



## **Working Document**

# **Decision Framework for Eastside Type Np Riparian Harvest Rules**

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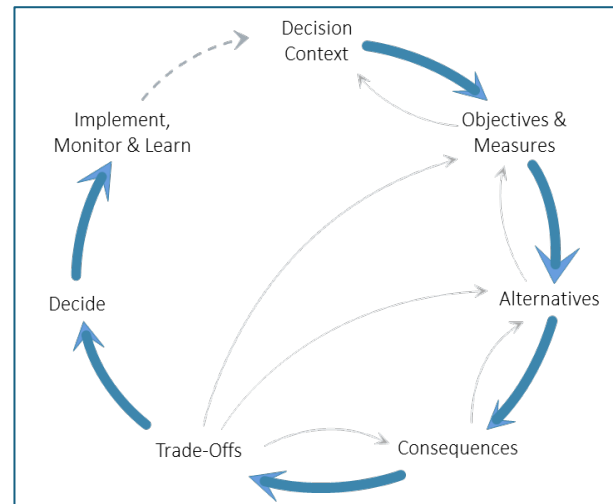
## 1 Document Purpose

This working document provides a status update on progress to date and will evolve into a roadmap for supporting TFW Policy’s upcoming decisions around Eastside Type Np rules for harvest within riparian areas.

The Washington State Adaptive Management Program (AMP) launched the ENREP study in 2019 as part of the CMER, 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):

- *Are 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?*

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



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](http://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. To date compass has been working with AMP members from TFW Policy, CMER and identified Subject Matter Experts to advance the case study.

Structured Decision Making (SDM) is an organized approach for helping groups work together to make informed and transparent choices in complex decision situations. The SDM process has 7 steps (see figure above) and involves informing decisions from clearly articulated fundamental objectives, recognizing the role of scientific predictions in decisions, dealing explicitly with uncertainty, and responding transparently to societal values in decision making. The final stage of the process focuses on what learning is needed to improve future decision making through implementation, monitoring and review.

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 program can use as a guide in other decision contexts.

## 2 Decision Context

A key function of the AMP is to perform studies to learn about the effects of the Forest Practices rules to ensure that they are protective of important values such as fish habitat, water quality, etc., while concurrent enabling 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. Regarding the ENREP study specifically, the decision facing the FPB is:

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.

*What changes (if any) to the riparian Forest Practices Rules for Eastside type Np basins should Policy recommend the Forest Practices Board adopt to ensure important ecosystem functions are protected while mitigating undesirable economic impacts?*

The first step in the SDM process requires clarifying the decision context – i.e., what the core decision is, what boundaries are relevant for that decision, and what the process will be to support that decision.

Implicit in this decision statement is a recognition that:

- The ENREP study results will provide an essential foundation for this process by demonstrating the degree to which the current WAC rules protect important ecosystem 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.

### 3 Decision Objectives and Performance Measures

Working with AMP members to date, Compass has 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.

These draft objectives will continue to be iteratively refined, with the goal of producing a concise set of decision objectives and PMs that best reflects what matters in decisions related to ENREP study results. Several considerations are guiding the development of the objectives:

- *Complete* – as a set, the objectives capture all the key interests;
- *Concise* – there is nothing unnecessary or ambiguous;
- *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.

At the core of an SDM process is a set of well-defined 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.).

Measures (also called attributes, performance measures or evaluation criteria) are the specific metrics that will be used to estimate/model and report the consequences or performance of the alternatives on the objectives.

Performance measures (PMs) serve to make these values specific to the context and decision at hand. Given their role in informing a decision about how the best path forward, PMs are inherently predictive – which means that they may or may not relate to how one might monitor the outcomes of a decision. 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.

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 and stand out to AMP members as the central focus of the ENREP project. There are several candidates for 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.

PMs are still under development. They will be developed to the extent possible to incorporate empirical results from the ENREP field study. However, similar to the recent SDM effort undertaken by the Westside Technical Type Np Prescription Workgroup (Technical Type Np Prescription Workgroup, 2021), it will be important to integrate outside literature and sources into the development of PMs. The most critical current need is to advance these potential performance measures toward predicting the consequences of the types of alternatives that Policy will want to evaluate.

**Table 1. Summary draft decision objectives, sub-objectives and potential performance measures, and preferred direction**

Objectives	Sub-objectives	Potential Performance Measures	Pref. Dir.
<b>Riparian Ecosystem Function</b>	Stream Temperature	TBD	↓
		Estimated Probability of Exceedance	↓
	Large Woody Debris Supply Potential	TBD	↑
<b>Riparian Forest Health</b>	Basal Area	TBD	↓
	Prevalence of resilient species	TBD	↑
	Excessive Windthrow Potential	TBD	↓
<b>Feasibility</b>	Ease of layout and operation	Constructed Scale	↑
<b>Timber Industry Economics</b>	Cash Flow	Net Change: Revenue - Cost (%)	↑
	Long-term Asset Value	Net Change in Harvestable Acres (acres)	↑

Below are brief descriptions of the current status of each decision objective and potential PM.

### 3.1 Riparian Ecosystem Function

#### 3.1.1 Background

This objective represents an interest in maintaining the ecological function of riparian non fish-bearing perennial streams in Eastern Washington. Important ecological functions provided by riparian areas include moderating stream temperature and primary productivity and recruiting LWD. These processes in turn impact other elements such as amphibian habitats at the site level as well as downstream. Suspended sediment and streamflow are also key elements of ecological function and may be explored further depending on ENREP results.

This objective also relates to three of the over-arching AMP goals which are: (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.

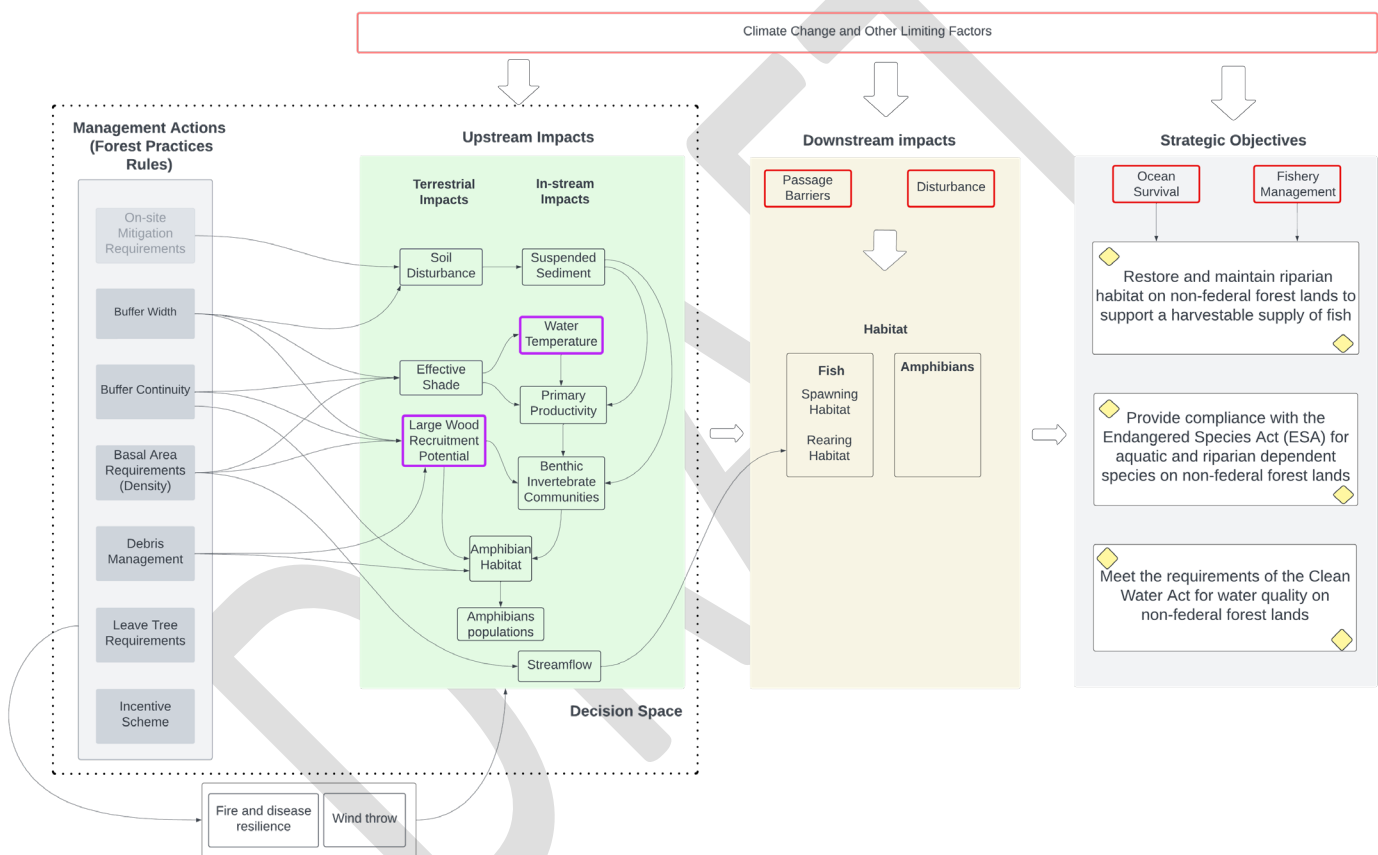
A key step in the SDM process is to develop an understanding of the basic causal links between actions (means) and outcomes (ends). Means-ends diagrams can be an effective tool for developing and representing these understandings. These diagrams help to clearly separate means from ends, while

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.

In this case, the means-ends diagrams included in this document describe the potential impacts of riparian forest harvesting practices on critical ecological processes, timber economics, and ultimately on the AMP program goals.

Based on conversations with CMER scientists and policy representatives, Compass has developed the following draft means-ends diagram for Riparian Ecosystem Function (Figure 1).

**Figure 1 Riparian Ecosystem Function**



Reading from right to left, the ultimate goals are the goals of the Adaptive Management Program. While these goals guide program decisions and priorities, it is difficult to draw direct causal links between timber harvesting practices in the RMZ in Eastern Washington Np streams and these high-level goals. Given the ENREP decision context, the relevant goals/objectives are captured in the left half of the diagram within the box labelled 'decision space'. The large white arrow between the decision space and the right-hand side of the diagram indicates a conceptual understanding that the elements to the left influence the elements to the right (all downstream impacts), including the overarching goals of the program. Throughout the diagram, elements contained in red boxes represent exogenous factors that influence program goals but are outside the control of the AMP program.

The decision space reveals important causal relationships between timber harvesting practices and riparian ecological processes that are critical to support. The boxes indicated in purple represent

candidate sub-objectives that are currently under consideration and development. These are the elements for which we expect to develop performance measures. Water temperature was selected as it represents a fundamental component of good fish habitat (downstream) and Clean Water Act compliance, while large wood recruitment represents a key ecological process that influences many other desirable outcomes (e.g., habitat). Together, these two sub-objectives capture Riparian Ecosystem Function in a defined, measurable, non-redundant way.

### 3.1.2 Potential PMs, Information Sources and Next Steps

The broad intent in developing suitable PMs is to:

- Develop methods that integrate ENREP results to the extent possible.
- Explore additional tools and sources of information (outside of ENREP) that would support the development of a predictive PM.

PMs currently under consideration include:

#### Stream Temperature

Ideally, the PM developed for stream temperature would directly predict the potential consequence of alternative riparian forest management prescriptions on stream temperature. Alternatively, effective shade may be developed into a predictive PM serving as a proxy measure for stream temperature.

In addition, the project will explore developing methods to predict the probability of exceeding the temperature measurable change standard (i.e., mean 7-day maximum temp of 0.3°C).

#### LWD Supply Potential

Table 2 summarizes the current status and next steps toward development of Riparian Ecosystem Function PMs.

**Table 2. Current Status & Next steps Summary**

Potential PM	ENREP – Current Status	Next Steps
Stream Temperature	<p>ENREP is measuring stream temperatures at surface and sub-surface levels both seasonally, and every 15 minutes. Data will be summarized by minimum, maximum, mean and diel temperature range.</p> <p>ENREP is also measuring effective shade through the following metrics: 1) the view to sky at 1m height and at surface level 2) canopy and topographic density and 3) effective shade at 1m height and surface level.</p>	<ul style="list-style-type: none"> <li>• Coordinate with the ENREP study team to:</li> <li>• Explore whether ENREP data can be used to calibrate a stream temperature model that could be used to predict the results of alternatives scenarios.</li> <li>• Explore whether it may be possible to leverage the Riparian Characteristics and Shade Response study currently underway to predict how shade levels will respond to the alternatives developed as part of this SDM process.</li> </ul>



		<ul style="list-style-type: none"> <li>• Explore methodology for predicting water temperature given expected shade characteristics under different alternatives</li> </ul>
LWD Supply Potential	ENREP is measuring: for each size class, pieces per unit length, volume per unit length, pieces per unit area, volume per unit area.	<ul style="list-style-type: none"> <li>• Develop a method to aggregate ENREP study results into a concise index.</li> <li>• Explore methodologies for a predictive tool.</li> <li>• Consider developing a proxy measure that captures underlying factors that influence LWD supply (e.g. stand density, species diversity, and windthrow)</li> </ul>

Other potential PMs to be considered upon review of preliminary ENREP results include:

- Suspended sediment
- Streamflow
- Benthic macroinvertebrate communities
- Amphibian Habitats
- Habitat Connectivity

### 3.2 Riparian Forest Health

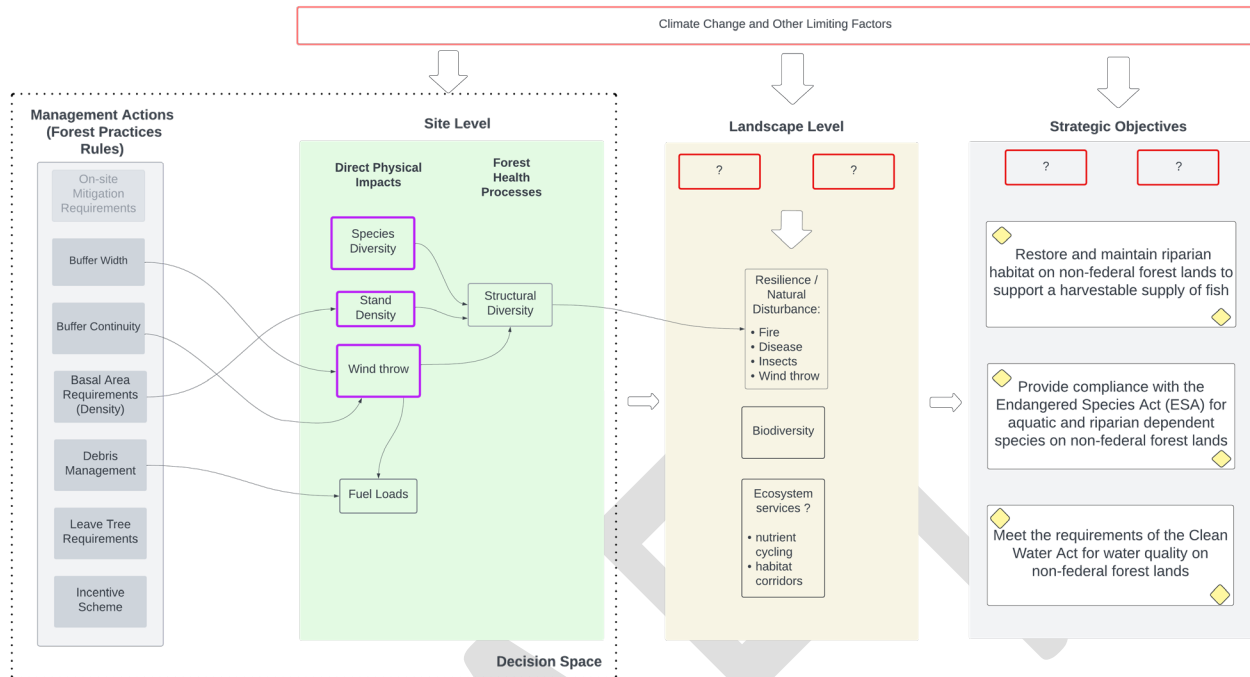
#### 3.2.1 Background

This objective represents concerns related to the impacts of timber harvesting on the overall health of state managed forests in Eastern Washington. It is understood that under current WAC rules, riparian management and harvest is extremely limited, potentially leading to overstocked stands that are more vulnerable to disease, insects, and fire.

The diagram below (figure 2) reflects the linkages between timber harvesting practices and key elements of riparian forest health and resilience. As in figure 1, the AMP strategic level goals are included on the right hand side of the diagram and the large white arrow in the center indicates a conceptual understanding that elements on the left influence those to the right. In other words, while site level factors influence landscape level processes such as overall resilience to disturbance and ultimately the AMP goals, we are not looking to tease out each relationship as part of this SDM process.

Structural diversity is understood as the primary driver of forest health and resilience. The boxes indicated in purple represent candidate sub-objectives that are currently under consideration and development. These are the elements for which we expect to develop performance measures. Species diversity, stand density, and windthrow were chosen as candidate sub-objectives as they are key elements of Structural Diversity.

**Figure 2 Riparian Forest Health**



### 3.2.2 Potential PMs, Information Sources and Next Steps

The broad intent in developing suitable PMs is to:

- Develop methods that integrate ENREP results to the extent possible.
- Explore additional tools and sources of information (outside of ENREP) that would support the development of a predictive PM.

As an initial step toward potentially developing a Structural Diversity PM, the following three proxy PMs are currently under development:

#### **Stand Density**

Refers to the number of trees in a given area and how much space they occupy. It is a key component of structural diversity.

#### **Species Diversity**

Species diversity... a diversity of resilient tree species in the riparian zone would support long-term forest health.

#### **Windthrow Potential**

Excessive windthrow can negatively impact the riparian ecosystem.

Table 3 summarizes the current status, information sources and next steps to be followed in the development of PMs.

**Table 3. Current Status & Next steps Summary**

Potential PM	ENREP – Current Status	Next Steps
Stand Density	??	<ul style="list-style-type: none"> <li>Coordinate with the ENREP study team to:</li> <li>Explore whether ENREP data can be used to develop a Structural Diversity index or measure that integrates Stand Density, Species Diversity and Windthrow Potential.</li> </ul>
Species Diversity	??	
Excessive Windthrow Potential	??	

### 3.3 Feasibility

#### 3.3.1 Background

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 concerns and interests related to both timber economics and ecological function.

#### 3.3.2 Potential PMs, Information Sources and Next Steps

A Constructed Scale is currently under discussion that combines 1-5 ratings on three criteria:

- Understandable: *Easy to interpret?*
- Implementable: *Practical and unchallenging?*
- Adaptable: *Provides operator flexibility?*

Table 4 summarizes the information sources and next steps to be followed in the development of PMs.

**Table 4. Current Status & Next steps Summary**

Potential PM	ENREP – Current Status	Next Steps
Feasibility	N/A	<ul style="list-style-type: none"> <li>Continue to work with AMP members to further develop a suitable constructed scale.</li> </ul>

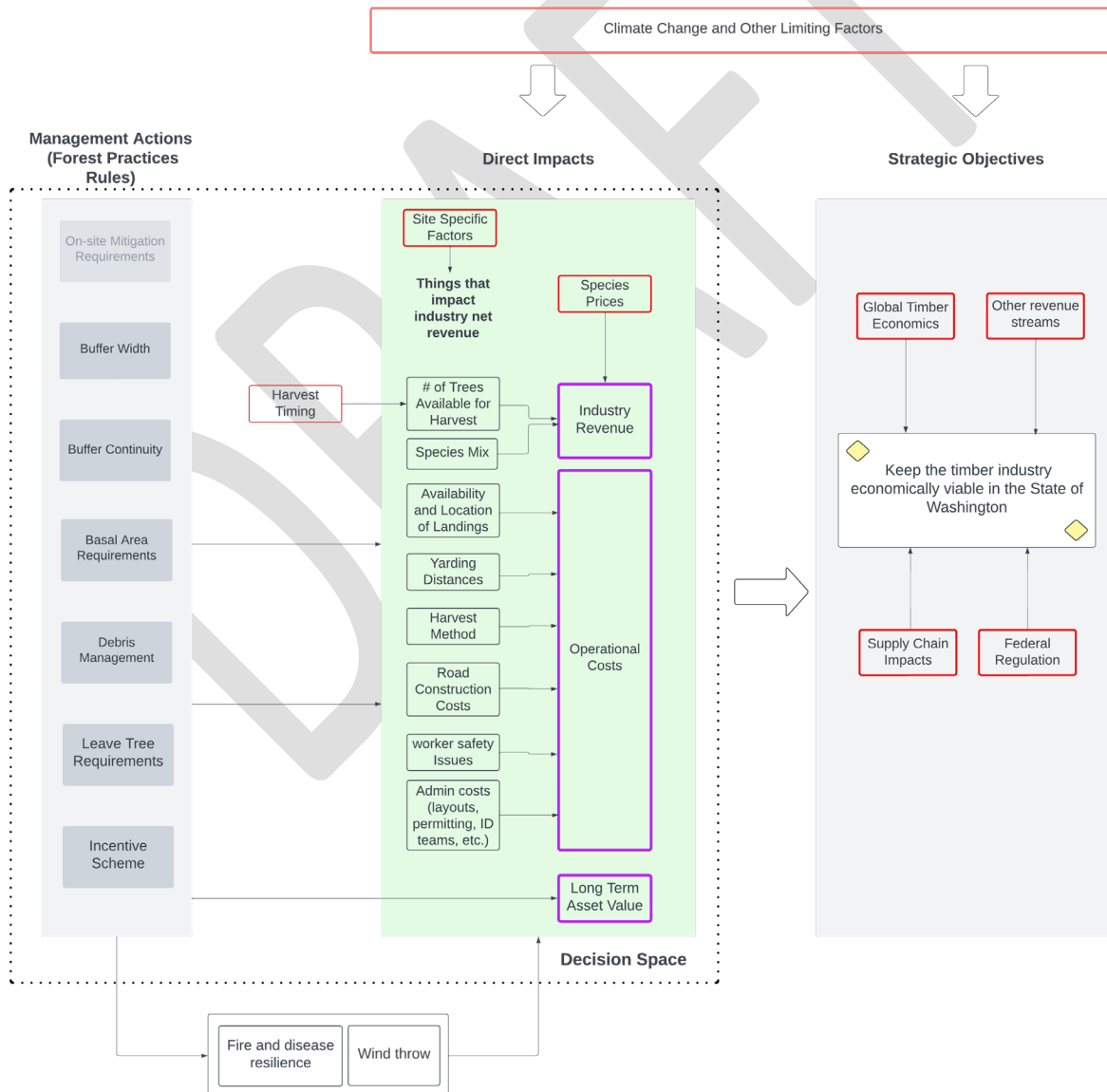
### 3.4 Economically Viable Timber Industry

#### 3.4.1 Background

This objective reflects a key interest of industry stakeholders, including both large and small forest landholders. This objective also represents the 4<sup>th</sup> overarching AMP goal which is 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. Reporting on the differences across alternatives in absolute terms is far beyond our scope. Our focus will be on developing a performance measure that reports the relative, incremental differences in potential revenues and costs for each of the alternatives that we want to evaluate. The means-ends diagram below (figure 3) captures the key relationships between timber harvesting practices and timber economics.

**Figure 3 Forest Industry Economics**



Once again, reading from right to left in figure 3 the ultimate strategic level (AMP) goal is to keep the timber industry economically viable in the state of Washington. The decision space focuses on the links between forestry practices and the three key elements of economic viability—revenues, operational costs, and long-term land asset value. As mentioned, forestry cash flow economics are highly variable (and volatile over time) given the multitude of exogenous (red boxes) and site-specific factors that influence both costs and revenues. In addition, forest land ownership is a long term financial investment with significant carrying costs (e.g., original purchase, roads, taxes, etc). Rules that limit harvestable area/volume reduce the opportunity to generate revenue and thereby lower the land asset value over the long term.

### 3.4.2 Potential PMs, Information Sources and Next Steps

PMs currently under consideration include:

#### Cash Flow

Change from Baseline – measured in %

For incremental differences in both revenues and costs.

#### Long-term Asset Value

Change in Harvestable Area – measured in Acres.

Table 5 summarizes the information sources and next steps to be followed in the development of PMs.

**Table 5. Current Status & Next steps Summary**

Potential PM	Current Status	Next Steps
Cash Flow	Currently pursuing DNR and other sources of information...	<ul style="list-style-type: none"> <li>Consider hiring external resources to develop financial methodologies</li> </ul>
Long-Term Asset Value	Currently pursuing DNR and other sources of information...	<ul style="list-style-type: none"> <li>Consider hiring external resources to develop financial methodologies</li> </ul>

## 4 Alternatives

The alternatives under consideration in this project involve different forest management prescriptions with 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 rules – other riparian forest management prescriptions – that AMP program participants will want to evaluate.

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 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.

While there are many important details within the rules, those that currently stand-out as the key categories of forest management and practice include:

- Buffer Width
- Buffer Continuity
- Basal Area Requirements
- Leave Tree Requirements
- Debris Management, and
- Incentive Schemes

There are other categories of forest management and practice that will be held constant across all alternatives, including:

- Fixed buffers in or near sensitive sites (e.g., Type F/N stream junctions, alluvial fans, headwater springs, etc.)
- Ground disturbance...
- ELZ? (What about potential access for treatments?)
- Other?

**Table 6. Key Forest Management Categories**

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).
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.

Basal Area Requirements	Basal area requirements are set to target the desired future conditions of riparian forest stands. Different prescriptions may be required for stands currently with high vs. low stand densities.
Leave Tree Requirements	The number, size and species of leave trees are important factors for long term forest health and forest economics.
Debris Management	Rules that direct volumes of debris left behind or removed are directly tied to large woody debris supply potential.
Incentive Schemes	It is understood that in practice very little riparian forest management occurs under the current WAC rules. Should there be a desire to undertake riparian forest management, to improve forest health condition or to improve forest harvest revenues, then there is an identified need to provide financial incentives to forest landowners.

#### 4.1 Strategy Table Representation

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.

Table 7 shows a Strategy Table representation for the Ponderosa Pine Habitat type, showing a depiction of the current WAC rules.

**Table 7. Draft Strategy Table**

<p><b>Buffer Widths</b></p> <p>100 ft</p> <p>75 ft</p> <p><b>50 ft</b></p> <p>25 ft</p> <p>No specific requirement</p> <p>Aspect adjusted</p>	<p><b>Buffer Continuity (% of stream length)</b></p> <p><b>= 100% of stream length</b></p> <p><b>&gt; =70% of stream length</b></p> <p>&gt; = 50% of stream length</p> <p>No specific requirement</p>	<p><b>Debris Management</b></p> <p>&gt; 16 tons / acre left</p> <p><b>&gt; 12 tons / acre left</b></p> <p>&gt; 8 tons / acre left</p>
<p><b>Basal Area Requirement</b></p> <p>100 ft<sup>2</sup>/acre</p> <p><b>60 ft<sup>2</sup>/acre</b></p> <p>20ft<sup>2</sup>/acre</p> <p>Other?</p> <p>N/A</p>	<p><b>Leave Tree Requirements</b></p> <p><b>Current WAC</b></p> <p>Resilient Species</p> <p>N / A</p> <p>Other?</p>	<p><b>Incentive Scheme</b></p> <p><b>None</b></p> <p>Scheme 1</p> <p>Scheme 2</p> <p>Scheme 3</p>

## 4.2 Two Reference Cases

It is common practice in SDM evaluations to use the 'status quo' as the current basis on which all alternatives will be compared. In this case, we have learned that under the current rules, riparian forest management rarely occurs. As a result, we intend to move forward with two different Reference Cases:

### Reference Case #1 – Current Rules

This alternative, as implemented by the ENREP Project Team (check: partial vs. clearcut strategy?), will serve as an Alternative, AND as a reference case to compare all new alternatives. It is imperative to have this basis of comparison if the project leads to consideration of rule changes.

### Reference Case #2 – Current Practice

We have been told that in practice (90% of cases), riparian forest management most often occurs with a basic 50' buffer (no entry?).

## 4.3 Incentive Schemes

There is potential long-term value in riparian forest management from both a Forest Health & Timber Economics perspective. However, under current WAC rules, it rarely occurs.

DNR recognizes the need to manage these areas, and in particular to manage for resilient species: "*Where ecologically appropriate, continue to promote more drought, disease and fire-resilient species by thinning less-resilient species and replanting with more-resilient species.*" - Climate Resilience Plan (DNR).

Currently identified information sources to explore in the development of potential incentive schemes include:

- [Forestry Riparian Easement Program](#)
- [Financial Assistance for Wildfire Resilience and Forest Health](#)
- [Forest Health Revolving Account \(RCW 79.64.130\)](#)
- [DNR's Plan for Climate Resilience \(2020\)](#)
- [20-Year Forest Health strategic Plan-Eastern Washington](#)
- [Forest Excise Tax credit \(Enhanced Aquatic Resources Requirements\)](#)

## 4.4 Next Steps

Continue working with AMP members and their representatives to develop a range of alternatives to be evaluated in a first round of SDM evaluation.



## 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. The process of populating a consequence table involves important shared learning about what is known and not known about potential outcomes. It highlights and focuses 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.

Table 8 presents the current structure of the Consequence Table.

**Table 8. Draft Consequence Table Structure**

Objective	Untreated	Current Rules - REF#1	Current Practice - REF#2	Alt 1	Alt 2	Alt 3
<b>Riparian Ecosystem Function</b>						
Stream Temperature						
LWD supply potential						
<b>Forest Health</b>						
Relative Density/Basal Area						
Prevalence of resilient species						
Windthrow potential						
Connectivity						
<b>Feasibility</b>						
Ease of layout and operation						
<b>Economically Viable Timber Industry</b>						
Cash Flow						
Long-term Asset Value						

### 5.1 Next Steps

- As Objectives, PMs and Alternatives are further developed and refined, the Consequence Table will be updated accordingly.
- The project will provide guidance on how TFW Policy can work through the trade-offs that emerge, and progress toward decisions and recommendations.
- Ultimately, the goal is to iteratively refine the alternatives with an aim toward developing a consensus alternative that best balances the full range of objectives.

## 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).

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