



**DEPARTMENT OF
NATURAL
RESOURCES**

**OFFICE OF THE
COMMISSIONER OF
PUBLIC LANDS**
1111 WASHINGTON
STREET SE
OLYMPIA WA 98504

360-902-1000
WWW.DNR.WA.GOV

MEMORANDUM

July 30, 2024

TO: Forest Practices Board
FROM: Marc Engel, Forest Regulation Senior Policy Planner
Marc.Engel@dnr.wa.gov | 360-628-1107
SUBJECT: Water Typing System Rulemaking: Board Actions Required

This memo describes the Board's remaining decision points in order to adhere to the current permanent Water Typing System Rule (WTS rule) development schedule reaffirmed by the board at the May 7th Special meeting. The memo and supporting attachments, along with the spatial analysis and preliminary cost-benefit analysis reports included in the Board packet, are intended to serve as a decision aid to inform the Board's action on the WTS rule at the August 28th special meeting.

Attachments to this memo provide the details that underpin the summary provided below. Attachment A is a glossary of technical and legal terms that you will frequently encounter in this memo and in all other information related to the WTS rule. Familiarity with these terms, their definitions and their place or function in our regulatory framework will help inform the Board's discussion. The rest of the attachments provide a summary of Board objectives for this rule, a brief timeline of prior Board decisions; a summary of the findings of the spatial analysis; and a summary of the findings of the draft preliminary cost-benefit analysis. Finally, a description of the rule-making process and all the remaining elements that would need to be completed for rule adoption is also provided.

To allow Board staff to move forward with the remaining elements of the WTS rule and meet the Board established deadline of November 2024 to approve the draft rule language and associated analyses for inclusion in the filing of the CR-102, the Board must approve one Anadromous Fish Floor (AFF) alternative and one Potential Habitat Break (PHB) alternative at the August 28th special meeting.

At this time, the spatial analysis and the preliminary findings of cost-benefit represent the best available information that Board staff can provide for the Board to compare the anticipated performance of each of the six AFF+PHB combinations in order to determine which option to advance for rulemaking. However, like all modeling exercises, these analyses are predictive tools

that come with inherent risk and uncertainties, not all which could be mitigated or reduced given the data available. This is especially important to consider as the Board's decision will be a significant action that will have long-lasting impacts on stream typing, a foundational element of the forest practices regulatory framework.

This memo, the spatial analysis and the preliminary findings of the costs-benefits are meant to be considered with the on-the-ground demonstrations of the current rule survey protocol and the proposed Fish Habitat Methodology (FHAM) approved by the Board for inclusion in the WTS rule. During the Board's August 13th special meeting, the application of the fish+ field survey protocol applied under the current water typing system rule and the Board approved WTS FHAM will be demonstrated in the field. The following day, at the August 14th regular meeting, the Board will receive in-depth presentations and briefings from subject matter experts who carried out the two rulemaking analyses. Members of the public and Timber, Fish and Wildlife (TFW) caucuses will also have an opportunity to share their opinions, expert knowledge and policy preferences.

At the August 28th special meeting, the Board will need to consider which AFF and PHB combination to advance for final rulemaking. Relying on the results of the spatial analysis and the preliminary findings of the costs-benefits, Board staff have summarized the anticipated effects of these different options, which will be applied to an estimated total of 53,630 miles of streams statewide.

- 1- Approval of AFF alternative A4 7% (AFF A4) alongside any one of the three PHB options. Anticipated effects:
 - a. Designates the majority of recoverable and accessible fish habitat for both resident and anadromous fish species as Type F waters, an effect driven primarily by the extent of AFF in this option.
 - b. Maximizes potential ecological benefits, most of which remain unquantified in the cost-benefit analysis.
 - c. Adds up to 7,000 miles¹ of Type F streams statewide that are currently identified as Type N streams on the DNR Hydro Layer – this estimate excludes existing concurred points on fish bearing streams.
 - d. Limits total stream lengths available for landowners to apply FHAM to establish the Type F/N water break points to <40%.
 - e. Establishes the AFF, on average, significantly upstream of the existing concurred field verified F/N breaks and some PHBs, potentially leading to more frequent requests for inter-disciplinary team review within the AFF.
 - f. Increases costs to landowners as compared to AFF Alternative D or to the current WTS rule.
 - g. Meets all objectives of the permanent WTS rule.

- 2- Approval of AFF alternative D alongside any one of the three PHB options. Anticipated effects:

¹ Representing a 58% increase relative to baseline estimate of 12,000 miles of F streams on DNR Hydro. For more details please refer to the analysis of probable costs and benefits included in the Board packet

- a. Establishes the AFF at a known point of anadromous fish presence (SWIFD) and all modeled AFF points fall within the known extent of Type F waters established under current rule for both resident and anadromous fish species.
- b. Adds up to 1,550 miles² of Type N streams statewide that are currently identified as Type F streams on the DNR Hydro Layer – this estimate excludes existing concurred points on fish bearing streams.
- c. Limits total stream lengths available for landowners to apply FHAM to establish the Type F/N water break points to ~52%.
- d. Extends the F stream, on average, up to or very close to the field verified and DNR concurred Type F/N regulatory breaks.
- e. Reduces the risk of misidentifying Type N waters as Type F waters but may not capture some recoverable fish habitat as compared to AFF A4.
- f. Reduces cost to landowners as compared to AFF A4.
- g. Potentially reduces interdisciplinary team review requests within the AFF as compared to AFF A4.
- h. Meets all objectives of the permanent water typing system rule.

If the Board approves one of the options listed above at the August 28th special meeting, then the rule making can proceed in accordance with the Board approved timeline.

If the Board determines that the information presented is not adequate to make a decision, or they need more time to evaluate the information provided, the Board has the authority to consider other options. Board staff have identified three other options the Board could consider, all of which would require an extension of the current rulemaking timeline.

- 3- Delay a decision and request additional information.
 - a. WTS rulemaking timeline and budget will need to be revised to allow time to gather the requested information and/or revised analyses. For example, if the Board requested a field verification of the spatial analysis report, this would add approximately 12 months to the timeline and a minimum of \$500,000 to the budget.
 - b. SEPA, CBA, and SBEIS analyses cannot be completed at this time and staff will still request the Board to select a single AFF and PHB combination after the additional information is provided to the Board.
- 4- Adopt consensus elements of FHAM and await the completion of Adaptive Management Program (AMP) PHB validation study:
 - a. The Board may consider codifying the FHAM process while waiting for the PHB validation study to be completed by the AMP before selecting the final PHB option. This would keep current rule identification procedures for potential fish barriers in place until the AMP study is completed.
 - b. The Board would need to revise the rule timeline and update the master project schedule to prioritize the full suite of water typing studies to ensure they are fully funded and prioritized for completion within the Board designated timeline.
- 5- Adopt consensus elements of AFF and awaiting the completion of AMP AFF Validation study.

² Representing a 12% reduction in F streams statewide relative to baseline estimate of 12000 miles of F streams on the DNR Hydro. For more details refer to the analysis of probable costs and benefits included in the Board packet.

- a. The Board could consider adopting validated SWIFD anadromous points to serve as an AFF for mainstem waters until the AFF validation study is completed by the AMP.
- b. The Board would need to revise the rule timeline and update the master project schedule to prioritize the full suite of water typing studies to ensure they are fully funded and prioritized for completion within the Board designated timeline.

If the Board decides to revise the rulemaking timeline, Board staff will pivot to concluding the Board's other rulemaking priorities such as the Type Np rulemaking and, depending on which option the Board selects, also gather the additional information – concurrently if possible. Additionally, the effectiveness of the current stream typing process as practiced today (see description in Attachment B) should help minimize risk to public resources until the permanent WTS rule is in place.

CC: Katie Rose Allen, Acting Deputy Supervisor Forest Regulation, Resilience and Aquatics
Saboor Jawad, Forest Regulation Division Manager
Terry Pruitt, Assistant Attorney General
Karen Zirkle, Assistant Division Manager, Policy and Landowner Services

Attachments:

- A. Glossary of Terms
- B. Current stream typing practices
- C. Purpose of the Permanent Water Typing System
- D. Key Board Decisions
- E. Summary of findings: spatial analysis
- F. Summary of findings: draft preliminary cost-benefit analysis
- G. Remaining Elements of rule making process

A. Glossary of Terms

F/N Break Point: For the purposes of the WTS rulemaking, the F/N Break Point is the regulatory stream break between Type F (fish) and Type N (non-fish) Waters. The DNR hydro layer shows two classes of Type F/N Water breaks: regulatory concurred, which have been established through DNR approved Water Type Modification Forms (WTMF) that were subject to Interdisciplinary Team (IDT) review; and modeled Type F/N Water break points. At present, approximately 20% of F/N Break Points are regulatory concurred points. For the purpose of correctly delineating a riparian management zone (RMZ), F/N breaks can be identified through the application of the Default Physical Criteria (DPC). These points are not regulatory F/N Break Points (see DPC below).

Default Physical Criteria: For all modeled Type F/N break points and waters not shown on the DNR hydro maps and where fish use has not been determined, for the purposes of applying an RMZ associated with a harvest, landowners can apply the default physical characteristics (DPC) to determine presumed fish. Waters having any of the following characteristics are presumed to have fish use:

- Stream segments having a defined channel of two feet or greater within the bankfull width in Western Washington; or, three feet or greater in width in Eastern Washington; and having a gradient of sixteen percent or less;
- Stream segments having a defined channel of two feet or greater within the bankfull width in Western Washington; or, three feet or greater within the bankfull width in Eastern Washington, and having a gradient greater than sixteen percent and less than or equal to twenty percent, and having greater than fifty acres in contributing basin size in Western Washington or greater than one hundred seventy five acres contributing basin size in Eastern Washington, based on hydrographic boundaries.

Last Fish: means, for the purposes of the WTS rule spatial analysis, the point of the upper most fish presence found in field protocol (Fish+) surveys, under the current interim water typing system rules, and associated with WTMF concurred regulatory F/N Break Points.

SWIFD: means the publicly available Statewide Washington Integrated Fish Distribution map, which provides data for all fish species, including anadromous fish.

FHAM: means the Board approved Fish Habitat Assessment Methodology to serve as the field protocol survey for the permanent WTS rule. This protocol is based on specific potential fish habitat breaks to determine the uppermost point of usable fish habitat (accessible and recoverable habitat) and the corresponding Type F/N Water break point. FHAM meets two of the Board WTS objectives for a field protocol which is more certain, and which reduces electrofishing.

Fish+: means the Board approved field protocol survey to be used in the implementation of the current interim water typing system rule. The Fish+ field survey protocol is used to determine the uppermost point of fish presence (last fish) and to determine the corresponding end of the stream segment which is used to establish the end of fish presence. This methodology uses current electrofishing protocols to locate the presence of fish; and relies on professional expertise to locate potential fish barriers within a stream segment exhibiting like physical characteristics to establish the end of

fish presence in a stream. The methodology also requires additional sampling upstream of the identified fish barrier to confirm no further presence of fish.

AFF: means the Anadromous Fish Floor, which the Board has defined as the measurable physical stream characteristics *downstream from which anadromous fish habitat is presumed* and has agreed that the AFF would establish the location upstream of which fish protocol surveys may begin under fish habitat assessment methodology.

AFF A4: means the Board approved AFF A4 7% alternative for analysis for potential inclusion in the WTS rule. This alternative would establish the AFF as all waters connected to saltwater which are below the combined upstream most documented or presumed anadromous fish use point included in the most current available anadromous fish data, and the upstream associated waters occurring below either a sustained stream gradient of seven percent or a permanent natural barrier, whichever comes first. For this alternative, a permanent natural barrier to anadromy is defined as:

(1) Non-vertical barrier:

- Channels < 5 feet bankfull width: sustained gradient $\geq 20\%$ for ≥ 100 feet (30 meters) without resting areas.
- Channels 5–10 feet in bankfull width: sustained gradient $\geq 20\%$ for ≥ 250 feet (76 meters) without resting areas.
- Channels > 10 feet in bankfull width: sustained gradient $\geq 20\%$ for ≥ 525 feet (160 meters) without resting pools.

(2) Vertical Barrier (permanent natural features):

- Channels < 5 feet in bankfull width: near vertical drop ≥ 5 feet in height (1.5 meters)
- Channels 5 – 10 feet bankfull width: near vertical drop ≥ 8 feet in height (2.5 meters)
- Channels > 10 feet bankfull width: near vertical drop ≥ 12 feet in height (3.7 meters)

AFF D: means the Board approved AFF D alternative for analysis for potential inclusion in the WTS rule. This alternative would establish the AFF as all waters connected to saltwater that are included in publicly available GIS datasets of known and presumed anadromous fish use, and include associated tributaries lacking a five-percent gradient increase or permanent natural obstacle at the junction with saltwater or the main stem stream to the next upstream PHB as described in PHB Option C. For this alternative, a permanent natural obstacle is:

- A vertical obstacle with a height equal to or greater than three feet; or
- A non-vertical step which is equal to or greater than twenty percent gradient and the elevation increase is equal to or greater than the upstream bankfull width.

PHB: means the metrics that identifies ‘potential habitat breaks’ for inclusion in the FHAM protocol field surveys. The Board approved PHB options includes metrics for: gradient change, permanent natural barriers (e.g., waterfalls), stream width, basin size,

channel size and others. The Board has directed CMER to develop and perform a study to determine whether fish can pass a PHB (CMER validation studies).

PHB Option A: means the Board approved criteria for potential habitat breaks to include any of the following:

- (1) Western Washington
 - (1) Stream segments having a gradient increase equal to or greater than five percent. The minimum distance for determining the gradient increase is measured over twenty-times the bankfull width both downstream and upstream from the change in gradient; or
 - (2) Stream segments having a bankfull width equal to or less than two feet. The minimum distance for determining a decrease in bankfull width is measured over twenty-times the average bankfull width both downstream and upstream from the change in width; or
 - (3) A permanent natural obstacle having a vertical obstacle height equal to or greater than the bankfull width, but not less than three feet.

PHB Option B: means the Board approved criteria for potential habitat breaks to include any of the following:

- (1) Stream segments having a gradient increase equal to or greater than ten percent. The minimum distance for determining the change in gradient is measured over twenty-times the average bankfull width.
- (2) Stream segments having a bankfull width equal to or less than two feet. The minimum distance for determining a decrease in bankfull width is measured over twenty-times the bankfull width.
- (3) A permanent natural obstacle having:
 - (1) a vertical obstacle height equal to or greater than the bankfull width, but not less than three feet; or
 - (2) a non-vertical step equal to or greater than twenty percent gradient if the elevation increase is equal to or greater than the upstream bankfull width.

PHB Option C: means the Board approved criteria for potential habitat breaks to include any of the following:

- (1) Stream segments having a gradient increase equal to or greater than five percent.
- (2) Downstream to upstream bankfull width decrease at the tributary junction equal to or greater than twenty percent. The minimum distance for determining a decrease in bankfull width is measured over twenty-times the bankfull width.
- (3) Permanent natural obstacle having:
 - (1) A vertical obstacle height equal to or greater than three feet; or
 - (2) A non-vertical step equal to or greater than twenty percent gradient and the elevation increase is equal to or greater than the upstream bankfull width.

RMZ: means the riparian management zone which is the area protected on each side of a Type S, F, or Np Water measured horizontally from the outer edge of the bankfull width for all waters or the outer edge of the CMZ, whichever is greater for Type S and F Waters.

Public resources: means water, fish, and wildlife and in addition means capital improvements of the state or its political subdivisions, WAC 222-16-010.

CBA: A preliminary cost-benefit analysis (CBA) is required for all significant rule makings. The CBA allows the Board to consider alternative versions of the rule, including an analysis showing the **probable benefits of the rule versions are greater than the probable costs**, and that the rule being adopted is the **least burdensome alternative** for those required to comply with the rule, and will achieve the general goals and specific objectives of the WTS rule, RCW 34.05.328

SBEIS: Under the Regulatory Fairness Act, a state agency must develop a small business economic impact statement (SBEIS) if a rule they propose to adopt under the Administrative Procedures Act will impose more than "minor" costs on businesses, 19.85 RCW.

CR-102: The CR-102 is the form that describes the proposed rule test, provides required economic analyses, agency contact information, the intended adoption date, public hearing details, public comment deadlines and the process for submitting comments. The CR-102 is filed with the Office of the Code Reviser to be published in the Washington State Register.

Concise Explanatory Statement: Before the Board can file an adopted rule with the code reviser, DNR staff must prepare a concise explanatory statement of the rule to explain the Board's reasons for adopting the rule; summarizing all comments received regarding the proposed rule, and responding to comments by category or subject matter, indicating how the final rule reflects Board consideration of the comments, or why it fails to do so; and, DNR staff shall provide the concise explanatory statement to any person upon request or from whom the agency received comment.

CR-103: The CR-103 is a form used in Washington State for adopted rulemaking orders. The CR-103 is filed with the Office of the Code Reviser to be published in the Washington State Register.

B. Current stream typing practices

The location of the Type F/N Water break under the current Interim Water Typing System rule is determined based on presumed fish presence. On streams where the regulatory F/N Break Point has not been established, landowners have two options to determine the water typing of the streams adjacent to their planned harvests.

The first is to establish the water typing using the default physical characteristics (DPC) for presumed fish presence. Applying DPC determines the type of RMZ buffer to apply to the waters adjacent to the harvested areas. The intent of DPC is to determine the water typing of a stream for A Forest Practices Application (FPA), not to determine the regulatory F/N Break Point.

To establish a regulatory F/N Break Point under the current Interim Water Type System rule, landowners first apply the Fish+ field protocol. This protocol is found within Board Manual Section 13, *Guidelines for Determining Fish Use for the Purposes of Water Typing*. The Fish+

survey protocol is used to determine the uppermost point of fish presence (last fish) and the corresponding end of the stream segment from which the end of fish presence is determined.

This methodology requires the surveyor to: locate the starting point of the survey by using publicly available fish data sources such as SWIFD, or local knowledge; apply current electrofishing protocols to locate the presence of fish; and apply professional expertise to locate potential fish barriers within a stream segment of like physical characteristics to establish the end of fish presence in a stream. The methodology also requires the surveyor to continue electrofishing sampling upstream of the identified fish barrier for at least ¼ mile to confirm no further presence of fish.

On completion of the Fish+ protocol survey, the proposed end of fish presence stream segment is marked in the field and the landowner prepares a Water Type Modification Form (WTMF) with a copy of the protocol survey results to submit to DNR for approval. Upon DNR concurrence the approved break become regulatory Type F/N Water break points.

All DNR concurred water breaks are regulatory Type F/N Break Points. DNR classifies streams, lakes and ponds on state and private forest lands of Washington State in cooperation with the departments of fish and wildlife and ecology, and in consultation with affected Indian tribes. DNR may convene an interdisciplinary team, to consider proposed modifications to the departments water type map. The Board has approved this process to be continued under the proposed Permanent Water Typing System rule.

Under the WTS rule, landowners will continue to complete the field protocol survey, the Fish Habitat Assessment Methodology, and then will follow the same protocol as is used today to complete and submit a WTMF for DNR review for concurrence and approval as a regulatory Type F/N Water Break point.

The Fish+ and FHAM field protocols are similar, however, FHAM is designed to reduce electrofishing and to reduce subjectivity through the identification of PHBs. These will be accomplished through the rule identification of the potential habitat breaks (PHB) for evaluation in FHAM, which will bookend the stream segments under evaluation; and the FHAM direction for the cessation of electrofishing at the first fish encountered within the stream segment. In comparison, under the current rule, Fish+ surveys the stream to find the uppermost point of fish presence, then the biologist determines the likely end point of fish presence for the stream segment being surveyed.

C. Purpose of the Permanent Water Typing System

In February 2013, the Board established their intent for a permanent water typing system which is:

1. To better address the Forest and Fish Report's foundational goal to protect accessible fish habitat.
2. To develop a field applied methodology to reliably identify accessible fish habitat in an objective and repeatable manner.
3. To maintain all essential elements of the methodology in rule.
4. To add long-standing Board guidance, found in the Board manual, into rules where appropriate.

In addition, at the same meeting, the Board established the goals of the permanent water typing system is:

5. To have a sound water typing system which ensures riparian buffers are properly placed at each stream, protecting aquatic resources and their respective habitats.

The Board acknowledged these goals support the statutory objectives endorsed in the Forests and Fish Report and Forest Practices Habitat Conservation Plan. In August 2015 the Board directed the TFW Policy Committee (Policy) to initiate development of a rule that would meet the following goals for a permanent WTS rule:

- To meet the statutory objective to protect accessible fish habitat outlined in the Forests and Fish Report (FFR) and the Forest Practices Habitat Conservation Plan.
- To develop a field applied method to reliably identify accessible fish habitat in an objective and repeatable manner.
- To maintain all essential elements of the methodology in rule.
- To add long-standing Board guidance to the rules where appropriate.

The Board further provided Policy direction to:

- Use existing information.
- Develop a method for accurately typing streams not on the DNR hydro layer;
- Make methods as accurate as possible.
- Balance error.
- Minimize the use of electrofishing.
- Improve the DNR hydro map over time.
- Develop methods to locate the stream break points on the ground.
- Ensure the methods accommodate the needs of small forest landowners.

Policy incorporated the Boards intent and goals and commenced the development of the WTS rules. The sequence of the Policy recommendations and Board decisions are covered Below.

The Board acknowledged on November 28, 2022, that inclusion of an anadromous fish floor is the final goal of the WTS rule. The definition and goal of the AFF:

6. The AFF is the “measurable physical stream characteristics downstream from which anadromous fish habitat is presumed; and,
7. The AFF would establish the location upstream of which fish protocol surveys may begin under fish habitat assessment methodology.”

D. Key Board Decisions

The Board initiated the process of approval of essential elements for inclusion in the WTS rule at their November 2016 regular meeting. At this meeting the Board accepted and approved the initial Policy consensus recommendations; and the Board directed Policy to initiate dispute resolution to resolve the remaining essential elements for inclusion in the rule.

In May 2017, the Board accepted and approved the consensus and majority recommendations resulting from the Policy dispute resolution process.

This resulted in the following rule elements approved by the Board for inclusion in the WTS rule:

- Existing language in the interim water typing system rule, WAC 222-16-031, to be included in a permanent water typing system rule (consensus);
- Acceptance of completed Type F/N points through Water Typing Modification Forms as the regulatory fish habitat points in the Fish Habitat Water Typing Map (consensus);
- The manner in which default physicals will be used to determine the end of presumed fish presence and the corresponding length of Type F Water for the purpose of establishing the correct RMZ adjacent to non-concurred regulatory F/N Water Breaks (consensus);
- Framework for a Fish Habitat Assessment Methodology (FHAM) (consensus); and,
- Off-channel habitat (OCH) definitions for Type F channelized and non-channelized streams (non-consensus, majority recommendation).

At the May meeting the Board also fully assumed the completion of the remaining necessary WTS rule elements through the convening of an expert science panel. The Board directed the AMPA to assemble and convene a science team to review the FHAM listed habitat break features for combinations of primary/secondary features to determine those elements that would constitute a barrier and/or potential habitat break (PHB).

At the February 2018 meeting, the Board received the expert science panel report which included combinations of primary and secondary instream features which could be considered for inclusion in FHAM as PHB's.

The Board accepted recommendations of PHBs for consideration from the western and eastern Washington tribes and the industrial landowners. The Board also accepted a recommendation from the western Washington tribes to add an anadromous fish floor to the rule to assure all waters downstream of the floor will be Type F Waters for the protection of anadromous fish. The eastern Washington tribes agreed to include an AFF, and the industrial landowners presented an AFF alternative which the Board also accepted. The AFF alternatives were added to the PHB options accepted for analyses by the Board.

The Board passed a motion to accept three PHB options, and corresponding AFF alternatives, to be included in the draft rule proposal and accompanying analyses, where the analyses will compare:

- No action – existing rule language.
- Eastern Washington tribes proposal as amended during board discussion at 2/14/2018 meeting (PHB Option C).
- Western Washington tribes proposal as presented at 2/14/2018 meeting (PHB Option A).
- Landowner's Proposal, as amended during board discussion at 2/14/2018 meeting (PHB Option C).

The Board motion also directed staff in consultation with stakeholders to incorporate the above PHB options into rule language, guidance and required analyses (CBA, SBEIS and SEPA) to accompany the draft water typing system rule.

In the development of the draft WTS rule, the initial PHB and AFF spatial analysis and associated analyses, it became clear that additional necessary elements were needed for a

complete WTS rule. In June 2019, the Board held a special meeting to establish a Board committee to address additional rule elements including:

- Development of an anadromous fish floor to replace the original two AFF alternatives.
- Determination of how the rule should be applied in eastern Washington.
- Determination if rule language, Board resolution, or other non-rule options would suitably encourage moving toward a Lidar modelled map-based water typing rule.

The Board subsequently determined that an anadromous fish floor will be applied statewide and that a map-based water typing system will be included in the WTS rule when the PHB validation study is completed and there is statewide Lidar coverage.

In August 2022, the Board approved the Committee recommended AFF alternatives A4 (7 percent) and D and directed DNR staff to include these alternatives for analysis for potential inclusion in the statewide permanent water typing system rule.

The Board acknowledged on November 28, 2022, that the anadromous fish floor is: “measurable physical stream characteristics downstream from which anadromous fish habitat is presumed and an agreement that the AFF would establish the location upstream of which fish protocol surveys may begin under fish habitat assessment methodology.” At this meeting the Board also acknowledged the following elements for the water typing system rule have been approved by the Board to:

- Balance error.
- Minimize electrofishing.
- Address stream segments not shown on the DNR hydro layer.
- Improve the water typing map over time.
- Include methods to locate the type F/N break on the ground.
- Ensure the methods provide the ability to be applied by small forest landowners.
- Be consistent with fish habitat as defined in rule.

E. Summary of findings: spatial analysis.

Spatial analysis, while not a required element of the rule making process, is necessary to inform the cost-benefit analysis, a required element, and to serve as a decision aid for the Board. The purpose of the analysis is to estimate regional and statewide values for the following metrics, and for each, compute the change from the current rule to each of the two AFF and three Board-approved PHB options that would be used in the application of FHAM:

- a) Relative extent of Type F and N waters
- b) Area of associated Type F and Np buffers
- c) Corresponding volume and value of timber protected within those buffers

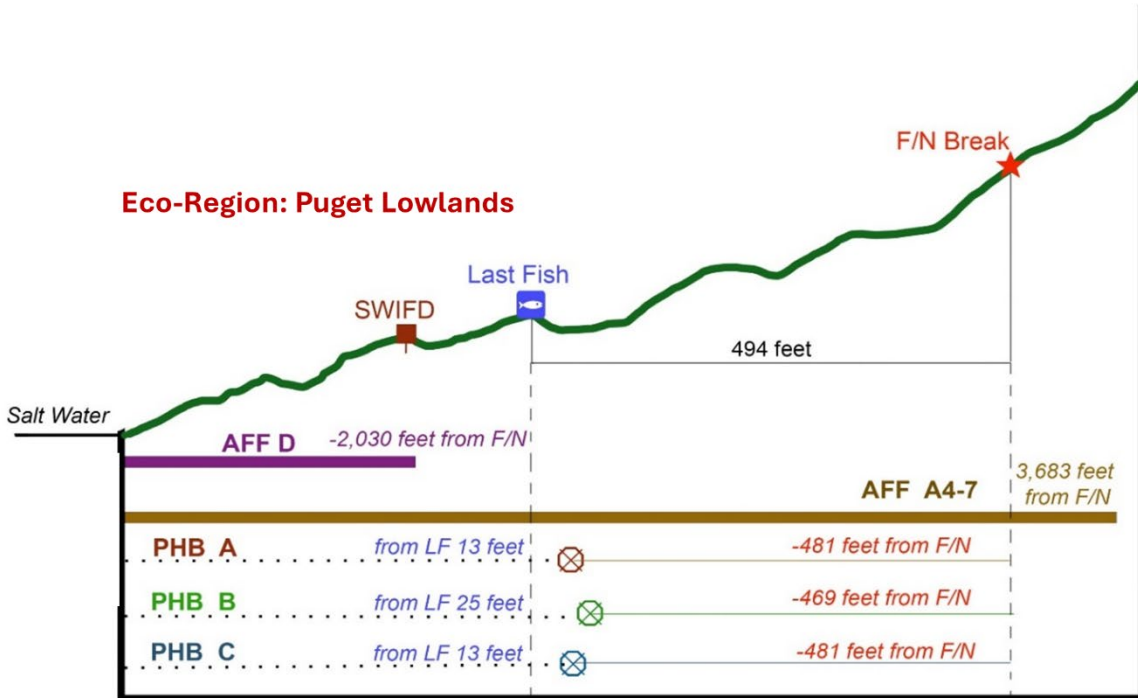
Four Peaks Environmental Science and Data Solutions used the following process and methods to combine Board approved datasets and a LiDAR derived digital terrain model (DTM) to estimate the metrics:

- a) Process and perform quality assurance/quality control on input of concurred F/N break points and last fish datasets (365 unique points) as well as to use them to create a synthetic stream network (SSN) – SSNs span seven Level III ecoregions, with between 12 and 76 networks in each ecoregion.

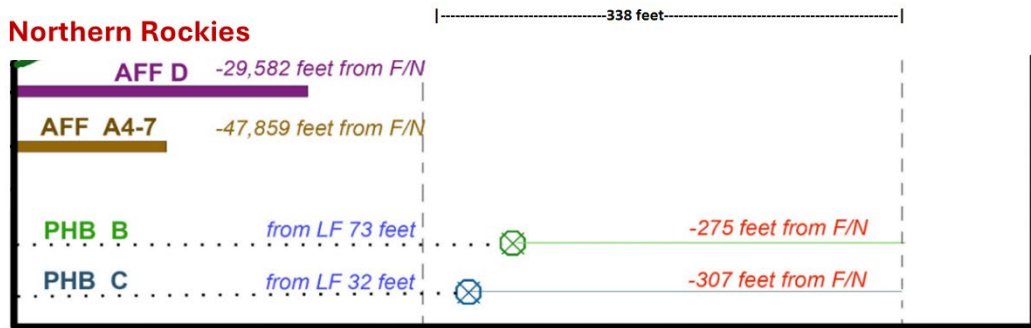
- b) Apply PHB, AFF and DPC on the SSN and calculate their locations and extents for reach SSN network
- c) Compare the extents of waters in each network meeting the criteria for each PHB option, each AFF alternative and DPC
- d) Compare the changes in riparian buffer area, and timber volume for water type buffers around SSNs

This process enabled the comparison of the different aspects of the current and proposed water typing rules under a single, GIS/remote-sensing based framework. Metrics were calculated for each network and then summarized at the ecoregion level. For more details about methods and limitations, please review the final spatial analysis report. The complete report was shared with the Board and is available by clicking this [link](#).

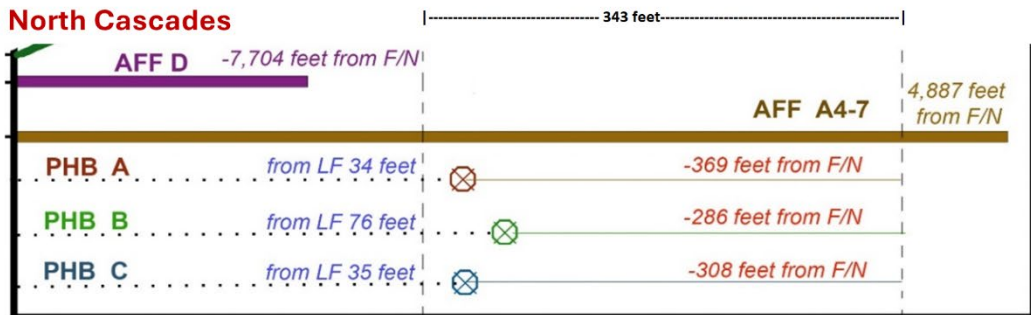
Here we summarize the results of the relative extent of Type F and N waters (option a) above). Using the field verified, concurred F/N breaks as a reference point, Figure 1 provides average distance of each rule alternative and option from the reference point. All numbers are eco-region averages. The stream- line in Figure 1 is illustrative and is neither an average stream nor is it drawn to scale. All numbers are from the spatial analysis report.



Northern Rockies



North Cascades



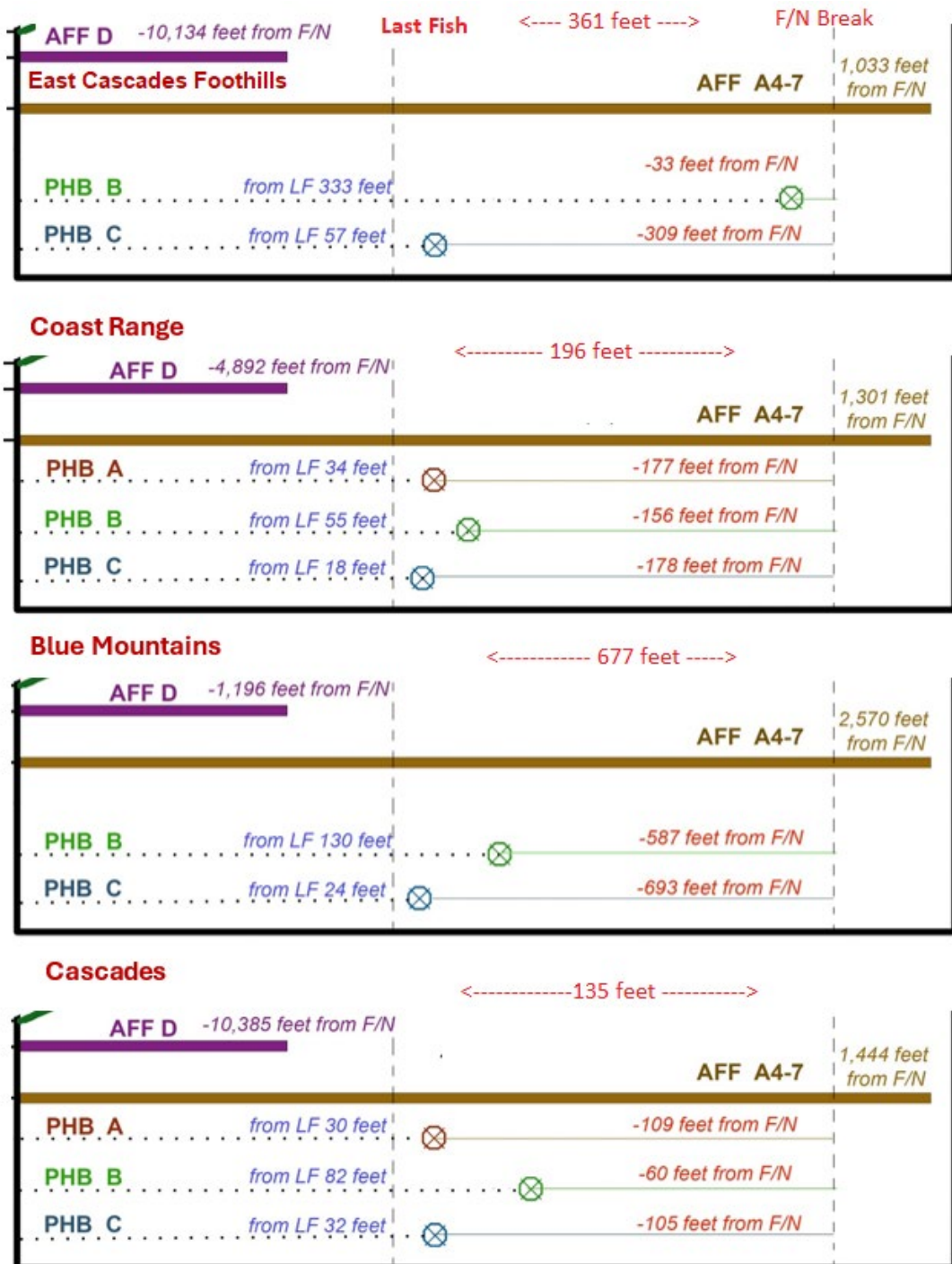


Figure 1: Summary of average distances of each rule alternative and option from the F/N break point. Numbers are average distances per eco-region. Stream line is illustrative. Distance between last fish and F/N break is also the average distance between these two points in that eco-region.

F. Summary of findings: analysis of probable costs and probable benefits

Industrial Economics, Incorporated (IEC) conducted a preliminary analysis of the probably costs and benefits of six regulatory alternatives. These include two AFF alternatives each paired with three PHB options (PHB A, B, and C). Below is a high-level summary of their findings. For more details, in-depth analysis and a description of the methodology, please refer to the IEC memo included in the Board's packet for the Board's August 14 regular meeting.

- **Probable Outcomes:** The rule options are expected to affect timberland values, costs of stream crossing upgrades, and fish abundance due to changes in the extent of Type F streams. Establishing any AFF and codifying FHAM survey protocols will reduce the risk of harm to fish and decrease the number of future stream surveys required.
- **Effects that are not probable:** The analysis indicates that the following rule effects are not probable outcomes of the rule options: a) changes in the cost of administering surveys; b) changes in fish harvest allocations; c) changes in harvestable timber area unlikely to affect industry productivity; d) changes in recreation activity unlikely to generate economy-wide impacts.
- **AFF the key driver of magnitude and direction of effects:** Significant differences are observed across regulatory alternatives, mainly due to the AFF options. AFF A4 and AFF D show substantial differences in their effects, while the 3 PHB options do not differ meaningfully.
- **Changes in Type F stream length primarily drive the rule's effects.** AFF A4 significantly increases Type F streams, adding 5,800 miles in western Washington and 1,200 miles in eastern Washington. AFF D results in minor reductions, with 1,300 fewer miles in western Washington and 250 fewer miles in eastern Washington.
- **Differences across eco-regions:** The increase in Type F streams under AFF A4 is concentrated in western Washington's Coast Range, North Cascades, and Puget Lowlands. AFF D's decrease in Type F streams is also greatest in western Washington, with minimal changes expected in eastern Washington.
- **Major Benefits and Major Costs of AFF A4:** Major benefits of AFF A4 include increased fish abundance and recreational fishing trips (\$220,000 in annualized terms), enhanced carbon sequestration (\$1.8 million in annualized terms), and improved wildlife habitat. Major costs include a \$11 million annualized decrease in timberland values and \$6.3 million in stream crossing upgrade costs.
- **Minor or negligible probable effects of AFF D:** AFF D leads to minor or negligible effects, with limited reductions in Type F streams and minor ecological costs (\$400,000 in global costs). It increases timberland values by \$2.4 million in annualized terms and reduces future stream crossing construction costs by \$380,000 in annualized terms.
- **Unquantified Ecological Effects:** Many ecological costs and benefits remain unquantified. The analysis could not reliably monetize the value of conserved riparian buffers and increased fish abundance for AFF A4 or the reduced ecological functions for AFF D.

- **Rule Objectives and Burden:** All rule options meet the rule's objectives. Rule options that include AFF D is likely the least burdensome due to lower costs to the regulated industry.
- **Costs of the AFF A4 rule options on businesses** are likely more than minor and disproportionately borne by small businesses. A SBEIS would be required for any rule option that includes AFF A4.

G. Remaining elements of the rule making process

The Board will meet three times in the month of August to receive key information from which to approve the water typing system rule language to take forward into rulemaking. Each meeting will focus on essential elements and analysis performed to inform the Board on how each PHB option and AFF alternative will affect the WTS rule.

On the August 13th Special meeting the Board will participate in a field tour to review the last fish location and the concurred regulatory Type F/N Water break point and how the location of the PHBs for each option and the location of the two AFF alternatives would be in relation to each other and the concurred Type F/N water break point.

On the August 14th Regular meeting the Board will receive the results of the spatial analysis and initial comparison of the PHB options and AFF alternatives for consideration in the cost/benefit analysis.

On the August 28th Special meeting the Board will make the decision on which PHB option and AFF alternative to include in the WTS rule and the required CBA, SBEIS, and SEPA analysis to accompany the WTS rule during public review under the CR-102 process.

If the Board approves an AFF alternative and a PHB option to be applied as part of FHAM, then DNR staff will complete the WTS rule packet for Board review at the November 2024 meeting. The packet will contain:

- Finalized draft WTS rule language.
- Finished preliminary CBA and SBEIS based on the approved AFF and PHB.
- Completed SEPA checklist with Determination statement based on final draft WTS'
- Completed draft Board Manual Section 23, Part 1. *Guidelines for Field Protocol to Locate Type F/N Water Breaks.*

To accomplish the work, staff will: provide the final draft rule for stakeholder review; present the preliminary CBA/SBEIS for Economic Workgroup review; and reconvene the working group to complete the draft Board Manual Section 23, Part 1.

Upon receipt of the WTS rulemaking packet at the November meeting, the Board will determine if the draft WTS rule is complete, and if so, approve the draft rule and direct staff to file a CR-102 form with the Office of the Code Reviser to initiate the public hearings, collect public comment to complete the rule making process.

Due to the statewide significance of the WTS rule, DNR staff intend to hold public hearings across the state. Because of the number of public hearings, the timing of the hearings falling within the holiday season, and the anticipated magnitude of the comments to address in the required concise explanatory statement, staff recommends the Board receive the final WTS rule packet for decision at the May 2025 meeting of the Board. At this meeting the Board will review the staff response to public comments in the concise explanatory statement, and the final CBA/SBEIS to determine if to adopt the permanent Water Typing System rule. Upon adoption, staff will file a CR-103 with the Office of the Code Reviser listing the effective date of the rule.