

Water Quality Assessment/Policy 1-11
February 9, 2017 Public Meeting/Webinar
High Level Meeting Notes from Discussions

This document contains Ecology Water Quality Program's notes of the discussion and points people made on three key topics that were focused on at the public meeting/webinar held on February 9, 2017 at the Department of Ecology Headquarters building in Olympia:

1. Human Health Criteria and Use of Fish Tissue (morning)
2. Data used in the Assessment (afternoon)
3. Bioassessment (afternoon)

The Ecology notes are in draft; if you see any problems or errors in what was captured, please contact Susan Braley at Ecology, subr@ecy.wa.gov or by phone at 360-407-6414.

Human Health Criteria and Use of Fish Tissue

The presentation focused on the information provided in Ecology's [Human Health Criteria options](#) paper.

Topic – Tissue Sample Representativeness

- Are the Department of Health fish advisories based on short term exposures?
DOH response: No, advisories are based on lifetime exposures and are presented as meals per week. The numbers behind the advisories are based on public health, not necessarily tied to the water quality standards.
EPA response: Advisories are designed so the reference dose would not be exceeded over time
- Is the timing of storms and seasons accounted for in the collection of fish tissue samples?
Ecology response: The current process for the assessment looks at the most recent year of data. In studies where the purpose is to evaluate trends in the data, the goal is to catch the same species in the same seasons. The current assessment process pools together all the fish tissue data, so the study design and goals are not captured in the data analysis.
- How are the temporal aspects for the tissue accounted for – currently water quality conditions versus what a fish might have picked up 15 years ago?
Ecology response: We'll be covering this topic later in the presentation.
- How were bioaccumulation and bioconcentration factors (BAFs and BCFs) accounted for in the criteria calculations? Were the species more likely to be consumed considered?
Ecology response: All good questions and we'll be talking about those topics later.

Topic – Sampling and Uncertainty

- If younger fish were included in the sampling, the confidence intervals would be smaller.
Ecology response: Yes, size is a substitute for age. In this particular study, medium sized fish were targeted.
- Are the rainbow trout hatchery fish? If so, that could impact the contaminants in tissue. The trophic levels would be interesting to see.
Ecology response: The rainbow trout could be from hatchery. The trophic levels of fish in lakes are much harder to discern than in rivers.
- Is Policy 1-11 going to address temporal issues, such as size and age, and the use of hatchery fish?
Ecology response: Yes, those issues will be discussed.
- How much did this study cost?
Ecology response: The lab analysis was about \$120,000. Total study was at least 1.5 FTE.
- Did the PCB analysis analyze for arochlors or congeners?
Ecology response: Both were analyzed and the results shown are a mix. We have found a good match between arochlor and congener results for most of the range.
King County response: We partnered with Manchester Laboratory and one other congener lab for a comparison study using method 1668. We found about a 40% difference, which was not as much as we expected in the mid-part of the range. At about 400-500 ppb, the variability falls apart.
- What data does Department of Health use for Fish Advisories?
Ecology response: DOH uses Ecology data. DOH also uses data from King County and UW, but 90% of the data comes from Ecology. The data objectives and sample design for Ecology's studies takes into account DOH needs.

Topic – Freshwater species list

- The freshwater list seems fine, but it was hard to determine what waterbodies are stocked year to year. Better communication with WDFW would help resolve this issue.
Ecology response: This would depend on the intent of the listing...whether we are addressing the harvest use or looking at pollution sources.
- If a stocked lake is listed for the harvest use, then what? Would Ecology communicate to WDFW to use cleaner fish meal? We shouldn't be listing waters if we are not able to do anything about it.
Ecology response: Our studies are designed to consider the fish that people are eating with the goal to capture multiple species. In designing the studies, we do communicate with WFDW to find out what is stocked. This question of hatchery fish has been ongoing. In the past, we did a study on catchable size hatchery trout and found that PCBs contamination was high. This led WDFW to change the fish feed. We currently have a study to look at this issue again. The PCBs found in hatchery trout were much lower than other pollutant sources of PCBs. It's also difficult to know when a fish was released. Most are released as fry and are in the waterbody for a couple of years, which allows more time for it to pick up contaminants from other sources. Some fish released are catchable, which don't stay long in the waterbody.

- For other contaminants such as mercury, dioxins and furans, it's important to know what fish people are eating. It's also important to keep in mind if you need to restrict what you are catching based on resources.
- These fish have different pathways of exposure other than the water column, sources could be sediment or groundwater, so it may be helpful to sample other fish for those sources. In the Spokane River, the homolog patterns are different in tissue and water. It depends on the purpose of the assessment, whether it is to meet water quality standards or uses, or maybe both.
- From the Spokane River, people are eating northern pike and yellow perch.
Ecology comment: It's important to point out that the harvest use answers the question if the fish is safe to eat. It does not back calculate to water criteria. This is a paradigm shift from how fish tissue was used previously in the Assessment.
- Does Ecology take into account the seasonality when sampling?
Ecology response: It depends on the objectives of the study. For example, the Spokane study targets seasonality, and species within the same reaches as past catches. Currently, the Assessment does not look at seasonality, only calendar year.
- Does seasonality matter? If one season it is okay, how likely would it be not okay the next season?
Ecology response: With the loss of body burden of female fish, it could make a difference when the sample concentrations are near criteria.
- Will Ecology consider subtracting hatchery fish concentrations from sample tissues?
Ecology response: It's hard to know when a fish was released from a hatchery. Doing this subtraction addresses the fish tissue equivalent concentration (FTEC) concerns, but what about the harvest use?
- Is there information on catch and consumption rates by waterbody?
Ecology response: We not aware of any specific studies. There is some information from tribal studies, but it is hard to break down information by species.
DOH response: We grapple with these same issues – fish for source control versus consumption issues. If we see something, we want to take action, but we need to understand who is eating it and the amount of resources to spend on reaching out with a warning. DOH processes and prioritizations do not always align with Ecology purposes.
- If contaminant levels at the hatcheries can exceed current FTECs, there needs to be action at the hatcheries. If we stick with a FTEC-like number, we're likely to have listings based on hatchery exposure, which is a known source. Ecology should develop generic background data for congeners from fish feed and consider that when high PBC concentrations are seen near hatcheries.
- Carrying out more fish consumption surveys could help provide rates. For calculating a tissue exposure concentration, consider using the relative source contribution term. A fraction or percentage of the reference dose could be used.
Ecology comment: In the past, we've conducted a study to look at levels of PCBs in pristine lakes. It could be possible for a similar study to be done for hatcheries. The pristine lake study was done to help prioritize PCB projects.

- A listing could result in a TMDL, which results in water column fixes. Before listing, drill down into the data. In the data presented, largescale suckers have varying concentrations but the water column is stable. Mountain whitefish have varying concentrations. Do we know what's in the sediment? Are we working on the right issues, especially when the water sources have been addressed? The PCB congeners found in tissue are not in the discharge sources.
Ecology response: It's hard – we have tissue-based listings that lead to water being addressed. How best to look for other sources if there isn't a water quality problem? This situation is an important illustration of listing on the use versus listing based on a comparison to the water quality standards.
- The multiple lines of evidence approach is good due to all the potential pathways for contamination. It allows for comparison between water quality data and tissue data. If the contaminants are not in the water, perhaps a different categorical listing could be used.
- Having anadromous fish in freshwater might be good. Coho spend a lot of time in freshwater and could reflect exposure to stormwater, for example.

Topic – Marine species list

- A specific short list of species should be used to evaluate the harvest use, not an infinite list. Those without high site fidelity could be used as a Puget Sound wide indicator, like chinook or maybe herring, but don't include species that are semi-oceanic or unknown. Everything else is site specific; long lived species may not be useful.
- Species have different uses by different people – some use the bone and/or liver. How is this taken into account?
- Is the Aquatic Life use also water column based? There is evidence that suggests that PCB concentrations impact the survivability of juveniles.
Ecology response: The Aquatic Life use was not included in the scoping comments and can be addressed at a later time.
- How will fish advisory listings be based on the harvest use? Resident chinook should be listed Puget Sound wide.
Ecology response: The credible data act requires that there be data at a location for a listing.
- Resident chinook is a poor fit for the credible data act. Policy 1-11 should provide for equality amongst where a fish was collected and the nearby point source discharge locations. It may be that a discharger closer to the catch location isn't a source of a contaminant, but could be hit harder than other discharger further away that is a higher contributor.
- These marine listings are not an individual block of water problem, a larger view is needed for the evaluation.
- Background conditions should be accounted for when sampling. Are weather patterns taken into account when sampling for bacteria?
Ecology response: Bacteria is not the focus of this discussion, but sampling does not take into account weather events.

- Do crustaceans metabolize PAHs?
Ecology response: Not sure, we'll have to check into that question.
- Consideration is needed when collecting bivalve samples. Harvest often takes place after sitting in water. In a study of caged and indigenous mussels, it was found that indigenous mussels had high contaminants, likely due to being in the sediment whereas caged mussels were above the sediment. Also like to caution on using crab livers, as it's unlikely that one would be eating 175 grams/day.
- Whole crab concentrations were generated in a study.
- King County depurates their bivalves. EIM needs the capacity to document design studies so these types of things can be verified; it's a data quality concern.
- What is the definition of harvest use?
Ecology response: Fish and shellfish eaten by all people.

Topic – Use of tissue samples/Tissue exposure concentrations (TEC)

- Interest in the log octanol/water partition coefficient (Kow) aspect, especially with bioaccumulation factors (BAFs) to evaluate some parameters with tissues and others with water.
- Potential issue with KOW – metabolism and food chain
- Could you use a higher risk level (10^{-5} instead of 10^{-6}) to calculate thresholds?
Ecology response: That is something that could be further discussed.
- Looking at the PCB examples in comparison to the FTEC on Keith's data slide, it helps to explain the multiplier need for high BAF parameters. It wouldn't be good to list the entire state for PCBs based on 0.2 ppb.
Ecology response: We can use both columns of TEC numbers to make category decisions. For PCBs, DOH uses 9.1 (non-cancer) for advisories.
- In using the weight of evidence approach, there are concerns with limiting it to the human health criteria. Unless the contamination is in tissue and a pollutant, we could still end up with a TMDL and trying to find the pollutant sources.
Ecology response: For the multiple lines of evidence approach, we could potentially add sediment which would help to paint a bigger picture.

Topic – Use of water samples/Drinking exposure concentrations (DEC)

- What about the joint exposure to tissue and water? Could look at the mid-range of bioaccumulation. If relying on tissue data alone and if a parameter is metabolized, could look at water column data.
- Could require more data over a longer time to address cancer impairments (2-3 years) and a shorter time for non-cancer comparisons (1 year or 1 study).
- Makes sense to use an average. If there is a one-time sample with a hit, that could trigger more sampling instead of triggering a listing.
- In using method 1668, the water met the old water column FTECs. Use the multiple lines of evidence to determine if it's a water column or sediment problem. Don't use just one line for a listing.
- Averaged is better for a long term exposure.

Topic –DECs

- A more robust dataset is needed when levels are close to criteria, but 1 or 2 super high numbers--such as a maximum contaminant level (MCL) or technology threshold (TT) -- would be an exceedance. There is a scientific basis – could use one sample, it gets back to the multiplier suggestion.

Topic – Factors/Lines of Evidence Table

- Each box in the table has a basis usability – would that usability be explained in Policy 1-11?
Ecology response: Yes, it would be explained in the policy.

Wrapping up HHC Discussion

- Likely we will need one more 3 hour meeting to discuss category determinations for HHC.
 - Stakeholders are highly encouraged to submit written comment and ideas for next meeting.
 - Stakeholders can also call with discussion points and ideas.
- Are other lines of evidence still on the table, such as site specific situations and presence/absence of species?
Ecology response: Yes, please let us know of other ideas. Some site specific situations may be tricky to deal with.
Stakeholder response: MTCA sites have GIS layers that can overlay the tissue data. It would help to get outside the “cube” of marine parcels.
- It would be helpful to have a couple of potential next meeting dates.
- Will there be another discussion on TMDL prioritization?
Ecology response: We will write-up a new draft section in Policy 1-11 for outreach and engagement on TMDL prioritization, and articulate a clear annual process. It will set up the regional expectations and provide early heads up of where we plan to do TMDLs and engagement of stakeholders.
- At the next human health criteria meeting, Ecology will present options for category determinations. March 2nd may be too early to aim for next meeting, we want to do a good job of putting options together for consideration, and give stakeholders time to review that before the next meeting is held.

Data used in the Assessment

The discussion focused on the remaining category of scoping issues identified in the Ecology [Issue Paper](#) on Data Used in the Assessment, Issue #3: Accuracy and Precision of Impairment Decisions (starting at page 6).

Issues – Suggestions for a two-step listing process and appeal period

- Having a two-step listing process or appeal period could provide greater opportunity for the public to challenge listings on the Assessment.

EPA comment: Listings are not effective until they are approved by EPA.

Ecology comment: EPA can receive challenges on approved listings as well.

- Is it possible to expand the comment period to 120 days?
Ecology response: Having a 4 month public comment period seems too long, we have found that having 45 to 60 days for review is appropriate. We tend to receive comments at the end of the period, regardless of how long it is. We'd need compelling reasons to extend it.

- For those jurisdictions that have a lot of listings, we need time to review and take our recommendations through our management. Perhaps 90 days is better. As listings become more complicated, more information is needed to provide feedback.

Ecology response: We will take this into consideration. Ecology has previously allowed for extensions on a case-by-case basis, upon request for a specific list of listings.

- We need to have a broader discussion of Category 5. After 20 years there are still many segments that are not addressed, and during that time, many more listings are added. There is an economic impact of having Category 5 listings. How do we get them off Category 5? Right now Category 5 feels like a catch all, and it's a big problem.

- It's favorable to have a 2-step process, given the current regulatory risk to dischargers and financial cost to the state and dischargers. A 2-step process would allow a stopping point for judgement if another solution (such as 4B) is more appropriate. States likely have more discretion in developing their listing methodologies than they are using. If data implies an impairment, rest it in Category 3. Then collect more data and/or let jurisdictions see if they have a program in place to address it.

- If a listing is corrected during the comment period, what is the public process to dispute the correction?

Ecology response: There is not a formal process in place for review of listing changes. We had a situation in the last assessment where we had a Category 5 listing, got feedback that it was incorrect and took it out of Category 5 before submitting the draft Assessment to EPA for approval. We then got additional information from another stakeholder that resulted in us making the decision to put the listing back into Category 5-we worked with EPA to make the correction. Overall, not many listings are challenged.

- Disagreement with that last statement, there are many listings that are challenged, however the challenges were not accepted for most of them. Can there be a product at the end of the process to let folks know what changed from the initial proposed list? There needs to be better advertisement of the changes.

Ecology response: Yes we can try to accommodate this request. We prepare a document for EPA that states what has changed from the previous list, so we can make that more readily available to the public.

- The WATS database is the place to dispute listings, however the current system to send comments doesn't allow for attachments or any greater capacity than commenting on a listing by listing basis.
- Can there be a type of triage protocol? For some listings that are warranted, a 1-step process may be all that's needed, others may need a 2-step process. If a change is made to the initial listing list, then other parties should be able to comment. Having a 2-step process is ideal, allows for stakeholders to have a way out.

Ecology comment: Yes we will consider this.

EPA comment: We understand the difficulties of Category 5. Many of these suggestions would cause delays in submitting the assessment. States are legally vulnerable to have a timely submittal. For a potential 2-step process, EPA would need to make sure that it fits with the water quality standards and the regulations. More resources would be needed by Ecology for a 2-step process and a longer comment period would result in a longer time before actions could be taken for a Category 5 listing. Ecology provides EPA a response to comments document for their submittal, and that is posted on Ecology's website.

- Perhaps listings needing statistical tests or those with unknown parameters could be placed on a planning list, other states do this.

Ecology response: Florida does that, they use Category 2 when more information is needed.

- Perhaps Category 2 could be used more willingly. It could be used in a 2-step process to allow for a bigger "gray" area.

Ecology response: For the conventional parameters, we'll talk about more room to increase accuracy.

- Support an approach that if water quality standards are violated, there isn't a need for a 2-step process or an extended appeal period. The load allocation and wasteload allocations in TMDLs are important tools.
- We rely on this process to provide a good review of listings, so there needs to be dialogue to determine what the flexibility is in the listing process. It's vital to set up the process to be right from the beginning.

Issues – Delisting and moving from Category 4A/4B to Category 1

- Part of the delisting process involves asking the TMDL leads for input. How we can move away from best professional judgement answers and have sideboards on this in the policy?

Ecology response: We think it's important to collaborate with the TMDL leads for listings within a TMDL area, and need to figure out good internal protocols for that. In many cases, the data we assess looks good, but the leads have more specific watershed information from which to make decisions within a TMDL area.

- In 2013, we proposed delisting for several 4A segments, but found that the policy lacked specificity for how to do that. We worked with NWRO on procedures and got 2 segments delisted. The volume of data needed, trend analysis and age of data we used was inconsistent with the policy and water quality standards. Recommendation that Ecology start with parameters that have the most 4A listings and establish clear procedures for delisting.

Ecology response: It sounds like there are differences between meeting load allocation and meeting the water quality standards. Instead of a specific process, it sounds like stakeholders want clarity in a statewide process to help answer the question if a segment can be delisted if it's within a TMDL area, or if there is a need to wait. We understand that stakeholders need to see successes to justify costs.

- We'd like to have a level of certainty when reaching a standard, unless it gets vetoed by the local office for a specific reason. For example, if we have 3 years of good bacteria data, it goes to Category 1. If it doesn't get delisted, there is a specific reason and we can work towards that.
- It would be helpful to have a high level view of how to get to Category 1. For details on many samples are needed in a year, reach, or season could be determined at a local level in a QAPP. This would allow for work to get done at a watershed basis.
Ecology response: In the past, regions would ask for a 303d verification study to find out the extent of the problem. This was done more likely for toxics, but not for bacteria. We can work on a general Category 5 to Category 1 process in the policy, but the development of a site specific study with a TMDL lead would be the path to Category 1. Headquarters would be the lead for a review process to makes sure the minimum requirements are met.
- It appears that currently the hurdles for delisting are different across the state. Local efforts to get waters delisted need more assurance that their efforts will be realized, especially in consideration of budgets and work plans.

Issue – Unequal requirements for listing and delisting

- *Ecology comment: We'll look into the idea of delisting from Category 5 into Category 3, given the higher bar to have enough data to meet Category 1 requirements.*
- What if there is a B-IBI listing for Category 5, and the stressor analysis shows flow and habitat?
Ecology response: If no pollutants were identified, It would go into Category 4C.
- It was mentioned that 100 single sample points would be needed to get to Category 1—that should be included in the design. It's important to design a process upfront that allows for clarity and mutual understanding. It's in place for other programs, such as MTCA.
Ecology response: There is a description in Policy 1-11 that describes the process to demonstrate why something should not be listed. We'll add steps and explicitly explain the process.
- The issue is that regions are uncertain of the study design to answer the question.

Ecology response: There needs to be formality with the sign offs. Have the study designed for the purposes of the assessment. If the QAPP is complete and followed, we'll be able to use the data.

- It might be helpful to simply remove the word “continuous” from the Category 1 requirements for conventional pollutants.
- The measure of success needs to be determined upfront, is it the wasteload allocation, or the water quality standard, or a model output? Success metrics need to be found.

Topic – Type I and Type II error rates

- How many listings use single sample data?

Ecology response: About one third of the temperature listings are based on single sample data.

- How can we determine if a high result value is worth chasing, or if it is an anomaly? We do get a lot of noise in the data.

Ecology response: We're focusing on determining if the criteria are being met and what an impairment is. The assessment process should be used to identify long term problems.

Topic – Temperature assessment premises

Ecology noted that the intent of the “once every ten years” under the temperature standards was that there could be 1 year out of 10 years with exceedances of the criteria magnitude without impairing the aquatic life use.

- Does Ecology intend to provide clarity on this in Policy 1-11?

Ecology response: Yes. This should also help to lay the foundation for monitoring efforts as well.

- It will be important to make sure that this presented intent is correct and is captured in the policy.

- Why is it necessary to look at magnitude, especially with continuous data or a great number of grab samples?

Ecology response: For many of our single sample datasets, we only have a few data points. Looking at magnitude allows for some flexibility in that fewer data points have less certainty.

- Disagreement with that last point, especially given the information that the single sample tends to underestimate the maximum value.

Ecology response: We'll go over examples a bit later in the presentation.

Topic – Continuous temperature data alternatives

- Why use 10% exceedances concept if 17.5 is a criterion?

Ecology response: We looked at the temperature criteria development document, and 10% is set at the end of the identified range of temperatures.

- Is there any consideration for the magnitude of exceedance for the non-conventionals?

Ecology response: We are not sure yet.

- What about exceedances from timberland management areas? If there are listings, the management practices for timberlands are known and the point sources are addressed.
Ecology response: May lead to the removal of some Category 5 listings.

Topic – Single sample freshwater data

- An example of using single sample data for temperature based on a hypergeometric mean was presented by Ecology. Interest was expressed in how this approach might play out for dissolved oxygen and pH. Surprised that this approach was generated for Category 1 determinations for single sample data of temperature, especially given the low costs and accessibility to HOBOS.
Ecology response: This provides a pathway for delisting using single sample data. It addresses some of the criticisms the Ecology received in the past.
- Is there precedent for this approach?
Ecology response: Some other states use the binomial, but they likely use all values per day instead of the one maximum per day. The other assumption for the binomial is that there is an equal chance of exceedance. Our data won't meet that assumption, unless the sample time period (season) is dialed down.
- If the study design doesn't meet the requirements, it would be fine to not use the data for listing purposes. Understand the desire and need to use all data, but leave it out.
- Good use of robust statistics, how did you arrive at the >5% days exceeding?
Ecology response: 5% of days in the focal period is 6 days. Temperature exceedances come in sets, typically a few days in a row. The 6 days gets in alignment with the 7DADMAX criteria, where you can have a few days exceed and still meet the criteria. Effort was made to match up the decisions made using single data with those made using continuous data.
- Concerns about a community with fewer resources not being as well protected. In areas where data gathering is based on a volunteer base, it isn't easy to buy HOBOS, write a QAPP, and maintain HOBOS. Prevention is easier than fixing issues.
- Can Ecology provide a hypergeometric mean spreadsheet?
Ecology response: Information on using the hypergeometric distribution can be found at: <http://stattrek.com/probability-distributions/hypergeometric.aspx>. A hypergeometric calculator can be found at: stattrek.com/online-calculator/hypergeometric.aspx.

Bioassessment

- If anyone wants to submit written comments on the bioassessment alternatives that Ecology presented at the January 19th meeting, please get them to Ecology by February 23, 2017.
- Ecology will make these comments available on Ecology's website and will consider them as revisions to the bioassessment section in the policy are made.

Next Steps with Key Topics

- Public dialogue on the following key topics has been completed: Data Used in the Assessment, Bioassessment, TMDL Prioritization, and the Sediment Management Standards. Ecology will begin to make draft revisions to Policy 1-11 based on feedback, suggestions, and ideas that can be reasonably carried out. Any further written comments received on these key topics will be posted on our website and considered as we move forward with revisions to Policy 1-11.
- Public dialogue on assessing data for the human health criteria will continue with one more meeting, to be scheduled in March. Ecology will propose some options for using fish tissue and water column data to assess for human health.
- It is still Ecology's goal to have a revised Policy 1-11 draft ready for public review in Spring 2017.