



**DEPARTMENT OF
NATURAL RESOURCES**

Forest Practices Division
1111 Washington St SE
Olympia, WA 98504

360-902-1400
FPD@DNR.WA.GOV
WWW.DNR.WA.GOV

MEMORANDUM

DATE: April 30, 2025
TO: Forest Practices Board
FROM: Saboor Jawad, Forest Regulation Division Manger ^{ASJ}
SUBJECT: Water Typing System Rule: Results of public review and Board consideration of rule adoption

At your June 6, 2025, special meeting, I will request the Board consider the results of the public review process and adopt a permanent water typing system rule by directing staff to file a CR103 Rule-Making Order with a delayed effectiveness date of January 1, 2026. The delayed effectiveness date will allow board staff to update the relevant forms and guidance; develop training materials; train agency staff, TFW partners, and other interested parties; and avoid changing rules and guidance for protocol surveys during the 2025 survey season.

At your May 14, 2025, meeting, DNR staff will present the proposed rule, Cost Benefit Analysis (CBA) and the Concise Explanatory Statement (CES) – which are included as attachments to this memo – for your review and discussion prior to your decision on rule adoption at your June 6, 2025, special meeting.

In November 2024, the Board approved initiation of the public review process for a permanent Water Typing System rule. Staff filed the CR102 Proposed Rule Making on December 18, 2024, and held five hearings across the state (Spokane, Ellensburg, Burlington, Kelso, and Olympia) for the WACs associated with the Water Typing System rule.

The CES outlines the history of rule development, summarizes the comments received along with the agency's responses, and documents two non-substantial changes to the rule language. There were no changes to the CBA from the preliminary CBA the Board received in August 2024. The Board received no comments on the SEPA Determination of Non-Significance during the public review process.

In addition to the documents listed above, the following salient items are separately listed for the Board's review and consideration:

1- Long-term Forest Practices Applications (LTAs)

LTAs are an option for small forest landowners and provide flexibility regarding when they conduct forest practices by allowing them to have an active forest practices application that is valid from 4 to 15 years. Under WAC 222-20-016(4)(b), when the Board considers new or amended rules to achieve resource protection objectives, staff must analyze the effects of existing approved LTAs on the public resources the new rule intends to protect. The intent of the Water Typing System Rule is to protect fish habitat by ensuring that the waters are correctly typed, so that is the resource our review focused on.

As of April 15, 2025, our records show 301 approved LTAs for small forest landowners across the state. Staff will present the results of our analysis at your May regular meeting with the recommendation that the Board will not need to request DNR to condition existing approved LTAs to meet the goals of the new rule.

2- Rule Implementation Plan

As required by RCW 34.05.328, DNR staff have prepared an implementation plan to be placed in the rule making file by June 6, 2025. This document covers the methods by which DNR plans to implement and enforce the rule, inform the public about the rule, promote voluntary compliance and evaluate the rule for effectiveness. The implementation plan outlines in detail why DNR has requested a delayed effectiveness date for the rule to ensure that there is adequate time for training and public outreach.

3- Order of Filing and Relationship with Type Np Rule

In addition to the changes to the water typing system, this rulemaking effort also included two minor updates to WAC 222-30-021. The first of these changes eliminates a reference to Type 1, 2, and 3 waters as these classifications are not part of the new water typing system. The second change eliminates a reference to WAC 222-16-031 as that rule is being rescinded. WAC 222-30-021, is also undergoing an update in the Type Np buffer rulemaking process, which is on your workplan to approve for public review at your June 6th, 2025 meeting. A rule cannot be open to changes in two processes at the same time. Since the proposed effectiveness date for the water typing rulemaking process is not until January 1, 2026, this rule will not be considered closed until then. Therefore, staff is recommending that the CR103 for WAC 222-16-021 not be filed with the rest of

the water typing system rule changes. Staff recommends that the changes noted above be added to the draft rule language for the Type Np buffer rulemaking and move forward as part of that process.

4- Board Manual 23

Part 1 and 2 of Board Manual Section 23 is now complete and ready for your review and approval. I have separately transmitted the draft manual for your consideration of approval at the June 6th special meeting. At the May 14th regular meeting, I will present the contents of the manual.

The Board should note that staff recommends the approval of the current draft of Board Manual Section 23 only if the Board decides to adopt the proposed rule. Approving the manual is not a requirement for adopting a rule and remains an entirely separate process and at the discretion of the Board.

I look forward to discussing these items with you at your May 14th meeting. Please reach out to me if you have any questions at Saboor.Jawad@dnr.wa.gov. You are also welcome to reach out to Karen Zirkle at karen.zirkle@dnr.wa.gov or Maggie Franquemont at maggie.franquemont@dnr.wa.gov.

c: Katie R. Allen, Acting Deputy Supervisor Forest Resilience, Regulation and Aquatics
Karen Zirkle, Forest Regulation Assistant Division Manager, Policy and Landowner Services
Terry Pruitt, Assistant Attorney General, Forest Practices Board Attorney
Maggie Franquemont, Policy Program Manager, Forest Regulation Division

Attachments:

- 1- Proposed Water Typing System Rule Language
- 2- Concise Explanatory Statement and Written Comments
- 3- Cost Benefit Analysis

As required by
the Administrative Procedure Act
Chapter 34.05 RCW

CONCISE EXPLANATORY STATEMENT
AND
RESPONSIVENESS SUMMARY
FOR THE ADOPTION OF
CHAPTER 222-12 WAC, Policy and Organization
CHAPTER 222-16 WAC, Definitions
CHAPTER 222-24 WAC, Road Construction and Maintenance
CHAPTER 222-30, Timber Harvesting

Prepared by:
Maggie Franquemont

04/22/2025

CONCISE EXPLANATORY STATEMENT

1. INTRODUCTION

Reason for adopting the rule:

The purpose of this rule is to codify the permanent water typing system rule to determine the extent of fish habitat and to inform the appropriate application of riparian protections needed while undertaking forest practice activities. The rule will replace the interim water typing system rule (WAC 222-16-031) and includes the Fish Habitat Assessment Methodology (FHAM) for establishing the break between fish and non-fish bearing waters, a description of off-channel habitat for fish use, and directions on when to use default physical criteria (DPC) for fish use. The rule clarifies the water typing system to create additional ease for landowner compliance and for the Department of Natural Resources' (DNR) implementation and enforcement.

- WAC 222-12-090 – repeals Board Manual Section 13
- WAC 222-16-030 – codifies the permanent water typing system rule
- WAC 222-16-0301 – codifies the fish habitat assessment methodology
- WAC 222-16-031 – repeals the interim water typing system rule
- WAC 222-24-040 – codifies requirements for fish passage structures if a fish/nonfish break is moved upstream of a current water crossing structure
- WAC 222-30-021 – amends language to match the updated language in WAC 222-16-030

Background:

In the 1999 Forests and Fish Report, the Forest Practice Board (Board) was directed to adopt a rule that included a statewide map delineating the waters of the state into categories for the purpose of riparian management. The map was to be the standard used for water typing determinations. The Forests and Fish Report directed that if the Board adopted rules before such a map could be developed that an interim rule should also be developed until the map could be finished. In 2001, the Board adopted the permanent rule as well as the interim rule, as the map was not yet finished.

In 2005, the model base for the statewide map was presented to the Board. The model did not reach the target accuracy, and the Board chose not to adopt the maps that resulted from the model. The Board chose to retain the process laid out in the interim rule. The Board also proposed several other solutions for moving toward the goal of a statewide map including updating the Board Manual and additional training.

In 2011 the Timber, Fish, & Wildlife Policy Committee (TFW Policy) brought the issue of the Type N strategy needed for Clean Water Act assurance milestones to the Board which included discussions about water typing and determining the F/N Break. TFW Policy had concerns about water typing and the implantation of a permanent water typing rule. At their November 2011 meeting, the Board directed TFW Policy to prioritize recommendations for a permanent water typing rule. The Board's direction began the process that ultimately resulted in this rulemaking.

In January 2013 dispute resolution was invoked in TFW Policy to address an impasse within the water typing subcommittee. There were four core concerns on which the subcommittee could not reach consensus: (1) how to deal with off-channel habitat, (2) the use electrofishing protocol surveys and DPC for water typing, (3) the use of a model to produce fish habitat water type maps, and (4) rule and guidance implementation.

In February 2014, TFW Policy brought majority and minority reports, and recommendations regarding the impasse to the Board. The Board agreed to initiate actions to remedy the Type F water concerns outline in

the majority and minority recommendation reports by obtaining additional information and directing additional work from TFW Policy. The Board then directed TFW Policy to bring forth recommendations for options on a permanent water typing rule. TFW Policy was directed to develop best practices recommendations for electrofishing and to evaluate the process for off-channel habitat identification. At the same time, the Board directed the Adaptive Management Program Administrator (AMPA) to re-run the existing hydrologic model using LiDAR and reevaluate the accuracy of the maps produced by the model. The Board's goal with these directions were to obtain the essential information necessary to make a final determination regarding the appropriate approach in the development of a permanent water typing rule.

In November 2016, TFW Policy brought their recommendations on water typing to the Board. The Board directed staff to file a CR 101, announcing that the Board was considering rule making related to a permanent water typing system. The Board directed staff to prepare draft rule language and prepare Board Manual Section 23 to provide guidance on the new rule. The Board directed TFW Policy to develop the FHAM for use in the new rule.

In May 2017, staff brought recommended draft rule language for FHAM and off-channel habitat to the Board. The Board accepted the recommendations. FHAM requires identification of potential habitat breaks (PHB). The Board directed the AMPA to assemble a group of experts to recommend PHB criteria to the Board in August in a science report. In August the Board delayed making a decision on PHB criteria until February 2018 to allow for additional data, analysis, and quality control.

In February 2018, staff presented all of the Board approved rule elements and Board Manual 23 as they stood, without PHB criteria to the Board. The Board also received a second science report evaluating the PHB criteria options. The westside tribes, eastside tribes, and landowners, all presented their recommendations for PHB criteria based on the report. The Board directs staff to move forward with rule making and to do the required rulemaking analysis on all three PHB options. The Board also directed staff to move forward with the concept of an anadromous fish floor (AFF).

In May 2019, staff presented the draft rule language, Board Manual 23, and a preliminary cost benefit analysis (CBA). The Board did not take any action.

In June 2019, a Board subcommittee was formed to facilitate discussions and to make recommendations on the remaining outstanding issues: (1) understanding the spatial analysis of the rule, (2) how the rule should be applied in eastern Washington, (3) determine if and when a PHB validation study should be done, (4) determine how to move forward with the LiDAR model map, and (5) how the AFF should be implemented. In August the committee reported that the issues had not been resolved but they were continuing to work forward. In November the committee recommended, among other things, that the Board clarify the goals and targets for the water typing rule, request DNR redo the PHB spatial analysis and also conduct a spatial analysis on the AFF and delay the adoption of the rule in eastern WA.

The Board subcommittee continued to work during 2020 and 2021. In November 2021 the subcommittee presented the state of development of the AFF including a timeline to have recommendations developed early in 2022. The subcommittee suggested that the Board hold a workshop where the subcommittee could present the AFF recommendations, and the Board would have adequate time for questions and discussion. Following the February 2022 Board meeting, a workshop was scheduled for April before being cancelled and rescheduled for June.

At the June 2022 special meeting, each TFW caucus presented their preferred alternative for AFF criteria. The Board committed to making a decision at their August meeting. In August DNR staff presented the Board's previous decisions regarding the water typing system rule as well as the outstanding rule elements that the Board still needed to decide. The remaining elements included selection of an AFF alternative,

confirmation that the rule would be statewide, and determining if the AFF would be applied statewide. The Board decided to move AFF alternatives A4 (7%) and D forward for analysis. The Board directed staff to begin the process of creating a CR102 packet but to hold off on conducting analysis of the two AFF alternatives until after their November 2022 meeting. The Board also directed staff to prepare a proposal initiative to develop and AFF validation study through the Adaptive Management Program.

In November 2022, the Board acknowledged the rule elements that it had previously approved. The Board accepted a definition of the AFF. The Board directed staff to complete the draft permanent water typing system rule language and complete the CR102 packet. The Board also acknowledged that the water typing rule was the number one priority.

In 2023 and 2024 staff continued to develop the CR102 packet. Staff worked with stakeholders to finalize the draft rule language and ensure that the language accurately reflected the work done during the rule development process. The draft rule language included optional language for two AFF options and three PHB options. Staff worked with contractors to perform a spatial analysis of the rule as well as a cost-benefit analysis. Both of these analysis included analysis for two AFF options and three PHB options. In 2024 the development of the rule had gone as far as it could without the Board making a decision to select one AFF and one PHB criteria. Subsequently, a field trip was held, and the Board's August 14th meeting included a workshop to assist the Board in their decision to refine the options. At their August 28th special meeting the Board approved the concept of AFF and PHB in the rule language but elected to provide criteria for establishing the AFF and PHB in guidance rather than rule. The Board directed staff to redraft the rule language and to begin work to incorporate the AFF implementation procedures and to describe all PHBs in Board Manual 23.

Rule Dates:

- The adoption day of the rule will be June 6, 2025.
- The effective date of the rule will be January 1, 2026.

2. DIFFERENCES BETWEEN PROPOSED AND FINAL RULE

- WAC 222-16-0301(b) Table Step 1: change “upstream most” to “most upstream”
 - This change is for grammatical clarity
- WAC 222-16-0301(b) Table Step 4: change “...this point...” to “...this PHB”
 - This change provides clarity that the last PHB is the regulatory habitat break. As the rule reads currently “this point” could refer to the last PHB or a point 0.25 miles upstream of the last PHB.

3. SUMMARY OF COMMENTS

This section contains a summary of comments the Board received via the comment period pursuant to RCW 34.05.320. The Board held 5 public hearings to receive verbal comments and accepted written comments. The Board received 5 written comments and 19 verbal comments. Several of the verbal commentors delivered a written version of their comments following their testimony.

This section divides the comments into three categories: support, oppose, and other. Responses are given where it is appropriate to respond (*in italic font*). The comments have been numbered and listed in the appropriate category.

Comments Supporting the Rule:

The Board received 18 comments that supported the rule. Comments 1-9, 12-15, 17-19, and 21 supported the rule in its current form. Most of them contained additional thoughts or guidance beyond just support.

- **AFF Implementation:** Comments 1, 2, 6, 7, 8, 11, 14, 19, and 21 all express concerns with the implementation of AFF. Generally, these comments are supportive of the AFF as a concept. However, there is concern that the process of delineating the AFF will supersede or interfere with the water typing process, specifically with surveys conducted under FHAM. There is also concern that the AFF may limit landowners' ability to conduct surveys in areas with limited or inaccurate fish data if it is not implemented with care. There is opposition to implementing the AFF as a standalone criteria for designating the Type F/N break.
 - *Response: The process for delineating the AFF is covered in Board Manual 23, these concerns are being addressed as part of the Board Manual development process.*
- **Water Typing Map:** Comments 1, 3, 8, 9, 12, 14, 15, 18, and 21 all reiterate that the Board has made a commitment to produce a highly accurate GIS-based water typing map. They point out that the map will reduce the regulatory burden on small forest landowners.
 - *Response: At their meeting on November 28, 2022, the Board confirmed that a lidar-based map, as part of the water typing system, is one of the primary goals. They recognized that it is not currently available and in order to create an implementable rule at this time the map was left out of the rule language. However, the Board and DNR have committed to continue to work on the map.*
- **Other:**
 - **Recommended revision:** Comment 12 offered the following recommended revision to the preamble on page 1 of draft WAC 222-16-030: Remove the paragraph that begins with "The objective" and ends with "WAC 222-16-0301" and replace with the following:

"The objective of the water typing system is to correctly classify waters to inform the appropriate application of riparian protections. Methods to determine the water type break between Type F and N waters are intended to be highly accurate at determining habitat likely to be used by fish and be equally over and under inconclusive at the landscape scale. The Forest Practices Board will validate default physical characteristics defining fish use, methods to determine the Type F/N water break, and complete a water typing map as rule meeting the functional objective and performance target specified in Schedule L-1 as soon as practicable. In the meantime, this section identifies the criteria to classify waters, and the requirements for determining fish use in the field are described in WAC 222-16-0301."
 - *Response: This revision has not been included in the draft rule language. The language of the proposed rule adequately captures the Board's objective for the water typing system.*
 - **Process concerns:** Comments 6 and 12 both address a potential error in process occurred when the Board included the concept of an AFF into the goals for the water typing system in 2022. These comments state the AFF did not fully go through the AMP process and urge the Board to stick to the AMP process moving forward.
 - *Response: The comments are noted.*
 - **WAC 222-24-040 implementation:** Comments 2 and 18 addressed implementation concerns for the changes made to WAC 222-24-040, they requested additional

clarification about how this rule change will be implemented and to ensure that major implementation changes would not occur without additional AMP engagement.

- *Response: The implementation of the rule change will include training and guidance that will address concerns with implementation.*

Comments Opposing the Rule

The Board received 5 comments that oppose the rule. Comments 16, 20, 22, 23, and 24 all oppose the rule. These comments all oppose the rule for the same reasons.

- These comments urge the Board to reevaluate their decision from August 28, 2024. They present information that the Board is not upholding its duty to protect fish habitat and Tribal Treaty obligations. Specifically, these comments urge the Board to put measurable criteria for both AFF and PHB in the rule language to ensure that the rule is consistently applied across the state.
 - *Response: These comments cannot be addressed in the current draft rule language without direction from the Board rescinding their decision from August 28, 2024, and an additional Board decision on specific AFF and PHB criteria.*
- Several of these comments note that since Board Manual 23 is critical to implementing the new rule it is vital that the Board Manual 23 language be available to the public as part of the CR102 process.
 - *Response: The Board Manual 23 language is currently under development with affected partners represented at workgroup meetings. The board manual section will be available for Board approval with the CR103.*

Other Comments

- Comment 10: This comment had no input on the proposed rule. The comment was adamant that a water typing map should be produced as the current system does not work for small forest landowners due to a lack of certainty. The proposed rule does not address the burden on small forest landowners.
 - *Response: comment is noted*
- Comment 11: The comment was related to concerns about how the restriction on surveying in the AFF was being interpreted in the Board Manual development group for Board Manual 23. This comment pointed out that based on current development it is likely that Board Manual 23 will rely on the statewide integrated fish database (SWIFD) as the core starting point for determining the end of AFF and the starting point for FHAM. Surveyors are asked to confirm that the SWIFD point is accurately based on a feature that will limit upstream fish movement. If the data point isn't correct, surveyors can only look upstream for such a feature to mark the end of AFF. This is how the Board Manual 23 development group is interpreting the rule language that surveys are not allowed in the AFF without ID team approval. This comment is concerned that since surveyors aren't allowed to look downstream from an inaccurate SWIFD point that the AFF is being artificially inflated and that the end of AFF may become the default F/N break in these cases. The commenter hopes that it can be resolved in the Board Manual development but also notes that slight changes within the rule language would help eliminate this issue entirely.
 - *Response: This issue is being addressed by the Board Manual development group. They hope to come to a solution to present the Board.*

4. SUMMARY OF PUBLIC INVOLVEMENT OPPORTUNITIES

- December 6, 2016 – CR 101 filed
 - Information supplied to interested parties on how to participate in rule development.
- Stakeholder workgroups:
 - Draft rule language workgroup 1 (prior to 2019)

- TFW Caucus representatives
 - Draft rule language workgroup 2 (after 2023)
 - TFW Caucus representatives
 - Economic workgroup
 - TFW Caucus representatives
- December 4, 2024 – CR 102 filed
 - Five public hearings in 2025:
 - Burlington, WA – 1/14/25 at 4pm
 - 15 people attended, 4 commented
 - Kelso, WA – 1/23/25 at 4pm
 - 5 people attended, 2 commented
 - Spokane, WA – 1/28/25 at 4pm
 - 3 people attended, 3 commented
 - Ellensburg, WA – 1/29/25 at 4pm
 - 1 person attended, 1 commented
 - Olympia, WA – 2/11/25 at 4pm
 - 10 people attended, 8 commented

Forest Practice Board Meeting

Burlington – January 14, 2025

Thank you for the opportunity to comment on the proposed updates to the water typing rule and its subsequent chapters. I support these modifications with minor clarification and generally support changes to the water crossing structures depending on considerations related to implementation.

- This is a realistic approach toward meeting the goals of the FPB and Policy's recommendations to have consistent water typing. The incorporation of FHAM (fish habitat assessment method) minimizes electro-shocking, while providing clarity in finding the F/N break. The current interim rule and practices have reliably extended fish habitats to areas where physical conditions preclude further fish movement. Codifying these practices will reduce subjectivity and improve transparency.
- The AFF (anadromous fish floor) in concept can be useful as a guide, but the FHAM (fish habitat assessment method) is necessary to establish the F/N break. In short, we must allow fish to determine fish habitat, not biological opinions, or cookie cutter processes.
- The undefined concept of "recoverable habitat" is addressed with the understanding that thousands of miles of fish habitat has been made accessible by removing fish passage barriers under RMAP and the recovery of habitat function over time is occurring with the implementation of buffers. Beyond this process potential or recoverable habitat is a site specific rather than a landscape scale consideration.
- Finally, I urge the FPB to expedite the effort to generate a statewide water typing map using field-based methods. An accurate water type map is critical to reduce regulatory burdens, especially for small landowners.

Dave Chamberlain

1/21/2025

TO: Forest Practices Board

From: Wade Boyd, Phd, Forester, 43 years of experience with WA Forest Practices

Re: Support for the Fish Habitat Assessment Method

Opposition to a fixed gradient standard for the F/N boundary

Thank you for the opportunity to comment on the proposals.

I support use of the Fish Habitat Assessment Method and its incorporation in the regulatory process. Stream environments are complex, and multifaceted procedures are required. FHAM minimizes e-fishing, incorporates concepts of the Anadromous Fish Floor and has reliably extended fish habitats where appropriate.

Applying simple fixed criteria in complex natural environments will certainly lead to errors in designating the F/N boundary and thus I oppose applying AFF as a standalone criteria for designating the F/N boundary.

.....

I understand this issue. My comments are not lightly given.

As President of WFPA I was deeply involved in the Forest and Fish negotiations , supportive of the process, and the final report. Changes in Forest Practices have been consequential, positive in so many aspects but also, in too many cases, disproportionately negative to small landowners. The Forest and Fish Report acknowledged this imbalance and the need for meaningful mitigation, which has yet to be realized. A simple fixed criteria will produce unnecessary negative consequences for many small forest landowners

All too often policies are made without addressing the true impact on rural forest communities and small forest landowners. Regulations with disproportionately negative impacts to small forest landowners increase political support of those who are working to reduce the power of environmental regulations.



Hello, thank you for the opportunity to comment. My name is Stephan Dillon. I represent Manulife Forest Management's Western Washington Region.

The company owns and manages close to 500,000 acres of timberland in Washington State. I am a registered professional Forest Engineer and I've worked in the timber industry for over 31 years. I have been an active and engaged participant with Washington Forest and Fish rules since its inception. Water typing has a long and complicated history in Forest Practices, well going on 25 years! Having said this, We are overall supportive of the FPB's proposal but...if the FPB wants to consider substantive changes to Rules affecting aquatic resources, full due diligence and validation is required.

I would like to highlight some of our support:

one support *water typing WAC 222-14-070 & 0301 as proposed in R4 CR-102 Dec 3 2024*
We cautiously support changes to water crossing structures WAC 222-24-040. We recommend additional Adaptive Management Program (AMP) work if these revisions substantively impact field implementation.

We feel that the current proposal aligns with previous proposals. This is a reasonable step toward stable, consistent water type classifications without significant changes to current field practices.

- FPB expectations (August 2015)
- CR-101 preproposal statement of inquiry (2016)
- TFW Policy recommendations (2017)

Incorporating a Fish Habitat Assessment Method (FHAM) minimizes electro-fishing and integrates the concepts of an Anadromous Fish Floor (AFF) and potential habitat breaks (PHBs) for clarity in determining fish habitat from non-fish habitat (F/N break).

While the Anadromous Fish Floor (AFF) may be a helpful starting point, we stress its role as a guide rather than a determining method. Fish Habitat Assessment Method (FHAM) should establish the F/N break, and the process should not increase the need for ID Teams nor require more field visits to determine water type.

We support revisiting the undefined concept of "recoverable habitat".

Potential or recoverable habitat is site-specific rather than a landscape scale consideration. Practically speaking - thousands of miles of recoverable fish habitat have been made accessible by removing fish passage barriers under RMAP and by applying fish buffers to streams likely to be used by fish.

The current interim rule and practices have reliably extended fish habitats to areas where physical conditions preclude further fish movement. This process has yielded field practice consistencies. Codifying these practices will reduce subjectivity and improve transparency.

Substantive rule changes require Adaptive Management Program (AMP) evaluations...validation. Past GIS analyses of Anadromous Fish Floor (AFF) and potential habitat breaks (PHB) criteria yielded inconsistent results, highlighting the need for evidence-based, field evaluation of all water typing components. This is particularly relevant for the default physical criteria (DPC) which have been in the rule for more than 25 years.

Unfulfilled Water Typing Map Commitment: The FPB must complete the GIS-based water typing map as promised, reducing regulatory burdens on small landowners and ensuring an equitable, consistent system.

Thank you for your time and consideration,

Stephan Dillon, P.E.
sdillon@manulife.com
253-208-4342

January 28, 2025

Skagit County Comments on CR-102 Water-Typing Rule

Chairman Lenny Young and Forest Practice Board Members,

I'm Kendra Smith, here on behalf of Skagit County. Thank you for the opportunity to make comments on the proposed revisions outlined in the CR-102 on the water-typing rule the Forest Practice Board (FPB) approved last August, specifically, WAC 222-16-030 and 031 (as well as WAC 222-12-090 and WAC 222-30-021). Skagit County has been actively involved in this process since 2005 within the Policy framework, when the water-typing maps were first introduced to implement the Forest Fish Report. Fast forward through a lengthy progression, Skagit County today supports these updates toward a permanent Rule, noting that some minor clarifications are needed. We want to thank the FPB for taking the time to try and understand the complexity and nuances around developing a workable consistent stable process, that delineates a breakpoint for the water-typing classifications... the Fish Habitat Assessment Method (FHAM). The codification will solidify current practices that have systematically extended fish habitats to areas beyond actual fish. This action should be seen as a win for all...stability for the industry, fish habitat protected beyond last fish, less electro-fishing and fewer ID teams. This is a rare moment providing a balance between the concerns of the various caucuses and meeting the intent of TFW. These proposed revisions are consistent and in concert with the FPB discussions and direction to Policy in 2015 and the TFW Policy recommendations in 2017.

We understand the concept of having a fish floor as **a guide for a starting point** to identify the fish/no fish breakpoint more quickly and though we are not opposed to the idea, with the current inconsistent data and lack of field verification, adopting such a floor at this time would lead to more electroshocking and ID teams. And as it stands, the FHAM **will establish this breakpoint and water classification made**. This is also true in the case of PHBs. So again, we applaud the established FHAM that will delineate the water classifications. And of course, we are hopeful that the FPB will expedite a field-based evaluation for AFF, PHB under the AMP provisions, along with the default physical criteria (DPC).

Skagit County believes the concern over 'recoverable habitat', an undefined concept, should be squelched just by using a practical common sense understanding that it **has and is** occurring, thanks to private landowners (and lesser extent counties) with the removal of fish barriers under RMAP creating 1,000s of miles of **stream buffered habitat**.

What has not occurred is the delivery of a water-typing map to fulfill the commitment made to the Small Landowners (SLO) and Counties in 1999! This map is critical to reduce regulatory burdens, especially for the small landowners in our counties. We need to ensure that the SLOs remain as an integral part of our county forested landscape.

Finally, as this proceeds, we would like to better understand the revisions to the water crossing structures (WAC 222-24-040_ as they are implemented in the field, but at this time are fundamentally supportive. We also support the non-substantive changes to the Forest Practices Board manual (WAC 222-12-090) and western Washington RMZs (WAC 222-30-021).

Thank you.



WASHINGTON FOREST PROTECTION ASSOCIATION

724 Columbia St NW, Suite 250
 Olympia, WA 98501
 360-352-1500 Fax: 360-352-4621

February 11, 2025

Washington Forest Practices Board
 1111 Washington St SE
 PO Box 47012
 Olympia, WA 98504-7012
 Forest.practicesboard@dnr.wa.gov

Re: Proposed Water Typing System Rule

Washington Forest Protection Association (WFPA) is a forestry trade association representing large and small forest landowners and managers of more than four million acres of productive working forests, including timberland located in the coastal and inland regions of the state. Our members support rural and urban communities through the sustainable growth and harvest of timber and other forest products for U. S. and international markets. For more information about WFPA, please visit our website at www.wfpa.org.

WFPA submits the following comments on the proposed Water Typing System Rule published under CR-102 WSR 24-24-107 on December 3, 2024. We thank the Forest Practices Board (FPB) for proposing a reasonable step forward in revising the rule and look forward to working with the FPB and other interested parties to finalize the proposed rule later this year.

Proposed Rule Language

- We support the revisions to the water typing WAC 222-16-030 and 0301 with the following recommended minor revisions:

- WAC 222-16-030 page 1, preamble

The objective of the water typing system is to correctly classify waters to inform the appropriate application of riparian protections and to accurately determine the extent of fish habitat at the landscape scale. This section identifies the criteria to classify waters. The requirements for determining fish use are described in WAC 222-16-0301.

Recommended Revision

The objective of the water typing system is to correctly classify waters to inform the appropriate application of riparian protections. Methods to determine the water type break between Type F and N waters are intended to be highly accurate at determining habitat likely to be used by fish and be equally over and under inconclusive at the landscape scale. The Forest Practices Board will validate default physical characteristics defining fish use, methods to determine the Type F/N water break, and complete a water typing map as rule meeting the functional objective and performance target specified in Schedule L-1 as soon as practicable. In the meantime, this section identifies the criteria to classify waters, and the requirements for determining fish use in the field are described in WAC 222-16-0301.

Step 3: If a fish is observed in the stream segment upstream from the first PHB, stop the electrofishing survey and proceed upstream to the next PHB. Repeat this process until no fish are observed upstream of a PHB.

Rationale - The above recommended revision reconciles recommended changes to paragraph 3, page 5 with the FHAM steps table, removes redundancy and aligns language with the fact that PHB criteria are not in rule.

- We support the proposed revisions to forest practices board manual WAC 222-12-090 and western Washington RMZs WAC 222-30-021 as they are non-substantive.
- We cautiously support the proposed revision to water crossing structures for typed waters WAC 222-24-040 although the implication of the proposed revision is uncertain. The topic was briefly considered by TFW Policy in 2019 at the request of the FPB, but no detailed technical or policy analysis of the issue occurred at that time. We are assuming the proposed revisions to water typing WAC 222-16-030 and 0301 will result in the proposed revision to water crossing structures for typed waters WAC 222-24-040 generally not being a factor in field implementation of the Forest Practices Rules. If that assumption turns out to be false however, additional Adaptive Management Program (AMP) work will be necessary.

Policy Basis for Support

- Our support is based on the proposal for water typing WAC 222-16-030 and 0301 being generally consistent with the FPB's water typing system expectations as established in [August 2015](#)¹, the December 2016 [CR-101](#) Preproposal Statement of Inquiry, and the TFW Policy water typing rule recommendations provided to the FPB in [May 2017](#).
- The proposed revisions are an incremental step forward in establishing a consistent, stable system for determining water type classifications by incorporating the fish habitat assessment method (FHAM) which minimizes the use of e-fishing, includes the concept of an AFF and PHBs and should not represent a significant change from the current practice of determining water type on forestland subject to the Forest Practices Rules. This anticipated outcome is documented in the [preliminary cost/benefit analysis](#) and [SEPA analysis](#) provided to the FPB in November 2024.
- While landowners are cautiously accepting of the inclusion of the concept of an AFF in the water typing system per the FPB's [stated objective](#)² in November 2022, the notable lack of any AMP evaluation supporting the AFF concept is a significant procedural and technical concern. Landowners' ongoing support for including the AFF in the FPB's proposal is contingent upon our interpretation of the practical effect:
 - The upstream extent of the AFF will be a reasonable location from which FHAM may begin (i.e., a place to start looking for fish use and PHBs) while recognizing a mapped AFF may occasionally contain uncertainty
 - Landowners will have reasonable opportunity to conduct FHAM in streams with unknown fish use,

¹ [Pg. 6-7](#)

² [Pg. 5](#)

- As recommended in the rule language revisions above, we support the FPB reaffirming their commitment to completing a map as rule³ as soon as possible. This unfulfilled FFR and FPB commitment is a significant source of disproportional regulatory impact to landowners, particularly small forest landowners, who do not have the capacity to conduct FHAM.

Technical Basis for Support

- Even though the current rule and field practice have not been specifically evaluated by the AMP for effectiveness in meeting the water typing performance targets in Schedule L-1, AMP work related to GIS logistic regression model development/testing conducted in the early 2000s evaluating seasonal/annual variability of uppermost fish location indicates seasonal/annual movement of upper most fish location in eastern Washington was not significant and typically varied within +/- ~50 meters with no landscape scale pattern of movement; also, efficacy of the survey protocol in detecting uppermost fish with single pass e-fishing was found to be reliable with 0 error distance at 27 of 28 sites and ~14 meters error distance at one site (Cole, et al. 2003).
- Similarly, the 2016 Electrofishing Report delivered to the FPB by the Adaptive Management Program Administrator⁴ evaluated several questions related to the efficacy of backpack protocol survey electrofishing. Topic areas considered include 1) probability of detection, 2) adequacy of single site visits, 3) seasonality of fish occupancy, and 4) harm to individual fish or their populations. The authors concluded 1) in the majority of cases electrofishing is the preferred method of detecting fish presence in headwater streams and is the technique most likely to provide accurate information, 2) Single site visits are believed to be sufficient to establish fish presence, particularly when surveys extend at least 1/4 mile above the location of the last sampled fish, 3) electrofishing survey guidelines provide a sufficient time window for electrofishing when flows are typically low or declining, but not at the lowest point in the hydrologic year. Therefore, surveys carried out according to the existing timelines have a high likelihood of detecting fish if they are present at a site, and 4) In most situations, protocol electrofishing surveys are unlikely to result in harmful demographic effects on headwater fish populations as long as appropriate precautions are taken to avoid damage to active redds, instream and riparian habitats, or to cause extensive downstream movement of population members.
- Consistent with the above referenced work, independent research conducted in western Washington entailing repeated field surveys across multiple seasons and years to assess variability in fish distribution indicates uppermost fish use (which is cutthroat trout in 95%+ of cases) is identified at or below the proposed fish habitat/zone for L-1, CFBP

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- Consistent with the above referenced work, independent research conducted in western Washington entailing repeated field surveys across multiple seasons and years to assess variability in fish distribution indicates uppermost fish use (which is cutthroat trout in 95%+ of cases) is identified at or below the proposed fish habitat/non-fish habitat (F/N) regulatory break in 90% of cases. The mean distance between uppermost fish and the proposed F/N break was ~+90', the max range was -2,500' to +430' (Walters et al. in press. 2025), well within the buffered extent of streams on forestland subject to the Forest Practices Rules.
- Other independent research indicates the distribution of headwater fish (primarily cutthroat trout) is not significantly different at the landscape scale between managed and unmanaged forested watersheds in Western Washington (Latterell et al. 2003).

³ Pg. 3-4

⁴ [fob_mte_packet_20160810.pdf](#)

February 11, 2025

Dear Chair Young and Members of the Forest Practices Board,

I am Claudine Reynolds, a fish and wildlife biologist with over 20 years of experience working for family-owned timber companies in western Washington. I am the Director of Wildlife and Environmental Policy for Port Blakely, a sixth-generation forest products company. Over the course of my career, I have surveyed 100s of miles of stream, with one main purpose, to accurately classify aquatic habitats and identify fish distribution, thus conduct water typing surveys.

I appreciate the efforts of the board to adopt a permanent water typing solution. I'm here to express my support to implement the current proposal. These rules are important for the following reasons:

Accurate Evaluation of Fish Habitat: Field practitioners bring significant education and experience to their work. I began conducting fish distribution surveys in 2004. For years, I applied my training to make informed decisions in the field before I learned there was a policy debate about how I should do my job. Developing effective policy to classify dynamic systems like streams is challenging because each stream is unique. I want to assure you that consistent with the Fish Habitat Assessment Methodology (FHAM) in the proposed rule, making a water type determination involves a thorough office and field evaluation. After reviewing internal and external databases, the field survey starts downstream where fish are likely present in the stream. Electrofishers are used minimally in known or presumed fish habitat, just to confirm fish presence. They are only used intensively where habitat conditions make the stream unlikely to support fish. The break between fish and non-fish streams is always placed at the upstream extent of the habitat where fish were detected, even if fish were not detected in some segments of that habitat. Practitioners need to be able to use their expertise and experience to assess habitats and conduct comprehensive evaluations so that water typing is as accurate and site-specific as possible.

Scientific Rigor: The proposed water typing rules are grounded in the latest scientific research and methodologies, while additional validation studies are underway through the CMER process. Any modifications to the methods and protocols must be informed by scientific findings. This rigor ensures that our practices are based on the best available science, allowing us to make objective, justifiable decisions that affect both the environment and the communities that depend on these resources. Changes in methodology or protocol should stay true to our commitment and be guided by the scientific process and implemented through the adaptive management process.

I urge the Forest Practices Board to approve these rules and ensure their effective implementation. Thank you for considering my testimony.

Good Evening, my name is Alan Kycek. I am a forester with Hampton and oversee the company's timberlands in Pierce County. I appreciate the opportunity to give testimony on the proposed revisions to water typing.

As much as I appreciate confidence in knowing stream types, I am very leery of the Anadromous Fish Floor concept, and in general trying to make anything based on a model the end-all be-all. Models are never perfect, and while they are often a great guide or starting point, we must maintain the ability to deviate from any model's results if on-the-ground reality differs. It appears that the ability to still call an ID team is included here, should a landowner believe true end of fish lies within the modeled AFF. This largely alleviates any concerns that I have, but I hope that the AFF model isn't so off-base that ID teams are regularly required for correction. As much as anything I just want to reiterate the need for FHAM to always be able to over-ride any model's output.

On the topic of modelled mapping, I have to say that the current iteration of the DNR's water type map is atrocious. I don't doubt that it was okay, maybe even good when it was originally built, however with the tools available today we should not have a stream map that has streams located running parallel to a draw mid-slope on the hillside. Lidar is publicly available for much of the state, and relatively cheaply obtained elsewhere in today's day and age. It is not difficult to accurately map streams in draws utilizing lidar. Heck, there are probably some awesome tools out there I don't even know about that would do it automatically and not rely on manual drawing.

X Along with accurately locating streams, the cartographers updating stream locations could do a better job of mapping typing accurately when updating the layer. On the approximately 41,000 acres that I manage for Hampton, I can think of three instances where the water type modifications were mapped incorrectly, but somehow made it through the review process (*if there was one*) and is now "official". I have concerns that when the time comes to operate around these errors we might again have to revisit it and waste a bunch of time re-confirming the actual end of fish due to a cartography error. If I have these known errors in the "official" F/N break points just on the property I manage, I suspect there are potentially hundreds across the state.

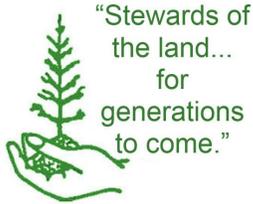
Still on the topic of mapping, I must say that it's disappointing that the layer isn't updated, even if just as better answer than the modeled layer, when an FPA is turned in, reviewed, and approved. By default, I see FPA approval as at least a soft concurrence by the reviewers. As a landowner, we have an internal stream layer that I keep updated as the "latest and greatest" information. I know where there are additional segments on the landscape, and where DNR modelled segments do not exist, but for anyone on the outside looking at the DNR's water type map they don't see these without looking at my FPA maps in FPARS. For F/N breaks, of course I don't mind completing a water type modification form if it deviates from the water type map in a significant way, but I'm sorry as the landowner I am not going to take the time to complete a two page form for every type N stream segment, or stream deletion for each harvest unit. That could in many cases be 30-40 pages of work that doesn't provide me with any benefit since I already have the information.

X I am also not advocating for mapping Np/Ns breaks, as those may change post-harvest or depending on the timing of typing. Without the standing timber there is less water up-take and the PIP could shift a bit, and the field verification for typing may have been done outside of the driest point of the year as well in the interest of getting a permit going.

I apologize for the bit of a rant on mapping. Everyone I know in the industry, including DNR staff, already knows the current iteration of the water type map needs a lot of work and I'm confident that the DNR can put out a much better product for everyone's use.

Regarding the water typing rules themselves, I don't have major heartburn and am generally supportive. I just encourage those in charge to make an accurate, modern water type map a priority.

Thank you for your time.



February 11, 2025

Re: Water Typing Rule Making

Washington State Forest Practice Board

Chairman Young and members of the Forest Practices Board:

For the record I'm Ken Miller, co-representing Washington Farm Forestry Association with Dave Roberts on behalf of the small forest land owners (SFLOs) on the TFW Policy Committee. The draft Water Typing Rule Making language is: relatively minor; necessarily technical; and beyond the comprehension of most of my peers, with the exception of Board Member Barnowe-Meyer who has years of experience with water typing and who I know to be a straight arrow when it comes stream typing protocol.

Below are some common language points I'd like to make that are related to your specific and general water typing efforts:

- Family forest owners want to do what is right for the forests and fish in our care!
- We do support the water typing rule-making language proposed by the Board despite few of our folks utilizing these technical and expensive processes – we need non-discriminatory default physical criteria and the long-promised maps as a rule.
- These rule changes appear to only affect the upper reaches of fish presence or fish habitat where the values to fish are minimal. However, the associated forest set-asides are grossly oversized relative to the potential fish risk or benefit – in my opinion these upper reach rules are more about a “no-touch” political paradigm than the functional effectiveness that is supposed to guide our rules.
- Family forest owners appreciate that the SFL Office can now provide stream typing help (in lieu of the required maps!), but we also understand the complexity of current and future rules require substantial access to upper stream reaches – full access not often available on our smaller ownerships. Technical assistance without being able to do protocol surveys perpetuates the discriminatory effects on SFLOs.
- Without full stream reach access, family forest owners are effectively precluded from using the full protocol survey methods in these rules, necessitating our use of the “default physicals” which are known to on average overprotect stream reaches that don't have fish, nor potential fish habitat.
- Studies have shown that on average the default physicals method of stream typing result in stream type breaks well over 1,000' upstream of actual fish

presence or fish habitat (Western WA) – a significant Disproportionate Impact on family forest owners that must be mitigated (SBEIS) in all future rules.

- Ultimately default physical rules should recognize the laws of diminishing functional effectiveness vs the economic costs of overprotection as required by balanced goals and shared risk commitments embodied in Forests and Fish. . . . not the overly precautionary paradigm for minimal fish benefits despite huge economic costs especially in our current default physicals. While awaiting the required stream typing maps the Board (at a minimum) needs to make a stronger AMP validation commitment to fixing default physical protocols.
- Many folks would like to eliminate electro-fishing. **Solution:** make the default physicals more shared risk and more balanced proportionate to the risks of fish vs economic risks; better yet, provide the long-promised map-based rules.

In summary: These draft rules, while technically appropriate seem to disregard the initial and remaining **Forests and Fish commitment to provide stream typing maps as our permanent rule!** Instead, our processes favor what seems a perpetual, ever complex, full employment stream typing process irrationally determined to define undefinable natural/changing conditions – processes that breed mistrust and debates about minutia that detract from the consensus spirit of Forests and Fish. **Get the maps done** using 20+ years of available information/better technology. Utilize these very technical rules only when there is reasonable doubt by the landowner or DNR. Stop the bickering in upper reaches of smaller streams providing minimal if any functional effectiveness seemingly used as a perpetual surrogate for the real issue of whether or not to manage our forests for multiple use. Well over 50% of our state's 22 million acres of forestland is already in some sort of no-touch classifications, losing sight and benefit of multiple use principles intended within Forests and Fish.

Ken

11 February 2025

To: The honorable Commissioner of Public Lands, Dave Upthegrove, Washington Department of Natural Resources.

From: Chris Mendoza, Mendoza Environmental LLC, representing the Washington Conservation Caucus.

Subject: Public testimony regarding DNR's Public Hearings on proposed water-typing rule and board manual 23 guidance.

Dear honorable Commissioner of Public Lands,

Thank you for the opportunity to provide public comments on an important issue critical to the conservation of aquatic species covered under DNR's federally approved, Forest Practices Habitat Conservation Plan. For the record, my name is Chris Mendoza and I represent Washington Conservation Action and other Environmental NGOs also known as the Washington Conservation Caucus who have actively participated in DNR's Forest Practices Adaptive Management Program for twenty plus years (2003-2025).

I have decades of experience stream typing under DNR's water typing rules and board manual guidance and am co-author of the Fish Habitat Assessment Method (FHAM) the Forest Practices Board is poised to adopt into rule. I have served on many of DNR's board manual technical committees over the past 20 years providing input based on my experience implementing DNR's rules and board manual guidance in the field so that they are repeatable, enforceable, and implementable as directed by prior DNR staff.

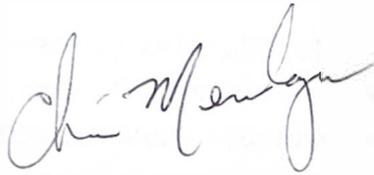
The WA FP Board is tasked with protecting fish habitat as defined in rule (WAC 222-16-010) and the Board has requested via motion (2015) to "reduce electrofishing" consistent with the FP HCP. TFW Policy went through two formal AMP dispute resolution processes spanning 5 years in a failed attempt to agree on how much fish habitat to protect, and how much to reduce electrofishing. In failing to agree, and consistent with DNR's AMP process, TFW Policy submitted majority / minority reports to the FP Board on water typing rule making.

At the August 28, 2024 special FP Board meeting, the Board shirked their responsibility of deciding how much fish habitat to project and how much electrofishing should be reduced by directing staff to move all of the PHBs from 3 different fish habitat protection Options (A, B, C) into board manual guidance. Their decision was irresponsible and nonsensical because those 3 Options represent distinctly different levels of fish habitat protection (e.g. $\leq 5\%$ with $\leq 10\%$ stream gradients) and reductions in electrofishing. Technical experts like myself cannot and should not be put in the position of resolving what are clearly natural resource protection Policy not technical issues, issues that TFW could not resolve after five years of formal disputes. As a result, Board staff have been unrealistically attempting to force technical experts during board manual 23 meetings into doing the Board's job for them.

Adopting the FHAM into rule while punting measurable Potential Habitat Breaks (PHBs) goes against 20 prior years of DNR's practices for rule adoption under the DNR's AMP. Recently retired DNR staff (Mark Engel) repeated told the public that "if you can measure it, it belongs in rule, not board manual guidance". All the PHB's the Board moved into board manual guidance are based on measurable criteria defining fish habitat like stream gradient, width, and length. By listing all the PHBs from three distinctly different protection Options together in a board manual "menu" for surveyors to choose from will only serve to create public confusion while ensuring that surveyors can choose the least protective PHBs (Option C).

This approach to rule making and board manual guidance is not repeatable, enforceable, or implementable. The standard for rulemaking DNR has repeatedly told the public it must follow whenever new rules and BM guidance are adopted by the Board.

Finally, I have vetted all of these concerns with Board staff at board manual 23 meetings and they have fallen on deaf ears. Board staff have also failed to restore the non-vertical option / step PHB in the Conservation Caucus supported Tribal Option (A) which caused much confusion during the FP Board's field trip on water typing rule making last fall. The CC has repeatedly requested DNR staff restore this particular PHB critical to the foundation of Option A and staff have refused to do so, unlike Board staff quickly correcting WFPA's Option (C) at their request when they got their proposal wrong.



Good afternoon, I am Court Stanley, and I am representing County government.

We support the revisions to the water typing WAC 222-16-030 and 0301 as proposed in CR-102 dated December 3, 2024.

We also support the proposed revisions to forest practices board manual WAC 222-12-090 and western Washington RMZs WAC 222-30-021 as they are non-substantive

The use of an e-fishing protocol survey (e.g., FHAM) to determine stream type is a mature system with few disputes between landowners and regulators; the proposed rule revisions will increase transparency and consistency and reduce the need for ID teams. We request the FPB make this expectation clear as part of the rule making deliberation.

landowners voluntarily go beyond the last fish to the point where the habitat changes where fish cannot access. The proposed rule revisions will essentially codify this existing practice which will decrease subjectivity and increase consistency in implementation.

We are supportive of continuing the field work being done by CMER to study AFF, PHB, and DPC criteria. No field-based AMP work to validate criteria for any of the proposed water typing rule components has been conducted. We need to follow the adaptive management protocol and only change rules when studies determine that current rules are not protecting the resource as intended.

Thank you.

- I am here to ask the Board to Fulfill the GIS-based water typing map obligation thereby reducing the regulatory burdens on small landowners as well as ensure equity and consistency.
- The interim rule and practices have reliably extended fish habitat to areas where physical conditions precluded further fish movement in a non-subjective and transparency manner.
- As such I would like to voice my support for the Proposed Revisions/Updates to
 - o WAC 222-16-030 and 0301,
 - o WAC 222-12-090,
 - o and WAC 222-30-021,
 - o I also support changes to water crossing structures WAC 222-24-040 provided that the field implementation cannot be is significantly impacted unless the Adaptive Management Program (AMP) is engaged.
- These changes and updates represent reasonable step towards a stable and consistent water type classification system without significant changes to current field practices. Further it aligns with Previous efforts:
 - o FPB expectations (August 2015),
 - o the CR-101 preproposal statement of inquiry (2016),
 - o TFW Policy recommendations (2017).
- Incorporating the Fish Habitat Assessment Method (FHAM) minimizes e-fishing, integrates the concepts of an Anadromous Fish Floor (AFF) and potential habitat breaks (PHBs) in determining F/N fish habitat. Though the AFF may be a helpful starting point, its role is better as a guide than a conclusive determinant. FHAM should establish the F/N break, without increased need for ID Teams or field visits.
- Thank you for your time and consideration.

Good afternoon, members of the Forest Practices Board. My name is Jason Walter. I am the Aquatic Resources Manager for Weyerhaeuser, where one of my responsibilities is to manage the company's water typing program. This program is responsible for thousands of water typing surveys over the past two decades. I have been told on a number of occasions and by numerous regulators that our work sets the standard for how water typing surveys should be conducted. In addition, I am the Chair of the ISAG, the Instream Science Advisory Group, which has been tasked within the Adaptive Management Program with developing the PHB, DPC and AFF Validation Study Designs as part of the AMP Water Typing Strategy. I am here to share my position on the proposed revisions to the water typing rules.

I support the updates to WAC 222-16-030 and 0301, as outlined in the CR-102 dated December 3, 2024, with minor clarifications. These revisions represent an important step toward a more consistent and stable system for water type classifications.

The proposed rules align with previous FPB expectations and TFW Policy recommendations, incorporating the Fish Habitat Assessment Method (FHAM). This method minimizes reliance on e-fishing, integrates key concepts like the anadromous fish floor (AFF) and potential habitat breaks (PHBs), and codifies long-standing practices, reducing subjectivity and enhancing consistency.

However, my support for the AFF is contingent on its practical use. It should serve as a starting point for FHAM, without increasing fieldwork burdens. FHAM—not AFF—must remain the method to establish the fish/non-fish break. I urge the FPB to expedite field-based Adaptive Management Program evaluation for AFF, PHB, and the default physical criteria (DPC).

In August 2024 I had the opportunity to work collaboratively with representatives from DNR, WDFW, and the Conservation Caucus, some of whom are here in the room today (Chris Briggs, ECY and Chris Mendoza, CC) to plan and implement a field tour focused on water typing for the WFPB on the Weyerhaeuser Vail Tree Farm. As you may remember... during that field tour you heard a unified message from all of the technical experts, regardless of caucus, that the water typing system in Washington State was 'not broken'. During the tour you did hear discussions that focused on the fact that the current water typing system could be adjusted or tweaked and would benefit from 'clarification' in some areas in order to reduce subjectivity and enhance consistency.

This reduced subjectivity and enhanced consistency can be achieved through the implementation of FHAM and the use of specific DPC, PHB, and AFF metrics validated by the multiple water typing studies that are currently being planned and/or implemented with the AMP.

In closing, I support these incremental revisions as a balanced approach to improving water typing rules, while emphasizing the need for field-based validation and long-term commitments.

Thank you for your time.

2/3/25

Washington State Forest Practices Board

I am writing in support of the updates to WAC 222-16-030 and 0301, as outlined in the CR-102 dated December 3, 2024, with minor clarifications. These revisions represent an important step toward a more consistent and stable system for water type classifications. I also support the non-substantive changes to the Forest Practices Board manual (WAC 222-12-090) and western Washington RMZs (WAC 222-30-021).

I cautiously support the revisions to water crossing structures (WAC 222-24-040), the implications remain uncertain. If these changes unexpectedly affect field implementation, additional Adaptive Management Program (AMP) work will be necessary.

The proposed rules align with previous FPB expectations and TFW Policy recommendations, incorporating the Fish Habitat Assessment Method (FHAM). This method minimizes reliance on e-fishing, integrates key concepts like the anadromous fish floor (AFF) and potential habitat breaks (PHBs), and codifies long-standing practices, reducing subjectivity and enhancing consistency.

However, my support for the AFF is contingent on its practical use. It should serve as a starting point for FHAM, without increasing fieldwork burdens. FHAM—not AFF—must remain the method to establish the fish/non-fish break.

Finally, I urge the FPB to expedite field-based Adaptive Management Program evaluation for AFF, PHB, and the default physical criteria (DPC) and fulfill the commitment to a statewide water typing map. This map is critical to reduce regulatory burdens, especially for small landowners.

Finally, I support these incremental revisions as a balanced approach to improving water typing rules, while emphasizing the need for field-based validation and long-term commitments.

Thank you for your consideration.

Sincerely,



JAMIE HILLERY



February 11, 2025

Patricia Anderson
FPB Rules Coordinator
Forest Practices Board
PO Box 47012
Olympia, WA 98504-7012

Via E-mail to: forest.practicesboard@dnr.wa.gov

Re: CR-102 Proposal to Codify Water Typing System Rule

Dear Forest Practices Board Members,

On behalf of the Snoqualmie Tribe, please accept the following comments regarding the current proposal to codify Washington State's Water Typing System Rule. The Snoqualmie Tribe [Tribe] is a federally recognized sovereign Indian Tribe. We were signatory to the Treaty of Point Elliott of 1855; we reserved certain rights and privileges and ceded certain lands to the United States. As a signatory to the Treaty of Point Elliot, the Tribe specifically reserved among other things, the right to fish at usual and accustomed areas and the "privilege of hunting and gathering roots and berries on open and unclaimed lands" off-reservation throughout the modern-day state of Washington. The State's water typing rule is fundamentally and foundationally important to protecting watersheds and fish habitat, and so the Tribe has concerns about several key aspects of the current proposal, which we explain further below. Snoqualmie Tribe suggests that **the Board should not approve the water typing rule as currently proposed** and instead should clarify several components of the rule and the processes entailed within the rule before finalizing the rule, because the primary goal of this rulemaking effort should be the adoption of clear, repeatable, enforceable criteria.

As currently proposed, key criteria in identifying fish habitat are relegated to the Forest Practices Board Manual. As a guidance document that is not formally adopted into rule, the Board Manual lacks the legal authority that this regulatory situation calls for, the inconsistent results of which have been demonstrated in practice repeatedly over the years. The upshot is that as guidance, not formally adopted by rule, the Board Manual cannot be reliably enforced, which in practice shifts the substantial burden of evaluation and attempted enforcement, on to Tribal governments, state agencies other than WA DNR, and privately funded conservation groups, while simultaneously stripping WA DNR's ability to hold surveyors accountable and ensure minimum baseline protections. And, problematically, the new draft Board Manual is not currently available for public review. **We urge the Board to clarify its intent with any water typing rule making process by specifically including water typing related Board Manual language in the CR 102, and to make that language available for review and comment during the rulemaking process.**

The Board's decision to allow surveyors to choose from three methodological options for determining Potential Habitat Breaks and/or the Anadromous Fish Floor is also problematic, in that the proposed "menu" approach is



counter to adoption of a repeatable, clear and enforceable system. This critical missed opportunity has had no opportunity for public review and input. Another of the Tribe's concerns with this approach is that it allows surveyors who may have an interest in maximizing harvestable timber yields to default to whichever method best serves that limited interest by choosing the method that results in the least habitat protection.

While it is not frequently discussed, the water typing system being proposed has implications far beyond "Forestry" areas. Local governments across the state have adopted these criteria by reference into their GMA-required Critical Areas and Shoreline codes. This system is far, far too important to adopt without adequate public review and comment process, and without actually meeting Board's obligation to adopt measurable, repeatable, enforceable criteria by rule. This would seem to be the minimum requirement, especially given that Best Available Science, including Washington State-adopted scientific principles and management recommendations (<https://wdfw.wa.gov/publications/01987>; <https://wdfw.wa.gov/publications/01988>) have demonstrated that to protect the integrity of habitat and water quality, that RMZs should be determined based on Site Potential Tree Height **regardless of the current presence of "fish habitat,"** which is just a snapshot in time in any case and is subject to change over time. This is the current scientific understanding and consensus, but we understand that what the Board has proposed for adoption is the result of negotiations and includes an effort to support industry and other economic interests. Therefore, this puts an even finer point on the need for the Board to **adopt measurable, repeatable, enforceable water typing criteria by rule.**

Thank you for your consideration.

Sincerely,

DocuSigned by:

Michael Ross

E0D26BDD350B44F...
Michael Ross

Deputy Executive Director, Government Affairs & Special Projects



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23

2200 Broadway Street Suite L
Vancouver, WA 98663

www.cascadeforest.org | (503) 222-0055

February 12, 2025

Patricia Anderson, FPB Rules Coordinator
Forest Practices Board
PO Box 47012
Olympia, WA 98504-7012

Via email: forest.practicesboard@dnr.wa.gov

RE: Public Comments on Permanent Water Typing System Rulemaking

Dear Ms. Anderson:

Thank you for the opportunity to comment on the Permanent Water Typing Rulemaking. Cascade Forest Conservancy's (CFC) mission is to protect and sustain forests, streams, wildlife, and communities in the southern Washington Cascades through conservation, education, and advocacy. We represent over 12,000 members and supporters. We recognize the great value in working together with a variety of partners and stakeholders, including the Washington Department of Natural Resources (DNR) and private landowners, in building a more resilient ecosystem for current and future generations. The Adaptive Management Program under the state's Habitat Conservation Plan (HCP) acknowledges the value of different groups working together and was built so different interests could work through a designated process using the best available science to ensure healthy forest and aquatic habitats while supporting harvest on private lands. However, the goals and objectives of the Adaptive Management Program have not been met in the case of this rulemaking.

Currently, the Washington Forest Practices Board and DNR are on the verge of failing their duty to protect fish habitat, uphold Tribal Treaty obligations, and safeguard forested watersheds. After more than a decade of delays, millions of dollars spent, and extensive stakeholder input, the Forest Practices Board failed in a recent decision to adopt a clear and enforceable water typing rule. Instead of choosing between three developed options and adopting a clear, binding rule, the Board has relegated these critical criteria to the unenforceable Board Manual, ensuring inconsistency in field application and leaving fish habitat protections dangerously ambiguous and subjective. A final water typing rule that accurately identifies fish habitat is fundamental to riparian buffer protections. Enforceable Anadromous Fish Floor (AFF) and Potential Habitat Break (PHB) criteria are critical to the rule's effectiveness. The decision to remove enforceable

criteria for PHBs and the AFF from the rule undermines the science based protections promised in the state's Habitat Conservation Plan (HCP).

Both DNR and the Forest Practices Board have failed to meet their obligations. DNR staff are responsible for informing and assisting the Forest Practices Board in its decision-making. However, DNR failed in its duty to adequately inform the Board of the implications of this decision, further jeopardizing the effectiveness of fish habitat protections. DNR and the Board must course correct during this rulemaking to uphold the promises of the state's HCP.

I. Current Approach Undermines Conservation Responsibilities

The Forest Practices Board's current approach undermines conservation efforts in two critically important ways: 1) by failing to include clear criteria for habitat protections in rule, and 2) by utilizing an approach that is not enforceable or consistent. These points are discussed in more detail below:

A. No Clear Criteria to Protect Habitat

The Forest Practices Board was tasked with selecting from three distinct options for PHBs and AFF, each providing different levels of fish habitat protection. For years Adaptive Management Plan stakeholders proceeded with the understanding the Board would select a single water typing alternative to codify as rule. Despite years of scientific review, technical work, and public investment, the Board failed to select a single, science-based set of measurable criteria. Instead, it opted for an unprecedented and unvetted approach: placing all possible criteria into the Board Manual as menu-style guidance rather than codifying enforceable standards in rule. This decision was never publicly contemplated, studied, or discussed.

By failing to choose a preferred option, the Board has effectively discarded a decade of effort enabling timber industry surveyors to default to the least protective measures without consequence. This outcome disproportionately benefits the timber industry, which is the very entity being regulated, at the expense of all other participants. The Board is responsible for balancing the interests of all stakeholders. However, this decision grants the regulated industry excessive influence over its own standards, undermining the integrity of science-based forest management contemplated by the Adaptive Management Program and HCP.

B. Lack of Enforceability and Consistency

Rather than establishing enforceable protections, the Forest Practices Board has relegated key PHB and AFF criteria to the Board Manual, which lacks legal weight and cannot be reliably enforced. This shift will make it nearly impossible for state agencies, Tribal governments, and

conservation groups to challenge inadequate survey results or hold surveyors accountable. Instead of setting a uniform standard, the Board has created a buffet of unenforceable options, allowing surveyors to rely solely on a subjective standard of best professional judgment that virtually ensures inconsistent application by surveyors and reviewers, and no accountability for misapplications of rule.

II. Corrective Steps Needed by Forest Practices Board

The Forest Practices Board must act decisively to restore public trust and uphold its responsibility to protect Washington's watersheds by 1) adopting measurable and enforceable water typing standards, 2) be more transparent about the decision making process, and 3) committing to minimizing electroshocking of fish. These points are discussed in more detail below:

A. Adopt Measurable & Enforceable Criteria in Rule for both PHBs and AFF

Rules with specific and measurable criteria, not unenforceable, vague Board Manual guidance are necessary to ensure adequate riparian protections. Without enforceable criteria, the water typing system adopted by this rulemaking will be ineffective and lead to less habitat protection than contemplated by the HCP. CFC requests the Board reconsider its decision and fulfill their responsibilities by selecting a set of PHB and AFF criteria.

B. Clarification of Intent Needed for Meaningful Public Involvement

CFC requests the Forest Practices Board be transparent about its decision-making process and allow for meaningful public input. If impacts of the rulemaking language substantively rely upon Board Manual guidance, then that language should be publicly available for review and comment during the CR102 process. Without more information to review – including the proposed Board Manual language – the public can not adequately participate in the rulemaking process.

C. Recommit to Minimizing Electroshocking of Fish

The Forest Practices Board's removal of all measurable stream gradient thresholds for AFF increases reliance on electrofishing, an invasive method that shocks fish to determine their presence. This contradicts previous commitments to minimize electrofishing and disproportionately harms juvenile salmon and trout. CFC requests that the Board recommit to minimizing electrofishing by adopting clear and enforceable criteria – a specific AFF and PHB.

III. Conclusion

The Forest Practices Board is at a crossroads. The current approach will lead to weaker habitat protections, increased electrofishing harm, and a degradation of public trust.

To fulfill its duty, the Board must adopt measurable, enforceable rules and not fall back to vague guidance that allows timberland owners to dictate environmental protections. We urge the Board to reconsider its approach and uphold its responsibility to protect Washington's watersheds and fish habitat by adopting a specific, enforceable AFF and PHB criteria in rule that minimizes the need for electrofishing, ensuring consistent and science-based protections.

We appreciate the opportunity to participate in this rulemaking process. Thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'AS', with a stylized flourish extending to the right.

Ashley Short
Policy Manager
Cascade Forest Conservancy
Ashley@cascadeforest.org



c/o Washington Conservation Action
(Coordinating Organization)
1417 4th Ave, Suite 800
Seattle, WA 98101
Tel: (206) 631-2600

To: Members of the Washington Forest Practices Board

From: Rico Vinh, Policy Representative for the Forests and Fish Conservation Caucus

Re: CR-102 Water Typing System Rule

Date: 2/12/2025

Dear Forest Practices Board Members

The mission of the Forests and Fish Conservation Caucus (CC) is to improve aquatic ecosystems in Washington by advancing science-based policy and technical information through the Adaptive Management Program of the Forest Practices Habitat Conservation Plan (AMP) and to assist the Forest Practices Board in determining when it is necessary or advisable to adjust rules and guidance for aquatic resources to achieve resource goals and objectives

On behalf of the Conservation Caucus, please accept the following comments on the Water Typing Rule.

Summary

The Washington Forest Practices Board and the Department of Natural Resources (DNR) are on the verge of failing their duty to protect fish habitat, uphold Tribal Treaty obligations, and safeguard forested watersheds. A final water typing rule that accurately identifies fish habitat is fundamental to riparian buffer protections. Enforceable Anadromous Fish Floor (AFF) and Potential Habitat Break (PHB) criteria are critical to the rule's effectiveness. After more than a decade of delays, millions of dollars spent, and extensive stakeholder input, the Board's recent decision to remove enforceable criteria for PHBs and the AFF from rule undermines the science-based protections promised in the state's Habitat Conservation Plan (HCP). Instead of choosing between three developed options and adopting a clear, binding rule, the Board has relegated these critical criteria to the unenforceable Board Manual, ensuring inconsistency in field application and leaving fish habitat protections dangerously ambiguous and subjective. DNR staff are responsible for informing and assisting the Forest Practices Board in their decision-making. However, DNR failed in their duty to adequately inform the Board of the implications of this decision, further jeopardizing the effectiveness of fish habitat protections. The Board should not approve the currently proposed Water Typing Rule.

The Board's Current Approach Undermines Conservation:

Rico Vinh, Policy Representative

Conservation Northwest ▪ Washington Conservation Action
Washington Forest Law Center ▪ Wild Fish Conservancy

1. No Clear Criteria for Habitat Protections

The Board was tasked with selecting from three distinct options for PHBs and AFF, each providing different levels of fish habitat protection. For years Adaptive Management Plan (AMP) stakeholders proceeded with the understanding the Board would select a single water typing alternative to codify as rule. Despite years of scientific review, technical work, and public investment, the Board failed to select a single, science-based set of measurable criteria. Instead, it opted for an unprecedented and unvetted approach: placing all possible PHB criteria into the Board Manual as menu-style guidance rather than codifying enforceable standards in rule and removing all AFF stream gradient thresholds from the rule. This decision was never publicly contemplated, studied, or discussed. By failing to choose a preferred option, the Board has effectively discarded a decade of effort, instead enabling timber industry surveyors to default to the least protective measures without consequence.

This outcome disproportionately benefits the timber industry, which is the very entity being regulated, at the expense of all other participants. The Board is responsible for balancing the interests of all stakeholders. However, this decision grants the regulated industry excessive influence over its own standards, undermining the integrity of science-based forest management.

2. Erosion of Enforceability and Consistency

Rather than establishing enforceable protections, the Board has relegated key PHB and AFF criteria to the Board Manual, which lacks legal weight and cannot be reliably enforced. This shift will make it nearly impossible for state agencies, Tribal governments, and conservation groups to challenge inadequate survey results or hold surveyors accountable. Instead of setting a uniform standard, the Board has created a buffet of unenforceable options, allowing surveyors to rely solely on a subjective standard of best professional judgment that virtually ensures inconsistent application by surveyors and reviewers, and no accountability for misapplications of rule.

The Forest Practices Board must act decisively to restore public trust and uphold its responsibility to protect Washington’s watersheds:

1. Adopt Measurable, Enforceable Criteria for AFF and PHBs in Rule

Rules with specific and measurable criteria—not unenforceable, vague Board Manual guidance—are necessary to ensure adequate riparian protections as required under WAC 222-16-010. The Board should reconsider their decision and fulfill their responsibility by selecting a single set of PHB and AFF criteria.

1. Clarify Intent During the CR-102 Process

The Board must be transparent about its decision-making process and allow meaningful public input. Since the impacts of the rulemaking language substantively rely upon Board Manual guidance, then that language should be publicly available for review and comment during the CR-102 process. If the Board wants the public to have fully informed engagement, the Board Manual language must be available for review along with the proposed rule language.

2. Commit to Minimizing Electroshocking of Fish

The Board’s removal of all measurable stream gradient thresholds for AFF increases reliance on electrofishing, an invasive method that shocks fish to determine their presence. This contradicts previous commitments to minimizing electrofishing and disproportionately harms juvenile salmon and trout. The federally approved, DNR Washington Forest Practices Habitat Conservation Plan (FPHCP Biological Opinion 2006) does not provide “coverage” for the extensive use of electrofishing as a method

for delineating fish-bearing streams (Type F) from non-fish streams (Type N). The Board must recommit to minimizing electrofishing through clear, enforceable criteria.

In conclusion, the Forest Practices Board is at a crossroads. The current approach will lead to weaker habitat protection, increased electrofishing harm, and a degradation of public trust.

To fulfill its duty, the Board must adopt measurable, enforceable rules and not fall back to vague guidance that allows timberland owners to dictate environmental protections. We urge the Board to reconsider its approach and uphold its responsibility to protect Washington's watersheds and fish habitat by adopting a specific, enforceable AFF and PHB criteria in rule that minimizes the need for electrofishing, ensuring consistent and science-based protections.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rico Vinh', with a stylized flourish at the end.

Rico Vinh

Policy Representative for the Forests and Fish Conservation Caucus
Washington Conservation Action

1 **Forest Practices Board**
2 **Water Typing System Rule Making**
3 **May 14, 2025**
4

5 **WAC 222-16-030 Water typing system.** (~~Until the fish habitat~~
6 ~~water type maps described below are adopted by the board, the~~
7 ~~Interim Water Typing System established in WAC 222-16-031 will~~
8 ~~continue to be used.)) The objective of the water typing system is
9 to correctly classify waters to inform the appropriate application
10 of riparian protections and to accurately determine the extent of
11 fish habitat at the landscape scale. This section identifies the
12 criteria to classify waters. The requirements for determining fish
13 use are described in WAC 222-16-0301.~~

14 The department classifies streams, lakes, and ponds on state
15 and private forest lands of Washington state in cooperation with
16 the departments of fish and wildlife, and ecology, and in
17 consultation with affected Indian tribes ((will classify streams,
18 lakes and ponds. The department will)). To assist applicants in
19 determining water type classifications, the department shall
20 prepare and update water type maps showing the location of Type S,
21 F, and N (Np and Ns) Waters within the forested areas of the state.
22 ~~((The maps will be based on a multiparameter, field-verified~~
23 ~~geographic information system (GIS) logistic regression model. The~~
24 ~~multiparameter model will be designed to identify fish habitat by~~
25 ~~using geomorphic parameters such as basin size, gradient, elevation~~
26 ~~and other indicators. The modeling process shall be designed to~~
27 ~~achieve a level of statistical accuracy of 95% in separating fish~~
28 ~~habitat streams and nonfish habitat streams. Furthermore, the~~
29 ~~demarcation of fish and nonfish habitat waters shall be equally~~
30 ~~likely to over and under estimate the presence of fish habitat.~~
31 ~~These maps shall be referred to as "fish habitat water typing maps"~~
32 ~~and shall, when completed, be available for public inspection at~~
33 ~~region offices of the department.~~

34 ~~Fish habitat water type maps will be updated every five years~~
35 ~~where necessary to better reflect observed, in-field conditions.~~
36 ~~Except for these periodic revisions of the maps, on-the-ground~~
37 ~~observations of fish or habitat characteristics will generally not~~
38 ~~be used to adjust mapped water types. However, if an on-site~~
39 ~~interdisciplinary team using nonlethal methods identifies fish, or~~
40 ~~finds that habitat is not accessible due to naturally occurring~~
41 ~~conditions and no fish reside above the blockage, then the water~~
42 ~~type will be immediately changed to reflect the findings of the~~

43 ~~interdisciplinary team. The finding will be documented on a water~~
44 ~~type update form provided by the department and the fish habitat~~
45 ~~water type map will be updated as soon as practicable. If a dispute~~
46 ~~arises concerning a water type the department shall make available~~
47 ~~informal conferences, as established in WAC 222-46-020 which shall~~
48 ~~include the departments of fish and wildlife, and ecology, and~~
49 ~~affected Indian tribes and those contesting the adopted water~~
50 ~~types.~~

51 ~~The waters will be~~) All Type S Waters, and department
52 concurred Type F and N Water breaks and Type Np and Ns Water breaks
53 shown on the water type map are official and may be relied upon by
54 landowners.

55 The water type maps and instructions for use are available for
56 public review from the department. All water breaks concurred by
57 the department are regulatory water type classifications; all other
58 mapped, and unknown Type F and N Water breaks or Type Np and Ns
59 Water breaks must be determined, in the field, by forest landowners
60 or their representative. The water type break can be determined per
61 this section or, for fish use, WAC 222-16-0301. Small forest
62 landowners can contact the department for technical assistance
63 and/or interdisciplinary teams to determine water typing breaks.

64 The department may convene an interdisciplinary team, as
65 defined in WAC 222-16-010, to consider proposed modifications to
66 the department's water type map; to address observed in-field
67 conditions, including observations of fish; to address naturally
68 occurring stream conditions or blockages making habitat
69 inaccessible to fish; or, if a dispute arises concerning a water
70 type classification in accordance with WAC 222-46-020.

71 Waters are classified using the following criteria:

72 * (1) **"Type S Water"** means all waters, within their bankfull
73 width, as inventoried as "shorelines of the state" under chapter
74 90.58 RCW and the rules promulgated pursuant to chapter 90.58 RCW
75 including periodically inundated areas of (~~their~~) associated
76 wetlands.

77 * (2) **"Type F Water"** means segments of natural waters (~~other~~
78 ~~than Type S Waters, which are within the bankfull widths of defined~~
79 ~~channels and~~) including periodically inundated areas of their
80 associated wetlands, (~~or within lakes, ponds, or impoundments~~
81 having a surface area of 0.5 acre or greater at seasonal low water
82 and) not classified as Type S Waters, which have a fish, wildlife,
83 or human use; which in any case contain fish habitat or are
84 described by one of the following (~~four~~) seven categories:

85 (a) Waters (~~(, which are)~~) within lakes, ponds, or impoundments
86 having a surface of 0.5 acre or greater at seasonal low water;
87 (b) Stream segments having a defined channel 20 feet or
88 greater within the bankfull width and having a gradient of less
89 than four percent;
90 (c) Waters which are off-channel habitat. These are areas
91 important for rearing and survival of fish and include riverine
92 ponds, wall-based channels, and stream associated wetlands. The
93 area must be connected to Type F or Type S Water and accessible to
94 fish during some portion of the year.
95 (i) For channelized streams, the edge of off-channel habitat
96 is determined based on the outer edge of inundation of the stream
97 at the bankfull elevation flow.
98 (ii) For nonchannelized streams, including stream associated
99 wetlands, off-channel habitat is the outer edge of the area
100 periodically inundated at the ordinary high water line.
101 (d) Waters used by fish. The department has prepared water
102 type maps showing the location of Type F Waters. All department
103 concurrent Type F and N Water breaks shown on the water type map are
104 official. Where fish use has not been determined:
105 (i) Waters having any of the following characteristics are
106 presumed to have fish use:
107 (A) Stream segments having a defined channel of two feet or
108 greater within the bankfull width in western Washington; or three
109 feet or greater in width in eastern Washington; and having a
110 gradient of 16 percent or less;
111 (B) Stream segments having a defined channel of two feet or
112 greater within the bankfull width in western Washington; or three
113 feet or greater within the bankfull width in eastern Washington,
114 and having a gradient greater than 16 percent and less than or
115 equal to 20 percent, and having greater than 50 acres in
116 contributing basin size in western Washington or greater than 175
117 acres contributing basin size in eastern Washington, based on
118 hydrographic boundaries;
119 (C) Ponds or impoundments having a surface area of less than
120 one acre at seasonal low water and having an outlet to a fish
121 stream;
122 (D) Ponds of impoundments having a surface area of 0.5 acre or
123 greater at seasonal low water;
124 (E) Waters within the anadromous fish floor, see WAC 222-16-
125 0301.
126 (ii) The department shall waive or modify the characteristics
127 in (d) (i) of this subsection where:

128 (A) Waters have confirmed, long term, naturally occurring
129 water quality parameters incapable of supporting fish;

130 (B) Snowmelt streams with short flow cycles that do not
131 support successful life history phases of fish. These streams
132 typically have no flow in the winter months and discontinue flow by
133 June 1st; or

134 (C) Sufficient information about a geomorphic region is
135 available to support a departure from the characteristics in (d) (i)
136 of this subsection, as determined in consultation with the
137 department of fish and wildlife, department of ecology, affected
138 tribes, and interested parties.

139 (e) Waters diverted for domestic use by more than 10
140 residential or camping units or by a public accommodation facility
141 licensed to serve more than 10 persons, where ((such diversion is
142 determined by the department to be a valid appropriation of water
143 and the only practical water source for such users. Such)) the
144 department determines the diversion is a valid appropriation of
145 water. These waters shall be considered ((to be)) Type F Water
146 upstream from the point of ((such)) diversion for 1,500 feet or
147 until the drainage area is reduced by 50 percent, whichever is
148 less;

149 ((b)) (f) Waters((, which are)) diverted for use by a
150 federal, state, tribal or private fish ((hatcheries. Such))
151 hatchery. These waters shall be considered Type F Water upstream
152 from the point of diversion for 1,500 feet, including tributaries
153 if highly significant for protection of downstream water quality.
154 The department may allow additional harvest beyond the requirements
155 of Type F Water ((designation provided)) classification if the
156 department determines after a landowner-requested ((on-site
157 assessment by the department of fish and wildlife, department of
158 ecology, the affected tribes and interested parties))
159 interdisciplinary team assessment that:

160 (i) The management practices proposed by the landowner will
161 adequately protect water quality for the fish hatchery; and

162 (ii) ((Such)) The additional harvest within the riparian
163 management zone meets the requirements of the water type
164 ((designation)) classification that would apply in the absence of
165 the hatchery;

166 ((e)) (g) Waters((, which are)) within a federal, state,
167 local governmental entity, or private campground having more than
168 10 camping units((: Provided, That the water shall not be
169 considered to enter a campground until it reaches)). These are
170 waters that enter a campground at the boundary of the park lands

171 available for public use and come(~~s~~) within 100 feet of a camping
172 unit, trail or other park improvement;

173 ~~((d) Riverine ponds, wall-based channels, and other channel
174 features that are used by fish for off-channel habitat. These areas
175 are critical to the maintenance of optimum survival of fish. This
176 habitat shall be identified based on the following criteria:~~

177 ~~(i) The site must be connected to a fish habitat stream and
178 accessible during some period of the year; and~~

179 ~~(ii) The off-channel water must be accessible to fish.)~~

180 (3) **"Type Np Water"** means all segments of natural waters
181 within the bankfull width of ~~((defined channels that are))~~
182 perennial nonfish habitat streams. Perennial streams are flowing
183 waters that do not go dry any time of a year of normal rainfall and
184 include the intermittent dry portions of the perennial channel
185 below the uppermost point of perennial flow.

186 (4) **"Type Ns Water"** means all segments of natural waters
187 within the bankfull width of the defined channels that are not Type
188 S, F, or Np Waters. These are seasonal, nonfish habitat streams in
189 which surface flow is not present for at least some portion of a
190 year of normal rainfall and are not located downstream from ~~((any
191 stream reach that is))~~ a Type Np Water. Type Ns Waters must be
192 physically connected by an above-ground channel system to Type S,
193 F, or Np Waters.

194 *(5) For purposes of this section:

195 (a) "Residential unit" means a home, apartment,
196 ~~((residential))~~ condominium unit or mobile home, serving as the
197 principal place of residence.

198 (b) "Camping unit" means an area intended and used for:

199 (i) Overnight camping or picnicking by the public containing
200 at least a fireplace, picnic table and access to water and sanitary
201 facilities; or

202 (ii) A permanent home or condominium unit or mobile home not
203 qualifying as a "residential unit" because of part time occupancy.

204 (c) "Public accommodation facility" means a business
205 establishment ~~((open to and))~~ licensed to serve the public, such as
206 a restaurant, tavern, motel or hotel.

207 (d) "Natural waters" only excludes water conveyance systems
208 which are artificially constructed and actively maintained for
209 irrigation.

210 (e) "Seasonal low ~~((flow" and "seasonal low))~~ water" means the
211 conditions of the 7-day, 2-year low water situation, as measured or
212 estimated by accepted hydrologic techniques recognized by the
213 department.

214 (f) (~~"Channel width and gradient"~~) "Bankfull width" for
215 defined channels means a measurement over a representative section
216 of at least 500 linear feet with at least 10 evenly spaced
217 measurement points along the normal stream channel but excluding
218 unusually wide areas of negligible gradient such as marshy or
219 swampy areas, beaver ponds and impoundments. (~~Channel gradient may~~
220 ~~be determined utilizing stream profiles plotted from United States~~
221 ~~geological survey topographic maps~~) See board manual section
222 23(+).

223 (g) "Intermittent (~~streams~~)" means those segments of streams
224 that normally go dry.

225 (~~(h) "Fish habitat" means habitat which is used by any fish~~
226 ~~at any life stage at any time of the year, including potential~~
227 ~~habitat likely to be used by fish which could be recovered by~~
228 ~~restoration or management and includes off-channel habitat.~~)

229 NEW SECTION

230 **WAC 222-16-0301 Verification of fish habitat and the break**

231 **between Type F and Type N Water.** To assist applicants in
232 determining the water type classification, the department prepares
233 water type maps showing the location of Type S, F, and N (Np and
234 Ns) Waters within the forested areas of the state. The mapping tool
235 and instructions for viewing water type maps is available on the
236 department's website.

237 For the purposes of forest practices, landowners are required
238 to verify the water type break between Type F and N Waters where
239 fish use has not previously been determined. Department concurred
240 breaks between Type F and N Waters are shown on the water type map.
241 These breaks are official and can be used by the landowner. All
242 other mapped stream breaks, and the establishment of the Type F and
243 N Water break on streams not shown on the map, need to have the
244 Type F and N Water break established through the application of the
245 default physical characteristics, per WAC 222-16-030 (2)(d)(i); or,
246 through the application of the fish habitat assessment method
247 (FHAM) described in subsection (1) of this section.

248 The application of FHAM is intended to establish the line of
249 demarcation between fish and nonfish habitat waters. No application
250 of default physical characteristics or FHAM to determine the Type F
251 and N Water break is allowed within the anadromous fish floor
252 (AFF), unless a landowner requests an interdisciplinary team, as
253 defined in WAC 222-16-010. The AFF is delineated on waters
254 connected to saltwater by measurable physical stream

255 characteristics, within which anadromous fish habitat is presumed,
 256 and upstream of which the default physical characteristics or a
 257 protocol fish survey under FHAM may be applied to establish the
 258 Type F and N Water type break. Board manual section 23 provides
 259 guidance on how to delineate the AFF.

260 * (1) **Fish habitat assessment methodology (FHAM)**. The FHAM is a
 261 series of steps used to delineate the upper extent of fish habitat
 262 coincident with the regulatory water type break between Type F and
 263 Type N Waters. Proposals to change the department water type map
 264 must include documentation of the use of the FHAM on a form
 265 designated by the department. FHAM shall be applied in waters
 266 situated upstream from the anadromous fish floor or known fish use.
 267 Board manual section 23 provides additional technical guidance for
 268 conducting the FHAM.

269 The FHAM requires the identification of geomorphic features
 270 meeting the definition of a potential habitat break (PHB) as
 271 described in subsection (2) of this section.

272 (2) **"Potential habitat break"** means a permanent, distinct, and
 273 measurable change to in-stream physical characteristics. PHBs are
 274 typically associated with underlying geomorphic conditions and may
 275 consist of natural obstacles that physically limit fish access to
 276 upstream reaches or a distinct measurable change in channel
 277 gradient, bankfull width, or a combination of the two. Natural,
 278 nondeformable obstacle PHB includes vertical drops, steep cascades,
 279 bedrock sheets and bedrock chutes. Guidance on how to identify PHB
 280 is contained in board manual section 23.

281 (3) The steps to conduct FHAM are:

Step 1	Locate the upstream extent of the AFF or other most upstream point of known fish use, whichever is furthest upstream. The process and sources used to determine known presence or fish habitat must be documented. Proponents are encouraged to contact the department of fish and wildlife and/or affected Indian tribes to assist in determining areas of known fish use.
Step 2	Locate the first PHB situated upstream of the stream segment with known fish use point, determined in Step 1. See the PHB criteria in subsection (2) of this section and associated guidance in board manual section 23.
Step 3	Begin the fish habitat assessment directly upstream of the PHB identified in Step 2. If a fish is observed in the stream segment upstream from the first PHB, stop the electrofishing survey and proceed upstream to the next PHB. Repeat this process until no fish are observed upstream of a PHB.
Step 4	When fish are not observed in the stream segment directly above a PHB, continue protocol surveying of all available habitats for 0.25 mile upstream of the PHB. If no fish are observed, this PHB becomes the end of fish habitat for the stream segment and the proposed water type break between Type F and Type N Waters. Document this location as the proposed habitat break.

282 REPEALER

283 The following section of the Washington Administrative Code is
284 repealed:

 WAC 222-16-031 Interim water typing system.

285



Washington State Final Water Typing System Rule

Final Cost Benefit Analysis

April 18, 2025

INDUSTRIAL ECONOMICS, INCORPORATED

Prepared for:

Washington Forest Practices Board
1111 Washington Street SE
Olympia, WA 98504

Prepared by:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, MA 0214

Table of Contents

Acknowledgements	iii
Acronyms	iv
Executive Summary	ES-1
ES.1 Summary of the Final Rule	ES-1
ES.2 Probable Benefits and Costs	ES-2
ES.3 Impacts on Small Businesses	ES-3
CHAPTER 1 Introduction	1
1.1 Objective and Description of the Final Rule	1
1.2 Background on the Rulemaking Process	3
1.3 Framework for the Economic Analysis	4
1.3.1 Focus on Identifying Probable Effects of the Rule	4
1.3.2 Focus on Incremental Effects	5
1.3.3 Geographic Scope and Scale	5
1.3.4 Analysis Timeframe	5
1.4 Organization of the Report	5
CHAPTER 2 Regulatory Baseline	6
2.1 Water Typing Under the Interim Rule	6
2.1.1 Baseline Processes for Water Typing	6
2.1.2 Baseline Number and Distribution of Water Typing Efforts	7
2.1.3 Baseline Extent of Electrofishing During Protocol Surveys	9
2.2 Extent of Waters Subject to Future Water Typing	11
CHAPTER 3 Incremental Costs and Benefits of the Final Rule	14
3.1 Effects Generated by the Final Rule	14
3.1.1 Potential for Changes in the Water Typing Process	14
3.1.2 Potential for Changes in the Outcomes of Water Typing	17
3.2 Probable Benefits	17
3.2.1 Reduced Risk of Potential Fish Harm	17
3.2.2 Regulatory Certainty	19
3.3 Probable Costs	20
3.4 Weighing of Probable Benefits and Costs	20
3.5 Key Assumptions and Sources of Uncertainty	20
CHAPTER 4 Impacts on Small Businesses	22
4.1 Small Businesses in Relevant Industries	22
4.2 Costs of the Final Rule Relative to Minor Cost Thresholds	23

4.3 Steps Taken to Reduce Costs of the Rule 23

4.4 Involvement of Small Businesses in the Rulemaking Process 24

4.5 Impact on Jobs 24

References 25

Appendix: Fish Values Information..... A-1

 Total Economic Value..... A-1

 Ceremonial and Subsistence Fishing and Tribal Cultural Values..... A-3

 Non-Use Values A-4

 Recreational Fishing A-5

 Commercial Fishing A-6

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The IEc project managers and lead analysts are Maura Flight, Megan Sheahan, Jen Kassakian, and Isabel Holland. The IEc team also included James Shannon, a fish biologist from Haley & Aldrich.

Acronyms

AFF	Anadromous Fish Floor
C&S	Ceremonial and Subsistence
CBA	Cost-Benefit Analysis
CRITFC	Columbia River Inter-Tribal Fish Commission
DNR	Washington Department of Natural Resources
DPC	Default Physical Characteristic
Ecology	Washington State Department of Ecology
ETG	Electrofishing Technical Group
FFR	Forests and Fish Report
FHAM	Fish Habitat Assessment Methodology
FPA	Forest Practices Application
GIS	Geographic Information System
LSI	Landslide Susceptibility Index
NAICS	North American Industry Classification System
NMFS	National Marine Fisheries Service
PHB	Potential Habitat Break
RCW	Revised Code of Washington
REIT	Real Estate Investment Trust
RFA	Washington Regulatory Fairness Act
SBEIS	Small Business Economic Impact Statement
SFL	Small Forest Landowner
TEV	Total Economic Value
TIMO	Timber Investment Management Organization
UBI	Uniform Business Identification
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WC Hydro	DNR's Hydrography – Watercourses GIS Open Layer

WDFW	Washington Department of Fish and Wildlife
WTMF	Water Type Modification Form
WTP	Willingness to Pay

Executive Summary

This report provides the results of a Cost-Benefit Analysis (CBA) of the Water Typing System Rule defined by the Washington Forest Practices Board. The rule amends the existing interim water typing system rule, in place since 2001, by 1) defining the role of the anadromous fish floor (AFF) in the water typing system process; and 2) prescribing a Fish Habitat Assessment Methodology (FHAM) for establishing the demarcation between fish and non-fish habitat waters outside of the AFF.

The Forest Practices Board determined that a Cost-Benefit Analysis (CBA) is required for the proposed water typing rule pursuant to Revised Code of Washington (RCW) 34.05.328. The objective of the CBA is to provide information to allow the Board to, "[d]etermine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented" (RCW 34.05.328(1)(d)). This report provides the basis for that determination.

Pursuant to RCW 19.85, a Small Business Economic Impact Statement (SBEIS) is required if the agency determines that the rule will impose "more than minor costs" on businesses in an industry. The objective of the SBEIS is to determine whether the rule will have a disproportionate cost impact on small businesses, and if so, where legal and feasible, to reduce the costs imposed by the rule on small businesses (RCW 19.85.30). The report also addresses these questions.

ES.1 Summary of the Final Rule

The primary objectives of the Board's water typing system rulemaking are to reduce the use of electrofishing and to reduce the potential for subjectivity when classifying stream water type. To meet these objectives, the rule introduces a new section (WAC 222-16-0301) into the Water Typing System rules that defines a consistent process for identifying the break between Type F and Type N water. The new section describes two elements of the rule to be used in concert to establish the break between Type F and N streams across the state:

1. *Prescribing FHAM as the protocol for all future water typing surveys.* FHAM provides a consistent means of establishing the demarcation between fish and non-fish habitat, removing ambiguity and subjectivity associated with the protocol survey approach for identifying the break between Type F and N water.
2. *Describing the application of an AFF.* The AFF delineates the stream extents that support anadromous fish. Stream length specified as the AFF would be managed as Type F and would not require typing by landowners to determine appropriate management requirements.

The rule defines the AFF as "waters connected to saltwater by measurable physical stream characteristics, within which anadromous fish habitat is presumed, and upstream of which the default physical characteristics (DPCs) or a protocol fish survey under FHAM may be applied to establish the Type F and N Water type break." The rule also enumerates four steps for implementing FHAM as well as a broad definition of physical habitat breaks (PHBs). For guidance on how to identify the extent of the AFF as well as PHBs, the rule directs landowners to Board Manual Section 23.

The rule applies to private, state, and other local forest landowners in Washington State that require information about whether streams intersecting their forestland are Type F or Type N. The rule does not apply to federal and tribal forestland owners and does not influence streams that have been permanently typed. The rule maintains the current option for landowners to type their streams by referring to a set of DPCs. The rule also does not affect any of the requirements associated with the outcome of a water typing effort (i.e., the size and composition of riparian buffers, accommodating fish passage on stream crossings, etc.).

ES.2 Probable Benefits and Costs

We evaluate the probable costs and benefits for the rule by comparing water typing in Washington under two scenarios: the world with the rule and the world without the rule. The world without the rule reflects the regulatory baseline for the analysis. An important aspect of the baseline is the current practices for determining water types under the interim rule. It also includes current and expected future industry practices with respect to water typing approach and implementation.

Relative to this baseline, we assess whether and to what extent the rule is likely to result in 1) changes in the water typing process as well as 2) changes in the outcomes of survey efforts. Table ES-1 summarizes the findings of our evaluation. Overall, we find that the rule, with its broad definitions of the AFF and PHBs used in the FHAM, largely codifies existing practices around survey implementation during water typing efforts. Therefore, the rule is unlikely to result in significant changes in process or outcomes of surveys relative to current conditions. As such, the rule does not result in changes to land use management, fish abundance, or other ecological conditions in riparian areas.

However, by codifying these practices in rule, the rule generates regulatory uncertainty and reduces the risk of potential fish harm by creating bounds on the use of electrofishing. We describe these two benefits of the rule in more detail below. **Because the rule is anticipated to generate benefits but not costs, we find that the probable benefits of the rule are likely to outweigh the probable costs.**

Table ES-1. Summary of Findings Related to the Effects of the Rule and Resulting Categories of Probable Costs and Benefits

Potential Effect of the Rule Evaluated	Finding of the Analysis	Incremental Costs	Incremental Benefits
Potential changes in water typing process			
Landowner choice of water typing method (i.e., use of DPCs versus protocol survey)	No effect of the rule	None	None
Effort devoted to water typing and concurrence	The rule is unlikely to result in changes in effort devoted to water typing and concurrence relative to current conditions but reduces the potential for subjectivity when classifying stream water type	None	Regulatory certainty regarding appropriate process for water typing
Extent of electrofishing during FHAM implementation	The rule is unlikely to change the extent of electrofishing relative to current survey implementation but reduces the risk for the potential increase in electrofishing in the future	None	Reduced risk of potential fish harm by codifying limits in electrofishing during protocol surveys
Potential changes in water typing outcomes			
Change in the expected location of F/N breakpoints (i.e., change in extent of Type F and Type N streams)	No effect of the rule	None	None

Reduced Risk of Potential Fish Harm

The rule reduces the risk of future increases in electrofishing, therefore a key benefit is the reduced risk of potential fish harm. The best available evidence suggests that the rule is unlikely to result in population-level

effects on fish, although may prevent harm to individual fish. Under current conditions, electrofishing for water typing purposes affects hundreds to thousands of fish each year. Given the limited use of electrofishing during survey efforts in the baseline, the rule is unlikely to result in less fish harm relative to these current conditions, although is likely to prevent these numbers from increasing in the future. We are unable to quantify the risk reduction associated with the rule given significant uncertainty about how electrofishing may change in the future, absent the rule.

The relevant economic benefits associated with this reduced risk are the public's willingness to pay (WTP) to reduce fish harm. To our knowledge, there is no literature evaluating the value that the public holds to avoid harm to fish through reduced electrofishing. However, there is abundant literature demonstrating that people value fish, in particular the species found in streams in Washington that experience electrofishing in the baseline. The appendix summarizes available literature demonstrating that people value fish presence.

Regulatory Certainty

The rule also reduces the potential for subjectivity when classifying water types by providing more scaffolding for surveyors, including a definition of where surveys should start and step-by-step instructions for implementing FHAM. Therefore, a key benefit of the rule is certainty in how streams will be typed in the future, reducing ambiguity in future implementation. Increasing certainty may translate into more confidence among landowners and other stakeholders that the outcome of a survey is unlikely to differ across surveyors.

The rule is the result of a long process that started with the publication of the interim water typing rule in 2001 and the Forest Practices Board's announcement in 2013 that it would commence work developing a permanent water typing rule. Since then, there has been significant uncertainty among landowners about what the new water typing system would mean for the process and outcomes of future survey efforts. The final rule codifies existing practices and creates flexibility for future improvement by relegating specific definitions of the AFF and the PHBs to guidance contained in the Board Manual. Relative to the uncertainty experienced over more than a decade, the rule provides landowners and other stakeholders with assurance about the processes that can be utilized to type their streams in the future.

ES.3 Impacts on Small Businesses

The rule directly regulates owners of forestland immediately adjacent to water. In some cases, these forestland owners are businesses; in other cases, these landowners are private individuals and public entities, including state and local government. We identify three North American Industry Classification System (NAICS) codes with businesses that are likely to be regulated by the rule because they are likely to harvest timberland in riparian areas: 113110 – Timber tract operations, 113210 – Forest nurseries, and 113310 – Logging. We find that approximately 99 percent of businesses in these industries meet Washington's definition of small business, i.e., a business with 50 or fewer employees.

However, the rule is not anticipated to result in probable costs to these industries. This is because the rule is unlikely to change how landowners conduct water typing relative to current conditions and is unlikely to change the outcomes of surveys. Therefore, we do not anticipate an increase in costs associated with surveys or compliance costs associated with more Type F stream requirements (i.e., unharvestable buffer area, fish passage through stream crossings). **Because the rule does not result in more than minor costs to businesses in the regulated industries, a complete SBEIS is not required for this rule.** For transparency purposes, this report also provides the information that is typically required of a SBEIS.

CHAPTER 1 | Introduction

In 1999, a collaboration of federal, state, tribal, and county governments, and private forest landowners, presented the Forests and Fish Report (FFR) to the Washington Forest Practices Board and Governor's Salmon Recovery Office to recommend, "...biologically sound and economically practical solutions that will improve and protect riparian habitat on non-federal forest lands in the State of Washington." The FFR, which provides the foundation for addressing forest management as part of Washington's Statewide Salmon Recovery Strategy, includes riparian forest management provisions that prescribe restrictions and conservation measures based on "water type." Water types are divided into shorelines (Type S), fish habitat (Type F), and seasonal and perennial streams that are neither shorelines nor fish habitat (Type Ns and Np streams, respectively).

In 1999, the Legislature passed HB 2091 which adopted the FFR and directed the Forest Practices Board to adopt rules consistent with the FFR. In 2001, the Washington Forest Practices Board adopted two rules to work toward a systematic approach for identifying water types. The first rule (WAC 222-16-030), which specified a GIS modeling approach to establish Type F waters, was never implemented as the model did not meet its targeted accuracy requirements. The second rule (WAC 222-16-031) is currently implemented across the state and specifies an "interim water typing system" based on fish presence and not fish habitat. In August 2024, the Forest Practices Board defined a proposed rule to codify a consistent, permanent system for determining water types in accordance with the FFR. The proposed rule was made available for public comment in late 2024; the final rule is consistent with the proposed rule. The rule amends the existing interim water typing system rule by 1) defining the role of the anadromous fish floor (AFF) in the water typing system process; and 2) prescribing a Fish Habitat Assessment Methodology (FHAM) for establishing the demarcation between fish and non-fish habitat waters outside of the AFF.

The Forest Practices Board determined that a Cost-Benefit Analysis (CBA) is required for the water typing rule pursuant to Revised Code of Washington (RCW) 34.05.328. The objective of the CBA is to provide information to allow the Board to, "[d]etermine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented" (RCW 34.05.328(1)(d)). This report provides the basis for that determination.

Pursuant to RCW 19.85, a Small Business Economic Impact Statement (SBEIS) is required if the agency determines that the rule will impose "more than minor costs" on businesses in an industry. The objective of the SBEIS is to determine whether the rule will have a disproportionate cost impact on small businesses, and if so, where legal and feasible, to reduce the costs imposed by the rule on small businesses (RCW 19.85.30). This report also addresses these questions.

1.1 Objective and Description of the Final Rule

The primary objectives of the Board's water typing system rulemaking are to reduce the use of electrofishing and to reduce the potential for subjectivity when classifying stream water type. To accomplish this, the Board established further objectives directing the Timber, Fish, and Wildlife (TFW) Policy Committee to:

1. Better address the FFR's foundational goal to protect accessible fish habitat through a field applied methodology to reliably identify accessible fish habitat in an objective and repeatable manner.
2. Maintain all essential elements of the methodology in rule by adding long-standing Board guidance, found in the Board Manual, into rules where appropriate.
3. To have a sound water typing system which ensures riparian buffers are properly placed at each stream, protecting aquatic resources and their respective habitats.

4. The AFF is the measurable physical stream characteristics downstream from which anadromous fish habitat is presumed and establishes the location upstream of which fish protocol surveys may begin under FHAM.

To meet these objectives, the rule introduces a new section (WAC 222-16-0301) into the Water Typing System rules that defines a consistent process for identifying the break between Type F and Type N water. The new section describes two elements to be used in concert to establish the break between Type F and N streams across the state:

1. *Prescribing FHAM as the protocol for all future water typing surveys.* FHAM provides a consistent means of establishing the demarcation between fish and non-fish habitat, removing ambiguity and subjectivity associated with the protocol survey approach for identifying the break between Type F and N water.
2. *Describing the application of an AFF.* The AFF delineates the stream extents that support anadromous fish. Stream length specified as the AFF would be managed as Type F and would not require typing by landowners to determine appropriate management requirements.

The rule defines the AFF as “waters connected to saltwater by measurable physical stream characteristics, within which anadromous fish habitat is presumed, and upstream of which the default physical characteristics (DPCs) or a protocol fish survey under FHAM may be applied to establish the Type F and N Water type break.” For guidance on how to identify the extent of the AFF, the rule directs landowners to Board Manual Section 23.

The FHAM prescribes the specific steps for delineating the upper extent of fish habitat coincident with the break between Type F and N waters, as follows:

- **Step One:** Locate the upstream extent of the AFF or other upstream most point of known fish use, whichever is further upstream. The rule encourages landowners to contact the Washington Department of Fish and Wildlife (WDFW) and/or affected Indian tribes to assist in determining areas of known fish use.
- **Step Two:** Locate the first potential habitat break (PHB) above the point identified in Step One. PHBs are defined as “permanent, distinct, and measurable changes to in-stream physical characteristics.” The rule refers landowners to Board Manual Section 23 for guidance on how to identify PHBs.¹
- **Step Three:** Begin the fish habitat assessment directly upstream of the PHB identified in Step 2. If a fish is observed in the stream segment upstream from the first PHB, stop the electrofishing survey and proceed upstream to the next PHB. Repeat this process until no fish are observed upstream of a PHB.
- **Step Four:** When fish are not observed in the stream segment directly above a PHB, continue protocol surveying of all available habitats for ¼ mile upstream of the PHB. If no fish are observed, this point becomes the end of fish habitat for the stream segment and the proposed water type break between Type F and Type N Waters. Document this location as the proposed habitat break.

The rule applies to private, state, and other local forest landowners in Washington State that require information about whether streams intersecting their forestland are Type F or Type N. The rule does not apply to federal and

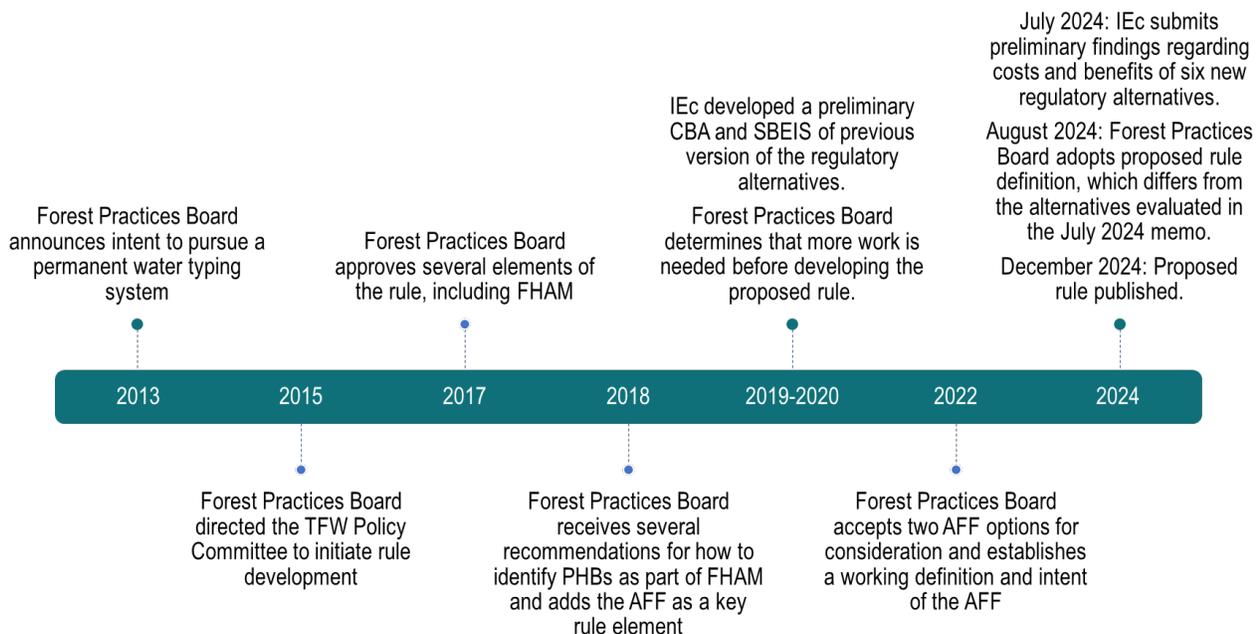
¹ While not providing a specific PHB definition in the rule, the rule describes that PHBs “are typically associated with underlying geomorphic conditions and may consist of natural obstacles that physically limit fish access to upstream reaches or a distinct measurable change in channel, bankfull width or a combination of the two. Natural, non-deformable obstacle PHB includes vertical drops, steep cascades, bedrock sheets and bedrock chutes.”

tribal forestland owners and does not influence streams that have been permanently typed. The rule maintains the current option for landowners to type their streams by referring to a set of DPCs, described in more detail in Chapter 2. The rule also does not affect any of the requirements associated with the outcome of a water typing effort (i.e., the size and composition of riparian buffers, accommodating fish passage on stream crossings, etc.).

1.2 Background on the Rulemaking Process

This section summarizes the history of the water typing rulemaking process that led to the rule that is the subject of this report, drawing heavily on a memorandum by Engel (2024). By providing a historical account, we aim to describe how this Final CBA relates to other economic analyses of rule options conducted to date. Figure 1 further summarizes key events in the process for this rulemaking.

Figure 1. Timeline of Rulemaking Process and Economic Analysis Development



In February 2013, the Forest Practices Board established the intent for a permanent water typing system that would replace that interim water typing system in place since WAC 222-16-031 was promulgated in 2001. In August 2015, the Forest Practices Board directed the TFW Policy Committee to initiate the development of a rule that would meet its various objectives. In May 2017, the board approved several key elements for inclusion in the rule, including the framework for FHAM. The following year, in 2018, the board received recommendations for specific criteria for identifying PHBs when implementing FHAM, as provided by the western and eastern Washington tribes as well as industrial landowners, and also accepted a recommendation from the western Washington tribes to add the AFF to the rule. It was at this stage that the Board directed Washington Department of Natural Resources (DNR) staff to proceed with other requirements for the rulemaking process.

In 2019 and 2020, DNR engaged IEc to develop drafts of a preliminary CBA and SBEIS of the initial version of the regulatory alternatives, which included various criteria for identifying PHBs and the AFF. Through that process, IEc received feedback on its methods, assumptions, data sources, and findings from various groups and individuals, including timber industry representatives, conservation interests, tribes, and other state agencies, including the Washington Department of Fish and Wildlife (WDFW) and the Washington Department of Ecology (Ecology).

Since then, the Forest Practices Board revisited the regulatory alternatives. In August 2022, the Board approved two new specifications of the AFF for consideration and, in November 2022, provided a working definition and purpose of the AFF. Following acceptance of three potential PHB options and two AFF alternatives, DNR engaged in detailed spatial analysis to identify the effects of the PHB and AFF options on the expected locations of the Type F/N breakpoints relative to the current water typing methods under the interim rule.

In spring 2024, the Forest Practices Board engaged IEc to develop economic analyses of six new regulatory alternatives, two alternatives for the criteria used to establish the AFF each paired with three options for PHBs that would be part of the FHAM survey protocol. IEc shared with stakeholders a memorandum detailing how it intends to perform the CBA and requested and received comments on its proposed methods, data sources, and assumptions (dated March 27, 2024). Subsequently, IEc prepared a memorandum for the Forest Practices Board with preliminary findings regarding the costs and benefits of each alternative for consideration during the Board's August 14, 2024 meeting (hereafter "July 2024 Preliminary Analysis Memorandum" or IEc 2024).

At a follow up meeting on August 28, 2024, the Forest Practices Board voted to include a broad definition of the AFF and PHBs in the rule and to exclude from rulemaking specific criteria for defining both the AFF and PHBs. The Board elected to provide landowners with guidance on how to determine whether a proposed forest practices activity is within the AFF and how to identify PHBs when applying FHAM protocol surveys into Board Manual Section 23 (see Section 1.1 for details). As such, the proposed rule, published in December 2024, differed from the six alternatives evaluated in the July 2024 Preliminary Analysis Memorandum. The final rule is consistent with the proposed rule.

This CBA evaluates the probable costs and benefits of the final rule as defined by the Board in August 2024. It does not include analysis of the six regulatory alternatives that were the subject of the July 2024 Preliminary Analysis Memorandum given the ultimate scope of the final rule. Given the final rule is consistent with the proposed rule, this Final CBA is not substantively changed from the Preliminary CBA that was made available with the proposed rule.

1.3 Framework for the Economic Analysis

This section summarizes our approach to evaluating the probable incremental costs and benefits of the rule as well as the geographic scale and timeframe for analysis. For framework and methods topics for which Washington State guidance and requirements are not prescribed, we follow best practices in regulatory cost benefit analysis.

1.3.1 Focus on Identifying Probable Effects of the Rule

This analysis assesses costs and benefits that are "probable" effects of the rule, consistent with RCW 34.05.328. To determine whether an effect is "probable," we employ logic to ensure consideration of those costs and benefits that can be considered likely outcomes of the rule. Where we determine the effect is likely, we then consider if information is available to provide perspective on the magnitude of the effect. According to RCW 34.05.328, the objective of the CBA is to determine whether the probable benefits of the rule outweigh the probable costs, *taking into account both quantitative and qualitative impacts*. This framing underscores the importance of a comprehensive weighing of all probable cost and benefit categories regardless of whether they are quantified or monetized. In this analysis, the weighing of probable benefits and costs is qualitative. This is justified by the limited changes in process relative to current (i.e., baseline) conditions as well as no change in the outcomes of water typing efforts.

1.3.2 Focus on Incremental Effects

We evaluate the incremental costs and benefits for the rule by comparing water typing in Washington under two scenarios: the world with the rule and the world without the rule. The world without the rule reflects the regulatory baseline for the analysis. An important aspect of the baseline is the current practices for determining water types under the interim rule. It also includes current and expected future industry practices with respect to water typing approach and implementation.

1.3.3 Geographic Scope and Scale

The main objective of this analysis is to determine statewide effects of the rule. Accordingly, we do not offer site-specific information. In some cases, we present data separately for western Washington and eastern Washington, where the dividing line between the two is the summit of the Cascade Mountains. Where feasible, this analysis also quantifies and summarizes conditions by ecoregion as a means of describing where the effects of the rule may be concentrated.

1.3.4 Analysis Timeframe

The incremental costs and benefits begin to accrue as soon as the rule is implemented, which we define as when the AFF is established and landowners begin implementing FHAM, and will persist as long as the rule is in effect. Where feasible, the analysis evaluates economic costs and benefits over a 55-year time period between the year the rule will take effect (estimated to be 2025) through 2079. This timeframe is tied to average harvest rotations in eastern Washington and balances the need to capture the important benefits of the rule that grow over time (i.e., ecological benefits), with increasing uncertainty regarding the socioeconomic and biophysical state of the world over longer timeframes.

1.4 Organization of the Report

The analysis in the chapters that follow addresses the requirements of RCW 34.05.328 and RCW 19.85. In Chapter 2, we characterize the baseline that serves as a point of comparison to the rule, including how water typing is conducted absent the rule and the extent of streams that may be typed in the future. We assess the probable effects of the rule in Chapter 3, evaluating and weighing the resulting incremental costs and benefits. Finally, in Chapter 4 we consider impacts of the rule on small businesses and provide information that is typically required in an SBEIS. The report also includes an appendix that summarizes information about the values people place on fish presence.

Although this analysis attempts to mirror the terms and wording of the final rule, no attempt is made to precisely replicate the regulatory language and readers are cautioned that the actual finalized regulatory text, not the text of this analysis, is binding.

CHAPTER 2 | Regulatory Baseline

This chapter defines and characterizes water typing in forestland across Washington State in the baseline (i.e., the “world without the rule”). Section 2.1 describes the water typing options available to regulated landowners and provides context on how these options are currently implemented across landowner groups. Section 2.2 relies on the best available information to estimate the number of stream miles that may be subject to water typing in the future and the portion that may be typed using a survey method. The baseline scenario described in this chapter represents the reference against which the incremental effects of the rule are assessed in Chapter 3.

2.1 Water Typing Under the Interim Rule

This section describes how water typing is currently implemented under the interim rule, including the options available to landowners, the number and distribution of water typing efforts conducted each year, and the extent of electrofishing in the baseline.

2.1.1 Baseline Processes for Water Typing

Water Typing Options Available to Landowners

To submit a Forest Practices Application (FPA) to DNR for harvest and other forest-based activities, the landowner must note if and what type of water exists on their property using one of the two methods described in the interim rule (WAC 222-16-031):

- (1) Use of DPCs of the stream for the assumption of fish habitat (i.e., particular levels of gradient or bankfull width); or
- (2) Implementation of a protocol survey that involves electrofishing to determine if fish are present.

The first method, use of DPCs, requires visual inspection of the stream segments and can be implemented by the landowner. The second method, use of a protocol survey, is expected to be more reliable than the first method and is generally undertaken by a hired survey firm. On average, surveyors charge landowners approximately \$2,000 per survey effort. The primary driver of costs is the distance surveyors need to travel to the field site.² Survey companies describe that the amount of electrofishing employed during a survey is not a significant contributor to surveying costs.

Board Manual Section 13 provides overarching guidance for implementing protocol surveys, which allows for significant discretion and professional judgement during implementation (Washington Forest Practices Board 2002). Over time, surveyors’ approach to conducting surveys has evolved to limit the use of electrofishing. According to industry experts interviewed, surveyors currently use the best available data on known fish presence to identify where they are likely to find the upper extent of fish habitat.³ This includes the use of topographical maps identifying fish habitat and other maintained data sources on observed fish presence. From this point, surveyors visually identify features in the stream that may function as “breaks” in fish habitat, then implement electrofishing to determine if fish are present above these points. Before implementing a survey in the field, surveyors are also required to notify all interested parties (including the state, tribes, and landowners)

² IEc calculation based on personal communication with representatives from West Fork Environmental on May 1, 2024; personal communication with representatives from Terrapin Environmental on May 22, 2024.

³ IEc interviews with representatives from West Fork Environmental on May 1, 2024, Terrapin Environmental on May 22, 2024, and staff from the DNR’s Small Forest Landowner Office on June 18, 2024.

about their planned survey approach. As part of this process, interested parties can provide additional data regarding fish use to inform where the survey effort should begin.

A document published by DNR's superintendent suggested that surveyors should use visual cues for identifying the likely end of fish habitat, as opposed to only fish presence, to determine where the F/N breakpoint occurs (Young 2002). While the memorandum represents neither a regulatory requirement nor official Board-approved guidance, industry practices adapted based on these recommendations.⁴ This represents another important aspect of industry practices absent the rule.

Permanent Water Typing

Only Type F/N breakpoints identified based on protocol surveys result in a permanent update to the water type map maintained by the DNR, which provides landowners with greater certainty in terms of forest management restrictions, for example on road crossing construction and timber harvests.⁵ To initiate the process of permanently typing a stream, referred to as concurrence, landowners submit Water Type Modification Forms (WTMFs) to DNR, for review by a four-person TFW Review Committee (including a representative each from DNR, Ecology, WDFW, and tribes) in the relevant region.

The main role of the TFW Review Committee is to ensure the landowner correctly applied the protocol survey by reviewing details about the survey administration and findings. Each region has a unique process for verifying surveys. In the Pacific Cascades region, approximately 95 percent of WTMFs are concurred via a brief monthly meeting among the TFW Review Committee which does not involve a significant time investment.⁶ For the remaining 5 percent of WTMFs, some or all of the TFW Review Committee participate in 1-2 field verification visits (of 1-2 days per visit) at the survey site.

2.1.2 Baseline Number and Distribution of Water Typing Efforts

There is no readily available data describing how many water typing efforts are implemented each year under each method available through the interim rule. To provide context, we reviewed data maintained by DNR on FPAs and WTMFs submitted over the a recent five year period (2019 to 2023).⁷ DNR's data show an average of approximately 3,700 FPAs submitted each year for timber harvest, road construction, and/or aerial chemical spraying (see Table 1).⁸ Only a sub-set of all submitted FPAs required new water typing efforts, because some of the streams on lands with planned forest practices were surveyed previously and/or are permanently typed. The data are not maintained in a format that readily enables determination of which portion of FPAs required new water typing.

DNR's data also identifies an average of approximately 660 WTMFs submitted annually (see Table 1). WTMFs typically rely on new protocol survey efforts although often include the results of multiple surveys per form. While these data do not provide precise information on the total number of survey efforts conducted each year, they suggest there are *at least* 660 protocol surveys completed each year and *no more than* 3,700 total surveys across both methods.

⁴ Personal communication with DNR on October 22, 2024.

⁵ There are exceptions. For instance, in eastern Washington implementing a protocol survey may not be possible for streams that are underground. In these cases, water typing via DPCs can serve as the basis for permanently typing a stream. (Personal communication with DNR on April 23, 2024)

⁶ Personal communication with DNR (Pacific Cascades Region) on June 4, 2024.

⁷ Data provided by DNR via email on various dates in May and June 2024.

⁸ An FPA can include multiple forest-based activities in a single application (e.g., road construction may be necessary to access timber for harvest). IEC's analysis of data provided by DNR finds that approximately 85 percent of all submitted FPAs include timber harvest.

Table 1. Number of Forest Practices Applications (FPAs) and Water Type Modification Forms (WTMFs) Submitted to DNR (2019-2023)

Species	Number of FPAs Submitted for Timber Harvest, Road Construction, Aerial Spraying	Number of WTMFs Submitted	Number of Permanently Typed Stream Miles Associated with Submitted WTMFs
2019	3,905	855	658
2020	3,896	592	408
2021	4,116	743	664
2022	3,490	501	527
2023	3,263	592	378
Average	3,734	657	527
Median	3,896	592	527

Sources: Summary of data provided by DNR via email on various dates in May and June 2024.

The WTMF data also finds that an average of approximately 530 stream miles are permanently typed each year (see Table 1). Representatives of the water typing industry describe that nearly all protocol surveys they implement result in submission of a WTMF.⁹ Therefore, we expect that approximately 530 stream miles are surveyed using protocol survey methods each year. Given the use of DPCs does not result in permanent water typing, data are not currently available in a format that would enable providing analogous information for the extent of streams typed using DPCs.

The choice of water typing method varies by landowner type. Based on interviews with water typing industry representatives, we found that large private landowners typically rely on protocol surveys.¹⁰ Individuals that support small forest landowners (SFLs) with their water typing assert that these entities are more likely to rely on DPCs due to costs, potentially using a survey approximately 20 percent of the time.¹¹ Others familiar with SFL water-typing practices believe the percent is likely less.¹² Interviews also reveal that state agencies tend to rely on DPCs as well and may only use protocol surveys with electrofishing during at most 10 percent of water typing efforts.¹³ While we did not interview land managers among local municipalities, we anticipate they apply survey methods with the same relative frequency as state land managers. Figure 2 summarizes findings from these conversations and conveys the approximate distribution of surveys across each available method by regulated landowner type.

⁹ Personal communication with representatives from West Fork Environmental on May 1, 2024; personal communication with representatives from Terrapin Environmental on May 22, 2024.

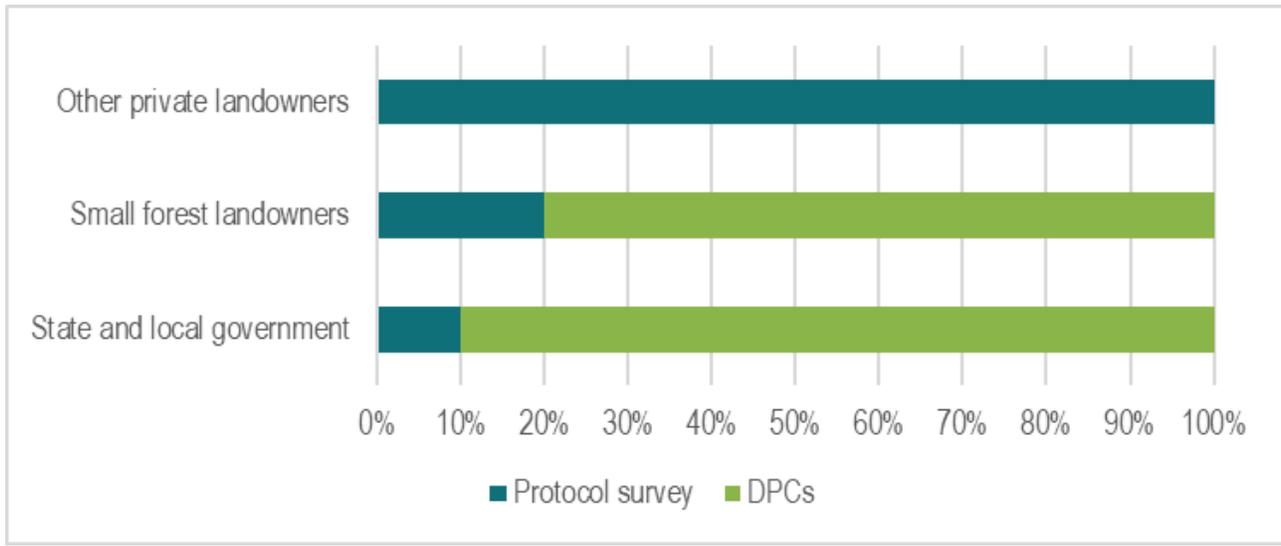
¹⁰ *Ibid.*

¹¹ Personal communication with representatives of DNR's Small Forest Landowner Office on June 12, 2024.

¹² Personal communication with representatives of the Economics Working Group on October 3, 2024.

¹³ Personal communication with a representative of DNR State Lands on May 30, 2024. While there are limited other state agencies that engage in water typing, we do not expect the relative ratio of water typing conducted via DPCs and surveys to differ significantly.

Figure 2. Distribution of Water Typing Method Employed by Landowner Type Under Interim Rule



Source: IEC estimates based on communication with members of the stream survey industry, state land managers that participate in water typing, and DNR representatives that provide water typing support to SFLs. See footnotes in the main text for more details.

2.1.3 Baseline Extent of Electrofishing During Protocol Surveys

As described above, current practice among surveyors limits the use of electrofishing during protocol survey implementation. Per Board Manual Section 13, above documented fish habitat, visual surveys and professional judgement can be used to identify areas further upstream of known occupancy where fish are likely to be present (Washington Forest Practices Board 2002). Past that point, survey effort should include shocking in at least 12 high quality pools within a given reach to demonstrate the absence of fish. However, according to two industry leaders, stream typing surveys often take a different approach.¹⁴

Specifically, industry experts interviewed describe an approach that similarly begins at the point of last known fish. From that point, the surveyor may assume fish presence in areas upstream until he or she identifies a likely physical barrier or characteristics of the stream that suggest fish are unlikely to be present. The surveyor then moves upstream of the identified barrier or habitat break, identifies areas (e.g., deep pools) where fish are likely to be, and then conducts electrofishing. If fish are found, then the process is repeated. Alternatively, rather than moving above an identified barrier, surveyors may conduct electrofishing along the reach to confirm presence of fish up to the barrier.¹⁵

To understand the current use of electrofishing during protocol surveys, we analyzed the last five years of available WDFW Scientific Collection Permit data (2019-2023).¹⁶ Any individual wishing to conduct electrofishing in the state must obtain a Scientific Collection Permit from WDFW, with a single annual permit covering all activities for the year, then annually report on activities undertaken under the permit. These data

¹⁴ This approach is commonly referred to as “Fish-Plus” and aligns with the process described in Weyerhaeuser’s technical guidance for conducting protocol surveys.

¹⁵ Personal communication with representatives from West Fork Environmental on May 1, 2024; personal communication with representatives from Terrapin Environmental on May 22, 2024.

¹⁶ Scientific Collection Permit reporting data provided by WDFW on May 30, 2024.

identify that at least 190 permits are issued on average each year for electrofishing in Washington State, although not all permits are used for water typing purposes.¹⁷

Scientific Collection Permit reporting data provided by WDFW identify the number and species of fish electrofished during each survey event. With input from WDFW, we reviewed the data to determine which reported electrofishing events were associated with water typing for forest practices purposes based on the permittee and project title. For one high-activity permit holder, Weyerhaeuser, it was not possible to conclusively distinguish between survey events that were for forest practices versus other activities. Therefore, we provide both a “low-end” and “high-end” estimate of the number of fish counted during electrofishing conducted as part of survey efforts by including and excluding this permit holder. For both the low- and high-end estimates, we calculate the annual average number of fish per species surveyed between 2019 and 2023. Using these data, we calculate between approximately 820 and 3,700 fish electrofished annually during water typing surveys (see Table 2).

The species most likely to be identified in electrofishing surveys is cutthroat trout (74 percent within the low-end estimate and 35 percent within the high-end estimate). Other trout species, including rainbow trout, are also identified with relatively high frequency. Coho salmon and other species are found during electrofishing, although in much lower numbers. Pairing these data with the number of stream miles associated with protocol surveys presented in Section 2.1.2 (i.e., about 530 stream miles per year on average), we estimate between 1.6 and 7.0 fish experience electrofishing per stream mile surveyed each year.

Table 2. Baseline Average Number of Fish Electrofished Per Year During Protocol Surveys

Species	Low-End	High-End
Coho Salmon	31	489
Cutthroat Trout	608	1,303
Rainbow Trout/Steelhead	145	1,042
Unidentified Salmonid Species	13	13
Unidentified Trout Species	13	816
All other species	14	20
Total	824	3,682

Sources: IEc analysis of WDFW Scientific Collection Permit data provided by email on May 30, 2024.

Notes: This analysis considers both a “high-end” estimate that includes all survey conducted by Weyerhaeuser, which overestimates the number of fish electrofished in the course of water typing surveys, and a “low-end” estimate that excludes them, which underestimates the affected fish. See text for details.

¹⁷ Other use cases for electrofishing permits include research as well as catch and relocation of fish in preparation for restoration.

2.2 Extent of Waters Subject to Future Water Typing

To assess the extent of waters that may be surveyed in the future under the baseline absent the rule, we assembled various data sources. The best available information regarding the distribution of Type F and Type Np streams that would occur under the interim rule survey options is DNR’s Hydrography – Watercourses (WC Hydro) GIS Open Data.¹⁸ From this layer, we removed various streams not subject to the future implementation of the interim rule, including:

- 1) permanently typed streams,¹⁹
- 2) stream segments marked as “shorelines of the state,”²⁰ and
- 3) stream segments overlapping federal and tribal land.²¹

To identify the subset of remaining streams where water typing surveys may be implemented in the future, we remove streams where forest practices are *less likely* (although not necessarily unallowed). These areas include:

- 1) streams abutting unstable slopes,²²
- 2) forest within portions of northern spotted owl habitat,²³ and
- 3) conservation land.²⁴

The rationale for removing these areas is that landowners are unlikely to pursue water-typing for harvest purposes within these areas specifically.²⁵ There may be other reasons that a landowner would not type their streams in the future, for instance because they are part of a conservation easement that precludes harvest or because they have no intention of harvesting their timber. This analysis makes use of available spatial data that provides some information about the extent of forestland where harvest is unlikely but is unable to account for all possible reasons future water typing may not occur on a given stream segment.

This analysis identifies nearly 54,000 stream miles with potential future water typing effort, including 40,000 in western Washington and 13,000 in eastern Washington (see Table 3). Within western Washington, nearly half of all identified stream miles are in the Coast Range ecoregion. While DNR’s WC Hydro represents the best available information about the extent of streams in Washington, it remains incomplete, particularly for smaller

¹⁸ The WC Hydro layer is available at <https://data-wadnr.opendata.arcgis.com/> and was downloaded on May 17, 2024 for use in this analysis.

¹⁹ Permanently typed streams are identified in WC Hydro. See footnote 18 for details.

²⁰ Shorelines of the state are identified in WC Hydro. See footnote 18 for details.

²¹ Federal and tribal land is identified using spatially explicit landownership data from Atterbury Consultants sent to IEc by DNR for analysis on February 26, 2024.

²² We identify unstable slopes using DNR’s Landslide Susceptibility Index (LSI) spatial layer available at <https://data-wadnr.opendata.arcgis.com/>. Downloaded on May 17, 2024. We note that the LSI layer may under-estimate the extent of unstable slopes where harvest may be unlikely because the database is a work in progress. The layer also has the potential to over-estimate the distribution of unstable slopes because it relies on an interpolation model that has not been fully field-verified. On net, it is uncertain whether this layer identifies too many or too few stream segments abutting slopes where harvest is not likely.

²³ The Northern Spotted Owl habitat layer was provided by DNR on June 4, 2024. As advised by DNR, we only excluded areas within old forest, sub-mature forest, and young forest marginal northern spotted owl habitat. Harvest is more likely in other parts of northern spotted owl habitat.

²⁴ We identify conservation land using the U.S. Geological Survey (USGS) Gap Analysis Project, 2024, Protected Areas Database of the United States 4.0: USGS data release, <https://doi.org/10.5066/P96WBCHS>. Downloaded June 5, 2024.

²⁵ While a landowner is unlikely to harvest in these areas and therefore unlikely to survey for the purposes of submitting a FPA, it is still possible that survey efforts along other stream segments will identify F/N breakpoints upstream or downstream that will result in permanent water-typing within areas where harvest is unlikely. In other words, forest practices activities outside of these areas may still influence whether these stream miles are typed in the future.

Type Np streams. Accordingly, the total extent of stream remaining to be typed in the state is most likely greater than this estimate.

WC Hydro also models F/N breakpoints using a computer modeling approach. Assuming those breakpoints represent where the F/N breakpoint would occur absent the rule (i.e., in the baseline), we identify approximately 72,000 breakpoints across these stream miles (see Table 3). Again, the majority of these breakpoints are found in the Coast Range ecoregion. When combined with the number of stream miles that could be typed in the future, there are approximately 1.1 breakpoints on average per stream mile.

Table 3. Total Number of Stream Miles and F/N Breakpoints with Potential Future Water Typing Efforts

Ecoregion	Stateside	Total Number of Stream Miles	Total Number of F/N Breakpoints
Blue Mountains	East	15	21
Cascades	West	8,995	8,355
	East	20	13
Coast Range	West	20,035	39,888
Columbia Plateau	East	1,184	1,252
Eastern Cascades Slopes and Foothills	East	1,845	1,545
	West	3,724	3,026
North Cascades	East	2,123	1,695
	West	8,285	6,619
Northern Rockies	East	8,285	6,619
Puget Lowland	West	7,109	9,393
Willamette Valley	West	297	29
West		40,158	60,691
East		13,472	11,145
Statewide		53,630	71,836

Source: IEc analysis using WC Hydro and various data sources described in the main text.

As described in Section 2.1.1, only some of these stream miles are likely to be surveyed using protocol surveys in the future. To estimate the portion of the total stream miles from Table 3 where protocol surveys, and therefore electrofishing, may occur in the future, we rely on information about the distribution of landowner types across these stream miles because the likelihood of applying a protocol survey over the DPCs varies by landowner type. To accomplish this, we calculated the landowner composition of streams using Atterbury Consultants' land ownership data and determined the percent of private land owned by SFLs using the 2019 Washington State Forestland Database.^{26,27} Table 4 presents the percent of stream miles by landowner type. As shown, the distribution varies significantly across ecoregions, and most of the total stream miles potentially subject to future typing occur on private land.

²⁶ For information on the Atterbury landownership data, see footnote 21. We made the following groupings using the Atterbury data: state, local (city and county), private (private, real estate investment trusts (REIT), and timber investment management organizations (TIMO)) and other (conserve, IFPC, lake, lender, port, river, and utility).

²⁷ The Washington State Forestland Database comes from the Natural Resources Spatial Informatics Group at the University of Washington School of Environmental and Forest Sciences. More about these data is available here: <https://nrsig.org/projects/small-forest-landowner-regulatory-impacts>. DNR provided these data on February 27, 2024.

The distribution of stream miles by landowner type (Table 4) is combined with the information about the probability of employing a protocol survey by landowner type (see Figure 2) to estimate the portion of total stream miles where protocol surveys may be employed in the future. When combining this information, we find that approximately 64 percent of the total stream miles available for future water typing are likely to be typed using a protocol survey (rightmost columns in Table 4). The ecoregions with the highest proportion of stream miles with likely protocol surveys include Coast Range and Cascades, where over 70 percent of stream miles may be subject to protocol surveys in the future. Across the entire state, this method identifies approximately 34,000 stream miles may be typed using a protocol survey in the future.

Table 4. Distribution of Stream Miles with Potential Future Water Typing Effort by Landowner Type, and Estimated Portion of Stream Miles Where Protocol Surveys May Be Employed in the Baseline

Ecoregion	Stateside	Landownership Distribution					Streams That May Be Subject to Protocol Surveys in the Baseline	
		State	Local	Private, SLF	Private, other	Other	% of Total Steams	Miles of Streams
Blue Mountains	East	0%	0%	67%	29%	4%	46%	7
Cascades	West	18%	2%	11%	56%	14%	74%	6,642
	East	11%	0%	11%	48%	30%	81%	16
Coast Range	West	14%	2%	12%	61%	11%	76%	15,225
Columbia Plateau	East	44%	0%	26%	28%	2%	40%	470
Eastern Cascades Slopes and Foothills	East	53%	2%	30%	11%	3%	26%	484
	West	43%	5%	4%	17%	30%	53%	1,976
North Cascades	East	39%	4%	31%	19%	7%	36%	767
	West	11%	1%	45%	24%	19%	53%	4,404
Puget Lowland	West	12%	4%	37%	35%	11%	55%	3,918
Willamette Valley	West	2%	1%	52%	42%	3%	56%	166
West		17%	3%	16%	51%	13%	70%	27,926
East		24%	1%	39%	22%	13%	46%	6,147
Statewide		19%	2%	22%	44%	13%	64%	34,074

Source: IEc analysis using WC Hydro and various data sources described in the main text.

Notes: To estimate the portion of stream miles subject to future water typing, we assume state and local municipalities rely on protocol surveys 10 percent of the time, SFLs 20 percent of the time, and other private landowners and all other landowners 100 percent of the time. See Figure 2.

CHAPTER 3 | Incremental Costs and Benefits of the Final Rule

This chapter describes the incremental effects of the rule, which are evaluated relative to the baseline conditions presented in Chapter 2. Section 3.1 provides an assessment of whether and to what extent the rule is likely to result in changes in the water typing process as well as the outcomes of survey efforts. Sections 3.2 and 3.3 translate any changes into incremental costs and benefits of the rule, respectively. The chapter concludes with a weighing of the probable benefits and costs attributable to the rule (Section 3.4) and a discussion of uncertainty (Section 3.5). Table 5 provides a high-level summary of the findings of this chapter discussed in greater detail in the sections that follow.

Table 5. Summary of Findings Related to the Effects of the Rule and Resulting Categories of Probable Costs and Benefits

Potential Effect of the Rule Evaluated	Finding of the Analysis	Incremental Costs	Incremental Benefits
Potential changes in water typing process			
Landowner choice of water typing method (i.e., use of DPCs versus protocol survey)	No effect of the rule	None	None
Effort devoted to water typing and concurrence	The rule is unlikely to result in changes in effort devoted to water typing and concurrence relative to current conditions but reduces the potential for subjectivity when classifying stream water type	None	Regulatory certainty regarding appropriate process for water typing
Extent of electrofishing during FHAM implementation	The rule is unlikely to change the extent of electrofishing relative to current survey implementation but reduces the risk for the potential increase in electrofishing in the future	None	Reduced risk of potential fish harm by codifying limits in electrofishing during protocol surveys
Potential changes in water typing outcomes			
Change in the expected location of F/N breakpoints (i.e., change in extent of Type F and Type N streams)	No effect of the rule	None	None

3.1 Effects Generated by the Final Rule

This section describes each potential effect of the rule as well as our determination as to which effects are probable outcomes, leading to costs and benefits. First, in Section 3.1.1, we describe whether the rule results in changes in the process of water typing. Then, in Section 3.1.2, we evaluate whether the rule may change the outcomes of water typing efforts.

3.1.1 Potential for Changes in the Water Typing Process

The rule clarifies and expands the water typing system applied by forestland owners. This analysis therefore evaluates whether the changes are likely to affect how landowners implement water typing in the future relative to water typing implemented under the interim rule. We consider the potential for changes in landowner choice

of water typing method, the effort devoted to water typing or concurrence, as well as the extent of electrofishing employed during surveys.

Landowner Choice of Water Typing Method

The rule replaces the protocol survey method described in the interim rule (WAC 222-16-031) with the more specific FHAM survey protocol. It also leaves open the option to continue typing streams using the DPCs. The rule does not, however, compel landowners to use one water typing option over the other. Given that cost is the primary reason some landowner types apply DPCs, and it unlikely there is a cost difference between the interim protocol survey and the FHAM protocol survey (see below), we conclude that the rule is unlikely to change a landowner's choice of water typing method. In other words, landowners that would select a survey method absent the rule are likely to employ FHAM under the rule while landowners likely to use the DPCs under current conditions are likely to continue doing so. Therefore, the distribution of water typing method employed by landowner type in the baseline described in Figure 2 is likely to remain constant under the rule.

Effort Devoted to Water Typing and Concurrence

One of the objectives of the rule is to reduce the potential for subjectivity when identifying the Type F/N breakpoint through the addition of the AFF and prescribing steps as part of FHAM. As described in more details below, our analysis identifies that water typing implementation is unlikely to change relative to current industry practices. However, by codifying these practices in the WAC, the rule reduces the potential for industry to diverge from its current methods in the future. We evaluated three mechanisms through which water typing implementation and the concurrence process may change relative to current conditions and found that the rule is unlikely to result in incremental effort during these processes. These three potential mechanisms and the outcomes of our assessment are described below.

- **Potential for change in effort during to implement the FHAM protocol surveys relative to surveys implemented in the baseline.** Discussions with DNR reveal that the steps associated with FHAM in the rule are intended to codify current industry practices.²⁸ Interviews with entities that represent approximately 95 percent of the survey efforts that resulted in electrofishing over the last five years confirmed their approach closely mirrors what is described for FHAM, including using the best available information to demark the end of known fish use, as well as the use of PHBs to determine where electrofishing should begin. It is possible the Board Manual Section 23 will provide more specific information about how to identify PHBs; the manual has not yet been developed for comparison with what surveyors use now. However, any text included in the manual is intended to provide guidance and is not regulation. By including a generic definition of PHBs, the rule does not require a change in effort among surveyors to learn about and employ PHB criteria that differ from the PHBs they employ in the baseline. Additionally, as described in Section 2.1.1, stream surveyors identified that the primary driver of water typing survey costs is the distance surveyors need to travel to reach the site; the amount of electrofishing and nature of PHBs were not identified as primary drivers of the survey costs. Therefore, the rule is unlikely to result in additional effort or cost to implement FHAM relative to the baseline protocol surveys.
- **The potential for decreased survey effort given the addition of the AFF.** The rule states that only streams above the AFF should be surveyed, meaning any stream that falls within the AFF would no longer require typing through a survey or the DPCs. The definition of the AFF included in the rule refers to “the measurable physical stream characteristics downstream of which anadromous fish habitat is presumed” and refers surveyors to the Board Manual Section 23 for guidance on how to identify the

²⁸ Personal communication with DNR on April 30, 2024.

AFF. As described in Section 2.1.1, surveyors currently rely on all available information to determine known fish use within streams before establishing the starting point for their survey, including information from the state and tribes. Because the rule does not offer a specific definition of what constitutes the “measurable physical stream characteristics,” surveyors are likely to continue using the same information as the basis for identifying the point at which the survey effort should begin, at least at the outset of rule implementation. While the addition of the AFF represents a significant procedural change relative to the language included in the interim rule, by providing a broad definition of the AFF, the rule is generally unlikely to change where surveyors commence their surveying and therefore the number of stream miles subject to surveying in the future.

- **The potential for changes in concurrence effort given both the AFF and FHAM.** Because we find that the rule is unlikely to change the number of stream miles subject to water typing in the future, there is no reason to expect a change in the number of stream miles for which landowners are likely to pursue permanent water typing. Further, the concurrence process itself is unaffected by the rule, and the addition of the AFF and FHAM are unlikely to measurably change the effort that the TFW Review Committee devotes to the concurrence process.

Extent of Electrofishing During Survey Implementation

The second objective of the rule is to reduce the use of electrofishing during survey implementation. To accomplish this, the rule does two things 1) precludes surveying within known fish habitat by establishing the AFF and 2) prescribes specific steps for implementing FHAM including the reliance on the location of PHBs for determining where electrofishing can occur. Relative to the text of the interim rule, the rule is significantly more prescriptive about where electrofishing should occur and therefore reduces the risk of potential future increases in electrofishing. However, the rule does not diverge from current industry practices.²⁹ These two ways in which the rule could reduce electrofishing are described below.

- **The potential for reduced electrofishing within the AFF.** The rule defines the AFF as “the measurable physical stream characteristics [...] upstream of which the DPCs or a protocol fish survey under FHAM may be applied.” Therefore, a landowner or surveyor may not conduct electrofishing within the AFF because FHAM, which includes the use of electrofishing, should not be implemented. Under current practices, surveyors already use available information about known fish use when determining where a survey should commence. This means that surveyors do not electrofish within known fish habitat in the baseline. The rule does not provide new information about what constitutes an AFF and therefore is unlikely to change where a surveyor starts a survey that relies on electrofishing. The rule, however, does reduce the need for electrofishing across the extent of the AFF and has the potential to reduce future electrofishing as a result.
- **The potential for reduced electrofishing during FHAM implementation.** The rule offers four steps for implementing fish protocol surveys via FHAM. As part of the process, electrofishing should only occur directly above PHBs, not along an entire stream length. When implementing surveys above areas of known fish use, surveyors already rely on physical attributes of the stream to determine where to conduct electrofishing. The rule does not provide new information that a surveyor would use to determine the location of a PHB and therefore change where electrofishing occurs. Although we find that surveyors already limit electrofishing effort under baseline protocol survey methods, codifying the need to limit electrofishing as described in the FHAM protocol reduces the risk that surveyors may

²⁹ Based on interviews with multiple industry and agency experts in water typing surveys conducted in May and June 2024 and analysis of Scientific Collection Permit reporting data provided by WDFW on May 30, 2024.

increase the use of electrofishing in the future. Under the baseline interim water typing rule, increased electrofishing would not be precluded as it will be under the FHAM protocol.

3.1.2 Potential for Changes in the Outcomes of Water Typing

The rule was not developed with the intent of changing outcomes of water typing surveys (i.e., the location of the identified Type F/N break). Accordingly, adding or reducing the extent of Type F stream is not an intended outcome of the rule. However, we consider the potential for unintended changes in the extent of Type F streams relative to the baseline resulting from both the AFF and the implementation of FHAM. Differences in the extent of Type F stream under the rule in turn would influence the size of the riparian buffer as well as the requirements and constraints on activities within the riparian buffer for Type F versus Type N streams in accordance with existing Forest Practices regulations.

Water Type Within the AFF

All streams included in the AFF will be Type F under the rule. To assess whether this represents a change relative to the baseline, we considered how these streams would be typed using baseline water typing methods. As described in Section 2.1, surveyors do not survey within known fish habitat because these are presumed to be Type F streams. Because the definition of AFF in the rule is similar to how a surveyor would determine the upper extent of fish habitat now (i.e., “the measurable physical stream characteristics downstream of which anadromous fish habitat is presumed”), there is no reason to expect that the definition of the AFF included in the rule is likely to result in changes in the extent of Type F stream.

Water Type Outside of the AFF

Beyond the AFF, we also assess whether implementing FHAM may identify a different location of the F/N breakpoint relative to where it would be identified under the baseline. If the F/N breakpoint identified is upstream under the rule as compared with baseline water typing practices, the length of Type F streams is increased and the length of Type Np streams is reduced; where the F/N breakpoint identified is downstream under the rule as compared with baseline practices, the length of Type F streams is reduced and the length of Type Np streams is increased.

The mechanism through which FHAM has the potential to change the location of the F/N breakpoint is through differences in how PHBs are determined via the rule relative to current conditions. For instance, analysis by Four Peaks (2024) demonstrates that specific definitions of PHBs have the potential to occur at different points along a stream. However, the rule specifies a broad definition of PHBs (i.e., “permanent, distinct, and measurable changes to in-stream physical characteristics”) that likely captures all ways in which surveyors are currently identifying, or may identify in the future, the location of habitat breaks during surveys. Therefore, the PHB definition is unlikely to result in differences in how the survey is conducted as well as the outcomes of the survey with respect to the location of the F/N breakpoint.

3.2 Probable Benefits

This section describes the two main categories of benefits stemming from the effects of the rule outlined above, including reduced risk of potential harm to fish (Section 3.2.1) and regulatory certainty (Section 3.2.2).

3.2.1 Reduced Risk of Potential Fish Harm

Section 3.1.1 describes that the rule reduces the risk for the potential future increase in electrofishing, therefore a key benefit of the rule is reduced risk of potential fish harm. Research indicates that electrofishing may cause behavioral changes, reduced growth, and spinal injury to fish. However, studies have shown that despite

electrofishing impacts on individual fish, abundance of salmonid species in small streams remained stable or increased after intensive backpack electrofishing over multiple years (Kocovsky et al. 1997).

The Electrofishing Technical Group (ETG) for the TFW Policy Committee authored a report regarding the use and effectiveness of protocol electrofishing surveys in detecting fish (ETG 2016). The ETG was asked to consider questions related to the efficacy of backpack protocol survey electrofishing and discuss the evidence supporting its conclusions. This evidence included published scientific papers as well as the collective experience of members of the ETG who have strong backgrounds in sampling small streams. Results of the ETG report concluded that:

In most situations, protocol electrofishing surveys are unlikely to result in harmful demographic effects on headwater fish populations as long as appropriate precautions are taken to avoid damage to active redds, damage to instream and riparian habitats, or to cause extensive downstream movement of population members[...]. The electrofishing technique itself does have the potential to harm individuals and eggs exposed to electrical fields. Spinal injuries are most common. The risk of injury can be minimized by employing modern equipment and using settings that are least harmful to fish. (ETG 2016)

Therefore, the best available evidence suggests that the rule is unlikely to result in population-level effects on fish. However, the rule may prevent harm to individual fish. Under the current conditions described in Section 2.1.3, electrofishing for water typing purposes affects hundreds to thousands of fish each year. Given the limited use of electrofishing during survey efforts in the baseline, the rule is unlikely to result in less fish harm relative to these current conditions, although is likely to prevent these numbers from increasing in the future. We are unable to quantify the risk reduction associated with the rule given significant uncertainty about how electrofishing may change in the future absent the rule.

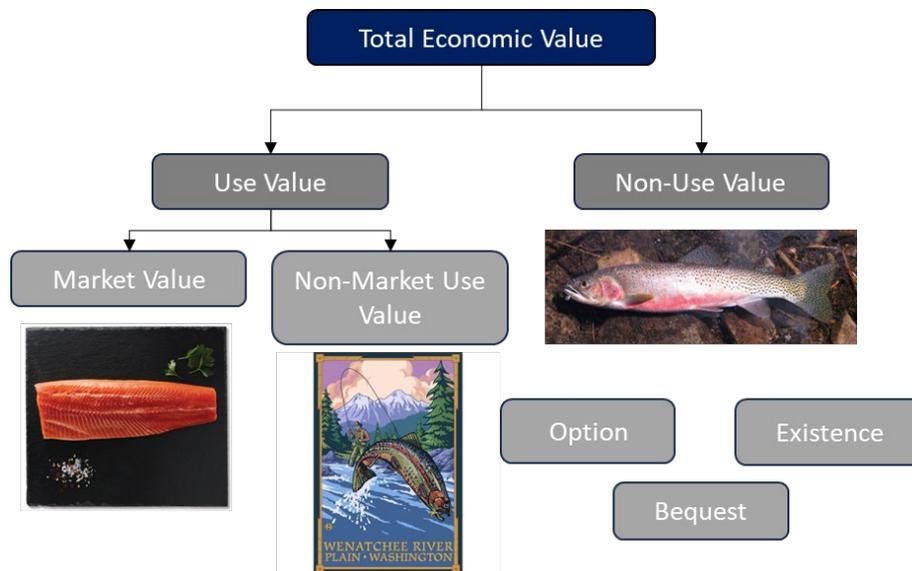
Values for Fish

The relevant economic benefits of this reduced risk are the public's willingness to pay (WTP) to reduce fish harm. To our knowledge, there is no literature evaluating the value that the public holds to avoid harm to fish through reduced electrofishing. However, there is abundant literature demonstrating that people value fish, in particular the species found in streams in Washington that experience electrofishing in the baseline. While much of the literature is focused on population-scale changes in fish abundance, some studies evaluate the WTP for fish population increases *per fish*, which can be more readily applied to this context where the number of affected fish is likely limited.³⁰

From an economic perspective, the "total economic value" (TEV) of a species or ecosystem reflects the full range of contributions the species makes to people's well-being. Value is frequently measured in terms of the public's WTP for the species, inclusive of all use and non-use services. This type of valuation is generally focused on endangered and threatened species. For example, salmon and steelhead provide value to society through multiple pathways that are difficult to disentangle. That is, their TEV has multiple components, and individual members of society may value salmon and steelhead for multiple reasons (see Figure 3).

³⁰ For instance, Layton et al. (1999) reports these numbers for five categories of fish: eastern Washington freshwater species (approximately \$15 per fish in \$2023), eastern Washington migratory species (\$600/fish), western Washington freshwater species (\$27/fish), western Washington migratory species (\$500/fish), and saltwater species.

Figure 3. Components of Total Economic Value (TEV) of a Species



First are the direct use values for which markets exist, namely commercial harvest. Next are the direct use values for which no markets exist, such as recreational fishing. Tribal harvest is unique in that it provides direct use value as both a marketed (commercial fishery) and nonmarketed (subsistence fishery) good. In contrast to the direct uses, which involve extraction, some non-consumptive use values may exist as well, including viewing spring salmon runs by nature enthusiasts. Additionally, the economics literature demonstrates that the public holds significant non-use values for Pacific salmon and steelhead. These types of values (existence, option, and bequest) are common for threatened and endangered species. Studies of the TEV of salmon attempt to capture all of these components of value collectively, though not individually.

Importantly, Pacific salmon and steelhead are part of the spiritual and cultural identity of regional tribes. *As these cultural values cannot be measured in monetary terms, they are not captured in estimates of TEV for the species.* However, it is important to consider the cultural significance of the species in any comparison of costs and benefits of policies affecting the species.

The appendix to this report provides evidence regarding the values people place on fish species of importance in Washington State. It documents studies that evaluate the TEV of the species, information from tribes regarding the cultural significance of the species, economics literature that isolates the non-use value component, and values associated with recreational and commercial fishing.

3.2.2 Regulatory Certainty

Section 3.1.1 also describes that the rule reduces the potential for subjectivity when classifying water types by providing more scaffolding for surveyors, including a definition of where surveys should start and step-by-step instructions for implementing surveys. Therefore, a key benefit of the rule is certainty in how streams will be typed in the future, reducing ambiguity in future implementation. Increasing certainty may translate into more confidence among landowners that the outcome of a survey is unlikely to differ across surveyors. It theoretically

has the potential to streamline the concurrence process, although DNR staff that participate in permanent water typing believe the “peer review” element remains essential for buy in among various stakeholders.³¹

The rule is the result of a long process that started with the publication of the interim water typing rule in 2001 and the Forest Practices Board’s announcement in 2013 that it would commence work developing a permanent water typing rule (see Section 1.2). Since then, there has been significant uncertainty among landowners about what the new water typing system would mean for the process and outcomes of future survey efforts. The rule codifies existing practices and creates flexibility for future improvement by relegating specific definitions of the AFF and the PHBs to guidance contained in the Board Manual. Relative to the uncertainty experienced over more than a decade, the rule provides landowners with assurance about the processes that can be utilized to type their streams in the future.

3.3 Probable Costs

The effects generated by the rule described in Section 3.1 are unlikely to result in incremental costs. This is because we anticipate no change relative to the current process through which streams are typed as well as no change in outcomes of future survey efforts. As previously mentioned, the rule is unlikely to generate an increase in survey costs to landowners or to result in new compliance costs associated with more Type F stream. We also considered the possibility that limiting increases in electrofishing could result in costs to landowners. However, surveyors confirm that the amount of electrofishing that accompanies a survey effort is not a driver of cost.³²

The rule does prompt the need to add guidance to the Board Manual 23 regarding the identification of the AFF and detection of PHBs. While this process will result in more effort among DNR staff and other stakeholders, we do not attribute those administrative costs to the rule given the recurring effort to update the Board Manual, as appropriate, even absent the rule.

3.4 Weighing of Probable Benefits and Costs

This analysis finds that the probable benefits of the rule exceed its probable costs. As described above, the rule generates incremental benefits in the form of reducing the potential for future fish harm and providing regulatory certainty to forestland owners. Neither of these outcomes can be quantified given significant uncertainty about the future and/or data limitations. However, we find that the benefits exceed costs because the rule does not result in incremental costs.

3.5 Key Assumptions and Sources of Uncertainty

The results of this analysis are subject to several key assumptions which introduce uncertainty. In Table 6, we describe the key assumptions associated with our findings as well as the potential magnitude of the effect on our overall estimates.

³¹ Personal communication with DNR (Pacific Cascades Region) on June 4, 2024.

³² Personal communication with representatives from West Fork Environmental on May 1, 2024; personal communication with representatives from Terrapin Environmental on May 22, 2024.

Table 6. Sources of Uncertainty in Assessment of Incremental Effects

Key Assumption or Source of Uncertainty	Direction of Potential Bias	Likely Effect of the Uncertainty on Results
The introduction of the AFF will not change the way that landowners or surveyors determine where to start survey efforts relative to how they conduct surveys now.	Underestimate costs.	Likely minor effect on results. Based on discussions with DNR and surveyors, we assume that the broad definition of the AFF included in the rule will not change where surveyors start surveys and therefore will have no effect on the process for typing streams. By extension, we assume that surveys will continue to identify the F/N breakpoint at the same location they could absent the rule. However, even if future surveys were implemented in these areas (absent delineation of an AFF), the presence of anadromous fish habitat in these stream reaches would mean the surveys would identify the stream as Type F. Thus, this assumption is unlikely to affect future outcomes of water types in Washington.
The addition of the AFF does not result in fewer survey efforts in the future.	Underestimate benefits.	Likely minor effect on results. We assume that establishing the AFF does not result in fewer survey efforts in the future because the definition of the AFF resembles how surveyors identify where to start surveys in the baseline. If the AFF does result in fewer surveys, then the rule would result in a decrease in survey costs for landowners.
The broad definition of PHBs is inclusive of the criteria surveyors use now and therefore is unlikely to result in changes to survey implementation or outcomes relative to how surveys are conducted now.	Unknown. May overestimate or underestimate effects.	Likely minor effect on results. We assume that the broad definition of a PHB in the rule captures the way surveyors identify PHBs during survey implementation absent the rule and therefore is unlikely to result in incremental effects. However, uncertainty exists in what PHBs surveyors will use without prescriptive guidance. As demonstrated in IEC (2024) and Four Peaks (2024), the location of specific definitions of PHB can occur in different points along a stream, including both upstream and downstream of where the F/N breakpoint would occur when implementing a survey absent the rule.

CHAPTER 4 | Impacts on Small Businesses

The Washington Regulatory Fairness Act (RFA), RCW 19.85, requires that DNR prepare an SBEIS if the rule “will impose more than minor costs on businesses in an industry.” Per the SBEIS *Frequently Asked Questions* guidance, agencies are required to consider “costs imposed on businesses and costs associated with compliance with the proposed rules” (Washington Attorney General Office 2021, p. 7). Agencies are not required under 19.85 RCW to consider indirect costs not associated with compliance with the rule. The SBEIS also requires consideration of whether small businesses are disproportionately affected by the costs of the rule.

A complete SBEIS is required if 1) the rule is likely to impose more than minor costs and 2) small businesses are likely to be disproportionately affected. The sections that follow provide justification for why an SBEIS is not required for the rule as defined by the Board. However, for context and transparency purposes, this chapter provides the information that is typically required of an SBEIS, as outlined in the text box.

Required Components of an SBEIS

1. What are the industries and universe of businesses that may incur costs as a result of this rule?
2. What are the likely costs of the rule to those businesses?
3. Are those costs resulting from the rule anticipated to be more than minor?
4. Will the rule disproportionately affect small businesses?
5. What steps has the agency taken to reduce the costs of the rule on small businesses?
6. How has the agency involved small businesses in the development of the rule?
7. How many jobs may be created or lost as a result of compliance with the rule?

4.1 Small Businesses in Relevant Industries

The rule directly regulates owners of forestland immediately adjacent to water. In some cases, these forestland owners are businesses; in other cases, these landowners are private individuals and public entities, including state and local government. Analysis by the U.S. Endowment for Forestry and Communities reports that about 43 percent of all forestland in Washington is privately owned, and approximately half of that is owned by private corporations (Alvarez, n.d.). Even among the forestland owners that are incorporated as private businesses, they likely span a wide variety of industry classifications given the diversity of ways that forestland is used for business purposes. For example, due to recent interest in holding forestland as a financial asset, financial institutions (including TIMOs and REITs) are among the industry types that could be subject to the rule (Alvarez, n.d.).

As the rule is relevant to all forest landowners (except federal and tribal entities) across the state, the scale of the analysis constrains our ability to accurately characterize the nature of all businesses that own forestland in riparian areas across Washington State. To our knowledge, no publicly available data source exists that identifies the locations and Uniform Business Identification (UBI) information of landowners that are small businesses in particular.³³ Instead, we identify three North American Industry Classification System (NAICS) codes with businesses most likely to harvest timberland in riparian areas that is subject to the rule:

113110 – Timber tract operations

³³ The Washington State Forestland Database provides information about ownership of specific forested parcels, although does not provide all information necessary for the analyses required of an SBEIS, including whether the landowner is a small business, and the data required to calculate minor cost thresholds.

113210 – Forest nurseries

113310 – Logging

Data provided by the Washington Department of Revenue reveals that there was a total of 811 businesses identified using these NAICS codes in 2022 (and virtually the same number in 2021).³⁴ Of these, approximately 99 percent meet Washington’s definition of small business, i.e., a business with 50 or fewer employees. Of note, all businesses in the “113110 – Timber tract operations” and “113210 – Forest nurseries” industries qualify as small businesses. Table 7 presents these findings.

Table 7. Number of Small Businesses and Minor Cost Threshold in Relevant Industries

NAICS code – Industry name	Total Number of Businesses in WA	Percent that are Small Businesses	Minor Cost Threshold for SBEIS Consideration (Based on Annual Revenue)
113110 – Timber tract operations	19	100%	\$5,537
113210 – Forest nurseries	25	100%	\$5,740
113310 – Logging	767	99%	\$6,970
Total	811	99%	-

Source: IEC analysis of data provided by the Washington Department of Revenue on May 2, 2024. The data characterize fiscal year 2022; very similar numbers were reported in 2021.

4.2 Costs of the Final Rule Relative to Minor Cost Thresholds

For these industries, we calculate the “minor cost” threshold associated with each. 19.85 RCW requires that the relevant agency prepare an SBEIS if the rule “will impose more than minor costs on businesses in an industry” (RCW 19.85.030). “Minor cost” is defined in RCW 19.85.020 as a cost per business that is less than 0.3 percent of annual revenue or income, or \$100, whichever is greater, or one percent of annual payroll (RCW 19.85.020). Table 7 also presents the minor cost threshold established for each of the three industries. For all three, we determine that the minor cost measure derived from revenue data is the greatest of the three options (i.e., based on revenue, payroll, or \$100).

However, as described in Chapter 2, the rule is not anticipated to result in probable costs to these industries. This is because the rule is unlikely to change how landowners and surveyors conduct water typing relative to current conditions and is unlikely to change the outcomes of any surveys. Therefore, we do not anticipate an increase in costs associated with surveys or compliance costs associated with more Type F stream requirements (i.e., unharvestable buffer area, fish passage through stream crossings). Because the rule does not result in more than minor costs to businesses in the regulated industries, a complete SBEIS is not required for the rule.

4.3 Steps Taken to Reduce Costs of the Rule

Before selecting a proposed rule, the Forest Practices Board undertook extensive research into different definitions and criteria for the AFF and PHB. Ultimately, the selected rule minimizes impacts (including both costs and benefits) and codifies current practices while meeting the stated objectives of the rule.

³⁴ Data provided by the Washington Department of Revenue on May 2, 2024. Analysis was prepared by the Research and Fiscal Analysis department by combining Department of Revenue and Employment Security Department data. While a longer time series of data was requested, the Department of Revenue cautioned against using data from 2020 given the influence of the COVID-19 pandemic.

While the rule does not result in new costs to landowners, DNR provides significant technical and financial assistance to reduce the burden of compliance with existing Forest Practices rules. In 1999, the Washington State Legislature determined that the regulatory requirements for forestland were “diminish[ing] the economic viability of small forest landowners” and established the Small Forest Landowner Office to serve as a resource and focal point for SFL concerns and policies (RCW 76.13.100). This office provides assistance to eligible SFL to help them meet the requirements of legislation with significant cost implications. To date, the Small Forest Landowner Office has implemented several programs that reduce the compliance costs for businesses:

- ***Family Forest Fish Passage Program:*** A cost-share program that subsidizes the cost to upgrade existing stream crossings to meet fish passage requirements by 75-100 percent.
- ***Forestry Riparian Easement Program:*** Compensates SFL for the loss of revenue associated with lost timber harvest in riparian buffer areas.

Given the expected overlap between SFL and small businesses in Washington State, these programs are expected to continue to mitigate the cost of Forest Practices rules for small businesses by transferring some portion of the compliance costs back to the state government.

4.4 Involvement of Small Businesses in the Rulemaking Process

Throughout the rule development process, DNR engaged with SFLs (who are likely to be small businesses). Small businesses were involved in rule development through inclusion of the industrial forest landowner (e.g., some industrial landowners are small businesses) and SFL caucuses in:

- the development of TFW Policy Committee recommendations to the Forest Practices Board of elements for inclusion in the water typing system;
- stakeholder meetings for the draft rule and associated Board Manual guidance; and as
- a Forest Practices Board member representing SFLs.

4.5 Impact on Jobs

Because the analysis does not identify changes in the process or outcomes of future water typing efforts, the rule is unlikely to result in the creation or loss of jobs.

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Note: This reference list includes sources cited in the main report and appendix that follows.

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Appendix: Fish Values Information

This appendix offers information regarding the values people derive from the presence of fish, in particular anadromous species found in the Northwest, building on the discussion started in Section 3.2.1 of the main report. First, we highlight available economics literature that quantifies TEVs for fish species relevant to this rulemaking. Next, we describe information regarding ceremonial and subsistence (C&S) fishing and tribal cultural values. Finally, we highlight literature that quantifies non-use values and recreational fishing values while concluding with information about how commercial fishing values are not relevant to the rule although are typically a component of the TEV of a species.

Total Economic Value

Table 8 summarizes relevant primary studies that estimate the TEV of anadromous species in the Northwest in terms of the valuation context (e.g., species, magnitude of change), the geographic location, the survey population, and WTP (per household and aggregated across the survey population). Studies included are those appearing in either peer-reviewed journals or the grey literature that estimate the TEV of Pacific salmon and/or steelhead recovery to residents of Washington State. Literature on TEV is more limited for other fish species (i.e., cutthroat trout) affected by the rule.

The economics literature consistently finds that the public places a high value on recovery of Pacific salmon and steelhead. However, the specific WTP estimates are difficult to compare across studies due to differences in the resources being valued (specific subpopulations of salmon), the study scope (i.e., both the number of species and the magnitude of increases), geographic scale of restoration (e.g., whether the change occurs in a single river system or region-wide), and elicitation methodology. Additionally, studies completed at different points in time may reflect variation in the ecological baseline (i.e., current abundance) or shifting preferences for restoration over time. Each study has advantages and disadvantages, and none perfectly match the context of valuing the changes induced by the rule (i.e., marginal increases to coho, Chinook salmon, and steelhead populations attributable to improvements in riparian habitats).

As mentioned, none of the studies identified match the context of this analysis of this rulemaking, which identifies relatively limited changes in the number of fish affected by electrofishing, including but not limited to salmon, in Washington. Accordingly, the remainder of this section provides insight into specific categories of value related to changes in fish abundance, beginning with tribal cultural values and then assessing components of TEV.

Table 8. Select Literature Describing the Total Economic Value (TEV) of Anadromous Fish in the Northwest

Study	Valuation Context	Site	Sampled Population	Annual WTP per Household (2023 USD) ^{1,2}	Aggregate Annual WTP ³ (2023 USD)
Lewis et al. (2022)	Increase Coho salmon returns by 1,000	All Oregon Coast Coho salmon runs	Pacific Northwest residents (including WA)	\$0.09-\$0.23	NA
Lewis et al. (2019)	Increase Coho salmon returns by 100,000 (least aggressive) to 375,000 (most aggressive, includes delisting)	All Oregon Coast Coho salmon runs	Pacific Northwest residents (including WA)	\$62 (least aggressive); \$179 (most aggressive)	NA
ECONorthwest (2019)	Restore wild salmon and improve water quality by removing four dams	Lower Snake River, WA	Active voters in WA	\$49-\$67	\$142-\$195M (WA state)
Stratus Consulting (2015)	Restoration of salmon at limited (25-50%) or extensive (60%) increase	Elwha River, WA	WA residents	\$310 (limited); \$369 (extensive)	\$1.040B (WA state, limited); \$1.220B (WA state, extensive)
Bell et al. (2003)	Doubling of local coho runs and harvest	Two estuaries in WA	Residents within 30 miles of estuary	\$126-\$196	NA
Layton et al. (1999)	Increase migratory fish populations by 50%	Eastern WA and Columbia River	WA residents	\$212-\$406	\$621M-\$1.189B (WA state)
Layton et al. (1999)	Increase migratory fish populations by 50%	Western WA and Puget Sound	WA residents	\$446-\$612	\$1.306B-\$1.795B (WA state)
Loomis (1996)	Increase salmon and steelhead (4 species) from 50,000 to 300,000	Elwha River, WA	Three samples: Clallam County, WA state, national	\$111 (Clallam); \$138 (WA); \$129 (national)	\$406M (WA state); \$15.987B (national)

Notes:

- Dollar values reported in studies are adjusted to 2023 dollars in this table.
- TEV includes both use and non-use values. However, it does not quantify significance to tribes, which is a potentially large source of additional (nonquantifiable) value.
- Aggregate values are estimated at the Washington State level and national level where appropriate based on the sampling frame of the original study. Number of households obtained from United States Census Bureau "Quick Facts": 2,931,841 (WA); 124,010,992 (United States).

Ceremonial and Subsistence Fishing and Tribal Cultural Values

Washington State tribes and indigenous communities more broadly value the natural environment as an interconnected and inseparable system where all components play a critical role.

It's all interconnected. Almost all cultures seem to have a word or phrase for this. For Nuu-chah-nulth, the words are hishuk'ish tsawalk, meaning everything is connected, everything is one. It is definitely a principal that is first and foremost in dialogue, discussion, and documents. Not giving lip service to it, but real meaning, that this is so fundamental to our existence. That protecting and caring for all—air, water, animals—that are in First Nations' territories, all interconnected.

Dr. Don Hall, Pacific Salmon Commission Canadian First Nations Caucus

As such, tribes place a high value on protection of fish and fish populations. While tribes recognize the critical role played by all fish species within the natural system, salmon are recognized as ecological and cultural keystone species to indigenous communities (Garibaldi and Turner 2004). In the words of Wilbur Slockish, Klickitat Chief:

All of the animals have a role in this world, in our belief. Rocks and water was the first one, the last one, but [salmon] is the first one that said he would take care of the people, providing them with drink to quench the thirst.

Wilbur Slockish, Klickitat Chief, Earth Economics 2021

As a result, efforts to document the importance of fish to Pacific northwest tribes have focused almost exclusively on salmon, and no information is readily available to support evaluation of the value of other species to tribes, including cutthroat trout.³⁵

Tribal cultural and social values typically reflect a higher intensity and range of use of natural resources by tribal communities than the general population. In addition to the market value derived by tribes from their involvement in commercial and recreational fishing activities, tribal communities hold other values for the affected fish species that are unique and distinct from those held by the general public. These values derive primarily from the harvest and use of the salmon through C&S fisheries. C&S fish refers to non-commercial fish caught by tribal members for purposes related to ceremonies or subsistence. Tribal members fishing commercially may designate a portion of their catch as “take home fish” (i.e., C&S fish), or a tribe may open a fishery expressly to harvest C&S fish for an intended purposes when there is no ongoing commercial fishing activity (National Marine Fisheries Service [NMFS] et al. 2004). To the extent that the rule may impact tribal C&S fishing, tribal cultural values may be affected.

Importantly, tribes do not support the concept of monetizing the value of natural resources:

We don't want to put a dollar value on fish. It means more to us than that. One of the sayings that First Nations have—both in Canada and in the United States—is that when the last tree is gone, when the last fish is gone, only then will people find out that you can't eat money. That's something that we have in common with the folks that we work with in the United States is that we have the same kind of belief system because we are family. Because before Canada and the United States existed, we existed, and we had those feelings about fish.

Grand Chief Ken Malloway, Stó:lō Nation

³⁵ Personal communication with Columbia River Inter-Tribal Fish Commission (CRITFC) on May 28, 2024.

For this reason, this analysis focuses on a qualitative description of the potential benefits of the rule to tribes. Washington is home to 29 federally recognized Indian tribes, as well as numerous additional tribes and bands without federal recognition. Despite diversity across these tribes in terms of values and practices, one commonality is that all indigenous communities within the region identify as “Salmon Nations and People” (Conarro 2020). Washington tribes are culturally connected to all five species of Pacific salmon (genus *Oncorhynchus*). For these tribes, salmon are more than simply a resource to be utilized but is seen as “family and relations gifted by the Creator” (Earth Economics 2021). Of these tribes, 20 nations in western Washington and five nations in eastern Washington hold treaty-reserved rights to fishing at usual and accustomed areas (Earth Economics 2021).

As described by Lane et al. (2004) and summarized in NMFS (2014), tribes in the region rely on salmon for numerous purposes including: personal and family consumption, informal inter-personal distribution and sharing, formal community distribution and sharing, and ceremonial uses. In addition to these uses, salmon also facilitates the intergenerational transfer of knowledge and culture. Young people are taught by elders the use of fishing gears, preparation and preservation of salmon (e.g., smoking), and an appreciation for and awareness of their environment and the place of salmon within it. To tribal communities, their obligation to salmon revolves around the concepts of renewal, reciprocity, and balance (Lane et al. 2004).

Earth Economics (2021) identifies a sociocultural framework for describing the significance and value of Pacific salmon for tribes and First Nations around five cultural themes. Within each, based on engagement with Northwest Tribes and First Nations and available research, they identify concepts or “codes” that emerge as particularly important values associated with salmon within those themes. These themes, as well as the concepts most frequently identified during interviews, include social, health, livelihood, indigenous management, and knowledge and practices.³⁶

Non-Use Values

Changes in the quality or quantity of fish resources may affect the non-use values that people hold for those resources. As described previously, non-use values reflect the positive preference that people may have for a resource beyond any current or planned future use. Non-use values are thought to reflect an environmental ethic and may be motivated by a desire to preserve the resource for future generations or based on the resource’s intrinsic importance. Theoretically, people may have non-use values for any fish affected by the rule. Research on TEVs for fish species is theoretically inclusive of use and non-use values. While existing research demonstrates that TEVs do include non-use components, the TEV studies are generally not able to parse the fraction of the value associated with non-use. Information on the magnitude of non-use values for fish species is very limited, although some research attempts to specifically quantify non-use values of fish and wildlife.

Table 9 highlights studies that have quantified the public’s WTP for actions that increase salmon and steelhead populations in Washington and have specifically attempted to isolate and quantify the non-use value respondents hold for fish. Overall, the findings of these studies suggest that people hold a positive value for increasing salmon populations and recovering ESA-listed populations to a level sufficient to justify delisting. The absence of research on TEVs or non-use values for other fish species does not indicate that people do not hold value for these species.³⁷ As noted above, the valuation context in these studies differs from the objective and likely

³⁶ The frequency with which interviewees mentioned each concept does not necessarily indicate its importance relative to other concepts but can serve as a proxy for understanding the associations and weight Tribal members place on it.

³⁷ The focus of the current literature on salmon is due to the fact that it is actively managed and information on the economic benefits of improving conservation of these fish allows managers to compare costs of the conservation actions with the economic benefits to society.

outcome of the rule: to limit harm to individual fish through the use of electrofishing. However, these studies provide support that the general public values protection of fish species and, by extension, likely hold non-use values associated with preventing harm to these same species.

Table 9. Select Literature Describing Non-Use Values for Anadromous Fish in the Northwest

Study	Valuation Context	Site	Sampled Population	Annual WTP per Household (2023 USD) ¹
Bell et al. (2003)	Doubling or quadrupling of coho salmon	Two Washington estuaries	Coastal residents of WA	\$130.89 and \$209.82 per year for five years
Johnston et al. (2015)	Delisting of Puget Sound Chinook salmon within 50 years	Puget Sound	U.S. residents	\$32.24 per year for 10 years
Olsen et al. (1991)	Doubling of salmon and steelhead runs from 2.5 million to 5 million	Columbia River Basin	Pacific Northwest residents	\$58.12 per year in perpetuity
Layton et al. (1999)	Scenario 1: Eastern Washington and Columbia River migratory fish populations (CM) increase from 0.5 million to 2 million while western Washington and Puget Sound migratory fish populations (PM) increase from 2.5 million to 5 million Scenario 2: CM increases from 2 million to 4 million and PM increases from 5 million to 10 million	Washington	2 million WA households	Scenario 1: \$81.85 per month Scenario 2: \$52.87 per month

Notes:

- Dollar values reported in studies are adjusted to 2023 dollars in this table.

Recreational Fishing

Recreational fishing in Washington occurs in marine and fresh water throughout the state. The species most frequently targeted recreationally in Washington of relevance to this analysis include salmon, steelhead, and trout. Some anadromous fish species are supply limited, suggesting that an increase in the ability or likelihood of harvesting one, or the quality of an experience fishing for one, may result in generation of new trips. For other species (e.g., cutthroat trout), it is less likely that additional fish or improved fishing experience would result in additional trips. The reduction in fish harm resulting from the rule may affect the quality of a limited number of recreational fishing experiences in given areas.

In particular, more fish in the water resulting from reduced electrofishing mortality may increase the catch rate (i.e., number of fish caught per trip, which may be harvested or caught and released) or increase the catch per unit effort (i.e., more fish caught per unit of time spent fishing). However, given the low mortality rate due to electrofishing and limited number of fish that experience electrofishing during water typing surveys, a more likely outcome is that the fish caught during fishing trips are less likely to have visible signs of harm. These improvements in recreational fishing experiences may increase the value that anglers derive from participation in the activity. Improved quality or quantity of recreational fishing trips may therefore be measured in terms of the effect on people's value for (i.e., WTP) for fishing in an area.

For context, the available economics literature on WTP for fishing trips suggests that people value recreational fishing trips that target anadromous fish species in Washington State on the order of \$87 per trip (2023 USD) (NMFS 2014). While the benefits to fish stemming from the rule are unlikely to support new fishing trips, they

may increase the value people derive from existing trips. Available literature does not offer information on the marginal increase in value of individual fishing trips that may be attributed to the rule.

Commercial Fishing

The commercial fishing industry in Washington targets a variety of species including shellfish (e.g., geoduck clams and Dungeness crabs), groundfish (e.g., sablefish and Pacific whiting), highly migratory species (e.g., albacore tuna), and salmon. Of the species identified as potentially affected by the rule, coho salmon, Chinook salmon, and steelhead are targeted in commercial fisheries. This analysis predicts no change in the population-level abundance of these species, therefore benefits to the commercial fishing industry are unlikely. However, in instances where commercial fishing benefits are the result of a rule change, the market value of those fish is typically a useful proxy.