Blue Mountains
Biodiversity Project

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June 29th, 2026

Ardin Simpson, District Ranger
North Fork John Day Ranger District
Umatilla National Forest
PO Box 158
Ukiah, Oregon 97880

RE: Blue Mountains Biodiversity Project's comments on the Battle Bruin scoping letter

Submitted via the CARA system at: https://cara.fs2c.usda.gov/Public/CommentInput?Project=56325

Ardin Simpson,

Blue Mountains Biodiversity Project (BMBP) hereby submits these comments and associated exhibits on the scoping letter for the Battle Bruin project on the North Fork John Day Ranger District on the Umatilla National Forest.

I am submitting these comments in addition to the comments submitted on behalf of BMBP by Austin Starnes, BMBP's Staff Attorney.

BMBP is an environmental nonprofit organization based in eastern Oregon that has been working to protect and restore the ecosystems of the Blue Mountains and Eastern Oregon Cascades since 1991. BMBP's focus is working to stop or modify management projects that threaten the biodiversity and ecological integrity of the landscape such as logging, road building, livestock grazing, herbicide and biocide use, and mining. BMBP's work area encompasses federal public lands in eastern Oregon and southeastern Washington, including the Deschutes, Ochoco, Malheur, Umatilla, Fremont-Winema, Wallowa-Whitman National Forests. BMBP prioritizes the protection of old growth; sensitive, threatened, and endangered species; water quality; roadless areas; and natural ecological processes.

Summary of Battle Bruin proposed logging and burning:

Mechanical logging/silviculture:
Commercial logging: 8,557 acres
Small diameter: 15,883 acres
Shaded fuel break commercial: 4,693
Shaded fuel break small diameter 5,392

Non-mechanical logging/silviculture:
Hand thinning: 6,566 acres
Hand thinning in RHCAs: 5,993

Other:
Landscape burning: 35,978
Planting and seeding: up to 35,978 acres (any use of herbicides? Poisoning of gophers, porcupines, etc?)
Temp roads: 27 miles (new: 19 miles; existing: 8 miles)
Roadside danger tree removal

> (note/ask about: number of acres? Number of large/old trees? Protection from logging for strategic placement of "temp" roads etc.?)

Special forest products:

> "Commercial firewood harvesters would only be allowed to remove dead trees 24 inches in diameter at a stump height of 12 inches, that are within 300 feet of a road."

My experience as a fire lookout at Desolation Butte:

Over three seasons between 2008 and 2012, I one of the contractors that staffed the fire lookout positions at Desolation and Tower Mountain Lookouts. During my time as fire lookout, I became intimately familiar with the landscape surrounding Desolation and Tower Mountain Lookouts. In particular, I spent considerable time exploring and getting to know the areas around Desolation Lookout, including the areas immediately surrounding the lookout as well as many nearby areas, such as Jump Off Joe Lake, Olive Lake, and nearby creeks. The forests in the Battle Bruin area are among my favorite places in Oregon. They are varied and highly heterogeneous mixed-conifer forests, supporting complex wildlife habitats and an incredible diversity of plants, birds, wildlife, and insects. The patchy post-fire habitats in particular seemed to attract the most wildlife, especially birds.

The forests surrounding Desolation Lookout and those nearby show clear evidence of recent high/mixed-severity fire. The birds and wildlife were extremely abundant in these heterogenous habitats created by patchy mixed-severity fires. The birds in particular flocked to snags and open meadows created by high severity fire, especially those surrounded by denser multi-story forests.

It was not unusual, while I was working at lookout, for dense clouds to roll in—even in June or July—and completely obscure my view of the surrounding landscape (and even the ground) for days if not weeks on end. The area is very moist, often steep, and at higher elevations. As such, it naturally supports multi-story dense mixed-conifer forests. These moist and mid to-high elevation areas burn much less frequently compared to drier, lower elevation forests, and have long fire return intervals on the order of >100 years.

It is important to note that it is relatively common for lighting strikes to start small fires of less than 1 acre (or even one tree) that go out without human intervention. For example, in my short time as fire lookout, I witnessed at least 3 lightning strikes that burned less than one acre before going out by themselves. I also witnessed a mixed-severity fire initiated by a lightning strike, just north of the lookout, which was allowed to burn naturally for several weeks, before eventually going out on its own.

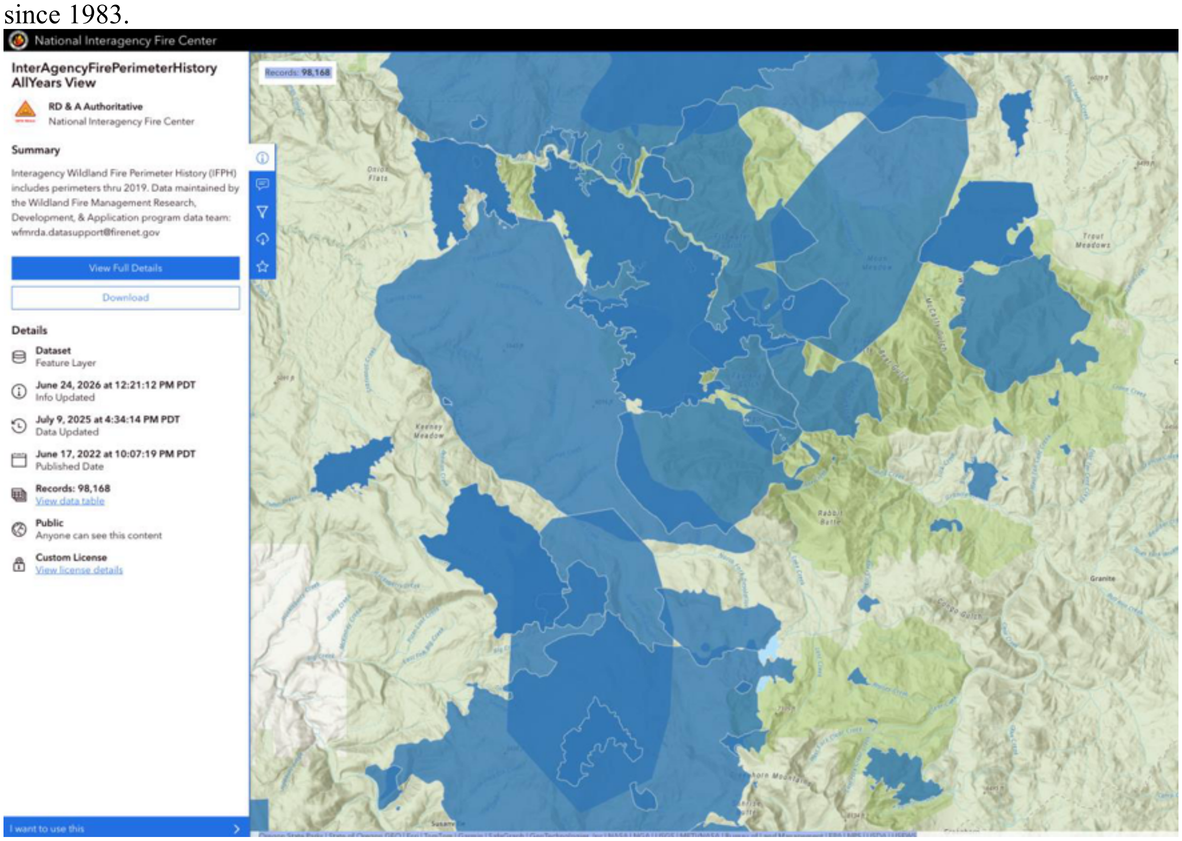
Unfortunately, fire scar analyses can mistake or misconstrue such spatially isolated incidents as an indicator of fire across a broader spatial scale. Fire scar analyses then use these single fire scars as evidence that these forests have fire return intervals that are comparable to the frequent, low-intensity fire return intervals found in lower elevations and drier forests. Such analyses run contrary to decades of scientific research and evidence. (Please see the summaries and white papers below for more details and citations).

The entire project area has experienced several mixed-severity fires over the past 135 years. As such, it is still within the historic range of variability for fire return intervals in mixed-conifer forests. Many of the areas with proposed commercial logging and other silvicultural treatments in the Battle Bruin sale appear to overlap with recent mixed severity fires including the Otter Creek fire (2007), the Bull fire (1996), the Kelsay Butte fire (2009), the Lost Lake fire (1986), the and the Jumpoff fire (1986). It's not clear if the Bull Spring 2 fire (2003) overlaps with planned logging/silvicultural activities within the project area. The 1893 fire overlaps with much of the central portion of the project area, and the 1910 fire appears to overlap with logging proposed west of Olive Lake, between the Lake and Jump Off Joe Ridge.

Also note that fire has burned in large areas across the National Forest surrounding the project area. This includes large and high-severity fires such as the Tower fire in 1996. Consequently, there are few areas remaining that provide fire refugia, which is particularly important for species that rely on mature and old forests or denser/multi-story forests. The project area is currently providing fire refugia for wildlife in some areas, such as those that burned over 100 years ago. Preserving this habitat is crucial, given how widespread fire has been across the landscape in and around the project area in the past 50-100 years.

Proposed logging, roading, and burning in these heterogenous post-fire habitats will homogenize the area, convert it to pine plantations, degrade or destroy important wildlife habitat, further fragment the forest, and degrade or destroy remaining habitat blocks and crucial connectivity corridors. It will further disrupt the dynamic and complex fire cycles that create unique and important habitats.

The figure below shows fires since 1893 within the project area, including several fires that occurred since 1983.



The following figures show several of these fires highlighted, and include information such as their name and year.

National Interagency Fire Center
InterAgencyFirePerimeterHistory AllYears View
RD & A Authoritative
National Interagency Fire Center
Summary
Interagency Wildland Fire Perimeter History (IFPH) includes perimeters thru 2019. Data maintained by the Wildland Fire Management Research, Development, & Application program data team: wfmrda.datasupport@firenet.gov
View Full Details
Download
Details
Dataset
Feature Layer
June 24, 2026 at 12:21:12 PM PDT
Info Updated
July 9, 2025 at 4:34:14 PM PDT
Data Updated
June 17, 2022 at 10:07:19 PM PDT
Published Date
Records: 98,168
View data table
Public
Anyone can see this content
Custom License
View license details
Records: 98,168
InteragencyFirePerimeterHistory:
Zoom to

National Interagency Fire Center
InterAgencyFirePerimeterHistory AllYears View
RD & A Authoritative
National Interagency Fire Center
Summary
Details
Records: 98,168
InteragencyFirePerimeterHistory:
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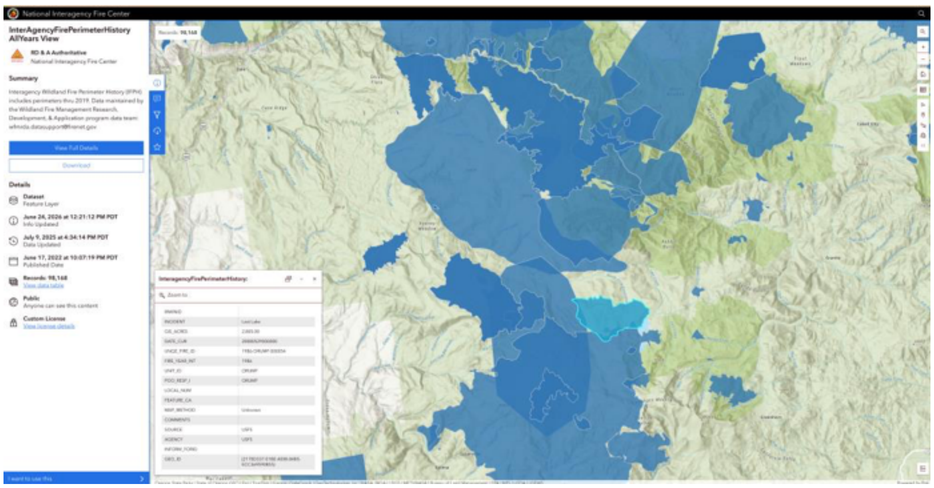
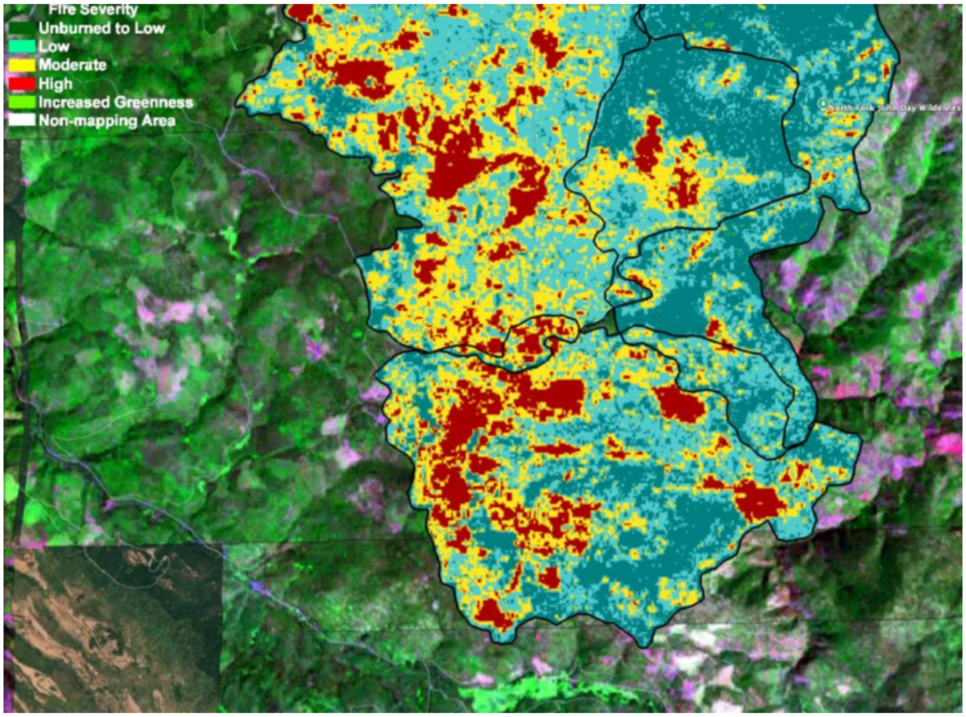
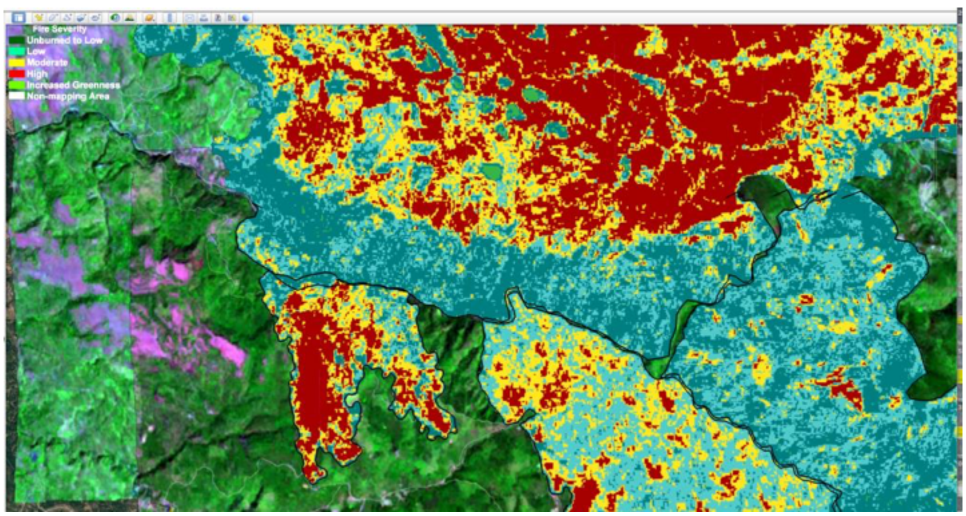


I was able to find fire severity information for a few of these fires on the government-run website "Burn Severity Viewer", which has an interactive map: https://burnseverity.cr.usgs.gov/viewer/.

The fires that I was able to find burn severity information for included the Bull, Kelsay Butte, Otter, and Lost Creek fires (see figures below). Note that most of the fires in these areas appeared to burn and moderate and severe intensity, which is indicative of a longer fire return interval of >100 years.

There is no "emergency" concerning fire in mid and high elevation forests with >100 year fire return intervals. Where these forests have not been decimated by recent logging, they are functionally intact and should not be logged.





Unfortunately, the Battle Bruin sale proposes extensive commercial logging as well as fuel breaks around Desolation lookout and Jumpoff Joe lake, as well as thinning along the North Fork of Desolation Creek, Bruin Creek, Kelsay Creek, and many other creeks, and thinning directly adjacent to Wilderness and other sensitive and ecologically important areas.

Jumpoff Joe lake, for example, is a recreational and ecological treasure that contains unique and sensitive habitats that support imperiled species such as Columbia spotted frog (I witnessed one there, and the areas within the project area are in their range and contain suitable habitat). Logging in these and other mature and old forests, post-fire and mixed-conifer forests, and ecologically unique and sensitive habitats in the project area will cause irreparable harm to these forest ecosystems, the species they support, and the recreational opportunities they provide.

Jumpoff Joe Lake has Google comments by users such as stating that the lake is “one of my favorite secluded alpine lakes”. Another person has included the following beautiful photo clearly showing evidence of past mixed-severity fire with heterogenous forest cover. The moist mixed-conifer forests around this lake sit at over 6,000’—which, again, contain functionally intact moist forests that have >100 year fire return intervals. It would be a travesty for the Forest Service to degrade or destroy the unique habitat or the remote and natural character of the forests surrounding the lake.

Image by Benjamin Klecker 2019, via Google Maps. Note the evidence of past fire, the heterogenous and mixed-conifer forests in this high elevation lake.

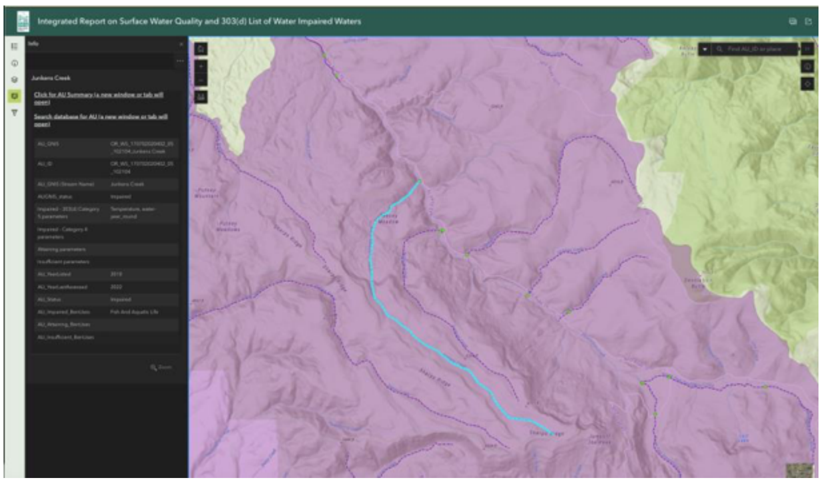
We are extremely concerned about the thinning within RHCA buffers on all major creeks in this large project area. While we appreciate that the Battle Bruin sale does not propose commercial logging, we remain opposed to such large-scale silvicultural activities within RHCA buffers. Further, we are concerned about thinning adjacent to streams that are violating water quality standards and are 303d listed.

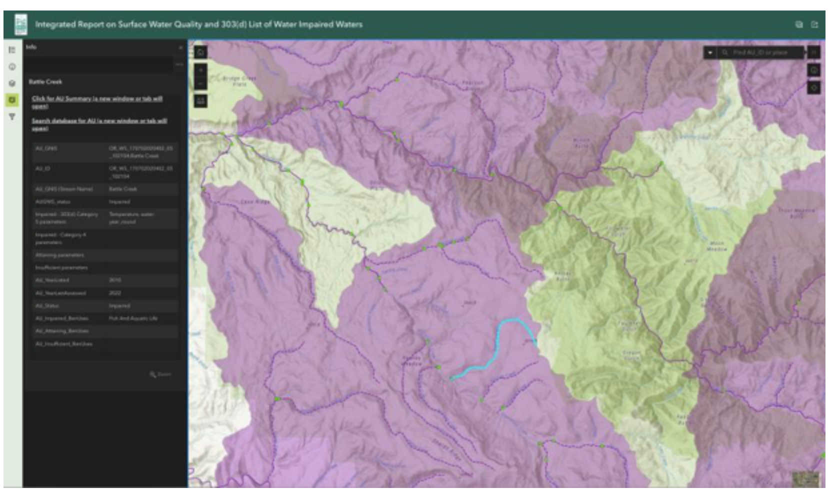
It appears that most creeks within the project area have a fish use designation of Bull trout Spawning and Juvenile Rearing, which has a 12 degree Celsius stream temperature standard. It also appears that many or most creeks within the project area are also on the ODEQ 303d list. These include: Junkens Creek, sections of Desolation Creek, Beeman Creek, Battle Creek, and others. We request that the Forest Service provide stream temperature data for public review and comment, as part of a DEIS for the Battle Bruin sale (including continuous temperature data summaries such as 7daymax temps). In addition, all data summaries for RMOs that the Forest Service has available for streams within the project area should also be made available for public review and comment, including those for stream sediment, LWD, shade, and others. We also want to note that using stream shade as a surrogate for stream temperature is neither accurate nor appropriate. Please see the attached white papers/summaries for additional details.

The John Day River Basin is currently undergoing the process for a new TMDL (https://www.oregon.gov/deq/wq/tmdls/Pages/John-Day-River-Basin-Temp.aspx). The Forest Service should not be logging (even hand thinning) within RHCAs in almost 6,000 acres along hundreds of miles of streams in the project area, particularly not in streams and watersheds that are already violating stream temperature standards and are awaiting a TMDL.

We are particularly concerned about stream temperature violations and 303d listings within the project area given that the entire project area is within a C7 Aquatics Emphasis designation. A DEIS should be published in order to address the significant impacts, particularly on aquatic ecosystems, that will result from logging, roading, and burning in the project area.

These are just two of the many creeks within the project area that are currently 303d listed and in need of a TMDL:





Logging proposed within the Battle Bruin sale will further retard attainment of RMOs by removal of riparian shade, as well as increased stream temperature and fine sediment, and retard attainment of RMOs such as pool depth, embeddedness, LWD, and others. PACFISH/INFISH no-cut stream buffers should be adhered to and fully implemented. Noncommercial logging should be dropped or severely scaled back. We are also very concerned about other activities within RHCAs, such as any overlap with widespread fuel breaks, pile burning, skidding, heavy equipment use within RHCA buffers, and other harmful actions the agency may engage in during project implementation. Such activities are likely to retard attainment of RMOs. It is not entirely clear if or how much the agency is proposing to deviate from PACFISH standards, since little information has been offered during scoping.

Blocks of unroaded forests, even relatively small blocks, are crucial for supporting clean cold water for fish and other sensitive aquatic species, and for maintaining healthy stream habitats. We are very worried that logging will further fragment the project area, as well as create human disturbance and edge habitats adjacent to the North Fork of the John Day Wilderness. For example, the "special products" woodcutting proposed in the sale appears to be directly adjacent to the Wilderness boundary. This seems to also risk woodcutters going into the Wilderness, even if accidentally, to cut wood. This risks ruining the Wilderness character of an extremely important Wilderness area.

Similarly, no wood cutting or any other thinning or logging should overlap with designated old growth areas. Such logging risks the loss of key large wood (LWD) needed for streams. In addition, large trees, logs, and snags-- and recruitment for all these large tree structures-- is important for watershed hydrology and riparian habitats and can be harmed by upslope logging as well as logging within RHCAs. Logging in RHCAs, as well as mixed-conifer, mature and old forests, and other sensitive habitats should also be dropped.

The C7 Aquatics Emphasis in the Forest Plan for the Umatilla National Forest includes the following direction (emphases added):

> "Anadromous fish habitat (includes streams and associated riparian areas) will be managed to **produce at least 90 percent of potential smolt habitat capability index (SHCI).** The standard should be achieved by meeting the following:
> • Riparian vegetation will be managed to promote floodplain, bank, and channel stability, resiliency to disturbance, and aquatic diversity.
> • Where natural conditions permit, streamside vegetation along the entire length of perennial streams will be managed to **maintain an average shading of 80 percent of the entire stream surface shaded. Where existing shading is already below this level, retain all vegetation contributing to stream surface shading.**
> **• Lands adjacent to perennial streams will be managed to provide for a continuous, well distributed supply of naturally occurring large woody material for instream fish and riparian habitat. At a minimum, these lands will include a zone within one tree height of the stream channel but may be extended to upland areas when the additional areas are determined to be critical to the provision of future large wood to downstream fish-bearing reaches.**
> • Streams will be managed to provide pools that are relatively large, frequent, well distributed, and persistent during low flows.
> **• Forest-wide Standards and Guidelines for water temperature and instream flows will be met.**
> **• The sediment budget will fall well within the range and frequency adapted to by indigenous aquatic communities. Fish habitat enhancement, restoration, and maintenance practices (projects) will be used to increase smolt habitat capability."**

As shown above, the Forest Plan directs the agency to manage this C7 Aquatic Emphasis landscape for the betterment of fish and stream habitats. However, the Forest Service is instead myopically focused on using fear of fire for widespread logging. Instead of logging, the agency should be focusing on ensuring

90% smolt capacity, aquatic diversity, bank and channel stability, at least 80% average shade along streams, a naturally occurring supply of large wood for streams, adequate flow in streams, and low levels of fine sediments that are well within the range and frequency of aquatic species and communities.

The Fish and Wildlife Service highlights the importance of the North Fork of the John Day River on their webpage about Wild and Scenic Rivers (https://www.fws.gov/rivers/river/john-day-north-fork):

> **"The North Fork supports the largest remaining wild run of chinook salmon and steelhead trout in the Columbia River Basin; the value of the only remaining genetically viable wild run of spring chinook salmon in the entire basin is incalculable. Wild populations of bull trout and redband/rainbow trout are also extremely valuable as genetic conservation pools of their species."**

It is unconscionable that the FS is proposing to log this area as a supposed "emergency", rather than focusing on protecting some of the most important stocks of imperiled fish in the entire region. Wild salmon and trout are seeing precipitous declines across the region, and their habitat is further threatened by climate change and habitat loss. Additional negative impacts in the form of logging and roading will jeopardize these populations with extirpation and possible extinction.

While the Battle Bruin scoping package does not mention Bull trout, Columbia River steelhead, Chinook salmon, or any other sensitive or ESA-listed aquatic species, these imperiled species are present within the project area. An EIS needs to be prepared to assess the impacts of proposed logging, roading, and burning on these and other species.

Aquatic ecosystems in the Blue Mountains evolved with and are adapted to wildfires, including high-severity wildfires. Such disturbances are integral to the structure, function, composition, and dynamics of stream ecosystems. While wildfire may have variable and complex effects on imperiled fish and their habitats, they also benefit from wildfire. For example, wildfire is crucial for the creation of stream structures and habitats for aquatic and riparian species, ensuring habitat complexity and biodiversity, and more. While wildfire can have detrimental impacts on aquatic species, these effects are shown by research to be short-term.

The Forest Service's proposed Forest Plan Revision (2014) vol 2. pg 60 admitted that Redband trout will recolonize a stream relatively rapidly after experiencing severe fire: *"Redband trout and bull trout have been shown to recolonize severely burned drainages within two years, provided the drainages were physically accessible (i.e., no culvert barriers, and provided that other fish in unburned areas were close enough to discover and move back into the recently burned habitat".*

Olson 2000, in her literature review for her master's thesis research on riparian forests in eastern Oregon noted: *"local extirpation of fishes is often patchy in the case of extensive high severity fires, and that recolonization is rapid."*

Similarly, the Forest Service study *Effects of Wildfire and Subsequent Hydrologic Events on Fish Distribution and Abundance in Tributaries of North Fork John Day River* by Howell (2006) looked at fish distribution after the Tower Fire in the Upper John Day Basin. Much of the Tower Fire burned at moderate to high severity. Howell's research found that fish populations, including steelhead and Chinook salmon, were highly resilient to wildfire and had rebounded to approximately pre-fire levels by four years.

Additionally, research by Rosenberg et al. 2012 *Fish Life Histories, Wildfire, and Resilience—A Case Study of Rainbow Trout in the Boise River, Idaho* found that rainbow trout are resilient to wildfire, except in very small and isolated habitats.

In the peer-reviewed study *Loss of riparian forests from wildfire led to increased stream temperatures in summer, yet salmonid fish persisted* by Warren et al. 2022, the authors investigated salmon abundance after moderate and severe wildfire in Western Oregon. Contrary to the authors' expectations, they found that fish abundances persisted and even increased by more than threefold in both of the study reaches.

In the Schwartz and Warren 2023 study *Wildfire in western Oregon increases stream temperatures, benthic biofilms, and juvenile coastal cutthroat trout size and densities with mixed effects on adult trout and coastal giant salamanders* the authors found mixed results—including increased biomass, density, length, and weight of juvenile cutthroat trout in post-fire areas.

On the other hand, potential negative effects to special status species due to logging and roading are well documented, particularly when conducted near riparian areas and when risks from climate change are considered.

We are very concerned that upland logging, including "regeneration" (aka clearcuts) and other heavy upslope logging, combined with thinning within RHCAs, will negatively affect water quality parameters and RMOs, and cause downward population trends for ESA-listed fish and sensitive and imperiled aquatic species. Again, what are the current stream temperature data and other RMO data for the streams within the project area? What data for fish population trends for imperiled species such as Bull trout and Mid-Columbia River steelhead does the Forest Service have? What monitoring and adaptive management plans does the Forest Service have for these streams? What ESA-listed aquatic and terrestrial species are present in the Battle Bruin project area? What evidence does the Forest Service have that such widespread logging will not cause increases in stream temperatures and fine sediments, as well as degrade stream habitats?

Further, has the Forest Service conducted monitoring of water quality, fish, and riparian ecosystems as required by the Forest Plan? For example, pages 5-9 thru 5-11 of the Forest Plan for the Umatilla National Forest direct the Forest Service to monitor effects of forest management activities on parameters such as low flows, timing of water yields, RMOs, and water quality parameters. It also requires that the agency determine fish population trends for MIS and to assess the attainment of fish habitat capacity, for example. The Forest Plan goes on to require regular reports detailing many of these parameters, generally every year to 5 years. Has the Forest Service been conducting this monitoring? Does the agency have these reports? Where? We request copies of those reports if they exist—particularly the reports showing fish population trends as well as those showing baseline data for stream temperatures, sediment, and other RMOs.

We also wish to incorporate the following attached BMBP comments and documents that we submitted on recent timber sales in eastern Oregon, as they deal with the same or very similar issues as those in the Battle Bruin timber sale.

Thank you for consideration of our comments,

Paula Hood

Paula Hood, Co-Director
Blue Mountains Biodiversity Project

Addendum for aquatics-focused comments:

We would like to include, for the record, the following additional relevant information and scientific references:

Should logging be implemented as proposed, riparian habitats, water quality, and fish would be directly and negatively impacted by the Forest Service's failure to recognize the importance of large trees, and by the logging of these large trees. **Approximately 75% of eastside terrestrial species depend upon riparian habitats for their life cycle needs or use these habitats more than others (Henjum et al. 1994).** Riparian and aquatic ecosystems are heavily reliant on large tree structure (including large living trees, large trees with cavities, large snags, large downed wood, and large woody debris in streams). Aquatic ecosystem integrity is intertwined with mature and old forests—and includes large *and* old trees, not *just* old trees.

Notably, the original Eastside Screens EA included the protection of ***large*** and old trees as part its Purpose and Need. Large trees, and the wildlife habitat needs they provide, were explicitly included as part of the definition of what constitutes old and late seral structure. The Wildlife Standard in the original Screens EA states that *"**the definition of 'remnant old and late seral and/or structural live trees' has been clarified by adding ">21 inch dbh" to better define what is meant."*** Also, ***large*** trees were central to the habitat needs of Late and Old Forest-Associated species in the original Screens EA. The Screens EA states that the "Habitat Needs of Late and Old Forest-Associated species" for northern goshawk, pileated, white-headed, and three-toed woodpeckers and the pine marten" were part of the significant issues considered in the analysis; these species were identified as management indicator species for late and old forest habitats. Each of these species depends on the habitat provided by large trees. The original Screens EA further highlights the importance of *large* tree structure by noting that ***"Large*** down woody debris (logs) provide habitat for numerous species". The original Screens EA also emphasizes the need to protect "high levels of ***large*** snags" under the Wildlife Interim Standards. The agency's narrow focus on including only *old* forest structure without proper context fails to protect wildlife species that rely on large tree structure, which were both clear goals of the original Screens. Also, the 1990's Eastside Forests Ecosystem Health Assessment (EFEHA) team concluded that there was a "loss of large trees", and that the team "developed the Eastside Screens in part to keep existing ***large*** and old trees and manage national forests to promote an increase in the number of ***large*** and old trees" (emphases ours). The agency's failure to wildlife habitat and old forest components (including large tree structure) produces myopic and incorrect assumptions and interpretations regarding large tree, wildlife habitats, and other ecosystem components in the current EA.

The Eastside Forests Scientific Society Panel was convened in 1993, not long after the order by President Clinton for the Forest Service to "develop a scientifically sound and ecosystem-based strategy for management of eastside forests." The recommendations and science in *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. (1994) were a part of the science and developments that history that help inform the Eastside Screens. *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. 1994, included the following recommendation: "**Cut no trees of any species older than 150 years or with a diameter at breast height of 20 inches or greater**". The report goes on to say that:

> *"**These mature trees have lived for decades, even centuries;** their very existence demonstrates that they have the genetic characteristics to survive the full range of environmental variation present in eastern Oregon and Washington. Their complex structure, the product of a millennia of natural selection, offers unique niches for microbes, invertebrates, and vertebrates. They serve as reservoirs of genetic diversity and irreplaceable sources of seed for forest regeneration; **they renew the supply of large snags and fallen logs, which furnish nest and den sites for many animals; they provide nutrients to the soil**; and they stand as a unique historic record, an irreplaceable link between the past and the future. These trees are living examples of our long-term objectives" (emphases ours).*

Clearly, the authors recognized the importance of large trees of any species, including those that were 'mature' and 'decades' old. The authors highlighted the importance of ongoing future recruitment of large snags and logs, and the necessity of large wood structure and recruitment for providing ongoing sources of wildlife habitat. They highlight the need to protect large *and* old trees—it was not limited to only old trees—and reflected the need to protect processes and functions dependent on large trees well into the future.

Henjum et al. 1994 further discussed the key importance of large trees for wildlife species. For example (pg.176):

> *"[T]he pileated woodpecker (Dryocopus pileatus) relies on large snags for roosting, nesting, and foraging sites. Loss of large trees eliminates habitat for this species. Because the woodpecker builds cavities that are in turn used by many other species, species besides the woodpecker can also disappear from a site when snags are removed."*

The authors also discuss the importance of large trees for species such as bald eagles, Vaux's swifts, and bears (pgs. 184, 185, and 188). Furthermore, the authors recognized the importance of large Grand fir in providing key wildlife habitat:

> *"Pileated woodpeckers depend on large snags for nesting and roosting (Bull et al. 1992). Within eastside forests, pileated woodpeckers seem to be closely tied to old grand fir (Abies grandis) stands with trees in advanced decay caused by the Indian paint fungus (Echinodontium tinctorium) (Bull et al. 1992); Bull and Holthausen 1993), a keystone organism that softens core wood. The woodpeckers in turn provide other keystone services by excavating nesting and shelter cavities in infected core wood, and these are eventually used by many birds and mammals (Thomas et al. 1979a)" (pg. 185).*

Clearly, large Grand fir were recognized as important and as needing to be preserved in the literature and analyses that helped to form the Screens.

Henjum et al. 1994 highlights the importance of preserving large trees in relation to climate change--something that the Forest Service has generally failed to acknowledge some 26 years later: *"Loss of large trees alters patterns of gas exchange, especially for carbon dioxide, changing global climate patterns" (pg. 172).*

The deficit of large trees across the landscape due to past logging has been extensively well-documented, and as a result is a central focus for protection in the original Eastside Screens. The past and ongoing deficit of large trees has important implications for wildlife. Many species rely on large trees and snags habitat, particularly in riparian forests. Yet, the FS analysis fails to adequately incorporate the importance of large trees, large snags, and large logs—or the complex processes necessary for creating and maintaining these components-- into its analyses or priorities for protection and restoration. The agency's analysis fails to acknowledge, for example, the key ecosystem functions of large Grand fir, and the need to protect large fir for wildlife habitat. The agency's analysis also fails to adequately protect or consider the importance of multistory forests for wildlife species and their habitat needs.

Bull et al. 1997 highlights the importance of large fir with cavities, as well as the importance and rarity of the multilayer stands that produce this habitat, notes:

> *"**In northeastern Oregon, grand fir and western larch make up most of the hollow trees used by wildlife.** Bull et al. 1997 goes on to note that "[l]arge, hollow trees are uncommon in managed landscapes and typically are found only in late- and old-seral stands of grand fir and western redcedar. Although isolated hollow trees in young stands have significant value to wildlife, these young stands cannot reproduce this type of structure for at least 150 to 200 years. **The late-seral, multilayer stands that produce hollow trees comprise less than 3 percent of the forested landscape in the interior Columbia River basin**."*

The Forest Service Region 6's Response to Blue Mountains Biodiversity Project's Freedom of Information Act request (2016-FS-R6-001106-F) included the "Eastside Screens Enclosure; Recent Science Findings and Practical Experience: Implications for the Eastside Screens September 2015". This Enclosure also recognizes the importance and rarity of large hollow firs. The Enclosure noted (emphases added):

"Implementation of the Screens has substantial species management implications. For example, the white-headed woodpecker, Lewis's woodpecker and several species of bats are Regional Forester's Sensitive Species that rely on large snags and defective trees for part of their life history. ***Large, defective grand fir trees and snags provide critical roosting and denning habitat for black bears, Vaux's swifts, pileated woodpeckers, American marten, and bats*** *(Bull et al., 1997).* ***These legacy trees, especially large, hollow grand fir, are rare on the landscape and have declined from historical conditions on the eastside of Oregon and Washington".*** *The enclosure also states: "These findings reinforce the importance of retaining and recruiting large, old trees in dry, mesic and moist mixed conifer forests on the eastside of the Region. It is critical that silvicultural prescriptions provide for* ***large*** *snags and defective trees in adequate numbers through time….****large, hollow grand firs take 150 to 200 years to develop (Bull et al. 1997): adequate numbers of smaller trees need to be left to allow for the processes that create replacement hollow trees."***

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Quigley et al. 1996) includes summaries of their finding. The "Highlighted Findings" note that **there has been a 27 percent decline in multi-story old forest structures** (Chapter 8, Findings, pg. 181). Given the extensive portion of forests that have already been logged on the landscape, large trees and patches of mature and old forests (and the large trees, snags, and logs within them) often provide some of the last high-quality wildlife habitat and connectivity corridors in and adjacent to timber sale areas.

In recent years, numerous studies have raised alarms regarding habitat loss, climate change, and decline of fauna and biodiversity across the planet. Warnings have been sounded by scientists regarding the declining bird populations we are seeing, and the projections of far greater losses to come. For example, the Rosenberg et al. (2019) study *Decline of the North American Avifauna* reported a "staggering decline of bird populations, and found "wide-spread population declines of birds over the past half-century, resulting in the cumulative loss of billions of breeding individuals across a wide range of species and habitats. They show that declines are not restricted to rare and threatened species—those once considered common and wide-spread are also diminished. These results have major implications for ecosystem integrity, the conservation of wildlife more broadly, and policies associated with the protection of birds and native ecosystems on which they depend."

Given the urgent need to address the biodiversity and climate crises, which includes species and habitats in the Blue Mountains, the agency needs to focus on protecting wildlife, clean water, high-quality habitat, and ecosystem integrity. Birds are an integral part of forested ecosystems on the Blue Mountains, and were not adequately considered in the EA. For example, a number of bird species rely on forest types or structural components that would be significantly affected by the proposed changes to the 21" Screens. These structural components and forest types include: large trees, mixed-conifer forests, fir dominant or codominant forests, and mature and late old structure forests. While the agency's analysis explicitly encourages increased logging of large firs, the proposed changes would greatly increase logging of *all* species of large trees, not just fir. The agency's analysis did not adequately analyze or avoid the negative effects to birds that would occur under all action alternatives.

The following is a summary of birds in the Blue Mountains of Oregon and SE Washington that are likely to be affected by the FS's proposed rollback of protections for large trees under the current 21" wildlife screens. For additional detail and citation information, please see the detailed notes and spreadsheet that compliments this section. These documents include additional detail about BBS population trends, Langham et al. (2015) climate threat determinations, and habitat descriptions from Csuti et al (1997), Thomas et al. (1979), Miller (personal communication), and Marshall et al. (2006).

Birds that rely on large trees: The agency's analysis fails to consider many at-risk species that may be negatively affected by the loss of large trees across the landscape, should the Forest Service's proposal to increase the logging of large trees be implemented. Bird species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction) include Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red crossbill; White crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Pileated woodpecker; Williamson's sapsucker; Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

Documented population declines & birds that rely on large trees: According to the Breeding Bird Survey (BBS), several of these birds that rely on large trees (listed above) are also facing declining populations across the Northern Rockies, the Great Basin Ecoregions, and/or Oregon or Washington state. Some of these also face declining populations across their entire survey range and the US. Birds that rely on large trees and also facing declining populations include: Bufflehead; Barrow's goldeneye; Common merganser; Wood duck; Vaux's swift; Lewis' woodpecker; Williamson's sapsucker; and Western screech owl.

Association with mature and old forests, mixed-conifer forests, and fir dominant or co-dominant forests & birds that rely on large trees: Many of the birds that rely on large trees are associated with mature forests, old growth forests, mixed-conifer forests, and/or Grand fir or Doug fir during a key portion of their life history. These include: Bufflehead; Barrow's goldeneye; Hooded merganser; Wood duck; Red crossbill; Brown creeper; Vaux's swift; Pileated woodpecker; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Great grey owl; Boreal owl; Long-eared owl; Flammulated owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications). All of these have either seen declining populations according to the BBS, and/or are considered climate endangered or climate threatened by Langham et al. (2015).

Birds that rely on large trees and are at risk from climate change: Climate change will affect bird populations, habitat availability, and ranges. In order to ensure the viability of native birds including waterfowl, raptors, neotropical songbirds and other migratory birds, the Forest Service must consider how climate change will impact these birds and the cumulative impacts with increased logging in mixed-conifer and mature and old growth forests.

Langham et al. 2015 *Conservation Status of North American Birds in the Face of Future Climate Change* identified 314 birds at risk of losing more than half of their current geographic ranges under climate change scenarios. In addition, 126 of these are not expected to see gains in their geographic ranges. The authors note: *"Our results demonstrate the need to include climate sensitivity into current conservation planning and to develop adaptive management strategies that accommodate shrinking and shifting geographic ranges. The persistence of many North American birds will depend on their ability to colonize climatically suitable areas outside of current ranges and management actions that target climate adaptation."* The authors also note: "*We suggest that the 126 species in this category be considered by conservation entities for immediate monitoring beyond existing programs such as BBS and CBC."*

Birds that rely on large trees (noted above) and are also considered climate threatened or climate endangered by Langham et al. (2015) include: Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red Crossbill; White-winged crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Boreal owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; Osprey.

Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir: Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir will be negatively affected by increased logging within these forest types. Logging within these forests may result in loss of key forest components such as multi-story canopies, shrubs, understory structure, unfragmented forests, needed cavities in trees and snags, snags, and logs. Logging of large trees, as well as increased size and intensity of logging projects, would result in forests becoming more younger, more homogenous and even aged, open, and drier. The FS's proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts on tree species composition and forest density across the landscape. As a direct result, available habitat, connectivity, and ranges (especially when climate change is considered) would be affected across the landscape by the FS's proposed changes.

Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Harlequin duck; Red crossbill; White-winged crossbill; Brown creeper; Vaux's swift; Evening grosbeak; Pine grosbeak; Hermit thrush; Swainson's thrush; Varied thrush; Pine siskin; Cordilleran flycatcher; Golden-crowned kinglet; Ruby-crowned kinglet; Black-capped chickadee; Chestnut-backed chickadee; Mountain chickadee; MacGillivray's warbler; Townsend's warbler; Yellow-rumped warbler; Mountain bluebird; Calliope hummingbird; Rufous hummingbird; Red-breasted nuthatch; American three-toed woodpecker; Black-backed woodpecker; Downy woodpecker, Hairy woodpecker, Lewis' woodpecker; Pileated woodpecker, Williamson's sapsucker; American kestrel, Winter Wren, Western Tanager, Hammond's flycatcher, Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Northern saw-whet owl; Northern pygmy owl, Bald eagle; Golden eagle; Osprey; Merlin, Peregrine falcon, and Northern goshawk. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

In addition, most of the birds listed above are also facing current population declines in part of all of their range within the Blue Mountains (according to the BBS) or are considered climate threatened or climate endangered (Langham et al. 2015). The habitat requirements of birds imperiled by declining populations and/or climate change should have been considered and analyzed in the EA. The Forest Service cannot protect the viability of these species without analyzing the effects of this proposal on their habitats, ranges, connectivity, and needed forest components and structures.

Thomas (1979) also highlights several wildlife species that rely on large trees and mixed-conifer, mature and old forests, and Grand fir. Examples include:

Wildlife species that rely on large trees: The agency's analysis fails to consider many at-risk species that may be negatively affected by the loss of large trees across the landscape, should the Forest Service's proposal to increase the logging of large trees be implemented. Wildlife species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction). For example, Pacific fishers, Spotted skunks, and American marten rely on large trees with cavities for reproduction.

Wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir: Wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir, will be negatively affected by increased logging within these forest types. Increased logging within these forests, which the Forest Service is targeting, may result in loss of key forest components which these species rely upon. The Forest Service's proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts available habitat, connectivity, and ranges (especially when climate change is considered). Examples of wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Canada lynx, bobcat, Snowshoe hare, White-tailed deer, Northern flying squirrel, numerous bats, Rubber boa, Malheur shrew, Vagrant shrew, Dusky shrew, Heather vole, Long-tailed vole, Gapper red-backed vole, Black bear, Short-tailed weasel, Jumping mouse, and mule deer.

Because forests within RHCAs have been somewhat more protected in the last few decades, these forests often have comparatively more large trees and mature and large forests compared to upland forests. As a result, they are providing even greater and disproportionately important wildlife habitat to fauna that rely on large trees. Unfortunately, these riparian forests have become increasingly targeted for logging in recent years. Given the paucity of surrounding mid-to-large trees in the uplands, logging in RHCAs threatens the remaining crucial wildlife habitat in these areas. Proposed logging of large trees would have far-reaching and damaging impacts to large trees structure, large trees with cavities, snags, downed logs, and large woody debris for streams both within the project area and in cumulative impacts to the region. In addition, the Forest Service's narrow focus on the logging of large trees ignores mycorrhizal networks, sharing resources among trees; windthrow; or other situations in which nearby trees and tree cohorts benefit each other and promote biodiversity.

Logging large trees in mixed-conifer forests within and adjacent to riparian corridors will negatively impact wildlife. For example, Northern goshawk and other accipiter hawks, American marten, Great gray owls, Black-backed woodpeckers, Three-toed woodpeckers, Pileated woodpeckers, Olive-sided flycatchers, and other species that rely on denser forests, mature or old growth mixed conifer forests, and/or will be negatively affected by logging in riparian corridors.

DellaSala et al. 2022 also highlight the importance of preserving large trees and mature and old forests:

> *"Federal forests in the Eastern region are maturing from logging that eliminated all but a fraction (1–2%) of the oldgrowth forests over a century ago (Davis, 1996). Most mature forest types in this region lack protections, many are not on federal lands, and most are fragmented especially given that large IRAs are mostly in western regions. Additionally, the USDA Forest Service (2022) revised its 20-year forest management plans for the 416,000 ha Nantahala and Pisgah National Forest in western North Carolina claiming that they needed to log mature forests to create a diversity of seral stages even though classic old-growth forests are still well below historical levels (Davis, 1996). A combination of federal protections, improved forestry practices, and conservation incentives on non-federal lands are needed in this region to meet conservation targets for MOG.*
>
> *Under the Trump administration, the USDA Forest Service removed protections for large diameter (>50 cm dbh, up to 150 years old) trees on national forests in eastern Oregon and Washington that were in place for over two decades, even though large trees remain below historical levels (Mildrexler et al., 2020). We recommend restoring those protections. The five state western proposal that includes the Northern Rockies Ecosystem Protection Act also contains nearly 11 M ha of MOG with only 20% in GAP1 and 2 status and another 30% in IRAs (GAP2.5). Recent policy and management decisions underscore the importance of increasing MOG protections in this region as well."*

The primary threats and stressors to special-status and at-risk riparian and aquatic species on National Forests in eastern Oregon are logging, roads, and livestock grazing. These activities result in increased fine sediment inputs to streams, warming stream temperature, increased diurnal stream temperature fluctuations, stream bank instability, soil compaction and erosion, fish passage barriers, and other widespread problems.

Proposed logging will have negative and long-term impacts on water quality, watershed hydrology, channel morphology, fish, and aquatic species. These and related potential impacts were not adequately analyzed or avoided in the DEA. The DEA has little or no analysis of the potential impacts to these parameters due to logging (such as increased erosion and sediment potentially caused by changes to peak flow timing and magnitude). The Forest Service also did not adequately analyze or avoid negative effects due to logging on hyporheic zones, groundwater function, or stream downcutting. The EA's insistence on logging to address forest health is not in line with the actual impacts, threats, and stressors to listed and at-risk riparian and aquatic species, and will instead exacerbate these issues.

The project area provides unique and important habitat for species such as Northern goshawks, Great grey owls, Flammulated owls, Black-backed woodpeckers, Three-toed woodpeckers, Williamson's sapsucker, primary cavity excavators, osprey, mountain lions, black bear, elk, deer, American marten, bats, Johnson's hairstreak butterfly, gray wolves, amphibians, sensitive plants, and numerous other species, including ESA-listed and Survey and Manage species. Many of the species within project area rely on the complex canopy structure, denser forests with more closed canopies, mature and old multi-story structure provided within these forests. The mature and old mixed-conifer forests within the project area are providing some of the best remaining habitat for many species in this area, particularly within RHCAs.

We are very concerned about the logging of large trees and the associated loss of key habitat for wildlife including the widespread loss of snags and of large downed wood recruitment for logs and in streams. Large trees, downed wood, and legacy snags are important components of these mature and older complex mixed-conifer forests. For example, legacy snags and snag habitats such as the 'stove pipe' snags (large hollow snags) are preferred habitat for Great grey owls, and are also crucial for species such as bears and Vaux's swifts. Should this sale move forward, what is the agency's estimate for the number of large trees that would be logged, felled as "hazards", or cut down in relation to roads or haul or transport corridors?

Riparian corridors provide particularly important habitat that is used at disproportionately high rates by many species of wildlife. The negative ecological impacts associated with logging in mature and old mixed-conifer forests, multi-story and complex habitat, and the logging of large trees are particularly concerning in relation to riparian forests and the streams they protect. Streams and riparian forests are impacted by what occurs in the uplands as well as within riparian corridors, and can be affected by actions in neighboring creeks and waterbodies. We are concerned about the effects to streams and riparian corridors from upland logging and roading, in addition to being very concerned about such activities within RHCAs.

In addition, crucial wildlife habitat such as snags and downed wood are vitally important, particularly in RHCAs as they see disproportionally high wildlife use and serve as connectivity corridors. Unfortunately, the FS increasingly sees this key wildlife habitat as "fuels" and logs such habitat or destroys it as part of the collateral damage of logging. In addition, managed stands have fewer snags than unmanaged stands (Cline 1997).

The August 2017 "Science Findings" from the PNW Research Station discussed the importance of snags and wildfire, and found that many more snags are needed than current regulations or standards provide for. Riparian forests are disproportionately used by wildlife and birds, and so these findings are particularly relevant to RHCAs. The 2017 Science Findings note:

> *"Currently, the best solution we can recommend is to provide large numbers of snags for the birds, which can be difficult without fire," According to the researchers' calculations, if one of every 20 snags (approximately 4 percent) has suitable wood, and there are five to seven species of woodpeckers nesting in a given patch, approximately 100 snags may be needed each year for nesting sites alone. This does not account for other nuances, like the fact that most species are territorial and will not tolerate close neighbors while nesting, or the fact that species like the black-backed woodpecker need more foraging options. Overall, more snags are needed than other studies have previously recommended. Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately, these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers."*

Large trees, regardless of age or species of the tree, that are required by most wildlife. Further, trees with mistletoe or heart rot, or other native diseases and unusual growth patterns are often the most beneficial to wildlife and provide the most opportunity for nesting or other uses.

In addition, we are concerned that the combined effects of logging and prescribed fire can also be severe for sapling recruitment. In addition, logging down to very low basal areas, followed by prescribed burning, may end up with severely open canopies-- especially if burns run larger or hotter than intended. Opening up forest canopies to a low basal area can cause forests to be substantially drier and hotter, and cause habitat loss for species that rely on multi-layered and dense canopies. Shrubs may extensively colonize such open areas, making it difficult for forests to recover from logging. Also missing from the FS's cumulative effects analyses are the past and possibly ongoing/future effects from fire lines, backburns, and other fire suppression efforts. We are also extremely concerned about the potential severe impacts associated with logging within fire lines and ember reduction zones, and the lack of adequate analyses surrounding these activities.

Van Pelt Guideline:

The Van Pelt guidelines do not include guidelines for aging Grand fir. The Forest Service does not have a reliable or objective method for aging Grand fir, and so does not have any way to ensure that old Grand fir (150 years or older) will not be felled/logged as a part of this sale.

It is disingenuous for the Forest Service to continually refer to trees 80-149 years old as 'young'. These trees were previously considered to be 'mature', which is an important distinction for as these trees have often begun to develop mature and old characteristics important for wildlife species.

POTENTIAL VIOLATIONS OF THE NATIONAL FOREST MANAGEMENT ACT, PACFISH/INFISH, RIPARIAN MANAGEMENT OBJECTIVES, AND/OR CLEAN WATER ACT:

Logging large trees will increase surface runoff and overland flow, which delivers warmer water and excess sediments into streams quickly, and can alter peak flows and increase stream temperatures. In addition, increased surface runoff and faster delivery of water into streams also means that less water becomes groundwater. This decreases groundwater storage, groundwater flows, and hyporheic flows. (Coutant 1999; Croke and Hairsine 2006; Jones and Grant 1996). Logging, including upland logging, can cause decreases in summer baseflows in the long-term. Decreased canopy cover due to logging can cause more snow to accumulate in these more open areas, which alters the timing and magnitude of runoff from snow melt. This can also cause changes to peak flows (Harr and Coffin 1992). Should proposed logging be implemented, it would create more open canopies, which will then increase solar radiation inputs, and as a result may increase the amount of early snow melt. This, in turn, may further alter peak flows and groundwater recharge and the hyporheic cold water delivery downstream, including to perennial streams. (Caissie 2006; Harr and Coffin 1992). Logging alters microclimates, creating hotter, drier, and windier conditions that stretch beyond forests directly affected and into adjacent forests, sometimes for distances of hundreds of feet. Such microclimate edge affects could extend into the entirety of riparian buffers, especially in smaller headwater streams. (Chen et al. 1992; Chen et al. 1995; Brosofske et al. 1999)

Protecting groundwater storage, groundwater flows, and hyporheic flows associated with intermittent streams is crucial for protecting temperatures in larger downstream perennial streams. Cold water inputs from intermittent streams to downstream reaches are essential providing cold water refugia for special-status and imperiled aquatic organisms, including ESA-listed fish (Caissie, 2006; Ebersole et al. 2015; Groom 2011; Groom 2011; Jones and Grant, 1996; Pollock et al. 2009). Patches of cold water refugia are crucial for fish. Shallow groundwater patterns can be important for influencing stream temperatures, (Poole et al. 2008) and so are likely vulnerable to upslope logging (Caissie 2006). In research in eastern Oregon, Ebersole 2015 found that dry streams supplied cold water to downstream reaches at confluence sites. Such cold water refugia habitats are important for fish, which were observed at these locations.

Given the research done by Ebersole and others cited above, it is very likely that logging within RHCAs, including the agency's proposals for no setback for small and intermittent streams and violations of PACFISH/INFISH requirements, and is likely to threaten the cold-water temperatures and refugia in streams that are important for Bull trout and other aquatic species.

The Eastside Screens riparian standard include the following (emphases ours): "**Timber sales (green and salvage) will not be planned or located within riparian areas as described below:**

a. **Perennial and intermittent fish-bearing streams:** consists of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or **300 feet slope distance (600 feet including both sides of the stream channel**}, whichever is greatest.

b. **Perennial nonfish-bearing streams:** consists of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the out edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or **150 feet slope distance (300 feet, including both sides of the stream channel}**, whichever is greatest.

c. **Intermittent non-fish bearing streams:** consists of the stream channel from the edges of the stream channel to the top of the inner gorge, or to the outer edges of the riparian vegetation, or to the extent of landslides or landslide-prone area, or to a distance of **100 feet slope distance (200 feet, including both sides of the channel), whichever is greatest.**

The Forest Service cannot credibly claim that there will be no significant impact to streams, water quality, stream temperature, fine sediment delivery, large woody debris, or other RMOs, as a result of proposed logging and roading within RHCAs.

Even as the FS is planning to ignore PACFISH/INFISH buffers and other standards, streams within the project area are already not currently meeting RMOs. Proposed logging and roading will further retard attainment of those RMOs.

The PACFISH Standards and Guidelines state that activities within the RHCA "should not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat."

According to the Fisheries BE, streams are already not meeting RMOs for several parameters. Logging is planned adjacent to streams, some of which are not meeting RMOs, and will further retard attainment of RMOs by removal of riparian shade, logging of large trees (and so removing of current large wood and future large wood recruitment), as well as increased stream temperature and fine sediments (especially given the rollback of RHCA buffers as defined in PACFISH/INFISH).

Logging within RHCAs has well-documented and negative effects on stream temperatures, including increased water temperatures. For example, Guenther et al. (2012) found increases in stream temperature in relation to selective logging. The Guenther study found increases in bed temperatures and in stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the harvest area from 1.6 to 3 degrees Celsius. Pollock et al. 2009 found that stream temperature was more closely associated with degree of logging within catchments than with streamside vegetation.

Small streams are particularly vulnerable to increases in temperature, even with limited selective logging. There is evidence to suggest that ***wider*** buffer widths may be necessary to protect stream temperatures, particularly in intermittent and headwater streams, and particularly when logging within 100' of streams. Logging within RHCAs, removing shade, road-related impacts, and degrading hyporheic flow can increase stream temperatures in small intermittent streams. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging alters these parameters, and degrades the ability of these parameters to support cold water, and is likely to increase stream temperatures. (Caissie 2006; Davies and Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 201; Jones et al. 2006; Sweeney 2013; Pollock et al. 2009; Wigington et al. 2006; Poole et al. 2008; Poole and Berman 2001; Ebersole et al. 2015).

Also, logging within RHCAs or forest wetlands can magnify water quality and hydrology impacts from upland logging. (Hicks et al. 1991; Moore and Wondzell 2005). Janisch et al. (2011 and 2012) and Buttle et al. (2009) found that wetlands associated with headwater and low order streams are more common and influential on stream hydrology and water quality than previously realized. Many of the wetlands associated with first order streams are small and fall below the size requirements for protection in relation to timber sales. Janisch et al.(2012) found streams in headwater catchments with wetlands had larger and more consistent increases in temperature in relation to adjacent logging than did the catchments that did not contain wetlands. The authors found that in streams with wetlands present in their catchments tended to have streams with finer sediments in their substrates.

Even in situations where logging within RHCAs is limited to thinning of smaller diameter trees, logging may compromise the ability of the RHCA buffer to protect streams or ameliorate the negative impacts from upland logging, including increased stream temperatures and the delivery of sediment and nutrients into waterways. Logging of large trees within RHCAs will substantially exacerbate these negative effects.

PACFISH/INFISH no-cut stream buffers should be adhered to and fully implemented. No commercial logging should occur with RHCAs, and noncommercial logging should be dropped or severely scaled back. Logging within RHCAs will retard the attainment of RMOs, including quantitative standards such as stream temperature, fine sediment, pool depth, embeddedness, LWD, and other RMOs. Does the FS have more complete/additional baseline data for RMOs within the project area? If so, the agency should include this information as part of an Environmental Impact Statement analysis for the project.

Overwhelming evidence shows that logging has negative effects on streams, water quality, and watershed hydrology. This is especially true for logging within riparian corridors, but is also true in regard to upland logging, particularly when large tree logging, logging on steep slopes and sensitive soils, and road-related activities are proposed. The Forest Service consistently fails to adequately consider the well-documented risks of logging and associated activities (such as road-related activities) on water quality, streams, and watershed hydrology.

In addition to some of the negative effects described above, logging is likely to increase surface runoff and overland flow, potentially delivering warmer water (and excess sediments) into streams more quickly and with a greater volume. As discussed in other sections of these comments, such inputs can also cause erosion and alter stream morphology. Such issues can, in turn, affect stream temperatures.

The Forest Service has ignored decades of scientific consensus, research, and expert opinion regarding riparian buffers, including their own. For example, the FS noted that: "[r]esearch has shown that effective vegetated filter strips need to be at least 200 to 300 feet wide to effectively capture sediment mobilizing by overland flow from outside the riparian management area" (2018 Draft Blue Mountains Forest Plan Revision vol. 2 pg. 52). The FS is clearly not adhering to the requirements or the intent of PACFISH/INFISH.

In addition, biodiversity in headwater systems can be significant, but is not well characterized and may be underestimated (Pearl et al. 2009). We are concerned that biodiversity will be severely negatively impacted by the FS's non-compliance with PACFISH/INFISH buffers. For example, amphibians such as the Columbia spotted frogs and tailed frogs, would benefit from the 300' buffers or larger protective riparian buffers. Stream-associated amphibians require clear, cold water (Corn & Bury 1989, Cushman 2006, Olson & Weaver 2007, Pearl et al. 2009, Semlisch & Bodie 2003). Corn and Bury (1989) found that amphibian diversity decreased in lower order streams adjacent to logging. Semlisch and Bodie (2003) found that riparian-associated amphibians utilized and depended upon large areas of upland terrestrial habitat (approximately 300 meters for most amphibians), and so require core habitats well beyond the traditional buffers afforded to the headwater riparian areas (Semlisch and Bodie 2003, Olson et al. 2007). Cushman (2006) suggested management strategies include headwater areas and/or patches that are prioritized for core habitats and maintain connectivity between some watershed areas (Cushman 2006). In general, amphibians in headwater areas may not receive sufficient protections in relation to land management projects (Corn & Bury 1989, Janisch et al. 2011, Semlisch & Bodie 2003). The FS is unfortunately going in the opposite direction, and attempting to decrease or altogether eliminate (such as in small streams) the already buffer protections under Forest Plan standards.

Fire scar analysis has limitations (as does all ecological study methodology). We are concerned that some of the potentially important implications of the limitations with fire scar analyses are being ignored by the FS—with potentially very unfortunate and negative ramifications for forests. For example, we are concerned that the fire scar analyses may be artificially inflating the frequency of fire regimes because small localized fires are overrepresented and/or conflated with fire return intervals (rather than recognized as often very localized, sometimes tiny events). For example, an isolated lighting strike that burns a handful of trees, sometimes repeatedly on the same ridge in different years, does not a fire return interval make.

Use of composite fire intervals tend to shorten the time between fires and give a false interpretation of the past fire history. For example, personal communications from George Wuerthner, in our communication regarding limitations of fire scar analyses used in research with similar methodology, include:

> *"Take a hypothetical situation: Let's say you have a 1000 acre study area. You note a fire someplace in that 1000 acres every single year over a hundred year period. However, for argument's sake, each of those fires burns less than a single acre. So you have a total of 100 fires and a fire interval of 1 year. I.e. the fire scar history suggests there is a fire every year. But because each fire is less than an acre, you have only burned 100 acres in a hundred years or only 10% of the 1000 acre study site. Even at a fire every year, it would require 1000 years to get to the fire rotation.*
>
> *This is why it's important to note how large the fire is. You can do this in a number of ways including using air photos, fire atlas, or Government Land Office survey notes as Baker has done.*
>
> *Using fire scars, the best way to do this is to only include fires that burn a significant amount of the study area. In other words, again using the 1000 acres. You would ignore all the fires that are only recorded at one or even a few sights and assume they are small fires of no consequence. After all we are trying to get to the notion of how important fire was in any area and the kind of fire that burned. The only fires you would include would be the years when the majority of the study sites burned, preferably across much of the 1000 acres. You could also note the occurrence of even-aged stands across large areas that might indicate regrowth after a stand replacement blaze. That would give you the real fire rotation."*

Similarly, personal communications from William Baker, in our communication regarding limitations of fire scar analyses used in research with similar methodology (and so are also relevant here), include:

> *"There are no estimates of historical fire rotations, the essential rate parameter of historical fires. Composite fire interval estimates are done within each site, not across sites, which is OK. But, there is little correction to remove small fires, so their MFRI is close to a mean CFI-all fires in the Baker (2017) terminology. Using Baker (2017 Table 2), to estimate fire rotation, for mean CFI--all fires, we would multiply MFRI by 2.44. For the range of MFRIs in their Table 1, which is 10.6-21.2 years, the estimated range of historical fire rotations would then be 25.9 to 51.7 years.*
>
> *Based on these fire rotations, these were not frequent-fire forests with fire rotations < 25 years that would have kept fuel loads generally reduced, since fuels can recover within about 10-20 years usually. Instead, historically there would have been ample time for fuels to fully recover between fires, including plenty of fully regrown shrubs, many small trees, lots of small wood, some larger wood etc. and some stands with higher tree density. It is important to estimate fire rotations because it is well accepted now in the scientific fire community that the MFRI used in Johnston et al. does not estimate historical rates of burning and should not be used to guide restoration programs (Baker 2017). See the quotes in this paper from well fire historians that make this very clear.*
>
> *Also, in the intro Johnston et al. suggest fire regimes would have been mixed severity, but then they did no reconstruction of fire severity, which of course is essential where fires where historically mixed in severity. The paper doesn't say so explicitly, but seems to assume that all fires were low-severity, and the final paragraphs even imply that higher-severity fires did not occur. Of course, what would be expected is that in moister forests, more of the fires that occurred would be higher-severity, including substantial patches of high-severity fire, whereas in ponderosa of course more of the fires would have been low-severity, with fewer that were higher-severity, as has been shown nearly everywhere that fire severities have been reconstructed in these kinds of forests. Showing, as they do, that MFRI did not differ between dry and moist forests has little meaning, since it is not the occurrence of fires, but instead fire size and fire severity that would be expected to differ. They have no data on the essential fire-severity parameter of historical fire regimes in ponderosa pine and mixed-conifer forests in their study areas, and certainly cannot conclude that historical fire regimes would have been similar in these two types of forest.*

Also, their historical basal area estimates are based on just extant (live) historical trees, not dead trees present on the forest floor. Although fires may have been suppressed, there are many other sources of continuing tree mortality that could have killed and even removed many of the smaller trees present in the late-1800s (e.g., bark beetles, drought, competition, root rots etc.). They did not compare their basal area estimates to early historical reports, such as Munger 1917 to see whether extant live historical trees even approximately estimate basal area, tree density, and tree diameter distributions in the late-1800s to early 1900s. It is well known that smaller trees present in the late-1800s would likely have burned, died from competition or other mortality agents, and decomposed since then, particularly in moister forests. Since logging is often aimed at smaller trees, and they have no validation at all that smaller trees are correctly reconstructed by using just extant live trees that happen to still be present, this study does not provide a sufficiently sound basis for any restoration logging program."

Baker and Ehle (2001) provide a more in-depth discussion of terminology and methodology regarding fire scar analyses; we've including a copy of this paper as part of our comments.

Large woody debris (LWD):

We are very concerned that logging, particularly logging of large trees will negatively affect the availability of large wood and future large wood recruitment for LWD in streams. Large wood recruitment and delivery is a crucial cornerstone of ecological integrity for streams, essential for the viability of many native and ESA-listed aquatic species, and a driving force of recovery for stream morphology. Hyporheic flows and groundwater storage and movement depend in part on large wood and future large wood recruitment, and are important for maintaining cold water in perennial streams. Groundwater movement and storage is interconnected with a number of complex watershed processes and forest components.

Aquatic ecosystems include complex and interdependent interactions. The loss of large woody debris in streams negatively affects stream morphology, including pools. The reduction of LWD and smaller wood for streams, as well as future recruitment for these components, is already occurring through logging in many timber sales across the landscape. Logging of large trees will greatly exacerbate this issue, negatively affect aquatic ecosystems, and potentially violate RMOs under PACFISH/INFISH.

It is important to highlight that small intermittent streams, as well as perennial streams, would also be negatively affected by the loss of large wood, and that those effects are felt downstream. Loss of large wood in small intermittent streams will negatively impact recruitment of large wood in downstream reaches. This, in turn, will negatively impact instream habitats and water quality for aquatic species including imperiled salmon and trout. Loss of large wood in intermittent streams in small catchments will result in less large wood in perennial streams, and thus result in fewer large pools and habitat complexity. Large wood is very important for protecting underground water storage and movement of small intermittent streams. Small streams are crucial to maintaining cold water for downstream perennial waterways, and to creating and ensuring cold water refugia for fish. (Benda et al. 2005; Caissie 2006; Kaufmann and Faustin 2011)

The agency has, in practice, been shrinking the size of protective RHCA buffers across the landscape. In addition, headwater streams do not have adequate buffers to protect them from the logging already occurring on the landscape. Increased logging of large trees would further exacerbate these issues and degrade water quality and riparian and aquatic habitats. Should this proposal be implemented, the increased logging of large trees and the road-related activities associated with logging, will result in increases in excess fine sediments and turbidity in streams, and harm special-status and imperiled aquatic species such as Bull trout and Mid-Columbia River steelhead.

We are concerned that the Forest Service has repeatedly and systematically failed to share water quality data with ODEQ and WA Dept. of Ecology. Until BMBP wrote letters to Forest Supervisors and ODEQ staff calling attention to this issue in 2018, the National Forests in eastern Oregon had not shared the vast majority of their water quality data with ODEQ for over a decade. After we highlighted this issue during the last ODEQ 'call for data' in 2018, the Forest Service shared large amounts of data with ODEQ, finally. However, based on stream temperature data that BMBP received through FOIA, the Forest Service still has not provided ODEQ with existing stream temperature data for some streams, including streams in violation of water quality standards. Did the Forest Service share all of their stream temperature data for streams within the project area with ODEQ and the WA Dept. of Ecology?

The Forest Service has a legal responsibility to uphold state water quality standards on the federal lands they manage. Their directives include adhering to 'adaptive management' practices. We are very concerned that the USFS is not upholding water quality standards and not adequately tracking or sharing the results of their water quality monitoring with the public or ODEQ, and that they have failed to create a framework for adaptive management. For example, the Forest Service lacks data or evidence showing that recent logging activity and current logging proposals will not adversely affect or further degrade water quality, including in streams that are already in violation of state water quality standards for temperature or sediment. The USFS, despite our persistent inquiries, has not been able to provide us with examples of or data from any upstream/downstream and before/after monitoring from logging projects in priority watersheds, including logging projects taking place within Riparian Habitat Conservation Areas. It seems that there *may* have been one or two projects that might have had such a targeted monitoring design, but the USFS has not been able to provide us with a location, name of stream, or any data. None of the dozens of USFS staff or specialists I've talked with have been able to say for sure if such monitoring has taken place, or tell me a location or stream where it will take place in the near future. The USFS does conduct subwatershed and watershed scale water temperature monitoring—these monitoring data often reflect high stream temperatures that are in violation of state water quality standards. The necessary follow-up work to figure out what is causing these widespread water quality issues and violations is lacking.

Monitoring and accurate inclusion of water quality data into Oregon and Washington's Integrated Database are key components for ensuring that water quality standards are being upheld, and for protecting the viability of aquatic species, including ESA-listed species. Given the widespread logging on public lands across eastern Oregon and southeastern Washington, including the increasingly common practices of commercial and non-commercial logging within streamside RHCAs, inclusion of accurate water quality data in ODEQ and WA Dept. of Ecology's Integrated databases is key for examining and assessing landscape scale data and for implementing adaptive management strategies.

In addition, we are concerned that the USFS is increasingly attempting to use streamside shade as a proxy for attainment of stream temperature standards. However, one has only to look briefly at NEPA documents to understand that data on the percent of shade in a streamside corridor is a poor substitution for water temperature data. For example, in the Aquatics Report of the Camp Lick timber sale on the Malheur National Forest, 25 out of the 31 stream reaches that the USFS surveyed for shade met fish habitat objectives. Yet, only 6 out of 25 of the reaches with stream temperature data met the USFS's fish habitat objectives in those streams (Camp Lick Aquatics Report pages 17-19). Clearly, using stream shade as a proxy for stream temperature in these eastside forests is not appropriate. While we understand that stream shade is an important driver of water temperatures, it is not the only one. Many factors influence stream temperatures, as we've discussed and provided scientific references for in numerous portions of these comments.

The agency's analysis does not give clear data summaries of the USFS's available data, nor how it was collected. For example, are there additional water temperature data from recent years? Do they reflect higher temperatures than the years that were included for public review?

The most common water quality impairment in National Forest System lands is stream temperature. Elevated stream temperatures are known to negatively impact fish stocks on National Forest lands in the Blue Mountains, including anadromous fish, and listed and at-risk fish such as Bull trout. Water quality standards for temperature, sediment, and other water quality parameters are not being met on hundreds of miles of streams on these National Forest lands. TMDLs and WQRPs have not been developed in a timely fashion for many 303(d) listed basins. BMPs have not been adequately re-evaluated or adjusted to assure compliance with water quality parameters such as temperature. WQRPs plans and TMDLs often do not adequately deal with forest management activities, and monitoring is not always followed through on and lacks public transparency.

More than 1,240 stream miles on National Forest lands in the Blue Mountains are listed as not meeting water quality criteria. The most common water quality impairment on National Forest lands is stream temperature (Draft EIS for the Blue Mountains Forest Plan Revision (BMFPR), Vol. 1 pg. 272). This baseline figure from the BMFPR is almost certainly an underestimate-- the large volume of recent data submissions in 2019 from the Forest Service to ODEQ reflect even more widespread problems with stream temperature violations across the landscape. The recent data submission was the first effort by the Forest Service to share a substantial portion of their data with ODEQ in over a decade.

Logging of large trees in upland and riparian forests would cause additional increases in stream temperatures across the landscape. High stream temperatures are already a limiting factor for at-risk and special status aquatic species in many areas. Threatened fish stocks are struggling due to high stream temperatures and increased fine sediments. Stream temperature increases, especially in areas that are already in violation of state and Forest Plan stream temperature standards, are especially dangerous to ESA-listed Threatened Bull trout and steelhead populations.

We are also extremely concerned that the agency's analysis and supporting documents downplay or ignore likely negative impacts on streams, water quality, and watershed hydrology that are well-documented to be associated with roads and logging. For example, in the Upper Touchet sale in the Umatilla NF, the Hydrology Report admits:

> *"The relationship between created openings in forested landscapes and changes in water yield and peak flows has been documented by numerous studies. Changes in forested stand and canopy density caused by harvest, fire, or insect and disease can change the distribution of the snow pack, increase the rate of melt of the snow pack, and cause the timing of the melt to be earlier. These factors may lead to changes in peakflows. In addition, reduction of stocking density reduces the overall vegetative use of water, increasing the amount of water available for runoff. Changes in water yield and in peak flows have the potential to destabilize channels, causing increased erosion and sedimentation in channels. Changes in these parameters would be of concern for aquatic habitat and biota, downstream water users, and for channel morphology."*

The Mill Creek DEA also acknowledges:

> *"Equivalent Harvest Area (EHA) Water yield is particularly affected by changes in the water budget, which includes changes to precipitation, evaporation, and transpiration from vegetation, infiltration, and runoff. Changes in water yield can influence bank erosion, stream temperatures, stream form, and habitat for fish. Resulting channel incision can reduce connection to floodplains and therefore reduce potential water retention across a valley section. EHA is an assessment required by the Ochoco National Forest Land and Resource Management Plan (Forest Plan) to determine the effects to peak flow from timber harvest activities and forest vegetative Mill Creek Dry Forest Restoration, Watershed and Fisheries Effects Analysis 3 conditions within a watershed. EHA is based on the principle that removing vegetation changes hydrologic response characteristics such as runoff, overland flow, peak flow, snow accumulation, timing, and total water yield. Excessive changes in these hydrologic response characteristics can lead to poor riparian conditions such as erosion, lateral scour, channel degradation, aggradation and/or incision resulting in poor water quality."*

Ashy soils typically hold more moisture than sandy or poor soils. As a result, they are often associated with mixed-conifer forests. Because the agency's analysis encourages logging of large firs, mixed-conifer forests on ashy soils are likely to be targeted for logging, and would be at risk of soil damage, compaction, and displacement, should this proposal be implemented. In the Upper Touchet sale, the FEA (pg. 47) notes that the "[e]ffects of ashy soil displacement and compaction by ground-based and cable activities on soil productivity is immediate and will persist on the landscape for up to 20 years or more (Giest, 1989)." The Upper Touchet FEA states: *"Ashy soils have low bearing strength and are susceptible to increased soil displacement and compaction by logging activities. When non-mixed ashy soils are disturbed, erosion is greater due to fine particle size and lack of cohesiveness between ash particles. The FEA also notes that "[a]sh cap soils cover about 80 percent of all the units in the project area".*

As logging is increasingly occurring within stream buffers, the agency has, in practice, been shrinking the size of protective RHCA buffers across the landscape. Headwater streams and small intermittent streams do not have buffer widths that are sufficient to protect water quality and stream habitats. Wider buffers are needed in order to prevent excess fine sediments and nutrients entering waterways. (Freeman et al. 2007; Gomi et al. 2005; Nieber et al. 2011; Sweeney and Newbold 2014).

Logging can be associated with changes in macroinvertebrate community structure or metrics (Flaspohler et al. 2002, Kreutzweiser et al. 2005), increases in stream temperatures (Guenther et al. 2012) and alterations in nutrient cycling and leaf litter decomposition rates (Lecerf and Richardson 2010). Flaspohler et al. (2002) noted that changes to biota associated with selective logging were found decades after logging. For example, the USFS's Draft Forest Plan Revision for the Blue Mountains (vol. 2 pg. 48) noted:

> *"Timber harvest can influence aquatic ecological condition via such activities as removal of trees in the riparian zone, removal of upslope trees, and associated understory or slash burning (Hicks et al. 1991). These activities can affect wood recruitment, stream temperatures, erosion potential, stream flow regime, and nutrient runoff, among others (Hicks et al. 1991). Effects of harvest are likely to be different at different scales. Hemstad and Newman (2006) found few effects of harvest at the site or reach scale, but found that harvest five to eight years earlier resulted in losses of habitat quality and species diversity at the scale of a stream segment (larger than a reach) or at the subwatershed level. Those losses were revealed in terms of increases in bank instability and fine sediment throughout the watershed and increased water temperatures and sediment problems throughout the channel segment. The cumulative effects of widespread harvest within a single drainage in a short period of time resulted in deterioration of the aquatic and riparian habitats, but evidence of effects lagged harvest by several years and different evidence of deterioration showed up at different spatial scales within the watershed".*

The USFS must disclose and avoid the threats and negative impacts of logging, including logging of large trees and in mature and old forests, to water quality and watershed hydrology. For example, logging can increase surface runoff and overland flow, which delivers warmer water and excess sediments into streams quickly, and can alter peak flows and increase stream temperatures. In addition, increased surface runoff and faster delivery of water into streams also means that less water becomes groundwater. This decreases groundwater storage, groundwater flows, and hyporheic flows. (Coutant 1999; Croke and Hairsine 2006; Jones and Grant 1996). Logging, including upland logging, can cause decreases in summer baseflows in the long-term. Decreased canopy cover due to logging can cause more snow to accumulate in these more open areas, which alters the timing and magnitude of runoff from snow melt. This can also cause changes to peak flows (Harr and Coffin 1992). Increasing canopy openings can increase solar radiation inputs, and as a result may increase the amount of early snow melt. This, in turn, may further alter peak flows and groundwater recharge and the hyporheic cold water delivery downstream, including to perennial streams. (Caissie 2006; Harr and Coffin 1992). Logging alters microclimates, creating hotter, drier, and windier conditions that stretch beyond forests directly affected and into adjacent forests, sometimes for distances of hundreds of feet. Such microclimate edge affects could extend into the entirety of riparian buffers, especially in smaller headwater streams. (Chen et al. 1992; Chen et al. 1995; Brosofske et al. 1999)

Protecting groundwater storage, groundwater flows, and hyporheic flows associated with intermittent streams is crucial for protecting temperatures in larger downstream perennial streams. Cold water inputs from intermittent streams to downstream reaches are essential providing cold water refugia for special-status and imperiled aquatic organisms, including ESA-listed fish (Caissie, 2006; Ebersole et al. 2015; Groom 2011; Groom 2011; Jones and Grant, 1996; Pollock et al. 2009). Patches of cold water refugia are crucial for fish. Shallow groundwater patterns can be important for influencing stream temperatures, (Poole et al. 2008) and so are likely vulnerable to upslope logging (Caissie 2006). In research in eastern Oregon, Ebersole 2015 found that dry streams supplied cold water to downstream reaches at confluence sites. Such cold water refugia habitats are important for fish, which were observed at these locations.

Logging, including logging in mature and old forests, has negative effects on stream temperatures. For example, Guenther et al. (2012) found increases in bed temperatures and in stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the harvest area from 1.6 to 3 degrees Celsius. Pollock et al. 2009 found that stream temperature was more closely associated with degree of logging within catchments than with streamside vegetation. Small streams are particularly vulnerable to increases in temperature, even with limited selective logging. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging alters these parameters, and degrades the ability of these parameters to support cold water, and is likely to increase stream temperatures. (Caissie 2006; Davies and Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 201; Jones et al. 2006; Sweeney 2013; Pollock et al. 2009; Wigington et al. 2006; Poole et al. 2008; Poole and Berman 2001; Ebersole et al. 2015). Logging is also likely to increase surface runoff and overland flow, potentially delivering warmer water (and excess sediments) into streams more quickly and with a greater volume. As discussed in other sections of these comments, such inputs can also cause erosion and alter stream morphology. Such issues can, in turn, affect stream temperatures.

Large woody debris (LWD):

We are very concerned that logging in mature and old forests will negatively affect the availability of large wood and future large wood recruitment for LWD in streams. Large wood recruitment and delivery is a crucial cornerstone of ecological integrity for streams, essential for the viability of many native and ESA-listed aquatic species, and a driving force of recovery for stream morphology. Hyporheic flows and groundwater storage and movement depend in part on large wood and future large wood recruitment, and are important for maintaining cold water in perennial streams. Groundwater movement and storage is interconnected with a number of complex watershed processes and forest components.

Aquatic ecosystems include complex and interdependent interactions. The loss of large woody debris in streams negatively affects stream morphology, including pools. The reduction of LWD and smaller wood for streams, as well as future recruitment for these components, is already occurring through logging in many timber sales across the landscape. Logging of mature large trees greatly exacerbates this issue.

The most common water quality impairment in National Forest System lands is stream temperature. Elevated stream temperatures are known to negatively impact fish stocks on National Forest lands in the Blue Mountains, including anadromous fish, and listed and at-risk fish such as Bull trout. Water quality standards for temperature, sediment, and other water quality parameters are not being met on hundreds of miles of streams on these National Forest lands. TMDLs and WQRPs have not been developed in a timely fashion for many 303(d) listed basins. BMPs have not been adequately re-evaluated or adjusted to assure compliance with water quality parameters such as temperature. WQRPs plans and TMDLs often do not adequately deal with forest management activities, and monitoring is not always followed through on and lacks public transparency.

More than 1,240 stream miles on National Forest lands in the Blue Mountains are listed as not meeting water quality criteria. The most common water quality impairment on National Forest lands is stream temperature (Draft EIS for the Blue Mountains Forest Plan Revision (BMFPR), Vol. 1 pg. 272). This baseline figure from the BMFPR is almost certainly an underestimate-- the large volume of recent data submissions in 2019 from the Forest Service to ODEQ reflect even more widespread problems with stream temperature violations across the landscape. The recent data submission was the first effort by the Forest Service to share a substantial portion of their data with ODEQ in over a decade.

High stream temperatures are already a limiting factor for at-risk and special status aquatic species in many areas. Threatened fish stocks are struggling due to high stream temperatures and increased fine sediments. Stream temperature increases, especially in areas that are already in violation of state and Forest Plan stream temperature standards, are especially dangerous to ESA-listed Threatened Bull trout and steelhead populations. Even localized increases at the subwatershed or reach scale can jeopardize already ESA-listed fish—especially if the problem is repeated in multiple stream reaches across the landscape. At-risk aquatic species such as Bull trout are already suffering from fragmented and small populations. Creating additional negative impacts across the landscape as a result of increased logging large trees is extremely risky at best. Small and isolated populations make for fragile populations (that are subject to declines due to localized events, genetic drift, and other factors). Reiman et al. (2001) noted that: ***"…vulnerable aquatic species could be impacted in the short term in ways from which they could not easily recover…"*** even in cases where the management actions resulted in long-term benefits in later years. The negative effects on water quality parameters such as stream temperature from proposed logging within this sale and from ongoing logging throughout the region are already putting Bull trout and Steelhead at risk. The increased stream temperatures that would result from the proposed logging and roading exacerbate the already dire situation for water quality and imperiled aquatic species across eastside Forests.

Watershed hydrology:

Excess fine sediments generated by road related erosion or harvest related soil compaction may be carried farther across the landscape because of decreases in water infiltration or runoff rates over damaged soils, which in turn can cause an increase in the distance of overland flow transporting the sediments. Thus, the sediments generated by management activity can reach streams (Croke and Hairsine 2006, Nietch et al. 2005, Wemple et al. 2000). In addition, improper road drainage can cause gullies, landslides, and other erosional features, which in turn lead to sediment generation, increased runoff, and more direct and rapid transport of runoff and sediment to streams (Croke and Hairsine 2006, Wemple et al. 2000). Furthermore, the distance of travel required for sediments to enter streams may be shortened by the artificial extension of stream networks by roads and culverts (Croke and Hairsine 2006, Wemple et al. 1996). Increases in the efficiency of delivery of water and sediment to streams due to road networks and changes to soil infiltration and groundwater inputs can affect the timing, magnitude, duration, and frequency of sediment inputs. Roads increase peak flows by intercepting surface and subsurface flow, and diverting it into culverts and ditches that drain into streams (Wemple et al. 1996). Instream sediment dynamics such as timing and placement of fine sediment deposition, embeddedness, and scour are affected by stream power and flow regimes (Moore and Wondzell 2005, Wood and Armitage 1997).

Studies have found selective logging may be associated with increases of instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010). Upslope logging, particularly on steep slopes above streams, can increase fine sediment inputs into streams, contribute to stream temperature increases, cause increased variability in water quality and aquatic habitat parameters, and alter stream morphology and watershed hydrology. Additionally, logging on thin soils, ash soils, and rain-on-snow zones greatly increase the risk of soil damage, erosion, and excess fine sediments in streams. Zhang et al (2009) found long-term impacts to macroinvertebrate communities and streambed substrates. These impacts lasted for up to 40 years due to excess fine sediments associated with logging. Effects, such as changes to sediment loading and stream morphology, may not show up for many years after logging. (Beechie 2001; Beechie et al. 2005; Benda and Dunne 1997; Kelsey 1982; Madej and Ozaki 1996).

MONITORING AND BASELINE INFORMATION:

The Forest Service has repeatedly demonstrated that it does not have the ability to collect, organize, store, analyze, or share data and monitoring information in an effective or consistent manner. The following are a few examples of issues with monitoring data and information:

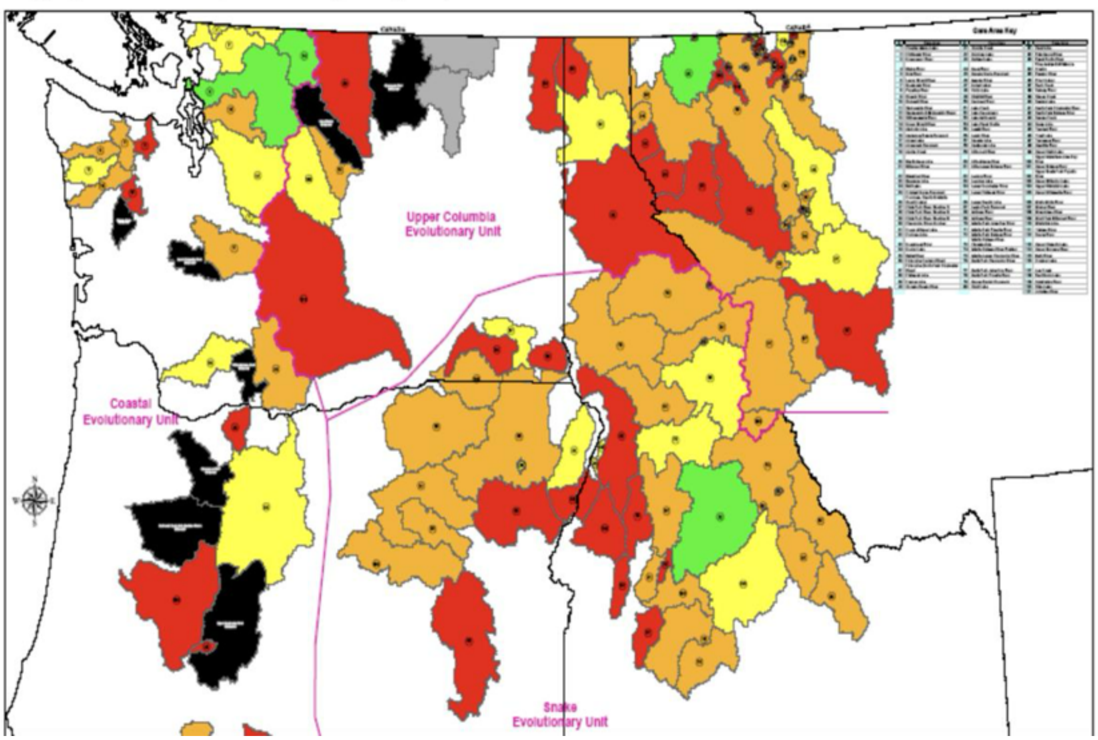
- The Forest Service lacks the will or internal organization to share data with outside agencies, such as Oregon Department of Environmental Quality, on a regular basis. Until BMBP wrote letters to Forest Supervisors and ODEQ staff calling attention to this issue, the USFS had not shared the vast majority of their water quality data with ODEQ for over a decade. After we highlighted this issue during the last ODEQ 'call for data' in 2018, the Forest Service shared large amounts of data with ODEQ, finally. However, based on stream temperature data that BMBP received through FOIA, the Forest Service still has not provided ODEQ with existing stream temperature data for some streams, including streams in violation of water quality standards. BMBP had to appeal the first FOIA response we received from the Forest Service in order to finally get the bulk of these data.
- Unwilling to be transparent with the public. The Forest Service has repeatedly made it difficult to obtain water quality information.
- Unable to properly organize data storage or coordinate data sharing among key staff members. For example, water temperature data does not generally seem to be housed in a central location in most instances. Submission of existing data into the centralized database is voluntary for staff members in charge of such data. Once it became clear that the Forest Service was planning to (finally) submit some of their data to ODEQ during the ODEQ 'call for data', it became clear that the Forest Service did not have an adequate internal system or protocol for data storage or organization. Much of this data was housed with individuals who were not required submit it to the centralized database for eventual submission to ODEQ.
- The Forest Service often does not have accurate or consistent water quality data in NEPA documents. We have documented this issue for numerous streams. For a few examples, please see our exhibit with our letter to the Malheur National Forest requesting an SEIS for the Camp Lick timber sale.
- The Forest Service does not conduct an adequate or statistically robust number of site visits to determine BMP and PDC effectiveness in timber sales. This only happens for a handful (or less) of timber sale sites on each forest per year. While the Forest Service claims that BMP monitoring is effective, in reality the agency does not have enough data to make this determination.
- The Forest Service is unable to follow through with monitoring plans and efforts (for example, stream temperature monitoring promises made and broken)
- The Forest Service sometimes uses very limited monitoring data in an inappropriate fashion. For example, the agency will sometimes collect a small number of tree cores without any sort of standardized protocols or sampling design, not do appropriate analyses on the data, and then use the data to justify log large trees in timber sales (even when the diameter limits in the sales don't correspond to the data collected).
- The agency lacks an appropriate framework for adaptive management. In many cases, the agency lacks baseline data, which is a key component of an adaptive management framework.
- When designing monitoring goals, the agency will often narrowly focus on monitoring parameters relative to 'fuels', silvicultural questions, tree species composition, or some other aspect of measuring trees or wood. The Forest Service rarely focuses substantial or widespread effort to systematically or responsibly collect data on and monitor issues such as: water quality response to logging in a before/after upstream/downstream design; wildlife or fish response to logging or grazing; soil compaction; etc.
- Lack of follow-through with long-term monitoring plans and promises, such as those for stream temperature monitoring in the Big Mosquito sale in the Malheur NF.

The Forest Service lacks data or evidence showing that recent logging activity and current logging proposals are not adversely affecting or further degrading water quality, including in streams that are already in violation of state water quality standards for temperature or sediment and are being targeted for logging—including logging of mature forests within their RHCAs. The USFS, despite our persistent inquiries, has not been able to provide us with examples of or data from any upstream/downstream and before/after monitoring from logging projects in priority watersheds, including logging projects taking place within Riparian Habitat Conservation Areas. None of the dozens of USFS staff or specialists BMBP has talked with have been able to say for sure if such monitoring has taken place, or provide a location or stream where it will take place in the future. The USFS does conduct subwatershed and watershed scale water temperature monitoring—and these monitoring data consistently reflect widespread high stream temperatures in violation of state water quality standards. The necessary follow-up work to figure out what is causing these widespread water quality issues and violations is lacking.

Based on these and other issues with current monitoring, there is no reason to believe that the Forest Service is able to conduct an adequate or comprehensive monitoring program in relation to the logging of large trees. Furthermore, the monitoring that the Forest Service is narrowly focused on parameters that miss the mark for actually looking for indicators of ecosystem response, or potential effects to wildlife, birds, water quality, riparian habitats, in stream habitats, etc.

Figure below from the USFWS 2008 Bull Trout 5-yr Review: Summary and Evaluation:

Figure 5. Map of Core Areas by Risk Category (red=high risk; orange=at risk; yellow=potential risk; green=low risk; gray=unknown risk; black=likely extirpated).



The Forest Service manages much of the land that encompasses core and critical habitats for spawning and rearing for numerous listed fish species. Spawning and rearing habitat quality is a limiting factor in the continued viability of these species, due in part to the widespread problems with high stream temperatures and excess fine sediments across National Forests in eastern Oregon (Middle Fork IMW Working Group 2017).

Logging poses a greater risk to aquatic species than wildfire, including high-severity wildfire. For example, the USFS proposed Forest Plan Revision (2014) vol 2. pg 60 notes that Redband trout will recolonize a stream relatively rapidly after experiencing severe fire:

> ***"Redband trout and bull trout have been shown to recolonize severely burned drainages within two years, provided the drainages were physically accessible (i.e., no culvert barriers, and provided that other fish in unburned areas were close enough to discover and move back into the recently burned habitat".***

In addition, the Olson 2000 thesis noted: *"Gresswell (1999) notes that local extirpation of fishes is often patchy in the case of extensive high severity fires, and that recolonization is rapid."*

The agency regularly overstates fire risk, while ignoring or severely downplaying risks from logging. Increased logging of large trees in uplands and logging in riparian corridors pose clear and serious risks to imperiled and at-risk aquatic and riparian species.

Dynamics between stream temperatures and sensitive aquatic species may be far more complex, and often more delicate, than agencies are taking into account—including for ESA-listed species. The study *Key findings for Stream Temperature Variability: Why It Matters To Salmon* by Steele and Beckman (2014) found that:

> *"Commonly used degree-day accumulation model is not sufficient to predict how organisms respond to stream temperatures. Changes in how the degree days are delivered have the potential to alter the timing of life history transitions in Chinook salmon and other organisms. Emerging from the gravel a few days earlier or later could directly affect their survival due to changes in available food resources, competition for feeding grounds, or strong currents".*

Also, evidence suggests that current BMPs and/or Project Design Criteria may not be sufficiently protective of sensitive aquatic species such as Bull trout. For example, the Fish and Wildlife Service Final Rule for Bull trout (Department of the Interior Fish and Wildlife Service 50 CFR part 17 2010) states that:

> *"Special management considerations or protection that may be needed include the implementation of best management practices specifically designed to reduce these impacts in streams with bull trout, particularly in spawning and rearing habitat. Such best management practices could require measures to ensure that road stream crossings do not impede fish migration or occur in or near spawning/rearing areas, or increase road surface drainage into streams."*

Increased logging of large trees in uplands and logging in riparian corridors pose clear and serious risks to imperiled and at-risk aquatic and riparian species. We are also extremely concerned that widespread upslope logging and roading activities will negatively affect Bull trout. For example, we the FS is proposing to build "temporary" road segments adjacent to headwater streams of Little Mill and Little Salmon Creeks, both of which are streams that support Bull trout. We are also concerned about the effects of extensive and heavy logging within RHCAs along streams that support Redband trout and other sensitive aquatic species, and that downstream habitats rely on for cold water inputs.

Fish, amphibians, and macroinvertebrate communities may be negatively impacted by excess fine sediment inputs resulting from logging and roads (Bryce et al. 2010, Nietch et al. 2005). Increases in fine sediment loading can cause simplification of 6 complex habitats and channel structure either through settling on or scouring out the streambed (Cover et al. 2008, Nietch et al. 2005). As a result, habitats such as pools, riffles, and side channels required by stream organisms for egg laying, resting, hiding, and rearing of young may be degraded or eliminated (Bryce et al. 2010, USEPA 2006). In addition, excess fine sediment loading, particularly in combination with the alteration of flow regimes and hydrologic processes, may negatively impact stream channel stability, limit hyporheic exchange, and alter groundwater inputs, potentially degrading conditions for stream organisms by further increasing sediment loading, decreasing necessary physical habitat, and altering stream water volume which can affect temperature and dissolved oxygen, and limit resources (Croke and Hairsine 2006, Moore and Wondzell 2005, Nietch et al. 2005, USEPA 2006). Fine sediment inputs exceeding natural background levels may bury and smother fish and amphibian eggs or young, decrease dissolved oxygen (DO) levels, interfere with behaviors such as mating, feeding and predator avoidance, cause shifts in macroinvertebrate community structures, and increase macroinvertebrate drift rates (Bryce et al. 2010, Nietch et al. 2005, USEPA 2006). For example, Coho salmon egg survival and fry emergence were negatively correlated with embedded fines of greater than 10%. In addition, when fines exceeded 20%, average survival decreases dramatically (Cederholm 1980). Macroinvertebrate drift rates increased significantly when exposed to suspended sediment concentrations of 8 mg/L for 5 hours, though ephemeroptera and plecoptera drift more rapidly upon exposure to sediments compared to those not exposed to sediments. Some ephemeroptera species, when exposed to concentrations of suspended sediments greater than 29mg/L for 30 days, 7 will disappear entirely. Longer exposure durations and smaller particle sizes caused increased rates of drift (IDEQ 2003).

The Forest Service must take responsibility for their part in the continued viability of fish that use key habitats on national forest lands, rather than downplaying and refusing to acknowledge the impacts from Forest Service Management, including logging and roading on forests—including mature and old forests. Logging on National Forests continues to cause ongoing negative affects to anadromous and resident fish populations that have important consequences for long-term trends and continued viability.

Actions that minimize increased water temperatures are important for maintaining cold water refugia. The Independent Scientific Advisory Board (2007) states:

> *"Adequate protection or restoration of riparian buffers along streams is the most effective method of providing summer shade. This action will be most effective in headwater tributaries where shading is crucial for maintaining cool water temperatures. Expanding efforts to protect riparian areas from grazing, logging, development, or other activities that could impact riparian vegetation will help reduce water temperature increases. It will be especially important to ensure that this type of protection is afforded to potential thermal refugia. Removing barriers to fish passage into thermal refugia also should be a high priority."*

Salmon face serious threats to their continued existence due to climate change, and are predicted to suffer significant habitat loss**.** The Independent Scientific Advisory Board (2007) notes that according to some research predictions:

> ***"****[T]emperature increases alone will render 2% to 7% of current trout habitat in the Pacific Northwest unsuitable by 2030, 5%-20% by 2060, and 8% to 33% by 2090. Salmon habitat may be more severely affected, in part because these fishes can only occupy areas below barriers and are thus restricted to lower, hence warmer, elevations within the region. Salmon habitat loss would be most severe in Oregon and Idaho with potential losses exceeding 40% by 2090****."***

Bull trout may lose over 90% of their habitat within the next 50 years due to increased stream temperatures as a result of climate change. Bull trout require very cold headwater streams for spawning, and so are likely to be disproportionately affected by stream temperature increases due to climate change. Recent projections of the loss of suitable habitat for bull trout in the Columbia Basin range from 22% to 92% (ISAB 2007). The US Fish and Wildlife Service notes that: "[g]lobal climate change threatens bull trout throughout its range in the coterminous United States…..With a warming climate, thermally suitable bull trout spawning and rearing areas are predicted to shrink during warm seasons, in some cases very dramatically, becoming even more isolated from one another under moderate climate change scenarios….Climate change will likely interact with other stressors, such as habitat loss and fragmentation; invasions of nonnative fish; diseases and parasites; predators and competitors; and flow alteration, rendering some current spawning, rearing, and migratory habitats marginal or wholly unsuitable."

Logging within RHCAs and upslope logging, particularly logging of large trees, would exacerbate stream temperature issues. Even localized temperature increases may have negative effects on struggling fish populations, especially when repeated in numerous streams across the project area and beyond. Past and current logging, grazing, and roads have increased stream temperatures to ecologically and legally unacceptable extremes. High stream temperatures, as well as increased fine sediment in many areas, are likely the pressing risks to fish viability and stream ecosystems. The synergistic effects of climate change, high temperatures, and increased fine sediments warrant actions such as protecting shade, ecosystem integrity, and terrestrial and aquatic connectivity. HRV of tree species composition and perceived wildfire dangers pose far less of a threat to these parameters than widespread logging of large trees.

In combination with climate change, the negative effects of increased logging of large trees may have especially severe consequences and unforeseen consequences. Logging has well documented negative effects on watershed hydrology and baseflows. In many areas, climate change is predicted to also lower baseflows and alter watershed hydrology.

Jones & Grant (1996) found that watersheds with drier conditions and more intense summer droughts were more sensitive to the effects of logging and roads on increased peak flows. Hicks et al. (1991) found base flows increased for 8 to 9 years after clearcut logging because rainfall is not intercepted, evaporated, and transpired by trees. Instead, most rainfall becomes surface, subsurface, or groundwater flow once the trees are removed, and therefore contributes to base flow increases. However, the author found that base flow rates declined to lower than normal volumes in areas of hardwood riparian re-growth for the following 18 of 19 years in their study. Logging to increase base flows has been widely cautioned against, and is unpredictable and unlikely to increase base flows during the lowest flow periods or for the long-term. In combination with climate change, unintended negative effects may have severe consequences.

We are concerned that logging within RHCAs and upslope logging, both of which include proposed logging of large trees, will have long-term negative effects on riparian and aquatic ecosystems that are vulnerable to climate change.

Logging in riparian corridors is likely to decrease connectivity, especially connectivity in mixed-conifer areas that currently serve as important corridors and are among the last remaining areas that can provide connectivity for species that are associated with LOS, mixed-conifer forests, denser forests, etc. Increasing connectivity is the most commonly recommended strategy for preserving biodiversity in the face of climate change, according to a review of 22 years of scientific recommendations (Heller and Zavaleta 2009). Increasing connectivity includes actions such as removing barriers to species dispersal, locating reserves near each other, and reforestation. Other commonly recommended connectivity-related actions include creating "ecological reserve networks [i.e.,] large reserves, connected by small reserves, stepping stones"; "protecting the "full range of bioclimatic variation"; increasing the number and size of reserves; and creating and managing buffer zones around reserves (Heller and Zavaleta 2009). Large blocks of habitat that are well-connected to each other are important for the long-term survival for many species in the face of climate change.

It is essential that we preserve core habitats and connectivity corridors because these areas are very important for maintaining genetic diversity, facilitating movement and migration, and providing for range and habitat needs. Connectivity corridors also allow for species to colonize new areas or recolonize after disturbances, which will help species adapt to shifts in geographic range due to climate change. Many species are already facing threats to their viability due to fragmentation and a lack of connectivity; climate change threatens to severely exacerbate risks to their continued survival by further fragmenting habitats.

The analysis failed to adequately consider the importance of carbon sequestration and storage, or to include the best available science on this issue. Large trees and intact, unmanaged forests sequester the most carbon. Logging is the largest source of carbon emissions in Oregon. (Law et al. 2018). The Forest Service failed to analyze how increased logging of large trees on federal lands would further increase carbon emissions, or consider alternatives to instead prioritize carbon sequestration.

ROADS:

There is overwhelming evidence based on peer-reviewed science, discussed throughout these comments, that logging, roading, and other activities proposed in the project harm water quality and imperiled aquatic species– which will negatively impact the mature and old forests also under threat from logging.

Road densities are already higher than Forest Plan standards in many areas, and are harmful to water quality and to aquatic habitats, as well as to terrestrial and avian species that are sensitive to forest fragmentation and road-related disturbances. Note: "temporary" roads are not temporary. ESA-listed fish and aquatic species continue to be jeopardized and face downward population trends as a result of high road densities across eastside forests. As a result, it is all the more important NOT to build or rebuild roads in the few areas that aren't already overburdened with a high density of roads—especially not in the service of degrading mature and old forests through logging.

The bloated road networks on National Forests lands threaten the long-term viability of imperiled and ESA-listed fish such as MCR steelhead and Bull trout, and other imperiled or sensitive aquatic species. The Forest Service notes (USFS 2015) that "*[t]he most important road related environmental issue is the effects of roads on aquatic resources in general, and specifically Threatened, Endangered and Sensitive aquatic species (bull trout, mid-Columbia steelhead, and Columbia spotted frog).*"

Increased road densities have been correlated with low population levels and declines in bull trout and other aquatic species that rely on clean, cold waters (USFWS 2010). Of particular concern are roads that interact with stream channels. Such roads are likely to have disproportionately negative effects on water quality and sensitive fish (USFS 2018). Sedimentation from roads is known to be one of the largest contributors for degradation to water quality as well as a source of degradation to fish habitat and spawning areas. Roads in disrepair create safety issues and conflicts with protection for natural resources, especially for those such as water quality, aquatic species, and functioning wetland processes.

Carnefix and Frissell (2009) discussed impacts from roads, and show that significant negative impacts to sensitive aquatic species are present at road densities greater than one mile per square mile:

> *"Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold for road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) highly significant impacts (e.g., threats of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less. Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., 1 mile per square mile, lower if attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans' environmental impact, with limited exceptions, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species."*

Fish stocks are stronger and better distributed in areas of little or no management and low road densities, even in fire suppressed areas, and even if severe fires occur. Numerous studies have implicated roads as a primary factor in altering watershed hydrology and/or declines in fish stocks, and show that many benefits are gained by leaving forests unroaded and to their own ecological processes (including processes involving fire, insects, and disease). (Bader 2000; Bradley et al. 2002; Carnefix and Frissell 2009; DellaSala et al. 2011; Frissell and Carnefix 2007; Rieman and Clayton 1997, Rieman et al. 2000, Thurow et al. 2001; Public Lands Initiative/Trout Unlimited 2004; Western Native Trout Campaign 2001; Quigley and Arbelbide 1997)

The effects of roads and stream sediments on stream integrity and aquatic habitats affect Bull trout, Steelhead, and other fish are well recognized. The Federal Registrar, Department of the Interior Fish and Wildlife Service 50 CFR part 17 (2010) Final Rule for Revised Designation of Critical Habitat for Bull Trout also recognizes the ecological threats posed by roads to fish and water quality:

"Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984, p. 6; Pratt 1992, p. 6). An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (Oncorhyncus clarkii bouvieri), westslope cutthroat trout (O. c. lewisi), and redband trout (O. mykiss spp.)) within the Columbia River basin, likely through a variety of factors associated with roads. Bull trout were less likely to use highly roaded basins for spawning and rearing and, if present in such areas, were likely to be at lower population levels (Quigley and Arbelbide 1997, p. 1183). These activities can directly and immediately threaten the integrity of the essential physical or biological features described in PCEs 1 through 6."

Meredith et al. 2014 found that increased logging of large trees resulted in increased road-related impacts, potentially negatively affect the abundance and recruitment of wood in streams. The authors found that high road densities have been correlated with lower large wood abundance in streams. The presence of roads in RHCAs also may increase solar radiation and stream temperatures.

The NOAA 5-Year Review of Snake River Salmonids notes the synergistic negative effects of both logging and roads occurring in watersheds:

"Information from the [PACFISH Biological Opinion Monitoring Program] PIBO monitoring program indicates that unmanaged or reference reaches (streams in watersheds with little or no impact from road building grazing, timber harvest, and mining) on Federal lands in the Interior Columbia basin (including the Snake River basin) are in better condition than managed streams (Al- Chockhachy et al. 2010b). In particular, managed watersheds with high road densities or livestock grazing tend to have stream reaches with worse habitat conditions than streams in reference watersheds."

National Forests sometimes acknowledge the risks that roads and high road densities have on fish and water quality, not only when limited to roads directly within the RHCAs. For example, in the Upper Touchet sale on the Umatilla NF, the FEA states: "Road density is used as an indicator of potential for affects to hydrologic function (extension of the stream network) and water quality (sediment delivery to surface waters). Stream crossings are used as an indicator of the degree of connectivity between the road system and the drainage network. To the degree that roads are connected to the drainage network the risk of road sediment reaching surface waters is increased, the drainage network is lengthened and the potential for precipitation to drain more quickly, with less residence time in the watershed is increased. Roads have the potential to intercept surface and subsurface water, reducing infiltration and increasing the delivery of water to channels. Roads which are hydrologically connected are a risk to water quality. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels."

Also from the Upper Touchet DEA: *"Roads have the potential to intercept surface and subsurface water, reducing infiltration and speeding the delivery of water to channels. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels. Road density alone does not indicate slope position, another critical factor. Valley bottom roads have the most direct effect on streams and riparian areas because of accelerated erosion and loss of streamside shade. Mid-slope roads intercept subsurface runoff, extend channel networks and accelerate erosion, and ridge top roads can influence watershed hydrology by channeling flow into small headwater swales, which may accelerate channel development. McCammon (1993) assigned three watershed risk classes based on road density (mi/mi2) to assess the potential of road impacts to adversely affecting hydrologic function and water quality: low (< 3), moderate (3.1-4.5) and high (> 4.5). The Upper North Fork Touchet SWS road density is 1.4 mi/mi2."*

Another example is found in the USFS's Draft EA for the Mill Creek sale in the Ochoco NF*: "Roads are a major source of erosion and stream sedimentation on forested lands. Roads can increase erosion rates and turbidity three orders of magnitude greater than the undisturbed forest condition (Megahan 1974). Sediment eroded from the road prism can be delivered to a forest stream, resulting in increased turbidity, sediment loads, and degraded* *habitat for fish. Research has shown that roads have the greatest effect on erosion relative to other forest management practices (Megahan and King 2004)."*

The Forest Service often builds or rebuilds "temporary" roads (that have impacts for decades or centuries on the landscape), as well as rebuilds "existing temporary roads" to access logging units. Roads that the agency terms "temporary" are not in reality "temporary". This is made evident by the repeated re-use of 'existing roadbeds' and the use of 'existing disturbance areas' for creating roads with each new timber sale. The Forest Service continues to repeatedly re-use these areas of permanent disturbance on the landscape as roads in current timber sales (and the USFS regularly uses these roads as reasons for disqualifying areas for IRAs or Potential Wilderness). Yet the USFS repeatedly claims that these roads won't actually continue to exist beyond each new timber sale's completion. These roads remain as scars on the landscape and show signs of erosion, compaction, or other impacts for years if not decades to come. "Temporary" roads which were not decommissioned or recontoured are ubiquitous on the landscape. They are also not well-documented or monitored, and they are often not included in road density calculations.

Road densities that exceed standards are a regular problem in watersheds and across eastside forests. Existing road density in eastside National Forest is generally well above the 2-miles/square mile NOAA (1996) threshold for watersheds to be considered "properly functioning". NOAA (1996) notes: properly functioning: 2 miles/sq mile; at risk 2-3 mi/sq mi; not properly functioning >3mi/sq mi. The widespread, chronic negative impacts to watersheds and streams caused by the bloated, unsustainable, and badly managed road network across public lands must be addressed by the agency.

Wilderness and Roadless areas occupy a small percentage of National Forests in the Blue Mountains, and the excessive road density outside of these areas has serious and ongoing negative ecological consequences for the majority of watersheds on these forests. Wilderness areas, for example, occupy approximately 17.1 percent of the combined area of the Malheur and Wallowa Whitman National Forests, and only four percent of Oregon's total land area. The agency needs to abandon their narrow attempt to increase large tree logging and instead address the actual causes of ecosystem degradation across the landscape.

The bloated and sprawling road systems on National Forest lands are fiscally burdensome as well as ecologically harmful. In discussing budget shortfalls, the Forest Service notes, for example, that on the Wallowa-Whitman National Forest, it would take approximately $64 million dollars to bring the entire road system back up to standard, and approximately $6.8 million dollars to keep it that way (US Forest Service (2015). Malheur National Forest Forest-Wide Travel Analysis. Pg. 28.)

Across Oregon and Washington, the USFS manages approximately 90,000 miles of roads. The agency notes that it is "a challenge to maintain all roads to proper safety and environmental standards to increased use, aging infrastructure, and decreasing budgets. Many roads, built between 1950 and 1990, have exceeded their designated lifespan and require costly repairs. Unmaintained roads and infrastructure can impact water quality and wildlife habitat, especially fish-bearing streams. Backlog maintenance projects top $1.2 billion, and funds available for road maintenance are only about 15% of what is needed to fully maintain the current road system." (US Forest Service. Webpage. Accessed at: https://www.fs.usda.gov/detail/r6/landmanagement/?cid=fseprd485439])

The Wallowa-Whitman has 4,633 miles of open roads and 4,486 miles of closed roads for a total of 9,119 miles of existing roads. One could drive from the northwestern tip of Washington state to the farthest northeastern tip of Maine, down to Miami, Florida, over to San Diego, California, and back up to the northwestern tip of Washington state, and still not have traveled as many road miles as are contained within the Wallowa-Whitman National Forests. The USFS notes that "of the 90,000 miles of Forest Service roads in Oregon and Washington, about 2/3 of those are currently open and maintained for both public and administrative uses." The USFS estimates that approximately 12% of the overall road network is "likely not needed", with many of these unneeded roads already being "closed or stored", and only about 20% or 2,000 miles being currently open to the public. (US Forest Service. Travel Analysis Report. Wallowa-Whitman National Forest. Table 3, page 19. Accessed online at:

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd486098.pdf) We are also extremely concerned about road-related fish passage barriers, which are an enormous problem for fish across the region.

Mixed-conifer forests, Grand and Douglas fir, and using fear of fire to log mature and old forests:

In eastern Oregon and southeastern Washington, the Forest Service is increasingly and heavily targeting mature and old mixed-conifer forests and large, mature Grand and Doug fir trees as part of their rationale to reduce wildfire risk. The Forest Service claims that Douglas and Grand firs and other less fire-resistant trees are present in larger numbers and higher densities across the landscape than they were historically, as a consequence of fire suppression. However, the Forest Service wildly abuses this rationale by applying it overly broadly and aggressively, and uses it as an excuse to extensively log old growth and mature forests– including in ecologically inappropriate areas such as forests with ample evidence of historic mixed-conifer and high-density forests, on north and east facing slopes; deep gulches and narrow valleys; forests on soils that hold more nutrients and moisture (such as ash soils); and other areas that show historic evidence of supporting mixed-conifer forests in general and Grand fir in particular. The Forest Service is using flawed assumptions that lack adequate scientific backing in order to log in ecologically inappropriate and sensitive areas, and to large trees across many thousands of acres—despite the documented deficit in large trees across the landscape and their importance to wildlife.
For example, recent study from Bradley et al. (2016) challenges USFS assumptions about the fire risk associated with more protected areas—those area that have been less-managed or less-logged, but may still have experienced some degree of fire exclusion (such as Wilderness areas. riparian corridors have also, of course, seen much more protection than upland areas). The authors state:

> *"There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression. This view has led to recent proposals—both administrative and legislative—to reduce or eliminate forest protections and increase some forms of logging based on the belief that restrictions on active management have increased fire severity. We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables.* ***We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy"***
>
> ***"Protected forests burn at lower severities: We found no evidence to support the prevailing forest/fire management hypothesis that higher levels of forest protections are associated with more severe fires based on the RF and linear mixed-effects modeling approaches. On the contrary, using over three decades of fire severity data from relatively frequent-fire pine and mixed-conifer forests throughout the western United States, we found support for the opposite conclusion—burn severity tended to be higher in areas with lower levels of protection status (more intense management), after accounting for topographic and climatic conditions in all three model runs. Thus, we rejected the prevailing forest management view that areas with higher protection levels burn most severely during wildfires."***

Furthermore, recent research suggests that Grand fir forests are more fire resistant than generally assumed by the agency. Moris et al. 2022 found:

> *"The grand fir forest type had severity values at the same level of forest types dominated by fire-resister species despite grand fir was classified as a fire-avoider species. ... In many ponderosa pine*

forests maintained historically by a high frequency, low-severity fire regime, the transition towards denser forests dominated by Douglas-fir and grand fir would explain why ponderosa pine and Douglas-fir still compose a significant proportion of basal area in the grand fir forest type, and many maintain large, old, fire-resistant ponderosa pine trees (Johnston et al. 2021; Merschel et al. 2021). Therefore, the particular structure and composition of these "recent" grand fir forests (e.g., Merschel et al. 2014), with an important presence of large-diameter trees of fire-resistant species, may provide latent fire resistance (Larson et al. 2013)."

Odion et al. (2014) noted, based on extensive literature review of landscape-scale evidence of historical fire severity patters in Ponderosa pine and mixed conifer forests:

"There is widespread concern that fire exclusion has led to an unprecedented threat of uncharacteristically severe fires in ponderosa pine (Pinus ponderosa Dougl. ex. Laws) and mixed-conifer forests of western North America. These extensive montane forests are considered to be adapted to a low/moderate-severity fire regime that maintained stands of relatively old trees. ***However, there is increasing recognition from landscape-scale assessments that, prior to any significant effects of fire exclusion, fires and forest structure were more variable in these forests. Biota in these forests are also dependent on the resources made available by higher-severity fire."***

"… most forests appear to have been characterized by mixed-severity fire that included ecologically significant amounts of weather-driven, high-severity fire."

"….paleoecological studies also support mixed-severity fire regimes for the ponderosa pine and mixed-conifer forests. These studies have found charcoal depositions from major fire episodes in ponderosa pine and interior Douglas-fir forests occurring for millennia in the northern Rockies (central Idaho: [100,101]), Klamath [102], Sierra Nevada [103], eastern Oregon Cascades [104], and southwestern USA [105–107]. ***These major episodes are generally interpreted as large, severe fire events [101– 107].***

"The high-severity fire rotations […] do not support the hypothesis that low/moderate-severity fire regimes were predominant in the majority of ponderosa pine and mixed-conifer forests of western North America. In all the large, forest landscapes for which data covering at least 70 years exist, high-severity fire rotations ranged from about 217 to 849 years [57], and were mostly 200–500 years. This is generally less than potential tree lifespans. For combined moderate- and high-severity fires in the eastern Cascades, rotations were 115–128 years"

"The majority of the evidence did not support the low/moderate-severity fire hypothesis, but, instead, supported the alternate hypothesis that mixed-severity fire shaped these forest landscapes. This finding applies to Pacific states ponderosa pine, Jeffrey pine, and California mixed-conifer forests, as well as ponderosa pine and mixed-conifer forests in the eastern Cascades, Rockies and southwestern USA, where low/moderate-severity regimes have often been applied."

"In addition, patch sizes of high severity fire in the central Rockies have not increased [58]. Our assessment of high-severity rotations based upon existing literature also revealed a generally lower incidence of high-severity fire in these forests in recent decades…"

"Based on direct observations of fire behavior, high winds (generally 10 m open wind speeds .32–35 kilometers/hr) may subject virtually any conifer forest, regardless of fuel density, to crown fire [108]. Thus, empirical data call into question a major premise of the low/moderate-severity fire regime: that ponderosa pine and mixed-conifer forests may be completely resistant to crown fire. Fire intensity increases with winds, and at winds of .30 km/hr spot fires may be ignited over 1 km ahead of the fire front

[109]. The coalescing of separate spot fires with the fire front can further energize wind-driven fire [110,111]. Severe droughts also intensify fires by reducing fuel moisture to extremely low levels, allowing crown fire under less windy conditions [108,112]. Severe drought years throughout much of western North America occurred from 1856 to 1865, 1870 to 1877 and 1890 to 1896 [113]. The extensive high-severity fires of 1910 (the Big Burn in Idaho and Montana), when large areas of drier forests burned at high severity prior to fire exclusion–much of it in ponderosa pine–illustrate how fire behavior that is rare temporally due to extreme climate and weather can dominate in space [1]. Many fire episodes in the charcoal records that exceed modern fires undoubtedly involve combinations of extreme wind, drought, and mass fire."

"The importance of multiple lines of evidence has been stressed in determining whether mixed-severity fire regimes applied historically [122]. ***Our results illustrate broad evidence of mixed-severity fire regimes in ponderosa pine and mixed-conifer forests of western North America. Prior to settlement and fire exclusion, these forests historically exhibited much greater structural and successional diversity than implied by the low/moderate-severity model"***

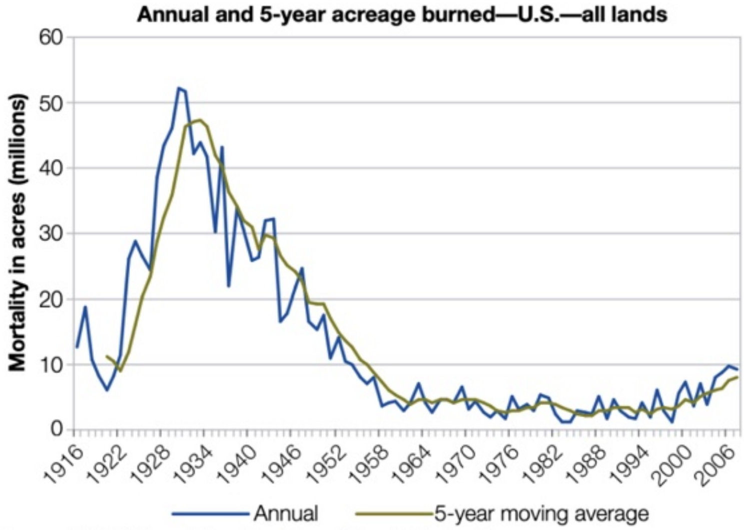
"To improve clarity in communication, we propose that ''low/ moderate-severity'' be applied to those regimes where, as the term implies, high-severity fire is absent. These circumstances appear to be quite rare in the ponderosa pine and mixed-conifer forests of western North America. Therefore, a fire regime with a high-severity component of any amount should not be classified as low/moderate-severity"

"Our findings suggest a need to recognize mixed-severity fire regimes (Table 2) as the predominant fire regime for most of the ponderosa pine and mixed-conifer forests of western North America"

Evidence that Mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

In addition, data from the USFS National Report on Sustainable Forests (2010) shows that fire extent was much more prevalent than today across the US:

Figure 16-1. Total acreage burned.



Source: USDA Forest Service, Forest Health Protection

Hessberg et al. (2007) found that historically mixed-conifer forests were dominated by dense forests. Many of the mixed conifer forests in the region are closed canopy forests that are highly interwoven complex ecosystems that provide high quality habitat for numerous species such as goshawk, marten, Pileated, Lewis woodpecker, and others. Much peer-reviewed scientific research on mixed-conifer forests has suggested that thinning is likely not needed, effective, nor ecologically beneficial in moist mixed-conifer forest to prevent fire, does not mimic the complex natural fire regime (Noss et al, 2006; Lindenmayer et al. 2009) and threatens to increase fire risk (Lindenmayer et al. 2009). The moist, mixed forest type is fragile and vulnerable to the chronic negative impacts of industrial commercial logging. Mature and old-growth moist mixed conifer stands have dense, moist interiors and little wind, which inhibit the spread of wildfire (Lindenmayer et al. 2009; Morrison and Smith 2005; Rhodes 2007). Large fires are climatically driven and fuels reduction treatments can be insignificant to prevent fire spread under these conditions. However, the post-fire habitat is significantly degraded by the logging that happens in the name of fuels reduction prior to the fire.

High intensity wildfires produce unique ecological conditions compared to low intensity fires. High intensity fires are historically natural, and unique, and are integral to the biodiversity of flora and fauna in the region. Favoring lower severity fires across the region in management activities may create unnatural ecological situations that are deleterious to the wildlife, ecological processes, and biodiversity of the area. An example of the importance of post-fire areas occurring after high intensity fires include the findings of Donato et al. (2008):

> *"[S]evere fires are typically expected to be deleterious to forest flora and development; however, these results indicate that in systems characterized by highly variable natural disturbances (e.g. mixed-severity fire regime), native biota possess functional traits lending resilience to recurrent severe fire. Compound disturbance resulted in a distinct early seral assemblage (i.e. interval- dependent fire effects), thus contributing to the landscape heterogeneity inherent to mixed-severity fire regimes. Process-oriented ecosystem management incorporating variable natural disturbances, including 'extreme' events such as SI severe fires, would likely perpetuate a diversity of habitats and successional pathways on the landscape."*

Evidence that mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

Williams and Baker have published several studies suggesting that forests in eastern Oregon were considerably more dense than estimates commonly asserted by agencies (Baker 2012; Williams and Baker 2012; and Baker and Williams 2015). Their research has received criticism by some, such as Fule et al. (2014). However, Williams and Baker (2014) provided in-depth responses to these criticisms and clear rationales and defense of their methods; their response was peer-reviewed and published. Their work should not be discounted; rather, it should be considered part of the ongoing conversation and part of the scientific controversy involved in these discussions. Williams and Baker (2014) note:

> *"Government wildland fire policies and restoration programmes in dry western US forests are based on the hypothesis that high- severity fire was rare in historical fire regimes, modern fire severity is unnaturally high and restoration efforts should focus primarily on thinning forests to eliminate high-severity fire. Using General Land Office (GLO) survey data over large dry-forest landscapes, we showed that the proportion of historical forest affected by high-severity fire was not insignificant, fire severity has not increased as a proportion of total fire area and large areas of dense forest were present historically….. In response, Fulé et al. ...suggest that our inferences are unsupported and land management based on our research could be damaging to native ecosystems. Here, we show that the concerns of FE are unfounded. Their criticism comes from misquoting W&B, mistaking W&B's methods, misusing evidence (e.g. from Aldo Leopold) and missing substantial available evidence. We also update corroboration for the extensive historical high-severity fire shown by W&B. We suggest that restoration programmes are misdirected in seeking to reduce all high-severity fire in dry forests, given findings from spatially extensive GLO data and other sources."*

> *"The best possible historical baseline for dry forests is likely to come from systematically combining all sources. Past studies that supported the past incomplete historical baseline, which suggested that low-severity fire primarily maintained historical dry forests, were often spatially limited, incomplete samples of larger landscapes. Tree-ring methods can reconstruct to fine scales back to the late 1800s, but are difficult to complete across large landscapes (but see Heyerdahl et al., 2001). Palaeoecological reconstructions can provide key temporal evidence, but are also difficult to replicate across large landscapes. GLO data, in contrast, can be used to develop reconstructions across hundred of thousands to millions of hectares. New findings from GLO data have challenged past findings about the nature of the historical baseline in dry forests, but it is the role of science to continually test past findings. Refining the historical baseline should help avoid misuse of evidence, false narratives, and misdirected restoration and provide a sound scientific foundation for predicting the effects of climatic change on wildfire and forests."*

Notably, the original Eastside Screens EA included the protection of ***large*** and old trees as part its Purpose and Need. Mature large trees, and the wildlife habitat needs they provide, were explicitly included as part of the definition of what constitutes old and late seral structure. The Wildlife Standard in the original Screens EA states that *"**the definition of 'remnant old and late seral and/or structural live trees' has been clarified by adding ">21 inch dbh" to better define what is meant.**"* Also, ***large*** trees were central to the habitat needs of Late and Old Forest-Associated species in the original Screens EA. The Screens EA states that the "Habitat Needs of Late and Old Forest-Associated species" for northern goshawk, pileated, white-headed, and three-toed woodpeckers and the pine marten" were part of the significant issues considered in the analysis; these species were identified as management indicator species for late and old forest habitats. Each of these species depends on the habitat provided by large trees. The original Screens EA further highlights the importance of *large* tree structure by noting that ***"Large*** down woody debris (logs) provide habitat for numerous species". The original Screens EA also emphasizes the need to protect "high levels of ***large*** snags" under the Wildlife Interim Standards. The agency's narrow focus on including only *old* forest structure without proper context fails to protect wildlife species that rely on large tree structure, which were both clear goals of the original Screens. Also, the 1990's Eastside Forests Ecosystem Health Assessment (EFEHA) team concluded that there was a "loss of large trees", and that the team "developed the Eastside Screens in part to keep existing ***large*** and old trees and manage national forests to promote an increase in the number of ***large*** and old trees" (emphases ours). The agency's failure to wildlife habitat and old forest components (including large tree structure) produces myopic and incorrect assumptions and interpretations regarding large tree, wildlife habitats, and other ecosystem components in the current EA.

The Eastside Forests Scientific Society Panel was convened in 1993, not long after the order by President Clinton for the Forest Service to "develop a scientifically sound and ecosystem-based strategy for management of eastside forests." The recommendations and science in *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. (1994) were a part of the science and developments that history that help inform the Eastside Screens. *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. 1994, included the following recommendation: "**Cut no trees of any species older than 150 years or with a diameter at breast height of 20 inches or greater**". The report goes on to say that:

> *"**These mature trees have lived for decades, even centuries;** their very existence demonstrates that they have the genetic characteristics to survive the full range of environmental variation present in eastern Oregon and Washington. Their complex structure, the product of a millennia of natural selection, offers unique niches for microbes, invertebrates, and vertebrates. They serve as reservoirs of genetic diversity and irreplaceable sources of seed for forest regeneration; **they renew the supply of large snags and fallen logs, which furnish nest and den sites for many animals; they provide nutrients to the soil**; and they stand as a unique historic record, an irreplaceable link between the past and the future. These trees are living examples of our long-term objectives" (emphases ours).*

Clearly, the authors recognized the importance of mature large trees of any species, including those that were 'mature' and 'decades' old. The authors highlighted the importance of ongoing future recruitment of large snags and logs, and the necessity of large wood structure and recruitment for providing ongoing sources of wildlife habitat. They highlight the need to protect large *and* old trees—it was not limited to only old trees—and reflected the need to protect processes and functions dependent on large trees well into the future.

Henjum et al. 1994 further discussed the key importance of large trees for wildlife species. For example (pg.176):

> *"[T]he pileated woodpecker (Dryocopus pileatus) relies on large snags for roosting, nesting, and foraging sites. Loss of large trees eliminates habitat for this species. Because the woodpecker builds cavities that are in turn used by many other species, species besides the woodpecker can also disappear from a site when snags are removed."*

The authors also discuss the importance of large trees for species such as bald eagles, Vaux's swifts, and bears (pgs. 184, 185, and 188). Furthermore, the authors recognized the importance of large Grand fir in providing key wildlife habitat:

> *"Pileated woodpeckers depend on large snags for nesting and roosting (Bull et al. 1992). Within eastside forests, pileated woodpeckers seem to be closely tied to old grand fir (Abies grandis) stands with trees in advanced decay caused by the Indian paint fungus (Echinodontium tinctorium) (Bull et al. 1992); Bull and Holthausen 1993), a keystone organism that softens core wood. The woodpeckers in turn provide*

> *other keystone services by excavating nesting and shelter cavities in infected core wood, and these are eventually used by many birds and mammals (Thomas et al. 1979a)" (pg. 185).*

Clearly, large Grand fir were recognized as important and as needing to be preserved in the literature and analyses that helped to form the Screens.

Henjum et al. 1994 highlights the importance of preserving large trees in relation to climate change--something that the Forest Service has generally failed to acknowledge some 26 years later: *"Loss of large trees alters patterns of gas exchange, especially for carbon dioxide, changing global climate patterns" (pg. 172).*

The deficit of large trees across the landscape due to past logging has been extensively well-documented, and as a result is a central focus for protection in the original Eastside Screens. The past and ongoing deficit of large trees has important implications for wildlife. Many species rely on large trees and snags habitat, particularly in riparian forests. Yet, the FS altogether fails to incorporate the importance of mature forests and large and mature trees. The complex processes necessary for creating and maintaining mature forests and their habitats should also be incorporated into agency analyses and priorities for protection and restoration.

Bull et al. 1997 highlights the importance of large fir with cavities, as well as the importance and rarity of the multilayer stands that produce this habitat, notes:

> *"**In northeastern Oregon, grand fir and western larch make up most of the hollow trees used by wildlife.** Bull et al. 1997 goes on to note that "[l]arge, hollow trees are uncommon in managed landscapes and typically are found only in late- and old-seral stands of grand fir and western redcedar. Although isolated hollow trees in young stands have significant value to wildlife, these young stands cannot reproduce this type of structure for at least 150 to 200 years. **The late-seral, multilayer stands that produce hollow trees comprise less than 3 percent of the forested landscape in the interior Columbia River basin**."*

The Forest Service Region 6's Response to Blue Mountains Biodiversity Project's Freedom of Information Act request (2016-FS-R6-001106-F) included the "Eastside Screens Enclosure; Recent Science Findings and Practical Experience: Implications for the Eastside Screens September 2015". This Enclosure also recognizes the importance and rarity of large hollow firs. The Enclosure noted (emphases added):

> *"Implementation of the Screens has substantial species management implications. For example, the white-headed woodpecker, Lewis's woodpecker and several species of bats are Regional Forester's Sensitive Species that rely on large snags and defective trees for part of their life history. **Large, defective grand fir trees and snags provide critical roosting and denning habitat for black bears, Vaux's swifts, pileated woodpeckers, American marten, and bats** (Bull et al., 1997). **These legacy trees, especially large, hollow grand fir, are rare on the landscape and have declined from historical conditions on the eastside of Oregon and Washington".** The enclosure also states: "These findings reinforce the importance of retaining and recruiting large, old trees in dry, mesic and moist mixed conifer forests on the eastside of the Region. It is critical that silvicultural prescriptions provide for **large** snags and defective trees in adequate numbers through time….**large, hollow grand firs take 150 to 200 years to develop (Bull et al. 1997): adequate numbers of smaller trees need to be left to allow for the processes that create replacement hollow trees."***

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Quigley et al. 1996) includes summaries of their finding. The "Highlighted Findings" note that **there has been a 27 percent decline in multi-story old forest structures** (Chapter 8, Findings, pg. 181). Given the extensive portion of forests that have already been logged on the landscape, large trees and patches of mature and old forests (and the large trees, snags, and logs within them) often provide some of the last high-quality wildlife habitat and connectivity corridors in and adjacent to timber sale areas.

In recent years, numerous studies have raised alarms regarding habitat loss, climate change, and decline of fauna and biodiversity across the planet. Warnings have been sounded by scientists regarding the declining bird populations we are seeing, and the projections of far greater losses to come. For example, the Rosenberg et al. (2019) study *Decline of the North American Avifauna* reported a "staggering decline of bird populations, and found "wide-spread population declines of birds over the past half-century, resulting in the cumulative loss of billions of breeding individuals across a wide range of species and habitats. They show that declines are not restricted to rare and threatened species—those once considered common and wide-spread are also diminished. These results have major implications for ecosystem integrity, the conservation of wildlife more broadly, and policies associated with the protection of birds and native ecosystems on which they depend."

Given the urgent need to address the biodiversity and climate crises, which includes species and habitats in the Blue Mountains, the agency needs to focus on protecting wildlife, clean water, high-quality habitat, and ecosystem integrity.

Birds are an integral part of forested ecosystems on the Blue Mountains. Wildlife, including birds, were not adequately considered in the EA. Numerous bird species rely on forest types or structural components, and face significant and continued threats to their viability due to ongoing logging large trees and mature and old forests. The agency's analysis did not adequately analyze or avoid the negative effects to wildlife or birds that would occur under all action alternatives.

The following is a summary of birds in the Blue Mountains that are likely to be affected by logging in mature and old forests. For additional detail and citation information, please see the detailed notes and spreadsheet that compliments this section. These documents include additional detail about BBS population trends, Langham et al. (2015) climate threat determinations, and habitat descriptions from Csuti et al (1997), Thomas et al. (1979), Miller (personal communication), and Marshall et al. (2006).

Birds that rely on large trees: The agency's analysis fails to consider many at-risk species that are negatively affected by the loss of large trees across the landscape, and will be affected by the USFS's failure to protect mature and old forests from logging. Bird species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction) include Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red crossbill; White crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Pileated woodpecker; Williamson's sapsucker; Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

Documented population declines & birds that rely on large trees: According to the Breeding Bird Survey (BBS), several of these birds that rely on large trees (listed above) are also facing declining populations across the Northern Rockies, the Great Basin Ecoregions, and/or Oregon or Washington state. Some of these also face declining populations across their entire survey range and the US. Birds that rely on large trees and also facing declining populations include: Bufflehead; Barrow's goldeneye; Common merganser; Wood duck; Vaux's swift; Lewis' woodpecker; Williamson's sapsucker; and Western screech owl.

Association with mature and old forests, mixed-conifer forests, and fir dominant or co-dominant forests & birds that rely on large trees: Many of the birds that rely on large trees are associated with mature forests, old growth forests, mixed-conifer forests, and/or Grand fir or Doug fir during a key portion of their life history. These include: Bufflehead; Barrow's goldeneye; Hooded merganser; Wood duck; Red crossbill; Brown creeper; Vaux's swift; Pileated woodpecker; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Great grey owl; Boreal owl; Long-eared owl; Flammulated owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications). All of these have either seen declining populations according to the BBS, and/or are considered climate endangered or climate threatened by Langham et al. (2015).

Birds that rely on large trees and are at risk from climate change: Climate change will affect bird populations, habitat availability, and ranges. In order to ensure the viability of native birds including waterfowl, raptors, neotropical songbirds and other migratory birds, the Forest Service must consider how climate change will impact these birds and the cumulative impacts with increased logging in mixed-conifer and mature and old growth forests.

Langham et al. 2015 *Conservation Status of North American Birds in the Face of Future Climate Change* identified 314 birds at risk of losing more than half of their current geographic ranges under climate change scenarios. In addition, 126 of these are not expected to see gains in their geographic ranges. The authors note: *"Our results demonstrate the need to include climate sensitivity into current conservation planning and to develop adaptive management strategies that accommodate shrinking and shifting geographic ranges. The persistence of many North American birds will depend on their ability to colonize climatically suitable areas outside of current ranges and management actions that target climate adaptation."* The authors also note: "*We suggest that the 126 species in this category be considered by conservation entities for immediate monitoring beyond existing programs such as BBS and CBC."*

Birds that rely on large trees (noted above) and are also considered climate threatened or climate endangered by Langham et al. (2015) include: Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red Crossbill; White-winged crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Boreal owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; Osprey.

Birds that rely on mature and old forests, mixed-conifer forests, and Grand fir: Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir will be negatively affected by increased logging within these forest types. Logging within these forests may result in loss of key forest components such as multi-story canopies, shrubs, understory structure, unfragmented forests, needed cavities in trees and snags, snags, and logs. Logging of large trees, as well as increased size and intensity of logging projects, would result in forests becoming more younger, more homogenous and even aged, open, and drier. The FS's proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts on tree species composition and forest density across the landscape. As a direct result, available habitat, connectivity, and ranges (especially when climate change is considered) would be affected across the landscape by the FS's proposed changes.

Birds that rely on mature and old forests, mixed-conifer forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Harlequin duck; Red crossbill; White-winged crossbill; Brown creeper; Vaux's swift; Evening grosbeak; Pine grosbeak; Hermit thrush; Swainson's thrush; Varied thrush; Pine siskin; Cordilleran flycatcher; Golden-crowned kinglet; Ruby-crowned kinglet; Black-capped chickadee; Chestnut-backed chickadee; Mountain chickadee; MacGillivray's warbler; Townsend's warbler; Yellow-rumped warbler; Mountain bluebird; Calliope hummingbird; Rufous hummingbird; Red-breasted nuthatch; American three-toed woodpecker; Black-backed woodpecker; Downy woodpecker, Hairy woodpecker, Lewis' woodpecker; Pileated woodpecker, Williamson's sapsucker; American kestrel, Winter Wren, Western Tanager, Hammond's flycatcher, Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Northern saw-whet owl; Northern pygmy owl, Bald eagle; Golden eagle; Osprey; Merlin, Peregrine falcon, and Northern goshawk. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

In addition, most of the birds listed above are also facing current population declines in part of all of their range within the Blue Mountains (according to the BBS) or are considered climate threatened or climate endangered (Langham et al. 2015). The habitat requirements of birds imperiled by declining populations and/or climate change should have been considered and analyzed in the EA. The Forest Service cannot protect the viability of these species without analyzing the effects of this proposal on their habitats, ranges, connectivity, and needed forest components and structures.

The agency's analysis fails to consider many at-risk species that may be negatively affected by the loss of large trees and mature and old forests across the landscape. For example, many wildlife species rely on mature mixed-conifer forests, and need protection from logging-associated impacts such as fragmentation and loss of canopy cover, loss of snags and downed wood, and loss of large tree structure. Wildlife species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction) include, for example, Pacific fishers, Spotted skunks, and American marten which rely on large trees with cavities for reproduction. Other examples include Northern goshawk and other accipiter hawks, Great gray owls, Black-backed woodpeckers, Three-toed woodpeckers, Pileated woodpeckers, Olive-sided flycatchers, and others. Thomas (1979) also highlights several wildlife species that rely on large trees, mature and old forests, and mixed-conifer and Grand fir: Canada lynx, bobcat, Snowshoe hare, White-tailed deer, Northern flying squirrel, numerous bats, Rubber boa, Malheur shrew, Vagrant shrew, Dusky shrew, Heather vole, Long-tailed vole, Gapper red-backed vole, Black bear, Short-tailed weasel, Jumping mouse, and mule deer.

DellaSala et al. 2022 also highlight the importance of preserving large trees and *mature* and old forests:

> *"Federal forests in the Eastern region are maturing from logging that eliminated all but a fraction (1–2%) of the oldgrowth forests over a century ago (Davis, 1996). Most mature forest types in this region lack protections, many are not on federal lands, and most are fragmented especially given that large IRAs are mostly in western regions. Additionally, the USDA Forest Service (2022) revised its 20-year forest management plans for the 416,000 ha Nantahala and Pisgah National Forest in western North Carolina claiming that they needed to log mature forests to create a diversity of seral stages even though classic old-growth forests are still well below historical levels (Davis, 1996). A combination of federal protections, improved forestry practices, and conservation incentives on non-federal lands are needed in this region to meet conservation targets for MOG.*
>
> *Under the Trump administration, the USDA Forest Service removed protections for large diameter (>50 cm dbh, up to 150 years old) trees on national forests in eastern Oregon and Washington that were in place for over two decades, even though large trees remain below historical levels (Mildrexler et al., 2020). We recommend restoring those protections. The five state western proposal that includes the Northern Rockies Ecosystem Protection Act also contains nearly 11 M ha of MOG with only 20% in GAP1 and 2 status and another 30% in IRAs (GAP2.5). Recent policy and management decisions underscore the importance of increasing MOG protections in this region as well."*

Crucial wildlife habitat such as snags and downed wood are vitally important, particularly in RHCAs as they see disproportionally high wildlife use and serve as connectivity corridors. Unfortunately, the FS increasingly sees this key wildlife habitat as "fuels" and logs such habitat or destroys it as part of the collateral damage of logging. In addition, managed stands have fewer snags than unmanaged stands (Cline 1997). The August 2017 "Science Findings" from the PNW Research Station discussed the importance of snags and wildfire, and found that many more snags are needed than current regulations or standards provide for. Riparian forests are disproportionately used by wildlife and birds, and so these findings are particularly relevant to RHCAs. The 2017 Science Findings note:

> *"Currently, the best solution we can recommend is to provide large numbers of snags for the birds, which can be difficult without fire," According to the researchers' calculations, if one of every 20 snags (approximately 4 percent) has suitable wood, and there are five to seven species of woodpeckers nesting in a given patch, approximately 100 snags may be needed each year for nesting sites alone. This does not account for other nuances, like the fact that most species are territorial and will not tolerate close neighbors while nesting, or the fact that species like the black-backed woodpecker need more foraging options. Overall, more snags are needed than other studies have previously recommended. Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately,*

these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers."

A summary of some key impacts from logging, roading, and fire suppression in mature and old forests:

- Roads: for example, such management requires repeated road maintenance and access. What is the over-arching plan with road access for such repeated management for this and other projects on the Wallowa-Whitman National Forest? Does the Forest Service intend to maintain the bloated and expensive road network that exists, which the FS has admitted it does not have the funding to maintain or fix? And which the agency has admitted are causing detrimental impacts to fish and water quality, as well as negative impacts to species such as elk and other animals sensitive to roads?

- Wildlife: What of the native species, many of which are struggling or declining, that depend on dense and complex forest canopies, such as those found in unlogged multi-story mixed conifer forests? Repeatedly managing forests for low-severity fire also has potentially severe and negative ecological impacts for numerous species, including marten, lynx, black-backed woodpeckers, numerous species that rely on dense and complex canopies, cavity-dependent species, species that rely on dead wood, species that rely on a high density of downed logs, and many others.

- Prescribed fire is not the same as wildfire. Prescribed burns can and do cause ecologically important damage to crucial wildlife habitat, particularly if done in ecologically inappropriate areas such as fire and climate refugia. We are also concerned about the loss of snags and downed logs, and note that prescribed burns do not necessarily mimic the same dynamics as wildfire. In addition, timing of prescribed burns, such as those done in spring, potentially interrupts delicate life cycle rhythms of wildlife, such as egg laying and hatching and can harm insects, butterflies, nesting birds, and other species. and that prescribed fire can cause lasting, long-term negative reductions in snags, logs, and dead wood habitats (Arkle and Pilliod, 2010; Pilliod et al. 2006).

- Given that riparian corridors are disproportionately relied upon by many species for connectivity, key habitat, thermal refugia and shade, and other parameters provided by these often denser, complex forests—what effect will repeated prescribed burning every 10 years have on the species that rely on riparian corridors for at least part of their life cycles?

- Snags and downed wood have lower densities in logged forests.

- Large severe fires are climate driven, and are expected to increase as a result of climate change. Fuels reduction activates have little to no impact on large, climate-driven fires.

- While logging and burning forests sometimes correlates to reduced fire severity or altered fire behavior—this is only true for fire events that are not weather and climate driven, and only for a very short period of time before these logged and burned areas start to grow back and "fuels reduction treatments" are no longer effective [cite]. Forests often grow back more densely and homogenously than before they were logged, creating an even more flammable situation [cite].

- Creating artificially open forest canopies makes more susceptible to heat, solar radiation, and wind, and can exacerbate fire risk

- Heavy, industrial-scale logging increases fire risk.

- More protected forests are not at increased risk of more frequent or severe fires.

- Reducing CO2 emissions is the most effective way to combat climate-driven wildfires—not more logging, which increases carbon emissions. Logging is the largest cause of carbon emissions in Oregon. [cite and cite]

- Most home losses to fire in the US are the result of grass fires. The Forest Service is not going to be able to log its way to safer communities or restored forests.

- Home hardening is the most effective strategy for keeping communities safe.

There is a very short window of time that "treatments" will be effective, usually ~10-15 years. "Treated" (logged) areas having a vanishingly small chance of encountering a wildfire during that 10-15 year window of time (Rhodes and Baker 2008). However, the FS appears to be planning to repeatedly "manage" forests (i.e., logging, burning, and roading) on a 10-15 year cycle across the project area and perhaps across much of the region in numerous timber sales. Such "management" is impractical, expensive, ineffective, and would have catastrophic consequences for fish, wildlife, and water quality.

Radeloff et al. 2023 found that most homes that burned in the US were destroyed by grass and shrub fire, not forest fire. This dynamic highlights the realities of climate-driven wildfire and lack of efficacy in logging to control fire behavior. Reporting from CNN about the study notes:

> "*Over the last three decades, the number of US homes destroyed by wildfire has more than doubled as fires burn bigger and badder, a recent study found. Most of those homes were burned not by forest fires, but by fires racing through grass and shrubs.*
>
> *The West is most at risk, the study found, where more than two-thirds of the homes burned over the last 30 years were located. Of those, nearly 80% were burned in grass and shrub fires."*

Another concern we have that much of the prescribed burning in the project area could be comprised of burning slash, including slash piles in RHCAs. Such burning can severely damage soils, and often supports some of the highest concentrations of invasive weeds on Forests. The USFS notes that prescribed fire units would include jackpot burning, which involves "burning of slash concentrations to reduce excess slash generated in harvest and/or non-commercial thinning units. Generally, jackpot burning is used to burn pockets of slash within a unit or to ignite specific targets within the unit without spread through the remainder of the unit. Jackpot burning would be accomplished through hand ignition techniques."

We also want to note that recent research found that the majority of fire ignitions that cross jurisdictional boundaries start on private lands, not public, and that most fires are started by human activity. OSU Newsroom coverage discussed the Downing et al. 2022 study:

> *"The study area covered almost 141 million acres across 11 states and included 74 national forests.*
>
> *Of all ignitions that crossed jurisdictional boundaries, a little more than 60% originated on private property, and 28% ignited on national forests. Most of the fires started due to human activity."*

We are concerned that building and reopening roads will further increase human access to these and other timber sale areas, which in turn increases the risk of human-caused ignitions. In addition, we note that this study counters the common narrative that fires are going to 'pop out' of National Forests to affect nearby communities.

Climate change

The FS fails to acknowledge that logging and "fuel reduction" does little to nothing to stop climate change related wildfires, which are overwhelmingly driven by drought, heat, and wind. Logging in the backcountry will not make communities safer—working near communities, home hardening, and emergency preparedness are far more effective in keeping people safe. Please see the research of Dr. Jack Cohen, a Forest Service researcher who has done decades of work on this topic.

Protecting forests from logging and human development does not lead to increased risk of fire. In fact, logging large trees makes forests more flammable. Increased forest protection does not lead to increased severity of wildfires. Although often associated with the highest levels of biomass and fuel loading, protected forests generally burn at lower severity levels than unprotected forests (Bradley et al. 2016). Zald and Dunn (2018) found that intensively managed forests tended to increase fire severity in plantation stands in climate-driven severe fire events. In their study in California, Levine et al. (2022) found that the odds of high-severity fires on private industrial lands were approximately 1.8 times greater compared to public lands.

Logging in mature and old forests increases C02 emissions and contribute to climate change-- thus exacerbating the warming stream temperatures, lower base flows, and other ecological harm caused by climate change. Logging and roading further exacerbates the negative effects caused by climate change.

Global climate change poses unprecedented threats to humanity and forests. Climate change is caused by excess CO 2 and other greenhouse gases transferred to the atmosphere from other pools. All temperate and tropical forests, including those in this project area, are an important part of the global carbon cycle. There is significant recent information reinforcing the need to conserve all existing large stores of carbon in forests, in order to keep carbon out of the atmosphere and mitigate climate change. The agency must do its part by managing forests to maintain and increase carbon storage. Logging would add to cumulative total carbon emissions so is clearly part of the problem, so it must be minimized and mitigated. Logging would not only transfer carbon from storage to the atmosphere but future regrowth is unlikely to ever make up for the effects of logging, because carbon storage in logged forests lags far behind carbon storage in unlogged forests for decades or centuries.

Forests are important for carbon storage and for carbon sinks—they store carbon in both the soils and the vegetation, and are important for mitigating the impacts of climate change. The U.S. has many forests owned by the public and managed by the Forest Service. Harvesting wood "represents the majority of [carbon] losses from US forests...." (Harris et al., 2016). Additionally, (Achat et al., 2015) has estimated that intensive biomass harvests could constitute an important source of carbon transfer from forests to the atmosphere. Pacific Northwest forests hold live tree biomass equivalent or larger than tropical forests. (Law and Waring, 2015). "Alterations in forest management can contribute to increasing the land sink and decreasing emissions by keeping carbon in high biomass forests, extending harvest cycles, reforestation, and afforestation." (Law et al., 2018). The FS omits an honest carbon accounting of the carbon outputs of this project.

Buotte et al. 2020 published an article prioritizing forest lands for preservation based on "carbon priority ranking with measures of biodiversity." This is important information that the Forest Service should consider in its analysis. The researchers mapped "high carbon priority forests in the western US exhibit features of older, intact forest with high structural diversity[], including carbon density and tree species richness." Here is the map from that article:

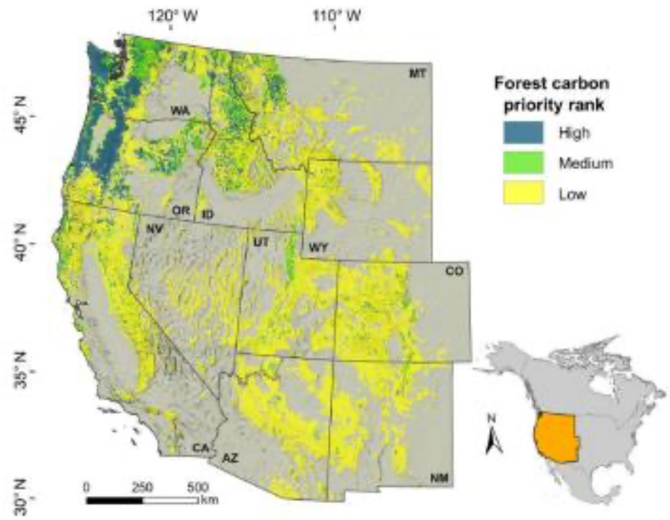


FIG. 1. Forested land in the western conterminous United States classified into priority for preservation to mitigate climate change based on the spatial co-occurrence of low vulnerability to drought and fire and low, medium, and high potential carbon sequestration. WA, Washington; ID, Idaho; MT, Montana; OR, Oregon; CA, California; NV, Nevada; UT, Utah; CO, Colorado; AZ, Arizona; NM, New Mexico.

Over the last several decades, forest managers in North America have used concepts of historical range of variability, natural range of variability, and ecological sustainability to set goals and inform management decisions. An underlying premise in these approaches is that by maintaining forest conditions within the range of presettlement conditions, managers are most likely to sustainably maintain forests into the future. We argue that although we have important lessons to learn from the past, we cannot rely on past forest conditions to provide us with adequate targets for current and future management. This reality must be considered in policy, planning, and management. Climate variability, both naturally caused and anthropogenic, as well as modern land-use practices and stressors, create novel environmental conditions never before experienced by ecosystems. Under such conditions, historical ecology suggests that we manage for species persistence within large ecoregions.

Large trees are especially important for carbon storage. On National Forest lands east of the Cascade Crest in Oregon and Washington, large trees equal to or over 21” in diameter at breast height comprise only ~3% of trees-- yet store ~42% of the carbon. (Mildrexler et al. 2020).

(Mildrexler, et al., 2020) state:

- *Large-diameter trees store disproportionally massive amounts of carbon and are a major driver of carbon cycle dynamics in forests worldwide.*
- *We examined the proportion of large-diameter trees on National Forest lands east of the Cascade Mountains crest in Oregon and Washington, their contribution to overall aboveground carbon (AGC) storage, and the potential reduction in carbon stocks resulting from widespread harvest. We analyzed forest inventory data collected on 3,335 plots and found that large trees play a major role in the accumulated carbon stock of these forests. Tree AGC (kg) increases sharply with tree diameter at breast height (DBH; cm) among five dominant tree species. Large trees accounted for 2.0 to 3.7% of all stems (DBH ≥ 1” or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC stored by each species. Pooled across the five dominant species, large trees accounted for 3% of the 636,520 trees occurring on the inventory plots but stored 42% of the total AGC. A recently proposed large-scale vegetation management project that involved widespread harvest of large trees, mostly grand fir, would have removed ~44% of the AGC stored in these large-diameter trees, and released a large amount of carbon dioxide into the atmosphere.*
- *Given the urgency of keeping additional carbon out of the atmosphere and continuing carbon accumulation from the atmosphere to protect the climate system, it would be prudent to continue*

protecting ecosystems with large trees for their carbon stores, and also for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

Given that large trees over 20" dbh are still rare on the landscape compared to historic norms, logging these trees only hurts carbon storage, as well as key wildlife habitat that is still at a deficit in the region, and biodiversity. Large trees are also essential to watershed health and stream, and logging large trees will negatively affect stream habitats and water quality. Logging large trees over 21" dbh will not make communities safer from wildfire, and will not make a meaningful difference in the FS achieving their tree species composition/forest conversion goals. It will however, negatively affect carbon storage and wildlife habitat in meaningful and harmful ways. Logging, particularly the logging of large trees, does not address the primary problems and sources of ecological degradation on the landscape—too many roads and roads that are harming water quality and wildlife, excess fine sediment and high stream temperatures, and invasives species.

Law et al. 2022 highlights the need for a paradigm shift for managing forests on public lands:

"The recent Intergovernmental Panel on Climate Change report on impacts, mitigation, and adaptation found, and member countries agreed, that maintaining the resilience of biodiversity and ecosystem services at a global scale is "fundamental" for climate mitigation and adaptation, and requires "effective and equitable conservation of approximately 30 to 50% of Earth's land, freshwater and ocean areas, including current near-natural ecosystems." Our key message is that many of the current and proposed forest management actions in the United States are not consistent with climate goals, and that preserving 30 to 50% of lands for their carbon, biodiversity and water is feasible, effective, and necessary for achieving them."

The FS fails to consider how climate change is already, and is expected to be even more in the future, influencing forest ecology. This has vast ramifications as to whether or not the forest in the project area will respond as the FS assumes.

Global warming and its consequences are effectively irreversible which implicates certain legal consequences under NEPA and NFMA and ESA (e.g., 40 CFR § 1502.16; 16 USC §1604(g); 36 CFR §219.12; ESA Section 7; 50 CFR §§402.9, 402.14). All net carbon emissions from logging represent "irretrievable and irreversible commitments of resources."

The Committee of Scientists, 1999 recognize the importance of forests for their contribution to global climate regulation. Also, the 2012 Planning Rule recognizes, in its definition of Ecosystem services, the "Benefits people obtain from ecosystems, including: (2) Regulating services, such as long term storage of carbon; climate regulation..."

Climate change science suggests that logging for sequestration of carbon, logging to reduce wild fire, and other manipulation of forest stands does not offer benefits to climate. Rather, increases in carbon emissions from soil disturbance and drying out of forest floors are the result. The FS can best address climate change through minimizing development of forest stands, especially stands that have not been previously logged, by allowing natural processes to function. Furthermore, any supposedly carbon sequestration from logging are usually more than offset by carbon release from ground disturbing activities and from the burning of fossil fuels to accomplish the timber sale, even when couched in the language of restoration. Reducing fossil fuel use is vital. Everything from travel planning to monitoring would have an important impact in that realm.

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, (Sallabanks, et al., 2001): (L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. ...Impending changes in regional climates ...have the capacity for causing great shifts in composition of ecological communities.

We want to highlight several recent studies and articles have been published in relation to climate change and forests, including papers on forest reserve strategies that include the Blue Mountains:

2022: DellaSala et al. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus?

2022: Ripple et al. World Scientists' Warning of a Climate Emergency

Dec 2022: Law et al. Strategic reserves in Oregon's forests for biodiversity, water and carbon to mitigate and adapt to climate change. *Front. Forests & Global Change* link

Aug 2022: Law & Schlesinger. Why mature and old forests are so important for climate mitigation and adaptation. *The Hill* link

Jul 2022: Law. Boreal and Temperate Forests. In: The Climate Book by Greta Thunberg. link

May 2022: Law et al. Creating Strategic Reserves to protect forest carbon and reduce biodiversity loss in the United States. *Land* link

Dec 2021: Law et al. Strategic Forest Reserves can protect biodiversity and mitigate climate change in the western US. *Nature Comm Earth & Environ*. link

Additional discussion on forest ecology, wildfire, logging, and prescribed burning:

Several studies suggests that numerous species are more negatively affected by thinning than by wildfire. Example include Olive-sided flycatchers, lynx, Pacific fisher, Spotted owls, flying squirrels, and other species. Robertson and Hutto (2007) provide evidence for the harmful effects of thinning to some species in their study *Is selectively harvested forest an ecological trap for Olive-sided flycatcher?* The authors state that:

> *"Human activities that closely mimic the appearance but not the fundamental quality of natural habitats could attract animals to settle whether or not these habitats are suitable for their survival or reproduction. We examined habitat selection behavior and nest success of Olive-sided Flycatchers (Contopus cooperi) in a naturally occurring burned forest and an anthropogenically created habitat type—selectively harvested forest. Olive-sided Fly- catcher density and nestling provisioning rates were greater in the selectively harvested landscape, whereas estimated nest success in selectively harvested forest was roughly half that found in naturally burned forest. Reduced nest success was probably a result of the relatively high abundance of nest predators found in the artificially disturbed forest.* ***These results are consistent with the hypothesis that selectively harvested forest can act as an "ecological trap" by attracting Olive-sided Flycatchers to a relatively poor-quality habitat type. This highlights the importance of considering animal behavior in biodiversity conservation."***

We note that the Forest Service does not have a legal mandate to manage forests for HRV. They are, however, responsible for ensuring the viability of the full compliment of native species, as well as species such as Bull trout and other ESA-listed species. We are very concerned that the FS is myopically focused on shifting tree species composition and structure, rather than on protecting values such as native species and water quality. We are concerned about issues such as the likely loss of snags, downed wood, and other key wildlife habitat. We are also concerned that the FS's answer to native diseases or pests that serve ecological functions is ecologically destructive logging (i.e., in relation to mistletoe, laminated root rot, native bark beetles, etc.).

Further, we are very concerned that the FS has systematically overlooked evidence that mixed-severity fire regimes are more widespread than generally acknowledged by the agency. For example, Baker et al. 2023 discuss in their abstract:

> *"The structure and fire regime of pre-industrial (historical) dry forests over ~26 million ha of the western USA is of growing importance because wildfires are increasing and spilling over into communities. Management is guided by current conditions relative to the historical range of variability (HRV). Two models of HRV, with different implications, have been debated since the 1990s in a complex series of papers, replies, and rebuttals. The "low-severity" model is that dry forests were relatively uniform, low in tree density, and dominated by low- to moderate-severity fires; the "mixed-severity" model is that dry forests were heterogeneous, with both low and high tree densities and a mixture of fire severities. Here, we simply rebut evidence in the low-severity model's latest review, including its 37 critiques of the mixed-severity model. A central finding of high-severity fire recently exceeding its historical rates was not supported by evidence in the review itself. A large body of published evidence supporting the mixed-severity model was omitted. These included numerous direct observations by early scientists, early forest atlases, early newspaper accounts, early oblique and aerial photographs, seven paleo-charcoal reconstructions, ≥18 tree-ring reconstructions, 15 land survey reconstructions, and analysis of forest inventory data. Our rebuttal shows that evidence omitted in the review left a falsification of the scientific record, with significant land management implications. The low-severity model is rejected and mixed-severity model is supported by the corrected body of scientific evidence."*

We also have concerns about prescribed fire, particularly landscape-scale prescribed fire in sensitive or remote areas (including RHCAs) that historically burned with mixed severity, including high severity. The FS also does not seem to account for the dynamic nature and natural variability and complexity of the landscape, or for fire refugia. Also, prescribed fires should not take place in the spring, as the potential to harm nesting birds, butterflies, and other species who are nesting or reproducing at that time is high.

Pilliod et al. 2006 examined potential unintended negative effects on wildlife and habitats due to thinning and prescribed fire. We are concerned that similar negative effects on wildlife and habitats will occur in the widespread logging in riparian corridors. For example, we are concerned about possible losses of snags and dead wood (both in direct response to the project and decreased future recruitment), negative effects on density-and closed canopy-dependent species, negative effects on alpha and beta biodiversity, declines in mammal populations, and other unintended negative effects on the flora and fauna and habitats in the project area. Highlights from their study include:

> *"Large-scale prescribed fires and thinning are still experimental tools in ecological restoration (box 1), and unanticipated effects on biodiversity, wildlife and invertebrate populations, and ecosystem function may yet be discovered (Allen and others 2002; Carey and Schumann 2003)."*

> *"Species that prefer closed-canopy forests or dense understory, and species that are closely associated with those habitat elements that may be removed or consumed by fuel reductions, will likely be negatively affected by fuel reductions. Some habitat loss may persist for only a few months or a few years, such as understory vegetation and litter that recover quickly. The loss of large-diameter snags and down wood, which are important habitat elements for many wildlife and invertebrate species, may take decades to recover…."*

> *"Wildlife and invertebrate species that depend on down wood, snags, dwarf mistletoe (Arceuthobium spp.) brooms, dense forests with abundant saplings and small poles, and closed-canopy forests for survival and reproduction are likely to be detrimentally affected by fuel treatments that alter these habitat elements"*

"Implementation of any thinning or prescribed burning is likely to result in loss of snags, future snags, and down wood that are important stand attributes of healthy forests and critical components of wildlife and invertebrate habitat"

Loss of large-diameter snags and down wood can take years to decades to recover, as indicated by wildland fire research (Passovoy and Fule 2006)."

"There is a great need for long-term observational and preferably experimental studies on the effects of a range of fuel reduction treatments at multiple spatial scales (stand or larger)."

Numerous studies have found negative impacts on wildlife habitats from thinning in riparian areas, even when snags removal is not intended. For example, Pollock et al. (2012) found that selective logging may cause riparian forests to develop characteristics outside of normal late seral conditions in reference stands. Pollock and Beechie (2014) study found that:

"Because far more vertebrate species utilize large deadwood rather than large live trees, allowing riparian forests to naturally develop may result in the most rapid and sustained development of structural features important to most terrestrial and aquatic species".

The August 2017 "Science Findings" from the PNW Research Station discussed the importance of snags and wildfire, and found that many more snags are needed than current regulations or standards provide for. Riparian forests are disproportionately used by wildlife and birds, and so these findings are particularly relevant to Riparian Reserves. The following quotes are from August 2017 "Science Findings" from the PNW Research Station:

- *In dry forests, a mixed-severity fire that kills trees is an important but underappreciated strategy for providing enough snags for cavity-dependent species. Low-severity prescribed fires may not provide enough snags for these species.*

- *Suitable snags are limited, such that snag availability drives landscape-level habitat selection by some species. For example, white-headed woodpeckers selected severely burned patches for nesting, which was initially puzzling because this species does not characteristically forage in burns.*

- *Within burns used by at-risk woodpeckers, the majority (86 to 96 percent) of seemingly suitable trees contained unsuitably hard wood; wood hardness limits nest site availability for these declining species.*

- *This suggests that past studies that did not measure wood hardness counted many sites as available to cavity-excavating birds when actually they were unsuitable. "By not accounting for wood hardness, managers may be overestimating the amount of suitable habitat for cavity-excavating bird species, some of which are at risk," Lorenz says.*

- *"Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately, these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers." Many studies have shown that a severely burned forest is a natural part of western forest ecosystems. Snags from these fires attract insects that love to burrow beneath charcoal bark. And where there are insects, there are birds that love eating these insects. Lorenz and her colleagues stress that providing snags that woodpeckers can excavate is crucial for forest ecosystem health in the*

Pacific Northwest, where more than 50 wildlife species use woodpecker-excavated cavities for nesting or roosting."

- The Forest Service claims that Douglas and Grand firs and other less fire-resistant trees are present in larger numbers and higher densities across the landscape than they were historically, as a consequence of fire suppression. However, the Forest Service abuses this rationale by applying it overly broadly and aggressively, and uses it as an excuse to extensively log old growth and mature forests– including in ecologically inappropriate areas such as forests with ample evidence of historic mixed-conifer and high-density forests, on north and east facing slopes; deep gulches and narrow valleys; forests on soils that hold more nutrients and moisture (such as ash soils); and other areas that show historic evidence of supporting mixed-conifer forests in general and Grand fir in particular. The Forest Service is using flawed assumptions that lack adequate scientific backing in order to log in ecologically inappropriate and sensitive areas, and to large trees across many thousands of acres—despite the documented deficit in large trees across the landscape and their importance to wildlife.

- A recent study from Bradley et al. (2016) challenges USFS assumptions about the fire risk associated with more protected areas—those area that have been less-managed or less-logged, but may still have experienced some degree of fire exclusion (such as Wilderness areas. riparian corridors have also, of course, seen much more protection than upland areas). The authors state:

- *"There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression. This view has led to recent proposals—both administrative and legislative—to reduce or eliminate forest protections and increase some forms of logging based on the belief that restrictions on active management have increased fire severity. We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables.* ***We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy"***

- ***"Protected forests burn at lower severities: We found no evidence to support the prevailing forest/fire management hypothesis that higher levels of forest protections are associated with more severe fires based on the RF and linear mixed-effects modeling approaches. On the contrary, using over three decades of fire severity data from relatively frequent-fire pine and mixed-conifer forests throughout the western United States, we found support for the opposite conclusion—burn severity tended to be higher in areas with lower levels of protection status (more intense management), after accounting for topographic and climatic conditions in all three model runs. Thus, we rejected the prevailing forest management view that areas with higher protection levels burn most severely during wildfires."***

- In addition, recent research suggests that Grand fir forests are more fire resistant than generally assumed by the agency. Moris et al. 2022 found:
-
- *"The grand fir forest type had severity values at the same level of forest types dominated by fire-resister species despite grand fir was classified as a fire-avoider species. ... In many ponderosa pine forests maintained historically by a high frequency, low-severity fire regime, the transition towards denser forests dominated by Douglas-fir and grand fir would explain why ponderosa pine and Douglas-fir still*

compose a significant proportion of basal area in the grand fir forest type, and many maintain large, old, fire-resistant ponderosa pine trees (Johnston et al. 2021; Merschel et al. 2021). Therefore, the particular structure and composition of these "recent" grand fir forests (e.g., Merschel et al. 2014), with an important presence of large-diameter trees of fire-resistant species, may provide latent fire resistance (Larson et al. 2013)."

- Odion et al. (2014) noted, based on extensive literature review of landscape-scale evidence of historical fire severity patters in Ponderosa pine and mixed conifer forests:

- *"There is widespread concern that fire exclusion has led to an unprecedented threat of uncharacteristically severe fires in ponderosa pine (Pinus ponderosa Dougl. ex. Laws) and mixed-conifer forests of western North America. These extensive montane forests are considered to be adapted to a low/moderate-severity fire regime that maintained stands of relatively old trees.* ***However, there is increasing recognition from landscape-scale assessments that, prior to any significant effects of fire exclusion, fires and forest structure were more variable in these forests. Biota in these forests are also dependent on the resources made available by higher-severity fire."***

- *"… most forests appear to have been characterized by mixed-severity fire that included ecologically significant amounts of weather-driven, high-severity fire."*

- *"….paleoecological studies also support mixed-severity fire regimes for the ponderosa pine and mixed-conifer forests. These studies have found charcoal depositions from major fire episodes in ponderosa pine and interior Douglas-fir forests occurring for millennia in the northern Rockies (central Idaho: [100,101]), Klamath [102], Sierra Nevada [103], eastern Oregon Cascades [104], and southwestern USA [105–107].* ***These major episodes are generally interpreted as large, severe fire events [101– 107].***

- ***"The high-severity fire rotations […] do not support the hypothesis that low/moderate-severity fire regimes were predominant in the majority of ponderosa pine and mixed-conifer forests of western North America. In all the large, forest landscapes for which data covering at least 70 years exist, high-severity fire rotations ranged from about 217 to 849 years [57], and were mostly 200–500 years. This is generally less than potential tree lifespans. For combined moderate- and high-severity fires in the eastern Cascades, rotations were 115–128 years"***

- *"The majority of the evidence did not support the low/moderate-severity fire hypothesis, but, instead, supported the alternate hypothesis that mixed-severity fire shaped these forest landscapes. This finding applies to Pacific states ponderosa pine, Jeffrey pine, and California mixed-conifer forests, as well as ponderosa pine and mixed-conifer forests in the eastern Cascades, Rockies and southwestern USA, where low/moderate-severity regimes have often been applied."*

- *"In addition, patch sizes of high severity fire in the central Rockies have not increased [58]. Our assessment of high-severity rotations based upon existing literature also revealed a generally lower incidence of high-severity fire in these forests in recent decades…"*

- *"Based on direct observations of fire behavior, high winds (generally 10 m open wind speeds .32–35 kilometers/hr) may subject virtually any conifer forest, regardless of fuel density, to crown fire [108]. Thus, empirical data call into question a major premise of the low/moderate-severity fire regime: that ponderosa pine and mixed-conifer forests may be completely resistant to crown fire. Fire intensity increases with winds, and at winds of .30 km/hr spot fires may be ignited over 1 km ahead of the fire front [109]. The coalescing of separate spot fires with the fire front can further energize wind-driven fire [110,111]. Severe droughts also intensify fires by reducing fuel moisture to extremely low levels, allowing* *crown fire under less windy conditions [108,112]. Severe drought years throughout much of western North America occurred from 1856 to 1865, 1870 to 1877 and 1890 to 1896 [113]. The extensive high-severity fires of 1910 (the Big Burn in Idaho and Montana), when large areas of drier forests burned at high severity prior to fire exclusion–much of it in ponderosa pine–illustrate how fire behavior that is rare temporally due to extreme climate and weather can dominate in space [1]. Many fire episodes in the charcoal records that exceed modern fires undoubtedly involve combinations of extreme wind, drought, and mass fire."*

- *"The importance of multiple lines of evidence has been stressed in determining whether mixed-severity fire regimes applied historically [122].* ***Our results illustrate broad evidence of mixed-severity fire regimes in ponderosa pine and mixed-conifer forests of western North America. Prior to settlement and fire exclusion, these forests historically exhibited much greater structural and successional diversity than implied by the low/moderate-severity model"***

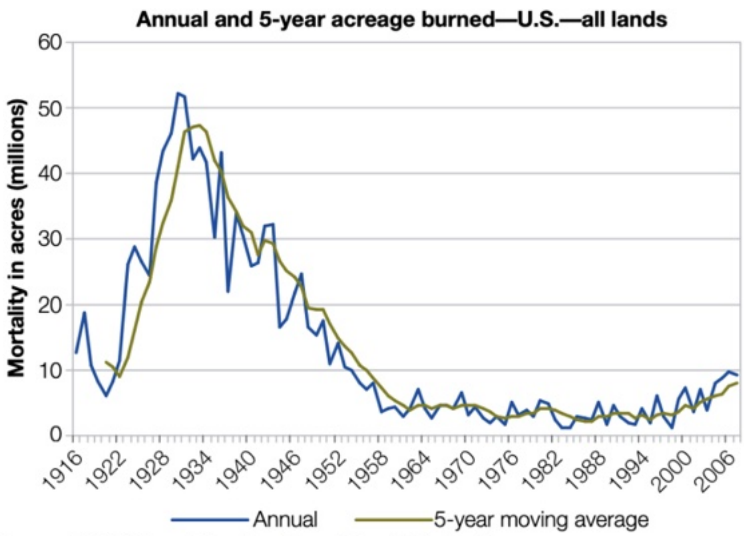
- ***"To improve clarity in communication, we propose that ''low/ moderate-severity'' be applied to those regimes where, as the term implies, high-severity fire is absent. These circumstances appear to be quite rare in the ponderosa pine and mixed-conifer forests of western North America. Therefore, a fire regime with a high-severity component of any amount should not be classified as low/moderate-severity"***

- ***"Our findings suggest a need to recognize mixed-severity fire regimes (Table 2) as the predominant fire regime for most of the ponderosa pine and mixed-conifer forests of western North America"***

- Evidence that Mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

- In addition, data from the USFS National Report on Sustainable Forests (2010) shows that fire extent was much more prevalent than today across the US:

Figure 16-1. Total acreage burned.



Source: USDA Forest Service, Forest Health Protection

- Hessberg et al. (2007) found that historically mixed-conifer forests were dominated by dense forests. Many of the mixed conifer forests in the region are closed canopy forests that are highly interwoven complex ecosystems that provide high quality habitat for numerous species such as goshawk, marten, Pileated, Lewis woodpecker, and others. Much peer-reviewed scientific research on mixed-conifer forests has suggested that thinning is likely not needed, effective, nor ecologically beneficial in moist mixed-conifer forest to prevent fire, does not mimic the complex natural fire regime (Noss et al, 2006; Lindenmayer et al. 2009) and threatens to increase fire risk (Lindenmayer et al. 2009). The moist, mixed forest type is fragile and vulnerable to the chronic negative impacts of industrial commercial logging. Mature and old-growth moist mixed conifer stands have dense, moist interiors and little wind, which inhibit the spread of wildfire (Lindenmayer et al. 2009; Morrison and Smith 2005; Rhodes 2007). Large fires are climatically driven and fuels reduction treatments can be insignificant to prevent fire spread under these conditions. However, the post-fire habitat is significantly degraded by the logging that happens in the name of fuels reduction prior to the fire.

- High intensity wildfires produce unique ecological conditions compared to low intensity fires. High intensity fires are historically natural, and unique, and are integral to the biodiversity of flora and fauna in the region. Favoring lower severity fires across the region in management activities may create unnatural ecological situations that are deleterious to the wildlife, ecological processes, and biodiversity of the area. An example of the importance of post-fire areas occurring after high intensity fires include the findings of Donato et al. (2008):

- *"[S]evere fires are typically expected to be deleterious to forest flora and development; however, these results indicate that in systems characterized by highly variable natural disturbances (e.g. mixed-severity fire regime), native biota possess functional traits lending resilience to recurrent severe fire. Compound disturbance resulted in a distinct early seral assemblage (i.e. interval- dependent fire effects), thus contributing to the landscape heterogeneity inherent to mixed-severity fire regimes. Process-oriented ecosystem management incorporating variable natural disturbances, including 'extreme' events such as SI severe fires, would likely perpetuate a diversity of habitats and successional pathways on the landscape."*

- Evidence that mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

- Williams and Baker have published several studies suggesting that forests in eastern Oregon were considerably more dense than estimates commonly asserted by agencies (Baker 2012; Williams and Baker 2012; and Baker and Williams 2015). Their research has received criticism by some, such as Fule et al. (2014). However, Williams and Baker (2014) provided in-depth responses to these criticisms and clear rationales and defense of their methods; their response was peer-reviewed and published. Their work should not be discounted; rather, it should be considered part of the ongoing conversation and part of the scientific controversy involved in these discussions. Williams and Baker (2014) note:

- *"Government wildland fire policies and restoration programmes in dry western US forests are based on the hypothesis that high- severity fire was rare in historical fire regimes, modern fire severity is unnaturally high and restoration efforts should focus primarily on thinning forests to eliminate high-severity fire. Using General Land Office (GLO) survey data over large dry-forest landscapes, we showed that the proportion of historical forest affected by high-severity fire was not insignificant, fire severity has not increased as a proportion of total fire area and large areas of dense forest were present historically….. In response, Fulé et al. ...suggest that our inferences are unsupported and land management based on our research could be damaging to native ecosystems. Here, we show that the concerns of FE are unfounded. Their criticism comes from misquoting W&B, mistaking W&B's methods, misusing evidence (e.g. from Aldo Leopold) and missing substantial available evidence. We also update corroboration for the extensive historical high-severity fire shown by W&B. We suggest that restoration programmes are misdirected in seeking to reduce all high-severity fire in dry forests, given findings from spatially extensive GLO data and other sources."*

- *"The best possible historical baseline for dry forests is likely to come from systematically combining all sources. Past studies that supported the past incomplete historical baseline, which suggested that low-severity fire primarily maintained historical dry forests, were often spatially limited, incomplete samples of larger landscapes. Tree-ring methods can reconstruct to fine scales back to the late 1800s, but are difficult to complete across large landscapes (but see Heyerdahl et al., 2001). Palaeoecological reconstructions can provide key temporal evidence, but are also difficult to replicate across large landscapes. GLO data, in contrast, can be used to develop reconstructions across hundred of thousands to millions of hectares. New findings from GLO data have challenged past findings about the nature of the historical baseline in dry forests, but it is the role of science to continually test past findings. Refining the historical baseline should help avoid misuse of evidence, false narratives, and misdirected restoration and provide a sound scientific foundation for predicting the effects of climatic change on wildfire and forests."*

Through the lens of species presence and evolutionary history

Mixed-severity fires (including high severity fires) create habitat that is necessary for species within the ONF and eastern Oregon, suggesting that high severity fires are natural and historically present, as well as necessary. High severity fires create important habitat that is very high in biodiversity, and may be rare compared to historic norms.

The evolutionary history and very existence of Black-backed woodpeckers suggests that large high-severity fires must regularly occur within their range. We are concerned that current fire suppression efforts (including thinning) through the region will continue to exclude high-severity wildfires (and continue despite project implementation) and threaten the viability of Black-backed woodpeckers and other species that depend on high-severity wildfire. Hutto et al. (2008) noted that:

> ***"Without embracing an evolutionary perspective, we run the risk of creating restoration targets that do not mimic evolutionarily meaningful historical conditions, and that bear little resemblance to the conditions needed to maintain populations of native species****, as mandated by law (e.g., National Forest Management Act of 1976)."*
>
> *"The degree to which the black-backed woodpecker is restricted to burned forest conditions in the intermountain west is truly remarkable. Although this species has been detected outside burned forest conditions, particularly in unburned, beetle-killed forests, the numbers therein are small, and nest success therein is substantially lower than in burned forests (Saab et al. 2005). Neither Powell (2000) nor Morrissey et al. (2008), for example, found any black-backed woodpeckers in surveys of mountain pine beetle-infested mixed-conifer forests even though they located northern flickers and three-toed, hairy, downy, and pileated woodpeckers. Similarly, a regionwide bird survey across a series of unburned, beetle-infested conifer forests within the Forest Service Northern Region (Cilimburg et al. 2006) yielded only two black-backed woodpecker detections (0.46 % of 433 point counts). This is less than one-tenth of the frequency of detection in forests burned 6 yr (Saab et al. 2007), so the probability of a severe fire occurring somewhere within an entire watershed in any given 6-year window is very high. Thus, when viewed on a landscape scale, it becomes easy to imagine that a sufficiently mobile plant or animal species (e.g., fire morel [Morchella angusticeps]; jewel beetle, Buprestidae; blackbacked woodpecker) could become specialized to use a burned forest condition that is ephemeral on a local scale but always present somewhere in the larger landscape."*
>
> *"…[T]he patterns of distribution and abundance for several other bird species (black-backed woodpecker [Picoides arcticus], buff-breasted flycatcher [Empidonax fulvifrons], Lewis' woodpecker [Melanerpes lewis], northern hawk owl [Surnia ulula], and Kirtland's warbler [Dendroica kirtlandii]) suggest that severe fire has been an important component of the fire regimes with which they evolved.* ***Patterns of habitat use by the latter species indicate that severe fires are important components not only of higher-elevation and high-latitude conifer forest types, which are known to be dominated by such fires, but also of mid-elevation and even low-elevation conifer forest types that are not normally assumed to have had high-severity fire as an integral part of their natural fire regimes.*** *Because plant and animal adaptations can serve as reliable sources of information about what constitutes a natural fire regime, it might be wise to supplement traditional historical methods with careful consideration of information related to plant and animal adaptations when attempting to restore what are thought to be natural regimes."*
>
> *"In addition, two lines of evidence suggest that it is the more severe fires that are needed to create conditions most suitable for this fire specialist: (1) not only is the black-backed woodpecker restricted to burned forests, but its distribution within burned forests is also relatively restricted to the more severely burned conditions (Kotliar et al. 2002, Smucker et al. 2005, Russell et al. 2007, Hutto 2008); (2) black-backed woodpecker nest sites occur in locations that harbor significantly larger and more numerous trees than occur around randomly selected sites within a burn (Saab and Dudley 1998, Kotliar et al. 2002, Russell et al. 2007).* ***Such nesting locations would be difficult to find in forests maintained as low-density, open, park-like stands due to frequent, low-severity fire."***

"How could a species evolve to depend on a condition that occurs only infrequently? The answer lies with the distribution and abundance of such fires across space and time. ***The return interval for severe fire in one location may be several hundred years, but black-backed woodpecker populations persist in a particular re for >6 yr (Saab et al. 2007), so the probability of a severe fire occurring somewhere within an entire watershed in any given 6-year window is very high.*** *Thus, when viewed on a landscape scale, it becomes easy to imagine that a sufficiently mobile plant or animal species (e.g., re morel [Morchella angusticeps]; jewel beetle, Buprestidae; black-backed woodpecker) could become specialized to use a burned forest condition that is ephemeral on a local scale but always present somewhere in the larger landscape."*

EFFICACY OF "FUELS REDUCTION":

The short-term and temporary nature of the perceived fuels reduction benefits from most project are not likely to result in meaningful changes to fire intensity, size, or severity. Most projects designed to reduce fuels note that perceived benefits are estimated to affect fire behavior for approximately 20 years. If the estimated effectiveness is only approximately 20 years, then the justification for this project is even more tenuous. For example, Rhodes and Baker (2008) found that:

"[u]sing extensive fire records for western US Forest Service lands, we estimate fuel treatments have a mean probability of 2.0-7.9% of encountering moderate-or high-severity fire during an assumed 20-year period of reduced fuels."

Hutto et al. 2016 note, in relation to climate change, that increased efforts towards fuels reduction would be an untenable emphasis:

"Any perceived problem with future changes in fire behavior cannot be solved by redoubling our effort to treat this particular climate change symptom by installing widespread fuel treatments that do nothing to stop the warming trend, and do little to reduce the extent or severity of weather-driven fires (Gedalof et al. 2005). Therefore, fuel management efforts to reduce undesirable effects of wildfires outside the xeric ponderosa pine forest types could be more strategically directed toward creating fire-safe communities….Fuel treatment efforts more distant from human communities may carry the negative ecological consequences we outlined earlier and do little to stop or mitigate the effects of fires that are increasingly weather driven (Rhodes and Baker 2008, Franklin et al. 2014, Moritz et al. 2014, Odion et al. 2014)."

DellaSala et al. 2022 highlight the often-overlooked negative environmental impacts of logging and thinning in the name of fire suppression:

"*Active Management Approach (MFAMA) in an attempt to contain wildfires increasingly influenced by top down climate forcings. Wildfire suppression activities aimed at stopping or slowing fires include expansive dozerlines, chemical <u>retardants</u> and <u>igniters</u>, backburns, and cutting trees (live and dead), including within roadless and wilderness areas. MFAMA involves logging of large, fire-resistant live trees and snags; <u>mastication</u> of beneficial shrubs; degradation of wildlife habitat, including <u>endangered species</u> habitat; aquatic impacts from an expansive road system; and logging-related <u>carbon emissions</u>. Such impacts are routinely dismissed with minimal environmental review and defiance of the precautionary principle in environmental planning. Placing restrictive bounds on these activities, deemed increasingly ineffective in a <u>change climate</u>, is urgently needed to overcome their contributions to the global biodiversity and <u>climate crises</u>. We urge land managers and decision makers to address the root cause of recent fire increases by reducing <u>greenhouse gas emissions</u> across all sectors, reforming*

> *industrial forestry and fire suppression practices, protecting carbon stores in large trees and recently burned forests, working with wildfire for ecosystem benefits using minimum suppression tactics when fire is not threatening towns, and surgical application of thinning and prescribed fire nearest homes."*

Baker et al. 2023 determined that nature-based solutions that emphasize natural disturbances are a viable and important strategy:

> *"Natural disturbances, unlike mechanical treatments, select survivors that are more likely to be genetically adapted to survive future disturbances and climate change, while perpetuating ecosystem services. Natural disturbances also could ecologically restore forest heterogeneity, better maintain carbon storage, and reduce management needs. A fully developed disturbance-based NbS could more effectively adapt dry forests to climate change within ~30–40 years if active management is reprioritized to protect the built environment and communities near public forests."*

Noss et al. 2006 also highlighted the paradigm shift needed for true restoration:

> *"One barrier to better use of ecological science is that individuals involved in developing fire policies and practices have tended to be specialists in fire and fuel management, not ecologists, conservation biologists, or other broadly trained scientists. It is not surprising, therefore, that current forest law does not adequately incorporate ecological considerations in its implementation and tends to promote a narrow definition of restoration that focuses almost exclusively on fuels (DellaSala et al. 2004; Schoennagel et al. 2004)."*

> *"True ecological restoration requires the maintenance of ecological processes, native species composition, and forest structure at both stand and landscape scales. Because forests are highly variable over space and time, few universal principles exist for integrating insights from ecology and conservation biology into fire management policies. Nevertheless, one fundamental principle is that managed forests should not only support the desired fire regime but also viable populations of native species in functional networks of habitat (Hessberg et al. 2005). A common-sense conservation goal is to achieve forests that are low maintenance and require minimal repeated treatment. With time, in a landscape of sufficient size, the right end of the restoration continuum (Figure 4) could be reached, where natural fire maintains the system in the desired state. Indeed, wildland fire use is the cheapest and most ecologically appropriate policy for many forests. We envision a future where fire is seen by land managers and the public as the key to healthy forests, but where each forest and each patch of the forest mosaic is recognized for its individuality and managed accordingly. Above all, a guiding principle of forest management should be a precautionary approach that avoids ecological harm."*

In the Balch et al. 2024 study *The fastest-growing and most destructive fires in the US (2001 to 2020)*, the authors found that most fast fires were in grasslands, and that fast fires were largely driven by climate change, high winds, low wind friction, and human ignitions. These findings highlight the outdated nature and ineffectiveness of the FS's primary focus on logging in mature and old forests to reduce fire risk.

"The most destructive and deadly wildfires in US history were also fast. Using satellite data, we analyzed the daily growth rates of more than 60,000 fires from 2001 to 2020 across the contiguous US. Nearly half of the ecoregions experienced destructive fast fires that grew more than 1620 hectares in 1 day. These fires accounted for 78% of structures destroyed and 61% of suppression costs ($18.9 billion). From 2001 to 2020, the average peak daily growth rate for these fires more than doubled (+249% relative to 2001) in the Western US. Nearly 3 million structures were within 4 kilometers of a fast fire

during this period across the US. Given recent devastating wildfires, understanding fast fires is crucial for improving firefighting strategies and community preparedness."

They also found that the *"[t]op 20 fastest-growing fires across the CONUS from 2001 to 2020. Summary statistics describe the top 20 fastest fires from FIRED linked to their associated incident command system summary report (44). The top 20 fastest fires accrued an estimated $398 million in suppression costs alone, exposed 264,338 properties (within 4 km of a fire perimeter), and destroyed >9000 structures. Of the 20 fastest fires, 16 occurred primarily in grassland vegetation types (>50% grassland in burned area)."*

In their closing summary, they note: *"Fires may be growing faster due to warming trends, vegetation transitions to more flammable fuels, or the co-occurrence of high winds with increasing human-related ignitions. Climate driven increases in burned area has been well documented in the US (57), as well as an observed tripling of fire frequency in the 2000s relative to the prior two decades (21). Many fast fires occur during downslope wind events coincident with anomalously dry autumn conditions, which increased both in frequency (25%) and in the area they burned (140%) from 1992 to 2020 (58). Juang et al. found that the increase in Western US forest fire area since the mid-1980s was driven almost exclusively by increasing sizes of the largest fires (59). The mechanism is a function of geometric growth: Larger fires tend to grow faster than smaller fires because longer firelines have greater potential for spread. It is also known that invasive grasses can drive increases in size (23), occurrence, and frequency (24). Because grassfueled fires are some of the fastest (table S3), it may then follow that where vegetation transitions have occurred, for example, from forest or shrubland to invasive grassland (60), fire speed may have also increased. Further, we know that there is a relationship between human ignitions and higher winds (11, 61), because lightning generally does not occur under high-wind conditions due to the constraints surrounding their associated storms (61). Across the US, there has been a steady increase (9%) in the percentage of wildfires started by humans since 1992 (62). It has yet to be tested whether the co-occurrence of windy conditions and human-related ignitions, such as downed power lines, is increasing. People start nearly all the wildfires that threaten our homes (3), making understanding of the ignition, climatic, and fuel drivers of fast fires an important area of future work."*

HISTORICAL DOCUMENTS:

Below are excerpts from historical documents, primarily USFS historical documents, that discuss "north slope" type forests, and the density and species composition of those forests:

The historical documents cited below can be found on this USFS webpage:
https://www.fs.usda.gov/detail/umatilla/learning/history-culture/?cid=fsbdev7_016132

Bolded emphases below are ours.

Excerpts from:
Evans 1912 GENERAL SILVICAL REPORT FOR WALLOWA AND MINAM FORESTS
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015545.pdf
"As its name signifies, the characteristic tree of this type is yellow pine. However, this rarely occurs pure, its chief associates being Douglas fir, western larch, grand fir, and lodgepole pine. Besides these, black cottonwood, birch and alder are coming along stream bottoms, western juniper is sometimes found on dry ridges and western yew occurs in moist sheltered locations. Of the chief associates mentioned, lodgepole pine is apparently a fugitive tree, its presence usually being due to the influence of some external factor, such as fire, windfall or insect infestation,

while its optimum range is in the higher zone. **Douglas fir, larch, and grand fir can always be found as scattered individuals, while on north slopes and at the heads of draws, they form a subtype from which yellow pine is practically excluded. The same thing sometimes happens in canyon bottoms, due apparently, to the excess of shade and moisture."**

Excerpts from:
Heintzleman 1913. *Whitman National Forest Annual Silvical Report North Slope Sub-Type of the Blue Mountains.* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015535.pdf

"The stand is very dense and the amount of debris upon the ground is very large."

"Occurrence of the North Slope Sub-type.

The physical feature which determines to a large extent if an area is "North Slope" or "Slope" is moisture in the soil and in the air. **A good supply of moisture during the growing season is very favorable to the four inferior species named above and yellow pine cannot compete with them successfully. Their reproduction is so dense and fast-growing that yellow pine is choked out.**

It is interesting to note the extent to which these inferior species are dependent upon abundant moisture. Small knolls and side ridges jutting out from a north slope area are covered almost invariably with an open stand of yellow pine due to the exposure to sun and wind, which dry out the soil and thus make the site unfavorable for the north slope species.

Much of the yellow pine on north slope areas occurs on this kind of site. The yellow pines which occur as scattered individuals throughout the entire stand undoubtedly secure a foothold in openings made by windfall or otherwise when a number of unusually dry summers occurring in succession produce soil conditions favorable to reproduction of this species.

The name "North Slope Sub-type" is rather misleading for the aspect cannot always be taken as an indication of the presence of this class of forest. A cool situation is the only condition demanded and very frequently it is found on moist flats, the lower slopes and bottoms of canyons with any aspect whatever and the summits of flat-topped ridges. In fact, numerous examples have been seen of this type occupying west and southwest exposures on one side of a canyon and the east and northeast exposures on the opposite side carrying slope type. Here the east slopes were warm, having bedrock close to the surface with numerous large outcrops in many places. The west exposures were cooler, due to deep soil and gentle slopes. A better name for the sub-type would be one that indicates its occurrence on cool sites.

There is a difference of opinion as to just what constitutes this sub-type, or, in other words, where to draw the line between it and the slope type on the lower situations, and between it and the transition type at the upper limits of its occurrence.

At the lower elevations areas are frequently found to contain quite a number of yellow pine trees per acre, although **north slope species occupy the greater percentage of the ground space.** Also, slope type conditions sometimes grade gradually in north slope, the per cent of yellow pine decreasing and grand fir, Douglas fir, etc., increasing."

Excerpts from:
Langille 1903. *The Proposed Heppner Forest Reserve Oregon.* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015593.pdf

Pg. 5: "The north slope type is represented by a mixed growth of the other species named, and occupies, mostly, the north and east exposures, **though on the north side of the mountains it covers the bottom lands which contain sufficient moisture to promote the growth of its components, and frequently creeps up the western and southern exposures. Over the greater part of the area covered by this type (and that is much the greater**

portion of the withdrawal), the forest occurs in open stand which differ materially in height, diameter, and volume of merchantable timber. Naturally, the best timber is found along the canyon and ravine bottoms, where a stand of from 20 M to 30 M is sometimes attained, but on the slopes the stand immediately decreases until, on the crests of the low ridges, it runs not higher than 3 to 10 M per acre, even in the most continuous forest."

Pg. 7: "**That the forest has a highly beneficial effect upon the water flow can not be questioned. Most of the living streams find their sources above the yellow pine zone in small, swampy tracts; the creeks which head lower in the yellow pine belt run dry early in the season. Even as early as June 20 the question of water for sheep was a serious one at the lower altitudes where the larger streams flow through deep gorges. Throughout the entire territory the relation between the forest and the water flow is apparent. Where the forests are dense, springs are numerous. Doubtless the reverse is equally true, but the dependence of each upon the other is obvious."**

Excerpts from:
Starker 1915. *Recommendations for Cutting Inferior Species On the Whitman National Forest, Oregon.* https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5414184.pdf

Pg. 3: "North Slopes. **The true north slope type is composed of the following species: Douglas fir, western larch, white fir, lodgepole pine and only an occasional yellow pine.** The yellow pine that does occur is usually mature and of good quality, **the dense stand making them clean themselves well;** but this density prevents the growth of seedlings and small trees are rate…"

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March 19, 2026

Bethany Parker, Blue Mountain District Ranger
Malheur National Forest
PO Box 909
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Re: Blue Mountains Biodiversity Project's comments on the Austin Project Draft Environmental Impact Statement

Submitted via email to: bethany.parker@usda.gov,
and online at: https://cara.fs2c.usda.gov/Public/CommentInput?Project=53678

Bethany Parker, Blue Mountain District Ranger:

Blue Mountains Biodiversity Project ("BMBP") hereby submits these comments and associated exhibits[1] on the Draft Environmental Impact Statement ("DEIS") for the Austin Project on the Blue Mountain Ranger District on the Malheur National Forest. BMBP submitted scoping comments during the original scoping phase of the Austin Project in 2019 and additional comments during the reinitiation of scoping regarding the use of the Secretary of Agriculture's Emergency Situation Determination ("EAD")[2] authority.

BMBP is an environmental nonprofit organization based in eastern Oregon that has been working to protect and restore the ecosystems of the Blue Mountains and Eastern Oregon Cascades since 1991. BMBP's focus is working to stop or modify management projects that threaten the biodiversity and ecological integrity of the landscape such as logging, road building, livestock grazing, herbicide and biocide use, and mining. BMBP's work area encompasses federal public lands in eastern Oregon and southeastern Washington, including the Deschutes, Ochoco, Malheur, Umatilla, Fremont-Winema, Wallowa-Whitman National Forests. BMBP prioritizes the protection of old growth; sensitive, threatened, and endangered species; water quality; roadless areas; and natural ecological processes.

Oregon Wild joins BMBP in submitting these comments. Oregon Wild represents 20,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy. Oregon Wild's goal is to protect areas that remain intact while striving to restore areas that have been degraded. This can be accomplished by moving over-represented ecosystem elements (such as logged and roaded areas) toward characteristics that are currently under-represented (such as roadless areas and complex old forest).

[1] Per email communications with District Ranger Bethany Parker, BMBP will submit its exhibits via a Google Drive link for inclusion in the project record.
[2] BMBP refers to the emergency authority stemming from the Secretary of Agriculture's Memorandum 1078-0006 (April 3, 2025) as the "EAD" to avoid confusion with other Forest Service emergency authorizations.

I. Inappropriate Use of the EAD

The Forest Service has misinterpreted, misapplied, and exceeded the Emergency Action Determination ("EAD") authority provided by Sec. 40807 of the Infrastructure Investment and Jobs Act ("IIJA" or "§ 40807") to bypass both public participation and adequate and thorough environmental review.[3] First, the Forest Service fails to justify why the Austin Project qualifies as an "Emergency Situation" under the IIJA and why that situation requires the "immediate implementation" of one or more Authorized Emergency Actions ("AEAs").[4] Second, even assuming an emergency situation exists which warrants the use of the EAD, the Forest Service fails to identify which specific proposed actions it claims are AEAs and fails to explain why the immediate implementation of those specific actions is necessary to achieve relief from hazards threatening human health and safety or mitigation of threats to natural resources on National Forest System lands. Third, because many of the proposed actions are not statutorily defined AEAs[5]—including site-specific plan amendments, temporary road construction, and broad commercial thinning unrelated to insect and disease or dead, dying, and damaged trees—the Forest Service has unlawfully excluded those actions from the pre-decisional administrative review process[6] ("Objection Process") and failed to analyze a reasonable range of alternatives for them.[7]

To justify the use of the EAD for the Austin Project, the Forest Service must (1) explain why implementation of one or more AEAs is necessary to achieve relief from hazards threatening human health and safety or mitigation of threats to natural resources on National Forest System land or adjacent land identified in the IIJA, (2) clearly identify which discrete actions it contends qualify as AEAs and why those actions specifically require immediate and necessary implementation to mitigate harm to life, property, or important natural or cultural resources, (3) for all remaining non-AEA actions, provide the required predecisional objection process and analyze a reasonable range of alternatives and, (4) analyze alternatives including options that avoid or narrow plan amendments, reduce or eliminate temporary road construction, and limit or exclude commercial thinning unrelated to insect, disease, or immediate hazard mitigation.

A. The Forest Service fails to support its determination that the Austin Project is an "emergency situation.

Though the Forest Service now presents the Project as an emergency situation warranting an EAD, it provides little, if any, reasoning to support that conclusion. First proposed in 2019, the Forest Service did not characterize the Austin Project as an emergency necessitating

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[3] *See generally* 16 U.S.C. § 6592c (exempting the Emergency Situation Determination and Authorized Emergency Actions from predecisional administrative review, and directing that, if an EA/EIS is prepared, the Secretary "shall study, develop, and describe" the proposed action and the "alternative of no action").
[4] *See* 16 U.S.C. § 6592c(a)(1)-(2) (defining an "Emergency Situation" as requiring a "situation on National Forest System land for which *immediate* implementation of 1 or more authorized emergency actions is *necessary*") (emphasis added).
[5] *See* 16 U.S.C. § 6592c(b)(2) (Authorized Emergency Actions).
[6] *See* 36 C.F.R §§ 218.1–218.13 (Project-Level Predecisional administrative review process), *see also* 36 C.F.R §§ 219.50–219.58 (Plan-level Predecisional administrative review process).
[7] *See* 7 C.F.R. § 1b.7(h)(3), *see also* 42 U.S.C. § 4332(2)(C)(iii) and (2)(E).

immediate action, nor did it invoke either of the emergency powers available at the time.[8] The Forest Service now asserts the Austin Project is an 'emergency situation' as defined by the IIJA. However, the Austin Project lacks the qualities of an emergency in both the statutory and ordinary understanding of the word. The IIJA clearly defines the conditions that define an 'emergency situation.' These are not suggested characteristics but statutory requirements. If the Forest Service wants to invoke the emergency authority of the IIJA, it must explain why the situation meets those statutory requirements. It has not done so here.

Even under the ordinary meaning of "emergency," the Forest Service's own discussion in the Draft EIS does not justify treating the Austin Project as one. Black's Law Dictionary defines an "emergency" as "a sudden and serious event or an unforeseen change in circumstances that calls for immediate action to avert, control, or remedy harm."[9] But the Draft EIS describes a project that has been in development for years. Beginning with field trips and meetings in 2017 and a Notice of Intent issued in 2019, the Forest Service provided no public update for 6 years before it renewed scoping for the Project in 2025,culminating in a plan to "expedite implementation" beginning in 2026.[10] That timeline is the opposite of "sudden" or "unforeseen," and the Forest Service does not identify any new, discrete triggering event that suddenly changed conditions such that immediate implementation of the full suite of proposed actions is now required. Instead, the Forest Service's reasoning amounts to a generalized assertion that the actions are "critical and time-sensitive," coupled with a desire to accelerate implementation.[11] Additionally, the Forest Service fails to adequately explain how the Project qualifies as an 'emergency situation' under the IIJA.

The IIJA sets a narrow trigger for emergency authority: an "emergency situation" exists only where "immediate implementation" of one or more AEAs is "necessary" to achieve relief from hazards threatening human health and safety or mitigate threats to natural resources on National Forest System land.[12] Thus, in order to invoke an EAD, three conditions must be met: (1) a situation must exist that requires the "immediate" implementation of an AEA, (2) the proposed AEAs are "necessary" to achieve relief from hazards threatening human health and safety or mitigation of threats to natural resources on National Forest System lands and (3) any implementation of AEAs must be consistent with the applicable LRMP.[13] Furthermore, to be considered an AEA, the action must have the purpose of mitigating harm to human life, property, or important natural or cultural resources.[14] Thus, the Forest Service must explain what the emergency is in the context of the Austin Project, why it requires immediate implementation of

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[8] *See* 7 CFR 1b.9(v)-(w) (NEPA Emergency Procedures), *see also* 36 CFR 218.21 (Emergency Situation Determination procedures).
[9] Black's Law Dictionary 660 (11th ed. 2019).
[10] *See* U.S. Forest Serv., *Austin Project Draft Environmental Impact Statement* at 149-50 (Feb. 2026) [hereinafter *Austin DEIS*].
[11] *Id*.
[12] 16 U.S.C. § 6592c(a)(1)-(2).
[13] *Id*.
[14] 16 U.S.C. § 6592c(a)(1). The IIJA enumerates a list of actions that may be implemented pursuant to an EAD. However, those actions must be implemented for the purpose of mitigating harm to life, property, or important natural or cultural resources on National Forest System or adjacent land. An action is not authorized simply because an EAD exists and the action is on the list of enumerated AEAs. There must be a connection between the action and the desired mitigation.

one or more AEAs, and why those specific AEAs are necessary to achieve relief or mitigation goals.

Here, the Forest Service does not describe what the emergency situation is in the context of the Project, why that situation requires the immediate implementation of one or more AEAs, and why the proposed AEAs are necessary to achieve the desired mitigation. Instead, the Forest Service relies on generalized wildfire-risk statements and conclusory assertions that the Project is "critical and time-sensitive," along with the purpose and need to lower wildfire intensity and reduce wildfire risk. The Forest Service erroneously declares that the Project is "determined to be an emergency situation," noting only that more than 50% of the planning area is within National Forest System lands rated "very high or high wildfire risk." This blatantly ignores the clear criteria outlined in the IIJA for making an EAD and conflates agency guidance with statutory requirements.[15] Neither of these discussions identifies a discrete emergency situation beyond the speculative risk of wildfire, explains why it is necessary to immediately implement one or more AEAs, or describes what specific AEAs are necessary to achieve a mitigation goal.

The Forest Service's own framing undercuts the "immediacy" premise. The Forest Service explicitly states that some proposed actions will not be implemented immediately and instead will be implemented "incrementally over approximately 10 to 15 years."[16] It states the Responsible Official is using emergency authority to "expedite implementation," recognizes that doing so "reduces one last opportunity for formal public involvement," and then describes the urgency as implementing "some or all of these actions starting in 2026."[17] That is not the same as demonstrating that immediate implementation is necessary to address an emergency situation. The Forest Service does not provide the required showing that a defined emergency situation exists, that one or more specific enumerated AEAs require immediate implementation, and that those specific actions are necessary to achieve relief from hazards threatening human health and safety or mitigation of threats to natural resources on NFS lands. Instead, the record shows this proposal has been under development for years. Compounding that failure, the Forest Service also assumes—without explanation—that the EAD authorizes treating the Project's entire suite of proposed actions as AEAs even though the IIJA's enumerated AEA list is narrow and many of the Project's most consequential components do not fit within it.

B. Plan amendments, road construction, and commercial timber harvest unrelated to the sanitation harvest of insect, disease, or salvage of dead, dying, or damaged trees are not Authorized Emergency Actions.

The Forest Service erroneously treats the full suite of management actions proposed in the Austin Project as AEAs and fails to provide the required objection process and analysis of a reasonable range of alternatives for non-AEAs. The Forest Service vaguely states that, pursuant to the EAD, "applicable activities under the Austin [FEIS] and [ROD] … are not subject to pre-decisional administrative review," but does not identify which "applicable activities" those are.[18]

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[15] *See* Secretary's Memorandum 1078-006 (asserting that "to use [IIJA] authority", at least 50 percent of the treatment areas supporting this authorized emergency action must be within the designated areas.") The 50% rule is not found in the statute and only represents a guidance document. Though the Austin Project meets the 50% rule, it still must satisfy the requirements of the statute.
[16] *Austin DEIS* at 55.
[17] *Austin DEIS* at 148.
[18] *Austin DEIS* at 1.

Though some proposed actions likely fall within the list of AEAs, many plainly do not. The list of AEAs under the IIJA does not include, nor can it be interpreted to include, plan amendments, road construction, and commercial timber harvest unrelated to insect and disease management or the salvage of dead, dying, or damaged trees.[19] Additionally, even if the list of AEAs could be interpreted to include any of these actions, the Forest Service has failed to provide any reasoning to support such an interpretation. Though many of the actions proposed under the Austin Project likely do not qualify as AEAs, this section specifically discusses the most significant of these non-authorized actions: the eight proposed site-specific plan amendments, the forty-three miles of temporary road construction, and 27,230 acres of commercial thinning. These actions are not only the most clear examples of actions not authorized by the IIJA, but also the among the most environmentally destructive actions, and those where it is most necessary to properly engage the public and consider a reasonable range of alternatives.

Congress not only provided clear conditions under which AEAs may be implemented and a plainly written, *exclusive* list of actions which may be carried out pursuant to an EAD, but also required any implementation of AEAs to be consistent with the applicable LRMP.[20] An action can only qualify as an AEA–and subsequently can be excluded from the objection process and analysis of a reasonable range of alternatives under NEPA–if two conditions are met: (1) AEAs must be carried out pursuant to an EAD and (2) be necessary to mitigate harm to life, property, or important natural and cultural resources on National Forest System lands.[21] Additionally, Congress enumerated an *exclusive* list of AEAs, which does not include the use of site-specific amendments:

> (A) the salvage of dead or dying trees;
> (B) the harvest of trees damaged by wind or ice;
> (C) the commercial and noncommercial sanitation harvest of trees to control insects or disease, including trees already infested with insects or disease;
> (D) the reforestation or replanting of fire-impacted areas through planting, control of competing vegetation, or other activities that enhance natural regeneration and restore forest species;
> (E) the removal of hazardous trees in close proximity to roads and trails;
> (F) the removal of hazardous fuels;
> (G) the restoration of water sources or infrastructure;
> (H) the reconstruction of existing utility lines; and
> (I) the replacement of underground cables.

The provision immediately following this list requires AEAs to be "conducted consistent with the applicable land and resource management plan."[22] That statutory structure is difficult to reconcile with treating plan amendments as AEAs, because an amendment is not an action

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[19] 16 U.S.C. § 6592c(b)(2).
[20] *See* 16 U.S.C. § 6592c.(b)(2)-(3).
[21] *See* 16 U.S.C. § 6592c(a)(1) (defining Authorized Emergency Action) does not explicitly state that AEAs must be 'necessary' to mitigate harm to life, property, and important natural and cultural resources. However, under IIJA § 40807(a)(2), an Emergency Situation can only be invoked where there is an "immediate" need to implement or one or more AEAs and the implementation of the AEAs are "necessary." Thus, in order to be carried out pursuant to an EAD under IIJA § 40807 an AEA must be necessary and the need must be immediate.
[22] *See* 16 U.S.C. § 6592c.(b)(3).

"conducted consistent with" the LRMP; it is a decision to change the LRMP so the agency can do what the plan would otherwise prohibit. The same structural logic applies to commercial harvest: Congress specifically identified commercial harvest only in the narrow context of sanitation harvest for insects and disease, salvage of dead or dying trees, and the harvest of trees damaged by wind and ice. Had Congress intended to authorize broader commercial thinning or timber production as an AEA, it would have explicitly included such an action in the list. Finally, road building is not mentioned, nor can any of the enumerated AEAs be interpreted to include it. These actions do not just textually conflict with the list of AEAs, but also conflict with reducing the risk that the EAD is intended to address.

The IIJA authorizes a narrow set of actions that are intended to have an immediate, tangible effect on the ground and are the kinds of measures that can be realistically deployed when addressing a true emergency. AEAs can also be understood as actions that—when implemented appropriately—are well-suited to rapid implementation: they are discrete, targeted, and operational in nature, and their effectiveness does not depend on advanced planning or complex, prescription-driven design. For example, the restoration of water sources, infrastructure, and the replacement and reconstruction of underground cables or utility lines are standard first-response activities in emergencies, in both urban and rural environments. Such actions directly contribute to restoring systems necessary to prevent loss of life and facilitate further emergency response.

Plan amendments, road construction, and commercial thinning unrelated to insect, disease, or hazard mitigation are not the kind of discrete, targeted emergency measures the IIJA contemplates. These actions require advanced planning, and their efficacy is impacted by a shortened planning period and limited alternatives analyses. They are among the most environmentally consequential and logistically complex elements of the proposed action and therefore are the very actions for which a detailed analysis of alternatives and public-involvement procedures are most important. Plan amendments, even site-specific amendments, are forward-looking changes in management strategy intended to achieve long term goals. They require detailed analysis because their impacts are both temporally and geographically extensive. Plan amendments are not a reactionary tool used to respond to or prepare for an emergency, and immediate implementation only undermines their efficacy.

Likewise, while the Forest Service would like to frame commercial thinning as contributing to long-term wildfire resiliency, its effects and rationale are fundamentally different from the IIJA's limited "commercial" categories (sanitation harvest for insects/disease, salvage of dead/dying timber, and harvest of wind/ice damaged trees). Thinning is an inherently prescription-driven activity: it requires stand-level planning, field surveys, and careful designation of treatment units to ensure the work actually achieves the stated objectives (e.g., reducing ladder fuels, retaining large/fire-resilient trees, protecting old forest structure, and avoiding sensitive habitats). When implemented quickly—especially at the scale proposed here—thinning decisions are more likely to rely on coarse assumptions rather than site-specific conditions, increasing the risk of misapplication, and amplifying adverse collateral impacts. In practice, thinning also depends on enabling decisions that require deliberation—unit layout, seasonal restrictions, road access, and temporary road placement, and mitigation measures—so "expedited" thinning tends to degrade design quality and weaken environmental safeguards rather than serve an emergency-response function. Additionally, unlike sanitation harvest of insect and disease-impacted trees, commercial thinning is not reactive or responsive to environmental factors. It necessarily requires discretion, judgment, and analysis from land managers and project-design level planning. Commercial thinning is not a responsive tool; it is a long-term management strategy. And frequently, the effects of the Forest Service's thinning results in increased wildfire risk and degraded watersheds and overall ecological health.

The Forest Service cannot treat the Austin Project as a single, undifferentiated package of AEAs and thereby avoid the procedural protections that otherwise apply. The statute authorizes a narrow, enumerated set of discrete emergency response measures; it does not authorize the agency to reclassify plan amendments, temporary road construction, or broad commercial thinning as AEAs simply by labeling the entire project as an emergency situation. Where the proposed action includes non-AEA components—especially components that are among the most environmentally consequential and design-dependent elements of the Project—those actions remain subject to the ordinary requirements of NEPA and the Forest Service's predecisional administrative review process.

1. The Forest Service must consider alternatives that avoid plan amendments, reduce or eliminate temporary road construction, and reduce or exclude commercial thinning.

Because plan amendments, road construction, and commercial timber harvest unrelated to insect and disease or dead, dying, and damaged timber are not AEAs, they are not exempt from the requirement to analyze a reasonable range of alternatives and provide an objection process. Analysis of alternatives should include options that avoid or narrow plan amendments, reduce or eliminate temporary road construction, and limit or exclude commercial thinning unrelated to insect, disease, or immediate hazard mitigation. These alternatives would be technically and economically feasible and meet the proposal's purpose and need, as they would reduce overall project complexity, require no additional financial investment, and still achieve the stated purpose of lowering wildfire intensity and reducing wildfire risk. Finally, the "Environmental Alternative" must be considered in full and cannot be dismissed because it "no longer aligns with agency direction and priorities."[23]

An alternative that meets the Project's wildfire-risk objectives without the proposed plan amendments (or with a narrower subset) would still allow the Forest Service to implement fuels and hazard-reduction measures that are consistent with existing forest plan direction and improve first responder and public safety. In short, because the purpose and need are framed in terms of wildfire risk and intensity—not timber output or maximizing commercial volume—NEPA requires the Forest Service to evaluate technically and economically feasible alternatives that achieve those objectives. Because of this fact, the "Environmental Alternative" must be fully considered. The only reasoning the Forest Service provides as to why this alternative is not considered fully is that "it no longer aligns with agency direction and priorities."[24] This is not a valid reason to eliminate an alternative from detailed consideration. Alternatives need only be technically and economically feasible and meet the purpose and need of the project.[25] The Forest

[23] *Austin DEIS* at 28.
[24] *Id.*
[25] *See* 7 CFR 1b.7(h)(3)(i).

Service does not claim, let alone explain, why the Environmental Alternative is not technically or economically feasible or why it would not meet the purpose and need of the Project.

For these reasons, the Forest Service cannot invoke IIJA as a wholesale procedural bypass for the Austin Project. The statute authorizes a narrow set of emergency actions; it does not authorize the agency to reclassify long-planned, high-impact, and logistically complex activities—such as site-specific plan amendments, road construction, and commercial thinning—as AEAs simply because the Secretary declared an EAD. Where the proposed action includes non-AEA components, those components remain subject to the ordinary requirements of NEPA and the Forest Service's predecisional administrative review procedures. At minimum, the Forest Service must (1) clearly identify which discrete actions it contends qualify as AEAs and are therefore excluded from objection, (2) provide adequate reasoning explaining why those action are necessary to mitigate harm to life, property, or important natural or cultural resources and (3) for all remaining non-AEA actions, provide the required predecisional objection process and analyze a reasonable range of alternatives and, (4) analyze a reasonable range of alternatives including alternatives that avoid or narrow plan amendments, reduce or eliminate temporary road construction, and limit or exclude commercial thinning unrelated to insect, disease, or immediate hazard mitigation.

C. The EAD was issued without required APA notice and comment procedures and judicial review, and therefore the Forest Service's reliance upon it for the Austin Project is illegal.

The EAD made by Secretary Rollins in SM 1078-006 should be considered a rule as defined under the APA, and therefore subject to notice and comment rulemaking and judicial review that did not take place here. In the GAO decision, file number B-337705, the Accountability Office held that the promulgation of a Resource Management Plan ("RMP") by the Bureau of Land Management is a Rule for the purposes of the APA, subject to notice & comment rulemaking.[26] The BLM conducted notice & comment procedures on the RMP pursuant to the Federal Land Policy and Management Act. However, the GAO determination of that RMPs are APA rules means the BLM would have needed to regardless of FLPMA, and the reasoning for it being a rule is transferable to the EAD.

The APA defines a rule as "the whole or part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency." 5 U.S.C. § § 551(4), 804(3). B-337705 clarified that even though the RMP was made in response to a presidential proclamation under the Antiquities Act, the RMP was not a presidential action and was subject to judicial review. This is because BLM was vested with the authority to create RMPs through statutes, it was not a power delegated to them by the President. That it was a hybrid regulatory instrument, reflecting the implementation of the Proclamation and the BLM's independent statutory authority, did not detract from its classification as an "agency statement."

Applying the other two pieces of the APA definition, the GAO concluded that RMPs are APA rules: "it is one of future effect because it was designed to apply prospectively to guide all subsequent management decisions and it implements and… it defines the conditions and

[26] https://www.gao.gov/products/b-337705#_ftnref37

constraints necessary to achieve the specific goals outlined in the RMP." And once it came into effect, the RMP "establishes a framework upon which future decisions will be made," and for all those reasons it had future effect. Finally, the "RMP implements, interprets, or prescribes law or policy, because it implements a management plan as directed by and in accordance with the Proclamations." Importantly, while it referred to language from the Proclamation, it established management policies which BLM is vested control over by FLPMA, which were not included in the proclamation.

SM 1078-006's EAD meets the APA definition of a rule, because it is an agency statement of general applicability and future effect implementing policy from the Executive and describing procedure requirements for the Forest Service. First, the EAD was promulgated in response to the President's Executive Order ("EO") calling for the immediate expansion of timber production,[27] but making an Emergency Situation Determination is a power vested solely in the Secretary of Agriculture by the IIJA. 16 U.S.C. § 6592c(b)(1)(A). It is interpreting and implementing the policy that the President put forth in his EO ("This Secretarial Memorandum details the actions I am directing the Forest Service to take in response to EO 14225"), but describes actions which is only available to the Secretary of Agriculture as vested by the IIJA, the Organic Administration Act of 1879, the Multiple-Use Sustained-Yield Act of 1960, and the Forest and Rangeland Renewable Resources Planning Act of 1974. "Provisions that affirm [EO 14225] do not change [SM 1078-006's] fundamental character–an agency-level administrative action." As a result, SM 1078-006 is an agency statement implementing policy for the purposes of the APA.

SM 1078-006 establishes prospective land-use plans and procedures across all National Forest Service lands and calls for expedited harvesting on 59% of them. It came into effect on the day of its promulgation, and it does not consider a sunset for its application. Further, just like the RMP in B-337705, it establishes a framework which future decisions will be made through, such as the Austin Project. For these reasons it has a future effect. Because SM 1078-006 has the requisite features of a Rule under the APA, it should have been promulgated through notice and comment rulemaking, and that it wasn't is arbitrary and capricious.

Further, the determination itself is not exempted from judicial review under the IIJA. While 16 U.S.C. § 6592c contemplates and restricts reviewability, it only does so in two places. First in 16 U.S.C. § 6592c(b)(1)(B) which limits the direct review of an emergency situation determination only under the predecisional administrative review processes from 36 C.F.R. § 218. Second, in 16 U.S.C. § 6592c(e) which limits a court's ability to enjoin emergency actions authorized by an EAD, but doesn't limit judicial reviewability of the EAD itself. Judicial review under the APA is broad, and "the mere fact that some acts are made reviewable should not suffice to support an implication of exclusion as to the others." *Abbott Laboratories v. Gardner*, 387 U.S. 136, 141 (1967). As a result, the determination that there is an emergency situation is subject to judicial review under the APA.

II. Inappropriate use of emergency consultation procedures under the ESA

BMBP submits these comments to address the Austin Project's apparent reliance on emergency consultation procedures under Section 7 of the Endangered Species Act ("ESA"), 16

[27] EO 14225 "Immediate Expansion of Timber Production"

U.S.C. § 1536. Under §7(a)(2) of the ESA, each federal agency, in consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service, must ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any Designated Critical Habitat. 16 U.S.C. § 1536(a)(2); see also 50 C.F.R. § 402.14.

Where an action "may affect" a listed species, the action agency must initiate formal consultation with the appropriate Service unless the agency determines, with written concurrence, that the action is "not likely to adversely affect" listed species or critical habitat. 50 C.F.R. § 402.14(a)-(b). Formal consultation requires the preparation of a Biological Assessment and the development of a Biological Opinion evaluating whether the action is likely to jeopardize listed species or result in the destruction or adverse modification of critical habitat. 50 C.F.R. §§ 402.14(c), 402.14(g). The Biological Opinion must analyze the action's direct, indirect, and cumulative effects, using the best scientific and commercial data available. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(g). If incidental take is anticipated, the Service must issue an Incidental Take Statement specifying the amount of take and prescribing reasonable and prudent measures necessary to minimize such impacts. An agency may not proceed in a manner inconsistent with the terms and conditions of the Incidental Take Statement.

While the ESA does provide limited mechanisms for expedited consultations in true emergency situations, these procedures are explicitly intended to address unforeseen, unexpected events requiring immediate mitigation action. 50 C.F.R. § 402.05. In addition, the regulation mandates that the action agency initiates formal consultation as soon as practicable once the emergency is under control. The emergency informal consultation procedures are not applicable where, as here, the agency is attempting to conduct long-term or planned management activities developed through extended planning processes.

In contrast to formal consultation, informal consultation is an optional, preliminary process designed to determine whether formal consultation is required. 50 C.F.R. § 402.13. During informal consultation, the action agency and appropriate Service exchange information and assess whether the proposed action is "not likely to adversely affect" listed species or critical habitat. Id. If the consulting Service concurs with that determination formally in writing, consultation concludes without preparation of a Biological Opinion or Incidental Take Statement. 50 C.F.R. § 402.13(c).

Here, the DEIS acknowledges that the project may affect listed species, and is likely to adversely affect designated critical habitat for listed species, including Middle Columbia River ("MCR") steelhead. DEIS at E-30. Furthermore, the Project proposes extensive vegetation treatments, prescribed burning, and road activities within designated critical habitat. DEIS at 16-21. Where an action is likely to adversely affect listed species, the ESA requires formal consultation under 50 C.F.R. § 402.14 and the preparation of a Biological Opinion. Because the Forest Service acknowledges that the Austin Project may adversely affect MCR steelhead and their designated critical habitat, the Forest Service must complete their statutorily mandated duty to initiate and complete § 7 ESA consultation.

Furthermore, both the statute itself and the implementing regulations require the agency to use the best available science in determining the Project's effects to listed species. 16 U.S.C.

§1536(a)(2); 50 C.F.R. § 402.14(g)(8). In particular, the best available science clearly demonstrates that the Project's determination of "[m]ay affect, not likely to adversely affect" bull trout violates this requirement. DEIS at E-30. As will be shown in these comments, bull trout are particularly vulnerable to changes in stream temperature and altered hydrological function. The DEIS acknowledges that streams designated as critical habitat for bull trout are currently temperature impaired. Because these streams are listed as impaired and the project proposes extensive activities which will impact riparian corridors directly affecting bull trout and their critical habitat, the best available science shows that the project is likely to adversely affect bull trout.

Additionally, the Project's designation as an "emergency" under the IIJA does not alter or displace the ESA's independently defined and narrowly construed emergency consultation provisions at 50 C.F.R. § 402.05. Although the Forest Service claims that the emergency authority under §40807 of the IIJA obviates the need for formal consultation, this determination is clearly erroneous given extensive case law which mandates that the action comports with the ESA's independent definition of emergency. Because the conditions described in the DEIS reflect long-term management concerns rather than sudden, unforeseen events requiring immediate response, reliance on emergency consultation procedures in lieu of full compliance with § 7 is inconsistent with the ESA's substantive and procedural mandates.

Finally, ESA §7(d) independently prohibits any federal agency from making any irreversible or irretrievable commitment of resources that would foreclose reasonable and prudent alternatives prior to the completion of consultation. 16 U.S.C. § 1536(d). Because the Austin Project proposes extensive vegetation management activities, including prescribed burning and road construction, implementation of Project activities prior to the completion of formal ESA consultation raises serious concerns under that section of the ESA.

A. Formal consultation is required because the project is likely to adversely affect listed species and designated critical habitat.

The Forest Service expressly acknowledges that the Austin Project is likely to affect designated critical habitat for MCR steelhead and bull trout. DEIS at E-30; DEIS at 92. Because the project is likely to adversely affect listed species and does not meet the independent definition of emergency under the ESA, the agency must initiate and complete formal consultation as a matter of law pursuant to 50 C.F.R. § 402.14.

1. The project proposes extensive activities within designated critical habitat which are likely to degrade habitat for listed salmonids, especially given that the streams are currently impaired due to legacy management activities.

The Forest Service states that the planning area includes habitat for both MCR steelhead and Columbia River bull trout. DEIS at 3. The project proposes large-scale vegetation management across approximately 78,200 acres, including: approximately 76,700 acres of prescribed burning across 14 burn blocks; approximately 35,946 acres proposed for upland restoration activities, which includes at least 27,230 acres for commercial thinning; 43 miles of temporary road construction, and; commercial and non-commercial thinning within vital riparian habitat conservation areas, including commercial logging of trees up to and exceeding 21 inches diameter at breast height in certain contexts. DEIS at 12-21. Furthermore, the Project area contains approximately 9,340 acres of riparian habitat conservation area ("RHCA"), including 4,468 acres of Category 1 RHCAs DEIS at 85. These RHCAs include at least 49 miles of steelhead designated critical habitat and 13 miles of bull trout designated critical habitat. DEIS at 86.

Furthermore, the Forest Service acknowledges that these watersheds are already degraded and remain impaired due to legacy land use and infrastructure development. Historic timber harvest, railroad and road construction, and grazing have contributed to reductions in riparian shade, altered channel structure, increased fine sediment, and elevated stream temperatures affecting fish habitat. DEIS at 7. As a result, many streams within the planning area are currently listed as impaired for temperature and do not meet the thermal requirements necessary for Columbia River bull trout or MCR steelhead. DEIS at 8. The Forest Service further explains that reduced floodplain connectivity, altered stream channels, and diminished riparian vegetation have contributed to elevated water temperatures and degraded aquatic habitat conditions. DEIS at 8-9.

Within these watersheds, the Austin Project authorizes a number of activities that would occur immediately within or adjacent to designated critical habitat for steelhead and bull trout. Specifically, the Project authorizes activities associated with upland fuels treatment in approximately 45% of RHCA acres within the project area. DEIS at 90. This includes activities along approximately 11 miles of streams designated as critical habitat for steelhead. DEIS at 91. Concerningly, the Project also authorizes commercial logging of trees for riparian meadow restoration on approximately 224 acres of RHCA, including treatments along 5 miles of category 1 RHCA streams, 47 acres within category 2, and 167 acres within category 4. DEIS at 91. Critically, the Forest Service acknowledges that tethered logging would occur within 25 feet of the Bridge Creek stream, and that this would result in "meaningfully measurable" negative effects to aquatic habitat. DEIS at 99. Furthermore, the Forest Service concludes that the above activities would directly or indirectly effect stream temperatures throughout the planning area. DEIS at 100.

The best available science indicates that forest management activities such as road construction, mechanical thinning, and prescribed burning can substantially increase sediment delivery, alter hydrologic processes, and degrade salmonid habitat conditions, particularly where they occur within or adjacent to riparian areas. Mechanical thinning and logging in riparian zones reduces canopy cover and alters microclimatic conditions that regulate stream temperature, while also disturbing soils and increasing the potential for sediment delivery to nearby streams.[28] Vegetation removal can further alter the hydrologic processes by reducing evapotranspiration and changing patterns of surface runoff and soil infiltration, which may increase peak flows and channel instability.[29]

Because the streams in the project area are already listed as impaired for temperature threshold needed to support salmonid spawning, even incremental disturbances that reduce

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[28] Beschta et al., *Stream Temperature and Aquatic Habitat: Fisheries and Forest Interactions*, Streamside Management: Forest and Fishery Interactions (1987); Gresswell, *Fire and aquatic ecosystems in forested biomes of North America.* Transactions of the American Fisheries Society (1999).
[29] Bisson et al., *Fire and aquatic ecosystems in the western USA*, Forest Ecology and Management (2003).

riparian shading, alter hydrologic processes, or increase sediment delivery may further degrade thermal characteristics and aquatic habitat conditions. Where watersheds already exhibit impaired characteristics, additional disturbances are much more likely to adversely affect listed species or critical habitat. These effects cannot reasonably be considered beneficial or insignificant, and therefore require formal consultation under 50 C.F.R. § 402.14.

Scientific literature unequivocally establishes that salmonids such as steelhead and bull trout are highly sensitive to increases in water temperature and changes in riparian function. Bull trout require extremely cold temperatures and generally only occur in streams with temperatures below approximately 15ºC during critical life stages.[30] Elevated stream temperatures reduce juvenile survival, impair growth rates, and limit adult migration and spawning success. Even modest increases in water temperature can have profoundly detrimental effects on the survival of listed salmonids, particularly bull trout.[31]

Because the project proposes extensive vegetation treatments, prescribed burning, and road construction within watersheds that already exhibit significantly degraded aquatic conditions, the potential for additional sediment delivery and riparian disturbance is a concomitant fact of this plan. These effects cannot reasonably be considered insignificant, discountable, or beneficial. Thus, where such impacts may occur within critical watersheds and designated habitat supporting listed salmonids, the Endangered Species Act requires formal consultation under 50 C.F.R. § 402.14.

Formal consultation with USFWS and NFMS would necessarily require a substantive cumulative effects analysis in the Biological Opinion, 50 C.F.R. §§ 402.14(g)(3)–(4), an analysis that is missing from the Austin DEIS in violation of NEPA. Such an analysis would likely to show a high risk of jeopardy and/or adverse modification of critical habitat for both ESA-listed bull trout and MCR steelhead, in violation of the ESA. The Forest Service tries to minimize the impacts to listed species and their critical habitat in individual projects by framing the impacts as relatively minor compared to the habitat across the Forest as a whole. *See, e.g.,* Austin DEIS at 105. And it has done this inappropriate minimization in successive timber sales across the Malheur National Forest and within the Middle Fork John Day River watershed.[32] On the Malheur National Forest, the Camp Lick, Big Mosquito, Magone, and Ragged Ruby Projects taken together have the potentially to adversely impact 26% of MCR steelhead habitat on the Malheur National Forest.[33] The Forest States that the Austin Project, combined with the Camp Lick and Ragged Ruby projects (but, arbitrarily, not the Big Mosquito project since treatments are not overlapping temporally), may adversely impact 31% of suitable MCR steelhead habitat on the Malheur National Forest. Austin DEIS at 105. However, the public, and perhaps even the Forest Service, does not know the overall impacts to MCR steelhead from this onslaught of logging in and around suitable MCR steelhead habitat because no cumulative effects analysis has been performed to quantify impacts to the species as a whole. And one will not be performed here unless the Forest Service complies with the cumulative effects analysis required under

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[30] Rieman & McIntyre, *Demographic and Habitat Requirements for Conservation of Bull Trout,* Gen. Tech. Rep. INT-302 (U.S. Forest Service 1993).
[31] Isaak et al., *Climate Change Effects on Stream Temperature and Salmonids*, (U.S. Forest Service, 2010).
[32] *See, e.g.,* BMBP's comments on the Camp Lick Preliminary EA, at 22; BMBP's objection to the Camp Lick DN/FONSI at 37.
[33] *See* Big Mosquito FEA at 136; Magone FEIS at 389; Camp Lick FEA at 142; Ragged Ruby at FEIS at 321.

NEPA in the Final EIS or undergoes formal consultation with NMFS and USFWS under the ESA. The same issues are present for ESA-listed bull trout.

These successive projects have resulted in degraded baseline conditions throughout these species critical habitats that the Forest Service has not analyzed in a cumulative effects analysis for the Austin Project, in part due to shoddy NEPA analysis and in part because of the failure of the Forest Service to engage in formal ESA consultation. When the adverse effects of the Austin Project are considered in conjunction with similar projects with similar adverse impacts throughout these species' critical habitat, any additional adverse modification of critical habitat is likely to appreciably diminish critical habitat, hamper recovery, and may in fact jeopardize the survival of these species. The Forest Service must undergo formal consultation with USFWS and NFMS in order to ensure that their proposed actions in the Austin Project do not jeopardize the survival of these ESA-listed species.

2. Road construction and road use are likely to increase sediment delivery and further degrade habitat conditions.

The Austin Project includes 43 miles of "temporary" road construction and 574 miles of haul, maintenance, and reconstruction. DEIS at 20. The DEIS further acknowledges that roads have historically contributed to altered hydrology, stream entrenchment, and sediment delivery within the project area. DEIS at 8-9. The DEIS acknowledges that many existing roads occur within valley bottoms or in close proximity to streams and may affect channel structure, floodplain connectivity, riparian vegetation, and water temperature. DEIS at 91–94. Project implementation would therefore involve both vegetation management and road-associated disturbance within riparian systems connected to designated critical habitat streams, including activities occurring within or immediately adjacent to RHCAs that contain habitat for MCR steelhead and Columbia River bull trout.

Specifically, the DEIS states that there are 76 haul route stream crossings that occur within category 1 RHCA, including 17 which cross critical habitat for steelhead. DEIS at 93. The Forest Service also proposes temporary road construction within 100 feet of streams which contain critical habitat for steelhead, and acknowledges that there are 7.1 miles of road haul routes that cross category 1 RHCA, including 3.2 miles within critical habitat for steelhead. DEIS at 93. Furthermore, the document explicitly states that proposed road activities have the potential to affect critical habitat for steelhead and bull trout. DEIS at 92.

Research shows that road density is highly correlated with increased sediment outputs, altered peak flows, and degraded aquatic habitat conditions in forested watersheds.[34] Fine sediment deposition reduces oxygenation necessary for salmonid egg development and decreases odds of juvenile survival. Forest roads are widely recognized as one of largest chronic sources of sediment in National Forests, particularly where they intersect with stream systems or increase hydrologic connectivity between hillslopes and channels.[35] Increased fine sediment deposition within spawning gravels can significantly reduce salmonid egg-to-fry survival ratio by limiting

[34] Gucinski et al., *Forest Service Roads: A Synthesis of Scientific Information*, Gen. Tech. Rep. PNW-GTR-509 (U.S. Forest Service 2001).
[35] *Id.*

oxygen exchange and altering substrate composition.[36] Fine sediment accumulation within redd gravels can also reduce dissolved oxygen concentrations and increase embryo mortality by limiting intra-gravel water flow.[37] Excessive sedimentation is therefore a major limiting factor in salmonid reproduction and juvenile survival, especially in degraded watersheds.

The DEIS also acknowledges that roads and related infrastructure continue to influence watershed processes within the planning area. Roads intercept subsurface soil water, accelerate runoff to valley floors, and contribute to ongoing channel erosion and hydrologic alteration. DEIS at 8-9. These processes can increase sediment transport and degrade spawning and rearing conditions necessary for salmonids. Legacy impacts from past management activities have already resulted in increased water temperatures, reduced habitat complexity, and elevated fine sediment levels affecting fish habitat throughout the area. DEIS at 9. Long-term habitat monitoring indicates that many aquatic habitat metrics in the Middle Fork John Day basin remain moderately to highly departed from reference conditions. DEIS at 9.

ESA listed steelhead and bull trout require cold, clean, and well oxygenated waters, and the proposed activities will have a detrimental effect on these prime ecological values. These values are already impaired in many places in the project area, and the proposed activities will unequivocally further impair these resources, resulting in biologically significant impacts to ESA listed species at both the individual and population levels. Thus, the best available science indicates that the effects of the proposed project will be anything but discountable, and formal consultation pursuant to 50 C.F.R. § 402.14 is legally required.

B. The Austin Project's designation as an "emergency" does not fit the definition in the ESA, and therefore is inappropriate as a means to waive formal consultation requirements.

The DEIS frames the Austin Project as an "emergency action" authorized under the Infrastructure Investment and Jobs Act and states that the "purpose of the project is to address the emergency situation in the Austin planning area to prevent uncharacteristically severe wildfire." DEIS at 3. However, the specific purposes identified in the DEIS describe long-recognized landscape conditions and strategic, long-term planning goals rather than the type of sudden, unforeseen event contemplated by the emergency consultation provisions of 50 C.F.R. § 402.05.

The DEIS explains that the project area has experienced decades of fire suppression, altered fuel regimes, and shifts in species composition, including that approximately 90% of the project area is in Fire Regime I, Class 3 condition, a high departure from historical conditions. DEIS at 4. These are chronic ecological conditions that have developed over decades of Forest Service mismanagement and are extensively documented in agency planning materials; they are not sudden or unexpected events requiring immediate action prior to consultation.

Similarly, the Project's stated objectives include transitioning forest stages to better reflect historical ranges, promoting long-term forest resiliency to wildfire, drought, insects, and disease, contributing to economic vitality through timber production, and restoring watershed

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[36]Jensen et al., *Impact of Fine Sediment on Egg-to-Fry Survival of the Pacific Salmon* (NOAA 2009).
[37]Heywood & Walling, *Sedimentation of Salmonid Spawning Gravels*, Hydrological Processes (2007).

and aquatic conditions for listed fish species. DEIS at 3–4. These are forward-looking land management goals to be implemented across approximately 78,200 acres, and involve extensive commercial thinning, prescribed burning, road construction, and multiple site-specific forest plan amendments. DEIS at 3–4, 12–21. The scale, scope and complexity of the proposed action underscore that it is a programmatic vegetation management project, not a discrete response to a time-sensitive emergency.

The DEIS states that the Austin Project is "moving forward as an emergency action under Secretary's Memorandum 1078-006 [EAD] under section 40807 of the Infrastructure Investment and Jobs Act." DEIS at 1. The document further explains that the project is "hereby determined to be an emergency situation under the Infrastructure Investment and Jobs Act" and therefore that applicable activities will not be subject to pre-decisional administrative review.

However, the fact that the project has been authorized as an "emergency" under the IIJA does not establish that it is an emergency under the Endangered Species Act's consultation regulations. 50 C.F.R. § 402.05 applies where "emergency circumstances mandate the need to consult in an expedited manner." That regulation has historically been applied to activities such as *active* wildfire suppression, emergency repairs from natural disasters, or imminent and unpredictable spillway failures, all of which would result in high risk to human health and property. It explicitly is not meant to apply to long-recognized, chronic landscape conditions best addressed through multi-year planning efforts nor to the purely speculative risk of some future wildfire or insect or disease outbreak. Notably, the Austin Project was first proposed in 2019, underscoring the fact that it represents the efforts of a multi-year planning process rather than a sudden or unforeseen emergency requiring an expedited consultation process.[38] Accordingly, the agencies cannot rely on the IIJA's "emergency" designation to evoke 50 C.F.R. § 402.05, and must instead comply with the ESA's standard, full consultation requirements.

C. The Forest Service must rely on the best scientific and commercial data available.

Section 7 of the Endangered species act requires federal agencies to ensure that their actions are not likely to jeopardize listed species or adversely modify critical habitat based on the best scientific and commercial data available. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(g)(8).

The Forest Service itself acknowledges that aquatic ecosystems within the planning area remain substantially impaired, including temperature-impaired streams and aquatic habitat metrics that remain moderately to highly departed from historical reference conditions. DEIS at 8-9. These conditions directly implicate habitat features necessary to support MCR steelhead and Columbia River bull trout. Furthermore, the DEIS acknowledges that mechanized treatments within riparian habitat conservation areas can increase sediment delivery and overland flow, with measurable short-term effects to fine sediment and embeddedness. DEIS at 96–98. Furthermore, it explicitly states that stream temperatures would be directly or indirectly affected by the proposed activities throughout the project area. DEIS at 100.

[38] U.S. Department of Agriculture, Forest Service. (2019, July 8). *Malheur National Forest, Blue Mountain and Prairie City Ranger Districts and Wallowa-Whitman National Forest, Whitman Ranger District, Oregon; Austin Project.* Federal Register, 84(130), 32401–32403.

The best available science demonstrates that cold-water salmonids such as bull trout and steelhead are highly sensitive to increases in stream temperature and disruptions to watershed processes. Regional analyses show that warming water temperatures across the Pacific Northwest have already reduced the extent of habitat available to cold-water salmonids and are expected to constrain their distribution.[39] Bull trout in particular require extremely cold, well-connected habitats and are highly vulnerable to habitat fragmentation and temperature increase. Research across the interior Columbia River Basin shows that warming temperatures have already increased stream temperatures throughout the Pacific Northwest and are projected to further reduce the availability of suitable habitat for cold-water salmonids.[40]

Similarly, research indicates that the persistence of salmonid populations through climate change depends heavily on the protection of cold-water refugia and intact watershed processes that regulate temperature and hydrologic function.[41] Disturbances that alter riparian vegetation, soil infiltration, and hydrologic connectivity can reduce the buffering capacity of watersheds and increase the vulnerability of cold-water habitats to regional warming trends. Riparian vegetation regulates stream temperature characteristics by shading channels and creating microclimates, while soil disturbance and harvesting alter infiltration and flow dynamics that influence stream temperature and sediment transport. Furthermore, the accelerating pace of climate change means that existing riparian requirements may not be enough to adequately stabilize stream temperatures.[42] Restoration or loss of riparian vegetation has been shown to significantly influence stream temperatures by up to several degrees in some systems. These effects are exacerbated by climate change, and even if the Forest Service's proposal included significant riparian vegetation restoration, the plan would not account for the mounting impacts of climate change.[43]

Because the DEIS acknowledges that many streams within the planning area already exceed temperature thresholds necessary to support Columbia River bull trout and MCR steelhead and that aquatic habitat conditions remain substantially degraded due to altered hydrology and legacy land uses, the best available scientific information demonstrates that additional disturbance within these watersheds may further impair habitat conditions necessary for these species. Accordingly, these impacts cannot reasonably be characterized as insignificant or discountable and must be evaluated through formal consultation pursuant to 50 C.F.R. § 402.14.

Specifically, although the designation of "likely to adversely affect" for steelhead independently requires formal consultation, the Forest Service must proceed with formal consultation for bull trout as well, given that the best available science establishes the species' extreme sensitivity to even minor changes in habitat values, particularly temperature. As described above, the Project proposes extensive management activities that will have a measurable effect on critical habitat for ESA listed species, particularly bull trout and steelhead. Given that the DEIS identifies both that streams within the project area are already temperature

[39] Isaak et al., *Climate Change Effects on Stream Temperature and Salmonids*, (U.S. Forest Service, 2010).
[40] Rieman et al., *Anticipated Climate Warming Effects on Bull Trout Habitats*, Transactions of the American Fisheries Society (2007).
[41] Isaak et al., *The Cold Water Climate Shield* (2017).
[42]Yonce et al., *Riparian buffers reduce timber harvesting effects*, J. Water Clim. Change (2021).
[43] Matthews et al., *Riparian vegetation shade restoration and loss effects*, Restoration Ecology (2022).

impaired, and that historic management has detrimentally affected riparian shading, sediment levels, and channel structure, the determination that bull trout are not likely to be adversely affected is clearly erroneous, and formal consultation pursuant to 50 C.F.R. § 402.14 is required.

D. Implementation of the Austin Project would constitute an irretrievable commitment of resources in violation of section 7 of the ESA

Section 7(d) of the ESA prohibits federal agencies from making any irretrievable or irreversible commitments of resources that would foreclose the implementation of reasonable and prudent alternatives prior to completion of consultation. 16 U.S.C. § 1536(d). This provision ensures that the consultation process remains meaningful by preventing agencies from taking any action that would effectively predetermine the outcome of consultation before the consulting agencies have completed their analysis.

That concern is directly implicated here. The Austin Project proposes a wide range of habit altering activities within habitats that support listed salmonid populations. In the riparian corridor itself, the Forest Service proposes stream and floodplain restoration on approximately 3,145 acres, including 653 acres of commercial thinning and 2,492 acres of noncommercial treatment within riparian habitat conservation areas. These riparian treatments include variable density thinning, created openings, and leave areas, as well as non-commercial thinning and wood-placement on approximately 2,492 acres. The DEIS further states that encroaching conifers up to 21 inches in diameter at breast height would be marked for felling, tipping, and placement into streams by heavy machinery. It also authorizes commercial byproduct removal on up to 368 acres within riparian habitat conservation areas, including removal of grand and Douglas fir 21 inches or larger diameter at breast height, and riparian meadow treatments on 443 acres involving the tipping, felling and removal of conifers and placement of trees into or adjacent to stream meadow channels. DEIS at 13−16.

The DEIS also authorizes mechanized implementation of these activities in and around riparian areas. It states that commercial removal may be facilitated by tractor skidding, tethered systems, skyline systems, and forwarding, that previously used landings in riparian habitat conservation areas may be reused, and that the Forest Service proposes to skid logs across intermittent streams in seven locations. DEIS at 15−16. In the aquatic effects analysis, the agency acknowledges that operation of equipment within inner and outer riparian habitat conservation areas for these treatments has the probability of generating sediment in the short term, that multiple passes of heavy equipment may increase overland flow, and that negative effects to fine sediment and embeddedness would be meaningfully measurable in the short term from tethered logging up to 25 feet from Bridge Creek and from hazardous fuels treatments within riparian habitat conservation areas. DEIS at 96−98.

The road program independently raises the same concern. The DEIS proposes 574 miles of haul, maintenance, and reconstruction and 43 miles of temporary road construction. DEIS at 20. It specifically authorizes road maintenance activities such as brushing roadside vegetation, felling hazard trees, blading roadbeds, cleaning ditches and culvert inlets and outlets, removing slough and slide material, dust abatement, and placing aggregate surfacing, as well as culvert replacement or reconstruction, repair of road failures, and junction alignments. DEIS at 20–21. It also proposes to expand and excavate Dixie Summit, Wigwam Spring, and Phipps Meadow rock pit sites. DEIS at 20. In addition, the DEIS provides that 34.9 miles of stored roads would be opened for haul, including mileage within bull trout critical habitat, and acknowledges short-term negative effects to fine sediment and embeddedness from stored roads used for haul in riparian areas. DEIS at 98–99.

Once implemented, these activities will remove trees, disturb soils, alter stream-adjacent vegetation, reopen and maintain roads, modify floodplains and stream margins, and commit agency and contractor resources to a fixed course of action. These are on-the-ground actions that risk foreclosing reasonable and prudent alternatives that could emerge through formal consultation. Because the Austin Project authorizes these actions before lawful completion of Section 7 consultation, implementation would risk an irreversible and irretrievable commitment of resources in violation of ESA § 7(d).

III. Comments on the proposed use of site-specific Forest Plan amendments

The site-specific amendments the Forest Service proposes in the Austin Project DEIS represent significant changes to the Malheur National Forest Plan and are likely to have significant environmental effects. Therefore, the Forest Service must conduct the level of environmental analysis required of an EIS.

As the DEIS states in the introduction to the proposed Forest Plan Amendments, "the Malheur Forest Plan provides a long-range strategy for managing the Forest." DEIS at 21. The Forest Service then claims that the Forest Plan allows the Forest Supervisor to "approve a[n] … amendment" to the Forest Plan if determined to be "the best way" to achieve the management area goals. *Id.* (quoting the Malheur Forest Plan at IV-25). However, the Forest Service's deceitful quotation from the Forest Plan removes an important limiting standard for Forest Plan amendments. Taken from Chapter IV Forest Management Direction, Section E "Forest-wide Standards," the Plan states that "if it is determined during the project analysis that the best way to meet the management area goals of the Forest Plan conflicts with a Forest Plan standard, the Forest Supervisor may approve a *nonsignificant* amendment to that standard for that project…" The Forest Service reads out nonsignificant in their DEIS, presenting the Forest Plan authorization for amendments as a blanket provision. This is an arbitrary and capricious reading of their Forest Plan.

None of the proposed amendments can be considered nonsignificant; they are capable of being significant when viewed collectively and some individually. Particularly, amendments 6, 7 and 8, removing the protections provided by the Eastside Screens are worthy of consideration for the environmental analysis typically required in an EIS. The Forest Service's own guidance documents indicate that the large tree and old growth protections of the Eastside Screens are still vitally important to the viability of wildlife in the region.[44] The removal of large trees weakens the forest's ability to absorb CO^2 at rates that are necessary to combat conditions conducive to promoting wildfires, such as expanded dry spells and higher summer temperatures. It also shrinks habitat of wildlife that relies on large trees and hampers habitat connectivity and the ability for wildlife to move between National Forests.

[44] *See* Forest Service Eastside Screens' Guidance folder in exhibits.

Proposed amendments 1, 2, 3 and 5, which have the potential to set back the progress of forest conditions as described in the Malheur National Forest Plan are also worthy of a full alternatives analysis typically required in an EIS. The first amendment proposes a significant reduction of summer cover for big game in the Project area from almost 50% to just 7%.[45] The Forest service acknowledges in Appendix E that this reduction in cover, in addition to the maintained road density proposed in amendment 2, would cause "cumulative adverse effects…on [Rocky Mountain E]lk distribution" causing them to leave National Forest System lands.[46] Because Rocky Mountain Elk are a management indicator species, under the Malheur Forest Plan, the Forest Service must maintain viable populations of elk on the Malheur National Forest. Further, this amendment harms the ability for citizens to engage in game hunting and the growing non-consumptive use of viewing and photographing elk on Forest Service Lands. Given these considerations, the Forest Service cannot reasonably claim that these amendments are nonsignificant.

Amendment 3 delays the needed determination of what areas of the forest satisfy the term "old growth," a categorization that now applies to many areas of the forest, yet which haven't been inventoried in the last fifteen years. Declining to extend these old growth forests their proper categorization leaves them vulnerable to intrusion and harvesting, and risks reducing cumulative old growth characteristics across the forest. Finally, amendment 5 risks destroying picturesque sightlines along America's highway systems for years to come, and without proper analysis into the impacts of this amendment may create a stain on the viewing experience for both citizens and visitors to the United States and its National Forests. This is in addition to the environmental impact in the regions that seed tree harvesting is being proposed.

These amendments, whether individually, grouped, or considered as a whole, create the risk of significant environmental effects. Under the 2012 planning rules, a proposed amendment that *may* create a significant environment effect "require[s] preparation of an [EIS and] is considered a significant change in the plan for the purposes of the National Forest Management Act ("NFMA")." 36 C.F.R. § 219.13(b)(3). NFMA describes the procedures when an amendment creates "significant change" at 16 U.S.C. § 1604(f)(4). It states that these amendments require processes "in accordance with the provisions of subsections (e) and (f) of [that] section, and public involvement comparable to that required by subsection (d)."

In other words, any amendment that significantly changes the plan for the project requires analysis and assurances that it is in accordance with the Multiple-Use Sustained-Yield Act of 1960, showing coordination not only for timber production but also the benefits of "outdoor recreation…watershed, wildlife and fish, and wilderness" viability. 16 U.S.C. § 1604(e)(1). Under subsection (f)(1) this analysis must be "available to the public at convenient locations," which is not present here as the analyses and specialist reports that the Forest Service refers to and the DEIS relies upon are only available in John Day, Oregon, a municipality far away from most major hubs in the region.[47]

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[45] Austin DEIS pg. 23
[46] Appendix E-22
[47] Not accounting for traffic, average travel time from the Portland metro region or Eugene to John Day is around 5 hours, requiring a 10 hour round trip travel commitment and not considering how long it may take for the production of the materials.

These same "convenient availability" requirements are mandated under subsection (d)(1) as well, and under 7 C.F.R. § 1b.9(e)(7)(ii) ("Subcomponents may not incorporate by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment.") This regulatory language is also problematic for the Forest Service, as they did not release the wildlife report or the fuels report until 2 weeks before the commenting period expired, yet incorporated the former by reference multiple times in the DEIS and dated the documents to 2025. This suggests at least a procedural failure to comply with their regulations, and at worst impropriety towards the completion of the document in a timely manner, and in turn improper tiering. Not releasing these specialist reports to the public in an easily accessible manner makes writing useful and detailed comments incredibly difficult and increases the risk of the submissions of comments that are not as useful to the Forest Service, frustrating the public involvement purposes of NEPA and NFMA. By not making these reports and analyses available, the Forest Service risks approving the Austin Project in an arbitrary and capricious—and therefore illegal—manner.

Returning to 16 U.S.C. § 1604(d)(1), any significant changes to the plan requires "a period of at least three months" for the public to participate in reviewing and commenting on the proposed changes. The forty-five day window that the Forest Service has provided the public is paltry in comparison, and asserting that an emergency situation exists conducive to limit public involvement is unpersuasive given the five year period the project was analyzed in before these significant amendments were added.[48]

The requirement for expanded public involvement depending on the scale of the amendments is reflected in both the 2012 Planning Rules and the Forest Service's own handbook. Both allow for overlapping the public involvement for amendments with the broader DEIS as demonstrated here, but state that the involvement provided should "consider the scope and scale of the need to change the plan." 36 C.F.R. § 219.13(b)(2); *see also* Forest Service Handbook 1909.12, Ch. 20, section 21.3 ("[When] an amendment is proposed…in relation to a specific project, the Responsible official should keep the scope and scale of the process, including public participation, commensurate with the scope of the plan amendment.") Here the plan amendments considered are 8-fold, and six of them were not adequately brought to the public's attention until the release of the DEIS.[49] As a result, a forty-five day window to review the amendments and write comments on them, without the Forest Service's analysis on them readily available, is not public involvement commensurate with the scale and scope of the amendments. It is instead an overwhelming of the public with amendments they were not prepared for by the Notice of Intent and providing them limited time to conduct independent analysis on their impacts and provide comments on them.

Pursuant to 36 C.F.R. § 219.13(b)(1), when a planning amendment is made with an individual project "the analysis prepared for the project or activity may serve as the documentation for the preliminary identification for the need to change the plan." This section

[48] *See Klamath Forest All. v. Jones*, No. 2:25-CV-3424-DMC, 2025 WL 3640859, at *12 (E.D. Cal. Dec. 15, 2025) ("If a wildfire in 2021 illuminate[s] for USFS the need for action, why was such action only implemented on an emergency basis… in 2025 after new regulations were promulgated in July 2025?")

[49] See Federal Register 2025-08684, Notice of intent to prepare an EIS; revision, only describing two amendments to management areas, while referring back to five amendments in the 2019 notice of intent which were ambiguous regarding what standards or management areas they were amending. 84 FR 32401-32403.

clearly lays out that while the DEIS for the Austin project may be used to demonstrate the need for these amendments, it does not satisfy the analysis into the environmental effects of these amendments. For that, the Forest Service must conduct independent analysis into the effects of each amendment, and for significant amendments, a NEPA-compliant EIS with a full suite of alternatives considered and analyzed, in order to be in compliance with the 2012 Planning Rules and the NFMA. That the Forest Service has not made what analysis they did conduct conveniently available to the public is a violation of the Planning Rules.

Simply listing proposed site-specific amendments in the DEIS does not demonstrate that the Forest Service has calculated their environmental impact with the detailed analysis that NEPA requires. Any plan amendments must be consistent with 36 C.F.R. §§ 219.8–11. The Forest Service have not described how their proposed amendments are consistent with these, just that they're potentially inconsistent with them. This does not satisfy their requirements pursuant to 16 U.S.C. 1604(g)(3).

Further, the sheer number of site-specific amendments combined with the lack of alternatives proposed by the Forest Service, due to its categorization of the forest as existing in a state of emergency, leads to a frustration of NEPA's purpose. While NEPA does not dictate specific outcomes, its mandates the consideration of "a reasonable range of alternatives to the proposed agency action…" 42 U.S.C. § 4332(C)(iii). Limiting the consideration of actions to the proposed action and the no action alternative eliminates from consideration multitudes of different management activities that differ from the proposed action, but would still meet the purpose and need and be economically feasible for the Austin Project. There is no reason to preemptively restrict the range of potential solutions to such a large and complex project, especially one for which an EIS is already being prepared.

In addition to the above suggestions that the Forest Service conduct thorough analysis into plan amendments with significant environmental effects, pursuant to 36 C.F.R. § 219.13(b)(3) and 16 U.S.C. § 1604(f)(4), the Forest Service should also consider adopting alternatives for consideration which are in accordance with the Forest Plan, meet the purpose and need of the project, and are technically and economically feasible. 42 U.S.C. § 4332(2)(C)(iii); 7 C.F.R. § 1b.7(h)(3)(i).

The Forest Service must consider an alternative where they do not need to amend the plan to carry out the Austin project. If the Forest Service believes that a project of this scale and importance is incongruent with the Forest Plan, then it is upon them to revise the Forest Plan entirely, not try piecemeal approaches for this project and others. FSH 1909.12-2025-1 Chapter 20, 21.31 ("The Responsible Official should recognize when there are multiple project-specific plan amendments and evaluate the presence of any systemic need to change the plan that should be addressed by a plan amendment.")

The Forest Plan was written with a lifespan of 10-15 years, but with analysis that projected what the Forest should look like up to 50 years in the future pursuant to the Forest Plan being maintained and followed. If the drafters of the Forest Plan could have this foresight, balancing the needs of the timber industry with the sustained yield and multiple uses of the forest lands, it is surely within the power of the Forest Service to achieve the purpose and need of the project without deviating from the plan. Importantly, the Forest Plan affords many protections to fish and wildlife, large trees, riparian areas and viewsheds which the Forest Service is claiming they must bypass.

When describing visuals, the Forest Plan at IV-9 states that by 2039 there should be stand diversity in visually sensitive areas, with a "diversity of species and multi-level stands." It is unclear how the Forest Service is planning to achieve this when they continue to engage in heavy harvesting of early-seral forests, which is likely to just reestablish the same type of forest again. The Plan further states that "changes will continue to be designed to maintain a natural appearance and to accentuate large diameter trees." MFP IV-9. The Forest Service must, as a result, only engage in such harvesting activities in viewsheds which will not leave the forest looking overly influenced by man, such as in the Coastal Range checkered-patterns. Further, large trees are to be protected and accentuated. The choice to use the word "accentuate," or "to make more prominent" should be interpreted as when large trees are present in a viewshed harvesting area, they should be left standing. Finally, "changes in landscape character within…viewshed corridors will be subtle…" *Id.*

For habitat protection, the Forest Plan draws attention to the need to retain and expand old growth for its critical use as habitat for species that rely on them. It says that such habitat "will exist on approximately 121,000 acres forest-wide and will be found within designated old-growth areas, semiprimitive areas [and] wilderness areas…there will be some 25,000 acres of old growth replacement stands being managed of which some additional acres will be at or near old growth." MFP IV-10. These projections seem hard to achieve when the Forest Service insists on altering the Forest Plan so that it may declassify some areas from old-growth designation. More than that though, the Forest Service has not upheld its obligation under the Forest Plan to designate areas as old-growth or as holding old-growth characteristics. Instead, they log large trees of species that do not fit "within the natural range of variation," a range that the Forest Service has consistently held as being one over 180 years old, that is, before carbon emissions and fire suppression began. Large and old trees will lead to old-growth characteristics within the forest, regardless of what species tree it is. The forest doesn't care what kind of large tree it is, the species don't care what kind of large tree it is, they simply want large trees. Plus, large trees of any species will become naturally fire resilient. Finally, the Forest Plan called for this expansion of old growth characteristic forests even while maintaining timber production sufficient to sustain "economic stability, while providing for regional and national needs." MFP IV-2. If the Forest Plan can provide for economically stable timber production and old-growth characteristic expansion, there is substantial grounds to believe the Forest Service can consider an alternative where both of those are accomplished that meets the purpose and need of the project.

It also calls for expansion of cover for big game, saying, "big game populations should experience a slight increase in conjunction with an increase in habitat capability." This is at odds with the Forest Service's current trajectory with the project and forest. Their current plans for the Austin project area are to engage in activities which will admittedly drive big game populations off of National Forest lands. In addition to being at odds with the Forest Service's obligations to maintain populations of management indicator species, see Standard 61 IV-32, it reduces the likelihood of that the forest will reach its projected status under the forest plan.

The Forest Plan also calls for the maintenance and improvement of Riparian areas. "[I]mprovements will have been brought about by better control and administration of livestock use in riparian areas, reduced timber harvest in forested riparian areas, more road closures and obliteration…" The Forest Plan in no way would allow for the transporting of timber through streams, and expressly calls for the reduction of harvesting in riparian areas. Both of these project proposals could be eliminated while still meeting the purpose and need of the Austin Project.

As mentioned above, the Forest Plan calls for the protection of management indicator species, and those endangered, threatened and sensitive species at risk of losing viability or population density in the forest. MFP IV-32, IV-50. Rocky Mountain Elk are one such management indicator species that the Forest Service acknowledges will be driven off the premises in greater numbers due to the activities they are proposing such as reducing winter range shading and retaining. The Forest Plan provides a continuous goal to reduce road density over time, not only for the benefits that brings to the broader forest, but also because it reduces disturbance to species. Instead, the Forest Service proposes to shrink the Elk's range and maintain current levels of road density, which combine towards an adverse effect on Elk distribution in the forest. They try to downplay this as not harming the species viability, but that does not satisfy the broad message across the Forest Plan: "provide necessary habitat to contribute to Forest-wide maintenance of viable populations of management indicator species…" IV-121; *see also* IV-56, IV-63, IV-91, IV-97, IV-100, IV-106, IV-123, IV-128. All of these demonstrate that the Forest Plan does not simply mandate the Forest Service provide for the survivability of these species, but that they must maintain their viability as management indicator species. They must guarantee that the species exist in the forest with sufficient numbers that they may be used to monitor forest heath.

For endangered species they must take their precautions a step further. The Forest Service must conduct a biological assessment if there are threatened or endangered species or habitat present, and create a mitigation and protection plan for these species. IV-33. If the Forest Service has a time line of 15 years to conduct this project, there is no rational need to not engage in formal ESA consultation in the name of speed. The Forest Service must seriously consider as an alternative a project proposal that maintains management indicator species populations on the forest lands and protects the interests of the listed species present, pursuant to both the ESA and the Malheur Forest Plan.

Ultimately, the entire project's purpose and need, to reduce the chances for an uncharacteristically severe wildfire in the Austin area can be met while operating within the bounds of the Forest Plan. Most, if not all of the strategies the Forest Service seeks to employ are available to them in the Forest Plan, they just require a moderation that the Service seems to want to blow past. But what is the harm in moderation when the project is anticipated to span over the course of 15 years; what is the purpose of expedited and heavy analysis and harvesting when they have 15 years to carry out the project. The Forest Service should seriously consider as an alternative a proposal where they operate within the bounds of the Malheur National Forest Plan.

A. Forest Plan Amendment to Forest-wide Standards 28, 33, and 35: Elk and Deer Habitat Amendments

The Forest Service is proposing site-specific amendments to three separate wildlife/big game Forest-wide standards in the Malheur Forest Plan.[50] These standards are laid out in full here:

> Forest-wide standard 28: "Maintain elk and deer summer range to provide for 20% cover and an elk habitat effectiveness index (HEI) or 0.4."
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> Forest-wide standard 33: "To limit disturbance to big game, the open road density will be no greater than 3.2 mi/mi^2 by 1999. Where existing conditions do not meet this goal, project transportation system designs will be developed in order to move toward the goal in the shortest time frame possible. Densities will be monitored on a watershed basis []."
>
> Forest-wide standard 35: "Utilize road and/or area closures to achieve the specific wildlife habitat management objectives of individual management areas."

Both the amendments reducing satisfactory cover below Malheur Forest Plan standards in big game summer range and maintaining current illegal open road density (hereinafter referred to as the elk and deer habitat amendments) are not consistent with the overall goals of the Malheur Forest Plan, Forest Goal 17, the Forest Plan Objective for fish and wildlife, and Forest-Wide Standards 58, 104, and 113 in the Malheur Forest Plan prioritize maintaining and/or enhancing habitats to sustain elk and deer populations.

Forest Goal 17 directs the Forest Service to maintain and enhance big-game habitat to sustain elk and deer populations at state management objective levels.[51] The elk and deer habitat amendments reduce big-game habitat, which is contrary to Forest Goal 17's mission of maintaining and enhancing elk and deer habitat. The elk and deer habitat amendments are not consistent with the Forest Plan Objective for fish and wildlife, which requires that big-game habitat be managed to support elk and mule deer population levels.[52] Since understory removal near roads increases sight distance, elk and deer are more vulnerable to disturbance, poaching, and harvest vulnerability.[53] These vulnerabilities caused by the Forest Service's proposed actions will reduce elk and deer populations, contradicting the Malheur Forest Plan, making the proposed actions illegal. Forest-Wide Standard 58 specifically involves maintaining the vegetative structure of elk calving habitats.[54] Calving habitats will be affected by the elk and deer habitat amendments, since the range of these amendments correlate with summer elk habitat. Forest-Wide Standards 104 and 113 involve restricting, delaying, or modifying logging or

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[50] U.S. Forest Serv., *Austin Project Draft Environmental Impact Statement*, at 23 (2025).

[51] Malheur Forest Plan at IV-2 (1990) ("Provide for the maintenance and enhancement of big-game habitat so as to sustain elk and deer populations at the state management objective level.").

[52] *Id.* at IV-16 ("Manage big-game habitat to achieve a sustained level habitat capability level over time which supports elk and mule deer population levels identified by Oregon Department of Fish and Wildlife. This will be achieved through the management of cover, forage quality, quantity and distribution as well as road use. …").

[53] U.S. Forest Serv., *Austin Project Wildlife Report*, at 84 (2025).

[54] U.S. Forest Serv., *Land and Resource Management Plan: Malheur National Forest*, at IV-31 (1990) ("Maintain the vegetative structure of confirmed calving habitats for elk by modification of management activities as appropriate on a site-specific basis. Mitigation measures will be developed through project level environmental analysis.").

thinning when needed to protect deer and elk range.[55] The elk and deer habitat amendments are for logging and thinning projects. Thinning and road construction associated with timber harvest are proven to increase pressure and disturbance to elk.[56]

Although the Forest Service asserts the elk and deer habitat amendments may increase the quality of elk habitat in 25−50 years, the Malheur Forest Plan does not prioritize future elk habitat, it focuses on current and near future big-game habitat.[57] The Malheur Forest Plan uses timeframes from 10−15 years and focuses on goals within those timeframes.[58] The elk and deer habitat amendments focusing on benefits in 25−50 years does not sit in harmony with the Malheur Forest Plan's short to mid-term goals.

The Forest Service claims in the draft EIS that elk populations will not be impacted by the amendments, only the distribution of these species will be impacted.[59] This statement, however, does not have any science supporting it. Reducing vegetation cover hurts elk populations by decreasing the female's reproductive success. Female Rocky Mountain elk who have access to vegetation with a higher biomass of preferred forage during the summer ended up having higher reproductive success than those who did not.[60] Summer nutrition drives fat storage, calf growth, and pregnancy rates in elk, and helps ensure cows enter winter with adequate fat to survive.[61] While reducing vegetation cover may not have an instant impact on elk, the impacts will be detrimental, due to the direct link between biomass of forage and reproductive success. The draft EIS even mentions that understory removal near roads increases sight distance, so deer and elk are more vulnerable to disturbance, poaching, and harvest vulnerability.[62] Despite these clear and direct dangers to deer and elk, the Forest Service still insists that the Austin project will not impact populations.

The Forest Service explains that the reasoning for amending the Malheur Forest Plan, Forest-wide standards 33 and 35—the amendment to maintain current open road density—is to not decrease motorized public access on public lands, citing a June 25, 2025 Regional forester guidance letter.[63] However, a single internal guidance document is not a legal justification for not abiding by otherwise applicable and binding Forest Plan standards developed under that authority of NFMA and Forest Service planning regulations, especially considering the rationale presented in the regional guidance. In the guidance letter, Regional Forester Jacqueline Buchanan states that "[d]eveloping more focused Purpose and Need statements [that do not include travel management decisions] will also reduce the complexity of NEPA analyses and facilitate more efficient analysis and decisionmaking." However, in attempting to implement this guidance in the Austin Project, the Forest Service is required to utilize (and therefore analyze) a site-specific amendment to maintain current open road density. The additional complex analysis

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[55] *Id.* at IV-38.
[56] U.S. Forest Serv., *Austin Project Wildlife Report*, at 85 (2025).
[57] *Id.* at 82.
[58] U.S. Forest Serv., *Land and Resource Management Plan: Malheur National Forest,* at I-1 (1990).
[59] U.S. Forest Serv., *Austin Project Draft Environmental Impact Statement*, at 141 (2025).
[60] John G. Cook et al., *Effects of Summer-Autumn Nutrition and Parturition Date on Reproduction and Survival of Elk*, 115 WILDLIFE MONOGRAPHS 1 (Dec. 2010).
[61] *Id.* at 46.
[62] U.S. Forest Serv., *Austin Project Wildlife Report*, at 84 (2025).
[63] U.S. Forest Serv., *Interim Guidance for Travel Management Proposals and Decisions*, File Code: 1950; 7710 (June 25, 2025).

that is required for the Forest Service to ***not*** abide by its own Forest Plan is antithetical to this rationale. As discussed throughout these comments, amending a Forest Plan is a heavily regulated process that will necessarily complicate the NEPA analysis required to implement the Austin Project. As such, the proposed site-specific amendments to maintain open road densities within the Austin Project area goes against the very guidance which the Forest Service indicates it is trying to follow.

Moreover, the proposed amendment to maintain open road density are not amending travel management Forest Plan standards. Rather, Forest-wide standards 33 and 35 are both wildlife conservation standards. The Regional Forester's guidance asks line officers to "limit such [travel management] proposals to those which are deemed necessary to safely implement other mission critical *work or fulfill requirements in the Land and Resource Management Plans that govern management of units in Region 6*." (emphasis added). One such mandatory requirement in the Malheur Forest Plan is the Forest-wide standard to reduce road density for wildlife populations. Therefore, the Forest Service cannot reasonably rely upon the Regional Forester Guidance to implement a site-specific amendment to an otherwise binding Forest Plan wildlife conservation standard.

Further, site-specific amendments are intended to address unique site-specific conditions present within a project area. Issuing *region-wide* guidance directing District Ranger offices to not engage in any travel management projects necessarily indicates that there are not that sort of unique site-specific characteristics that would justify the use of such an amendment.

The purpose and need of the Austin project is characterized as a fire management and forest restoration project, while the reasoning for the amendment to maintain current open road density is primarily to follow the administration's priority to not decrease motorized public access.[64] Due to only considering alternatives that do not decrease motorized public access, many alternatives that achieve the purpose and need of the Austin project, which is forest restoration and limiting wildfire risk, are dismissed without real consideration. This is not an authorized emergency action, rendering the use of the EAD for the Austin project wildly inappropriate and illegal.

The amendment to maintain current open road density was not included in a Notice of Intent in violation of 36 CFR 219.13(b)(2) and 219.16(a)(1). 36 CFR 219.13(b)(2) requires that for every plan amendment, the responsible official includes information in the initial notice for the amendment about which substantive requirements of §§ 219.8 through 219.11 are likely to be directly related to the amendment. The amendment to maintain current open road density first appeared in the Draft Environmental Impact Statement, and not in the Notice of Intent documents like the rest of the amendments.

The Forest Service also did not comply with § 219.16(a)(1), which provides that public notification must be provided to initiate the development of a proposed plan, plan amendment, or plan revision. Due to the lack of public notification in initiating the development of the maintaining current open road density amendment, the Forest Service did not comply with its own notice regulations. While § 219.16 does provide that the public notification requirements

[64] U.S. Forest Serv., *Austin Project Draft Environmental Impact Statement*, at 23 (2025).

may be combined where appropriate, this current case of adding the amendment into the draft EIS was not appropriate. When combining public notification requirements, the effect shall still be to notify the public. The draft EIS did not even effectively notify the public about this new amendment, as the only mention of this amendment being new is the draft EIS mentioning that since scoping, one forest plan amendment for maintaining current open road density was added. This was not announced elsewhere, just one page of the draft EIS.[65]

Since the amendment to maintain current open road density was not included in a Notice of Intent, there was no initial notice of the amendment, which goes against public notification requirements in § 219.16(a)(1) and amendment requirements in § 219.13(b)(2).

The Forest Service must consider as an alternative a plan that conforms with the Forest Plan by bringing road density in the planning area into compliance with the Forest Plan. The Forest Service cannot bypass its obligations under the Forest Plan because the administration believes roadways in forests are beneficial. Science clearly demonstrates the opposite with road use leading to adverse soil impacts, stream pollution, and a major cause of man-made wildfires. Further, where roads are not contributing to integrated land management objectives, then they are obliterated. MFP IV-42. Finally, when the Forest Service is already considering other project actions that will have the effect of negatively impacting elk populations in the Malheur Forest, they have an obligation to consider methods which prevent worsening their migration. The duty to reduce road density in the Malheur completes that, and mitigating other activities while also coming into compliance with their Forest Plan is achievable, economic, and meets the purpose and need of the project. The Forest Service must seriously consider as an alternative where they meet their goals to reduce forest density.

B. Forest Plan Amendment to Management Area 13, Standards 4-8: Dedicated Old Growth Changes

The Forest Service proposes amending management area 13, standards 4 through 8, of the Malheur Forest Plan to accurately reflect the current inventory of current old growth forest. One of the Forest Service's changes to old growth designation is creating a single continuous stand of old growth rather than smaller separated patches. While reducing fragmented habitat is ideal for wildlife, creating a continuous stand is not a reason to reduce the number of acres in the specific old growth management area. In the 4 instances where separate blocks of habitat were combined, 3 times resulted in an overall decrease of acres.[66]

In Table 18 of the Austin Wildlife Report, the total number of existing acres of old growth is 7,281, when the proposed total old growth is also 7,281 acres.[67] Though, when adding up all the values accounted for in the table, the totals end up as 7,283 acres of existing old growth in the planning area and 7,163 acres of proposed replacement old growth. This table misrepresents that the proposed acres in redesignating old growth decreases from the existing acres in management area 13. Table 18 also accounts for old growth management areas that have no proposed changes. Though, when looking at the existing acres and the proposed acres for

[65] *Id.* at 27 (2025).
[66] U.S. Forest Serv., *Austin Project Wildlife Report*, at 59-62 (2025).
[67] U.S. Forest Serv., *Austin Project Wildlife Report*, at 59-62 (2025).

management areas with no proposed changes, the numbers do not match, as the number for proposed acres is often smaller than the number for existing acres.[68]

C. Forest Plan Amendment to Management Area 14 Standard 11: Short-term Deviation from Visual Quality Objective Standard of Retention

In the draft EIS, the Forest Service proposes an amendment to management area 14, standard 11, to deviate from retention visual quality objectives in the U.S. Highway 26 and Oregon Highway 7 viewsheds during the Austin project. The analysis in the draft EIS rationalizes the amendment by stating that the no action alternative would result in "increasing stand density, encroachment of less resilient species, increasing fuel loads, and high levels of mortality."[69] This analysis fails to meaningfully evaluate why the no action alternative is not adequate, as the analysis is filled with vague statements regarding increased wildfire risk over an undefined period of time.

D. Forest Plan Amendment to Management Area 14 Standard 19: Seedtree Harvest in U.S. Highway 26 Viewshed Middleground

The draft EIS proposes seedtree harvest—essentially a type of clearcut—to increase early seral species through natural regeneration and remove late seral species to improve ecological resiliency and make the landscape a more fire-adapted ecosystem. The Forest Service does not answer a key question in the draft EIS: Why are we abandoning these standards now? The vague reasoning of wildfire risk does not sufficiently answer why 136 acres of forest must be almost entirely removed. Did the Forest Service consider whether it could meet the purpose and need of the Austin project without clearcutting the Highway 26 Viewshed? The Forest Service should (1) give area-specific reasoning as to why seedtree harvest is the only way to meet the purpose and need of the Austin Project, and (2) analyze less environmentally destructive ways to increase early seral species and reduce late seral species in the U.S. Highway 26 Viewshed Middleground. With only analyzing the no action alternative (no harvest) and the proposed action (full harvest), the Forest Service misses out on analyzing alternatives that accomplish the purpose and need of wildfire suppression while being less harsh on wildlife habitats and ecosystems.

If the Forest Service clear cuts, it must be in compliance with NFMA[70] and the process outlined on IV-20 and in Appendix C of the Malheur National Forest Plan, which requires a "determination that it is the optimal silvicultural system." Appendix C-1. These restrictions also apply to any site for seed tree regeneration. Appendix C-2. A determination that such harvesting styles may only be done after site specific, on-the-ground analysis, analysis which may not be

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[68] For the DOG 03335 Pileated Woodpecker and Pacific marten (PP), there are no proposed changes, yet there are 318 existing acres and 308 proposed acres. This can also be seen in 03134 Replacement Area (ROG), DOG 03237 Pacific marten (MM), DOG 04360 Pileated Woodpecker and Pacific marten (PP), and 04365 Replacement Area (ROG).

[69] U.S. Forest Serv., *Austin Project Draft Environmental Impact Statement*, at 79 (2025).

[70] E.g. 16 U.S.C. §§ 1604(g)(3)(E)(iv) ("[I]nsure that timber will be harvested from National Forest System lands only where … the harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber"); 16 U.S.C. § 1604(g)(3)(F) ("[I]nsure that clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an evenaged stand of timber will be used as a cutting method on National Forest System lands only where … for clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan;")

expedited and must be made available to the public.[71] If it is probable that clearcutting and seedtree regeneration are not the optimal means by which to manage the location, the Forest Service may not conduct such operations there. Appendix C limits seed tree and clearcutting to Douglas-fir, grand firs, and sub-alpine firs, which is not what the DEIS specifies as its target for seed tree regeneration. Instead, the DEIS refers to "mixed conifer" stands, which may extend beyond the scope of what the Forest Plan allows. Regulations also prohibit any seed tree harvesting of Grand Fir in areas exceeding 60 acres, yet the Forest Service does not address this in their DEIS. 36 C.F.R. § 219.11(d)(4).

Additional consideration must be given towards how such seed tree harvesting will affect Management Indicator Species, in addition to ESA listed and candidate species. The Forest Service has an obligation to maintain habitat for those species that it uses to monitor forest health and recovery. It has a stronger obligation towards ESA species that rely on the selected regions for habitat. MFP IV-32, IV-56. As volunteers from Blue Mountain Biodiversity Project have established such species existing in potential areas, the Forest Service must consider the presence of these species on their decision to conduct seed-tree harvesting. Any even-aged harvesting, like seed tree regeneration must be "carried out in a manner consistent with the protection of soil, watershed, wildlife, recreation, and aesthetic resources…" 16 U.S.C. § 1604(g)(3)(F)(v). This is especially powerful when the Forest Service plans such even-aged harvesting activities adjacent to previous regeneration units that may still be recovering from the upheaval.

No seed tree harvesting should be conducted which results in material which is only to be slash and burned. Such operations produce no economic benefit and reduce the effectiveness of the forest's ability to absorb CO^2. Further, such burn piles are capable for burning for extended periods of time, and smoldering long after the fire has burned out. This leaves nearby forest area susceptible to fire if embers are caught and carried by winds. Finally, any seed tree harvesting must retain trees larger than 21 inches, as these are the most efficient trees for CO^2 retention and provide habitat for critical forest species.

It is possible for the Austin project to meet its purpose and need without conducting any seed tree regeneration. The project only contemplates 668 acres for this type of harvest, yet the Forest Service goes so far as to attempt amending the Forest Plan to allow it to conduct seed tree harvesting in sight lines of America's public roads. These limited but highly disturbing harvests are not necessary for the purpose and need of the project, and the Forest Service must seriously consider an alternative where seed tree harvesting is eliminated.

E. Forest Plan Amendment to the Eastside Screens' Standard 6(d)(2)(a): Remove Trees 21 Inches or Larger Diameter at Breast Height

The Forest Service proposes amending Eastside Screens standard 6(d)(2)(a) to allow removal of "young" (<150 years), relatively large (≥21" DBH) grand fir and Douglas-fir across a massive footprint—commercial thinning units (approx. 29,340 acres), stream and floodplain restoration units (approx. 3,047 acres), and seedtree regeneration units (668 acres). This is an extraordinary carveout from one of the core "large tree" screens, and the Forest Service's analysis does not justify it with the rigor NEPA demands.

[71] The draft Austin silviculture prescription is currently not available to the public.

First, the "young-but-large" framing is not a reliable safeguard against cutting precisely the large-tree component the Screens are designed to retain. The Forest Service itself acknowledges large trees are present even where stands are otherwise "young," and estimates an average of ~6–7 trees per acre >21" across the planning area and ~4 trees per acre >21" in young forest stands. Yet the project would "commercially remove" grand fir and Douglas-fir ≥21" whenever they "do not exhibit old tree characteristics," using an "approximately 150 years old" proxy, and would obtain about 80% of large-tree removal from stands *not* classified as late/old structure (including ~50% from the understory reinitiation structural stage). This targets the very cohort most likely to serve as recruitment into late/old conditions over time—large trees outside mapped LOS—while relying on judgment calls about age/"old tree characteristics" that are inherently uncertain at project scale.

Second, the evaluation's rationale (fire suppression, ingrowth of grand fir/Douglas-fir, increased density and stress to older pine/larch, departure from HRV, etc.) is not responsive to the *specific* question a Screens amendment must answer: why is it necessary to violate the ≥21" retention screen rather than meeting the purpose and need through less environmentally consequential means? The Forest Service does not carry its burden to explain why the "large-tree" screen itself is the obstacle.

Third, the Forest Service's cumulative-effects discussion is framed to minimize the significance of repeated Screens exceptions, rather than analyze the actual ecological risk of normalizing 21"+ removals. The evaluation notes the Forest has authorized 15 amendments to allow removal of 21"+ trees and that those amendments covered ~45,000 acres (2.6% of the Forest), with the suggestion that effects from some past projects have "likely recovered" over ~20 years. This conclusory statement is not supported by any analysis and is not a substitute for analyzing whether (1) large-tree recruitment is becoming increasingly constrained by climate stressors, drought, insects/disease, and wildfire, and (2) repeated "temporary" project-specific exceptions are functionally rewriting the Screens in practice.

The use of site-specific amendments is intended to address unique site-specific conditions that are not present across the forest as a whole. However, the Malheur National Forest has a storied history of proposing and implementing nearly identical site-specific amendments to the large tree and LOS/old growth protections of the Eastside Screens in spatially and temporally adjacent timber sales. The Federal District of Oregon has ruled that this practice is illegal, in violation of NFMA and the APA. *LOWD/BMBP v. Connaughton*, 2014 WL 6977611. Therefore, the proposal of nearly identical amendments to the binding standards of the Eastside Screens in the Austin Project is arbitrary and capricious, and in violation of federal law.

The Forest Service should analyze, in detail, an alternative that prohibits the logging or felling of any species of tree ≥21" DBH anywhere in the Austin project area.

F. Forest Plan Amendment to the Eastside Screens' Standard 6(d): Not Maintain Connectivity between All Late and Old Structure and Old Growth Stands

The Draft EIS proposes amending Eastside Screens standard 6(d) to allow *commercial* removal inside old forest multi-strata and old forest single-stratum stands, including (among other categories) commercial thinning and biomass removal acres totaling thousands of acres within old forest conditions. The Forest Service asserts there will be "no net loss of late and old structure stands *long-term*."[72] (emphasis added). The Forest Service's evaluation does not adequately support this conclusion, and it fails to justify why commercial entry into LOS is necessary to meet the project's stated objectives. The evaluation's core rationale is that some structural stages are below HRV and some are within/above HRV in each PVG, combined with a general "restoration" narrative about density reduction, shifting species composition, protecting old trees, and increasing resiliency. But that is an incomplete analysis for at least three reasons.

First, "HRV" is not a permission slip to commercially log within the scarce, highest-value habitat conditions on the landscape. The evaluation does not grapple with the ecological function of existing LOS/old forest as refugia, seed sources, and connectivity routes—especially under contemporary disturbance regimes that are not "historical." Simply stating that one stage is "within or above" HRV does not explain why the Forest must *commercially remove* within old forest, rather than meeting restoration goals by focusing treatments in younger/dense stands.

Second, the "no net loss long-term" claim is too conclusory to satisfy NEPA, particularly where the agency is expressly authorizing commercial removal in both multi-strata and single-stratum old forest across a large area. The evaluation leans heavily on modeling/growth assumptions and frames the analysis in such a way that minimizes the impacts (e.g., projecting cumulative acres "impacted" as a fraction of the Forest). That framing masks the key question: whether the short- to mid-term degradation, fragmentation, and simplification of LOS structure (including canopy layering, snag/down wood dynamics, microclimate) will materially impair old-forest-dependent species and ecological integrity during the decades (at minimum) it would take to "recover," if such speculative recovery occurs at all under climate stressors.

Third, the evaluation does not demonstrate that *commercial* removal within LOS is the least-impactful or necessary means to achieve the stated purpose and need. The Forest Service itself recognizes that proposed implementation is spread over 10–15 years, not an immediate "emergency" response. The objective of the EAD—and, ostensibly, the Austin project—is wildfire risk reduction and resiliency in the face of an emergency. Why, then, is the Forest Service prioritizing economic considerations by commercially logging the little old growth these forests have left instead of acknowledging that the best available science directly contradicts the efficacy of this action.

It is well-established that the main driver of severe wildfires is not increased fuel loading, but rather climate change and weather events.[73] In Oregon, the timber industry is the top source of greenhouse gas emissions, representing a major contributor to the worsening climate crisis.[74] Logging not only decreases the current carbon stores of these forests—releasing stored carbon dioxide back into the atmosphere at faster pace than the natural carbon cycle of living forests, thus worsening the effects of climate change—but also inhibits the potential future sequestration

[72] *Austin DEIS* at 25.
[73] Keyser, A, A Westerling. 2017. Climate drives inter-annual variability in probability of high severity fire occurrence in the western United States. Environ. Res. Lett. 12 065003.
[74] Law, B.E., Hudiberg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., Harmon, M.E., 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. *Proc. Natl. Acad. Sci. U.S.A.* 115 (14) 3663-3668, https://doi.org/10.1073/pnas.1720064115 (2018).

and storage of carbon dioxide from the atmosphere.[75] Moreover, the proposed logging and/or felling of large grand fir greater than 20 inches in diameter at breast height will remove some of the most fire-resistant live trees on the landscape.[76] The proposed commercial logging in the LOS stands will open up the canopy and reduce the basal area of targeted stands, thus allowing more solar radiation to dry out the forest floor and allowing wind-driven wildfires to increase in severity and speed.[77] The proposed logging will only worsen the primary drivers of severe wildfire, thereby bringing about the very emergency the EAD is purportedly trying to address. The Forest Service cannot achieve meaningful risk reduction by prioritizing commercial logging in the old growth forest stands that are already among the most resilient stands on the forest.

The Forest Service should analyze, in detail, an alternative that prohibits commercial removal within old forest single-/multi-strata (allowing only narrowly tailored noncommercial treatments or true hazard-tree work where strictly necessary), and should disclose—by PVG and LOS type—the expected structural changes, canopy-layer impacts, and wildlife-habitat consequences in the near term, rather than relying on "no net loss long-term" assurances.

G. Forest Plan Amendment to the Eastside Screens' Standard 6(d)(3)(a): Do not maintain/enhance connectivity between all LOS and old growth

The Forest Service proposes amending Eastside Screens standard 6(d)(3)(a) to allow for a decrease in the current level of connectivity between all late/old structure stands and old growth (MA 13). The Forest Service indicates that corridors would be designated to connect all MA 13 stands and adjacent watersheds, but the project would intentionally not connect 35% of late/old structure stands. It also states that approximately 9,220 acres of wildlife connectivity corridors would be designated, with about 65% of late/old structure stands connected two ways.

The evaluation explicitly frames the "need" for the amendment as necessary to "not maintain designated connectivity between all late and old structure stands in order to allow for restoration treatments" that reduce density, shift structure/species composition, and reduce risk of stand-replacing wildfire. That is backwards. If the Forest Service's treatments are expected to reduce canopy cover and structurally simplify portions of the landscape, then maintaining *functional* connectivity among remaining LOS/old growth becomes more—not less—important to ecological resilience, dispersal, and recolonization following disturbance. The forested ecosystems in eastern Oregon serve as a vital east-west wildlife connectivity corridor between the Greater Rocky Mountains and the East Oregon Cascades ecoregions. Connectivity within the individual National Forests—especially connectivity between important LOS/old growth habitat—is especially important to facilitate safe and effective wildlife migration and dispersal.

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[75] Mildrexler, D.J., Berner, L.T., Law, B.E., Birdsey, R.A. and Moomaw, W.R., 2020. Large trees dominate carbon storage in forests east of the cascade crest in the United States Pacific Northwest. Frontiers in Forests and Global Change, 3, p.594274

[76] Moris, J.V., Reilly, M.J., Yang, Z., Cohen, W.B., Motta, R. and Ascoli, D., 2022. Using a trait-based approach to assess fire resistance in forest landscapes of the Inland Northwest, USA. Landscape Ecology, 37(8), pp.2149-2164

[77] Fitzgerald, S., Bennet, M. 2013. A Land Manager's Guide for Creating Fire-Resistant Forests. Oregon State University, Northwest Fire Science Consortium, available at http://www.nwfirescience.org/sites/default/files/publications/A%20Land%20Managers%20Guide%20for%20Creating%20Fire-resistant%20Forests%20.pdf

The evaluation's cumulative-effects discussion further illustrates the problem: it acknowledges that Ragged Ruby likewise did not connect all LOS stands, and concedes there could be a "slight negative cumulative effect," but then asserts the effect would "likely be minor" because other projects have designated connectivity corridors totaling ~36,050 acres and Austin would result in ~19% of the Middle Fork John Day River drainage being designated as connectivity corridor. That is not a functional-connectivity analysis. Acres "designated" says little about whether corridors actually provide the cover, width, and continuity needed for old-forest-associated species—particularly where the Forest Service allows harvest within corridors if understory retention requirements are met, and where corridor design is constrained by treatment objectives. The evaluation also fails to identify which LOS stands will be left unconnected, why those stands can be sacrificed, and what the biological consequences are for species that depend on connected late-seral habitat.

The Forest Service should (1) disclose the specific LOS stands it proposes to leave unconnected and provide stand-level rationale; (2) analyze an alternative that maintains two-way connectivity for *all* LOS stands by shifting treatment units or modifying prescriptions outside corridors; and (3) evaluate connectivity function (not just acreage) under post-treatment conditions, including whether corridor prescriptions will maintain adequate cover and structural characteristics over time.

The Eastside Screens' wildlife protection standards are still necessary to address the degraded old growth habitat conditions that still exist across eastern Oregon's national forests. The Forest Service's piecemeal abandonment of these standards is actively contributing to the continual decline in the prevalence and quality of LOS/old growth habitat on the Malheur National Forest and is preventing the Forest Service from meeting the goals and objectives of the Forest Plan as amended by the Eastside Screens. The Forest Service must analyze an alternative that does not include any site-specific amendments to the Eastside Screens.

H. Mischaracterization of the Project's Purpose and Need to support the need for amendments and dismiss alternatives.

The Forest Service improperly narrows the Purpose and Need of the Austin Project and frames it in such a way to dismiss alternatives and support the need for plan amendments. The mischaracterization of the Purpose and Need is a substantial issue throughout the DEIS because the Purpose and Need necessarily frame consideration of alternatives and support the use of EAD authority.

In the discussion of Large Tree Structure, the already limited analysis of "no action" is summarily dismissed because it would not "meet the purpose and need of maintaining and improving diverse forest composition and stocking levels to promote landscape resiliency." This assertion is in direct conflict with the purpose and need stated earlier in the DEIS. On the very first page the Forest Service states that "The purpose and need of this project and applicable proposed activities include lowering wildfire intensity and reducing wildfire risk" and again in the section titled "Purpose and Need" the Forest Service again clearly states the purpose and need as "The purpose of the project is to address the emergency situation in the Austin planning area to prevent uncharacteristically severe wildfire." This conflict exists throughout various environmental analyses. For example, in the "Alternatives Considered but Not Analyzed in Detail" section, several alternatives are dismissed partially because they conflict with the "purpose and need of maintaining and improving diverse forest composition and stocking levels."[78] Similarly, the amendment to Eastside Screens, standard 6(d)(3)(a) is in part justified for the same reason.[79] The Forest Service consistently fails to explain how these preferred forest conditions and stocking levels contribute to wildlife and disease resilience in the face of a changing climate. The Forest Service cannot log its way out of this "emergency."

IV. Aquatics Comments

Aquatics focused comments on the Austin DEIS

The Austin sale proposes 40,000 acres of commercial logging, as stated in the DEIS (pg. 18): "There are approximately 40,000 acres proposed for commercial treatment via the most appropriate and applicable harvest system to meet desired objectives (see Austin Appendix A – Activity Tables)."

Aquatic-specific logging and other activities include:

- 82 acres commercial logging in aspen units (plus 125 NCT). Large tree logging included
- 943 acres commercial logging in "watershed and fisheries restoration" (2,556 NCT)
- 653 acres commercial logging "stream and floodplain restoration" (2,492 NCT)
- 2,492 acres for NCT/wood placement re: stream and floodplain restoration.
    - Includes created openings
    - Shift species composition
    - Increase shrubs
    - Leave areas range from 5-65% of stream and floodplain treatment areas (percentages determined by PVG)
    - Treatments would not remove, fell, or tip old trees as defined by Van Pelt (2008) guidelines and Johnston and Lindsay (2022).
- 308 acres "commercial byproduct removal" includes logging of large trees within "outer" RHCA
- 339 acres commercial logging in riparian meadow "treatment" (104 acres NCT)

These actions also include:

- Steep slope logging on slopes over 45 percent
    - "Where slopes are generally greater than 45 percent and skyline is not feasible, ground-based tethered systems could be utilized."
- Cat 4 stream crossings
    - 7 locations, intermittent streams
- Prescribed burning on approx. 76,700 acres

Roads:

- 574 miles of haul, maintenance, and reconstruction
- 43 miles of "temporary" road construction

[78] *See Austin DEIS* at 29 (discussing alternatives not considered in detail including; Do Not Target Fir for Commercial Treatments Based on Species Composition or Historical Range of Variability, Only Noncommercially Thin and Prescribed Burn).
[79] *See Austin DEIS* at 25 (Not Maintain Connectivity between All Late and Old Structure and Old Growth Stands).

Aquatics-focused comments:

Overview of water quality and aquatic species concerns:

Aquatic and riparian ecosystems are especially vulnerable to negative impacts of logging, both from logging within RHCAs and from upslope logging. We are very concerned that the Austin sale DEIS did not adequately disclose, analyze, or avoid the negative effects that logging would have on these ecosystems and the cumulative impacts of ongoing threats (roads, livestock grazing, fragmentation, climate change, logging, invasive species, etc.). The EIS cherry-picked science and scientific interpretations that bolstered their desired actions of logging within riparian corridors, while ignoring or severely downplaying science that did not align with the agency's assumptions or conclusions.

The EIS's proposed logging in riparian corridors (RHCAs) and heavy upslope logging--including in connectivity corridors and other sensitive and unique habitats-- flies in the face of widespread scientific consensus to increase core habitats and connectivity in response to climate change (Heller and Zavaleta 2009). The agency needs to consider how existing conditions and proposed logging would potentially exacerbate possible negative impacts from climate change. The EIS has an extreme and disproportional emphasis on logging and fails to consider the importance of less risky and more effects strategies that do not focus on logging.

Managed watersheds with logging associated roads have worse stream habitat conditions. From NOAA 5-Year Review of Snake River Salmonids: *"Information from the [PACFISH Biological Opinion Monitoring Program]* ***PIBO monitoring program indicates that unmanaged or reference reaches (streams in watersheds with little or no impact from road building grazing, timber harvest, and mining) on Federal lands in the Interior Columbia basin (including the Snake River basin) are in better condition than managed streams (Al- Chockhachy et al. 2010b). In particular, managed watersheds with high road densities or livestock grazing tend to have stream reaches with worse habitat conditions than streams in reference watersheds. When roads and grazing both occur in the same watershed, the presence of grazing has an additional significant negative effect on the relationship between road density and the condition of stream habitat (Al-Chockhachy et al 2010b)."***

Logging can be associated with changes in macroinvertebrate community structure or metrics (Flaspohler et al. 2002, Kreutzweiser et al. 2005), increases in stream temperatures (Guenther et al. 2012) and alterations in nutrient cycling and leaf litter decomposition rates (Lecerf and Richardson 2010). Flaspohler et al. (2002) noted that changes to biota associated with selective logging were found decades after logging.

Headwater streams and non-fish bearing streams are particularly at risk and need more, not less, protection. In order to protect downstream fish bearing reaches, headwater streams need at least as much protection as larger downstream reaches (Rhodes et al., 1994; Erman et al., 1996; Espinosa et al., 1997). Both Erman et al., (1996) and Rhodes et al., (1994) concluded, based on review of available information, that intermittent and non-fish-bearing streams should receive stream buffers significantly larger than those afforded by PACFISH/INFISH. Headwater streams and small intermittent streams do not have buffer widths that are sufficient to protect water quality and stream habitats. Wider buffers are needed in order to prevent excess fine sediments and nutrients entering waterways. (Freeman et al. 2007; Gomi et al. 2005; Nieber et al. 2011; Sweeney and Newbold 2014). Negative impacts to upstream reaches, such as higher temperatures, increased sediment loading, down-cutting, and altered hydrographs also negatively affect downstream reaches.

In research in eastern Oregon, Ebersole 2015 found that dry streams supplied cold water to downstream reaches at confluence sites. Such cold water refugia habitats are important for fish, which were observed at these locations. In another recent project in the Wallowa-Whitman National Forest, the Morgan Nesbitt Project, the Aquatics BE for that project notes that *"[m]ost riparian thinning is located in the RHCAs of Cat 2 and 4 streams, with the majority of these acres in Cat 4 RHCAs (Table 3). Although these streams are fishless,* ***water temperature in these smaller streams is important for fish habitat because cold water inputs from tributaries provide thermal refugia, and intermittent streams can still provide cold groundwater inputs even after surface flow ceases*** *(Ebersole et al. 2015)."*

We note that the Austin sale is planning to commercially log a huge number of acres (more than 30,000), including hundreds of acres of commercial logging within RHCAs. The negative effects that logging will have on aquatic resources are very likely to be widespread and long-term, and have measurable and significant effects at the subwatershed scales. Given the enormity of logging throughout the uplands, the effects from logging within RHCAs combined with upland logging, the negative effects are likely to be seen at downstream and at larger watershed scales as well. Even localized negative impacts to streams, water quality, and fish can have long-term negative effects from which fish and other aquatic organisms may have difficulty recovering from.

The primary threats and stressors to special-status and at-risk riparian and aquatic species on National Forests in eastern Oregon are logging, roads, and livestock grazing. These activities result in increased fine sediment inputs to streams, warming stream temperature, increased diurnal stream temperature fluctuations, stream bank instability, soil compaction and erosion, fish passage barriers, and other widespread problems.

Logging will increase surface runoff and overland flow, which delivers warmer water and excess sediments into streams quickly, and can alter peak flows and increase stream temperatures. In addition, increased surface runoff and faster delivery of water into streams also means that less water becomes groundwater. This decreases groundwater storage, groundwater flows, and hyporheic flows. (Coutant 1999; Croke and Hairsine 2006; Jones and Grant 1996). Protecting groundwater storage, groundwater flows, and hyporheic flows associated with intermittent streams is crucial for protecting temperatures in larger downstream perennial streams. Cold water inputs from intermittent streams to downstream reaches are essential providing cold water refugia for special-status and imperiled aquatic organisms, including ESA-listed fish (Caissie, 2006; Ebersole et al. 2015; Groom 2011; Groom 2011; Jones and Grant, 1996; Pollock et al. 2009). Patches of cold water refugia are crucial for fish. Shallow groundwater patterns can be important for influencing stream temperatures, (Poole et al. 2008) and so are likely vulnerable to upslope logging (Caissie 2006).

Logging, including upland logging, can cause decreases in summer baseflows in the long-term. Decreased canopy cover due to logging can cause more snow to accumulate in these more open areas, which alters the timing and magnitude of runoff from snow melt. This can also cause changes to peak flows (Harr and Coffin 1992). Should proposed logging be implemented, it would create more open canopies, which will then increase solar radiation inputs, and as a result may increase the amount of early snow melt. This, in turn, may further alter peak flows and groundwater recharge and the hyporheic cold water delivery downstream, including to perennial streams. (Caissie 2006; Harr and Coffin 1992).

Logging also alters microclimates, creating hotter, drier, and windier conditions that stretch beyond forests directly affected and into adjacent forests, sometimes for distances of hundreds of feet. Such microclimate edge affects could extend into the entirety of riparian buffers, especially in smaller headwater streams. (Chen et al. 1992; Chen et al. 1995; Brosofske et al. 1999)

Given the research done by Ebersole and others cited above, it is very likely that logging within RHCAs, is likely to threaten the cold-water temperatures and refugia in streams that are important for aquatic and riparian species. We are very concerned that the agency is ignoring PACFISH buffers, with commercial and non-commercial logging proposed within RHCAs.

The Forest Service also should have made the fisheries and aquatics-related specialists reports available for the public to review during the DEIS comment period.

"Outer" and "Inner" RHCA:

The DEIS (pg. 16) states: "Outer portions of riparian habitat conservation areas are generally more ecologically similar to upland stands than to the inner portions of the riparian habitat conservation area, therefore they would be treated in a similar manner as upland treatment units."

It is unclear what evidence or justification the USFS is relying on to log within RHCA buffers, or to create artificial "inner" and "outer" delineations within RHCA buffers. No such distinction exists in PACFISH/INFISH, the Malheur Forest Plan, the ODEQ TMDL from 2010, or any other regulatory or credible source that we were able to find. The DEIS provided no scientific justification or evidence for the "inner" and "outer" RHCA buffer zones. What peer reviewed scientific studies is the USFS using to determine these "inner" and "outer" RHCA buffer zones?

While the Austin timber sale does not make any direct references to Olson 2000 or Harley et al. 2020, those are usually the studies that the Forest Service points to in order to justify artificially portioning off the "inner" and "outer" zones within RHCAs, and then claiming they need to be logged. We did not see any citations to justify the "inner" and "outer" zones, or to generally justify logging within RHCAs in the Austin project.

Olson 2000 and Harley et al. 2020 studies:

Response to the USFS's reliance on these two studies to justify logging within RHCAs:

Olson 2000. Master's thesis: Fire in riparian zones: a comparison of historical fire occurrence in riparian and upslope forests in the Blue Mountains and southern Cascades of Oregon.

Harley, G.; Heyerdahl, E.; Johnston, J.; Olson, D. 2020. Riparian and adjacent upland forests burned synchronously during dry years in eastern Oregon (1650-1900 CE), USA.

Since fire scar analyses have been used in almost every other USFS project we've commented on in the past 8 years that proposes logging within RHCA buffers, we are including the following concerns about the Olson 2000 and Harley et al. 2020 papers in the assumption that they are implicitly being used by the Forest Service (or similar papers are being used, with similar issues), in the justification for inner/outer zones and logging within RHCAs.

The Olson 2000 research mapped fire years for "every year there was clear evidence of fire scarring" (Olson 2000 Appendix E. pp. 181- 237), and show data from 1428 through 1972. In our review of the Olson 2000 maps, we note that there are substantial portions of the these areas had no evidence of any fire, including the headwaters/upper watersheds of Mill, Marble, and Salmon Creeks. The Olson fire maps show a distinct absence of fire, and so suggest that these areas have infrequent (and likely high severity) fire with long return intervals, and have been acting as fire refugia for centuries. Such forests provide important habitat for species that rely on mature and old forests, and dense and complex canopy forests, and will be instrumental for providing habitat and connectivity in a changing climate. However, the complex mosaics of fire history become lumped together, essentially erasing the very real, on-the-ground results that depict an extremely variable landscape that includes very long fire return intervals.

We want to note some finer scale detail from those maps that we observed. ***Olson 2000 data shows <u>no evidence of fire</u> in higher elevation areas within the Baker study location, such as the upper portions of Mill, Marble, and Salmon watersheds portions of the study area:***

- There appears to be no evidence of fire scars shown on the maps for the upper portions of high elevation watersheds such as the Mill, Marble, and Salmon watersheds. The lack of fire scars suggests that these forests are likely to have experienced infrequent, high severity fires historically.
- The maps also show no evidence of fire for these more incised, steep watersheds between 1428-1529 (~100 years).
- Between 1529 and 1645, there are only isolated incidents of evidence of fire scars at single sites in these watersheds, with the exception of 1581 when there was a second location that had "probable" fire evidence. So, between 1428 and 1646 there was no evidence of more than one isolated small fire until 1646 for the three watersheds (~218 years), with the exception of the "probable" other single location.
- Mill Creek had only isolated evidence of fire scars at single sites, with two exceptions, one with 2 sites showing evidence and the other with five (in 1783 and the other in 1828, respectively). So, aside from single isolated locations showing evidence of fire scarring within Mill Creek, there was no evidence of fire in Mill Creek between 1428 and 1782 (352 years); between 1784 and 1827 (43 years); or between 1829 and 1972 (143 years).

Several of the locations in the Olson 2000 that show repeated fire included those along the mid and lower portions of Mill and Marble creeks appear to have very isolated and small-scale fire activity, possibly suggesting only extremely small fires such as those related to lighting strikes that burn less than one acre. I.e., it is likely that those locations are attracting repeated fire strikes at the same ridge tops and topographic high points.

We also note that the Harley et al. 2020 paper only sampled riparian plots at lower elevations in the Baker plots. The Harley et al. 2020 study notes: "At Dugout, we sampled riparian plots along the major streams throughout the extent of the upland plots. However, at Baker ***we only sampled riparian plots at low elevation along the major streams*** (below 1770 m) ***because visible fire scars did not occur at high elevations at this site."*** (Emphasis ours). Wouldn't those higher elevation sites with no apparent/visible fire scars indicate either fire refugia/no fire and/or stand replacement fire in those areas—contrary to how the agency has characterized them and based their plans for logging?

The Harley et al. 2020 paper goes on to state: "*All the riparian plots were installed more than 46 m and downslope from existing upland plots (range 49 - 939 m, mean = 316 m; Heyerdahl et al 2001)* ***where fire scars were visible on either lie or dead trees and within the riparian buffer.****"* (Emphasis ours). It would seem that the targeted selection of sampling plots within areas where both upland and riparian forests showed clear signs of fire scars potentially skew the results and/or bias the conclusions about widespread low intensity fire. I.e., if it was a randomized selection, would there not be more potential evidence for infrequent and high severity fires within the project area?

The only data collected in higher elevation riparian areas was from the Olson 2000 study, which—again-- shows no evidence of fire in significant portions of higher elevation areas within the project area. The authors of the Harley paper stated that they left out possible sites in riparian areas at higher elevation because no visible fire scars were not present. Of course, this biases their findings towards detecting low severity fire regimes, because they left out the very areas that lacked fire scars which would suggest infrequent and/or high severity fires.

The Harley et al. 2020 study also states: "As elevation increases and terrain becomes more dissected at Baker, ***longer and more variable fire intervals also occurred. This is likely a result of forest composition changes related to both topography and elevational changes in temperature, as well as aspect controls on varying insolation levels*** (Olson 2000); Heyerdahl et al. 2001). ***When forests occur within interaction zones of climate and topography, such that riparian forests contain greater variety in vegetation composition relative to upslope forests, then fire intervals differ, suggesting that forest composition is important as landscape dissection increases.*** Compared with Dugout, ***riparian valleys at Baker are more incised and therefore receive less insolation, resulting in a north-facing slope and riparian forest composition that is more mesic compared with adjacent south-facing upslope forests.***" (Emphasis ours).

We note that the authors found longer and more variable fire intervals DESPITE sampling at only lower elevation locations along major streams.

In addition, an overwhelming majority of sample sites in both the Dugout and Baker locations are predominantly on south or west facing slopes. The predominance of south or west facing slopes in the Harley et al. 2020 paper study may also have skewed the results towards more frequent and lower intensity fire being more common in riparian forests (and similar to uplands).

If one is looking for statistical differences between riparian and uplands—then predominately choosing sample sites most likely to burn more frequently may dampen any statistical signals one might have found with a more robust sampling protocol. Any possible statistical signal from a small sample size with this composition is likely to be muted or overwhelmed by the larger number of sites that are drier, at lower elevations, and have more gentle and open topography. This is especially the case as the Harley study has an extremely small proportion of sample sites in locations that would be more likely to be more moist and have longer fire intervals (i.e., north, northeast, or east facing slopes; higher elevations; and more incised valleys and gulches).

- The Baker study area plots have a total of 35 upland sites. Twenty of those appear to be primarily on south-facing slopes. Of the 15 sites that have more of a northern or eastern slope orientation, five appear to also include strong southern or western influences, as they are somewhat northwest or southeast facing. Of the 35 upslope sites in the Baker study area, only 10 appear to be clearly on slopes that have a strong north, northeast, or east orientation.

- In the Dugout study area, there appear to be a total of approximately 75 upland sites. Only 12 of those sites appear to be on slopes with strong and predominant north, northeastern, or eastern facing. Of these, four are on ridgetops.

- Riparian sites are almost entirely situated all on the larger order streams within the study area, which tend to be less incised and more open. Only eight suites were situated on smaller tributaries, and only one of these sites faces N/NE.

Figure from the Harley paper:

Eastern Oregon riparian versus upland fires Int. J. Wildland Fire 603

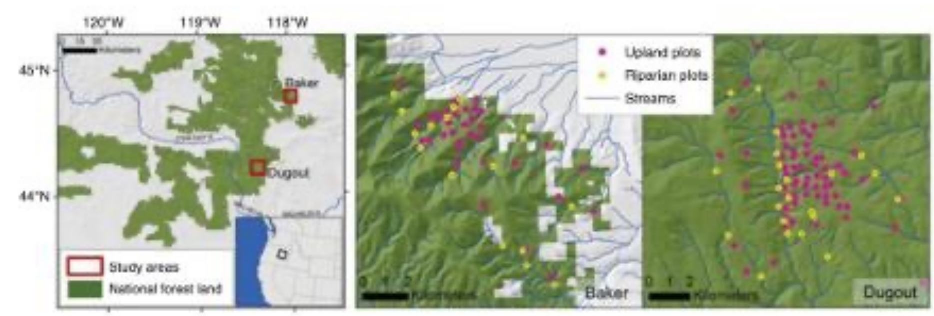


Fig. 1. Location of Baker and Dugout study areas and riparian and upland plots in the Blue Mountains of eastern Oregon, USA. Most of the riparian plots were sampled for this study and most of the upland plots were sampled for an existing study (Heyerdahl *et al.* 2001).

The Harley paper also states: *"[i]n the two study sites in the Blue Mountains of eastern Oregon during the period 1650–1900,* ***historical fires burned more frequently in upland forests compared with adjacent, downslope riparian forests.*** *However, the difference between riparian and upland fire intervals at both Baker (5 years) and Dugout (3 years) was not statistically significant (P . 0.10) and* ***likely not ecologically relevant."*** (Emphases added)

Lack of statistical significance does not necessarily mean lack of data patterns or trends. Lack of statistical significance can be due to a variety of factors, including small sample size. In this instance, the sample size for sites representing north/northeast facing sites was an even smaller proportion of an already small sample size, and seems to have constituted far less than half of the sample sites. While statistically significant differences were not found between upland and riparian forests, there was a clear trend pointing to a difference between the two-- even with the small data sets in this one study. Choices and/or limitations in statistical analyses can also mute variation and complexity, especially when working with small sample sizes, large elevation gradients, and other confounding factors. The Forest Service's standard conclusion for timber sales across the region when applying this research is that most, if not all, forests are dry forests with historically low intensity and frequent fire regimes. This contradicts the data trends-- including the reality of very long fire intervals in large portions of the project area, such as the higher and mid elevation portions.

The Harley et al. 2020 authors also dismissed any ecological importance in the data trend of more frequent fire in uplands compared to the riparian areas (see quote from Harley et al. 2020 above). However, the authors provide no evidence to support this claim, and do not attempt to substantiate their declaration that this very important data trend would lack ecological importance.

The Harley et al. 2020 paper notes that an average of five trees (range 2 - 9 trees) were sampled per hectare by removing fire-scared partial cross-sections. These cross sections were sanded and looked at with a microscope, and were used to assign calendar years to tree rings through cross dating and against existing ring-width chronologies. This small sample size of trees at each plot then means that the study's already small sample size in riparian forests, especially in the Baker location, is an even smaller sample size for areas most likely to have infrequent and/or stand replacement fire. If the smaller end of the sample range was present at the more northern/eastern slopes and/or in the higher elevations and more incised valleys– then this is potentially only a couple of handfuls of samples in these locations.

Also, evidence of fire at a specific location(s) does not necessarily mean that the fire was widespread, or part of a larger fire regime. For example, lightning strikes may result in only a very small area burning, sometimes even one to several trees. Lightning can and does tend to strike certain ridges and areas repeatedly, also an important factor to consider. In addition, a relatively few trees were sampled at any sample site, potentially leaving room for misinterpretation of fire scars. I.e., some small fires may have been from lightning strikes (not widespread low intensity fires). It could also be the case that some of these fire scars were the result of high severity fire mosaic patterns that include low intensity fire within the fire perimeter.

The Harley et al. 2020 authors also state that for smaller fire years that *"[s]maller fires were likely characterized by a mosaic of varied fuel dryness across the study area. Hence, fuel moisture levels may have varied enough within and between riparian forests and upslope forests, resulting in smaller fires and greater variations in burn severity."* This suggests that there was at least some mixed or high severity fire within riparian zones. High severity fire has specific dynamics and processes that are crucial for certain species and for the ecological integrity of forests that evolved with it. Managing the mixed-conifer forests-- especially those on north/northeast/east facing slopes and at higher elevations-- for a frequent and low-severity fire regime artificially homogenizes them, and degrades or entirely destroys the wildlife habitat and connectivity they provide, as well as greatly impairs their ability to support clean and cold water for fish and people.

The actual data from both the Olson and Harley studies suggest that the topographically and ecologically diverse areas than are recognized by the Forest Service, and are actually more varied in terms of fire intensity and frequency than the usual FS claims. The statistical conclusions of the Harley et al. 2020 paper are based on analyses of sample sites that are more likely to have frequent and low severity fires (lower elevation, west and/or south facing locations, gentle and open topography, etc.). Areas with less frequent and higher intensity fire were sampled in only a handful of locations, or excluded entirely (as with higher elevation sites at Baker in the Harley paper). These sampling biases, as well as the lumping in of data from higher elevations, steep and incised valleys, and N/NE/E facing slopes with data from lower elevations, open topography, and S/SW/W facing slopes— are very likely to have overwhelmed any possible statistical signals of variation, and skewed results towards overgeneralizations of frequent and low severity fire regimes. Lumping all forests in the area together as "*dry forests adapted with low severity fire"* reflects the agency's failure to take a hard look at the data, and the potential limitations of sampling, methodology, and analyses. The data from the Olson thesis fire maps clearly reflects very, very long fire return intervals (and/or stand replacement fire) in the upper and mid elevations of the project area.

Fire scar analysis:

Use of composite fire intervals tend to shorten the time between fires and give a false interpretation of the past fire history. For example, personal communications from George Wuerthner, in our communication regarding limitations of fire scar analyses used in research with similar methodology, include:

> *"Take a hypothetical situation: Let's say you have a 1000 acre study area. You note a fire someplace in that 1000 acres every single year over a hundred year period. However, for argument's sake, each of those fires burns less than a single acre. So you have a total of 100 fires and a fire interval of 1 year. I.e. the fire scar history suggests there is a fire every year. But because each fire is less than an acre, you have only burned 100 acres in a hundred years or only 10% of the 1000 acre study site. Even at a fire every year, it would require 1000 years to get to the fire rotation.*
>
> *This is why it's important to note how large the fire is. You can do this in a number of ways including using air photos, fire atlas, or Government Land Office survey notes as Baker has done.*
>
> *Using fire scars, the best way to do this is to only include fires that burn a significant amount of the study area. In other words, again using the 1000 acres. You would ignore all the fires that are only recorded at one or even a few sights and assume they are small fires of no consequence. After all we are trying to get to the notion of how important fire was in any area and the kind of fire that burned. The only fires you would include would be the years when the majority of the study sites burned, preferably across*

much of the 1000 acres. You could also note the occurrence of even-aged stands across large areas that might indicate regrowth after a stand replacement blaze. That would give you the real fire rotation."

Similarly, personal communications from William Baker, in our communication regarding limitations of fire scar analyses used in research with similar methodology (and so are also relevant here), include:

"There are no estimates of historical fire rotations, the essential rate parameter of historical fires. Composite fire interval estimates are done within each site, not across sites, which is OK. But, there is little correction to remove small fires, so their MFRI is close to a mean CFI-all fires in the Baker (2017) terminology. Using Baker (2017 Table 2), to estimate fire rotation, for mean CFI--all fires, we would multiply MFRI by 2.44. For the range of MFRIs in their Table 1, which is 10.6-21.2 years, the estimated range of historical fire rotations would then be 25.9 to 51.7 years.

Based on these fire rotations, these were not frequent-fire forests with fire rotations < 25 years that would have kept fuel loads generally reduced, since fuels can recover within about 10-20 years usually. Instead, historically there would have been ample time for fuels to fully recover between fires, including plenty of fully regrown shrubs, many small trees, lots of small wood, some larger wood etc. and some stands with higher tree density. It is important to estimate fire rotations because it is well accepted now in the scientific fire community that the MFRI used in Johnston et al. does not estimate historical rates of burning and should not be used to guide restoration programs (Baker 2017). See the quotes in this paper from well fire historians that make this very clear.

Also, in the intro Johnston et al. suggest fire regimes would have been mixed severity, but then they did no reconstruction of fire severity, which of course is essential where fires where historically mixed in severity. The paper doesn't say so explicitly, but seems to assume that all fires were low-severity, and the final paragraphs even imply that higher-severity fires did not occur. Of course, what would be expected is that in moister forests, more of the fires that occurred would be higher-severity, including substantial patches of high-severity fire, whereas in ponderosa of course more of the fires would have been low-severity, with fewer that were higher-severity, as has been shown nearly everywhere that fire severities have been reconstructed in these kinds of forests. Showing, as they do, that MFRI did not differ between dry and moist forests has little meaning, since it is not the occurrence of fires, but instead fire size and fire severity that would be expected to differ. They have no data on the essential fire-severity parameter of historical fire regimes in ponderosa pine and mixed-conifer forests in their study areas, and certainly cannot conclude that historical fire regimes would have been similar in these two types of forest.

Also, their historical basal area estimates are based on just extant (live) historical trees, not dead trees present on the forest floor. Although fires may have been suppressed, there are many other sources of continuing tree mortality that could have killed and even removed many of the smaller trees present in the late-1800s (e.g., bark beetles, drought, competition, root rots etc.). They did not compare their basal area estimates to early historical reports, such as Munger 1917 to see whether extant live historical trees even *approximately estimate basal area, tree density, and tree diameter distributions in the late-1800s to early 1900s. It is well known that smaller trees present in the late-1800s would likely have burned, died from competition or other mortality agents, and decomposed since then, particularly in moister forests. Since logging is often aimed at smaller trees, and they have no validation at all that smaller trees are correctly reconstructed by using just extant live trees that happen to still be present, this study does not provide a sufficiently sound basis for any restoration logging program."*

The Forest Service claims that Douglas and Grand firs and other less fire-resistant trees are present in larger numbers and higher densities across the landscape than they were historically, as a consequence of fire suppression. However, the Forest Service abuses this rationale by applying it overly broadly and aggressively, and uses it as an excuse to extensively log old growth and mature forests– including in ecologically inappropriate areas such as forests with ample evidence of historic mixed-conifer and high-density forests, on north and east facing slopes; deep gulches and narrow valleys; forests on soils that hold more nutrients and moisture (such as ash soils); and other areas that show historic evidence of supporting mixed-conifer forests in general and Grand fir in particular.

A study from Bradley et al. (2016) challenges USFS assumptions about the fire risk associated with more protected areas—those area that have been less-managed or less-logged, but may still have experienced some degree of fire exclusion (such as Wilderness areas. riparian corridors have also, of course, seen much more protection than upland areas). The authors state:

"There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression. This view has led to recent proposals—both administrative and legislative—to reduce or eliminate forest protections and increase some forms of logging based on the belief that restrictions on active management have increased fire severity. We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables. **We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy"**

"Protected forests burn at lower severities: We found no evidence to support the prevailing forest/fire management hypothesis that higher levels of forest protections are associated with more severe fires based on the RF and linear mixed-effects modeling approaches. On the contrary, using over three decades of fire severity data from relatively frequent-fire pine and mixed-conifer forests throughout the western United States, we found support for the opposite conclusion—burn severity tended to be higher in areas with lower levels of protection status (more intense

management), after accounting for topographic and climatic conditions in all three model runs. Thus, we rejected the prevailing forest management view that areas with higher protection levels burn most severely during wildfires."

In addition, recent research suggests that Grand fir forests are more fire resistant than generally assumed by the agency. Moris et al. 2022 found:

> *"The* grand fir forest *type had severity values at the same level of* forest *types dominated by* fire-*resister species despite* grand fir *was classified as a* fire-*avoider species. ... In many ponderosa pine forests maintained historically by a high frequency, low-severity* fire *regime, the transition towards denser forests dominated by Douglas-*fir *and* grand fir *would explain why ponderosa pine and Douglas-*fir *still compose a significant proportion of basal area in the* grand fir forest *type, and many maintain large, old,* fire-*resistant ponderosa pine trees (Johnston et al. 2021; Merschel et al. 2021). Therefore, the particular structure and composition of these "recent"* grand fir *forests (e.g., Merschel et al. 2014), with an important presence of large-diameter trees of* fire-*resistant species, may provide latent* fire *resistance (Larson et al. 2013)."*

Potential violations of the National Forest Management Act, PACFISH/INFISH, Riparian Management Objectives, and/or the Clean Water Act:

The PACFISH Standards and Guidelines state that activities within the RHCA *"should not prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat."*

According to the Austin DEIS, many streams are already not meeting RMOs, including for temperature. In fact, only 27% of streams in the project area are meeting temperature standards according to Table 36 in the DEIS (see below). Nevertheless, logging is planned adjacent to streams. Such logging will further retard attainment of RMOs by removal of riparian shade, as well as increased stream temperature and fine sediment, alteration of watershed hydrology, and negative effects on pool depth, embeddedness, LWD, and others. PACFISH/INFISH no-cut stream buffers should be adhered to and fully implemented. No commercial logging should occur with RHCAs, and noncommercial logging should be dropped or severely scaled back. We are also very concerned about other activities within RHCAs, skidding, heavy equipment use within RHCA buffers, and other harmful actions the agency has proposed that will retard attaining RMOs.

DEIS pg. 88:

Table 36. Percentage of surveyed stream miles in Austin planning area meeting riparian management objectives as outlined in PACFISH and Malheur Forest Plan Amendment 29 with Region 6 habitat survey data.

Riparian Management Objective (Habitat Indicator)	Surveyed Streams Meeting Objectives (Percent)
Bank Stability	99
Fine Sediment Embeddedness	37
Large Wood	27
Pool Frequency	11
Stream Shade	52
Temperature	27
Width-to-Depth Ratio	14

DEIS pg. 88: *"Lingering effects from historical features and practices are still apparent. Today, most streams within the planning area have roads or railroad grades paralleling them, have very limited large wood,* ***and are not meeting riparian management objectives*** *(see Table 36). This lack of wood likely contributes to or maintains poor conditions of riparian habitat. Large wood has a dominant influence on stream habitat and channel formation and when large wood is removed from a stream, a cascade of corresponding effects to other habitat elements can occur. Loss of wood can lead to sediment scour and channel incision (Gurnell et al. 2002). With this, there is often a corresponding loss of pools and decreased bank stability, which can lead to altered channel shape, as indicated by greater width-to-depth ratios, and changes to fine sediment and embeddedness. These stream channel adjustments often result in an increase in water temperature and overall reduction in fish abundance."*

BMBP is supportive of much well-proven, non-experimental stream restoration work such as LWD placement in streams, floodplain work to increase complexity and groundwater interactions, and beaver restoration. However, logging within RHCAs is likely to cause harm to streams and water quality, is extremely risky under the best of circumstances, is scientifically controversial, and does not mimic natural processes. Even with LWD placement, extreme caution is warranted—particularly when removing large trees from adjacent terrestrial forests. Effects on wildlife habitat, terrestrial ecosystems, erosion and sediment, ground water interactions, loss of future large wood recruitment, and other issues require small-scale actions with monitoring and adaptive management. The Austin sale throws caution to the wind and is removing massive numbers of large trees, which will likely increase stream temperatures and excess fine sediments in streams, and degrade riparian forests and stream habitats. We support increasing LWD in streams, and understand that it will likely increase stream sinuosity, groundwater recharge and water storage, and fish habitat. However, extensive and large-scale removal or tipping of hundreds of large trees-- a substantial portion of the only terrestrial large tree habitat left on the terrestrial landscape will cause widespread negative impacts on both terrestrial and aquatic ecosystems. The DEIS failed to analyze these impacts. It also failed to analyze alternatives, such as canceling commercial logging of large trees to drastically reduce the impacts to terrestrial large tree structure when tipping some large trees into streams, canceling commercial logging in RHCAs, dropping or significantly scaling back noncommercial logging in

RHCAs, using smaller trees for stream restoration, conducting restoration on much a much smaller number of stream miles, incorporating robust monitoring and adaptive management.

Stream temperatures:

The most common water quality impairment in National Forest System lands is stream temperature. More than 1,240 stream miles on National Forest lands in the Blue Mountains are listed as not meeting water quality criteria. The most common water quality impairment on National Forest lands is stream temperature (Draft EIS for the Blue Mountains Forest Plan Revision (BMFPR), Vol. 1 pg. 272). This baseline figure from the BMFPR is almost certainly an underestimate-- the large volume of recent data submissions in 2019 from the Forest Service to ODEQ reflect even more widespread problems with stream temperature violations across the landscape. The agency's 2018 data submissions were the first effort by the Forest Service to share a substantial portion of their data with ODEQ in over a decade.

The DEIS (pg. 100) states:
"Watershed and fisheries restoration described in the proposed action would occur at selected sites along Bridge, Clear, Dry Fork Clear, Mill, Summit, and Wiwaanaytt Creeks, or their tributaries in the six subwatersheds and along unnamed tributaries to Middle Fork John Day River in Mill Creek-Middle Fork John Day River subwatershed. Effects of riparian meadow treatments proposed, where entrenched streams run through meadows and conifers have encroached on streambanks, are expected to be similar to those described above. Cutting conifers may increase water availability and temporarily decrease shade. However, due to the abundance of sedge-like grasses in meadows, replacement shade that meets Malheur Forest Plan standard of 80 percent is expected to develop in two to three years.

Narrow openings in primary or secondary shade zones may occur during temporary road construction or from skid trails, depending on their proximity and that of their intersections with existing roads. Table 39 displays the number of instances of these activities in riparian habitat conservation areas along perennial streams by subwatershed. These openings are expected to be less than twenty feet wide; removal of shade, even on southern or western sides of perennial streams for that distance is not expected to measurably affect stream temperature. ***Replacement shade, from canopy expansion of adjacent trees or establishment of new trees, is expected to regrow within ten to thirty years following temporary road removal."***

The DEIS admits to removing shade and creating openings directly adjacent to streams, and within the RHCA buffers. It is clear that removing conifers, and then having to wait 10-30 years for replacement shade to regrow, is retarding attainment of the shade and stream temperature RMOs. Similarly the DEIS notes that, because of the sedge-like grasses left after logging shade conifers, shade will be expected to attain Forest Plan standards in 2-3 years.
This is in flagrant disregard to PACFISH/INFISH buffers and to RMO and CWA standards for temperature and sediment. We also note that waiting 10-30 years for replacement shade to regrow, as discussed in the DEIS quote above, will be extremely detrimental to stream temperatures in the long term, violate RMOs and CWA standards, and put ESA-listed aquatic species such as Bull trout and MCR steelhead in jeopardy of downward population trends, localized extirpations, and contribute to overall extinction. This is especially true for Bull trout, as their numbers are often depressingly and shockingly low throughout their range.

Additionally, logging only increases water availability for a short time (and during peak flows)—but this is usually followed by a long period of decreased water availability, especially during base flows, as vegetation grows back. Please see studies in our addendum.

The Oregon Department of Water Quality temperature standard for streams within the Austin project area is 12 degrees Celsius. The Austin DEIS acknowledges that *"...streams in the planning area are listed as impaired under the Clean Water Act for temperature. Temperature data indicate that streams in the planning area do not meet temperature requirements for bull trout or Middle Columbia River steelhead during summer months."*

The DEIS also acknowledges that stream temperatures are impaired as a result of alterations to the natural hydrological processes in the project area, including reduced floodplain storage and water runoff leaving the landscape too quickly. The DEIS cites these issues as the result of human disturbance causing a loss of floodplain storage and entrenched stream channels (which cause issues such as incised channels that lack floodplain complexity and have lost groundwater capacity, among other complex processes).

Specifically, the DEIS states (pg. 8): *"Stream temperatures in Austin planning area are elevated because natural hydrological processes in this physiographic region are highly altered. Floodplain storage is reduced because snowmelt and other runoff leave the landscape too fast due to altered channel conditions. In addition, floodplain storage capacity is reduced due to human disturbance. Entrenched channels reduce floodplain storage capacity, lower the water table, and reduce availability of water for riparian."*

The DEIS goes on to acknowledge that past timber harvest and roads (as well as overgrazing and railroad disturbance) have caused the departure from historic conditions in streams and water quality. The DEIS (pg. 9) states: *"Legacy effects to aquatic habitat from past timber harvest, over-grazing, beaver removal, and road and railroad construction include reductions in shade and bank-stabilizing wetland vegetation; streambank alteration; and increases in width-to-depth ratios and fine sediment levels. This impacted fish habitat by increasing water temperatures and decreasing habitat complexity, pool formation, and instream habitat availability (NMFS 2009, Middle Fork John Day IMW Working Group 2017). Improved management practices on both private and National Forest System lands have resulted in improved aquatic conditions; however, most streams have not returned to pre-disturbance conditions or achieved desired conditions. Historical timber harvest and railroad construction in Austin planning area removed large trees from most riparian areas and, in some cases, from the streams themselves."*

The "improved practices" the DEIS references as being responsible improved riparian conditions are the PACFISH/INFISH riparian buffers implemented in the mid 1990's that, until the past several years, were treated as no-cut buffers. Protections that excluded logging were responsible for the improved riparian conditions that now, unfortunately, the agency is seeking to reverse.

We note that Forest Plan standards and PACFISH/INFISH buffers were intended to uphold no activity buffers, where logging was rare if allowed at all, and carried stringent requirements to not retard the attainment of RMOs and to only conduct restoration activities for the purpose of improving water quality and stream habitats. For almost three decades after PACFISH/INFISH was implemented, almost no logging of any kind was conducted within RHCAs across the region. The full PACFISH/INFISH buffers, without logging, were what was referred to as "improved practices". For example, the Morgan Nesbit Aquatics BE (pg. 32) states, in relation to similar plans to log within RHCAs in that sale: *"the Morgan Nesbit project restricts activity and has additional project design criteria within default PACFISH buffers,* ***but does not use default PACFISH no activity buffers (PACFISH 1995)****."* Unfortunately, over the past 10 years, the Forest Service has carried out coordinated regional efforts to test the limits of PACFISH/INFISH loopholes, and to increase logging within RHCAs. Region-wide commercial logging within RHCAs was not the letter nor intent of the Forest Plan as amended under PACFISH/INFISH.

We also note that while the Austin DEIS acknowledges that logging and roads were primary drivers that created the altered conditions we see today, including the stream temperature impairments that the DEIS caused by altered hydrologic processes (not just or even primarily by shade) in these streams—the Austin DEIS then goes on to propose more of the same sorts of activities that got us into this mess in the first place.

Indeed, the DEIS acknowledges that historically, harmful timber practices sometimes included removing large trees from riparian areas—but then proposes to revive these same practices in the Austin sale.

The DEIS (pg. 56) states that large trees could be logged throughout most sale units—including in riparian areas (emphasis added): *"Proposed treatments that would allow removal of large grand and Douglas-fir include seed tree regeneration harvest; upland restoration commercial thinning within dry upland forest ponderosa pine and mixed conifer units****; commercial removal from aspen stands****, mountain mahogany units,* ***riparian meadow restoration units, and outer riparian habitat conservation areas in stream and floodplain restoration units.****"* (The DEIS notes (pg. 15) that: "*Commercial thinning in aspen would occur only in outer riparian habitat conservation areas."*)

In addition, large trees ≥21" dbh would be removed from 308 acres in the "Commercial Byproduct Removal" category. The DEIS states (pg. 18): *"Commercial Byproduct Removal: Up to approximately 308 acres of commercial byproduct removal are proposed and would include removal of grand and Douglas-fir trees 21 inches or larger diameter at breast height. Commercial removal would only be completed in the outer zone of riparian habitat conservation areas (see Table 2 for definition of inner and outer zones) and when material exceeds that needed for restoration activities."*

Combined, commercial logging of large trees within RHCAs—apparently with no upper diameter limit-- would occur on over approximately 1,000 acres of riparian forest. (From the DEIS: Aspen "restoration" 82 acres; Riparian meadow "restoration" 339 acres; Stream and floodplain "restoration" 653 acres; Commercial byproduct 308 acres).

In addition, large-scale noncommercial logging would take place. From the DEIS Pg. 90:

> *"Proposed Action: Activities associated with upland vegetation management are proposed to extend into riparian habitat conservation areas.* ***Approximately 45 percent***

> ***of riparian habitat conservation area acres in Austin planning area would be noncommercially thinned through stream and floodplain treatment, riparian meadow treatments, and hazardous fuels treatment of strategic roads****. Strategic road treatments would not occur within 100 feet of stream channels.*
>
> *Stream and floodplain treatments would noncommercially thin approximately 2,450 acres* ***(26.2 percent)*** *of riparian habitat conservation areas in the planning area. These activities would occur adjacent to Middle Columbia River steelhead critical habitat for approximately 5.2 miles on Summit Creek, 1.5 miles on Idaho Creek, 7 miles on Dry Fork Clear Creek, and 2.5 miles on Crawford Creek. Noncommercial material would not be removed and would primarily be used for aquatic restoration activities. These treatments would occur within riparian habitat conservation areas over 24.5 stream miles* ***(16 miles in category 1 riparian habitat conservation areas, 2.5 miles in category 2, and 6 miles in category 4).***
>
> *Approximately 224 acres (4.7 percent) of riparian habitat conservation area acres in Austin planning area would be noncommercially or commercially thinned for riparian meadow restoration treatments. Riparian meadow restoration would occur along 5 miles of category 1 riparian habitat conservation area on Crawford, Summit, North Fork Summit, and Wiwaanaytt Creeks. Crawford and Summit Creeks represent the largest proportion of that distance with treatments primarily occurring within lodgepole-encroached headwater meadows and lower elevation meadows with incised channels. Approximately 47 acres over 0.5 stream mile would occur within category 2 riparian habitat conservation areas and approximately 167 acres over 1 mile would occur within category 4 riparian habitat conservation areas (See Austin Appendix B – Maps, Maps 11, 12, 15, and 16)."*

Such heavy logging within RHCAs, including logging of large trees, logging across hundreds in RHCAs, and intensive silvicultural prescriptions that include openings adjacent to streams—such practices are on par with past logging practices that caused the degradation of riparian forests, streams, and water quality that we are still dealing with today.

In addition, there will be a loss of large trees across approximately 2,500 acres for "stream and floodplain restoration". Can any of the large trees cut down in the stream and riparian floodplain restoration be removed off site and/or sold under any circumstances? The DEIS (pg. 90) notes that *"Approximately 45 percent of riparian habitat conservation area acres in Austin planning area would be noncommercially thinned through stream and floodplain treatment, riparian meadow treatments, and hazardous fuels treatment of strategic roads."*

The scale of commercial and noncommercial logging, as well as road-related haul, skidding, maintenance, building, and reconstruction are likely to increase stream temperatures and excess fine sediments, as well as further alter watershed hydrology and degrade stream habitats.

The DEIS acknowledges (pg. 11) that *"Roads may accelerate delivery of overland flow to valley floors, maintaining overly widened or straightened stream channels or contributing to ongoing* *erosion. Roads in riparian areas reduce productive area for growing trees for large wood recruitment to the stream channel. In some locations, they may reduce potential stream shade."*

Despite the well-recognized negative impacts to watershed hydrology, increased erosion and sedimentation, decreased large wood recruitment, and loss of shade that are all associated with roads-- the Forest Service is proposing to hundreds of miles of haul, maintenance, and construction or reconstruction of roads. In order to implement logging in the Austin sale, the DEIS proposes 574 miles of haul, maintenance, and reconstruction as well as 43 miles of "temporary" road construction. The sale, if implemented as proposed, would also include 7 locations for skidding logs across streams. The DEIS (pg. 21) specifies: *"Category 4 Stream Crossing: We propose to skid logs from upland units across intermittent streams in 7 locations to reduce the need for temporary roads. Considerations for site-specific skidding locations across intermittent streams include proximity to category 1 streams, channel type, channel and riparian function, floodplain function, soil type, and timing of operations."*

*We note that regarding roads in RHCAs, the Malheur Forest Plan (*pg. IV-67) directs the agency to: *"Leave stream channels of Class I to IV streams undisturbed by roads, except for crossings. Minimize adverse impacts to water and fisheries resources when designing necessary crossings."*

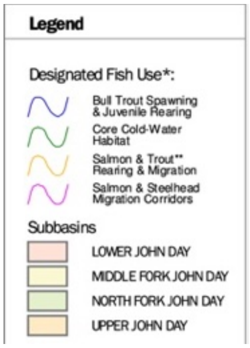
The primary drivers of stream impairments in the project area are logging, roads, livestock grazing, and the absence of beaver—not HRV or the presence of native conifers such as Grand fir and Douglas fir. Rather than addressing the primary drivers of stream temperature impairments, the Forest Service is instead proposing to log within RHCAs and to conduct upland logging at a massive scale. The DEIS also proposes to log large trees within RHCAs as well as throughout uplands, and to build more roads—including roads and skid trails within RHCAs.

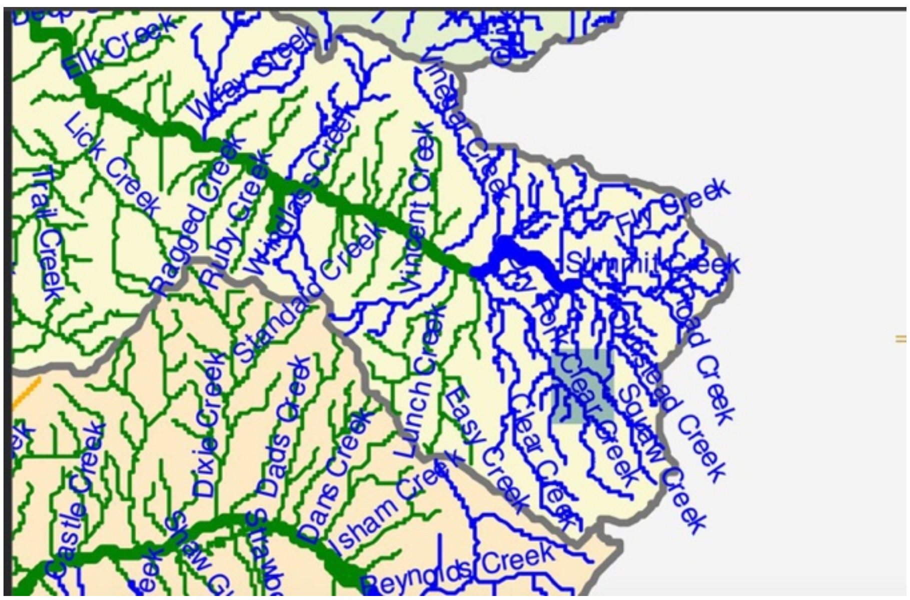
The USFS has a legal responsibility to restore streams in order to attain water quality standards, including those for stream temperature and sediment. The agency also has a legal responsibility under PACFISH/INFISH to ensure that streams are meeting RMOs, and that the agency's actions do not retard attainment of RMOs.

The Austin DEIS states on pg. 102 (emphasis added): "Effects to stream shade from winter shading treatments **may result in a short-term decrease in stream shade** on patches of Bridge Creek due to tree removal **between 25 and 50 feet from the stream as part of commercial byproduct removal.** Survey data indicates primary shade is from alder adjacent to the stream and conifers from northern hillsides. **The 25-foot buffer which provides primary shade in these reaches of Bridge Creek would remain intact along the north- facing slope. The 7-day average daily maximum for water temperature within this area is 18 degrees Celsius based on 2020 temperature data.** Due to steep topography, the 25-foot buffer, shade from existing riparian hardwood community, and untreated areas, **this loss of shade is not expected to measurably cause stream temperatures to increase."**

We note that, according to the DEIS, the 7-day average daily maximum temperature standard for the streams within the Austin project area is 12 degrees Celsius—and so 18 degrees Celsius far exceeds the Clean Water Act standard for these streams. If stream temperatures are as high as 18 degrees Celsius, then they are not meeting stream temperature standards. Stream temperature standards apply even, and especially, during the peak of summer.

From ODEQ:





How does the FS credibly assert that removal of conifers that provide shade will not increase stream temperatures? We are very concerned about the loss of shade for streams in RHCAs. In particular, it does not seem that the DEIS provides a reasoned, evidence-based explanation for why the removal os shade will not increase stream temperatures. The Forest Service’s assertion that stream temperatures will not increase as a result of logging within RHCAs is not a sound or reasonable assertion, has no evidence or rationale, and is arbitrary and capricious.

We also note, for example, that in other TMDLs in the Blue Mountains region, such as the Walla Walla River Temperature TMDL for Washington, the TMDL suggests that removing trees within 75 to 140 feet from streams can affect stream shade (Walla Walla River TMDL 2007, pg. 16). The TMDL states, in the summary paragraph on assessing the differing ranges of widths of buffers important to stream shade: *"Steinblums et al. (1984) concluded that that shade could be delivered to forest streams from beyond 75 feet (22 m) and potentially out to 140 feet (43 m). In some site-specific cases, forest practices between 75 and 140 feet from the channel have the potential to reduce shade delivery by up to 25 percent of maximum."*

The Austin DEIS (pg. 100) also states: *"Shade reduction following creation of openings and variable density thinning in the primary shade zone is not expected to result in a measurable change in stream temperature. Shade in streamside openings is expected to be replaced as riparian hardwoods or other vegetation grows. Conifer vegetation would also be reduced within the wider riparian habitat conservation areas outside the primary shade zone either in openings or through variable density thinning. These reductions are **unlikely to affect shade or stream temperature because shade produced from areas farther than 50 feet from streams would not typically fall on streams**."*

We note that the above statement from the DEIS is in direct contradiction to the statement concerning scientific research on shade in the TMDL for the John Day River basin.

While we are very worried about the removal of shade along streams, we also note that shade-- while an important component of stream temperature moderation-- is not the only driver of stream temperatures. We note that alterations to channels, floodplains, and valley conditions and processes are also drivers of stream temperature, as admitted by the DEIS (pg. 97): *"Water temperature is elevated in most perennial streams for reasons related to altered channel, floodplain, and valley condition and processes; encroachment by non-riparian plant species, primarily conifer trees; diminished shade resulting from past management activities implemented before development and application of Watershed Best Management Practices; and climate change."*

The Forest Service has not provided any evidence to suggest that logging and associated actions in adjacent to Bridge Creek, or any of the other thousands of acres along creeks throughout the project area, will not result in a 0.5 degrees C or greater increase in stream temperatures (which is the maximum amount allowable for stream temps increases for 303d streams).

We note that most streams for which the FS has data are currently in violation of stream temperature standards, as shown the DEIS—despite the FS's assertion that "*Water quality in headwater streams in the planning area is generally good*". The DEIS asserts (pg. 8): "*Water quality in headwater streams in the planning area is generally good."* The DEIS goes on to acknowledge: *"However, streams in the planning area are listed as impaired under the Clean Water Act for temperature. Temperature data indicate that streams in the planning area do not meet temperature requirements for bull trout or Middle Columbia River steelhead during summer months."*

The public should be provided with baseline temperature data for the streams in the project area. At the very least, stream temperature data summaries should have been provided in the EIS for the public to review. Has the Forest Service shared all of their stream temperature data with the

Oregon Department of Environmental Quality (ODEQ)? ODEQ has had at least two calls for data in recent years. On the ODEQ website, temperature data is lacking for several streams within the project area.

Further, stream shade is not an adequate or appropriate surrogate for stream temperature, and cannot reliably be used to ensure compliance with state water quality standards. Stream temperatures and shade are not well correlated in many-- often the majority-- of instances for which the Forest Service has provided stream temperature data as well as shade data along streams proposed for logging. In the few instances where the FS actually has comprehensive stream temperature and shade data and discloses it to the public, it is clear that in many or even most locations where stream shade standards are met, stream temperature standards are not.

In the Austin project area, Table 36 shows that while only 52% of streams are meeting stream shade RMOs, an even fewer number—27%-- are meeting stream temperature standards/RMOs. Stated another way, approximately half of streams meeting stream shade standards are also meeting stream temperatures standards. Stream shade as a surrogate for temperature has a 50% failure rate here.

It's clear from Table 36 that removing stream shade through logging and roading in the Austin sale will move shade in the wrong direction, and retard attainment of this RMO. Removing stream shade will also increase stream temperature, further retarding attainment for that RMO. It's also clear that large scale-logging in watersheds that are not meeting numerous RMOs will likely exacerbate cumulative effects on watershed hydrology and further impair stream habitats and water quality through numerous pathways. For example, stream temperatures will likely be negatively impacted by decreased base flows in summer due to logging. We also note that LWD placement in some streams will not cancel out the negative effects of large scale logging in uplands and RHCAs—and the FS hasn't honestly analyzed the negative effects to stream sediment or temperature anyway, and has not developed any sort of quantitative analysis to determine the magnitude of increase in stream temperatures and sediments, as well as to peak flows and altered watershed hydrology.

DEIS pg. 88:

Table 36. Percentage of surveyed stream miles in Austin planning area meeting riparian management objectives as outlined in PACFISH and Malheur Forest Plan Amendment 29 with Region 6 habitat survey data.

Riparian Management Objective (Habitat Indicator)	Surveyed Streams Meeting Objectives (Percent)
Bank Stability	99
Fine Sediment Embeddedness	37
Large Wood	27
Pool Frequency	11
Stream Shade	52
Temperature	27
Width-to-Depth Ratio	14

Given the large project areas and massive amounts of logging planned in the Austin sale, even small percentages can have measurable impacts. Also, since the USFS will be altering stream shade, there is no evidence to suggest that there would not be measurable increases to stream temperatures. The USFS's assertion is arbitrary and capricious.

While stream shade standards—or maintaining stream shade-- can create the illusion of temperature compliance, in reality stream temperatures were often excessively high and at levels recognized as limiting or lethal for ESA-listed and sensitive fish. While protecting stream shade is a very important component of protecting stream temperatures, it is not the whole story. Particularly if watersheds are suffering from ongoing forest degradation and altered hydrology from logging and roads—then simply protecting shade does not sufficiently protect stream water temperatures.

Of course, in the Austin sale, the FS is removing significant portions of stream shade—begging the question of what rationale the agency is using to claim that removing stream shade will not negatively impact stream temperatures in meaningful and measurable long-term ways.

In the Morgan Nesbit timber sale (Wallowa-Whitman NF), the Aquatics BE for that sale admits that shade is NOT a strong predictor of stream temperature: *"Studies on riparian thinning have found that thinning is sometimes correlated with increases in stream temperature, but responses are variable and* ***shade is only one factor influencing stream temperature.*** *Janisch et al. (2012) found that patch cuts in western Washington forest had smaller than expected, and* ***highly variable effects on temperature in intermittent streams despite reducing shade.*** *They found that other* ***<u>variables such as aspect, substrate size, and amount of surface flow had a greater impact on temperature</u>****."*

In addition to the evidence discussed above, one has only to look briefly at NEPA documents to understand that data on the percent of shade in a streamside corridor is a poor substitute for water temperature data. For example, in the Aquatics Report of the Camp Lick timber sale on the Malheur National Forest, in the 25 reaches for which both stream shade and temperature were reported in Camp Lick NEPA documents, the data show streams meeting stream shade standards but NOT meeting stream temperature standards in 13 out of 25 reaches. **That's a 52% failure rate regarding the accuracy of using stream shade as a surrogate for stream temperature**. Only one instance went the other direction—i.e., showed stream shade standards not being met, while the stream shade standard was met. **In the Big Mosquito timber sale in the Malheur National Forests, using stream shade as a surrogate for temperature would fail in one or more reaches in 80% of creeks for which data were collected (Big Mosquito Aquatics Report Table 1). In the Ragged Ruby timber sale NEPA documents (Ragged Ruby Final Aquatics Report Table 3) shows that using stream shade as a surrogate for temperature fails in one or more reaches in 42% of streams for which data were reported.** Five of the twelve streams met shade standards, while stream temperature did not meet standards.

Clearly, using stream shade as a proxy for stream temperature in these eastside forests is not appropriate. While we understand that stream shade is an important driver of water temperatures, it is not the primary or only one, especially in smaller streams. Many factors influence stream temperatures, as we've discussed and provided scientific references for in numerous portions of these comments.

Forest Plan standards and PACFISH/INFISH buffers were intended to uphold no-activity buffers, where logging was rare if allowed at all, and carried stringent requirements to not retard the attainment of RMOs and to only conduct restoration activities for the purpose of improving water quality and stream habitats. For almost 3 decades after PACFISH/INFISH was implemented, almost no logging of any kind was conducted within RHCAs across the region. The full PACFISH/INFISH buffers, without logging, were what was understood to be the Forest Plan at the time these TMDLs and WQRPs were put in place.

For example, the Morgan Nesbit Aquatics BE (pg. 32) states, in relation to similar plans to log within RHCAs in that sale: *"the Morgan Nesbit project restricts activity and has additional project design criteria within default PACFISH buffers,* ***but does not use default PACFISH no activity buffers (PACFISH 1995)****."* Unfortunately, over the past 10 years, the Forest Service has carried out coordinated regional efforts to test the limits of PACFISH/INFISH loopholes, and to increase logging within RHCAs. Region-wide commercial logging within RHCAs was not the letter nor intent of the Forest Plan as amended under PACFISH/INFISH. As such, the FS cannot now claim that logging within RHCAs is consistent with the Forest Plan or with the CWA.

Multiple lines of evidence from primary peer-reviewed literature suggests that logging, including riparian thinning and upslope logging, has negative effects on stream temperatures. For example, Guenther et al. (2012) found increases in bed temperatures and in stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the harvest area from 1.6 to 3 degrees Celsius. Pollock et al. 2009 found that stream temperature was more closely associated with degree of logging within catchments than with streamside vegetation. Small streams are particularly vulnerable to increases in temperature, even with limited selective logging. There is evidence to suggest that wider buffer widths may be necessary to protect stream temperatures, particularly in intermittent and headwater streams, and particularly when logging within 100' of streams. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging degrades the ability of these parameters to support cold water, and so is likely to increase stream temperatures.

Janisch et al. 2012 discusses the findings of their research and note: *"These analyses showed that the amount of canopy cover retained in the riparian buffer was not a strong explanatory variable…".* Furthermore, in some study sites in the Janisch et al. research, riparian buffers with ***more logging had a smaller magnitude of stream temperature increases compared to streams with less logging***. I.e., riparian zones with patch cuts had LESS stream temperature increase compared with riparian zones with continuous buffers (i.e., removal of less canopy cover). The point is that the results clearly indicate that stream shade was not correlated to stream temperature changes, and that the results were highly variable regardless of amount of riparian canopy cover. The FS seems to be willfully ignoring such research, in order to suggest that less shade removal in riparian zones will produce negligible increases on stream temperatures. While stream shade is important, it does not necessarily protect stream temperatures from the wideranging and complex dynamics of the negative impacts to stream temperatures associated with logging in RHCAs and uplands. Janisch et al. 2012 found statistically significant increases in stream temperature as a result of all logging treatments. The Janicsh et al. 2012 study found that: *"[s]tatistical analyses indicated that all treatments resulted in significant (α = 0.05) increases in stream temperature. In the first year after logging, daily maximum temperatures during July and August increased in clearcut catchments by an average of 1.5 °C (range 0.2 to 3.6 °C), in patch-buffered catchments by 0.6 °C (range −0.1 to 1.2 °C), and in continuously buffered catchments by 1.1 °C (range 0.0 to 2.8 °C)."* It is important to note that stream temperature increases were statistically significant for all treatments. Comparable increases in stream temperatures in the Austin sale area—even if they were to be substantially lower than many of those found in the Janicsh et al. 2012 study—would still result in measurable increases that would be detrimental to sensitive aquatic species such as Redband trout, Columbia spotted frogs, Rocky mountain tailed frog, and others, and would be in violation of state CWA regulations.

Many streams within the Austin sale area are vulnerable to temperature increases as a result of logging within RHCAs, based on parameters demonstrated in the Janisch et al. 2012 paper. These include stream substrates with relatively fine composition, longer surface-flowing extent, and the presence of stream-adjacent small wetlands (please see BMBP's survey sheets). Streams within the Austin sale include the parameters that the Janisch et al. 2012 study identified as correlated with increased stream temperatures in response to logging, including northerly aspects, relatively longer surface flow, adjacent wetlands, and fine substrates. The Janisch et al. 2012 study noted: "*cumulative surface area of small, stream-adjacent wetlands (0.93) and length of flowing surface water above our stream temperature monitoring stations (0.65). Additionally, stream sediment texture appeared important, with streams having coarse substrates being thermally unresponsive and streams having fine substrates being thermally responsive."*

Logging is likely to increase surface runoff and overland flow, potentially delivering warmer water (and excess sediments) into streams more quickly and with a greater volume. This, in turn, can also cause erosion and alter stream morphology, and potentially affect stream temperatures.

No commercial logging should occur within RHCAs, and any noncommercial logging should be drastically scaled back, and not include conversion of stand structure or dominant forest type. We note that the DEIS's description of logging within RHCAs obfuscates the extent to which logging will occur near streams. How far will logging equipment be reaching into the inner zone of RHCAs to log or fell trees? Understory thinning can also negatively affect stream temperature. How much will canopy cover be reduced across the inner and outer zones within RHCAs? See also our concerns about erosion and sediments in these comments.

Small streams are particularly vulnerable to increases in temperature, even with limited selective logging. There is evidence to suggest that ***wider*** buffer widths may be necessary to protect stream temperatures, particularly in intermittent and headwater streams, and particularly when logging within 100' of streams. Logging within RHCAs, removing shade, road-related impacts, and degrading hyporheic flow can increase stream temperatures in small intermittent streams. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging alters these parameters, and degrades the ability of these parameters to support cold water, and is likely to increase stream temperatures. (Caissie 2006; Davies and Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 201; Jones et al. 2006; Sweeney 2013; Pollock et al. 2009; Wigington et al. 2006; Poole et al. 2008; Poole and Berman 2001; Ebersole et al. 2015).

Also, logging within RHCAs or forest wetlands can magnify water quality and hydrology impacts from upland logging. (Hicks et al. 1991; Moore and Wondzell 2005). Janisch et al. (2011 and 2012) and Buttle et al. (2009) found that wetlands associated with headwater and low order streams are more common and influential on stream hydrology and water quality than previously realized. Many of the wetlands associated with first order streams are small and fall below the size requirements for protection in relation to timber sales. Janisch et al.(2012) found streams in headwater catchments with wetlands had larger and more consistent increases in temperature in relation to adjacent logging than did the catchments that did not contain wetlands. The authors found that in streams with wetlands present in their catchments tended to have streams with finer sediments in their substrates.

Even in situations where logging within RHCAs is limited to thinning of smaller diameter trees, logging may compromise the ability of the RHCA buffer to protect streams or ameliorate the negative impacts from upland logging, including increased stream temperatures and the delivery of sediment and nutrients into waterways.

Additional useful information regarding the Janisch et al. 2012 paper: *"....spatially intermittent streams with short surface-flowing extent above the monitoring station and usually characterized by coarse-textured streambed sediment tended to be thermally unresponsive. In contrast, streams with longer surface-flowing extent above the monitoring station and streams with substantial stream-adjacent wetlands, both of which were usually characterized by fine-textured streambed sediment, were thermally responsive."*

The Washington Department of Ecology provides a concise and informative summary of the Janisch et al. 2012 research (https://apps.ecology.wa.gov/publications/SummaryPages/1203020.html):

> *"During approximately the past 50 years, stream temperature response to logging practices has been frequently studied. These studies have suggested that the amount of shade from stream-adjacent forest, as well as other variables such as elevation and aspect, can influence stream temperature when the streamside forest is removed by logging or otherwise disturbed.*
>
> *Results from these studies, however, have been variable, and the magnitude of stream temperature response has not always been predictable by the amount of stream-adjacent forest removed. Recent thought and research on this topic has thus tended to consider why, given similar logging treatments, some streams increase greatly in temperature after logging whereas temperatures of others increase only slightly, and why occasionally temperatures of yet other streams after logging have appeared to decline. Hyporheic flow and streambed sediment texture have been proposed as possible explanations.*
>
> *Recently, we observed that the temperature response of small forested headwater streams to logging were also highly variable. We further observed, however, that the degree of*

> *stream temperature response in the streams studied was strongly correlated with two landscape variables: cumulative surface area of small, stream-adjacent wetlands (0.93) and length of flowing surface water above our stream temperature monitoring stations (0.65). Additionally, stream sediment texture appeared important, with streams having coarse substrates being thermally unresponsive and streams having fine substrates being thermally responsive. Conversely, our measure of stream shade was not a strong predictor of stream thermal response.*
>
> *These results suggest that very small headwater streams may be fundamentally different than many larger streams because factors other than shade from the overstory tree canopy can have sufficient influence on stream energy budgets to strongly moderate stream temperatures even following complete removal of the overstory canopy. This raises the possibility that there are several types of very small headwater streams, some being thermally responsive and some not. Such a finding is potentially of importance to several fields of natural resource management. Confirming our observations, however, will take substantial additional work."*

Excess fine sediments:

The DEIS (pg. 105) admits there would be measurable and meaningful increases in excess fine sediment in streams. Given that streams in the project area are generally not meeting state water quality standards and Forest Plan RMOs for sediment, then increasing sediment would be in violation of PACFISH/INFISH and the CWA. Further, increasing fine sediments in streams is likely to further increase stream temperatures. The majority of streams in the project area are not meeting stream temperature standards or RMOs, and are 303d listed and need new TMDLs.

DEIS Pg. 105: *"Project design criteria would minimize sediment, **though short-term effects are anticipated to be negative and meaningfully measurable cumulatively with multiple activities using equipment proposed within riparian areas in proximity of stream channels. Effects of road actions were also found to be detrimental and meaningfully measurable for fine sediment and embeddedness in the short-term, and would be additive with reasonably foreseeable activities proposed within riparian habitat conservation areas."***

The DEIS acknowledges increases in sediment in streams such as Bridge Creek—but then dismisses these increases in the long term. However, research shows that such impacts—even short-term impacts—can have long-term negative impacts on at-risk aquatic species such as ESA-listed fish that they have difficulty recovering from (see citations in this document and scientific studies in our addendum). The DEIS failed to quantify how much sediment would be increased by, or offer evidence as to why the agency believes this wouldn't produce long-term negative impacts to stream habitats or fish.

DEIS (pg. 104): *"Slight increases in sediment and removal of trees from the wood recruitment zone in Bridge Creek are likely to result in cumulative adverse effects for fine sediment and embeddedness in the short term when combined with reasonably foreseeable aquatic restoration actions that would also have short- term negative effects on sediment. However, reasonably foreseeable aquatic actions combined with Austin proposed watershed and fisheries restoration* *would cumulatively result in a long-term decrease in total sediment production. Effects of foreseeable aquatic restoration on the remaining primary habitat indicators were either neutral or not meaningfully measurable."*

Logging, including tethered logging, clearcut-style logging such as group select cuts and shelterwood logging, and logging on steep slopes-- all have the potential to increase erosion. Such logging is documented to have significant and negative effects to watershed hydrology, stream habitats, water quality, and imperiled aquatic species.

Another sale in the Blue Mountains—the the Morgan Nesbit sale in the WWNF, notes in its Aquatics BE (pg. 32) that "***The default PACFISH buffers of 300 ft are well established as sufficient to protect streams from any sedimentation impacts, but less in known about the effects of limited commercial thinning within 150 ft of streams."*** The Aquatics BE also states (pg. 13): *"Note that the Morgan Nesbit project restricts activity and has additional project design criteria within default PACFISH buffers,* ***but does not use default PACFISH no activity buffers (PACFISH 1995)****."*

Also in violation of PACFISH/INFISH standards, the Austin DEIS proposes commercial logging within RHCAs. If the agency is not adhering to PACFISH/INFISH buffer widths, and it acknowledges that they don't actually know if logging within 150 feet of streams will protect against increased fine sediment in streams from upland logging—then how can it then claim that the buffer widths it's adopting for this sale are in fact going to protect streams from upslope logging? How can it claim that streams are protected from sediments generated from upland logging by PACFISH buffers, yet also admit that it isn't adhering to PACFISH buffers?

The Forest Service is ignoring decades of scientific consensus, research, and expert opinion regarding riparian buffers, including their own. For example, the FS noted that: *"[r]esearch has shown that effective vegetated filter strips need to be at least 200 to 300 feet wide to effectively capture sediment mobilizing by overland flow from outside the riparian management area"* (Draft Blue Mountains Forest Plan Revision vol. 2 pg. 52).

Studies have found selective logging may be associated with increases of instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010). Upslope logging, particularly on steep slopes above streams, can increase fine sediment inputs into streams, contribute to stream temperature increases, cause increased variability in water quality and aquatic habitat parameters, and alter stream morphology and watershed hydrology. Additionally, logging on thin soils, ash soils, and rain-on-snow zones greatly increase the risk of soil damage, erosion, and excess fine sediments in streams. Zhang et al (2009) found long-term impacts to macroinvertebrate communities and streambed substrates. These impacts lasted for up to 40 years due to excess fine sediments associated with logging. Effects, such as changes to sediment loading and stream morphology, may not show up for many years after logging. (Beechie 2001; Beechie et al. 2005; Benda and Dunne 1997; Kelsey 1982; Madej and Ozaki 1996).

Roads outside (as well as inside) of RHCAs can also harm stream water quality. Road networks act as artificial stream channels, greatly increasing the magnitude and timing of peak flows and potentially carrying sediment into streams. Transport can occur through a variety of mechanisms, including roadside ditches, culverts, erosion, and gullies. Small and large landslides increase in frequency in association with roads, providing another mechanism by which fine sediments can be carried into streams—even if these roads and events occur outside of RHCAs.

Excess fine sediments generated by road related erosion or harvest related soil compaction may be carried farther across the landscape because of decreases in water infiltration or runoff rates over damaged soils, which in turn can cause an increase in the distance of overland flow transporting the sediments. Thus, the sediments generated by management activity can reach streams (Croke and Hairsine 2006, Nietch et al. 2005, Wemple et al. 2000). In addition, improper road drainage can cause gullies, landslides, and other erosional features, which in turn lead to sediment generation, increased runoff, and more direct and rapid transport of runoff and sediment to streams (Croke and Hairsine 2006, Wemple et al. 2000). Furthermore, the distance of travel required for sediments to enter streams may be shortened by the artificial extension of stream networks by roads and culverts (Croke and Hairsine 2006, Wemple et al. 1996). Increases in the efficiency of delivery of water and sediment to streams due to road networks and changes to soil infiltration and groundwater inputs can affect the timing, magnitude, duration, and frequency of sediment inputs. Roads increase peak flows by intercepting surface and subsurface flow, and diverting it into culverts and ditches that drain into streams (Wemple et al. 1996). Instream sediment dynamics such as timing and placement of fine sediment deposition, embeddedness, and scour are affected by stream power and flow regimes (Moore and Wondzell 2005, Wood and Armitage 1997).

Ashy soils typically hold more moisture than sandy or poor soils. As a result, they are often associated with mixed-conifer forests. Because RHCAs, steep slopes, and mixed-conifer forests on ashy soils are targeted for logging, and would be at risk of soil damage, compaction, and displacement, should this proposal be implemented. For example, in a recent Forest Service timber sale, the Upper Touchet sale on the Umatilla NF, the FEA (pg. 47) notes that the *"[e]ffects of ashy soil displacement and compaction by ground-based and cable activities on soil productivity is immediate and will persist on the landscape for up to 20 years or more (Giest, 1989)."* The Upper Touchet FEA also states: ***"Ashy soils have low bearing strength and are susceptible to increased soil displacement and compaction by logging activities. When non-mixed ashy soils are disturbed, erosion is greater due to fine particle size and lack of cohesiveness between ash particles."***

Large Woody Debris

We are very concerned that logging, especially within RHCAs, will negatively affect the availability of future large wood recruitment for LWD in streams. We are also concerned about effects on fish-bearing streams, as portions of LWD do come from upstream, and because logging is widespread on adjacent slopes. Wood recruitment and delivery is a crucial cornerstone of ecological integrity for streams, essential for the viability of many native and special-status aquatic species, and a driving force of recovery for stream morphology. Hyporheic flows and groundwater storage and movement depend in part on wood and future large wood recruitment, and are important for maintaining cold water in perennial streams. Groundwater movement and storage is interconnected with a number of complex watershed processes and forest components, and may be negatively impacted by soil compaction and other negative effects from logging.

We are also concerned about effects to pools from changes to watershed hydrology and increases in sedimentation. Aquatic ecosystems include complex and interdependent interactions. The loss of snags and downed wood along streams negatively affects stream morphology, including pools. The reduction of smaller wood for streams, as well as future recruitment for these components, is already occurring through logging in many timber sales across the landscape.

It is also important to highlight that small intermittent stream, as well as perennial streams, would also be negatively affected by logging and the loss of wood for streams, and that those effects are felt downstream. Small streams are crucial to maintaining cold water for downstream perennial waterways, and to creating and ensuring cold water refugia for fish. (Benda et al. 2005; Caissie 2006; Kaufmann and Faustin 2011)

For example, the Morgan Nesbit project (Wallowa-Whitman NF) notes in its Aquatics BE (pg. 49) that *"[p]ool habitat and LWD levels are likely lower than prior to the start of intensive timber harvest activities in the analysis area. While specific habitat data is not available for the project area, trends in changes in LWD and pool habitat in the Pacific Northwest and adjacent areas have likely occurred in the project area. McIntosh et al. (2000) and Quigley et al (1997) documented a general decline pool habitat since the 1930's.* ***Bilby and Ward (1991) found a significant decrease in LWD in managed streams compared to old-growth streams. Cover et al. (2008) documented increases in fine sediment in streams as the result of management activities in the Klamath Mountains of northern California. Timber harvesting activities (including riparian harvesting) and the development of the current road system are likely causative factors in the decline in LWD, pool habitat, and increases in fine sediment compared to the pre-settlement conditions."***

Given the information that logging and roading have historically caused declines in LWD and pool habitats, and increases to fine sediment—why is the Forest Service bent on repeating the mistakes of the past? There is ample scientific evidence that even more modern logging and roading practices on federal lands continue to be harmful to streams, water quality, and fish.

Watershed conditions:

Given the widespread stream temperature violations in the project area, the FS's proposal for widespread and intensive logging will further retard attainment of water quality standards and RMOs. The FS proposal includes including logging on steep slopes, logging on ash soils, and in sensitive areas such mature and old forests and RHCAs. Such areas are crucial for protecting water quality, and for aquatic and terrestrial wildlife and species diversity.

The USFS has ignored ample and well-documented evidence regarding the negative impacts logging and associated activities have on RMOs such as stream temperatures, fine sediments, LWD, pool frequency, and others, as well as peak and base flows, watershed hydrology, and other parameters. We are extremely concerned that the EIS downplays or ignores the likely negative impacts on streams, water quality, and watershed hydrology that are well-documented to be associated with roads and logging.

For example, in the Umatilla NF, the Tiger-Mill Scoping Notice of Proposed Action does a more transparent job of acknowledging the complex nature of these dynamics: *"Depending on the* *nature, extent and timing of disturbances, changes in vegetative structure can reduce rainfall interception, water infiltration, and evapotranspiration, which can increase the amount of surface runoff and streamflow, respectively, and can also alter the timing of that flow. Increases in runoff and streamflow can lead to a decrease in water quality from non-point source pollutants through increased nutrient and sediment loads because hillslope erosion transported into streams, as well as increased streambank and streambed scour."*

From the Upper Touchet Hydrology Report in the Umatilla NF: *"The relationship between created openings in forested landscapes and changes in water yield and peak flows has been documented by numerous studies. Changes in forested stand and canopy density caused by harvest, fire, or insect and disease can change the distribution of the snow pack, increase the rate of melt of the snow pack, and cause the timing of the melt to be earlier. These factors may lead to changes in peakflows. In addition, reduction of stocking density reduces the overall vegetative use of water, increasing the amount of water available for runoff. Changes in water yield and in peak flows have the potential to destabilize channels, causing increased erosion and sedimentation in channels. Changes in these parameters would be of concern for aquatic habitat and biota, downstream water users, and for channel morphology."*

The Mill Creek DEA in the Ochoco NF: *"Equivalent Harvest Area (EHA) Water yield is particularly affected by changes in the water budget, which includes changes to precipitation, evaporation, and transpiration from vegetation, infiltration, and runoff. Changes in water yield can influence bank erosion, stream temperatures, stream form, and habitat for fish. Resulting channel incision can reduce connection to floodplains and therefore reduce potential water retention across a valley section. EHA is an assessment required by the Ochoco National Forest Land and Resource Management Plan (Forest Plan) to determine the effects to peak flow from timber harvest activities and forest vegetative Mill Creek Dry Forest Restoration, Watershed and Fisheries Effects Analysis 3 conditions within a watershed. EHA is based on the principle that removing vegetation changes hydrologic response characteristics such as runoff, overland flow, peak flow, snow accumulation, timing, and total water yield. Excessive changes in these hydrologic response characteristics can lead to poor riparian conditions such as erosion, lateral scour, channel degradation, aggradation and/or incision resulting in poor water quality."*

BMPs are largely subjective and voluntary, and it cannot be assumed that they will be implemented to their fullest possible extent. The protective measures intended by BMPs may or may not be applied in most situations, and lack any strong mechanism of enforcement. There is no guarantee or enforcement mechanism to ensure that they will be properly applies.

Studies such as Jones & Grant (1996) found that watersheds with drier conditions and more intense summer droughts were more sensitive to the effects of logging and roads on increased peak flows. We postulate that this may apply to eastside streams. Hicks et al. (1991) found base flows increased for 8 to 9 years after clearcut logging because rainfall is not intercepted, evaporated, and transpired by trees. Instead, most rainfall becomes surface, subsurface, or groundwater flow once the trees are removed, and therefore contributes to base flow increases. However, the author found that base flow rates declined to lower than normal volumes in areas of hardwood riparian re-growth for the following 18 of 19 years in their study. In combination with climate change, unintended negative effects may have severe consequences.

The EIS fails to adequately analyze and avoid impacts to water quality and stream habitats from issues such as past logging and potential indirect, direct, and cumulative impacts from the Austin sale. These impacts are likely to be significant and to pose risks to water quality and aquatic habitats. Such direct, indirect, and cumulative impacts are likely to retard attainment of RMOs, including pool depth and width to depth ratios, and alter hydrology and stream morphology--which in turn can result in negative impacts to stream temperature, bank stability, and streambed erosion. The EIS fails to take the requisite 'hard look' at the indirect, direct, or cumulative effects of logging on stream water quality, hydrologic processes, or stream morphology.

The Austin DEIS admits that road within the project area, particularly within RHCAs and those interacting with streams, are leading to degradation of stream habitats and hydrology. From the DEIS: *"Many of the streams in this planning area have roads on one or both sides that focus flows within the stream channel, resulting in over-widening or channel incision. Wide and shallow streams are prone to increases in stream temperature due to high surface area to volume ratio and provide little habitat for fish, due to lack of depth. Perched culverts also lead to stream downcutting and incising, and undersized culverts further these impacts by concentrating and increasing flow; both occur within the planning area."*

The Austin timber sale proposes 574 miles of haul, maintenance, and reconstruction and 43 miles of "temporary" road construction. These are alarming numbers of road-crossings, road building, and log haul—particularly in an area crucial for supporting imperiled ESA-listed aquatic species. These stream crossings are likely already having negative impacts on water quality. Proposed road-related activities such as building and rebuilding of "temporary" roads, road maintenance, and log haul will greatly exacerbate negative impacts on stream sediments and temperatures, as well as alter hydrology including peak and base flows.

The DEIS admits: *"Existing roads and proposed road activities have the potential to affect riparian function; aquatic habitat for threatened Middle Columbia River steelhead and bull trout; and management indicator species directly and indirectly. Roads affect riparian function because more sediment is contributed to streams from roads and road maintenance than by any other land management activity. Roads in proximity of streams are known to alter large wood recruitment, constrict floodplains, and lead to incision of stream channels. These effects result in reduced pool frequency, altered width-to-depth ratios, increased streambank instability, and inhibited riparian hardwood vegetation and shade, thus negatively impacting water temperature and fish habitat quality. Roads within floodplains have potential to negatively affect off-channel habitat and floodplain connectivity that directly influence juvenile salmonid rearing productivity. In Austin Project, approximately 50 miles of National Forest System roads are in valley bottoms or immediately adjacent to toeslopes in proximity to the stream channel, affecting the ability of a stream to meander laterally through its floodplain.* ***Roads in Austin planning area that occur within 100 feet of streams or that cross streams impact fish and fish habitat more than roads located in the uplands.***

Road-stream crossings have impacted local stream channels and water quality. ***Some crossings were poorly designed with improperly sized culverts and misalignment relative to the natural stream channel. Other culverts have become fish passage barriers that limit distribution of fish. Stream crossings can provide direct input of sediment into streams, particularly on native***

surface roads that are improperly drained and create a "fire hose" effect amplifying stream energy. There are currently 124 stream crossings within Austin planning area; there are 22 native surface crossings within Middle Columbia River steelhead critical habitat in Austin planning area and 1within bull trout critical habitat."

Furthermore, the agency already has a road density problem in the project area. From the DEIS:

Table 50. HEI, cover, and open road density standard followed by conditions post-treatment by subwatersheds.

Subwatershed	Hec*	HEs*	Her*	HEI*	Percent S*	Percent M*	Percent Total Cover*	Open Road Density miles/mile2
Malheur Forest Plan Standard	0.3	0.3	0.4	0.4	12	5	20	3.
Bridge Creek	0.76	0.74	0.37	0.57	15.6	14.6	30.1	3.2
Clear Creek	0.83	0.73	0.41	0.59	19.3	9.9	29.2	2.74
Dry Fork	0.81	0.7	0.35	0.56	15.0	9.4	24.3	4.63
Mill Creek	0.77	0.7	0.51	0.61	13.2	11.4	24.6	1.74
Wiwaanaytt Creek	0.68	0.62	0.34	0.52	7.2	12.8	20.0	3.66
Summit Creek	0.8	0.66	0.49	0.6	18.8	12.9	31.7	1.98

*Header row: HEc: habitat effectiveness derived from the quality of cover; HEs: habitat effectiveness derived from the size and spacing of cover; HEr: habitat effectiveness derived from the density of roads open to vehicular traffic; HEI: overall habitat effectiveness index; percent S: satisfactory cover; percent M: marginal cover; percent total cover: percent satisfactory plus percent marginal cover. Note: in summer range, forage is not considered a limiting factor, therefore a forage value was not used in these calculations.

The agency should not be increasing road miles in any portion of the Forest—the Forest Service already manages over 90,000 miles of roads in Oregon and Washington. The agency admits it does not have an adequate budget to maintain these roads, and that they pose challenges for forest and stream health as well as human safety. (USFS Webpage: https://www.fs.usda.gov/detail/r6/landmanagement/?cid=fseprd485439]) The Forest Service clearly needs to stop building more roads, "temporary" or otherwise.

Felling of trees for "temporary" roads, skyline logging or cable-assisted corridors, and other similar actions may result in excessive and widespread logging of large trees (even if these trees are not officially "targeted" for logging). Allowing large trees to be sold in these circumstances incentivizes cutting them, and inappropriately sidesteps environmental analyses and public transparency. We have similar concerns about logging within fuel breaks and ember reduction zones. Will fuel breaks be treated similarly to roads or haul routes, and result in the felling of large trees in and adjacent to the fuel break?

BMBP's recent post-logging field surveys in Forests in Eastern Oregon, such as the Malheur NF, suggest that the felling of large and old trees in relation to hazard trees and clearing road beds, skid trails, haul corridors, etc. can be very extensive. The pictures below are of recent felling of large and mature or old Ponderosa pine trees, most of which were felled as "hazard" trees or for road, haul, skid trails, or cable corridors in the Big Mosquito and Camp Lick timber sales. Dozens of large mature and old Ponderosa pines were felled in the Big Mosquito sale. Logging in the Camp Lick sale has only just begun, and already BMBP found legacy Ponderosa pines felled as part of either "hazard" tree felling or "temporary" road and other road-related work. The FS confirmed that many of the trees depicted in the pictures below were sold at the mill.


Photo credit: Daniel Howland 2021; all other pics from BMBP
Big Mosquito sale (Malheur NF)


09/23/2021 14:22
Camp Lick sale in 2021 (Malheur NF)

Should the Austin sale move forward, what is the agency's estimate for the number of large trees that would be logged, felled as "hazards", or cut down in relation to roads or haul or transport corridors?

The Forest Service often builds or rebuilds "temporary" roads (that have impacts for decades or centuries on the landscape), as well as rebuilds "existing temporary roads" to access logging units. Roads that the agency terms "temporary" are not in reality "temporary". This is made evident by the repeated re-use of 'existing roadbeds' and the use of 'existing disturbance areas' for creating roads with each new timber sale. The Forest Service continues to repeatedly re-use these areas of permanent disturbance on the landscape as roads in current timber sales (and the USFS regularly uses these roads as reasons for disqualifying areas for IRAs or Potential Wilderness). Yet the USFS repeatedly claims that these roads won't actually continue to exist beyond each new timber sale's completion. These roads remain as scars on the landscape and show signs of erosion, compaction, or other impacts for years if not decades to come. "Temporary" roads which were not decommissioned or recontoured are ubiquitous on the landscape. They are also not well-documented or monitored, and they are often not included in road density calculations.

Road densities that exceed standards are a regular problem in watersheds and across eastside forests. Existing road density in many areas of the Malheur National Forest is well above the 2-miles/square mile NOAA (1996) threshold for watersheds to be considered "properly functioning". NOAA (1996) notes: properly functioning: 2 miles/sq mile; at risk 2-3 mi/sq mi; not properly functioning >3mi/sq mile. The widespread, chronic negative impacts to watersheds and streams caused by the bloated, unsustainable, and badly managed road network across public lands must be addressed by the agency.

Furthermore, the Malheur Forest has not yet completed Travel Planning as required by the 2005 Final Rule for Travel Management. The Malheur National Forest currently has existing road densities at levels that are recognized as threats to water quality, fish, and watershed health, and exceed Forest Plan standards for road density in many watersheds, including those designated for prioritizing the protection of water quality and fish. Wilderness and Roadless areas occupy a small percentage of National Forests in the Blue Mountains, and the excessive road density outside of these areas has serious and ongoing negative ecological consequences for the majority of watersheds on these forests. Wilderness areas, for example, occupy approximately 17.1 percent of the combined area of the Malheur and Wallowa Whitman National Forests, and only four percent of Oregon's total land area.

The bloated and sprawling road systems on National Forest lands, including the Malheur and Wallowa-Whitman National Forests, are fiscally burdensome as well as ecologically harmful. In discussing budget shortfalls, the Forest Service notes, for example, that on the Wallowa-Whitman National Forest, it would take approximately $64 million dollars to bring the entire road system back up to standard, and approximately $6.8 million dollars to keep it that way (US Forest Service (2015). Malheur National Forest Forest-Wide Travel Analysis. Pg. 28.)

Across Oregon and Washington, the USFS manages approximately 90,000 miles of roads. The agency notes that it is "a challenge to maintain all roads to proper safety and environmental standards to increased use, aging infrastructure, and decreasing budgets. Many roads, built between 1950 and 1990, have exceeded their designated lifespan and require costly repairs. Unmaintained roads and infrastructure can impact water quality and wildlife habitat, especially fish-bearing streams. Backlog maintenance projects top $1.2 billion, and funds available for road maintenance are only about 15% of what is needed to fully maintain the current road system." (US Forest Service. Webpage. Accessed at: https://www.fs.usda.gov/detail/r6/landmanagement/?cid=fseprd485439])

The Malheur NF has over 9,000 miles of existing roads(up from just over 8,000 miles of roads when the Forest Plan was implemented—road density has been increasing in the Malheur NF despite Forest Plan standards). One could drive from the northwestern tip of Washington state to the farthest northeastern tip of Maine, down to Miami, Florida, over to San Diego, California, and back up to the northwestern tip of Washington state, and still not have traveled as many road miles as are contained within the Wallowa-Whitman National Forests. The USFS notes that "of the 90,000 miles of Forest Service roads in Oregon and Washington, about 2/3 of those are currently open and maintained for both public and administrative uses." The USFS estimates that approximately 12% of the overall road network is "likely not needed", with many of these unneeded roads already being "closed or stored", and only about 20% or 2,000 miles being currently open to the public. (US Forest Service. Travel Analysis Report. Wallowa-Whitman National Forest. Table 3, page 19. Accessed online at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd486098.pdf)

What is the over-arching plan with road access for such repeated management for this and other projects on the Malheur National Forest? Does the Forest Service intend to maintain the bloated and expensive road network that exists, which the FS has admitted it does not have the funding to maintain or fix? And which the agency has admitted are causing detrimental impacts to fish and water quality, as well as negative impacts to species such as elk and other animals sensitive to roads?

We are concerned that repeated building and reopening roads will further increase human access to these and other timber sale areas, which in turn increases the risk of human-caused ignitions. In addition, we note that this study counters the common narrative that fires are going to 'pop out' of National Forests to affect nearby communities. Home hardening is the most effective strategy for keeping communities safe.

Forests are important for carbon storage and for carbon sinks—they store carbon in both the soils and the vegetation, and are important for mitigating the impacts of climate change. Harvesting wood "represents the majority of [carbon] losses from US forests...." (Harris et al., 2016). Additionally, (Achat et al., 2015) has estimated that intensive biomass harvests could constitute an important source of carbon transfer from forests to the atmosphere. Pacific Northwest forests hold live tree biomass equivalent or larger than tropical forests. (Law and Waring, 2015). "Alterations in forest management can contribute to increasing the land sink and decreasing emissions by keeping carbon in high biomass forests, extending harvest cycles, reforestation, and afforestation." (Law et al., 2018). The FS omits an honest carbon accounting of the carbon outputs of this project.

“Temporary” roads remain compacted and disturbed for many years if not decades, and contribute to erosion, sedimentation in streams, alterations to watershed hydrology, and forest fragmentation.

The agency already has a road density problem in the watersheds within the project area, and is already in violation of Forest Plan standards. Building more “temporary” and new roads will further exacerbate Forest Plan violations, and further degrade water quality, streams, and forest habitats for native and special-status species.

Also, while roads within RHCAs are more likely to cause detrimental impacts to streams and water quality, other roads, especially hydrologically connected roads, can also have significant and ongoing impacts. Also, mid-slope roads can greatly increase the rate of small landslides, erosion, and sediment delivery to streams (Montgomery et al. 2000).

The DEIS (pg. 94) goes on to state: “Approximately 2.1 miles of winter shading treatments are proposed on Bridge Creek ***within a category 1 riparian habitat conservation area and Middle Columbia River steelhead critical habitat. These units include tethered and tractor logging.*** Solar exposure modeling indicates a combination of topography and trees from north-facing slopes as well as trees between the stream and highway are creating shade on U.S. Highway 26. ***Commercial removal of byproduct no closer than 25 feet from Bridge Creek on north-facing slopes would occur on approximately 66 acres of category 1 riparian habitat conservation area and 35 acres of category 2 riparian habitat conservation area.*** Commercial byproduct removal would be variable due to topography (rock cliffs) and the Sumpter railroad grade which travels along the entire extent of Bridge Creek, resulting in patches that would remain untreated outside of the 25-foot stream buffer.

Large-scale commercial logging within RHCAs, as proposed in the Austin sale, is already likely to cause extensive and irreversible damage to streams, water quality, and watershed hydrology. Commercial logging within Category 1 fish-bearing perennial streams that support critical habitat for an ESA-listed imperiled species is inexcusable. Such logging is likely to severely degrade or destroy critical habitat for MCR steelhead, and to cause long-term negative impacts and downward population trends to MCR steelhead. Further, logging on steep slopes (tethered logging), logging so close to streams, and logging large trees—all within RHCAs-- will severely exacerbate the already dire negative impacts to streams and water quality. (Logging within “Commercial Removal of Byproduct” areas are those that, according to the DEIS, can remove large trees over 21” dbh, apparently with no diameter limit). Such logging within RHCAs will also retard attainment of RMOs for those streams, and will jeopardize MCR steelhead instead of furthering their recovery.

Also, in our recent field surveys in the nearby Big Mosquito timber sale (also in the Middle Fork of the John Day River basin), the sale units with tethered logging included logging of dozens of old growth trees and extensive clearing of non-target large and old trees. This was explained to us by Forest Service staff, and was justified as necessary for meeting safety OSHA standards for clearing cable corridors in the unit. Such logging practices are more compatible with industrial timber lands, and do not belong on public lands—particularly within RHCAs.

ESA-listed Threatened Bull trout and MCR steelhead, Redband trout, Western ridged mussels, California floater, Columbia spotted frogs, Pacific lamprey, and other aquatic species:

We are extremely concerned about the effects of the Austin project on the species in Table 33 (see below), particularly given the likely increases to stream temperature and sediment, and negative effects on stream habitats and watershed hydrology.

Table 33. Approximate miles of habitat for threatened and regionally sensitive aquatic species in Austin planning area.

Aquatic Species or Habitat	Miles of Habitat in the Planning Area
Middle Columbia River steelhead (critical habitat)*	49
Redband trout**	88
Columbia River bull trout (critical habitat)*	13
Western ridged mussel**	6
California floater**	6
Pacific lamprey**	1
Columbia spotted frog**	88

*Threatened
**Regionally Sensitive

We are also very concerned that the Forest Service has not consulted with NMFS/NOAA or USFWS concerning the effects of the Austin sale on ESA-listed aquatic species such as Bull trout and MCR steelhead.

In addition, the DEIS only mentions Bull trout briefly, and provides no quantification of potential effects to the species from admitted increases in stream temperature or sediment, and provides no estimate of likely take to this species. The same is true for other imperiled aquatic organisms in the project area, such as MCR steelhead.

The Forest Service also did not provide baseline population data or population trends for ESA-listed Threatened Bull trout and MCR steelhead, Redband trout, Western ridged mussels, California floater, Columbia spotted frogs, Pacific lamprey, or other aquatic species. The agency also failed to adequately consider the quality of baseline habitat conditions for these species, or quantify how much habitat would be impacted. The agency also did not quantify or adequately analyze the severity of the impacts to aquatic species, such as how many individuals may be affected by actions or how much "take" would occur from effects such as sedimentation from logging, roads, burning, and associated and activities.

We note that imperiled salmon and trout occupied a vastly greater number of streams than they currently do—largely because of habitat degradation and loss from actions such as logging. We note that logging and other "restoration" often results in long-term, not short-term effects, even when restoration was the goal. And we note that direct, indirect, and cumulative impacts have not been adequately considered. In reality, these large-scale and intensive logging plans are likely to cause long-term negative effects that result in downward trends and a loss of viability for these species. We also note that while the agency is using the vastness of the Forest to obfuscate serious and widespread impacts at the project scale—the agency also has failed to account for the many projects that are also negatively impacting these species and their habitats across the forest in the present, recent past, or reasonably foreseeable future.

Repeatedly, scientific research has shown that fish stocks are stronger and better distributed in areas of little or no management and low road densities, even in fire suppressed areas, and even if severe fires occur. Numerous studies have implicated roads as a primary factor in altering watershed hydrology and/or declines in fish stocks, and show that many benefits are gained by leaving forests unroaded and to their own ecological processes (including processes involving fire, insects, and disease). (Bader 2000; Bradley et al. 2002, Carnefix and Frissell 2009; DellaSala et al. 2011; Frissell and Carnefix 2007; Rieman and Clayton 1997, Rieman et al. 2000, Thurow et al. 2001; Public Lands Initiative/Trout Unlimited 2004 (Exhibit QQ); Western Native Trout Campaign 2001; Quigley and Arbelbide 1997).

The DEIS did not mention any "undeveloped" areas within the project area. Were these mapped or analyzed by the agency? Are there any roadless blocks, even small ones?

Carnefix and Frissell (2009) discussed impacts from roads, and show that significant negative impacts to sensitive aquatic species are present at road densities greater than one mile per square mile: *"Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold for road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) highly significant impacts (e.g., threats of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less. Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., 1 mile per square mile, lower if attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans' environmental impact, with limited exceptions, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species."*

We note that in other USFS projects, such as the USFS's Draft EA for the Mill Creek sale in the Ochoco NF, the FS admits that*: "Roads are a major source of erosion and stream sedimentation on forested lands. Roads can increase erosion rates and turbidity three orders of magnitude greater than the undisturbed forest condition (Megahan 1974). Sediment eroded from the road prism can be delivered to a forest stream, resulting in increased turbidity, sediment loads, and degraded habitat for fish. Research has shown that roads have the greatest effect on erosion relative to other forest management practices (Megahan and King 2004)."*

Aquatic ecosystems in the Blue Mountains evolved with and are adapted to wildfires, including high-severity wildfires. Such disturbances are integral to the structure, function, composition, and dynamics of stream ecosystems. While wildfire may have variable and complex effects on imperiled fish and their habitats, they also benefit from wildfire. For example, wildfire is crucial for the creation of stream structures and habitats for aquatic and riparian species, ensuring habitat complexity and biodiversity, and more. While wildfire can have detrimental impacts on aquatic species, these effects are shown by research to be short-term.

The Forest Service's proposed Forest Plan Revision (2014) vol 2. pg 60 admitted that Redband trout will recolonize a stream relatively rapidly after experiencing severe fire: *"Redband trout and bull trout have been shown to recolonize severely burned drainages within two years, provided the drainages were physically accessible (i.e., no culvert barriers, and provided that other fish in unburned areas were close enough to discover and move back into the recently burned habitat".*

Olson 2000, in her literature review for her master's thesis research on riparian forests in eastern Oregon noted: *"local extirpation of fishes is often patchy in the case of extensive high severity fires, and that recolonization is rapid."*

Similarly, the Forest Service study *Effects of Wildfire and Subsequent Hydrologic Events on Fish Distribution and Abundance in Tributaries of North Fork John Day River* by Howell (2006) looked at fish distribution after the Tower Fire in the Upper John Day Basin. Much of the Tower Fire burned at moderate to high severity. Howell's research found that fish populations, including steelhead and Chinook salmon, were highly resilient to wildfire and had rebounded to approximately pre-fire levels by four years.

Additionally, research by Rosenberg et al. 2012 *Fish Life Histories, Wildfire, and Resilience—A Case Study of Rainbow Trout in the Boise River, Idaho* found that rainbow trout are resilient to wildfire, except in very small and isolated habitats.

In the peer-reviewed study *Loss of riparian forests from wildfire led to increased stream temperatures in summer, yet salmonid fish persisted* by Warren et al. 2022, the authors investigated salmon abundance after moderate and severe wildfire in Western Oregon. Contrary to the authors' expectations, they found that fish abundances persisted and even increased by more than threefold in both of the study reaches.

In the Schwartz and Warren 2023 study *Wildfire in western Oregon increases stream temperatures, benthic biofilms, and juvenile coastal cutthroat trout size and densities with mixed effects on adult trout and coastal giant salamanders* the authors found mixed results—including increased biomass, density, length, and weight of juvenile cutthroat trout in post-fire areas.

On the other hand, potential negative effects to special status species due to logging and roading are well documented, particularly when conducted near riparian areas and when risks from climate change are considered. For example, the USFS's 2014 Draft Forest Plan Revision for the Blue Mountains (vol. 2 pg. 48) noted: *"Timber harvest can influence aquatic ecological condition via such activities as removal of trees in the riparian zone, removal of upslope trees, and associated understory or slash burning (Hicks et al. 1991). These activities can affect wood recruitment, stream temperatures, erosion potential, stream flow regime, and nutrient runoff, among others (Hicks et al. 1991). Effects of harvest are likely to be different at different scales. Hemstad and Newman (2006) found few effects of harvest at the site or reach scale, but found that harvest five to eight years earlier resulted in losses of habitat quality and species diversity at the scale of a stream segment (larger than a reach) or at the subwatershed level. Those losses were revealed in terms of increases in bank instability and fine sediment throughout the watershed and increased water temperatures and sediment problems throughout the channel* *segment. The cumulative effects of widespread harvest within a single drainage in a short period of time resulted in deterioration of the aquatic and riparian habitats, but evidence of effects lagged harvest by several years and different evidence of deterioration showed up at different spatial scales within the watershed".*

The negative effects of roads and stream sediments on stream integrity and aquatic habitats, as well as on imperiled fish such as Bull trout, Steelhead, and others are well recognized. For example, the Federal Registrar, Department of the Interior Fish and Wildlife Service 50 CFR part 17 (2010) Final Rule for Revised Designation of Critical Habitat for Bull Trout also recognizes the ecological threats posed by roads to fish and water quality: *"Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984, p. 6; Pratt 1992, p. 6). An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (Oncorhyncus clarkii bouvieri), westslope cutthroat trout (O. c. lewisi), and redband trout (O. mykiss spp.)) within the Columbia River basin, likely through a variety of factors associated with roads…."*

In addition, "treated" (logged) areas having a vanishingly small chance of encountering a wildfire during that 10-15 year window of time (Rhodes and Baker 2008). If the agency is planning on re-entering these areas every 15-20 years to repeat logging, then the agency also needs to be honest about the ecological cost of such plans. For example, road-related activities to access backcountry areas—what of the already out-of-control road system on the Forest? What of the effects to wildlife, and the fragmentation and edge effects? What of the ubiquitous high road densities and increased human access—allowing for more human fire-starts? What of the effects of repeated logging and roads on fish, water quality, and wildlife? Such "management" every ~15 years is impractical, expensive, ineffective, and would have catastrophic consequences for water quality, imperiled aquatic organisms—especially ESA-listed fish and aquatic species—as well as wildlife.

We want to note that the USFWS comments, from the CARA reading room:
"Data Submitted (UTC 11): 3/2/2026 11:13:09 PM First name: Carmen Last name: Leguizamon Organization: U.S. Fish and Wildlife Service Title: Fish and Wildlife Biologist Comments: The Service recommends incorporating additional Conservation Measures associated with water drafting. More specifically, we recommend avoidance of bull trout spawning habitat entirely to limit effects to spawning individuals or redds. If that is not determined to be feasible, recommend avoiding the spawning window (August 15 - October 15). If water drafting occurs within spawning habitat, recommend that Forest staff trained in resident bull trout redd identification conduct surveys of drafting sites prior to drafting to ensure no spawning individuals or redds are observed within the immediate area. Would any physical modifications related to drafting occur (such as digging of pools to accommodate a pump)? Surveys would have to be done at appropriate timeframes in advance of drafting to avoid disturbance of redds/eggs. If spawning is occurring nearby, recommend moving drafting location. While NMFS water drafting criteria should still be incorporated, these criteria do not encompass spawning specific standards or guidelines."

We share these concerns with the USFWS biologist, and find it deeply concerning that the USFS has not formally consulted with the regulatory agencies on this timber sale.

Van Pelt Guidelines:

How will the Forest Service age "young" Grand fir? The Van Pelt guidelines do not include guidelines for aging Grand fir. The guidelines explicitly state that they cannot be used to reliably age Grand fir. The DEIS also cites the Johnston and Lindsay 2022 paper as having methods for aging Grand fir. However, it is highly unclear how these very subjective and difficult to quantify methods will be put to use in the field with contractors.

The Forest Service does not have a practical, reliable, or objective method for aging Grand fir, and so does not have any way to ensure that old Grand fir (150 years or older) will not be felled/logged as a part of this sale.

It is disingenuous for the Forest Service to continually refer to trees 80-149 years old as 'young'. These trees were previously considered to be 'mature', which is an important distinction for as these trees have often begun to develop mature and old characteristics important for wildlife species.

Large and old trees:

The DEIS (pg. 57) admits that only 13% of the project area is comprised of Old Forest Multi-Strata, (OFMS) and that **over 85% of the project area is comprised of young forest.** The reason Old Forest Single Strata (OFSS) is below HRV is because young forests dominate the landscape far beyond historic norms—not because there is too much OFMS. Based on historic and recent logging practices, as well as on our field surveys and photos, most of these young forests are Ponderosa pine plantations that the Forest Service has "restored" to grow into OFSS.

Given that the FS is systematically converting forests to becoming Ponderosa pine dominant, and so assuming that these young forests are predominantly pine-dominated, then over 90% of the forests within the Austin sale are pine dominated, and will eventually grow into OFSS. None of the USFS timber sale NEPA documents we've reviewed have suggested that only 10% OFMS is the target HRV percentage for OFMS.

The USFS is not doing the math on the real problem—that widespread logging has created a huge and disproportional amount of young pine plantations. These plantations are what has replaced both OFSS and OFMS.

The small portion of OFMS remaining on the landscape within the project area should not be logged at all, for any reason—including conversion into OFSS.

Table 24. Existing number and proportion of acres of each structural stage within forested acres of Austin planning area.

Structure	Acres	Proportion of Planning Area (Percent)
Stand Initiation	1,650	2
Stem Exclusion	22,990	31
Understory Reinitiation	38,620	52
Old Forest Single-Stratum	4,060	5
Old Forest Multi-Strata	7,500	10

From the DEIS pg. 57: *Currently, young forest comprises approximately 85 percent of forested stands within Austin planning area. Although 85 percent is classified as young forest, large and old trees are still present in these structural stages below the 10 trees per acre threshold. Based on collected stand exam data, forested stands are estimated to contain an average of approximately 6 to 7 trees per acre larger than 21 inches diameter at breast height across the entire Austin planning area, and an average of approximately 4 trees per acre larger than 21 inches diameter at breast height in young forest stands.*

Table 25 shows that 3,720 acres of OFMS will be "treated", along with 1,700 acres of OFSS. While these figures are relatively small portions of the project area—that is only because the project area is so massive. Only a few years ago, a 3,720 acre project area would have been a standard size for an entire timber sale. Enormous project areas do not somehow make it more palatable to log thousands of acres of mature and old forests. Again, all commercial logging should be dropped within OFMS, OFSS, LOS, and all mixed-conifer forests as well as within RHCAs.

Table 25. Acres within each structural stage and proportion of treated acres where trees larger than 21 inches diameter at breast height would be commercially removed.

Structure	Acres	Proportion of Treated Acres (Percent)
Stand Initiation	60	0
Stem Exclusion	9,240	31
Understory Reinitiation	14,620	50
Old Forest Single-Stratum	1,700	6
Old Forest Multi-Strata	3,720	13

Notably, the DEIS (pg. 121) has a different acreage number for the FS's plans to log in OFMS: *"Approximately 4,360 acres of old forest multi-strata and approximately 660 acres of old forest single-stratum are proposed for commercial restoration treatment. Young grand fir and Douglas-fir 21 inches or larger diameter at breast height, as well as select individuals of other species up to 21 inches diameter at breast height, are proposed for removal."*

Are there OFMS or OFSS in RHCAs that will be logged? How many large trees will be logged in the project area overall? How many will be logged within RHCAs? How many will be felled, tipped, or girdled? Mature and old fir are providing crucial and rare habitat for terrestrial and aquatic species. Even if only one tree is felled per acre, on average, in commercial logging units across the project area, this still equates to over approximately 35,000 large trees. And this is almost certainly an extreme underestimate, as there are no sideboards for preventing more logging of large trees. Also the DEIS does not account for large and old trees cut down due to logging implementation—"temporary" road building, landings, skid trails, cable corridors, proximity to logging operations and roads, etc.

Notably, the original Eastside Screens EA included the protection of ***large*** and old trees as part its Purpose and Need. Mature large trees, and the wildlife habitat needs they provide, were explicitly included as part of the definition of what constitutes old and late seral structure. The Wildlife Standard in the original Screens EA states that ***"the definition of 'remnant old and late seral and/or structural live trees' has been clarified by adding ">21 inch dbh" to better define what is meant."*** Also, ***large*** trees were central to the habitat needs of Late and Old Forest-Associated species in the original Screens EA. The Screens EA states that the "Habitat Needs of Late and Old Forest-Associated species" for northern goshawk, pileated, white-headed, and three-toed woodpeckers and the pine marten" were part of the significant issues considered in the analysis; these species were identified as management indicator species for late and old forest habitats. Each of these species depends on the habitat provided by large trees. The original Screens EA further highlights the importance of *large* tree structure by noting that ***"Large*** down woody debris (logs) provide habitat for numerous species". The original Screens EA also emphasizes the need to protect "high levels of ***large*** snags" under the Wildlife Interim Standards. The agency's narrow focus on including only *old* forest structure without proper context fails to protect wildlife species that rely on large tree structure, which were both clear goals of the original Screens. Also, the 1990's Eastside Forests Ecosystem Health Assessment (EFEHA) team concluded that there was a "loss of large trees", and that the team "developed the Eastside Screens in part to keep existing ***large*** and old trees and manage national forests to promote an increase in the number of ***large*** and old trees" (emphases ours). The agency's failure to wildlife habitat and old forest components (including large tree structure) produces myopic and incorrect assumptions and interpretations regarding large tree, wildlife habitats, and other ecosystem components in the current EA.

The Eastside Forests Scientific Society Panel was convened in 1993, not long after the order by President Clinton for the Forest Service to "develop a scientifically sound and ecosystem-based strategy for management of eastside forests." The recommendations and science in *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. (1994) were a part of the science and developments that history that help inform the Eastside Screens. *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. 1994, included the following recommendation: "**Cut no trees of any species older than 150 years or with a diameter at breast height of 20 inches or greater**". The report goes on to say that:

> *"**These mature trees have lived for decades, even centuries;** their very existence demonstrates that they have the genetic characteristics to survive the full range of environmental variation present in eastern Oregon and Washington. Their complex structure, the product of a millennia of natural selection, offers unique niches for*

> *microbes, invertebrates, and vertebrates. They serve as reservoirs of genetic diversity and irreplaceable sources of seed for forest regeneration;* ***they renew the supply of large snags and fallen logs, which furnish nest and den sites for many animals; they provide nutrients to the soil****; and they stand as a unique historic record, an irreplaceable link between the past and the future. These trees are living examples of our long-term objectives" (emphases ours).*

Clearly, the authors recognized the importance of mature large trees of any species, including those that were 'mature' and 'decades' old. The authors highlighted the importance of ongoing future recruitment of large snags and logs, and the necessity of large wood structure and recruitment for providing ongoing sources of wildlife habitat. They highlight the need to protect large *and* old trees—it was not limited to only old trees—and reflected the need to protect processes and functions dependent on large trees well into the future.

Henjum et al. 1994 further discussed the key importance of large trees for wildlife species. For example (pg.176):

> *"[T]he pileated woodpecker (Dryocopus pileatus) relies on large snags for roosting, nesting, and foraging sites. Loss of large trees eliminates habitat for this species. Because the woodpecker builds cavities that are in turn used by many other species, species besides the woodpecker can also disappear from a site when snags are removed."*

The authors also discuss the importance of large trees for species such as bald eagles, Vaux's swifts, and bears (pgs. 184, 185, and 188). Furthermore, the authors recognized the importance of large Grand fir in providing key wildlife habitat:

> *"Pileated woodpeckers depend on large snags for nesting and roosting (Bull et al. 1992). Within eastside forests, pileated woodpeckers seem to be closely tied to old grand fir (Abies grandis) stands with trees in advanced decay caused by the Indian paint fungus (Echinodontium tinctorium) (Bull et al. 1992); Bull and Holthausen 1993), a keystone organism that softens core wood. The woodpeckers in turn provide other keystone services by excavating nesting and shelter cavities in infected core wood, and these are eventually used by many birds and mammals (Thomas et al. 1979a)" (pg. 185).*

Clearly, large Grand fir were recognized as important and as needing to be preserved in the literature and analyses that helped to form the Screens.

Henjum et al. 1994 highlights the importance of preserving large trees in relation to climate change--something that the Forest Service has generally failed to acknowledge some 26 years later: *"Loss of large trees alters patterns of gas exchange, especially for carbon dioxide, changing global climate patterns" (pg. 172).*

The deficit of large trees across the landscape due to past logging has been extensively well-documented, and as a result is a central focus for protection in the original Eastside Screens. The past and ongoing deficit of large trees has important implications for wildlife. Many species rely on large trees and snags habitat, particularly in riparian forests. Yet, the EIS altogether fails to incorporate the importance of mature OFMS forests and mature and large fir trees. The complex processes necessary for creating and maintaining mature forests and their habitats should also be incorporated into agency analyses and priorities for protection and restoration.

Bull et al. 1997 highlights the importance of large fir with cavities, as well as the importance and rarity of the multilayer stands that produce this habitat, notes:

> *"**In northeastern Oregon, grand fir and western larch make up most of the hollow trees used by wildlife.** Bull et al. 1997 goes on to note that "[l]arge, hollow trees are uncommon in managed landscapes and typically are found only in late- and old-seral stands of grand fir and western redcedar. Although isolated hollow trees in young stands have significant value to wildlife, these young stands cannot reproduce this type of structure for at least 150 to 200 years. **The late-seral, multilayer stands that produce hollow trees comprise less than 3 percent of the forested landscape in the interior Columbia River basin**."*

Importantly, approximately 75% of eastside terrestrial species depend upon riparian habitats for their life cycle needs or use these habitats more than others (Henjum et al. 1994). The EIS fails to acknowledge the key ecosystem functions of mixed-conifer forests dominated or co-dominated by Grand fir, and the need to protect fir forests for wildlife habitat. The EIS fails to adequately protect or consider the importance of multistory forests for wildlife species and their habitat needs.

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Quigley et al. 1996) includes summaries of their finding. The "Highlighted Findings" note that **there has been a 27 percent decline in multi-story old forest structures** (Chapter 8, Findings, pg. 181). Given the extensive portion of forests that have already been logged on the landscape, mature and old forests (and the trees, snags, and logs within them) often provide some of the last high-quality wildlife habitat and connectivity corridors in and adjacent to timber sale areas.

Young and mature fir are also needed for future recruitment of old and large fir. Bull et al. 1997 highlights the importance of large fir with cavities, as well as the importance and rarity of the multilayer stands that produce this habitat, notes: *"**In northeastern Oregon, grand fir and western larch make up most of the hollow trees used by wildlife.** Bull et al. 1997 goes on to note that "[l]arge, hollow trees are uncommon in managed landscapes and typically are found only in late- and old-seral stands of grand fir and western redcedar. Although isolated hollow trees in young stands have significant value to wildlife, these young stands cannot reproduce this type of structure for at least 150 to 200 years. **The late-seral, multilayer stands that produce hollow trees comprise less than 3 percent of the forested landscape in the interior Columbia River basin**."*

The Forest Service Region 6's Response to Blue Mountains Biodiversity Project's Freedom of Information Act request (2016-FS-R6-001106-F) included the "Eastside Screens Enclosure; Recent Science Findings and Practical Experience: Implications for the Eastside Screens September 2015". This Enclosure also recognizes the importance and rarity of large hollow firs. The Enclosure noted (emphases added):

> *"Implementation of the Screens has substantial species management implications. For example, the white-headed woodpecker, Lewis's woodpecker and several species of bats are Regional Forester's Sensitive Species that rely on large snags and defective trees for part of their life history.* ***Large, defective grand fir trees and snags provide critical roosting and denning habitat for black bears, Vaux's swifts, pileated woodpeckers, American marten, and bats*** *(Bull et al., 1997).* ***These legacy trees, especially large, hollow grand fir, are rare on the landscape and have declined from historical conditions on the eastside of Oregon and Washington".*** *The enclosure also states: "These findings reinforce the importance of retaining and recruiting large, old trees in dry, mesic and moist mixed conifer forests on the eastside of the Region. It is critical that silvicultural prescriptions provide for* ***large*** *snags and defective trees in adequate numbers through time….****large, hollow grand firs take 150 to 200 years to develop (Bull et al. 1997): adequate numbers of smaller trees need to be left to allow for the processes that create replacement hollow trees."***

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Quigley et al. 1996) includes summaries of their finding. The "Highlighted Findings" note that **there has been a 27 percent decline in multi-story old forest structures** (Chapter 8, Findings, pg. 181). Given the extensive portion of forests that have already been logged on the landscape, large trees and patches of mature and old forests (and the large trees, snags, and logs within them) often provide some of the last high-quality wildlife habitat and connectivity corridors in and adjacent to timber sale areas.

In recent years, numerous studies have raised alarms regarding habitat loss, climate change, and decline of fauna and biodiversity across the planet. Warnings have been sounded by scientists regarding the declining bird populations we are seeing, and the projections of far greater losses to come. For example, the Rosenberg et al. (2019) study *Decline of the North American Avifauna* reported a "staggering decline of bird populations, and found "wide-spread population declines of birds over the past half-century, resulting in the cumulative loss of billions of breeding individuals across a wide range of species and habitats. They show that declines are not restricted to rare and threatened species—those once considered common and wide-spread are also diminished. These results have major implications for ecosystem integrity, the conservation of wildlife more broadly, and policies associated with the protection of birds and native ecosystems on which they depend."

Given the urgent need to address the biodiversity and climate crises, which includes species and habitats in the Blue Mountains, the agency needs to focus on protecting wildlife, clean water, high-quality habitat, and ecosystem integrity.

Birds are an integral part of forested ecosystems on the Blue Mountains. Wildlife, including birds, are disproportionately reliant on riparian forests, and were not adequately considered in the EA. Numerous bird species rely on forest types or structural components, and face significant and continued threats to their viability due to ongoing logging large trees and mature and old forests. The EIS did not adequately analyze or avoid the negative effects to wildlife or birds that would occur under all action alternatives.

The following is a summary of birds in the Blue Mountains that are likely to be affected by proposed logging and associated actions in this sale. For additional detail and citation information, please see the detailed notes and spreadsheet that compliments this section. These documents include additional detail about BBS population trends, Langham et al. (2015) climate threat determinations, and habitat descriptions from Csuti et al (1997), Thomas et al. (1979), Miller (personal communication), and Marshall et al. (2006).

Birds that rely on large trees: The DEIS fails to consider many at-risk species that are negatively affected by the loss of large trees across the landscape, and will be affected by the USFS's failure to protect mature and old forests from logging. Bird species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction) include Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red crossbill; White crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Pileated woodpecker; Williamson's sapsucker; Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

Documented population declines & birds that rely on large trees: According to the Breeding Bird Survey (BBS), several of these birds that rely on large trees (listed above) are also facing declining populations across the Northern Rockies, the Great Basin Ecoregions, and/or Oregon or Washington state. Some of these also face declining populations across their entire survey range and the US. Birds that rely on large trees and also facing declining populations include: Bufflehead; Barrow's goldeneye; Common merganser; Wood duck; Vaux's swift; Lewis' woodpecker; Williamson's sapsucker; and Western screech owl.

Association with mature and old forests, mixed-conifer forests, and fir dominant or co-dominant forests & birds that rely on large trees: Many of the birds that rely on large trees are associated with mature forests, old growth forests, mixed-conifer forests, and/or Grand fir or Doug fir during a key portion of their life history. These include: Bufflehead; Barrow's goldeneye; Hooded merganser; Wood duck; Red crossbill; Brown creeper; Vaux's swift; Pileated woodpecker; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Great grey owl; Boreal owl; Long-eared owl; Flammulated owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications). All of these have either seen declining populations according to the BBS, and/or are considered climate endangered or climate threatened by Langham et al. (2015).

Birds that rely on large trees and are at risk from climate change: Climate change will affect bird populations, habitat availability, and ranges. In order to ensure the viability of native birds including waterfowl, raptors, neotropical songbirds and other migratory birds, the Forest Service must consider how climate change will impact these birds and the cumulative impacts with increased logging in mixed-conifer and mature and old growth forests.

Langham et al. 2015 *Conservation Status of North American Birds in the Face of Future Climate Change* identified 314 birds at risk of losing more than half of their current geographic ranges under climate change scenarios. In addition, 126 of these are not expected to see gains in their geographic ranges. The authors note: *"Our results demonstrate the need to include climate sensitivity into current conservation planning and to develop adaptive management strategies that accommodate shrinking and shifting geographic ranges. The persistence of many North American birds will depend on their ability to colonize climatically suitable areas outside of current ranges and management actions that target climate adaptation."* The authors also note: "*We suggest that the 126 species in this category be considered by conservation entities for immediate monitoring beyond existing programs such as BBS and CBC."*

Birds that rely on large trees (noted above) and are also considered climate threatened or climate endangered by Langham et al. (2015) include: Bufflehead; Barrow's goldeneye; Common merganser; Hooded merganser; Wood duck; Red Crossbill; White-winged crossbill; Brown creeper; Vaux's swift; American three-toed woodpecker; Black-backed woodpecker; Lewis' woodpecker; Williamson's sapsucker; Boreal owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; Osprey.

Birds that rely on mature and old forests, mixed-conifer forests, and Grand fir: Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir will be negatively affected by increased logging within these forest types. Logging within these forests may result in loss of key forest components such as multi-story canopies, shrubs, understory structure, unfragmented forests, needed cavities in trees and snags, snags, and logs. Logging of large trees, as well as increased size and intensity of logging projects, would result in forests becoming more younger, more homogenous and even aged, open, and drier. The FS's proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts on tree species composition and forest density across the landscape. As a direct result, available habitat, connectivity, and ranges (especially when climate change is considered) would be affected across the landscape by the FS's proposed changes.

Birds that rely on mature and old forests, mixed-conifer forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Harlequin duck; Red crossbill; White-winged crossbill; Brown creeper; Vaux's swift; Evening grosbeak; Pine grosbeak; Hermit thrush; Swainson's thrush; Varied thrush; Pine siskin; Cordilleran flycatcher; Golden-crowned kinglet; Ruby-crowned kinglet; Black-capped chickadee; Chestnut-backed chickadee; Mountain chickadee; MacGillivray's warbler; Townsend's warbler; Yellow-rumped warbler; Mountain bluebird; Calliope hummingbird; Rufous hummingbird; Red-breasted nuthatch; American three-toed woodpecker; Black-backed woodpecker; Downy woodpecker, Hairy woodpecker, Lewis' woodpecker; Pileated woodpecker, Williamson's sapsucker; American kestrel, Winter Wren, Western Tanager, Hammond's flycatcher, Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Northern saw-whet owl; Northern pygmy owl, Bald eagle; Golden eagle; Osprey; Merlin, Peregrine falcon, and Northern goshawk. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

In addition, most of the birds listed above are also facing current population declines in part of all of their range within the Blue Mountains (according to the BBS) or are considered climate threatened or climate endangered (Langham et al. 2015). The habitat requirements of birds imperiled by declining populations and/or climate change should have been considered and analyzed in the EA. The Forest Service cannot protect the viability of these species without analyzing the effects of this proposal on their habitats, ranges, connectivity, and needed forest components and structures.

The Forest Service should review and incorporate Dr. David Mildrexler's work, including peer-review published studies that map out and propose a reserve system for the Blue Mountains, as well as studies that highlight the ecological and climate importance of large trees, despite how rare they are on the landscape.

We are very concerned that the EIS refuses to analyze an alternative or avoid harm to the Humongous Fungus, and instead dismisses concerns by declaring that "it is unlikely that forest management (such as thinning or controlled burning) would have a significant effect on it". The FS makes this statement without evidence, and despite well-documented scientific research and understanding that the soil compaction and damage associated with logging and roads are likely to negatively affect fungi. Similarly, prescribed burning may burn soils—especially if fire burns hotter or becomes more widespread than intended—thereby harming fungi.

Also, prescribed fire is not the same as wildfire. Prescribed burns can and do cause ecologically important damage to crucial wildlife habitat, particularly if done in ecologically inappropriate areas such as fire and climate refugia. We are also concerned about the loss of snags and downed logs, and note that prescribed burns do not necessarily mimic the same dynamics as wildfire. In addition, timing of prescribed burns, such as those done in spring, potentially interrupts delicate life cycle rhythms of wildlife, such as egg laying and hatching and can harm insects, butterflies, nesting birds, and other species. and that prescribed fire can cause lasting, long-term negative reductions in snags, logs, and dead wood habitats (Arkle and Pilliod, 2010; Pilliod et al. 2006).

Another concern we have that much of the prescribed burning in the project area could be comprised of burning slash, including slash piles in RHCAs. Such burning can severely damage soils, and often supports some of the highest concentrations of invasive weeds on Forests. The USFS notes that prescribed fire units would include jackpot burning, and pile burning within RHCAs. Such burning often damages soils and fosters a concentration of invasive plants.

Given that riparian corridors are disproportionately relied upon by many species for connectivity, key habitat, thermal refugia and shade, and other parameters provided by these often denser, complex forests—what effect will repeated prescribed burning every 10 years have on the species that rely on riparian corridors for at least part of their life cycles?

Large severe fires are climate driven, and are expected to increase as a result of climate change. Fuels reduction activates have little to no impact on large, climate-driven fires. While logging and burning forests sometimes correlates to reduced fire severity or altered fire behavior— this is only true for fire events that are not weather and climate driven, and only for a very short period of time before these logged and burned areas start to grow back and "fuels reduction treatments" are no longer effective. Forests often grow back more densely and homogenously than before they were logged, creating an even more flammable situation. Heavy, industrial-scale logging increases fire risk.

There is a very short window of time that "treatments" will be effective, usually ~10-15 years. "Treated" (logged) areas having a vanishingly small chance of encountering a wildfire during that 10-15 year window of time (Rhodes and Baker 2008). However, the FS appears to be planning to repeatedly "manage" forests (i.e., logging, burning, and roading) on a 10-15 year cycle across the project area and perhaps across much of the region in numerous timber sales. Such "management" is impractical, expensive, ineffective, and would have catastrophic consequences for fish, wildlife, and water quality.

The FS fails to acknowledge that logging and "fuel reduction" does little to nothing to stop climate change related wildfires, which are overwhelmingly driven by drought, heat, and wind. Logging in the backcountry will not make communities safer—working near communities, home hardening, and emergency preparedness are far more effective in keeping people safe. Please see the research of Dr. Jack Cohen, a Forest Service researcher who has done decades of work on this topic.

Radeloff et al. 2023 found that most homes that burned in the US were destroyed by grass and shrub fire, not forest fire. This dynamic highlights the realities of climate-driven wildfire and lack of efficacy in logging to control fire behavior. Reporting from CNN about the study notes: "*Over the last three decades, the number of US homes destroyed by wildfire has more than doubled as fires burn bigger and badder,* a recent study found*. Most of those homes were burned not by forest fires, but by fires racing through grass and shrubs."… "The West is most at risk, the study found, where more than two-thirds of the homes burned over the last 30 years were located. Of those, nearly 80% were burned in grass and shrub fires."*

Further, most large fires in eastern Oregon in 2024 were grass fires.

We also want to note that recent research found that the majority of fire ignitions that cross jurisdictional boundaries start on private lands, not public, and that most fires are started by human activity. OSU Newsroom coverage discussed the Downing et al. 2022 study: *"The study area covered almost 141 million acres across 11 states and included 74 national forests"*… "*Of all ignitions that crossed jurisdictional boundaries, a little more than 60% originated on private property, and 28% ignited on national forests. Most of the fires started due to human activity."*

Thank you for your consideration of our comments,

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In Defense of Grand Fir

Why broadscale logging of large grand fir trees to protect old-growth ponderosa pine and western larch is not supported by the science.

Why grand fir trees need defense

In 2020, the Trump Administration and Forest Service rushed through a proposal to eliminate protections for big and old trees east of the Cascade Crest in Oregon and Washington.

Their justification? Large grand fir trees (*Abies grandis*) were threatening ponderosa pine (*Pinus ponderosa*) and western larch (*Larix occidentalis*) by competing for limited resources.

While the proposal to rollback large tree protections was halted following a federal judge's ruling that it violated three bedrock environmental laws, logging projects conducted by the USFS continue to target large grand fir for removal under the pretext of protecting large ponderosa pine and larch trees.

Why do grand fir trees matter?

Grand fir is a native tree to forested ecosystems east of the Cascade Crest in Oregon and Washington. Grand fir trees of all sizes play an important ecological role in mixed-conifer forests in the region, including by providing dense forest habitats many species depend upon (Thomas 1979; Bull et al. 1997).

Grand fir trees provide essential wildlife habitat

Grand fir trees are important to the biodiversity of many eastside forests, providing habitat for species such as American marten, Canada lynx, Rocky Mountain elk, flying squirrel, Vaux Swift, American Goshawk, Pacific tree frog and many others (Thomas 1979; Wisdom 2000).

In many eastside forests, grand fir and western larch comprise the majority of the hollow trees used by wildlife (Bull et al. 1997). The relatively soft wood of grand fir trees creates ideal wildlife habitat by providing natural hollows, cavities, and unusual growth forms that wildlife use for shelter, nesting, and foraging (Henjum 1994; Wisdom et al. 2000). "No artificial means to create or encourage the formation of a hollow tree structure has been found, so retaining such trees…is essential to providing habitat for the species that depend on them" (Bull et al. 1997).

Grand fir trees are key to mitigating climate change

Large diameter trees (≥21 inches) including grand fir account for just 3% of all trees, but hold 42% of total aboveground carbon on six national forests in eastern Oregon and Washington (Mildrexler et al. 2020). Retaining these trees throughout their lifecycle allows for long-term carbon storage with an eventual slow release through decomposition.

In Defense of Grand Fir

Grand fir trees are naturally resistant to fire

The thick bark and height of large and old grand fir trees provide natural resistance to fire. In a grand fir forest, wildfire severity is relatively low and second only to ponderosa pine forests in fire resistant traits (Moris et al. 2022).

The canopy of grand fir trees offer several additional benefits: canopy trees help create cool, moist conditions that help moderate fire behavior (Hakkenberg et al. 2024); the canopy shade helps suppress growth of hazardous surface and ladder fuels (Zhou et al. 2013); and the canopy helps reduce penetration of warm dry air into the forest that can increase evaporative demand and increase the drought stress that trees are exposed to (Jarecke et al. 2023; Watts et al. 2024).

Grand fir trees provide critical large tree structure

The geographic extent and number of large trees (≥21 inches) across six national forests in eastern Oregon and Washington shrank dramatically over the last century (Bolsinger and Gerger 1975; Cowlin et al. 1942; Henjum 1994; Merschel et al 2014). A Forest Service Bulletin from 1975 found that between the mid-1950s and 1975, there was a 44% reduction in the acreage of trees ≥21 inch DBH (Bolsinger and Gerger 1975).

Today, large grand fir represent only 2% of the total grand fir population but 19% of all trees ≥21 inches dbh among five dominant species, providing much needed large tree structure in forests east of the Cascade Crest in Oregon and Washington (Mildrexler et al. 2020; Mildrexler et al. 2023).

Grand fir trees are not a “threat” to old growth ponderosa pine

Ponderosa pines are the most common species of large trees found on all national forests in central and eastern Oregon and infrequently co-mingle with large grand fir. Further, researchers noted large ponderosa pine and grand fir were found together on only 8% of over 3,300 plots; large western larch and grand fir were found together on only 4% of all plots (Mildrexler et al. 2023). Sweeping regulatory changes are not needed to address this relatively infrequent occurrence.

Conclusion

Grand fir trees are a native species on all national forests east of the Cascade Mountains in Oregon and Washington and play an outsized ecological role in providing important wildlife habitat in a landscape experiencing a significant deficit of large trees. Further, large grand fir trees are relatively fire resistant and resilient, play an essential role in regulating climate extremes, and seldom intermix with large ponderosa pine and larch trees in Oregon and Washington.

For these reasons, Forest Service plans for large-scale removal of large grand fir trees is not supported by science or logic.

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LOGGING IS A FALSE SOLUTION TO WILDFIRE AND COMMUNITY SAFETY

Logging in the backcountry will not make communities safer.
Working near communities, home hardening, and emergency preparedness are far more effective strategies for keeping homes and communities safe (Calkin et al. 2023; Cohen 2000; Gibbons et al. 2012; Syphard et al. 2014).

The primary threat to homes is from grassfires, not forest fires.
Most homes that burned in the US in recent years were destroyed by grass and shrub fire, not by forest fires (Radeloff et al. 2023). This highlights the realities of climate-driven wildfire and lack of efficacy in logging to control fire behavior. Reporting from CNN about the study notes:"*Over the last three decades, the number of US homes destroyed by wildfire has more than doubled as fires burn bigger and badder, a recent study found. Most of those homes were burned not by forest fires, but by fires racing through grass and shrubs."… "The West is most at risk, the study found, where more than two-thirds of the homes burned over the last 30 years were located. Of those, nearly 80% were burned in grass and shrub fires."*

Most homes are burned by large, fast moving fires.
Fast-moving wildfires comprise less than 3% of all U.S. fire events– but they account for 89% of all structures damaged or destroyed. Fires move fastest in ecosystems that have low wind friction due to sparse or absent tree cover, which is associated with a dominance of grasses. Firefighters quickly become overwhelmed by fast-moving fires (Balch et al. 2024).

Large, fast-moving wildfires are primarily driven by climate.
Large, fast moving fires are primarily driven by drought, heat, and wind– **not** by "fuels". In addition, climate change is increasing the frequency and severity of wildfires, as well as the amount of area burned. (Abatzoglou & Koldon 2013; Abatzoglou & Williams 2016; Abatzoglou et al 2021; Balch et al. 2024; Jain et al. 2022; Keeley & Syphard 2019; Keyser & Westerling 2017; Kirchmeyer-Young et al. 2019; Littell et al. 2009; Miller et al. 2012).

The majority of fire ignitions that cross jurisdictional boundaries start on private lands, not public lands.
The Oregon State University Newsroom discussed the Downing et al. 2022 study: *"The study area covered almost 141 million acres across 11 states and included 74 national forests"*… "*Of all ignitions that crossed jurisdictional boundaries, a little more than 60% originated on private property, and 28% ignited on national forests. Most of the fires started due to human activity."*

Most fires are started by human activity.
The Balch et al. 2017 study found that *"[h]uman-started wildfires accounted for 84% of all wildfires, tripled the length of the fire season, dominated an area seven times greater than that affected by lighting fires, and were responsible for nearly half of all area burned"*. Furthermore, increasing road access– which is an essential part of logging– will further put large swaths of forests at risk for the most common fire ignitions– human-caused fire starts.

Protecting forests from logging does not increase their fire risk.
Protected forests do not burn more severely or with greater frequency compared to logged forests (Bradley et al. 2016; Odion & Hanson 2008). In fact, logging may increase fire intensity and risk (Cruz et al. 2014; Evers et al. 2022; Zald and Dunn 2018). For example, logged forests become more susceptible to solar radiation, winds, and drying– thus becoming more flammable after logging in many situations (Achat et al. 2015; Countryman 1956; Leismeister et al. 2021; Platt et al. 2006; Summary of the Sierra Nevada Ecosystem Project Report 1996). Heavy, industrial logging results in homogenous forests can increase fire risk and burn more severely (Zald & Dunn. 2018). In addition, there is a very short window of time that "treatments" are ostensibly effective, usually ~10-15 years (Rhodes and Baker 2008). The authors found that "treated" (logged) areas have a vanishingly small chance of encountering a wildfire during that 10-15 year window of time.

Logging increases carbon emissions compared to unlogged forests, and compared to wildfire.
Forests store vast amounts of carbon, and are a key part of the climate solution if they are left unlogged. Pacific Northwest forests alone hold live tree biomass equivalent or larger than tropical forests (Law and Waring, 2015). Conversely, logging is a major source of carbon emissions (Hudiburg et al. 2018, Law et al. 2018), greater by far than CO2 emissions from wildfires (Bartowitz et al. 2022), and represents the majority of emissions from US forests (Harris et al, 2016; Campbell et al. 2011). Logging is the largest source of carbon emissions in Oregon (Law and Harmon 2018). Additionally, intensive biomass logging– which is becoming increasingly widespread in the US with industry plans for expansion– could constitute an important source of carbon transfer from forests to the atmosphere (Achat et al. 2015). Increasing emissions intensifies climate change, and further exacerbates wildfires and the negative effects of climate change to ecosystems.

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HISTORICAL DOCUMENTS: A SUMMARY OF FOREST DENSITY AND SPECIES COMPOSITION

The following are the primary summary points gleaned from review of historical documents dated from the early to mid 1900s. The forest conditions described in these historical documents, such as generally dense forests and abundant representation of fir trees in the pictures, are conditions that run contrary to the EA's assumptions used to justify logging of large firs.

The following are the main summary points gleaned from research BMBP did on historic documents dated from the early to mid 1900s. The forest conditions described in these historical documents, such as generally dense forests and abundant representation of fir trees in the pictures, are conditions that run contrary to USFS assumptions used to justify logging. All photographs are from *Mosgrove, J. 1980. The Malheur National Forest An Ethnographic History. USDA Forest Service*. Note the generally dense forests and abundant representation of fir trees in the pictures. The documents we examined focused on the Malheur National Forest, though similarities with these issues exist in other parts of the Blue Mountains as well.

*** Clumps of higher density forests are natural and documented in early historical accounts —even within Ponderosa pine forests.**

*** Grand fir and other non-Ponderosa pine species were historically well-represented on the landscape. Historical accounts of mixed conifer stands include descriptions of fir being the most abundant and dominant species in those forest types; Douglas fir and smaller percentages of Western larch were also described. Early seral species were not the dominant or most abundant components of these stands in the majority of historical accounts. Mixed conifer forests comprised large percentages of the forested landscapes in Eastern Oregon. In some watersheds, close to half of the forests were mixed conifer stands. Percentages vary according to historical documents and geographic area.**

*** Ponderosa pine forests also contained a substantial percentage of other tree species, including Grand fir. Pure Ponderosa pine stands were rare.**

*** Grand fir was targeted for removal as per regional direction to foresters working on National Forests. Current estimates of Grand fir density and volume may be erroneously based on anecdotal observations that occurred after substantial proportions of fir were already removed across the landscape.**

*** Extensive overgrazing during the turn of the century may have created artificially open forest stands in some areas.**

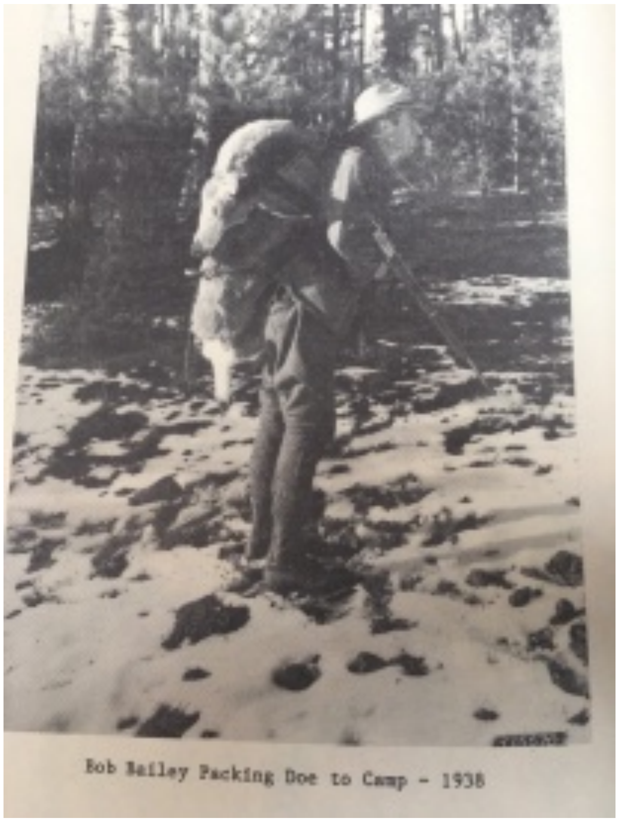
Reseeding Project on Big Cow Creek Burn - 1939

"Reseeding Project on Big Cow Creek Burn 1939"

C. J. Bingham and L. E. Lucas (with pipe) and Families on Huckleberrying Expedition 13 June 1908

"C.J. Bingham and L. H. Lucas (with pipe) and families on Heckleberrying Expedition 13 June 1908" (note high density forest in background)

NOTE: In historical documents from the early to mid 1900s, the common name "White fir" generally refers to Grand fir, but may also include other Abies species. "Western yellow pine" or "yellow pine" refers to Ponderosa pine. (Bright, 1912, Miles 1911, Munger 1912). From Miles (1911), noting common names of specific tree species at the time: "Pinus monticola Western white pine; Pinus albicaulis White-bark pine; Pinus ponderosa Western yellow pine, Bull pine; Pinus contorta Lodgepole pine, Black pine; Larix occidentalis Western larch, Tamarack; Picea engelmanni Engelmann spruce; Abies lasiocarpa White fir; Abies grandis White fir; Abies concolor White fir (?)"



"Bob Bailey Packing Doe to Camp – 1938"

Merritt (1910) Head Water Middle Fork of the John Day River discusses distinct forest type categories on pgs. 12-13. The "north slope type" is distinct from the "yellow pine type", and discussed separately. It also describes "north slope type" (mixed conifer) stands as being overwhelmingly comprised of fir and larch, with the most common tree being White fir (Abies). "North Slope Type.

The north slope type is so-called since it grows mainly upon north hillslopes where it is protected from the hot drying sun so that a **sufficient amount of soil moisture is retained to permit the growth of other species than yellow pine, usually to the exclusion of that tree. This type of forest also occurs upon moist stream bottoms and benches generally.** Larch, Douglas fir, lodgepole pine, and White fir are the usual species comprising this type. These are desirable in the order named. Larch is present in the greatest quantity as regards merchantable board feet, while **numerically and as regards the actual percent of the area occupied lodgepole pine and White fir are by far the most common.**

Survey Crew on the Malheur

Yellow pine is found as scattered trees in many situations where the exposure is such as to give the warming, drying effects of the sun a chance, or where drainage is especially good." "The north slope type, therefore, comprises stands in all stages of development from young lodgepole burns to mature stands of larch and Douglas fir. Even in the best places, however, fire and insects have worked together, doing so much damage that the forest seldom has much present commercial value." **"In the north slope type there is invariably a superabundance of seedlings wherever the shade is not too great."**

Forest Road Engineers with Horse-drawn Scraper

"Forest Service Engineers with Horse-drawn Scraper"

Merritt (1910) pg. 23: North Slope Type. WHITE FIR
While there are a great number of trees of this species, it is estimated that not to exceed 15% of the volume of any of them is merchantable, this amount being in the top logs. The lumber is chiefly used for boxes."

"Fishing Magone Lake" (1938)

In the Recommendations for Cutting Inferior Species on the Whitman National Forest, Starker (1915) also notes: **"North Slopes.** The **true north slope type is composed of the following species: Douglas fir, western larch, white fir, lodgepole pine and only an occasional yellow pine.** The yellow pine that does occur is usually mature and of good quality, **the dense stand making them clean themselves well; but this density prevents the growth of seedlings and small trees are rate, excepting where fire or windfall has made an opening."**

Whitman National Forest, Proposed Timber Sale Dry Fork Clear Creek (1911) pg. 4: **"North Slope Type**. This type comprises **almost one-half of the sale area, much of it containing little or no merchantable timber**. The species consist of Douglas fir, larch, lodgepole pine, and white fir, desirable in the order named."

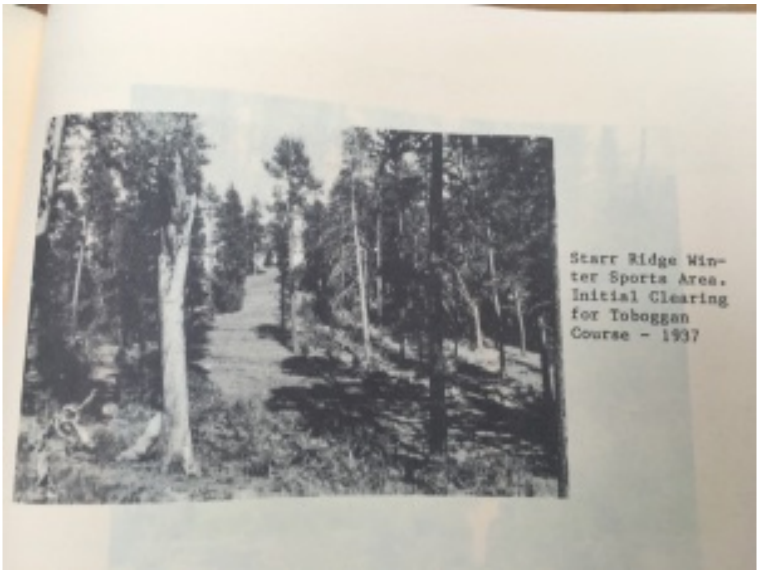
In The Relative Merits of Larch and Douglas Fir in the Blue Mountains, Oregon Bright, G., (1913) pg. 5 states: **"White and grand firs are more tolerant than either larch or Douglas fir and they generally compose the greater portion of the timber of the north slopes.**

Mining at Susanville 1901

Matz (1934) discusses "Yellow pine type" forests distinctly from "White Fir-Larch-Douglas Fir Type in his report Descriptive Report Middle Fork John Day River Timber Sale Project Malheur National Forest 1930. White fir is described as being "quite generally distributed", even in the Ponderosa pine type forest. Additionally, the report shows that the percent of acreage "in Yellow Pine Type" in the timber sale blocks varied greatly, and included a range from 28 to 66%. This report also describes pure yellow pine stands as occurring "only on small acreages". It is important to note that his description states that most Yellow pine stands commonly contain Douglas and white fir, as well as some Western larch. Also of note is that Matz (1934) describes a severe underestimation of White fir in typical silvicultural calculations in merchantable timber stands, meaning that tables found in other documents that quantify fir volumes (such as sale prospectus records), do not accurately reflect the true amount of fir on the landscape and in fact severely underestimate it.

"Skidding Logs to Landing – 1941"

Matz (1934) page 21: "Forest Types **Yellow Pine Type.** In the mature age class of this type there are trees of all age classes and a selection method of cutting is recommended. As a whole, the stand is rather light, the trees being widely spaced and more or less grouped. **Only small acreages of pure yellow pine stands occur on the project and it is customary to find Douglas fir and white fir quite generally distributed and occasionally some western larch.** Percentage of Acreage in Yellow Pine Type: Camp Creek 66%; Slide Creek 56%; Beech Creek 54%; Long Creek 28%; For the Project 59%". Pages. 23-24: **"White Fir-Larch-Douglas Fir Type** In this type there is a mixture of all species found on the project and the western **yellow pine occurring in it is found usually near the outer edges, or in the drier sites. The type prevails on the cool northerly exposures and in the higher elevations along the watercourses.**



"Starr Ridge Winter Sports Area, Initial Clearing for Toboggan Course – 1937"

Matz (1934) continues: "White Fir
The B. M. volume tabulated for this specie is computed for trees 24 inches and less d. b.h. Many of the trees of this species attain diameter sizes of 42" and occasionally more, but trees of such large size are worthless for lumber because of conk rot or windshake. **The defect in the larger trees is so pronounced that all trees 26 inches and more in diameter were excluded in computing the timber volume, they are accounted for in the tabulations by number only, under the classification of diseased trees." "White fir-larch-Douglas fir type – In this type there is a mixture of all species found on the project and the ponderosa pine occurring in it is found usually near the outer edges, or in the drier sites.** The type prevails on the cool, northerly exposures and in the higher elevations along the water courses."

“Hiyu Ranger Station in 1930 – Destroyed by fire in 1936”

Also from Matz (1934): Percentage of Acreage Block Name in Ponderosa Pine Type: Big Creek 52%; Indian Creek 57%; Galena 57%; Desolation 77%; For the Project – 55%”. Ponderosa pine forests contain “a fair sprinkling” of trees of all age classes. In addition, most Ponderosa forests contain numerous mixed conifer species.

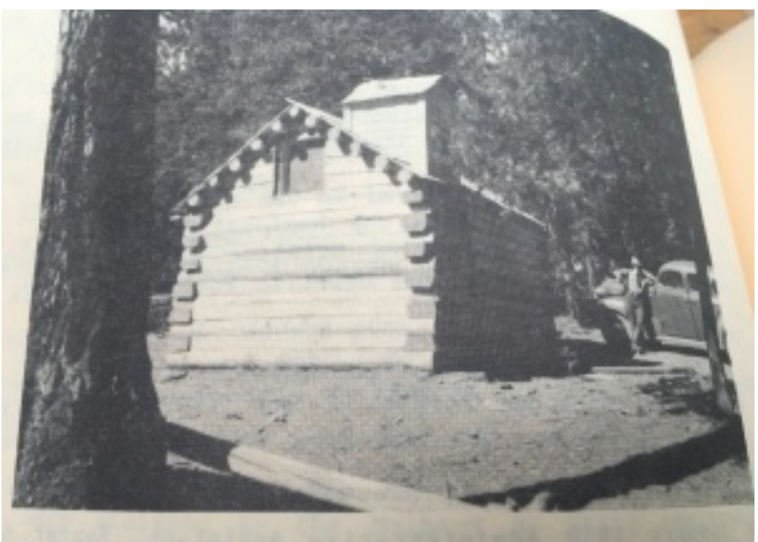
In the Malheur River Timber Survey Project Malheur National Forest Service 1927, Matz (1928) stated (pg. 31): “**Forest types: Yellow pine**: Throughout all of the mature age class of this type, there is a fair sprinkling of trees of all age classes which is highly desirable for cutting under the selection system. There is usually a mixture of inferior species of varying density along with the pine in this type.”“Smaller areas of pure pine stands one section and less in size occur in other parts of the project, but **throughout most of the area typed as pine there is a representation of Douglas fir, white fir, larch and lodgepole pine.”**

"Raddue Ranger Station – 1930"

"Loader Loading Truck and Trailer for Railroad Spur Several Miles Distant – Bear Valley Sale, Hines Lumber Company"

According to statements within the historical documents (see direct quotes here from Miles 1911, Matz 1934), white fir and other non-Ponderosa pine species were found throughout the area, and were also found throughout Ponderosa pine type forests including in mature Ponderosa pine forests.

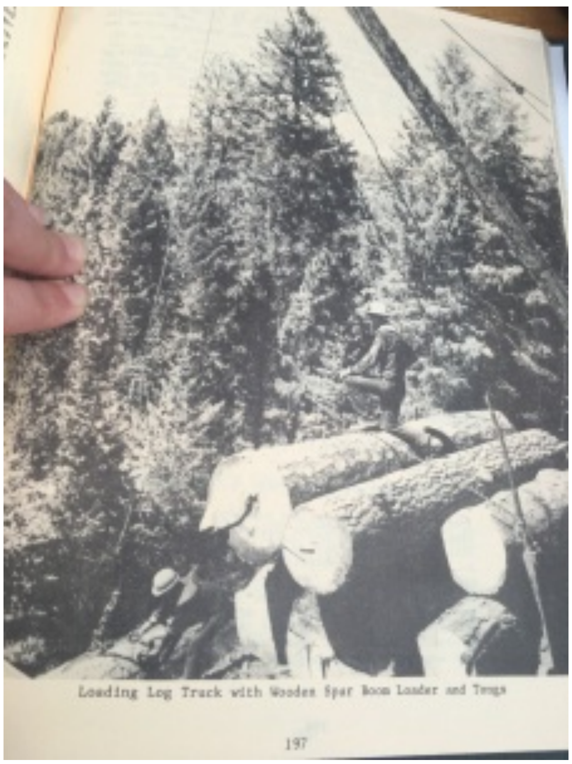
Miles (1911) from the Annual Silvicultural Report Malheur National Forest states on pgs. 4-5: "SLOPE TYPE. (a) The slope type comprises approximately 60% of the Forest. (b) The type, which has an approximate altitudinal range of from 3,000 to 7,000, or 7,500 feet, has a hot, very dry summer climate with no rainfall from about the first of June to the first of October. The winters are severe with much snow and strong west and northwest winds. Rain is fairly plentiful during spring and autumn. On the lower slopes frost occurs from early fall to late spring, while on the higher slopes the occurrence of frost probably extends over a longer period. The type, as has been stated, may be divided into two classes, the south slope and the north slope. The south slope is found on the long slopes of montain {mountain} sides having a moderate to fairly steep ascent and bearing alluvial soil on the lower slopes and rocky glacial-drift on the upper slopes. Benches and minor ridges frequently break the continuity of the slope, and frequent outcropping of rimrock are found at the upper edges of the type. The north slope is found on a very steep, rough canyon sides. The soil is alluvial near the bottoms of the canyons, and above it is rocky glacial-drift. (c) The best and most important timber occurs in this type. The stand on the south slope is composed chiefly of yellow pine, with a sparse mixture of Douglas fir. Toward the tops of the slopes Douglas fir becomes more prominent, forming nearly one-half of the stand, and white fir appears.



Snow Course Shelter - 1937 - Prairie Ranger Distric

"Snow Course Shelter – 1937 – Prairie Ranger" District

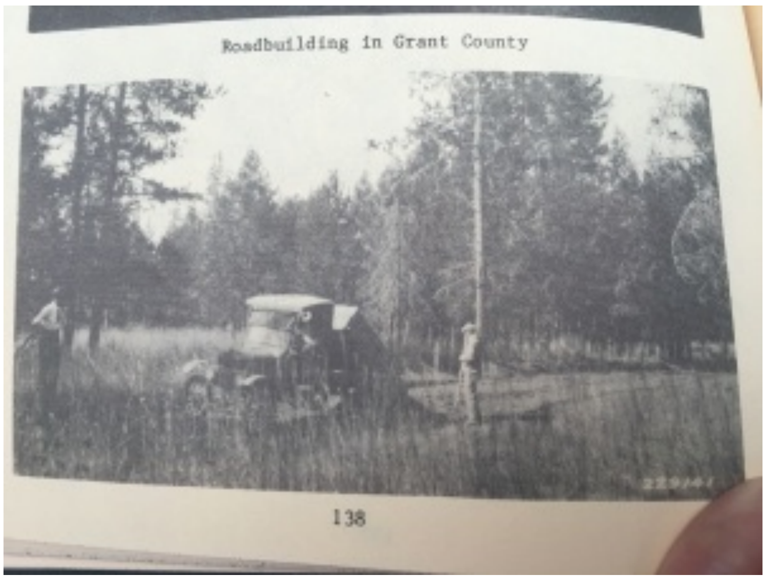
Miles (1911) goes on to state that: "**The north slope stand is composed of Douglas fir, white fir, and western larch in about even proportions, with scatteringly yellow pine.** Very excellent yellow pine is found at the upper edges of the north slopes, showing its delight in cool, fairly dry and well lighted situations. Throughout both slopes are found dry knobs bearing juniper and mountain mahogany. The stand on the north slopes is much denser than that on the south slopes, being composed of much more tolerant trees. The stand on both slopes is mainly of standards and veterans, with large poles. Reproduction on the south slopes is excellent in wells and only fair under the mature timber. **Reproduction on the north slopes is generally good throughout the stand.**"



"Loading Log Truck with Wooden Spar Boom Loader and Tongs"

Matz (1934) also gives different descriptions for the different forest types, and Ponderosa pine type is clearly differentiated from other types. Note that the area described by Matz (1934) in the Descriptive Report Middle Fork John Day River Timber Survey Project overlap with the Big Mosquito project area. Numerous timber sales throughout the Malheur National Forest make similar claims to those in the Summit project, i.e., that forests within the project areas should be less dense, and contain a greater proportion of Ponderosa pine and other early seral species in order to be in line with historic norms.

On a larger scale, according to Miles (1911) in Annual Silvicultural Report Malheur National Forest 1911, the general Malheur region has 60% slope type of forest (elevation 3,000 to 7,000 or 7,500'). If 60% is an accurate estimate, then the proportion of the "slope type" that faces a southern exposure is a percentage of this (perhaps half?). This would mean that the southern exposure, which has more dominant mature Ponderosa pine forests, would only occur on percent of the forest equal to much less than 60%. Estimates are of course rough and would also depend on general landscape aspect.



"Roadbuilding in Grant County"

Matz (1928) in the Malheur River Timber Survey Project Malheur National Forest Service 1927 noted that White fir dominated mixed conifer stands: **"White Fir-Larch-Douglas Fir type:**
This type occurs in three age classes on the project and is found mostly on the north slopes or along cool stream beds. It is composed of a mixture of practically all of the commercial species found in the region, and western larch is almost always in evidence. **White fir is the most prominent species in the type."**

The Sale Prospectus Camas Creek Unit, Umatilla National Forest (1937) states (pg. 11) that within the project area: "Ponderosa pine type—**Very little of the ponderosa pine type in the proposed sale unit consists of a pure stand. The pine is usually found in mixture with other species.**

"Loading Chrome-bearing Ore for Hauling to Railroad""Loading Chrome-bearing Ore for Hauling to Railroad"

Starker (1916) in the Annual Technical Report Whitman National Forest Service Instructions for Marking Timber in the Western Yellow Pine Region Pacific Northwest stated (pg. 8): "Stands with little or no yellow pine: This is the kind of an area which is typical of the transition type, and since it contains practically no yellow pine, is usually excluded from the timber sales. However, such areas often occur on the north slopes in patches and if in any considerable size the logger should not be forced to go in and cut, the cost of logging being very high and the acreage value of the material secured generally very low."

"Road Maintenance Mess Wagon at Myrtle Rock – 1937

Matz (1928) in the Malheur River Timber Survey Project Malheur National Forest Service 1927 also stated: **“Most of the larger trees of this species [White fir] are unmerchantable because they are rotten and shaky. When computing the volume of this species, trees indicated as more than 26 inches d.b.h. were considered culls and the volumes of same were not compiled.”**

Descriptions suggest that Abies spp., Douglas fir, and Larch dominated in mixed-conifer stands to a much greater extent than is regularly concluded in USFS projects, (for example in the Summit scoping package). It is also interesting to note that Grand fir were considered weeds to be eradicated. Excerpts from Munger (1917) Western Yellow Pine in Oregon:

ASSOCIATES.

The associates of yellow pine in mixed stands are variable, and depend upon the locality. In the Blue Mountains western larch (*Larix occidentalis*) is its usual companion and grows with it in an intimate and harmonious mixture. In the moister situations white fir (*Abies concolor*) is a common associate, as is also Douglas fir (*Pseudotsuga taxifolia*) in most parts of the State. All of these species occur to a large extent in groups by themselves; in the Blue Mountains it is common for the south slopes to be covered with a fine stand of yellow pine, while the north slopes are covered almost entirely with larch, white fir, and Douglas fir. Lodgepole pine (*Pinus contorta*) is another common member of the mixed forests, particularly along the eastern slopes of the Cascades. It is a thrifty and militant species, and has the ability to occupy burns to the exclusion of all others. With the help of periodic surface fires, which have encouraged its reproduction and at the same time discouraged the reproduction of yellow pine, it has been able to encroach upon land where yellow pine might be growing.

B. *Mixed stands with some yellow pine.*—This is the kind of timber that is characteristic of the north slope subtype in the Blue Mountains. This class of land is well adapted to the growth of yellow pine; and, therefore, this species should be favored in marking in preference to all other species. Yet the species of secondary importance, Douglas fir and western larch, should not be marked heavily except where by so doing young yellow pines already in the stand will be directly benefited. This practice is advisable for two reasons: (1) At the present time Douglas fir and western larch in yellow-pine sales are undesirable to the purchaser and do not bring a price commensurate with what they will be worth in the future, and (2) it seems better to mark these secondary species lightly now and have the assurance of an early second cut than to make a heavy cutting now and as a result not obtain a second cut until the remote future, even though by the heavier cutting more yellow pine might be gotten into the future stand. In other words, do not sacrifice now any thrifty Douglas fir and larch unless the silvicultural conditions and composition of the forest is going to be directly benefited. The marking, therefore, should conform to the following principles, supplementing those under "General Principles:"

1. Consider white fir, grand fir, and lodgepole pine as forest weeds to be marked to as low a diameter as is consistent with the terms of the timber-sale contract and justice to the purchaser, both in order to strive to decrease the proportion of these species in the forest and to give place to more desirable species.
2. Consider Douglas fir and western larch not as undesirable species, but as species of secondary value.

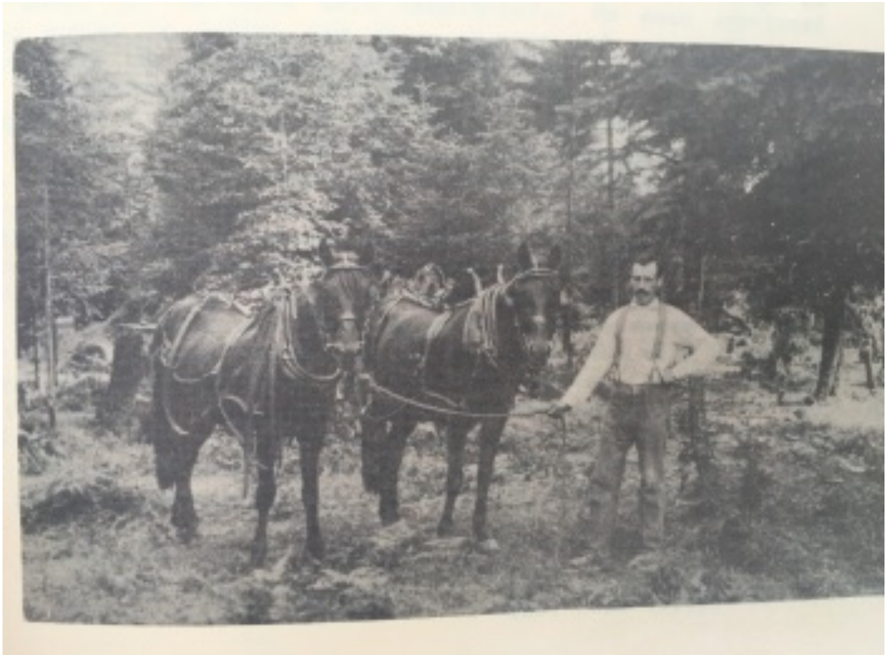
Therefore, mark only such thrifty Douglas fir and larch as are in active competition with good yellow pines, or with superior Douglas firs and larches. For example, where a Douglas fir (or larch) and a yellow pine, both thrifty and of the same character, are growing side by side, one to be reserved and the other removed, the yellow pine should be reserved and the species of secondary value cut. In choosing between a Douglas fir and a larch, preference should be shown the larch except in situations not well adapted to this species.

8. In general, the species should be favored in marking in the following order of preference: Western yellow pine, sugar pine, western larch, Douglas fir, white (or grand) fir, and lodgepole pine. The last two species should be considered forest weeds, and always marked heavily where better species are present.

The forests of this region may be, for the convenience of discussion, grouped into three classes: (A) practically pure stands of yellow pine; (B) mixed stands in which there is a good deal of yellow pine; (C) mixed stands in which there is little or no yellow pine. The marking in each type involves some considerations peculiar to that type.

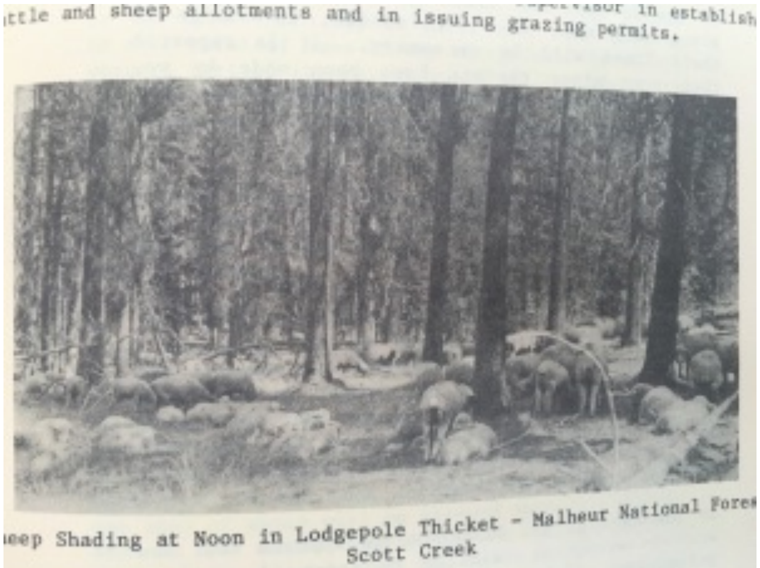
“Frazier Point Lookout”

Conversion of uneven-aged Ponderosa pine stands to even-aged stands began at the turn of the century. In an official notice included as a preamble letter to responsible officials with the Bright (1912) report: “In preparing this, it strikes me that it would be well to discuss more fully than is done in either Bright’s or Munger’s reports **the possibility and the advisability of converting uneven-aged stands of yellow pine into even-aged stands**. The intolerance of the tree and the fact that in parts of its range it occurs in large, even-aged groups seem to indicate that the tree is adapted to management in even-aged stands. Doubtless better yields could be obtained from stands of this character. **While the change from uneven-aged to even- aged stands in your District may not be practicable at the present time and may involve risks in securing good reproduction on cut-over areas, I feel that this phase of the management of the species deserves serious study.”**



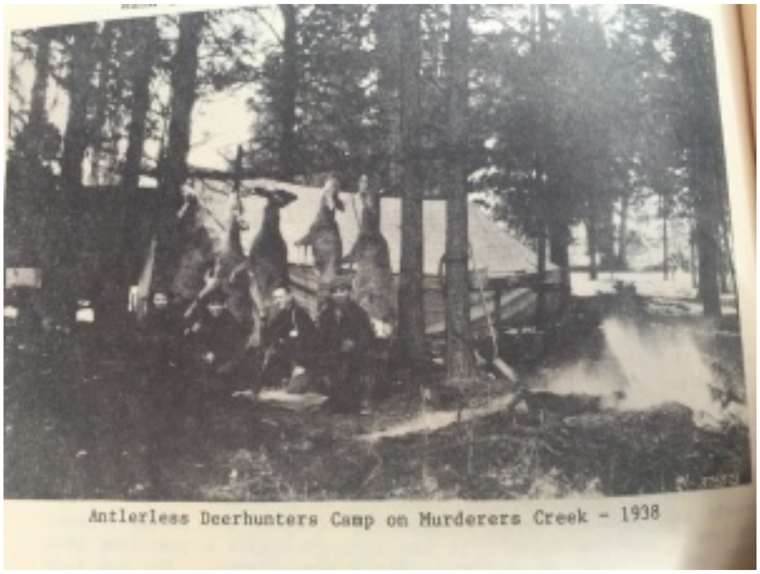
“Settler with Team”

Weidman (1921) **discussed in his paper Forest Successsion as a Basis of the Silviculture of Western Yellow Pine, how Ponderosa pine forests were being converted from irregular and uneven aged-aged stands to even-aged stands. It is important to remember that this paper refers to “pure yellow pine forest”, which was relatively rare on the landscape (as discussed in this document). Nevertheless, it is interesting to note that Weidman’s account suggests clumps of young growth, and uneven-aged more multi-story structure for pure Ponderosa pine forests than is commonly discussed today. This may be contrary to the common USFS practice of often seeking to convert Old Forest Multi-Strata into Old Forest Single Strata. “In general the pure yellow pine forest is characterized by open, irregular and uneven-aged stands with a preponderance of mature and overmature trees. In addition there is generally an excellent ground cover of advance reproduction made up partly of dense groups of seedlings here and there in the openings of the forest, but mostly of uniformly distributed and suppressed little seedlings struggling along directly under the overwood.”**



"Sheep Shading at Noon in Lodgepole Thicket – Malheur National Forest Scott Creek"

Weidman (1921): **"It is important now to consider what sort of a forest this remaining stand after selection cutting will develop into and how the proposed periodic cuts at 60-year intervals will affect it. From old private cuttings, a few of which are already 50 years old, it is possible to get a very good idea what the development will be. The private areas cutover previous to years ago had practiced upon them a partial cutting method similar as far as the number of trees left per acre is concerned, to the present selection method on timber sales. Thus the old logger's cutting and the present timber sale cutting are comparable in effect. On these old cut-over areas–and there are many thousands of acres of them–there are uniformly dense stands of yellow pine second growth which are practically even-aged."**



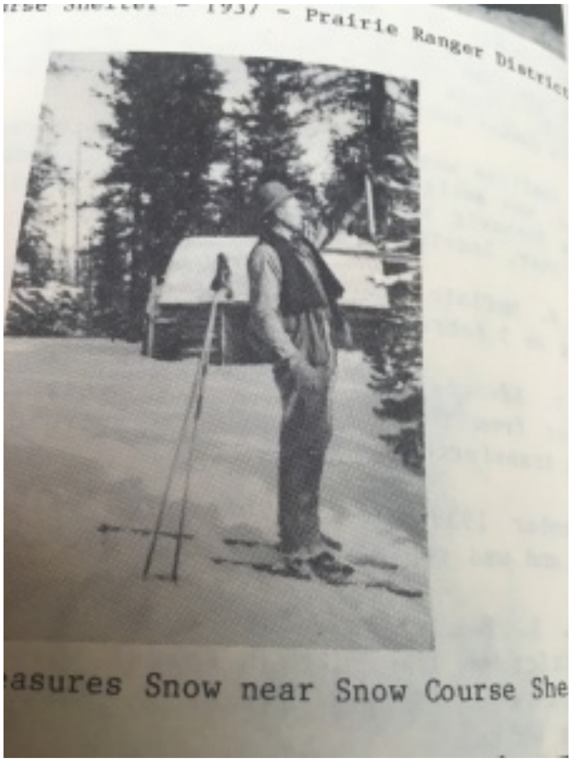
"Antlerless Deerhunters Camp on Murderers Creek – 1938"

More from Weidman (1921): **"This prevailing occurrence of practically even-aged masses of second growthon large areas of old cuttings indicates what will be the future condition of our timber sale areas. If upon these old cuttings the remaining or overwood trees should be removed, the 'young growth would then absolutely make an even-aged yellow pine forest in the sapling stage. In the case of the 50-year-old miners' cutting near Galena, such a removal of the overwood trees was actually effected a number of years ago–by the early settlers for the purpose of getting conveniently located firewood–and the forest now on the ground is a pure, even-aged stand of poles. With this succession of even-aged young growth after heavy selection cutting on old private areas prevailing so universally, it is safe to expect with the passage of time, the same sort of succession after timber sale cutting. If the future is looked into 60 years hence to the first periodic cut when most of the present overwood will be removed, it is not inconceivable that the liberated underwood will then be a stand of small poles very similar to that on the old miner's cutting at Galena. The statement that western yellow pine, now almost everywhere a many-aged forest in its virgin condition, will develop after heavy cutting into an even-aged forest will perhaps be difficult for most foresters to accept unchallenged. But there is no doubt of the ultimate acceptance of the idea, for the proof of it already exists."**

"Rangers Elliot and Ward Recording Snow – 1936"

Other historical accounts document the prevalence of uneven-aged Ponderosa pine forests. For example, in the Head Watershed Middle Fork of the John Day River Whitman National Forest Oregon 1910, Merritt (1910) notes that Yellow pine forests were predominately uneven-aged: On pg. 11 (discussing specifically Yellow pine type forests): **"The forest is uneven aged, being composed of a stand of large mature and overmature trees, young immature pines, known locally as "bull" pines, and large numbers of seedlings, saplings, and poles**." Pg. 29: **"Since the yellow pine type is essentially uneven aged, it should be treated as a selection forest, bearing in mind that it is now overstocked with mature and overmature trees."**

Starker (1916) discusses Yellow pine in eastern Oregon and Washington, and notes that this forest type consists primarily of uneven aged stands. Pg. 4: "**Since these forests are primarily uneven aged,** they should be managed by the selection system, (or a modified form of the selection system)."



"Chick Watson Measures Snow near Snow Course Shelter"

GRAND FIR WERE HISTORICALLY TARGETED FOR REMOVAL

There is evidence to suggest that especially when it occurred with Ponderosa pine, fir was targeted for removal on a widespread, landscape scale basis across the Blue Mountains. Historic accounts show that regional direction existed to remove firs, and give preference to tree species more desirable for timber production. This was true even where firs were documented to be very well represented or be the dominant species in the stand. Exceptions were stated to be when Ponderosa pines were completely absent and unlikely to tolerate the site and firs were needed to stabilize soils for the purpose of protecting creeks in those situations (such as in deep gulch situations). Silvicultural practices have directed favoring Ponderosa pine for future recruitment since the turn of the century, and this stated wholesale conversion of mixed conifer stands to Ponderosa pine stands needs to be recognized by the USFS. Given this conversion of mixed Ponderosa pine stands to pure or near-pure stands, as well as other historical evidence of a heavy fir component including in Ponderosa pine stands, there is little reason to believe that fir spp., including Grand fir, are severely overrepresented in these stands as is stated by the USFS. Also, later historic accounts may have included a landscape in which firs had already been targeted for removal and were underrepresented in Ponderosa stands across the landscape. North slope areas were sometimes left uncut because they were not considered sufficiently commercially profitable due to their predominately fir composition.

"Tom Bennett and A.F. Meyers Packing Doe to Camp – 1938"

<u>Miles (1911) pg. 6:</u> "The mature and over-mature timber on the north slopes should be removed and the poles left for a future crop. The white fir which is of low value, should all be removed and preference given to Douglas fir and western larch."

<u>Starker (1916)</u> in the Annual Technical Report Whitman National Forest Service Instructions for Marking Timber in the Western Yellow Pine Region Pacific Northwest states on pg. 5: "Most Desirable Species.
In general, the species should be favored in marking in the following order; western yellow pine, Douglas fir, western larch, lodgepole pine, and white fir. Yellow pine is far ahead of any of the other species and should always be given the preference and encouraged to replace one of the more inferior species. Douglas fir, because of its slow growth, is very strong, and yields a good growth of construction timber. It is quite free from defect. Western larch, especially in the larger diameters, is very susceptible to shake, and these are usually filled with pitch. This brings down the general value of larch, although the lumber is especially well adapted for construction work coming in contact with the ground, being very decay resisting. Lodgepole would receive more consideration except for its small size, as it produces a high grade of common lumber, soft in texture, and with small tight knots. **White fir in this region is very poor and should be considered a weed. If merchantable, heavy marking should be the rule, especially on the yellow pine areas**. Trees of this species over 16 inches D.B.H. are seldom sound because of the heavy attacks of indian paint fungus (Echinodontiom tinctorum) which gain access to the tree through frost cracks and fire scars."

Loading Flatcars with Logs - 1941

"Loading Flatcars with Logs – 1941"

Starker (1916) states (pg. 7), regarding "practically pure stands of yellow pine": **"On these areas special endeavor should be made to eliminate all the inferior species, leaving the yellow pine in as pure a stand as possible."**

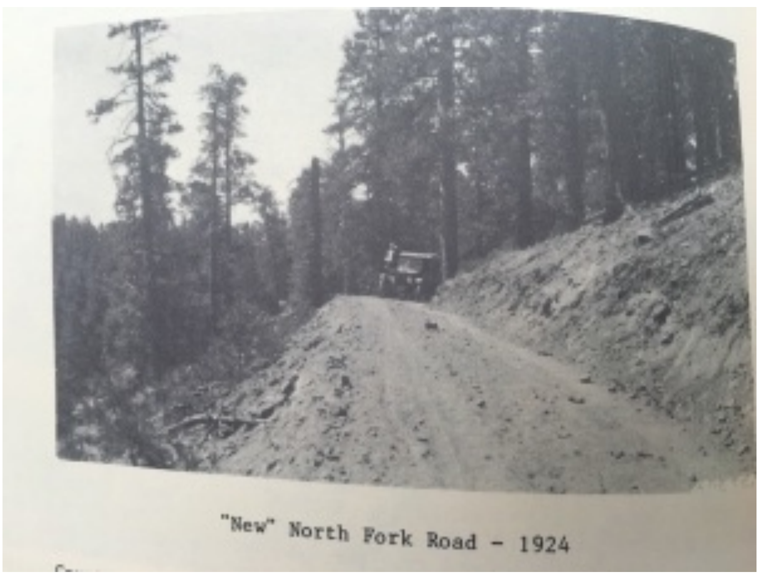
Starker (1916) goes on to state (pg. 8): "**Mixed stands with considerable yellow pine:**
These north slope areas are well adapted to the growth of yellow pine and perhaps grow a better grade than do the south slope areas. Therefore this species should be favored in marking in preference to all other species, for they, being able to reproduce in dense shade, are competing very severely with the yellow pine. Next to yellow pine, Douglas fir and western larch should be encouraged and the other species cut to a low diameter limit. Judgment will be of value as to where to draw the line between "B" and "C" stands [Mixed stands with considerable yellow pine vs. Stands with little or no yellow pine]."

“Skidding Logs to Loading – 1941”

The Western Yellow Pine Region (Northern Division) for General Instructions for Marking Timber on National Forests (1908) states: **“Balsam and white fir should not ordinarily be left in mixture with better species. In cold deep gulches where either grows to good size and spruce is wanting, they may be left. Leave the firs only where needed to protect the watershed, or for seed in default of better species. All trees which will cut one merchantable log should be marked for removal, and the destruction of balsam and white fir reproduction should be permitted in logging operations, but only where reproduction of more valuable kinds may reasonably be expected to take its place.”**

“Badger Mill at Susanville 1901”

Starker (1915) in the Recommendations for Cutting Inferior Species on the Whitman National Forest: **"Yellow Pine Types** On the slopes commonly known as Yellow Pine Types, where yellow pine is the principal tree, with Douglas fir, western larch, white fit and lodgepole occurring only singly or in small scattered groups, **the cutting should be heavy in the inferior species.** The logger being on the ground can easily afford to take out the small percentage of fir and larch along with the pine, as he has his railroad in and his skidding trails swamped out. **Silviculturally it is good policy to remove a big percentage of the inferior species** occurring on these slopes, because they are occupying valuable space that could as well or better produce a yellow pine selling at $3.00 per thousand as a western larch, which is financially immature, selling at $1.00, as the pine is at home while the larch is out of its proper site on a dry south slope."



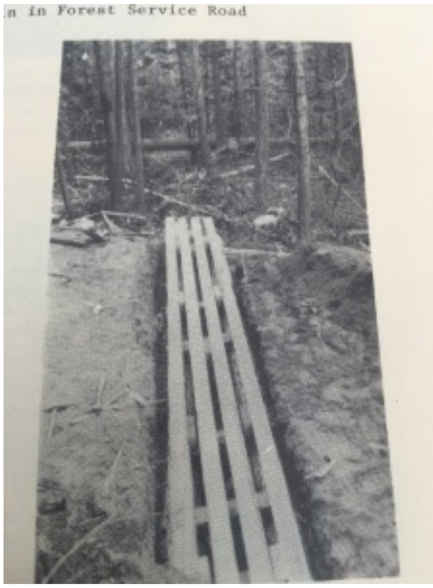
"New" North Fork Road – 1924"

Starker (1915) goes on to state: **"All the unmerchantable white fir growing on the yellow pine areas should be cut under the snag clause, giving additional room for yellow pine."** "The north slope areas, because of the loss commercially and the impossibility of practicing intensive silviculture at this time should be left in a virgin condition. Certain scattered north slope areas may possess enough yellow pine to make it profitable to log them, but this can only be decided in the field. In case the financial or market conditions change so that the lumberman desires more of the inferior species he should first be given the creek bottoms, next the smaller and more isolated patches of fir and larch and lastly the larger areas. This is to leave the inferior species in as compact bodies as possible to later facilitate and cheapen the cost of logging….In the yellow pine type the inferior species should furnish at least 10% of the total volume cut. From assurances of certain lumbermen operating in this region they would be willing to take this amount to keep up their stock and to use around the mill and yard….This 10% will enable the marking of all trees that should be removed; that is, all trees that are either mature, defective or a severe wind risk, and will leave the area stocked with young, thrifty trees, making good growth for the return crop."

orraine Watson - Lookout on Antelope Mountai

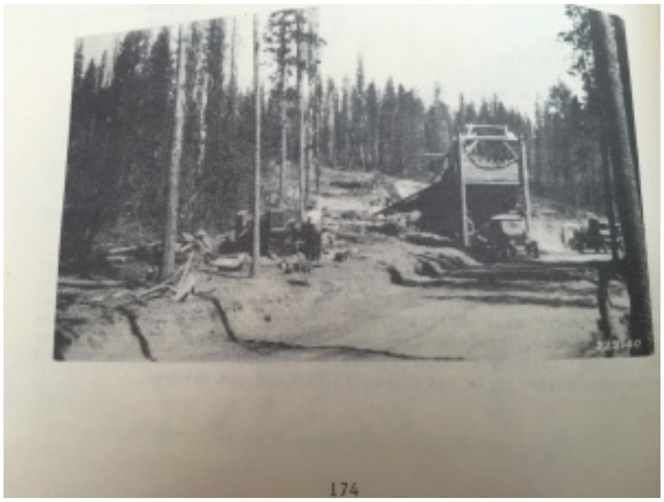
"Lorraine Watson – Lookout on Antelope Mountain"

<u>Proposed Timber Sale Whitman National Forest, Proposed Timber Sale Dry Fork Clear Creek (1911).</u> The area applied for embraces that part of Clear Creek drainage locally known as the Dry Fork Clear Creek. "It is bounded on the north by the Forest boundary; the northern part of the east side is the Forest boundary, the major portion of the east boundary being the divide between this drainage and Squan Creek, which divide is part of the western boundary of the Wm. Eccles and Company Sale of 12/22/10; on the south by the divide between the Middle Fork John Day and the South Fork of Burnt River, which is the boundary line of Baker and Grant Counties; on the west by the divide separating the drainage of Dry Fork and the Main Fork of Clear Creek." Pg. 3: "Except for the cutting of a few trees and poles in several places throughout the tract for the purposes of sheep corral constructions, there are no old cuttings on or very near the area."



“Installation of Cross Drain in Forest Service Road”

Proposed Timber Sale Whitman National Forest, Proposed Timber Sale Dry Fork Clear Creek (1911) continues: pg. 11: “North Slope Type. Yellow Pine in Mixture. In this type no such plan as outlined under yellow pine type can be followed. In these situations yellow pine usually grows tall and has scanty crowns, ordinarily precluding retention for seed trees even, owing to their undesirability for this purpose and susceptibility to windthrow. Therefore ordinarily, only such trees should be left as have good seed crowns and those which are not liable to windfall. Where there are an insufficient number of trees left to insure reseeding, artificial seeding should be done in the roads over which logs have been skidded. The soil in these places having been well disturbed, makes an excellent seed bed. By this means a nucleus stand may be had. Douglas fir in these situations should be considered the next desirable species. Thrifty trees of this kind 20 inches in diameter and under should be left. Western larch in such situations, unless growing in gulches or moist places, does not ordinarily attain a diameter greater than 18 or 20 inches before dying. The cause of this is unknown, but probably due to moisture conditions. Since this condition prevails in general where there is a sufficient amount of other species to warrant logging, it would be well to mark larch to as low a diameter as is practical for an operator to handle. **White fir is usually totally worthless except for a few of the young trees. All that it is practical to handle should be removed.** North Slope Type This type of forest is, for the most part, un-merchantable. At the present time it cannot be expected that any great amount of this type can be exploited. Since by the time the next cutting cycle is here the predominant species in this and the preceding type will be of value sufficient to warrant extensive exploitation, it is not believed to be good policy to sacrifice…”

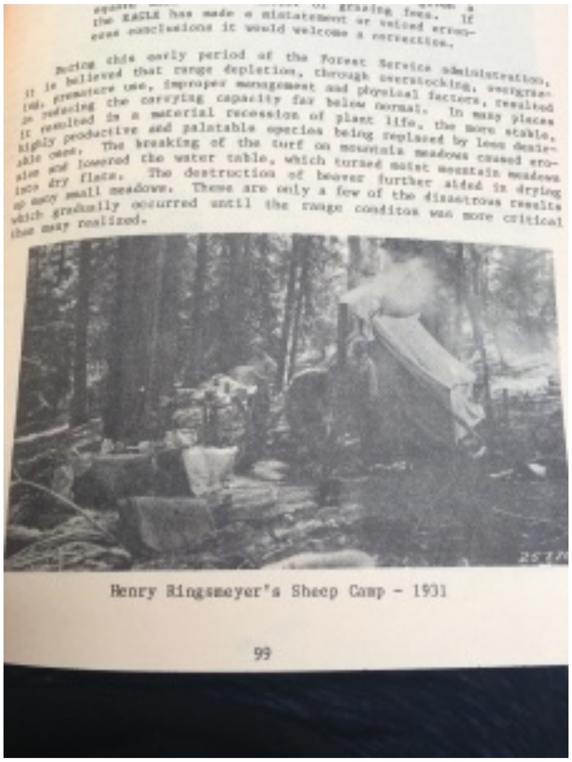


"Loading Chrome-bearing Ore for Haul to Railroad"

Merritt (1910) pg. 29: "RULES FOR MARKING TIMBER AND FOR HAULING SALE
Marking must be done differently in each of the different forest types. The remarks concerning any one type, however, apply equally well in all Blocks. The species to favor throughout the whole area is western yellow pine wherever there is likelihood of that species growing successfully. In other situations, western larch and Douglas fir are most desirable. White fir is always a weed tree and every effort should be made to rid the forest of this species." Pg. 32: "White fir and lodgepole should be considered undesirable and no effort should be made to reproduce them unless no other species are present."

EXTENSIVE OVERGRAZING DURING THE TURN OF THE CENTURY MAY HAVE CREATED ARTIFICIALLY OPEN FOREST STANDS IN SOME AREAS.

Wernstendt 1906 (pg. 8) in A Favorable Report on a Proposed Addition to the Blue Mountains Forest Reserve: "The condition of the open range is, however, in a state of rapid deterioration, and the grass cannot be compared at all with what it used to be or with what it ought to be. According to everybody this used to be an exceptionally fine feed country with the grass knee deep. Now the grass is more open, more stunted, and on a base that is smaller and thinner. The condition of the timbered range is decidedly poor. Over portions the grass cover is destroyed by the sheep."



... of grazing fees. ... the EAGLE has made a misstatement or voiced erroneous conclusions it would welcome a correction.

During this early period of the Forest Service administration, it is believed that range depletion, through overstocking, overgrazing, premature use, improper management and physical factors, resulted in reducing the carrying capacity far below normal. In many places it resulted in a material recession of plant life, the more stable, highly productive and palatable species being replaced by less desirable ones. The breaking of the turf on mountain meadows caused erosion and lowered the water table, which turned moist mountain meadows into dry flats. The destruction of beaver further aided in drying up many small meadows. These are only a few of the disastrous results which gradually occurred until the range conditon was more critical than many realized.

Henry Ringsmeyer's Sheep Camp - 1931

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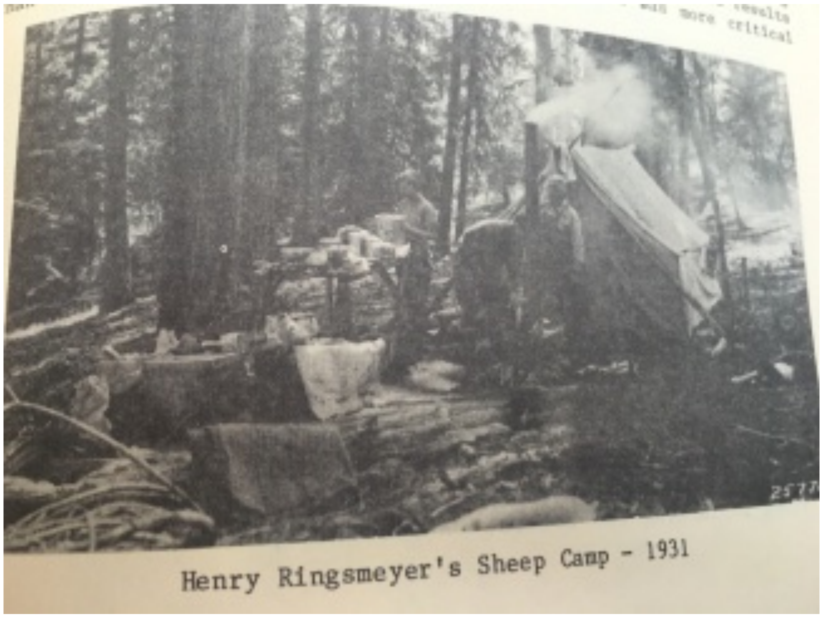
"Henry Ringsmeyer's Sheep Camp – 1931". Note the description of extensive overgrazing in the paragraph above the picture.

<u>Tucker 1940:</u> "In the Northern Blues:

Sheep and cattle began to graze in what later became the Umatilla National Forest to a limited extent about 1875. The use of the forest area for summer grazing increased from year to year, particularly insofar as the sheep were concerned. In these earlier days the grazing of cattle in the mountains was confined to the outer edges of the timber and in the lower canyons along the fringes of the settlements. More and more sheepmen began to use the mountain ranges until there were so many sheep in the mountains that each band was confined to a small area. There would be a grand rush of the sheepmen to the mountains as soon as the high country was free of snow with the idea of being first on the ground and getting the pick of the range."



"Henry Ringsmeyer's Sheep Camp – 1931"

Sparkawk (1918) discusses using grazing as a strategy to reduce understory fuels, and posits that this could affect fire behavior. This suggests that grazing may have artificially decreased understory vegetation. Since overgrazing was widespread and extensive, artificially open forests may have been widespread across the landscape. Sparhawk (1918): "White fir and lodgepole should be considered undesirable and no effort should be made to reproduce them unless no other species are present."

EFFECT OF GRAZING ON WESTERN YELLOW PINE. 27

PROTECTION AGAINST FIRE.

The most important benefit to the forest which can be attributed to grazing is the reduction in quantity of inflammable ground cover and the consequent decrease in fire hazard. It is not probable that the number of fires can be reduced in this way, but their intensity and consequently their size and the amount of damage done, is bound to decrease with a decrease in the quantity of fuel on the ground. This is particularly apt to be true in a forest of the western yellow pine type, where fire seldom runs in the crowns but nearly always on the ground. If the ground cover is scanty, the older timber is to a certain extent immune from serious damage by surface fires and there is more likelihood that occasional patches of reproduction will escape destruction. Entire denudation of the soil, such as occurs on much-used bed grounds and along driveways, absolutely prevents fires from spreading in such places, but of course destroys any reproduction which may be present. Light or moderate grazing does not remove enough of the cover to stop fires, but may considerably reduce their heat and rapidity of spread and make them easier to combat.

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