



Flat Country Project Review Report

USDA Forest Service
Willamette National Forest
McKenzie River Ranger District
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Introduction

This report summarizes findings of a targeted regional review of the Flat Country Environmental Impact Statement (EIS) that considered:

1. Whether the original decision and analysis are still valid and applicable given new or changed information as it relates to the effects analysis of the project;
2. Broader issues identified during the review.

Information included in this report can be used to develop a Supplemental Information Report (SIR), which would become part of the project record. However, this document also includes information beyond the scope of a SIR. In this document the Willamette National Forest will be referred to as “the Forest.”

This review is not a comprehensive review of the project and associated environmental analysis in their entirety. Rather, it focuses specifically on some of the issues raised in an external request for this review, which include use of science, conservation of mature and old-growth forests, climate change, and the effects of 2020 wildfires. It addresses these topics in the specific context of the Flat Country project and in the broader context. Given the targeted nature of this review and in the intent to inform further decision-making by leadership, this review does not cover each point raised in the external request for review but rather focuses on high-level issues that would require leadership consideration.

Background

Reason for the Review

This review is responsive to the Chief’s request in July 2022 to examine the project in the context of policy changes and wildfire impacts. Subsequently, in August 2022, the Regional Forester received a written request to conduct a Supplemental Information Report expressed in a letter from [Western Environmental Law Center](#).

The Region 6 Deputy Regional Forester requested this targeted review of the Flat Country project to assess the importance of potentially relevant new information on the analysis in the Flat Country Project final EIS and help inform options for next steps for leadership consideration, including whether a formal interdisciplinary Supplemental Information Report would be necessary.



Project Timeline

The Flat Country Project was formally initiated in May 2018, with the public scoping period running from May 22 to June 23, 2018. The 45-day comment period for the Draft Environmental Impact Statement was published in the Federal Register on January 31, 2020, in which 23 letters were received from members of the public, federal officials, public interest organizations, and private businesses. Response to comments can be found in Appendix J of the Final Environmental Impact Statement.

The objection period was initiated on June, 26, 2020, in which three timely objection letters were filed: Cascadia Wildlands and Oregon Wild; Benton Forest Coalition; and American Forest Resource Council. An online resolution meeting was held on October 7, 2020, with all three objecting parties. A follow-up meeting was held on October 15, 2020; however, no resolution was reached with Cascadia Wildlands, Oregon Wild, and Benton Forest Coalition. American Forest Resource Council withdrew their objection. On October 26, 2020, the Objection Reviewing Officer, Dave Warnack, issued his [response](#) to objectors. The final Record of Decision was signed by the District Ranger Darren Cross on January 19, 2021. To date, no activities authorized by this decision have been implemented.

Purpose and Need

The purpose of the Flat Country Project is to (1) provide a sustainable supply of timber products, (2) actively manage stands to improve stand conditions in terms of density, diversity, and structure, (3) increase vegetative habitat complexity and hardwood composition along streams, and (4) sustainably manage the network of roads in the project area.

The proposed project is needed for the following reasons:

- There is a need to ensure the Forest continues to provide a sustainable supply of timber products, and in doing so contributes to the stability of local, regional, and national economies as well as the annual Probable Sale Quantity (PSQ) target for the Forest (FEIS p. 18). The majority of the project area and treatment units are within the Forest Plan's General Forest allocation and Northwest Forest Plan's Matrix allocation.
- The stands proposed for harvest in the project area are overstocked or showing signs of mortality or reduced growth from competition. Overstocked stands occur when trees are closely spaced, resulting in a competition for resources. Closely spaced trees competing for resources generally result in decreased individual tree growth. Overstocked stands can also cause increased tree/stand stress, resulting in increased susceptibility to insect and disease outbreaks. Additionally, overstocked stands can increase the potential for high severity wildfires (FEIS pp. 18-19). Therefore, there is a need to help improve stand conditions, diversity, density, and structure.
- There is a need to help restore the vegetative habitat complexity and hardwood composition along streams, while providing secondary benefits to wildlife and fisheries by improving habitat in second-growth stands and previously managed stands (FEIS p. 19). According to the Northwest Forest Plan, the Aquatic Conservation Strategy "must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This



approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds” (Northwest Forest Plan, p. B-9).

- There is a need to meet resource and other travel management objectives adopted in the Forest Plan and the 2015 Willamette National Forest Road Investment Strategy, to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, and to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance (36 CFR part 212, Subpart A) (FEIS p. 20).

Decision

The District Ranger selected a modified version of Alternative 2 in the Record of Decision (ROD p. 5). The decision would allow harvest on 4,438 acres and include thinning, gap creation (323 acres), dominant tree release, regeneration harvest (961 acres), and skips. Harvest treatments would occur in stands ranging in age from approximately 27-150 years old and yield approximately 102 million board feet of timber. Post-harvest fuels treatments include pile and burn and post-harvest underburn. There would be about 10.3 miles of temporary road construction and 130 miles of road maintenance on existing roads. Modifications to the selected alternative are described in the Record of Decision on page 6 and include dropping specific acres for treatment and changing treatment methods and prescriptions.

Review of Potentially Relevant New Information

The review of new information is organized across three categories: 1) new policies, 2) impacts of 2020-2022 wildfires, and 3) additional issues identified during the review. Within each category, there are additional sub-headers.

Use of Best Available Science and Data

On January 27, 2021, President Biden issued a Memorandum for the Heads of Executive Departments and Agencies, *Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking* (86 FR 8845), which states:

“It is the policy of my Administration to make evidence-based decisions guided by the best available science and data. Scientific and technological information, data, and evidence are central to the development and iterative improvement of sound policies, and to the delivery of equitable programs, across every area of government. Scientific findings should never be distorted or influenced by political considerations. When scientific or technological information is considered in policy decisions, it should be subjected to well-established scientific processes, including peer review where feasible and appropriate, with appropriate protections for privacy. Improper political interference in the work of Federal scientists or other scientists who support the work of the Federal Government and in the communication of scientific facts undermines the welfare of the Nation, contributes to systemic inequities and injustices, and violates the trust that the public places in government to best serve its collective interests.”

The memorandum does not provide specific requirements for NEPA and does not require review of science used in completed or ongoing projects.

The Flat Country EIS includes a section that describes the role of science in the EIS. It states:



“Scientific information improves the ability to estimate consequences and risks of decision alternatives. The effects of each alternative are predicted based on scientific literature and the professional experience of the IDT specialists. The conclusions of the IDT specialists are based on the best available science and current understanding. Relevant and available scientific information is incorporated by reference and a complete bibliography is included at the end of this DEIS. The referenced material is considered the best available science.” (Flat Country FEIS, p. 66).

Analysis: Based on the project record, it appears that the EIS aligns with the intent of the memorandum. There is no evidence in the project record of distortion or influence by political considerations on the science used in the FEIS. In addition, the FEIS cites various peer-reviewed sources, including journal articles and General Technical Reports, which provide the scientific basis for conclusions. The science used in the analysis sufficiently demonstrates how the proposed action would achieve the purpose and need, including to provide a sustainable supply of timber, and documents significant environmental impacts associated with the proposed action as required by NEPA. Our review does not find a need to supplement the environmental analysis to address this memorandum.

1. Additional information on this topic is integrated into subsequent sections of this review. Additional details on the above options could be provided in other contexts, though those are outside the scope of this review.

New Policies related to Conservation of Mature and Old-growth Forests and Climate Change

Since the Flat Country decision was signed, there have been several new policies that establish priorities for the Forest Service, including conserving mature and old-growth forests and tackling climate change through carbon stewardship and climate adaptation and resilience.

Executive Order 14008 and Adaptation Plans

In January 2021, President Biden issued Executive Order (EO) 14008 – *Tackling the Climate Crisis at Home and Abroad*, which establishes a government-wide approach to reducing risks associated with climate change. Among other policy goals, the EO states:

“It is the policy of my Administration to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands, waters, and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth, especially through innovation, commercialization, and deployment of clean energy technologies and infrastructure.”

In addition, EO 14008 directs governmental departments and agencies to develop climate adaptation plans, which provide more details about how the broader policy goals described above apply to specific agencies.

In response to EO 14008, the USDA released its department-wide *Action Plan for Climate Adaptation and Resilience* in October 2021. In July 2022, the USDA Forest Service released its agency-specific Climate Adaptation Plan (CAP), which tiers to the USDA plan and identifies vulnerabilities facing the agency and adaptation actions that it can take to respond. These are organized across six categories:



shifting fire regimes; extreme events and disturbances; chronic stressors to watersheds and ecosystems; disruptions in the delivery of ecosystem products and services; disproportionate impacts on disadvantaged communities and Tribal Nations; and threats to the agency mission, infrastructure, and operations.

On old-growth and mature forests, the Forest Service CAP states:

“Old-growth and mature forests, and other forests with similar characteristics, are an ecologically and culturally important part of the National Forest System. They reside within a continuum of forest age classes and vegetation types that provides for a wide diversity of ecosystem values. Many forests with old-growth characteristics have a combination of higher carbon density and biodiversity that contributes to both carbon storage and climate resilience. They are often viewed as ideal candidates for increased conservation efforts, and are frequently found within areas designated as wilderness or roadless or other management areas where timber harvest is precluded. Even so, as climate continues to deviate from historical norms, many of these forests are expected to be at increasing risk from acute and chronic disturbances such as drought, wildfires, and insect and disease outbreaks. As a result, climate-amplified disturbances like these have become the primary threat to old-growth stands on national forests. In response, Executive Order 14072 Strengthening the Nation’s Forests, Communities, and Local Economies emphasizes the climate-informed stewardship of mature and old-growth forests on Federal lands, as part of a science-based approach to maintain valued characteristics and reduce wildfire risk. There is no single ‘right answer’ in addressing the complex problem, but the spirit and practice of shared stewardship can help us generate the frank discussions necessary to consider values and risks as we find the best paths forward” (USDA Forest Service Climate Adaptation Plan, p. 13).

On carbon stewardship, the Climate Adaptation Plan states:

“America’s forests provide multiple benefits, such as clean air and water, biodiversity, recreation, wildlife habitat, and timber and nontimber forest products. In this era of climate change, carbon uptake and storage are also critical benefits from healthy forests. Nearly 13 percent of U.S. carbon emissions are taken up and stored in America’s forests, including old- growth and other wildland, urban, and working forests. Unfortunately, many forests are increasingly vulnerable to climate-amplified impacts and stressors. If a forest is vulnerable, so is its carbon. Thoughtful carbon stewardship does not seek to maximize carbon at the expense of forest health but rather to optimize carbon within the context of ecosystem integrity and climate adaptation. Some forests, such as those at risk for high severity wildfire, might require hazardous fuels treatments and other forest health interventions that reduce carbon storage in the short term even as they stabilize carbon in the long term. These ideas are at the core of the USDA climate-smart strategy, which supports the Forest Service goals of protecting communities and watersheds and creating long-term, nature-based climate solutions.” (USDA Forest Service Climate Adaptation Plan, p. 39) America the Beautiful Initiative (30x30)

EO 14008 tasked a group of agencies with developing a report within 90-days that “[recommends] steps that the United States should take...to achieve the goal of conserving at least 30 percent of our lands and waters by 2030” (Section 216). This is commonly referred to as the “America the Beautiful Initiative” or “30x30.” The EO also indicated the report “shall propose guidelines for determining whether lands



and waters qualify for conservation” (Section 216(a)(ii)). In response to this requirement in EO 14008, the agencies released a report titled “Conserving and Restoring America the Beautiful” in 2021, which provides principles and recommendations for achieving the goal of conserving 30 percent of the Nation’s lands and waters. This report does not require the prioritization of conserving and restoring federal lands.

The America the Beautiful Initiative does not provide specific management direction that applies to project-level planning and decision-making. Ongoing efforts to implement the initiative are focusing on incentivizing locally led conservation projects, including through a competitive grant program open to non-federal entities. Federal agencies are currently developing an American Conservation and Stewardship Atlas that will be used to assess progress towards goals associated with this initiative. It is not necessary to supplement the analysis to address this initiative.

Executive Order 14072

In April 2022, President Biden issued EO 14072 - *Strengthening the Nation’s Forests, Communities, and Local Economies*. EO 14072 states:

“It is the policy of my Administration, in consultation with State, local, Tribal, and territorial governments, as well as the private sector, nonprofit organizations, labor unions, and the scientific community, to pursue science-based, sustainable forest and land management; conserve America’s mature and old-growth forests on Federal lands; invest in forest health and restoration; support indigenous traditional ecological knowledge and cultural and subsistence practices; honor Tribal treaty rights; and deploy climate-smart forestry practices and other nature-based solutions to improve the resilience of our lands, waters, wildlife, and communities in the face of increasing disturbances and chronic stress arising from climate impacts.”

It also states:

“My Administration will manage forests on Federal lands, which include many mature and old-growth forests, to promote their continued health and resilience; retain and enhance carbon storage; conserve biodiversity; mitigate the risk of wildfires; enhance climate resilience; enable subsistence and cultural uses; provide outdoor recreational opportunities; and promote sustainable local economic development.”

The EO recognizes the need to also continue climate-smart forestry practices and provide sustainable forest practices: “Conserving old-growth and mature forests on Federal lands while supporting and advancing climate-smart forestry and sustainable forest products is critical to protecting these and other ecosystem services provided by those forests.”

In addition to the overarching policy statements, EO 14072 directs BLM and USFS to complete specific tasks, beginning with ongoing implementation of wildfire mitigation strategies that address the threat that catastrophic wildfires present to mature and old-growth forests on Federal lands. The EO tasks agencies with developing definitions and an inventory of mature and old-growth forests on Federal lands recognizing ecological variation by April 2023. Following completion of the inventory, agencies are to analyze threats mature and old-growth forests, coordinate conservation and wildfire risk reduction



efforts, and develop policies that institutionalize climate-smart management and address threats to mature and old-growth forests.

EO 14072 also directs agencies to develop recommendations for “community-led local and regional economic development opportunities to create and sustain jobs in the sustainable forest product sector, including innovative materials, and in outdoor recreation, while supporting healthy, sustainably managed forests in timber communities.”

USDA Secretary’s Memorandum 1077-004

In June 2022, USDA Secretary Vilsack issued Memorandum 1077-004, *Climate Resilience and Carbon Stewardship of America’s National Forests and Grasslands*, which provides more specific policy direction related to climate change and mature and old-growth forests, building on EO 14072 and other policies. Upfront language in SM 1077-004 highlights key threats from climate change facing national forests and grasslands and describes their role as “climate mitigation powerhouses.” SM 1077-004 provides context on various relevant Executive Orders and policies, including those described above and the Forest Service’s Wildfire Crisis Strategy and the Bipartisan Infrastructure Law.

In addition to outlining the context from these various policies, SM 1077-004 also directs the Forest Service to implement several specific actions. While some of these involve spatial analysis and policy recommendations that will be developed over the next six months to a year, SM 1077-004 also directs the Forest Service to “carry out immediate actions to accelerate climate resilience and carbon stewardship,” including through implementation of the Bipartisan Infrastructure Law and inventorying and retaining old-growth and mature forest characteristics in line with EO 14072. SM 1077-004 indicates that agencies should identify recommend management actions that align with “science-based principles of carbon stewardship optimization” and that recognize potential tradeoffs between managing for carbon stewardship optimization and achieving other values.

Policy Issue Summary

These policies outline general policy goals of the administration and identify a series of specific tasks for the Forest Service and other agencies to complete. At this point in time, these specific tasks have not been completed. Broadly, the policies summarized above elevate the following as priorities for the Forest Service most relevant to this project:

- Conservation of mature and old-growth forests
- Carbon stewardship
- Climate adaptation and climate resilience
- Sustainable local economies

The policies recognize the potential for tradeoffs among the above priorities and with other priorities and expectations.

Analysis

Current Status of Policies and their Relevance to the Project

At this time, the policies described above do not require specific actions or decisions in project-level planning and decision-making. They do not explicitly require additional analysis in NEPA. They do not



preclude management in mature forests. In addition, in their current form, they do not provide guidance on how to manage potential tensions between different goals outlined in the policies, including conserving mature and old-growth forests and providing sustainable forest products. In response to the policies, the Forest Service is developing resources and guidance, including an inventory of mature and old-growth forests expected by April 2023, spatial tools, and recommended measures that contribute to conserving mature and old-growth forests. Presumably, these policies will provide additional clarity about how the goals of these policies apply to specific projects like Flat Country.

As such, based on a strict read of these policies, it would not be necessary to undertake supplementary analysis, since these policies lack specifics at this time. However, it may be useful for the deciding official to consider the project in terms of the broader goals of these policies, which are clear at this time.

Mature and Old-growth Definitions

The results of the national effort to define and inventory mature and old-growth forests are not available at this time. However, the Flat Country FEIS does explicitly consider these forest age classes using age-based definitions. It defines mature stands as those that are theoretically entering the understory re-initiation phase between 81 and 180 years old, while old-growth stands are greater than 180 years old. The FEIS notes that old growth stands “have large, live trees, often dominated by lateseral Douglas fir; large, dead, standing and downed trees; a multi-layered canopy; and a heterogeneous understory” (Flat Country FEIS, p. 69). Both the mature and old-growth categories make up 38 percent of the overall Flat Country project area (approximately 22,000 acres for each category). Neither of the action alternatives includes treatments in old-growth, defined as forests older than 180 years. Alternative 2 includes 3,136 acres of harvest units (including skips) in the mature category (understory re-initiation, 81-180 years old), while Alternative 3 includes no treatments in mature stands (Flat Country FEIS, Table 10).

Stand ages were determined based on information from the Forest Service’s VEGIS database and stand exams conducted in 2015-2016. During the stand exams, crews established one plot per four acres and cored two trees of each species within the plot to determine stand age. There were over 1,000 stand exam plots completed across the Flat Country treatment area, and 2,751 trees cored to directly establish stand ages within proposed treatment units.

The age-based definitions and use of tree coring during stand exams to identify age are appropriate approaches. It would also be possible to complement an age-based characterization of mature and oldgrowth forests with one that considers characteristics of forest structure. The NWFP effectiveness monitoring program uses a structural definition of mature and old-growth forests, since it is not feasible to collect tree ages at the landscape scale. For NWFP monitoring, late-successional and old-growth forests are classified based on four forest characteristics considered as key ecological and structural attributes: large live tree density, large snag density, tree diameter diversity, and large down wood cover. The four characteristics are converted into a single index (old-growth structure index, or OGSi) and forests are classified based on whether the OGSi score exceeds the expected value for forests of 80 (OGSi-80) and 200 years (OGSi-200), which are generally associated with “mature” and “old-growth” condition in the region. Regional monitoring uses forest inventory information and remoted-sensed mapping to assess trends, since it is not possible to conduct stand exams at this large scale (Davis et al. 2015, “in press”). This approach used in regional effectiveness monitoring is best-suited for monitoring



trends at broader landscape scales, while the use of stand exams, as was done for Flat Country, is generally more appropriate for project-level decisions.

Because some stands develop old-growth characteristics at a faster or slower rate depending on productivity and biological legacies from the last disturbance (e.g. remnant trees, snags, dead wood), definitions that focus on ecological and structural variables may differ in the classification of mature and old-growth forests compared to stand age. As a consequence, some forest stands classified as mature based on stand age (80-150 years) may be structurally more similar to old-growth forests while others may be structurally more similar to younger forests. If necessary due to future policy developments, it would be possible to use stand exam data to generate OGS data for individual treatment units, assuming that there is sufficient information regarding large live trees, large snags, tree diameter distributions, and down wood.

Ongoing tasks related to EO 14072 and SM 1077-004 may result in a definitional framework for mature and old-growth forests that considers factors beyond age, such as structural characteristics. In addition, the spatial analysis products developed as part of these efforts may apply similar methods to what are used in the NWFP effectiveness monitoring. In response to EO 14072, the USFS is collecting existing definitions of mature and old-growth forests, and the Pacific Northwest Region identified OGS-80 and OGS-200 as existing definitions for the NWFP area in response to this request.

The Flat Country proposed action does not include any treatments in forests that are currently old growth based on the age-based definition, and the project thus aligns with the goal of the executive order to conserve old-growth forests. The use of an age-based definition is reasonable but may not entirely capture stands that have reached old-growth status based on structural characteristics but have not reached the age of 180 years.

Planned Treatments and Conservation of Mature and Old-growth Forests

The proposed action does not include any treatments in the 22,000 acres of old-growth forests, defined as those above 180 years in age, in the Flat Country project area. Avoiding treatments in these forests thus contributes to the goals of conserving old-growth in EO 14072 and other policies, and additional treatments in these moist old-growth forests are not necessary to enhance resilience to fire and climate change.

The proposed action does include treatments in young and mature forests. These include thinning (in and outside of riparian reserves), dominant tree release, shelterwood regeneration harvest with reserves, gaps, and skips (in and outside of riparian reserves). Our review focuses on thinning and shelterwood since these treatment types are most prominent in the proposed action. Aside from treatments in riparian reserves, the treatments would occur exclusively in areas designated as Matrix by the Northwest Forest Plan, where most of the timber harvest in the NWFP is expected to occur.

Thinning and Conservation of Mature and Old-growth Forests

The proposed action does not include thinning in old-growth forests but does include thinning in both younger and mature forests. With regards to *thinning*, the effects analysis in the Flat Country FEIS states that thinning “will promote increased development of trees with characteristics normally associated with old trees in old-growth stands” (Flat Country FEIS, p. 73). Treatments also include dominant tree release treatments that will help promote species diversity by promoting growth of western white pine



and sugar pine. These early seral species are dependent on disturbance (e.g., fire) and have experienced declines due to invasive pathogens and climate change.

With regards to thinning in young stands, the FEIS provides sufficient scientific rationale for the ecological benefits of these activities. For example, it states:

“Thinning will promote increased development of trees with characteristics normally associated with old trees in old-growth stands. Many old trees grew rapidly when they were young (30-100 years), producing large stems and crowns. Evidence (Franklin et al., 1981, Tappeiner et al., 1997) suggests that the growth rates of some older forests resulted from slow regeneration and low densities over a long period with little tree-to-tree competition. Old-growth stands typically have multiple canopy layers, and thinning promotes a second canopy layer by allowing for natural regeneration to occur (Tappeiner et al., 1997).” (Flat Country FEIS, p. 73).

There are around 1000 acres of thinning included in Alternative 2 (modified), the Selected Alternative, that would occur in mature forest stands over 80 years in age (Flat Country ROD, Table ROD-1). On the topic of thinning in mature forests in the Flat Country project area, the FEIS states:

“Thinning in mature forests, will provide many of the same benefits as shown in younger stands. Old-growth stands which developed as a result of non-stand replacing fires, developed as cohorts of multiple species, and sizes (Weisburg 2004, Poage et al. 2009, Tepley et al. 2013). The results of non-stand replacing fires is stand density reduction by killing individual trees and pockets of trees, similar to thinning.

Newton and Cole (1987) showed that in stands 120-140 years old the minimum features to meet old-growth characteristics is exceeded with multiple thinnings, however downwood was lower presumably due to harvest capturing mortality. Other studies suggest that multiple thinnings up to 150 years old could promote rapid development of late-successional structure while maintain multiple cohorts (Latta and Montgomery 2004, Andrews et al. 2005, Cole and Newton 2009). In mature stands, Gray et al. (2012) found that residual trees, including mature overstory, demonstrated rapid release following thinning.” (Flat Country FEIS, p. 74)

Analysis: There is substantial scientific evidence that thinning in young stands contributes to the development of old-growth forest characteristics, confirming the statements in the FEIS. Though it is not cited in the Flat Country FEIS, the NWFP Science Synthesis chapter on old growth, disturbance, and succession (Chapter 3) cites more than fifteen studies that provide scientific support for thinning in younger plantation forests as a restoration strategy, noting evidence that this strategy increases ecological heterogeneity and accelerates growth of large trees and tree crowns (NWFP Science Synthesis, p. 188).

However, the NWFP Science Synthesis notes that there is uncertainty about the potential benefits of thinning treatments in mature moist forests, like those in the Flat Country project area. This reflects a lack of research on thinning in mature moist forests to develop old-growth characteristics, which ultimately reflects the relatively limited amount of thinning that has occurred in these mature moist forests in the NWFP area. The NWFP Science Synthesis indicates that additional research and adaptive management trials are needed on this topic (NWFP Science Synthesis). The studies cited in the second

paragraph of the above excerpt of the FEIS generally focus on research on forests that were thinned as younger stands and clearly support thinning in those stands, but do not directly address the effects of thinning in mature forests; this reflects the lack of research on thinning in older forests.

The first paragraph of the above excerpt of the FEIS describes the historical role of non-stand replacing fires in stand development in some Douglas-fir/western hemlock forests, noting that thinning may fill the role of fire. This idea is supported by the NWFP Science Synthesis, which states:

“One hypothesis is that some late-successional conditions (e.g., spatial heterogeneity, species cohort composition, diameter diversity and development of large-diameter trees) in the drier parts of the western hemlock and Pacific silver fir zones are no longer developing at the same rate because lower severity fire would have thinned the older stands, creating gaps, initiating new shade-tolerant cohorts, and accelerating growth of surviving canopy trees (Brown et al. 2013, Tepley et al. 2013, Weisberg 2004).” (NWFP Science Synthesis, p. 169)

As such, there is scientific evidence that thinning in mature stands may contribute to the goal of conserving mature forests and the development of old-growth forests from these stands, though the support for this approach is less robust compared to the evidence supporting thinning in younger stands.

Analysis summary: Our review suggests that the thinning in young and mature forests in the proposed action generally supports the goals of conserving mature and old-growth forests. Several of these policies suggest thinning as a preferred management activity for conserving forests, and our review suggests that this approach is appropriate in the Flat Country project area. Management of these stands is consistent with the NWFP, though it is worth noting that development of old-growth characteristics is not the primary objective for management in the Matrix land use allocation where these treatments are occurring.

Shelterwood Harvests and Conservation of Mature and Old-growth Forests

Alternative 2 also includes 961 acres of *shelterwood harvests with reserves* that would occur in mature forest stands between 98-150 years old, with no treatments in mature stands older than 150 years. These shelterwood harvests would affect around 2 percent of the approximately 44,000 acres of mature and old-growth forests in the project area. The FEIS notes that shelterwood harvests are regeneration harvests that retain trees to provide beneficial microclimates for regeneration. Around 25 trees per acre will be retained, and the treatments would result in around 30 percent retention distributed across reserves and the trees retained as part of the shelterwood harvest system. This aligns with requirements in the NWFP. The trees retained following harvest would generally include the older trees in harvested stands. The FEIS provides analysis of the effects of shelterwood harvest in facilitating regeneration, citing several publications that primarily focus on the effects for regeneration, the intended goal of the harvests (Williamson 1973, Burns 1983, Urgenson et al. 2013). The analysis also notes that the treatments would contribute to development of under-represented age classes (0-30 years), which would support a sustainable supply of timber products. The FEIS notes that future treatments may include precommercial thinning and harvest around 40-60 years later. The FEIS also notes that the shelterwood harvests along with other treatments would “promote the development of diverse multilayered stands” (Flat Country FEIS, p. 78).

Analysis: The intent of the treatments to regenerate younger age classes suggests that the treatments would negatively affect mature forest characteristics at the stand scale and limit the potential for these stands to develop into old-growth forests in the near-term. However, the retention aspect of the treatments would mitigate to an extent the adverse effects. Biological legacies such as large remnant trees are an important focus on ecological forestry and have the potential to accelerate the successional and structural development (Keeton and Franklin 2005, Donato et al. 2012). Maintaining these legacies provide continuity and late seral structural through early seral stages of development. These conclusions reflect information in the NWFP Science Synthesis, which notes that green tree retention harvests may retain habitat for some late-successional animal and plant species, but also notes that research on the topic is somewhat limited as large-scale experiments and adaptive management has not occurred (NWFP Science Synthesis, p. 152). Later, the NWFP Science Synthesis also states:

“There is no new science that specifically indicates that timber management using retention silviculture in forests over 80 years old in the matrix is inconsistent with the original goals of the NWFP. In addition, partial stand-replacement fires were part of the historical dynamics of some older forests of the moist zone, and the ecological effects of excluding this type of disturbance are not well understood but might convey some resilience to climate and future fire.” (NWFP Science Synthesis, p. 976).

Analysis summary: As such, our review highlights a potential tension in the Flat Country project. The shelterwood treatments planned in the Flat Country proposed action adversely affect mature forest conditions and the development of old-growth forests, though aspects of the treatments could mitigate these effects. However, the project is located in the NWFP Matrix Management Area where these types of treatments are allowed, and these treatments contribute to meeting goals in the NWFP associated with providing a sustainable timber supply. The new policies do not provide explicit direction that decision-makers should prioritize conservation of mature and old-growth forests or at what scales these decisions (e.g., project, landscape, or national forest unit level) should be made. Current work to develop additional recommendations may provide additional specific clarity on these topics.

Carbon Stewardship

The policies described above acknowledge the role of mature and old-growth forests in storing carbon and emphasizes the need for place-specific and science-based strategies for carbon stewardship. These policies recognize that carbon stewardship should not necessarily involve maximized carbon stored by forests across all ecosystems and notes potential tradeoffs between carbon stewardship and climate change adaptation and with other priorities for management, including providing for multiple uses.

The FEIS section on climate change (Section 3.14) qualitatively analyzes the project effects on climate change, concluding that the project would result in small initial releases of forest carbon into the atmosphere. This analysis of climate change does not quantify effects on forest carbon and does not compare alternatives. This approach aligns with current national CEQ and USFS guidance on climate change analyses in NEPA. Specifically, CEQ rescinded 2019 draft guidance and is currently reviewing and updating a previous version of the guidance published in 2016. While this CEQ review occurs, agencies are recommended to consider all available tools and resources, including the 2016 guidance, which allows for qualitative consideration of project effects on greenhouse gases as was used in this FEIS. The FEIS analysis of project effects on carbon concludes:



“In summary, this proposed action affects a relatively small amount of forest land and carbon on the Willamette National Forest and, in the near term, might contribute an extremely small quantity of GHG emissions relative to national and global emissions. This proposed action will not convert forest land to other non-forest uses, thus allowing any carbon initially emitted from the proposed action to have a temporary influence on atmospheric GHG concentrations, because carbon will be removed from the atmosphere over time as the forest regrows or will transfer carbon to the product sector where it may be stored for decades and substitute for more emission intensive materials or fuels. This proposed action is consistent with internationally recognized climate change adaptation and mitigation practices” (Flat Country FEIS, 225).

In addition, the FEIS further discusses carbon stewardship in Appendix J: Response to Comments on the DEIS (Flat Country FEIS, p. 346-347). The response-to-comments states that the project is not intended to maximize carbon and notes that the Forest Service manages for carbon sequestration as one of several ecosystem services. This logic provided in the FEIS reflects statements in recent policies, which note the need to consider potential tradeoffs between carbon stewardship and other ecosystem services and management goals.

The Response-to-Comments also provides additional literature review discussing the potential effects of thinning for reducing severity of potential wildfire and the implications of these activities for carbon storage:

“Several studies throughout western forests support the efficacy of thinning for reducing severity of potential wildfire (Agee and Skinner, 2005; Safford et al., 2009; Stephens et al., 2009; Safford et al., 2012). There is also evidence to suggest that treatments such as thinning reduce burn probability in adjacent untreated stands (Moghaddas et al., 2010). Evidence does indicate a cost in terms of reduced carbon storage for this reduced burn severity (Campbell, Harmon, and Mitchell, 2012). However, over large areas and long periods of time, Campbell and Ager (2013) show forest carbon stocks are insensitive to a wide range in fuel reduction treatment effectiveness, lifespan, vegetation recovery rates, and other factors.” (Flat Country FEIS, p. 346)

However, the papers cited in this analysis are primarily focused on drier forest types affected by fire exclusion, and their applicability to the moist forests in the Flat Country project area are limited (Reilly et al. 2022).

The response-to-comments also provides information on baseline carbon stocks on the Willamette National Forest. Specifically, the response reports that the Willamette National Forest, as a whole, stores around 250 teragrams of carbon and disturbances (including fire, harvest, and insects) that occurred over a 60-year period resulted in a loss of around 25 teragrams of potential carbon storage, though regeneration and growth would likely have offset the loss of potential carbon storage. In addition, this analysis indicates that, during the time period between 1991 and 2011, wildfire became the dominant disturbance type affecting the Willamette, overtaking timber harvest. This information is provided to support a conclusion that the project is not likely to have substantial effects on carbon storage on the Willamette National Forest (Flat Country FEIS, p. 346-347).

Analysis: The NWFP Science Synthesis summarizes science on carbon uptake and storage, including how old-growth and mature forests contribute to carbon storage and sequestration and how forest management affects forest carbon. The NWFP Science Synthesis discusses how old-growth forests in the



NWFP area store some of the highest amounts of carbon in forests in the United States and, as a result, their carbon storage potential is receiving increasing interest. The synthesis notes that Douglasfir/western hemlock forests can continue to function as carbon sinks for over 500 years. It states:

“Forest management effects on carbon differ with management intensity, rotation length, and forest type. It is often thought that managing forests on a short rotation (e.g., 40 to 50 years) would provide the most effective long-term carbon sequestration, but longer rotations and selective or no harvest provides the most carbon sequestration (Harmon et al. 1990, Ryan et al. 2010). Forest management under the NWFP to promote older forests with a low level of timber harvest would provide for more carbon sequestration than more intensive management (Creutzburg et al. 2017, Kline et al. 2016)” (NWFP Science Synthesis, p. 147).

However, the science synthesis also notes potential tradeoffs between managing forests to maximize carbon storage and management efforts to create early-successional habitat, and tradeoffs in drier forests between management that maximizes carbon storage and efforts to reduce forest density in order to increase resilience to disturbances. However, these tradeoffs in drier forests are less relevant to the wetter Douglas-fir/hemlock forests, where increasing carbon stored in forests by facilitating the development of older forests is a viable goal.

There have been regional modelling studies focused on forests in the Pacific Northwest that indicate that retaining and even increasing carbon stocks on public lands as opposed to harvesting and storing carbon in wood products, could play an important role in mitigating carbon emissions (e.g., Law et al. 2018). These studies and other arguments generally highlight the relatively high amounts of carbon in forests in the Pacific Northwest and the relatively low risk of disturbance effects in wetter Northwest forests, when compared to drier forests elsewhere in the West. In response to SM 1077-004, the Forest Service is required to develop spatial analyses that will consider carbon, disturbance and climate change vulnerabilities, and current management direction. These products are not currently available, but there is a possibility that they will highlight wetter forests in the Pacific Northwest, including those in the Flat Country project area, as especially important for the conservation of forest carbon in line with these other modelling studies.

Timber harvest would involve removing carbon currently stored in forests in the project area. Some of the carbon removed would be stored in wood products and forests would take up carbon as they regenerate and grow. However, the proposed action would likely involve some reduction in the amount of carbon stored in the Flat Country project area. As such, there is a tradeoff between carbon storage and uptake, on one hand, and providing a sustainable supply of timber, on the other. The new policies described above do allow for these types of tradeoffs.

Analysis summary: As the FEIS acknowledges, our review suggests that it is likely that the proposed action would result in some reduction in the amount of carbon stored by forests in the project area. However, the policies described above do not require maximizing carbon stored in forests and allow for tradeoffs between carbon storage and other priorities, such as sustainable timber production. The FEIS does address carbon and the new policies that have come out to date do not specifically require supplementing the current analysis. However, there is uncertainty associated with this determination given the fact that CEQ is currently updating its NEPA guidance on the topic and the USFS is developing spatial analyses and recommendations pertaining to carbon stewardship.



Climate Adaptation and Resilience

In addition, the policies described above also direct the Forest Service to manage for *climate resilience* both in general and for climate resilience of mature and old-growth forests. As described in the above policies and the USDA and Forest Service climate adaptation plans, managing public lands for climate resilience requires understanding potential climate vulnerabilities and developing adaptation actions to respond to these vulnerabilities. As is the case for other goals, these policies do not specifically require that all projects include consideration of climate adaptation and resilience.

Analysis: The Flat Country FEIS does not provide detailed analysis of how the proposed action might affect climate resilience. However, under previous NEPA guidance, this would not be required, and it is not clear in the new policies that this would be required in all NEPA analyses, though we note that this may change.

Information on climate vulnerabilities relevant to the Flat Country project area can be found in the NWFP Science Synthesis and a recently published peer-reviewed climate change vulnerability assessment that covers the Willamette National Forest and two other management units in the region (Halofsky et al. 2022). These syntheses indicate that temperatures in the western Cascades have increased by about 2 degrees Fahrenheit since the beginning of the 20th Century. Climate projections indicate that temperatures will increase by up to an additional 8 degrees Fahrenheit by the end of the 21st Century. There is uncertainty in the projections about the change in total annual precipitation; however, it is likely that more precipitation will come as rain rather than snow due to warmer temperatures (Halofsky et al. 2022).

The most substantial effects of climate change on forests in the area will occur through increases in disturbances, including drought and wildfire (NWFP Science Synthesis; Halofsky et al. 2022). There has been an increase in area burned over the past several decades on the Pacific Northwest, though fire exclusion has effectively reduced the area burned by fire at regional scales (Reilly et al 2017), as well as in the project area given the large number of suppressed ignitions. Fires have affected much of the surrounding landscape in which the study area is embedded, most notably the 2020 Holliday Farm fire. This fire created large patches of early seral conditions which are now approaching the historical range of variability at both landscape and ecoregional scales (Reilly et al. 2022). However, fires within the project area have been limited to upper elevations and the immediate project area landscape currently lacks in heterogeneity that would have been promoted by mixed-severity fires had suppressed fires been allowed to burn under more moderate weather conditions.

Moist forests, like those in the Flat Country project area, are expected to continue to be dominated by Douglas-fir, though species like western hemlock that are less tolerant of drought and fire may decrease in abundance. With expected increases in fire, there may be an increase in abundance of hardwoods. Overall productivity may increase due to warmer temperatures; however, limited moisture availability may limit these benefits (Halofsky et al. 2022).

While this increasing trend in wildfire since the early 1980s has not been attributed directly to the effects of climate change, the science clearly indicates that hotter and drier conditions associated with increases in temperature will lead to more wildfire activity and wildfire projections suggest that area burned by wildfire will increase in the Pacific Northwest. However, these projected changes will vary based on location (Davis et al 2017, Reilly et al. 2018; NWFP Science Synthesis). Research is indicating



that younger forests may be more vulnerable to high-severity fire than older forests, since older forests tend to have larger trees with thicker bark that offer some resistance to fire under moderate conditions, though forests of all types are likely to burn at high-severity during periods of extreme fire behavior driven by strong winds as was the case during the 2020 Labor Day fires (Evers et al. 2022; Reilly et al. 2022). As such, the shelterwood treatments may slightly reduce resilience to wildfire in treated areas due to the removal of larger trees.

Thinning and dominant tree release treatments may provide climate adaptation benefits by promoting the development of species like western white pine and sugar pine that are better adapted to drought and that would contribute to overall species diversity. Similarly, planting following regeneration harvests may also contribute to this goal.

Impacts of Recent Wildfires

Since completion of the FEIS, there has been a substantial amount of wildfire activity in the Pacific Northwest, including a series of large fires occurring around Labor Day of 2020. Additional fires occurred on the Willamette National Forest and elsewhere in the western Cascades in Oregon in 2021 and 2022. While none of these fires directly affected the Flat Country project area, the Holiday Farm Fire occurred in the McKenzie River Watershed, primarily west of the Willamette National Forest. This and other fires have changed forest conditions across the NWFP area. This section summarizes information on these fires to inform a determination of whether a supplemental NEPA analysis is needed. This section first provides a summary of the effects of these fires at the landscape scale and then addresses whether there is a need to provide supplementary analysis on certain topics in the FEIS.

Summary of Recent Wildfires

Wildfires occurring in 2020 in the western Cascades in Oregon burned 817,893 acres in total, including >70% at high severity (Reilly et al. 2022). The rapid growth of these fires occurred during a several-day period that coincided with the Labor Day holiday weekend when anomalously dry conditions coincided with strong winds blowing from east-to-west. While these fires burned much larger areas in total and larger areas at high severity than fires in previous decades, science suggests that these fires in 2020 were consistent with wildfires that occurred in the western Cascades in the late 19th and early 20th century following European colonization. These infrequent but large fire events occurring during particularly dry and windy periods are characteristic of westside Cascades forests with infrequent, highseverity and moderately frequent, mixed-severity fire regimes (Reilly et al. 2022). These fires included the Holiday Farm Fire, which burned around 173,000 acres west of the project area in the McKenzie River watershed.

In 2021, around 200,000 additional acres burned in the western Cascades in Oregon, including the 30,000 acre Middle Fork Complex on the Willamette National Forest.

NWFP effectiveness monitoring data provides insights on the effects of these fires at the landscape scale. Mapped OGSIs for 2017 censored based on high-severity disturbances indicate that the western Cascades of Oregon lost 3.1% of the late-successional forests (OGSI-80) in this ecoregion and 2.4% of the old-growth forests (OGSI-200) in this ecoregion between 2019 and 2021. During the most recent NWFP monitoring report, losses for the entire 25-year reporting period (1993-2017) were 3.1% for OGSIs-80 and 2.5% for OGSIs-200 (Davis et al. *In press*). Most of the regional losses for 2019-2021 were associated with large wildfires, consistent with the recognition that fire, rather than timber harvesting, has become the

primary risk to late-successional and old-growth forests in the region (Davis et al. 2015, *in press*). This point is also noted in recent policies described above.

Table 1. Changes in OGSi-80 and OGSi-200 from 1993-2017 (25-year NWFP reporting cycle) and 2019-2021 for the western Cascades of Oregon.

	OGSI-80 Change		OGSI-200 Change	
	(acre)	(%)	(acre)	(%)
1993-2017*	-93,500	-3.1	-44,100	-2.5
2019-2021	-92,592	-3.1	-41,456	-2.4

* from Davis et al. *In press*

Analysis

For most resources, the effects analysis focuses on the project area, which is in line with NEPA requirements. Since wildfires did not directly affect the project area, the effects of the fires and the projects would still be within the range of effects considered in the FEIS. The Fire and Fuels section of the Flat Country FEIS provides a brief summary of fire history in the project area. Specifically, the section identifies three large fires that have burned into the project area from the Mount Washington Wilderness since 2010. The section also notes that nearly 200 fires have occurred in the project area between 1970-2018. As such, there is not a need to conduct supplementary analysis of the effects of the fires on the project area. As noted above, the fires had effects on the broader landscape, including by increasing the amount of early-seral forests in the broader landscape. However, consideration of these broader landscape effects falls outside of the scope of this analysis.

Cumulative Effects

The original review during the objection resolution period found that there were some weaknesses in the FEIS cumulative effects analysis for several resources. From the Objection Reviewing Officer review documentation it states, “Upon review of the Flat Country FEIS, there are several sections of the FEIS where the cumulative effects analysis is a bit brief and lacking detail. For example, the FEIS at 210 states that ‘The Flat Country Project will not add cumulatively to effects to recreation in the Flat Country project area because there will be no long-term adverse effects to recreation as a result of project implementation.’ Long-term impacts are not the same as cumulative impacts. Under scenic resources, the FEIS at 203 concludes that ‘The no-action and proposed action will not add cumulatively to past, present and reasonably foreseeable future projects because the no-action and proposed action alternative will not adversely affect scenic resources.’ However, the discussion of direct and indirect effects notes that there will be short term adverse effects to scenery...In addition, some resources correctly stated that there would be no cumulative effects associated with no action, while others stated there would be cumulative effects without taking action. If there is no action taken, by definition, there can be no cumulative effect. Instead, under no action it would have been appropriate to discuss what would happen if the project didn’t take place, which was correctly done for most resources...Some resources articulated that there would be a cumulative effect (beneficial or adverse) but did not say why this mattered or didn’t matter – there was no ‘so what’ that was explained as part of the analysis” (Objection Reviewing Officer Briefing, September 4, 2020).

Effects of Fires on Timber Supply and the Purpose and Need



The FEIS and ROD state that the Willamette National Forest's Probable Sale Quantity (PSQ) annual target is 111 million board feet based on estimates from 1998. Citing the NWFP, the FEIS defines PSQ as "an estimate of probable harvest levels that could be maintained on a forest annually" and notes that PSQs "represent the best assessment of the average annual amount of timber harvest that could occur on a forest without decline, over the long term, if the schedule of harvests and regeneration are followed" (Flat Country FEIS, p. 118). The purpose and need for the project ties to the PSQ (most likely tied to matrix management area objectives) both in terms of the project's contribution of 102 MMBF to the Willamette's target over a near-term five-year period and the development of younger stands that will provide longer term timber supply.

PSQ does not directly correspond to actual timber outputs. Timber outputs from the NWFP area have been consistently below estimated PSQ because expectations that matrix lands would be managed for timber production have not been met. Today, an estimated 8 percent of the NWFP area aligns with timber production emphasis. In 1994, about 16 percent of the NWFP area emphasized timber production. Since the inception of the NWFP, large areas of matrix have been designated as critical habitat for the NSO and therefore no longer contribute to timber harvest as predicted. In addition, projects in the NWFP area generally do not use clearcutting as assumed in the original NWPF estimates of PSQ.

The recent fires (2020/2021) on the Willamette National Forest impacted 16.3 MMBF of advertised sales that were modified or cancelled completely, 13 active sale contracts that were in various states of harvest/remaining work to be completed, and over 100 MMBF of existing planning efforts that were put on hold, cancelled, or modified. Prior to the 2020/2021 fire years the Willamette was on track to sustainably award between 80 and 90 MMBF annually and planned to award that consistently over the long-term with existing NEPA decisions and out-year planning in place.

Following the fires, the Forest has entered a period of rebuilding NEPA out-year planning and green tree program while simultaneously focusing on opening the Forest and ensuring safe access to the public. That recovery effort is ongoing, and the Forest is currently analyzing a proposal to address danger trees within road corridors so that the public has safe entry to the Forest. In FY21 the Forest awarded approximately 32 MMBF (down from 82 MMBF in FY20 and 112 MMBF in FY19) and are on track to award a similar amount (32 MMBF) in FY22. The material mainly derived from suppression deck sales, hazard and danger tree abatement treatment and to a lesser degree salvage sales.

The Region launched a five-year effort to stabilize the timber and fuels base programs and rebuild NEPA and sale preparation shelf stock in FY22. The Forest is on track to rebuild their base timber program to predictably and consistently award 75 MMBF annually over the long-term starting in FY27. This trajectory towards consistent delivery of volume relies on projects like Flat Country moving forward to implementation. Therefore, the purpose and need of this project reflects current needs to meet Forest Plan direction by producing timber in matrix lands.

Regional Scale

In June 2021, Oregon Forest Resources Institute (OFRI) completed an assessment of the impact of the 2020 fires to Oregon's forest products sector. This report covered impacts to private, state, and federal timber resources. OFRI focused on the 12 largest fires in 2020 that covered nearly one million acres. Utilizing RAVG data the report estimates that about 45% of the impacted acres were affected by high severity fire defined as a loss of greater than 75% canopy cover. The long-term annual impact from this



work showed a reduction of between 115 –265MMBF per year for the next 40 years – approximate time for growth to meet minimum commercial size utilized by existing forest product manufacturers. The economic impact to Oregon's forest products sector was estimated to be \$5.9 billion and between 1,200 and 3,000 jobs over the next 40 years.

In March of 2022, the Beck Group (a private forest planning and consulting firm based in Portland, OR), building on the OFRI report, assessed the trends across the regional timber supply for Oregon and Washington. They looked at adjustments to state's habitat conservation plans (HCPs), the Oregon Forest Accord, impacts of the 2020 fires, and adjustments to WA state's sustainable harvest calculations to summarize the regional outlook for the timber industry. The report notes that there is likely to be a 575 MMBF annual decline in timber volume harvested for the next 40 years in Oregon and Washington. This volume represents sustaining 8 mills and 6,325 jobs in the forest products sector according to their calculations.

Broader-scale Issues

As described above, the review of the Flat Country project reveals potential tradeoffs between different priorities outlined in these new policies, including between supporting local economies through the provision of sustainable forest products and conserving mature and old-growth forests. There is uncertainty in the direction in these policies, as they stand now, in terms of how to reconcile this tradeoff. There is also currently uncertainty in determining at what scale these goals should be considered and whether project-level decision-making is the appropriate venue for navigating these tradeoffs.

The project complies with the direction outlined in the NWFP. The NWFP was designed to balance providing sustainable timber supplies and protecting old-growth forests and habitat for associated species through a system of land use allocations that focuses on conservation of old-growth forests in most areas (e.g., Late Successional Reserves) while allowing for timber harvest in others (e.g., Matrix), coupled with standards and guidelines. In addition, our review suggests that the NEPA is adequate.

Recent large wildfires, including the Labor Day Fires as well as the 2022 Cedar Creek Fire to the south of the project area, are not unprecedented and are unlikely to disappear from landscapes of the western Cascades of Oregon (Reilly et al. 2022). These fires did not directly impact the project area, but rather impacted resources in the broader region. In some cases, these fires are of a similar or larger in area than project area itself. These fires make it more difficult for the agency to achieve goals, including conserving mature and old-growth forests and providing sustainable timber supplies. Effectively analyzing the effects of these recent fires and tradeoffs between these priorities is difficult to do at the project-scale. As such, it may be more effective to address the issues in the context of land management planning rather than project planning.

Viewing the project in the context of the broader landscape could yield mixed conclusions. On one hand, it may be more possible to determine that the project aligns with the priorities outlined in new policies if the broader landscape view suggests that there are adequate other lands available where conflicting priorities could be achieved. However, on the other hand, it is possible that a broader landscape view would identify the Flat Country project area as a focal area for achieving both conserving mature and old-growth forests and providing sustainable timber given higher levels of ongoing and expected change elsewhere on the landscape. Determining this falls outside the scope of this project-level review.



Public concern over projects of this sort is likely to continue, given the increased attention focused on these issues as a result of new policies as well as the increasing trend in wildfire activity in the area. Thus, the decision reached for this project, as well as reactions to that decision, may have implications for other projects, planning efforts, and agency priorities.

Options

Several options are available to the decision-maker, including:

- Implement the proposed action without further analysis or modification.
- Implement the proposed action with modifications to reduce impacts on forests that are mature based on age classification but that may be starting to exhibit structural characteristics of old growth forests (e.g., dropping units, ensuring that retained trees and reserves protect patches exhibiting characteristics of older forests).
- Complete formal interdisciplinary Supplementary Information Report and supplementary analysis, if necessary, to address potential issues related to new policy goals.
- Select Alternative 3.

Options for Supplementary Analysis

Our review has identified several options for the Forest to address in a supplementary analysis in the event that they decide to do one. These address issues identified in the review of the issues above.

- Explore using stand exam data to calculate Old-Growth Structural Index (OGSI) for treatment units. This approach would provide a way of explicitly considering forest structural characteristics associated with old-growth that would complement the age-based classification of old-growth.
- Incorporate additional information from NWFP Science Synthesis and other recent literature to enhance effects analysis, particularly for discussion of the effects of thinning and shelterwood harvests on forest structure.
- Add additional consideration of priorities in recent policies, including conservation of mature and old-growth forests, climate resilience, and carbon stewardship.
- Review effects analysis and consider whether recent wildfires would affect conclusions about effects.
- Weaknesses remain in the cumulative effects analysis in the FEIS. If the decision is made to supplement the Flat Country analysis, all resources should review their cumulative effects analysis for completeness. Particular attention should be paid to the cumulative effects analysis area.

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