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# MEMORANDUM

**July 25, 2025**

**TO:** Forest Practices Board (Board) LC

**FROM:** Lori Clark, Adaptive Management Program Administrator (AMPA)
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**SUBJECT:** Structured Decision-Making

In January 2021, the Office of the Washington State Auditor (SAO) completed a performance audit of the Forest Practices Adaptive Management Program (AMP)[1]. The audit provided 13 recommendations for improving program performance. The report referred 11 of these recommendations to the Forest Practices Board (Board). In May 2021, the Board approved priorities among the recommendations in the form of a response plan including the TFW Policy workgroup & AMPA recommendations list of 5 net gains options in support of the SAO Recommendation #05, adopting a net gains model for TFW Policy that includes a Structured Decision-Making (SDM) framework to support making informed and transparent choices in complex decisions.

The TFW Policy Committee and CMER have been working over the past two years with Compass Resource Management to establish a SDM framework to apply multi-criteria decision-making for future AMP recommendations to the Board. TFW Policy's consensus recommendation is to utilize SDM framework for AMP decisions/recommendations. If the Board approves, TFW Policy will continue to develop and incorporate the SDM framework and BM22 language for consideration at a future Board meeting.

Please let me know if you have any questions or need more information.

**Attachments:**

- **Compass Advice Memo**
- **AMP Prioritization - Compass Report**
- **Decision Framework for Eastside Type Np Rules**

[1] Performance Audit of the Adaptive Management Program

# Cover Memo

**To: Timber Fish & Wildlife Policy, AMPA**

**From: Compass Resource Management**

**Date: June 30th 2025**

**Re: Structured Decision Making Advice for TFW Policy and the Adaptive Management Program**

Compass was hired to demonstrate an approach to two complex and potentially contentious decisions faced by TFW Policy. First, we were asked to demonstrate a Structured Decision Making (SDM) approach to support a potential future decision about changes to riparian harvest rules in Eastside Type Np basins. Second, we were asked to develop guidance for the AMP around how to improve its prioritization process for projects in the CMER workplan. Please find attached Compass' final deliverables for these two efforts: ***SDM Framework for Eastside Type Np Riparian Harvest Rules*** and ***Guidance Document: Re-setting the MPS Prioritization and CMER Work Plan Processes***. These represent our advice, observations, and recommended approaches specific to the decisions related to Eastside riparian prescriptions and to MPS / CMER Workplan prioritization.

As we discussed with Policy at several of our meetings, SDM is not a panacea for all conflict in decision making, but instead provides a robust roadmap that groups like Policy can use to navigate complex decisions in a collaborative manner. However, the roadmap still requires that groups establish and work together from a shared foundation of collaboration. We believe both of these documents lay out promising approaches for the AMP to pursue. However, as noted by many Policy and CMER participants during the development of these case studies, many aspects of what we lay out represent a significant departure from current AMP functioning. We expect the program will run into several important hurdles in implementing our recommended approaches that we believe should be explicitly named, and we do this below. Our thoughts and recommendations, here and in our deliverables, are agnostic about any necessary revisions to the Board Manual, Policy Manual, or other program documentation that may be required to enable putting these recommendations into practice. Expected hurdles include:

- **Navigating the inherent tension between the rigidity baked into the program's foundations and the principles underlying the SDM approach and tools.** The AMP was founded on a heavily negotiated set of regulatory requirements and prescriptive agreements that tightly defined the scope of the Program and its responsibilities (e.g. FPHCP, SL1 etc.). However, SDM as a practice, and more broadly the family of "net gains" approaches to conflict resolution and decision making, explicitly and by design reduce conflict by expanding the scope of what can be considered in a decision. This process of "making the pie bigger" is evidenced particularly in the Eastside Type Np decision framework. While we note that our recommendations and demonstrated approach aligns closely with the recommendations of other third-party reviews of the Program (e.g., the State Auditor's report, and the Stillwater Report), we simultaneously acknowledge that this approach may be a serious challenge for the stability of the Program's core foundations.
- **Adopting a joint-learning focus for all Policy deliberations** in way that builds trust and co-learning. We've observed that many Policy discussions are rooted in established caucus positions, and the emphasis in these discussions is on each member attempting to more clearly communicate their own positions. Overcoming the habits of this style of communication (which may be difficult to dislodge) and shifting towards a deliberate joint-learning approach will not be easy, but could benefit the Program and its participants. This requires focusing on active deliberation and inquiry-based dialogue with the intent to understand how others see core issues

and express their fundamental interests. Meaningful deliberation and dialogue means offering participants space to clearly articulate their values and concerns, encouraging Policy members to explore why specific positions are held, and collaboratively identifying opportunities that could enhance mutual understanding and lead to cooperative solutions. Testing whether the group has achieved shared understanding by summarizing core elements of what was discussed or decided (ideally by someone in a neutral facilitation role) can be useful tool to gauge and track progress.

- **Learning to adopt and implement a decision framing mindset**. Adopting a decision framing mindset involves applying core "decision skills" to every decision, large or small, and requires a stronger emphasis on proactive and deliberate decision making. To support this, the Program will need to make an effort to clearly define the specific decision at hand and distinguish it from related decisions (both decisions already made and those that will be made in the future and affected by the decision at hand). Once the decision is clear, fundamental objectives should be explicitly articulated, and creative alternatives should be developed early on to guide the collection of any required information (e.g., scientific study design and socio-economic analyses) and frame the discussion of relative merits of the options for moving forward. For example, in developing the Eastside Type Np Decision Framework, we worked collaboratively and iteratively with Program participants to explicitly clarify the decision context and understand the degree to which distinct objectives and a range of strategic alternatives would address Policy's decision needs. In future projects, this style of thinking should be done ahead of developing and implementing scientific studies to ensure that the study designs adequately address the decisions that need to be made.
- **Re-conceptualizing the Policy-CMER "firewall"** as an interface in a way that improves dialogue but maintains distinct and respected roles for each committee. The current interaction between TFW Policy and CMER is tightly constrained to mitigate the potential for infusing bias into the technical work of the Program. To that end, it appears that CMER typically provides technical studies with limited input from Policy regarding their decision-making needs (which may not be well understood). This relationship is reflected in the Board Manual's description of a rigid separation, or "firewall" between the committees. Though we advocate for transforming this rigid "firewall" into a more effective "interface" that enables a seamless flow of communication regarding decisions and information requirements, we recognize that other – not yet defined – approaches to mitigating bias in technical work may be required. An effective interface should include clear policy direction from TFW Policy to CMER on decision needs, development of decision-relevant information by CMER with appropriate context and clarification as required, and continuous dialogue between committees to align each committees' progress. We recognize that this may require reframing committee roles, processes and high-level guidance.

In closing, we believe the hurdles described above represent significant challenges that the Program will need to overcome in order to adopt the recommendations that we and others have made about improving the Program's effectiveness. Our deliverables, including the Eastside Type Np decision framework and the MPS prioritization recommendations, serve as practical demonstrations of how the principles of structured decision making can be applied to improve alignment between science and policy, foster collaborative decision-making, and enhance overall program effectiveness. However, pursuing these changes should be done with the recognition that they will require a careful and thoughtful approach to ensure that any adjustments are made in a way that preserves the critical elements of the Program's foundation and origins. We acknowledge that the direction shift implied by adopting these SDM-based recommendations is significant and that many specific details and tasks need to be fleshed out. We look forward to the opportunity to discuss in further detail.

# Guidance Document

# Re-setting the MPS Prioritization and CMER Work Plan Processes

**Prepared for**
Timber, Fish, and Wildlife Policy Committee, Forest Practices Adaptive Management Program, State of Washington

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**Date**
June 2025

compass

## Executive Summary

Compass was hired to provide recommendations on how to improve the Washington State Adaptive Management Program's prioritization process. Specifically, Compass was asked to apply Structured Decision Making (SDM) principles to prioritization decisions and recommend improvements to the process such that it is done transparently, consistently, and in service of overarching AMP goals.

**Section 1** of this report describes our (current) understanding of how prioritization within the AMP was designed to work. It focusses on relevant milestones in the history of the program, and the current status of the processes and systems that lead to the CMER Workplan and the Master Project Schedule. An overarching observation of this section is that, though there are challenges today, the AMP had strong beginnings and is grounded in effective principles of adaptive management and collaboration.

**Section 2** describes key observations based on our experience working with other large scale adaptive management programs and our foundational practice of SDM. Compass' primary observations, elaborated on in the report are the following:

- The current prioritization process lacks structure, transparency and accountability.
- There is a workflow sequencing mismatch (between the respective cycles of the CMER workplan, the Master Project Schedule and legislative funding)
- A lack of flexibility limits choices
- Critical Questions and Targets are out of date or incomplete
- How Policy direction (from the Board) and Scientific advice (from CMER) come together at Policy needs improved clarity

**Section 3** envisions and describes the features of an improved, future Master Project Schedule prioritization and CMER workplan development process. This section unpacks 3 essential features of the ideal MPS and prioritization process.

- Feature 1: The Scientific Basis (risk/uncertainty rankings, critical questions, Schedule L-1) is updated and maintained. This feature details what is known and not known about each rule group and provides the scientific rationale for any further studies.
- Feature 2: Iterative Technical Work Planning (i.e., scoping, staging, integration of FPB priorities, etc.) results in:
    - Each Rule Group contains one or more Programs, each with one or more Projects.
    - Over the 10-year horizon some Programs are nearing completion (with planned future validation Projects).
    - Interdependencies between Projects and Programs.
- Feature 3: Alignment with AMP Goals is evaluated periodically by Policy. This feature allows the AMP to periodically reassess its relative priorities and the degree to which studies on various rule groups further those priorities.

**Section 4** presents Compass' recommendations. We outline four key suggestions and specific next steps for the program to strategically reset and ultimately shift towards a more effective, transparent prioritization process that directly supports overarching AMP goals. Compass' recommendations, expanded on in section 4 are the following:

- Recommendation 1: Re-set the Scientific Basis
- Recommendation 2: Scope-out new Rule Group / Program Strategies
- Recommendation 3: Develop a Prioritization Approach for an Evergreen MPS
- Recommendation 4: Maintain Everything Transparently on the AMP online Dashboard

## Contents

# 1 Context

In November 2024, Compass was asked to support the Washington State Adaptive Management Program (AMP) to make improvements to their program and project prioritization process. Specifically, in January of each biennium, CMER delivers a Work Plan to TFW policy that is used to inform TFW Policy's prioritization process and the refinement of the Master Project Schedule (MPS). Compass was asked to apply Structured Decision Making (SDM) principles to prioritization decisions and recommend improvements to the process such that it is done transparently, consistently, and in service of overarching AMP goals. These improvements will ultimately serve the program in deciding how to allocate available resources, adjust to budget shortfalls or other constraints, and to run a more effective adaptive management program. These improvements will also be useful in synchronizing the overall cycle of developing the CMER workplan, the Master Project Schedule, the Policy Annual Work Plan, and the AMP Implementation Schedule.

This report begins with a brief background on the AMP to contextualize observations and recommendations. An over-arching observation of the history of the program is that the AMP began by doing many things right. There are strong analytical foundations and collective agreements for cooperation. If you are familiar with the program's history, skip to section 1.3 (Our Approach).

## 1.1 Background

In 1974, the Forest Practices Act assigned the Forest Practices Board (FPB) the task of developing forest practices rules and regulations to cover private and state lands in Washington. The following decades saw timber companies, tribes, the state, and environmental groups competing in expensive lobbying efforts and contentious and fruitless legal cases throughout the 1970s and 1980s. Recognizing this was ineffective for all involved, the 1987 Timber Fish and Wildlife Agreement was created to "put an end to the war in the woods with a cooperative science-based management approach that ensures a healthy timber industry while also protecting fish and wildlife" (TFW,1987). Importantly, the participants of TFW agreed that "the State of Washington needs a viable timber industry, and it needs to protect and enhance its fish, wildlife, water and cultural archeological resources. Further, they agreed that these needs are not mutually exclusive. They are compatible." (TFW 1987).

In the late 1990s, in response to the listing of several salmonid species under the Endangered Species Act (ESA) and associated unemployment of fishers, water quality concerns under the Clean Water Act (CWA) on over 660 streams, and a challenging regulatory environment for landowners, TFW participants and federal government representatives developed the Forest and Fish Report (FFR)—a comprehensive plan, based in adaptive management and negotiation, to develop forest practices rules that would be protective of aquatic species and ecosystems while maintaining a viable timber industry (Forests and Fish Report, 1999). This formalized adaptive management as a key tool for managing timber harvest in the State of Washington.
Recognizing the inherent uncertainty associated with the original Forest Practices rules, today, the adaptive management program's (AMP) role is to provide science-based recommendations to the FPB regarding whether and how to change forest practice rules. The AMP has two committees, The Cooperative Monitoring, Evaluation and Research Committee (CMER) whose role is to "advance the science needed to support adaptive management" (CMER Protocol and Standards Manual) and the TFW Policy committee who, relying on input from CMER, develops solutions to

issues that arise and makes policy recommendations to the Forest Practices Board (Board Manual). While participants on the committees represent 9 different caucuses, the program is structured around providing consensus-based recommendations to the FPB, continuing the spirit of collaboration set forth in the original TFW agreement (Figure 1).

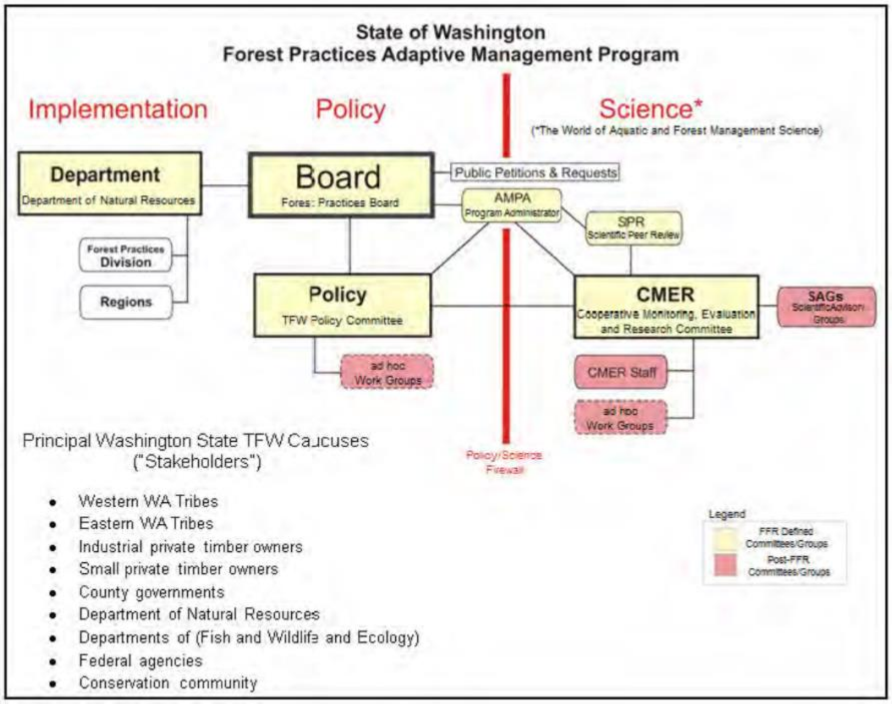



**Figure 1: Visual representation of the AMP structure from the 2013 FPB Manual**

There are several important features of the AMP that provide the foundation for developing an improved approach to prioritization.

### 1.1.1 Defined Goals

The AMP has 4 over-arching goals which originated in the FFR. These are to:

1) provide compliance with the federal Endangered Species act for aquatic and riparian dependent species on non-federal forest lands.
2) Restore and maintain riparian habitat on non-federal lands to support a harvestable supply of fish.
3) Meet the requirements of the federal Clean Water Act for water quality on non-federal forest lands.
4) Keep the timber industry economically viable in the State of Washington (Forest Practices Board Manual, 2013).

Beneath these goals Schedule L-1 structures Resource Objectives, consisting of Functional Objectives and Performance Targets, intended to more fully define and track progress toward success in meeting the over-arching goals.[1] It is assumed that in meeting performance targets, resource objectives and overall program goals will be met. (More on targets and the status of Schedule L-1 below).

### 1.1.2 Comprehensive Monitoring Design Approach

In addition to structured goals and targets, the AMP's described approach to monitoring, data collection and analysis is based in strong adaptive management principles. In the early 2000s, a Monitoring and Design Team (MDT), commissioned by the policy committee, developed a monitoring approach for the program. The MDT report describes a "conceptual framework for a coordinated monitoring plan" and represents a "collective vision for how an effective monitoring plan could be structured" (MDT report, 2006). Central the MDT's proposed framework are multiple and interrelated monitoring types, each of which is necessary for effective adaptive management. These are **Compliance Monitoring** (i.e., are management rules being followed?), **Effectiveness Monitoring** (i.e., are performance targets achieved?) and **Validation Monitoring** (i.e., are expected biotic responses achieved when targets are met?). As indicated in figure 2b) below, Effectiveness monitoring should track both the effectiveness of prescriptions (prescription monitoring) as well as the current and anticipated future status of key indicators across the state (extensive monitoring) (MDT, 2006). Importantly, the MDT report proposes an integrated monitoring approach involving each of these monitoring types to support management decisions. The MDT also describes guiding principles for monitoring. Key principles include that monitoring must:

- aim to determine cause and effect relationships between forest practices and input processes; it should also aim to determine cumulative effects of all forest practices;
- provide stakeholders with information about how prescriptions are working statewide;
- provide clear linkages between compliance, effectiveness and validation monitoring;
- test both more and less conservative alternatives (MDT, 2006).

When Compass was first brought on to support Policy with an SDM case study, we developed Figure 2a as a representation of how we understood the program was designed to function. We subsequently found the more complex visual (figure 2b) developed by the MDT which lays out intended functioning in more detail. Both visuals represent the following: **Rules** are written and implemented with the goal of achieving functional objectives and performance targets. **Studies** are then designed to test whether the rules are achieving the **targets and objectives** (effectiveness monitoring) and to validate the assumptions underlying the targets i.e. are the expected responses achieved? (validation monitoring). Studies should inform any changes to targets and objectives as well as changes to FP Rules.

Overall, the integrated framework proposed by the MDT is aligned with principles of effective adaptive management and represents a strong basis for the program's monitoring activities. However, whereas the program began in agreement with these principles of effective monitoring, today there are disagreements as to what is necessary for decision making.

[1] Notably, there are no objectives and targets for the 4th goal regarding the timber industry.

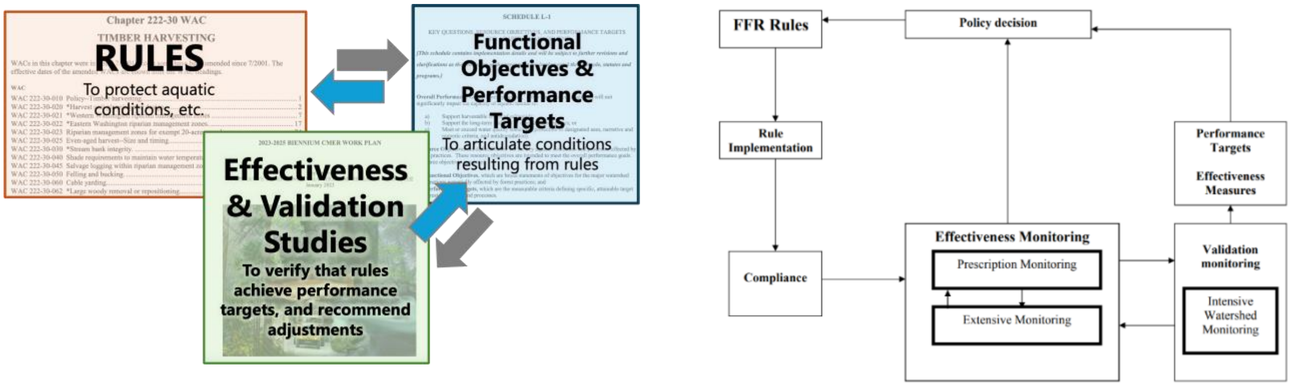



**Figure 2: Intended AMP Design and Function. 2a) Compass Representation. 2b) MDT Representation.**

### 1.1.3 Independent Science Review

Having independent science review is another important foundation of adaptive management programs. The AMP is designed to have multiple mechanisms to ensure regular and comprehensive scientific review.

One key mechanism is the ability for CMER to establish Scientific Advisory Groups (SAGs) to "design and implement research and monitoring programs within specific areas of expertise." (CMER Protocols and Standards Manual). CMER recommends types of expertise desired on a SAG and all caucuses may appoint representatives. SAG participants are "scientists and practitioners qualified in the scientific discipline that the SAG is intended to address." (CMER Protocols and Standards Manual). Several SAGs have been established over the years and this appears to be a form of science review and input that is functioning generally as intended.

A second mechanism for review is the broadscale periodic review that was envisioned in the AMP to occur every 5 years. Under WAC 222-12-045, the program is required to complete a peer review of all of CMER's work as well as "other available, relevant data, including recommendations from the CMER staff". This is an important mechanism for reviewing CMER work and keeping the AMP current. However, as noted by the State Auditor, this review has only been complete once in 2009 (Washington State Auditor, 2021)

The review in 2009 was completed by Stillwater Sciences and resulted in many valuable recommendations. For example, the review recommends "tak[ing] a fresh look at the "Critical Questions" by rule group in the CMER workplan" and "creat[ing] a master plan for each of the key questions" (Stillwater Sciences, 2009). Notably, it also recommends "expand[ing] extensive monitoring and embrac[ing] the need for *natural* as well as *managed* sites" emphasizing a return to the key questions described in the Schedule L1. (i.e., "*will the rules produce forest conditions and processes that achieve resource objectives as measured by the performance targets, while taking into account the natural spatial and temporal variability inherent in forest ecosystems*?")

Given the value of the review and recommendations, it seems clear that the program should ensure the 5-year review is completed consistently. It is unclear to us to what degree these recommendations were carried forward and whether there an accountability mechanism to ensure recommendations are considered. It is also unclear why the required science review has not been repeated.

### 1.1.4 Performance Targets

As mentioned above, performance targets were intended to be precise measures of program success. Program performance targets were originally proposed in the Schedule L1 (SL-1) of the Forests and Fish Report (1999) and generally aim to quantify the resource objectives the program is seeking to achieve. For example, where the objective for water temperature is to "provide cool water by maintaining shade, groundwater temperature, flow, and other watershed processes controlling stream temperature", the performance target for stream temperature is to meet the water quality standards under the CWA.

Currently, many SL-1 targets remain incomplete. There are efforts underway to address this. A dedicated CMER workgroup has reviewed current performance targets, identified and prioritized targets in need of updating, and suggested targets for which Subject Matter Expert (SME) groups should be formed. Recommendations from SME groups on priority targets are expected by the end of June 2025. While each step of the process to update the performance targets has been agreed to by consensus, push back is expected on the SME recommendations.

**Box 1: Some Perspective on the Trouble with Performance Targets**

While we understand the intention behind pursuing performance targets to ultimately support regulatory compliance, we note the widespread challenges of attempting to develop targets in the context of non-point source impacts with high levels of uncertainty. Here in the context of the AMP, as recognized in both the original MDT report and the SL-1 itself, natural spatial and temporal variability and inherent uncertainty make specific performance targets inappropriate in many cases and it is understood that "performance targets are not attainable in all places, even under natural conditions" (Schedule L-1, 1999).

In these contexts, it's important to understand that "the act of setting quantitative targets is itself a decision and should be based on a good understanding of objectives, alternatives and the consequences associated with different targets" (Gregory et al., 2012). In other words, whether a target is acceptable should depend on what alternative targets could be and the trade-offs across them. Further, targets that refer to "desired minimum levels of achievement" often constrain actions that do not meet them and embed values-based trade-offs from the get-go (Gregory et al., 2012).

Given these challenges, in circumstances where targets or existing regulatory standards are highly uncertain and disputed, the approach to developing performance measures to support collaborative decision making in an SDM context often express the evaluation as a 'probability associated with meeting the metric, or multiple metrics'.

## 1.2 CMER Work Plan and the Master Project Schedule

This section briefly describes the CMER workplan and the Master Project Schedule, what they are, how they serve the program, and some of the history of how they were developed.

### 1.2.1 CMER Work Plan

Early on, CMER developed an initial workplan to answer key questions and reduce uncertainties associated with the original forest practice rules. Research and monitoring needs were structured into Rule Groups (Table 1). “A rule group is a set of forest practices rules relating either to a particular resource… or to a particular type of forest practice” (CMER workplan).

| Rule Group | Description | Rule Context |
|---|---|---|
| Stream Typing | Prescriptions for identifying fish-bearing and non-fish-bearing streams | WAC 222-16 |
| Type N Riparian Prescriptions | Prescriptions for identifying non-fish-bearing streams and management of adjacent riparian areas | WAC 222-30 |
| Type F Riparian Prescriptions | Prescriptions for managing fish-bearing streams and adjacent riparian areas | WAC 222-30 |
| Channel Migration Zone | Prescriptions for delineating channel migration zones | WAC 222-30 |
| Unstable Slopes | Prescriptions for identifying and managing areas potentially susceptible to mass wasting/erosion processes | WAC 222-24, -30 |
| Roads | Prescriptions for identifying and managing erosion and runoff from forest roads | WAC 222-24 |
| Fish Passage | Prescriptions for identifying and preventing fish passage barriers | WAC 222-24 |
| Pesticides | Prescriptions for application of forest chemicals | WAC 222-38 |
| Wetlands Protection | Prescriptions for identifying and managing wetlands | WAC 222-30 |
| Wildlife | Prescriptions for protecting wildlife | WAC 222-10, -30 |

**Table 1: Description of the Rule Groups (CMER Work Plan)**

For each Rule Group, CMER identified a set of related critical questions to be answered and designed programs consisting of one or more projects to answer them. Together, programs and projects constitute integrated and coordinated strategies for reducing uncertainties associated with the critical questions for each rule group. (CMER Work Plan).

At the inception of the program, and true to today, resource constraints limit the number of projects that can be pursued concurrently. Therefore, in 2002, CMER members provided an initial ranking of programs to guide what the program should study first. For example, ranking of effectiveness and validation monitoring programs was based on 2 key questions:

1) “How certain are we of the science and/or assumptions underlying the rule?
2) How much risk is there to aquatic resources if the science or assumptions underlying the rule are incorrect?” (CMER Work Plan)

Generally speaking, the setting of monitoring priorities based on expert judgements of scientific uncertainty and risk to resources is an effective approach and important ingredient into the prioritization process. As we understand it, the initial critical questions and rankings formed the basis of CMER's Work Plan at the time, and remain the basis today. While CMER lightly adjusts and edits the workplan each biennium, prior to handing it off to Policy for approval, it has never, to our understanding, been meaningfully refreshed.

Finally, the CMER Work Plan includes a biennium summary budget for current projects. We assume that costing for each Project and Program is estimated out for the full duration of each Rule Group strategy and feeds into a ~10-year outlook within the MPS.

### 1.2.2 Master Project Schedule

In response to the threat of a lawsuit, in 2012 a settlement was reached that had implications for the CMER workplan. The settlement included a project work schedule (Master Project Schedule, MPS) which emphasized projects related to meeting Clean Water Act standards (CMER Workplan). The MPS itself is a budget of all expected program expenditures looking out a decade. This includes all CMER projects as well as other AMP costs (e.g. administrative costs). Ultimately, developing and adjusting the MPS is where prioritization decisions occur.

The MPS is updated each biennium to adjust for funding constraints and opportunities as well as emerging priorities. When deciding how to allocate available resources, Policy must consider FPB/public priorities, budget fluctuations and "other factors associated with meeting milestones in accordance with the FP HCP and/or Clean Water Act (CWA) assurances" (CMER Workplan). The MPS can be changed by consensus at Policy and is approved annually by the Board.

Figure 3 shows a snapshot of the MPS circa March 2025. At present, ~ 45% of program funding is allocated for FPB tasks and overall program delivery (which includes funding for CMER staff scientists and DNR project managers, Independent Science Review, and other elements critical to delivering the program) and ~55% is available for targeted research and monitoring projects[2].

[2] There are additional program expenditures that include participation grants among other items.

| Expenditure | Origin | Status | FY2026 | FY2027 |
|---|---|---|---|---|
| **Program Administration (Staff, Board priorities)** | | | | |
| Sub-total | | | 2,587,450 | 2,305,321 |
| **Research and Monitoring Projects** | | | | |
| Extensive Monitoring: Type F/N Stream Temperature | FPB | Scoping | | |
| Eastside Type N Riparian Effectiveness (ENREP) | CWA | Implementation | 619,672 | 561,931 |
| Temperature and Amphibians in discontinuously | CWA | Scoping | 250,000 | 360,000 |
| Riparian Characteristics and Shade Response | | Study Design | 90,000 | 90,000 |
| Type F Experimental Buffer Treatment Project | CWA | Implementation | | |
| Unstable Slopes Criteria - Projects | FPB | Scoping | 75,000 | 75,000 |
| Deep Seated Research Strategy - Projects | FPB | | 260,000 | 100,000 |
| Water Typing Strategy (PHB Validation, Physicals, | FPB | Scoping | 1,158,900 | 1,153,400 |
| Forested Wetlands Effectiveness Study | CWA | Implementation | | 35,000 |
| Wetlands Management Zone Effectiveness | CWA | Scoping | | 50,000 |
| Wetlands Intensive Monitoring | CWA | On Hold | | |
| Road Prescription-Scale Effectiveness Monitoring | CWA | Implementation | 500,000 | 300,000 |
| Road Sub-Basin-Scale Effectiveness Monitoring -- | CWA | On Hold | | |
| Watershed Scale Assessment of Cumulative Effects | CWA | On Hold | | |
| Eastside Timber Harvest Types Evaluation Project | | Scoping | 42,000 | |
| Sub-total | | | 2,995,572 | 2,725,331 |
| **Total Expenses** | | | **5,583,022** | **5,030,652** |

**Figure 3: MPS circa March 2025**

Broadly, the division of roles and responsibilities between CMER and Policy in the development of the workplan and MPS are appropriate. The structure aims to ensure that prioritization is informed by science and by policy-level discussion. The system also accounts for the need to make adjustments regularly. Broadly, these features are good, though we have thoughts on how to improve them below.

### 1.2.3 Milestone Recap

In summary, the AMP has deep foundations and a long history. There are several significant milestones within the program's development including several external reviews of the program. We have reviewed most of these and largely agree with much of what has been observed and suggested. Figure 4 is a general timeline of important milestones, commonly referenced by AMP participants.

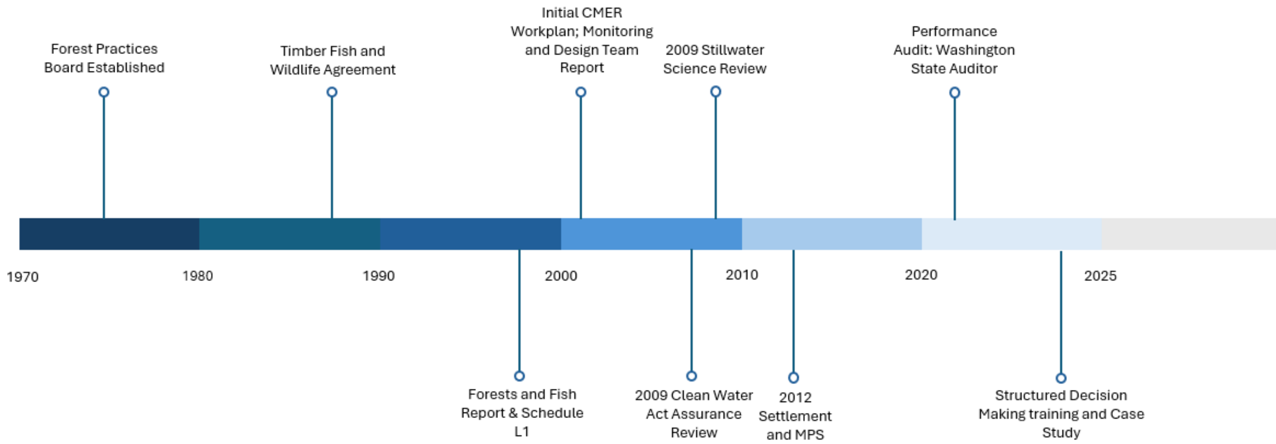



**Figure 4: Timeline of Key Milestones**

## 1.3 Our Approach

We began by reviewing both the history and current functioning of the AMP with a deep dive into foundational documents such as the latest CMER workplan, Forest Practices Board Manual, and the Monitoring and Design Team Report. We then interviewed CMER and Policy members and co-chairs, as well as program staff to better understand the programs' current prioritization process, any challenges associated with it, and where there could be opportunities to improve.

Interview Questions:

- *What do you think about the current process? (How) Should it be improved?*
- *Does the current prioritization process lead to completed studies that support decision making and program goals?*
- *What criteria do you think should be used to rank Programs at the Policy Level?*
- *Can the workflow be improved?*
- *Are rule group critical questions updated to reflect contemporary contexts?*

Drawing on our SDM expertise and our experience with other large-scale adaptive management programs, we then reflected on the AMP's prioritization process and work planning more broadly.

We compiled some observations about the current process: *What's working today? What's not working?*

Then we envisioned an ideal future: *How should the process work? What would be ideal?*

Finally, we thought pragmatically about how the AMP could get from where it is today, to the ideal future we envisioned. We brought our initial reflections and ideas for the ideal future to Policy in March 2025 for feedback.

This report documents Compass' observations, identifies key features of a future, ideal prioritization process, and recommends specific actions for the program to implement.

## 2 Observations

As described above, the AMP originated with a strong collaborative intent, fairly clear objectives, and an effective monitoring approach. Program priorities were set based on the judgements of uncertainty and risk to resources as well as the need for meeting regulatory requirements across the state. As mentioned above, this is a reasonable approach that initially, set the program up well for effective adaptive management.

Over time, the structure of the AMP has been largely effective in keeping conflicts out of the courts and in a more collaborative forum. However, the program has been less successful in progressing its workplan in a timely way and making decisions about rule prescriptions. As per the State Auditor's report (2021), due to a variety of factors including lack of trust, lack of accountability measures, and the requirement for unanimous voting, the program has struggled to make decisions and adaptively manage forest lands in the state of Washington. We broadly support the observations and suggestions of the Auditor's report and suggest that many of them are relevant to improving the AMP's prioritization process.

Building on the Auditor's report and drawing on the principles underlying Structured Decision Making, as well as our experience with other adaptive management programs, our observations about the program's prioritization process are the following:

### 2.1 The current prioritization process lacks structure, transparency and accountability

Currently, there is no formal approach to support Policy Member's deliberation and decision making regarding program priorities. This means priority setting is not necessarily or clearly done with a line of sight to the AMP goals. This creates a lack of transparency around how or why decisions are made. For example, it can be difficult, to understand and justify why certain projects are included in the MPS. This represents an accountability concern for the program and challenges the intent of a shared vision of success. There is a need for a transparent and subjective prioritization method that ties back to the AMP goals.

### 2.2 There is a workflow sequencing mismatch

The respective cycles of updating the CMER workplan, the Master Project Schedule and legislative funding are out of synch. The MPS is provisionally approved prior to the development of the updated CMER workplan. As a result, Policy cannot base budgetary decisions on scientific recommendations and CMER cannot contribute essential information to the process. We understand that Board approval of the MPS is also out of synch from legislative funding decisions.

As we understand it, the current MPS at any given time can be viewed as a negotiated outcome among Policy members. Another current reality is that FPB emergent issues and priorities arise from time-to-time that must be accommodated, and potential budget uncertainties and shortfalls are a continual concern.

These realities must be accommodated in the ongoing cycle of updating the CMER Work Plan and MPS. Viewing these documents as evergreen in nature should form part of the program design.

### 2.3 A lack of flexibility limits choices

Decisions about program priorities are often limited because much of the program budget is already accounted for. Almost half of program funds are needed for administrative costs and FPB tasks (MPS, 2025). Moreover, most, if not all, projects have large budgets and require years to complete. Once a large program is initiated, funds are essentially "locked in" until the study is completed—making changes is therefore difficult due to sunk costs and the large commitment inherent in initiating and implementing a study.

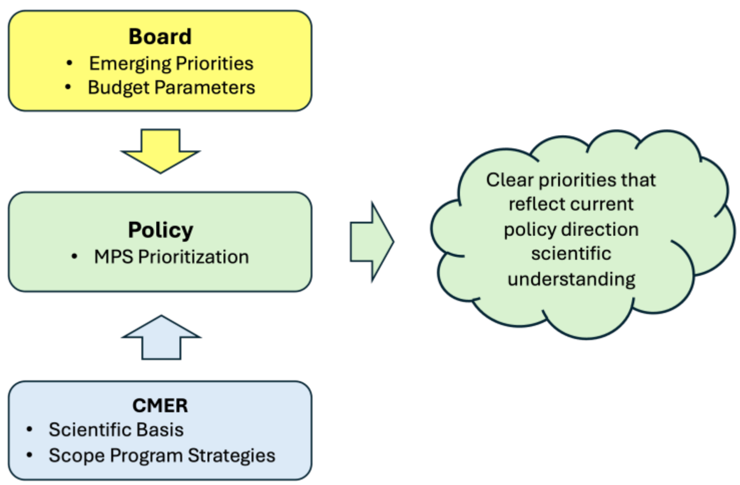
Choices are further limited by prior commitments (e.g., CWA assurances required by the Department of Ecology). Board priorities can also lock in certain kinds of projects (e.g. unstable slopes). All of these limitations are reasonable and expected within a program of this sort; however, they make it all the more important to effectively identify priorities and strategically select projects to advance. To support this, it is essential to re-fresh the state of the science and pre-scope programs to feed into a structured prioritization process. Each of these tasks would require a dedicated effort/team and a carefully considered approach.

### 2.4 Critical Questions are out of date or incomplete

Critical questions and uncertainties are at the core of the program's adaptive management approach but have not been comprehensively updated since the program's inception. Additionally, the 2002 ranking of projects based on level of uncertainty and risk to resources stand today as the research and monitoring priorities. This means the program's workplan is more reflective of 20-year-old needs than current day priorities.

### 2.5 How Board direction and CMER advice come together needs improved clarity

Since the prioritization process is unclear, it is difficult to understand and track how either Board direction or CMER advice are integrated to inform priorities. There is a particular need for improved processes for dialogue and information flow between CMER and Policy as part of a new prioritization process.



# 3 Vision of a Future Prioritized Evergreen MPS

To develop our recommendations for how the program can prioritize more effectively, we envisioned an ideal future. We wondered, *what would the ideal MPS look like and what elements and/or steps are needed to create and maintain it?*

This section sketches a hypothetical, future MPS, elaborates on its features, and identifies key elements of effective program functioning that support prioritization efforts as well as overall program effectiveness.

Figure 5 provides a snapshot representation of an envisioned future MPS, and Table 1 elaborates on its key features:

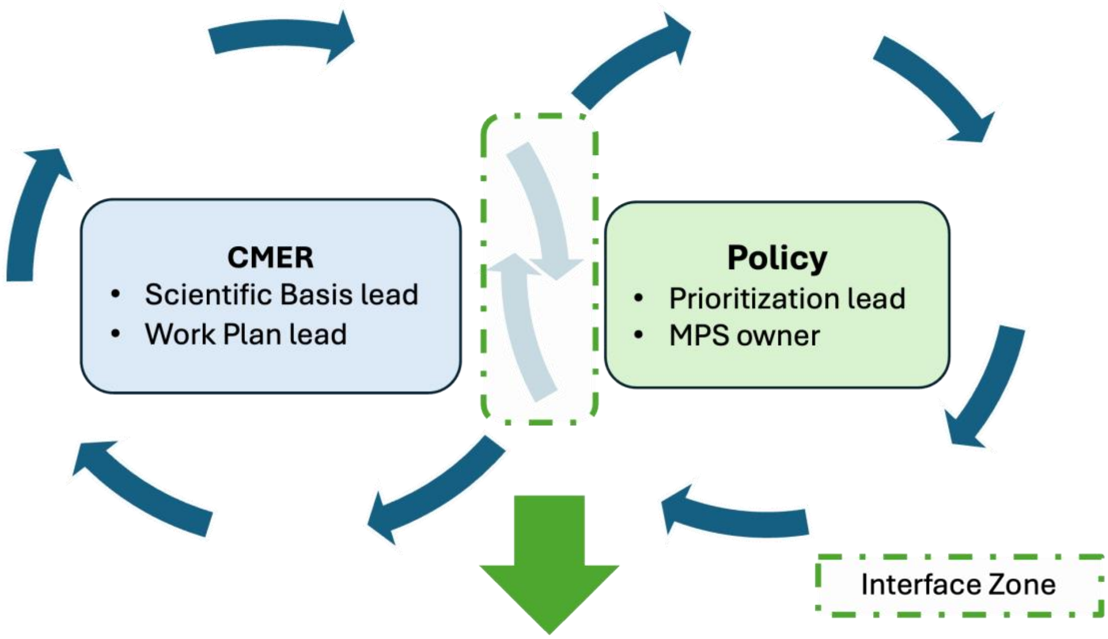
- Feature 1: The Scientific Basis (critical questions, risk/uncertainty rankings, Schedule L-1) is updated and maintained. This feature details what is known and not known about each rule group's effectiveness and provides the scientific rationale for any further studies. To clarify, we understand the critical questions to be key, narrowly scoped science questions (e.g. What is the frequency and distribution of windthrow in forest buffers on Type N and F streams? (CMER Workplan)). Developing and assessing these is therefore a CMER responsibility. However, Policy must support this process by clearly articulating their overall priorities and decision needs and developing broader, overarching questions that guide program direction and directly link to forest practice rules. This division of roles and responsibilities is consistent with other large scale AM programs.
- Feature 2: Iterative Technical Work Planning (scoping, staging, integration of FPB priorities, etc.) results in:
    - Each Rule Group contains one or more Programs, each with one or more Projects.
    - Over the rolling 10-year horizon some Programs are nearing completion (with planned future validation Projects).
    - Interdependencies between Projects and Programs are developed.
    - Note: for the AMP to be grounded in SDM principles and practice, projects and programs should anticipate and include socio-economic analysis and the development of alternatives and performance measures either through the creation of workgroups or through contracted work.
- Feature 3: Alignment with AMP Goals is evaluated periodically by Policy. This feature allows the AMP to periodically reassess its relative priorities and the degree to which studies on various rule groups further those priorities. Policy must also consider the AMP Goals when developing guiding questions and providing ongoing direction to CMER in the Iterative Technical Work Planning process.

In order for these features to leverage each other appropriately, continual iteration and clear communications in the CMER/Policy interface will be a key element of the process. Consider:

- Depending on the pace of study completion, revisiting the assessment of risks and uncertainties every two to five years is consistent with other successful adaptive management programs that we've worked with. This is a critical step to know when further study on a rule group or specific rule is no longer needed to support decisions.

- Once the state of the science is clear for each rule group, scoping level workplans that (a) describe the core study approaches and what could reasonably be expected in terms of learning and inferential strength, and (b) provide general cost estimates, will support Policy to understand the value of proposed studies within each rule group. This step is largely aligned with CMER's current process of study design and scoping, but better targets the current state of knowledge and decision needs related to the rule groups. These scoping level plans would be adjusted as necessary when the science basis is updated and/or studies are completed and reviewed.
- In tandem with CMER updating the technical planning work, Policy's review of alignment of each rule group with AMP goals and other current priorities provides the third dimension of what information Policy needs to logically and consistently prioritize studies across rule groups.

Once these three pieces are in place, Policy has the ability to determine, given the available budget, what sequence of projects and programs will best address the dominant uncertainties, and best support the Program's current priorities most expeditiously. But this will only work if the assumptions and current status are updated regularly.




| Rule Group | Program | Project | FY 1 | FY 2 | FY 3 | FY 4 | FY 5 | FY 6 | FY 7 | FY 8 | FY 9 | FY 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | A1 - 1 | | | | | | $200,000 | $200,000 | | | |
| | | A1 - 2 | $500,000 | | | | | | | $200,000 | $200,000 | |
| | | A1 - 3 | $200,000 | $200,000 | | | | | | | | |
| | 2 | A2 - 1 | | | | | | | $200,000 | $200,000 | | |
| | | A2 - 2 | $500,000 | $500,000 | $300,000 | | | | | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | | |
| B | 1 | B1 - 1 | | | | | | | | $200,000 | $200,000 | $200,000 |
| | | B1 - 2 | $500,000 | $500,000 | $200,000 | | | | | $200,000 | | |
| | | B1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| | 2 | B2 - 1 | $100,000 | $100,000 | | | | | | $200,000 | $200,000 | $200,000 |
| | | B2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | | |
| | | B2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| C | 1 | A1 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | | |
| | | A1 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | |
| | | A1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | |
| | 2 | A2 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | A2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | |
| D | 1 | B1 - 1 | $100,000 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | B1 - 2 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $200,000 | | |
| | | B1 - 3 | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | |
| | 2 | B2 - 1 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | |
| | | B2 - 2 | | | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $100,000 | $200,000 |
| | | B2 - 3 | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| E | 1 | E1 - 1 | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E1 - 2 | | | | $300,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E1 - 3 | | | | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| | 2 | E2 - 1 | | | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E2 - 2 | | | | | $100,000 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E2 - 3 | | | | | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 |
| Contingency | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $600,000 | $600,000 | $600,000 | $1,000,000 | $1,000,000 |
| | | | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$4,300,000** | **$4,100,000** | **$3,500,000** | **$3,400,000** |

**Figure 5: A Future Evergreen MPS – See Table 1 for a description of Key Features**

**Table 2: Key Features of a Future MPS**

## Feature 1

**The Scientific Basis is updated and maintained**

*To support this, the 5-year science review required by WAC 222-12-045 is regularly completed.*

**A)** CMER has updated the rankings to the original guiding questions about **Risk and Uncertainty**. (i.e., how certain are we of the science and/or assumptions underlying the harvest rule? And how much risk is there to aquatic resources if the science or assumptions underlying the rule are incorrect?)
These rankings are also reviewed periodically to ensure they represent current understandings.

**B).** The **Critical Questions** that describe the AMP's understanding of the uncertainties and assumptions associated with harvest rules are fully and regularly updated and guide both the Risk/Uncertainty rankings (1A) and the development and prioritization of strategies. Critical questions should be management oriented, geared towards making decisions regarding forest practice rules. This is informed by both Influence Diagrams (1C) and the status of Schedule L-1 (1D).

Update

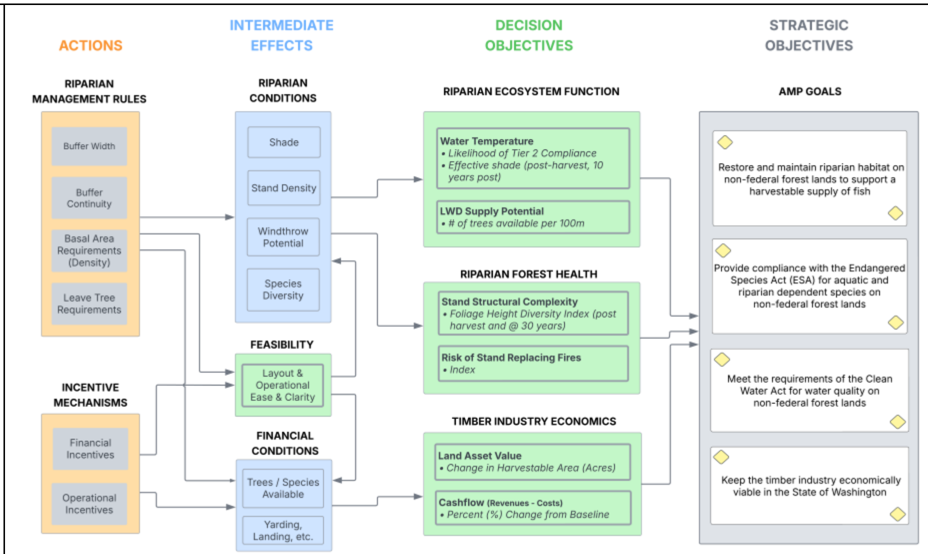
| Program Title | Overall Ranking | Uncertainty | | Risk | |
|---|---|---|---|---|---|
| | | Mean | Rank | Mean | Rank |
| **Effectiveness/Validation Programs** | | | | | |
| Type N Buffer Characteristics, Integrity Function | 1 | 4.4 | 1 | 3.9 | 1 |
| Eastside Type F Desired Future Range and Target | 2 | 4.2 | 2 | 3.8 | 2 |
| Type N Amphibian Response | 3 | 4.2 | 2 | 3.7 | 3 |
| Road Sub-Basin-Scale Effectiveness Monitoring | 4 | 3.4 | 5 | 3.4 | 4 |
| Type F Statewide Prescription Monitoring | 5 | 3.2 | 7 | 3.1 | 6 |
| Mass Wasting Effectiveness Monitoring | 6 | 3.2 | 6 | 2.9 | 8 |
| Eastside (BTO) Temperature | 7 | 3.0 | 9 | 3.2 | 5 |
| Wetlands Revegetation Effectiveness | 8 | 3.5 | 4 | 2.7 | 11 |
| Road Prescription-Scale Effectiveness Monitoring | 9 | 2.6 | 14 | 3.1 | 6 |
| Hardwood Conversion | 10 | 3.0 | 8 | 2.6 | 12 |
| Wetlands Mitigation | 11 | 2.8 | 11 | 2.7 | 10 |
| Fish Passage Effectiveness Monitoring | 12 | 2.6 | 14 | 2.9 | 9 |
| Wildlife Program | 13 | 2.9 | 10 | 2.4 | 14 |
| Wetland Management Zone Effectiveness Monitoring | 14 | 2.8 | 12 | 2.5 | 13 |
| CMZ Effectiveness Monitoring | 15 | 2.7 | 13 | 2.1 | 15 |
| Forest Chemicals | 16 | 2.0 | 16 | 2.1 | 16 |
| **Extensive Status and Trends Monitoring Programs** | | | | | |
| Extensive Riparian Monitoring | 1 | 3.5 | 2 | 3.5 | 1 |
| Extensive Mass Wasting Monitoring | 2 | 3.7 | 1 | 2.9 | 3 |
| Extensive Fish Passage Monitoring | 3 | 3.1 | 3 | 3.1 | 2 |

| Priority | | | |
|---|---|---|---|
| Rule Group | Program | UNC? | RISK? |
| A | 1 | 4 | 3 |
| | 2 | 4 | 4 |
| B | 1 | 5 | 2 |
| | 2 | 3 | 3 |
| C | 1 | 3 | 5 |
| | 2 | 2 | 4 |
| D | 1 | 5 | 3 |
| | 2 | 3 | 4 |
| E | 1 | 5 | 4 |
| | 2 | 4 | 3 |

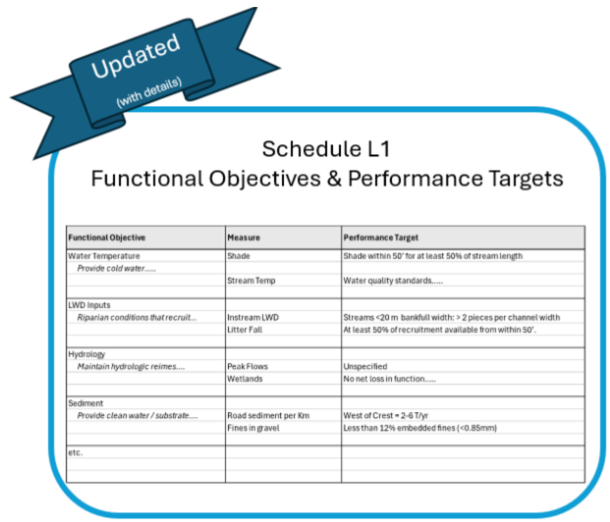
**C). Conceptual Models** are used to support assessment and prioritization of scientific needs.

Conceptual models (similar to diagrams developed as part of ENREP case study) visualize pathways of effects between actions and outcomes and help unpack and support inferences.

These diagrams help clarify what questions we need to answer such that we can better understand whether and how to adjust management actions to achieve desired outcomes.




**D). Updated Resource Objectives**
The current status of Schedule L-1 (functional objectives and performance targets) informs the development Critical Questions (1B) and the ranking of Risk/Uncertainty Rankings (1A).




| Functional Objective | Measure | Performance Target |
|---|---|---|
| Water Temperature | Shade | Shade within 50' for at least 50% of stream length |
| *Provide cold water.....* | | |
| | Stream Temp | Water quality standards..... |
| LWD Inputs | | |
| *Riparian conditions that recruit...* | Instream LWD | Streams <20 m bankfull width: > 2 pieces per channel width |
| | Litter Fall | At least 50% of recruitment available from within 50'. |
| Hydrology | | |
| *Maintain hydrologic reimes....* | Peak Flows | Unspecified |
| | Wetlands | No net loss in function..... |
| Sediment | | |
| *Provide clean water / substrate....* | Road sediment per Km | West of Crest = 2-6 T/yr |
| | Fines in gravel | Less than 12% embedded fines (<0.85mm) |
| etc. | | |

compass

## Feature 2

**Iterative Technical Planning**

*Each Rule Group has a complete and comprehensive strategy*

**A).** Rule Group Strategies scope out specific Programs and Projects needed to answer the Critical Questions within the Rule Group.

Iterative technical planning between CMER, Policy and AMP Staff results in an MPS with:

- 10-year time horizon
- Cost estimates for all projects
- Mixture of monitoring types
- Staging over time

Work planning takes into account the need for socio-economic analyses and alternative development. Necessary workgroups and/or consultants are formed/hired.

| Rule Group | Program | Project | FY 1 | FY 2 | FY 3 | FY 4 | FY 5 | FY 6 | FY 7 | FY 8 | FY 9 | FY 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | A1 - 1 | | | | | | $200,000 | $200,000 | | | |
| | | A1 - 2 | $500,000 | | | | | | | $200,000 | $200,000 | |
| | | A1 - 3 | $200,000 | $200,000 | | | | | | | | |
| | 2 | A2 - 1 | | | | | | | $200,000 | $200,000 | | |
| | | A2 - 2 | $500,000 | $500,000 | $300,000 | | | | | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | | |
| B | 1 | B1 - 1 | | | | | | | | $200,000 | $200,000 | $200,000 |
| | | B1 - 2 | $500,000 | $500,000 | $200,000 | | | | | $200,000 | | |
| | | B1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| | 2 | B2 - 1 | $100,000 | $100,000 | | | | | | $200,000 | $200,000 | $200,000 |
| | | B2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | | |
| | | B2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| C | 1 | A1 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | | |
| | | A1 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | |
| | | A1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | |
| | 2 | A2 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | A2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | |
| D | 1 | B1 - 1 | $100,000 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | B1 - 2 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $200,000 | | |
| | | B1 - 3 | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | |
| | 2 | B2 - 1 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | |
| | | B2 - 2 | | | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $100,000 | $200,000 |
| | | B2 - 3 | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| E | 1 | E1 - 1 | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E1 - 2 | | | | $300,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E1 - 3 | | | | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| | 2 | E2 - 1 | | | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E2 - 2 | | | | | $100,000 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E2 - 3 | | | | | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 |
| Contingency | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $600,000 | $600,000 | $600,000 | $1,000,000 | $1,000,000 |
| | | | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$4,300,000** | **$4,100,000** | **$3,500,000** | **$3,400,000** |

**B) Interdependencies**

An important part of the strategy development process is to plan for opportunities to leverage projects in one Rule Group / Program to inform implementation of projects in other areas.

| Rule Group | Program | Project | Critical Questions |
|---|---|---|---|
| A | 1 | A1 - 1 | Q1, Q2, Q3.... |
| | | A1 - 2 | Q1, Q2, Q3.... |
| | | A1 - 3 | Q1, Q2, Q3.... |
| | 2 | A2 - 1 | Q1, Q2, Q3.... |
| | | A2 - 2 | Q1, Q2, Q3.... |
| | | A2 - 3 | Q1, Q2, Q3.... |
| B | 1 | B1 - 1 | Q1, Q2, Q3.... |
| | | B1 - 2 | Q1, Q2, Q3.... |
| | | B1 - 3 | Q1, Q2, Q3.... |
| | 2 | B2 - 1 | Q1, Q2, Q3.... |
| | | B2 - 2 | Q1, Q2, Q3.... |
| | | B2 - 3 | Q1, Q2, Q3.... |
| C | 1 | A1 - 1 | Q1, Q2, Q3.... |
| | | A1 - 2 | Q1, Q2, Q3.... |
| | | A1 - 3 | Q1, Q2, Q3.... |
| | 2 | A2 - 1 | Q1, Q2, Q3.... |
| | | A2 - 2 | Q1, Q2, Q3.... |
| | | A2 - 3 | Q1, Q2, Q3.... |
| D | 1 | B1 - 1 | Q1, Q2, Q3.... |
| | | B1 - 2 | Q1, Q2, Q3.... |
| | | B1 - 3 | Q1, Q2, Q3.... |
| | 2 | B2 - 1 | Q1, Q2, Q3.... |
| | | B2 - 2 | Q1, Q2, Q3.... |
| | | B2 - 3 | Q1, Q2, Q3.... |
| E | 1 | E1 - 1 | Q1, Q2, Q3.... |
| | | E1 - 2 | Q1, Q2, Q3.... |
| | | E1 - 3 | Q1, Q2, Q3.... |
| | 2 | E2 - 1 | Q1, Q2, Q3.... |
| | | E2 - 2 | Q1, Q2, Q3.... |
| | | E2 - 3 | Q1, Q2, Q3.... |

compass

**C).** Strategies are **revisited** as needed given updated understandings of uncertainties and recommendations based on validation monitoring and the latest science.

| Rule Group | Program | Project | FY 1 | FY 2 | FY 3 | FY 4 | FY 5 | FY 6 | FY 7 | FY 8 | FY 9 | FY 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | A1 - 1 | | | | | | $200,000 | $200,000 | | | |
| | | A1 - 2 | $500,000 | | | | | | | $200,000 | $200,000 | |
| | | A1 - 3 | $200,000 | $200,000 | | | | | | | | |
| | 2 | A2 - 1 | | | | | | | $200,000 | $200,000 | | |
| | | A2 - 2 | $500,000 | $500,000 | $300,000 | | | | | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | | |
| B | 1 | B1 - 1 | | | | | | | | $200,000 | $200,000 | $200,000 |
| | | B1 - 2 | $500,000 | $500,000 | $200,000 | | | | | $200,000 | | |
| | | B1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| | 2 | B2 - 1 | $100,000 | $100,000 | | | | | | $200,000 | $200,000 | $200,000 |
| | | B2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | | |
| | | B2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | | |
| C | 1 | A1 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | | |
| | | A1 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | | |
| | | A1 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | | |
| | 2 | A2 - 1 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | A2 - 2 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | | | |
| | | A2 - 3 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | | |
| D | 1 | B1 - 1 | $100,000 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | | |
| | | B1 - 2 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $200,000 | | |
| | | B1 - 3 | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | | |
| | 2 | B2 - 1 | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | | |
| | | B2 - 2 | | | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $200,000 | $100,000 | $200,000 |
| | | B2 - 3 | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| E | 1 | E1 - 1 | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E1 - 2 | | | | $300,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E1 - 3 | | | | $100,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 |
| | 2 | E2 - 1 | | | | | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| | | E2 - 2 | | | | | $100,000 | $200,000 | $500,000 | $500,000 | $500,000 | $500,000 |
| | | E2 - 3 | | | | | | $200,000 | $100,000 | $200,000 | $200,000 | $200,000 |
| Contingency | | | $200,000 | $200,000 | $200,000 | $200,000 | $200,000 | $600,000 | $600,000 | $600,000 | $1,000,000 | $1,000,000 |
| | | | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$5,000,000** | **$4,300,000** | **$4,100,000** | **$3,500,000** | **$3,400,000** |

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## Feature 3

**Alignment with AMP Goals is evaluated periodically**

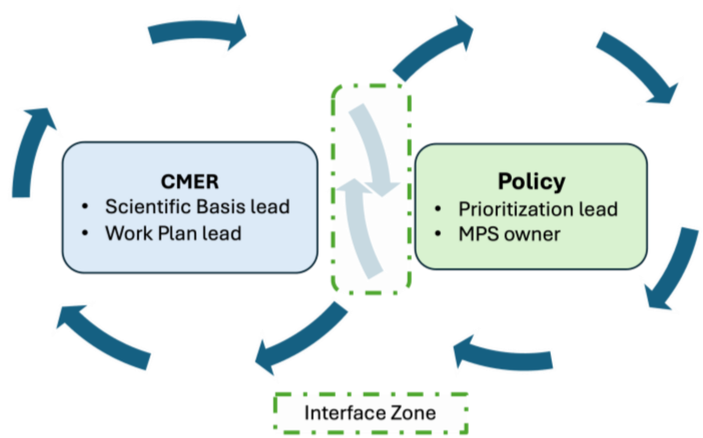
**A). AMP Goals guide prioritization.** Once CMER, has determined the uncertainty and risk associated with the current FP rules and developed a strategic, prioritized workplan to address them, Policy, using the workplan as a starting point, considers which rule groups, programs and projects should be prioritized given the AMP goals. In simple form, Policy considers the following question: “given what we know from the scientific basis, to what degree will implementing each Rule Group / Program support the AMP in achieving its fundamental Goals?”

**B). Defined scales** could be developed and used in a weighting exercise to support Policy in evaluating the relative priority among Rule Groups / Programs.

| Priority | | AMP Goals | | | | |
|---|---|---|---|---|---|---|
| | | ESA Compliance | Clean Water Act Assuranes | Harvestable Supply of Fish | Viable Timber Industry | |
| Rule Group | Program | 25% | 25% | 25% | 25% | |
| A | 1 | 3 | 4 | 2 | 2 | 2.75 |
| | 2 | 3 | 4 | 3 | 2 | 3 |
| B | 1 | 2 | 3 | 4 | 4 | 3.25 |
| | 2 | 3 | 4 | 4 | 4 | 3.75 |
| C | 1 | 5 | 2 | 2 | 3 | 3 |
| | 2 | 4 | 4 | 4 | 4 | 4 |
| D | 1 | 4 | 3 | 3 | 2 | 3 |
| | 2 | 5 | 5 | 3 | 5 | 4.5 |
| E | 1 | 5 | 5 | 2 | 2 | 3.5 |
| | 2 | 4 | 3 | 4 | 2 | 3.25 |

**B)** CMER and Policy have **effective deliberations** in the interface zone to support informed, collaborative development of both the CMER Work Plan and the MPS.

Since the prioritization process relies heavily on a sound scientific basis, CMER members are included in prioritization discussion to provide context and clarification as needed. Similarly, Policy input is sought at the early stages of CMER work planning to ensure study results will effectively inform Policy decision making.



# 4 Recommendations

Like all landscape-scale natural resource management AM programs, the Timber Fish and Wildlife AMP is a complex socio-institutional system put in place to manage equally complex forest, aquatic and watershed ecosystems. Though well designed at the onset, over time, the system has become cumbersome, rigid, and overly tangled in alternative perspectives of past milestones and agreements. The result is that the current approach to MPS prioritization involves as much positional negotiation as it does analytical rigour. To move through challenges and apparent impasses, many of which have been identified time and again by previous reviewers (e.g., Stillwater Sciences, State Auditor), there is a need for a formal reset and reorganization.

These recommendations aim to rekindle the original intent of the program including nurturing a collaborative process, building strong science, and continuing learning and improving program function, and ultimately forest management over time. Our recommendations leverage aspects of the solid foundation already in place. They lean on the existing committee structures, accumulated scientific knowledge, and institutional relationships. Existing challenges do not point toward a need for a dramatic ‘clean slate’ approach to renewal. Rather, there are solid parts of the system that will provide the stability necessary for a strategic re-set (creative destruction and reorganization) of the way the TFW AMP functions.

Compass’ recommendations are the following:

**Recommendation 1: Re-set the Scientific Basis**

Coordinated by CMER, under the guidance of TFW Policy, and consistent with the requirements for Independent Science Review (WAC 222-12-045), tasks include:

1. Re-set the Critical Questions for each Rule Group / Program
    a. Re-affirm the Rule Group / Program structure and definitions
    b. Update the Critical Questions with focus on what is needed for better understanding forest practice rule effectiveness in a way that accounts for natural variability.

Re-setting the scientific basis requires Policy to be clear about the priority decisions facing the program and to articulate their information needs to CMER. It also requires CMER to develop critical science questions and to re-assess what is known currently relative to what needs to be known to support Policy’s needs. This re-set will require a dedicated, collaborative, structured effort involving both CMER and Policy groups.

2. Re-set the Resource Objectives (Functional Objectives and Performance Targets)
    a. Update Schedule L-1, understanding that there will always be uncertainties and challenges with developing and setting targets.
3. Re-set the Risk and Uncertainty rankings for each Ruleset / Program. Develop a rigorous and repeatable methodology. CMER members noted on review the importance of ensuring

CMER, Policy and Board members alike understand the distinction between technical and policy uncertainty. Here, we are speaking about technical uncertainty.

**Recommendation 2: Scope out new Rule Group / Program Strategies**

Coordinated by CMER, supported by AMP Staff:

1. Update the strategies for an integrated set of monitoring projects (i.e., effectiveness monitoring, extensive, intensive, rule tools) as needed to address the updated Critical Questions. As noted by multiple CMER members, this will be a significant challenge for the program; e.g., designing and implementing large scale extensive monitoring programs will be a learning curve for many participants. *[Identify linkages between studies and between critical questions. i.e. are there answers to some questions that will inform study design for others or, from a scientific perspective, which questions need to be answered first?]*
2. Given the primary AMP focus on understanding and improving the effectiveness of forest practice rules in meeting all four program goals, ensure that the scoping and strategy development process:
    a. Recognizes that the fastest way to test rule effectiveness is to test alternative treatments.
    b. Includes projects (or program linkages) necessary to understand the socio-economic consequences of alternative rule sets on the goal of maintaining a viable timber industry.

Includes tasks to develop suitable SDM performance measures (e.g. ENREP case study) and forest practice alternatives? This may involve the development of designated workgroups.

**Recommendation 3: Develop a Prioritization Approach for an Evergreen MPS**

Coordinated by Policy, supported by AMP staff:

1. Develop and document a procedure to guide how Rule Groups and Programs can be evaluated for their support of the four AMP goals.
    a. Relies on criteria and defined scales
    b. Integrates understanding of the Scientific Basis
    c. Responsive to emergent FPB priorities
2. Develop a Transition Plan
    a. Recognizing that the development of an updated Science Basis, renewed Rule Group / Program Strategies, and prioritization reflecting AMP Goals is a large task, seek opportunities to transition from projects that are lower rated to higher rated (reflecting on the original rationale, sunk costs, etc.).

## Recommendation 4: Maintain Everything Transparently on the AMP online Dashboard

Coordinated by AMP Staff

1. Ensure that the latest versions of the MPS, CMER Workplan and all supporting information pieces are shared and available on the program online dashboard.
2. Update the AMP Guidelines as described in the Board Manual as needed to reflect the process changes as implemented.

## 5 References

Forest Practices Board Manual, Section 22 Guidelines for Adaptive Management Program, 2013

Gregory, R., Failing, L., Harstone, M., Long, G., McDaniels, T., & Ohlson, D. (2012). *Structured Decision Making: A Practical guide to environmental management choices.* John Wiley & Sons.

Monitoring and Design Team, July 2002, Monitoring Design for the Forestry Module of the Governor's Salmon Recovery Plan

Office of the Washington State Auditor Pat McCarthy, 2021, Adaptive Management Program: Improving Decision-Making and Accountability

Stillwater Sciences, 2009, Cooperative Monitoring and Evaluation, and Research (CMER) Review of Science: Final Report

Timber/Fish/Wildlife Agreement: A Better Future In Our Woods and Streams, Final Report, 1987

WAC 222-12-045. Adaptive Management Program. February 2023

Washington State Cooperative Monitoring, Evaluation and Research Committee (CMER), Protocols and Standards Manual, Revised 2024

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# Guidance Document

# SDM Framework for Eastside Type Np Riparian Harvest Rules

## FINAL

**Prepared for**

Timber, Fish, and Wildlife Policy Committee, Forest Practices Adaptive Management Program, State of Washington

**Prepared by**

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**Date**

June 30, 2025

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# Executive Summary


This guidance document, prepared by Compass Resource Management Ltd. for the Timber, Fish, and Wildlife (TFW) Policy Committee, outlines a Structured Decision Making (SDM) approach (Gregory et al., 2012; structureddecisionmaking.org) for decisions facing TFW Policy. The document aims to provide a clear framework for the AMP's upcoming decision-making process on Eastside type Np streams and serve as a guide for other decision contexts.

This document demonstrates an approach to evaluating potential changes to Eastside Np riparian harvest rules following the completion of the Eastside type Np Riparian Effectiveness Program (ENREP) study. The decision facing TFW Policy is: "What changes, if any, to the riparian harvest rules for Eastside Np basins should TFW Policy recommend to better balance protective riparian functions, landscape-level forest health, and a viable timber industry?" While the ENREP study will assess whether current rules protect key stream ecosystem functions, it does not address alternative rules or their broader impacts. This framing of the decision explicitly recognizes that the ENREP study provides an essential foundation, but a comprehensive evaluation of alternatives against a broader set of objectives is required.

At the heart of this SDM framework are four fundamental decision objectives: Riparian Ecosystem Function, Riparian Forest Health, Feasibility of Implementation, and Timber Industry Economics. These objectives are directly linked to the broad program goals but are specifically tailored for evaluating a range alternative harvest rules. Each objective is broken down into sub-objectives with associated performance measures (PMs) designed to quantify the outcomes of various alternatives. While many of the PMs will require further development and modeling, they provide helpful starting points for metrics that will demonstrate how different approaches perform.

The document also describes a range of alternative riparian harvest prescriptions, built from individual components such as various buffer width requirements, buffer continuity requirements, basal area requirements, leave tree requirements, and incentive schemes. These components are combined into distinct strategies for comparison, including reference cases and illustrative "bookend" strategies that prioritize specific objectives. Additionally, hybrid alternatives are introduced to demonstrate an approach to developing combinations that promote multiple objectives simultaneously. Further work is needed to refine aspects of these alternatives to ensure clear and meaningful comparisons.

Finally, the framework emphasizes the importance of a consequence table, a summary matrix illustrating the performance of each alternative on each objective. Populating this table involves collaborative technical work to develop and test models, fostering shared learning about potential outcomes and uncertainties. The consequence table will then facilitate deliberations on key value-based trade-offs. The goal is to find the alternative that offers the best balance across the objectives, considering diverse values and perspectives, ultimately leading to broadly supported recommendations for the Forest Practices Board.

This framework demonstrates an approach for working through a technically complex decision problem, providing useful starting points for many of the elements of the decision.

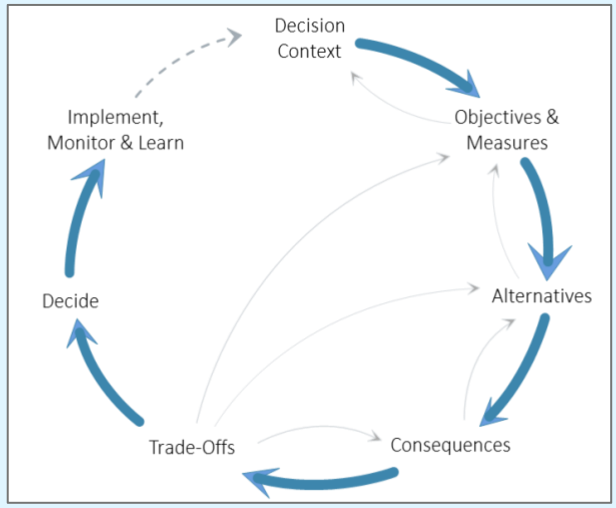
## Contents

# 1 Document Purpose

This working document provides a roadmap for supporting TFW Policy's upcoming decisions about harvest prescriptions for Eastside Type Np rules within riparian areas.

Compass Resource Management was hired by the AMP to facilitate and demonstrate the application of a Structured Decision Making (SDM) approach (Gregory et al., 2012; structureddecisionmaking.org) to decisions facing TFW Policy. Given the forthcoming results from the ENREP study in the next two to three years, TFW Policy has given us the direction to use riparian Forest Practices rules in Eastside Np basins as a case study. Compass worked closely with AMP members from TFW Policy, CMER and identified Subject Matter Experts to advance the case study.

**Box 1**. The Structured Decision Making (SDM) process




SDM doesn't make tough choices easy. But it does make them more explicit, better informed, more transparent, and more efficient.

Structured Decision Making (SDM) is an organized approach for helping groups work together to make informed and transparent choices in situations where values conflicts and scientific uncertainty introduce significant complexity. The SDM process has 7 steps (see Box 1) and involves informing decisions based on clearly articulated fundamental objectives that are responsive to broadly held values, creative development of alternative courses of action, recognizing the role of scientific predictions in decisions, dealing explicitly with uncertainty, and responding transparently to different values-based trade-offs. The final stage of the process focuses on what learning is needed to improve future decision making through implementation, monitoring, and review.

This document will identify the core components of a decision framework that the AMP can use to inform decisions about whether and how to recommend changes to the riparian harvest rules for Eastside type Np basins, including:

- A clear articulation of the decision that TFW will face;
- A proposed set of objectives and related performance measures developed by members of CMER, TFW Policy, and other subject matter experts;
- A proposed range of alternative riparian harvest prescriptions that demonstrate the approach to combining individual rule types into comprehensive and comparable strategies; and
- An articulation of the key trade-offs that TFW Policy will likely need to address through any recommendations made to the Forest Practices Board.

In addition to providing a roadmap for the program's upcoming decision making on East side type Np streams, this project aims to provide an SDM Framework that the AMP can use as a guide in other decision contexts.

## 2 Decision Context

**Box 2**. The first step in the SDM process is to clarify the decision context. What is the underlying problem or opportunity? What is the decision to be made and who will make it? What's in and out of scope and what does that tell us about what values are at stake and what range of alternatives will be considered? Key constraints for the process (timelines, budget, legal issues) are also identified.

A key function of the Washington State Department of Natural Resources Adaptive Management Program (AMP) is to perform studies to learn about the effects of the Forest Practices rules to ensure that they are supportive of the four AMP goals; that is, that they are protective of important values such as fish habitat and water quality, that they support regulatory compliance, and concurrently enable a viable forest industry. The results of these studies ultimately inform recommendations by TFW Policy to the Forest Practices Board (FPB) on potential changes to the rules, which must balance the AMP goals.

The AMP launched the Eastside type Np Riparian Effectiveness Program (ENREP) study in 2019 as part of the Type N Riparian Prescriptions Rule Group and Type N Riparian Effectiveness Program. The critical questions to be addressed by the study include (Link et al., 2022):

- A*re riparian processes and functions provided by Type Np (non-fish perennial) buffers maintained at levels that meet resource objectives and performance targets for shade, stream temperature, large woody debris (LWD) recruitment, and aquatic life?*
- *Do different types of Type N channels explain the variability in the response of Type N channels to forest practices?*
- *What is the effect of buffering or not buffering spatially intermittent stream reaches in Np streams?*

Once complete, the ENREP study will address whether the current rules are protective of key stream ecosystem functions, including maintaining water temperature, that are important for supporting downstream salmonid habitats. If the results of the ENREP study indicate that the current rules are not protective, TFW Policy will need to make recommendations on changes to the rules.

However, the study was not designed to address what other rules would be more protective, nor if other rules could be as protective and simultaneously better support other AMP goals (e.g., viable timber industry). While the ENREP study will provide a solid technical foundation for understanding the effects of the current rules, any recommendations from Policy to the FPB will need to be based on an evaluation of how a range of alternative rules might affect the full suite of interests relevant to the Program participants and carefully weigh the inherent trade-offs.

In discussions with Policy and CMER members, the broader context for riparian forest management on the Eastside yielded a more nuanced picture of the decision opportunity that TFW Policy will face upon completion of the ENREP study. In general terms, forest condition on the Eastside reflects a long history of fire suppression, which has resulted in overstocked stands with low productivity and low resilience to fire, disease, and other climate change related issues. While it's possible that this forest condition helps to provide dense shade that in turn is protective of stream temperatures, restorative forest management practices that thin these stands from below to introduce vertical complexity and select for more resilient species could stand to provide broad benefits for overall forest health – especially if these actions were applied widely.

However, the complexity of the current WAC rules for riparian zones makes it difficult for landowners and operators to understand their eligibility for various active management approaches in riparian zones. Faced with the somewhat onerous task of understanding and properly laying out a riparian cutblock and with the relatively poor condition of trees in the riparian zone, many landowners choose to not harvest within these areas. This choice means that the opportunity for broad application of good forest management approaches is missed.

The completion of the ENREP study, taken together with the need to evaluate alternatives across a broader set of objectives presents TFW Policy with an opportunity to find creative solutions to ensure that riparian forests are broadly protective of stream temperatures while improving forest condition at a landscape scale and improving (or at least maintaining) timber harvest viability in riparian areas.

Fundamentally, the decision facing TFW Policy (supported by CMER) will be:

> *What changes, if any, to the riparian harvest rules for Eastside Np basins should TFW Policy recommend to better balance protective riparian functions, landscape-level forest health, and a viable timber industry?*

Implicit in this decision statement is a recognition that:

- The ENREP study results will provide an essential foundation for this decision process by demonstrating the degree to which the current WAC rules protect important riparian and in-stream ecological functions;
- In order to inform a decision about whether and how to change the WAC rules, Policy must evaluate the current rules alongside reasonable alternatives to determine whether these alternatives are better able to protect ecosystem functions at acceptable costs.
- Additional tools and approaches to understanding the effects of the current rules and reasonable alternatives on other objectives will be required, and developing these will take focused attention and effort from the Program.
- To find solutions that balance multiple (and possibly competing) objectives, TFW Policy and CMER may need to directly and transparently address trade-offs between actions to support stream temperatures and forest health.

# 3 Decision Objectives and Performance Measures

Working with Policy and CMER members, Compass developed a set of draft decision objectives, sub-objectives and associated performance measures to capture key interests and concerns related to the decision described above and how they may or may not be impacted by potential changes to the current Forest Practices rules for harvest in Eastside riparian zones.

A summary of draft decision objectives and potential PMs are provided below in Table 1. Arrows represent the preferred direction for the objective.

The four fundamental objectives – Riparian Ecosystem Function, Riparian Forest Health, Feasibility of Implementation, and Timber Industry Economics – are directly linked to broad program goals (Figure 1), but are more specifically suited to evaluating alternative harvest rules and therefore more useful from a decision making perspective (see Box 3). Each of these objectives has been broken down into several sub-objectives, which further articulate and specify the objectives. Evaluating performance against this concise set of objectives and sub-objectives will serve to identify potentially important trade-offs across alternatives for Policy deliberation.

Performance Measures serve to clarify the specific quantitative metric that will form the basis of the predicted outcomes of the alternatives. For the purposes of informing a decision about adjusting the Eastside rules, PMs were identified that most directly connected to the principal changes in rules being evaluated as part of this case study. PMs are summarized in Table 1and described more fully below. While the tools to evaluate all identified PMs do not currently exist within the Program, many would rely on established models and statistical approaches employed elsewhere in the Pacific Northwest and could easily be tailed for use within the Program on this and other similar decisions.

**Box 3**. At the core of an SDM process is a set of well-defined **decision objectives** that clarify "what matters" – the things that people care about and could be affected by the decision. Objectives should include all the things that matter, not just the ones that are easily quantified (e.g., increase the abundance of salmon, minimize greenhouse gas emissions, increase cultural value, etc.). A good set of objectives has the following attributes:

- *Complete* – as a set, the objectives capture all the key interests;
- *Concise* – there is nothing unnecessary;
- *Sensitive* – they are differentially influenced by the alternatives under consideration;
- *Understandable* – clearly relate to the things that matter;
- *Independent* – they contribute independently to the performance of alternatives.

**Performance measures** (also called attributes or evaluation criteria) are the specific metrics that will be used to predict the consequences of the alternatives relative to the objectives. Several key considerations – closely related to those used to structure objectives – have been used to guide the development of potential PMs for each sub-objective:

- *Accurate and direct* – there is a clear and well-accepted relationship between the PM and the decision objective;
- *Unambiguous* – it is clearly defined, suitably precise, and will be interpreted by everyone the same way;
- *Understandable* – consequences and value trade-offs made using the PM can be readily understood and communicated;
- *Operational* – information and tools needed to make predictions relative to it (e.g., through modeling) are or can be made available;
- *Complete and concise* – as a set, the PMs report all the essential consequences without duplication.

Note that PMs are not equivalent to *performance targets* (e.g., Schedule L-1 targets), which track attainment of particular metrics post-implementation.

**Figure 1. Means-ends diagram connecting the actions available to the Program (means, in orange box) with decision objectives (in green box) and Program goals.**

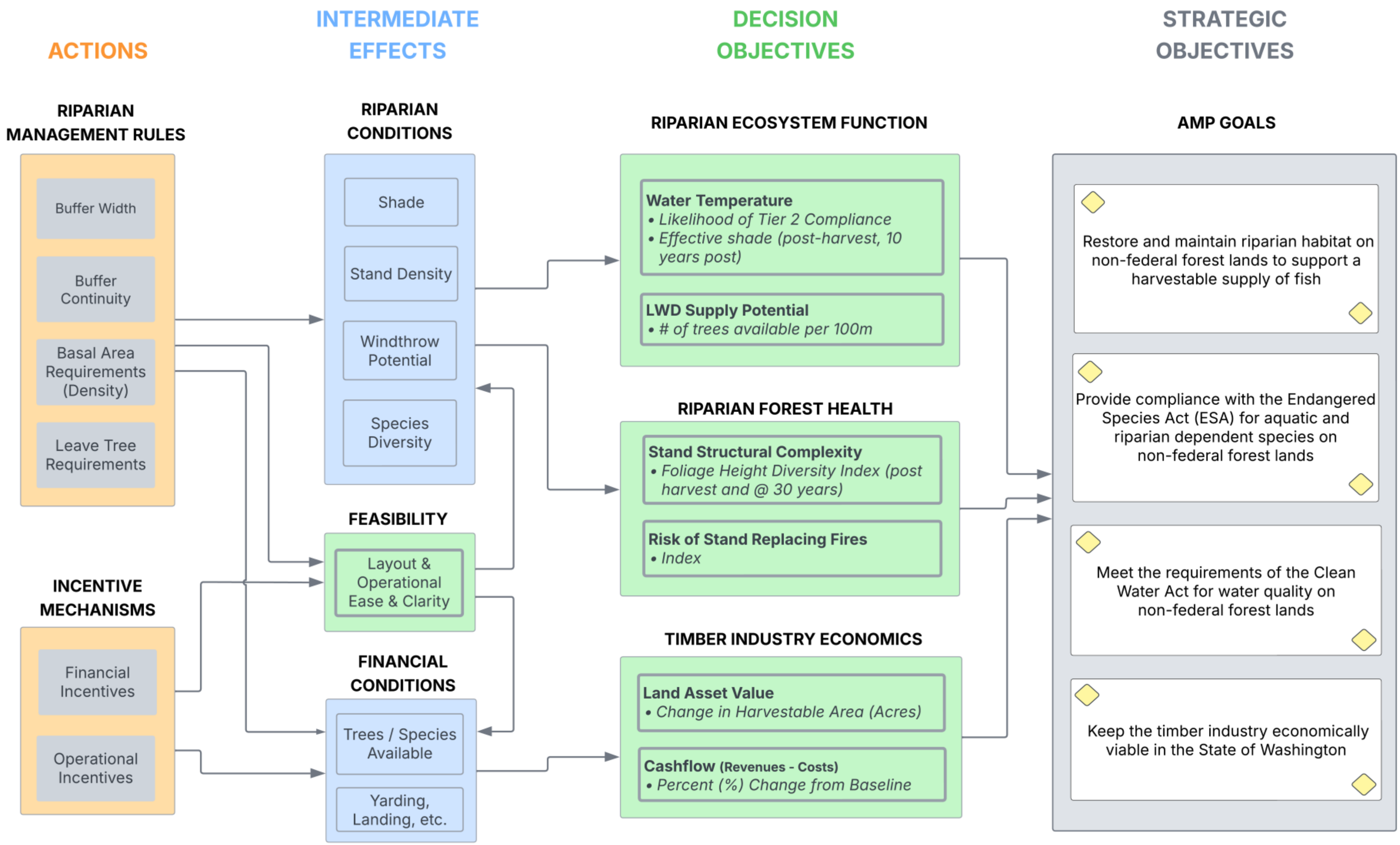


**Table 1. Summary draft decision objectives, sub-objectives and potential performance measures, and preferred direction of change (all else being equal).**

| Objectives | Sub-objectives | Potential Performance Measures | Pref. Dir. |
|---|---|---|---|
| **Riparian Ecosystem Function** | Stream Temperature | Effective Shade (Post Harvest) | ↑ |
| | | Effective Shade (@ 30 years) | ↑ |
| | | Likelihood of no measurable warming after harvest | ↑ |
| | Large Woody Debris Supply Potential | # of available trees per 100m of stream length | ↑ |
| **Riparian Forest Health** | Structural Complexity | Foliage Height Diversity Index (@ 50 years) | ↑ |
| | Fire Risk | Relative Index | ↓ |
| | Excessive Windthrow Potential | Constructed Scale (1-3) | ↓ |
| **Feasibility** | Ease of layout and operation | Constructed Scale (1-4) | ↑ |
| **Timber Industry Economics** | Incremental Cash Flow | Incremental Change: Revenue - Cost (%) | ↑ |
| | Incremental Long-term Asset Value | Net Change in Harvestable Acres (acres) | ↑ |

Below are brief descriptions of each decision objective and performance measure.

## 3.1 Riparian Ecosystem Function

This objective represents an interest in maintaining core ecological functions of riparian areas of non fish-bearing perennial streams in Eastern Washington. Two of the important ecological functions provided by riparian areas most directly affected by this decision include moderating stream temperature and Large Woody Debris (LWD) Supply Potential. In addition to the important roles these processes play in helping to create and maintain downstream salmonid habitats (i.e., in F-type steams), they also are also important for contributing to amphibian habitats at the Np basin scale.

> **Box 4**. A key phase in the refinement of objectives and performance measures is to develop an understanding of the basic causal links between actions (means) and important outcomes (ends). Means-ends diagrams can be an effective tool for developing and representing these understandings. These diagrams help to clearly separate means from ends, while highlighting the causal variables over which managers have some control. They also play an important role in identifying potential performance measures and in determining modeling and information needs.

This objective also directly relates to three of the over-arching AMP goals: (1) to provide compliance with the Endangered Species Act (ESA) for aquatic and riparian dependent species on non-federal forest lands, (2) to restore and maintain riparian habitat on non-federal forest lands to support a harvestable supply of fish, and (3) to meet the requirements of the Clean Water Act for water quality on non-federal lands.

### 3.1.1 Stream Temperature

Two PMs have been proposed to characterize the effects of potential changes to the Forest Practice Rules on stream temperature.

Effective Shade

Stream temperature in Np basins (as measured at the basin outlet) is directly affected by several factors, including topographical shading, shading by riparian forests, interactions of ground, sub-surface, and surface water (i.e., hyporheic interactions), and air temperatures. The range of conditions with respect to each of these factors across Eastern Washington results in a wide range in sensitivity to changes in the riparian zone. Effective shade has been proposed as a performance measure for stream temperature because FPR prescriptions most directly affect shading by riparian forests, and therefore predictions of temperature effects would be muted by the other factors described above. However, all else being equal, improved effective shade is generally accepted to support lower stream temperatures, and this PM will report on basin-scale measures of effective shade at two timescales: in the first post-harvest year, and at 10 years, recognizing that vegetative recovery of riparian zones and the areas outside the riparian zone are likely to have a significant effect on shade over the long term.

To predict these values, shade models that relate tree species, stand density, vertical complexity, and other relevant factors will need to be tailored for Eastside conditions and parameterized with values reflective of a given alternative.

Likelihood of No Measurable Warming after Harvest

It is important to understand how different buffer configurations, and the shade they provide, may affect stream temperatures. Given the variability in relative influence of the factors described above on stream temperatures post-harvest, the ability to prevent or minimize warming will be assessed using a constructed scale that describes the proportion of Np basins that would experience little to no warming. This scale recognizes explicitly that due to site-specific factors and the limited data available at the landscape scale, some uncertainty regarding the effectiveness of different buffer prescriptions to prevent or minimize warming and some variability in response to any given prescription are expected to remain.

To predict these values, a constructed scale could be developed as the basis for CMER scientists to provide judgements for a given alternative.

### 3.1.2 LWD Supply Potential

Large woody debris that can be recruited into Np streams during channel forming events plays two ecological functions important to supporting the maintenance of downstream salmon habitats. Firstly, incorporation of LWD in the channel helps to create riffle-pool morphologies that in turn keep water temperatures low (though forcing hyporheic exchange) and also hold and sort preferred sediments that can replenish downstream sediments during high flows. Secondly, LWD recruitment provides key pieces that can move downstream into the type F stream network following major flow events and provide similar functions lower in the stream network.

To predict these values, established stand-recruitment models can be used to predict the number of trees within a set distance of the stream (e.g., 50 feet) that are likely to die, given parameterized starting conditions including species diversity, age class distribution and stand density.

## 3.2 Riparian Forest Health

This objective represents interests related to using timber harvest practices and riparian buffer design to make progress toward improving the overall health of state managed forests in Eastern Washington. As described in Section 2, forest health (including riparian forests) is generally poor on the Eastside, and reflects a long history of fire suppression. In addition, it is understood that under the current WAC rules, riparian management and harvest is extremely limited, potentially contributing to overstocked stands that are more vulnerable to disease, insects, and fire, and are not productive from a timber growth standpoint.

Two factors were selected to describe forest health for this decision context: structural complexity (particularly vertical complexity) and risk of stand-replacing fires. In addition, the potential for excessive windthrow as a result of buffer design was identified as a key indicator for helping to understand the long-term trajectory for forest health in managed riparian areas.

#### 3.2.1 Structural Complexity

Structural complexity is a primary indicator of forest health and resilience. In particular, vertical complexity (i.e., the diversity of forest layers in any given area), species diversity, and stand density were all recognized as important contributors to structural complexity.

This PM would predict the diversity of foliage heights within the riparian zone, given different thinning and harvest approaches.

#### 3.2.2 Fire Risk

The risk of stand replacing fires, which can eliminate the ecological functions provided by riparian areas (e.g., shading) as well as have significant economic effects. This PM would report a relative index of fire risk based on the post-harvest fuel load.

#### 3.2.3 Excessive Windthrow Potential

Excessive windthrow can negatively impact the stream ecosystem by removing the ability of the riparian zone to provide shade and other important benefits. Generally speaking, narrower buffers are more susceptible to major wind throw events, particularly in the first few years after harvest.

This PM would report values on a constructed scale describing the relative likelihood of stand-replacing windthrow events.

### 3.3 Feasibility

This objective emerged from the understanding that due to the complexity of current WAC rules, harvest in the riparian zone rarely occurs in Eastern Washington leading to both unhealthy forest stands and reduced timber revenues. This objective therefore represents interests related to creating mechanisms to encourage harvest within riparian zones, either by simplifying the rules to reduce planning, layout, and harvest costs, or by providing incentives to tip the economic balance for landowners toward harvesting these areas to improve both timber economics and forest health.

Given that more feasible sets of rules are more likely to be implemented and therefore affect forest health, riparian ecosystem function, and timber economics outcomes, this PM could be used as a screening criteria to ensure that evaluation only occurs for alternatives that are considered feasible and likely to be implemented.

#### 3.3.1 Ease of layout and operation

A constructed scale could be developed that combines ratings on four criteria:

- Understandable: *How easy is it to interpret the rules?*
- Implementable: *Are the requirements practical and unchallenging to lay out on the ground?*
- Adaptable: *Do the rules provide operator flexibility to improve efficiency in harvesting?*
- Incentives: *Are there incentives to encourage landowner harvest in riparian zones?*

## 3.4 Economically Viable Timber Industry

This objective reflects a key interest of industry stakeholders, including both large and small forest landholders. This objective also directly connects an overarching Program goal to keep the timber industry economically viable in the state of Washington.

Forestry cash flow economics are highly variable and volatile over time given the multitude of exogenous and site-specific factors that influence both costs and revenues. As a result, reporting on the absolute differences across alternatives is exceptionally difficult. However, two subobjectives have been proposed that provide an indication of the relative and incremental differences in potential revenues and costs for each of the alternatives that Policy will evaluate.

### 3.4.1 Incremental effect on cash flow

Within the context of this decision riparian harvest rules can affect revenues by determining which trees (number, species, and size) are allowed to be harvested, and can affect costs through the complexity of planning tasks, through restrictions on harvest techniques, and through buffer design elements that determine whether trees can be hauled across the stream.

Cash flow (i.e., revenues minus costs) is fundamentally the metric that determines whether harvest of a particular cut block is economically viable. Therefore, this PM reports on the proportional change in the balance of revenues minus costs.

### 3.4.2 Incremental Effect on Long-term Asset Value

Forest land ownership is a long-term financial investment with significant carrying costs (e.g., original purchase, roads, taxes, opportunity value, etc.). Rules that limit the harvestable area (and wood volume) reduce the opportunity to generate revenue from this investment and thereby lower the value of this asset over the long term. This in turn, in particular for small forest landowners, increases the likelihood that these areas will be converted into other land uses.

This PM would report on the incremental change in effectively harvestable area, recognizing that this is a simple proxy for more complex investment decisions on the part of landowners

## 3.5 Further Work to develop PMs

The PMs described in this section were developed at a coarse scale for the purposes of demonstrating their development and their use in a deliberative process. To properly support a possible decision by the FPB, each PM will require revision or refinement, as appropriate, to better capture the objectives described above and provide insights into the key trade-offs. Further development of these PMs will require work in several related workstreams, which include:

- Working through how to use AMP data where available (and how to fill data gaps that exist) to develop, tailor, or parameterize predictive models for several of the sub-objectives that will estimate effects of changes to buffer widths, densities, species selections, etc. Sub-objectives that are likely to lend themselves to modelling approaches may include, at a minimum, effective shade, LWD supply potential, structural complexity, and fire risk. The choices about how to develop these models for use in this decision context will be important steps in building transparency – and ultimately trust – in the modelling analyses done to support any decisions.
- Agreeing on the specific methods to capture the key trade-offs that the board will need to wrestle with – for example in this case, the long-term effects on forest health and the near-term effects on shade and stream temperature. Part of this work will also require clarifying the analytical assumptions including the geographic and temporal scale of the analysis, what factors are

included and excluded from consideration, what assumptions about unknowns are required to be made in the analysis, etc.

- Agreeing on how to contextualize PM results for Policy and the Board so that decision makers understand the significance of any differences among alternatives. This often involves two tasks: first, effort to fairly and appropriately characterize the degree of uncertainty in the PM estimates, and second, relating specific PM results (especially any proxy PMs) to the fundamental objectives to the best of CMER's ability (e.g., relating changes in shade to potential changes in stream temperature).

# 4 Alternatives

The alternatives under consideration in this project involve different forest management prescriptions within riparian areas of Np streams. The current Eastside Riparian rules are prescribed in WAC 222-30-022 (2023). These are the rules that are under consideration and therefore serve as an important reference case for comparison to other sets of rules – other conceptual riparian forest management prescriptions – that AMP program participants will evaluate.

While there are many important details within the rules, those that currently stand-out as the key categories of forest management and practice include with the greatest influence on riparian functions, forest health, and timber economics include:

- Buffer Width
- Buffer Continuity
- Basal Area Requirements
- Leave Tree Requirements

For the purposes of this case study, all other aspects of the riparian rules, including debris management, on-site erosion mitigation requirements, buffers around sensitive sites (type N/F confluences, alluvial fans, perennial initiation points, etc.), and road requirements, will be assumed to be held constant.

Though the current WAC rules provide avenues to harvest within the riparian zone, the poor condition of the forest (and therefore low profitability) and the complexity of the rules dictating which trees can be harvested and which must be left result in landowners most often leaving a 50-foot buffer along each side of the stream and not harvesting within it. Therefore, to encourage landowners to harvest within the riparian zone, several categories of incentive schemes were developed for the purposes of discussion and included in the development of alternatives. Though the current rules do not describe these kinds of programs and therefore may be considered out of scope of the program, TFW Policy has recognized that discussion of novel mechanisms to incentivize actions to support broader forest restoration goals may be required to enable landowners to apply these actions at the large scale required.

Collectively, these conceptual alternatives provide a framework for the AMP to build on through iterative refinement (see Box 5). In addition to two reference cases and the status quo alternative (i.e., the current WAC rules), these starting alternatives reflect a “value-focused thinking” approach, each of which are intended to prioritize one decision objective over all others, for the purposes of learning. In reality, the best alternatives (i.e., the most creative combinations of actions that strike the best balance among all objectives) will be hybrids of these starting points, and potentially include other novel components as well.

**Box 5**. *Alternatives* are the various actions or strategies that are under consideration. Creating and evaluating a range of well-defined, internally coherent alternatives is central to good decision making. In many environmental management contexts, the alternatives are complex sets of actions that need to be thoughtfully developed. In these cases, it’s useful to combine groups of actions into discrete *strategies* for comparison.

Often there are several rounds of identifying and evaluating alternatives as more is learned (through modeling and other methods of consequence assessment) about how well different combinations of actions work. An emphasis on reporting the consequences of alternatives relative to one or more *reference cases* provides important context for evaluating the significance of trade-offs.

In public planning processes, having all interested parties participate in the process of alternatives creation is important both for ensuring that a wide range of possible solutions to the problem are heard and explored, and for supporting participant buy-in of the process.

Ultimately, a good range of alternatives will reflect substantially different approaches to a problem based on both different technical or policy approaches and different priorities across objectives.

## 4.1 Individual Components

For the purposes of this case study, the following individual components were included in the development of alternative strategies.

**Table 2. Key categories for forest management actions**

| Category | Description |
| --- | --- |
| **Buffer Width** | The width of the riparian buffer is a primary determinant of its effectiveness in providing riparian ecosystem functions (e.g., water quality protection, stream temperature regulation and wildlife habitat). Possible values included for consideration included:<br>• **100 ft. two-sided**<br>• **75 ft. two-sided**<br>• **50 ft. two-sided**<br>• **25 ft. two-sided**<br>• **Aspect-adjusted**, such that a buffer of a default width (e.g., 50 ft.) could be adjusted up for south-facing banks (e.g., to 75 ft) or down for north facing banks (e.g., to 25 ft) when the streams are running east-west. |
| **Buffer Continuity** | The continuity of the riparian buffer is similarly a primary determinant of its effectiveness in providing riparian ecosystem functions. Width and continuity of buffers play an important role in forest economics as well. Possible values included for consideration included:<br>• **100% of the stream length** (i.e., fully continuous)<br>• **75% of the stream length**<br>• **50% of the stream length**<br>• **Dry reach exceptions**, such that reaches of the stream that are seasonally dry would be excluded from continuity requirements. |
| **Basal Area Requirements** | Basal area requirements are set to target the desired future conditions of riparian forest stands. Desirable ranges for basal area can often be set by considering habitat types and desired future growth. Possible choices included for consideration within this category included:<br>• **Desirable range** (e.g., 60-80 sq. ft / acre)<br>• **Understocked** (e.g., 40-60 sq. ft. / acre) |
| **Leave Tree Requirements** | The number, size and species of leave trees are important factors for site-level habitat values, long term forest health, and forest economics. Possible choices included for consideration within this category included:<br>• **Current WAC rules** (detailed set of criteria for selecting trees to leave)<br>• **Resilient species approach** (focus on leaving a range of sizes of a preferred set of climate change resilient species (Black Cottonwood, White Pine, Paper Birch, Western Larch, Ponderosa Pine, Quaking Aspen, Western Hemlock, Western Red Cedar, Douglas Fir).<br>• **No specific requirement** (no guidance on which trees to leave – operator would decide for themselves what to leave, subject to other requirements). |

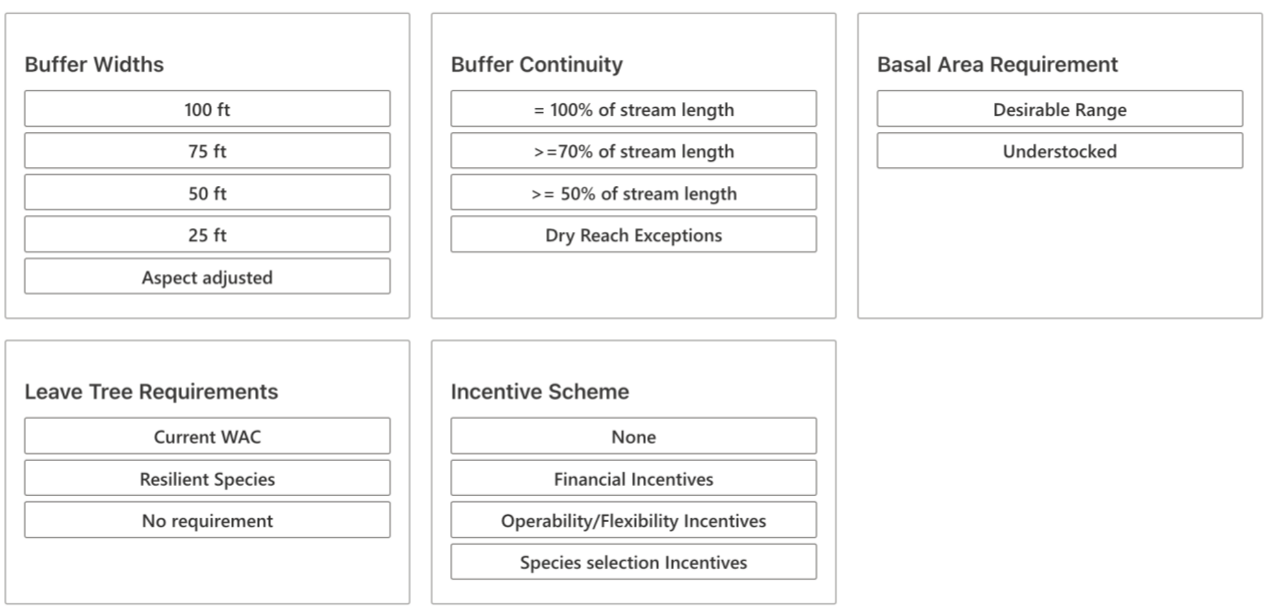
| | |
|---|---|
| **Incentive Schemes** | Should there be a desire to undertake riparian forest management, to improve forest health condition, to improve forest harvest revenues, or both, there will be a need to provide incentives to forest landowners. Possible choices included for consideration within this category included:<br>• **Financial Incentives:** these could include a variety of mechanisms, including a excise tax credits, payments from the Forest Health Revolving Fund, etc.<br>• **Operational Incentives:** these allow the landowner / operator to develop site-specific prescriptions to achieve equivalent environmental benefits, and apply these at the basin-scale.<br>• **Species-selection Incentives:** these could allow the operator to select individual trees for harvest that are of higher economic value, subject to other requirements. |

## 4.2 Process to develop strategies

*A Strategy Table* is a visual structuring tool for helping to group logical packages of actions. A key benefit of using strategy tables is that it enables people to engage interactively in strategic thinking about alternatives, without getting too bogged down in specification details. It's a powerful tool for collaborative decision making.

Figure 2 shows a Strategy Table representation of the elements shown above, with showing choices within the categories of actions described in Table 2.

**Figure 2. Draft Strategy Table**



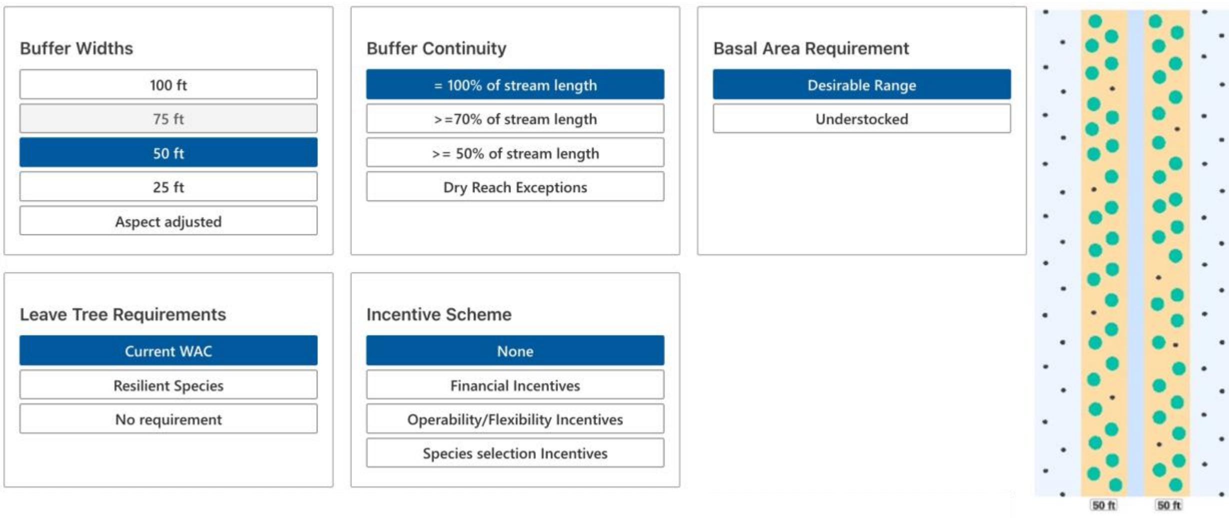

## 4.3 Reference Cases

It is common practice in SDM evaluations to use a variety of references cases against which all alternatives are compared, as multiple references can add nuance and context to understanding trade-offs. In this case, there two relevant reference cases: the current WAC rules, and the current practice (i.e., an unmanaged 50 ft. buffer).

**Current WAC 1: Partial cut Strategy**

The current WAC rules, as implemented in the ENREP project, will serve as critical bases of comparison for any new alternatives. The current Partial Cut strategy calls for 50 ft. two-sided buffers, and a fully continuous buffer harvested to a basal area of 70-110 sq. ft./ac (for mixed conifer habitat types, depending on site index). Leave tree requirements follow the detailed set of criteria currently described in the rules.

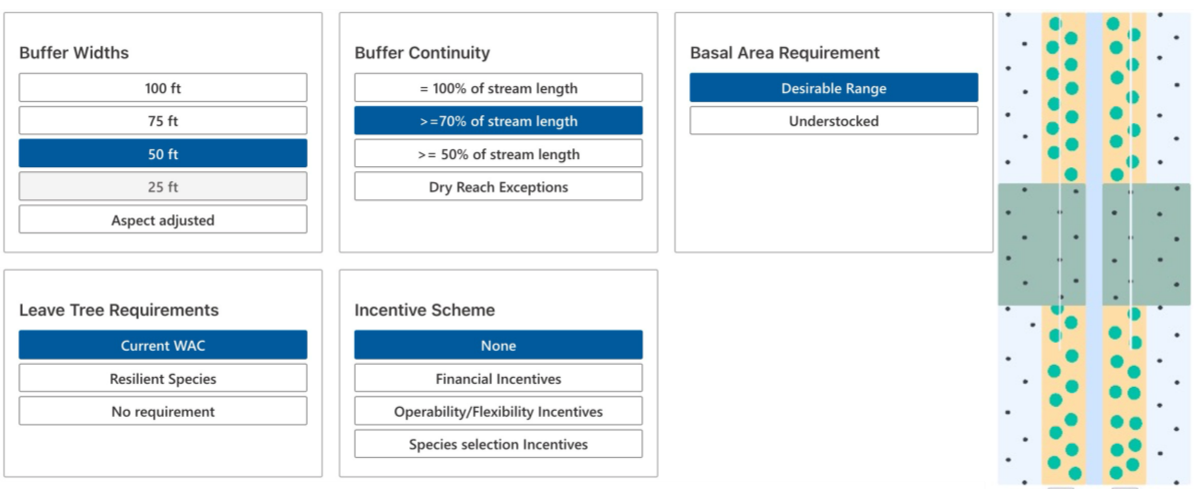
**Figure 3. Strategy table representation and illustration of the Current WAC Rules - Partial Cut Strategy.**




**Current WAC 2: Clear Cut Strategy**

This alternative formulation of the current WAC rules allows some clear cutting (up to 30% of the stream length), subject to the basal area requirements. Other elements are the same as the Partial Cut Strategy.

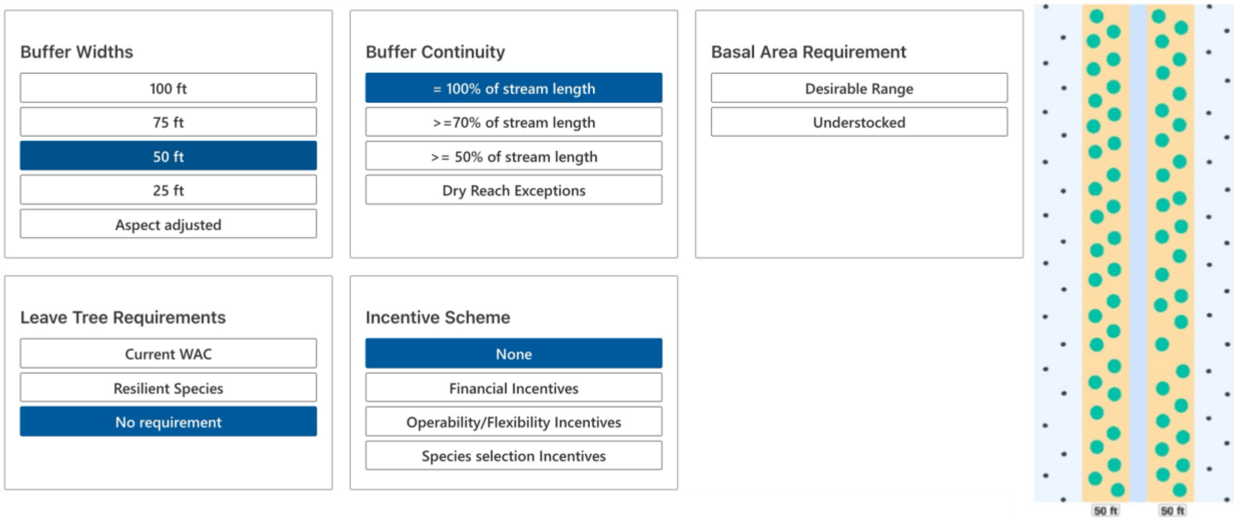
**Figure 4. Strategy table representation and illustration of the Current WAC Rules - Clear Cut Strategy.**




**Current Practice**

As described previously in this document, the general current practice (i.e., 90%+ of cases) is that riparian forest management most often does not occur. Continuous 50ft buffers are measured and left untouched (leaving whatever basal area exists pre-harvest). This reference will provide important context for understanding for the scale (and possibly direction) of trade-offs among any novel alternatives.

**Figure 5. Strategy table representation and illustration of the Current Practice reference case**



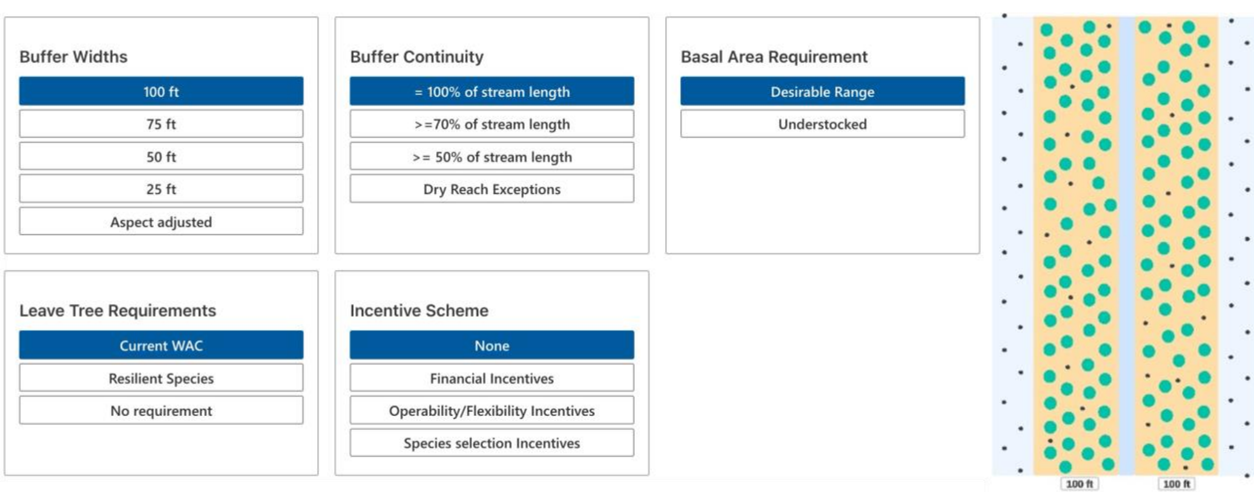

## 4.4 Illustrative Alternative Bookend Strategies

As described in Box 5, these alternative strategies demonstrate conceptually different approaches to striking a balance between supporting important riparian functions, restoring forest health, improving feasibility of the rules, and supporting timber economics. These also represent value-focused approaches, in that they are intended to promote one thematic objective over others. It is expected that these alternatives demonstrate a set of bookends which can be hybridized to find creative solutions that address multiple objectives.

**Alternative 1: Shade focused**

This alternative seeks to maximize effective shade. Buffer widths and continuity, basal area and leave tree requirements are selected with the sole purpose of achieving the best possible outcomes in terms of shade. Recognizing the complexity of current leave tree requirements, this alternative assumes no harvest will occur within the buffer. Given the link between effective shade and stream temperature, the assumption is that this alternative also represents the most protective strategy in terms of stream temperature.

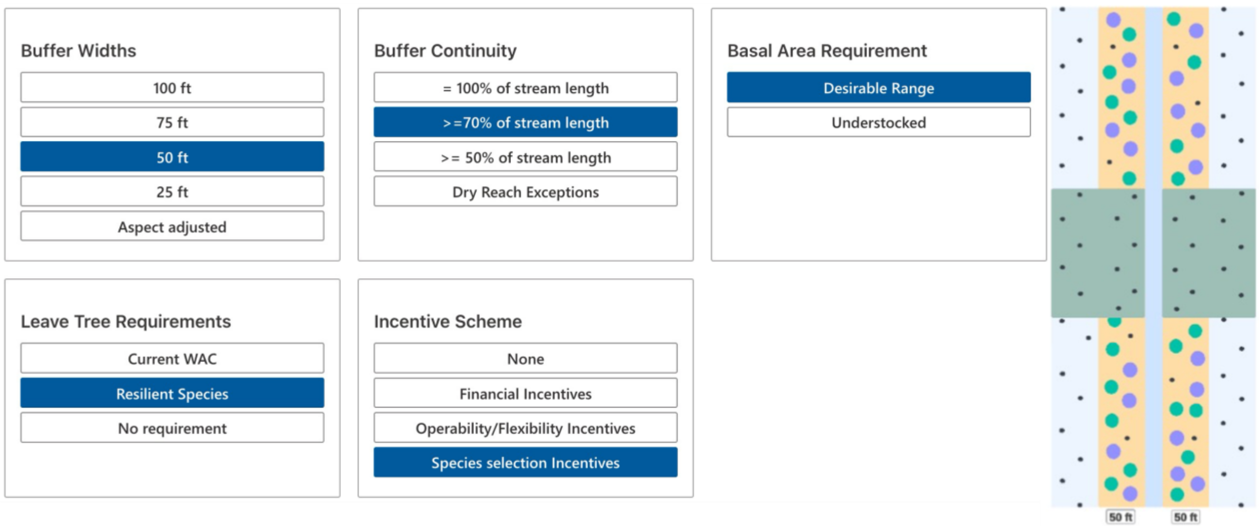
**Figure 6. Strategy table representation and illustration of the shade focused alternative.**



**Alternative 2: Forest Health focused**

This alternative seeks to achieve benefits for overall forest health in Eastern Washington primarily by selecting for climate and disturbance-resilient species. Buffer widths and continuity, basal areas are similar to the current WAC rules, but leave tree requirements would be changes to promote structural complexity and reduce fire risk. A basic assumption for this alternatives is that by selecting for resilient species, landowners could put riparian areas on trajectories that are more conducive to future forest health. However, this alternative recognizes the need to incentivize management in riparian areas, and so also allows operators to harvest economically viable species (e.g. western red cedar) as a means to encourage riparian management.

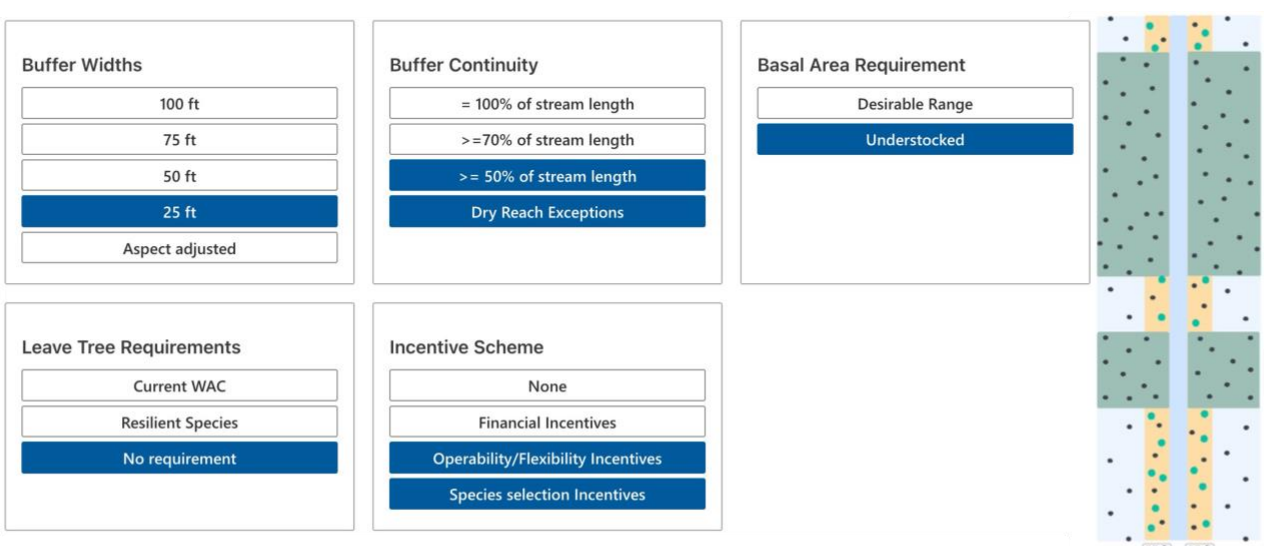
**Figure 7. Strategy table representation and illustration of the forest health focused alternative**




**Alternative 3: Timber focused**

This alternative seeks to maximize economic outcomes for landowners in Eastern Washington. Together, these actions allow for the greatest volume of harvest, including of the most financially valuable species, while reducing administrative hurdles.

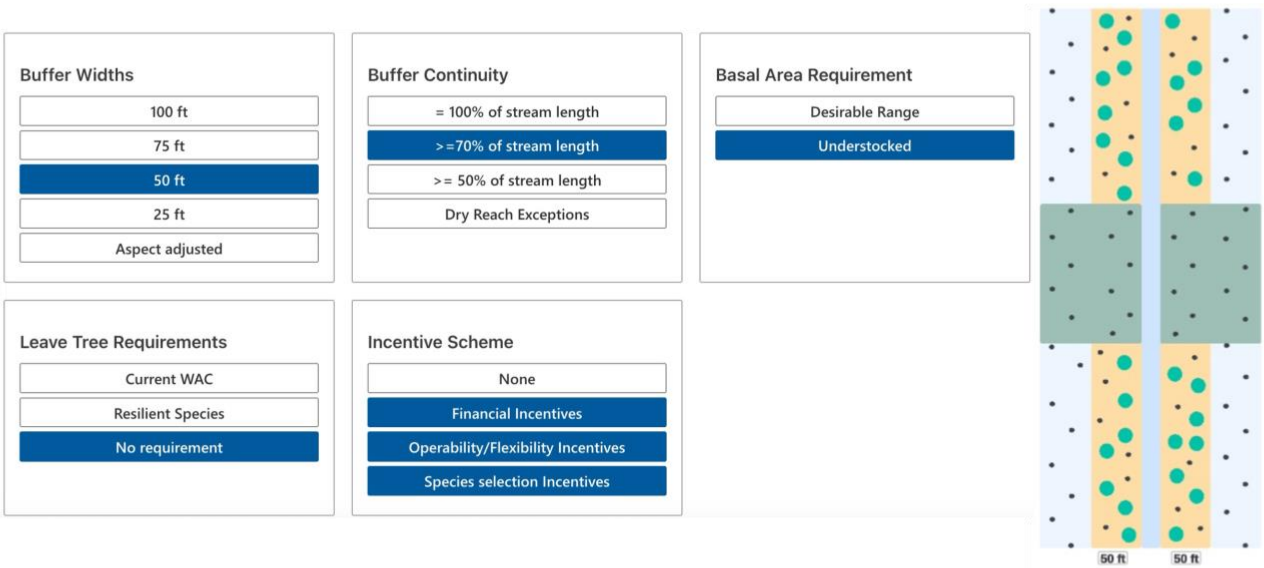
**Figure 8. Strategy table representation and illustration of the timber focused alternative**



**Alternative 4: Implementable**

This alternative represents the simplest, most implementable option for landowners. Buffer widths and continuity, basal area and leave tree requirements are chosen in consideration of practical realities such as the benefits of corridors across streams and a desire to simplify harvest layout requirements. In addition to these operability and flexibility incentives, landowners are also incentivized financially and through the ability to harvest valuable species. This alternative is presumed to have the highest likelihood of being implemented as written.

**Figure 9. Strategy table representation and illustration of the feasibility focused alternative**



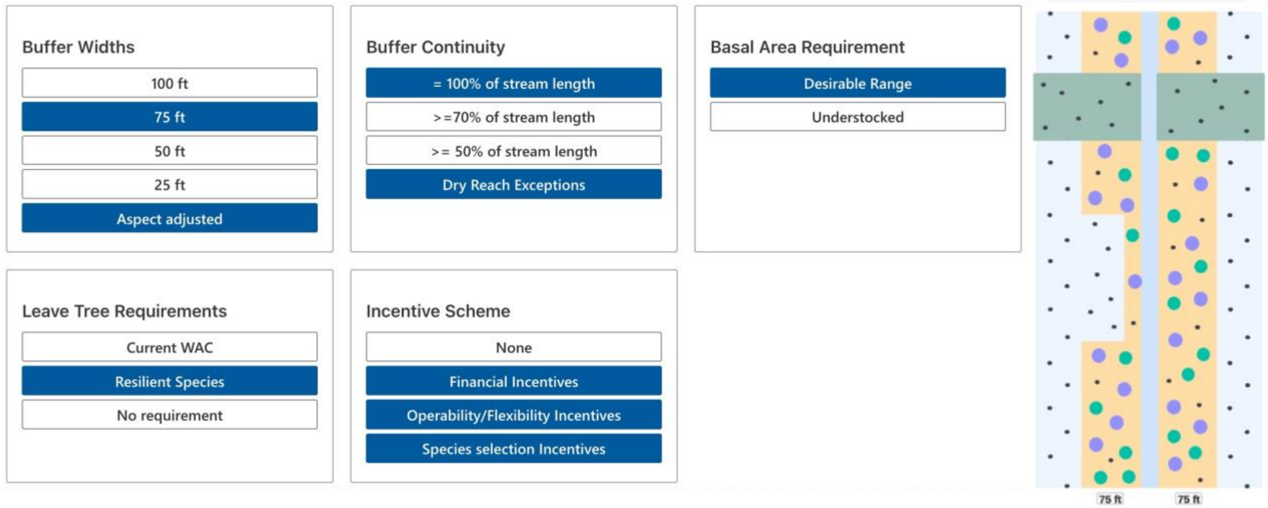

## 4.5 Hybrid Alternatives

While the alternatives described in section 4.4 are designed to promote one objective at a time, the following two alternatives are designed to promote two or more objectives at a time. These represent possible combinations of the alternatives described above – other similar alternatives could be developed as the effects of the individual components on the objectives are better understood.

**Alternative 5: Kitchen Sink**

This alternative seeks to improve effective shade and improvements to forest health without incurring costs to landowners. Buffer widths and continuity, basal area, leave tree requirements, and incentive schemes are selected to encourage harvest through multiple mechanisms, and create operator flexibility, while providing shade to the stream (recognizing topographic impacts) and generating long term forest health and resilience. For example, buffer widths are increased but aspect adjusted allowing operators to rely on site specific conditions to create flexibility while providing equivalent shade to the stream; similarly, buffer continuity is increased, but allows for dry reach exceptions to allow for moving logs across the stream.

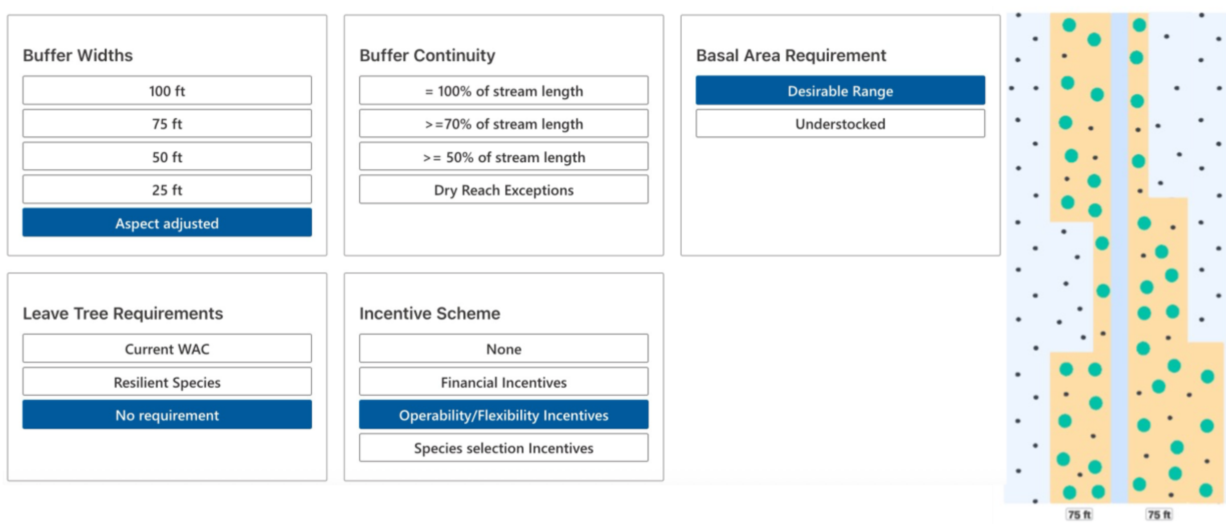
**Figure 10. Strategy table representation and illustration of the Kitchen Sink alternative**




**Alternative 6: Basin Scale Planning**

The alternative seeks to reduce administrative hurdles for landowners and create flexibility to adapt to the conditions on the ground while supporting environmental outcomes. It also recognizes the benefits to landowners in terms of ease of operation of being able to plan at a basin scale rather than the unit scale where possible. A core assumption of this alternative is that it would achieve similar environmental benefits to the current WAC rules; as such, this alternative could be considered similar to the current Alternate Plan approach, but applied at broader scales to promote flexibility and save on planning and layout costs.

**Figure 11. Strategy table representation and illustration of the basin scale planning focused alternative**




## 4.6 Further Work to develop Alternatives

The alternatives developed for the purposes of this exercise were intended to demonstrate broad strategic options for how to change the riparian harvest rules for Type Np basins. Two elements of the strategy table described above, Leave Tree Requirements and Incentive Schemes, were introduced in this exercise as key possible mechanisms to help simplify the rules and encourage responsible harvest within riparian areas. To further develop these alternatives and enable meaningful comparisons among them, these two categories of actions will need significant attention to further flesh out and develop. In addition to work to clarify to what degree TFW Policy can make recommendations on – and the Board can ultimately decide about – these specific items, key areas of effort required for these two categories of actions include:

- **Leave Tree Requirements**: Defining "Resilient Species" to prioritize leaving in place; determining whether and how to include size class requirements; determining whether and how to specify requirements for wildlife trees or other individual trees with unique functions.
- **Incentive Schemes**: Specifying the types of financial incentives, including who ultimately bears the financial burden; specifying the types of operability incentives to provide flexibility for operators; Specifying how any species selection incentive would work with other requirements; and, estimating how each incentive program is likely to affect the sub-objectives and performance measures described above.

# 5 Consequences and Trade-offs

With an SDM approach, results of alternative evaluations are typically presented in a *consequence table*, which summarizes the expected performance of each alternative with respect to each decision objective, as reported by the performance measures. If there are uncertainties that affect the selection of a preferred alternative, these should be reflected in the consequence table so that decision makers can make choices that reflect their risk tolerance.

**Box 6**. A *consequence table* is a summary matrix illustrating the performance of each alternative on each objective. It is like an executive summary of the relative performance of the alternatives – it presents the key messages about the trade-offs and uncertainties relevant for decision making.

Importantly, there will normally be supporting information about every cell in the table. This information will help participants put that number or summary statement in context, including understanding what's included and not, the significance of differences across the alternatives, and whether and how uncertainty affects the interpretation of results. The back-up information should provide participants with confidence that the performance expressed in the consequence table is in fact a good summary of how that alternative performs relative to others.

The process of populating a consequence table involves collaborative technical work to develop and test models that make consistent predictions about the effects of the alternatives and characterize the uncertainty in those predictions. This collaborative development of these tools allows important shared learning about what is known and not known about potential outcomes.

Once the consequence table is populated, its main use is to focus deliberations on key value-based trade-offs. The goal of collectively evaluating trade-offs is to find the alternative that offers the best balance across the objectives, in consideration of the diverse values and perspectives of the affected parties. This step involves thinking and talking about difficult value-based trade-offs, clarifying preferences and the reasons for those preferences, and seeking a solution that can be broadly supported.

Figure 12 provides an empty consequence table, which lays out the decision framework for the Eastside Np harvest rules. Each Policy member should review this table and reflect on the following questions:

- Assuming the PMs could be refined and clarified, will the set of objectives and PMs collectively provide you with all of the relevant information that you would need to identify a preferred alternative? Is anything missing?
- Recognizing that there are many possible combinations of actions to develop new alternatives, are there any novel solutions or mechanisms to find a balance among the listed objectives that you think TFW Policy needs to evaluate?

If policy members review the draft consequences table structure and confirm that, given better alternatives, the objectives and performance measures are likely to provide all of the critical information needed to support a decision, the next steps involve further iteration of the PMs and Alternatives as described above.

## Figure 12. Draft Consequence Table Structure

| Objective | Performance Measure | Preferred Direction | Current Practice (Reference) | Current Rules | Shade Oriented | Forest Health Oriented | Economically Oriented | Implementable | Kitchen Sink | Basin Scale Planning |
|---|---|---|---|---|---|---|---|---|---|---|
| **Riparian Ecosystem Function** | | | | | | | | | | |
| Stream Temperature Protection (near-term) | Effective Shade post harvest | Higher | | | | | | | | |
| Stream Temperature Protection (long-term) | Effective Shade @ 30 years | Higher | | | | | | | | |
| Stream Warming | Likelihood of Warming After Harvest | Higher | | | | | | | | |
| LWD supply potential (short term) | Available Trees Per Acre after harvest | Higher | | | | | | | | |
| **Riparian Forest Health** | | | | | | | | | | |
| Structural Complexity (long-term) | Index @ 30 years | Higher | | | | | | | | |
| Fire Risk (long term) | Index @ 30 years post harvest | Lower | | | | | | | | |
| Excessive windthrow | Scale | Lower | | | | | | | | |
| **Feasibility** | | | | | | | | | | |
| Ease of layout and operation | Scale | Higher | | | | | | | | |
| **Economically Viable Timber Industry** | | | | | | | | | | |
| Cash Flow | Incremental Change: Revenue-Cost | Higher | | | | | | | | |
| Long-term Asset Value | Net Change in Harvestable Area | Higher | | | | | | | | |

# 6 References


Gregory, R., Failing, L., Harstone, M., Long, G., McDaniels, T., & Ohlson, D. (2012). *Structured Decision Making: A Practical guide to environmental management choices.* John Wiley & Sons.

Link, T., Hawkins, C., Toledo, A., Rubin, R., Stewart, G., Robinson, P., Cohen, L., Nelson, D. & Teply, M. (2022). Project Charter: Eastside Type N Riparian Effectiveness Project (ENREP).

Technical Type Np Prescription Workgroup, 2021. Review of current and proposed riparian management zone prescriptions in meeting westside Washington State anti-degradation temperature criteria' Prepared for the Timber, Fish, and Wildlife Policy Committee, Forest Practices Adaptive Management Program, State of Washington, Department of Natural Resources.

WAC 222-30-022. Eastern Washington riparian management zones. February 2023

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