February 13, 2018

Dear Chairman Bernath and Forest Practice Board Members,

I'm Kendra Smith, testifying on behalf of WSAC. Thank you for the opportunity to make comments today regarding the Science Panel's work on Potential Habitat Breaks (PHB) on type F waters. We would like to thank the Science Panel for their work and appreciate their struggle to produce recommendations in the allotted timeframe. We also acknowledge their hope in trying to develop metric sets that would work around the state.

Unfortunately, the data was skinny and incomplete (as acknowledged by the Science Panel and presented during the comment period today) making the results of the Science Panel's analysis fall short of producing any sort of confidence in the selection of any ***one*** alternative. For that reason, we are asking you, the Board, to look at a suite of alternatives during this evaluation including at least one from the Review and Recommendations for Potential Fish Habitat Breaks prepared by the Science Panel dated January 26, 2018, the proposal from WFPA submitted yesterday, February 12, 2018, and potentially any other forth coming proposal. We then ask that a full analysis of each alternative be assessed ensuring the requirement of a cost/benefit analysis and balance of risk be done up front. From our perspective this must include: 1 what the benefit to the resource will be, 2. what the risk to the resource will be and 3. what is the economic impact. These questions need to be answered completely as part of the analysis of each of the alternatives. By having thorough information in front of you, you will then be able to make a well-informed decision as to the best approach to proceed.

It is crucial to counties that this work be done correctly as it significantly affects our resources and our communities. Thank you for your consideration.

Most sincerely,

Kendra Smith

Jason Walter, Weyerhaeuser – Testimony RE PHB Science Panel Report

February 13, 2018, Washington Forest Practices Board Meeting, Olympia, WA

Good morning Forest Practices Board Members. My name is Jason Walter and I have worked as an Aquatic Biologist for the Weyerhaeuser Company for almost 23 years. In this role I am responsible for managing the water typing program for Weyerhaeuser, overseeing the implementation of over 500 surveys a year, on average. We see a very high concurrence rate (~98%) on WTMFs for which we are the proponent, in large part because **our water typing program and protocols have been developed over the past 17 years in cooperation with our regulators from state agencies including DNR, WDFW, and Ecology, as well as affected tribes**. These protocols recognize not only current fish distribution, but also habitat that is similar to and accessible from habitats where fish are found, and therefore likely to be used by fish.

In addition to managing the Weyerhaeuser water typing program I was a member of the Protocol Electrofishing Technical Group, which recently provided the Board with a report on electrofishing best practices, as well as a member of the multi-stakeholder Fish Habitat Technical Group (FHTG). The FHTG was responsible for developing the Fish-Habitat-Assessment-Method (FHAM), and I, along with other stakeholders across caucus lines, were **extremely encouraged** in 2017 when the Board voted on and approved the FHAM framework as the basis for the new and permanent water typing system… one that would be **implementable, repeatable, and enforceable**. As a reminder, the primary tenant of the FHAM framework is that it is a step-wise approach to water typing that incorporates the identification of "Potential Habitat Breaks" (PHBs) as acceptable locations to establish a Type-F/N break. Language from the FHAM report clearly states that:

> "PHBs are defined as permanent, distinct, and measurable changes to in-channel physical characteristics. PHBs are typically associated with underlying geomorphic conditions and may consist of natural barriers that physically prevent fish access to upstream reaches, or a distinct and measurable change in channel gradient, size, or a combination of the two."

In addition, the motion passed by the Board in May of 2017 included the following language as guidance for the Science Panel in developing specific PHB criteria to inform the already adopted FHAM process:

> "…determine those physical, biological, and chemical elements that would individually or in combination constitute a high probability the PHB is coincident with a significant change in habitat including stream size, stream gradient, the interaction of size and gradient and the presence of barriers that limit accessibility…"

The recommendations presented by the Science Panel, that PHBs should be associated with single threshold values (for stream gradient and/or size) is inconsistent with the original intent of the FHAM. These threshold based PHB metrics would result in the **consistent misidentification of habitat likely to be used by fish**, on both ends of the spectrum, providing no protections for potential fish habitat in many cases where it is warranted, while at the same time extending the Type-F/N break upslope in other cases when it is not actually necessary to provide protections for habitat likely to be used by fish.

Using one of the threshold based PHB recommendations included in the Science Panel Report as an example… A threshold based gradient PHB of 10% would allow for the establishment of a Type-F/N break at a point along a stream channel where the stream gradient changed from 9% downstream to 10% upstream. Such a point clearly **does not represent a significant change in stream habitat characteristics**, and there is no reason to assume that it would be biologically meaningful to the movement of fish. On the other end of the spectrum, this same threshold based gradient PHB of 10% would not identify a PHB at a point along a stream channel where stream gradient changed from 11% downstream to 19% upstream. This would function to potentially **ignore permanent, distinct, and measurable changes to in-channel physical characteristics that were biologically significant** once the recommended threshold value has been met in a given stream system. Essentially, **the threshold based PHB recommendations provided by the Science Panel result in a 'lose-lose' scenario** when attempting to inform a system that **accurately** identifies habitat likely to be used by fish.

The aforementioned concerns are only some of a longer list of issues we have with the Science Panel Report and the subsequent threshold based PHB recommendations contained within it. As a member of the technical stakeholder committee invited to provide comments on the PHB Science Panel Draft Report from December of 2017, I summarized these additional concerns and issues in writing and submitted that information to the AMPA on December 22, 2017. In short, this written response, which has been provided to you today as an attachment to my testimony, includes the following:

1. Inconsistencies in the 'new' analysis and recommendations with:
    - FHAM protocol
    - Multiple Washington Forest Practices Board (WFPB) motions
    - Language contained within the body of the PHB Science Panel Report, itself
2. Use of a sub-par dataset in the 'new' analysis
3. Fundamental flaws with 'new' analysis and subsequent recommendations

In closing, as a field professional responsible for implementing the Board's final decisions regarding new water typing rules on the ground, I would like to reemphasize the need for a system that is not only **implementable, repeatable, and enforceable**, but also one that is **accurate**. In addition, it is essential to allow for the time necessary to conduct a true field verification of any new potential rules prior to them becoming final.

Thank you for this opportunity to provide testimony today. I look forward to continued work with other stakeholders in the near future to find solutions to the issues you are hearing about today, and in the development of a permanent water typing system.

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31 January 2018

Stephen Bernath
Chair, Forest Practices Board
Department of Natural Resources
1111 Washington St. SE; MS 47012
Olympia, WA 98504-7012

Dear Chair Bernath and Forest Practices Board Members:

The Kalispel Tribe would like to support the Forest Practices Board's adoption of the Interim Potential Habitat Break (PHB) recommendations from the Science Panel's recommendations dated January 16, 2018. Specifically, with regard to the PHB criteria, we believe the Board should adopt the 2-foot bankfull width and 10% gradient criteria for the entire sate as it was the best scientific fit. We also recommend specific guidance to Board staff to develop a new Water Type Modification Form to report data collected on gradient, bankfull width, and barriers, as described in the report. This important step should be included with the Board's decision regarding the PHB. We further support the development and completion of the PHB criteria validation study. Rule effectiveness under the Adaptive Management Program (AMP) should be prioritized and validation will confirm final recommendations that adequately protect salmonids and their habitats – both occupied and restorable.

The Tribe would also recommend the Board direct the AMP Administrator (AMPA) to hire an Eastside scientist under the CMER Program. This proposal has had overwhelming support from the AMPA and stakeholders that participate on the eastside of the State. When the proposal reached the Policy Committee, it was not supported by the large industrial landowner caucus representative for reasons that could not be addressed short of dropping the proposal. Ironically, under the ENREP study, the scientist hired for project specific site validation work was used in this capacity while waiting for the study design to be completed. That work confirmed the need for a CMER scientist position within the AMP to support Eastside projects and Scientific Advisory Group.

We encourage and support the Board moving forward with both of these actions. As you are aware neither request is fully supported by all stakeholder groups, but this does not diminish the urgency or importance for moving the AMP forward. Regarding these and other process accountability related issues, the Kalispel Tribe once again encourages the Board to quickly move forward with our recommendations from the May 2017 Board meeting in order to ensure the Program can accomplish its work as directed under the Forest and Fish law.

Sincerely,

Deane Osterman
Executive Director, Kalispel Natural Resources Department

Good Morning Chairman Bernath and members of the Forest Practices Board. My name is Michael Johnson and I am a Harvest Manager for Hancock Forest Management in NE Washington. Thank you for allowing me time to present testimony related to the work being done with Potential Habitat Breaks. One of our key principles at Hancock Forest Management is Environmental Stewardship. We take our responsibility to try to meet the needs of all stakeholders very seriously. Over our three decades of timberland ownership and management in Washington we have spent significant time and effort to restore fish passages on our road systems and establish buffering regimes on streams. Looking ahead, we believe it is critical that decisions

related to establishing stream typing be based on sound, current science from as wide a geographic area as possible. Eastern Washington has unique issues when it comes to establishing fish habitat. This is demonstrated by the difference in current rules. Information from studies such as Cole et al, referenced in the report, may provide value in looking at criteria that will both protect fish and help minimize impacts. As such, we believe this important science should receive further consideration. We also have concerns about the use of "Percent Captured" to evaluate the various alternatives. While it may seem correct to lean toward solutions that capture the most known points, it is unclear whether this would also

lead to a shift upstream that misclassifies non-fish waters at a greater rate. At Hancock we try to do the right thing every day. In this context we want to protect fish where they live. But as a fiduciary, we can't afford to protect streams where fish do not reside. The TFW is an agreement with shared responsibilities. It is our hope that this delicate balance does not get shifted too far in either direction, in this case to the over-protecting resources due to limited use of good and available science. Finally, I would like to ask the Board to consider the financial impact that these alternatives will generate. There are multiple costs to consider - the cost of additional fish passage

structures for streams that are upgraded - the cost of additional timber volumes that are left alongside upgraded streams - the cost of additional silvicultural operations that are impacted by more streams being buffered higher up in the watershed. It is our hope that a cost-benefit analysis, including a ~~spat~~ spatial component will be done on the various alternatives to better understand the impact of each alternative. Thank you for your time today and for your attention to this important matter.

SIERRA PACIFIC INDUSTRIES
Growing Forests For Our Future

Sierra Pacific Industries

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(360) 424-7619

February 13, 2018

Forest Practices Board
1111 Washington St. SE
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Olympia, WA 98504-7012

hand delivered

RE: Type F potential habitat break recommendations

Dear Members of the Board:

Sierra Pacific Industries owns over 270,000 acres of productive forestland in western Washington. In addition, we source logs for our four softwood lumber mills from private and State lands from over twenty Washington Counties. As you consider how to proceed in acting on the Potential Habitat Break Recommendations and particularly whether and how to make changes to the water typing rules, we respectfully ask that you consider the following.

1) To date, the Board has not received any independent analysis demonstrating that resource protection standards are not being met under the current water typing system. Over the entire course of policy discussions about the water typing rules since 2005, **no data has been presented to the Board showing that fish habitat is under-protected to the detriment of fish populations.** We believe that the current practice by forest landowners not only meets, but far exceeds, the current rule. Our practice—based in large part on protocol electrofishing surveys—identifies and protects not only streams with demonstrated fish use but additionally and effectively identifies and protects habitat likely to be used by fish, recoverable habitat, and off-channel habitat.

2) Our previous written testimony (November 9, 2016, FPB meeting) documented an assessment of 341 streams on SPI property, representing over 80 miles of potential fish habitat below the regulatory Type F/N break. This assessment showed that **protocol surveys, as approved in the current Water Type Modification process, were effective in identifying "habitat likely to be used" by fish which was unoccupied in the initial single pass survey.**

3) **Any new rule making by covering aquatic resources must be supported by best available science** and by recommendations resulting from the scientifically based adaptive management program (RCW 76.09.370 (6) and (7)).

4) The standards for the Water Typing system are articulated in the Forest and Fish Report, and have been affirmed by this Board:

   - 95 % accuracy predicting Type F and Type N waters,
   - equal likelihood of over/under estimating the presence of fish habitat.

   The January, 2018, report by the PHB Science Panel notably lacks a credible analysis of all 31 PHB metric sets tested with respect to either of these standards. **We believe the Board is unable to commence rule-making based upon the Panel's recommendations without first conducting an analysis of accuracy and uncertainty relative to the current rule.**

5) Any of the PHB habitat metric sets presented in Tables 4 and 5 which include "threshold" values would introduce systematic upstream bias into the Water Typing system by precluding the use of electrofishing in stream segments downslope of such thresholds. The shared goals of Forest and Fish are compliance with the ESA, supporting a harvestable supply of fish, maintaining water quality under the CWA, and keeping the timber industry economically viable. **We believe the Board is unable to commence rule-making based upon the Panel's recommendations without first conducting an analysis of economic impacts and resource benefits relative to the current rule.**

6) The adoption of any of the PHB habitat metric sets presented in Tables 4 and 5 which include "threshold" values would call into question hundreds of stream crossings previously accepted under the now-completed RMAP program as not needing to be fish passable. **RMAPs II could impose a substantial and arbitrary burden on landowners, in the case of SPI ownership alone estimated to exceed $ 4 million.**

Sincerely,

John. D. Gold
for Sierra Pacific Industries

Westside Tribal PHB Recommendations

2/9/2018

ID Teams are still an integral part of the stream typing process.

Anadromous Floor
All waters below a sustained stream gradient of 10%, applied once per stream, are presumed fish habitat. Exceptions to this presumption of fish habitat include waters above Permanent Natural Barriers[1], where protocol surveys may be conducted to identify the F/N break, or through the ID Team review process.

Channel size criterion cannot be used to identify the F/N break below the Anadromous Floor unless done through an ID Team review process. A validation study should address if and how stream size can be included in an Anadromous Floor definition.

Protocol surveys

(a) Below the Anadromous Floor, protocol surveys are only permitted above Permanent Natural Barriers, or based on the outcome of an ID Team review.

(b) Above the Anadromous Floor or at known fish, whichever is higher, protocol surveys are permitted above the following Potential Habitat Breaks (PHBs):
PHB1: 2' or less sustained bankfull channel width.
PHB2: 5% abrupt inflection in stream gradient.[2]
PHB3: vertical and non-vertical obstacles:

Vertical obstacle: The greater of a 3 ft non-deformable step or a step => 1 BFW. Ex.: 2' BFW = 3' step. 3' BFW = 3' step. 4' BFW = 4' step. etc.

Non-vertical obstacle: Stream gradient over 30% and change in elevation over obstacle distance greater than 2 bankfull channel widths.

(c) Protocol surveys are conducted above PHBs over a minimum distance of quarter mile or as defined in Board Manual 13.

[1] Permanent natural barriers are permanent, non-deformable, geologically-based features that block upstream fish passage. See WDFWs Fish Passage Barrier Manual (2009).
[2] How to measure an 'abrupt inflection' is to be determined. The new gradient value needs to be sustained over a distance of 20 bankfull channel widths.

Summary of Tribal FHAM PHB recommendations.

FHAM PHBs	
Waters at or downstream of 10% stream gradient Anadromous Floor	Waters upstream of 10% stream gradient Anadromous Floor
1. Permanent Natural Barrier	1. Abrupt change in stream gradient (inflection) of at least 5% 2. Mean bankfull stream width of 2 feet or less. 3. Fish Passage Obstacle: *Vertical* – The greater of a 3 ft non-deformable step or a step => 1 BFW. *Non-vertical* – Stream gradient over 30% and change in elevation over obstacle distance greater than 2 bankfull channel widths.

<u>Other recommendations:</u>

Man-made structures that impede fish movement are not considered PHBs. Default physical criteria are used to identify the F/N break in streams with that contain these structures.

<u>Validation study</u>

- Include test of barriers for stream reaches that support lamprey
- Examine the assumption of 10% stream gradient Anadromous Floor
- Examine how stream size can be incorporated into an Anadromous Floor definition
- Evaluate obstacle and barrier definitions
- Evaluate fish use of habitat during all seasons and when fish presence is likely
- Examine use of other relatively simple and easily measured stream characteristics outside of width and gradient metrics in determining extent of fish use (examples are substrate types and pool frequency)

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February 9, 2018

Forest Practices Board
Washington Department of Natural Resources
PO Box 47012
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Re: Permanent Water Typing Rule

Dear Forest Practices Board members and Chairman Bernath:

Thank you very much for your hard work considering a proposal for a permanent water typing rule. Since 2005, the Washington Forest Law Center (WFLC) and members of the Conservation Caucus have worked with DNR and other forest stakeholders to develop a permanent water typing rule that protects known occupied and potentially occupied fish habitat in accordance with WAC 222-16-010 and the letter and spirit of the Forest Practices HCP while cognizant of timber industry viability. We are hopeful that the end is finally in sight and we congratulate all parties for working together to complete this important task.

It has come to the Conservation Caucus' attention that at least one stakeholder is arguing that any Board selection of a draft permanent water typing rule would be "arbitrary and capricious" based on the science and policy record before the Board at the current time. Specifically, that any rule based in whole or in part on the DNR's Expert Science Panel's Potential Habitat Break Report (PHB) would lack a "scientific basis" and would, accordingly, be arbitrary and capricious.

WFLC would like to respond to this argument. In short, there <u>is</u> an ample and well-documented record, including the Panel's Report, in support of moving forward with the process for adoption of a permanent water typing rule that rationally implements the already-adopted definition of "fish habitat" in the forest practice rules (WAC 222-16-010).

A. The Board has a duty to adopt a permanent water typing rule that implements the Board's existing definition of "fish habitat" and improves upon the existing system by reducing reliance on unfettered electrofishing to make fish presence/absence determinations in accordance with the Board's 2016 decision adopting a fish habitat assessment method.

Before addressing why the record <u>supports</u> decisive Board action to advance a credible permanent water typing rule now, we think it would be helpful to reiterate why change is imperative.

In general, an agency, like the Board, has a duty to initiate rulemaking to amend a rule when post-rule developments known to the agency have occurred that require the agency to reconsider whether its previously adopted rule faithfully implements the applicable statute.[1] An agency's decision not to re-initiate rulemaking is arbitrary and capricious when the agency turns a blind-eye to these post-rule developments.[2] An agency's decision not to initiate rulemaking is arbitrary and capricious when it is "unreasoning and taken without regard to the attending facts or circumstances."[3] An agency may only decline to initiate rulemaking "through a reasoned process."[4]

Under these cases, the Board has a duty to adopt a substantively different permanent water typing rule because today's rule-authorized water typing process does not actually implement the Board's definition of "fish habitat." Both the Forest Practices HCP and this Board's rule[5] provide that "fish habitat" includes both stream segments known to be actually occupied and those with that potential:

> "Fish Habitat" means habitat which 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.[6] (emphasis added)

Yet WAC 222-16-031(3)(b), the interim water typing rule in effect today, only protects fish habitat where fish are detected by a one-day survey and not potential upstream fish habitat farther upstream where fish are not detected on the day of the survey. This is because WAC 222-16-031(3)(b) defines Type F waters as "segments of natural waters and periodically inundated areas of their associated wetlands," which "are used by fish for spawning, rearing, or migrations." (emphasis added). As then Forest Practice Division manager Lenny Young wrote in an August 27, 2002 memorandum to DNR Region managers describing the interim rule:

> Under the interim water typing system, Type 3 water breaks are to be based upon fish presence, not fish habitat. After an acceptable fish use survey has been completed, the Type 3 water break should be set at a point upstream of the last fish detection where presence of the last fish detected can be logically and directly assumed. This recognizes that the upper extent of Type 3 water is not necessarily "where the nose of the last fish detected breaks the surface" and requires the reasonable exercise of sound professional judgment. In other words, if it is reasonable to assume that the last fish detected was likely using an upward portion of the stream, then the Type 3 water break should be set at the point which represents the upper extent of the fish use area. This is not the same as the upward extent of fish habitat. (emphasis added)

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[1] *Rios v. Dept. of Labor & Indust.*, 145 Wn.2d 483, 507 (2002).
[2] *Id*.
[3] *Hillis v. Dept. of Ecology*, 131 Wn.2d 373, 383 (1997).
[4] *Rios*, 145 Wn.2d at 501.
[5] WAC 222-16-010 (definition of "fish habitat").
[6] FFR at 20; WAC 222-16-010 (definition of "fish habitat").

Mr. Young's memorandum makes it clear that the interim rule in place today protects only habitat slightly upstream from "the nose of the last fish," (with how far upstream entirely discretionary with a surveyor's view of the upstream area it is "reasonable to assume" that fish was likely using) as opposed to the actual upward extent of potential fish habitat. Moreover, while determining the accuracy of the Fish Habitat Model based maps, the CMER committee conducted a seasonal fish distribution study (Cole 2005) yielding results that clearly demonstrate that actual fish presence, movement and distribution in upper watersheds in highly variable and dependent on changes in seasonal and annual stream flow patterns. This variability confirms the inherent risk of habitat under-identification associated with reliance on single-pass electrofishing surveys to declare fish absence.

Not only is the "nose of the last fish" not a legally permissible or scientifically credible metric for measuring "fish habitat," the existing interim rule, WAC 222-16-031(3)(b), allows potential fish habitat to be eliminated from Type F classification through the use of a WDFW-approved fish survey protocol involving electrofishing under the Board Manual (this rule provides "[t]he requirements for determining fish use are described in the board manual section 13. If fish use has not been determined…."). For example, in western Washington, WAC 222-16-031(3)(b)(i)(A) currently provides that streams wider than two (2) feet with a channel gradient of less than 20% (10 degrees) are presumed to contain fish. But this WAC allows a landowner to conduct an electrofishing survey protocol under Section 13 of the Board's Manual to overcome the fish use presumption and "downgrade" a stream segment to a non-fish bearing Type Np water.

The option for landowners to "downgrade" a stream segment to Type Np from Type F via a protocol survey specified only in non-regulatory board manual guidance undercuts the rule—and HCP—mandate for adequate protection of potential fish habitat. This is because stream segments with all the attributes of "fish habitat" may not, on that single day the protocol survey, is conducted, contain fish (Cole 2005), despite the fact that these same segments may be properly characterized as "potential habitat likely to be used by fish which could be recovered by restoration or management." In other words, the Board's water typing rule in effect today permits landowners to eliminate potential "fish habitat" through a Board Manual electrofishing process that is incapable of identifying potential fish habitat. The Board has already recognized the need to change this.

It is time for the Board to move forward with the adoption of a permanent water typing rule that properly identifies "fish habitat" in the field and does not eliminate that potential habitat with a broadly applicable fish-presence-based protocol survey process. Since 2005 (13 years ago), the current water typing system has only protected occupied—as opposed to potential—fish habitat. The Board's water-typing regulatory scheme is thus not implementing the Board's definition of "fish habitat" in WAC 222-16-010.

B. There is an adequate administrative record for the Board to move forward with the adoption of a permanent water typing rule that meets the definition of "fish habitat" in WAC 222-16-010.

The next issue is whether the Board has before it a sufficient technical and policy record, including the PHB Panel's Report dated January 26, 2018, to advance a permanent draft rule.

The answer is yes, so long as this new rule ultimately implements the definition of "fish habitat" in WAC 222-16-0010.

At the outset, we briefly reiterate the legal standard against which any rulemaking will be tested. The burden of proving that a rule is invalid is on the party asserting the invalidity.[7] A rule will be declared invalid if it is arbitrary and capricious.[8] A rule is arbitrary and capricious if it is "willful and unreasoning and taken without regard to the attending facts and circumstances."[9] "Where there is room for two opinions, an action taken after due consideration is not arbitrary and capricious even though a reviewing court may believe it to be erroneous."[10] The "willful and unreasoning" determination is based on the entire record, the facts and circumstances behind the rule, and the agency's explanations for adopting the rule.[11]

The Board's development of a permanent water typing rule is a policy decision. The policy task is for the Board to identify where and when instream channel conditions (e.g., gradients, widths, and natural barriers) can be used to reduce the use of electrofishing surveys by focusing them upstream of habitat "breaks" that lower the potential for fish to use upstream reaches. If the Board's proposed final rule establishes a reasonable means to more accurately implement the definition of "fish habitat" in WAC 222-16-010, the Board's policy decision would be clearly supported by the administrative record in this rulemaking initiative for the following reasons.

1. This record is at least as strong as the one establishing the physical defaults. The current rule, WAC 222-16-031(3)(b), adopted in 2001, already establishes numeric physical defaults that presume "fish habitat" and this default has been in place for 17 years. There is no question that the Board had the authority at the inception to adopt these defaults, and, likewise, the Board has the authority today to refine the protocol survey process governing how "fish habitat" is "determined."

2. Authority over the subject matter is well-established. The current rules defer to Board Manual Section 13 for the process for when and where it is appropriate to conduct "electrofishing" (the use of the "survey protocol"). This Manual has been in effect for 16 years. If the Manual has governed electrofishing for 16 years, the Board has the authority to modify the Manual or to adopt a rule that more scientifically conforms to the regulatory definition of "fish habitat."

3. Best available information, even if not perfect, is enough. The Panel's Report was based on a review of likely end-of-fish-habitat points derived from data gleaned from official DNR water type modification forms. These are the best data available to inform the question of PHB metrics. All stakeholders had the opportunity to submit their "data points" indicating the end of fish habitat and the forest landowners did so.

[7] RCW 34.05.570(1)(a).
[8] RCW 34.05.570(2)(c).
[9] *Rios*, 145 Wn.2d at 501.
[10] *Id*.
[11] *Washington Independent Telephone Ass'n v. Washington Util. and Transp. Comm'n*, 148 Wn.2d 887, 906 (2003).

4. The Panel's Report responds to Board direction. The Panel reviewed available literature, best available science, and rendered its professional opinion. This opinion is properly being considered and weighed along with other information by the Board.

5. The framework for the new stream typing rule has already been decided. The Panel's Report is based on and implements the Fish Habitat Assessment Method (FHAM), developed by stakeholders and recommended by consensus of the Policy Committee to the Board at its May 2017 meeting. The Report merely addresses blanks left open by the FHAM method, which itself is the product of years of deliberation and is clearly not vulnerable to arbitrariness claims.

6. The Panel was composed of subject matter experts. The Panel consisted of experts in fisheries biology, geomorphology, fish habitat relationships in the forested environment, and included career timber industry personnel. The Panel had "more than 200 years of experience on fish and fish habitat in forested streams of the Pacific Northwest."

7. The Panel based its decision on commonly-accepted metrics. The Panel documented that three metrics—stream size, channel gradient, and obstacles—based on statistical correlation with previously established F/N breaks—could be used to identify potential habitat barriers.

8. The Panel's recommendations are a starting place for determining "fish habitat." The recommendations do not make a final determination of the limits of such habitat. The recommendations do not alone establish the "fish habitat" line (Type F/Type N break); instead, they merely identify instream channel features that the Board could use to define a significant change in habitat above which fish are less likely to access and therefore, it is reasonable and appropriate to judiciously use electrofishing surveys under a strengthened protocol. The Report provides: "It is important to note that the PHB (potential habitat barrier) is not necessarily the F/N break, but rather the first point of potentially unfavorable habitat upstream from the last known fish (end of fish or EOF) and the starting point for protocol survey").

In conclusion, the above points reflect that there is an extensive administrative record assembled to date, including the Expert Panel's PHB Report**,** in support of a rule change to obtain a more accurate, implementable, repeatable and enforceable fish habitat identification method**.** So long as the Board ultimately selects a water typing method that implements the definition of "fish habitat" in WAC 222-16-010, then there is a basis in the record for the Board to move forward at this time.

Very truly yours,

Peter Goldman
Director

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31 January 2018

Stephen Bernath
Chair, Forest Practices Board
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We encourage and support the Board moving forward with both of these actions. As you are aware neither request is fully supported by all stakeholder groups, but this does not diminish the urgency or importance for moving the AMP forward. Regarding these and other process accountability related issues, the Kalispel Tribe once again encourages the Board to quickly move forward with our recommendations from the May 2017 Board meeting in order to ensure the Program can accomplish its work as directed under the Forest and Fish law.

Sincerely,

Deane Osterman
Executive Director, Kalispel Natural Resources Department

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Stephen Bernath
Chair, Forest Practices Board
WA Department of Natural Resources
Olympia, WA

Dear Chair Bernath and Forest Practices Board Members:

The Upper Columbia United Tribes (UCUT), Colville Confederated Tribes, Kalispel Tribe, and Spokane Tribe supports the Forest Practices Board's adoption of the Interim Potential Habitat Break (PHB) recommendations from the Science Panel dated January 16, 2018. We believe the analysis and its recommendations came from a well-managed and implemented process with scientific integrity and balance, even though some skepticism and concerns exists with the data used.

Specifically regarding the PHB criteria, we believe the Board should adopt:

- The 2-foot bankfull width and 10% gradient criteria for the entire State as it is the best scientific fit.
- In addition, we support the 5 ft. threshold criteria option for obstacles. If the 3 ft. option is considered, we suggest that from 3-5 ft. the feature must be a vertical fall with no gradient criteria. These obstacles must also be explicitly defined as non-deformable bedrock features. Describing these obstacles as non-deformable has been the common understanding throughout this investigation and if it is not explicitly described as such it could lead to confusion and complications in the future.
- We also recommend specific guidance to Board staff to develop a new Water Type Modification Form to report data collected on gradient, bankfull width, and barriers, as described in the report.

We further support the development and completion of the PHB criteria validation study. Rule effectiveness under the Adaptive Management Program (AMP) should be prioritized and the validation study will confirm final recommendations that adequately protect salmonids and their habitats, including occupied and restorable.

After thorough review and consideration, the Eastside Tribes are supportive of the final recommendation to the Board which includes the best scientific fit for the PHB criteria as described. Although imperfect, we believe this is an agreeable interim step given validation will follow and further inform and strengthen the FPB portion of the Fish Habitat Assessment Method.

With Regard,

DR Michel
UCUT Executive Director

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UNITED TRIBES

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Stephen Bernath
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WA Department of Natural Resources
Olympia, WA

Dear Chair Bernath and Forest Practices Board Members:

The Upper Columbia United Tribes (UCUT), Colville Confederated Tribes, Kalispel Tribe, and Spokane Tribe request the Forest Practices Board direct the Adaptive Management Program Administrator (AMPA) to create a job description and hire an Eastside Scientist under the CMER portion of the Program. Based on discussions with the AMPA, funding is available and is a supported across the majority of stakeholder groups. This position is essential for scientifically sound representation of Eastern Washington CMER studies and SAGE support.

During our participation in the TFW Policy Committee this proposal had broad support, yet we could not reach consensus due to one caucus' concerns without providing viable solutions. This is just another example of the issues plaguing the existing AMP processes. Since movement regarding the improvements proposed by the UCUT's and AMPA (May 2017) have been slow to nonexistent, the Eastside Tribes will be recommending supportable and important issues directly to the Board for consideration.

We look forward to an improved and accountable AMP process that includes full participation by the Eastside Tribes. Our recommendations from past letters and testimony stand and we feel strongly that rapid implementation is possible. Further delays only create space for divides and challenges within the AMP.

We ask that the Board direct the AMPA to hire an Eastside Scientist under the CMER program which will go a long way to address some of the East versus West concerns of fair and equitable representation.

Optimistically,

DR Michel
UCUT Executive Director

From: ANDERSON, PATRICIA (DNR)
To: [redacted]
Subject: FW: WFPA recommendation for PHB Path Forward
Date: Monday, February 12, 2018 6:35:05 PM

Evening Board Members
See message below from the Washington Forest Protection Association. A paper copy will be available for you tomorrow.

Patricia Anderson
Forest Practices Board
Department of Natural Resources
360.902.1413

From: Karen Terwilleger [KTerwilleger@wfpa.org]
Sent: Monday, February 12, 2018 3:16 PM
To: Bernath, Stephen (DNR); ANDERSON, PATRICIA (DNR)
Cc: Mark Doumit
Subject: WFPA recommendation for PHB Path Forward

Dear Chair Bernath and Forest Practices Board Members:

The Washington Forest Protection Association offers the following alternative for consideration and evaluation as an interim water typing solution by stakeholders and the Forest Practices Board (Board).

- Our proposed alternative is consistent with the Fish Habitat Assessment Method and expectations of the water typing system adopted by the Board.
- We have built upon and incorporated the Science Panel's work and recommendations.
- We have conducted and incorporated additional analysis of PHB alternatives that recognizes the Board's need to understand accuracy and error allocation in their decision-making and analysis.
- In response to stakeholder feedback, we have included adjustments to the Fish Habitat Assessment Method (FHAM) process to address protections on streams likely to be used by anadromous fish where protocol surveys conducted within the prescribed FHAM may not capture the full extent of habitat likely to be used by those species.
- We are committed to supporting the completion of supplemental analyses, including a spatial analysis of potential PHB alternatives, to include multi-stakeholder representation and oversight to refine and more fully develop a recommendation that includes specific numeric criteria in time for use in the 2019 field season.
- We support the Board's identification of several alternatives to be assessed for cost, benefit and accuracy considerations.

The Board would direct assessment of the following:

- Accuracy and directional error distances for PHB alternatives listed below and any additional PHB alternatives identified by the multi-stakeholder group to be evaluated against known

upper extent of fish use and concurred WTMF EOH points.

- Floor-based and other alternatives for determining the extent of anadromous fish habitat for connected tributaries adjacent to anadromous habitat;
- PHB evaluations in E WA should include assessments incorporating CMER E WA study results and databases.

The assessment will include a spatial analysis of alternatives and be designed to support the analysis of public resource benefits, economic impacts and alternatives required under the Administrative Procedures Act and compare levels of accuracy and error allocation. The assessment will also support the Water Typing Objectives identified by the Board in August 2015 and included in the Forests and Fish Report and Forest Practices Habitat Conservation Plan: use of the existing information, develop a method for addressing streams not on the hydro layer, make methods as accurate as possible, balance error, minimize electrofishing, improve map over time, develop methods to locate the stream break points on the ground, and ensure the methods address small forest landowners.

Alternative #1: For Both Eastern and Western Washington. For Western Washington, measures below would apply above an "anadromous overlay" described below.

- PHB #1: Change of 5% gradient (both Eastern and Western Washington)
- PHB #2: .7 or .8 ft upstream/downstream ratio (both Eastern and Western Washington)
- Fish Passage Obstacle (both Eastern and Western Washington):
  - *Vertical*: 3 ft non-deformable step
  - *Non-vertical*: Obstacle gradient over 20% and change in elevation over obstacle distance greater than the upstream bankfull channel width.
- For Western Washington, the Board would further direct the development of an "anadromous overlay" to define the extent of core anadromous waters likely to be used by anadromous fish in Western Washington. The extent of the core anadromous waters with be determined using a combination of information describing known anadromous fish use, and likely anadromous fish use based on a gradient floor, the presence of permanent natural barriers to anadromous fish movement, and stream size considerations. Specific criteria and data to identify the core anadromous zone will be developed in cooperation with the multi-stakeholder Fish Habitat Technical Group and will include a range of gradients to be tested between 2-10%.

Other Alternatives as requested & agreed to by the board

Patricia, would you kindly forward this to the Board. Thanks. kt

Karen Terwilleger
Senior Director of Forest and Environmental Policy
Washington Forest Protection Association
Cell: 360-480-0927
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February 13, 2018

Washington State Forest Practice Board
P.O. Box 47012
Olympia, WA 98504-7012

Re: Science Panel PHB recommendations

Good morning Forest Practices Board members,
My name is Steve Barnowe-Meyer and, along with Ken Miller, I represent small forestland owners and the Washington Farm Forestry Association (WFFA) on the TFW Policy Committee.

I am also the small forest landowner representative on the technical committee of stakeholder representatives that was invited to participate in making recommendations to the PHB Science Panel and review draft recommendations prior to the PHB Report being submitted to this Board. Attached are the written comments on the December 8th draft Science Panel recommendations that I submitted to the AMPA on December 22nd, including a number of serious concerns with their process and draft recommendations.

Now that the Science Panel has finalized their recommendations to the Board, WFFA is obliged to express to the Board our grave concerns about what we view as a substandard data collection and analytical process followed by the Panel, resulting in (what we contend) are several flawed recommendations being submitted to you by that Panel:

- Why did the Panel replace the original landowner database, rather than supplement the previously submitted data set with data from underrepresented areas, as directed by the Board?
- Why was the Cole et al CMER study data not used in the new analysis?
- Why were data standards for the new data set consciously relaxed, allowing inclusion of data points lacking critical data parameters such as downstream measurements and end of fish data, thereby precluding appropriate analysis of these critical change parameters by the Panel, as well as effectively upending the process to favor alternatives based on threshold parameters over change parameters?
- In addition to this significant flaw within the new dataset, the new dataset is inferior compared to the landowner dataset, with the Report indicating a 20% error rate for the new dataset versus a 10% error rate for the landowner dataset
- All threshold recommendations are a substantial departure from the adopted FHAM, which assumed stream character **changes** rather than thresholds
- The Report (and verbal explanations by the Panel) lack clarity and consistency on how the recommendations will be implemented, potentially impairing consistent repeatable / reproducible application in the field
- Use of and reliance upon a highly questionable "percent captured" statistic as a substitute for a thorough analysis to evaluate which of the PHB alternatives is the most accurate or balanced for allocation of error

- Failure by the Panel to include either the comments from the technical committee of stakeholder representatives or the written responses by the Panel to any of these stakeholder comments

To mitigate and resolve many of the grave concerns listed above, as well as build upon and incorporate supportable work and recommendations of the Science Panel, WFFA strongly supports the PHB Motion that Washington Forest Protection Association (WFPA) will / has submitted to the Board today. WFFA is firmly committed to a multi-stakeholder, eastern and western Washington PHB solution that is consistent with the FHAM and expectations of the water typing system adopted by the Board and we believe that WFPA's proposal / motion to the Board meets all those expectations.

Also, as you well know, the Administrative Procedures Act requires a preliminary cost-benefit analysis, with a determination that the probable benefits of a proposed rule change are greater than its probable costs; the Act also requires a determination, after considering alternative versions of a rule change, that the rule being adopted is the least burdensome alternative (for those required to comply with it) that will achieve the general goal and objectives of the stated rule. Also a Small Business EIS will be required for any proposed rule change adopted by the Board. Thorough and conscientious completion of these requirements are particularly and critically important to small forest landowners.

Thank you for this opportunity to provide input to you about PHBs and the permanent water typing system.

Steve Barnowe-Meyer
Washington Farm Forestry Association
(360) 880-0689

Written comments from Small Forest Landowner Caucus on draft PHB recommendation report prepared by the PHB Science Panel for the Forest Practices Board (December 8, 2017)

- In the context of use of the PHB recommendations, does the Science Panel have a recommendation(s) on the appropriate distance ("…at least 1/4 mile of stream length…" in the current protocol) upstream of the last known fish or (now a PHB) that the survey effort must cover? And does the Science Panel have a recommendation(s) on the other component on the requirement for the survey effort (a gradient threshold: "…unless the stream gradient increases and remains above the 20% gradient threshold…") in the current protocol?
- Does the WTMF data analysis inform or does the Science Panel have a recommendation for potential changes to the current default physicals?
- I am concerned that it appears that at least some of the WTMFs from eastern WA and those under-represented areas of western WA brought forward to supplement the original Landowner WTMFs did not contain data items (such as, but not limited to, fish use, downstream gradient /size data at some PHB features, etc.) that were previously provided in the original Landowner WTMFs, and yet these supplemental WTMFs were still included in the analysis. Why were WMTFs that lacked data parameters used in the original analysis still included in the most recent analysis? Why were these WTMFs not simply removed from analysis?
- As an example, at the draft report review meeting on December 14th, I thought I heard Phil Roni explain that in the original analysis and report using the Landowner data, the Science Panel did not differentiate between the tribs (lateral stream) data and terminal stream data, while for the current analysis and draft report, tribs (lateral stream) data and terminal stream data were evaluated separately. I don't have a particular problem with evaluating lateral streams separate from terminal streams, but I am concerned about the explanation given for the separate analyses. As I recall, the explanation given for this "bucketing" of the data was that not all of the lateral stream data had information on the downstream gradient at the junction of the lateral with the mainstem stream. Accepting this explanation (that some WTMFs lacked downstream gradient information at the lateral / mainstem junction), why were lateral WTMFs lacking the downstream gradient information not removed from the analysis? Or why not analyze those lateral WTMFs with downstream gradient/size information separate from those lateral WTMFs lacking such information? The gradient difference at the junction of mainstems and laterals are quite often profound but I am left with the impression that the analysis essentially ignored investigation of this situation and effectively assumed that laterals somehow exist outside of any connection to a mainstem.
- The percentages shown in the two right-hand columns of Tables 4 and 5 need to be explained much more clearly. My initial reading of the draft report erroneously left me with the impression that these percentages were somehow a measure of the "accuracy"

of each of the modeled options, even though the report clearly states that the "Percent of EFH points captured indicates the **efficacy** of the model." The report (and Forest Practices Board members) would greatly benefit from an paragraph explaining efficacy and how the analysis does or does not address accuracy and minimization of systematic error of the recommendations provided

- Tables 4 and 5 seem to imply that the data analysis resulted in recommendations reliant on a two factor model (gradient threshold and width threshold). Could the efficacy of the model be improved with use of other criteria or more than two factors, such as including gradient change or width ratios?
- I am quite concerned with the two ("recorded" and heard) responses below to two of Jason Walter's questions at the December 14th meeting:

If implementing a survey and hit 10% threshold and implement survey find fish then gradient is no longer a criterion and therefore must use other PHB criteria from that point upstream.
Hans – yes, use other criteria.

What happens if it gradient changes to some higher value than threshold?
Hans – In this situation can use an ID team if it is less than 20% and more than 10%. With the recommendations from the panel, gradient wouldn't be a PHB between 11 and 20%. The panel will look to add another scenario for this situation.

As noted by several participants in the meeting, the scenarios described by Jason's questions are quite common on the landscape and do not represent "one-offs"; if ID teams were required for such situations, hundreds and hundreds of ID team meetings (not previously required) would need to occur to address these quite common situations. The Science Panel needs to understand that this "thresholds only" draft recommendation (but also including barriers) and stepwise use of the thresholds (such as dropping gradient as a criterion once the 10% threshold is hit) will likely greatly expand upstream where F/N breaks are located, in the absence of scientific evidence indicating that such an expansion is warranted. As at least suggested in the last sentence of the second response above, the Science Panel **needs** to look at the described scenario (and others like it) and incorporate into the model additional parameter(s) (such as gradient / size change) that address these types of common occurrences across the landscape.

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Testimony of Elaine Oneil to the Washington State Forest Practices Board on February 13, 2018 with concerns regarding the science included in the Science Panel PHB recommendations

Chairman Bernath and members of the Forest Practices Board, I am Dr. Elaine Oneil, Executive Director of the Washington Farm Forestry Association. I reviewed the Science Panel recommendations, not as a subject matter expert, but from the perspective of a scientist. I have questions and concerns to share with the Board as they are likely to influence your understanding of what you have before you today.

First off – units matter. Starting in the literature review section there is a mix of units. For example one study reported stream widths at which fish are no longer able to move upward from 2-16 m (that is 6.5' – 52'). That is quite a bit larger than the threshold value of 2 or 3 feet at which to begin measuring end of fish habitat which made me ask "Why are Washington streams with fish so much smaller?" In this report, probability distribution functions are shown for wetted width (p 27) instead of channel width. Why? The charts show that the probability distribution function captures nearly all the streams beyond the End of Fish Habitat (EFH) at 2-3 feet of wetted width for the samples used in both eastern and western Washington. But the metrics you have been asked to choose between are not wetted width, they are channel width. Why are the threshold values the same as the wetted width values, instead of the channel width values that, by definition, are at least as large as wetted width and usually larger? This is especially concerning as the report also indicates that:

> *In addition, many PHBs appeared to be selected not by strict criteria but because they would make it through the concurrence process.*

There are a lot of ways to interpret that statement, but since the agencies must concur (agree to) the EFH, it suggests that these Water Type Modification Forms (WTMF) *with concurrence* are already conservative with respect to moving the EFH further upstream than may be necessary.

Statistics. Thresholds are not a model. There is a lack of clarity regarding whether one metric or both are required in the proposed evaluation system. In some places I understand it to say only one threshold is needed, in others more than one. And I am especially concerned about how a percent (%) of WTMF that are within a threshold value, but were noted to be incomplete, with lots of transmission errors, are presented as sufficient to be implementing a proposed change of this magnitude. Or even a testing for their efficacy to support a permanent rule since it isn't clear that the threshold is where the test should begin. It is akin to the old story of looking for your keys under the lamppost because there is light there, even though you misplaced them in the house where it is dark. In short, this report, while a substantial effort given the time frame that was allowed, is not ready for prime time. If I were reviewing it for publication, I would have similar queries and I would require that they be addressed prior to taking any recommended action. We want to set the science up to give us answers that reflect where fish habitat stops, so I would urge you to do the same.

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February 9, 2018

Forest Practices Board
Washington Department of Natural Resources
PO Box 47012
Olympia, WA 98504-7012

Re: Permanent Water Typing Rule

Dear Forest Practices Board members and Chairman Bernath:

Thank you very much for your hard work considering a proposal for a permanent water typing rule. Since 2005, the Washington Forest Law Center (WFLC) and members of the Conservation Caucus have worked with DNR and other forest stakeholders to develop a permanent water typing rule that protects known occupied and potentially occupied fish habitat in accordance with WAC 222-16-010 and the letter and spirit of the Forest Practices HCP while cognizant of timber industry viability. We are hopeful that the end is finally in sight and we congratulate all parties for working together to complete this important task.

It has come to the Conservation Caucus' attention that at least one stakeholder is arguing that any Board selection of a draft permanent water typing rule would be "arbitrary and capricious" based on the science and policy record before the Board at the current time. Specifically, that any rule based in whole or in part on the DNR's Expert Science Panel's Potential Habitat Break Report (PHB) would lack a "scientific basis" and would, accordingly, be arbitrary and capricious.

WFLC would like to respond to this argument. In short, there <u>is</u> an ample and well-documented record, including the Panel's Report, in support of moving forward with the process for adoption of a permanent water typing rule that rationally implements the already-adopted definition of "fish habitat" in the forest practice rules (WAC 222-16-010).

A. The Board has a duty to adopt a permanent water typing rule that implements the Board's existing definition of "fish habitat" and improves upon the existing system by reducing reliance on unfettered electrofishing to make fish presence/absence determinations in accordance with the Board's 2016 decision adopting a fish habitat assessment method.

Before addressing why the record <u>supports</u> decisive Board action to advance a credible permanent water typing rule now, we think it would be helpful to reiterate why change is imperative.

In general, an agency, like the Board, has a duty to initiate rulemaking to amend a rule when post-rule developments known to the agency have occurred that require the agency to reconsider whether its previously adopted rule faithfully implements the applicable statute.[1] An agency's decision not to re-initiate rulemaking is arbitrary and capricious when the agency turns a blind-eye to these post-rule developments.[2] An agency's decision not to initiate rulemaking is arbitrary and capricious when it is "unreasoning and taken without regard to the attending facts or circumstances."[3] An agency may only decline to initiate rulemaking "through a reasoned process."[4]

Under these cases, the Board has a duty to adopt a substantively different permanent water typing rule because today's rule-authorized water typing process does not actually implement the Board's definition of "fish habitat." Both the Forest Practices HCP and this Board's rule[5] provide that "fish habitat" includes both stream segments known to be actually occupied and those with that potential:

> "Fish Habitat" means habitat which 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.[6] (emphasis added)

Yet WAC 222-16-031(3)(b), the interim water typing rule in effect today, only protects fish habitat where fish are detected by a one-day survey and not potential upstream fish habitat farther upstream where fish are not detected on the day of the survey. This is because WAC 222-16-031(3)(b) defines Type F waters as "segments of natural waters and periodically inundated areas of their associated wetlands," which "are used by fish for spawning, rearing, or migrations." (emphasis added). As then Forest Practice Division manager Lenny Young wrote in an August 27, 2002 memorandum to DNR Region managers describing the interim rule:

> Under the interim water typing system, Type 3 water breaks are to be based upon fish presence, not fish habitat. After an acceptable fish use survey has been completed, the Type 3 water break should be set at a point upstream of the last fish detection where presence of the last fish detected can be logically and directly assumed. This recognizes that the upper extent of Type 3 water is not necessarily "where the nose of the last fish detected breaks the surface" and requires the reasonable exercise of sound professional judgment. In other words, if it is reasonable to assume that the last fish detected was likely using an upward portion of the stream, then the Type 3 water break should be set at the point which represents the upper extent of the fish use area. This is not the same as the upward extent of fish habitat. (emphasis added)

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[1] *Rios v. Dept. of Labor & Indust.*, 145 Wn.2d 483, 507 (2002).
[2] *Id*.
[3] *Hillis v. Dept. of Ecology*, 131 Wn.2d 373, 383 (1997).
[4] *Rios*, 145 Wn.2d at 501.
[5] WAC 222-16-010 (definition of "fish habitat").
[6] FFR at 20; WAC 222-16-010 (definition of "fish habitat").

Mr. Young's memorandum makes it clear that the interim rule in place today protects only habitat slightly upstream from "the nose of the last fish," (with how far upstream entirely discretionary with a surveyor's view of the upstream area it is "reasonable to assume" that fish was likely using) as opposed to the actual upward extent of potential fish habitat. Moreover, while determining the accuracy of the Fish Habitat Model based maps, the CMER committee conducted a seasonal fish distribution study (Cole 2005) yielding results that clearly demonstrate that actual fish presence, movement and distribution in upper watersheds in highly variable and dependent on changes in seasonal and annual stream flow patterns. This variability confirms the inherent risk of habitat under-identification associated with reliance on single-pass electrofishing surveys to declare fish absence.

Not only is the "nose of the last fish" not a legally permissible or scientifically credible metric for measuring "fish habitat," the existing interim rule, WAC 222-16-031(3)(b), allows potential fish habitat to be eliminated from Type F classification through the use of a WDFW-approved fish survey protocol involving electrofishing under the Board Manual (this rule provides "[t]he requirements for determining fish use are described in the board manual section 13. If fish use has not been determined…."). For example, in western Washington, WAC 222-16-031(3)(b)(i)(A) currently provides that streams wider than two (2) feet with a channel gradient of less than 20% (10 degrees) are presumed to contain fish. But this WAC allows a landowner to conduct an electrofishing survey protocol under Section 13 of the Board's Manual to overcome the fish use presumption and "downgrade" a stream segment to a non-fish bearing Type Np water.

The option for landowners to "downgrade" a stream segment to Type Np from Type F via a protocol survey specified only in non-regulatory board manual guidance undercuts the rule—and HCP—mandate for adequate protection of potential fish habitat. This is because stream segments with all the attributes of "fish habitat" may not, on that single day the protocol survey, is conducted, contain fish (Cole 2005), despite the fact that these same segments may be properly characterized as "potential habitat likely to be used by fish which could be recovered by restoration or management." In other words, the Board's water typing rule in effect today permits landowners to eliminate potential "fish habitat" through a Board Manual electrofishing process that is incapable of identifying potential fish habitat. The Board has already recognized the need to change this.

It is time for the Board to move forward with the adoption of a permanent water typing rule that properly identifies "fish habitat" in the field and does not eliminate that potential habitat with a broadly applicable fish-presence-based protocol survey process. Since 2005 (13 years ago), the current water typing system has only protected occupied—as opposed to potential—fish habitat. The Board's water-typing regulatory scheme is thus not implementing the Board's definition of "fish habitat" in WAC 222-16-010.

B. There is an adequate administrative record for the Board to move forward with the adoption of a permanent water typing rule that meets the definition of "fish habitat" in WAC 222-16-010.

The next issue is whether the Board has before it a sufficient technical and policy record, including the PHB Panel's Report dated January 26, 2018, to advance a permanent draft rule.

The answer is yes, so long as this new rule ultimately implements the definition of "fish habitat" in WAC 222-16-0010.

At the outset, we briefly reiterate the legal standard against which any rulemaking will be tested. The burden of proving that a rule is invalid is on the party asserting the invalidity.[7] A rule will be declared invalid if it is arbitrary and capricious.[8] A rule is arbitrary and capricious if it is "willful and unreasoning and taken without regard to the attending facts and circumstances."[9] "Where there is room for two opinions, an action taken after due consideration is not arbitrary and capricious even though a reviewing court may believe it to be erroneous."[10] The "willful and unreasoning" determination is based on the entire record, the facts and circumstances behind the rule, and the agency's explanations for adopting the rule.[11]

The Board's development of a permanent water typing rule is a policy decision. The policy task is for the Board to identify where and when instream channel conditions (e.g., gradients, widths, and natural barriers) can be used to reduce the use of electrofishing surveys by focusing them upstream of habitat "breaks" that lower the potential for fish to use upstream reaches. If the Board's proposed final rule establishes a reasonable means to more accurately implement the definition of "fish habitat" in WAC 222-16-010, the Board's policy decision would be clearly supported by the administrative record in this rulemaking initiative for the following reasons.

1. This record is at least as strong as the one establishing the physical defaults. The current rule, WAC 222-16-031(3)(b), adopted in 2001, already establishes numeric physical defaults that presume "fish habitat" and this default has been in place for 17 years. There is no question that the Board had the authority at the inception to adopt these defaults, and, likewise, the Board has the authority today to refine the protocol survey process governing how "fish habitat" is "determined."

2. Authority over the subject matter is well-established. The current rules defer to Board Manual Section 13 for the process for when and where it is appropriate to conduct "electrofishing" (the use of the "survey protocol"). This Manual has been in effect for 16 years. If the Manual has governed electrofishing for 16 years, the Board has the authority to modify the Manual or to adopt a rule that more scientifically conforms to the regulatory definition of "fish habitat."

3. Best available information, even if not perfect, is enough. The Panel's Report was based on a review of likely end-of-fish-habitat points derived from data gleaned from official DNR water type modification forms. These are the best data available to inform the question of PHB metrics. All stakeholders had the opportunity to submit their "data points" indicating the end of fish habitat and the forest landowners did so.

[7] RCW 34.05.570(1)(a).
[8] RCW 34.05.570(2)(c).
[9] *Rios*, 145 Wn.2d at 501.
[10] *Id*.
[11] *Washington Independent Telephone Ass'n v. Washington Util. and Transp. Comm'n*, 148 Wn.2d 887, 906 (2003).

4. The Panel's Report responds to Board direction. The Panel reviewed available literature, best available science, and rendered its professional opinion. This opinion is properly being considered and weighed along with other information by the Board.

5. The framework for the new stream typing rule has already been decided. The Panel's Report is based on and implements the Fish Habitat Assessment Method (FHAM), developed by stakeholders and recommended by consensus of the Policy Committee to the Board at its May 2017 meeting. The Report merely addresses blanks left open by the FHAM method, which itself is the product of years of deliberation and is clearly not vulnerable to arbitrariness claims.

6. The Panel was composed of subject matter experts. The Panel consisted of experts in fisheries biology, geomorphology, fish habitat relationships in the forested environment, and included career timber industry personnel. The Panel had "more than 200 years of experience on fish and fish habitat in forested streams of the Pacific Northwest."

7. The Panel based its decision on commonly-accepted metrics. The Panel documented that three metrics—stream size, channel gradient, and obstacles—based on statistical correlation with previously established F/N breaks—could be used to identify potential habitat barriers.

8. The Panel's recommendations are a starting place for determining "fish habitat." The recommendations do not make a final determination of the limits of such habitat. The recommendations do not alone establish the "fish habitat" line (Type F/Type N break); instead, they merely identify instream channel features that the Board could use to define a significant change in habitat above which fish are less likely to access and therefore, it is reasonable and appropriate to judiciously use electrofishing surveys under a strengthened protocol. The Report provides: "It is important to note that the PHB (potential habitat barrier) is not necessarily the F/N break, but rather the first point of potentially unfavorable habitat upstream from the last known fish (end of fish or EOF) and the starting point for protocol survey").

In conclusion, the above points reflect that there is an extensive administrative record assembled to date, including the Expert Panel's PHB Report**,** in support of a rule change to obtain a more accurate, implementable, repeatable and enforceable fish habitat identification method**.** So long as the Board ultimately selects a water typing method that implements the definition of "fish habitat" in WAC 222-16-010, then there is a basis in the record for the Board to move forward at this time.

Very truly yours,

Peter Goldman
Director

Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

January 31, 2018

Washington Forest Practices Board
1111 Washington St. SE
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RE: Potential Habitat Break Report and Recommendations

Chairman Bernath and Board Members,

We recently received a copy of the report to the Forest Practices Board entitled, "Review and recommendations for potential fish habitat breaks to begin protocol surveys to determine end of fish habitat on state and private forest lands in Washington State." We understand this report and its recommendations will be considered for adoption by the Board at the upcoming February meeting. After review of the report, we have identified several questions and concerns. **We would respectfully request that the Board not adopt or approve the recommendations in the report until our concerns have been fully addressed.**

The authors of the report (hereafter Science Panel) compiled and analyzed end of fish habitat data (EFH) from large industrial forest landowners, and then later data obtained from past water type modification forms. We have questions about some of the surveys and data, but won't go into those concerns at this time. After analysis, the Science Panel recommended four Potential Habitat Break (PHB) metric sets for western Washington and two for eastern Washington (Table 4 and 5 of the report). We are unclear how these recommended PHB metric sets will be utilized. Are these recommended PHB metric sets to be used solely for starting protocol surveys as suggested in the report title and parts of the report introduction? Or, are these recommended metric sets to be used also for making calls for the end of fish habitat or Type F/N breaks? This is a major distinction in the use and purpose of these recommended metric sets that needs to be clarified.

If the purpose of the recommended metric sets is solely to determine the point at which to begin protocol surveys, this might be an applicable use. The report indicates that 91-96% of EFH data points for western Washington and 73-79% of EFH data points in eastern Washington met or exceeded one of the recommended set of PHB criteria (Table 4 and 5). Starting protocol surveys at one of the recommended set of PHB criteria would probably be downstream of the true EFH point and not miss it.

However, if the recommended criteria will be used for designating the EFH or Type F/N breaks as suggested in Figure 8 of the report, we strongly oppose such use. Most of the EFH data points had greater upstream gradient and/or less upstream width than the recommended

PHB criteria (see attached Figure 7 from the report with comments). The recommended criteria would in many cases greatly underestimate what constitutes an EFH or Type F/N break. The criteria should be based at least on the average or median of the data, and preferably on the 75th percentile of the data considering uncertainty and ESA-listed fish. We would therefore request that the Forest Practices Board not adopt, or approve use of, the report's recommended PHB criteria for determining the EFH or Type F/N break.

We also have concerns with the report's recommendations for the definition of obstacle habitat breaks. The report recommends that non-vertical obstacles be defined as an abrupt step in the stream channel with at least 20% slope and elevation change over obstacle length of greater than or equal to 1 upstream bankfull channel width (Table 6). The density plot in Figure 6 of the report shows the vast majority of the EFH data for obstacle height were much more than one upstream channel width of elevation change length (see attached Figure 6 with comments). We therefore oppose using one upstream channel width elevation change length as the definition of an non-vertical obstacle habitat break. The report also recommends vertical obstacles be defined as a vertical drop of 3 feet or more. For some streams and settings, a 3 feet vertical drop isn't a major obstacle to fish, especially streams with steelhead, coho and/or larger trout. Steelhead have been documented to be able to leap vertically more than 15 feet under the right conditions. Bull trout and coho are also well known for their ability to get over vertical drops and cascades much greater than 3 feet in height. We therefore do not support the recommended definition of 3 feet as a vertical obstacle, at least for streams used by anadromous fish or larger trout. Both vertical and non-vertical obstacle criteria need to account for the species of fish, size of fish, pool depth and size below the obstacle, range of flows and velocities, whether side channels are present, permanency of the obstacles, as well as the actual physical drop.

Again, we respectfully request that the Board not approve or adopt the report recommendations for determining EFH or Type F/N breaks. The majority of the EFH data do not support the recommendations. **We would also ask that the existing default physical criteria continue to be used until further studies and data can clearly justify changes.** Thank you for your time and attention on this important matter. If you have any questions of a technical nature regarding of these comments, please contact Jim Matthews of my staff at (509) 865-5121, ext. 6311, or I can be reached at ext. 4655.

Sincerely,

Philip Rigdon, Superintendent
Department of Natural Resources

C: (files)
YN Office of Legal Counsel
Gerald Lewis, YN Tribal Council Fish and Wildlife Committee
Paul Ward, YN Fisheries

Hillary Franz, Commissioner of Public Lands

Enclosure

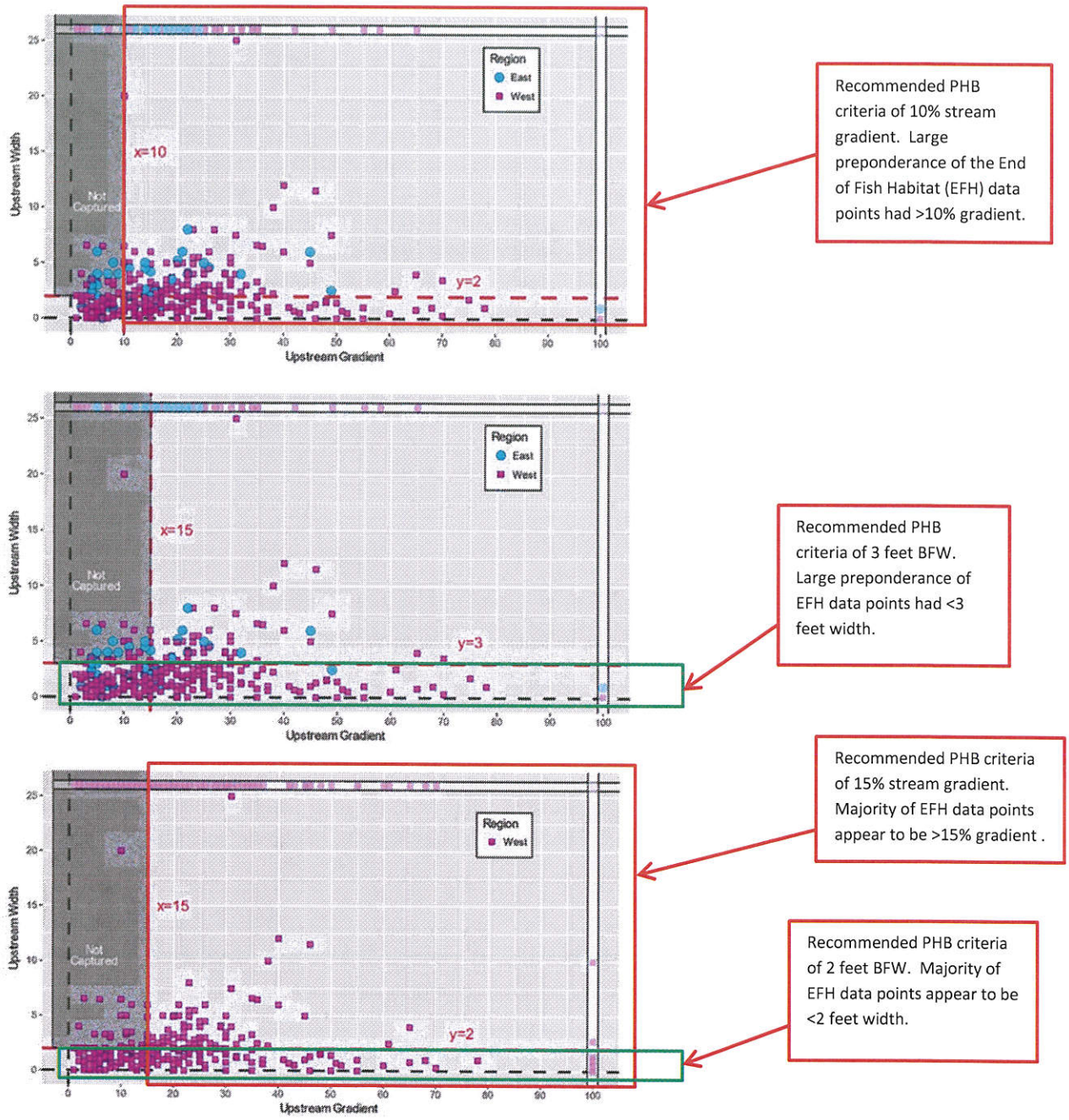

Figure 7 from the PHB Science Panel Report for the Forest Practices Board, dated January 16, 2018. The graphics show about 5-25% of the EFH data points were "Not Captured" by the recommended Potential Habitat Break (PHB) criteria in the report. If so, protocol surveys started at the recommended criteria would have a low likelihood of missing the EFH point downstream. However, this also means that roughly 75-95% of the EFH data points had a higher channel gradient, smaller stream width or both, than the recommended PHB criteria in the Report.

The recommended criteria in the Report are therefore not appropriate for designating EFH or Type F/N breaks. Using the recommended PHB criteria in the report would mostly underestimate the channel gradient, or overestimate the stream width compared to the EFH data. Recommendations for PHB criteria should be based off of the average or median of the EFH data, or even the 75th percentile in the face of uncertainty.

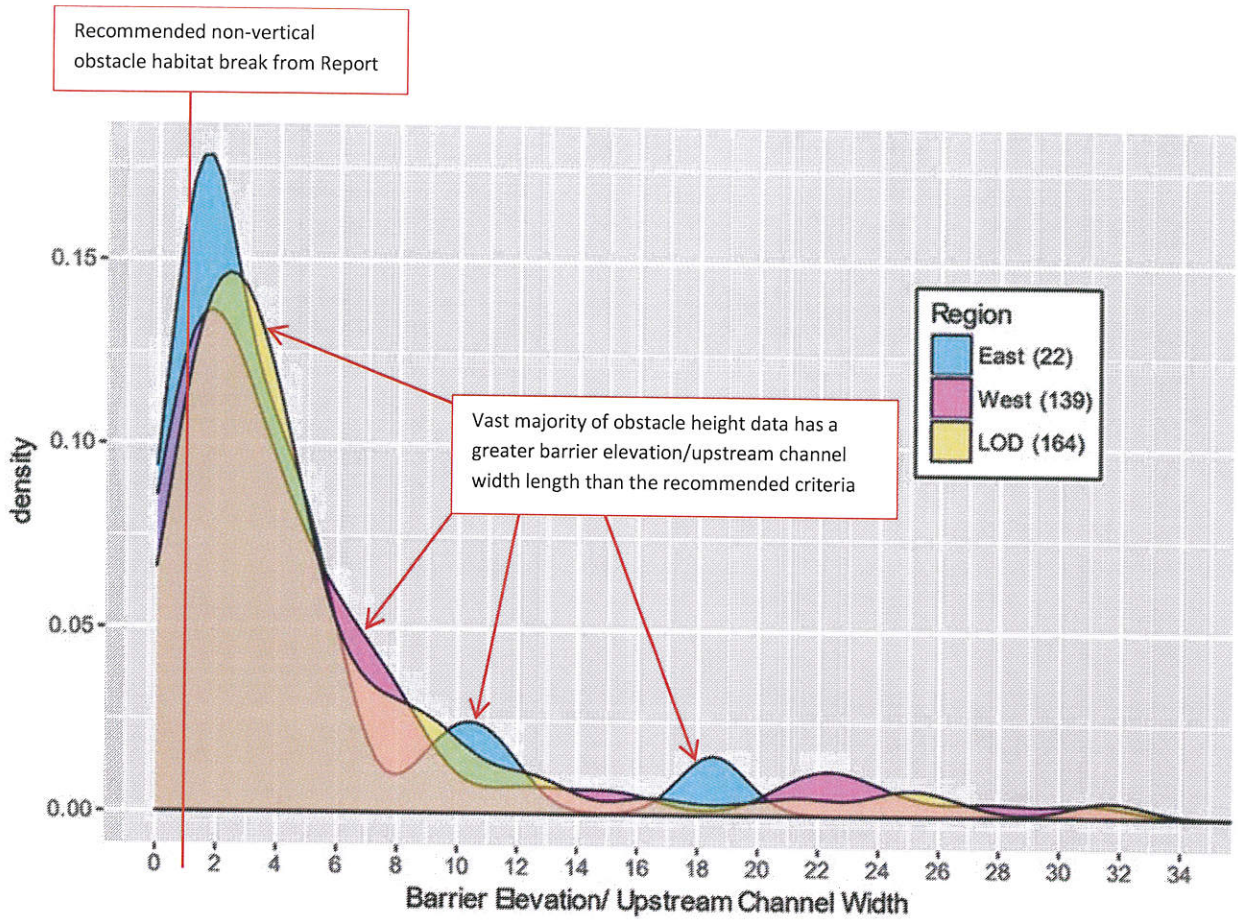

Figure 6. Density plot showing distribution (proportion) of obstacle height for expanded data in eastern and western Washington and LOD (western Washington only).

Red line denotes Report recommendation for non-vertical obstacle height break criteria of elevation change over obstacle length of 1 upstream bankfull channel width. NOTE: The vast majority of data distribution had a much greater barrier elevation/upstream channel width length than the recommended criteria.

Weyerhaeuser

Date December 21, 2017

From Jason Walter, Weyerhaeuser

Subject **Weyerhaeuser concerns and issues with the PHB Science Panel report and recommendations from December 8, 2017**

To PHB Science Panel, Hans Berge (AMPA)

The intent of this document is to ensure that Weyerhaeuser staff concerns and issues with the PHB Science Panel report and recommendations from December 8, 2017, are captured on the record. These concerns and issues include:

- **Inconsistencies in the 'new' analysis and recommendations with:**
  - **FHAM protocol**
  - **Multiple Washington Forest Practices Board (WFPB) motions**
  - **Language contained within the body of the PHB Science Panel Report, itself**
- **Use of a sub-par dataset in the 'new' analysis**
- **Fundamental flaws with 'new' analysis and subsequent recommendations**

Inconsistencies in 'new' analysis and recommendations with FHAM protocol

In January 2017, a multi-stakeholder group of water typing 'experts' worked together to develop a consensus framework for a 'Fish Habitat Assessment Method' (FHAM), recognizing 'Potential Habitat Breaks' (PHBs) as possible locations to identify a regulatory Type-F/N break as the result of a Protocol Electrofishing Survey. If followed, this framework would meet two main goals as directed by the Board's motion on moving to a Permanent Water Typing Rule; 1) an overall reduction in electrofishing and 2) a systematic approach to electrofishing that is based on the recognition and identification of "fish habitat" not just fish use. While this original FHAM proposal did not include specific metrics for PHBs, it was agreed upon that this systematic approach to conducting protocol electrofishing surveys, once informed with these specific metrics, would meet DNR's objective of developing an alternative that is "repeatable, enforceable, and implementable".

The figure and text below (on Page 2) are taken from a report submitted by this multi-stakeholder group, and clearly suggest that PHBs are associated with barriers that restrict fish access, and/or 'changes' in stream character, not single threshold value(s). The (new) recommendation by the PHB Science Panel, that PHBs should be associated with single threshold values (for stream

gradient or size) is inconsistent with the original intent of the FHAM, and would function to potentially ignore permanent, distinct, and measurable changes to in-channel physical characteristics once the underlying/recommended threshold value(s) has been met in a given stream system.

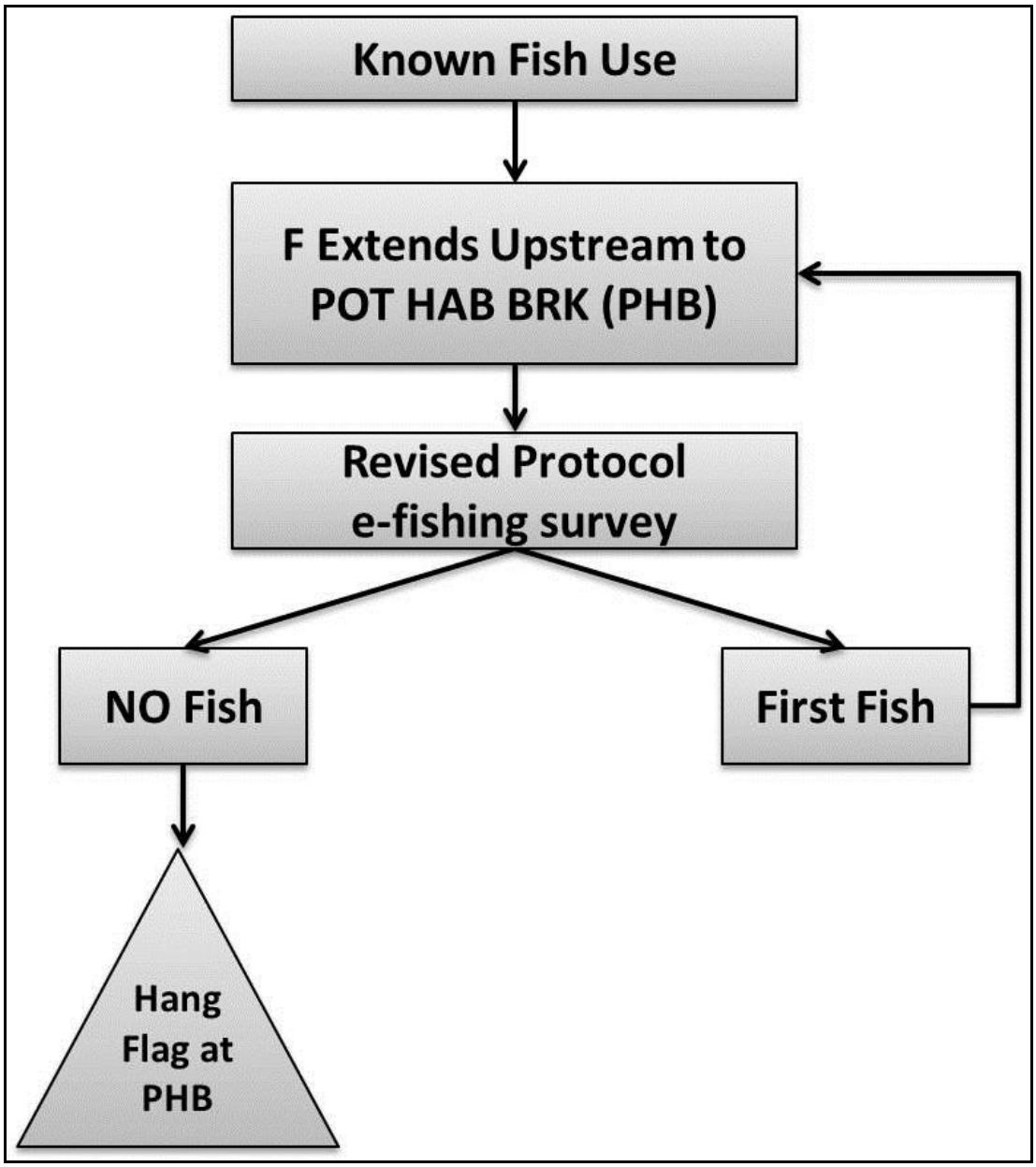

Figure 1 taken from the FHAM consensus framework report (above) illustrates a sequential approach to FHAM that incorporates the identification of "potential habitat breaks" (PHBs). PHBs are defined as permanent, distinct, and measurable changes to in-channel physical characteristics. PHBs are typically associated with underlying geomorphic conditions and may consist of natural barriers that physically prevent fish access to upstream reaches (e.g. steep bedrock chute, vertical waterfall), or a distinct and measurable change in channel gradient, size, or a combination of the two.

Inconsistencies in 'new' analysis and recommendations with multiple WFPB motions

In May 2017, the WFPB passed a motion that included the following language:

> "…determine those elements that would constitute a barrier and/or PHB…determine those physical, biological, and chemical elements that would individually or in combination constitute a high probability the PHB is coincident with a significant change in habitat including stream size, stream gradient, the interaction of size and gradient and the presence of barriers that limit accessibility, thus the appropriate point to initiate a protocol [electrofishing] survey"

The (new) recommendation by the PHB Science Panel that PHBs should be associated with single threshold values (for stream gradient or size) is inconsistent with the direction of this WFPB motion, and would function to potentially ignore significant changes in habitat (including changes in stream size and/or stream gradient) once the underlying/recommended threshold value(s) has been met in a given stream system.

Furthermore, in August 2017, the WFPB passed a motion that included the following language:

> "…direct the AMPA to facilitate the gathering of data for eastern Washington and in those areas of western Washington not represented currently and work with the Science/Technical Expert Panel to incorporate this data into their analyses to determine PHBs…"
>
> "…AMPA and/or science panel will report on progress collecting the data for eastern Washington and those parts in western Washington that needed augmenting…"

The intent of this WFPB motion is clear, and it was not to replace the dataset used in the original PHB analysis (contained in the report delivered to the WFPB in July 2017), but to supplement or "augment" that dataset with additional data from areas not represented. The decision of the PHB Science Panel to ignore the original dataset in the 'new' analysis not only results in an inferior product, but is inconsistent with the (clear) direction of the WFPB.

Inconsistencies in 'new' analysis and recommendations with language contained within the body of the PHB Science Panel Report, itself

Throughout the PHB Science Panel Report, multiple references are made to suggest the link between PHBs and 'permanent, distinct, and measurable changes to in-channel physical characteristics'. These include:

- Page 4 – Line 30: "…since we were looking for changes in habitat conditions that could potentially signal a habitat break, we needed measurements of width and gradient both up- and downstream from the determined EFH point to characterize the change occurring at that point."
- Page 6 – Line 8: "Multiple factors have been previously identified as PHB factors including (1) natural fish movement barriers such as waterfalls, (2) changes in stream size, and (3) change in stream gradient."

- Page 10 – Line 12: "Abrupt changes in stream size are frequently associated with the upper extent of fish occurrence, often in the absence of other observed influences…"

- Page 15 – Line 25: "In these analyses, we observed expected differences between upstream and downstream stream widths (smaller channels upstream) and gradients (steeper upstream)…"

- Page 16 – Line 16: "...clear from the data is that a stream channel change is likely to be a PHB if it meets either gradient or width criterion, as often less than ¼ of the points met both criteria…"

- Page 16 – Line 26: "...choosing PHB criteria that rely on a single rigidly-defined parameter such as a 2 foot channel width, would mean once a survey crew reached the last fish they would need to continue until the average channel width drops below 2 feet or meets other gradient or barrier criteria. This could result in increased distances between EOF and the PHB."

Despite these multiple references to the potential link between changes in stream characteristics and PHBs, and the open recognition by the PHB Science Panel that relying on a single rigidly-defined parameter such as 2 foot channel width (a threshold) could result in an increased distance between the EOF and the PHB, the new recommendations ignore 'change' and instead are associated with single threshold values. Again, this protocol would not recognize significant changes in habitat (including changes in stream size and/or stream gradient) once the underlying/recommended threshold value(s) has been met in a given stream system.

Use of a sub-par dataset in the 'new' analysis

The original (Landowner) dataset that was used to inform the analysis for the first (July) report circulated by the PHB Science Panel included over 1,500 data points throughout western Washington, and (largely) included data on stream habitat metrics (including size and gradient) both upstream and downstream from BOTH surveyed 'last-fish' locations and proposed regulatory Type-F/N break points. This original dataset did not include points in eastern Washington or in some regions within western Washington. Given the language included in WFPB motions passed in August, and that the intent of this process is to develop a state-wide rule, the augmentation of this original dataset with additional data from the regions of the state without representation was well founded. However, the decision to simply eliminate this original data from the new analysis should be reconsidered, particularly given what is reported by the PHB Science Panel in the new report (Page 18 – Line 19).

> "Our results from the new random data set for western Washington and the Landowner data used in our previous analysis were similar. This suggests that while not randomly selected, the Landowner data were representative of western Washington."

Given the (acknowledged) consistency between the 'random' western Washington dataset and the Landowner dataset, the exclusion of the Landowner data from the 'new' analysis should be reconsidered, particularly given that the new random western Washington dataset appears to contain only 221 points (information taken from Table 4 of the PHB Science Panel Report).

In addition, per discussion at the 'Stakeholder/Science Panel Meeting' (December 14, 2017) the 'new' dataset lacked information on 'downstream' physical stream characteristics on a large number of the sites, yet were still included in the analysis. This lack of downstream information would make the assessment of actual 'change' at the proposed regulatory Type-F/N break point impossible. Furthermore, it is this reviewer's opinion that this lack of downstream information may be, in large part, why the PHB Science Panel has changed direction, focusing now on 'thresholds' instead of 'change'. Again, these downstream measurements (on both 'lateral' and 'terminal' sites), from both 'last-fish' locations and proposed regulatory Type-F/N break points, were (largely) included in the original Landowner dataset.

Lastly, the 'new' dataset did not include any information on actual fish use and/or the location of the uppermost fish associated with each survey. Given that the FHAM process is clearly intended to start with 'known fish use', the lack of consideration of fish use information in the 'new' analysis is troubling, if not inappropriate.

Fundamental flaws with 'new' analysis and subsequent recommendations

The presentation of the separate analyses and subsequent recommendations in each of the two (July and December) PHB Science Panel reports appears to be done in a similar fashion (see Figure 6 and Table 3 from July report, and Figure 7 and Table 4 from December report). While presented and (apparently) 'analyzed' in a similar way, it is the fundamental difference in what the data represent in each of the two reports that causes the problem.

Data from the July report represents, "upstream to downstream gradient difference (X-axis) and upstream to downstream width ratios (Y-axis) of end of fish habitat and non-habitat break points"… or in other words, the 'change' in habitat characteristics (associated with the regulatory Type-F/N break) as originally intended in the FHAM process. Data from the December report, however, represents ONLY, "upstream gradient (X-axis) and channel width (Y-axis) for end of fish habitat points". Given that these data represent only the upstream habitat metrics, it is impossible to assess the 'change' in habitat associated with the points. (Both figures are presented on the following pages for reference.)

In both cases, a point is considered to be 'captured' if it falls within either the upper right, lower left, or lower right quadrants of the graph, and it is the 'percent of points captured' that is presented (in Tables 3 (July) and 4 (December)) and then used to demonstrate the efficacy of specific PHB criteria. Basically… the higher the value in the far right column of each table, the 'better' the associated PHB criteria is said to work or 'fit'. (Excerpts from both tables are presented on the following pages for reference.)

While this sort of 'analysis' can be used when assessing points of 'change' in habitat condition (as done with the July report) it is inappropriate when assessing potential threshold values, yielding a significantly inflated 'percent captured' or 'correct' value in those cases. This is what we see in the December report… resulting in greatly inflated 'percent captured' values for Tests 4, 5 and 2 (presented as the 'recommended alternatives' in the top 3 rows of Table 4).

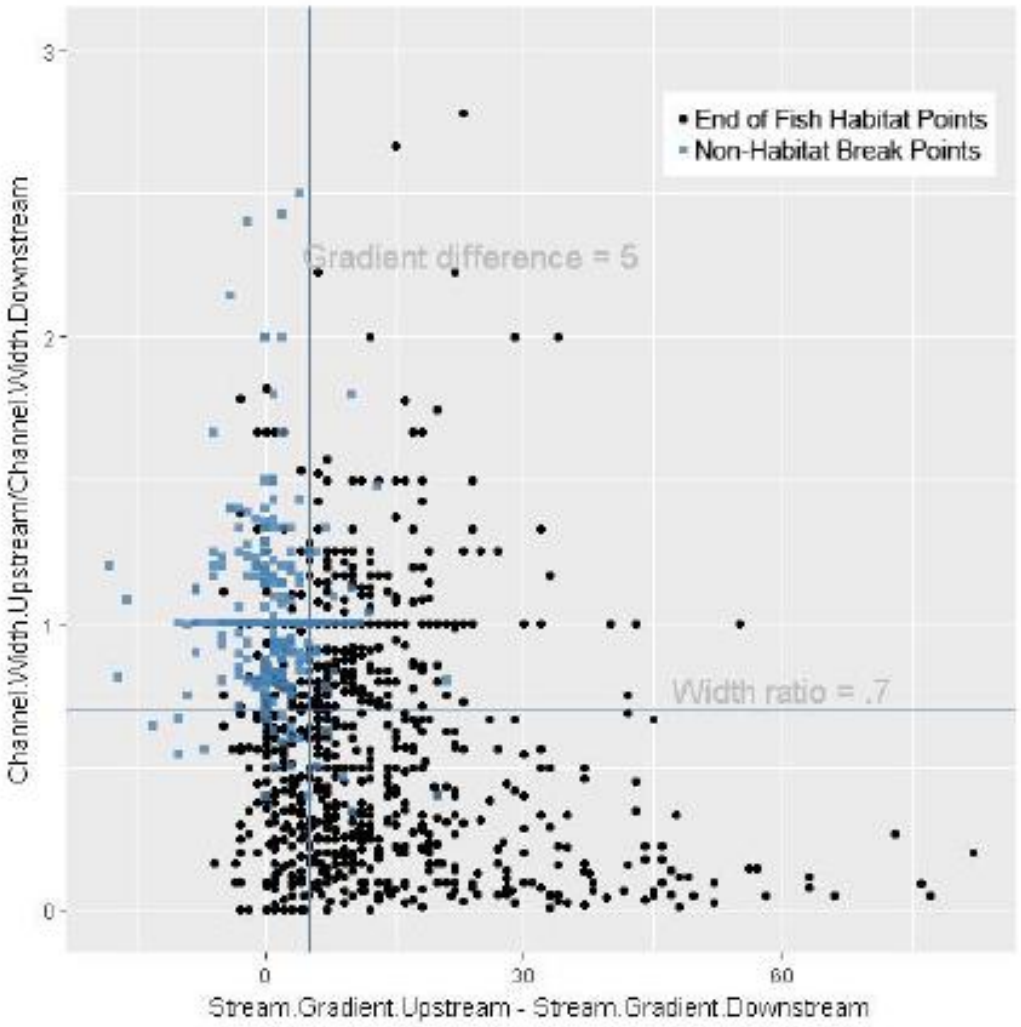

Figure 6 taken from the July PHB Report used to assess the efficacy of PHB criteria associated with a change in gradient of 5% or more and/or a reduction in stream size of 30% or more (Test 7).

Test	Gradient Metric	Gradient Threshold	Width Metric	Width Threshold	Percent of Surveyed EFH points captured	Percent of non-habitat-break points captured
7	**Difference up-down**	**5%**	**Ratio up/down**	**0.7**	**92.0%**	**15.6%**

Excerpt from Table 3 taken from the July PHB Report summarizing the 'recommended' PHB criteria associated with a change in gradient of 5% or more and/or a reduction in stream size of 30% or more.

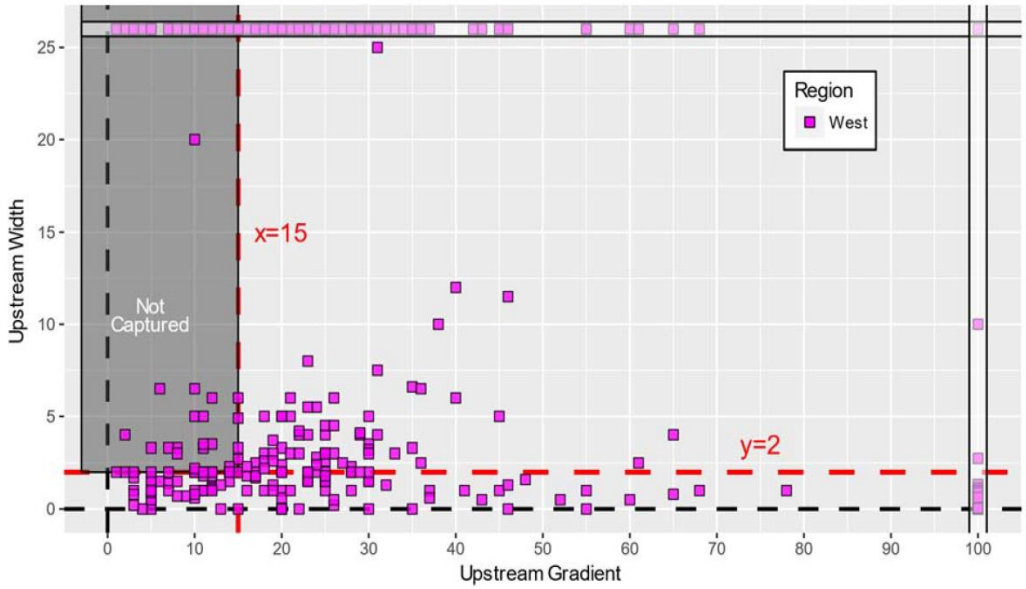

Figure 7 – Panel 1 (above) taken from the December PHB Report used to assess the efficacy of PHB criteria associated with threshold values of 15% gradient and 2 feet channel width (Test 2).

Test	Gradient Metric	Gradient Threshold	Width Metric	Width Threshold (ft.	LOD (n)	Western Washington (n)
4	Upstream Threshold	10%	Upstream Threshold	2	88%	96% (221)
5	Upstream Threshold	15%	Upstream Threshold	3	92%	91% (221)
2	Upstream Threshold	15%	Upstream Threshold	2	80%	90% (221)

Excerpt from Table 4 taken from the December PHB Report summarizing the 'recommended' PHB criteria associated with threshold values of 15% gradient and 2 feet channel width.

The points on the upper plot from the July report represent the actual change in habitat characteristics associated with a concurred regulatory Type-F/N break, and therefore can be used to accurately assess whether the proposed PHB 'change' metrics would 'capture' that point. All of the 'black' points on this graph (upper right, lower left and lower right quadrants) would be accurately captured because all of those points represent an actual measured change in gradient of 5% or more and/or a reduction in stream size of 30% or more.

The PHB Science Panel has assumed that the same approach can be used when assessing a potential threshold, and has done so when considering the data presented on the plot from the December report. However, the data presented on this plot represent ONLY the habitat characteristics upstream from a concurred regulatory Type-F/N break, and one CANNOT assume that a given point in one of the upper right, lower left, or lower right quadrants would actually be captured by using the newly recommended 'threshold' PHB criteria without knowledge of the underlying (downstream) stream channel size and/or gradient. Per members of the Science Panel and the AMPA (during the December 14, 2017 meeting with stakeholders), once a given threshold (i.e. 15% gradient, 2 foot channel width) is met or exceeded, and fish are found upstream from that point, that PHB type is no longer a consideration for the given survey, and PHBs could then only be based on the other 'remaining' PHB types, essentially resulting in a circumstance where the regulatory Type-F/N break would have to be based on multiple PHB thresholds (creating an 'AND' and not 'OR' PHB situation). When investigating the new 'random' dataset it appears that downstream habitat information is not present for most points. This lack of downstream habitat information makes a true assessment of whether or not the points would actually be 'eligible' for capture using a single threshold criteria impossible.

Furthermore, a fundamental principal of the FHAM is that once a fish is encountered, the surveyor proceeds upstream to a PHB, looking for fish upstream from that PHB, and so on… until no fish are found above a PHB. When considering points of 'change' along a stream network… this process allows those potential PHBs to function independent from one another, resulting in the potential for multiple PHB locations in a given stream system based on stream size, stream gradient, barriers, or any combination of the above. When using the 'threshold' criteria, the number of potential PHB locations within a given stream system is significantly limited… resulting in only ONE POINT within each watershed that can be considered a PHB based on gradient and only ONE POINT within each watershed that can be considered a PHB based on stream size. This is a fact, and is true regardless of what other permanent, distinct, and measurable changes to in-channel physical characteristics (size and gradient) may be present. These additional points of change would essentially be ignored as the result of a 'threshold' based PHB system.

In closing, I just want to say thank you for the opportunity to comment on the report, and I look forward to our continued work on PHBs in the near future.