



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Pacific Northwest Region, Umatilla National Forest, Walla Walla RD, Project #62658, February 2025

Tiger-Mill Project

Environmental Assessment, Finding of No Significant Impact, and Decision Notice



Cover Photo: Mill Creek Municipal Watershed, looking north into Southeastern Washington. Photo taken in Blue Mountains from the headwaters of Low Creek. USDA Forest Service Photo by Joseph Sciarrino.

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Project Information

Project Location: 13 miles east of Walla Walla, via Mill Creek Road. A vicinity map is in [Appendix B, Map 01](#).

Project Area Description: The Tiger-Mill project boundary encompasses approximately 38,000 acres of National Forest System (NFS) lands elevation ranges from 2,300 to more than 5,500 feet along ridgetops with annual precipitation ranging from 40-70 inches, mostly as snowfall. In the center of the project area lies the Mill Creek Municipal Watershed which is About 57% (21,440 acres) of the project area. The Mill Creek Inventoried Roadless area also lies within the Mill Creek Municipal Watershed and adjacent lands. The City of Walla Walla relies on water from the Umatilla National Forest for drinking water supplies, obtaining approximately 90% of its water from the project area. The Walla Walla and Umatilla County Community Wildfire Protection Committees have designated the majority of the project area as Wildland Urban Interface. A project area map is in [Appendix B, Map 02](#).

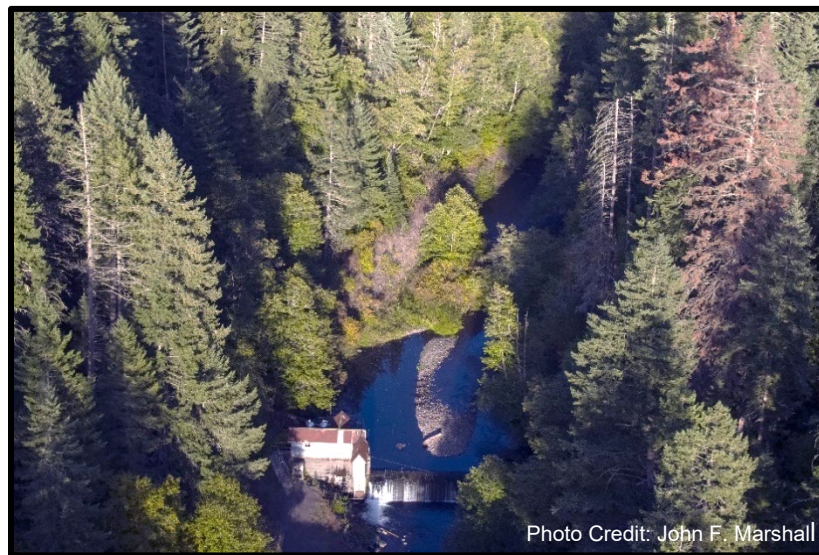


Photo 1. Aerial View of the Mill Creek Intake

The project area occupies portions of ten subwatersheds (hydrologic unit code 12 or HUC12), and includes streams that are tributary to Mill Creek, North Fork Walla Walla River, Wolf Fork Touchet River and South Fork Touchet River. No wilderness areas are found within the project boundaries.

Umatilla National Forest Land and Resources Management Plan:

This environmental assessment has been prepared in accordance with regulations for implementing the National Environmental Policy Act of 1996 (NEPA) located at 40 CFR 1500-1508. It is tiered to the Final Environmental Impact Statement for the Umatilla National Forest Land and Resource Management Plan (1990), USDA Forest Service, including the Eastside Screens and PACFISH amendments.

In addition, the project will assure consistency with the Forest Plan conducting a review with the Regional Forester for the treatments identified within the Inventoried Roadless Area within the project boundary. A review and approval would be needed to maintain consistency with Roadless Area direction.

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A management emphasis is assigned to each portion of the Umatilla National Forest. Chapter 4 of the [Forest Plan](#) describes specific multiple-use Forest-wide Management Area specific goals and objectives for each designated Management Area (pp. 144-146, 151-154 and 158-166). The Forest-wide goals apply to all areas of the forest, whereas management area goals apply to unique Management Areas. For more information on Forest-wide goals, see pages 4-1 to 4-3 of the Forest Plan. The Forest-wide goals which are most applicable to the proposed Tiger-Mill project are:

- **Forest Plan Goal 1-** To provide land and resource management that achieves a more healthy and productive forest and assists in supplying lands, resources, uses, and values which meet local, regional, and national social and economic needs.
- **Forest Plan Goal 13-** Provide for diversity of plant and animal communities and species consistent with overall multiple-use objectives for the Forest. Maintain or enhance ecosystem functions to provide for the long-term integrity (stability) and productivity of biological communities.
- **Forest Plan Goal 17-** Manage Forest resources to protect all existing beneficial uses of water and to meet or exceed all applicable state and Federal water quality standards. Within the Forest capability, maintain or enhance water quantity, quality, and timing of streamflow to meet needs of downstream users and other resources. Maintain integrity and equilibrium of all stream systems, riparian areas, and wetlands on the Forest. Manage designated municipal supply watersheds to provide water which, with treatment, would result in a satisfactory and safe supply.
- **Forest Plan Goal 25-** Provide and execute a fire protection and fire use program that is cost efficient and responsive to land and resource management goals and objectives.

The Forest Plan designates management areas to characterize the landscape for the type and intensity of management activities that may occur on Umatilla National Forest. A3 Viewshed 1 (3%), A4 Viewshed 2 (1%), A9 Special Interest Area (<1%), C1 Dedicated Old Growth (<1%), C3 Big Game Winter Range (<1%), C4 Wildlife Habitat (25%), C5 Riparian (Fish and Wildlife) (<1%), D2 Research Natural Area (20%), E2 Timber and Big Game (5%), F2 Mill Creek Municipal Watershed – Undeveloped (33%), and F4 Walla Walla River Watershed (10%) are the management areas of the project area. Section C1 Dedicated Old Growth (<1%), would have no management activities proposed. A management area map is in [Appendix B, Map 3](#). The Wenaha-Tucannon Wilderness, 176,784 acres, is to the east of the project.

PACFISH Riparian Goals:

PACFISH ([USDA 1995](#)) is a broad-scale conservation strategy that amended the Umatilla Forest Plan in 1995. PACFISH goals are supported by project activity reviews and consultation with appropriate oversight agencies including NOAA National Marine Fisheries Service and US Fish and Wildlife Service. The PACFISH strategy contains goals, riparian management objectives, standards, and guidelines to conserve habitat and aid in the recovery of Endangered Species Act-listed fish. These goals are explicitly defined and met through the consultation and review process. PACFISH riparian goal number five is most applicable to the proposed project.

- **PACFISH Riparian Goal 5** - Maintain or restore riparian diversity and productivity of native and desired non-native plant communities in riparian zones.

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Eastside Screens: The 1995 Regional Forester's Forest Plan Amendment #2, Revised Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales:

The Eastside Screens requires analyses that National Forests “Characterize the proposed timber sale[s] and its associated watershed for patterns of stand structure by biophysical environment and compare to the Historic Range of Variability...based on conditions in the pre-settlement era,” (US Forest Service, 1995) “The Screens’ ecosystem standard requires a landscape-level assessment of the historical range of variability for forest structural stages, including a determination of how existing structural stage percentages compare with their historical ranges” (see Powell D., 2019) for a summary of the HRV concept.

Range of variability analysis shows that for both moist and cold upland forest the biophysical environments (aka potential vegetation groups) in this project, late and old forest structure (LOS) is above or within historical ranges. Scenario B of the Eastside screens standard would then apply, meaning timber harvest can occur without a diameter limit if the LOS conditions do not fall below the range of variability.

However, in the dry upland forest, the range of variability does not meet this same standard for single stratum with large trees. Scenario A of the Eastside screens would apply instead. Harvesting would not be allowed in the single stratum stands and all LOS seral live trees greater than or equal to 21” DBH (diameter breast height) would be retained.

Mill Creek Watershed Inventoried Roadless Area

The area is approximately 24,351 acres and 72% of the project area. In keeping with the 1918 cooperative agreement the Mill Creek Watershed Roadless Area was managed to protect the City’s municipal water supply. Protections for the watershed were continued in the 1990 Forest Plan (USDA 1990).

Management of the Mill Creek Watershed Roadless Area follows the policy set forth in the 2001 Roadless Area Conservation Rule ([USDA 2001](#)). Under the 2001 Rule, timber may not be cut, sold, or removed from IRAs except under specified circumstances. “Generally small diameter timber” (while not defined, there will be no cutting of trees greater than or equal to 21 inches in the Roadless Area) may be cut, sold, or removed if doing so would improve or maintain one or more roadless area characteristics 36 CFR 294.13(b)(1)) and would serve one of the following purposes:

- Improve habitat for endangered, threatened, proposed, or sensitive species, as defined under the Endangered Species Act of 1973. (36 CFR 294.13(b)(1)(i)).
- Maintain or restore the characteristics of ecosystem composition and structure, such as reducing the risk of uncharacteristic wildfire effects (36 CFR 294.13(b)(1)(ii)).

Shared Stewardship

The Tiger-Mill planning team has collaborated with partners, states, Tribes and local communities to inform the development of the Tiger-Mill Project. The project is in line with The National Cohesive Wildland Fire Management Strategy goals:

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- Resilient Landscapes – Landscapes, regardless of jurisdictional boundaries are resilient to fire, insect, disease, invasive species and climate change disturbances, in accordance with management objectives.
- Fire Adapted Communities – Human populations and infrastructure are as prepared as possible to receive, respond to, and recover from wildland fire.
- Safe, Effective, Risk-based Wildfire Response – All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions

The project is consistent with objectives and stated needs of the Washington Department of Natural Resources 20-Year Forest Health Strategic Plan, Oregon Department of Forestry 20-Year Landscape Resiliency Strategy, Northern Blues Forest Restoration Project, Northern Blues Restoration Partnership, Local Community Wildfire Protection Committees, and the City of Walla Walla.

With these goals in mind, the US Forest Service planning team has completed determinations of project needs by comparing current conditions within the project area to the desired future conditions and informed by best available science.

Purpose and Need: Why do we need to act?

Existing Condition

Secretary of Agriculture, Tom Vilsack, and Secretary of the Interior, Debra Haaland have made clear that the severity of wildland fires is taken seriously by the United States Government. Recent Direction to Wildland Fire Leadership updated strategy and provided guidance to define and mitigate risk. We are at “...devastating intersection of extreme heat, drought, and the spread of invasive species, wildfire activity is trending toward increasingly intense, destructive fires that have profound impacts on our natural landscapes, communities, and public health.”

The Tiger-Mill project area is trending toward increased intense and destructive fires as it has missed many cycles of fire due to over 100 years of fire exclusion. Fire exclusion has increased tree densities, altered forest structure and species composition. This compromises overall ecological health and makes fire management increasingly difficult. The environment remains conducive to wildfire and is unlikely to change in a way that would mitigate wildfire occurrence. These conditions have triggered a self-perpetuating feedback loop, as fire exclusion leads to further fuels buildup perpetuating risk of extreme wildfire events. This feedback loop cannot be broken without improved wildfire and land management in the fire-adapted landscapes. Current conditions of the project area, and why action needs to be taken are discussed in this Environmental Assessment, supporting documents, and were disclosed in the [Tiger-Mill Notice of Proposed Action \(NOPA\)](#).

Project Purpose (Objective):

The primary purposes for implementing this project are to increase opportunities to manage the spread of wildland fires (natural and prescribed) safely and effectively, to manage forest stands for resilience to future disturbances across the landscape, to reduce the scale of future high-severity wildland fires, and to reduce the potential for wildfires to degrade the municipal water supply of the city of Walla Walla, Washington.

While wildfire plays an essential role in maintaining the health and function of the Forest’s plant and animal communities, it can also threaten human values like safety, health, livelihoods, homes, and property. Fire management strives to balance the natural role of fire while minimizing the impacts from fire on values to be protected.

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To develop and maintain forest and rangeland conditions across the landscape, vegetation treatments would be designed to move forest vegetation toward desired species composition, density, and size class distributions to promote resistance and resilience to disturbance such as insects, wildfires, and drought.

Need For Management Action Based on Desired Conditions:

- **Reduce Hazard Fuels:** There is a need to reduce fuels along strategic features, such as roads and across the landscape to develop a forest condition better suited to withstand the negative effects from natural and managed wildfire.
- **Enhance Diversity:** There is a need to enhance diversity of vegetation structure, densities, and composition to adapt to more frequent fire to restore the project area to a healthier forest state.
- **Protect Water Quality:** There is a need to protect water quality for the city of Walla Walla, WA by lowering the watershed's elevated risk of adverse effects from wildland fire thereby reducing the risk or likelihood of water quality degrading conditions.

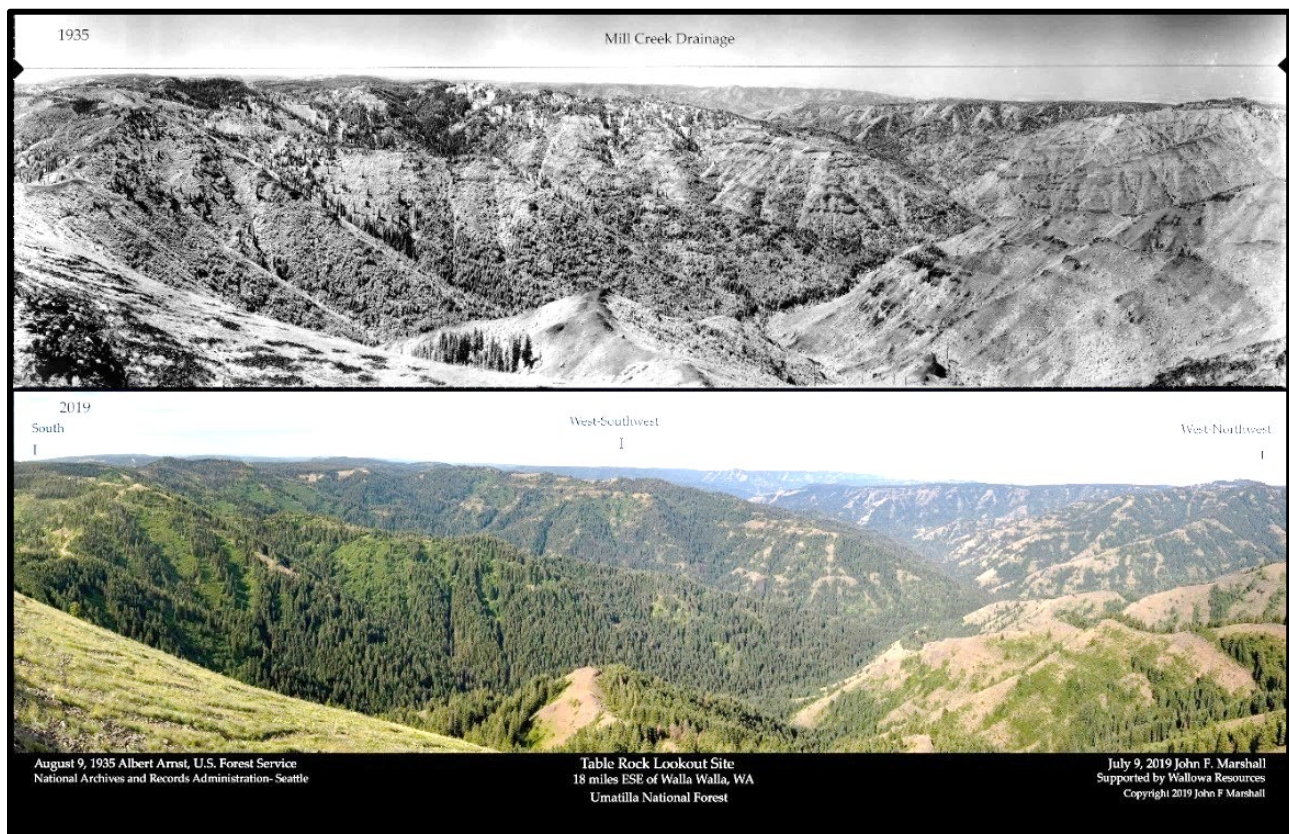


Photo 2. Mill Creek Drainage Vegetation Changes over 84 Years

Proposed Action: What are we proposing to do?

Forest and rangeland management and fuel reduction treatments can play a role in mitigating and managing the risk of wildfire. The Walla Walla Ranger District proposes to address the purpose and need by implementing a combination of vegetation treatments and prescribed fire to achieve desired conditions.

A scoping letter and Notice of Proposed Action (NOPA) were made available for public comment on January 26th, 2023. It proposed a combination of treatments including mechanical and hand tree thinning, commercial thinning, silvicultural treatments, logging systems (ground based, cable assist, and helicopter), fuel reductions, non-commercial thinning, and prescribed fires as described in pages 13 through 19. The preliminary Proposed Action specified in the NOPA was then modified to address issues raised internally, and during external scoping, and to incorporate newly acquired data. Alternative A is the new proposed action, modified from the initial NOPA. Alternative B was developed to address concerns about active management's impacts to Inventoried Roadless Areas, Riparian Habitat Conservation Areas, soils, and large diameter trees.

Alternative A: Proposed Action

The following are the modifications made to the preliminary Proposed Action disclosed in the NOPA:

- Newly acquired LiDAR (Light Detection and Ranging remote sensing) allowed for updates to stream and road features which modified unit boundaries.
- LiDAR and inputs from timber, heritage, soils, and botany specialists modified temporary roads. They were relocated, shortened, and/or removed to reflect need and minimize resource effects.
- Temporary road modifications led to adjusting proposed activities in some units.
- Areas of unstable slopes were switched from commercial thinning to non-commercial thinning or no treatment.
- Commercial thinning within Fire Regime 4 in the Mill Creek Watershed Inventoried Roadless Area (IRA) was removed because it would not meet the criteria for reducing the likelihood of uncharacteristic wildfire.
- Landscape prescribed burning units within the municipal watershed that predominately contain Fire Regime 4 were removed due to implementation feasibility and prescribed fire prescription needing to be high intensity.
- Cable-assist commercial thinning was removed within the Research Natural Area. Non-commercial thinning is proposed in place of commercial thinning.
- Commercial thinning within Old Forest single stratum in dry forest was replaced by non-commercial thinning.
- Post-commercial thinning within areas designated for commercial thinning would occur to meet desired vegetation and fuels conditions within the stand.
- Alternative A action is consistent with 1995 Eastside Screens and the "snag and green tree retention" portion of the 2021 Eastside Screens Amendment, following the March 29, 2024, order granting the plaintiffs' Motion for Summary Judgment in Greater Hells Canyon Council v. Wilkes. It

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would not follow the 2021 Revised Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales Regional Forester's Forest Plan Amendment.

- Non-commercial thinning within type 4 Riparian Habitat Conservation Areas (RHCAs) is located within/adjacent to Dry and Warm Moist vegetation types and within 300 feet of Potential Control Lines¹.
- No commercial thinning within RHCAs is proposed.

Alternative B: Action Alternative

To address concerns about active management's effects to Inventoried Roadless Areas (IRA), Riparian Habitat Conservation Areas (RHCA), soils, and large diameter trees. Alternative B follows the modifications mentioned above and:

- Excludes commercial harvest in the Mill Creek Watershed IRA.
- Uses only existing templates for the location of temporary roads. An existing template is a road that is not within the Forest's established road network but where a road prism exists.
- Excludes commercial and non-commercial thinning in RHCA.
- Limits harvest to trees less than 21 inches diameter at breast height (DBH).

Alternative B has similar proposed activities to Alternative A, but, as outlined in Tables 1 through 7, the treated acres by activity differ.

Alternative A and Alternative B Treatments

Proposed silvicultural treatments are designed to shift stand structures toward those that existed prior to the widespread settlement of the west by European Americans in the 1850s. Conditions prior to 1850 are widely considered to be more resilient to large scale disturbance events and a hotter and drier future climate scenario marked by acute moisture stress, more frequent and intense droughts, and a longer fire season. Proposed fuel treatments are designed to reduce activity-generated fuel and natural fuel loads toward historical conditions and create safe and effective areas to manage wildland fire.

Preliminary Silvicultural prescriptions have been developed in accordance with the Forest Plan that would move vegetation conditions towards desired future conditions for each forested stand. Thinning and prescribed fire prescriptions are intended to move stand structures, species compositions, and densities towards the middle of their Historical Range of Variability (HRV), returning aspect-driven, variable heterogeneity to forested stands with stocking ranges matching site-specific plant associations. Generally, the largest and healthiest trees would be retained. Treatments would occur amidst variable skips (no treatment) and gaps (openings), primarily reducing overrepresented species, emphasizing retention of underrepresented ponderosa pine, lodgepole pine, and western larch where historically prevalent, which are expected to be more resilient to drought and climate change. The following tables display the actions proposed within the Project Area, measured in approximate acres, for both Alternative A and the Alternative B. Appendix B contains maps (Maps 6-11) that reveal where the actions would take

¹ Areas where large fires historically tend to stop or lull. See glossary (Appendix E) for more information.

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place. Activities in some areas may require land use agreements or access permits as they enter private land. Temporary agreements will be obtained prior to implementation of any proposed treatment or log haul. Primary treatment types are discussed in detail in [Appendix C](#).

Table 1. Primary Thinning Treatments

	Alternative A (Acres)		Alternative B (Acres)	
	Project Area	Inventoried Roadless Area	Project Area	Inventoried Roadless Area
Commercial Thin	6,622	1,268	4,877	0
Non-Commercial Thin	5,246	3,486	6,991	4,691
Type 4 RHCA Non-Commercial Thin	570	190	0	0
Total	12,438	4,944	11,868	4,691

Table 2. Silvicultural Treatments

	Alternative A (Acres)	Alternative B (Acres)
Commercial Thin	3,895	2,842
Improvement Cut	1,699	1,177
Seed Tree with Reserves	308	161
Intermediate	720	697
Non-Commercial Thin -Hand	5,017	6,069
Non-Commercial Thin -Mechanical	799	922
Total	12,438	11,868
<i>Commercially Thinned units would receive a secondary non-commercial thin treatment (post-commercial thinning.)</i>		
Post-Commercial Thinning	6,622	4,877

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Table 3. Fuels Treatments

	Alternative A (Acres)	Alternative B (Acres)
Hand-Pile and Burn	2,173	3,099
Lop and Scatter	2,494	3,055
Machine-Pile and Burn	6,622	4,906
Mastication	579	826
Jack Pot Burn	1,867	1,992
Under Burn	2,972	3,632
Whole Tree Yard (WTY) or Leave Tops Attached (LTA)	3,131	2,464
WTY or LTA and End Haul Slash	2,256	1,329
Potential Control Line Buffer	1,727	1,727

Table 4. Logging Systems

	Alternative A (Acres)	Alternative B (Acres)
Cable/Cable Assist	3,131	2,464
Ground Based	1,235	1,084
Helicopter	2,256	1,329
Total	6,622	4,877

Table 5. Haul Routes

Operational Maintenance Level	Miles
1 – Basic Custodial Care (Closed)	35.6
2 – High Clearance Vehicles	36.6
3 – Suitable for Passenger Cars	16.6
5 – High Degree of User Comfort	7.2
Total	96

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Table 6. Temporary Roads

	Miles	
	Alternative A	Alternative B
Existing	4.8	4.8
New	5.8	0
Total	10.6	4.8

Table 7. Landscape Prescribed Fire

Jurisdiction	Acres
Forest Service	19,026*
Private	2,299
Prescription	
Low Intensity	13,888
Moderate Intensity	7,437
Roadless	
Inside	14,689
Outside	4,337
Riparian Habitat Conservation Areas	
1	1,449
2 and 3	900
4	2,356
Grand Total	21,325

*5,730 acres intersect with mechanical treatment activities

Project Design Criteria (PDCs)

Project Design Criteria (PDCs) are listed in Appendix A. The design elements and strategies listed were developed to avoid or eliminate adverse effects from project activities and are incorporated as an integrated part of the proposed action and incorporated into all implementation phases of Alternative A and/or Alternative B. PDCs are based upon standard practices and operating procedures that have been employed and proven effective in similar circumstances and conditions; Forest Service Manual and Handbook direction, Forest Plan standards and guidelines, and other management requirements that apply to the proposed activities.

Alternatives Considered, but Not Analyzed in Detail

No Commercial Thinning in Previously Unlogged Areas: This would limit treatments to 13% of the project area. Limiting commercial thinning to these areas does not meet the landscape need to create resilient stands, nor reduce wildland fire severity and consequent negative effects to ecosystem services.

Limit Activities to Dry Forest: In response to comments received, an alternative was suggested to eliminate management actions within moist and cold forest vegetation types because they are not in need of restoration. This would limit treatments to 7% of the project area. Moist forest, (60% of the project area) management is integral to meeting purpose and need of the project.

No treatment within the Municipal Watershed / Research Natural Area/ Inventoried Roadless Area: An alternative was considered which would not include proposed activities within Mill Creek Inventoried Roadless Area which includes the Mill Creek Municipal Watershed and Research Natural Area. The Mill Creek Inventoried Roadless Area amounts to 72% of the project area. Existing conditions within this area does not differ from existing conditions across the project area landscape, and the purposes and needs of the project include lands within this area. Proposed treatments were modified to align with regulatory restrictions and prohibitions for activities within inventoried roadless areas and management direction from the Forest Plan. Removing these treatments would not meet the project's purposes of improving and maintaining a resilient landscape and reducing the fire risk to the Municipal Watershed.

The Notice of Proposed Action specifies no roads, temporary or permanent, would be used for treatments in the inventoried roadless area.

No steep slope logging: Umatilla Forest Plan allows steep slope logging. Project design criteria would reduce adverse effects to soil. The vast majority (85%) of the project area is greater than 35% slope and the need to reduce tree density and modify stand structure and species composition is still necessary on steep slopes. Steep slopes also lead to strategic control lines where limiting fire intensity would aid in the safe and effective management of wildland fire.

No treatment in Old Forest Structure: Multi-strata (distinct forest layers) with Large Trees structural stage is overrepresented at 47% of the project area, while the maximum proportion under Historical Range of Variability (HRV) should be 20%, indicating a need to move multi-canopied stands to single stratum with large trees structure.

What Will Be Decided?

The need for the proposal outlined earlier sets the scope of the project and analysis to be completed. The responsible official for the decision is the Walla Walla District Ranger. Based on the analysis, the Ranger will determine whether the proposed project alternatives could result in a significant impact. If there is a finding of no significant impact, the responsible official (Ranger) will select an alternative deciding:

- Whether to implement the activities described in the proposed action.
- What specific design criteria or mitigation measures are needed.
- What specific project monitoring requirements are needed to assure design criteria and mitigation measures are implemented and effective.

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The decision will be based on:

- How well the selected alternative achieves the purpose and need.
- How well the selected alternative protects the environment and addresses issues and concerns.
- How well the selected alternative complies with relevant policies, laws and regulations.

Project Screening

Legal and Regulatory Considerations

Given the nature of the project, the responsible official is requesting documentation to demonstrate compliance with the following legal and regulatory considerations in addition to NEPA:

- | | |
|---|--|
| ☒ NFMA/Land Management Plan | ☒ Clean Water Act (CWA) |
| ☒ Endangered Species Act (ESA) | ☒ Pertinent Executive Orders |
| ☒ Sensitive Species (FSM 2670) | |
| ☒ National Historic Preservation Act (NHPA) | <u>Special Management Areas:</u> |
| ☒ Tribal Consultation | ☒ Inventoried Roadless Areas |
| ☒ Clean Air Act (CAA) | ☒ Research Natural Areas |

Consultation and Coordination

Given the nature of the project, the responsible official consulted the following agencies, organizations, tribes, and persons during development and analysis of the project:

Agencies

City of Walla Walla, Washington Department of Natural Resource, Washington Department of Fish and Wildlife, Oregon Department of Forestry, Oregon Department of Fish and Wildlife, US Fish and Wildlife Service, National Marine Fisheries Service, Natural Resources Conservation Service (Washington and Oregon).

Native American Tribes

Confederated Tribes of the Umatilla Indian Reservation.
Nez Perce Tribe (Nimiipuu).

Collaborative Groups

Walla Walla Community Wildland Protection Committee and Northern Blues Restoration Partnership.

Elected Officials

Walla Walla, Columbia, Wallowa, and Umatilla County Commissioners.

Interested or Affected Public

Landowners adjacent to the project area. Public and interested persons.

Supporting Project Documentation

Reference 1. Applicable project files documentation to support analysis

Documentation Type	Location
Tribal Program of Work 2021, 2022, 2023 and 2024	See project record
Walla Walla County Community Wildland Protection Plan	See project record
Adjacent Landowner Mailer	See project record
Tiger-Mill Story Map	See project record
Pre-Scoping Virtual Engagement Session	See project record
Interested Parties Email List	See project record
Scoping Letters	See pinyon public
Tiger-Mill Project Notice of Proposed Action	See pinyon public
Comment Period Open House	See project record

Environmental Impacts: How would our management actions affect the environment?

The following sections describe how the project complies with the relevant laws, regulations, policies, and the land management plan, which provide the basis for thresholds for effects. Consistency with relevant laws, regulations, policies, and land management plan standards ensures that the proposed action does not exceed thresholds for effects and supporting analysis and rationale for consistency are provided to reach a finding of no significant impact (FONSI).

The following are summaries of the effects analyzed in detail. Full resource analyses and consideration and selection of issues, including those eliminated from detailed study, are incorporated in the project record. Design features have been identified for the action alternatives A and B (Appendix A). The interdisciplinary team and responsible official determined heritage, air quality, invasive species, issues have been sufficiently addressed through design features and no further analysis is warranted.

There are several reasons issues are analyzed in detail. They can be topics of public interest, specified in a regulation or policy, or identified by members of the interdisciplinary team that may factor whether issues require an action or alternative. The teams identify and address issues during the project development and analysis process, called issue disposition. The issue disposition table is available in the project record. The main issues identified from public comments during the scoping period were the potential negative effects of the proposed activities on the following:

- Inventoried Roadless Area Values
- Undeveloped Lands
- Climate
- Wildlife and Aquatic Habitats
- Soil productivity
- Water quality and quantity
- Vegetation management
- Fire Behavior
- Recreational Values

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Cumulative Effects

Past Actions

Past actions are land disturbance projects fully implemented under completed NEPA decisions. In order to understand the contribution of past actions to cumulative effects, this analysis relies on existing conditions as a proxy for the impacts of past actions. Existing conditions reflect the aggregate impact of all prior human actions and natural events that affected the environment and might contribute to cumulative effects. The vegetation database, updated for the project in 2022, reflects existing conditions as of that year.

Present Actions

Present actions are land disturbance projects with completed NEPA decisions that are not yet fully implemented on the ground. The present land disturbance actions are:

- Forest Wide Invasive Treatment- Decision was signed July 7, 2010, to treat 25,000 acres.
- Tiger Creek Prescribed Fire- Decision was signed February 7, 2020, to treat 560 acres.
- Ongoing trail and road maintenance.
- Yearly Elk Hunt
- Recreational Activities

Detailed information about these projects is available on the [Umatilla National Forest webpage](#).

Reasonably Foreseeable Future Actions

There are no reasonably foreseeable future actions or land disturbance projects in preliminary planning stages.

Silviculture

Summary

Silviculture, or forest vegetation management, is directly related to the purpose and need of the Tiger-Mill Project. The Project would affect forest structure, cover, and density. Changes in these forest characteristics directly affect other resources of concern and silvicultural direction will be the basis for other resource effects analysis. This Environmental Assessment incorporates by reference the [Tiger-Mill Silviculture Specialist Analysis](#), which is included in the project record. The Tiger-Mill Silviculture Specialist Analysis, summarized below, focuses on the composition, structure, stand history and associated processes that shape forests and how each alternative maintains or reduces fuel loading and potential fire severity. Forest Vegetation is analyzed by comparing existing conditions to reference conditions established for use with the Range of Variation (RV) analytical technique (Martin, 2010) (US Forest Service, 1995). The Eastside Screens amendment requires that a range of variation approach be used when comparing historical (c.1840's) and current conditions, and this approach must be based on the best available science.

Effects Analyzed in Detail

Effect 1: Vegetation and fuels management activities alter live and dead trees and affect range of variation in forest structure.

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Effect 2: Vegetation and fuels management activities alter live and dead trees and affect range of variation in forest cover species.

Effect 3: Vegetation and fuels management activities alter live and dead trees and affect forest densities.

Resource Indicators and Measures

Resource indicators are used to describe the status of forest vegetation conditions, and they are used to quantify changes in vegetation for analyzing the effects (environmental consequences) of different actions on the project area (Table 8). Species composition, forest structure, and stand density are three indicators used when evaluating forest vegetation conditions and trends for this project; indicators can provide meaningful measures to develop an overall understanding of upland forest vegetation changes through time.

Potential Vegetation types consist of plant associations, also known as plant communities. Potential vegetation types are grouped into plant association groups, and plant association groups are grouped into Potential Vegetation Groups (PVGs). During analysis of upland forest vegetation conditions, the calculations and results are stratified by PVGs. For more information on potential vegetation hierarchy, see (Powell, Johnson, Crowe, Wells, & Swanson, 2007).

Table 8. Resource condition indicators and measures for assessing effects.

Effect	Resource Indicator	Measure	Source
Species Composition	Forest cover types	Cover type percent	Revised Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales: Regional Forester's Forest Plan Amendment #2, AKA Eastside Screens, (US Forest Service, 1995), Martin Letter Martin, 2010), National Core BMP Technical Guide (Volume 1, FS-990a, April 2012). "Stream Crossings, page 117," FSM 7722, FSH 7709.56b; Water Erosion Prediction Project (WEPP): Road version 2014.09.05 USDA Forest Service Rocky Mountain Research Station
Forest Structure	Structural stages	Structural stage percent	Eastside Screens Regional Policy (US Forest Service, 1995), Martin Letter (Martin, 2010)
Stand Density	Density classes	Density class percent	Eastside Screens Regional Policy (US Forest Service, 1995), Martin Letter (Martin, 2010)

Spatial and Temporal Context for Effects Analysis

The Tiger-Mill vegetation analysis area is approximately 37,792 acres and encompasses the Tiger-Mill project area at the same acreage. The analysis area was chosen as areas greater than 35,000 acres are

appropriate and preferable for a Range of Variation (RV) analysis. The analysis area also includes the entire project's elevation gradient (2,500-6,250 ft) and three potential vegetation groups (PVG), dry, moist, and cold upland forest) that represent the diversity of the project area.

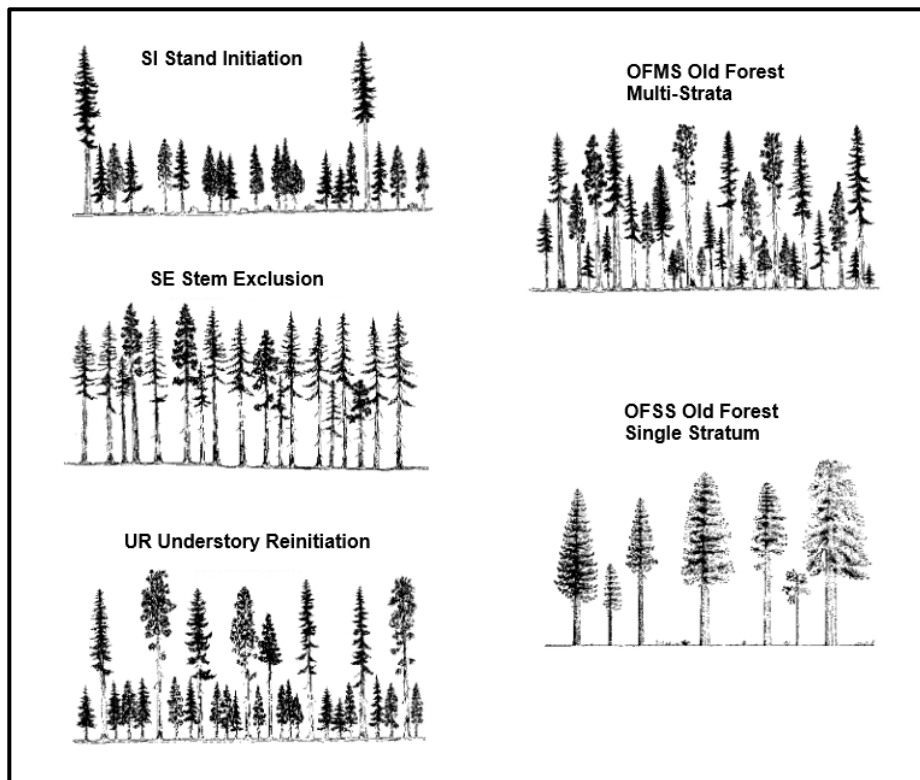
The effects timeframe covers 50 years as this period allows for responses in species composition, forest structure, and stand density to silvicultural treatments.

Potentially Affected Environment

Forest Structure

The project area comprises a mosaic of forest structures, including non-forested (NF) and stand initiation (SI) [11,146 acres], stem exclusion (SE), [5,546 acres], understory reinitiation (UR) [4,940 acres], Old Forest Multi-Strata (OFMS) [12,291 acres], and Old Forest Single Stratum (OFSS) [3,869 acres] {See Appendix E – Glossary for more information}. 61% or 17,846 acres of the project's forest is high density, with 22% (6,551 acres) at medium density, and 17% (4,867 acres) at low density (Table 11). Density-related water stress and climate warming are drivers in ongoing tree mortality across the landscape (Hammond, 2022). "Silvicultural interventions such as thinning to reduce tree densities can be used to increase the resistance and resilience of some forests to bark beetles, a relationship attributed to decreases in tree competition and associated increases in tree vigor," (Crimmins, 2023).

Figure 1. Structural Stages



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Table 9. Current Forest structural stages of the Tiger-Mill project area by Potential Vegetation Group. *

Current Forest Structural Changes of the Tiger-Mill project area by Potential Vegetation Group (PVG)							
PVG	Structural Stage	Acres	Current Percent	Lower RV Limit Percentage	Upper RV Limit Percentage	Interpretation	Eastside-Screens Scenario
Cold Upland Forest	BG/NF	50.7	Combined w SI				
	SI	70	5.6	20	45	Well below RV	A
	SE	303.7	14.2	10	30	Within RV	A
	UR	560.4	26.2	10	25	Above RV	A
	OFSS	433.1	20.2	5	20	Above RV	A
	OFMS	722.3	33.7	10	25	Well above RV	A
Cold UF Total		2140.1					
Dry Upland Forest	BG	10.8	Combined w SI				B
	NF	16.4	Combined w SI				B
	SI	19.6	1.7	15	25	Well below RV	B
	SE	936.7	33.6	10	20	Above RV	B
	UR	566	20.3	5	10	Above RV	B
	OFSS	320	11.5	40	60	Well below RV	B
	OFMS	918.4	32.9	5	15	Well above RV	B
Dry UF Total		2787.9					
Moist UF	BG	271.6	Combined with SI				A
(Includes High SM RF)	NF	10.3	Combined with SI				A
	SI	428.4	3.1	20	30	Well below RV	A
	SE	4305.5	19.1	20	30	Below RV	A
	UR	3813.5	16.9	10	20	Within RV	A
	OFSS	3116.1	13.8	10	20	Within RV	A
	OFMS	10650	47.1	15	20	Well above RV	A
Moist UF Total		22595.4					

*Lower and Upper RV limits are derived from Range of Variation Recommendations for Dry, Moist, and Cold Forest. (Powell, 2019 RV- Reference Conditions), UF- Upland Forest, BG- Bare Ground, SI- Stand Initiation, SE- Stem Exclusion, UR- Understory Reinitiation, OFSS- Old Forest Single Stratum, OFMS- Old Forest Multi-Strata, NF- Non-Forested. Gray shading indicates current percentages outside of the Historical Range of Variation (RV). Scenarios under 1995 Eastside Screens.

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Across the Tiger-Mill project area, old forest multi-strata (OFMS) are the most common structural stage, covering 33.7% of cold upland forest, 32.9% of dry upland forest (second to dry upland forest stem exclusion (SE) at 33.6%), and 47.1% of moist upland forest. OFMS structure historically occupied no more than 15-25% of the landscape, varying by PVG, but now occupies 44.6% of the upland forest, or 32.5% of the total project area, including non-forested areas and bare ground. For more information, see Map 4 in Appendix B.

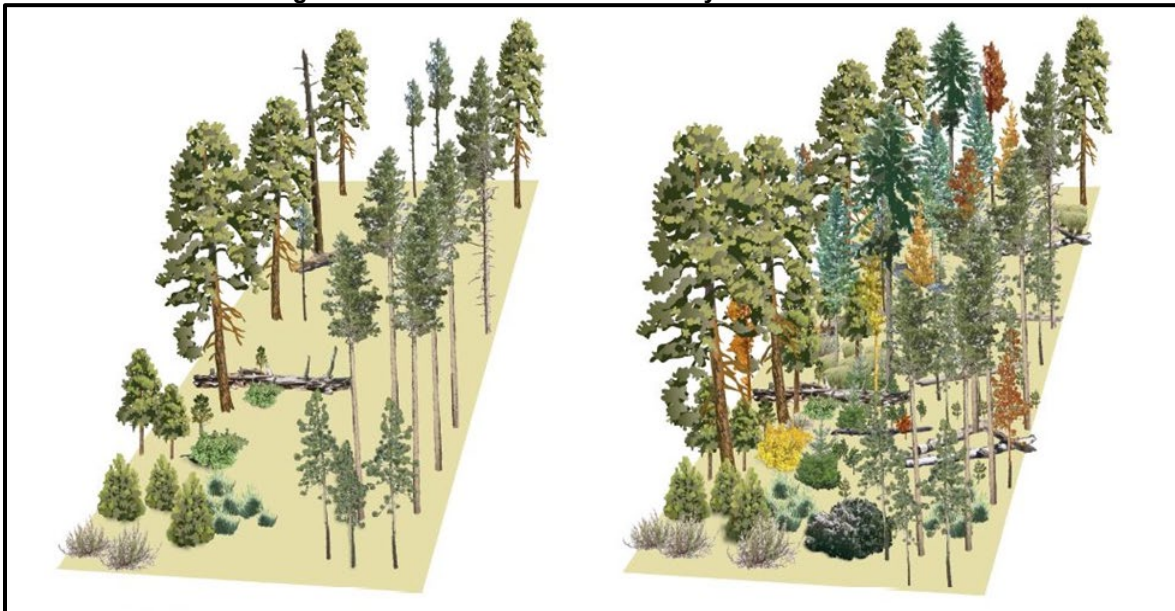
Figure 2., that follows (Keeley, 2019), is a visual representation of historical forest and current structure because of fire exclusion. The figure on the left shows a historical forest that experienced regular low intensity fire. Individual trees would be torched, but overall fire intensity remained low. The figure on the right shows the same forest after decades of fire suppression. There is increased competition and reduced tree vigor, as well as increased risk for high intensity fire. There is also reduced wildlife value for some species in terms of forage and large healthy trees.

Most structural stages across all three PVGs are outside of reference conditions or range of variation, with only stem exclusion structure within RV for cold upland forest, and no structural stages within RV for dry upland forest. Moist upland forest structural stages are all outside of RV except understory reinitiation and single stratum with large trees, as seen in Table 10.

Structural stages with multiple canopy groups (UR, OFMS) are over-represented in the project area while single-canopy structural stages (SI, SE, OFSS) are under-represented. These structural trends indicate a lack of disturbances that initiate or maintain single-layered forest stands.

The structures most departed from their historical ranges include an excess of OFMS, and a scarcity of stand initiation (SI), in moist, dry, and cold upland forest, as common disturbances that produce SI structure, such as insect outbreaks, harvesting, and wildfire (Barrett & Robertson, 2021) have been limited in Tiger-Mill in recent decades.

Figure 2. Historical versus Present Day Forest Structure



Tiger-Mill



Cover Type

The plant communities, in order of their dominance, are grand fir (13,390 acres, 35%), grass and shrub (10,595 acres, 28%), mixed conifer (7,116 acres, 19%), Douglas-fir (4,914 acres, 13%), ponderosa pine (812 acres, 2%), subalpine fir (667 acres, 2%), and lodgepole pine (305 acres, 1%). Northern aspects are mostly covered with grand fir and mixed conifer at lower elevations (2,500 to 4,000 feet), changing to Engelmann spruce, subalpine fir (*Abies lasiocarpa*), and brush at the higher elevations (4,000 to 6,200 feet). Southern aspects are predominantly Douglas-fir and ponderosa pine forested draws interspersed with steep grasslands. Riparian areas in the bottoms of draws and low elevation ridgelines contain stands of ponderosa pine and mixed conifer.

Forest Cover types are used to evaluate tree species composition, as seen in Table 10, and are named for the dominant tree species, or the species with the greatest percentage of stocking in each stand. The western larch cover type, for example, contains the greatest percentage of western larch than in other cover types but may contain associated species such as Douglas-fir and grand fir.

All three potential vegetation groups currently have an overabundance of species that benefit from a lack of fire, when compared to the historically dominant species by PVG. In both moist and cold upland forest, serotinous lodgepole pine was historically most prevalent within reference conditions (although lodgepole pine is usually not the dominant species in late stand development), and in dry upland forest, ponderosa pine was historically dominant.

The RV analysis for species composition shows:

- In cold upland forest, Engelmann spruce occupies 64.3% of growing space, far above reference conditions, while lodgepole pine and western larch are present at levels well below RV. Douglas-fir and grand fir are below their RV, while ponderosa pine and subalpine fir are within their RV.
- In dry upland forest, Douglas-fir is overrepresented at 64.6% of forest cover, while ponderosa pine (21.1%) is well below the range of variation, as is western larch (0%). Grand fir is above its reference conditions at 14%. Engelmann spruce, lodgepole pine, and subalpine fir are all within RV at 0%.
- In moist upland forest, grand fir occupies 57.1% of growing space and Engelmann spruce has 23.9%, and both are well above reference conditions. Lodgepole pine, western larch, Douglas-fir, and ponderosa pine are all underrepresented, while subalpine fir is within its RV.

Density

Density classes provide an indicator of tree stocking for an area, expressed as the number of tree stems occupying a unit of land, such as an acre. Published stocking guidelines (Powell D., 2024) were used to evaluate stand density levels, estimating how much forestland acreage is presently stocked with trees at a low, moderate, or high level, in comparison to the RV for a potential vegetation group. Stands with high densities are beyond their historical ranges in all three upland forest groups. High density stands are in or are approaching a period of self-thinning, where the sunlight, moisture, and/or nutrient requirements for all trees on the site are not being met. Self-thinning, or overstocked, stands are likely to face mortality from crowding, which can yield stressed trees that are more susceptible to attack by bark beetles or diseases. Density management may substantially decrease risks to individual tree and stand vigor (Anderson & Palik, 2011).

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As seen in Table 11, in moist upland forest, the project has 61.7% high density (>150 feet squared of basal area/acre, or BA) stands (13,934 acres), which is more than twice the maximum reference condition density. Moderate density (100 to 150 BA) stands are within RV at 26.3% of the PVG within the project area. Low density (<100 BA) stands are increasingly uncommon, at 12% of the PVG, below reference values.

Table 10. Current Species Distribution in Upland Forest for the Tiger-Mill project area by Potential Vegetation Group (PVG).

	Species	Acres	Current Percent	Lower RV Limit	Upper RV Limit	Interpretation
Cold Upland Forest	Grand Fir	92.0	4.3	5	15	Below RV
	Subalpine Fir	349.5	16.3	15	35	Within RV
	Western Larch	35.4	1.7	5	15	Below RV
	Lodgepole Pine	161.4	7.5	25	45	Well below RV
	Engelman Spruce	1376.6	64.3	15	35	Well above RV
	Ponderosa Pine	0.0	0.0	0	5	Within RV
	Douglas-Fir	72.9	3.4	5	15	Below RV
	Cold UF Total	2140.1				
Dry Upland Forest	Grand Fir	389.8	14	1	10	Above RV
	Subalpine Fir	0.0	0.0	0	0	Within RV
	Western Larch	0.0	0.0	1	10	Below RV
	Lodgepole Pine	0.0	0.0	0	0	Within RV
	Engelman Spruce	0.0	0.0	0	0	Within RV
	Ponderosa Pine	587.6	21.1	50	80	Well below RV
	Douglas-Fir	1799.8	64.6	5	20	Well above RV
	Dry UF Total	2787.9				
Moist UF	Grand Fir	12882.8	57.1	15	30	Well above RV
	Subalpine Fir	317.6	1.4	1	10	Within RV
	Western Larch	298.9	1.3	10	30	Well below RV
	Lodgepole Pine	144.0	0.6	25	45	Well below RV
	Engelman Spruce	5403.9	23.9	1	10	Well below RV
	Ponderosa Pine	224.4	1.0	5	15	Below RV
	Douglas-Fir	1522	13.5	15	30	Below RV
	Moist UF Total	22569.5				

*RV- Reference Conditions (Range of Variation), UF- Upland Forest. Gray shading indicates current percentages outside of the Historical Range of Variation.

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In cold upland forest, all density classes are outside of their RV, with high density (>120 BA) stands occupying 77.7% of available growing space, or 17.7% above the maximum high density stands reached historically. Consequently, moderate (80 to 120 BA) and low (<80 BA) density stands are both below their RV; making these types of stands increasingly uncommon. Similarly in dry upland forest, all density classes are beyond their reference values with 80.7% of stands at high density (>85 BA), 11.2% at moderate density (55 to 85 BA), and only 8.1% at low density (<55 BA), when historically a minimum of 40% of dry upland forest had low density.

Table 11. Current Stand Density Distribution in Upland Forest for the Tiger-Mill project area by Potential Vegetation Group.

Range of Variation (RV) for Density of Upland Forest in Tiger-Mill Project Area					
PVG	Density of basal area*	Acres	Lower-Upper RV Limits (%)	Current Percentage	Interpretation
Cold UF	High > 120	1661.9	25-60	77.7	Above RV
	Mod 80-120	308.6	20-40	14.4	Below RV
	Low <80	169.6	15-35	7.9	Below RV
Total Acres CUF		2140.1			
Dry UF	High > 85	2250.4	5-15	80.7	Well above RV
	Mod 55-85	311.5	15-30	11.2	Below RV
	Low <55	226.1	40-85	8.1	Well below RV
Total Acres DUF		2787.9			
Moist UF	High >150	13934	15-30	61.7	Well above RV
	Mod 100-150	5931.1	25-60	26.3	Within RV
	Low <100	2704.4	20-40	12	Below RV
Total Acres MUF		22569.5			

*In square feet/acre at 10-inch Quadratic Mean Diameter. Gray shading indicates current percentages outside of the Historical Range of Variation.

Consideration of No Action: What would happen if we took no action?

Forest Structure

Taking no action would continue the decline of low-density forest. Until a disturbance occurs, stands would continue to trend towards mature stands affected by mortality from root rots, wind, beetles, lightning, and ice damage (Palik, 2021). A loss of younger tree structures via limited sunlight and water could be expected until a large, severe wildfire is successful at reinitiating stand development potentially at a scale uncharacteristic for the PVG.

Cover Species

Without action, increases in the dominance of grand fir and Engelmann spruce would continue until a disturbance causes widespread overstory mortality, initiating a new cohort of seedlings. Uncommon native species would be expected to continue to decline in abundance without action, including subalpine fir, western larch, lodgepole pine, and ponderosa pine. "Late seral species will continue to regenerate while early seral species will die out from competition," (Spiegel, 2019). The increased growing space of Alternative A and Alternative B are expected to increase shade intolerant conifer recruitment. "For fire-dependent species such as western larch, increased heat and drought stress resulting from climate change may be offset, at least in the near term, by an increase in early seral stand conditions resulting from increased fire disturbance," (Steed, 2020).

Stand Density

Taking no action would continue the decline of low-density forest. "Without active management insects will continue to cause mortality as density increases, causing increased competition for moisture and other site resources," (Spiegel, 2019). Anticipated warmer and drier growing seasons may increase fire risks by reducing moisture levels in plants and fuels. Sustained climatic stress can increase the threat of overcrowded, older-aged forests predisposed to insect epidemics (Anderson & Palik, 2011).

Direct and Indirect Effects of Alternative A and Alternative B

Effects to Forest Structure

Alternative A and the Alternative B have beneficial direct effects to forest structure by moving toward a range of structures that would resist future disturbance events and provide greater diversity of habitats.

The treatment process from the proposed actions is expected to trend stands closer to reference conditions. Across all potential vegetation groups, stands manipulated for improvement would generally follow this process in the next twenty to fifty years:

- Old Forest Multi-Strata: would remain Old Forest Multi-Strata or convert to Old Forest Single Stratum.
- Understory Reinitiation: would remain or convert to either Stem Exclusion or Stand Initiation.
- Stem Exclusion: would remain or convert to Stand Initiation.

The floating bar graphs 1 and 2 show estimated structural changes from all proposed treatments, which would modify the distribution of structural stages over 21,325 acres (56%) of the project area in both alternatives. Fire simulation models suggest landscape burning would result in surface and passive fire types, generally establishing and maintaining single-cohort SE and OFSS structures. Additionally,

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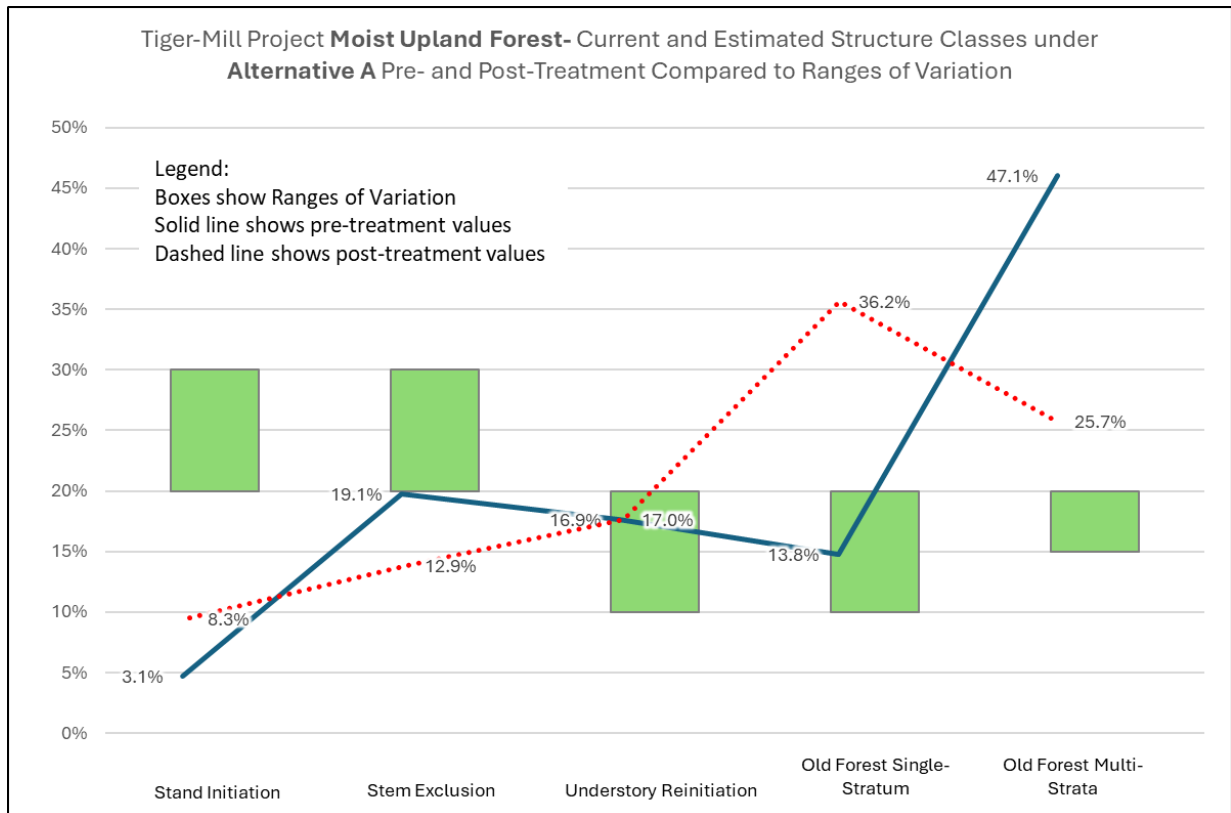


landscape burning would lead to individual tree and group torching, creating a mosaic of small-scale gaps or group openings for stand initiation.

The Alternative A alters the project area's vegetation over the same acreage as the Alternative B, but Alternative A provides for a higher intensity of mechanical treatments with product removal, which results in beneficial direct and indirect effects toward desired forest structure. Alternative A includes 6,622 acres of various types of commercial thinning, (or 17% of the project area) including 308 acres of Seed Trees with Reserves regeneration harvesting for promoting underrepresented stand initiation structure. Commercial treatment acres would also include non-commercial thinning (whip-felling or mastication) post-harvest. 5,246 acres of non-commercial thinning are planned in younger stands (14% of the project area).

Alternative B proposes 4,877 acres of commercial thinning, (or 13% of the project area) including 161 acres of Seed Trees with Reserves regeneration harvesting for promoting stand initiation structure, alongside 6,991 acres of non-commercial thinning (18% of the project area). Alternative A allows removal of more trees outside of non-commercial (usually 9" diameter breast height) specifications, allowing greater shifts towards ranges of variation. Stands assigned to Seed Tree with Reserves regeneration harvesting are in SE and UR structural stages.

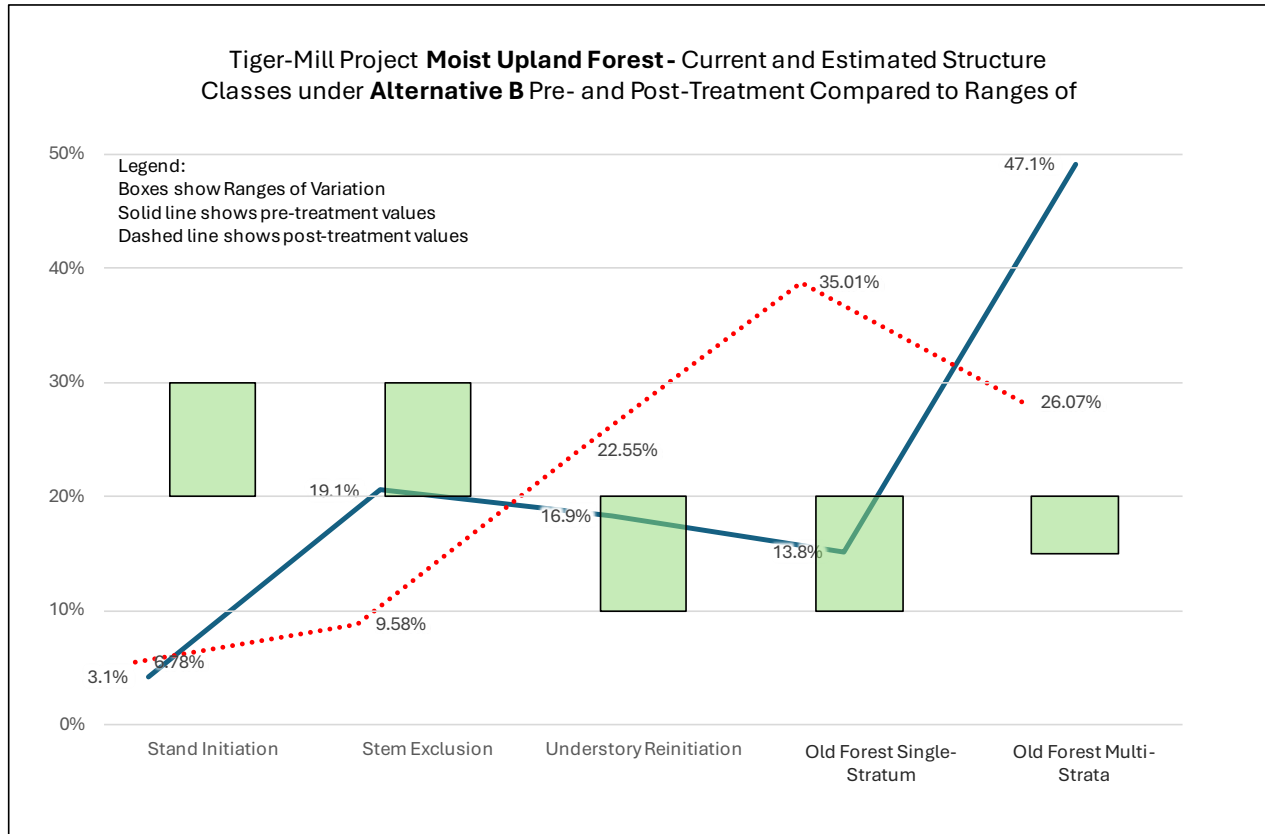
Graph 1. Ranges of Variation (RV) for Moist Upland Forest in Alternative A compared to pre-treatment and post-treatment estimates of forest structure.



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Graph 2. Ranges of Variation (RV) for Moist Upland Forest in the Alternative B compared to pre-treatment and post-treatment estimates of forest structure.



For brevity, Table 12 showing RV results covering Moist Upland Forest (60% of the project area) is included. RV floating bar graphs and tables for Cold and Dry upland are in the Silviculture Report [Supplemental], which is available and accessible in the project record.

In the moist upland forest, both alternatives show favorable increases in underrepresented SI and OFSS structures. In line with policy, large trees, or late and old structure are being maintained or enhanced for wildlife connectivity (US Forest Service, 1995), nutrient retention, and soil stabilization (Palik, 2021). Many OFMS stands would be thinned and prescribed burned (all treatments) to move to OFSS where fewer trees, representing the largest and healthiest in each stand, would be retained. The intent is to maintain or enhance late and old structural stages as much as possible (US Forest Service, 1995)

In the dry upland forest, under Alternative A and Alternative B, SI would increase to 7% and 4.2% respectively, while OFSS would increase to 30% and 28.1% respectively, with a corresponding decrease in OFMS, resulting in 15% coverage under Alternative A, and 20.7% coverage under Alternative B, representing a shift towards RV values.

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In the cold upland forest, similar results for Alternative A and Alternative B increase SI to 9.3% and 7.2% respectively, while OFSS would expand to 34% and 29.9% respectively. Consequently, OFMS would decrease to 21.6% and 24% respectively, bringing OFMS structure towards the top of its reference range, with the remaining overabundance of large trees moving into OFSS to maintain late and old Structure (US Forest Service, 1995). While shifts from overabundant OFMS to overrepresented OFSS may move forest structures closer to RV (Graph 1), both alternatives indirectly protect large trees, and shifting to OFSS would provide more water and light for leave trees over the next several decades where ingrowth of new cohorts of trees could occur unless subsequently managed.

Table 12. Estimated Effect of No Action, Alternative A, and Alternative B on Forest Structure in Moist Upland Forest in the Tiger-Mill Project Area

Forest Structural Stage	Moist Upland Forest				
	Current Conditions	No Action Expected Future Conditions	Alternative A	Alternative B	RV Values
	%	%	%	%	%
SI: Stand Initiation	3.1	1.1	8.3	6.8	20-30
SE: Stem Exclusion	19.1	19.6	12.9	9.6	20-30
UR: Understory Reinitiation	16.9	16.6	17	22.5	10-30
OFSS: Old Forest Single Stratum	13.8	7	36.2	35	10-20
OFMS: Old Forest Multi-Strata	47.1	55.8	25.7	26	15-20

Effects to Cover Species

In both Alternative A and Alternative B, 33% (8,850 acres) of the moist upland forest within the project area would be modified via a variety of thinning prescriptions (tree cutting) to favor native conifer species that are currently below their ranges of variation (Table 13). 65% of the project area's moist upland forest would receive prescribed burning, stand thinning, or a combination of both activities.

In cold upland forest, both alternatives would modify 30.4% (1,187 acres) of the PVG with a range of tree cutting and 50% of the cold upland forest would experience prescribed burning, tree cutting, or a combination of both treatments. For dry upland forest, both alternatives propose a combination of prescribed burning and mechanical tree management for 78.4% of the PVG, while 23.5% (1,789 acres) would be treated with tree cutting to improve growing conditions for leave trees.

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In all three PVGs, generally underrepresented species such as western larch, lodgepole pine, and ponderosa pine, would be favored for retention and regeneration. Overrepresented grand fir, Engelmann spruce, and Douglas-fir (in dry forest) would be the primary species for removal, moving the landscape's composition closer to reference values and indirectly enhance native biodiversity by improving availability of light and water to shade-intolerant species which have diminished under fire exclusion.

Table 13. Estimated Effect of No Action, Alternative A, and the Alternative B on Forest Cover Species in Moist Upland Forest in the Tiger-Mill project area.

Forest Cover Type	Moist Upland Forest				
	Current Conditions	No Action-Future Condition	Alternative A	Alternative B	RV Values
	%	%	%	%	%
Grand fir	57.1	65	39.7	46.3	15-30
Subalpine fir	1.4	1	1.6	1.4	1-10
Western larch	1.3	0	15.6	8.2	10-30
Lodgepole pine	0.6	0	8.5	2	25-45
Engelmann spruce	24.9	31	12.9	21	1-10
Ponderosa pine	1.2	0	8	3.9	5-15
Douglas-fir	13.5	3	15.3	17.2	15-30

Table 13 offers a comparison of estimated outcomes to species composition between Alternative A and Alternative B and the expected future conditions from taking no action. Alternative A on is expected to trend species compositions closer to RV than Alternative B, largely due to the intensity of treatments. In Alternative A, 1,699 acres of improvement cutting are prescribed; an intermediate harvest which removes the less desirable trees of any species, primarily to improve the composition and quality (US Forest Service, 2023). Indirectly, after all treatments occur, stands would experience reduced shrub, hardwood, or shade-tolerant conifer competition for growing space.

Alternative B prescribes improvement cutting over 1,177 acres, with the remaining difference assigned to noncommercial hand or mastication thinning, reducing the opportunities for stands of pole-sized or larger low-vigor or overrepresented trees to be cut. A direct effect of improvement cutting would be making space for less common native conifers to germinate under ideal conditions with increased water and light. The varying intensity of mechanical treatments makes the Proposed Action more successful at returning

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western larch, lodgepole pine, and ponderosa pine to the landscape, and reducing the dominance of Engelmann spruce and grand fir to a greater extent. Indirectly, some stands may maintain overrepresented late-seral species dominance to maintain late and old structure.

Effects to Stand Density

Approximately 69% of proposed treatments under both Alternative A and Alternative B are within high density stands. Both alternatives would modify densities on the same 11,868 acres with mechanical treatments and 21,325 acres with prescribed burning, with dual treatments planned on 5,732 acres under both alternatives.

In Alternative A, 6,622 acres would receive commercial thinning, including 308 acres of Seed Tree with Reserves regeneration harvest, while the Alternative B would have 4,877 acres of commercial thinning, including 161 acres of Seed Tree with Reserves regeneration harvest. A 26% higher proportion of commercial treatment acres would reduce densities more under Alternative A compared to Alternative B, as additional trees (diameters >9") would be cut and removed across the same treatment acres. Densities would be expected to change as seen in Table 14, where many high-density stands would be shifted towards low density, even exceeding RV for low density stands post-treatment. Prescribed fire would help expand low-density prevalence, igniting a patchy and dense fuel bed accumulated over decades. This tool is likely to be effective at extending the longevity of treatments in thinned stands (Johnston, 2021). As the years after treatment increase, low-density stands would gradually shift towards moderate density until anticipated future noncommercial thinning or prescribed burning are implemented to maintain the project area closer to RV values for structure, composition, and density.

Table 14. Estimated Effect of No Action, Alternative A, and Alternative B on Forest Density Classes in moist upland forest in the Tiger-Mill project area*.

Moist Upland Forest					
Forest Density Class	Current Condition	No Action-Expected Future Condition	Alternative A	Alternative B	RV Values
	%	%	%	%	%
Low	12	7.8	43.1	35.2	20-40
Moderate	26.3	29.3	35.2	35.7	25-60
High	61.7	62.9	21.7	29.1	15-30

*Additional potential vegetation group tables are available in the Silviculture Analysis.

High-density forest would be reduced almost 65% under Alternative A, nearly 53% under Alternative B. The continued high-density growth without action would be affected by warming and drying weather trends which are expected to accelerate self-thinning (Zylstra, 2022) in favor of lower density stands. Silvicultural activities that maintain a balance between the supply and demand for site resources or that mitigate local environmental stressors will have an important adaptation role, (Anderson & Palik, 2011). Without action, moderate and high-density stands would become increasingly common and low-density

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stands would become rarer, shifting from 12% currently (below RV) to 7.8% post decision. Moderate density stands would remain within RV under all three scenarios.

Cumulative Effects

The Tiger Creek Prescribed Fire project is a present action that will reduce stand density, change stand structure, and increase the proportion of fire-resistant cover species. This directly benefits the resource indicators moving them closer to historic reference condition on 560 acres within the analysis area. There are no reasonably foreseeable actions that would cause additional measurable changes to forest structure, species composition, or stand density, or have additional impact to the environment, with implementation of either Alternative A or B.

Effects Conclusions

Effects of changes shown on Forest Cover Type, Forest Density Class, and Forest Structure Stage (Tables 12,13, and 14) indicate both Alternative A and Alternative B would meet the purpose and need of the project and meet the requirements of moving the forested landscape towards reference conditions. Implementation of either action would generate conditions better suited to dealing with increasing drought conditions and allow for managed fire that would directly and indirectly benefit under-represented species.



Photo 3. Mill Creek Watershed from Paradise Ridge

Fire and Fuels

Summary

This Environmental Assessment incorporates by reference the Tiger-Mill Fire and Fuels Specialist Analysis, which is included in the project record. The Tiger-Mill Fire and Fuels Specialist Analysis, summarized below, discusses the area analyzed, resource indicators and measures, and possible effects of proposed treatments by alternatives. Fuel reduction treatments are designed to reduce fire intensity and hazard and improve safety and effectiveness of fire management. Fuel reduction treatments are designed to target and disrupt the vertical progression of fire from surface fuels to ladder fuels to canopy fuels and its corresponding horizontal progression.

Effects Analyzed in Detail

Effect 1: Vegetation and fuels management activities alter live and dead fuels and affect fire intensity and fire hazard.

Effect 2: Vegetation and fuels management activities along potential control lines affect the safety of fire management resources and control effectiveness.

Resource Indicators and Measures

This analysis will use potential fire behavior and fire hazard as indicators to relate the effect of Alternative A and the Alternative B.

Fire behavior is commonly defined as the way fuel ignites, flame develops, and fire spreads and exhibits other related phenomena. Understanding how fire behaved historically and would potentially behave under present or altered conditions is important for predicting the effects of a future wildland fire.

The term *Hazard* is used by the wildland fire community to define a variety of conditions or situations where damage to assets by fire is being evaluated.

Spatial and Temporal Context for Effects Analysis

The spatial bounding's of the fire behavior effects analysis are the defensible fuel profile zone (DFPZ) and the treated area for potential fire behavior. DFPZ (14,487 acres) is the area within one-quarter mile of the projects potential control lines. A distance of one-quarter mile was used based on the spotting distances calculated for the project area. The treated area is 27,594 acres and includes proposed treatment on USFS managed land and the potential private lands to be included in the landscape prescribed fire area.

The spatial bounding for fire hazard is 67,230 acres this area encompasses the nine Potential Operational Delineations (PODs) that treatments are being proposed within. PODs are spatial units or containers defined by potential control features, such as roads and ridge tops, within which relevant information on forest conditions, ecology, and fire potential can be summarized.

Short term effects to fire behavior and fire hazard are considered one to five years post initial treatment. Activity, natural surface, and ladder fuels are treated within this five-year window. Longevity of fuels reduction treatments are variable. Treatment intensity, fuels removed, and characteristics of the residual stand impact the long-term effectiveness to fire behavior. A single treatment will not permanently "fix" the problem, even where treatment intensity is high (e.g., a large basal area reduction). As the time since

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treatment lengthens, tree and understory growth responses rebuild fuel load, fuel ladders, and surface and canopy fuel; without follow-up action, treatment ability to influence fire behavior declines. Long term effects to Fire and Fuels will likely be 15-30 years post treatment. There is a gap in knowledge on longevity of treatments on each fuel layer (ground, surface, and canopy). This analysis compares the current condition of resource indicators and proposed alternatives as though all treatments have been implemented.

Potentially Affected Environment

Fire and Fuels

When a fire occurs within or adjacent to Mill Creek Municipal Watershed regional and national assets are prioritized in its protection. The West Side Wildfire Risk, Umatilla National Forest Priority Landscape Restoration, Washington Department Natural Resources 20-Year Forest Health Strategic Plan "Touchet Mill Planning Area", and the 2017 Walla Walla County Community Wildfire Protection Plan assessments have all highlighted an elevated risk that wildland fire could negatively affect the ecosystem services that this landscape provides, predominately due to the current fuels condition and fire hazard. The Mill Creek Watershed Inventoried Roadless Area (IRA), Walla Walla River IRA, and the Wenaha-Tucannon Wilderness limit active management treatments and have limited access roads within the project area. Minimal access roads and current road conditions, limit strategic locations to manage wildland fire. Potential Control Lines have been delineated for the project area where adjacent treatments aim to decrease fire intensity so that wildfire can be managed with reduced risk to firefighters and the ecosystem services the area provides, see Map 05 in Appendix B.

Risk to private infrastructure exists predominately along the Western boundary. The potential for fire to start on private lands and spread into the project area is highly likely as the 2015 Blue Creek fire demonstrated. Almost all the vegetated land of the Blue Mountains has burned and will continue to burn. The project area has not been affected by a large wildland fire within the last 100 years; however, within the subwatersheds of the project area seven large fires have occurred affecting 115,537 acres. The two notable fires were the Blue Creek Fire in 2015 (5,9994 acres) and the Columbia Complex of fires in 2006 (109,259 acres). Both fires threatened the Mill Creek Municipal Watershed. Table 15 displays the areas fire history since the 1970's (period of record).

The current composition and structure of fuels within the project area have accrued over time through both varying disturbances and the lack of disturbance. Manmade improvements, such as roads has removed all fuels. Commercial harvests have occurred creating patches of young stands and mixed age stands with decreased fuel loading. In many instances patch clear-cuts removed all fuels through harvesting and broadcast burning. 3,284 acres have been actively managed within the project area by the U.S. Forest Service. This only accounts for 8.5% of the total project area. Boise Cascade Corporation previously owned and managed approximately 4,000 acres between Henry Creek and Tiger Creek, although the exact acreage treated is unknown. Direct effects of temporary roads within riparian areas are visible and vegetation removal is evident. The likely outcome of those treatments was the removal of large early seral tree species allowing for shade tolerant trees to increase leading to an increase of ladder fuels.

Visible group tree mortality in Douglas-fir, grand fir, and subalpine fir indicates the role of insects and diseases within the project area. Their disturbances increase fine fuels in tree crowns in the short-term as needles turn red and stay attached one to two years. Increases in surface fuel loadings can be expected

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in the long-term. The Tiger Creek Prescribed Fire project lies within the project area and has treated 160 acres to date and will treat another 410 acres over the next several years.

Invasive annuals are present within the area and project design features aim to mitigate their spread.

As mentioned, the disturbances, or lack thereof, have created fuels conditions that are not characteristic for a landscape adapted to fire. Current conditions exhibit elevated surface, ladder, and canopy fuel loads at levels outside of reference condition in dry and moist vegetation types.

Consideration of No Action: What would happen if we took no action?

If no action is taken the surface, ladder, and canopy fuels would continue to increase. The amount of combustible fuel available indicates future wildland fires have the potential to be more intense and severe. This analysis discloses fire behavior under current fuels conditions which highlights the effects of no action. If a wildfire were to occur in the project area, even if the proposed actions for Tiger-Mill do not take place, there is no 'let it burn' policy. The significance of the area and the elevated risk presented by the current condition requires a full fire suppression strategy that would continuously be engaged to protect the private lands and municipal watershed. No action would inhibit the management of wildland fires and place greater risk to fire management personnel.



Photo 4. 2015 Blue Creek Fire

Direct and Indirect Effects of Alternative A and Alternative B

Non-commercial and commercial thinning, mechanical treatment of surface fuel and prescribed fire treatments can moderate fire behavior by manipulating fuel loading and layering which effect potential flame length, fire type, safety of fire personnel, control effectiveness, and fire hazard.

Table 15. Wildland Fire Statistics Since 1970.

	Fire Cause	# of Fires	Acres Burned
Natural	Lightning	229	109,417
Human Caused	Equipment Use	4	5,996
	Smoking	3	1
	Campfire	29	32
	Debris Burn	8	164
	Arson	1	<1
	Children	1	3
No Official Determination	Misc.	6	51
	Total	283	115,662

Direct effects to fuel loading and layering:

The fuel layers that would change due to the proposed activities are surface fuels, ladder fuels and canopy fuels. Surface fuels are those below six feet above the ground, such as downed woody fuels (for example twigs, limbs, tree boles) and live fuels (grass, forbs, and brush). For most of the treated area the direct effects of treatment are a short term, one to three years, increase in dead surface fuels (activity generated slash) with a long term, 15 to 20 years, reduction in natural and activity generated surface fuels. Two proposed activities that retain or increase surface fuel loading are mastication and lop and scattering of non-commercial trees. Instead of removing fuels they redistribute the fuels from standing to the ground surface. This redistribution reduces the risk of crown fire initiating but can increase flame length. Indirect effects of surface fuels treatments would likely lead to an increase in live fuels, grass, and brush. Invasive species may increase, and project design criteria have been incorporated to minimize their spread. Invasive grasses can out-compete native species and establish where native grasses do not, such as scablands.

Crown fuels (also referred to as canopy fuels or aerial fuels) are those higher than six feet above the ground, such as trees, snags, and ladder fuels. The initial thinning of live conifers directly removes ladder and canopy fuel; increasing height to live crown, decreasing crown cover and crown bulk density (Agee and Skinner 2005). These changes to crown fuels lower the potential for crown fire initiation “torching” and tree-to-tree crown fire. Reducing crown fuels is a primary means of reducing fire hazard (Graham et al., 1999, 2004; Brown and Aplet, 2000). Depending on the intensity of treatment, how many trees are removed, directly impacts the length of effects to crown fuels. Ladder fuel reduction would likely last 20

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years as new trees fill in the open space where sun and water are now less limiting. The effects to crown cover and bulk density may last longer as young trees gain height and reconnect with overstory tree crowns. There is a lack of studies that have been completed for long term effects to some fuel layers.

Broadcast burning has a similar effect to crown fuels however its outcomes are more variable and harder to predict. Low intensity broadcast burning would result in severities that lead to 25% or less overstory mortality while moderate intensity broadcast burning would result in overstory mortalities of 25 to 50%. Most overstory mortality would be a result of single tree and group tree torching due to heavy ground fuel concentrations and ladder fuels. Created openings in the uplands are estimated to be less than 10 acres in size and less than 10% of the forested areas. No created openings would occur within riparian habitat conservation areas. Broadcast burning also directly decreases ladder fuels through inducing mortality to understory vegetation, lower live limbs, and overstory trees.

Any changes in forest stand structure that reduce the canopy-bulk density results in an increase in the critical rate of fire spread needed for active crowning. This is to say that, for lower canopy-bulk densities, more severe burning conditions (for example, higher wind speed and lower dead fuel moisture content) are required to maintain a self-sustaining active crown fire. High canopy-bulk densities are associated with dense stands, and low values are associated with open stands. According to Van Wagner (1977), minimum threshold values for canopy fuel/bulk density are necessary to sustain active crown fire at given spread rates.

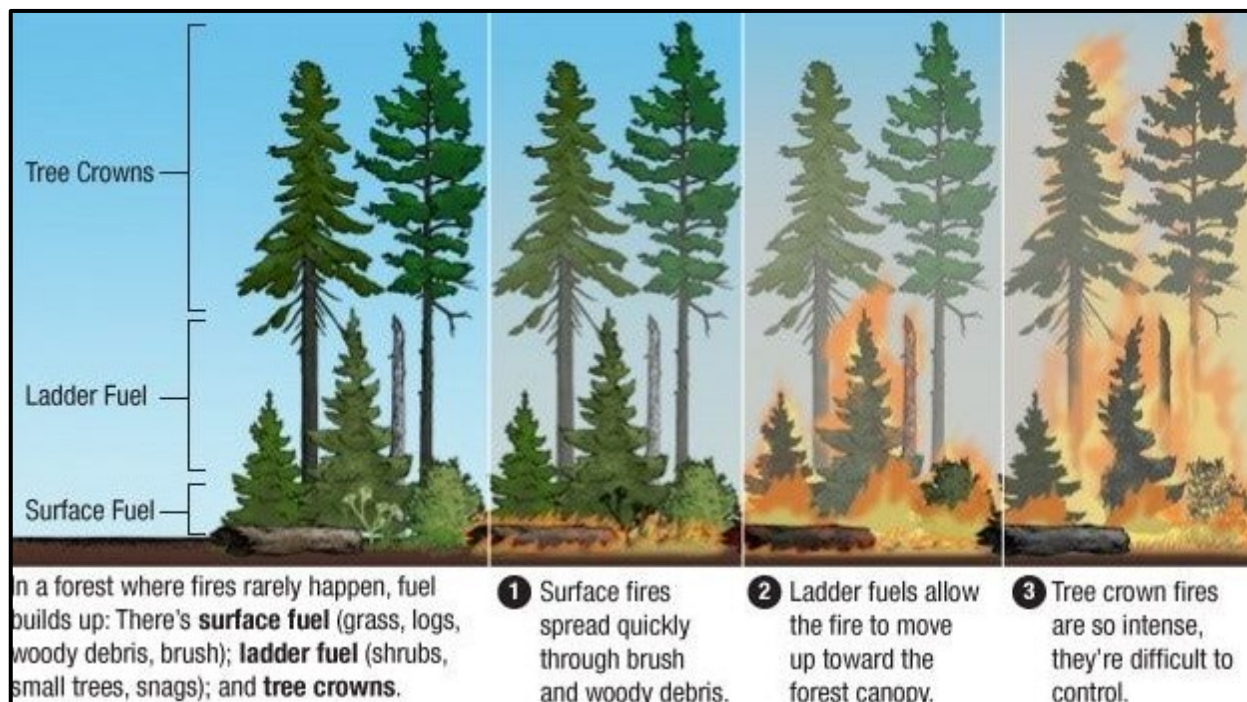


Figure 3. Fuel Layers and Potential Fire Behavior Characteristics

Indirect effects to the safety of fire management resources and control effectiveness:

A control line is made safe and effective by creating a Defensible Fuel Profile Zone (DFPZ)² adjacent to a control feature, where fuel loading and potential fire behavior is reduced. The DFPZ for this analysis is considered the area within one-quarter mile of the projects potential control lines (14,487 acres). The effects discussed above to the fuel layers reduce the fuel available for combustion therefore decreasing the likely potential flame length and reducing the likelihood of fire getting into the canopy. It is important to treat all layers to accomplish the intended outcome. Fuel treatments create fire suppression opportunities by reducing flame lengths and crown fire potential. They create areas that facilitate line construction (anchor points), spot fire suppression, and firing operations. Suppression crews would not have to put as many hours in to manipulate the fuel bed in a wildland fire emergency. This is an important aspect to increasing the safety of firefighters by reducing the hours necessary to establish a safe place to work. The basic safety zone concept in firefighting is that the distance between the firefighters and flames should be at least four times the maximum flame height. If you can reduce the flame length potential in a treatment area, you can make it safer. Table 16 reveals that both Alternative A and the Alternative B reduce the potential flame length, increase fire management effectiveness, and reduce risk to firefighters. Fire suppression and prescribed fire activities are critical for fuel treatments to be effective, as less than 1% of the wildfires are stopped by reduced fuel zone alone. The DFPZ would be prioritized to treat, and treatments would likely occur within 10-15 years of the decision. Table 16 displays modeled output of a fire starting within the treated area. If an active crown fire spreads toward the DFPZ treatments that would reduce crown bulk density would be more effective at transitioning the fire from the crown to the surface. Alternative A would treat 6,874 acres or 47% of the DFPZ and would have greater reduction in crown bulk density and spacing because Alternative A would commercially thin more acres. Alternative B treats 6,713 acres or 46% of the DFPZ. When compared, Alternative B would be equally effective at reducing fire behavior within the DFPZ but would be less effective at transitioning a spreading crown fire to a surface fire decreasing fire fighter safety and control effectiveness.

Indirect effects to fire behavior within the treated area (27,594 acres):

Studies show that fuel treatments are effective at the stand level in reducing fire intensity and severity (Fule' et al. 2012; Hunter and Robles 2020; Martinson and Omi 2013; Jain et al. 2021). The modeling output did not reveal many areas that would exhibit active crown fire under current fuels conditions and modeled weather. This is due to the wind input being 10 mph; to sustain an active or independent crown fire the wind would need to be higher. Many local large fires have had large runs with wind speeds of 20 to 40 mph and other compounding extreme weather and fuel moisture conditions. When crown bulk density is reduced, higher wind speeds are necessary to sustain an active crown fire. Lower crown bulk density is important within stands adjacent to Potential Control Lines, along slope breaks and where crown fuels are connected from valley bottom to ridge top. Reducing crown bulk density in these strategic locations would create a more effective fuel break at higher windspeeds. Table 17 shows the anticipated effectiveness of the treatments at changing fire behavior within the treated area from a fire initiating within the stand. Both alternatives reduce the overall fire behavior within the treated area. These effects would be spread out over time as mechanical treatments and landscape broadcast burning are completed. It is

² an area where vegetation has been strategically managed to reduce the risk and intensity of wildfires. (See Appendix E for more information).

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estimated that mechanical treatments may take up to 15 years to complete and that broadcast burning may take up to 25 years to complete. The alternatives would be effective at reducing flame lengths and transitioning crown fire to surface fire from fires that start within the treated area. There are only slight differences between the two alternatives.

Table 16. Treatment effect to fire management along Potential Control Lines

Potential Flame Length	Fire Management Effectiveness	Current Condition	Alternative A	Alternative B
		Proportion of DFPZ, 14,487 acres (%)		
0 to 4	Direct handline is effective.	43%	64%	64%
4 to 8	Handline effectiveness decreased need for heavy equipment for line to be effective.	28%	14%	15%
8 to 11	Torching, crowning, and spotting create serious control problems. Indirect methods are necessary.	6%	4%	4%
11+	Major fire runs probable. Indirect methods are necessary.	33%	16%	15%
Non-burnable		2%	2%	2%

Direct effects to Fire Hazard at the landscape level:

Landscape-scale fuel treatment effectiveness is the ability of fuel treatments to affect wildfire outside of their footprint. Empirical studies have confirmed that landscape-scale fuel treatments can reduce the rate of fire spread, progression, extent, or severity of proceeding wildfires (Urza, et al. 2023). When the proportion of treated area increased, fire severity declined both within and outside of treated areas. Simulation studies confirmed that treatments of a greater extent, or amount of treated area, can reduce wildfire effects, and studies pointed to a threshold of about 30%, beyond which further treatments result in diminishing effect (Jain, et al. 2021). The treatment and effects described above create complex pyrodiversity at the landscape level. This complexity encourages variation in fire size and severity (Hessburg, et al 2016). Treated areas can change how fire interacts with untreated stands. Finney et al. (2005) observed reductions in wildfire severity in portions of the Rodeo and Chediski wildfires on the lee side of areas previously treated with prescribed fire.

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Table 17. Treatment Effect to Fire Behavior Within the Treated Area

	Current Condition	Alternative A	Alternative B
Potential Flame Length (Feet)	Acres		
0 to 4	8,566	20,321	19,930
4 to 8	3,767	5,646	6,329
8 to 11	1,602	238	212
11+	13,468	943	917
Non-burnable	191	206	206
Fire Type	Acres		
Surface Fire	9,807	25,928	26,202
Passive Crown Fire	17,588	1,453	1,185
Active Crown Fire	8	7	2
Non-burnable	191	206	206

The effects discussed to the fuel bed and potential flame lengths of the two action alternatives are integrated with the burn probability of the landscape to disclose the effect to fire hazard. Fire hazard is used to disclose the effect of treatment at the landscape level.

Burn probabilities (see Tiger-Mill Fire and Fuels Effects Analysis for more details) are related to the sizes of fires that occur on a given landscape. Large fires produce higher probabilities than small fires. Since fire size is a function of both the rate of spread, and the duration of a fire, treatments or weather conditions that reduce fire behavior would lower the burn probability. Table 18 displays the effect to fire hazard of the treatments being proposed. The alternatives are effective at reducing the proportion of the landscape from high to low fire hazard. Just like the other indicators the two alternatives are very similar in effect to fire hazard.

Cumulative Effects to Fuels and Fire Behavior

Past actions and the Tiger Creek Prescribed Fire Project have been incorporated into the current condition for the resource and disclosed in the affected environment section. There are no activities that are foreseeable within the project area that will impact the fire and fuels resource under modeled conditions.

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Table 18. Treatment Effect to Fire Hazard

Integrated Hazard	Current Condition	Alternative A	Alternative B
	Proportion of Landscape (%)		
Non-burnable	1	1	1
Burnable, but not burned	0	2	3
Lowest hazard (Blue)	29	54	52
Lower hazard (Green)	24	20	21
Middle hazard (Yellow)	29	16	16
Higher hazard (Orange)	13	6	6
Highest hazard (Red)	4	2	2

Effects Conclusions

The results of modeling show us that treatments would be effective at reducing fire behavior and fire type within the DFPZ, the entire treated area and fire hazard at landscape level. The proposed actions would decrease the amount of fuel on the landscape. A future wildland fire would have less fuel to consume which would decrease potential fire intensity. The ability to manage fire outbreaks would increase and management of wildland fire would be more effective and safer. Alternative A and Alternative B would both meet the purpose and need related to fire and fuels. Alternative A would be more effective at transitioning an approaching crown fire to a surface fire. Increasing fire fighter safety and control effectiveness under high wind conditions and/or active crown fire approaching the treated area.

Soils

Summary

The Tiger-Mill Soils Effects Analysis is incorporated by reference into this Environmental Analysis and summarized below. The detailed analysis is available in the project record and compares indicators, measures, and treatments by alternatives. It describes the potential effects of implementation of proposed actions, as well as application of PDCs that would ensure consistency with the forest plan, relevant laws, regulations, and policies.

Effects Analyzed in Detail

Effect 1: Machinery used for thinning can expose mineral soil, leading to soil erosion and decreased soil productivity in the area of disturbance when:

- driving under soil conditions near or exceeding field capacity,
- when turning, or
- when equipment slips off rocks or trees stumps.

Effect 2: Removal of timber by harvest and fuels treatments reduce available organic matter for nutrient cycling in the immediate area.

Effect 3: Machinery used for thinning and fuels treatments can disturb surface soil and expose mineral soil to sheet, rill, and gully erosion. Decreased soil thickness may result which, if severe enough, changes the soils productivity and corresponding potential plant association.

Effect 4: Heavy machinery usage leads to soil compaction concentrated in skidding corridors, unmapped trails, and temporary roads- all reducing upper profile pore space leading to reductions in water infiltration, water infiltration, exchange in soil-atmosphere gasses, root growth and vigor, and increased potential for puddling and runoff.

Effect 5: Timber removal on sloping unconsolidated material has the potential to initiate mass movement events when deposit disturbance and meteorological conditions result in saturated profiles.

Resource Indicators and Measures

Treatment alternatives are evaluated on their effect to soil productivity function and condition. Indicators used to analyze effects of proposed actions are listed in Table 19. Forest Plan identifies 20% or less detrimental soil conditions (DSC) post action is acceptable within a treated activity unit. The threshold for significance for each indicator is not to exceed 20% when combined with all other indicators. Soil productivity would remain above 80% (or more) after actions are completed.

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Table 19. Resource condition indicators and measures for assessing effects.

Effect	Indicator or Measure	Threshold for Significance
Nutrient Cycling (Organic Matter)	Surficial cover of fine organic matter or woody debris, including slash, remaining in the activity unit after actions (Qualitative)	Percentage of cover is relative to site potential for the plant association. Percentage of the area not meeting the site potential is considered part of the total DSCs for the activity unit.
Erosion	Spatial area with mineral soil exposed from signs of sheet or rill erosion, including deposition area outside of activity unit boundary (Qualitative)	Percentage of area affected by soil movement out of a disturbed area or out of the <i>activity unit of an area greater than 100' square. Percentage of the area negatively affected by sediment movement is considered part of the total DSCs for the activity unit.</i>
Compaction	Spatial area of skid trails, new roads, landings, and staging areas that result in puddling, rutting, or impaired soil infiltration. (Qualitative)	Volcanic ash soils not to exceed 20% and other soils not to exceed 15% increase of soil bulk density as estimated by change in soil structure in profiles. Percentage of area affected by impaired soil function is part of the total DSCs for the activity unit.
Displacement	Spatial area of mineral soil exposure greater than 5 feet in diameter resulting from harvest or fuel treatment actions (Qualitative)	Percentage of the area affected by lack of 'O or A' horizon (Organic horizons) covering mineral soil that exceeds 100' square and at least 5' wide. Percentage of the area affected by missing organic matter cover is part of the total DSCs for the activity unit.
Detrimental Soil Mass Wasting	Land movement of small and large scales which include organic and mineral soil movement which also can include rock movement as either a debris flow, mud flow, landslide, block slide, or topple. Increases reactivation of historic mass movement areas by increased rate of creep or other listed mass movement classifications. (Qualitative)	Visual evidence of any new mass movement or ignition of historic mass movement areas associated with land management activities within an activity unit or within the project areas equal to or greater than 100 square feet or more at least 5 feet wide.

Sources Umatilla NF Land and Resource Management Plan, 1) [Minimum Percentage Effective Ground Cover table](#), 2) [R-6 Supplement No. 2500.98-1](#) 3) [R-6 Supplement No. 2500.98-1](#) 4) [R-6 Supplement No. 2500.98-1](#) 5) [R-6 Supplement No. 2500.98-1](#)

Spatial and Temporal Context for Effects Analysis

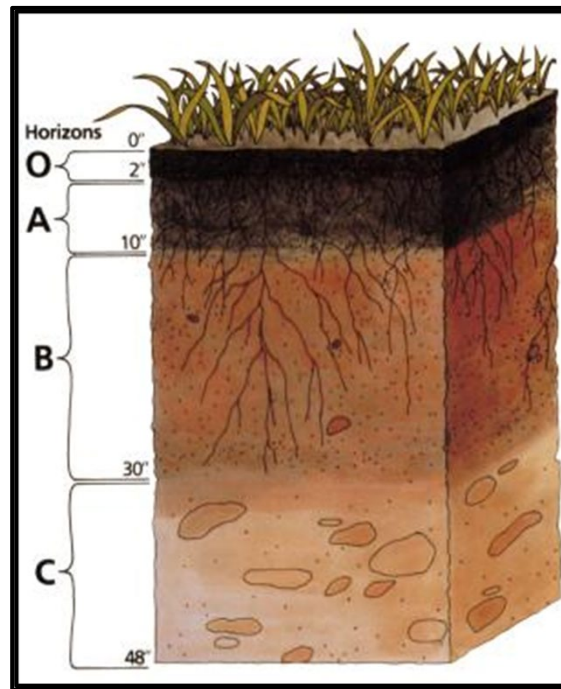
The scale of analysis for effects to soil indicators encompasses the area of treatment within the approximately 38000- acre project boundary.

The temporal scale of considered for direct, indirect, and cumulative effects to soil are short-term (within 5 years), mid-term (5-20 years) and long-term (more than 20 years). These temporal scales account for the reasonably foreseeable duration of effects and the timeframes during which soil processes start to alter disturbed soil or sediment to produce surface stability, soil structure, waterholding capacity, and nutrient cycling that allow for the same vegetation assemblages to flourish in the future.

Potentially Affected Environment

The affected environment for this project includes all areas of ground-based mechanical disturbance, landing use, and immediate areas of pile burning within the project area boundary. When disturbed areas are connected, the spaces between mineral soil exposure are then included in the affected environment for the soil resource with this project.

Figure 4. Soil Layers



Within Tiger-Mill project boundary, areas with past ground-based actions, greater than 20-years-old, on slopes less than 35% have detrimental soil conditions (DSCs). These range from 10% to 20% mainly as compaction, and are located in old skid trails, travel corridors, and landing areas. Activity areas with ground-based actions that occurred less than 20 years ago average 15% to 25% DSCs. Areas exceeding 35% slope in Skyline logging corridors average 2% to 5% DSCs as soil compaction mostly located in skid trail corridors. Landing areas associated with Skyline logging average 10% to 20% DSCs mostly as compaction but are usually located outside activity units. Areas with no ground disturbing actions, within the municipal watershed and other areas of less financial importance, remain at or near natural soil productivity levels. Many closed access roads for past commercial thinning are still used by the public to access the area and add to the detrimental soil conditions (compaction, erosion, and displacement) of activity units and the project area. Actions are proposed on many slopes and aspects of the project area.

Much of forested soils in the project area contain a mantle of volcanic ash, 50 to 100+ cm thick, which has low bulk density with high-water holding capacity that is readily available to vegetation. This volcanic ash cap is what makes Umatilla National Forest soils productive to conifer growth. Very shallow (less than 25

cm thick) soil areas support short statured vegetation not found on deeper soil and have a limited extent within the project area.

Consideration of No Action: What would happen if we take no action?

Areas of no action would continue soil-forming processes and degraded areas would improve. Nutrient cycling would continue at natural levels. Mass wasting potential would continue at the same risk level. Taking no action within the project treatment areas would maintain soil productivity comparable to the current condition. With increasing potential for large scale wildfire events there may be an increase. And in the potential for detrimental soil disturbance post wildfire may be greater due to hotter burns on greater areas of the landscape.

Direct and Indirect Effects of the Alternative A

Soil Compaction and Displacement

The Tiger Mill Environmental Assessment incorporates by references the Tiger-Mill Soil Effects Analysis and Appendix A, included in the project record. These include a more complete description of effects of soil compaction and displacement and mitigation through Project Design Criteria (PDCs). Compaction is expected in temporary roads, skid or forwarding trails, and to some degree, in user-created routes as a direct effect. Compaction is also expected in proposed landing areas- outside of some activity unit areas and to a smaller extent within activity units under small temporary landings that are organized prior to removal from the activity unit. Displacement is expected to a lesser extent within the same areas identified for compaction. These direct detrimental effects to soil productivity are expected to be scattered within 5,312 acres (Table 6) of ground based thinning activities as identified in Alternative A, which is 45% of the total project area thinning acres. Field observations of past ground-based actions on similar soils and landscapes find that following PDCs on slopes less than 35% would remain within forest plan standards. Ground-based actions on steep slopes are expected to also remain within forest plan standards based on similar actions that occurred on Wallowa-Whitman National Forest in the Sparta project area when applying the suggested project design criteria Sparta project has a similar geomorphology, aspect, elevation, parent material, vegetative cover, and soil profile development. For additional information on tethered logging information refer to the Soil Analysis.

Detrimental soil disturbance by helicopter thinning would be low within treatment units because transportation of timber would not occur by ground-disturbing mechanical travel on soils (see Table 4 for acres). The direct effects of helicopter thinning direct effects are greatest at landing areas. There are fewer helicopter landing areas than landings for other thinning activities, but the helicopter landing areas are generally somewhat larger, except where landings occur on Forest System roads. While total effects from helicopter logging are less overall, compaction and possible displacement is greater at the individual helicopter landing sites due to the generally larger scale and concentration of log piles and vehicles in the limited area. Implementation of PDCs and mitigation measures for rehabilitation of helicopter harvest landing sites would be important. Helicopter landings are sited to on roads or existing pull-out sites to limit new disturbance. [Tables 2, 3 and 4](#) compare acres affected by proposed mechanical actions between the Alternative A and Alternative B.

Units having a few acres of overlap with post-1999 treatments or identified for non-commercial treatments would likely see minimal effects that would keep soil productivity within forest plan standards.

Direct and in-direct effects of noncommercial thinning, hand thinning and fuel treatment effects are minimal in relation to mechanical ground-based thinning. Noncommercial thinning and fuel treatments

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directly create a mosaic of disturbance that is not connected linearly, are not parallel to slope, and which do not result in detrimental soil conditions that add to or result in exceeding forest plan standards. Proper implementation of PDCs in previously entered and comparably similar forest areas yielded a substantial reduction in detrimental effects. Based on these results this project is anticipated to see comparable effects.

Within areas of Riparian Habitat Conservation Area (RHCA) treatments, hand thinning would occur on approximately 569 acres under Alternative A. would occur. Potential effects of treatments utilizing the listed PDCs would be expected to within Forest Plan standard as seen in effectiveness of comparable projects on the North Zone.

Temporary roads are located within and outside of activity units within the project boundary. Alternative A identifies approximately 10.6 miles of temporary road, of which, 4.8 miles (8 acres)) is reuse of existing disturbed areas (i.e. old roads not obliterated or not part of the system road footprint (Table 6). The intent is to return the approximately 8 acres of disturbed area used for temporary roads to soil. productivity. Approximately 5.8 miles (10 acres or 0.0% of the project area) of temporary road construction would directly result in soil disturbance. Proposed activities include returning most temporary roads to natural conditions by ripping compacted soils and blocking access. Restoration of road disturbance may take of years for soil forming processes to return to natural conditions but is faster than leaving the restoration to natural processes.

Skidder and forwarder soil compaction and displacement would be expected within treatment units in narrow linear manner only. Other displacement or compaction associated with landings or vehicle placement outside of activity units and based on similar past treatment activities would be expected to be very limited of a short term and negligible level of effect. Restoration of disturbances associated with compaction and displacement following implementation of unit activities is expected to return soil conditions and soil processes to acceptable levels within a several years. User created routes are made by one or two passes by vehicles that are found throughout activity units and result in negligible detrimental effects. Displacement is the most common effect observed on the landscape during mechanical mastication actions. These disturbances are isolated and usually well below the spatial area identified by the Forest Plan (pg. 4-80).

Individual activity units identified for equipment activity are expected to have a low to moderate effect post-implementation through implementation of PDCs. Areas with slopes less than 35% are expected to see more soil compaction and slopes greater than 35% are expected to see more soil displacement (conversational observations by Oregon State University graduate study of Sparta units on Wallowa-Whitman National Forest). This would result in slower soil recovery within the first year or two after disturbance as soil processes act on the disturbed portion of the profile. Within 5 to 10 years, soil productivity would be expected to trend positively towards background levels.

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Activity units identified for hand or fuel treatments are expected to have a mosaic of different levels of disturbance but remain less than 2% additional detrimental soil conditions. Even at the most disturbed areas of fuels treatments, pile burns, the disturbance associated with high soil burn severity can be mitigated or left to natural processes which would trend towards background levels of productivity within a few years. The same actions on steep slopes have greater potential for soil erosion, but application of PDC Soil 1 would reduce potential for erosion increase in productivity.

The magnitude and intensity of compaction and displacement are dependent on landscape conditions when the treatments are implemented. Soil moisture conditions and total disturbances have been within forest plan expectations with application of PDCs.

A required condition of 80% soil productivity in an area post implementation (Forest Plan, pg. 4-80) is achievable with the actions proposed in this project.

Organic Matter

Organic matter removal is promoted by commercial activities performing whole tree yarding involving removal of tree trunks, treetops, and many branches. Cut to length harvesting, however, would leave treetops and branches in activity units adding to nutrient cycling potential of the area despite the removal of whole trunks. Fuel treatments through prescribed fire and pile burning would directly reduce organic matter across sections of the portions of the landscape lasting for a short time. Because vegetation and tree contributions add to uppermost soil layer profiles (O horizons) the effects of organic matter reduction diminish moving fairly quickly towards natural surface cover conditions within the short term (a few months to years - Pfeifer white paper, 2005). The loss of organic matter by tree removal or burning is expected to reflect similar removal by natural wildfires.

Effects of organic matter reduction to nutrient cycling are expected to be minimal. Effects would occur in the short term because of stored nutrients found in A horizons of soil profiles.

Proposed treatments would space treatments and minimize the potential for wildland fire in intervals that would reduce detrimental effects to soil productivity. Prior treatments on the forest indicate that cycling nutrients would continue as remaining trees, needles, and leaves would contribute to regrowth of understory vegetation. An indirect benefit of adjacent contributions of organic matter and regrowth of sprouting plants and seed sources in most areas of the project boundary would cause vegetation to initiate return to natural conditions resulting in little effect to soil productivity.

Removal of organic matter from treatment units would decrease the potential for nutrient cycling and increases the potential for soil erosion with increased mineral soil exposure. PDCs are expected to ensure approximately 80% of the treatment area would remain within acceptable soil productivity levels and desired outcomes would be met.

Soil Erosion

Most of the area potentially directly affected by soil erosion is within activity units identified for mechanical ground-based actions or pile burns. The extent of disturbances would be limited to scattered disconnected areas within activity units. Similar actions reveal low potential for soil erosion to last for more than a few days or weeks- but can be made more severe due to detrimental weather events.

Mechanical actions on steep slopes pose greater risk to soil erosion due to mineral soil exposure and increased energy potential of surface flow. Removal of soil material and decrease in soil profile thickness

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immediately decreases soil productivity in that area. Loss of the soil profile thickness has the greatest effect on soil productivity. Use of PDCs (Appendix A) would mitigate effects and limit soil erosion activity.

Mass Movement

Landscape areas considered stable may stay that way for hundreds to thousands of years. Stability through time is highly dependent on the geologic deposit, vegetation cover, and climate. Removal of the soil profile by mass movement has the same effect as smaller erosional events but on a larger scale. Soil profile loss changes future vegetative potential due to an immediate and drastic decrease thickness affecting soil productivity. It takes thousands of years to restore the same soil productivity in an area that has been removed by mass movement. Landforms with slopes greater than 35% have greater potential for future mass movement but maintaining live root growth of grasses, shrubs and some trees will help to maintain stability on steep slopes. Although mass movement events can occur on slopes less than 35 percent, it is rare unless there is an underlying geologic relationship that makes the area prone to deposit movement.

With changes in local weather patterns and timing of moisture delivery, rain on snow events is expected into the future making it difficult to predict where mass wasting may occur in the future. Recent rain on snow events resulted in isolated mass movement on mountain backslopes of past wildland fire footprints, in past harvest areas, and areas where no harvest has occurred (School Fire footprint). Predicting where the next mass wasting event will occur is difficult. However, applying PDCs and implementing thinning prescriptions that consider the possibility of mass movement events in activity units has, and will continue to, lower the risk throughout the project area.

Any part of activity areas with slopes greater than 35 percent are prone to mass movement in pre and post-harvest conditions (as indicated by Web Soil Survey and Oregon Department of Geology and Mineral Industries (DoGAMI) online analysis). There is a greater potential for debris or mud flows mass wasting to occur in areas where over story and soil is disturbed. Many areas in the Blue Mountains show past signs of mass movement in the form of headscarps, slumps, or creep but are considered stable under current conditions. Indicators with expressions greater than a couple feet were used in the review of DoGAMI's LiDAR and SLiDO (Landslide) database layers for the project area.

Maintaining abundant live vegetative cover is necessary. Avoidance of thinning at seed tree level prescriptions and more extreme thinning prescriptions is avoided by this project. Only a few areas of recent mass movement were identified in the following activity units: 069, 142, 228, 436, 463, 467, and 497. Treatments proposed for units with mass movement indicators (463, 467 and 497) are identified for NCT or helicopter treatments with prescriptions that do not include heavy thinning prescriptions. Application of PDC SR-12 to the remaining units and others with newly observed indicators are expected to avoid additional mass movement activity. The actions proposed by this project are designed to maintain stability from mass movement on all slopes under general climatic conditions and application of PDCs are expected to maintain forest plan standards.

Direct and Indirect Effects of the Alternative B

Soil Compaction and Displacement

The effects of ground-based disturbance, soil compaction and displacement by commercial and non-commercial thinning, are anticipated to be comparable or the same as those addressed in analyses for Alternative A. Alternative B has fewer acres of treatment (Table 19), but the same disturbances are expected in skid-trails (narrow linear areas within a treatment area), landings, and user defined routes as analyzed Alternative A.

Organic Matter

Alternative B retains greater quantities of woody biomass in the treatment areas. There would be less removal of organic matter and, indirectly, more nutrient cycling potential over a wider area. No mechanical treatments in IRA and RHCAs means nutrient cycling would continue in a manner similar to natural processes of decay and wildland fire reduction. No substantial detrimental effect to nutrient cycling is expected from these actions.

Erosion

Within Alternative B, erosion potential between treatments would be the same, but within a smaller footprint.

Within the IRA, approximately 780 acres would be treated by hand thinning compared to a commercial thinning proposal in Alternative A. There is a difference of 2% soil disturbance between Alternatives resulting in a negligible effect regard to soil productivity.

The degree of direct and indirect effects is predominantly low intensity and short term. Lasting from a few days to weeks and resulting in less than a few hundreds of pounds of sediment to water bodies with limited movement on the backslope. Isolated areas have minimal potential for medium to high intensity effects, however, application of PDCs would be anticipated to reduce the extent and duration of erosion.

Effects under Alternative B would be less than Alternative A.

Mass Movement

The potential for mass movement events associated with Alternative B are comparable to Alternative A, however, there would be less indirect adverse effect due to fewer acres of potential surficial disturbance. Identifying where mass movement events may occur as a result of changing climate is not possible, but limiting actions in areas of previous mass movement has proven successful in prevention.

The potentially affected environment is comprised of predominantly slopes exceeding 35% and areas of historic mass wasting that are currently stable.

The degree of potential effects between the two Alternatives is fundamentally the same

Cumulative Effects

Past, present and foreseeable actions identified in this EA were reviewed in a cumulative manner to determine potential effects to soil productivity. Effects of past activities include tractor harvest (whole tree yarding), skyline harvest (whole tree yarding), prescribed burning, including landscape and pile burning,

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and non-commercial thinning. Effects of these treatments were incorporated into existing soil condition and considered when determining detrimental soil condition for activity units.

The approximately 300-acre Tiger Creek Prescribed Burn, implemented in the fall of 2024, was analyzed several years ago and overlaps the area of analyses for the Tiger Mill project. Soil-burn severity of these acres have either meet the desired condition proposed by this project or have minimal effect to proposed actions. The Tiger Creek wildfire exceeded the original prescribed burn footprint overlapping approximately 196 acres with Tiger Mill project. Effects to soil productivity from the fire is limited due to the minimal acres of high soil burn severity (5 acres) spread over 5 disconnected areas. In these areas future ground-based actions would be limited or avoided. Moderate soil burn severity is limited to <18 acres of the fire and are expected to minimally influence what actions can be implemented from Tiger Mill project proposal. Proposed fuel treatments of landscape burning across all low SBS and no soil burn severity are expected to have no effect on soil productivity. Proposed treatments in low soil burn severity and un-burned areas are repeatable or implementable and are expected to remain within forest plan standards with application of PDCs.

There are no reasonably foreseeable future actions planned within the project area that would affect soil productivity. Past and future actions or fire related incidents occurring outside of the project boundary have and will affect soil productivity in those areas but do not have a cumulative effect on the soil productivity of this project area. Application of Soil PDCs address the potential for cumulative effects and as evidenced by past and on-going projects to keep detrimental soil conditions below forest plan thresholds for soil productivity.

Effects Conclusion

Potential effects of Alternative A and Alternative B were considered and both analyses would comply with the Forest Plan while maintaining soil productivity over the short and long-term when implemented with appropriate Soils PDCs.

Taking no action would continue soil processes in a positive direction for soil productivity but would not meet the purpose and need of the Tiger-Mill Project.

The differences between the Alternatives are based on acres proposed for treatment with the potential for both beneficial and adverse effects. A comparison of ground disturbing actions in (Table 4). with helicopter acres of both actions the potential effects of soil compaction and displacement, soil erosion, and mass wasting are about the same. Comparison of acres from (Table 1) that would remove organic matter vs. keep organic matter in activity units finds that Alternative B has about 3% greater potential for nutrient cycling.

Hydrology

Summary

This section of the Environmental Assessment includes a summary of the Tiger-Mill Hydrology Specialist Analysis, which discusses the effects to water resources by alternatives, indicators and measures, and environmental consequences. The full analysis is incorporated by reference into the project record. Protecting water quality and hydrologic function is a key purpose and need for this project. Detailed analysis of changes to temperature, water yield, erosion, sedimentation, and other hydrologic functions were conducted to maintain compliance with Forest Plan and other relevant laws and regulations, as applicable. The hydrologic system and the hydrologic effects of proposed actions were analyzed for

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National Forest System (NFS) lands by the 12-digit Hydrologic Unit Code (HUC), also known as a subwatershed (SWS). HUC is a hierarchical national level interagency map of the hydrologic system.

Effects Analyzed in Detail

Effect 1: Changes in forested stand and canopy density caused by harvest, fire, or insect and disease can change the distribution of the snowpack, increasing its rate of melt, and cause it to melt earlier in the season, all of which may lead to changes in peak flows. Changes in water yield and in peak flows have the potential to destabilize channels, and increase erosion and sedimentation. Reduction of stocking density would also reduce the overall vegetative use of water, increasing water available for runoff. These parameter changes would concern aquatic habitat and biota, downstream water users, and channel morphology.

Effect 2: Roads affect hydrologic function (extension of the stream network) and water quality (sediment delivery to surface waters).

Effect 3: Water temperature can be increased by reductions in the density of shade over the water surface.

Effect 4: Proposed activities effect erosion rates and sediment production.

Resource Indicators and Measures

Treatment alternatives will be evaluated based on their effect to hydrologic function and condition, water quality, and water yield. Indicators used to analyze effects of proposed actions are as follows:

- Hydrologic Function, Floodplains and Wetlands:
 - road density (Miles per square mile [mi/mi²])
 - roads in Riparian Habitat Conservation Areas (RHCAs) [miles]
 - road-stream crossings on haul routes and temporary roads (number)
- Water Quality:
 - water temperature (shade)
 - sediment (tons/year)
- Water Yield:
 - Equivalent Clearcut Area (ECA) < 15-20% threshold
 - road density (< 3 miles per square mile [mi/mi²])
 - Relative volume (acres-feet)

Spatial and Temporal Context for Effects Analysis

Effects to water quality are based on the stream reaches identified by Oregon Department of Environmental Quality and Washington Department of Ecology. The States designate beneficial uses of water resources and establish water quality standards protective of those uses. Sedimentation is compared to background rates in tons/year.

Cumulative effects analysis for water quality in this project area were analyzed at the stream reach scale, assessing past, present and reasonably foreseeable impacts to sedimentation and temperature. Effects to water quality were analyzed for short term (1 day to 1 week) and for long term, up to one year or longer for changes at the landscape scale. These time scales were chosen to display short term concentrated

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effects, and longer-term seasonal effects that are sometimes seen during spring runoff and for longer term (years) effects, whether beneficial or adverse, that can be expected to materialize.

Cumulative effects to water yield at the HUC12 scale are calculated using records of timber harvest activity. The Equivalent Clearcut Area (ECA) model has a 12–33-year timeframe for hydrologic recovery (collection, storage, and release of precipitation) depending on silvicultural prescription and plant association. Vegetation management proposed in the project would occur over the course of several years, and the calculation reflects the estimated time frame for thinning and prescribed burning provided by timber and fuels specialists.

Potentially Affected Environment

The Tiger-Mill project boundary contains approximately 38,000 acres of NFS lands located in portions of ten subwatersheds (Table 20) including approximately 300 miles of perennial, intermittent and ephemeral streams. Proposed actions in the Blue Creek and Headwaters Dry Creek subwatersheds contain only small acreages, would occur near ridgetops and in discontinuous parcels and with no direct, indirect, or cumulative effects to hydrologic resources, therefore, there will be no further discussion of these areas in this analysis.

Snow can accumulate throughout the project area but is transient below 2,500 to 3,000 feet, and variable year to year between 2,500 and 4,000 feet, the so-called "rain-on-snow" zone. Above 4,000 feet, snow generally persists through the winter months. The project area occurs predominantly (63%) in the snow-dominated zone, with about 37% in the rain-on-snow zone and < 1% in the rain-dominated zone. Forested areas account for 75% of the landscape in the snow dominated zone (~ 18,500 acres) and 66% (~ 9,500 acres) in the rain-on-snow zone. Proposed commercial thinning would occur on about 4,500 snow dominated acres and 1,500 rain-on-snow acres.

Floods-of-record (> 100-year return interval flows) recorded at USGS Mill Creek gauge 14013000, 2 miles downstream of the mouth of Henry Canyon and 4 miles downstream of the City of Walla Walla water intake occurred in 1931, 1965, 1996, and 2020 because of rain-on-snow events. These types of events can result in mass movements in the form of hillslope slides and channelized debris flows. Mapped slides/debris flows, attributed to the 1996 event, include 10 in the Upper Mill Creek subwatershed and 4 in the Middle Mill Creek subwatershed.

Mapped slides/debris flows after the 2020 event include 57 in the Upper Mill Creek subwatershed and 12 in the Middle Mill Creek subwatershed. All these flows/slides occurred in the rain-on-snow zone and nearly all originated in ephemeral and intermittent drainages and most extended downstream into perennial streams. In addition, a June 2022 rain event caused localized flooding along Mill Creek, downstream of Tiger Canyon.

Watershed response to changing climate and modified by increased size and severity of wildfires is well-documented (Collar et al 2022, Smoot and Gleason 2021, Gustine et al 2021). The Climate Change vulnerability assessment for the Blue Mountains (Halofsky and Peterson 2017) highlighted the following considerations based on current and modeled future trends due to a warming climate:

- Changes from snow to rain-dominated precipitation (not necessarily net change in amount; declining snowpack due to less precipitation falling as snow, more rain-on-snow events, more frequent and intense summer thunderstorms)
- Changes to timing of water yield (earlier snowmelt and peak flows, lower summer flows)
- Stream water temperatures increase (warmer ambient air temperature, lower summer flows)
- Increased extent, duration, severity of forest insect, disease, and fire frequency

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- Increased sedimentation related to changes in precipitation patterns and disturbance regimes.

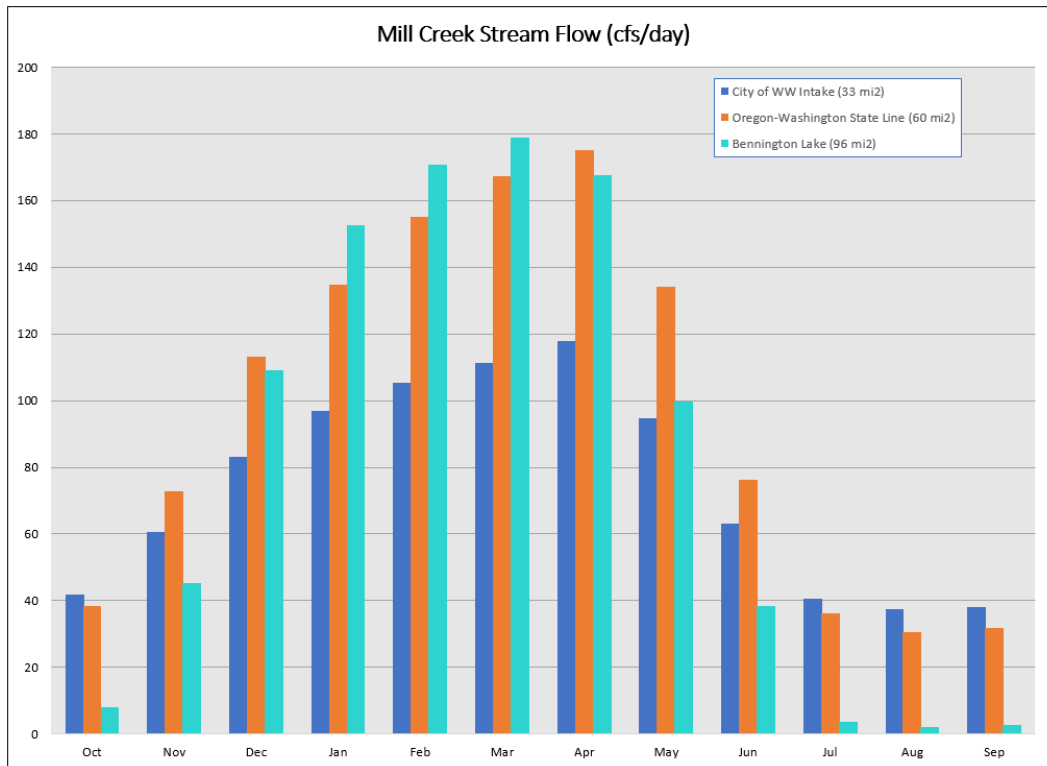
Table 20. Subwatersheds (SWS) within the Tiger-Mill Analysis Area

Subwatershed (HUC12)	SWS Name	SWS acres	NFS acres in SWS	Project Acres in SWS	% Project Area in SWS-FS
170601060301	Upper South Fork Wenaha River	20250	20250	129	< 1%
170601060303	North Fork Wenaha River	17586	17586	477	< 3%
170701020101	Upper South Fork Walla Walla River	17595	17595	1013	6%
170701020104	North Fork Walla Walla River	28573	9780	3234	33%
170701020201	Upper Mill Creek	21440	19348	19348	100%
170701020202	Middle Mill Creek	20560	7853	7853	100%
170701020203	Blue Creek	12653	48	48	100%
170701020303	Wolf Fork	26757	6765	1038	15%
170701020304	South Fork Touchet River	27932	4654	4654	100%
170701020801	Headwaters Dry Creek	28837	2	2	100%

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Graph 3. Average annual streamflow of Upper Mill Creek, illustrating its importance for maintaining year-round flow for adequate water supply and downstream uses.



(data from USGS gauges 14013000 and 14015000, [USGS Current Water Data for Washington](#) and Pierson 2018)

Consideration of No Action: What would happen if we took no action?

The ability to maintain existing high-quality habitats and to restore degraded habitats would be influenced by climate change over the next several decades with projected higher average air temperatures, more winter precipitation falling as rain versus snow, and diminishing winter snowpacks resulting in earlier snowmelt and lower summer baseflows. Changes in timing and amount of precipitation and runoff associated with climate change affect every resource, including terrestrial vegetation, wildlife, riparian and aquatic species, and water availability for human use. There would continue to be elevated risk of large-scale high severity fire.

Motor vehicle and recreational off-road vehicle use would continue to occur on routes designated on the Umatilla National Forest motor vehicle use map ([MVUM](#)). Erosion and sedimentation from roads would continue as roads are utilized and maintained according to their respective maintenance level. Continued deferred maintenance on the majority of system roads would be the primary management-related source of accelerated erosion. As a surrogate for water yield, current ECA values for all subwatersheds are low compared to threshold values.

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Natural disturbance events such as fires and floods could affect stream temperature and sediment regimes over time if these events cause large-scale changes to vegetation or stream channel morphology. Smoot and Gleason (2021) found that forest fires have widespread and persistent effects on snow hydrology in the Pacific Northwest by reducing snow-water storage and resulting in earlier snow disappearance. They reported that high severity burned forests increase snowmelt rates for at least 10 years following fire.

This leads to:

- Increased immediate risk of degraded water quality from erosion and sedimentation,
- decreased snow-water storage,
- earlier melt because of high severity fire,
- decreasing health of downstream water quality and habitats,
- decreased stream volume and increased temperature in summer months,
- lower flow volume,
- and reduction in overstory shade.

Environmental Consequences of Alternative A

Direct and Indirect Effects

Hydrologic Function

The existing road system would not change in Alternative A (no new system roads are proposed, the project would not decommission any NFS roads), and temporary road construction would be located and managed such that there would be no effect to the drainage network. Road maintenance would occur on up to 102 miles of NFS and non-system roads used by timber sales and could include blading, ditch relief culvert cleanout, spot rock and ditch cleanout, as needed (see Transportation Specialist Analysis, incorporated by record). Sedimentation from ditch cleanout would be short term (less than one year). Closed roads would be left in a self-maintaining condition after completion of the project.

Alternative A would require the development of 10.6 miles of temporary roads to access vegetation treatment units within seven subwatersheds. Road density in the subwatersheds would increase slightly under Alternative A, because of temporary road construction, but remain in their respective risk category. There would be no increase in roads in riparian conservation areas or number of stream crossings. Planned road maintenance would improve drainage from road surfaces and reduce sediment post-treatment therefore, there would be no direct or indirect effects to hydrologic function in the analysis area.

Water Temperature

Harvest activities can initiate pronounced temperature changes by the removal of forest vegetation and reducing shade density along channels (Beschta et al 1987).

Prescribed burning and hazard tree falling in riparian areas also have the potential to reduce existing vegetation. Danger trees would be felled, but not removed, in riparian areas. They would have negligible effects on shade density.

Alternative A would not adversely affect water temperature because harvest, thinning and burning would not measurably remove the shade component along any stream channel. Because there would be no

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change to shade, there would be no direct or indirect adverse effect to beneficial uses and no effect on the 303(d) impairment³ status of streams.

Sediment

Harvest and Fuels Treatments

Harvest, thinning and prescribed burning would produce lower short- and long-term sedimentation rates than a higher severity wildfire based on Water Erosion Prediction Project (WEPP) model runs and assumed background levels. In addition, the longer-term indirect benefit of treatments would be to reduce the severity of future wildfires commensurate with changes to desired vegetation/fuels condition (see Silviculture and Fuels Section), which would result in lower erosion and sedimentation rates. This effect is expected to last for 15 to 20 years as fuels reaccumulate over time and fire behavior increases. Soil condition would continue to meet Forest Plan criteria. Vegetation treatments may temporarily (1 day to 1 week) bring water quality degradation from sedimentation but would have long-term benefits. The structural density and fuels conditions brought about by desired forest composition would maintain hillslope sedimentation within natural ranges (described in the Purpose and Need and Fire and Fuels and Silviculture Analyses). PACFISH (1995) reported the effectiveness of RHCAs in influencing sediment delivery from non-channelized flow was highly variable. They concluded that the interim riparian habitat widths were adequate to protect streams from non-channelized sediment inputs and risk of sediment entering stream channels when design features are implemented were low.

Roads

Approximately 10.6 miles of temporary road construction is proposed in Alternative A in the seven subwatersheds. Temporary roads include 64 segments ranging from 0.03 to 0.7 miles long. Temporary roads would occur on existing disturbed areas such as old roads and new construction would occur on stable terrain - although road surface stability is influenced by the amount and class of vehicle. All temporary roads would be restored to production, per the Forest Plan. There would be log-haul on approximately seven noncontiguous miles of unpaved roads within RHCAs.

Log haul on unpaved roads are more likely to increase suspended sediment in streams than those outside of RHCAs. Roads inside RHCAs and with culvert problems are the most likely sediment contributors to surface waters currently. Increased road surface sedimentation from log haul is temporary; when traffic conditions return to normal the sediment would correspondingly decline (Table 21).

Sediment modeling of 56 stream crossings on unpaved haul routes shows a potential 90-95% reduction in road-related sediment from existing condition when maintenance occurs for harvest traffic (see Project Design Criteria [PDC] table for road ID and location).

Design features related to timing of activities and installation of physical erosion measures would further minimize the risk of erosion in the short term. Road maintenance and reconstruction followed by closing/stabilizing 35.6 miles of closed (maintenance level 1) roads (see Transportation Analysis) and obliteration of new temporary roads would directly reduce road-related sediment during the longer term.

³ * [Impaired Waters under Clean Water Act Section 303\(d\)](#)

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Design features such as halting log-haul during wet conditions, adding spot surfacing, and blading ditches only where needed, would further mitigate the adverse effects of wet weather or winter haul.

Table 21. Comparison of sedimentation from haul routes at stream crossings (tons/year)

Subwatershed	Number of Stream Crossings	Existing Condition	Maintenance Scenario 1*	Maintenance Scenario 2*
North Fork Wenaha River	8	73	5.8	1.9
North Fork Walla Walla River	39	26	2.1	1.2
Middle Mill Creek	4	0.1	0.4	0.2
Wolf Fork	4	0.4	1.3	0.2
South Fork Touchet River	1	0.04	0.2	0.05
Total	56	100	9.9	3.5

*Scenario 1 - Surface blading to remove ruts and restore outsloping/insloping surface drainage, ditches are not bladed and there is the same road length contributing runoff to culvert crossings as existing condition

Scenario 2 - Surface blading with no ditch blading, and relief drainage every 200 ft (or < 200 ft if currently less); FSH 7709.56 Chapter 40 provides design specifications ([Forest Service Handbook](#))

Water Yield

All temporary roads would occur in upland areas, above the point on the landscape in which snowmelt or rainfall runoff enters a defined channel and road density would remain in low-risk category for all subwatersheds. There would be no new road crossings that would extend the stream network farther into upland areas. As a result, there would be no measurable increase in streamflow at the subwatershed scale. Therefore, there would be no direct or indirect effect to water yield or peak flows from these actions under this alternative.

Cumulative Effects Common to Both Alternatives

Motor vehicle and recreational off road vehicle use would continue to occur on routes designated on the Umatilla National Forest per the Motor Vehicle Use Map ([MVUM](#)). Erosion and sedimentation from roads would continue as roads/trails are used and maintained according to their respective maintenance level. Continued deferred maintenance of most system roads would be the primary management related sources of accelerated erosion.

The Recreation section describes the various forms of recreational activities that occur within the project area. The MVUM shows NFS roads and trails that are designated for motor vehicle use, in addition to types of vehicles and seasonal use restrictions. Motorized uses are administered via the MVUM, including unauthorized use and resource damage. Effects related to roads are described above.

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Large-scale changes to vegetation, ground cover, or stream channel morphology from fires, floods, or other natural events could affect stream temperature and sediment regimes over time. Natural recovery of Tiger, Webb, and China Creek channel morphology would occur gradually over decades or longer, as large wood accumulates and facilitates retention of the bedload and sediment needed to build functional floodplains and associated riparian-wetland areas.

Cumulative Effects Analyses:

Effects of past harvest and road building, proposed harvest, and activity fuels treatments on water yield and peak flows were analyzed with the ECA Model (Ager and Clifton 2005).

The combined effects of past, current, and proposed actions would result in ECA percentage increases that exceed the 15% threshold identified in the National Marine Fisheries Service biological opinion for PACFISH for the Middle Mill Creek subwatershed (Graph 4). McCammon (1993) describes the relative risk to watershed function...He assigned risk to watersheds from changes in cover and evapotranspiration in the form of an ECA as follows: low (< 15%), moderate (15 – 30%) and high (> 30%). When RHCAs are buffered and treatments spread out over several years, the ECA would not exceed the 20% level at which effects to water yield, peak flows, or timing of peak flows, have been reported in various studies (Stednick 1996, Scherer 2001, Grant et al 2008).

Based on the assumptions of implementation and ECA modeling, and the literature cited:

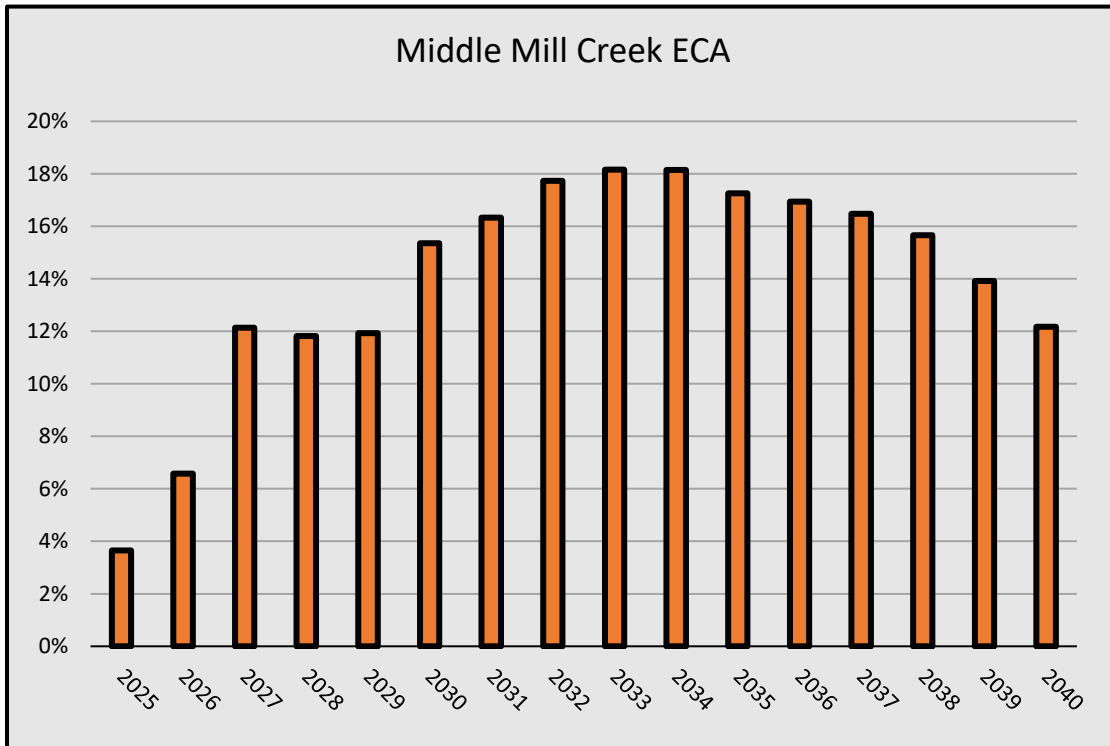
- The proposed thinning and fuels treatments would not have a measurable effect to hydrologic functions (capture, storage, and release of water) in the any of the subwatersheds when combined with past actions
- The temporary addition of about 16 acres of temporary road would add a negligible amount to overall ECA.
- When RHCAs are buffered, and treatments are spread out over several years
 - No adverse changes to channel condition from silvicultural treatments are predicted because water yield and peak flow would not be affected,
 - Morphological stream channel changes which could affect stream temperature would not occur,
 - Stream channel morphology and streambank stability would not measurably change from the existing condition,
 - Maintenance of RHCA buffers and implementation of thinning guidelines would improve forest health by retaining effective shade.

Therefore, ECA would remain below threshold values (15%-20%) and there would be no long term negative cumulative effects to effective shade or stream temperature from this project.

Managing landscape with planned treatments toward the range of variation is intended to result in a more resilient composition, structure, density, and fuel loading. A natural range of variation from the watershed processes of precipitation capture, storage and runoff, and associated hillslope, along with channel processes of erosion and deposition are also expected to represent the natural range of variability for those processes.

Road construction has reduced shade along some stream segments and may have an effect on the current water temperature in those areas. Implementing RHCA buffers and eliminating new disturbances would allow vegetation to grow to maturity, offering more effective shade along perennial streams.

Graph 4. Middle Mill Creek Subwatershed Equivalent Clearcut Area (ECA)



Therefore, there would be no long-term negative cumulative effects to current levels of effective shade or stream temperature from this alternative. There are no planned reasonably foreseeable actions that would measurably change the structure of shade-producing vegetation. Natural events, such as wildfire and debris flows could alter the structure and composition of shade-producing vegetation.

Alternative A and Alternative B necessitate road maintenance. The proper maintenance of roads and culverts would reduce sedimentation risks of the existing road system; and storage or decommissioning of roads, skid trails, landings and non-system roads would reduce the amount of sedimentation available for transport to streams. Resurfacing roads would have a net beneficial effect to water quality. Therefore, there would be no long-term adverse cumulative effects to sedimentation from Alternative A or Alternative B.

Hillslope erosion from high severity wildfire could increase sedimentation substantively during the initial rainfall immediately following a wildfire. Vegetation treatments are expected to reduce the severity and extent of landscape fire, and future fires would be expected to burn with lower severity, which would have a beneficial long-term effect on hillslope sedimentation.

The WEPP Cloud model was used to compare pre- and post-treatment wildfire burn severity on water and sediment yields for the major drainages of the project area. Table 22 compares changes to soil burn severity, water yield and sediment yield. Modeling indicates that substantial reductions in both fire severity and soil burn severity (Graph 5) could be achieved as a result of proposed treatments.

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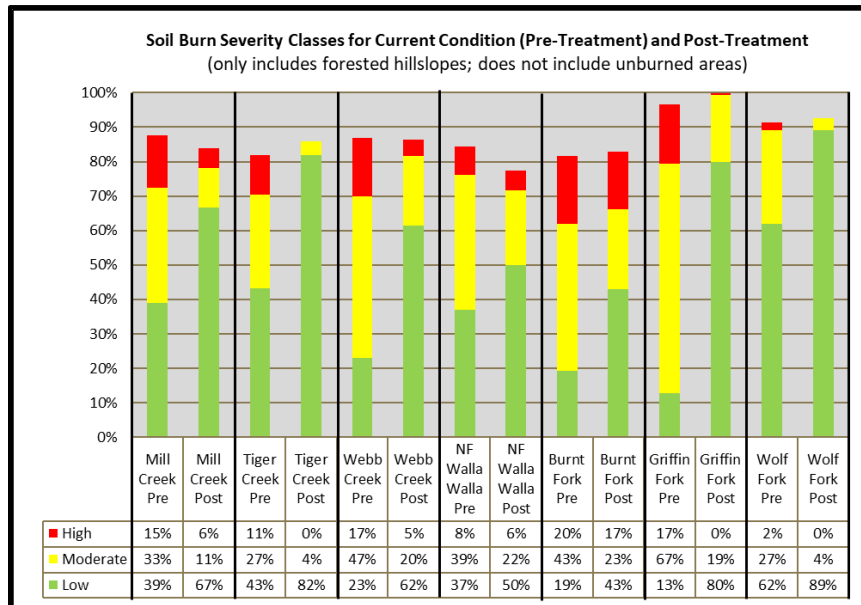
Table 22. Relative changes to average annual water and sediment yields as a result of modeled wildfire soil burn severity before and after treatments.

Modeled Watershed	Area Acres	Wildfire M-H SBS		Water Yield (ac-ft/yr)				Sediment Yield (tons/yr)		
		Pre-trt	Post-trt	Unburn	Pre-trt	Post-trt	Difference*	Pre-trt	Post-trt	Difference
Mill Ck Municipal	21000	49%	17%	45900	61980	59700	35%	24000	8300	-290%
Tiger Creek	4400	39%	4%	6200	9870	9640	60%	8400	860	-980%
Webb Creek	1300	64%	25%	1600	2680	2755	67%	1800	840	-215%
NF Walla Walla	4600	47%	27%	9410	12625	12400	34%	5100	3500	-145%
Burnt Fork	3500	63%	40%	6660	9400	9400	41%	8500	6100	-140%
Griffin Fork	1500	84%	20%	2750	4130	3900	50%	3500	550	-635%
Wolf Fork	1100	30%	4%	2270	2980	2270	31%	460	75	-610%

M-H- Moderate to High Soil Burn Severity; trt- treatment, Ck-Creek, NF-North Fork, Water yield in acres-feet per year (ac-ft/yr), Sediment yield in tons per year.

* Difference is compared to the unburned condition; Effects to water yield are similar for both wildfire scenarios due to reductions to vegetation densities as a result of mortality due to fire and fuel reduction treatments

Graph 5. Comparison of high and moderate soil burn severity from pre- and post-vegetation treatments showing reductions in high and moderate soil burn severity.



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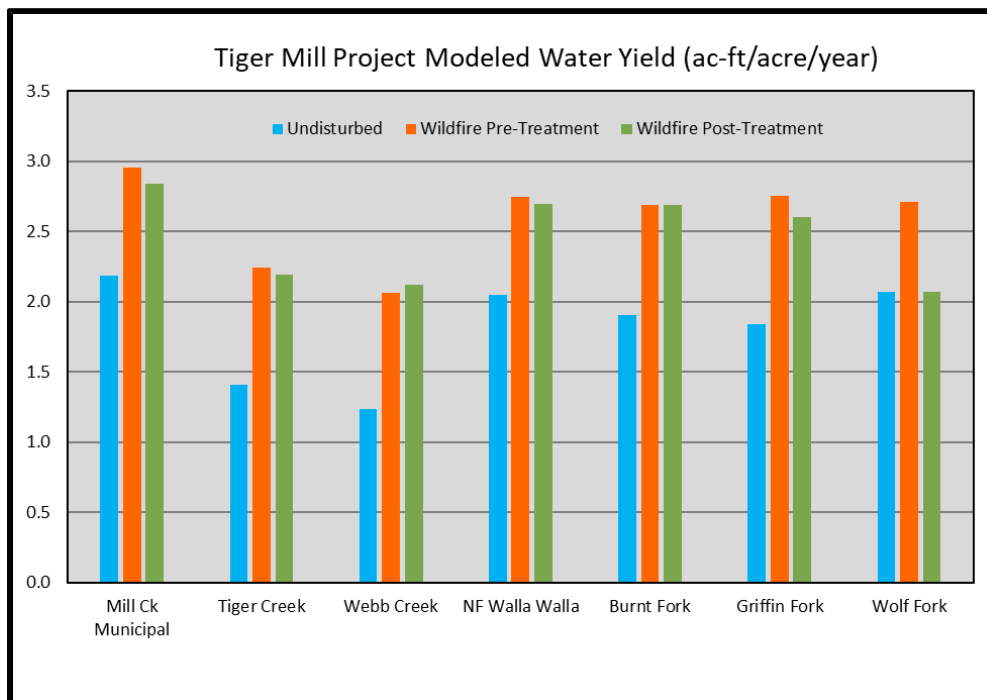


Table 23. Water Erosion Prediction Project (WEPP) FuME results for potential post-fire hillslope and background sediment delivery

Precipitation Zone (Average)	Fire Regime*	Mean Return Interval (year)	Year Zero Sedimentation (tons/square mile)	Average Hillslope Sedimentation (tons/square mile/year)
46"	1, 3	20, 55	6330	77
52"	1, 3, 4	20, 55, 140	9606	134
57"	3, 4	55, 140	11712	115

*Forested Fire Regimes: FR1 = 7%; FR3 = 46%; FR4 = 21% of the project area

Graph 6. Water Erosion Prediction Project (WEPP) Cloud modeled results of average annual water yield from undisturbed landscape and pre- and post-treatment wildfire.



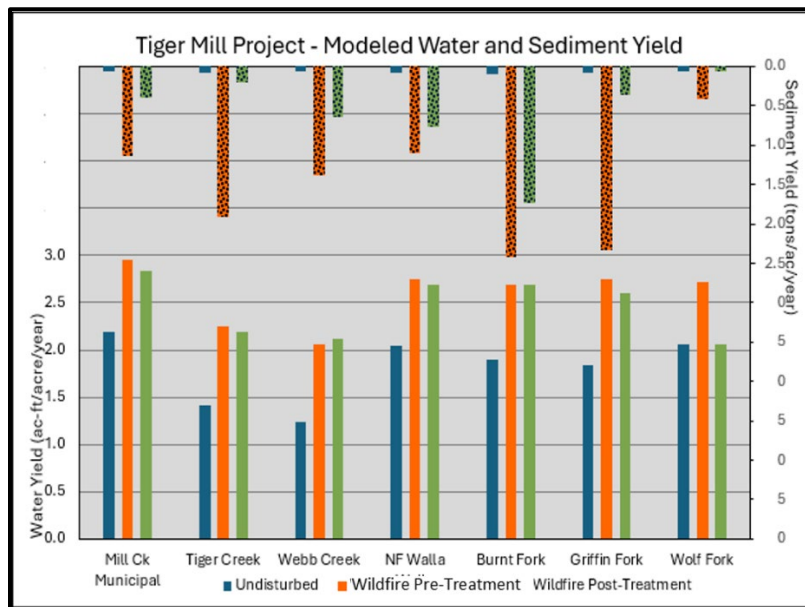
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Fire Mapping and Analysis System (FlamMap) model runs assume that the landscape all burns at the same time and that treatments are implemented concurrently and that the WEPP output displays average annual water and sediment yield based on these assumptions. Recent fire occurrences in the northern Blue Mountains indicate that high severity, large-scale wildfire is a reasonable scenario. Because vegetation treatments would occur in a non-synchronous manner across the landscape and be implemented over the course of 10 to 15 years or longer, the increase in post-treatment water yield is expected to be less than the modeled amounts shown on an annual basis. Graph 6 displays average annual water yield under undisturbed conditions, after wildfire burning under current fuel loads and after wildfire burning after proposed treatments are implemented.

The main factor that determines the effects of burning on runoff and erosion is the amount of disturbance to the forest floor organic material (duff layer) that protects the underlying mineral soil. When this duff layer is highly altered, erosion and runoff can be greatly increased (Robichaud et al 2010). Proposed vegetation treatments following PDCs would be implemented to maintain soil productivity and reductions in hillslope and channel sedimentation of 140 - 980% compared to higher severity wildfire are reasonable expectations and support the purpose and need to protect water quality for municipal supply and aquatic life uses, as illustrated in Graph 6, which shows both water and sediment yield on annual per acre basis for modeled drainages.

Graph 7. Water Erosion Prediction Project (WEPP) Cloud modeled results of comparing relative water yield and sedimentation from pre- and post-treatment wildfire, normalized on a per acre basis.



WEPP Fuel Management Erosion Analysis (FuME) was used to model hillslope sediment yields of proposed treatments on a 60% hillslope for lower elevation more frequent fire regime to higher elevation longer term fire regime in the year of disturbance. WEPP FuME does not consider PDCs designed to protect soil productivity and ground cover, and for this analysis is only used to illustrate the overall effectiveness of treatments to reduce the short- and long-term effects of high severity wildfire. Potential hillslope sedimentation during the first runoff producing events immediately post-fire could be up to two orders of magnitude higher than current average modeled background rate, when ash and surface soils are mobilized during high intensity, short duration storms that often occur during fire season.

Environmental Consequences of Alternative B

Direct, Indirect and Cumulative Effects

Summary: Alternative B proposes 4,877 acres of commercial thinning, and 6,991 acres of non-commercial thinning. This constitutes an approximate 26% reduction in soil disturbing commercial activities. Construction of 4.8 miles of temporary roads is proposed under the Alternative B, a reduction in temporary roads of approximately 55% as compared to Alternative A. Treatment areas and temporary road locations under Alternative B would be in the same locations as Alternative A, therefore, the direct, indirect, and cumulative effects of this alternative would be less than Alternative A and further analysis would be redundant.

Implementation of the Alternative B would not cause additional, measurable changes to the direct, indirect, or cumulative effects to the resource measures for hydrologic resources. As required by the Clean Water Act and Forest Plan, Best Management Practices that apply to this project are found in the PDC Table (Appendix A).

Effects Conclusion

The proposed treatments would meet the project purpose and needs, and design features would be implemented to maintain or improve hydrologic function (including wetland and floodplain function), RHCA condition, water quality, and water yield.

Existing roads, landings and skid trails increase the risk of sedimentation to streams. Proper post-harvest closure of system roads and decommissioning of non-system roads would reduce this risk for the future. A brief sediment pulse would occur from ground-disturbing activities such as road maintenance and closure, and this would quickly be flushed through the system in the following winter/spring runoff with no long-term adverse effects. Stream shade levels would not be affected by the proposed activities and stream temperatures would likely remain consistent with past temperatures, although climate change scenarios predict increasing stream temperatures. Likewise, no adverse effects to stream morphology are anticipated in the analysis area. Future wildfire risk would decline as forest fuels are removed. Forest treatments would reduce the risk of future wildfire extent and severity from high to low, the negligible short-term increase in erosion associated with the proposed activities would be offset by the reduced risk of fire and associated reduction in hillslope and channel erosion risk which often occur as a result of large-scale, high-severity fire.

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Fisheries

Summary

The purpose of this section is to disclose potential effects to fish, other aquatic species, and their habitats from implementing either Alternative A or the Alternative B. Fisheries biologists made multiple site visits to the project area during the 2023 and 2024 field seasons to conduct stream surveys, assess habitat suitability and assess potential effects to species addressed in this document. The quantity and quality of fisheries habitat and the effects of proposed activities was assessed using the following: district records, field reviews and stream surveys, aerial imagery, data in Geographic Information System (GIS), Tiger-Mill Soils Effects and Hydrology Specialist Analyses, publications, scientific papers, and information from other specialist reports. Effects to fisheries were assessed based on effects to the indicators below that may contribute to effects on fisheries and aquatic invertebrates.

The Tiger-Mill EA incorporates by reference the Hydrology Specialist Analysis and Fisheries Biological Evaluation (BE). These are included in the project record and include a more complete description of effects of road maintenance and prescribed fire actions.

Effects Analyzed in Detail

Effect 1: Proposed road treatments could affect Regional Forester Sensitive Species (RSS), Management Indicator Species (MIS) and Endangered Species Act (ESA) listed fish species and their habitat.

Effect 2: Proposed water withdrawals for pump use could affect Regionally Sensitive Species, Management Indicator Species, and Endangered Species Act listed fish species and their habitat.

Resource Indicators and Measures

Table 24. Resource condition indicators and measures for assessing effects.

Effect	Indicator or Measure	Threshold for Significance	Source
Impacts to RSS, MIS, and ESA listed species*	Number and location of road/stream crossings and miles of road maintenance in Riparian Habitat Conservation Areas.	Trend a species towards federal listing; a reduction in Forest-wide viability; or an effect to ESA species or their Designated Critical Habitat (DCH) resulting in uplisting.	Forest Service Manual 2670; National Forest Management Act, Umatilla N.F. LRMP as amended by PACFISH; and the Endangered Species Act.
Impacts to RSS, MIS, and ESA listed species*	Number of pump water withdrawal sites	Habitat reduction leading to reduced Forest-wide viability, or determination of ESA effects leading to a change in listing status	Forest Service Manual 2670; National Forest Management Act, Umatilla N.F. LRMP as amended by PACFISH; and the Endangered Species Act.

*RSS (Regional Forester Sensitive Species; MIS (Management Indicator Species; ESA (Endangered Species Act Listed Fish); LRMP- Land and Resource Management Plan

Spatial and Temporal Context for Effects Analysis

The scale of analysis for effects to fisheries varies by species.

- Regionally Sensitive Species (RSS) are analyzed at the project scale to ensure that actions do not contribute to a loss of viability or cause a significant trend toward listing under the ESA.
- NFMA viability compliance for Management Indicator Species (MIS) is determined at the forest scale as influenced by project level modifications to primary habitat features.
- Endangered Species Act (ESA) effects analysis is completed at the action area scale to evaluate effects to species and their Designated Critical Habitat.

Time frames considered for direct, indirect, and cumulative effects to fisheries are short-term (from project commencement to 10 years), and long-term (post Commercial Silvicultural activities up to 25 years during Prescribed Fire activities). These temporal scales account for the reasonably foreseeable duration of effects and short- and long-term timeframes. Short-term duration considers the influence on habitat features from commercial vegetation and effects from project activities, such as road maintenance. Long-term temporal scales include the impact of prescribed fire activities on specific aquatic species.

Scale of analysis for fish, other aquatic species, and their habitats in the Tiger-Mill project area utilizes the Hydrology Effects Analysis scale. The project area analysis area boundary is the 12th field HUC (Hydrologic Unit) boundaries described in Hydrology Effects Analysis. In addition, the action area analysis boundary includes haul routes outside of the project activity areas. The action area includes timber haul until haul reaches paved roads, or is not discernable from current use, or is distant from ESA fish and DCH. These locations are the Mill Creek bridge on the 65 Road, the 64 Road where pavement begins near the junction of the 64-650 spur near the Ski Bluewood area, and at the analysis area boundary on Forest Road 6511/Government Mountain Road.

Potentially Affected Environment

The affected environment includes all areas within the project where proposed actions, such as commercial and non-commercial thinning, prescribed burning, and road maintenance and construction, overlap riparian habitat and streams for management indicator species (MIS), Regionally Sensitive Species or ESA listed species and their designated critical habitats (DCH). Specific habitat features are described in riparian management objectives, and habitat indicators are described in the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service publications “Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale” (USDC NMFS 1996) and “The Framework to assist in making ESA determinations...at the bull trout subpopulation watershed scale” (USDI FWS 1998). Habitat indicators are used to describe the environmental baseline for ESA listed species and is commonly known as the NMFS Matrix of Pathways and Indicators (NMFS MPI). The NMFS MPI identifies indicators to analyze for the following pathways: (1) water quality, (2) habitat access, (3) habitat elements, (4) channel condition and dynamics, (5) flow and hydrology and, (6) watershed condition.

Effects to habitat indicators are summarized below. The Tiger-Mill Fisheries Biological Assessment (BA), available in the project record, provides a full description of potential effects to each pathway and its habitat indicators.

Management Indicator Species

MIS for the Umatilla National Forest include Inland Columbia Basin Redband trout and Middle Columbia River Steelhead. These species have suitable habitat and are known or presumed to occur within the Tiger-Mill project area.

Effects to habitat for these two MIS species are assessed at the Forest scale in the context of long-term viability. The project area contains considerable high quality instream habitat (see BE for a complete description of instream and riparian habitat conditions). Water quality is within or below standards described by the Clean Water Act for these species except a few times a year when spawning temperature for bull trout exceeds 12°C (53.6°F) (Hydrology Specialist Analysis).

Regional Sensitive Species

Numerous sensitive species are known to occur or have potentially suitable habitat and are presumed present within the Tiger-Mill project area. Effects to these species are assessed at the project scale but also in the context of each species range-wide trends and potential for federal listing as threatened or endangered. Some of the species are considered relatively common and secure locally with frequent observations and considerable suitable habitat within the project area and elsewhere on the Forest. Other species, specifically invertebrates such as snails are more cryptic, less well documented, and are more difficult to assess in terms of habitat suitability. Overall, Regional Sensitive Species rely on cool, clean water and complex instream habitat, similar to that of ESA listed species. See Tiger-Mill Fisheries Biological Evaluation in the project record.

ESA Listed Species

Middle Columbia River Steelhead and Columbia River Bull Trout and their Designated Critical Habitat are found in the Tiger-Mill project area. In addition, the analysis area includes two road segments that would be used for log-haul that extend beyond the project area. Effects of log-haul may extend to the Mill Creek bridge on the 65 road along the lower mile of the 65 road, and on the 64 road approximately one mile upstream of the paved section of road ending at the Ski Bluewood entrance. These two sections of road are gravel surface, and the 65 road would receive specific road maintenance within the Riparian Habitat Conservation Area (RHCA) boundary (see Project Design Criteria [PDC] WTR-5). Additional information is available in the Tiger-Mill Fisheries BE.

Consideration of No Action: What would happen if we take no action?

Habitat indicators for MIS redband trout and steelhead, RSS and ESA listed bull trout and steelhead would remain unchanged in the short term if no action were taken. High quality riparian and instream habitat would remain abundant. The area would remain at elevated risk for other disturbances. For example, an uncharacteristic wildfire could result in a loss of riparian habitat, increase in stream sediment, and increase in stream temperature that could be detrimental to fish and their habitat.

Additional high impact road maintenance at several road/stream crossings and road segments at locations along the ridgeline 64 and 65 road system would not occur. Maintenance at these sites is predicted to reduce road-related sediment from existing conditions by 90-95% (see Hydrology Effects Analysis and PDC WTR-6).

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Direct and Indirect Effects of No Action

Effects of no action in the project area will result in no change for habitat conditions for MIS redband trout and steelhead, RSS and ESA listed bull trout and steelhead in the short term. Current high-quality riparian and instream habitat would remain abundant. In the long term, current high-quality riparian and instream habitat would be at elevated risk for other disturbances such as uncharacteristic wildfire that could result in a loss of riparian habitat, increase in stream sediment and increase in stream temperature that could be detrimental to fish and their habitat.

Direct and Indirect Effects of Alternative A and Alternative B

Alternative A and Alternative B both include the same level of activity of road maintenance on the same number of road/stream crossings, high impact road maintenance at several locations, and use of pumps to withdraw water to control prescribed fire. A complete description of effects of road maintenance, thinning treatments, and prescribed fire actions is available in the project record and can be found in the Hydrology Effects Analysis and Fisheries BE. Effects to MIS, RSS and ESA species and habitat are summarized below.

Both action alternatives would be consistent with Forest Plan direction regarding native fish populations. None of the potential effects of timber, fire/fuels management and road activities under either alternative would be expected to delay progress towards PACFISH Riparian Management Objectives. The Tiger-Mill project is consistent with LRMP and PACFISH requirements for fisheries resources. These effects are discussed in detail in the Fisheries Specialist Analysis and Biological Evaluation.

Road Maintenance

Road maintenance has the potential to increase stream sedimentation. However, effects of sedimentation are minimized, due to:

- Location of most road maintenance would be conducted on the ridgetop road system where most of the road system is located outside Category IV RHCAs, thus greatly reducing the probability of sediment transport to fish bearing and perennial streams,
- PDCs were developed and designed to reduce, minimize and/or eliminate sediment transport,
- Site specific road maintenance PDCs on the lower segment of the 65 road and associated two existing helicopter landings were developed and designed to reduce, minimize and/or eliminate sediment transport from road and landing maintenance in the Category I RHCA.

PDCs reduce but do not eliminate the potential for indirect negative effects to DCH due to a pulse of sediment the first winter following road maintenance and during periods of higher log haul traffic crossing the 65 Mill Creek bridge. There are likely to be adverse effects to DCH. Any effect to MIS or RSS species would be insignificant and would not change or lead to a loss of viability or lead to a federal ESA listing.

Water Pump Withdrawals

Water pump withdrawals to control the spread of prescribed fires are proposed for each prescribed fire season. Pump run times would average two hours per 24-hour period and one to two water withdrawal locations per sub-watershed may be needed.

PDCs specific to the Tiger-Mill project have been developed along with NMFS 2022 guidelines and can be found in Appendix A.

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If prescribed fire is implemented in the spring, stream flows should still be elevated due to snowmelt runoff and in the range of their lowest temperatures. In the fall, from late September until mid-November, streams cool with dropping night temperatures and increased flow in response to precipitation and reduced transpiration. Fisheries or wildlife biologists would be present in the fall to designate locations to avoid bull trout and effects to spawning activity.

PDCs and NMFS guidelines reduce but do not eliminate the potential to affect feeding behavior, and possibly entrainment, of ESA listed fish species. Due to the potential for direct effects to individual juvenile fish, water pump withdrawals may- and are likely to- adversely affect, ESA listed bull trout and steelhead. Any effect to MIS or RSS species would impact a small number of individuals and would not change or lead to a loss of viability or lead to a federal ESA listing.

Cumulative Effects

The Hydrology Specialists Analysis summarizes cumulative effects as “there will be no long term negative cumulative effects to effective shade or stream temperature from this project”. In addition, “stream channel morphology and streambank stability would not be altered”. A beneficial effect, the reduction in both fire severity and soil burn severity, and long-term reduction in sediment from road maintenance could be achieved as a result of proposed treatments (as described in the Hydrology Analysis).

The direct effect associated with water withdrawals would be limited to the days or weeks of use during prescribed fire implementation. Due to the finite time frame, there is no overlap in time or space from this activity and no cumulative effect. In summary, there are no new negative cumulative effects from the Tiger-Mill project from either alternative to fish or aquatic habitat.

Effects determination to MIS

All Tiger-Mill project components are consistent with direction in the Umatilla National Forest Land and Resource Management Plan, as amended by PACFISH. The limited actions proposed in RHCAs does not pose a risk to the long-term viability of MIS species and the Tiger-Mill project is consistent with the Forest Plan (See BE).

Effects determination to Threatened, Endangered, and Regionally Sensitive Species

The Biological Evaluation concluded that the Tiger-Mill project “may affect and is likely to adversely affect” federally threatened Bull Trout and Steelhead and their Designated Critical Habitat found in the Tiger-Mill project area.

The project may impact the following Region 6 Sensitive species, but is not likely to contribute to a trend towards federal listing or cause a loss of viability:

- Redband Trout, Margined Sculpin, Pacific Lamprey

Determinations of effects made in the biological evaluation do not differ by alternative. The full Fisheries and Aquatics Biological Evaluation and the Biological Assessment is available for rationale of the determination in the Tiger-Mill project record.

Effects Conclusion

In summary, direct and indirect effects of the proposed action to fish, other aquatic species, and their habitats may affect some sensitive species but is not likely to contribute toward federal listing or cause a

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loss of viability. The project 'may affect and is likely to adversely affect' ESA listed Bull Trout and Steelhead, and their habitats. Further information on how design criteria is being used to mitigate effects can be found in the Biological Evaluation and Biological Assessment. Reduction in both fire severity and soil burn severity along with reduction in sediment from road maintenance would positively affect fisheries and their habitats in the long-term. This project would be consistent with the forest plan and all other federal and state laws regarding fisheries and habitats.



Photo 5. Bull trout

Botany

Summary

The Botany section of the Environmental Assessment summarizes and incorporates by reference the Tiger-Mill Botany Specialist Analysis. It includes a discussion of resource indicators and measures, effects to botany resources and sensitive species, potential effects by alternatives. There are documented sensitive species in the project area. Proposed actions, including thinning and prescribed fire, could affect sensitive botanical species. Since impacts to sensitive species are possible, an analysis of the significance of adverse effects to the populations, habitats, and species viability was prepared in the form of a Biological Evaluation, per the Forest Service Manual, and is available in the project record. Project Design Criteria protecting individual populations of sensitive species as well as suitable habitat for such species should reduce, but not eliminate, the chances of negative direct, indirect, and cumulative effects to sensitive plant populations and habitats. Implementation of either Alternative A or Alternative B may impact sensitive species or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

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There are no documented botanical species listed as Threatened, Endangered, Proposed, or Candidate under the Endangered Species Act (ESA), nor habitat for such species in the project area. Implementation of the Alternative A or Alternative B would have no effect to botanical ESA-listed, Proposed, or Candidate species.

Effects Analyzed in Detail

Effect 1: Proposed actions, including commercial and non-commercial thinning, and prescribed fire, could affect the viability of sensitive botanical species.

Resource Indicators and Measures

Table 25. Resource condition indicators and measures for assessing effects.

Effect	Indicator or Measure	Threshold for Significance	Source
Special status species response to proposed activities	Special status species (number of species, populations, individuals affected) (Quantitative) and effects determination (Qualitative)	Anticipated level of risk for disturbance of biological functions, injury, or mortality of individuals.	Forest Service Manual 2670

Spatial and Temporal Context for Effects Analysis

This analysis is confined to the project planning area. Direct effects occur immediately and shortly after implementation of project activities. Long term effects occur more than five years after implementation of all activities.

The temporal boundaries for analyzing the cumulative effects begin at the time European people first came to the area. The time frame for cumulative effects into the future is approximately 30 years from the time the project begins. All the activities would have been completed, and habitat conditions and hydrologic processes would have stabilized. See Botany BE page 10.

Potentially Affected Environment

The affected environment includes all areas within the project where proposed actions overlap suitable habitat for Region Six-designated sensitive species, including federally listed, proposed, and candidate species. See Botany BE page 13.

Federally Listed, Proposed, and Candidates for Federal Listing

There are no federally listed, proposed or candidate plant species, or suitable habitat, in the project area. See Botany BE page 13.

Sensitive Species

There are twelve documented sensitive plants within the project area. Table 26 lists the number of populations and individuals, when available, for each of the twelve sensitive species known to occur in the Tiger-Mill project area. In addition to documented sensitive species, there is also suitable habitat for 105 sensitive species in the project area. For a list of all sensitive species with potential habitat in the project area, see the Botany Biological Evaluation. See Botany BE page 13-15.

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Table 26. Documented Region Six sensitive plants

Species	Number of Known Populations in Project Area	Number of Individuals in the Project Area	Location Relative to Proposed Activities
Sierra onion (<i>Allium campanulatum</i>)	1	2	1 population within NCT-hand unit
Oregon bolandra (<i>Bolandra oregana</i>)	1	No population data available	Vague record in Mill Creek Watershed vicinity
Mountain moonwort (<i>Botrychium montanum</i>)	1	1	Located outside of all project activity units
Snake River daisy (<i>Erigeron disparipilus</i>)	2	117	Several populations located adjacent to thinning units; one population located inside prescribed fire unit
Cordilleran sedge (<i>Carex cordillerana</i>)	3	31	Mill Creek Watershed on municipal property within prescribed fire unit
Midget quillwort (<i>Isoetes minima</i>)	1	321	One population partially overlapping a thinning unit
Smith's melic (<i>Melica smithii</i>)	1	Unknown	One population documented in the Mill Creek Watershed on municipal property within prescribed fire unit
Blue Mountain penstemon (<i>Penstemon pennellianus</i>)	7	795	Several populations located adjacent to thinning units, and within thinning and prescribed fire units
Many flowered phlox (<i>Phlox multiflora</i>)	4	1,000+	Several populations located adjacent to and within thinning and prescribed fire units (Known populations occur in a state where the species does not have sensitive status.)
Yeti phlox (<i>Phlox solivaga</i>)	1	500	Single population located within prescribed fire units
Mountain buttercup (<i>Ranunculus populago</i>)	3	1060	Populations located along haul routes, within, and adjacent to thinning units
Dwarf snow willow (<i>Salix nivalis</i>)	1	Unknown	Vague location information

Consideration of No Action: What would happen if we take no action?

Without action, no new activities would be implemented in the project planning area. Previously approved ongoing activities such as wildfire suppression and containment, firewood cutting, recreation, and routine road maintenance would occur. Sensitive plant populations would likely continue to persist in the project area, facing the same threats they do today if no action were taken. These threats include competition with invasive species, changes in hydrology, road maintenance activities, recreation (including off-road

vehicle use, trail maintenance and effects from trail users), collection, predation, and succession. See Botany Specialist Analysis page 11.

Direct and Indirect Effects of Alternative A

Federally Listed, Proposed, and Candidates for Federal Listing

Since there is no potential habitat within the project area for any federally listed, proposed or candidate species, implementation of Alternative A would have “no effect” to any federally listed, proposed, or candidate plant species. See Botany BE page 16.

Sensitive Species

While sensitive species do occur in proposed thinning and fuels reduction units, most direct and indirect effects would be avoided with Project Design Criteria. These measures would protect populations from the direct effects, including ground disturbance from thinning and fuels reduction operations, as well as indirect effects, including changes in microsite conditions due to overstory removal. See Appendix A: Project Design Criteria, and the Botany Effects Analysis for details on the measures incorporated for the protection of sensitive species.

Despite these measures, some direct and indirect effects may still occur. Landscape-scale burning may result in short-term negative impacts to sensitive species. These effects may be direct, though the loss of above-ground vegetation, or mortality of individuals, or could occur indirectly, with the potential for fire to reduce reproduction during the season of the burn. Populations exposed to landscape burning are expected to recover from this short-term disturbance without a decline in the overall population or species viability. While survey efforts targeting the highest likelihood habitat for sensitive species will be conducted prior to project implementation, undiscovered sensitive plant populations may be missed, and would be the most vulnerable to detrimental impacts. Since special habitats most likely to support sensitive species are protected through Project Design Criteria, and the highest likelihood habitats will be surveyed for sensitive species, the relative risk is low to species that may be present.

Therefore, implementation of Alternative A may impact sensitive species or habitat but would not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species. See Botany BE page 16-19.

Direct and Indirect Effects of Alternative B

Federally Listed, Proposed, and Candidates for Federal Listing

There is no potential habitat within the project area for any federally listed, proposed or candidate species, thus implementation of Alternative B, like Alternative A, would have “no effect” to any federally listed, proposed, or candidate plant species. See Botany BE page 20.

Sensitive Species

Since the proposed activities under Alternative B are very similar to Alternative A, the effects to sensitive plant habitats are essentially the same. Constructing fewer temporary roads and excluding commercial harvest in Mill Creek Watershed Inventoried Roadless Area (IRA) reduces potential effects to sensitive plant habitat since fewer acres would be disturbed. Additionally, Riparian Habitat Conservation Areas would see less disturbance without the non-commercial thinning treatments that are proposed in

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Alternative A. Habitat for sensitive species associated with large, old trees would be better protected under the Alternative B, though no such species have been documented within the project area.

Although fewer acres of forest would be potentially affected, the overall call for sensitive plants is still the same, since the relative risk remains low for negative impacts to sensitive species, as described in the Environmental Effects of Alternative A section, above.

Activities proposed under the Alternative B “may impact individuals or habitat but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species”. See Botany BE page 20.

Cumulative Effects of Alternatives A and B

It is highly likely that historical activities, particularly grazing, and timber harvest, road construction, and fire suppression activities have destroyed populations, and altered habitats for sensitive plants.

Since 1990, protection and management of sensitive species and their habitats in the form of project design features, avoidance, or other mitigations have been included in nearly all projects. This is in accordance with Umatilla National Forest planning documents and Forest Service policy set forth in FSM 2670. These policies have, and would continue to, reduce the potential of cumulative effects to sensitive plant populations and supporting habitats. For the foreseeable future, this project would likely be the only landscape-scale project implemented in the area.

The cumulative impacts from the forest wide invasive treatment, prescribed fires, and trail and road maintenance are negligible and will not contribute toward federal listing of sensitive plants. See Botany BE page 16-19; 20.

Effects Conclusions

Federally Listed, Proposed, and Candidates for Federal Listing

Since there is no potential habitat within the project area for any federally listed, proposed or candidate species in the project area, implementation of either Alternative would have “no effect” to any federally listed, proposed, or candidate plant species. See Botany BE page 21.

Sensitive Species

Project design criteria for both Alternatives should reduce the chances of negative direct, indirect, and cumulative effects to sensitive plant populations and habitats. It is still possible that some populations and habitat may be inadvertently impacted, but these effects carry a low risk due to survey efforts and protection of suitable habitat. Therefore, the call for sensitive plants for implementation of this project is “May impact individuals or populations but should not contribute a trend towards federal listing”. See Botany BE page 21.



Photo 6. Blue Mountain Penstemon

Wildlife

Summary

The Tiger-Mill Environmental Assessment incorporates by reference the Tiger-Mill Wildlife Specialist Analysis, which is summarized in this section. Detailed analysis was conducted for potential effects to Federally Threatened and Endangered species, Regional Sensitive Species, and Umatilla National Forest management indicator species (MIS). Additional assessments were conducted for compliance with the forest plan and other relevant policy and law. These include Regional Forester Amendment (Eastside Screens) standards for late old forest structure connectivity, dead wood and green tree retention, and protections for American goshawk and the Migratory Bird Treaty Act. Additional information regarding MIS, sensitive species, and effects determinations can be found in the Tiger-Mill Wildlife Report and Tiger-Mill Biological Evaluation, which are available in the project record.

Effects Analyzed in Detail

Effect 1: Proposed vegetation treatments could impact regionally sensitive wildlife species and their habitat. This component of the analysis can be found in the Tiger-Mill Wildlife Biological Evaluation.

Effect 2: Proposed vegetation treatments may impact habitat suitability for management indicator species (Rocky Mountain elk, Pacific marten, pileated woodpecker, American three-toed woodpecker).

Resource Indicators and Measures

Table 27. Resource condition indicators and measures for assessing effects.

Effect	Indicator or Measure	Threshold for Significance	Source
Impacts to Regional Sensitive Species	Number of species, populations, individuals and/or acres of habitat affected.	Trend a species towards federal listing.	Forest Service Manual 2670, Endangered Species Act.
Effects to habitat for Management Indicator Species	Acres / percent of forest-wide habitat affected for marten and woodpeckers. Old forest and dead wood levels. Habitat Effectiveness Index and Security for elk.	Habitat reduction leading to reduced Forest-wide viability.	National Forest Management Act, Umatilla N.F. Land and Resource Management Plan

Spatial and Temporal Context for Effects Analysis

The scale of analysis for effects to wildlife varies by species.

- Elk habitat is assessed by forest plan management area.
- NFMA viability compliance for management indicator species is determined at the forest scale as influenced by project level modifications to primary habitat features including live trees, snags, and down wood.
- Old Forest distribution is assessed primarily at the project scale with additional consideration for connectivity to adjacent old forest beyond the project.

Time frames considered for direct, indirect, and cumulative effects to wildlife are short-term (within 5 years), mid-term (5-20 years) and long-term (more than 20 years). These temporal scales account for the reasonably foreseeable duration of effects and the timeframes during which vegetation influenced habitat features may respond and impact specific wildlife species. Primary examples include grass, forb, shrub and conifer succession and related dead wood decay processes.

Potentially Affected Environment

The affected environment includes all areas within the project where proposed actions such as commercial and non-commercial thinning, prescribed burning, and road construction overlap potentially suitable habitat for management indicator species (MIS) and Regional Forester sensitive species. The specific habitat features assessed vary by species and include canopy cover, road densities, old forest distribution and connectivity, and snags/down wood. See Tiger-Mill Wildlife Analysis for more detail.

Management Indicator Species

MIS for the Umatilla National Forest include Rocky Mountain Elk, Pacific marten, pileated woodpecker, American three-toed woodpecker, and primary cavity excavators. All of which have suitable habitat and are known to occur within the Tiger-Mill project area. The amount of Forest-wide reproductive (source) habitat for these species is periodically calculated using current vegetation data. This allows assessment of habitat trends and provides baseline existing conditions used in determining individual project impacts in relation to forest-wide habitat. This habitat assessment was updated in 2022 and showed stable to increasing Forest-wide trends in available habitat for these species. This trend is consistent with an analysis of long-term viability conducted during forest planning efforts (Wales 2011).

Regional Sensitive Species

Numerous sensitive species are known to occur or have potentially suitable habitat and are presumed present within the Tiger-Mill project area. Effects to these species are assessed at the project scale but also in the context of each species range-wide trends and potential for federal listing as threatened or endangered. Some of the species are considered relatively common and secure locally with frequent observations and considerable suitable habitat within the project area and elsewhere on the Forest. Other species, specifically invertebrates such as snails and bumblebees are more cryptic, less well documented, and are more difficult to assess in terms of habitat suitability. Overall, those species that prefer dense closed forest conditions have seen increased habitat suitability within the project area over the last century because of fire suppression. Other species who favor open forest conditions, deciduous vegetation and floral resources have seen those habitat features decline in the absence of fire and other disturbance. See Tiger-Mill Wildlife Biological Evaluation in project record.

Consideration of No Action: What would happen if we take no action?

Elk

Habitat measures for elk would remain unchanged in the short term if no action were taken. Cover would remain abundant while forage abundance and distribution would remain below optimal. The area would remain at elevated risk for other disturbances such as fire that could result in loss of cover at a scale and intensity that could be detrimental to elk in the mid-term. There would be no change to elk security in the short term as motorized routes would remain unchanged.

Pacific Marten, Pileated & Northern Three-toed Woodpecker

Absent the Tiger-Mill proposed actions, there would be no direct effect to habitat for these MIS species. Foraging and nesting/denning trees and snags would remain standing in the short term while eventually falling and adding to down wood levels which are also important for both woodpeckers and marten. In the short term, live and dead tree densities would remain at current levels across the 37,800-acre project area. The area would be expected to provide sufficient habitat for pileated woodpecker, three-toed

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woodpecker, and marten reproduction although various disturbance factors would influence the amount, distribution, and duration of suitable habitat.

Snags and Down Wood for Primary Cavity Excavators

Habitat for primary cavity excavators would remain well distributed in high abundance resulting in continued viability for this group. Ongoing insect outbreaks would continue to generate varying degrees of mortality across a range of tree species and sizes. This would increase snag abundance but also prevent those trees from developing into larger size classes which may limit future availability of large snags for nesting and down wood for foraging or denning. High tree density and fuel loading may result in large scale high severity wildfire which would alter habitat across the project area and beyond. These events could result in direct mortality to individuals and loss of reproductive habitat. Post fire snag density would increase considerably in the short term which could benefit woodpeckers. A “snag gap” would likely develop in the longer term after the fire killed trees have fallen but new stands of trees have not yet developed into suitable sizes for recruitment as medium to large snags. This could result in long term negative effects to cavity excavators and other dead wood dependent species.

Direct and Indirect Effects of Alternative A and Alternative B

The effects of the proposed action that were identified for analysis due to the potential for significant effects to this resource are:

Effects to Management Indicator Species Viability

Elk

Alternative A and Alternative B both include tree harvest which directly reduce cover ratios in the relevant management areas. Some cover stands would be thinned and reclassified as forage areas due to increased space and sunlight and corresponding increases in herbaceous plants and woody shrubs available to elk. In this case the treatments and increase in forage results in indirect short to mid-term beneficial improvement to Habitat Effectiveness Index (HEI) values for management areas. Table 28 below shows Alternative A would result in satisfactory cover, total cover, and HEI values that continue to exceed forest plan standards.

Because Alternative B proposes fewer acres of commercial harvest than Alternative A it would retain somewhat more cover, less forage, and comparable HEI values to Alternative A so the Alternative B would also meet Forest Plan standards for elk.

Prescribed fire is proposed in 43% of the post-harvest suitable elk cover across the four management areas with elk cover standards. Fuel/silvicultural prescribed fire would be applied when seasonal and climatic conditions result in a mosaic of low to moderate intensity fire that produces a patchwork of fuel consumption and mortality patterns. Stands could transition from cover to forage if low or moderate severity fire reduce stand canopy closure below 40%, however this is expected to occur infrequently and at small scales during project implementation. Since management areas would exceed cover standards after commercial thinning there is a comfortable margin for moderate fire related cover reductions. The prescribed fire treatments are proposed to occur in carefully managed burn units of limited size over the course of 25 years. This implementation schedule moderates the possible fire effects to elk cover and allows for monitoring and adaptive management to ensure retention of high-quality elk habitat consistent with Forest Plan standards.

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Neither alternative would change open road density resulting in no measurable change to elk security. However, reduction in stand densities adjacent to open roads has the potential to alter the quality of security and hiding cover. Under both alternatives, the combination of remaining cover and varied topography within one-half mile of open roads is expected to result in continued use of these areas by elk even though they don't technically qualify as security habitat. Some closed roads would be opened temporarily for harvest and fuels activities but would remain closed to the public.

Table 28 Elk Cover Standards and Effects Comparison

Scale	Measure	Forest Plan Standard	Current Condition		Alternative A	
			Acres	%	Acres	%
Management Area C3* Winter Range (6,976 acres)	Satisfactory Cover	10%	3,099	44	2,840	41
	Total Cover	30%	3,570	51	3,281	47
	HEI	70	91		92	
Management Area C4 (North) (3,717 acres)	Satisfactory Cover	15%	2,118	57	1,396	38
	Total Cover	30%	2,742	74	1,909	51
	HEI	60	85		87	
Management Area C4 (South) (6,119 acres)	Satisfactory Cover	15%	3,570	58	1,770	29
	Total Cover	30%	4,561	75	2,330	38
	HEI	60	74		78	
Management Area E2 (7,829 acres)	Satisfactory Cover	10%	3,199	41	2,699	34
	Total Cover	30%	4,437	57	3,911	50
	HEI	45	77		78	
Management Area F4 (3,830 acres)	Satisfactory Cover	15%	2,064	54	897	23
	Total Cover	30%	2,813	73	1,257	33
	HEI	60	63		66	

Cumulative Effects to Elk

The Tiger Creek prescribed fire proposes approximately 150 acres of burning in the C4 portion of the Tiger-Mill elk analysis area. This could cause a very minor cumulative reduction in elk cover in the project area, but the result would still be far above forest plan standards.



Photo 7. Wildlife Snag

Pacific Marten, Pileated & Northern Three-toed Woodpecker

Alternative A

Commercial thinning is proposed in pileated habitat, three-toed habitat, and marten habitat (Table 29). Direct effects from commercial harvest include reductions in tree density, live canopy, snag and down wood, and variable transition from multi- to single stratum. If any of these three species are present in thinning units, they may be displaced during treatment activities. Highly mobile species such as pileated and three toed woodpeckers would likely still forage in these areas and some suitable nesting trees and snags are expected to be retained in thinned stands. Marten are less likely to use commercially thinned stands for foraging or reproduction due to increased energy demands and risk of predation, particularly where canopy closures are reduced below 50% (Bull et al. 2005).

Prescribed burning could occur in an additional 6,800 acres of pileated habitat, 7,350 acres of three-toed habitat, and 6,100 acres of marten habitat. Some snags and down wood used for nesting and foraging would be consumed by fire, but replacement dead wood features would also be created by fire injury in the short to mid-term. Prescribed fire severity is predicted to result in less than 25% tree mortality across most of the burn area. Pileated woodpeckers appear to tolerate considerable tree mortality and canopy closure reductions when abundant large snags and down wood remain (Bull et al. 2007). Habitat suitability for both pileated and three-toed woodpeckers is expected to remain unchanged following prescribed fire. Marten may be more sensitive to canopy reductions and habitat patch size however the predicted fire effects would generally maintain sufficient canopy and dead wood at levels suitable for marten.

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Indirectly, trees that remain after thinning are expected to accelerate growth and be less susceptible to mortality. In the long term this could provide future levels of large trees, snags, and down wood which would provide valuable habitat features that seldom develop in existing high density, stem exclusion condition found throughout much of the project area. In the short to mid-term, the scale and severity of wildfire is expected to be reduced which would be a moderately beneficial effect. Additionally, considerable levels of dead wood are present outside of treatment boundaries providing abundant foraging and nesting/denning habitat for this suite of management indicator species.

Project design criteria are in place to ensure forest plan standards are met.

Alternative B

Overall, direct effects to the three MIS species are similar to those of Alternative A but with no removal of trees greater than or equal to 21 inches diameter breast height and fewer acres of commercial thinning in suitable habitat. Compared to Alternative A, Alternative B would retain higher numbers of suitable nesting trees in the short to mid-term and in the long term would provide more large snags and down wood for foraging and reproduction. Prescribed fire acres would remain unchanged. Reduced scale and intensity of commercial thinning results in approximately 30% less direct short term negative effects to habitat for pileated woodpecker, three-toed woodpecker, and marten.

Table 29. Alternative A – Manager Indicator Species (MIS) Habitat

Species forest wide habitat estimate(acres)	Potential habitat in project area (acres)	Commercial harvest in habitat	Project area habitat affected	Forest wide habitat affected
Pileated woodpecker 331,000	14,800	2,970	20%	0.9%
Northern three-toed woodpecker 363,000	18,400	3,950	21%	1%
American marten 203,000	13,400	2,650	20%	1.3%

Cumulative Effects to Pileated woodpecker, Three-toed woodpecker, and American marten

In some instances, firewood collection could affect snag habitat for MIS species by reducing foraging, resting or denning sites. However, this activity is relatively limited in the project area and not expected to result in meaningful cumulative effects to project actions. The previously analyzed Tiger Creek prescribed fire could affect approximately 150 acres of suitable MIS habitat within the Tiger-Mill Project analysis area. Minimal reductions in live tree and dead wood levels in the burn area could cause very minor cumulative increases to the moderate, mid-term, adverse effects of the proposed action.

Pileated woodpecker, three-toed woodpecker and American Marten habitat would remain in moderate quantity and relatively well distributed across the project area and beyond. The project area is expected to retain habitat sufficient to support two reproducing pair of marten, twelve pairs of pileated woodpeckers and twenty or more pairs of three-toed woodpecker. The project would reduce suitability on approximately 1% of Forest-wide habitat for pileated woodpecker, three-toed woodpecker, and marten. This does not

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pose a risk to the long-term viability of these species and the Tiger-Mill project is consistent with the Forest Plan.

Snags and Down Wood for Primary Cavity Excavators

Alternative A

Commercial thinning would directly reduce snag density in the short to mid-term. However, this activity is proposed on only 18% of the project area and less than 5% of the broader snag analysis area of the three sub-watersheds. The largest snags would be retained if they are not hazardous (danger trees). Overall, there would be no meaningful departures from reference conditions or reduction in primary cavity excavator distribution or abundance.

Prescribed burning may consume snags but in general there is likely to be moderate, short to mid-term, beneficial, net increase in standing dead trees. Primary cavity excavators would benefit from higher proportions of mid to high densities of large snags. Similarly, down wood would be consumed but there would be some unburned residual components. Any remaining snags and live trees can continue to be recruited as down wood for MIS species in the mid to long-term.

Down wood would be reduced within 300 feet of potential control lines (totaling 1,727 acres). However, design criteria would retain dead wood amounts to continue benefiting dependent species and meet the Forest Plan standards.

Indirectly, thinned stands would have fewer trees to recruit as snags. Remaining green trees grow larger and have less density related mortality. In the long term, they are more likely to be recruited as large snags and down wood. The snag analysis area is expected to provide dead wood continually and meet the 50% tolerance level for most species at scales similar to the reference condition.

Alternative B

1,745 fewer acres would be commercially thinned in this alternative- They would retain higher tree density, have no direct effects to snags, and provide more available habitat for primary cavity excavators. The 4,877 acres of commercial harvest would retain trees greater than or equal 21 inches diameter breast height which indirectly increases future availability of large snags on these acres. Prescribed fire and primary control line fuel reductions are the same as Alternative A. Effects are similar to Alternative A but with approximately 30% less direct adverse snag reductions in commercial thinning stands and an overall moderate, short to mid-term beneficial increase in snags resulting from prescribed fire.

Cumulative Effects to Snags and Down Wood for Primary Cavity Excavators

Personal firewood collection and road management can contribute to snag reductions, however the overall effects on snag dependent wildlife would be limited to roadways and this activity is relatively limited in the project area and not expected to result in meaningful effects cumulative to project actions.

Current and future down wood levels are expected to be of sufficient quantity and quality to meet the needs of primary cavity excavators and dead wood dependent wildlife in the project area. Forest Plan Standards for dead wood habitat and Forest-wide viability of primary cavity excavators are met through a combination of considerable dead wood levels in untreated areas in addition to project design criteria for retaining snags, down wood, and green tree replacements.

Effects Conclusion

Alternative A and Alternative B were determined to have no effect to any Federally Threatened, Endangered, or Proposed terrestrial wildlife. Both alternatives would have direct and indirect effects on Regional Forester Sensitive and Management Indicator Species. Project implementation may cause minor, short-term detrimental impacts to species but is not likely to trend species toward federal listing or loss of species viability. The proposed actions of both Alternative A and B include project design criteria that comply with Forest Plan standards for: late old structure wildlife connectivity, snag/down wood retention, green tree replacement, and protections for American goshawk. The project incorporates guidance consistent with Executive Order 13186 and the Migratory Bird Treaty act. Project implementation would provide long-term direct and indirect benefits, improving habitat conditions and reducing the risk of stand-replacing wildfires. The Tiger-Mill Environmental Analysis incorporates by reference the Tiger-Mill Wildlife Analysis, Tiger-Mill Wildlife Report, Tiger-Mill Wildlife Biological Evaluation, and Tiger-Mill Project Design Criteria. These documents are available and accessible in the project record.



Photo 8. Rocky Mountain Tailed Frog

Recreation

Summary

This section includes a summary of the Tiger-Mill Recreation Specialist Analysis, which is incorporated by reference. A discussion of indicators and measures, effects of both alternatives, and recreation resources is covered below. Overall, the effects of the Alternative A and Alternative B would have little impact to recreation. The majority of actions would take place in areas closed to the public. There may be areas of construction or road closure and some Forest Service Roads would have noticeable short-term effects. Overall, visual and recreational objectives would benefit or be improved in the long-term.

Effects Analyzed in Detail

Effect 1: Proposed activities could affect recreation values.

Effect 2: Proposed activities could affect Visual Quality Objectives (VQO).

Effect 3: Proposed activities could affect Undeveloped Lands characteristics.

Resource Indicators and Measures

Table 30. Resource condition indicators and measures for assessing effects.

Resource Indicator	Measure	Source
Recreational Experience	Recreation Opportunity Spectrum (ROS)	Umatilla National Forest Land & Resource Management Plan
Visuals and Scenery	Adherence to prescribed Visual Quality Objectives (VQOs)	Umatilla Land & Resource Management Plan; National Forest Landscape Management
Undeveloped Lands	Acres of undeveloped lands	There is no forest, regional, or national direction or guidance for evaluating undeveloped lands. Undeveloped lands are managed consistent with forest-wide and management area standards and guidelines designated by the Umatilla Forest Plan.

Spatial and Temporal Context for Effects Analysis

The scale of analysis for effects to recreation covers the proposed project area.

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Temporal context for direct, indirect, and cumulative effects are short-term (immediately post-project), mid-term (3-5 years post project), and long-term (5+ years post project). These temporal scales account for the reasonably foreseeable duration of effects

Potentially Affected Environment

The Tiger-Mill project area is characterized by steep, rocky drainages that feed into Mill Creek and the Walla Walla River. Developed recreation features of this landscape are primarily limited to trails on ridgetops or canyon bottoms.

The Walla Walla Municipal Watershed is closed to public entry. Aside from a limited number of strictly controlled and permitted hunts, no recreation occurs within the watershed.



Photo 9. Posted No Entry Sign Along the Watershed

Other recreation features within Tiger-Mill include:

- Indian Ridge Trail #3221, a 4.8-mile trail at the western boundary of the municipal watershed.
- Tiger Ridge Trail #3224, a 2-mile trail along the crest of a prominent ridge.
- West Tiger Creek Trail #3229, a 1-mile trail in the creek bottom west of Tiger Ridge.
- Tiger Creek Trail, a user-built trail in the creek bottom east of Tiger Ridge. This trail has a series of switchbacks that leave the drainage and climb steeply up to Forest Service Road 65. Alternatively, another user-built trail continues southeast and eventually reaches Forest Service Road 6511. Despite being user built, non-system trails, these trails are the most popular recreation destinations in Tiger-Mill. The Tiger Creek Trail was recently featured in the Walla Walla Union-Bulletin and is a point of interest for many local trail groups.

The Recreation Opportunity Spectrums (ROS) in the project area consist of:

- Roaded Natural (A3, A4)

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- Roaded Modified (A4, C3, C4, E2)
- Semi-Primitive Motorized (F4)

The project area currently meets the prescribed ROS.

The Visual Quality Objectives (VQO) in the project area consist of:

- Retention (A3 Foreground, D2, F4). The Retention VQO generally means that management activities are not evident to the casual forest visitor.
- Partial Retention (A3 Middle Ground, A4 Foreground, F2, F4). The Partial Retention VQO means that management activities may be evident but must be subordinate to the characteristic landscape.
- Modification (A4 Middle Ground, E2, F4). The Modification VQO means that management activity may dominate the landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.
- In Management Area C3 and C4, visual objectives are subordinate to management priorities for wildlife habitat.
- In Management Areas E2 and F4, rehabilitation should be provided in areas where Visual Quality Objectives have not been met.

Currently the project area meets the prescribed VQO.

The Tiger-Mill project area boundary includes 30,014 acres of undeveloped lands. These lands are defined as being greater than one acre in size, 300 feet or more from a road, and with no documented history of management. There are no forest-wide or management area standards specific to undeveloped lands in the Umatilla Forest plan. All lands, including undeveloped lands, are managed consistent with forest-wide standards and guidelines and by designated Forest Plan Management Area allocations.

Approximately 24,659 acres of the Mill Creek Municipal Watershed are classified as undeveloped lands, which represents a substantial overlap with the Inventoried Roadless Area also discussed in this analysis, see Appendix B, Map 12. The Walla Walla River Inventoried Roadless Area (IRA) lies to the south of the project area and contains 34,458 acres of undeveloped lands. There are 577 acres of proposed undeveloped lands treatments in Tiger-Mill that are contiguous with the Walla Walla IRA yet technically lie outside of it. An area between Webb Creek and the western boundary of the forest was erroneously identified as being undeveloped due to a data gap. Analysis of satellite imagery reveals that this landscape was harvested prior to coming into federal ownership. The 969 acres in this area have been removed from the total initially identified as undeveloped.

Consideration of No Action: What would happen if we took no action?

If no action were taken, the planning area would still provide a range of recreational opportunities that are primarily dispersed in nature and would continue to meet the desired conditions for the VQOs listed above. Over time, changes in the natural composition of the forest would slightly alter its overall appearance to the casual forest visitor; it is unlikely that these incremental changes would be sufficient to move an area away from meeting its desired VQO.

Hiking, dirt biking, horseback riding, mountain biking, sightseeing, snowmobiling, forest product gathering, and Wilderness access would continue to be available to the same degree that they are now. Routine administrative activities such as trail maintenance would keep trails and corridors open and cleared for

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public access. Over time, the natural evolution of the forested landscape would result in incremental changes, especially for the availability of condition-dependent forest products like mushrooms or berries that might draw visitors to one part of the forest instead of another. The possibility of a large-scale fire that would substantially alter the character of the landscape would increase if no action were taken.

Direct and Indirect Effects of Alternative A

Developed Recreation

The Tiger-Mill proposed action would result in minor to moderate, localized, direct and indirect, short term adverse effects to the recreation resource. These effects may be present as noise, smoke and dust from harvest and burning activities, which could make adjacent locations unpleasant for recreation until the activities are complete. There may also be road or area closures due to management activities, which would be an inconvenience for recreationists who are forced to modify their plans.

Effects to the recreation resource are confined to the Tiger-Mill project area and the immediately adjacent land, such as the trail system to the south of the project. It is unlikely that enough recreationists would be displaced from Tiger-Mill to warrant analyzing effects to other Forest Service lands. In the mid to long term, trail access may be improved with post-project rehabilitated road systems. Trail integrity and maintenance needs would benefit from a more fire-resilient surrounding forest.

The adverse effects to the recreation resource from Alternative A would be concentrated during the implementation period. Once obvious signs of harvest are gone, there would be few tangible adverse effects to recreationists. Some users who prefer a more wild, undisturbed setting, may prefer not to recreate in harvested areas until they have begun to fill back in with new vegetation. Beneficial effects from a post-project forest landscape may improve access and recreational conditions over a span of 5-10 years or longer.

The types of effects to the recreation resource likely to occur from Tiger-Mill are common and predictable for vegetation management projects of this size. The post-project landscape would still conform to the existing Recreation Opportunity Spectrum categories of Roaded Natural, Roaded Modified, and Semi-Primitive Motorized.

Visuals and Scenery

The Tiger-Mill proposed action would have minor to moderate direct and indirect effects to visual quality in the short term (immediately post-project) and in the mid-term (3-5 years post project). The effects would be most obvious in the immediate foreground visible from Forest Service Roads 64 and 65, as well as middleground vistas of increasingly distant slopes and ridgelines. Depending on the topography, foreground is from the viewer's position to 0.25-0.5 miles away. Middleground is generally defined as 0.25-0.5 miles to 3-5 miles from the viewer.

Negative direct effects to the scenic resource would primarily consist of visible stumps, slash piles, skid trails, exposed soil, and disturbed vegetation. While these effects may temporarily reduce the VQO below its current standard, they would generally dissipate with a few years after slash has been burned, skid trails have been restored, and new vegetation has established the affected area.

Sensitivity to visual disturbance is heavily subjective and dependent on the individual forest visitor. Through application of scenery-specific Project Design Criteria (PDC), the Tiger-Mill landscape would continue to meet current VQOs. These PDC, in the project record, include timelines for site rehabilitation, stump height guidelines, and priorities for burning slash piles.

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In management areas A3 and A4, management activities would be designed to maintain Retention and Partial Retention VQOs, meaning that management activities are either not evident to the casual forest visitor, or are evident but subordinate to the overall landscape.

Visual Quality Objectives Retention, Partial Retention, and Modification all share the component that treatments would repeat form, line, color, and texture which already occurs in the representative environment. The treatment methods proposed for Tiger-Mill would be able to meet these objectives due to their flexibility and scalability on the landscape.

Undeveloped Lands

The Tiger-Mill project area contains 30,014 acres of undeveloped lands, as described above. Although the majority of those acres are in the Mill Creek Watershed IRA, there are several other areas that do not have a history of past management. Included in those areas are 577 acres that are within the project area boundary but are contiguous with the Walla Walla IRA.

For Tiger-Mill, undeveloped lands were analyzed as polygons between 1-100 acres in size, 100-499 acres in size, 5,000 acres or greater in size, and the Mill Creek Watershed IRA, see Appendix B, Map 12. This analysis identified 31 polygons, of which 26 are between 1 and 40 acres in size. Polygons of that size are typically very dissected and scattered throughout the non-IRA portion of the project area.

Management activities that would affect undeveloped lands character are distributed throughout the project area, both within and outside the IRA. Table 31 summarizes those acreages below.

Table 31. Undeveloped Lands under Alternative A

	Within IRA	Outside IRA
Existing Undeveloped Acreage	24,659	5,354
Proposed Treatment Acreage	4,147	2,855
Post-Project Undeveloped Acreage	20,512	2,499

Of the 30,014 acres of the current undeveloped lands (Map 12, Appendix B), 7,002 acres would be treated during management activities, leaving 23,011 acres of undeveloped lands post-project. Overall, Alternative A maintains 76% of undeveloped lands in their current condition.

Project activities would eliminate some polygons of undeveloped lands. Larger polygons would be reduced in size and could be more fragmented than they are currently. In the long-term, the direct and indirect effects of thinning, especially non-commercial thinning, would largely be unnoticeable to the casual forest visitor.

The direct and indirect effects to undeveloped lands from prescribed fire are common to both alternatives. Although there may be incidental tree cutting during burn operations, fire typically reinforces the aesthetics of a wild, natural-appearing landscape. Acres that only receive prescribed fire treatments would still be considered undeveloped post-project.

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Direct and Indirect Effects of Alternative B

Developed Recreation

The majority of the changes in Alternative B fall within the Mill Creek Watershed IRA, which is closed to public entry except on rare and strictly regulated circumstances. Because of the lack of nexus between recreational use and the changes to Alternative A, it is unlikely that the effects to recreation would be measurably different in the Alternative B.

Visuals and Scenery

The Alternative B incorporates several changes that would have minor beneficial effects to the visual character of Tiger-Mill. There would be no commercial harvesting within the Mill Creek Watershed IRA, so it would be more natural looking in appearance compared to Alternative A. Alternative A's treatments mostly concentrated at the edge of the watershed, adjacent to and visible from Forest Service Roads 64 and 65. Excluding both of these treatments would keep medium or larger trees less than 21 inches intact, and keep the natural-appearing features of the landscape visible along the roads.

Additional changes in the Alternative B that would have different direct and indirect effects to the visual resource include using only existing roadbeds instead of temporary roads and limiting harvest to trees less than 21" diameter at breast height (dbh).

Alternative A included 5.83 miles of temporary road construction to facilitate harvest activities. Removing these miles from the project would maintain a slightly more natural-appearing environment, both during project implementation and for several years post-project when the temporary roads would have been naturally growing back in with vegetation or would have been intentionally rehabilitated.

Similar to the effect mentioned above regarding IRA treatments, leaving all trees greater than or equal to 21" dbh in place would still maintain the existing natural appearance of the landscape.

Undeveloped Lands

Because of the criteria involved in developing Alternative B, the effects to undeveloped lands are substantially similar to Alternative A discussed above. Due to the conversion from commercial treatments to non-commercial treatments, a slightly larger number of acres would be treated under Alternative B.

Table 32. Undeveloped Lands under the Alternative B

	Within IRA	Outside IRA
Existing Undeveloped Acreage	24,659	5,354
Proposed Treatment Acreage	4,257	2,880
Post-Project Undeveloped Acreage	20,402	2,474

Of the 30,014 acres of the current undeveloped lands, 7,137 acres would be treated during management activities, leaving 22,876 acres of undeveloped lands post-project. Overall, Alternative B maintains 76% of undeveloped lands in their current condition.

Cumulative Effects

Based on analysis, there are no past, present, or reasonably foreseeable actions that would have a cumulative effect on this resource.

Effects Conclusion

Short term effects to recreational and visual resources would be minimal outside of direct harvest and burning activities. Very little displacement to recreation is expected with either proposed action.

Taking no action would not have any direct effects to the landscape but increases the risk of a large-scale fire that could substantially alter the landscape. Over time, treated areas would resume a wild, natural-looking appearance.

Climate

Summary

This section incorporates by reference the Tiger-Mill Climate Change Effects Specialist Analysis. It considers the spatial and temporal context, resource indicators, and the effects of each alternative on climate. The proposed actions would affect forested land and associated carbon stocks and result in some greenhouse gas emissions. Alternative A and Alternative B would reduce risks of uncharacteristic fires and retain forest features better suited to climate change and contribute to more stable forest carbon stocks.

Effects Analyzed in Detail

Effect 1: Project effects on climate change and greenhouse gas emissions

Effect 2: Effects of climate change on the project – climate change vulnerability and adaptation

Resource Indicators and Measures

This analysis will use forest carbon and climate change as indicators to relate the effect of Alternative A and the Alternative B.

Spatial and Temporal Context for Effects Analysis

The analysis draws on national forest-level estimates of carbon stocks and changes in stocks from disturbances derived from Forest Service monitoring data and from carbon estimation calculation tools, including the Carbon Calculation Tool and the Forest Carbon Management Framework. These estimates are provided at the forest-level at one plot per 6,000 acres, as finer-scale estimates are not available given the resolution of the underlying data source. Incorporated in the project record is the Umatilla National Forest's 2022 carbon white paper, which provides carbon estimates for the time period of 1990-2013. We supplemented these estimates with additional carbon stock estimates available for 1990-2020, which are available via the Forest Service Carbon Dashboard.

Potentially Affected Environment

Forest carbon.

Total carbon stocks for the Umatilla National Forest were estimated to be 92.8 ± 18.9 Teragrams (Tg) as of 2020. Carbon density was estimated to be 189.1 Mg/ha (megagrams per hectare). These stocks have remained steady since 1990. Modeling between 1990 to 2011 has shown that fires and timber harvests account for the majority of carbon loss in the 21-year study period.

In addition to wildfires, insect outbreaks are likely to be the most important agents of change for both forest and non-forest vegetation on the Umatilla National Forest (Halofsky et al. 2017). Warmer and drier conditions allow insects and pathogens to spread further upslope, limit winter mortality, and may reduce the ability of vegetation to defend against insect attacks and disease (Halofsky et al. 2017). More frequent and extreme drought, driven by increasing temperatures and altered precipitation patterns, increases vegetation vulnerability to insects and wildfire. Large fires in the Pacific Northwest have generally occurred during hotter and drier periods (Reilly et al. 2020) and such periods of increased aridity are projected to become longer and more pronounced with climate change (McKenzie et al. 2004, Littell et al. 2010, Halofsky et al. 2020).

Hydrologic process would be altered by increasing temperatures and sensitive watersheds in the area would be exposed to seasonal earlier snowmelts and shifts from rain-on-snow events to increasing rain-only events. Storms would be more intense but occur less frequently, delivering heavier precipitation per event and increasing flood risk. In contrast, the earlier snowmelts combined with less summer precipitation would lead to a greater number of low flows (Halofsky et al. 2017; Clifton et al. 2018).

Consideration of No Action: What would happen if we took no action?

If the proposed activities were not to occur, carbon would not be removed and would be vulnerable to emissions associated with natural disturbances such as wildfire. (Hessburg et al. 2020; Johnston et al. 2021).

Direct and Indirect Effects of Alternative A

Project effects on climate change

Treatments would directly affect the aboveground live carbon pool, forest floor carbon, and other pools. Soil carbon (35% of total carbon) would likely be unaffected. Thinning would reduce the basal area by 58%. Primary treatments would result in initial removal of, at most, 38% of the carbon stored ($0.38 = 0.65 \times 0.58$) in the 12,438 acres receiving primary treatments. In addition, some carbon would reaccumulate through enhanced tree growth and regeneration.

The proposed action would result in a reduction of carbon stored in forests in the project area. However, the proposed action would improve the stability of the remaining carbon by promoting retention of currently underrepresented species, including ponderosa pine and western larch. They are better adapted to future climate conditions and disturbance regimes. Studies indicate treated stands generally retain more carbon than untreated stands (Hessburg et al. 2020) when affected by subsequent wildfire.

Treatment prescriptions would also emphasize retaining the largest and healthiest trees, both of which generally store a greater proportion of a stand's carbon (Mildrexler et al. 2020; Johnston et al. 2021). As described, carbon storage on the Umatilla National Forest (1990-2011) is most adversely affected by wildfire. Proactive forest management to reduce the risk of wildfire-caused carbon loss in the Western

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United States also contains opportunities to plan, implement, and maintain treatments that support fire-resilient forests. (Peeler et al. 2023).

The project area is less than 3% of the 1.4-million-acre Umatilla National Forest, with primary treatment areas amounting to 0.9% of the Umatilla Forest. As described above, treatments would at most result in a removal of, at most, 38% of carbon in primary treatment areas. The project would directly affect at most 0.3% of the total carbon stored in the Umatilla Forest based on primary treatment areas (0.9%). Carbon stocks for the Umatilla Forest in 2020 were estimated to be 92.8 Teragrams (Tg) with confidence intervals of around 20%. The maximum amount of carbon that would be removed through the primary treatments in Alternative A (0.3% of the forest's total carbon stock estimate) is much smaller than the confidence intervals for the estimate of the forest's total carbon stocks (20% of the forest's total carbon stock estimate). Furthermore, some carbon removed would be stored for long periods of time in harvested wood products. Treatments would indirectly increase the stability of remaining forest carbon stocks thereby reducing risks from wildfire and future emissions.

Climate change effects on the project area

Treatments would reduce overrepresented species, including Engelmann spruce and grand fir, and promote underrepresented species, including ponderosa pine, western larch, and lodgepole pine. This action would generally promote stands with species composition better adapted to future climate conditions as well as increases in wildfire activity associated with climate change (Halofsky et al. 2017).

Climate change intensifies the need to prepare the watershed for wildland fire and protect water quality. The hot and dry conditions during fire season that are conducive to large fires would become more frequent and prolonged with warming temperatures and shifting precipitation regimes projected for the Blue Mountains (Halofsky et al. 2017; Halofsky et al. 2020). In addition, climate change is projected to result in more intense rainstorms, more rain, less snow, and increasing risks from rain-on-snow events- all of which would contribute to adverse effects to water quality in environments affected by large high severity fires (Halofsky et al. 2017; Clifton et al. 2018). Achieving the project's purpose and need include increasing opportunities to manage the spread of wildland fire safely and effectively. It creates stands resilient to future disturbances, reduces risks associated with degraded water quality from wildfires, and supports overall efforts by the Umatilla and downstream communities to adapt to climate change.

Direct and Indirect Effects of Alternative B

Effects would be similar to Alternative A, though the slightly lower levels of treatments associated with Alternative B would result in slightly smaller initial reductions in carbon stored in the project area.

Cumulative Effects

The spatial scale for cumulative effects analysis for forest carbon is the Umatilla National Forest. We use data from the Forest Service's Carbon Dashboard ([USFS Carbon Dashboard](#)). Specifically, we consider data on disturbance effects on forest carbon for a baseline time-period of 1990-2011. This data demonstrates that disturbances during this time-period reduced forest carbon storage by nearly 4% compared to a hypothetical scenario with no disturbances; around 1% of this reduction was due to harvest. If the amount of disturbance over the next 20 years is similar to the baseline time-period (1990-2011) then we can conclude that the cumulative effects of this proposed action along with other projects and disturbances (i.e., insects and fire) would be a reduction of at most 4% of total forest carbon stored in the Umatilla National Forest compared to a hypothetical scenario with no disturbance. However, given

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effects of climate change, it is likely that wildfire and insect activity would be higher in the next couple decades compared to the baseline period and thus effects may be larger.

Effects Conclusion

Short term carbon losses would affect at most 38% of carbon stored in the treatment areas, which amounts to at most 0.3% of the total carbon stored in the Umatilla National Forest. However, Alternative A and Alternative B would reduce risks of wildfires and allow the forest and nearby communities to adapt to climate change.

Inventoried Roadless Area

Summary

The Mill Creek Watershed is an Inventoried Roadless Area (IRA) and is subject to the 2001 Roadless Area Conservation Rule (RACR), which includes, prohibitions limiting, with some exceptions, timber harvest and road construction and reconstruction within inventoried roadless areas. On October 24, 2018, the Chief of the Forest Service delegated the authority to review all activities in IRAs to the Regional Forester. The Regional Forester has reviewed the proposed activities within the Mill Creek Watershed IRA on the Umatilla National Forest and determined that the Tiger-Mill Project is consistent with RACR. Consistency information can be found in the Other Law, Regulation, and Policy Consistency section of the Tiger-Mill Environmental Assessment.

Effects Analyzed in Detail

Effect 1: Prescribed fire and thinning activities could affect Inventoried Roadless values- indicated below.

Resource Indicators and Measures

Roadless Area Characteristics: The following values or features often characterize Inventoried Roadless Areas (36 CFR 294):

- High-quality or undisturbed soil, water or air
- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land
- Primitive, semi-primitive motorized, and semi-primitive non-motorized
- Reference landscapes
- Natural-appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites

The Tiger-Mill project has been designed to maintain or improve these characteristics. The issues identified and addressed in the Tiger-Mill Environmental Assessment are directly linked to the protection and maintenance or improvement of IRA characteristics.

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Spatial and Temporal Context for Effects Analysis

The spatial context will be the size of the Mill Creek Watershed IRA (24,351 acres). Temporal extent would be through the duration and maintenance of the Tiger-Mill Project (0-25 years).

Potentially Affected Environment

The project area includes proposed treatments within the Mill Creek Watershed IRA. The area is 24,351 acres and 72% of the project area. The Umatilla National Forest and City of Walla Walla have co-managed the Mill Creek Watershed since 1918 under a unique agreement signed by the Secretary of Agriculture and the City to protect the City's municipal water supply.

There are no records indicating mechanical vegetation activities have occurred in this area other than wildfire suppression. Public access and travel into the Mill Creek Watershed is controlled and limited to an annual special elk hunt. Approximately 2,100 acres of private or non-national forest land are surrounded by the Mill Creek IRA. The City of Walla Walla owns four parcels, one of which lies along three miles of Mill Creek and contains municipal water facilities. The Walla Walla River IRA lies to the south of the project and encompasses 34,416 acres. The Wenaha-Tucannon Wilderness lies to the east of the project and encompasses 176,557 acres. These areas would not be affected by the Tiger-Mill project. No roads would be constructed within the Mill Creek Watershed IRA. The activities listed on Table 33 would increase opportunities to manage the spread of natural and prescribed fire safely and reduce negative fire effects on roadless area values such as water and air quality, vegetation, or habitats.

Consideration of No Action: What would happen if we took no action?

No action would lead to increased risk to ecosystem services and fire fighters and necessitate full fire suppression rather than lead to a fire-adapted landscape. Continued suppression and consequential exclusion would elevate the possibility of a large-scale fire that would substantially alter the characteristics of the Mill Creek IRA.

Table 33. Treatments Proposed within the Mill Creek Watershed IRA by Alternative

Treatment Type		Alternative A (Acres)	Alternative A (% of IRA)	Alternative B (Acres)	Alternative B (% of IRA)
Tree Thinning	Commercial Thin	1,175	4.8	0	0
	Cable/Cable Assist	138	.6	0	0
	Ground Based	110	.5	0	0
	Helicopter	928	3.8	0	0
	Non-Commercial Thin	3,581	14.7	4,570	18.8
	Hand Thin and Pile	3,190	13.1	4,077	16.7

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	Mastication or Grapple Pile	391	1.6	493	2.0
	Post-Commercial Thin	1,175	4.8	0	0
	Tree Thinning Total	4,756	19.5	4,570	18.8
Prescribed Fire		14,508	59.6	14,580	59.6

Direct and Indirect Effects

Direct and Indirect effects to high-quality or undisturbed soil, water, or air

There is a very real risk that large-scale disturbances events would negatively affect soil, water, and air in the Tiger-Mill Project area. The project is designed to directly and indirectly reduce those negative effects and reduce the scale and severity of future disturbance events. The Soil, Hydrology, and Air Specialist Analyses (available in the project record) disclose that there would be short-term negative but long-term beneficial effects to these resources. Each resource considers what would happen if no action were taken in the project area.

Alternative A has 248 acres more commercial thinning with ground-based equipment, so would have more direct impacts to the soil resource. These effects would impact 1.1% of the IRA. Helicopter logging does not have the same soil displacement because felling is done by hand and logs are flown off site rather than yarded over the forest floor. The soil displacement and increase in erosion has potential to increase sedimentation into streams and affect water quality. Alternative B has no direct effects from commercial thinning.

Alternative A proposes 186 acres of non-commercial thinning with Riparian Habitat Conservation Areas (RHCA) and the project has been designed to minimize the risk of increased water temperature that may be possible with thinning. Alternative B has no direct impacts from non-commercial thinning within RHCAs.

Prescribed fire may directly expose soil through the consumption of surface fuels and the construction of hand fire lines. Water quality could be impacted if soil displacement into waterways occurs. Mitigation efforts are discussed in detail in the Soil and Hydrology analyses, which are available in the project record, and respective project design criteria have been created to minimize mineral soil exposure and reduce soil displacement and sedimentation. Prescribed fire creates smoke directly impacting air quality. The impacts to air quality would be managed with adherence to Washington and Oregon Smoke Management. There is no reduction in treated acres with prescribed fire between Alternative A and B therefore the effects to soil, water and air are the same.

Direct and Indirect effects to sources of public drinking water

Wildfire influences all types of watersheds and affects water quality, affecting the provision of clean drinking water (Shakesby and Doerr, 2006). For watersheds that draw drinking water from streams, vulnerability of drinking water contamination and treatment costs can be exacerbated by increased frequency as well as magnitude of wildfire and precipitation (Goss et al., 2020; Sherson et al., 2015). Precipitation falling as rain instead of snow were found to have higher effects on turbidity levels following

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wildfires (Mast et al., 2016). The Climate Change Specialist Analysis (available in the project record) states that the climate of the project area is shifting toward more rain and less snow. Therefore, future wildfires may cause greater turbidity levels. If post-fire high turbidity levels can be successfully mitigated, drinking water treatment plants can rely on cheaper treatment methods and reduce both operational cost and the upkeep cost of maintaining more expensive membrane-based treatment facilities (Dearmont et al., 1998; Warziniack and Morgan, 2016). Moderate to high burn severity fires are more frequently found to have the strongest association to elevated turbidity levels (Caldwell et al., 2020; Rhoades et al., 2011). While there are data gaps in effects of treatment to turbidity and sediment, prescribed fire and thinning would aid managers in controlling the scale and severity of a future wildland fire event. Application of prescribed fire and thinning would reduce the risk of elevated turbidity levels. Effects to drinking water have been analyzed in the hydrology analysis and project design features decrease potential effects.

The direct effects to public drinking water are connected to the effects to soil and water from the proposed activities. Both action alternatives coordinate with the City of Walla Walla to treat within the Mill Creek Municipal Watershed and incorporate design features that reduce impacts to water quality and monitor treatment effects. Alternative A has more acres of ground disturbance leading to short term impacts to soils.

Direct and Indirect effects to diversity of plant and animal communities

The range of variation analysis shows that the vegetation of the Tiger-Mill landscape is less diverse than it was historically, likely due to the removal of natural disturbance events, such as wildfire. Habitat complexity and diversity of plant and animal species have shifted from historical reference range and are more susceptible to wildfires in their current condition. The effects to plants and animal communities were analyzed in detail and are available in the project record via the Silviculture, Botany, Wildlife, and Fisheries Analyses, and respective Biological Evaluations.

Alternative A would thin 1,175 more acres than Alternative B, and would directly move forest structure and density, species composition, and habitat diversity toward their historical range of variation.

Direct and Indirect effects to habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land

The effects to threatened, endangered, proposed, candidate, and sensitive species were analyzed in detail and are available in the project record via the Botany, Wildlife and Fisheries Analyses and Biological Evaluations. Project design criteria and avoidance tactics would mitigate adverse effects from the proposed action.

Direct and Indirect effects to primitive, semi-primitive motorized, and semi-primitive non-motorized

The effects to recreation were analyzed in detail in the Recreation Analysis and are available in the project record. Of the 24,351-acre IRA, 19,966 acres are within the closed Mill Creek Municipal Watershed where the only recreational activities permitted are the annual elk hunt. The area provides minimal recreational opportunity and is surrounded by the Wenaha-Tucannon Wilderness and Walla Walla River Inventoried Wilderness Area that provide abundant primitive, semi-primitive motorized, and semi-primitive non-motorized experiences.

Commercial thinning would have the greatest direct impact to primitive, semi-primitive motorized, and semi-primitive non-motorized character. During implementation there would be an increase in thinners within treatment units and an increase of noise from chainsaw and logging equipment operations. These

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effects would be short term during implementation, generally 1-10 years. Alternative A would commercially thin 1,032 acres outside of the Mill Creek Municipal Watershed while Alternative B has no commercial thinning within IRA.

There are no discernible differences in effect from non-commercial thinning and prescribed fire between the alternatives.

Direct and Indirect effects to reference landscapes

The proposed thinning and prescribed fire activities would decrease stand densities and shift species composition to align with their historical range of variability. This is generally consistent with the role of Research Natural Areas as areas of the landscape representative of typical plant communities undergoing natural ecosystem dynamics. Alternative A would thin 1,175 more acres than Alternative B and would move forest densities, species composition, and structure further toward historical range of variation.

Direct and Indirect effects to natural-appearing landscapes with high scenic quality

The effects to visual quality were analyzed in detail in the Recreation Analysis and available in the project record. Project design criteria for Tiger-Mill Project minimize impacts to scenic quality.

Direct and Indirect effects to traditional cultural properties and sacred sites

The Heritage Specialist for Tiger-Mill Project has determined that traditional cultural properties and sacred sites within the area of potential effect would not be negatively affected by either alternative per the project design criteria and would adhere to laws, regulations, and policy. In regards to traditional gathering areas within the project area, treatment may have a positive long term effect through the enhancement of traditional food resources such as huckleberry, cous, and others. The Heritage Analysis is available in the project record.

Cumulative Effects

There are no records of actions taken in the proposed area prior to 1918. There are no present actions or reasonably foreseeable future actions that are expected to add to the effects of this project to the inventoried roadless area. Therefore, no cumulative effects to IRA characteristics are foreseen or anticipated by this undertaking.

Effects Conclusion

The Tiger-Mill project was designed to modify forest vegetation to address the goals of forest health and resiliency, improve both safety and management options in the event of a wildfire, and reduce risk of uncharacteristic wildfire in a landscape that has been altered by human intervention and policies. IRAs have been affected by full suppression policies. The current landscape has moved away from historical reference conditions and subsequent fire adaptation. The proposed alternatives would have short term adverse effects to soil, water, air, and recreation but would provide long term benefits and better adhere to all IRA characteristics and values.

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National Forest Management Act (NFMA) – Land Management Plan Consistency

The pertinent specialist has reviewed the proposed action including design features and provided supporting analysis and rationale for determinations in the project record. The following are specialist determinations regarding project consistency with applicable land management plan direction, standards, and guidelines:

Botany: Consistent	Range: N/A
Cultural/Heritage: Consistent	Recreation: Consistent
Transportation: Consistent	Scenic Resources: Consistent
Fisheries: Consistent	Soils: Consistent
Fuels: Consistent	Silviculture: Consistent
Hydrology: Consistent	Special Management Areas: Consistent
Lands and Special Uses: N/A	Wildlife: Consistent
Minerals: N/A	Other Resources: N/A

Lands and Special Uses do not apply to this project because project activities would not affect any active permits within the project area. Minerals do not apply to this project because there is no active mineral extraction, and any reserved mineral rights would not be impeded by proposed activities. Range does not apply to this project because there are no allotments within the project area.

Supporting Project Documentation

Reference 2. Applicable project files documentation to support analysis.

Documentation Type	Location
Tiger-Mill Air Specialist Analysis	See Pinyon Public
Tiger-Mill Botany Specialist Analysis	See Pinyon Public
Tiger-Mill Cultural/Heritage Specialist Analysis	See Pinyon Public
Tiger-Mill Transportation Specialist Analysis	See Pinyon Public
Tiger-Mill Fisheries Specialist Analysis	See Pinyon Public
Tiger-Mill Fire and Fuels Specialist Analysis	See Pinyon Public
Tiger-Mill Hydrology Specialist Analysis	See Pinyon Public
Tiger-Mill Recreation Specialist Analysis	See Pinyon Public
Tiger-Mill Soil Specialist Analysis	See Pinyon Public
Tiger-Mill Silviculture Specialist Analysis	See Pinyon Public
Tiger-Mill Wildlife Specialist Analysis	See Pinyon Public

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Documentation Type	Location
Tiger-Mill Wildlife Specialist Report	See Pinyon Public

Other Law, Regulation, and Policy Consistency

Endangered Species Act

Threatened, Endangered, Proposed, and Candidate Species and Critical Habitat

The pertinent specialists reviewed the proposed action and made the following determinations for threatened, endangered and/or proposed species:

Botany

There are no botanical species listed as Threatened, Endangered, Proposed or Candidate under the Endangered Species Act (Public Law 93-205) in the project area. Implementation of the Tiger-Mill project would have no effect on listed botanical species.

Fisheries

The Biological Evaluation and Biological Assessment concluded that the Tiger-Mill project **may affect and is likely to adversely affect** federally threatened Bull Trout and Steelhead and their Designated Critical Habitat found in the Tiger-Mill project area.

The effects of any action authorized, funded, or carried out by the Forest Service on an ESA listed or proposed species and their Designated Critical Habitat (DCH) is analyzed in a Biological Evaluation ([Tiger-Mill Fisheries BE on file](#)). The potential for effects is then analyzed in a Biological Assessment (BA) prepared for Federal regulatory agencies as described in Section 7 of the ESA (Tiger-Mill BA on file and available in the project record). Upon completion of Section 7 consultation, the National Marine Fisheries Service and Fish and Wildlife Service are to provide a Biological Opinion to the Forest Service. The Forest Service will follow the terms and conditions of the Biological Opinion from the National Marine Fisheries Service and Fish and Wildlife Service and implementation will be consistent with the Biological Opinion.

Wildlife

The biological evaluation concluded that the Tiger-Mill project would have no effect to any federally threatened, endangered, or proposed terrestrial wildlife or invertebrate species due to the absence of these species and critical habitat in the project area . See Tiger-Mill Biological Evaluation for more detail.*Supporting Project Documentation*

Reference 3. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Botany Biological Evaluation	See Pinyon Public
Tiger-Mill Botany Specialist Analysis	See Pinyon Public
Tiger-Mill Fisheries Biological Evaluation	See Pinyon Public
Tiger-Mill Fisheries Specialist Analysis	See Pinyon Public
Tiger-Mill Wildlife Biological Evaluation	See Pinyon Public

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Documentation Type	Location
Tiger-Mill Wildlife Specialist Analysis	See Pinyon Public

Sensitive Species (FSM 2670)

The pertinent specialists reviewed the proposed action and made the following determinations for sensitive species:

Botany

Because sensitive botanical species are present in the project area, a biological evaluation (BE) was prepared. The significance of potential adverse effects on populations, habitat, and viability was analyzed. Habitat for sensitive botanical species would be managed to ensure that the species do not become threatened or endangered through Forest Service actions.

May Impact Individuals or Habitat, but Will Not Likely Contribute to A Trend Towards Federal Listing or Loss of Viability to the Population or Species: Sierra onion (*Allium campanulatum*), Oregon bolandra (*Bolandra oregana*), mountain moonwort (*Botrychium montanum*), Cordilleran sedge (*Carex cordillerana*), Snake River daisy (*Erigeron disparipilus*), midget quillwort (*Isoetes minima*), Smith's melic (*Melica smithii*), Blue Mountain penstemon (*Penstemon pennellianus*), many flowered phlox (*Phlox multiflora*), yeti phlox (*Phlox solivaga*), mountain buttercup (*Ranunculus populago*), and dwarf snow willow (*Salix nivalis*)

Project design criteria, BOT-1,2,3,4, and 5, implemented for the protection of sensitive species, would be assessed to ensure desired outcomes are met. Survey records and botanical inventories, including monitoring of sensitive species and habitat, would be kept.

Fish

May Impact Individuals or Habitat, but Will Not Likely Contribute to A Trend Towards Federal Listing or Loss of Viability to the Population or Species: Redband Trout, Margined Sculpin, and Pacific Lamprey. Determinations of effects made in the biological evaluation do not differ by alternative.

Project design criteria, FR- 1-8, implemented for the protection of sensitive species.

Wildlife

Because sensitive wildlife species are present in the project area, a biological evaluation (BE) was prepared. The significance of potential adverse effects on populations, habitat, and viability was analyzed. Species with no habitat or that are otherwise not expected to occur within the project were determined to have no impacts from project actions. The determination of "may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species" for species listed below was based on intensity, scale, and duration of direct and indirect effects. Individuals, breeding populations, and habitat of all sensitive species are expected to remain at levels that maintain viability. Habitat for sensitive wildlife species would be managed to ensure that the species do not become threatened or endangered through Forest Service actions. See Tiger-Mill Biological Evaluation for further discussion of project impacts.

May Impact Individuals or Habitat, but Will Not Likely Contribute to A Trend Towards Federal Listing or Loss of Viability to the Population or Species: Preble's shrew, American goshawk, Great

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gray owl, Lewis' woodpecker, White-headed woodpecker, Green-tailed towhee, Rocky Mountain tailed frog, Fringed myotis, Little brown myotis, Pallid bat, Lustrous copper, Great Basin fritillary, Morrison's bumble bee, Western bumble bee, Half-black bumble bee, Suckley cuckoo bumble bee, Fir pinwheel, Columbia Oregonian, Blue mountainsnail, Humped coin, Crater Lake tightcoil, Shiny tightcoil, Thinlip tightcoil and Umatilla megomphix

Project design criteria, WR-3-11, would be implemented for the protection of sensitive species.

Supporting Project Documentation

Reference 4. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Botany Biological Evaluation	See Pinyon Public
Tiger-Mill Botany Specialist Analysis	See Pinyon Public
Tiger-Mill Fisheries Biological Evaluation	See Pinyon Public
Tiger-Mill Fisheries Specialist Analysis	See Pinyon Public
Tiger-Mill Wildlife Biological Evaluation	See Pinyon Public
Tiger-Mill Wildlife Specialist Analysis	See Pinyon Public

Consultation with Federally Recognized Tribes

Consultation with federally recognized tribes was conducted as follows:

Walla Walla Ranger District and tribal representatives meet periodically to discuss new and ongoing concerns, partnership opportunities, and issues that may affect sacred and spiritual sites with representatives from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Nez Perce Tribes (Nimiipuu). The tribes were sent government to government letters describing the proposed action for the Tiger-Mill project. The proposed Tiger-Mill project was also presented to the CTUIR at the annual program of work meetings in the spring of 2018-2024. General concerns around first foods, traditional cultural properties, and protection of archaeological sites were discussed during these meetings.

The effects of Alternative A and Alternative B would be evaluated according to concerns raised during program of work meetings, and past statements of tribal interest that expressed concerns regarding similar projects and outlined Treaty Rights resources that could be affected by the project. Generally, these concerns have to do with potential effects on treaty rights, fish habitat and populations, water quality, and protection of archaeological sites, traditional cultural properties, and first foods resources.

Supporting Project Documentation

Reference 5. Applicable project file documentation to support analysis.

Documentation Type	Location
Scoping/NOPA letter to tribal chairs	See pinyon public
Tribal Program of Work	See project record

Special Management Areas

The pertinent specialist has reviewed Alternative A and Alternative B and made the following determinations based on special management area presence, proximity, or lack of:

The Wenaha-Tucannon Wilderness lies adjacent to the Tiger-Mill project area, separated by Forest Service Road 6400. Since no project activities are proposed within the Wilderness boundary, we do not anticipate any effects to the Wilderness resource from Tiger-Mill.

Mill Creek Watershed Inventoried Roadless Area

The Regional Forester has reviewed Alternative A and Alternative B within the Mill Creek Watershed Inventoried Roadless Area (IRA) on the Umatilla National Forest for compliance and consistency with the 2001 Roadless Area Conservation Rule (RACR). It has been determined that the Tiger-Mill Project is consistent with the 2001 Roadless Rule.

RACR §294.13 Prohibition on Road construction and road reconstruction:

Project Compliance: No road construction or reconstruction or temporary road creation is proposed within the IRA.

RACR §294.13 Prohibition on Timber Cutting, sale, or removal:

Exception situation 294.13(b)(1)(ii) The cutting, sale, or removal of generally small diameter timber is needed to maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period.

Project Compliance: The Tiger-Mill Project is designed to improve watershed health, restore the composition and structure of ecosystem components, and reduce the risk of uncharacteristic wildfire effects by managing vegetation to be more resilient to wildfire. All Potential Vegetation Groups (PVG) have high stand densities exceeding the Historical Range of Variability (HRV). All thinning in stands with large structure would be from below, within HRV ranges for density by PVG, retaining the largest and healthiest trees on the landscape. Stands with large tree structure would not be converted to an earlier successional stage to minimize fragmentation of large tree structure. Late old structures would not fall below HRV. Commercial thinning is focused within fire regimes 1-3 with limited non-commercial thinning in Fire Regime 4 adjacent to control features to aid in the implementation of prescribed fire and reduce the scale of future unplanned fire events (36 CFR 294.13(b)(1)(ii)). During the past 100 plus years of fire suppression multiple fire return intervals have been missed in Fire Regimes 1-3 in the project area. This would likely lead to uncharacteristic effects such as high severity fire and larger fires when they occur.

All the treatments where tree cutting is involved would target the smaller and less fire tolerant species. The mean diameter of the stands would be increased by treatment. Looking at six representative stands that would be treated within the IRA, the current quadratic mean diameter (QMD) range is 5.8-16.9 inches; post treatment the QMD would be 15.3-23.2 inches (36 CFR 294.13(b)(1)).

Tree cutting within the watershed has been infrequent. This is the first landscape scale vegetation treatment project including tree cutting within the watershed since its designation as a municipal watershed. While some level of maintenance would be needed moving forward, treatments have been designed to limit future entries to the extent feasible. For this reason, tree cutting within the IRA itself is expected to be infrequent (36 CFR 294.13(b)). The timber harvest is incidental to proposed prescribed

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fire activities and is needed to control wildland fire. Appropriate silvicultural prescriptions would be applied as discussed above.

IRA Characteristics Maintained or Improved:

Alternative A and Alternative B and design criteria of the project would maintain and/or improve all nine IRA characteristics (36 CFR 294.13(b)(1)). The project specifically seeks to improve:

- High-quality or undisturbed soil, water, or air
 - There is risk of large-scale disturbance events that would likely negatively affect soil, water, and air if no action were taken. The project is designed to mitigate the effects of treatments and reduce the scale and severity of future disturbance events.
- Sources of public drinking water
 - See [Inventoried Roadless Effects Analysis](#).
- Diversity of plant and animal communities
 - See [Inventoried Roadless Effects Analysis](#).

The project maintains the following characteristics through treatment design, project design criteria and adherence to laws, regulations and policy:

Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land

- Primitive, semi-primitive motorized, and semi-primitive non-motorized
- Reference landscapes
- Natural-appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites

Mill Creek Research Natural Area (RNA)

Under Alternative A and Alternative B, silvicultural prescriptions would focus on reducing the proportion of grand fir and Engelmann spruce to promote underrepresented shade-intolerant Douglas-fir, lodgepole pine, western larch, ponderosa pine, red alder, and snowberry, based on the project's Historical Range of Variability (HRV) vegetation analysis. Douglas-fir and ponderosa pine, species which represent the exemplified plant community assigned to the RNA (Forest Plan p 4-30), are below their HRV and are experiencing encroachment by grand fir and Engelmann spruce as the RNA has missed multiple fire return intervals ([NOPA](#)). Increasing light availability and growing space to underrepresented species favored for retention is intended to preserve and maintain diversity.

HRV analysis for Eastside Screens (1995) compliance has shown the multi-strata with large trees structural stage overrepresented at 47% of the project area, while the maximum proportion under HRV should be 20%, indicating a need to move multi-canopied stands to single stratum with large trees structure. Commercial timber of "generally small diameter" under the 2001 Roadless Rule would be cut and removed to restore ecosystem structure and function in and around the RNA, reducing the likelihood of human-caused environmental disruptions, including uncharacteristic wildfire exacerbated by fire exclusion and climate change. This project proposes to not cut trees greater than or equal to 21 inches within the RNA.

Supporting Project Documentation

Reference 6. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Air Specialist Analysis	See Pinyon Public
Tiger-Mill Fire and Fuels Specialist Analysis	See Pinyon Public
Tiger-Mill Silviculture Specialist Analysis	See Pinyon Public
Tiger-Mill Hydrology Specialist Analysis	See Pinyon Public
Tiger-Mill Soil Effects Specialist Analysis	See Pinyon Public
Inventoried Roadless Area Briefing	See Project Record
Inventoried Roadless Concurrence	See Project Record
Mill Creek Research Natural Area Briefing	See Project Record
Mill Creek Research Natural Area Concurrence	See Project Record

National Historic Preservation Act – Section 106 Review

The pertinent specialist has reviewed Alternative A and Alternative B and made the following determination regarding Section 106 compliance:

The National Historic Preservation Act (NHPA) is the primary cultural resource management law that governs Federal agencies. This act and the following regulation in 36 CFR 800 outline a process of identifying and evaluating historic properties within the Area of Potential Effect (APE) of a proposed undertaking as well as procedures for consultation with state and tribal governments. The Federal action referred to as an undertaking within the NHPA is general integrated vegetation management including commercial thinning, non-commercial thinning, and prescribed fire. Section 106 of the NHPA requires federal agencies to consider the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in the National Register.

The proposed undertaking occurs in Washington and Oregon. In both the 2004 Programmatic Agreement with the Oregon State Historic Preservation Officer (SHPO) and the 2020 Programmatic Agreement with the Washington State Department of Archaeology and Historic Preservation (DAHP), streamlined compliance processes with the NHPA are outlined. It targets numerous undertakings with limited potential to negatively affect cultural resources. The majority of the aquatics restoration project work covered by this analysis falls under the criteria of undertakings, which can receive NHPA clearance using these streamlined procedures. Most work conducted under the proposed project is of a nature that has very limited potential to effect cultural resources. These are exempt from case-by-case review under appendices A, B, and C of the 2004 Programmatic Agreement. Those cleared under Appendix B in that document would be inspected or monitored as required under the 2004 Programmatic Agreement.

If any previously unidentified cultural resources are located during project implementation, ground disturbing work would be halted, in the vicinity, until the resources are evaluated by the North Zone archaeologist. If the cultural resources are determined to be potentially eligible for listing on the National Register of Historic Places (NRHP), work would either be permanently halted within site boundaries, or a mitigation plan would be developed in consultation with Washington DAHP, Oregon SHPO and Tribal Historic Preservation Office staff before work continues.

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A cultural resource survey and consultation with Washington DAHP, Oregon SHPO, and Tribal Historic Preservation Offices would be completed before the decision is signed. The APE of the project area is being surveyed utilizing a modified version of the Umatilla National Forest Inventory Plan. This survey, coupled with previous survey work, will identify all reasonably expected cultural resources within the APE. Appropriate project design criteria (HR 1, 2, 3, and 4) have been implemented to ensure that no historic properties will be affected by either of the alternatives described in the proposed undertaking. In the event that previously undocumented historic properties are discovered during remaining fieldwork, treatment units will be modified to avoid these properties. Based upon the anticipated results of the 2024 survey and previous surveys in the area, a determination of No Historic Properties Affected, pursuant to 36 CFR 800 and the 2004 Programmatic Agreement between the Region 6 of the US Forest Service and Oregon SHPO as well as the 2020 Programmatic Agreement between Region 6 of the US Forest and Washington DAHP, is expected to be reached under the provision that the project design criteria outlined in Appendix A are followed.

Comments

The NHPA, as amended, directs all Federal agencies to consider the effects of their undertakings (actions, financial support, and authorizations) on properties included in or eligible for the National Register.

With adherence to design elements requiring site specific surveys prior to implementation and the SHPO consultation process outlined in the implementation checklists, proposed activities would be consistent with NHPA.

Supporting Project Documentation

Reference 7. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Cultural/Heritage Effects Analysis	See Pinyon Public

Archaeological Resources Protection Act. Public law 95-341, 42 U.S.C.

The Archaeological Resources Protection Act (ARPA) is a federal law of the United States passed in 1979 and amended in 1988. It governs the excavation of archaeological sites on federal and Native American lands in the United States, and the removal and disposition of archaeological collections from those sites.

With adherence to Project Design Criteria HR-1, 2, 3, and 4 and the SHPO consultation process outlined in the implementation checklists, Alternative A and Alternative B would be consistent with ARPA.

Survey work for the project is in progress and will be complete before a decision is signed. Survey results will be reported to complete NHPA process (Sec.106 consultation) before signing a decision.

National Register of Historic Places 36 CFR Part 60 revised 2004

The National Register of Historic Places (NRHP) is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's

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National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. No properties listed on the NRHP are located within the APE of this project, though properties that are eligible for inclusion in this list are present.

With adherence to Project Design Criteria HR-1, 2, 3, and 4 and the SHPO consultation process outlined in the implementation checklists, Alternative A and Alternative B would not affect the integrity or eligibility of these properties for inclusion on the NRHP.

Clean Air Act

The pertinent specialist has reviewed Alternative A and Alternative B and made the following determinations regarding the Clean Air Act (CAA):

Prescribed fire and their associated smoke emissions comply with the Clean Air Act. All burning operations associated with the Tiger-Mill project (from slash piles to natural broadcast burns) are to be regulated by Oregon Department of Forestry and Washington Department of Natural Resources to minimize impacts and meet criteria set forth by the CAA. Specific modeling occurs based on current meteorological factors and tonnage to be consumed, providing real time analysis in which to minimize impacts to the human environment. See Project Design Criteria FF-3 and 4.

Supporting Project Documentation

Reference 8. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Air Specialist Analysis	See Pinyon Public
Washington Smoke Management Plan	WA SMP
Oregon Smoke Management Plan	OR SMP

Safe Drinking Water Act Compliance

The pertinent specialist has reviewed Alternative A and Alternative B and made the following determination:

The Mill Creek Municipal Watershed (UNF Plan Management Area F2) was established by cooperative agreement between the City of Walla Walla and the Secretary of Agriculture in 1918 (USDA 1918) to protect the City's water supply from human-caused pollution. The Agreement acknowledges that measures necessary for the proper protection and care of the forests (including vegetation management and related infrastructure) are consistent with the objectives of the Agreement when project design criteria are implemented to protect the water supply.

The Safe Water Drinking Act (SDWA) was passed by Congress in 1974, with amendments added in 1986 and 1996, to protect our drinking water (US EPA 2004). Under the SDWA, the U. S. Environmental Protection Agency (EPA) sets the standards for drinking water quality and monitors states, local authorities, and water suppliers who enforce those standards. The EPA sets standards and regulations for many different contaminants in public drinking water, including disease-causing germs, animal wastes, chemicals, and naturally occurring substances that can contaminate drinking water.

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The City of Walla Walla relies on the Umatilla National Forest water supply for approximately 90% of its drinking water. The SDWA requires actions to protect drinking water and its sources and sets national standards for drinking water to protect against naturally occurring and man-made contaminants. A 1996 amendment to the SDWA requires each state to implement Source Water Assessment Programs (SWAP). The SWAP program in Washington is administered by the State Department of Health, Office of Drinking Water. There is one State-designated surface water protection area within the project area. The SWAP area aligns with the boundary of the Upper Mill Creek subwatershed. Through adherence to Forest Plan Standards and Project Design Criteria, the Mill Creek Municipal Watershed source water area would not be adversely impacted.

Reference 9. Applicable project file documentation to support analysis.

Documentation Type	Location
1993 Mill Creek Watershed Program Protection Plan	See Project Record
Mill Creek Surface Water Protection Area Map	See Pinyon Public
Tiger-Mill Hydrology Specialist Analysis	See Pinyon Public

Clean Water Act

The hydrologist has reviewed Alternative A and Alternative B and made the following determination:

There would be no measurable increase in water temperature, streamflow, or sediment from this project which could degrade downstream beneficial uses when the prescribed water quality Project Design Criteria (PDCs) [in addition to PDCs prescribed by the soil scientist and fisheries biologist] are implemented, monitored, and adjusted (if needed). All the activities proposed in this project were designed to be consistent with the Clean Water Act and States of Oregon and Washington Water Quality Standards.

Supporting Project Documentation

Reference 10. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Hydrology Specialist Analysis (Pg. 4-6)	See Pinyon Public

Migratory Bird Treaty Act

Both Alternative A and Alternative B are consistent with the 1918 Migratory Bird Treaty Act (MBTA). The Forest Service supports the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions. Some specific examples for this project include retaining snags, retention of large trees, protecting raptor nests, and not burning during nesting season. Specific species of concern were considered and the Conservation Strategy for Landbirds (Altman 2017) was reviewed for effects disclosures. This project is consistent with this Act.

Bald and Golden Eagle Protection Act

Alternative A and Alternative B comply with the National Bald Eagle Management Guidelines ([USDI 2007](#)) and the Bald and Golden Eagle Protection Act. Use of the area by eagles is sporadic, and no nesting or roosting habitat would be affected by the proposed activities. This project is consistent with this Act.

National Environmental Policy Act

During development of this project and environmental analyses, the Council on Environmental Quality (CEQ) developed Phase 1 and Phase 2 updates to the 2020 rule. Phase 1 was implemented on April 20, 2022, and restored broader definitions of "direct and indirect" effects and "cumulative" effects, changed the FONSI criteria, and made several other key provisions. Phase 2 and the 2024 Final Rule were implemented in May and July of 2024, respectively. This project was developed, follows, and complies with the Phase 1 requirements based on its NEPA scoping date in January 2023. Neither 2024 Phase 2 rule or the 2024 rule, which modifies, removes, or changes the 2020 rule, apply to the development of this project. This project is consistent with this Act.

USDA Departmental Regulation 9500-3 Land Use Policy

There is no prime farmland, range land, and forest land within the bounds of the project area. There would be no effect from implementation of any alternative. This project is consistent with this Policy.

Pertinent Executive Orders

The responsible official and/or applicable specialist(s) have determined that both Alternatives comply with the following Executive Orders (EO), which were deemed pertinent based on the nature of the project:

EO 11514, Protection of Environment - The Federal Government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals.

EO 11593, Protection and Enhancement of the Cultural Environment- The Federal Government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Agencies of the executive branch of the Government (hereinafter referred to as "Federal agencies") shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored and maintained for the inspiration and benefit of the people, and (3), in consultation with the Advisory Council on Historic Preservation (16 U.S.C. 4701), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance. The project is consistent with the executive order.

EO 11988, Floodplain Management – requires determination of action occurring in a floodplain, using HUD floodplain map or more detailed map if available.

- Alternative A and Alternative B would avoid harvest and equipment entry into all floodplains (except on roads at existing crossings). The implementation of Project Design Criteria (PDCs) and Best

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Management Practices (BMPs) would result in no change to current floodplain condition. This project is consistent with this executive order.

EO 11990, Protection of Wetlands – avoid actions within wetlands unless there are no practical alternatives, and the action includes all practicable means to minimize harm to wetlands.

- All seeps, springs, and other wetlands (including stream-associated floodplain wetlands) would retain buffers where harvest and equipment entry would be restricted. The implementation of PDCs and BMPs would result in no measurable change to current wetland condition under Alternative A and Alternative B. This project is consistent with this executive order.

EO 13007, Indian Sacred Sites – avoid adversely affecting the physical integrity of these sites.

- With adherence to PDCs HR-1,2,3, and 4 and the State Historic Preservation Officer consultation process outlined in PDCs and the implementation checklists, Alternative A and Alternative B would be consistent with this executive order.

EO 13175, Consultation and Coordination with Indian Tribal Governments - agencies consult with Indian tribes and respect tribal sovereignty as they develop policy on issues that impact Indian communities.

- Project has consulted and coordinated with relevant Tribal Governments, including Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Nez Perce Tribe. This project is consistent with this executive order.

EO 13112, Invasive Species – prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

- Project design criteria, IP-1,2,3,4,5,6,7,8,9 and 10, are incorporated in both Alternative A and Alternative B to lessen the risk of introduction and spread of invasive species from project activities. Invasive species treatment and post-project monitoring would continue consistent with the 2010 Umatilla National Forest Invasive Plant FEIS. This project is consistent with this executive order.

EO 13186, Migratory Birds – identify actions that may have a measurable negative effect on migratory bird populations.

- The Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington was referenced to assess project effects to the identified priority habitat types and associated focal species. Project design criteria, WR-1,3,4,5,7,9,14, are included to retain habitat and minimize adverse impacts to these species. Within the project area, dry forest, late successional mesic mixed conifer, riparian woodland, and shrub habitat types would be enhanced or maintained at levels that provide suitable habitat and continued viability of all focal species currently present. This project is consistent with this executive order.

EO 13855 Promoting Active Management of America's Forests, Rangelands, and other Federal Lands to Improve Conditions and Reduce Wildfire Risk, December 21, 2018

- Proposed activities would actively manage federal lands to improve conditions and reduce wildfire risk. This project is consistent with this executive order.

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Supporting Project Documentation

Reference 11. Applicable project file documentation to support analysis.

Documentation Type	Location
Tiger-Mill Botany Specialist Analysis	See Pinyon Public
Tiger-Mill Heritage Specialist Analysis	See Pinyon Public
Tiger-Mill Hydrology Specialist Analysis	See Pinyon Public
Tiger-Mill Wildlife Specialist Analysis	See Pinyon Public



NEPA: Finding of No Significant Impact (FONSI)

The Finding of No Significant Impact documents the reasons why an action, not otherwise categorically excluded, will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. § 1501.4. The Finding of No Significant Impact (FONSI) discussion considers all information included in the Environmental Assessment (EA), including the Potentially Affected Environment, as well as documentation in the project record. Pertinent specialists have reviewed the proposal and based on their input, the responsible official made the following determinations with regards to the potentially affected environment and degree of effects considered for a Finding of No Significant Impact. The project does not set precedent for nor preclude other actions.

My finding of no significant impact is based on consideration of the potentially affected environment and the degree of effects, as identified in 40 CFR 1501.3(b). Based upon the start date for this project, the FONSI falls under the Council on Environmental Quality's 2022 Phase 1 Rule, we will use the specified criteria as directed in that Rule.

Context

NEPA's implementing regulations direct that agencies determine significance based on context and intensity (40 CFR 1508.27). The project is located within the Mill Creek Municipal Watershed and subwatersheds adjacent to it. Potential environmental effects will be localized to the project area and areas immediately surrounding, as applicable, and will not be measurable at a regional or larger scale.

Degree of Effect

The following effects (or impacts) discussions focus on changes to the human environment from the proposed action (or alternatives) that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action (or alternatives) and may include effects that are later in time or farther removed in distance from the proposed action or alternatives.

Intensity

The regulations define degree of effect as intensity (the severity of the impact). The FONSI is based on the context of my decision and the intensity of effects using the four criteria identified in regulations under 2022 Phase 1 Rule and discussed below. Based on the consideration of the degree of effects discussed in the EA, which includes implementation of the project design criteria (PDCs) as identified in Appendix A, the degree of effect of the decision would not be significant.

1. Both short- and long-term effects.

Consideration of the intensity of environmental effects is not biased by beneficial effects of the action. No significant short-term or long-term effects were identified in consideration of potential effects to threatened, endangered, or sensitive species; silviculture resources, hydrologic resources; soil resources; cultural/heritage resources; recreation resources, fire and fuels resources, air quality, other analyzed resources, or other permitted land uses. PDCs are designed to mitigate, prevent, or protect from adverse effects.

Existing conditions that formed the baseline for analysis in the influence of the natural landscape and land management activities include, but are not limited to, municipal watershed management, past and current

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dispersed recreation, past commercial thinning, invasive plant management activities, prescribed fire activities, and past wildland fire suppression activities.

Project implementation includes repeated entries for vegetation management including commercial harvest, non-commercial thinning, and prescribed burning over a number of years starting in 2025-2026. Short-term effects will occur at different locations and times across the landscape as project activities are implemented and there will be reduced localized effects to resources. In the longer-term, improvements to forest conditions within and adjacent to the municipal watershed, along open roads, and across locations strategic for fire and fuels are expected to benefit public health and safety by protecting water quality, creating safer working environment for fire managers, and reducing potential for uncharacteristic wildfire.

There are Municipal Watershed, Inventoried Roadless Area, and Research Natural Area lands in the project area, however, no significant short-term, long-term, or cumulative effects were identified in consideration of the potential effects to resources (see the EA and project record).

Some (But Not Limited to) Examples of Potential Short-Term Effects:

Air Quality: There may be very local and temporary (1 to 3 days) adverse impacts to air quality during prescribed burns. All burning operations associated with the Tiger-Mill project (from slash piles to natural broadcast burns) are to be regulated by Oregon Department of Forestry and the Washington State Department of Natural Resources in order to minimize impacts and meet criteria set forth by the CAA.

Fisheries: short-term effects may occur to aquatic resources during timber management and road management actions from water quality disturbances,

Recreation: temporary trail, road, and dispersed area closures that would have a short-term adverse effect on recreationists during project activity implementation,

Soil and Hydrology: short-term adverse effects to the soil and water resources at localized scales would not affect the broader area and downstream resources and pose minimal risk to surface or groundwater water quality,

Carbon and climate: proposed action may temporarily contribute extremely small quantity of greenhouse gas emissions relative to national or global emissions.

Botany: short-term potential increase in non-native invasive plant spread and introduction during implementation activities,

Recreation and Scenic Resources: thinning and prescribed burning along with the implementation of PDCs would result in short-term adverse effects in regard to motor vehicle use map changes, noise and visual quality,

Wildlife: potential short-term displacement (0 to 10 yrs.) due to noise and human presence and habitat alteration which is the is the most common temporary adverse effect for almost all animal species,

Fire/Fuels: short-term adverse effects may result from increases in coarse woody surface fuel loads from commercial thinning activities of 1 to 3 years before activity fuel treatments are complete.

Some (But Not Limited To) Examples of Potentially Long-Term Effects:

Fisheries: Reduction in both fire severity and soil burn severity along with reduction in sediment from road maintenance would positively affect fisheries and their habitats in the long-term,

Hydrology/Municipal Water Supply: long-term beneficial effects from improved protection of source waters for potable water supplying the community of Walla Walla, WA,

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Silviculture: long-long term beneficial effects from improved forest vegetation health and resiliency by reducing basal area, increasing growing space, increasing age class diversity, and structure, and for reduction of risk for uncharacteristic wildfire,

Wildlife/Threated Endangered Species: improved habitat conditions over time and more diversity of habitats while helping to prevent large-scale, higher intensity habitat disturbances,

Soils: long-term beneficial effects as long term trends concerning road system improvements and designated motorized use changes reduce impacts to the productive soil resource,

Botany: rare plants may potentially experience multiple habitat effects from proposed timber harvests, mechanical site preparation, and road work but effects are mitigated through PDCs,

Carbon: proposed project would transfer carbon in the harvested wood to the product sector, where it may be stored for up to several decades and provide a substitute for more emission intensive materials or fuels.

2. Both beneficial and adverse effects.

The Interdisciplinary Team (IDT) identified no significant effects associated with implementing Alternative A or Alternative B. The overall effect is anticipated to be beneficial, while resource specific adverse direct, indirect, and cumulative effects would be within standards set forth by the Forest Plan, and consistent with applicable environmental laws.

While both beneficial and adverse impacts have been fully considered in the EA, the project does not rely on significant beneficial effects to balance any adverse effects. Based on comparison of the effects of comparable projects across the local area for many years, beneficial and adverse effects from the proposed action would likely be similar past fuel reduction and forest health projects. No comparable projects have demonstrated significant impacts to the human environment during implementation or in review.

Long-term effects of the proposed action are anticipated to be beneficial overall as activities are designed to protect water quality and forest health. Proposed actions would improve vegetation health and resiliency over the landscape, contribute to a diversity of habitat and structure, affect fire behavior and spread at scale, and improve resilience to disturbances across the project area.

3. Effects on public health and safety.

Both Alternative A and Alternative B are designed to minimize the potential impacts on public health and safety, during and after implementation, and promote quality water supply by reducing the risk of uncharacteristic wildfire in the project area which could lead to water quality disturbance. The Alternatives were each developed and analyzed with PDCs written specifically to protect, avoid, or minimize effects.

Based on analyses and professional judgement, there would be no significant effects on public health and safety as determined by discussions with the IDT members, review of NEPA documentation, and relevant resource analyses, which highlight (but are not limited to) the following:

Public health and safety are a key concern in development and implementation of this project, and concerns such as vehicle traffic, heavy equipment on and near roads, and prescribed burning would be mitigated through implementation management and contract safety provisions. See Appendix A Project Design Criteria.

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There are no highly uncertain, unique, or unknown risks of having any known potential effects on the human environment identified from public comment or resource analysis. The treatments proposed by this project are not precedent setting. Project treatments are consistent with numerous comparable projects occurring over many years in the geographic area, none of which have been determined to pose significant adverse effects. See project record for resource analyses.

Water supply from the watershed varies depending on the time of year. While water is abundant in late spring to early summer, it is lowest in the summer and fall. Proximal aquifer water is tapped during periods of potable water need when water resources are inadequate, or water quality is lacking. Project actions should have a beneficial effect on this municipal water source with no adverse effects to the supply infrastructure. Water quality and supply to the public would be enhanced and protected through PDC elements.

Smoke from prescribed fire could temporarily degrade visibility in downwind areas and locally around the burn. To limit the potential effects to air quality, fuels treatments would be designed to comply with National Ambient Air Quality Standards issued by the Environmental Protection Agency. All prescribed burning would comply with Washington Department of Ecology and Oregon Department of Forestry regulations which guide prescribed burning on federal land. All proposed activities will follow the Clean Air Act, as amended, as well, and are designed to protect human health (such as respiratory effects) and public welfare (such as visibility).

Fuels treatments would return hazardous fuels to a fuel load that would reduce the negative effects of a wildfire and maintain a safe environment for firefighters and the public.

4. Effects that would violate Federal, State, or local law protecting the environment.

Applicable laws, regulations, and executive orders were considered in the development of the Environmental Assessment. There are no effects from implementation of the proposed action that would violate Federal, State, Tribal or local environmental protection law or executive orders, provided the PDCs are implemented as proposed. The project meets the requirements of NEPA, and both Alternative A and B are consistent with the Forest Plan and Other Law, Regulation, and Policy.

NEPA requires the degree to which the action may adversely affect unique characteristics of the geographic area be addressed. As there are no identified or designated parks, prime farmlands, wild and scenic rivers, or ecologically critical areas within the project area, they are not addressed within this document. There would be "no effect" to Historic Properties listed in the National Register of Historic Places and that there would be no effects to Tribal Sacred Sites due to PDCs to include identification, marking, and avoidance of known or discovered features as well as work stoppage for evaluation of any cultural finds. No adverse effects on the rights of Tribal Nations are anticipated consistent with ongoing consultation and discussions with the tribes regarding concerns they may have. Heritage consultation will continue throughout the life of the project. Botany, fisheries, and wildlife specialists have identified a range of effects between no adverse effects to may affect, likely to adversely affect threatened or endangered species or its habitat determined to be critical under the Threatened and Endangered Species Act. Region 6 Regional Forester Sensitive Species and Migratory Birds were analyzed, and it was determined that project activities would not lead towards federal listing or result in significantly negative impacts to species in the short- or long-term. The project will not adversely affect the local community or specific populations as it is expected the thriving urban population of Walla Walla (~35,000) and adjacent College Place (~10,000) to whom water is supplied from the municipal watershed will see an overall beneficial effect in assurance of potable water supply and quality into the future.

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Supporting Project Documentation

Reference 1. Applicable project file documentation to support analysis.

Documentation Type	Location
See EA-FONSI-DDN document and all resource analysis documents	Project Record
See FMP, as amended 1990	Umatilla Forest Plan Webpage
Tiger-Mill Resource Analysis Documents	Pinyon Public

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Decision Notice

Tiger-Mill Project (2025)

U.S. Forest Service

Walla Walla Ranger District, Umatilla National Forest

Walla Walla and Columbia Counties, Washington and Wallowa and Umatilla Counties, Oregon

This Decision Notice explains my intent and rationale for proceeding with the Tiger-Mill Project on the Walla Walla Ranger District, Umatilla National Forest. The background information, selected alternative and respective analysis, and supporting documentation for my decision is incorporated in this combined Environmental Assessment-Finding of No Significant Impact-Decision Notice. ([EA-FONSI-DN](#)).

In development of the [FONSI](#), I considered that “in an environmental assessment and finding of no significant impact there should be only enough discussion to show why more study is not warranted.” [40 CFR 1502.2\(b\)](#)). The implementation of these forest management practices is consistent with federal law, regulation, policy, and by the 1990 Umatilla National Forest Land and Resource Management Plan, as amended, (Forest Plan). The project does not have significant effects on the resources addressed in the EA based upon interdisciplinary team review and substantive issues parsed from public comment. Hyperlinks refer to important sections of the EA and FONSI within the DN.

My Decision is based on the results and findings of the EA, FONSI, project record, a review of public comments, and direction provided to managers in the Forest Plan.

Introduction

The Mill Creek Municipal Watershed provides drinking water to the city of Walla Walla, WA. Current forested stands within the project area are out of the range of historical variability and contain heavy ground cover making them susceptible to high intensity wildfire. There is a need to mitigate the potential effects from high intensity wildfire to the municipal watershed, Mill Creek and tributaries, and other resources. The EA for the Tiger-Mill Project documents a proposal to treat an area within the Walla Walla Ranger District of the Umatilla National Forest with forest fuels reduction, non-commercial thinning, and commercial thinning. The preliminary Proposed Action was described in a [Notice of Proposed Action](#) which, along with a Scoping letter, were made available to interested parties in January 2023. It was further developed based on internal and public input and subsequently analyzed as Alternative A. An additional alternative was developed also in response to internal and public input and analyzed as Alternative B. The EA provides a summary of the effects analyses of Alternative A and B.

Tiger Creek Wildfire

Ignition of the Tiger Creek Wildfire occurred on October 1, 2024, which was after the EA, Finding of No Significant Impact and draft Decision Notice for the Tiger-Mill EA was released to initiate the objection filing period (legal notice published on September 18, 2024). The District prepared a burned area report to document the effects of the wildfire. The Tiger Creek fire perimeter encompasses about 531 acres; soil burn severity within the fire perimeter was assessed at 32% unburned, 63% low severity, 4% moderate severity and 1% high severity (Tiger Creek Burned Area Report at 1-3). The report determined the probability of damage to soil productivity over the affected area is unlikely as the prescribed fire resulted in low soil burn severity (Tiger Creek Burned Area Report at 5).

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Approximately 196 acres of the Tiger Creek fire perimeter overlap the Tiger-Mill project perimeter (38,000acre). Due to the low intensity burn and the limited effects to soils in the project area effects from the wildfire were considered to have been adequately addressed under the alternatives analyzed. No effects determinations changed within the EA as a result of the wildfire.

I have determined that changes to the proposed decision because of wildfire effects are not warranted.

Decision

I have read the [Tiger-Mill Project EA](#), reviewed the [analyses](#) in the project record, including documents incorporated by reference, and fully understand the environmental effects disclosed therein. I have also considered the comments submitted during public engagement, legal notices, scoping/Notice of Proposed Action, and objections pursuant to 36 CFR Part 218. Timely and specific comments as well as objections on the project and how they were considered are available upon request in the project record. My decision is based on a thorough review of the project record which displays relevant scientific information and a consideration of responsible opposing views.

I have reviewed the two action alternatives, environmental assessment and considered the purpose and need for the proposal. Based on my understanding of the effects of the proposed action as described in the specialists' analyses documents, and input received from the public; I have decided to authorize the activities described in the [Purpose and Need](#) and [Proposed Action](#), sections of the EA, to include any modifications identified through scoping, comment, objections, environmental analysis, and review of legal and regulatory compliance. It is my decision to select Alternative A. The Forest Service will use non-commercial and commercial techniques to mechanically and hand thin trees, masticate, pile and burn, and conduct prescribed burning in treatment units within the approximately 38,000-acre project area. These actions would aid in the protection of the Mill Creek Municipal Watershed, and the surrounding area, from uncharacteristic wildfire, improve forest health and resiliency, improve stand structure and protect water quality.

Planned forest management actions authorized under Alternative A include:

- 6,622 acres of commercial thinning
- 5,246 acres of non-commercial thinning
- 570 acres of type 4 RHCA non-commercial thinning
- 6,622 acres of secondary non-commercial thinning in commercially thinned stands
- 21,325 acres of prescribed fire
- Associated secondary fuel treatments:
 - hand-piling and burning
 - lop and scatter
 - machine-piling and burning
 - mastication
 - jack pot burning
 - under burning
 - whole tree yarding (WTY) or leave tops attached (LTA)
 - WTY or LTA and end haul slash
 - potential control line buffer treatments
- Construction of approximately 10.6 miles of temporary roads
- Maintenance of 96 miles of haul route
- All Project Design Criteria and Monitoring identified in Appendix A and G

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The project has been designed to improve the structure and resilience of forest stands, reducing the potential impacts from high intensity uncharacteristic wildfire to the watershed and adjacent forest lands. Implementation of Alternative A would accomplish these needs and goals in part or in whole, moving toward more sustainable and manageable conditions in the future.

The Tiger-Mill Project is intended to reduce risk associated with high intensity wildfire and potential effects such as debris flows and is not intended to stop a wildfire. Treatments to meet that goal translate into beneficial effects described within the [environmental assessment](#) and [analyses documents](#). See maps of approximate treatment areas in [Appendix B](#). This project will follow terms and conditions of National Marine Fisheries Service and Fish and Wildlife Service and implementation will be consistent with the Biological Opinion.

The Tiger-Mill Project is consistent with the 1990 Forest Land and Resource Management Plan, as amended and as confirmed in each resource analyses. Alternative A is consistent with federal, state, and local laws and requirements imposed for the protection of the environment (40 CFR 1500 – 1508). Consistency checks were reviewed within each specialist analysis document and summarized in the EA to confirm compliance. No significant effects to any resource were identified in the analysis and it is my determination that a Finding of No Significant Impact is supported, therefore, an Environmental Impact Statement will not be prepared.

Project Design Features

Project design features (See Appendix A) are site-specific management activities designed to avoid and / or reduce potential adverse effects of implementing project activities. Project Design Criteria (PDCs) and Best Management Practices (BMPs) will be utilized during project design, layout, and implementation. Post implementation monitoring of the effectiveness of the PDCs and BMPs by resource specialists will occur to assure achievement of intended results. Should follow up assessment indicate any concerns with effectiveness, mitigation measures would be developed and applied. The PDCs and BMPs I am choosing to implement are found in Appendix A of the Environmental Assessment. The measures include actions such as equipment limitations, stream protections, wildlife timing restrictions, and limitations on activities to minimize impacts to soils and water quality and quantity. I am confident that these measures, along with direction and guidance from the Forest Plan will minimize adverse effects. These measures have been used successfully on comparable projects within the Blue Mountains and are based on best available science and current research.

Monitoring

My decision includes monitoring of implementation of the project design features. Project-level monitoring assures that all aspects of the project are implemented as intended with periodic assessment identifying any concerns requiring re-addressing PDCs and BMPs and application of mitigation measures. Appendix H describes the project level monitoring for Tiger-Mill. Ongoing assessment determines that the effects of the activities are consistent with the intent; and allows for adaptation if it is found that activities are not being implemented correctly or are not having the desired effects. Forest Service specialists will conduct monitoring during and post-implementation while personnel implementing the project, such as presale foresters, sale administrators, harvest inspectors, and fuels personnel will be responsible for verifying adherence to established measures. They will notify Forest Service specialists and me if any concerns arise.

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The interdisciplinary team will review any contracts prepared to implement this project to ensure the contract provisions correctly describe the actions and PDCs/BMPs to be performed. These resource specialists will also work with contract administrators to ensure proper implementation of PDCs.

Once implementation is in progress on a portion of the project, resource specialists will visit locations where work has been completed. During this field visits, resource specialists will be monitoring the implementation and effectiveness of PDCs. This will inform further project implementation should adjustments be needed to meet the objectives of the project and its design features included to minimize effects to resources. Specialists may also visit field sites individually as determined efficient as implementation proceeds to ensure PDC/BMPs and mitigation measures are being implemented properly.

Decision Rationale

The work authorized by the Decision Notice is necessary and prudent to provide a safe and reliable source of water for the City of Walla Walla, WA through accomplishment of multi-use management objectives for these public lands. The purpose of this project is to increase opportunities to manage the spread of natural and prescribed fire safely and effectively, manage stands for resilience to future disturbances across the landscape, and to reduce the risk associated with wildland fires' potential to degrade the municipal water supply. This will be done through reduction of hazardous fuels, enhanced diversity in vegetation and protection of water quality. This work is important in forest management, establishing safer conditions for wildland fire fighters, and in the long-term management of water resources within the municipal watershed and adjacent public lands.

The existing and desired conditions discussed in the EA provide a compelling need for management action. This decision to implement these activities is supported by the mission of the Forest Service and the direction of the 1990 Umatilla National Forest Land and Resource Management Plan, as amended which is inclusive of, but not limited to, PACFISH and Interim Standards for Wildlife Habitat referred to as Eastside Screens

It is my determination that Alternative A best meets the purpose and need for the Tiger-Mill Project because I expect it to:

- Effectively protect water quality in the Mill Creek Municipal Watershed
- Reduce fire hazards and reduce fire behavior at strategic locations by reducing canopy bulk density and raising canopy base height, fire is less likely to move through the canopy. Additionally, lower canopy bulk density requires greater wind speed for crown fire initiation. The analysis concludes both action alternatives would decrease the amount of fuel on the landscape. Alternative A, however, would be more effective at transitioning an approaching crown fire to a surface fire under a greater range of weather and fuel moisture conditions.
- Provide more effective fuel breaks to aid firefighting strategy and tactics for future wildland and prescribed fires
- Move forest structure, species composition, and stand density closer toward their historic range of variation and the desired future conditions to create more resilient stands and landscape that would decrease the negative outcomes to ecosystem function from future disturbance events.
- Provide for less frequent entries into the IRA. If we treat all fuel layers now the need to reenter to remove fuels in future emergency situations, under adverse conditions, would be less likely. The IRA is directly adjacent to strategic roads and private ownership with no buffer.

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Alternative B which was also fully analyzed in the EA. was developed based on internal and public comment and specifically designed to 1) avoid commercial thinning in the Mill Creek Watershed Inventoried Roadless Area, 2) use only existing templates for the location of temporary roads, 3) exclude non-commercial thinning in Riparian Habitat Conservation Areas (RHCA), and 4) limit harvest to trees less than 21 inches diameter at breast height (DBH).

I did not select Alternative B because it would lead to fewer acres identified as lowest fuels hazard, therefore, the strategic locations to combat wildfires and implement prescribed burns in the IRA would be less effective with higher residual stand densities following only non-commercial thinning; fewer acres would be moved towards the Historic Range of Variation specified in the silviculture analysis.

Taking no action was also considered in the EA by evaluating the existing and desired conditions. The long-term and cumulative effects of no action, as addressed in analyses documentation, would continue to be detrimental to the human environment. No action would not meet the need to reduce the risk to the public, firefighters and to enhance the forest resilience to disturbance. I do not believe it would be prudent or responsible to take no action at this time.

Summary of Public Involvement

This project was added to the Umatilla National Forest Schedule of Proposed Actions and posted to the project Pinyon Public page at (usda.gov) January 26, 2023. On this date, a legal notice was posted to the Umatilla National Forest newspaper of record, the East Oregonian. A Scoping Letter and Notice of Proposed Action were published for a 30-day comment period on that date as well. Over 100 recipients received the Scoping Letter and NOPA via email (govdelivery) with several individuals provided information by postal mailing. The public was offered the opportunity to sign up/register for access to all project updates on the Pinyon Public site which has been available since January 2023. We received 13 responses to Scoping and NOPA, with most in support of the proposed action in its entirety. Several comments identified concerns regarding retaining "large trees"; not treating "old trees"; and not implementing treatments in the Municipal Watershed, Inventoried Roadless Area (IRA), Research Natural Area (RNA), or Riparian Habitat Conservation Areas (RHCAs).

I identified issues from public and internal input to be brought forward and those were addressed and further developed the preliminary Proposed Action as described in the NOPA resulting in Alternative A. Alternative B, also based on internal and public comment addressed issues to include 1) no commercial thinning in IRA or RHCAs, 2) no thinning of large trees, 3) no thinning of old trees, and 4) road management.

Several issues were determined to not warrant further analysis because they were outside the scope and/or scale of the project, not specific and substantive to this project, or did not meet the purpose and need for the project. See the Issue Disposition Table in the project record for more information on issue disposition.

The legal notice announcing the start of the 45-day Objection Period was posted in the East Oregonian in September 2024. At that time, those commenters having "standing to object" based on their submission of timely and specific comments on the content of the Scoping Letter and NOPA, were afforded the opportunity to present objections to the Reviewing Official in accordance with 36 CFR 218.

A list of agencies, tribal governments, and organizations consulted and/or coordinated with regarding this proposal is provided in the EA in the "Consultation and Coordination" section.

As the responsible official, I have taken the comprehensive array of support, criticism, and input from interested and affected agencies, tribal governments, and affected and interested public to heart in

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coming to this decision. The interdisciplinary team worked carefully and diligently in response to the diverse concerns and interests of those commenting on this project. I sincerely believe we have provided the best balance of interests with this project to best meet the needs of the natural and human environment.

Findings Required by Other Laws and Regulations

The project was analyzed in accordance and reviewed by resource specialists and me to ensure activities would be consistent with the 1990 Umatilla National Forest Land and Resource Management Plan, as amended. The project will meet direction of the Forest Plan to maintain and manage forest resources, to respond to resource management objectives, and facilitate recreational use, timber management, and considers Forest and city agreements for municipal water resources, administration, and resource protection. Alternative A and PDCs/BMPS/Mitigation measures for this project were developed to meet and achieve consistency with Forest Plan standards and guidelines which consider compliance with federal law and regulation, and policy, state requirements as applicable, and Regional direction. The integrated Environmental Assessment-Finding of No Significant Impact-and Decision Notice document for this project was prepared according to regulations for implementing the procedural provisions of the National Environmental Policy Act of both the Council on Environmental Quality (40 CFR §§1500-1508, 85 FR 137, p. 43357.

Findings required by other laws, regulations and Executive Orders applicable to the proposal can be found summarized in the [Environmental Impacts](#) section of the EA as well as in the detailed resource specialists' [analysis documentation](#) in the project record. Consistency with Federal law, regulation, policy and Forest Plan, by resource, is assured by each specialist based on their analyses, experience, knowledge, and professional judgment in preparing the EA-FONSI-DN in the "[Consistency](#)" section of the EA.

Administrative Review and Supplemental Information

The Tiger-Mill project was subject to pre-decisional administrative review pursuant to 36 CFR 218 Subparts A and B. The 45-day objection period for the draft Decision Notice began on September 16, 2024, with a legal notice published in the East Oregonian. Only individuals or organizations who submitted timely, specific written comments during the designated opportunity for public participation (January-February 2023) as provided during the combined scoping and NOPA 30-day comment period were eligible to file an objection (36 CFR 218.2 and 36 CFR 218.5). Objections were required to meet all requirements of 36 CFR 218.8(d). Issues raised in objections are required to be based on previously submitted, specific written comments regarding this proposed project and to be attributed to the objector, unless the issue was based on new information that arose after the opportunity for comment.

Clarifications and Edits

Objections were received from 6 parties. Oregon Wild, Blue Mountains Biodiversity Project, Greater Hells Canyon Council, American Forest Resource Council, and two members of the public. Objections received are available upon request. A formal objection resolution meeting was held on January 10, 2025, with the objectors, the Reviewing Official, and the Responsible Official participating. The Reviewing Officer has responded in writing to all objections. Following the resolution meeting, the Reviewing Official, Eric Watrud (Forest Supervisor), and myself as the Responsible Official, discussed and agreed to the clarifications and edits to the project record as indicated in Appendix H.

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Implementation

No implementation will occur until after the Biological Opinion is received. Implementation is expected to begin summer of 2025. I will publish notification of the availability of the FONSI and Decision Notice on the Project Pinyon Public webpage as soon as practical after signing (36 CFR 220.S(g)).

Contact

For additional information concerning the Tiger-Mill Project, please contact Joseph Sciarrino, 509-522-6290, Fuels and Prescribed Fire Specialist, Walla Walla Ranger District, Umatilla National Forest. Approved By:

A handwritten signature in blue ink, appearing to read 'Johnny Collin', written over a horizontal line.

February 26, 2025

Johnny Collin

Walla Walla District Ranger

Umatilla National Forest, Walla Walla Ranger District