct initial BMP projects.
- 2) Based on initial conversations with stakeholders and the STAC, the process will definitely be stepwise and scalable. Step 1 x, Step 2 y, Step 3 z. Magnifying glass concept.
- 3) this is a stepwise coordination at both state and regional scales, the PAC is advising on setting up a framework for what will eventually become a patchwork of local catchment final priorities.

Susan Cormier:

Where to put the data should also be a consideration a list of wants/goals. Eg. a list of what to measure, where to measure, where to put BMPs.

Rhea – Ecology has an environmental information data support system in place that could help sponsor spatial and environmental information to help local entities prioritize.

Side conversation in chat – capture later.

Derek Day:

Need a lens for magnifying hot spots. Is a basin under-seeded? Or un-useable rearing habitat? **Concern that if we focus on areas that are BIBI problem spots it is often a hydrology problem and not a 6PPD problem.**

Rhea:

- 1) Agreed and appreciates lens concept, or filter/threshold approach? Not only filter out creeks with hydrology issues, but streams with poor general habitat assessments (no canopy cover, no pools, no ripples) – process of elimination
- 2) Need to coordinate efforts across these different paradigms –
 - a. Ecological traps –fish passage retrofits coordination, NOAA et al. is doing some of this in Snohomish with Tulalip tribe.
 - b. WDFW is coordinating with WSDOT to conduct before and after salmon habitat assessments, Rhea want to suggest in the Proviso to coordinate with fish passage program to collect corresponding B-IBI and 6PPD-Q samples as a monitoring strategy to help fill in gaps.

Julann:

Focus on productivity in streams in areas rapidly urbanizing, thinks this will be an area of ecologically important and critical to supporting Coho populations. We have to invest on the good habitat that we have remaining, before trying to recover expired or expiring salmon runs.

Ailene:

Connectivity between sub-basins will be hard, easy to state in a paper, but really how to use with logic biologically.

Small independent streams and runs vs highly networked streams system – do we have to prioritize if both are existing?

Colin Hume:

Near-term report goals is likely only illustrative of a prioritization effort that will live well past this report.

Rhea:

This report is representing a first phase to conceptualize the scale and summarize what is known to date. A big focus of this first phase is to tee up initial framework vs what will be the final official prioritization plan. The report will outline a prioritization strategy based on the STACs recommendations.

Susan C:

Would be good to think outside the box, e.g. smog and asking the social fabric to pitch in. Don't be restrictive of our thinking, or others thinking. Recommendations for products to develop as part of this STAC? Any homework? Need a structure for STAC members to participate as we move forward.

Rhea will follow up with homework and a survey.

Karen:

Overlapping goals; where do the venn diagrams overlap across the circles of biology needs, cultural needs, stormwater delivery, initial sources. Where do these overlap....consider funding. Gaps are important but maybe not as important as laying out what we do know we have.

3:40 Wrap up

Meeting Prep Resource Links:

[Tire Chemical Video](#) – Washington Stormwater Center, UW-Tacoma, WSU-Puyallup & NOAA Urban Runoff Mortality Syndrome (URMS)

[Stormwater Heatmap](#) – Washington Nature Conservancy & Geosyntec

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

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

[Tribal Habitat Strategy](#) - NWIFC

[Watershed Characterization Project](#) – Ecology & EPA National Estuarine Program

Link from Catherine Gockel on CA DISC's process:

[Proposed Priority Product: Motor Vehicle Tires Containing 6PPD](#)