

Discussion Notes

Salmon Spawning Habitat Protection Rule Science Advisory Group (SAG)

1:15 – 4:15 p.m., Thursday, November 19, 2020, online meeting

Introduction of Meeting participants¹ (Braley)

Ecology Watershed Management Section staff & their role

Susan Braley (Facilitator), Chad Brown (Unit Supervisor), Bryson Finch (Technical Rule Lead), Marla Koberstein (Moderator)

Public Advisory Group attendees & the organizations they represent²:

Joy Archuleta (USDA Forest Service), Jennifer Arthur (Seattle Public Utilities), Seth Book (Skokomish Tribe), Ashley Coble (NCASI), Joanna Crowe Curran (US Corps of Engineers), Chris Frissell (Salish Kootenai College), Lindsay Guzzo (EPA), Tim Hagan (Pierce County), Kirk Krueger (WDFW), Brian Mattax (WSP/Consultant), Ted Parker (Snohomish County), Rainy Rau (City of Vancouver)

Ecology Advisory Group attendees & the region/program they represent:

Jordan Bauer (ERO/Hydropower), Patrick Lizon (Nonpoint Source Pollution), Glenn Merritt (EAP Watershed Health Monitoring), Cleo Neculae (NWRO/TMDL), Cole Provence (CRO/TMDL), Keunyea Song (Stormwater Action Monitoring), Leanne Weiss (SWRO/TMDL), Angela Zeigenfuse (Water Quality Permits)

Finish Discussion on Dissolved Oxygen Criteria (Finch)

Implementation of Oregon's DO criteria

- Oregon's criteria is: 11.0 mg/L DO water column criteria, 8.0 mg/L intragravel DO criteria, and 95% DO saturation.
- The main point taken from discussion with Oregon DEQ is that the IGDO (intragravel DO) is not readily used unless it needs to be used for site-specific evaluations. DO saturation percentage and water column DO criteria are primarily used by the agency.
- A concern was raised about how the antidegradation standard is used in Washington and whether it captures the necessary background data to define pre-anthropogenic conditions.

¹ See [EZView page](#) for full bios of Advisory Group members.

² A list of acronyms is on page 5

Percent DO saturation threshold (see Davis 1975 on EZ View)

- The **IDEAL** protection level observed in the paper for salmonid larvae and mature eggs for temperatures 0-15°C is 98% DO saturation while at 20-25°C a 100% DO saturation is needed.
- A concern was raised regarding monitoring results within the Puget Sound area showing only 10% of the monitoring stations would meet the DO water column and saturation criteria even during the winter months when values tend to be higher.
- It was suggested that this could be because of the area being a high urban ecoregion.
- The member expressed thought on how some of these criteria may be out of attainable reason and beyond financial commitments/funding.
- There are other tools available to compensate for those environments that may be unique to the criterion (e.g. Use Attainability Analysis).
- An important part of this whole process is coming up with criteria that provide full protection for salmonids.
- Minimal work has been done supporting a threshold for DO saturation. Davis (1975) presents DO saturation recommendations for early life stages of salmonids as well as older life stages. These recommendations represent some support for DO saturation criteria but further justification may be warranted.

DO in Spawning Gravel Redds

- Construction of redds will increase dissolved oxygen but will decrease over time due to DO consumption by the early stage salmonids and filling of intragravel spaces in tailspin by fine sediments.
- The most sensitive time during early life stages of salmonids is egg emergence, so regardless of construction or filling of spaces the most important DO concentration comes during the emergence period.
- The enhancement of DO in gravels may be depleted over time depending on the movement of sediment in the water body.

Dissolved oxygen criteria averaging period

- WA currently has a 1-day minimum averaging period for the DO criteria.
- Members agree that a 30 day averaging period is too long and salmonids have more of an acute impact if DO values drop. Is there a need to have chronic criteria if unique biological conditions exist?
- Internal processes in lakes and deeper water bodies can have an impact on sediment oxygen demand (SOD) and DO values that may require special criteria.
- Averaging period may be appropriate for temperature but not DO since their need is acute and early salmonid life stages are not mobile.
- Other states use longer averaging periods (7 and 30-day common) when an 11 mg/L water column DO criteria is applied.

- If multiple pathways to reach full protection for the criteria are available, then it makes sense to choose the pathway with the easiest way to measure the required parameter.
- Typically longer averaging periods require criteria protection (magnitude component increases)
- One member expressed concern of the difficulty to utilize the UAA as a tool due to data acquisition.
- Staff pointed out that economic considerations are not part of the EPA rule. Biological protection is the primary means of establishing criteria.
- Supplemental spawning criteria would assist in streams that are unique and may not fall under the DO criteria umbrella.
- We may revisit the seasonal criteria option in future discussion.

Fine Sediment Criteria Development

Background on fine sediment

- Fines are generally <2mm.
- WA water quality standards has a narrative criterion of “no deleterious materials” but this does not specifically cover fine sediment concerns.

Other states’ fine sediment impairment methods

Idaho

- Uses narrative criteria and has the most parameters monitored of the other states in determining fine sediment impairments.
- Parameters considered are both literature backed and site specific (e.g. embeddedness, surface sediment).

Montana

- Uses narrative based criteria and has both fines and coarse substrate habitat monitoring parameters considered.

Colorado

- Uses narrative based criteria.
- Compares parameters to similar reference sites in sediment-like ecoregions.

Alaska

- Uses numeric criteria. Measured by weight. Exceedances occur if a certain percent weight composition occurs above background conditions.

New Mexico

- Uses narrative criteria.
- Has a seven-step framework with assessment matrix.

Discussion of what other states do to regulate fine sediment

- Anything stand out? Thoughts?

- There is interest to use the macroinvertebrate community to characterize fine sediment impacts. There's already data collected for WA and standard operating procedures for collecting and analyzing macroinvertebrate collections in streams.
- Watershed monitoring programs, including Washington, uses EPA's framework for assessing stream health and is highly regarded in other states and studies.
- It was pointed out that there are no specific results showing macroinvertebrate biological (IBI) indices showing correlation with fry emergence.
- The reason Alaska is using weight as a numeric criteria is because they are using McNeil core sampling and collecting physical core samples and characterizing through sieves.
- There could be a combination of multiple matrices and timing with sediment methods and IBI work.

Fine sediment quantitative relationships

- There are few parameters with a fine sediment quantitative relationship and targets/thresholds can be difficult to establish
- Washington has turbidity criteria, which may be useful as a parameter for relationships to other parameters.
- It is clear from what other states are doing and the literature that no single measure can be used to define fine sediment.

Merits of a numeric vs. narrative criteria

- After discussion, several members were not convinced that an actual fine sediment threshold exists for a specific water body or ecoregion.
- It is very difficult to know how the natural conditions were prior to anthropogenic alterations and defining what background conditions were. Alaska's approach would be difficult to implement.
- Wadeable streams were used as the primary means of establishing reference sites in Alaska for defining background conditions. Large rivers and other stream orders were based on those means since they were practical and most quantifiable to measure.
- Rosgen stream order may be impractical to use with fine sediment characterization, given the diverse makeup of some wadeable streams and ecoregions. May need to look more at generalizing streams rather than having numeric criteria for all.

Using reference sites for fine sediment impairment determinations

- It is not useful to talk about using a reference site if there's not an adequate number of sites to characterize a region.
- Montgomery and MacDonald (2002) study is a good resource for fine sediment monitoring and stream assessment.
- Fine sediment characterization will change drastically during different seasons due to river dynamics and geomorphic areas. Many field visits will need to occur throughout the year.

- Temporal measurements will be difficult to determine.
- Biologically speaking, fine sediment additions will likely be considered harmful whatever the circumstances. Some streams may be so degraded that more fines may not be detrimental to fish; however, impacts may still be observed somewhere else.
- Using multiple methods to measure fine sediments are beneficial because there may be a time when evaluation may be unclear.
- The question was raised on how to define support or partial support in the standards if a matrix is used for fine sediment evaluation?
- Lines of evidence approach allows flexibility in determining if an impairment exists versus natural occurrence of fine sediment and provides a tool to account for measurement variability

Next Meeting

- Continuing the fine sediments discussion, the next meeting will focus on specific parameters to characterize fine sediment.
- Members are welcome to present their own monitoring expertise on the various parameters used to evaluate fine sediment. Contact Bryson if you are interested in helping out.
- It was also suggested that we should consider more bank stability concepts at the next meeting.

Ecology contacts

Project Technical Lead

Bryson Finch

360-999-9610

bryson.finch@ecy.wa.gov

Rulemaking Lead

Marla Koberstein

360-628-6376

marla.koberstein@ecy.wa.gov

More information

Meeting materials are stored on our [Salmon Spawning SAG EZ View page](#)

Follow the progress of this rule on Ecology's [Salmon spawning Habitat Protection Rulemaking](#) webpage

Get updates on this rulemaking by joining our [WQ Information listserv](#)

Acronyms

CRO – Central Regional Office

DO – Dissolved Oxygen

EAP – Environmental Assessment Program

EPA – Environmental Protection Agency

ERO – Eastern Regional Office

IGDO – Intragravel Dissolved Oxygen

NWRO – Northwest Regional Office

TMDL – Total Maximum Daily Load

SWRO – Southwest Regional Office

WDFW – Washington Department of Fish and Wildlife