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Public Comments on Water Typing Rule Making

WFPA would like to acknowledge the substantial effort put forth by Forest Practices Board (FPB) staff and cooperators to move the Water Typing Rule making process forward. Progress has been made and learning has occurred on several topics, such as electrofishing, the Fish Habitat Assessment Methodology, and off channel habitat. We've learned conducting a spatial analysis of potential habitat breaks (PHB) and an anadromous overlay, while informative, can be challenging, and there's no substitute for good field data. One of the most important things we've probably learned is conducting rule-making outside of the collaborative stakeholder process can be precarious.

Therefore, if the FPB chooses to continue moving the rule-making process forward, WFPA requests that be done in a collaborative stakeholder process consistent with the requirements of, and caucus commitments to follow, the Adaptive Management Program (AMP).

PHBs

The spatial analysis of PHBs needs to be completed before any other work can proceed. Specifically, the width based PHBs adopted by the FPB in February 2018 needs to be included in the analysis. We acknowledge the challenge associated with identifying a discrete bankfull width in small stream channels using GIS methods, but WFPA's width based PHB relied on a change in stream size at stream junctions, which can be reliably estimated using GIS methods. The spatial analysis of PHBs is the foundation for estimating the potential impact of rule proposal alternatives, and it is a required element of the rule-making process. It is critical to get that analysis right as it drives the outcomes of

other required work such as the State Environmental Policy Act (SEPA), Cost Benefit Analysis (CBA), and Small Business Economic Impact Statement (SBEIS).

Anadromous Overlay

In addition to incorrectly describing WFPA's PHB based anadromous alternative in draft rule language, it was also not included in the spatial analysis as directed by the FPB. Therefore, the anadromous overlay analysis is incomplete as well. There is a large degree of uncertainty associated with the anadromous component of this rule making, yet we believe it to be an important element and are very willing to work on it in a collaborative stakeholder process consistent with the requirements of the AMP.

WFPA Spatial Analysis

As we committed in our February 2018 proposal to the Board, WFPA has conducted an independent spatial analysis in six watersheds, three in Western Washington (WWA) and three in Eastern Washington (EWA) . The results of our PHB analysis for WWA differ significantly from the results DNR presented at the November 2018 Board meeting. Our EWA PHB results differ in magnitude from DNR's; however, the overall direction is the same.

Our analysis of the anadromous overlay alternatives indicates all of them add considerable length to the existing Type F stream network. Most of that additional Type F stream has not been surveyed and is therefore of unknown accuracy. Based on this analysis, all the anadromous alternatives add significant uncertainty into the water typing system. In addition, it appears that much of that uncertainty will be disproportionately borne by small forest landowners and non-forest users of DNR's water typing system. Our conversations with stakeholders indicate there may be differing views of what problem is being solved with an anadromous overlay. Given the lack of a clear and agreed upon problem statement, and the substantial uncertainty associated with the anadromous alternatives, additional work is needed before adoption of a state-wide alternative.

To be clear, we are not suggesting our analysis provides the final solution for this rule making, but we have developed a considerable amount of useful information which we stand ready to share, including access to the spatial analysis, within a collaborative stakeholder process. The goal of this process would be to refine and agree on a single, PHB and anadromous alternative which meets the stated objectives for the water typing system adopted by the Board in August 2015 (use existing data, accurate as possible, balance uncertainty, improve map over time, minimize electrofishing, methods to locate break points on the ground, address SFLO needs, etc.).

Water Typing Rule-Making Performance Objectives

One of the reasons past water typing rule making efforts have failed is due to lack of understanding and agreement on the performance targets and expectations for risk allocation. Comparing alternatives with concurred Type F/N breaks as a measure of performance has been implied through the department's spatial analysis. WFPA agrees this is currently the best baseline to evaluate performance against, and we used the same metric in our WWA analysis. However, for this rule making to be successful, we recommend the Board clearly and specifically reaffirm the performance targets for water typing, which are clearly stated in the Forests & Fish Report, the Forest Practices Rules adopted in 2001, the Forest Practices HCP, and reaffirmed at the August 2015 board meeting.

Potential Consequences for the Rule Making Processes

If DNR's spatial analysis of alternatives adopted by the FPB is not completed, it is unclear how other rule making process steps, such as the CBA and SBEIS, can be legally defensible. In addition, to needing more time to review these documents (five days not adequate), we recommend DNR coordinate a meeting between the CBA authors and caucus fish biology experts to discuss the inherent assumptions and analytical methods of the fish effects analysis.

Conclusion

We acknowledge the collaborative stakeholder process can be time consuming. However, that process is the fundamental backbone of the Forest Practices HCP, and our governing statutes and rules. Compliance with this process might require more time up front, but it is designed to ensure a defensible product at the conclusion. It is a required component of any Board rule making for aquatic resources, and when successful, significantly reduces risks for Board decisions and DNR implementation. WFPA respectfully requests the Board engage the collaborative stakeholder process, with clearly stated performance objectives for the Water Typing Rule, and prioritize development of consensus alternatives, including draft rule language, to present to the Board's as soon as possible, ideally before the end of 2019.

WFPA looks forward to continued work with the Board and caucuses on a permanent water typing rule which meets the legal requirements and the intent of the Forest Practices HCP. Please don't hesitate to contact us with questions.

Thank you

Perspectives and Supporting Science for Use of Tributary Junctions as Potential Habitat Breaks

Background

Regulations guiding the management of aquatic systems include protections on waters containing fish habitat intended to support meeting the goals established in the Forest and Fish Report. Riparian protections and provisions to restore fish passage intended to support meeting these goals rely on a water typing system that distinguishes between fish habitat (Type F) and non-fish habitat (Type N) waters.

Fish habitat is defined in WAC 222-16-010:

> ***"Fish habitat"*** *means habitat, that is used by fish at any life stage at any time of the year including potential habitat likely to be used by fish, which could be recovered by restoration or management and includes off-channel habitat.*

Performance expectations for the water typing system are clearly articulated in the Forest and Fish Report (FFR), the Biological Opinion of the Forest Practices Habitat Conservation Plan (FPHCP), the Legislature's Forest Practices Salmon Recovery Act, and in 30 years of TFW Policy and Forest Practices Board (FPB) deliberations. Within all of these, performance of the water typing system is consistently described in in the context of achieving the most accurate placement of the boundary between Type F and Type N waters possible, with equitable allocation of remaining uncertainty or error. In other words, errors in over-classification of Type F waters count the same as error in under-classification of Type F waters in the evaluation of performance of alternatives.

Decisions related to water typing regulatory issues made by the FPB over the past 20 years have been consistent with these negotiated sideboards. In 2001 permanent rulemaking, electro-fishing was retained as an alternative for locating the F/N regulatory break based on data demonstrating poor accuracy and bias in error allocation arising from placement of the regulatory break based on default physical criteria. CMER assessments of Western and Eastern Washington fish habitat model maps characterized accuracy and error in modeled F/N breaks against field surveyor determinations of both fish use and estimates of fish habitat. A CMER pilot study was completed intended to develop a better understanding of the accuracy and error of statewide fish habitat model maps. In 2005, the FPB declined to adopt the resulting statewide model-based maps based on concerns about mapped F/N breaks not meeting FFR's accuracy and error allocation targets. At the same meeting, the FPB unanimously endorsed a hybrid solution that would supplement model-based water typing maps with field survey information to improve their accuracy. In November of 2016, the FPB adopted consensus recommendations re-affirming the expectation for a water typing system with high accuracy and balance in the allocation of error. It is clear that information characterizing accuracy and error of water typing alternatives has been - and continues to be - an essential component of FPB decision-making.

Perspectives on the Evaluation of Alternatives

Alternatives and recommendations for the implementation of water typing alternatives (e.g. treatment of tributary junctions) should be supported by a thorough analysis of available data to quantify performance against the targets established by the FPB, and as described in FFR and the FPHCP. The FPB's Science Panel was provided instruction that consideration of accuracy and equitable allocation of error in PHBs alternatives as prescribed in FFR was **not** necessary for completion of their assigned work. This assertion was challenged, and guidance was requested from the FPB to clarify their expectations for the analysis of PHB alternatives. The Panel was told that FPB clarification would not be possible without a formal meeting of the FPB. Given this direction, the Science Panel recommendations for Potential Habitat Breaks PHBs) were subsequently based on a review or relevant literature, evaluation of operational survey data, and a ranking of alternatives against a "Percent Captured' statistic. The Panel's reports included language referring to the percent captured statistic as a measure of performance of alternatives.

There is no question that the quality of the available data presented challenges for use in evaluating alternatives using standard statistical procedures. However, the percent captured statistic used by the Panel to identify recommended alternatives provides no reliable information to support an evaluation of the accuracy or error allocation of alternatives as described in FFR and the FPHCP Biological Opinion. No citation or precedent was presented for use of the statistic as a reliable measure of "performance" of PHB alternatives being considered. Based on unresolved technical concerns regarding the lack of reliable information characterizing accuracy and error allocation of alternatives, consensus on Science Panel recommendations was not achieved, and a non-consensus report was forwarded to the FPB.

Tributary Streams

Recommendations of the Science Panel included a sentence stating that evaluations of tributary junctions and PHBs should only consider information upstream of tributary junctions being evaluated. This recommendation is inconsistent with the Panel's own analysis and PHB criteria recommendations, which included gradient and size-based PHB criteria identifying inflection points where a change in stream characteristics measured in both a downstream and upstream direction occurs. Implementation of the Panel's tributary recommendation would have the effect of eliminating the use of tributary junctions as PHB's in many situations. No analysis was conducted to evaluate accuracy or error allocation impacts with or without incorporating the Panel's tributary recommendation.

Tributary junctions have long been identified by surveyors as important features influencing likely upstream fish use. In a call for field survey data to support the Western Washington Fish Model development, 3,120 "Last Fish Habitat" surveys were contributed by 16 organizations representing state agency, tribal, and landowner stakeholders (Conrad et al 2003). Of those "Last Fish Habitat" points, 2248 (73%) were associated with tributary stream junctions. Lateral tributary stream junctions were associated with 1410 (45%) of contributed "Last Fish Habitat" points. More recently, in a sample of concurred-with survey data contributed by landowners to the Science Panel, 875 of 1561 (56%) fish habitat survey points were associated with lateral tributaries identified by surveyors as the end of habitat likely to be used by fish.

Analysis conducted by CMER statisticians assigned responsibility for developing FFR's fish habitat models demonstrated that the influence of stream size (as indicated by upstream basin area) was highly a significant variable ($P<.001$) in models predicting the extent of fish habitat. Upstream basin area was selected by the stepwise variable selection procedure employed by the statisticians as the first physical attribute selected in 50 out of 50 models estimated. Consistent with the field survey data, resulting end

of fish habitat points predicted by fish habitat models frequently coincided with changes in stream size associated with lateral tributary junctions. An evaluation of the accuracy of resulting models found that 68% of model predictions occurring at lateral stream junctions aligned exactly with a field survey-identified end of fish habitat break. Less than 5% of other F/N boundary types aligned exactly with field survey-identified end of fish habitat breaks.

Multiple CMER field studies also support lateral tributary junctions as reliable indicators of a change in the likelihood of fish use. Resurveys of lateral tributary streams initially determined not to support fish use by electrofishing survey demonstrated a low likelihood of upstream movement by fish across multiple seasons and years (Cole et al 2005, Cole and Lemke 2005). In a CMER pilot field study to evaluate the W WA fish habitat model (Cupp 2003), 92% of end of fish habitat predictions associated with lateral tributary junctions correctly identified the end of fish use as determined by field verification.

Summary

The intent of the Fish Habitat Assessment Method (FHAM) is to bridge the gap between single-visit protocol surveys of fish use and the WAC definition of fish habitat that includes consideration of habitats likely to be used that may not be occupied at the time of survey. PHB criteria identifying a discrete pool of size, gradient, and obstacle features are intended to support a reproducible, enforceable, and science-based process to meet this need. PHB's successfully implemented within the FHAM should incorporate the habitat needs of fish at all life history stages including the influence of temporal variability in the likely upstream extent of fish use arising from seasonal movement by fish or temporary displacement of fish due to low population abundance or natural disturbance events.

However, information characterizing the accuracy and allocation of error in placement of the boundary between Type F and Type N waters is also a necessary part of the FPBs information needs. Reliable, credible, meaningful, and defensible measures of accuracy in placement of the F/N break and the frequency, magnitude, and direction of errors define the expected performance targets for water typing alternatives described in FFR. All alternatives considered should therefore be evaluated against a common performance expectation using reliable and statistically sound procedures. The most accurate alternative that meets public resource protection needs provides a logical regulatory solution consistent with FFR, FPHCP, and Salmon Recovery Act expectations. Meaningful and technically reliable information describing accuracy and error allocation of alternatives are necessary to support this need. The percent captures statistic does not inform the evaluation of accuracy or error allocation.

There is no dispute that small tributaries provide important habitats for fish. However, the technical work necessary for the development of reliable small tributary PHB alternatives is incomplete. It is important to recognize that within the FHAM, PHB's identify locations where a protocol survey can be initiated. PHB's are proposed as potential regulatory breaks only after the completion of a protocol electro-fishing survey demonstrating no upstream fish use at the time of survey. Situations where fish occur in unusually steep or small streams are therefore identified and incorporated into the classification of Type F waters - no regulatory F/N breaks are proposed below the surveyed extent of fish use. PHBs provide a means by which streams <u>found not to support fish at the time of a protocol survey</u> are identified as likely to be used by fish at some other time and classified and Type F water. Rather than include an unsupported and precautionary restriction to PHB implementation, a recommendation by the Science Panel to conduct additional work to develop PHB criteria that better differentiate between tributary stream likely or unlikely to be used at some other time would probably have been

more appropriate given the available data. The Panel discussed many options to refine PHB criteria associated with tributary stream junctions but never completed the task.

Recommendations:

Disagreements among the TFW technical participants preventing consensus on recommendations supporting the FPB's water typing efforts are almost always a result of differences in individual risk tolerance for placing the regulatory break too far upstream or downstream, and not in availability or interpretations of existing science and data. The assignment of sideboards for the expected performance of regulatory solutions is a policy function, to be supported by (but not determined by) technical participants. Unresolved differences in the policy arena related to the performance expectation of the water typing system are preventing progress and consensus in the development of consensus technical solutions.

1. Consistent, credible, and robust measures of performance of PHB alternatives and recommendations are necessary to support the FPB decisions and the prescribed rulemaking process. It is essential that any alternatives being considered include a reliable and consistent evaluation of accuracy and error allocation. These criteria define "performance" of alternatives potentially used to identify the F/N regulatory break in the context of FFR's water typing system.
2. Clarity on performance expectations and FPB decision making needs to be provided to technical participants before they begin their assigned work. Had the Science Panel been provided clear instruction describing the FPB expectations for accurate and balanced placement of the F/N regulatory break, there is no doubt that the Panel's recommendations would be different and very likely with consensus among all Panel members.
3. Advocates for abandoning or changing the FFR's negotiated measures of water typing performance should seek resolution of their arguments before further technical work is initiated. A process for adopting rules that deviate from FFR is described in the 2001 Forest Practices Salmon Recovery Act. Lacking a common understanding regarding the performance of the FFR water typing system, proposed technical solutions will continue to simply represent divergent risk tolerances of individual participants.
4. It is essential that technical products relied upon by the FPB in their deliberations be reliable and credible. A dispute obviously exists regarding the use of "percent captured" as a measure of performance. In recent testimony and deliberations, several FPB and TFW Policy participants have referred to the recommended PHBs as "best performing" in reference to the Panel's ranking of alternatives, indicating continued reliance on the percent captured statistic as a measure of performance. There has been no independent technical review of the Science Panel's use of this statistic, and there has been no process to resolve technical differences among Science Panel participants on this matter. Independent review and the input of independent statisticians to further inform this discussion is recommended to support development of consensus on estimates of performance.
5. Available data and analytical tools limit the ability of technical participants to fully characterize accuracy and error allocation of alternatives. A spatial analysis will be necessary to more completely evaluate accuracy and the frequency, magnitude, and direction of errors for alternatives being considered.